Rotary Position Technology
Absolute Encoders, Multiturn

Kübler by TURCK

Sendix absolute, multiturn type 5868 (shaft) / 5888 (blind hollow shaft)CANopen/CANlift

Mechanical drive	Safety-Lock™	High rotational speed	-40 to 80°C Temperature	High IP	High shaft load capacity	Shock/vibration resistant	Magnetic field proof	Short-circuit proof	Reverse polarity protection	Optical sensor	Seawater-resistant version on request

Reliable

- **increased ability to withstand vibration and installation errors.** Sturdy Safety-Lock™ Design bearing structure **eliminates machine downtime and repairs.**

- **Fewer components and connection points increase the operational reliability:** TURCK OptoASIC technology with highest integration density (Chip-on-Board).

- Die cast housing and protection up to IP67: **Remains sealed even when subjected to harsh everyday use.**

- Wide temperature range.
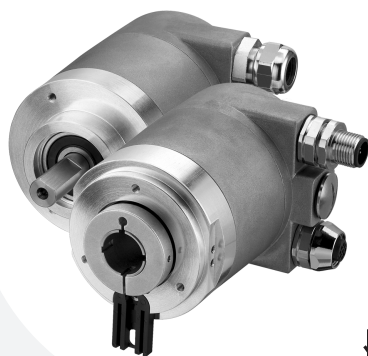
Sendix® absolute

CANopen

CANopen LIFT © cia

RoHS compliant c(UL)us Ex 2/22

Fast

- **Real time-servo position detection of several axes:** Extended CAN Sync Mode with realtime position acquisition.

- **Fast data availability, while reducing the load on the bus and the controller:** Intelligent functions like the transmission of speed, acceleration or exiting a working area.

Versatile

- CANopen, CANlift fieldbus with the latest profiles.

- **Connections for every application:** Bus terminal cover with M12 connector or fixed connection with M12, M23 or D-Sub connector.Point-to-point connections also available.

- **Real-time data: position, speed or working area.** Variable PDO mapping in the memory.

- **Fast, error-free start-up, without setting any switches.** Node address, baud rate and termination can be programmed via the bus.

- Direct mounting of hollow shaft on large diameter standard shafts; up to 15 mm for blind hollow shaft.

Mechanical characteristics:

Max. speed without shaft sealing (IP65) up to 158°F (70°C):	9,000 RPM, continuous 7,000 RPM
Max. speed without shaft sealing (IP65) up to Tmax:	7,000 RPM, continuous 4,000 RPM
Max. speed with shaft sealing (IP67) up to 158°F (70°C):	8,000 RPM, continuous 6,000 RPM
Max. speed with shaft sealing (IP67) up to Tmax:	6,000 RPM, continuous 3,000 RPM
Starting torque without shaft seal (IP65):	1.4 oz-in (< 0.01 Nm)
Starting torque with shaft seal (IP67):	4.25 oz-in (< 0.03 Nm)
Moment of inertia:	Shaft version: 0.219 oz-in^2 (4.0 x 10^{-6} kgm^2) Hollow shaft version: 0.41 oz-in^2 (7.5 x 10^{-6} kgm^2)
Radial load capacity of shaft:	18 lbs (80 N)
Axial load capacity of shaft:	9 lbs (40 N)
Weight:	approx. 1.26 lbs (0.57 kg) with bus terminal cover approx. 1.15 lbs (0.52 kg) with fixed connection
Protection acc. to EN 60 529:	Housing: IP67, Shaft: IP65, opt. IP67
EX approval for hazardous areas:	optional zone 2 and 22
Working temperature:	-40 to +176°F (-40 to +80°C) [1]
Materials:	Shaft: stainless steel, Flange: aluminum, Housing: die cast zinc, Cable: PVC
Shock resistance acc. to DIN-IEC 68-2-27:	> 250 g (> 2,500 m/s^2), 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	> 10 g (> 100 m/s^2), 55-2,000 Hz

[1] Cable versions: -22 to +167°F (-30 to +75°C)

- Safe operation in strong magnetic fields
- Special gears with specific toothing

Rotary Position Technology
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General electrical characteristics:

Supply voltage:	10-30 VDC
Current consumption (w/o output load):	Max. 100 mA
Reverse polarity protection	Yes
Conforms to CE requirements acc. to EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3	
UL certified	File 224618
RoHS compliant acc. to EU guideline 2002/95/EG	

SET control button (zero or defined alue, option)

Protected against accidental activation, can only be depressed with the tip of a ballpoint pen or similar.

Diagnostic LED (yellow)

LED on with: optical sensor path faulty (code error, LED error), low voltage and over-temperature

incremental track characteristics:

Output driver:	RS422 (TTL-compatible)
Permissible load/channel:	Max. 20 mA
Signal level:	High typ. 3.8 V Low typ. 1.3 V
Short circuit proof outputs	Yes [1]
Resolution:	2048 ppr

[1] Short circuit to OV or to output, only one channel at a time, supply voltage correctly applied.

interface characteristics CANopen/CANlift:

Singleturn resolution (max, scalable):	1-65536 (16 bits), default scale value is set to 8192 (13 bits)
Total resolution:	1-268 435 456 (28 Bit) Default: 25 Bit
Code:	Binary
interface:	CAN High-Speed according ISO 11898, Basic- and Full-CAN CAN Specification 2.0 B

protocol:	CANopen profile DS 406 V3.2 with manufacturer-specific add-on's or CANlift profile DS 417 V1.1
Baud rate:	10-1000 kbits/s (set by DIP switches/software configurable)
Node address:	1-127 (set by rotary switches / software configurable)
Termination switchable:	Set by DIP switches (software configurable)

General information about CAN/CANlift

The CANopen encoders support the latest CANopen communication profile according to DS 301 V4.02. In addition, device-specific profiles, like the DS 406 V3.2 and DS 417 V1.1 (for lift applications), 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 may be programmed via the CANopen fieldbus. When switching the device on, all parameters, which have been saved on an EEPROM to protect them against power failure, are loaded again.

Position, speed, acceleration and status output values may be combined in a freely variable way as PDO mapping.

Encoders with a connector or a cable connection are available. Models with bus terminal cover and integrated T-shaped coupler allow a particularly easy installation via M12 connectors. The device address is set by means of two hexadecimal rotary switches. Furthermore, another DIP switch allows setting the baud rate and switching on a termination resistor. Three LEDs indicate the operating or fault status of the CANopen fieldbus, as well as the status of an internal diagnostics.

CANopen Communication profile DS 301 V4.02

The following functionality is integrated:
Class C2 Functionality • NMT Slave • Heartbeat Protocol • High Resolution Sync Protocol • Identity Object • Error Behavior Object • Variable PDO Mapping • Self-start programmable (power on to operational) •
Three Sending PDO's • Node address, baud rate and CANbus • Programmable termination

CANopen Encoder profile DS 406 V3.2

The following parameters may be programmed:
• Event mode
• Units for speed selectable (Steps/Sec or RPM)
• Factor for speed calculation (e.g. measuring wheel circumference)
• Integration time for speed value of 1 to 32
• Two work areas with 2 upper and lower limits and the corresponding output states
• Variable PDO mapping for position, speed, acceleration and work area status
• Extended failure management for position sensing with integrated temperature control
• User interface with visual display of bus and failure status – 3 LED's
• Optional – 32 CAM's programmable
• Customer-specific memory – 16 Bytes

CANopen Lift profile DS 417 V1.1

The following functionality is integrated:
• Car position unit
• Two virtual devices
• One virtual device delivers the position in absolute measuring steps (steps)
• One virtual device delivers the position as an absolute travel information in mm
• Lift number programmable
• Independent setting of the node address in relation with the CAN identifier
• Factor for speed calculation (e.g. measuring wheel circumference)
• Integration time for speed value of 1 to 32
• Two work areas with 2 upper and lower limits and the corresponding output states
• Variable PDO mapping for position, speed, acceleration, work area status
• Extended failure management for position sensing with integrated temperature control
• User interface with visual display of bus and failure status – 3 LEDs

Key features:
The object 6003h "Preset" is assigned to an integrated key, accessible from the outside "Watchdog-controlled" device.

Absolute Encoders

Sendix absolute, multiturn type 5868 (shaft) / 5888 (blind hollow shaft)CANopen/CANlift

pin configu ation:
Bus terminal cover with terminal box (Connection 1)

Direction	OUT					iN				
Signal:	CAN Ground	CAN_Low (-)	CAN_High (+)	Common (0 V) power supply	+V power supply	Common (0 V) power supply	+V power supply	CAN_Low (-)	CAN_High (+)	CAN Ground
Abbrv:	CG	CL	CH	0 V	+V	0 V	+V	CL	CH	CG

pin configu ation:
Cable connection (Connection A)

Direction	iN				
Signal:	Common (0 V) power supply	+V power supply	CAN_Low (-)	CAN_High (+)	CAN Ground
Abbrv:	0 V	+V	CL	CH	CG
Color:	WH	BN	YE	GN	GY

pin configu ation:
M23 connector or M12 connector or D-Sub 9 (Connection i) (Connection E) (Connection K)

Direction	iN					
Signal:	Common (0 V) power supply	+V power supply	CAN_Low (-)	CAN_High (+)	CAN Ground	**pinout**
Abbrv:	0 V	+V	CL	CH	CG	
M23 pin:	10	12	2	7	3	A
M12 pin:	3	2	5	4	1	C
D-Sub 9:	6	9	2	7	3	-

pin configu ation:
Bus terminal cover with 2 - M12, 2 - M12, 2 - M23 (Connection 2) (Connection F) (Connection J)

Direction	OUT						iN					
Signal:	CAN Ground	CAN_Low (-)	CAN_High (+)	0 V power supply	+V power supply	**pinout**	0 V power supply	+V power supply	CAN_Low (-)	CAN_High (+)	CAN Ground	**pinout**
Abbrv:	CG	CL	CH	0 V	+V		0 V	+V	CL	CH	CG	
M23 pin:	3	2	7	10	12	A	10	12	2	7	3	A
M12 pin:	1	5	4	3	2	B	3	2	5	4	1	C

pin configu ation:
Terminal assignment incremental track

Signal:	A	Ā	B	B	0 V	**pinout**
Pin:	1	2	3	4	5	D

Wiring Diagrams:

A	B	C	D
Male encoder view	**Female encoder view**	**Male encoder view**	**Male encoder view**
CCW			
Bus in and Out M23 *multifast* pinout	**Bus Out** M12 *eurofast* pinout	**Bus in** M12 *eurofast* pinout	**incremental track pinout**
Mating cordset:[1] Consult factory	Mating cordset:[1] **RSC 572-*M/S3118**	Mating cordset:[1] **RKC 572-*M/S3117**	Mating cordset:[1] **WASW 4.5T-*/S618**

[1] See cable section for additional options.
* Length in meters. Available in 0.1 meter increments ≥0.2 meters.

Rotary Position Technology
Absolute Encoders, Multiturn

Sendix absolute, multiturn type 5868 (shaft) / 5888 (blind hollow shaft)CANopen/CANlift

part number key: 5868 shaft version

T8.5868.XXXX.XX1X

Type

Flange

1 = clamping flange Ø 58 IP65
2 = servo flange Ø 58 mm, IP65
3 = clamping flange Ø 58 mm, IP67
4 = servo flange Ø 58 mm, IP67
5 = square flange 2.5" / 63.5 mm, IP65
6 = servo flange 2.5" / 63.5 mm, IP65
7 = square flange 2.5" / 63.5 mm, IP67
8 = servo flange 2.5" / 63.5 mm, IP67

Shaft (Ø x L)

1 = 6 mm x 10 mm
2 = 10 mm x 20 mm
3 = 1/4" x 7/8"
4 = 3/8" x 7/8"

Voltage supply and output circuit

2 = 10-30 VDC, CANopen DS 301 V4.02
5 = 10-30 VDC, CANopen DS 301 V4.02 with 2048
      ppr incremental track (TTL-compatible)[2]

Options (service)

2 = no option
3 = SET button

Fieldbus profile [1]

21 =   CANopen encoder-profile, DS 406 V3.2
22 =   CANlift DS 417 V1.01

Type of connection

1 = with removable bus terminal cover, with
radial screwed cable passage
2 = removable bus terminal cover with 2 x M12 connector
A = fixed connection without bus terminal
      cover, with radial cable (2 m PVC)
E = fixed connection without bus terminal cover,
      with 1 x M12 **eurofast** radial connector
F = fixed connection without bus terminal cover,
      with 2 x M12 **eurofast** radial connector
I = fixed connection without bus terminal cover,
      with 1 x M23 **multifast** radial connector
J = fixed connection without bus terminal cover,
      with 2 x M23 **multifast** radial connector
K = fixed connection without bus terminal cover,
      with 1 x D-Sub 9-pin connector

[1] CAN parameters can also be factory-preset
[2] Only in conjunction with connection type 2

part number key: 5888 blind hollow shaft version

T8.5888.XXXX.XX1X

Type

Flange

1 = flange with torque stop IP65
2 = flange with torque stop IP67
3 = flange with flex mount pitch circle Ø 65, IP65
4 = flange with flex mount pitch circle Ø 65, IP67
5 = flange with slotted flex mount pitch circle Ø 63, IP65
6 = flange with slotted flex mount pitch circle Ø 63, IP67

Blind hollow shaft (30 mm depth)

3 = Ø 10 mm
4 = Ø 12 mm
5 = Ø 14 mm
6 = Ø 15 mm
8 = Ø 9.52 mm (3/8")
9 = Ø 12.7 mm (1/2")

Voltage supply and output circuit

2 = 10-30 VDC, CANopen DS 301 V4.02
5 = 10-30 VDC, CANopen DS 301 V4.02 with 2048
      ppr incremental track (TTL-compatible)[2]

Options (service)

2 = no option
3 = SET button

Fieldbus profile [1]

21 =   CANopen encoder-profile, DS 406 V3.2
22 =   CANlift DS 417 V1.01

Type of connection

1 = with removable bus terminal cover, with
radial screwed cable passage
2 = removable bus terminal cover with 2 x M12 connector
A = fixed connection without bus terminal
      cover, with radial cable (2 m PVC)
E = fixed connection without bus terminal cover,
      with 1 x M12 **eurofast** radial connector
F = fixed connection without bus terminal cover,
      with 2 x M12 **eurofast** radial connector
I = fixed connection without bus terminal cover,
      with 1 x M23 **multifast** radial connector
J = fixed connection without bus terminal cover,
      with 2 x M23 **multifast** radial connector
K = fixed connection without bus terminal cover,
      with 1 x D-SUB 9-pin connector

[1] CAN parameters can also be factory-preset
[2] Only in conjunction with connection type 2

Accessories:

• See page J1, Connectivity, for cables and connectors
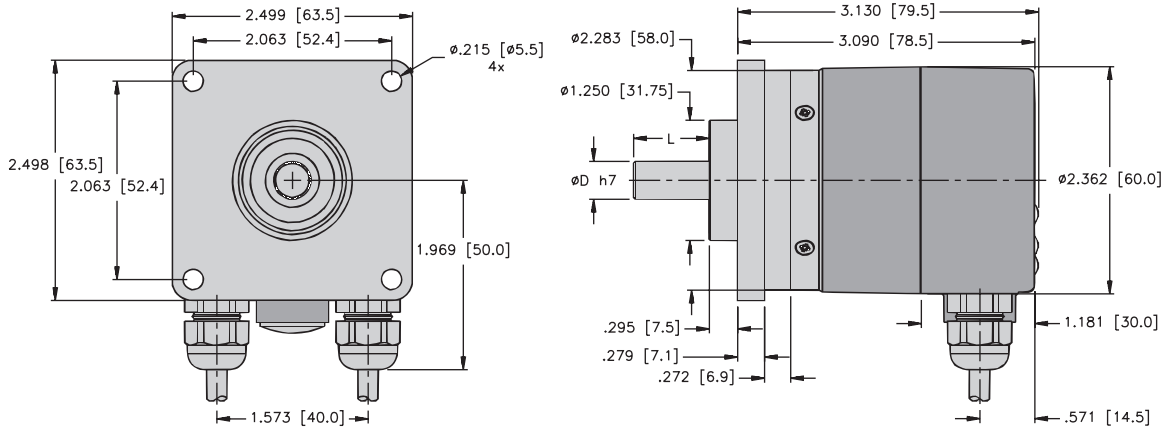• See page G1, Accessories, for mounting attachments and couplings
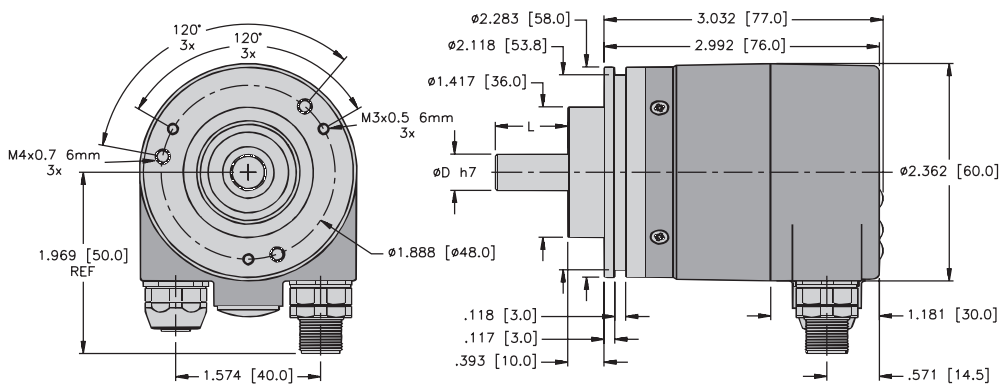
Absolute Encoders

Sendix absolute, multiturn type 5868 (shaft) / 5888 (blind hollow shaft)CANopen/CANlift
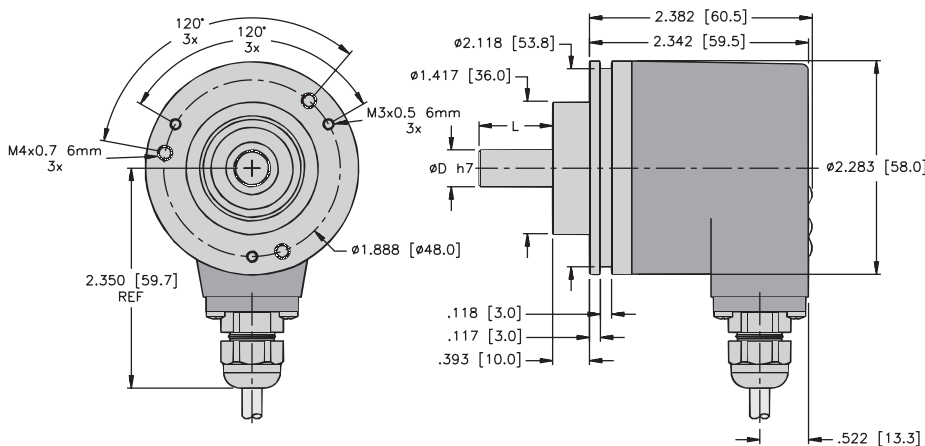
Dimensions: 5868 shaft version

**5868 flanges 5 &
Cable connection 1**

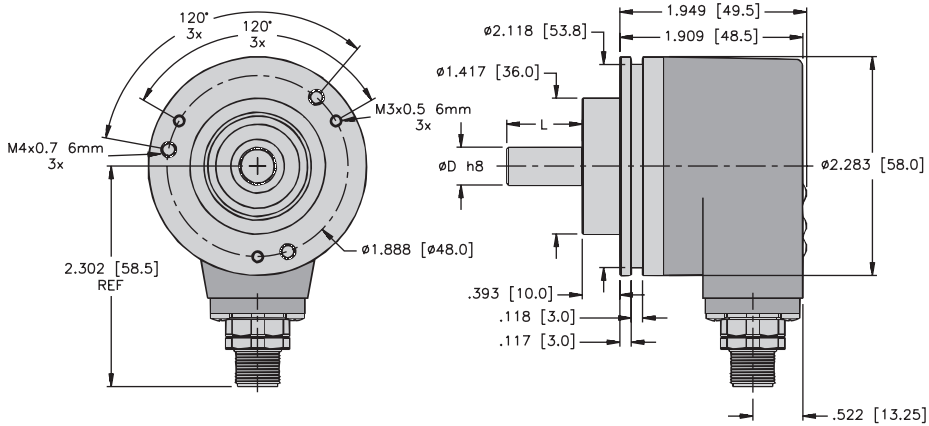**5868 flanges 1 &
M12 *eurofast* ° connection 2**

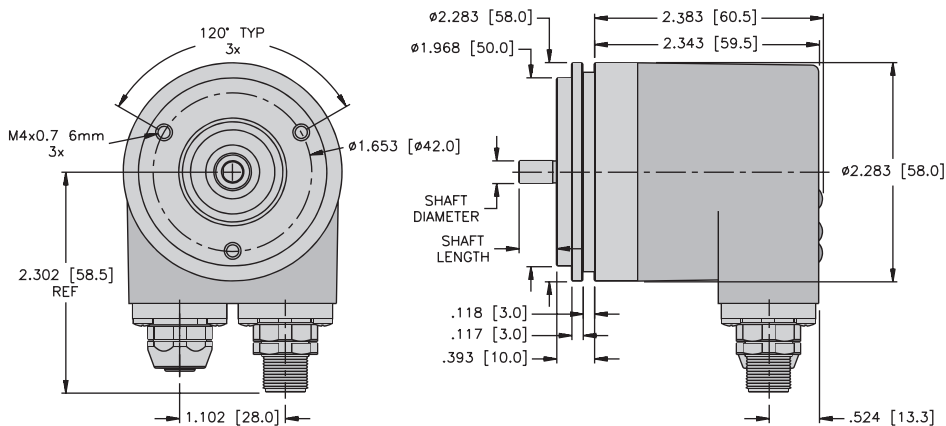**5868 flanges 1 &
Cable connection A**

Rotary Position Technology
Absolute Encoders, Multiturn

Industrial Automation

Dimensions: 5868 shaft version

5868 flanges 1 &
M12 *eurofast* connection E

- 120° 3x
- 120° 3x
- M3x0.5 6mm 3x
- M4x0.7 6mm 3x
- ø1.888 [ø48.0]
- 2.302 [58.5] REF
- 1.949 [49.5]
- 1.909 [48.5]
- ø2.118 [53.8]
- ø1.417 [36.0]
- L
- øD h8
- ø2.283 [58.0]
- .393 [10.0]
- .118 [3.0]
- .117 [3.0]
- .522 [13.25]

5868 flanges 2 &
M12 *eurofast* connection F

- 120° TYP 3x
- M4x0.7 6mm 3x
- ø1.653 [ø42.0]
- 2.302 [58.5] REF
- 1.102 [28.0]
- ø2.283 [58.0]
- ø1.968 [50.0]
- SHAFT DIAMETER
- SHAFT LENGTH
- .118 [3.0]
- .117 [3.0]
- .393 [10.0]
- 2.383 [60.5]
- 2.343 [59.5]
- ø2.283 [58.0]
- .524 [13.3]

5868 flanges 6 &
M23 *multifast* connection i

- ø1.875 [ø47.6]
- 120°
- 2.303 [58.5] REF
- 10−32 UNF 3x
- .104 [2.7]
- ø2.500 [63.5]
- SHAFT LENGTH
- ø1.250 [31.75]
- SHAFT DIAMETER
- .295 [7.5]
- .590 [15.0]
- .453 [11.5]
- 2.383 [60.5]
- 2.343 [59.5]
- ø2.283 [58.0]
- .522 [13.3]

Absolute Encoders

Sendix absolute, multiturn type 5868 (shaft) / 5888 (blind hollow shaft)CANopen/CANlift

Dimensions: 5868 shaft version

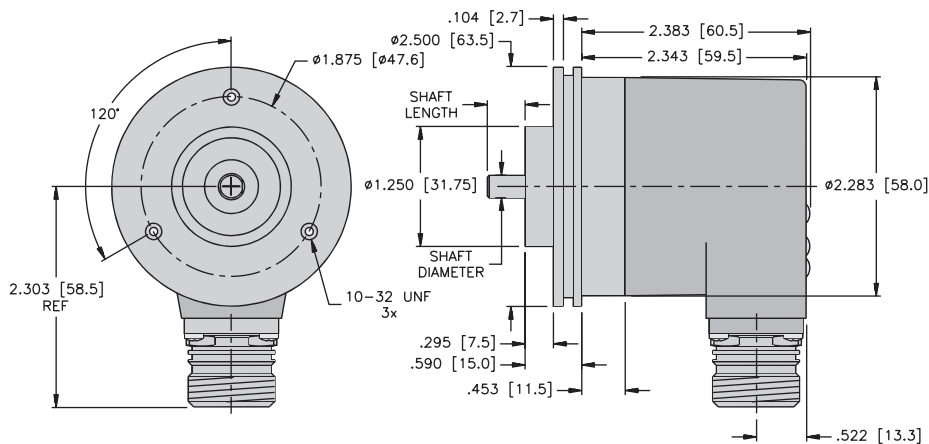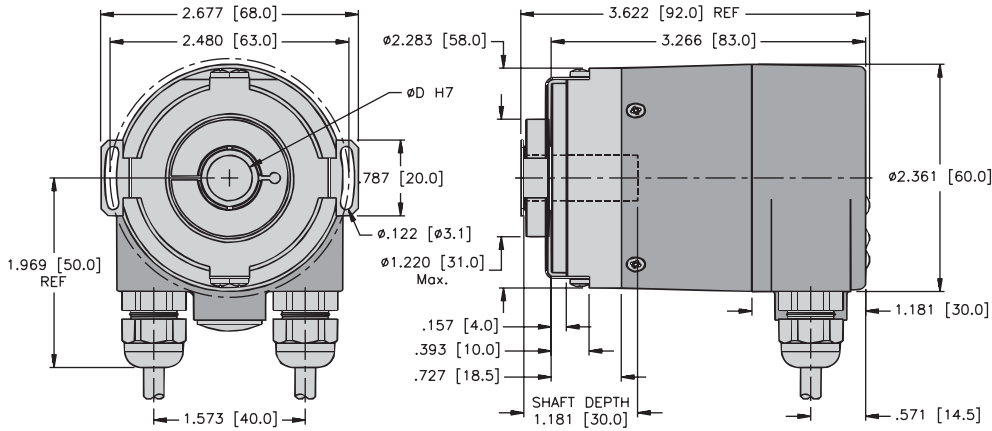**5868 flanges 5 &**
M23 *multifast* ® connection J

2.499 [63.5]
2.063 [52.4]
Ø.215 [Ø5.5]
4x
Ø1.250 [31.75]
2.498 [63.5]
2.063 [52.4]
2.303 [58.5] REF
2.481 [63.0]
2.441 [62.0]
SHAFT DIAMETER
SHAFT LENGTH
Ø2.283 [58.0]
.295 [7.5]
.279 [7.1]
.272 [6.9]
.523 [13.3]

5868 flanges 2 &
D-Sub connection K

120° TYP 3x
M4x0.7 6mm 3x
1.642 [41.7]
Ø1.653 [Ø42.0]
Ø2.283 [58.0]
Ø1.968 [50.0]
2.383 [60.5]
2.343 [59.5]
SHAFT DIAMETER
SHAFT LENGTH
Ø2.283 [58.0]
.118 [3.0]
.117 [3.0]
.393 [10.0]
.453 [11.5]
.561 [14.25]

Rotary Position Technology
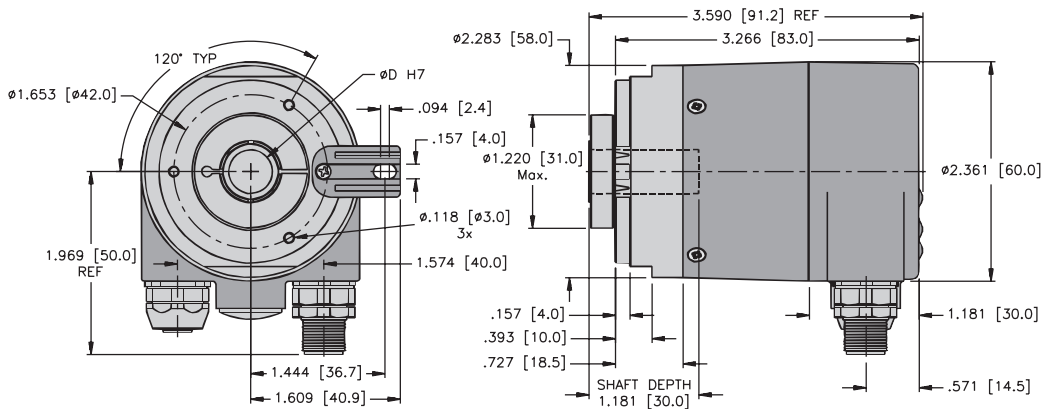## Absolute Encoders, Multiturn

Sendix absolute, multiturn type 5868 (shaft) / 5888 (blind hollow shaft)CANopen/CANlift

Dimensions: 5888 blind hollow shaft version

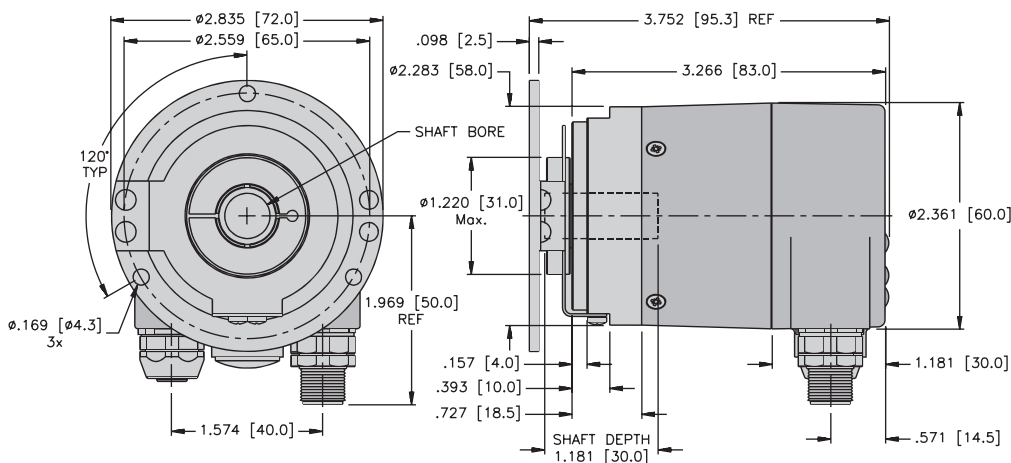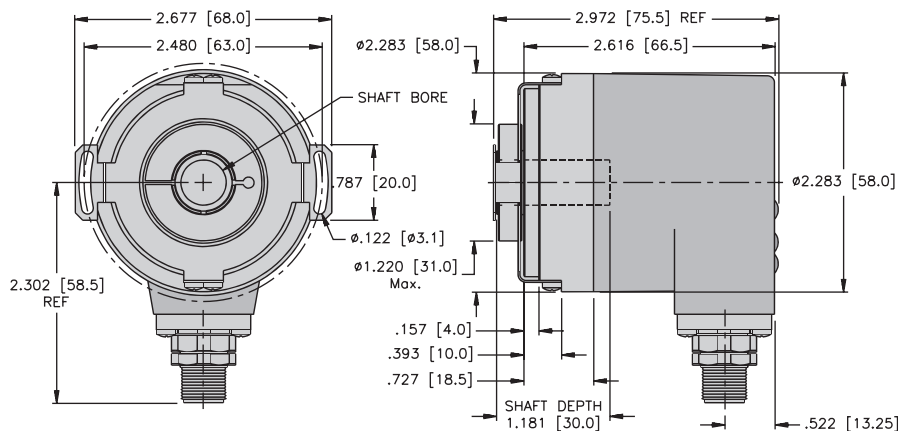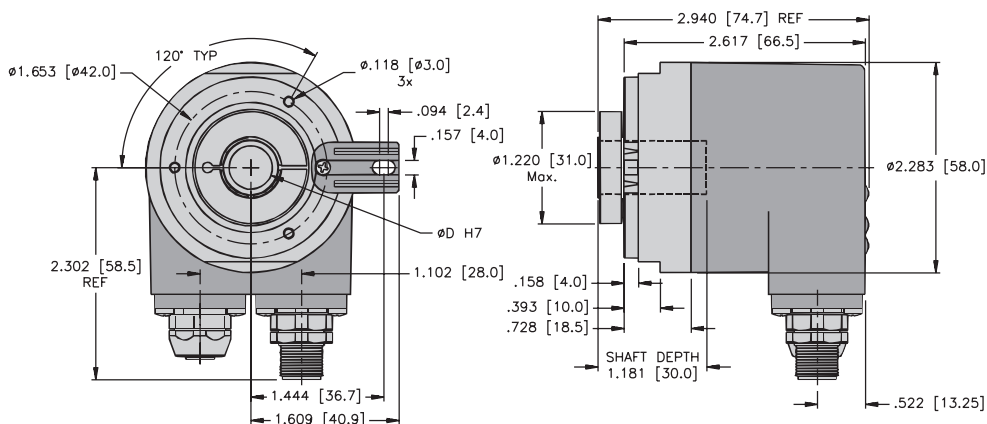### 5888 flanges 5 & Cable connection 1

2.677 [68.0]
2.480 [63.0]
ø2.283 [58.0]
øD H7
.787 [20.0]
ø.122 [ø3.1]
ø1.220 [31.0] Max.
1.969 [50.0] REF
1.573 [40.0]

3.622 [92.0] REF
3.266 [83.0]
ø2.361 [60.0]
.157 [4.0]
.393 [10.0]
.727 [18.5]
SHAFT DEPTH 1.181 [30.0]
1.181 [30.0]
.571 [14.5]

5888 flanges 1 & M12 *eurofast* ° connection 2

120° TYP
ø1.653 [ø42.0]
øD H7
.094 [2.4]
.157 [4.0]
ø1.220 [31.0] Max.
ø.118 [ø3.0] 3x
1.574 [40.0]
1.969 [50.0] REF
1.444 [36.7]
1.609 [40.9]

3.590 [91.2] REF
ø2.283 [58.0]
3.266 [83.0]
ø2.361 [60.0]
.157 [4.0]
.393 [10.0]
.727 [18.5]
SHAFT DEPTH 1.181 [30.0]
1.181 [30.0]
.571 [14.5]

5888 flanges 3 & M12 *eurofast* connection 2

ø2.835 [72.0]
ø2.559 [65.0]
.098 [2.5]
ø2.283 [58.0]
SHAFT BORE
120° TYP
ø1.220 [31.0] Max.
1.969 [50.0] REF
ø.169 [ø4.3] 3x
1.574 [40.0]

3.752 [95.3] REF
3.266 [83.0]
ø2.361 [60.0]
.157 [4.0]
.393 [10.0]
.727 [18.5]
SHAFT DEPTH 1.181 [30.0]
1.181 [30.0]
.571 [14.5]

Absolute Encoders

Sendix absolute, multiturn type 5868 (shaft) / 5888 (blind hollow shaft)CANopen/CANlift

Dimensions: 5888 blind hollow shaft version

5888 flanges 3 &
Cable connection A
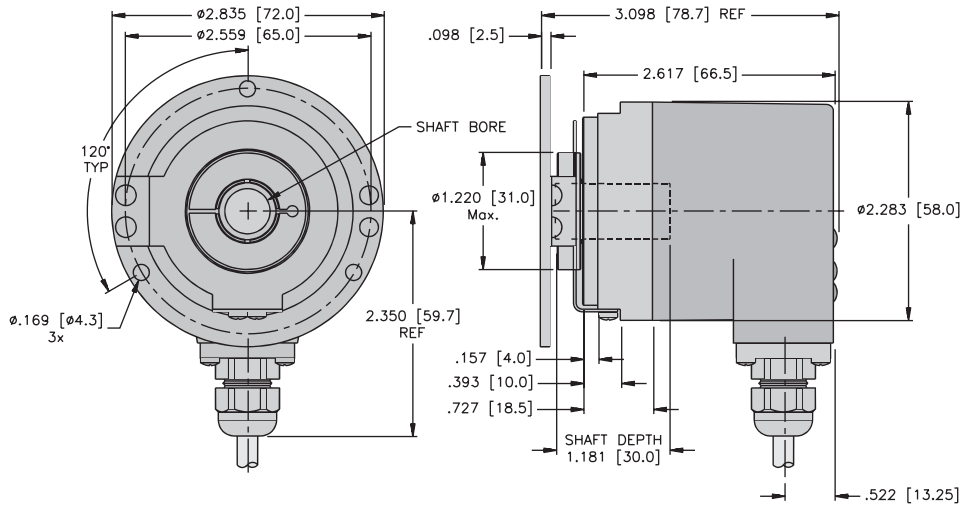
5888 flanges 5 &
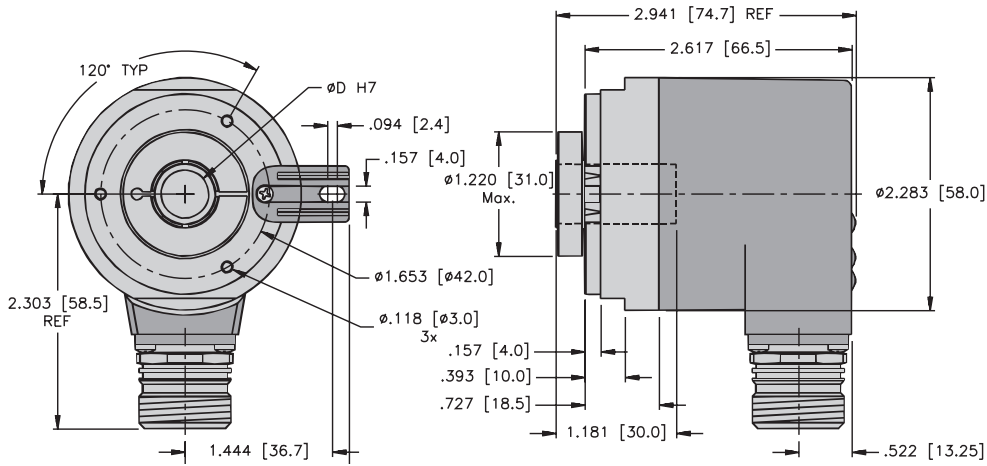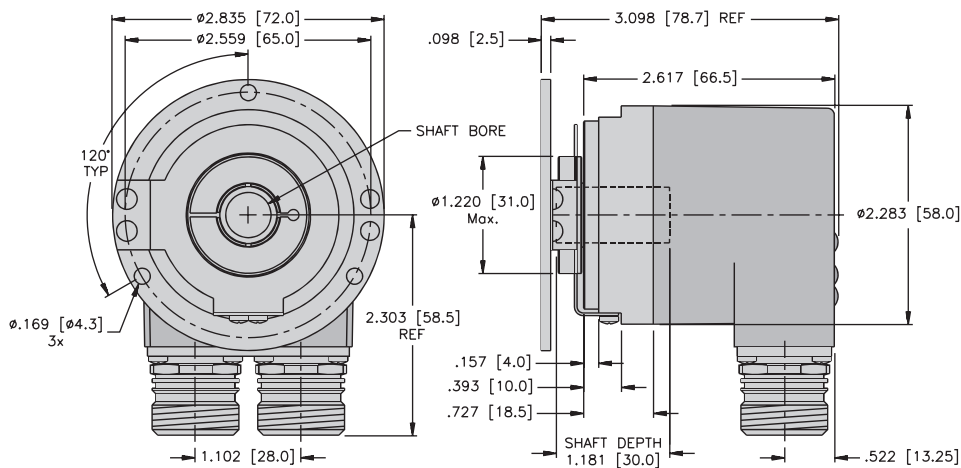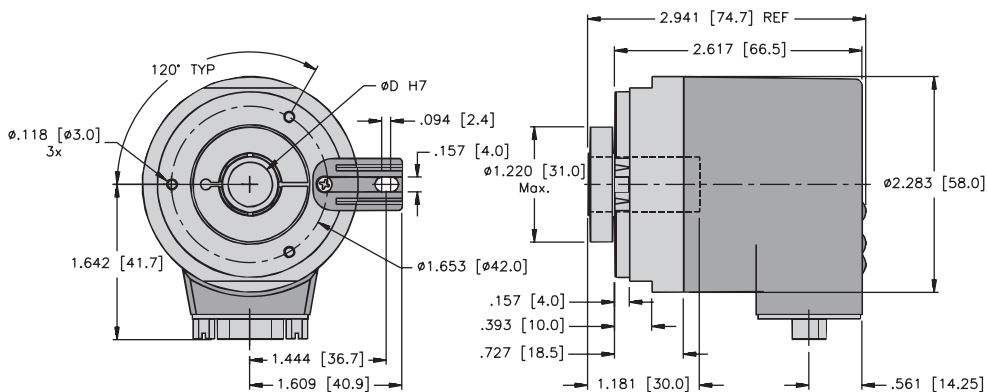**M12 *eurofast* ° connection E**

5888 flanges 1 &
M12 *eurofast* connection F

Rotary Position Technology
Absolute Encoders, Multiturn

Dimensions: 5888 blind hollow shaft version

5888 flanges 1 &
M23 *multifast®* connection i

5888 flanges 3 &
M23 *multifast* connection J

5888 flanges 1 &
D-Sub connection K

Absolute Encoders