DRAW WIRE SENSOR



GX200 SERIES

Key-Features:

- *Multifunctional sensor for extremely rough environments (Position, Velocity, Inclination)*
- *Suitable for marine and offshore, mining, railway applications, commercial vehicles, and construction machinery*
- *Suitable for SIL 2 in accordance with DIN EN 61508 and PL d in accordance with EN 13849-1 (for analog and redundant position signals)*
- *Measurement ranges from 3 to 12 m*
- *Output signals: potentiometer, current, voltage or CANopen, optional redundant output*
- *Protection class up to IP69K*
- *Temperature range -40...+85 °C*

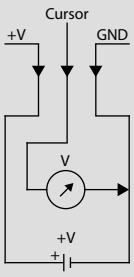
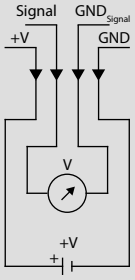
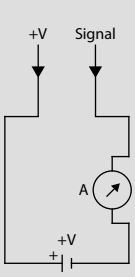
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TECHNICAL DATA

Measurement range	[m]	3	4	5	6	7	8	9	10	11	12
Draw wire diameter	[mm]	1.6 / optional: 1 / 2								1.6 / optional: 1	
Linearity	[%]	±0.15			±0.1 (±0.15 for 5R/10R)						
Resolution		see output types below									
Sensor element		position: potentiometer | velocity: tacho generator | inclination: MEMS									
Measured dimension		Position, optional: velocity, inclination									
Output signals position		potentiometer / 0.5...4.5 V / 0...5 V / 0...10 V / 4...20 mA / CANopen									
Redundant output signals position		optional for: potentiometer / 0.5...4.5 V / 0...5 V / 0...10 V / 4...20 mA / CANopen									
Connection		connector output M12 radial or cable output radial (TPE cable)									
Protection class		IP67/IP69K (only with cable output)									
Humidity		max. 90 % relative, no condensation									
Operating temperature	[°C]	-40...+85									
Shock		DIN EN 60068-2-27:2010, 50 g / 11 ms, 100 shocks per direction, 600 shocks total									
Vibration		DIN EN 60068-2-6:2008, 10 g, 10-2000-10 Hz, 10 cycles									
Acceleration $A_{ø}$	[m/s²]	100									
Extraction force F_{min}	[N]	40									
Extraction force F_{max}	[N]	45	46	47	48	49	50	51	52	53	54
Housing		aluminium (EN AW-5083, EN AW-6060, EN AW-6082) seawater-resistant anodised, stainless steel (1.4404 / V4A)									
Draw wire		stainless steel V4A with synthetic coating									
Weight	[kg]	approx. 12									

POSITION OUTPUT - ANALOG

Output type	**Potentiometer**			**Voltage** [1]			**Current**
Order code	1R	5R	10R	4,5V	5V	10V	420A
Output	1 kΩ	5 kΩ	10 kΩ	0.5...4.5 V	0...5 V	0...10 V	4...20 mA
Supply	max. 30 V			8...30 VDC		12...30 VDC	12...30 VDC [2]
Recommended cursor current	<1 µA			-			
Current consumption max.	-			max. 25 mA (no load)			-
Power consumption max.	-						
Output current	-			max. 10 mA, min. load 10 kΩ			max. 50 mA in case of error [3]
Dynamics	-			<3 ms from 0...100 % and 100...0 %			<1 ms from 0...100 % and 100...0 %
Resolution	theoretically unlimited, limited by the noise						
Noise	depends on the quality of the power supply			0.5 mV_{eff}			1.6 $µA_{eff}$
Inverse-polarity protection	-			yes			
Short-circuit proof	-			yes			-
Operating temperature	-40...+85 °C						
Temperature coefficient	±0.0025 %/K			0.0037 %/K			0.0079 %/K
EMC	-			according to EN 61326-1:2013			
Circuit							

[1] Galvanically isolated
[2] Load: 250 Ω (max. 500 Ω)
[3] Load max. 0.5 kΩ

POSITION OUTPUT - DIGITAL CANOPEN

Link to the manual		CANopen (WCAN)
Link to the EDS file		WayCon EDS zip file
CAN specification		Full CAN 2.0B (ISO11898)
Communication profile		CANopen CiA 301 V 4.2.0
Device profile		Encoder, absolute linear; CIA 406 V 3.2.0
Error control		Producer Heartbeat, Emergency Message, Node Guarding
Node ID		Default: 7, configurable via SDO
PDO		1 x TPDO, static mapping
PDO Modes		Event-triggered, Time-triggered, Sync-cyclic, Sync-acyclic
Transmission rate		1 Mbps, 800, 500, 250, 125, 50, 20 kbps configurable via SDO
Integrated Bus termination resistor		120 Ω, connectible via SDO
Bus, galvanic separation		No
Supply	[VDC]	8…30
Current consumption		10 mA typical at 24 V, 20 mA typical at 12 V
Measurement rate		1 kHz with 16-bit resolution
Repeatability		equal to the linearity
Resolution		0.002 % of measurement range
Electrical protection		inverse polarity protection
Operating temperature	[°C]	-40...+85
Temperature coefficient	[%/K]	0.0014
EMC		DIN EN61326-1:2013, conformity with directive 2014/30/EU

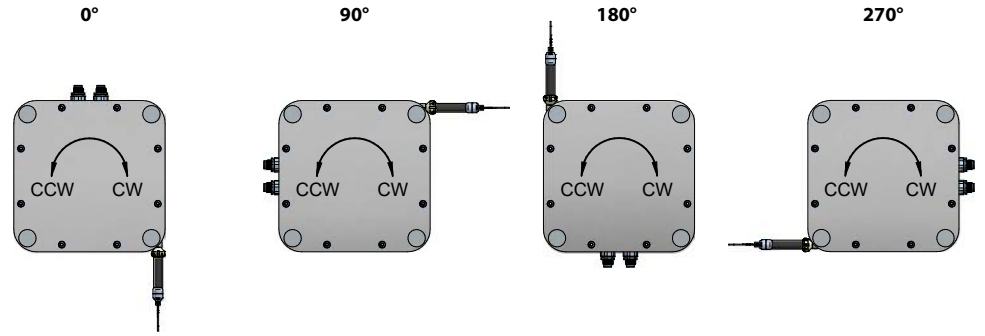
VELOCITY OUTPUT

Output	[V/m/s]	1
Standard deviation	[V]	±1 % of the output value
Sensor element		Tachometer generator
Speed V_{min}	[mm/s]	10
Tachometer supply		self-sufficiency

INCLINATION OUTPUT

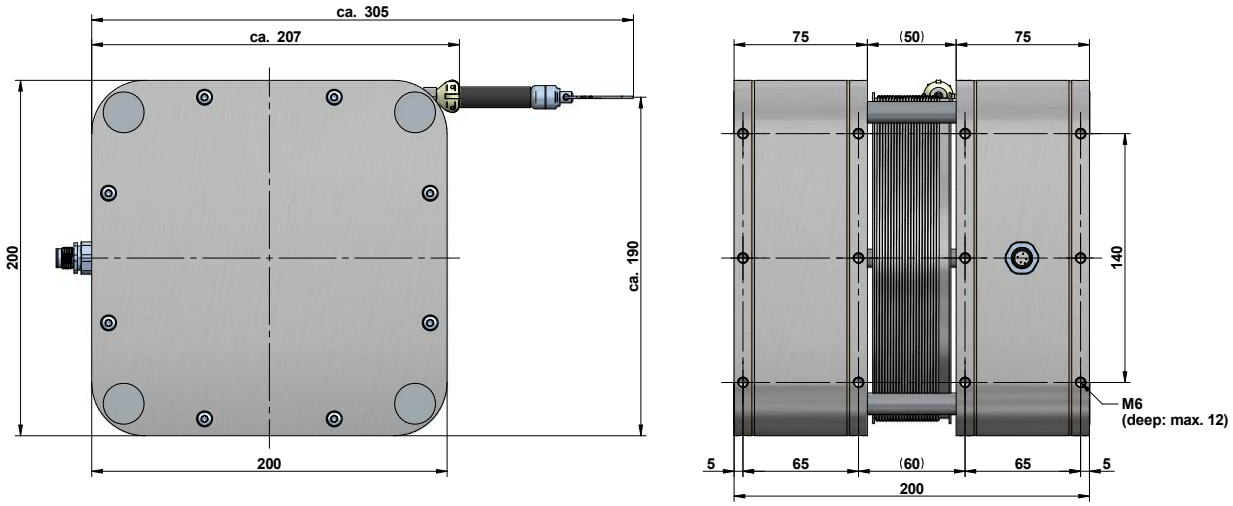
Output type		Voltage	Current
Measurement range		360°	
Repeatability		±0.2°	
Resolution		12 bit (0.088°)	
Sampling rate		50 Hz (20 ms)	
Output		0...10 V	4...20 mA
Supply	[VDC]	15...30	10...30
Current consumption max.	[mA]	40	
Short-circuit proof (supply)		yes	

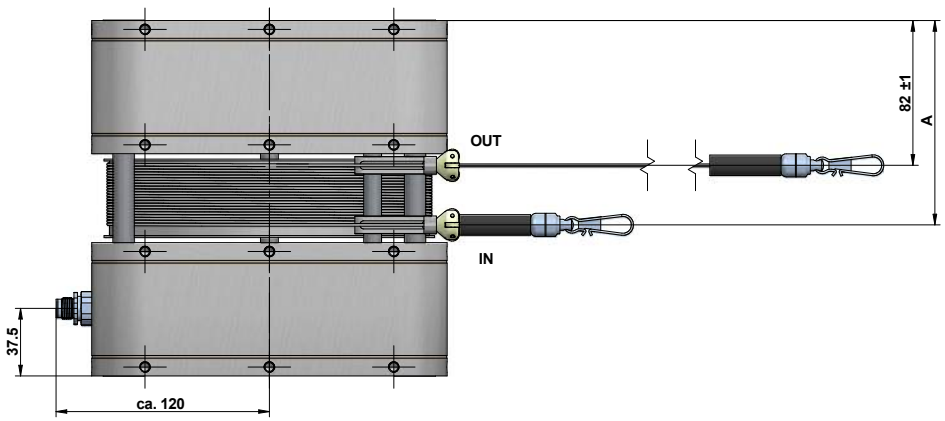
Signal position



	0°		90°		180°		270°	
Output	NGV	NGA	NGV	NGA	NGV	NGA	NGV	NGA
CW	0 V or 10 V	4 mA or 20 mA	7.5 V	16 mA	5 V	12 mA	2.5 V	8 mA
CCW	10 V or 0 V	20 mA or 4 mA	2.5 V	8 mA	5 V	12 mA	7.5 V	16 mA

TECHNICAL DRAWING

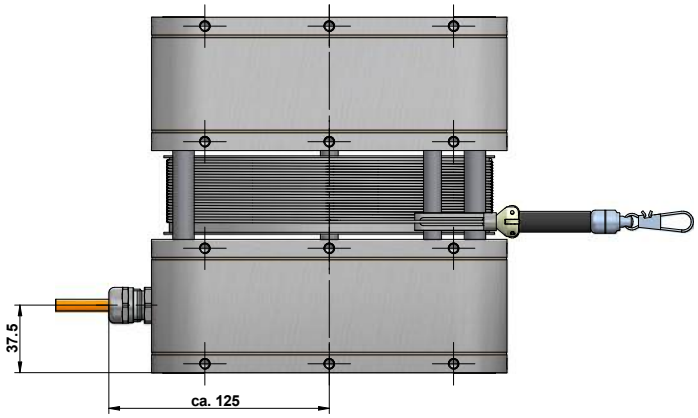




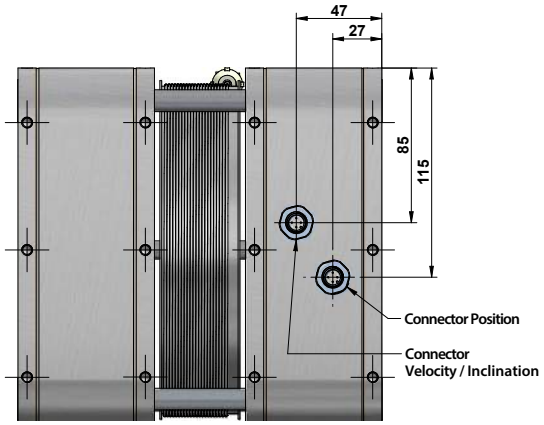
Position rope outlet for D16K	
Measurement range	A (±1)
3	90.5
4	93.5
5	96
6	99
7	102
8	104.5
9	107.5
10	110
11	113
12	116

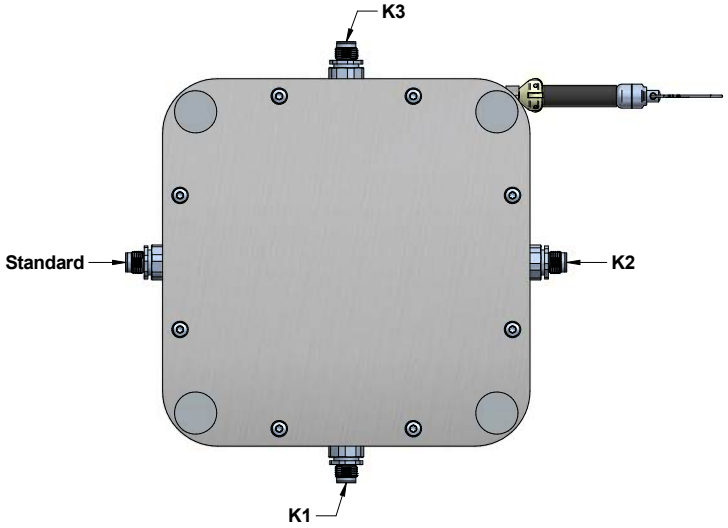
TECHNICAL DRAWING

Version cable output



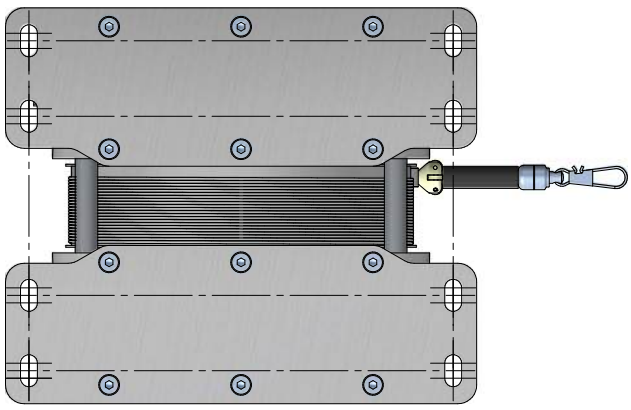
Version velocity / inclination

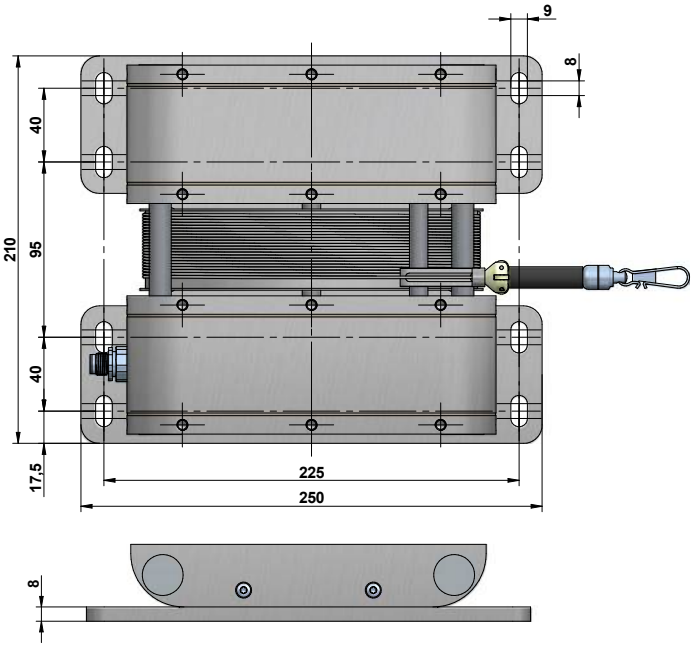




ACCESSORIES

Base plate GX200-BP1
Contains the following:
2 x base plate GX200-BP1
8 x washer DIN9021, M8, A4
12 x cylinder head screw DIN7984, M6x14, A4
8 x cylinder head screw DIN912, M8x20, A4

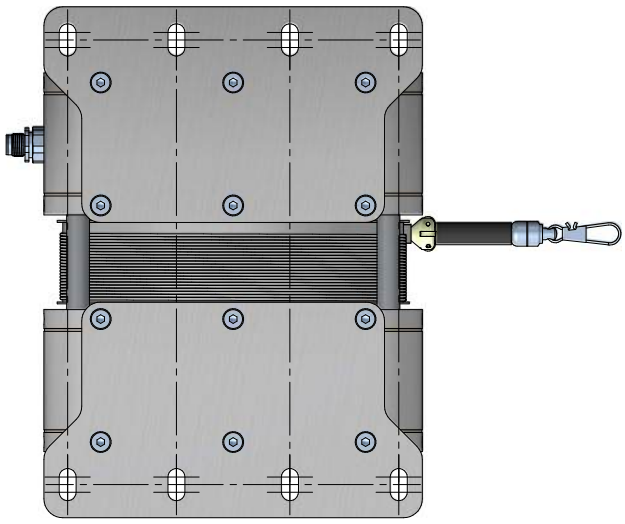


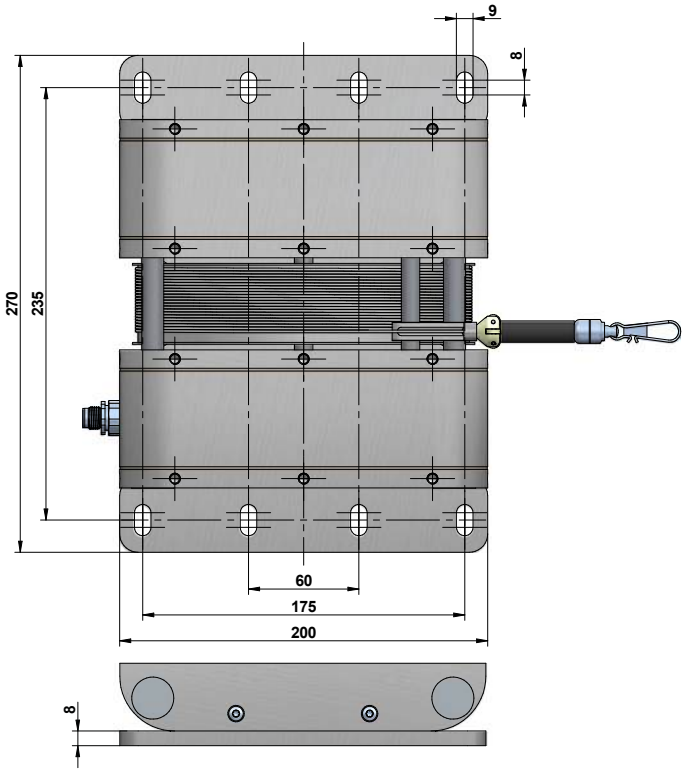


Please note the connector / cable orientation (options K1, K2, K3)!

ACCESSORIES

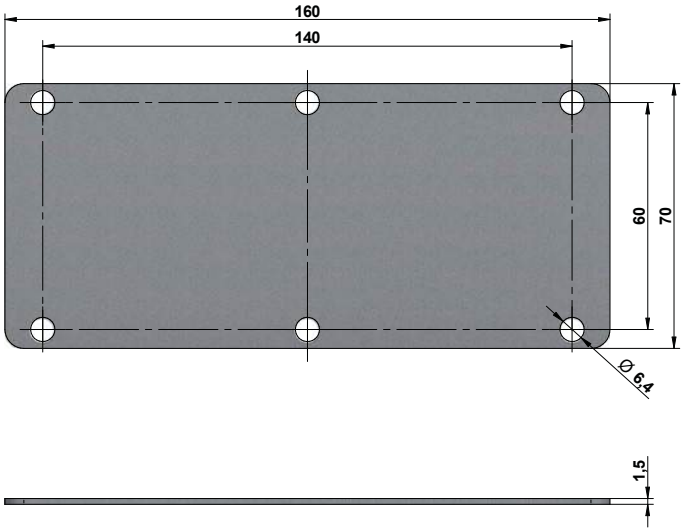
Base plate GX200-BP2
Contains the following:
2 x base plate GX200-BP2
8 x washer DIN9021, M8, A4
12 x cylinder head screw DIN7984, M6x14, A4
8 x cylinder head screw DIN912, M8x20, A4

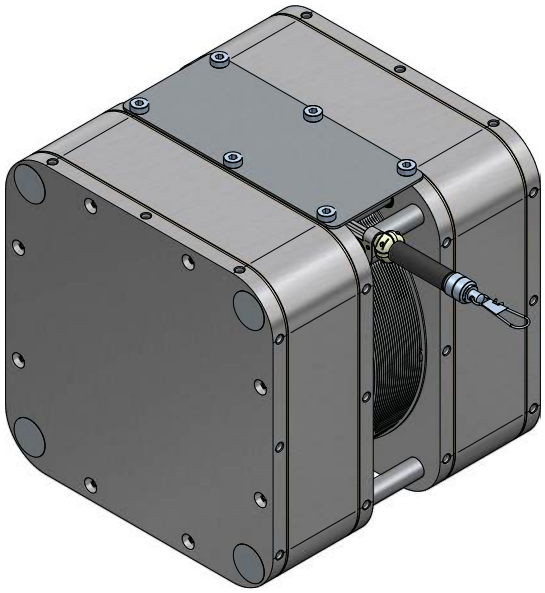




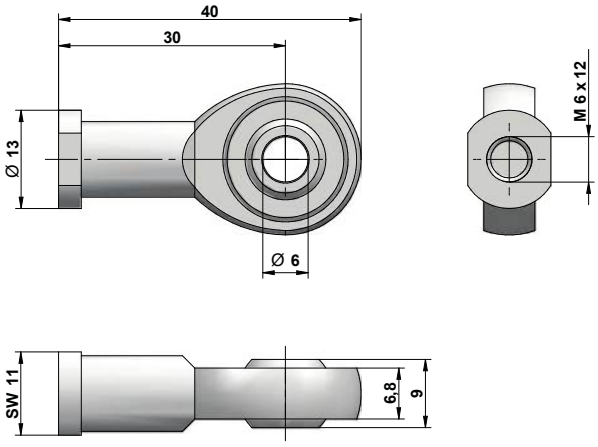
Please note the connector / cable orientation (options K1, K2, K3)!

Protection plate GX200-PC1
Contains the following:
1 x protection plate GX200-PC1, V4A
6 x cylinder head screw DIN7984, M6x10, A4

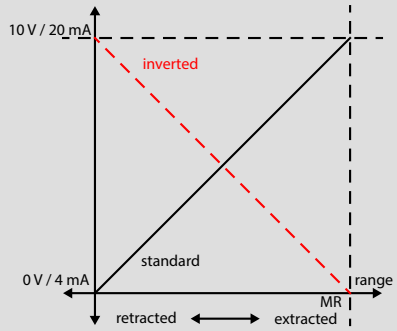




Ball joint head GX200-GK6 (for rope fixation M6)
Contains the following:
1 x Ball joint head M6, V4A
1 x nut 934, M6, A4



OPTIONS

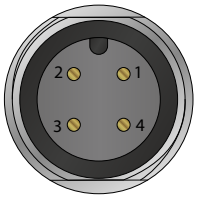
Option	Order Code	Description
Changed cable or connector orientation (drawing see page 5)	K1, K2, K3	Rope bridge points to the right: Standard: cable or connector output shows to the left K1: cable or connector output shows downwards K2: cable or connector output shows to the right K3: cable or connector output shows upwards
Inverted output signal (analog position output only, INR with redundant options only)	IN, INR	The analog signal of the sensor is increasing by extracting the rope (standard). Option IN inverts the signal, i.e. the signal of the sensor declines by extracting the rope. IN: inverted output signal (both signals with redundant options) INR: Signals in opposite directions. 1 signal standard, 1 signal inverted (example: 0...10 V and 10...0 V) 
Redundant output signal (Position output only)	R1, R2, R3, R4	By using a double potentiometer the sensor delivers two independent output signals. R1: 2 x potentiometer output R2: 2 x voltage output R3: 2 x current output R4: 2 x CANopen
Velocity output	TG	The sensor is equipped with an additional velocity output. Technical data see page 3.
Inclination output	NGV, NGA	The sensor is equipped with an additional inclination output. Technical data see page 4. NGV: output signal 0...10 V NGA: output signal 4...20 mA
Wire rope diameter	D10K, D16K, D20K	The wire rope is made of V4A stainless steel, 1.4401 with a synthetic coating. Please choose the wire rope diameter in part two of the order code. D10K: Ø 1 mm (on request) D16K: Ø 1,6 mm (standard) D20K: Ø 2 mm (on request, not with measurement ranges 11 m and 12 m)
Rope fixation by M6 thread	M6	Optional, pivoted rope fixation with screw thread M4. Ideal for attachment to through holes or thread holes M4. 
Rope fixation by eyelet	R20	The end of the wire rope is equipped with a eyelet instead of a rope clip. Inside diameter 20 mm 

ELECTRICAL CONNECTION

Single position output signal

Cable output	Connector output	Potentiometer output	Voltage output	Current output	Connection cable K4P...
BN	Pin 1	+V	+V	+V	BN
WH	Pin 2	Cursor	Signal	n. c.	WH
BU	Pin 3	GND	GND	Signal	BU
BK	Pin 4	n. c.	GND_{Signal}	n. c.	BK

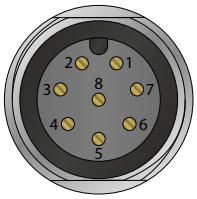
Connector , M12 (male)



Redundant position output signal

Cable output	Connector output	Potentiometer output	Voltage output	Current output	Connection cable K8P...
WH	Pin 1	$+V_1$	$+V_1$	$+V_1$	WH
BN	Pin 2	$Cursor_1$	$Signal_1$	n. c.	BN
GN	Pin 3	GND_1	GND1	$Signal_1$	GN
YE	Pin 4	n. c.	$GND_{Signal, 1}$	n. c.	YE
GY	Pin 5	$+V_2$	$+V_2$	$+V_2$	GY
PK	Pin 6	$Cursor_2$	$Signal_2$	n. c.	PK
BU	Pin 7	GND_2	GND_2	$Signal_2$	BU
RD	Pin 8	n. c.	$GND_{Signal, 2}$	n. c.	RD

Connector , M12 (male)



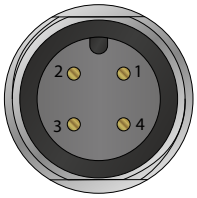
Digital output CANopen

Information on the CANopen digital output and the corresponding pin assignment can be found in the manual at www.waycon.biz/downloads.

Velocity or Inclination output

Cable output	Connector output	Velocity	Inclination	Connection cable K4P...
BN	Pin 1	n. c.	+V	BN
WH	Pin 2	Signal	Signal CW	WH
BU	Pin 3	n. c.	GND	BU
BK	Pin 4	GND_{Signal}	Signal CCW	BK

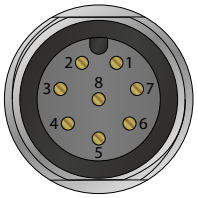
Connector , M12 (male)



Velocity and Inclination output

Cable output	Connector output	Function	Connection cable K8P...
WH	Pin 1	$+V_{Inclination}$	WH
BN	Pin 2	Signal $CW_{Inclination}$	BN
GN	Pin 3	$GND_{Inclination}$	GN
YE	Pin 4	Signal $CCW_{Inclination}$	YE
GY	Pin 5	n. c.	GY
PK	Pin 6	$Signal_{Velocity}$	PK
BU	Pin 7	n. c.	BU
RD	Pin 8	$GND_{Velocity}$	RD

Connector , M12 (male)



ORDER CODE

GX200 – □ – □ – □ – □ – □

Measurement range MR [m]	
3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12	

Wire rope	
Diameter 1 mm (on request)	D10K
Diameter 1.6 mm (Standard)	D16K
Diameter 2 mm (on request)	D20K

Output signal		
Potentiometer	1 kΩ	1R
Potentiometer	5 kΩ	5R
Potentiometer	10 kΩ	10R
Voltage	0.5...4.5 V	4,5V
Voltage	0...5 V	5V
Voltage	0...10 V	10V
Current	4...20 mA	420A
Digital	CANopen	WCAN

Connection	
Connector output M12, radial [1]	SR12
Cable output, radial, 2 m [1]	KR02
Cable output, radial, 5 m [1]	KR05
Cable output, radial, 10 m [1]	KR10

Version	
Standard	-
Sensor with options	O

Option	**Description (see page 7)**
K1	Cable/connector orientation bottom
K2	Cable/connector orientation right
K3	Cable/connector orientation top
IN	Inverted output signal [2]
INR	Inverted signals, opposite directions [2], [3]
R1	Redundant potentiometer output [2]
R2	Redundant voltage output [2]
R3	Redundant current output [2]
R4	Redundant CANopen output [2]
TG	Velocity sensor
NGV	Inclination sensor 0...10 V
NGA	Inclination sensor 4...20 mA
M6	Rope fixation M6 thread
R20	Rope fixation eyelet

Option	**Not combinable with**
IN	WCAN
D20K	MR 11/12

[1] Analog outputs: 4 pole
WCAN or Option R4: 5 pole
Options R1, R2, R3: 8 pole
Option TG or NGV/NGA: additional 4 pole (see page 5)
Options TG and NGV/NGA: additional 8 pole (see page 5)

[2] Position output only

[3] INR in combination with R1, R2, R3 or R4 only

GENERAL ACCESSORIES

GX200-BP1	Base plate version 1
GX200-BP2	Base plate version 2
GX200-PC1	Protection plate
GX200-GK6	Ball joint head for rope fixation M6

ACCESSORIES CABLES AND CONNECTORS

Cable with connector (female) M12, 4 poles, shielded, IP67	
K4P2M-S-M12	2 m, straight connector
K4P5M-S-M12	5 m, straight connector
K4P10M-S-M12	10 m, straight connector
K4P2M-SW-M12	2 m, angular connector
K4P5M-SW-M12	5 m, angular connector
K4P10M-SW-M12	10 m, angular connector

Cable with connector (female) M12, 5 poles, shielded, IP67	
K5P2M-S-M12	2 m, straight connector
K5P5M-S-M12	5 m, straight connector
K5P10M-S-M12	10 m, straight connector
K5P2M-SW-M12	2 m, angular connector
K5P5M-SW-M12	5 m, angular connector
K5P10M-SW-M12	10 m, angular connector

Mating connector (female) M12, 4 poles, for self assembly	
D4-G-M12-S	straight connector
D4-W-M12-S	angular connector

Mating connector (female) M12, 5 poles, for self assembly	
D5-G-M12-S	straight connector
D5-W-M12-S	angular connector

Cable with connector (female) M12, 8 poles, shielded, IP67	
K8P2M-S-M12	2 m, straight connector
K8P5M-S-M12	5 m, straight connector
K8P10M-S-M12	10 m, straight connector
K8P2M-SW-M12	2 m, angular connector
K8P5M-SW-M12	5 m, angular connector
K8P10M-SW-M12	10 m, angular connector

Mating connector (female) M12, 8 poles, for self assembly	
D8-G-M12-S	straight connector
D8-W-M12-S	angular connector

ACCESSORIES DISPLAYS

Digital displays for sensors with analog output, 2 channel	
WAY-AX-S	touch screen, supply: 18...30 VDC
WAY-AX-AC	touch screen, supply: 115...230 VAC

For more information and options please refer to the WAY-AX data sheet.

Subject to change without prior notice.

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