



**ENCÓDER LINEAL MODELO: M2**  
***LINEAR ENCODER MODEL: M2***

**MANUAL DE INSTALACIÓN / *INSTALLATION MANUAL***

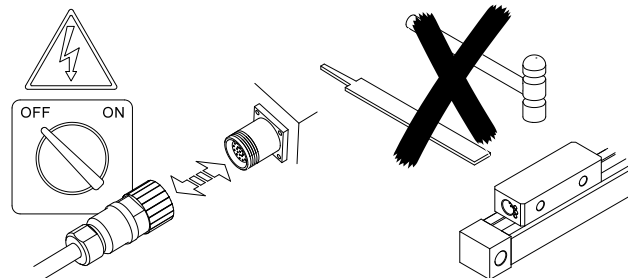
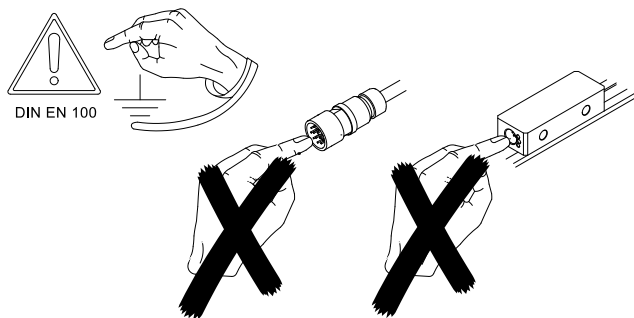
Manual Code: 14460180

Manual Version: 2505

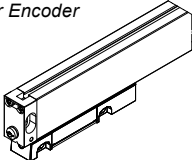
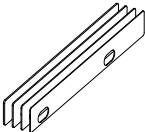
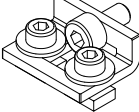




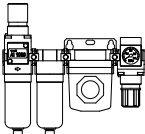
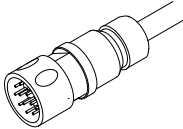
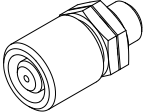
## Precaución / Caution



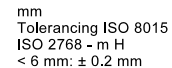
## ELEMENTOS SUMINISTRADOS / SUPPLIED PARTS

|                                                                                                                                                    |                                                                                                                                      |                                                                                                                                                   |                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Instrucciones de montaje<br/><i>Mounting Instructions</i></p>  | <p>IG Encóder lineal<br/><i>Linear Encoder</i></p>  | <p>EL Galgas (calas) de montaje<br/><i>Mounting Gauges</i></p>  | <p>G CM <math>\geq</math> 520 mm<br/>Soporte Intermedio. Ver <a href="#">3)</a><br/><i>Intermediate Support. See <a href="#">3)</a></i></p> <p>SI</p>  |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

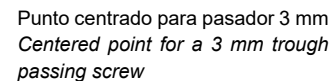
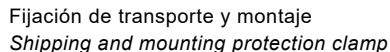
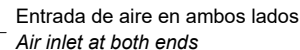
## ACCESORIOS SUMINISTRADOS POR SEPARADO / ACCESSORIES SUPPLIED SEPARATELY

|                                                                                                                                                                                        |                                                                                                                                                   |                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>FA Filtro de aire y accesorios<br/><i>Compressed Air &amp; Accessories</i><br/>Cod.: 02200004</p>  | <p>CA Cables y accesorios<br/><i>Cables and Accessories</i></p>  | <p>RA Racor recto<br/><i>Straight Fitting</i><br/>Cod.: 82620172</p>  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|

## Dimensiones / Dimensions



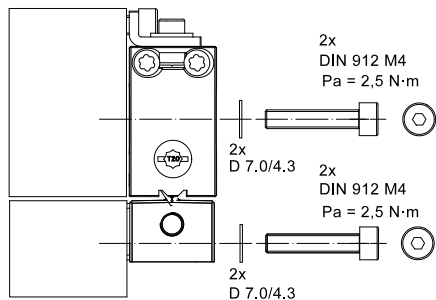
G = Guía máquina / *Machine Guide*



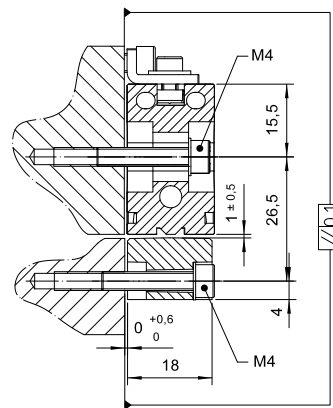
Margen de seguridad en ambos extremos  
Safety clearance at both ends  
(WARNING MRX MODEL = 4)

## Opciones de montaje / Mounting Options

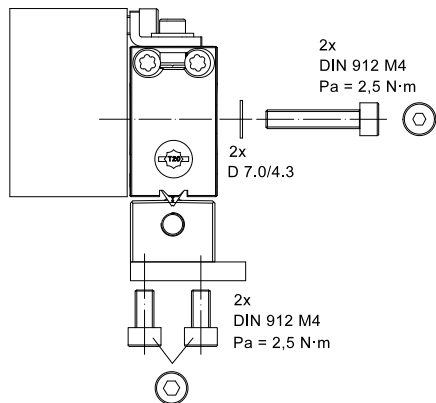
1



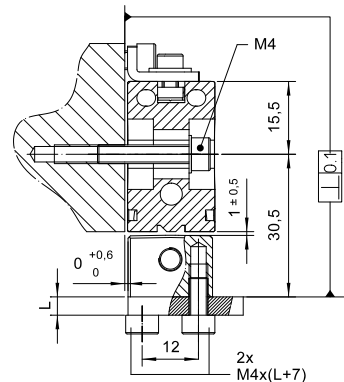
1



2



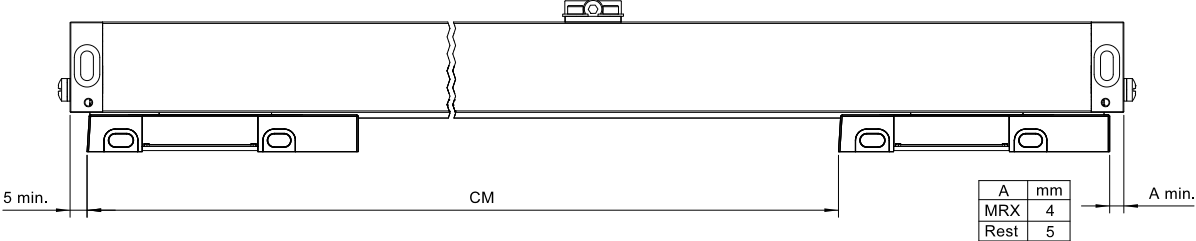
2



Pa = Par de apriete / Tightening Torque

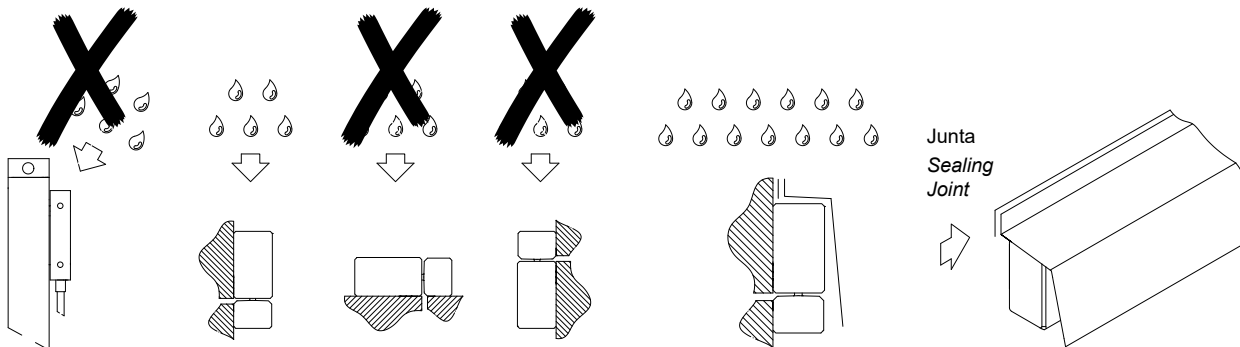
1 2 = Opciones de montaje / Mounting Options

# Tolerancias de montaje / Mounting Tolerances



Seleccionar el montaje de manera que el recorrido máximo del desplazamiento se encuentre dentro del curso de medición CM del encóder lineal.  
*Select the assembly, so that the maximum travel movement is within the CM measuring length of the linear encoder.*

## Condiciones de montaje / Mounting Conditions

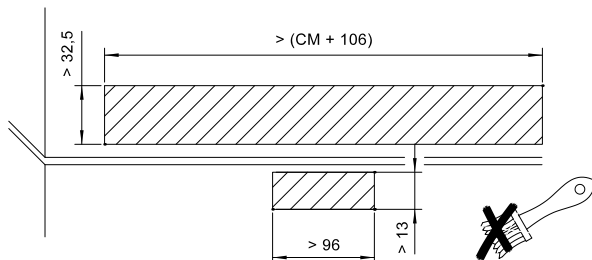


Montar con los labios de estanqueidad no orientados a posibles fuentes de contaminación.

*Assemble using sealing lips that do not face any possible source of contamination.*

En ambientes muy contaminantes conviene proteger el encóder lineal. Utilizar juntas de estanqueidad para evitar filtraciones.

*In very contaminated environments, it is advisable to protect the linear encoder. Use sealing joints to prevent leaks.*



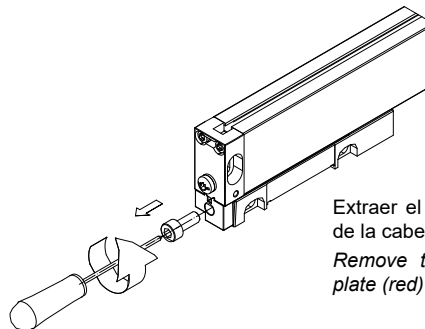
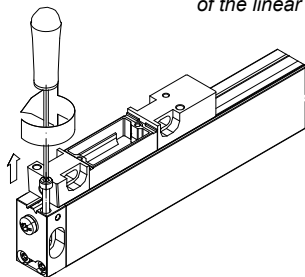
La superficie de montaje estará libre de pintura.

*The mounting surface must be paint free.*

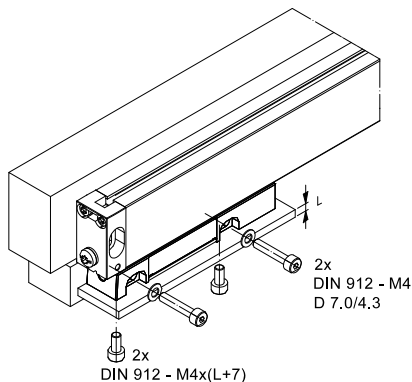


## Montaje / Mounting

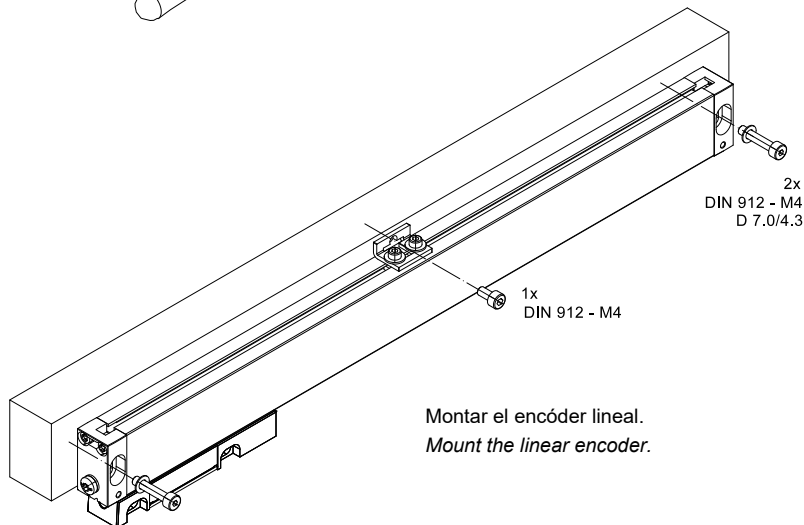
Soltar el tornillo de fijación que se utiliza para el transporte del encóder lineal.  
*Unscrew the shipping protection screw of the linear encoder.*



Extraer el soporte de sujeción (rojo) de la cabeza lectora.  
*Remove the reader head securing plate (red).*

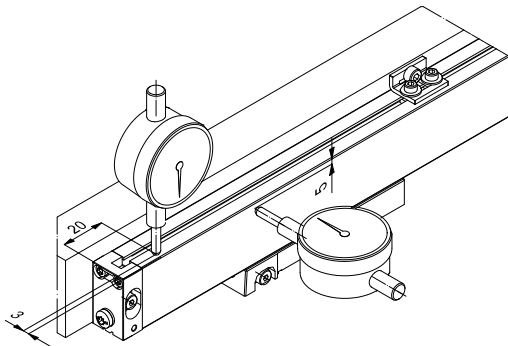


Posibilidades de fijación de la cabeza lectora.  
*Reader head mounting possibilities.*



Montar el encóder lineal.  
*Mount the linear encoder.*

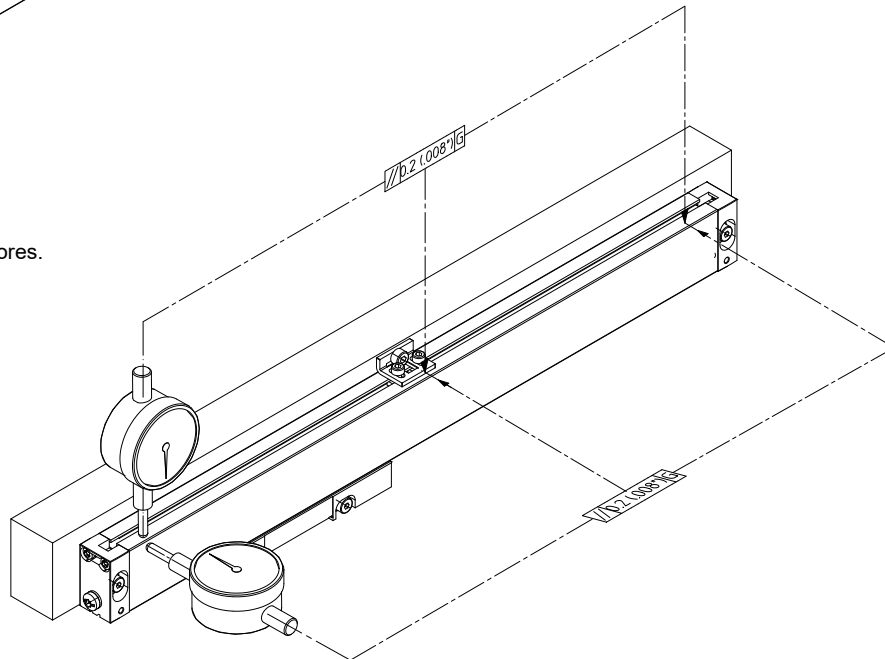




Posicionamiento de los relojes comparadores.  
Positioning of the dial indicators.

Alinear las caras del encóder lineal realizando mediciones en los extremos y en el punto central.

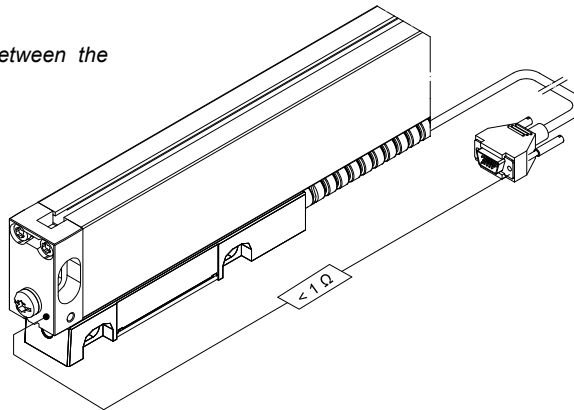
Align the sides of the linear encoder by indicating the ends and the center.



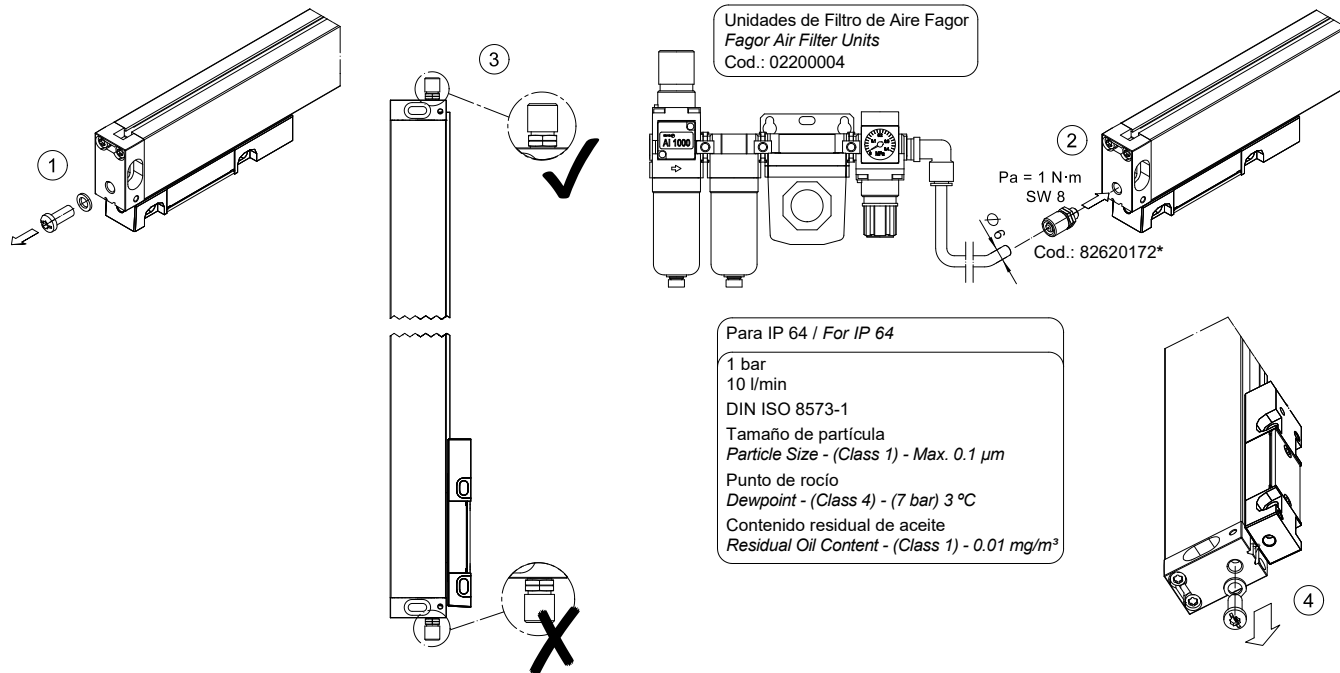
## Conexión a tierra / *Ground Connection*

Conectar el cable de la cabeza lectora y comprobar que la impedancia existente entre el conector del cable y el encóder lineal es inferior a 1  $\Omega$ .

*Connect the reader head cable and verify that the impedance between the connector and the scale is less than 1  $\Omega$ .*



## Conexión del equipo de aire / Connecting Air Equipment



Existe la posibilidad de presurizar el encóder lineal para minimizar la entrada de contaminación desde el exterior. Fagor suministra unidades de aire específicas a tal efecto.

1. Extraer el tornillo del orificio de entrada de aire.
2. Amarrar el racor al orificio de entrada de aire.
3. En montajes verticales no introducir aire por la parte inferior.
4. En instalaciones verticales es conveniente retirar el tornillo inferior de aire que hace de tapón para favorecer el drenaje.

\* Material exclusivo suministrado por Fagor. Código indicado para realizar pedido de unidades adicionales.

You can pressurize the linear encoder to reduce any contamination from entering from the outside. Fagor supplies specific air units for this purpose.

1. Remove the screw from where the air is going to enter.
2. Fasten the air inlet.
3. For vertical assemblies, do not run air through the bottom.
4. For vertical installations, it is advisable to remove the lower air screw to allow for drainage.

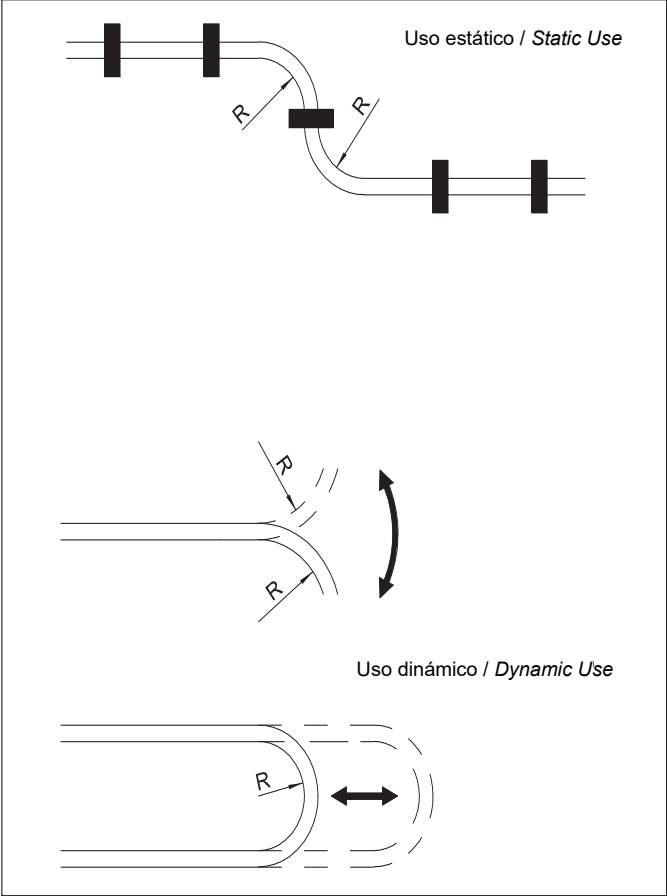
\* Exclusive material supplied by Fagor. Code shown for ordering additional units.

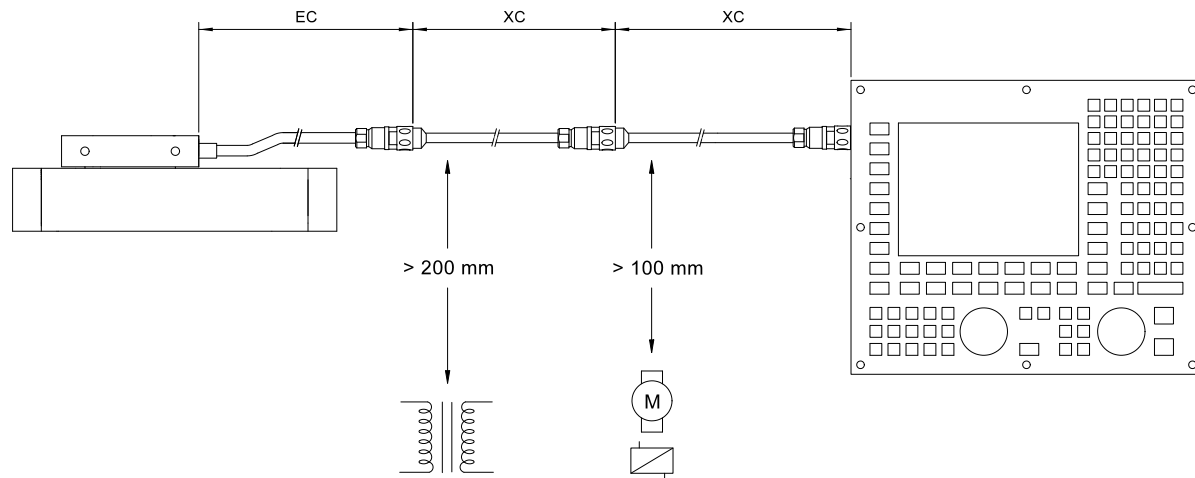
Características eléctricas / *Electrical Characteristics*

|                                                               | M2X / M2RX                                            | M2Y    | M2P                                                    |
|---------------------------------------------------------------|-------------------------------------------------------|--------|--------------------------------------------------------|
| Alimentación / <i>Power Supply</i>                            | 5 (1 ± 5 %) V<br>< 150 mA<br>(sin carga/without load) |        | 5 (1 ± 10 %) V<br>< 150 mA<br>(sin carga/without load) |
| Periodo señal incremental<br><i>Incremental Signal Period</i> | 4 µm                                                  | 2 µm   | 20 µm                                                  |
| Resolución / <i>Resolution</i>                                | 1 µm                                                  | 0,5 µm | hasta / <i>up to</i><br>0,1 µm                         |
| Longitud del cable / <i>Cable Length</i>                      | 50 m / 164 ft                                         |        | 150 m / 492 ft                                         |

Radio de curvatura del cable / *Cable Bending Radius*

| Diámetro exterior<br><i>Outside Diameter</i>       | Estático<br><i>Static</i> | Dinámico<br><i>Dynamic</i> |
|----------------------------------------------------|---------------------------|----------------------------|
| Ø 6 mm                                             | > 24 mm                   | > 60 mm                    |
| Ø 10 mm<br>con protección / <i>with protection</i> | > 35 mm                   | > 60 mm                    |
| Ø 8 mm                                             | > 50 mm                   | > 80 mm                    |





## Cables para conexión de encoders incrementales Fagor

### Cables for connection of Fagor Incremental Encoders

#### Sistemas Fagor / Fagor Systems

Conexión directa cable EC / *Direct connection EC Cable*

**EC-P-D** Longitud / *Length* = 1, 3, 6, 9, 12 m

|                                                                   |                                                                                            |                                                                  |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Conexión con alargadera<br><i>Connection with extension cable</i> | (4 x 2 x 0.14 mm <sup>2</sup> + 4 x 0.5 mm <sup>2</sup> )                                  |                                                                  |
| Cable EC / <i>EC Cable</i>                                        | Alargadera intermedia opcional XCint<br><i>Intermediate extension cable optional XCint</i> | Alargadera XC<br><i>Extension cable XC</i>                       |
| <b>EC-A-C1</b><br>Longitud / <i>Length</i> = 1, 3 m               | <b>XC-C2-C1</b><br>Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m                          | <b>XC-C2-D</b><br>Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m |

#### Sistemas Fanuc / Fanuc Systems

Conexión directa cable EC / *Direct connection EC Cable*

**EC-C-FN1** Longitud / *Length* = 1, 3, 6, 9, 12 m

|                                                                   |                                                                                            |                                                                    |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Conexión con alargadera<br><i>Connection with extension cable</i> | (4 x 2 x 0.14 mm <sup>2</sup> + 4 x 0.5 mm <sup>2</sup> )                                  |                                                                    |
| Cable EC / <i>EC Cable</i>                                        | Alargadera intermedia opcional XCint<br><i>Intermediate extension cable optional XCint</i> | Alargadera XC<br><i>Extension cable XC</i>                         |
| <b>EC-A-C1</b><br>Longitud / <i>Length</i> = 1, 3 m               | <b>XC-C2-C1</b><br>Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m                          | <b>XC-C2-FN1</b><br>Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m |

#### Sistemas Siemens, Heidenhain, Selca / Siemens, Heidenhain, Selca Systems

Conexión directa cable EC / *Direct connection EC Cable*

**EC-AS-H** Longitud / *Length* = 1, 3, 6, 9, 12 m

|                                                                   |                                                                                            |                                                                  |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Conexión con alargadera<br><i>Connection with extension cable</i> | (4 x 2 x 0.14 mm <sup>2</sup> + 4 x 0.5 mm <sup>2</sup> )                                  |                                                                  |
| Cable EC / <i>EC Cable</i>                                        | Alargadera intermedia opcional XCint<br><i>Intermediate extension cable optional XCint</i> | Alargadera XC<br><i>Extension cable XC</i>                       |
| <b>EC-A-C1</b><br>Longitud / <i>Length</i> = 1, 3 m               | <b>XC-C2-C1</b><br>Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m                          | <b>XC-C2-H</b><br>Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m |

## Sistemas Siemens Solution Line / Siemens Solution Line Systems

**SME 20** sólo 1 Vpp / *only 1 Vpp*

**SMC 20** sólo 1 Vpp / *only 1 Vpp*

**SMC 30** sólo TTL diferencial / *only differential TTL*

Conexión directa cable EC / *Direct connection EC Cable*

**SME 20 EC-A-C5** Longitud / *Length* = 1, 3, 6, 9, 12 m

**SMC 20 EC-P-S3** Longitud / *Length* = 1, 3, 6, 9, 12 m

**SMC 30 EC-P-S2** Longitud / *Length* = 1, 3, 6, 9, 12 m

|                                                                   |                                                                                            |                                                                |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Conexión con alargadera<br><i>Connection with extension cable</i> | (4 x 2 x 0.14 mm <sup>2</sup> + 4 x 0.5 mm <sup>2</sup> )                                  |                                                                |
| Cable EC / <i>EC Cable</i>                                        | Alargadera intermedia opcional XCint<br><i>Intermediate extension cable optional XCint</i> | Alargadera XC<br><i>Extension cable XC</i>                     |
| <b>SME 20 EC-A-C5</b> Longitud / <i>Length</i> = 1, 3 m           | <b>XC-C4-C5</b> Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m                             | <b>XC-C4-C5</b> Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m |
| <b>SMC 20 EC-A-C5</b> Longitud / <i>Length</i> = 1, 3 m           | <b>XC-C4-C5</b> Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m                             | <b>XC-C4-S3</b> Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m |
| <b>SMC 30 EC-A-C5</b> Longitud / <i>Length</i> = 1, 3 m           | <b>XC-C4-C5</b> Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m                             | <b>XC-C4-S2</b> Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m |

## Otros sistemas (sin conector terminal) / Other Systems (without terminal connector)

Conexión directa cable EC / *Direct connection EC Cable*

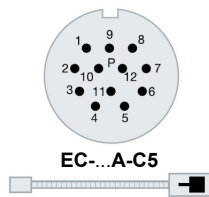
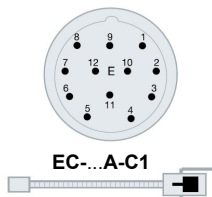
**EC-AS-O** Longitud / *Length* = 1, 3, 6, 9, 12 m

**EC-P-O** Longitud / *Length* = 1, 3, 6, 9, 12 m

|                                                                   |                                                                                            |                                                                  |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Conexión con alargadera<br><i>Connection with extension cable</i> | (4 x 2 x 0.14 mm <sup>2</sup> + 4 x 0.5 mm <sup>2</sup> )                                  |                                                                  |
| Cable EC / <i>EC Cable</i>                                        | Alargadera intermedia opcional XCint<br><i>Intermediate extension cable optional XCint</i> | Alargadera XC<br><i>Extension cable XC</i>                       |
| <b>EC-A-C1</b><br>Longitud / <i>Length</i> = 1, 3 m               | <b>XC-C2-C1</b><br>Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m                          | <b>XC-C2-O</b><br>Longitud / <i>Length</i> = 5, 10, 15, 20, 25 m |



| EC-...A-C1<br>EC-...A-C5 | Conector M23 12 macho / 12-pin Male M23 Connector |                    |              |             |              |              |                   |                 |                |                 |               |                    |
|--------------------------|---------------------------------------------------|--------------------|--------------|-------------|--------------|--------------|-------------------|-----------------|----------------|-----------------|---------------|--------------------|
| PIN                      | 5                                                 | 6                  | 8            | 1           | 3            | 4            | 7                 | 12              | 2              | 10              | 11            | Carcasa<br>Housing |
| SEÑAL<br>SIGNAL          | A                                                 | /A                 | B            | /B          | Io           | /Io          | /Alarm            | +5 V            | +5 V<br>sensor | 0 V             | 0 V<br>sensor | Tierra<br>Ground   |
| COLOR                    | Verde<br>Green                                    | Amarillo<br>Yellow | Azul<br>Blue | Rojo<br>Red | Gris<br>Grey | Rosa<br>Pink | Violeta<br>Purple | Marrón<br>Brown |                | Blanco<br>White |               | Malla<br>Shield    |



| EC-...AS-O      | Sin conector / Without Connector |                    |              |             |              |              |                 |                   |                 |                |                  |
|-----------------|----------------------------------|--------------------|--------------|-------------|--------------|--------------|-----------------|-------------------|-----------------|----------------|------------------|
| SEÑAL<br>SIGNAL | A                                | /A                 | B            | /B          | Io           | /Io          | +5 V            | +5 V<br>sensor    | 0 V             | 0 V<br>sensor  | Tierra<br>Ground |
| COLOR           | Verde<br>Green                   | Amarillo<br>Yellow | Azul<br>Blue | Rojo<br>Red | Gris<br>Grey | Rosa<br>Pink | Marrón<br>Brown | Violeta<br>Purple | Blanco<br>White | Negro<br>Black | Malla<br>Shield  |

| EC-...P-O       | Sin conector / Without Connector |                    |              |             |              |              |                 |                 |                  |
|-----------------|----------------------------------|--------------------|--------------|-------------|--------------|--------------|-----------------|-----------------|------------------|
| SEÑAL<br>SIGNAL | A                                | /A                 | B            | /B          | Io           | /Io          | +5 V            | 0 V             | Tierra<br>Ground |
| COLOR           | Verde<br>Green                   | Amarillo<br>Yellow | Azul<br>Blue | Rojo<br>Red | Gris<br>Grey | Rosa<br>Pink | Marrón<br>Brown | Blanco<br>White | Malla<br>Shield  |

| XC-C2-...-O     | Sin conector / Without Connector |                |              |              |             |                |                   |                                           |                                              |                  |
|-----------------|----------------------------------|----------------|--------------|--------------|-------------|----------------|-------------------|-------------------------------------------|----------------------------------------------|------------------|
| SEÑAL<br>SIGNAL | A                                | /A             | B            | /B           | Io          | /Io            | /Alarm            | +5 V                                      | 0 V                                          | Tierra<br>Ground |
| COLOR           | Marrón<br>Brown                  | Verde<br>Green | Gris<br>Grey | Rosa<br>Pink | Rojo<br>Red | Negro<br>Black | Violeta<br>Purple | Marrón-Verde + Azul<br>Brown-Green + Blue | Blanco-Verde + Blanco<br>White-Green + White | Malla<br>Shield  |

## Condiciones de garantía / *Warranty Terms*

Las condiciones de garantía de este producto están disponibles en la zona de descargas del sitio web corporativo de FAGOR.

<http://www.fagorautomation.com>. (Tipo de fichero: Condiciones generales de venta-Garantía).

*The warranty conditions for this product are available in the downloads section of FAGOR's corporate website at <http://www.fagorautomation.com>.*

*(Type of file: General Terms and Conditions of Purchase - Warranty).*

## Declaración de conformidad / *Declaration of Conformity*

La declaración de conformidad de este producto está disponible en la zona de descargas del sitio web corporativo de FAGOR.

<http://www.fagorautomation.com>. (Tipo de fichero: Declaración de conformidad).

*The declaration of conformity for this product is available in the downloads section of FAGOR'S corporate website at <http://www.fagorautomation.com>.*

*(Type of file: Declaration of conformity).*

## Registro de garantía / *Warranty Register*

Para registrar su producto y obtener todas las ventajas del completo servicio postventa de Fagor Automation rellene el formulario disponible en el siguiente enlace: <https://www.fagorautomation.com/servicio/carera-de-servicios/registro-de-producto/>

*To register your product and obtain all the advantages of Fagor Automation's full after-sales service fill out form available at the following link:*

*<https://www.fagorautomation.com/en/customer-service/service-portfolio/product-registration/>*



FAGOR AUTOMATION S. COOP.

Bº San Andrés Nº 19

Apdo de correos 144

20500 Arrasate/Mondragón

- Spain -

Web: [www.fagorautomation.com](http://www.fagorautomation.com)

Email: [contact@fagorautomation.es](mailto:contact@fagorautomation.es)

Tel.: (34) 943 039800

Fax: (34) 943 791712

