

Incremental Type RI-16 (Shaft) / RI-64 (Hollow Shaft), High Resolution

High rotational speed	High IP	Temperature -20 to 80 °C	High shaft load capacity	Shock/vibration resistant	Magnetic field proof	Short-circuit protected	Optical sensor

High Performance

- High shaft loading capability
- Maximum speed up to 12000 revolutions per minute
- High IP protection up to max. IP66



Many Variants

- With RS422 or push-pull interface
- With cable or connector

Compact

- Ø 58 mm housing, industry standard

Mechanical Characteristics:

Speed:	Shaft IP65 Hollow Shaft IP40 Hollow Shaft IP66 ¹⁾	12000 RPM 12000 RPM 6000 RPM
Moment of inertia:	Shaft version Hollow shaft version	approx. 0.098 oz-in ² (1.8 x 10 ⁻⁶ kgm ²) approx. 0.328 oz-in ² (6 x 10 ⁻⁶ kgm ²)
Starting torque at 68 °F (20 °C):		<1.4oz-in (0.01 Nm), IP40/IP65 <7oz-in (0.05 Nm), IP66
Radial load capacity of the shaft:		18 lbs (80 N)
Axial load capacity of the shaft:		9 lbs (40 N)
Weight:		approx. 0.9 lbs (0.4 kg)
Protection acc. to EN 60529 :		IP40, IP65, IP66
Working temperature:		-4 to +221 °F (-20 to +105 °C), IP40/IP65 -4 to +194 °F (-20 to +90 °C), IP66
Materials:	Shaft/hollow shaft	stainless steel
Shock resistance acc. to EN 60068-2-27:		approx. 100 g (1000 m/s ²), 6 ms
Vibration resistance acc. to EN 60068-2-27:		approx. 10 g (100 m/s ²), 10-2000 Hz

¹⁾ For continuous operation max 3000 RPM, ventilated

Rotary Position Technology

Incremental Encoders

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Electrical Characteristics:

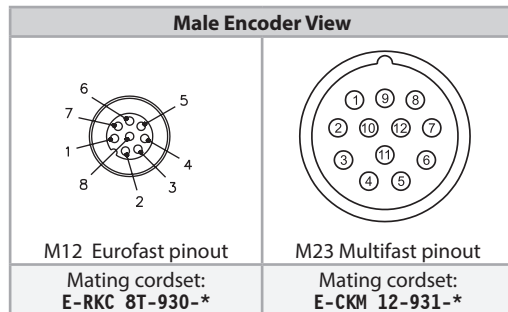
Output circuit [Key Code]:	RS 422 [4A/4C] (TTL compatible)	Push-Pull [2B]
Supply voltage:	5 VDC ($\pm 5\%$) or 10-30 VDC	10-30 VDC
Power consumption (no load):	typ. 70 mA / max. 120 mA	typ. 115 mA / max. 160 mA
Permissible load/channel:	max. ± 20 mA	max. ± 30 mA
Pulse frequency:	max. 800 kHz	max. 600 kHz
Signal level high:	min. 2.5 V	min. +V -2.5 V
Signal level low:	max. 0.5 V	max. 2.0 V
Rise time t_r :	max. 200 ns	max. 1 μ s
Fall time t_f :	max. 200 ns	max. 1 μ s
Short-circuit protected:	yes ¹⁾	yes
Reverse polarity protection:	5 VDC: No, 10-30 VDC: yes	yes
UL approval:	file E356899	
RoHS compliant acc. to EU guideline 2011/65/EU		

¹⁾ Only one channel allowed to be shorted-out: (If +V = 5 V, short-circuit to channel, 0 V, or +V is permitted) (If +V = 10-30 V, short-circuit to channel or 0 V is permitted)

Standard Wiring:

Connection Type	Case Ground	Common (0 V)	+V	A	\bar{A}	B	\bar{B}	Z	\bar{Z}	-	-	Com / Sensor	+V Sensor
M23 Multifast	Coupling Nut	10	12	5	6	8	1	3	4	-	-	11	2
M12 Eurofast	Coupling Nut	1	2	3	4	5	6	7	8	-	-	-	-
Cable	Shield/Drain	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY/PK	RD/BU

Wiring Diagrams:



* Length in meters.

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Part Number Key: RI-16 Shaft Version

A	B	C		D	E		F
RI-16T	6	C	-	2B	6000	-	H1181

A	Type
RI-16T	Ø 58 mm, Shaft w/ Flat, IP65 Shaft Seal

B	Shaft (Ø x L)
6	Ø 6 mm x 10 mm
10	Ø 10 mm x 20 mm

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

D	Voltage Supply and Output Type
2B	10-30 VDC, Push-Pull (w/ Inverted Signals)
4A	5 VDC, RS422 (w/ Inverted Signals)
4C	10-30 VDC, RS422 (w/ Inverted Signals)

E	Pulse Rate
	6000, 7200, 8000, 8192, 9000, 10000, 18000, 36000 Other Pulse Rates Available on Request

F	Type of Connection
H1181	Radial 8-pin M12 Eurofast Connector
H1481	Axial 8-pin M12 Eurofast Connector
12M23	Radial 12-pin M23 Multifast Connector
12M23A	Axial 12-pin M23 Multifast Connector
C1M	Radial Cable (1 m PUR)
CA1M	Axial Cable (1 m PUR)

Part Number Key: RI-64 Hollow Shaft Version

A	B	C		D	E		F
RI-64B	6	T	-	2B	6000	-	H1181

A	Type
RI-64B	Ø 58 mm, Blind Hollow Shaft, IP66 Shaft Seal
RI-64C	Ø 58 mm, Blind Hollow Shaft, IP40 Shaft Seal
RI-64H	Ø 58 mm, Hollow Shaft, IP66 Shaft Seal
RI-64I	Ø 58 mm, Hollow Shaft, IP40 Shaft Seal

B	Bore (30 mm max insertion depth for blind hollow shaft)
6	Ø 6 mm
8	Ø 8 mm
10	Ø 10 mm
12	Ø 12 mm

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

D	Voltage Supply and Output Type
2B	10-30 VDC, Push-Pull (w/ Inverted Signals)
4A	5 VDC, RS422 (w/ Inverted Signals)
4C	10-30 VDC, RS422 (w/ Inverted Signals)

E	Pulse Rate
	6000, 7200, 8000, 8192, 9000, 10000, 18000, 36000 Other Pulse Rates Available on Request

F	Type of Connection
H1181	Radial 8-pin M12 Eurofast Connector
12M23	Radial 12-pin M23 Multifast Connector
C1M	Radial Cable (1 m PVC)

Accessories:

- See page H1, Connectivity, for cables and connectors
- See page G1, Accessories, for mounting attachments and couplings

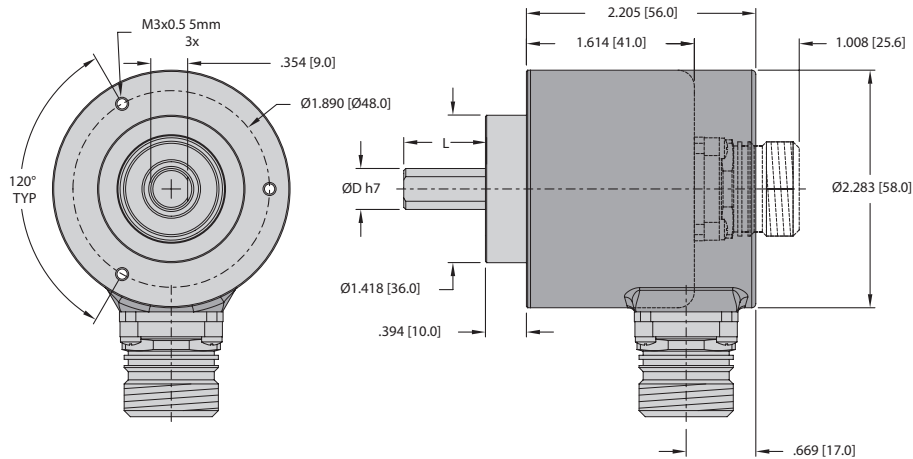
Rotary Position Technology

Incremental Encoders

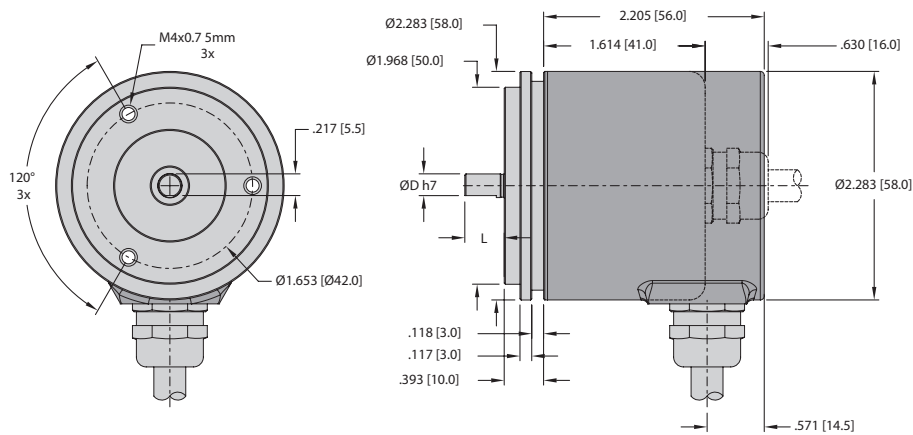
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Dimensions: RI-16 Shaft Version

RI-16 Flange C Connection 12M23 & 12M23A



RI-16 Flange S Connection C1M & CA1M



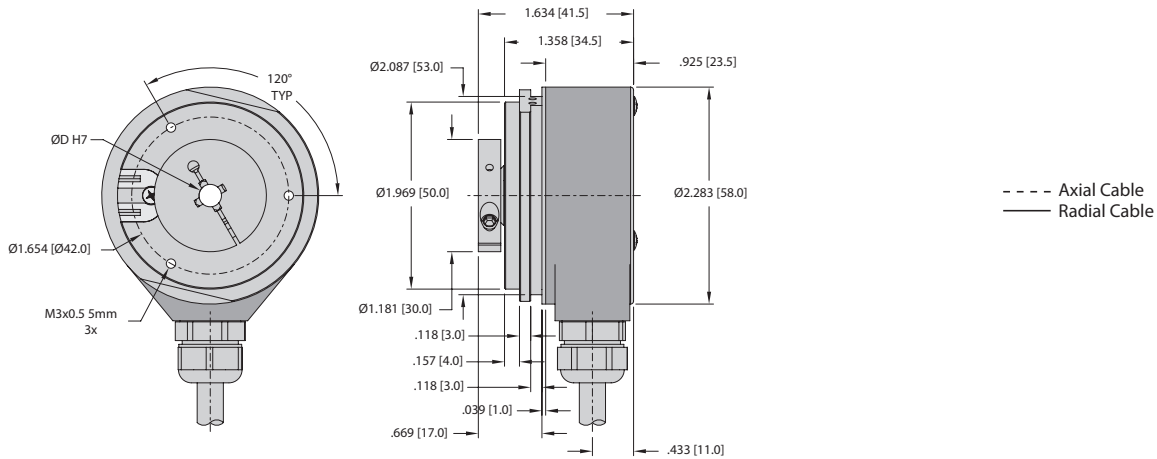
Mounting advice:

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).

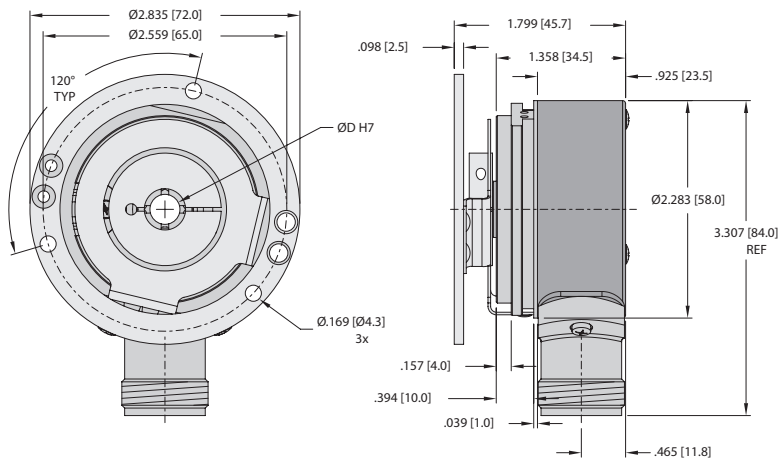
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Dimensions: RI-64 Hollow Shaft Version

RI-64 Flange T Connection C



RI-64 Flange E1 Connection 12M23



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).