

Angular Position Technology

Inclinometers

Dual Axis with Analog Output

Turck's standard product is a low profile dual axis (X and Y) inclinometer with standard angular ranges of $\pm 10^\circ$, $\pm 45^\circ$, $\pm 60^\circ$ and $\pm 85^\circ$, with additional ranges optional. Each axis has independent outputs. The 5 VDC version is a ratiometric design and the power is limited between 4.75 and 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.

- $\pm 10^\circ$, $\pm 45^\circ$, $\pm 60^\circ$, $\pm 85^\circ$
- 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 $\pm 15\%$ with teach adapter VB2-SP4
- FM Class I, Div 2 approved when used with Guard-Q20L60 and approved cordset.



Part Number	ID Number	Angular Range	Resolution	Absolute Accuracy	Zero Point Calibration	Temperature Drift	Temperature Coefficient	Load Resistance	Dimensional Drawing	Wiring Diagram
Dual Axis – Analog Output, 4-20 mA										
B2N10H-Q20L60-2LI2-H1151	1534012	$\pm 10^\circ$	< 0.04°	$\pm 0.3^\circ$	$\pm 5^\circ$	$\leq \pm 0.05^\circ/\text{K}$	0.01 %/K	$\leq 200 \Omega$	1	1
B2N45H-Q20L60-2LI2-H1151	1534013	$\pm 45^\circ$	< 0.1°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\leq 200 \Omega$	1	1
B2N60H-Q20L60-2LI2-H1151	1534014	$\pm 60^\circ$	< 0.14°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\leq 200 \Omega$	1	1
B2N60H-Q20L60-2LI2-H1151/S97	1534046	$\pm 60^\circ$	< 0.14°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\leq 200 \Omega$	1	1
B2N85H-Q20L60-2LI2-H1151	1534032	$\pm 85^\circ$	< 0.14°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\leq 200 \Omega$	1	1
Dual Axis – Analog Output, 0.1–4.9 V										
B2N10H-Q20L60-2LU3-H1151	1534006	$\pm 10^\circ$	< 0.04°	$\pm 0.3^\circ$	$\pm 5^\circ$	$\leq \pm 0.05^\circ/\text{K}$	0.01 %/K	$\geq 40 \text{ k}\Omega$	1	1
B2N45H-Q20L60-2LU3-H1151	1534007	$\pm 45^\circ$	< 0.1°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\geq 40 \text{ k}\Omega$	1	1
B2N45H-Q20L60-2LU3-H1151/S97	1534039	$\pm 45^\circ$	< 0.1°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\geq 40 \text{ k}\Omega$	1	1
B2N60H-Q20L60-2LU3-H1151	1534008	$\pm 60^\circ$	< 0.14°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\geq 40 \text{ k}\Omega$	1	1
B2N60H-Q20L60-2LU3/S97	1534060	$\pm 60^\circ$	< 0.14°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\geq 40 \text{ k}\Omega$	1	1
B2N85H-Q20L60-2LU3-H1151	1534027	$\pm 85^\circ$	< 0.14°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\geq 40 \text{ k}\Omega$	1	1
B2N85H-Q20L60-2LU3/S97	1534040	$\pm 85^\circ$	< 0.14°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\geq 40 \text{ k}\Omega$	1	1
Dual Axis – Analog Output, Ratiometric 0.1-4.9 V @ 5 VDC										
B2N10H-Q20L60-2LU5-H1151	1534009	$\pm 10^\circ$	< 0.04°	$\pm 0.3^\circ$	$\pm 5^\circ$	$\leq \pm 0.05^\circ/\text{K}$	0.01 %/K	$\geq 40 \text{ k}\Omega$	1	1
B2N45H-Q20L60-2LU5-H1151	1534010	$\pm 45^\circ$	< 0.1°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\geq 40 \text{ k}\Omega$	1	1
B2N60H-Q20L60-2LU5-H1151	1534011	$\pm 60^\circ$	< 0.14°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\geq 40 \text{ k}\Omega$	1	1
B2N85H-Q20L60-2LU5-H1151	1534042	$\pm 85^\circ$	< 0.14°	$\pm 0.5^\circ$	$\pm 15^\circ$	$\leq \pm 0.025^\circ/\text{K}$	0.03 %/K	$\geq 40 \text{ k}\Omega$	1	1

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:	$\leq 0.2\%$ of measuring range [A-B] $\leq 0.1\%$ after warm-up time of 0.5 h

Technical Specifications – Q42:

Voltage:	10-30 VDC
Protection:	IP68
Operating temperature:	-40 to +70 °C (-40 to +158 °F)
Housing:	PA12
Shock resistance:	30 g (11 ms)
Vibration:	55 Hz (1 mm)
Max. linear deviation:	$\pm 0.2^\circ$ (10° or 360°) / $\pm 0.3^\circ$ (45°) / $\pm 0.4^\circ$ (60°)
Baud rate:	10 kBit/s to 1 MBit/s
Interface:	CANopen

Inclinometers

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).

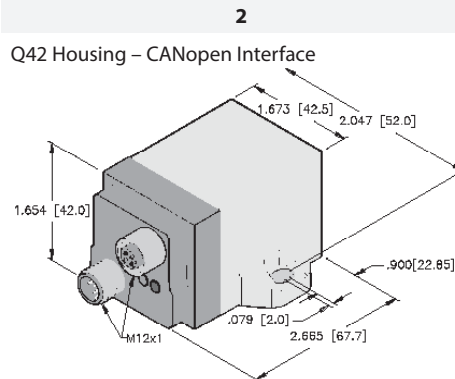
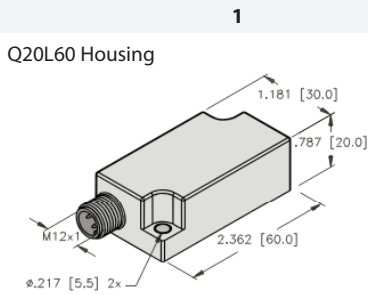
- Transmit data object (TPDO1) with four operating modes
- Service-data object (Standard-SDO)
- Error message via emergency object
- Monitoring functions Heartbeat as well as Nodeguarding/Lifeguarding
- Memory and recovery function of all parameters
- Indication of status and error via two-color LED
- 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	1534068	360°	< 0.14°	±0.5°	N/A	N/A	0.03 °/K	≤ 200 Ω	1	2
Single Axis 360° – Analog Output, Adjustable Measuring Range 0.1–4.9 V										
B1N360V-Q20L60-2LU3-H1151	1534069	360°	< 0.14°	±0.5°	N/A	N/A	0.03 °/K	≤ 40 kΩ	1	2
Single Axis 360° – Digital Output, PNP, N.O./N.C. Programmable, Adjustable Switchpoints										
B1N360V-Q20L60-2UP6X3-H1151	1534051	360°	< 0.14°	±0.5°	N/A	≤ ±0.03° K	0.03 °/K	≤ 500 mA	1	3
Single Axis – CANopen Interface										
B1N360V-Q42-CNX2-2H1150	1534065	360°	< 0.01°	±0.1°	N/A	N/A	0.008 °/K	N/A	2	4
Dual Axis – CANopen Interface										
B2N10H-Q42-CNX2-2H1150	1534061	±10°	≤ 0.05°	±0.1°	N/A	N/A	0.008 °/K	N/A	2	4
B2N45H-Q42-CNX2-2H1150	1534062	±45°	≤ 0.1°	±0.1°	N/A	N/A	0.008 °/K	N/A	2	4
B2N60H-Q42-CNX2-2H1150	1534063	±60°	≤ 0.1°	±0.1°	N/A	N/A	0.008 °/K	N/A	2	4

Inclinometers

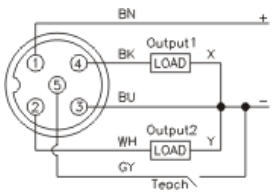
Dimensional Drawings



Wiring Diagrams

Diagram 1

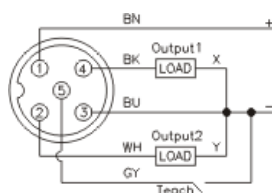
5-pin M12 Eurofast Connection



Mating Cordset: **RK 4.5T-*/S618**
Teaching Adapter: **VB2-SP4**

Diagram 2

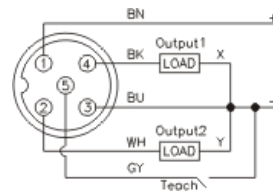
5-pin M12 Eurofast Connection



Mating Cordset: **RK 4.5T-*/S618**
Teaching Adapter: **VB2-SP4**

Diagram 3

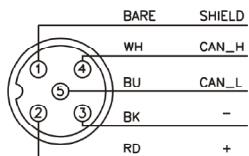
5-pin M12 Eurofast Connection



Mating Cordset: **RK 4.5T-*/S618**
Teaching Adapter: **VB2-SP5**

Diagram 4

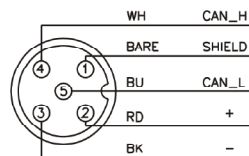
5-pin M12 Eurofast Connection



Male

Mating Cordset: **RKC 572-*M**

5-pin M12 Eurofast Connection



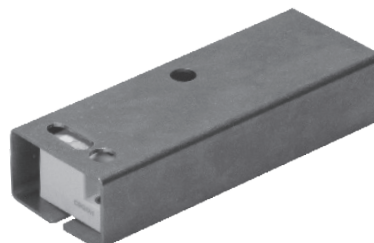
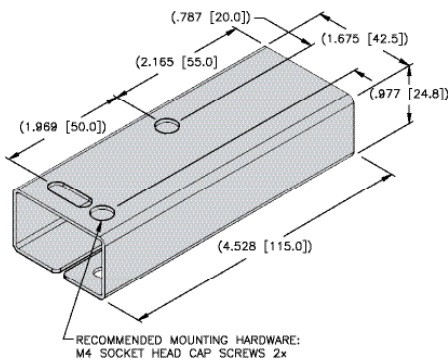
Female

Mating Cordset: **RSC 572-*M**

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

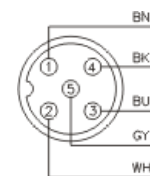
Accessories

Guard - Q20L60, required for use with an inclinometer to maintain FM approval in a Class I, Div 2 environment



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