

Rotary Position Technology

Absolute Encoders, Multiturn

Absolute, Multiturn Type RM-105 (Shaft) /RM-106 (Hollow Shaft)

CANopen



Bearing-Lock



High rotational speed



Temperature range
-40 to 80 °C



High IP



High shaft load capacity



Shock/vibration resistant



Reverse polarity protection



Surface protection salt spray-tested optional



Intelligent Scan Technology



Magnetic field proof

Reliable

- Sturdy bearing construction in Bearing-Lock design for resistance against vibration and installation errors.
- Ideal for use outdoors thanks to IP67 protection and wide temperature range from -40 up to +80 °C.



Absolute



CANopen

Up-To-The-Minute

Fieldbus Performance

- CANopen with current encoder profile.
- LSS services for configuration of the node address and baud rate.
- Variable PDO mapping in the memory.
- Universal scaling function.
- 32 bits total resolution (16 bit MT + 16 bit ST).

Insensitive

- Turck OptoASIC technology with all singleturn and multiturn functions on one single OptoASIC - offering the highest reliability, a high resolution up to 32 bits and 100% magnetic field insensitivity.

Mechanical Characteristics:

Max. speed shaft version:	12000 RPM, continuous 10000 RPM
IP65 up to 70 °C:	8000 RPM, continuous 5000 RPM
IP65 up to T max:	11000 RPM, continuous 9000 RPM
IP67 up to 70 °C:	8000 RPM, continuous 5000 RPM
IP67 up to T max:	

Max. speed hollow shaft version:	9000 RPM, continuous 6000 RPM
IP65 up to 70 °C:	6000 RPM, continuous 3000 RPM
IP65 up to T max:	8000 RPM, continuous 4000 RPM
IP67 up to 70 °C:	4000 RPM, continuous 2000 RPM
IP67 up to T max:	

Starting torque (68 °F 20 °C):	
IP65:	< 1.4 oz - in (0.01 Nm)
IP67:	< 7.0 oz - in (0.05 Nm)

Shaft load capacity:	
Radial:	18 lbs (80 N)
Axial:	9 lbs (40 N)

Mass moment of inertia:	
Shaft version:	0.16 oz - in ² (3.0 × 10 ⁻⁶ kgm ²)
Hollow shaft version:	0.328 oz - in ² (6.0 × 10 ⁻⁶ kgm ²)

Weight:	approx. 1.0 lbs (0.45 kg)
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Protection acc. to EN 60529:	
Housing:	IP67
Shaft:	IP65, opt. IP67

Working temperature range:	-40 to +176 °F (-40 to +80 °C) ¹⁾
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Materials:	
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 ²), 6 ms
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Vibration resistance acc. to EN 60068-2-6:	10 g (100 m/s ²), 55 - 2,000 Hz
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General Electrical Characteristics:

Power supply:	10 - 30 VDC
Current consumption (no load):	max. 80 mA
Reverse polarity protection at power supply (+V):	yes
UL approval:	file E356899
CE compliant acc. to:	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

Diagnostic LED (two-color, red/green):

LED ON or blinking:	
Red:	error display
Green:	status display
Combo red/ green:	error code

Interface Characteristics CANopen:

Resolution singleturn:	1 - 65536 (16 bit), scalable default: 8192 (13 bit)
Number of revolutions (multiturn):	max. 65536 (16 bit) scalable only via the total resolution
Total resolution:	1 - 4,292,967,296 (32 bit) default: 25 bit
Code:	binary
Interface:	CAN high-speed acc. to ISO 11898, Basic- and Full-CAN, CAN specification 2.0 B
Protocol:	CANopen profile DS406 V3.2 with manufacturer-specific add-ons, LSS-Service DS305 V2.0
Baud rate:	10 - 1000 kbit/s software configurable
Node address:	1 - 127 software configurable
Termination switchable:	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

General Information About CANopen

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

The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode and a High Resolution Sync Protocol. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CAN bus.

When switching the device on, all parameters, which have been saved on an EEPROM 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, temperature** 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.

Universal Scaling Function

At the end of the physical resolution of an encoder, when scaling is active, an error appears if the division of the physical limit (GP_U) by the programmed total resolution (TMR) does not produce an integer.

The universal scaling function remedies this problem.

CANopen Communication Profile DS301 V4.2

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

- NMT Slave
- Identity Object
- Error Behavior Object
- Variable PDO Mapping self-start programmable (Power on to operational), 4 Sending PDO's.
- Node address, baud rate and CANbus / programmable termination.
- Producer / consumer heartbeat.

CANopen encoder profile DS406 V3.2

The following parameters can be programmed:

- Event mode
- 2 working areas with 2 upper and lower limits and the corresponding output states.
- Variable PDO mapping for position, speed, work area status, error message, raw data.
- Extended failure management for position sensing.
- User interface with visual display of bus and failure status.
- Customer-specific memory 16 Byte.
- Customer-specific protocol.
- Universal Scaling Function (USF).
- "Watchdog controlled" device.
- Extended diagnostic modes.

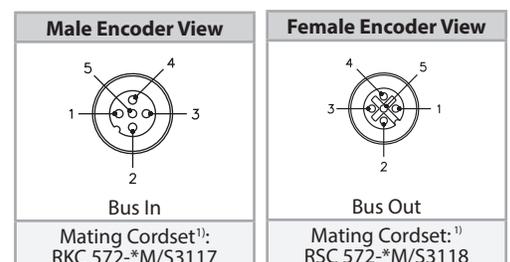
LSS Layer Setting Services DS305 V2.0

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

Standard Wiring:

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

Wiring Diagrams:



* Length in meters.
¹⁾ See Connectivity section H for corresponding cable color code.

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CANopen

Part Number Key: RM-105 Shaft Version

A	B	C		D		E		F
RM-105S	6	C	-	9D32B	-	B2M12	/	N46

A	Type
RM-105S	Ø 58 mm, Shaft, IP67 Shaft Seal
RM-105T	Ø 58 mm, Shaft, IP65 Shaft Seal

B	Shaft (Ø × L)
6	Ø 6 mm × 10 mm
10	Ø 10 mm × 20 mm
A0	Ø 1/4" × 7/8"
A1	Ø 3/8" × 7/8"

C	Flange
C	Ø 58 mm Clamping Flange
S	Ø 58 mm Servo Flange

D	Voltage Supply and Output Type
9D32B	10 - 30 VDC, CANopen DS301 V4.02

E	Type of Connection
B1M12	Radial 1 × M12 Eurofast Connector
B2M12	Radial 2 × M12 Eurofast Connector
C	Radial Cable (1m PVC)

F	Options
(BLANK)	No Options
N46	SET Button

Part Number Key: RM-106 Hollow Shaft Version

A	B	C		D		E		F
RM-106B	10	T	-	9D32B	-	B1M12	/	N46

A	Type
RM-106B	Ø 58 mm, Hollow Shaft, IP67 Shaft Seal
RM-106C	Ø 58 mm, Hollow Shaft, IP65 Shaft Seal
RM-106H	Ø 58 mm, Blind Hollow Shaft, IP67 Shaft Seal ¹
RM-106I	Ø 58 mm, Blind Hollow Shaft, IP65 Shaft Seal ¹

¹ = only available with bore "12"

B	Bore
10	Ø 10 mm
12	Ø 12 mm (30 mm insertion depth on blind hollow)
14	Ø 14 mm
15	Ø 15 mm

C	Flange
T	Ø 58 mm Flange w/ Torque Stop
E	Ø 63 mm Flange w/ Slotted Flex Mount
E1	Ø 65 mm Flange w/ Flex Mount

D	Voltage Supply and Output Type
9D32B	10...30 VDC, CANopen DS 301 V4.02

E	Type of Connection
B1M12	Radial 1 × M12 Eurofast Connector
B2M12	Radial 2 × M12 Eurofast Connectors ²
CT	Tangential Cable (2m PVC)

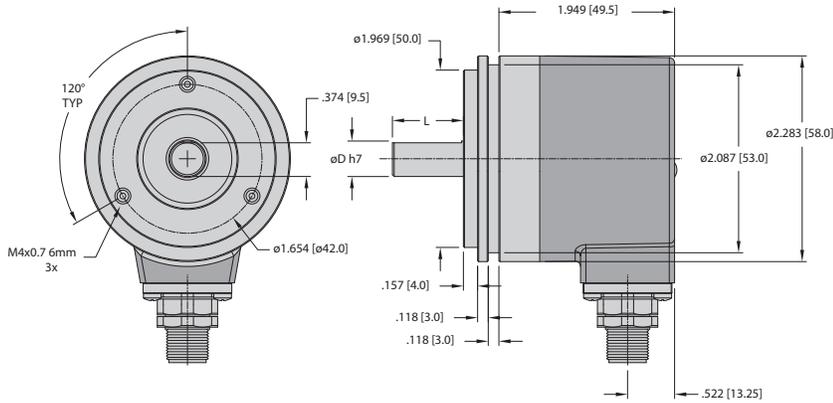
² = only available with flange "H" or "I" and bore "12".

F	Options
(BLANK)	No Options
N46	SET Button

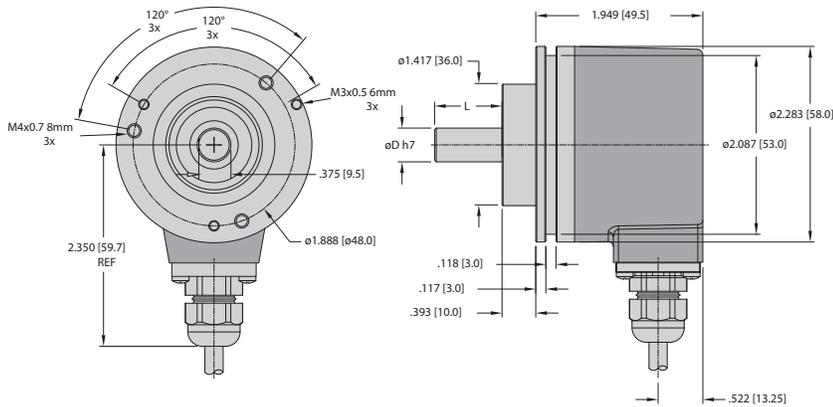
Absolute, Multiturn Type RM-105 (Shaft) /RM-106 (Hollow Shaft) CANopen

Dimensions: RM-105 Shaft Version

**RM-105 Flange S
 Connection B1M12**



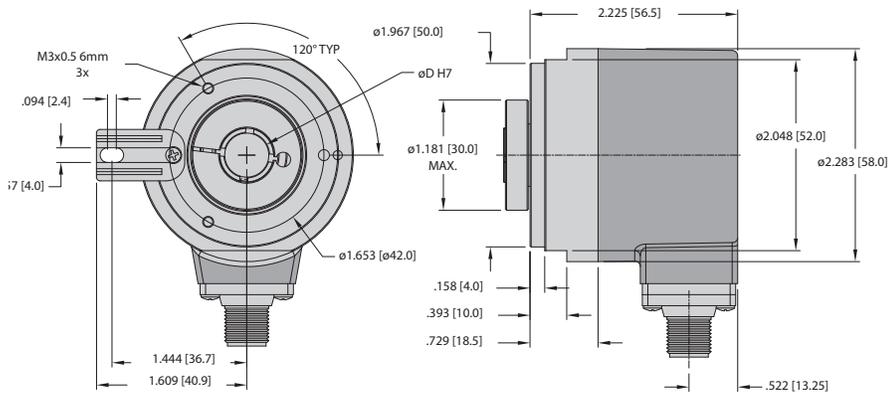
**RM-105 Flange C
 Connection C**



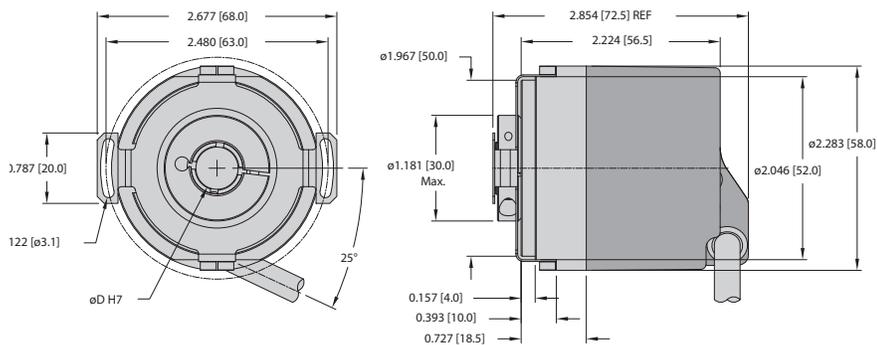
Absolute Encoders

Dimensions: RM-106 Hollow Shaft Version

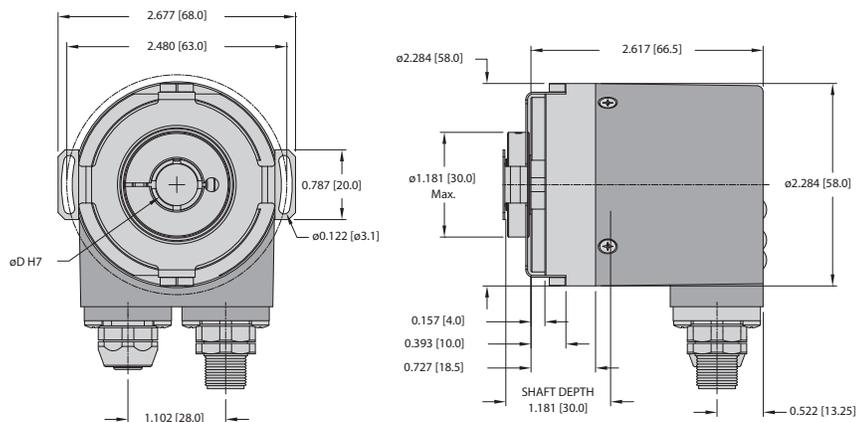
RM-106 Flange T Connection B1M12



RM-106 Flange E Connection CT



RM-106 Flange E1 Connection B2M12



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).