M70LL

Laser Distance Sensor

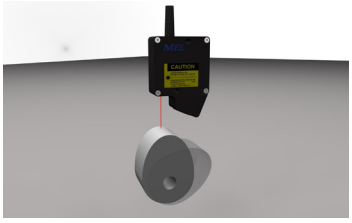
for automated manufacturing
with Ethernet interface
to connect with PLC

» 100 kHz Measuring frequency
for high-speed measurements

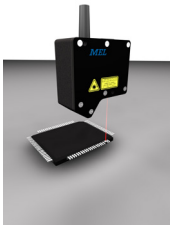
- Ethernet interface
- Analog output
- Ranges 0.5 mm up to 200 mm
- Measuring frequency 100 kHz
- Low noise
- Reliable results also with white/black transition
- Replacable protection glasses

The analog sensors of series M70LL use a PSD for their receiver optics. This assures a continuous position measurement at high-speed movements. Replacable protection glasses and a robust casing allow the use even in dirty environments.

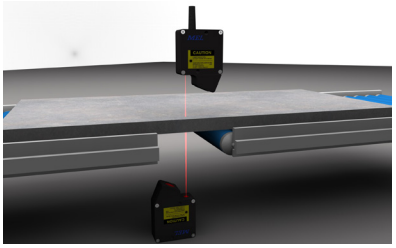
Applications:



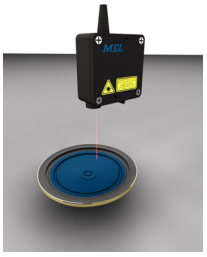
Roundness Measurement:
The sensor is mounted in a defined distance to the rotating object. Even smallest deviations from roundness are recognised due to a continuous displacement measurement.



IC check:
To avoid error during placement the ICs are detected by a M70LL laser sensor. Bent or absent pins are realised and can be signaled to the machine control. Thus waste will be recognised immediately and the appropriate corrective action can be initiated without delay.



Thickness Measurement:
Two sensors are measuring onto the top and the bottom side of the target. The thickness of the object results from the measured distance values.



Vibration Measurement:
The M70LL measures die deflection of a membrane at vibrations up to 100 kHz.

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Specifications

Sensor M70LL/		0.5	2	4	10	20	50	100	200
Measuring range	[mm]	0.5	2	4	10	20	50	100	200
Range begin	[mm]	23.75	23	22	40	55	115	170	240
Linearity ±	[µm]	1.5	6	12	30	60	150	300	600
Resolution [1]	[µm]	0.8	3.5	7	17.5	35	50	100	330
Resolution [2]	[µm]	0.05	0.2	0.4	1	2	7.5	15	50
Light spot diameter	[mm]	0.1	0.2	0.3	0.6	0.9	1.5	1.5	2

Laser class	class 2 according to DIN EN 60825-1:2001-11, optionally enhanced laser power
Light source	Laser, wave length 650 ... 670 nm, red visible
Sampling rate	400 kHz
Interface	Ethernet
Distance output	4-20 mA; ±10 V (optional 0-20 mA, 0-10 V, 0-5 V, ±5 V)
Impedance	approx. 0 Ohm (10 mA max.)
Output rate	100 kHz (-3 db)
Temperature drift	0.02% of range / K
Light intensity output	0-10 V
MIN	+24 V / 10 mA when lower than MIN, LED yellow
OK	+24 V / 10 mA when higher than MIN and lower than MAX, LED green
MAX	+24 V / 10 mA when higher than MAX, LED orange
Error output	+24 V / 10 mA, LED red
Switching hysteresis	approx. 0.5% of range
Ambient light	20,000 Lux
Operation time	50,000 h for laser diode
Isolation voltage	200 VDC, 0 V against casing
Max. vibration	5 g up to 1 kHz
Operation temperature	0° ... +50°C
Storage temperature	-20° ... +70°C
Humidity	up to 90% RH, non condensing
Protection class	Sensor head: IP 64, electronic unit: IP 40
Power supply	+24 VDC / 250 mA (10 ... 30 V)

All specifications are valid for measurements on matt white objects
[1] Measuring rate 100 kHz [2] Measuring rate 230 Hz

Pin assignment 25 pin SUB-D

Pin	Signal	Level	Pin	Signal	Level
1	Distance output	±10 V	14	Analog GND	0 V
2	Error output	0 / 24 V	15	Sync in	
3	Sync out		16	Digital output MAX	0 / 24 V
4	n.c.		17	Distance input	0 ... 5 V
5	Digital output OK	0 / 24 V	18	GND	
6	Distance output	4 ... 20 mA	19	Digital output MIN	0 / 24 V
7	n.c.		20	Intensity output	±10 V
8	GND power supply	0 V	21	Supply voltage	+24 V
9	Encoder A		22	Encoder B	
10	Laser out	+24 V	23	n.c.	
11	n.c.		24	n.c.	
12	n.c.		25	n.c.	
13	n.c.		Housing	EMV	

Dip switch settings

Output rate	S1	S2	S3	S4	S5	S6
100 kHz	–	–	–	–	–	–
70 kHz	x	–	–	–	–	–
40 kHz	x	x	–	–	–	–
10 kHz	–	x	x	–	–	–
2,5 kHz	–	–	–	x	–	–
1 kHz	–	–	–	–	x	–
250 kHz	–	–	–	–	x	x
230 kHz	x	x	x	x	x	x

bold text: factory settings

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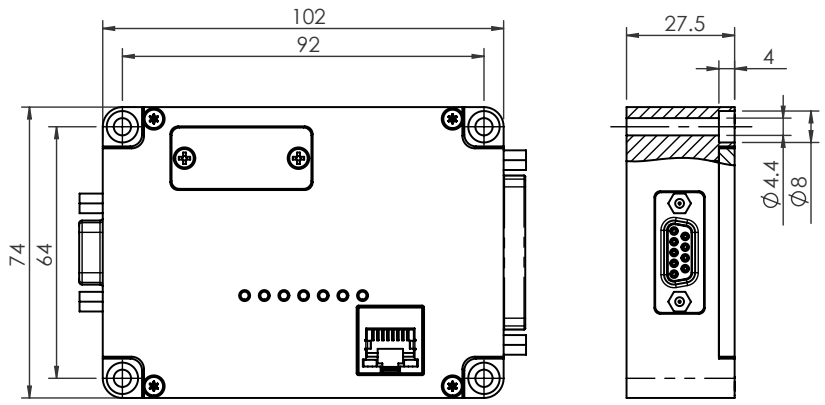
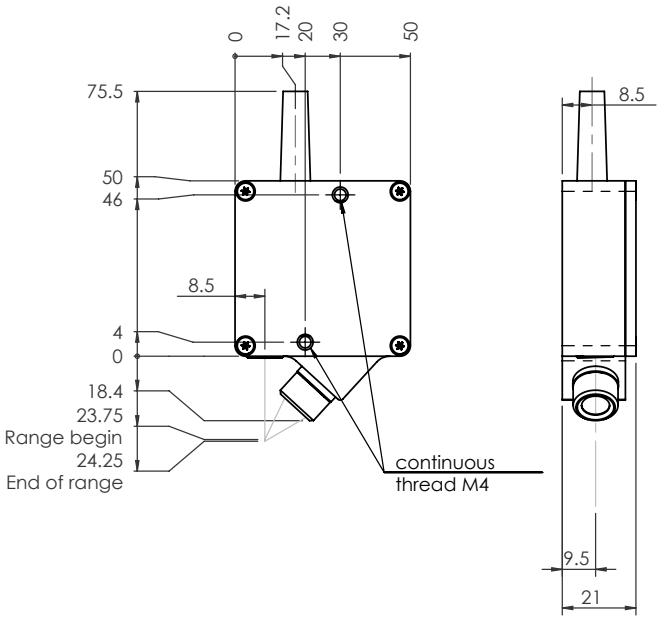
M70LL - Electronic unit

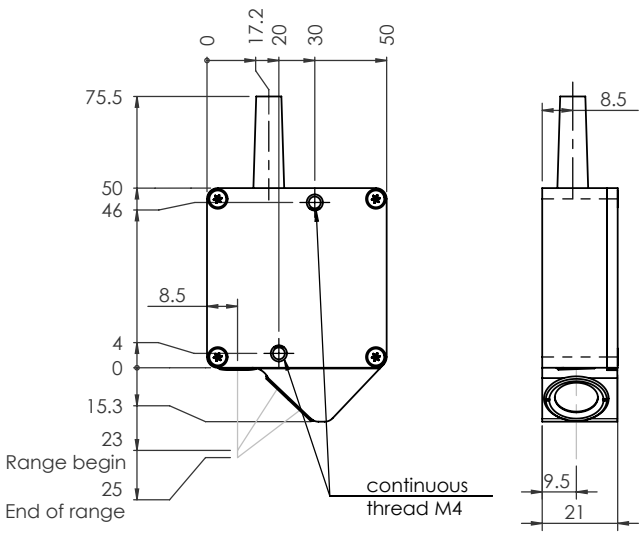


Sensor head M70LL/0.5



Weight 250 g

Sensor head M70LL/2



Weight 250 g

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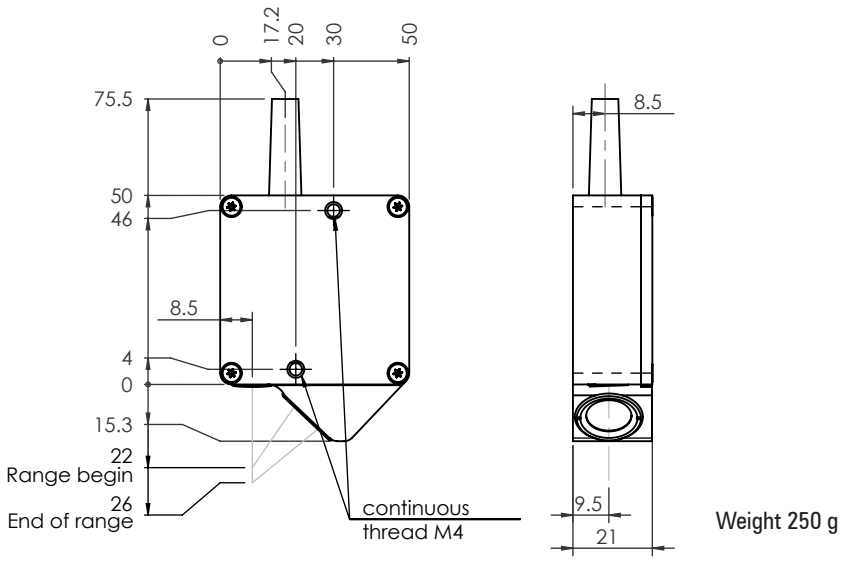
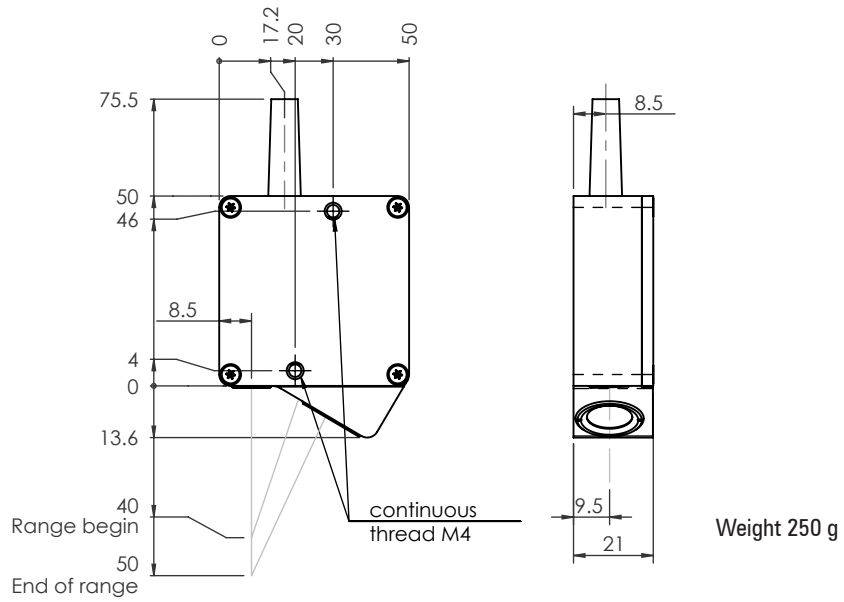
Sensor head M70LL/4



Weight 250 g

Sensor head M70LL/10



Weight 250 g

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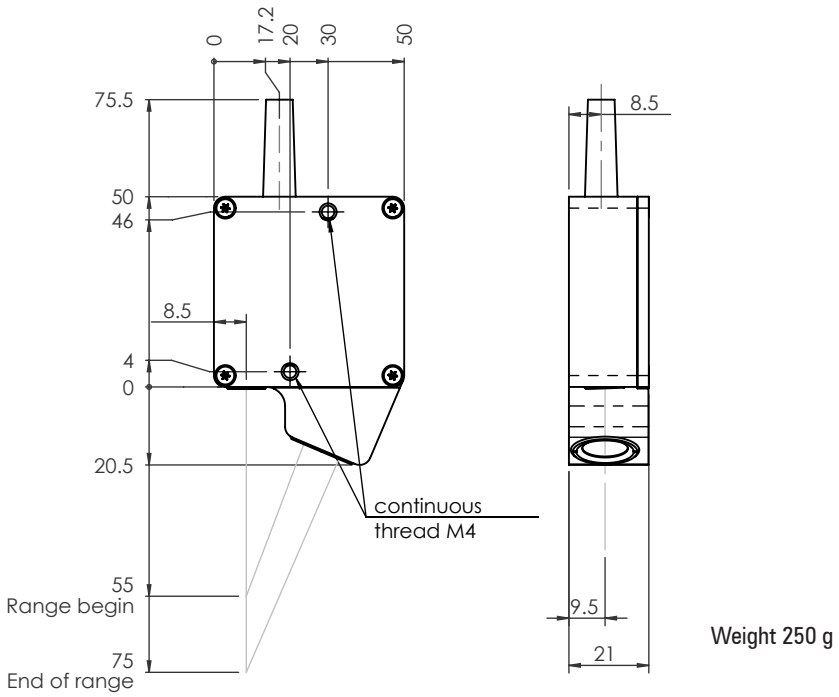
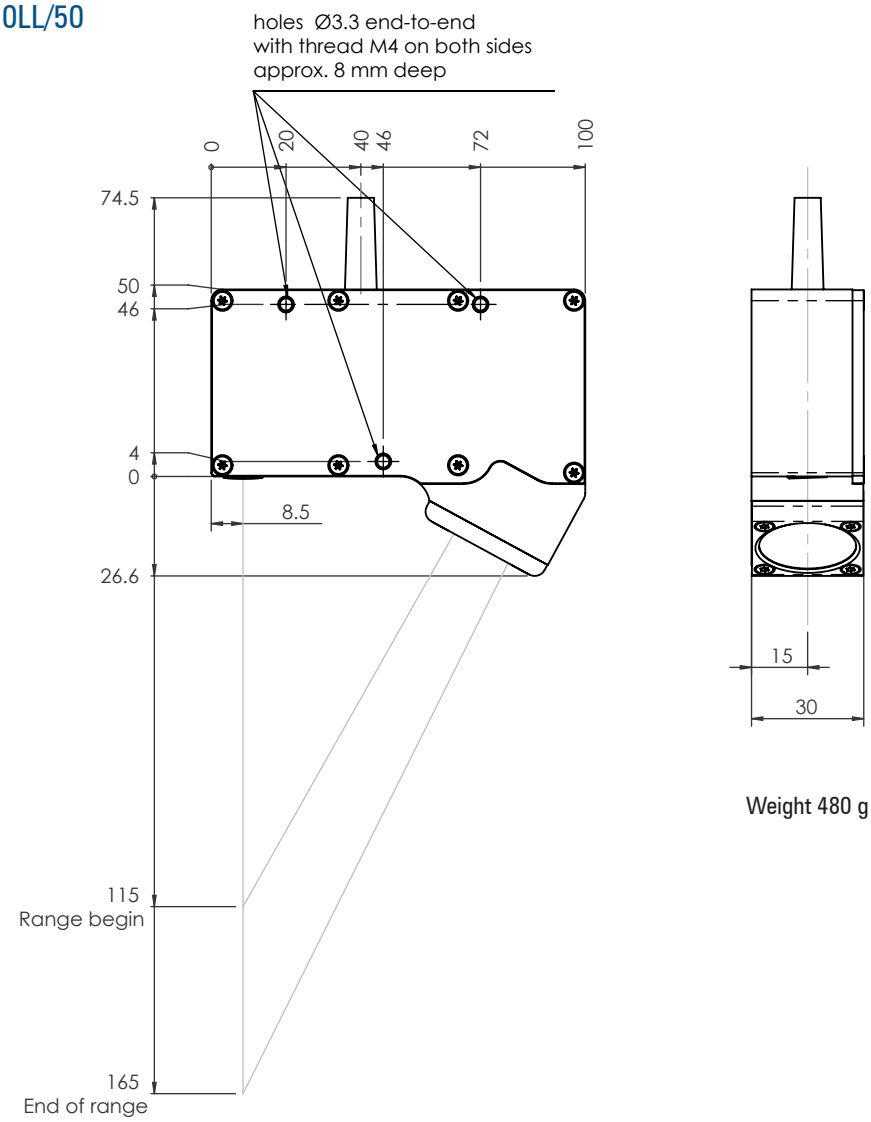
Sensor head M70LL/20



Weight 250 g

Sensor head M70LL/50



Weight 480 g

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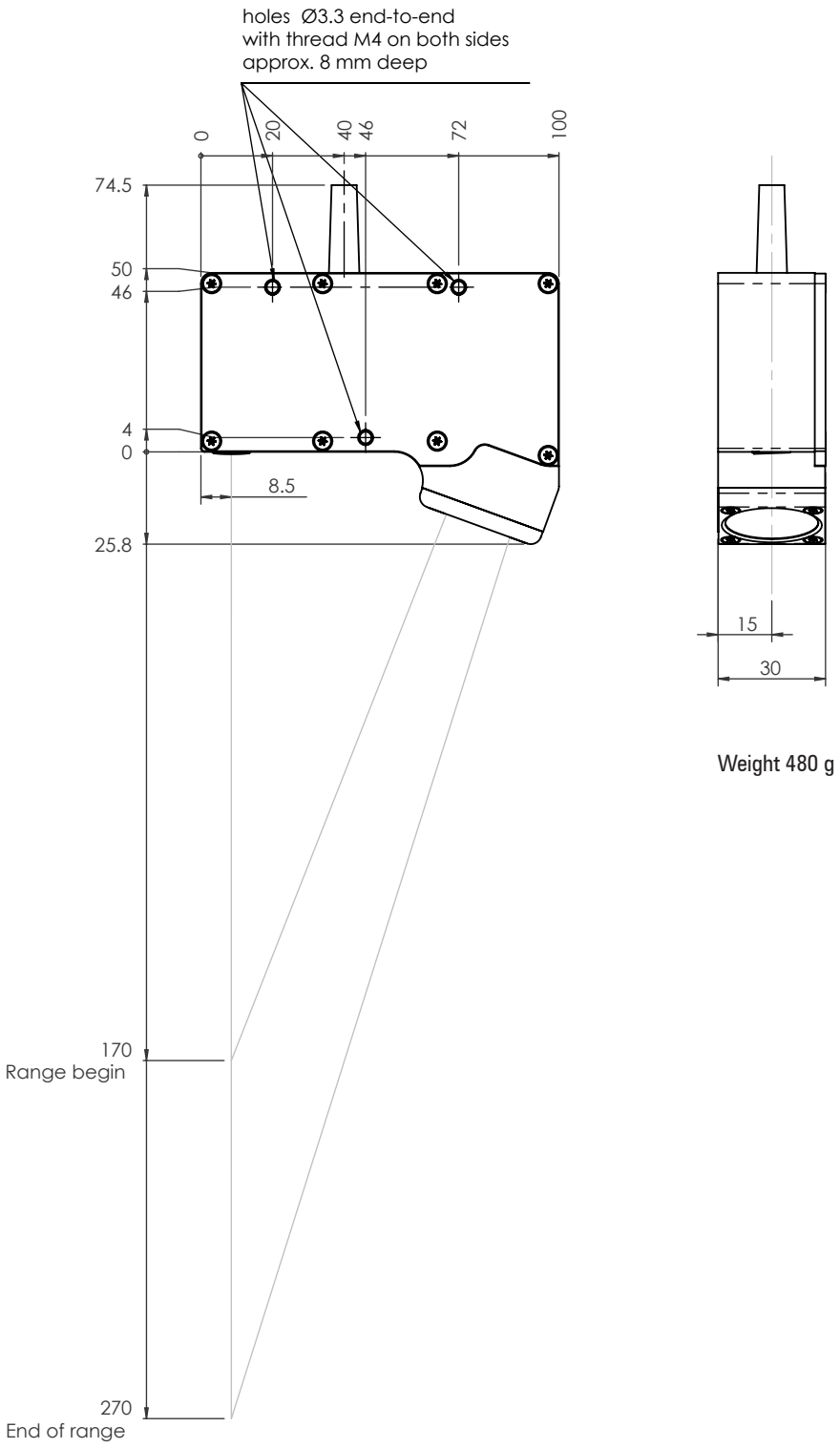
Sensor head M70LL/100



Weight 480 g

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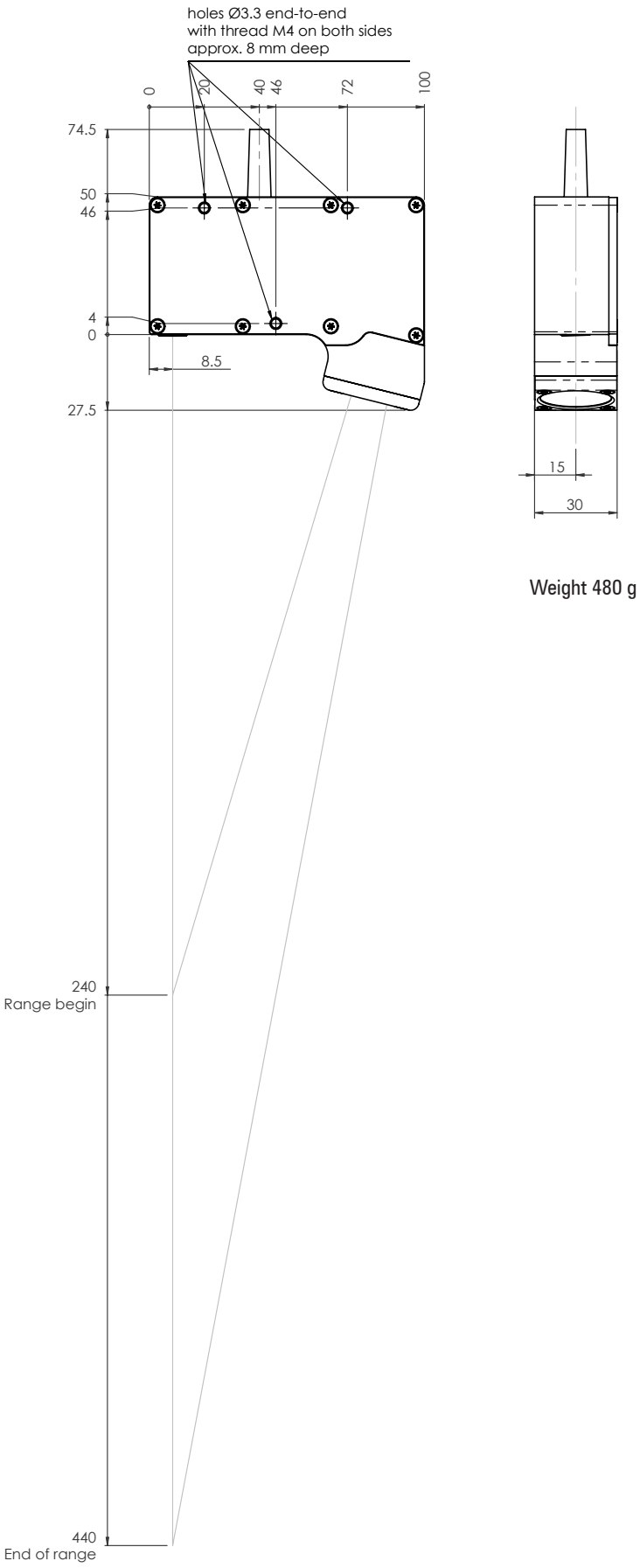
Sensor head M70LL/200



Weight 480 g

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