

# **FAGOR** **ENCODER HAS-27-D200**

Fagor Automation S. Coop.

Manual code: 14460158

Manual version: 1312



**MANUAL DE INSTALACIÓN  
INSTALLATION MANUAL**

**FAGOR AUTOMATION S. COOP.**

B<sup>a</sup> San Andrés N° 19

Apdo de correos 144

20500 Arrasate/Mondragón

- Spain -

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

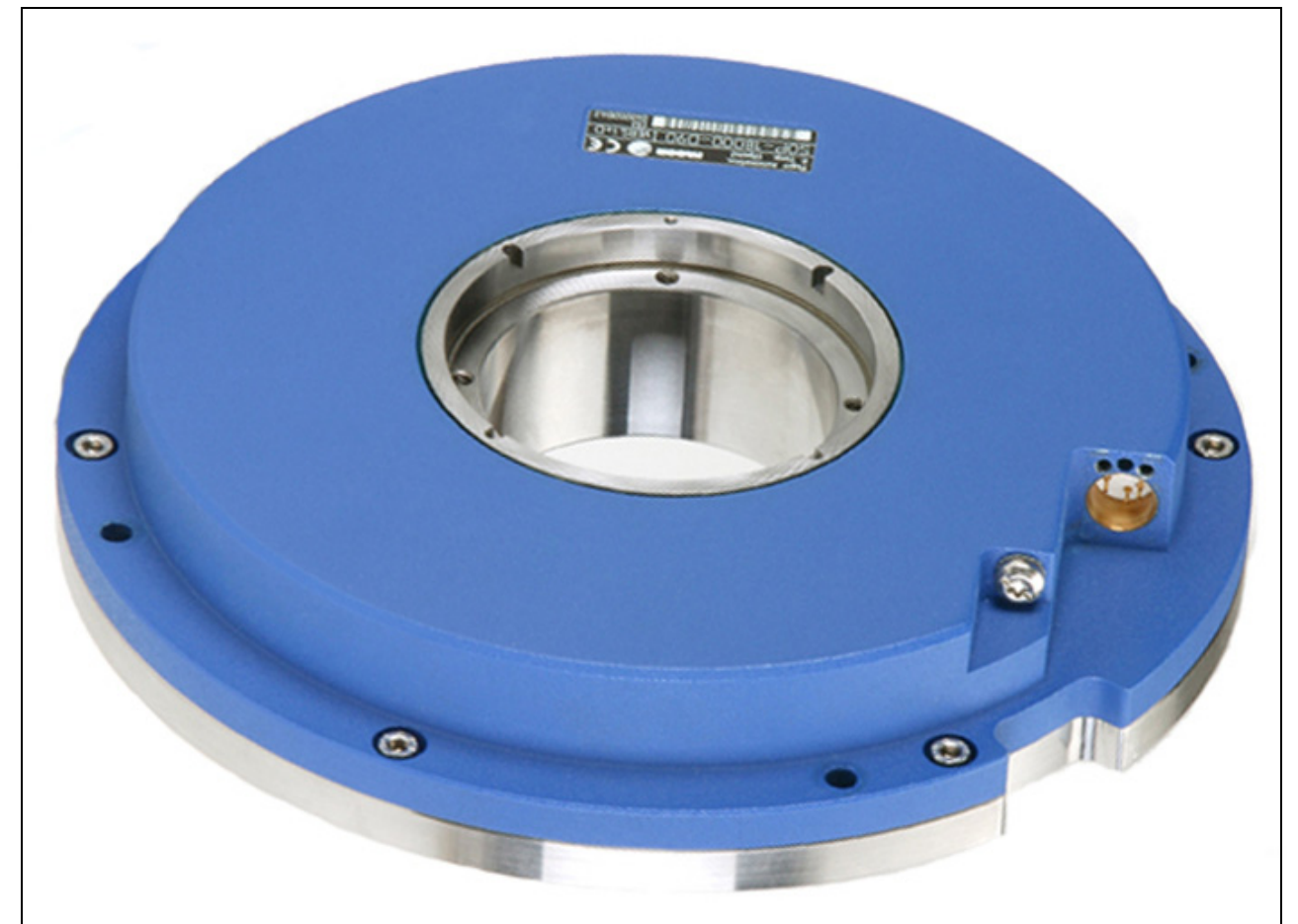
Email: [info@fagorautomation.es](mailto:info@fagorautomation.es)

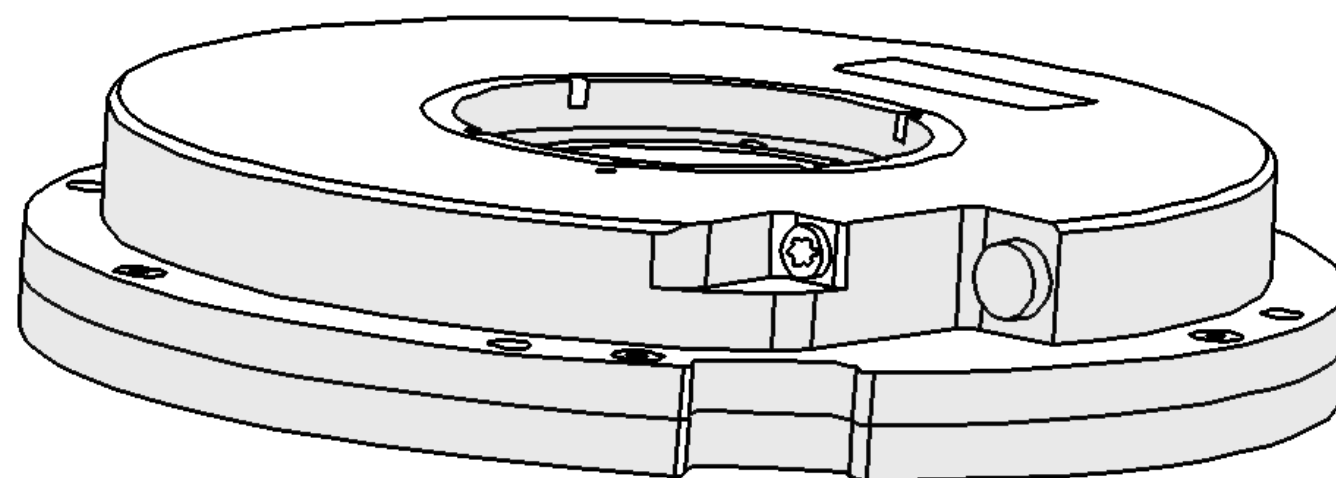
Tel.: (34) 943 719200

Fax: (34) 943 791712



Fagor Automation S. Coop.





MANUAL

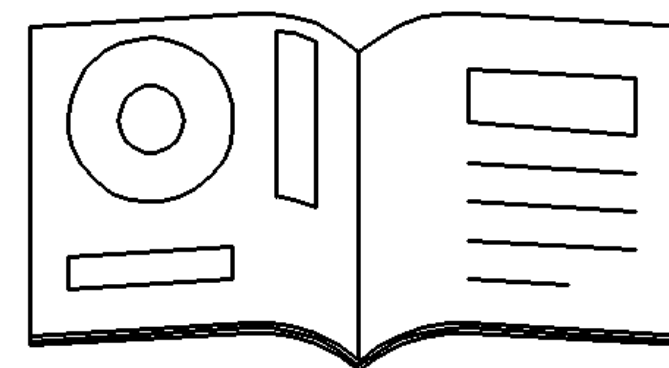
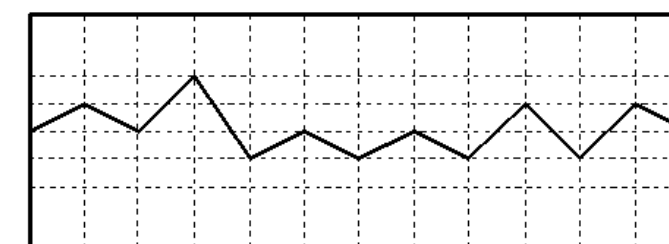
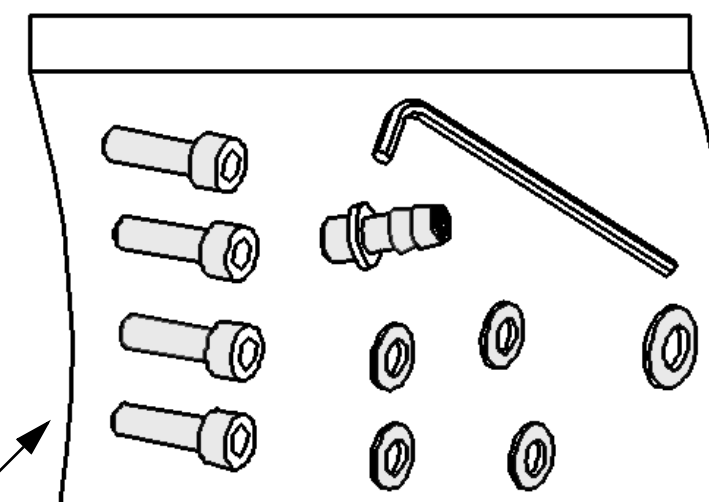


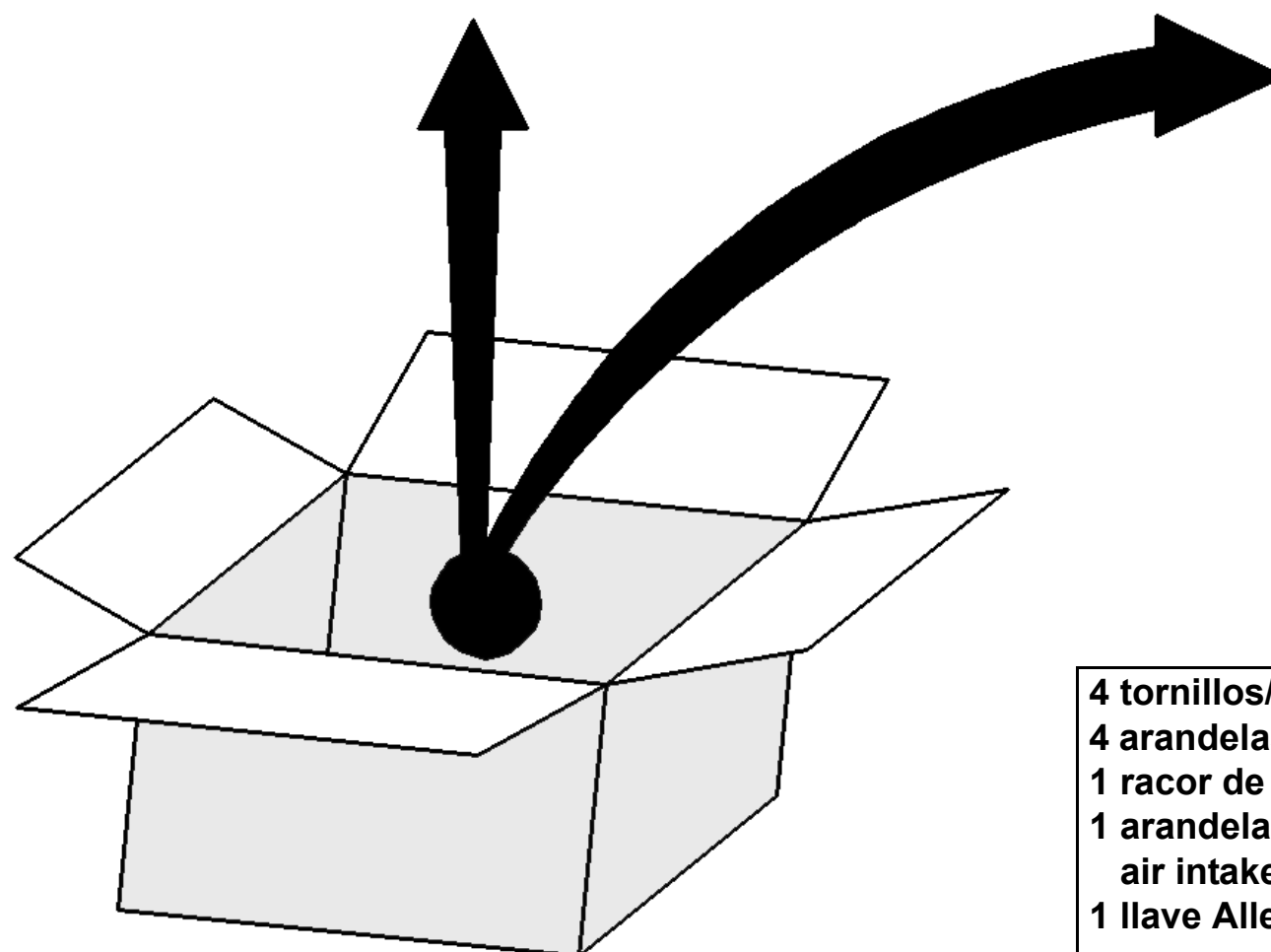
GRÁFICO  
GRAPH



ACCESORIOS  
ACCESSORIES

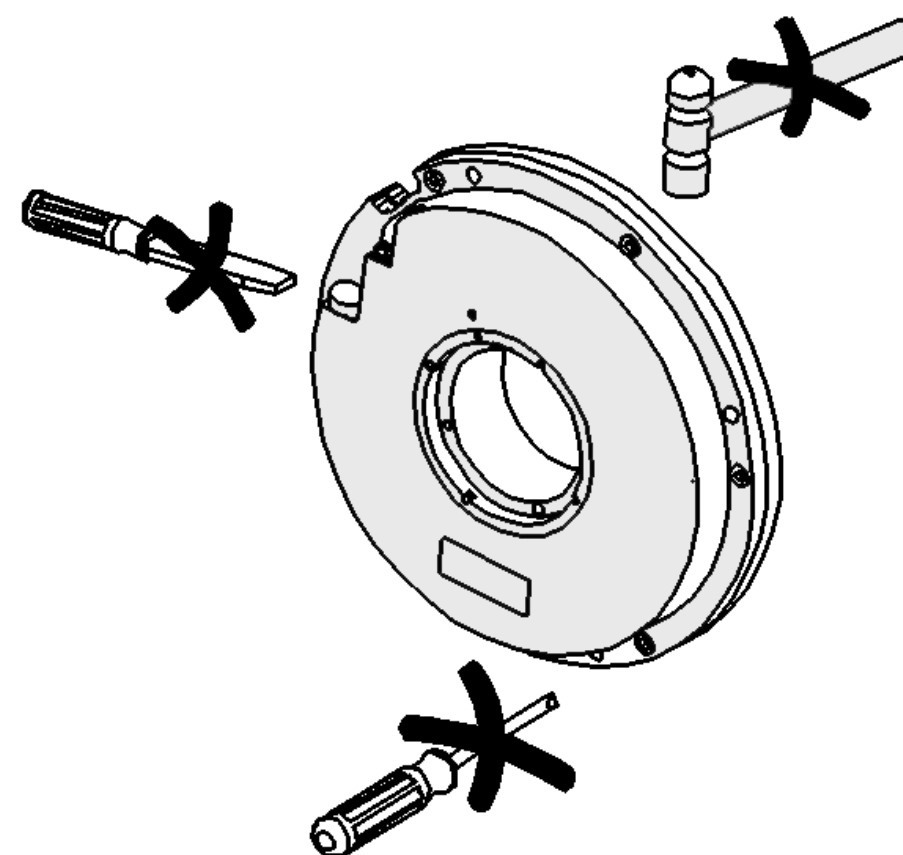
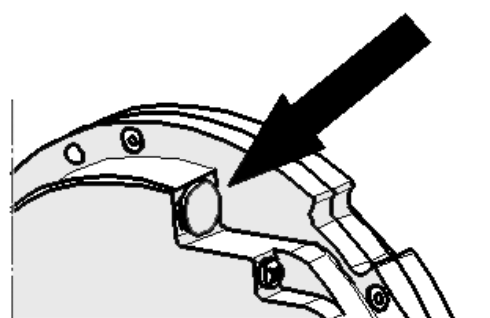
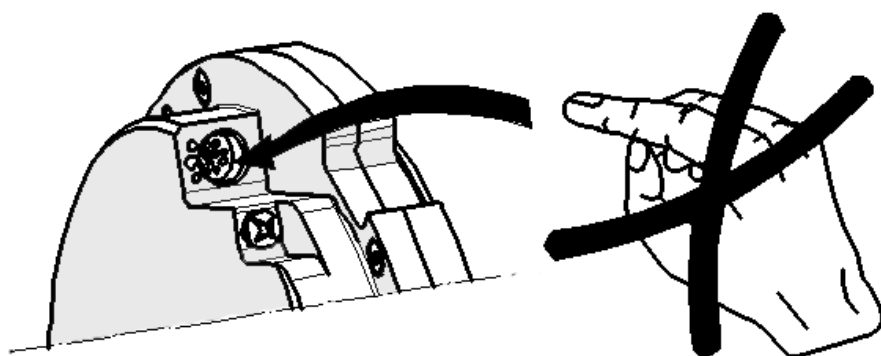
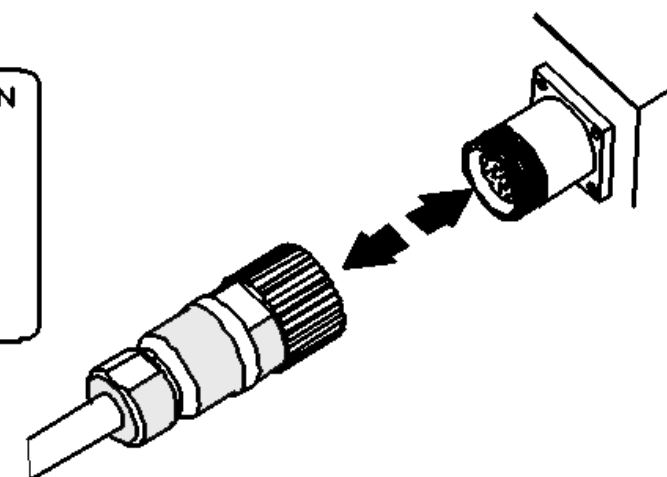
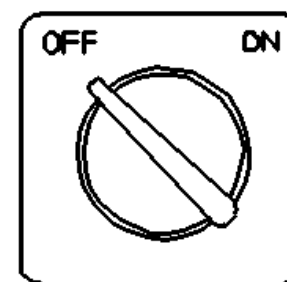
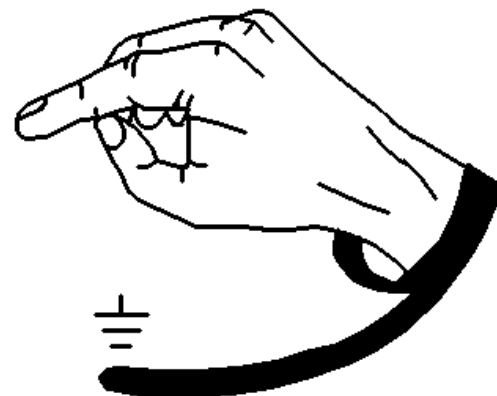


4 tornillos/bolts M5 x 25 DIN 912  
4 arandelas/washers M5 DIN 125  
1 racor de aire / air intake  
1 arandela racor de aire /  
air intake washer  
1 llave Allen / Allen wrench

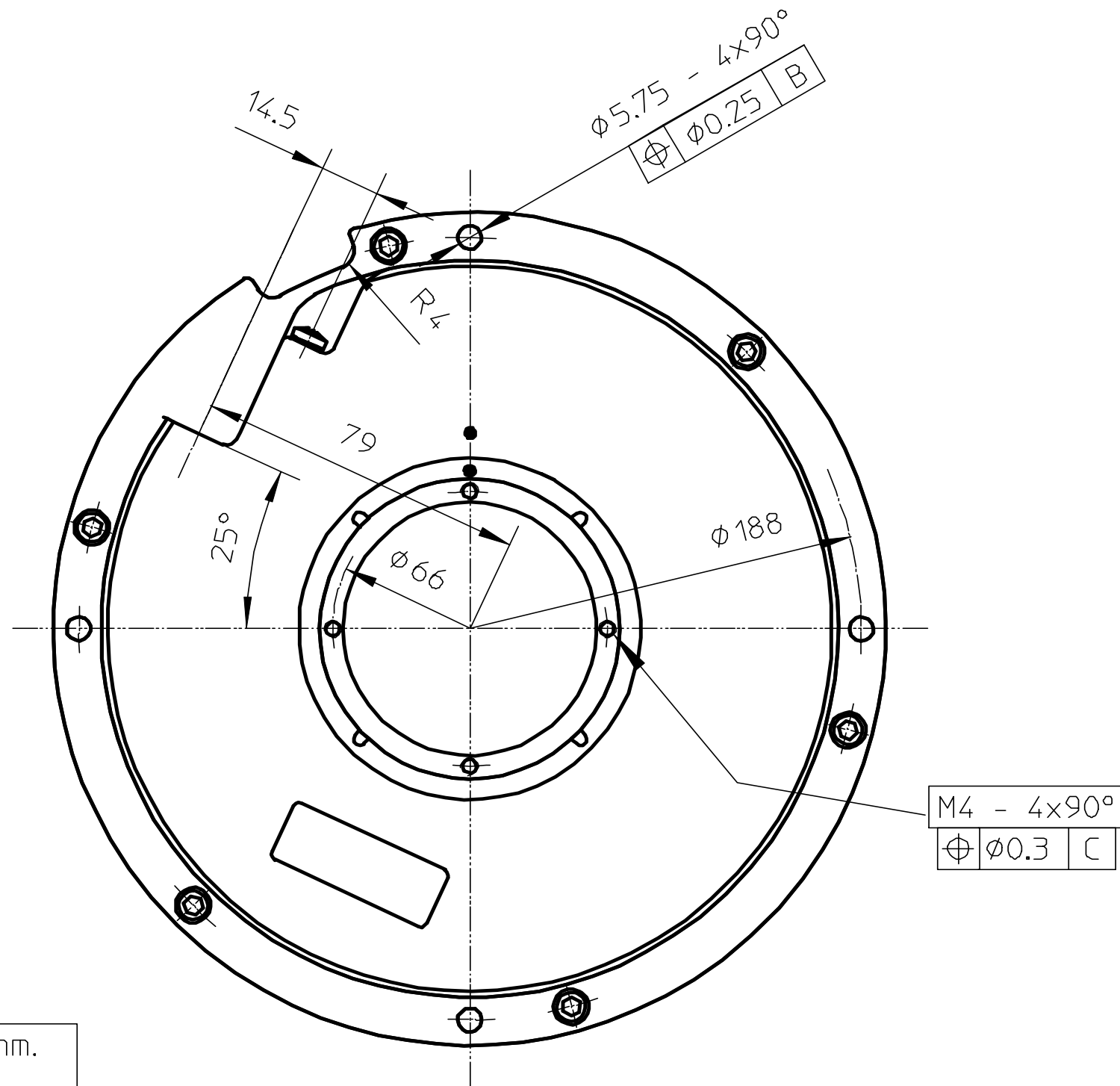




DIN EN 100



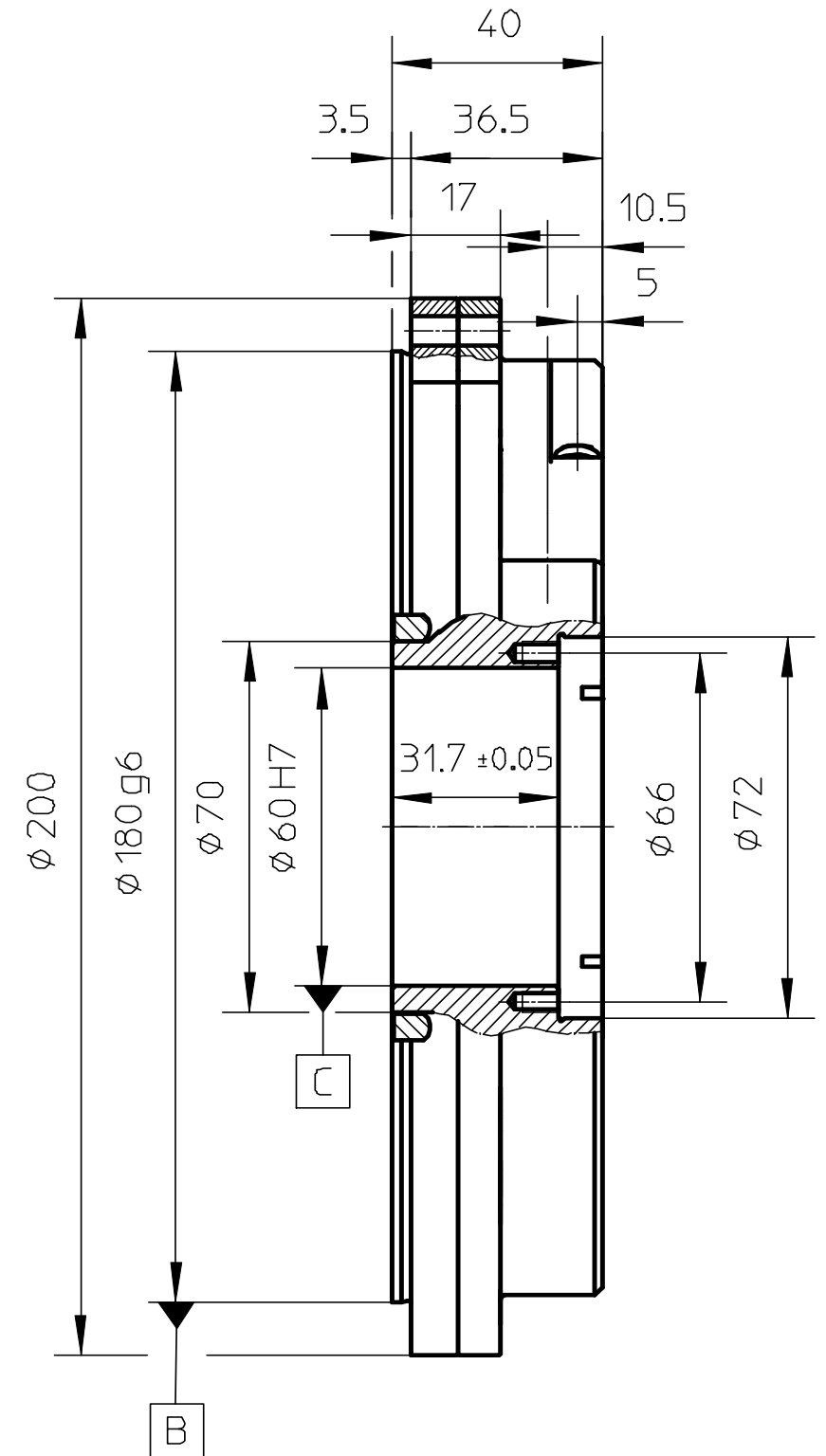
## GENERAL DIMENSIONS



Dimensions in mm.



Tolerance ISO 8015  
ISO 2768 - m H

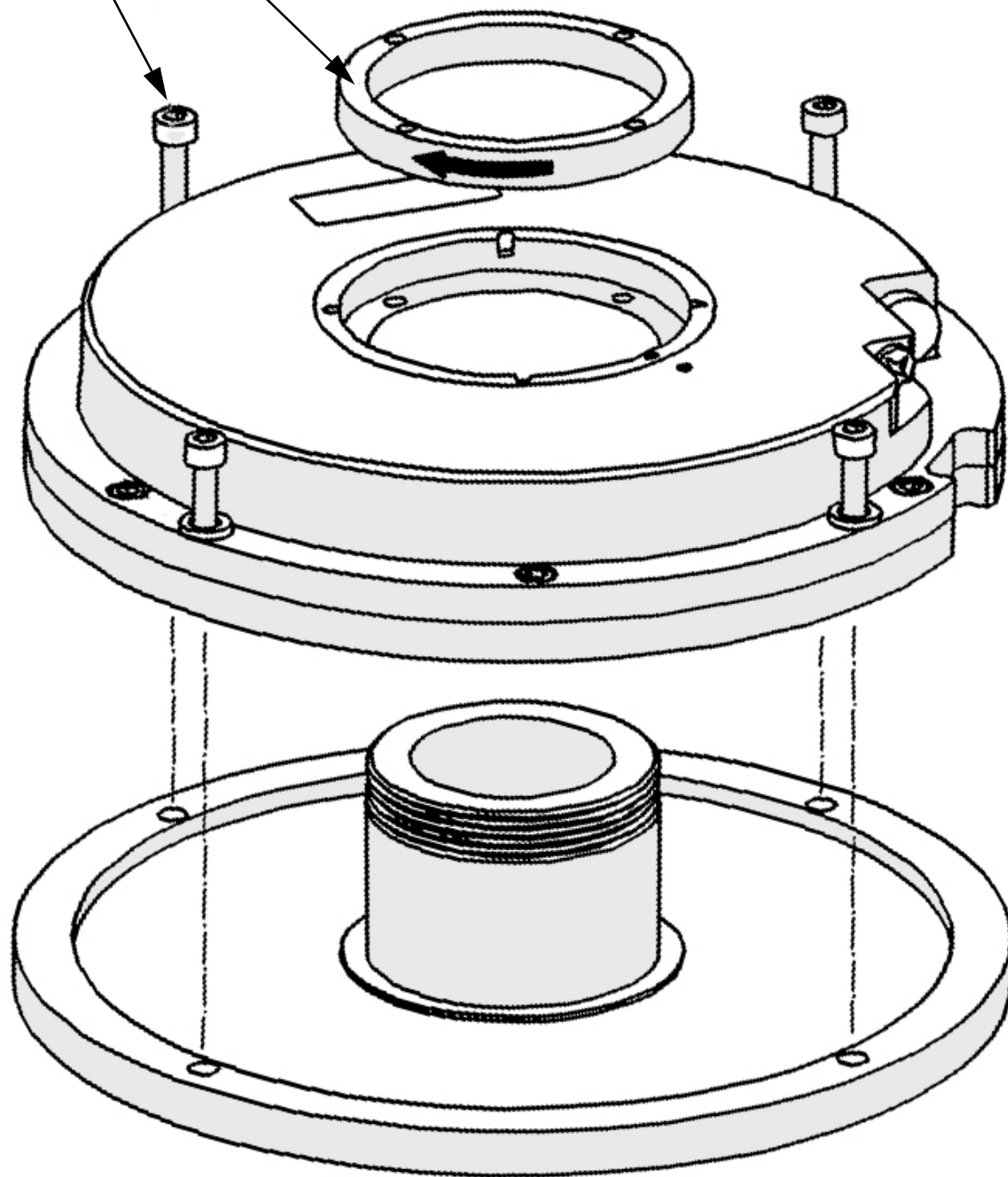


## MONTAJE / MOUNTING

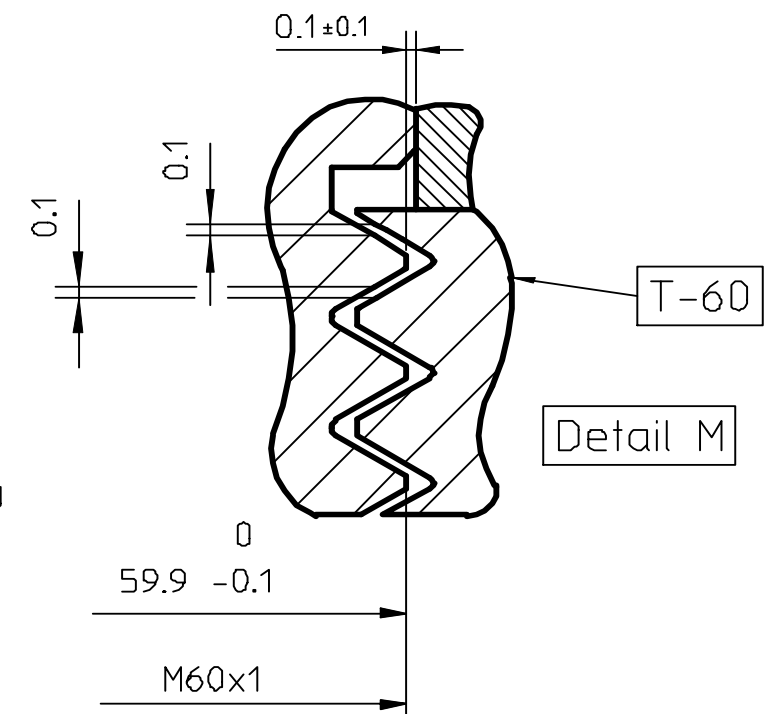
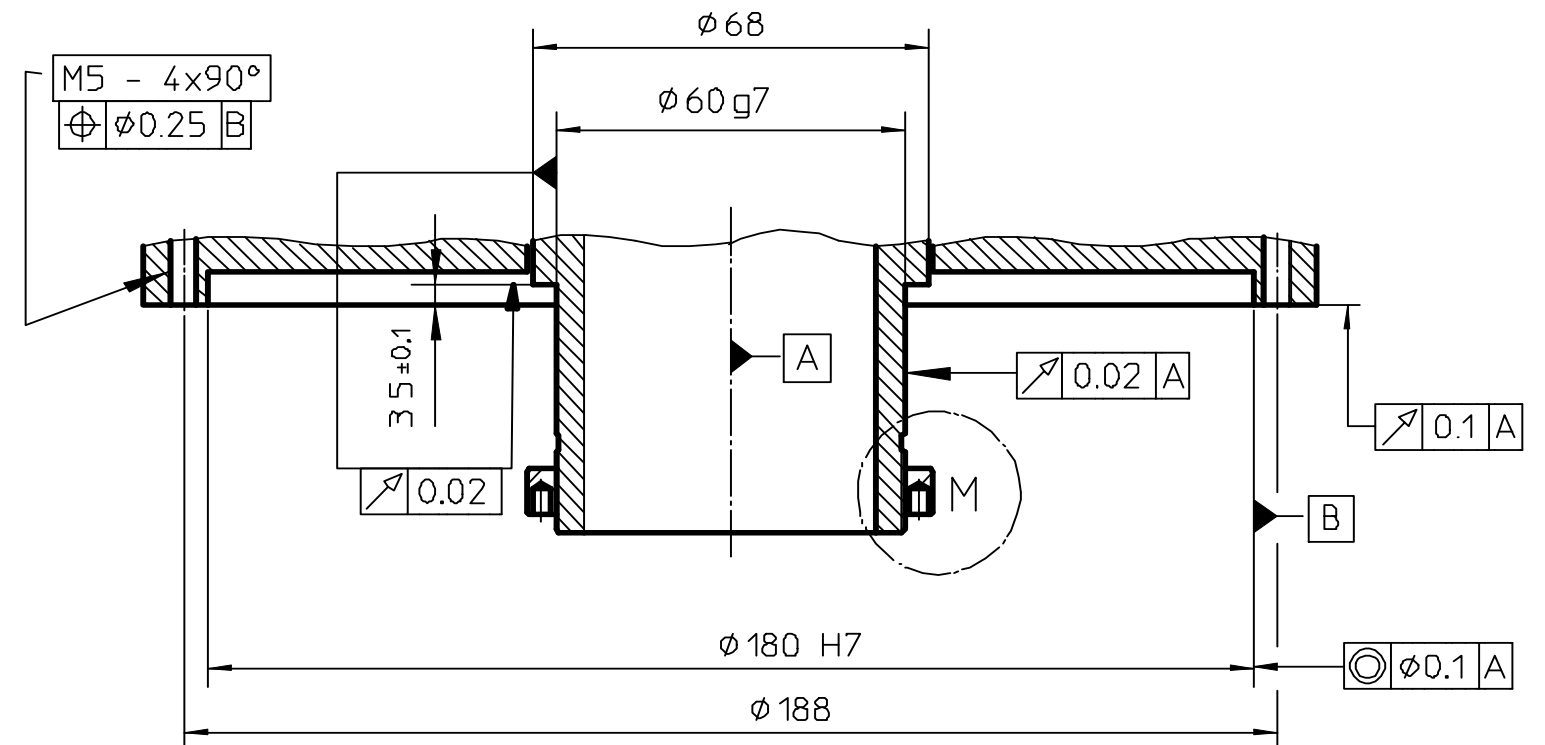
4 M5 DIN 125

4 M5 DIN 912, T = 5 Nm

T = 20 Nm T-60 (ver página 10 / see page 10)



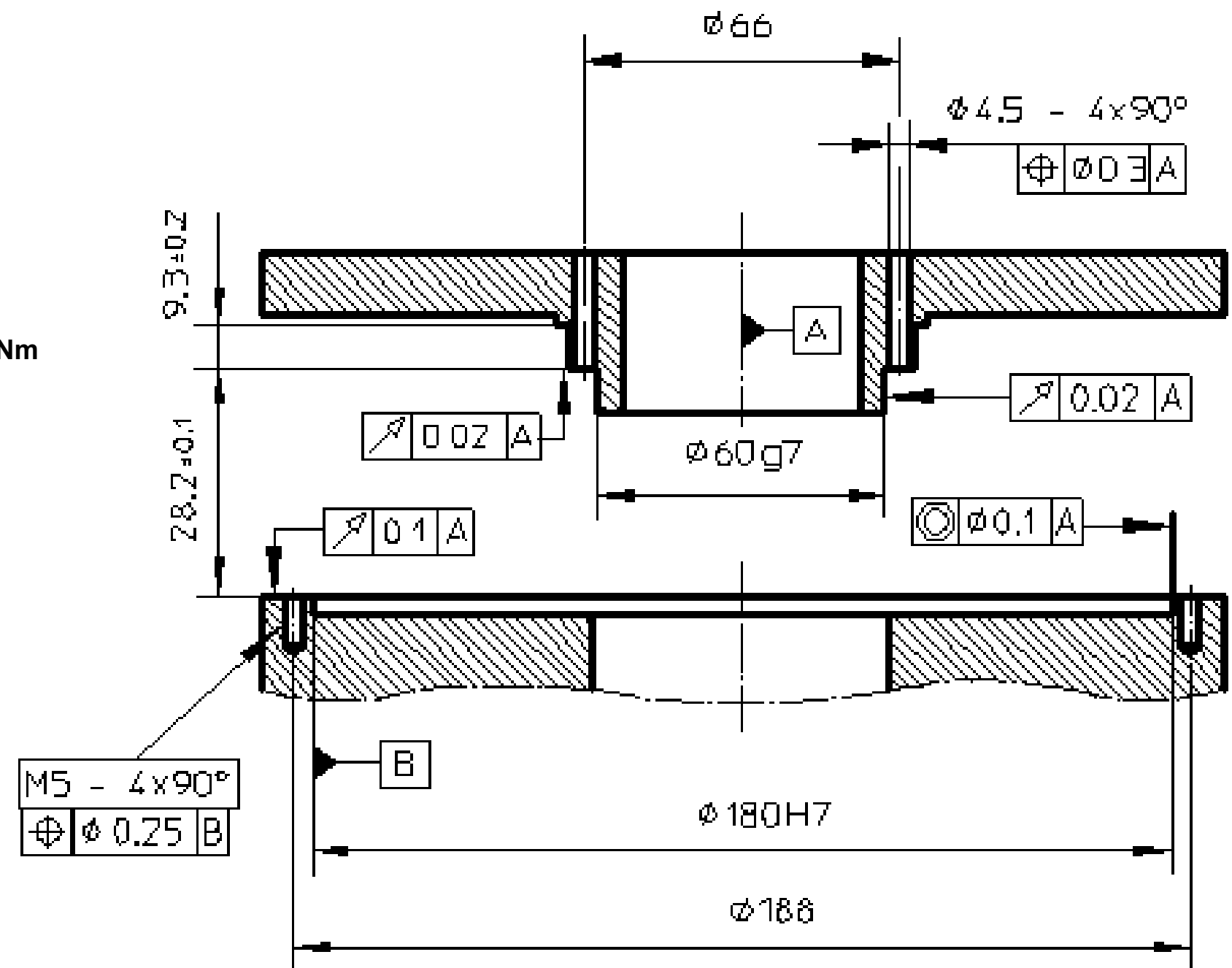
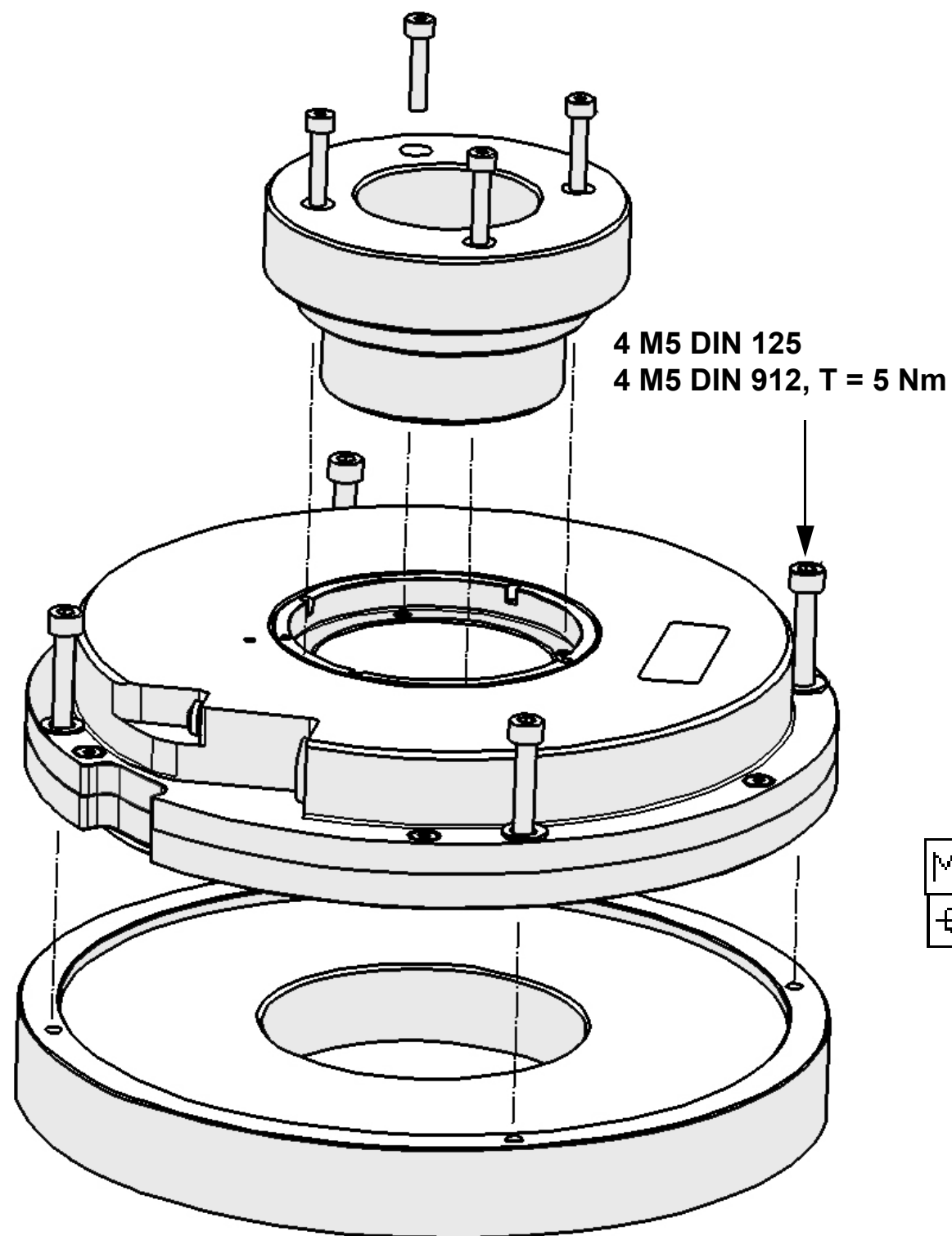
## Cotas de montaje / Mounting dimensions



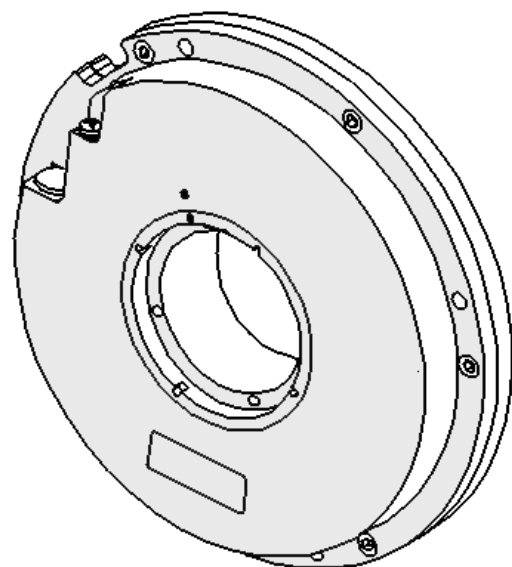
A Rodamiento / Roller bearing

## MONTAJE / MOUNTING

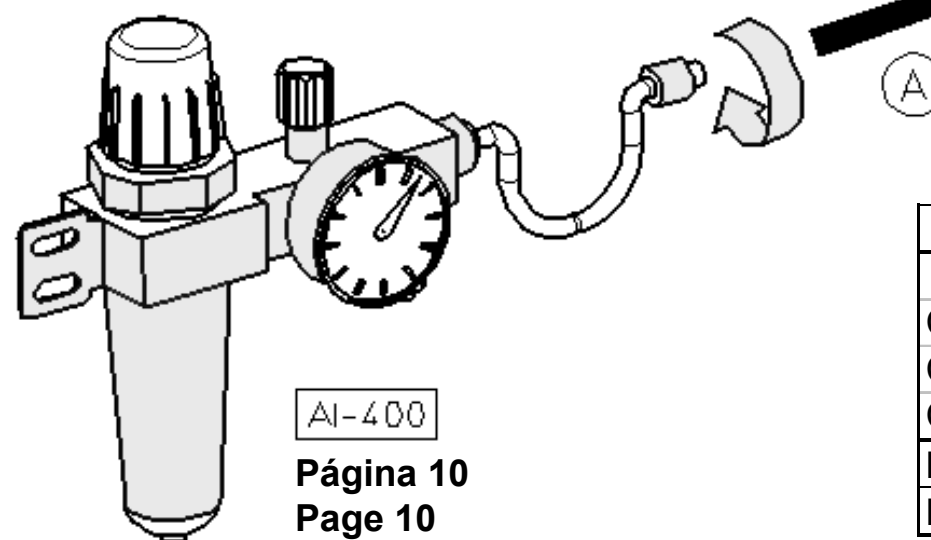
## Cotas de montaje / Mounting dimensions



**Nivel máximo: IP 64**  
**Maximum level IP 64**

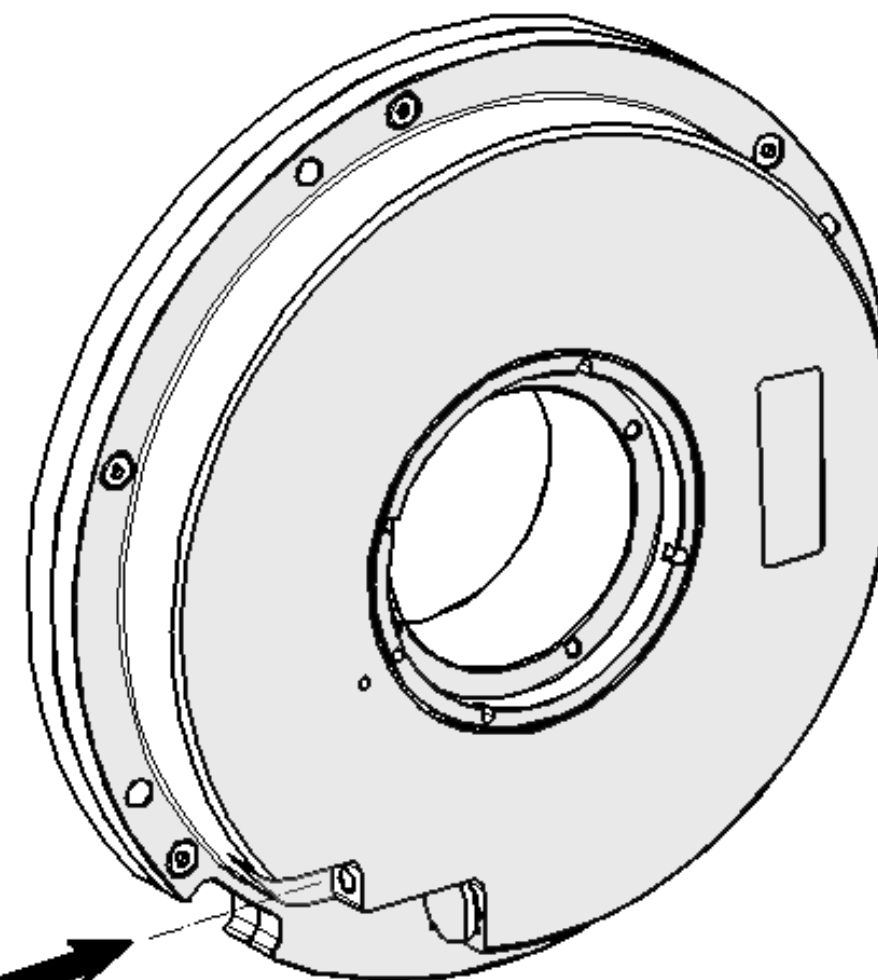


**> IP 64**



AI-400

Página 10  
 Page 10



| (A) AIR CONDITIONS                            |                        |
|-----------------------------------------------|------------------------|
| DIN ISO 8573 -1                               |                        |
| Class 1 - Particule Max. 0.1 $\mu$            |                        |
| Class 4 (7 bar) - Punto rocío / dewpoint 3 °C |                        |
| Class 1 - Max. Concentration oil 0.01 mg/m3   |                        |
| Presión / Pressure                            | 1 Kg / cm3             |
| Flujo / Flow                                  | 10 l. / min. / encoder |

## CARACTERÍSTICAS MECÁNICAS MECHANICAL CHARACTERISTICS

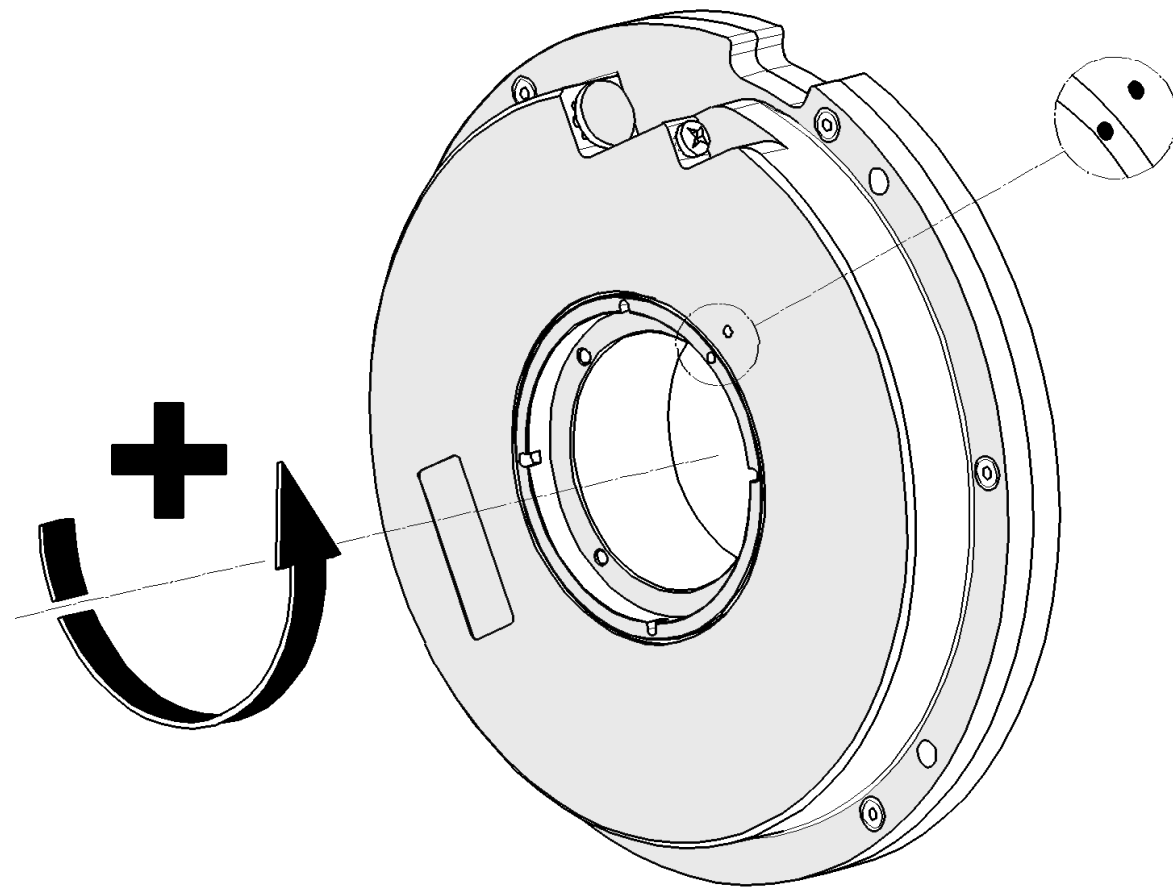
|                               |                                         |                          |
|-------------------------------|-----------------------------------------|--------------------------|
| Precisión                     | ±2"                                     | Accuracy                 |
| Maxima velocidad de giro      | 1000 rpm *                              | Max. Turning speed       |
| Momento de inercia del eje    | 10000 gr.cm <sup>2</sup>                | Inertia of the rotor     |
| Par (20°C)                    | ≤ 0.05 Nm                               | Torque                   |
| Frecuencia natural            | ≥ 1000 Hz                               | Natural frequency        |
| Peso                          | 3.2 kg                                  | Weight                   |
| Estanqueidad                  | IP-64 (DIN 40050)                       | Sealing protection       |
| Vibración (55 - 2000 Hz)      | 100 m/s <sup>2</sup> (IEC 60 068-2-6)   | Vibration (50 - 2000 Hz) |
| Impacto (6ms)                 | 1000 m/s <sup>2</sup> (IEC 60 068-2-27) | Impact (6 ms)            |
| Temperatura de funcionamiento | 0 °C ... 50 °C (32 °F ... 122 °F)       | Operating temperature    |
| Temperatura de almacenamiento | -30 °C ... 80 °C (-22 °F ... 176 °F)    | Storage temperature      |

\* Limitación eléctrica: 300 rpm / Electrical limitation: 300 rpm

# CARACTERÍSTICAS ELÉCTRICAS / ELECTRICAL CHARACTERISTICS

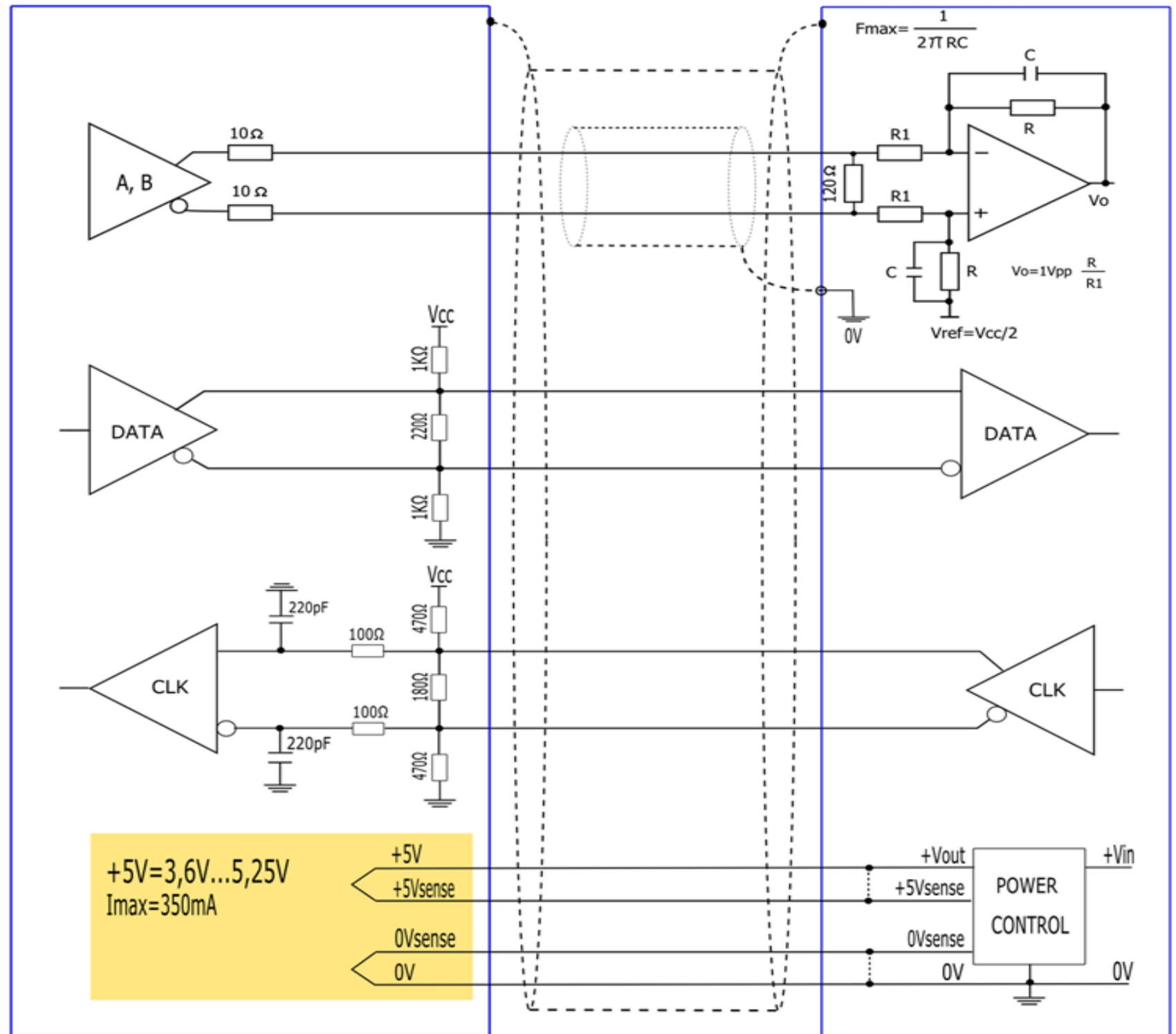
Posición del origen 0°  
0° origin position

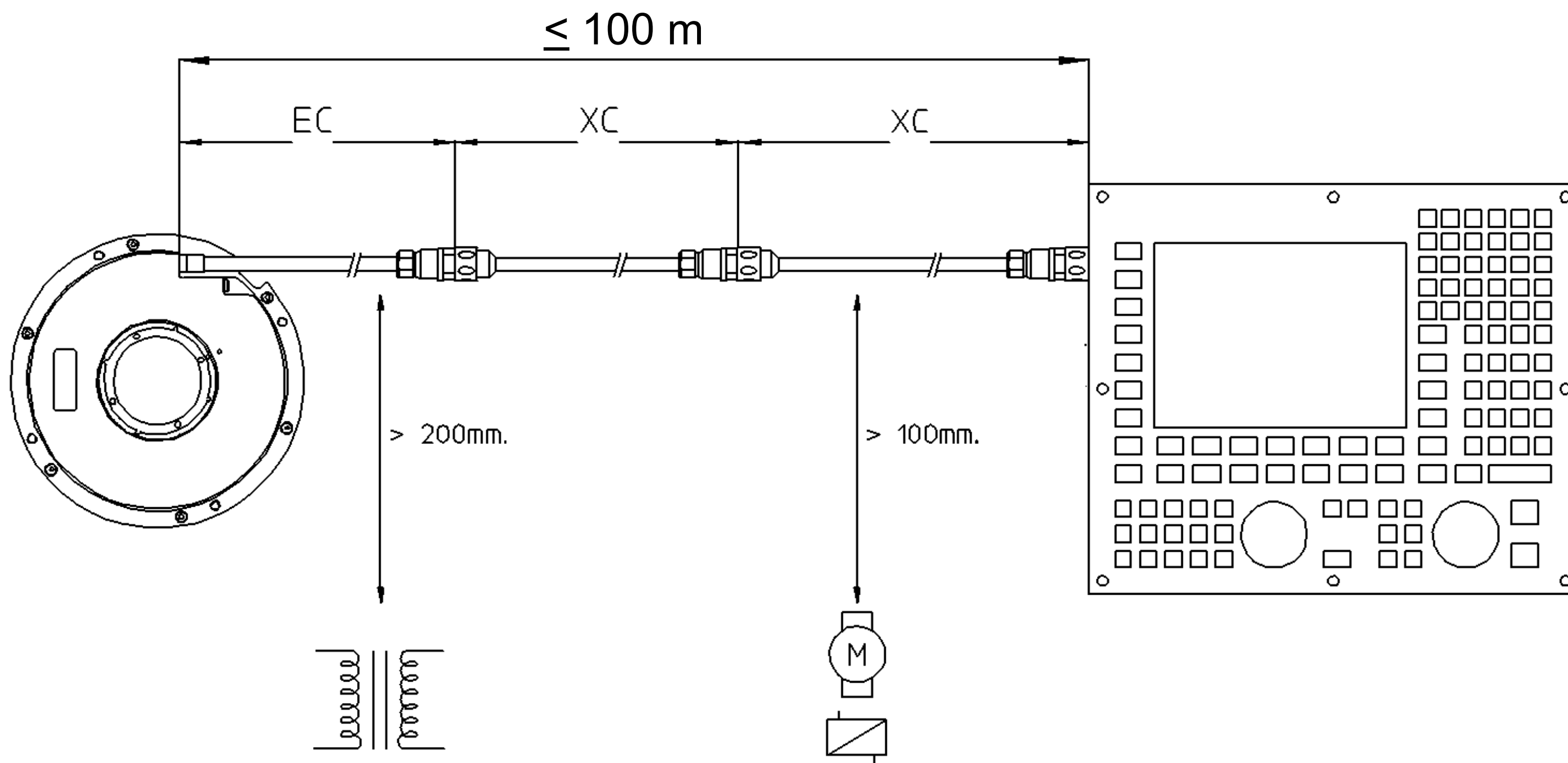
Girar eje para alinear puntos  
Turn the shaft lining up the dots



ENCODER

SYSTEM CONTROL





INFORMACIÓN ELÉCTRICA / ELECTRICAL DATA



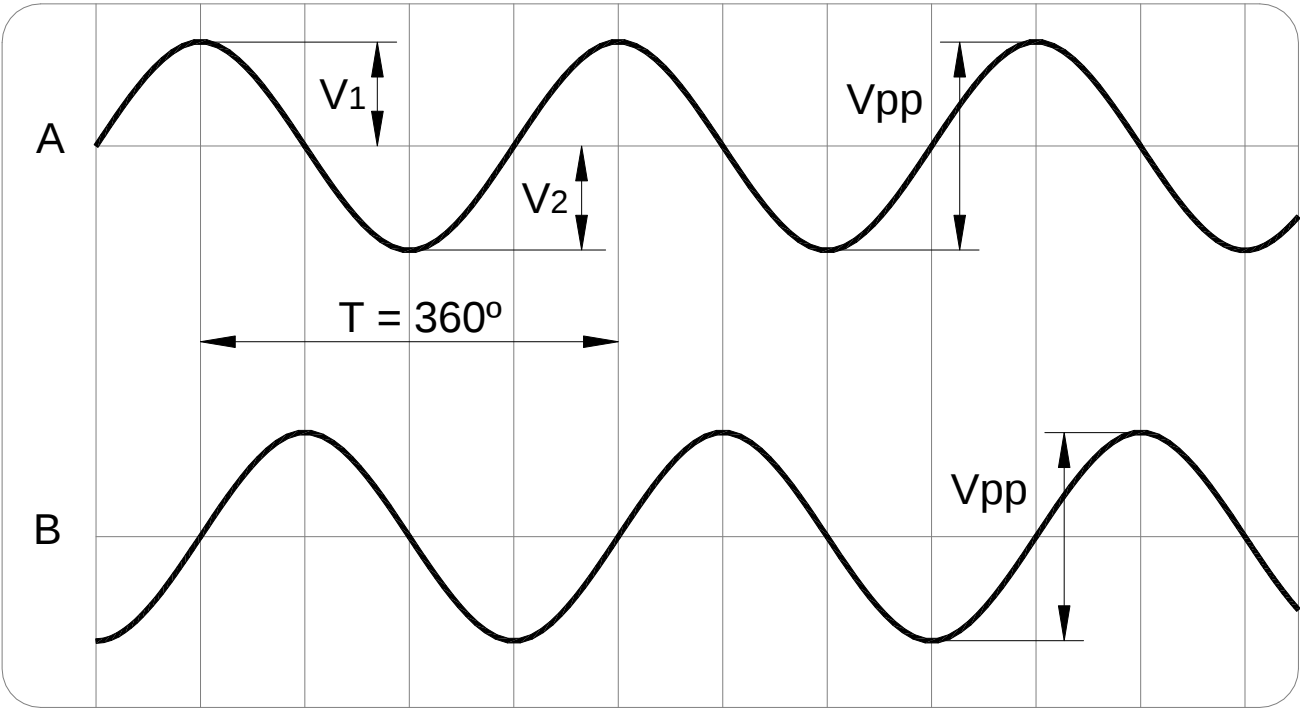
1 Vpp  
1 Vpp

SEÑALES DIFERENCIALES  
DIFFERENTIAL SIGNALS

HAS-27-D200

Características - Characteristics

|                                                                              |                                |
|------------------------------------------------------------------------------|--------------------------------|
| Señales<br>Signals                                                           | A, /A, B, /B                   |
| Vapp                                                                         | 1 V +20%, -40%                 |
| Vbpp                                                                         | 1 V +20%, -40%                 |
| DC offset                                                                    | 2.5V ± 0.5V                    |
| Impulsos por vuelta<br>Pulses per turn                                       | 32768                          |
| Alimentación<br>Supply                                                       | 3.6 V - 5.25 V<br>Imax: 350 mA |
| Máx. longitud de cable<br>Max. cable length                                  | 100 metros<br>328 feet         |
| A, B centrado: $ V_1-V_2  / 2V_{pp}$<br>Centered A, B: $ V_1-V_2  / 2V_{pp}$ | $\leq 0.065$                   |
| Relación A&B: $V_{app} / V_{bpp}$<br>A&B Relationship: $V_{app} / V_{bpp}$   | $0.8 \div 1.25$                |
| Desfase A&B<br>A&B phase shift                                               | $90^\circ \pm 10^\circ$        |



INFORMACIÓN ELÉCTRICA / ELECTRICAL DATA

SEÑALES ABSOLUTAS  
ABSOLUTE SIGNALS

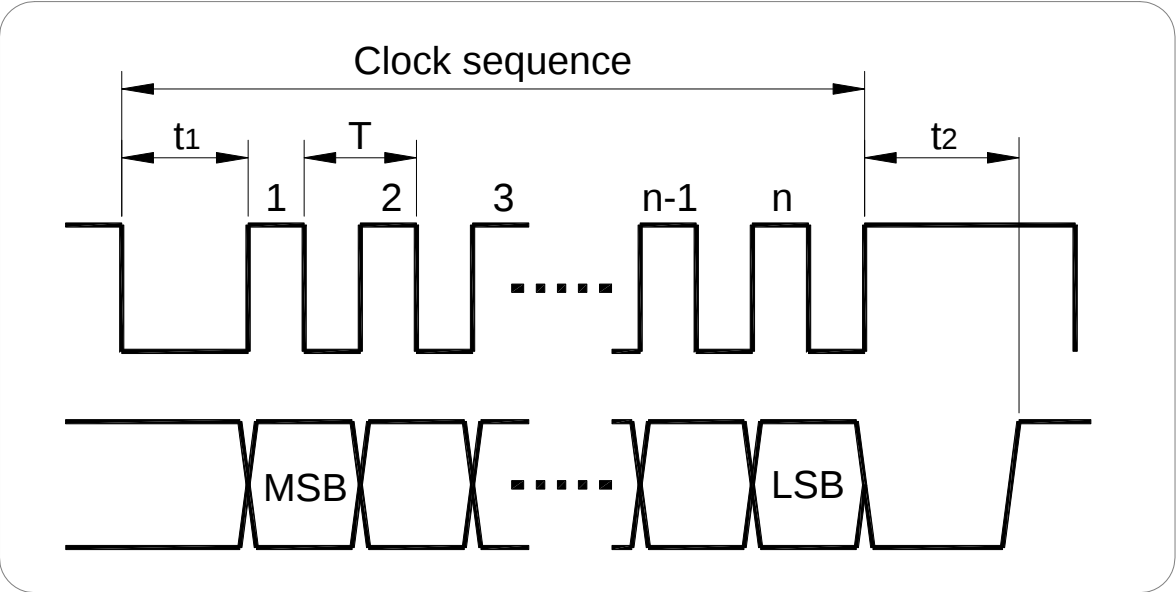
HAS-27-D200

Especificaciones - Specification

|                                    |                                                                                                          |
|------------------------------------|----------------------------------------------------------------------------------------------------------|
| Transmisión / Transmission         | SSI transferencia serie sin-<br>crons vía RS 485.<br>SSI synchronous serial<br>data transfer via RS 485. |
| Niveles / Levels                   | EIA RS 485                                                                                               |
| Frecuencia Reloj / Clock Frequency | 100 kHz - 1000 kHz                                                                                       |
| Max. bit (n)                       | 27                                                                                                       |
| T                                  | 1 µs ÷ 10 µs                                                                                             |
| t1                                 | > 0.5 µs                                                                                                 |
| t2                                 | 20 µs ÷ 35 µs                                                                                            |
| SSI                                | Gray o Binario (configurable)<br>Gray or Binary (configurable)                                           |
| Paridad / Parity                   | Totalmente configurable<br>Fully configurable                                                            |

Valores por defecto para el protocolo SSI  
Default values for SSI protocol

|                                 |                         |
|---------------------------------|-------------------------|
| Número de bits / Number of bits | 28 (27 data + 1 parity) |
| Tipo de datos / Data type       | Gray                    |
| Paridad / Parity                | Impar / Odd             |
| Time out                        | 450 µs                  |



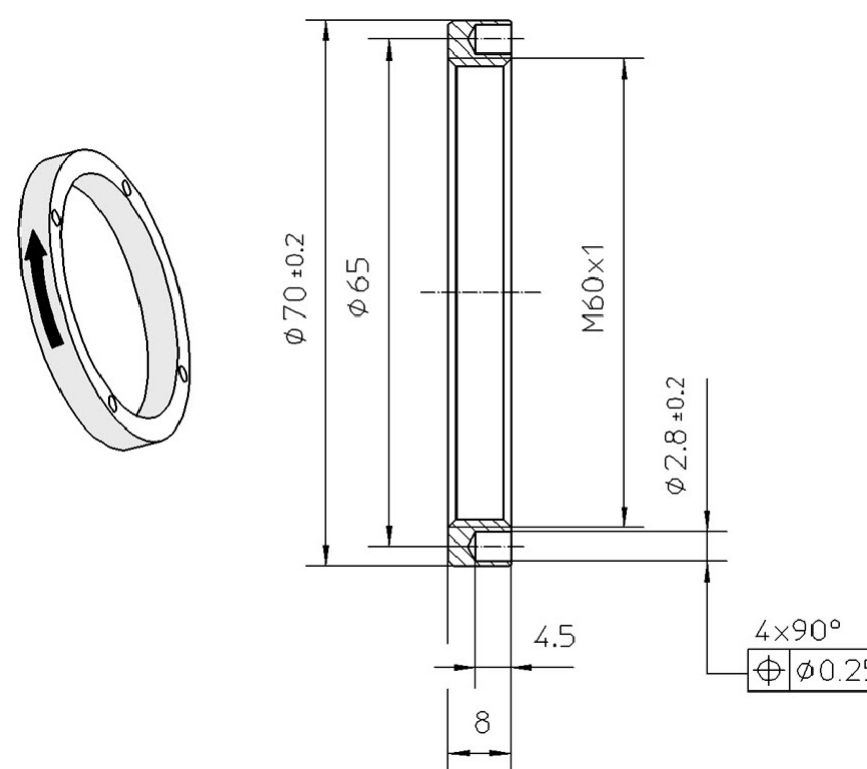
**NOTA:** Para la configuración de los parámetros es necesario el adaptador Fagor PD-U-ENC.

Para más información contacte con Fagor Automation.

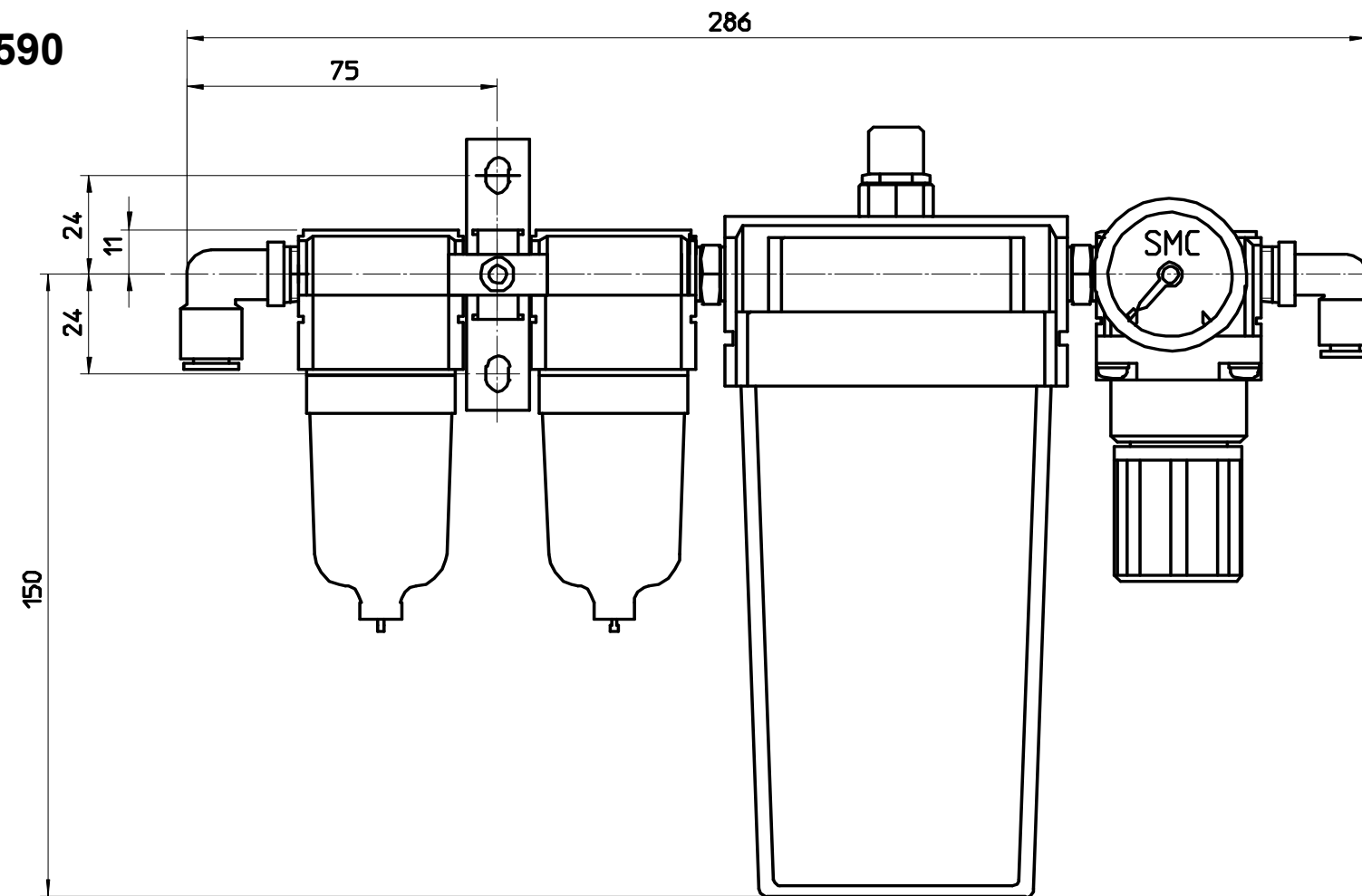
**NOTE:** For the parameters configuration Fagor PD-E-ENC adapter is needed.

For further information contact Fagor Automation.

## TUERCA / NUT



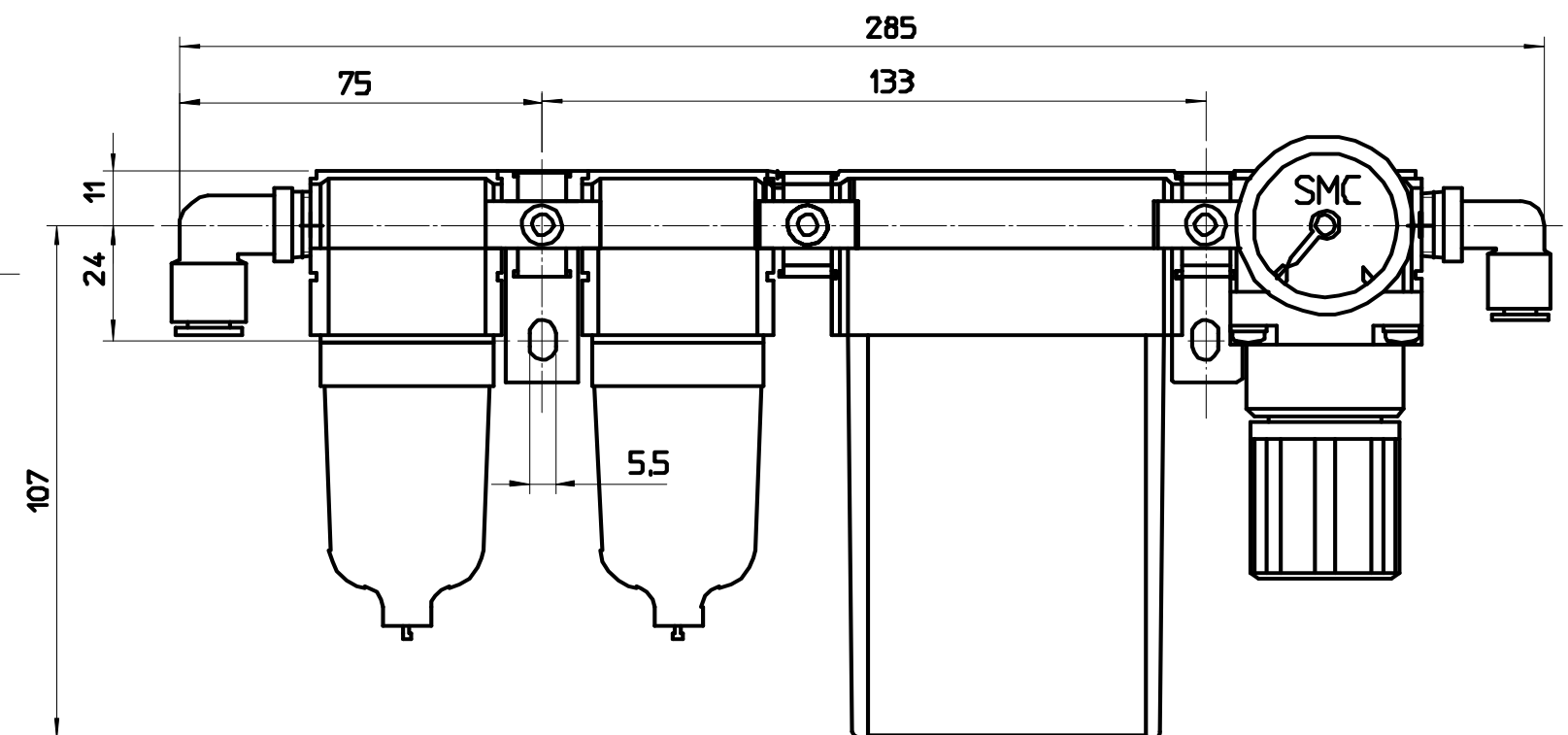
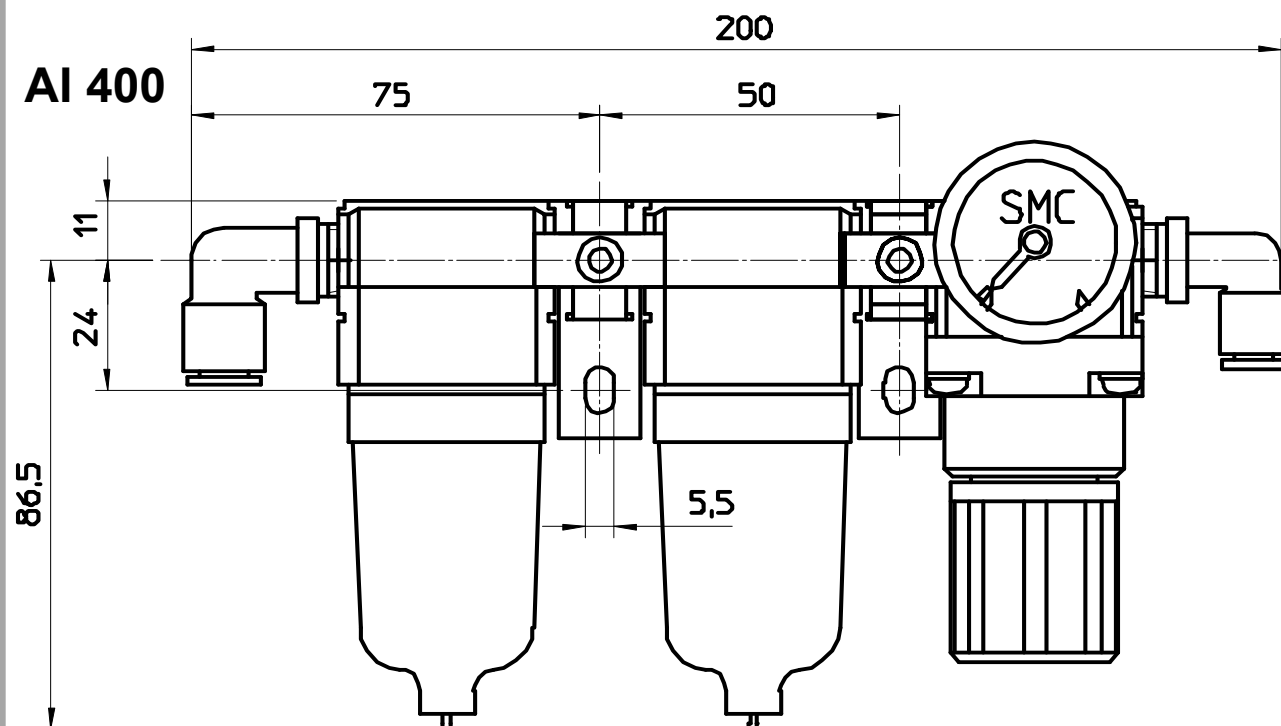
**AI 590**



## FILTROS DE AIRE / AIR FILTERS

|         |        |            |
|---------|--------|------------|
| 2200000 | AI 400 | 25 l/min   |
| 2200001 | AI 525 | (25l/min)  |
| 2200002 | AI 550 | (50 l/min) |
| 2200003 | AI 590 | (90 l/min) |

### AI 525 / AI 550



CABLES

CABLES PARA CONEXIÓN DIRECTA DE ENCODERS ABSOLUTOS FAGOR A SISTEMAS SIEMENS
CABLES FOR DIRECT CONNECTION OF FAGOR ABSOLUTE ENCODERS TO SIEMENS SYSTEMS

SIEMENS SMC 20
HASTA 9 METROS - UP TO 9 METERS

Table with 16 columns: EC-...B-S1, PIN, SEÑAL/SIGNAL, COLOR, and 12 signal pins. It details the wiring for the Siemens SMC 20 encoder connection, including pin numbers, signal names (e.g., +5V, 0V, A, /A), and corresponding colors (e.g., Marrón, Blanco, Verde).

A PARTIR DE 9 METROS- FROM 9 METERS

\* Longitudes hasta 25 metros (EC- ...B - C9 ) + (XC - C8 - ... F- S1)
\* Superiores a 25 metros (EC- ...B - C9 ) + (XC - C8 - ...F - C9) + (XC - C8 - ... F- S1)

Table with 16 columns: EC-...B-C9, PIN, SEÑAL / SIGNAL, COLOR, and 12 signal pins. It details the wiring for the Siemens SMC 20 encoder connection for lengths up to 9 meters, including pin numbers, signal names, and colors.

SIEMENS SME 25
HASTA 9 METROS - UP TO 9 METERS

Table with 16 columns: EC-...B-C9, PIN, SEÑAL / SIGNAL, COLOR, and 12 signal pins. It details the wiring for the Siemens SME 25 encoder connection, including pin numbers, signal names, and colors.

A PARTIR DE 9 METROS- FROM 9 METERS

\* Longitudes hasta 25 metros (EC- ...B - C9 ) + (XC - C8 - ... F- C9)
\* Superiores a 25 metros (EC- ...B - C9 ) + (XC - C8 - ...F - C9) + (XC - C8 - ... F- C9)



# CABLES

ALARGADERAS PARA CONEXIÓN DIRECTA DE ENCODERS ABSOLUTOS FAGOR A SISTEMAS SIEMENS

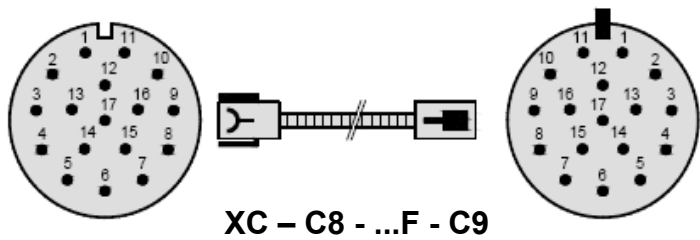
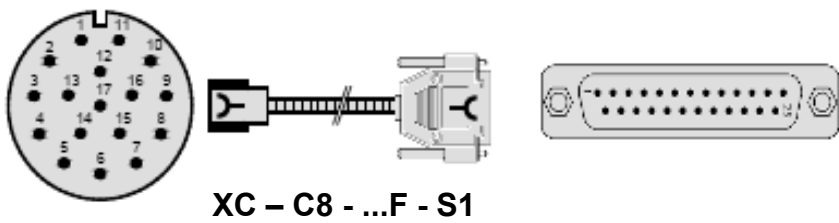
EXTENSION CABLES FOR DIRECT CONNECTION OF FAGOR ABSOLUTE ENCODERS TO SIEMENS SYSTEMS

SIEMENS SMC 20

|                                                                                       |                                                                                                                                                                                                                                              |                                |                          |                         |              |              |                   |                    |                             |              |                             |                 |                                  |                                  |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------|-------------------------|--------------|--------------|-------------------|--------------------|-----------------------------|--------------|-----------------------------|-----------------|----------------------------------|----------------------------------|
| XC – C8 - ...F – S1                                                                   | Alargadera con Conector Circular 17 hembra / Conector SubD 25 hembra. En longitudes de 5, 10, 15, 20 y 25 metros.<br>Extension cable with Circular 17 female Connector / SubD 25 femail Connector. Available in 5, 10, 15, 20 and 25 meters. |                                |                          |                         |              |              |                   |                    |                             |              |                             |                 |                                  |                                  |
| PIN  | 15                                                                                                                                                                                                                                           | 16                             | 12                       | 13                      | 14           | 17           | 8                 | 9                  | 7                           | 1            | 10                          | 4               | 11                               | Carcasa / Housing                |
| PIN  | 3                                                                                                                                                                                                                                            | 4                              | 6                        | 7                       | 15           | 23           | 10                | 12                 | 1                           | 14           | 2                           | 16              | 5                                | Carcasa / Housing                |
| SEÑAL / SIGNAL                                                                        | A                                                                                                                                                                                                                                            | /A                             | B                        | /B                      | DATA         | / DATA       | CLOCK             | /Clock             | +5 V                        | +5 V sensor  | 0V                          | 0V sensor       | Tierra / Ground                  | Tierra / Ground                  |
| COLOR                                                                                 | Verde-Negro<br>Green-Black                                                                                                                                                                                                                   | Amarillo-Negro<br>Yellow-Negro | Azul-Negro<br>Blue-Black | Rojo-Negro<br>Red-Black | Gris<br>Grey | Rosa<br>Pink | Violeta<br>Purple | Amarillo<br>Yellow | Marrón-Verde<br>Brown-Green | Azul<br>Blue | Blanco-Verde<br>White-Green | Blanco<br>White | Malla interna<br>Internal shield | Malla externa<br>External shield |

SIEMENS SME 25

|                                                                                         |                                                                                                                                                                                                                                                   |                                |                          |                         |              |              |                   |                    |                             |              |                             |                 |                                  |                                  |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------|-------------------------|--------------|--------------|-------------------|--------------------|-----------------------------|--------------|-----------------------------|-----------------|----------------------------------|----------------------------------|
| XC – C8 - ... F– C9                                                                     | Alargadera con Conector Circular 17 hembra / Conector Circular 17 macho. En longitudes de 5, 10, 15, 20 y 25 metros.<br>Extension cable with Circular 17 female Connector / Circular 17 male Connector. Available in 5, 10, 15, 20 and 25 meters. |                                |                          |                         |              |              |                   |                    |                             |              |                             |                 |                                  |                                  |
| PIN  | 15                                                                                                                                                                                                                                                | 16                             | 12                       | 13                      | 14           | 17           | 8                 | 9                  | 7                           | 1            | 10                          | 4               | 11                               | Carcasa / Housing                |
| PIN  | 15                                                                                                                                                                                                                                                | 16                             | 12                       | 13                      | 14           | 17           | 8                 | 9                  | 7                           | 1            | 10                          | 4               | 11                               | Carcasa / Housing                |
| SEÑAL / SIGNAL                                                                          | A                                                                                                                                                                                                                                                 | /A                             | B                        | /B                      | DATA         | / DATA       | CLOCK             | /Clock             | +5 V                        | +5 V sensor  | 0V                          | 0V sensor       | Tierra / Ground                  | Tierra / Ground                  |
| COLOR                                                                                   | Verde-Negro<br>Green-Black                                                                                                                                                                                                                        | Amarillo-Negro<br>Yellow-Negro | Azul-Negro<br>Blue-Black | Rojo-Negro<br>Red-Black | Gris<br>Grey | Rosa<br>Pink | Violeta<br>Purple | Amarillo<br>Yellow | Marrón-Verde<br>Brown-Green | Azul<br>Blue | Blanco-Verde<br>White-Green | Blanco<br>White | Malla interna<br>Internal shield | Malla externa<br>External shield |



## GARANTIA

\*Plazo: 12 meses a partir de la fecha de expedición de fábrica.

\*Cubre gastos de Materiales y Mano de Obra de reparación en FAGOR AUTOMATION.

\*Los gastos de desplazamiento son a cargo del cliente.

\*No cubre averías por causas ajenas a FAGOR AUTOMATION, como: golpes, manipulación por personal no autorizado, etc.

## WARRANTY

\*Term: 12 months from factory invoice date.

\*It covers parts and labor at FAGOR AUTOMATION.

\*Travel expenses are payable by the customer.

\*Damages due to causes external to FAGOR AUTOMATION, such as unauthorized handling, blows, etc. are not covered.

## DECLARACION DE CONFORMIDAD

**Fabricante: Fagor Automation, S. Coop.**

Barrio de San Andrés 19, C.P. 20500, Mondragón -Guipúzcoa- (ESPAÑA)

Declaramos bajo nuestra exclusiva responsabilidad la conformidad del producto al que hace referencia este manual

**Nota.** Algunos caracteres adicionales pueden seguir a las referencias de los modelos indicados en este manual. Todos ellos cumplen con las siguientes normas:

### COMPATIBILIDAD ELECTROMAGNÉTICA:

EN 61000-6-2:2005 Norma de Inmunidad en entornos industriales

EN 61000-6-4:2007 Norma de Emisión en entornos industriales

De acuerdo con las disposiciones de la Directiva Comunitaria: 2004/108/CE de Compatibilidad Electromagnética.

Mondragón a 1 de Septiembre de 2012

Fagor Automation, S. Coop.

  
Director Gerente  
Pedro Ruiz de Aguirre

## DECLARATION OF CONFORMITY

**Manufacturer: Fagor Automation, S. Coop.**

Barrio de San Andrés 19, C.P. 20500, Mondragón -Guipúzcoa- (SPAIN)

We declare under our exclusive responsibility the conformity of the product referred to in this manual.

**Note.** Some additional characters may follow the model references indicated in this manual. They all comply with the following regulations:

### ELECTROMAGNETIC COMPATIBILITY:

EN 61000-6-2:2005 Standard on immunity in industrial environments

EN 61000-6-4:2007 Standard on emission in industrial environments

According to the European Directive: 2004/108/CE on electromagnetic compatibility.

Mondragón Sep 1st 2012