

**METALLUX**

Swiss technology at your service

ME77x/MEP77x datasheet

FLUSH DIAPHRAGM, PIEZORESISTIVE CERAMIC PRESSURE TRANSDUCER

Metallux ME77x and MEP77x pressure sensors are made with a ceramic base body glued to flush diaphragm and work following the piezoresistive principle. The Wheatstone bridge is screen printed on one side of the ceramic diaphragm. The bridge faces the inside of the sensors where a cavity is made. Signal conditioning electronics are added to generate 0.5...4.5 V ratiometric output (ME770), current loop 4...20 mA (ME771) or 0...10 V non ratiometric output (ME772).

Pressure and temperature calibration are done electronically with the on-board ASIC and can be performed in bar (ME77x) or in psi (MEP77x). Electronics provide offset and span correction when temperature changes. Aging detection is constantly performed. This new method guarantees good precision and long-term stability. The Metallux ME77x family meets EMC 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_2O_3 ceramic, the ME77x sensors are suitable for nearly all aggressive media.

FEATURES

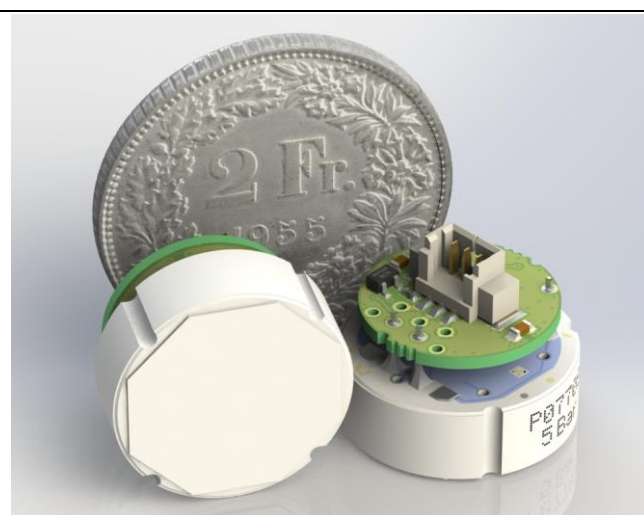
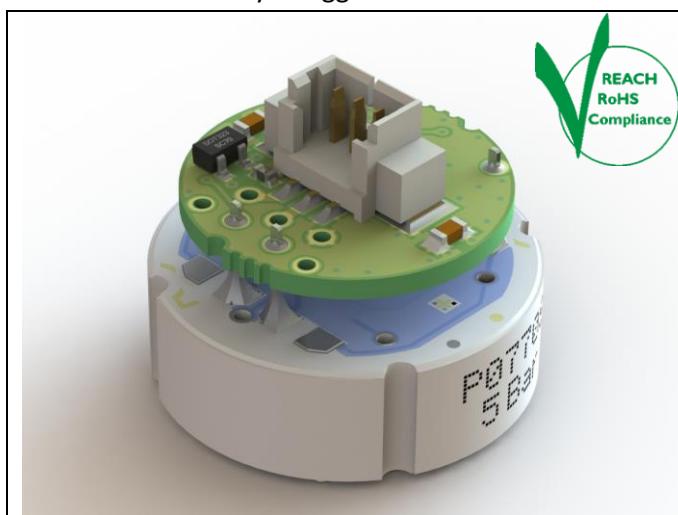
Excellent resistance to corrosion and abrasion

Signal conditioning

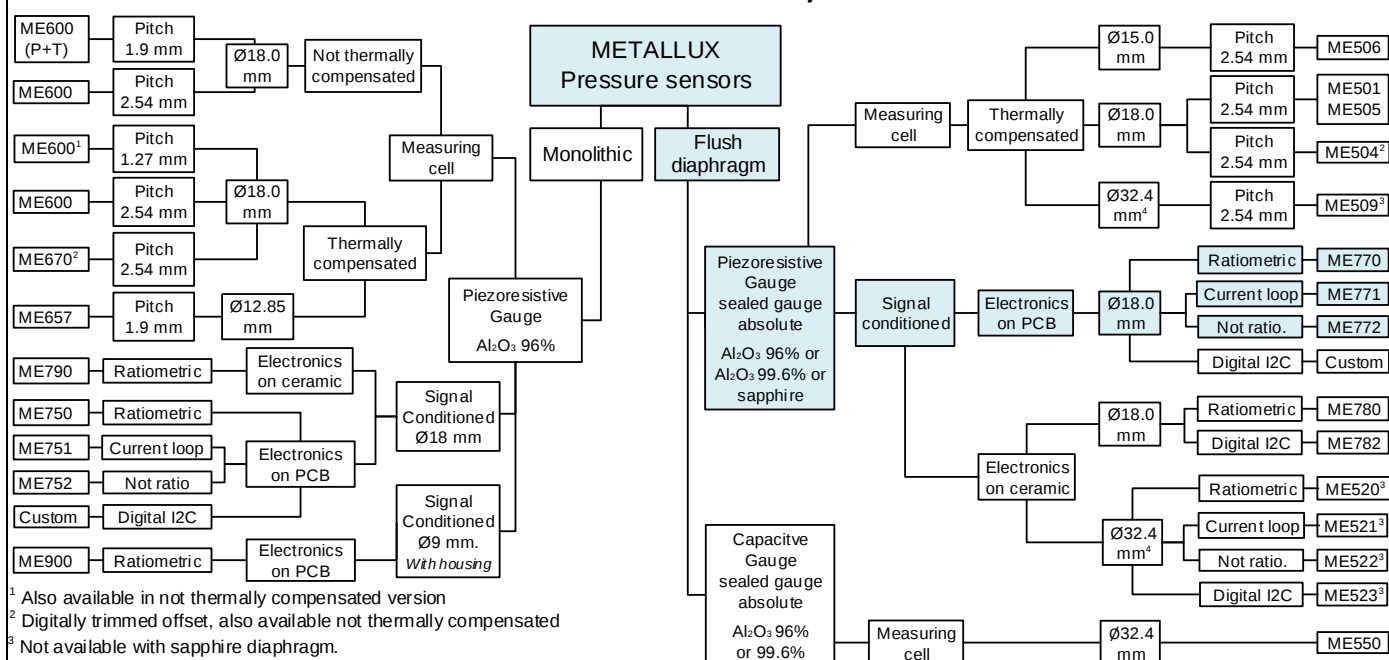
EMC compliant

Thermally compensated

Zero stress mounting software



Pressure sensors family tree



¹ Also available in not thermally compensated version

² Digitally trimmed offset, also available not thermally compensated

³ Not available with sapphire diaphragm.

⁴ Suitable for low pressure range (≤ 1 bar)

Technical characteristics

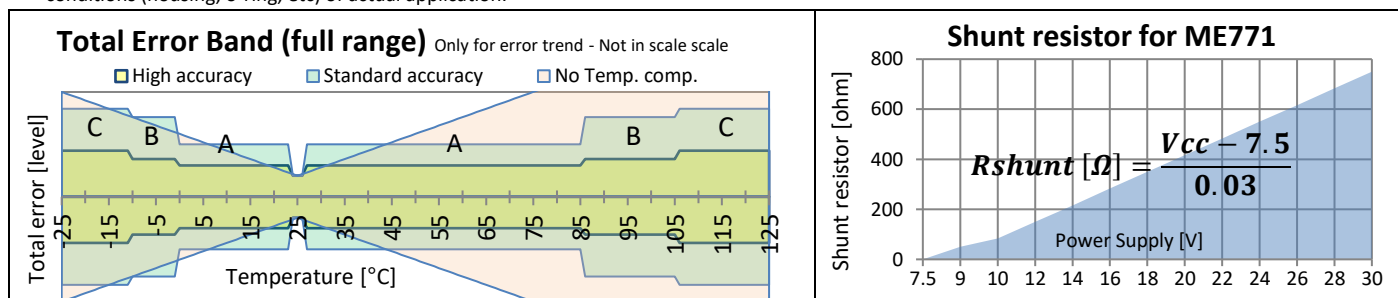
Parameters	Units	ME770 / MEP770	ME771 / MEP771	ME772 / MEP772
Output	-	Ratiometric	Current loop	Non ratiometric
Output range	-	0.5...4.5 [V]	4...20 [mA]	0...10 [V]
Sensor type	-	Flush diaphragm, absolute (A), gauge (R) or sealed gauge (S)		
Technology	-	Piezoresistive with electronic signal conditioning		
Diaph. material	-	Ceramic Al ₂ O ₃ 96% (standard), 99.6% or sapphire (on request)		
Weight	g	≤ 10 (with standard wires)		
Response time	ms	≤ 5		
Supply voltage	VDC	4.5...5.5	9...35	12...35
Max current ¹	mA	6 (R _{LOAD} ≥ 2 kΩ)	4...20	8 (R _{LOAD} ≥ 2 kΩ)
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 / ESD compliance ²	-	IEC/EN 61000-4-2 ESD immunity IEC/EN 61000-4-3 Rad. EM field imm. IEC/EN 61000-4-4 EFT / Burst ³ imm. IEC/EN 61000-4-5 → Not applicable IEC/EN 61000-4-6 Conducted RF imm.	IEC/EN 61000-4-2 ESD immunity IEC/EN 61000-4-3 Rad. EM field imm. IEC/EN 61000-4-4 EFT / Burst imm. IEC/EN 61000-4-5 Surge immunity IEC/EN 61000-4-6 Conducted RF imm.	IEC/EN 61000-4-2 ESD immunity IEC/EN 61000-4-3 Rad. EM field imm. IEC/EN 61000-4-4 EFT / Burst ³ imm. IEC/EN 61000-4-5 → Not applicable IEC/EN 61000-4-6 Conducted RF imm.

Pressure ranges		ME77x / MEP77x													
Nominal	ME	bar	0.5	1	2	5	10	16	20	50	100	200	250	400	600
Pressure ⁴	MEP	psi ⁵	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		14	29	58	145	217	507	507	1450	2175	5075	5075	7250	10875
Burst pressure	bar		2	3	6	15	25	65	65	120	200	500	500	650	950
	psi		29	43	87	217	362	942	942	1740	2900	7250	7250	9425	13775
Vacuum capability	bar		-0.1	-0.5	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	psi		-1.5	-7	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14
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
Sensor 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
Diaph. shape	-		round				octagonal								round

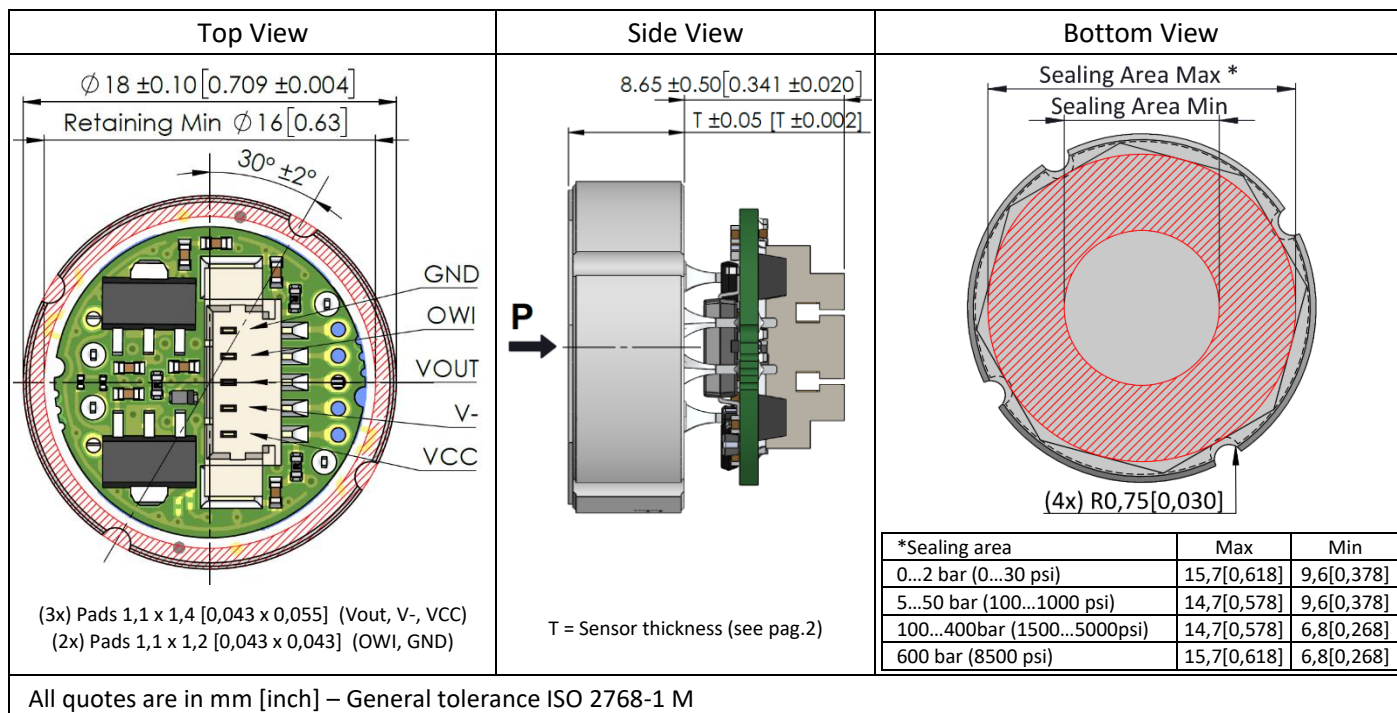
Accuracy ⁶ [%FS]		Calibration with high accuracy						
25°C (77 °F)	1.5	1.0					1.5	
A) 0...85°C (32...185°F)	1.5	1.4		1.6	1.8	2.4	2.8	
B)-10...105°C (14...221°F)	1.8	1.7		1.8	2.2	2.6	3.2	
C)-25...125°C (-13...257°F)	2.2	2.0		2.2	2.5	3.1	3.5	
Accuracy ⁶ [%FS]		Calibration with standard accuracy						
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	3.8	
B)-10...105°C (14...221°F)	3.8	3.7		3.8	4.2	4.6	4.6	
C)-25...125°C (-13...257°F)	4.2	4.0		4.2	4.5	5.5	5.5	
Accuracy ⁶ [%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.

- During calibration or auto-zero, current consumption is < 30 mA.
- All the EMC/ESD tests are performed in Metallux metallic housing grounded.
- EFT/Burst level is according to EN 61326-1:2013
- Pressure ranges not shown specifically in the technical chart have performance of the nearest listed pressure range.
- Psi values are not the exact conversion of bar value. PSI ranges are defined to cover different standard values.
- 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.

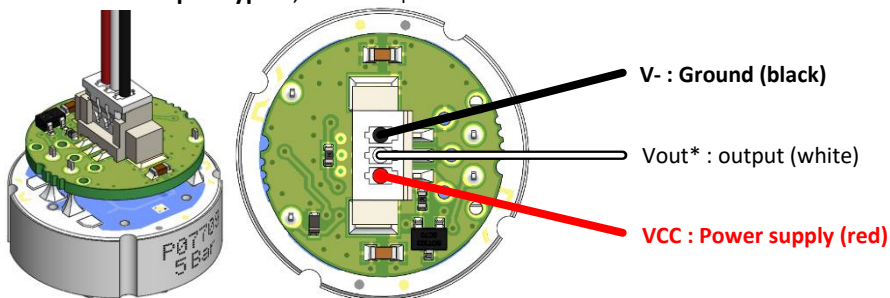


Mechanical drawings



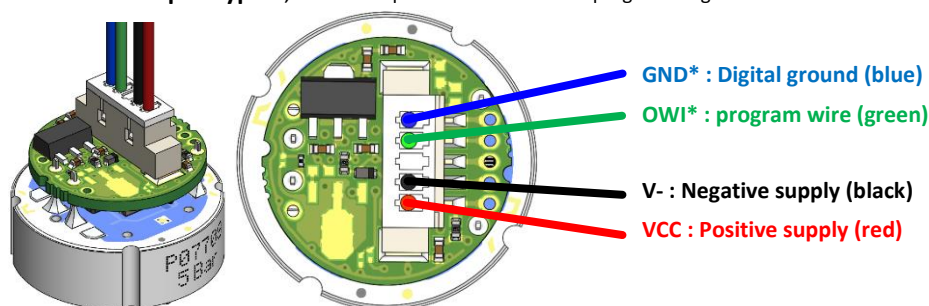
Electrical terminations

MEM770 Example: type 0, Connector plus 52 mm cable



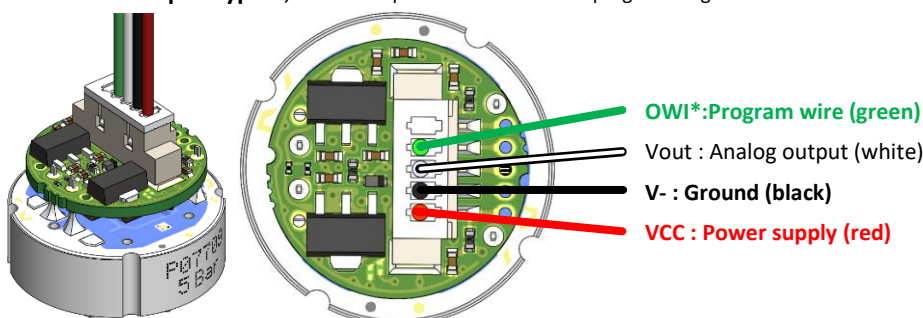
Wire section : AWG 28
Cable length: L = 52. ± 2 [2 ± 0.08]
Stripping length: S = 3.2 ± 0.7 [0.13 ± 0.028]
Op. Temp: -25°C...+125°C (-13 °F...257 °F)
Connector on PCB : FCI 10114828-10203LF
 *programming through Vout wire

MEM771 Example: type 2, Connector plus 52 mm cable with programming wires



Wire section : AWG 28
Cable length: L = 52.0 ± 2 [2 ± 0.08]
Stripping length: S = 3.2 ± 0.7 [0.13 ± 0.028]
Op. Temp: -25°C...+125°C (-13 °F...257 °F)
Connector on PCB : FCI 10114828-10205LF
 *optional wires (termination type 2)

MEM772 Example: type 2, Connector plus 52 mm cable with programming wires



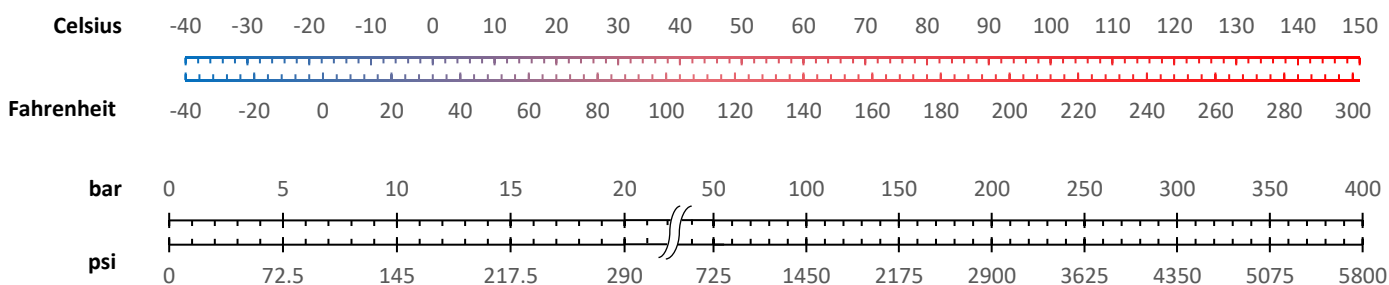
Wire section : AWG 28
Cable length: L = 52.0 ± 2 [2 ± 0.08]
Stripping length: S = 3.2 ± 0.7 [0.13 ± 0.028]
Op. Temp: -25°C...+125°C (-13 °F...257 °F)
Connector on PCB : FCI 10114828-10205LF
 *optional wire (termination type 2)

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

Ordering code

	ME		—	77	—	—	— — —	—	—	—
Pressure unit										
	bar				blank					
	psi				P					
Output signal										
	Ratiometric		0.5...4.5 [V]		0					
	Current loop		4...20 [mA]		1					
	Non ratiometric		0...10 [V]		2					
Sensor type										
	Absolute				A					
	Gauge				R					
	Sealed Gauge				S					
Pressure range	ME		MEP		ME – MEP					
	0...0.5 bar	or	0...7.5 psi	[-/R/-]	0P5 – 7P5					
	0...1 bar	or	0...15 psi	[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					
Calibration										
	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					
Termination type										
	Connector plus 52 mm cable				0					
	Only connector				1					
	Connector plus 52 mm cable with programming wires (only for current loop and non ratiometric)				2					
	Others on request (please specify)				9					
Additional coating										
	Without				0					
	Others on request (please specify)				9					

Conversion tools



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