



# ME78x/MEP78x datasheet



FLUSH DIAPHRAGM, PIEZORESISTIVE CERAMIC PRESSURE TRANSDUCER

Swiss technology at your service

Metallux ME78x and MEP78x 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, in turn, glued to the sensor's body. The bridge faces the inside where a cavity is made. Signal conditioning electronics are directly integrated on the ceramic to generate 0.5...4.5 V ratiometric output (ME780) or I<sup>2</sup>C digital output code (ME782). Pressure and temperature calibration are done electronically with the on-board ASIC and can be performed in bar (ME78x) or in psi (MEP78x). Electronics provides offset and span correction when the temperature changes. Aging detection and compensation are constantly performed. This new method guarantees good precision and long-term stability. The Metallux ME78x family meets EMI requirements. The ASIC stores production lot specific data for sensor traceability and allows custom calibration. Due to the excellent chemical immunity of the the Al<sub>2</sub>O<sub>3</sub> ceramic, the ME78x sensors are suitable for nearly all aggressive media. Metallux ME78x are patented pressure sensors.

## FEATURES

Excellent resistance to corrosion and abrasion

Fully integrated signal conditioning

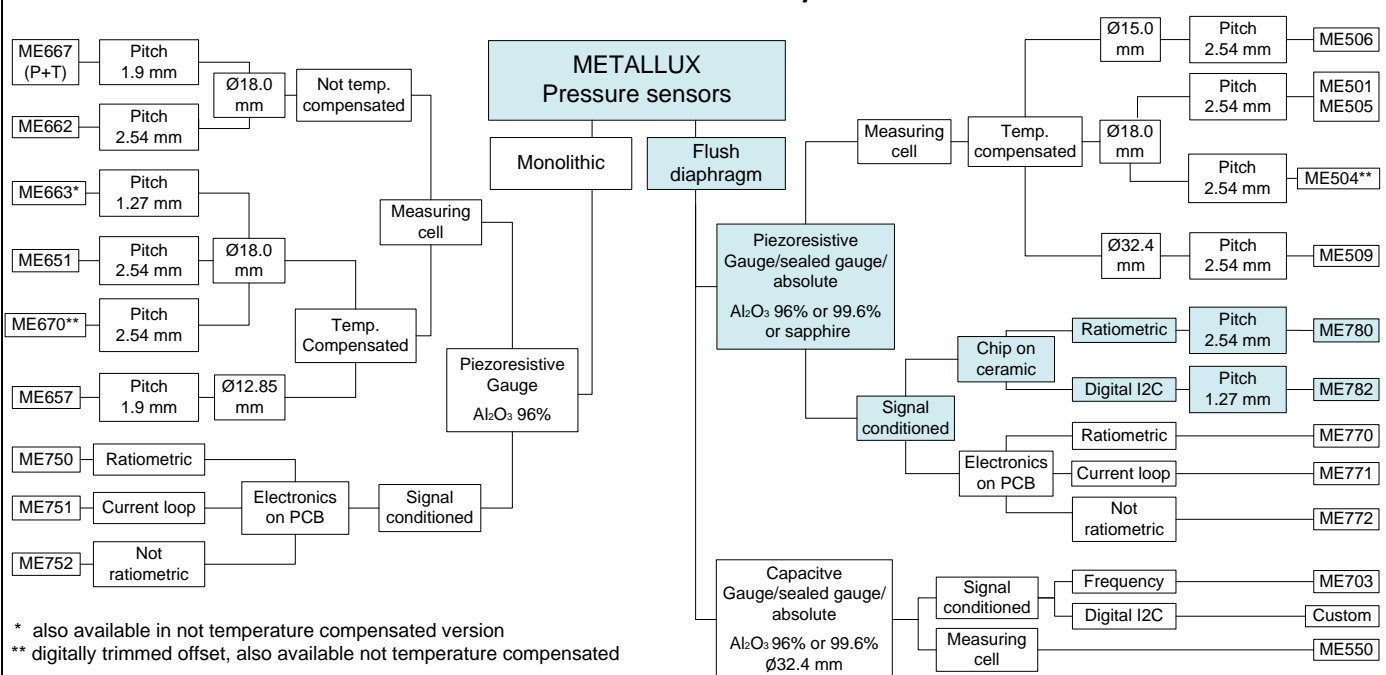
EMI certified

Thermally compensated

Zero stress mounting software



## Pressure sensors family tree





## Technical characteristics

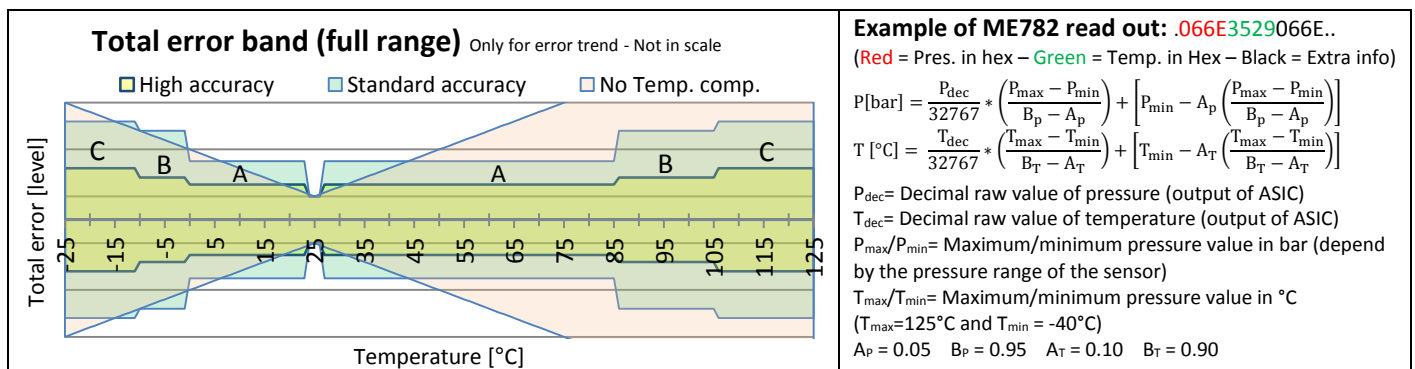
Parameters	Units	ME780	ME782
Output	-	Ratiometric	Digital I <sup>2</sup> C
Output range	-	0.5...4.5 [V]	Hexadecimal code (output register address : 0x78)
Sensor type	-	Flush diaphragm, absolute (A), gauge (R) or sealed gauge (S)	
Technology	-	Piezoresistive with electronic signal conditioning	
Diaph. material	-	Ceramic Al <sub>2</sub> O <sub>3</sub> 96%, 99.6% or sapphire	
Weight	g	≤ 9 (with standard wires)	
Response time	ms	≤ 5	
Supply voltage	VDC	4.5...5.5	3.3 or 5.0
Max current <sup>1</sup>	mA	6 ( R <sub>LOAD</sub> ≥ 2 kΩ )	8
Operating temp.	°C	-25...+125 (-13 °F...+257 °F)	
Storage temp.	°C	-40...+135 (-40 °F...+275 °F)	
Compliant with	-	Reach, RoHS, Conflict Minerals free	
EMC compliances	-	Electrostatic discharge	IEC/EN 61000-4-2(2000)
		Radiated electromagnetic field	IEC/EN 61000-4-3(2006)
		Electrical fast transient burst	IEC/EN 61000-4-4(2004)
		Surge	IEC/EN 61000-4-5(2005)
		RF conducted disturbances	IEC/EN 61000-4-6(2006)

Pressure ranges		ME78x													
Nominal pressure <sup>2</sup>	ME bar	0.5	1	2	5	10	16	20	50	100	200	250	400	600	
	MEP psi <sup>3</sup>	7.5	15	30	100	150	300	400	1000	1500	3000	4000	5000	8500	
Overload pressure	bar	1	2	4	10	15	35	35	100	150	350	350	500	750	
	psi	15	29	58	145	217	507	507	1450	2175	5075	5075	7250	10875	
Burst pressure	bar	2	3	6	12	20	50	50	120	200	500	500	650	950	
	psi	29	43	87	174	290	725	725	1740	2900	7250	7250	9425	13775	
Vacuum capability	bar	-0.1	-0.5	-0.5	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
	psi	-1.5	-7	-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	A/R/S	S	S	S	S	S	
Sensor thickness	mm	6.15	6.17	6.23	6.30	6.35	6.55	6.55	6.70	6.70	7.05	7.05	7.32	7.55	
	in	0.242	0.243	0.245	0.248	0.250	0.258	0.258	0.263	0.263	0.278	0.278	0.288	0.297	

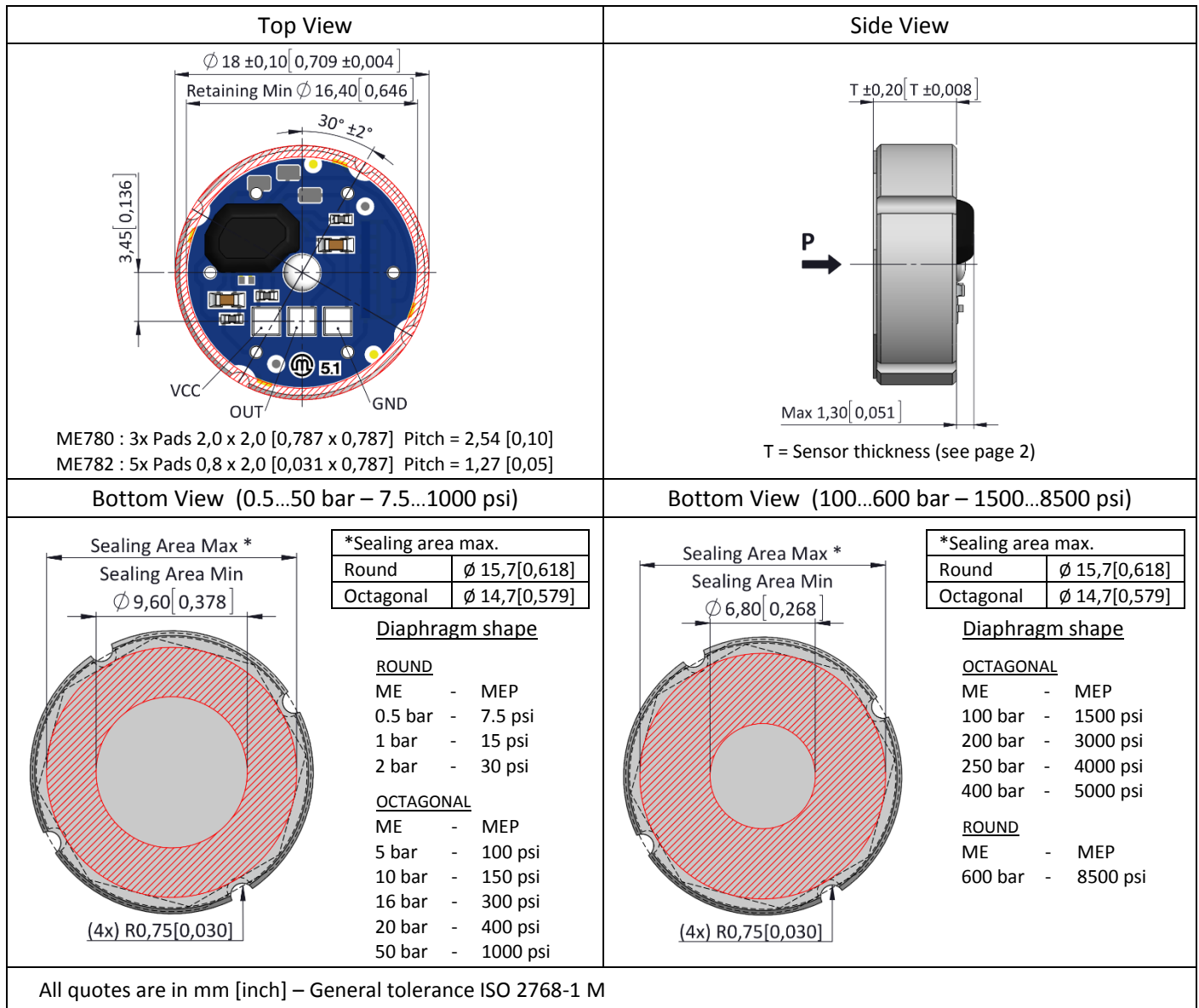
Accuracy <sup>4</sup> [%FS]	Calibration with high accuracy									
25°C (77 °F)	1.5		1.0						1.5	
A) 0...85 °C (32...185°F)	1.5		1.4		1.6		2.8		2.4	
B) -10...105°C (14...221°F)	1.8		1.7		1.8		3.2		2.6	
C) -25...125°C (-13...257°F)	2.2		2.0		2.2		3.5		3.1	
Accuracy <sup>4</sup> [%FS]	Calibration with standard accuracy									
25°C (77 °F)	1.5		1.0						1.5	
A) 0...85 °C (32...185°F)	2.5		2.4		2.6		2.8		3.4	
B) -10...105°C (14...221°F)	3.8		3.7		3.8		4.2		4.6	
C) -25...125°C (-13...257°F)	4.2		4.0		4.2		4.5		5.5	
Accuracy <sup>4</sup> [%FS]	Calibration without thermal compensation									
25°C (77 °F)	1.5		1.0						1.5	
-25...125°C (-13...257°F)	Max ± 0.08 %FS/K (Ceramic cell thermal offset shift + thermal span shift) + Accuracy at 25°C									

Unless indicated, all data are based on a reference temperature of 25°C and a power supply of 5 VDC.

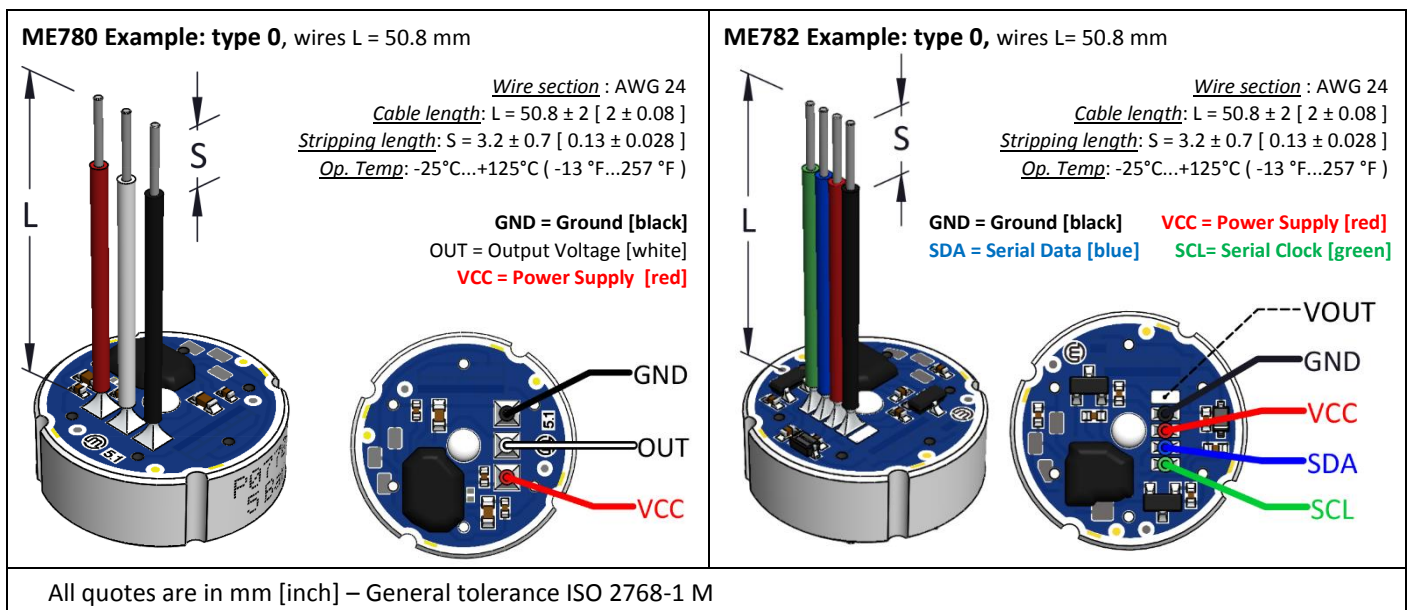
1. During calibration or auto-zero, current consumption is < 30 mA
2. Pressure ranges not shown specifically in the technical chart have performance of the nearest listed pressure range.
3. Psi values are not the exact conversion of bar value. PSI ranges are defined to cover different standard values.
4. Accuracy includes room temperature error of non-linearity, hysteresis and non-repeatability, offset and span deviation PLUS thermal span shift and thermal offset shift. Accuracy calculation is performed in Metallux housings; accuracy excludes temperature hysteresis which primarily depends on mechanical conditions (housing, o-ring, etc) of actual application.



## Mechanical drawings



## Electrical terminations





# ME78x/MEP78x datasheet

## Ordering code

	ME	-	78	-	-	----	-	-	-	-	-
<b>Pressure unit</b>	bar										
	psi										
		blank									
<b>Output signal</b>	Ratiometric	0.5...4.5 [V]									0
	Digital I <sup>2</sup> C	5%...95% 15 bit ADC									2
<b>Sensor Type</b>	Absolute										A
	Gauge										R
	Sealed gauge										S
<b>Pressure range</b>	ME	MEP									ME – MEP
	0...0.5 bar	or	0...7.5 psi								[-/R/] 0p5 – 7p5
	0...1bar	or	0...15psi								[A/R/S] 001 – 015
	0...2 bar	or	0...30 psi								[A/R/S] 002 – 030
	0...5 bar	or	0...100 psi								[A/R/S] 005 – 100
	0...10 bar	or	0...150 psi								[A/R/S] 010 – 150
	0...16 bar	or	0...300 psi								[A/R/S] 016 – 300
	0...20 bar	or	0...400 psi								[A/R/S] 020 – 400
	0...50 bar	or	0...1000 psi								[A/R/S] 050 – 1k0
	0...100 bar	or	0...1500 psi								[-/-/S] 100 – 1k5
	0...200 bar	or	0...3000 psi								[-/-/S] 200 – 3k0
	0...250 bar	or	0...4000 psi								[-/-/S] 250 – 4k0
	0...400 bar	or	0...5000 psi								[-/-/S] 400 – 5k0
0...600 bar	or	0...8500 psi								[-/-/S] 600 – 8k5	
Others on request (please specify)											999 – 999
<b>Calibration</b>	High accuracy										0
	Standard accuracy										1
	No temperature compensation (calibration done at room temperature)										2
	Not calibrated, not compensated (electrical test only)										3
	Others on request (please specify)										9
<b>Termination type</b>	Wires 50.8 mm										0
	Pre-tinned soldering pads										1
	Others on request (please specify)										9
<b>Additional coating</b>	Without										0
	Parylene coating										1
	Others on request (please specify)										9
<b>Ceramic 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
	Sapphire										2
<b>Venting hole pipe</b>	Without										0
	Metal pipe Ø1.2 mm (gauge version only)										1
	Others on request (please specify)										9

## Conversion tools

