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- Spain -
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Email: info@fagorautomation.es
Tel.: (34) 943 719200
Fax: (34) 943 791712

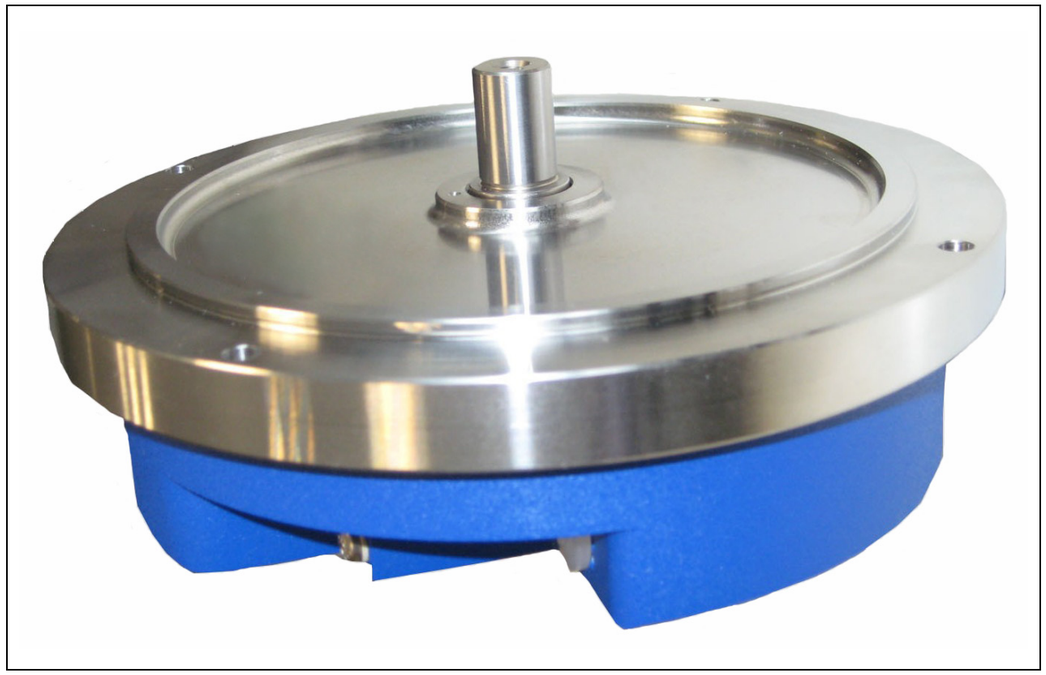
FAGOR
Fagor Automation S. Coop.

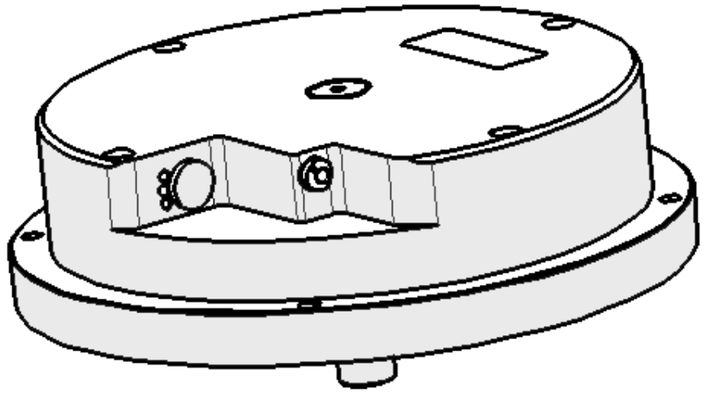
Manual code: 14460146
Manual version: 1405

FAGOR
Fagor Automation S. Coop.

ENCODER SA-D170

MANUAL DE INSTALACIÓN
INSTALLATION MANUAL





MANUAL

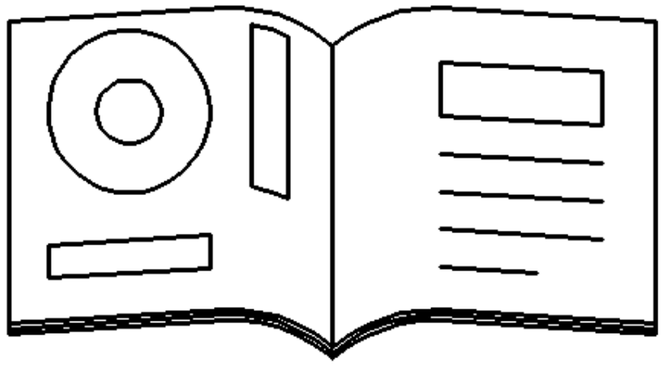
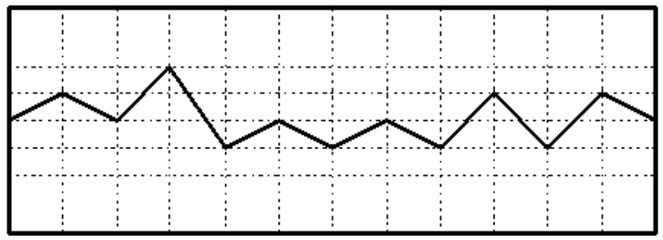
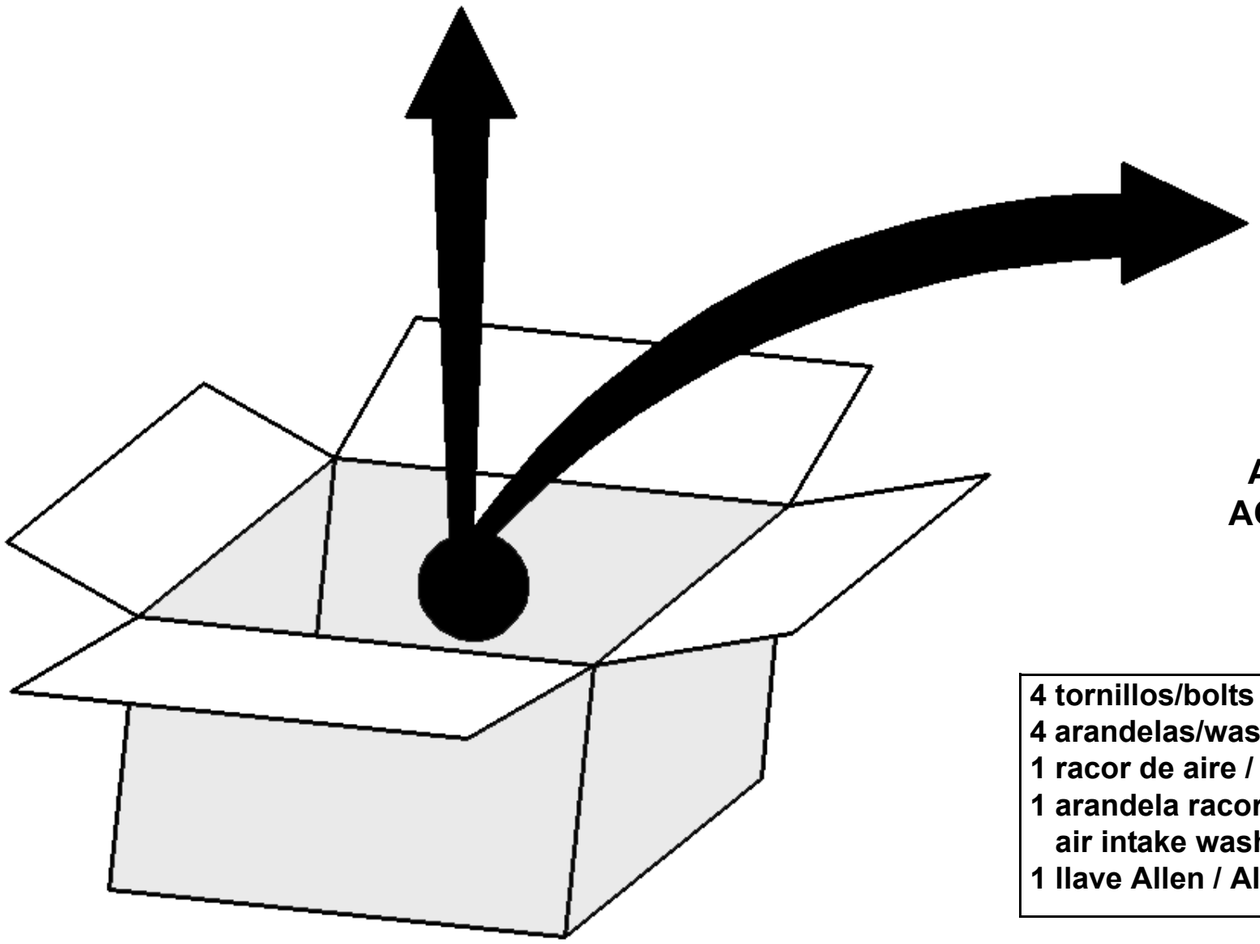
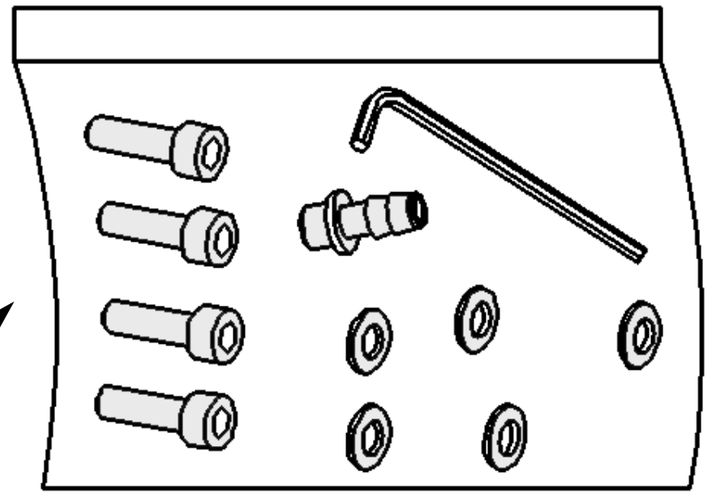


GRÁFICO
GRAPH



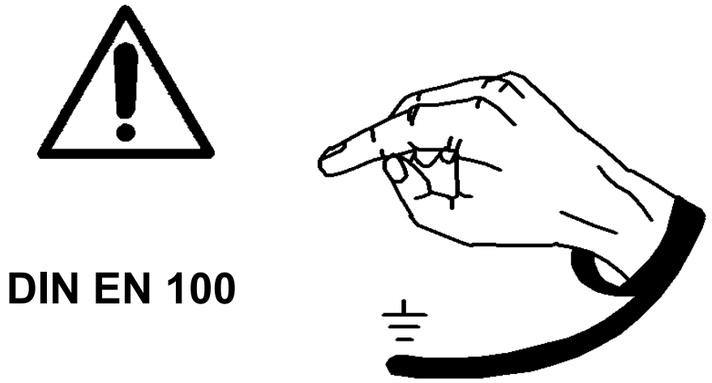


ACCESORIOS
ACCESSORIES



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

FAGOR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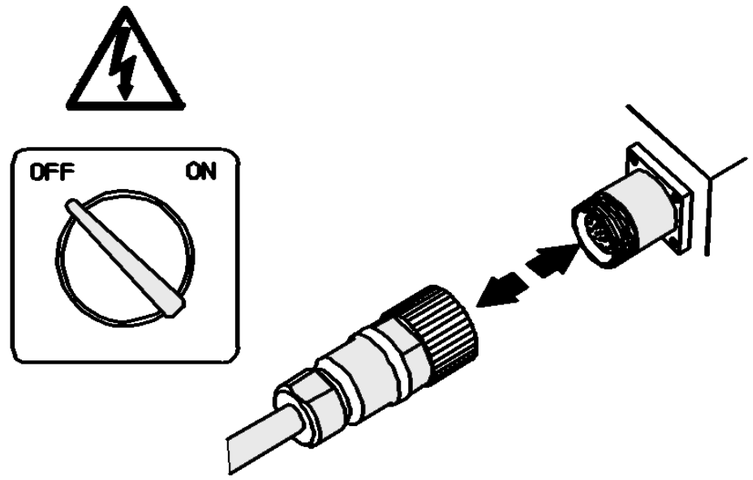
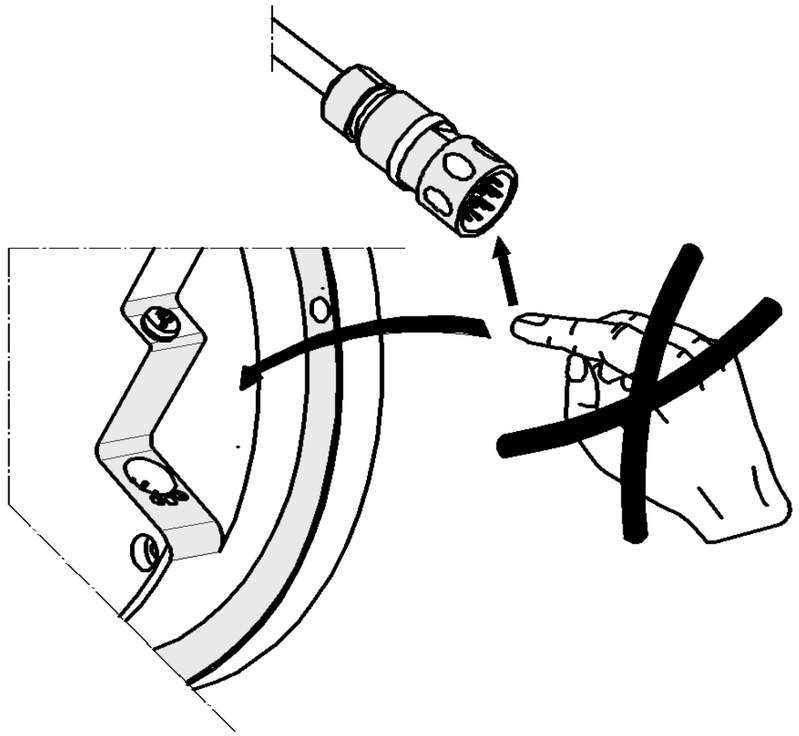
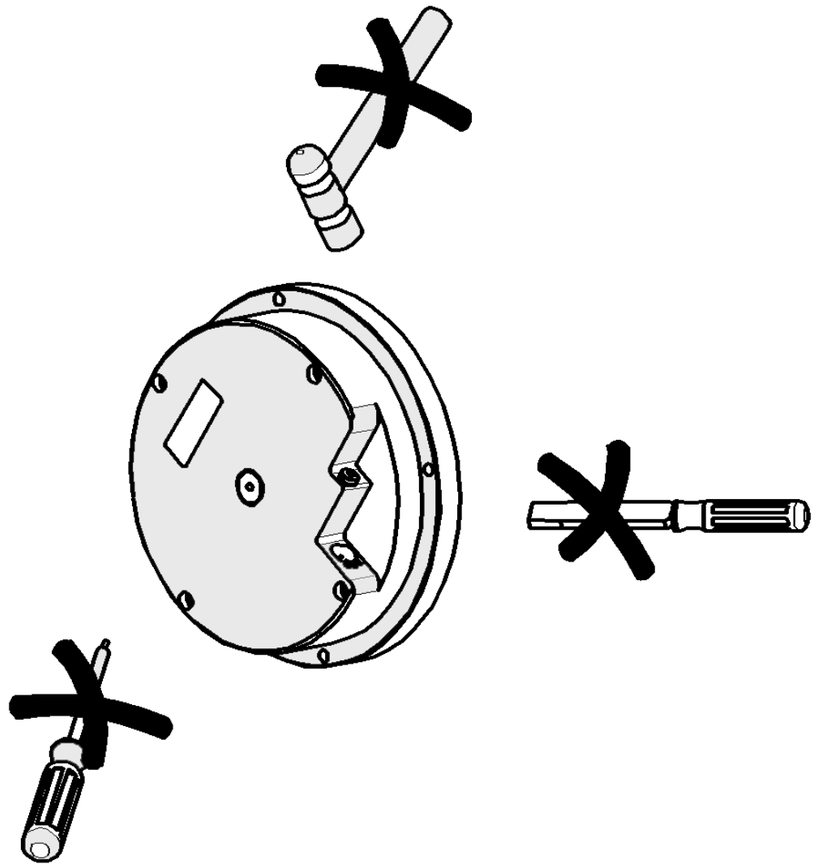
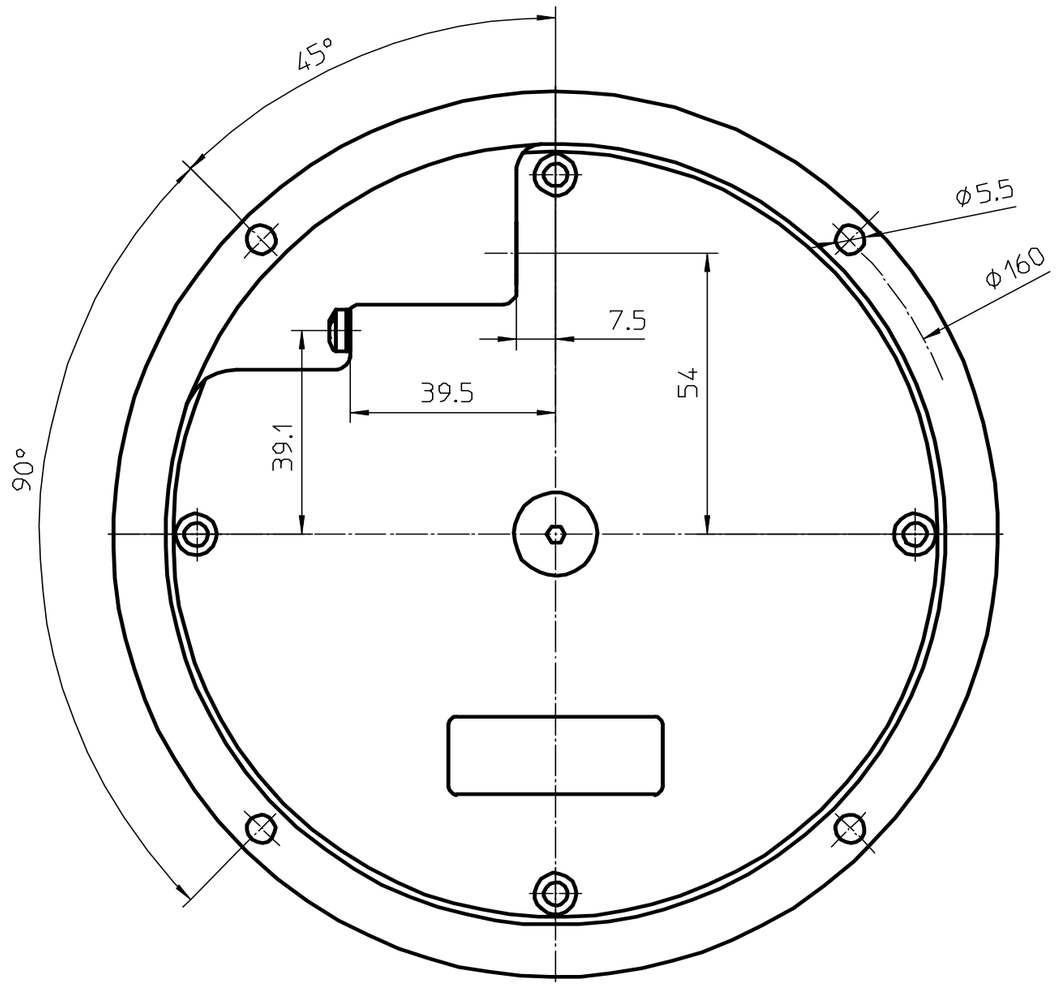
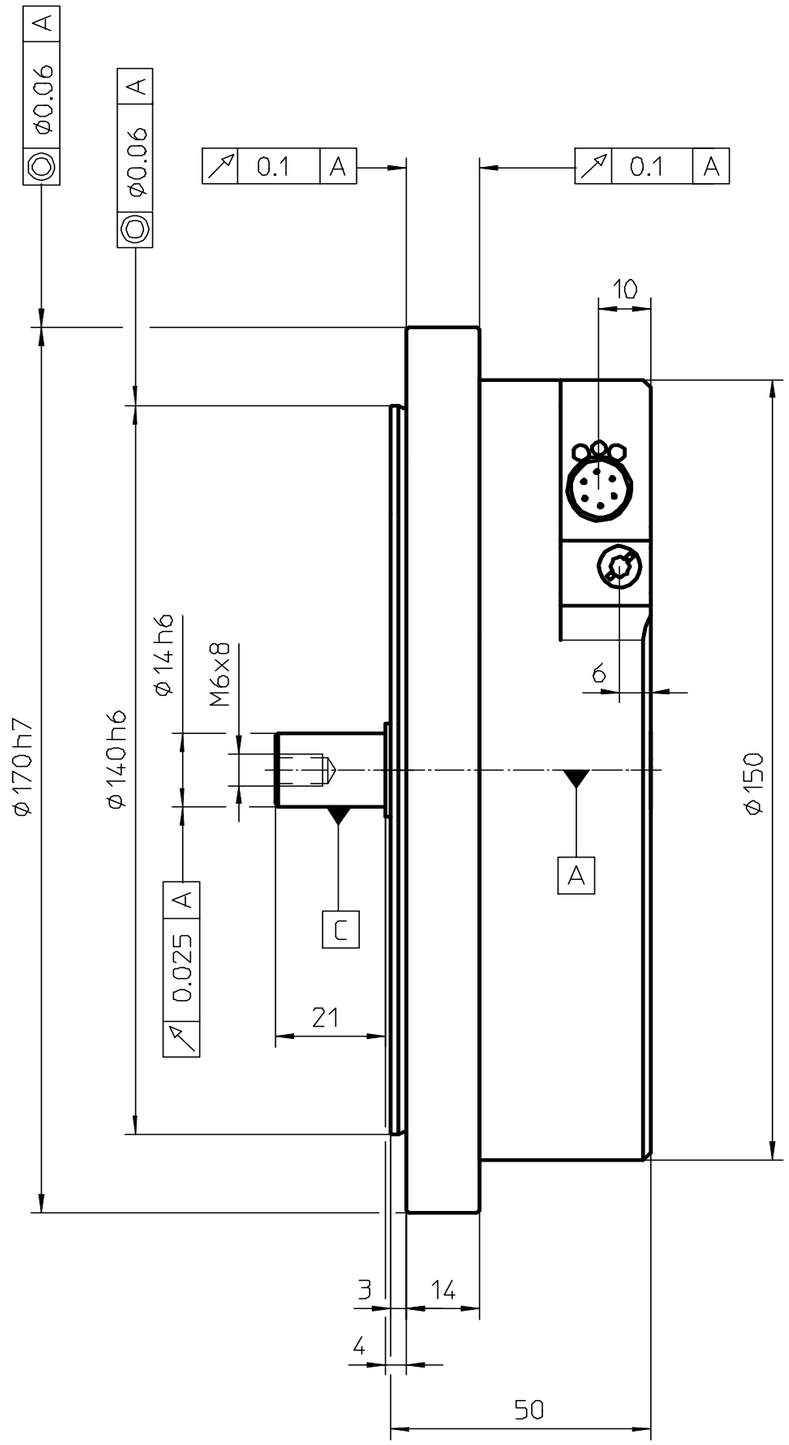

OFF
ON





GENERAL DIMENSIONS

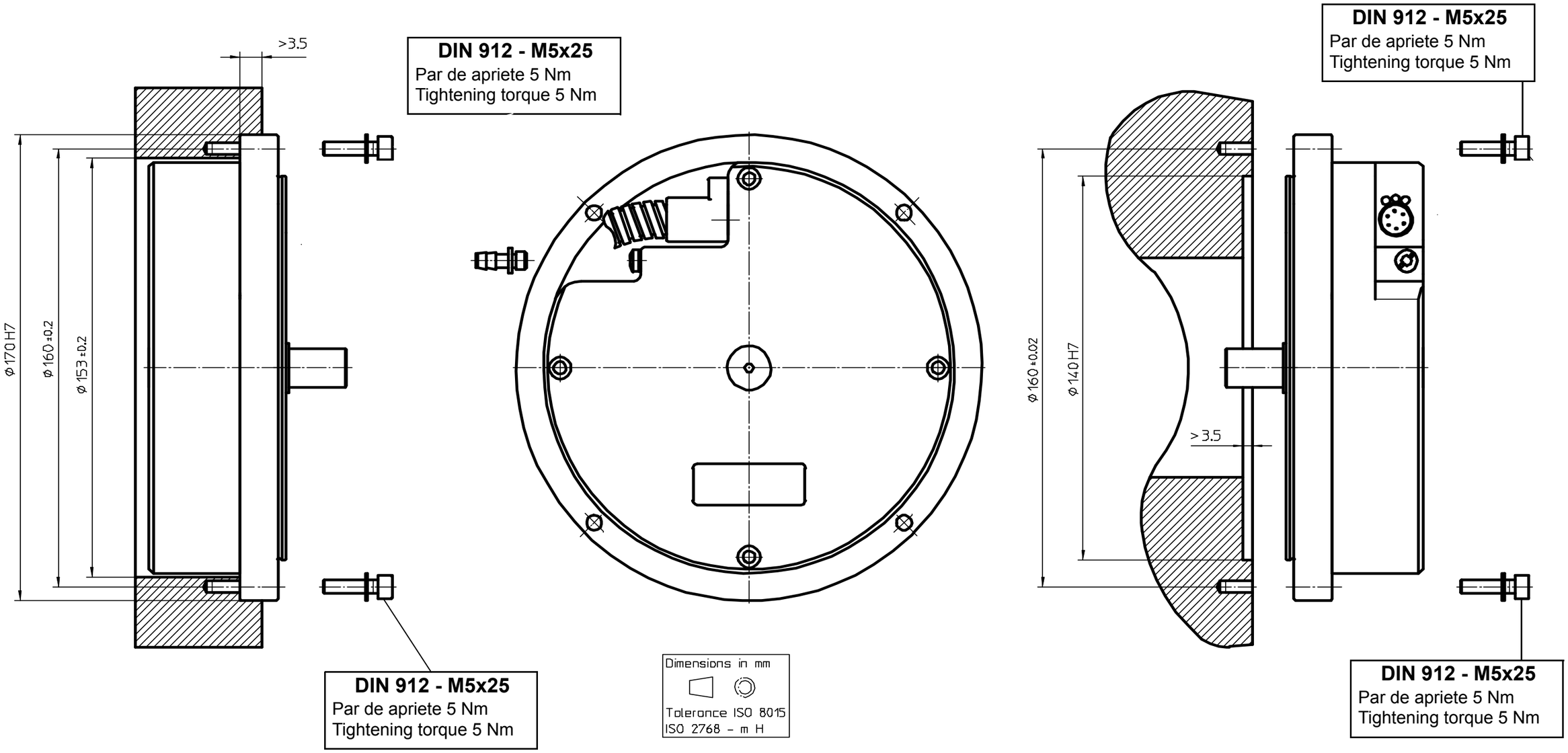




FAGOR

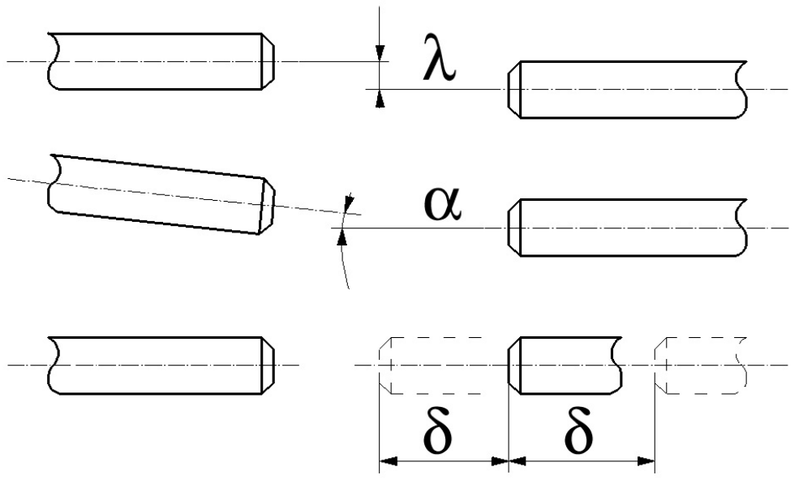
MONTAJE / MOUNTING

Cotas de montaje / Mounting dimensions



FAGOR

MONTAJE / MOUNTING



Error cinemático de transferencia:
Kinematic error of transfer:

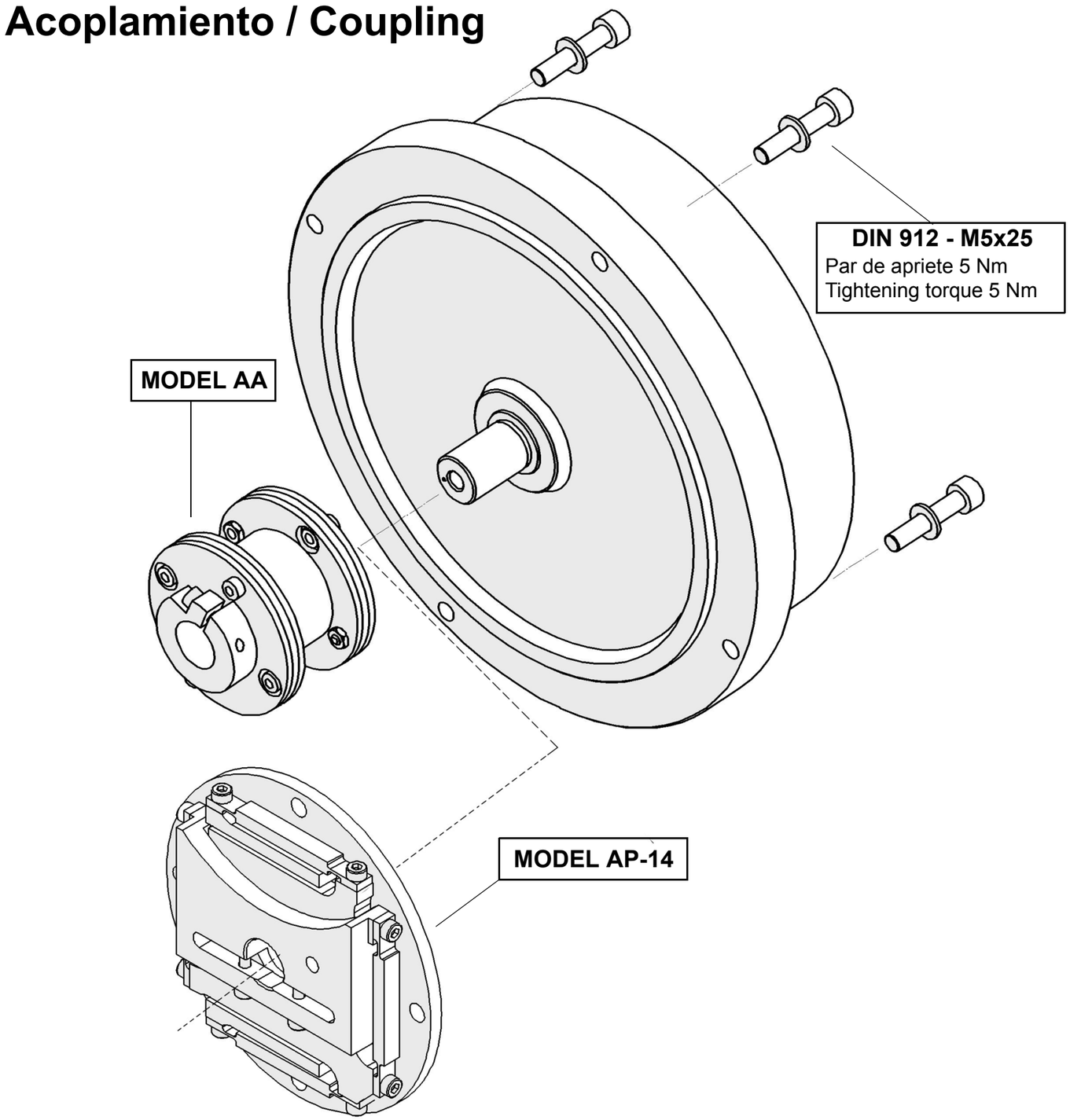
Model AA: ± 2” at λ ≤ 0.1 mm & α ≤ 0.09º

λ max.: 0.3 mm
α max.: 0.5º
δ max.: 0.2 mm

Model AP-14: ± 2” at λ ≤ 0.1 mm & α ≤ 0.09º

λ max.: 0.3 mm
α max.: 0.2º
δ max.: 0.1 mm

Acoplamiento / Coupling



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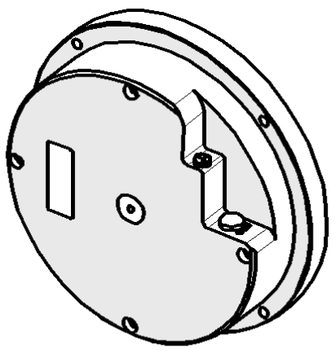
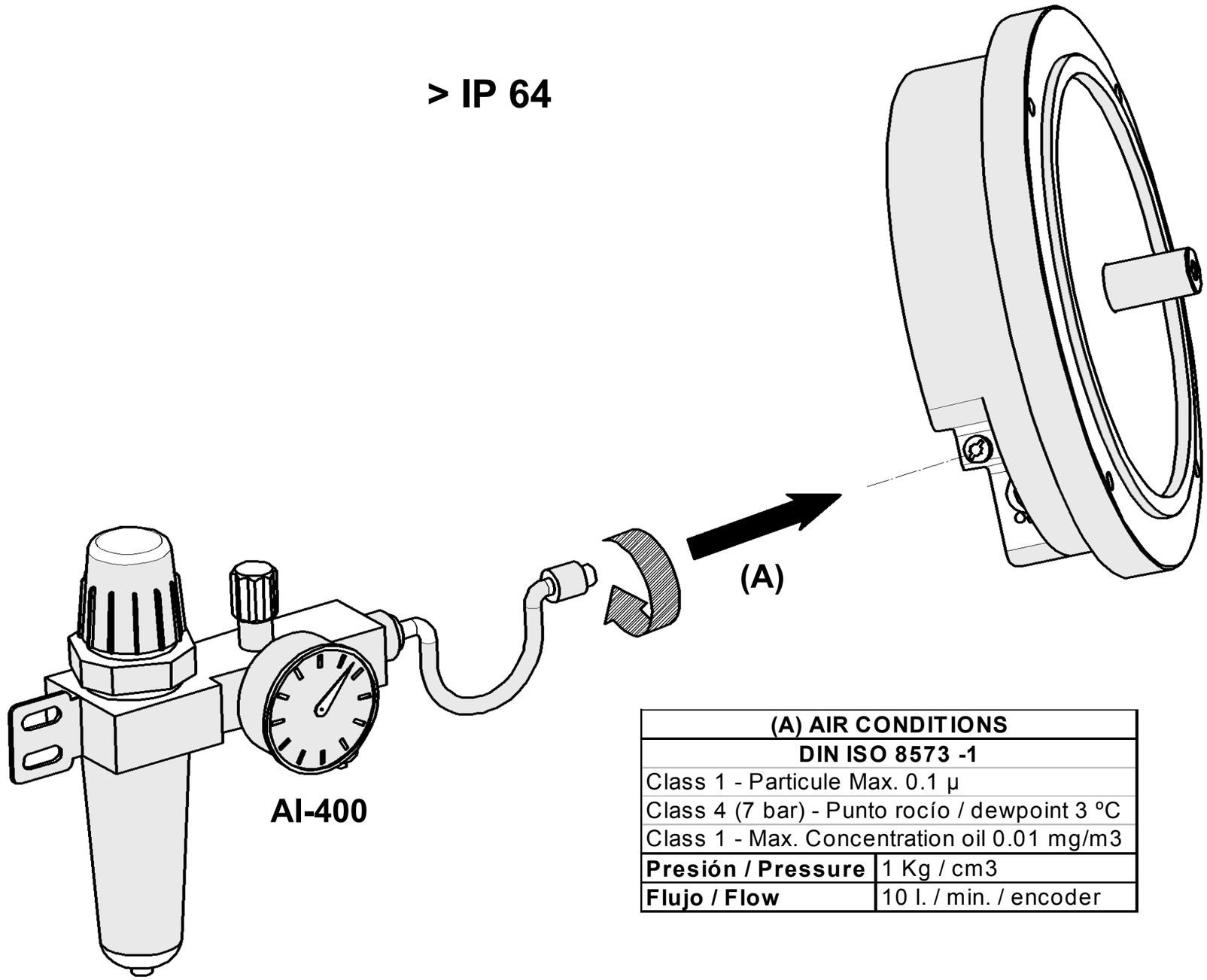
Nivel máximo: IP 64
Maximum level IP 64



> IP 64



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

FAGOR

CARACTERÍSTICAS MECÁNICAS
MECHANICAL CHARACTERISTICS

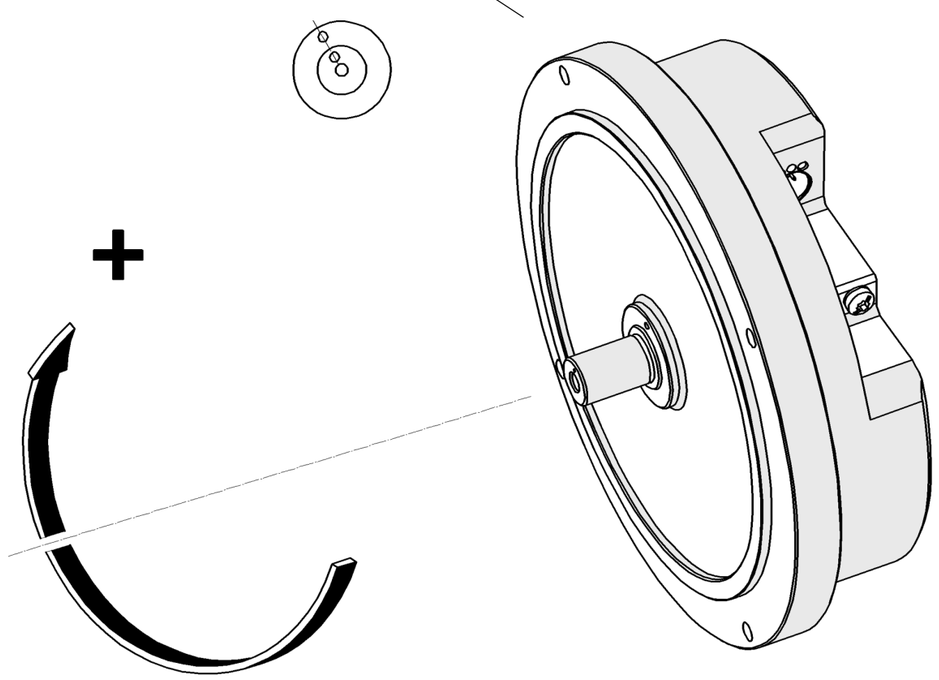
Modelo	SA-D170-23	Model
Precisión	±2"	Accuracy
Maxima velocidad de giro	3000 rpm *	Max. Turning speed
Momento de inercia del eje	350 gr.cm2	Inertia of the rotor
Par (20ºC)	≤ 0.01 Nm	Torque
Carga axial en el eje	10 N	Axial shaft load
Carga radial al final del eje	10 N	Radial load at the end of the shaft
Peso	2.65 kg	Weight
Estanqueidad	IP-64 (DIN 40050)	Sealing protection
Vibración (50-2000 Hz)	100 m/s2 (IEC 68-2-6)	Vibration (50-2000 Hz)
Impacto (6ms)	1000 m/s2 (IEC-68-2-27)	Impact (6 ms)
Temperatura de funcionamiento	0 ºC ... 50 ºC (32 ºF ... 122 ºF)	Operating temperature
Temperatura de almacenamiento	-30 ºC ... 80 ºC (-22 ºF ... 176 ºF)	Storage temperature

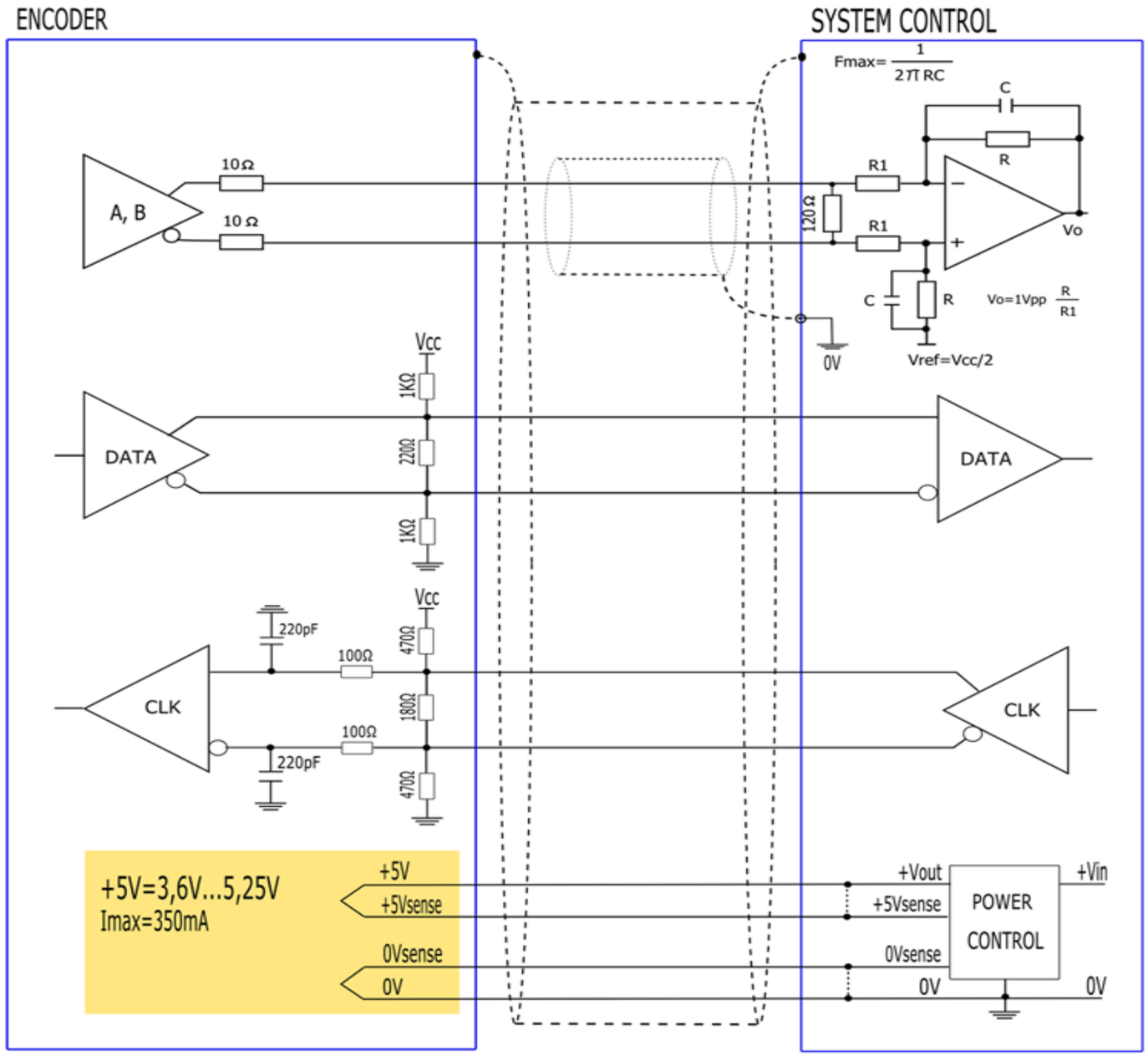
* Limitación eléctrica = 1500 rpm / *Electrical limitation = 1500 rpm*

CARACTERÍSTICAS ELÉCTRICAS / ELECTRICAL CHARACTERISTICS

Posición del origen 0º
0º origin position

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





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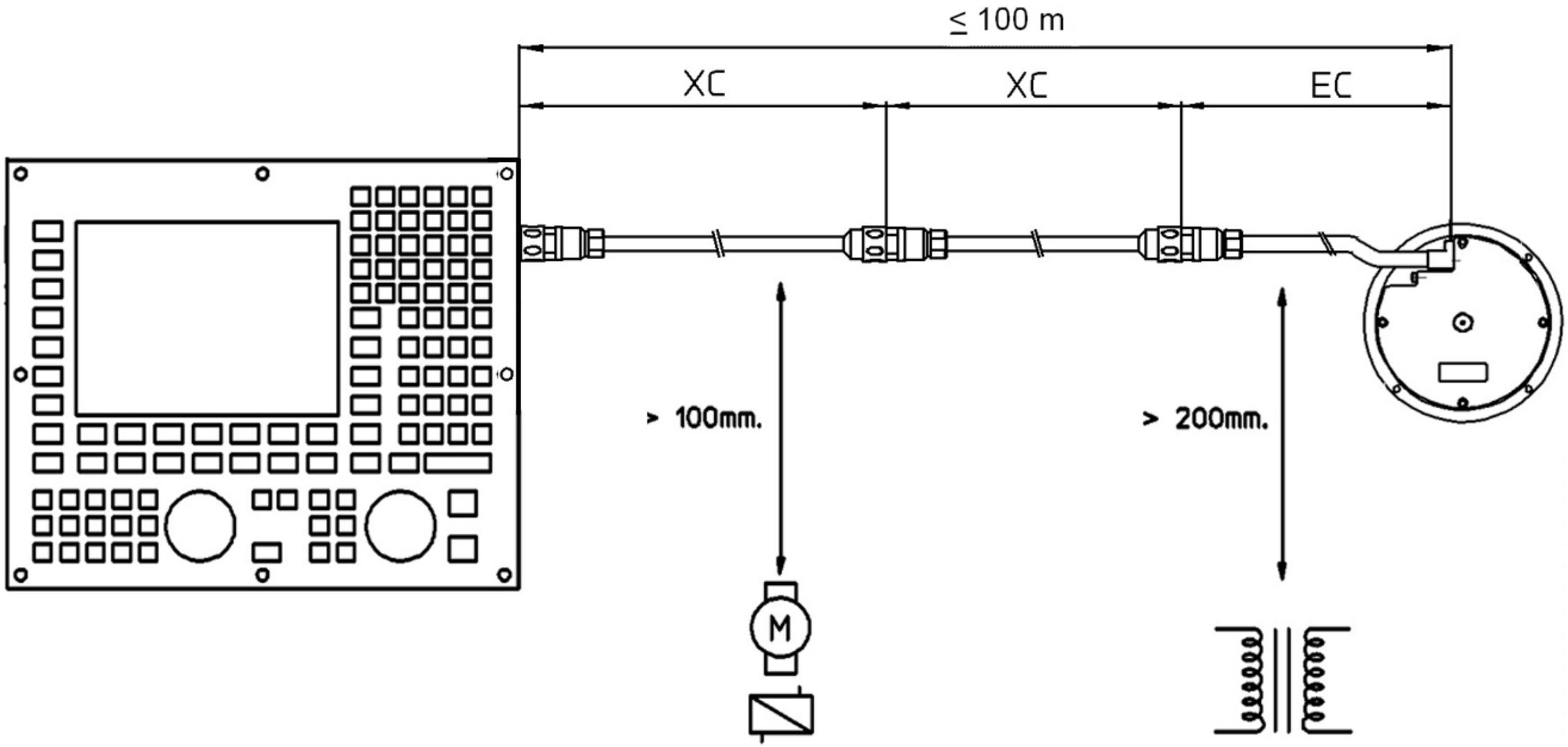

≤ 100 m
XC
XC
EC
> 100mm.
> 200mm.
M

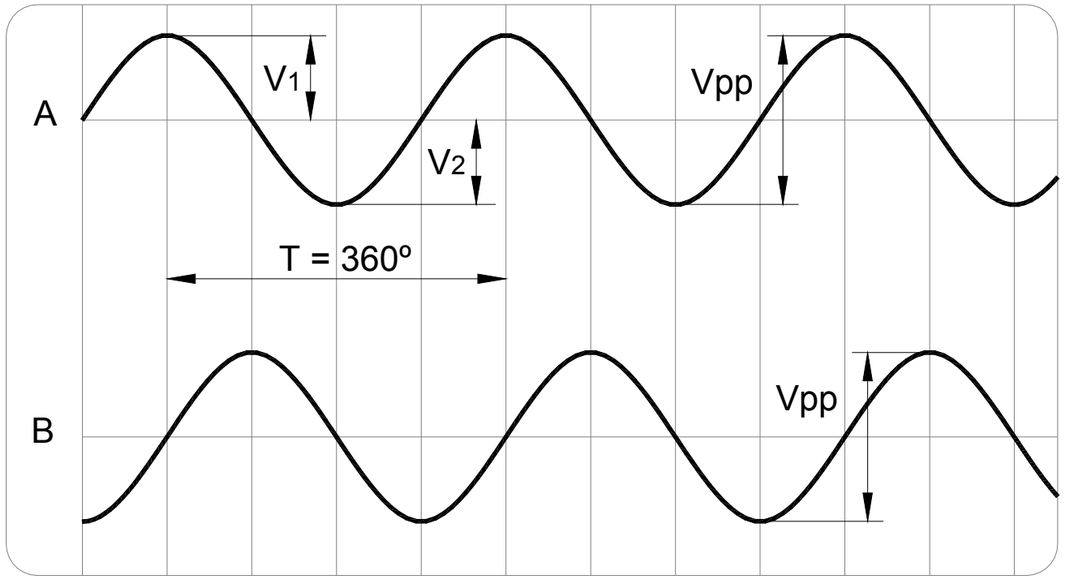
INFORMACIÓN ELÉCTRICA / ELECTRICAL DATA

1 Vpp **SEÑALES DIFERENCIALES**
1 Vpp ***DIFFERENTIAL SIGNALS***

SA-D170

Características - *Characteristics*

Señales *Signals*	A, /A, B, /B
V_{App}	1 V +20%, -40%
V_{Bpp}	1 V +20%, -40%
DC offset	2.5V ± 0.5V
Impulsos por vuelta *Pulses per turn*	16384
Alimentación V *Supply V*	3.6 - 5.25
Máx. longitud de cable *Max. cable length*	100 metros *328 feet*
A, B centrado: $\lvert V_1-V_2\rvert$ / 2Vpp *Centered A, B: $\lvert V_1-V_2\rvert$ / 2Vpp*	⩽ 0.065
Relación A&B: V_{App} / V_{Bpp} *A&B Relationship: V_{App} / V_{Bpp}*	0.8 ÷ 1.25
Desfase A&B *A&B phase shift*	90º ± 10º



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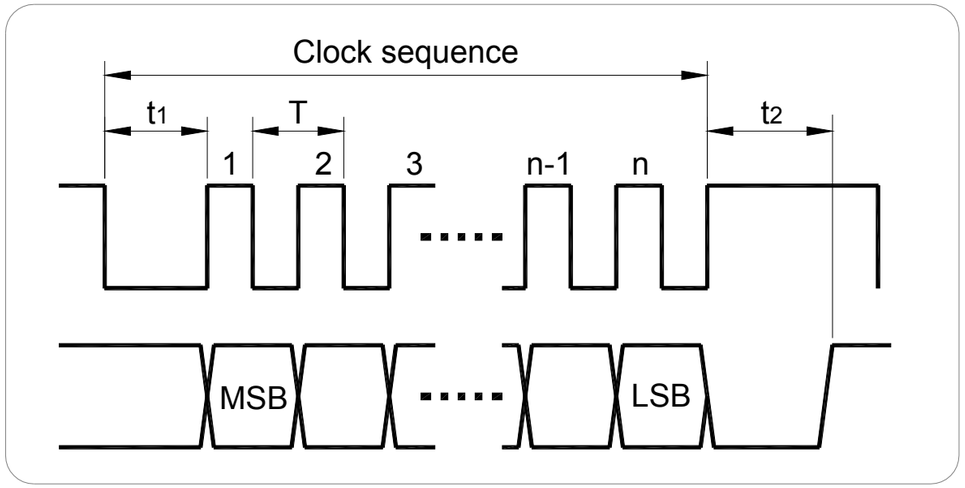
INFORMACIÓN ELÉCTRICA / ELECTRICAL DATA

SEÑALES ABSOLUTAS
ABSOLUTE SIGNALS

SA-D170

Especificaciones - *Specification*

Transmisión / *Transmission*	SSI transferencia serie sincrona vía RS 485. *SSI synchronous serial data transfer via RS 485.*
Niveles / *Levels*	EIA RS 485
Frecuencia Reloj / *Clock Frequency*	100 kHz - 1000 kHz
Max. bit (n)	32 (Configurable)
T	1 µs ÷ 10 µs
t_1	> 0.5 µs
t_2	20 µs ÷ 35 µs
SSI	Grey o Binario (Configurable) *Grey or Binary (Configurable)*
Paridad / *Parity*	Totalmente configurable *Fully configurable*



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

Número de bits / *Number of bits*	23
Tipo de datos / *Data type*	Binario / *Binary*
Paridad / *Parity*	NO
Time out	450 µs

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

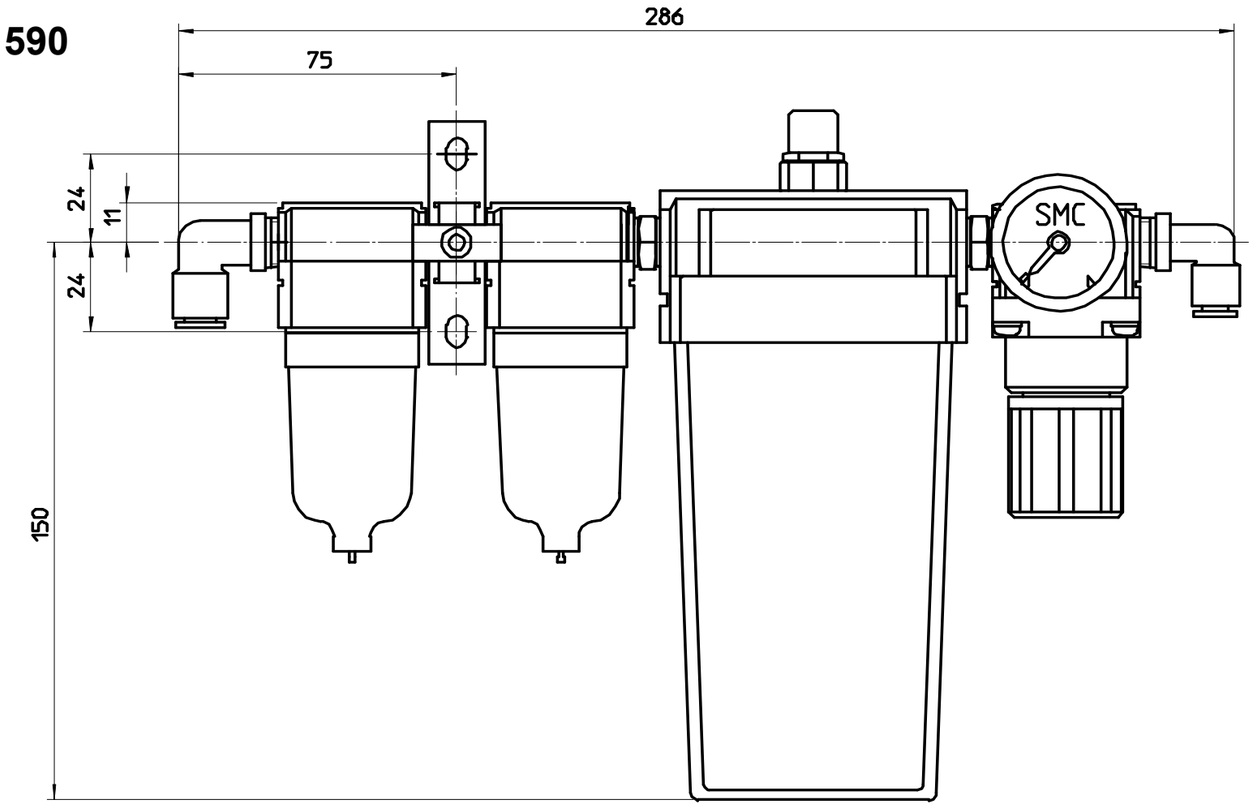
Para más información contacte con Fagor Automation.

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

For further information contact Fagor Automation.

FAGOR

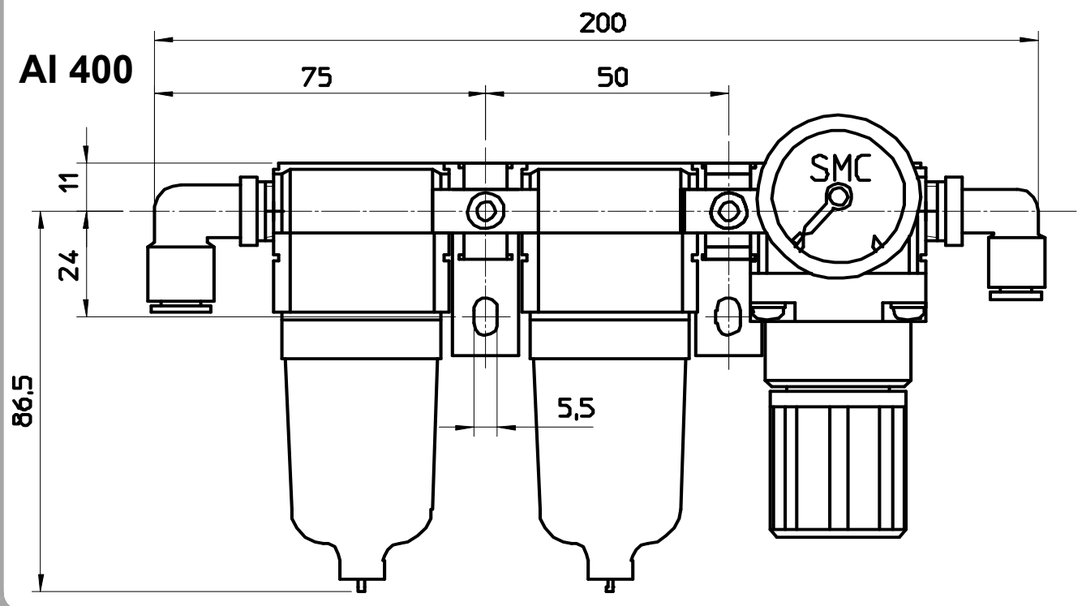
AI 590



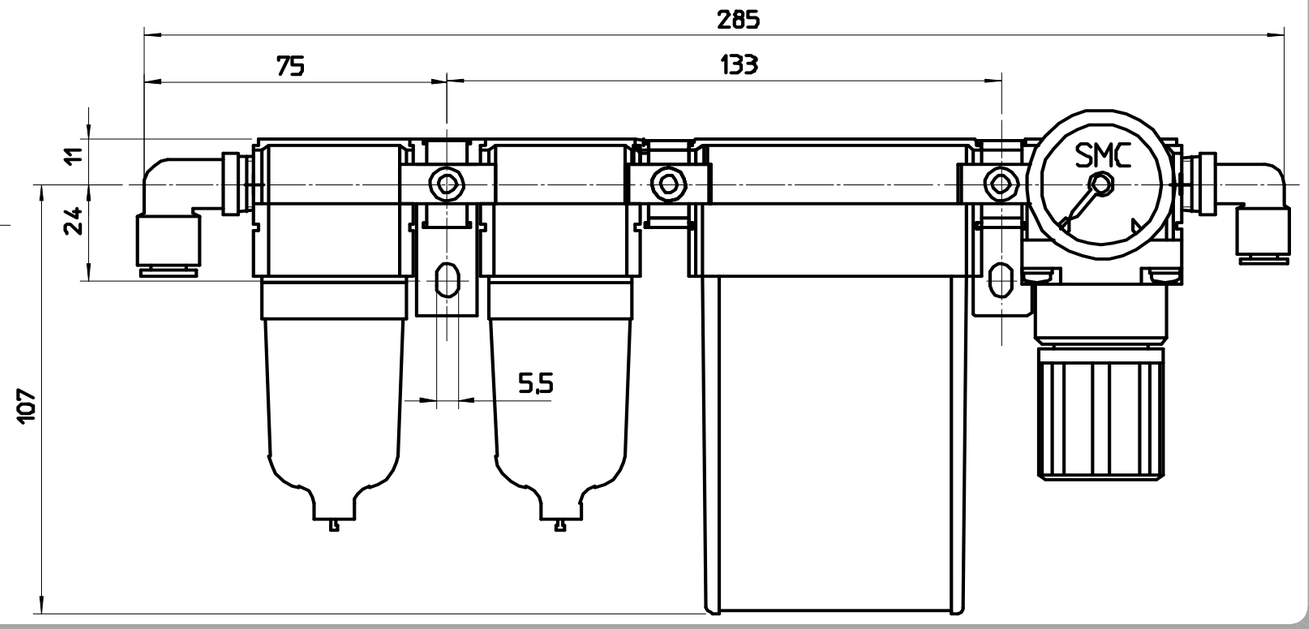
FILTROS DE AIRE / AIR FILTERS

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

AI 400



AI 525 / AI 550



FAGOR

CABLES

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

HASTA 9 METROS - *UP TO 9 METERS*

EC - ...B - D Conector SUB D 15 HD macho en longitudes de 1, 3, 6 y 9 metros.
SUB D 15 HD male Connector available in 1, 3, 6 and 9 meters.

PIN	1	2	3	4	5	6	7	8	9	10	11	12	15	Carcasa/*Housing*
SEÑAL / *SIGNAL*	A	/A	B	/B	Data	/Data	Clock	/Clock	+5V	+5V sensor	0V	0V sensor	Tierra /*Ground*	Tierra /*Ground*
COLOR	Verde *Green*	Amarillo *Yellow*	Azul *Blue*	Rojo *Red*	Gris *Gray*	Rosa *Pink*	Negro *Black*	Violeta *Purple*	Marrón *Brown*	VerdeClaro *LigthGreen*	Blanco *White*	Naranja *Orange*	Malla Interna *Internal Shield*	Malla Externa *External Shield*

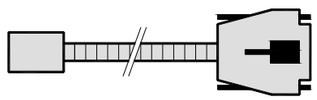
A PARTIR DE 9 METROS - *FROM 9 METERS*

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

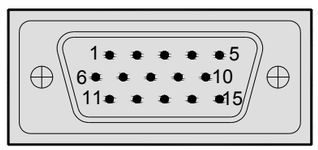
* *Lengths up to 25 meters; (EC -...B - C9) + (XC - C8 -...F - D).*
* *Lengths longer than 25 meters; (EC -...B - C9) + (XC - C8 -...F - C9)+ (XC - C8 -...F - D).*

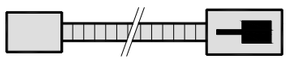
EC - ...B - C9 Conector Circular 17 macho en longitudes de 1 y 3 metros (otras longitudes consultar a Fagor).
Circular 17 male Connector available in 1 and 3 meters (contact Fagor for other lengths).

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	+5V	+5V sensor	0V	0V sensor	Tierra /*Ground*	Tierra /*Ground*
COLOR	Verde *Green*	Amarillo *Yellow*	Azul *Blue*	Rojo *Red*	Gris *Gray*	Rosa *Pink*	Negro *Black*	Violeta *Purple*	Marrón *Brown*	VerdeClaro *LigthGreen*	Blanco *White*	Naranja *Orange*	Malla Interna *Internal Shield*	Malla Externa *External Shield*

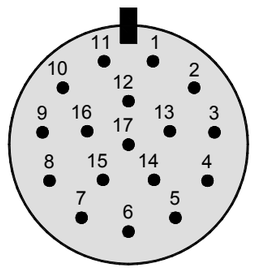


EC - ...B - D





EC - ...B - C9



FAGOR

CABLES

ALARGADERAS PARA CONEXIONES DE LOS ENCODERS ABSOLUTOS FAGOR A SISTEMAS FAGOR
EXTENSION CABLES FOR CONNECTING FAGOR ABSOLUTE ENCODERS TO FAGOR SYSTEMS

XC - C8 - ...F - D Alargadera con Conector Circular 17 hembra / Conector SUB D 15 HD macho. En longitudes de 5, 10, 15, 20 y 25 metros.
Extension cable with Circular 17 female Connector / SUB D 15 HD male Connector. Available in 5, 10, 15, 20 and 25 meters.

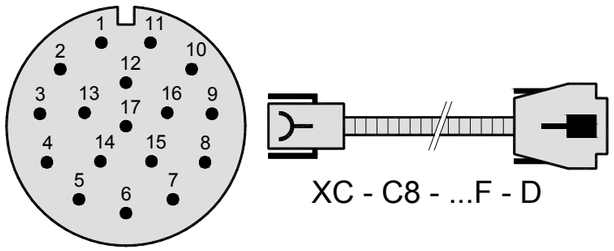
[(4x0.14mm²) + 4x2x0.14mm² + 4x0.5mm²]; con doble apantallamiento / *with double shield*

PIN ⊃–	15	16	12	13	14	17	8	9	7	1	10	4	11	Carcasa/*Housing*
PIN –■	1	2	3	4	5	6	7	8	9	10	11	12	15	Carcasa/*Housing*
SEÑAL *SIGNAL*	A	/A	B	/B	Data	/Data	Clock	/Clock	+5V	+5V sensor	0V	0V sensor	Tierra *Ground*	Tierra *Ground*
COLOR	Verde-Negro *Green-Black*	Amarillo-Negro *Yellow-Black*	Azul-Negro *Blue-Black*	Rojo-Negro *Red-Black*	Gris *Grey*	Rosa *Pink*	Violeta *Purple*	Amarillo *Yellow*	Marrón-Verde *Brown-Green*	Azul *Blue*	Blanco-Verde *White-Green*	Blanco *White*	Malla Interna *Internal Shield*	Malla Externa *External Shield*

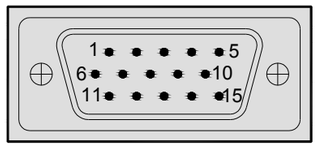
XC - C8 - ...F - C9 Alargadera intermedia con Conector Circular 17 hembra / Conector Circular 17 macho. En longitudes de 5, 10, 15, 20 y 25 m.
Intermediate extension cable with Circular 17 female Connector / Circular 17 male Connector.Available in 5,10,15,20 and 25 m.

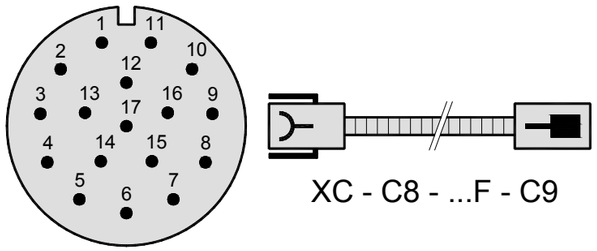
[(4x0.14mm²) + 4x2x0.14mm² + 4x0.5mm²]; con doble apantallamiento / *with double shield*

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*
COLOR	Verde-Negro *Green-Black*	Amarillo-Negro *Yellow-Black*	Azul-Negro *Blue-Black*	Rojo-Negro *Red-Black*	Gris *Grey*	Rosa *Pink*	Violeta *Purple*	Amarillo *Yellow*	Marrón-Verde *Brown-Green*	Azul *Blue*	Blanco-Verde *White-Green*	Blanco *White*	Malla Interna *Internal Shield*	Malla Externa *External Shield*

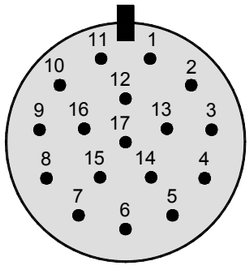


XC - C8 - ...F - D





XC - C8 - ...F - C9



FAGOR

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 Mayo de 2011

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 Mayo 1st 2011

Fagor Automation, S. Coop.

Director Gerente
Pedro Ruiz de Aguirre

NOTAS DE USUARIO / USER NOTES