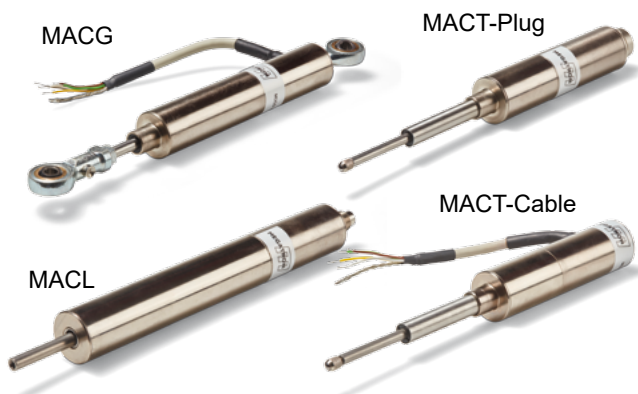


# Data Sheet for Linear Sensors

## Inductive Linear Transducer

## Series MAC



- Probe, ball joints, loose push rod (loose core)
- Measuring strokes from 2 to 200 mm
- Cable or plug connection
- Protection grade IP65 (optional IP67/68)

The MAC series consists of three designs: MACG with ball joints, MACT as a probe with spring return and MACL with a loose push rod.

Electrical Data	MAC-2	MAC-5	MAC-10	MAC-20	MAC-50	MAC-100	MAC-200
Effective electrical travel <b>MACG</b> (ball joints) in mm 1.)	±1 (2)	±2.5 (5)	±5 (10)	±10 (20)	±25 (50)	--	--
Effective electrical travel <b>MACL</b> (loose core) in mm 1.)	±1 (2)	±2.5 (5)	±5 (10)	±10 (20)	±25 (50)	±50 (100)	±100 (200)
Effective electrical travel <b>MACT</b> (as a probe) in mm 1.)	±1 (2)	±2.5 (5)	±5 (10)	±10 (20)	±25 (50)	--	--
Sensitivity mV/V/mm	76	82	43	34	27	12.2	7
Independent linearity (best straight line) 1.)	±0.5% (±0.25%)					±1%	
Excitation voltage	1..10 V RMS						
Excitation frequency	0.5..5 kHz						
Primary resistance typ. Ohm	332	69	97	175	221	460	820
Primary impedance typ. Ohm	790	134	188	345	369	2240	5770
Output impedance typ. Ohm	900	170	118	360	525	2140	5060
Temperature coefficient	±0.2 % F.S./10K						
Calibration at	5 V RMS / 2.5 kHz RL=1 MOhm						

Mechanical Data, Environmental Conditions, Miscellaneous	MAC-2	MAC-5	MAC-10	MAC-20	MAC-50	MAC-100	MAC-200
Operational temperature	-35 °C up to +120 °C						
Storage temperature	-55 °C up to +120 °C						
Protection grade (IEC60529)	IP65 (optional IP67 / IP68)						
Vibration (IEC 68-2-6, Test Fc)	10 g (2..2000 Hz)						
Shock (IEC 68-2-27, Test Ea)	200 g, 2 ms						
Mass <b>MDCG</b> (cable 1 m ca.)	140 g	165 g	180 g	230 g	290 g	--	--
Mass <b>MDCL</b> (cable 1 m/plug ca.)	85/65 g	100/80 g	120/100 g	175/155 g	230/210 g	440/420 g	670/650 g
Mass <b>MDCT</b> (cable 1 m/plug ca.)	110/90 g	125/105 g	140/120 g	190/170 g	260/240 g	--	--
Material housing	Steel nickel plated						
Material push rod / Core material	Stainless steel / Nickel-Iron-Alloy						
Electrical connection	Round cable 1 m / plug 5-pin (not for MACG)						
Mounting parts (included in delivery)	2 pc. ball joints (MACG), probe (MACT), loose push rod (MACL)						

1.) According IEC 60393

2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

# Data Sheet for Linear Sensors

Inductive Linear Transducer

Series MAC

## Order Code

Description	Selection: <b>standard=black/bold</b> , possible <i>options=grey/italic</i>					
<b>Series:</b>	<b>MAC</b>					
<b>Design:</b>						
<b>With ball joints</b>		<b>G</b>				
<b>With loose core</b>		<b>L</b>				
<b>As a probe</b>		<b>T</b>				
<b>Effective electrical travel:</b>						
<b>2 mm</b>				<b>2</b>		
<b>5 mm</b>				<b>5</b>		
<b>10 mm</b>				<b>10</b>		
<b>20 mm</b>				<b>20</b>		
<b>50 mm</b>				<b>50</b>		
<b>100 mm (only version L)</b>				<b>100</b>		
<b>200 mm (only version L)</b>				<b>200</b>		
<b>Electrical connection:</b>						
<b>Plug 5-pole (not version G)</b>					<b>S</b>	
<b>Cable 1 m</b>					<b>K</b>	
<i>Option cable length in m</i>					<i>Kxx</i>	
<b>Independent linearity:</b>						
<b>±0,5% / ±1% (depends on electrical travel)</b>						<b>-</b>
<i>Option ±0,25 (not for ≥100 mm)</i>						<i>L0,25</i>
<b>Protection class:</b>						
<b>Standard IP65</b>						<b>-</b>
<i>Option IP67</i>						<i>IP67</i>
<i>Option IP68</i>						<i>IP68</i>

### Accessory (not included in delivery):

- Mating connector (STEM16) #110906: M16 thread, 5-pole, IP67, straight, shielded (STE M16 5POL IP67 G S)
  - Mating connector (STEM16) #114462: M16 thread, 5-pole, IP67, angled, shielded (STE M16 5POL IP67 W S)
  - Mating connector with cable (STKM16) #127664: M16 thread, 5-pole, IP67, straight, shielded, 2 m (STK M16 5POL IP67 G GS 2M AWG24)
  - Mating connector with cable (STKM16) #127665: M16 thread, 5-pole, IP67, angled, shielded, 2 m (STK M16 5POL IP67 W GS 2M AWG24)
  - Mounting bracket #106656: take a look at drawing in document
  - Mounting flange - take a look at drawing in document
  - Extension for armature (50..315 mm) - take a look at drawing in document
- More connectors with and without cable on request. Take a look at data sheet STEM16 for connector without cable or STKM16 for connector with cable.

### For higher quantities or on-going demand, additional options are available as described below on request for example:

- Cable assemblies with and without connector
- Special probe, special axis length and much mores

Please note for the type with >100 mm displacement: For a horizontal installation, the sensor housing must be stabilized additionally. An axial alignment must be ensured. Otherwise the sensor could bend due to its own weight! We recommend to use 3 mounting brackets.

# Data Sheet for Linear Sensors

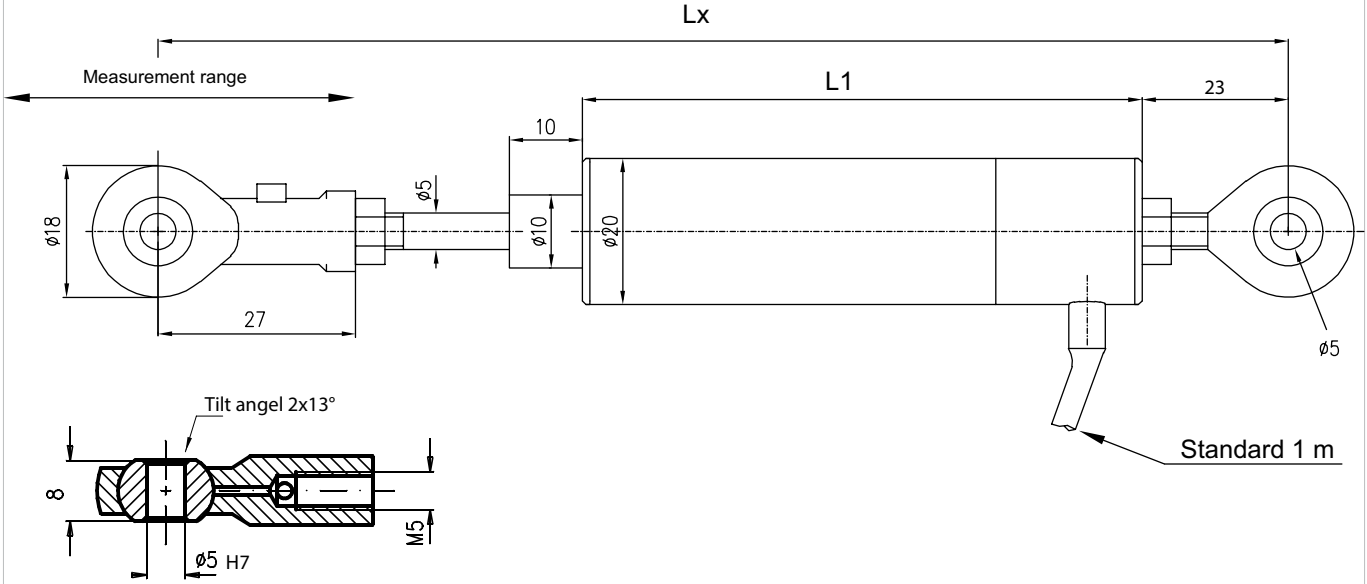


Inductive Linear Transducer

Series MAC

## Drawing

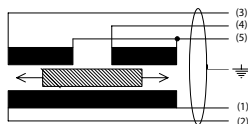
### MAC G



Dimension in mm

Connection	
Color of cable	Signal
Red 1	Primary 1
Black 2	Primary 2
Orange 3	Secondary 1
Yellow 4	Secondary 2
White 5	Secondary 1, 2 Centre
Housing	Shield

Sensor	MAC G	MAC G	MAC G	MAC G	MAC G
Lx [elec. zero position ±1,5 mm]	136 mm	144,5 mm	155 mm	191 mm	252 mm
L1	51 mm	62 mm	76 mm	115 mm	160 mm
Stroke	±1 mm	±2,5 mm	±5 mm	±10 mm	±25 mm



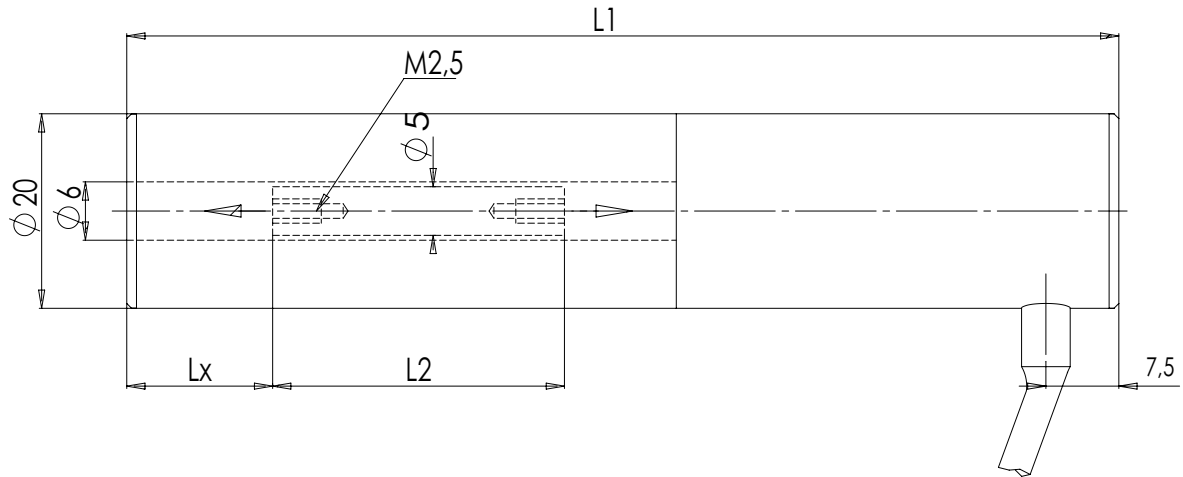
# Data Sheet for Linear Sensors

Inductive Linear Transducer

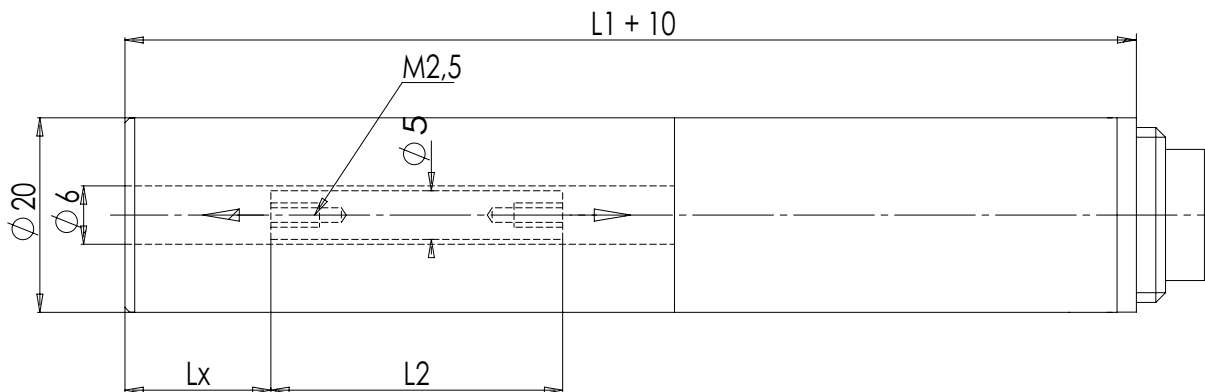
Series MAC

## Drawing

### MAC L cable version

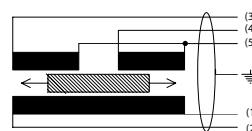
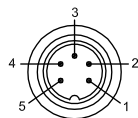


### MAC L connector version



Connection		
Pin number	Color of cable	Signal
1	Red	Primary 1
2	Black	Primary 2
3	Orange	Secondary 1
4	Yellow	Secondary 2
5	White	Secondary 1, 2 Centre
	Housing	Shield

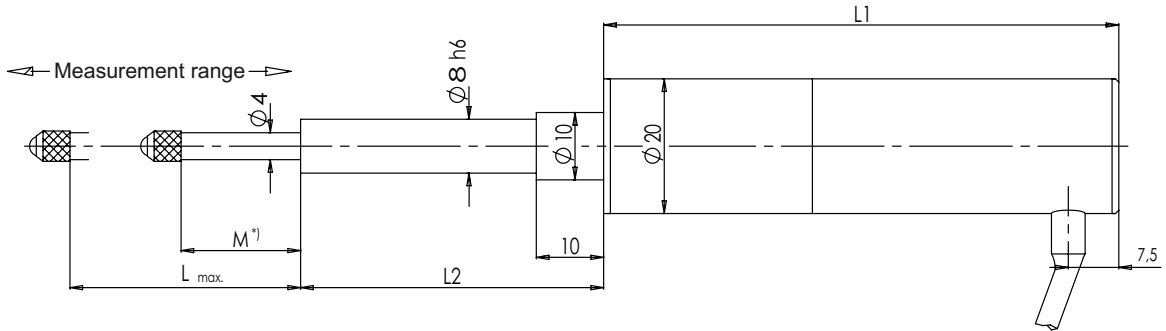
Sensor	MAC L	MAC L	MAC L	MAC L	MAC L	MAC L	MAC L
Lx [elec. zero position ±1,5 mm]	9 mm	11,5 mm	15 mm	18 mm	32 mm	81 mm	116 mm
L1	51 mm	62 mm	76 mm	115 mm	160 mm	298 mm	466 mm
L2	17 mm	23 mm	30 mm	62 mm	80 mm	130 mm	230 mm
Stroke	±1 mm	±2,5 mm	±5 mm	±10 mm	±25 mm	±50 mm	±100 mm



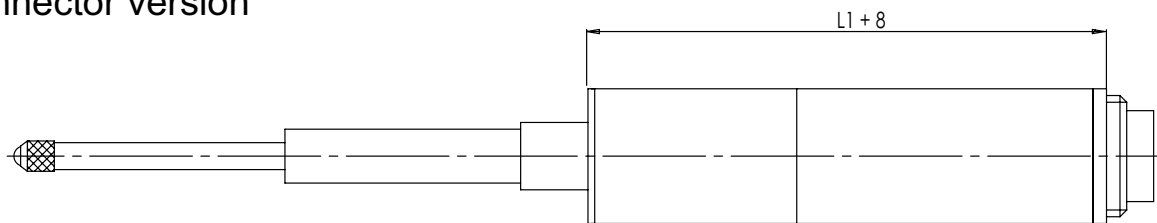
Dimension in mm

### Drawing

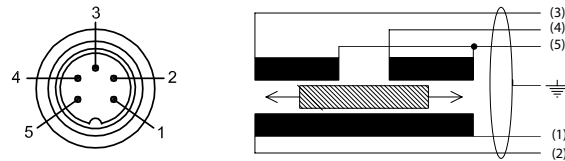
#### MAC T cable version



#### MAC T connector version



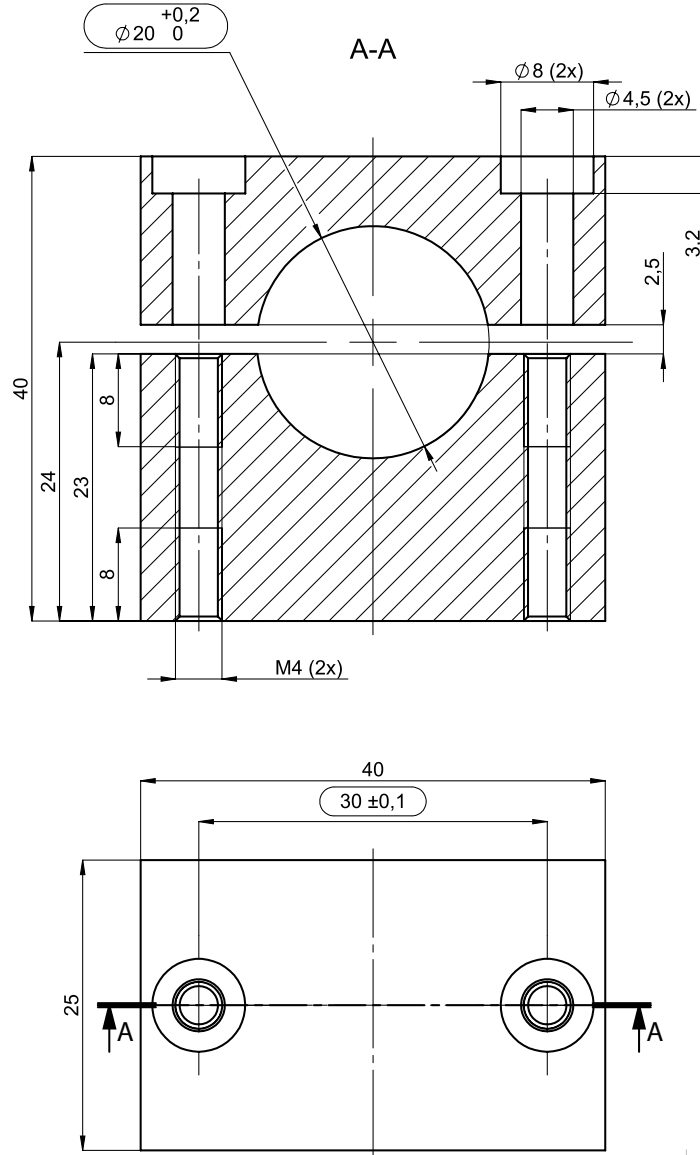
Connection		
Pin number	Color of cable	Signal
1	Red	Primary 1
2	Black	Primary 2
3	Orange	Secondary 1
4	Yellow	Secondary 2
5	White	Secondary 1, 2 Centre
	Housing	Shield



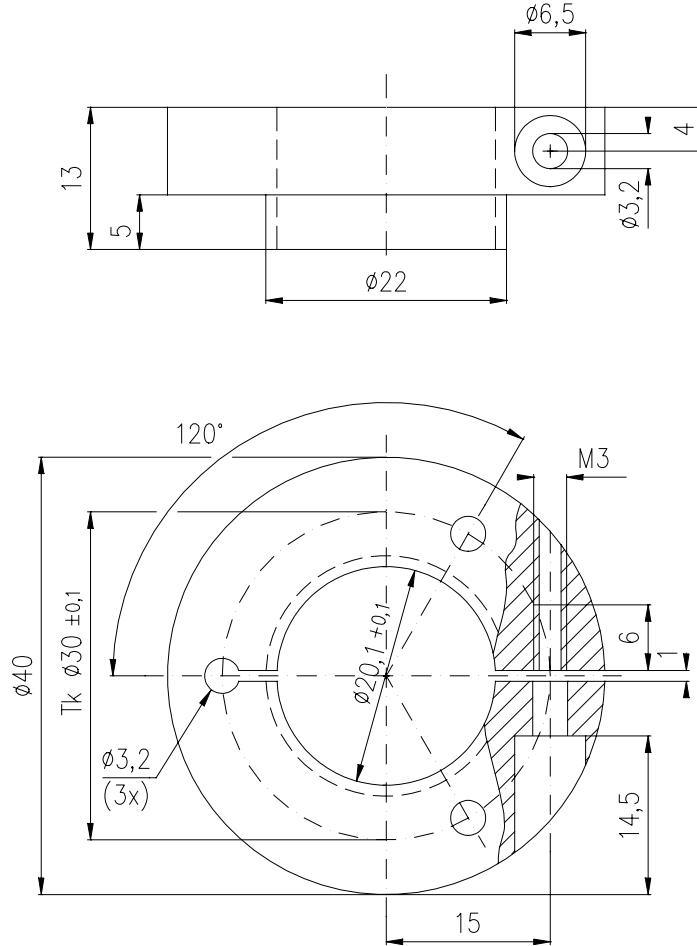
Dimension in mm

Sensor	MAC T	MAC T	MAC T	MAC T	MAC T
M [elec. zero position ±1,5 mm]	26 mm	23,5 mm	20 mm	16,5 mm	40 mm
L1	51 mm	62 mm	76 mm	115 mm	160 mm
L2	45 mm	45 mm	45 mm	45 mm	83 mm
L max	30,5 mm	30,5 mm	30,5 mm	30,5 mm	69,5 mm
Stroke	±1 mm	±2,5 mm	±5 mm	±10 mm	±25 mm

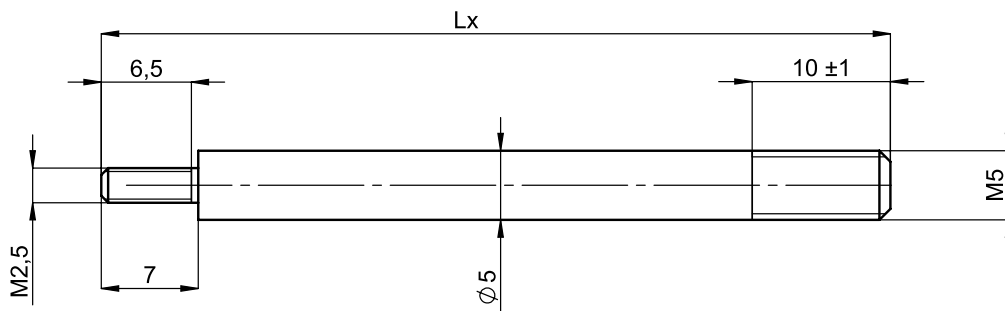
## Drawing mounting bracket



## Drawing mounting flange



## Drawing extension for armature



Lx
57
77
87
94
157
257
322

Dimensions in mm