



Metallux ME504 pressure sensors are made with a ceramic base plate and a flush diaphragm and work following the piezoresistive principle.

The Wheatstone bridge is screen printed on one side of the flush ceramic diaphragm which is, in turn, glued to the sensor's body. The bridge faces the inside where a cavity is made and the diaphragm's opposite side can therefore be exposed directly to the medium to be measured.

Because of the Al<sub>2</sub>O<sub>3</sub> ceramic excellent chemical resistance (aggressive gases, most of solvents and acids, etc.), no additional protection is normally required.

On the sensor body, layout is optimized to allow easy mounting of signal conditioning PCB when requested.

Metallux ME504 sensors are thermally compensated by laser-adjustable PTC resistors and the use of ceramic ensures a high linearity across the entire range of measurement, reducing effects of hysteresis to a minimum.

## FEATURES

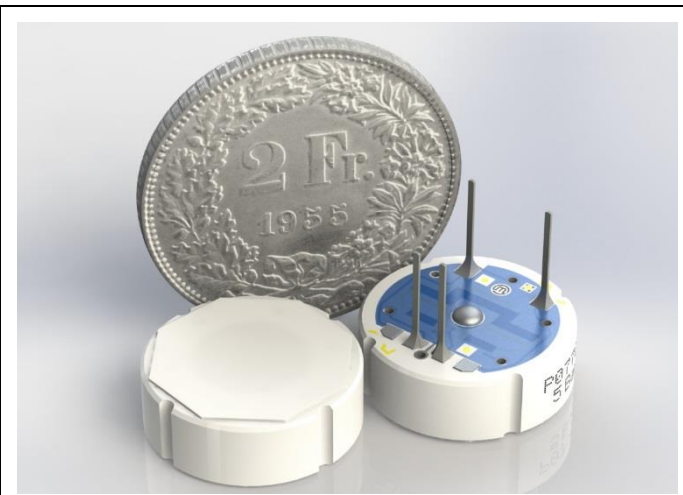
**Excellent resistance to corrosion and abrasion**

**Absolute measurement available**

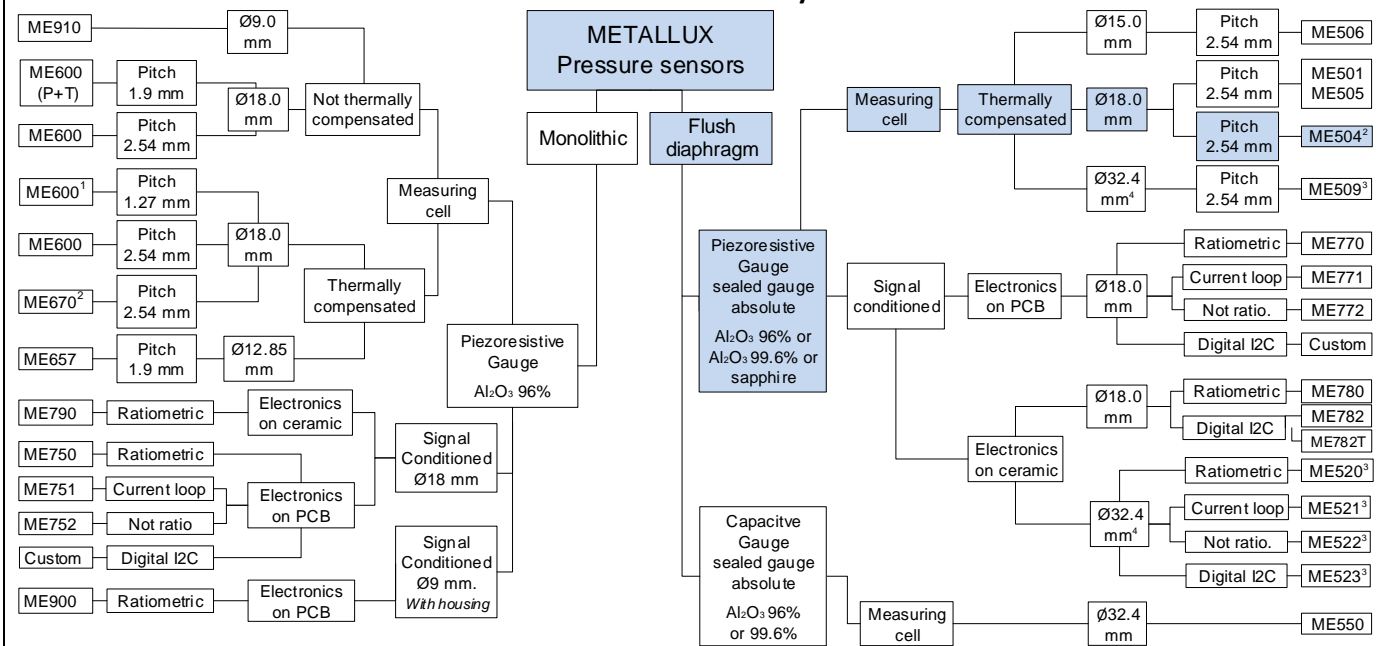
**Thermally compensated**

**Optimized for PCB mounting**

**Extended choice of measuring ranges**



## Pressure sensors family tree



<sup>1</sup> Also available in not thermally compensated version  
<sup>2</sup> Digitally trimmed offset, also available not thermally compensated

<sup>3</sup> Not available with sapphire diaphragm.  
<sup>4</sup> Suitable for low pressure range ( $\leq 1$  bar)

## Technical characteristics

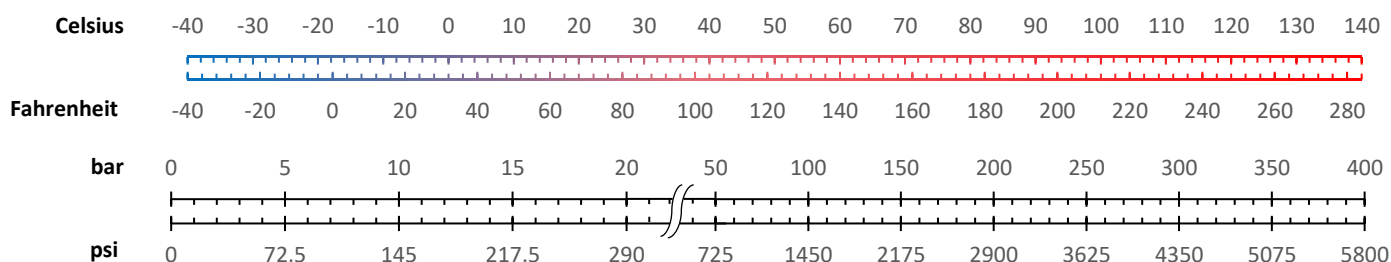
Parameters	Units	Description
Sensor type	-	Flush diaphragm, absolute (A), gauge (R) or sealed gauge (S)
Technology	-	Piezoresistive
Diaphragm material	-	Ceramic Al <sub>2</sub> O <sub>3</sub> 96%, 99.6% or sapphire
Weight	g	≤ 8 (ceramic cell only)
Response time	ms	≤ 1
Supply voltage	VDC	2...30
Offset	mV/V	0 ± 5 (Other nominal values available on request)
Current cons.	mA	≤ 1.3 @ 10V
Operating temperature	°C	-40...+135 (-40 °F...+275 °F)
Storage temperature	°C	-40...+150 (-40 °F...+302 °F)
Impedance	kΩ	10 ± 30%
Compliant with	-	REACH, RoHS, Conflict Minerals Free

		ME504											
Nominal pressure FSO	bar	0.5	1	2	5	10	20	50	100	200	400	600	800
	psi <sup>1</sup>	7	14	29	73	145	290	725	1450	2900	5800	8700	11600
Overload pressure	bar	1	2	4	10	15	35	100	150	350	500	750	1000
	psi <sup>1</sup>	14	29	58	145	217	507	1450	2175	5075	7250	10875	14500
Burst pressure	bar	2	3	6	15	25	65	120	200	500	650	950	1250
	psi <sup>1</sup>	29	43	87	217	362	942	1740	2900	7250	9425	13775	18125
Vacuum capability	bar	-0.1	-0.5	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	psi <sup>1</sup>	-1.4	-7	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14
Pressure type	-	R	A / R / S	A / R / S	A / R / S	A / R / S	A / R / S	A / R / S	S	S	S	S	S
Total thickness	mm	6.15	6.17	6.23	6.30	6.35	6.55	6.70	6.70	7.05	7.32	7.55	8.05
	in	0.242	0.243	0.245	0.248	0.250	0.258	0.263	0.263	0.278	0.288	0.297	0.317
Sensitivity <sup>2</sup>	mV/V	1.4...2.4	2.0...3.6	2.0...3.5	2.3...4.0	3.1...5.5	2.4...4.0	4.0...6.0	3.0...4.8	2.5...3.9	3.1...4.8	3.1...4.8	2.0...3.5
Accuracy <sup>3</sup> (typ./max.)	%FS	0.4/0.9	0.3/0.9	0.3/0.6	0.2/0.4	0.2/0.5	0.2/0.5	0.2/0.5	0.2/0.5	0.4/0.8	0.5/1.0	0.5/1.0	0.5/1.0
Thermal offset shift (typ./max.)	%FS/K	± 0.02 / ± 0.07 +25 °C...+85 °C (+77 °F...+185 °F)											
		± 0.05 / ± 0.15 -40 °C...+25 °C (-40 °F...+77 °F) / +85 °C...+135 °C (+185 °F...+275 °F) Not compensated											
Thermal span shift	%FS/K	± 0.01 / ± 0.03 +25 °C...+85 °C (+77 °F...+185 °F)											
		± 0.03 / ± 0.06 -40 °C...+25 °C (-40 °F...+77 °F) / +85 °C...+135 °C (+185 °F...+275 °F) Compensated											
Thermal span shift	%FS/K	Min.	Typ.	Max.									
		-0.030	-0.016	0									
Reliability tests <sup>4</sup>	-	1000 hours @85 °C (185 °F) & 85 %RH						500 thermal shocks -40 °C...+150 °C (-40 °F... +302 °F)					
		1000 hours burn-in @150 °C (302 °F)						10 million 0 bar to P <sub>nom</sub> pressure cycles					

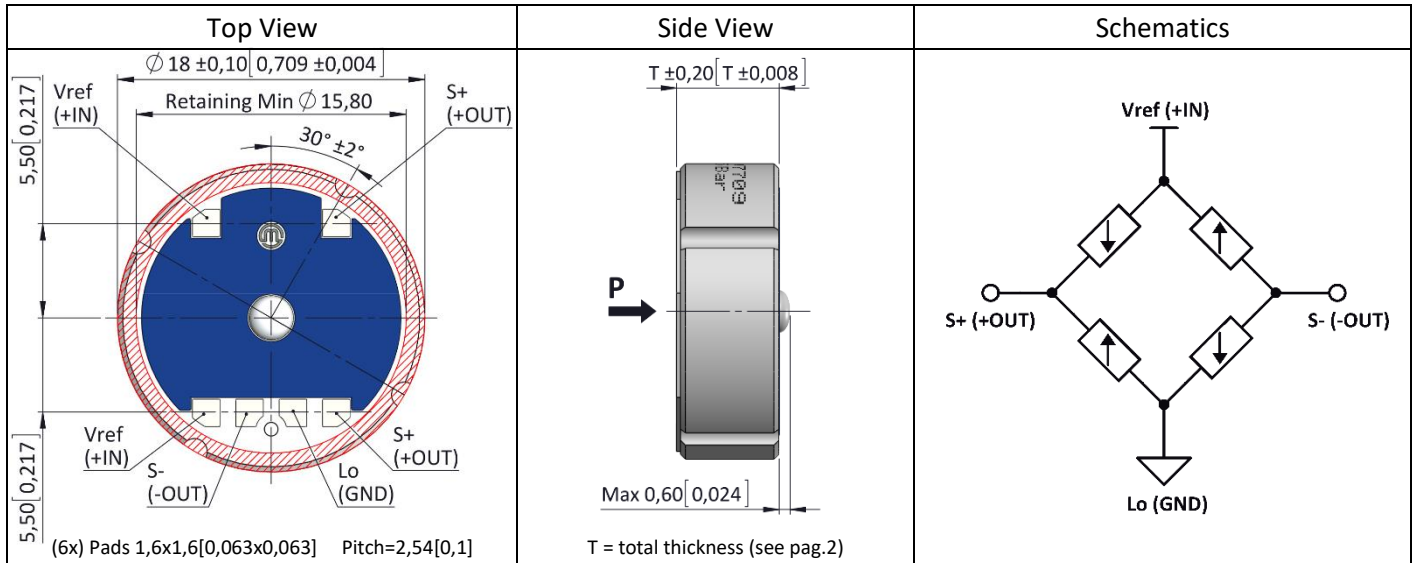
Tests performed at 25°C in Metallux housings, unless otherwise specified. Different housings may affect performances.

1. Psi values for reference only.
2. The sensitivity of each production batch is constant, within the indicated range and with minimal dispersion.
3. Accuracy =  $\sqrt{\text{NonLinearity}^2 + \text{Hysteresis}^2 + \text{NonRepeatability}^2}$ , terminal based.
4. All technical characteristics will remain within indicated ranges performing the above-mentioned reliability tests.

## Conversion tools

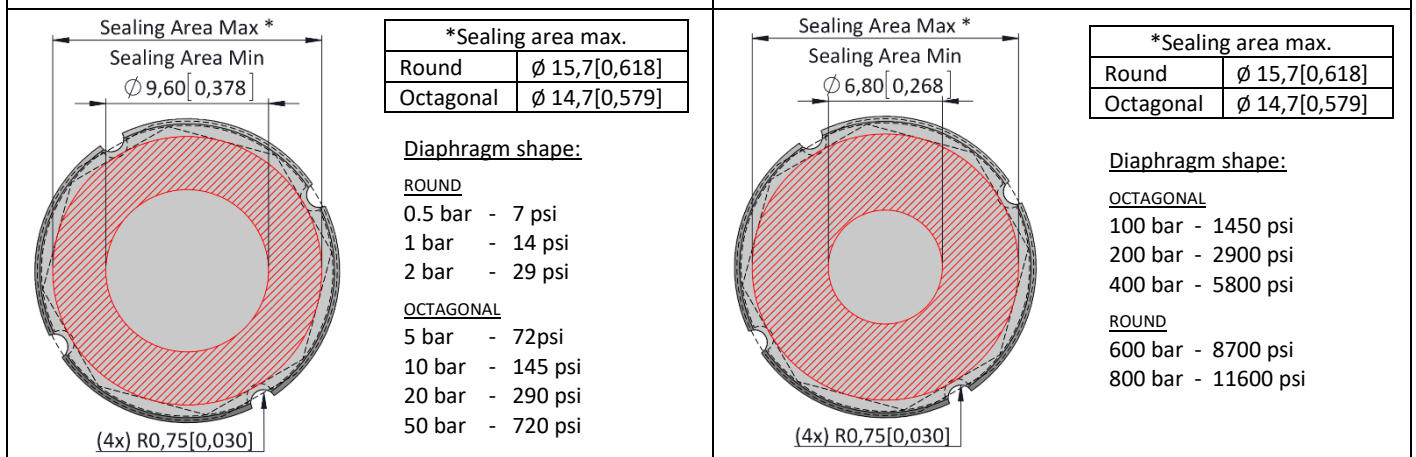


## Mechanical drawings and electrical schematics



ME504 0.5...50 bar (0...720 psi) bottom view

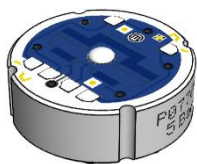
ME504 100...800 bar (1450...11600 psi) bottom view



All quotes are in mm [inch] – General tolerance ISO 2768-1 M

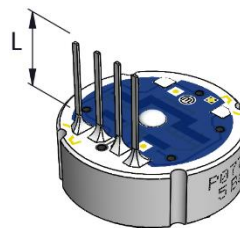
## Electrical terminations

**Example: type 1**, pre-tinned soldering pads



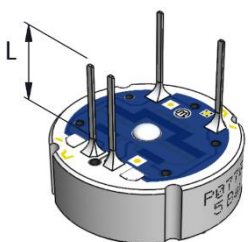
*Pitch:*  $2.54 \pm 0.05$  [0.1 ± 0.002]  
*Max. tin thickness:* 0.3 [0.01]  
*Op. Temp:* -40°C...+135°C (-40 °F...275 °F)

**Example: type 4**, 4 pins single line  $L = 9 \pm 0.5$  mm [0.39 ± 0.02 in]



*Pitch:*  $2.54 \pm 0.05$  [0.1 ± 0.002]  
*Pin section:* 0.51x0.25 [0.02 x 0.01]  
*Pin length:*  $L = 9.0 \pm 0.5$  [0.35 ± 0.02]  
*Op. Temp:* -40°C...+135°C (-40 °F...275 °F)

**Example: type 7**, 4 pins two lines  $L = 9 \pm 0.5$  mm [0.39 ± 0.02 in]



*Upper line pitch:*  $7.62 \pm 0.05$  [0.1 ± 0.002]  
*Lower line pitch:*  $2.54 \pm 0.05$  [0.1 ± 0.002]  
*Pin section:*  $\varnothing 0.5 \pm 0.004$  [0.02 x 0.0002]  
*Pin length:*  $L = 9.0 \pm 0.5$  [0.35 ± 0.02]  
*Op. Temp:* -40°C...+135°C (-40 °F...275 °F)

**Other types available**

- Type 2** : 4 single wires  $50.8 \pm 2.0$  mm
- Type 3** : 4 pins on single line,  $L = 5 \pm 0.5$  mm [0.20 ± 0.02 in]
- Type 5** : 4 pins on single line,  $L = 13 \pm 0.5$  mm [0.51 ± 0.02 in]
- Type 6** : 4 pins on two lines,  $L = 5 \pm 0.5$  mm [0.20 ± 0.02 in]
- Type 9** : customization on request

All quotes are in mm [inch] – General tolerance ISO 2768-1 M

## Ordering code

	ME504	-	---	-	-	-	--	-	-
<b>Sensor type</b>	Absolute	A							
	Gauge	R							
	Sealed Gauge	S							
<b>Pressure range</b>	0...0.5 bar [0...7 psi] (-/R/-)	Op5							
	0...1 bar [0...14 psi] (A/R/S)	001							
	0...2 bar [0...29 psi] (A/R/S)	002							
	0...5 bar [0...72 psi] (A/R/S)	005							
	0...10 bar [0...145 psi] (A/R/S)	010							
	0...20 bar [0...290 psi] (A/R/S)	020							
	0...50 bar [0...720 psi] (A/R/S)	050							
	0...100 bar [0...1450 psi] (-/-/S)	100							
	0...200 bar [0...2900 psi] (-/-/S)	200							
	0...400 bar [0...5800 psi] (-/-/S)	400							
	0...600 bar [0...8700 psi] (-/-/S)	600							
	0...800 bar [0...11600 psi] (-/-/S)	800							
	Others on request (please specify)	999							
<b>Offset adjustment</b>	0 ± 5 mV/V							0	
	5 ± 5 mV/V							1	
	-5 ± 5 mV/V							2	
	0 ± 50 mV/V (not trimmed)							3	
	Others on request (please specify)							9	
<b>Thermal offset shift adjustment</b>	≤ 0.07 % FS/K (not thermally compensated)							0	
	≤ 0.03 % FS/K							1	
	Others on request (please specify)							9	
<b>Additional coating</b>	Without							0	
	Parylene							1	
	Others on request (please specify)							9	
<b>Diaphragm type</b>	Ceramic Al <sub>2</sub> O <sub>3</sub> 96.0%							0	
	Ceramic Al <sub>2</sub> O <sub>3</sub> 99.6%							1	
	Others on request (please specify)							9	
<b>Venting hole pipe</b>	Without							0	
	Metal pipe Ø1.2 mm (gauge version only)							1	
	Others on request (please specify)							9	
<b>Termination type</b>	4 Pre-tinned soldering pads, pitch 2.54 mm								1
	4 wires on single line, 50.8 ± 2.0 mm								2
	4 pins on single line, 5 mm ± 0.5 mm								3
	4 pins on single line, 9 mm ± 0.5 mm								4
	4 pins on single line, 13 mm ± 0.5 mm								5
	4 pins on two lines, 5 mm ± 0.5 mm								6
	4 pins on two lines, 9 mm ± 0.5 mm								7
	Others on request (please specify)								9



To be disposed of according to local regulations (OTRif 16 02 97 for Switzerland, CER 16 02 16 for European Union)