

UNIVERSIDAD DE OVIEDO

CENTRO INTERNACIONAL DE POSTGRADO

MASTER EN INGENIERÍA MECATRÓNICA

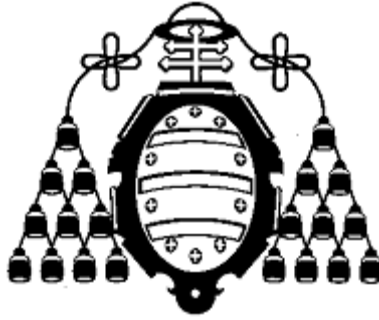
TRABAJO FIN DE MÁSTER

MEJORA DE CÉLULA DE SOLDADURA DE ÁLABES

JULIO DE 2015

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ANEXOS

ÍNDICE DE LOS ANEXOS

1.	ANEXO I: CÁLCULOS.....	1
1.1.	CÁLCULO DEL PAR DE ACCIONAMIENTO NECESARIO.....	2
1.2.	CÁLCULO DE ESFUERZOS SOBRE EL ENGRANAJE.....	4
2.	ANEXO II: DIAGRAMAS	6
3.	ANEXO III: PROGRAMACIÓN PLC'S	11
4.	ANEXO IV: MATERIALES	31
4.1.	ACERO S275-JR.....	32
4.2.	ACERO F-1110.....	32
4.3.	ACERO F-1140.....	33
4.4.	POLIURETANO OBOMODULAN®	34
5.	ANEXO V: HOJAS DE CARACTERÍSTICAS	35
5.1.	COMPONENTES MECÁNICOS.....	36
5.2.	COMPONENTES NEUMÁTICOS.....	62
5.3.	COMPONENTES ELÉCTRICOS Y ELECTRÓNICOS.....	79

ANEXO I

CÁLCULOS

1. ANEXO I: CÁLCULOS

Se presentan a continuación los diferentes cálculos realizados para el desarrollo del diseño de la alternativa presentada para la célula de soldadura de álabes optimizada.

1.1. Cálculo del par de accionamiento necesario

Para el diseño de la mesa giratoria finalmente seleccionada, se hace necesario evaluar el par requerido para la ejecución del movimiento, de manera que se posibilite con ello la elección del motorreductor precisado para tal función.

El sistema consta de una corona de giro dentada, sobre el que se instala el bastidor de soporte de los utillajes. Además se incorpora un bastidor exterior como segundo apoyo de los mismos que se desplazará sobre bolas de transferencia. Se deduce por tanto que el par resistente que debe ser superado por el motorreductor proviene principalmente de las resistencias a la rodadura de ambos elementos. No existe ningún otro tipo de esfuerzos o cargas que generen mayores requerimientos.

Para la estimación del par resistente se recurre al método de cálculo planteado por el fabricante de coronas Tecnogiro, a través del cual y en base a una serie de parámetros allí definidos, se hace posible conocer el par resistente que ofrece el sistema.

Para el cálculo de la resistencia al movimiento presentada por el conjunto de las bolas de transferencia no existe ningún método específico suministrado por el fabricante. Debido a que se esperan resultados de esfuerzos relativamente bajos que serán ampliamente superados por el motorreductor más pequeño, se hace una simplificación a través de la cual se considera que el par resistente al giro presentado por las bolas de transferencia sobre la pista externa será el doble del calculado para el rodamiento interior.

Se decide adoptar esta simplificación en base al peor contacto y menor cantidad de elementos rodantes del sistema de rodadura exterior, sabiendo que en la realidad el par ofrecido será inferior (se plantea un diseño del lado de la seguridad). En el supuesto caso de que el par resultante de los cálculos fuese elevado obligando a la selección de un motorreductor más potente, se deberá proceder a un nuevo cálculo más exacto para precisar la verdadera necesidad.

Según el fabricante Tecnogiro el par resistente al giro generado por la corona debe ser calculado según:

$$M_w = \frac{D_L}{2000} \cdot (\mu \cdot k \cdot \left(M_k \cdot \frac{1000}{2000} + \frac{F_r \cdot f_L}{D_L} + F_a \right) + \frac{D_L \cdot W_R}{1000}) \quad (1)$$

Donde:

$D_L = 890$ mm	Diámetro primitivo de rodadura de los elementos rodantes
$\mu = 0,01$	Coefficiente de rozamiento (obtenido de tabla del fabricante para corona elegida)
$k = 4,37$	Factor de distribución de carga (obtenido de tabla del fabricante para corona elegida)
$M_k = 0$	Momento dinámico de vuelco (las cargas existentes no generan momento de vuelco)

$F_r = 0$	Carga dinámica radial en la rodadura (la única carga radial que puede aparecer es debida a la fuerza centrífuga, y en base a las bajas velocidades planteadas, puede ser despreciada)
$f_L = 1,73$	Factor de pista de rodadura (obtenido de tabla del fabricante para corona elegida)
$F_a = 0,08 \text{ kN}$	Carga dinámica axial en al rodadura (peso total soportado por el rodamiento)
$W_R = 0,21$	Fuerza de rodamiento resultante de las obturaciones, jaulas, etc. (de tabla proporcionada por el fabricante para corona elegida)

La carga dinámica axial en la rodadura se considera como el peso soportado por el rodamiento, que es la única carga presente en el sistema. Para su cálculo se considera el peso del bastidor de soporte interior y la mitad del peso de los 8 utillajes y álabes colocados sobre la mesa (la otra mitad se transfiere al bastidor exterior). Para el cálculo exacto se consideran los volúmenes y densidades de los materiales respectivos de cada elemento (aceros, fibra OBOMODULAN, etc.).

Del diseño planteado y los cálculos realizados se obtiene un peso total del bastidor interior de 39,27 kg. A ello se debe añadir la mitad del peso de los elementos de fijación radial, que asciende a 12,19 kg.

Se calcula por otro lado el peso de cada utillaje, incorporando además las bridas y otros elementos instalados. El peso final del utillaje en vacío resulta de 4,22 kg.

Adicionalmente se considera el peso del álabe de mayor tamaño soldado en la célula que es de 1,6 kg.

Con todos estos pesos, y considerando que la mesa dispone de 8 utillajes y álabes, se obtiene una carga axial final de 673,59 N.

Debido a que la célula se emplea para la soldadura general de álabes, y que pueden existir modificaciones de diseño futuras que varíen el peso de los álabes introducidos, se aplica una mayoración de la carga calculada de un 50% para mantener los cálculos del lado de la seguridad. Se obtiene con ello una carga axial final de 1,01 kN.

De la ecuación (1) se obtiene finalmente que el par resistente presentado por el rodamiento interior asciende a 102,82 Nm. Como había sido introducido, se asume una simplificación por la que se considera la resistencia al giro sobre el bastidor exterior del doble que la ya calculada para el rodamiento interno. El par resistente total que debe superar el motorreductor asciende así a 308,46 kN.

Para el cálculo de la potencia requerida para el accionamiento se considera una velocidad de giro de la mesa equivalente a la establecida en la actual: 1,5 rpm.

Para el cálculo de la potencia precisada se sustituyen los valores obtenidos en la ecuación (2):

$$N_{nom}[kW] = \frac{n[rpm] \cdot M_d[Nm]}{9550} \quad (2)$$

Se obtiene una potencia nominal requerida de 0,048 kW. Se trata, como era esperado, de una potencia relativamente baja, y que por tanto posibilita el empleo de los motorreductores

existentes en la mesa actual cuya potencia es de 0,12 kW, quedando así los requerimientos holgadamente satisfechos.

Debido al bajo valor de potencia obtenida, se da por válida la asunción tomada para la estimación del par resistente para la pista externa.

1.2. Cálculo de esfuerzos sobre el engranaje

En el diseño planteado se decide acoplar directamente el eje del engranaje de actuación de la corona de giro sobre el motorreductor. Se precisa por tanto calcular el esfuerzo generado sobre el mismo para su comparación con la carga admisible por el reductor especificada por el fabricante.

Para el cálculo se considera el par máximo susceptible de ser desarrollado en el sistema, pese a que el desarrollado en el giro es netamente inferior. Se consigue así un diseño siempre del lado de la seguridad.

Se considera una potencia del motorreductor de 0,12 kW y una velocidad de giro de la mesa de 1,5 rpm, lo que se traduce en una velocidad a la salida del reductor de 14 rpm (al considerarse la multiplicación debida al engrane de piñon y corona). A partir de dichos valores se calcula el par generado sobre el engranaje de acuerdo a la siguiente fórmula:

$$M_d[Nm] = \frac{n[rpm] \cdot N_{nom}[kW]}{9550} \quad (3)$$

Se obtiene un par de 81,86 Nm. A partir del mismo se puede calcular la fuerza tangencial sobre el engranaje como:

$$F_t[kN] = \frac{M_t}{r_p} \quad (4)$$

Donde r_p es el radio primitivo del engranaje calculado como:

$$r_p[mm] = m \cdot \frac{z}{2} = 6 \cdot \frac{15}{2} = 45mm \quad (5)$$

Sustituyendo se obtiene una fuerza tangencial de 1,82 kN. Adicionalmente aparece una fuerza radial que se obtiene según:

$$F_R = F_t \cdot \tan(\alpha) \quad (6)$$

Donde α es 20° para engranajes cilíndricos rectos. Se obtiene por tanto una fuerza radial de 0,66 kN.

Ambas componentes contribuyen a generar una fuerza total sobre el eje acoplado al reductor de 1,94 kN, admisibles por el reductor SM35 de la casa SADORNIL, cuya resistencia máxima para un intervalo de velocidades entre 25 y 40 rpm asciende a 2,25 kN.

En el catálogo se especifica además una reducción de la carga máxima admisible por el reductor susceptible de ser aplicada cuando la distancia a la que actúa la fuerza es superior a 30 mm con respecto a la carcasa del mismo. En el diseño planteado dicha distancia asciende a 86 mm, para la cual no se especifica el valor exacto de la reducción a aplicar.

Se decide por tanto evaluar también los esfuerzos nominales que aparecen sobre el motorreductor funcionando en condiciones normales (y no en la situación crítica, que difícilmente se producirá, anteriormente planteada).

Se aplican para ello las ecuaciones (4), (5) y (6) considerando el par resistente nominal calculado en el apartado 1.1 que asciende a 308,46 Nm, sobre el que se aplica la reducción introducida por el conjunto engranaje corona, generándose por tanto un par de 33 Nm.

Se obtiene así una fuerza tangencial de 0,73 kN y una radial de 0,27 kN, que se traduce en un esfuerzo total actuante sobre el eje de 1,0 kN. Este valor es menos de la mitad de la carga máxima admisible por el reductor, por lo que se considera que pese a la distancia mayor a la recomendada existente, el diseño es suficientemente resistente y apto.

ANEXO II

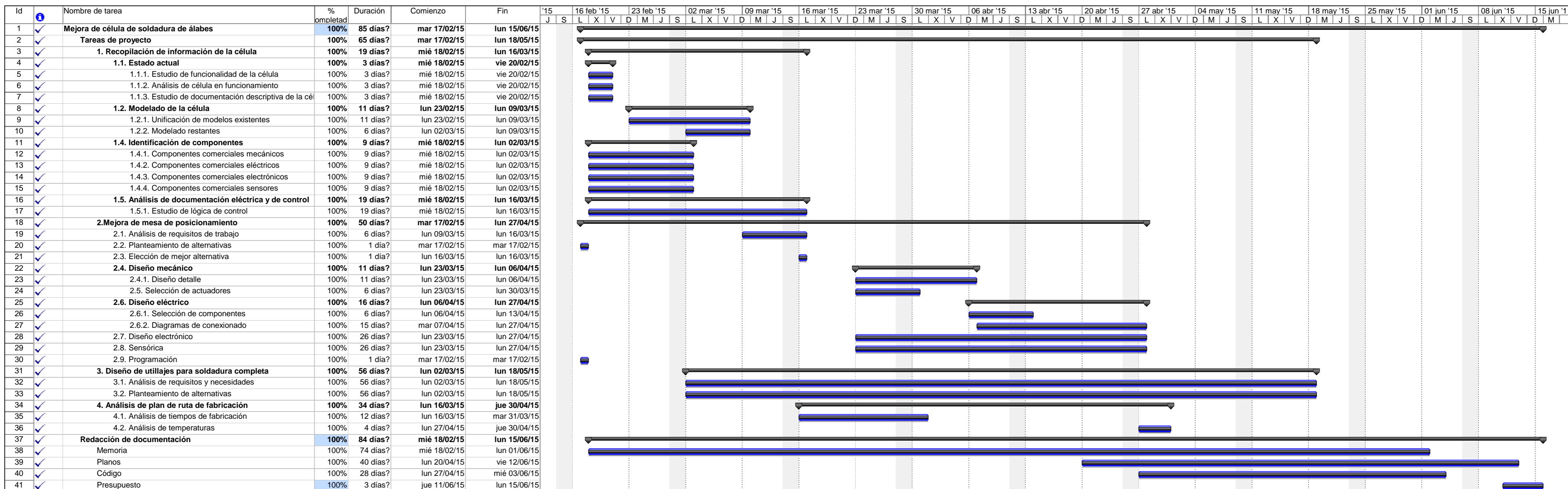
DIAGRAMAS

2. ANEXO II: DIAGRAMAS

Se procede en este capítulo a la muestra de los diferentes diagramas y esquemas creados en el desarrollo del proyecto, algunos de los cuales han sido introducidos a lo largo de la memoria pero que, por cuestiones de escala, resultan difícilmente allí visualizables.

Los diagramas desarrollados son tres: GANTT de planificación y desarrollo de las tareas ejecutadas en el proyecto, diagrama de estados del funcionamiento de la célula actual y diagrama de estados de la célula optimizada diseñada.

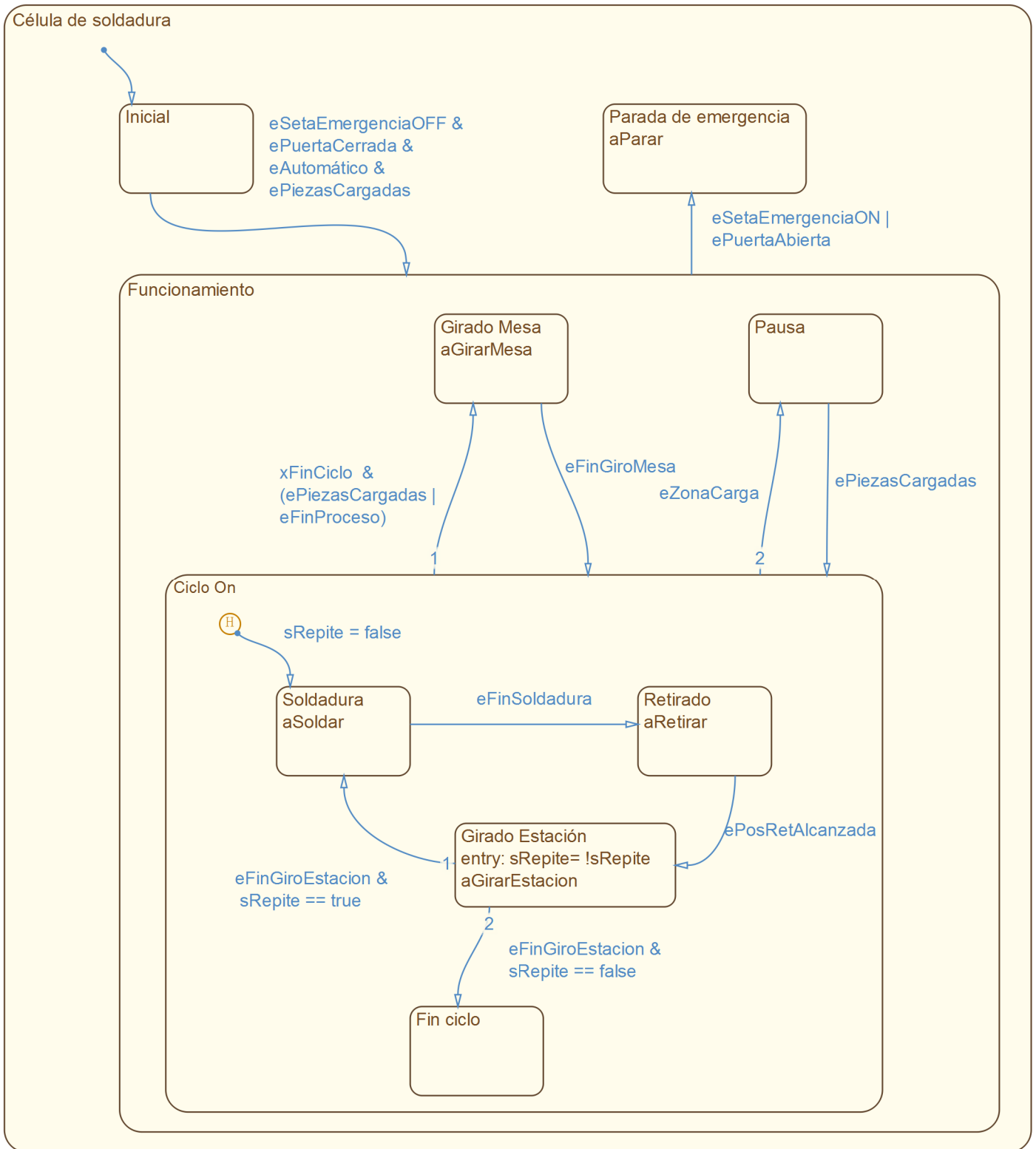
DIAGRAMA DE GANTT: PLANIFICACIÓN DE LAS TAREAS



Proyecto: 15_6_22-Planificacion
Fecha: lun 22/06/15

Tarea Progreso Resumen Tareas externas Fecha límite
División Hito Resumen del proyecto Hito externo

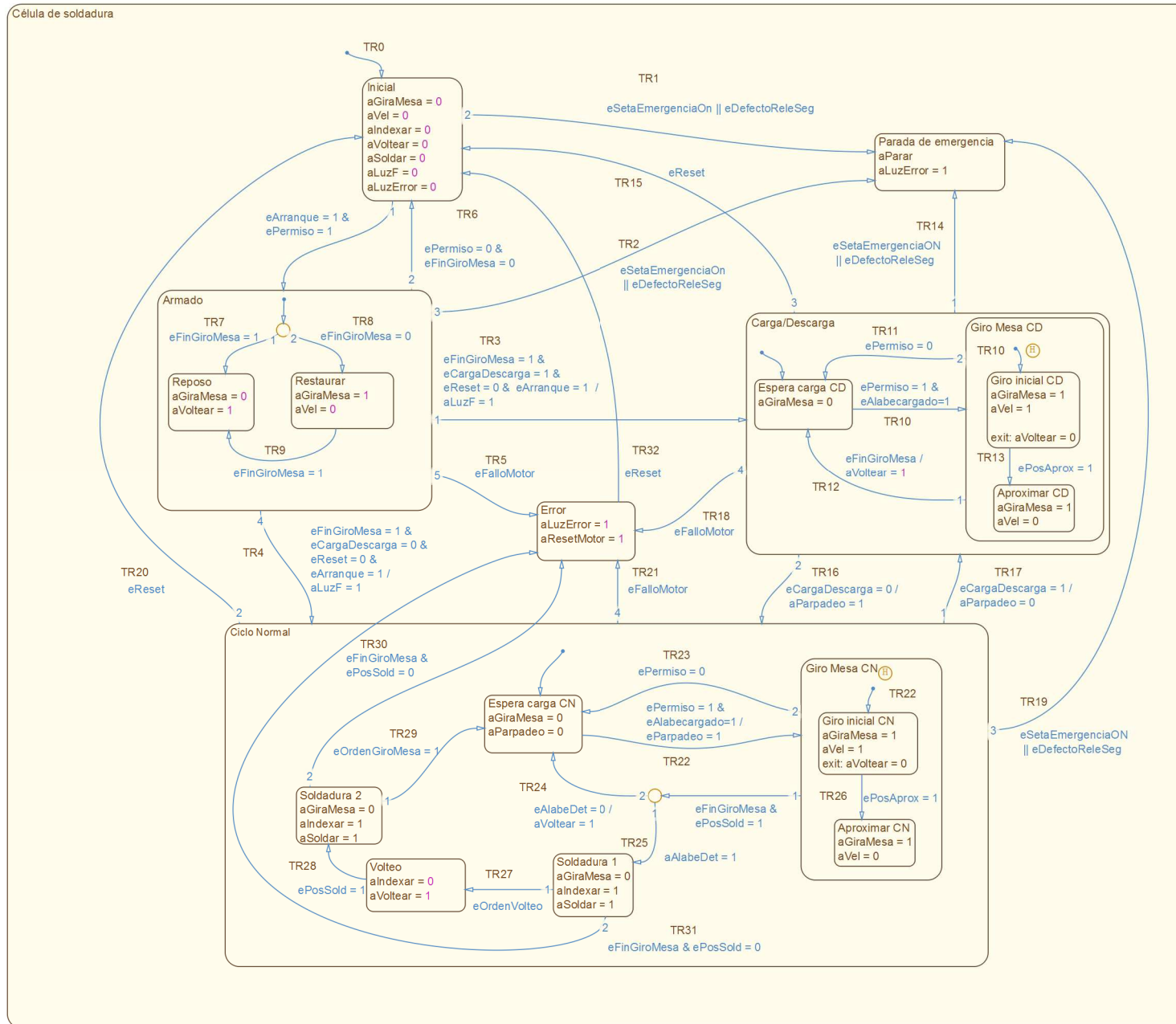
DIAGRAMA DE ESTADOS: CÉLULA ACTUAL



eArranque = Alabe_Cargado (Pulsador)

eAlabeDet = DET_ALABE (sensor inductivo)

DIAGRAMA DE ESTADOS: CÉLULA OPTIMIZADA



ANEXO III

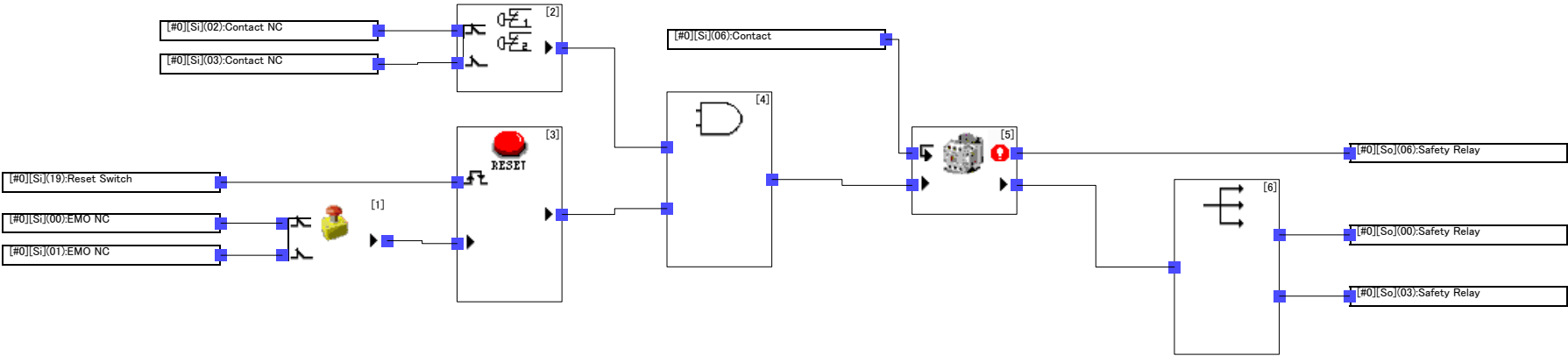
PROGRAMACIÓN PLC's

3. ANEXO III: PROGRAMACIÓN PLC'S

En el presente anexo se dispone la programación planteada para el correcto funcionamiento de la célula optimizada diseñada. Se muestra inicialmente el programa planteado para el autómata de seguridad G9SP. Tras ello se detalla la programación diseñada para el autómata de control CP1L, comenzando por el pseudo-código obtenido a partir del diagrama de estados, definido por ecuaciones matemáticas lógicas, y que posibilita la posterior generación del programa en el lenguaje del propio PLC.

Por último se muestra el programa traducido a lenguaje escalera (de contactos) instalado en el autómata de control CP1L de OMRON, desarrollado a través del software CX-PROGRAMMER.

PROGRAMA AUTÓMATA DE SEGURIDAD G9SP



PSEUDO-CÓDIGO

// EVALUACION DE TRANSICIONES

```

TR0 := "inicio"
TR1:= X_INICIAL AND (eSetaEmergenciaOn OR eDefectoReleSeg)
TR2:= X_ARMADO AND (eSetaEmergenciaOn OR eDefectoReleSeg)
TR3:= X_ARMADO AND eFinGiroMesa AND eCargaDescarga AND (NOT eReset) AND eArranque
TR4:= X_ARMADO AND eFinGiroMesa AND (NOT eCargaDescarga) AND (NOT eReset) AND eArranque
TR5:=X_ARMADO AND eFalloMotor
TR6:= X_ARMADO AND (NOT ePermiso) AND (NOT eFinGiroMesa)
TR7 := X_INICIAL AND eArranque AND ePermiso AND eFinGiroMesa
TR8 := X_INICIAL AND eArranque AND ePermiso AND (NOT eFinGiroMesa)
TR9:= X_RESTAURAR AND eFinGiroMesa
TR10:= X_ESPERA_CARGA_CD AND ePermiso AND eAlabeCargado
TR11:= X_GIRO_MESA_CD AND (NOT ePermiso)
TR12:= X_GIRO_MESA_CD AND eFinGiroMesa
TR13:= X_GIRO_INICIAL_CD AND ePosAprox
TR14:= X_CARGA_DESCARGA_CD AND (eSetaEmergenciaOn OR eDefectoReleSeg)
TR15:= X_CARGA_DESCARGA_CD AND eReset
TR16:= X_CARGA_DESCARGA_CD AND (NOT eCargaDescarga)
TR17:= X_CICLO_NORMAL AND eCargaDescarga
TR18:= X_CARGA_DESCARGA AND eFalloMotor
TR19:= X_CICLO_NORMAL AND (eSetaEmergenciaOn OR eDefectoReleSeg)
TR20:= X_CICLO_NORMAL AND eReset
TR21:= X_CICLO_NORMAL AND eFalloMotor
TR22:= X_ESPERA_CARGA_CN AND ePermiso AND eAlabeCargado
TR23:= X_GIRO_MESA_CN AND (NOT ePermiso)
TR24:= X_GIRO_MESA_CN AND eFinGiroMesa AND ePosSold AND (NOT eAlabeDet)
TR25:= X_GIRO_MESA_CN AND eFinGiroMesa AND ePosSold AND eAlabeDet
TR26:= X_GIRO_INICIAL_CN AND ePosAprox
TR27:= X_SOLDADURA_1 AND eOrdenVolteo
TR28:= X_VOLTEO AND ePosSold
TR29:= X_SOLDADURA_2 AND eOrdenGiroMesa
TR30:= X_SOLDADURA_1 AND eFinGiroMesa AND (NOT ePosSold)
TR31:= X_SOLDADURA_2 AND eFinGiroMesa AND (NOT ePosSold)
TR32:= X_ERROR AND eReset

```

//ACTIVACIÓN Y DESACTIVACIÓN DE ESTADOS

S(X_INICIAL) := TR0 OR TR6 OR TR15 OR TR20 OR TR32

R(X_INICIAL) := TR1 OR TR7 OR TR8

S(X_PARADA_EMERGENCIA) := TR1 OR TR2 OR TR14 OR TR19

S(X_ARMADO) := TR7 OR TR8

R(X_ARMADO) := TR2 OR TR3 OR TR4 OR TR5 OR TR6

S(X_REPOSO) := TR7 OR TR9

R(X_REPOSO) := TR2 OR TR3 OR TR4 OR TR5 OR TR6

S(X_RESTAURAR) := TR8

R(X_RESTAURAR) := TR9 OR TR2 OR TR3 OR TR4 OR TR5 OR TR6

S(X_CARGA_DESCARGA) := TR3 OR TR17

R(X_CARGA_DESCARGA) := TR14 OR TR15 OR TR16 OR TR18

S(X_ESPERA_CARGA_CD) := TR3 OR TR17

R(X_ESPERA_CARGA_CD) := TR10 OR TR14 OR TR15 OR TR16 OR TR18

S(X_GIRO_MESA_CD) := TR10

R(X_GIRO_MESA_CD) := TR11 OR TR12 OR TR14 OR TR15 OR TR16 OR TR18

S(X_GIRO_INICIAL_CD) := H_GIRO_INICIAL_CD AND TR10

R(X_GIRO_INICIAL_CD) := TR13 OR TR14 OR TR15 OR TR16 OR TR18

S(X_APROXIMAR_CD) := (H_APROXIMAR_CD AND TR10) OR TR13

R(X_APROXIMAR_CD) := TR11 OR TR12 OR TR14 OR TR15 OR TR16 OR TR18

S(X_CICLO_NORMAL) := TR4 OR TR16

R(X_CICLO_NORMAL) := TR17 OR TR19 OR TR20 OR TR21

S(X_ESPERA_CARGA_CN) := TR4 OR TR16 OR TR23 OR TR24 OR TR29

R(X_ESPERA_CARGA_CN) := TR22 OR TR17 OR TR19 OR TR20 OR TR21

S(X_GIRO_MESA_CN) := TR22

R(X_GIRO_MESA_CN) := TR23 OR TR24 OR TR25 OR TR17 OR TR19 OR TR20 OR TR21

S(X_GIRO_INICIAL_CN) := H_GIRO_INICIAL_CN AND TR22

R(X_GIRO_INICIAL_CN) := TR26 OR TR23 OR TR24 OR TR25 OR TR17 OR TR19 OR TR20 OR TR21

S(X_APROXIMAR_CN) := TR26 OR (H_APROXIMAR_CN AND TR22)

R(X_APROXIMAR_CN) := TR23 OR TR24 OR TR25 OR TR17 OR TR19 OR TR20 OR TR21

S(X_SOLDADURA_1) := TR25

R(X_SOLDADURA_1) := TR27 OR TR31 OR TR17 OR TR19 OR TR20 OR TR21

S(X_VOLTEO) := TR27

R(X_VOLTEO) := TR28 OR TR17 OR TR19 OR TR20 OR TR21

S(X_SOLDADURA_2) := TR28

R(X_SOLDADURA_2) := TR29 OR TR30 OR TR17 OR TR19 OR TR20 OR TR21

S(X_ERROR) := TR5 OR TR18 OR TR21 OR TR30 OR TR31

R(X_ERROR) := TR30

//HISTORIA

S(H_GIRO_INICIAL_CD) := X_GIRO_INICIAL_CD OR X_INICIAL OR TR12

R(H_GIRO_INICIAL_CD) := TR13

S(H_APROXIMAR_CD) := X_APROXIMAR_CD

R(H_APROXIMAR_CD) := TR12 OR X_INICIAL

S(H_GIRO_INICIAL_CN) := X_GIRO_INICIAL_CN OR X_INICIAL OR TR24 OR TR25

R(H_GIRO_INICIAL_CN) := TR26

S(H_APROXIMAR_CN) := X_APROXIMAR_CN

R(H_APROXIMAR_CN) := TR24 OR TR25 OR X_INICIAL

//EJECUCIÓN DE ACCIONES

aGiraMesa:= (X_RESTAURAR OR X_GIRO_INICIAL_CD OR X_APROXIMAR_CD OR X_GIRO_INICIAL_CN OR X_APROXIMAR_CN) AND (NOT X_PARADA_EMERGENCIA)

aVel:=(X_GIRO_INICIAL_CD OR X_GIRO_INICIAL_CN) AND (NOT X_PARADA_EMERGENCIA)

aIndexar:= (X_SOLDADURA_1 OR X_SOLDADURA_2) AND (NOT X_PARADA_EMERGENCIA)

aSoldar:= (X_SOLDADURA_1 OR X_SOLDADURA_2) AND (NOT X_PARADA_EMERGENCIA) AND (NOT X_ERROR)

aLuzF:= X_CARGA_DESCARGA OR X_CICLO_NORMAL

aLuzError:= X_PARADA_EMERGENCIA OR X_ERROR

aParpadeo:= X_GIRO_MESA_CN OR X_SOLDADURA_1 OR X_SOLDADURA_2 OR X_VOLTEO

//La acción de volteo se gestiona con un biestable por quedar definidas las posiciones o bien con su estado activo o con el inactive

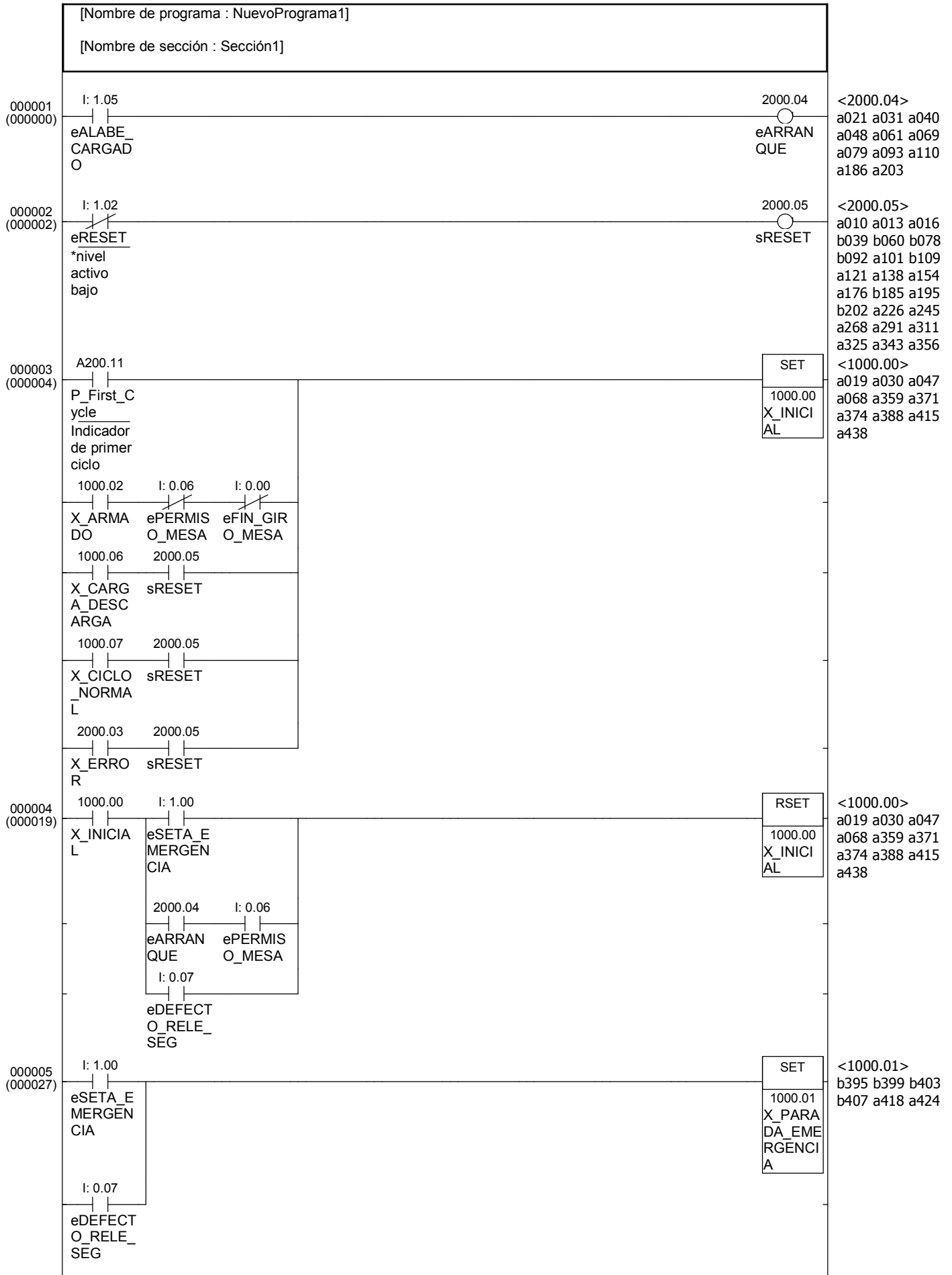
S(aVoltear) := X_REPOSO OR TR12 OR X_VOLTEO OR TR24

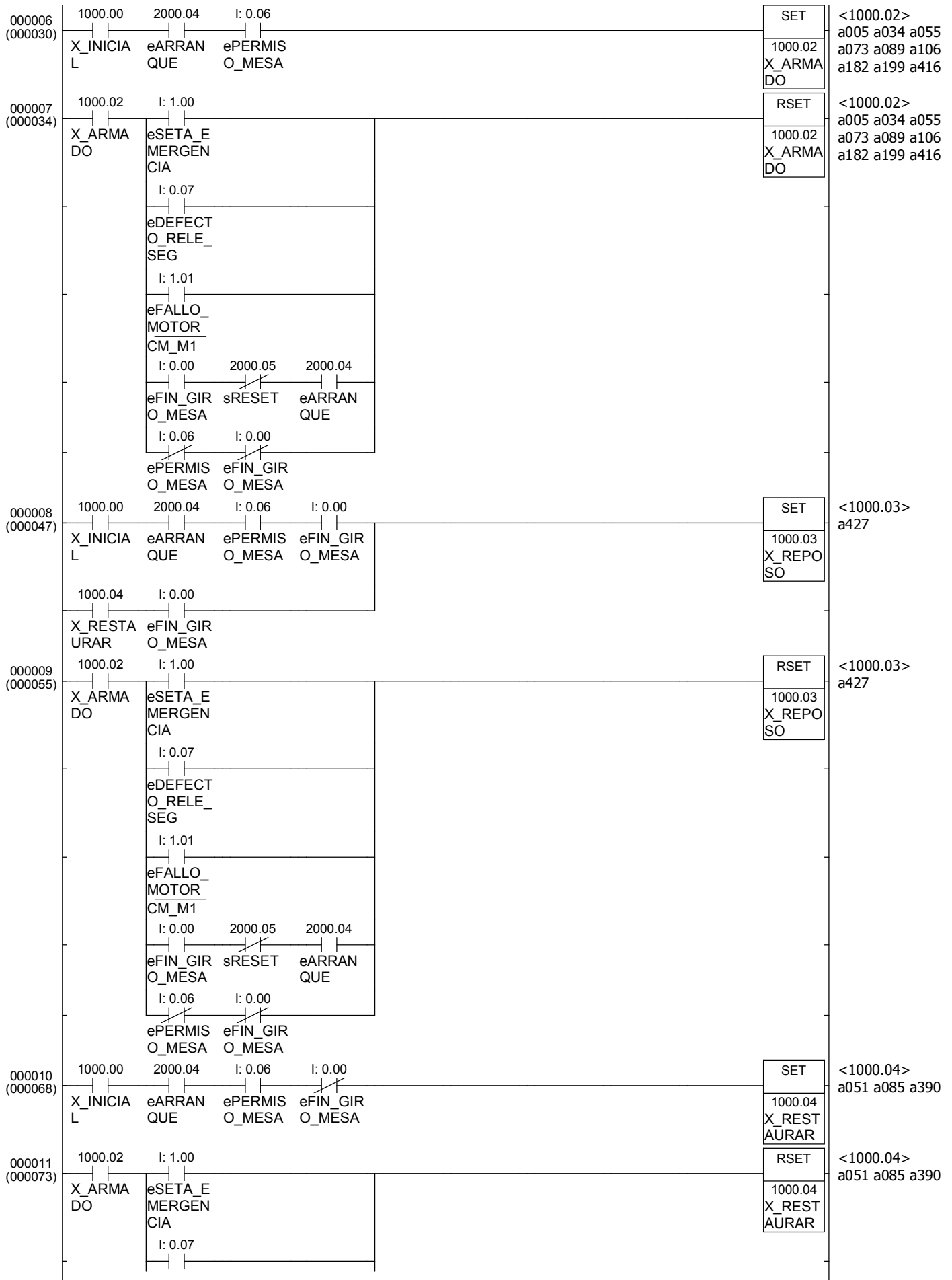
R(aVoltear) := X_INICIAL OR TR13 OR TR26

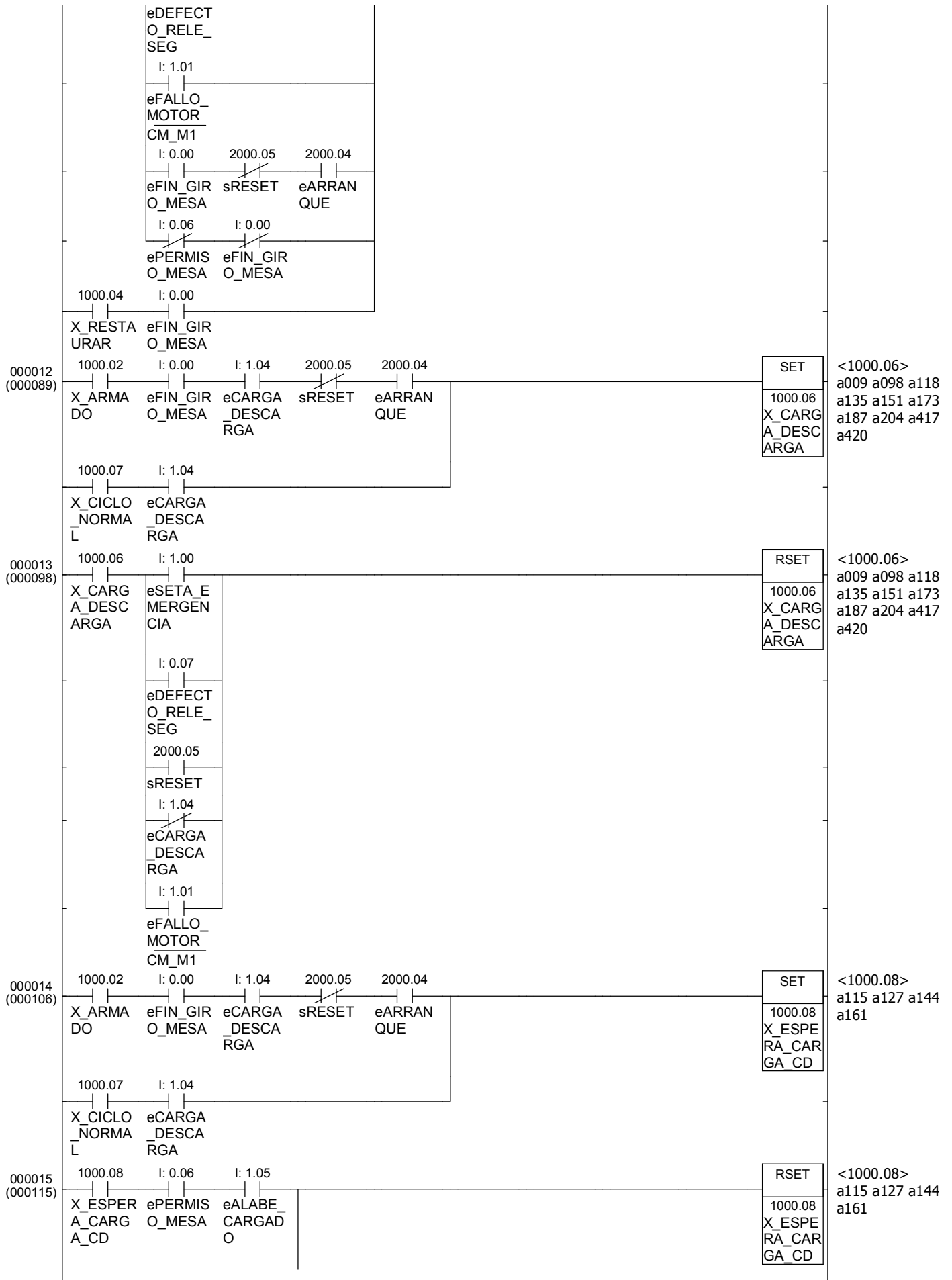
aParar := X_PARADA_EMERGENCIA

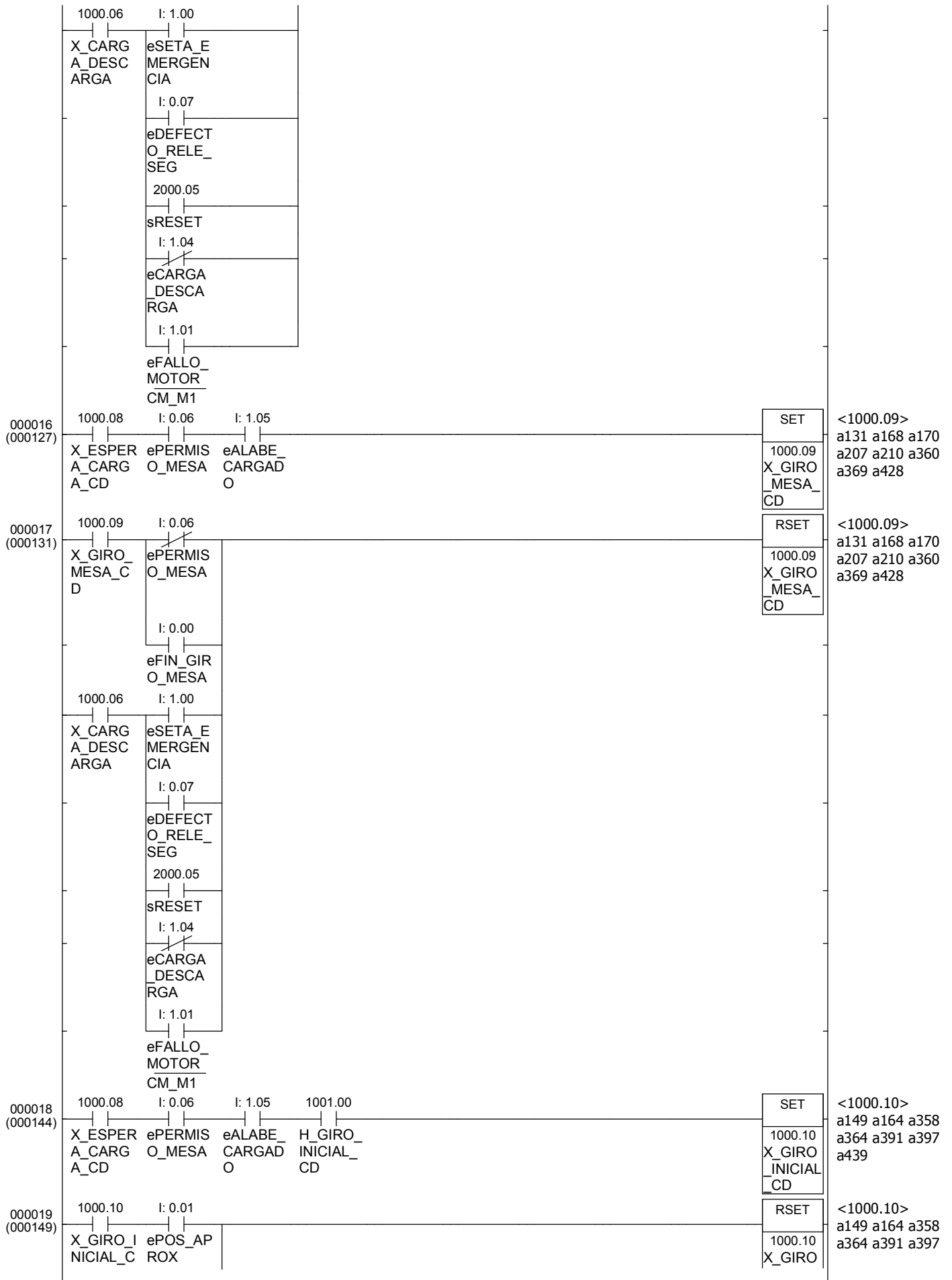
aResetMotor := X_ERROR

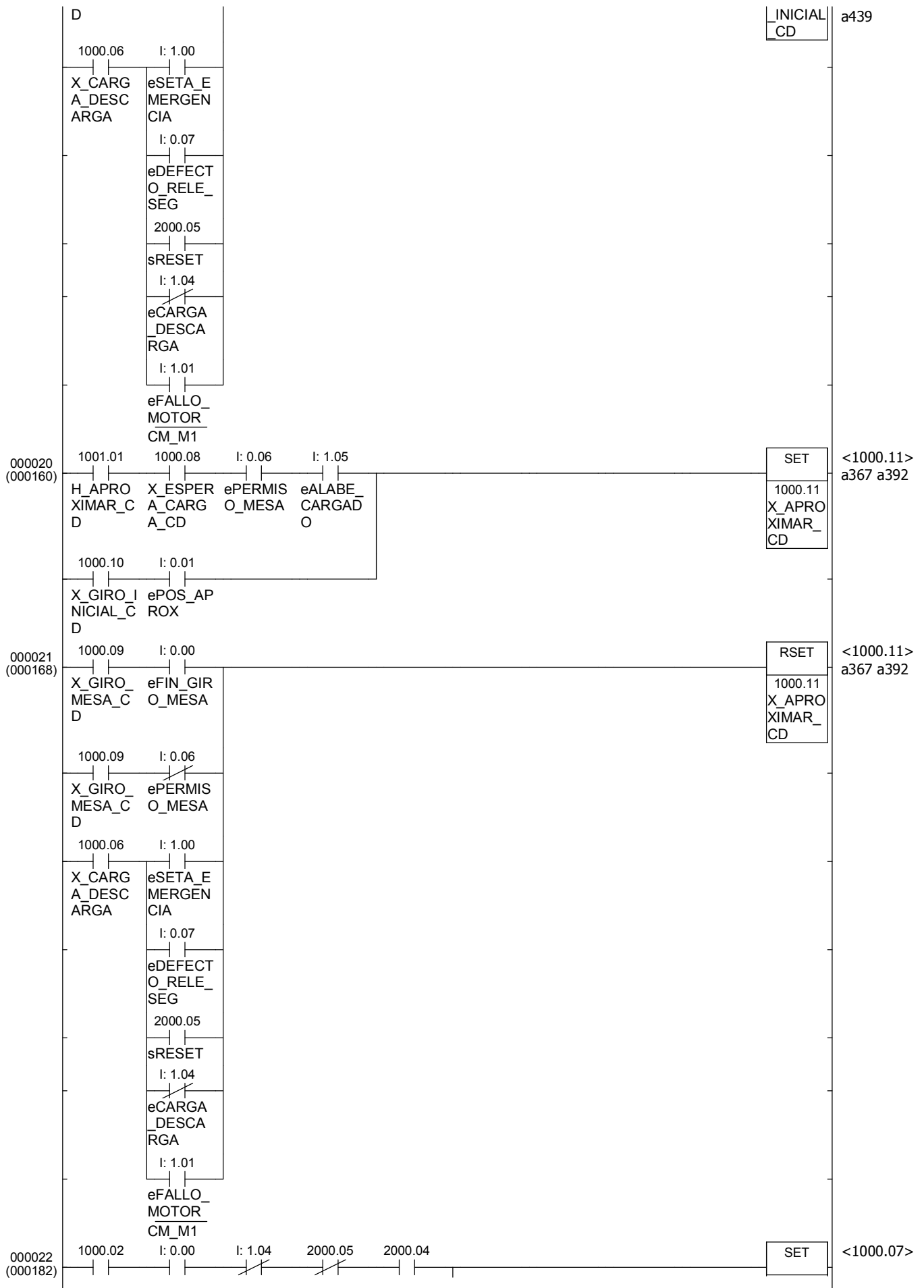
PROGRAMA AUTÓMATA DE CONTROL CP1L

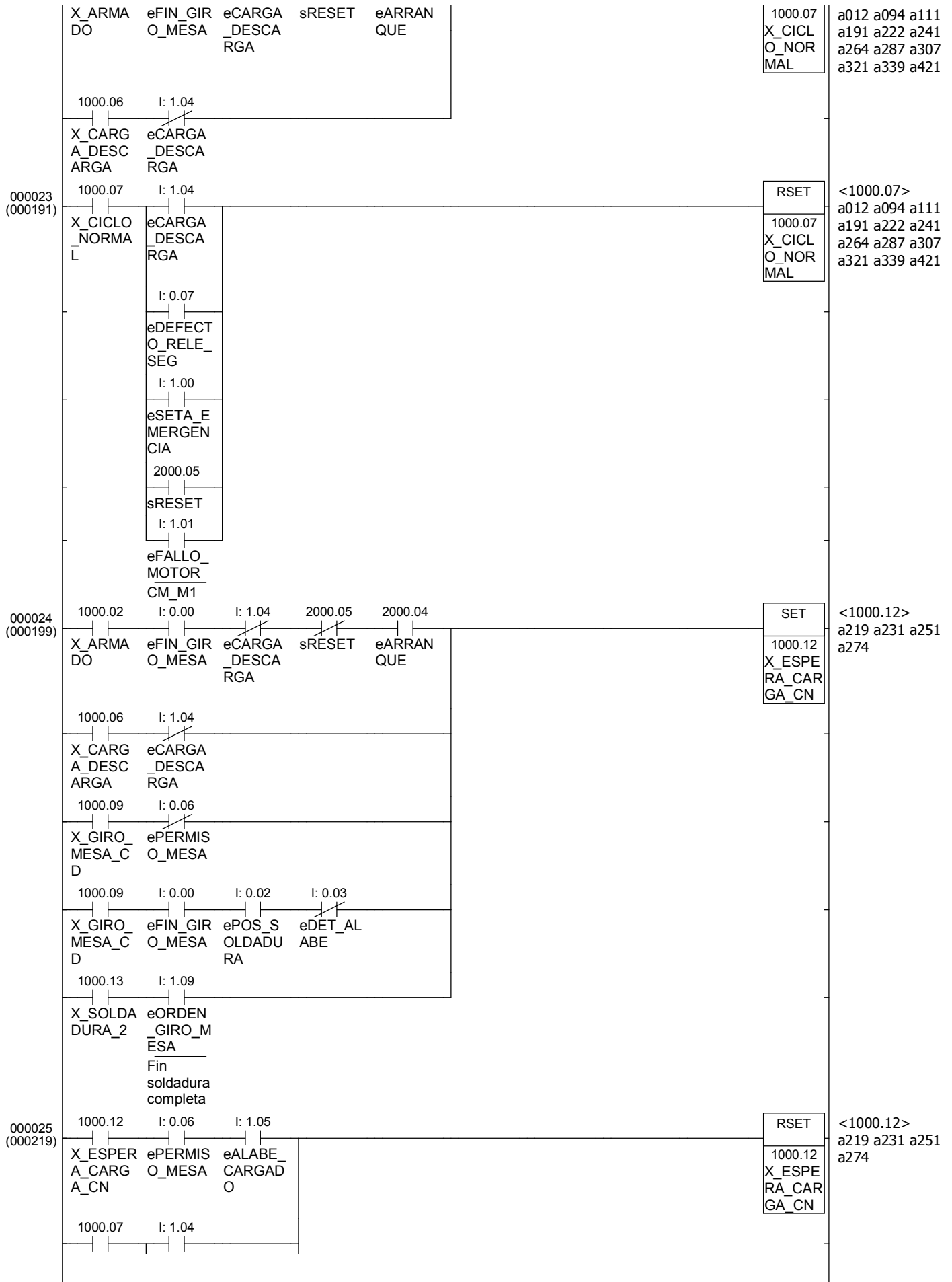


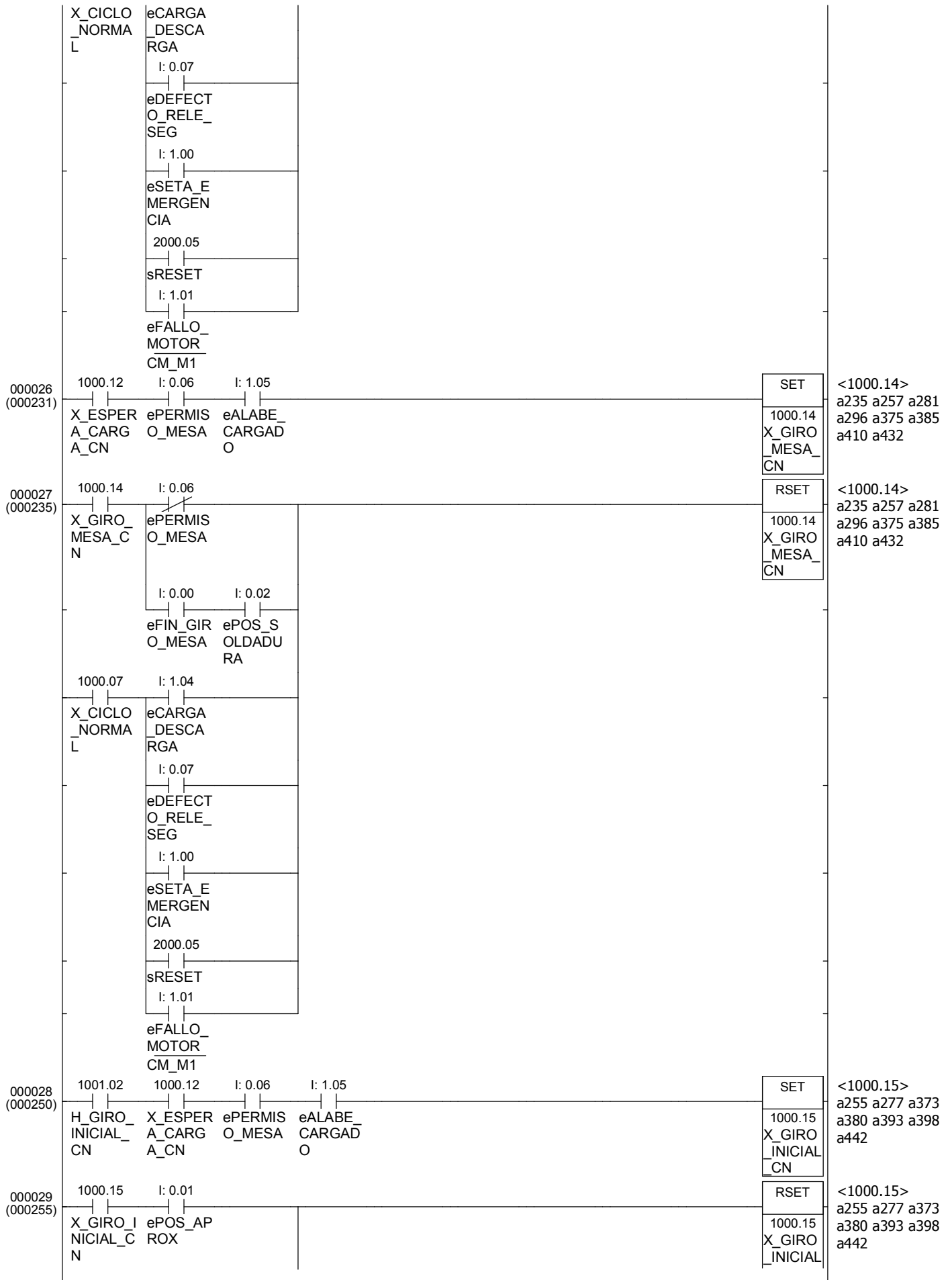


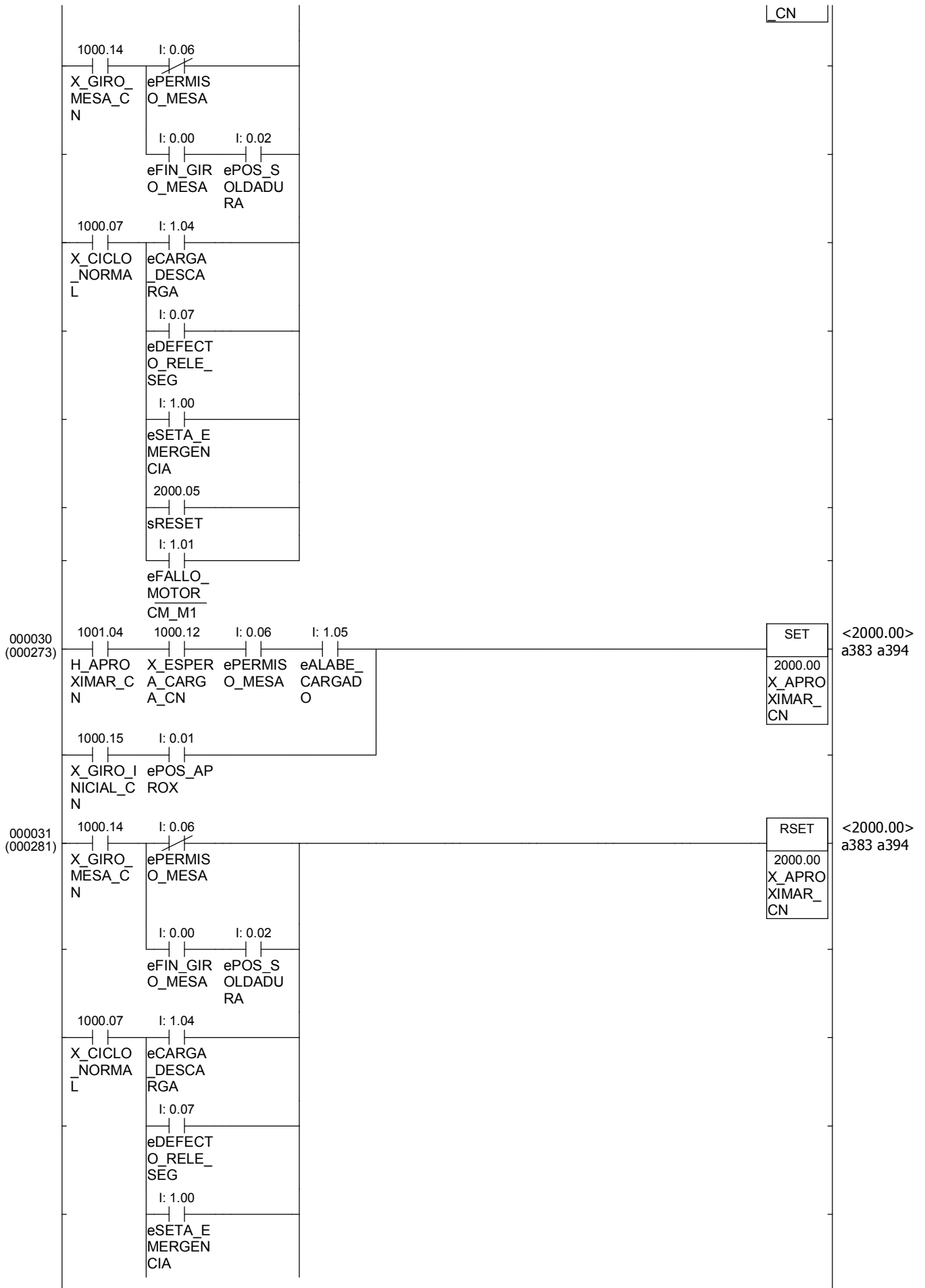


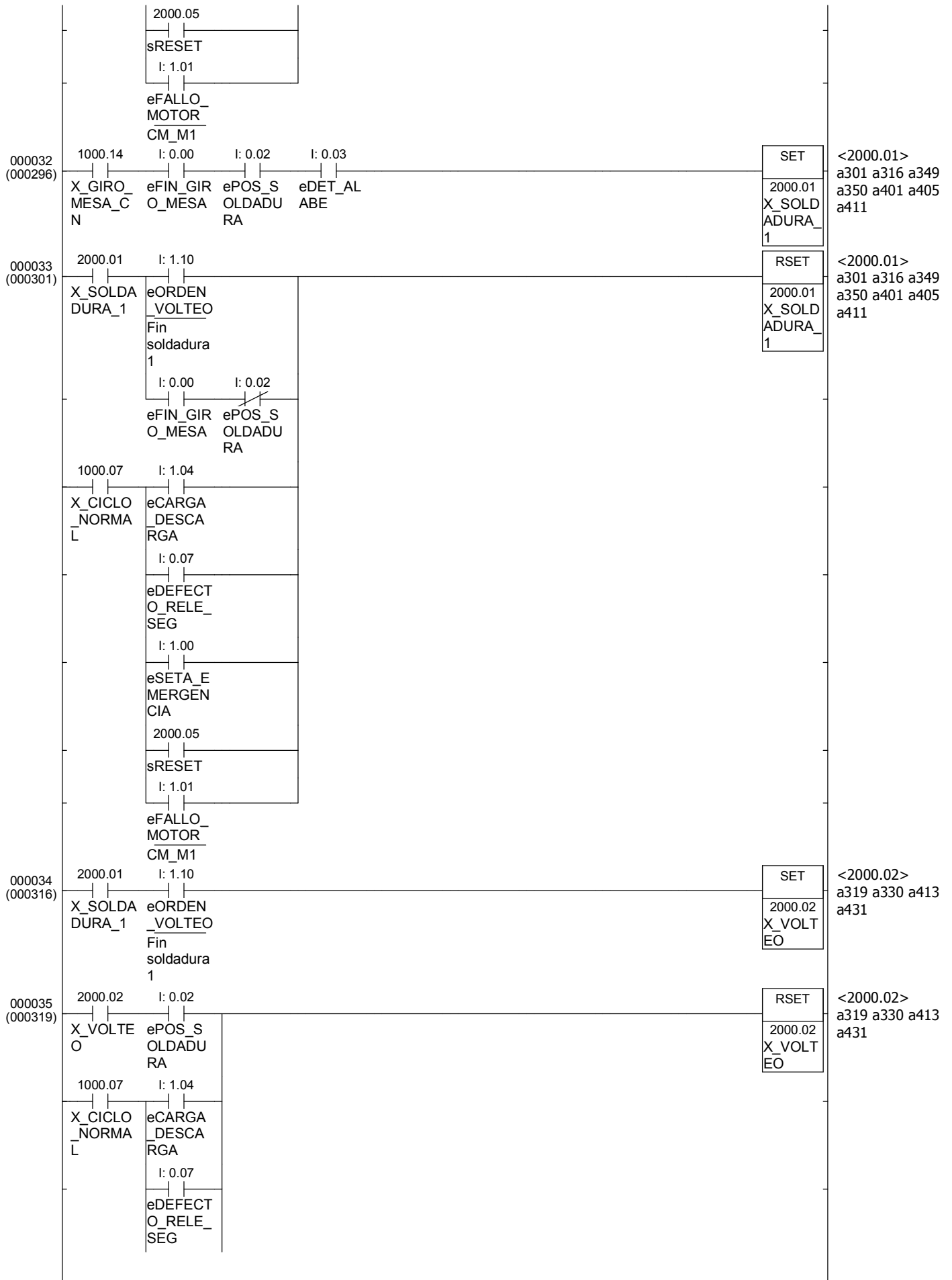


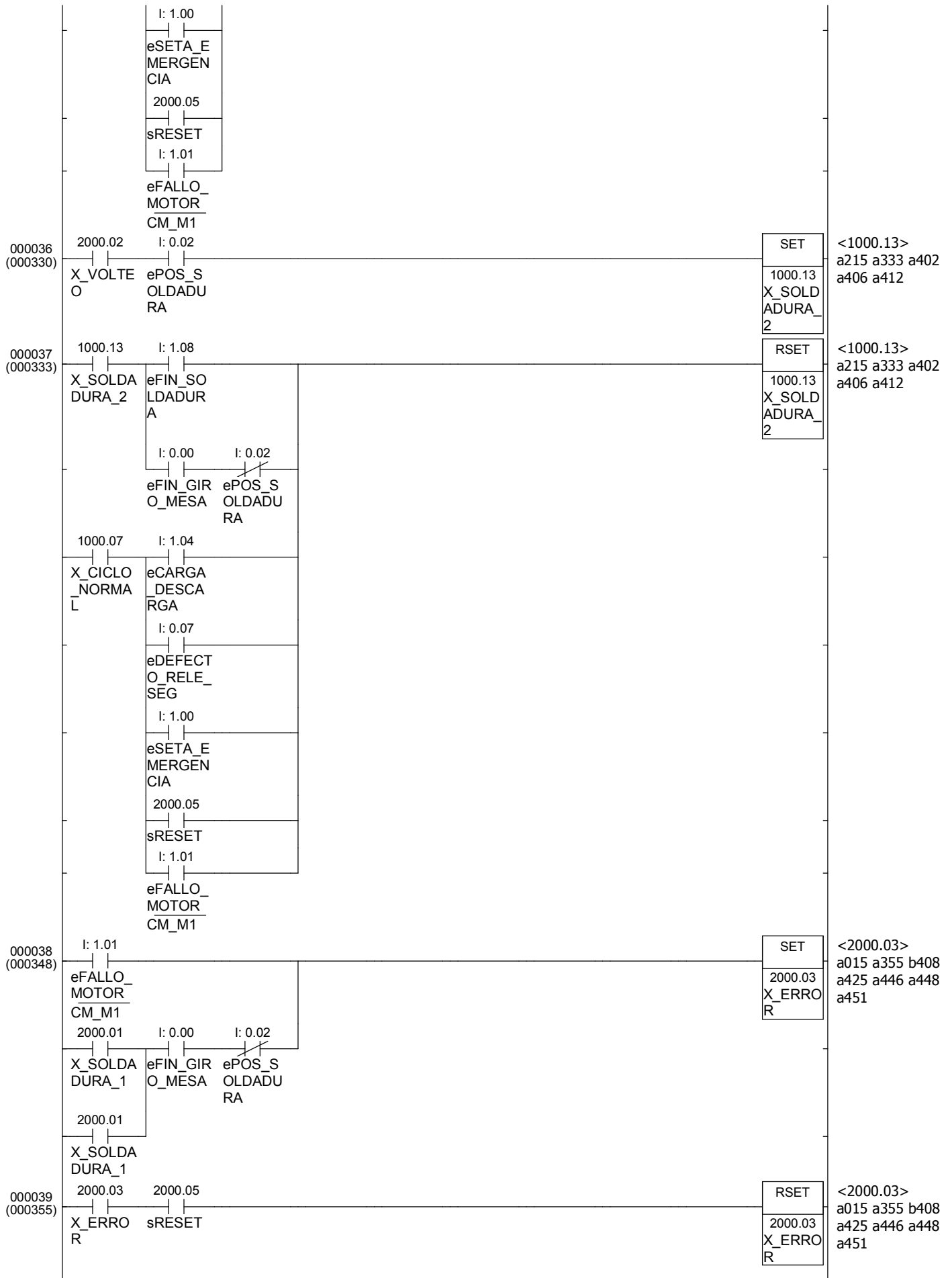


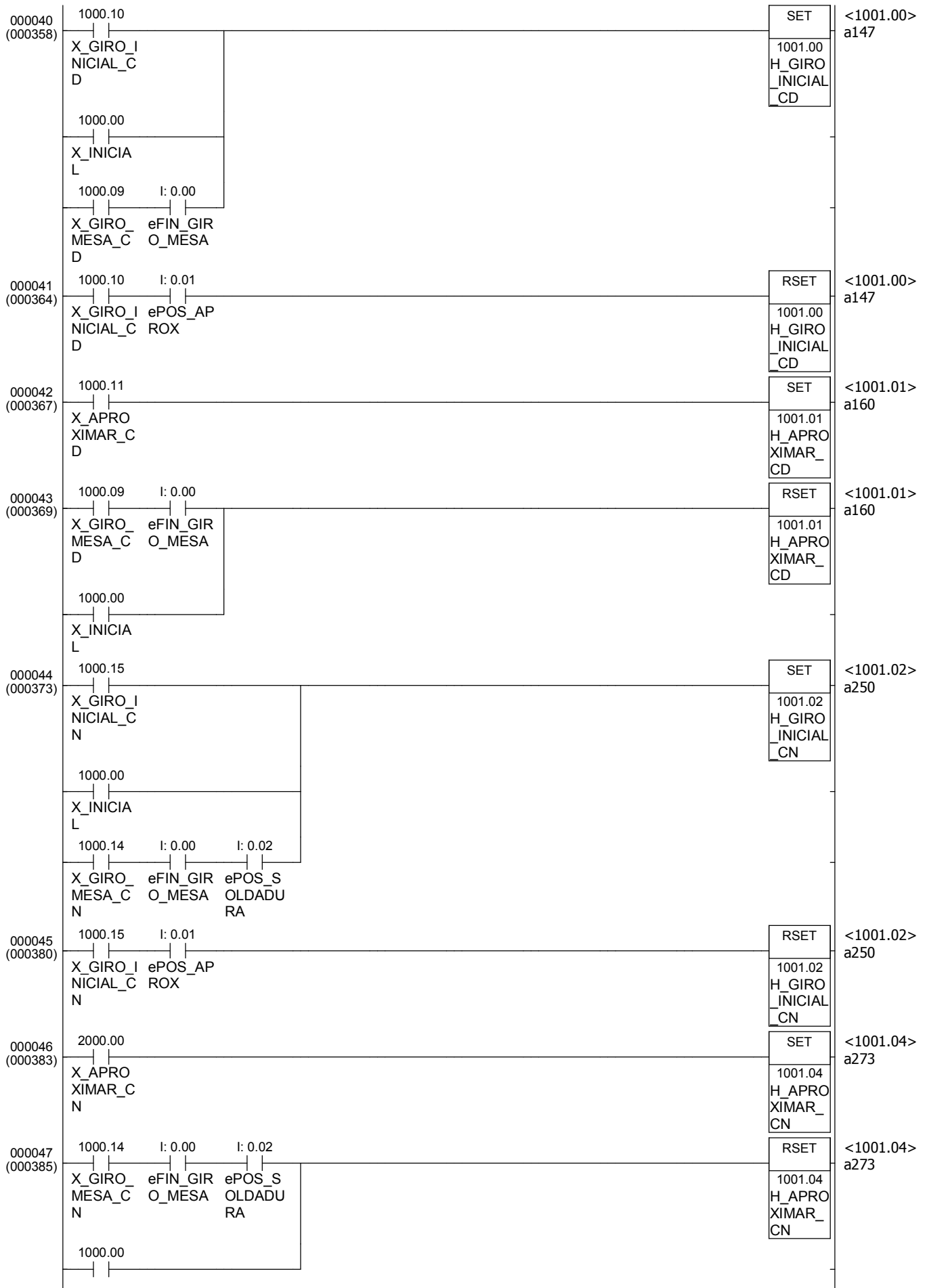


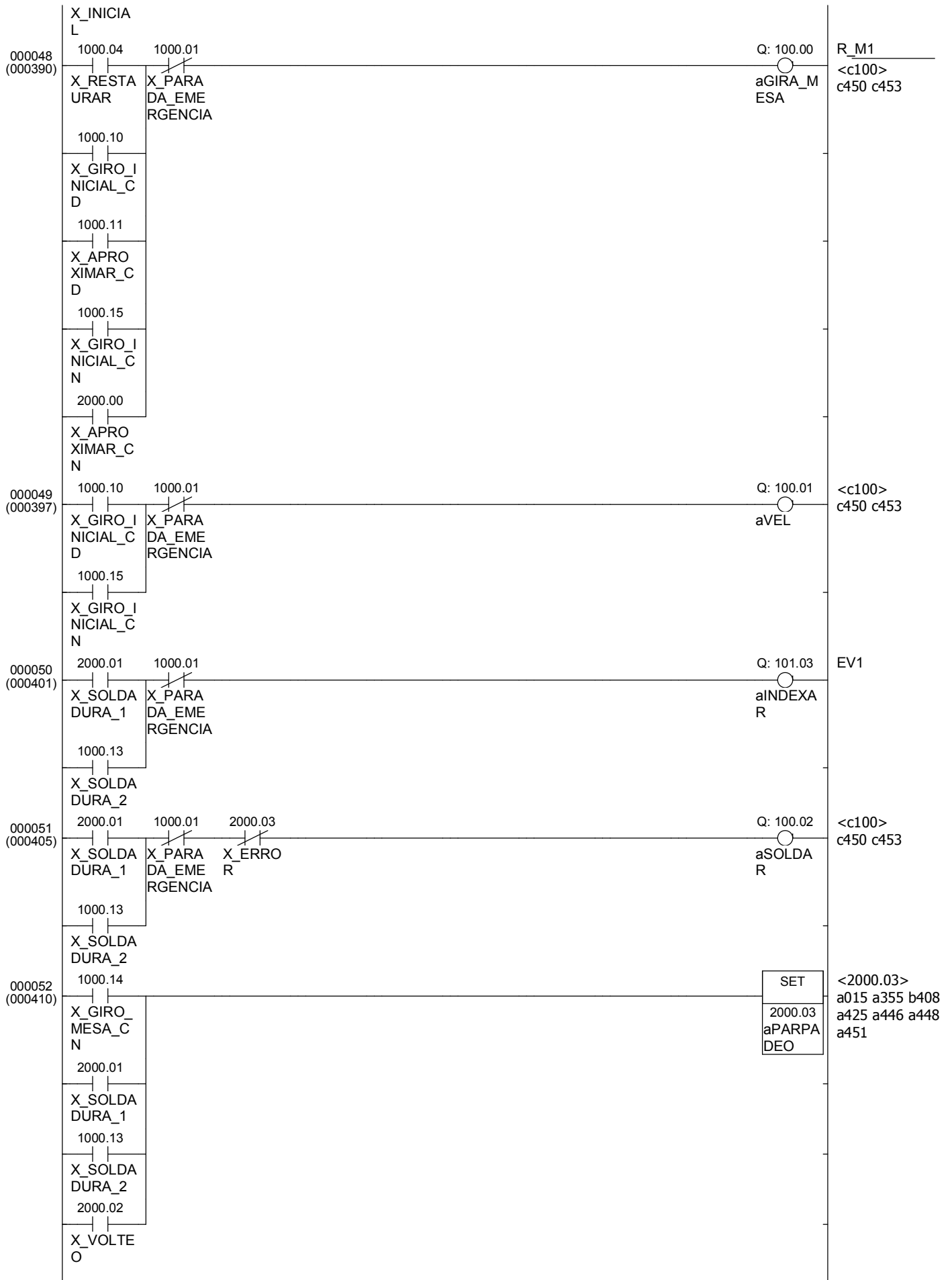




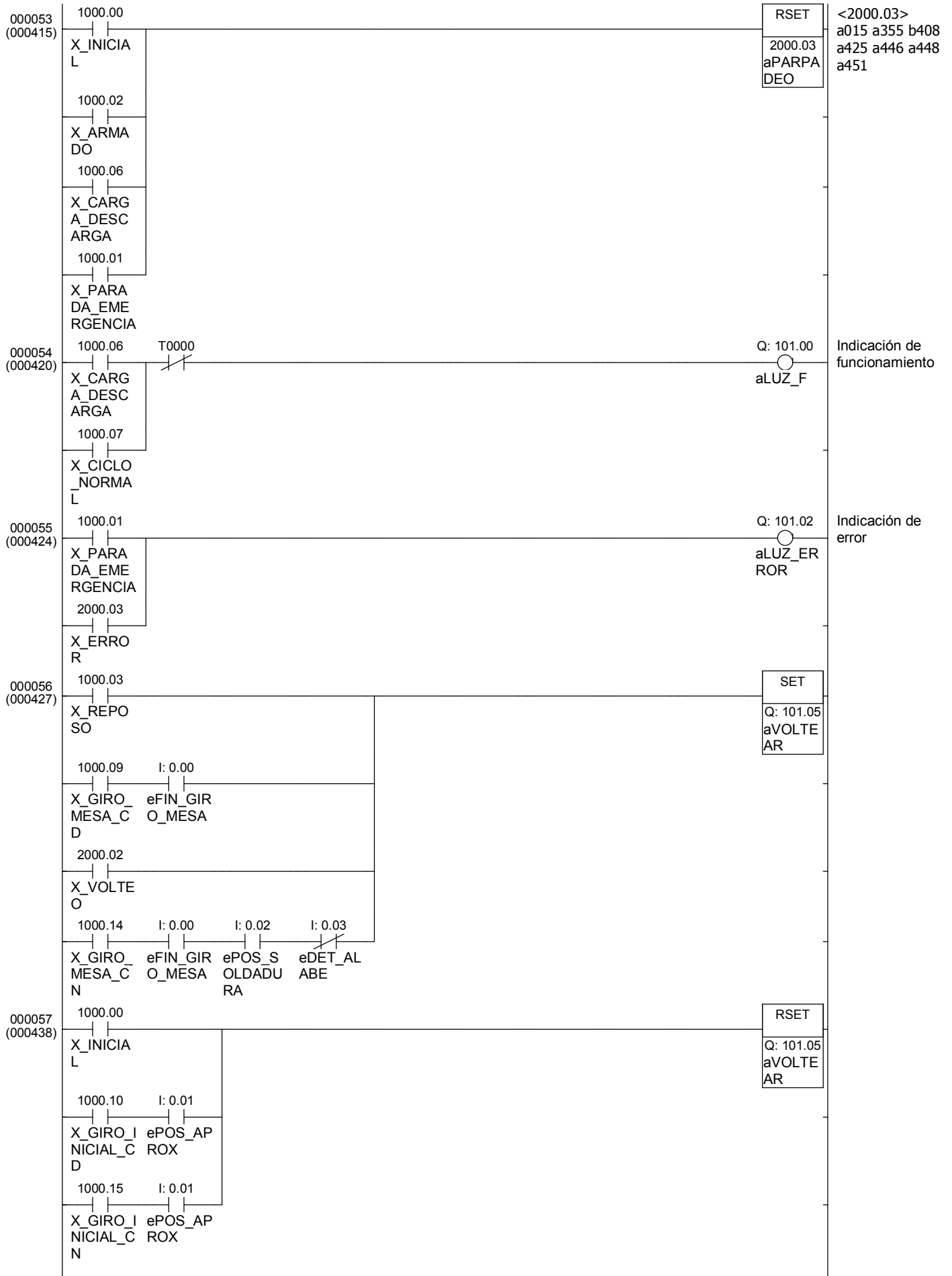


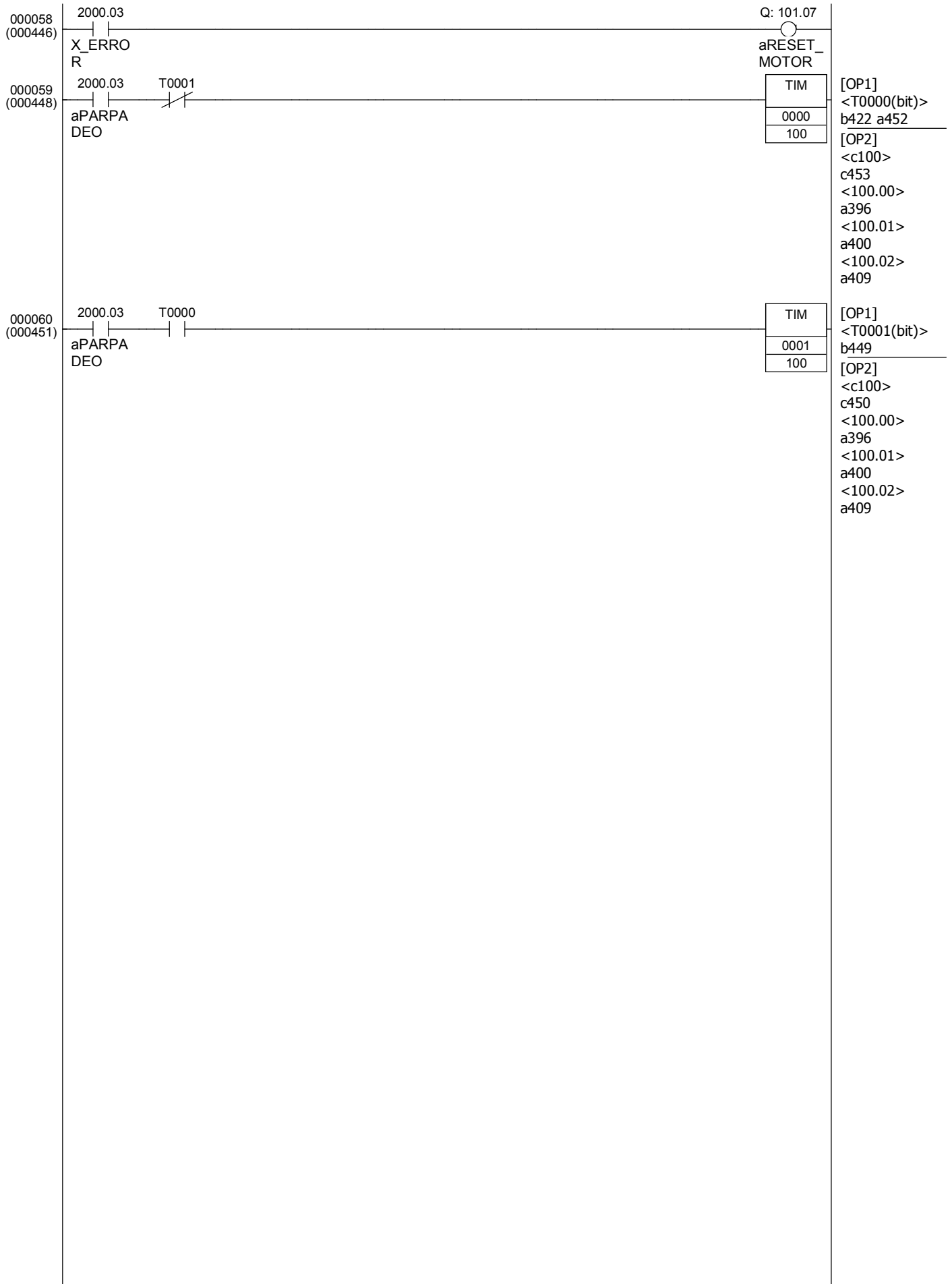






Mejora de célula de soldadura de álabes





ANEXO IV

MATERIALES

4. **ANEXO IV: MATERIALES**

Se procede a continuación a la descripción técnica y presentación de características fundamentales de los materiales empleados en el diseño de la célula optimizada.

4.1. **Acero S275-JR**

El acero empleado para la mayoría de las piezas necesarias para la ejecución de la mesa posicionadora optimizada es, de acuerdo a la práctica habitual en la Zitrón, el S-235-JR, de límite elástico 2400 Kg/cm², de acuerdo con la norma UNE - EN 10025:2006-2007 “*Productos laminados en caliente de aceros para estructuras*”, y en que quedan definidas sus características mecánicas y composición química.

El resumen básico de las características de este acero son las siguientes:

- Módulo de elasticidad (E): 210.000 N/mm²
- Módulo de rigidez (G): 81.000 N/mm²
- Coeficiente de Poisson (ν): 0,3
- Coeficiente de dilatación térmica (α): 1,2·10⁻⁵ (°C)⁻¹
- Densidad (ρ): 7.850 Kg/m³
- Resistencia a la tracción: 430 – 580 MPa
- Límite elástico al 0,2% mín: 275 MPa
- Alargamiento mínimo: 19-23%
- Dureza máxima: 120 – 170 HB

Así mismo, la composición química característica del material viene definida por las siguientes proporciones:

Tabla 1. Composición química del acero S275-JR

%C	%Mn	%P	%S	%N	%Cu
0,24-0,25	1,60	0,045	0,045	0,014	0,60

Se trata de un material caracterizado por sus adecuadas propiedades mecánicas generales, buena maquinabilidad y bajo coste, que le hacen idóneo para su aplicación en las múltiples piezas sin elevados requerimientos mecánicos del presente proyecto.

4.2. **Acero F-1110**

Para algunos de los perfiles tubulares calibrados empleados en el diseño de la mesa posicionadora optimizada se emplea acero F-1110, con un límite elástico de entre 2500 y 4000 Kg/cm².

El resumen básico de sus principales características mecánicas es el siguiente:

- Módulo de elasticidad (E): 210.000 N/mm²

- Módulo de rigidez (G): 81.000 N/mm²
- Coeficiente de Poisson (ν): 0,3
- Coeficiente de dilatación térmica (α): 1,2·10⁻⁵ (°C)⁻¹
- Densidad (ρ): 7.850 Kg/m³
- Resistencia a la tracción: 450 MPa
- Límite elástico al 0,2% mín: 330 MPa
- Alargamiento mínimo: 10%
- Dureza máxima: 140 HB

La composición química típica del material viene determinada por los siguientes porcentajes:

Tabla 2. Composición química del acero F-1110

%C	%Mn	%P	%S
0,10-0,20	0,30-0,60	0,035	0,035

Es un material caracterizado por su elevada tenacidad empleado típicamente en piezas sometidas a movimientos relativos y choques. Se caracteriza además por su buena admisión de la soldadura en cualquier espesor.

4.3. Acero F-1140

Algunos de los perfiles calibrados empleados en la mesa posicionadora optimizada son fabricados en acero F-1140, con límite elástico comprendido entre 3700 y 4900 kg/cm².

Sus principales características mecánicas quedan resumidas a continuación:

- Módulo de elasticidad (E): 210.000 N/mm²
- Módulo de rigidez (G): 81.000 N/mm²
- Coeficiente de Poisson (ν): 0,3
- Coeficiente de dilatación térmica (α): 1,2·10⁻⁵ (°C)⁻¹
- Densidad (ρ): 7.850 Kg/m³
- Resistencia a la tracción: 650-850 MPa
- Límite elástico al 0,2% mín: 440 MPa
- Alargamiento mínimo: 15 - 17%
- Dureza máxima: 207 HB

Así mismo, la composición química característica del material viene definida por las siguientes proporciones:

Tabla 3. Composición química del acero F-1140

%C	%Mn	%P	%S	%Si	%Cr	%Ni	%Mo
0,42-0,50	0,50-0,80	0,035	0,035	0,40	0,40	0,40	0,10

El material se caracteriza por su capacidad para ser templado y revenido, teniendo una elevada tenacidad y resistencia al desgaste. Sus condiciones de soldabilidad no son demasiado buenas. Se aplica comúnmente en piezas con responsabilidad mecánica media, y buena resistencia al desgaste.

4.4. Poliuretano OBOMODULAN®

Los utillajes porta-álabes son fabricados en poliuretano específicamente concebido para el desarrollo de moldes y modelos. Se emplea concretamente el desarrollado por la casa OBO-Werke, modelo OBOMODULAN PU 710.

Se trata de un material caracterizado por su capacidad de mecanizado, aptitud para alojar insertos de otros materiales, bajo coeficiente de expansión térmica, baja generación de polvo durante el maquinado y elevada resistencia en las aristas.

Se procede a continuación a resumir las principales características del modelo específicamente empleado OBOMODULAN PU 710:

- Densidad (ρ): 700 Kg/m³
- Resistencia a compresión: 50 MPa
- Resistencia a flexión: 30 MPa
- Coeficiente de dilatación térmica (α): $30 \cdot 10^{-6} \text{ (K)}^{-1}$
- Dureza máxima (Shore D): 68

Las mencionadas características hacen al material idóneo para aplicaciones de moldes maestros, moldes de fabricación por vacío, moldes para laminación o modelos para fundición. Todo ello hace que su aplicación sea idónea para el soporte de los álabes soldados en la célula objeto del presente proyecto.

ANEXO V

HOJAS DE CARACTERÍSTICAS

5. ANEXO V: HOJAS DE CARACTERÍSTICAS

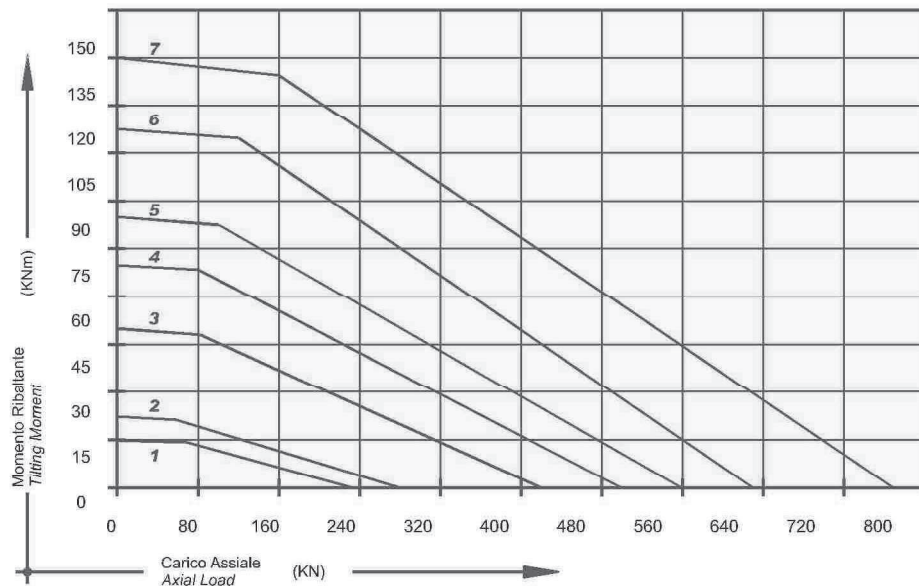
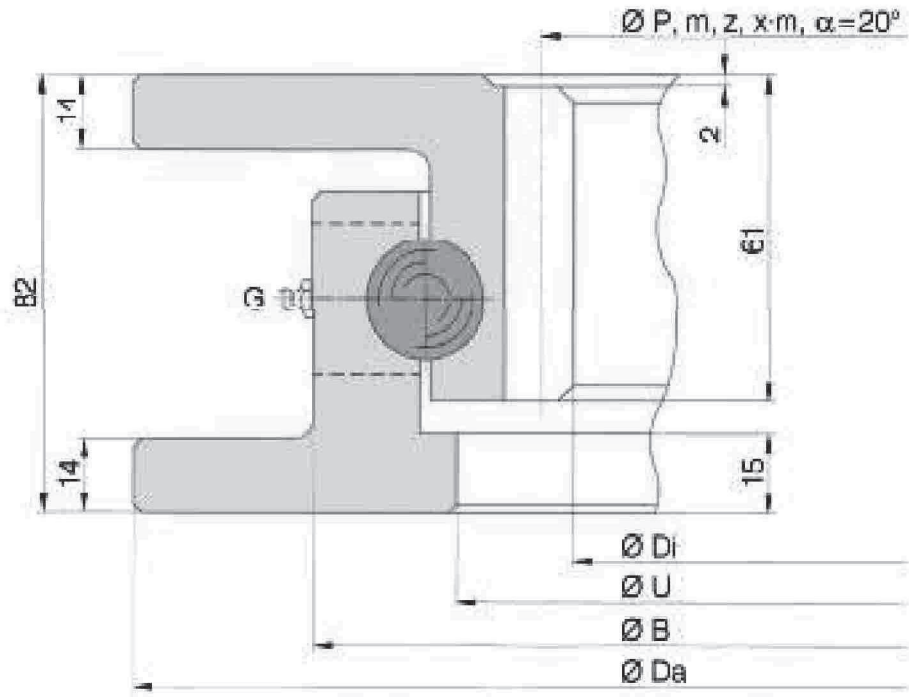
Se procede en el presente capítulo a la recopilación de las hojas de características de los diferentes elementos comerciales empleados en el diseño de la célula de soldadura de álabes optimizada.

5.1. Componentes mecánicos

Los elementos comerciales de carácter mecánico empleados en el proyecto, excluyendo la tornillería definida por su norma, son:

1. Corona de giro dentada
2. Engranaje cilíndrico recto
3. Bola de transferencia
4. Reductor SM35
5. Rodamiento rígido de bolas
6. Casquillo cilíndrico sin valona

A continuación se presentan sus respectivas hojas de características según el orden especificado.



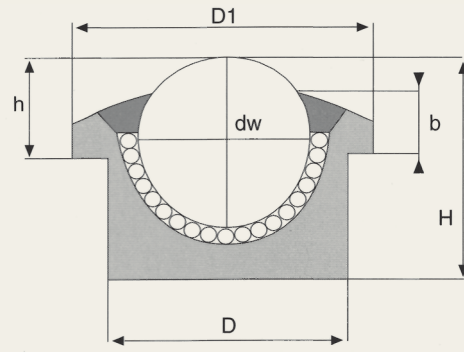
Serie series I.22.A

	Tipo di cuscinetto Bearing type	Dimensioni Dimensions				Dentatura Gear teeth				Forza sul dente Tooth force		Massa Mass
		Da mm	B mm	U mm	Di mm	P mm	m	z n°	xm mm	Fz nor kN	Fz max kN	Peso Weight Kg
1	I.400.22.00.A	395	330	280	232	240	4	60	-	7.40	14.80	28
2	I.500.22.00.A	499	431	379	330	340	5	68	-	11.30	22.60	38
3	I.700.22.00.A	699	631	579	530	540	5	108	-	11.30	22.60	59
4	I.800.22.00.A	805	739	687	636	648	6	108	-	16.30	32.60	68
5	I.880.22.00.A	879	811	759	708	720	6	120	-	16.30	32.60	75
6	I.1000.22.00.A	999	931	879	828	840	6	140	-	16.30	32.60	88
7	I.1100.22.00.A	1095	1027	975	924	936	6	156	-	16.30	32.60	97

G = N°2 Ingrassatori DIN 71412 AM 6x1 equidistanti. G = N°2 greasetopples DIN 71412 AM 6x1 equi-spaced

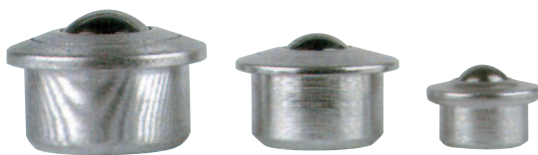
I SERIE "SPM" MACIZA CON COLLAR

BOLAS TRANSPORTADORAS CON CARCASA MACIZA DE ACERO AL CARBONO PARA CARGAS PESADAS. ALOJAMIENTO INTERNO EN ACERO CEMENTADO HRc 60-62. BOLAS DE ACERO CROMO AISI 52100 HRc 63+/-3. AGUJERO DE DESCARGA INCORPORADO EN EL FONDO. GUARNICIÓN INTERNA CON PARAPOLVO (SÓLO EN MODELOS SPM 22, SPM 30, SPM 45).
TEMPERATURA DE TRABAJO: +100 °C -30°C



TIPO	Características	Dw	D	Tol	D1	h	Tol	H	b	Kg		Kg Peso U.
										Capacidad carga	Capacidad carga	
SPM 12 A	CARCASA Y BOLAS DE ACERO	12	22	±0,030	27,3	7,5	±0,2	16,8	4,5	30	12	0,035
SPM 15 A		15	24	±0,065	31	9,5	±0,2	21	5,5	60	24	0,060
SPM 22 A		22	36	±0,080	45	9,8	±0,2	30,5	6	180	72	0,185
SPM 30 A		30	45	±0,080	55	14	±0,3	37	8	350	140	0,365
SPM 45 A		45	62	±0,095	75	19	±0,4	53,5	10	600	240	0,990
SPM 12 B	CARCASA DE ACERO ZINCADO Y BOLAS DE ACERO	12	22	±0,030	27,3	7,5	±0,2	16,8	4,5	30	12	0,035
SPM 15 B		15	24	±0,065	31	9,5	±0,2	21	5,5	60	24	0,060
SPM 22 B		22	36	±0,080	45	9,8	±0,2	30,5	6	180	72	0,185
SPM 30 B		30	45	±0,080	55	14	±0,3	37	8	350	140	0,365
SPM 45 B		45	62	±0,095	75	19	±0,4	53,5	10	600	240	0,990
SPM 12 C	CARCASA DE ACERO ZINCADO Y TODAS LAS BOLAS DE ACERO INOX. AISI 420	12	22	±0,030	27,3	7,5	±0,2	16,8	4,5	20	8	0,035
SPM 15 C		15	24	±0,065	31	9,5	±0,2	21	5,5	40	16	0,060
SPM 22 C		22	36	±0,080	45	9,8	±0,2	30,5	6	120	48	0,185
SPM 30 C		30	45	±0,080	55	14	±0,3	37	8	200	80	0,365
SPM 45 C		45	62	±0,095	75	19	±0,4	53,5	10	300	120	0,990
SPM 12 SS	CARCASA DE ACERO INOX. AISI 303 Y TODAS LAS BOLAS DE ACERO INOX. AISI 420	12	22	±0,030	27,3	7,5	±0,2	16,8	4,5	20	8	0,035
SPM 15 SS		15	24	±0,065	31	9,5	±0,2	21	5,5	40	16	0,060
SPM 22 SS		22	36	±0,080	45	9,8	±0,2	30,5	6	120	48	0,185
SPM 30 SS		30	45	±0,080	55	14	±0,3	37	8	200	80	0,365
SPM 45 SS		45	62	±0,095	75	19	±0,4	53,5	10	300	120	0,990

Carga superior Carga inferior





**1.0 REDUCTEURS - MOTOREDUCTEURS ORTHOGONAUX A AXES GAUCHES
 REDUCTORES - MOTORREDUCTORES ORTOGONALES CON EJES
 OBLICUOS
 REDUTORES - MOTOREDUTORES ORTOGONAIS COM EIXOS OBLÍQUOS**

S

				Page Pág. Pág.
1.1	Caractéristiques techniques	<i>Características técnicas</i>	Technische Eigenschaften	D2
1.2	Dénomination	<i>Designación</i>	Designação	D2
1.3	Versions	<i>Versiones</i>	Versões	D4
1.4	Lubrification	<i>Lubricación</i>	Caractéristiques techniques	D5
1.5	Charges radiales et axiales	<i>Cargas radiales y axiales</i>	Cargas radiais e axiais	D6
1.6	Performances réducteurs	<i>Prestaciones reductores</i>	Desempenhos redutores	D7
1.7	Performances motoréducteurs	<i>Prestaciones motorreductores</i>	Desempenhos motoredutores	E10
1.8	Dimensions	<i>Dimensiones</i>	Dimensões	D14
1.9	Accessoires	<i>Accesorios</i>	Acessórios	D18
1.10	Languettes	<i>Chavetas</i>	Lingüetas	D19



**1.1 Caractéristiques techniques**

La conception de ces réducteurs a été établie sur une structure monolithique particulièrement rigide qui permet l'application de grandes charges.

Les réducteurs - motoréducteurs gauches orthogonaux sont réalisés avec deux étages de réduction à engrenages cylindriques hélicoïdaux à axes gauches.

1.1 Características técnicas

El proyecto de estos reductores ha sido realizado sobre una estructura monolítica particularmente rígida que permite la aplicación de cargas elevadas.



Los reductores – motorreductores oblicuos ortogonales están realizados con dos etapas de reducción con engranajes cilíndricos helicoidales de ejes oblicuos.

1.1 Características técnicas

O projeto destes redutores foi feito em uma estrutura monolítica particularmente rígida que garante a aplicação de elevadas cargas.

Os redutores – motoredutores oblíquos ortogonais são feitos com duas fases de redução com engrenagens cilíndricas helicoidais e com eixos oblíquos.

1.2 Dénomination**2.2 Designación****1.2 Designação**

	Grand. Size Größe	Tipo Type Typ	* 1	* 2	* 3	*4	ir	IEC	*5	Dénomination Moteurs Designación Motores Designação motores
SM	25	— F1	(standard)	—	Diamètre trou optionnel	—		D9 56(B5) ...	—	
	35	F2 FL	-	B	Diámetro agujero opcional	—	voir tableaux performances consultar tablas prestaciones	112(B5)		
	45	FA FB	S	C	Diámetro furo opcional	S	Veja tabelas dos desempenhos		B	

Spécifications:

• **[*1] Côté bride sortie:**

Aucune indication = bride côté sortie avec montage droit (brides du côté comme indiqué dans les figures du catalogue);

S = brides côté sortie avec montage gauche (brides du côté opposé aux figures indiquées dans le catalogue).

Especificaciones:

• **[*1] Lado brida salida:**

Ninguna indicación = brida salida con montaje derecho (bridas en el lado como ilustran las figuras del catálogo);

S = bridas salida con montaje izquierdo (bridas del lado opuesto a las figuras que se indican en el catálogo).

Especificações:

• **[*1] Lado flange de saída:**

Nenhuma indicação = flange de saída com montagem a direita (flange de lado indicado nas figuras do catálogo);

S = flange de saída com montagem esquerda (flange de lado indicado nas figuras do catálogo).



1.2 Dénomination

- **[*2] Arbre côté sortie:**
Aucune indication = arbre foré;
B = arbre bilatéral intégral;
C = arbre foré avec frette de serrage.
- **[*3] Diamètre arbre:**
Aucune indication = diamètre standard

diamètre trou optionnel = (tableau 2.2).

1.2 Designación

- **[*2] Eje salida:**
Ninguna indicación = eje perforado;
B = doble saliente integral;
C = eje perforado con ensamblador.
- **[*3] Diámetro eje:**
Ninguna indicación = diámetro estándar

diámetro agujero opcional = (consultar tabla 2.2).

1.2 Designação

- **[*2] Eixo de saída:**
Nenhuma indicação = eixo furado;
B = bi-saliente integral;
C = eixo furado com encaixe.
- **[*3] Diâmetro eixo:**
Nenhuma indicação = diâmetro standard

diâmetro furo opcional=(tabela 2.2).

Tab. 2.2

Grandeur Medida Dimensão	[*3]						
	Arbre Foré Eje Perforado Eixo Furado		arbre foré avec frette de serrage eje perforado con ensamblador eixo furado com encaixe		arbre bilatéral intégral doble saliente integral bi-saliente integral		
	Standard	Sur demande sobre pedido sob encomenda		Standard	Sur demande sobre pedido sob encomenda		
25	Ø 19	Ø 20	Ø 24	Ø 19	-	Ø 19	-
35	Ø 25	Ø 28	Ø 30	Ø 25	-	Ø 25	-
45	Ø 30	Ø 28	Ø 25	Ø 30	-	Ø 30	-

- **[*4] Position frette de serrage (valable uniquement pour la solution avec frette de serrage):**
Aucune indication = côté droit (standard) ;
S = côté gauche, (optionnel).

- **[*4] Posición ensamblador (válido solamente para solución con ensamblador):**
Ninguna indicación = lado derecho (estándar);
S = lado izquierdo, (opcional).

- **[*4] Posição encaixe (válido apenas para solução com encaixe):**
Nenhuma indicação = lado direito (standard);
S = lado esquerdo, (opcional).

Arbre foré avec frette de serrage eje perforado con ensamblador eixo furado com encaixe		S			-
---	--	---	--	--	---



1.2 Dénomination

Autres spécifications:

- **M1, M2, M3, M4, M5, M6** Positions de montage avec indication des bouchons de niveau, remplissage et vidange ; sauf indication contraire, on considère standard la position **M1** (voir par. 1.3).
- **[T] Bras de torsion.**
Bras de torsion (voir par. 1.9).
- **[2, 3, 4]** Position de la plaque à bornes du moteur si différente de celle standard (1)
- **[*5] Condition bilatérale côté Entrée:**
Aucune indication = entrée sans condition bilatérale;
B = entrée avec condition bilatérale.

1.2 Designación

Otras especificaciones:

- **M1, M2, M3, M4, M5, M6** Posiciones de montaje con indicación de los tapones de nivel, carga y descarga; si no está especificado se considera estándar la posición **M1** (consultar párr. 1.3).
- **[T] Brazo de reacción.**
Brazo de reacción (consultar párr. 1.9).
- **[2, 3, 4]** Posición de la caja de bornes del motor si es distinta de la estándar (1)
- **[*5] Doble saliente Entrada:** Ninguna indicación = ingreso sin doble saliente;
B = entrada con doble saliente.

1.2 Designação

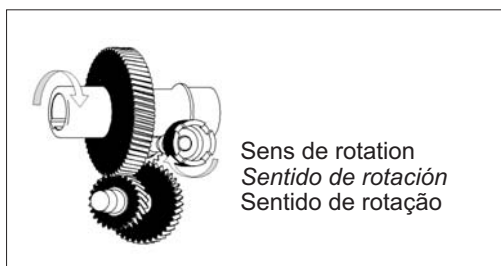
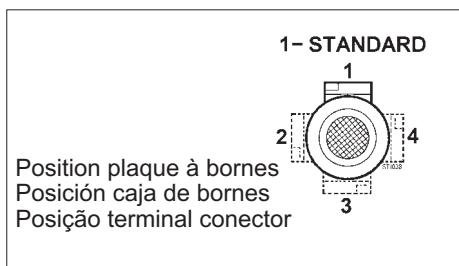
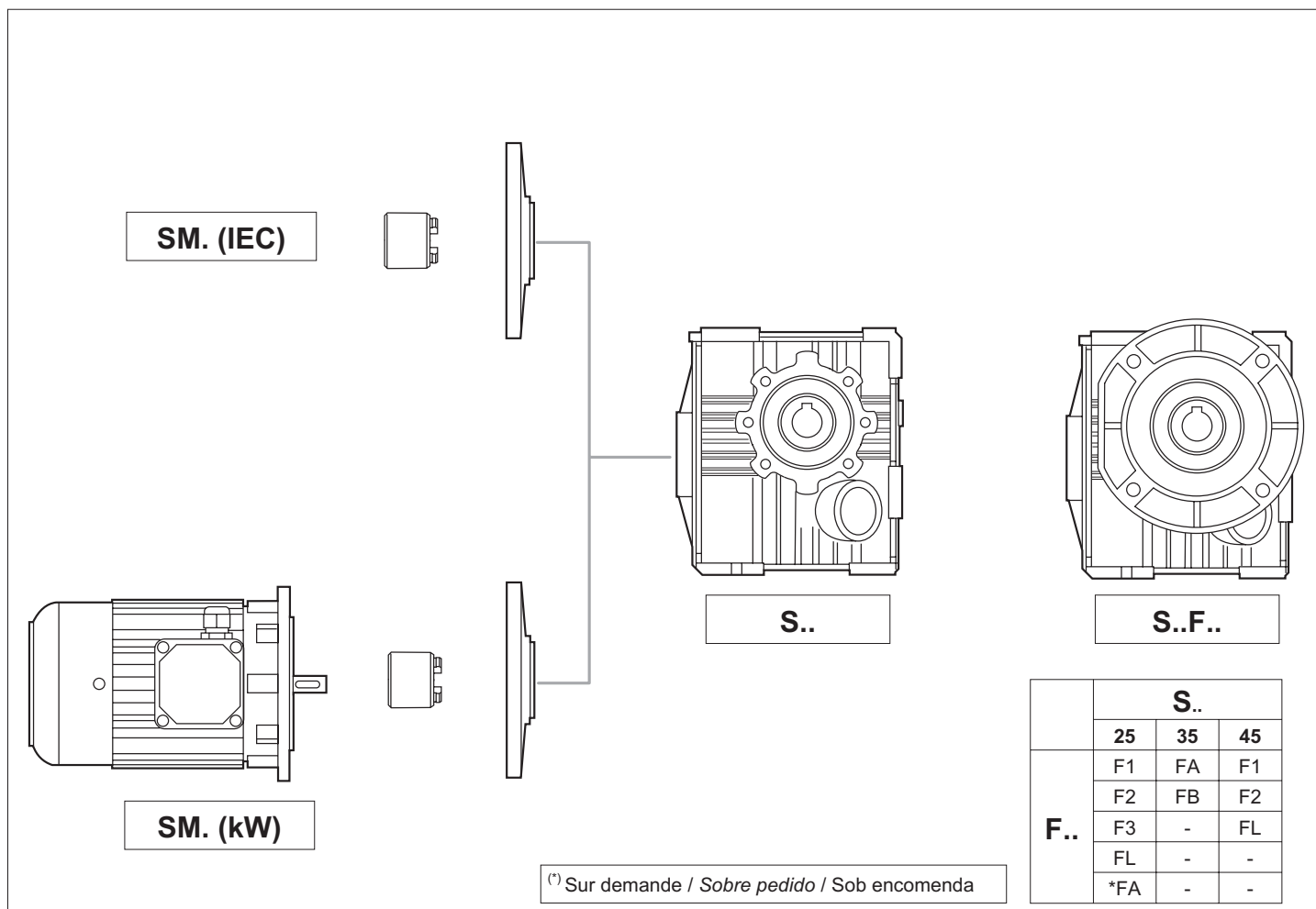
Outras especificações:

- **M1, M2, M3, M4, M5, M6** Posições de montagem com indicação dos tampos de nível, carga e descarga; caso não especificado considere standard a posição **M1** (veja par. 1.3).
- **[T] Braço de reação.**
Braço de reação (veja par. 1.9).
- **[2, 3, 4]** Posição do terminal conector do motor se diversa da standard (1).
- **[*5] Bi-saliência Entrada:**
Nenhuma indicação = entrada sem bi-saliência;
B = entrada com bi-saliência.

1.3 Versions

1.3 Versiones

1.3 Versões





1.4 Lubrification

Le réducteur est fourni avec de l'huile synthétique du type (PAO) avec une valeur additive EP élevée.

Ne pas verser un type d'huile différent de celui indiqué. Pour toute autre informations, consulter notre Service Technique. Le Tab. 2.4 indique les quantités d'huile nécessaires au bon fonctionnement des réducteurs.

Durant le remplissage, s'en tenir aux quantités prescrites car dans certains cas le niveau du lubrifiant dépasse le voyant de niveau.

Au moment de la commande, toujours spécifier la position de montage souhaitée. Si omise, le réducteur sera fourni avec les bouchons prévus pour la position **M1**.

1.4 Lubricación

El reductor se suministra con aceite sintético del tipo (PAO) con elevado valor de aditivación EP.

No colocar un tipo de aceite distinto al indicado. Para ulteriores informaciones, consultar a Nuestra Oficina Técnica. En la Tab.2.4 se indican las cantidades de aceite necesarias para el correcto funcionamiento de los reductores.

Durante el llenado, respetar las cantidades, porque en algunos casos el nivel del lubricante supera el testigo de nivel.

En fase de pedido especificar siempre la posición de montaje deseada. Si se omitiera, el reductor será suministrado con los tapones predispuestos para la posición **M1**.

1.4 Lubrificação

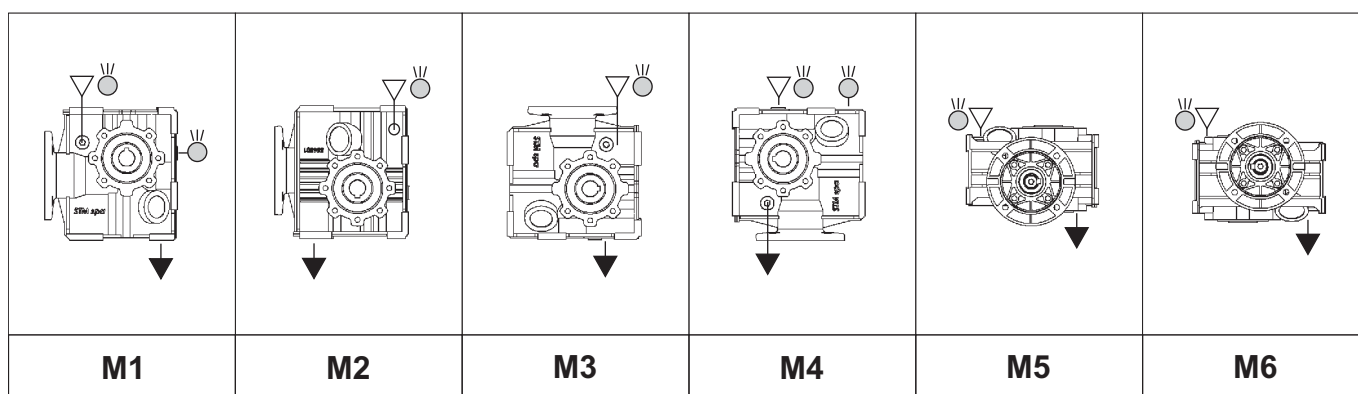
O redutor é fornecido com óleo sintético do tipo (PAO) com alto valor de aditivção EP. Não use nenhum tipo de óleo diferente do indicado.

Para ulteriores informações consulte o Nosso Departamento Técnico.

Na Tab. 2.4 são indicados os quantitativos de óleo necessários para o funcionamento correto dos redutores.

Durante o enchimento atente aos quantitativos pois em alguns casos o nível do lubrificante ultrapassa o indicador.

Em fase de encomenda especifique sempre a posição de montagem. Caso seja omitida, o redutor será fornecido com os tampos predispostos para a posição **M1**.



- ▽ Remplissage / Carga / Carga
- Niveau / Nivel / Nivel
- ▼ Vidange / Descarga / Descarga
- ⊙ Reniflard / Alivio / Ventilado



Le bouchon de reniflard est inclus dans toutes les grandeurs des réducteurs et il faut l'appliquer avant sa mise en marche.

El tapón de alivio se suministra en todas las medidas de los reductores y es necesario aplicarlo antes de la puesta en servicio del mismo.



O tampo ventilado é incluído em todas as dimensões dos redutores e é necessário aplicá-lo antes do acionamento dos mesmos.

Tab. 2.4

SM	Quantité de lubrifiant / Cantidad de lubricante / Quantidade de lubrificante (kg)						*n°. bouchons huile *N° tapones aceite *n°. tampos óleo
	Positions de montage / Posiciones de montaje / Posições de montagem						
	M1	M2	M3	M4	M5	M6	
25	0.300	0.480	0.480	0.480	0.480	0.480	2
35	0.400	0.580					
45	0.500	0.850	0.800	0.800	0.800	0.800	3

* Les fournitures avec dispositions bouchons différentes de celles indiquées dans le tableau, devront être établies.

* *Eventuales suministros con predisposiciones para tapones diferentes de las indicadas en la tabla, deberán ser acordadas.*

* Eventuais fornecimentos com predisposições tampos diversas da indicada na tabela devem ser concordados.



1.5 Charges radiales et axiales

Quand la transmission du mouvement se fait au moyen de mécanismes qui engendrent des charges radiales sur l'extrémité de l'arbre, il est nécessaire de vérifier que les valeurs résultantes n'excèdent pas celles indiquées dans les tableaux.

Le Tab. 2.6 indique les valeurs des charges radiales admissibles pour l'arbre côté entrée (F_{r2}). Comme charge axiale admissible simultanée on a:

$$F_{a2} = 0.2 \times F_{r2}$$

1.5 Cargas radiales y axiales

Quando la transmisión del movimiento se realiza por medio de mecanismos que generan cargas radiales en la extremidad del eje, es necesario verificar que los valores resultantes no excedan los indicados en las tablas.

En la Tab. 2.6 se indican los valores de las cargas radiales admisibles para el eje veloz (F_{r2}). Como carga axial admisible contemporánea se tiene:

$$F_{a2} = 0.2 \times F_{r2}$$

1.5 Cargas radiais e axiais

Se a transmissão de movimento acontece por mecanismos que gerem cargas radiais na extremidade do eixo, controle para que os valores resultantes não excedam aos das tabelas.

Na Tab. 2.6 são indicados os valores das cargas radiais admissíveis para o eixo rápido (F_{r2}). A carga axial contemporânea admissível será:

$$F_{a2} = 0.2 \times F_{r2}$$

Tab. 2.6

n_2 [min ⁻¹]	F_{r2} [N]		
	SM 25	SM 35	SM 45
400	1000	1250	1500
320	1000	1250	1750
260	1050	1313	1950
200	1100	1375	2050
160	1300	1625	2250
125	1300	1625	2400
90	1800	2250	2750
60	1800	2250	2900
40	1800	2250	3300
25	2300	2875	4000
16	2300	2875	4500
10	2800	3500	5300
5	3000	3750	6400

Les charges radiales indiquées dans les tableaux sont appliquées à mi-extension de l'arbre et elles se réfèrent aux réducteurs agissant avec facteur de service 1.

Pour les charges qui n'agissent pas sur la ligne médiane de l'arbre côté sortie ou côté entrée on a:

à 0.3 de l'extension:

$$F_{rx} = 1.25 \times F_{r1-2}$$

à 0.8 de l'extension:

$$F_{rx} = 0.8 \times F_{r1-2}$$

Las cargas radiales indicadas en las tablas se entienden aplicadas en la mitad de la saliente del eje y se refieren a los reductores que operan con factor de servicio 1.

Para las cargas que no operan en el centro del eje lento o veloz se tiene:

a 0.3 de la saliente:

$$F_{rx} = 1.25 \times F_{r1-2}$$

a 0.8 de la saliente:

$$F_{rx} = 0.8 \times F_{r1-2}$$

As cargas radiais indicadas nas tabelas são aplicadas na metade da saliência do eixo e referem-se aos redutores operantes com fator de serviço 1.

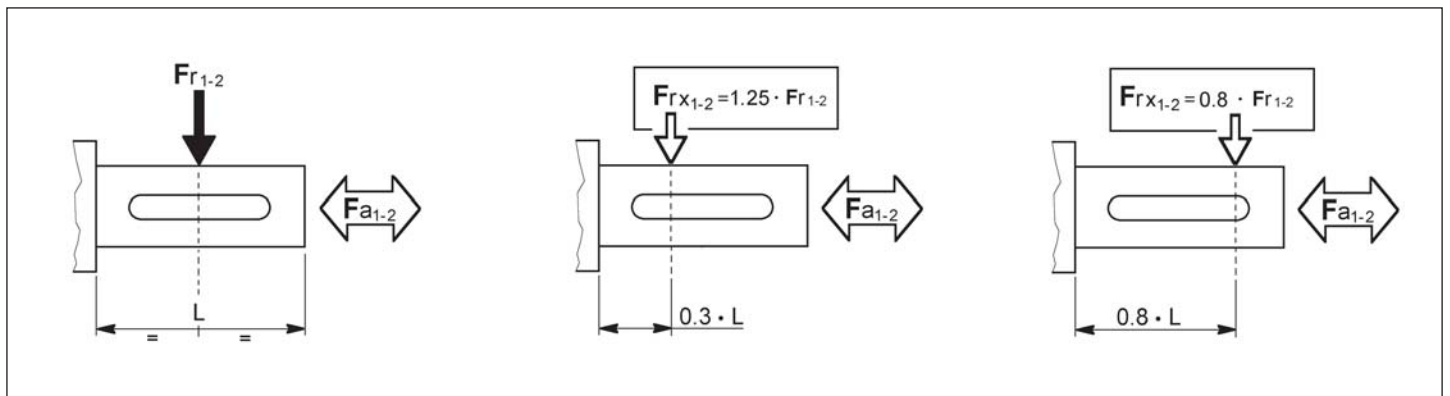
Para cargas não agem no centro do eixo lento ou rápido tem-se:

a 0.3 da saliência:

$$F_{rx} = 1.25 \times F_{r1-2}$$

a 0.8 da saliência:

$$F_{rx} = 0.8 \times F_{r1-2}$$





1.6 Performances réducteurs SM

1.6 Prestaciones reductores SM

1.6 Prestações redutores SM

SM 25



5

ir	$n_1 = 2800 \text{ min}^{-1}$				$n_1 = 1400 \text{ min}^{-1}$				$n_1 = 900 \text{ min}^{-1}$				IEC
	n_2	T_{2M}	P	RD	n_2	T_{2M}	P	RD	n_2	T_{2M}	P	RD	
	min^{-1}	Nm	kW	%	min^{-1}	Nm	kW	%	min^{-1}	Nm	kW	%	
8	350	67	2,71	90	175	70	1,43	90	113	74	0,96	90	90 B5 ⁽²⁾ 90 B14 ⁽²⁾
10	280	81	2,63	90	140	85	1,38	90	90	89	0,93	90	
14	200	95	2,21	90	100	100	1,16	90	64	105	0,79	90	
18	156	95	1,72	90	78	100	0,90	90	50	105	0,61	90	
20	140	95	1,55	90	70	100	0,81	90	45	105	0,55	90	
25	112	95	1,24	90	56	100	0,65	90	36	105	0,44	90	
35	80	95	0,88	90	40	100	0,47	90	26	105	0,31	90	
45	62	95	0,69	90	31	100	0,36	90	20	105	0,24	90	
50	56	95	0,62	90	28	100	0,33	90	18	105	0,22	90	
56	50	95	0,55	90	25	100	0,29	90	16	105	0,20	90	
72	39	95	0,43	90	19	100	0,23	90	13	105	0,15	90	
80	35	95	0,39	90	18	100	0,20	90	11	105	0,14	90	
90	31	95	0,34	90	16	100	0,18	90	10	105	0,12	90	
100	28	95	0,31	90	14	100	0,16	90	9	105	0,11	90	

SM 35



7.5

ir	$n_1 = 2800 \text{ min}^{-1}$				$n_1 = 1400 \text{ min}^{-1}$				$n_1 = 900 \text{ min}^{-1}$				IEC
	n_2	T_{2M}	P	RD	n_2	T_{2M}	P	RD	n_2	T_{2M}	P	RD	
	min^{-1}	Nm	kW	%	min^{-1}	Nm	kW	%	min^{-1}	Nm	kW	%	
8	350	86	3,48	90	175	90	1,83	90	113	95	1,24	90	90 B5 ⁽¹⁾ 90 B14 ⁽¹⁾
10	280	109	3,56	90	140	115	1,87	90	90	121	1,26	90	
12.5	224	138	3,59	90	112	145	1,89	90	72	152	1,28	90	
14	200	138	3,21	90	100	145	1,69	90	64	152	1,14	90	
18	156	138	2,49	90	78	145	1,31	90	50	152	0,89	90	
20	140	138	2,24	90	70	145	1,18	90	45	152	0,80	90	
25	112	166	2,17	90	56	175	1,14	90	36	180	0,75	90	
29.75	94	162	1,77	90	47	170	0,93	90	30	180	0,63	90	
35	80	166	1,55	90	40	175	0,81	90	26	180	0,54	90	
45	62	157	1,13	90	31	165	0,60	90	20	173	0,40	90	
50	56	157	1,02	90	28	165	0,54	90	18	173	0,36	90	
56	50	157	0,91	90	25	165	0,48	90	16	173	0,32	90	
63	44	157	0,81	90	22	165	0,43	90	14	173	0,29	90	
70	40	157	0,73	90	20	165	0,38	90	13	173	0,26	90	
80	35	157	0,64	90	18	165	0,34	90	11	173	0,23	90	
95.20	29	157	0,54	90	15	165	0,28	90	9	173	0,19	90	
108	26	157	0,47	90	13	165	0,25	90	8	173	0,17	90	
120	23	157	0,43	90	12	165	0,22	90	8	173	0,15	90	
142.8	19	157	0,35	90	10	165	0,19	90	6	173	0,13	90	

N.B. Pour les réducteurs caractérisés par le double bord dans la colonne des puissances, il est nécessaire de vérifier l'échange thermique du réducteur (A-1.5). Pour toute autre information, contacter notre Service Technique.

Nota: Para los reductores que se evidencian por el doble borde en la columna de las potencias es necesario verificar el intercambio térmico del reductor (A-1.5). Para mayores informaciones, contactar nuestra oficina técnica.

OBS. Para os redutores evidenciados com duplo contorno na coluna das potências é necessário controlar a sua troca térmica (A-1.5). Para maiores informações contate o nosso dep.to técnico.

N.B. Les poids indiqués sont à titre indicatif et ils peuvent varier en fonction de la version du réducteur.

Nota: Los pesos indicados son ilustrativos y pueden variar en función de la versión del reductor.

OBS. Os pesos indicados são indicativos e podem variar em função da versão do reductor.

**SM 45**

10

ir	$n_1 = 2800 \text{ min}^{-1}$				$n_1 = 1400 \text{ min}^{-1}$				$n_1 = 900 \text{ min}^{-1}$				IEC
	n_2	T_{2M}	P	RD	n_2	T_{2M}	P	RD	n_2	T_{2M}	P	RD	
	min^{-1}	Nm	kW	%	min^{-1}	Nm	kW	%	min^{-1}	Nm	kW	%	
8	350	100	4,07	90	175	110	2,24	90	113	130	1,70	90	100-112 B14 ⁽²⁾ 90 B5 ⁽¹⁾ 90 B14 ⁽¹⁾ 80 B5 80 B14 71 B5 71 B14
10	280	120	3,91	90	140	145	2,36	90	90	160	1,68	90	
14	200	180	4,19	90	100	200	2,33	90	64	225	1,68	90	
16	175	195	3,97	90	88	230	2,34	90	56	250	1,64	90	
18	160	200	3,72	90	80	230	2,14	90	51	230	1,38	90	
20	140	215	3,50	90	70	250	2,04	90	45	260	1,36	90	
25	112	220	2,87	90	56	250	1,63	90	36	260	1,09	90	
28	100	220	2,56	90	50	250	1,45	90	32	250	0,93	90	
32	88	230	2,34	90	44	250	1,27	90	28	260	0,85	90	
35	80	220	2,05	90	40	250	1,16	90	26	245	0,73	90	
40	70	230	1,87	90	35	250	1,02	90	23	260	0,68	90	
50	56	220	1,43	90	28	250	0,81	90	18	260	0,54	90	
56	50	220	1,28	90	25	250	0,73	90	16	260	0,49	90	
62	45	210	1,10	90	23	245	0,64	90	15	245	0,41	90	
70	40	220	1,02	90	20	250	0,58	90	13	260	0,39	90	
86,8	32	220	0,83	90	16	245	0,46	90	10	245	0,30	90	
100	28	200	0,65	90	14	240	0,39	90	9	260	0,27	90	
124	23	200	0,53	90	11	240	0,32	90	7	260	0,22	90	
148,8	19	200	0,44	90	9	240	0,26	90	6	245	0,17	90	

N.B. Pour les réducteurs caractérisés par le double bord dans la colonne des puissances, il est nécessaire de vérifier l'échange thermique du réducteur (A-1.5). Pour toute autre information, contacter notre Service Technique.

N.B. Les poids indiqués sont à titre indicatif et ils peuvent varier en fonction de la version du réducteur.

Nota: Para los reductores que se evidencian por el doble borde en la columna de las potencias es necesario verificar el intercambio térmico del reductor (A-1.5). Para mayores informaciones, contactar nuestra oficina técnica.

Nota: Los pesos indicados son ilustrativos y pueden variar en función de la versión del reductor.

OBS. Para os redutores evidenciados com duplo contorno na coluna das potências é necessário controlar a sua troca térmica (A-1.5). Para maiores informações contate o nosso dep.to técnico.

OBS. Os pesos indicados são indicativos e podem variar em função da versão do redutor.

⁽¹⁾ ATTENTION!

Languettes sur dessin STM.
(Voir Paragraphe A-1.9).

⁽¹⁾ ¡ATENCIÓN!

Chavetas de diseño STM.
(Consultar Párrafo A-1.9).

⁽¹⁾ ATENÇÃO!

Lingüetas projetadas por STM.
(Veja Parágrafo A-1.9).



Le Tab. 2.7 indique les grandeurs moteur accouplés (IEC) avec les dimensions arbre/bride moteur standard.

En la tab. 2.7 se indican las medidas motor acoplables (IEC) junto con las dimensiones eje/brida motor estándar.

Na tab. 2.7 são indicadas as dimensões de motor acopláveis (IEC) com as dimensões eixo/flange motor standard.

Tab. 2.7

Accouplements possibles avec moteurs IEC / Posibles acoplamientos con motores IEC / Possíveis acoplamentos com motores IEC		
	IEC	ir
		Tous / todos / Todos
SM25	90 ⁽²⁾	24/200 (B5) - 24/140 (B14) 24/160 - 24/120 - 24/105• - 24/90•
	80 ⁽¹⁾	19/200 (B5) - 19/120 (B14) 19/160 - 19/140 - 19/105• - 19/90•
	71	14/160 (B5) - 14/105• (B14) 14/200 - 14/140 - 14/120 - 14/90•
	63	11/140 (B5) - 11/90• (B14) - 11/200 - 11/160 - 11/120 - 11/105•
SM 35	90 ⁽¹⁾	24/200 (B5) - 24/140 (B14) 24/160 - 24/120 - 24/105•
	80	19/200 (B5) - 19/120 (B14) 19/160 - 19/140 - 19/105•
	71	14/160 (B5) - 14/105• (B14) 14/200 - 14/140 - 14/120
SM45	112 ⁽²⁾	28/160 (B14)
	100 ⁽²⁾	28/160 (B14)
	90 ⁽¹⁾	24/200 (B5) - 24/140 (B14) 24/160 - 24/120 - 24/105•
	80	19/200 (B5) - 19/120 (B14) 19/160 - 19/140 - 19/105•
	71	14/160 (B5) - 14/105• (B14) 14/200 - 14/140 - 14/120

⁽²⁾ Sur demande / Sobre pedido / Sob encomenda

<p>(1) ATTENTION! Languettes sur dessin STM. (Voir Paragraphe A-1.9).</p>	<p>(1) ¡ATENCIÓN! Chavetas de diseño STM. (Consultar Párrafo A-1.9).</p>	<p>(1) ATENÇÃO! Lingüetas projetadas por STM. (Veja Parágrafo A-1.9).</p>
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Légende:

11/140 (B5) 11/120
11/140 : combinaisons arbre/bride standard
(B5) : forme de construction moteur IEC
11/120 : combinaison arbre/bride sur demande

N.B.
La configuration standard de la bride de fixation moteur prévoit 4 trous à 45° (exemple x: voir par. 1.3).

Pour les brides marquées d'un symbole (*), les trous de fixation moteur sont disposés en parcours croisé (exemple +). Il s'avère donc nécessaire d'évaluer l'encombrement de la plaque à bornes du moteur qui sera installée car elle sera orientée à 45° par rapport aux axes. Pour le choix de la position de la plaque à bornes par rapport aux axes, se référer au schéma suivant (où la position 5 est celle standard) :

Leyenda:

11/140 (B5) 11/120
11/140 : combinaciones eje/brida estándar
(B5) : forma constructiva motor IEC
11/120 : combinación eje/brida, sobre pedido

Nota:
La configuración estándar de la brida toma motor prevé 4 agujeros a 45° (ejemplo x: consultar párr. 1.3).

Para las bridas marcadas con el símbolo (*) los agujeros para la fijación al motor están dispuestos en cruz (ejemplo +). Por lo tanto, se recomienda evaluar las dimensiones de la caja de bornes del motor que será instalada porque deberá encontrarse orientada a 45° respecto a los ejes. Para la elección de la posición de la caja de bornes respecto a los ejes, consultar el siguiente esquema (en el cual la posición 5 es la estándar):

Legenda:

11/140 (B5) 11/120
11/140 : combinações eixo/flange standard
(B5) : forma construtiva motor IEC
11/120 : combinação eixo/flange sob encomenda

OBS.
A configuração standard da flange de conexão ao motor prevê 4 furos de 45° (exemppllo x: veja par. 1.3).

Para as flanges marcadas com (*) os furos para fixagem ao motor são em cruz (exemplo +). Portanto é oportuno calcular o espaço do terminal conector do motor que será instalado, pois esta deve encontrar-se a 45° em relação aos eixos. Para a escolha da posição da sua posição em relação aos eixos veja o esquema seguinte (onde a posição 5 é a standard):



1.7 Performances motoréducteurs

1.7 Prestaciones motorreductores

1.7 Desempenhos motoredutores

n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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0.09 kW		$n_1 = 860 \text{ min}^{-1}$	63B 6
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108	8.0	7.2	10.3	SM 25	63B 6
86	10.0	9.0	9.9	SM 25	63B 6
61	14.0	12.6	8.3	SM 25	63B 6
48	18.0	16.2	6.5	SM 25	63B 6
43	20.0	18.0	5.8	SM 25	63B 6
34	25.0	22	4.7	SM 25	63B 6
25	35.0	31	3.3	SM 25	63B 6
19.1	45.0	40	2.6	SM 25	63B 6
17.2	50.0	45	2.3	SM 25	63B 6
15.4	56.0	50	2.1	SM 25	63B 6
11.9	72.0	65	1.6	SM 25	63B 6
10.8	80.0	72	1.5	SM 25	63B 6
9.6	90.0	81	1.3	SM 25	63B 6
8.6	100.0	90	1.2	SM 25	63B 6

0.13 kW		$n_1 = 1360 \text{ min}^{-1}$ $n_1 = 860 \text{ min}^{-1}$	63A 4 63C 6
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170	8.0	6.6	10.7	SM 25	63A4
136	10.0	8.2	10.3	SM 25	63A4
97	14.0	11.5	8.7	SM 25	63A4
76	18.0	14.8	6.8	SM 25	63A4
68	20.0	16.4	6.1	SM 25	63A4
54	25.0	21	4.9	SM 25	63A4
48	18.0	23	4.5	SM 25	63C6
43	20.0	26	4.0	SM 25	63C6
39	35.0	29	3.5	SM 25	63A4
30	45.0	37	2.7	SM 25	63A4
27	50.0	41	2.4	SM 25	63A4
24	56.0	46	2.2	SM 25	63A4
18.9	72.0	59	1.7	SM 25	63A4
17.0	80.0	66	1.5	SM 25	63A4
15.1	90.0	74	1.4	SM 25	63A4
13.6	100.0	82	1.2	SM 25	63A4
11.9	72.0	94	1.1	SM 25	63C6
10.8	80.0	104	1.0	SM 25	63C6
9.6	90.0	117	0.90	SM 25	63C6
8.6	100.0	130	0.81	SM 25	63C6

n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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0.18 kW		$n_1 = 1370 \text{ min}^{-1}$ $n_1 = 870 \text{ min}^{-1}$	63B 4 71A 6
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171	8.0	9.0	7.7	SM 25	63B4
137	10.0	11.3	7.5	SM 25	63B4
109	8.0	14.2	5.2	SM 25	71A6
98	14.0	15.8	6.3	SM 25	63B4
76	18.0	20	4.9	SM 25	63B4
69	20.0	23	4.4	SM 25	63B4
55	25.0	28	3.5	SM 25	63B4
48	18.0	32	3.3	SM 25	71A6
44	20.0	36	3.0	SM 25	71A6
39	35.0	40	2.5	SM 25	63B4
35	25.0	44	2.4	SM 25	71A6
30	45.0	51	2.0	SM 25	63B4
27	50.0	56	1.8	SM 25	63B4
24	56.0	63	1.6	SM 25	63B4
19.0	72.0	81	1.2	SM 25	63B4
17.1	80.0	90	1.1	SM 25	63B4
15.2	90.0	102	0.98	SM 25	63B4
13.7	100.0	113	0.89	SM 25	63B4
12.4	70.0	124	2.1	SM 45	71A6
12.4	70.0	124	1.4	SM 35	71A6
12.1	72.0	128	0.82	SM 25	71A6
10.9	80.0	142	1.2	SM 35	71A6
10.0	86.8	154	1.6	SM 45	71A6
9.1	95.2	169	1.0	SM 35	71A6
8.7	100.0	178	1.5	SM 45	71A6
8.1	108.0	192	0.90	SM 35	71A6
7.3	120.0	213	0.81	SM 35	71A6
7.0	124.0	221	1.2	SM 45	71A6
5.8	148.8	265	0.93	SM 45	71A6

0.22 kW		$n_1 = 1400 \text{ min}^{-1}$	63C 4
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175	8.0	10.8	6.5	SM 25	63C 4
140	10.0	13.5	6.3	SM 25	63C 4
100	14.0	18.9	5.3	SM 25	63C 4
78	18.0	24	4.1	SM 25	63C 4
70	20.0	27	3.7	SM 25	63C 4
56	25.0	34	3.0	SM 25	63C 4
40	35.0	47	2.1	SM 25	63C 4
31	45.0	61	1.6	SM 25	63C 4
28	50.0	68	1.5	SM 25	63C 4
25	56.0	76	1.3	SM 25	63C 4
19.4	72.0	97	1.0	SM 25	63C 4
17.5	80.0	108	0.93	SM 25	63C 4
15.6	90.0	122	0.82	SM 25	63C 4

n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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0.25 kW		$n_1 = 1370 \text{ min}^{-1}$ $n_1 = 870 \text{ min}^{-1}$	71A 4 71B 6
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199	14.0	10.8	8.8	SM 25	63B2
171	8.0	12.5	5.6	SM 25	71A4
155	18.0	13.9	6.9	SM 25	63B2
140	20.0	15.4	6.2	SM 25	63B2
137	10.0	15.7	5.4	SM 25	71A4
112	25.0	19.3	4.9	SM 25	63B2
110	12.5	19.6	7.4	SM 35	71A4
98	14.0	22	4.6	SM 25	71A4
76	18.0	28	3.5	SM 25	71A4
69	20.0	31	3.2	SM 25	71A4
62	14.0	35	3.0	SM 25	71B6
55	25.0	39	2.6	SM 25	71A4
50	56.0	43	2.2	SM 25	63B2
46	29.8	47	3.6	SM 35	71A4
39	35.0	55	3.2	SM 35	71A4
39	35.0	55	1.8	SM 25	71A4
34	40.0	63	4.0	SM 45	71A4
30	45.0	71	2.3	SM 35	71A4
30	45.0	71	1.4	SM 25	71A4
27	50.0	78	3.2	SM 45	71A4
27	50.0	78	2.1	SM 35	71A4
27	50.0	78	1.3	SM 25	71A4
24	56.0	88	2.8	SM 45	71A4
24	56.0	88	1.9	SM 35	71A4
24	56.0	88	1.1	SM 25	71A4
22	62.0	97	2.5	SM 45	71A4
22	63.0	99	1.7	SM 35	71A4
19.6	70.0	110	2.3	SM 45	71A4
19.6	70.0	110	1.5	SM 35	71A4
19.0	72.0	113	0.89	SM 25	71A4
17.1	80.0	125	1.3	SM 35	71A4
17.1	80.0	125	0.80	SM 25	71A4
15.8	86.8	136	1.8	SM 45	71A4
14.4	95.2	149	1.1	SM 35	71A4
13.7	100.0	157	1.5	SM 45	71A4
12.7	108.0	169	0.97	SM 35	71A4
11.4	120.0	188	0.88	SM 35	71A4
11.0	124.0	194	1.2	SM 45	71A4
9.2	148.8	233	1.0	SM 45	71A4
8.7	100.0	247	1.1	SM 45	71B6
7.0	124.0	306	0.85	SM 45	71B6



1.7 Performances motoreducteurs

1.7 Prestaciones motorreductores

1.7 Desempenhos motoredutores

n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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0.37 kW		$n_1 = 2790 \text{ min}^{-1}$ $n_1 = 1380 \text{ min}^{-1}$ $n_1 = 910 \text{ min}^{-1}$	63C 2 71B 4 80A 6
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279	10.0	11.4	7.1	SM 25	63C2
199	14.0	16.0	6.0	SM 25	63C2
173	8.0	18.4	3.8	SM 25	71B4
155	18.0	21	4.6	SM 25	63C2
138	10.0	23	3.7	SM 25	71B4
112	25.0	28	3.3	SM 25	63C2
110	12.5	29	5.0	SM 35	71B4
99	14.0	32	3.1	SM 25	71B4
91	10.0	35	2.5	SM 25	80A6
77	18.0	41	3.5	SM 35	71B4
77	18.0	41	2.4	SM 25	71B4
69	20.0	46	3.1	SM 35	71B4
69	20.0	46	2.2	SM 25	71B4
55	25.0	58	3.0	SM 35	71B4
55	25.0	58	1.7	SM 25	71B4
46	29.8	69	2.5	SM 35	71B4
43	32.0	74	3.4	SM 45	71B4
39	35.0	81	3.1	SM 45	71B4
39	35.0	81	2.2	SM 35	71B4
39	35.0	81	1.2	SM 25	71B4
35	40.0	92	2.7	SM 45	71B4
31	45.0	104	1.6	SM 35	71B4
31	45.0	104	0.96	SM 25	71B4
28	50.0	115	2.2	SM 45	71B4
28	50.0	115	1.4	SM 35	71B4
28	50.0	115	0.87	SM 25	71B4
25	56.0	129	1.9	SM 45	71B4
25	56.0	129	1.3	SM 35	71B4
22	62.0	143	1.7	SM 45	71B4
22	63.0	145	1.1	SM 35	71B4
19.7	70.0	161	1.5	SM 45	71B4
19.7	70.0	161	1.0	SM 35	71B4
17.3	80.0	184	0.90	SM 35	71B4
15.9	86.8	200	1.2	SM 45	71B4
13.8	100.0	230	1.0	SM 45	71B4
11.1	124.0	286	0.84	SM 45	71B4

0.55 kW		$n_1 = 2800 \text{ min}^{-1}$ $n_1 = 1390 \text{ min}^{-1}$ $n_1 = 1380 \text{ min}^{-1}$	71B 2 80A 4 71C 4
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28	50.0	170	1.5	SM 45	80A4
28	50.0	170	0.97	SM 35	80A4
28	50.0	171	1.5	SM 45	71C4
28	50.0	171	0.96	SM 35	71C4
25	56.0	190	1.3	SM 45	80A4
25	56.0	190	0.87	SM 35	80A4

n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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0.55 kW		$n_1 = 2800 \text{ min}^{-1}$ $n_1 = 1390 \text{ min}^{-1}$ $n_1 = 1380 \text{ min}^{-1}$	71B 2 80A 4 71C 4
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350	8.0	13.5	5.0	SM 25	71B2
280	10.0	16.9	4.8	SM 25	71B2
200	14.0	24	4.0	SM 25	71B2
174	8.0	27	3.3	SM 35	80A4
174	8.0	27	2.6	SM 25	80A4
173	8.0	27	3.3	SM 35	71C4
173	8.0	27	2.6	SM 25	71C4
156	18.0	30	3.1	SM 25	71B2
139	10.0	34	3.4	SM 35	80A4
139	10.0	34	2.5	SM 25	80A4
138	10.0	34	3.4	SM 35	71C4
138	10.0	34	2.5	SM 25	71C4
111	12.5	43	3.4	SM 35	80A4
110	12.5	43	3.4	SM 35	71C4
99	14.0	48	3.0	SM 35	80A4
99	14.0	48	2.1	SM 25	80A4
99	14.0	48	3.0	SM 35	71C4
99	14.0	48	2.1	SM 25	71C4
87	16.0	54	4.2	SM 45	80A4
86	16.0	55	4.2	SM 45	71C4
77	18.0	61	2.4	SM 35	80A4
77	18.0	61	1.6	SM 25	80A4
77	18.0	62	2.4	SM 35	71C4
77	18.0	62	1.6	SM 25	71C4
70	20.0	68	2.1	SM 35	80A4
70	20.0	68	1.5	SM 25	80A4
69	20.0	69	2.1	SM 35	71C4
69	20.0	69	1.5	SM 25	71C4
56	25.0	85	2.9	SM 45	80A4
56	25.0	85	2.1	SM 35	80A4
56	25.0	85	1.2	SM 25	80A4
55	25.0	86	2.9	SM 45	71C4
55	25.0	86	2.0	SM 35	71C4
55	25.0	86	1.2	SM 25	71C4
50	28.0	95	2.6	SM 45	80A4
49	28.0	96	2.6	SM 45	71C4
47	29.8	101	1.7	SM 35	80A4
46	29.8	102	1.7	SM 35	71C4
43	32.0	109	2.3	SM 45	80A4
43	32.0	110	2.3	SM 45	71C4
40	35.0	119	2.1	SM 45	80A4
40	35.0	119	1.5	SM 35	80A4
40	35.0	119	0.84	SM 25	80A4
39	35.0	120	2.1	SM 45	71C4
39	35.0	120	1.5	SM 35	71C4
39	35.0	120	0.83	SM 25	71C4
35	40.0	136	1.8	SM 45	80A4
35	40.0	137	1.8	SM 45	71C4
31	45.0	153	1.1	SM 35	80A4
31	45.0	154	1.1	SM 35	71C4

n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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0.55 kW		$n_1 = 2800 \text{ min}^{-1}$ $n_1 = 1390 \text{ min}^{-1}$ $n_1 = 1380 \text{ min}^{-1}$	71B 2 80A 4 71C 4
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25	56.0	192	1.3	SM 45	71C4
25	56.0	192	0.86	SM 35	71C4
22	62.0	211	1.2	SM 45	80A4
22	62.0	212	1.2	SM 45	71C4
19.9	70.0	238	1.1	SM 45	80A4
19.7	70.0	240	1.0	SM 45	71C4
16.0	86.8	295	0.83	SM 45	80A4
15.9	86.8	297	0.82	SM 45	71C4

0.75 kW		$n_1 = 2800 \text{ min}^{-1}$ $n_1 = 1390 \text{ min}^{-1}$	71C 2 80B 4
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350	8.0	18.4	3.6	SM 25	71C2
280	10.0	23	3.5	SM 25	71C2
200	14.0	32	2.9	SM 25	71C2
174	8.0	37	3.0	SM 45	80B4
174	8.0	37	2.4	SM 35	80B4
174	8.0	37	1.9	SM 25	80B4
139	10.0	46	3.1	SM 45	80B4
139	10.0	46	2.5	SM 35	80B4
139	10.0	46	1.8	SM 25	80B4
111	12.5	58	2.5	SM 35	80B4
99	14.0	65	3.1	SM 45	80B4
99	14.0	65	2.2	SM 35	80B4
99	14.0	65	1.5	SM 25	80B4
87	16.0	74	3.1	SM 45	80B4
77	18.0	83	2.8	SM 45	80B4
77	18.0	83	1.7	SM 35	80B4
77	18.0	83	1.2	SM 25	80B4
70	20.0	93	2.7	SM 45	80B4
70	20.0	93	1.6	SM 35	80B4
70	20.0	93	1.1	SM 25	80B4
56	25.0	116	2.2	SM 45	80B4
56	25.0	116	1.5	SM 35	80B4
56	25.0	116	0.86	SM 25	80B4
50	28.0	130	1.9	SM 45	80B4
47	29.8	138	1.2	SM 35	80B4
43	32.0	148	1.7	SM 45	80B4
40	35.0	162	1.5	SM 45	80B4
40	35.0	162	1.1	SM 35	80B4
35	40.0	186	1.3	SM 45	80B4
28	50.0	232	1.1	SM 45	80B4
25	56.0	260	0.96	SM 45	80B4
22	62.0	288	0.85	SM 45	80B4



1.7 Performances motoréducteurs

1.7 Prestaciones motorreductores

1.7 Desempenhos motoredutores

n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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0.88 kW		$n_1 = 1350 \text{ min}^{-1}$	80C 4
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169	8.0	45	2.5	SM 45	80C4
169	8.0	45	2.0	SM 35	80C4
169	8.0	45	1.6	SM 25	80C4
135	10.0	56	2.6	SM 45	80C4
135	10.0	56	2.1	SM 35	80C4
135	10.0	56	1.5	SM 25	80C4
108	12.5	70	2.1	SM 35	80C4
96	14.0	78	2.5	SM 45	80C4
96	14.0	78	1.8	SM 35	80C4
96	14.0	78	1.3	SM 25	80C4
84	16.0	90	2.6	SM 45	80C4
75	18.0	101	2.3	SM 45	80C4
75	18.0	101	1.4	SM 35	80C4
75	18.0	101	0.99	SM 25	80C4
68	20.0	112	2.2	SM 45	80C4
68	20.0	112	1.3	SM 35	80C4
68	20.0	112	0.89	SM 25	80C4
54	25.0	140	1.8	SM 45	80C4
54	25.0	140	1.2	SM 35	80C4
48	28.0	157	1.6	SM 45	80C4
45	29.8	167	1.0	SM 35	80C4
42	32.0	179	1.4	SM 45	80C4
39	35.0	196	1.3	SM 45	80C4
39	35.0	196	0.89	SM 35	80C4
34	40.0	224	1.1	SM 45	80C4
27	50.0	280	0.89	SM 45	80C4
24	56.0	314	0.80	SM 45	80C4

1.1 kW		$n_1 = 2830 \text{ min}^{-1}$ $n_1 = 1390 \text{ min}^{-1}$	80B 2 80D 4
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354	8.0	27	3.2	SM 35	80B2
354	8.0	27	2.5	SM 25	80B2
283	10.0	33	3.3	SM 35	80B2
283	10.0	33	2.4	SM 25	80B2
226	12.5	42	3.3	SM 35	80B2
202	14.0	47	3.0	SM 35	80B2
202	14.0	47	2.0	SM 25	80B2
174	8.0	54	2.0	SM 45	80D4
174	8.0	54	1.7	SM 35	80D4
174	8.0	54	1.3	SM 25	80D4
139	10.0	68	2.1	SM 45	80D4
139	10.0	68	1.7	SM 35	80D4
139	10.0	68	1.2	SM 25	80D4


n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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1.1 kW		$n_1 = 2830 \text{ min}^{-1}$ $n_1 = 1390 \text{ min}^{-1}$	80B 2 80D 4
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111	12.5	85	1.7	SM 35	80D4
99	14.0	95	2.1	SM 45	80D4
99	14.0	95	1.5	SM 35	80D4
99	14.0	95	1.1	SM 25	80D4
87	16.0	109	2.1	SM 45	80D4
77	18.0	122	1.9	SM 45	80D4
77	18.0	122	1.2	SM 35	80D4
77	18.0	122	0.82	SM 25	80D4
70	20.0	136	1.8	SM 45	80D4
70	20.0	136	1.1	SM 35	80D4
56	25.0	170	1.5	SM 45	80D4
56	25.0	170	1.0	SM 35	80D4
50	28.0	190	1.3	SM 45	80D4
47	29.8	202	0.84	SM 35	80D4
43	32.0	218	1.1	SM 45	80D4
40	35.0	238	1.1	SM 45	80D4
35	40.0	272	0.92	SM 45	80D4

1.5 kW		$n_1 = 2830 \text{ min}^{-1}$ $n_1 = 1400 \text{ min}^{-1}$	80C 2 90L 4
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354	8.0	36	2.7	SM 45	80C2
354	8.0	36	2.4	SM 35	80C2
354	8.0	36	1.8	SM 25	80C2
283	10.0	46	2.6	SM 45	80C2
283	10.0	46	2.4	SM 35	80C2
283	10.0	46	1.8	SM 25	80C2
226	12.5	57	2.4	SM 35	80C2
202	14.0	64	2.8	SM 45	80C2
202	14.0	64	2.2	SM 35	80C2
202	14.0	64	1.5	SM 25	80C2
175	8.0	74	1.5	SM 45	90L4
175	8.0	74	1.2	SM 35	90L4
175	8.0	74	0.95	SM 25	90L4
140	10.0	92	1.6	SM 45	90L4
140	10.0	92	1.2	SM 35	90L4
140	10.0	92	0.92	SM 25	90L4
112	12.5	115	1.3	SM 35	90L4
100	14.0	129	1.6	SM 45	90L4
100	14.0	129	1.1	SM 35	90L4
88	16.0	147	1.6	SM 45	90L4
78	18.0	166	1.4	SM 45	90L4
78	18.0	166	0.87	SM 35	90L4
70	20.0	184	1.4	SM 45	90L4
56	25.0	230	1.1	SM 45	90L4

n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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1.5 kW		$n_1 = 2830 \text{ min}^{-1}$ $n_1 = 1400 \text{ min}^{-1}$	80C 2 90L 4
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50	28.0	258	0.97	SM 45	90L4
44	32.0	295	0.85	SM 45	90L4

1.8 kW		$n_1 = 2770 \text{ min}^{-1}$ $n_1 = 1400 \text{ min}^{-1}$	80D 2 90LB 4
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346	8.0	45	2.2	SM 45	80D2
346	8.0	45	1.9	SM 35	80D2
346	8.0	45	1.5	SM 25	80D2
277	10.0	56	2.1	SM 45	80D2
277	10.0	56	2.0	SM 35	80D2
277	10.0	56	1.5	SM 25	80D2
222	12.5	70	2.0	SM 35	80D2
198	14.0	78	2.3	SM 45	80D2
198	14.0	78	1.8	SM 35	80D2
198	14.0	78	1.2	SM 25	80D2
175	8.0	88	1.2	SM 45	90LB4
175	8.0	88	1.0	SM 35	90LB4
154	18.0	101	2.0	SM 45	80D2
154	18.0	101	1.4	SM 35	80D2
154	18.0	101	0.94	SM 25	80D2
140	10.0	111	1.3	SM 45	90LB4
140	10.0	111	1.0	SM 35	90LB4
112	12.5	138	1.0	SM 35	90LB4
100	14.0	155	1.3	SM 45	90LB4
100	14.0	155	0.94	SM 35	90LB4
88	16.0	177	1.3	SM 45	90LB4
78	18.0	199	1.2	SM 45	90LB4
70	20.0	221	1.1	SM 45	90LB4
56	25.0	276	0.90	SM 45	90LB4
50	28.0	309	0.81	SM 45	90LB4



1.7 Performances motoréducteurs

1.7 Prestaciones motorreductores

1.7 Desempenhos motoredutores

n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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n_2 min ⁻¹	ir	T2 Nm	FS'	SM	
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2.2 kW	$n_1 = 2840 \text{ min}^{-1}$	90L 2
	$n_1 = 1410 \text{ min}^{-1}$	100A 4
	$n_1 = 940 \text{ min}^{-1}$	100LB 6

3 kW	$n_1 = 2840 \text{ min}^{-1}$	90LB 2
	$n_1 = 1420 \text{ min}^{-1}$	100LB 4

4 kW	$n_1 = 2860 \text{ min}^{-1}$	100B 2
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355	8.0	53	1.9	SM 45	90L2
355	8.0	53	1.6	SM 35	90L2
355	8.0	53	1.3	SM 25	90L2
284	10.0	67	1.8	SM 45	90L2
284	10.0	67	1.6	SM 35	90L2
284	10.0	67	1.2	SM 25	90L2
227	12.5	83	1.7	SM 35	90L2
203	14.0	93	1.9	SM 45	90L2
203	14.0	93	1.5	SM 35	90L2
203	14.0	93	1.0	SM 25	90L2
176	8.0	107	1.0	SM 45	100A4
142	20.0	133	1.0	SM 35	90L2
141	10.0	134	1.1	SM 45	100A4
101	14.0	188	1.1	SM 45	100A4
95	29.8	198	0.82	SM 35	90L2
88	16.0	215	1.1	SM 45	100A4
78	18.0	241	0.95	SM 45	100A4
71	20.0	268	0.93	SM 45	100A4
67	14.0	282	0.80	SM 45	100BL6

355	8.0	73	1.4	SM 45	90LB2
355	8.0	73	1.2	SM 35	90LB2
355	8.0	73	0.92	SM 25	90LB2
284	10.0	91	1.3	SM 45	90LB2
284	10.0	91	1.2	SM 35	90LB2
284	10.0	91	0.89	SM 25	90LB2
227	12.5	113	1.2	SM 35	90LB2
203	14.0	127	1.4	SM 45	90LB2
203	14.0	127	1.1	SM 35	90LB2
178	16.0	145	1.3	SM 45	90LB2
158	18.0	163	1.2	SM 45	90LB2
158	18.0	163	0.84	SM 35	90LB2
142	20.0	182	1.2	SM 45	90LB2
142	10.0	182	0.80	SM 45	100B4
114	25.0	227	0.97	SM 45	90LB2
101	28.0	254	0.87	SM 45	90LB2

358	8.0	96	1.0	SM 45	100B2
286	10.0	120	1.0	SM 45	100B2
204	14.0	168	1.1	SM 45	100B2
179	16.0	192	1.0	SM 45	100B2
159	18.0	216	0.92	SM 45	100B2
143	20.0	240	0.89	SM 45	100B2





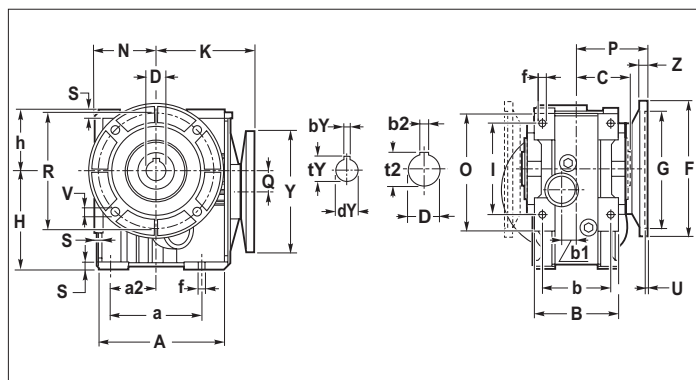
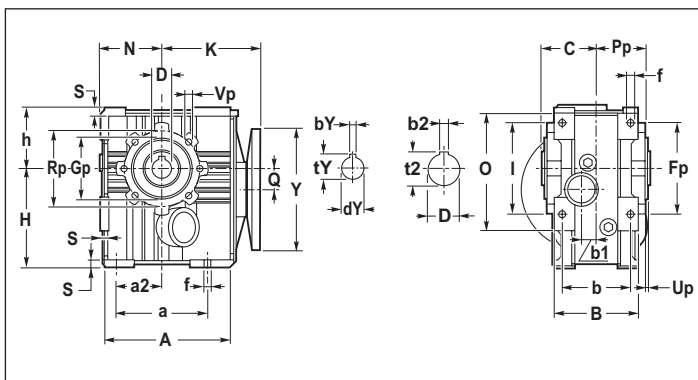
1.8 Dimensions

1.8 Dimensiones

1.8 Dimensões

SM 25 - 35 - 45

SM 25 - 35 - 45...F1...



Tab. 2.8.1

SM	A	a	a2	B	b	b1	C	D	f	h	H	I	N	O	Q	S	K
25	122	90	45	90	73.5	16,55	52.5	19 (20*) (24*)	9	65	107	90	65	122	25.5	8	100 ⁽¹⁾
35	130	100	50	95	75	17.5	60	25 (28*) (30*)	9	70	123.5	100	70	130	28.5	8	122.5
45	165	120	60	110	90	19	70	30 (25*) (28*)	9	80	130	120	80	155	27.5	10	129.5 ⁽²⁾

⁽¹⁾ Pour le PAM 90 B5 et B14, contacter le Bureau Commercial
⁽¹⁾ Para el PAM 90 B5 y B14 contactar la Oficina Comercial
⁽¹⁾ Para o PAM 90 B5 e B14 contacte o Departamento Comercial

⁽²⁾ Pour le PAM 100-112 et B14, contacter le Bureau Commercial
⁽²⁾ Para el PAM 100-112 y B14 contactar la Oficina Comercial
⁽²⁾ Para o PAM 100-112 B14 contacte o Departamento Comercial

* Sur demande / Sobre pedido / Sob encomenda

Tab. 2.8.2

SM	25	35	45
Fp	100	110	120
Gp	70	80	80
Pp	50	55.5	65
Rp	85	95	100
Up	2.5	2.5	3
Vp	M8	M8	M8

Tab. 2.8.3

SM	F	Fq	G (g6)	P	R	U	V	Z
25	F1	175	-	115	78.5	150	5	11
	F2	200	-	130	94.5	165		13
	F3	160	-	110	74.5	130		10
	FL	180	-	115	108.5	150		11
	* FA	125	110	70	96.5	85		8.5
35	FA	180	142	115	84.5	150	6	11
	FB				114.5			
45	F1	175	-	115	116	150	5	11
	F2	175	-	115	85	150		
	FL	200	-	130	111	165		

*Sur demande / Sobre pedido / Sob encomenda

ARBRES COTE SORTIE

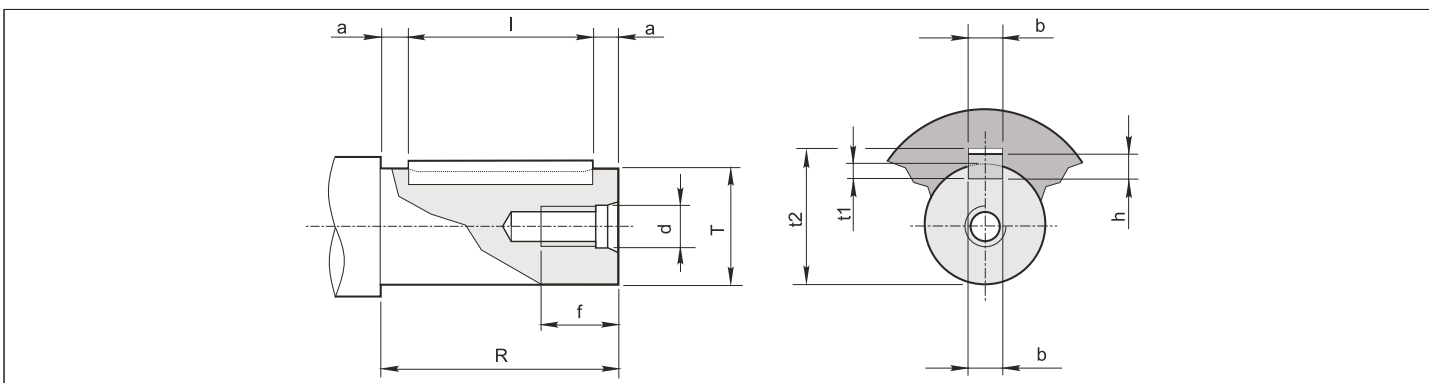
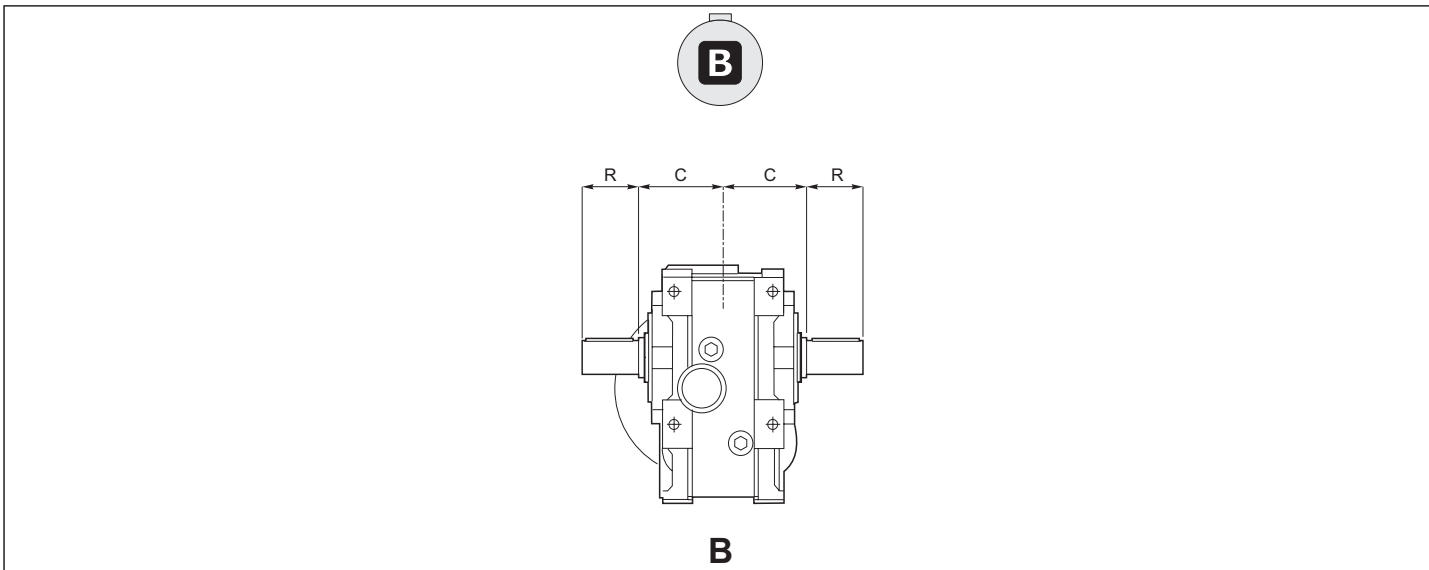
EJES LENTOS

ABTRIEBSWELLEN

Bout d'arbre côté sortie

Extremidad de eje salida

Extremidade do eixo de saída



	Ø Arbre Ø Eje Ø Eixo		Trou taraudé Tête Agujero rosc. cabeza Furo sulcado		Rainure Ranura Fossa			Bout d'arbre Extremidad de eje Extremidade do eixo		Langnette Chaveta Linguetta
	T	C	d	f	b	t1	t2	R	a	bxhxl
25	19 g6	52.5	M 6	15	6	3.5	21.8	40	8	6X7X25
35	25 g6	60	M 8	22	8	4	28.3	60	10	8X7X40
45	30 g6	70	M 10	25	8	4	33.3	60	5	8X7X50



SADORNIL

HIGH TECH

line

ARBRES COTE SORTIE

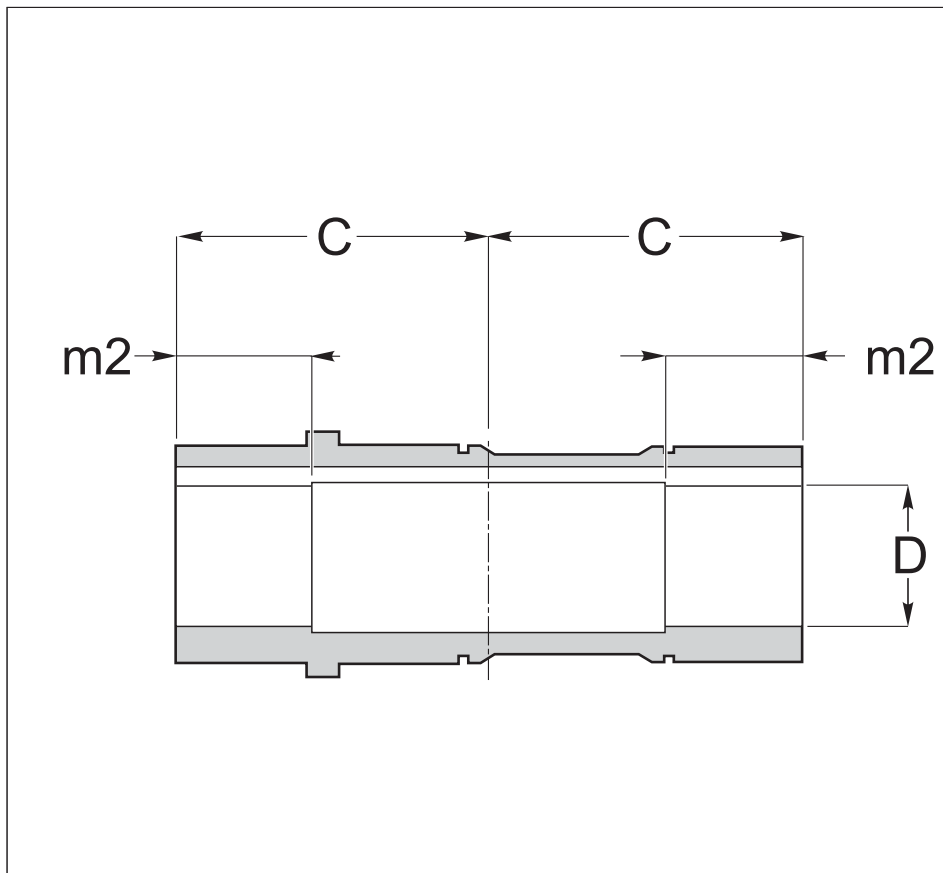
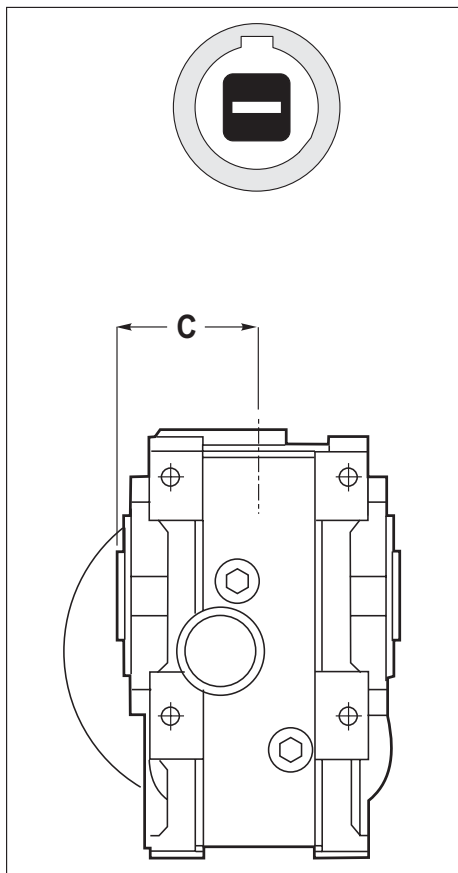
Arbre côté sortie creux

EJES LENTOS

Eje lento hueco

ABTRIEBSWELLEN

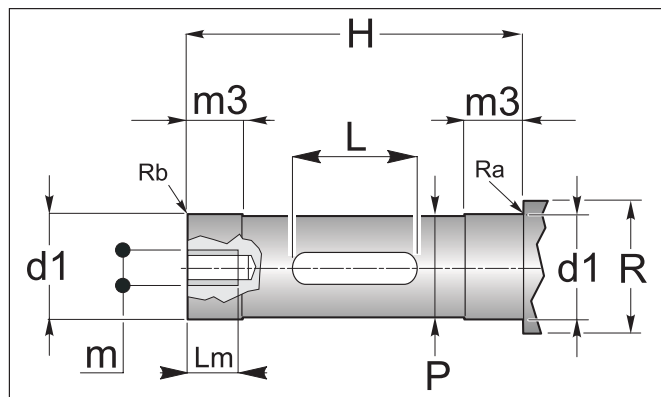
Eixo lento oco



	25	35	45
C	52.5	60	70
D	19	25	30
H7	(24)	(30)	(28)
	(20)	(28)	(25)
m2	25.5	25.5	30.5

Axe machine / Perno máquina / Perno máquina

	d1	m3	Lm	m	H	L	P	R	Ra	Rb
	g6					min				
25	19 (24) (20)	30	15 (25) (15)	M 6 (M 8) (M 6)	103	40	18.8 (23.8) (19.8)	30		
35	25 (30) (28)	30	25 (25) (25)	M 8 (M 10) (M 10)	118	60	24.8 (29.8) (27.8)	40		
45	30 (28) (25)	35	25 (25) (25)	M 10 (M 10) (M 8)	138	60	29.8 (27.8) (24.8)	40		





ARBRES COTE SORTIE

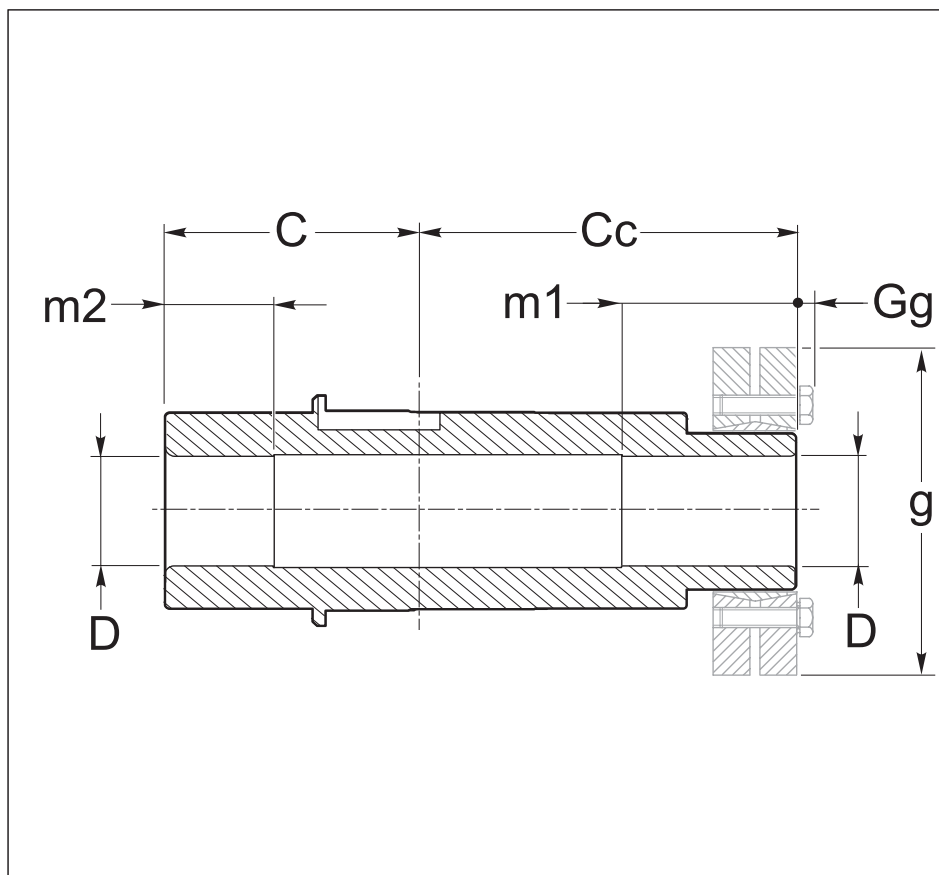
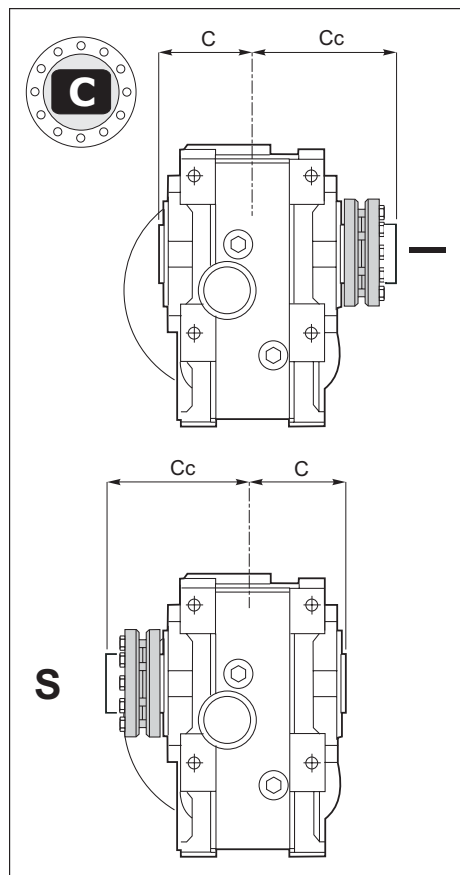
EJES LENTOS

ABTRIEBSWELLEN

Arbre avec frette de serrage

Eje con ensamblador

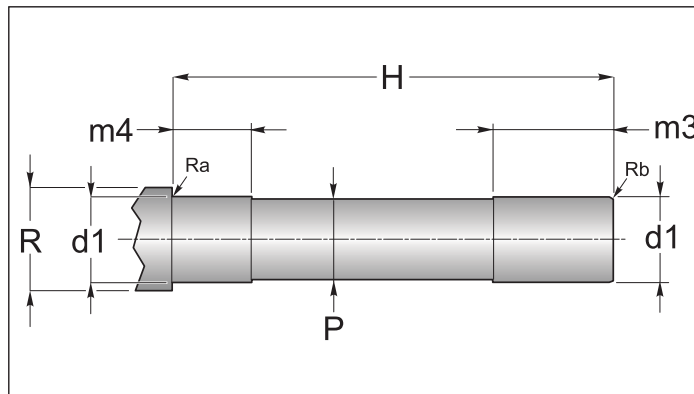
Eixo com encaixe



	25	35	45
C	52.5	60	70
Cc	74.5	85	*
D H7	19	25	30
m1	35	40	*
m2	25.5	25.5	30.5
g	50	60	80
Gg	3.5	3.5	4

Axe machine / Perno máquina / Perno máquina

	d1 h6	H	m3	m4	P	R	Ra	Rb
25	19	127	40	30	18.8	30		
35	25	145	45	30	24.8	40		
45	30	*	*	35	34.8	43		



*Contacter notre Service Technique / Contactar nuestro servicio técnico / Consulte o nosso serviço técnico



1.9 Accessoires

ARBRE COTE SORTIE A EXTENSION

Tous les réducteurs sont fournis avec un arbre côté sortie creux. Sur demande, on peut fournir des kits de montage pour arbres à extension munis de languettes, rondelles et vis de fixation. Les dimensions des languettes sont conformes aux normes UNI 6604-69.

1.9 Accesorios

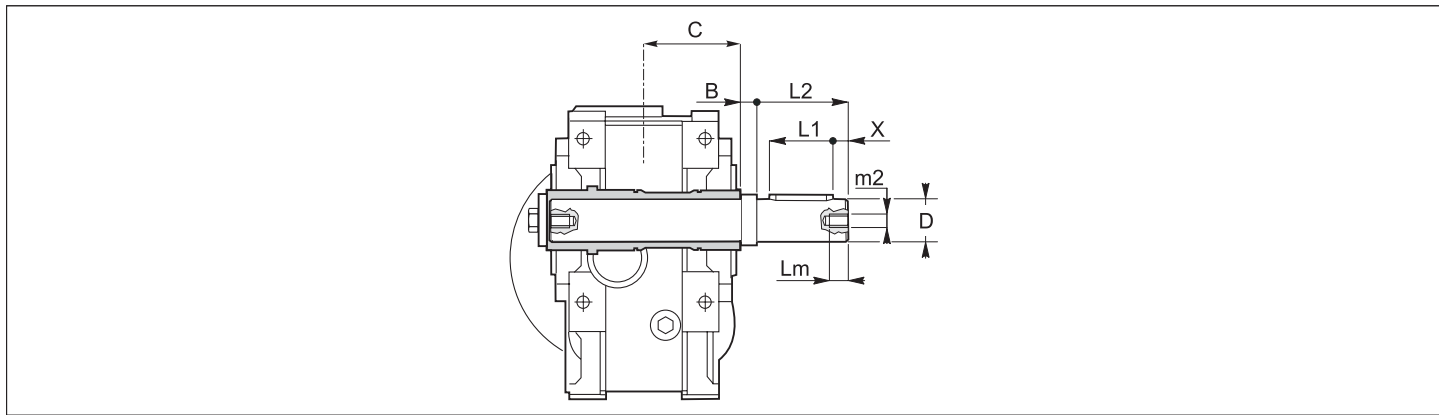
SINGLE OUTPUT SHAFTS

Todos los reductores se suministran con eje lento hueco. Sobre pedido, se puede suministrar kit de montaje para ejes salientes con chavetas, arandelas y tornillos de fijación. Las dimensiones de las chavetas cumplen con las normas UNI 6604-69.

1.9 Acessórios

EIXO LENTO SALIENTE

Todos os redutores são fornecidos com eixo lento oco. Sob encomenda, podem ser fornecidos kits de montagem para eixos salientes disponíveis com linguetas, anéis isolantes e parafusos de fixagem. As dimensões das linguetas estão conforme as normas UNI 6604-69.



	B	C	D g6	m₂	L₁	L₂	L_m	X
25*	10	52.5	19	M 8	25	40	16	8
35*	10	60	25	M 8	40	60	20	10
45*	3	70	30	M 10	50	60	25	5

ATTENTION

L'arbre côté sortie saillant est fourni pour être installé sur la version du réducteur avec arbre **CREUX** doté de diamètre **STANDARD**.

*** ATENCIÓN**

El eje lento saliente se suministra para ser instalado en la versión del reductor con eje **CAVO** con diámetro **ESTÁNDAR**.

*** ATENÇÃO**

O eixo lento saliente é fornecido para ser instalado na versão do redutor com eixo **OCO**, com diâmetro **STANDARD**.

BRAS DE TORSION [T]

Pour la fixation du réducteur au moyen d'un tirant, on fournit le bras de torsion spécial.

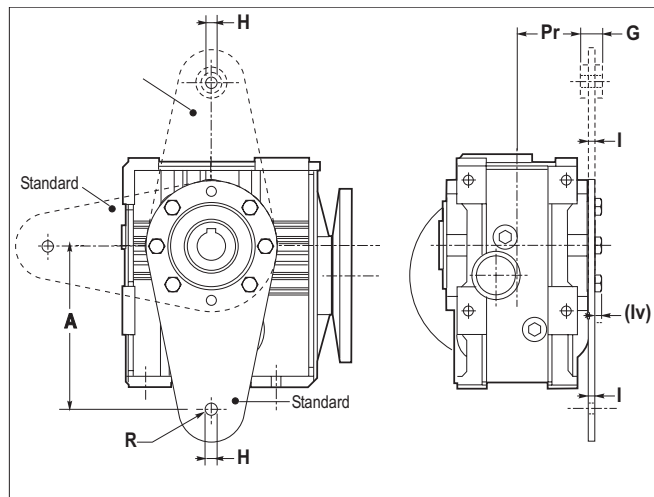
BRAZO DE REACCIÓN [T]

Para fijar el reductor mediante tirante, se suministra adjuntado el específico brazo de reacción.

BRAÇO DE REAÇÃO [T]

Para a fixagem do redutor com tirante, é fornecido o braço de reação adequado.

Tab. 2.9.1



S SM	BRAS DE TORSION [T] BRAZO DE REACCIÓN [T] BRAÇO DE REAÇÃO [T]						
	A	G	H	I	Iv	Pr	R
25	100	15	10	4	5	40.5	25
35*	150	20	10	6	5	48.5	25
45	150	20	10	6	5	58	30

* Avec douille VK / Con casquillo VK / Com argola VK



1.10 Languettes

1.10 Chavetas

1.10 Lingüetas

Arbre côté entrée / Eje entrada / Eixo entrada

SR		
d	b ₁	t ₁
9	3	10.2
11	4	12.5
14	5	16.0
16	5	18.0
18	6	20.5
19	6	21.5
24	8	27.0
25	8	28.0
28	8	31.0
30	8	33.0
32	10	35.0
35	10	38.0
38	10	41.0
42	12	45.0
45	14	48.5
48	14	51.5
50	14	53.5
55	16	59.0
65	18	69.0

SM PAM B5				
PAM B5	Y	dY	bY	tY
56	120	9	3	10.4
63	140	11	4	12.8
71	160	14	5	16.3
80	200	19	6	21.8
90	200	24	8	27.3
100	250	28	8	31.3
112	250	28	8	31.3
132	300	38	10	41.3
160	350	42	12	45.3
180	350	48	14	51.8
200	400	55	16	59.3

SM PAM B14				
PAM B14	Y	dY	bY	tY
56	80	9	3	10.4
63	90	11	4	12.8
71	105	14	5	16.3
80	120	19	6	21.8
90	140	24	8	27.3
100	160	28	8	31.3
112	160	28	8	31.3
132	200	38	10	41.3

Arbre côté sortie / Eje salida / Eixo saída

Arbre Foré / Eje Perforado / Eixo Furado S - SR - SM		
D	b ₂	t ₂
14	5	16.3
18	6	20.8
19	6	21.8
24	8	27.3
25	8	28.3
28	8	31.3
30	8	33.3
32	10	35.3
35	10	38.3
42	12	45.3
45	14	48.8
48	14	51.8
50	14	53.8
55	16	59.3
65	18	69.4

Arbre plein / Eje Pleno / Eixo Cheio S - SR - SM		
d ₂	b ₂	t ₂
9	3	10.2
11	4	12.5
14	5	16.0
16	5	18.0
18	6	20.5
19	6	21.5
24	8	27.0
25	8	28.0
28	8	31.0
30	8	33.0
32	10	35.0
35	10	38.0
38	10	41.0
42	12	45.0
45	14	48.5
48	14	51.5
50	14	53.5
55	16	59.0
65	18	69.0



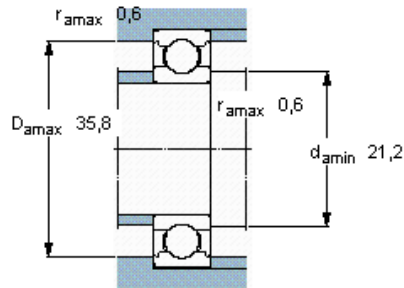
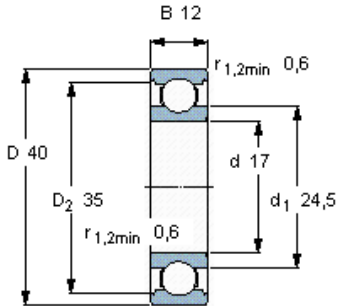
SADORNIL

HIGH TECH

line

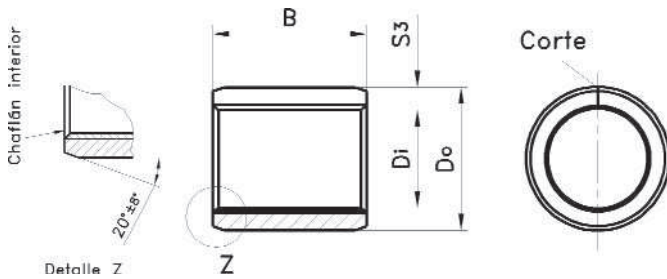
Rodamientos rígidos de bolas, de una hilera

Dimensiones principales			Capacidades de carga básica		Velocidades nominales		Designación
d	D	B	dinámica C	estática C0	Velocidad de referencia	Límite de velocidad	
mm			kN		rpm		* rodamiento SKF Explorer
17	40	12	9,95	4,75	38000	24000	6203 *



Factores de cálculo

k_r 0,025
 f_0 13

COJINETES CILÍNDRICOS DU™
TABLA DIMENSIONES MÉTRICA

TABLA DE TOLERANCIAS PARA LOS EJES Y ALOJAMIENTOS

Ø eje	Tolerancia
2 a 4	h6
5 a 75	f7
80 a 300	h8

Ø alojamiento	Tolerancia
3 a 6	H6
7 a 305	H7

Referencia	Ø Di	Ø Do	B ±0,25	Código	Referencia	Ø Di	Ø Do	B ±0,25	Código
0203DU	2	3,5	3	604.967	2020DU	20	23	20	541.516
0205DU	2	3,5	5	604.975	2025DU	20	23	25	541.524
0303DU	3	4,5	3	541.102	2030DU	20	23	30	541.532
0305DU	3	4,5	5	541.110	2215DU	22	25	15	541.540
0306DU	3	4,5	6	541.128	2220DU	22	25	20	541.557
0403DU	4	5,5	3	541.136	2225DU	22	25	25	541.565
0404DU	4	5,5	4	541.144	2230DU	22	25	30	541.573
0406DU	4	5,5	6	541.151	2415DU	24	27	15	541.581
0410DU	4	5,5	10	541.169	2420DU	24	27	20	541.599
0505DU	5	7	5	541.177	2425DU	24	27	25	541.607
0508DU	5	7	8	541.185	2430DU	24	27	30	541.615
0510DU	5	7	10	541.193	2515DU	25	28	15	541.623
0604DU	6	8	4	424.299	2520DU	25	28	20	541.631
0606DU	6	8	6	541.201	2525DU	25	28	25	541.649
0608DU	6	8	8	542.555	2530DU	25	28	30	541.656
0610DU	6	8	10	541.219	2550DU	25	28	50	541.664
0710DU	7	9	10	541.227	2815DU	28	32	15	542.662
0806DU	8	10	6	423.263	2820DU	28	32	20	541.672
0808DU	8	10	8	541.235	2825DU	28	32	25	542.670
0810DU	8	10	10	541.243	2830DU	28	32	30	541.680
0812DU	8	10	12	541.250	3010DU	30	34	10	385.422
1008DU	10	12	8	541.268	3015DU	30	34	15	542.688
1010DU	10	12	10	541.276	3020DU	30	34	20	541.698
1012DU	10	12	12	541.284	3025DU	30	34	25	541.706
1015DU	10	12	15	541.292	3030DU	30	34	30	541.714
1020DU	10	12	20	541.300	3040DU	30	34	40	541.722
1208DU	12	14	8	541.318	3220DU	32	36	20	542.696
1210DU	12	14	10	541.326	3230DU	32	36	30	542.704
1212DU	12	14	12	541.334	3240DU	32	36	40	541.730
1215DU	12	14	15	541.342	3520DU	35	39	20	541.748
1220DU	12	14	20	541.359	3530DU	35	39	30	541.755
1225DU	12	14	25	541.367	3535DU	35	39	35	541.763
1310DU	13	15	10	541.375	3540DU	35	39	40	542.712
1320DU	13	15	20	542.563	3550DU	35	39	50	541.771
1405DU	14	16	5	542.571	3720DU	37	41	20	542.720
1410DU	14	16	10	542.589	4020DU	40	44	20	541.789
1412DU	14	16	12	542.597	4030DU	40	44	30	541.797
1415DU	14	16	15	541.383	4040DU	40	44	40	541.805
1420DU	14	16	20	541.391	4050DU	40	44	50	541.813
1425DU	14	16	25	542.605	4520DU	45	50	20	542.738
1510DU	15	17	10	542.613	4530DU	45	50	30	541.821
1512DU	15	17	12	541.409	4540DU	45	50	40	542.746
1515DU	15	17	15	541.417	4545DU	45	50	45	541.839
1520DU	15	17	20	542.621	4550DU	45	50	50	541.847
1525DU	15	17	25	541.425	5020DU	50	55	20	542.753
1610DU	16	18	10	542.639	5030DU	50	55	30	542.761
1612DU	16	18	12	541.433	5040DU	50	55	40	541.854
1615DU	16	18	15	541.441	5050DU	50	55	50	541.862
1620DU	16	18	20	541.458	5060DU	50	55	60	541.870
1625DU	16	18	25	541.466	5520DU	55	60	20	542.779
1720DU	17	19	20	542.647	5525DU	55	60	25	542.787
1810DU	18	20	10	664.714	5530DU	55	60	30	542.795
1815DU	18	20	15	541.474	5540DU	55	60	40	541.888
1820DU	18	20	20	541.482	5550DU	55	60	50	542.803
1825DU	18	20	25	541.490	5555DU	55	60	55	541.896
2010DU	20	23	10	542.654	5560DU	55	60	60	541.904
2015DU	20	23	15	541.508	6020DU	60	65	20	542.811

5.2. Componentes neumáticos

Se presentan a continuación las hojas de características de los componentes neumáticos principales necesarios para la implementación de la célula optimizada. Se obvian las referencias del grupo generador de presión por estar ya instalado en la fábrica, así como componentes de menor entidad como conductos y racorería.

1. Cilindro de doble efecto
2. Actuador de giro de 180°
3. Electroválvulas de control

A continuación se presentan sus respectivas hojas de características según el orden especificado.

Compact cylinders to AFNOR NF E49-004-1 and NF E49-004-2 standards

series BU

DESCRIPTION

Cylinders series "BU" are available from Ø 20 to Ø 100 and, complying with AFNOR NF E49-004-1 and NF E49-004-2 standards, they're interchangeable also without using anchorages. Besides from Ø 32 to Ø 100 they are available even with end caps distance between centers to ISO 15552 standard. Cylinder series "BU" with magnetic piston type can be supplied with magnetic sensors inserted in the slots arranged on the extruded profile.

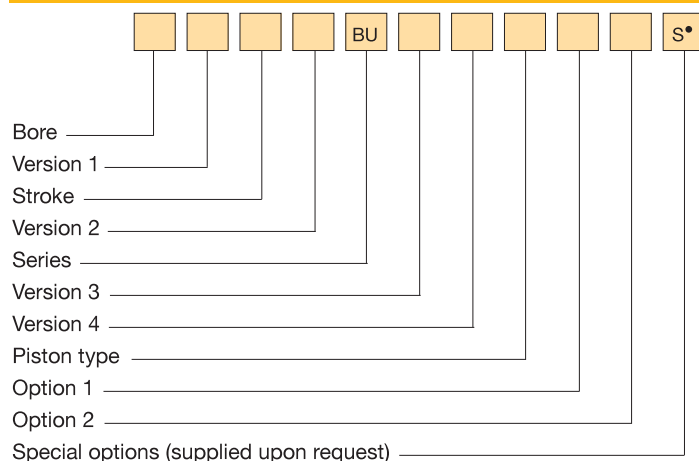
TECHNICAL DATA

Operating pressure	Single acting: 2 ÷ 10 bar; Double acting: 1 ÷ 10 bar.
Working temperature	0 ÷ +80 °C (-20 °C with dry air) 0 ÷ +130 °C with seals for high temperatures (-10°C with dry air; for single acting versions: max 100°C)
Fluid	Filtered, unlubricated or continuous lubricated compressed air
Versions	Double acting; Single acting front spring; Single acting rear spring; Through rod; Double push tandem; Double stroke tandem; Opposed tandem; Non-rotating piston rod device; Hollow through rod; Distance between centers to ISO standard
Bore	Ø 20, 25, 32, 40, 50, 63, 80, 100
Port size	Ø 20 - 25 = M 5; Ø 32 ÷ 100 = G 1/8
Standard strokes (mm)	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 100, 125, 150, 160, 200, 250, 300, 320, 350, 400
Maximum strokes (mm)	Ø 20 - 25 = 200; Ø 32 ÷ 63 = 300; Ø 80 - 100 = 400
Max. strokes single acting (mm)	Ø 20 ÷ 100 = 25
Max. strokes hollow through rod (mm)	Ø 20 ÷ 32 = 40; Ø 40 ÷ 63 = 60; Ø 80 - 100 = 80
Max. strokes non-rotating (mm)	Ø 20 - 25 = 40; Ø 32 ÷ 100 = 80

MATERIALS

End caps	Extruded profile, anodized aluminium alloy
Cylinder barrel	Extruded profile, 20 µm anodized aluminium alloy
Screws	Steel
Piston rod	Ø 20 - 25 = AISI 303 rolled stainless steel Ø 32 ÷ 100 = C45 chromium-plated steel
Rod nut	Steel Stainless steel
Piston rod bearing	Self-lubricating sintered bronze
Piston	Ø 20 - 25 = galvanized steel (supplied with and without magnet) Ø 32 ÷ 100 = aluminium alloy (supplied with and without magnet)
Seals	Polyurethane
Springs	Springs steel

ORDER KEY



P.S.: *Magnetic sensors* FM 100 (see chapter magnetic sensors from page 1.93)

• See technical data on page 0.12

ORDER EXAMPLES

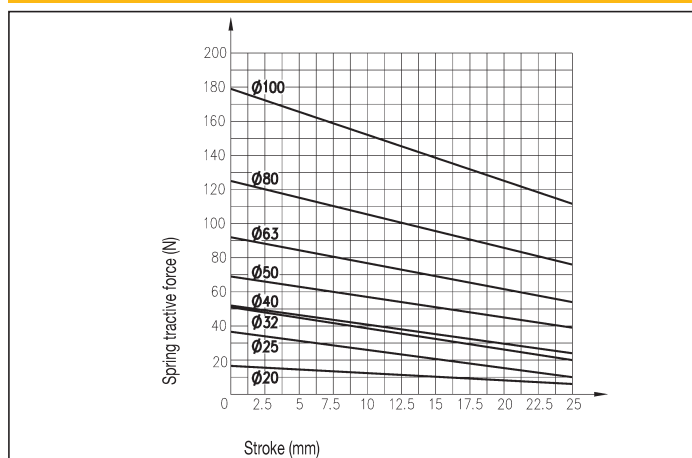
Basic cylinder Ø50, 50 mm stroke, double acting, magnetic piston type, female threaded piston rod 50/50 DBU/M8

Cylinder Ø63, through rod, 80 mm stroke, double acting, magnetic piston type, stainless steel and male threaded piston rod 63R80 DBU/M17

Cylinder Ø80, double stroke tandem, 50 mm stroke 1 + 100 mm stroke 2, double acting, magnetic piston type, female threaded piston rod 80P50+100 DBU/M8



SPRING THEORETICAL TRACTIVE FORCE



VERSION 1

/ Basic cylinder	T Double push tandem
R Through rod	P Double stroke tandem
F Hollow through rod	V Opposed tandem

VERSION 2

D Double acting	Y Single acting rear spring
S Single acting front spring	

VERSION 3

I End caps distance between centers to ISO 15552 standard*
--

VERSION 4

A Non-rotating piston rod device (supplied only with female threaded piston rod option)

PISTON TYPE

Non-magnetic	/M Magnetic
--------------	-------------

OPTION 1

1 Stainless steel piston rod and rod nut**	3 Stainless steel piston rod and rod nut and seals for high temperatures***
2 Seals for high temperatures***	

OPTION 2

7 Male threaded piston rod	8 Female threaded piston rod
----------------------------	------------------------------

* Supplied only from Ø 32 to Ø 100

For versions "T", "P" and "V" contact our commercial office

** Supplied as standard for Ø 20 and Ø 25

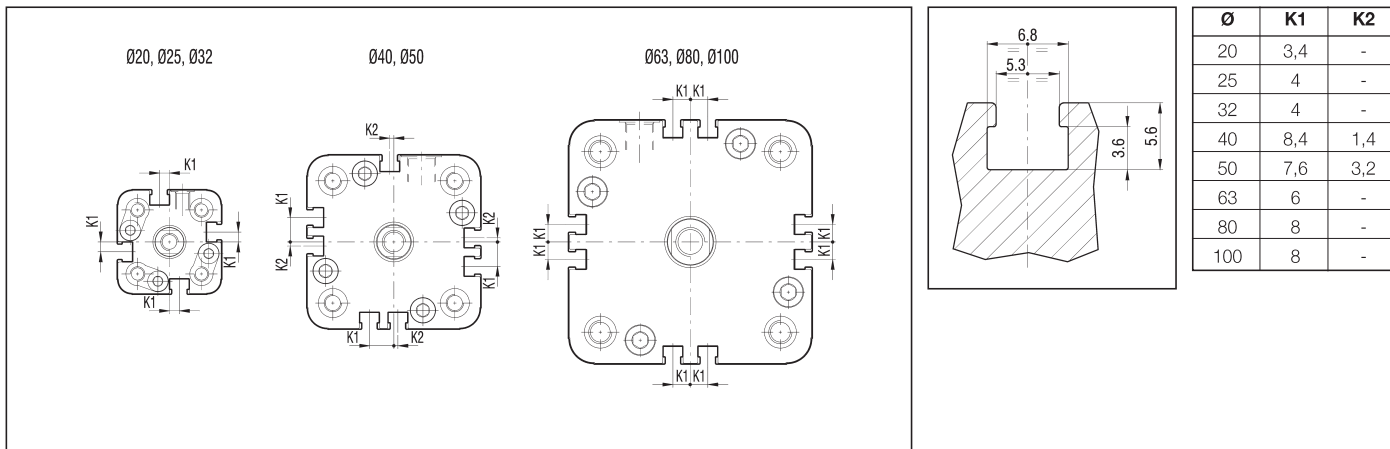
*** Supplied only with non-magnetic piston type

P.S.: End caps mountings accessories of Version No. 3 (end caps distance between centers to ISO standard) are the same of the cylinders series "X" and "CPU" (see from page 1.28)

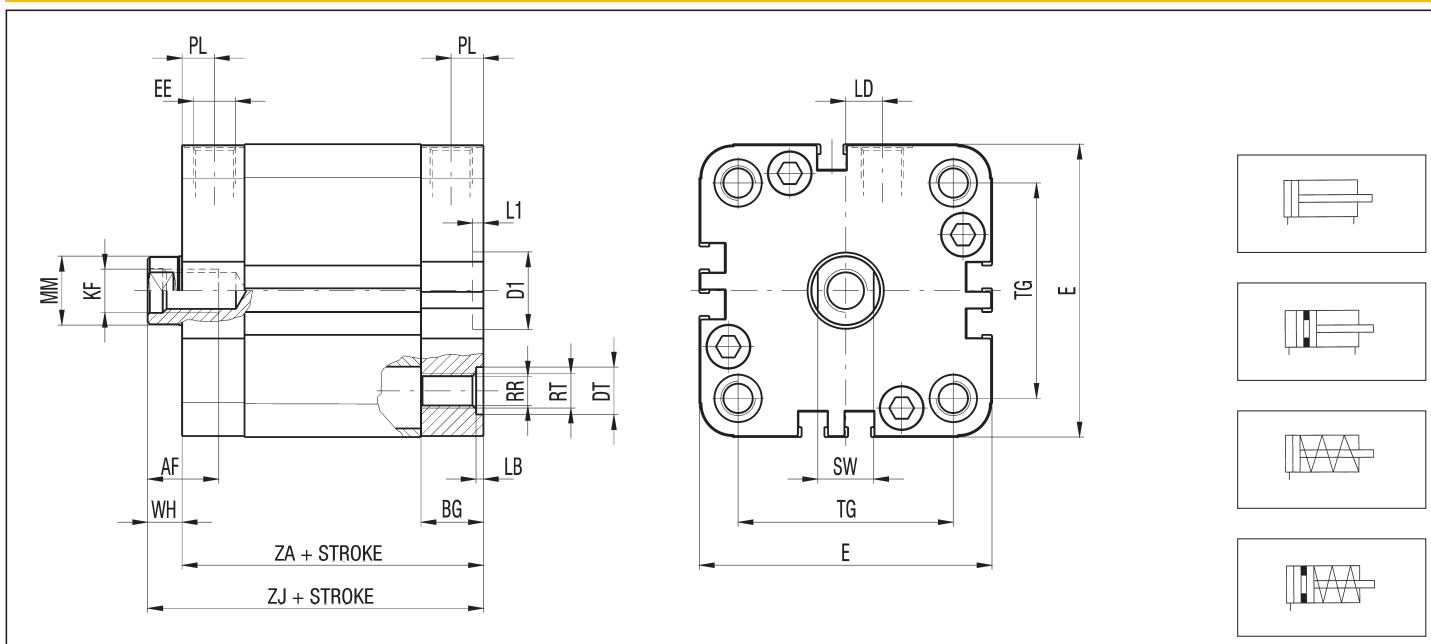
SPARE PARTS

SEALS KIT			
Polyurethane	Ø/SG/BU	Through rod, polyurethane	Ø/SG/R/BU
For high temperatures	Ø/SG/BU2	Through rod, for high temperatures	Ø/SG/R/BU2

DISPOSITION OF THE SLOTS FOR MAGNETIC SENSORS



BU BASIC CYLINDER, FEMALE THREADED PISTON ROD



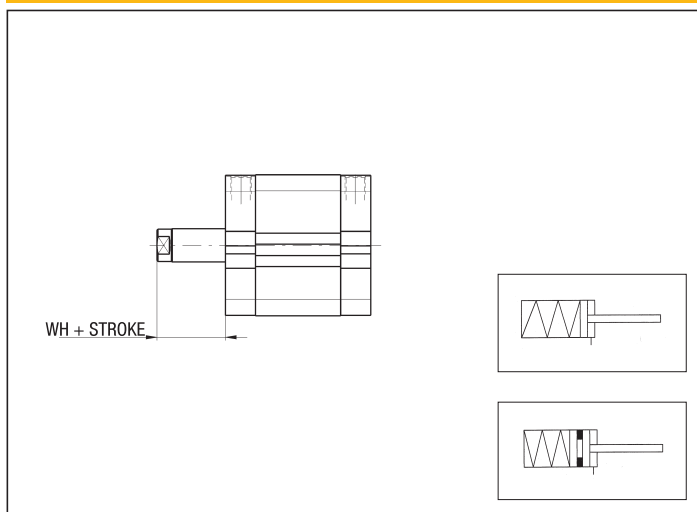
DIMENSIONS AND WEIGHTS BASIC CYLINDER FEMALE THREADED PISTON ROD

Ø	AF	BG*	D	D1 H11	DT H13	E	EE	KF	LB	LD	L1	MM	PL	RR	RT	SW	TG**		WH	ZA	ZB	ZJ	WEIGHT (g)	INCR. (g) x 5 mm
																	A	I						
20	11,5	12	3,8	12	8	36	M5	M6	4,4	4,5	2,5	10	7	4,3	M5	8	22	-	6	37	62	43	130	10
25	11,5	13	3,8	12	8	40	M5	M6	4,4	5,5	2,5	10	8	4,3	M5	8	26	-	6	39	65	45	160	11
32	13	14,5	4,5	14	10,5	50	G 1/8	M8	5,4	5	2,5	12	7,5	5,3	M6	10	32	32,5	7	44	73,5	51	215	16
40	13	14,5	4,5	14	10,5	60	G 1/8	M8	5,4	9,5	2,5	12	7,5	5,3	M6	10	42	38	7	45	75,5	52	330	20
50	16,5	14,5	6	18	11	68	G 1/8	M10	1,7	8,5	2,5	16	7,5	6,4	M8	13	50	46,5	8	45	75,5	53	470	25
63	16,5	14,5	6	18	11	84	G 1/8	M10	1,7	-17,5	2,5	16	7,5	6,4	M8	13	62	56,5	8	50	85,5	58	710	37
80	21	16,5	8	23	15	102	G 1/8	M12	1	-21	3	20	8,5	8,4	M10	16	82	72	8	56	95,5	64	1295	50
100	24,5	19,5	10	28	15	123	G 1/8	M16	3,5	-25	3	25	10	8,4	M10	21	103	89	10	67	114,5	77	2250	70

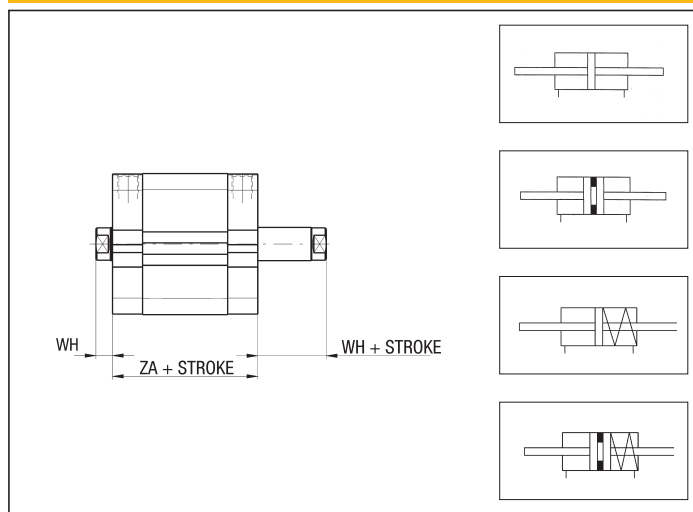
* IN THE TANDEM VERSIONS (T, P, V), DIMENSION (BG - LB) IS REDUCED OF 5 mm

** A - AFNOR
I - ISO

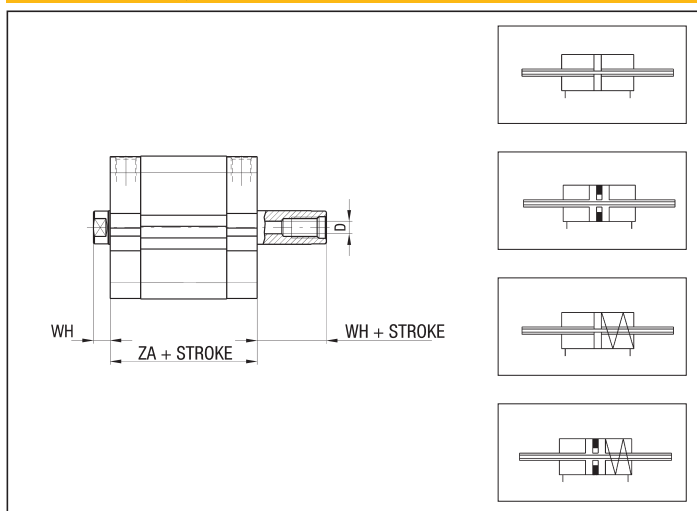
**SINGLE ACTING, REAR SPRING,
FEMALE THREADED PISTON ROD**



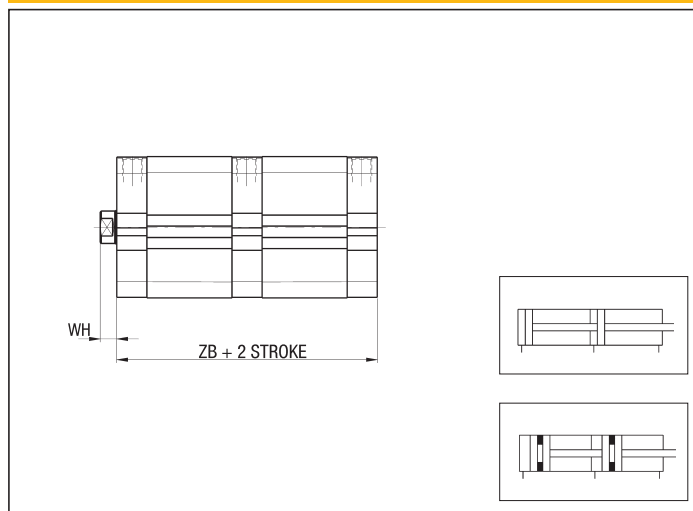
**FEMALE THREADED THROUGH ROD AND
SINGLE ACTING, FEMALE THREADED THROUGH ROD**



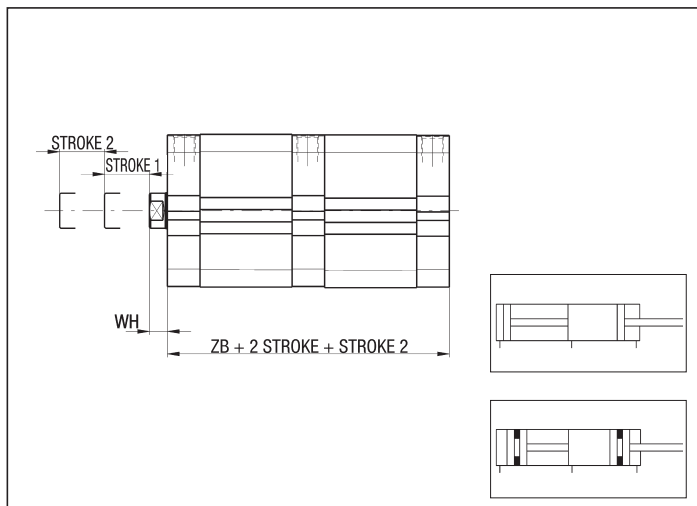
**HOLLOW FEMALE THREADED THROUGH ROD AND
SINGLE ACTING, HOLLOW FEMALE THREADED THROUGH ROD**



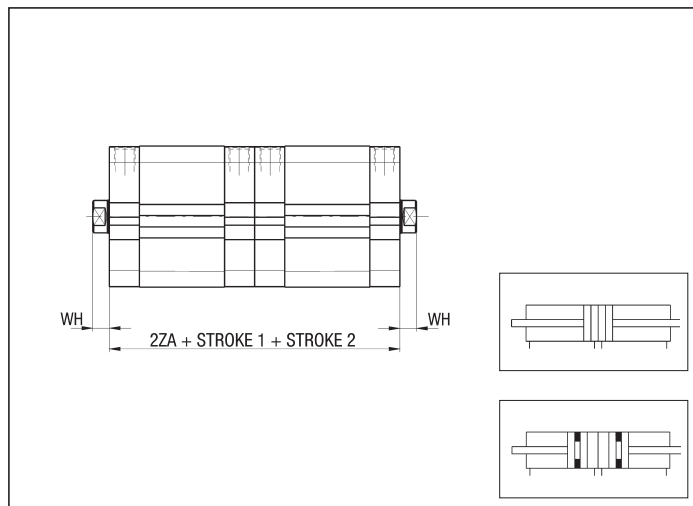
**DOUBLE PUSH TANDEM,
FEMALE THREADED PISTON ROD**



DOUBLE STROKE TANDEM, FEMALE THREADED PISTON ROD

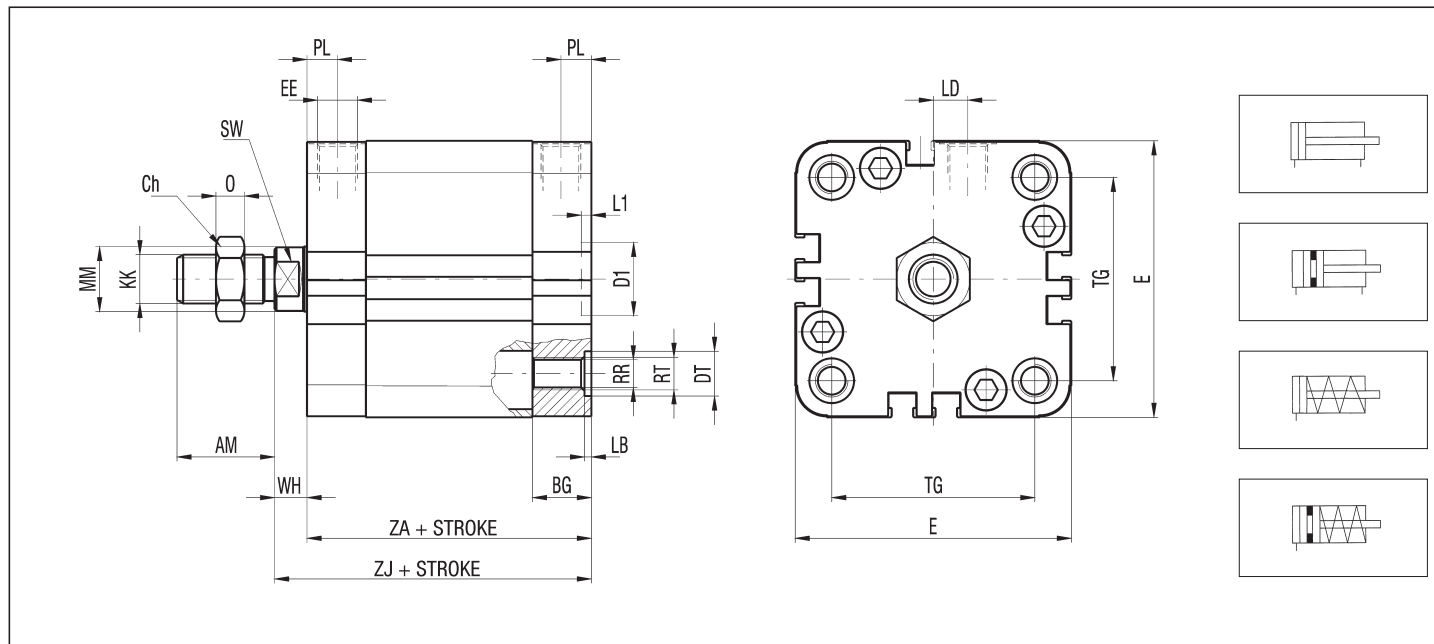


OPPOSED TANDEM, FEMALE THREADED PISTON ROD



1

BU BASIC CYLINDER, MALE THREADED PISTON ROD



P.S.: Rod nut supplied as standard

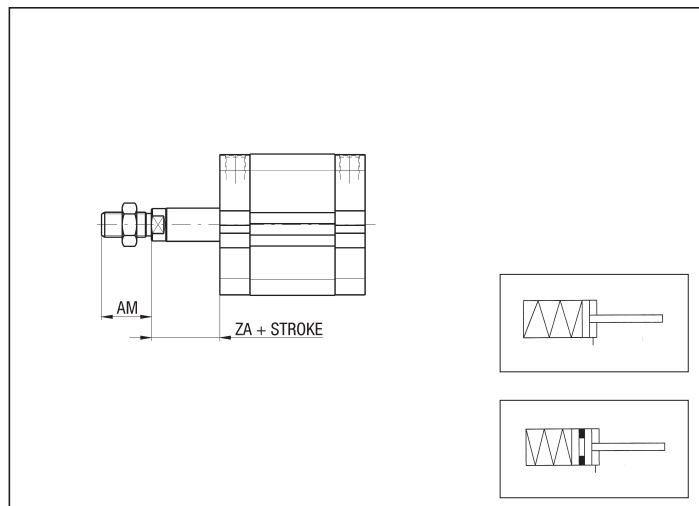
DIMENSIONS AND WEIGHTS BASIC CYLINDER MALE THREADED PISTON ROD

Ø	AM	BG*	Ch	D	D1 H11	DT H13	E	EE	KK	LB	LD	L1	MM	O	PL	RR	RT	SW	TG**		WH	ZA	ZB	ZJ	WEIGHT (g)	INCR. (g) x 5 mm
																			A	I						
20	22	12	17	3,8	12	8	36	M5	M10x1,25	4,4	4,5	2,5	10	6	7	4,3	M5	8	22	-	6	37	62	43	150	10
25	22	13	17	3,8	12	8	40	M5	M10x1,25	4,4	5,5	2,5	10	6	8	4,3	M5	8	26	-	6	39	65	45	180	11
32	22	14,5	17	4,5	14	10,5	50	G 1/8	M10x1,25	5,4	5	2,5	12	6	7,5	5,3	M6	10	32	32,5	7	44	73,5	51	240	16
40	22	14,5	17	4,5	14	10,5	60	G 1/8	M10x1,25	5,4	9,5	2,5	12	6	7,5	5,3	M6	10	42	38	7	45	75,5	52	355	20
50	24	14,5	19	6	18	11	68	G 1/8	M12x1,25	1,7	8,5	2,5	16	7	7,5	6,4	M8	13	50	46,5	8	45	75,5	53	505	25
63	24	14,5	19	6	18	11	84	G 1/8	M12x1,25	1,7	-17,5	2,5	16	7	7,5	6,4	M8	13	62	56,5	8	50	85,5	58	745	37
80	32	16,5	24	8	23	15	102	G 1/8	M16x1,5	1	-21	3	20	8	8,5	8,4	M10	16	82	72	8	56	95,5	64	1360	50
100	40	19,5	30	10	28	15	123	G 1/8	M20x1,5	3,5	-25	3	25	9	10	8,4	M10	21	103	89	10	67	114,5	77	2390	70

* IN THE TANDEM VERSIONS (T, P, V), DIMENSION (BG - LB) IS REDUCED OF 5 mm

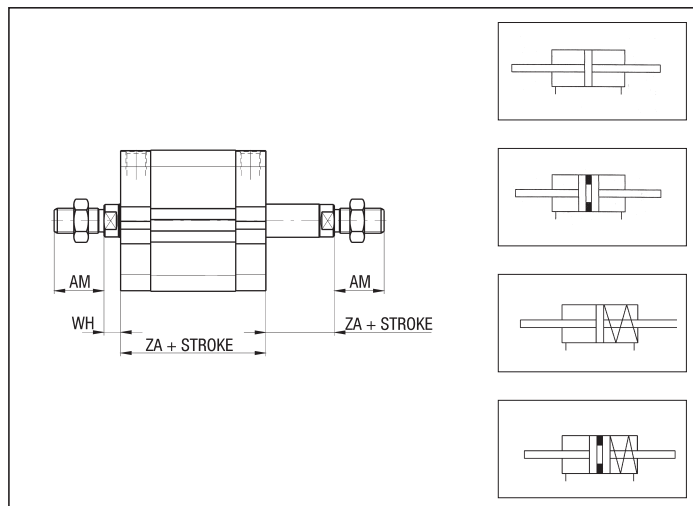
** A - AFNOR
I - ISO

SINGLE ACTING, REAR SPRING, MALE THREADED PISTON ROD



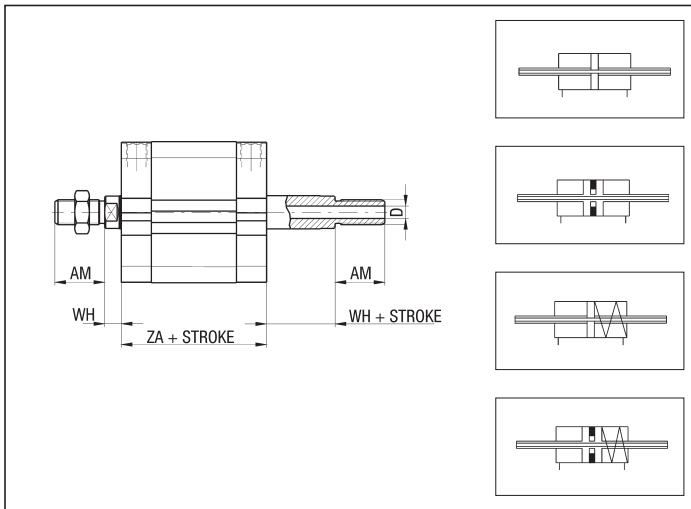
P.S.: Rod nut supplied as standard

MALE THREADED THROUGH ROD AND SINGLE ACTING, MALE THREADED THROUGH ROD



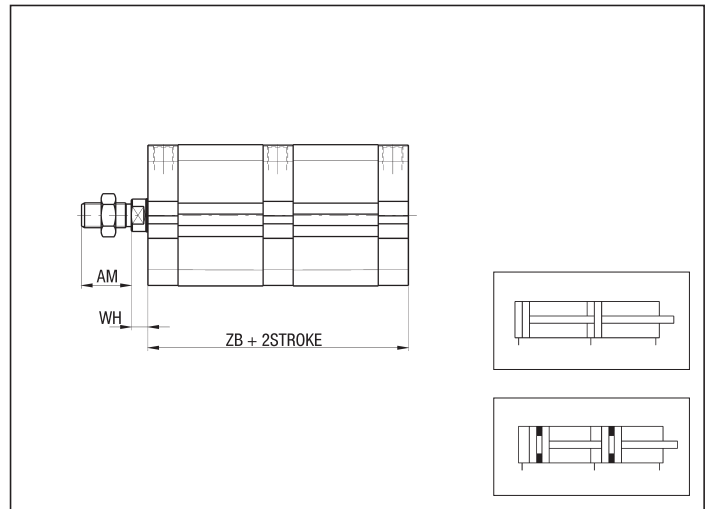
P.S.: Rod nuts supplied as standard

HOLLOW MALE THREADED THROUGH ROD AND SINGLE ACTING, HOLLOW MALE THREADED THROUGH ROD



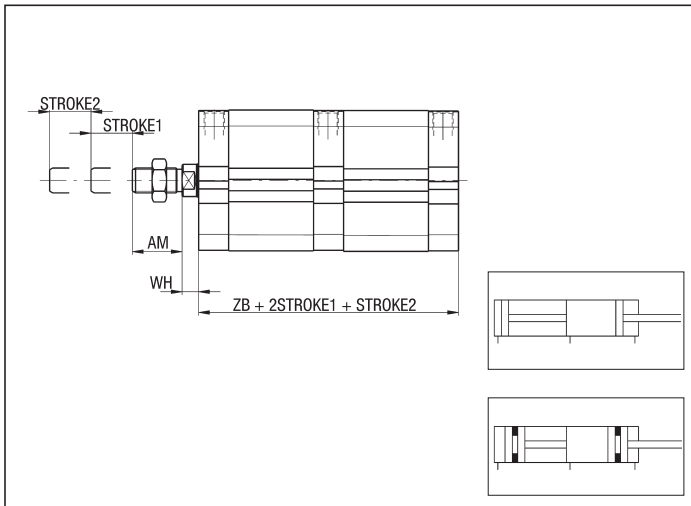
P.S.: Rod nuts supplied as standard

DOUBLE PUSH TANDEM, MALE THREADED PISTON ROD



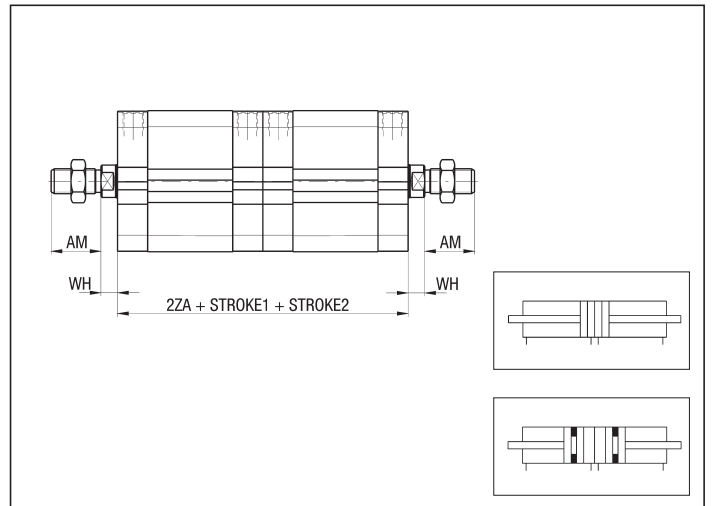
P.S.: Rod nut supplied as standard

DOUBLE STROKE TANDEM, MALE THREADED PISTON ROD



P.S.: Rod nut supplied as standard

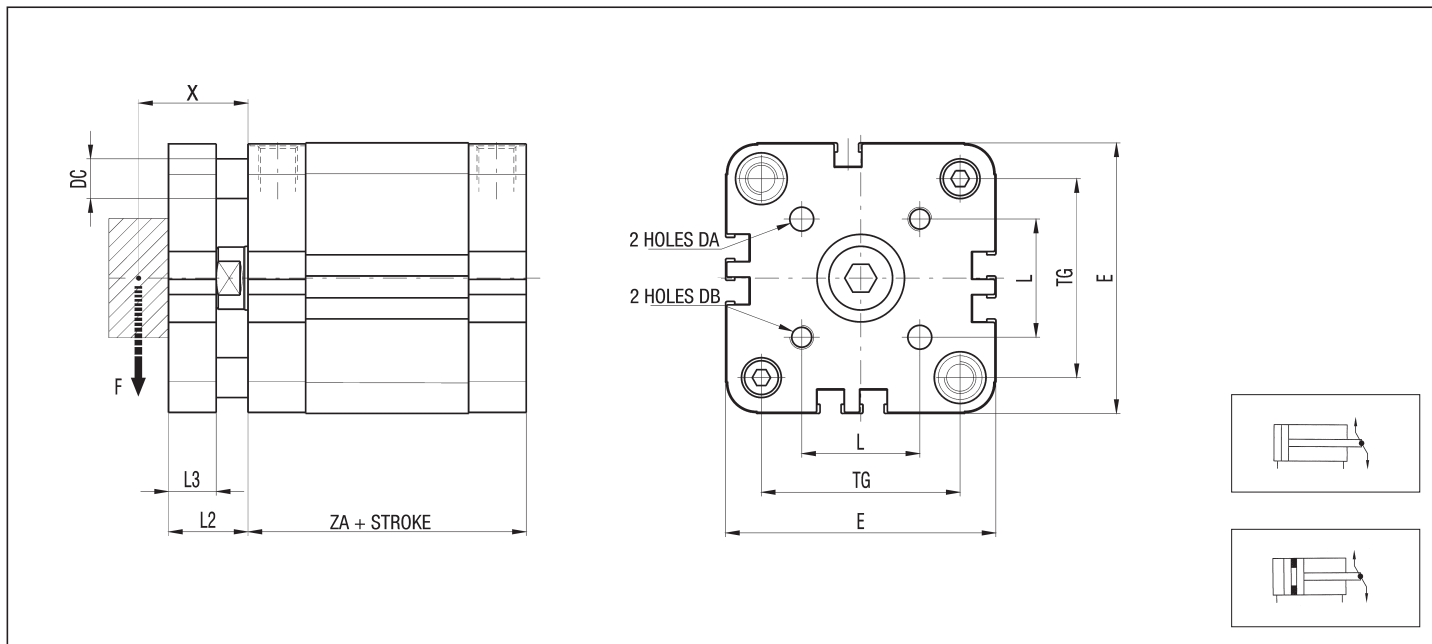
OPPOSED TANDEM, MALE THREADED PISTON ROD



P.S.: Rod nuts supplied as standard

BU NON-ROTATING BASIC CYLINDER

1

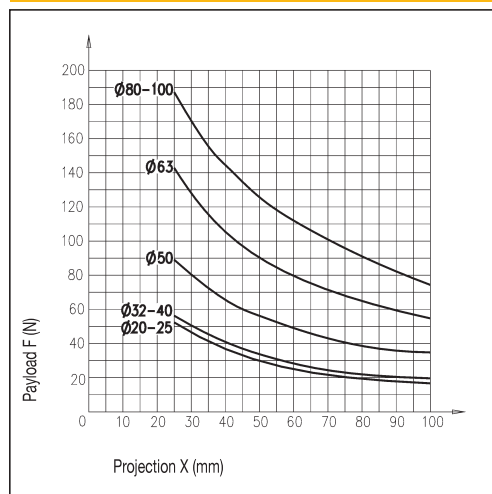


DIMENSIONS AND WEIGHTS

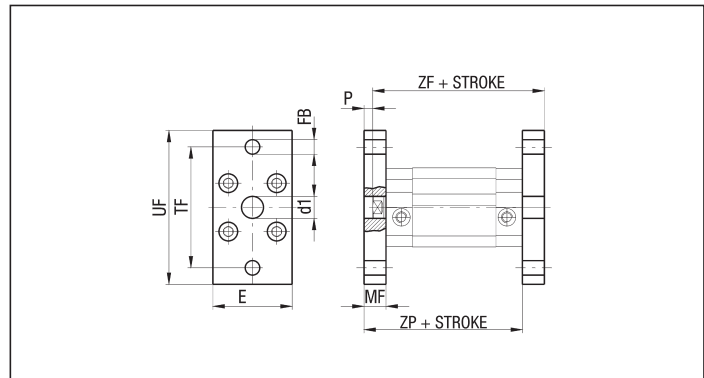
Ø	DA	DB	DC	E	L	L2	L3	TG**		ZA	WEIGHT (g)	INCR. (g) x 5 mm
								A	I			
20	4	M4	6	36	12	14	8	22	-	37	170	15
25	5	M5	6	40	15,6	14	8	26	-	39	210	16
32	5	M5	8	50	19,8	17	10	32	32,5	44	300	25
40	5	M5	8	60	23,3	17	10	42	38	45	440	30
50	6	M6	10	68	29,7	20	12	50	46,5	45	610	40
63	6	M6	10	84	35,4	20	12	62	56,5	50	930	55
80	8	M8	12	102	46	22	14	82	72	56	1690	75
100	10	M10	12	123	56,6	24	14	103	89	67	2950	105

** A - AFNOR
I - ISO

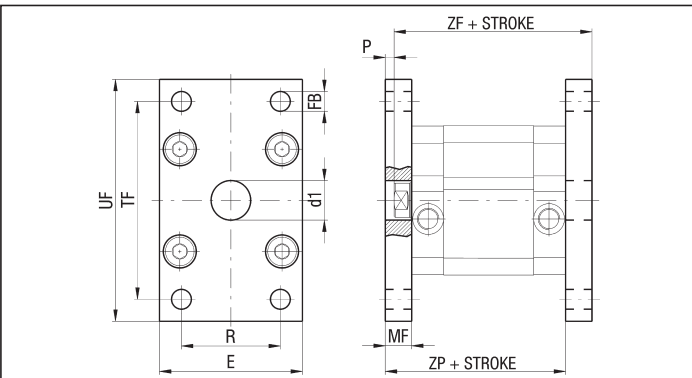
MAX. PERMISSIBLE LOAD - NON-ROTATING BU



FLANGE Ø 20 - 25 - ALUMINIUM - BU/F Ø
(Supplied with screws) - STEEL - BU/F Ø AC



FLANGE Ø 32 ÷ 100 - ALUMINIUM - BU/F Ø
(Supplied with screws) - STEEL - BU/F Ø AC



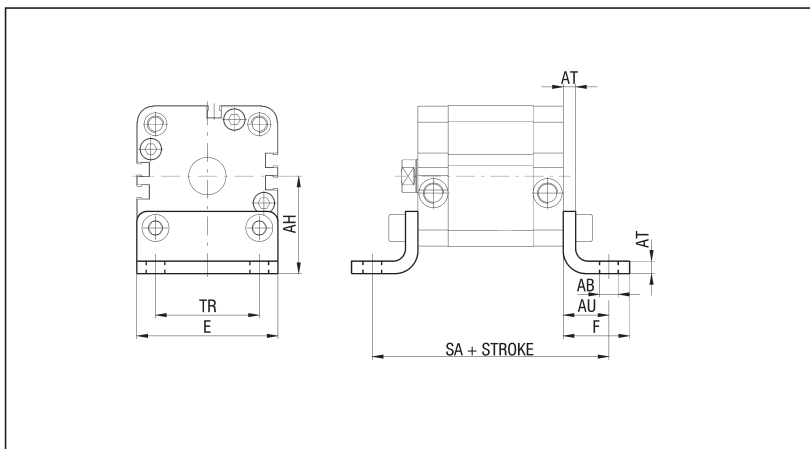
Ø	d1 H11	E	FB H13	MF	P	R	TF	UF	ZF	ZP	WEIGHT ALL. (g)	WEIGHT STEEL (g)
20	12	36	6,6	10	4	-	55	70	53	47	70	160
25	12	40	6,6	10	4	-	60	76	55	49	80	200
32	14	50	7	10	3	32	65	80	61	54	100	260
40	14	60	9	10	3	36	82	102	62	55	160	420
50	18	68	9	12	4	45	90	110	65	57	240	600
63	18	87	9	15	7	50	110	130	73	65	450	1200
80	23	107	12	15	7	63	135	160	79	71	690	1800
100	28	128	14	15	5	75	163	190	92	82	980	2550

IN THE TANDEM VERSIONS (T, P, V),
ADD THE READING "TANDEM" TO THE CODE.
EXAMPLE: BU/F Ø TANDEM

LOW FOOT - STEEL - BU/PB Ø

Ø	AB H13	AH	AU	AT	E	F	SA	TR	WEIGHT (g)
20	6,6	27	16	4	36	22	69	22	32
25	6,6	30	16	4	40	22	71	26	38
32	6,6	32	18	5	50	26	80	32	66
40	9	42,5	20	5	60	28	85	42	100
50	9	47	24	6	68	32	93	50	150
63	11	59,5	27	6	84	39	104	62	250
80	11	65,5	30	8	102	42	116	82	380
100	13,5	78,5	33	8	123	45	133	103	500

IN THE TANDEM VERSIONS (T, P, V), ADD THE READING
"TANDEM" TO THE CODE.
EXAMPLE: BU/PB Ø TANDEM

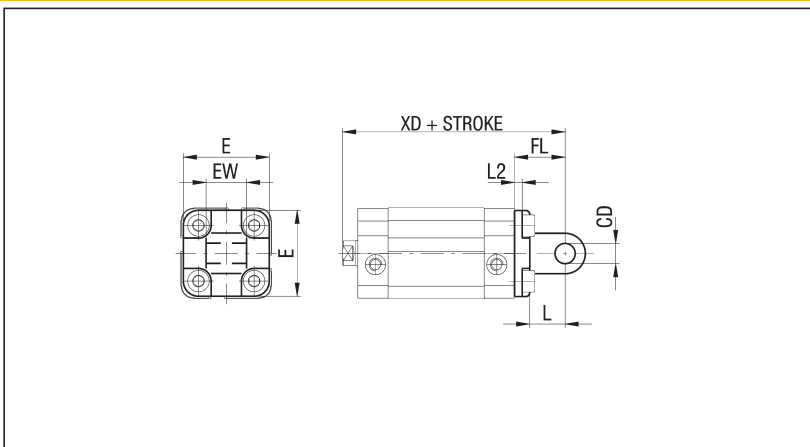


REAR MALE HINGE - ALUMINIUM - BU/CM Ø
(Supplied with screws) - STEEL - BU/CM Ø AC

Ø	CD H9	E	EW h14	FL	L	L2	XD	WEIGHT ALL. (g)	WEIGHT STEEL (g)
20	8	34	16	20	14	2,6	63	21	80
25	8	38	16	20	14	2,6	65	27	85

P.S.: THIS MOUNTING CAN BE USED WITH THE REAR HINGE
MOUNTING OF CYLINDERS SERIES "U" (SEE ON PAGE 1.6)

IN THE TANDEM VERSIONS (T, P),
ADD THE READING "TANDEM" TO THE CODE.
EXAMPLE: BU/CM Ø AC TANDEM



1

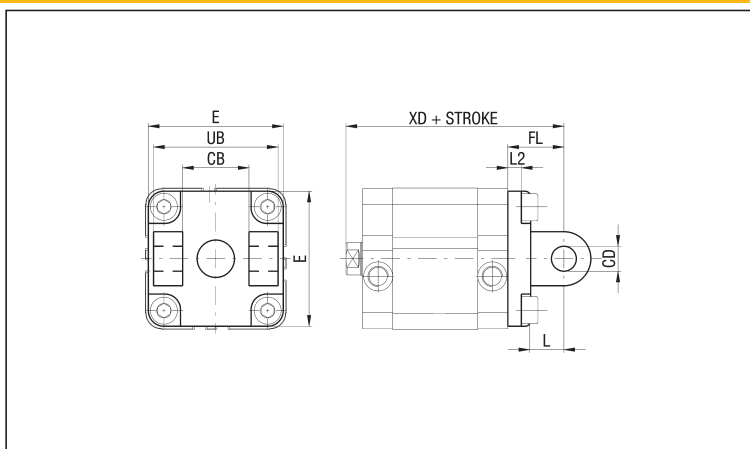
REAR FEMALE HINGE - ALUMINIUM - BU/CF Ø
 (Supplied with screws) - STEEL - BU/CF Ø AC

Ø	CB H14	CD H9	E	FL	L	L2	UB h14	XD	WEIGHT ALL (g)	WEIGHT ACC (g)
32	26	10	48	22	13	5,5	45	73	60	170
40	28	12	58	25	16	5,5	52	77	104	270
50	32	12	66	27	16	6,5	60	80	142	378
63	40	16	83	32	21	6,5	70	90	240	645
80	50	16	102	36	23	10	90	100	420	1070
100	60	20	123	41	26	10	110	118	721	1730

P.S.: THIS HINGE CAN BE USED ALSO WITH PIVOT AND MALE HINGE OR SQUARE JOINT OF SERIES "X" AND "CPU" (SEE FROM PAGE 1.29)

IN THE TANDEM VERSIONS (T, P, V),
 ADD THE READING "TANDEM" TO THE CODE.

EXAMPLE: BU/CF Ø TANDEM

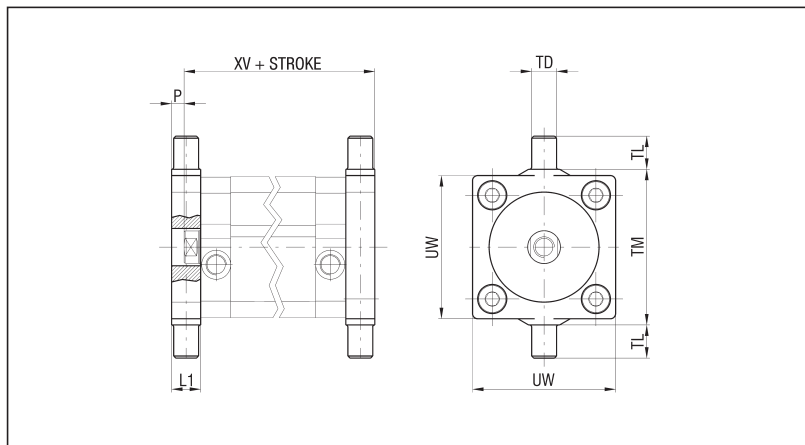


FLOATING HINGE - STEEL - BU/CTA Ø (Supplied with screws)

Ø	L1	P	TD e9	TL h14	TM h14	UW	XV	WEIGHT (g)
20	14	8	12	12	38	35	57	100
25	14	8	12	12	42	39	59	114
32	14	7	12	12	52	46	65	132
40	19	12	16	16	63	59	71	278
50	19	11	16	16	75	69	72	362
63	24	16	20	20	90	84	82	624
80	24	16	20	20	110	102	88	765
100	29	19	25	25	132	125	106	1464

IN THE TANDEM VERSIONS (T, P, V),
 ADD THE READING "TANDEM" TO THE CODE.

EXAMPLE: BU/CTA Ø TANDEM



ACCESSORIES FOR CYLINDERS WITH END CAPS DISTANCE BETWEEN CENTERS TO ISO 15552 STANDARD

The accessories of Version No. 3 (end caps distance between centers to ISO standard) are the same of the cylinders series "X" and "CPU" to ISO 15552 standard (see from page 1.28)

Actuadores de giro ▶ Accionamientos de cremallera

Módulo giratorio, Serie RCM-SE

▶ Ángulo de giro: 0 - 180 ° ▶ Ø6 - 25 mm ▶ con émbolo magnético ▶ émbolo doble con cremallera ▶ Easy-2-Combine-compatible ▶ Amortiguación: elástico



00117211

Presión de funcionamiento mín./máx.	2 bar / 8 bar
Temperatura ambiente mín./máx.	+5 °C / +60 °C
Temperatura del medio mín./máx.	+5 °C / +60 °C
Fluido	Aire comprimido
Tamaño de partículas máx.	5 μm
contenido de aceite del aire comprimido	0 mg/m³ - 1 mg/m³
Par de giro teórico con	6 bar

Materiales:

Carcasa	aluminio, anodizado
Tapas	aluminio anodizado negro
Base	aluminio, anodizado negro
juntas	caucho de acrilnitrilo butadieno
Eje	acero, templado
Brida giratoria	acero, templado

Observaciones técnicas

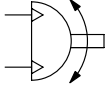
- El punto de condensación de presión se debe situar como mínimo 15 °C por debajo de la temperatura ambiental y del medio, y debe ser como máx. de 3 °C.
- El contenido de aceite del aire comprimido debe permanecer constante durante toda la vida útil.
- Utilice sólo aceites permitidos por AVENTICS, véase capítulo "Información técnica".

tamaño de construcción		RCM-06	RCM-08	RCM-12	RCM-16	RCM-20
Carga de cojinete axial máx. admisible	[N]	170	280	330	490	620
Carga de cojinete radial máx. admisible	[N]	170	300	360	580	780
Momento de inercia de masa máx. admisible	[kgcm²]	0,08	0,25	0,7	1,6	3,2
Precisión de repetición	[°]	0,2	0,2	0,2	0,2	0,2
Par de giro teórico	[Nm]	0,17	0,33	0,95	1,7	3

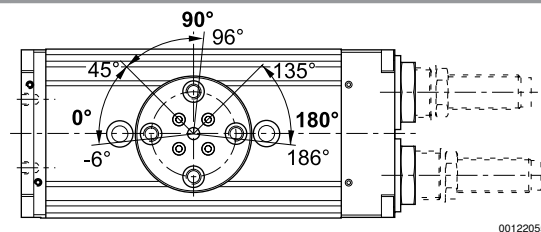
tamaño de construcción		RCM-25			
Carga de cojinete axial máx. admisible	[N]	1160			
Carga de cojinete radial máx. admisible	[N]	1480			
Momento de inercia de masa máx. admisible	[kgcm²]	6,3			
Precisión de repetición	[°]	0,2			
Par de giro teórico	[Nm]	6,5			

Módulo giratorio, Serie RCM-SE

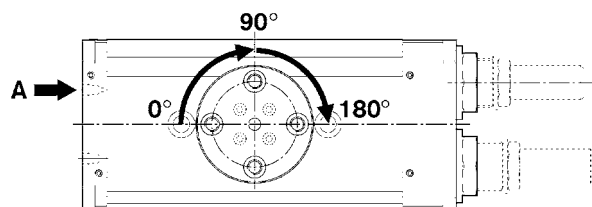
▶ Ángulo de giro: 0 - 180 ° ▶ Ø6 - 25 mm ▶ con émbolo magnético ▶ émbolo doble con cremallera ▶ Easy-2-Combine-compatible ▶ Amortiguación: elástico

	tamaño de construcción	Conexión de aire comprimido	Ángulo de giro	Tiempo de giro mín./máx.	Consumo de aire por giro	Peso	N° de material
			[°]	[s]	[cm³]	[kg]	
	RCM-06	M3	0 - 90	0,08 / --	1,13	0,13	R412000357
	RCM-06	M3	0 - 180	0,12 / --	2,26	0,13	R412000358
	RCM-08	M3	0 - 90	0,1 / --	2,14	0,18	R412000359
	RCM-08	M3	0 - 180	0,16 / --	4,27	0,18	R412000360
	RCM-12	M5	0 - 90	0,1 / --	5,86	0,42	R412000361
	RCM-12	M5	0 - 180	0,16 / --	11,72	0,42	R412000362
	RCM-16	M5	0 - 90	0,13 / --	10,36	0,7	R412000363
	RCM-16	M5	0 - 180	0,2 / --	20,71	0,7	R412000364
	RCM-20	M5	0 - 90	0,16 / --	17,92	0,91	R412000365
	RCM-20	M5	0 - 180	0,25 / --	35,84	0,91	R412000366
RCM-25	M5	0 - 90	0,16 / --	38,75	1,73	R412000367	
RCM-25	M5	0 - 180	0,25 / --	77,5	1,73	R412000368	

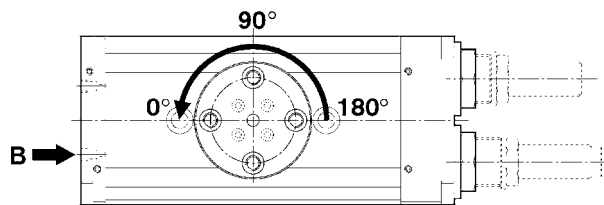
gama de regulación de los finales de carrera 0° / 90° / 180°



arranque de las posiciones finales 90° / 180°



arranque de la posición final 0°

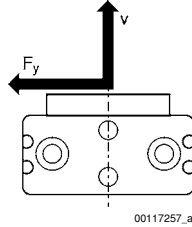


Actuadores de giro ▶ Accionamientos de cremallera

Módulo giratorio, Serie RCM-SE

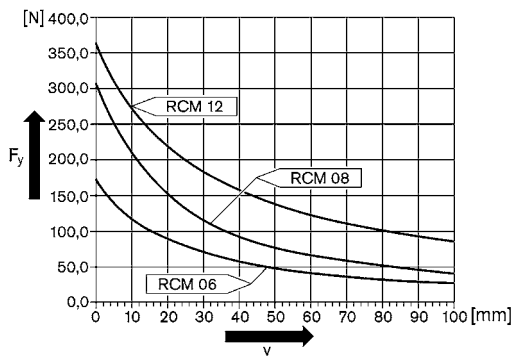
▶ Ángulo de giro: 0 - 180 ° ▶ Ø6 - 25 mm ▶ con émbolo magnético ▶ émbolo doble con cremallera ▶ Easy-2-Combine-compatible ▶ Amortiguación: elástico

fuerza radial máxima admisible F_y [N] en función de v [mm]



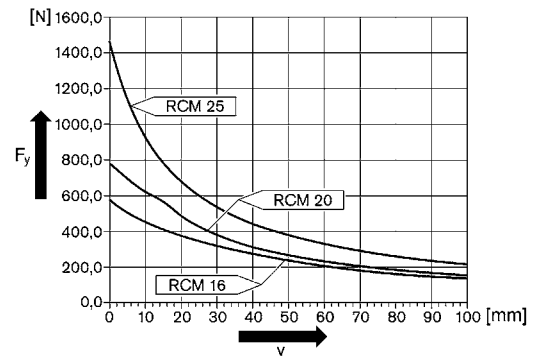
00117257_a

RCM 6 – 12



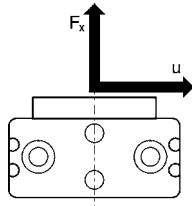
00117261_b

RCM 16 – 25



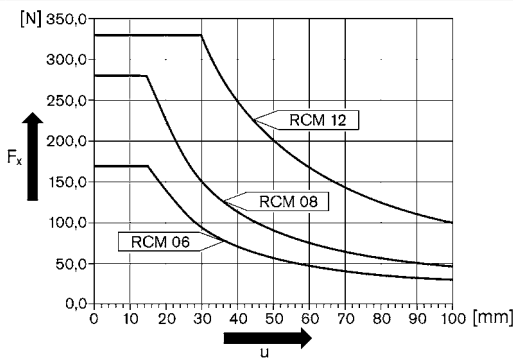
00117262_b

fuerza axial máxima admisible F_x [N] en función de u [mm]



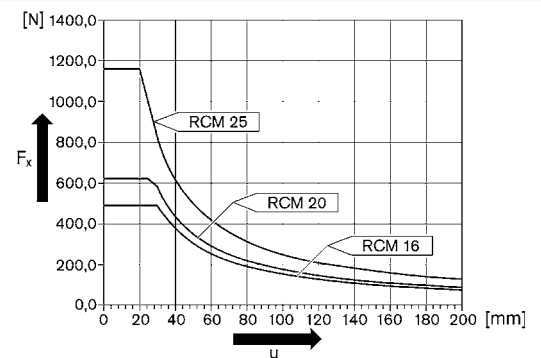
00117258_a

RCM 6 – 12



00117259_b

RCM 16 – 25



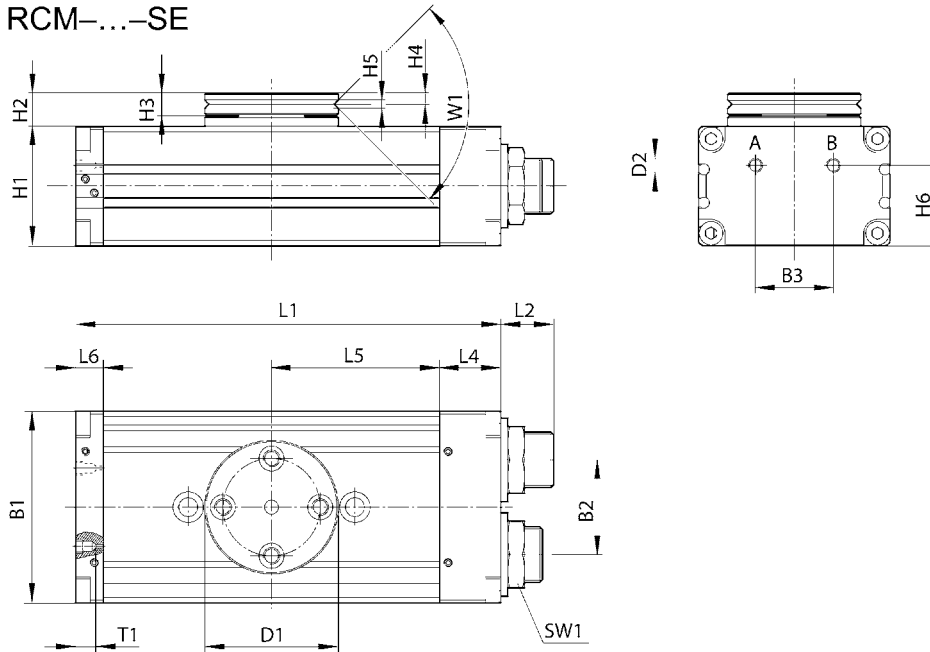
00117260_b

Módulo giratorio, Serie RCM-SE

▶ Ángulo de giro: 0 - 180 ° ▶ Ø6 - 25 mm ▶ con émbolo magnético ▶ émbolo doble con cremallera ▶ Easy-2-Combine-compatible ▶ Amortiguación: elástico

RCM-6/.../-25

RCM-...-SE



00125723

T1 = profundidad de rosca

tamaño de construcción	B1	B2	B3	Ø D1	Ø D2	H1	H2	H3	H4	H5	H6	L1	L2
RCM-06	31	13,6	11,6	26	M3	17	7,5	5	2,4	2	12,9	71	9
RCM-08	35	15	13	28	M3	18	8	5	2,4	2	14	77	9,5
RCM-12	43	18	18	35	M5	24	10,5	6	2,9	2,5	18	103	12,5
RCM-16	52	24	20	40	M5	32	10	7	3,3	2,5	21	108	15
RCM-20	58	30	20	42	M5	37	11	7	3,3	3	26	114	15
RCM-25	69	34	28	48	M5	43	12	8	4	3	29	153	19

tamaño de construcción	L4	L5	L6	SW1	T1	W1							
RCM-06	7	28,5	7	8	3	90°							
RCM-08	7	31,5	7	10	3	90°							
RCM-12	14	40	9	15	4	90°							
RCM-16	18	40	10	19	4	90°							
RCM-20	19	43	9	19	4	90°							
RCM-25	22	60,5	10	23	4	90°							

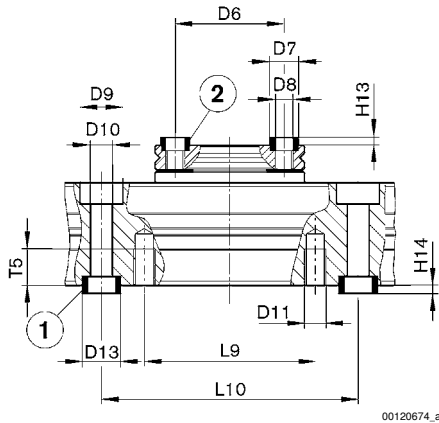
Actuadores de giro ▶ Accionamientos de cremallera

Módulo giratorio, Serie RCM-SE

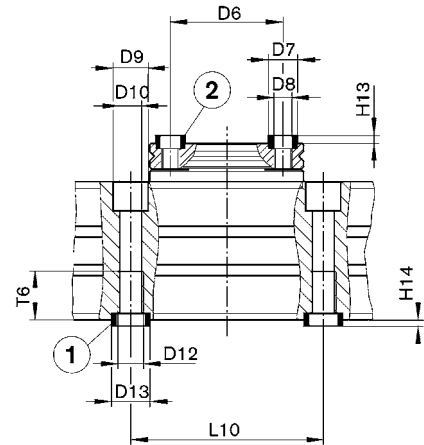
▶ Ángulo de giro: 0 - 180 ° ▶ Ø6 - 25 mm ▶ con émbolo magnético ▶ émbolo doble con cremallera ▶ Easy-2-Combine-compatible ▶ Amortiguación: elástico

fijación y montaje, RCM-6/-12

RCM-8/-16/-20/-25



00120674_a



00120675_a

1) Casquillo de centrado, incluido en el volumen de suministro 2) Casquillo de centrado

tamaño de construcción	Ø D6 ±0,02	Ø D7 k6	Ø D8	Ø D9	Ø D10	Ø D11	Ø D12	Ø D13 k6	H13 +0,2	H14 +0,2	L9	L10 ± 0,02	T5
RCM-06	18	5	M3	6	3,3	M4	-	5	1,6	1,6	20	40	7
RCM-08	20	5	M3	7,5	4,2	-	M5	7	1,6	1,6	-	40	-
RCM-12	25	7	M4	10	5,1	M5	-	9	1,6	2,1	40	60	8,5
RCM-16	30	7	M5	10	5	-	M6	9	1,6	2,1	-	60	-
RCM-20	30	7	M5	11	6,8	-	M8	12	1,6	2,1	-	60	-
RCM-25	35	9	M6	11	6,8	-	M8	12	2,1	2,1	-	60	-

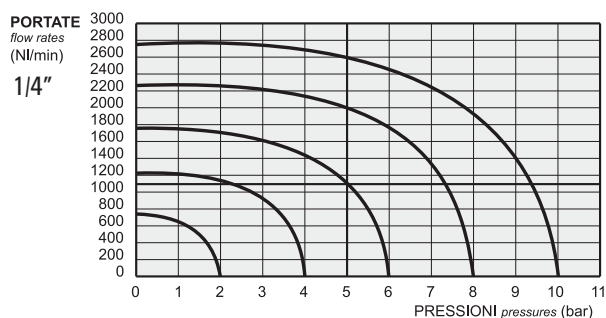
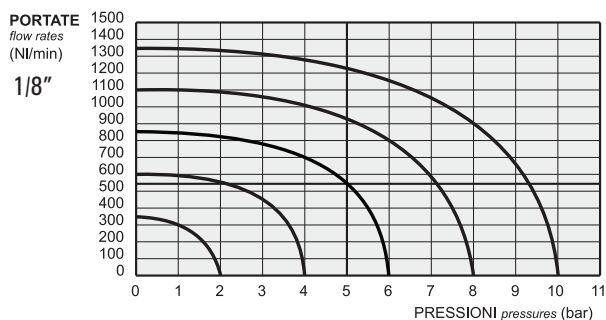
tamaño de construcción	T6												
RCM-06	-												
RCM-08	9,1												
RCM-12	-												
RCM-16	11,1												
RCM-20	15,1												
RCM-25	15,1												

valvole ad azionamento elettropneumatico

solenoid actuated valves



- Valvole a spola 3/2-5/2-5/3 con attacchi filettati G1/8"-G1/4"
3/2-5/2-5/3 spool valves with G1/8"-G1/4" threaded ports
- Montaggio in linea, su collettori multipli o su basi manifold
Installation in-line, on gang or modular manifolds
- Comandi elettrici con azionamento manuale bistabile
Solenoid pilots with detented manual override as standard
- A richiesta versione a basso assorbimento 1.5W
On request with low consumption 1.5W
- Esecuzioni speciali a richiesta
Special versions on request



Materiali

Corpo: alluminio 11S

Comando e fondello: tecnopolimero (*)

Molle: INOX

Guarnizioni: NBR

Spola: alluminio nichelato

Parti interne: ottone OT58

Materials

Body: aluminium 11S

End caps: technopolymer (*)

Springs: stainless steel

Seals: NBR

Spool: nickel plated aluminium

Internal parts: brass OT58

(*) Su richiesta e dietro supplemento di prezzo, le valvole sono fornibili con corpo, comando e fondello interamente in alluminio. Alcune valvole, come di seguito specificato, sono disponibili solo nella versione in alluminio. Le valvole ATEX sono solo in alluminio.

Le parti in tecnopolimero recano impresso il logo

(*) On request and upon extra charge, the valves are available also with body and end caps entirely in aluminium. Some valves, as specified in the next pages, are available only in the aluminium version. ATEX valves are only in aluminium.

The parts in technopolymer are marked with the logo

Tempi di risposta - response times

	1/8"	1/4"
monostabile <i>mono-stable</i>	TRA (14): 15 ms TRR (12): 35 ms	TRA (14): 19 ms TRR (12): 45 ms
bistabile <i>bi-stable</i>	TRA (14): 20 ms TRR (12): 20 ms	TRA (14): 22 ms TRR (12): 22 ms

I prodotti di seguito indicati sono venduti senza bobine, da acquistarsi separatamente (vedi pag. 185).
The following listed products are sold without coils, which are bought separately (refer to page 185).

Diametro nominale <i>Nominal orifice</i>	1/8": 5 mm 1/4": 7.5 mm		
Temperatura di esercizio <i>Temperature range</i>	max +60°C		
Pressione di esercizio <i>Working pressure</i>	al. interna monost. [<i>monost. internal air supply</i>]	al. interna bist. [<i>bi-stable internal air supply</i>]	alim. separata [<i>separate air supply</i>]
	2.5 ... 10 bar 0.25 ... 1 MPa	1 ... 10 bar 0.1 ... 1 MPa	-0.9 ... 10 bar -0.09 ... 1 MPa
Pressione di azionamento (per alimentazione separata) <i>Actuating pressure (for separate air supply)</i>	monostabile [<i>mono-stable</i>]		bistabile [<i>bi-stable</i>]
	2.5 ... 10 bar 0.25 ... 1 MPa		1 ... 10 bar 0.1 ... 1 MPa
Fluido <i>Fluid</i>	Aria filtrata 50µ con o senza lubrificazione <i>50µ filtered, lubricated or non lubricated air</i>		

valvole ad azionamento elettropneumatico

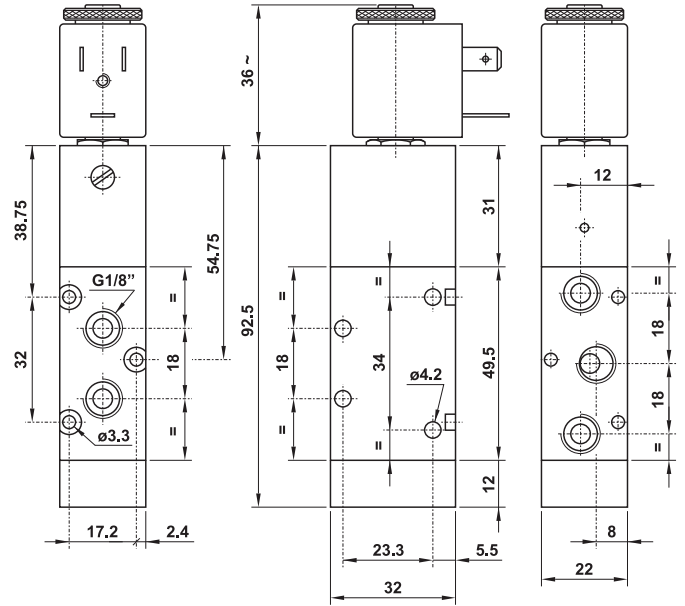
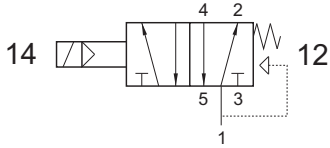
solenoid actuated valves



521 ME

5/2 1/8" comando elettrico - ritorno a molla

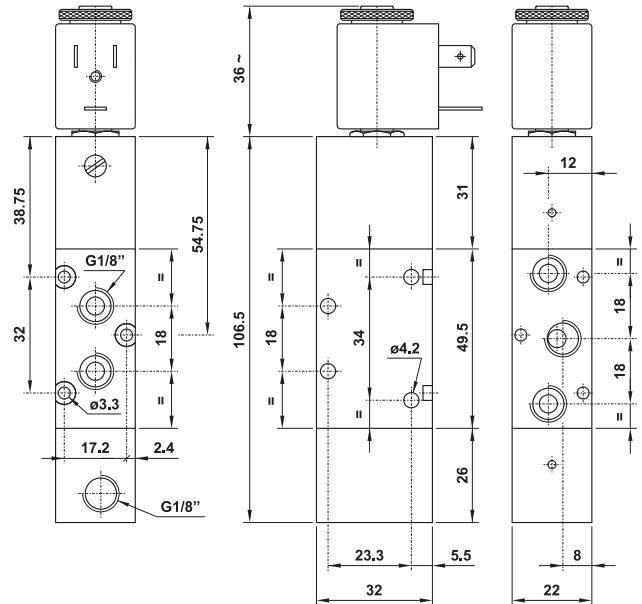
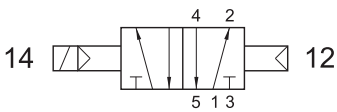
5/2 1/8" solenoid pilot - spring return



521 CE

5/2 1/8" comando elettrico - ritorno a comando pneumatico

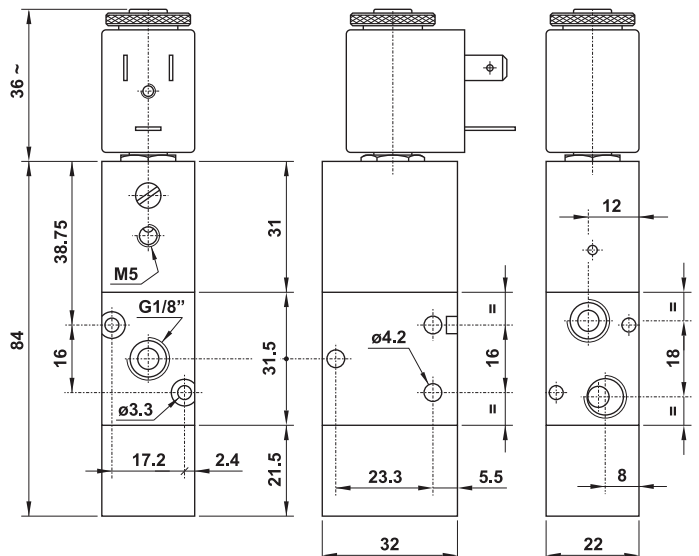
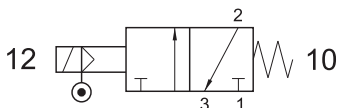
5/2 1/8" solenoid pilot - separate pneumatically piloted return



321 ME AS

3/2 1/8" comando elettrico alimentazione separata - ritorno a molla

3/2 1/8" solenoid pilot with separate air supply - spring return



5.3. Componentes eléctricos y electrónicos

En este apartado quedan constatadas las hojas de características de los múltiples elementos eléctricos y electrónicos planteados en el diseño de la célula optimizada. Se trata de los siguientes componentes, cuyas descripciones aparecerán según el mismo orden aquí dispuesto:

1. Armario eléctrico
2. Interruptor magnetotérmico IC60N
3. Interruptor magnetotérmico kC60N – 4A
4. Interruptor magnetotérmico kC60N – 2A
5. Interruptor magnetotérmico unipolar – 0,5A
6. Ventilador extractor
7. Fuente de alimentación 24VDC
8. Controlador de seguridad G9SP
9. Autómata de control CP1L
10. Variador de frecuencia VACON10
11. Relé contactor
12. Relé
13. Seta de emergencia
14. Pulsador NC rojo
15. Selector dos posiciones
16. Pulsador NA verde
17. Luz indicadora rotativa
18. Luz indicadora verde
19. Luz indicadora roja
20. Borneras
21. Final de carrera D4N
22. Sensor inductivo E2A
23. Barrera de detección de presencia
24. Motor 0,12kW CEMER
25. Clavija CNEM



Main

Range of product	Spacial CRN
Application	Multi-purpose
Category	Compact enclosure
Enclosure nominal height	600 mm
Enclosure nominal width	400 mm
Enclosure nominal depth	200 mm
Installation accessory type	Wall-mounting
Device composition	Body 1 Cable gland plate 1 Door 1 Lock 1
Door type	Plain
Mounting plate description	Without mounting plate

Complementary

Body type	Sides made from a single folded section Back welded with double profile forming a protected sealed area
Number of doors	1 front face
Door opening	Reversible 120 °
Lock type	3 mm double-bar lock
Type of gland plate	Standard
Accessibility for operation	Front
Removable parts	Door by hinges Cable gland plate by screws
Material	Steel for body
Surface finish	Epoxy-polyester powder
Colour	Grey RAL 7035
Standards	IEC 62208
Product certifications	CUL UL

Environment

IP degree of protection	IP66 conforming to IEC 60529
IK degree of protection	IK10 conforming to IEC 62262
RoHS EUR status	Compliant
RoHS EUR conformity date	0940

Interruptores automáticos iC60N

Protección magnetotérmica de circuitos y receptores

Certificación
AENOR



UNE-EN 60947-2, UNE-EN 60898-1 Curvas B, C y D

- Los iC60N son interruptores automáticos que combinan las siguientes funciones:
- Protección de circuitos contra corrientes de cortocircuito.
- Protección de circuitos contra corrientes de sobrecarga.
- Adecuados para aislamiento industrial según la norma UNE-EN 60947-2.
- Señalización de defecto mediante un indicador mecánico situado en la parte frontal del interruptor automático.

Corriente alterna (CA) 50/60 Hz

Poder de corte (Icu) según la norma UNE-EN 60947-2	Tensión (Ue)				Poder de corte de servicio (Ics)
	12 a 133 V	220 a 240 V	380 a 415 V	440 V	
F/F (2P, 3P, 4P)	12 a 133 V	220 a 240 V	380 a 415 V	440 V	100 % de Icu
F/N (1P, 1P+N)	12 a 60 V	100 a 133 V	220 a 240 V	–	
Calibre (In)	0,5 a 4 A	50 kA	50 kA	50 kA	25 kA
	6 a 63 A	36 kA	20 kA	10 kA	6 kA

Poder de corte (Icn) según la norma UNE-EN 60898-1

Poder de corte (Icn) según la norma UNE-EN 60898-1	Tensión (Ue)	
	12 a 133 V	220 a 240 V
F/F	400 V	–
F/N	230 V	–
Calibre (In)	0,5 a 63 A	6.000 A

Corriente continua (CC)

Poder de corte (Icu) según la norma UNE-EN 60947-2	Tensión (Ue)				Poder de corte de servicio (Ics)
	12 a 72 V	100 a 133 V	220 a 250 V	–	
Entre +/-	12 a 72 V	100 a 133 V	220 a 250 V	–	100% de Icu
Número de polos	1P	2P (en serie)	3P (en serie)	4P (en serie)	
Calibre (In)	0,5 a 63 A	6 kA	6 kA	6 kA	

Referencias

Interruptor automático iC60N

Tipo	1P	1P+N			
Auxiliares	Indicación y disparo remotos, ver página 1/109	Indicación y disparo remotos, ver página 1/109			
Quick Vigi iC60	Dispositivo de protección diferencial Quick Vigi iC60, ver página 1/63	Dispositivo de protección diferencial Quick Vigi iC60, ver página 1/63			
Calibre (In)	Curva				
	B	C ⁽¹⁾	D		
0,5 A ⁽¹⁾	–	A9F74170	A9F75170	A9F73670	A9F74670
1 A ⁽¹⁾	A9F73101	A9F74101	A9F75101	A9F73601	A9F74601
2 A ⁽¹⁾	A9F73102	A9F74102	A9F75102	A9F73602	A9F74602
3 A ⁽¹⁾	A9F73103	A9F74103	A9F75103	A9F73603	A9F74603
4 A ⁽¹⁾	A9F73104	A9F74104	A9F75104	A9F73604	A9F74604
6 A	A9F78106	A9F79106	A9F75106	A9F78606	A9F79606
10 A	A9F78110	A9F79110	A9F75110	A9F78610	A9F79610
16 A	A9F78116	A9F79116	A9F75116	A9F78616	A9F79616
20 A	A9F78120	A9F79120	A9F75120	A9F78620	A9F79620
25 A	A9F78125	A9F79125	A9F75125	A9F78625	A9F79625
32 A	A9F78132	A9F79132	A9F75132	A9F78632	A9F79632
40 A	A9F78140	A9F79140	A9F75140	A9F78640	A9F79640
50 A	A9F78150	A9F79150	A9F75150	A9F78650	A9F79650
63 A	A9F78163	A9F79163	A9F75163	A9F78663	A9F79663
Ancho en módulos de 9 mm	2		4		
Accesorios	Ver página 1/109		Ver página 1/109		

(1) Certificación AENOR.

Interruptores automáticos iC60N

(continuación)

Protección magnetotérmica de circuitos y receptores

PE104434-40



- Aumento de la vida útil del producto gracias a las características siguientes:
- Alta resistencia a sobretensiones gracias a un diseño industrial de alto nivel (grado de contaminación, tensión asignada impulsional y tensión asignada de aislamiento).
- Alto poder de limitación (ver curvas de limitación).
- Cierre brusco independientemente de la velocidad de actuación de la maneta.
- Indicación, apertura, cierre y disparo remotos mediante contactos auxiliares opcionales.
- Alimentación eléctrica superior o inferior.

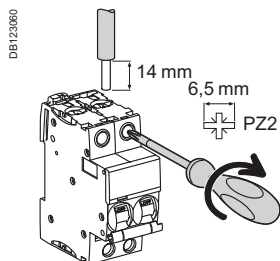
2P			3P			4P		
Indicación y disparo remotos, ver página 1/109			Indicación y disparo remotos, ver página 1/109			Indicación y disparo remotos, ver página 1/109		
Dispositivo de protección diferencial Quick Vigi iC60, ver página 1/63			Dispositivo de protección diferencial Quick Vigi iC60, ver página 1/63			Dispositivo de protección diferencial Quick Vigi iC60, ver página 1/63		
Curva			Curva			Curva		
B	C ⁽¹⁾	D	B	C ⁽¹⁾	D	B	C ⁽¹⁾	D
-	A9F74270	A9F75270	-	A9F74370	A9F75370	-	A9F74470	A9F75470
A9F73201	A9F74201	A9F75201	A9F73301	A9F74301	A9F75301	A9F73401	A9F74401	A9F75401
A9F73202	A9F74202	A9F75202	A9F73302	A9F74302	A9F75302	A9F73402	A9F74402	A9F75402
A9F73203	A9F74203	A9F75203	A9F73303	A9F74303	A9F75303	A9F73403	A9F74403	A9F75403
A9F73204	A9F74204	A9F75204	A9F73304	A9F74304	A9F75304	A9F73404	A9F74404	A9F75404
A9F78206	A9F79206	A9F75206	A9F78306	A9F79306	A9F75306	A9F78406	A9F79406	A9F75406
A9F78210	A9F79210	A9F75210	A9F78310	A9F79310	A9F75310	A9F78410	A9F79410	A9F75410
A9F78216	A9F79216	A9F75216	A9F78316	A9F79316	A9F75316	A9F78416	A9F79416	A9F75416
A9F78220	A9F79220	A9F75220	A9F78320	A9F79320	A9F75320	A9F78420	A9F79420	A9F75420
A9F73225	A9F79225	A9F75225	A9F78325	A9F79325	A9F75325	A9F78425	A9F79425	A9F75425
A9F78232	A9F79232	A9F75232	A9F78332	A9F79332	A9F75332	A9F78432	A9F79432	A9F75432
A9F78240	A9F79240	A9F75240	A9F78340	A9F79340	A9F75340	A9F78440	A9F79440	A9F75440
A9F78250	A9F79250	A9F75250	A9F78350	A9F79350	A9F75350	A9F78450	A9F79450	A9F75450
A9F78263	A9F79263	A9F75263	A9F78363	A9F79363	A9F75363	A9F78463	A9F79463	A9F75463
4			6			8		
Ver página 1/109			Ver página 1/109			Ver página 1/109		

Interruptores automáticos iC60N

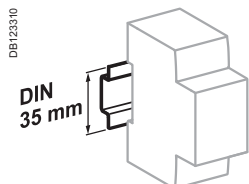
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Protección magnetotérmica de circuitos y receptores

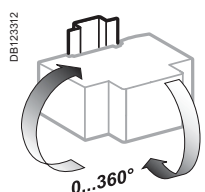
Conexión



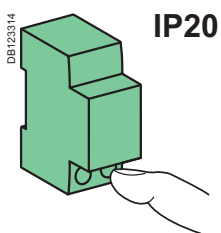
Calibre	Par de apriete	Sin accesorios		Con accesorios			
		Cables de cobre Rígidos	Flexibles o con terminales	Terminal AI 50 mm ²	Conexión de tornillo para terminal de anillo	Terminal multicables	
		DB122945	DB122946	DB122935 AI	DB118789	DB118787	
0,5 a 25 A	2 N.m	1 a 25 mm ²	1 a 16 mm ²	—	Ø 5 mm	—	—
32 a 63 A	3,5 N.m	1 a 35 mm ²	1 a 25 mm ²	50 mm ²	—	3 × 16 mm ²	3 × 10 mm ²



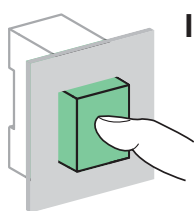
Clip en carril DIN de 35 mm.



Posición de instalación indiferente.



IP20



IP40

Datos técnicos

Características principales

Según la norma UNE-EN 60947-2

Tensión asignada de aislamiento (Ui)	500 V CA	
Grado de contaminación	3	
Tensión asignada impulsional (Uimp)	6 kV	
Disparo térmico	Temperatura de referencia	50 °C
	Degradación por temperatura	Ver capítulo 6
Disparo magnético	Curva B	4 I _n ± 20%
	Curva C	8 I _n ± 20%
	Curva D	12 I _n ± 20%
Categoría de utilización	A	

Según la norma UNE-EN 60898-1

Clase de limitación	3
Poder de corte y conexión nominal de un polo individual (I _{cn1})	I _{cn1} = I _{cn}

Características adicionales

Grado de protección (UNE-EN 60529)	Dispositivo únicamente	IP20
	Dispositivo en cofret modular	IP40 Clase de aislamiento II
Endurancia (apertura-cierre)	Eléctrica	10.000 ciclos
	Mecánica	20.000 ciclos
Categoría de sobretensión (UNE-EN 60364)		IV
Temperatura de funcionamiento		-35 °C a +70 °C
Temperatura de almacenamiento		-40 °C a +85 °C
Tropicalización (UNE-EN 60068-1)		Tratamiento 2 (humedad relativa 95% a 55 °C)

Interruptores automáticos iC60N

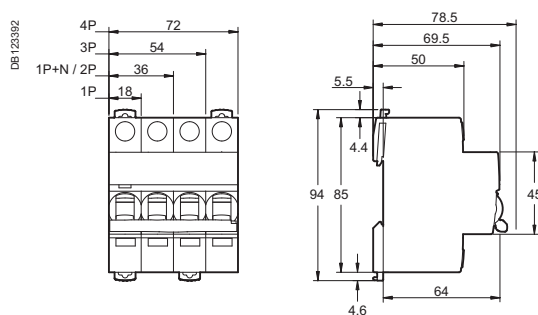
(continuación)

Protección magnetotérmica de circuitos y receptores

Peso (g)

Interruptor automático	
Tipo	iC60N
1P	125
2P	250
3P	375
4P	500

Dimensiones (mm)





PVR*: 70.06 EUR



Principal

Estatus comercial	Comercializado
Aplicación dispositivo	Distribution
Gama	Acti 9
Tipo de producto o componente	Disyuntor en miniatura
Nombre del producto	IK60
Nombre del dispositivo	IK60N
Número de polos	2P
Número de polos protegidos	2
[In] corriente nominal	4 A
Tipo de red	CA
Tipo de unidad de control	Térmico-magnético
Código de curva de disparo ins	C
Poder de corte	6000 A Icn de acuerdo con EN/IEC 60898-1 - 400 V CA 50/60 Hz 6000 A Icn de acuerdo con EN/IEC 60898-1 - 230 V CA 50/60 Hz
Aptitud al seccionamiento	Sí de acuerdo con EN/IEC 60898-1

Complementario

Frecuencia asignada de empleo	50/60 Hz
Límite de enlace magnético	5...10 x In
[Ics] poder de corte en servicio	6000 A 100 % x Icu de acuerdo con EN/IEC 60898-1 - 400 V CA 50/60 Hz 6000 A 100 % x Icu de acuerdo con EN/IEC 60898-1 - 230 V CA 50/60 Hz
1 tornillo	3 de acuerdo con EN/IEC 60898-1
[Ui] Tensión asignada de aislamiento	440 V CA 50/60 Hz de acuerdo con EN/IEC 60898-1
[Uimp] Tensión asignada de choque	4 kV de acuerdo con EN/IEC 60898-1
Indicación de contacto positivo	No
Tipo de control	Maneta
Señalizaciones en local	Indicación encendido/apagado
Modo de montaje	Ajustable en clip
Soporte de montaje	Carril DIN
Pasos de 9 mm	4
Altura	85 mm
Anchura	36 mm
Profundidad	78.5 mm
Peso del producto	200 g
Color	Blanco
Endurancia mecánica	20000 ciclos
Endurancia eléctrica	10000 ciclos
Descripción de las opciones de bloqueo	Dispositivo de cierre con candado
Conexiones - terminales	Terminal, arriba o abajo Flexible cableado(s) 1...16 mm ² max Terminal, arriba o abajo rígido cableado(s) 1...25 mm ² max

Longitud de pelado de cable	14 mm arriba o abajo
Par de apriete	2 N.m arriba o abajo
Protección de fugas a tierra	Sin

Entorno

Normas	EN/IEC 60898-1
Grado IP	IP20 de acuerdo con IEC 60529
Grado de contaminación	2 de acuerdo con EN/IEC 60898-1
Categoría de sobretensión	II
Temperatura ambiente de trabajo	-25...60 °C
Temperatura ambiente de almacenamiento	-40...85 °C

Sostenibilidad de la oferta

Estado de la Oferta sostenible	Producto Green Premium
RoHS	Compliant - since 1001 - Schneider Electric declaration of conformity Declaración de conformidad de Schneider Electric
REACH	Reference not containing SVHC above the threshold
Perfil ambiental del producto	Disponible Descargar Perfil Medioambiental
Instrucciones Fin de Vida del producto	No necesita operaciones de reciclaje específicas



PVR*: 70.06 EUR



Principal

Estatus comercial	Comercializado
Aplicación dispositivo	Distribution
Gama	Acti 9
Tipo de producto o componente	Disyuntor en miniatura
Nombre del producto	IK60
Nombre del dispositivo	IK60N
Número de polos	2P
Número de polos protegidos	2
[In] corriente nominal	2 A
Tipo de red	CA
Tipo de unidad de control	Térmico-magnético
Código de curva de disparo ins	C
Poder de corte	6000 A lcn de acuerdo con EN/IEC 60898-1 - 400 V CA 50/60 Hz 6000 A lcn de acuerdo con EN/IEC 60898-1 - 230 V CA 50/60 Hz
Aptitud al seccionamiento	Sí de acuerdo con EN/IEC 60898-1

Complementario

Frecuencia asignada de empleo	50/60 Hz
Límite de enlace magnético	5...10 x In
[Ics] poder de corte en servicio	6000 A 100 % x Icu de acuerdo con EN/IEC 60898-1 - 400 V CA 50/60 Hz 6000 A 100 % x Icu de acuerdo con EN/IEC 60898-1 - 230 V CA 50/60 Hz
1 tornillo	3 de acuerdo con EN/IEC 60898-1
[Ui] Tensión asignada de aislamiento	440 V CA 50/60 Hz de acuerdo con EN/IEC 60898-1
[Uimp] Tensión asignada de choque	4 kV de acuerdo con EN/IEC 60898-1
Indicación de contacto positivo	No
Tipo de control	Maneta
Señalizaciones en local	Indicación encendido/apagado
Modo de montaje	Ajustable en clip
Soporte de montaje	Carril DIN
Pasos de 9 mm	4
Altura	85 mm
Anchura	36 mm
Profundidad	78.5 mm
Peso del producto	200 g
Color	Blanco
Endurancia mecánica	20000 ciclos
Endurancia eléctrica	10000 ciclos
Descripción de las opciones de bloqueo	Dispositivo de cierre con candado
Conexiones - terminales	Terminal, arriba o abajo Flexible cableado(s) 1...16 mm ² max Terminal, arriba o abajo rígido cableado(s) 1...25 mm ² max

Longitud de pelado de cable	14 mm arriba o abajo
Par de apriete	2 N.m arriba o abajo
Protección de fugas a tierra	Sin

Entorno

Normas	EN/IEC 60898-1
Grado IP	IP20 de acuerdo con IEC 60529
Grado de contaminación	2 de acuerdo con EN/IEC 60898-1
Categoría de sobretensión	II
Temperatura ambiente de trabajo	-25...60 °C
Temperatura ambiente de almacenamiento	-40...85 °C

Sostenibilidad de la oferta

Estado de la Oferta sostenible	Producto Green Premium
RoHS	Compliant - since 1001 - Schneider Electric declaration of conformity Declaración de conformidad de Schneider Electric
REACH	Reference not containing SVHC above the threshold
Perfil ambiental del producto	Disponible Descargar Perfil Medioambiental
Instrucciones Fin de Vida del producto	No necesita operaciones de reciclaje específicas

Description

One and two pole thermal-magnetic circuit breaker in compact design with slide actuator, trip-free mechanism, various trip characteristics and optional auxiliary contacts.

Meets the requirements of the circuit breaker standard EN 60934 (IEC 60934): S-type, TM.

Typical applications

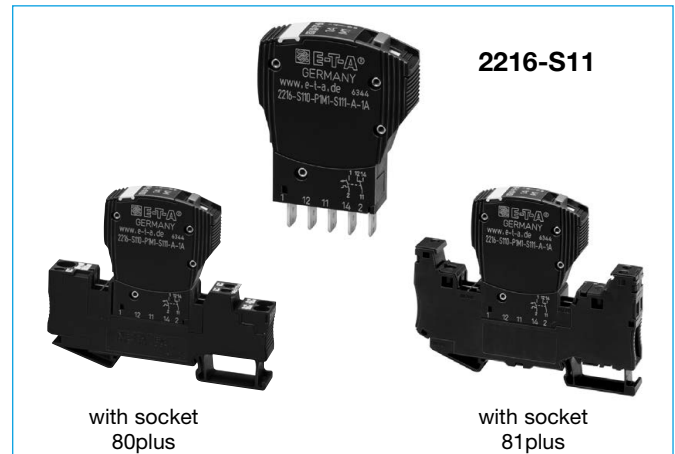
Protection of AC and DC control circuits in industrial automation applications and buildings, e.g. in the chemical industry, power plants, steel industry and machine construction (machine tools, packing machines etc.)

Ordering information

Type no.	2216 thermal-magnetic circuit breaker
Mounting method	S1 plug-in mounting
Number of poles	1 1-pole 2 2-pole
Additional function / accessories	0 without
Main terminals	P1 blade terminals A6.3 x 0.8 with polarising tooth (standard)
Characteristic curve	F1 therm. 1.01-1.4 x I _N ; magn. 2-4 x I _N (only for DC) F2 therm. 1.01-1.4 x I _N ; magn. 3-6 x I _N AC / 4-8 I _N DC M1 therm. 1.01-1.4 x I _N ; magn. 6-12 x I _N AC / 8-15 I _N DC
Auxiliary contacts	S0 without auxiliary contact S1 with auxiliary contact
Auxiliary contact function	0 without 1 change-over
Auxiliary contact terminals	0 without 1 blade terminals A6.3 x 0.8 with polarising tooth (standard)
Voltage rating	A ≤ AC 277 V, ≤ DC 80 V
Current ratings	0.5...16 A
2216 - S1 1 0 - P1 F1- S1 1 1 - A-16A Ordering example	

Standard current ratings and typical internal resistance values

Current rating (A)	Internal resistance (Ω)	Current rating (A)	Internal resistance (Ω)
0.5	5.0	6	0.05
1	1.1	8	≤ 0.02
2	0.3	10	≤ 0.02
3	0.14	12	≤ 0.02
4	0.09	15	≤ 0.02
5	0.06	16	≤ 0.02



Technical data

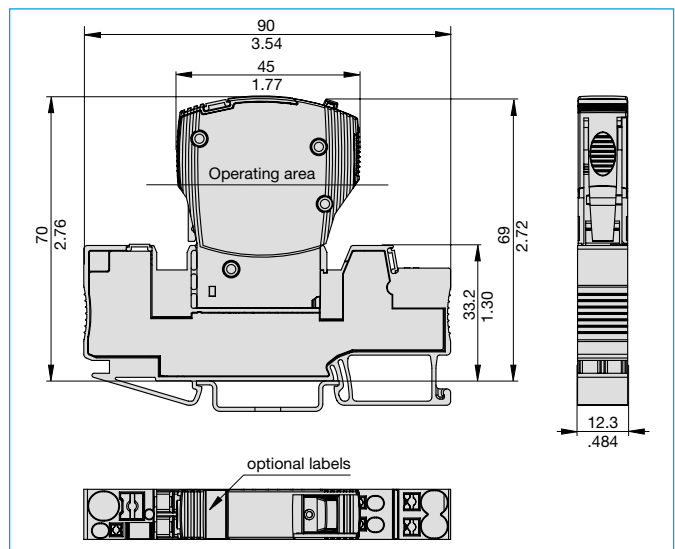
Voltage rating	AC 240 V (50/60 Hz); DC 50 V (1-pole) DC 80 V (2-pole)
Current rating range	0.5...16 A
Auxiliary circuit	AC 240 V, 0.5 A (VDE) AC 277 V, 0.5 A (UL) DC 50 V, 1 A (VDE/UL)
Typical life	6,000 operations at 1 x I _N 3,000 operations at 1 x I _N DC 80 V, 2-pole
Ambient temperature	-30...60 °C
Insulation co-ordination (IEC 60664)	2.5 kV/2 re-inforced insulation in operating area
Dielectric strength	operating area main/aux. circuit test voltage AC 3,000 V test voltage AC 1,500 V
Open aux. circuit	AC 1,000 V
Insulation resistance	> 100 MΩ (DC 500 V)
Interrupting capacity I_{cn}	AC 240 V 1-pole 300 A DC 32 V 1-pole 1500 A DC 50 V 1-pole 600 A AC 240 V 2-pole 400 A DC 32 V 2-pole 1500 A DC 80 V 2-pole 600 A
Interrupting capacity (UL 1077)	AC 277 V 1,000 A DC 50 V 1-pole 1,000 A DC 80 V 2-pole 1,000 A
Degree of protection (IEC 60529)	operating area IP30 terminal area IP00
Vibration	curve F1: 5 g (57-500 Hz), ± 0.38 mm (10-57 Hz); curves F2, M1: 8 g (57-500 Hz) ± 0.61 mm (10-57 Hz) test to IEC 60068-2-6, test Fc, 10 frequency cycles per axis
Shock	curve F1: 15 g (11 ms) for shock direction 1-6 curves F2, M1: 30 g (11 ms) for shock direction 1-6 test to IEC 60068-2-27, test Ea
Corrosion	96 hrs in 5 % salt mist, test to IEC 60068-2-11, test Ka
Humidity	240 hrs in 95 % RH, test to IEC 60068-2-78, test Cab
Mass	approx. 25 g (per pole with aux. contact)

Approvals

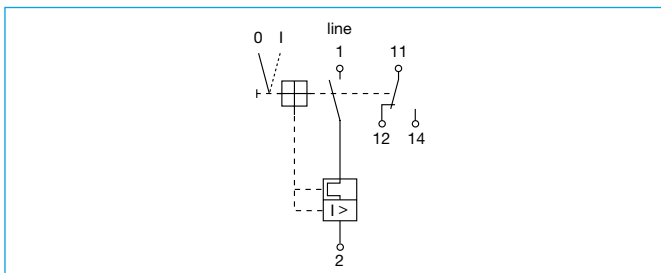
Authority	Standard	Voltage ratings	Current ratings
CSA	C22.2 No. 235	AC 277 V DC 50 V DC 80 V	0.1...16 A (1-, 2-pole) 0.1...16 A (1-pole) 0.1...16 A (2-pole)
VDE	IEC / EN 60934	AC 240 V DC 50 V DC 80 V	0.1...16 A (1-, 2-pole) 0.1...16 A (1-pole) 0.1...16 A (2-pole)
UL	UL 1077 C22.2 No 235	AC 277 V DC 50 V DC 80 V	0.1...16 A (1-, 2-pole) 0.1...16 A (1-pole) 0.1...16 A (2-pole)
GL	IEC / EN 60934	AC 240 V DC 50 V DC 80 V	0.1...16 A (1-, 2-pole) 0.1...16 A (1-pole) 0.1...16 A (2-pole)
UL *)	UL 60947-4-1A C22.2 No 60947-4-1	AC 277 V DC 50 V DC 80 V	0.1...10 A (1-, 2-pole) 0.1...16 A (1-pole) 0.1...10 A (2-pole)

*) cULus (listed) using with socket 80PLUS or socket 81PLUS

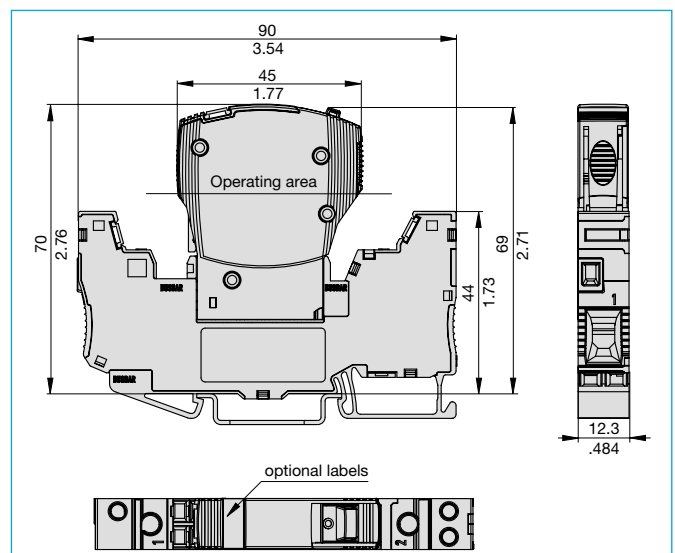
Dimensions 2216-S11 with socket 80plus



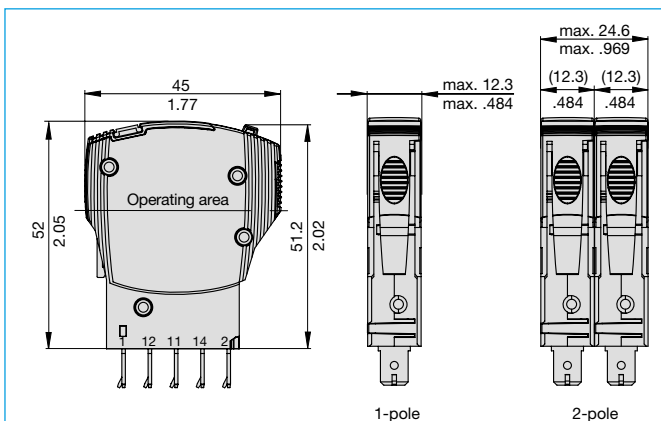
Schematic diagram



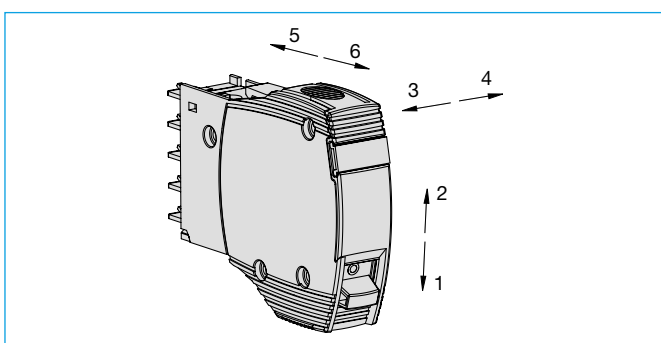
Dimensions 2216-S11 with socket 81plus



Dimensions 2216-S1

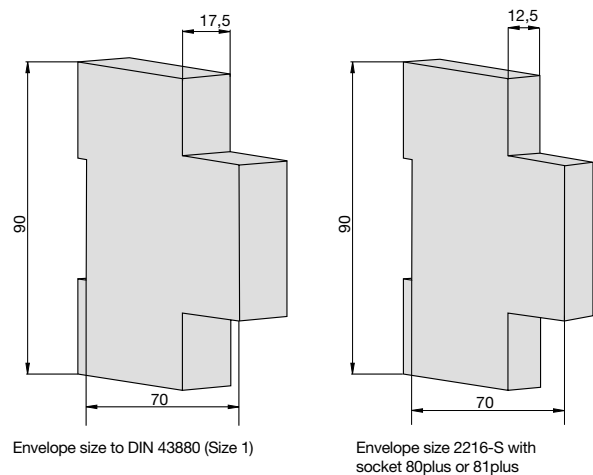


Shock directions

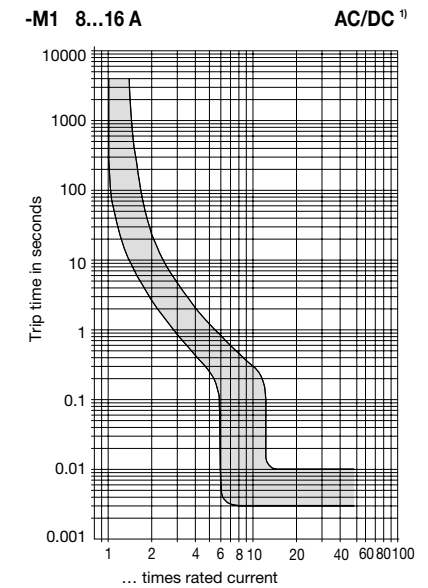
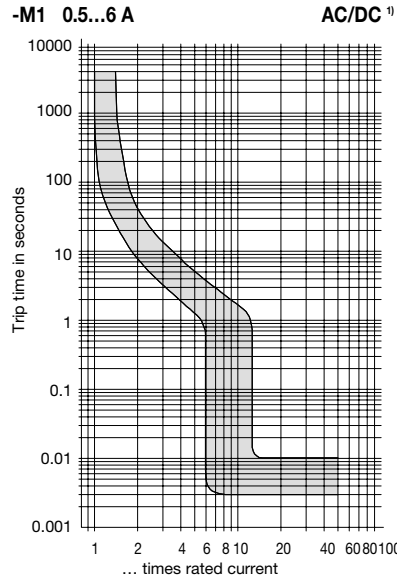
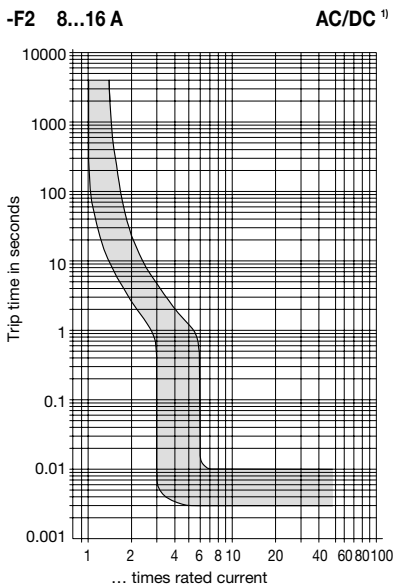
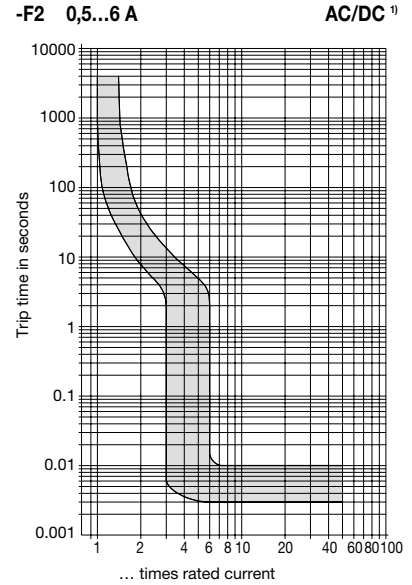
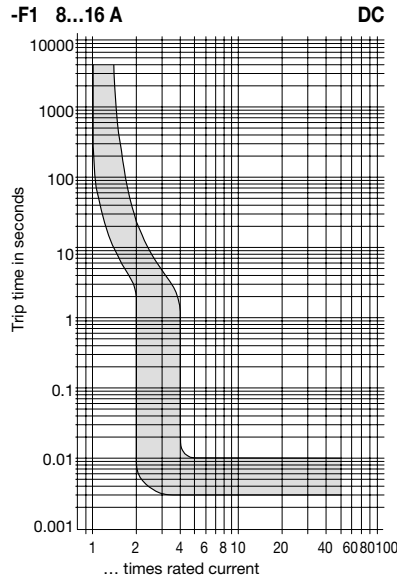
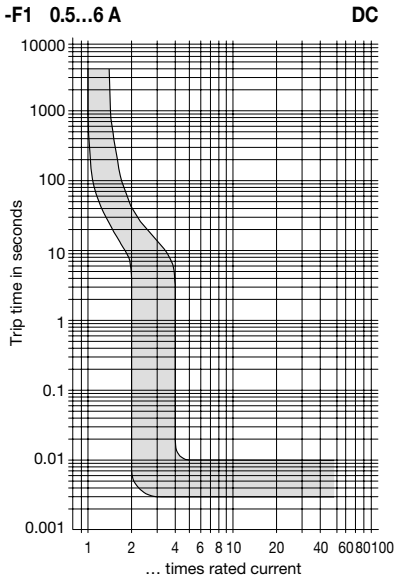


Envelope size to DIN 43880

The envelope size of type 2216-S with socket 80plus or 81plus complies with the requirements of DIN 43880 (built-in equipment for electrical installation).



Time/current characteristics



¹⁾ Magnetic tripping currents are or the curves M1 and F2 are increased by 30 % on DC supplies.

When mounted side-by-side, the breakers can only carry up to 80 % of their rated or a higher rating should be selected (please also see Technical Information).

The time current characteristic curve depends on the ambient temperature. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below (please also see Technical Information).

Ambient temperature °C	-30	-20	-10	0	10	23	30	40	50	60
Derating factor	0.76	0.79	0.83	0.88	0.93	1	1.04	1.12	1.22	1.35

Caution: High inrush peaks of < 0.003 sec. may trip the breaker.

This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.

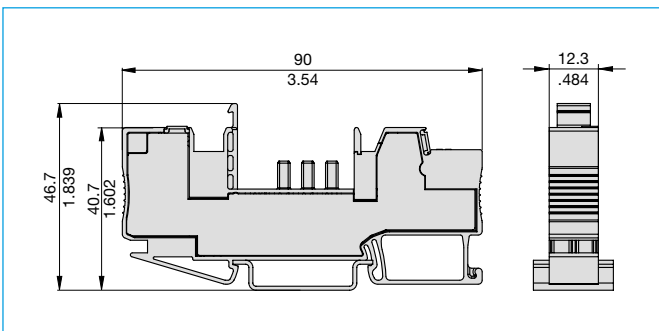
Description

Single pole, with PT connection technology, to accommodate 1- or 2-pole circuit breakers type 2216-S

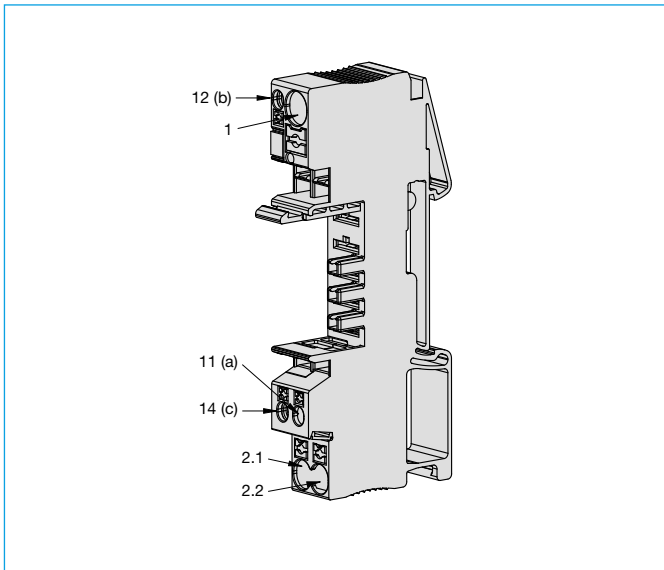
Part number: 80PLUS-PT01

- Push-in design: push the stripped wire (cross section $\geq 0.25 \text{ mm}^2$, rigid or with wire end ferrule) into the round hole of the terminal without using a tool
- For smaller cable cross sections or flexible wires without wire end ferrule you have to push in the orange push button to open the spring.
- For release push in the orange push button with a screw driver.

Dimensions



Line connection

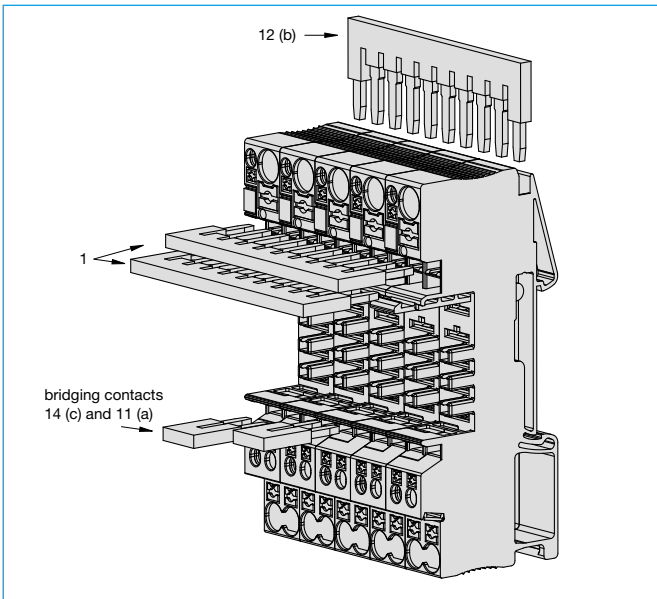


1	Supply
2.1 / 2.2	Power distribution
11 (a)	
14 (c)	
12 (c)	

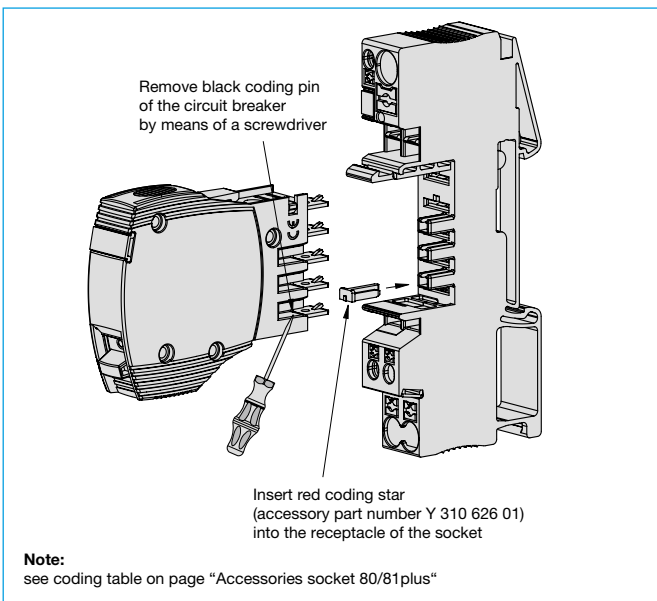
Cable cross section

	Cross section when opening the push-in terminal	Cable cross section directly pluggable	stripped wire length
terminal 1 (line)	- rigid: 0.5...6 mm ² - flexible: 0.5...6 mm ² - flexible with wire end ferrule: (with plastic sleeve) 0.5...6 mm ² (10 mm ²) - flexible with wire end ferrule: (without plastic sleeve) 0.5...6 mm ² - flexible with TWIN-wire end ferrule: 0.5...1 mm ²	- rigid: 1...6 mm ² - flexible with wire end ferrule: (with plastic sleeve) 0.5...6 mm ² (10 mm ²) - flexible with wire end ferrule: (without plastic sleeve) 0.5...6 mm ²	12 mm
terminals 2.1 and 2.2 (load)	- rigid: 0.2...6 mm ² - flexible: 0.2...4 mm ² - flexible with wire end ferrule: (with plastic sleeve) 0.25...4 mm ² - flexible with wire end ferrule: (without plastic sleeve) 0.25...4 mm ² - flexible with TWIN-wire end ferrule: 0.5...1 mm ²	- rigid: 0.5...6 mm ² - flexible with wire end ferrule: (with plastic sleeve) 0.75...4 mm ² - flexible with wire end ferrule: (without plastic sleeve) 0.5...4 mm ²	12 mm
terminals 11, 12 and 14 (signalling)	- rigid: 0.14...1.5 mm ² - flexible: 0.14...1.5 mm ² - flexible with wire end ferrule: (with plastic housing) 0.14...1.5 mm ² - flexible with wire end ferrule: (without plastic sleeve) 0.14...1 mm ²	- rigid: 0.25...1.5 mm ² - flexible with wire end ferrule: (with plastic housing) 0.34...1.5 mm ² - flexible with wire end ferrule: (without plastic sleeve) 0.34...1 mm ²	8 mm

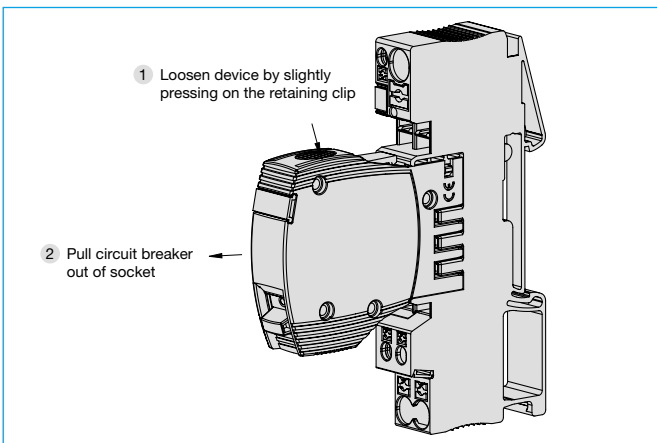
Insertion of busbars/jumpers



Coding of circuit breaker 2216-S and socket 80plus following the lock-key-principle

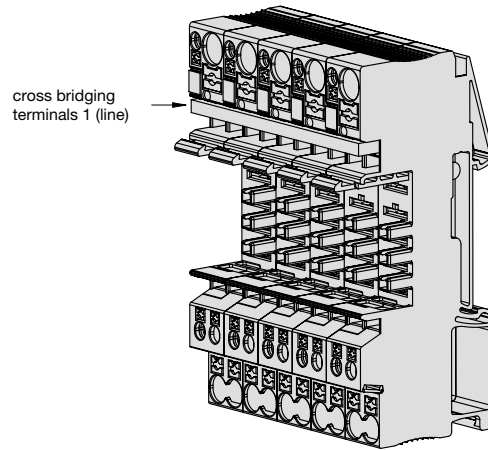


Replacing a circuit breaker

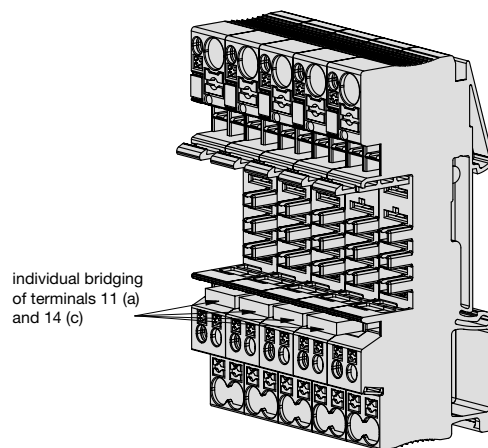


Application examples

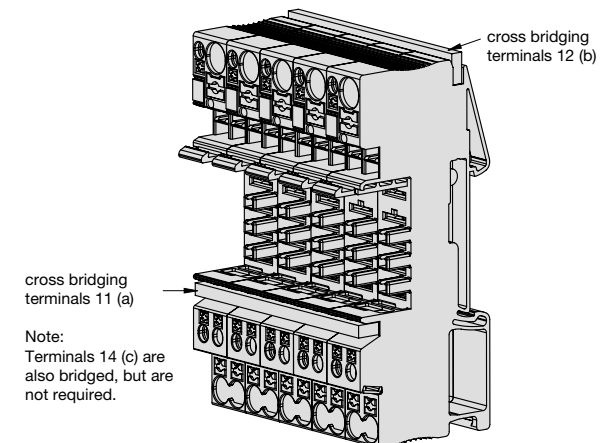
Common line entry



Series connection of auxiliary contacts



Parallel connection of auxiliary contacts

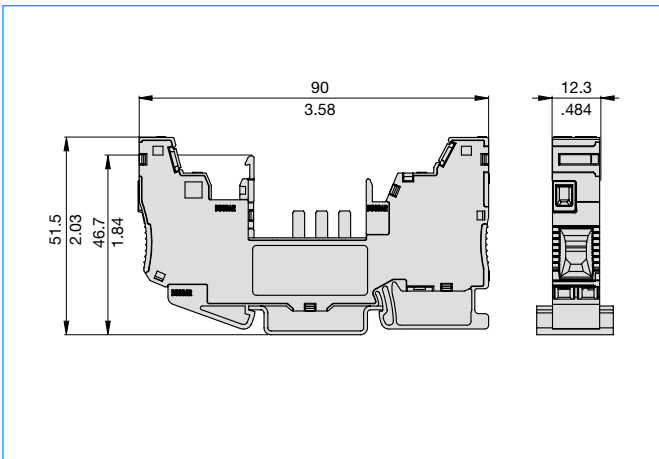


Description

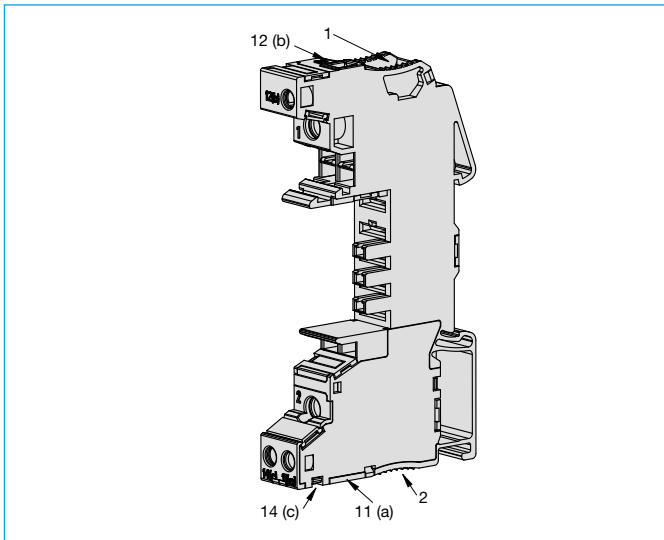
Single pole, with screw terminals, to accommodate 1- and 2- pole circuit breakers type 2216-S

Part number: 81PLUS-UT01

Dimensions



Line connection



1	Supply
2	Power distribution
11 (a)	Change-over contact
14 (c)	
12 (c)	

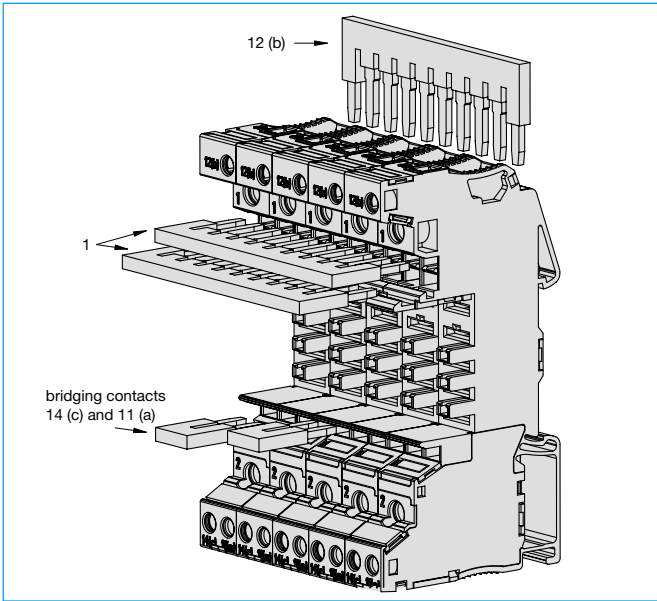
Cable cross section

	thread size	max. cable cross section		stripped wire length	tightening torque
terminals 1 (line) and 2 (load)	M4	Wire - rigid (single-wire or multistrand) 0.5...16 mm ² - flexible: 0.5...10 mm ² - flexible with wire end ferrule: 0.5...10 mm ² (with and without plastic sleeve) - flexible with TWIN-wire end ferrule: 0.5...6 mm ²		10 mm	1.2 Nm
		Multi-lead connection (two wires with identical cross section) - rigid (single-wire or multistrand) 0.5...4 mm ² - flexible: 0.5...4 mm ² - flexible with TWIN-wire end ferrule (without plastic sleeve) 0.5...2.5 mm ²			
terminals 11, 12 and 14 (signalling)	M3	Wire - rigid: 0.14...4 mm ² - flexible: 0.14...4 mm ² - flexible with wire end ferrule: 0.14...2.5 mm ² (with and without plastic sleeve)		9 mm	0.5 Nm
		Multi-lead connection (two wires with identical cross section) - rigid: 0.14...1.5 mm ² - flexible: 0.14...1.5 mm ² - flexible with TWIN AEH: 0.5...1.5 mm ² (with plastic sleeve) - flexible with AEH: 0.14...1.5 mm ² (without plastic sleeve)			

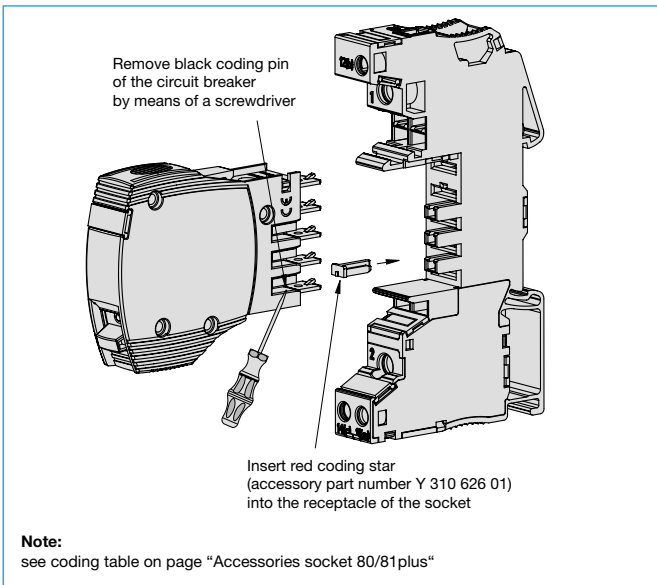
This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)

All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.

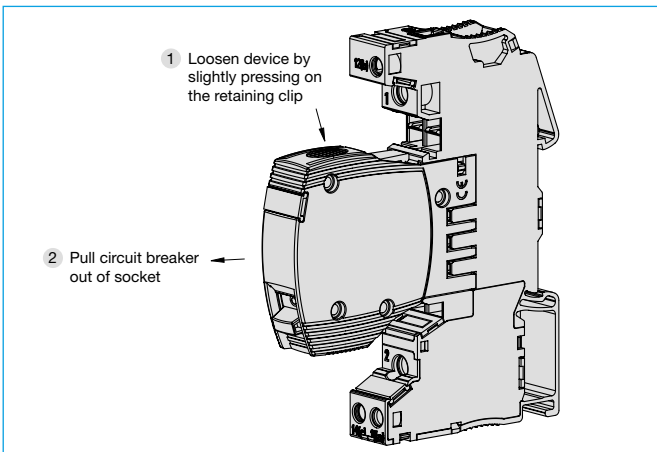
Insertion of busbars/jumpers



Coding of circuit breaker 2216-S and socket 81plus following the lock-key-principle

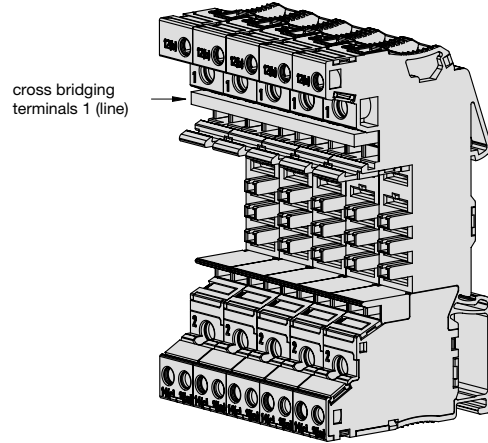


Replacing a circuit breaker

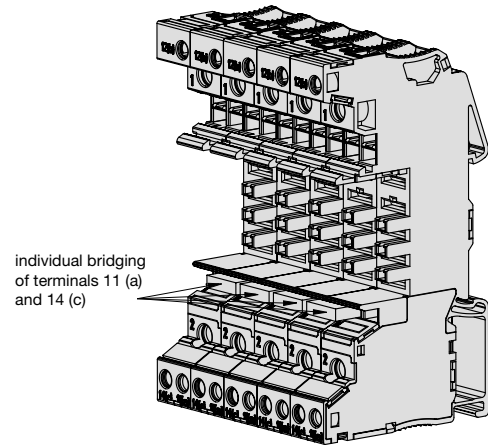


Application examples

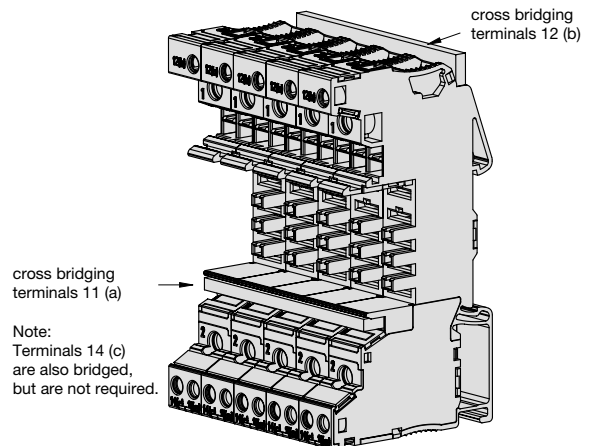
Common line entry



Series connection of auxiliary contacts



Parallel connection of auxiliary contacts



Accessories

Accessories for Socket 80plus and Socket 81plus		part number	packing qty
busbar, for cross-bridging in the bridge shaft, red, 2 poles *		Y 310 624 01	50
busbar, for cross-bridging in the bridge shaft, red, 4 poles *		Y 310 625 01	50
busbar, for cross-bridging in the bridge shaft, red, 10 poles *		Y 308 823 11	10
busbar, for cross-bridging in the bridge shaft, blue, 2 poles *		Y 310 624 02	50
busbar, for cross-bridging in the bridge shaft, blue, 4 poles *		Y 310 625 02	50
busbar, for cross-bridging in the bridge shaft, blue, 10 poles *		Y 308 823 12	10
busbar, for cross-bridging in the bridge shaft, grey, 2 poles *		Y 310 624 03	50
busbar, for cross-bridging in the bridge shaft, grey, 10 poles *		Y 308 823 13	10
coding star, red, with 4 coding pins each		Y 310 626 01	50
label		X 222 977 50	50
busbar/jumper, 10 poles	coding star	label	



* Max. bridge current: 32 A

When using two busbars/jumpers (in both bridge shafts of terminal 1), the max. current capacity is 41 A.

Caution:

When using busbars/jumpers for bridging the aux. contacts (11(a), 12(b) and 14(c)), the max. bridge current is 4 A

Coding table

Coding example:

Avoid hazardous oversize current ratings

Your benefit:

Coded circuit breakers can no longer be inserted into slots with a lower current rating coding.

Coding of circuit breakers and sockets

Sockets: Insert coding pins in accordance with coding table into receptacles of the sockets.

Circuit breakers: Remove coding pins in accordance with coding table by means of screw driver.

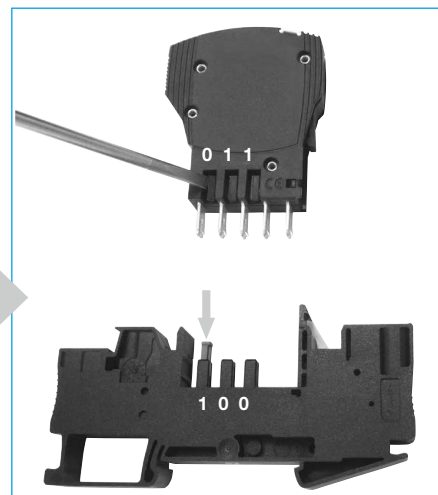
Breaker-socket-coding for the circuit protector with the **highest** current rating

decreasing current rating

Breaker-socket-coding for the circuit protector with the **lowest** current rating

Coding table	Example
Breaker 1 1 1	10 A
Socket 0 0 0	
Breaker 1 1 0	8 A
Socket 0 0 1	
Breaker 1 0 1	6 A
Socket 0 1 0	
Breaker 1 0 0	4 A
Socket 0 1 1	
Breaker 0 1 1	3 A
Socket 1 0 0	
Breaker 0 1 0	2 A
Socket 1 0 1	
Breaker 0 0 1	1 A
Socket 1 1 0	
Breaker 0 0 0	0.5 A
Socket 1 1 1	

1: With PIN / 0: No PIN



FILTER FAN

FF 018 | 14 - 69 CFM



- > Very low noise
- > Minimal mounting depth
- > Functional design

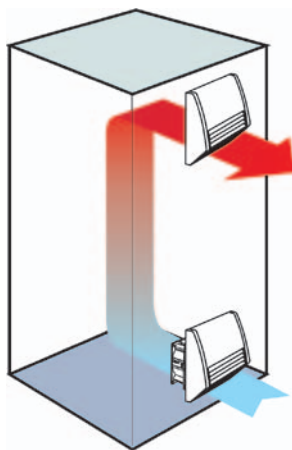
- > Time-saving installation
- > UV resistant plastic

Filter fans are used to provide an optimum climate in enclosures. The interior temperature of an enclosure can be reduced by channeling cooler filtered outside air into the enclosure thus expelling heated internal air. The resulting air flow prevents formation of localized heat pockets and protects the electronic components from overheating. The plastic used for the hood of this filter fan series is impact and UV light resistant. These filter fans are intended for indoor use.



TECHNICAL DATA

Axial fan, ball bearing	service life min. 50,000 h at 77 °F (25 °C) and 65 %RH aluminum fan body, plastic rotor
Connection	2 wires w/ cage clamps, AWG 14 (2.5 mm ²), length 4" (100 mm)
Housing (filter fan and exhaust filter)	plastic, UL 94V-0, light grey
Hood (filter fan and exhaust filter)	plastic, UL 94V-0, light grey; UV light resistant according to UL 746C (f1)
Mounting frame	with double-sided industrial adhesive for mounting to the outside of enclosure; certain operating circumstances may make the additional use of screws necessary; cut-out template included
Filter media rating	G4 acc. to DIN EN 779, filtering degree 94%
Filter material	synthetic fiber with progressive construction, temperature resistant to 212 °F, self-extinguishing class F1; moisture resistant to 100 %RH, reusable - can be cleaned by washing or vacuuming
Operating / Storage temperature	+14 to +158 °F (-10 to +70 °C) / -40 to +158 °F (-40 to +70 °C)
Operating / Storage humidity	max. 90 %RH (non-condensing)
Protection class / Protection type	I (grounded) / IP55 (according to VDE), UL Type 12
Approvals	UL File No. E234324 (all), GOST TR (all), VDE (AC 230 V only)



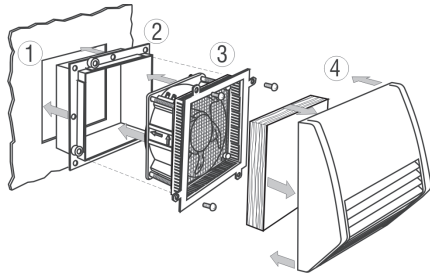
Enclosure ventilation using a filter fan and exhaust filter

Special features

- > The **self-adhesive seal** of the mounting frame prevents dust and water from entering the cabinet.
- > **Functional design** of the intake and exhaust fan hoods very effectively prevents direct infiltration of falling water and dust. The advantage is that the filter mat does not rapidly become contaminated with dirt and therefore does not need to be exchanged as often.
- > The **air channeling** makes the filter fan particularly quiet in operation.
- > The direction of **air flow can easily be switched** by reversing the axial fan.
- > EMC versions and other voltages are available upon request.

Part No.	Operating voltage	Air volume, free blowing	Air volume with exhaust filter	Current consumption	Power consumption	Average noise level (DIN EN ISO 4871)	Mounting depth	Enclosure cut-out	Weight (approx.)
01800.0-00	AC 230 V, 50 Hz ¹	12 cfm (21 m ³ /h)	9 cfm (16 m ³ /h)	80 mA	13 W	31 dB (A)	1.8" (45 mm)	3.8 x 3.8"	1.3 lbs. (0.6 kg)
01800.0-01	AC 120 V, 60 Hz	14 cfm (24 m ³ /h)	11 cfm (18 m ³ /h)	160 mA	13 W	31 dB (A)	1.8" (45 mm)	3.8 x 3.8"	1.3 lbs. (0.6 kg)
01801.0-00	AC 230 V, 50 Hz ¹	32 cfm (55 m ³ /h)	25 cfm (42 m ³ /h)	100 mA	15 W	40 dB (A)	2.3" (58 mm)	4.9 x 4.9"	2.2 lbs. (1.0 kg)
01801.0-01	AC 120 V, 60 Hz	37 cfm (63 m ³ /h)	28 cfm (48 m ³ /h)	180 mA	15 W	40 dB (A)	2.3" (58 mm)	4.9 x 4.9"	2.2 lbs. (1.0 kg)
01802.0-00	AC 230 V, 50 Hz ¹	60 cfm (102 m ³ /h)	40 cfm (68 m ³ /h)	100 mA	15 W	39 dB (A)	3.4" (86 mm)	6.9 x 6.9"	2.9 lbs. (1.3 kg)
01802.0-01	AC 120 V, 60 Hz	69 cfm (117 m ³ /h)	46 cfm (78 m ³ /h)	180 mA	15 W	39 dB (A)	3.4" (86 mm)	6.9 x 6.9"	2.9 lbs. (1.3 kg)

¹ air volume increases by 15% when operating AC 230 V filter fans at 60 Hz



Installation sketch

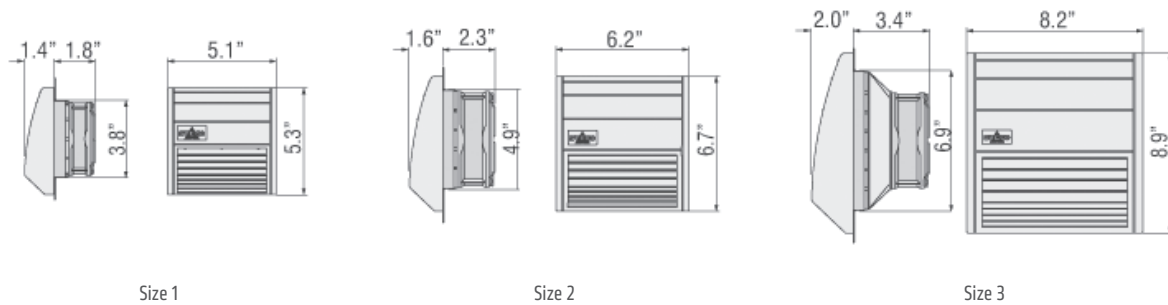
Time-saving assembly and maintenance

STEGO's filter fans are easily installed by one person **from outside** the cabinet.

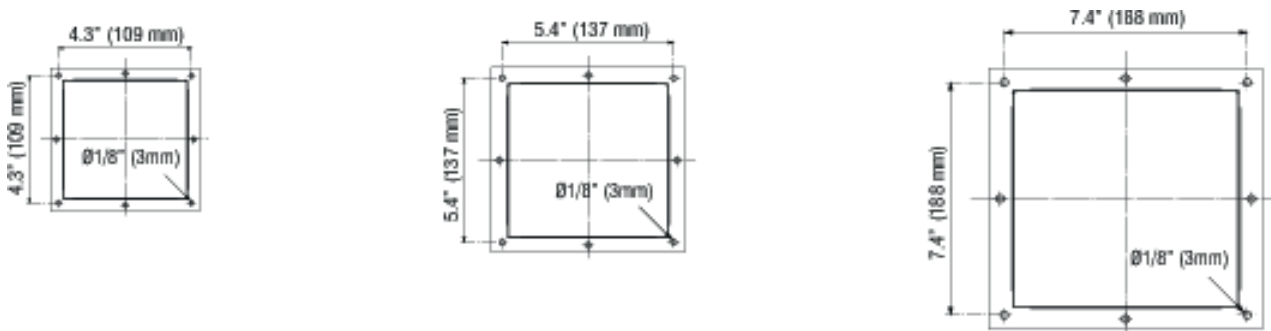
- 1.) Make cut-out in the cabinet wall. The cut edge of the cabinet opening should be free of dirt, filings and grease. A template for the enclosure cut-out is included with the filter fan.
- 2.) Remove protective film from the sealing strips on the mounting frame. Press mounting frame into the cabinet opening. The frame stays permanently in the cabinet.
- 3.) Electrically connect the axial fan using the cage clamp connectors. Push the unit into the mounting frame. Affix using screws if necessary.
- 4.) Insert the filter mat in the hood. Clip on. Finished.

To change the filter mat, simply remove the filter hood, insert the new mat and snap the hood back again. No tools are required. Maintenance of the fan can easily be performed without removing the mounting frame (2).

TECHNICAL DRAWINGS



DRILLING TEMPLATE FOR MOUNTING FRAME



EXHAUST FILTER EF 118

Part No.	Mounting depth	Enclosure cut-out	Weight (approx.)	Filter mat	Protection type
11800.0-00	0.6" (16 mm)	3.8 x 3.8"	0.6 lbs. (0.3 kg)	G4 acc. to DIN EN 779, filtering degree 94%	IP55 ²
11801.0-00	0.6" (16 mm)	4.9 x 4.9"	0.8 lbs. (0.4 kg)	G4 acc. to DIN EN 779, filtering degree 94%	IP55 ²
11802.0-00	0.6" (16 mm)	6.9 x 6.9"	1.3 lbs. (0.6 kg)	G4 acc. to DIN EN 779, filtering degree 94%	IP55 ²

² according to VDE

FILTER MATS FM 086 / FFM 086

Filter mat	3.5 x 3.5" (89 x 89 mm)	4.6 x 4.6" (118 x 118 mm)	6.6 x 6.6" (168 x 168 mm)
G4 (1 packing unit = 3 pcs.)	Part No. 08600.0-00	Part No. 08601.0-00	Part No. 08602.0-00
F5 (1 packing unit = 3 pcs.)	Part No. 08603.0-00	Part No. 08604.0-00	Part No. 08605.0-00

Switch Mode Power Supply

S8VK-G (15/30/60/120/240/480-W Models)

Reliable and Easy Operation-Worldwide Power Supply
Resistant in tough environments
Easy and fast installation
The most compact class on the market

- Universal input for worldwide applications:
100 to 240 VAC (85 to 264 VAC)
- DC input can be available: 90 to 350 VDC
- Possible for 2 phases input usage.
- Wide operation temperature range: -40 to 70 °C
- Power Boost function at 120%
- Safety standards:
UL508/60950-1, CSA C22.2 No. 107.1/60950-1
EN50178, EN60950-1.
Lloyd's standards, EN60204-1 PELV
Safety of Power Transformers: EN61558-2-16
- ANSI/ISA 12.12.01 (excluding 480-W models)
- CSA C22.2 No.213 (excluding 480-W models)
- 15-W,30-W, and 60-W models conform to
UL Class 2 output Standards
- EMS: EN 61204-3
EMI: EN61204-3 Class B
- Three years Warranty *1



Refer to *Safety Precautions for All Power Supplies and Safety Precautions* on page 17.

*1.Three years warranty conditions: Rated input voltage, 80% load, Ambient operating temperature: 40°C, Standard mounting

S8VK-G

Model Number Structure

Model Number Legend

Note: Not all combinations are possible. Refer to *List of Models in Ordering Information*, below.

S8VK-
 1 2 3

1. Input voltage types

G: Single phase

2. Power Ratings

015: 15 W
 030: 30 W
 060: 60 W
 120: 120 W
 240: 240 W
 480: 480 W

3. Output voltage

05: 5 V
 12: 12 V
 24: 24 V
 48: 48 V

Ordering Information

Note: For details on normal stock models, contact your nearest OMRON representative.

Power ratings	Input voltage	Output Voltage	Output current	Boost Current	Model number
15 W	Single phase 100 to 240 VAC 90 to 350 VDC	5 V	3 A	3.6 A	S8VK-G01505
		12 V	1.2 A	1.44 A	S8VK-G01512
		24 V	0.65 A	0.78 A	S8VK-G01524
30 W		5 V	5 A	6 A	S8VK-G03005
		12 V	2.5 A	3 A	S8VK-G03012
		24 V	1.3 A	1.56 A	S8VK-G03024
60 W		12 V	4.5 A	5.4 A	S8VK-G06012
		24 V	2.5 A	3 A	S8VK-G06024
120 W		24 V	5 A	6 A	S8VK-G12024
240 W		24 V	10 A	12 A	S8VK-G24024
		48 V	5 A	6 A	S8VK-G24048
480 W		24 V	20 A	24 A	S8VK-G48024
	48 V	10 A	12 A	S8VK-G48048	

Specifications

Ratings, Characteristics, and Functions

Item	Power ratings		15 W			30 W		
	Output voltage		5 V	12 V	24 V	5 V	12 V	24 V
Efficiency (Typical)	230 VAC input		77%		80%	79%	82%	86%
Input	Voltage *1		100 to 240 VAC, 90 to 350 VDC (allowable range: 85 to 264 VAC) *6					
	Frequency *1		50/60 Hz (47 to 450 Hz)					
	Current (Typical)	115 VAC input	0.32 A	0.3 A	0.31 A	0.5 A	0.57 A	0.58 A
		230 VAC input	0.2 A	0.21 A	0.2 A	0.32 A	0.37 A	0.36 A
	Power factor (Typical)	230 VAC input	0.42			0.43	0.42	0.43
	Harmonic current emissions		Conforms to EN61000-3-2					
	Leakage current (Typical)	115 VAC input	0.14 mA			0.13 mA		
		230 VAC input	0.25 mA			0.24 mA		
Inrush current (Typical) *2	115 VAC input	16 A						
	230 VAC input	32 A						
Output	Voltage adjustment range *3		-10% to 15% (with V.ADJ) (guaranteed)					
	Ripple *4	at 20 MHz (Typical)	60 mV	50 mV	30 mV	30 mV	30 mV	30 mV
	Input variation influence		0.5% max. (at 85 to 264 VAC input, 100% load)					
	Load variation Influence (Rated Input voltage)		3.0% max. (5 V), 2.0% max. (12 V), 1.5% max. (24 V), at 0% to 100% load					
	Temperature variation influence		0.05%/°C max.					
	Start up time (Typical) *2	115 VAC input	530 ms	520 ms	580 ms	550 ms	550 ms	600 ms
		230 VAC input	330 ms	400 ms	400 ms	430 ms	490 ms	480 ms
	Hold time (Typical) *2	115 VAC input	28 ms	29 ms	32 ms	33 ms	36 ms	23 ms
230 VAC input		134 ms	138 ms	134 ms	177 ms	170 ms	154 ms	
Additional functions	Overload protection *2		121% to 160% of rated load current (130% typ value)					
	Overvoltage protection *2		Yes *5					
	Power Boost		120% of rated current (Refer to Engineering Data)					
	Parallel operation		Yes (Refer to Engineering Data)					
	Series operation		Possible for up to two Power Supplies (with external diode)					
Others	Ambient operating temperature		-40 to 70°C (Refer to Engineering Data)					
	Storage temperature		-40 to 85°C					
	Ambient operating humidity		0% to 95% (Storage humidity: 0% to 95%)					
	Dielectric strength (detection current: 20 mA)		3.0 kVAC for 1 min. (between all inputs and outputs) 2.0 kVAC for 1 min. (between all inputs and PE terminal) 1.0 kVAC for 1 min. (between all outputs and PE terminal)					
	Insulation resistance		100 MΩ min. (between all outputs and all inputs/ PE terminals) at 500 VDC					
	Vibration resistance		10 to 55 Hz, 0.375-mm single amplitude for 2 h each in X, Y, and Z directions 10 to 150 Hz, 0.35-mm single amplitude (5 G max.) for 80 min. each in X, Y, and Z directions					
	Shock resistance		150 m/s ² , 3 times each in ±X, ±Y, and ±Z directions					
	Output indicator		Yes (color: green), lighting from 80% to 90% or more of rated voltage					
	EMI	Conducted Emission	Conforms to EN61204-3 EN55011 Class B and based on FCC Class A					
		Radiated Emission	Conforms to EN61204-3 EN55011 Class B					
	EMS		Conforms to EN61204-3 high severity levels					
	Approved Standards		UL Listed: UL508 (Listing, Class2 Output: Per UL1310) UL UR: UL60950-1 (Recognition) cUL: CSA C22.2 No.107.1 (Class2 Output: Per CSA C22.2 No.223) cUR: CSA C22.2 No.60950-1 EN/VDE: EN50178, EN60950-1 Lloyd's standards *7 ANSI/ISA 12.12.01 CSA C22.2 No.213					
	Fulfilled Standards		SELV (EN60950-1/EN50178/UL60950-1), PELV (EN60204-1, EN50178), Safety of Power Transformers (EN61558-2-16) EN50274 for Terminal parts					
	Degree of protection		IP20 by EN / IEC60529					
	SEMI		Conforms to F47-0706 (200 to 240 VAC)					
Weight		150 g			195 g			

*1. Do not use an inverter output for the Power Supply. Inverters with an output frequency of 50/60 Hz are available, but the rise in the internal temperature of the Power Supply may result in ignition or burning.

*2. For a cold start at 25°C. Refer to *Engineering Data* on page 11 for details.

*3. If the output voltage adjuster (V. ADJ) is turned, the voltage will increase by more than +15% of the voltage adjustment range. When adjusting the output voltage, confirm the actual output voltage from the Power Supply and be sure that the load is not damaged.

*4. A characteristic when the ambient operating temperature is between -25 to 70°C.

*5. To reset the protection, turn OFF the input power for three minutes or longer and then turn it back ON.

*6. Safety Standards for a DC Input

The following safety standards apply to a DC input: UL 60950-1, cUR (CSA C22.2 No. 60950-1), EN 50178, EN 60950-1, and Lloyd's.

For a DC input, safety is ensured by an external fuse. Select an external fuse that meets the following conditions.

S8VK-G015□□: 350 VDC min, 3 A
S8VK-G030□□: 350 VDC min, 4 A

*7. Clamp filter "ZCAT2035-0930" manufactured by TDK Corporation. or equivalent should be installed in the cable connected to the input - output terminals of S8VK-G series. Noise filter "FN2080-10-06" manufactured by SCHAFFNER Corporation. or equivalent should be connected to the Input terminals of S8VK-G series.

S8VK-G

Item	Power ratings		60 W		120 W
	Output voltage		12 V	24 V	24 V
Efficiency (Typical)	230 VAC input		85%	88%	89%
Input	Voltage *1		100 to 240 VAC, 90 to 350 VDC (allowable range: 85 to 264 VAC) *6		
	Frequency *1		50/60 Hz (47 to 450 Hz)		50/60 Hz (47 to 63 Hz)
	Current (Typical)	115 VAC input	1.0 A	1.1 A	1.3 A
		230 VAC input	0.6 A	0.7 A	
	Power factor (Typical)	230 VAC input	0.46	0.45	0.94
	Harmonic current emissions		Conforms to EN61000-3-2		
	Leakage current (Typical)	115 VAC input	0.16 mA		0.24 mA
		230 VAC input	0.30 mA		0.38 mA
Inrush current (Typical) *2	115 VAC input	16 A			
	230 VAC input	32 A			
Output	Voltage adjustment range *3		-10% to 15% (with V.ADJ) (guaranteed)		
	Ripple *4	at 20 MHz (Typical)	150 mV	50 mV	150 mV
	Input variation influence		0.5% max. (at 85 to 264 VAC input, 100% load)		
	Load variation Influence (Rated Input voltage)		2.0% max. (12 V), 1.5% max. (24 V), at 0% to 100% load		
	Temperature variation influence		0.05%/°C max.		
	Start up time (Typical) *2	115 VAC input	570 ms	650 ms	790 ms
		230 VAC input	430 ms	500 ms	750 ms
	Hold time (Typical) *2	115 VAC input	26 ms	25 ms	42 ms
230 VAC input		139 ms	129 ms	42 ms	
Additional functions	Overload protection *2		121% to 160% of rated load current, (130% typ value)		121% to 160% of rated load current, (125% typ value)
	Overvoltage protection *2		Yes *5		
	Power Boost		120% of rated current (Refer to Engineering Data)		
	Parallel operation		Yes (Refer to Engineering Data)		
	Series operation		Possible for up to two Power Supplies (with external diode)		
Others	Ambient operating temperature		-40 to 70°C (Refer to Engineering Data)		
	Storage temperature		-40 to 85°C		
	Ambient operating humidity		0% to 95% (Storage humidity: 0% to 95%)		
	Dielectric strength (detection current: 20 mA)		3.0 kVAC for 1 min. (between all inputs and outputs) 2.0 kVAC for 1 min. (between all inputs and PE terminal) 1.0 kVAC for 1 min. (between all outputs and PE terminal)		
	Insulation resistance		100 MΩ min. (between all outputs and all inputs/ PE terminals) at 500 VDC		
	Vibration resistance		10 to 55 Hz, 0.375-mm single amplitude for 2 h each in X, Y, and Z directions 10 to 150 Hz, 0.35-mm single amplitude (5 G max.) for 80 min. each in X, Y, and Z directions		
	Shock resistance		150 m/s ² , 3 times each in ±X, ±Y, and ±Z directions		
	Output indicator		Yes (color: green), lighting from 80% to 90% or more of rated voltage		
	EMI	Conducted Emission	Conforms to EN61204-3 EN55011 Class B and based on FCC Class A		
		Radiated Emission	Conforms to EN61204-3 EN55011 Class B		
	EMS		Conforms to EN61204-3 high severity levels		
	Approved Standards		UL Listed: UL508 (Listing, For 60 W only Class2 Output: Per UL1310) UL UR: UL60950-1 (Recognition) cUL: CSA C22.2 No.107.1 (For 60 W only Class2 Output: Per CSA C22.2 No.223) cUR: CSA C22.2 No.60950-1 EN/VDE: EN50178, EN60950-1 Lloyd's standards *7 ANSI/ISA 12.12.01 CSA C22.2 No.213		
	Fulfilled Standards		SELV (EN60950-1/EN50178/UL60950-1), PELV(EN60204-1, EN50178), Safety of Power Transformers (EN61558-2-16) EN50274 for Terminal parts		
	Degree of protection		IP20 by EN / IEC60529		
	SEMI		Conforms to F47-0706 (200 to 240 VAC)		
	Weight		260 g		620 g

- *1. Do not use an inverter output for the Power Supply. Inverters with an output frequency of 50/60 Hz are available, but the rise in the internal temperature of the Power Supply may result in ignition or burning.
- *2. For a cold start at 25°C. Refer to *Engineering Data* on page 11 for details.
- *3. If the output voltage adjuster (V. ADJ) is turned, the voltage will increase by more than +15% of the voltage adjustment range. When adjusting the output voltage, confirm the actual output voltage from the Power Supply and be sure that the load is not damaged.
- *4. A characteristic when the ambient operating temperature is between -25 to 70°C.
- *5. To reset the protection, turn OFF the input power for three minutes or longer and then turn it back ON.

- *6. Safety Standards for a DC Input
The following safety standards apply to a DC input: UL 60950-1, cUR (CSA C22.2 No. 60950-1), EN 50178, EN 60950-1, and Lloyd's.
For a DC input, safety is ensured by an external fuse. Select an external fuse that meets the following conditions.
S8VK-G060□□: 350 VDC min, 6 A
S8VK-G12024: 350 VDC min, 5 A
- *7. Clamp filter "ZCAT2035-0930" manufactured by TDK Corporation. or equivalent should be installed in the cable connected to the input - output terminals of S8VK-G series. Noise filter "FN2080-10-06" manufactured by SCHAFFNER Corporation. or equivalent should be connected to the Input terminals of S8VK-G series.

Item	Power ratings		240 W		480 W	
	Output voltage		24 V	48 V	24 V	48 V
Efficiency (Typical)	230 VAC input		92%		93%	
Input	Voltage *1		100 to 240 VAC, 90 to 350 VDC (allowable range: 85 to 264 VAC) *6			
	Frequency *1		50/60 Hz (47 to 63 Hz)			
	Current (Typical)	115 VAC input	2.4 A		4.7 A	
		230 VAC input	1.3 A		2.3 A	
	Power factor (Typical)	230 VAC input	0.9		0.97	
	Harmonic current emissions		Conforms to EN61000-3-2			
	Leakage current (Typical)	115 VAC input	0.23 mA		0.3 mA	
230 VAC input		0.33 mA		0.49 mA		
Inrush current (Typical) *2	115 VAC input	16 A				
	230 VAC input	32 A				
Output	Voltage adjustment range *3		-10% to 15% (with V.ADJ) (guaranteed)			
	Ripple *4	at 20 MHz (Typical)	180 mV	350 mV	230 mV	470 mV
	Input variation influence		0.5% max. (at 85 to 264 VAC input, 100% load)			
	Load variation Influence (Rated Input voltage)		1.5% max. (24 V, 48 V), at 0% to 100% load			
	Temperature variation influence		0.05%/°C max.			
	Start up time (Typical) *2	115 VAC input	250 ms	290 ms	380 ms	
		230 VAC input	250 ms	290 ms	260 ms	
Hold time (Typical) *2	115 VAC input	44 ms	43 ms	40 ms		
	230 VAC input	44 ms		50 ms		
Additional functions	Overload protection *2		121% to 160% of rated load current (130% typ value)			
	Overvoltage protection *2		Yes *5			
	Power Boost		120% of rated current (Refer to Engineering Data)			
	Parallel operation		Yes (Refer to Engineering Data)			
	Series operation		Possible for up to two Power Supplies (with external diode)			
Others	Ambient operating temperature		-40 to 70°C (Refer to Engineering Data)			
	Storage temperature		-40 to 85°C			
	Ambient operating humidity		0% to 95% (Storage humidity: 0% to 95%)			
	Dielectric strength (detection current: 20 mA)		3.0 kVAC for 1 min. (between all inputs and outputs) 2.0 kVAC for 1 min. (between all inputs and PE terminal) 1.0 kVAC for 1 min. (between all outputs and PE terminal)			
	Insulation resistance		100 MΩ min. (between all outputs and all inputs/ PE terminals) at 500 VDC			
	Vibration resistance		10 to 55 Hz, 0.375-mm single amplitude for 2 h each in X, Y, and Z directions			
	Shock resistance		150 m/s ² , 3 times each in ±X, ±Y, and ±Z directions			
	Output indicator		Yes (color: green), lighting from 80% to 90% or more of rated voltage			
	EMI	Conducted Emission	Conforms to EN61204-3 EN55011 Class B and based on FCC Class A			
		Radiated Emission	Conforms to EN61204-3 EN55011 Class B			
	EMS		Conforms to EN61204-3 high severity levels			
	Approved Standards		UL Listed: UL508 (Listing) UL UR: UL60950-1 (Recognition) cUL: CSA C22.2 No.107.1 cUR: CSA C22.2 No.60950-1 EN/VDE: EN50178, EN60950-1 Lloyd's standards *7 ANSI/ISA 12.12.01 (excluding 480-W models) CSA C22.2 No.213 (excluding 480-W models)			
	Fulfilled Standards		SELV (EN60950-1/EN50178/UL60950-1), PELV(EN60204-1, EN50178), Safety of Power Transformers (EN61558-2-16) EN50274 for Terminal parts			
	Degree of protection		IP20 by EN / IEC60529			
	SEMI		Conforms to F47-0706 (200 to 240 VAC)			
Weight		900 g		1,500 g		

*1. Do not use an inverter output for the Power Supply. Inverters with an output frequency of 50/60 Hz are available, but the rise in the internal temperature of the Power Supply may result in ignition or burning.

*2. For a cold start at 25°C. Refer to *Engineering Data* on page 11 for details.

*3. If the output voltage adjuster (V. ADJ) is turned, the voltage will increase by more than +15% of the voltage adjustment range. When adjusting the output voltage, confirm the actual output voltage from the Power Supply and be sure that the load is not damaged.

*4. A characteristic when the ambient operating temperature is between -25 to 70°C.

*5. To reset the protection, turn OFF the input power for three minutes or longer and then turn it back ON.

*6. Safety Standards for a DC Input

The following safety standards apply to a DC input: UL 60950-1, cUR (CSA C22.2 No. 60950-1), EN 50178, EN 60950-1, and Lloyd's.

For a DC input, safety is ensured by an external fuse.

Select an external fuse that meets the following conditions.

S8VK-G240□□: 350 VDC min, 8 A

S8VK-G480□□: 350 VDC min, 12 A

*7. Shipping Standards

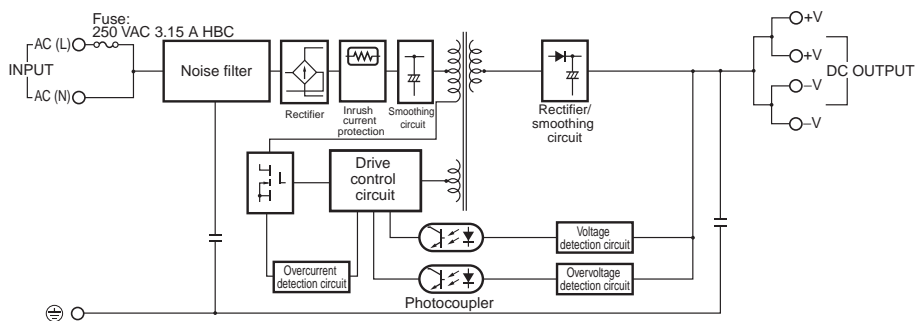
Clamp filter "ZCAT2035-0930" manufactured by TDK Corporation. or equivalent should be installed in the cable connected to the input - output terminals of S8VK-G series. Noise filter "FN2080-10-06" manufactured by SCHAFFNER Corporation. or equivalent should be connected to the Input terminals of S8VK-G series.

S8VK-G

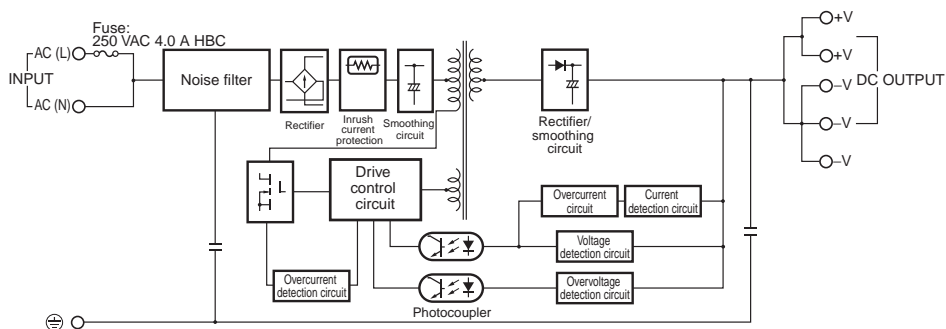
Connections

Block Diagrams

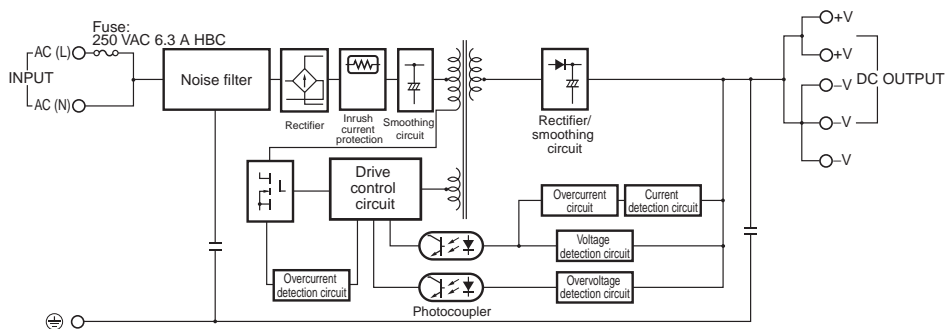
S8VK-G015□□ (15 W)



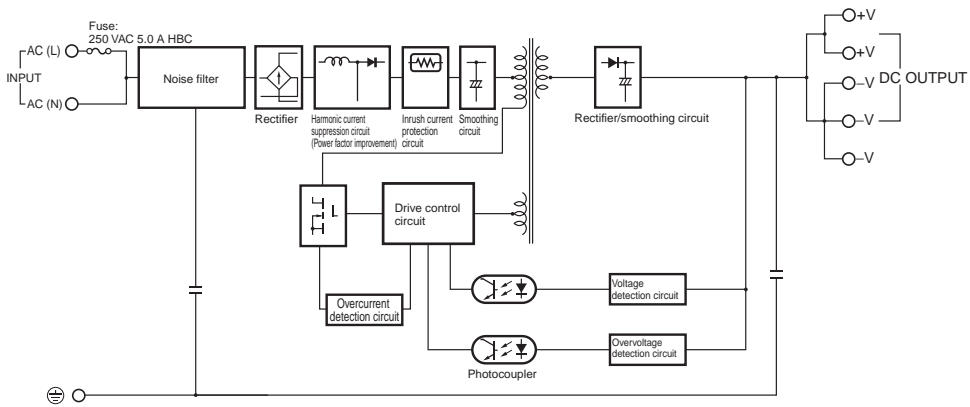
S8VK-G030□□ (30 W)



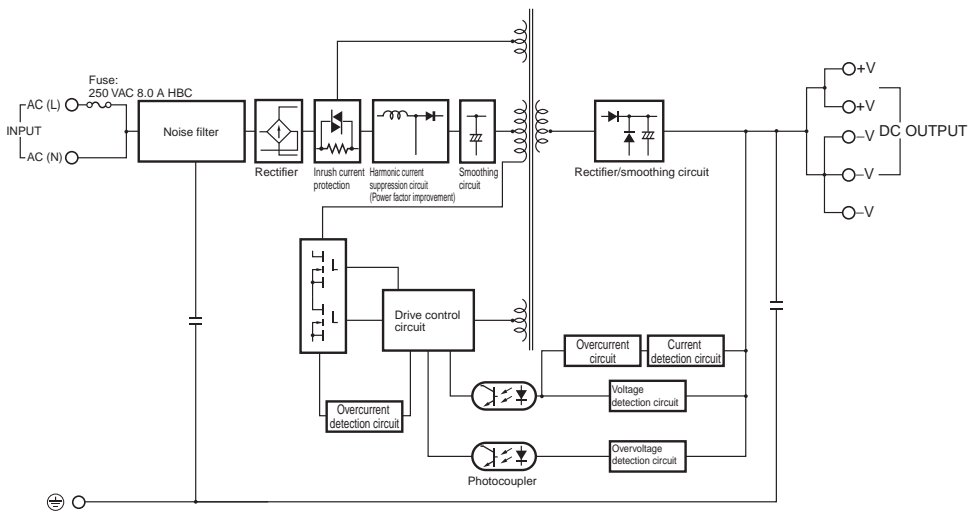
S8VK-G060□□ (60 W)



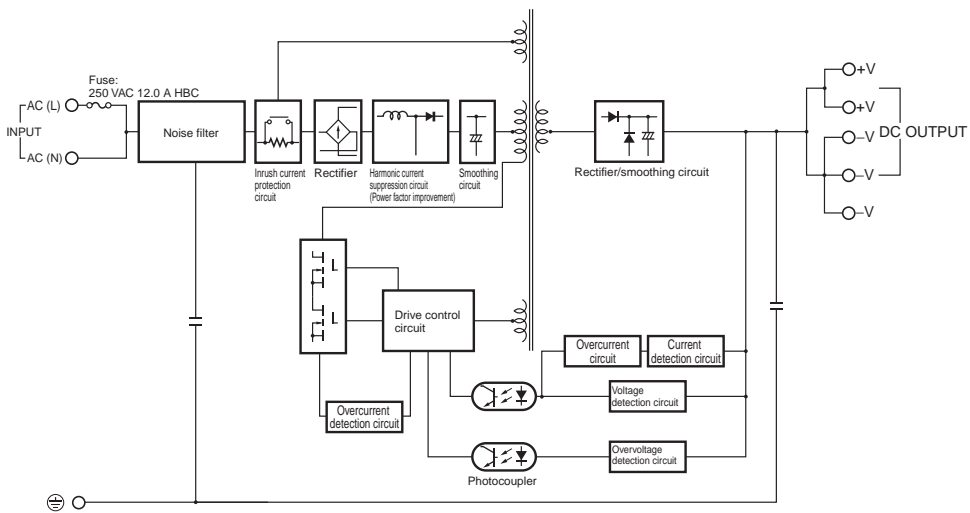
S8VK-G12024 (120 W)



S8VK-G240 (240 W)



S8VK-G480 (480 W)



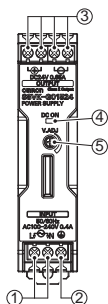
S8VK-G

Construction and Nomenclature

Nomenclature

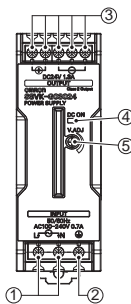
15-W Models

S8VK-G015□□



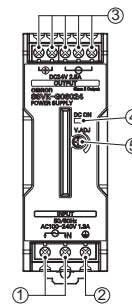
30-W Models

S8VK-G030□□



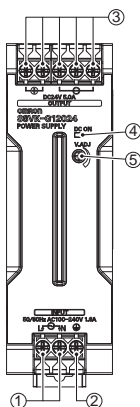
60-W Models

S8VK-G060□□



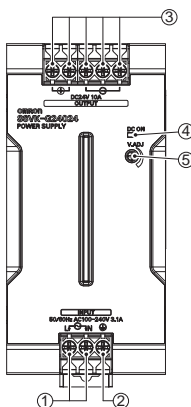
120-W Models

S8VK-G12024



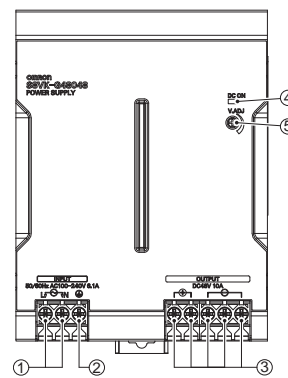
240-W Models

S8VK-G240□□



480-W Models

S8VK-G480□□



No.	Name	Function
1	Input terminals (L), (N)	Connect the input lines to these terminals. *1
2	Protective Earth terminal (PE)	Connect the ground line to this terminal. *2
3	DC Output terminals (-V), (+V)	Connect the load lines to these terminals.
4	Output indicator (DC ON: Green)	Lights while a direct current (DC) output is ON.
5	Output voltage adjuster (V.ADJ)	Use to adjust the voltage.

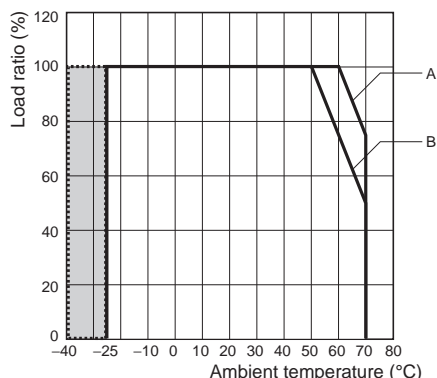
*1. The fuse is located on the (L) side. It is not user-replaceable. For a DC input, connect the positive voltage to the L terminal.

*2. This is the protective earth terminal specified in the safety standards. Always ground this terminal.

Engineering Data

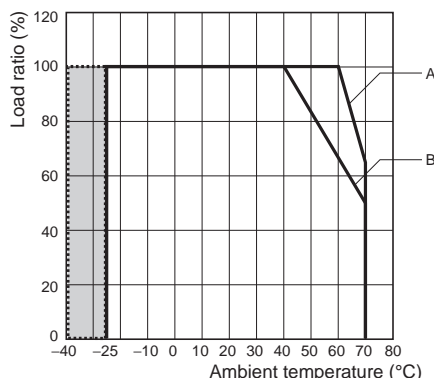
Derating Curve

15, 30, 240 W (S8VK-G015□□, S8VK-G030□□, S8VK-G240□□)



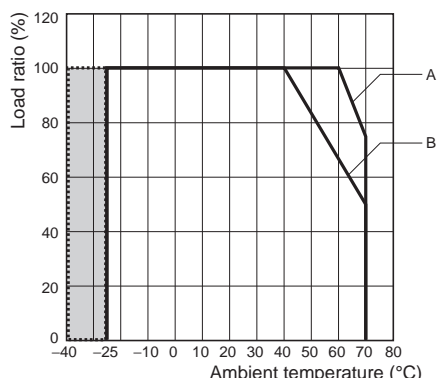
- Note:**
- At less than 90 VAC, the derating is 2.5%/V
 - For a DC power input, reduce the load given in the above derating curve by multiplying the following coefficients.
 S8VK-G015□□: 1.0
 S8VK-G030□□: 0.9
 S8VK-G240□□: 0.8
 - See “-40°C Operation Guarantee Condition”
- A.** Standard mounting
 60°C and over: the derating is 2.5%/°C
- B.** Face-up mounting / Side mounting (15W only)
 50°C and over: the derating is 2.5%/°C

120 W (S8VK-G12024)



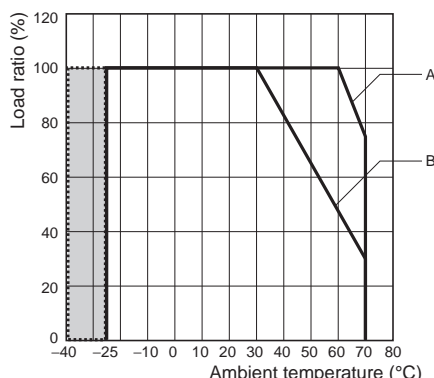
- Note:**
- At less than 90 VAC, the derating is 2.5%/V
 - For a DC power input, reduce the load given in the above derating curve by multiplying the following coefficients.
 S8VK-G12024: 0.9
 - See “-40°C Operation Guarantee Condition”
- A.** Standard mounting
 60°C and over: the derating is 3.5%/°C
- B.** Face-up mounting
 40°C and over: the derating is 1.67%/°C

60 W (S8VK-G060□□)



- Note:**
- At less than 90 VAC, the derating is 2.5%/V
 - For a DC power input, reduce the load given in the above derating curve by multiplying the following coefficients.
 S8VK-G060□□: 0.9
 - See “-40°C Operation Guarantee Condition”
- A.** Standard mounting
 60°C and over: the derating is 2.5%/°C
- B.** Face-up mounting
 40°C and over: the derating is 1.67%/°C

480 W (S8VK-G480□□)



- Note:**
- At less than 90 VAC, the derating is 2.5%/V
 - For a DC power input, reduce the load given in the above derating curve by multiplying the following coefficients.
 S8VK-G480□□: 0.8
 - See “-40°C Operation Guarantee Condition”
- A.** Standard mounting
 60°C and over: the derating is 2.5%/°C
- B.** Face-up mounting
 30°C and over: the derating is 1.75%/°C

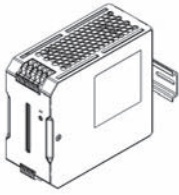
-40°C Operation Guarantee Condition

The unit can start up and operate normally at -40°C, but the following criteria will be inferior to the values of datasheet. Please consider these influences.

		15 W 5 V	15 W 12 V	15 W 24 V	30 W 5 V	30 W 12 V	30 W 24 V	60 W 12 V	60 W 24 V	120 W 24 V	240 W 24 V	240 W 48 V	480 W 24 V	480 W 48 V
Ripple (Typ.)	230 VAC input	280 mV	170 mV	100 mV	110 mV	330 mV	180 mV	200 mV	420 mV	440 mV	840 mV	1220 mV	460 mV	580 mV
Ripple (Max.)	230 VAC input	830 mV	450 mV	220 mV	240 mV	630 mV	290 mV	480 mV	430 mV	450 mV	1030 mV	1320 mV	670 mV	870 mV
Start up time (Typ.)	230 VAC input	420 ms	440 ms	490 ms	410 ms	440 ms	480 ms	420 ms	490 ms	760 ms	230 ms	280 ms	260 ms	260 ms
Hold time (Typ.)	230 VAC input	88 ms	110 ms	109 ms	137 ms	112 ms	114 ms	124 ms	118 ms	20 ms	35 ms	37 ms	39 ms	41 ms

Mounting

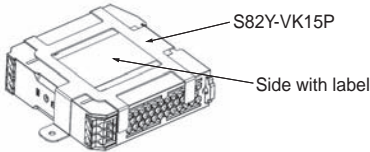
(A) Standard (Vertical) mounting



(B) Face-up mounting



(C) Side mounting only for 15 W

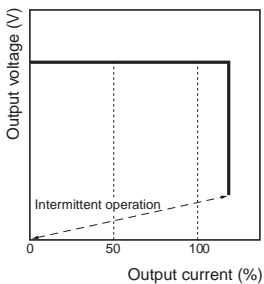


Side mounting only for S8VK-G015□□.

Use a mounting bracket (S82Y-VK15P, sold separately) when the product is mounted horizontally. Heat dissipation will be adversely affected. When the product is mounted facing horizontally, always place the side with label facing horizontally.

Overload Protection

The load and the power supply are automatically protected from overcurrent damage by this function. Overload protection is activated if the output current rises above 121% of the rated current. When the output current returns within the rated range overload protection is automatically cleared.



The values shown in the above diagrams are for reference only.

- Note: 1.** Internal parts may occasionally deteriorate or be damaged if a short-circuited or overcurrent state continues during operation.
- 2.** Internal parts may possibly deteriorate or be damaged if the Power Supply is used for applications with frequent inrush current or overloading at the load end. Do not use the Power Supply for such applications.

Power Boost Function

For All Models

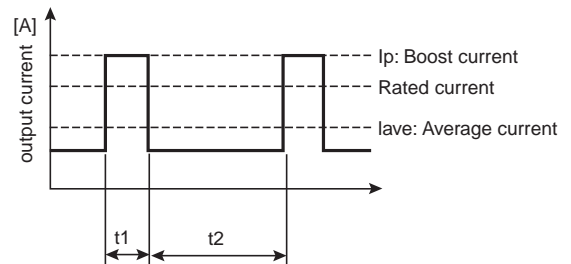
Power Boost is a function that can output the temporary repeated boost current larger than the rated current. However, it should meet the following four Boost current conditions.

1. Time that the boost current flows: t_1
2. The maximum value of the boost current: I_p
3. The average output current: I_{ave}
4. The time ratio of the boost current flow: Duty

Note: Boost current conditions

- $t_1 \leq 10$ s
- $I_p \leq$ Rated boost current
- $I_{ave} \leq$ Rated current

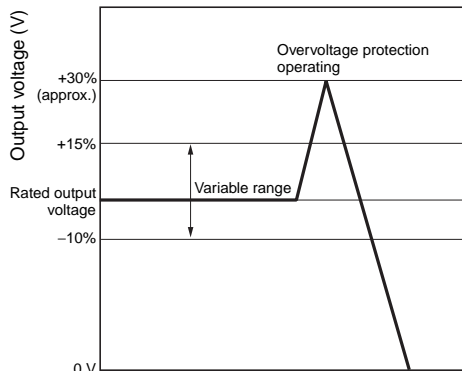
$$\text{Duty} = \frac{t_1}{t_1 + t_2} \times 100 [\%] \leq 30\%$$



- Do not allow the boost current to continue for more than 10 seconds. Also, do not let the duty cycle exceed the boost current conditions. These conditions may damage the Power supply.
- Ensure that the average current of one cycle of the boost current does not exceed the rated output current. This may damage the Power Supply.
- Lessen the load of the boost load current by adjusting the ambient temperature and the mounting direction.

Overvoltage Protection

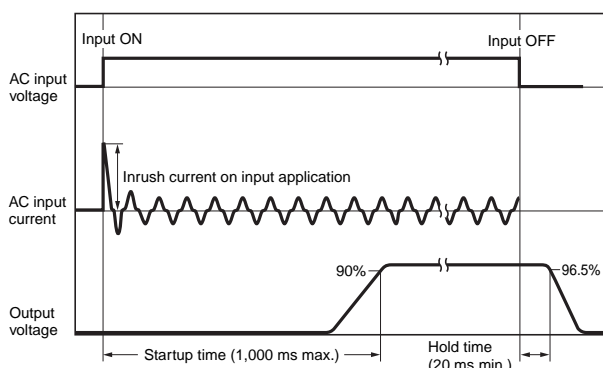
Consider the possibility of an overvoltage and design the system so that the load will not be subjected to an excessive voltage even if the feedback circuit in the Power Supply fails. If an excessive voltage that is approximately 130% of the rated voltage or more is output, the output voltage is shut OFF. Reset the input power by turning it OFF for at least three minutes and then turning it back ON again.



The values shown in the above diagram is for reference only.

Note: Do not turn ON the power again until the cause of the overvoltage has been removed.

Inrush Current, Startup Time, Output Hold Time

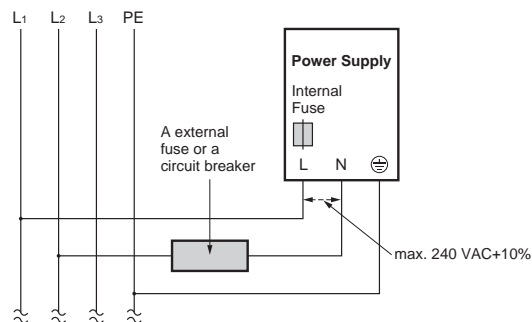


Note: Twice the input current or above will flow during the parallel operation or redundant system. Therefore, check the fusing characteristics of fuses and operating characteristics of breakers making sure that the external fuses will not burn out and the circuit breakers will not be activated by the inrush current.

Two phases application for Single phase models For All Single phase Models, S8VK-G

Basically OMRON single phase power supply can be used on two-phases of a 3-phase-system when some of conditions satisfy like below.

1. The supplying voltage is below the maximum rated input. OMRON Power supply allows the input voltage equivalent or less than 240 VAC+10%. Please confirm the input voltage between two lines if the input voltage satisfies this condition before connecting.
2. The external protector is needed on N input line to secure a safety. N line has no protection of a fuse internally. An appropriate fuse or circuit breaker should be connected on N input line like the following.

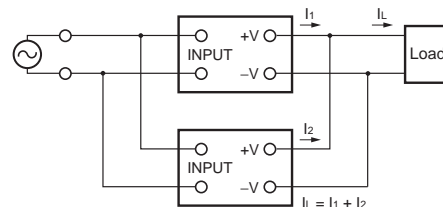


Parallel Operation

The parallel operation of S8VK-G is possible to increase the output power.

However please consider the following notes when the parallel operation must be done.

1. The range of ambient temperature for Parallel operation is -25 to 40°C
2. Up to two of the same model can be connected in parallel.
3. Adjust the output voltage difference of each Power Supply to 50 mV or less, using the output voltage adjuster (V. ADJ).
4. There is no current balancing function for S8VK-G. A high output voltage unit may work at overcurrent state and in this situation, a life of a Power Supply will be extremely short. After adjusting the output voltage, confirm the output current of the two Power Supplies balances.
5. Using the parallel operation will not satisfy UL1310 Class2 output.
6. For Parallel Operation, to balance the current of the each unit, the length and thickness of each wire connected to the load and each unit must be same as much as possible.
7. For Parallel Operation with units 120 W or less, connect diodes or S8VK-R to the outputs of each unit if sudden load variation influence occurs in the ambient operation environment.



Reference Value

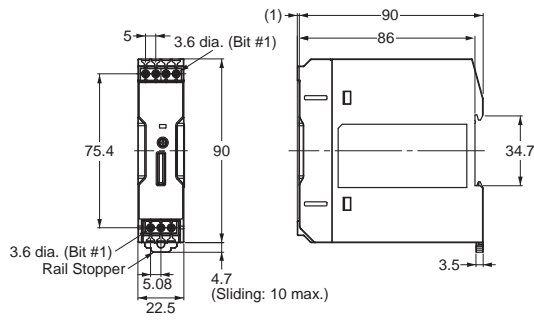
	Value
Reliability (MTBF)	Single phase model
	15 W: 600,000 hrs
	30 W: 580,000 hrs
	60 W: 590,000 hrs
	120 W: 450,000 hrs
	240 W: 360,000 hrs
	480 W: 230,000 hrs
Definition	MTBF stands for Mean Time Between Failures, which is calculated according to the probability of accidental device failures, and indicates reliability of devices. Therefore, it does not necessarily represent a life of the product.
Life expectancy	10 yrs. Min.
Definition	The life expectancy indicates average operating hours under the ambient temperature of 40°C and a load rate of 50%. Normally this is determined by the life expectancy of the built-in aluminum electrolytic capacitor.

S8VK-G

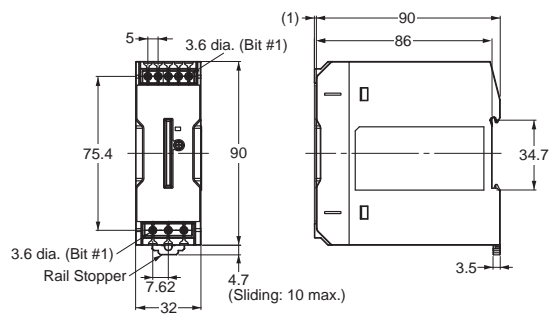
Dimensions

(Unit: mm)

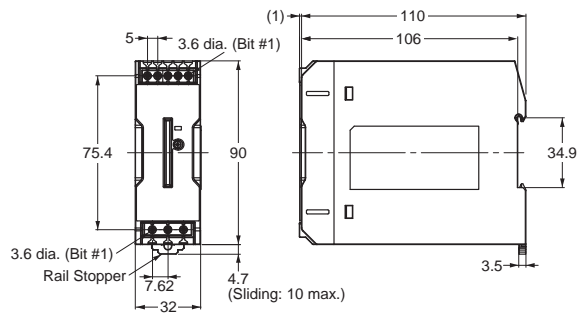
S8VK-G015□□ (15 W)



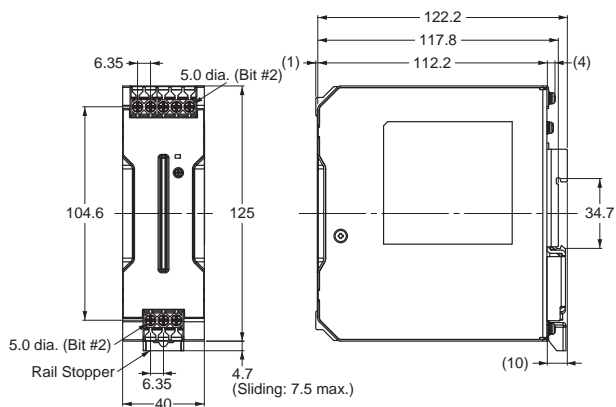
S8VK-G030□□ (30 W)



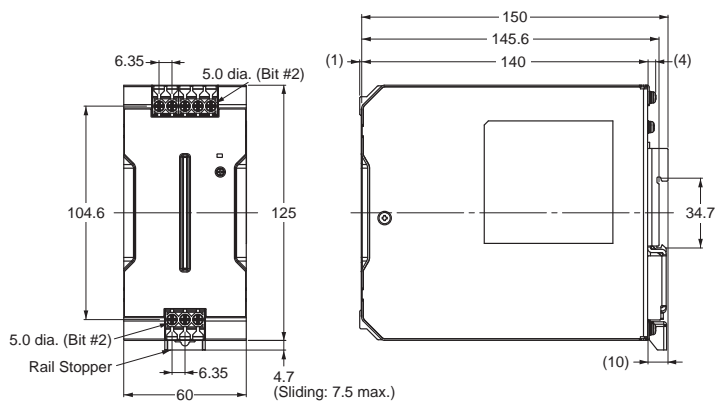
S8VK-G060□□ (60 W)



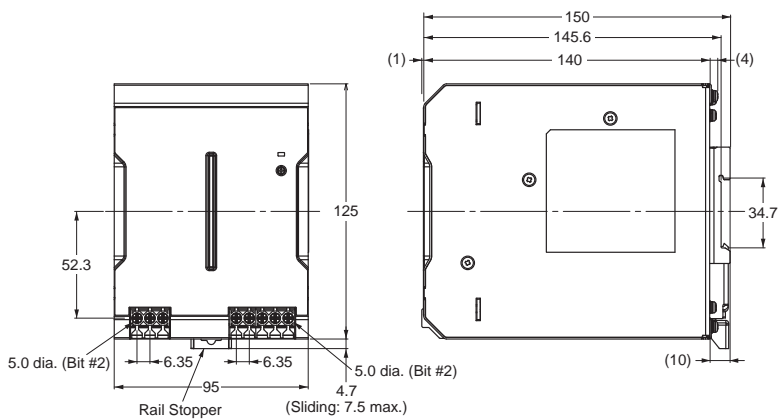
S8VK-G12024 (120 W)



S8VK-G240 (240 W)



S8VK-G480 (480 W)



S8VK-G

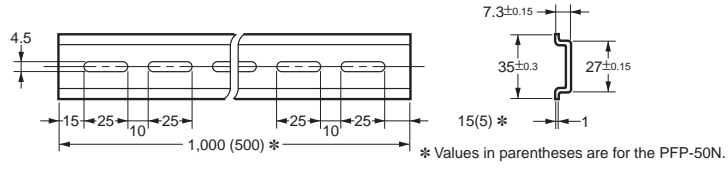
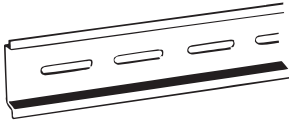
DIN Rail (Order Separately)

Note: All units are in millimeters unless otherwise indicated.

Mounting Rail (Material: Aluminum)

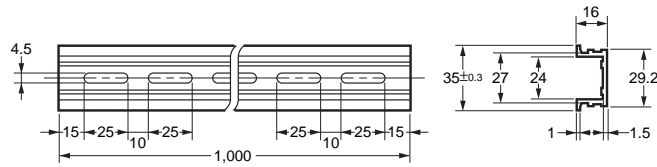
PFP-100N

PFP-50N



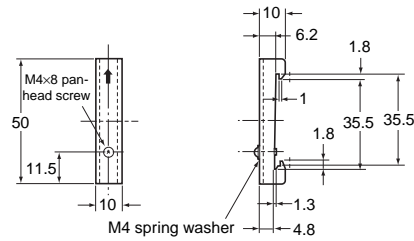
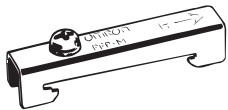
Mounting Rail (Material: Aluminum)

PFP-100N2



End Plate

PFP-M



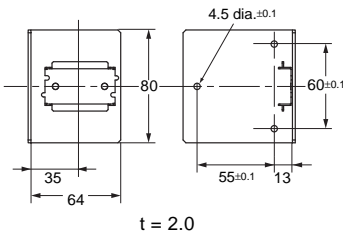
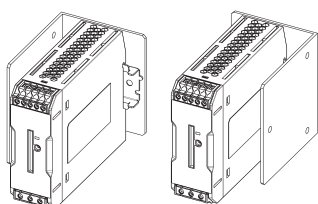
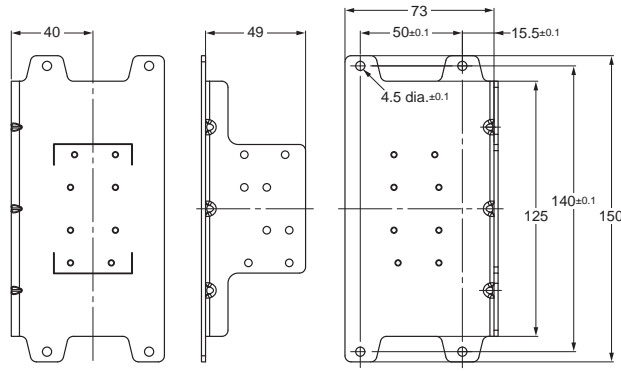
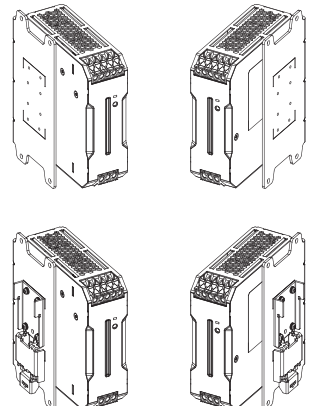
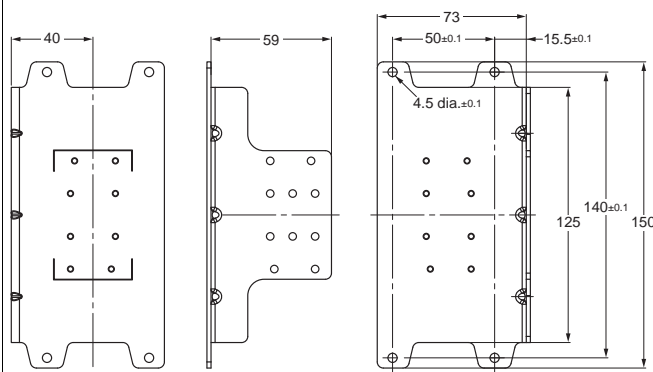
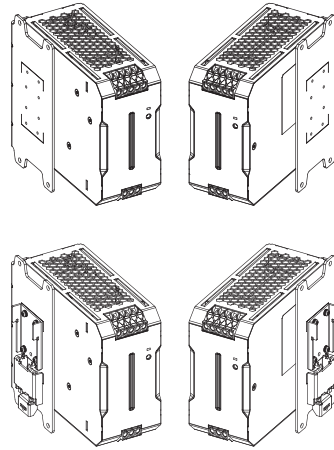
Note: If there is a possibility that the Unit will be subject to vibration or shock, use a steel DIN Rail. Otherwise, metallic filings may result from aluminum abrasion.

Mounting Brackets

Name	Model
Front-mounting bracket (for 15, 30 and 60 W models)	S82Y-VS10F
Front-mounting bracket (for 120, 240 and 480 W models)	S82Y-VK10F
Side-mounting bracket (for 15 W models)	S82Y-VK15P
Side-mounting bracket (for 30 and 60 W models)	S82Y-VS10S
Side-mounting bracket (for 120 W models)	S82Y-VK10S
Side-mounting bracket (for 240 W models)	S82Y-VK20S


Type	Model	Dimensions	Appearance
Front-mounting bracket (For 15, 30 and 60 W models)	S82Y-VS10F		
Front-mounting bracket (for 120, 240 and 480 W models)	S82Y-VK10F		<p>(For 120 W types) (For 240 W types)</p>
Side-mounting bracket (For 15 W Models)	S82Y-VK15P		<p>Right-side mounting</p>

S8VK-G





Type	Model	Dimensions	Appearance
Side-mounting bracket (For 30 and 60 W models)	S82Y-VS10S	 <p style="text-align: center;">t = 2.0</p>	Left-side mounting Right-side mounting 
Side-mounting bracket (For 120 W models)	S82Y-VK10S	 <p style="text-align: center;">t = 2.0</p>	Left-side mounting Right-side mounting 
Side-mounting bracket (For 240 W models)	S82Y-VK20S	 <p style="text-align: center;">t = 2.0</p>	Left-side mounting Right-side mounting 

Safety Precautions

Warning Indications

 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
Precautions for Safe Use	Supplementary comments on what to do or avoid doing, to use the product safely.
Precautions for Correct Use	Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.

Meaning of Product Safety Symbols

	Used to warn of the risk of electric shock under specific conditions.
	Used to warn of the risk of minor injury caused by high temperatures.
	Used for general mandatory action precautions for which there is no specified symbol.
	Use to indicate prohibition when there is a risk of minor injury from electrical shock or other source if the product is disassembled.

CAUTION

Minor electric shock, fire, or Product failure may occasionally occur. Do not disassemble, modify, or repair the Product or touch the interior of the Product.



Minor burns may occasionally occur. Do not touch the Product while power is being supplied or immediately after power is turned OFF.



Fire may occasionally occur. Tighten terminal screws to the specified torque (0.5 to 0.6 N·m).



Minor injury due to electric shock may occasionally occur. Do not touch the terminals while power is being supplied. Always close the terminal cover after wiring.



Minor electric shock, fire, or Product failure may occasionally occur. Do not allow any pieces of metal or conductors or any clippings or cuttings resulting from installation work to enter the Product.



Precautions for Safe Use

Wiring

- Connect the ground completely. A protective earthing terminal stipulated in safety standards is used. Electric shock or malfunction may occur if the ground is not connected completely.
- Minor fire may possibly occur. Ensure that input and output terminals are wired correctly.
- Do not apply more than 75-N force to the terminal block when tightening it.
- Be sure to remove the sheet covering the Product for machining before power-ON so that it does not interfere with heat dissipation.
- Use the following material for the wires to be connected to the S8VK-G to prevent smoking or ignition caused by abnormal loads.

Terminals and Wiring

Model	INPUT		OUTPUT		PE	
	American Wire Gauge	Solid Wire /Stranded Wire	American Wire Gauge	Solid Wire /Stranded Wire	American Wire Gauge	Solid Wire /Stranded Wire
S8VK-G01505	AWG24 to 12	0.25 to 4 mm ² /0.25 to 2.5 mm ²	AWG20 to 12	0.5 to 4 mm ² /0.5 to 2.5 mm ²	AWG14 or thicker	2.5 mm ² or thicker /2.5 mm ² or thicker
S8VK-G01512			AWG22 to 12	0.35 to 4 mm ² /0.35 to 2.5 mm ²		
S8VK-G01524			AWG24 to 12	0.25 to 4 mm ² /0.25 to 2.5 mm ²		
S8VK-G03005	AWG24 to 12	0.25 to 4 mm ² /0.25 to 2.5 mm ²	AWG18 to 12	0.75 to 4 mm ² /0.75 to 2.5 mm ²		
S8VK-G03012			AWG20 to 12	0.5 to 4 mm ² /0.5 to 2.5 mm ²		
S8VK-G03024			AWG22 to 12	0.35 to 4 mm ² /0.35 to 2.5 mm ²		
S8VK-G06012	AWG22 to 12	0.35 to 4 mm ² /0.35 to 2.5 mm ²	AWG18 to 12	0.75 to 4 mm ² /0.75 to 2.5 mm ²		
S8VK-G06024			AWG20 to 12	0.5 to 4 mm ² /0.5 to 2.5 mm ²		
S8VK-G12024	AWG22 to 10	0.35 to 6 mm ² /0.35 to 4 mm ²	AWG18 to 10	0.75 to 6 mm ² /0.75 to 4 mm ²		
S8VK-G24024	AWG20 to 10	0.5 to 6 mm ² /0.5 to 4 mm ²	AWG14 to 10	2.5 to 6 mm ² /2.5 to 4 mm ²		
S8VK-G24048			AWG18 to 10	0.75 to 6 mm ² /0.75 to 4 mm ²		
S8VK-G48024	AWG16 to 10	1.5 to 6 mm ² /1.5 to 4 mm ²	AWG12 to 10	4 to 6 mm ² /4 mm ²		
S8VK-G48048			AWG14 to 10	2.5 to 6 mm ² /2.5 to 4 mm ²		

- Strip I/O wires for 8 mm when using a screwless terminal block.

Note: The rated current for output terminals is 10 A per terminal.

Be sure to use multiple terminals simultaneously for current that exceeds the terminal rating.

When applying a current of 10 A or more, use at least two terminals each for the positive and negative wires.

Installation Environment

- Do not use the Power Supply in locations subject to shocks or vibrations. In particular, install the Power Supply as far away as possible from contactors or other devices that are a vibration source. For usage onboard a ship, always attach an End Plate (PFP-M) to both sides of the Power Supply to hold the Power Supply in place.
- Install the Power Supply well away from any sources of strong, high-frequency noise and surge.

Operating Life

- The life of a Power Supply is determined by the life of the electrolytic capacitors used inside. Here, Arrhenius Law applies, i.e., the life will be cut in half for each rise of 10°C or the life will be doubled for each drop of 10°C. The life of the Power Supply can thus be increased by reducing its internal temperature.

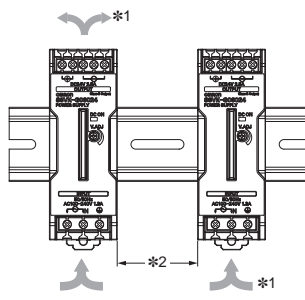
Ambient Operating and Storage Environments

- Store the Power Supply at a temperature of -40 to 85°C and a humidity of 0% to 95%.
- Do not use the Power Supply in areas outside the derating curve otherwise, internal parts may occasionally deteriorate or be damaged.
- Use the Power Supply at a humidity of 0% to 95%.
- Do not use the Power Supply in locations subject to direct sunlight.
- Do not use locations where liquids, foreign matter, or corrosive gases may enter the interior of Products.

Precautions for Correct Use

Mounting

- Take adequate measures to ensure proper heat dissipation to increase the long-term reliability of the Product. Be sure to allow convection in the atmosphere around devices when mounting. Do not use in locations where the ambient temperature exceeds the range of the derating curve.
- When cutting out holes for mounting, make sure that cuttings do not enter the interior of the Products.



*1. Convection of air
*2. 20 mm min.

- Improper mounting will interfere with heat dissipation and may occasionally result in deterioration or damage of internal parts. Use the Product within the derating curve for the mounting direction that is used.
- Use a mounting bracket when the Product is mounted facing horizontally.
- Heat dissipation will be adversely affected. When the Product is mounted facing horizontally, always place the side with the label facing upward.
- Operate the Power Supply within a range that is 5°C less than the values in the derating curve in *Engineering Data* on page 9 if the Power Supply is used with an installation spacing of 10 mm min. (20 mm max.) on the left and right.

Overcurrent Protection

- Internal parts may possibly deteriorate or be damaged if a short-circuited or overcurrent state continues during operation.
- Internal parts may possibly deteriorate or be damaged if the Power Supply is used for applications with frequent inrush current or overloading at the load end. Do not use the Power Supply for such applications.
- The DC ON indicator (green) flashes if the overload protection function operates.

Charging a Battery

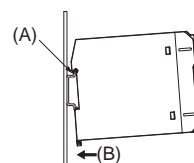
If you connect a battery as the load, install overcurrent control and overvoltage protection circuits.

Output Voltage Adjuster (V.ADJ)

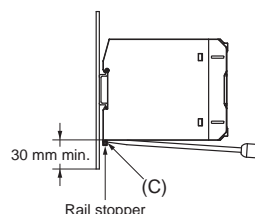
- The output voltage adjuster (V.ADJ) may possibly be damaged if it is turned with unnecessary force. Do not turn the adjuster with excessive force.
- After completing output voltage adjustment, be sure that the output capacity or output current does not exceed the rated output capacity or rated output current.

DIN Rail Mounting

To mount the Block on a DIN Rail, hook portion (A) of the Block onto the rail and press the Block in direction (B).

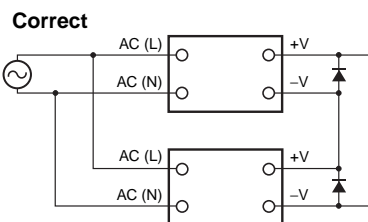


To dismount the Block, pull down portion (C) with a flat-blade screwdriver and pull out the Block.



Series Operation

Two power supplies can be connected in series.



Note: 1. The diode is connected as shown in the figure. If the load is short-circuited, a reverse voltage will be generated inside the Power Supply. If this occurs the Power Supply may possibly deteriorate or be damaged. Always connect a diode as shown in the figure. Select a diode having the following ratings.

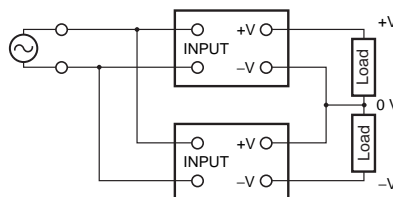
Type	Schottky Barrier diode
Dielectric strength (VRRM)	Twice the rated output voltage or above
Forward current (IF)	Twice the rated output current or above

2. Although Products having different specifications can be connected in series, the current flowing through the load must not exceed the smaller rated output current.

Making Positive/Negative Outputs

- The outputs are floating outputs (i.e., the primary circuits and secondary circuits are separated). You can therefore make positive and negative outputs by using two Power Supplies. You can make positive and negative outputs with any of the models.

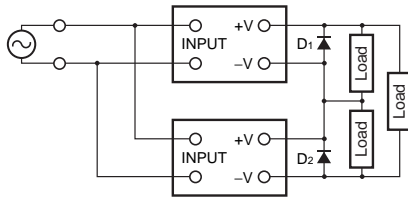
If positive and negative outputs are used, connect Power Supplies of the same model as in the following figure. (Combinations with different output capacities or output voltages can be made. However, use the lower of the two maximum rated output currents as the current to the loads.)



- Depending on the model, internal circuits may be damaged due to startup failure when the power is turned ON if loads such as a servomotor or operational amplifier may operate in series.

Therefore, connect bypass diodes (D1, D2) as shown in the following figure.

If the list of models that support series connection of outputs says that an external diode is not required, an external diode is also not required for positive/negative outputs.



- Use the following information as a guide to the diode type, dielectric strength, and current.

- Type: Schottky barrier diode
- Dielectric strength (V_{RRM}): Twice the rated Power Supply output voltage or higher
- Forward current (I_F): Twice the rated Power Supply output current or higher

Backup Operation

Backup operation can be performed with S8VK-R.
Refer to the S8VK-R Datasheet for detail.

In Case There Is No Output Voltage

The possible cause for no output voltage may be that the overcurrent or overvoltage protection has operated. The internal protection may operate if a large amount of surge voltage such as a lightning surge occurs while turning ON the power supply.

In case there is no output voltage, please check the following points before contacting us:

- Checking overload protected status:
 - Check whether the load is in overload status or is short-circuited.
 - Remove wires to load when checking.
- Checking overvoltage or internal protection:
 - Turn the power supply OFF once, and leave it OFF for at least 3 minutes. Then turn it ON again to see if this clears the condition.

Audible Noise at Power ON (120-W, 240-W, and 480-W Models)

A harmonic current suppression circuit is built into the Power Supply. This circuit can create noise when the input is turned ON, but it will last only until the internal circuits stabilize and does not indicate any problem in the Product.

Read and Understand this Catalog

Please read and understand this catalog before purchasing the product. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

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IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the product in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

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CSM_2_1_0813
Cat. No. T056-E1-01

0213

ERROR: undefined
OFFENDING COMMAND: eexec

STACK:

/quit
-dictionary-
-mark-

Programmable Safety Controllers

G9SP



Rev. 8.11

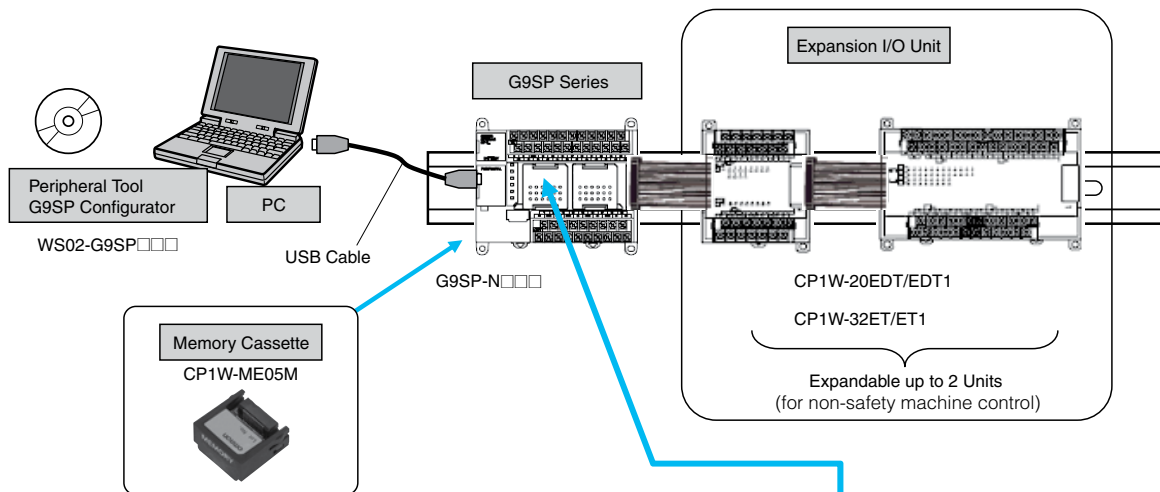


Compact Stand-Alone Programmable Controller

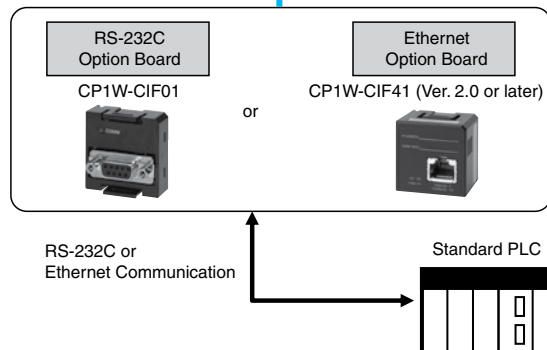
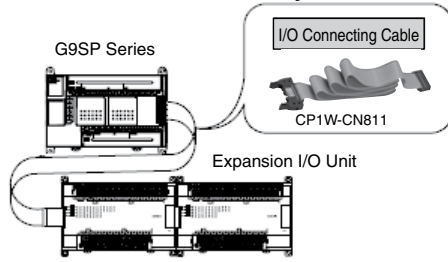
- Stand-alone safety controller for small and mid-sized machinery
- Easy programming for complex safety control
- Three types of CPU with different I/O size to suit the application
- Four types of Expansion I/O Units for hard-wired diagnosis or standard non-safety signals
- Clear diagnosis and monitoring via Ethernet (Omron FINS protocol), EtherNet/IP, or serial (RS-232) connection
- Supports direct connection with non-contact switches and safety mats
- Easy design, verification, standardization and reusage of safety control by unique programming software
- ISO 13849-1(PLe), IEC61508(SIL3) certified



Example of System Configuration



● When the Units are distantly-positioned such as one above the other layout



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Specifications

G9SP Series

General Specifications

Power supply voltage	24 VDC (20.4 to 26.4 VDC -15% +10%)
Current consumption*	G9SP-N10S: 400 mA (V1: 300 mA, V2: 100 mA) G9SP-N10D: 500 mA (V1: 300 mA, V2: 200 mA) G9SP-N20S: 500 mA (V1: 400 mA, V2: 100 mA)
Isolation class	Class III (SELV)
Overvoltage category	II
Noise immunity	Conforms to IEC61131-2
Vibration resistance	5 to 8.4 Hz: 3.5 mm, 8.4 to 150 Hz: 9.8 m/s ²
Shock resistance	147 m/s ² : 11 ms
Mounting	DIN track mounting (IEC60715 TH35-7.5/TH35-15) or M4 screws
Ambient operating temperature	0 to +55°C
Ambient operating humidity	10% to 90% (with no condensation)
Ambient storage temperature	-20°C to +75°C
Atmosphere	No corrosive gas
Degree of protection	IP20 except terminal blocks
Terminal screws	M3 self-rising screws

*Not including the current consumption of external devices.

	G9SP-N10S	G9SP-N10D	G9SP-N20S
Safety inputs	10	10	20
Safety outputs	4	16	8
Test outputs	4	6	6
Standard outputs	4	—	—
Weight	290 g max.	440 g max.	430 g max.

Safety Input Specifications

Input type	Sinking inputs (PNP)
Input current	6 mA
ON voltage	11 VDC min. (between each input terminal and G1)
OFF voltage	5 VDC max. (between each input terminal and G1)
OFF current	1 mA max.

Test Output Specifications

Output type	Sourcing outputs (PNP)
Rated Output Current	G9SP-N10S
	T0, T1 : 60 mA max.
	T2 : 30 mA max. *1
	T3 : 300 mA max. *2
	T0-2 total : 60 mA max.
	G9SP-N10D
	T0, T1, T2 : 60 mA max.
	T3 : 300 mA max. *2
	T4, T5 : 30 mA max. *1
	Total of T0-2 and T4-5 : 60 mA max.
	G9SP-N20S
	T0, T1, T2 : 100 mA max.
T3 : 300 mA max. *2	
T4, T5 : 30 mA max. *1	
Total of T0-2 and T4-5 : 120 mA max.	

*1 Connection to OMRON D40A Non-contact Door Switch is possible.

*2 With the Muting Lamp Output (open circuit detection)

Safety Output Specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.8 A max./output 1.6 A max./4 outputs (G9SP-N10S/-N20) *1 1.2 A max./4 outputs (G9SP-N10D) *2
ON residual voltage	1.2 V max. (between each output terminal and V2)
OFF residual voltage	2 V max.
Leakage current	0.1 mA max.

*1. Total current for So0 to So3 and So4 to So7

*2. Total current for So0 to So3, So4 to So7, So8 to So11 and So12 to So15

Note: When a safety output is set as a pulse output, make sure that the connected devices do not malfunction due to the OFF pulse (pulse width: 640 μs).

Standard Output Specifications (G9SP-N10S)

Output type	Sourcing outputs (PNP)
ON residual voltage	1.5 V max. (between each output terminal and V2)
Rated output current	100 mA max.

Specifications (continued)

Configurator

General Specifications

Applicable PC	DOS/V PC (Refer to the attached file for the operating environment of G9SP tool.)	
CD-ROM or DVD-ROM drive	One or more	
Applicable OS	Windows 2000 (Service Pack 3 or later), Windows XP (Service Pack 2 or later)	Windows Vista (32-bit & 64-bit), Windows 7 (32-bit & 64-bit)
CPU processing speed	Pentium II 333 MHz or faster (Pentium III 1GHz or faster is recommended.)	Pentium III 1GHz or faster is recommended.
Memory (RAM)	256 MB min. (512 MB or more is recommended.)	512 MB min. (1 Gbyte or more is recommended.)
Hard disk	200 MB or more	
Monitor	High-intensity display of SVGA (800 x 600) or more Required min. 256 colors display	
Communication port to connect with G9SP Series	USB 1.1	

Certified Standards

Certification body	Standard
TÜV Rheinland	EN ISO 13849-1: 2008 EN ISO 13849-2: 2008 IEC 61508 parts 1-7: 2010 IEC/EN 62061: 2005 IEC 61131-2: 2007 EN ISO 13850: 2008 (EN418: 1992) EN 60204-1: 2006 EN 61000-6-2: 2005 EN 61000-6-4: 2007 NFPA 79-2007 ANSI RIA 15.06-1999 (R2009) ANSI B11.19-2010 UL1998
UL	UL508 CSA22.2 No.142

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Specifications (continued)

Expansion I/O Unit

Input Specifications (CP1W-20EDT/20EDT1)

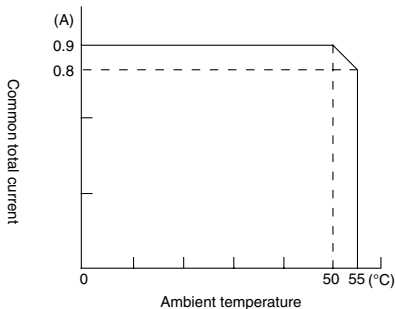
Input voltage	24 VDC, -15% +10%
Input impedance	4.7 kΩ
Input current	5 mA TYP
ON voltage	14.4 VDC min.
OFF voltage	5.0 VDC max.
ON delay	1 ms max. *
OFF delay	1 ms max. *
Circuit configuration	

*ON/OFF delay represents the hardware delay time.

Output Specifications (Transistor outputs: sinking/sourcing type)

	CP1W-20EDT/EDT1	CP1W-32ET/32ET1
Maximum switching capacity *1	24 VDC -5% +10% 0.3 A/output 0.9 A/common 1.8 A/unit	4.5 to 30 VDC 0.3 A/output 0.9 A/common 7.2 A/unit
Leakage current	0.1 mA max.	0.1 mA max.
Residual voltage	1.5 V max.	1.5 V max.
ON delay	0.1 ms max.	0.1 ms max.
OFF delay	1 ms max. 24 VDC, -5% +10%, when 5 to 300 mA	1 ms max. 24 VDC, -5% +10%, when 5 to 300 mA
Maximum number of outputs for simultaneous ON	8 outputs (100% load)	24 outputs (75% load)
Fuse *2	1/common	1/common
Circuit configuration	Sinking type (CP1W-20EDT, CP1W-32ET) 	Sourcing type (CP1W-20EDT1, CP1W-32ET1)

*1. A maximum of 0.9 A per common can be switched at an ambient temperature of 50°C.



*2. User cannot replace fuses. Replace the unit if a fuse blows due to short circuit, etc.

Specifications (continued)

Option Unit

RS-232C Option Board (CP1W-CIF01)

Communication Specifications

Connection method	D-SUB 9P (female)
Maximum transmission distance	15 m
Communication protocol	Non-procedural
Maximum data length	Refer to the Users Manual for details.

Ethernet Option Board (CP1W-CIF41 unit ver. 2.0 or later)

Ethernet Communication Specifications

Name	CP Series Ethernet Option Board			
Model	CP1W-CIF41			
Type	100 BASE-TX (applicable as a 10 BASE-T)			
Transmission specifications	Media access method	CSMA/CD		
	Modulation method	Baseband		
	Transmission path type	Star form		
	Baud rate	100 Mbps (100 BASE-TX)	10 Mbps (10 BASE-T)	
		Internal transmission speed between G9SP and Ethernet Option Board is of 115.2 kbps.		
	Transmission media	Unshielded twisted-pair (UDP) cable Categories: 5, 5e Shielded twisted-pair (STP) cable Categories: 100 Ω at 5, 5e	Unshielded twisted-pair (UDP) cable Categories: 3, 4, 5, 5e Shielded twisted-pair (STP) cable Categories: 100 Ω at 3, 4, 5, 5e	
	Transmission distance	100 m (distance between hub and node)		
Number of cascade-connectable units	No limit when a switching hub is used.			
Weight	23 g max.			
Dimensions	36.4 (W) x 36.4 (H) x 28.2 (D) mm			

EtherNet/IP Option Board (CM-EIP-1)

Communication Specifications

Communications protocol	EtherNet/IP		
Type	100 BASE-TX (See note)		
Transmission specifications	Media access method	CSMA/CD	
	Modulation method	Baseband	
	Transmission path type	Star form	
	Baud rate	100 Mbps (100 BASE-TX)	
	Transmission media	Shielded twisted-pair (STP) cable Categories: 100 Ω at 5, 5e or higher	
	Transmission distance	100 m (distance between hub and node)	
	Number of cascade-connectable units	No limit when a switching hub is used.	











Note: If tag data links are being used, use 100 BASE-TX.

*Please note when communicating with the H-T40M-P Status Display Touchscreen, network communication over ethernet is not possible.

Functions







Function Blocks

Logic Functions

Function Block Name	Notation on Function List	Icon	Details
NOT	NOT		Outputs the logical complement of the input condition.
AND	AND		Outputs the logical AND of the input conditions.
OR	OR		Outputs the logical OR of the input conditions.
NAND	NAND		Outputs the logical NAND of the input conditions.
NOR	NOR		Outputs the logical NOR of the input conditions.
Exclusive OR	EXOR		Outputs the exclusive OR of the input conditions.
Exclusive NOR	EXNOR		Outputs the exclusive NOR of the input conditions.
RS-FF (Reset Set Flip-Flop)	RS-FF		When the input signal turns ON, RS-FF holds the ON status in the function block and continuously connects to the output.
Comparator	Comparator		Compares the input signals to the set value and turns ON the output if they match.
Comparator 2	Comparator2		Compares the input signals to the set value and outputs the comparison result.













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Timer/Counter Functions



Function Block Name	Notation on Function List	Icon	Details
Off-Delay Timer	Off-Delay Timer		Operates an OFF-delay timer.
On-Delay Timer	On-Delay Timer		Operates an ON-delay timer.
Pulse Generator	Pulse Generator		Cyclically outputs ON/OFF pulses on the Output Enable while the input signal is ON.
Counter	Counter		Counts the number of input signals and turns ON the output when the count reaches the specified number.
Up-Down Counter	Up-Down Counter		Increments the counter on the leading edge of an up count input and decrements the counter on the leading edge of a down count input.
Serial-Parallel Converter	Serial-Parallel Converter		Counts the number of input signals and outputs the count value.

Functions (continued)



Safety Device Function Blocks

Function Block Name	Notation on Function List	Icon	Details
External Device Monitoring	EDM		Evaluates the input signal and external device status and sends a safety output to the external device. This function block is used to detect fused contacts or external wiring problems (disconnected lines) for safety relays, contactors, and other safety devices.
Enable Switch Monitoring	Enable Switch	 Enable	Monitors the status of an Enable Switch device.
Emergency Stop Switch Monitoring	E-Stop		Monitors the status of an Emergency Stop Switch.
Light Curtain Monitoring	Light Curtain Monitoring		Monitors the input signal from a Safety Light Curtain.
Muting	Muting	 Mute	Temporarily disables the input signals for a Light Curtain when the muting signal is detected.
Safety Gate Monitoring	Safety Gate Monitoring		Monitors the status of a safety door (Safety-door Switch or Safety Limit Switch). This function block can be used to set function tests for Safety Category 2.
Two Hand Controller	Two Hand Controller		Monitors the status of a Two-hand Switch.
User Mode Switch Monitoring	User Mode Switch		Monitors the operating mode switch for a user system or device.
Redundant Input Monitoring	Redundant Input		Monitors for discrepancies in two input signals.
Single Beam Safety Sensor	Single Beam Safety Sensor		Monitors the input signal of an OMRON E3ZS/E3FS Single-beam Safety Sensor.
Non-Contact Door Switch Monitoring	Non-Contact Door Switch		Monitors an Omron STI D40A Non-contact Door Switch.
Safety Mat Monitoring	Safety Mat		Monitors an Omron STI UM Safety Mat.

Reset and Restart Function Blocks

Function Block Name	Notation on Function List	Icon	Details
Reset	Reset	 RESET	Outputs ON if the reset signal is correctly input while the input condition is ON. This function block can be used to prevent equipment from starting automatically.
Restart	Restart	 Restart	Performs the same operation as a Reset function block. The icon is different.

Connector Function Blocks

Function Block Name	Notation on Function List	Icon	Details
Multi Connector	Multi Connector		Outputs the status of the input signals.
Routing	Routing		Distributes an input signal to multiple signals.

Wiring

Terminal Arrangement

G9SP-N10S

Top (17 pin)	V1	G1	Si1	Si3	Si5	Si7	Si9	T1	T3
	NC	Si0	Si2	Si4	Si6	Si8	T0	T2	
Bottom (14 pin)	NC	So0	So2	O0	O2	NC	NC		
	V2	G2	So1	So3	O1	O3	NC		

G9SP-N10D

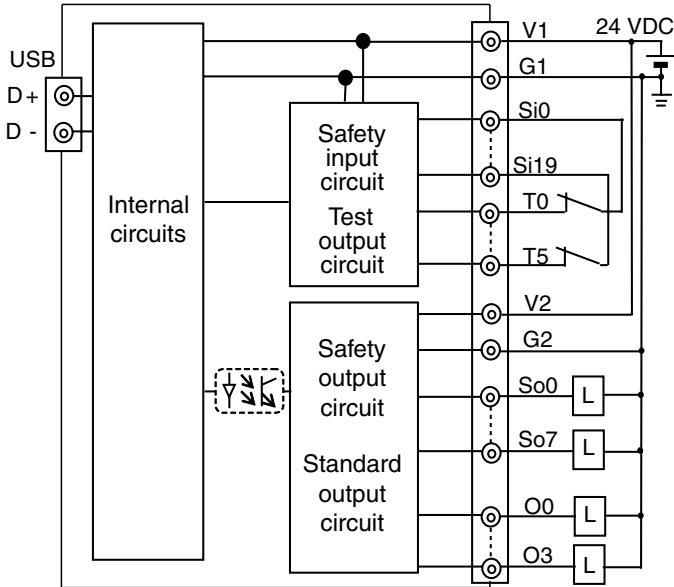
Top (24 pin)	V1	G1	Si1	Si3	Si5	Si7	Si9	NC	NC	T1	T3	T5
	NC	Si0	Si2	Si4	Si6	Si8	NC	NC	T0	T2	T4	NC
Bottom (19 pin)	NC	So0	So2	So4	So6	So8	So10	So12	So14			
	V2	G2	So1	So3	So5	So7	So9	So11	So13	So15		

G9SP-N20S

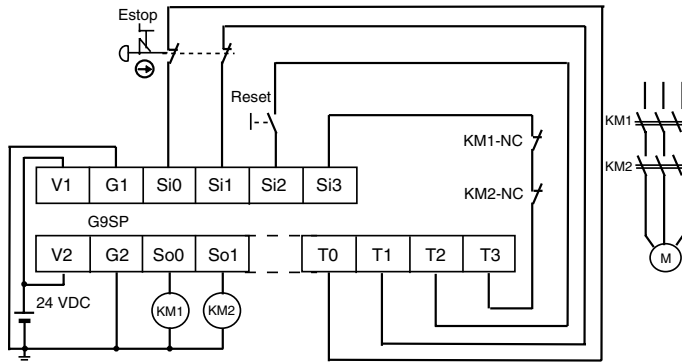
Top (24 pin)	V1	G1	Si1	Si3	Si5	Si7	Si9	Si11	Si13	Si15	Si17	Si19
	NC	Si0	Si2	Si4	Si6	Si8	Si10	Si12	Si14	Si16	Si18	NC
Bottom (19 pin)	NC	So0	So2	So4	So6	NC	T0	T2	T4			
	V2	G2	So1	So3	So5	So7	NC	T1	T3	T5		

Terminals	Function
V1/G1	Power supply terminals for Internal/Input circuits (24 VDC)
V2/G2	Power supply terminals for output circuits (24 VDC)
NC	Not used (Do not connect.)
Si0 - Si19	Safety input terminals
T0 - T5	Test output terminals
So0 - So15	Safety output terminals
O0 - O3	Standard output terminals

Internal Circuits and Wiring Example



I/O Wiring Example: Emergency Stop (Dual Channel) with Manual Reset

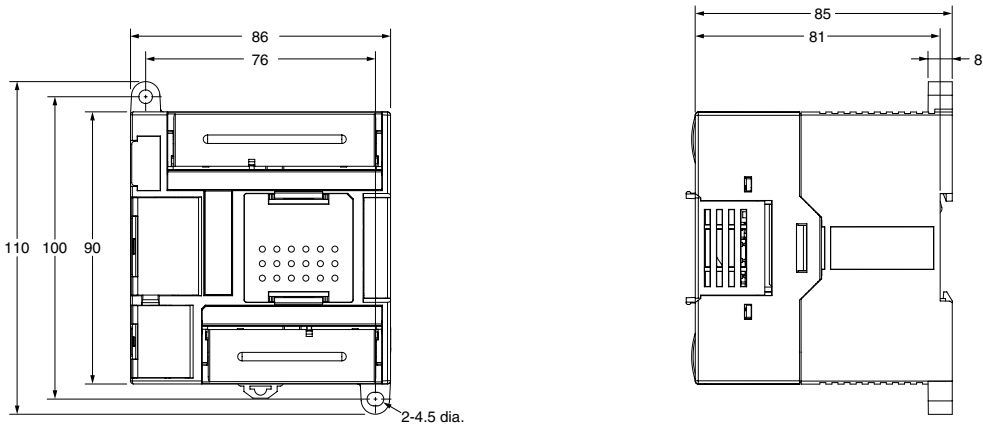


Dimensions

(mm)

Safety Controller

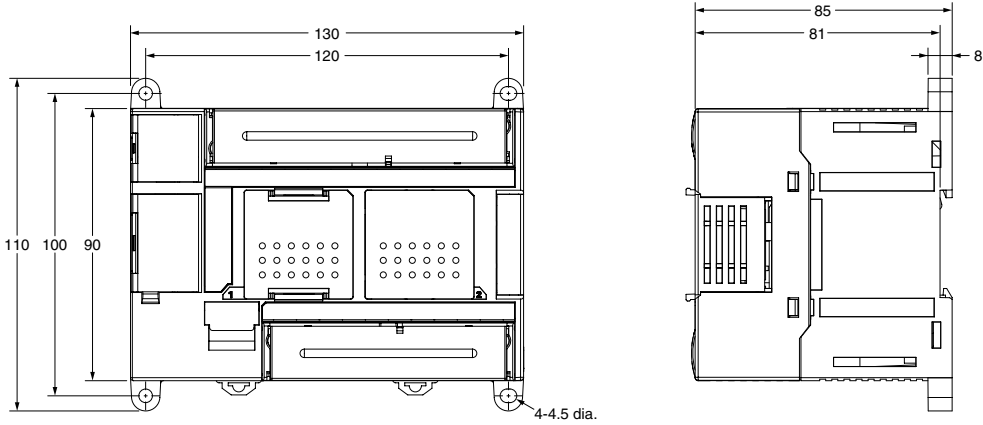
G9SP-N10S



Safety Controller

G9SP-N10D

G9SP-N20S



Ordering

G9SP Series

Name	Number of I/O				Unit version	Model
	Safety inputs	Test outputs	Safety outputs	Standard outputs		
Safety Controller	10	4	Solid-state outputs: 4	4	Ver. 1.0	G9SP-N10S
	10	6	Solid-state outputs: 16	—		G9SP-N10D
	20	6	Solid-state outputs: 8	—		G9SP-N20S
Safety Controller Kit with EIP Communication Module (includes controller and CM-EIP-1)	10	4	Solid-state outputs: 4	4	Ver. 1.0	G9SP-N10S-EIP (KIT)
	10	6	Solid-state outputs: 16	—		G9SP-N10D-EIP (KIT)
	20	6	Solid-state outputs: 8	—		G9SP-N20S-EIP (KIT)
Safety Controller Kit with Status Display Touchscreen (includes controller, CP1W-CIF01, H-T40M-P, 2m/6 ft. RS232C cable)	10	4	Solid-state outputs: 4	4	Ver. 1.0	G9SP-N10S-SDK (KIT)
	10	6	Solid-state outputs: 16	—		G9SP-N10D-SDK (KIT)
	20	6	Solid-state outputs: 8	—		G9SP-N20S-SDK (KIT)

Expansion I/O Unit (for standard non-safety machine control)

Name	Type	Number of I/O		Model
		Inputs	Outputs	
Expansion I/O Unit	Sinking type	12	Solid-state outputs: 8	CP1W-20EDT
	Sourcing type			CP1W-20EDT1
	Sinking type	—	Solid-state outputs: 32	CP1W-32ET
	Sourcing type			CP1W-32ET1

Note: CP1W-CN811 I/O Connecting Cable is available.

Refer to the Catalog of CP1H/CP1L Programmable Controller (Cat. No. P057-E1) for details.

I/O Connecting Cable

Name	Specifications	Model
I/O Connecting Cable	80 cm (for the distantly-positioned units connection)	CP1W-CN811

Note: An I/O Connecting Cable (approx. 6 cm) for alongside setting is included in the Expansion I/O Unit package.

J

Option Unit

Name	Model
RS-232C Option Board	CP1W-CIF01
Ethernet Option Board (Unit Ver. 2.0 or later) (FINS protocol)	CP1W-CIF41
Memory Cassette	CP1W-ME05M
Status Display Touchscreen for G9SP	H-T40M-P

Note: Refer to the Catalog of CP1H/CP1L Programmable Controller (Cat. No. P057-E1) for details.



For information on the H-T40M-P, see page J14.

Configurator

Name	Media	Applicable OS	Model
G9SP Configurator	Setup Disk (CD-ROM: 1 license)	Windows 2000 (Service Pack 3 or advanced) Windows XP Windows Vista Windows 7	WS02-G9SP01-V1
	Setup Disk (CD-ROM: 10 licenses)		WS02-G9SP10-V1
	Setup Disk (CD-ROM: 50 licenses)		WS02-G9SP50-V1
	Setup Disk (CD-ROM: Site license)		WS02-G9SPXX-V1

 = Highlighted **Rapid Delivery** products are available for shipment today or within **FIVE** days.

CP1L

CPU y Unidades de expansión

En lo que respecta a controladores para máquinas compactas, la nueva serie CP1L de Omron ofrece la compactibilidad de un micro PLC con la capacidad de un PLC modular.

Esta nueva e interesante gama, no solo es compacta, también es ampliable, tiene una velocidad de procesamiento más rápida que otros controladores y es única en lo que se refiere a precio/rendimiento. Naturalmente, es compatible con el resto de PLCs de Omron.

- 4 entradas de encoder de alta velocidad y 2 salidas de impulsos de alta velocidad
- CPUs con alimentación de c.a. o c.c. y 14, 20, 30 ó 40 E/S integradas
- Conjunto de instrucciones compatible con los PLCs de las series CP1H, CJ1 y CS1
- Puertos serie RS232C y RS-422A/485 opcionales
- Puerto de programación USB
- Ampliables con una gran variedad de unidades de E/S (hasta un máximo de 160 puntos de E/S)
- Funcionalidad de Motion
- El mismo y único software que en otros controladores Omron



Especificaciones de la CPU

Unidades CPU

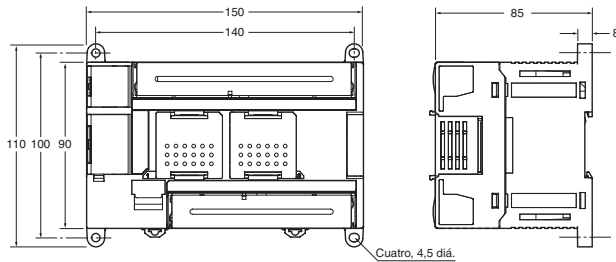
Tipo		CP1L-M40 (40 puntos)	CP1L-M30 (30 puntos)	CP1L-L20 (20 puntos)	CP1L-L14 (14 puntos)
Elemento	Modelos	CP1L-M40□□□□	CP1L-M30□□□□	CP1L-L20□□□□	CP1L-L14□□□□
Método de control	Método de programa almacenado				
Método de control de E/S	Scan cíclico y refresco inmediato				
Lenguaje de programación	Diagrama de relés				
Bloques de función	Número máximo de definiciones de bloques de función: 128 Número máximo de instancias: 256 Lenguajes que se pueden utilizar en definiciones de bloques de funciones: diagramas de relés, texto estructurado				
Longitud de instrucción	1 a 7 pasos por instrucción				
Instrucciones	Aprox. 500 (códigos de función: 3 dígitos)				
Tiempo de ejecución de instrucciones	Instrucciones básicas: 0,55 µs mín.; Instrucciones especiales: 4,1 µs mín.				
Tiempo de procesamiento común	0,4 ms				
Capacidad de programa	10 Kpasos			5 Kpasos	
Número de tareas	288 (32 tareas cíclicas y 256 tareas de interrupción)				
	Tareas de interrupción programadas	1 (tarea de interrupción nº 2, fija)			
	Tareas de entrada de interrupción	6 (tareas de interrupción nº 140 a 145, fijas)			4 (tareas de interrupción nº 140 a 143, fijas)
(Las tareas de interrupción también pueden especificarse y ejecutarse para interrupciones y ejecuciones de contador de alta velocidad.)					
Número máximo de subrutinas	256				
Número máximo de saltos	256				
Áreas de E/S	Bits de entrada	24: CIO 0.00 hasta CIO 0.11 y CIO 1.00 hasta CIO 1.11	18: CIO 0.00 hasta CIO 0.11 y CIO 1.00 hasta CIO 1.05	12: CIO 0.00 hasta CIO 0.11	8: CIO 0.00 hasta CIO 0.07
	Bits de salida	16: CIO 100.00 hasta CIO 100.07 y CIO 101.00 hasta CIO 101.07	12: CIO 100.00 hasta CIO 100.07 y CIO 101.00 hasta CIO 101.03	8: CIO 100.00 hasta CIO 100.07	6: CIO 100.00 hasta CIO 100.05
	Área de enlace 1:1	1.024 bits (64 canales): CIO 3000.00 hasta CIO 3063.15 (CIO 3000 hasta CIO 3063)			
	Área PLC Link serie	1.440 bits (90 canales): CIO 3100.00 hasta CIO 3189.15 (CIO 3100 hasta CIO 3189)			
Bits de trabajo	8.192 bits (512 canales): W000.00 hasta W511.15 (W0 hasta W511) Área CIO: 37.504 bits (2.344 canales): CIO 3800.00 hasta CIO 6143.15 (CIO 3800 hasta CIO 6143)				
Área TR	16 bits: TR0 hasta TR15				
Área de retención	8.192 bits (512 canales): H0.00 hasta H511.15 (H0 hasta H511)				
Área AR	Sólo lectura (prohibida la escritura): 7168 bits (448 canales): A0.00 hasta A447.15 (A0 hasta A447) Lectura/escritura: 8192 bits (512 canales): A448.00 hasta A959.15 (A448 hasta A959)				
Temporizadores	4.096 bits: T0 hasta T4095				
Contadores	4.096 bits: C0 hasta C4095				
Área DM	32 Kcanales: D0 hasta D32767			10 Kcanales: D0 hasta D9999, D32000 hasta D32767	
Área de registro de datos	16 registros (16 bits): DR0 hasta DR15				
Área de registros de índice	16 registros (32 bits): IR0 hasta IR15				
Área de indicador de tarea	32 indicadores (32 bits): TK0000 hasta TK0031				
Memoria de seguimiento	4.000 canales (500 muestras para datos de seguimiento, máximo de 31 bits y 6 canales)				

Tipo	CP1L-M40 (40 puntos)	CP1L-M30 (30 puntos)	CP1L-L20 (20 puntos)	CP1L-L14 (14 puntos)
Elemento	Modelos	Modelos	Modelos	Modelos
Cassette de memoria	Se puede montar un cassette de memoria especial (CP1W-ME05M). Nota: Se puede utilizar para copias de seguridad de programas y reinicio automático.			
Función de reloj	Soportado. Precisión (desviación mensual): -4,5 min. a -0,5 min. (temperatura ambiente: 55°C), -2,0 min a +2,0 min (temperatura ambiente: 25°C), -2,5 min a +1,5 min (temperatura ambiente: 0°C)			
Funciones de comunicaciones	Un puerto de periféricos incorporado (USB 1.1): sólo para conexión de software de programación.			
Backup de memoria	Se puede montar un máximo de dos módulos opcionales de comunicaciones serie.		Se puede montar un máximo de un módulo opcional de comunicaciones serie.	
Vida útil de la batería	Memoria flash: los programas de usuario, parámetros (como la configuración del PLC), datos de comentarios y todo el área DM se pueden guardar en la memoria flash como valores iniciales. Batería de backup: El área de retención, el área DM y los valores de contador (indicadores, PV) se mantienen gracias a una batería de backup.			
Terminales de entrada incorporados	40 (24 entradas, 16 salidas)	30 (18 entradas, 12 salidas)	20 (12 entradas, 8 salidas)	14 (8 entradas, 6 salidas)
Número de canales de conexión a unidades de expansión y unidades de E/S de expansión	Unidades de expansión y unidades de E/S de expansión de la serie CP: 3 máx.		Unidad de expansión y unidades de E/S de expansión de la serie CP: 1 máx.	
Número máximo de puntos de E/S	160 (40 incorporadas + 40 por unidad de expansión (E/S) × 3 unidades)	150 (30 incorporadas + 40 por unidad de expansión (E/S) × 3 unidades)	60 (20 incorporadas + 40 por unidad de expansión (E/S) × 1 unidad)	54 (14 incorporadas + 40 por unidad de expansión (E/S) × 1 unidad)
Entradas de interrupción	6 entradas (tiempo de respuesta: 0,3 ms)			4 entradas (tiempo de respuesta: 0,3 ms)
Modo de contador de entradas de interrupción	6 entradas (frecuencia de respuesta: 5 kHz máx. para todas las entradas de interrupción), 16 bits Contadores ascendentes o descendentes			4 entradas (frecuencia de respuesta: 5 kHz máx. para todas las entradas de interrupción), 16 bits Contadores ascendentes o descendentes
Entradas de respuesta rápida	6 puntos (ancho de impulso de entrada mín.: 50 µs)			4 puntos (ancho de impulso de entrada mín.: 50 µs)
Interrupciones programadas	1			
Contadores de alta velocidad	4 contadores, 2 ejes (entrada de 24 V c.c.) 4 entradas: Fases diferenciales (x 4), 50 kHz o Monofásico (impulso más dirección, ascendente/descendente, incremento), 100 kHz Rango de valores: 32 bits, modo lineal o circular: Interrupciones: comparación del valor objeto o comparación por rango			
Salidas de impulsos (sólo modelos con salidas transistor)	Salidas de impulsos	Aceleración y deceleración trapezoidal o curva S (relación de ON/OFF: 50% fijo) 2 salidas, 1 Hz a 100 kHz (CCW/CW o impulso más dirección)		
	Salidas PWM	Relación de ON/OFF: 0,0% a 100,0% (especificada en incrementos de 0,1% ó 1%) 2 salidas, 0,1 a 6553,5 Hz ó 1 a 32.800 Hz (precisión: ±5% a 1 kHz)		
Control analógico	1 (rango de selección: 0 a 255)			
Entrada analógica externa	1 entrada (resolución: 1/256, rango de entrada: 0 a 10 V). No aislada.			

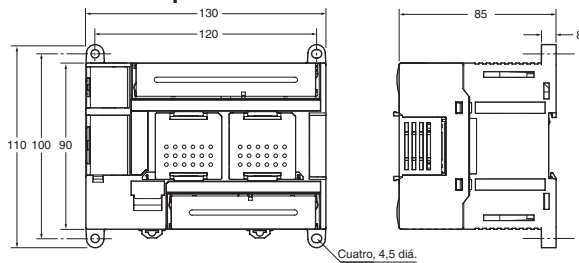
Dimensiones

(unidad: mm)

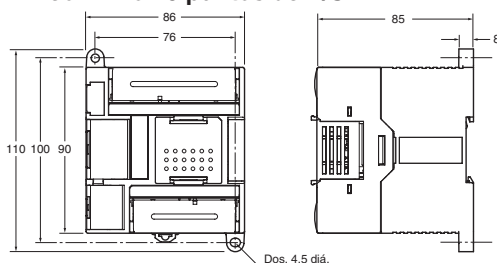
CPU CP1L con 40 puntos de E/S



CPU CP1L con 30 puntos de E/S

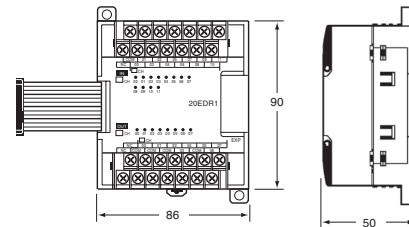


CPU CP1L con 14 ó 20 puntos de E/S

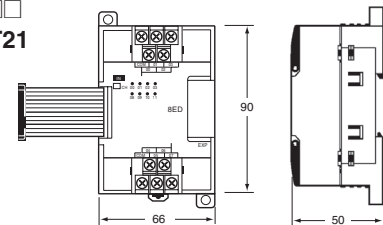


Unidades de expansión y unidades de expansión de E/S

CP1W-20ED □
CP1W-16ER
CP1W-AD041/CP1W-DA041
CP1W-MAD11/CP1W-TS □□□



CP1W-8E □□
CP1W-SRT21



CP1W-40ED □

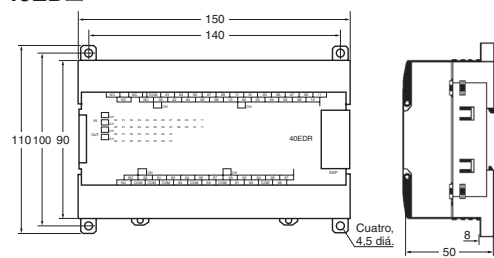

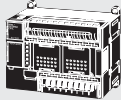

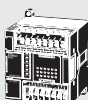


Tabla de selección

CPU CP1L

CPU	Especificaciones				Modelo	Normas
	Fuente de alimentación	Método de salida	Entradas	Salidas		
CPU CP1L-M con 40 puntos 	Fuente de alimentación de c.a.	Salida de relés	24	16	CP1L-M40DR-A	UC1, N, L, CE
	Fuente de alimentación de c.c.	Salida de transistor (NPN)			CP1L-M40DR-D	
		Salida de transistor (PNP)			CP1L-M40DT-D	
CPU CP1L-M con 30 puntos 	Fuente de alimentación de c.a.	Salida de relés	18	12	CP1L-M30DR-A	
	Fuente de alimentación de c.c.	Salida de transistor (NPN)			CP1L-M30DR-D	
		Salida de transistor (PNP)			CP1L-M30DT-D	
CPU CP1L-L con 20 puntos 	Fuente de alimentación de c.a.	Salida de relés	12	8	CP1L-L20DR-A	
	Fuente de alimentación de c.c.	Salida de transistor (NPN)			CP1L-L20DR-D	
		Salida de transistor (PNP)			CP1L-L20DT-D	
CPU CP1L-L con 14 puntos 	Fuente de alimentación de c.a.	Salida de relés	8	6	CP1L-L14DR-A	
	Fuente de alimentación de c.c.	Salida de transistor (NPN)			CP1L-L14DR-D	
		Salida de transistor (PNP)			CP1L-L14DT-D	

Opciones para CPU

Nombre	Especificaciones	Modelo	Normas
Módulo opcional RS-232C	Para puerto opcional de CPU.	CP1W-CIF01	UC1, N, L, CE
Módulo opcional RS-422A/485	Para puerto opcional de CPU.	CP1W-CIF11	
Cassette de memoria	Se puede utilizar para copias de seguridad de programas o reinicio automático.	CP1W-ME05M	

Dispositivos de programación

Nombre	Especificaciones	Modelo	Normas	
Paquete de herramientas FA integrado en CX-One versión 2.0	CX-One es un paquete que integra el software de programación para los PLCs y componentes de OMRON. CX-One se ejecuta en los siguientes sistemas operativos. SO: Windows 98SE, Me, NT 4.0 (Service Pack 6a), 2000 (Service Pack 3 o superior) o XP *CX-Thermo se ejecuta solamente en Windows 2000 (Service Pack 3 o superior) o XP. CX-One ver. 2.0 incluye CX-Programmer ver. 7.□. Consulte información detallada en el catálogo de CX-One (Cat.No. R134). *El software se facilita en CD para CXONE-AL□□C-□EV2, y en DVD para CXONE-AL□□D-□EV2. *Disponemos de licencias para usuarios que tengan que ejecutar CX-One en varios ordenadores. Solicite información detallada al representante de OMRON.	1 licencia	CXONE-AL01C-EV2 CXONE-AL01D-EV2	---
		3 licencias	CXONE-AL03C-EV2 CXONE-AL03D-EV2	
		10 licencias	CXONE-AL10C-EV2 CXONE-AL10D-EV2	
		50 licencias	CXONE-AL50C-EV2 CXONE-AL50D-EV2	
Cable de programación USB	Macho tipo A a macho tipo B (longitud: 1,8 m)	CP1W-CN221	---	
Cable de programación para el módulo opcional CP1W-CIF01 RS-232C	Conector D-Sub de 9 patillas para ordenadores (longitud: 2,0 m)	Para conectores antiestáticos	XW2Z-200S-CV	---
	Conector D-Sub de 9 patillas para ordenadores (longitud: 5,0 m)		XW2Z-500S-CV	
	Conector D-Sub de 9 patillas para ordenadores (longitud: 2,0 m)		XW2Z-200S-V	
	Conector D-Sub de 9 patillas para ordenadores (longitud: 5,0 m)		XW2Z-500S-V	
Cable de conversión USB-serie (ver nota)	Cable de conversión USB-RS-232C (longitud: 0,5 m) y controlador de PC (en disco CD-ROM) incluidos. Compatible con la Especificación USB 1.1 En el ordenador personal: USB (conector A macho) En el PLC: RS-232C (D-Sub de 9 patillas, macho) Controlador: Compatible con Windows 98, Me, 2000 y XP	CS1W-CIF31		

- Nota: 1. No se puede utilizar con un puerto USB de periféricos.
 2. Los PLC CP1L son compatibles con CX-Programmer versión 7.1 o superior.

Unidades de expansión

Nombre	Método de salida	Entradas	Salidas	Modelo	Normas
Unidades de expansión de E/S	Relé	24	16	CP1W-40EDR	N, L, CE
	Transistor (NPN)			CP1W-40EDT	
	Salida de transistor (PNP)			CP1W-40EDT1	
	Relé	12	8	CP1W-20EDR1	U, C, L, CE
	Transistor (NPN)			CP1W-20EDT	U, C, N, L, CE
	Salida de transistor (PNP)			CP1W-20EDT1	
	Relé	---	16	CP1W-16ER	CE
	---	8	---	CP1W-8ED	U, C, N, L, CE
	Relé	---	8	CP1W-8ER	U, C, N, L, CE
	Transistor (NPN)	---	8	CP1W-8ET	
Salida de transistor (PNP)	---	8	CP1W-8ET1		
Unidad de entrada analógica	Analógica (resolución: 1/6000)	4	---	CP1W-AD041	UC1, CE
Unidad de salida analógica	Analógica (resolución: 1/6000)	---	4	CP1W-DA041	UC1, CE
Unidad de E/S analógica	Analógica (resolución: 1/6000)	2	1	CP1W-MAD11	U, C, N, CE
Unidad Esclava de CompoBus/S	---	8 (Bits de entrada de I/O Link)	8 (Bits de entrada de I/O Link)	CP1W-SRT21-	U, C, N, L, CE
Unidad de sensor de temperatura	2 entradas de termopar			CP1W-TS001	U, C, N, L, CE
	4 entradas de termopar			CP1W-TS002	
	2 entradas de termorresistencia de platino			CP1W-TS101	
	4 entradas de termorresistencia de platino			CP1W-TS102	

Productos opcionales, productos de mantenimiento y accesorios para carril DIN

Nombre	Especificaciones	Modelo	Normas
Batería	Para CPU CP1L (Utilice baterías cuya fecha de fabricación no sea superior a los 2 años).	CJ1W-BAT01	CE
Carril DIN	Longitud: 0,5 m; altura: 7,3 mm	PFP-50N	---
	Longitud: 1 m; altura: 7,3 mm	PFP-100N	
	Longitud: 1 m; altura: 16 mm	PFP-100N2	
Tope final	Las CPUs y las unidades de interfaz de E/S incluyen de serie 2 topes como accesorios para fijarlas al carril DIN.	PFP-M	

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VACON

DRIVEN BY DRIVES



**VARIADORES COMPACTOS VACON DE CA
CREANDO LA ARMONÍA PERFECTA**



¿QUÉ ES LA ARMONÍA?

Vemos la armonía como un estado de equilibrio. Creemos que la solución creada es la mejor posible para sus necesidades específicas. Que el proveedor seleccionado es el correcto. Que hay buena comunicación y comprensión de sus necesidades. Los asuntos medioambientales se gestionan del mejor modo posible.



CREANDO LA ARMONÍA PERFECTA

Los convertidores contribuyen a mejorar el control de las máquinas y a aumentar la eficiencia energética. Sin embargo, seleccionar el convertidor CA correcto es mucho más que seleccionar el producto adecuado, es sobre todo seleccionar un proveedor con la actitud adecuada para ser su partner. Para conseguir la armonía perfecta es necesario seleccionar el producto correcto, la solución óptima y el mejor partner. Y hacer todo esto en armonía con la naturaleza.

TODO COMIENZA CON LA ACTITUD

Sabemos bien, y lo hemos comprobado muchas veces, que nuestro éxito es siempre el resultado del éxito de nuestro cliente. Cuando nuestro cliente es el ganador en su mercado, como socio nosotros también somos ganadores. Siendo conscientes de este hecho tan simple, hemos construido la cultura de nuestra compañía y el modo de trabajo alrededor de esta actitud. Trabajando con Vacon, usted puede estar seguro de que hacemos todo lo posible para conseguir el mejor resultado final, ya esté relacionado con el producto, las soluciones, la logística o relacionado con el apoyo. Esto es lo que convierte a Vacon la mejor elección como socio.

ARMONÍA EN LAS RELACIONES

Vacon es un joven proveedor de variadores que en un breve periodo de tiempo se ha convertido en uno de los principales proveedores de variadores en todo el mundo. El objetivo del equipo de expertos en variadores de Vacon es poner a su disposición la experiencia y conocimientos para servir a nuestros clientes del mejor modo posible. Nuestro objetivo es construir una relación de larga duración basada en la confianza; para nosotros esa es la armonía perfecta.

ARMONÍA EN LOS PRODUCTOS

Para cubrir las diferentes necesidades de nuestros clientes hemos creado una amplia gama de productos CA compactos. Todos los productos: Vacon 10, Vacon 20 y Vacon 20 Cold Plate tienen una cosa principal en común. Han sido diseñados para ser eficientes y fáciles de utilizar. Utilizar el producto debería ser fácil: debería encajar en el espacio disponible para él y queremos que el tiempo de configuración e instalación sea lo más breve posible.

ARMONÍA EN LA ADAPTACIÓN DEL PRODUCTO SEGÚN EL CLIENTE

La maquinaria y los productos fabricados a gran escala deben ser óptimos y eficientes. Una solución de convertidor estándar no siempre es la solución óptima. Desde que comenzamos en Vacon hemos desarrollado nuestros procesos de trabajo de modo que nos permitan adaptar los productos para cubrir las necesidades de los clientes. Por tanto, si usted es usuario de un gran volumen de dispositivos, póngase en contacto con su socio local de Vacon para saber cómo podemos crear soluciones de variadores de primera clase juntos.

UN PROVEEDOR DEDICADO A LOS OEM



EN ARMONÍA CON EL MEDIOAMBIENTE

El uso de variadores CA es uno de los contribuidores clave para ahorrar energía y reducir así las emisiones y la contaminación. Vacon intenta ser una compañía respetuosa con el medioambiente y nuestros productos son un buen ejemplo de esto. Esto queda patente en nuestra forma de trabajar. Hemos desarrollado nuestro proceso de fabricación para minimizar el impacto en el medioambiente. Todos los materiales que sobran en la producción y en los procesos de servicio se separan y se reciclan con sumo cuidado.



VACON 10 - LO MÁS FÁCIL POSIBLE

Vacon 10 es un variador de CA diseñado para aplicaciones donde la simplicidad y la eficiencia son los requisitos clave. Si usted necesita un variador de CA compacto que haga el trabajo sin ninguna complicación extra, Vacon 10 es el producto en el que debería fijarse.

La característica principal de diseño de Vacon 10 es la simplicidad, que significa manipulación rápida. Cuenta con todas las funciones necesarias en un solo accionamiento. Nuestros clientes de Vacon 10 aprecian una configuración rápida y un tamaño compacto.

INSTALACIÓN RÁPIDA

Elija Vacon 10 y benefíciese de un rápido proceso de instalación. Si el convertidor está montado en un carril DIN no es necesario utilizar tornillos para fijarlo. No se necesitan componentes externos, como filtros RFI, etc... ya que todos pueden estar integrados en el convertidor.

CONFIGURACIÓN RÁPIDA

Para ahorrar tiempo a nuestros clientes, hemos creado herramientas para programar el convertidor Vacon 10 de la manera más eficaz posible. Un tutorial de inicio en el convertidor le permite programarlo con tan solo tres parámetros. Con la Unidad MCA, nuestros clientes pueden

clonar sus convertidores en segundos, todos sin tener que conectar la electricidad al convertidor.

TAMAÑO COMPACTO

El espacio disponible para el variador normalmente está bastante limitado. Éste es también un factor económico ya que proporcionar más espacio conlleva un incremento en el coste del envolvente. El secreto tras el tamaño compacto de Vacon 10 es un concepto de refrigeración único del dispositivo. Se fabrica como la mayoría de ordenadores personales, un disipador de calor refrigerado de alta eficiencia montado directamente sobre los semiconductores de potencia.

VENTAJAS CLAVE:

- Instalación rápida
- Diseño que ahorra espacio
- Copiado de parámetros sin electricidad

CARACTERÍSTICAS Y DIMENSIONES

Tensión de alimentación	Tipo de variador de CA	Potencia		Corriente del motor		Tamaño del bastidor	Dimensiones An x Al x P		Peso	
		kW	HP	I _N (A)	1,5 x I _N (A)		mm	pulgadas	kg	lb
110-120 VCA, Monofásico (Sólo para América del Norte)	VACON0010-1L-0001-1	0,25	0,33	1,7	2,6	MI2	90 x 195 x 102	3,54 x 7,68 x 4,02	0,7	1,54
	VACON0010-1L-0002-1	0,37	0,5	2,4	3,6					
	VACON0010-1L-0003-1	0,55	0,75	2,8	4,2					
	VACON0010-1L-0004-1	0,75	1	3,7	5,6					
208-240 VCA, Monofásico	VACON0010-1L-0005-1	1,1	1,5	4,8	7,2	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18
	VACON0010-1L-0001-2	0,25	0,33	1,7	2,6					
	VACON0010-1L-0002-2	0,37	0,5	2,4	3,6	MI1	66 x 160 x 99	2,60 x 6,30 x 3,90	0,55	1,21
	VACON0010-1L-0003-2	0,55	0,75	2,8	4,2					
	VACON0010-1L-0004-2	0,75	1	3,7	5,6					
	VACON0010-1L-0005-2	1,1	1,5	4,8	7,2					
208-240 VCA, Trifásico	VACON0010-1L-0007-2	1,5	2	7	10,5	MI2	90 x 195 x 102	3,54 x 7,68 x 4,02	0,7	1,54
	VACON0010-1L-0009-2	2,2	3	9,6	14,4					
	VACON0010-3L-0001-2	0,25	0,33	1,7	2,6	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18
	VACON0010-3L-0002-2	0,37	0,5	2,4	3,6					
	VACON0010-3L-0003-2	0,55	0,75	2,8	4,2					
	VACON0010-3L-0004-2	0,75	1	3,7	5,6					
380-480 VCA, Trifásico	VACON0010-3L-0005-2	1,1	1,5	4,8	7,2	MI2	90 x 195 x 102	3,54 x 7,68 x 4,02	0,7	1,54
	VACON0010-3L-0007-2	1,5	2	7	10,5					
	VACON0010-3L-0011-2	2,2	3	11	16,5	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18
	VACON0010-3L-0001-4	0,37	0,5	1,3	2,0					
	VACON0010-3L-0002-4	0,55	0,75	1,9	2,9					
	VACON0010-3L-0003-4	0,75	1	2,4	3,6					
575 VCA, Trifásico (Sólo para América del Norte)	VACON0010-3L-0004-4	1,1	1,5	3,3	5,0	MI2	90 x 195 x 102	3,54 x 7,68 x 4,02	0,7	1,54
	VACON0010-3L-0005-4	1,5	2	4,3	6,5					
	VACON0010-3L-0006-4	2,2	3	5,6	8,4	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18
	VACON0010-3L-0008-4	3	5	7,6	11,4					
	VACON0010-3L-0009-4	4	6	9	13,5					
	VACON0010-3L-0012-4	5,5	7,5	12	18,0					
575 VCA, Trifásico (Sólo para América del Norte)	VACON0010-3L-0002-7	0,75	1	1,7	2,6	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18
	VACON0010-3L-0003-7	1,5	2	2,7	4,1					
	VACON0010-3L-0004-7	2,2	3	3,9	5,9					
	VACON0010-3L-0006-7	4	5	6,1	9,2					
	VACON0010-3L-0009-7	5,5	7,5	9	13,5					

APLICACIONES TÍPICAS: ASPECTOS TÉCNICOS MÁS IMPORTANTES:

- | | | |
|-------------------|--|---|
| • Bombas | • Interfaz de pulsadores fácil de utilizar | • Montaje sin separación entre unidades |
| • Ventiladores | • E/S estándar amplio | • Filtro EMC integrado |
| • Transportadores | • Ventilador de refrigeración controlado por temperatura | • Controlador PI integrado |



VACON 20 - POSIBILIDADES Y RENDIMIENTO

El variador Vacon 20 de CA dispone de la funcionalidad y las posibilidades para llevar el control de la máquina a un nivel completamente nuevo. El tamaño compacto junto con una amplia gama de potencias es la base, pero las posibilidades de Vacon 20 no acaban aquí. Una funcionalidad PLC integrada, que es una de las más flexibles en el mercado, hace que este producto se adapte a cualquier trabajo y suponga ahorro de costes para el usuario.

Para que los fabricantes de maquinaria puedan competir en un mercado cada vez más competitivo, es importante buscar continuamente soluciones para mejorar el rendimiento y la eficiencia de costes. Vacon ofrece nuevas posibilidades en este sentido.

AMPLIA GAMA DE POTENCIAS

Vacon 20 está disponible en todas las tensiones comunes en la gama de 110-600V. Combinado con una amplia gama de potencias de hasta 18.5kW /25 HP. Vacon 20 tiene algo para los clientes de todo el globo. Los clientes pueden reducir costes implementando nuestra gama de productos armonizada y aumentar la eficiencia en sus procesos de fabricación. En corrientes por encima de 16A, el variador está disponible con un inductancia de filtrado armónico integrado para las redes públicas según la IEC61000-3-12.

RENDIMIENTO DE VANGUARDIA

El rendimiento de la maquinaria depende mucho del rendimiento del variador de CA. En Vacon 20 hemos hecho todo lo posible por reducir los tiempos de respuesta de los ciclos y maximizar el rendimiento del control del variador. La interfaz RS-485 integrada ofrece una interfaz de control de serie simple y rentable para el convertidor. Con los módulos opcionales, Vacon 20 se puede conectar a casi cualquier sistema de bus de campo, incluidos CANOpen, DeviceNet and Profibus DP.

CONFIGURACIÓN E INSTALACIÓN RÁPIDA

Vacon 20 ha sido diseñado para una fabricación de volúmenes eficiente donde cada segundo en tiempo de instalación y configuración cuenta. Las terminales de fácil acceso, el montaje de carril DIN integrado y la herramienta de copia de parámetros MCA que puede clonar las configuraciones sin electricidad en el convertidor son sólo ejemplos de las características que contribuyen a reducir el tiempo de arranque.

FUNCIONALIDAD PLC INTEGRADA BASADA EN IEC61131-3

La funcionalidad PLC integrada presenta una oportunidad para aumentar el rendimiento de la máquina y reducir costes. El cliente puede construir su propia lógica de control en el convertidor y utilizar el E/S sin utilizar el variador para que realice otras tareas de la máquina. Otra característica única de Vacon 20 es que la lista de parámetros se puede modificar libremente y que los ajustes de los parámetros específicos de la aplicación y los ajustes de fábrica se pueden crear. Utilizando las oportunidades de optimización del control del variador Vacon 20 puede mejorar y hacer que los diseños de la máquina más rentables.

VENTAJAS CLAVE:

- Conectividad a bus de campo
- Copia de parámetros sin electricidad
- Software personalizado

CARACTERÍSTICAS Y DIMENSIONES

Tensión de alimentación	Tipo de variador de CA	Potencia		Corriente del motor		Tamaño del bastidor	Dimensiones An x Al x P		Peso		
		kW	HP	I _N (A)	1,5 x I _N (A)		mm	pulgadas	kg	lb	
110-120 VCA, Monofásico (Sólo para América del Norte)	VACON0020-1L-0001-1	0,25	0,33	1,7	2,6	MI2	90 x 195 x 102	3,54 x 7,68 x 4,02	0,7	1,54	
	VACON0020-1L-0002-1	0,37	0,5	2,4	3,6						
	VACON0020-1L-0003-1	0,55	0,75	2,8	4,2						
	VACON0020-1L-0004-1	0,75	1	3,7	5,6	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18	
	VACON0020-1L-0005-1	1,1	1,5	4,8	7,2						
208-240 VCA, Monofásico	VACON0020-1L-0001-2	0,25	0,33	1,7	2,6	MI1	66 x 160 x 99	2,60 x 6,30 x 3,90	0,55	1,21	
	VACON0020-1L-0002-2	0,37	0,5	2,4	3,6						
	VACON0020-1L-0003-2	0,55	0,75	2,8	4,2						
	VACON0020-1L-0004-2	0,75	1	3,7	5,6	MI2	90 x 195 x 102	3,54 x 7,68 x 4,02	0,7	1,54	
	VACON0020-1L-0005-2	1,1	1,5	4,8	7,2						
	VACON0020-1L-0007-2	1,5	2	7	10,5	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18	
	VACON0020-1L-0009-2	2,2	3	9,6	14,4						
	208-240 VCA, Trifásico	VACON0020-3L-0001-2	0,25	0,33	1,7	2,6	MI1	66 x 160 x 99	2,60 x 6,30 x 3,90	0,55	1,21
		VACON0020-3L-0002-2	0,37	0,5	2,4	3,6					
VACON0020-3L-0003-2		0,55	0,75	2,8	4,2						
VACON0020-3L-0004-2		0,75	1	3,7	5,6	MI2	90 x 195 x 102	3,54 x 7,68 x 4,02	0,7	1,54	
VACON0020-3L-0005-2		1,1	1,5	4,8	7,2						
VACON0020-3L-0007-2		1,5	2	7	10,5	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18	
VACON0020-3L-0011-2		2,2	3	11	16,5						
VACON0020-3L-0012-2		3	4	12,5	18,8	MI4	165 x 370 x 165	6,5 x 14,6 x 6,5	8	18	
VACON0020-3L-0017-2		4	5	17,5	26,3						
VACON0020-3L-0025-2		5,5	7,5	25	37,5						
VACON0020-3L-0031-2		7,5	10	31	46,5	MI5	165 x 414 x 202	6,5 x 16,3 x 8	10	22	
VACON0020-3L-0038-2		11	15	38	57						
380-480 VCA, Trifásico		VACON0020-3L-0001-4	0,37	0,5	1,3	2,0	MI1	66 x 160 x 99	2,60 x 6,30 x 3,90	0,55	1,21
		VACON0020-3L-0002-4	0,55	0,75	1,9	2,9					
		VACON0020-3L-0003-4	0,75	1	2,4	3,6					
	VACON0020-3L-0004-4	1,1	1,5	3,3	5,0	MI2	90 x 195 x 102	3,54 x 7,68 x 4,02	0,7	1,54	
	VACON0020-3L-0005-4	1,5	2	4,3	6,5						
	VACON0020-3L-0006-4	2,2	3	5,6	8,4	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18	
	VACON0020-3L-0008-4	3	5	7,6	11,4						
	VACON0020-3L-0009-4	4	6	9	13,5						
	VACON0020-3L-0012-4	5,5	7,5	12	18,0	MI4	165 x 370 x 165	6,5 x 14,6 x 6,5	8	18	
	VACON0020-3L-0016-4	7,5	10	16	24						
	VACON0020-3L-0023-4	11	15	23	34,5						
	VACON0020-3L-0031-4	15	20	31	46,5	MI5	165 x 414 x 202	6,5 x 16,3 x 8	10	22	
	VACON0020-3L-0038-4	18,5	25	38	57						
	575 VCA, Trifásico (Sólo para América del Norte)	VACON0020-3L-0002-7	0,75	1	1,7	2,6	MI3	100 x 255 x 109	3,94 x 10,04 x 4,29	0,99	2,18
		VACON0020-3L-0003-7	1,5	2	2,7	4,1					
VACON0020-3L-0004-7		2,2	3	3,9	5,9						
VACON0020-3L-0006-7		4	5	6,1	9,2						
VACON0020-3L-0009-7		5,5	7,5	9	13,5						

APLICACIONES TÍPICAS:

- Bombas y Ventiladores
- Transportadores
- Embalaje, procesado y máquinas de lavar

ASPECTOS TÉCNICOS MÁS IMPORTANTES:

- Amplia gama de potencia de hasta 18,5kW
- Alto rendimiento y funcionalidad
- E/S completo + opción de soporte de tarjetas
- Rápida instalación y configuración
- Inductancia integrada como opción en los tipos ≥16A



VACON 20 COLD PLATE - FLEXIBILIDAD EN LA REFRIGERACIÓN

Si el entorno es más exigente o ya hay un medio de refrigeración como un líquido, la refrigeración del variador de CA aún se puede optimizar más. Vacon 20 Cold Plate comparte el control y la topología de potencia con el variador estándar Vacon 20, pero ofrece completamente nuevas posibilidades para crear soluciones de refrigeración únicas y eficientes.

Los convertidores CA son productos de energía extremadamente eficientes; sin embargo generan un poco de calor. La pérdida de calor puede algunas veces limitar la densidad del diseño de la máquina, especialmente si se monta en una envolvente sellado simplemente porque no hay circulación de aire. El diseño de Vacon 20 Cold Plate se basa en una superficie plana del variador en la que se concentra la mayor parte de pérdidas de calor. Adjuntando esta superficie a un elemento de refrigeración, es decir, a la "placa fría", la refrigeración del variador puede funcionar incluso en las circunstancias más exigentes.

USO DE CUALQUIER MEDIO DE REFRIGERACIÓN

Puesto que la refrigeración se realiza mediante un interfaz de refrigeración transparente, es posible utilizar un medio de refrigeración diferente según la situación. Al montar el variador a un disipador de calor con amplias aletas de refrigeración, se crea un variador totalmente refrigerado de manera pasiva. Como alternativa, el variador se puede montar sobre una placa, que se refrigera con líquido para crear una solución del convertidor refrigerada por líquido. Otro medio de refrigeración posible incluye diferentes tipos de refrigerantes o construcciones de metal con una masa conductora de energía de calor alta.

ENVOLVENTES SELLADOS COMPACTOS

Si el transporte de calor desde el variador no se gestiona mediante circulación de aire, sino mediante el calor

conducido fuera de la envolvente a través de una superficie de metal plana, el sellado de la envolvente no es un ya un factor que afecte de manera significativa la refrigeración. Así es posible crear e instalar la envolvente del variador en entornos con grandes cantidades de polvo y humedad. Vacon 20 es tiene una forma única que se ha diseñado para permitir soluciones de envolventes finos y planos que se pueden integrar perfectamente en la construcción de la máquina que se va a crear.

FUNCIONALIDAD PLC INTEGRADA SEGÚN IEC61131-3

Vacon 20 Cold Plate utiliza un avanzado concepto de control de la familia de productos Vacon 20, ofreciendo un rendimiento del control y una funcionalidad completa. También soporta la funcionalidad PLC integrada que permite la creación de software y soluciones específicas para la aplicación.

VENTAJAS CLAVE:

- La mayor flexibilidad en la refrigeración
- Rápida conexión del cableado E/S
- Software customizado



CARACTERÍSTICAS Y DIMENSIONES

Tensión de alimentación	Tipo de variador de CA	Potencia		Corriente del motor		Tamaño del bastidor	Dimensiones An x Al x P		Peso	
		kW	HP	I _N (A)	1,5 x I _N (A)		mm	pulgadas	kg	lb
380-480 VCA, Trifásico	VACON0020-3L-0003-4-CP	0,75	1	2,4	3,6	MS2	133 x 159 x 80	5,24 x 6,26 x 3,15	2	4,4
	VACON0020-3L-0004-4-CP	1,1	1,5	3,3	5,0					
	VACON0020-3L-0005-4-CP	1,5	2	4,3	6,5					
	VACON0020-3L-0006-4-CP	2,2	3	5,6	8,4					
	VACON0020-3L-0008-4-CP	3,0	5	7,6	11,4	MS3	161 x 240 x 83	6,34 x 9,45 x 3,27	3	6,6
	VACON0020-3L-0009-4-CP	4,0	6	9,0	13,5					
	VACON0020-3L-0012-4-CP	5,5	7,5	12,0	18,0					
	VACON0020-3L-0016-4-CP	7,5	10	16,0	24,0					

APLICACIONES TÍPICAS:

- Maquinaria de textil
- Polipastos y grúas
- Transportadores en entornos exigentes
- Compresores y bombas de calor

ASPECTOS TÉCNICOS MÁS IMPORTANTES:

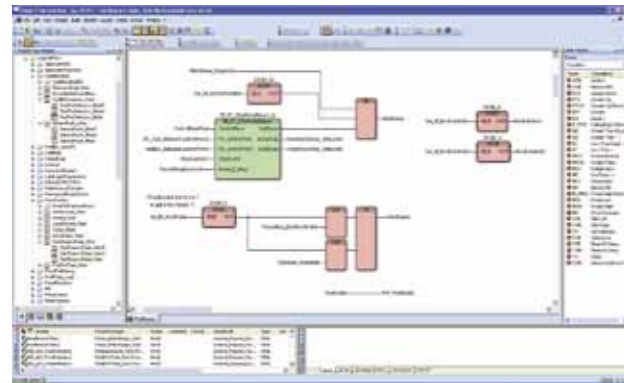
- Refrigeración de placa fría
- Diseño de baja profundidad único
- STO - Parada segura apagado según SIL2
- Alto rendimiento y funcionalidad
- Alto rango de temperatura ambiente hasta 70°C

- Inducción y apoyo al motor PM
- Chopper de frenado
- LED de estado en el variador
- Ranura de expansión para E/S o bus de campo
- Teclado manual con la función copiar
- Conector E/S de enchufe único para Fabricantes de Equipos Originales

ADAPTACIÓN DEL SOFTWARE

PROGRAMACIÓN DE VACON

La funcionalidad PLC integrada del producto Vacon 20 y la programación se realiza según IEC61131-3. La lista de parámetros y la configuración de fábrica se editan con una herramienta por separado.



INTERFAZ DE PC Y COPIA DE PARÁMETROS

La MCA [Adaptador de Microcomunicaciones] es una unidad de copiado inteligente, que se conecta a presión, para los productos Vacon 10 y Vacon 20.

- Copia de los parámetros sin electricidad en el convertidor
- Descarga de configuración directamente a la MCA desde el PC sin un variador
- Interfaz HW para la conexión de PC al variador

La copia de parámetros del variador Vacon 20 Cold Plate se realiza con el teclado de mano.

CONFIGURACIÓN E/S

Terminal	Descripción	Vacon 10	Vacon 20	Vacon 20 CP
1	+10 V _{ref} Carga máxima 10 mA	●	●	●
2	AI1 0-10V	●	●	0-10V / 0(4)-20mA*
3	GND	●	●	●
4	AI2 0-10V / 0(4)-20mA*	0(4)-20mA	●	●
5	GND	●	●	●
6	24 V _{out} Máx. 50 mA / CP 100 mA	●	●	●
7	GND/DIC*	GND	●	●
8	DI1	●	●	●
9	DI2 0-+30 V R _i = 12 kΩ	●	●	●
10	DI3 Placa fría R _i = 4 kΩ	●	●	●
13	DOC Salida digital común	GND	●	●
14	DI4 0-+30 V R _i = 12 kΩ	●	●	●
15	DI5 Placa fría R _i = 4 kΩ	●	●	●
16	DI6	●	●	●
18	SA Salida analógica	0(4)-20mA	0-10V / 0(4)-20mA*	0-10V
20	D0 Colector abierto, carga máx. 48 V/50 mA	●	●	●
22	RO13-CM Salida de relé 1	●	●	●
23	RO14-NO	●	●	●
24	RO22-NC	●	●	●
25	RO21-CM Salida de relé 2	●	●	●
26	RO24-NO	●	●	●
A	A-RS485 Modbus RTU	●	●	●
B	B-RS485 Modbus RTU	●	●	●
STO	Entradas S1, G1, S2, G2 Retroalimentación F+/F-			●

* Seleccionable



ADAPTADOR MCA



TARJETA OPCIONAL KIT DE MONTAJE



PUERTA DEL TECLADO KIT DE MONTAJE



KIT IP21/NEMA1

CARACTERÍSTICAS TÉCNICAS

Conexión eléctrica	Tensión de entrada U _m	110...120 V, -15 %...+10 % 1- 208...240 V, -15 %...+10 % 1- 208...240 V, -15 %...+10 % 3- 380...480 V, -15 %...+10 % 3- 575 V, -15 %...+10 % 3-
	Frecuencia de entrada	45...66 Hz
	Conexión a red	Una por minuto o menos (en casos normales)
Conexión del motor	Tensión de salida	0...U _m (2 x U _m con unidades de 115 V)
	Corriente de salida	Corriente continua estimada I _N a temperatura ambiente estimada sobrecarga 1,5 x I _N máx. 1 min/10 min
	Corriente de arranque/Par	Corriente 2 x I _N durante 2 s en cada período de 20 s El par depende del motor.
	Frecuencia de salida	0...320 Hz
	Resolución de frecuencia	0.01 Hz
Características de control	Método de control	Control de frecuencia U/f. Control de vector sin sensor de bucle abierto
	Frecuencia de conmutación	1,5...16 kHz; Valor predeterminado de fábrica 4 kHz (valor predeterminado 2 kHz para el modelo de 575 V) Modelos Cold Plate 6kHz
	Par de frenada	100 % x T _N con relé limitador en versión trifásica, tamaños MS2-3, MI2-5 30 % x T _N con frenado CC. Frenado de flujo dinámico disponible en todos los tipos
Condiciones ambientales	Temperatura ambiente de trabajo	-10°C (sin hielo)...+50°C: capacidad de carga estimada I _N (1L-0009-2, 3L-0007-2, 3L-0011-2 y con opciones ENC-IP21-Mix y ENC-IN01-Mix máx ambiente +40°C) Modelos Cold Plate -10°C...+70°C
	Temperatura de almacenamiento	-40°C...+70°C
	Altitud	100 % de capacidad de carga (sin reducción) hasta 1.000 m 1 % de reducción por cada 100 m por encima de 1000 m; máx. 2000 m. Cold Plate máx 3000 m
	Clase de caja de protección	MI1-3:IP20, MI4-5:IP21, Cold Plate:IP00
CEM	Inmunidad	Cumple con la normativa EN61800-3 (2004)
	Emisiones	208-240 V: CEM nivel C2: con una opción +EMC2 interna 380-480 V: CEM nivel C2: con una opción +EMC2 interna
Certificaciones	EN61800, C-Tick, Gost R, CB, CE, UL, cUL, IEC (no todas las versiones, consulte la placa de características de la unidad para obtener información más detallada)	

Código de opciones instaladas de fábrica	Descripción	Adaptabilidad		
		Vacon 10	Vacon 20	Vacon 20 CP
+EMC2	Filtro de CEM nivel C2 (incluye +QPES)	●	●	●
+QPES	Kit de puesta a tierra del cable apantallado	●	●	
+QFLG	Kit de montaje de brida para MI4 y MI5		●	
+DBIR	Resistor de freno de placa fría integrado			●

Código de opciones entregadas por separado	Descripción	Adaptabilidad		
		Vacon 10	Vacon 20	Vacon 20 CP
ENC-SLOT-MC03-13	Kit de montaje de tarjeta opcional Vacon 20 MI1-MI3		●	
ENC-SLOT-MC03-45	Kit de montaje de tarjeta opcional Vacon 20 MI4-MI5		●	
ENC-IP21-Mix	Cubierta IP21 MI1-MI3. x=1,2,3	●	●	
ENC-IN01-Mix	Kit Nema 1 MI1-MI5. x=1,2,3,4,5	●	●	
VACON-ADP-MCAA	Adaptador MCA RS-422 con copia de parámetros	●	●	
VACON-ADP-MCAA-KIT	Kit completo de MCA + cable USB	●	●	
CAB-USB/RS-485	Sólo cable USB			●
VACON-ADP-PASSIVE	Adaptador RS-422 pasivo		●	
VACON-PAN-HMDR-MC03	Kit de montaje de puerta teclado completo (cable 3.0 m)		●	●
VACON-PAN-HMTX-MC06	Teclado Magnético/Manual (cable de 1.0m)		●*	●

*Requiere VACON-ADP-PASSIVE

CÓDIGO DE DESIGNACIÓN DE TIPO

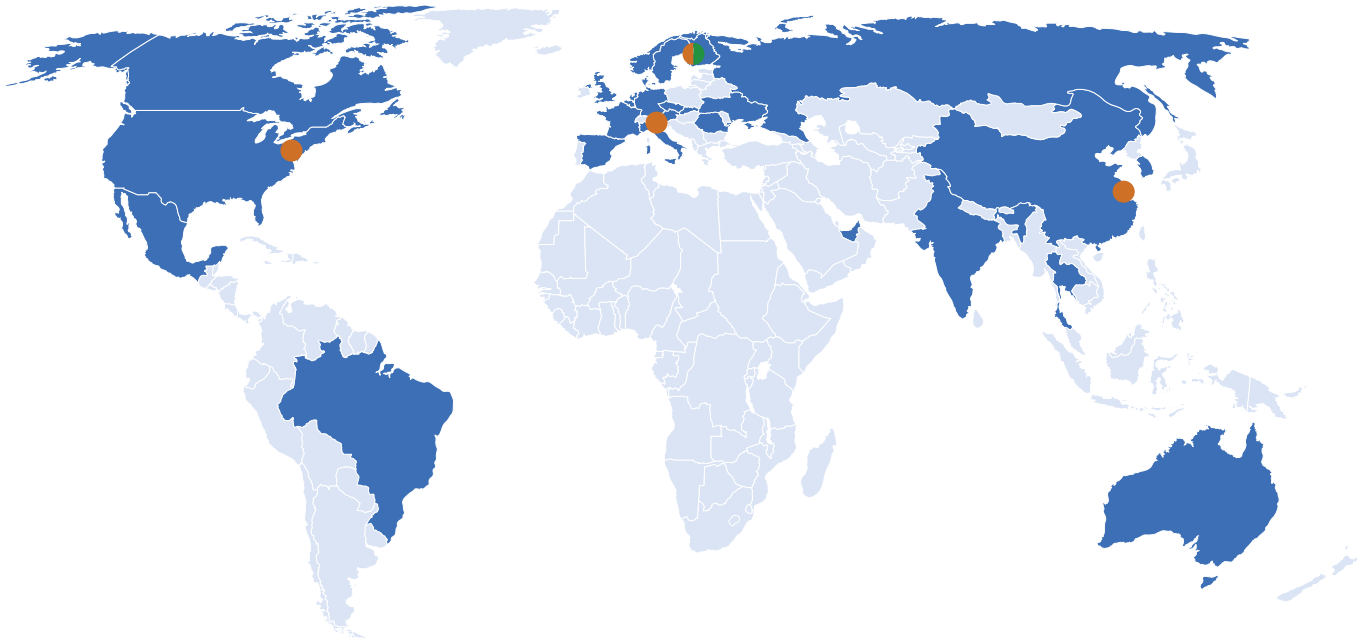
VACON 0020 - 3L - 0009 - 4 - CP + CÓDIGOS DE OPCIONES

Producto	Fases de entrada	Corriente	Voltaje	Versión	+Opciones
0020	3	L	0009	4	CP

VACON A SU SERVICIO

Vacon es un proveedor líder de variadores de ca de velocidad variable. Vacon se mueve impulsado por una pasión por diseñar, fabricar y vender sólo los mejores variadores de CA del planeta, y nada más. Los variadores de CA se utilizan para controlar motores eléctricos además de para generar energía renovable. Vacon tiene unidades de I+D y producción en Finlandia, Estados Unidos, China e Italia, y oficinas de venta en 27 países. Los variadores de CA de Vacon se venden a través de socios en aproximadamente 100 países. El servicio, el apoyo de soluciones y el desarrollo de aplicaciones de Vacon puede servirle a usted a nivel local, en cualquier lugar donde trabaje.

VACON - REALMENTE GLOBAL



● Producción e I+D ● Vacon PLC ■ Oficinas de ventas propias de Vacon ■ Atendido por el distribuidor Vacon

FABRICACIÓN

e I+D en 3 continentes

VENTAS

y centros de servicio en 27 países

SERVICE CENTER

en 52 países (incluidos los socios)

VACON
DRIVEN BY DRIVES

Distribuidor Vacon





Main

Range of product	TeSys D
Product or component type	Contacteur
Device short name	LC1D
Contacteur application	Motor control Resistive load
Utilisation category	AC-1 AC-3
Poles description	3P
Power pole contact composition	3 NO
[Ue] rated operational voltage	<= 690 V DC for power circuit <= 690 V AC 25...400 Hz for power circuit
[Ie] rated operational current	9 A (<= 60 °C) at <= 440 V AC AC-3 for power circuit 25 A (<= 60 °C) at <= 440 V AC AC-1 for power circuit
Motor power kW	5.5 kW at 660...690 V AC 50/60 Hz 5.5 kW at 500 V AC 50/60 Hz 4 kW at 415...440 V AC 50/60 Hz 4 kW at 380...400 V AC 50/60 Hz 2.2 kW at 220...230 V AC 50/60 Hz
Motor power HP (UL / CSA)	7.5 hp at 575/600 V AC 50/60 Hz for 3 phases motors 5 hp at 460/480 V AC 50/60 Hz for 3 phases motors 2 hp at 230/240 V AC 50/60 Hz for 3 phases motors 2 hp at 200/208 V AC 50/60 Hz for 3 phases motors 1 hp at 230/240 V AC 50/60 Hz for 1 phase motors 0.5 hp at 115 V AC 50/60 Hz for 1 phase motors
Control circuit type	DC standard
Control circuit voltage	24 V DC
Auxiliary contact composition	1 NO + 1 NC
[Uimp] rated impulse withstand voltage	6 kV conforming to IEC 60947
Overvoltage category	III
[Ith] conventional free air thermal current	10 A at <= 60 °C for signalling circuit 25 A at <= 60 °C for power circuit
Irms rated making capacity	250 A DC for signalling circuit conforming to IEC 60947-5-1 140 A AC for signalling circuit conforming to IEC 60947-5-1 250 A at 440 V for power circuit conforming to IEC 60947
Rated breaking capacity	250 A at 440 V for power circuit conforming to IEC 60947
[Icw] rated short-time withstand current	61 A <= 40 °C 1 min power circuit 30 A <= 40 °C 10 min power circuit 140 A 100 ms signalling circuit 120 A 500 ms signalling circuit 100 A 1 s signalling circuit 210 A <= 40 °C 1 s power circuit 105 A <= 40 °C 10 s power circuit
Associated fuse rating	20 A gG at <= 690 V coordination type 2 for power circuit 25 A gG at <= 690 V coordination type 1 for power circuit 10 A gG for signalling circuit conforming to IEC 60947-5-1
Average impedance	2.5 mOhm at 50 Hz - Ith 25 A for power circuit

[Ui] rated insulation voltage	600 V for signalling circuit certifications UL 600 V for signalling circuit certifications CSA 690 V for signalling circuit conforming to IEC 60947-1 600 V for power circuit certifications UL 600 V for power circuit certifications CSA 690 V for power circuit conforming to IEC 60947-4-1
Electrical durability	2 Mcycles 9 A AC-3 at $U_e \leq 440$ V 0.6 Mcycles 25 A AC-1 at $U_e \leq 440$ V
Power dissipation per pole	0.2 W AC-3 1.56 W AC-1
Safety cover	With
Mounting support	Plate Rail
Standards	EN 60947-4-1 EN 60947-5-1 IEC 60947-4-1 IEC 60947-5-1 UL 508 CSA C22.2 n° 14
Product certifications	BV CCC CSA DNV GL GOST RINA UL LROS
Connections - terminals	Control circuit: screw clamp terminals 2 cable(s) 1...4 mm ² - cable stiffness: solid - without cable end Control circuit: screw clamp terminals 1 cable(s) 1...4 mm ² - cable stiffness: solid - without cable end Control circuit: screw clamp terminals 2 cable(s) 1...2.5 mm ² - cable stiffness: flexible - with cable end Control circuit: screw clamp terminals 1 cable(s) 1...4 mm ² - cable stiffness: flexible - with cable end Control circuit: screw clamp terminals 2 cable(s) 1...4 mm ² - cable stiffness: flexible - without cable end Control circuit: screw clamp terminals 1 cable(s) 1...4 mm ² - cable stiffness: flexible - without cable end Power circuit: screw clamp terminals 2 cable(s) 1...4 mm ² - cable stiffness: solid - without cable end Power circuit: screw clamp terminals 1 cable(s) 1...4 mm ² - cable stiffness: solid - without cable end Power circuit: screw clamp terminals 2 cable(s) 1...2.5 mm ² - cable stiffness: flexible - with cable end Power circuit: screw clamp terminals 1 cable(s) 1...4 mm ² - cable stiffness: flexible - with cable end Power circuit: screw clamp terminals 2 cable(s) 1...4 mm ² - cable stiffness: flexible - without cable end Power circuit: screw clamp terminals 1 cable(s) 1...4 mm ² - cable stiffness: flexible - without cable end
Tightening torque	Control circuit: 1.7 N.m - on screw clamp terminals - with screwdriver Philips No 2 Control circuit: 1.7 N.m - on screw clamp terminals - with screwdriver flat Ø 6 mm Power circuit: 1.7 N.m - on screw clamp terminals - with screwdriver Philips No 2 Power circuit: 1.7 N.m - on screw clamp terminals - with screwdriver flat Ø 6 mm
Operating time	16...24 ms opening 53.55...72.45 ms closing
Safety reliability level	B10d = 2000000 cycles contactor with mechanical load conforming to EN/ISO 13849-1 B10d = 1369863 cycles contactor with nominal load conforming to EN/ISO 13849-1
Mechanical durability	30 Mcycles
Operating rate	3600 cyc/h at ≤ 60 °C

Complementary

Coil technology	Built-in bidirectional peak limiting diode suppressor
Control circuit voltage limits	0.7...1.25 U _c at 60 °C operational 0.1...0.25 U _c at 60 °C drop-out
Time constant	28 ms
Inrush power in W	5.4 W at 20 °C
Hold-in power consumption in W	5.4 W at 20 °C
Auxiliary contacts type	Type mirror contact (1 NC) conforming to IEC 60947-4-1 Type mechanically linked (1 NO + 1 NC) conforming to IEC 60947-5-1
Signalling circuit frequency	25...400 Hz
Minimum switching current	5 mA for signalling circuit
Minimum switching voltage	17 V for signalling circuit
Non-overlap time	1.5 ms on energisation (between NC and NO contact) 1.5 ms on de-energisation (between NC and NO contact)
Insulation resistance	> 10 MOhm for signalling circuit

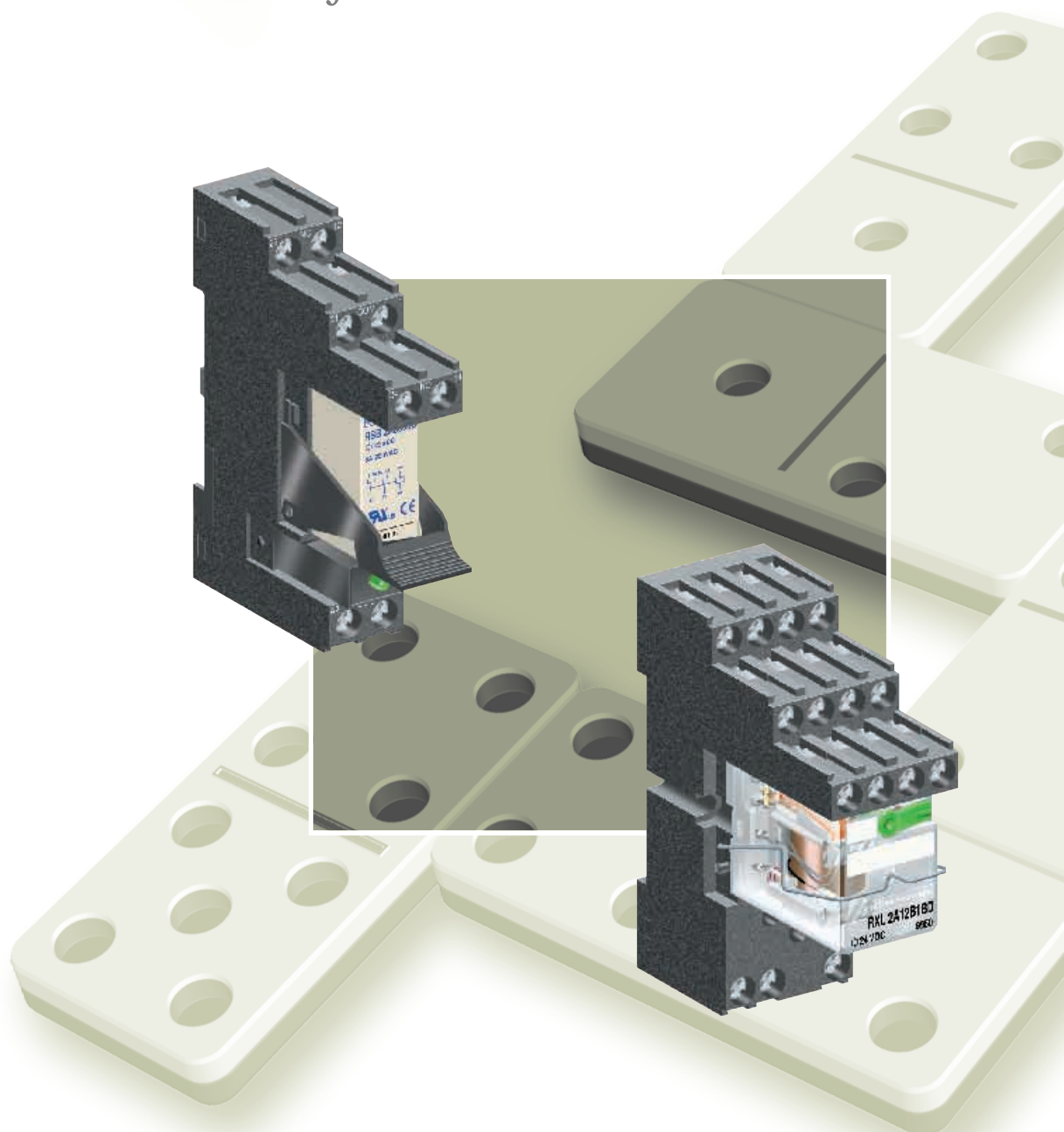
Environment

IP degree of protection	IP2x front face conforming to IEC 60529
Protective treatment	TH conforming to IEC 60068-2-30
Pollution degree	3
Ambient air temperature for operation	-5...60 °C
Ambient air temperature for storage	-60...80 °C
Permissible ambient air temperature around the device	-40...70 °C at U _c
Operating altitude	3000 m without derating in temperature
Fire resistance	850 °C conforming to IEC 60695-2-1
Flame retardance	V1 conforming to UL 94
Mechanical robustness	Shocks contactor closed 15 Gn for 11 ms Shocks contactor open 10 Gn for 11 ms Vibrations contactor closed 4 Gn, 5...300 Hz Vibrations contactor open 2 Gn, 5...300 Hz
Height	77 mm
Width	45 mm
Depth	95 mm
Product weight	0.48 kg

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS	Compliant - since 0627 - Schneider Electric declaration of conformity download declaration of conformity
REACH	Reference not containing SVHC above the threshold
Product environmental profile	Available Download Product Environmental
Product end of life instruction	Need no specific recycling operations Download Product environmental

Telemecanique
Zelio Relay
complementary
and easy to assemble



RS interface relays

- Compact dimensions, enabling multiplication of contacts in electrical enclosures.
- Plug-in relay, fast and easy interchangeability.
- Simplicity; no adjustment required in normal use.
- Function marking on relay.



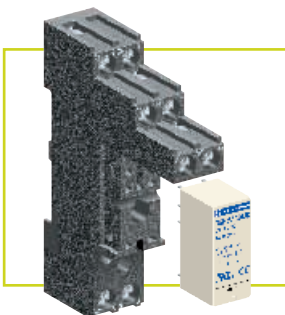
CONTACT				COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	Rated voltage								Rated power VA W	
				V DC				V AC 50-60 Hz				0.75	0.45
2	8	250/400	5	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V		
* RSB2A080				JD	BD	ED	FD	B7	E7	F7	P7		



CONTACT				COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	Rated voltage								Rated power VA W	
				V DC				V AC 50-60 Hz				0.75	0.45
1	12	250/400	5	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V		
* RSB1A120				JD	BD	ED	FD	B7	E7	F7	P7		



CONTACT				COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	Rated voltage								Rated power VA W	
				V DC				V AC 50-60 Hz				0.75	0.45
1	16	250/400	5	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V		
* RSB1A160				JD	BD	ED	FD	B7	E7	F7	P7		

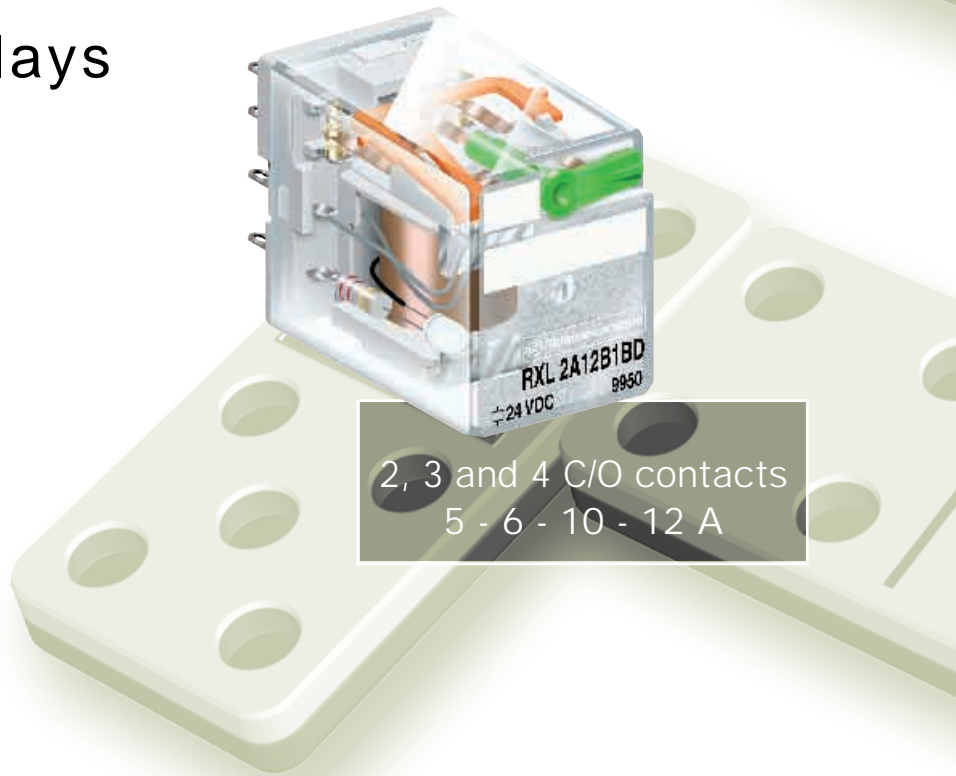


* insert an S after the complete product reference to order the relay and its socket :

RSB2A080JDS

RX miniature relays

- Choice of number of contacts.
- Relay conforming to international standards.
- Adaptable to all common voltages.
- Fast and easy “plug-in” interchangeability.
- Adjustment by manual control; LED relay state display.
- Simplicity; no adjustment required in normal use.



2, 3 and 4 C/O contacts
5 - 6 - 10 - 12 A



CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	LED		Rated voltage				Rated power					
				without	with	V DC				V AC 50-60 Hz				VA	W
2	12	250/400	5			12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	1.6	0.9
RXL2A12B						1	2	JD	BD	ED	FD	B7	E7	F7	P7



CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	LED		Rated voltage				Rated power					
				without	with	V DC				V AC 50-60 Hz				VA	W
3	10	250/400	5			12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	1.6	0.9
RXL3A10B						1	2	JD	BD	ED	FD	B7	E7	F7	P7



CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	LED		Rated voltage				Rated power					
				without	with	V DC				V AC 50-60 Hz				VA	W
4	6	250/400	5			12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	1.6	0.9
RXL4A06B						1	2	JD	BD	ED	FD	B7	E7	F7	P7



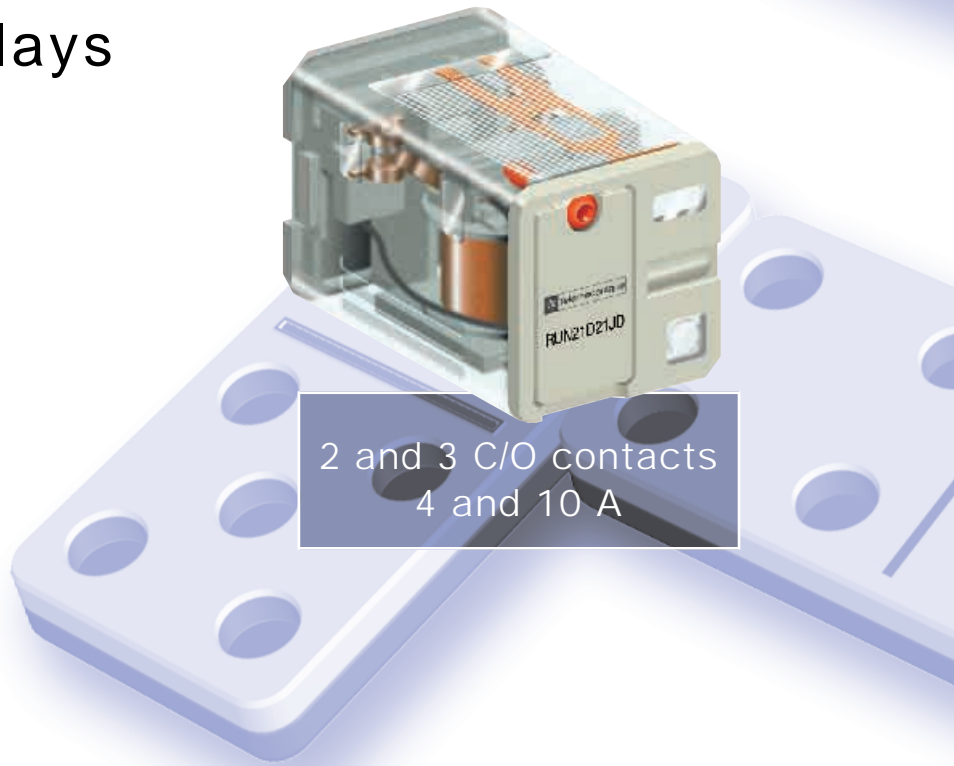
CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	LED		Rated voltage				Rated power					
				without	with	V DC				V AC 50-60 Hz				VA	W
2	5	250/250	5			12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	1.9	0.9
RXN21E1						1	2	JD	BD	ED	FD	B7	E7	F7	P7



CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	LED		Rated voltage				Rated power					
				without	with	V DC				V AC 50-60 Hz				VA	W
4	5	250/250	5			12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	1.9	0.9
RXN41G1						1	2	JD	BD	ED	FD	B7	E7	F7	P7

RU universal relays

- Choice of plug type (universal/flat tags).
- Extremely wide power range.
- Adaptable to all common voltages.
- Adjustment by manual control, LED relay state display.
- Possibility of paralleling simplifies data processing.
- Fast and easy “plug-in” interchangeability.
- Simplicity; no adjustment required in normal use.



CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	LED		V DC				V AC 50-60 Hz				Rated power VA W	
				without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	2.3	1.2
2	10	220/250	10mA 17V	without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	2.3	1.2
RUN21D2						1	2	JD	BD	ED	FD	B7	E7	F7	P7



CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	LED		V DC				V AC 50-60 Hz				Rated power VA W	
				without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	2.3	1.2
3	10	220/250	10mA 17V	without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	2.3	1.2
RUN31A2						1	2	JD	BD	ED	FD	B7	E7	F7	P7



CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	LED		V DC				V AC 50-60 Hz				Rated power VA W	
				without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	2.3	1.2
3	4	220/250	3mA 5V	without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	2.3	1.2
RUN33A2						1	2	JD	BD	ED	FD	B7	E7	F7	P7



CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	LED		V DC				V AC 50-60 Hz				Rated power VA W	
				without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	3	1.5
2	10	220/250	20	without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	3	1.5
RUN21C2						1	2	JD	BD	ED	FD	B7	E7	F7	P7





CONTACT						COIL									
Number & type	Rated current A	Max switching voltage DC/AC	Min switching voltage DC	DEL		V DC				V AC 50-60 Hz				Rated power VA W	
				without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	3	1.5
3	10	220/250	20	without	with	12 V	24 V	48 V	120 V	24 V	48 V	120 V	230 V	3	1.5
RUN31C2						1	2	JD	BD	ED	FD	B7	E7	F7	P7


RUZ sockets


- **DIN rail or panel mounting.**
- **Easy integration into existing equipment.**
- **Cage terminal block connection.**
- **Simplicity of installation and connection.**
- **Conforms to international standards.**
- **A range of external accessories plug directly into socket.** (protection module, LED state display).
- **Highly compact enabling insertion of more functions in enclosures.**




	TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
	Coil/contact mixed	None	400 VAC	10 A	H x W x D 66.5 x 37.5 x 25 mm
	RUZ1D mixed	Type E2			75 x 38 x 26 mm

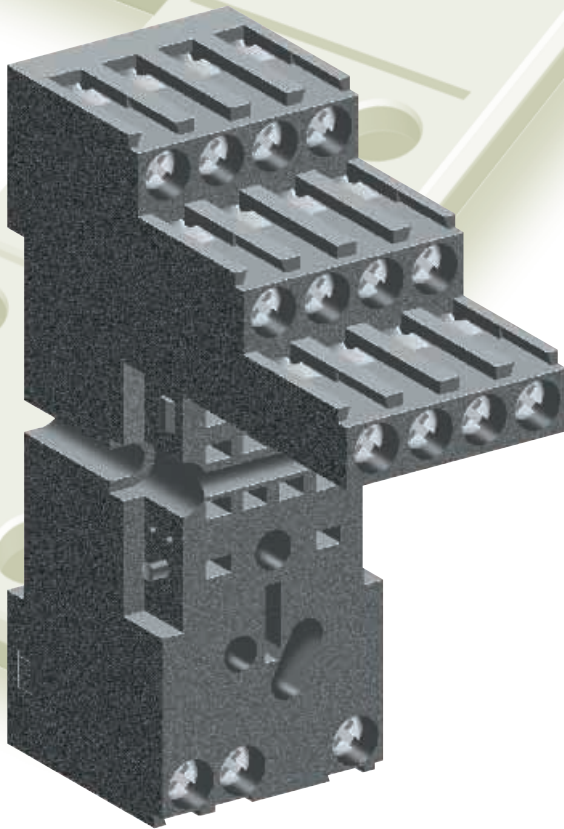
	TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
	Coil/contact mixed	None	400 VAC	10 A	H x W x D 66.5 x 37.5 x 25 mm
	RUZ1A mixed	Type E2			75 x 38 x 26 mm

	TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
	Coil/contact mixed	None	400 VAC	10 A	H x W x D 66.5 x 37.5 x 25 mm
	RUZ1A mixed	Type E2			75 x 38 x 26 mm

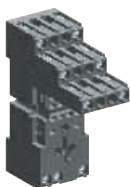
	TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
	Coil/contact mixed	None	250 VAC	10 A	H x W x D 72 x 44 x 26 mm

	TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
	Coil/contact mixed	None	250 VAC	10 A	H x W x D 72 x 44 x 26 mm

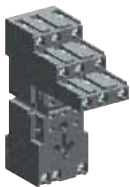
RXZE sockets



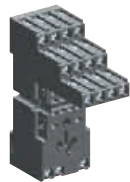
- **DIN rail or panel mounting.**
- **Possibility of paralleling.**
- **Cage terminal block connection.**
- **Simplicity of installation and connection.**
- **Conforms to international standards.**
- **Easy integration into existing equipment.**
- **Highly compact enabling insertion of more functions in enclosures.**
- **A range of external accessories plug directly into socket.** (protection module, LED state display).



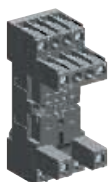
TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
Coil/contact				H x W x D
separate RXZE1S108M	Type E	300 VAC	12 A	75 x 27 x 61 mm
mixed RXZE1M114	None		10 A	



TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
Coil/contact				H x W x D
separate RXZE1S111M	Type L	300 VAC	12 A	75 x 27 x 61 mm



TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
Coil/contact				H x W x D
separate RXZE1S114M	Type E	300 VAC	12 A	75 x 27 x 61 mm
mixed RXZE1M114	None		10 A	

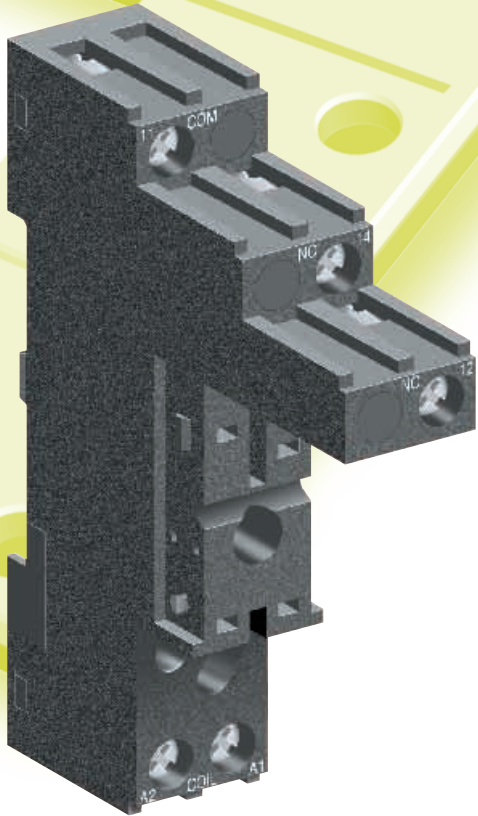


TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
Coil/contact				H x W x D
separate RXZE1M108M	Type E	300 VAC	12 A	75 x 27 x 61 mm
mixed RXZ7G	Type L	250 VAC	5 A	74 x 27.4 x 42 mm
mixed RXZE1M114	None	300 VAC	10 A	66 x 29.5 x 29 mm



TERMINAL ARRANGEMENT	MODULE	VOLTAGE	CURRENT	DIMENSIONS
Coil/contact				H x W x D
separate RXZE1M114M	Type E	300 VAC	12 A	75 x 27 x 61 mm
mixed RXZ7G	Type L	250 VAC	5 A	74 x 27.4 x 42 mm
mixed RXZE1M114	None	300 VAC	10 A	66 x 29.5 x 29 mm

RSZE sockets



- **DIN rail or panel mounting.**
- **Cage terminal block connection.**
- **Conforms to international standards.**
- **Simplicity of installation and connection.**
- **Possibility of paralleling.**
- **Easy integration into existing equipment.**
- **Function marking on socket.**
- **A range of external accessories plug directly into socket.** (protection module, LED state display).



TERMINAL ARRANGEMENT

Coil/contact
separate

MODULE

Yes
Type E

VOLTAGE

300 VAC

CURRENT

12 A

DIMENSIONS

H x W x D
78.5 x 15.5 x 61 mm

RSZE1S48M



TERMINAL ARRANGEMENT

Coil/contact
separate

MODULE

Yes
Type E

VOLTAGE

300 VAC

CURRENT

12 A

DIMENSIONS

H x W x D
78.5 x 15.5 x 61 mm

RSZE1S35M



TERMINAL ARRANGEMENT

Coil/contact
separate

MODULE

Yes
Type E

VOLTAGE

300 VAC

CURRENT

12 A

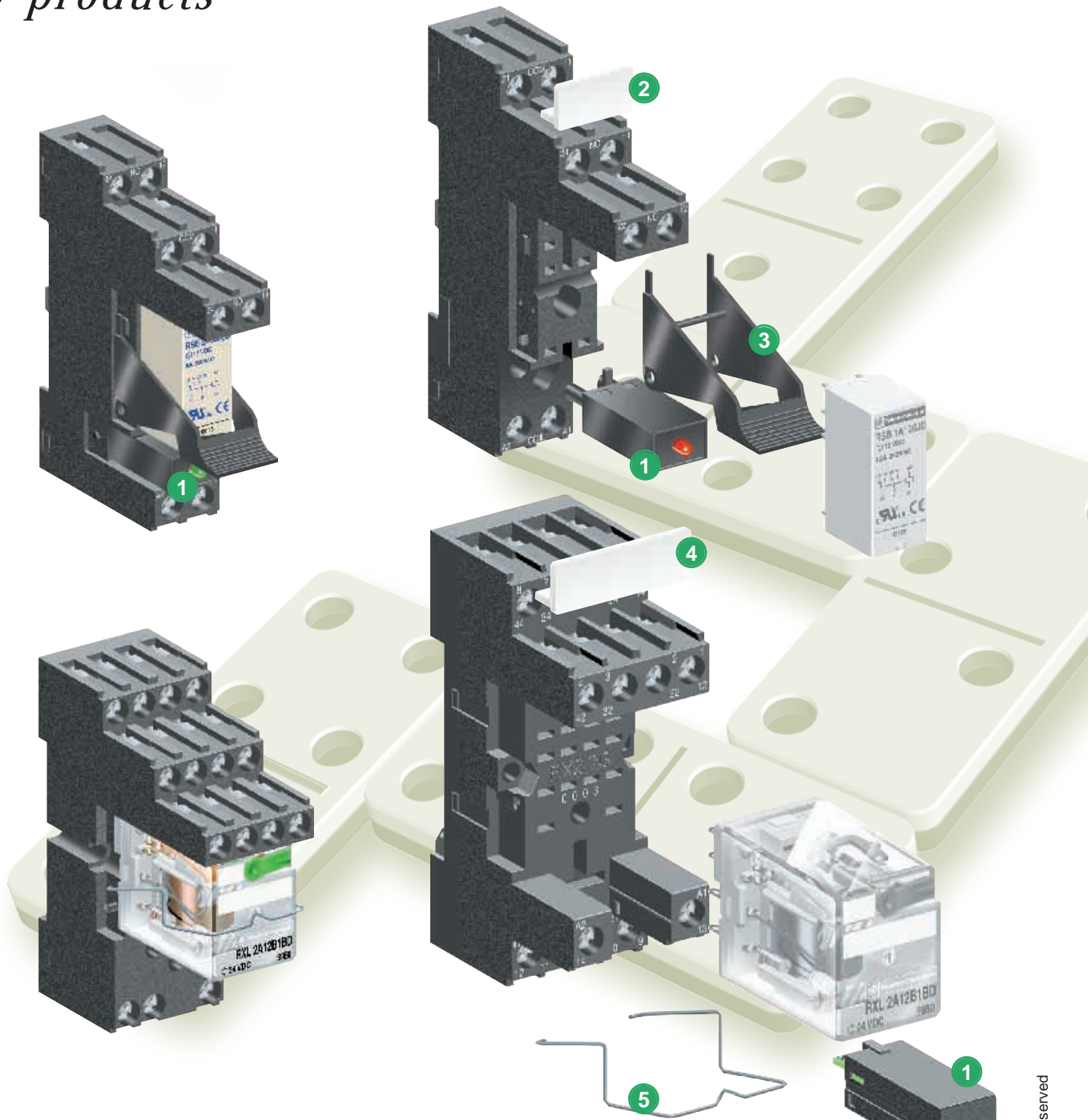
DIMENSIONS

H x W x D
78.5 x 15.5 x 61 mm

RSZE1S48M

Accessories

New products



- 1 Diode
- Surge Suppressor + green LED (DC)
- Surge Suppressor + green LED (AC)
- RC circuit

- RZM 040 .
- RZM 031 ...
- RZM 021 ..
- RZM 041 ...

(● according to voltage)

- 2 Label
- 3 Maintaining clamp
- 4 Label
- 5 Maintaining clamp

- RSZL300
- RSZR215
- RXZL320
- RXZR235

Schneider Electric Industries S.A.

5, rue Nadar
92506 Rueil-Malmaison
Cedex - France
Tel: (33) 01 41 29 82 00
Fax: (33) 01 47 51 80 20

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Design, illustration and production :  ATTR - Tel: (33) 01 43 60 91 66

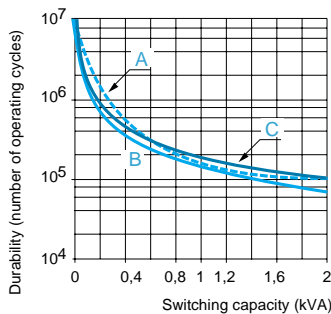
Relay type	RSB 2A080●●	RSB 1A120●●	RSB 1A160●●
Contact characteristics			
Number and type of contacts	2 C/O	1 C/O	1 C/O
Contact materials	(AgNi)		
Conventional rated thermal current (Ith) For temperature ≤ 40°C	A 8	12	16
Maximum operating rate In operating cycles/h	No-load	72 000	
	Under load	600	
Switching voltage	Minimum	V 5	
	Maximum	V ~ 400, --- 250	
Maximum breaking capacity	VA 2000	3000	4000

Coil characteristics			
Rated voltage (Un)	~	V 24...240, 50/60 Hz	
	---	V 6...110	
Average consumption	~	VA 0.75	
	---	W 0.45	
Permissible voltage variation		0.8...1.1 Un (50/60 Hz or ---) à 20 °C	
Drop-out voltage threshold	~	≥ 0.15	
	---	≥ 0.1 Un	

Environment			
Conforming to standards	Standard version	IEC 61810-1	
Approvals (pending)	Standard version	UL, CSA	
Ambient air temperature around the device	Storage	°C	- 40...+ 85
	Operation	°C	--- - 40...+ 85, ~ - 40...+ 70
Vibration resistance	Conforming to IEC 68-2-6	> 10 gn (10...150 Hz)	
Degree of protection		IP 40	
Shock resistance		10 gn (closing), 5 gn (opening)	
Mechanical durability	In millions of operating cycles	≥ 30	
Operating time (response time)	Between coil energisation and making of the On-delay contact	~	ms About 12
		---	ms About 9
	Between coil de-energisation and making of the Off-delay contact	~	ms About 10
		---	ms About 4
Electrical durability In millions of operating cycles/h	Resistive load	8 A - 250 V : ≥ 0.1	
	Inductive load	See curves below	

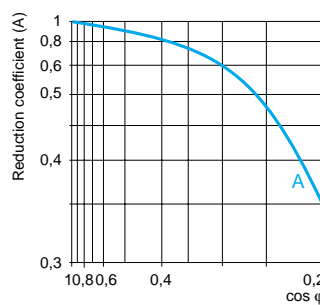
Insulation characteristics			
Rated insulation voltage (Ui)	Conforming to IEC 947	V	400
Insulation class	Conforming to VDE 0110		C 250
Dielectric strength (rms voltage)	Between coil and contact	~	V 5000
	Between poles		V 2500
	Between contacts	~	V 1000

Electrical durability of the contacts
Resistive load ~

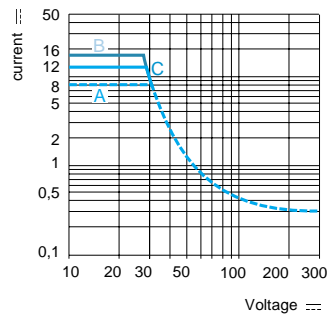


- A RSB 2A080●●
- B RSB 1A160●●
- C RSB 1A120●●

Reduction coefficient for inductive load ~
(depending on power factor cos φ)



Maximum switching capacity on a resistive load ---



Durability (inductive load) = durability (resistive load) x reduction coefficient.

References



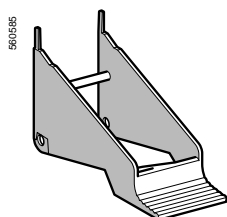
RSB 2A080BD + RSZ E1S48M



RSB 1A120JD + RZM 030FPD + RSZ E1S35M



RSB 1A160BD + RSZ E1S48M



RSZ 215

Relays for standard applications

Number of C/O contacts	Conventional rated thermal current	Sold in lots of	Unit reference, to be completed by adding the control voltage code (1) (2)	Weight
	A			kg
2	8	10	RSB 2A080●●	0.014
1	12	10	RSB 1A120●●	0.014
	16	10	RSB 1A160●●	0.014

Protection modules

Description	Type	Voltage	Sold in lots of	Unit reference	Weight
		V			kg
Diode	E	—	6...230	10 RZM 040W	0.003
Diode + LED	E	—	6...24	10 RZM 031RB	0.004
		—	24...60	10 RZM 031BN	0.004
		—	110...230	10 RZM 031FPD	0.004
Varistor + LED	E	— or ~	6...24	10 RZM 021RB	0.005
		— or ~	24...60	10 RZM 021BN	0.005
		— or ~	110...230	10 RZM 021FP	0.005
RC circuit	E	~	24...60	10 RZM 041BN7	0.010
		~	110...240	10 RZM 041FU7	0.010

Sockets - 12 A, ~ 300 V

For use with	Sold in lots of	Unit reference	Weight
RSB 2A080 and RSB 1A160	10	RSZ E1S48M	0.050
RSB 1A120	10	RSZ E1S35M	0.060

Accessories

Application	Sold in lots of	Unit reference	Weight
Maintaining clamp	10	RSZ R215	0.002
Legend	10	RSZ L300	0.001

(1) Standard control circuit voltages

Volts	6	12	24	48	60	110	120	220	230	240
—		RD	JD	BD	ED	ND	FD	—	—	—
~ 50/60 Hz	—	—	B7	E7	—	—	F7	M7	P7	U7

For other voltages, please consult your Regional Sales Office.

(2) To order a relay complete with socket: add suffix **S** to the references selected above.
Example: RSB 2A080●● becomes RSB 2A080●●S

Coil characteristics

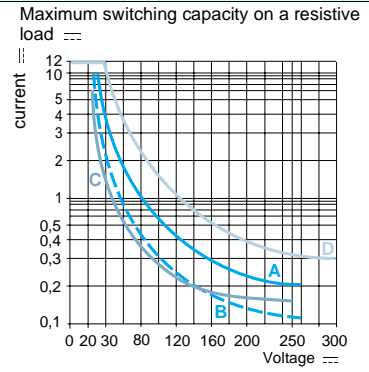
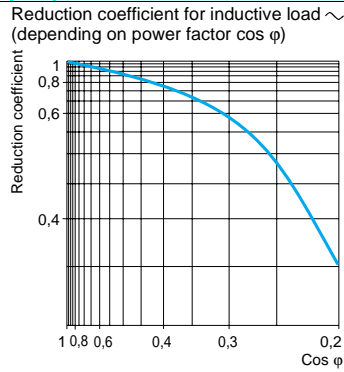
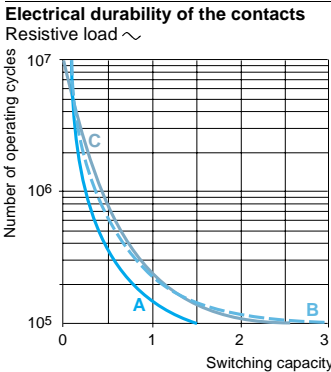
Control circuit voltage U _c	d.c. supply			a.c. supply, 50/60 Hz			
	Average resistance at 20 °C ± 10%	Cod.	Operating voltage limits	Average resistance at 20 °C ± 15 %	Cod.	Operating voltage limits	
V	Ω		Min	Max	Ω	Min	Max
6	90	RD	4.2	15.3	—	—	—
12	360	JD	8.4	30.6	—	—	—
24	1440	BD	16.8	61.2	400	B7	19.2 26.4
48	5700	ED	33.6	122.4	1550	E7	38.4 32.8
60	7500	ND	42	153	—	—	—
110	25 200	FD	77	280	—	—	—
120	—	—	—	—	10 200	F7	96 132
220	—	—	—	—	35 500	M7	176 242
230	—	—	—	—	38 500	P7	184 253
240	—	—	—	—	42 500	U7	192 264

Relay type	RXL 2A12B●●●	RXL 3A10B●●●	RXL 4A06B●●●	RXL 4G06B●●●
Contact characteristics				
Number and type of contacts	2 C/O	3 C/O	4 C/O	
Contact materials	(AgNi)			AgNi/AU 0.2 μ
Rated conventional thermal current (I _{th})	For temperature ≤ 40°C	A 12	10	6
Maximum operating rate	No-load	18 000		
	In operating cycles/h	1200		
Switching voltage	Minimum	V 5		
	Maximum	V ~ 400, --- 250		
Maximum breaking capacity	VA 3000	2500	1500	

Coil characteristics				
Rated voltage (U _n)	~	V 24...230, 50/60 Hz		
	---	V 12...110		
Average consumption	~	VA 1.6		
	---	W 0.9		
Permissible voltage variation		0.8...1.1 U _n (50/60 Hz or ---)		
Drop-out voltage threshold	~	≥ 0.15 U _n		
	---	≥ 0.1 U _n		

Environment				
Conforming to standards	Standard version	IEC 61810-1		
Approvals (pending)	Standard version	UL, CSA		
Ambient air temperature around the device	Storage	°C - 40...+ 85		
	Operation	°C --- - 40...+ 70, ~ - 40...+ 55		
Vibration resistance	To IEC 68-2-6	> 5 gn (10...150 Hz)		
Degree of protection		IP 40		
Shock resistance		10 gn (closing), 5 gn (opening)		
Mechanical durability	In millions of operating cycles	≥ 20	≥ 20	
Operating time (response time)	Between coil energisation and making of the On-delay contact	~	ms About 12	
		---	ms About 12	
	Between coil de-energisation and making of the Off-delay contact	~	ms About 12	
		---	ms About 4	
Electrical durability	Resistive load	12 A - 250 V: ≥ 0.1	10 A - 250 V: ≥ 0.1	6 A - 250 V: ≥ 0.1
	Inductive load	See curves below		

Insulation characteristics				
Rated insulation voltage (U _i)	Conforming to IEC 947	V 250		
Insulation class	Conforming to VDE 0110	C 250	B 250	
Dielectric strength (rms voltage)	Between coil and contact	~	V 2500	
	Between poles	V 2500	2000	
	Between contacts	~	V 1500	



- A RXL 4
- B RXL 2
- C RXL 3

— RXL 2, RXL 3 and RXL 4

- A RXL 3 (T = 0 ms)
- B RXL 3 (T = 40 ms)
- C RXL 4
- D RXL 2

Durability (inductive load) = durability (resistive load) x reduction coefficient

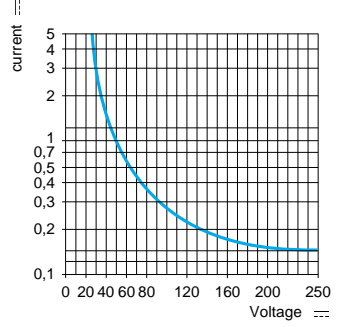
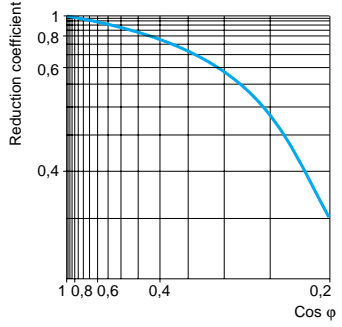
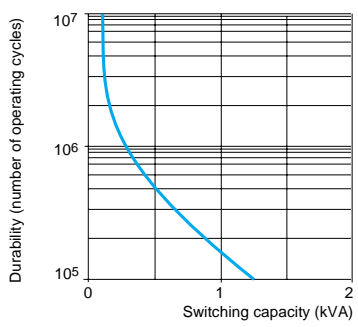
Relay type		RXN 21E1●●●	RXN 41G1●●●
Contact characteristics			
Number and type of contacts		2 C/O	4 C/O
Contact materials		AgNI	
Conventional rated thermal current (I _{th})	For temperature ≤ 40°C	A 5	
Maximum operating rate In operating cycles/h	No-load	7200	
	Under load	3600	
Switching voltage	Minimum	V 5	
	Maximum	V 400 ~ , 250 ---	
Maximum breaking capacity		VA 1250	1250

Coil characteristics			
Rated voltage (U _n)	~	V 24...230, 50/60 Hz	
	---	V 12...110	
Average consumption	~	VA 1.9	
	---	W 0.9	
Permissible voltage variation		0.8...1.1 U _n (50/60 Hz or ---)	
Drop-out voltage threshold	~	≥ 0.15 U _n	
	---	≥ 0.1 U _n	

Environment			
Conforming to standards	Standard version		IEC 61 810-1
Approvals (pending)	Standard version		CSA, UL
Ambient air temperature around the device	Storage	°C	- 40...+ 70
	Operation	°C	- 20...+ 50
Vibration resistance	Conforming to IEC 68-2-6		> 5 gn (30...150 Hz)
Degree of protection			IP 40
Shock resistance			20 gn
Mechanical durability	In millions of operating cycles		20
Operating time (response time)	Between coil energisation and making of the On-delay contact	~	ms About 12
		---	ms About 12
	Between coil de-energisation and making of the Off-delay contacts	~	ms About 12
		---	ms About 4
Electrical durability In millions of operating cycles/h	Resistive load		5 A / 250 V
	Inductive load		See curves below

Insulation characteristics			
Rated insulation voltage (U _i)	Conforming to IEC 947	V	250
Insulation class	Conforming to VDE 0110		A 250
Dielectric strength (rms voltage)	Between coil and contact	~	V 2000
	Between poles		V 2000
	Between contacts	~	V 1500

Electrical durability of the contacts
 Resistive load ~ Reduction coefficient for inductive load ~ (depending on power factor cos φ) Maximum switching capacity on a resistive load ---



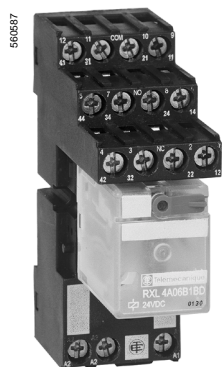
Durability (inductive load) = durability (resistive load) x reduction coefficient

Zelio Relay plug-in relays

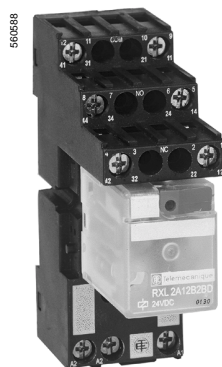
Miniature relays



RXN 21E12BD + RXZ E1M114



RXL 4A06B1BD + RXZ E1S114M



RXL 2A12B2BD + RXZ P20 + RXZ E1S108M

RXL 2A12B2BD + ZRM 030RB
+ RXZ P10 + RXZ E1S111M

References

Relays for standard applications (1)

Number of C/O contacts	Conventional rated thermal current	LED	Sold in lots of	Unit reference, to be completed by adding the control voltage code (2)	Weight
					kg
2	5	Red	10	RXN 21E12●●	0.035
		Without	10	RXN 21E11●●	0.034
	12	Green	10	RXL 2A12B2●●	0.036
3	10	Without	10	RXL 2A12B1●●	0.035
		Green	10	RXL 3A10B2●●	0.036
4	5	Without	10	RXL 3A10B1●●	0.035
		Red	10	RXN 41G12●●	0.035
	6	Without	10	RXN 41G11●●	0.034
		Green	10	RXL 4A06B2●●	0.036
		Without	10	RXL 4A06B1●●	0.035

Relays with gold-flashed contacts (1)

4	6	With	10	RXL 4G06B1●●	0.036
		Without	10	RXL 4G06B2●●	0.035

Protection modules for sockets RXZ 7G

Description	Type	Voltage	Sold in lots of	Unit reference	Weight	
					kg	
V						
Diode	L	---	12...250	10	RXW 040MD	0.010

Protection modules for relay/sockets RXZ E●●●●M

Diode	---	---	6...230	10	RZM 040W	0.003
Diode + Green LED	E	---	6...24	10	RZM 031RB	0.004
		---	24...60	10	RZM 031BN	0.004
Varistor + Green LED	E	---	110...230	10	RZM 031FPD	0.004
		---	6...24	10	RZM 021RB	0.005
		---	24...60	10	RZM 021BN	0.005
RC circuit	E	~	110...230	10	RZM 021FP	0.005
		~	24...60	10	RZM 041BN7	0.010
		~	110...240	10	RZM 041FU7	0.010

(2) Standard control circuit voltages

Volts	12	24	48	110	120	230
---		JD	BD	ED	FD	-
~ (50/60 Hz)		RXN	B7	E7	F7	-
		RXL	B7	E7	-	F7

For other voltages, please consult your Regional Sales Office.

Coil characteristics

Control circuit voltage Uc	d.c. supply Average resistance at 20 °C ± 10%	Cod. Operating voltage limits		a.c. supply, 50/60 Hz		
		Min	Max	Average resistance at 20 °C ± 15 %	Cod. Operating voltage limits	
V	Ω	V	V	Ω	V	V
RXN relays						
12	160	JD	9.6	13.2	-	-
24	640	BD	19.2	26.4	150	B7 19.2 26.4
48	2600	ED	38.4	52.8	635	E7 38.4 52.8
110	13 600	FD	88	121	-	F7 - -
230	-	-	-	-	15 400	P7 184 253
RXL relays						
12	160	JD	9.6	13.2	-	-
24	640	BD	19.2	26.4	158	B7 19.2 26.4
48	2600	ED	38.4	52.8	640	E7 38.4 52.8
110	13 600	FD	88	121	-	-
120	-	-	-	-	3770	F7 96 132
230	-	-	-	-	16 100	P7 184 253

(1) These relays have a lockable Test button on their front face, which can be converted to non-lockable or can be eliminated, see accessories on page opposite.

Characteristics:
pages 28042/2 and 28042/3

Dimensions:
page 28046/2

Schemes:
page 28047/2

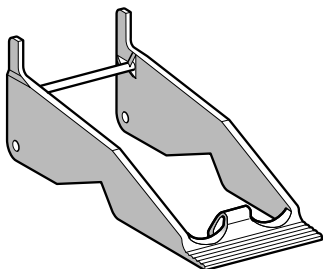
References

590590



RXZ 200

590591



RXZ R235

Sockets (1)

Protection module	Application	Type	I/O	Sold in lots of	Unit reference	Weight kg
Without	RXN 21, RXN 41, L RXL 2A12 and RXL 4A06	Mixed		10	RXZ E1M114	0.048
With	RXN 21, RXN 41, E RXL 2, RXL 4	Mixed		10	RXZ 7G	0.055
	RXN 21, RXL 2	E	Separate	10	RXZ E1S108M	0.058
	RXL 3A10	E	Separate	10	RXZ E1S111M	0.065
	RXN 4, RXL 4A06	E	Separate	10	RXZ E1S114M	0.070
		E	Mixed	10	RXZ E1M114M	0.070

Accessories

Description	Application	Sold in lots of	Unit reference	Weight kg
Button	For non-lockable Test function	20 (2)	RXZ P20	0.001
Blanking cover	For elimination of Test function	20 (2)	RXZ P10	0.001
Metal maintaining clamps	For use on all sockets	10	RXZ 200	0.001
Plastic maintaining clamps	RXZ E	10	RSZ R235	0.005
Legends	Clip-in fixing on socket RXZ-7G	10	RXZ 300	0.010
	Clip-in fixing on socket RXZ-7G in place of module RXW 040MD	10	RXZ 310	0.011
	Clip-in fixing on socket RXZ-E	10	RSZ L320	0.001

(1) A bag containing ten **RXZ 300** legends is supplied with sockets **RXZ 7G**.

RXZ E1M114: 7 A, ~ 300 V.

RXZ 7G: 6 A, ~ 300 V.

RXZ E1S114M: 12 A, ~ 300 V.

(2) 10 red and 10 green.

Relay type		RUN 21C	RUN 31C	RUN 21D	RUN 31A	RUN 33D
Contact characteristics						
Number and type of contacts		2 C/O	3 C/O	2 C/O	3 C/O	3 C/O linked
Contact materials		AgNi				Hard silver, 10 μ gold-flashed
Conventional rated thermal current (Ith)	For temperature ≤ 40°C	A 10		10		4
Maximum operating rate	No-load			36 000		36 000
	In operating cycles/h			3600		3600
Switching voltage	Minimum	V 20		20		10
	Maximum	V ~ / --- 250		~ / --- 250		~ 250, --- 125
Maximum breaking capacity		VA 3000		3000		1000

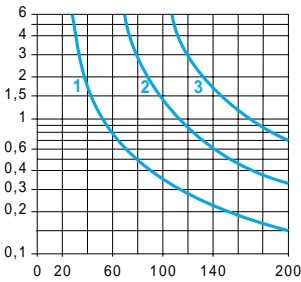
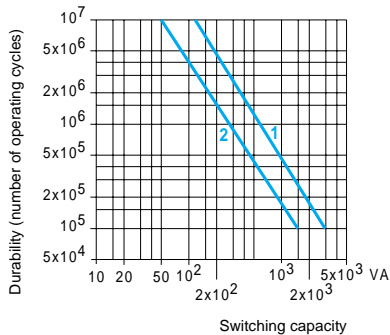
Coil characteristics						
Rated voltage (Un)	~	V 24, 48, 110, 230, 50/60 Hz (Other voltages available on request)				
	---	V 12, 24, 48, 110 (Other voltages available on request)				
Average consumption	Inrush	~	VA 3.5	3.5		3.5
		Sealed	~	VA 2.3	2.3	2.3
			---	W 1.5	1.5	
Permissible voltage variation			0.8...1.1 Un (50 Hz or ---), 0.85...1.1 Un (60 Hz)			
Drop-out voltage threshold	~		≥ 0.15 Un			≥ 0.15 Un
	---		≥ 0.05 Un			

Environment						
Conforming to standards	Standard version		EN 61810-1			
Approvals (pending)	Standard version		UL, CSA			
Ambient air temperature around the device	Storage		°C - 40...+ 70			
	Operation	~	°C - 20...+ 40			
		---	°C - 20...+ 60			
Vibration resistance	Conforming to IEC EN 68-2-6		4 gn (30...100 Hz)			
Degree of protection			IP 40			
Shock resistance			10 gn			
Mechanical durability	In millions of operating cycles		20			
Operating time (response time)	Between coil energisation and making of the On-delay contact	~	ms About 15			
		---	ms About 15			
	Between coil de-energisation and making of the Off-delay contact	~	ms About 15			
		---	ms About 15			
Electrical durability	Resistive load		≥ 0.1 to 10 A			
	In millions of operating cycles/h	Inductive load		See curves below		

Insulation characteristics						
Rated insulation voltage (Ui)	Conforming to IEC 947	V 250				
Insulation class	Conforming to VDE 0110	C250, B380				
Dielectric strength (rms voltage)	Between coil and contact	~	V 2500			
	Between poles		V 2500			
	Between contacts	~	V 1000			

Durability in N (230 V, 50 Hz)

Switching capacity on a --- supply for minimum durability of: 10⁶ operating cycles (resistive or inductive load with diode RVW 040BD).



- 1 Resistive load
- 2 Inductive load

- 1 Contact
- 2 Contacts in series
- 3 Contacts in series

References



RUN 31C22●● + RUZ 1C



RUN 31A21●● + RUZ 1A



RUN 33A22●● + RUW 101MW + RUZ 7A



RUZ 200

Relays for standard applications

Number of C/O contacts	Conventional rated thermal current A	LED	Pins	Sold in lots of	Unit reference, to be completed by adding the control voltage code (1)	Weight kg
2	10	without	Octal	10	RUN 21D21●●	0.105
			8 flat pins	10	RUN 21C21●●	?
		Green	Octal	10	RUN 21D22●●	0.105
			8 flat pins	10	RUN 21C22●●	?
3	10	Without	Undecal	10	RUN 31A21●●	0.105
			11 flat pins	10	RUN 31C21●●	?
		Green	Undecal	10	RUN 31A22●●	0.105
			11 flat pins	10	RUN 31C22●●	?

Relays with gold-flashed contacts

3	4	Green	Undecal	10	RUN 33A22●●	0.105
---	---	-------	---------	----	-------------	-------

LED indicator modules

Description	Voltage V		Sold in lots of	Unit reference	Weight kg
"Power on" indication	~	110/230	20	RUW 010P7	0.006
	—	6/24	20	RUW 030BD	0.006
	With protection diode				

Protection module

Diode	—	6...220	20	RUW 040BD	0.006
Varistor	~	24	20	RUW 042B7	0.006
	~	230	20	RUW 042P7	0.006
RC circuit	~	110...240	20	RUW 041P7	0.006

Timer modules

Multifunction	⋈	24...240	1	RUW 101MW	0.020
---------------	---	----------	---	-----------	-------

Sockets

Protection module	Application	I/O	Sold in lots of	Unit reference	Weight kg
Without	RUN 21 octal	Mixed	10	RUZ 1D	0.067
	RUN 31 and RUN 33 undecal	Mixed	10	RUZ 1A	0.067
	RUN 21C and RUN 31C	Mixed	10	RUZ 1C	0.067
With	RUN 31 and RUN 33	Mixed	10	RUZ 7D	0.069
	RUN 21 octal	Mixed	10	RUZ 7A	0.069

Accessories

Description	Sold in lots of	Unit reference	Weight kg
Maintaining clamp	25	RUZ 200	0.001

(1) Standard control circuit voltages

Volts		12	24	48	110	230
—	RUN 21 and RUN 31	JD	BD	ED	FD	—
	RUN 33	—	BD	ED	—	—
~ 50/60 Hz	RUN 21, RUN 31 and RUN 33	—	B7	E7	F7	P7

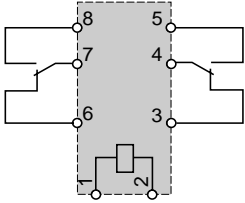
For other voltages, please consult your Regional Sales Office.

Coil characteristics

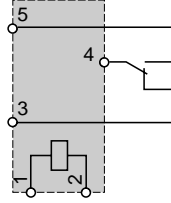
Control circuit voltage Uc	d.c. supply				a.c. supply, 50/60 Hz			
	Average resistance at 20 °C ± 10%	Cod. Operating voltage limits		Average resistance at 20 °C ± 15 %	Cod. Operating voltage limits		Min	Max
		Min	Max		Min	Max		
V	Ω	V	V	Ω	V	V		
12	96	JD	9.6	19.2	—	—	—	—
24	384	BD	19.2	26.4	73.7	B7	204	26.4
48	1336	ED	38.4	52.8	305	E7	408	54.8
	7660	FD	88	121	1710	F7	93.5	121
230	—	—	—	—	7500	P7	196	253

Interface relays

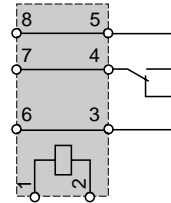
RSB 2A080●●



RSB 1A120●●



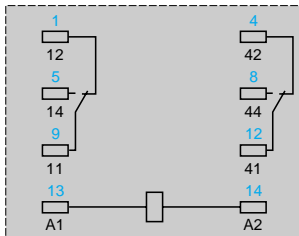
RSB 1A160●●



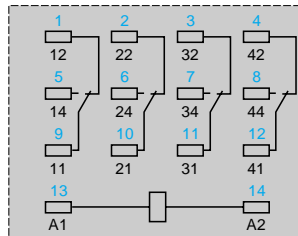
When using relay RSB 1A160●● with socket RSZ E1S48M, terminals 11 and 21, 14 and 24, 12 and 22 must be linked.

Miniature relays

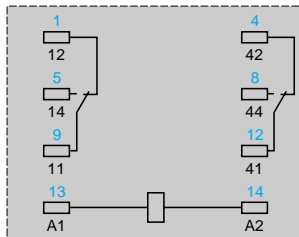
RXN 21E1●●●



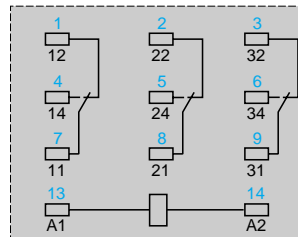
RXN 41G



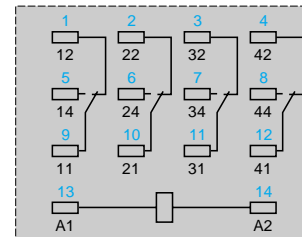
RXL 2●●



RXL 3●●

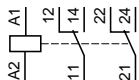


RXL 4●●

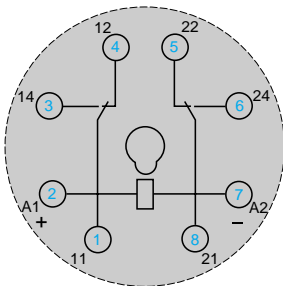


Universal relays

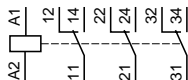
RUN 21D2●●●, RUN 21C2●●●



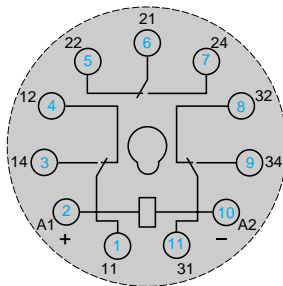
RUN 21D2●●●



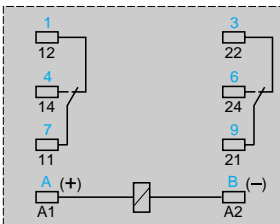
**RUN 31A2●●●, RUN 33A2●●●
RUN 31C2●●●**



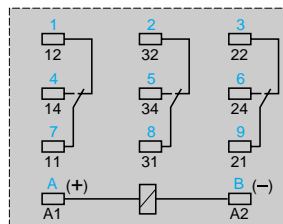
RUN 33A2●●●



RUN 21C2●●●

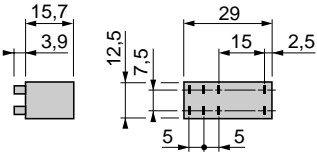


RUN 31C2●●●

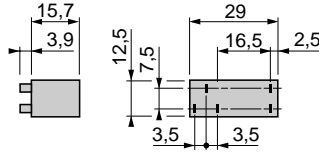


Interface relays (References: page 28041/3)

RSB 2A080●●, RSB 1A160●●

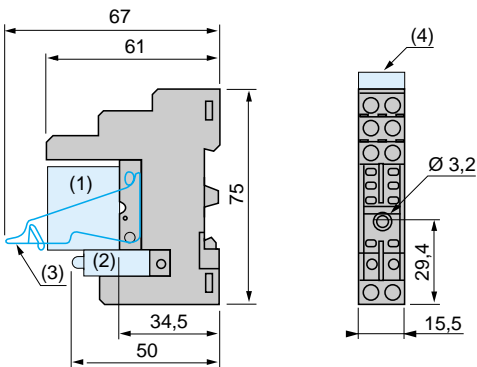


RSB 1A120●●

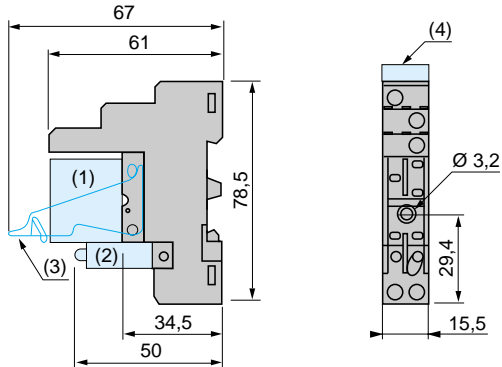


Sockets

RSZ E1S48M



RSZ E1S35M



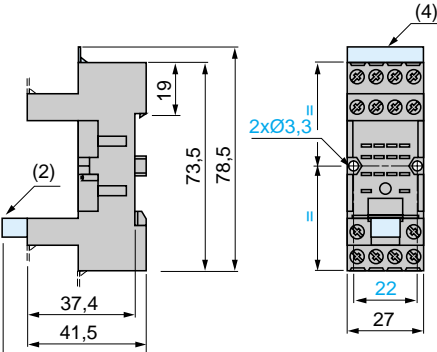
Miniature relays (References: pages 28042/4 and 28042/5)

RXN 21E1●●●, RXN 41G1●●●, RXL

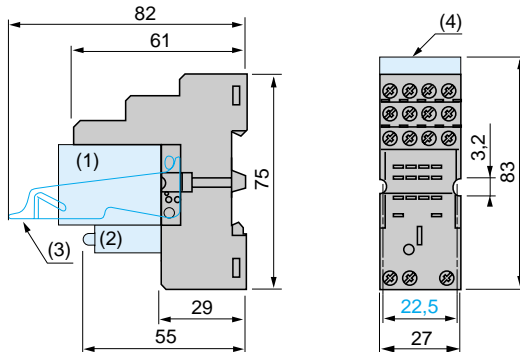


Sockets

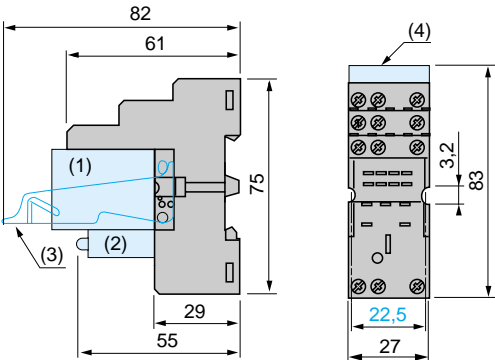
RXZ 7G



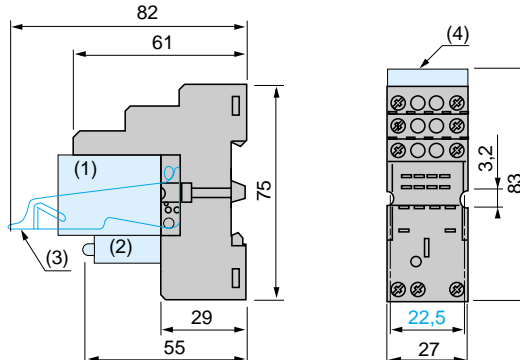
RXZ E1S108M



RXZ E1S111M



RXZ E1S114M, RXZ E1M114M

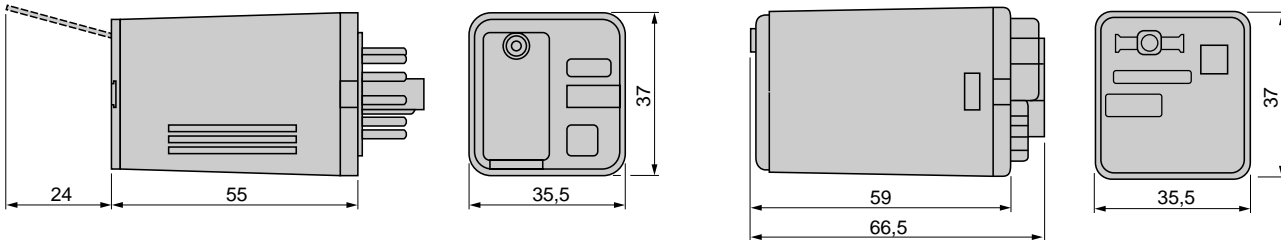


(1) Relays, (2) Add-on protection module,
(3) Maintaining clamp, (4) Legend.

Universal relays (References: page 28043/3)

RUN 21D2●●●
 RUN 31A2●●●
 RUN 33A2●●●

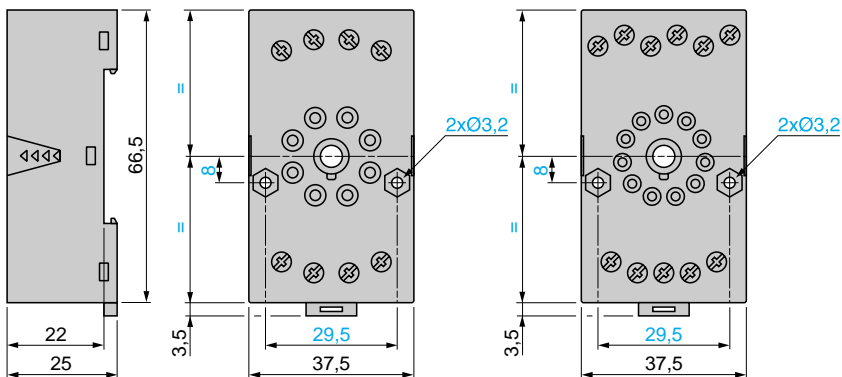
RUN 21C2●●●
 RUN 31C2●●●



Sockets

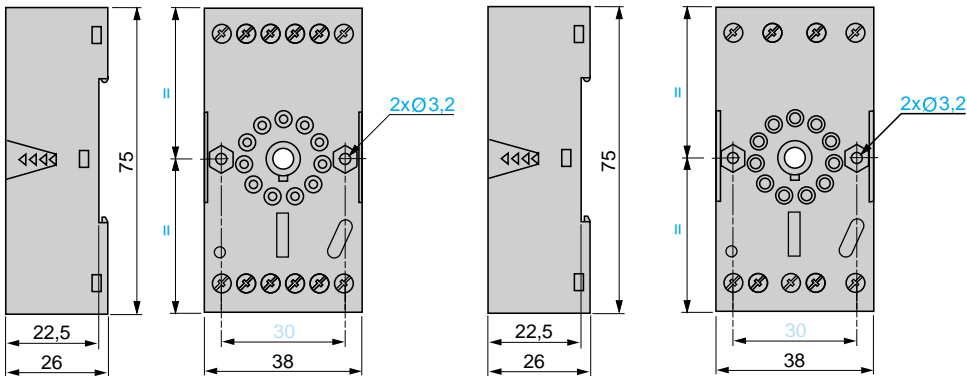
RUZ 1D

RUZ 1A

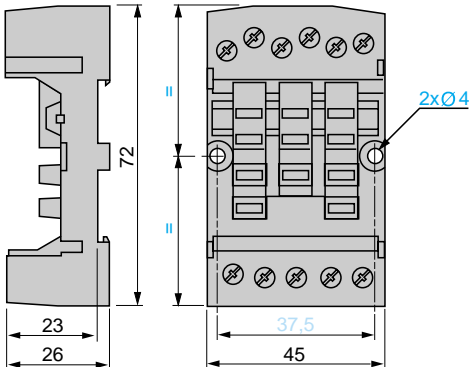


RUZ 7D

RUZ 7A



RUZ 1C



XB4BS8445

red Ø40 Emergency stop pushbutton Ø22
trigger latching turn release 1NO+1NC



Main

Commercial Status	Commercialised
Range of product	Harmony XB4
Product or component type	Complete emergency stop pushbutton
Device short name	XB4
Bezel material	Chromium plated metal
Fixing collar material	Zamak
Mounting diameter	22 mm
Sale per indivisible quantity	1
Shape of signaling unit head	Round
Type of operator	Trigger action and mechanical latching
Reset	Turn to release
Operator profile	Red mushroom Ø 40 mm unmarked
Contacts type and composition	1 NO + 1 NC
Contacts operation	Slow-break
Connections - terminals	Screw clamp terminals: >= 1 x 0.22 mm ² without cable end conforming to EN 60947-1 Screw clamp terminals: <= 2 x 1.5 mm ² with cable end conforming to EN 60947-1

Complementary

Height	47 mm
Width	40 mm
Depth	82 mm
Terminals description ISO n°1	(13-14)NO
Product weight	0.13 kg
Resistance to high pressure washer	7000000 Pa at 55 °C, distance: 0.1 m
Contacts usage	Standard contacts
Positive opening	With positive opening conforming to EN/IEC 60947-5-1 appendix K
Operating travel	4.3 mm (total travel) 2.6 mm (NO changing electrical state) 1.5 mm (NC changing electrical state)
Operating force	44 N
Mechanical durability	300000 cycles
Tightening torque	0.8...1.2 N.m conforming to EN 60947-1
Shape of screw head	Slotted head compatible with flat Ø 5.5 mm screwdriver Slotted head compatible with flat Ø 4 mm screwdriver Cross head compatible with pozidriv No 1 screwdriver Cross head compatible with Philips no 1 screwdriver
Contacts material	Silver alloy (Ag/Ni)
Short circuit protection	10 A cartridge fuse type gG conforming to EN/IEC 60947-5-1
[I _{th}] conventional free air thermal current	10 A conforming to EN/IEC 60947-5-1
[U _i] rated insulation voltage	600 V (degree of pollution: 3) conforming to EN 60947-1
[U _{imp}] rated impulse withstand voltage	6 kV conforming to EN 60947-1

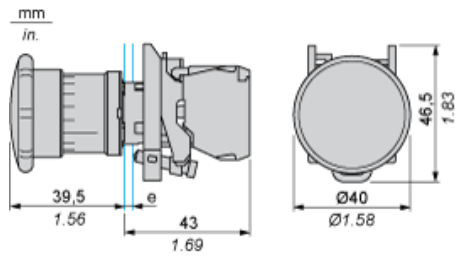
The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric Industries SAS nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein.

[I _e] rated operational current	1.2 A at 600 V, AC-15, A600 conforming to EN/IEC 60947-5-1 0.55 A at 125 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 0.27 A at 250 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 0.1 A at 600 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 6 A at 120 V, AC-15, A600 conforming to EN/IEC 60947-5-1 3 A at 240 V, AC-15, A600 conforming to EN/IEC 60947-5-1
Electrical durability	1000000 cycles, DC-13, 0.5 A at 24 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, DC-13, 0.2 A at 110 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, AC-15, 4 A at 24 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, AC-15, 3 A at 120 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, AC-15, 2 A at 230 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C
Electrical reliability IEC 60947-5-4	$\Lambda < 10\exp(-8)$ at 17 V, 5 mA in clean environment conforming to EN/IEC 60947-5-4 $\Lambda < 10\exp(-6)$ at 5 V, 1 mA in clean environment conforming to EN/IEC 60947-5-4

Environment

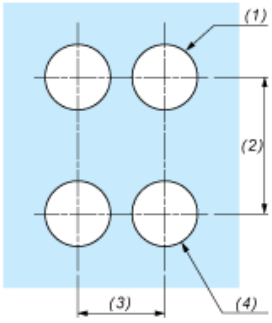
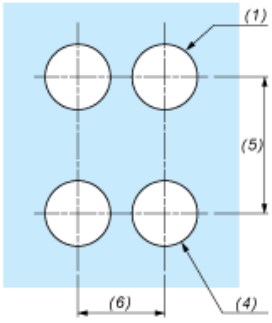
Protective treatment	TH
Ambient air temperature for storage	-40...70 °C
Ambient air temperature for operation	-25...70 °C
Class of protection against electric shock	Class I conforming to IEC 60536
IP degree of protection	IP66 conforming to IEC 60529
NEMA degree of protection	NEMA 4X NEMA 13
IK degree of protection	IK03 conforming to IEC 50102
Standards	EN/IEC 60204-1 EN/IEC 60947-1 EN/IEC 60947-5-1 EN/IEC 60947-5-4 EN/IEC 60947-5-5 EN/ISO 13850 JIS C 4520 UL 508 CSA C22.2 No 14
Product certifications	BV CSA DNV GL LROS (Lloyds register of shipping) RINA UL listed
Vibration resistance	5 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn for 11 ms half sine wave acceleration conforming to IEC 60068-2-27 30 gn for 18 ms half sine wave acceleration conforming to IEC 60068-2-27

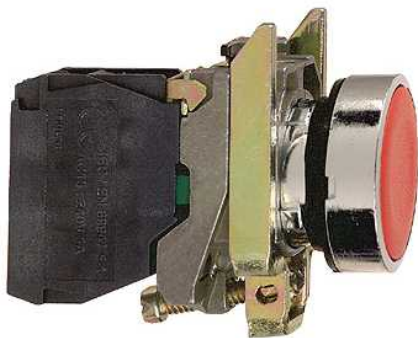
Dimensions



e : clamping thickness: 1 to 6 mm / 0.04 to 0.24 in.

Panel Cut-out for Pushbuttons, Switches and Pilot Lights (Finished Holes, Ready for Installation)

Connection by Screw Clamp Terminals or Plug-in Connectors or on Printed Circuit Board	Connection by Faston Connectors
	
<p>(1) Diameter on finished panel or support (2) 40 mm min. / 1.57 in. min. (3) 30 mm min. / 1.18 in. min. (4) $\varnothing 22.5 \text{ mm} / 0.89 \text{ in. recommended } (\varnothing 22.3 \text{ mm }_0^{+0.4} / 0.88 \text{ in. }_0^{+0.016})$ (5) 45 mm min. / 1.78 in. min. (6) 32 mm min. / 1.26 in. min.</p>	



Main

Commercial Status	Commercialised
Range of product	Harmony XB4
Product or component type	Complete pushbutton
Device short name	XB4
Bezel material	Chromium plated metal
Fixing collar material	Zamak
Mounting diameter	22 mm
Sale per indivisible quantity	1
Shape of signaling unit head	Round
Type of operator	Spring return
Operator profile	Red flush unmarked
Contacts type and composition	1 NC
Contacts operation	Slow-break
Connections - terminals	Screw clamp terminals: 1 x 0.22...2 x 2.5 mm ² without cable end conforming to EN/IEC 60947-1 Screw clamp terminals: ≤ 2 x 1.5 mm ² with cable end conforming to EN/IEC 60947-1

Complementary

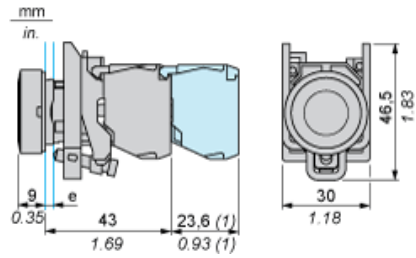
Height	47 mm
Width	30 mm
Depth	52 mm
Terminals description ISO n°1	(21-22)NC
Product weight	0.08 kg
Resistance to high pressure washer	7000000 Pa at 55 °C, distance: 0.1 m
Contacts usage	Standard contacts
Positive opening	With positive opening conforming to EN/IEC 60947-5-1 appendix K
Operating travel	4.3 mm (total travel) 1.5 mm (NC changing electrical state)
Operating force	3.5 N (NC changing electrical state)
Mechanical durability	5000000 cycles
Tightening torque	0.8...1.2 N.m conforming to EN 60947-1
Shape of screw head	Slotted head compatible with flat Ø 5.5 mm screwdriver Slotted head compatible with flat Ø 4 mm screwdriver Cross head compatible with pozidriv No 1 screwdriver Cross head compatible with Philips no 1 screwdriver
Contacts material	Silver alloy (Ag/Ni)
Short circuit protection	10 A cartridge fuse type gG conforming to EN/IEC 60947-5-1
[I _{th}] conventional free air thermal current	10 A conforming to EN/IEC 60947-5-1
[U _i] rated insulation voltage	600 V (degree of pollution: 3) conforming to EN/IEC 60947-1
[U _{imp}] rated impulse withstand voltage	6 kV conforming to EN/IEC 60947-1
[I _e] rated operational current	1.2 A at 600 V, AC-15, A600 conforming to EN/IEC 60947-5-1 0.55 A at 125 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 0.27 A at 250 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 0.1 A at 600 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 6 A at 120 V, AC-15, A600 conforming to EN/IEC 60947-5-1 3 A at 240 V, AC-15, A600 conforming to EN/IEC 60947-5-1

Electrical durability	1000000 cycles, DC-13, 0.5 A at 24 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, DC-13, 0.2 A at 110 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, AC-15, 4 A at 24 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, AC-15, 3 A at 120 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, AC-15, 2 A at 230 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C
Electrical reliability IEC 60947-5-4	$\Lambda < 10\exp(-8)$ at 17 V, 5 mA in clean environment conforming to EN/IEC 60947-5-4 $\Lambda < 10\exp(-6)$ at 5 V, 1 mA in clean environment conforming to EN/IEC 60947-5-4

Environment

Protective treatment	TH
Ambient air temperature for storage	-40...70 °C
Ambient air temperature for operation	-25...70 °C
Class of protection against electric shock	Class I conforming to IEC 60536
IP degree of protection	IP66 conforming to IEC 60529
NEMA degree of protection	NEMA 4X NEMA 13
IK degree of protection	IK03 conforming to IEC 50102
Standards	EN/IEC 60947-1 EN/IEC 60947-5-1 EN/IEC 60947-5-4 EN/IEC 60947-5-5 JIS C 4520 UL 508 CSA C22.2 No 14
Product certifications	BV CSA DNV GL LROS (Lloyds register of shipping) RINA UL listed
Vibration resistance	5 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn for 11 ms half sine wave acceleration conforming to IEC 60068-2-27 30 gn for 18 ms half sine wave acceleration conforming to IEC 60068-2-27

Dimensions



- e : clamping thickness: 1 to 6 mm / 0.04 to 0.24 in.
- (1) Additional row of contacts or double contact.

Panel Cut-out for Pushbuttons, Switches and Pilot Lights (Finished Holes, Ready for Installation)

Connection by Screw Clamp Terminals or Plug-in Connectors or on Printed Circuit Board	Connection by Faston Connectors
	
<p>(1) Diameter on finished panel or support (2) 40 mm min. / 1.57 in. min. (3) 30 mm min. / 1.18 in. min. (4) $\varnothing 22.5 \text{ mm} / 0.89 \text{ in. recommended } (\varnothing 22.3 \text{ mm }_0^{+0.4} / 0.88 \text{ in. }_0^{+0.016})$ (5) 45 mm min. / 1.78 in. min. (6) 32 mm min. / 1.26 in. min.</p>	



Main

Commercial Status	Commercialised
Range of product	Harmony XB4
Product or component type	Complete selector switch
Device short name	XB4
Bezel material	Chromium plated metal
Fixing collar material	Zamak
Mounting diameter	22 mm
Sale per indivisible quantity	1
Shape of signaling unit head	Round
Type of operator	Stay put
Operator profile	Black standard handle
Operator position information	2 positions 90°
Contacts type and composition	1 NO + 1 NC
Contacts operation	Slow-break
Connections - terminals	Screw clamp terminals: >= 1 x 0.22 mm ² without cable end conforming to EN/IEC 60947-1 Screw clamp terminals: <= 2 x 1.5 mm ² with cable end conforming to EN/IEC 60947-1

Complementary

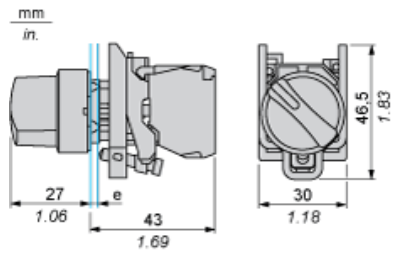
Height	47 mm
Width	30 mm
Depth	68 mm
Terminals description ISO n°1	(13-14)NO (21-22)NC
Product weight	0.105 kg
Resistance to high pressure washer	7000000 Pa at 55 °C, distance: 0.1 m
Contacts usage	Standard contacts
Positive opening	With positive opening conforming to EN/IEC 60947-5-1 appendix K
Operating torque	0.14 N.m (NO changing electrical state)
Mechanical durability	1000000 cycles
Tightening torque	0.8...1.2 N.m conforming to EN 60947-1
Shape of screw head	Slotted head compatible with flat Ø 5.5 mm screwdriver Slotted head compatible with flat Ø 4 mm screwdriver Cross head compatible with pozidriv No 1 screwdriver Cross head compatible with Philips no 1 screwdriver
Contacts material	Silver alloy (Ag/Ni)
Short circuit protection	10 A cartridge fuse type gG conforming to EN/IEC 60947-5-1
[I _{th}] conventional free air thermal current	10 A conforming to EN/IEC 60947-5-1
[U _i] rated insulation voltage	600 V (degree of pollution: 3) conforming to EN 60947-1
[U _{imp}] rated impulse withstand voltage	6 kV conforming to EN 60947-1
[I _e] rated operational current	1.2 A at 600 V, AC-15, A600 conforming to EN/IEC 60947-5-1 0.55 A at 125 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 0.27 A at 250 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 0.1 A at 600 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 6 A at 120 V, AC-15, A600 conforming to EN/IEC 60947-5-1 3 A at 240 V, AC-15, A600 conforming to EN/IEC 60947-5-1

Electrical durability	1000000 cycles, DC-13, 0.5 A at 24 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN 60947-5-1 appendix C 1000000 cycles, DC-13, 0.2 A at 110 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN 60947-5-1 appendix C 1000000 cycles, AC-15, 4 A at 24 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN 60947-5-1 appendix C 1000000 cycles, AC-15, 3 A at 120 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN 60947-5-1 appendix C 1000000 cycles, AC-15, 2 A at 230 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN 60947-5-1 appendix C
Electrical reliability IEC 60947-5-4	$\Lambda < 10\exp(-8)$ at 17 V, 5 mA in clean environment conforming to EN/IEC 60947-5-4 $\Lambda < 10\exp(-6)$ at 5 V, 1 mA in clean environment conforming to EN/IEC 60947-5-4

Environment

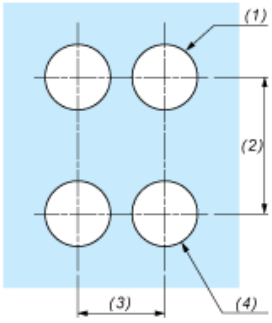
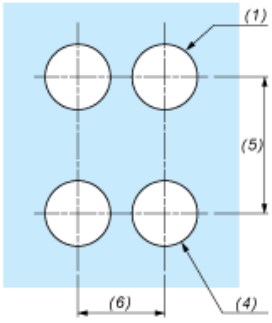
Protective treatment	TH
Ambient air temperature for storage	-40...70 °C
Ambient air temperature for operation	-25...70 °C
Class of protection against electric shock	Class I conforming to IEC 60536
IP degree of protection	IP69 K conforming to IEC 60529
NEMA degree of protection	NEMA 4X NEMA 13
IK degree of protection	IK06 conforming to IEC 50102
Standards	EN/IEC 60947-1 EN/IEC 60947-5-1 EN/IEC 60947-5-4 EN/IEC 60947-5-5 JIS C 4520 UL 508 CSA C22.2 No 14
Product certifications	BV CSA DNV GL LROS (Lloyds register of shipping) RINA UL
Vibration resistance	5 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn for 11 ms half sine wave acceleration conforming to IEC 60068-2-27 30 gn for 18 ms half sine wave acceleration conforming to IEC 60068-2-27

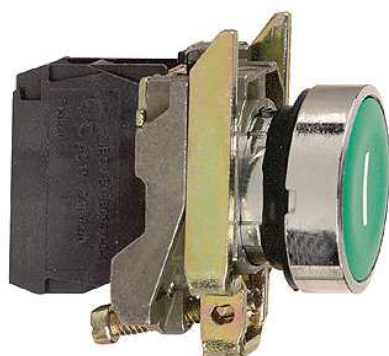
Dimensions



e : clamping thickness: 1 to 6 mm / 0.04 to 0.24 in.

Panel Cut-out for Pushbuttons, Switches and Pilot Lights (Finished Holes, Ready for Installation)

Connection by Screw Clamp Terminals or Plug-in Connectors or on Printed Circuit Board	Connection by Faston Connectors
	
<p>(1) Diameter on finished panel or support (2) 40 mm min. / 1.57 in. min. (3) 30 mm min. / 1.18 in. min. (4) $\varnothing 22.5 \text{ mm} / 0.89 \text{ in. recommended } (\varnothing 22.3 \text{ mm }_0^{+0.4} / 0.88 \text{ in. }_0^{+0.016})$ (5) 45 mm min. / 1.78 in. min. (6) 32 mm min. / 1.26 in. min.</p>	



Main

Commercial Status	Commercialised
Range of product	Harmony XB4
Product or component type	Complete pushbutton
Device short name	XB4
Bezel material	Chromium plated metal
Fixing collar material	Zamak
Mounting diameter	22 mm
Sale per indivisible quantity	1
Shape of signaling unit head	Round
Type of operator	Spring return
Operator profile	Green flush unmarked
Contacts type and composition	1 NO
Contacts operation	Slow-break
Connections - terminals	Screw clamp terminals: 1 x 0.22...2 x 2.5 mm ² with-out cable end conforming to EN/IEC 60947-1 Screw clamp terminals: <= 2 x 1.5 mm ² with cable end conforming to EN/IEC 60947-1

Complementary

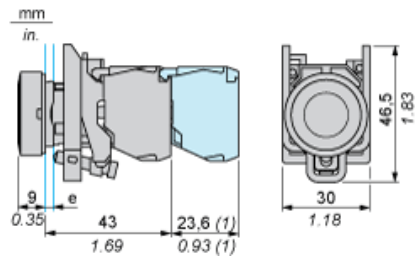
Height	47 mm
Width	30 mm
Depth	52 mm
Terminals description ISO n°1	(13-14)NO
Product weight	0.08 kg
Resistance to high pressure washer	7000000 Pa at 55 °C, distance: 0.1 m
Contacts usage	Standard contacts
Positive opening	Without positive opening
Operating travel	4.3 mm (total travel) 2.6 mm (NO changing electrical state)
Operating force	3.8 N (NO changing electrical state)
Mechanical durability	5000000 cycles
Tightening torque	0.8...1.2 N.m conforming to EN 60947-1
Shape of screw head	Slotted head compatible with flat Ø 5.5 mm screwdriver Slotted head compatible with flat Ø 4 mm screwdriver Cross head compatible with pozidriv No 1 screwdriver Cross head compatible with Philips no 1 screwdriver
Contacts material	Silver alloy (Ag/Ni)
Short circuit protection	10 A cartridge fuse type gG conforming to EN/IEC 60947-5-1
[I _{th}] conventional free air thermal current	10 A conforming to EN/IEC 60947-5-1
[U _i] rated insulation voltage	600 V (degree of pollution: 3) conforming to EN/IEC 60947-1
[U _{imp}] rated impulse withstand voltage	6 kV conforming to EN/IEC 60947-1
[I _e] rated operational current	1.2 A at 600 V, AC-15, A600 conforming to EN/IEC 60947-5-1 0.55 A at 125 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 0.27 A at 250 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 0.1 A at 600 V, DC-13, Q600 conforming to EN/IEC 60947-5-1 6 A at 120 V, AC-15, A600 conforming to EN/IEC 60947-5-1 3 A at 240 V, AC-15, A600 conforming to EN/IEC 60947-5-1

Electrical durability	1000000 cycles, DC-13, 0.5 A at 24 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, DC-13, 0.2 A at 110 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, AC-15, 4 A at 24 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, AC-15, 3 A at 120 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C 1000000 cycles, AC-15, 2 A at 230 V, operating rate: 3600 cyc/h, load factor: 0.5 conforming to EN/IEC 60947-5-1 appendix C
Electrical reliability IEC 60947-5-4	$\Lambda < 10\exp(-8)$ at 17 V, 5 mA in clean environment conforming to EN/IEC 60947-5-4 $\Lambda < 10\exp(-6)$ at 5 V, 1 mA in clean environment conforming to EN/IEC 60947-5-4

Environment

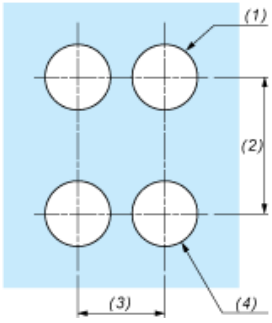
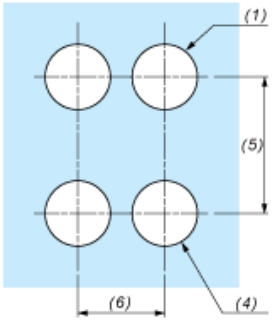
Protective treatment	TH
Ambient air temperature for storage	-40...70 °C
Ambient air temperature for operation	-25...70 °C
Class of protection against electric shock	Class I conforming to IEC 60536
IP degree of protection	IP66 conforming to IEC 60529
NEMA degree of protection	NEMA 4X NEMA 13
IK degree of protection	IK03 conforming to IEC 50102
Standards	EN/IEC 60947-1 EN/IEC 60947-5-1 EN/IEC 60947-5-4 EN/IEC 60947-5-5 JIS C 4520 UL 508 CSA C22.2 No 14
Product certifications	BV CSA DNV GL LROS (Lloyds register of shipping) RINA UL listed
Vibration resistance	5 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn for 11 ms half sine wave acceleration conforming to IEC 60068-2-27 30 gn for 18 ms half sine wave acceleration conforming to IEC 60068-2-27

Dimensions



- e : clamping thickness: 1 to 6 mm / 0.04 to 0.24 in.
- (1) Additional row of contacts or double contact.

Panel Cut-out for Pushbuttons, Switches and Pilot Lights (Finished Holes, Ready for Installation)

Connection by Screw Clamp Terminals or Plug-in Connectors or on Printed Circuit Board	Connection by Faston Connectors
	
<p>(1) Diameter on finished panel or support (2) 40 mm min. / 1.57 in. min. (3) 30 mm min. / 1.18 in. min. (4) $\varnothing 22.5 \text{ mm} / 0.89 \text{ in.}$ recommended ($\varnothing 22.3 \text{ mm}_0^{+0.4} / 0.88 \text{ in.}_0^{+0.016}$) (5) 45 mm min. / 1.78 in. min. (6) 32 mm min. / 1.26 in. min.</p>	

Elemento óptico - PSD-S OE LED GN - 2700119

Tenga en cuenta que los datos indicados aquí proceden del catálogo en línea. Los datos completos se encuentran en la documentación del usuario. Son válidas las condiciones generales de uso de las descargas por Internet.
(<http://phoenixcontact.es/download>)




Elemento luminoso permanente LED, 24 V AC/DC, verde

Propiedades del artículo

- Cambio de elemento sin herramientas
- Se puede combinar a voluntad
- Alta intensidad de color e iluminación
- Duración de LED al menos 50.000 h
- Baja absorción de potencia
- Grado de protección IP65
-



Datos mercantiles

Unidad de embalaje	1 pcs
EAN	 4 046356 491143
Peso por unidad (sin incluir el embalaje)	72.2 g
Número de tarifa arancelaria	85318095
País de origen	Alemania

Datos técnicos

Medidas

Diámetro	70 mm
Altura	65,5 mm

Condiciones ambientales

Temperatura ambiente (servicio)	-30 °C ... 50 °C
Índice de protección	IP65, en estado montado o con tapa final

Generalidades

Material	Policarbonato PC
Color de la calota	verde

Elemento óptico - PSD-S OE LED GN - 2700119

Datos técnicos

Generalidades

Peso	58 g
Posición para el montaje	discrecional
Indicaciones de montaje	Junta con cada elemento premontado

Datos eléctricos

Tensión de entrada	24 V AC/DC
Corriente de conexión máxima	máx. 500 mA
Absorción de corriente	25 mA
Vida útil eléctrica	máx. 100.000 h
Duración de conexión	100 %
Tipo de señal óptica	Luz permanente

Homologaciones/conformidades

Compatibilidad electromagnética	Conformidad con la directiva CEM 2004/108/CE
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Clasificaciones

eCl@ss

eCl@ss 4.0	27143203
eCl@ss 4.1	27143203
eCl@ss 5.0	27371220
eCl@ss 5.1	27371220
eCl@ss 6.0	27371220
eCl@ss 7.0	27371220
eCl@ss 8.0	27371220

ETIM

ETIM 3.0	EC000232
ETIM 4.0	EC000232
ETIM 5.0	EC000232

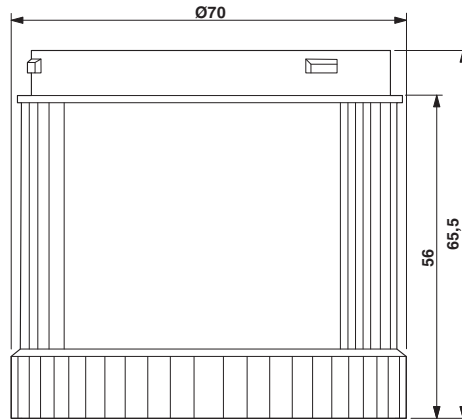
UNSPSC

UNSPSC 6.01	43172015
UNSPSC 7.0901	43201404
UNSPSC 11	39121311
UNSPSC 12.01	39121311
UNSPSC 13.2	39121311

Dibujos

Elemento óptico - PSD-S OE LED GN - 2700119

Esquema de dimensiones





XB7EV03BP3

round pilot light Ø 22 - green - integral LED - 24 V - faston connectors



[Download your XB7EV03BP3 datasheet](#)

[Characteristics](#) | [Documents & Downloads](#)

Main

Hide

Range of product	Harmony XB7
Product or component type	Monolithic pilot light
Device short name	XB7
Mounting diameter	22 mm
Sale per indivisible quantity	10
Shape of signaling unit head	Round
Cap/operator or lens colour	Green
Light source	LED
Bulb base	Integral LED
[Us] rated supply voltage	24 V AC/DC, 50/60 Hz

Complementary

Hide

Height	29 mm
Width	29 mm
Depth	54 mm
Terminals description ISO n°1	(X1-X2)PL
Product weight	0.02 kg
Device mounting	Fixing hole: Ø 22.5 mm (22.3 +0.4/0) conforming to EN/IEC 60947-5-1
Fixing center	>= 30 x 40 mm on support panel, metal, thickness: 1...6 mm >= 30 x 40 mm on support panel, plastic, thickness: 2...6 mm
Fixing mode	Fixing nut beneath head recommended torque: 2.2 N.m (+/- 0.2 N.m)
Connections - terminals	Faston connectors(1 x 6.35 mm) conforming to EN/IEC 60947-1 Faston connectors(2 x 2.8 mm) conforming to EN/IEC 60947-1
[Ui] rated insulation voltage	250 V (degree of pollution: 3) conforming to EN/IEC 60947-1
[Uimp] rated impulse withstand voltage	6 kV conforming to EN/IEC 60947-1
Signalling type	Steady
Supply voltage limits	19.2...30 V DC 21.6...26.4 V AC
Current consumption	20...27 mA
Service life	70000 h at rated voltage and 25 °C

Environment

Hide

Protective treatment	TH
Ambient air temperature for storage	-40...70 °C
Ambient air temperature for operation	-25...70 °C

Class of protection against electric shock	Class II conforming to IEC 60536
IP degree of protection	IP20 (rear face) conforming to IEC 60529 IP65 (front face) conforming to IEC 60529
NEMA degree of protection	NEMA 12 conforming to UL 50 E NEMA 4 conforming to UL 50 E
Standards	EN/IEC 60947-1 EN/IEC 60947-5-1 JIS C 4520 UL 508 CSA C22.2 No 14
Vibration resistance	5 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn (duration = 11 ms) for half sine wave acceleration conforming to IEC 60068-2-27
Electromagnetic emission	Class B conforming to EN 55011

Contractual warranty

Period 18 months

 **Hide**



Main

Range of product	Harmony XB7
Product or component type	Monolithic pilot light
Device short name	XB7
Mounting diameter	22 mm
Sale per indivisible quantity	10
Shape of signaling unit head	Round
Cap/Operator or lens colour	Red
Light source	LED
Bulb base	Integral LED
[Us] rated supply voltage	24 V AC/DC, 50/60 Hz

Complementary

Height	29 mm
Width	29 mm
Depth	54 mm
Terminals description ISO n°1	(X1-X2)PL
Product weight	0.02 kg
Device mounting	Fixing hole: Ø 22.5 mm (22.3 +0.4/0) conforming to EN/IEC 60947-5-1
Fixing center	>= 30 x 40 mm on support panel, plastic, thickness: 2...6 mm >= 30 x 40 mm on support panel, metal, thickness: 1...6 mm
Fixing mode	Fixing nut beneath head recommended torque: 2.2 N.m (+/- 0.2 N.m)
Connections - terminals	Screw clamp terminals: 1 x 0.22...2 x 2.5 mm ² without cable end conforming to EN/IEC 60947-1 Screw clamp terminals: <= 2 x 1.5 mm ² with cable end conforming to EN/IEC 60947-1
Tightening torque	0.8...1.2 N.m conforming to EN 60947-1
Shape of screw head	Slotted head compatible with flat Ø 5.5 mm screwdriver Slotted head compatible with flat Ø 4 mm screwdriver Cross head compatible with pozidriv No 1 screwdriver Cross head compatible with Philips no 1 screwdriver Cross head compatible with JIS No 1 screwdriver
[Ui] rated insulation voltage	250 V (degree of pollution: 3) conforming to EN/IEC 60947-1
[Uimp] rated impulse withstand voltage	6 kV conforming to EN/IEC 60947-1
Signalling type	Steady
Supply voltage limits	21.6...26.4 V AC 19.2...30 V DC
Current consumption	20...27 mA
Service life	80000 h at rated voltage and 25 °C

Environment

Protective treatment	TH
Ambient air temperature for storage	-40...70 °C
Ambient air temperature for operation	-25...70 °C
Class of protection against electric shock	Class II conforming to IEC 60536
IP degree of protection	IP54 (front face) conforming to IEC 60529 IP20 (rear face) conforming to IEC 60529

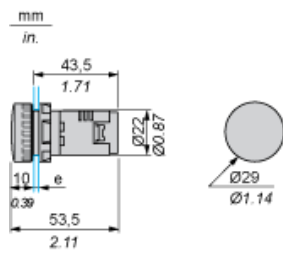
NEMA degree of protection	NEMA 4
Standards	CSA C22-2 No 14 EN/IEC 60947-1 EN/IEC 60947-5-1 EN/IEC 60947-5-5 JIS C 4520 UL 508
Vibration resistance	5 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn for 11 ms half sine wave acceleration conforming to IEC 60068-2-27
Electromagnetic emission	Class B conforming to EN 55011

Contractual warranty

Period	18 months
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Pilot Light with Screw Terminal

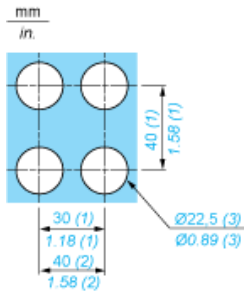
Dimensions



e Support panel thickness: 1 to 6 mm/0.4 to 0.24 in. (metal), 2 to 6 mm/0.8 to 0.24 in. (plastic).

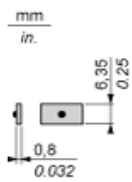
Mounting

Diameter of Finished Fixing Holes

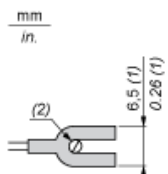


- (1) Minimum value.
- (2) 40 mm/1.58 in. for Emergency switching off pushbutton only.
- (3) Standard value: $\varnothing 22.3$ (0; + 0.4) mm/ $\varnothing 0.88$ (0; + 0.02) in.

Faston Clip Connection



“U” Type Tag Connection



- (1) 6.5 mm/0.26 in. recommended, 7 mm/0.28 in. max.
- (2) M3 screw clamp terminal.

Borne de paso - UT 2,5 - 3044076

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(<http://phoenixcontact.es/download>)




Borne de paso, Tipo de conexión: Conexión por tornillo, Sección: 0,14 mm² - 4 mm², AWG: 26 - 12, Anchura: 5,2 mm, Color: gris, Tipo de montaje: NS 35/7,5, NS 35/15

Propiedades del artículo

- El receptáculo de conexión grande permite la conexión de conductores rígidos y flexibles sin puntera, también mediante secciones nominales
- La construcción compacta ofrece al mismo tiempo además de ahorro de espacio un cómodo cableado en espacios reducidos
- Guía del destornillador óptima a través de fosos de tornillos cerrados
- La conexión multilínea ofrece la máxima flexibilidad y obturación de cableado
- Comprobado para aplicaciones ferroviarias
- El cono de entrada de cables permite el alojamiento de conductores con puntera y cuellos aislantes en sección nominal
-



Datos mercantiles

Unidad de embalaje	50 pcs
Cantidad de pedido mínima	50 pcs
EAN	 4 017918 960377
Peso por unidad (sin incluir el embalaje)	7.6 g
Número de tarifa arancelaria	85369010
País de origen	Alemania

Datos técnicos

Generalidades

Número de pisos	1
Número de conexiones	2
Color	gris
Aislamiento	PA
Clase de combustibilidad según UL 94	V0
Campo de empleo	Industria ferroviaria

Borne de paso - UT 2,5 - 3044076

Datos técnicos

Generalidades

	Construcción de maquinaria
	Construcción de instalaciones
	Industria de procesos
Corriente de carga máxima	32 A (con una sección de conductor de 4 mm ²)
Tensión transitoria de dimensionamiento	8 kV
Grado de polución	3
Categoría de sobretensiones	III
Grupo material aislante	I
Conexión según norma	IEC 60947-7-1
Corriente de carga máxima	32 A (con una sección de conductor de 4 mm ²)
Corriente nominal I _N	24 A
Tensión nominal U _N	1000 V
Corriente de carga máxima	32 A (con una sección de conductor de 4 mm ²)
Pared lateral abierta	ja
Especificación de ensayo protección contra contacto	DIN EN 50274 (VDE 0660-514):2002-11
Protección del dorso de la mano	Garantizado
Seguridad ante contacto con los dedos	Garantizado
Valor nominal ensayo de tensión transitoria	9,8 kV
Resultado ensayo de tensión transitoria	Prueba aprobada
Valor nominal tensión alterna soportable	2,2 kV
Resultado prueba de tensión alterna soportable	Prueba aprobada
Ensayo de la resistencia mecánica de los puntos de embornaje (5 conexiones de conductores)	Prueba aprobada
Ensayo de flexión velocidad de rotación	10 r.p.m.
Ensayo de flexión revoluciones	135
Ensayo de flexión de sección de conductor/peso	0,14 mm ² /0,2 kg
	2,5 mm ² /0,7 kg
	4 mm ² /0,9 kg
Resultado prueba de flexibilidad	Prueba aprobada
Prueba de tracción sección del conductor	0,14 mm ²
Fuerza de tracción Valor nominal	10 N
Prueba de tracción sección del conductor	2,5 mm ²
Fuerza de tracción Valor nominal	50 N
Prueba de tracción sección del conductor	4 mm ²
Fuerza de tracción Valor nominal	60 N
Result. prueba tracción	Prueba aprobada
Asiento fijo sobre superficie de fijación	NS 35
Valor nominal	1 N
Resultado prueba de apriete	Prueba aprobada
Exigencia Caída de tensión	≤ 3,2 mV

Borne de paso - UT 2,5 - 3044076

Datos técnicos

Generalidades

Resultado prueba de caída de tensión	Prueba aprobada
Verific. calent.	Prueba aprobada
Ensayo de corriente de corta duración sección del conductor	2,5 mm ²
Corriente de corta duración	0,3 kA
Ensayo de corriente de corta duración sección del conductor	4 mm ²
Corriente de corta duración	0,48 kA
Result. ensayo corr. corta dur.	Prueba aprobada
Comprobación de características térmicas (llama de aguja) tiempo de acción	30 s
Resultado prueba térmica	Prueba aprobada
Especificación de ensayo, oscilaciones, ruido de banda ancha	DIN EN 50155 (VDE 0115-200):2008-03
Espectro de ensayo	Ensayo de vida útil categoría 1, clase B, en la caja del vagón
Frecuencia de ensayo	f ₁ = 5 Hz hasta f ₂ = 150 Hz
Nivel ASD	1,857 (m/s ²) ² /Hz
Aceleración	0,8g
Duración de ensayo por eje	5 h
Direcciones de ensayo	Ejes X, Y y Z
Resultado prueba oscilaciones, ruido de banda ancha	Prueba aprobada
Especificación de ensayo, prueba de choque	DIN EN 50155 (VDE 0115-200):2008-03
Tipo de choque	Semisinusoidal
Aceleración	5g
Duración del choque	30 ms
Número de choques por dirección	3
Direcciones de ensayo	Ejes X, Y y Z (pos. y neg.)
Resultado prueba de choque	Prueba aprobada
Índice de temperatura material aislante (DIN EN 60216-1 (VDE 0304-21))	130 °C
Utilización estática de material aislante en frío	-60 °C

Dimensiones

Anchura	5,2 mm
Ancho de tapa	2,2 mm
Longitud	47,7 mm
Altura NS 35/7,5	47,5 mm
Altura NS 35/15	55 mm

Datos de conexión

Conexión según norma	IEC 60947-7-1
Tipo de conexión	Conexión por tornillo
Observación	Atención: en el área de descargas encontrará habilitaciones de artículos, secciones de conexión y notas sobre la conexión de conductores de aluminio.
Sección de conductor rígido mín.	0,14 mm ²

Borne de paso - UT 2,5 - 3044076

Datos técnicos

Datos de conexión

Sección de conductor rígido máx.	4 mm ²
Sección de conductor AWG mín.	26
Sección de conductor AWG máx.	12
Sección de conductor flexible mín.	0,14 mm ²
Sección de conductor flexible máx.	4 mm ²
Sección del conductor flexible AWG mín.	26
Sección del conductor flexible AWG máx.	12
Sección de conductor flexible con puntera, sin manguito de plástico mín.	0,14 mm ²
Sección de conductor flexible con puntera, sin manguito de plástico máx.	2,5 mm ²
Sección de conductor flexible con puntera, con manguito de plástico mín.	0,14 mm ²
Sección de conductor flexible con puntera, con manguito de plástico máx.	2,5 mm ²
2 conductores con la misma sección, rígidos mín.	0,14 mm ²
2 conductores con la misma sección, rígidos máx.	1,5 mm ²
2 conductores con la misma sección, flexibles mín.	0,14 mm ²
2 conductores con la misma sección, flexibles máx.	1,5 mm ²
2 conductores con la misma sección, flexibles con TWIN-AEH, con manguito de plástico mín.	0,5 mm ²
2 conductores con la misma sección, flexibles con TWIN-AEH con manguito de plástico máx.	1,5 mm ²
2 conductores con la misma sección, flexibles con AEH, sin manguito de plástico mín.	0,14 mm ²
2 conductores con la misma sección, flexibles con AEH sin manguito de plástico máx.	1,5 mm ²
Conexión según norma	IEC/EN 60079-7
Sección de conductor rígido mín.	0,14 mm ²
Sección de conductor rígido máx.	4 mm ²
Sección de conductor AWG mín.	26
Sección de conductor AWG máx.	12
Sección de conductor flexible mín.	0,14 mm ²
Sección de conductor flexible máx.	2,5 mm ²
Longitud a desaislar	9 mm
Calibre macho	A3
Rosca de tornillo	M3
Par de apriete mín.	0,5 Nm
Par de apriete máx.	0,6 Nm

Clasificaciones

eCl@ss

eCl@ss 4.0	27141120
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Borne de paso - UT 2,5 - 3044076

Clasificaciones

eCl@ss

eCl@ss 4.1	27141120
eCl@ss 5.0	27141120
eCl@ss 5.1	27141120
eCl@ss 6.0	27141120
eCl@ss 7.0	27141120
eCl@ss 8.0	27141120

ETIM

ETIM 2.0	EC000897
ETIM 3.0	EC000897
ETIM 4.0	EC000897
ETIM 5.0	EC000897

UNSPSC

UNSPSC 6.01	30211811
UNSPSC 7.0901	39121410
UNSPSC 11	39121410
UNSPSC 12.01	39121410
UNSPSC 13.2	39121410

Homologaciones

Homologaciones

Homologaciones

CSA / UL Recognized / VDE Gutachten mit Fertigungsüberwachung / cUL Recognized / LR / GL / DNV / RS / IECCEB Scheme / EAC / EAC / cULus Recognized

Homologaciones Ex

IECEX / ATEX / UL Recognized / cUL Recognized / EAC Ex / cULus Recognized

Homologaciones solicitadas

Detalles de homologaciones

	B	C
	mm ² /AWG/kcmil	26-12

Borne de paso - UT 2,5 - 3044076

Homologaciones

	B	C
Corriente nominal IN	20 A	20 A
Tensión nominal UN	600 V	600 V

UL Recognized

	B	C
mm ² /AWG/kcmil	26-12	26-12
Corriente nominal IN	20 A	20 A
Tensión nominal UN	600 V	600 V

VDE Gutachten mit Fertigungsüberwachung

mm ² /AWG/kcmil	0.2-2.5
Tensión nominal UN	800 V

cUL Recognized

	B	C
mm ² /AWG/kcmil	26-12	26-12
Corriente nominal IN	20 A	20 A
Tensión nominal UN	600 V	600 V

LR

GL

DNV

RS

IECEE CB Scheme


mm ² /AWG/kcmil	0.2-2.5
Tensión nominal UN	800 V

Borne de paso - UT 2,5 - 3044076

Homologaciones

EAC

EAC

cULus Recognized  US

Dibujos

Esquema de cableado



Safety Limit Switch D4N

Upgraded Safety Limit Switches Based on the Popular D4D, Providing a Full Lineup Conforming to International Standards

- Lineup includes three contact models with 2NC/1NO and 3NC contact forms in addition to the previous contact forms 1NC/1NO, and 2NC. Models with MBB contacts are also available.
- M12-connector models are available, saving on labor and simplifying replacement.
- Standardized gold-clad contacts provide high contact reliability. Can be used with both standard loads and microloads.
- Free of lead, cadmium, and hexavalent chrome, reducing the burden on the environment.
- Conforms to EN115 and EN81-1.
- Lineup includes both slow-action and snap-action models with Zb contacts.
- Approved standards: UL, EN (TÜV), and CCC

Note: Be sure to read the “Safety Precautions” on page B-23.



NEW

Note: Contact your sales representative for details on models with safety standard certification.

Safety Limit
Switches

D4N

Model Number Structure

■ Model Number Legend

D4N-□□□□
1 2 3

1. Conduit/Connector size

- 1: Pg13.5 (1-conduit)
- 2: G1/2 (1-conduit)
- 3: 1/2-14NPT (1-conduit)
- 4: M20 (1-conduit)
- 5: Pg13.5 (2-conduit)
- 6: G1/2 (2-conduit)
- 7: 1/2-14NPT (2-conduit)
- 8: M20 (2-conduit)
- 9: M12 connector (1-conduit)

2. Built-in Switch

- 1: 1NC/1NO (snap-action)
- 2: 2NC (snap-action)
- A: 1NC/1NO (slow-action)
- B: 2NC (slow-action)
- C: 2NC/1NO (slow-action)
- D: 3NC (slow-action)
- E: 1NC/1NO (MBB contact) (slow-action)
- F: 2NC/1NO (MBB contact) (slow-action)







3. Head and Actuator

- 20: Roller lever (resin lever, resin roller)
- 22: Roller lever (metal lever, resin roller)
- 25: Roller lever (metal lever, metal roller)
- 26: Roller lever (metal lever, bearing roller)
- 2G: Adjustable roller lever, form lock (metal lever, resin roller)
- 2H: Adjustable roller lever, form lock (metal lever, rubber roller)
- 31: Top plunger
- 32: Top roller plunger
- 62: One-way roller arm lever (horizontal)
- 72: One-way roller arm lever (vertical)
- 80: Cat whisker
- 87: Plastic rod
- RE: Fork lever lock (right operation)
- LE: Fork lever lock (left operation)





Ordering Information

List of Models

Switches with Two Contacts


Actuator	Conduit size		Built-in switch mechanism							
			1NC/1NO (Snap-action)		2NC (Snap-action)		1NC/1NO (Slow-action)		2NC (Slow-action)	
			Direct opening	Model	Direct opening	Model	Direct opening	Model	Direct opening	Model
Roller lever (resin lever, resin roller) 	1-conduit	Pg13.5	⊙	D4N-1120	⊙	D4N-1220	⊙	D4N-1A20	⊙	D4N-1B20
		G1/2		D4N-2120		D4N-2220		D4N-2A20		D4N-2B20
		1/2-14NPT		D4N-3120		D4N-3220		D4N-3A20		D4N-3B20
		M20		D4N-4120		D4N-4220		D4N-4A20		D4N-4B20
	2-conduit	M12 connector	D4N-9120	D4N-9220	D4N-9A20	D4N-9B20				
		Pg13.5	⊙	D4N-5120	⊙	D4N-5220	⊙	D4N-5A20	⊙	D4N-5B20
		G1/2		D4N-6120		D4N-6220		D4N-6A20		D4N-6B20
		M20		D4N-8120		D4N-8220		D4N-8A20		D4N-8B20
Roller lever (metal lever, resin roller) 	1-conduit	Pg13.5	⊙	D4N-1122	⊙	D4N-1222	⊙	D4N-1A22	⊙	D4N-1B22
		G1/2		D4N-2122		D4N-2222		D4N-2A22		D4N-2B22
		1/2-14NPT		D4N-3122		D4N-3222		D4N-3A22		D4N-3B22
		M20		D4N-4122		D4N-4222		D4N-4A22		D4N-4B22
	2-conduit	M12 connector	D4N-9122	D4N-9222	D4N-9A22	D4N-9B22				
		Pg13.5	⊙	D4N-5122	⊙	D4N-5222	⊙	D4N-5A22	⊙	D4N-5B22
		G1/2		D4N-6122		D4N-6222		D4N-6A22		D4N-6B22
		M20		D4N-8122		D4N-8222		D4N-8A22		D4N-8B22
Roller lever (metal lever, metal roller) 	1-conduit	Pg13.5	⊙	D4N-1125	⊙	D4N-1225	⊙	D4N-1A25	⊙	D4N-1B25
		G1/2		D4N-2125		D4N-2225		D4N-2A25		D4N-2B25
		1/2-14NPT		D4N-3125		D4N-3225		D4N-3A25		D4N-3B25
		M20		D4N-4125		D4N-4225		D4N-4A25		D4N-4B25
2-conduit	M12 connector	D4N-9125	D4N-9225	D4N-9A25	D4N-9B25					
	Pg13.5	⊙	D4N-5125	⊙	D4N-5225	⊙	D4N-5A25	⊙	D4N-5B25	
	G1/2		D4N-6125		D4N-6225		D4N-6A25		D4N-6B25	
	M20		D4N-8125		D4N-8225		D4N-8A25		D4N-8B25	
Roller lever (metal lever, bearing roller) 	1-conduit	Pg13.5	⊙	D4N-1126	⊙	D4N-1226	⊙	D4N-1A26	⊙	D4N-1B26
		G1/2		D4N-2126		D4N-2226		D4N-2A26		D4N-2B26
		1/2-14NPT		D4N-3126		D4N-3226		D4N-3A26		D4N-3B26
		M20		D4N-4126		D4N-4226		D4N-4A26		D4N-4B26
2-conduit	M12 connector	D4N-9126	D4N-9226	D4N-9A26	D4N-9B26					
	Pg13.5	⊙	D4N-5126	⊙	D4N-5226	⊙	D4N-5A26	⊙	D4N-5B26	
	G1/2		D4N-6126		D4N-6226		D4N-6A26		D4N-6B26	
	M20		D4N-8126		D4N-8226		D4N-8A26		D4N-8B26	
Plunger 	1-conduit	Pg13.5	⊙	D4N-1131	⊙	D4N-1231	⊙	D4N-1A31	⊙	D4N-1B31
		G1/2		D4N-2131		D4N-2231		D4N-2A31		D4N-2B31
		1/2-14NPT		D4N-3131		D4N-3231		D4N-3A31		D4N-3B31
		M20		D4N-4131		D4N-4231		D4N-4A31		D4N-4B31
	2-conduit	M12 connector	D4N-9131	D4N-9231	D4N-9A31	D4N-9B31				
		Pg13.5	⊙	D4N-5131	⊙	D4N-5231	⊙	D4N-5A31	⊙	D4N-5B31
		G1/2		D4N-6131		D4N-6231		D4N-6A31		D4N-6B31
		M20		D4N-8131		D4N-8231		D4N-8A31		D4N-8B31
Roller plunger 	1-conduit	Pg13.5	⊙	D4N-1132	⊙	D4N-1232	⊙	D4N-1A32	⊙	D4N-1B32
		G1/2		D4N-2132		D4N-2232		D4N-2A32		D4N-2B32
		1/2-14NPT		D4N-3132		D4N-3232		D4N-3A32		D4N-3B32
		M20		D4N-4132		D4N-4232		D4N-4A32		D4N-4B32
	2-conduit	M12 connector	D4N-9132	D4N-9232	D4N-9A32	D4N-9B32				
		Pg13.5	⊙	D4N-5132	⊙	D4N-5232	⊙	D4N-5A32	⊙	D4N-5B32
		G1/2		D4N-6132		D4N-6232		D4N-6A32		D4N-6B32
		M20		D4N-8132		D4N-8232		D4N-8A32		D4N-8B32

Safety Limit Switches D4N

Actuator	Conduit size		Built-in switch mechanism													
			1NC/1NO (Snap-action)		2NC (Snap-action)		1NC/1NO (Slow-action)		2NC (Slow-action)							
			Direct opening	Model	Direct opening	Model	Direct opening	Model	Direct opening	Model						
One-way roller arm lever (horizontal) 	1-conduit	Pg13.5	⊕	D4N-1162	⊕	D4N-1262	⊕	D4N-1A62	⊕	D4N-1B62						
		G1/2		D4N-2162		D4N-2262		D4N-2A62		D4N-2B62						
		1/2-14NPT		D4N-3162		D4N-3262		D4N-3A62		D4N-3B62						
		M20		D4N-4162		D4N-4262		D4N-4A62		D4N-4B62						
		M12 connector		D4N-9162		D4N-9262		D4N-9A62		D4N-9B62						
	2-conduit	Pg13.5	⊕	D4N-5162	⊕	D4N-5262	⊕	D4N-5A62	⊕	D4N-5B62						
		G1/2		D4N-6162		D4N-6262		D4N-6A62		D4N-6B62						
		M20		D4N-8162		D4N-8262		D4N-8A62		D4N-8B62						
		One-way roller arm lever (vertical) 		1-conduit		Pg13.5		⊕		D4N-1172	⊕	D4N-1272	⊕	D4N-1A72	⊕	D4N-1B72
						G1/2				D4N-2172		D4N-2272		D4N-2A72		D4N-2B72
1/2-14NPT	D4N-3172		D4N-3272		D4N-3A72	D4N-3B72										
M20	D4N-4172		D4N-4272		D4N-4A72	D4N-4B72										
M12 connector	D4N-9172		D4N-9272		D4N-9A72	D4N-9B72										
2-conduit	Pg13.5		⊕	D4N-5172	⊕	D4N-5272	⊕	D4N-5A72	⊕	D4N-5B72						
	G1/2			D4N-6172		D4N-6272		D4N-6A72		D4N-6B72						
	M20			D4N-8172		D4N-8272		D4N-8A72		D4N-8B72						
	Adjustable roller lever, form lock (metal lever, resin roller) 			1-conduit		Pg13.5		⊕		D4N-112G	⊕	D4N-122G	⊕	D4N-1A2G	⊕	D4N-1B2G
						G1/2				D4N-212G		D4N-222G		D4N-2A2G		D4N-2B2G
1/2-14NPT		D4N-312G	D4N-322G		D4N-3A2G	D4N-3B2G										
M20		D4N-412G	D4N-422G		D4N-4A2G	D4N-4B2G										
M12 connector		D4N-912G	D4N-922G		D4N-9A2G	D4N-9B2G										
2-conduit		G1/2	⊕	D4N-612G	⊕	D4N-622G	⊕	D4N-6A2G	⊕	D4N-6B2G						
		M20		D4N-812G		D4N-822G		D4N-8A2G		D4N-8B2G						
		Adjustable roller lever, form lock (metal lever, rubber roller) 		1-conduit		Pg13.5		⊕		D4N-112H	⊕	D4N-122H	⊕	D4N-1A2H	⊕	D4N-1B2H
						G1/2				D4N-212H		D4N-222H		D4N-2A2H		D4N-2B2H
						1/2-14NPT				D4N-312H		D4N-322H		D4N-3A2H		D4N-3B2H
M20	D4N-412H		D4N-422H		D4N-4A2H	D4N-4B2H										
M12 connector	D4N-912H		D4N-922H		D4N-9A2H	D4N-9B2H										
2-conduit	G1/2		⊕	D4N-612H	⊕	D4N-622H	⊕	D4N-6A2H	⊕	D4N-6B2H						
	M20			D4N-812H		D4N-822H		D4N-8A2H		D4N-8B2H						








Note: It is recommended that M20 be used for Switches to be exported to Europe and 1/2-14NPT be used for Switches to be exported to North American countries.

Switches with Three Contacts and MBB Contacts



Actuator	Conduit size		Built-in switch mechanism							
			2NC/1NO (Slow-action)		3NC (Slow-action)		1NC/1NO MBB (Slow-action)		2NC/1NO MBB (Slow-action)	
			Direct opening	Model	Direct opening	Model	Direct opening	Model	Direct opening	Model
Roller lever (resin lever, resin roller) 	1-conduit	Pg13.5	⊕	D4N-1C20	⊕	D4N-1D20	⊕	D4N-1E20	⊕	D4N-1F20
		G1/2		D4N-2C20		D4N-2D20		D4N-2E20		D4N-2F20
		1/2-14NPT		D4N-3C20		D4N-3D20		D4N-3E20		D4N-3F20
		M20		D4N-4C20		D4N-4D20		D4N-4E20		D4N-4F20
		M12 connector		---		---		D4N-9E20		---
	2-conduit	Pg13.5	⊕	D4N-5C20	⊕	D4N-5D20	⊕	D4N-5E20	⊕	D4N-5F20
		G1/2		D4N-6C20		D4N-6D20		D4N-6E20		D4N-6F20
		M20		D4N-8C20		D4N-8D20		D4N-8E20		D4N-8F20

Safety Limit Switches

D4N





Actuator	Conduit size		Built-in switch mechanism							
			2NC/1NO (Slow-action)		3NC (Slow-action)		1NC/1NO MBB (Slow-action)		2NC/1NO MBB (Slow-action)	
			Direct opening	Model	Direct opening	Model	Direct opening	Model	Direct opening	Model
Roller lever (metal lever, resin roller) 	1-conduit	Pg13.5	⊕	D4N-1C22	⊕	D4N-1D22	⊕	D4N-1E22	⊕	D4N-1F22
		G1/2		D4N-2C22		D4N-2D22		D4N-2E22		D4N-2F22
		1/2-14NPT		D4N-3C22		D4N-3D22		D4N-3E22		D4N-3F22
		M20		D4N-4C22		D4N-4D22		D4N-4E22		D4N-4F22
		M12 connector		---		---		D4N-9E22		---
	2-conduit	Pg13.5	⊕	D4N-5C22	⊕	D4N-5D22	⊕	D4N-5E22	⊕	D4N-5F22
		G1/2		D4N-6C22		D4N-6D22		D4N-6E22		D4N-6F22
		M20		D4N-8C22		D4N-8D22		D4N-8E22		D4N-8F22
Roller lever (metal lever, metal roller) 	1-conduit	Pg13.5	⊕	D4N-1C25	⊕	D4N-1D25	⊕	D4N-1E25	⊕	D4N-1F25
		G1/2		D4N-2C25		D4N-2D25		D4N-2E25		D4N-2F25
		1/2-14NPT		D4N-3C25		D4N-3D25		D4N-3E25		D4N-3F25
		M20		D4N-4C25		D4N-4D25		D4N-4E25		D4N-4F25
		M12 connector		---		---		D4N-9E25		---
	2-conduit	Pg13.5	⊕	D4N-5C25	⊕	D4N-5D25	⊕	D4N-5E25	⊕	D4N-5F25
		G1/2		D4N-6C25		D4N-6D25		D4N-6E25		D4N-6F25
		M20		D4N-8C25		D4N-8D25		D4N-8E25		D4N-8F25
Roller lever (metal lever, bearing roller) 	1-conduit	Pg13.5	⊕	D4N-1C26	⊕	D4N-1D26	⊕	D4N-1E26	⊕	D4N-1F26
		G1/2		D4N-2C26		D4N-2D26		D4N-2E26		D4N-2F26
		1/2-14NPT		D4N-3C26		D4N-3D26		D4N-3E26		D4N-3F26
		M20		D4N-4C26		D4N-4D26		D4N-4E26		D4N-4F26
		M12 connector		---		---		D4N-9E26		---
	2-conduit	Pg13.5	⊕	D4N-5C26	⊕	D4N-5D26	⊕	D4N-5E26	⊕	D4N-5F26
		G1/2		D4N-6C26		D4N-6D26		D4N-6E26		D4N-6F26
		M20		D4N-8C26		D4N-8D26		D4N-8E26		D4N-8F26
Plunger 	1-conduit	Pg13.5	⊕	D4N-1C31	⊕	D4N-1D31	⊕	D4N-1E31	⊕	D4N-1F31
		G1/2		D4N-2C31		D4N-2D31		D4N-2E31		D4N-2F31
		1/2-14NPT		D4N-3C31		D4N-3D31		D4N-3E31		D4N-3F31
		M20		D4N-4C31		D4N-4D31		D4N-4E31		D4N-4F31
		M12 connector		---		---		D4N-9E31		---
	2-conduit	Pg13.5	⊕	D4N-5C31	⊕	D4N-5D31	⊕	D4N-5E31	⊕	D4N-5F31
		G1/2		D4N-6C31		D4N-6D31		D4N-6E31		D4N-6F31
		M20		D4N-8C31		D4N-8D31		D4N-8E31		D4N-8F31
Roller plunger 	1-conduit	Pg13.5	⊕	D4N-1C32	⊕	D4N-1D32	⊕	D4N-1E32	⊕	D4N-1F32
		G1/2		D4N-2C32		D4N-2D32		D4N-2E32		D4N-2F32
		1/2-14NPT		D4N-3C32		D4N-3D32		D4N-3E32		D4N-3F32
		M20		D4N-4C32		D4N-4D32		D4N-4E32		D4N-4F32
		M12 connector		---		---		D4N-9E32		---
	2-conduit	Pg13.5	⊕	D4N-5C32	⊕	D4N-5D32	⊕	D4N-5E32	⊕	D4N-5F32
		G1/2		D4N-6C32		D4N-6D32		D4N-6E32		D4N-6F32
		M20		D4N-8C32		D4N-8D32		D4N-8E32		D4N-8F32
One-way roller arm lever (horizontal) 	1-conduit	Pg13.5	⊕	D4N-1C62	⊕	D4N-1D62	⊕	D4N-1E62	⊕	D4N-1F62
		G1/2		D4N-2C62		D4N-2D62		D4N-2E62		D4N-2F62
		1/2-14NPT		D4N-3C62		D4N-3D62		D4N-3E62		D4N-3F62
		M20		D4N-4C62		D4N-4D62		D4N-4E62		D4N-4F62
		M12 connector		---		---		D4N-9E62		----
	2-conduit	Pg13.5	⊕	D4N-5C62	⊕	D4N-5D62	⊕	D4N-5E62	⊕	D4N-5F62
		G1/2		D4N-6C62		D4N-6D62		D4N-6E62		D4N-6F62
		M20		D4N-8C62		D4N-8D62		D4N-8E62		D4N-8F62
One-way roller arm lever (vertical) 	1-conduit	Pg13.5	⊕	D4N-1C72	⊕	D4N-1D72	⊕	D4N-1E72	⊕	D4N-1F72
		G1/2		D4N-2C72		D4N-2D72		D4N-2E72		D4N-2F72
		1/2-14NPT		D4N-3C72		D4N-3D72		D4N-3E72		D4N-3F72
		M20		D4N-4C72		D4N-4D72		D4N-4E72		D4N-4F72
		M12 connector		---		---		D4N-9E72		---
	2-conduit	Pg13.5	⊕	D4N-5C72	⊕	D4N-5D72	⊕	D4N-5E72	⊕	D4N-5F72
		G1/2		D4N-6C72		D4N-6D72		D4N-6E72		D4N-6F72
		M20		D4N-8C72		D4N-8D72		D4N-8E72		D4N-8F72

Safety Limit Switches
D4N

Actuator	Conduit size		Built-in switch mechanism							
			2NC/1NO (Slow-action)		3NC (Slow-action)		1NC/1NO MBB (Slow-action)		2NC/1NO MBB (Slow-action)	
			Direct opening	Model	Direct opening	Model	Direct opening	Model	Direct opening	Model
Adjustable roller lever, form lock (metal lever, resin roller) 	1-conduit	Pg13.5	⊕	D4N-1C2G	⊕	D4N-1D2G	⊕	D4N-1E2G	⊕	D4N-1F2G
		G1/2		D4N-2C2G		D4N-2D2G		D4N-2E2G		D4N-2F2G
		1/2-14NPT		D4N-3C2G		D4N-3D2G		D4N-3E2G		D4N-3F2G
		M20		D4N-4C2G		D4N-4D2G		D4N-4E2G		D4N-4F2G
		M12 connector		---		---		D4N-9E2G		---
	2-conduit	G1/2	⊕	D4N-6C2G	⊕	D4N-6D2G	⊕	D4N-6E2G	⊕	D4N-6F2G
	M20		D4N-8C2G		D4N-8D2G		D4N-8E2G		D4N-8F2G	
Adjustable roller lever, form lock (metal lever, rubber roller) 	1-conduit	Pg13.5	⊕	D4N-1C2H	⊕	D4N-1D2H	⊕	D4N-1E2H	⊕	D4N-1F2H
		G1/2		D4N-2C2H		D4N-2D2H		D4N-2E2H		D4N-2F2H
		1/2-14NPT		D4N-3C2H		D4N-3D2H		D4N-3E2H		D4N-3F2H
		M20		D4N-4C2H		D4N-4D2H		D4N-4E2H		D4N-4F2H
		M12 connector		---		---		D4N-9E2H		---
	2-conduit	G1/2	⊕	D4N-6C2H	⊕	D4N-6D2H	⊕	D4N-6E2H	⊕	D4N-6F2H
	M20		D4N-8C2H		D4N-8D2H		D4N-8E2H		D4N-8F2H	

Note: It is recommended that M20 be used for Switches to be exported to Europe and 1/2-14NPT be used for Switches to be exported to North American countries.

General-purpose Switches with Two Contacts





Actuator	Conduit size		Built-in switch mechanism							
			1NC/1NO (Snap-action)		2NC (Snap-action)		1NC/1NO (Slow-action)		2NC (Slow-action)	
			Direct opening	Model	Direct opening	Model	Direct opening	Model	Direct opening	Model
Fork lever lock (right operation) 	1-conduit	G1/2	---	---	---	---	---	D4N-2ARE	---	D4N-2BRE
		1/2-14NPT						D4N-3ARE		D4N-3BRE
		M20						D4N-4ARE		D4N-4BRE
	2-conduit	G1/2	---	---	---	---	---	D4N-6ARE	---	D4N-6BRE
		M20						D4N-8ARE		D4N-8BRE
Fork lever lock (left operation) 	1-conduit	G1/2	---	---	---	---	---	D4N-2ALE	---	D4N-2BLE
		1/2-14NPT						D4N-3ALE		D4N-3BLE
		M20						D4N-4ALE		D4N-4BLE
	2-conduit	G1/2	---	---	---	---	---	D4N-6ALE	---	D4N-6BLE
		M20						D4N-8ALE		D4N-8BLE
Cat whisker 	1-conduit	G1/2	---	D4N-2180	---	D4N-2280	---	---	---	D4N-2B80
		1/2-14NPT		D4N-3180		D4N-3280				D4N-3B80
		M20		D4N-4180		D4N-4280				D4N-4B80
	2-conduit	G1/2	---	D4N-6180	---	D4N-6280	---	---	---	D4N-6B80
		M20		D4N-8180		D4N-8280				D4N-8B80
Plastic rod 	1-conduit	G1/2	---	D4N-2187	---	D4N-2287	---	---	---	D4N-2B87
		1/2-14NPT		D4N-3187		D4N-3287				D4N-3B87
		M20		D4N-4187		D4N-4287				D4N-4B87
	2-conduit	G1/2	---	D4N-6187	---	D4N-6287	---	---	---	D4N-6B87
		M20		D4N-8187		D4N-8287				D4N-8B87

Note: 1. It is recommended that M20 be used for Switches to be exported to Europe and 1/2-14NPT be used for Switches to be exported to North American countries.

2. Mechanically speaking, these models are basic limit switches.

Safety Limit Switches D4N

General-purpose Switches with Three Contacts and MBB Contacts

Actuator	Conduit size		Built-in switch mechanism								
			Direct opening	2NC/1NO (Slow-action)	Direct opening	3NC (Slow-action)	Direct opening	1NC/1NO MBB (Slow-action)	Direct opening	2NC/1NO MBB (Slow-action)	
Fork lever lock (right operation) 	1-conduit	G1/2	---	D4N-2CRE	---	D4N-2DRE	---	D4N-2ERE	---	D4N-2FRE	
		1/2-14NPT		D4N-3CRE		D4N-3DRE		D4N-3ERE		D4N-3FRE	
		M20		D4N-4CRE		D4N-4DRE		D4N-4ERE		D4N-4FRE	
	2-conduit	G1/2	---	D4N-6CRE	---	D4N-6DRE	---	D4N-6ERE	---	D4N-6FRE	
		1/2-14NPT		D4N-8CRE		D4N-8DRE		D4N-8ERE		D4N-8FRE	
		M20									
Fork lever lock (left operation) 	1-conduit	G1/2	---	D4N-2CLE	---	D4N-2DLE	---	D4N-2ELE	---	D4N-2FLE	
		1/2-14NPT		D4N-3CLE		D4N-3DLE		D4N-3ELE		D4N-3FLE	
		M20		D4N-4CLE		D4N-4DLE		D4N-4ELE		D4N-4FLE	
	2-conduit	G1/2	---	D4N-6CLE	---	D4N-6DLE	---	D4N-6ELE	---	D4N-6FLE	
		1/2-14NPT		D4N-8CLE		D4N-8DLE		D4N-8ELE		D4N-8FLE	
		M20									
Cat whisker 	1-conduit	G1/2	---	---	---	D4N-2D80	---	---	---	---	
		1/2-14NPT				D4N-3D80					D4N-4D80
		M20									
	2-conduit	G1/2	---	---	---	---	D4N-6D80	---	---	---	---
		1/2-14NPT					D4N-8D80				
		M20									
Plastic rod 	1-conduit	G1/2	---	---	---	D4N-2D87	---	---	---	---	
		1/2-14NPT				D4N-3D87					D4N-4D87
		M20									
	2-conduit	G1/2	---	---	---	---	D4N-6D87	---	---	---	---
		1/2-14NPT					D4N-8D87				
		M20									

Note: 1. It is recommended that M20 be used for Switches to be exported to Europe and 1/2-14NPT be used for Switches to be exported to North American countries.

2. Mechanically speaking, these models are basic limit switches.

Specifications

Standards and EC Directives

- Conforms to the following EC Directives:
 - Machinery Directive
 - Low Voltage Directive
 - EN50047
 - EN1088 (slow-action models only)
 - GS-ET-15

Approved Standards

Agency	Standard	File No.
TÜV Product Service	EN60947-5-1 (approved direct opening)	(See note 1.)
UL (See note 2.)	UL508, CSA C22.2 No.14	E76675
CCC (CQC)	GB14048.5	2004010305105973

- Note:**
- Consult your OMRON representative for details.
 - Approval for CSA C22.2 No. 14 is authorized by the UL mark.
 - Ask your OMRON representative for information on approved models.

Approved Standard Ratings

TÜV (EN60947-5-1), CCC (GB14048.5)

Item	Utilization category	AC-15	DC-13
Rated operating current (I_e)		3 A	0.27 A
Rated operating voltage (U_e)		240 V	250 V

Note: Use a 10-A fuse type gI or gG that conforms to IEC269 as a short-circuit protection device. This fuse is not built into the Switch.

UL/CSA (UL508, CSA C22.2 No. 14)

A300

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	10 A	60 A	6 A	7,200 VA	720 VA
240 VAC		30 A	3 A		

Q300

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
125 VDC	2.5 A	0.55 A	0.55 A	69 VA	69 VA
250 VDC		0.27 A	0.27 A		

■ Characteristics

Degree of protection (See note 3.)		IP67 (EN60947-5-1)
Durability (See note 4.)	Mechanical	15,000,000 operations min. (See note 7.)
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC (See note 5.) 300,000 operations min. for a resistive load of 10 A at 250 VAC
Operating speed		1 to 500 mm/s (D4N-1120)
Operating frequency		30 operations/minute max.
Contact resistance		25 mΩ max.
Minimum applicable load (See note 6.)		Resistive load of 1 mA at 5 VDC (N-level reference value)
Rated insulation voltage (U_i)		300 V
Protection against electric shock		Class II (double insulation)
Pollution degree (operating environment)		Level 3 (EN60947-5-1)
Impulse withstand voltage (EN60947-5-1)		Between terminals of the same polarity: 2.5 kV
		Between terminals of different polarities: 4 kV
		Between other terminals and uncharged metallic parts: 6 kV
Insulation resistance		100 MΩ min.
Contact gap		Snap-action: 2 x 0.5 mm min Slow-action: 2 x 2 mm min
Vibration resistance	Malfunction	10 to 55 Hz, 0.75-mm single amplitude
Shock resistance	Destruction	1,000 m/s ² min.
	Malfunction	300 m/s ² min.
Conditional short-circuit current		100 A (EN60947-5-1)
Rated open thermal current (I_{th})		10 A (EN60947-5-1)
Ambient temperature		Operating: -30°C to 70°C with no icing
Ambient humidity		Operating: 95% max.
Weight		Approx. 82 g (D4N-1120)
		Approx. 99 g (D4N-5120)

- Note:**
- The above values are initial values.
 - Once a contact has been used to switch a standard load, it cannot be used for a load of a smaller capacity. Doing so may result in roughening of the contact surface and contact reliability may be lost.
 - The degree of protection is tested using the method specified by the standard (EN60947-5-1). Confirm that sealing properties are sufficient for the operating conditions and environment beforehand. Although the switch box is protected from dust or water penetration, do not use the D4N in places where foreign material such as dust, dirt, oil, water, or chemicals may penetrate through the head. Otherwise, premature wear, Switch damage or malfunctioning may occur.
 - The durability is for an ambient temperature of 5°C to 35°C and an ambient humidity of 40% to 70%. For more details, consult your OMRON representative.
 - If the ambient temperature is greater than 35°C, do not pass the 3-A, 250-VAC load through more than 2 circuits.
 - This value will vary with the switching frequency, environment, and reliability level. Confirm that correct operation is possible with the actual load beforehand.
 - The mechanical durability of fork lever lock models is 10,000,000 operations min.

Connections

■ Contact Form

Model	Contact	Contact form	Operating pattern	Remarks
D4N-□1□	1NC/1NO (Snap-action)			Only NC contacts 31-32 have an approved direct opening mechanism. (→) The terminals 13-14 and 31-32 can be used as unlike poles.
D4N-□2□	2NC (Snap-action)			Only NC contacts 11-12 and 31-32 have an approved direct opening mechanism. (→) The terminals 11-12 and 31-32 can be used as unlike poles.
D4N-□A□	1NC/1NO (Slow-action)			Only NC contacts 11-12 have an approved direct opening mechanism. (→) The terminals 11-12 and 33-34 can be used as unlike poles.
D4N-□B□	2NC (Slow-action)			Only NC contacts 11-12 and 31-32 have an approved direct opening mechanism. (→) The terminals 11-12 and 31-32 can be used as unlike poles.
D4N-□C□	2NC/1NO (Slow-action)			Only NC contacts 11-12 and 21-22 have an approved direct opening mechanism. (→) The terminals 11-12, 21-22, and 33-34 can be used as unlike poles.
D4N-□D□	3NC (Slow-action)			Only NC contacts 11-12, 21-22, and 31-32 have an approved direct opening mechanism. (→) The terminals 11-12, 21-22, and 31-32 can be used as unlike poles.
D4N-□E□	1NC/1NO MBB (Slow-action)			Only NC contacts 11-12 have an approved direct opening mechanism. (→) The terminals 11-12 and 33-34 can be used as unlike poles.
D4N-□F□	2NC/1NO MBB (Slow-action)			Only NC contacts 11-12 and 21-22 have an approved direct opening mechanism. (→) The terminals 11-12, 21-22 and 33-34 can be used as unlike poles.

Note: 1. Terminals are numbered according to EN50013 and the contact forms are according to IEC947-5-1.

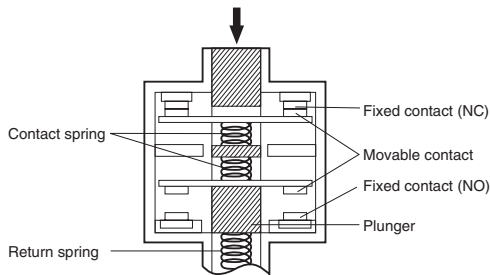
2. MBB (Make Before Break) contacts have an overlapping structure, so that before the normally closed contact (NC) opens, the normally open contact (NO) closes.

Safety Limit Switches
D4N

Operation

Direct Opening Mechanism

1NC/1NO Contact (Slow-action)

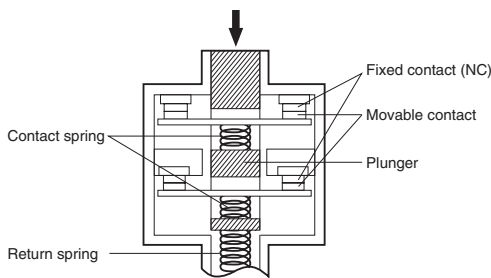


Conforms to EN60947-5-1 Direct Opening Operation ⊖

(Only the NC contact side has a direct opening mechanism.)

When contact welding occurs, the contacts are separated from each other by the plunger being pushed in.

2NC Contact (Slow-action)



Conforms to EN60947-5-1 Direct Opening Operation ⊖

(Both NC contacts have a direct opening mechanism.)

Nomenclature

Structure

Safety-oriented Lever Setting (Form-lock construction)
Grooves which engage the lever are cut in the lever and rotary shaft to prevent the lever from slipping against the rotary shaft. There are resin-lever and metal-lever types.

Head
The direction of the switch head can be varied to any of the four directions. (Roller plunger models can be mounted in either of two directions at a 90° angle.)

Built-in Switch
The built-in switch has a direct opening mechanism that forcibly separates the NC contact even when there is contact deposit.

Cover
The cover, with a hinge on its lower part, can be opened by removing the screw of the cover, which ensures ease of maintenance and wiring.

Conduit Opening
A wide variety of conduits is available.

Size	1-conduit	2-conduit
Pg13.5	Yes	Yes
G1/2	Yes	Yes
1/2-14NPT	Yes	Yes
M20	Yes	Yes
M12 connector	Yes	---

Note: M12 connector types are not available for Switches with three contacts.

Dimensions

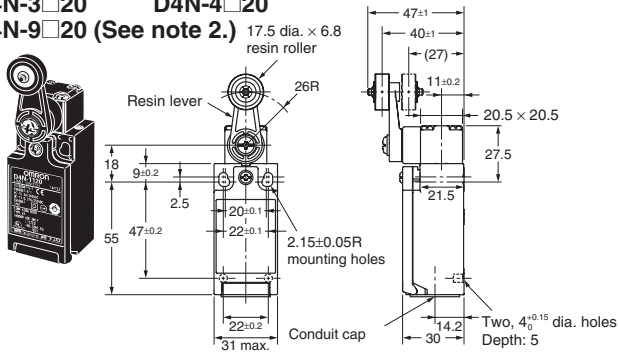
Switches

Note: All units are in millimeters unless otherwise indicated.

1-conduit Models

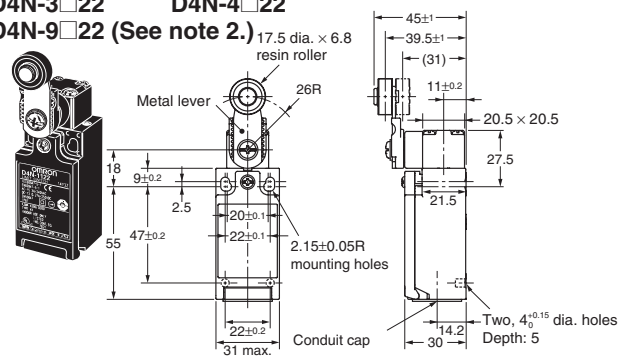
Roller Lever (Resin Lever, Resin Roller)

- D4N-1□20 D4N-2□20
- D4N-3□20 D4N-4□20
- D4N-9□20 (See note 2.)



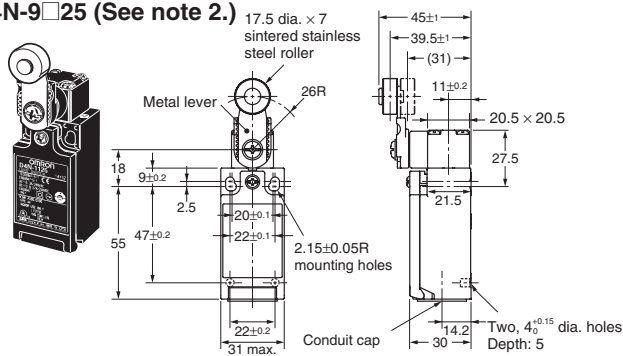
Roller Lever (Metal Lever, Resin Roller)

- D4N-1□22 D4N-2□22
- D4N-3□22 D4N-4□22
- D4N-9□22 (See note 2.)



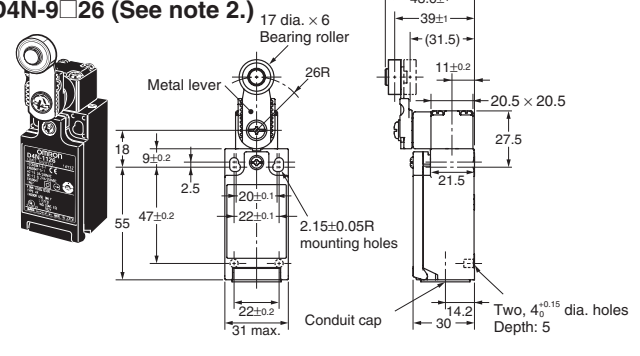
Roller Lever (Metal Lever, Metal Roller)

- D4N-1□25 D4N-2□25
- D4N-3□25 D4N-4□25
- D4N-9□25 (See note 2.)



Roller Lever (Metal Lever, Bearing Roller)

- D4N-1□26 D4N-2□26
- D4N-3□26 D4N-4□26
- D4N-9□26 (See note 2.)



Note: 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
2. Refer to page B-17 for details on M12 connectors.

Snap-action (1NC/1NO) (2NC), Slow-action (2NC) (3NC)

Model	D4N-□120 D4N-□220 D4N-□B20 D4N-□D20	D4N-□122 D4N-□222 D4N-□B22 D4N-□D22	D4N-□125 D4N-□225 D4N-□B25 D4N-□D25	D4N-□126 D4N-□226 D4N-□B26 D4N-□D26
OF max.	5.0 N			
RF min.	0.5 N			
PT	18° to 27°			
OT min.	40°			
MD max. (See note 2.)	14°			
OP	---			
TT (See note 3.)	(80°)			
DOT min. (See note 4.)	50°			
DOF min. (See note 4.)	20 N			

Note: 1. Variation occurs in the simultaneity of contact opening/closing operations of 2NC, 2NC/1NO, and 3NC contacts. Check contact operation.
2. Only for snap-action models.
3. Reference value.
4. Only for slow-action models. For safe use, always make sure that the minimum values or greater are provided.

Slow-action (1NC/1NO) (2NC/1NO)

Model	D4N-□A20 D4N-□C20 D4N-□E20 D4N-□F20	D4N-□A22 D4N-□C22 D4N-□E22 D4N-□F22	D4N-□A25 D4N-□C25 D4N-□E25 D4N-□F25	D4N-□A26 D4N-□C26 D4N-□E26 D4N-□F26
OF max.	5.0 N			
RF min.	0.5 N			
PT (See note 1.)	18° to 27°			
PT (2nd) (See note 2.)	(44°)			
PT (See note 3.)	27.5° to 36.5°			
PT (2nd) (See note 4.)	(18°)			
OT min.	40°			
OP	---			
TT (See note 5.)	(80°)			
DOT min. (See note 6.)	50°			
DOF min. (See note 6.)	20 N			

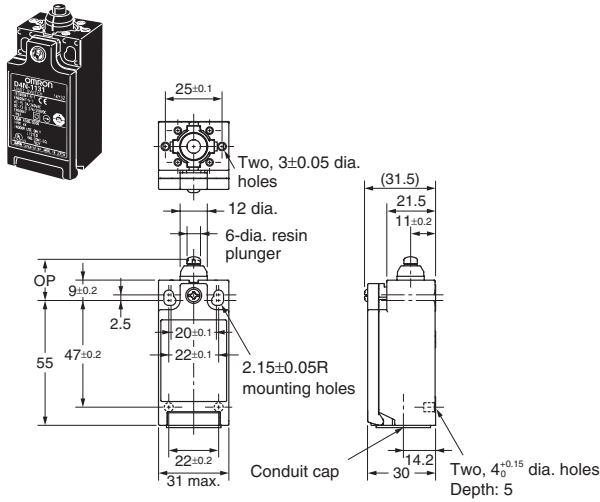
Note: 1. These PT values are possible when the NC contacts are open (OFF).
2. These PT values are possible when the NO contacts are closed (ON).
3. Only for MBB models.
4. Reference values for MBB models only.
5. Reference values.
6. For safe use, always make sure that the minimum values or greater are provided.

Safety Limit Switches D4N

1-conduit Models

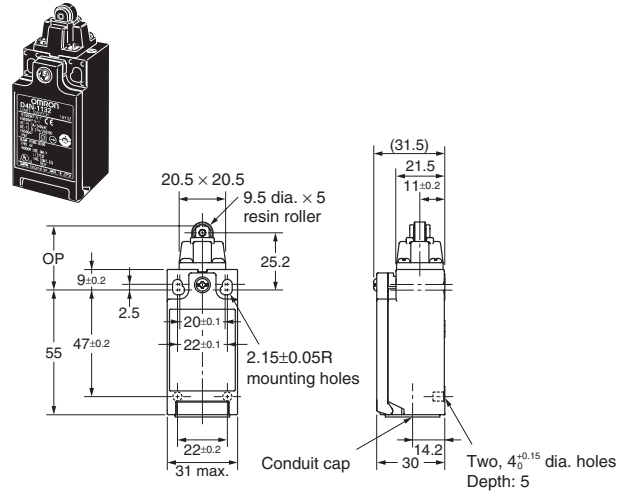
Plunger

D4N-1□31 D4N-2□31
 D4N-3□31 D4N-4□31
 D4N-9□31 (See note 2.)



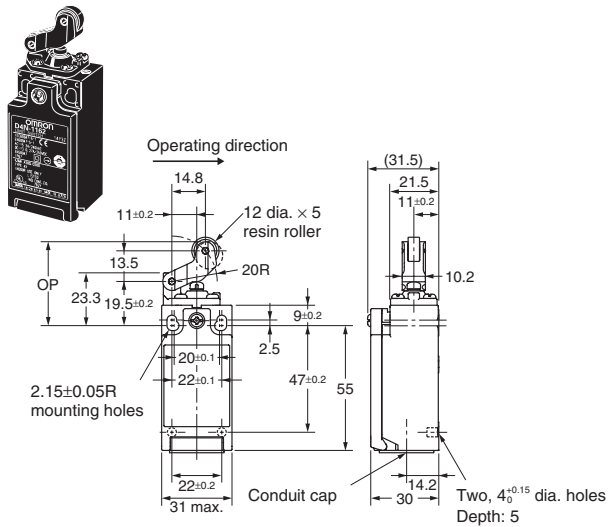
Roller Plunger

D4N-1□32 D4N-2□32
 D4N-3□32 D4N-4□32
 D4N-9□32 (See note 2.)



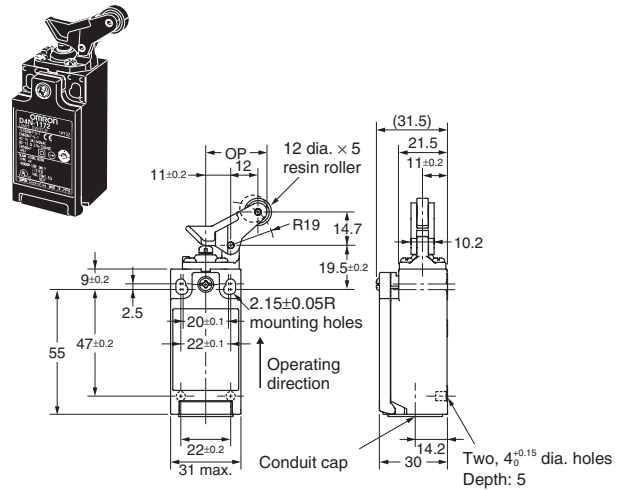
One-way Roller Arm Lever (Horizontal)

D4N-1□62 D4N-2□62
 D4N-3□62 D4N-4□62
 D4N-9□62 (See note 2.)



One-way Roller Arm Lever (Vertical)

D4N-1□72 D4N-2□72
 D4N-3□72 D4N-4□72
 D4N-9□72 (See note 2.)



Note: 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
 2. Refer to page B-17 for details on M12 connectors.

Snap-action (1NC/1NO) (2NC), Slow-action (2NC) (3NC)

Model	D4N-□131 D4N-□231 D4N-□B31 D4N-□D31	D4N-□132 D4N-□232 D4N-□B32 D4N-□D32	D4N-□162 D4N-□262 D4N-□B62 D4N-□D62	D4N-□172 D4N-□272 D4N-□B72 D4N-□D72
OF max.	6.5 N	6.5 N	5.0 N	5.0 N
RF min.	1.5 N	1.5 N	0.8 N	0.8 N
PT max.	2 mm	2 mm	4 mm	4 mm
OT min.	4 mm	4 mm	5 mm	5 mm
MD max. (See note 2.)	1 mm	1 mm	1.5 mm	1.5 mm
OP	18.2 ±0.5 mm	28.6 ±0.8 mm	37 ±0.8 mm	27 ±0.8 mm
TT (See note 3.)	(6 mm)	(6 mm)	(9 mm)	(9 mm)
DOT min. (See note 4.)	3.2 mm	3.2 mm	5.8 mm	4.8 mm
DOF min. (See note 4.)	20 N	20 N	20 N	20 N

- Note:**
1. Variation occurs in the simultaneity of contact opening/closing operations of 2NC, 2NC/1NO, and 3NC contacts. Check contact operation.
 2. Only for snap-action models.
 3. Reference value.
 4. Only for slow-action models. For safe use, always make sure that the minimum values or greater are provided.

Slow-action (1NC/1NO) (2NC/1NO)

Model	D4N-□A31 D4N-□C31 D4N-□E31 D4N-□F31	D4N-□A32 D4N-□C32 D4N-□E32 D4N-□F32	D4N-□A62 D4N-□C62 D4N-□E62 D4N-□F62	D4N-□A72 D4N-□C72 D4N-□E72 D4N-□F72
OF max.	6.5 N	6.5 N	5.0 N	5.0 N
RF min.	1.5 N	1.5 N	0.8 N	0.8 N
PT max. (See note 1.)	2 mm	2 mm	4 mm	4 mm
PT (2nd) (See note 2.)	(2.9 mm)	(2.9 mm)	(5.2 mm)	(4.3 mm)
PT max. (See note 3.)	2.8 mm	2.8 mm	4 mm	4 mm
PT (2nd) (See note 4.)	(1 mm)	(1 mm)	(1.5 mm)	(1.5 mm)
OT min.	4 mm	4 mm	5 mm	5 mm
OP	18.2 ±0.5 mm	28.6 ±0.8 mm	37 ±0.8 mm	27 ±0.8 mm
OP (See note 5.)	17.4 ±0.5 mm	28 ±0.8 mm	36 ±0.8 mm	26.1 ±0.8 mm
TT (See note 6.)	(6 mm)	(6 mm)	(9 mm)	(9 mm)
DOT min. (See note 7.)	3.2 mm	3.2 mm	5.8 mm	4.8 mm
DOF min. (See note 7.)	20 N	20 N	20 N	20 N

- Note:**
1. These PT values are possible when the NC contacts are open (OFF).
 2. These PT values are possible when the NO contacts are closed (ON).
 3. Only for MBB models.
 4. Reference values for MBB models.
 5. Only for MBB models.
 6. Reference value.
 7. For safe use, always make sure that the minimum values or greater are provided.

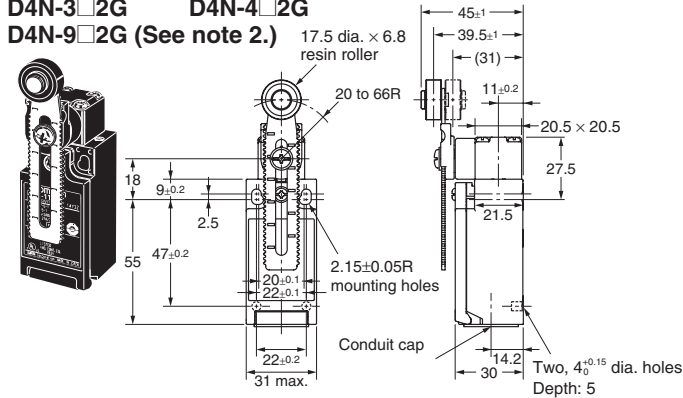
Safety Limit Switches

D4N

1-conduit Models

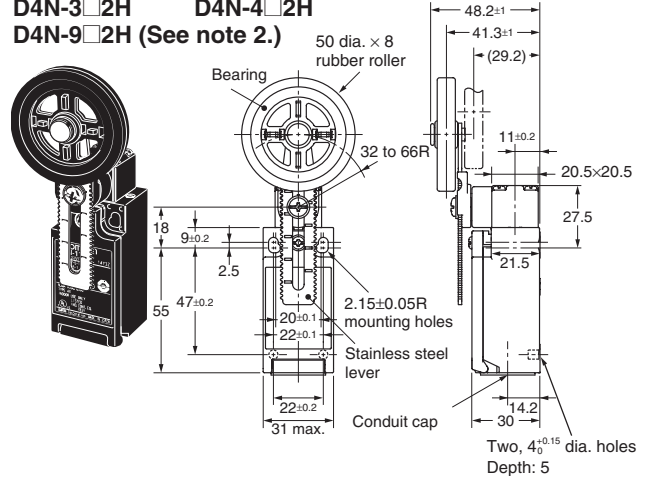
Adjustable Roller Lever, Form Lock (with Metal Lever, Resin Roller)

D4N-1□2G D4N-2□2G
D4N-3□2G D4N-4□2G
D4N-9□2G (See note 2.)



Adjustable Roller Lever, Form Lock (with Metal Lever, Rubber Roller)

D4N-1□2H D4N-2□2H
D4N-3□2H D4N-4□2H
D4N-9□2H (See note 2.)



- Note:** 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
2. Refer to following diagrams for details on M12 connectors.

Snap-action (1NC/1NO) (2NC), Slow-action (2NC) (3NC)

Model	D4N-□12H D4N-□22H D4N-□B2H D4N-□D2H	D4N-□12G D4N-□22G D4N-□B2G D4N-□D2G (See note 2.)
OF max.	4.5 N	
RF min.	0.4 N	
PT	18° to 27°	
OT min.	40°	
MD max. (See note 3.)	14°	
OP	---	
TT (See note 4.)	(80°)	
DOT min. (See note 5.)	50°	
DOF min. (See note 5.)	20 N	

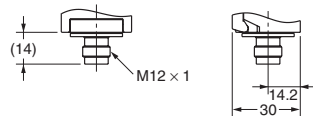
- Note:** 1. Variation occurs in the simultaneity of contact opening/closing operations of 2NC, 2NC/1NO, and 3NC contacts. Check contact operation.
2. The operating characteristics of these Switches were measured with the roller lever set at 32 mm.
3. Only for snap-action models.
4. Reference value.
5. Only for slow-action models. For safe use, always make sure that the minimum values or greater are provided.

Slow-action (1NC/1NO) (2NC/1NO)

Model	D4N-□A2H D4N-□C2H D4N-□E2H D4N-□F2H	D4N-□A2G D4N-□C2G D4N-□E2G D4N-□F2G (See note 1.)
OF max.	4.5 N	
RF min.	0.4 N	
PT (See note 2.)	18° to 27°	
PT (2nd) (See note 3.)	(44°)	
PT (See note 4.)	27.5° to 36.5°	
PT (2nd) (See note 5.)	(18°)	
OT min.	40°	
OP	---	
TT (See note 6.)	(80°)	
DOT min.	50°	
DOF min. (See note 7.)	20 N	

- Note:** 1. The operating characteristics of these Switches were measured with the roller lever set at 32 mm.
2. This PT value is possible when the NC contacts are open (OFF).
3. This PT value is possible when the NO contacts are closed (ON).
4. Only for MBB models.
5. Reference value for MBB models only.
6. Reference value.
7. For safe use, always make sure that the minimum values or greater are provided.

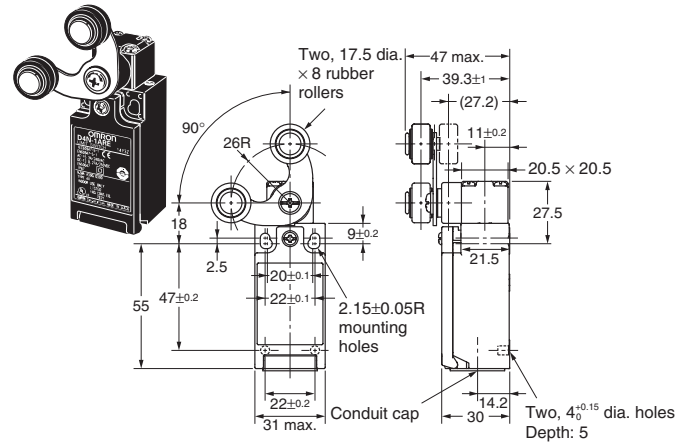
1-conduit M12 Connector D4N-9□□□



1-conduit Models

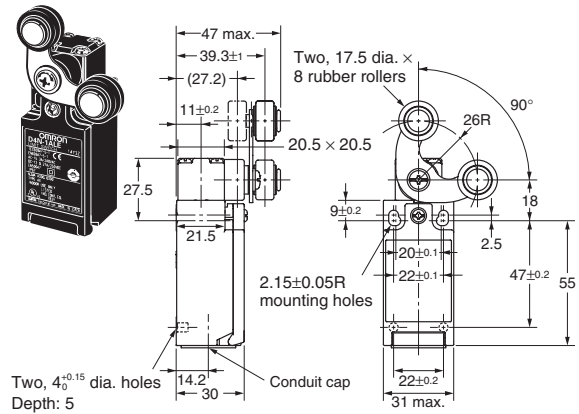
Fork Lever Lock
(Right Operation)

D4N-1□RE D4N-2□RE
D4N-3□RE D4N-4□RE



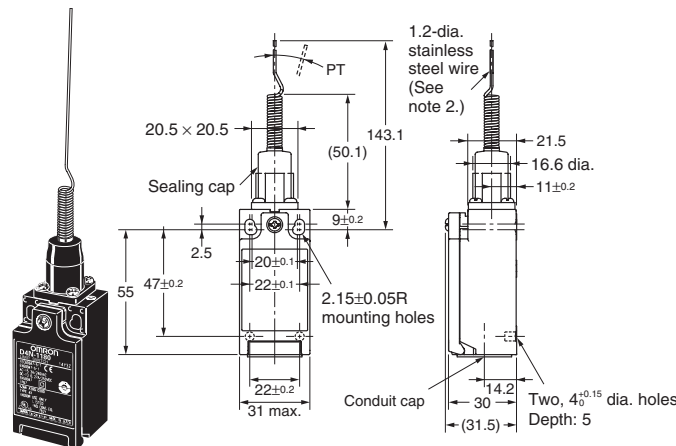
Fork Lever Lock
(Left Operation)

D4N-1□LE D4N-2□LE
D4N-3□LE D4N-4□LE



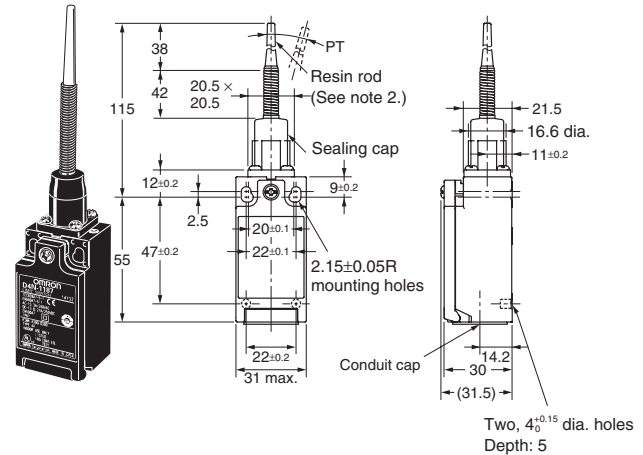
Cat Whisker

D4N-1□80 D4N-2□80
D4N-3□80 D4N-4□80



Plastic Rod

D4N-1□87 D4N-2□87
D4N-3□87 D4N-4□87



Note: 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

2. The usable range for stainless steel wires and resin rods is 35 mm max. from the end with a total travel of 70 mm max.

Slow-action (1NC/1NO) (2NC/1NO) (2NC) (3NC)

Model	D4N-□□RE	D4N-□□LE
Force necessary to reverse the direction of the lever: max.	6.4 N	6.4 N
Movement until the lever reverses	55 ±10°	55 ±10°
Movement until switch operation (NC)	6.5° (MBB: 10°)	6.5° (MBB: 10°)
Movement until switch operation (NO)	18.5° (MBB: 5°)	18.5° (MBB: 5°)
DOT min.	30°	30°
DOF min.	20 N	20 N

Note: Variation occurs in the simultaneity of contact opening/closing operations of 2NC, 2NC/1NO, and 3NC contacts. Check contact operation.

Snap-action (1NC/1NO) (2NC), Slow-action (2NC) (3NC)

Model	D4N-□□80	D4N-□□87
OF max.	1.5 N	1.5 N
PT max.	15°	15°

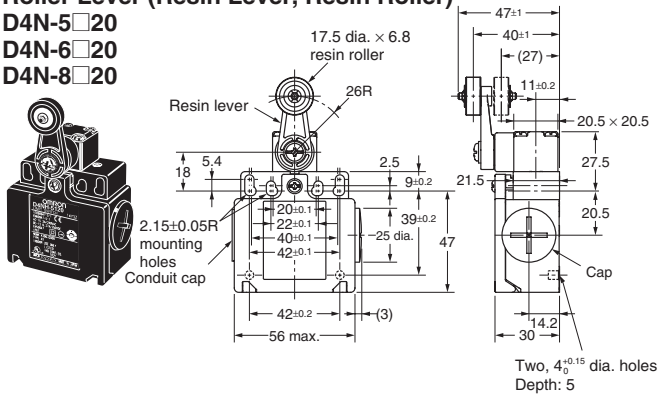
Safety Limit Switches

D4N

2-conduit Models

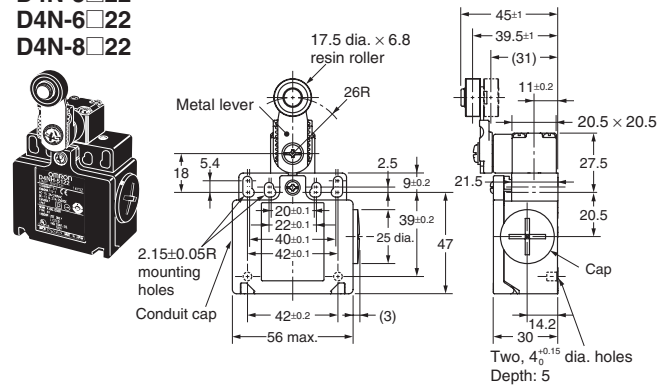
Roller Lever (Resin Lever, Resin Roller)

D4N-5□20
D4N-6□20
D4N-8□20



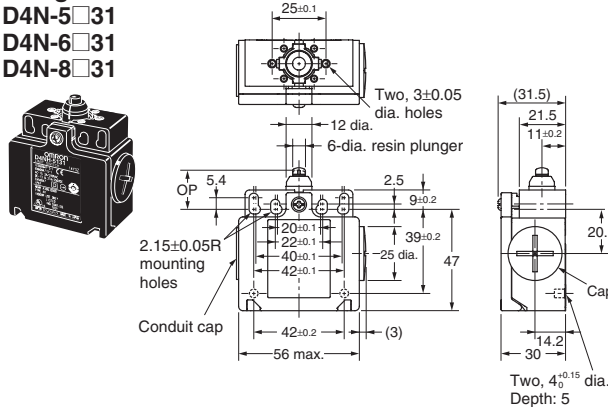
Roller Lever (Metal Lever, Resin Roller)

D4N-5□22
D4N-6□22
D4N-8□22



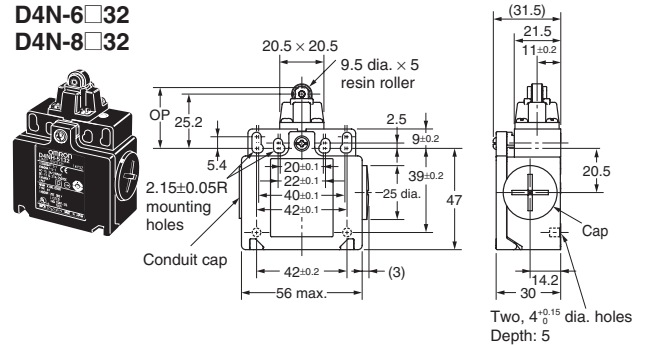
Plunger

D4N-5□31
D4N-6□31
D4N-8□31



Roller Plunger

D4N-5□32
D4N-6□32
D4N-8□32



Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

Snap-action (1NC/1NO) (2NC), Slow-action (2NC) (3NC)

Model	D4N-□120 D4N-□220 D4N-□B20 D4N-□D20	D4N-□122 D4N-□222 D4N-□B22 D4N-□D22	D4N-□131 D4N-□231 D4N-□B31 D4N-□D31	D4N-□132 D4N-□232 D4N-□B32 D4N-□D32
OF max.	5 N	5 N	6.5 N	6.5 N
RF min.	0.5 N	0.5 N	1.5 N	1.5 N
PT	18° to 27°	18° to 27°	2 mm	2 mm
OT min.	40°	40°	4 mm	4 mm
MD max. (See note 2.)	14°	14°	1 mm	1 mm
OP	---	---	18 ±0.5 mm	28.2 ±0.8 mm
TT (See note 3.)	(80°)	(80°)	(6 mm)	(6 mm)
DOT min. (See note 4.)	50°	50°	3.2 mm	3.2 mm
DOF min. (See note 4.)	20 N	20 N	20 N	20 N

- Note: 1. Variation occurs in the simultaneity of contact opening/closing operations of 2NC, 2NC/1NO, and 3NC contacts. Check contact operation.
2. Only for snap-action models.
3. Reference value.
4. Only for slow-action models. For safe use, always make sure that the minimum values or greater are provided.

Slow-action (1NC/1NO) (2NC/1NO)

Model	D4N-□A20 D4N-□C20 D4N-□E20 D4N-□F20	D4N-□A22 D4N-□C22 D4N-□E22 D4N-□F22	D4N-□A31 D4N-□C31 D4N-□E31 D4N-□F31	D4N-□A32 D4N-□C32 D4N-□E32 D4N-□F32
OF max.	5 N	5 N	6.5 N	6.5 N
RF min.	0.5 N	0.5 N	1.5 N	1.5 N
PT (See note 1.)	18° to 27°	18° to 27°	2 mm	2 mm
PT (2nd) (See note 2.)	(44°)	(44°)	(2.9 mm)	(2.9 mm)
PT (See note 3.)	27.5° to 36.5°	27.5° to 36.5°	2.8 mm	2.8 mm
PT (2nd) (See note 4.)	(18°)	(18°)	(1 mm)	(1 mm)
OT min.	40°	40°	4 mm	4 mm
OP	---	---	18 ±0.5 mm	28.2 ±0.8 mm
OP (See note 5.)	---	---	17.4 ±0.5 mm	28 ±0.8 mm
TT (See note 6.)	(80°)	(80°)	(6 mm)	(6 mm)
DOT min. (See note 7.)	50°	50°	3.2 mm	3.2 mm
DOF min. (See note 7.)	20 N	20 N	20 N	20 N

- Note: 1. This PT value is possible when the NC contacts are open (OFF).
2. This PT value is possible when the NO contacts are closed (ON).
3. Only for MBB models.
4. Reference value for MBB models.
5. Only for MBB models.
6. Reference value.
7. For safe use, always make sure that the minimum values or greater are provided.

2-conduit Models

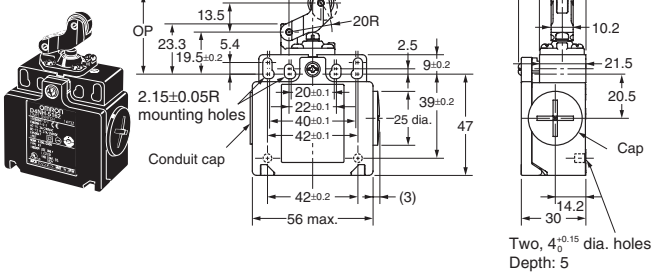
One-way Roller Arm Lever

(Horizontal)

D4N-5□62

D4N-6□62

D4N-8□62



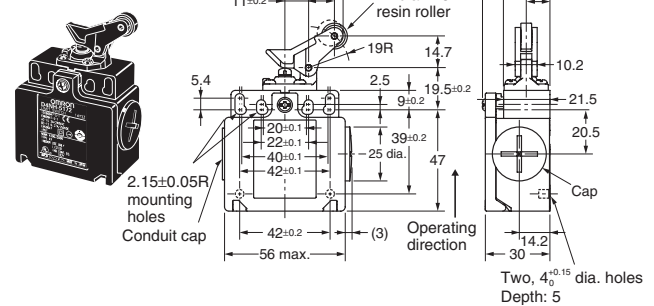
One-way Roller Arm Lever

(Vertical)

D4N-5□72

D4N-6□72

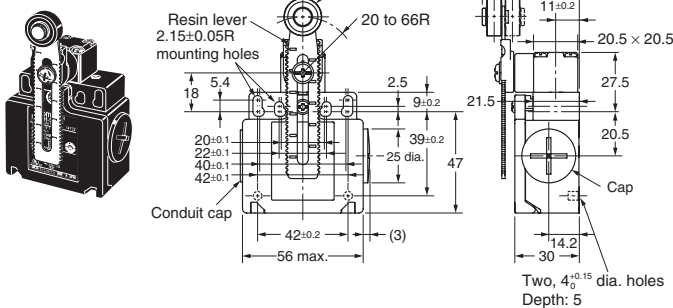
D4N-8□72



Adjustable Roller Lever, Form Lock (with Metal Lever, Resin Roller)

D4N-6□2G

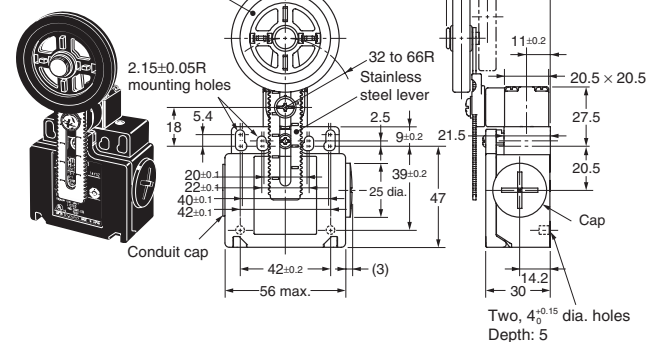
D4N-8□2G



Adjustable Roller Lever, Form Lock (with Metal Lever, Rubber Roller)

D4N-6□2H

D4N-8□2H



Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

Snap-action (1NC/1NO) (2NC), Slow-action (2NC) (3NC)

Model	D4N-□162 D4N-□262 D4N-□B62 D4N-□D62	D4N-□172 D4N-□272 D4N-□B72 D4N-□D72	D4N-□12G D4N-□22G D4N-□B2G D4N-□D2G (See note 2.)	D4N-□12H D4N-□22H D4N-□B2H D4N-□D2H (See note 3.)
OF max.	5.0 N	5.0 N	4.5 N	4.5 N
RF min.	0.8 N	0.8 N	0.4 N	0.4 N
PT max. (See note 3.)	4 mm	4 mm	18° to 27°	18° to 27°
OT min.	5 mm	5 mm	40°	40°
MD max. (See note 4.)	1.5 mm	1.5 mm	14°	14°
OP	37 ±0.8 mm	27 ±0.8 mm	---	---
TT (See note 5.)	(9 mm)	(9 mm)	(70°)	(70°)
DOT min. (See note 6.)	5.8 mm	4.8 mm	50°	50°
DOF min. (See note 6.)	20 N	20 N	20 N	20 N

- Note:
- Variation occurs in the simultaneity of contact opening/closing operations of 2NC, 2NC/1NO, and 3NC contacts. Check contact operation.
 - The operating characteristics of these Switches were measured with the roller lever set at 30 mm.
 - The operating characteristics of these Switches were measured with the roller lever set at 31 mm.
 - Only for snap-action models.
 - Reference value.
 - Only for slow-action models. For safe use, always make sure that the minimum values or greater are provided.

Slow-action (1NC/1NO) (2NC/1NO)

Model	D4N-□A62 D4N-□C62 D4N-□E62 D4N-□F62	D4N-□A72 D4N-□C72 D4N-□E72 D4N-□F72	D4N-□A2G D4N-□C2G D4N-□E2G D4N-□F2G (See note 1.)	D4N-□A2H D4N-□C2H D4N-□E2H D4N-□F2H (See note 2.)
OF max.	5.0 N	5.0 N	4.5 N	4.5 N
RF min.	0.8 N	0.8 N	0.4 N	0.4 N
PT max. (See note 3.)	4 mm	4 mm	18° to 27°	18° to 27°
PT (2nd) (See note 4.)	(5.2 mm)	(4.3 mm)	(44°)	(44°)
PT max. (See note 5.)	4 mm	4 mm	27.5° to 36.5°	27.5° to 36.5°
PT (2nd) (See note 6.)	(1.5 mm)	(1.5 mm)	(18°)	(18°)
OT min.	5 mm	5 mm	40°	40°
OP	37 ±0.8 mm	27 ±0.8 mm	---	---
OP (See note 7.)	36 ±0.8 mm	26.1 ±0.8 mm	---	---
TT (See note 8.)	(9 mm)	(9 mm)	(70°)	(70°)
DOT min. (See note 9.)	5.8 mm	4.8 mm	50°	50°
DOF min. (See note 9.)	20 N	20 N	20 N	20 N

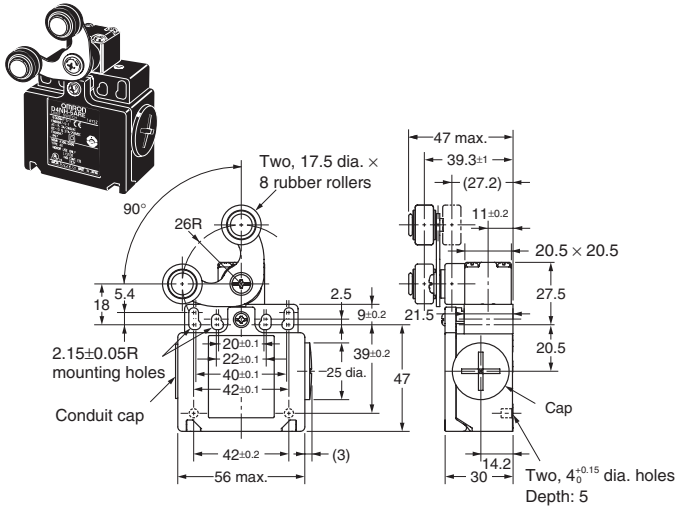
- Note:
- The operating characteristics of these Switches were measured with the roller lever set at 30 mm.
 - The operating characteristics of these Switches were measured with the roller lever set at 31 mm.
 - This PT value is possible when the NC contacts are open (OFF).
 - This PT value is possible when the NO contacts are closed (ON).
 - Only for MBB models.
 - Reference value for MBB models only.
 - Only for MBB models.
 - Reference value.
 - For safe use, always make sure that the minimum values or greater are provided.

Safety Limit Switches D4N

2-conduit Models

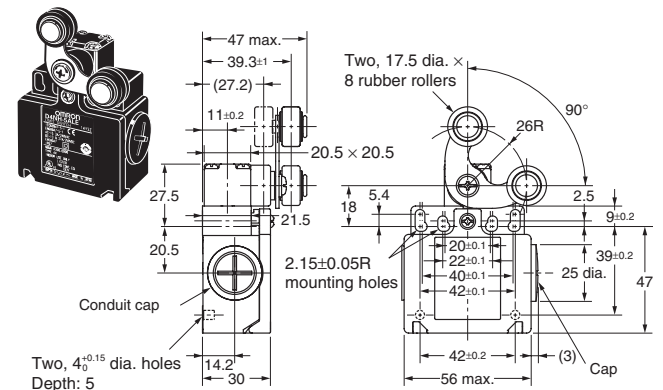
Fork Lever Lock (Right Operation)

D4N-5□RE D4N-6□RE
D4N-7□RE D4N-8□RE



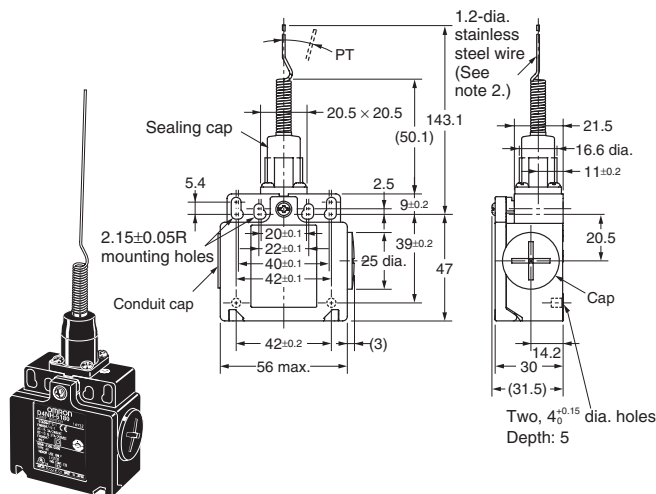
Fork Lever Lock (Left Operation)

D4N-5□LE D4N-6□LE
D4N-7□LE D4N-8□LE



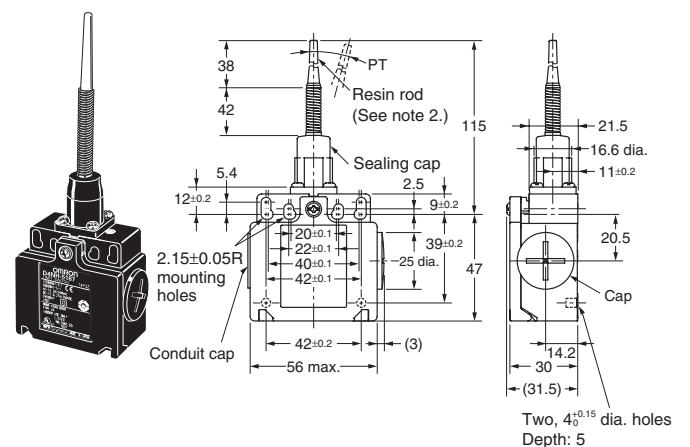
Cat Whisker

D4N-5□80 D4N-6□80
D4N-7□80 D4N-8□80



Plastic Rod

D4N-5□87 D4N-6□87
D4N-7□87 D4N-8□87



Note: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

2. The usable range for stainless steel wires and resin rods is 35 mm max. from the end with a total travel of 70 mm max.

Slow-action (1NC/1NO) (2NC), Slow-action (2NC) (3NC)

Model	D4N-□□RE	D4N-□□LE
Force necessary to reverse the direction of the lever: max.	6.4 N	6.4 N
Movement until the lever reverses	$55 \pm 10^\circ$	$55 \pm 10^\circ$
Movement until switch operation (NC)	(6.5°)	(6.5°) (MBB: 10°)
Movement until switch operation (NO)	(18.5°)	(18.5°) (MBB: 5°)

Note: Variation occurs in the simultaneity of contact opening/closing operations of 2NC, 2NC/1NO, and 3NC contacts. Check contact operation.

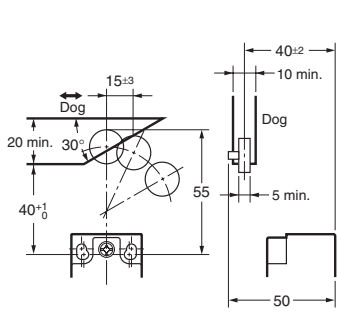
Snap-action (1NC/1NO), Slow-action (2NC) (3NC)

Model	D4N-□□80	D4N-□□87
OF max.	1.5 N	1.5 N
PT max.	15°	15°

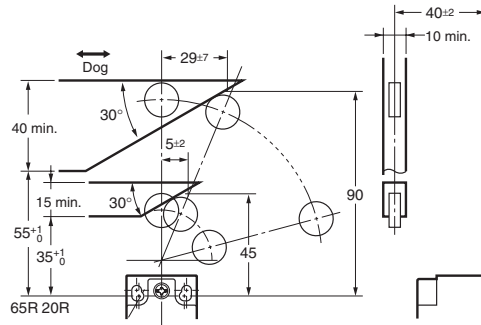
Levers

Refer to the following for the angles and positions of the watchdogs (source: EN50047.)

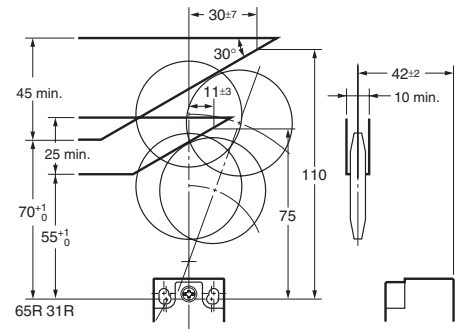
**Roller Lever
(D4N-□□20)**



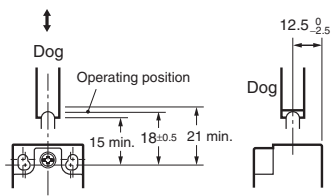
**Adjustable Roller Lever, Form Lock
(with Metal Lever, Resin Roller)
(D4N-□□2G) (Reference Values)**



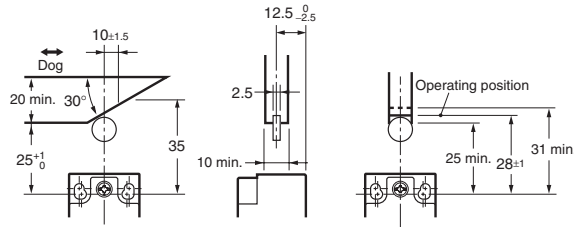
**Adjustable Roller Lever, Form Lock
(with Metal Lever, Rubber Roller)
(D4N-□□2H) (Reference Values)**



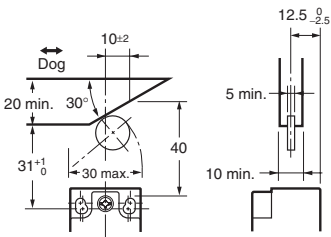
**Sealed Plunger
(D4N-□□31)**



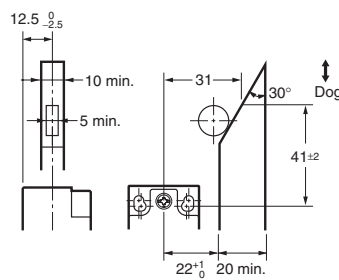
**Roller Plunger
(D4N-□□32)**



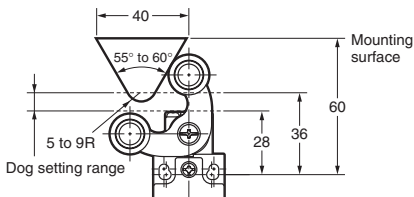
**One-way Roller Arm Lever
(Horizontal)
(D4N-□□62)**



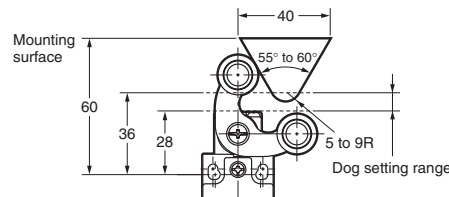
**One-way Roller Arm Lever
(Vertical) (Reference Values)
(D4N-□□72)**



**Fork Lever Lock
(Right Operation)
(D4N-□□RE)**



**Fork Lever Lock
(Left Operation)
(D4N-□□LE)**



Note: Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Safety Limit
Switches

D4N

Safety Precautions

Refer to the "Precautions for All Switches" on page I-2 and "Precautions for All Safety Limit Switches" on page B-2.

CAUTION

Do not use metal connectors or conduits. If the Switch is made of resin, damage at the conduit section may cause electric shock.

Precautions for Safe Use

- Do not drop the Switch. Doing so may result in the Switch not performing to its full capacity.
- Do not attempt to disassemble or modify the Switch. Doing so may cause the Switch to malfunction.
- Do not use the Switch where explosive gas or flammable gas may be present.
- Do not use the Switch submerged in oil or water, or in locations continuously subject to splashes of oil or water. Doing so may result in oil or water entering the Switch interior. (The IP67 degree of protection specification for the Switch refers to water penetration while the Switch is submersed in water for a specified period of time.)
- Protect the head from foreign material. Subjecting the head to foreign material may result in premature wear or damage to the Switch. Although the switch body is protected from penetration by dust or water, the head is not protected from penetration by minute particles or water.
- Turn the power OFF before wiring. Not doing so may result in electric shock.
- Install the cover after wiring. Not doing so may result in electric shock.
- Connect a fuse to the Switch in series to protect the Switch from short-circuit damage. Use a fuse with a breaking current 1.5 to 2 times larger than the rated current. To conform to EN ratings, use an IEC60269-compliant 10-A fuse type gL or gG.
- Do not switch circuits for two or more standard loads (250 VAC, 3 A) at the same time. Doing so may adversely affect insulation performance.
- The durability of the Switch is greatly affected by operating conditions. Evaluate the Switch under actual working conditions before permanent installation and use within a number of switching operations that will not adversely affect the Switch's performance.
- Be sure to indicate in the machine manufacturer's instruction manual that the user must not attempt to repair or maintain the Switch and must contact the machine manufacturer for any repairs or maintenance.
- Check the Switches before use and inspect regularly, replacing them when necessary. If a Switch is kept pressed for an extended period of time, the components may deteriorate quickly, and the Switch may not release.

Precautions for Correct Use

Environment

- The Switch is intended for indoor use only.
- Do not use the Switch outdoors. Doing so may cause the Switch to malfunction.
- Do not use the Switch where corrosive gases (e.g., H₂S, SO₂, NH₃, HNO₃, Cl₂) are present or in locations subject to high temperature and humidity. Doing so may result in damage to the Switch caused by contact failure or corrosion.
- Do not use the Switches in the following locations.
 - Locations subject to severe temperature changes
 - Locations subject to high temperatures or condensation
 - Locations subject to severe vibration

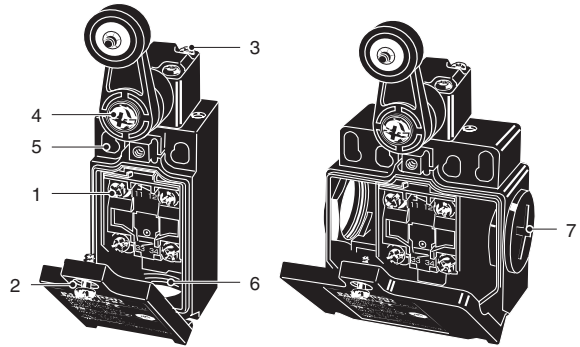
- Locations where the interior of the Protective Door may come into direct contact with cutting chips, metal filings, oil, or chemicals
- Locations where the Switch may come into contact with thinner or detergents

Mounting Method

Mounting Screw Tightening Torque

Tighten each of the screws to the specified torque. Loose screws may result in malfunction of the Switch within a short time.

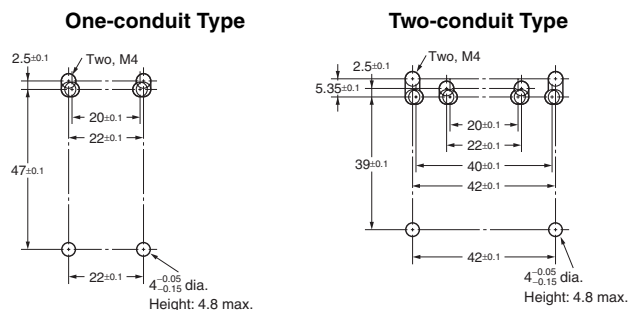
1	Terminal screw	0.6 to 0.8 N·m
2	Cover clamping screw	0.5 to 0.7 N·m
3	Head clamping screw	0.5 to 0.6 N·m
4	Lever clamping screw	1.6 to 1.8 N·m
5	Body clamping screw	0.5 to 0.7 N·m
6	Conduit mounting connection, M12 adaptor	1.8 to 2.2 N·m (except 1/2-14NPT) 1.4 to 1.8 N·m (1/2-14NPT)
7	Cap screw	1.3 to 1.7 N·m



Switch Mounting

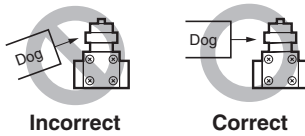
- Mount the Switch using M4 screws and washers and tighten the screws to the specified torque.
- For safety, use screws that cannot be easily removed, or use an equivalent measure to ensure that the Switch is secure.
- Secure the Switch with two M4 bolts and washers. Provide studs with a diameter of $4_{-0.05}^{-0.15}$ and a height of 4.8 mm max. at two places, inserting into the holes at the bottom of the Switch as shown below so that the Switch is firmly fixed at four points.

Switch Mounting Holes



- Make sure that the dog contacts the actuator at a right angle. Applying a load to the switch actuator (roller) on a slant may result in deformation or damage of the actuator or rotary shaft.

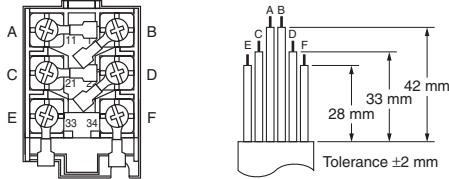
Safety Limit Switches D4N



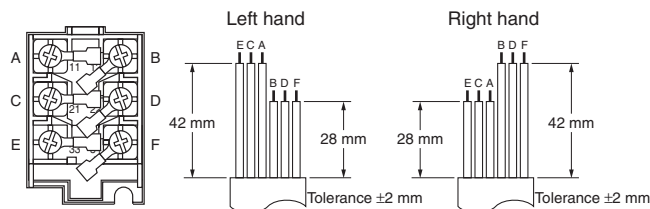
Wiring

- When connecting to the terminals via insulating tube and M3.5 crimp terminals, arrange the crimp terminals as shown below so that they do not rise up onto the case or the cover. Applicable lead wire size: AWG20 to AWG18 (0.5 to 0.75 mm²). Use lead wires of an appropriate length, as shown below. Not doing so may result in excess length causing the cover to rise and not fit properly.

One-conduit Type (3 Poles)



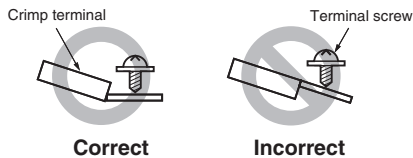
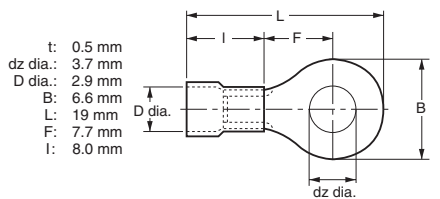
Two-conduit Type (3 Poles)



- Do not push crimp terminals into gaps in the case interior. Doing so may cause damage or deformation of the case.
- Use crimp terminals not more than 0.5 mm in thickness. Otherwise, they will interfere with other components inside the case. The crimp terminals shown below are not more than 0.5 mm thick.

Manufacture	Type	Wire size
J.S.T.	FV0.5-3.7 (F type) V0.5-3.7 (straight type)	AWG20 (0.5 mm ²)

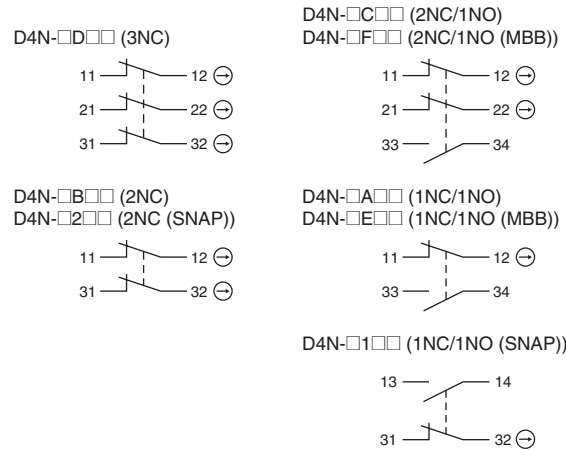
J.S.T is a Japanese manufacturer.



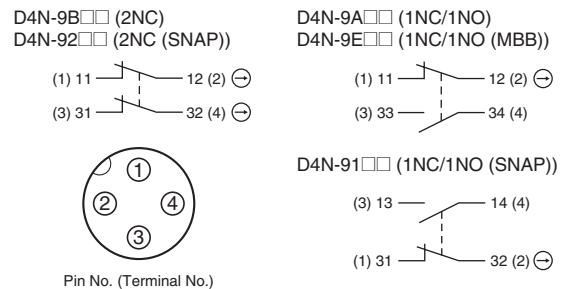
Contact Arrangement

- The following diagrams show the contact arrangements used for screw terminal types and connector types.

Screw Terminal Type



Connector Type



- Applicable socket: XS2F (OMRON).
- Refer to the *Connector Catalog* for details on socket pin numbers and lead wire colors.

Socket Tightening (Connector Type)

- Turn the socket connector screws by hand and tighten until no space remains between the socket and the plug.
- Make sure that the socket connector is tightened securely. Otherwise, the rated degree of protection (IP67) may not be maintained and vibration may loosen the socket connector.

Conduit Opening

- Connect a recommended connector to the opening of the conduit and tighten the connector to the specified torque. The case may be damaged if an excessive tightening torque is applied.
- When using 1/2-14NPT, wind sealing tape around the joint between the connector and conduit opening so that the enclosure will conform to IP67.
- Use a cable with a suitable diameter for the connector.
- Attach and tighten a conduit cap to the unused conduit opening when wiring. Tighten the conduit cap to the specified torque. The conduit cap is provided with the Switch (2-conduit types).

Changing the Lever

The lever mounting screws can be used to set the lever position to any position in a 360° angle at 7.5° increments. Grooves are incised on the lever and rotary shaft that engage to prevent the lever from slipping against the rotary shaft. The screws on adjustable roller lever models can also loosened to change the length of the lever.

Remove the screws from the front of the lever before mounting the lever in reverse (front/back), and set the level so that operation will be completed before exceeding a range of 180° on the horizontal.

Recommended Connectors

Use connectors with screws not exceeding 9 mm, otherwise the screws will protrude into the case interior, interfering with other components in the case. The connectors listed in the following table have connectors with thread sections not exceeding 9 mm. Use the recommended connectors to ensure conformance to IP67.

Size	Manufacturer	Model	Applicable cable diameter
G1/2	LAPP	ST-PF1/2 5380-1002	6.0 to 12.0 mm
Pg13.5	LAPP	ST-13.5 5301-5030	6.0 to 12.0 mm
M20	LAPP	ST-M20 × 1.5 5311-1020	7.0 to 13.0 mm
1/2-14NPT	LAPP	ST-NPT1/2 5301-6030	6.0 to 12.0 mm
M12	LAPP	ST-M12 × 1.5 5311-1000	3.5 to 7.0 mm

Use LAPP connectors together with seal packing (JPK-16, GP-13.5, GPM20, or GPM12), and tighten to the specified tightening torque. Seal packing is sold separately.

LAPP is a German manufacturer.

Before using an M12 type, attaching the provided changing adaptor to the Switch and then connect the recommended connector.

Before using a 2-conduit 1/2-14NPT type, attach the provided changing adaptor to the Switch and then connect the recommended connector.

Storage

Do not store the Switch in locations where corrosive gases (e.g., H₂S, SO₂, NH₃, HNO₃, Cl₂) or dust is present, or in locations subject to high temperatures and humidity.

Others

- Do not allow the load current to exceed the rated value.
- Confirm that the seal rubber has no defects before use. If the seal rubber is displaced or raised, or has foreign particles adhered to it, the sealing capability of the seal rubber will be adversely affected.
- Use the correct cover mounting screws only, or the sealing capability of the seal rubber will deteriorate.
- Inspect the Switch regularly.
- Make sure that foreign particles do not enter the head when removing the screws from the four corners to change the head position in any of the four directions.
- Use the following recommended countermeasures to prevent telegraphing when using adjustable or long levers.
 1. Make the rear edge of the dog smooth with an angle of 15° to 30° or make it in the shape of a quadratic curve.
 2. Design the circuit so that no error signal will be generated.
 3. Use or set a Switch that is operated in one direction only.

Production Discontinuation

Following the release of the D4N, production of the D4D-N will be discontinued.

Date of Production Discontinuation

Production of the D4D-N Series will be discontinued as of the end of March 2006.

Product Replacement

1. Dimensions

The D4D-N and D4N use the same mounting method, and mounting hole. The multi-contact structure and the extra 4 mm in length, however, are different.
2. Terminal Numbers

For the 2-contact slow-action model, the terminals 21, 22, 23, and 24 on the D4D-N are 31, 32, 33, and 34 on the D4N.
3. Recommended Terminals

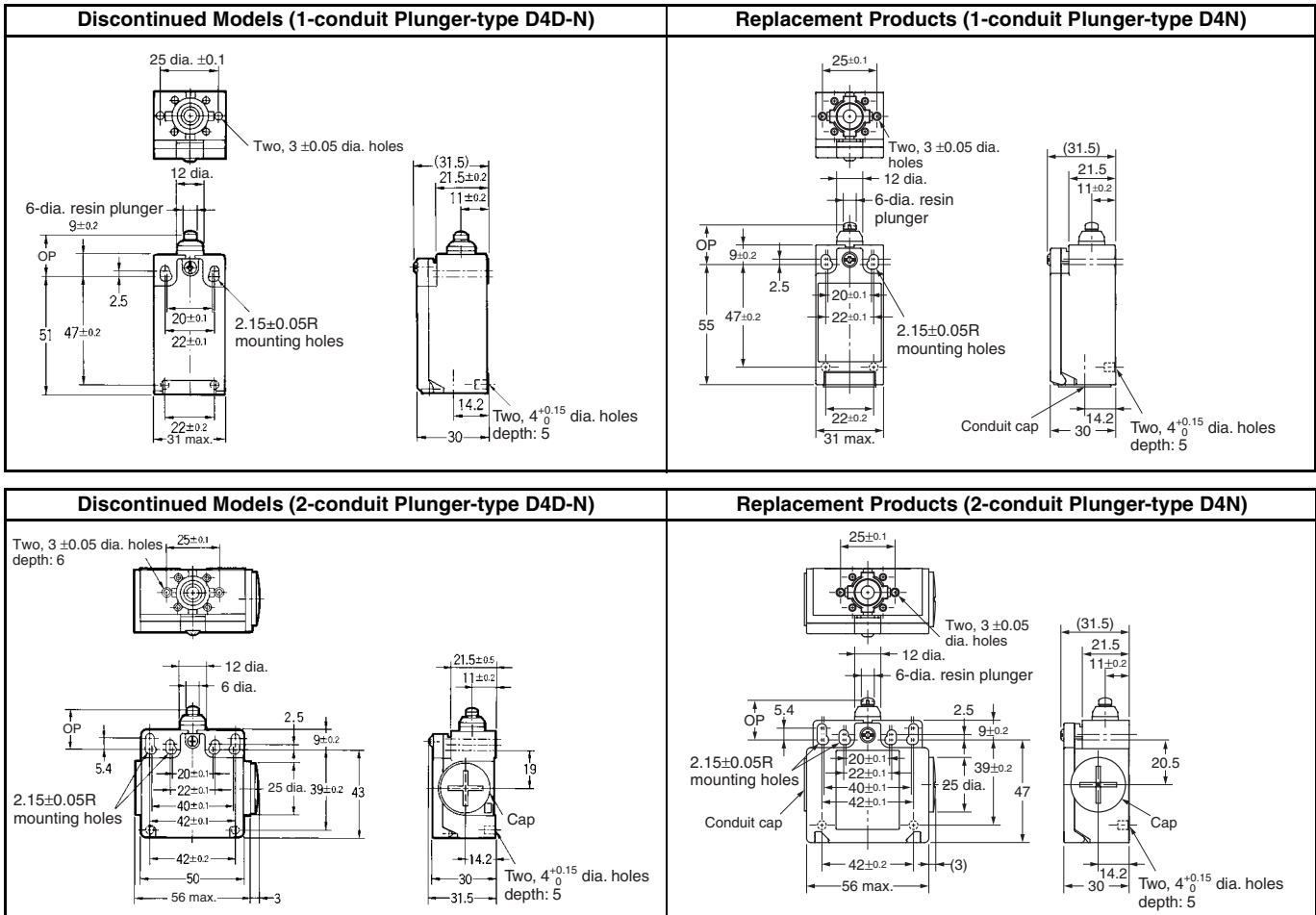
If the recommended terminals are not used, the Switch may not be compatible. Make sure that the Switch is compatible with the terminals.

Comparison of the D4D-N and Substitute Products

Model	D4N
Switch color	Very similar
Dimensions	Very similar
Wiring/connection	Significantly different
Mounting method	Completely compatible
Ratings/performance	Very similar
Operating characteristics	Very similar
Operating method	Completely compatible

Safety Limit Switches
D4N

Dimensions (Unit: mm)



Safety Limit Switches

D4N

List of Recommended Substitute Products

■ : The actuator on the D4D-N is a non-safety type. The D4N is recommended for safety applications (form lock type). Be sure to mount it correctly.

■ : M screws are recommended to comply with European standards. Therefore, the M20 type is recommended as a substitute when the Pg13.5 conduit-type is not available in a D4N model.

Safety Limit Switches

D4D-N product to be discontinued	Recommended substitute product	D4D-N product to be discontinued	Recommended substitute product	D4D-N product to be discontinued	Recommended substitute product
D4D-1120N	D4N-1120	D4D-1520N	D4N-1A20	D4D-1A20N	D4N-1B20
D4D-2120N	D4N-2120	D4D-2520N	D4N-2A20	D4D-2A20N	D4N-2B20
D4D-3120N	D4N-3120	D4D-3520N	D4N-3A20	D4D-3A20N	D4N-3B20
D4D-5120N	D4N-5120	D4D-5520N	D4N-5A20	D4D-5A20N	D4N-5B20
D4D-6120N	D4N-6120	D4D-6520N	D4N-6A20	D4D-6A20N	D4N-6B20
D4D-1122N	D4N-1122	D4D-1522N	D4N-1A22	D4D-1A22N	D4N-1B22
D4D-2122N	D4N-2122	D4D-2522N	D4N-2A22	D4D-2A22N	D4N-2B22
D4D-3122N	D4N-3122	D4D-3522N	D4N-3A22	D4D-3A22N	D4N-3B22
D4D-5122N	D4N-5122	D4D-5522N	D4N-5A22	D4D-5A22N	D4N-5B22
D4D-6122N	D4N-6122	D4D-6522N	D4N-6A22	D4D-6A22N	D4N-6B22
D4D-1125N	D4N-1125	D4D-1525N	D4N-1A25	D4D-1A25N	D4N-1B25
D4D-2125N	D4N-2125	D4D-2525N	D4N-2A25	D4D-2A25N	D4N-2B25
D4D-3125N	D4N-3125	D4D-3525N	D4N-3A25	D4D-3A25N	D4N-3B25
D4D-1131N	D4N-1131	D4D-1531N	D4N-1A31	D4D-1A31N	D4N-1B31
D4D-2131N	D4N-2131	D4D-2531N	D4N-2A31	D4D-2A31N	D4N-2B31
D4D-3131N	D4N-3131	D4D-3531N	D4N-3A31	D4D-3A31N	D4N-3B31
D4D-5131N	D4N-5131	D4D-5531N	D4N-5A31	D4D-5A31N	D4N-5B31
D4D-6131N	D4N-6131	D4D-6531N	D4N-6A31	D4D-6A31N	D4N-6B31
D4D-1132N	D4N-1132	D4D-1532N	D4N-1A32	D4D-1A32N	D4N-1B32
D4D-2132N	D4N-2132	D4D-2532N	D4N-2A32	D4D-2A32N	D4N-2B32
D4D-3132N	D4N-3132	D4D-3532N	D4N-3A32	D4D-3A32N	D4N-3B32
D4D-5132N	D4N-5132	D4D-5532N	D4N-5A32	D4D-5A32N	D4N-5B32
D4D-6132N	D4N-6132	D4D-6532N	D4N-6A32	D4D-6A32N	D4N-6B32
D4D-1162N	D4N-1162	D4D-1562N	D4N-1A62	D4D-1A62N	D4N-1B62
D4D-2162N	D4N-2162	D4D-2562N	D4N-2A62	D4D-2A62N	D4N-2B62
D4D-3162N	D4N-3162	D4D-3562N	D4N-3A62	D4D-3A62N	D4N-3B62
D4D-5162N	D4N-5162	D4D-5562N	D4N-5A62	D4D-5A62N	D4N-5B62
D4D-6162N	D4N-6162	D4D-6562N	D4N-6A62	D4D-6A62N	D4N-6B62
D4D-1172N	D4N-1172	D4D-1572N	D4N-1A72	D4D-1A72N	D4N-1B72
D4D-2172N	D4N-2172	D4D-2572N	D4N-2A72	D4D-2A72N	D4N-2B72
D4D-3172N	D4N-3172	D4D-3572N	D4N-3A72	D4D-3A72N	D4N-3B72
D4D-5172N	D4N-5172	D4D-5572N	D4N-5A72	D4D-5A72N	D4N-5B72
D4D-6172N	D4N-6172	D4D-6572N	D4N-6A72	D4D-6A72N	D4N-6B72
D4D-112HN	D4N-112H	D4D-152HN	D4N-1A2H	D4D-1A2HN	D4N-1B2H
D4D-212HN	D4N-212H	D4D-252HN	D4N-2A2H	D4D-2A2HN	D4N-2B2H
D4D-312HN	D4N-312H	D4D-352HN	D4N-3A2H	D4D-3A2HN	D4N-3B2H

Safety Limit Switches
D4N

General-purpose Limit Switches

D4D-N product to be discontinued	Recommended substitute product	D4D-N product to be discontinued	Recommended substitute product	D4D-N product to be discontinued	Recommended substitute product
D4D-1121N	D4N-112G	D4D-15REN	D4N-1ARE	D4D-1AREN	D4N-1BRE
D4D-2121N	D4N-212G	D4D-25REN	D4N-2ARE	D4D-2AREN	D4N-2BRE
D4D-3121N	D4N-312G	D4D-35REN	D4N-3ARE	D4D-3AREN	D4N-3BRE
D4D-5121N	D4N-512G	D4D-55REN	D4N-5ARE	D4D-5AREN	D4N-5BRE
D4D-6121N	D4N-612G	D4D-65REN	D4N-6ARE	D4D-6AREN	D4N-6BRE
D4D-1127N	D4N-112H	D4D-15LEN	D4N-1ALE	D4D-1ALEN	D4N-1BLE
D4D-2127N	D4N-212H	D4D-25LEN	D4N-2ALE	D4D-2ALEN	D4N-2BLE
D4D-3127N	D4N-312H	D4D-35LEN	D4N-3ALE	D4D-3ALEN	D4N-3BLE
D4D-5127N	D4N-512H	D4D-55LEN	D4N-5ALE	D4D-5ALEN	D4N-5BLE
D4D-6127N	D4N-612H	D4D-65LEN	D4N-6ALE	D4D-6ALEN	D4N-6BLE
D4D-1180N	D4N-4180	D4D-1521N	D4N-1A2G	D4D-1A21N	D4N-1B2G
D4D-2180N	D4N-2180	D4D-2521N	D4N-2A2G	D4D-2A21N	D4N-2B2G
D4D-3180N	D4N-3180	D4D-3521N	D4N-3A2G	D4D-3A21N	D4N-3B2G
D4D-5180N	D4N-8180	D4D-5521N	D4N-5A2G	D4D-5A21N	D4N-5B2G
D4D-6180N	D4N-6180	D4D-6521N	D4N-6A2G	D4D-6A21N	D4N-6B2G
D4D-1187N	D4N-4187	D4D-1527N	D4N-1A2H	D4D-1A27N	D4N-1B2H
D4D-2187N	D4N-2187	D4D-2527N	D4N-2A2H	D4D-2A27N	D4N-2B2H
D4D-3187N	D4N-3187	D4D-3527N	D4N-3A2H	D4D-3A27N	D4N-3B2H
D4D-5187N	D4N-8187	D4D-5527N	D4N-5A2H	D4D-5A27N	D4N-5B2H
D4D-6187N	D4N-6187	D4D-6527N	D4N-6A2H	D4D-6A27N	D4N-6B2H
				D4D-1A80N	D4N-4B80
				D4D-2A80N	D4N-2B80
				D4D-3A80N	D4N-3B80
				D4D-5A80N	D4N-8B80
				D4D-6A80N	D4N-6B80
				D4D-1A87N	D4N-4B87
				D4D-2A87N	D4N-2B87
				D4D-3A87N	D4N-3B87
				D4D-5A87N	D4N-8B87
				D4D-6A87N	D4N-6B87

Safety Limit Switches
D4N

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. C130-E1-02

In the interest of product improvement, specifications are subject to change without notice.

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 - c. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid;
 - d. Delivery and shipping dates are estimates only; and
 - e. Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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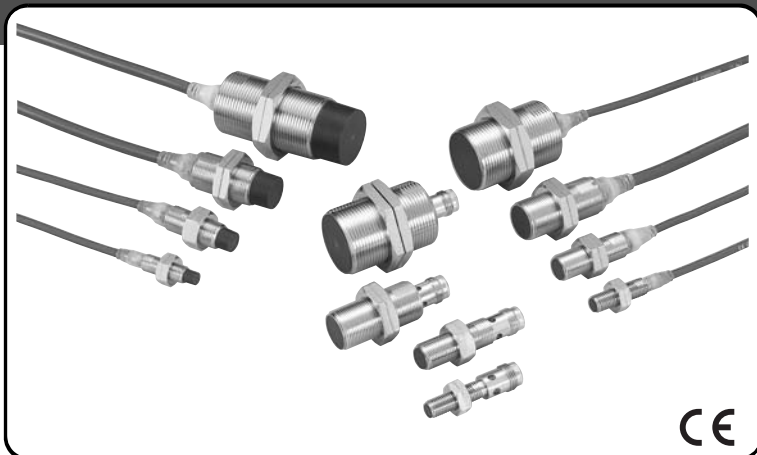
Cylindrical Proximity Sensor E2A

Safe Mounting with Greater Sensing Distance

- Ensures a sensing distance approximately 1.5 to 2 times larger than that of any conventional OMRON Sensor.
- Problems such as the collision of workpieces are eliminated.
- Full range of standard sizes (M8, M12, M18 and M30; both long and short barrels)
- Modular construction simplifies customization.

<READ AND UNDERSTAND THIS CATALOG>

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.



Ordering Information

Size		Sensing distance	Connection	Body material	Thread length (overall length)	Output configuration	Operation mode NO	Operation mode NC		
M8	Shielded	2.0 mm	Pre-wired	Stainless steel	27 (40)	PNP	E2A-S08KS02-WP-B1 2M	E2A-S08KS02-WP-B2 2M		
						NPN	E2A-S08KS02-WP-C1 2M	E2A-S08KS02-WP-C2 2M		
					49 (62)	PNP	E2A-S08LS02-WP-B1 2M	E2A-S08LS02-WP-B2 2M		
						NPN	E2A-S08LS02-WP-C1 2M	E2A-S08LS02-WP-C2 2M		
					M12 connector	Stainless steel	27 (43)	PNP	E2A-S08KS02-M1-B1	E2A-S08KS02-M1-B2
								NPN	E2A-S08KS02-M1-C1	E2A-S08KS02-M1-C2
			49 (65)	PNP		E2A-S08LS02-M1-B1	E2A-S08LS02-M1-B2			
				NPN		E2A-S08LS02-M1-C1	E2A-S08LS02-M1-C2			
			Brass	27 (43)	PNP	E2A-M08KS02-M1-B1	E2A-M08KS02-M1-B2			
					NPN	E2A-M08KS02-M1-C1	E2A-M08KS02-M1-C2			
			49 (65)	PNP	E2A-M08LS02-M1-B1	E2A-M08LS02-M1-B2				
				NPN	E2A-M08LS02-M1-C1	E2A-M08LS02-M1-C2				
	M8 connector (3-pin)	Stainless steel	27 (39)	PNP	E2A-S08KS02-M5-B1	E2A-S08KS02-M5-B2				
				NPN	E2A-S08KS02-M5-C1	E2A-S08KS02-M5-C2				
		49 (61)	PNP	E2A-S08LS02-M5-B1	E2A-S08LS02-M5-B2					
			NPN	E2A-S08LS02-M5-C1	E2A-S08LS02-M5-C2					
		Non-shielded	4.0 mm	Pre-wired	Stainless steel	27 (40)	PNP	E2A-S08KN04-WP-B1 2M	E2A-S08KN04-WP-B2 2M	
							NPN	E2A-S08KN04-WP-C1 2M	E2A-S08KN04-WP-C2 2M	
	49 (62)					PNP	E2A-S08LN04-WP-B1 2M	E2A-S08LN04-WP-B2 2M		
						NPN	E2A-S08LN04-WP-C1 2M	E2A-S08LN04-WP-C2 2M		
	M12 connector					Stainless steel	27 (43)	PNP	E2A-S08KN04-M1-B1	E2A-S08KN04-M1-B2
								NPN	E2A-S08KN04-M1-C1	E2A-S08KN04-M1-C2
				49 (65)	PNP	E2A-S08LN04-M1-B1	E2A-S08LN04-M1-B2			
					NPN	E2A-S08LN04-M1-C1	E2A-S08LN04-M1-C2			
Brass	27 (43)			PNP	E2A-M08KN04-M1-B1	E2A-M08KN04-M1-B2				
				NPN	E2A-M08KN04-M1-C1	E2A-M08KN04-M1-C2				
49 (65)	PNP			E2A-M08LN04-M1-B1	E2A-M08LN04-M1-B2					
	NPN			E2A-M08LN04-M1-C1	E2A-M08LN04-M1-C2					
M8 connector (3-pin)	Stainless steel	27 (39)	PNP	E2A-S08KN04-M5-B1	E2A-S08KN04-M5-B2					
			NPN	E2A-S08KN04-M5-C1	E2A-S08KN04-M5-C2					
	49 (61)	PNP	E2A-S08LN04-M5-B1	E2A-S08LN04-M5-B2						
		NPN	E2A-S08LN04-M5-C1	E2A-S08LN04-M5-C2						

Size		Sensing distance	Connection	Body material	Thread length (overall length)	Output configuration	Operation mode NO	Operation mode NC
M12	Shielded	4.0 mm	Pre-wired	Brass	34 (50)	PNP	E2A-M12KS04-WP-B1 2M	E2A-M12KS04-WP-B2 2M
						NPN	E2A-M12KS04-WP-C1 2M	E2A-M12KS04-WP-C2 2M
					56 (72)	PNP	E2A-M12LS04-WP-B1 2M	E2A-M12LS04-WP-B2 2M
						NPN	E2A-M12LS04-WP-C1 2M	E2A-M12LS04-WP-C2 2M
			M12 connector	Brass	34 (48)	PNP	E2A-M12KS04-M1-B1	E2A-M12KS04-M1-B2
						NPN	E2A-M12KS04-M1-C1	E2A-M12KS04-M1-C2
					56 (70)	PNP	E2A-M12LS04-M1-B1	E2A-M12LS04-M1-B2
						NPN	E2A-M12LS04-M1-C1	E2A-M12LS04-M1-C2
	Non-shielded	8.0 mm	Pre-wired	Brass	34 (50)	PNP	E2A-M12KN08-WP-B1 2M	E2A-M12KN08-WP-B2 2M
						NPN	E2A-M12KN08-WP-C1 2M	E2A-M12KN08-WP-C2 2M
					56 (72)	PNP	E2A-M12LN08-WP-B1 2M	E2A-M12LN08-WP-B2 2M
						NPN	E2A-M12LN08-WP-C1 2M	E2A-M12LN08-WP-C2 2M
			M12 connector	Brass	34 (48)	PNP	E2A-M12KN08-M1-B1	E2A-M12KN08-M1-B2
						NPN	E2A-M12KN08-M1-C1	E2A-M12KN08-M1-C2
					56 (70)	PNP	E2A-M12LN08-M1-B1	E2A-M12LN08-M1-B2
						NPN	E2A-M12LN08-M1-C1	E2A-M12LN08-M1-C2
M18	Shielded	8.0 mm	Pre-wired	Brass	39 (59)	PNP	E2A-M18KS08-WP-B1 2M	E2A-M18KS08-WP-B2 2M
						NPN	E2A-M18KS08-WP-C1 2M	E2A-M18KS08-WP-C2 2M
					61 (81)	PNP	E2A-M18LS08-WP-B1 2M	E2A-M18LS08-WP-B2 2M
						NPN	E2A-M18LS08-WP-C1 2M	E2A-M18LS08-WP-C2 2M
			M12 connector	Brass	39 (53)	PNP	E2A-M18KS08-M1-B1	E2A-M18KS08-M1-B2
						NPN	E2A-M18KS08-M1-C1	E2A-M18KS08-M1-C2
					61 (75)	PNP	E2A-M18LS08-M1-B1	E2A-M18LS08-M1-B2
						NPN	E2A-M18LS08-M1-C1	E2A-M18LS08-M1-C2
	Non-shielded	16.0 mm	Pre-wired	Brass	39 (59)	PNP	E2A-M18KN16-WP-B1 2M	E2A-M18KN16-WP-B2 2M
						NPN	E2A-M18KN16-WP-C1 2M	E2A-M18KN16-WP-C2 2M
					61 (81)	PNP	E2A-M18LN16-WP-B1 2M	E2A-M18LN16-WP-B2 2M
						NPN	E2A-M18LN16-WP-C1 2M	E2A-M18LN16-WP-C2 2M
			M12 connector	Brass	39 (53)	PNP	E2A-M18KN16-M1-B1	E2A-M18KN16-M1-B2
						NPN	E2A-M18KN16-M1-C1	E2A-M18KN16-M1-C2
					61 (75)	PNP	E2A-M18LN16-M1-B1	E2A-M18LN16-M1-B2
						NPN	E2A-M18LN16-M1-C1	E2A-M18LN16-M1-C2
M30	Shielded	15.0 mm	Pre-wired	Brass	44 (64)	PNP	E2A-M30KS15-WP-B1 2M	E2A-M30KS15-WP-B2 2M
						NPN	E2A-M30KS15-WP-C1 2M	E2A-M30KS15-WP-C2 2M
					66 (86)	PNP	E2A-M30LS15-WP-B1 2M	E2A-M30LS15-WP-B2 2M
						NPN	E2A-M30LS15-WP-C1 2M	E2A-M30LS15-WP-C2 2M
			M12 connector	Brass	44 (58)	PNP	E2A-M30KS15-M1-B1	E2A-M30KS15-M1-B2
						NPN	E2A-M30KS15-M1-C1	E2A-M30KS15-M1-C2
					66 (80)	PNP	E2A-M30LS15-M1-B1	E2A-M30LS15-M1-B2
						NPN	E2A-M30LS15-M1-C1	E2A-M30LS15-M1-C2
	Non-shielded	20.0 mm	Pre-wired	Brass	44 (64) (See note.)	PNP	E2A-M30KN20-WP-B1 2M	E2A-M30KN20-WP-B2 2M
						NPN	E2A-M30KN20-WP-C1 2M	E2A-M30KN20-WP-C2 2M
					30.0 mm	PNP	E2A-M30LN30-WP-B1 2M	E2A-M30LN30-WP-B2 2M
						NPN	E2A-M30LN30-WP-C1 2M	E2A-M30LN30-WP-C2 2M
		20.0 mm	M12 connector	Brass	44 (58) (See note.)	PNP	E2A-M30KN20-M1-B1	E2A-M30KN20-M1-B2
						NPN	E2A-M30KN20-M1-C1	E2A-M30KN20-M1-C2
					30.0 mm	PNP	E2A-M30LN30-M1-B1	E2A-M30LN30-M1-B2
						NPN	E2A-M30LN30-M1-C1	E2A-M30LN30-M1-C2

Note: M30 non-shielded Models with double sensing distance and short barrels cannot be mounted due to the necessary separation distance from the surrounding metal. Standard sensing models are thus available.

■ Model Number Legend

E2A□-□□□□□-□-□□-□□
 1 2 3 4 5 6 7 8 9 10 11 12

Example: E2A-M12LS04-M1-B1 Standard, M12, long barrel, shielded, Sn=4 mm, M12 connector, PNP-NO
 E2A-M08KN04-WP-B1 5M Standard, M8, short barrel, non-shielded, Sn=4 mm, pre-wired PVC cable, PNP-NO, cable length=5 m

1. Basic name

E2A

2. Sensing technology

Blank: Standard double distance

3. Housing shape and material

M: Cylindrical, metric threaded, brass

S: Cylindrical, metric threaded, stainless steel

4. Housing size

08: 8 mm

12: 12 mm

18: 18 mm

30: 30 mm

5. Barrel length

K: Standard length

L: Long body

6. Shield

S: Shielded

N: Non-shielded

7. Sensing distance

Numeral: Sensing distance: e.g. 02=2 mm, 16=16 mm

8. Kind of connection

WP: Pre-wired, PVC

M1: M12 connector (4-pole)

M3: M8 connector (4-pole)

M5: M8 connector (3-pole)

9. Power source and output

B: DC, 3-wire, PNP open collector

C: DC, 3-wire, NPN open collector

D: DC, 2-wire

E: DC, 3-wire, NPN voltage output

F: DC, 3-wire, PNP voltage output

10. Operation mode

1: Normally open (NO)

2: Normally closed (NC)

11. Specials (e.g., cable material, oscillating frequency)

12. Cable length

Blank: Connector type

Numeral: Cable type

Specifications

■ DC 3-wire Models

Item	Size Type	M8		M12	
		Shielded	Non-shielded	Shielded	Non-shielded
		E2A-M08□S02-M1-B1 E2A-M08□S02-M1-B2 E2A-M08□S02-M1-C1 E2A-M08□S02-M1-C2 E2A-S08□S02-□□-B1 E2A-S08□S02-□□-B2 E2A-S08□S02-□□-C1 E2A-S08□S02-□□-C2	E2A-M08□N04-M1-B1 E2A-M08□N04-M1-B2 E2A-M08□N04-M1-C1 E2A-M08□N04-M1-C2 E2A-S08□N04-□□-B1 E2A-S08□N04-□□-B2 E2A-S08□N04-□□-C1 E2A-S08□N04-□□-C2	E2A-M12□S04-□□-B1 E2A-M12□S04-□□-B2 E2A-M12□S04-□□-C1 E2A-M12□S04-□□-C2	E2A-M12□N08-□□-B1 E2A-M12□N08-□□-B2 E2A-M12□N08-□□-C1 E2A-M12□N08-□□-C2
Sensing distance	2 mm ± 10%	4 mm ± 10%	4 mm ± 10%	8 mm ± 10%	
Setting distance	0 to 1.6 mm	0 to 3.2 mm	0 to 3.2 mm	0 to 6.4 mm	
Differential travel	10% max. of sensing distance				
Target	Ferrous metal (The sensing distance decreases with non-ferrous metal.)				
Standard target (mild steel ST37)	8×8×1 mm	12×12×1 mm	12×12×1 mm	24×24×1 mm	
Response frequency (See note 1.)	1,500 Hz	1,000 Hz	1,000 Hz	800 Hz	
Power supply voltage (operating voltage range)	12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)				
Current consumption (DC 3-wire)	10 mA max.				
Output type	-B models: PNP open collector -C models: NPN open collector				
Control output	Load current (See note 2.)	200 mA max. (32 VDC max.)			
	Residual voltage	2 V max. (under load current of 200 mA with cable length of 2 m)			
Indicator	Operation indicator (Yellow LED)				
Operation mode (with sensing object approaching)	-B1/-C1 models: NO -B2/-C2 models: NC For details, refer to the timing charts.				
Protection circuit	Power source circuit reverse polarity protection, Surge suppressor, Short-circuit protection		Output reverse polarity protection, Power source circuit reverse polarity protection, Surge suppressor, Short-circuit protection		
Ambient air temperature	Operating: -40°C to 70°C, Storage: -40°C to 85°C (with no icing or condensation)				
Temperature influence (See note 2.)	±10% max. of sensing distance at 23°C within temperature range of -25°C to 70°C ±15% max. of sensing distance at 23°C within temperature range of -40°C to 70°C				
Ambient humidity	Operating: 35% to 95%, Storage: 35% to 95%				
Voltage influence	±1% max. of sensing distance in rated voltage range ±15%				
Insulation resistance	50 MΩ min. (at 500 VDC) between current carry parts and case				
Dielectric strength	1,000 VAC at 50/60 Hz for 1 min between current carry parts and case				
Vibration resistance	10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y and Z directions				
Shock resistance	500 m/s ² , 10 times each in X, Y and Z directions		1,000 m/s ² , 10 times each in X, Y and Z directions		
Standard and listings (See note 3.)	IEC60529: IP67, Degree of protection EN60947-5-2: EMC				
Connection method	-WP models: Pre-wired models (Standard length: 2 m) -M1 models: M12 4-pin connector models -M5 models: M8 3-pin connector models				
Weight (packaged)	Pre-wired model	Approx. 65 g		Approx. 85 g	
	M12 connector model	M12 connector models: Approx. 20 g M8 connector models: Approx. 15 g		Approx. 35 g	
Material	Case	Stainless steel or brass-nickel plated		Brass-nickel plated	
	Sensing surface	PBT			
	Cable	PVC			
	Clamping nut	Brass-nickel plated			

Note 1. The response frequency is an average value. Measurement conditions are as follows: standard target, a distance of twice the standard target distance between targets, and a setting distance of half the sensing distance.

2. When using any model at an ambient temperature between -40°C and -25°C and a power voltage between 30 and 32 VDC, use a load current of 100 mA max.,

3. For USA and CANADA : use class 2 circuit only.

■ DC 3-wire Models

Item	Size Type	M18		M30		
		Shielded	Non-shielded	Shielded	Non-shielded	Non-shielded
		E2A-M18□S08-□□-B1 E2A-M18□S08-□□-B2 E2A-M18□S08-□□-C1 E2A-M18□S08-□□-C2	E2A-M18□N16-□□-B1 E2A-M18□N16-□□-B2 E2A-M18□N16-□□-C1 E2A-M18□N16-□□-C2	E2A-M30□S15-□□-B1 E2A-M30□S15-□□-B2 E2A-M30□S15-□□-C1 E2A-M30□S15-□□-C2	E2A-M30KN20-□□-B1 E2A-M30KN20-□□-B2 E2A-M30KN20-□□-C1 E2A-M30KN20-□□-C2	E2A-M30LN30-□□-B1 E2A-M30LN30-□□-B2 E2A-M30LN30-□□-C1 E2A-M30LN30-□□-C2
Sensing distance		8 mm±10%	16 mm±10%	15 mm±10%	20 mm±10%	30 mm±10%
Setting distance		0 to 6.4 mm	0 to 12.8 mm	0 to 12 mm	0 to 16 mm	0 to 24 mm
Differential travel		10% max. of sensing distance				
Target		Ferrous metal (The sensing distance decreases with non-ferrous metal.)				
Standard target (mild steel ST37)		24×24×1 mm	48×48×1 mm	45×45×1 mm	60×60×1 mm	90×90×1 mm
Response frequency (See note 1.)		500 Hz	400 Hz	250 Hz	100 Hz	100 Hz
Power supply voltage (operating voltage range)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)				
Current consumption (DC 3-wire)		10 mA max.				
Output type		-B models: PNP open collector -C models: NPN open collector				
Control output	Load current (See note 2.)	200 mA max. (32 VDC max.)				
	Residual voltage	2 V max. (under load current of 200 mA with cable length of 2 m)				
Indicator		Operation indicator (Yellow LED)				
Operation mode (with sensing object approaching)		-B1/-C1 models: NO -B2/-C2 models: NC For details, refer to the timing charts.				
Protection circuit		Output reverse polarity protection, Power source circuit reverse polarity protection, Surge suppressor, Short-circuit protection				
Ambient air temperature		Operating: -40°C to 70°C, Storage: -40°C to 85°C (with no icing or condensation)				
Temperature influence (See note 2.)		±10% max. of sensing distance at 23°C within temperature range of -25°C to 70°C ±15% max. of sensing distance at 23°C within temperature range of -40°C to 70°C				
Ambient humidity		Operating: 35% to 95%, Storage: 35% to 95%				
Voltage influence		±1% max. of sensing distance in rated voltage range ±15%				
Insulation resistance		50 MΩ min. (at 500 VDC) between current carry parts and case				
Dielectric strength		1,000 VAC at 50/60 Hz for 1 min between current carry parts and case				
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y and Z directions				
Shock resistance		1,000 m/s ² , 10 times each in X, Y and Z directions				
Standard and listings (See note 3.)		IEC60529: IP67, Degree of protection EN60947-5-2: EMC				
Connection method		-WP models: Pre-wired models (Standard length: 2 m) -M1 models: M12 4-pin connector models -M5 models: M8 3-pin connector models				
Weight (packaged)	Pre-wired model	Approx. 160 g		Approx. 280 g	Approx. 280 g	Approx. 370 g
	M12 connector model	Approx. 70 g		Approx. 200 g	Approx. 200 g	Approx. 260 g
Material	Case	Brass-nickel plated				
	Sensing surface	PBT				
	Cable	PVC				
	Clamping nut	Brass-nickel plated				

Note 1. The response frequency is an average value. Measurement conditions are as follows: standard target, a distance of twice the standard target distance between targets, and a setting distance of half the sensing distance.

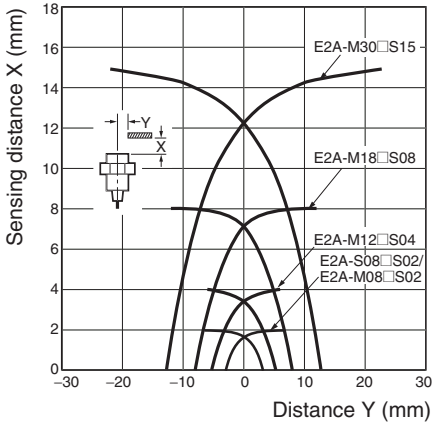
2. When using any model at an ambient temperature between -40°C and -25°C and a power voltage between 30 and 32 VDC, use a load current of 100 mA max.

3. For USA and CANADA : use class 2 circuit only.

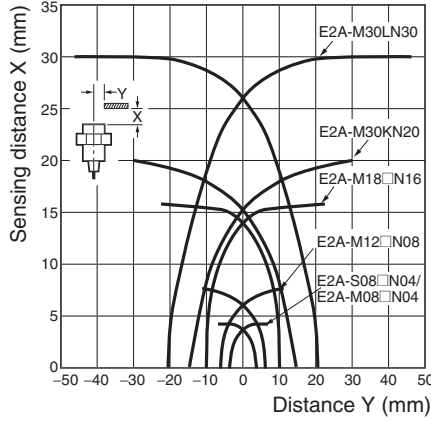
Engineering Data

Operating Range (Typical)

Shielded Models



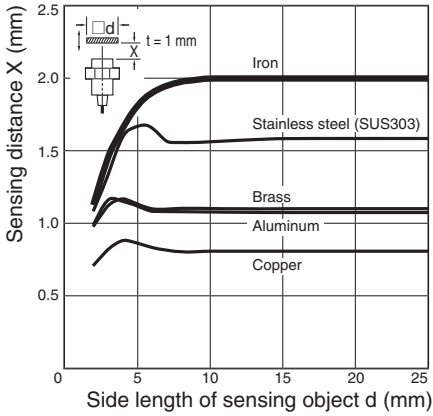
Non-shielded Models



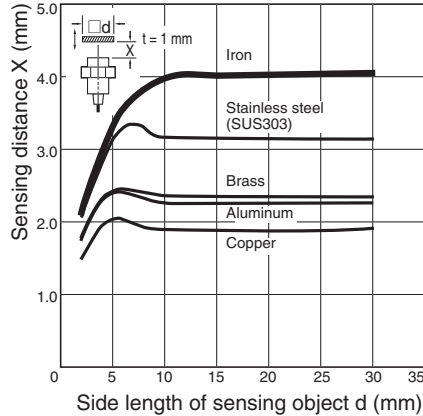
Influence of Sensing Object Size and Materials

Shielded Models

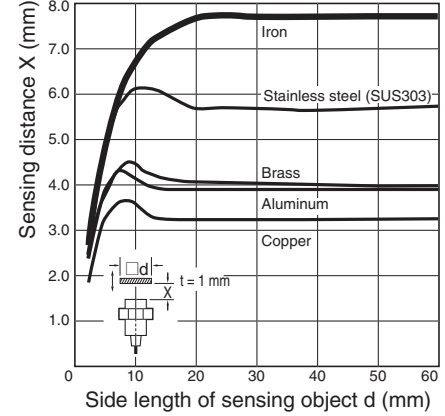
E2A-S08□S02/M08□S02



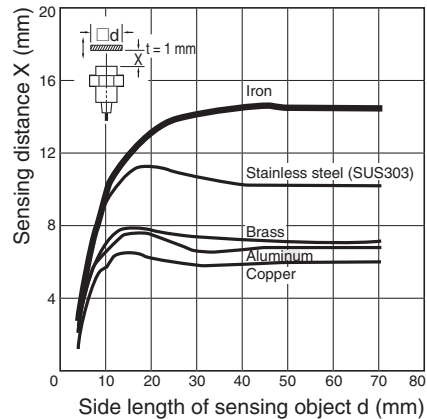
E2A-M12□S04



E2A-M18□S08

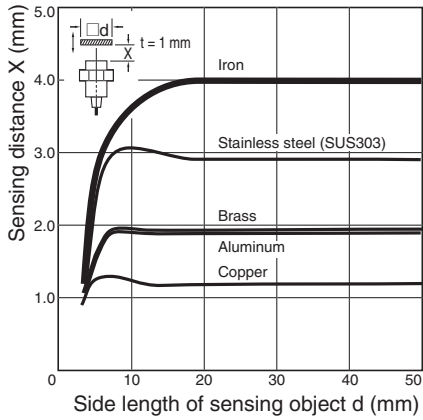


E2A-M30□S15

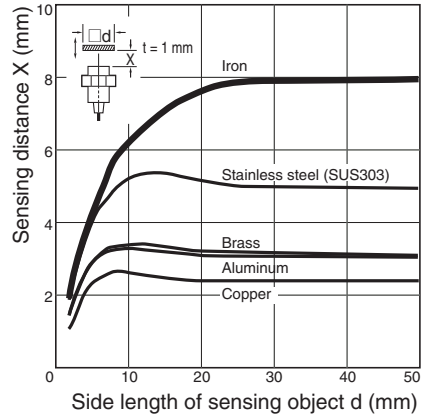


Non-shielded Models

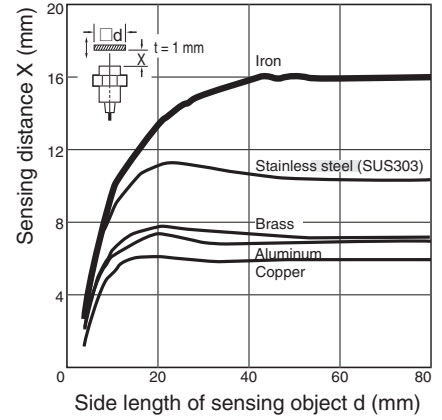
E2A-S08□N04/M08□N04



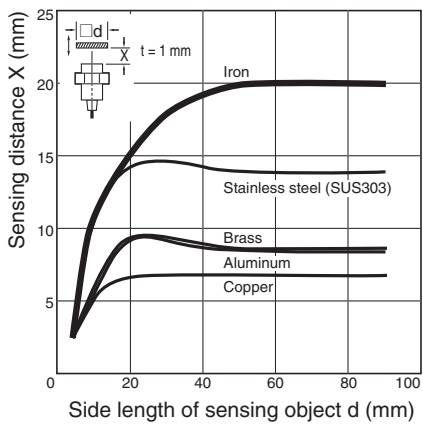
E2A-M12□N08



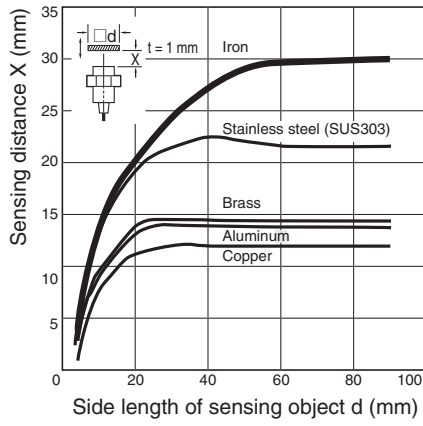
E2A-M18□N16



E2A-M30KN20



E2A-M30LN30



Operation

■ PNP Output

Operation mode	Model	Timing chart	Output circuit
NO	E2A-□-□- B1	<p>Non-sensing zone Sensing zone Proximity Sensor</p> <p>Sensing object</p> <p>(%) 100 0</p> <p>Rated sensing distance</p> <p>ON OFF Yellow indicator</p> <p>ON OFF Control output</p>	<p>Proximity Sensor main circuits</p> <p>(See note 1.)</p> <p>Load</p> <p>Brown ① +V</p> <p>Black ④</p> <p>Blue ③ 0V</p> <p>Note 1: With M8 connector models, there is no output reverse polarity protection diode.</p> <p>M12 Connector Pin Arrangement (See note 2.)</p> <p>M8 Connector Pin Arrangement</p> <p>Note 2: Terminal 2 of the M12 connector is not used.</p>
NC	E2A-□-□- B2	<p>Non-sensing zone Sensing zone Proximity Sensor</p> <p>Sensing object</p> <p>(%) 100 0</p> <p>Rated sensing distance</p> <p>ON OFF Yellow indicator</p> <p>ON OFF Control output</p>	<p>Proximity Sensor main circuits</p> <p>(See note 1.)</p> <p>Load</p> <p>Brown ① +V</p> <p>Black ② (M8 connector: ④)</p> <p>Blue ③ 0V</p> <p>Note 1: With M8 connector models, there is no output reverse polarity protection diode.</p> <p>M12 Connector Pin Arrangement (See note 2.)</p> <p>M8 Connector Pin Arrangement</p> <p>Note 2: Terminal 4 of the M12 connector is not used.</p>

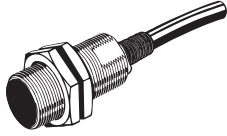
■ NPN Output

Operation mode	Model	Timing chart	Output circuit
NO	E2A-□-□-C1		<p>M12 Connector Pin Arrangement (See note 2.)</p> <p>M8 Connector Pin Arrangement</p> <p>Note 2: Terminal 2 of the M12 connector is not used.</p>
NC	E2A-□-□-C2		<p>M12 Connector Pin Arrangement (See note 2.)</p> <p>M8 Connector Pin Arrangement</p> <p>Note 2: Terminal 4 of the M12 connector is not used.</p>

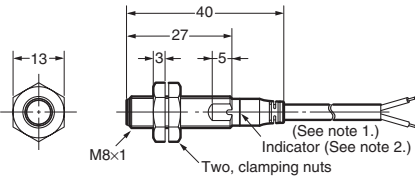
Dimensions

Note: All units are in millimeters unless otherwise indicated.

Pre-wired Models (Shielded)

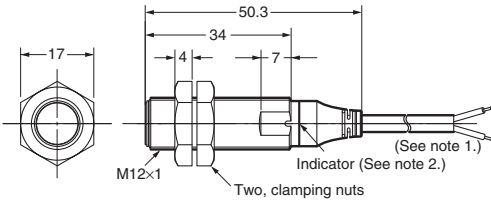


E2A-S08KS02-WP-□□



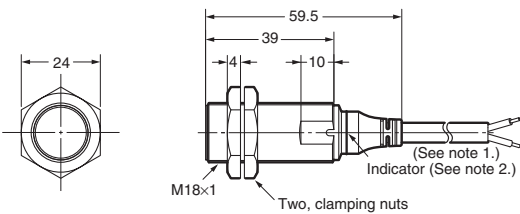
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
Note 2. Operation indicator (yellow)

E2A-M12KS04-WP-□□



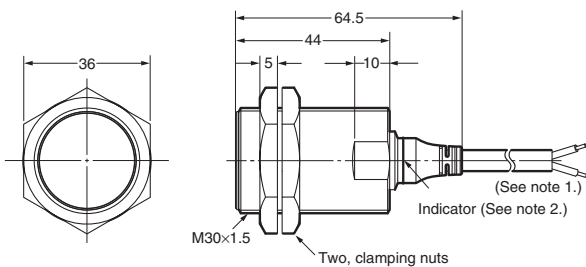
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
Note 2. Operation indicator (yellow)

E2A-M18KS08-WP-□□



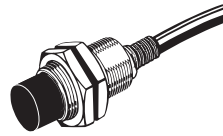
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
Note 2. Operation indicator (yellow)

E2A-M30KS15-WP-□□

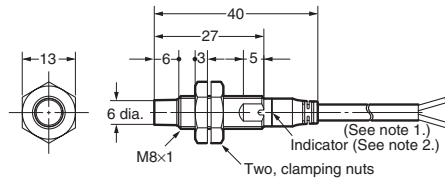


Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
Note 2. Operation indicator (yellow)

Pre-wired Models (Non-shielded)

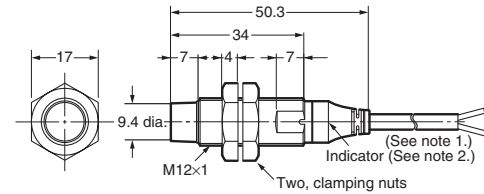


E2A-S08KN04-WP-□□



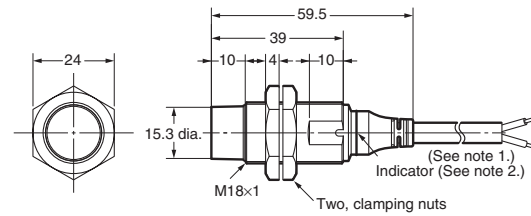
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
Note 2. Operation indicator (yellow)

E2A-M12KN08-WP-□□



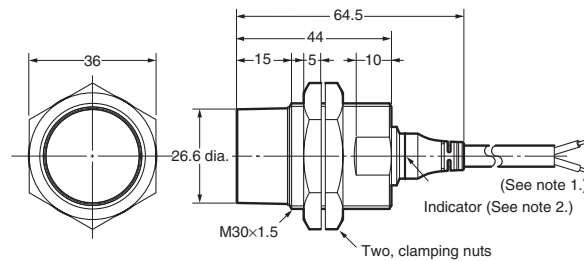
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
Note 2. Operation indicator (yellow)

E2A-M18KN16-WP-□□



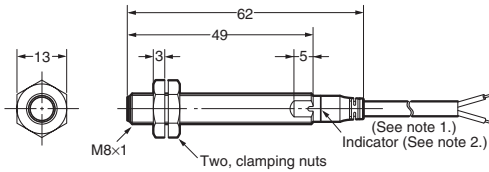
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
Note 2. Operation indicator (yellow)

E2A-M30KN20-WP-□□



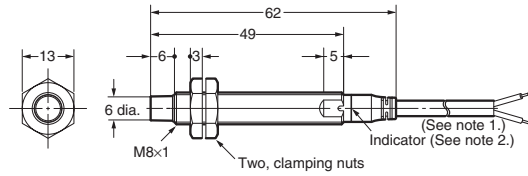
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
Note 2. Operation indicator (yellow)

E2A-S08LS02-WP-□□



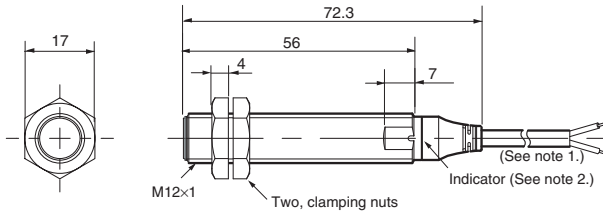
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

E2A-S08LN04-WP-□□



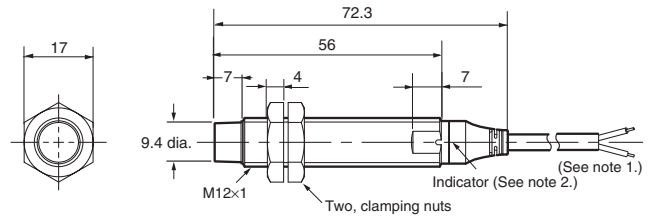
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

E2A-M12LS04-WP-□□



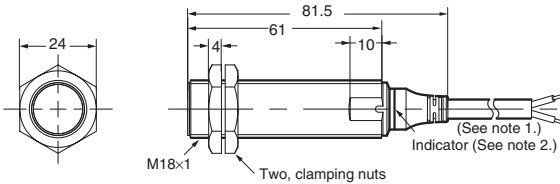
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

E2A-M12LN08-WP-□□



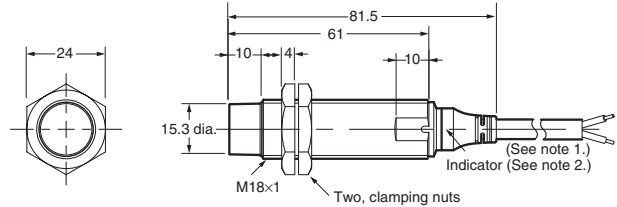
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

E2A-M18LS08-WP-□□



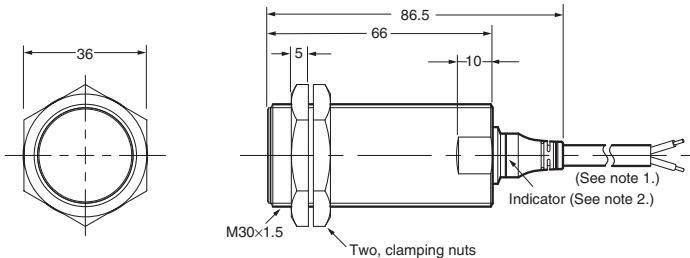
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

E2A-M18LN16-WP-□□



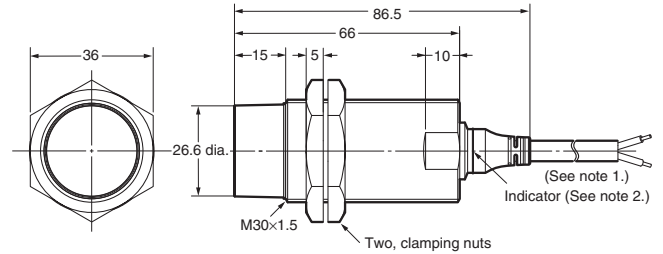
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

E2A-M30LS15-WP-□□



Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

E2A-M30LN30-WP-□□



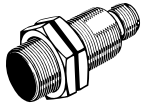
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

Mounting Hole Cutout Dimensions

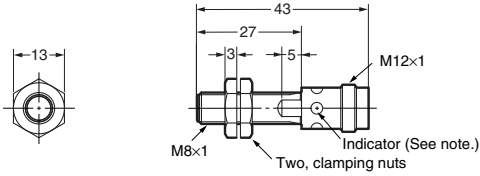


External diameter of Proximity Sensor	Dimension F (mm)
M8	8.5 dia. ^{+0.5} / ₀
M12	12.5 dia. ^{+0.5} / ₀
M18	18.5 dia. ^{+0.5} / ₀
M30	30.5 dia. ^{+0.5} / ₀

M12 Connector Models (Shielded)

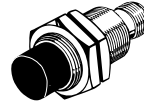


E2A-S08KS02-M1-□□
E2A-M08KS02-M1-□□

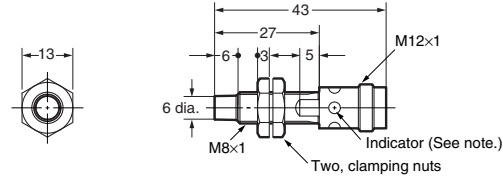


Note: Operation indicator (yellow LED, 4×90°)

M12 Connector Models (Non-shielded)

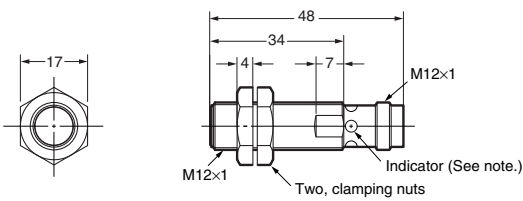


E2A-S08KN04-M1-□□
E2A-M08KN04-M1-□□



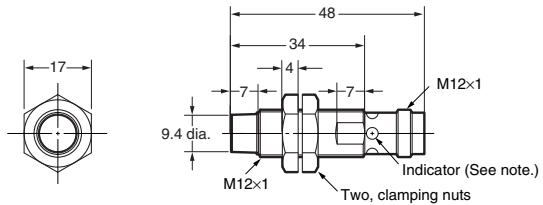
Note: Operation indicator (yellow LED, 4×90°)

E2A-M12KS04-M1-□□



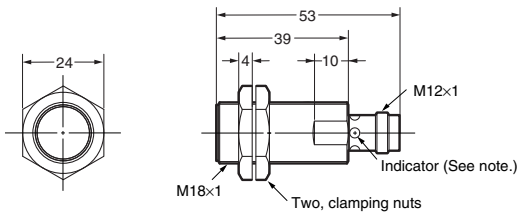
Note: Operation indicator (yellow LED, 4×90°)

E2A-M12KN08-M1-□□



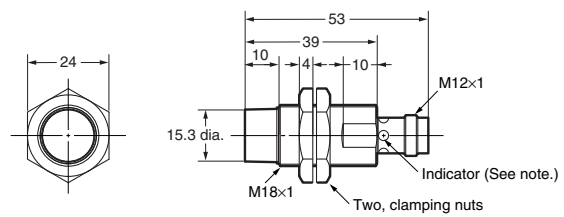
Note: Operation indicator (yellow LED, 4×90°)

E2A-M18KS08-M1-□□



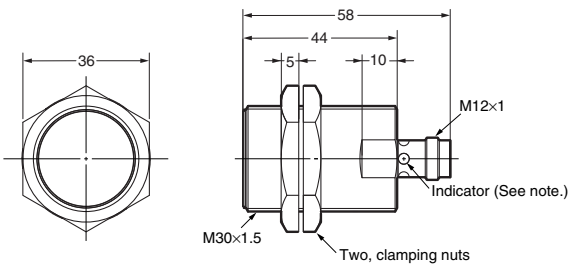
Note: Operation indicator (yellow LED, 4×90°)

E2A-M18KN16-M1-□□



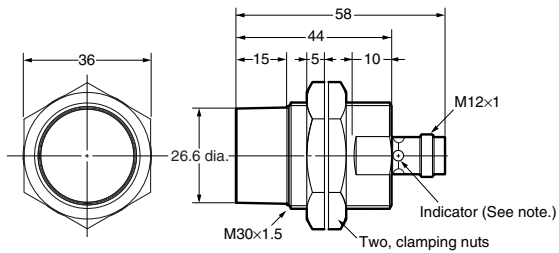
Note: Operation indicator (yellow LED, 4×90°)

E2A-M30KS15-M1-□□



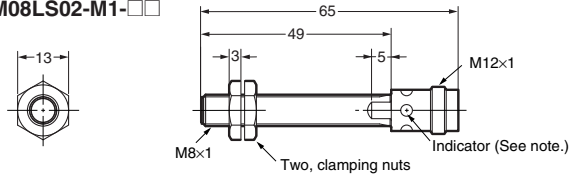
Note: Operation indicator (yellow LED, 4×90°)

E2A-M30KN20-M1-□□



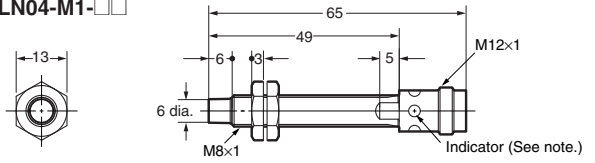
Note: Operation indicator (yellow LED, 4×90°)

E2A-S08LS02-M1-□□
E2A-M08LS02-M1-□□



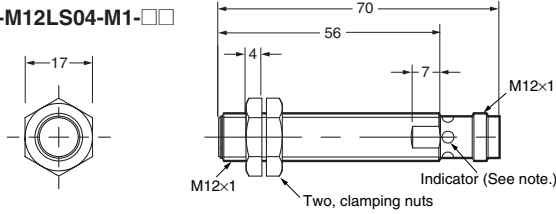
Note: Operation indicator (yellow LED, 4×90°)

E2A-S08LN04-M1-□□
E2A-M08LN04-M1-□□



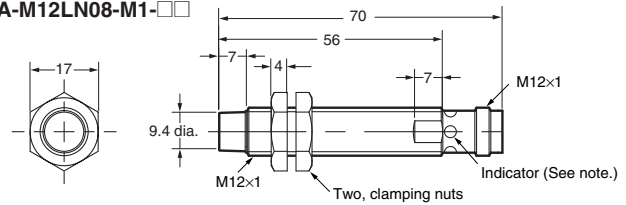
Note: Operation indicator (yellow LED, 4×90°)

E2A-M12LS04-M1-□□



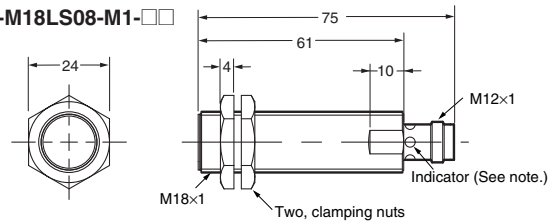
Note: Operation indicator (yellow LED, 4×90°)

E2A-M12LN08-M1-□□



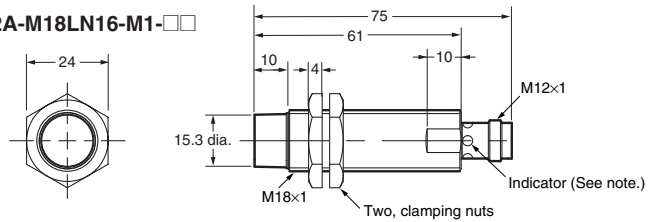
Note: Operation indicator (yellow LED, 4×90°)

E2A-M18LS08-M1-□□



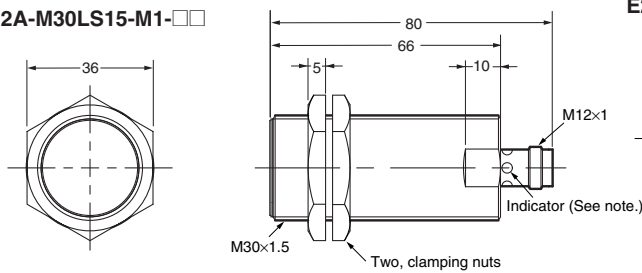
Note: Operation indicator (yellow LED, 4×90°)

E2A-M18LN16-M1-□□



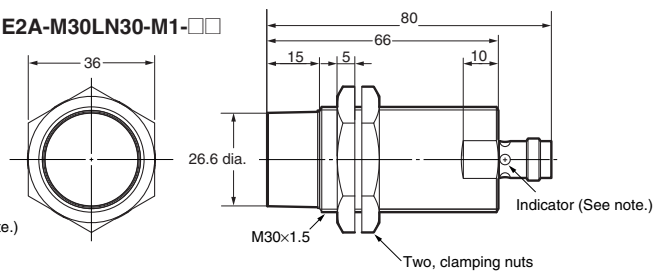
Note: Operation indicator (yellow LED, 4×90°)

E2A-M30LS15-M1-□□



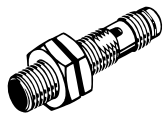
Note: Operation indicator (yellow LED, 4×90°)

E2A-M30LN30-M1-□□

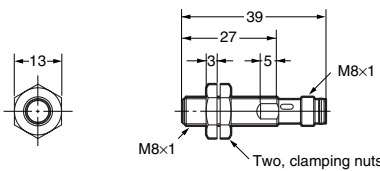


Note: Operation indicator (yellow LED, 4×90°)

M8 Connector Models (Shielded)



E2A-S08KS02-M5-□□

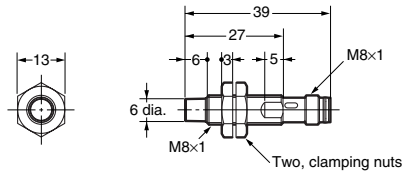


Note: Operation indicator (yellow LED, 4×90°)

M8 Connector Models (Non-shielded)

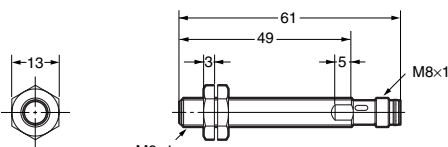


E2A-S08KN04-M5-□□



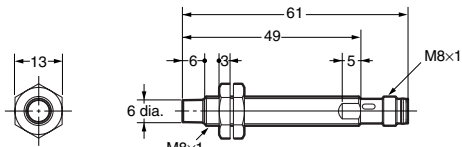
Note: Operation indicator (yellow LED, 4×90°)

E2A-S08LS02-M5-□□



Note: Operation indicator (yellow LED, 4×90°)

E2A-S08LN04-M5-□□



Note: Operation indicator (yellow LED, 4×90°)

Precautions

■ Safety Precautions

Power Supply

Do not impose an excessive voltage on the E2A, otherwise it may be damaged. Do not impose AC current (100 to 240 VAC) on any DC model, otherwise it may be damaged.

Load Short-circuit

Do not short-circuit the load, or the E2A may be damaged.

The E2A's short-circuit protection function will be valid if the polarity of the supply voltage imposed is correct and within the rated voltage range.

■ Correct Use

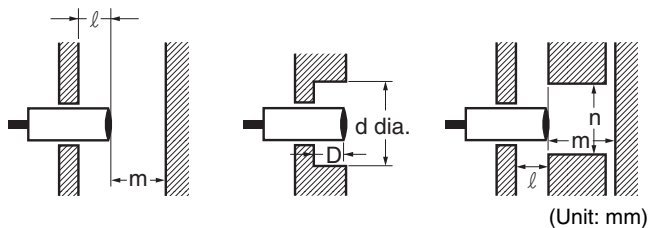
Designing

Power Reset Time

The Proximity Sensor is ready to operate within 100 ms after power is supplied. If power supplies are connected to the Proximity Sensor and load respectively, be sure to supply power to the Proximity Sensor before supplying power to the load.

Effects of Surrounding Metal

When mounting the E2A within a metal panel, ensure that the clearances given in the following table are maintained.



Type	Dimension	M8	M12	M18	M30	
					Short barrel	Long barrel
Shielded	l	0	0	0 (See note 1.)	0 (See note 2.)	
	m	4.5	12	24	45	
	d	---	---	27	45	
	D	0	0	1.5	4	
	n	12	18	27	45	
Non-shielded	l	12	15	22	30	40
	m	8	20	48	70	90
	d	24	40	70	90	120
	D	12	15	22	30	40
	n	24	40	70	90	120

Note 1. In the case of using the supplied nuts.
If true flash mounting is necessary, apply a free zone of 1.5 mm.

2. In the case of using the supplied nuts.
If true flush mounting is necessary, apply a free zone of 4 mm.

Wiring

Be sure to wire the E2A and load correctly, otherwise it may be damaged.

Connection with No Load

Be sure to insert loads when wiring. Make sure to connect a proper load to the E2A in operation, otherwise it may damage internal elements.

Do not expose the product to flammable or explosive gases.

Do not disassemble, repair, or modify the product.

Power OFF

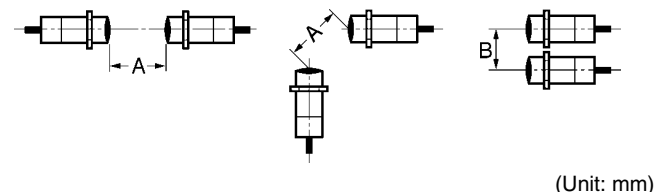
The Proximity Sensor may output a pulse signal when it is turned OFF. Therefore, it is recommended that the load be turned OFF before turning OFF the Proximity Sensor.

Power Supply Transformer

When using a DC power supply, make sure that the DC power supply has an insulated transformer. Do not use a DC power supply with an auto-transformer.

Mutual Interference

When installing two or more Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.



Type	Dimension	M8	M12	M18	M30	
					Short barrel	Long barrel
Shielded	A	20	30	60	110	
	B	15	20	35	70	
Non-shielded	A	80	120	200	300	300
	B	60	100	120	200	300

Wiring

High-tension Lines

Wiring through Metal Conduit:
If there is a power or high-tension line near the cable of the Proximity Sensor, wire the cable through an independent metal conduit to prevent against Proximity Sensor damage or malfunctioning.

Cable Extension

Standard cable length is less than 200 m.
The tractive force is 50 N.

Mounting

The Proximity Sensor must not be subjected to excessive shock with a hammer when it is installed, otherwise the Proximity Sensor may be damaged or lose its water-resistivity.

Do not tighten the nut with excessive force. A washer must be used with the nut.



Type		Torque
M8	Stainless steel type	9 N·m
	Brass type	4 N·m
M12		30 N·m
M18		70 N·m
M30		180 N·m

Maintenance and Inspection

Periodically perform the following checks to ensure stable operation of the Proximity Sensor over a long period of time.

1. Check for mounting position, dislocation, looseness, or distortion of the Proximity Sensor and sensing objects.
2. Check for loose wiring and connections, improper contacts, and line breakage.
3. Check for attachment or accumulation of metal powder or dust.
4. Check for abnormal temperature conditions and other environmental conditions.
5. Check for proper lighting of indicators (for models with a set indicator.)

Never disassemble or repair the Sensor.

Environment

Water Resistivity

Do not use the Proximity Sensor underwater, outdoors, or in the rain.

Operating Environment

Be sure to use the Proximity Sensor within its operating ambient temperature range and do not use the Proximity Sensor outdoors so that its reliability and life expectancy can be maintained. Although the Proximity Sensor is water resistive, a cover to protect the Proximity Sensor from water or water-soluble machining oil is recommended so that its reliability and life expectancy can be maintained.

Do not use the Proximity Sensor in an environment with chemical gas (e.g., strong alkaline or acid gasses including nitric, chromic, and concentrated sulfuric acid gases).

Inrush Current

A load that has a large inrush current (e.g., a lamp or motor) will damage the Proximity Sensor, in which case connect the load to the Proximity Sensor through a relay.

Warranties, Limitations of Liability

■ WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

■ LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

■ SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Disclaimers

■ CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

■ DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. D100-E1-01B

In the interest of product improvement, specifications are subject to change without notice.

OMRON Corporation

Industrial Automation Company

Sensing Devices Division H.Q.

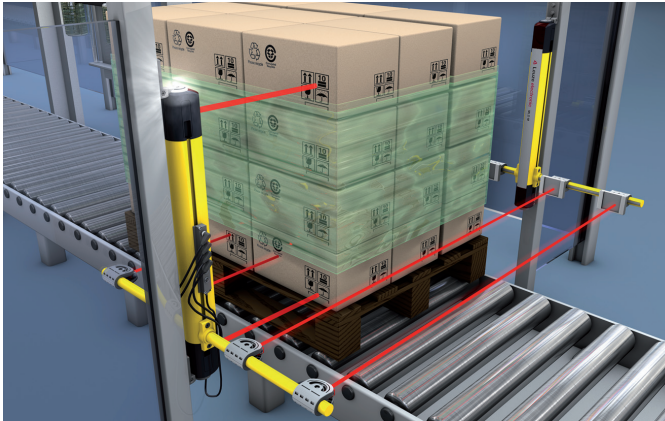
Industrial Sensors Division

Shiokoji Horikawa, Shimogyo-ku,
Kyoto, 600-8530 Japan

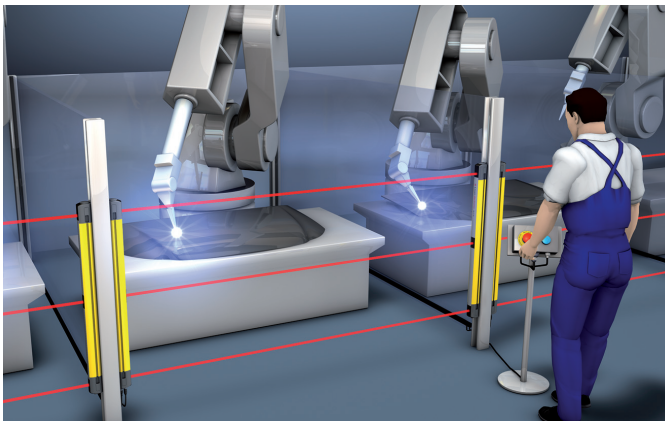
Tel: (81)75-344-7022/Fax: (81)75-344-7107

MULTIPLE LIGHT BEAM SAFETY DEVICES

Overview



MLD 500 Multiple Light Beam Safety Device with integrated muting indicator in an application with sequential muting



With their integrated laser alignment aid, the series MLD 300 and MLD 500 enable the efficient and economic setup of type 2 and type 4 access guardings with and without muting

In many production systems there is often the requirement of guarding the access to automatic production cells without obstructing the conveyor system and material feed in the process. The user is provided with a harmonized range of Multiple Light Beam Safety Devices for this requirement.

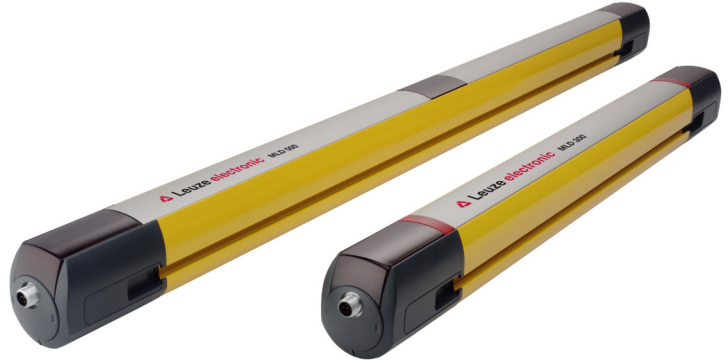
The individual features and performance data of the individual Light Beam Devices allow the most varied applications to be optimally implemented, and often without additional measures. The high ranges of the sensors also allow very spacious systems to be guarded. Integrated additional functions, such as integrated alignment lasers, support the speedy start-up.

ROTOSCAN RS4-4E Safety Laser Scanners can also be used with numerous advantages for complete guarding of access areas with bigger heights or contours that are not square.

MLD 500
p. 188

MLD 300
p. 216

Selection table



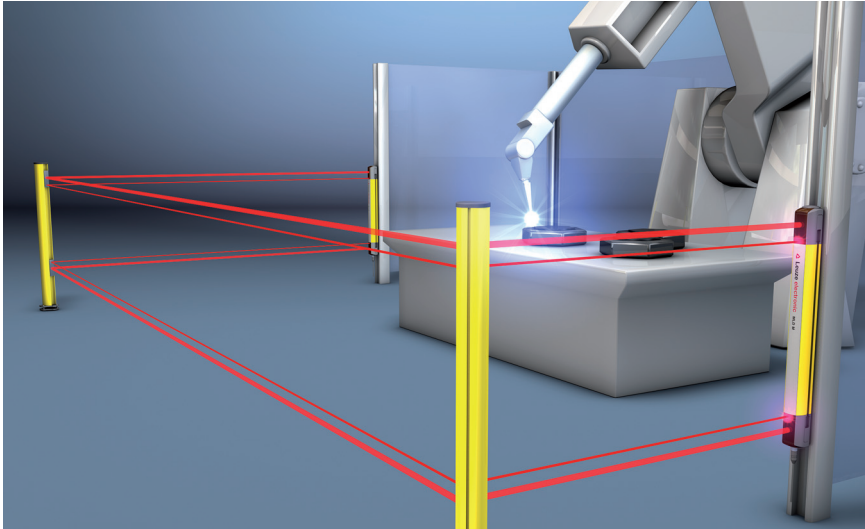
Countless varieties of MLD 500 or MLD 300 Multiple Light Beam Safety Devices are available for solving individual tasks

						Features, type-dependent									
Type in accordance with EN/IEC 61496	SIL in accordance with IEC 61508 or SILCL in accordance with EN/IEC 62061	Performance Level (PL) in accordance with EN ISO 13849-1	W x D in mm	Beam distance (mm) Number of beams	Range in m	Transmitter/receiver	Transceiver system	RES / EDM, selectable	Muting functions, selectable	Integrated muting indicator (optional)	Integrated laser alignment aid (optional)	pnp transistor output	Integrated AS-i Safety interface	Series	Page
4	3	e	52 x 65	500/2	0.5 - 50 / 20 - 70	●		●	●	●	●	●	●	MLD 500	190
				400/3			●	●	●	●	●	●	●		
2	2	d	52 x 65	500/2	0.5 - 50 / 20 - 70	●		●	●	●	●	●		MLD 300	218
				400/3			●	●	●	●	●	●	●		

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MULTIPLE LIGHT BEAM SAFETY DEVICES

MLD 500

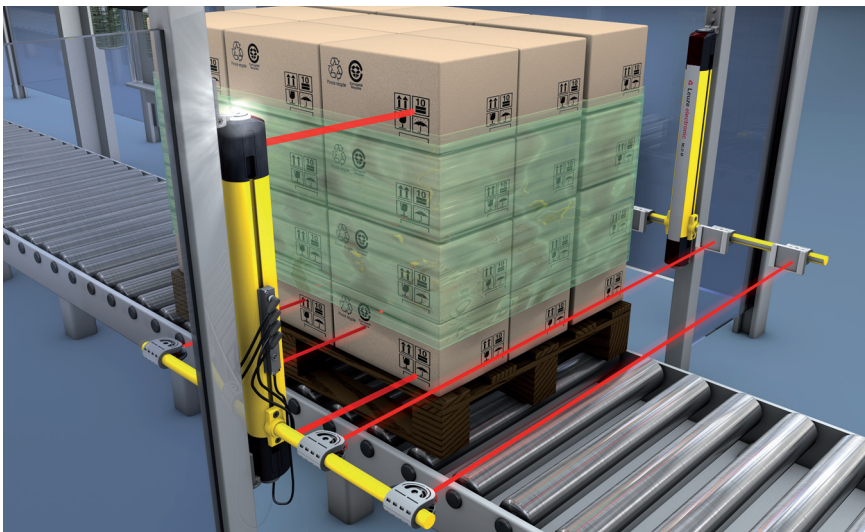


Easy setting up of an access guarding with integrated laser alignment aid

It is advantageous from a cost effectiveness and optimum usability standpoint to use safety sensors that are characterized by functions that match the specific requirements of the given application as closely as possible. The Multiple Light Beam Safety Device MLD 500 (type 4, PLe) has been specially designed for this.

As for the MLD 300 series (type 2, PL d), the MLD 500 sensors are characterized by their individual function classes. A start/restart interlock and contactor monitoring can thereby be selected and, if necessary, various muting modes realized. The series can be used both as standard access guarding as well as for applications where sequential, parallel or partial muting is required. Additional muting devices are not required, thus simplifying construction and lowering costs during setup of the muting application.

The series is predestined for wide-area perimeter guarding, which is realized with Deflecting Mirrors, enabling operation at ranges of up to 70 m. In addition to transmitter/receiver versions, 2- and 3-beam (patented) transceiver versions are also available. No PC is necessary for configuration, as the functions are set via the pin assignments at the connection. Operating temperatures as low as -30°C are possible. Options such as the integrated laser alignment aid, an integrated muting indicator and the patented swivel mount for easy fastening and alignment round out the MLD product range.



MLD 500 Multiple Light Beam Safety Device with integrated muting indicator in an application with sequential muting

Typical areas of application

- Access guardings with and without muting on robot cells, processing centers, production lines
- Packaging machinery, palletizers, wrapping machinery, plastic and rubber machinery, concrete and stoneware machinery, ...
- Rear zone guarding on pressure forming presses

MLD 500
p. 188

MLD 300
p. 216

Important technical data, overview

Type in accordance with EN/IEC 61496	4		
SIL in accordance with IEC 61508 and SILCL in accordance with EN/IEC 62061	3		
Performance Level (PL) in accordance with EN ISO 13849-1	e		
Category in accordance with EN ISO 13849	4		
Number of beams*	2	3	4
Beam distance	500 mm	400 mm	300 mm
Range (transmitter-receiver systems, type-dependent)	MLDxyy-R /-T: 0.5...50 m MLDxyy-xR /-xT: 20...70 m		
Range (transceiver systems)	0.5 - 8 m		
Profile cross-section	52 mm x 65 mm		
Safety-related switching outputs	2 pnp transistor outputs, AS-i Safety Interface		
Connection system	M12 plug		

*) Information on MLD Single Light Beam Safety Devices can be found on page 246.

Functions

	MLD 510	MLD 520	MLD 530	MLD 535
Automatic start/restart	●	●		
Start/restart interlock (RES)		●*	●	●
Contacting monitoring (EDM)		●*	●*	●*
2-sensor muting (timing controlled, sequence controlled)			●	
4-sensor muting (timing controlled)				●
Configurable operating modes		●	●	●
Laser alignment aid (optional for transmitter-receiver systems)	●	●		

*) selectable

Special features

- Version available as 3-beam transceiver
- Integrated muting function, no additional muting module is necessary
- The configuration is simply performed by means of wiring, i. e. no software, PC or DIP switch are necessary
- The use at ambient temperatures as low as -30°C is possible
- Options: integrated laser alignment aid, integrated muting indicator, 7-segment display, AS-i Safety interface.



Features

Further information

Page

● Ordering information	190
● Electrical connection	203
● Technical data	205
● Dimensional drawings	207
● Dimensional drawings: Accessories	211
● Assembly drawings	507
● Accessories ordering information	213

MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 510, consisting of transmitter and receiver
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: Automatic restart, 2 OSSDs

Beam distance/ number of beams	MLD 510			
	Range: 0.5 - 50 m			
	Part no.	Article	Description	Option
500 mm / 2	66501100	MLD500-T2	Transmitter	
	66533100	MLD510-R2	Receiver	
	66502100	MLD500-T2L	Transmitter	With integrated laser alignment aid
	66536100	MLD510-R2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66501200	MLD500-T3	Transmitter	
	66533200	MLD510-R3	Receiver	
	66502200	MLD500-T3L	Transmitter	With integrated laser alignment aid
	66536200	MLD510-R3L	Receiver	With reflex element for laser alignment aid
300 mm / 4	66501300	MLD500-T4	Transmitter	
	66533300	MLD510-R4	Receiver	
	66502300	MLD500-T4L	Transmitter	With integrated laser alignment aid
	66536300	MLD510-R4L	Receiver	With reflex element for laser alignment aid

Ordering information

MLD 510, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: Automatic restart, 2 OSSDs

Beam distance/ number of beams	MLD 510			
	Range: 20 - 70 m			
	Part no.	Article	Description	Option
500 mm / 2	66501500	MLD500-XT2	Transmitter	
	66533500	MLD510-XR2	Receiver	
	66502500	MLD500-XT2L	Transmitter	With integrated laser alignment aid
	66536500	MLD510-XR2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66501600	MLD500-XT3	Transmitter	
	66533600	MLD510-XR3	Receiver	
	66502600	MLD500-XT3L	Transmitter	With integrated laser alignment aid
	66536600	MLD510-XR3L	Receiver	With reflex element for laser alignment aid
300 mm / 4	66501700	MLD500-XT4	Transmitter	
	66533700	MLD510-XR4	Receiver	
	66502700	MLD500-XT4L	Transmitter	With integrated laser alignment aid
	66536700	MLD510-XR4L	Receiver	With reflex element for laser alignment aid

Beam distance/ number of beams	MLD 510 transceiver systems			
	Range: 0.5 - 8 m			
	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66537100	MLD510-RT2	Transceiver	
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66537200	MLD510-RT3	Transceiver	

Beam distance/ number of beams	MLD 510 transceiver systems			
	Range: 0.5 - 6 m			
	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66537200	MLD510-RT3	Transceiver	

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Machine Safety
 Machine Safety Services
 Safety Engineering Software
 Safety Laser Scanners
 Safety Light Curtains
 Multiple Light Beam Safety Devices
 Light Beam Safety Device Sets
 Single Light Beam Safety Devices
 AS-Interface Safety at Work
 Safety Proximity Sensors

MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 520, consisting of transmitter and receiver
Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock selectable, contactor monitoring selectable, automatic start/restart

Beam distance/ number of beams	MLD 520			
	Range: 0.5 - 50 m			
	Part no.	Article	Description	Option
500 mm / 2	66501100	MLD500-T2	Transmitter	
	66553100	MLD520-R2	Receiver	
	66554100	MLD520-R2M	Receiver	With integrated status indicator
	66502100	MLD500-T2L	Transmitter	With integrated laser alignment aid
	66556100	MLD520-R2L	Receiver	With reflex element for laser alignment aid
	66555100	MLD520-R2LM	Receiver	With reflex element for laser alignment aid and integrated status indicator
400 mm / 3	66501200	MLD500-T3	Transmitter	
	66553200	MLD520-R3	Receiver	
	66554200	MLD520-R3M	Receiver	With integrated status indicator
	66502200	MLD500-T3L	Transmitter	With integrated laser alignment aid
	66556200	MLD520-R3L	Receiver	With reflex element for laser alignment aid
	66555200	MLD520-R3LM	Receiver	With reflex element for laser alignment aid and integrated status indicator
300 mm / 4	66501300	MLD500-T4	Transmitter	
	66553300	MLD520-R4	Receiver	
	66554300	MLD520-R4M	Receiver	With integrated status indicator
	66502300	MLD500-T4L	Transmitter	With integrated laser alignment aid
	66556300	MLD520-R4L	Receiver	With reflex element for laser alignment aid
	66555300	MLD520-R4LM	Receiver	With reflex element for laser alignment aid and integrated status indicator

Ordering information

MLD 520, consisting of transmitter and receiver
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock selectable, contactor monitoring selectable, automatic start/restart

Beam distance/ number of beams	MLD 520			
	Range: 20 - 70 m			
	Part no.	Article	Description	Option
500 mm / 2	66501500	MLD500-XT2	Transmitter	
	66553500	MLD520-XR2	Receiver	
	66554500	MLD520-XR2M	Receiver	With integrated status indicator
	66502500	MLD500-XT2L	Transmitter	With integrated laser alignment aid
	66556500	MLD520-XR2L	Receiver	With reflex element for laser alignment aid
	66555500	MLD520-XR2LM	Receiver	With reflex element for laser alignment aid and integrated status indicator
400 mm / 3	66501600	MLD500-XT3	Transmitter	
	66553600	MLD520-XR3	Receiver	
	66554600	MLD520-XR3M	Receiver	With integrated status indicator
	66502600	MLD500-XT3L	Transmitter	With integrated laser alignment aid
	66556600	MLD520-XR3L	Receiver	With reflex element for laser alignment aid
	66555600	MLD520-XR3LM	Receiver	With reflex element for laser alignment aid and integrated status indicator
300 mm / 4	66501700	MLD500-XT4	Transmitter	
	66553700	MLD520-XR4	Receiver	
	66554700	MLD520-XR4M	Receiver	With integrated status indicator
	66502700	MLD500-XT4L	Transmitter	With integrated laser alignment aid
	66556700	MLD520-XR4L	Receiver	With reflex element for laser alignment aid
	66555700	MLD520-XR4LM	Receiver	With reflex element for laser alignment aid and integrated status indicator

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MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 520, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock selectable, contactor monitoring selectable, automatic start/restart

Beam distance/ number of beams	MLD 520 transceiver systems			
	Range: 0.5 - 6 m			
	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66557200	MLD520-RT3	Transceiver	
	66558200	MLD520-RT3M	Transceiver	With integrated status indicator

Beam distance/ number of beams	MLD 520 transceiver systems			
	Range: 0.5 - 8 m			
	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66557100	MLD520-RT2	Transceiver	
	66558100	MLD520-RT2M	Transceiver	With integrated status indicator
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66557200	MLD520-RT3	Transceiver	
	66558200	MLD520-RT3M	Transceiver	With integrated status indicator

Ordering information

MLD 530, consisting of transmitter and receiver
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, muting-time-out extension, alternative connection for second muting signal, partial muting

Beam distance/ number of beams	MLD 530			
	Range: 0.5 - 50 m			
	Part no.	Article	Description	Option
500 mm / 2	66501100	MLD500-T2	Transmitter	
	66563100	MLD530-R2	Receiver	
	66564100	MLD530-R2M	Receiver	With integrated status and muting indicator
	66502100	MLD500-T2L	Transmitter	With integrated laser alignment aid
	66566100	MLD530-R2L	Receiver	With reflex element for laser alignment aid
	66565100	MLD530-R2LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator
400 mm / 3	66501200	MLD500-T3	Transmitter	
	66563200	MLD530-R3	Receiver	
	66564200	MLD530-R3M	Receiver	With integrated status and muting indicator
	66502200	MLD500-T3L	Transmitter	With integrated laser alignment aid
	66566200	MLD530-R3L	Receiver	With reflex element for laser alignment aid
	66565200	MLD530-R3LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator
300 mm / 4	66501300	MLD500-T4	Transmitter	
	66563300	MLD530-R4	Receiver	
	66564300	MLD530-R4M	Receiver	With integrated status and muting indicator
	66502300	MLD500-T4L	Transmitter	With integrated laser alignment aid
	66566300	MLD530-R4L	Receiver	With reflex element for laser alignment aid
	66565300	MLD530-R4LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator

MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 530, consisting of transmitter and receiver or transceiver and Deflecting Mirror
Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, muting-time-out extension, alternative connection for second muting signal, partial muting

Beam distance/ number of beams	MLD 530			
	Range: 20 - 70 m			
	Part no.	Article	Description	Option
500 mm / 2	66501500	MLD500-XT2	Transmitter	
	66563500	MLD530-XR2	Receiver	
	66502500	MLD500-XT2L	Transmitter	With integrated laser alignment aid
	66566500	MLD530-XR2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66501600	MLD500-XT3	Transmitter	
	66563600	MLD530-XR3	Receiver	
	66502600	MLD500-XT3L	Transmitter	With integrated laser alignment aid
	66566600	MLD530-XR3L	Receiver	With reflex element for laser alignment aid
300 mm / 4	66501700	MLD500-XT4	Transmitter	
	66563700	MLD530-XR4	Receiver	
	66502700	MLD500-XT4L	Transmitter	With integrated laser alignment aid
	66566700	MLD530-XR4L	Receiver	With reflex element for laser alignment aid

Beam distance/ number of beams	MLD 530 transceiver systems			
	Range: 0.5 - 8 m			
	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66567100	MLD530-RT2	Transceiver	
	66568100	MLD530-RT2M	Transceiver	With integrated status and muting indicator
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66567200	MLD530-RT3	Transceiver	
	66568200	MLD530-RT3M	Transceiver	With integrated status and muting indicator

Beam distance/ number of beams	MLD 530 transceiver systems			
	Range: 0.5 - 6 m			
	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66567200	MLD530-RT3	Transceiver	
	66568200	MLD530-RT3M	Transceiver	With integrated status and muting indicator

Ordering information

MLD 535, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, timing controlled 4-sensor muting, muting-timeout extension, alternative connection for second muting signal, muting enable function, partial muting

Beam distance/ number of beams	MLD 535			
	Range: 0.5 - 50 m			
	Part no.	Article	Description	Option
500 mm / 2	66501100	MLD500-T2	Transmitter	
	66573100	MLD535-R2	Receiver	
	66574100	MLD535-R2M	Receiver	With integrated status and muting indicator
	66502100	MLD500-T2L	Transmitter	With integrated laser alignment aid
	66576100	MLD535-R2L	Receiver	With reflex element for laser alignment aid
	66575100	MLD535-R2LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator
400 mm / 3	66501200	MLD500-T3	Transmitter	
	66573200	MLD535-R3	Receiver	
	66574200	MLD535-R3M	Receiver	With integrated status and muting indicator
	66502200	MLD500-T3L	Transmitter	With integrated laser alignment aid
	66576200	MLD535-R3L	Receiver	With reflex element for laser alignment aid
	66575200	MLD535-R3LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator
300 mm / 4	66501300	MLD500-T4	Transmitter	
	66573300	MLD535-R4	Receiver	
	66574300	MLD535-R4M	Receiver	With integrated status and muting indicator
	66502300	MLD500-T4L	Transmitter	With integrated laser alignment aid
	66576300	MLD535-R4L	Receiver	With reflex element for laser alignment aid
	66575300	MLD535-R4LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator

MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 535, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, timing controlled 4-sensor muting, muting-timeout extension, alternative connection for second muting signal, muting enable function, partial muting

Beam distance/ number of beams	MLD 535			
	Range: 20 - 70 m			
	Part no.	Article	Description	Option
500 mm / 2	66501500	MLD500-XT2	Transmitter	
	66573500	MLD535-XR2	Receiver	
	66502500	MLD500-XT2L	Transmitter	With integrated laser alignment aid
	66576500	MLD535-XR2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66501600	MLD500-XT3	Transmitter	
	66573600	MLD535-XR3	Receiver	
	66502600	MLD500-XT3L	Transmitter	With reflex element for laser alignment aid
	66576600	MLD535-XR3L	Receiver	With integrated laser alignment aid
300 mm / 4	66501700	MLD500-XT4	Transmitter	
	66573700	MLD535-XR4	Receiver	
	66502700	MLD500-XT4L	Transmitter	With integrated laser alignment aid
	66576700	MLD535-XR4L	Receiver	With reflex element for laser alignment aid

Beam distance/ number of beams	MLD 535 transceiver systems			
	Range: 0.5 - 8 m			
	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66577100	MLD535-RT2	Transceiver	
	66578100	MLD535-RT2M	Transceiver	With integrated status and muting indicator
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66577200	MLD535-RT3	Transceiver	
	66578200	MLD535-RT3M	Transceiver	With integrated status and muting indicator

Beam distance/ number of beams	MLD 535 transceiver systems			
	Range: 0.5 - 6 m			
	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66577200	MLD535-RT3	Transceiver	
	66578200	MLD535-RT3M	Transceiver	With integrated status and muting indicator

MLD 500
p. 188

MLD 300
p. 216

Ordering information

MLD 510/AS-i, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions (in combination with ASM Safety Monitor):
 start/restart interlock selectable, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, timing controlled 4-sensor muting, muting-timeout extension

Beam distance/ number of beams	MLD 510/AS-i			
	Range: 0.5 - 50 m			
	Part no.	Article	Description	Option
500 mm / 2	66501101	MLD500-T2/A	Transmitter	
	66533101	MLD510-R2/A	Receiver	
	66534101	MLD510-R2M/A	Receiver	With integrated muting indicator
	66533102	MLD510-R2E/A	Receiver	With connection socket for external muting indicator
	66502101	MLD500-T2L/A	Transmitter	With integrated laser alignment aid
	66536101	MLD510-R2L/A	Receiver	With reflex element for laser alignment aid
	66535101	MLD510-R2LM/A	Receiver	With reflex element for laser alignment aid and integrated muting indicator
400 mm / 3	66501201	MLD500-T3/A	Transmitter	
	66533201	MLD510-R3/A	Receiver	
	66534201	MLD510-R3M/A	Receiver	With integrated muting indicator
	66533202	MLD510-R3E/A	Receiver	With connection socket for external muting indicator
	66502201	MLD500-T3L/A	Transmitter	With integrated laser alignment aid
	66536201	MLD510-R3L/A	Receiver	With reflex element for laser alignment aid
	66535201	MLD510-R3LM/A	Receiver	With reflex element for laser alignment aid and integrated muting indicator
300 mm / 4	66501301	MLD500-T4/A	Transmitter	
	66533301	MLD510-R4/A	Receiver	
	66534301	MLD510-R4M/A	Receiver	With integrated muting indicator
	66533302	MLD510-R4E/A	Receiver	With connection socket for external muting indicator
	66502301	MLD500-T4L/A	Transmitter	With integrated laser alignment aid
	66536301	MLD510-R4L/A	Receiver	With reflex element for laser alignment aid
	66535301	MLD510-R4LM/A	Receiver	With reflex element for laser alignment aid and integrated muting indicator
	66536302	MLD510-R4LE/A	Receiver	With reflex element for laser alignment aid and connection socket for external muting indicator

MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 510/AS-i, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions (in combination with ASM Safety Monitor):
 start/restart interlock selectable, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, timing controlled 4-sensor muting, muting-timeout extension

Beam distance/ number of beams	MLD 510/AS-i			
	Range: 20 - 70 m			
	Part no.	Article	Description	Option
500 mm / 2	66501501	MLD500-XT2/A	Transmitter	
	66533501	MLD510-XR2/A	Receiver	
	66502501	MLD500-XT2L/A	Transmitter	With integrated laser alignment aid
	66536501	MLD510-XR2L/A	Receiver	With reflex element for laser alignment aid
	66533502	MLD510-XR2E/A	Receiver	With connection socket for external muting indicator
	66536502	MLD510-XR2LE/A	Receiver	With reflex element for laser alignment aid and connection socket for external muting indicator
400 mm / 3	66501601	MLD500-XT3/A	Transmitter	
	66533601	MLD510-XR3/A	Receiver	
	66502601	MLD500-XT3L/A	Transmitter	With integrated laser alignment aid
	66536601	MLD510-XR3L/A	Receiver	With reflex element for laser alignment aid
	66533602	MLD510-XR3E/A	Receiver	With connection socket for external muting indicator
	66536602	MLD510-XR3LE/A	Receiver	With reflex element for laser alignment aid and connection socket for external muting indicator
300 mm / 4	66501701	MLD500-XT4/A	Transmitter	
	66533701	MLD510-XR4/A	Receiver	
	66502701	MLD500-XT4L/A	Transmitter	With integrated laser alignment aid
	66536701	MLD510-XR4L/A	Receiver	With reflex element for laser alignment aid
	66533702	MLD510-XR4E/A	Receiver	With connection socket for external muting indicator
	66536702	MLD510-XR4LE/A	Receiver	With reflex element for laser alignment aid and connection socket for external muting indicator

Ordering information

MLD 510/AS-i, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions (in combination with ASM Safety Monitor):
 start/restart interlock selectable, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, timing controlled 4-sensor muting, muting-timeout extension

Beam distance/ number of beams	MLD 510/AS-i transceiver systems			
	Range: 0.5 - 8 m			
	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66537101	MLD510-RT2/A	Transceiver	
	66538101	MLD510-RT2M/A	Transceiver	With integrated muting indicator
	66537102	MLD510-RT2E/A	Transceiver	With connection socket for external muting indicator
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66537201	MLD510-RT3/A	Transceiver	
	66538201	MLD510-RT3M/A	Transceiver	With integrated muting indicator
	66537202	MLD510-RT3E/A	Transceiver	With connection socket for external muting indicator

Beam distance/ number of beams	MLD 510/AS-i transceiver systems			
	Range: 0.5 - 6 m			
	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66537201	MLD510-RT3/A	Transceiver	
	66538201	MLD510-RT3M/A	Transceiver	With integrated muting indicator
	66537202	MLD510-RT3E/A	Transceiver	With connection socket for external muting indicator

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MULTIPLE LIGHT BEAM SAFETY DEVICES

Article list for MLD 500, MLD 300

Article	Description
MLD	Multiple Light Beam Safety Device
X	Series
3	MLD 300
5	MLD 500
yy	Function variant
00	Transmitter
10	Automatic restart
12	External testing
20	Start/restart interlock selectable, contactor monitoring selectable
30	2-sensor muting (timing controlled, sequence controlled)
35	Timing controlled 4-sensor muting
z	Device type
T	Transmitter
R	Receiver
RT	Transceiver
xT	Transmitter for high range
xR	Receiver for high range
a	Number of beams
2	2-beam
3	3-beam
4	4-beam
b	Option
L	Integrated laser alignment aid
M	Integrated indicator
E	Connection socket for external muting indicator (only AS-i variants)
t	Safety-related switching outputs (OSSD), connection system
-	Transistor output, M12 plug
A	Integrated AS-Interface, M12 connector, (safety bus systems)

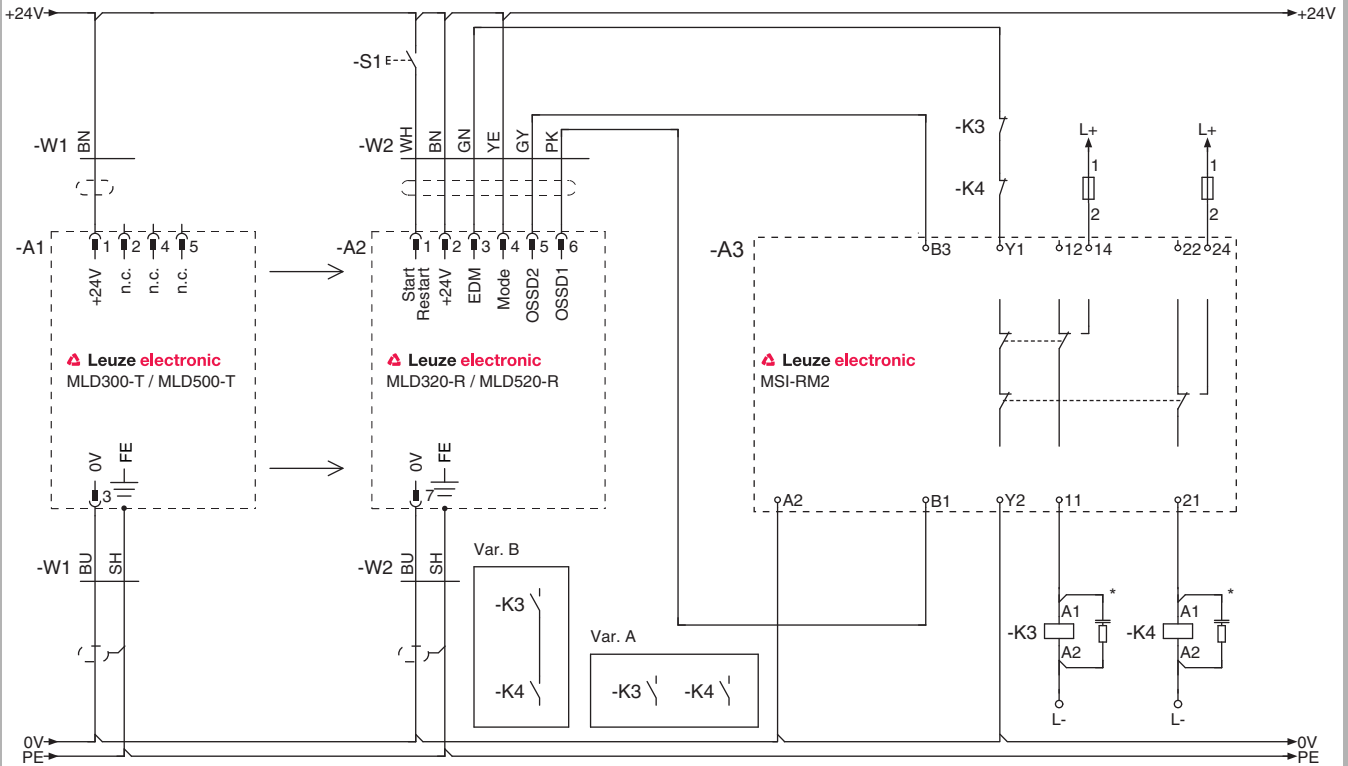
MLD X yy z a b /t

MLD 500
p. 188

MLD 300
p. 216

Electrical connection

MLD 500 connection example



*) Spark extinction circuit, supply suitable spark extinction

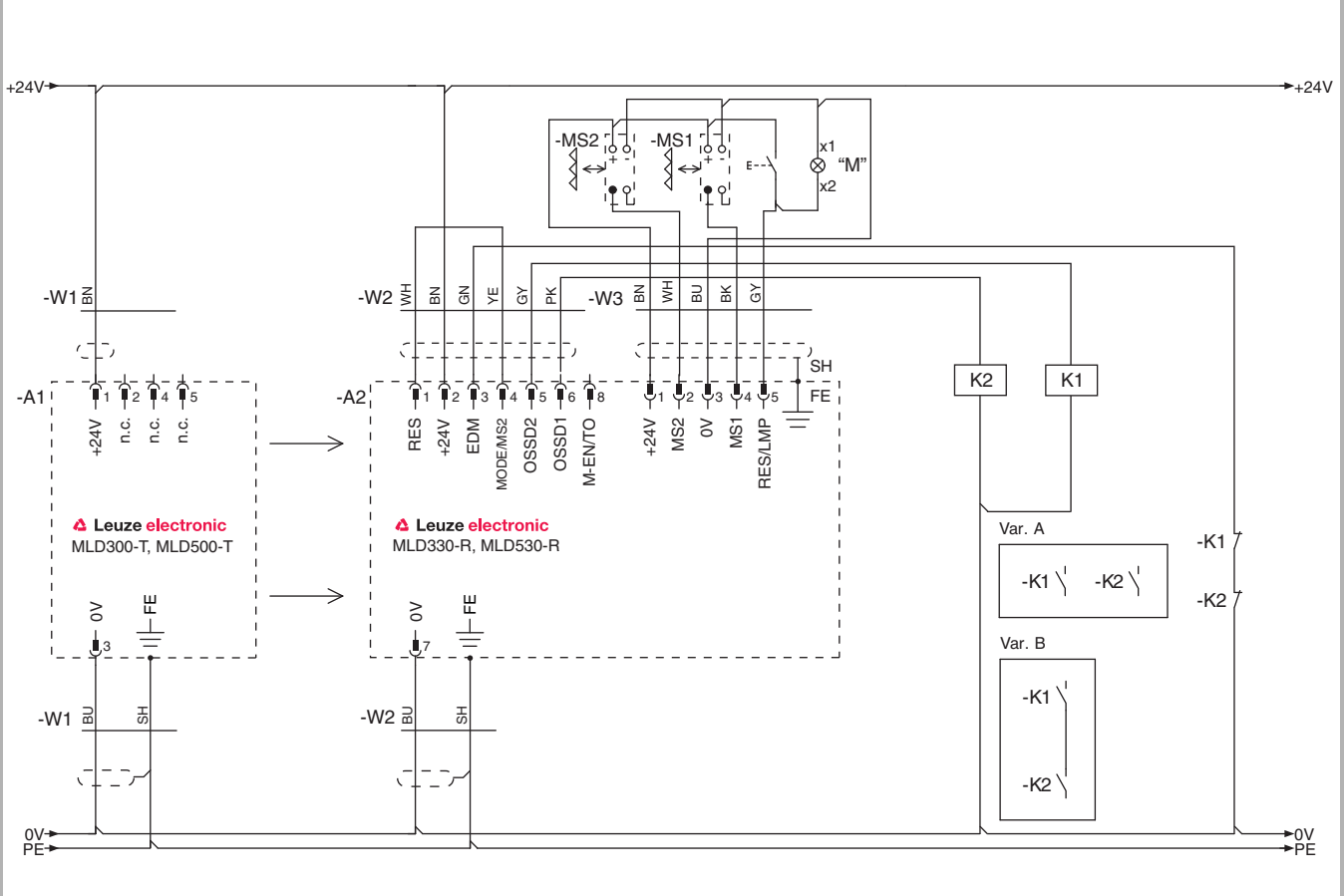
MLD 500 Multiple Light Beam Safety Device (transmitter-receiver system) with MSI-RM2 Safety Relay (transceiver connected in an analogous manner)

Please observe the operating instructions of the components!

MULTIPLE LIGHT BEAM SAFETY DEVICES

Electrical connection

MLD 500 connection example



2-sensor muting with MLD 530 Multiple Light Beam Safety Device (transmitter-receiver system), muting timeout 10 min (transceiver connected in an analogous manner)

⚠ Please observe the operating instructions of the components!

Technical data

General system data			
Type in accordance with EN/IEC 61496	4		
SIL in accordance with IEC 61508 and SILCL in accordance with EN/IEC 62061	3		
Performance Level (PL) in accordance with EN ISO 13849-1	e		
Category in accordance with EN ISO 13849	4		
Number of beams	2	3	4
Beam distance	500 mm	400 mm	300 mm
Average probability of a failure to danger per hour (PFH _d)	6.6 x 10 ⁻⁹		
Mean time to dangerous failure (MTTF _d)	146 years		
Service life (T _M) in accordance with EN ISO 13849-1	20 years		
Range (transmitter-receiver systems, type-dependent)	MLDxyy-R /-T: 0.5...50 m MLDxyy-xR /-xT: 20...70 m		
Range (transceiver systems)	0.5 - 8 m		
Response time	25 ms for MLD 510, MLD 520. 50 ms for MLD 530		
Supply voltage	+24 V, ±20%		
Connection cable length	100 m		
Safety class	III		
Protection rating	IP 67		
Ambient temperature, operation	-30...+55 °C		
Ambient temperature, storage	-40...+75 °C		
Relative humidity	0...95%		
Profile cross-section	52 mm x 65 mm		
Weight	Type-dependent		
Transmitter			
Transmitter diodes, class in accordance with EN 60825	1		
Wavelength	850 nm		
Current consumption	50 mA		
Connection system	M12 plug, 5-pin		
Receiver			
Current consumption	150 mA without external load, muting sensors and muting indicator		
Safety-related switching outputs	2 pnp transistor outputs, AS-i Safety Interface		
Switching voltage high active	Min. 18.2 V		
Switching voltage low	Max. 2.5 V		
Switching current	Typical, 300 mA		
Connection system	M12 plug, 5-pin, 8-pin		

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MULTIPLE LIGHT BEAM SAFETY DEVICES

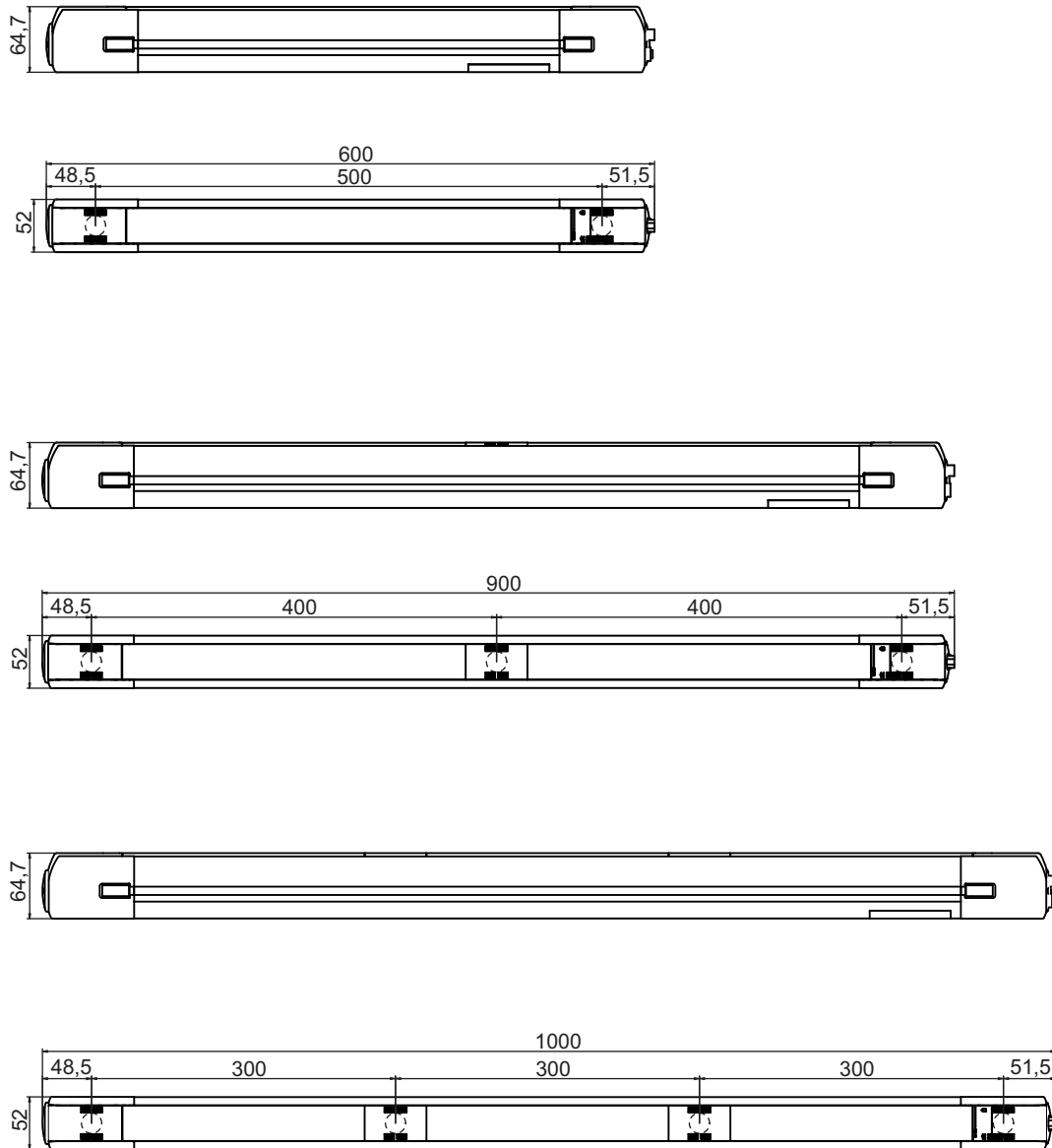
Technical data

Transceiver	
Current consumption	150 mA without external load, muting sensors and muting indicator
Safety-related switching outputs (OSSDs)	2 pnp transistor outputs
Switching voltage high active	Min. 18.2 V
Switching voltage low	Max. 2.5 V
Switching current	Typical, 300 mA
Connection system	M12 plug, 5-pin

Additional information can be found in the MLD Connecting and Operating Instructions at www.leuze.com/en/mld.

Dimensional drawings

MLD 500 Multiple Light Beam Safety Device, transmitter, receiver



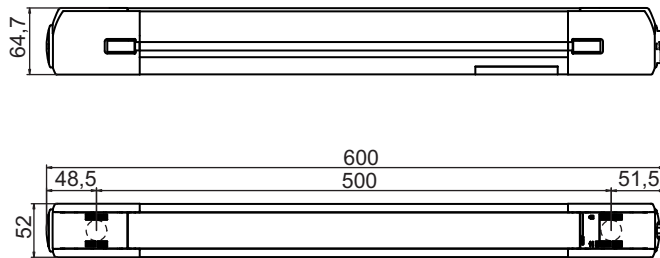
Dimensions in mm

www.leuze.com/en/msl/

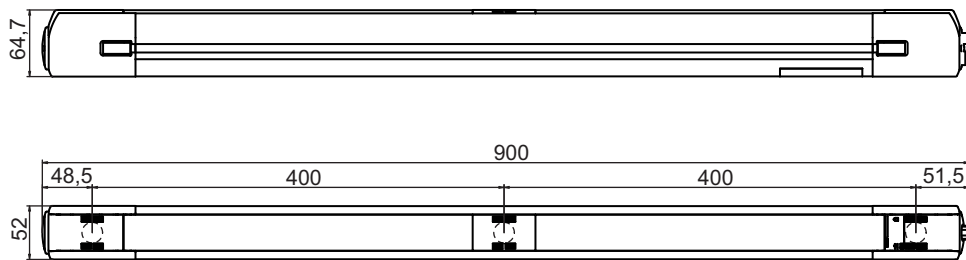
MULTIPLE LIGHT BEAM SAFETY DEVICES

Dimensional drawings

MLD 500 transceiver



2-beam transceiver

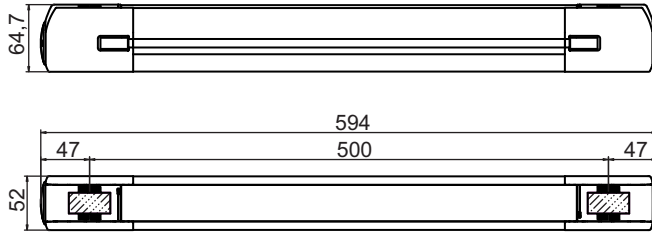


3-beam transceiver

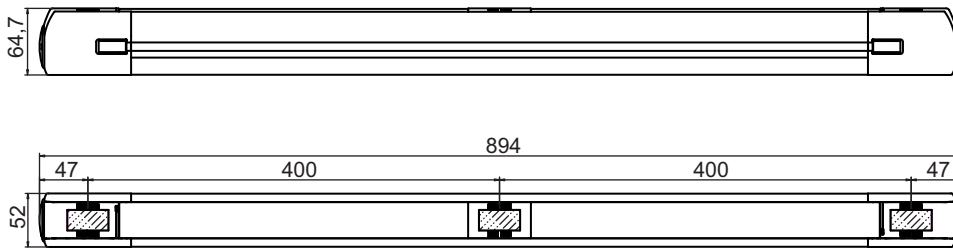
Dimensions in mm

Dimensional drawings

MLD-M Deflecting Mirrors



2-beam Deflecting Mirror MLD-M002



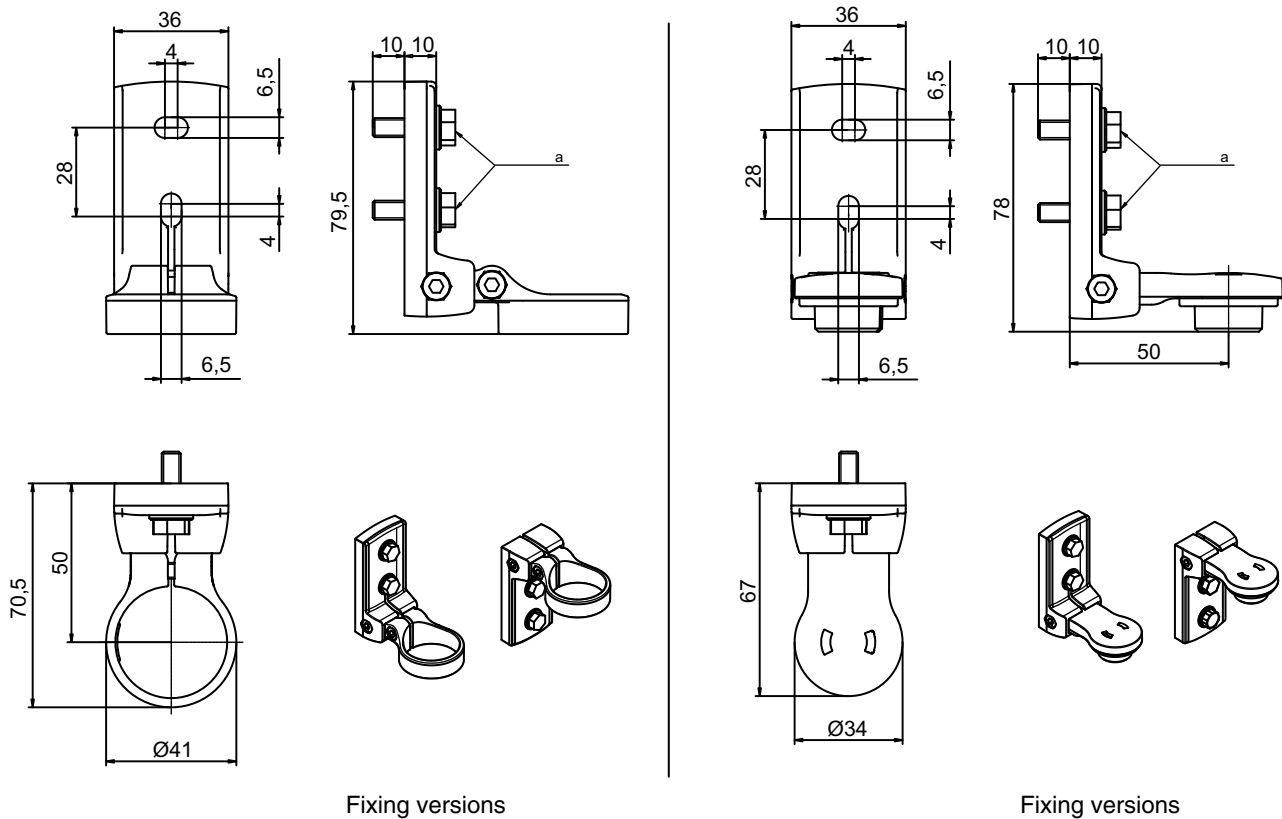
3-beam Deflecting Mirror MLD-M003

Dimensions in mm

MULTIPLE LIGHT BEAM SAFETY DEVICES

Dimensional drawings: Accessories

Mounting brackets



Fixing versions

Fixing versions

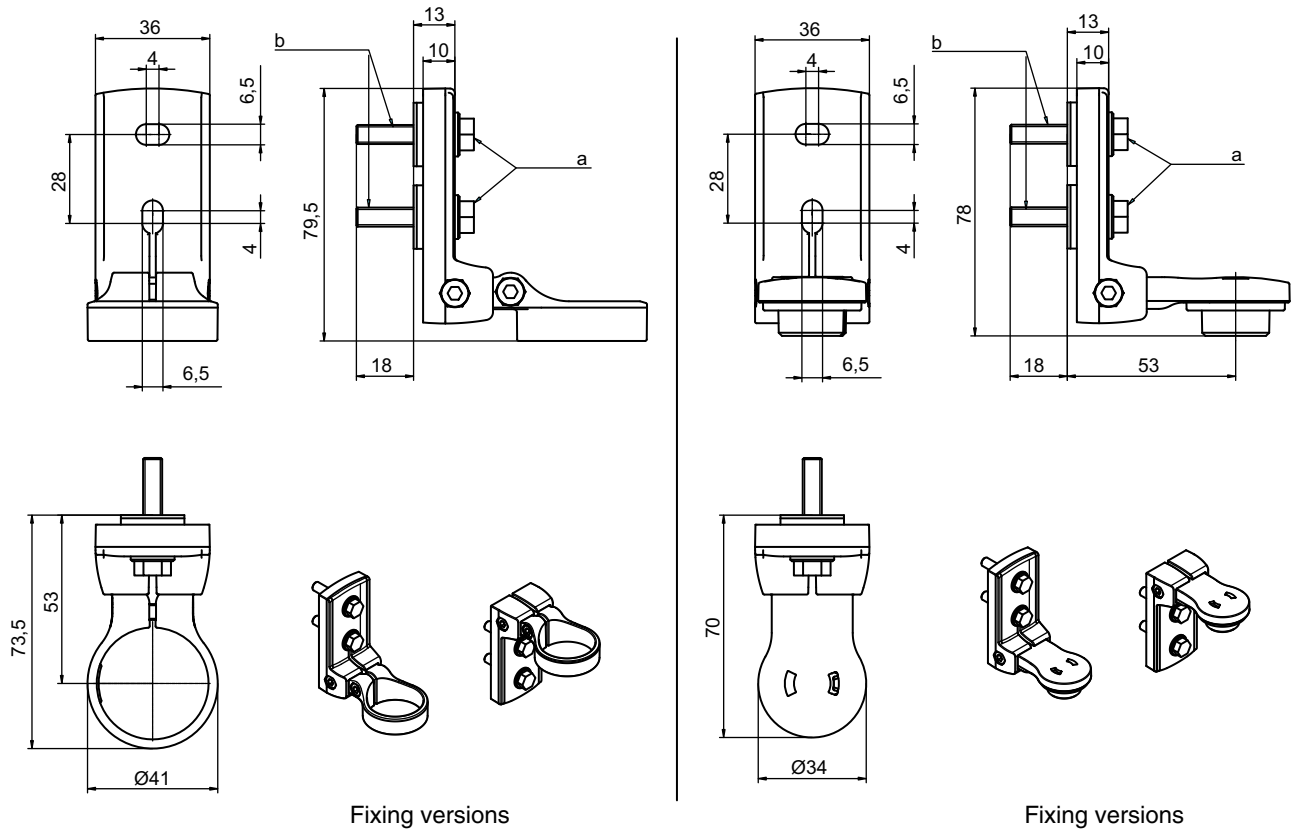
a = screw M6

BT-SET-240BC mounting bracket set, consisting of BT-240B swivel mounts (right) and BT-240C (left), screws.
For all MLD 300/500 (but not for MLD-M00X; here, the BT-SET-240CC is to be selected)

Dimensions in mm

Dimensional drawings: Accessories

Mounting brackets



a = screw M6
 b = shock absorber, thread M6

BT-SET-240BC mounting bracket set, consisting of BT-240B swivel mounts (right) and BT-240C (left), screws, shock absorber. For all MLD 300/500 (but not for MLD-M00X; here, the BT-SET-240CCS is to be selected)

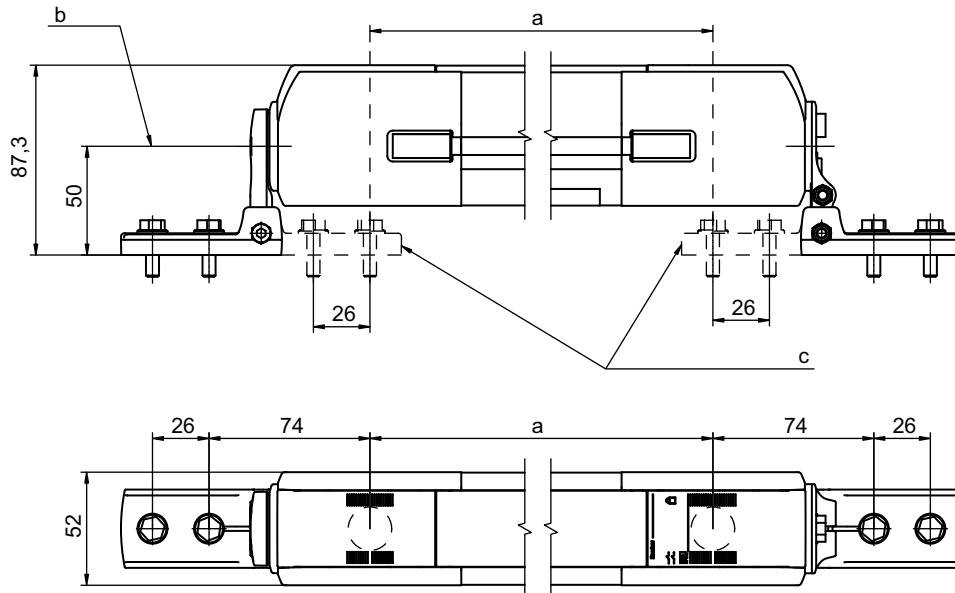
Dimensions in mm

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MULTIPLE LIGHT BEAM SAFETY DEVICES

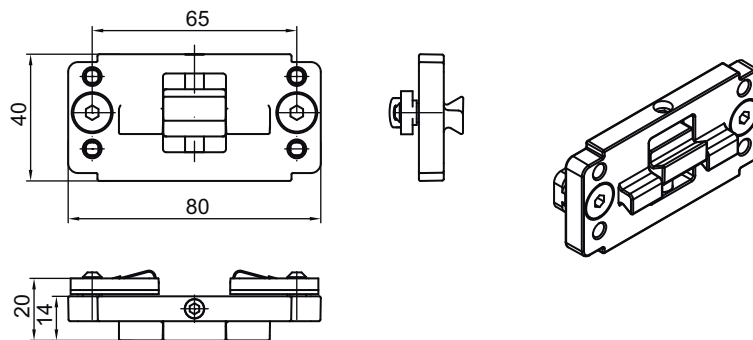
Dimensional drawings: Accessories

Mounting brackets



- a = beam distance
- b = swivel axis
- c = alternative fixing version

BT-240B and BT-240C swivel mount mounting dimensions



BT-P40 clamp bracket

Dimensions in mm

Accessories ordering information

Part no.	Article	Description	Length, design
Connection cables for MLD 310, MLD 312, MLD 510 (machine interface), MLD 300 transmitter, MLD 500 transmitter			
678055	CB-M12-5000E-5GF	Connection cable shielded with M12 coupling, 5-pin	5 m, straight/open end
678056	CB-M12-10000E-5GF	Connection cable shielded with M12 coupling, 5-pin	10 m, straight/open end
678057	CB-M12-15000E-5GF	Connection cable shielded with M12 coupling, 5-pin	15 m, straight/open end
678058	CB-M12-25000E-5GF	Connection cable shielded with M12 coupling, 5-pin	25 m, straight/open end
678059	CB-M12-50000E-5GF	Connection cable shielded with M12 coupling, 5-pin	50 m, straight/open end
Connection cables for MLD 320, MLD 330, MLD 335, MLD 520, MLD 530, MLD 535 (machine interface)			
678060	CB-M12-5000E-8GF	Connection cable shielded with M12 coupling, 8-pin	5 m, straight/open end
678061	CB-M12-10000E-8GF	Connection cable shielded with M12 coupling, 8-pin	10 m, straight/open end
678062	CB-M12-15000E-8GF	Connection cable shielded with M12 coupling, 8-pin	15 m, straight/open end
678063	CB-M12-25000E-8GF	Connection cable shielded with M12 coupling, 8-pin	25 m, straight/open end
678064	CB-M12-50000E-8GF	Connection cable shielded with M12 coupling, 8-pin	50 m, straight/open end
Connection cables for MLD 330, MLD 530 (local interface)			
678050	CB-M12-5000E-5GM	Connection cable shielded with M12 plug, 5-pin	5 m, straight/open end
678051	CB-M12-10000E-5GM	Connection cable shielded with M12 plug, 5-pin	10 m, straight/open end
678052	CB-M12-15000E-5GM	Connection cable shielded with M12 plug, 5-pin	15 m, straight/open end
678053	CB-M12-25000E-5GM	Connection cable shielded with M12 plug, 5-pin	25 m, straight/open end
Connection cables for MLD 335, MLD 535 (local interface)			
50110180	KB M12/8-5000-SA	Connection cables for MLD 335, MLD 535 (local interface), 8-pin, length 5 m	
50110181	KB M12/8-10000-SA	Connection cables for MLD 335, MLD 535 (local interface), 8-pin, length 10 m	
50110186	KB M12/8-15000-SA	Connection cables for MLD 335, MLD 535 (local interface), 8-pin, length 15 m	
50110188	KB M12/8-25000-SA	Connection cables for MLD 335, MLD 535 (local interface), 8-pin, length 25 m	
User-configurable cable connectors for machine interface (axial)			
429175	CB-M12-5GF	5-pin screw connection (M12)	
429178	CB-M12-8GF	8-pin screw connection (M12)	

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MULTIPLE LIGHT BEAM SAFETY DEVICES

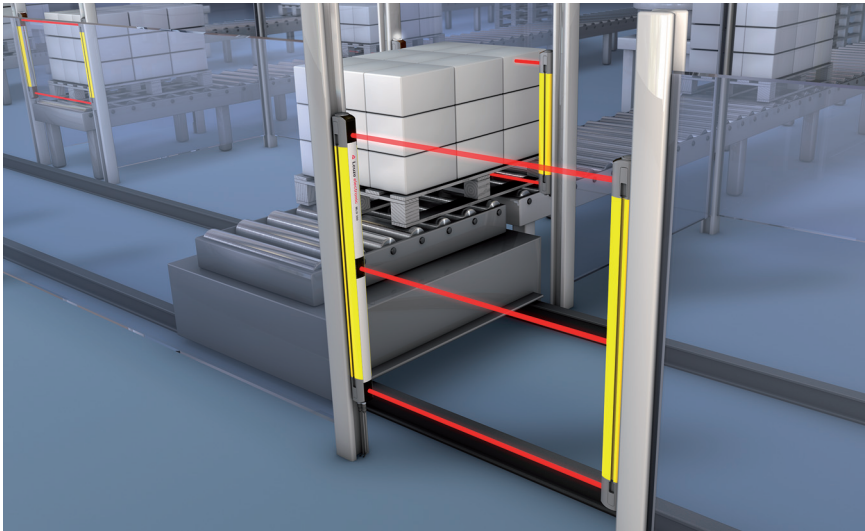
Accessories ordering information

Part no.	Article	Description	Length, design
Mounting brackets and mounting bracket sets			
424416	BT-P40	Clamp bracket	
560340	BT-SET-240BC	Consisting of BT-240B, BT-240C swivel mounts, screws	
560341	BT-SET-240CC	Consisting of 2 x BT-240C swivel mounts, screws (for MLD-M002 or MLD-M003 deflecting mirror)	
560342	BT-SET-240BCS	Consisting of BT-240B, BT-240C swivel mounts, screws, shock absorber	
560343	BT-SET-240CCS	Consisting of 2 x BT-240C swivel mounts, screws, shock absorber (for MLD-M002 or MLD-M003 Deflecting Mirror)	
560344	BT-SET-240C	Consisting of BT-240C swivel mount, screws	
560345	BT-SET-240CS	Consisting of BT-240C swivel mount, screws, shock absorber	
560346	BT-SET-240BS	Consisting of BT-240C swivel mount, screws, shock absorber	
560347	BT-SET-240B	Consisting of BT-240 B standard swivel mount (swivel mount 240° rotation), screws	
Accessories for muting			
520062	AC-SCM5	Local connection box with M12-connection for connecting to 5-pin local interface (4 connections for 2 muting sensors, muting indicator, reset button)	
520063	AC-SCM5-BT	Local connection box with M12-connection for connecting to 5-pin local interface (4 connections for 2 muting sensors, muting indicator, reset button), with mounting plate	
520058	AC-SCM6	Local connection box with M12-connection for connecting to 8-pin local interface (6 connections for 4 muting sensors, muting indicator, reset button)	
520059	AC-SCM6-BT	Local connection box with M12-connection for connecting to 8-pin local interface (6 connections for 4 muting sensors, muting indicator, reset button), with mounting plate	
Muting Sensor Sets			
For accessories, see page 502.			
Accessories for laser alignment aid			
520071	AC-MK1	MagnetKey for activation of the laser alignment aid	

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MULTIPLE LIGHT BEAM SAFETY DEVICES

MLD 300

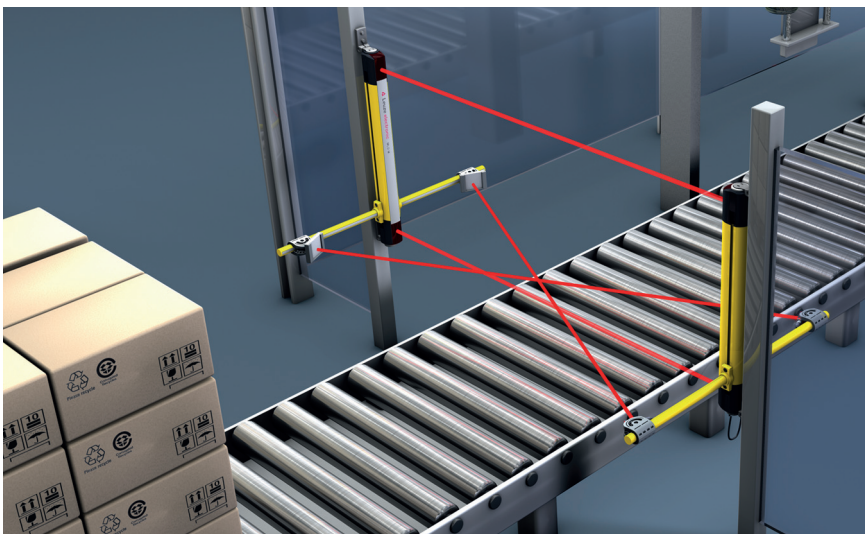


Access guarding with 3-beam transceiver of the MLD 300 series for conveyor and storage systems

It is advantageous from a cost effectiveness and optimum usability standpoint to use safety sensors that are characterized by functions that match the specific requirements of the given application as closely as possible. The Multiple Light Beam Safety Device MLD 300 (type 2, PLd) has been specially designed for this.

As for the MLD 500 series (type 4, PL e), the MLD 300 sensors are characterized by their individual function classes. A start/restart interlock and contactor monitoring can thereby be selected and, if necessary, various muting modes realized. The series can be used both as standard access guarding as well as for applications where sequential, parallel or partial muting is required. Additional muting devices are not required, thus simplifying construction and lowering costs during setup of the muting application.

The series is predestined for wide-area perimeter guarding, which is realized with Deflecting Mirrors, enabling operation at ranges of up to 70 m. In addition to transmitter/receiver versions, 2- and 3-beam (patented) transceiver versions are also available. No PC is necessary for configuration, as the functions are set via the pin assignments at the connection. Operating temperatures as low as -30°C are possible. Options such as the integrated laser alignment aid, an integrated muting indicator and the patented swivel mount for easy fastening and alignment round out the MLD product range.



MLD 300 Multiple Light Beam Safety Device with integrated parallel muting at one conveyor line

Typical areas of application

- Print and paper machinery; Packaging machinery in accordance with EN 415
- Conveyor systems in accordance with prEN 620; continuous conveyors for piece goods in accordance with EN 619
- Woodworking machinery in accordance with EN 691, textile machinery, e.g. in accordance with ISO 11111
- Protective devices for storage and narrow passages in accordance with DIN 15185, Part 2
- Further areas of application: machinery and plant systems acc. to C-standards, in which category 2 safety devices are required

MLD 500
p. 188

MLD 300
p. 216

Important technical data, overview

Type in accordance with EN/IEC 61496	2		
SIL in accordance with IEC 61508 and SILCL in accordance with EN/IEC 62061	2		
Performance Level (PL) in accordance with EN ISO 13849-1	d		
Category in accordance with EN ISO 13849	3		
Number of beams	2	3	4
Beam distance	500 mm	400 mm	300 mm
Range (transmitter-receiver systems, type-dependent)	MLDxyy-R /-T: 0.5...50 m MLDxyy-xR /-xT: 20...70 m		
Range (transceiver systems)	0.5 - 8 m		
Profile cross-section	52 mm x 65 mm		
Safety-related switching outputs (OSSDs)	2 pnp transistor outputs		
Connection system	M12 plug		

Functions

	MLD 310, MLD 312*	MLD 320	MLD 330	MLD 335
Automatic start/restart	●	●		
Start/restart interlock (RES)		●**	●	●
Contacting monitoring (EDM)		●**	●**	●**
2-sensor muting (timing controlled, sequence controlled)			●	
4-sensor muting (timing controlled)				●
Configurable operating modes		●	●	●
Laser alignment aid (optional for transmitter-receiver systems)	●	●		


*) MLD 312 with external test selectable
 **) selectable




Special features

- Version available as 3-beam transceiver
- Integrated muting function, no additional muting module is necessary
- The configuration is simply performed by means of wiring, i. e. no software, PC or DIP switch are necessary
- The use at ambient temperatures as low as -30°C is possible
- Options: integrated laser alignment aid, integrated muting indicator, 7-segment display



Features



Further information	Page
● Ordering information	218
● Electrical connection	203
● Technical data	230
● Dimensional drawings	207
● Dimensional drawings: Accessories	210
● Accessories ordering information	213

MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 310, consisting of transmitter and receiver
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: Automatic restart, 2 OSSDs

MLD 310 transmitter-receiver systems				
Range: 0.5 - 50 m				
Beam distance/ number of beams	Part no.	Article	Description	Option
500 mm / 2	66001100	MLD300-T2	Transmitter	
	66033100	MLD310-R2	Receiver	
	66002100	MLD300-T2L	Transmitter	With integrated laser alignment aid
	66036100	MLD310-R2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66001200	MLD300-T3	Transmitter	
	66033200	MLD310-R3	Receiver	
	66002200	MLD300-T3L	Transmitter	With integrated laser alignment aid
	66036200	MLD310-R3L	Receiver	With reflex element for laser alignment aid
300 mm / 4	66001300	MLD300-T4	Transmitter	
	66033300	MLD310-R4	Receiver	
	66002300	MLD300-T4L	Transmitter	With integrated laser alignment aid
	66036300	MLD310-R4L	Receiver	With reflex element for laser alignment aid

Ordering information

MLD 310, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: Automatic restart, 2 OSSDs

Beam distance/ number of beams	MLD 310			
	Range: 20 - 70 m			
	Part no.	Article	Description	Option
500 mm / 2	66001500	MLD300-XT2	Transmitter	
	66033500	MLD310-XR2	Receiver	
	66002500	MLD300-XT2L	Transmitter	With integrated laser alignment aid
	66036500	MLD310-XR2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66001600	MLD300-XT3	Transmitter	
	66033600	MLD310-XR3	Receiver	
	66002600	MLD300-XT3L	Transmitter	With integrated laser alignment aid
	66036600	MLD310-XR3L	Receiver	With reflex element for laser alignment aid
300 mm / 4	66001700	MLD300-XT4	Transmitter	
	66033700	MLD310-XR4	Receiver	
	66002700	MLD300-XT4L	Transmitter	With integrated laser alignment aid
	66036700	MLD310-XR4L	Receiver	With reflex element for laser alignment aid

Beam distance/ number of beams	MLD 310 transceiver systems			
	Range: 0.5 - 8 m			
	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66037100	MLD310-RT2	Transceiver	
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66037200	MLD310-RT3	Transceiver	

Beam distance/ number of beams	MLD 310 transceiver systems			
	Range: 0.5 - 6 m			
	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66037200	MLD310-RT3	Transceiver	

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MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 312, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF files on CD-ROM)

Functions: Automatic restart, 1 OSSD, 1 test input

Beam distance/ number of beams	MLD 312			
	Range: 0.5 - 50 m			
	Part no.	Article	Description	Option
500 mm / 2	66001100	MLD300-T2	Transmitter	
	66043100	MLD312-R2	Receiver	
	66002100	MLD300-T2L	Transmitter	With integrated laser alignment aid
	66046100	MLD312-R2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66001200	MLD300-T3	Transmitter	
	66043200	MLD312-R3	Receiver	
	66002200	MLD300-T3L	Transmitter	With integrated laser alignment aid
	66046200	MLD312-R3L	Receiver	With reflex element for laser alignment aid
300 mm / 4	66001300	MLD300-T4	Transmitter	
	66043300	MLD312-R4	Receiver	
	66002300	MLD300-T4L	Transmitter	With integrated laser alignment aid
	66046300	MLD312-R4L	Receiver	With reflex element for laser alignment aid

Ordering information

MLD 312, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF files on CD-ROM)

Functions: Automatic restart, 1 OSSD, 1 test input

Beam distance/ number of beams	MLD 312			
	Range: 20 - 70 m			
	Part no.	Article	Description	Option
500 mm / 2	66001500	MLD300-XT2	Transmitter	
	66043500	MLD312-XR2	Receiver	
	66002500	MLD300-XT2L	Transmitter	With integrated laser alignment aid
	66046500	MLD312-XR2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66001600	MLD300-XT3	Transmitter	
	66043600	MLD312-XR3	Receiver	
	66002600	MLD300-XT3L	Transmitter	With integrated laser alignment aid
	66046600	MLD312-XR3L	Receiver	With reflex element for laser alignment aid
300 mm / 4	66001700	MLD300-XT4	Transmitter	
	66043700	MLD312-XR4	Receiver	
	66002700	MLD300-XT4L	Transmitter	With integrated laser alignment aid
	66046700	MLD312-XR4L	Receiver	With reflex element for laser alignment aid

Beam distance/ number of beams	MLD 312 transceiver systems			
	Range: 0.5 - 8 m			
	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66047100	MLD312-RT2	Transceiver	
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66047200	MLD312-RT3	Transceiver	

Beam distance/ number of beams	MLD 312 transceiver systems			
	Range: 0.5 - 6 m			
	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66047200	MLD312-RT3	Transceiver	

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MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 320, consisting of transmitter and receiver
 Included in delivery: 4 sliding blocks, 1 connecting and operating
 instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock selectable,
 contactor monitoring selectable

Beam distance/ number of beams	MLD 320			
	Range: 0.5 - 50 m			
	Part no.	Article	Description	Option
500 mm / 2	66001100	MLD300-T2	Transmitter	
	66053100	MLD320-R2	Receiver	
	66054100	MLD320-R2M	Receiver	With integrated status indicator
	66002100	MLD300-T2L	Transmitter	With integrated laser alignment aid
	66056100	MLD320-R2L	Receiver	With reflex element for laser alignment aid
	66055100	MLD320-R2LM	Receiver	With reflex element for laser alignment aid and integrated status indicator
400 mm / 3	66001200	MLD300-T3	Transmitter	
	66053200	MLD320-R3	Receiver	
	66054200	MLD320-R3M	Receiver	With integrated status indicator
	66002200	MLD300-T3L	Transmitter	With integrated laser alignment aid
	66056200	MLD320-R3L	Receiver	With reflex element for laser alignment aid
	66055200	MLD320-R3LM	Receiver	With reflex element for laser alignment aid and integrated status indicator
300 mm / 4	66001300	MLD300-T4	Transmitter	
	66053300	MLD320-R4	Receiver	
	66054300	MLD320-R4M	Receiver	With integrated status indicator
	66002300	MLD300-T4L	Transmitter	With integrated laser alignment aid
	66056300	MLD320-R4L	Receiver	With reflex element for laser alignment aid
	66055300	MLD320-R4LM	Receiver	With reflex element for laser alignment aid and integrated status indicator

Ordering information

MLD 320, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock selectable, contactor monitoring selectable

Beam distance/ number of beams	MLD 320			
	Range: 20 - 70 m			
	Part no.	Article	Description	Option
500 mm / 2	66001500	MLD300-XT2	Transmitter	
	66053500	MLD320-XR2	Receiver	
	66054500	MLD320-XR2M	Receiver	With integrated status indicator
	66002500	MLD300-XT2L	Transmitter	With integrated laser alignment aid
	66056500	MLD320-XR2L	Receiver	With reflex element for laser alignment aid
	66055500	MLD320-XR2LM	Receiver	With reflex element for laser alignment aid and integrated status indicator
400 mm / 3	66001600	MLD300-XT3	Transmitter	
	66053600	MLD320-XR3	Receiver	
	66054600	MLD320-XR3M	Receiver	With integrated status indicator
	66002600	MLD300-XT3L	Transmitter	With integrated laser alignment aid
	66056600	MLD320-XR3L	Receiver	With reflex element for laser alignment aid
	66055600	MLD320-XR3LM	Receiver	With reflex element for laser alignment aid and integrated status indicator
300 mm / 4	66001700	MLD300-XT4	Transmitter	
	66053700	MLD320-XR4	Receiver	
	66054700	MLD320-XR4M	Receiver	With integrated status indicator
	66002700	MLD300-XT4L	Transmitter	With integrated laser alignment aid
	66056700	MLD320-XR4L	Receiver	With reflex element for laser alignment aid
	66055700	MLD320-XR4LM	Receiver	With reflex element for laser alignment aid and integrated status indicator

Beam distance/ number of beams	MLD 320 transceiver systems			
	Range: 0.5 - 8 m			
	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66057100	MLD320-RT2	Transceiver	
	66058100	MLD320-RT2M	Transceiver	With integrated status indicator
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66057200	MLD320-RT3	Transceiver	
	66058200	MLD320-RT3M	Transceiver	With integrated status indicator

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Machine Safety
 Machine Safety Services
 Safety Engineering Software
 Safety Laser Scanners
 Safety Light Curtains
 Multiple Light Beam Safety Devices
 Light Beam Safety Device Sets
 Single Light Beam Safety Devices
 AS-Interface Safety at Work
 Safety Proximity Sensors

MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 320, consisting of transmitter and receiver or transceiver and Deflecting Mirror
Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock selectable, contactor monitoring selectable

Beam distance/ number of beams	MLD 320 transceiver systems			
	Range: 0.5 - 6 m			
	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66057200	MLD320-RT3	Transceiver	
	66058200	MLD320-RT3M	Transceiver	With integrated status indicator

Ordering information

MLD 330, consisting of transmitter and receiver
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, muting-time-out extension, alternative connection for second muting signal, partial muting

Beam distance/ number of beams	MLD 330			
	Range: 0.5 - 50 m			
	Part no.	Article	Description	Option
500 mm / 2	66001100	MLD300-T2	Transmitter	
	66063100	MLD330-R2	Receiver	
	66064100	MLD330-R2M	Receiver	With integrated status and muting indicator
	66002100	MLD300-T2L	Transmitter	With integrated laser alignment aid
	66066100	MLD330-R2L	Receiver	With reflex element for laser alignment aid
	66065100	MLD330-R2LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator
400 mm / 3	66001200	MLD300-T3	Transmitter	
	66063200	MLD330-R3	Receiver	
	66064200	MLD330-R3M	Receiver	With integrated status and muting indicator
	66002200	MLD300-T3L	Transmitter	With integrated laser alignment aid
	66066200	MLD330-R3L	Receiver	With reflex element for laser alignment aid
	66065200	MLD330-R3LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator
300 mm / 4	66001300	MLD300-T4	Transmitter	
	66063300	MLD330-R4	Receiver	
	66064300	MLD330-R4M	Receiver	With integrated status and muting indicator
	66002300	MLD300-T4L	Transmitter	With integrated laser alignment aid
	66066300	MLD330-R4L	Receiver	With reflex element for laser alignment aid
	66065300	MLD330-R4LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator

MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 330, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, muting-time-out extension, alternative connection for second muting signal, partial muting

Beam distance/ number of beams	MLD 330			
	Range: 20 - 70 m			
	Part no.	Article	Description	Option
500 mm / 2	66001500	MLD300-XT2	Transmitter	
	66063500	MLD330-XR2	Receiver	
	66002500	MLD300-XT2L	Transmitter	With integrated laser alignment aid
	66066500	MLD330-XR2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66001600	MLD300-XT3	Transmitter	
	66063600	MLD330-XR3	Receiver	
	66002600	MLD300-XT3L	Transmitter	With integrated laser alignment aid
	66066600	MLD330-XR3L	Receiver	With reflex element for laser alignment aid
300 mm / 4	66001700	MLD300-XT4	Transmitter	
	66063700	MLD330-XR4	Receiver	
	66002700	MLD300-XT4L	Transmitter	With integrated laser alignment aid
	66066700	MLD330-XR4L	Receiver	With reflex element for laser alignment aid

Beam distance/ number of beams	MLD 330 transceiver systems			
	Range: 0.5 - 8 m			
	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66067100	MLD330-RT2	Transceiver	
	66068100	MLD330-RT2M	Transceiver	With integrated status and muting indicator
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66067200	MLD330-RT3	Transceiver	
	66068200	MLD330-RT3M	Transceiver	With integrated status and muting indicator

Beam distance/ number of beams	MLD 330 transceiver systems			
	Range: 0.5 - 6 m			
	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66067200	MLD330-RT3	Transceiver	
	66068200	MLD330-RT3M	Transceiver	With integrated status and muting indicator

Ordering information

MLD 335, consisting of transmitter and receiver or transceiver and Deflecting Mirror
 Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, timing controlled 4-sensor muting, muting-timeout extension, alternative connection for second muting signal, muting enable function, partial muting

Beam distance/ number of beams	MLD 335			
	Range: 0.5 - 50 m			
	Part no.	Article	Description	Option
500 mm / 2	66001100	MLD300-T2	Transmitter	
	66073100	MLD335-R2	Receiver	
	66074100	MLD335-R2M	Receiver	With integrated status and muting indicator
	66002100	MLD300-T2L	Transmitter	With integrated laser alignment aid
	66076100	MLD335-R2L	Receiver	With reflex element for laser alignment aid
	66075100	MLD335-R2LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator
400 mm / 3	66001200	MLD300-T3	Transmitter	
	66073200	MLD335-R3	Receiver	
	66074200	MLD335-R3M	Receiver	With integrated status and muting indicator
	66002200	MLD300-T3L	Transmitter	With integrated laser alignment aid
	66076200	MLD335-R3L	Receiver	With reflex element for laser alignment aid
	66075200	MLD335-R3LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator
300 mm / 4	66001300	MLD300-T4	Transmitter	
	66073300	MLD335-R4	Receiver	
	66074300	MLD335-R4M	Receiver	With integrated status and muting indicator
	66002300	MLD300-T4L	Transmitter	With integrated laser alignment aid
	66076300	MLD335-R4L	Receiver	With reflex element for laser alignment aid
	66075300	MLD335-R4LM	Receiver	With reflex element for laser alignment aid and integrated status and muting indicator

MULTIPLE LIGHT BEAM SAFETY DEVICES

Ordering information

MLD 335, consisting of transmitter and receiver or transceiver and Deflecting Mirror
Included in delivery: 4 sliding blocks, 1 set of connecting and operating instructions (PDF file on CD-ROM)

Functions: 2 OSSDs, start/restart interlock, contactor monitoring selectable, timing controlled 2-sensor muting, sequence controlled 2-sensor muting, timing controlled 4-sensor muting, muting-timeout extension, alternative connection for second muting signal, muting enable function, partial muting

MLD 335				
Range: 20 - 70 m				
Beam distance/ number of beams	Part no.	Article	Description	Option
500 mm / 2	66001500	MLD300-XT2	Transmitter	
	66073500	MLD335-XR2	Receiver	
	66002500	MLD300-XT2L	Transmitter	With integrated laser alignment aid
	66076500	MLD335-XR2L	Receiver	With reflex element for laser alignment aid
400 mm / 3	66001600	MLD300-XT3	Transmitter	
	66073600	MLD335-XR3	Receiver	
	66002600	MLD300-XT3L	Transmitter	With reflex element for laser alignment aid
	66076600	MLD335-XR3L	Receiver	With integrated laser alignment aid
300 mm / 4	66001700	MLD300-XT4	Transmitter	
	66073700	MLD335-XR4	Receiver	
	66002700	MLD300-XT4L	Transmitter	With integrated laser alignment aid
	66076700	MLD335-XR4L	Receiver	With reflex element for laser alignment aid

MLD 335 transceiver systems				
Range: 0.5 - 8 m				
Beam distance/ number of beams	Part no.	Article	Description	Option
500 mm / 2	66500100	MLD-M002	Deflecting Mirror	
	66077100	MLD335-RT2	Transceiver	
	66078100	MLD335-RT2M	Transceiver	With integrated status and muting indicator
400 mm / 3	66500201	MLD-XM03	Deflecting Mirror	
	66077200	MLD335-RT3	Transceiver	
	66078200	MLD335-RT3M	Transceiver	With integrated status and muting indicator

MLD 335 transceiver systems				
Range: 0.5 - 6 m				
Beam distance/ number of beams	Part no.	Article	Description	Option
400 mm / 3	66500200	MLD-M003	Deflecting Mirror	
	66077200	MLD335-RT3	Transceiver	
	66078200	MLD335-RT3M	Transceiver	With integrated status and muting indicator

Article list for MLD 500, MLD 300

Article	Description
MLD	Multiple Light Beam Safety Device
X	Series
3	MLD 300
5	MLD 500
yy	Function variant
00	Transmitter
10	Automatic restart
12	External testing
20	Start/restart interlock selectable, contactor monitoring selectable
30	2-sensor muting (timing controlled, sequence controlled)
35	Timing controlled 4-sensor muting
z	Device type
T	Transmitter
R	Receiver
RT	Transceiver
xT	Transmitter for high range
xR	Receiver for high range
a	Number of beams
2	2-beam
3	3-beam
4	4-beam
b	Option
L	Integrated laser alignment aid
M	Integrated indicator

Electrical connection

Connection examples see page 203, and 204

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MULTIPLE LIGHT BEAM SAFETY DEVICES

Technical data

General system data			
Type in accordance with EN/IEC 61496	2		
SIL in accordance with IEC 61508 and SILCL in accordance with EN/IEC 62061	2		
Performance Level (PL) in accordance with EN ISO 13849-1	d		
Category in accordance with EN ISO 13849	3		
Number of beams	2	3	4
Beam distance	500 mm	400 mm	300 mm
Average probability of a failure to danger per hour (PFH _d)	1.2 x 10 ⁻⁸		
Mean time to dangerous failure (MTTF _d)	146 years		
Service life (T _M) in accordance with EN ISO 13849-1	20 years		
Range (transmitter-receiver systems, type-dependent)	MLDxyy-R /-T: 0.5...50 m MLDxyy-xR /-xT: 20...70 m		
Range (transceiver systems)	0.5 - 8 m		
Response time	25 ms for MLD 310, MLD 312, MLD 320. 50 ms for MLD 330		
Supply voltage	+24 V, ±20%		
Connection cable length	100 m		
Safety class	III		
Protection rating	IP 67		
Ambient temperature, operation	-30...+55 °C		
Ambient temperature, storage	-40...+75 °C		
Relative humidity	0...95%		
Profile cross-section	52 mm x 65 mm		
Weight	Type-dependent		
Transmitter			
Transmitter diodes, class in accordance with EN 60825	1		
Wavelength	850 nm		
Current consumption	50 mA		
Connection system	M12 plug, 5-pin		
Receiver			
Current consumption	150 mA without external load, muting sensors and muting indicator		
Safety-related switching outputs (OSSDs)	2 pnp transistor outputs		
Switching voltage high active	Min. 18.2 V		
Switching voltage low	Max. 2.5 V		
Switching current	Typical, 300 mA		
Connection system	M12 plug, 5-pin, 8-pin		

MLD 500
p. 188

MLD 300
p. 216

Technical data

Transceiver	
Current consumption	150 mA without external load, muting sensors and muting indicator
Safety-related switching outputs (OSSDs)	2 pnp transistor outputs
Switching voltage high active	Min. 18.2 V
Switching voltage low	Max. 2.5 V
Switching current	Typical, 300 mA
Connection system	M12 plug, 5-pin

Additional information can be found in the MLD Connecting and Operating Instructions at www.leuze.com/en/mld.

Dimensional drawings

Dimensional drawings, see page 207.

Dimensional drawings: Accessories

Dimensional drawings of accessories, see page 210.

Accessories ordering information

Accessories ordering information, see page 213.

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MOTORES ASÍNCRONOS TRIFÁSICOS
CLASE DE EFICIENCIA SEGÚN IEC 60034-30

1ª EDICIÓN

Series **IE1/IE2-MS - IE1/IE2-EG**

IE1 "Eficiencia estándar"
IE2 "Alta eficiencia"



MOTORES ASÍNCRONOS TRIFÁSICOS Y MONOFÁSICOS

ÍNDICE

Introducción.

Normas y especificaciones	3
Tolerancias mecánicas y eléctricas	4

Información General.

Características principales.	5
Placa de características.....	6
Esquema de conexiones.....	6

Características Mecánicas.

Formas constructivas	7
Rodamientos y Retenes. Motores serie MS y MY	8
Rodamientos y Retenes. Motores serie EG.....	9

Características Eléctricas.

Condiciones nominales de servicio	10
Sistemas de protección	11
Motores trifásicos para uso con convertidor de frecuencia.....	11

Datos Eléctricos

Motores trifásicos IE1-MS/EG de 1 velocidad, 3000 rpm.....	12
Motores trifásicos IE1-MS/EG de 1 velocidad, 1500 rpm.....	13
Motores trifásicos IE1-MS/EG de 1 velocidad, 1000 rpm.....	14
Motores trifásicos IE1-MS/EG de 1 velocidad, 750 rpm	15
Motores monofásicos MY de 1 velocidad, 3000 rpm, 1500 rpm y 1000 rpm	16
Motores trifásicos IE2-MS/EG de 1 velocidad, 3000 rpm.....	17
Motores trifásicos IE2-MS/EG de 1 velocidad, 1500 rpm.....	18
Motores trifásicos IE2-MS/EG de 1 velocidad, 1000 rpm.....	19

Dimensiones.

Motores trifásicos IE1-MS	20
Motores trifásicos IE2-MS	21
Motores trifásicos IE1/IE2-EG	22
Motores monofásicos MY	23

Piezas de Repuesto.

Piezas de repuesto series MS.....	24
Piezas de repuesto serie EG	25

Garantía.

Garantía, Devoluciones y Reclamaciones	26
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INTRODUCCIÓN



NORMAS Y ESPECIFICACIONES

Los motores CEMER cumplen con las normas europeas e internacionales más relevantes y en particular con las siguientes:

NORMA TÍTULO	REFERENCIA	
	EN Europa	IEC Internacional
Máquinas eléctricas rotativas. Parte 1: Características asignadas y características de funcionamiento.	EN 60034-1	IEC 60034-1
Máquinas eléctricas rotativas. Parte 2-1: Métodos normalizados para la determinación de las pérdidas y del rendimiento a partir de ensayos.	EN 60034-2-1	IEC 60034-2-1
Máquinas eléctricas rotativas. Parte 5: Grados de protección proporcionados por el diseño integral de las máquinas eléctricas rotativas (código IP). Clasificación.	EN 60034-5	IEC 60034-5
Máquinas eléctricas rotativas. Parte 6: Métodos de refrigeración (Código IC).	EN 60034-6	IEC 60034-6
Máquinas eléctricas rotativas. Parte 7: Clasificación de los tipos de construcción, de las disposiciones de montaje y posición de la caja de bornes (código IM).	EN 60034-7	IEC 60034-7
Máquinas eléctricas rotativas. Parte 8: Marcas de los bornes y sentido de giro.	EN 60034-8	IEC 60034-8
Máquinas eléctricas rotativas. Parte 9: Límites de ruido.	EN 60034-9	IEC 60034-9
Máquinas eléctricas rotativas. Parte 11: Protección térmica.	-	IEC 60034-11
Máquinas eléctricas rotativas. Parte 12: Características de arranque de los motores trifásicos de inducción de jaula con una sola velocidad para tensiones de alimentación inferiores o iguales a 660 V, 50 Hz.	EN 60034-12	IEC 60034-12
Máquinas eléctricas rotativas. Parte 14: Vibraciones mecánicas de determinadas máquinas con altura de eje igual o superior a 56 mm. Medición, evaluación y límites de la intensidad de vibración.	EN 60034-14	IEC 60034-14
Máquinas eléctricas rotativas. Parte 30: Clases de rendimiento para los motores trifásicos de inducción de jaula de velocidad única (código IE).	-	IEC 60034-30
Evaluación y clasificación térmica del aislamiento eléctrico.	-	IEC 60085
Tensiones de alimentación normalizadas IEC.	-	IEC 60038
Motores trifásicos de inducción de aplicación general con dimensiones y potencias normalizadas. Designación de carcasas de 56 a 315.	EN 50347	IEC 60072

INTRODUCCIÓN



TOLERANCIAS MECÁNICAS

Símbolo	Descripción cota	Tolerancia
A	Entre centros de taladros de patas en dirección axial	± 1 mm
AB, AC	Anchura máxima del motor (sin caja de bornes)	+ 2 %
B	Entre centros de taladros de patas en dirección transversal	± 1 mm
C	Centro del primer agujero de pata a resalte de eje	± 3 mm
D	Diámetro exterior de eje	k6 hasta 48 mm m6 desde 55 mm
E	Diámetro del eje < de 55 mm Diámetro del eje > de 60 mm	- 0,3 mm + 0,5 mm
F	Anchura de la chaveta	h9
GA	Plano inferior de eje a plano superior de chaveta	+ 0,2 mm
H	Altura de centro de eje a base de patas	- 0,5 \leq 250 mm - 1 \geq 280 mm
HD	Altura total (del punto más bajo al más alto)	+ 2 %
K, S	Diámetro de los agujeros de fijación, patas o brida.	+ 3 %
L	Longitud total del motor	+ 1 %
M	Entre centros de taladros de fijación brida	$\pm 0,8$ mm
N	Diámetro del resalte de brida	j6 hasta 230 mm h6 desde 250 mm
P	Diámetro exterior de brida	± 1 mm
	Resalte de eje a plano de brida, con rodamiento bloqueado.	$\pm 0,5$ mm
	Resalte de eje a plano de brida.	± 3 mm
m	Peso del motor	De - 5 a + 10 %

TOLERANCIAS ELÉCTRICAS

Parámetros eléctricos. Conforme con la norma EN 60034-1:

Rendimiento (η) (Determinación indirecta)	- 0,15 (1- η) para $P_N \leq 150$ kW - 0,1 (1- η) para $P_N > 150$ kW
Factor de potencia ($\cos \varphi$)	$\frac{1-\cos \varphi}{6}$ mínimo 0,02 máximo 0,07
Deslizamiento (rpm) (A temperatura y carga nominales)	$\pm 20\%$ para $P_N \geq 1$ kW $\pm 30\%$ para $P_N < 1$ kW
Intensidad de arranque (I_A)	+ 20% (sin límite inferior)
Par de arranque (M_A)	-15% y +25%
Par nominal (M_k) (máximo)	-10% (con este valor M_k / M_n deberá ser como mínimo de 1,6)
Par mínimo (M_s)	-15%
Momento de inercia (J)	$\pm 10\%$
Nivel sonoro (presión sonora)	+3 dB (A)

INFORMACIÓN GENERAL



CARACTERÍSTICAS PRINCIPALES

Los motores CEMER asíncronos trifásicos y monofásicos presentan las siguientes características, diseño según IEC 60034, IEC 60038, IEC 60072; tamaños 56 a 355; potencias 0,06 a 315 kW para un servicio continuo (S1) a una tensión y frecuencia nominal. Así como para una temperatura ambiente máxima de 40 °C y una altitud máxima de 1000 m. De una sola velocidad 2, 4, 6 y 8 polos a 230/400 V o 400/690 V, 50 Hz y 230 V 50 Hz. Aislamiento clase F y temperatura de calentamiento clase B. Protección IP 55 asegurando una estanquidad contra el polvo y los chorros de agua desde cualquier dirección.

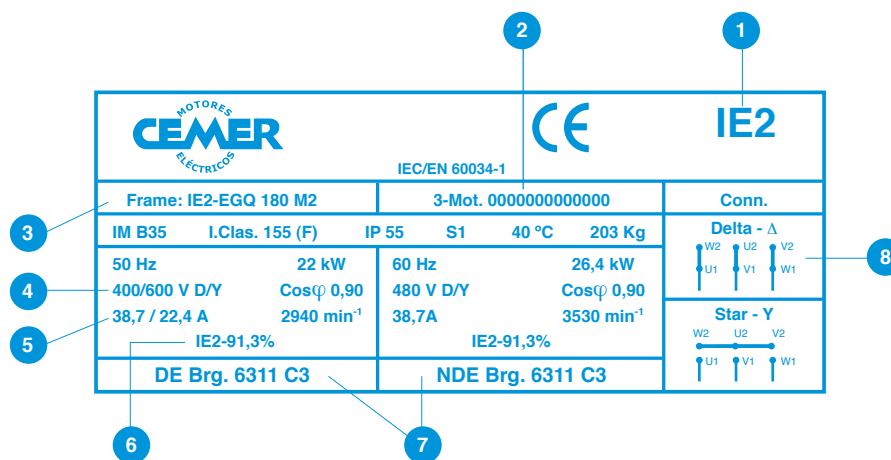
Pieza	Material	Serie MS / MY	Serie EG
Carcasa	Aluminio (series MS/MY) Fundición (serie EG)	Aluminio fundido a presión Patas desmontables Cáncamo de elevación carcasa \geq 100 Toma tierra	Fundición de acero Cáncamo de elevación Toma tierra
Escudos y bridas	Aluminio (series MS/MY) Fundición (serie EG)	Aluminio fundido a presión Injerto de acero en el alojamiento del rodamiento	Fundición de hierro Engrasador de lubricación
Estator	Chapa magnética laminada en frío Cobre electrolítico	Fabricado con doble impregnación al vacío y a presión con resinas sintéticas (VIP)	Fabricado con doble impregnación al vacío y a presión con resinas sintéticas (VIP) Sondas PTC
Caja de bornes	Aluminio (series MS/MY) Fundición (serie EG)	Orientable 90° en las cuatro posiciones Equipada con prensa estopas Toma tierra en el interior	Orientable 90° en las cuatro posiciones Equipada con prensa estopas Toma tierra en el interior
Rotor	Chapa magnética laminada en frío Aluminio	Equilibrado dinámico con media chaveta Montaje en caliente sobre el eje	Equilibrado dinámico con media chaveta Montaje en caliente sobre el eje y con chaveta de arrastre
Eje	Acero	Agujero frontal roscado Chaveta con extremos redondeados	Agujero frontal roscado Chaveta con extremos redondeados
Rodamientos		Rodamientos de bolas con doble obturación y lubricados de por vida Precarga lado eje	Rodamientos de bolas abiertos, con lubricación exterior Precarga lado eje
Retenes	Caucho sintético	Retenes en ambos lados para todos los tamaños	Retenes en ambos lados para todos los tamaños
Ventilador	Termoplástico o aluminio (opcional)	Alabes radiales bidireccionales	Alabes radiales bidireccionales
Tapa ventilador	Chapa de acero	Posición V1 (B5 vertical con el eje hacia abajo) con sombrerete (opcional)	Posición V1 (B5 vertical con el eje hacia abajo) con sombrerete (opcional)
Pintura		Color azul, RAL 5010 (serie MS) Color negro, RAL 9005 (serie MY)	Color azul, RAL 5010

INFORMACIÓN GENERAL



PLACA DE CARACTERÍSTICAS

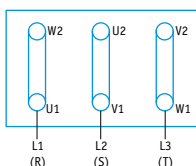
Cada motor está identificado con una placa de características donde están los datos que requiere la norma IEC 60034-30:2008. La placa es de aluminio o de acero según la serie y está colocada en la parte lateral o superior de la carcasa del motor.



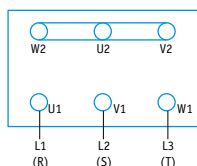
- 1 Logo clase de eficiencia (IE1 o IE2)
- 2 Número de serie
- 3 Tipo (IE2-EGQ 180M 2): clase de eficiencia (IE2), serie (EGQ), tamaño (180M) y polos (2)
- 4 Tensión nominal a 50 Hz
- 5 Intensidad nominal a 50 Hz
- 6 Clase de eficiencia IE y eficiencia nominal al 100 % de la carga a 50 Hz
- 7 Tipo de rodamientos
- 8 Diagrama de conexiones (para motores carcasa ≥ 160)

ESQUEMA DE CONEXIONES

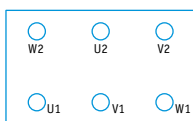
Motor trifásico de 1 velocidad



Tensión baja (Δ)



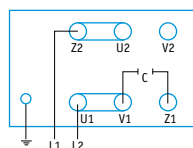
Tensión alta (Y)



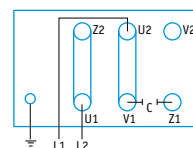
En caso de conmutador estrella-triángulo sin puentes, conexión según esquema del conmutador.

Arrancador (Y - Δ)

Motor monofásico



Sentido horario



Sentido anti-horario

CARACTERÍSTICAS MECÁNICAS



FORMAS CONSTRUCTIVAS

Los motores CEMER del tamaño 56 al 355 se pueden suministrar en las formas constructivas de la siguiente tabla. Las formas constructivas básicas están denominadas de acuerdo a la norma EN 60034-7. Los motores en forma constructiva IM B3, IM B5 o IM B14 también se pueden utilizar en otras posiciones de montaje.

IM B3 en IM V5, IM V6, IM B6, IM B7, IM B8.

IM B35 en IM V15, IM V36, IM 2051, IM 2061, IM 2071.

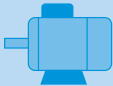

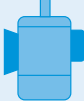
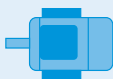


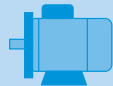




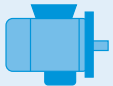
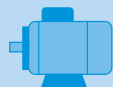


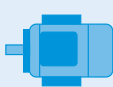
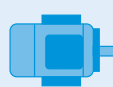
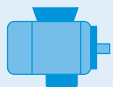



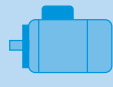
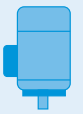

IM B34 en IM 2111, IM 2131, IM 2151, IM 2161, IM 2171.

IM B5 en IM V1 y IM V3. (Brida con agujeros pasantes).

IM B14 en IM V18 y IM V19. (Brida con agujeros roscados).

Para los tamaños 160 al 355 es necesario consultar previamente para cualquier forma constructiva y en especial para las formas IM V5, IM V6, IM B6, IM B7 y IM B8.

Las formas IM B5 y IM V3 no se pueden utilizar para los tamaños 315 y 355; para el tamaño 280 se debe consultar.

Formas constructivas básicas		Otras formas constructivas			
IM B3 IM 1001 	IM V5 IM 1011 	IM V6 IM 1031 	IM B6 IM 1051 	IM B7 IM 1061 	IM B8 IM 1071 
IM B35 IM 2001 	IM V15 IM 2011 	IM V36 IM 2031 	IM 2051 	IM 2061 	IM 2071 
IM B34 IM 2101 	IM 2111 	IM 2131 	IM 2151 	IM 2161 	IM 2171 
IM B5 IM 3001 	IM V1 IM 3011 	IM V3 IM 3031 			
IM B14 IM 3601 	IM V18 IM 3611 	IM V19 IM 3631 			

CARACTERÍSTICAS MECÁNICAS



Motores serie MS / MY

RODAMIENTOS

Los motores de las series **MS/MY** llevan rodamientos rígidos de bolas con obturaciones de caucho en ambos lados, están lubricados de por vida y no necesitan mantenimiento.

Motor		Rodamiento	
Tamaño	Polos	Delantero	Trasero
56	2-4-6-8	6201 2RS C3	6201 2RS C3
63	2-4-6-8	6201 2RS C3	6201 2RS C3
71	2-4-6-8	6202 2RS C3	6202 2RS C3
80	2-4-6-8	6204 2RS C3	6204 2RS C3
90	2-4-6-8	6205 2RS C3	6205 2RS C3 (6204 2RS C3*)
100	2-4-6-8	6206 2RS C3	6206 2RS C3
112	2-4-6-8	6306 2RS C3	6306 2RS C3
132	2-4-6-8	6308 2RS C3	6308 2RS C3
160	2-4-6-8	6309 2RS C3	6309 2RS C3

* Entre paréntesis figura el rodamiento para los motores trifásicos serie IE1-MSL.

RETENES

La serie MS/MY utiliza retenes con muelle y doble labio para reforzar su eficiencia en la obturación del motor.

Motor		Retén	
Tamaño	Polos	Delantero	Trasero
56	2-4-6-8	12x22x5	12x22x5
63	2-4-6-8	12x24x5	12x24x5
71	2-4-6-8	15x25x7	15x25x7
80	2-4-6-8	20x34x7	20x34x7
90	2-4-6-8	25x37x7	25x37x7 (20x34x7*)
100	2-4-6-8	30x44x7	30x44x7
112	2-4-6-8	30x44x7	30x44x7
132	2-4-6-8	40x58x7	40x58x7
160	2-4-6-8	45x65x8	45x65x8

* Entre paréntesis figura el retén para los motores trifásicos serie IE1-MSL.

Nota: Las dimensiones de los rodamientos y los retenes no son vinculantes a las series, para más información consultar.

CARACTERÍSTICAS MECÁNICAS



Motores serie EG

RODAMIENTOS

Los rodamientos son rígidos de una hilera de bolas y están abiertos. Se deben engrasar con una grasa de base lítica adecuada para rodamientos. Los motores de fundición de la serie EG llevan un dispositivo de lubricación exterior.

Motor		Rodamiento		
Tamaño	Polos	Delantero	Trasero	Engrase horas/cm ³ .
160	2-4-6-8	6309 C3	6309 C3	2000 - 4000 / 20-20
180	2-4-6-8	6311 C3	6311 C3	2000 - 4000 / 23-23
200	2-4-6-8	6312 C3	6312 C3	2000 - 4000 / 31-31
225	2	6312 C3	6312 C3	2000 / 31-31
	4-6-8	6313 C3	6312 C3	4000 / 35-31
250	2	6313 C3	6313 C3	2000 / 35-35
	4-6-8	6314 C3	6313 C3	4000 / 41-35
280	2	6314 C3	6314 C3	2000 / 41-41
	4-6-8	6317 C3	6314 C3	4000 / 57-41
315	2	6317 C3	6317 C3	2000 / 57-57
	2	6317 C3	7317 ⁽¹⁾	2000 / 57-57
	4-6-8	6319 C3	6319 C3	4000 / 64-64
	4-6-8	6319 C3	7319 ⁽¹⁾	4000 / 64-64
	2	6319 C3	6319 C3	2000 / 64-64
355	2	6319 C3	7319 ⁽¹⁾	2000 / 64-64
	4-6-8	NU 322	6322 C3	3000 / 78-78
	4-6-8	NU 322	7322 ⁽¹⁾	3000 / 78-78

⁽¹⁾ Tipo de rodamiento para motor en posición vertical.

TRANSMISIONES

Una correcta selección de los elementos de transmisión, es fundamental para el buen comportamiento del motor. Consulten a su proveedor de poleas, correas o acoplamientos, o a nuestro propio departamento técnico.

NOTA IMPORTANTE. Los rodamientos de rodillos cilíndricos (NU) siempre deben estar sometidos, como mínimo, a un 25% de su carga radial máxima al objeto de asegurar su correcto funcionamiento. En muchos casos, el peso del elemento soportado por el rodamiento, junto con las fuerzas externas, es mayor que la carga mínima requerida.

RETENES

La serie **EG** utiliza retenes con muelle y doble labio para reforzar su eficiencia en la obturación del motor.

Motor		Retén	
Tamaño	Polos	Delantero	Trasero
160	2-4-6-8	45x62x8	45x62x8
180	2-4-6-8	55x72x8	55x72x8
200	2-4-6-8	60x80x8	60x80x8
225	2	65x85x10	60x80x8
	4-6-8	65x90x10	60x80x8
250	2-4-6-8	70x90x10	65x85x10
280	2	70x90x10	70x90x10
	4-6-8	85x110x12	70x90x10
315	2	85x110x12	85x110x12
	4-6-8	95x120x12	95x120x12

Nota: Las dimensiones de los rodamientos y los retenes no son vinculantes a las series, para más información consultar.

CARACTERÍSTICAS ELÉCTRICAS



CONDICIONES NOMINALES DE SERVICIO

Potencia

Las potencias nominales especificadas en este catálogo, cumplen con la EN 60034-1, por lo que se entienden para temperatura ambiente de hasta 40 °C y una altura sobre el nivel del mar de ≤ 1000 m. Las sobrecargas admisibles son 10 % para la temperatura máxima a 40 °C o la potencia nominal hasta 2500 m. sobre el nivel del mar.

En ambientes con temperaturas superiores a la máxima o cuando la altura sobre el nivel del mar es superior a 1.000 m es posible operara con los motores siempre que la potencia nominal se reduzca según las tablas siguientes:

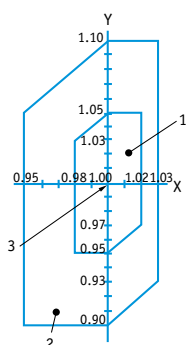
Temperatura ambiente °C	40	45	50	55	60			
Potencia %	100	97	93	87	82			
Altura en metros sobre el nivel del mar		1000	1500	2000	2500	3000	3500	4000
Potencia %		100	98	95	91	87	83	78

Tensiones y frecuencias

Los motores están diseñados para poder funcionar en las condiciones de tensión y frecuencia nominales, con las tolerancias indicadas en la figura.

Los motores pueden trabajar dentro del área de uso normal, zona A, sin disminución de la potencia nominal con variaciones de tensión de un $\pm 5\%$ del valor de diseño y una variación de la frecuencia de un $\pm 2\%$.

Además, los motores también pueden trabajar en el área de uso con restricciones, zona B, con unas variaciones de tensión de un $\pm 10\%$ y una frecuencia de un $\pm 3\%$, respetando siempre las indicaciones requeridas en la norma 60034-1.



1. Zona A, área de uso normal
2. Zona B, área de uso con restricciones.
3. Punto de diseño, características nominales.

X = Relación de frecuencia, f/f_N

$$f/f_N = \frac{\text{Frecuencia de funcionamiento}}{\text{Frecuencia nominal}}$$

Y = Relación de tensión, U/U_N

$$U/U_N = \frac{\text{Tensión de funcionamiento}}{\text{Tensión nominal}}$$

Los motores, en su versión básica, se suministran con las siguientes tensiones y frecuencias,

230/400 V	Δ/Y	50 Hz
400/690 V	Δ/Y	50 Hz
690 V	Δ	50 Hz
480 V	Δ ó Y	60 Hz

Bajo demanda, se pueden suministrar con tensiones y frecuencias especiales.

Capacidad de sobrecarga

Conforme a la norma EN 60034-1, todos los motores pueden estar sometidos a las siguientes condiciones de sobrecarga a la tensión y frecuencia nominales:

- 1,5 veces la intensidad nominal durante 2 minutos.
- 1,6 veces el par nominal durante 15 segundos ($I_A/I_N < 4,5$).

CARACTERÍSTICAS ELÉCTRICAS



SISTEMAS DE PROTECCIÓN

Bajo demanda, se pueden suministrar los motores con las siguientes protecciones,

- Sondas de temperatura PTC, termistores, insertadas en el devanado.
- Sondas de temperatura bimetalicos, normalmente cerrados NC o normalmente abiertos NO.
- Sondas de temperatura Pt100 en los rodamientos.
- Resistencias calefactoras en el devanado.

MOTORES ASÍNCRONOS PARA USO CON CONVERTIDOR DE FRECUENCIA

Todos los motores CEMER pueden estar alimentados por un convertidor de frecuencia, pero siempre teniendo en cuenta los siguientes requisitos técnicos.

Si el cliente no toma ninguna precaución en el diseño del sistema eléctrico, los motores fabricados con aislamiento estándar pueden fallar y estropearse. Los picos de voltaje sobre los terminales del motor pueden tener una amplitud muy elevada y de larga duración. Dependiendo del tipo, longitud y configuración del cableado al motor, puede pasar que los impulsos aumenten hasta dos veces el voltaje de enlace del convertidor.

Si el voltaje de enlace del convertidor no excede de 600V, los motores CEMER pueden operar con un convertidor con un voltaje de salida hasta 420V sin ningún tipo de filtro posterior. Se recomienda pedir los motores preferiblemente en conexión estrella (Y).

A partir de la carcasa 280, COSGRA recomienda utilizar un rodamiento aislado en el lado B (lado ventilador) para evitar que las corrientes los puedan afectar.

Consejos para el funcionamiento de los motores con convertidor.

Los motores son solo una parte compleja de un sistema de accionamiento eléctrico. Hoy en día, el convertidor se autoprotege y también al motor, contra sobrecargas térmicas. Pero, no son conscientes del exceso de picos de voltaje en los terminales del motor. Por el sistema de accionamiento, los problemas pueden aumentar con la ausencia de filtros a la salida del convertidor, y/o a un exceso de longitud del cableado. Esto causa a menudo, serios daños en el aislamiento del motor.

Hay varias opciones para optimizar el sistema de accionamiento eléctrico:

- Circuitos de filtros a la salida del convertidor (obtención, du/dt , sinus).
- Motor con sistema de aislamiento reforzado.
- Combinación de los dos anteriores.

El responsable del estudio debe seleccionar cuidadosamente los diferentes componentes del sistema. Es de su responsabilidad que el voltaje en los terminales del motor no se exceda de lo permitido. Esto incluye también la selección del sistema de aislamiento del motor, siempre teniendo en cuenta los efectos de los otros componentes del conjunto.

Disponemos de un departamento técnico especializado en este tipo de aplicaciones que puede asesorarles para una correcta selección del motor en función de cada aplicación.

DATOS ELÉCTRICOS

Motores asíncronos trifásicos, rotor jaula de ardilla.

Ventilación exterior IC 41 1, servicio continuo S1.

Aislamiento clase 155 (F), grado de protección IP 55.

Motores de aluminio serie **IE1-MS**

Motores de fundición serie **IE1-EG**

Velocidad síncrona 3000 rpm - 2 polos

400 V, 50 Hz

TIPO	Potencia		M _N N.m	n rpm	Eficiencia clase IE1 EN 60034-2-1 100%	I _N 400 V A	I _A /I _N	Cosφ	M _A /M _N	M _K /M _N	J Kgm ²	Nivel sonoro dB(A)	m Kg
	kW	CV											
MS 56 1-2	0,09	0,12	0,32	2710	53	0,36	4	0,72	2,2	2,3	0,00006	58	2,6
MS 56 2-2	0,12	0,17	0,42	2700	61	0,4	4	0,72	2,2	2,3	0,00008	58	3,0
• MS 56 3-2	0,18	0,25	0,63	2710	63	0,55	6	0,75	2,2	2,4	0,00010	61	4,0
MS 63 1-2	0,18	0,25	0,63	2710	63	0,55	6	0,75	2,2	2,4	0,00013	61	4,0
MS 63 2-2	0,25	0,33	0,88	2710	65	0,71	6	0,78	2,2	2,4	0,00015	61	4,2
• MS 63 3-2	0,37	0,5	1,30	2710	65	1,05	6	0,78	2,2	2,4	0,00017	62	4,7
MS 71 1-2	0,37	0,5	1,29	2730	70	0,97	6	0,79	2,2	2,4	0,00021	64	5,2
MS 71 2-2	0,55	0,75	1,90	2760	71	1,42	6	0,79	2,2	2,4	0,00027	64	6,0
• MS 71 3-2	0,75	1	2,62	2730	72	1,83	6	0,82	2,2	2,4	0,00033	65	7,0
IE1-MS 80 1-2	0,75	1	2,59	2770	73	1,77	6	0,84	2,2	2,4	0,00039	67	8,7
IE1-MS 80 2-2	1,1	1,5	3,79	2770	76,2	2,51	6	0,83	2,2	2,4	0,00051	67	10,0
• MS 80 3-2	1,5	2	5,12	2800	78,5	3,32	6	0,83	2,2	2,4	0,00068	70	11,2
IE1-MS 90 S-2	1,5	2	5,04	2840	78,5	3,28	6	0,84	2,2	2,4	0,00093	72	12,0
IE1-MS 90 L1-2	2,2	3	7,40	2840	81	4,61	6	0,85	2,2	2,4	0,00115	72	14,5
• MS 90 L2-2	3	4	10,09	2840	82,6	6,1	6	0,86	2,2	2,4	0,00142	74	15,0
IE1-MS 100 L1-2	3	4	10,09	2840	82,6	6,03	7	0,87	2,2	2,3	0,00211	76	20,0
• MS 100 L2-2	4	5,5	13,40	2850	84,2	7,88	7,5	0,87	2,2	2,3	0,00272	77	24,0
IE1-MS 112 M-2	4	5,5	13,26	2880	84,2	7,88	7,5	0,87	2,2	2,3	0,00317	77	26,0
• MS 112 L2-2	5,5	7,5	18,24	2880	85,7	10,5	7,5	0,88	2,2	2,3	0,00434	78	29,3
IE1-MS 132 S1-2	5,5	7,5	18,11	2900	85,7	10,5	7,5	0,88	2	2,2	0,00744	80	38,4
IE1-MS 132 S2-2	7,5	10	24,53	2920	87	14,1	7,5	0,88	2	2,2	0,00910	80	41,3
• MS 132 M1-2	9,2	12,5	29,99	2930	88	17,3	7,5	0,89	2	2,2	0,01072	81	48,2
• MS 132 M2-2	11	15	35,85	2930	88,4	20	7,5	0,90	2	2,2	0,01146	83	52,5
IE1-MS 160 M1-2	11	15	35,73	2940	88,4	20	7,5	0,90	2	2,2	0,02380	86	76,0
IE1-MS 160 M2-2	15	20	48,72	2940	89,4	26,6	7,5	0,91	2	2,2	0,03117	86	77,5
IE1-MS 160 L2-2	18,5	25	60,09	2940	90	32,6	7,5	0,91	2	2,2	0,03617	86	92,0
IE1-EG 160 M1-2	11	15	35,9	2930	88,4	21,2	7,5	0,89	2,2	2,3	0,0377	88	109
IE1-EG 160 M2-2	15	20	48,9	2930	89,4	28,6	7,5	0,89	2,2	2,3	0,0449	88	125
IE1-EG 160 L-2	18,5	25	60,3	2930	90	34,7	7,5	0,90	2,2	2,3	0,0550	88	147
IE1-EG 180 M-2	22	30	71,5	2940	90,5	41	7,5	0,90	2	2,3	0,0750	91	180
IE1-EG 200 L1-2	30	40	97,1	2950	91,4	55,4	7,5	0,90	2	2,3	0,1240	94	240
IE1-EG 200 L2-2	37	50	120	2950	92	67,9	7,5	0,90	2	2,3	0,1390	94	255
IE1-EG 225 M-2	45	60	145	2970	92,5	82,1	7,5	0,90	2	2,3	0,2330	94	309
IE1-EG 250 M-2	55	75	177	2970	93	99,8	7,5	0,90	2	2,3	0,3120	95	403
IE1-EG 280 S-2	75	100	241	2970	93,6	135	7,5	0,90	2	2,3	0,5790	96	572
IE1-EG 280 M-2	90	125	289	2970	93,9	160	7,5	0,91	2	2,3	0,6750	96	620
IE1-EG 315 S-2	110	150	353	2980	94	195	7,1	0,91	1,8	2,2	1,1800	98	980
IE1-EG 315 M-2	132	180	423	2980	94,5	233	7,1	0,91	1,8	2,2	1,8200	98	1080
IE1-EG 315 L1-2	160	220	513	2980	94,6	279	7,1	0,92	1,8	2,2	2,0800	101	1160
IE1-EG 315 L2-2	200	270	641	2980	94,8	348	7,1	0,92	1,8	2,2	2,4100	101	1190

• Carcasas reducidas.

* Los datos eléctricos no son vinculantes a las series, para más exactitud consultar. Datos serie MSL y serie EGQ.

DATOS ELÉCTRICOS

Motores asíncronos trifásicos, rotor jaula de ardilla.

Ventilación exterior IC 411, servicio continuo S1.

Aislamiento clase 155 (F), grado de protección IP 55.

Motores de aluminio serie **IE1-MS**

Motores de fundición serie **IE1-EG**

Velocidad síncrona 1500 rpm - 4 polos

400 V, 50 Hz

TIPO	Potencia		M _N N.m	n rpm	Eficiencia clase IE1 EN 60034-2-1 100%	I _N 400 V A	I _A /I _N	Cosφ	M _A /M _N	M _K /M _N	J Kg·m ²	Nivel sonoro dB(A)	m Kg
	kW	CV											
MS 56 1-4	0,06	0,08	0,42	1360	50	0,35	4	0,56	2,3	2,4	0,00009	50	2,9
MS 56 2-4	0,09	0,12	0,63	1360	52	0,45	4	0,59	2,3	2,4	0,00011	50	3,2
• MS 56 3-4	0,12	0,17	0,84	1360	52	0,55	4	0,64	2,2	2,4	0,00014	52	3,7
MS 63 1-4	0,12	0,17	0,84	1360	52	0,55	4	0,64	2,2	2,4	0,00016	52	3,7
MS 63 2-4	0,18	0,25	1,31	1310	57	0,7	4	0,65	2,2	2,4	0,00020	52	4,2
• MS 63 3-4	0,25	0,33	1,78	1340	60	0,91	4	0,66	2,2	2,2	0,00023	54	5,0
MS 71 1-4	0,25	0,33	1,77	1350	60	0,84	6	0,72	2,2	2,4	0,00058	55	5,0
MS 71 2-4	0,37	0,5	2,58	1370	65	1,11	6	0,74	2,2	2,4	0,00065	55	5,8
• MS 71 3-4	0,55	0,75	3,81	1380	66	1,6	6	0,75	2,2	2,4	0,00087	57	6,5
MS 80 1-4	0,55	0,75	3,83	1370	67	1,58	6	0,75	2,2	2,4	0,00124	58	8,1
IE1-MS 80 2-4	0,75	1	5,19	1380	72	1,93	6	0,78	2,2	2,4	0,00167	58	9,1
• MS 80 3-4	1,1	1,5	7,56	1390	76,2	2,67	6	0,78	2,2	2,4	0,00185	60	11,0
IE1-MS 90 S-4	1,1	1,5	7,50	1400	76,2	2,64	6	0,79	2,2	2,4	0,00168	61	11,7
IE1-MS 90 L1-4	1,5	2	10,23	1400	78,5	3,45	6	0,80	2,2	2,4	0,00217	61	14,4
• MS 90 L2-4	2,2	3	15,01	1400	81	4,9	7	0,80	2,2	2,4	0,00262	63	17,6
IE1-MS 100 L1-4	2,2	3	14,80	1420	81	4,84	7	0,81	2,2	2,3	0,00335	64	19,2
IE1-MS 100 L2-4	3	4	20,18	1420	82,6	6,47	7	0,81	2,2	2,3	0,00463	64	22,5
• MS 100 L3-4	4	5,5	26,71	1430	84,2	8,36	7	0,82	2,2	2,3	0,00508	65	27,3
IE1-MS 112 M-4	4	5,5	26,71	1430	84,2	8,26	7	0,83	2,2	2,2	0,00866	65	29,0
• MS 112 L-4	5,5	7,5	36,48	1440	85,7	11,2	7	0,83	2,2	2,2	0,00955	68	35,7
IE1-MS 132 S-4	5,5	7,5	36,22	1450	85,7	11	7	0,84	2,2	2,2	0,01803	71	39,0
IE1-MS 132 M-4	7,5	10	49,40	1450	87	14,6	7	0,85	2,2	2,2	0,02218	71	48,6
• MS 132 L1-4	9,2	12,5	60,18	1460	87,5	17,9	7,5	0,85	2,2	2,2	0,02436	74	56,5
• MS 132 L2-4	11	15	71,95	1460	88,4	20,9	7,5	0,86	2,2	2,2	0,02672	74	64
IE1-MS 160 M-4	11	15	71,95	1460	88,4	20,6	7	0,87	2,2	2,2	0,04575	75	73,0
IE1-MS 160 L-4	15	20	98,12	1460	88,4	28,2	7,5	0,87	2,2	2,2	0,05968	75	88,5
IE1-EG 160 M-4	11	15	72	1460	88,4	22,5	7	0,84	2,2	2,3	0,0747	80	118
IE1-EG 160 L-4	15	20	98,1	1460	89,4	30	7,5	0,85	2,2	2,3	0,0918	79	138
IE1-EG 180 M-4	18,5	25	120,2	1470	90	36,3	7,5	0,86	2,2	2,3	0,1390	80	182
IE1-EG 180 L-4	22	30	142,9	1470	90,5	43	7,5	0,86	2,2	2,3	0,1580	80	190
IE1-EG 200 L-4	30	40	194,9	1470	91,4	58	7,2	0,86	2,2	2,3	0,2620	83	243
IE1-EG 225 S-4	37	50	239	1480	92	70,2	7,2	0,87	2,2	2,3	0,4060	85	284
IE1-EG 225 M-4	45	60	290	1480	92,5	85	7,2	0,87	2,2	2,3	0,4690	84	320
IE1-EG 250 M-4	55	75	355	1480	93	103	7,2	0,87	2,2	2,3	0,6600	86	452
IE1-EG 280 S-4	75	100	484	1480	93,6	140	7,2	0,87	2,2	2,3	1,1200	89	562
IE1-EG 280 M-4	90	125	577	1490	93,9	167	7,2	0,87	2,2	2,3	1,4600	89	667
IE1-EG 315 S-4	110	150	705	1490	94,5	201	6,9	0,88	2,1	2,2	3,1100	96	1000
IE1-EG 315 M-4	132	180	846	1490	94,8	240	6,9	0,88	2,1	2,2	3,6200	96	1100
IE1-EG 315 L1-4	160	220	1026	1490	94,9	288	6,9	0,89	2,1	2,2	4,1300	100	1160
IE1-EG 315 L2-4	200	270	1282	1490	94,9	360	6,9	0,89	2,1	2,2	4,9400	100	1270
IE1-EG 355 M-4	250	340	1608	1485	95,2	443	6,9	0,90	2,1	2,2	5,6700	104	1700
IE1-EG 355 L2-4	315	430	2026	1485	95,2	559	6,9	0,90	2,1	2,2	6,6600	104	1850

• Carcasas reducidas.

* Los datos eléctricos no son vinculantes a las series, para más exactitud consultar. Datos serie MSL y serie EGQ.

DATOS ELÉCTRICOS

Motores asíncronos trifásicos, rotor jaula de ardilla.

Ventilación exterior IC 411, servicio continuo S1.

Aislamiento clase 155 (F), grado de protección IP 55.

Motores de aluminio serie **IE1-MS**

Motores de fundición serie **IE1-EG**

Velocidad síncrona 1000 rpm - 6 polos

400 V, 50 Hz

TIPO	Potencia		M _N	n	Eficiencia clase IE1 EN 60034-2-1 100%	I _N 400 V A	I _A /I _N	Cosφ	M _A /M _N	M _K /M _N	J Kgm ²	Nivel sonoro dB(A)	m Kg
	kW	CV	N.m	rpm									
MS 63 1-6	0,09	0,12	1	840	42	0,51	3,5	0,61	2	2	0,00021	50	4,2
MS 63 2-6	0,12	0,17	1,3	850	45	0,62	3,5	0,62	2	2	0,00023	50	4,5
MS 71 1-6	0,18	0,25	2	880	56	0,7	4	0,66	1,6	1,7	0,00065	52	5,6
MS 71 2-6	0,25	0,33	2,7	900	59	0,87	4	0,70	2,1	2,2	0,00087	52	6,0
• MS 71 3-6	0,37	0,5	4	890	61	1,27	4	0,69	2	2,1	0,00108	54	6,8
MS 80 1-6	0,37	0,5	3,9	900	62	1,23	4	0,70	1,9	1,9	0,00140	56	8,1
MS 80 2-6	0,55	0,75	5,8	900	67	1,65	4	0,72	2	2,3	0,00186	56	9,6
• MS 80 3-6	0,75	1	8	900	68	2,21	4	0,72	2	2,3	0,00232	58	10,0
IE1-MS 90 S-6	0,75	1	7,8	920	69	2,18	5,5	0,72	2,2	2,2	0,00266	59	11,3
IE1-MS 90 L1-6	1,1	1,5	11,4	925	72	3,02	5,5	0,73	2,2	2,2	0,00350	59	14,4
• MS 90 L2-6	1,5	2	15,5	925	74	3,9	5,5	0,75	2	2,2	0,00625	60	15,5
IE1-MS 100 L1-6	1,5	2	15,2	945	74	3,85	6	0,76	2,2	2,2	0,00562	61	18,8
• MS 100 L2-6	2,2	3	22,1	950	77	5,43	6	0,76	2,2	2,2	0,01225	63	19,8
IE1-MS 112 M-6	2,2	3	22	955	78	5,36	6	0,76	2,2	2,2	0,01333	64	25,0
• MS 112 L-6	3	4	30,2	950	79	7,12	6	0,77	2,2	2,2	0,01800	64	30,0
IE1-MS 132 S-6	3	4	29,8	960	79	7,21	6,5	0,76	2	2	0,02187	64	35,0
IE1-MS 132 M1-6	4	5,5	39,8	960	80,5	9,44	6,5	0,76	2	2	0,02541	68	47,6
IE1-MS 132 M2-6	5,5	7,5	54,7	960	83	12,4	6,5	0,77	2	2	0,03068	68	50,7
• MS 132 L-6	7,5	10	74,6	960	85	16,5	6,5	0,77	2	2	0,03602	68	47,6
IE1-MS 160 M-6	7,5	10	74,6	960	86	15,7	6,5	0,80	2	2,2	0,06927	68	70,0
IE1-MS 160 L-6	11	15	109,4	960	87,5	23	6,5	0,79	2	2,2	0,12674	73	87,0
IE1-EG 160 M-6	7,5	10	73,8	970	86	17	6,5	0,77	2	2,1	0,0881	80	119
IE1-EG 160 L-6	11	15	108	970	87,5	24,5	6,5	0,78	2	2,1	0,1160	80	147
IE1-EG 180 L-6	15	20	148	970	89	31,6	7	0,81	2	2,1	0,2070	79	195
IE1-EG 200 L1-6	18,5	25	182	970	90	38,6	7	0,81	2,1	2,1	0,3150	82	220
IE1-EG 200 L2-6	22	30	217	970	90	44,7	7	0,83	2,1	2,1	0,3600	82	250
IE1-EG 225 M-6	30	40	292	980	91,5	59,3	7	0,84	2	2,1	0,5470	82	292
IE1-EG 250 M-6	37	50	361	980	92	71	7	0,86	2,1	2,1	0,8340	84	408
IE1-EG 280 S-6	45	60	439	980	92,5	86	7	0,86	2,1	2	1,3900	85	536
IE1-EG 280 M-6	55	75	536	980	92,8	105	7	0,86	2,1	2	1,6500	85	595
IE1-EG 315 S-6	75	100	723	990	93,5	142	7	0,86	2	2	4,1100	90	990
IE1-EG 315 M-6	90	125	868	990	93,8	170	7	0,86	2	2	4,2800	90	1080
IE1-EG 315 L1-6	110	150	1061	990	94	207	6,7	0,86	2	2	5,4500	90	1150
IE1-EG 315 L2-6	132	180	1273	990	94,2	245	6,7	0,87	2	2	6,1200	89	1210
IE1-EG 355 M1-6	160	220	1543	990	94,5	292	6,7	0,88	1,9	2	8,8500	96	1600

• Carcasas reducidas.

* Los datos eléctricos no son vinculantes a las series, para más exactitud consultar. Datos serie MSL y serie EGQ.

DATOS ELÉCTRICOS

Motores asíncronos trifásicos, rotor jaula de ardilla.

Ventilación exterior IC 411, servicio continuo S1.

Aislamiento clase 155 (F), grado de protección IP 55.

Motores de aluminio serie **IE1-MS**

Motores de fundición serie **IE1-EG**

Velocidad síncrona 750 rpm - 8 polos

400 V, 50 Hz

TIPO	Potencia		M _N N.m	n rpm	Eficiencia clase IE1 EN 60034-2-1 100%	I _N 400 V A	I _A /I _N	Cosφ	M _A /M _N	M _K /M _N	J Kgm ²	Nivel sonoro dB(A)	m Kg
	kW	CV											
MS 71 1-8	0,09	0,12	1,3	680	48	0,48	3	0,56	1,5	1,7	0,00084	50	5,6
MS 71 2-8	0,12	0,17	1,7	690	51	0,58	2,7	0,59	1,6	1,7	0,00087	50	6,0
MS 80 1-8	0,18	0,25	2,5	680	51	0,84	2,8	0,61	1,5	1,7	0,00140	52	9,4
MS 80 2-8	0,25	0,33	3,5	680	56	1,06	2,7	0,61	1,6	2	0,00186	52	10,1
• MS 80 3-8	0,37	0,5	5,2	680	63	1,35	2,8	0,63	1,6	1,8	0,00195	56	14,8
MS 90 S-8	0,37	0,5	5,2	680	63	1,35	2,8	0,63	1,6	1,8	0,00186	56	12,5
MS 90 L-8	0,55	0,75	7,7	680	66	1,85	3	0,65	1,6	1,8	0,00217	56	15,3
MS 100 L1-8	0,75	1	10,1	710	66	2,45	3,5	0,67	1,7	2,1	0,00563	59	17,2
MS 100 L2-8	1,1	1,5	14,8	710	72	3,2	3,5	0,69	1,7	2,1	0,00716	59	19,5
MS 112 M-8	1,5	2	20,2	710	74	4,3	4,2	0,68	1,8	2,1	0,01159	61	25,5
MS 132 S-8	2,2	3	29,2	720	75	5,96	5,5	0,71	2	2	0,02541	64	34,2
MS 132 M-8	3	4	39,8	720	77	7,7	5,5	0,73	2	2	0,03068	64	40,0
MS 160 M1-8	4	5,5	52,3	730	80	9,89	6	0,73	1,9	2,1	0,06927	68	59,0
MS 160 M2-8	5,5	7,5	73	720	83,5	12,9	6	0,74	2	2,2	0,09353	68	69,0
MS 160 L-8	7,5	10	99,5	720	85	17	6	0,75	1,9	2,2	0,11300	68	87,0
EG 160 M1-8	4	5,5	53,1	720	81	10,3	6	0,73	1,9	2	0,0753	76	118
EG 160 M2-8	5,5	7,5	73	720	83	13,6	6	0,74	2	2	0,0931	76	119
EG 160 L-8	7,5	10	99,5	720	85,5	17,8	6	0,75	2	2	0,1260	76	145
EG 180 L-8	11	15	143,9	730	87,5	25,1	6,6	0,76	2	2	0,2030	78	184
EG 200 L-8	15	20	196,2	730	88	34,1	6,6	0,76	2	2	0,3390	80	250
EG 225 S-8	18,5	25	242	730	90	41,1	6,6	0,76	1,9	2	0,4910	80	266
EG 225 M-8	22	30	283,9	740	90,5	47,4	6,6	0,78	1,9	2	0,5470	80	292
EG 250 M-8	30	40	387,2	740	91	63,4	6,6	0,79	1,9	2	0,8340	82	405
EG 280 S-8	37	50	477,5	740	91,5	78	6,6	0,79	1,9	2	1,3900	83	520
EG 280 M1-8	45	60	580,7	740	92	94	6,6	0,79	1,9	2	1,6500	82	592
EG 315 S-8	55	75	709,8	740	92,8	111	6,6	0,81	1,8	2	4,7900	88	1000
EG 315 M-8	75	100	967,9	740	93	151	6,6	0,81	1,8	2	5,5800	88	1100
EG 315 L1-8	90	125	1161,5	740	93,8	178	6,6	0,82	1,8	2	6,3700	88	1160
EG 315 L2-8	110	150	1419,6	740	94	217	6,4	0,82	1,8	2	7,2300	88	1230

• Carcasas reducidas.

* Los datos eléctricos no son vinculantes a las series, para más exactitud consultar. Datos serie MSL y serie EGQ.

DATOS ELÉCTRICOS

Motores asíncronos monofásicos con condensador permanente.
Ventilación exterior IC 411, servicio continuo S1.
Aislamiento clase 155 (F), grado de protección IP 55.

Velocidad síncrona 3000 rpm - 2 polos

Motores de aluminio serie **MY**

TIPO	Potencia		n	I (Amp)	η	Cos φ	M_A/M_N	M_S/M_N	I_A	Condensador permanente	Nivel sonoro	m
	kW	CV	rpm	230 V	%				(A)	(μ f/V)	dB(A)	Kg
MY 56 1-2	0,09	0,12	2760	0,81	54	0,90	0,70	1,6	3	4 μ f/450V	67	2,9
MY 56 2-2	0,12	0,17	2770	0,98	58	0,92	0,70	1,6	4	6 μ f/450V	67	3,2
MY 63 1-2	0,18	0,25	2780	1,42	60	0,92	0,70	1,7	5	10 μ f/450V	70	4,0
MY 63 2-2	0,25	0,33	2780	1,94	61	0,92	0,68	1,7	7	12 μ f/450V	70	4,5
MY 71 1-2	0,37	0,5	2800	2,75	63	0,93	0,63	1,7	12	20 μ f/450V	75	5,1
MY 71 2-2	0,55	0,75	2810	3,50	72	0,95	0,63	1,7	15	25 μ f/450V	75	7,2
MY 80 1-2	0,75	1	2810	4,77	72	0,95	0,45	1,7	20	25 μ f/450V	75	9,6
MY 80 2-2	1,1	1,5	2810	6,80	74	0,95	0,43	1,7	28	35 μ f/450V	78	11,0
MY 90 S-2	1,5	2	2820	9,15	75	0,95	0,35	1,8	40	45 μ f/450V	80	14,0
MY 90 L-2	2,2	3	2820	13,08	77	0,95	0,35	1,8	60	60 μ f/450V	80	16,5
MY 100 L-2	3	4	2840	17,83	77	0,95	0,35	1,8	75	80 μ f/450V	83	25,0

Velocidad síncrona 1500 rpm - 4 polos

Motores de aluminio serie **MY**

TIPO	Potencia		n	I (Amp)	η	Cos φ	M_A/M_N	M_S/M_N	I_A	Condensador permanente	Nivel sonoro	m
	kW	CV	rpm	230 V	%				(A)	(μ f/V)	dB(A)	Kg
MY 56 1-4	0,06	0,09	1360	0,59	48	0,92	0,75	1,6	2,5	4 μ f/450V	63	3,5
MY 56 2-4	0,09	0,12	1370	0,83	51	0,92	0,75	1,6	3	6 μ f/450V	63	3,8
MY 63 1-4	0,12	0,17	1380	1,09	52	0,92	0,65	1,6	3,5	10 μ f/450V	65	4,0
MY 63 2-4	0,18	0,25	1380	1,55	55	0,92	0,65	1,5	5,5	12 μ f/450V	65	4,6
MY 71 1-4	0,25	0,33	1380	2,15	55	0,92	0,60	1,5	8	20 μ f/450V	65	5,7
MY 71 2-4	0,37	0,5	1380	2,91	60	0,92	0,55	1,5	10	20 μ f/450V	68	6,7
MY 80 1-4	0,55	0,75	1400	3,93	64	0,95	0,45	1,7	15	20 μ f/450V	70	9,5
MY 80 2-4	0,75	1	1410	5,05	68	0,95	0,45	1,7	20	25 μ f/450V	70	10,5
MY 90 S-4	1,1	1,5	1410	6,90	73	0,95	0,45	1,8	30	40 μ f/450V	73	14,5
MY 90 L-4	1,5	2	1420	9,38	74	0,94	0,45	1,8	40	45 μ f/450V	75	16,2
MY 100 L1-4	2,2	3	1430	13,75	74	0,94	0,30	1,8	60	80 μ f/450V	78	24,0
MY 100 L2-4	3	4	1440	17,83	77	0,95	0,45	1,7	76	100 μ f/450V	80	32,0

Velocidad síncrona 1000 rpm - 6 polos

Motores de aluminio serie **MY**

TIPO	Potencia		n	I (Amp)	η	Cos φ	M_A/M_N	M_S/M_N	I_A	Condensador permanente	Nivel sonoro	m
	kW	CV	rpm	230 V	%				(A)	(μ f/V)	dB(A)	Kg
MY 63 1-6	0,09	0,12	900	0,92	46	0,92	0,55	1,45	2	8 μ f/450V	63	5,1
MY 63 2-6	0,12	0,16	900	1,05	54	0,92	0,55	1,45	3	11 μ f/450V	63	6,0
MY 71 1-6	0,18	0,25	900	1,55	55	0,92	0,60	1,5	4	16 μ f/450V	68	6,3
MY 71 2-6	0,25	0,33	900	2,07	57	0,92	0,60	1,5	5	20 μ f/450V	68	7,6
MY 80 1-6	0,37	0,55	900	2,69	65	0,92	0,35	1,6	8	25 μ f/450V	68	9,0
MY 80 2-6	0,55	0,75	900	3,84	67	0,93	0,35	1,6	14	30 μ f/450V	70	11,6
MY 90 S-6	0,75	1	900	4,97	69	0,95	0,35	1,6	16	40 μ f/450V	70	13,5
MY 90 L-6	1,1	1,5	900	7,19	70	0,95	0,35	1,6	25	50 μ f/450V	70	16,2

* Los datos eléctricos no son vinculantes a las series, para más información consultar. Datos serie MY.

DATOS ELÉCTRICOS

Motores asíncronos trifásicos, rotor jaula de ardilla.

Ventilación exterior IC 411, servicio continuo S1.

Aislamiento clase 155 (F), grado de protección IP 55.

Motores de aluminio serie **IE2-MS**

Motores de fundición serie **IE2-EG**

Velocidad síncrona 3000 rpm - 2 polos

400 V, 50 Hz

TIPO	Potencia		M _N N.m	n rpm	Eficiencia clase IE2 EN 60034-2-1 400 V			I _N A	I _A /I _N	Cosφ	M _A /M _N	M _K /M _N	J Kgm ²	Nivel sonoro dB(A)	m Kg
	kW	CV			100%	75%	50%								
IE2-MS 80 1-2	0,75	1	2,5	2865	79,3	78,8	75,3	1,84	6,5	0,74	2,65	2,95	0,00092	67	9,8
IE2-MS 80 2-2	1,1	1,5	3,7	2865	81,1	80,7	77,2	2,55	6,2	0,77	2,5	2,6	0,00010	67	10,6
IE2-MS 90 S-2	1,5	2	5	2875	81,4	80,9	78	3,2	6,5	0,83	2,5	2,9	0,00160	72	13,9
IE2-MS 90 L-2	2,2	3	7,3	2885	83,3	82,4	79	4,8	7,2	0,80	2,9	3	0,00193	72	16,7
IE2-MS 100 L-2	3	4	9,9	2900	84,7	84,2	83,2	5,9	8,5	0,87	2,9	2,5	0,00554	76	24,8
IE2-MS 112 M-2	4	5,5	13,1	2910	86	85,2	84,5	7,69	8,4	0,87	2,6	3,3	0,00586	77	30,0
IE2-MS 132 S1-2	5,5	7,5	17,8	2950	87,7	86,4	82,2	10,88	9,8	0,83	4	5	0,01438	80	45,4
IE2-MS 132 S2-2	7,5	10	24,4	2935	89,7	89,1	86,9	13,6	10,5	0,89	3	3,8	0,01670	80	53,8
IE2-EG 160 M1-2	11	15	35,9	2930	89,4	89,3	87,8	19,9	8,1	0,89	2,2	2,3	0,0489	81	123
IE2-EG 160 M2-2	15	20	48,9	2930	90,3	90,2	88,8	26,9	8,1	0,89	2,2	2,3	0,0559	81	132
IE2-EG 160 L-2	18,5	25	60,3	2930	90,9	90,8	89,5	33	8,1	0,89	2,2	2,3	0,0648	81	151
IE2-EG 180 M-2	22	30	71,5	2940	91,3	91,2	89,9	38,6	8,1	0,88	2	2,3	0,0808	83	203
IE2-EG 200 L1-2	30	40	97,1	2950	92	91,9	90,7	52,3	8,1	0,88	2	2,3	0,1630	84	246
IE2-EG 200 L2-2	37	50	120	2950	92,5	92,4	91,3	64,1	8,1	0,89	2	2,3	0,1720	84	256
IE2-EG 225 M-2	45	60	145	2960	92,9	92,8	91,8	77,7	8,1	0,89	2	2,3	0,3020	86	328
IE2-EG 250 M-2	55	75	177	2965	93,2	93,1	92,1	94,6	8,1	0,90	2	2,3	0,4200	89	433
IE2-EG 280 S-2	75	100	242	2960	93,8	93,7	92,8	128	8,1	0,90	2	2,3	0,9860	91	572
IE2-EG 280 M-2	90	125	290	2960	94,1	94	93,1	151	8,1	0,91	2	2,3	1,0400	91	632
IE2-EG 315 S-2	110	150	353	2975	94,3	94,2	93,4	185	7,7	0,90	1,8	2,2	1,3300	92	950
IE2-EG 315 M-2	132	180	424	2975	94,6	94,5	93,7	221	7,7	0,90	1,8	2,2	1,5000	92	1080
IE2-EG 315 L1-2	160	220	514	2975	94,8	94,8	93,9	264	7,7	0,89	1,8	2,2	1,6700	92	1210
IE2-EG 315 L2-2	200	270	642	2975	95	95	94,2	330	7,7	0,89	1,8	2,2	1,8800	92	1240
IE2-EG 355 M-2	250	340	801	2980	95	95	94,2	412	7,7	0,92	1,6	2,2	4,0200	100	1970
IE2-EG 355 L1-2	315	430	1009	2980	95	95	94,2	520	7,7	0,92	1,6	2,2	4,8600	100	2000

* Los datos eléctricos no son vinculantes a las series, para más exactitud consultar. Datos serie MSX y serie EGQ.

DATOS ELÉCTRICOS

Motores asíncronos trifásicos, rotor jaula de ardilla.
Ventilación exterior IC 41 1, servicio continuo S1.
Aislamiento clase 155 (F), grado de protección IP 55.

Motores de aluminio serie **IE2-MS**

Motores de fundición serie **IE2-EG**

Velocidad síncrona 1500 rpm - 4 polos

400 V, 50 Hz

TIPO	Potencia		M _N N.m	n rpm	Eficiencia clase IE2 EN 60034-2-1			I _N 400 V A	I _A /I _N	Cosφ	M _A /M _N	M _K /M _N	J Kgm ²	Nivel sonoro dB(A)	m Kg
	kW	CV			100%	75%	50%								
IE2-MS 80 2-4	0,75	1	5,02	1420	79,5	79,7	77,5	1,88	5,7	0,73	2,85	2,77	0,0027	58	12,0
IE2-MS 90 S-4	1,1	1,5	7,35	1430	81,5	81,6	79,3	2,67	6	0,73	2,8	2,35	0,0031	61	14,0
IE2-MS 90 L-4	1,5	2	10	1430	82,9	83	80,2	3,57	6,3	0,73	2,9	2,3	0,0040	61	17,8
IE2-MS 100 L1-4	2,2	3	14,5	1450	84,5	84,7	82,2	4,85	6,2	0,78	2,2	2,6	0,0076	64	23,5
IE2-MS 100 L2-4	3	4	19,8	1450	85,5	85,7	83,8	6,49	6,6	0,78	2,5	2,6	0,0092	64	27,4
IE2-MS 112 M-4	4	5,5	26,3	1455	86,7	85,9	82,1	8,58	7,3	0,78	2,5	2,9	0,0123	65	35,7
IE2-MS 132 S-4	5,5	7,5	36,1	1455	88	86,8	84,4	11	7,3	0,82	2,3	2,8	0,0204	72	45,4
IE2-MS 132 M-4	7,5	10	49,3	1455	88,8	89,2	88,2	14,25	7	0,86	2,2	2,4	0,0296	72	58,6
IE2-EG 160 M-4	11	15	72	1460	89,8	89,7	88,2	21	8,9	0,84	2,2	2,3	0,0771	73	123
IE2-EG 160 L-4	15	20	98,1	1460	90,6	90,5	89,1	28,1	8,9	0,85	2,2	2,3	0,1010	73	153
IE2-EG 180 M-4	18,5	25	120	1470	91,2	91,1	89,8	34	7,9	0,86	2,2	2,3	0,1520	76	204
IE2-EG 180 L-4	22	30	143	1470	91,6	91,5	90,3	40,3	7,9	0,86	2,2	2,3	0,1870	76	215
IE2-EG 200 L-4	30	40	195	1470	92,3	92,2	91,1	54,5	7,9	0,86	2,2	2,3	0,2850	76	243
IE2-EG 225 S-4	37	50	240	1475	92,7	92,6	91,5	66,2	7,9	0,87	2,2	2,3	0,4730	78	305
IE2-EG 225 M-4	45	60	292	1470	93,1	93	92	80,1	7,9	0,87	2,2	2,3	0,5540	78	328
IE2-EG 250 M-4	55	75	355	1480	93,5	93,4	92,4	97,5	7,9	0,87	2,2	2,3	0,7510	79	452
IE2-EG 280 S-4	75	100	486	1475	94	93,9	93	132	7,9	0,87	2,2	2,3	1,9200	80	592
IE2-EG 280 M-4	90	125	583	1475	94,2	94,1	93,3	158	7,9	0,87	2,2	2,3	2,3200	80	672
IE2-EG 315 S-4	110	150	707	1485	94,5	94,4	93,6	195	7,6	0,86	2,1	2,2	2,3400	88	980
IE2-EG 315 M-4	132	180	849	1485	94,7	94,6	93,8	233	7,6	0,86	2,1	2,2	2,5800	88	1040
IE2-EG 315 L1-4	160	220	1029	1485	94,9	94,9	94,1	282	7,6	0,86	2,1	2,2	2,9600	88	1180
IE2-EG 315 L2-4	200	270	1286	1485	95,1	95,1	94,3	357	7,6	0,85	2,1	2,2	3,4600	88	1260
IE2-EG 355 M-4	250	340	1608	1485	95,1	95,1	94,3	421	7,6	0,90	2,1	2,2	6,6000	95	1810
IE2-EG 355 L2-4	315	430	2026	1485	95,1	95,1	94,3	537	7,6	0,89	2,1	2,2	7,5500	95	1910

* Los datos eléctricos no son vinculantes a las series, para más exactitud consultar. Datos serie MSX y serie EGQ.

DATOS ELÉCTRICOS

Motores asíncronos trifásicos, rotor jaula de ardilla.
Ventilación exterior IC 411, servicio continuo S1.
Aislamiento clase 155 (F), grado de protección IP 55.

Motores de aluminio serie **IE2-MS**

Motores de fundición serie **IE2-EG**

Velocidad síncrona 1000 rpm - 6 polos

400 V, 50 Hz

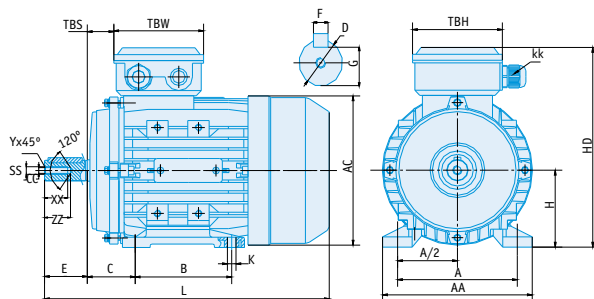
TIPO	Potencia		M _N N.m	n rpm	Eficiencia clase IE2 EN 60034-2-1			I _N 400 V A	I _A /I _N	Cosφ	M _A /M _N	M _K /M _N	J Kgm ²	Nivel sonoro dB(A)	m Kg
	kW	CV			100%	75%	50%								
IE2-MS 90 S-6	0,75	1	7,74	925	75,9	75,2	71,6	1,92	4,5	0,75	2,2	2,5	0,0038	59	14,0
IE2-MS 90 L-6	1,1	1,5	11,3	930	78,2	77,7	74,2	2,71	4,8	0,75	2,4	2,6	0,0050	60	18,0
IE2-MS 100 L-6	1,5	2	15,24	940	79,9	78,8	74,6	3,69	6,2	0,74	3,3	3	0,0095	61	23,2
IE2-MS 112 M-6	2,2	3	22,23	945	81,8	81,6	78,6	5	6,1	0,78	2,8	2,6	0,0177	64	29,2
IE2-MS 132 S-6	3	4	29,84	960	83,4	83,2	80,4	6,7	6,4	0,78	2,5	2,5	0,0312	66	37,8
IE2-MS 132 M1-6	4	5,5	39,79	960	85,6	85	82,2	8,7	7,5	0,78	2,9	2,7	0,0460	68	42,7
IE2-MS 132 M2-6	5,5	7,5	54,7	960	86,5	86	83,3	11,7	7,7	0,79	2,9	2,6	0,0572	69	52,5
IE2-EG 160 M-6	7,5	10	73,8	970	87,2	87,1	85,3	16,1	6	0,77	2	2,1	0,0964	73	151
IE2-EG 160 L-6	11	15	108	970	88,7	88,6	87	22,9	6	0,78	2	2,1	0,1270	73	167
IE2-EG 180 M-6	15	20	148	970	89,7	89,6	88,1	29,7	7,5	0,81	2	2,1	0,2010	73	206
IE2-EG 200 L1-6	18,5	25	182	970	90,4	90,3	88,9	36,4	7,5	0,81	2,1	2,1	0,3250	73	243
IE2-EG 200 L2-6	22	30	217	970	90,9	90,8	89,5	42	7,5	0,83	2,1	2,1	0,3710	73	256
IE2-EG 225 M-6	30	40	292	980	91,7	91,6	90,4	56,2	7,5	0,84	2	2,1	0,5330	74	317
IE2-EG 250 M-6	37	50	361	980	92,2	92,1	91	67,3	7,5	0,86	2,1	2,1	0,8770	76	435
IE2-EG 280 S-6	45	60	439	980	92,7	92,6	91,5	81,4	7,5	0,86	2,1	2	1,8500	78	603
IE2-EG 280 M-6	55	75	536	980	93,1	93	92	99,1	7,5	0,86	2,1	2	2,1200	78	693
IE2-EG 315 S-6	75	100	727	985	93,7	93,6	92,7	135	7,5	0,85	2	2	2,6100	83	970
IE2-EG 315 M-6	90	125	873	985	94	93,9	93	162	7,5	0,85	2	2	3,0400	83	1180
IE2-EG 315 L1-6	110	150	1066	985	94,3	94,2	93,4	195	7,3	0,86	2	2	3,7100	83	1240
IE2-EG 315 L2-6	132	180	1280	985	94,6	94,5	93,7	234	7,3	0,86	2	2	4,2400	83	1300
IE2-EG 355 M1-6	160	220	1543	990	94,8	94,8	93,9	276	7,3	0,88	1,9	2	7,4400	85	1740

* Los datos eléctricos no son vinculantes a las series, para más exactitud consultar. Datos serie MSX y serie EGQ.

DIMENSIONES

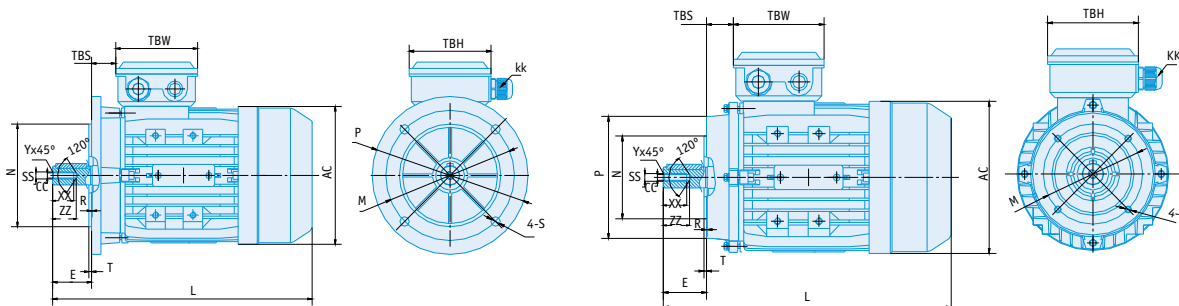
Motores de aluminio serie **IE1-MS**

Formas constructivas **B3 - B5 - B5R - B14 - B14G**



IM B3 / IM 1001													Extremo eje Tolerancia j6							
Tamaño	A	AA	AC	B	C	H	HD	K	KK	L	TBS	TBW	TBH	D	E	F	G	SS	XX	ZZ
56	90	110	117	71	36	56	156	5,8x8,8	1-M16x1,5	196	14	88	88	9	20	3	7,2	M3	9	12
63	100	120	130	80	40	63	171	7x10	1-M16x1,5	220	14	94	94	11	23	4	8,5	M4	10	14
71*	112	132	147	90	45	71	186	7x10	1-M20x1,5	241 (255)	20	94	94	14	30	5	11,0	M5	12	17
80	125	160	163	100	50	80	213	10x13	1-M20x1,5	290	27	105	105	19	40	6	15,5	M6	16	21
90S	140	175	183	100	56	90	229	10x13	1-M20x1,5	312	30	105	105	24	50	8	20	M8	19	25
90L1	140	175	183	125	56	90	229	10x13	1-M20x1,5	337	30	105	105	24	50	8	20	M8	19	25
90L2	140	175	183	125	56	90	229	10x13	1-M20x1,5	367	30	105	105	24	50	8	20	M8	19	25
100*	160	198	205	140	63	100	252	12x15	2-M20x1,5	369 (387)	26	105	105	28	60	8	24	M10	22	30
112	190	220	229	140	70	112	279	12x15	2-M25x1,5	395	32	112	112	28	60	8	24	M10	22	30
132S	216	252	265	140	89	132	318	12x15	2-M25x1,5	437	38	112	112	38	80	10	33	M12	28	37
132M	216	252	265	178	89	132	318	12x15	2-M25x1,5	475	38	112	112	38	80	10	33	M12	28	37
132L	216	252	265	178	89	132	318	12x15	2-M25x1,5	501	38	112	112	38	80	10	33	M12	28	37
160M	254	290	325	210	108	160	384	15x19	2-M32x1,5	640	64	143	143	42	110	12	37	M16	36	45
160L	254	290	325	254	108	160	384	15x19	2-M32x1,5	640	64	143	143	42	110	12	37	M16	36	45

* Carcasa IEC (carcasa reducida).



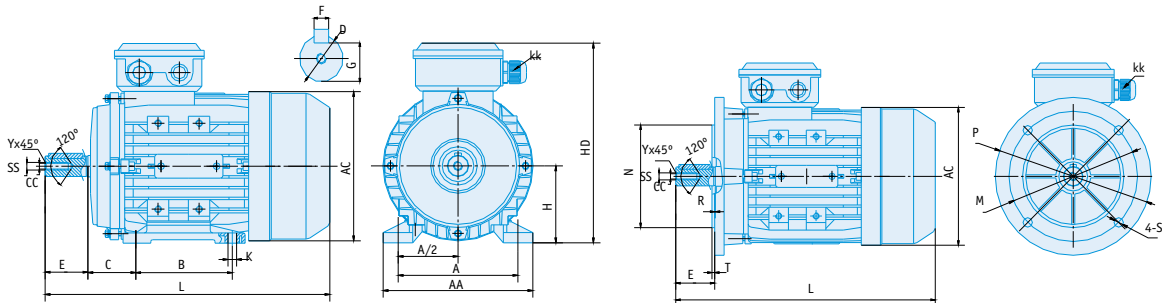
Tamaño	IM B5 / IM 3001 4 agujeros a 45°					IM B5R 4 agujeros a 45°					IM B14 / IM 3601 4 agujeros a 45°					IM B14G / IM 3601 G 4 agujeros a 45°						
	M	N	P	S	T	M	N	P	S	T	M	N	P	S	T	M	N	P	S	T		
56	100	80	120	7	3,0	NO DISPONIBLE					65	50	80	M5	2,5	NO DISPONIBLE						
63	115	95	140	10	3,0	NO DISPONIBLE					75	60	90	M5	2,5	100	80	120	M6	2,5		
71	130	110	160	10	3,5	115	95	140	10	3,0	85	70	105	M6	2,5	115	95	140	M8	3,0		
80	165	130	200	12	3,5	130	110	160	10	3,5	100	80	120	M6	3,0	130	110	160	M8	3,5		
90	165	130	200	12	3,5	130	110	160	10	3,5	115	95	140	M8	3,0	130	110	160	M8	3,5		
100	215	180	250	15	4,0	165	130	200	12	3,5	130	110	160	M8	3,5	165	130	200	M10	3,5		
112	215	180	250	15	4,0	165	130	200	12	3,5	130	110	160	M8	3,5	165	130	200	M10	3,5		
132	265	230	300	15	4,0	215	180	250	15	4,0	165	130	200	M10	4,0	215	180	250	M12	4,0		
160	300	250	350	19	5,0	NO DISPONIBLE					215	180	250	M12	4,0	NO DISPONIBLE						

* Las dimensiones no son vinculantes a las series, para más información consultar. Dimensiones serie MSL.

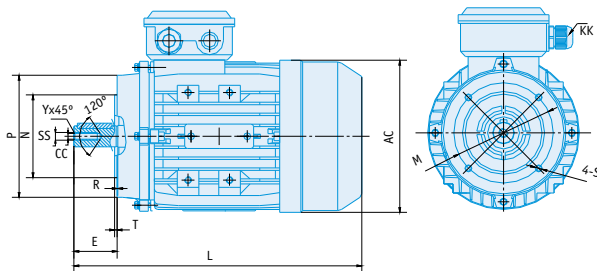
DIMENSIONES

Motores de aluminio serie **IE2-MS**

Formas constructivas B3 - B5 - B5R - B14 - B14G



IM B3 / IM 1001											Extremo eje Tolerancia j6					IM B5 / IM 3001 4 agujeros a 45°				
Tamaño	A	AA	AC	B	C	H	HD	K	KK	L	D	SS	E	F	G	M	N	P	S	T
80	125	155	158	100	50	80	210	10	1-M20x1,5	295	19	M6	40	6	15,5	165	130	200	12	3,5
90S	140	180	179	100	56	90	228	10	1-M20x1,5	320	24	M8	50	8	20	165	130	200	12	3,5
90L	140	180	179	125	56	90	228	10	1-M20x1,5	345	24	M8	50	8	20	165	130	200	12	3,5
100	160	200	202	140	63	100	260	12	1-M20x1,5	385	28	M10	60	8	24	215	180	250	15	4,0
112	190	233	225	140	70	112	285	12	2-M25x1,5	410	28	M10	60	8	24	215	180	250	15	4,0
132S	216	255	260	140	89	132	325	12	2-M25x1,5	470	38	M12	80	10	33	265	230	300	15	4,0
132M	216	255	260	178	89	132	325	12	2-M25x1,5	510	38	M12	80	10	33	265	230	300	15	4,0



IM B5R 4 agujeros a 45°					
Tamaño	M	N	P	S	T
80	130	110	160	12	3,5
90	130	110	160	12	3,5
100	165	130	200	15	3,5
112	165	130	200	15	3,5
132	215	180	250	15	4,0

IM B14 / IM 3601 4 agujeros a 45°					
Tamaño	M	N	P	S	T
80	100	80	120	M6	3,0
90	115	95	140	M8	3,0
100	130	110	160	M8	3,5
112	130	110	160	M8	3,5
132	165	130	200	M10	4,0

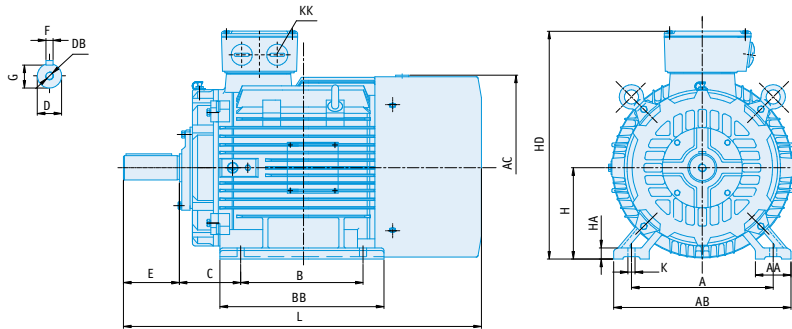
IM B14G / IM 3601 G 4 agujeros a 45°					
Tamaño	M	N	P	S	T
80	130	110	160	M8	3,5
90	130	110	160	M8	3,5
100	165	130	200	M10	3,5
112	165	130	200	M10	3,5
132	215	180	250	M12	4,0

* Las dimensiones no son vinculantes a las series, para más información consultar. Dimensiones serie MSX .

DIMENSIONES

Motores de fundición serie **IE1-IE2 EG**

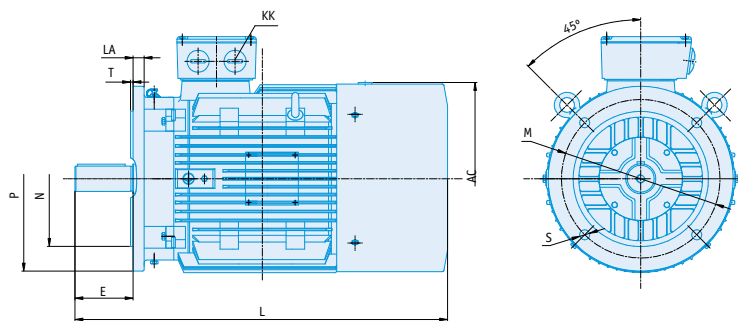
Formas constructivas B3 - B5



IM B3 / IM 1001															Extremo eje				
Tamaño	Polos	A	AA	AB	AC	B	BB	C	H	HA	HD	K	KK	L	D	DB	E	F	G
160M	2-8	254	73	320	330	210	318	108	160	20	420	15	2-M40x1,5	659	42	M16x36	110	12	37
160L	2-8	254	73	320	330	254	362	108	160	20	420	15	2-M40x1,5	714	42	M16x36	110	12	37
180M	2-8	279	73	355	380	241	349	121	180	22	455	15	2-M40x1,5	738	48	M16x36	110	14	42,5
180L	2-8	279	73	355	380	279	387	121	180	22	455	15	2-M40x1,5	778	48	M16x36	110	14	42,5
200L	2-8	318	73	395	400	305	375	133	200	25	505	19	2-M50x1,5	770	55	M20x42	110	16	49
225S	4-8	356	83	435	470	286	375	149	225	28	560	19	2-M50x1,5	820	60	M20x42	140	18	53
225M	2	356	83	435	470	311	400	149	225	28	560	19	2-M50x1,5	815	55	M20x42	110	16	49
225M	4-8	356	83	435	470	311	400	149	225	28	560	19	2-M50x1,5	845	60	M20x42	140	18	53
250M	2	406	88	490	510	349	450	168	250	30	615	24	2-M63x1,5	910	60	M20x42	140	18	53
250M	4-8	406	88	490	510	349	450	168	250	30	615	24	2-M63x1,5	910	65	M20x42	140	18	58
280S	2	457	93	550	547	368	490	190	280	35	680	24	2-M63x1,5	985	65	M20x42	140	18	58
280S	4-8	457	93	550	547	368	490	190	280	35	680	24	2-M63x1,5	985	75	M20x42	140	20	67,5
280M	2	457	93	550	547	419	540	190	280	35	680	24	2-M63x1,5	1035	65	M20x42	140	18	58
280M	4-8	457	93	550	547	419	540	190	280	35	680	24	2-M63x1,5	1035	75	M20x42	140	20	67,5
315S	2	508	120	635	645	406	575	216	315	45	845	28	2-M63x1,5	1185	65	M20x42	140	18	58
315S	4-8	508	120	635	645	406	575	216	315	45	845	28	2-M63x1,5	1215	80	M20x42	170	22	71
315M	2	508	120	635	645	457	685	216	315	45	845	28	2-M63x1,5	1295	65	M20x42	140	18	58
315M	4-8	508	120	635	645	457	685	216	315	45	845	28	2-M63x1,5	1325	80	M20x42	170	22	71
315L	2	508	120	635	645	508	685	216	315	45	845	28	2-M63x1,5	1295	65	M20x42	140	18	58
315L	4-8	508	120	635	645	508	685	216	315	45	845	28	2-M63x1,5	1325	80	M20x42	170	22	71
355M	2	610	120	730	710	560	750	254	355	52	1010	28	2-M63x1,5	1500	75	M24x50	140	20	67,5
355M	4-8	610	120	730	710	560	750	254	355	52	1010	28	2-M63x1,5	1530	100	M24x50	210	28	90
355L	2	610	120	730	710	630	750	254	355	52	1010	28	2-M63x1,5	1500	75	M24x50	140	20	67,5
355L	4-8	610	120	730	710	630	750	254	355	52	1010	28	2-M63x1,5	1530	100	M24x50	210	28	90

Tolerancias extremo de eje: Hasta diámetro 48, k6. Resto m6.

IM B5 / IM 3001						
Tamaño	P	N	M	S	T	LA
160	350	250	300	19	5	15
180	350	250	300	19	5	18
200	400	300	350	19	5	18
225	450	350	400	19	5	20
250	550	450	500	19	5	22
280	550	450	500	19	5	22
315	660	550	600	24	6	24
355	800	680	740	24	6	24



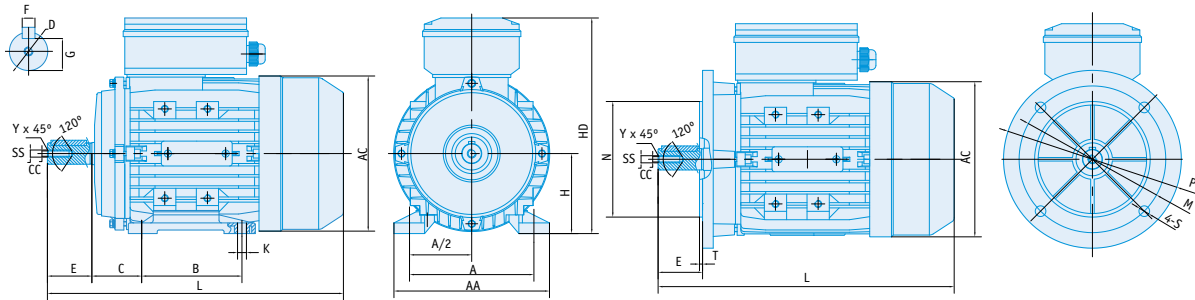
Tamaños 160, 180 y 200, 4 agujeros a 45°. Resto 8 agujeros a 22,5°.

* Las dimensiones no son vinculantes a las series, para más información consultar. Dimensiones serie EGQ.

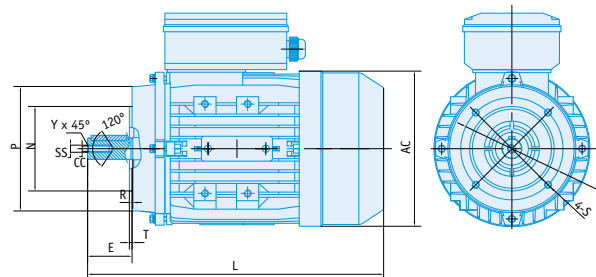
DIMENSIONES

Motores de aluminio serie **MY**

Formas constructivas B3 - B5 - B5R - B14 - B14G



IM B3 / IM 1001										Extremo eje Tolerancia k6					IM B5 / IM 3001 4 agujeros a 45°				
Tamaño	A	AA	AC	B	C	H	HD	K	L	D	SS	E	F	G	M	N	P	S	T
56	90	110	117	71	36	56	144	5,8x8,8	196	9	M3	20	3	7,2	100	80	120	7	3,0
63	100	120	130	80	40	63	181	7x10	220	11	M4	23	4	8,5	115	95	140	10	3,0
71	112	132	147	90	45	71	196	7x10	255	14	M5	30	5	11	130	110	160	10	3,5
80	125	160	163	100	50	80	226	10x13	290	19	M6	40	6	15,5	165	130	200	12	3,5
90S	140	175	183	100	56	90	243	10x13	312	24	M8	50	8	20	165	130	200	12	3,5
90L	140	175	183	125	56	90	243	10x13	367	24	M8	50	8	20	165	130	200	12	3,5
100	160	198	205	140	63	100	265	12x15	387	28	M10	60	8	24	215	180	250	15	4,0



IM B5R 4 agujeros a 45°					
Tamaño	M	N	P	S	T
56	NO DISPONIBLE				
63	NO DISPONIBLE				
71	115	95	140	10	3,0
80	130	110	160	12	3,5
90	130	110	160	12	3,5
100	165	130	200	15	3,5

IM B14 / IM 3601 4 agujeros a 45°					
Tamaño	M	N	P	S	T
56	65	50	80	M5	2,5
63	75	60	90	M5	2,5
71	85	70	105	M6	2,5
80	100	80	120	M6	3,0
90	115	95	140	M8	3,0
100	130	110	160	M8	3,5

IM B14G / IM 3601 G 4 agujeros a 45°					
Tamaño	M	N	P	S	T
56	NO DISPONIBLE				
63	100	80	120	M6	2,5
71	115	95	140	M8	3,0
80	130	110	160	M8	3,5
90	130	110	160	M8	3,5
100	165	130	200	M10	3,5

* Las dimensiones no son vinculantes a las series, para más información consultar. Dimensiones serie MY.

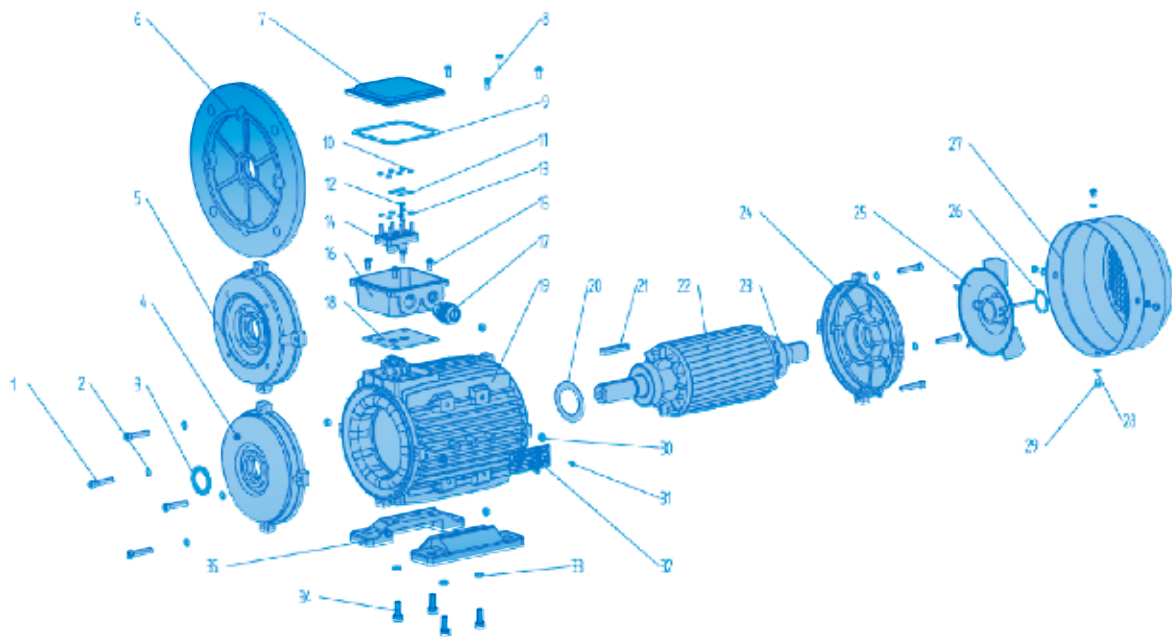
PIEZAS DE REPUESTO



Motores de aluminio

PIEZAS DE REPUESTO

Motor de aluminio serie **MS**, tamaños 56-160.



- | | |
|---------------------------------------|--------------------------------------|
| 1 Tornillo fijación escudo delantero | 19 Estator (carcasa) |
| 2 Arandela grower | 20 Arandela ondulada |
| 3 Retén | 21 Chaveta |
| 4 Escudo delantero | 22 Rotor + eje |
| 5 Brida B14 | 23 Rodamiento |
| 6 Brida B5 | 24 Escudo trasero |
| 7 Tapa caja de bornes | 25 Ventilador |
| 8 Tornillo fijación tapa caja bornes | 26 Circlip |
| 9 Junta plana tapa caja de bornes | 27 Tapa ventilador |
| 10 Tuerca placa bornes | 28 Arandela grower |
| 11 Puentes | 29 Tornillo fijación tapa ventilador |
| 12 Tornillo fijación placa de bornes | 30 Tuerca fijación escudo trasero |
| 13 Arandela plana | 31 Remache |
| 14 Placa de bornes | 32 Placa de características |
| 15 Tornillo fijación base caja bornes | 33 Arandela grower |
| 16 Base caja de bornes | 34 Tornillo fijación patas |
| 17 Prensa estopas | 35 Patas |
| 18 Junta plana base caja de bornes | |

* Las piezas de recambio no son vinculantes a las series, para más información consultar. Piezas series MS.

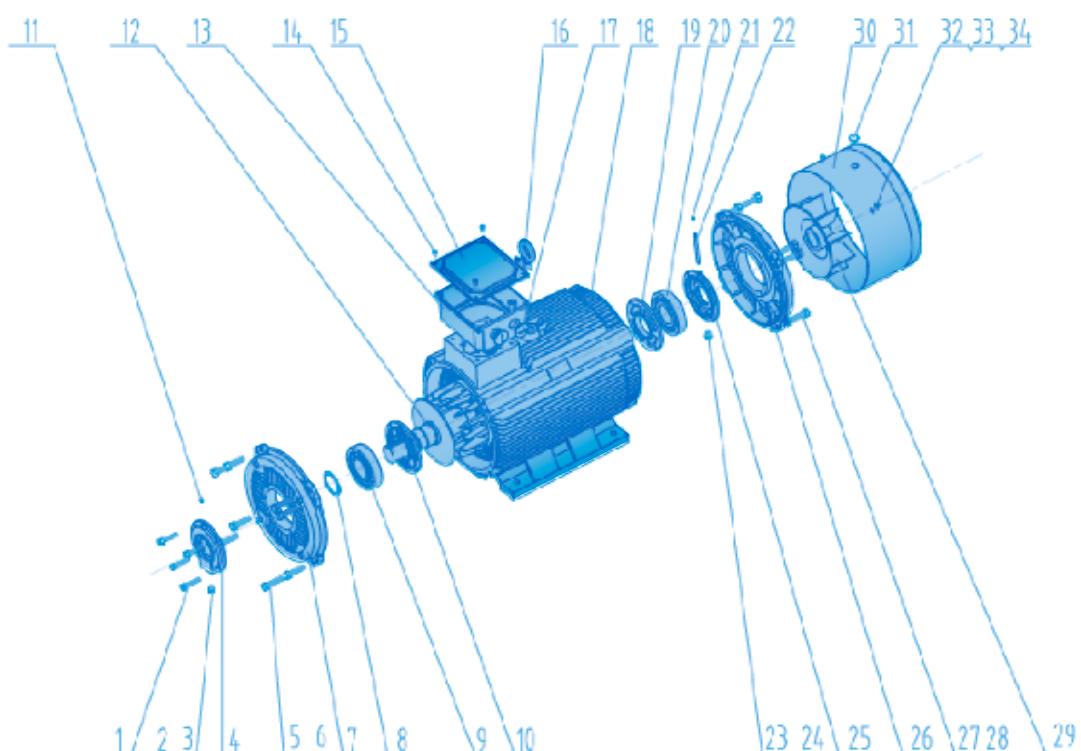
PIEZAS DE REPUESTO



Motores de fundición

PIEZAS DE REPUESTO

Motor de fundición serie **EG**, tamaños 160-355.



- 1 Tornillo fijación tapetas rodamiento lado eje
- 2 Tapón engrasador
- 3 Arandela
- 4 Tapeta exterior rodamiento lado eje
- 5 Tornillo fijación escudo lado eje
- 6 Arandela grower
- 7 Escudo lado eje
- 8 Circlip
- 9 Rodamiento lado eje
- 10 Tapeta interior rodamiento lado eje
- 11 Engrasador
- 12 Rotor + eje
- 13 Base caja de bornes
- 14 Tornillo fijación tapa caja de bornes
- 15 Tapa caja de bornes
- 16 Cáncamo
- 17 Prensa estopas

- 18 Estator (carcasa)
- 19 Tapeta interior rodamiento lado ventilador
- 20 Rodamiento lado ventilador
- 21 Engrasador
- 22 Tubo engrase
- 23 Tapón engrasador
- 24 Arandela
- 25 Tapeta exterior rodamiento lado ventilador
- 26 Escudo lado ventilador
- 27 Tornillo fijación escudo lado ventilador
- 28 Arandela grower
- 29 Ventilador
- 30 Tapa ventilador
- 31 Tapón
- 32 Tornillo fijación tapa ventilador
- 33 Arandela plana
- 34 Arandela grower

* Las piezas de recambio no son vinculantes a las series, para más información consultar. Piezas series EG.

GARANTÍAS, DEVOLUCIONES Y RECLAMACIONES



GARANTÍAS

- **COSGRA** garantiza los motores que suministra en lo referente a defectos de materiales o de fabricación por un periodo de un año contando a partir de la fecha de envío, tomando como fecha válida la indicada en el albarán de entrega. Salvo acuerdo específico en la oferta o en la aceptación del pedido.
- Las reparaciones se entienden en las instalaciones de **COSGRA** corriendo a cargo del Comprador los desmontajes, embalajes, transportes, aduanas, tasas, etc., originados por el envío del material a las instalaciones de **COSGRA** y su posterior entrega al Comprador.
- **COSGRA** podrá acordar con el Comprador la realización de las reparaciones o sustituciones de las piezas defectuosas en las instalaciones del Comprador. **COSGRA** no asumirá las reparaciones efectuadas por terceros.
- La garantía consiste en la reparación o sustitución de las piezas defectuosas, bien por defectos del material o de fabricación. Si es de aplicación se sustituye el motor defectuoso completo por uno de nuevo y los portes de llegada y reexpedición.
- La reparación o sustitución de una pieza defectuosa no varía la fecha de inicio del periodo de garantía del material suministrado. No obstante, la pieza reemplazada o reparada tendrá un año de garantía a partir de su reparación o sustitución.
- Quedan excluidos de la garantía los daños o efectos debidos al desgaste por el uso normal del material, así como los daños y defectos producidos por una puesta en marcha incorrecta, una conservación o mantenimiento inadecuados, almacenamiento o manejo erróneo, modificaciones introducidas sin el consentimiento, por escrito, de **COSGRA** y en general por causas no imputables a **COSGRA**.
- A todo lo expuesto en los apartados anteriores, **COSGRA** no será responsable de los defectos en los motores y materiales suministrados por un plazo superior a un año a partir de la fecha de envío.
- **COSGRA** no será responsable en ningún caso de los daños indirectos y/o consecuenciales que pudiesen sobrevenir como consecuencia del suministro; pérdida de producción, averías o coste de paradas, etc.
- La responsabilidad total contractual de **COSGRA** derivada del suministro queda limitada al valor del suministro que ha originado la reclamación. Dicha limitación no será aplicable a la responsabilidad por daños directos a personas y propiedades.
- Es de exclusiva responsabilidad y cuidado del Comprador o usuario final el buen funcionamiento, o conservación, o mantenimiento del material suministrado.

DEVOLUCIONES. RECLAMACIONES.

- **COSGRA** no admitirá devoluciones de materiales sin previo acuerdo al respecto con el Comprador. Se establece un plazo de 15 días desde que el suministro ha sido recibido por el Comprador, para que este notifique a **COSGRA** su intención de realizar una devolución y la justificación de la misma, y acuerde con **COSGRA**, en su caso, el procedimiento de la devolución. En cualquier caso las reclamaciones del Comprador a **COSGRA** deberán realizarse por escrito y de forma fehaciente.
- Las devoluciones o envíos de material a las instalaciones de **COSGRA**, ya sea para su abono, sustitución o reparación deberán hacerse siempre a portes pagados.
- **COSGRA** no admitirá devoluciones de materiales que hayan sido utilizados, montados en otros equipos o instalaciones, o sujetos a desmontajes ajenos a **COSGRA**.
- **COSGRA** no admitirá devoluciones de productos diseñados o fabricados especialmente para el pedido.





MOTORES ELÉCTRICOS, CA

Monofásicos | Trifásicos | Autofrenantes | Antiexplosivos | Antideflagrantes | Velocidad variable

CIERRES MECÁNICOS PARA EJES ROTATIVOS

Ctra. de Banyoles a Figueres, Km 9 _ Telfs. +34 902 405 205 - +34 972 597 807 _ Fax +34 972 597 233

www.cosgra.com _ comercial@cosgra.com _ 17832 **CRESPIÀ** (Girona) _ SPAIN

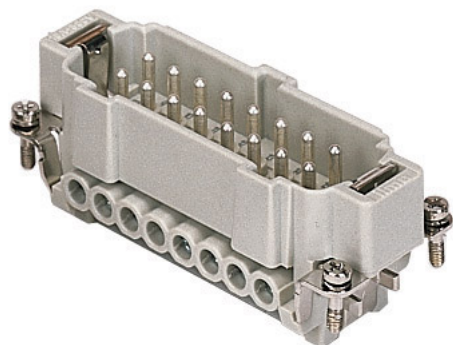
Apartado 100 _ 17820 **BANYOLES** (Girona)



(E) Esponellà Latitud: 42°10'42.6"N Longitud: 2°48'04.9"E Altitud: 120 m.



Product Sheet

Part Number: CNEM 16 T



Family	inserts
Version	screw terminal connections
Series	CNE
Product type	with male contacts
Type	with plate
Model	male insert
Reference standard	EN 61984 (2001-11)
Contact type	silver plated
No. of poles	16 poles + 
Voltage (V)	500V
Current (A)	16A (A.C. and D.C.)
Wire section	0,5mm ² - 2,5mm ²
Awg size	20 - 14
Quality mark	
IP degree of protection	IP20 degree of protection without enclosure; IP65, IP66, IP68 (EN 60529) and IP69K (DIN 40050 - 9) with enclosure
Fixing centre distance	size "77.27"

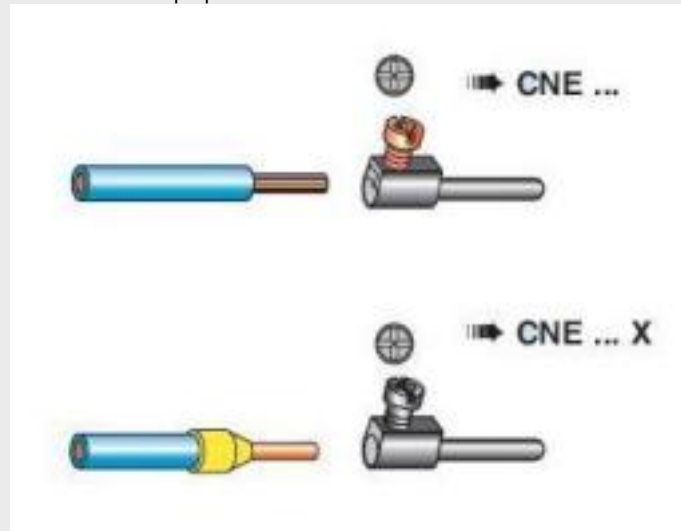
The information and the dimensions contained are not binding and may be changed without prior notice.
The drawing's dimensions are in mm.

Impulse withstand voltage 6kV

Pollution degree 3

Notes

CNE ... : for non-prepared conductors



CNE ... X : for conductors with bush terminal

CNE inserts:

- characteristics according to EN 61984:
(16A 500V 6kV 3)
(16A 400/690V 6kV 2)