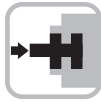


Rotary Position Technology

Absolute Encoders, Multiturn

Absolute, Multiturn Type RM-97 (Shaft) / RM-98 (Blind Hollow Shaft)

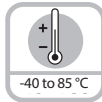
Analog



Bearing-Lock



High rotational speed



Temperature range
-40 to 85 °C



High IP



High shaft load capacity



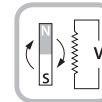
Shock/vibration resistant



Reverse polarity protection



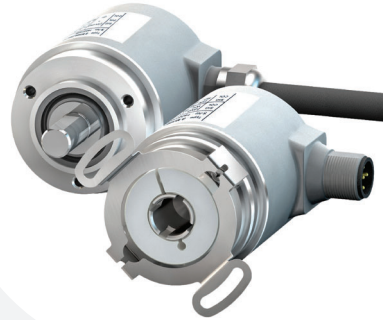
Surface protection
salt spray-tested optional



Energy Harvesting

Reliable

- Sturdy bearing construction in Bearing-Lock design for resistance against vibration and installation errors.
- Without gear and without battery, thanks to the Energy Harvesting technology.



Absolute



Application Oriented

- Current output 4 - 20 mA.
- Voltage output 0 - 10 V or 0 - 5 V.
- Measuring range scalable.
- Limit switch function.

Insensitive

- Reduced number of components ensures magnetic insensitivity.
- IP67 protection and wide temperature range -40 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)
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Protection acc. to EN 60529:	IP65 / IP67
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Working temperature range:	-40 to +185 °F (-40 to +85 °C)
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Materials:

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

Shock resistance acc. to EN 60068-2-27:	250g (2500 m/s ²), 6 ms
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Vibration resistance acc. to EN 60060-2-6:	30g (300 m/s ²), 10 - 2000 Hz
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Absolute, Multiturn Type RM-97 (Shaft) / RM-98 (Blind Hollow Shaft)

Analog

General Electrical Characteristics Interface 4 - 20mA:

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 ¹⁾
Measuring range:	
Factory setting:	2 ⁴ revolutions
Optionally scalable:	up to 2 ¹⁶ revolutions
DA converter resolution:	12 bit
Singleturn accuracy, at 77 °F 25 °C:	±1 °
Temperature coefficient:	< 100 ppm/K
Repeat accuracy at 77 °F 25 °C:	±0.2 °
Output load:	max. 200 0hm at 10 VDC max. 900 0hm at 24 VDC max. 1200 0hm at 30 VDC
Setting time:	< 1 ms, R _{Load} = 900 0hm, 77 °F 25 °C
LEDs (green/red):	• system status • current loop interruption—input load too high • reference point display (only with factory settings) at cw: betw. 0 ° and 1 ° at ccw: betw. 0 ° and -1 ° • status in teach mode
Options:	• output signal scalable via the teach inputs • output signal scalable via the teach inputs + limit switch function
Teach inputs:	level= +V for 1 s minimum
PowerON time:	< 1 s
Update Rate:	1 ms
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

Measuring Range 'AL' or 'AR':

Connection Type:	Common (0V)	+V	Output	Set 1	Set 2
Cable:	WH	BN	GN	N/C	N/C
M12 pin:	3	1	2	N/C	N/C

Measuring Range 'S*NS' or 'S*WL':

Connection Type:	Common (0V)	+V	Output	Set 1	Set 2
Cable:	WH	BN	GN	GY	PK
M12 pin:	3	1	2	4	5

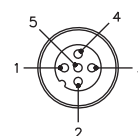
General Characteristics Voltage Interface 0 - 10 V / 0 - 5 V:

Power supply:	output 0 - 5 V 10 - 30 VDC output 0 - 10 V 15 - 30 VDC
Current consumption (no load):	max. 30 mA
Reverse polarity protection at power supply (+V):	yes
Short-circuit protected outputs:	yes ¹⁾
Measuring range:	
Factory setting:	2 ⁴ revolutions
Optionally scalable:	up to 2 ¹⁶ revolutions
DA converter resolution:	0 - 10 V 12 bit 0 - 5 V 11 bit
Singleturn accuracy, at 77 °F 25 °C:	±1 °
Temperature coefficient:	< 100 ppm/K
Repeat accuracy at 77 °F 25 °C:	±0.2 °
Current output:	max. 10 mA
Setting time:	< 1 ms, R _{Load} = 1000 0hm, 77 °F 25 °C
LEDs (green/red):	• system status • reference point display (only with factory settings) at cw: betw. 0 ° and 1 ° at ccw: betw. 0 ° and -1 ° • status in teach mode
Options:	• output signal scalable via the teach inputs • output signal scalable via the teach inputs + limit switch function
Teach inputs:	level= +V for 1 s minimum
PowerON time:	< 1 s
Update Rate:	1 ms
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

¹⁾ = when the power supply is correctly applied.

Wiring Diagram:

5-pin M12 Eurofast Connection

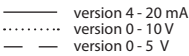

Mating Cordset: **RKC 4.5T-*/S618**
Teaching Adapter: **VB2-SP6**

Rotary Position Technology
Absolute Encoders, Multiturn

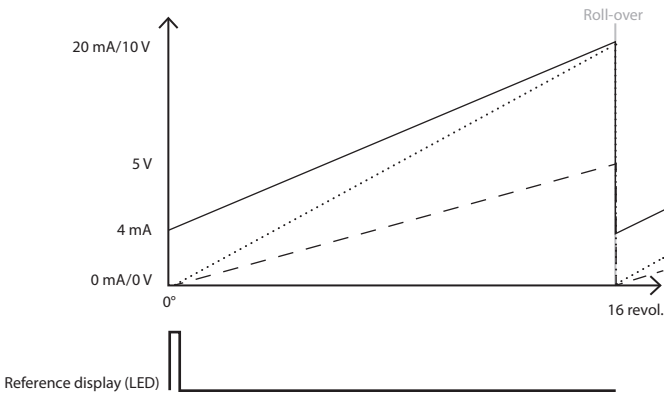
Absolute, Multiturn Type RM-97 (Shaft) / RM-98 (Blind Hollow Shaft) Analog

Note: Encoders must be ordered with a clockwise or counterclockwise profile. This determines whether the analog output increases or decreases in the given direction.

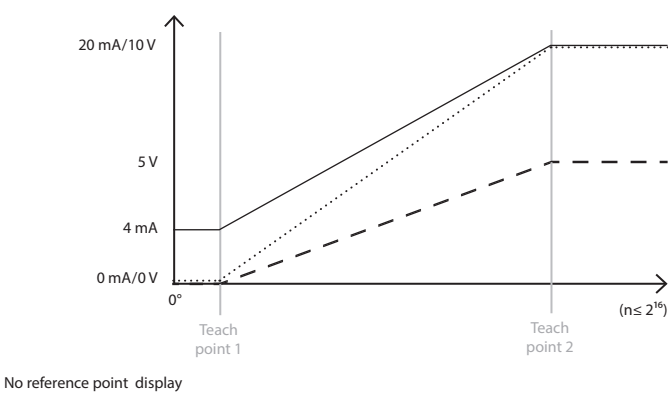
Example (output signal profile):



Clockwise (CW) version



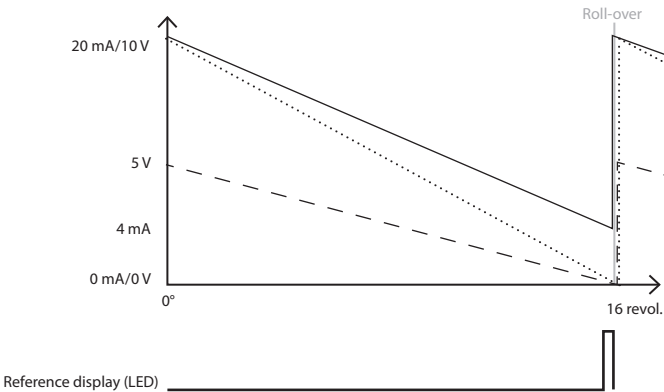
Scalable version without limit switch function



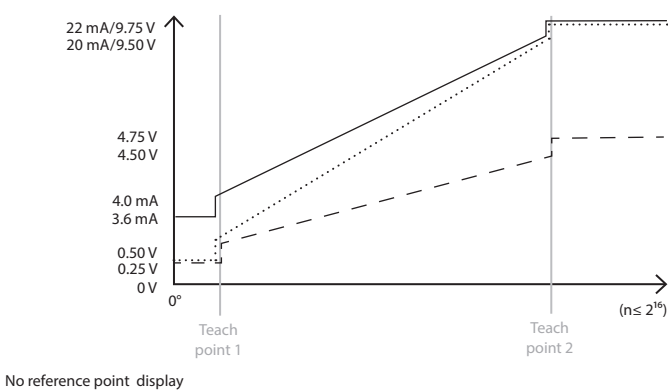
Example (output signal profile):



Counter Clockwise (CCW) version



Scalable version with limit switch function



Note: Factory-set measuring range: 2⁴ revolutions with roll-over

Note: Limit switch function:

version:	0 - 10 V	0 - 5 V	4 - 20 mA
limit switch low:	0.25 V	0.25 V	3.60 mA
limit switch high:	9.75 V	4.75 V	22.00 mA

Absolute, Multiturn Type RM-97 (Shaft) / RM-98 (Blind Hollow Shaft)

Analog

Part Number Key: RM-97 Shaft Version

A	B	C		D	E		F
RM-97S	6	C	-	7A	AL	-	H1151

A	Type
RM-97S	Ø 39 mm, Shaft w/Flat, IP67 Shaft Seal
RM-97T	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
7A	10 - 30 VDC, 4 - 20 mA
8B	15 - 30 VDC, 0 - 10 V
BA	10 - 30 VDC, 0 - 5 V

E	Measuring Range
AL	16 Turns, Count Direction CCW*
AR	16 Turns, Count Direction CW*
SALNS	Scalable to 65,536 Turns, CCW*, w/o Limit Switch
SALWL	Scalable to 65,536 Turns, CCW*, w/ Limit Switch
SARNS	Scalable to 65,536 Turns, CW*, w/o Limit Switch
SARWL	Scalable to 65,536 Turns, CW*, w/ Limit Switch

* = increasing code values when shaft turning in direction listed. Top view on shaft.

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

Part Number Key: RM-98 Blind Hollow Shaft Version

A	B	C		D	E		F
RM-98B	6	E	-	7A	AL	-	H1151

A	Type
RM-98B	Ø 36 mm, Blind Hollow Shaft, IP67 Shaft Seal
RM-98C	Ø 36 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" × 1/2"

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

D	Voltage Supply and Output Type
7A	10 - 30 VDC, 4 - 20 mA
8B	15 - 30 VDC, 0 - 10 V
BA	10 - 30 VDC, 0 - 5 V

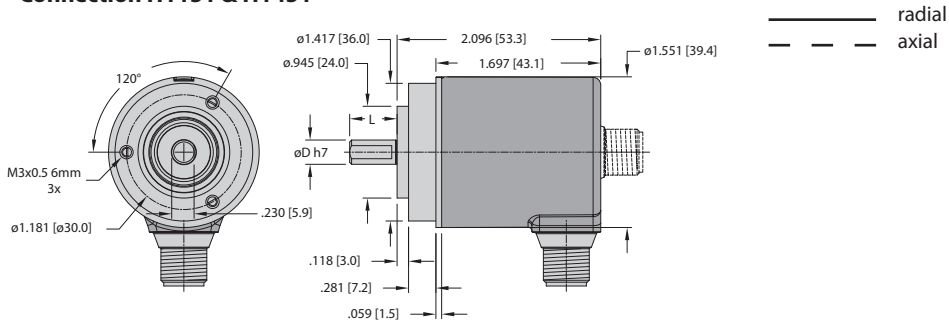
E	Measuring Range
AL	16 Turns, Count Direction CCW*
AR	16 Turns, Count Direction CW*
SALNS	Scalable to 65,536 Turns, CCW*, w/o Limit Switch
SALWL	Scalable to 65,536 Turns, CCW*, w/ Limit Switch
SARNS	Scalable to 65,536 Turns, CW*, w/o Limit Switch
SARWL	Scalable to 65,536 Turns, CW*, w/ Limit Switch

* = increasing code values when shaft turning in direction listed. Top view on shaft.

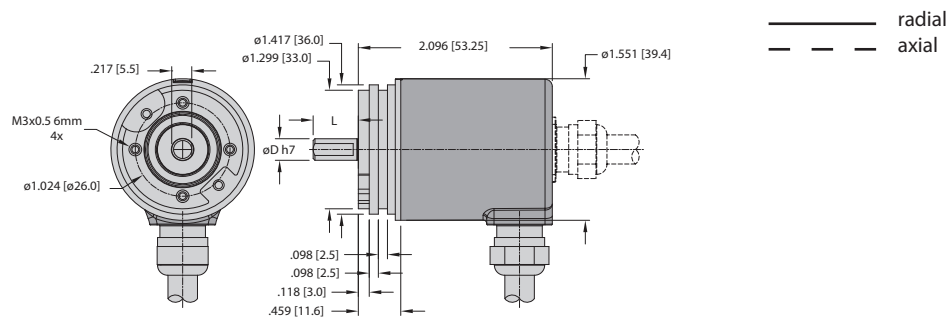
F	Type of Connection
H1151	Radial 5-pin M12 Eurofast Connector
H1451	Axial 5-pin M12 Eurofast Connector
C1M	Radial Cable (1m PVC)
CA1M	Axial Cable (1m PVC)

Dimensions: RM-97 Shaft Version

RM-97 Flange C Connection H1151 & H1451

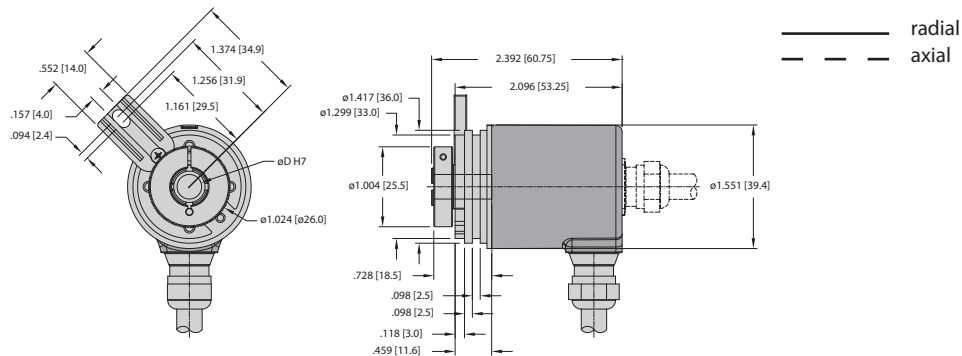


RM-97 Flange S Connection C1M & CA1M

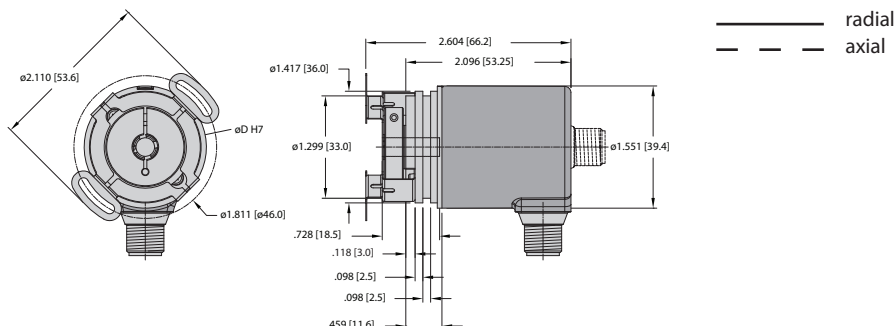


Dimensions: RM-98 Blind Hollow Shaft Version

RM-98 Flange T Connection C1M & CA1M



RM-98 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).