Your Global Automation Partner

TURCK

Mobile Equipment

TURCK

YOUR AUTOMATION SOLUTIONS PROVIDER

At TURCK, we understand that not every application is the same. That's why we dedicate ourselves to finding the optimal engineered solution for every application; not just the standard ones.
Listening to customers and developing solutions are part of what makes TURCK fast, flexible and easy to do business with.
Whether you need a single product or a full suite of innovative automation solutions our experience allows us to tap into an extensive amount of engineering knowledge and solve customer problems others can't. Additionally, TURCK uses the most up to date manufacturing processes and quality materials so our products not only survive, but thrive in even the harshest applications.

That's the TURCK advantage.

SOLUTIONS FOR MOBILE EQUIPMENT

TURCK's broad line of solutions specially designed for industrial vehicle and mobile equipment manufacturers has led to product innovations and ease of operations for customers worldwide. We strive to provide products of exceptional quality that may be used in harsh applications, and we are able to customize our solutions based on your specifications.

Our extensive line of solutions includes advanced sensors and encoders for position detection of booms, outriggers, seats, doors and gates. Level indication may be determined with TURCK's line of inclinometers, and our cordsets and junction boxes help you streamline wiring and connect your components with ease.




SENSING SOLUTIONS

- Inductive Position Sensors
- Pressure Monitoring Sensors
- Angular Position Sensors
- Rotary Position Sensors

Features:

- Non-contact technology provides longer service life
- Able to withstand heavy shock and vibration
- Extended temperature ranges
- Ease of installation
- Superior noise immunity
- Low operating voltage
- Exceptional sealing

CONNECTIVITY SOLUTIONS

- Cordsets
- Junction Boxes
- Wiring Harness

Features:

- Rugged junction box housing
- Quick-disconnect connectors
- Vibration immune connectors
- IEC IP 67 and NEMA 6P protection
- Excellent abrasion and cut-through resistant PUR jacketed cordsets
- Customizable

FIELDBUS TECHNOLOGY SOLUTIONS

- Distributed I/O Devices
- Network Junctions
- Network Media

Features:

- Rugged housing
- Flexible I/O configurations
- Quick-disconnect

APPLICATION FOR MOBILE EQUIPMENT

MINING TRUCK

1. Deutsch Connector
Lighting

2. Inductive Sensor
Seat Position

3. Distributed I/O
Accessory System
Feedback and Control

4. Inclinometer
Level Indication

5. Pressure Sensor
Hydraulic System
Monitoring

AGRICULTURE

1. Inductive Sensor
Head Postion

2. Rotary Sensor
Extension

3. Inductive Sensor
Position

4. Deutsch Connector
Hydraulic Valve
Manifold

5. Fieldbus Technology
Accessory System
Feedback and Control

FIRE TRUCK

1. Deutsch Connector
Lighting

2. Rotary Sensor
Position

3. Inductive Sensor
Ladder End Stop

4. Rotary Sensor
Ladder Extension

5. *eurofast*® Connector
Cargo

BUCKET TRUCK

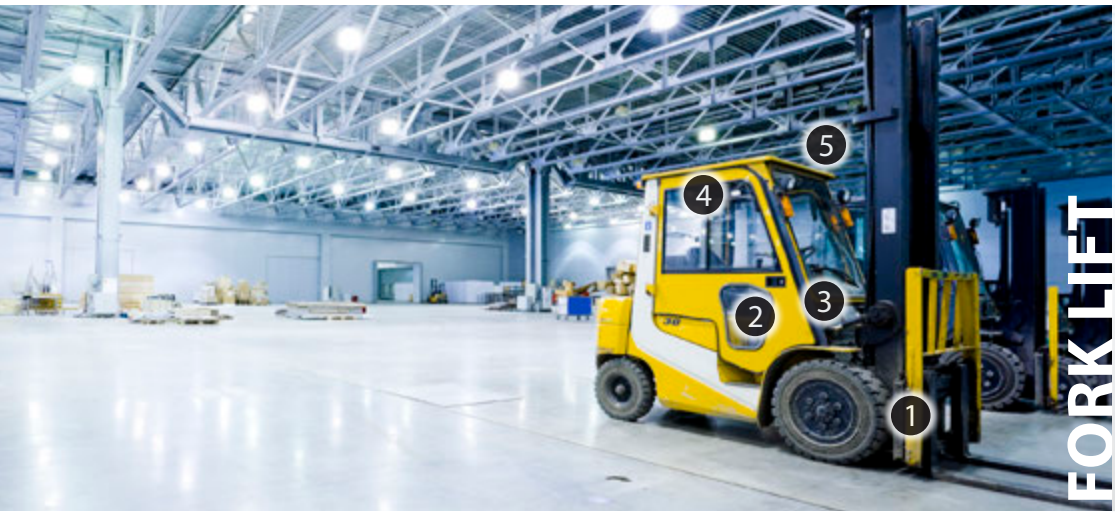
1. Pressure Sensor
Hydraulic System Monitoring

2. Inclinometer
Level Indication

3. Rotary Sensor
Position

4. Inductive Sensor
Outriggers

5. Deutsch Connector
CAN Controller



FORK LIFT

1. Draw Wire Encoder
Mast Height

2. Inductive Sensor
Seat Position

3. RFID System
Load Tracking and Management

4. Junction Box
Wiring Consolidation

5. Deutsch Connector
Lighting

GARBAGE TRUCK

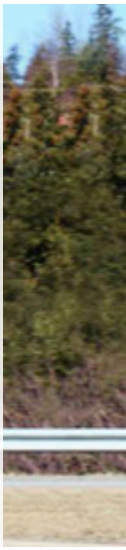
1. Rotary Position
Position

2. Inductive Sensor
Hydraulic Ramp Position

3. Pressure Sensor
Hydraulic System Monitoring

4. Valve Connector
Hydraulic System Manifold

5. Daisy Chain Harness



TURCK

Collect. Connect. Communicate. Automate.




SENSORS

CONNECTIVITY

FIELDBUS TECHNOLOGY

Notes

SENSORS
FOR MOBILE EQUIPMENT

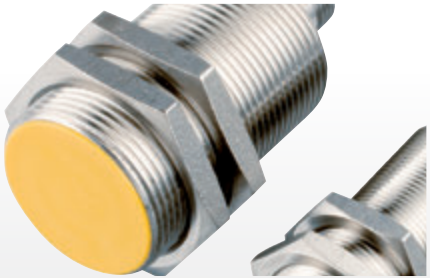
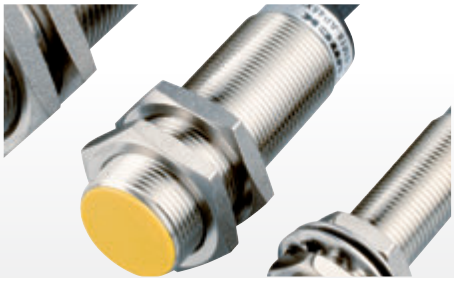
Inductive

Angular

Inclinometer

Pressure

Rotary


Inductive Position Sensors

Resistance to vibration and mechanical shock

TURCK's mobile equipment sensor series is ideally equipped to withstand continuous vibration and shock. The sensors are vibration proof up to 3000 Hz, 20 g, and can withstand continuous shocks of 100 g in 3 axes.

- EN 60068-2-6 (vibration resistance): 20 g 10-3000 Hz; 50 cycles; 3 axes
- EN 60068-2-27 (shock resistance): 150 g; 6 ms; 2 g; 3 x each; 3 axes
- EN 60068-2-29 (continuous shock resistance) 100 g; 11ms, 1/2 sinusoidal; 3 x each; 3 axes

High degree of protection

IP 67 plus IP 68 and IP 69k:

- 24 hrs. continuous storage at 70°C
- 24 hrs. continuous storage at -25°C
- 7 days submersion, depth 1 m, 10 temperature changes from 70°C to -25°C, each temperature for 1 hour
- IP 69k, suitable for high pressure steam-jet cleaning to DIN 40050-9, following EN 60529

Excellent EMC immunity

The mobile equipment sensor series for utility vehicles meets more requirements than stipulated by DIN ISO 7637-2 (conducted and emitted electrical interference - Part 2: Vehicles with 12 V or 24 V systems) and DIN EN ISO 14982 for the severe radiated and line-conducted interference usually present in vehicles.

Plug & play with standard automotive connectors

On request, TURCK can also supply the sensors with short cables and connectors, as commonly used with standard makes in the automotive sector: Deutsch, Packard and Molex are just some examples. This makes connection on the prefabricated cable harness a simple plug & play operation with a proven connection technology.

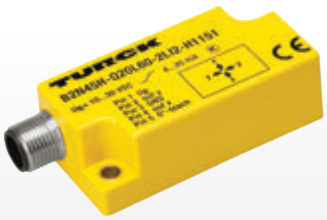
Extended temperature range

From -40°C to 85°C or from the polar region to the Sahara, the extended temperature range of the sensors allows worldwide use. Even the radiant heat up to 85°C emitted from motors, gears or exhaust systems cannot damage these sensors. Extreme temperature changes as defined by DIN 60068-2-14 (temperature change, -40°C to 85°C; 20 cycles) are not a problem.

Load dump protection

Test pulse 5 to DIN ISO 7637-2 / SAE J 1113-11 emulates the disconnection pulse of the battery charging current. This pulse occurs if a battery is disconnected while the generator is supplying charging current. This may occur if a battery is disconnected while the motor is running due to corrosion, a poor connection, or intentionally. In addition, the mobile equipment sensors passed test pulses 1-4 per DIN ISO 7637-2 with 12 V and 24 V systems.

Angular Position



TURCK inclinometer products utilize cutting edge technology to provide level feedback in a compact, yet rugged package. Engineered using MEMS (micro-electromechanical system) technology, these sensors are designed to help keep your equipment operating safely within the most challenging, rugged environments.

- Inclinometers offer 1-axis or 2-axis control from a single IP 67 housing
- Temperature ranges from -40°C to 70°C
- Robust, fast, stable and precise
- Input voltages from 10 VDC to 30 VDC
- Analog outputs in Logic Control compatible 0.1 – 4.9 VDC and 4-20 mA versions
- Factory level setpoints are easily teachable to local terrains and equipment setups
- Standard available measuring ranges are +/- 10°, +/- 45°, +/- 60°, +/- 85°
- Custom ranges are available up to +/- 85°

Rotary Position

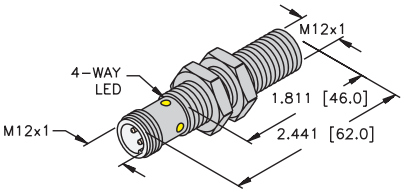
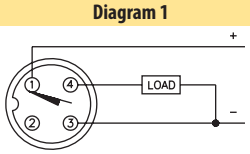
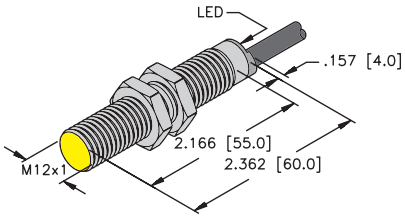
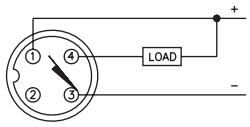
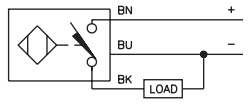
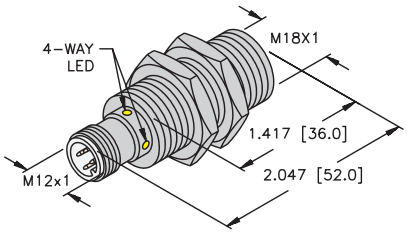
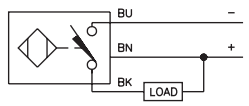
TURCK rotary position products offer flexible solutions providing you with the tools to solve even the most demanding positioning applications. Regardless of your environment, our engineers are ready to help you choose the right solutions for your specific requirements.

- Encoders available from -40°C to 90°C and IP 69K
- Heaviest standard bearings in the industry
- Rugged, die cast aluminum and optional stainless steel housings
- Popular fieldbus networks including SSI/BiSS, CANopen, and J1939
- Speeds up to 12,000 RPM, standard
- Draw wire lengths up to 40 meters
- M12, M23, MS 6, MS7, and MS10 standard connector types
- Input voltages from 5 VDC to 30 VDC

INDUCTIVE POSITION SENSORS

Features

- Load Dump Protection
- Shock Resistant
- EMC Immunity
- Extended Temperature Range
- Broader Operating Voltage
- Improved Sealing and Environmental Protection
- Longer Sensing Range

Housing	Part Number	ID Number	Sensing Range (mm)	Output		Wiring Diagrams
12 mm Embeddable, M12 ***eurofast*** Connection 	Bi 4-EM12E-AP45XLD-H1141	T1585000	4	DC 3-Wire PNP	1	Diagram 1 
	Bi 4-EM12E-AN45XLD-H1141	T1584003	4	DC 3-Wire NPN	2	
12 mm Embeddable, Potted-in Cable 	Bi 4-EM12E-AP45XLD	T1584001	4	DC 3-Wire PNP	3	Diagram 2 
	Bi 4-EM12E-AN45XLD	T1584004	4	DC 3-Wire NPN	4	Diagram 3 
18 mm Embeddable, M12 ***eurofast*®** Connection 	Bi 8-EM18-AP45XLD-H1141	T1584010	8	DC 3-Wire PNP	1	
	Bi 8-EM18-AN45XLD-H1141	T1584017	8	DC 3-Wire NPN	2	Diagram 4 

Specifications for 12 mm	
Voltage:	8.4-65 VDC
Switching Freq. (kHz):	≤ 2.0
Operating Current (mA):	≤ 200
Operating Temp. (°C):	-40° to +85°C (-40° to +185°F)
Protection:	IP 68, IP 69K
Housing:	SS
Face:	PA12
Output LED:	YE

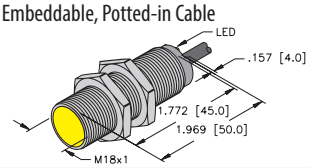
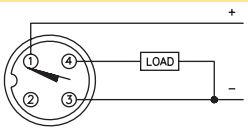
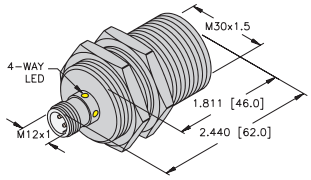
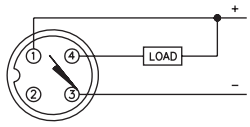
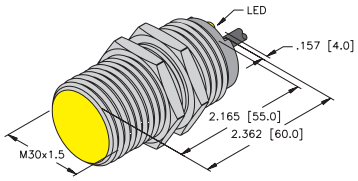
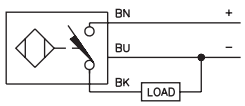
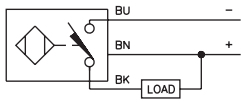
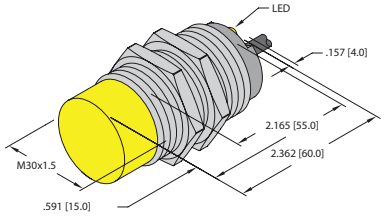
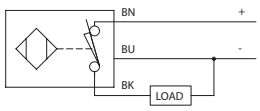
Specifications for 18-30 mm	
Voltage:	8.4-65 VDC
Switching Freq. (kHz):	≤ 0.5
Operating Current (mA):	≤ 200
Operating Temp. (°C):	-40° to +85°C (-40° to +185°F)
Protection:	IP 68, IP 69K
Housing:	SS
Face:	PA12
Output LED:	YE

* Length in meters.

INDUCTIVE POSITION SENSORS

Features

- Load Dump Protection
- Shock Resistant
- EMC Immunity
- Extended Temperature Range
- Broader Operating Voltage
- Improved Sealing and Environmental Protection
- Longer Sensing Range

Housing	Part Number	ID Number	Sensing Range (mm)	Output		Wiring Diagrams
18 mm Embeddable, Potted-in Cable 	Bi 8-EM18-AP45XLD	T1584011	8	DC 3-Wire PNP	3	Diagram 1 
	Bi 8-EM18-AN45XLD	T1584014	8	DC 3-Wire NPN	4	
30 mm Embeddable, M12 ***eurofast***® Connection 	Bi15-EM30-AP45XLD-H1141	T1584020	15	DC 3-Wire PNP	1	Diagram 2 
	Bi15-EM30-AN45XLD-H1141	T1584024	15	DC 3-Wire NPN	2	
30 mm Embeddable, Potted-in Cable 	Bi15-EM30-AP45XLD	T1584021	15	DC 3-Wire PNP	3	Diagram 3 
	Bi15-EM30-AN45XLD	T1584022	15	DC 3-Wire NPN	4	
	Bi 15-EM30-RP45XLD	T1584084	15	DC 3-Wire PNP	5	Diagram 4 
30 mm Nonembeddable, Potted-in Cable 	Ni20-EM30-AP45XLD	T1584027	20	DC 3-Wire PNP	5	Diagram 5 
	Ni20-EM30-RP45XLD	T1584028	20	DC 3-Wire PNP	5	

Specifications for 12 mm	
Voltage:	8.4-65 VDC
Switching Freq. (kHz):	≤ 2.0
Operating Current (mA):	≤ 200
Operating Temp. (°C):	-40° to +85°C (-40° to +185°F)
Protection:	IP 68, IP 69K
Housing:	SS
Face:	PA12
Output LED:	YE

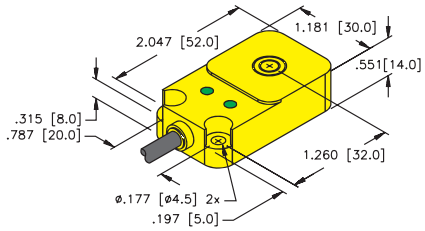
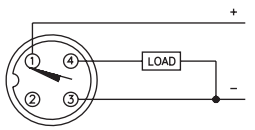
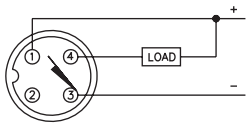
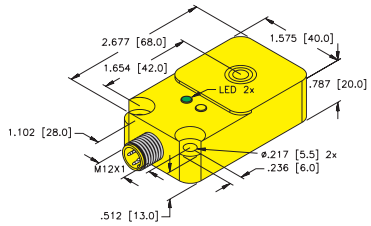
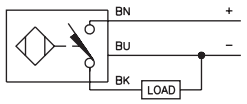
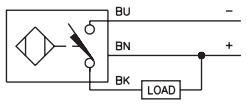
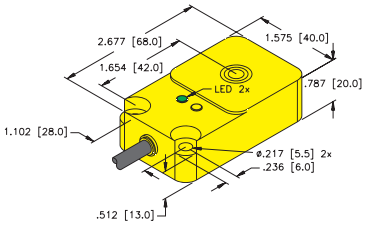
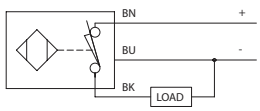
Specifications for 18-30 mm	
Voltage:	8.4-65 VDC
Switching Freq. (kHz):	≤ 0.5
Operating Current (mA):	≤ 200
Operating Temp. (°C):	-40° to +85°C (-40° to +185°F)
Protection:	IP 68, IP 69K
Housing:	SS
Face:	PA12
Output LED:	YE

* Length in meters.

INDUCTIVE POSITION SENSORS

Features

- Load Dump Protection
- Shock Resistant
- EMC Immunity
- Extended Temperature Range
- Broader Operating Voltage
- Improved Sealing and Environmental Protection
- Longer Sensing Range

Housing	Part Number	ID #	Sensing Range (mm)	Output	Wiring Diagrams	
Q14 Embeddable, Potted-in Cable 	Bi10-Q14-AP45X2LD	M1584031	10	DC 3-Wire PNP	3	Diagram 1 
	Bi10-Q14-AN45X2LD	M1584032	10	DC 3-Wire NPN	4	
	BI10-Q14-RP45X2LD	T1584033	10	DC 3-Wire NPN	5	Diagram 2 
Q20 Embeddable, M12 ***eurofast*** ® Connection 	Bi20-Q20-AP45X2LD-H1141	M1584040	20	DC 3-Wire PNP	1	Diagram 3 
	Bi20-Q20-AN45X2LD-H1141	M1584042	20	DC 3-Wire NPN	2	Diagram 4 
Q20 Embeddable, Potted-in Cable 	Bi20-Q20-AP45X2LD	M1584041	20	DC 3-Wire PNP	3	
	Bi20-Q20-AN45X2LD	M1584043	20	DC 3-Wire NPN	4	Diagram 5 

Specifications	
Voltage:	8.4-65 VDC
Switching Freq. (kHz):	≤ 0.5
Operating Current (mA):	≤ 200
Operating Temp. (°C):	-40° to +85°C (-40° to +185°F)
Protection:	IP 68, IP 69K
Housing/Face:	PBT
Power LED:	GN
Output LED:	YE

* Length in meters.

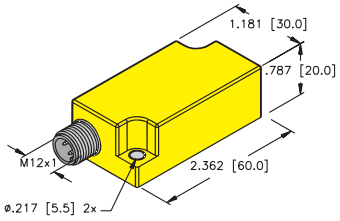
ANGULAR POSITION SENSORS

Dual Axis with Analog Output

TURCK's standard product is a low profile dual axis (X and Y) inclinometer with standard angular ranges of ±10°, ±45°, ±60° and ±85°, with additional ranges optional. Each axis has independent outputs. The 5 VDC version is a ratiometric design and the power is limited to 4.75 to 5.25 VDC. This means that the output is proportional to the supply voltage. The 10-30 VDC supply units are regulated and the output is fixed regardless.

- ±10°, ±45°, ±60°, ±85°
- Current 4-20 mA, 10-30 VDC
- Voltage output 0.1-4.9 V, 10-30 VDC
- Voltage output 0.1-4.9 V @ 5 VDC
- Teachable zero point up to ±15% with teach adapter VB2-SP4
- FM Class I, Div 2 approved when used with Guard-Q20L60 and approved cordset.

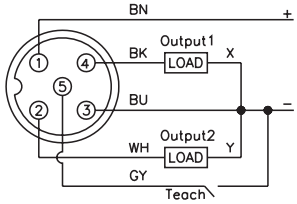
Housing	Part Number	ID #	Angular Range	Resolution	Absolute Accuracy	Zero Point Calibration	Temperature Drift	Temperature Coefficient	Load Resistance	Wiring Diagram
20mm, Embeddable	**Dual Axis - Analog Output, 4-20 mA**									
	B2N10H-Q20L60-2LI2-H1151	M1534012	±10°	< 0.04°	±0.3°	±5°	≤ ±0.05° K	0.01° /K	≤ 200 Ω	1
	B2N45H-Q20L60-2LI2-H1151	M1534013	±45°	< 0.1°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≤ 200 Ω	1
	B2N60H-Q20L60-2LI2-H1151	M1534014	±60°	< 0.14°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≤ 200 Ω	1
	B2N60H-Q20L60-2LI2-H1151/S97	M1534046	±60°	< 0.14°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≤ 200 Ω	1
	B2N85H-Q20L60-2LI2-H1151	M1534032	±85°	< 0.14°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≤ 200 Ω	1
	Dual Axis – Analog Output, 0.1–4.9 V									
	B2N10H-Q20L60-2LU3-H1151	M1534006	±10°	< 0.04°	±0.3°	±5°	≤ ±0.05° K	0.01° /K	≥ 40 kΩ	1
	B2N45H-Q20L60-2LU3-H1151	M1534007	±45°	< 0.1°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≥ 40 kΩ	1
	B2N45H-Q20L60-2LU3-H1151/S97	M1534039	±45°	< 0.1°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≥ 40 kΩ	1
	B2N60H-Q20L60-2LU3-H1151	M1534008	±60°	< 0.14°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≥ 40 kΩ	1
	B2N60H-Q20L60-2LU3/S97	M1534060	±60°	< 0.14°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≥ 40 kΩ	2
	B2N85H-Q20L60-2LU3-H1151	M1534027	±85°	< 0.14°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≥ 40 kΩ	1
	B2N85H-Q20L60-2LU3/S97	M1534040	±85°	< 0.14°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≥ 40 kΩ	2
	Dual Axis – Analog Output, Ratiometric 0.1-4.9 V @ 5 VDC									
	B2N10H-Q20L60-2LU5-H1151	M1534009	±10°	< 0.04°	±0.3°	±5°	≤ ±0.05° K	0.01° /K	≥ 40 kΩ	1
	B2N45H-Q20L60-2LU5-H1151	M1534010	±45°	< 0.1°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≥ 40 kΩ	1
	B2N60H-Q20L60-2LU5-H1151	M1534011	±60°	< 0.14°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≥ 40 kΩ	1
	B2N85H-Q20L60-2LU5-H1151	M1534042	±85°	< 0.14°	±0.5°	±15°	≤ ±0.025° K	0.03° /K	≥ 40 kΩ	1



Wiring Diagrams

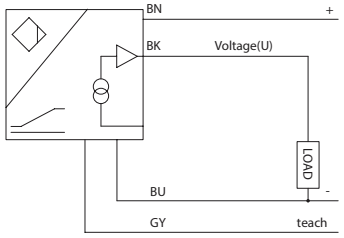
Wiring Diagram 1

5-pin M12 ***eurofast***® connection



Mating cordset: RK 4.5T-*/S618
Teaching adapter: VB2-SP4

Wiring Diagram 2



Technical Specifications - Q20L60

Voltage:	10-30 VDC / Ratiometric: 4.75-5.25 VDC
Protection:	IP68
Operating Temperature:	-30° to +70°C (-22° to +158°F)
/S97 Option:	-40° to +70°C (-40° to +158°F)
Housing:	Polycarbonate
Shock Resistance:	30 g (11 ms)
Vibration:	55 Hz (1 mm)
Repeatability:	≤ 0.2% of measuring range |A-B|
	≤ 0.2% ≤ 0.1% after warm-up time of 0.5 h

Single Axis 360° with Analog Output

When a larger range is required or only one axis is necessary, the single axis 360° inclinometer has an adjustable measuring range and allows for programming a specified span within the 360°. The teach function is simple and can be done in seconds. In addition, this version comes with two outputs in one device. The first output increases with clockwise rotation (CW). The second output increases with counter-clockwise rotation (CCW).

- Measuring range is adjustable via teach adapter VB2-SP4
- Current 4-20 mA output
- Voltage 0.1-4.9 V output
- Vertical mount only
- Factory default is 1° to 360°
- FM Class I, Div 2 approved when used with Guard-Q20L60 and approved cordset.

Single Axis 360° with Two Discrete Switchpoints

This version has dual discrete outputs that are programmable as either normally open or normally closed with an adjustable span within the full angular range 0° to 360°.

- Two switchpoints (PNP, N.O. or N.C.), hysteresis, and span are all adjustable with teach adapter VB2-SP5
- Switch state indication by LEDs

Single and Dual Axis with CANopen Interface

A standard CANopen interface according to CIA DS-301/CiA DSP-410. All measured values and parameters are accessible via the object directory (OD).

- Transmit data object (TPDO1) with four operating modes
- Service-data object (Standard-SDO)
- Error message via emergency object
- Monitoring functions Heartbeat as well as Nodeguarding/Lifeguarding
- Memory and recovery function of all parameters
- Indication of status and error via two-color LED
- Setting of node ID as well as baud rate via object dictionary
- Freely configurable limit frequency (digital filter)
- Configuration of the minimal change of angle for TPDO1 send event
- Optional monitoring of internal device temperature

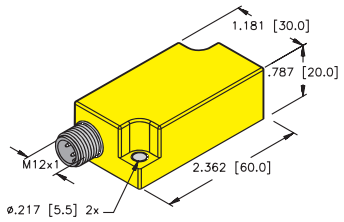
Part Number	ID Number	Angular Range	Resolution	Absolute Accuracy	Zero Point Calibration	Temperature Drift	Temperature Coefficient	Load Resistance	Dimensional Drawing	Wiring Diagram
Single Axis 360° – Analog Output, Adjustable Measuring Range 4–20 mA										
B1N360V-Q20L60-2LI2-H1151	M1534068	360°	< 0.14°	±0.5°	N/A	N/A	0.03° /K	≤ 200 Ω	1	1
Single Axis 360° – Analog Output, Adjustable Measuring Range 0.1–4.9 V										
B1N360V-Q20L60-2LU3-H1151	M1534069	360°	< 0.14°	±0.5°	N/A	N/A	0.03° /K	≤ 40 kΩ	1	1
Single Axis 360° – Digital Output, PNP, N.C./N.O. Programmable, Adjustable Switchpoints										
B1N360V-Q20L60-2UP6X3-H1151	M1534051	360°	< 0.14°	±0.5°	N/A	≤ ±0.03° K	0.03° /K	≤ 500 mA	1	2
Single Axis – CANopen Interface										
B1N360V-Q42-CNX2-2H1150	M1534065	360°	< 0.01°	±0.1°	N/A	N/A	0.008° /K	N/A	2	3
Dual Axis – CANopen Interface										
B2N10H-Q42-CNX2-2H1150	M1534061	±10°	≤ 0.05°	±0.1°	N/A	N/A	0.008° /K	N/A	2	3
B2N45H-Q42-CNX2-2H1150	M1534062	±45°	≤ 0.1°	±0.1°	N/A	N/A	0.008° /K	N/A	2	3
B2N60H-Q42-CNX2-2H1150	M1534063	±60°	≤ 0.1°	±0.1°	N/A	N/A	0.008° /K	N/A	2	3

See next page for the Dimensional Drawings, Wiring Diagrams and Technical Specifications.

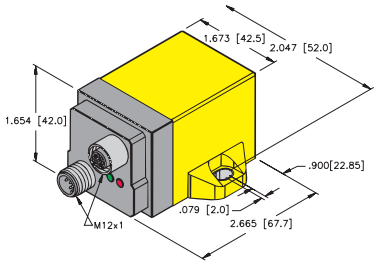
ANGULAR POSITION SENSORS

Dimensional Drawing

1 Q20L60 Housing



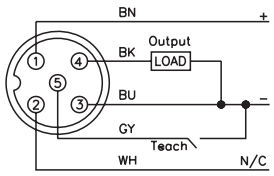
2 Q42 Housing



Wiring Diagrams

Diagram 1

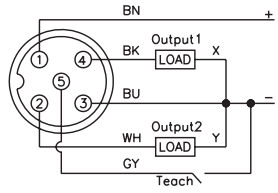
4-pin M12 ***eurofast***® connection



Mating cordset: RK 4.5T-*/S618
Teaching adapter: VB2-SP4

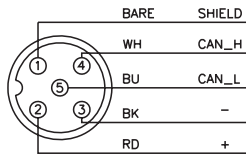
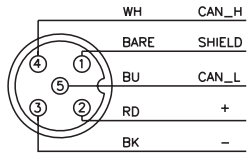
Diagram 2

5-pin M12 ***eurofast***® connection



Mating cordset: RK 4.5T-*/S618
Teaching adapter: VB2-SP5

Diagram 3

5-pin M12 ***eurofast***® connection	5-pin M12 ***eurofast***® connection
	
Male	**Female**
Mating cordset: RKC 572-*M	Mating cordset: RSC 572-*M

* Length in meters. Standard cable lengths are 2, 5, 10 and 15 meters. Consult factory for other lengths.

Technical Specifications - Q20L60

Voltage:	10-30 VDC / Ratiometric: 4.75-5.25 VDC
Protection:	IP68
Operating Temperature:	-30° to +70°C (-22° to +158°F)
/S97 Option:	-40° to +70°C (-40° to +158°F)
Housing:	Polycarbonate
Shock Resistance:	30 g (11 ms)
Vibration:	55 Hz (1 mm)
Repeatability:	≤ 0.2% of measuring range |A-B|
	≤ 0.2% ≤ 0.1% after warm-up time of 0.5 h

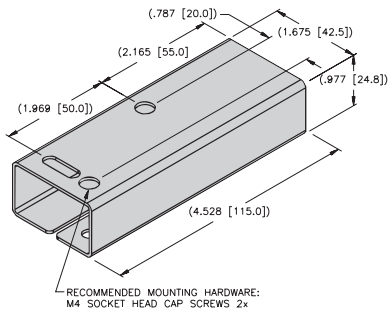
Technical Specifications – Q42

Voltage:	10-30 VDC
Protection:	IP68
Operating Temperature:	-40° to +80°C (-40° to +176°F)
Housing:	PA12
Shock Resistance:	30 g (11 ms)
Vibration:	55 Hz (1 mm)
Max. Linear Deviation:	±0.2°(10° or 360°) / ±0.3°(45°) / ±0.4°(60°)
Baud Rate:	10 kBit/s to 1 MBit/s
Interface:	CANopen

Accessories

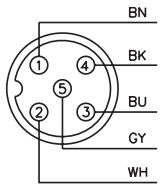
Guard - Q20L60

Dimensional Drawing



Wiring Diagram

5-pin M12 ***eurofast***® connection



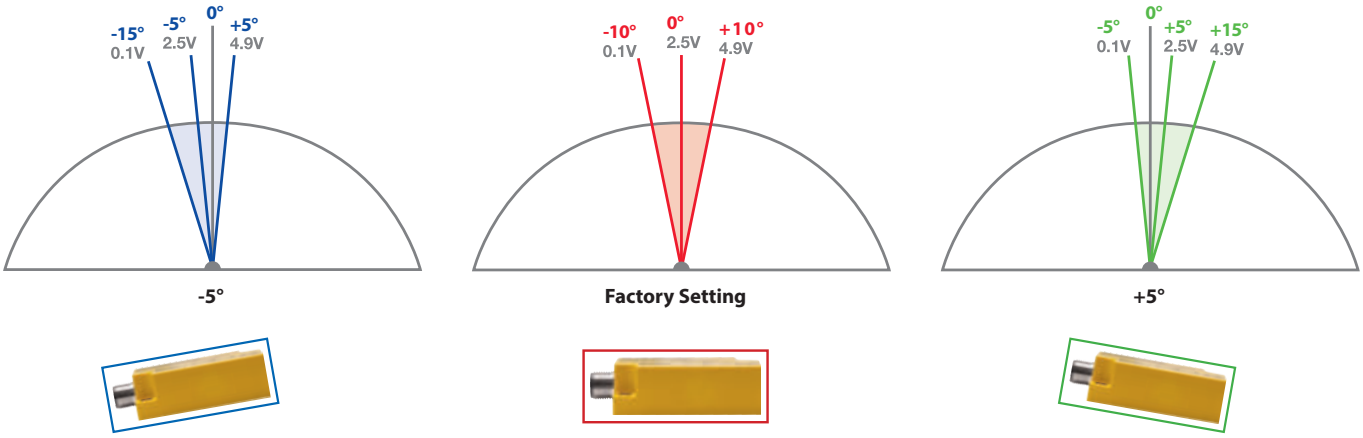
Mating cordset: P-RKG 5.64T-1877-*
Recommended mating cordset for use in
FM Class I, Div 2 environment

Required for use with an inclinometer to maintain FM approval in a Class I, Div 2 environment

Zero Setpoint Teach Function

The zero point, or level reference, of the inclinometer may be reset to the unique grade of your application. Depending on the model, it is adjustable up to +/- 15 degrees from the factory setting of absolute horizon level. This allows you to effectively shift the sensing window to accommodate slightly non-level rest positions of your equipment, such as the difference between an empty and a loaded dump truck. We offer a teaching pendant to make this a simple, single push-button task.

Inclinometer Teach Range Example : B2N 10H-Q20L60-2LU3-H1151



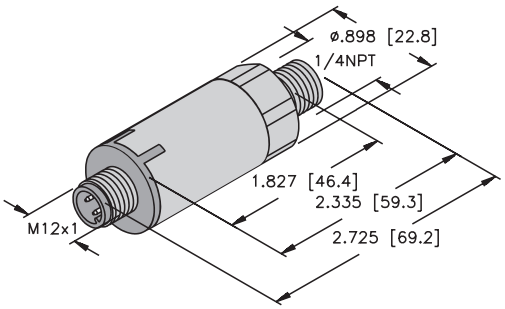
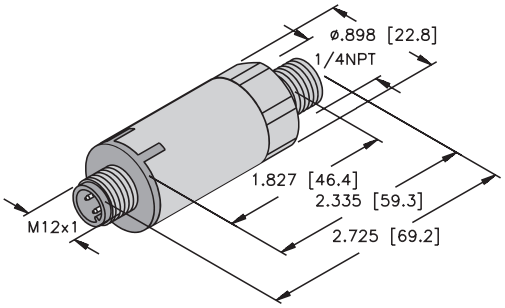
Optional Teaching Pendant: VB2-SP4

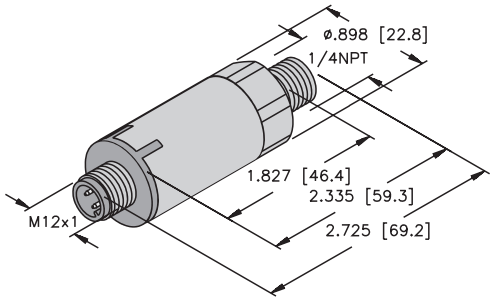
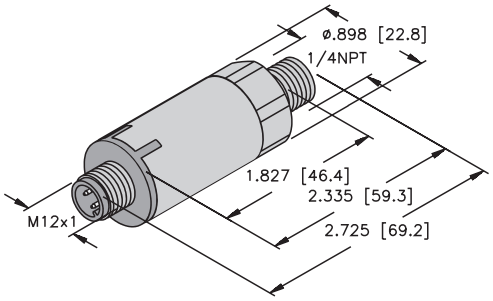
PRESSURE MONITORING SENSORS

TURCK pressure transmitters (PTs) are designed to meet the rugged demands of hydraulic systems in mobile applications.

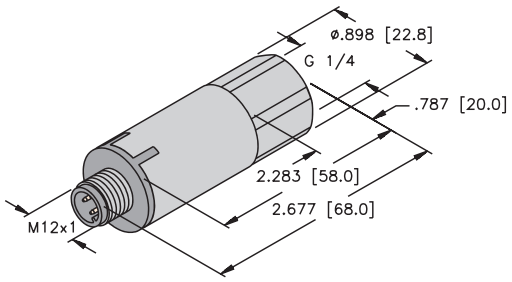
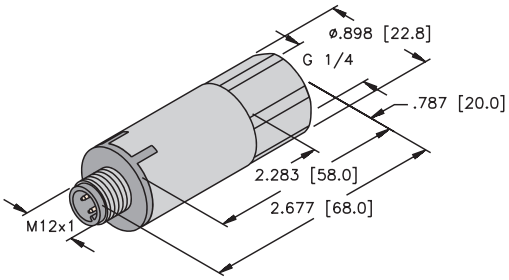
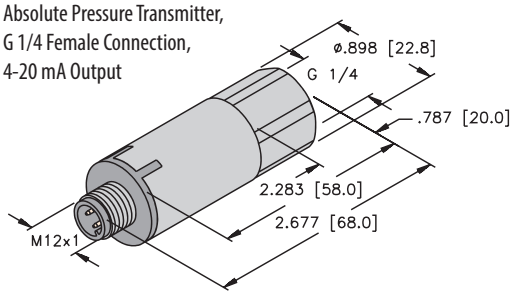
Pressure transmitters have the following features that make them ideal for mobile equipment applications:

- Fixed range to 8700 psi
- 4-20 mA and 0-10 DC outputs
- Stainless housing
- Robust ceramic element
- M12 connection
- IP 67

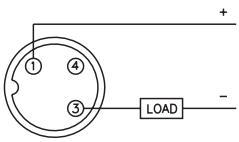
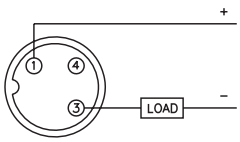
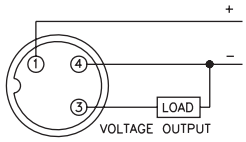
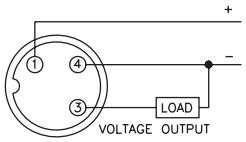
Housing	Part Number	ID Number	Scaled Pressure Range (psig)	Allowable Over Pressure (psig)
Gauge Pressure Transmitter, 1/4" Male NPT Connection, 4-20 mA Output 	PT-30HG-13-LI3-H1131	H6831455	0 to -30 inHg	60 inHg
	PT15psig-13-LI3-H1131	H6831456	0 to 15	45
	PT30psig-13-LI3-H1131	H6831457	0 to 30	90
	PT60psig-13-LI3-H1131	H6831458	0 to 60	150
	PT100psig-13-LI3-H1131	H6831459	0 to 100	250
	PT200psig-13-LI3-H1131	H6831460	0 to 200	500
	PT300psig-13-LI3-H1131	H6831461	0 to 300	750
	PT500psig-13-LI3-H1131	H6831462	0 to 500	1250
	PT750psig-13-LI3-H1131	H6831463	0 to 750	1875
	PT1000psig-13-LI3-H1131	H6831464	0 to 1000	2500
	PT2000psig-13-LI3-H1131	H6831465	0 to 2000	5000
	PT3000psig-13-LI3-H1131	H6831466	0 to 3000	7500
	PT5000psig-13-LI3-H1131	H6831467	0 to 5000	12,500
	PT7500psig-13-LI3-H1131	H6831468	0 to 7500	13,050
Gauge Pressure Transmitter, 1/4" Male NPT Connection, 0-10V Output 	PT-30HG-13-LU2-H1131	H6831469	0 to 30 inHg	60 inHg
	PT15psig-13-LU2-H1131	H6831470	0 to 15	45
	PT30psig-13-LU2-H1131	H6831471	0 to 30	90
	PT60psig-13-LU2-H1131	H6831472	0 to 60	150
	PT100psig-13-LU2-H1131	H6831473	0 to 100	250
	PT200psig-13-LU2-H1131	H6831474	0 to 200	500
	PT300psig-13-LU2-H1131	H6831475	0 to 300	750
	PT500psig-13-LU2-H1131	H6831476	0 to 500	1250
	PT750psig-13-LU2-H1131	H6831477	0 to 750	1875
	PT1000psig-13-LU2-H1131	H6831478	0 to 1000	2500
	PT2000psig-13-LU2-H1131	H6831479	0 to 2000	5000
	PT3000psig-13-LU2-H1131	H6831480	0 to 3000	7500
	PT5000psig-13-LU2-H1131	H6831481	0 to 5000	12,500
	PT7500psig-13-LU2-H1131	H6831482	0 to 7500	13,050

Housing	Part Number	ID Number	Scaled Pressure Range (bar)	Allowable Over Pressure (bar)
Gauge Pressure Transmitter, 1/4" Male NPT Connection 4-20 mA Output 	PT01VR-13-LI3-H1131	H6831496	-1 to 0	3
	PT001R-13-LI3-H1131	H6831497	0 to 1	3
	PT002R-13-LI3-H1131	H6831498	0 to 1.6	4.8
	PT003R-13-LI3-H1131	H6831499	0 to 2.5	7.5
	PT004R-13-LI3-H1131	H6831500	0 to 4	12
	PT006R-13-LI3-H1131	H6831501	0 to 6	15
	PT010R-13-LI3-H1131	H6831502	0 to 10	25
	PT016R-13-LI3-H1131	H6831503	0 to 16	40
	PT025R-13-LI3-H1131	H6831504	0 to 25	62.5
	PT040R-13-LI3-H1131	H6831505	0 to 40	100
	PT060R-13-LI3-H1131	H6831506	0 to 60	150
	PT100R-13-LI3-H1131	H6831507	0 to 100	250
	PT160R-13-LI3-H1131	H6831508	0 to 160	400
	PT250R-13-LI3-H1131	H6831509	0 to 250	625
	PT400R-13-LI3-H1131	H6831510	0 to 400	900
	PT600R-13-LI3-H1131	H6831511	0 to 600	900
Gauge Pressure Transmitter, 1/4" Male NPT Connection 0-10V Output 	PT01VR-13-LU2-H1131	H6831512	-1 to 0	3
	PT001R-13-LU2-H1131	H6831513	0 to 1	3
	PT002R-13-LU2-H1131	H6831514	0 to 1.6	4.8
	PT003R-13-LU2-H1131	H6831515	0 to 2.5	7.5
	PT004R-13-LU2-H1131	H6831516	0 to 4	12
	PT006R-13-LU2-H1131	H6831517	0 to 6	15
	PT010R-13-LU2-H1131	H6831518	0 to 10	25
	PT016R-13-LU2-H1131	H6831519	0 to 16	40
	PT025R-13-LU2-H1131	H6831520	0 to 25	62.5
	PT040R-13-LU2-H1131	H6831521	0 to 40	100
	PT060R-13-LU2-H1131	H6831522	0 to 60	150
	PT100R-13-LU2-H1131	H6831523	0 to 100	250
	PT160R-13-LU2-H1131	H6831524	0 to 160	400
	PT250R-13-LU2-H1131	H6831525	0 to 250	625
	PT400R-13-LU2-H1131	H6831526	0 to 400	900
	PT600R-13-LU2-H1131	H6831527	0 to 600	900

PRESSURE MONITORING SENSORS

Housing	Part Number	ID Number	Scaled Pressure Range (bar)	Allowable Over Pressure (bar)
Gauge Pressure Transmitter, G 1/4 Female Connection, 4-20 mA Output 	PT01VR-11-LI3-H1131	H6831433	-1 to 0	3
	PT0.5R-11-LI3-H1131	H6831495	0 to 0.5	1.5
	PT001R-11-LI3-H1131	H6831434	0 to 1	3
	PT002R-11-LI3-H1131	H6831435	0 to 1.6	4.8
	PT003R-11-LI3-H1131	H6831436	0 to 2.5	7.5
	PT004R-11-LI3-H1131	H6831437	0 to 4	12
	PT006R-11-LI3-H1131	H6831438	0 to 6	15
	PT010R-11-LI3-H1131	H6831432	0 to 10	25
	PT016R-11-LI3-H1131	H6831439	0 to 16	40
	PT025R-11-LI3-H1131	H6831440	0 to 25	62.5
	PT040R-11-LI3-H1131	H6831441	0 to 40	100
	PT060R-11-LI3-H1131	H6831442	0 to 60	150
	PT100R-11-LI3-H1131	H6831443	0 to 100	250
	PT160R-11-LI3-H1131	H6831444	0 to 160	400
	PT250R-11-LI3-H1131	H6831445	0 to 250	625
	PT400R-11-LI3-H1131	H6831446	0 to 400	900
	PT600R-11-LI3-H1131	H6831447	0 to 600	900
Gauge Pressure Transmitter, G 1/4 Female Connection, 0-10 V Output 	PT01VR-11-LU2-H1131	H6831454	-1 to 0	3
	PT001R-11-LU2-H1131	H6831483	0 to 1	3
	PT002R-11-LU2-H1131	H6831484	0 to 1.6	4.8
	PT003R-11-LU2-H1131	H6831485	0 to 2.5	7.5
	PT004R-11-LU2-H1131	H6831486	0 to 4	12
	PT006R-11-LU2-H1131	H6831452	0 to 6	15
	PT010R-11-LU2-H1131	H6831487	0 to 10	25
	PT016R-11-LU2-H1131	H6831488	0 to 16	40
	PT025R-11-LU2-H1131	H6831489	0 to 25	62.5
	PT040R-11-LU2-H1131	H6831490	0 to 40	100
	PT060R-11-LU2-H1131	H6831491	0 to 60	150
	PT100R-11-LU2-H1131	H6831492	0 to 100	250
	PT160R-11-LU2-H1131	H6831453	0 to 160	400
	PT250R-11-LU2-H1131	H6831451	0 to 250	625
	PT400R-11-LU2-H1131	H6831493	0 to 400	900
	PT600R-11-LU2-H1131	H6831494	0 to 600	900
Absolute Pressure Transmitter, G 1/4 Female Connection, 4-20 mA Output 	PT001A-11-LI3-H1131	H6831449	0 to 1	3
	PT002A-11-LI3-H1131	H6831450	0 to 1.6	4.8
	PT003A-11-LI3-H1131	H6831448	0 to 2.5	7.5

Wiring Diagrams

	PT..LI3 (scaled in bar)	PT..LI3 (scaled in psi)	PT..LU2 (scaled in bar)	PT..LU2 (scaled in psi)
				
Mating Cordset:	RK 4T-*/S618	RK 4T-*/S618	RK 4T-*/S618	RK 4T-*/S618
Output:	4-20 mA Loop Powered	4-20 mA Loop Powered	0-10 V	0-10 V
Voltage:	8-33 VDC	8-33 VDC	11.4-33 VDC	11.4-33 VDC
Accuracy (Full Scale):	≤ 0.3%	≤ 0.3%	≤ 0.3%	≤ 0.3%

See below for technical information.
Conversion: 1 bar = 14.5038 psi

* Length in meters

Specifications

Ambient Temperature:	-40° to +85°C (-40° to +185°F)
Medium Temperature:	-40° to +150°C (-40° to +302°F)
Current Consumption:	≤ 20mA
Reverse Polarity Protection:	Yes
Enclosure Rating:	IP 67
Housing Material:	Stainless Steel 1.430 (AISI 303) / PBT
Shock Resistance:	75 G, 11 ms per IEC 68-2-27
Vibration Resistance:	20 G, 15 mm per IEC 68-2-6
Zero Shift:	< ± 0.015% of measuring range / °C
Span Shift:	< ± 0.015% of measuring range / °C
Voltage Output:	> 10 k Ω/ <100 nF
Current Output:	$\leq \frac{\text{supply voltage}}{0.02\ \text{A}} = \text{Ohm}$

Materials

Housing:	303 Stainless Steel/PBT
Sensing Element:	AL_2O_3 Ceramic
Media Stop:	FPM (VITON)
Cable Connector:	303 Stainless Steel / PBT
Pressure Connection:	303 Stainless Steel
O-ring Seal:	Viton

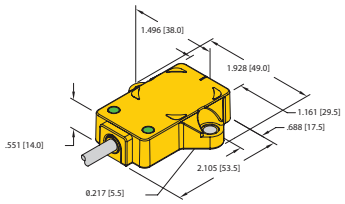
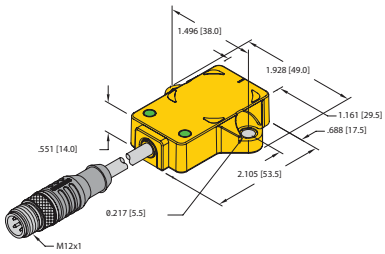
ROTARY INDUCTIVE ANALOG SENSORS

TURCK's Rotary Inductive Analog Sensor operation is based on the RLC (Resistance Inductive Capacitance) principle and incorporates an advanced microprocessor and precisely positioned emitter and receiver coils on a printed circuit board.

The tuned positioning element can be mounted in a number of ways, but because it is contactless, there is no wear to the sensor or positioning element.

Features

- EMC Immunity
- High linearity and precision
- Extended temperature range
- Shock resistant
- Programmable measuring range

Housing	Part Number	ID #	Measuring Range	Resolution (12 bit)	Ambient Temperature	Operating Voltage	Voltage Output	Current Output	Wiring Diagram
	Ri360P2-QR14-ELiU5X2*	M1590857	0-360°	≤ 0.09°	-13° to +158°F (-25° to +70°C)	15-30 VDC	0-10 V	4-20 mA	1
	Ri360P2-QR14-ELU4X2/S97*	M1590858	0-360°	≤ 0.09°	-40° to +158°F (-40° to +70°C)	8-30 VDC	0.5-4.5 V	N/A	2
	Ri360P2-QR14-ELiU5X2-0.3-RS5*	M1590859	0-360°	≤ 0.09°	-13° to +158°F (-25° to +70°C)	15-30 VDC	0-10 V	4-20 mA	3

*P2 of part number indicates position element P2-Ri-QR14 included in delivery.

Wiring Diagrams

Diagram 1

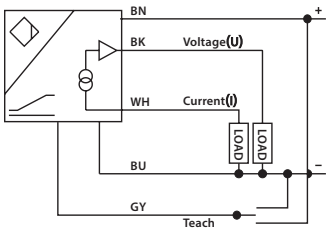


Diagram 2

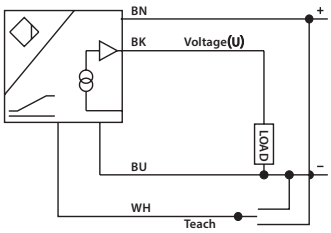
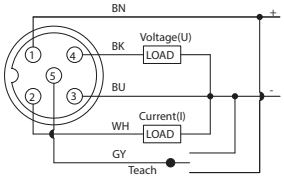


Diagram 3

5-pin M12 ***eurofast***® connection

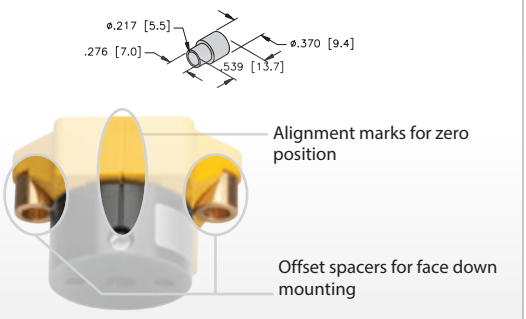
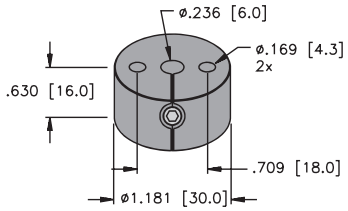
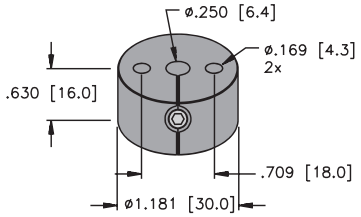


Mating Cordset: RK 4.4T-*/S618

Technical Specifications

Linearity deviation:	≤ 0.3% f.s.	Current consumption:	< 100 mA
Temperature drift:	≤ ±0.01% K	Housing:	Rectangular, QR14
Lateral offset:	≤ 3 mm	Dimensions:	53.5 x 49 x 14 mm
Residual ripple:	≤ 10% Upp	Housing material:	Plastic, PBT-GF30-V0
Rated insulation voltage:	≤ 0.5 kV	Electrical connection:	Cable/Connector
Short-circuit protection:	yes	Vibration resistance:	55 Hz (1 mm)
Wire-break/Rev. pol. protection:	yes/fully	Shock resistance:	30 g (11 ms)
Load resistance voltage:	≥ 4.7 kΩ	Degree of protection:	IP67
Load resistance current output:	≤ 0.4 kΩ	Power-on indication:	LED, green
Sampling rate:	800 Hz	Measuring range indication:	Multifunction LED, green

Accessories-QR14

Spacer Sleeve	Positioning Element	Positioning Element
DS-Ri-QR14 [M1590814]	**P1-Ri-QR14 [M1590812]**	**P2-Ri-QR14 [M1590819]**
		
Spacer sleeve for overhead mounting	Positioning element, operating at a distance of 0-6 mm to the sensor surface	Positioning element, operating at a distance of 0-6 mm to the sensor surface

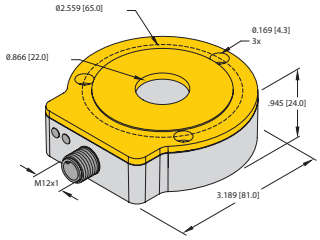
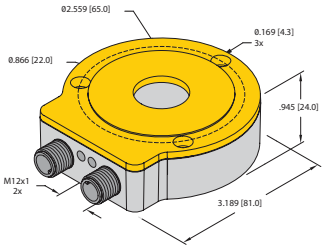
ROTARY INDUCTIVE SENSORS

TURCK's Rotary Inductive Analog Sensor operation is based on the RLC (Resistance Inductive Capacitance) principle and incorporates an advanced microprocessor and precisely positioned emitter and receiver coils on a printed circuit board.

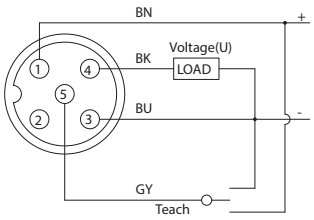
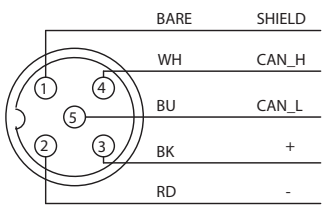
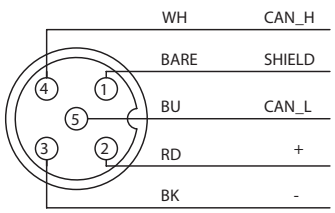
The tuned positioning element can be mounted in a number of ways, but because it is contactless there is no wear to the sensor or positioning element.

Features

- Non-Contact
- EMC Immunity
- High linearity and precision
- Extended temperature range
- Shock resistant
- Programmable measuring range

Housing	Part Number	ID #	Measuring Range	Resolution	Ambient Temperature	Operating Voltage	Output	Wiring Diagram
	Ri360P0-QR24M0-ELU4X2-H1151/S97	M1590909	0-360°	≤ 0.08°	-40° to +185°F (-40° to +85°C)	8-30 VDC	0.5 V-4.5 V	1
	Ri360P0-QR24M0-CNX4-2H1150	M1590914	0-360°	≤ 0.005°	-13° to +158°F (-25° to +85°C)	10-30 VDC	CANopen, profile DS406 V3.2, CS5 DS 305	2

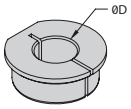
Wiring Diagram

Diagram 1	Diagram 2	
		
Mating Cordset: RK 4.5T-*/S618	Mating Cordset: RKC 572-*M	Mating Cordset: RSC 572-*M

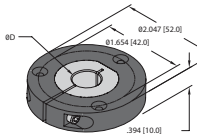
Technical Specifications

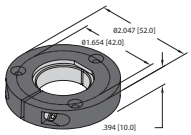
Linearity deviation:	≤ 0.05% f.s.	Housing material:	Metal/plastic, ZnAlCu1/PBT-GF30-V0
Temperature drift:	≤ ±0.004% / K	Electrical connection:	M12 x 1
Residual ripple:	≤ 10% Uss	Vibration resistance:	55 Hz (1 mm)
Rated insulation voltage:	≤ 0.5 kV	Shock resistance:	40c (6 ms), continous
Load resistance voltage:	≥ 4.7 kΩ	Degree of protection:	IP68/IP69k
Housing:	QR24	Power-on indication:	LED green
Dimensions:	81 x 78 x 24mm	Measuring range Indication:	LED, yellow, yellow flashing

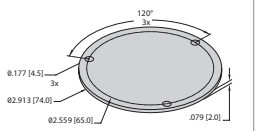
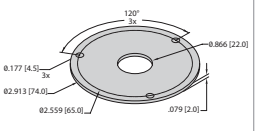
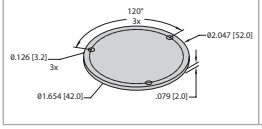
Positioning elements and reducing bushings

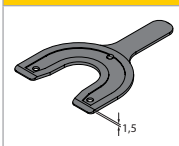
Dimension drawing	Type	Description
	RA1-QR24 (20 mm)	Reducing bushing 20 mm
	RA2-QR24 (14 mm)	Reducing bushing 14 mm
	RA3-QR24 (12 mm)	Reducing bushing 12 mm
	RA4-QR24 (10 mm)	Reducing bushing 10 mm
	RA5-QR24 (6 mm)	Reducing bushing 6 mm
	RA6-QR24 (3/8 inches)	Reducing bushing 3/8"
	RA7-QR24 (1/4 inches)	Reducing bushing 1/4"
	RA8-QR24 (BP)	Blanking plug
	RA9-QR24 (1/2 inches)	Reducing bushing 1/2"
	RA10-QR24 (5/8 inches)	Reducing bushing 5/8"
	RA11-QR24 (3/4 inches)	Reducing bushing 3/4"

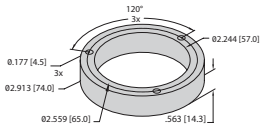
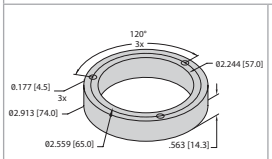
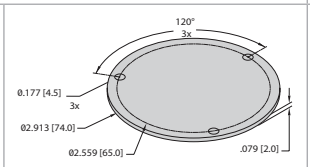
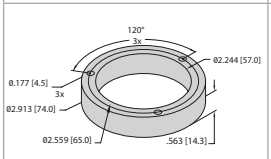
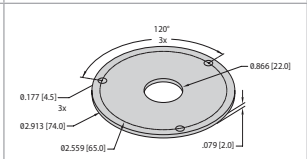
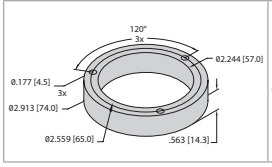
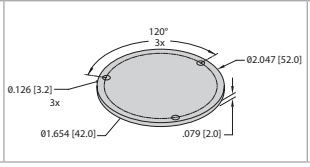
Ready-to-install positioning elements

Dimension drawing	Type	Description
	P1-Ri-QR24 (20 mm)	Positioning element with hollow shaft 20 mm
	P2-Ri-QR24 (14 mm)	Positioning element with hollow shaft 14 mm
	P3-Ri-QR24 (12 mm)	Positioning element with hollow shaft 12 mm
	P4-Ri-QR24 (10 mm)	Positioning element with hollow shaft 10 mm
	P5-Ri-QR24 (6 mm)	Positioning element with hollow shaft 6 mm
	P6-Ri-QR24 (3/8 inches)	Positioning element with hollow shaft 3/8"
	P7-Ri-QR24 (1/4 inches)	Positioning element with hollow shaft 1/4"
	P8-Ri-QR24 (BP)	Positioning element with blanking plug
	P9-Ri-QR24 (1/2 inches)	Positioning element with hollow shaft 1/2"
	P10-Ri-QR24 (5/8 inches)	Positioning element with hollow shaft 5/8"
	P11-Ri-QR24 (3/4 inches)	Positioning element with hollow shaft 3/4"

Dimension drawing	Type	Description
	PE1-QR24	Base unit for positioning element

Dimension drawing	Type	Description
	SP1-QR24	Shield Ø 74 mm, aluminium
	SP2-QR24	Shield Ø 74 mm with bore for shaft guidance, aluminium
	SP3-QR24	Shield Ø 52 mm, aluminium

Dimension drawing	Type	Description
	MT-QR24	Mounting aid, already included in the delivery scope of the encoder

Dimension drawing	Type	Description
	M1-QR24	Aluminium ring
 	M2-QR24	M1-QR24+SP1-QR24
 	M3-QR24	M1-QR24+SP2-QR24
 	M4-QR24	M1-QR24+SP3-QR24

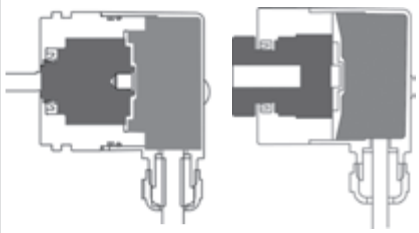
ROTARY POSITION SENSORS / ANALOG

Absolute, Singleturn Encoder Type RS-06 (Shaft) / RS-07 (Blind Hollow Shaft)

Absolute

RoHS compliant

All-round protection



Bearing-Lock:
IP69K protection on the flange side, robust bearing assemblies with interlocking bearings, mechanically protected shaft seal.

Protected Sensor:
Fully encapsulated electronics, separate mechanical bearing assembly.

Versatile

- **Interface of 4-20 mA, 0-10 V:** One size available for different applications.
- **Measuring range of 45°, 90°, 180° and 360°.**
- **Easy diagnosis in case of fault condition:** Error indication via red LED (only current output).
- **Hollow shaft version may be fixed individually:** Torque stop and flex coupling available.
- **May be used in outdoor applications with large fluctuations in temperature:** Resistant against humidity and condensation.

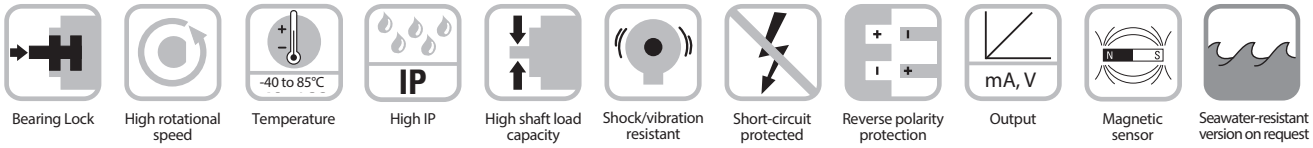
Compact

- **Can be used where space is tight:** Overall diameter of only 36 mm.
- **Shaft version can be mounted on a tight radius:** Fixing holes on Ø 26 mm.
- **Hollow shaft version is ideal for large shafts:** Blind hollow shaft up to 10 mm.

Rugged

- **Non-contact measuring system:** Ensures long service life and the reliability of the application.
- **Stays sealed even when subjected to harsh everyday use:** Solid die-cast housing with up to IP69K protection **offers security against failures in the field.**
- **Wide temperature range:** -40 to +185°F (-40 to +85°C).
- **Increased ability to withstand vibration and installation errors:** High shock (> 500 g) and vibration resistance (> 30 g) **eliminates machine downtime and repairs.**

Mechanical Characteristics	
Max. speed:	6,000 RPM
Starting torque:	< 8.5 oz-in (< 0.06 Nm)
Radial load capacity of shaft:	9.0 lbs (40 N)
Axial load capacity of shaft:	4.5 lbs (20 N)
Weight:	approx. 0.44 lbs (0.2 kg)
Protection acc. to EN 60 529 / DIN 40050-9:	IP67 / IP69K
Working temperature range:	-40 to +185°F (-40 to +85°C)
Materials:	Shaft: stainless steel, Flange: aluminium, Housing: die cast zinc, Cable: PUR
Shock resistance acc. to EN 60068-2-27:	500 g (5,000 m/s²), 6 ms
Vibration resistance acc. to EN 600688-2-6:	30 g (300 m/s²), 10-2,000 Hz
Permanent shock resistance acc. to EN 60068-2-29:	100 g (1,000 m/s²), 2 ms
Vibration (broad-band random) to EN 60068-2-64:	5-2,500 Hz, 10 g (100 m/s²) - rms



Bearing Lock · High rotational speed · Temperature · High IP · High shaft load capacity · Shock/vibration resistant · Short-circuit protected · Reverse polarity protection · Output · Magnetic sensor · Seawater-resistant version on request

Absolute, Singleturn Encoder Type RS-06 (Shaft) / RS-07 (Blind Hollow Shaft)

Electical Characteristics Current Interface 4-20 mA	
Sensor:	
Supply voltage:	10-30 VDC
Current consumption (without output load):	max. 38 mA
Reverse polarity protection at power supply (+V):	Yes
Measuring range:	45°, 90°, 180° or 360°
Resolution/Code:	12 Bit
Linearity 77°F (25°C):	< 1° (360° measurement range)
Repeat accuracy 77°F (25°C):	< 0.1° (360 ° measurement range)
Status LED:	Red: sensor break detection, input too high Green: reference point (CW: 0° to 1°) (CCW: 0° to -1°)

Electrical Characteristics Voltage Interface	
Sensor:	
Supply voltage:	0.5 V, 10-30 VDC 0-10V, 15-30 VDC
Current consumption (without output load):	max. 35 mA
Reverse polarity protection at power supply (+V):	Yes
Measuring range:	45°, 90°, 180° or 360°
Resolution/Code:	12 Bit
Linearity 77°F (25°C):	< 1° (360° measurement range)
Repeat accuracy:	< 0.1° (360 ° measurement range)

4-20 mA Current Loop	
Output load:	max. 200 ohms at 10 VDC max. 900 ohms at 24 VDC
Setting time:	1 ms (R_{load} = 400 Ohm, 77°F (25°C))
Short-circuit protected outputs: when the supply voltage is correctly applied, then output to output is short-circuit protected, but not output to 0 V or to +V.	
Supply voltage and sensor output signal are not galvanically isolated.	

Voltage Output	
Current output:	max. 10 mA
Setting time:	< 1 ms (R_{load} ≥1 KOhm, 77°F (25°C))
Supply voltage and sensor output signal are not galvanically isolated. Short-circuit protected outputs: when the supply voltage is correctly applied, then output to output is short-circuit protected, but not output to 0 V or to +V.	
Status LED	Green: reference point display turns on at cw: between 0° and 1° at ccw: between 0° and -1°

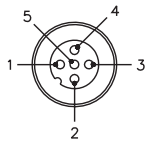
General Electrical Characteristics	
RoHS compliant:	acc. to EU guideline 2011/65/EU

Standard Wiring				
Connection Type:	Common (0 V)	+V	+I	-I
Cable:	WH	BN	GN	YE
M12 ***eurofast***®:	3	2	4	5

Wiring Diagram

Male encoder view

M12 ***eurofast***® pinout



Mating cordset:
E-RKC 4.5T-1695-*/A

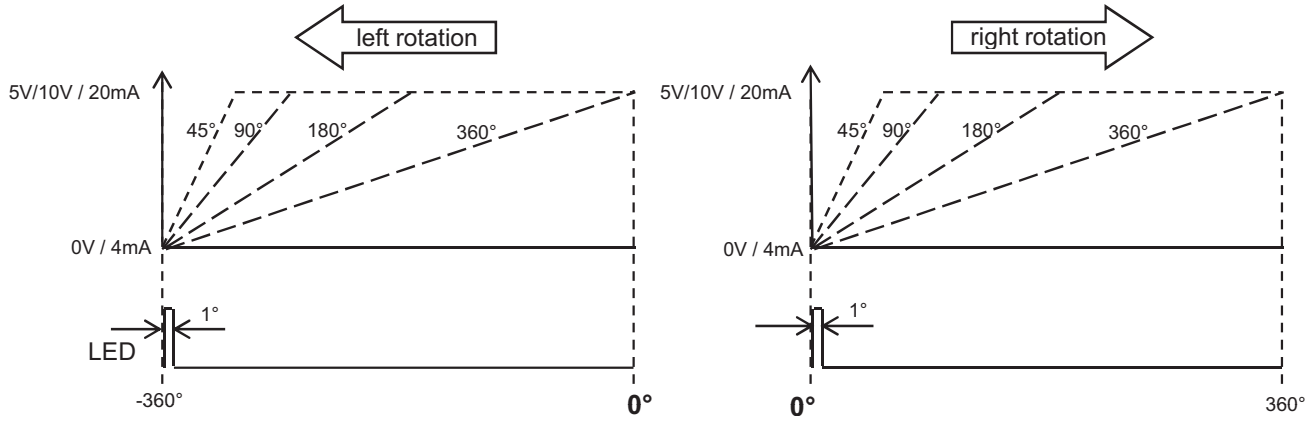
* Length in meters.

Absolute, Singleturn Encoder Type RS-06 (Shaft) / RS-07 (Blind Hollow Shaft)

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

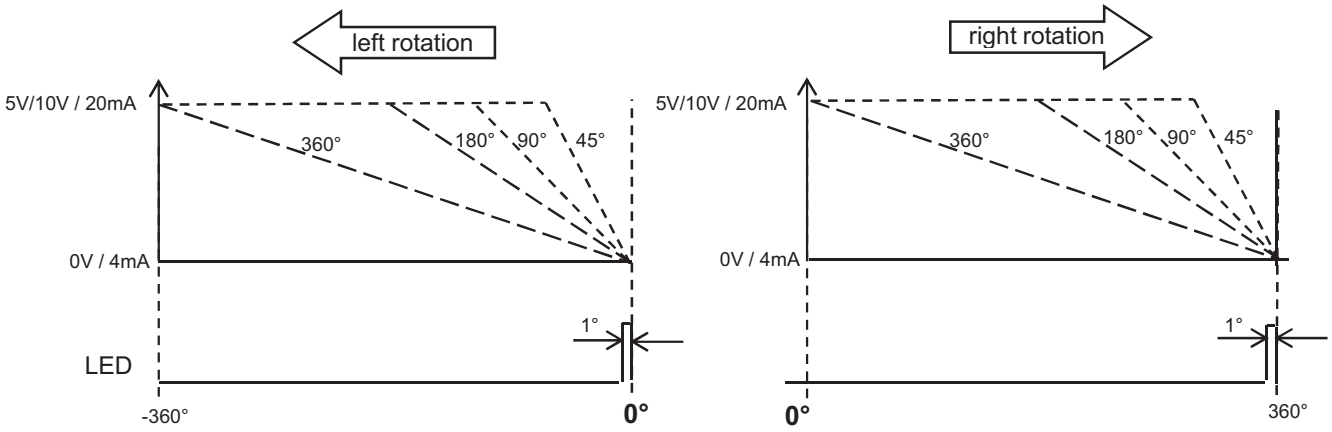
Example (Output Signal Profile):
Measuring range 45° / 90° / 180° / 360°

Clockwise (CW) Version



Example (Output Signal Profile):
Measuring range 45° / 90° / 180° / 360°

Counterclockwise (CCW) Version



Absolute, Singleturn Encoder Type RS-06 (Shaft) / RS-07 (Blind Hollow Shaft)

Part Number Key: RS-06 Shaft Version

A	B	C		D	E		F		G
RS-06P	6	S	-	7A	AL	-	H1151	/	N0

A	Type
RS-06P	Ø 36mm, Shaft, IP69K Shaft Seal
RS-06S	Ø 36mm, Shaft, IP67 Shaft Seal

B	Shaft (Ø x L)
6	Ø 6mm x 12.5mm
8	Ø 8mm x 12.5mm
A0	Ø 1/4" x 12.5mm

C	Flange
S	Servo Flange

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

E	Direction
AL	Count Direction CCW
AR	Count Direction CW

F	Type of Connection
H1151	Radial 5-pin M12 ***eurofast®*** Connector
H1451	Axial 5-pin M12 ***eurofast®*** Connector
C1M	Radial Cable (1m PUR)
CA1M	Axial Cable (1m PUR)

G	Measurement Range
N0	1 x 360°
N4	1 x 180°
N3	1 x 90°
N1	1 x 45°

*cw = increasing code values when shaft turning clockwise (cw). Top view on shaft.

Part Number Key: RS-07 Blind Hollow Shaft Version

A	B	C		D	E		F		G
RS-07B	6	E	-	7A	AL	-	H1151	/	N0

A	Type
RS-07B	Ø 36mm, Blind Hollow Shaft, IP69K Shaft Seal
RS-07C	Ø 36mm, Blind Hollow Shaft, IP67 Shaft Seal

B	Bore (18mm Insertion Depth)
6	Ø 6mm
8	Ø 8mm
10	Ø 10mm
A0	Ø 1/4"

C	Flange
E	Ø 46mm 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
CA	10-30 VDC, 0-5 V

E	Direction
AL	Count Direction CCW
AR	Count Direction CW

F	Type of Connection
H1151	Radial 5-pin M12 ***eurofast®*** Connector
H1451	Axial 5-pin M12 ***eurofast®*** Connector
C1M	Radial Cable (1m PUR)
CA1M	Axial Cable (1m PUR)

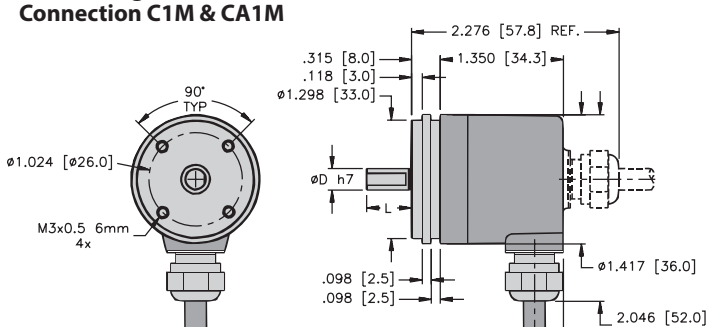
G	Measurement Range
N0	1 x 360°
N4	1 x 180°
N3	1 x 90°
N1	1 x 45°

*cw = increasing code values when shaft turning clockwise (cw). Top view on shaft.

Absolute, Singleturn Encoder Type RS-06 (Shaft) / RS-07 (Blind Hollow Shaft)

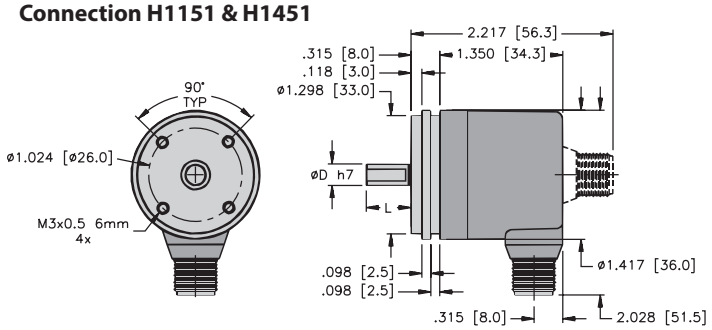
Dimensions: RS-06 Shaft Version

RS-06 Flange S
Connection C1M & CA1M



radial
axial

RS-06 Flange S
Connection H1151 & H1451

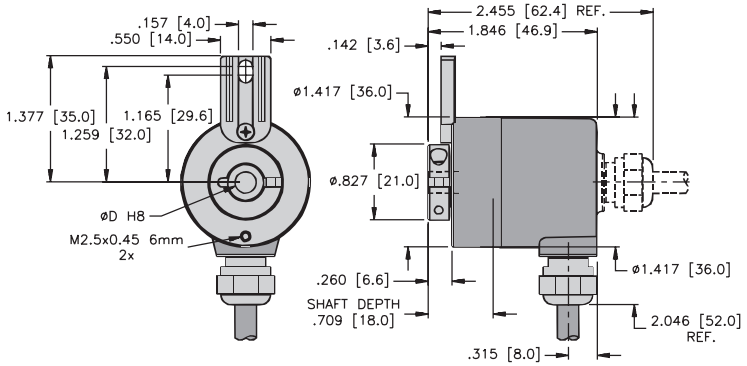


radial
axial

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

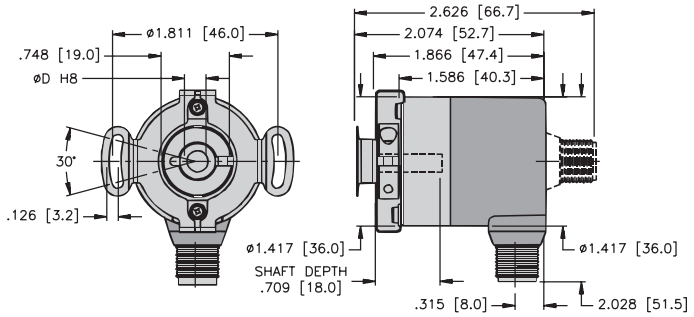
Dimensions: RS-07 Blind Hollow Shaft Version

RS-07 Flange T
Connection C1M & CA1M



radial
axial

RS-07 Flange E
Connection H1151 & H1451



radial
axial

TURCK

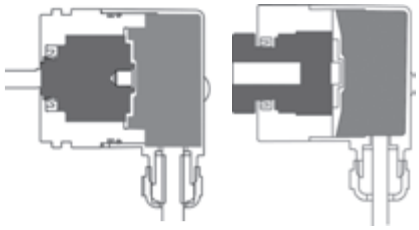
Absolute, Singleturn Encoder Type RS-52 (Shaft) / RS-53 (Blind Hollow Shaft)

Absolute

RoHS compliant

CANopen

All-round protection



Bearing-Lock:
IP69K protection on the flange side, robust bearing assemblies with interlocking bearings, mechanically protected shaft seal.

Protected Sensor:
Fully encapsulated electronics, separate mechanical bearing assembly.

Versatile

- **CANopen fieldbus** with the latest profiles.
- **Connections for every application:** M12 connector or cable connection.
- **Real-time data: Position, speed or working area.** Variable PDO mapping in the memory.
- **Fast, error-free start-up, without setting any switches.** LSS services for configuration of the node address and baud rate via CIA DS 305 V2.0. Node address, baud rate and termination can be programmed via the bus.
- **Hollow shaft version may be fixed individually:** Torque stop and flex coupling available.
- **May be used in outdoor applications with large fluctuations in temperature:** Resistant against humidity and condensation.

Compact

- **Can be used where space is tight:** Overall diameter of only 36 mm.
- **Shaft version can be mounted on a tight radius:** Fixing holes on Ø 26 mm.
- **Hollow shaft version is ideal for large shafts:** Blind hollow shaft up to 10 mm.

Rugged

- Non-contact measuring system: **Ensures long service life and the reliability of the application.**
- **Stays sealed even when subjected to harsh everyday use:** Solid die-cast housing with up to IP69K protection **offers security against failures in the field.**
- **Wide temperature range:** -40 to +185°F (-40 to +85°C).
- **Increased ability to withstand vibration and installation errors:** High shock (> 500 g) and vibration resistance (> 30 g) **eliminates machine downtime and repairs.**

Mechanical Characteristics	
Max. speed:	6,000 RPM
Starting torque:	< 8.5 oz-in (< 0.06 Nm)
Radial load capacity of shaft:	9.0 lbs (40 N)
Axial load capacity of shaft:	4.5 lbs (20 N)
Weight:	approx. 0.44 lbs (0.2 kg)
Protection acc. to EN 60 529 / DIN 40050-9:	IP67 / IP69K
Working temperature range:	-40 to +185°F (-40 to +85°C)
Materials:	Shaft: stainless steel, Flange: aluminium, Housing: die cast zinc, Cable: PUR
Shock resistance acc. to DIN-IEC 68-2-27:	50 g (5,000 m/s²), 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	30 g (300 m/s²), 10-2,000 Hz
Permanent shock resistance acc. to DIN-IEC 68-2-29:	100 g (1,000 m/s²), 2 ms
Vibration (broad-band random) to DIN-IEC 68-2-64:	5-2,500 Hz, 10 g (100 m/s²) - rms

Bearing Lock | High rotational speed | Temperature | High IP | High shaft load capacity | Shock/vibration resistant | Short-circuit protected | Reverse polarity protection | Magnetic sensor | Seawater-resistant version on request

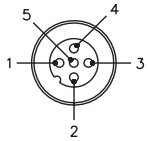
ROTARY POSITION SENSORS/ CANopen

Absolute, Singleturn Encoder Type RS-52 (Shaft) / RS-53 (Blind Hollow Shaft)

Wiring Diagram

Male encoder view

M12 ***eurofast***® pinout



Mating cordset:
RKC 572-*M/S3117

* Length in meters.

Diagnostic LED (two-color, red/green)

LED ON or blinking red: Error display

LED ON or blinking green: Status display

Standard Wiring

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

General Information about CANopen

The RS-52 and RS-53 series of encoders support the latest CANopen communication profile according to DS 301 V4.02 . In addition, device-specific profiles like the encoder profile DS406 V3.2 are available.

The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CANopen fieldbus. When switching the device on, all parameters, which have been saved on a flash memory to protect them against power failure, are loaded again.

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

The encoders are available with a connector or a cable connection. The device address and baud rate can be set or modified by means of the software. The two-color LED indicates the operating or fault status of the CANopen fieldbus, as well as the status of the internal diagnostics.

CANopen Communication Profile DS301 V4.02

The following Class C2 functionality is integrated:

- **NMT Slave**
- **Heartbeat Protocol**
- **Identity Object**
- **Error Behavior Object**
- **Variable PDO Mapping self-start programmable (power on to operational), 3 Sending PDO's**
- **Node address, baud rate and CANopen**
- **Programmable termination**

CANopen Encoder Profile DS406 V3.2

The following parameters may be programmed:

- **Event mode**
- **One work area with upper and lower limit and the corresponding output states**
- **Variable PDO mapping for position, speed and work area status**
- **Extended failure management for position sensing with integrated temperature control**
- **User interface with visual display of bus and failure status – one LED, two colors**
- **Customer-specific memory – 16 Bytes**
- **Watchdog controlled device LSS Layer Setting Services DS305 V2.0**
- **Global support of Node-ID and baud rate**
- **Selective protocol via identity object (1018h)**

General Electrical Characteristics	
Sensor:	
Supply voltage:	8-30 VDC
Current consumption (without output load):	max. 25 mA
Reverse polarity protection at power supply (+V):	Yes
Measuring range:	360°
Linearity:	< 1
Repeat accuracy 77°F (25°C):	< 0.1°
Data refresh rate:	400 µs
RoHS compliant acc. to EU guideline 2011/65/EU	

Interface Characteristics CANopen	
Resolution:	1-16384 (14 bit), (scalable: 1-16384)
Default value:	16384 (14 bit)
Code:	Binary
Interface:	CAN High-Speed according to ISO 11898,
	Basic and Full CANCAN Specification 2.0 B
Protocol:	CANopen profile DS 406 V3.2 with manufacturer-specific add-ons LSS-Services DS305 V2.0
Baud rate:	10-1000 kbit/s (Software configurable)
Node address:	1-127 (Software configurable)
Termination switchable:	Software configurable
LSS Services:	CIA LSS protocol DS305 Global command support for node address and baud rate. Selective commands via attributes of the identity object

Absolute, Singleturn Encoder Type RS-52 (Shaft) / RS-53 (Blind Hollow Shaft)

Part Number Key: RS-52 Shaft Version

A	B	C		D		E
RS-52S	6	S	-	9D14B	-	H1151

A	Type
RS-52S	Ø 36mm, Shaft, IP69K Shaft Seal
RS-52T	Ø 36mm, Shaft, IP67 Shaft Seal

B	Shaft (Ø x L)
6	Ø 6mm x 12.5mm
8	Ø 8mm x 12.5mm
A0	Ø 1/4" x 12.5mm

C	Flange
S	Servo Flange

D	Voltage Supply and Output Type
9D14B	8-30 VDC, CANopen DS301 V4.02

E	Type of Connection
H1151	Radial 5-pin M12 ***eurofast***® Connector
C1M	Radial Cable (1m PUR)

Part Number Key: RS-53 Blind Hollow Shaft Version

A	B	C		D		E
RS-53B	6	E	-	9D14B	-	H1151

A	Type
RS-53B	Ø 36mm, Blind Hollow Shaft, IP69K Shaft Seal
RS-53C	Ø 36mm, Blind Hollow Shaft, IP67 Shaft Seal

B	Bore (18mm Insertion Depth)
6	Ø 6mm
8	Ø 8mm
10	Ø 10mm
A0	Ø 1/4"

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

D	Voltage Supply and Output Type
9D14B	8-30 VDC, CANopen DS301 V4.02

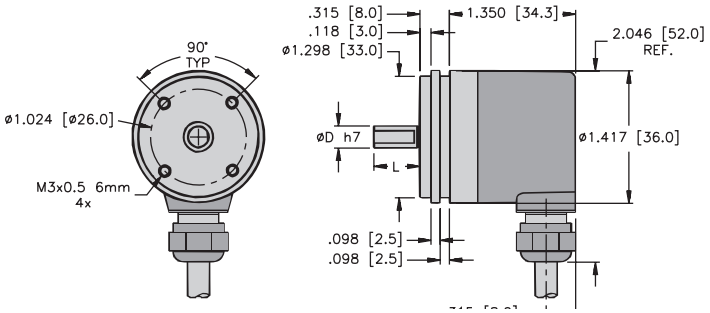
E	Type of Connection
H1151	Radial 5-pin M12 ***eurofast***® Connector
C1M	Radial Cable (1m PUR)

ROTARY POSITION SENSORS/ CANopen

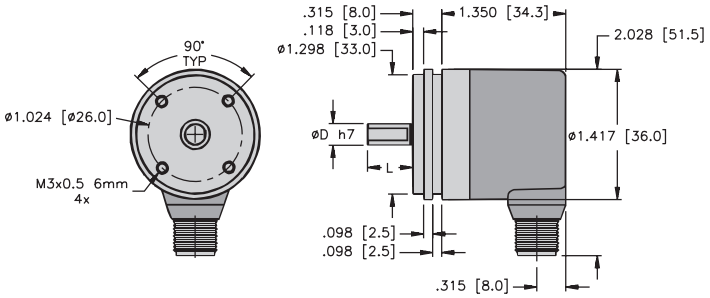
Absolute, Singleturn Encoder Type RS-52 (Shaft) / RS-53 (Blind Hollow Shaft)

Dimensions: RS-52 Shaft Version

RS-52 Flange S Connection C1M



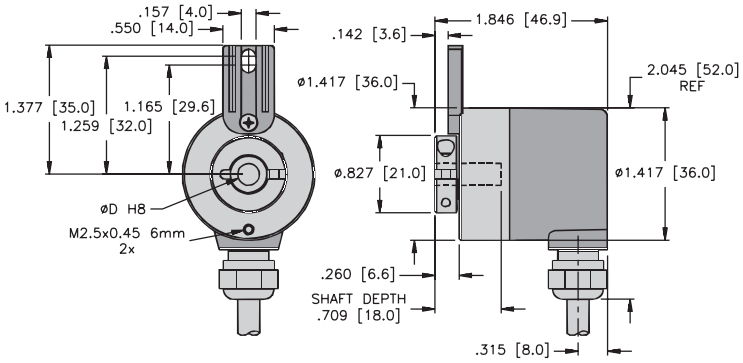
RS-52 Flange S Connection H1151



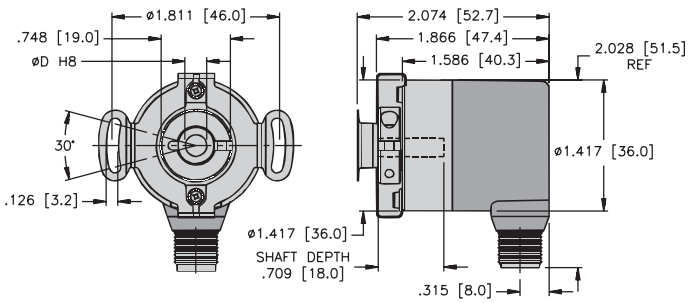
Mounting advice:
The flanges and shafts of the encoder and drive should not be rigidly coupled together at the same time.

Dimensions: RS-53 Blind Hollow Shaft Version

RS-53 Flange T Connection C1M



RS-53 Flange E Connection H1151



ROTARY POSITION SENSORS/ SAEJ1939

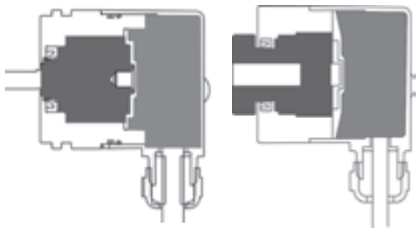
Absolute, Singleturn Encoder Type RS-52 (Shaft) / RS-53 (Blind Hollow Shaft)

Absolute

RoHS compliant

SAE J1939

All-round protection



Bearing-Lock:
IP69K protection on the flange side, robust bearing assemblies with interlocking bearings, mechanically protected shaft seal.

Protected Sensor:
Fully encapsulated electronics, separate mechanical bearing assembly.

Versatile

- **Latest fieldbus performance:** SAE J1939 with CAN Highspeed according to ISO 11898.
- **Connections for every application:** M12 connector or cable connection.
- **Simple, fast recognition of the operating status:** Bicolored LED signalizes Bus-Status or potential errors.
- **Fast, error-free start-up, no need to set switches:** Automatic address allocation via Address Claiming (ACL).
- **May be used in outdoor applications with large fluctuations in temperature:** Resistant against humidity and condensation.

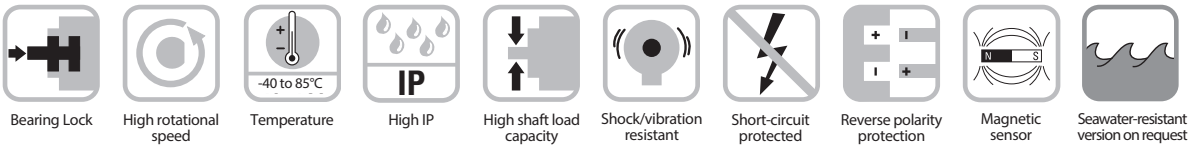
Compact

- **Can be used where space is tight:** Overall diameter of only 36 mm.
- **Shaft version can be mounted on a tight radius:** Fixing holes on Ø 26 mm.
- **Hollow shaft version is ideal for large shafts:** Blind hollow shaft up to 10 mm.

Rugged

- Non-contact measuring system: **Ensures long service life and the reliability of the application.**
- **Stays sealed even when subjected to harsh everyday use:** Solid die-cast housing with up to IP69K protection **offers security against failures in the field.**
- **Wide temperature range:** -40 to +185°F (-40 to +85°C).
- **Increased ability to withstand vibration and installation errors:** High shock (> 500 g) and vibration resistance (> 30 g) **eliminates machine downtime and repairs.**

Mechanical Characteristics	
Max. speed:	6,000 RPM
Starting torque:	< 8.5 oz-in (< 0.06 Nm)
Radial load capacity of shaft:	9.0 lbs (40 N)
Axial load capacity of shaft:	4.5 lbs (20 N)
Weight:	approx. 0.44 lbs (0.2 kg)
Protection acc. to EN 60 529 / DIN 40050-9:	IP67 / IP69K
Working temperature range:	-40 to +185°F (-40 to +85°C)
Materials:	Shaft: stainless steel, Flange: aluminium, Housing: die cast zinc, Cable: PUR
Shock resistance acc. to DIN-IEC 68-2-27:	50 g (5,000 m/s²), 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	30 g (300 m/s²), 10-2,000 Hz
Permanent shock resistance acc. to DIN-IEC 68-2-29:	100 g (1,000 m/s²), 2 ms
Vibration (broad-band random) to DIN-IEC 68-2-64:	5-2,500 Hz, 10 g (100 m/s²) - rms



Bearing Lock · High rotational speed · Temperature · High IP · High shaft load capacity · Shock/vibration resistant · Short-circuit protected · Reverse polarity protection · Magnetic sensor · Seawater-resistant version on request

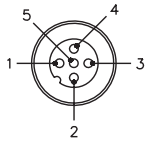
ROTARY POSITION SENSORS/ SAEJ1939

Absolute, Singleturn Encoder Type RS-52 (Shaft) / RS-53 (Blind Hollow Shaft)

Wiring Diagram

Male encoder view

M12 ***eurofast*** ® pinout



Mating cordset:
RKC 572-*M/S3117

* Length in meters.

Diagnostic LED (two-color, red/green)

LED ON or blinking red: Error display

LED ON or blinking green: Status display

Standard Wiring

Connection Type:	+V	0V	CAN GND	CAN High	CAN Low
Cable:	BN	WH	GY	GN	YE

General Information Concerning SAE J1939

The protocol J1939 originates from the international Society of Automotive Engineers (SAE) and operates on the physical layer with high speed CAN as per ISO11898. The application emphasis lies in the area of the power train and chassis of commercial vehicles. It serves to transfer diagnostic data (e.g., motor speed, position or temperature) and control information. Series RS-52 and RS-53 encoders support the total functionality of J1939.

This protocol is a multimaster system with decentralized network management that does not involve channel-based communication. It supports up to 254 logic nodes and 30 physical control devices per segment. The information is described as Parameters (signals) and combined on 4 memory pages (Data Pages) into Parameter Groups (PGs). Each parameter group can be identified via a unique number, the Parameter Group Number (PGN). Independently of this, each signal is assigned a unique SPN (Suspect Parameter Number).

The major part of the communication occurs cyclically and can be received by all control devices without the explicit request for data (Broadcast). Furthermore, the parameter groups are optimized to a length of 8 data bytes. This enables very efficient utilization of the CAN protocol.

If greater amounts of data need to be transferred, then transport protocols (TP) can be used: BAM (Broadcast Announce Message) and CMDT (Connection Mode Data Transfer). With BAM TP the transfer of data occurs as a broadcast.

Encoder Implementation SAE J1939

- **PGNs that are adaptable to the customer's application**
- **Resolution of address conflicts -> Address Claiming (ACL)**
- **Continuous checking whether control addresses have been assigned twice within a network**
- **Change of control device addresses during run-time**
- **Unique identification of a control device with the help of a name that is unique worldwide. This name serves to identify the functionality of a control device in the network**
- **Predefined PGs for Position, Speed and Alarm**
- **250 kBit/s, 29-Bit Identifier**
- **Watchdog controlled device**

A two-color LED, located on the rear of the encoder, signals the operating and fault status of the J1939 protocol, as well as the status of the internal sensor diagnostics.

General Electrical Characteristics

Sensor:	
Supply voltage:	8-30 VDC
Current consumption (without output load):	max. 25 mA
Reverse polarity protection at power supply (+V):	Yes
Measuring range:	360°
Linearity:	< 1
Repeat accuracy 77°F (25°C):	< 0.1°
Data refresh rate:	400 µs
RoHS compliant acc. to EU guideline 2011/65/EU	

Interface Characteristics CANopen

Resolution:	1-16384 (14 bit), (scalable: 1-16384)
Default value:	16384 (14 bit)
Code:	Binary
Interface:	CAN High-Speed according to ISO 11898
	Basic and Full CAN CAN Specification 2.0 B
Protocol:	J1939
Baud rate:	250 kbit/s (software configurable)
Node address:	1-255 (via address claiming)
Termination:	Software configurable

Absolute, Singleturn Encoder Type RS-52 (Shaft) / RS-53 (Blind Hollow Shaft)

Part Number Key: RS-52 Shaft Version

A	B	C		D		E
RS-52S	6	S	-	9F14B	-	H1151

A	Type
RS-52S	Ø 36mm, Shaft, IP69K Shaft Seal
RS-52T	Ø 36mm, Shaft, IP67 Shaft Seal

B	Shaft (Ø x L)
6	Ø 6mm x 12.5mm
8	Ø 8mm x 12.5mm
A0	Ø 1/4" x 12.5mm

C	Flange
S	Servo Flange

D	Voltage Supply and Output Type
9F14B	8-30 VDC, CAN Highspeed

E	Type of Connection
H1151	Radial 5-pin M12 ***eurofast***® Connector
C1M	Radial Cable (1m PUR)

Part Number Key: RS-53 Blind Hollow Shaft Version

A	B	C		D		E
RS-53B	6	E	-	9F14B	-	H1151

A	Type
RS-53B	Ø 36mm, Blind Hollow Shaft, IP69K Shaft Seal
RS-53C	Ø 36mm, Blind Hollow Shaft, IP67 Shaft Seal

B	Bore (18mm Insertion Depth)
6	Ø 6mm
8	Ø 8mm
10	Ø 10mm
A0	Ø 1/4"

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

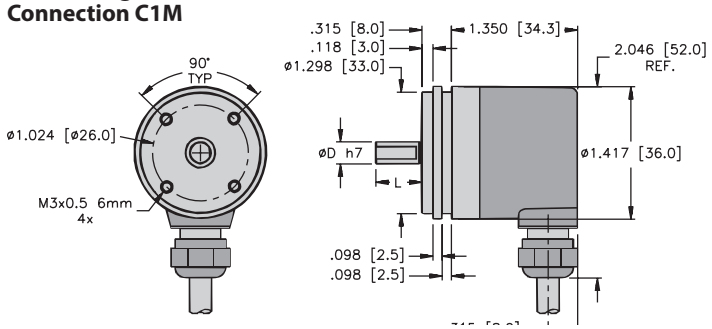
D	Voltage Supply and Output Type
9F14B	8-30 VDC, CAN Highspeed

E	Type of Connection
H1151	Radial 5-pin M12 ***eurofast***® Connector
C1M	Radial Cable (1m PUR)

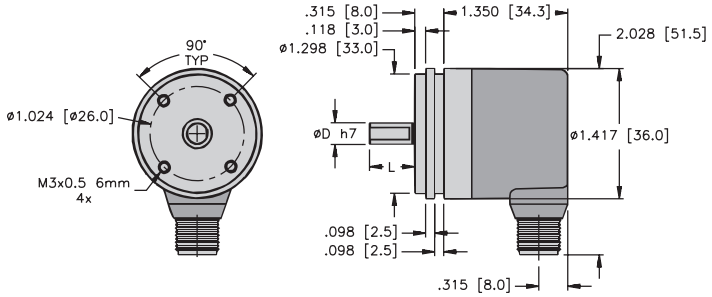
Absolute, Singleturn Encoder Type RS-52 (Shaft) / RS-53 (Blind Hollow Shaft)

Dimensions: RS-52 Shaft Version

RS-52 Flange S
Connection C1M



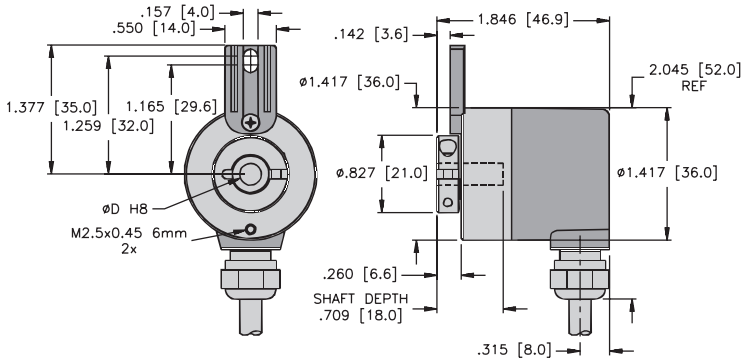
RS-52 Flange S
Connection H1151



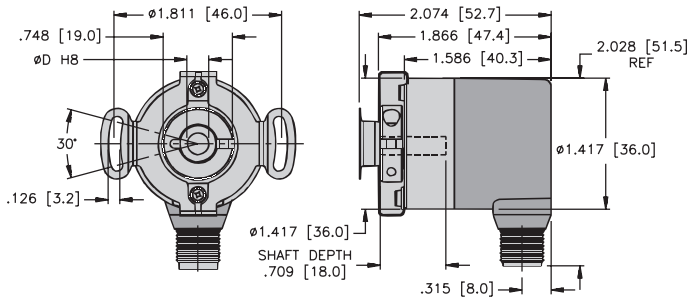
Mounting advice:
The flanges and shafts of the encoder and drive should not be rigidly coupled together at the same time. We recommend the use of suitable couplings (see page G1, Accessories).

Dimensions: RS-53 Blind Hollow Shaft Version

RS-53 Flange T
Connection C1M



RS-53 Flange E
Connection H1151



TURCK

Absolute, Singleturn Type RS-45 (Shaft) / RS-49 (Blind Hollow Shaft)

Absolute

RoHS compliant

CANopen

General Electrical Characteristics	
Supply voltage:	10-30 VDC
Current consumption (no load):	80 mA
Reverse connection of the supply voltage (+V):	yes
RoHS compliant acc. to EG-guideline 2002/95/EG	

General Electrical Characteristics		
LED ON or blinking	red:	error display
	green:	status display

Standard Wiring

Connection Type:	+V	0 V	CAN GND	CAN High	CAN Low
Cable:	BN	WH	GY	GN	YE

Versatile

- CANopen with current encoder profile.
- LSS services for configuration of the node address and baud rate.
- Variable PDO mapping in the memory.
- High-precision optical sensor technology can achieve a resolution of up to 17 bits.

Compact

- **Overall size of 36 x 42 mm:** Hollow shaft of up to 8 mm, blind hollow shaft of up to 10 mm.

Rugged

- **Sturdy bearing construction:** Bearing-Lock design for resistance against vibration and installation errors.
- Ideal for use outdoors, thanks to IP67 protection.
- **Wide temperature range:** -40 to +185°F (-40 to +85°C).

Interface Characteristics CANopen	
Resolution Singleturn:	1-65536 (16 bit), scaleable: 1-65536
Default value Singleturn:	8192 (13 bit)
Code:	Binary
Interface:	CAN High-Speed according to ISO 11898, Basic- and Full-CAN , CAN Specification 2.0 B
Protocol:	CANopen profile DS 406 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

Mechanical Characteristics	
Max. speed: Shaft or blind hollow shaft version without shaft sealing (IP65): Shaft version (IP67) or blind hollow shaft (IP65) with shaft sealing:	12,000 RPM, continuous operation 10,000 RPM 10,000 RPM, continuous operation 8,000 RPM
Starting torque without shaft sealing:	< 1 oz-in (< 0.007 Nm)
Starting torque with shaft sealing:	< 1.4 oz-in (< 0.01 Nm)
Radial load capacity of shaft:	9.0 lbs (40 N)
Axial load capacity of shaft:	4.5 lbs (20 N)
Weight:	approx. 0.44 lbs (0.2 kg)
Protection acc. to EN 60 529:	Housing: IP67 Shaft: IP65, opt. IP67
Working temperature:	-40 to +185°F (-40 to +85°C)
Materials:	Shaft/Hollow shaft: stainless steel, Flange: aluminum, Housing: die cast zinc, Cable: PUR
Shock resistance acc. to DIN-IEC 68-2-27:	> 250g (> 2,500 m/s2), 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	> 10 g (>100 m/s2), 55-2,000 Hz
Vibration (broad-band random) to DIN-IEC 68-2-64:	5-2,500 Hz, 10 g (100 m/s2) - rms

Bearing Lock · High rotational speed · Temperature · High IP · High shaft load capacity · Shock/vibration resistant · Short-circuit protected · Reverse polarity protection · Magnetic field proof · Optical sensor · Seawater-resistant version on request

ROTARY POSITION SENSORS/ CANopen

Absolute, Singleturn Type RS-45 (Shaft) / RS-49 (Blind Hollow Shaft)

General information about CANopen

The CANopen encoder series support the latest CANopen communication profile according to DS 301 V4.02 . In addition, device specific profiles, like the DS 406 V3.2, are available.
The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CANbus. When switching the device on, all parameters, which have been saved on a flash memory to protect them against power failure, are loaded again. Position, speed and status of the working area output values may be combined in a freely variable way as PDO mapping.
The encoders are available with a connector or a cable connection. The device address and baud rate may be set/modified by means of the software. A two-color LED indicates the operating or fault status of the CANbus, as well as the status of the internal diagnostics.

CANopen Communication Profile DS301 V4.02

The following Class C2 functionality is integrated:

- **NMT Slave**
- **Heartbeat Protocol**
- **Identity Object**
- **Error Behavior Object**
- **Variable PDO Mapping self-start programmable (Power on to operational), 3 sending PDO's**

Node address, baud rate and CANbus/programmable termination

CANopen Encoder Profile DS406 V3.2

The following parameters may be programmed:

- **Event mode**
- **One work area with upper and lower limit and the corresponding output states**
- **Variable PDO mapping for position, speed and work area status**
- **Extended failure management for position sensing**
- **User interface with visual display of bus and failure status: 1 LED, two-color**
- **Customer-specific memory - 16 Bytes**
- **Customer-specific protocol**
- **"Watchdog controlled" device**

LSS Layer Setting Services DS305 V2.0

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

Part Number Key: RS-45 Shaft Version

A	B	C		D		E
RS-45S	6	C	-	9D16B	-	CT1M

A	Type
RS-45S	Ø 39mm, Shaft, IP67 Shaft Seal
RS-45T	Ø 39mm, Shaft, IP65 Shaft Seal

B	Shaft (Ø x L)
6	Ø 6mm x 12.5mm
8	Ø 8mm x 15mm
10	Ø 10mm x 20mm
A0	Ø 1/4" x 12.5mm
A1	Ø 3/8" x 5/8"

C	Flange
C	Ø 36mm Clamping Flange
S	Ø 36mm Servo Flange

D	Voltage Supply and Output Type
9D16B	10-30 VDC, CANopen DS301 V4.02

E	Type of Connection
CT1M	Tangential Cable (1m PUR)
CT5M	Tangential Cable (5m PUR)

Part Number Key: RS-49 Blind Hollow Shaft Version

A	B	C		D		E
RS-49B	6	E	-	9D16B	-	CT1M

A	Type
RS-49B	Ø 39mm, Blind Hollow Shaft, IP65 Shaft Seal

B	Bore (14.5mm Insertion Depth)
6	Ø 6mm
8	Ø 8mm
10	Ø 10mm
A0	Ø 1/4"

C	Flange
E	Ø 36mm Flange w/ Slotted Flex Mount
T	Ø 36mm Flange w/ Long Torque Stop
T1	Ø 36mm Flange w/ Short Torque Stop

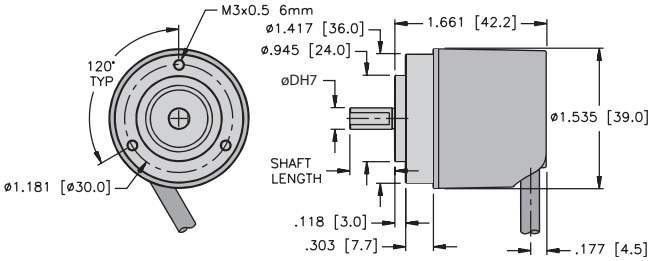
D	Voltage Supply and Output Type
9D16B	10-30 VDC, CANopen DS301 V4.02

E	Type of Connection
CT1M	Tangential Cable (1m PUR)
CT5M	Tangential Cable (5m PUR)

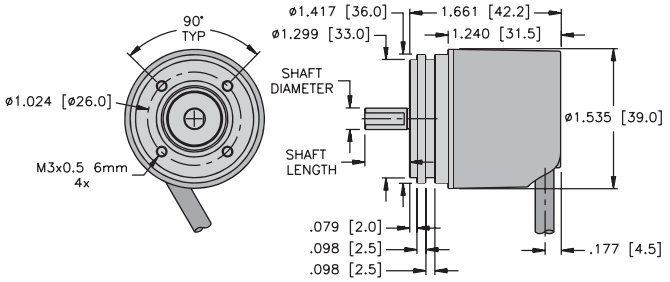
Absolute, Singleturn Type RS-45 (Shaft) / RS-49 (Blind Hollow Shaft)

Dimensions: RS-45 Shaft Version

RS-45 Flanges C
Connection CT*M



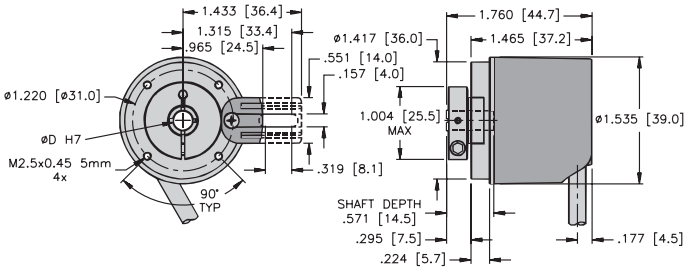
RS-45 Flanges S
Connection CT*M



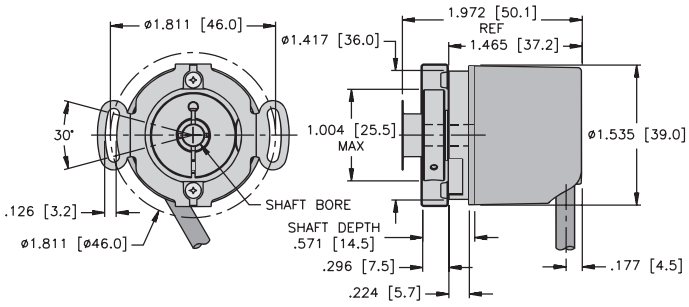
Mounting advice:
The flanges and shafts of the encoder and drive should not be rigidly coupled together at the same time.

Dimensions: RS-49 Blind Hollow Shaft Version

RS-49 Flange T1 and T (dotted)
Connection CT*M



RS-49 Flanges E
Connection CT*M



ROTARY POSITION SENSORS/ CANopen

Absolute, Multiturn Type RM-47 (Shaft) / RM-51 (Blind Hollow Shaft)

Absolute

RoHS compliant

CANopen

General Electrical Characteristics	
Supply voltage:	10-30 VDC
Current consumption (no load):	Max. 80 mA
Reverse connection of the supply voltage (+V):	yes
RoHS compliant acc. to EG-guideline 2011/65/EG	

General Electrical Characteristics		
LED ON or blinking	red:	error display
	green:	status display

Standard Wiring

Connection Type:	+V	0 V	CAN GND	CAN High	CAN Low
Cable:	BN	WH	GY	GN	YE

Versatile

- **CANopen with current encoder profile.**
- **LSS services for configuration of the node address and baud rate.**
- **Variable PDO mapping in the memory.**

Compact

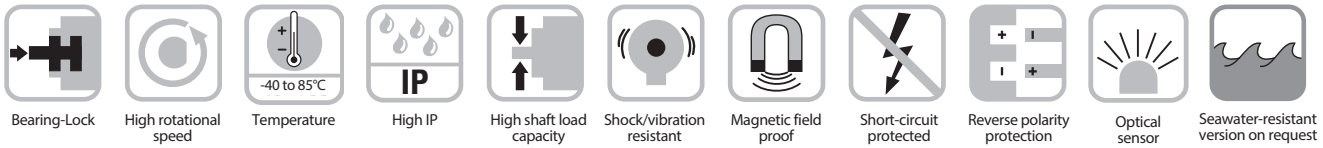
- Overall size of 36 x 42 mm: **Hollow shaft of up to 8 mm, blind hollow shaft of up to 10 mm.**

Rugged

- **Electronic multiturn is 100% magnetic-field resistant.**
- **Sturdy bearing construction in Bearing-Lock design for resistance against vibration and installation errors.**
- **Wide temperature range: -40 to +185°F (-40 to +85°C).**

Interface Characteristics CANopen	
Resolution Singleturn:	1-65536 (16 bit), scaleable: 1-65536
Default value Singleturn:	8192 (13 bit)
Total resolution:	1-4.294.967.296 (32 bit); Default: 25 bit
Code:	Binary
Interface:	CAN High-Speed according to ISO 11898, Basic- and Full-CAN , CAN Specification 2.0 B
Protocol:	CANopen profil DS 406 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

Mechanical Characteristics	
Max. speed: Shaft or blind hollow shaft version without shaft sealing (IP65): Shaft version (IP67) or blind hollow shaft (IP65) with shaft sealing:	12,000 RPM, continuous operation 10,000 RPM 10,000 RPM, continuous operation 8,000 RPM
Starting torque without shaft sealing:	< 1 oz-in (< 0.007 Nm)
Starting torque with shaft sealing:	< 1.4 oz-in (< 0.01 Nm)
Radial load capacity of shaft:	9.0 lbs (40 N)
Axial load capacity of shaft:	4.5 lbs (20 N)
Weight:	approx. 0.44 lbs (0.2 kg)
Protection acc. to EN 60 529:	Housing: IP67 Shaft: IP65, opt. IP67
Working temperature:	-40 to +185°F (-40 to +85°C)
Materials:	Shaft/Hollow shaft: stainless steel, Flange: aluminum, Housing: die cast zinc, Cable: PUR
Shock resistance acc. to DIN-IEC 68-2-27:	> 250g (> 2,500 m/s2), 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	> 10 g (>100 m/s2), 55-2,000 Hz



Bearing-Lock · High rotational speed · Temperature · High IP · High shaft load capacity · Shock/vibration resistant · Magnetic field proof · Short-circuit protected · Reverse polarity protection · Optical sensor · Seawater-resistant version on request

Absolute, Multiturn Type RM-47 (Shaft) / RM-51 (Blind Hollow Shaft)

General Information about CANopen

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, are available.

The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CANbus. When switching the device on, all parameters, which have been saved on a flash memory to protect them against power failure, are loaded again. Position, speed and status of the working area output values may be combined in a freely variable way as PDO mapping.

The encoders are available with a cable connection. The device address and baud rate may be set/modified by means of the software. A two-color LED indicates the operating or fault status of the CANbus, as well as the status of the internal diagnostics.

CANopen Communication Profile DS301 V4.02

The following Class C2 functionality is integrated:

- **NMT Slave**
- **Heartbeat Protocol**
- **Identity Object**
- **Error Behavior Object**
- **Variable PDO Mapping self-start programmable (Power on to operational), 3 sending PDO's**
- **Node address, baud rate and CANbus/programmable termination**

CANopen Encoder Profile DS406 V3.2

The following parameters may be programmed:

- **Event mode**
- **One work area with upper and lower limit and the corresponding output states**
- **Variable PDO mapping for position, speed, work area status**
- **Extended failure management for position sensing**
- **User interface with visual display of bus and failure status: 1 LED, two-color**
- **Customer-specific memory - 16 Bytes**
- **"Watchdog controlled" device**

LSS Layer Setting Services DS305 V2.0

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

Part Number Key: RM-47 Shaft Version

A	B	C		D		E
RM-47S	6	C	-	9D25B	-	CT1M

A	Type
RM-47S	Ø 39mm, Shaft, IP67 Shaft Seal
RM-47T	Ø 39mm, Shaft, IP65 Shaft Seal

B	Shaft (Ø x L)
6	Ø 6mm x 12.5mm
8	Ø 8mm x 15mm
10	Ø 10mm x 20mm
A0	Ø 1/4" x 12.5mm
A1	Ø 3/8" x 5/8"

C	Flange
C	Ø 36mm Clamping Flange
S	Ø 36mm Servo Flange

D	Voltage Supply and Output Type
9D25B	10-30 VDC, CANopen DS 301 V4.02

E	Type of Connection
CT1M	Tangential Cable (1m PUR)
CT5M	Tangential Cable (5m PUR)

Part Number Key: RM-51 Blind Hollow Shaft Version

A	B	C		D		E
RM-51B	6	E	-	9D25B	-	CT1M

A	Type
RM-51B	Ø 39mm, Blind Hollow Saft, IP65 Shaft Seal

B	Bore (14.5mm Insertion Depth)
6	Ø 6mm
8	Ø 8mm
10	Ø 10mm
A0	Ø 1/4"

C	Flange
E	Ø 36mm Flange w/ Slotted Flex Mount
T	Ø 36mm Flange w/ Long Torque Stop
T1	Ø 36mm Flange w/ Short Torque Stop

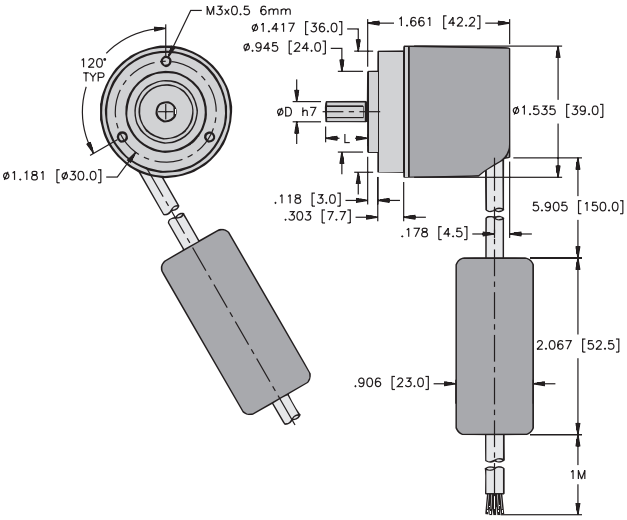
D	Voltage Supply and Output Type
9D25B	10-30 VDC, CANopen DS 301 V4.02

E	Type of Connection
CT1M	Tangential Cable (1m PUR)
CT5M	Tangential Cable (5m PUR)

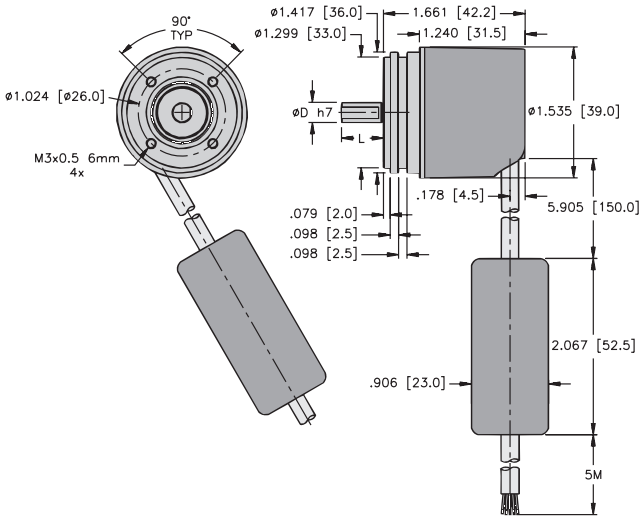
Absolute, Multiturn Type RM-47 (Shaft) / RM-50 (Blind Hollow Shaft)

Dimensions: RM-47 Shaft Version

RM-47 Flange C
Connection CT1M

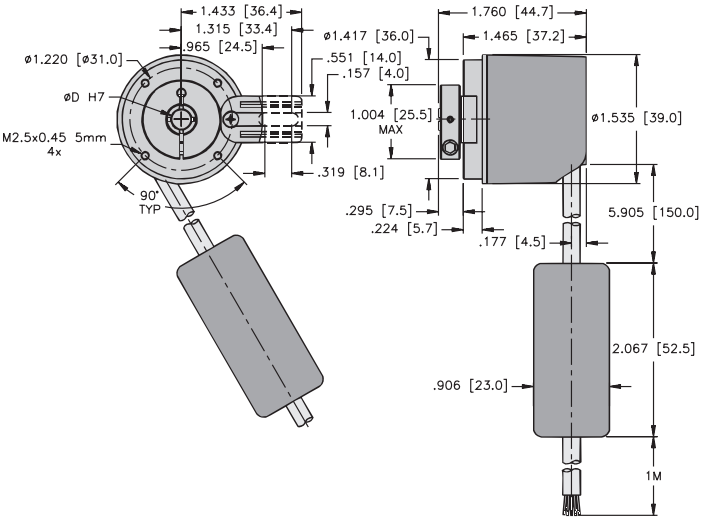


RM-47 Flange S
Connection CT5M

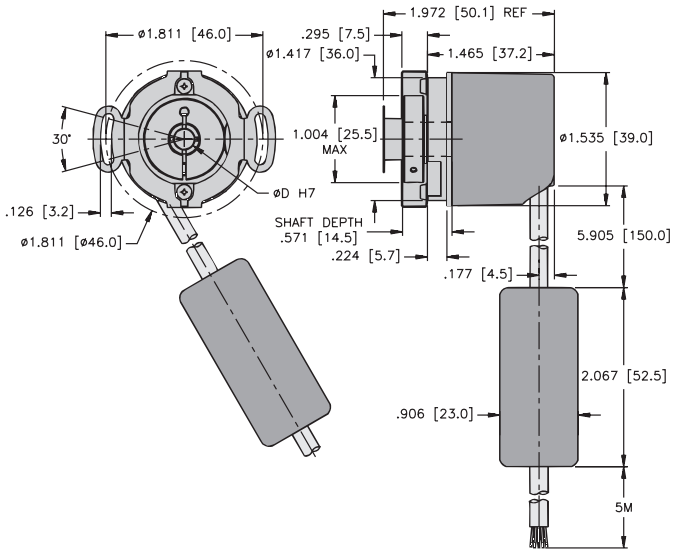


Dimensions: RM-51 Blind Hollow Shaft Version

RM-51 Flange T&T1
Connection CT1M



RM-51 Flange E (Blind Hollow Shaft)
Connection CT5M



Notes

Notes

CONNECTIVITY
FOR MOBILE EQUIPMENT

Receptacles

Connectors

Wiring Consolidation

Mil-Spec

Custom Plug and Play Wiring Harness

Wiring Consolidation

Easy and accessible wiring consolidation from sensors and devices.

VB2 SPLITTER

JUNCTION BOX

Benefits & Features:

- Maintain, identify and consolidate wiring from multiple I/O points.
- Die-cast aluminum or industrial hardened plastic box housings
- Integral cable or quick-disconnect homerun cable
- 4-pin single or 5-pin dual outputs per port and power and signal LEDs
- Customization available

Custom Capabilities

Custom Wire Harness designed to your specifications.

Benefits & Features:

- Engineering and Technical design support
- Quick delivery
- High quality robust construction
- Low to High volume
- Endless possibilities, one manufacturer

Our Capabilities:

- 1800 different varieties of cable and wires
- 500 different styles of OEM connectors
- Custom overmold capabilities
- 100% functionally tested
- Rapid prototypes
- Custom marking and labelling

Harsh Duty Connectors

Harsh Duty Plug & Play Connectors.

DEUTSCH DT-SERIES

OVERMOLDED MIL-SPEC

MINIFAST CONNECTORS

Benefits & Features:

- IP67 & IP69K environmentally sealed
- Antivibration features to withstand continuous vibration and shock
- Abrasion, Oil and Cut-Through resistant cable jackets
- Multi-pin configurations
- Customization available

DEUTSCH DT-SERIES CONNECTORS

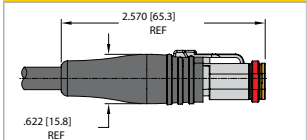
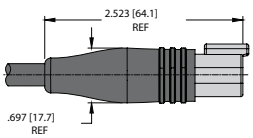
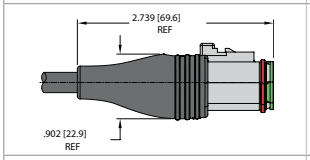
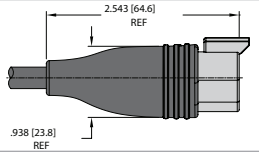
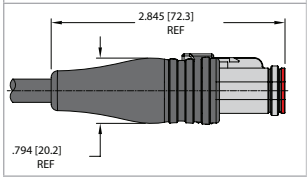
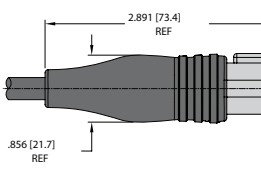
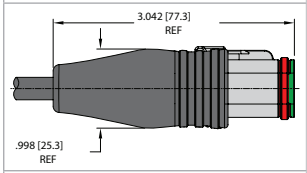
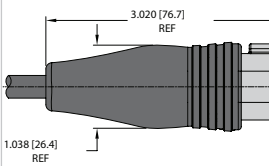
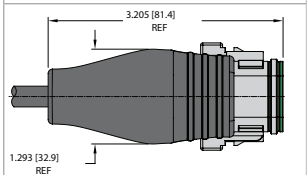
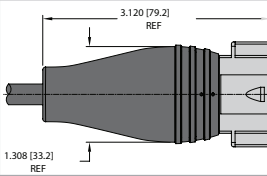
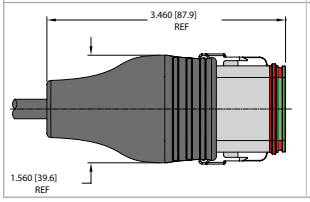
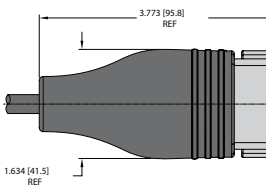
TURCK's Deutsch DT Series connectors feature a fully encapsulated rugged overmold ensuring longevity in demanding environments where shock, vibration, cold temperature, moisture and oils can affect performance.

Product Highlights

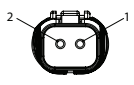
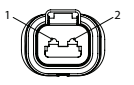
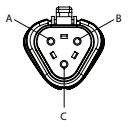
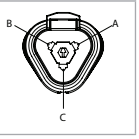
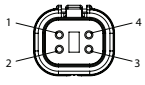
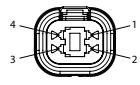
- Solid contacts
- Meets IEC IP67
- TPU connector body

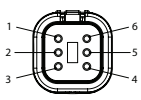
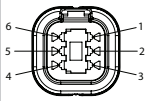
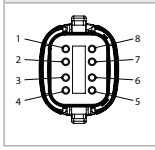
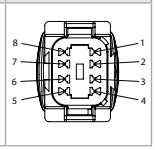
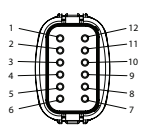
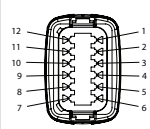
Cable Features

- 18 AWG Conductors
- Cut-Through and Abrasion resistant TPE
- Flexible and Oil Resistant
- Temperature range -40°C to 105°C
- Sunlight Resistant
- Cold Bend rated to -40°C

Female	Male	Application	Female	Male	Extension	End View with Pinout
		2-wire	DT06-2S-2125-*M	DT04-2P-2125-*M	DT06-2S-2125-*M-DT04-2P	1. WH 2. BK
		3-wire	DT06-3S-2145-*M	DT04-3P-2145-*M	DT06-3S-2145-*M-DT04-3P	A. GN B. BK C. WH
		4-wire	DT06-4S-2146-*M	DT04-4P-2146-*M	DT06-4S-2146-*M-DT04-4P	1. BK 3. RD 2. WH 4. GN
		6-wire	DT06-6S-2132-*M	DT04-6P-2132-*M	DT06-6S-2132-*M-DT04-6P	1. WH 4. OG 2. RD 5. BK 3. GN 6. BU
		8-wire	DT06-8S-2156-*M	DT04-8P-2156-*M	DT06-8S-2156-*M-DT04-8P	1. OG 5. WH 2. BU 6. RD 3.WH/BK 7. GN 4. BK 8.RD/BK
		12-wire	DT06-12SA-2157-*M	DT04-12PA-2157-*M	DT06-12SA-2157-*M-DT04-12PA	1. OG 7.BU/BK 2. BU 8.BK/WH 3.WH/BK 9. GN 4.RD/BK 10. RD 5.GN/BK 11. WH 6.OG/BK 12. BK

Pinouts

Female 2 pin	Male 2 pin	Female 3 pin	Male 3 pin	Female 4 pin	Male 4 pin
					

Female 6 pin	Male 6 pin	Female 8 pin	Male 8 pin	Female 12 pin	Male 12 pin
					

* Length in meters.
For other combinations or cable options, consult factory

VALVE CONNECTOR, TYPE "A" (18 mm)

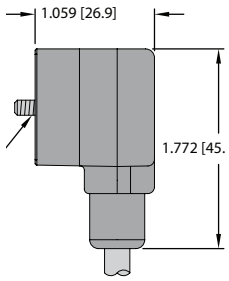
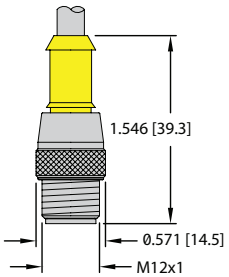
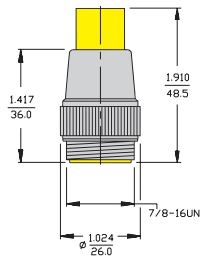
TURCK carries a full line of Industry standard style valve connectors with LED and surge suppression options. Embedded LEDs provide superior protection against breakage and material buildup. Additional styles available include: DIN Form B, I/S (Industrial Standard) Form B, DIN Form C, I/S Form C.

Cable Features

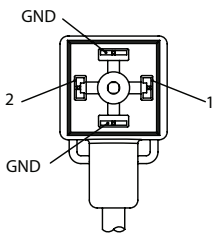
- 18 AWG Conductors
- Cut-Through and Abrasion resistant TPU
- Flexible and Oil Resistant
- Temperature 90°C

Product Highlights

- Conforms to EN 175301-803 Form A Standard (replacing DIN 43650)
- Vibration and Mechanically Shock compliant to IEC 60512-6-4
- Meets NEMA 1, 3, 4, 6P and IEC IP67
- Embedded LED
- Molded in Gasket
- TPU connector body

Housing	Application	No LED	Indicator LED	Indicator LED & MOV	Indicator LED & Diode
	Pigtail, 1.BK1, 2. BK2, GND-GN/YE	VAS 22-A669-*M	VAS 22 B669-*M	VAS 22-D669-*M	VAS 22-F669-*M
	Extension to ***eurofast***®, M12	VAS 22-A669-*M-RS 5.3T	VAS 22 B669-*M-RS 5.3T	VAS 22-D669-*M-RS 5.3T	VAS 22-F669-*M-RS 5.3T
	Extension to ***minifast***®, 7/8"	VAS 22-A669-*M-RSM 30	VAS 22 B669-*M-RSM 30	VAS 22-D669-*M-RSM 30	VAS 22-F669-*M-RSM 30

End View



* Length in meters.
For top exit cabling, replace the V with H (e.g., HAS 22-A669-*M)
For other combinations or cable options, consult factory

OVERMOLDED MIL-SPEC CONNECTORS

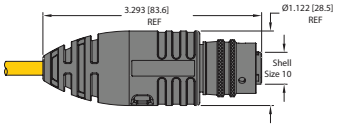
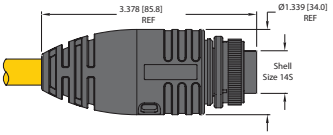
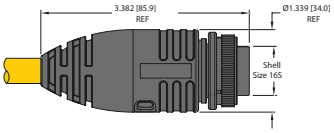
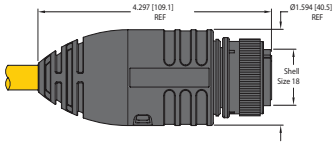
Overmolded Mil-Spec connectors provide a robust solution for connecting to instrumentation devices.

Cable Features

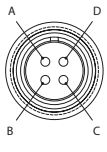
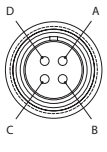
- Cut-Through and Abrasion resistant TPU
- Flexible and Oil Resistant
- Temperature 90°C

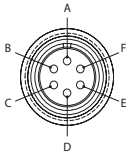
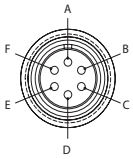
Product Highlight

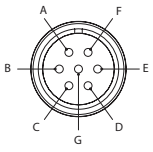
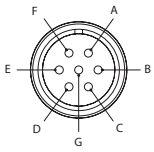
- Saves time over field assembled connectors
- Meets IEC IP68
- Integral lanyard hole
- Threaded or bayonet options

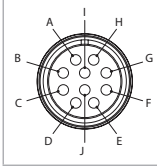
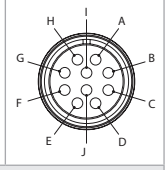
Housing	Application	Wire Size	Style	Female	Male	Pinout
	6-wire	24 AWG	Bayonet	MS 3116M-10-6S-0728-*	MS 3116M-10-6P-0728-*	A. WH D. GY B. BN E. BK C. PK F. BU
	4-wire	18 AWG	Threaded	MS 3106M-14S-2S-0544-*	MS 3106M-14S-2P-0544-*	A. BU B. BN C. WH D. BK
	7-wire	18 AWG	Threaded	MS 3106M-16S-1S-676-*	MS 3106M-16S-1P-676-*	A. WH E. GY B. BN F. GN/YE C. GN G. BU D. YE
	10-wire	16 AWG	Threaded	MS 3106M-18-1S-1141-*	MS 3106M-18-1P-1141-*	A. OG, F. OG/BK B. BU G. RD C. WT/BK H. GN D. RD/BK I. BK E. GN/BK J. WH

Pinout

Female	Male
	
4-wire	

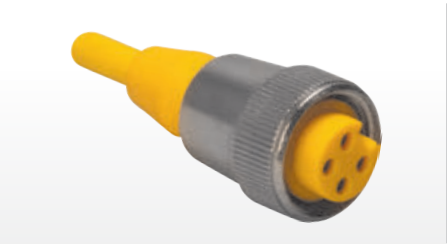
Female	Male
	
6-wire	

Female	Male
	
7-wire	

Female	Male
	
10-wire	

* Length in meters.
For other combinations or cable options, consult factory

minifast® 7/8" CONNECTORS



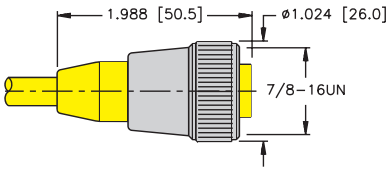
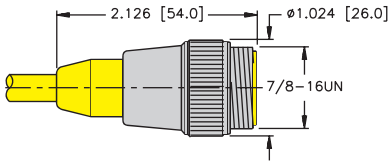
3, 4, 5 and 6-wire ***minifast***® Cordsets rise to the challenge of tough applications.

Cable Features

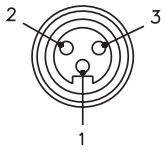
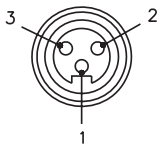
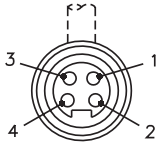
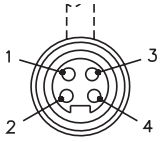
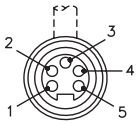
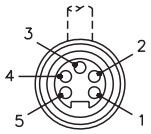
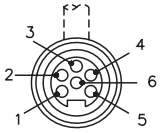
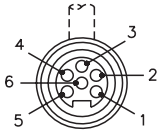
- 18 AWG Conductors
- Cut-Through and Abrasion resistant TPU
- Flexible and Oil Resistant
- Temperature range 90°C

Product Highlight

- 9A (3-5 wire), 8A (6 wire), 600VAC/DC
- Nickel plated brass coupling nut
- Meets NEMA 1, 3, 4, 6P and IEC IP68
- Conforms to ANSI B93.55M-1981 & SAE H1738-2
- Right and Straight configurations
- TPU connector body
- Pull rated to SAE H1738-2

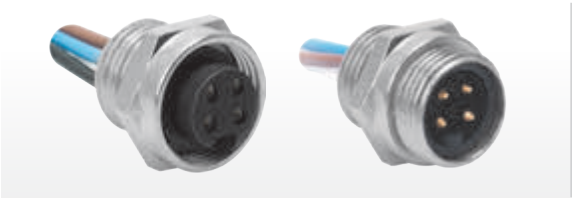
Housing	Application	Female	Male	Extension cable	Pinout
	3-wire	RKM 30-*M/S90	RSM 30-*M/S90	RSM RKM 30-*M	1. GN/YE 2. BN 3. BU
	4-wire	RKM 40-*M/S90	RSM 40-*M/S90	RSM RKM 40-*M	1. BN 2. WH 3. BU 4. BK
	5-wire	RKM 50-*M/S90	RSM 50-*M/S90	RSM RKM 50-*M/S90	1. BK 2. BU 3. GN/YE 4. BN 5. WH
	6-wire	RKM 61-*M/S90	RSM 61-*M/S90	RSM RKM 61-*M/S90	1. GN 2. WH 3. BU 4. GY 5. YE 6. BN

Pinouts

Female 3 pin	Male 3 pin	Female 4 pin	Male 4 pin
			
Female 5 pin	**Male 5 pin**	**Female 6 pin**	**Male 6 pin**
			

* Length in meters.
For right angle version, replace R with W (e.g., WKM 30-*M/S90)
For Stainless steel, add V to part description (e.g., RKV 30-*/S90)
For other combinations or cable options, consult factory
UL * c(UL) listed

minifast® 7/8" PANEL MOUNT RECEPTACLES



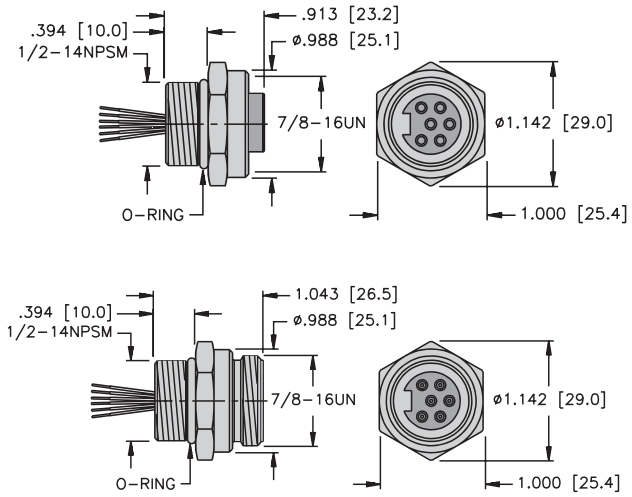
3, 4, 5 and 6-wire panel mount receptacles

Wire Features

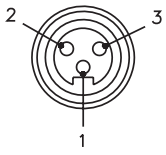
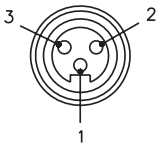
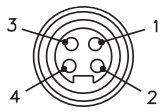
- 18 AWG PVC Conductors
- Temperature range -40°C to 105°C

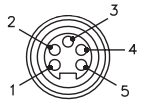
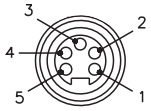
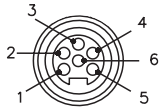
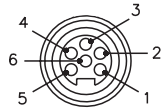
Product Highlight

- 9A (3-5 wire), 8A (6-wire), 600VAC/DC
- Nickel plated brass coupling nut
- Meets NEMA 1, 3, 4, 6P and IEC IP67
- Conforms to ANSI B93.55M-1981 & SAE H1738-2
- 1/2-NPSM thread, other threads available

Housing	Application	Female	Male	Pinout
	3-wire	RKF 30-*M	RSF 30-*M	1. GN/YE 2. BN 3. BU
	4-wire	RKF 40-*M	RSF 40-*M	1. BN 2. WH 3. BU 4. BK
	5-wire	RKF 50-*M	RSF 50-*M	1. BK 2. BU 3. GN/YE 4. BN 5. WH
	6-wire	RKF 61-*M	RSF 61-*M	1. GN 2.WH 3. BU 4. GY 5. YE 6. BN

Pinouts

Female 3 pin	Male 3 pin	Female 4 pin	Male 4 pin
			

Female 5 pin	Male 5 pin	Female 6 pin	Male 6 pin
			

Additional mounting threads available	
1/2-14NPT	M20x1.5

Add Suffix	
NPT	M20

* Length in meters.
For Stainless steel, add V to part description (e.g., RKFV 30-*M)
For other combinations or cable options, consult factory
UL * c(UL) listed

minifast® 1" & 1 1/8" CONNECTORS

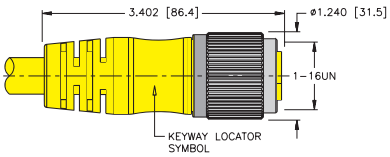
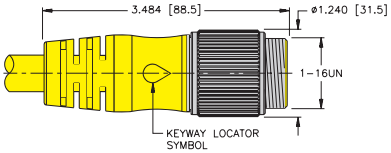
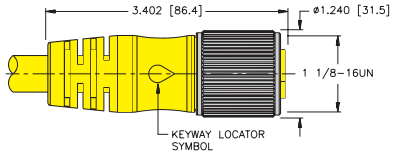
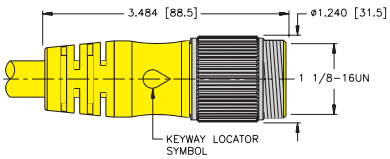
6, 7, 8, 9, 10, 12 and 19-wire ***minifast***® Cordsets rise to the challenge of tough applications.

Cable Features

- 16 AWG Conductors
- Cut-Through and Abrasion resistant TPU
- Flexible and Oil Resistant
- Temperature 90°C

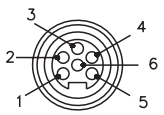
Product Highlight

- 8A (6-8 wire), 7A (9-12 wire), 4A/2A (19-wire) 600VAC/DC
- Nickel plated brass coupling nut
- Meets NEMA 1, 3, 4, 6P and IEC IP68
- Conforms to ANSI B93.55M-1981 & SAE H1738-2

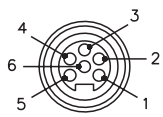
Housing	Application	Female	Male	Extension cable	Pinout
	6-wire	RKM 6B6-*M/S90	RSM 6B6-*M/S90	RSM RKM 6B6-*M/S90	1. OG 2. BU 3. BK 4. WH 5. RD 6. GN
	7-wire	RKM 76-*M/S90	RSM 76-*M/S90	RSM RKM 76-*M/S90	1. WH/BK 2. BK 3. WH 4. RD 5. OG 6. BU 7. GN
	8-wire	RKM 86-*M/S90	RSM 86-*M/S90	RSM RKM 86-*M/S90	1. OG 2. BU 3. WH/BK 4. BK 5. WH 6. RD 7. GN 8. RD/WK
	9-wire	RKM 96-*M/S90	RSM 96-*M/S90	RSM RKM 96-*M/S90	1. OG 2. BU 3. RD/BK 4. GN/BK 5. WH 6. RD 7. GN 8. WH/BK 9. BK
	10-wire	RKM 106-*M/S90	RSM 106-*M/S90	RSM RKM 106-*M/S90	1. OG 2. BU 3. WH/BK 4.RD/BK 5.GN/BK 6. OG/BK 7. RD 8. GN 9. BK 10. WH
	12-wire	RKM 126-*M/S90	RSM 126-*M/S90	RSM RKM 126-*M/S90	1. OG 2. BU 3. WH/BK 4.RD/BK 5.GN/BK 6.OG/BK 7.BU/BK 8.BK/WH 9. GN 10. RD 11.WH 12.BK
	19-wire	RKM 190-*M/S90	RSM 190-*M/S90	RSM RKM 196-*M/S90	1. VT 2. RD 3. GY 4.RD/BU 5. BU 6. GN 7. BN 8.WH/GN 9.WH/YE 10. WH/GY 11. BK 12.GN/YE 13.YE/BN 14.BN/GN 15. WH 16. YE 17. PK 18.GY/BN 19.GY/PK

Pinouts

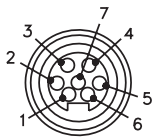
Female 6 pin



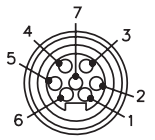
Male 6 pin



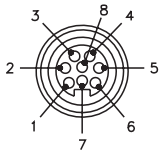
Female 7 pin



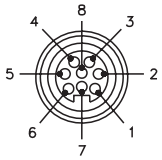
Male 7 pin



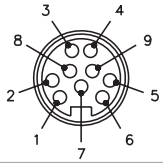
Female 8 pin



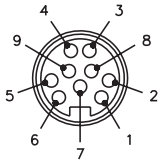
Male 8 pin



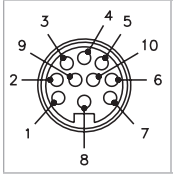
Female 9 pin



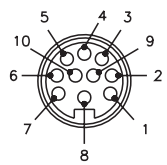
Male 9 pin



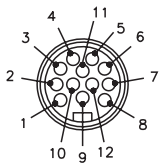
Female 10 pin



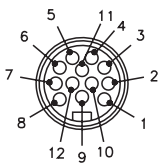
Male 10 pin



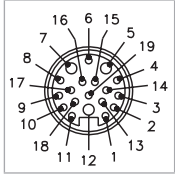
Female 12 pin



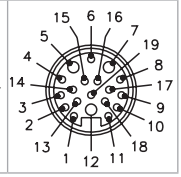
Male 12 pin



Female 19 pin



Male 19 pin

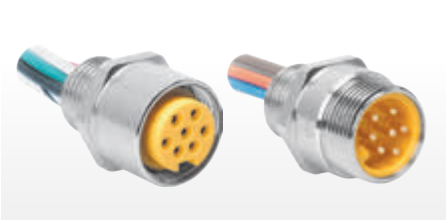


* Length in meters.
For right angle version, replace R with W (e.g., WKM 6B6-*M/S90)
For Stainless steel, add V to part description (e.g., RKV 6B6-*M/S90)
For other combinations or cable options, consult factory
UL * c(UL) listed

Additional mounting threads available	
1/2-14NPT	3/4-14NPT

Add Suffix	
14.5/NPT	14.75/NPT

minifast® 1" & 1 1/8" PANEL MOUNT RECEPTACLES



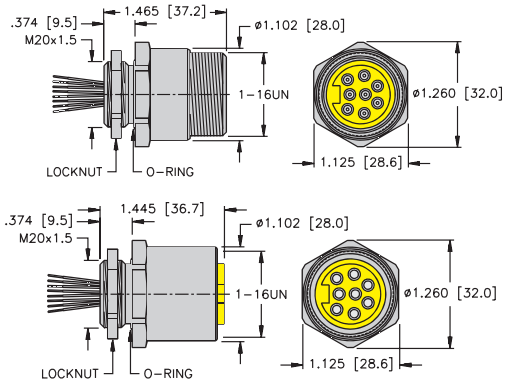
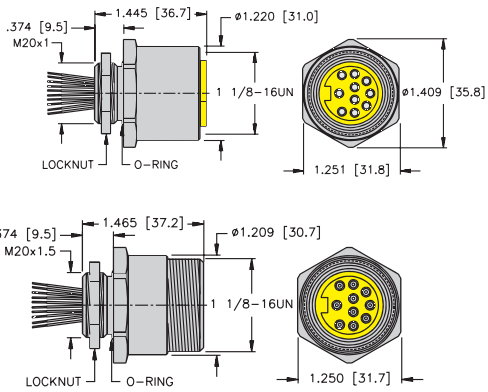
6, 7, 8, 9, 10, 12 and 19-wire
minifast® Receptacles

Wire Features

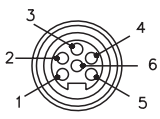
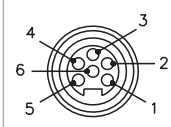
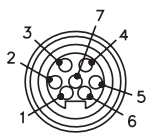
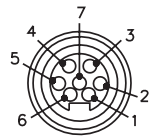
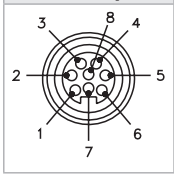
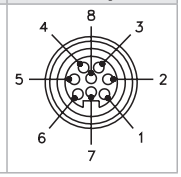
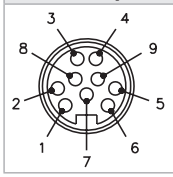
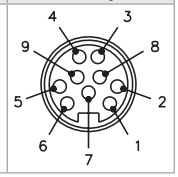
- 16 AWG Conductors
- Temperature range -40°C to 105°C

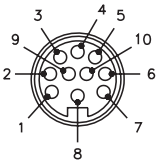
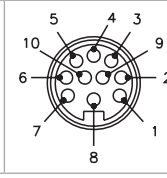
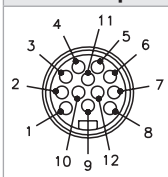
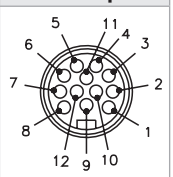
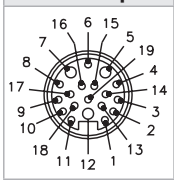
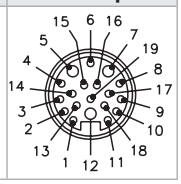
Product Highlight

- 8A (6-8 wire), 7A (9-12 wire), 4A/2A (19-wire) 600VAC/DC
- Nickel plated brass coupling nut
- Meets NEMA 1, 3, 4, 6P and IEC IP68
- Conforms to ANSI B93.55M-1981 & SAE H1738-2
- M20 thread, other threads available

Housing	Application	Female	Male	Pinout
	6-wire	RKF 6B6-*M/M20	RSF 6B6-*M/M20	1. OG 2. BU 3. BK 4. WH 5. RD 6. GN
	7-wire	RKM 76-*M/M20	RSF 76-*M/M20	1. WH/BK 2. BK 3. WH 4. RD 5. OG 6. BU 7. GN
	8-wire	RKF 86-*M/M20	RSF 86-*M/M20	1. OG 2. BU 3.WH/BK 4. BK 5. WH 6. RD 7. GN 8.RD/WK
	9-wire	RKF 96-*M/M20	RSF 96-*M/M20	1. OG 2. BU 3.RD/BK 4.GN/BK 5. WH 6. RD 7. GN 8.WH/BK 9. BK
	10-wire	RKF 106-*M/M20	RSF 106-*M/M20	1. OG 2. BU 3.WH/BK 4.RD/BK 5.GN/BK 6. OG/BK 7. RD 8. GN 9. BK 10. WH
	12-wire	RKF 126-*M/M20	RSF 126-*M/M20	1. OG 2. BU 3.WH/BK 4.RD/BK 5.GN/BK 6.OG/BK 7.BU/BK 8.BK/WH 9. GN 10. RD 11.WH 12.BK
	19-wire	RKF 196-*M/M20	RSF 196-*M/M20	1. VT 2. RD 3. GY 4.RD/BU 5. BU 6. GN 7. BN 8.WH/GN 9.WH/YE 10. WH/GY 11. BK 12.GN/YE 13.YE/BN 14.BN/GN 15. WH 16. YE 17. PK 18.GY/BN 19.GY/PK

Pinouts

Female 6 pin	Male 6 pin	Female 7 pin	Male 7 pin	Female 8 pin	Male 8 pin	Female 9 pin	Male 9 pin
							

Female 10 pin	Male 10 pin	Female 12 pin	Male 12 pin	Female 19 pin	Male 19 pin
					

* Length in meters.
For Stainless steel, add V to part description (e.g., RKFV 6B6-*M/M20)
For other combinations or cable options, consult factory
UL * c(UL) listed

M12 CONNECTORS

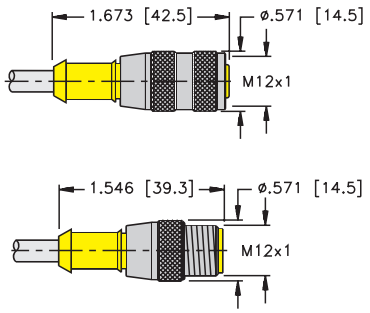
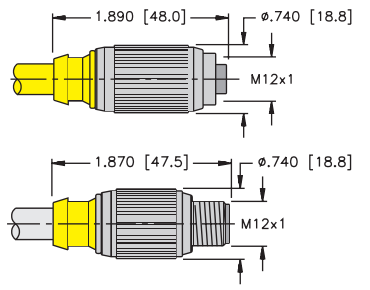
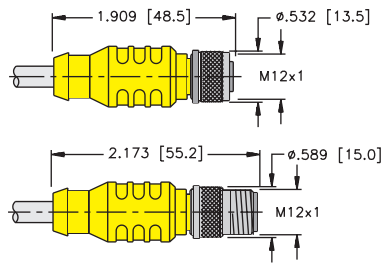
3, 4 and 5-wire M12 ***eurofast***® Cordsets provide reliable and rugged sensor and signal connections.

Cable Features

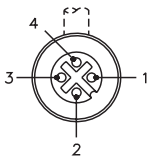
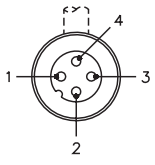
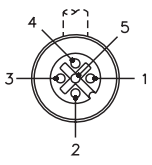
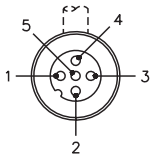
- 22 AWG or 18 AWG PVC Conductors
- Cut-Through and Abrasion resistant TPU
- Flexible and Oil Resistant
- Temperature 90°C

Product Highlight

- 4A, 250V
- Nickel plated brass coupling nut
- Meets IP67
- Shielded assembly provides RFI/EMI Protection
- Anti-vibration coupling nuts
- Right and Straight configurations
- TPU connector body

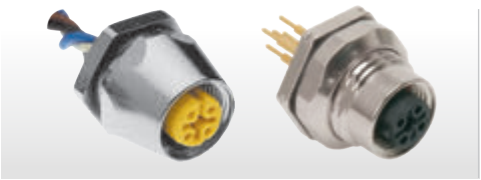
Housing	Application	Female	Male	Extension cable	Pinouts
	3-wire	RK 4T-*/S90	RS 4T-*/S90	RK 4T-*-RS 4T/S90	1. BN 2. N/C 3. BU 4. BK
	4-wire	RK 4.4T-*/S90	RS 4.4T-*/S90	RK 4.4T-*-RS 4.4T/S90	1. BN 2. WH 3. BU 4. BK
	5-wire	RK 4.5T-*/S90	RS 4.5T-*/S90	RK 4.5T-*-RS 4.5T/S90	1. BN 2. WH 3. BU 4. BK 5. GY
	4-wire	RKG 4.4T-*/S90	RSG 4.4T-*/S90	RKG 4.4T-*-RSG 4.4T/S90	1. BN 2. WH 3. BU 4. BK
	4-wire shielded to the coupling nut	RKS 4.4T-*/S90	RSS 4.4T-*/S90	RKS 4.4T-*-RSS 4.4T/S90	

Pinouts

Female 4 pin	Male 4 pin	Female 5 pin	Male 5 pin
			

* Length in meters.
For right angle version, replace R with W (e.g., WK 4T-*/S90)
For Stainless steel, add V to part description (e.g., RKV 4T-*/S90)
For other combinations or cable options, consult factory
UL * c(UL) listed

M12 PANEL MOUNT RECEPTACLES



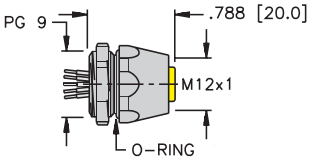
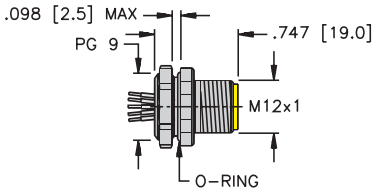
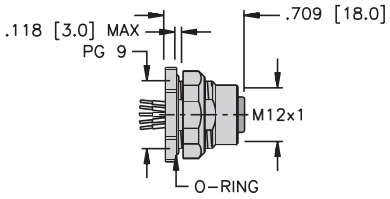
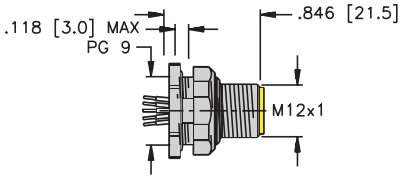
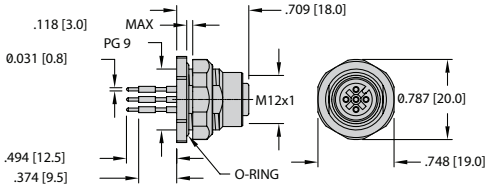
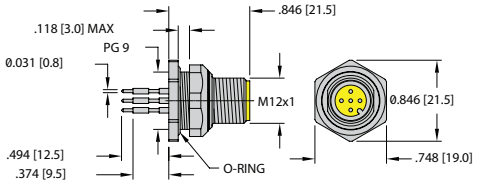
4 and 5-wire panel mount receptacles available in front or rear mount. Wire or PCB termination.

Wire Features

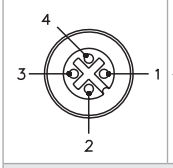
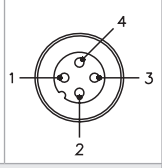
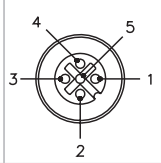
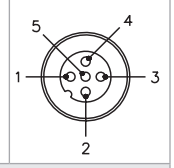
- 22 AWG PVC Conductors
- Temperature range -40°C to 105°C

Product Highlight

- 4A, 250V
- Nickel plated brass housing
- Meets NEMA 1, 3, 4, 6P and IEC IP68

Housing	Application	Female	Male	Pinouts
	4-wire front mount	FK 4.4-*	FS 4.4-*	1. BN 2. WH 3. BU 4. BK
	5-wire front mount	FK 4.5-*	FS 4.5-*	1. BN 2. WH 3. BU 4. BK 5. GY
	4-wire rear mount	FKFD 4.4-*	FSFD 4.4-*	1. BN 2. WH 3. BU 4. BK
	5-wire front mount	FKFD 4.5-*	FSFD 4.5-*	1. BN 2. WH 3. BU 4. BK 5. GY
	4 pin PCB	FKFD 4.4	FSFD 4.4	-
	5 pin PCB	FKFD 4.5	FSFD 4.5	-

Pinout

Female	Male	Female	Male
			
4-wire		5-wire		

Additional mounting threads available				
1/4-18 NPT	1/2-14 NPSM	1/2-14NPT	M20x1.5	PG 13.5

Add Suffix				
/18.25	/14.5	/14.5/NPT	/M20	/PG13.5

* Length in meters.
For Stainless steel, add V to part description (e.g., FKV 4.4-*)
For other combinations or cable options, consult factory
UL * c(UL) listed

M12 JUNCTION BOXES : 4 PORT

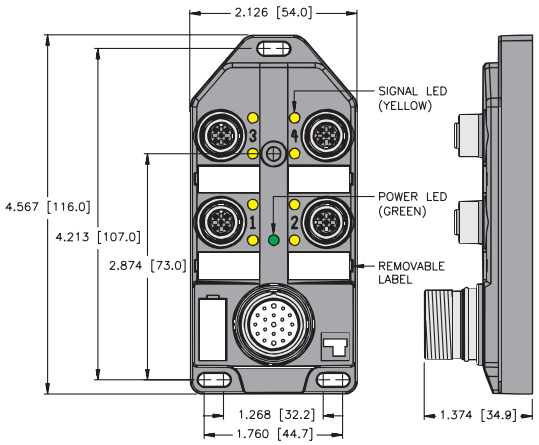
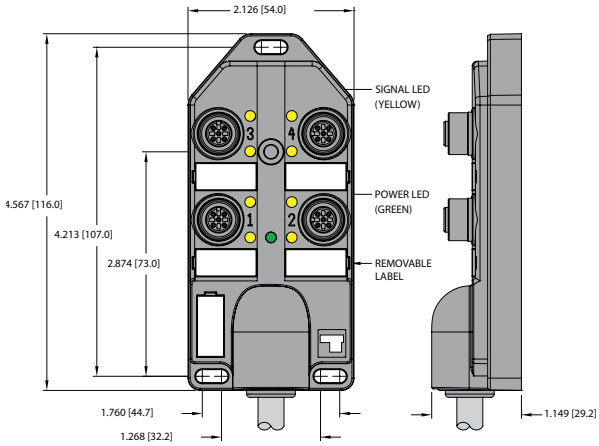
Consolidate up to 8 I/O signals in these compact, low profile housings.

Cable Features

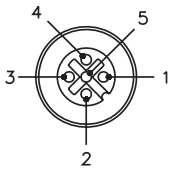
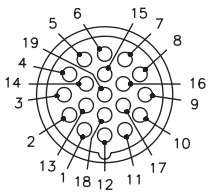
- Cut-Through and Abrasion reistant TPU
- Flexible and Oil Resistant
- Temperature 90°C

Product Highlight

- 2A per signal, 9A total
- 10-30VDC
- Meets IEC IP67, 69k
- Available with or without LEDs
- -40°C to 85°C
- Homerun connector or cable options

Housing	Homerun	No LED	PNP LED	Mating Homerun Cordset
	**4-Port; One signal per port**			
	M23 connector	4MB12Z-4-CS12	4MB12Z-4P2-CS12	CKCM 12-7-*/S90
	Cable	4MB12Z-4-*/S90	4MB12Z-4P2-*/S90	-
	**4-Port; Two signals per port**			
	M23 connector	4MB12Z-5-CS19	4MB12Z-5P2-CS19	CKM 19-11-*/S90
	Cable	4MB12Z-5-*/S90	4MB12Z-5P2-*/S90	-

Pinout

Female	Male
	
5-Pin M12 *eurofast*®	**19-Pin M23 *multifast*®**

UL * c(UL) listed

M12 JUNCTION BOXES : 6 PORT

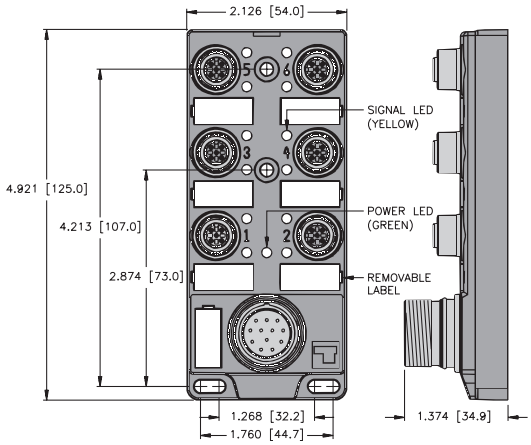
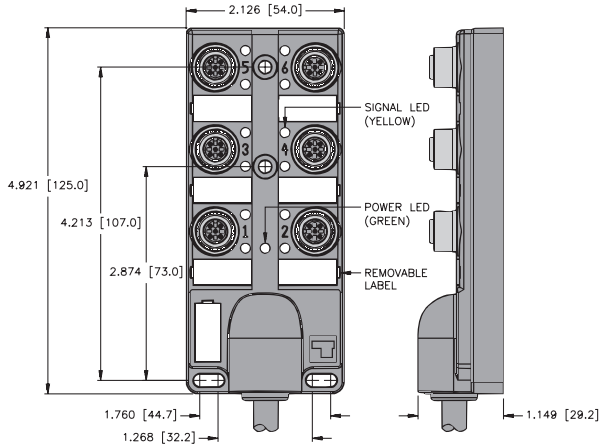
Consolidate up to 12 I/O signals in these compact, low profile housings.

Cable Features

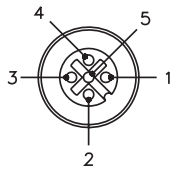
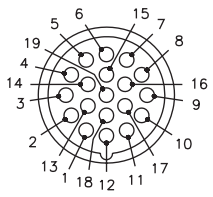
- Cut-Through and Abrasion reistant TPU
- Flexible and Oil Resistant
- Temperature 90°C

Product Highlight

- 2A per signal, 9A total
- 10-30VDC
- Meets IEC IP67, 69k
- Available with or without LEDs
- -40°C to 85°C
- Homerun connector or cable options

Housing	Homerun	No LED	PNP LED	Mating Homerun Cordset
	**6-Port; One signal per port**			
	M23 connector	6MB12Z-4-CS12	6MB12Z-4P2-CS12	CKCM 12-9-*/S90
	Cable	6MB12Z-4-*/S90	6MB12Z-4P2-*/S90	-
	**6-Port; Two signals per port**			
	M23 connector	6MB12Z-5-CS19	6MB12Z-5P2-CS19	CKM 19-15-*/S90
	Cable	6MB12Z-5-*/S90	6MB12Z-5P2-*/S90	-

Pinout

Female	Male
	
5-Pin M12 *eurofast*®	**19-Pin M23 *multifast*®**

UL * c(UL) listed

M12 JUNCTION BOXES : 8 PORT

Consolidate up to 16 I/O signals in these compact, low profile housings.

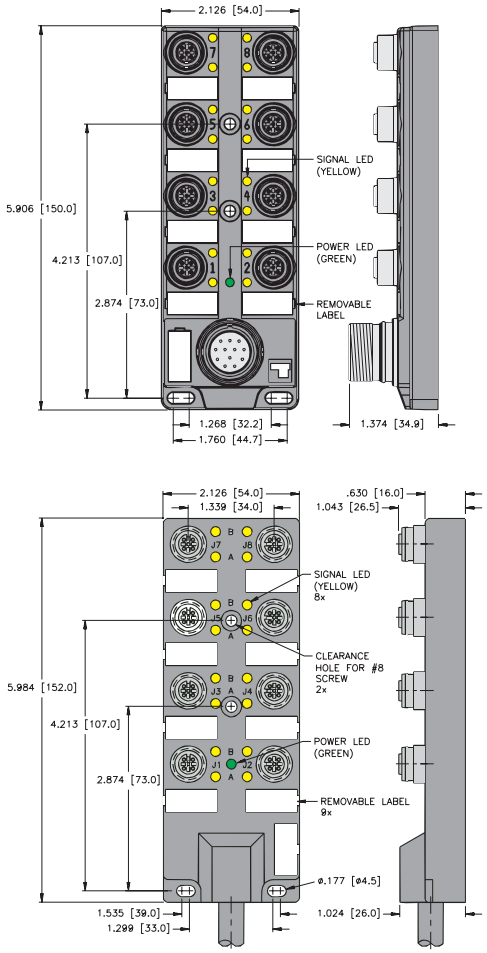
Cable Features

- Cut-Through and Abrasion reistant TPU
- Flexible and Oil Resistant
- Temperature 90°C

Product Highlight

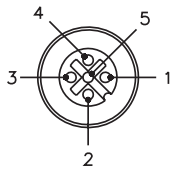
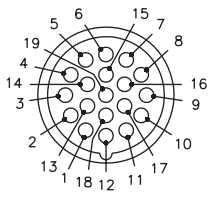
- 2A per signal, 9A total
- 10-30VDC
- Meets IEC IP67, 69k
- Available with or without LEDs
- -40°C to 85°C
- Homerun connector or cable options

Housing



Homerun	No LED	PNP LED	Mating Homerun Cordset
8-Port; One signal per port			
M23 connector	8MB12Z-4-CS12	8MB12Z-4P2-CS12	CKCM 12-11-*/S90
Cable	8MB12Z-4-*/S90	8MB12Z-4P2-*/S90	-
8-Port; Two signals per port			
M23 connector	8MB12Z-5-CS19	8MB12Z-5P2-CS19	CKM 19-19-*/S90
Cable	8MB12Z-5-*/S90	8MB12Z-5P2-*/S90	-

Pinout

Female	Male
	
5-Pin M12 *eurofast*®	**19-Pin M23 *multifast*®**

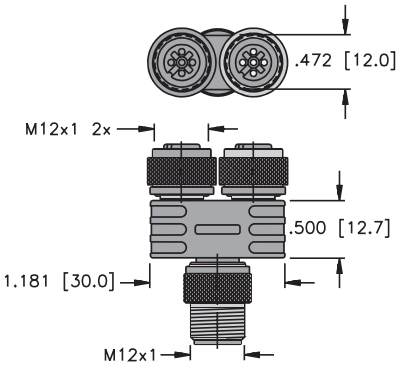
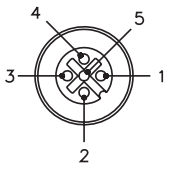
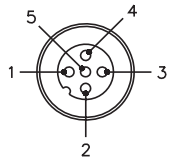
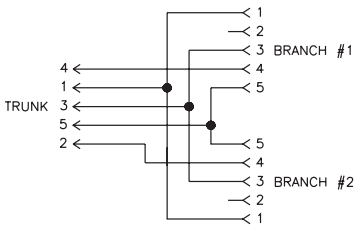
UL * c(UL) listed

M12 SPLITTERS

Consolidate two signals into one connector in a compact, rugged mold body.

Product Highlight

- Up to 4A, 30V
- Nickel plated brass coupling nuts
- Meets IEC IP67
- Anti-vibration coupling nuts
- TPU connector body

Housing	Part Number	Pinout	Wiring Diagrams
	YB2-FSM 4.5-2FKM 4.5	Female  Male 	

UL * c(UL) listed

M23 CONNECTORS

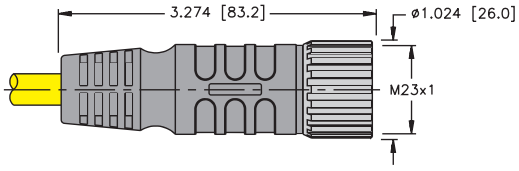
Rugged, high density homerun cordsets for M12 junction boxes.

Cable Features

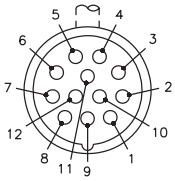
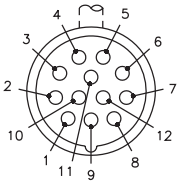
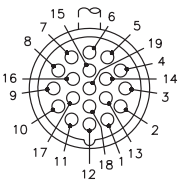
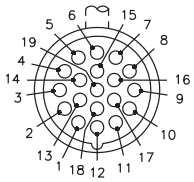
- Cut-Through and Abrasion reistant TPU
- Flexible and Oil Resistant
- Temperature 90°C
- Foil shield with drain

Product Highlight

- Up to 9A, up to 300V
- Nickel plated brass coupling nut
- Meets IEC IP67
- Straight and angle configurations
- TPU connector body
- UL Listed

Housing	Application	Female	Extension Cable	Pinout
	4-port, 1 signal/port	CKCM 12-7-*/S90	CSCM CKCM 12-7-*/S90	1. WH 2. GN 3. YE 4. GY 10. BU 11. BN 12.GN/YE
	6-port, 1 signal/port	CKCM 12-9-*/S90	CSCM CKCM 12-9-*/S90	1. WH 2. GN 3. YE 4. GY 5. PK 6. RD 10. BU 11. BN 12. GN/YE
	8-port, 1 signal/port	CKCM 12-11-*/S90	CSCM CKCM 12-11-*/S90	1. WH 2. GN 3. YE 4. GY 5. PK 6. RD 7. BK 8. VT 10. BU 11. BN 12. GN/YE
	4-port, 2 signals/port	CKM 19-11-*/S90	CSM CKM 19-11-*/S90	3. GY 4.RD/BU 5. GN 6. BU 7.GY/PK 8.WH/GN 12.GN/YE 14.BN/GN 15. WH 16. YE 19. BN
	6-port, 2 signals/port	CKM 19-15-*/S90	CSM CKM 19-15-*/S90	2. RD 3. GY 4.RD/BU 5. GN 6. BU 7.GY/PK 8.WH/GN 9.WH/YE 12.GN/YE 13.YE/BN 14.BN/GN 15. WH 16. YE 17. PK 19. BN
	8-port, 2 signals/port	CKM 19-19-*/S90	CSM CKM 19-19-*/S90	1. VT 2. RD 3. GY 4.RD/BU 5. GN 6. BU 7.GY/PK 8.WH/GN 9.WH/YE 10.WH/GY 11.BK 12.GN/YE 13.YE/BN 14.BN/GN 15.WH 16.YE 17.PK 18.GY/BN 19.BN

Pinouts

Female 12 pin	Male 12 pin	Female 19 pin	Male 19 pin
			

* Length in meters.
For right angle version, change description to CKCWM 12-7-*/S90 or CKWM 19-11-*/S90, for example
For Stainless steel, add V to part description, (e.g., CKCMV 12-11-*/S90)
For other combinations or cable options, consult factory
UL * c(UL) listed

Notes

Notes

FIELDBUS TECHNOLOGY

FOR MOBILE EQUIPMENT

TBEN

BL-Compact

RFID

Fieldbus Technology

TURCK provides a complete line of distributed I/O products for most common industrial fieldbus protocols, including modular and block I/O systems, in-cabinet and on-machine I/O, decentralized intelligence with programmable systems conforming to IEC 61131, and innovative technologies such as RFID.

Distributed I/O products from TURCK provide a variety of configurations to suit the needs of any application. All platforms provide the ability to reduce time and costs during a project's planning, installation, commissioning and operation phases.

TURCK's block I/O solutions include the BL compact™ and rugged TBEN block I/O stations. These distributed I/O stations are capable of providing RFID capabilities and a variety of I/O signals in a wide range of industrial network protocols. Signals include digital/discrete, analog, temperature, counter, RS485, RS232, and SSI inputs.

TURCK also offers modular I/O systems, BL20 and BL67, which provide a high degree of flexibility to varying types of applications. The BL20 is an in-cabinet I/O system that includes flexible gateway options in a variety of fieldbus protocols, decentralized control/programmability via CoDeSys, and IEC 61131-3 programming environment. BL67 combines all of the flexibility of an in cabinet I/O system with ruggedness and connectorization in an IP67 housing. Both BL families support TURCK's BL ident® RFID system.

TURCK products have some of the highest tolerances to environmental extremes on the market. Block I/O products are rated from -40°C to 70°C and are protected up to IP69K. These parts are able to withstand the rugged environmental conditions often found in mobile equipment applications.

TBEN Block I/O

BL compact®

For Harsh Environments:

Block I/O Stations – Compact I/O

Multiprotocol Industrial Ethernet Stations:

- Multiprotocol Industrial Ethernet: EtherNet/IP, Modbus TCP, PROFINET
- Available with up to 16 channels of I/O
- Universal I/O option – each channel can be an input or output.
- Per point diagnostics available
- Available with: IO link master

BL compact® – flexible, compact I/O

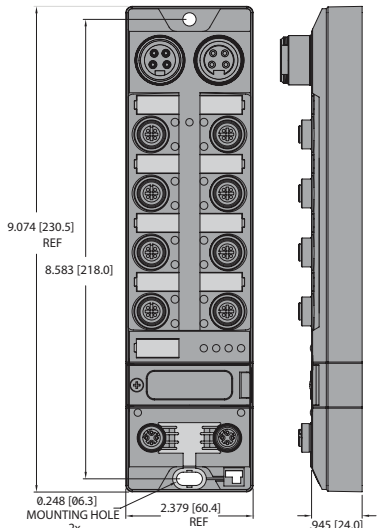
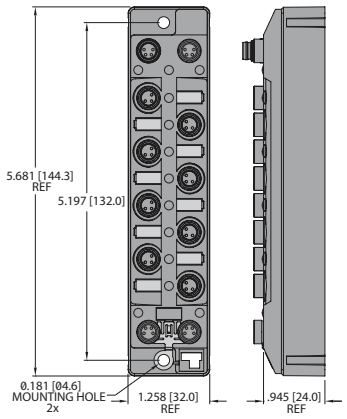
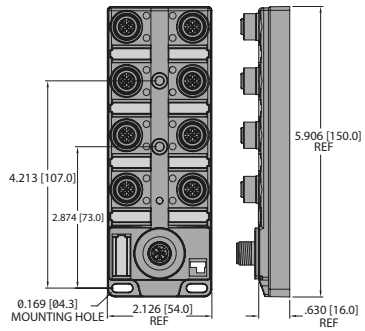
Protocols Supported:

- Multiprotocol Industrial Ethernet
- EtherCAT
- DeviceNet, PROFIBUS-DP and CANopen

Configurable I/O:

- Digital I/O
- Full line of analog I/O (current, voltage and temperature)
- RFID
- Signal types can be easily combined for custom modules

- Multiprotocol: 1 device = 3 protocols (EtherNet/IP, Modbus TCP, PROFINET)
- Integrated Ethernet switch
- Auxiliary power connection
- CE, cULus certifications
- Fiberglass Reinforced Nylon Housing (fully potted)
- IP67/IP69k
- Operating temperature: -40° to 70°C (-40° to 158°F)

Housing	Part Number	No. of Inputs	No. of Outputs	I/O Type	Notes
	TBEN-L1-16DIP	16		Discrete	
	TBEN-L1-8DIP-8DOP	8	8	Discrete	High Power 2A Outputs
	TBEN-L1-16DOP		16	Discrete	High Power 2A Outputs
	TBEN-L1-16DXP	16	16	Configurable Discrete	High Power 2A Outputs, 16 Configurable Input or Output Channels
	TBEN-L4-16DIP	16		Discrete	4 Pin Aux Power Connector
	TBEN-L4-8DIP-8DOP	8	8	Discrete	High Power 2A Outputs, 4 Pin Aux Power Connector
	TBEN-L4-16DOP		16	Discrete	High Power 2A Outputs, 4 Pin Aux Power Connector
	TBEN-L4-16DXP	16	16	Configurable Discrete	High Power 2A Outputs, 16 Configurable Input or Output Channels, 4 Pin Aux Power Connector
	TBEN-L1-EN1				Ethernet Spanner
	TBEN-S1-8DIP	8		Discrete	M8 Power and Signal Connectors
	TBEN-S1-4DIP-4DOP	4	4	Discrete	M8 Power and Signal Connectors, 0.5A Outputs
	TBEN-S1-8DOP		8	Discrete	M8 Power and Signal Connectors, 0.5A Outputs
	TBEN-S1-8DXP	8	8	Configurable Discrete	8 Configurable Input or Output Channels, M8 Power and Signal Connectors, 0.5A Outputs
	TBEN-S1-8DIP-D	8		Discrete	M8 Power and Signal Connectors, With Diagnostics
	TBEN-S2-4AI	4		Current, Voltage, RTD, Thermocouple	M12 (5 pin) Signal Connectors, M8 power and bus connector
	TBEN-S2-4AO		4	Current, Voltage	M12 (5 pin) Signal Connectors, M8 power and bus connector, 0.5A Outputs
	TBEN-S2-4IOL			4 IO-Link Channels	IO-Link, M12 signal connector, M8 power and bus connector
IO-Link					
	TBIL-MI-16DXP	16	16	Configurable Discrete	IO-Link slave, M12 signal connectors, single M12 connector for signal and power.
	TBIL-MI-16DIP	16		Discrete	
	TBIL-MI-8DOP		8	Discrete	

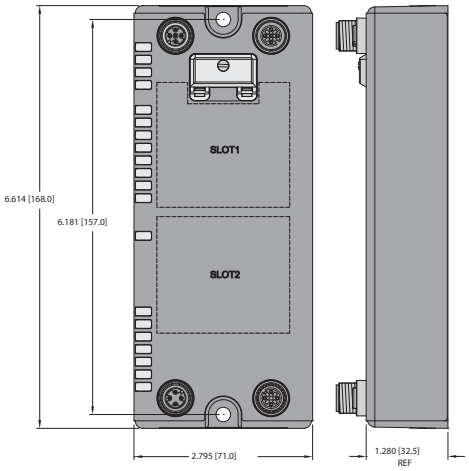
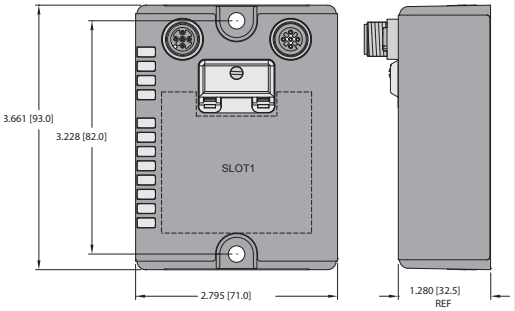
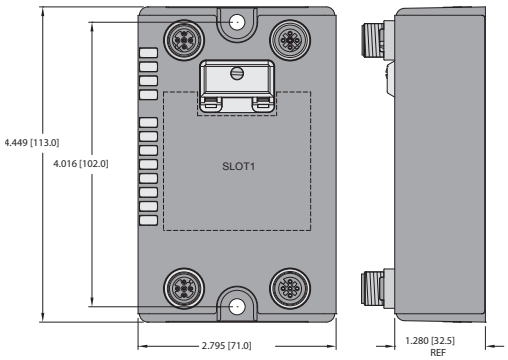
* For fieldbus cables and accessories, refer to Distributed I/O Sales Guide or www.turck.us

BL COMPACT

Discrete I/O

- PNP Style I/O*
- 0.5A Outputs*
- Fiberglass Reinforced Nylon Housing (fully potted)
- Nickel Plated Brass Connectors*
- IP67/1P69K
- Certifications - UL,CE

* Unless otherwise specified in the notes

Housing Style	Part Number	Protocol	Aux. Power	No. of Inputs	No. of Outputs	Notes
	BLCEN-16M8LT-8XSG-P-8XSG-P	Multiprotocol Ethernet	x	16	16	16 Configurable Input or Output Channels, M8 I/O connectors
	BLCCO-16M8LT-8XSG-P-8XSG-P	CANopen	x	16	16	
	BLCCO-8M12L-8DI-P-8DI-P	CANopen		16		
	BLCCO-8M12LT-4DO-0.5A-P-4DO-0.5A-P	CANopen	x		8	
	BLCCO-8M12LT-8XSG-P-8XSG-P	CANopen	x	8		16 Configurable Input or Output Channels
	BLCCO-4M12S-4DI-P	CANopen		4		
	BLCCO-4M12S-8XSG-P	CANopen		8	8	8 Configurable Input or Output Channels
	BLCCO-8M8S-8XSG-P	CANopen		8	8	8 Configurable Input or Output Channels, M8 I/O Connectors
	BLCEN-4M12MT-8DI-P	Multiprotocol Ethernet	x	8		
	BLCEN-4M12MT-8DO-0.5A-P	Multiprotocol Ethernet	x		8	
	BLCEN-8M8MT-8XSG-P	Multiprotocol Ethernet	x	8	8	8 Configurable Input or Output Channels, M8 I/O Connectors
	BLCCO-4M12MT-4DO-0.5A-P	CANopen	x		4	
	BLCDN-4M12MT-4DO-2A-P	CANopen	x		4	High Power 2A Outputs

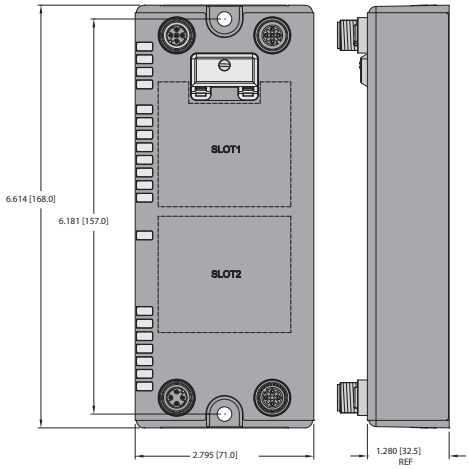
* For fieldbus cables and accessories, refer to Distributed I/O Sales Guide or www.turck.us

* Additional and custom configurations available. Contact your TURCK representative or TURCK Application Engineering for more information.

Analog/Specialty I/O

- PNP Style Discrete I/O*
- 0.5A Outputs*
- Fiberglass Reinforced Nylon Housing (fully potted)
- Nickel Plated Brass Connectors*
- IP67/1P69K
- Housing Style = D
- Certifications - UL,CE

* Unless otherwise specified in the notes

Housing Style	Part Number	Protocol	Aux. Power	No. of Inputs	No. of Outputs	No. of Tech Channels	Notes
	BLCEN-6M12LT-2RFID-S-8XSG-P	Mulitprotocol	x	8	8	2	2 RFID Channels, 8 Configurable Discrete Inputs or Outputs
	BLCEN-3M12LT-1RS232-2RFID-S	Multiprotocol	x			3	1 RS232 Channel, 2 RFID Channels
	BLCEN-4M12LT-2AI-PT-2AI-PT	Multiprotocol	x	4			4 RTD Analog Inputs
	BLCEN-4M12LT-2RFID-S-2RFID-S	Multiprotocol	x			4	4 RFID Channels
	BLCEN-6M12LT-4AI-VI-2AO-I	Multiprotocol	x	4	2		4 Configurable Analog Inputs, 2 Current Analog Outputs
	BLCEN-8M12LT-4AI4AO-VI-4AI4AO-VI	Multiprotocol	x	8	8		8 Configurable Analog Inputs, 8 Voltage Analog Outputs
	BLCEN-8M12LT-4AI-VI-4AI-VI	Multiprotocol	x	8			8 Configurable Analog Inputs
	BLCEN-8M12LT-4AI-TC-4AI-TC	Multiprotocol	x	8			8 Thermocouple Analog Inputs
	BLCCO-4M12S-4AIPT	CANopen		4			4 RTD Analog Inputs
	BLCCO-4M12L-2RFID-S-2RFID-S	CANopen				4	4 RFID Channels
	BLCCO-6M12L-4AI-VI-2AO-I	CANopen		4	2		4 Configurable Analog Inputs, 2 Current Analog Outputs
	BLCCO-6M12LT-2RFID-S-8XSG-P	CANopen	x	8	8	2	2 RFID Channels, 8 Configurable Discrete Inputs or Outputs
	BLCCO-8M12L-4AI-VI-4AI-VI	CANopen		8			8 Configurable Analog Inputs
	BLCCO-8M12LT-4AI-VI-4DO-0.5A-P	CANopen	x	4	4		4 Configurable Analog Inputs, 4 Discrete Outputs
	BLCCO-8M12LT-4AI-VI-8XSG-P	CANopen	x	12	8		4 Configurable Analog Inputs, 8 Configurable Discrete Inputs or Outputs

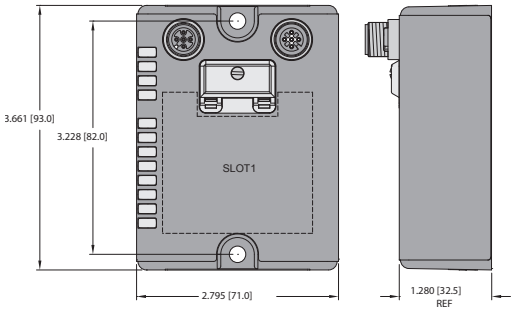
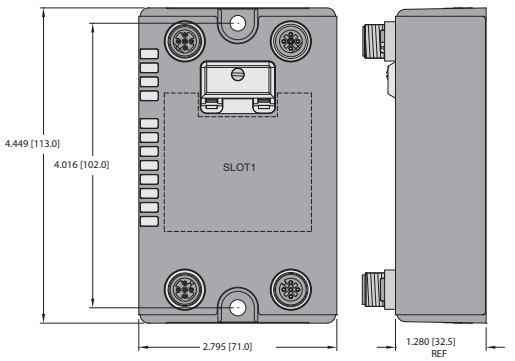
* For fieldbus cables and accessories, refer to Distributed I/O Sales Guide or www.turck.us
* Additional and custom configurations available. Contact your TURCK representative or TURCK Application Engineering for more information.

BL COMPACT

Analog/Advanced I/O

- PNP Style Discrete I/O*
- 0.5A Outputs*
- Fiberglass Reinforced Nylon Housing (fully potted)
- Nickel Plated Brass Connectors*
- IP67/1P69K
- Housing Style = G
- Certifications - UL,CE

* Unless otherwise specified in the notes

Housing Style	Part Number	Protocol	Aux. Power	No. of Inputs	No. of Outputs	No. of Tech Channels	Notes
	BLCCO-2M12S-2AO-V	CANopen			2		2 Voltage Analog Outputs
	BLCCO-2M12S-2RFID-S	CANopen				2	2 RFID Channels
	BLCCO-4M12S-4AI-TC	CANopen		4			4 Thermocouple Analog Inputs
	BLCCO-4M12S-4AI-VI	CANopen		4			4 Configurable Analog Inputs
	BLCEN-1M12MT-1RS232	Multiprotocol Ethernet	x			1	1 RS232 Channel
	BLCEN-1M12MT-1RS485-422	Multiprotocol Ethernet	x			1	1 RS485/422 Channel
	BLCEN-1M12MT-1SSI	Multiprotocol Ethernet	x			1	1 SSI Channel
	BLCEN-2M12MT-2AI-PT	Multiprotocol Ethernet	x	2			2 RTD Analog Inputs
	BLCEN-2M12MT-2RFID-S	Multiprotocol Ethernet	x			2	2 RFID Channels
	BLCEN-4M12MT-4AI4AO-VI	Multiprotocol Ethernet	x	4	4		4 Configurable Analog Inputs, 4 Voltage Analog Outputs
	BLCEN-4M12MT-4AI-TC	Multiprotocol Ethernet	x	4			4 Thermocouple Analog Inputs
	BLCEN-4M12MT-4AI-VI	Multiprotocol Ethernet	x	4			4 Configurable Analog Inputs
	BLCEN-4M12MT-4AO-V	Multiprotocol Ethernet	x		4		4 Voltage Analog Outputs

* For fieldbus cables and accessories, refer to Distributed I/O Sales Guide or www.turck.us
* Additional and custom configurations available. Contact your TURCK representative or TURCK Application Engineering for more information.

BL ident® - maximum freedom and highest flexibility offered by an RFID system

Controllers

- ISO 15693 – HF 13.56 MHz; EPC Global Gen2 900 MHz
- IP20, IP67 and IP68/69K protection ratings
- Available for all of the popular networks including Multiprotocol Ethernet, PROFIBUS®, DeviceNet™, CANopen and EtherCAT®
- Stand alone control with programmable gateways
- Multiple RFID channels available in a single solution
- Ability to integrate RFID with other types of inputs and outputs

Transceivers

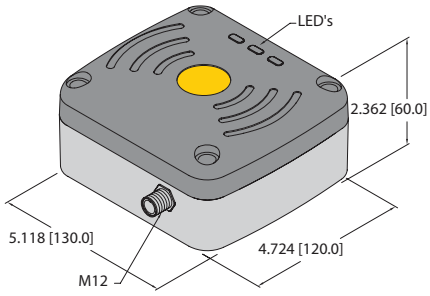
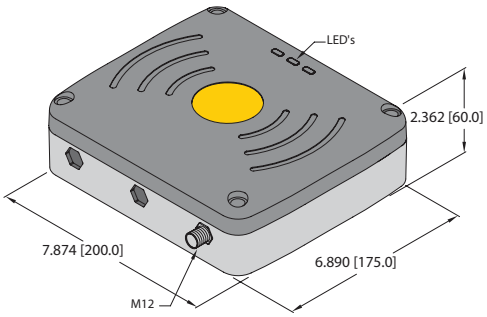
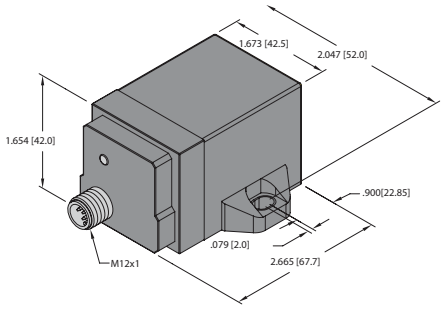
- Robust industrial design available in a variety of sizes and package styles
- Ability to read tags on the fly, up to 10 meters per second
- Read/write distances available to suit a variety of applications

Tags

- Available in FRAM and EPROM options
- Data sizes up to 9K
- Direct mounting on metal
- Custom tag designs available

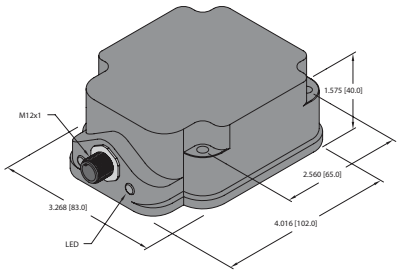
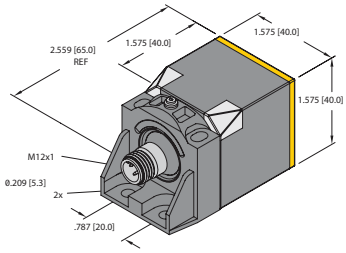
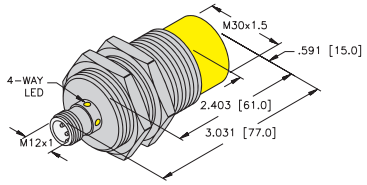
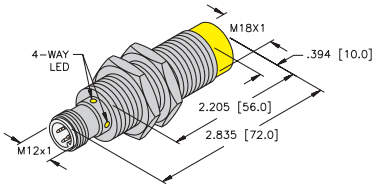
Handhelds

- Industrial duty handheld units with WLAN and Bluetooth built in.
- HF/UHF versions available

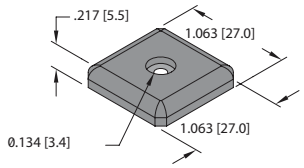
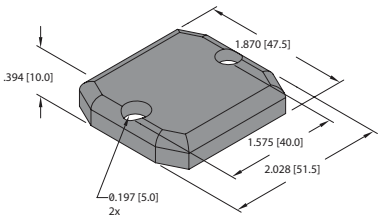
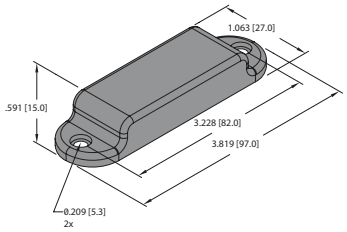
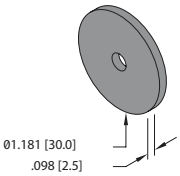
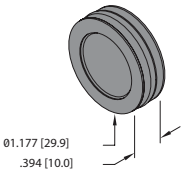
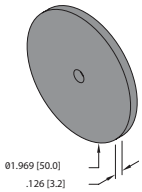
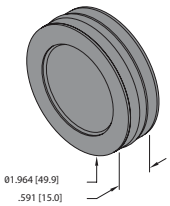
Housing	Part Number	UF/UHF	Operating Temp	Notes
Transceivers				
	TN902-Q120L130-H1147	UHF	-25 to 50° C	Compact UHF, Short to Medium Range Applications
	TN902-Q175L200-H1147	UHF	-25 to 50 °C	Medium to Long Range Applications
	TNSLR-Q42TWD-H1147	HF	-25 to 70 °C	Extreme Long Range HF, Wash Down

* I/O to Transceiver connection cable example: RK 4.5T-*-RS 4.5T/S2501 (* is length in meters)

RFID

Housing	Part Number	UF/UHF	Operating Temp	Notes
Transceivers				
	TNSLR-Q80WD-H1147	HF	-25 to 70 C	Extreme Long Range HF, Wash Down
	TN-CK40-H1147	HF	-25 to 70 C	Multi-position Mounting with Included Bracket
	TN-M30-H1147	HF	-25 to 70 C	M30x1.5 Threaded Barrel
	TN-EM30WD-H1147	HF	-25 to 70 C	M30x1.5 Threaded Barrel, Wash Down, Stainless Steel
	TN-M18-H1147	HF	-25 to 70 C	M18x1 Threaded Barrel
	TN-EM18WD-H1147	HF	-25 to 70 C	M18x1 Threaded Barrel, Wash Down, Stainless Steel

* I/O to Transceiver connection cable example: RK 4.5T-*-RS 4.5T/S2501 (* is length in meters)

Housing	Part Number	UF/UHF	Operating Temp	User Memory	Notes
Tags					
	TW902-928-Q27-M-B112	UHF	-20 to 80 C	76 bytes	Direct Metal Mount
	TW902-928-Q47L51-M-B110	UHF	-40 to 85 C	94 bytes	Direct Metal Mount, Outdoor Applications
	TW860-960-Q27L97-M-B112	UHF	-40 to 80 C	80 bytes	Direct Metal Mount, Outdoor Applications
	TW-R30-B128	HF	-25 to 85 C	128 bytes	Metal Mount with Spacer
	TW-R30-K2	HF	-25 to 85 C	2 Kbytes	Metal Mount with Spacer
	TW-R30-K9	HF	-20 to 85 C	9 Kbytes	High Memory Fast Read/Write
	TW-R30-M-B128	HF	-25 to 85 C	128 bytes	Multiple Direct/Embeddable Mounting Options
	TW-R30-M-K2	HF	-25 to 85 C	2 bytes	Multiple Direct/Embeddable Mounting Options
	TW-R50-B128	HF	-25 to 85 C	128 bytes	Metal Mount with Spacer
	TW-R50-K2	HF	-25 to 85 C	2 Kbytes	Metal Mount with Spacer
	TW-R50-M-B128	HF	-25 to 85 C	128 bytes	Multiple Direct/Embeddable Mounting Options
	TW-R50-M-K2	HF	-25 to 85 C	2 Kbytes	Multiple Direct/Embeddable Mounting Options

Notes

WARRANTY TERMS AND CONDITIONS

RISK OF LOSS

Delivery of the equipment to a common carrier shall constitute delivery to the Purchaser and the risk of loss shall transfer at that time to Purchaser. Should delivery be delayed due to an act or omission on the part of the Purchaser, risk of loss shall transfer to the Purchaser upon notification by TURCK Inc. that the order is complete and ready for shipment.

WARRANTIES

TURCK INC. (hereinafter "TURCK") offers five (5) WARRANTIES to cover all products sold. They are as follows:

1) The **12-MONTH WARRANTY** is available for the products listed - generally those not covered by **LIFETIME**, **5-YEAR**, **24-MONTH** or **18-MONTH** warranty. No registration required.
2) The **18-MONTH WARRANTY** is available for the products listed - generally those not covered by **LIFETIME** or **5-YEAR WARRANTY**. No registration is required.
3) The **24-MONTH WARRANTY** is available for the products listed - generally those not covered by **LIFETIME**, **5-YEAR** or **18-MONTH**. No registration is required.
4) The **5-YEAR WARRANTY** is available generally for the products listed. No registration is required.
5) A **LIFETIME WARRANTY** is available for the products listed. It becomes effective when the accompanying TURCK **LIFETIME WARRANTY REGISTRATION** is completed and returned to TURCK.

GENERAL TERMS AND CONDITIONS FOR ALL WARRANTIES

- **12-MONTH STANDARD WARRANTY**
- **18-MONTH STANDARD WARRANTY**
- **24-MONTH STANDARD WARRANTY**
- **5-YEAR WARRANTY**
- **LIFETIME WARRANTY**

TURCK warrants the Products covered by the respective WARRANTY AGREEMENTS to be free from defects in material and workmanship under normal and proper usage for the respective time periods listed above from the date of shipment from TURCK. In addition, certain specific terms apply to the various WARRANTIES.

THESE EXPRESS WARRANTIES ARE IN LIEU OF AND EXCLUDE ALL OTHER REPRESENTATIONS MADE - BOTH EXPRESSED AND IMPLIED. THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE FOR PRODUCTS COVERED BY THESE TERMS AND CONDITIONS.

TURCK warrants that the goods sold are as described, but no promise, description, affirmation of fact, sample model or representation, oral or written shall be part of an order, unless set forth in these terms and conditions, or are in writing and signed by an authorized representative of TURCK. These WARRANTIES do not apply to any Product which has been subject to misuse, negligence, or accident - or to any Product which has been modified or repaired, improperly installed, altered, or disassembled - except according to TURCK's written instructions.

These WARRANTIES are subject to the following conditions:

1) These WARRANTIES are limited to the electronic and mechanical performance only, as expressly detailed in the Product specifications and NOT to cosmetic performance.
2) These WARRANTIES shall not apply to any cables attached to, or integrated with the Product. However, the **18-MONTH WARRANTY** shall apply to cables sold separately by TURCK.
3) These WARRANTIES shall not apply to any Products which are stored, or utilized, in harsh environmental or electrical conditions outside TURCK's written specifications.
4) The WARRANTIES are applicable only to Products shipped from TURCK subsequent to January 1, 1988.

ADDITIONAL SPECIFIC TERMS FOR:
(12-MONTH STANDARD WARRANTY) for Linear Displacement Transducers, EZ Track, RFID Products, Draw Wire Assemblies and Slip Rings.

(18-MONTH STANDARD WARRANTY) FOR Q-TRACK INDUCTIVE SENSORS, ULTRASONIC SENSORS, FLOW SENSORS, PRESSURE SENSORS, TEMPERATURE SENSORS, INCLINOMETERS, CABLES AND ALL NON-SENSING PRODUCTS SOLD BY TURCK INC. INCLUDING MULTI-SAFE, MULTI-MODUL, MULTI-CART AND RELATED AMPLIFIER PRODUCTS, RELAYS AND TIMERS.

(24-MONTH STANDARD WARRANTY) FOR ENCODERS excluding Draw Wire Assemblies.

5-YEAR WARRANTY FOR INDUCTIVE AND CAPACITIVE PROXIMITY SENSORS: The periods covered for the above WARRANTIES and Products shall be 12 MONTHS, 18-MONTHS, 24-MONTHS and 5-YEARS, respectively, from the date of shipment from TURCK.

LIFETIME WARRANTY (OPTIONAL - REGISTRATION REQUIRED) FOR INDUCTIVE, INDUCTIVE MAGNET OPERATED AND CAPACITIVE PROXIMITY SENSORS SOLD TO THE ORIGINAL PURCHASER FOR THE LIFETIME OF THE ORIGINAL APPLICATION.

WARRANTY TERMS AND CONDITIONS

The following terms apply to the LIFETIME WARRANTY in addition to the General Terms:

1) This WARRANTY shall be effective only when the LIFETIME WARRANTY REGISTRATION has been completed, signed by the End User and an authorized TURCK Representative or Distributor and has been received by TURCK no later than six (6) months after installation in the End User's Plant, or two (2) years from the date product was shipped from TURCK, whichever is sooner.
2) This warranty is available only to TURCK's authorized Representatives, Distributors and to the Original User. (The term "Original User" means that person, firm, or corporation which first uses the Product on a continuous basis in connection with the operation of a production line, piece of machinery, equipment, or similar device.) In the event the ownership of the product is transferred to a person, firm or corporation other than the Original User, this WARRANTY shall terminate.
3) This WARRANTY is applicable only to the Original Application. In the event the machinery, equipment, or production line to which the Product is connected, or on which it is installed, is substituted, changed, moved or replaced, the WARRANTY shall terminate.
4) This WARRANTY shall be valid only if the Product was purchased by the Original User from TURCK, or from an authorized TURCK Distributor, or was an integral part of a piece of machinery and equipment obtained by the Original user from an Original Equipment Manufacturer, which itself, was purchased directly from TURCK or from an authorized Distributor.

PURCHASER'S REMEDIES

This Remedy shall apply to all WARRANTIES. If a TURCK Distributor desires to make a WARRANTY Claim, the Distributor shall, if requested by TURCK, ship the Product to TURCK's factory in Minneapolis, Minnesota, postage or freight prepaid. If the User desires to make a WARRANTY Claim, they shall notify the authorized TURCK Distributor from whom it was purchased or, if such Distributor is unknown, shall notify TURCK. TURCK shall, at its option, take any of the following two courses of action for any products which TURCK determines are defective in materials or workmanship.

1) Repair or replace the Product and ship the Product to the Original Purchaser or to the authorized TURCK Distributor, postage or freight prepaid; or
2) Repay to the Original Purchaser that price paid by the Original Purchaser; provided that if the claim is made under the LIFETIME WARRANTY, and such Product is not then being manufactured by TURCK, then the amount to be repaid by TURCK to the Original Purchaser shall be reduced according to the following schedule:

Number of Years Since Date of Purchase by Original Purchaser	Percent of Original Purchase Price To Be Paid by TURCK
10	50%
15	25%
20	10%
More than 20	5%

PURCHASER'S REMEDIES SHALL BE LIMITED EXCLUSIVELY TO THE RIGHT OF REPLACEMENT, REPAIR OR REPAYMENT AS PROVIDED AND DOES NOT INCLUDE ANY LABOR COST OR REPLACEMENT AT ORIGINAL PURCHASER'S SITE. TURCK SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF ANY WARRANTY, EXPRESSED OR IMPLIED, APPLICABLE TO THE PRODUCT, INCLUDING WITHOUT LIMITATION, ANY DAMAGES RESULTING FROM PROPERTY DAMAGE, PERSONAL INJURY OR BUSINESS INTERRUPTION.

CONSIDER SAFETY AND PROTECTION PRECAUTIONS

TURCK takes great care to design and build reliable and dependable products, however, some products can fail eventually. You must take precautions to design your equipment to prevent property damage and personal injury in the unlikely event of failure. As a matter of policy, TURCK does NOT recommend the installation of electronic controls as the sole device FOR THE PROTECTION OF PERSONNEL in connection with power driven presses, brakes, shears and similar equipment and, therefore, the customer should build in redundancy or dual control using approved safety devices for these applications.

GOVERNING LAW

The sale and purchase of Products covered hereby and all terms and conditions hereof shall be governed by the law of the States of Minnesota.

MOBILE EQUIPMENT PRODUCTS

TURCK Inc. sells its products through Authorized Distributors. These distributors provide our customers with technical support, service and local stock. TURCK distributors are located nationwide – including all major metropolitan marketing areas.
For Application Assistance or for the location of your nearest TURCK distributor, call:
1-800-544-7769

Specifications in this manual are subject to change without notice. TURCK also reserves the right to make modifications and makes no guarantee of the accuracy of the information contained herein. Literature and Media questions or concerns?
Contact Marketing Communications TURCK USA – media@turck.com

USA

TURCK Inc.
3000 Campus Drive
Minneapolis, MN 55441
Phone: (763) 553-7300
Fax: (763) 553-0708
Application Support:
1-800-544-7769
E-mail: turckusa@turck.com

MEXICO

TURCK Mexico S. de R.L. de C.V.
Carr. Saltillo-Zacatecas km 4.5 Nave 35
Parque Industrial "La Angostura"
Saltillo, COAH. C.P. 25315
México
Phone: +52 (844) 411-6650
Fax: +52 (844) 482-6926
Local Toll Free: 01-800-01-88725
E-mail: mexico@turck.com

CANADA

TURCK Chartwell Canada Inc.
140 Duffield Drive
Markham, Ontario
Canada, L6G 1B5
Phone: (905) 513-7100
Fax: (905) 513-7101
Toll Free: 1-877-513-7769

AUSTRALIA

TURCK Australia Pty. Ltd.
Unit 5, 6-7 Gilda Court
Mulgrave, Victoria 3170
Australia
Phone: (+61) 3 9560 9066
Fax: (+61) 3 9560 1620
Local Toll Free: 1300 132 566
E-mail: turckaustralia@turck.com

GERMANY

WORLD HEADQUARTERS

Hans TURCK GmbH & Co. KG
Witzlebenstrasse 7
D-45472 Muelheim an der Ruhr
Federal Republic of Germany
Phone: (+49) 208-49 52-0
Fax: (+49) 208-49 52 264

www.turck.com

Printed in USA

B1101 A 07/15