

## ILT 110 Series

“Touchless, Inductive Measurement Technology”



- Inductive measurement technology
- Absolute working principle
- Magnetic field resistant
- Touchless measurement
- Status LED
- Versatile mounting
- 1  $\mu\text{m}$  resolution
- 500 Hz high update rate
- Shock and vibration resistance
- Analog, SSI, CANopen, RS-232 or RS-485 interface
- IP64 protection class

**کانون ابزار**

تلفن :

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**0912 147 3023**

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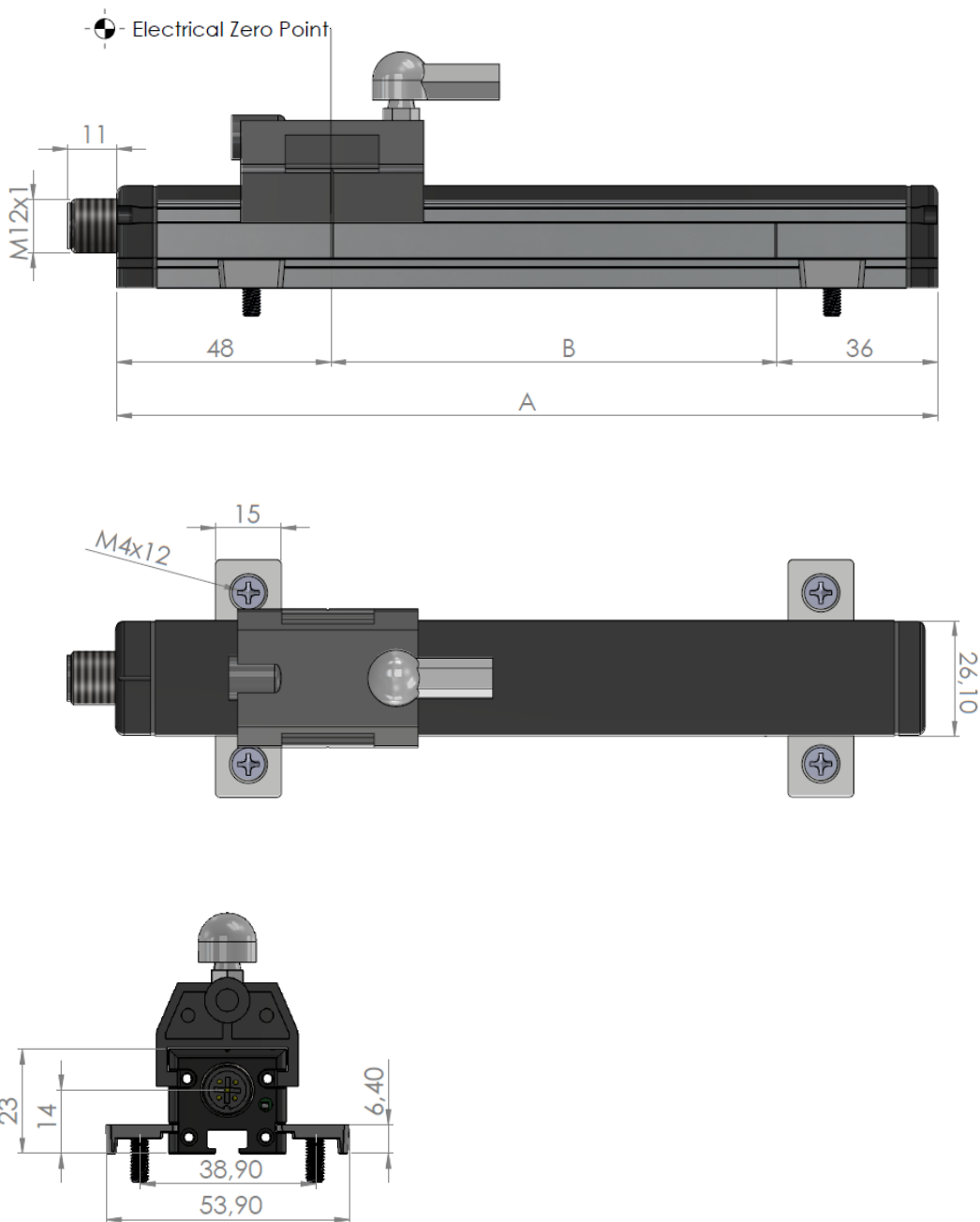
The working principle of ILT 110 series inductive linear position sensors depends on the RLC coupling between the positioning element and the sensor. An output signal is provided according to the position of the positioning element. Thanks to the touchless working principle, they are long-lasting since there are no factors such as wear and tear.

They offer wide temperature tolerance, high repeatability, resolution and linearity. They work stably for a long time without being affected by electromagnetic fields. They are used in applications such as manufacturing engineering, plastic injection molding, textile, packaging, sheet metal working, woodworking, automation technology.

## MECHANICAL DATA

<b>Housing Length (A)</b>	B + 84 mm
<b>Electrical Stroke (B)</b>	Between 100 mm... 500 mm in steps of 50 mm Between 500 mm... 1000 mm in steps of 100 mm
<b>Protection Class</b>	IP64
<b>Life</b>	Mechanically unlimited
<b>Mechanical Fixing</b>	Adjustable (movable) mounting clamps
<b>Operating Temperature</b>	-20°C...+70°C
<b>Storage Temperature</b>	-20°C...+70°C
<b>Material</b>	Position Marker: POM
	Housing: Anodized aluminum

## MECHANICAL DIMENSIONS (mm)



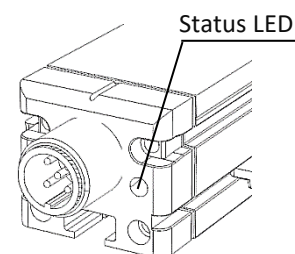
## ANALOG INTERFACE

### Electrical Specifications

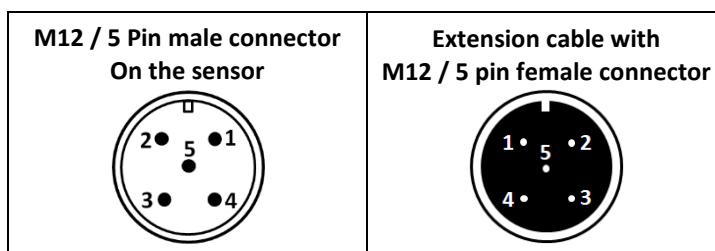
Electrical stroke (B)	Between 100 mm... 500 mm in steps of 50 mm Between 500 mm... 1000 mm in steps of 100 mm
Output Signal	0-10V, 0.5-4.5V, 0-5V, 0-20 mA, 4-20 mA
Number of channel	1
Output update rate	500 Hz max.
Signal propagation delay	2, 3, 4, 5, 6, 8, 10 ms (according to filter selection)
Resolution	16 bit
Absolute Linearity	$\leq \pm 0.025$ FS (min. $\pm 100 \mu\text{m}$ ) (when the signal propagation delay is 10 ms)
Reproducibility	$< \pm 0.012$ FS (when the signal propagation delay is 10 ms)
Supply voltage	15...33VDC
Supply voltage ripple	$\leq 10\%$ V <sub>ss</sub>
Power consumption (w/o load)	0.5W
Overvoltage protection	33 VDC
Reverse polarity protection	Yes, up to supply voltage max
Short circuit protection	Yes (outputs, GND and supply voltage), Up to 12V

### LED Function

Led Color	Description
Off	Sensor is not working – No supply
Green	Sensor is working – Position marker is within measuring range
Blue flash (1sn)	Sensor is working - Position marker is outside od measuring range ( $\pm 6\text{mm}$ max)
Red flash (1sn)	Sensor is working - Position marker is outside od measuring range
Red fast flash (100ms)	Sensor error



### Electrical Connection



Analog Voltage	Analog Current	Pin No	Cable Color	Pin No	Cable Color
+V	+V	1	Red	1	Brown
N/C	I <sub>out</sub>	2	Green	2	White
GND	GND	3	Black	3	Blue
V <sub>out</sub>	N/C	4	Yellow	4	Black
Prog	Prog	5	Pink	5	Grey

### Analog Output Settings

Blue or green LED flashes every second in normal operating condition.

Prog pin (pin 5) and GND (pin 3) are short-circuited until the LED on the product starts to flash blue. Thus, programming mode is entered.

**Step 1 - Setting the starting point:** After the position marker is brought to the desired starting point, Prog pin (pin5) and GND (pin3) are short-circuited for 1 second and the minimum analog value (4mA/0V) is set. In this case, the LED lights up blue for 2 seconds and then proceed to step 2.

**Step 2 – Setting the end point:** After the position marker is brought to the desired end point, Prog pin (pin5) and GND (pin3) are short-circuited for 1 second. Thus, the max analog value (20mA / 10V) is set and the programming mode is exited.

#### Return to Factory Settings:

In step 1, if Prog pin(pin5) and GND(pin3) are short-circuited until the LED on the product starts to flash green, the factory settings will be restored (starting 4mA / 0V, ending 20mA / 10V).

In step 2, if Prog pin(pin5) and GND(pin3) are short-circuited until the LED on the product starts to flash green, the factory settings will be restored (start 20mA / 10V, end 4mA / 0V).

**Note:** After the analog output settings are finished, the Prog pin must be left connected to + V.

## Order Code

### Filter Selection

**02** : 2ms (standard)

\*For others see  
Electrical specifications/signal  
propagation delay

### Electrical Connection

**S69M** : M12/5 pin male  
connector

### Model

<b>ILT 110</b>	-	<b>XXXX</b>	-	<b>XX</b>	-	<b>XX</b>	-	<b>XXXX</b>
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### Measuring Lengths (stroke)

Different measuring lengths from 100  
mm to 1000 mm

\*Measuring length can be selected between  
100 mm... 500 mm in 50 mm steps, between  
500 mm... 1000 mm in 100 mm steps.

### Electrical Interface

**V**: 0-10V

**V1**: 0-5V

**V3**: 0.5-4.5V

**A**: 4-20 mA

**A0**: 0-20 mA

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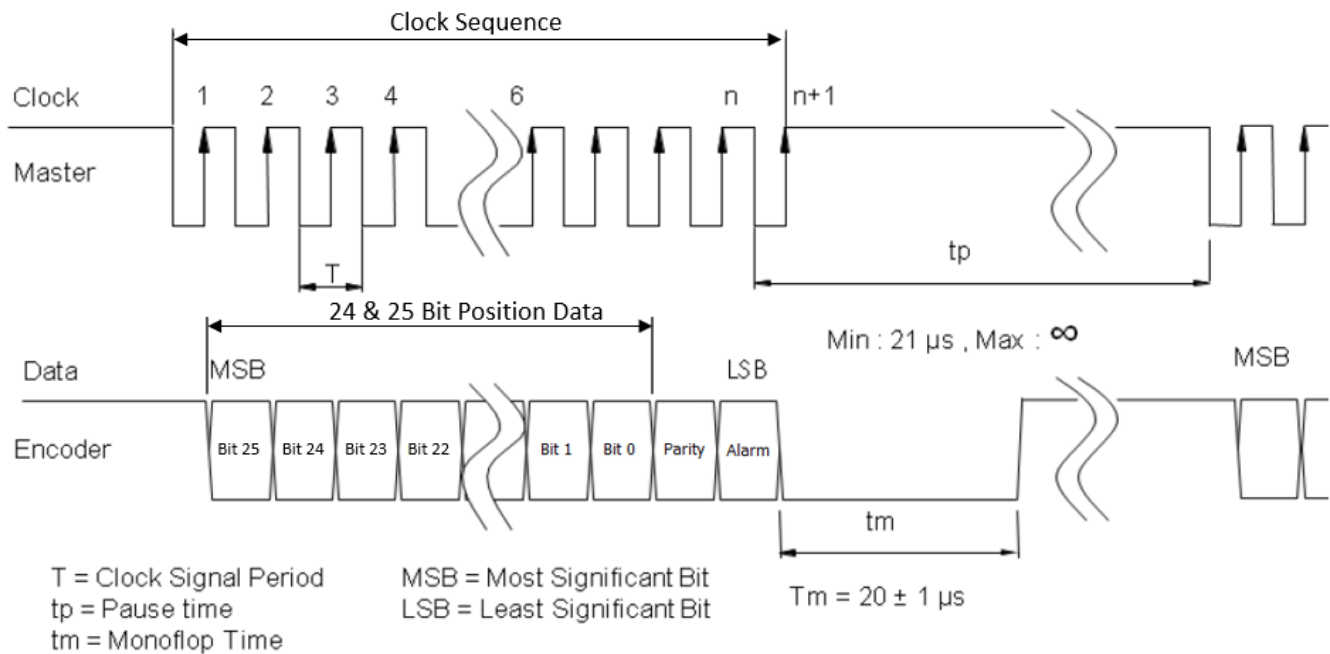
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## SSI INTERFACE

### Electrical Specifications

Electrical stroke (B)	Between 100 mm... 500 mm in steps of 50 mm Between 500 mm... 1000 mm in steps of 100 mm
Protocol	SSI 24 and 25 bit (ask for others)
Parity Bit	Even / Odd / None (default)
Alarm Bit	Active High / Active Low / None (default)
Process data area	Bit 0... Bit 19
Inputs	RS422
Monofloptime (tm)	20 µs
Encoding	Gray, Binary
Output update rate	500 Hz (depends on the filter)
Resolution (LSB)	Selectable between 1...1000 µm
Signal propagation delay	2, 3, 4, 5, 6, 8, 10 ms (according to filter selection)
Reproducibility	$\leq \pm 0.012$ FS (when the signal propagation delay is 10 ms)
Absolute Linearity	$\leq \pm 0.025$ FS (min. $\pm 100$ µm) (when the signal propagation delay is 10 ms)
Supply voltage	8...33 VDC
Supply voltage ripple	$\leq 10\%$ Vss
Power consumption (w/o load)	0.5W
Overvoltage protection	33 VDC
Reverse polarity protection	Yes, up to supply voltage max
Short circuit protection	Yes (outputs, GND and supply voltage up to 7V)
Ohmic load at outputs	$>120\Omega$
Max. Clock rate	1 MHz

### SSI TIMING DIAGRAM



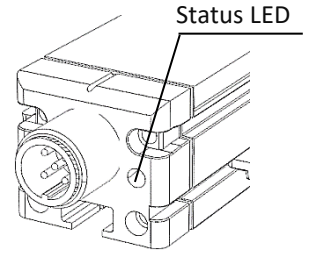
If the device resolution is less than 24 or 25 Bits, the remaining bit fields from the MSB are filled with 0.

The device indicates this status with the Alarm bit at power-on after the lock state.

Alarm: 1 (alarm)                      MCU lock up alarm    MCU watchdog alarm  
0 (no alarm)

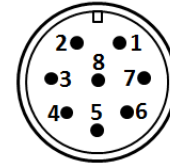
## LED Function

Led Color	Description
Off	Sensor is not working – No supply
Green	Sensor is working – Position marker is within measuring range
Blue flash (1 sn)	Sensor is working - Position marker is outside od measuring range ( $\pm 6$ mm max)
Red flash (1 sn)	Sensor is working - Position marker is outside od measuring range
Red fast flash (100 ms)	Sensor error



## Electrical Connection

Signal	Cable	M12 / 8 pin male connector
Clk+	White	Pin 1
Data+	Yellow	Pin 2
Clk-	Blue	Pin 3
N/C	N/C	Pin 4
Data-	Green	Pin 5
GND	Black	Pin 6
+V (Supply Voltage)	Red	Pin 7
N/C	N/C	Pin 8



## Order Code

Model	Resolution	Electrical Interface	Parity Bit	Electrical Connection
ILT 110 - XXXX - XXXX - XX - XXX - XXX - X - X - XXXX	Selectable between 1...1000 $\mu$ m	SSI : SSI	E: Even O: Odd N: None (default)	S14M : M12/8pin male connector
<b>Measuring Lengths (stroke)</b>	<b>Filter Selection</b>	<b>Output Signal</b>	<b>Alarm Bit</b>	
Different measuring lengths from 100 mm to 1000 mm  *Measuring length can be selected between 100 mm... 500 mm in 50 mm steps, between 500 mm... 1000 mm in 100 mm steps.	<b>02</b> : 2ms (standard)  *For others see Electrical specifications/signal propagation delay	<b>24G</b> : SSI 24 bit, Gray <b>25G</b> : SSI 25 bit, Gray <b>24B</b> : SSI 24 bit, Binary <b>25B</b> : SSI 25 bit, Binary *Ask for others.	<b>H</b> : Active high <b>L</b> : Active low <b>N</b> : None (default)	

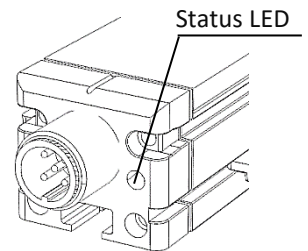
# CANopen INTERFACE

## Electrical Specifications

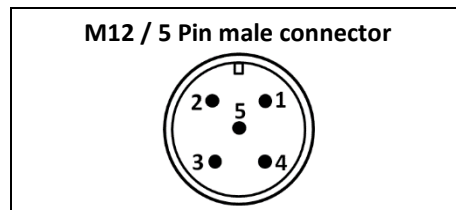
Measured variables	Position, speed and temperature
Electrical stroke (B)	Between 100 mm... 500 mm in steps of 50 mm Between 500 mm... 1000 mm in steps of 100 mm
Measuring range speed	0...5 m/s
Protocol	CANopen protocol to CiA DS-301 V4.2.0, Device profile DS-406 V3.2
Programmable parameter	nod-id, baud-rate
Node-ID	1...127 (default 127)
Baud rate	10 ... 1000 kBaud
Output update rate	500 Hz
Position resolution	1 µm min.
Speed resolution	10 µm/s min.
Signal propagation delay	2, 3, 4, 5, 6, 8, 10 ms (according to filter selection)
Reproducibility	≤ ± %0.012 FS (when the signal propagation delay is 10 ms)
Absolute Linearity	≤ ± %0.025 FS (min. ± 100 µm) (when the signal propagation delay is 10 ms)
Supply voltage	8...33 VDC
Supply voltage ripple	≤ %10 Vss
Power consumption (w/o load)	0.5W
Overvoltage protection	33 VDC
Reverse polarity protection	Yes, up to supply voltage max
Short circuit protection	Yes (outputs, GND and supply voltage max.)
Termination resistance	No (optional internal 120 Ω load resistance)

## LED Function

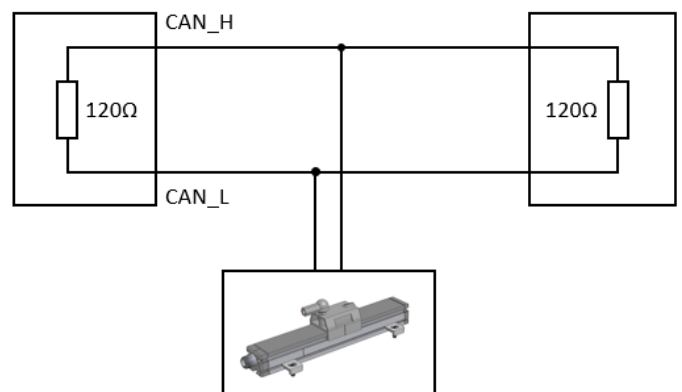
Led Color	Description
Off	Sensor is not working – No supply
Green	Sensor is working – Position marker is within measuring range
Blue flash (1 sn)	Sensor is working - Position marker is outside od measuring range (±6mm max)
Red flash (1 sn)	Sensor is working - Position marker is outside od measuring range
Red fast flash (100 ms)	Sensor error



## Electrical Connection



Signal	Cable Color	Pin No
CAN SHIELD	CAN SHIELD	1
+V (Supply Voltage)	Red	2
GND	Black	3
CAN_H	Yellow	4
CAN_L	Green	5



## Order Code

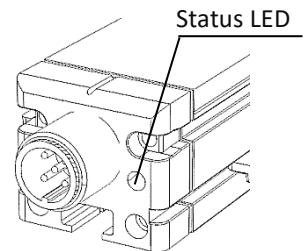
Model		Electrical Interface	
ILT 110	-	XXXX	- X - XXXX
<b>Measuring Lengths (stroke)</b>		<b>Electrical Connection</b>	
Different measuring lengths from 100 mm to 1000 mm		<b>S13M</b> : M12/5 pin male connector	
*Measuring length can be selected between 100 mm... 500 mm in 50 mm steps, between 500 mm... 1000 mm in 100 mm steps.			

## Electrical Specifications

<b>Electrical stroke (B)</b>	Between 100 mm... 500 mm in steps of 50 mm Between 500 mm... 1000 mm in steps of 100 mm
<b>Communication Protocols</b>	Modbus RTU, Modbus ASCII, ASCII (every 100 ms)
<b>Baud Rate</b>	600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200 MODBUS RTU / MODBUS ASCII Default: 19200 ASCII Default: 9600
<b>Data Bits</b>	MODBUS ASCII: 7 ASCII / MODBUS RTU: 8
<b>Parity</b>	None, Odd, Even Default: None
<b>Address</b>	Between 1 and 247 Default: 1
<b>Output update rate</b>	500 Hz
<b>Signal propagation delay</b>	2, 3, 4, 5, 6, 8, 10 ms (according to filter selection)
<b>Resolution</b>	16 bit
<b>Reproducibility</b>	< ± %0.012 FS (when the signal propagation delay is 10 ms)
<b>Absolute Linearity</b>	≤ ± %0.025 FS (min. ± 100 μm) (when the signal propagation delay is 10 ms)
<b>Supply voltage</b>	8...33 VDC
<b>Supply voltage ripple</b>	≤ %10 Vss
<b>Power consumption (w/o load)</b>	0.5W
<b>Overvoltage protection</b>	33 VDC
<b>Reverse polarity protection</b>	Yes, up to supply voltage max
<b>Short circuit protection</b>	Yes (outputs, GND and supply voltage max.)

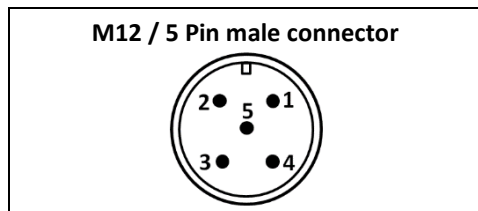
## LED Function

Led Color	Description
Off	Sensor is not working – No supply
Green	Sensor is working – Position marker is within measuring range
Blue flash (1 sn)	Sensor is working - Position marker is outside of measuring range (±6mm max)
Red flash (1 sn)	Sensor is working - Position marker is outside of measuring range
Red fast flash (100 ms)	Sensor error



## Electrical Connection

Signal	Cable Color	Pin No
SHIELD	SHIELD	1
+V (Supply Voltage)	Red	2
GND	Black	3
(RS232 - Rx) / (RS485 - A)	Yellow	4
(RS232 - Tx) / (RS485 - B)	Green	5



## ASCII DATA FRAME FORMAT (Sent every 100 ms)

Pos Data 8	7	6	5	4	3	2	Pos Data 1 digit	CRC H	CRC L	1F (0x0A)
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Position Data

Should be calculated with CRC-16 Maxim Algorithm

## RS-232 / RS-485 ASCII output telegram:

8 character digit + 16 bit CRC High Byte + 16bit CRC Low Byte + LF (0x0A)




[Click for sample CRC calculation algorithm with C#](#)



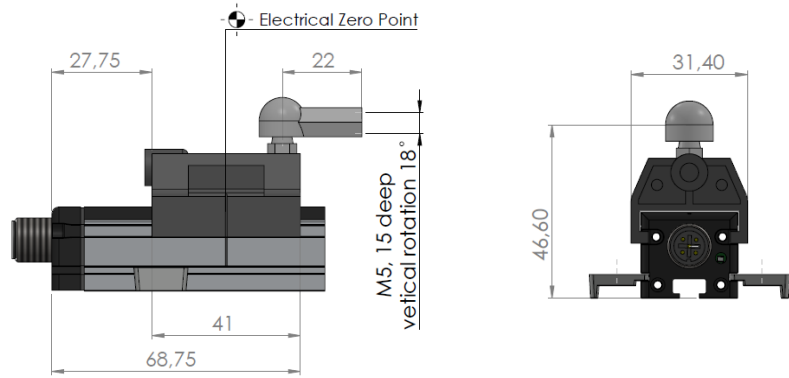
## Order Code

Model				Electrical Interface			Electrical Connection		
				S1 : RS-232			S13M : M12/5 pin male connector		
				S2 : RS-485					
ILT 110	-	XXXX	-	XX	-	XXXX	-	XXXX	
<b>Measuring Lengths (stroke)</b>				<b>Comm. Protocol</b>					
Different measuring lengths from 100 mm to 1000 mm				MR : Modbus RTU					
*Measuring length can be selected between 100 mm... 500 mm in 50 mm steps, between 500 mm... 1000 mm in 100 mm steps.				MA : Modbus ASCII					
				AS : ASCII (every 100 ms)					

## OPTIONAL PRODUCTS

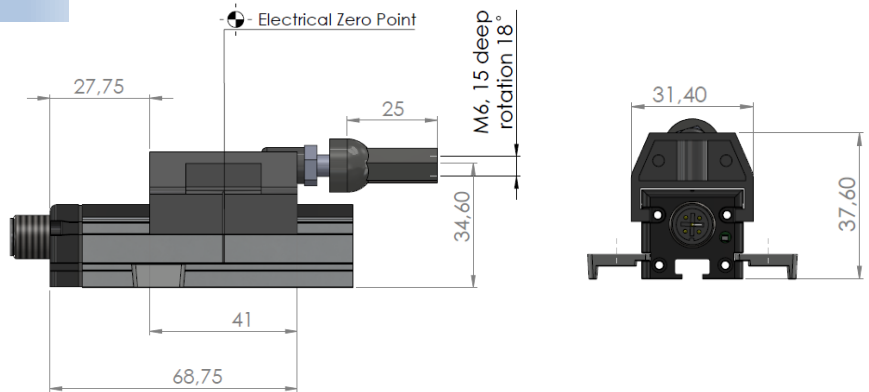
Product	Code	Description	Pin Configuration
	M12/P5 CONNECTOR 5MT 90°	M12/5 pin female connector, with 5 meters cable, 90° (For connection with M12/5 pin male connector on the sensor)	 <p>Pin1 : Brown Pin2 : White Pin3 : Blue Pin4 : Black Pin5 : Grey</p>
	M12/P5 CONNECTOR 5MT STRAIGHT	M12/5 pin female connector, with 5 meters cable, straight (For connection with M12/5 pin male connector on the sensor)	

GPM-U (Guided and Top Joint)



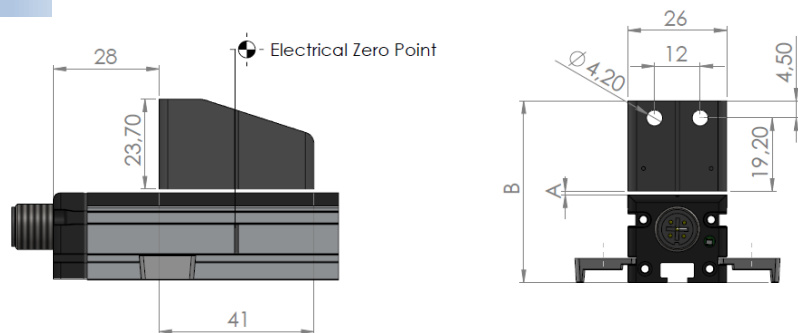
	GPM-6-U	GPM-10-U
Stroke Used	100 ... 600 mm	700 ... 1000 mm
Housing Material	POM	
Joint Material	Igumid G / iglide® L280 (W300)	
Weight	~20 gr	

GPM-Y (Guided and Side Joint)



	GPM-6-Y	GPM-10-Y
Stroke Used	100 ... 600 mm	700 ... 1000 mm
Housing Material	POM	
Joint Material	Igumid G / iglide® L280 (W300)	
Weight	~22 gr	

FPM (Floating and independent)



	FPM-6	FPM-10
Stroke Used	100 ... 600 mm	700 ... 1000 mm
Working Distance (A)	0,3 mm	
Mounting Dimension (B)	47 mm	
Perm. Lateral offset	± 0,5 mm	
Housing Material	POM	
Weight	~23 gr	

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