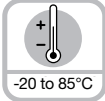




High rotational speed



Temperature



Shock/
vibration
resistant



Short-circuit
proof



Reverse polarity
protection

Rugged

- Highest shock resistance on the market: ($\geq 200 \text{ g}$ ($2,500 \text{ m/s}^2$), 6 ms acc. to DIN IEC 68-2-27).
- IP65 rated shaft version and IP66 rated hollow shaft version.
- Short-circuit proof outputs.
- Patented construction integrates all components; use of an opto-asic and 6-layer technology on a single PCB with resolution of up to 14 bits.



Compact

- Housing $\varnothing 58 \text{ mm}$.

Versatile

- Parallel interface.
- Divisions: up to 16384 (14 bits), sinleturn.
- Gray, Binary or BCD code.
- Various options.
- Shaft version: current interface 4 to 20 mA.

Mechanical characteristics:

Speed:	Shaft version: max. 12,000 RPM Hollow shaft version ¹⁾ : max. 6,000 RPM
Rotor moment of inertia:	Shaft version: approx. 0.098 oz-in^2 ($1.8 \times 10^{-6} \text{ kgm}^2$) Hollow shaft version: approx. 0.328 oz-in^2 ($6 \times 10^{-6} \text{ kgm}^2$)
Starting torque:	Shaft version: $< 1.4 \text{ oz-in}$ ($< 0.01 \text{ Nm}$) Hollow shaft version: $< 7 \text{ oz-in}$ ($< 0.05 \text{ Nm}$)
Radial load capacity of shaft:	40 lbs (178 N)
Axial load capacity of shaft:	40 lbs (178 N)
Weight:	approx. 0.88 lbs (0.4 kg)
Protection acc. to EN 60 529:	Shaft version: IP65 Hollow shaft version: IP66
EX approval for hazardous areas:	optional zone 2 and 22
Working temperature:	$-4 \text{ to } +185^\circ\text{F}$ ($-20 \text{ to } +85^\circ\text{C}$) ³⁾
Shaft:	stainless steel
Shock resistance acc. to DIN-IEC 68-2-27:	250 g ($2,500 \text{ m/s}^2$), 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	10 g (100 m/s^2), $10\text{-}2,000 \text{ Hz}$

¹⁾ For continuous operation 1500 RPM ²⁾ 176°F (80°C), shaft version and cable connection
³⁾ 158°F (70°C), hollow shaft version and cable connection

Electrical characteristics SSI or parallel interface:

Interface type:	Parallel	Parallel
Supply voltage (+V):	5 VDC ($\pm 5 \%$)	10-30 VDC
Output driver:	Push-pull	Push-pull
Current consumption typ.: / (no load) max.:	109 mA / 169 mA	109 mA / 169 mA
Permissible load/channel:	max. $\pm 10 \text{ mA}$	$\geq 180 \text{ kHz}$
Signal level high:	min. 3.4 V	min. $+V - 2.8 \text{ V}$
Signal level low	$(I_{\text{Load}} = 10 \text{ mA})$: max. 1.5 V $(I_{\text{Load}} = 1 \text{ mA})$: max. 0.3 V	max. 1.8 V -
Rise time t_r (without cable):	max. $0.2 \mu\text{s}$	max. $1 \mu\text{s}$
Fall time t_f (without cable):	max. $0.2 \mu\text{s}$	max. $1 \mu\text{s}$
Short-circuit proof outputs: ¹⁾	yes	yes
Reverse connection protection at +V :	no	yes
UL certified	File 224618	
Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3		
RoHS compliant acc. to EU guideline 2002/95/EG		

¹⁾ If supply voltage correctly applied

Universal type 5850 (shaft) / 5870 (hollow shaft) analog, parallel

Pin configuration (Parallel interface, up to 13 bits and max. 2 options, 17 pin plug):

Signal:	Common (0 V)	+V	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/VR	VR/LH	Coupling Nut
Color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY PK	RD BU	WH GN	BN GN	WH YE	YE BN	WH GY	Case Ground
Pin:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	

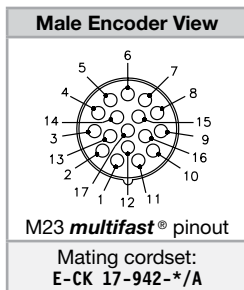
Pin configuration (Parallel interface, 14 bits and max. 2 options, cable version):

Signal:	Common (0 V)	+V	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/VR	VR/LH	14
Color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY PK	RD BU	WH GN	BN GN	WH YE	YE BN	WH GY	GY BN

Pin configuration (Parallel interface, 14 bits, 1 option, 17 pin plug):

Signal:	Common (0 V)	+V	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/VR /LH	14	Coupling Nut
Pin:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Case Ground

Wiring diagrams:



* Length in meters.

Control inputs:

Up/down input to switch the counting direction

By default, absolute encoders deliver increasing code values when shaft rotates clockwise. When the shaft rotates counter-clockwise, the output delivers decreasing code values. The same applies to models with current interfaces. When the shaft rotates clockwise, the output delivers increasing current values, and decreasing values when it rotates counter-clockwise.

If the up/down input receives the corresponding signal (high), this feature is reversed. Clockwise rotation will deliver decreasing code values while counter-clockwise rotation will deliver increasing code values.

- The response time is:
- 0.4 ms for 5 VDC supply voltage.
 - 2 ms for 10-30 VDC supply voltage.

SET input

This input is used to reset (to zero) the encoder. A control pulse (high) sent to this input allows storing the current position value as new zero position in the encoder. For models equipped with a current interface, the analog output (4-20 mA) will be set accordingly to the value 4 mA. Note : Before activating the SET input after supplying the encoder with the supply voltage, a counting direction (clockwise or counter-clockwise) must be defined univocally on the up/down input.

- The response time is:
- 0.4 ms for 5 VDC supply voltage.
 - 2 ms for 10-30 VDC supply voltage.

LATCH input

This input is used to "freeze" the current position value. The position value will be statically available on the parallel output as long as this input will remain active (high).

- The response time is:
- 140 µs for 5 VDC supply voltage
 - 200 µs for 10-30 VDC supply voltage

Switching level of the control inputs:

Supply Voltage:	5 VDC	10-30 VDC
Low:	≤ 1.7 V	≤ 4.5 V
High:	≥ 3.4 V	≥ 8.7 V

Universal type 5850 (shaft) / 5870 (hollow shaft)

analog, parallel

Electrical characteristics current interface 4-20 mA (Shaft version):

Sensor part:

Interface type:	4-20 mA	4-20 mA
Supply voltage (+V):	10-30 VDC	5 VDC
Current consumption typ.:	70 mA	70 mA
(no load) max.:	84 mA	84 mA

Current loop:

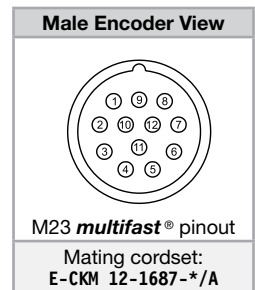
Supply voltage (Us):	10-30 VDC
Analog signal:	4-20 mA
max. input resistance of the input circuit:	200 Ω (Us = 10 V), 1 kΩ (Us = 30 V)

Measuring range:	0-360°
Max. failure (25°C):	0.2°
Resolution:	13 Bit
Building up time:	max. 2 ms
Temperature coefficient:	0.1°/10 K
Current if detector error:	≤ 3.5 mA
Sensor and current loop are galvanically isolated	
UL certified	File 224618
Conforms to CE requirements according to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3	
RoHS compliant according to EU guideline 2002/95/EG	

Pin configuration (Current interface 4-20 mA, 12 pin plug):

Signal:	Common (0 V)	+V	-	-	I+	I-	ST	VR						Coupling nut
Color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY PK	RD BU		Case ground
Pin:	1	2	3	4	5	6	7	8	9	10	11	12		

Wiring diagrams:



* Length in meters.

Code type and division with parallel output (5850 / 5870)

Interface and supply voltage, version 3 or 4 (Parallel):

Division	Part number key Gray/Gray-Excess	Part number key Binary	Part number key BCD
250	E02	B02	D02
360	E03	B03	D03
500	E05	B05	D05
720	E07	B07	D07
900	E09	B09	D09
1000	E01	B01	D01
1024 (10 Bit)	G10	B10	D10
1250	E12	BA1	DA2
1440	E14	B14	DA1
1800	E18	BA2	D18
2000	E20	B20	D20
2500	E25	B25	
2880	E28	B28	
3600	E36	B36	
4000	E40	B40	
4096 (12 Bit)	G12	B12	
5000	E50	B50	
7200	E72	B72	
8192 (13 Bit)	G13	B13	
16384 (14 Bit)	G14	B14	

Code type and division for encoder with analog output (5850)

Interface and supply voltage, version 7 or 8 (4-20 mA)

8192 (13 Bit)	G13
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Universal type 5850 (shaft) / 5870 (hollow shaft) analog, parallel

Part number key: 5850 shaft version

T8.5850.XXXX.XXXX

<p>Type</p> <hr/> <p>Flange</p> <p>1 = clamping flange 2 = servo flange</p> <p>Shaft (Ø x L)</p> <p>1 = Ø 6 mm x 10 mm 2 = Ø 10 mm x 20 mm</p> <p>Output and voltage supply</p> <p>3 = 5 VDC, parallel 4 = 10-30 VDC, parallel 7 = 5 VDC, 4-20 mA 8 = 10-30 VDC, 4-20 mA</p> <p>Type of connection</p> <p>1 = axial cable (1 m PVC-cable) 2 = radial cable (1 m PVC-cable) 3 = axial 12-pin M23 <i>multifast</i>® plug without mating connector 5 = radial 12-pin M23 <i>multifast</i> plug without mating connector</p>	<p>Options</p> <p>2 = SET and V/R 3 = SET and Latch ¹⁾ 4 = V/R ¹⁾ and Latch ALARM output on request</p> <p>Code type and division</p> <p>See table on page D33</p> <p>¹⁾ For version with 14 bits parallel output and 17-pin plug.</p>
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Part number key: 5870 hollow shaft version

T8.5870.XXXX.XXXX

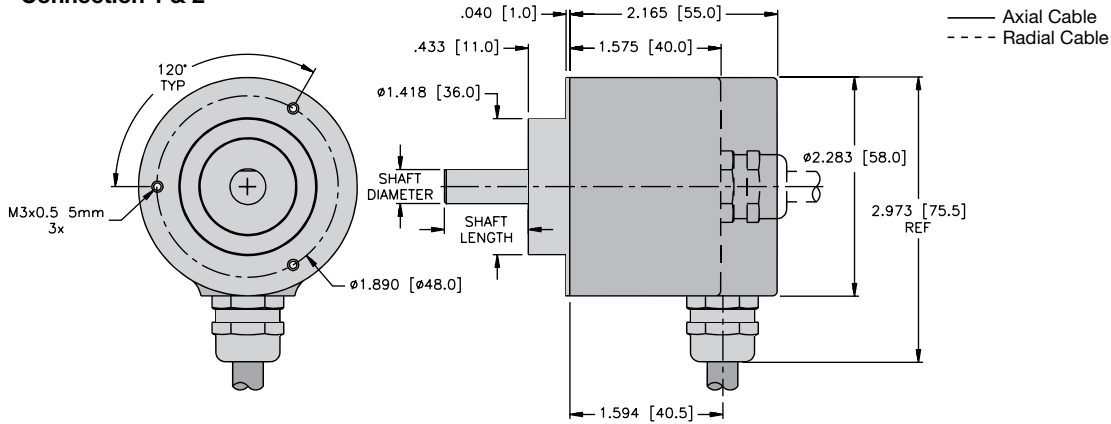
<p>Type</p> <hr/> <p>Flange</p> <p>1 = flange type 1 with through shaft 2 = flange type 1 with blind hollow shaft 3 = flange type 3 with flex mount 4 = flange type 3 with blind hollow shaft</p> <p>Hollow shaft</p> <p>6 = Ø 10 mm 8 = Ø 12 mm</p> <p>Output and voltage supply</p> <p>3 = 5 VDC, parallel 4 = 10-30 VDC, parallel</p> <p>Type of connection</p> <p>1 = radial cable (1 m PVC-cable) 2 = radial 12-pin M23 <i>multifast</i> plug without mating connector</p>	<p>Options</p> <p>2 = SET ¹⁾ and V/R 3 = SET and Latch ¹⁾ 4 = V/R ¹⁾ and Latch ALARM output on request</p> <p>Code type and division</p> <p>See table on page D33</p> <p>¹⁾ For version with 14 bits parallel output and 17-pin plug.</p>
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Accessories:

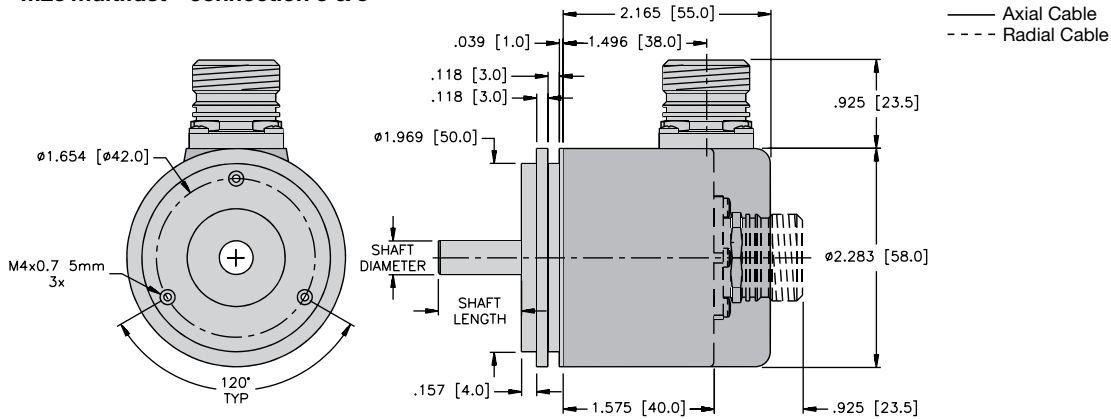
- See page J1, Connectivity, for cables and connectors
- See page E1, Accessories, for mounting attachments and couplings

Dimensions: 5850 shaft version

5850 flange 1
Connection 1 & 2



5850 flange 2
M23 multifast® connection 3 & 5



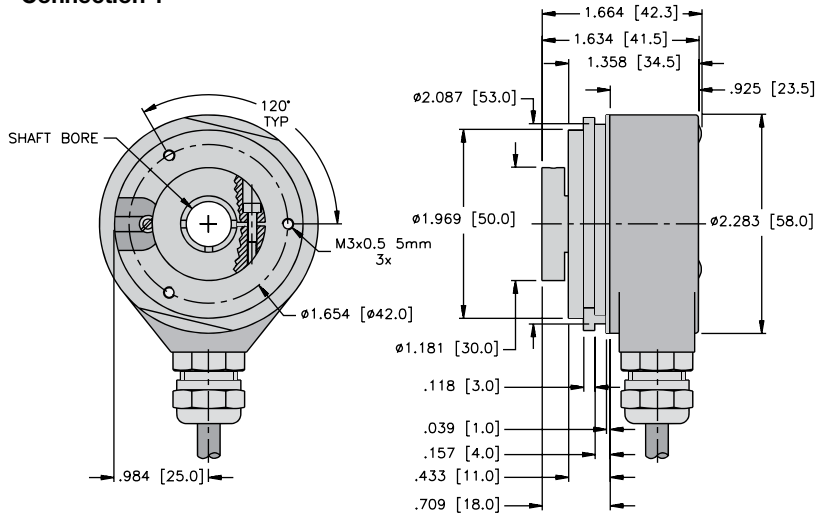
Mounting advice:

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 E1, Accessories).

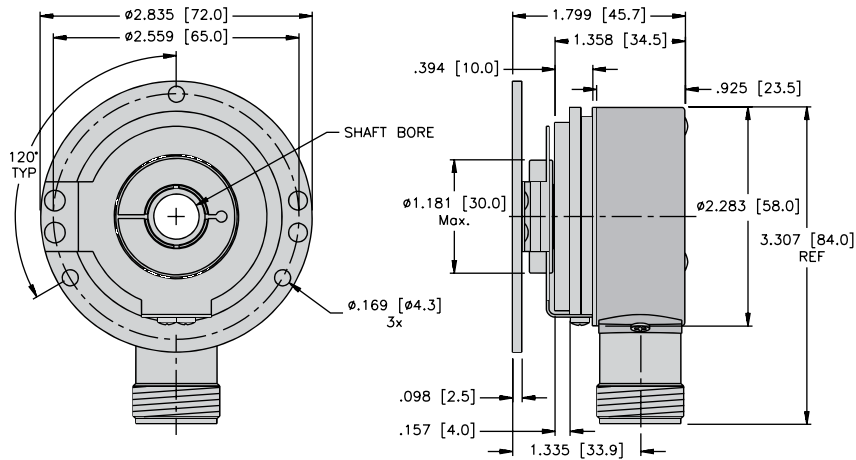
Universal type 5850 (shaft) / 5870 (hollow shaft) analog, parallel

Dimensions: 5870 hollow shaft version

5870 flange 1 & 2
Connection 1



5870 flange 3 & 4
M23 multifast® connection 2



Mounting advice:

The flanges and shafts of the encoder and drive should not be rigidly coupled together at the same time.

When mounting a hollow shaft encoder, we recommend using a torque stop pin or a flex mount.