

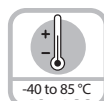
### Absolute, Singleturn Type RS-184 (Shaft) / RS-185 (Blind Hollow Shaft)

**CANopen**


Bearing-Lock



High rotational speed


 Temperature range  
-40 to 85 °C


High IP



High shaft load capacity



Shock/vibration resistant



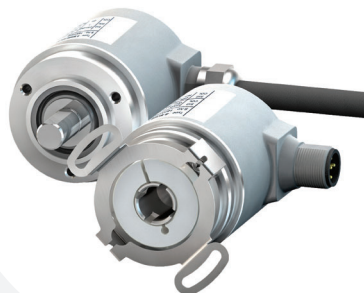
Reverse polarity protection



Surface protection salt spray-tested optional

#### Reliable

- Sturdy bearing construction in Bearing-Lock design for resistance against vibration and installation errors.



#### Absolute


**CANopen**


#### Up-To-The-Minute Fieldbus Performance

- LSS services for configuration of the node address and baud rate.
- Variable PDO mapping in the memory.
- Universal scaling function.
- Configuration management (bootloader).

#### Insensitive

- Reduced number of components ensures magnetic insensitivity.
- IP67 protection and wide temperature range -40 °C to +85 °C.

#### Mechanical Characteristics:

##### Max. speed:

Shaft or blind hollow shaft version:	6000 RPM
Without shaft seal (IP65):	3000 RPM (continuous)
Shaft or blind hollow shaft version:	4000 RPM
With shaft seal (IP67):	2000 RPM (continuous)

##### Starting torque (68 °F | 20 °C):

Without shaft seal (IP65):	< 1.0 oz - in (0.007 Nm)
With shaft seal (IP67):	< 1.4 oz - in (0.01 Nm)

##### Shaft load capacity:

Radial:	9.0 lbs (40 N)
Axial:	4.5 lbs (20 N)

Weight: approx. 0.44 lbs (0.2 kg)

Protection acc. to EN 60529: IP65 / IP67

Working temperature range: -40 to +185 °F (-40 to +85 °C)

##### Materials:

Shaft / Hollow shaft:	stainless steel
Flange:	aluminium
Housing:	zinc die-cast
Cable:	PVC

Shock resistance acc. to EN 60068-2-27: 250 g (2,500 m/s<sup>2</sup>), 6 ms

Vibration resistance acc. to EN 60068-2-6: 30 g (300 m/s<sup>2</sup>), 10 - 2,000 Hz

# Rotary Position Technology

## Absolute Encoders, Singleturn

### Absolute, Singleturn Type RS-184 (Shaft) / RS-185(Blind Hollow Shaft)

### CANopen

#### General Electrical Characteristics:

##### Sensor:

Power supply: 10 - 30 VDC

Current consumption (no load): max. 30 mA

Reverse polarity protection at power supply (+V): yes

Short-circuit protected outputs: yes<sup>1)</sup>

e1 compliant acc. to (pending): EU guideline 2009/19/EC (acc. to EN 55025, ISO 11452 and ISO 7637)

UL approval: file E356899

CE compliant acc. to: EMC guideline 2014/30/EU  
RoHS guideline 2011/65/EU

#### Interface Characteristics CANopen:

Resolution singleturn: 1 - 16384 (14 bit), (scalable default: 16384 (14 bit))

Absolute accuracy<sup>2)</sup>:  $\pm 0.5^\circ$

Repeat accuracy:  $\pm 0.2^\circ$

Code: binary

Interface: CAN high-speed acc. to ISO 11898, Basic- and Full-CAN, CAN specification 2.0 B

Protocol: CANopen profile DS406 V4.0 with manufacturer-specific add-ons, LSS-Service, bootloader

Power-ON time: < 1200 ms

SDO timeout: < 1000 ms

Baud rate: 10 - 1000 k bit/s software configurable

Node address: 1 - 127 software configurable

Termination: software configurable

LSS protocol: CIA LSS protocol DS305, global command support for node address and baud rate, selective commands via attributes of the identity object

Bootloader: configuration management  
CIA DS 302-3

<sup>1)</sup> = short circuit protected to 0V or to output when power supply correctly applied.  
<sup>2)</sup> = over the entire temperature range.

#### General Information about CANopen

The CANopen encoders support the latest CANopen communication profile according to DS301 V4.02. In addition, device-specific profiles like the encoder profile DS406 V3.2, DS305 (LSS) and DS302 (Bootloader) are available.

The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CANbus. When switching the device on, all parameters, which have been saved on a flash memory to protect them against power failure, are loaded again.

The following output values may be combined in a freely variable way as PDO(PDO mapping): **position, speed, acceleration** as well as the **status of the working area**.

The encoders are available with a connector or a cable connection.

The device address and baud rate can be set/modified by means of the software.

The two-color LED located on the back indicates the operating or fault status of the CAN-bus, as well as the status of the internal diagnostics.

#### CANbus connection

The CANopen encoders are equipped with a bus trunk line in various lengths or a M12 connector and can be terminated in the device.

The devices do not have an integrated T-coupler nor are they looped internally and must therefore only be used as end devices.

#### Standard Wiring:

Connection Type:	+V	Common (0 V)	CAN GND	CAN High	CAN Low
Cable:	BN	WH	GY	GN	YE
M12 Eurofast:	2	3	1	4	5

#### LSS layer setting services DS305 V2.0

- Global support of node-ID and baud rate.
- Selective protocol via identity object (1018h).

#### CANopen Communication Profile DS301 V4.2

Among others, the following functionality is integrated (Class C2 functionality):

- NMT Slave
- Heartbeat Protocol
- Identity Object
- Error Behavior Object
- Variable PDO Mapping self-start programmable (Power on to operational), 3 Sending PDO's.
- Node address, baud rate and CANbus / programmable termination.

#### CANopen encoder profile DS406 V4.0

The following parameters can be programmed:

- Event mode, start optional.
- 1 work area with upper and lower limit and the corresponding output states variable PDO mapping for position, speed, work area status, error and acceleration.
- Extended failure management for position sensing.

- User interface with visual display of bus and failure status 1 LED two colors.
- Customer-specific protocol.
- "Watchdog controlled" device.

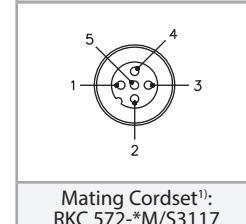
#### Bootloader functionality DS302-3

Configuration Management:

- Program download
- Program start
- Program erase

#### Wiring Diagram:

##### Male Encoder View



\* Length in meters.

<sup>1)</sup> See Connectivity section H for corresponding cable color code.

### Absolute, Singleturn Type RS-184 (Shaft) / RS-185 (Blind Hollow Shaft)

**CANopen**

#### Part Number Key: RS-184 Shaft Version

A	B	C		D		E
RS-184S	6	C	-	9D14B	-	H1151

A	Type
RS-184S	Ø 39 mm, Shaft w/ Flat, IP67 Shaft Seal
RS-184T	Ø 39 mm, Shaft w/ Flat, IP65 Shaft Seal

B	Shaft (Ø × L)
6	Ø 6 mm × 12.5 mm
8	Ø 8 mm × 15 mm
10	Ø 10 mm × 20 mm
A0	Ø 1/4" × 1/2"

C	Flange
C	Ø 36 mm Clamping Flange
S	Ø 36 mm Servo Flange

D	Voltage Supply and Output Type
9D14B	10 - 30 VDC, CANopen DS 301 V4.2

E	Type of Connection
H1151	Radial 5-pin M12 Eurofast Connector
H1451	Axial 5-pin M12 Eurofast Connector
C1M	Radial Cable (1 m PVC)
CA1M	Axial Cable (1 m PVC)

#### Part Number Key: RS-185 Blind Hollow Shaft Version

A	B	C		D		E
RS-185B	6	E	-	9D14B	-	H1151

A	Type
RS-185B	Ø 39 mm, Blind Hollow Shaft, IP67 Shaft Seal
RS-185C	Ø 39 mm, Blind Hollow Shaft, IP65 Shaft Seal

B	Bore (18.5 mm insertion depth)
6	Ø 6 mm
8	Ø 8 mm
10	Ø 10 mm
A0	Ø 1/4"

C	Flange
E	Ø 46 mm Flange w/ Slotted Flex Mount
T	Flange w/ Long Torque Stop

D	Voltage Supply and Output Type
9D14B	10 - 30 VDC, CANopen DS 301 V4.2

E	Type of Connection
H1151	Radial 5-pin M12 Eurofast Connector
H1451	Axial 5-pin M12 Eurofast Connector
C1M	Radial Cable (1 m PVC)
CA1M	Axial Cable (1 m PVC)

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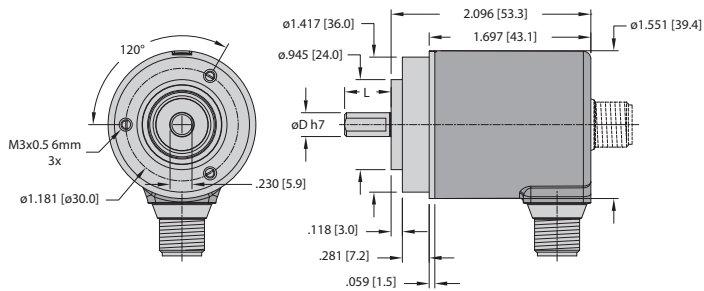
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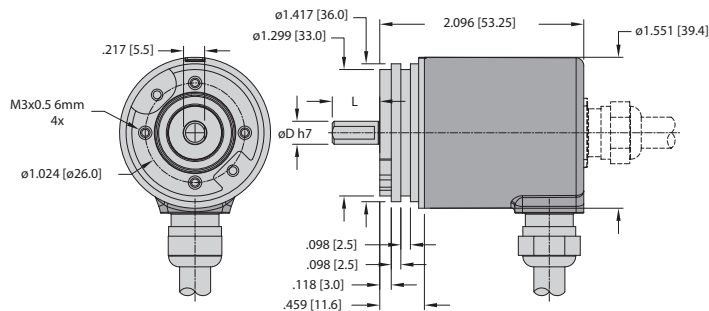
CANopen

#### Dimensions: RS-184 Shaft Version

##### RS-184 Flange C Connection H1151 & H1451

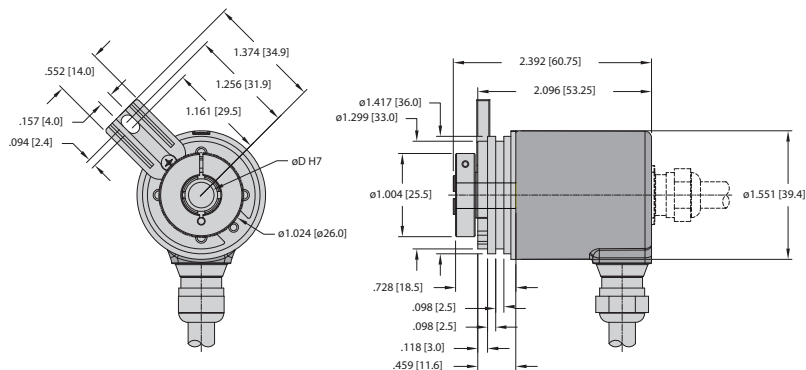


##### RS-184 Flange S Connection C1M & CA1M

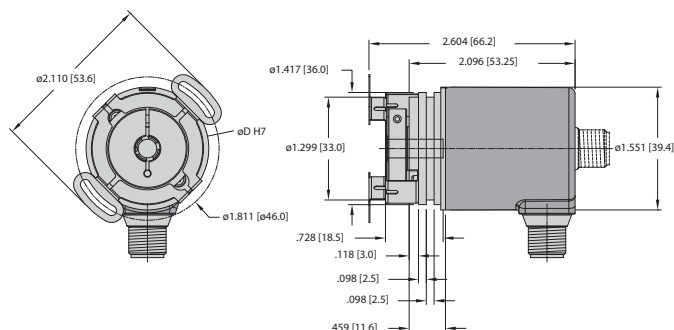


#### Dimensions: RS-185 Blind Hollow Shaft Version

##### RS-185 Flange T Connection C1M & CA1M



##### RS-185 Flange E Connection H1151 & H1451



#### Mounting Advice:

The flanges and shafts of the encoder and drive should not be rigidly coupled together at the same time. We recommend the use of suitable couplings (see page G1, Accessories).