

DATA SHEET

Speed sensor

Häggglunds SPDC

VALID FOR

- Häggglunds CA
- Häggglunds Quantum
- Häggglunds Quantum Power
- Häggglunds CBp 140
- Häggglunds CBm

FEATURES

- Slim design fully integrated in motor
- Magnetic sensor
- Non-contact, wear-free sensing system
- Radial sensor positioning
- Frequency to analogue converter is available as option
- Possibility for redundant speed sensor functionality

Contents

1	Preface.....	3
2	Ordering code key	4
3	Functional description	6
4	Technical data	7
4.1	Redundance	8
5	Main parts in the Hägglunds SPDC	9
5.1	Hägglunds CA, CBp 140	9
5.2	Hägglunds Quantum	10
5.3	Hägglunds Quantum Power	10
5.4	Hägglunds CBm	11
6	Accessories	12
6.1	F/A Converter	12
6.2	IO-Link repeater	13
6.2.1	Cable extension guidelines.....	14
6.3	IO-Link master.....	15
7	Installation.....	16
7.1	Hägglunds CA, CBp 140	16
7.2	Hägglunds CA and CBp 140 with through hole.....	17
7.3	Hägglunds CA with BICA	18
7.4	Hägglunds Quantum	19
7.5	Hägglunds Quantum with through hole	20
7.6	Hägglunds Quantum Power	20
7.7	Hägglunds CBm	21
7.8	Hägglunds CBm with through hole	22
7.9	Hägglunds CBm with BICA	23
7.10	Cable and sensor assembly	23
7.11	IO Link installation	24
7.11.1	Connecting and configuring the IO-Link System	24
7.11.2	Process Data Inputs	25
8	Additional documentation	26

1 Preface

Safety messages




This documentation includes safety messages placed before sequential operating procedures that may involve the risk of personal or property damage. The described precautionary measures must be observed.

Safety messages are structured as shown below:

 SIGNAL WORD	
Type and source of risk	Consequences if disregarded
	▶ Precautionary measures

Warning sign:	Draws attention to the risk
Signal word:	Identifies the hazard level
Type and source of risk:	Identifies the type and source of the hazard
Consequences:	Describes what occurs when the safety messages are not complied with
Precautions:	Indicates how the hazard can be avoided

The signal words have the following meaning:

Warning sign, signal word	Meaning
 DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates potential property damage: the product or the environment may be damaged.

2 Ordering code key

In order to identify Hägglunds equipment exactly, the following ordering code is used.

These ordering codes should be stated in full in all correspondence e.g. when ordering spare parts.

Example: Hägglunds SPDC

1		2		3		4	5		6		7		8		9		10		11		12	13
HD	-	SPDC	-	02	-	0	0	-	01856	-	0	-	00	-	0	-	3		2002	-	B	00

01	Brand					Hägglunds	HD
02	Speed sensor						SPDC
03	Mounting set for motor type					CA, CBp 140	02
						Quantum (QMX) ¹	04
						Quantum Power (QMP) ¹	05
						CBm	06
04	Motor type					Standard hollow shaft	0
						With through hole kit	H
05	BICA brake²		02	04	05	06	
	No	X	X	X	X		0
	Yes	X	-	-	X		B
06	Pulse rate		02	04	05	06	
	1856 pulse/rev.	X	X	-	-		01856
	2976 pulse/rev.	-	-	X	-		02976
	4544 pulse/rev.	-	-	-	X		04544
07	Redundancy		02	04	05	06	
	None (1 sensor)	X	X	X	X		0
	Two sensors	X	X	X	X		2
	Three sensors	X ³	-	-	X		3
08	Submerged					No	00
09	Explosive environment					Not available	0
10	Painting system					C3 (corrosivity category medium)	3
						C5 (corrosivity category very high)	5
						CX (corrosivity category extreme)	X

1 Hägglunds SPDC is part of the hydraulic motor and normally not purchased as a standalone accessory

2 Hägglunds Quantum (04) and Quantum Power (05) use standard SPDC (0) together with BICA brake

3 Three sensors is not available for Hägglunds CA with BICA brake

11	Painting colour	
	Hägglunds standard (RAL 2002)	2002
	Special RAL 1000 – 9023 (specify with RAL colour code)	****
12	Modification	
	Current modification	B
13	Design	
	Standard	00
	Special index	01-99

Note!

It must be stated that the speed sensor shall be mounted on the motor at the factory, when ordering the Hägglunds SPDC. The SPDC will be sent separately if not stated.

It shall be noted that there are several valuable advantages to have the SPDC mounted at the factory, as some parts of the motor must be dismantled and exchanged with new parts if the SPDC is mounted afterwards.

3 Functional description

The Hägglands SPDC is an incremental encoder system used for speed measurement. The sensing principle is non-contact magnetic.

The encoder provides incremental square-wave output signals A+ and B+ with a 90° phase shift, enabling direction and speed detection. The resolution is pre-programmed depending on motor type.

The encoder supports two output modes, digital puls output (HTL/TTL) or IO-link.

All sensor parameters (resolution, interface, signal processing, monitoring functions) are pre-configured at delivery, but can be changed via the IO-Link interface.

4 Technical data

Mechanical specification		
		Material ID
Sensor head	HD-SPDC-01856-B00	R939083648
	HD-SPDC-02976-B00	R939083649
	HD-SPDC-04544-B00	R939083650
Protection class	IP 66 (open connector)/IP 67 (connected/plugged) acc. to DIN EN 60529	
Operating temperature	-40...+95 °C	
Vibration	EN 60068-2-6 Vibration 30 g, 10-2000 Hz	
Shock	EN 60068-2-27 Shock 500 g, 1 ms	
Material sensor	Housing: Polyamide	
Material connector	Standard: Nickel-plated brass	

Table 1: Mechanical specification

Electrical specification		
Value supply voltage +U _b	HTL/TTL	+ 24 VDC (4.5-30 VDC)
	IO-Link	18-30 VDC
Current consumption at no-load	≤ 100 mA	
Outputs	HTL (push-pull short-circuit proof) or TTL ¹	
Output level	Low	≤ 2 V (HTL); ≤ 0.5 V (TTL)
	High	≥ U _b -2 V (HTL); ≥ 2.5 V (TTL)
Cable length max	HTL/TTL	120 m at 50 kHz
	IO-Link	20 m
Output Frequency	≤ 500 kHz	
EMC approval (Immunity)	DIN EN 61000-6-2	
EMC approval (Emission)	DIN EN 61000-6-4	
Initializing time	≤ 300 ms after power on	
System accuracy	±0,1°	
Phase shift	90° ±20°	

Table 2: Electrical specification

Electrical ratings (IO-Link)	
IO-Link version	1.1
Device profile	Identification and diagnosis
IO-Link port type	Class A
Baud rate	230.4 kBaud (COM 3)
Cycle time	≥ 1 ms
Process data length	72 bit
Process data structure	Bit 0 = SSC1 (speed monitor) Bit 1 = SSC2 (direction monitor) Bit 2 = quality Bit 3 = alarm Bit 4 = SSC3 (standstill monitor) Bit 7 = condition monitoring Bit 8-39 = 32 Bit position Bit 40-71 = 32 Bit speed
Additional data	Signal quality value Working distance (airgap) Device temperature Device status Statistic data
Adjustable parameters	User data (3x32 Byte) Interpolation settings Speed filter Condition monitoring Motion monitor settings Digital switch output settings

Table 3: Electrical ratings (IO-Link)

Specification, Female cable connector (included in delivery)	
Cable connector	Material ID: R901615366
Type	Female M12 A-coded IEC 610 76-2-101
Connection	4 pin screw terminal
Cable diameter	Ø 6-8 mm
Conductor cross section	0,25-0,75 mm ² AWG 24-18

Table 4: Specification, Female cable connector

Specification, Optional cable ²	
Connecting cable	Material ID
	5 m R901615367
	10 m R913016699
	20 m R901615452
Connector type	Female M12 A-coded
Connection customer	Free cable end
Cable type	PUR, Halogen-free
Cable diameter	Ø 5 mm
Conductor	4 x 0,34 mm ²
Shielding	Advanced Shielding Technology

Table 5: Specification, Optional cable

1 Outputs depend on supply voltage: +U_b=10...30 VDC → HTL, +U_b=4.5...5.5 VDC → TTL

2 Replaces the included female cable connector

Pulse rate	
Motor type	Pulse rate
CA, CBp 140, Quantum	1856 ppr
Quantum Power	2976 ppr
CBm	4544 ppr

Table 6: Pulse rate

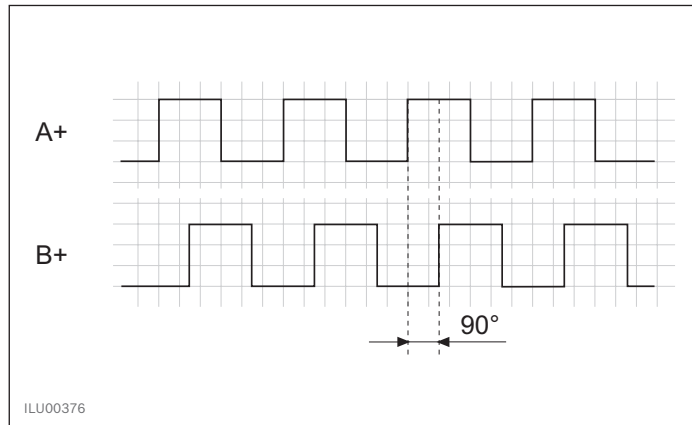


Fig.1: Sequence for clockwise direction of rotation

Specification, Pin out		
Pin #	Assignment	Description
1	+U _b	Voltage supply
2	B+	Output B
3	0 V	Voltage supply
4	A+ / IO-Link	Output A / IO-Link

Table 7: Specification, Pin out

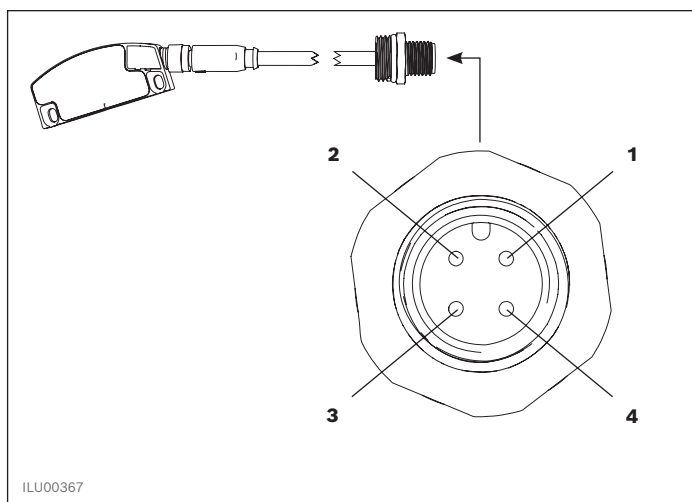


Fig.2: Connection female cable connector, seen from connecting side

4.1 Redundance

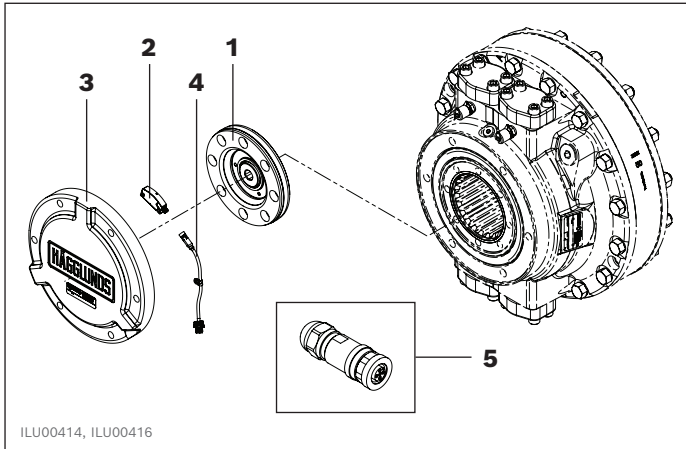
Hägglunds SPDC is available with single, double or triple sensors depending on motor type. Should the primary sensor fail, a standby sensor can be activated. This feature ensures continuous, uninterrupted operation and allows for the replacement of the faulty sensor during scheduled maintenance, maximizing production uptime.

Note! For Hägglunds CBm with BICA brake it is strongly recommended to have redundancy. This is because accessing the sensor head requires the brake to be removed.

Please contact your Bosch Rexroth representative for further information about redundancy.

5 Main parts in the Hägglunds SPDC

5.1 Hägglunds CA, CBp 140



1. Magnetized bearing holder
2. Sensor head
3. Cover
4. Cable with M8 and M12 connector
5. Cable connector for customer cable

Fig.3: Parts in the Hägglunds SPDC for Hägglunds CA and CBp 140

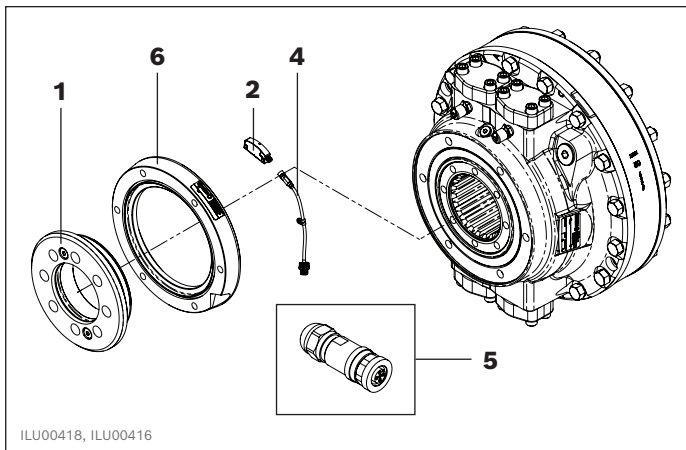


Fig.4: Parts in the Hägglunds SPDC for Hägglunds CA and CBp 140 with through hole

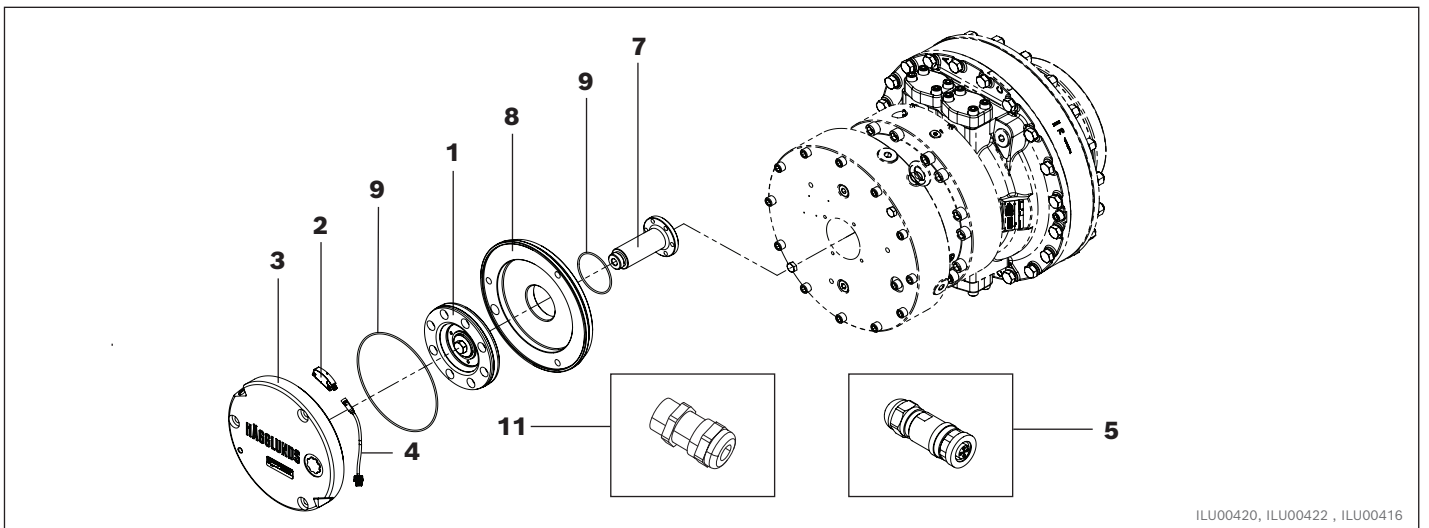


Fig.5: Parts in the Hägglunds SPDC for Hägglunds CA with BICA

5.2 Hägglunds Quantum

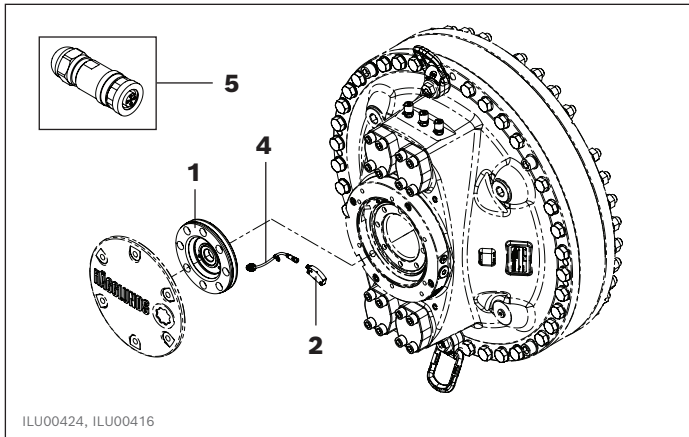


Fig.6: Parts in the Hägglunds SPDC for Hägglunds Quantum

5.3 Hägglunds Quantum Power

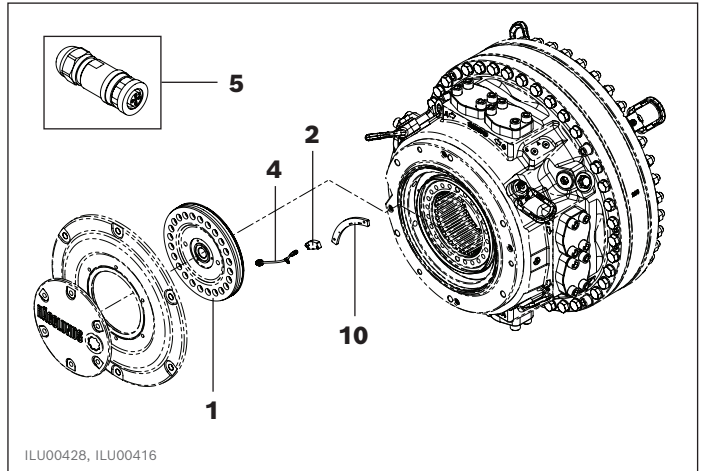


Fig.8: Parts in the Hägglunds SPDC for Hägglunds Quantum Power

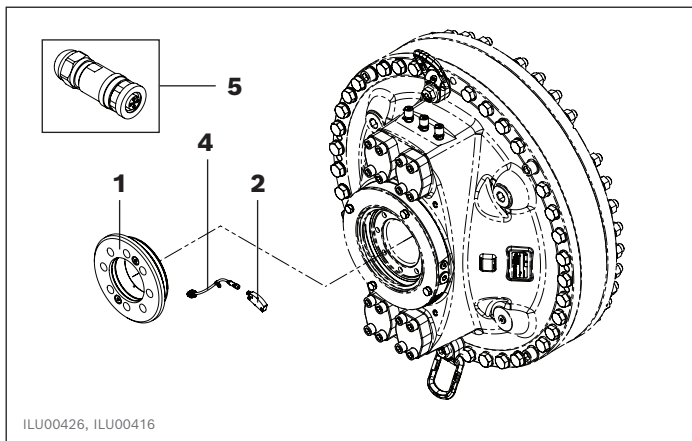


Fig.7: Parts in the Hägglunds SPDC for Hägglunds Quantum with through hole

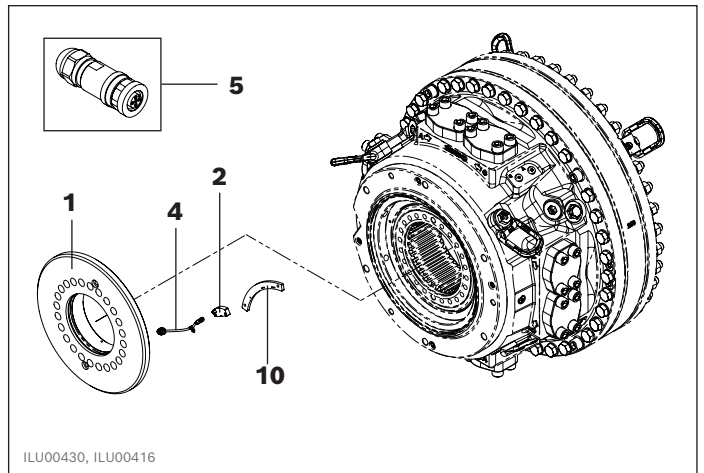


Fig.9: Parts in Hägglunds SPDC for Hägglunds Quantum Power with through hole

1. Magnetized bearing holder
2. Sensor head
4. Cable with M8 and M12 connector
5. Cable connector for customer cable
10. Bracket

5.4 Hägglunds CBm

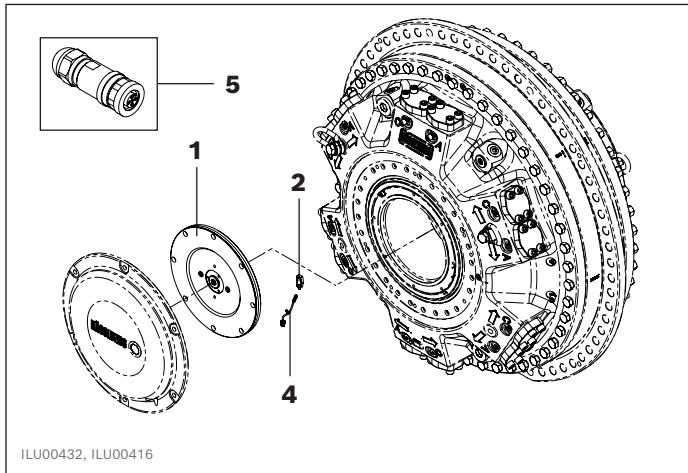


Fig.10: Parts in the Hägglunds SPDC for Hägglunds CBm

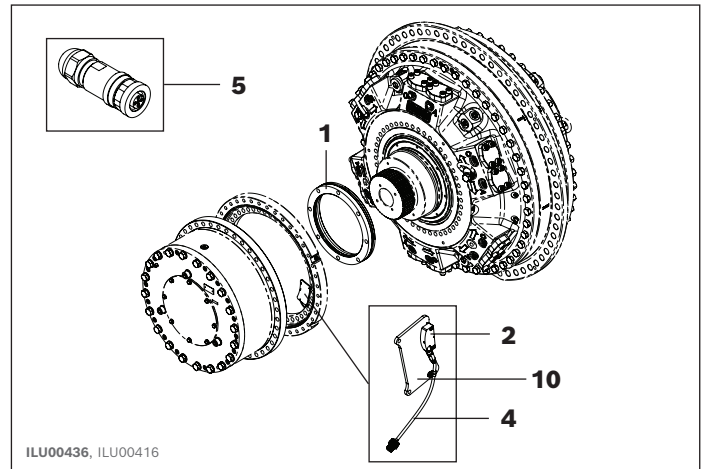


Fig.12: Parts in the Hägglunds SPDC for Hägglunds CBm with BICA

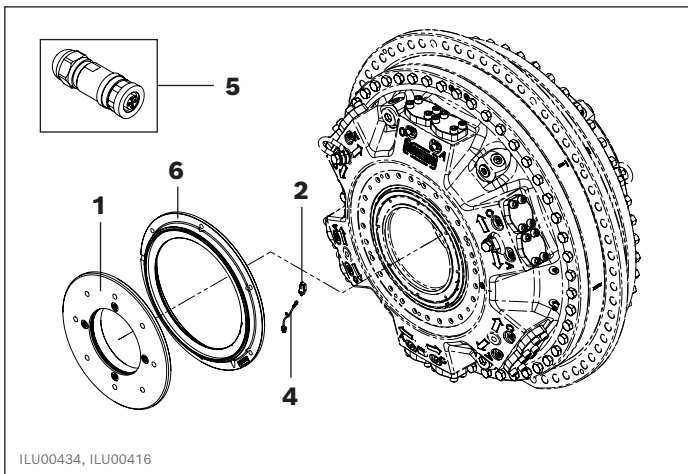


Fig.11: Parts in the Hägglunds SPDC for Hägglunds CBm with through hole

1. Magnetized bearing holder
(Not included in delivery, due to Included in BICA)
2. Sensor head
4. Cable with M8 and M12 connector
5. Cable connector for customer cable
6. Outer ring
10. Bracket

6 Accessories

6.1 F/A Converter

Functional description

The F/A Converter converts a single puls train to a 4-20 mA output signal. The output is based on an internal reference frequency selectable in 16 steps. This gives a full output at 16 different pulse rates. The F/A Converter is optional and must be mounted externally.

Technical data	
Material ID	R939004770
Supply voltage	24 V (12-50 V)
Power consumption	3 W
Operating temperature	-20° C... +60° C
Humidity	0-90 % RH, non condensing
Temperature coefficient	< 0,01 % / ° C
Accuracy	better than 0,3 %
Resolution	0,1 %
Mounting	NS35 DIN rail
Size	w45 x d70 x h117 mm

Table 8: Technical data

Electrical connections	
Pulse input:	
- Input high	$V_{in} > 15 V$
- Input low	$V_{in} < 6 V$
4-20 mA output	Max. output load 500 Ω
EMC approval	
	EN 50081-1, EN 50082-2
Safety	
	EN 60730

Table 9: Electrical connections

Settings of SW1 for different type of speed sensors and rpm range

SW1	1856 ppr	2976 ppr	4544 ppr	
0	0 - 0,05	0 - 0,03	0 - 0,02	rpm
1	0 - 0,11	0 - 0,07	0 - 0,04	rpm
2	0 - 0,27	0 - 0,17	0 - 0,11	rpm
3	0 - 0,54	0 - 0,34	0 - 0,22	rpm
4	0 - 1,08	0 - 0,67	0 - 0,44	rpm
5	0 - 2,69	0 - 1,68	0 - 1,10	rpm
6	0 - 5,39	0 - 3,36	0 - 2,20	rpm
7	0 - 10,78	0 - 6,72	0 - 4,40	rpm
8	0 - 3,23	0 - 2,02	0 - 1,32	rpm
9	0 - 6,47	0 - 4,03	0 - 2,64	rpm
A	0 - 16,16	0 - 10,08	0 - 6,60	rpm
B	0 - 32,33	0 - 20,16	0 - 13,20	rpm
C	0 - 64,66	0 - 40,32	0 - 26,41	rpm
D	0 - 161,64	0 - 100,81	0 - 66,02	rpm
E	0 - 323,28	0 - 201,61	0 - 132,04	rpm
F	0 - 646,55	0 - 403,23	0 - 264,08	rpm

Table 10: Settings of SW1

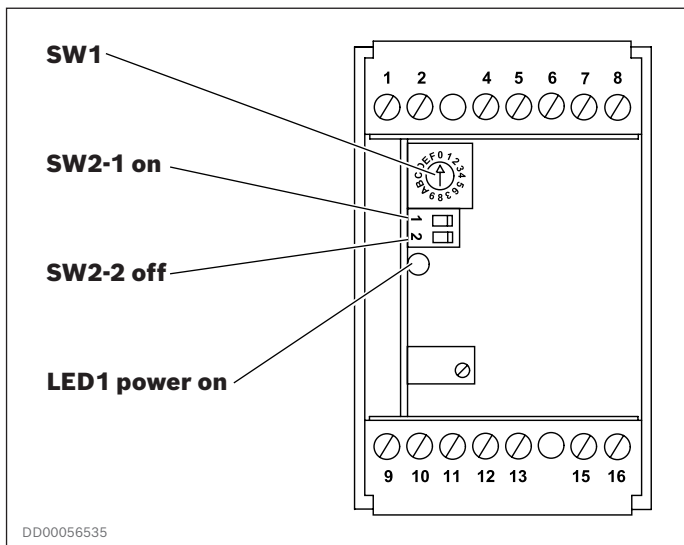


Fig.13: F/A converter, details

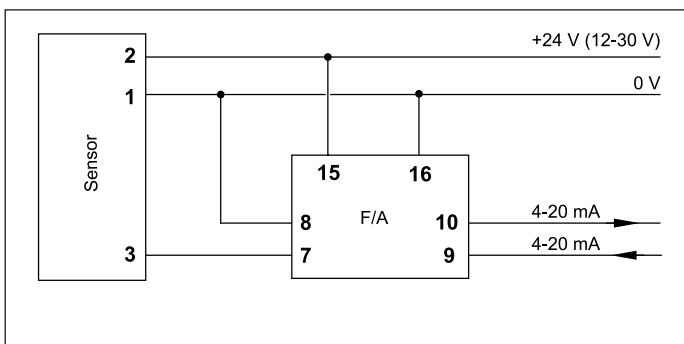


Fig.14: Connection diagram

6.2 IO-Link repeater

The IO-Link repeater is used to extend the communication range of IO-Link devices beyond the standard 20 m limit. With up to three repeaters connected in series, total length of up to 240 m can be achieved. The repeater operates transparently with all certified IO-Link masters and requires no configuration (plug & play). Its stainless steel IP68/IP69K-rated housing makes it ideal for demanding environments.

Article information	
Material ID	Model
R911432272	E30444

Table 11: Article Information

Environmental and mechanical data	
Protection rating	IP68; IP69K (7 days / 3 m water depth / 0.3 bar: IP 68)
Operating temperature	-25°C to +65°C
Storage temperature	-40°C to +85°C
Dimensions	Ø 30 mm × 116 mm (L)
Weight	approx. 212 g
Materials	Stainless steel (316L/1.4404); PEI; PA reinforced fibre; FKM; Grounding clamp: stainless steel (304/1.4301)

Table 12: Environmental and mechanical data

Electrical Data	
Operating voltage	18–30 V DC
Nominal voltage	24 V DC
Current consumption	< 20 mA
Protection class	III
Reverse polarity protection	Master side
Overvoltage protection	Integrated
Power-on delay	< 2 s per repeater
Current rating per port	0.84 A (Port Class A); 2 A (Port Class B)
Functional grounding	Grounding terminal with minimum 1.5 mm ² conductor
Surge protection for voltage	Between L+, signal cables and ground: U _{max} = 90 V for surge U _{min} = 60 V for normal operation Between L-, pin 5 and ground: U _{max} = 45 V for surge U _{min} = 30 V for normal operation
Surge protection for current	Surge current: I _{max} = 25 A Leakage current: I _{max} = 10 µA

Table 13: Electrical data

1 Pin 4 is used for regeneration of the IO-Link signal.

IO-Link features	
IO-Link revision	1.0 / 1.1
Supported master port class	A / B
Transmission speed	COM3 (230.4 kBaud)
SDCI standard	IEC 61131-9
Process data delay	The base delay is 1 cycle. Each connected repeater adds up to 1 additional cycle
Acyclic data delay	The base delay is 1 cycle. Each connected repeater adds up to 2 additional cycles

Table 14: IO-Link features

Electrical connection	Connector
Plug	Connector: 1 × M12, A-coded, contacts gold-plated.
Socket	1 × M12, A-coded, contacts gold-plated.

Table 15: Electrical connection

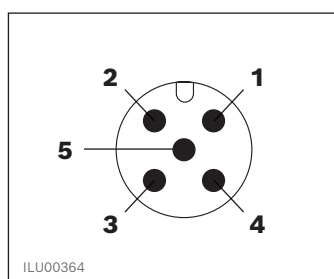


Fig.15: Electrical connection – plug

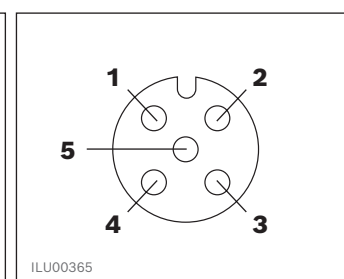


Fig.16: Electrical connection – socket

Pin assignment		
Pin	Port Class A	Port Class B
1	L+	L+
2	Bridged, electrically isolated	P24
3	L-	L-
4 ¹	C: IO-Link	C: IO-Link
5	Bridged, electrically isolated	N24

Table 16: Pin assignment

Tests / approvals	
EMC	DIN EN 61000-6-2 DIN EN 61000-6-4 (in plastic or open metal tanks)
Shock resistance	DIN EN 60068-2-27 (50 g, 11 ms)
Vibration resistance	DIN EN 60068-2-6 (20 g, 10-2000 Hz)
MTTF (Mean time to failure)	409 years
UL approval	File number E205959

Table 17: Test / approvals

6.2.1 Cable extension guidelines

6.2.1.1 Maximum achievable distance

The achievable distance depends on three factors:

- Baud rate
- Cable cross-section
- Current consumption of the connected IO-Link device

Baud rate	Max length
COM 3 (230.4 kBaud)	Up to 200 m

Table 18: Maximum achievable distance

Cable Cross-Section Selection				
Device Current (I_{max})	0.12 mm ²	0.25 mm ²	0.34 mm ²	0.5 mm ²
40 mA	~82	~171	~232	~240
80 mA	~56	~116	~158	~232
120 mA	~42	~88	~120	~176
160 mA	~34	~71	~96	~141
200 mA	~28	~59	~80	~118

Table 19: Cable cross-section selection

Note: Values are approximate. For precise calculations, use the formula (copper conductors):

$$A_{min} = (I_{max} + 45) \times L \times k, \text{ with } k = 17.24 \times 10^{-6} \text{ mm}^2 / (\text{mA} \times \text{m}).$$

6.2.1.2 System setup at different distances

General rules:

- Maximum 3 repeaters can be connected in series.
- The first segment (Master → first Repeater) must be max. 20 m.
- The last segment (last Repeater → Device) must be max. 20 m.
- Middle segments can be longer (see [table 20](#)).

Maximum partial distances COM3 (230.4 kBaud)		
Length	Repeaters	Dimensioning, maximum partial distances in meters
20–40 m	1	M –[20]– R –[20]– D
40–120 m	2	M –[20]– R –[80]– R –[20]– D
120–200 m	3	M –[20]– R –[80]– R –[80]– R –[20]– D

Table 20: (*M* = Master, *R* = Repeater, *D* = Device)

Maximum partial distances COM3 (230.4 kBaud)

Note: With COM3, a range of max. 200 m is possible.

6.3 IO-Link master

The IO-Link master is the interface between IO-Link sensors and the PLC/controller, and it translates IO-Link data from devices into fieldbus protocols for the PLC. In this application the IO-Link master is used as the interface for connecting Häggglunds SPDC sensors and actuators to the customer control system, when the communication range of IO-Link devices is beyond the standard 20 m limit. With the IO-Link master, a total length of up to 220 m can be achieved, depending on fieldbus.

The IO-Link master features a plastic housing with IP65/IP67 protection and M12 connectors and is intended for industrial use.

A 24 VDC power supply is required for operation.

The IO-Link master features separate power inputs (M12 T-coded connectors) for the module electronics/sensors and the actuators.

Fieldbus variants		
Material ID	Fieldbus	Model
R901572777	PROFIBUS DP	AXL E PB IOL8 DI4 M12 6P
R911175258	EtherCAT	AXL E EC IOL8 DI4 M12 6P
R901596732	PROFINET	AXL E PN IOL8 DI4 M12 6P
R901596730	Ethernet/IP	AXL E EIP IOL8 DI4 M12 6P

Table 21: Fieldbus variants

Environmental and mechanical data	
Protection class	IP65 / IP67
Operating temperature	-25°C to +60°C
Dimensions (W × H × D)	60 × 185 × 30.5 mm (212 mm incl. mounting clip)
Weight	approx. 480 g

Table 22: Environmental and mechanical data

Power Supply		
Module electronics and sensors (U_s)	19.5–31.2 V DC	170–180 mA ±15% typical current consumption
Actuators (U_A)	18–31.2 V DC	28–30 mA ±15% typical current consumption

Table 23: Power supply

Note: M12 power connectors and cabling are not included in the delivery.

IO-Link Features	
IO-Link version	V1.1.2
IO-Link Ports	8 ports (4× Class A, 4× Class B). Maximum current per port is 150 mA on pin 4 (C/Q). Total sensor current from U_s supply is limited to 1.6 A
Transmission speed	COM3
Min. cycle time	2 ms
Parameter data storage	Supported (automatic parameter transfer to connected device)
Contacts	M12
Class B power supply	Separate supply (U_A) for actuators via Pin 2 and Pin 5, up to 2 A
Customer connection (Fieldbus)	M12 D-coded connector for PROFINET, EtherCAT, and Ethernet/IP variants; M12 B-coded connector for PROFIBUS variant
Cable Length	Permissible cable length: < 20 m (between master and IO-Link device)

Table 24: IO-Link features

Note: Network/Fieldbus cables are not included in the delivery.

7 Installation

7.1 Hägglunds CA, CBp 140

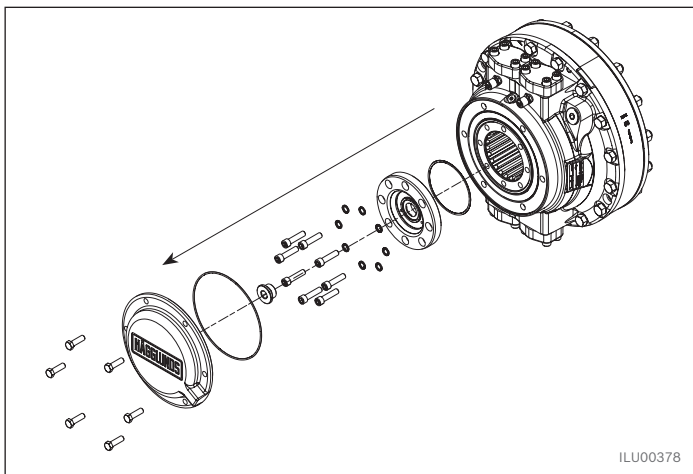


Fig.17: Dismounting of Hägglunds CA and CBp 140

1. Dismount cover and bearing holder.

Note! Save screws, washers, plugs and O-rings for reassembling.

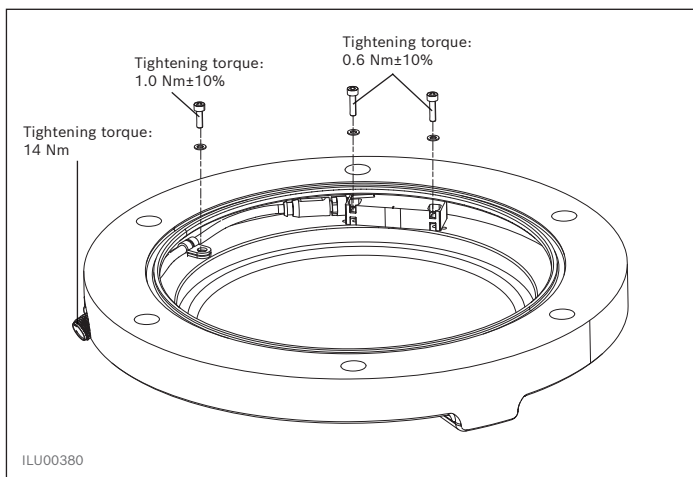


Fig.18: Sensor head and cable grip in SPDC cover

2. Assemble instruction cable, cable grip and sensor. See [7.10 Cable and sensor assembly](#).

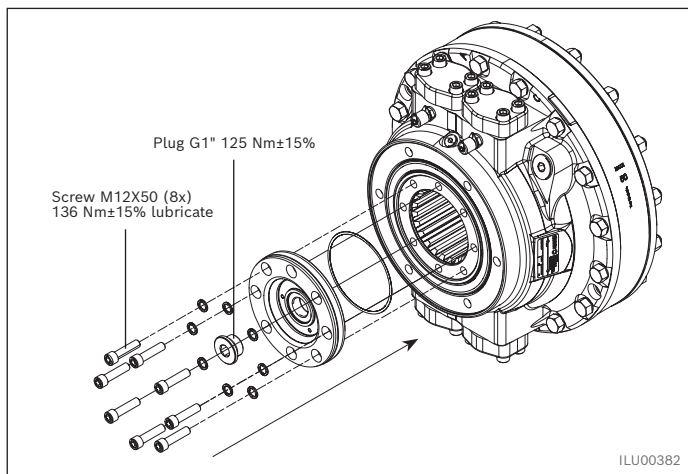


Fig.19: SPDC magnetized bearing holder

3. Mount SPDC magnetized bearing holder.

NOTICE

External magnetic fields

Bearing holder damage

- Keep magnetized bearing holder away from magnetic fields!

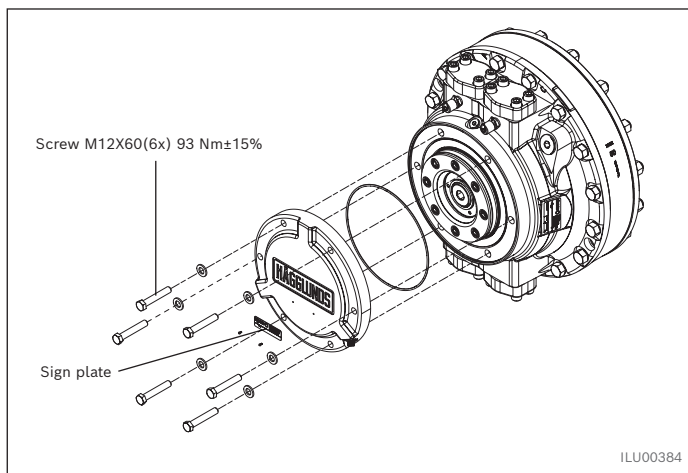


Fig.20: SPDC cover and product identification sign plate

4. Mount SPDC cover. Attach the sign plate on the cover by using the rivets into the pre-drilled 2 mm holes.

NOTICE

Uncontrolled positioning of cover

Sensor damage

- Use steel dowels to secure positioning!

7.2 Hägglunds CA and CBp 140 with through hole

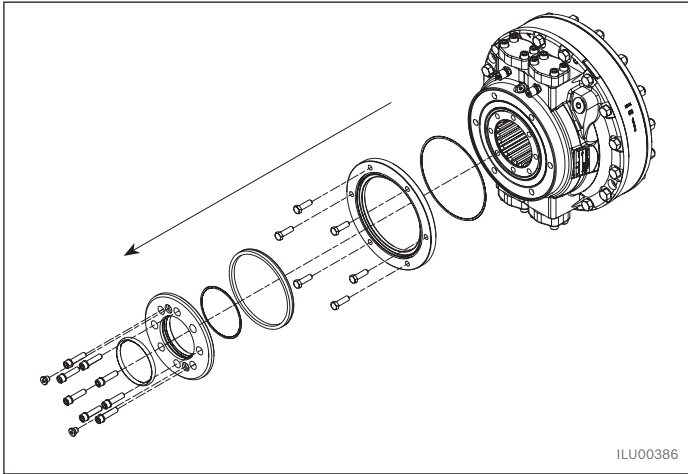


Fig.21: Dismounting of Hägglunds CA and CBp 140 with through hole

1. Dismount outer ring and bearing holder.

Note! Save screws, washers, plugs and O-rings for reassembling.

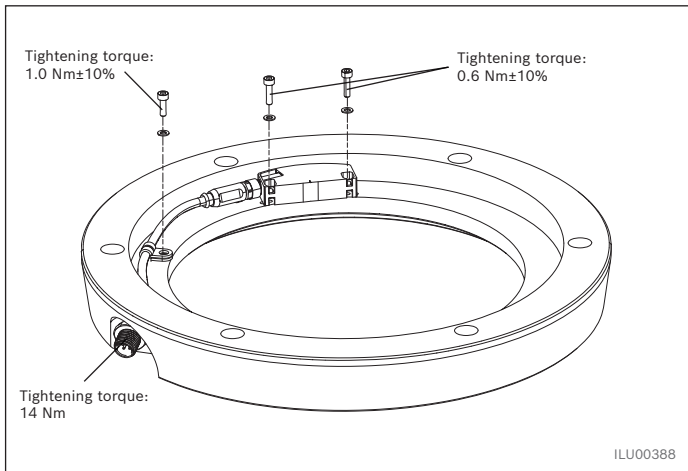


Fig.22: Sensor head and cable in SPDC outer ring

2. Assemble instruction cable, cable grip and sensor. See [7.10 Cable and sensor assembly](#).

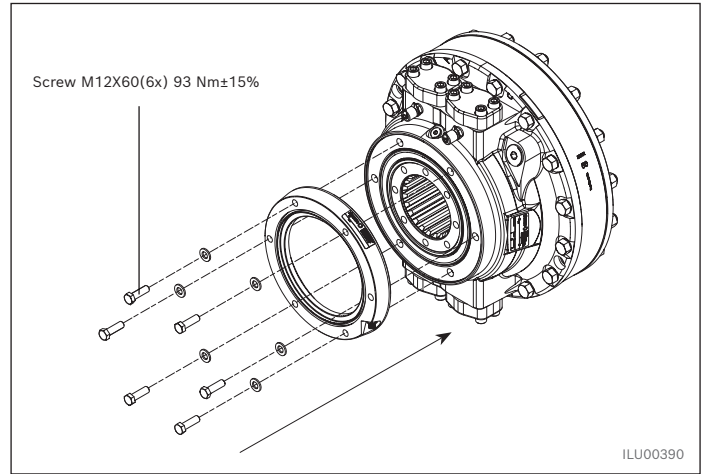


Fig.23: SPDC Outer ring

3. Mount SPDC outer ring.

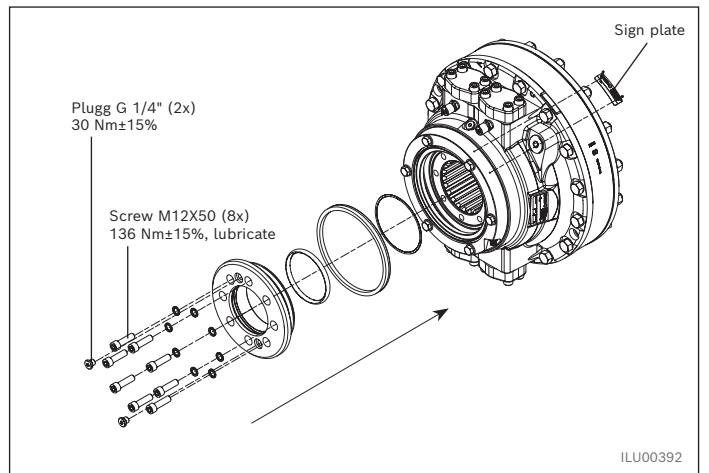


Fig.24: SPDC magnetized bearing holder and sign plate

4. Mount SPDC magnetized bearing holder. Attach the sign plate on the outer ring by using the rivets into the pre-drilled 2 mm holes.

NOTICE

External magnetic fields

Bearing holder damage

- ▶ Keep magnetized bearing holder away from magnetic fields!

7.3 Hägglunds CA with BICA

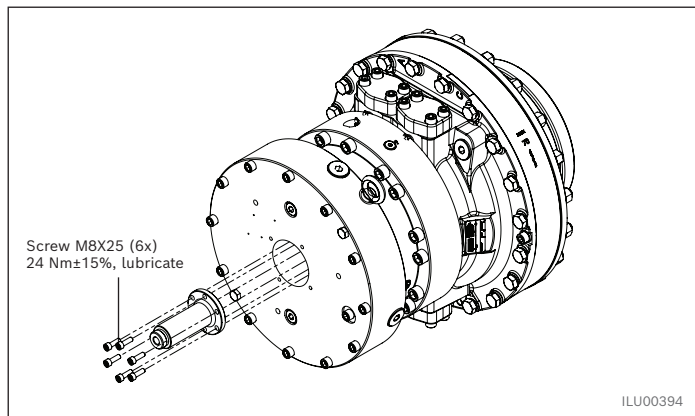


Fig.25: Carrier

1. Remove the small cover on BICA by loosen the 4 x M8X16 and mount carrier inside of BICA.

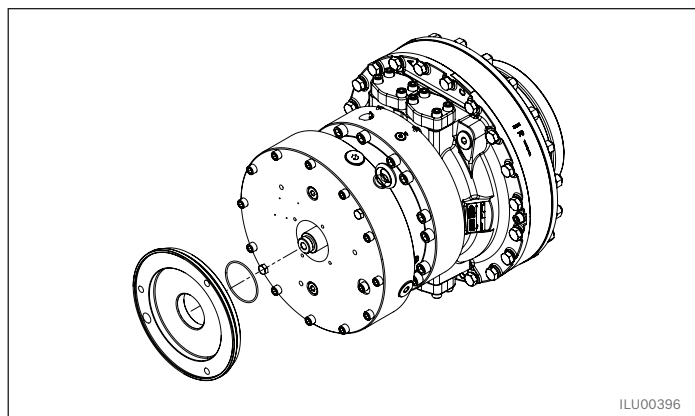


Fig.26: Spacer

2. Place o-ring on spacer and then mount spacer on BICA.

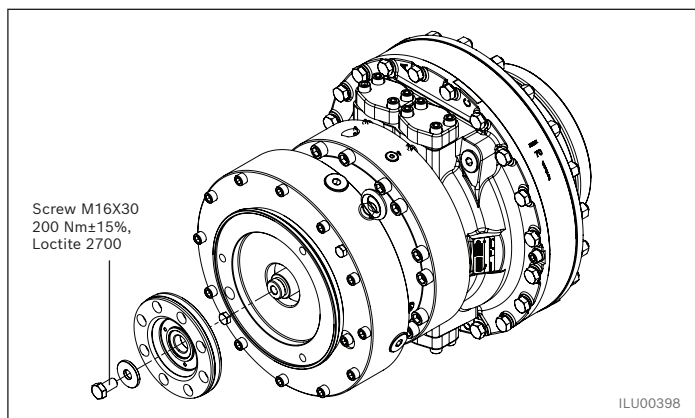


Fig.27: SPDC magnetized bearing holder

3. Mount SPDC magnetized bearing holder on BICA and fix it with washer and screw. Lock screw with Loctite 2700.

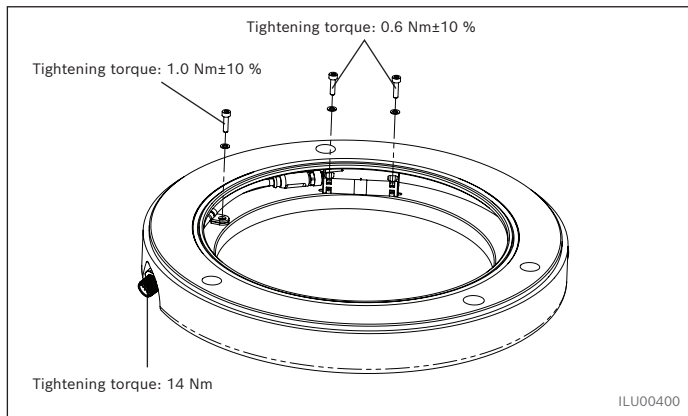


Fig.28: Sensor head and cable grip in SPDC cover

4. Assemble instruction cable, cable grip and sensor. See [7.10 Cable and sensor assembly](#).

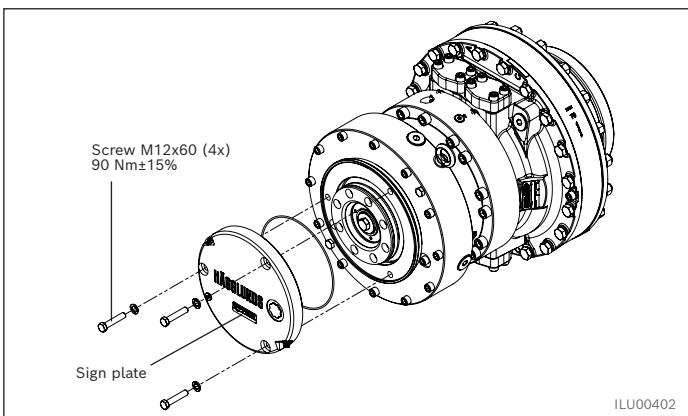


Fig.29: SPDC cover and sign plate

5. Mount SPDC cover on spacer. Attach the sign plate on SPDC cover by using the rivets into the pre-drilled 2 mm holes.

Hägglunds CA with BICA and on-off sensor

Cable gland is used instead of plug when the BICA has an on-off sensor.

NOTICE

External magnetic fields

Bearing holder damage

- ▶ Keep magnetized bearing holder away from magnetic fields!

7.4 Hägglunds Quantum

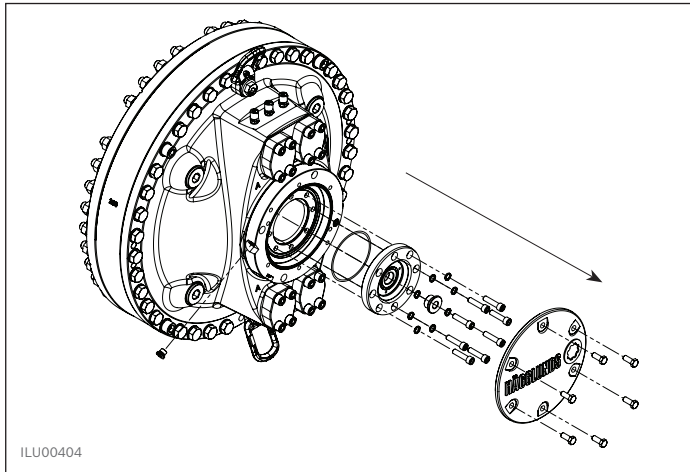


Fig.30: Dismounting of Hägglunds Quantum

1. Dismount cover and bearing holder and flange housing.

Note! Save screws, washers, plugs and O-rings for reassembling.

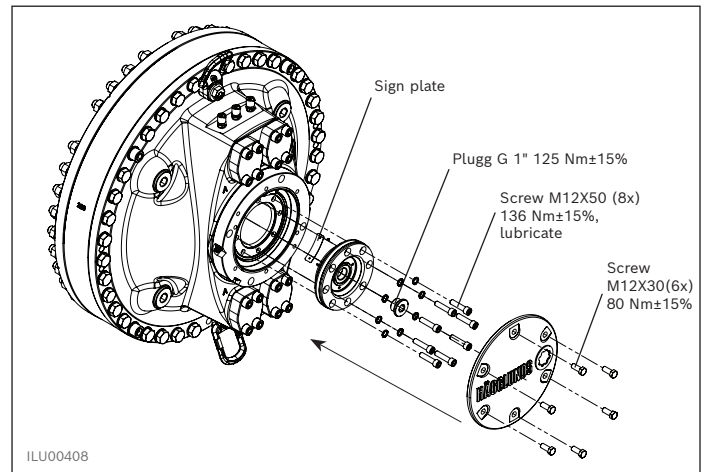


Fig.32: SPDC magnetized bearing holder, sign plate and cover

3. Mount SPDC magnetized bearing holder and cover. Attach the sign plate on the sealing fastener by using the rivets into the pre-drilled 2 mm holes.

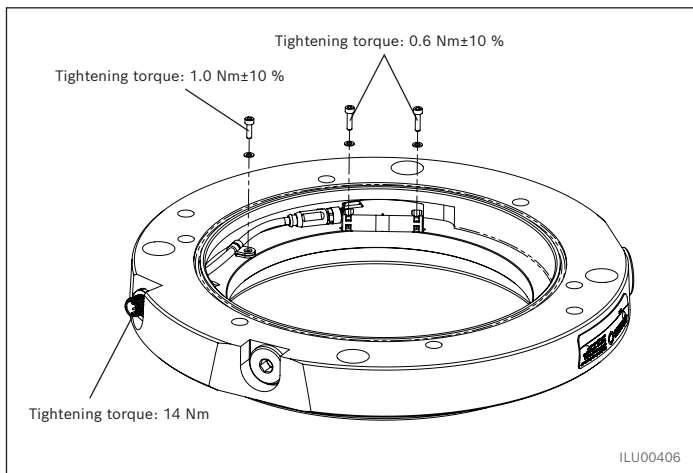


Fig.31: Sensor head and cable in sealing fastener

2. Assemble instruction cable, cable grip and sensor.

See [7.10 Cable and sensor assembly](#).

Note!

Hägglunds SPDC is part of the Hägglunds Quantum and normally not purchased as a standalone accessory. Which means that the SPDC is normally installed at the factory.

NOTICE

External magnetic fields

Bearing holder damage

- ▶ Keep magnetized bearing holder away from magnetic fields!

7.5 Hägglunds Quantum with through hole

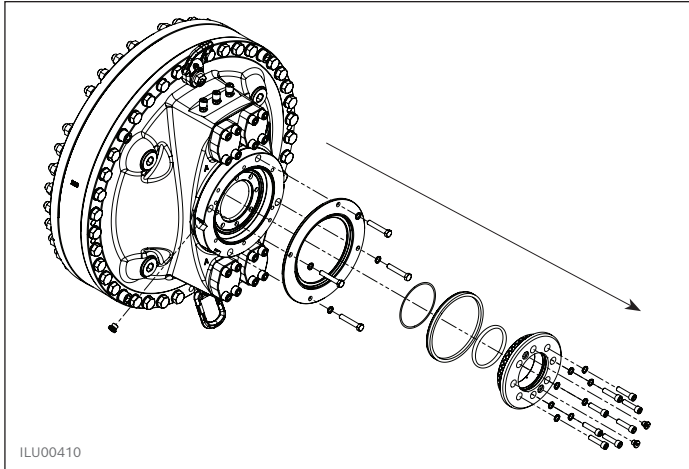


Fig.33: Dismounting of Hägglunds Quantum with through hole

1. Dismount outer ring and bearing holder and flange housing.

Note! Save screws, washers, plugs and O-rings for reassembling.

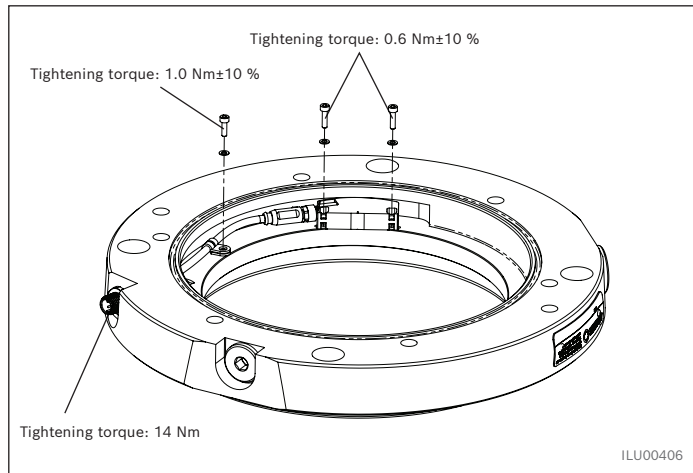


Fig.34: Sensor head and cable in sealing fastener

2. Assemble instruction cable, cable grip and sensor. See [7.10 Cable and sensor assembly](#).

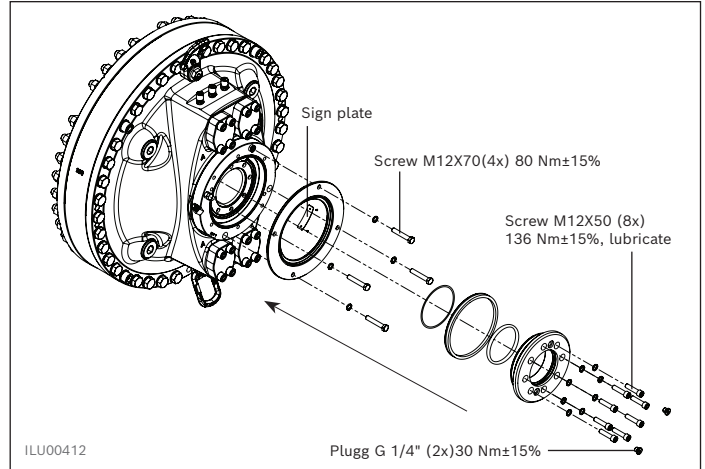


Fig.35: Outer ring, sign plate and SPDC magnetized bearing holder

3. Mount outer ring and SPDC magnetized bearing holder. Attach the sign plate on the sealing fastener by using the rivets into the pre-drilled 2 mm holes.

NOTICE

External magnetic fields

Bearing holder damage

- Keep magnetized bearing holder away from magnetic fields!

Note!

Hägglunds SPDC is part of the Hägglunds Quantum and normally not purchased as a standalone accessory. Which means that the SPDC is normally installed at the factory.

7.6 Hägglunds Quantum Power

Hägglunds SPDC is part of the Hägglunds Quantum Power and normally not purchased as a standalone accessory, which means that the SPDC is normally installed at the factory.

For installation of standalone accessory on hydraulic motor, contact your Bosch Rexroth representative.

7.7 Hägglunds CBm

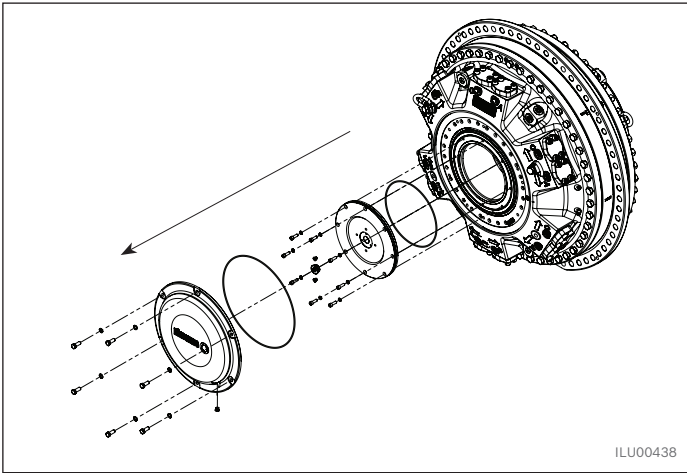


Fig.36: Dismounting of Hägglunds CBm

1. Dismount cover and bearing holder.

Note! Save screws, washers, plugs and O-rings for reassembling.

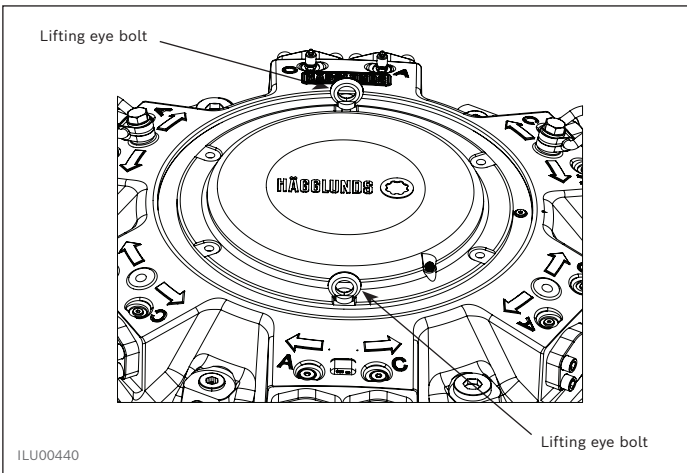


Fig.37: Lifting eye bolts

! CAUTION

Falling cover!
Personal injuries
▶ Use lifting equipment when handling cover!

2. Assemble instruction cable, cable grip and sensor.
See [7.10 Cable and sensor assembly](#).

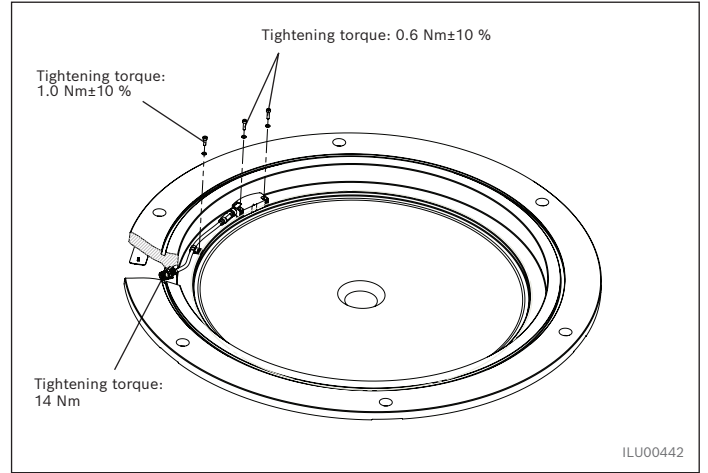


Fig.38: Sensor head and cable grip in cover

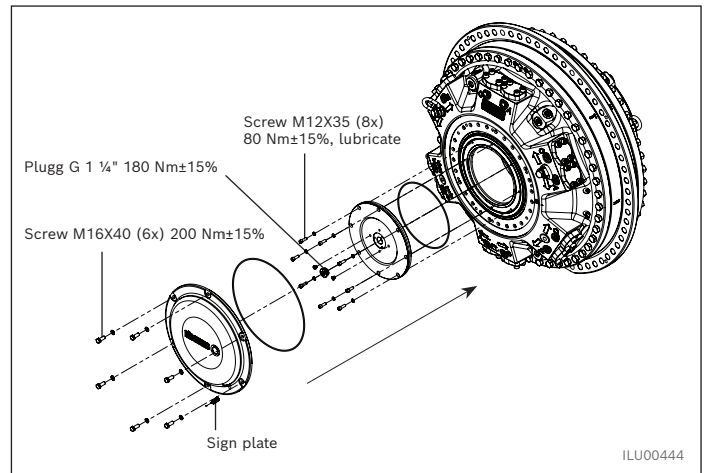


Fig.39: SPDC magnetized bearing holder, sign plate and cover

3. Mount SPDC magnetized bearing holder and cover.
Attach the sign plate on the cover by using the rivets into the pre-drilled 2 mm holes.

NOTICE

External magnetic fields
Bearing holder damage
▶ Keep magnetized bearing holder away from magnetic fields!

Uncontrolled positioning of cover
Sensor damage
▶ Use steel dowels to secure positioning!

7.8 Hägglunds CBm with through hole

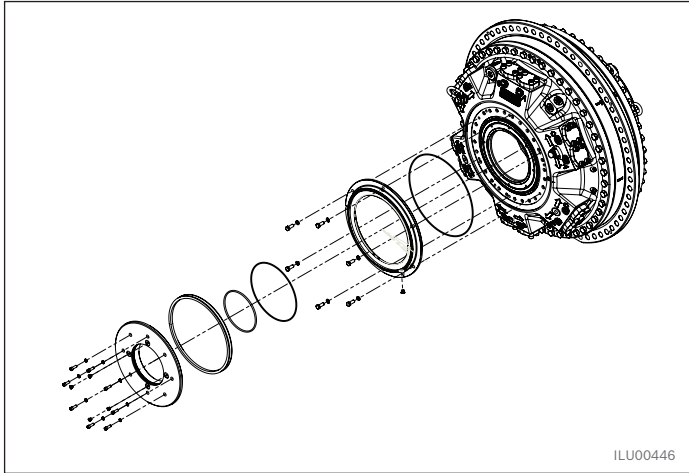


Fig.40: Dismounting of Hägglunds CBm with through hole

1. Dismount cover, bearing holder and flange housing.

Note! Save screws, washers and O-rings for reassembling.

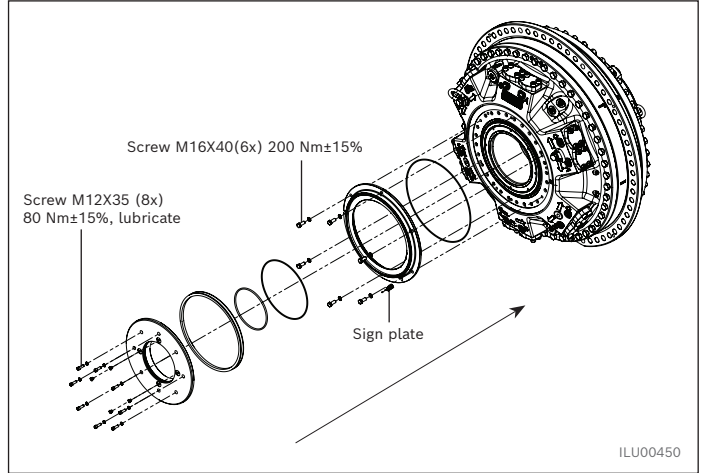


Fig.42: Outer ring, sign plate and SPDC magnetized bearing holder

3. Mount outer ring and SPDC magnetized bearing holder. Attach the sign plate on the outer ring by using the two drive screws (2 mm. holes is needed).

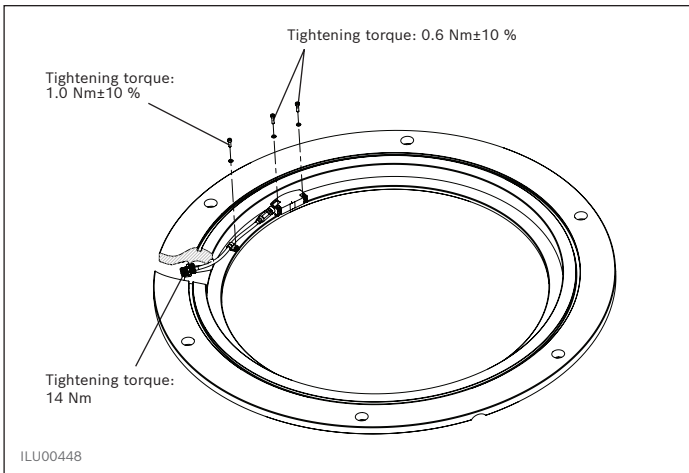


Fig.41: Sensor head and cable grip in outer ring

2. Assemble instruction cable, cable grip and sensor. See [7.10 Cable and sensor assembly](#).

<h2>NOTICE</h2>
<p>External magnetic fields Bearing holder damage</p> <ul style="list-style-type: none"> ▶ Keep magnetized bearing holder away from magnetic fields!

7.9 Hägglunds CBm with BICA

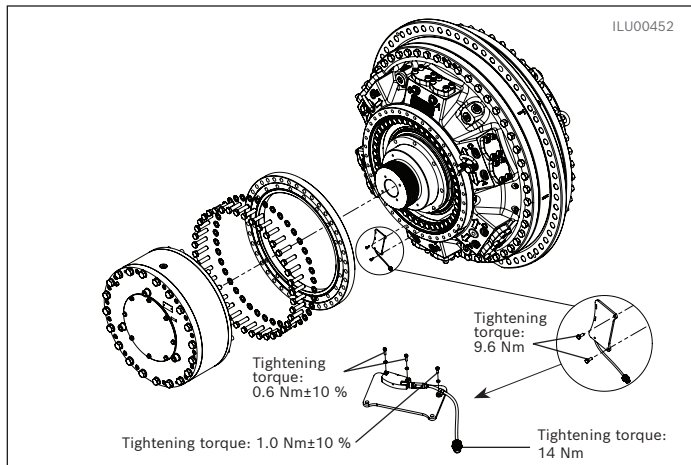


Fig.43: Hägglunds CBm with BICA and SPDC

1. Dismount the BICA brake from the motor, see RE 15366-WA or contact your Bosch Rexroth representative.
2. Remove the outer spacer ring from the motor.
3. Assemble instruction cable, cable grip and sensor. See [7.10 Cable and sensor assembly](#).
4. Mount the BICA on the motor see RE 15366-WA or contact your Bosch Rexroth representative.

7.10 Cable and sensor assembly

The procedure for mounting the cable and sensor is the same for all models. The figures below illustrates the procedure on Cover CA and CBp as an example.

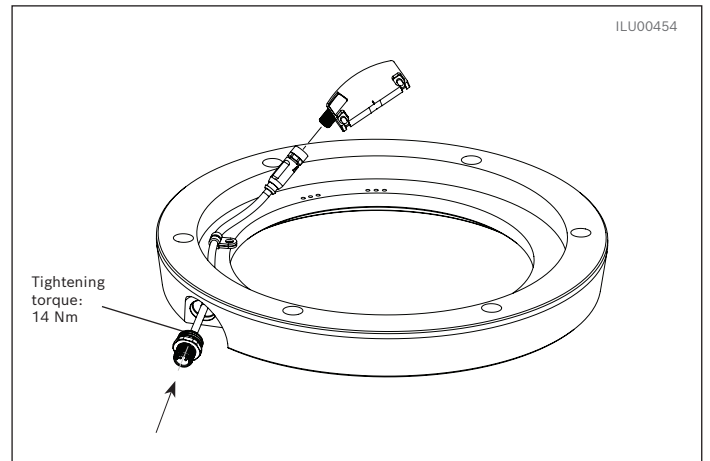


Fig.44: Cable assembly

1. Insert the cable (with M12 and M8 connector) through the M16 hole and tighten the M12 connector (thread M16x1.5) to the specified torque. Mount the sensor on the M8 connector on the cable. Place the cable grip on the cable.

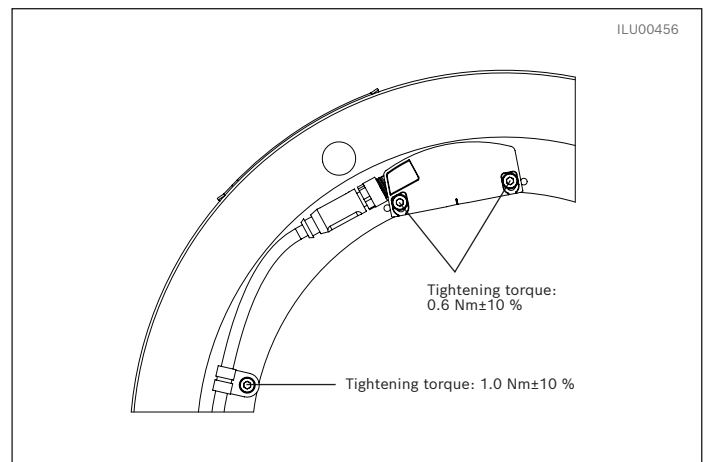


Fig.45: Sensor

2. Mount the cable grip and sensor on the cover with the screws and washers. Before tightening the sensor screws, press the sensor towards the center so that it rests against the screws. Then tighten to the specified torque on both cable grip and sensor.

Note! Use Loctite 243 (or similar glue) for the screws.

7.11 IO Link installation

7.11.1 Connecting and configuring the IO-Link System

This section describes the procedure for the commissioning, software configuration, and parameterization of the IO-Link speed sensor.

7.11.1.1 Commissioning

- Connect the sensor to an IO-Link port on the IO-Link master using an M12 cable.
- The sensor is powered via the IO-Link port through the same cable.
- Ensure the IO-Link master is connected to the field-bus/Ethernet network used by the control system.

7.11.1.2 Software Configuration

The process for integrating the sensor into the control system follows these general steps:

1. Obtain the IODD file for the sensor and the correct Device Description File for the IO-Link master, under <https://ioddfinder.io-link.com>. Device ID: 400111.
2. Import both files into the engineering software.
3. In the hardware configuration, navigate to the IO-Link master and assign the imported sensor's IODD to the port where it is physically connected.
4. Download the hardware configuration to the control system. The master will now automatically recognize and communicate with the sensor.

7.11.1.3 Sensor Parameterization with IO-Link

IO-Link allows for detailed configuration of the sensor's behavior directly through software. A dedicated IO-Link configuration tool or the engineering software for your automation platform shall be used.

For this application, the key parameters to configure are the number of poles on the magnetic ring and the desired interpolation factor. These values determine the final resolution of the sensor. This configuration is made in the factory before delivery.

Parameterization of physical unit for measured speed			
Value (Index 74.7)	Unit	Application area	Precision
1997	steps/s	Low-speed applications where high precision is required	Very high, measures the smallest incremental movement
1085	rpm	Applications with higher speeds	Lower precision at very low speeds, but more practical for higher speeds

Table 25: Parameterization of physical unit for measured speed

Parameterization for different magnetic rings			
Outer diameter (mm)	Poles	Interpolation factor	Resulting pulses per revolution
180	116	16	1856
295	186	16	2976
450	284	16	4544

Table 26: Parameterization for different magnetic rings

Fieldbus integration reference	
Fieldbus	Configuration file
PROFIBUS	GSD
EtherCAT	ESI
PROFINET	GSDML
EtherNet/IP	EDS

Table 27: Fieldbus integration reference

1 All the iodd files with same device works with the sensor

7.11.2 Process Data Inputs

Note! For each communication cycle, the encoder sends a 72-bit (9-byte) Process Data Input(PDI) packet to the IO-Link master. The structure of this real-time data is detailed in the mapping table below ([table 28](#) and [table 29](#)).












Process data mapping of Process data input								
Octet	0 - 3	4 - 7	8					
Name	Speed	Position	CM	SSC3	Alarm	Quality	SSC2	SSC1
Description	Speed [steps/s] or [rpm]	Position [steps]	Condition Monitor	Standstill monitor	Alarm monitor	Quality monitor	Direction monitor	Speed monitor
Type	32-bit Integer	32-bit Integer	Boolean	Boolean	Boolean	Boolean	Boolean	Boolean
Bit offset	40	8	7	4	3	2	1	0
Sub index	1	2	3	4	5	6	7	8

Table 28: Process data mapping of process data input

Subindex	Bit offset	Name	Type	Range	Description
1	40	Speed	Int32	$-2^{31} - 2^{31}-1$	Speed value [unit according index 74]
2	8	Position	Int32	$-2^{31} - 2^{31}-1$	Position value [steps]
3	7	Condition monitor	Boolean	0/1	State of Condition monitor
4	4	SSC3	Boolean	0/1	State of Standstill monitor (SSC3)
5	3	Alarm	Boolean	0/1	0: Device temperature within limit values 1: Device temperature exceeds limit values
6	2	Quality	Boolean	0/1	0: Signal quality above signal quality threshold 1: Signal quality below threshold, please check working distance and setting of quality threshold
7	1	SSC2	Boolean	0/1	State of Direction monitor (SSC2)
8	0	SSC1	Boolean	0/1	State of Speed monitor (SSC1)

Table 29: Detailed mapping information of PDI status bits

8 Additional documentation

Title	Document no	Document type
 Hägglands CA	RE 15305	Data sheet
 Hägglands Quantum	RE 15428-A	Data sheet
 Hägglands Quantum Power	RE 15428-B	Data sheet
 Hägglands CBm	RE 15300	Data sheet
 Hägglands CBp	RE 15301	Data sheet
 Hägglands BICA	RE 15366	Data sheet
 Hägglands BICA	RE 15366-WA	Installation & maintenance manual
 Hägglands SPDC for Hägglands CA	RA30086648	Dimension drawing
 Hägglands SPDC for Hägglands CA with BICA	RA30086662	Dimension drawing
 Hägglands SPDC for Hägglands Quantum	RA30086665	Dimension drawing
 Hägglands SPDC for Hägglands CBm	RA30086664	Dimension drawing

Contact your Bosch Rexroth representative for dimension drawings.



HÄGGLUNDS

Bosch Rexroth AB

SE-895 80 Mellansel

tel: +46 (0)660 870 00

www.hagglunds.com

Häggglunds is a brand of Rexroth, a leading global supplier of drive and control technologies. Häggglunds solutions enrich a comprehensive Rexroth portfolio.

The data specified above only serve to describe the product. As our products are constantly being further developed, no statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.