

PROGRAMMABLE DRAW WIRE SENSOR WITH INCLINOMETER

AWI 100

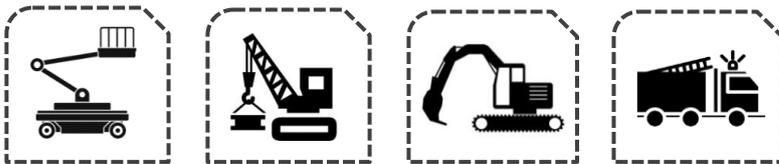
“Simultaneous inclination and length measurement, Analog or CANopen output, IP67 protection”



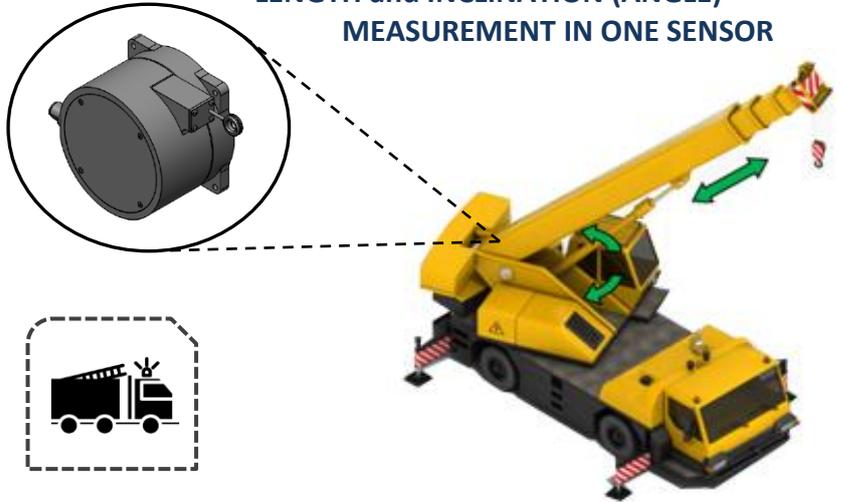
- Model options with or without inclinometer
- Integrated inclination sensor for simultaneous length and inclination measurement
- Different stroke (measuring) lengths up to 12000 mm (12 meters)
- Analog or CANopen output
- Programmable analog output option for length measurement
- Selectable angle values between 0...360° or $\pm 180^\circ$ for inclination measurement
- Ability to determine the 0° point for inclination measurement
- IP67 protection class
- Compact design and easy installation
- 1 m/s maximum movement speed
- Shock / vibration resistant structure

APPLICATIONS

- Fixed or mobile cranes
 - Fire and rescue vehicles
 - Transport systems
 - Excavators
 - Lifting and working platforms
- Machines



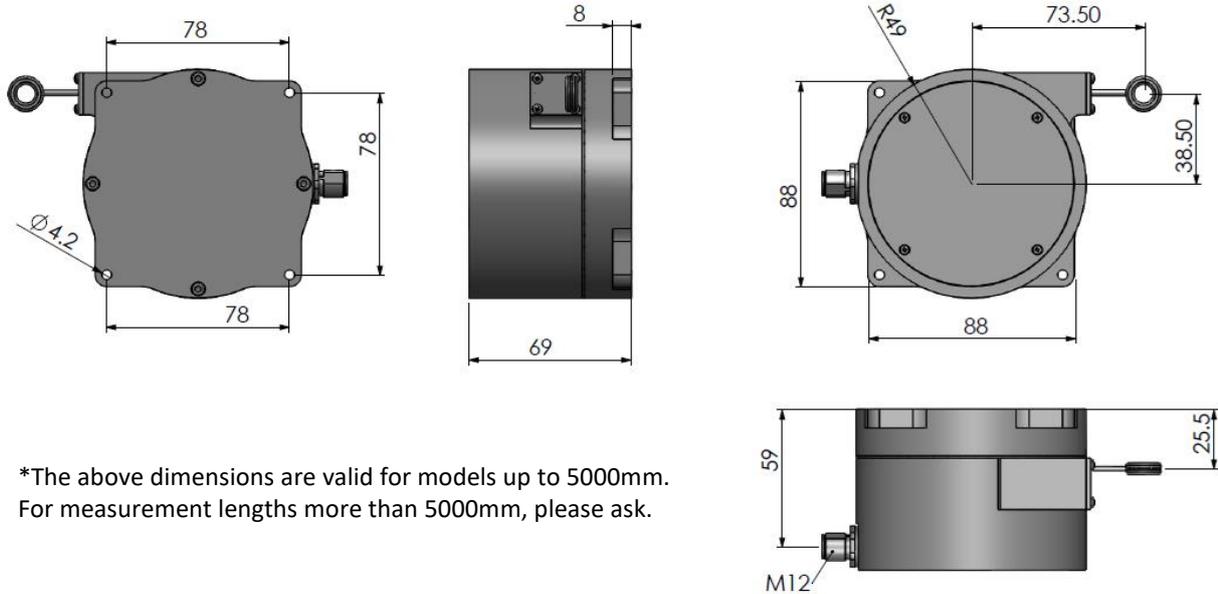
LENGTH and INCLINATION (ANGLE) MEASUREMENT IN ONE SENSOR



MECHANICAL DATA

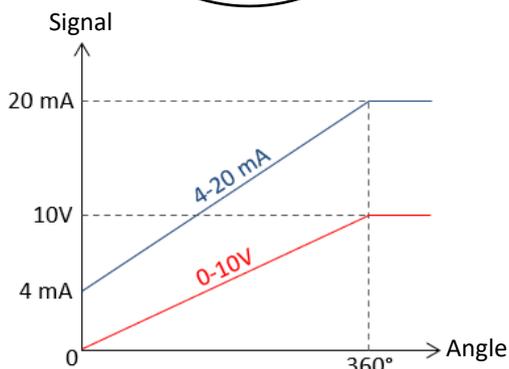
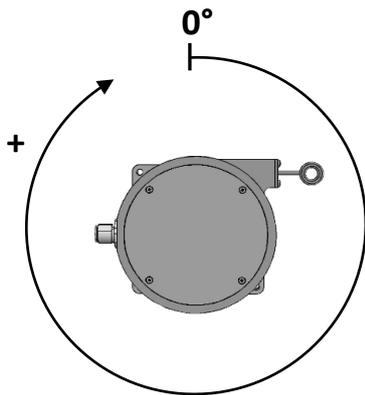
Measuring Range (stroke)	AWI 105: Different lengths up to 5000 mm AWI 112: Different lengths up to 12000 mm
Wire pull-out speed max	1 m/s
Wire Pull-out Force	AWI 105: 10N AWI 112: 12N
Protection Class	IP67
Operating Temperature	-40°C...+85°C
Material	Body: Aluminium
	Measuring wire: Stainless steel

MECHANICAL DIMENSIONS (mm)

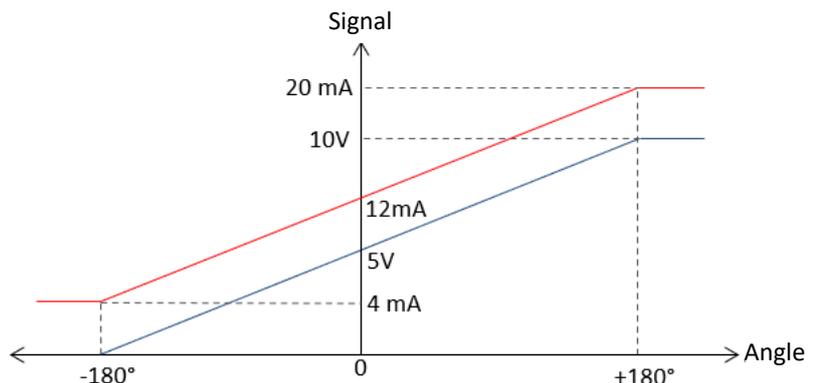
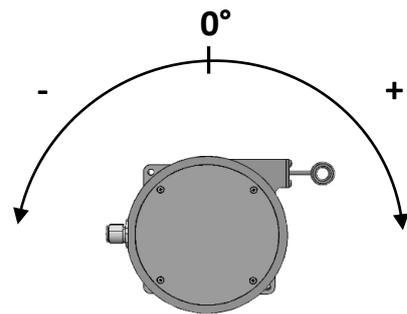


INCLINOMETER MEASUREMENT AXIS AND SIGNAL OUTPUT GRAPH

0...360°



±180°

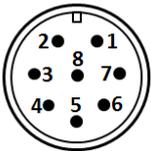


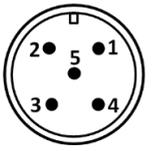
ANALOG VERSION

➤ **Electrical Specifications**

	Draw Wire Sensor	Inclinometer
Measuring range	AWI 105: Different lengths up to 5000 mm AWI 112: Different lengths up to 12000 mm	Different angle values between 0...360° Different angle values between ±180°
Supply voltage	15...26 VDC	
Reverse polarity	Yes	
Short circuit protection	Yes	
Response frequency	500 Hz	10Hz
Resolution	0.05 mm	12 bit
Linearity	±%0.5 FS	-
Accuracy	-	0,2°
Output signal	Voltage: 0-10V, 0.5-4.5V, 0-5V Current: 4-20 mA	
Electrical connection	M12 connector or cable	

➤ **Electrical Connection**

	DRAW WIRE SENSOR + INCLINOMETER		
	Signal	Cable	 M12 / 8 pin male connector
DRAW WIRE SENSOR OUTPUT (LENGTH MEASUREMENT)	V+ (15...26 VDC)	Red	Pin 1
	ANALOG OUT	Yellow	Pin 2
	GND	Black	Pin 3
	N/C	Pink	Pin 4
INCLINOMETER OUTPUT (INCLINATION MEASUREMENT)	V+ (15...26 VDC)	White	Pin 5
	ANALOG OUT	Green	Pin 6
	GND	Blue	Pin 7
	ZERO	Grey	Pin 8

	DRAW WIRE SENSOR		
	Signal	Cable	 M12 / 5 pin male connector
V+ (15...26 VDC)	Red	Pin 1	
ANALOG OUT	Yellow	Pin 2	
GND	Black	Pin 3	
N/C	Pink	Pin 4	
N/C	Green	Pin 5	

DETERMINING THE 0° POINT OF INCLINOMETER

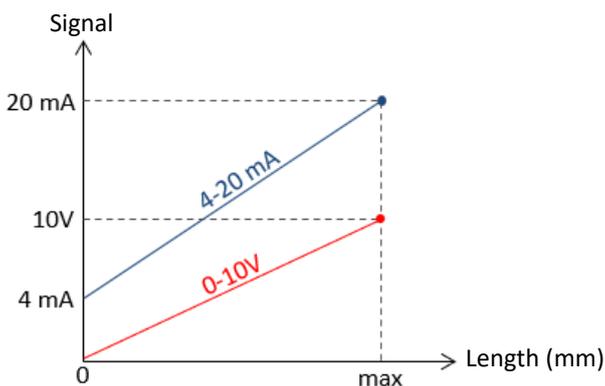
ZERO (pin8/grey) and GND (pin7/blue) terminals are short-circuited once and then disconnected. Thus, the sensor recognizes that the position is 0°. If the same operation is repeated a second time, the sensor is reset to the factory settings.

The ZERO (pin8/grey) terminal should not be left idle. After the adjustment process is completed, it must be connected to the V+ (pin5/white) terminal.

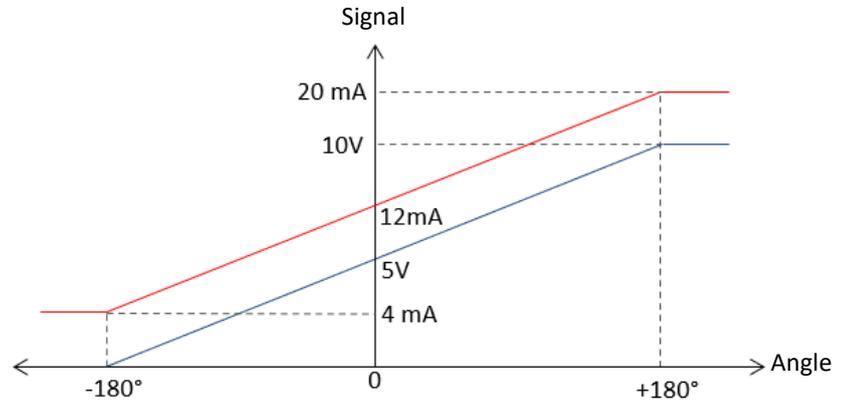
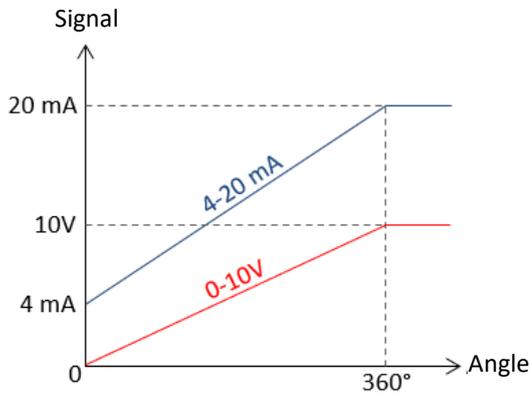
During the operations, the sensor position should be kept constant for approximately 4 seconds.

➤ **Sample Signal Output Graphics**

Draw Wire Sensor



Inclinometer



➤ Order Code (Draw Wire Sensor + Inclinometer)

Model	Inclinometer Number of Axis	Inclinometer Rotation Direction	Electrical Connection
AWI 105: Up to 5000mm AWI 112: Up to 12000mm	01: Single axis	CW: Clockwise CCW: Counterclockwise	S14M: M12/8 pin male conn. 2M: 2m cable *Optional others
AWI 1XX - XXXX - XX - XXX - XXX - XX - XXXX			
Measuring Range ⁽¹⁾ Different measuring lengths up to 12000 mm	Inclinometer Measuring Range ⁽²⁾ 360: 0...360° -180...+180: -180°...+180°	Analog Output Signal V : 0-10 VDC V1 : 0-5 VDC V3 : 0.5-4.5 VDC A : 4-20 mA	

(1) The measuring length can be selected in different lengths depending on customer request, up to 5000mm for AWI 105 and up to 12000mm for AWI 112.

(2) The inclination measuring range can be selected in different values between 0...360° or -180°...+180° depending on customer request.

Sample Order Code: AWI 105 4000 01 -90...+90 CW V S14M

➤ Order Code (Draw Wire Sensor)

Model	Analog Output Signal
AWI 105: Up to 5000mm AWI 112: Up to 12000mm	V : 0-10 VDC V1 : 0-5 VDC V3 : 0.5-4.5 VDC A : 4-20 mA
AWI 1XX - XXXX - XXXX - XX	
Measuring Range ⁽¹⁾ Different measuring lengths up to 12000 mm	Electrical Connection S13M: M12/5 pin male conn. 2M: 2m cable *Optional others

(1) The measuring length can be selected in different lengths depending on customer request, up to 5000mm for AWI 105 and up to 12000mm for AWI 112.

Sample Order Code: AWI 105 4000 V S13M

➤ **Electrical Specifications**

	Draw Wire Sensor	Inclinometer
Measuring range	AWI 105: Different lengths up to 5000 mm AWI 112: Different lengths up to 12000 mm	Different angle values between 0...360° Different angle values between ±180°
Supply voltage	15...26 VDC	
Reverse polarity	Yes	
Short circuit protection	Yes	
Response frequency	500 Hz	10Hz
Resolution	0.05 mm	12 bit
Linearity	±%0.5 FS	-
Accuracy	-	0,2°
Output signal	Voltage: 0-10V, 0.5-4.5V, 0-5V (Programmable for draw wire output) Akım: 4-20 mA (Programmable for draw wire output)	
Electrical connection	M12 connector or cable	

➤ **Electrical Connection**

DRAW WIRE SENSOR + INCLINOMETER			
	Signal	Cable	M12 / 8 pin erkek soket
DRAW WIRE SENSOR OUTPUT (LENGTH MEASUREMENT)	V+ (15...26 VDC)	Red	Pin 1
	ANALOG OUT	Yellow	Pin 2
	GND	Black	Pin 3
	SPAN/ZERO	Pink	Pin 4
INCLINOMETER OUTPUT (INCLINATION MEASUREMENT)	V+ (15...26 VDC)	White	Pin 5
	ANALOG OUT	Green	Pin 6
	GND	Blue	Pin 7
	ZERO	Grey	Pin 8

DRAW WIRE SENSOR			
	Signal	Cable	M12 / 5 pin male connector
V+ (15...26 VDC)	Red	Pin 1	
ANALOG OUT	Yellow	Pin 2	
GND	Black	Pin 3	
SPAN/ZERO	Pink	Pin 4	
N/C	Green	Pin 5	

DETERMINING THE 0° POINT OF INCLINOMETER

ZERO (pin8/grey) and GND (pin7/blue) terminals are short-circuited once and then disconnected. Thus, the sensor recognizes that the position is 0°. If the same operation is repeated a second time, the sensor is reset to the factory settings.

The ZERO (pin8/grey) terminal should not be left idle. After the adjustment process is completed, it must be connected to the V+ (pin5/white) terminal.

During the operations, the sensor position should be kept constant for approximately 4 seconds.

SETTING MEASUREMENT LIMITS FOR DRAW WIRE SENSOR (LENGTH MEASUREMENT)

With this feature, you can set the minimum and maximum measurement limits.

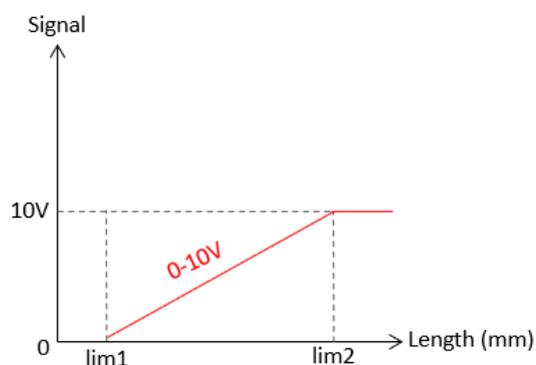
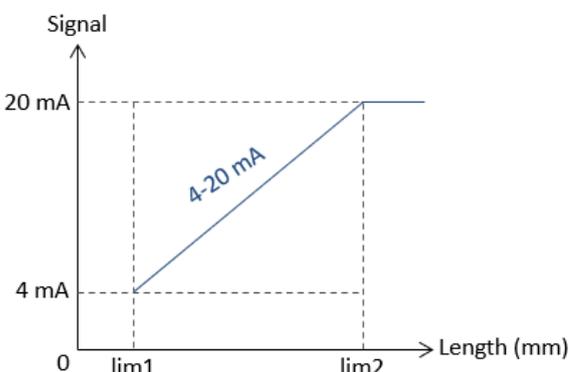
In order to determine the **minimum measurement limit (lim1)**, the SPAN/ZERO (pin4/pink) and GND (pin3/black) terminal are short-circuited for at least 3 seconds.

In order to determine the **maximum measurement limit (lim2)**, the SPAN/ZERO (pin4/pink) and GND (pin3/black) terminal are short-circuited for at least 6 seconds.

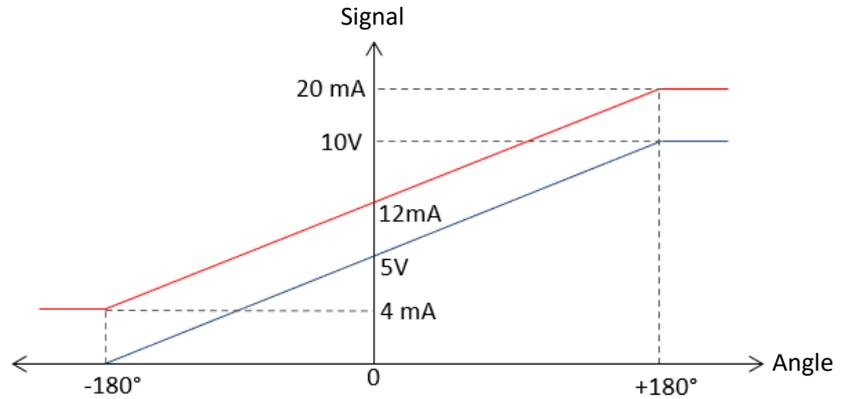
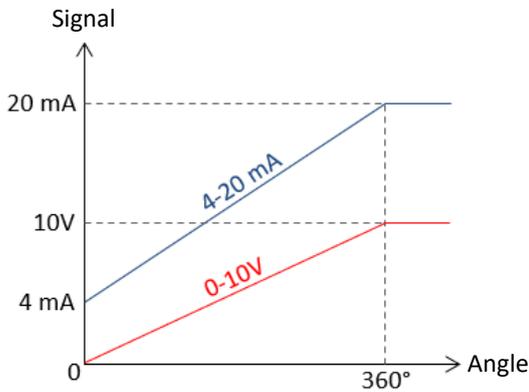
To **return to the factory settings**, the SPAN/ZERO (pin4/pink) and GND (pin3/black) terminal are short-circuited for at least 10 seconds.

➤ **Sample Signal Output Graphics**

Draw Wire Sensor, Programmable



Inclinometer



➤ Order Code (Draw Wire Sensor + Inclinometer)

Model	Inclinometer Number of Axis	Inclinometer Rotation Direction	Electrical Connection
AWI 105: Up to 5000mm AWI 112: Up to 12000mm	01: Single axis	CW: Clockwise CCW: Counterclockwise	S14M: M12/8 pin male conn. 2M: 2m cable *Optional others
AWI 1XX - XXXX - XX - XXX - XXX - XX - XXXX - XXX	Measuring Range ⁽¹⁾ Different measuring lengths up to 12000 mm	Inclinometer Measuring Range ⁽²⁾ 360: 0...360° -180...+180: -180°...+180°	Analog Output Signal V : 0-10 VDC V1 : 0-5 VDC V3 : 0.5-4.5 VDC A : 4-20 mA
			Draw Wire Output Programming Feature PL: Programmable

(1) The measuring length can be selected in different lengths depending on customer request, up to 5000mm for AWI 105 and up to 12000mm for AWI 112.

(2) The inclination measuring range can be selected in different values between 0...360° or -180°...-180° depending on customer request.

Sample Order Code: AWI 105 4000 01 -90...+90 CW V S14M PL

➤ Order Code (Draw Wire Sensor)

Model	Analog Output Signal	Draw Wire Output Programming Feature
AWI 105: Up to 5000mm AWI 112: Up to 12000mm	V : 0-10 VDC V1 : 0-5 VDC V3 : 0.5-4.5 VDC A : 4-20 mA	PL: Programmable
AWI 1XX - XXXX - XXXX - XX - XX	Measuring Range ⁽¹⁾ Different measuring lengths up to 12000 mm	Electrical Connection S13M: M12/5 pin male conn. 2M: 2m cable *Optional others

(1) The measuring length can be selected in different lengths depending on customer request, up to 5000mm for AWI 105 and up to 12000mm for AWI 112.

Sample Order Code: AWI 105 4000 V S13M PL

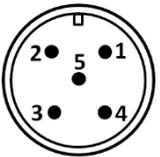
➤ Electrical Specifications

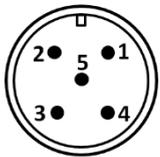
	Draw Wire Sensor	Inclinometer
Measuring range	AWI 105: Different lengths up to 5000 mm AWI 112: Different lengths up to 12000 mm	Different angle values between 0...360° Different angle values between ±180°
Supply voltage	12...30 VDC	
Reverse polarity	Yes	
Short circuit protection	Yes	
Response frequency	500 Hz	10Hz
Resolution	50µm	12 bit
Linearity	±%0.5 FS	-
Accuracy	-	0,2°
Output signal	CANopen, CiA DS406	
Electrical connection	M12 connector or cable	

CANopen Specifications

Communication Profile	CiA 301
Device Type	CANopen, CiA DS406
Node ID	Adjustable from 1 to 127 with LSS or SDO
Baud Rate	10 kBit/s, 20 kBit/s, 50 kBit/s, 100 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 Mbit/s
PDO Data Rate	100 ms
Error Control	Heartbeat, Emergency Message
PDO	3 Tx PDO
PDO Modes	Event/Time triggered, Synch/Asynch
SDO	1 server
Position Information	Object Dictionary 0x6020
Termination Resistance	Optional 120Ω

➤ Electrical Connection

DRAW WIRE SENSOR + INCLINOMETER		
Signal	Cable	 M12 / 5 pin male conn.
CAN SHIELD	CAN SHIELD	Pin 1
V+ (12...30VDC)	Red	Pin 2
GND	Black	Pin 3
CAN_H	Yellow	Pin 4
CAN_L	Green	Pin 5

DRAW WIRE SENSOR		
Signal	Cable	 M12 / 5 pin male conn.
CAN SHIELD	CAN SHIELD	Pin 1
V+ (12...30VDC)	Red	Pin 2
GND	Black	Pin 3
CAN_H	Yellow	Pin 4
CAN_L	Green	Pin 5

➤ Order Code (Draw Wire Sensor + Inclinometer)

Model AWI 105: Up to 5000mm AWI 112: Up to 12000mm		Inclinometer Number of Axis 01: Single axis		Inclinometer Rotation Direction CW: Clockwise CCW: Counterclockwise		Electrical Connection S13M: M12/5 pin male conn. 2M: 2m cable *Optional others						
AWI 1XX	-	XXXX	-	XX	-	XXX	-	XXX	-	XX	-	XXXX
Measuring Range ⁽¹⁾ Different measuring lengths up to 12000 mm				Inclinometer Measuring Range ⁽²⁾ 360: 0...360° -180...+180: -180°...+180°				Output Signal C : CANopen				

(1) The measuring length can be selected in different lengths depending on customer request, up to 5000mm for AWI 105 and up to 12000mm for AWI 112.

(2) The inclination measuring range can be selected in different values between 0...360° or -180°...-180° depending on customer request.

Sample Order Code: AWI 105 4000 01 -90...+90 CW C S13M

➤ Order Code (Draw Wire Sensor)

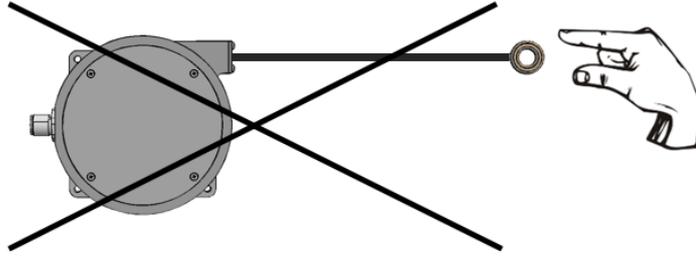
Model AWI 105: Up to 5000mm AWI 112: Up to 12000mm		Output Signal C : CANopen				
AWI 1XX	-	XXXX	-	XXXX	-	XX
Measuring Range ⁽¹⁾ Different measuring lengths up to 12000 mm				Electrical Connection S13M: M12/5 pin male conn. 2M: 2m cable *Optional others		

(1) The measuring length can be selected in different lengths depending on customer request, up to 5000mm for AWI 105 and up to 12000mm for AWI 112.

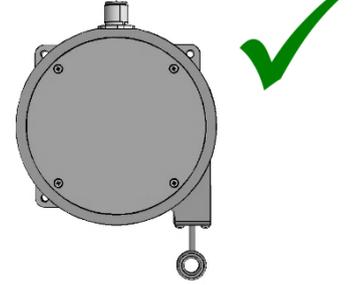
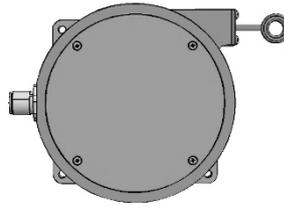
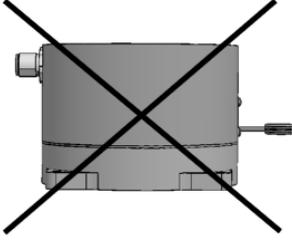
Sample Order Code: AWI 105 4000 C S13M

MOUNTING AND WARNINGS

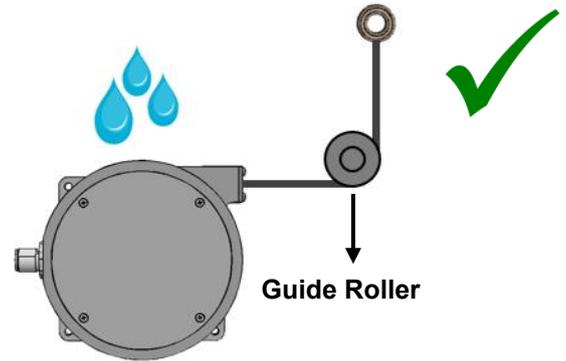
1. Never release the wire after pulling. Otherwise, the coil spring will be damaged.



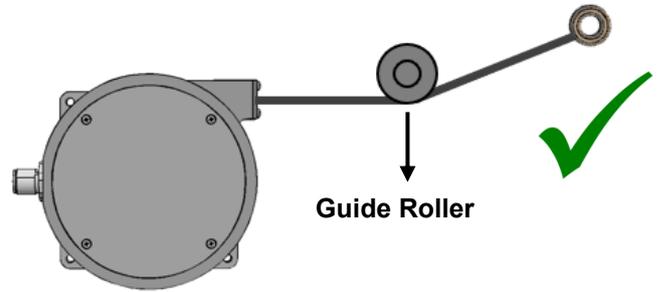
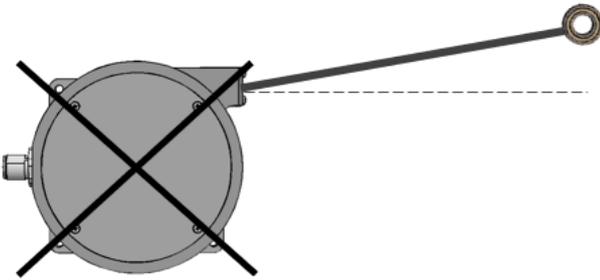
2. Mount the sensor according to the mounting directions shown below.



3. If there is a trickle of water (like a rain), the wire outlet must not be a drip of water upstream. If needed please use guide rollers.



4. The wire should not be pulled in angular. If needed, please use guide rollers.



Important Note(!): Failure to comply with these recommendations, the malfunctions that may occur will not be under the warranty.