ME600 datasheet

MONOLITHIC PIEZORESISTIVE CERAMIC PRESSURE SENSOR

Metallux ME600 monolithic pressure sensors are made with a ceramic cell and work following the piezoresistive principle. The Wheatstone bridge is screen printed directly on one side of the ceramic diaphragm by means of Thick Film technology. The diaphragm's opposite side can be exposed directly to the medium to be measured. Because of the Al_2O_3 ceramic excellent chemical resistance (aggressive gases, most of solvents and acids, etc.), no additional protection is normally required. Thanks to the reinforced outer area (monolithic structure), the sensor can be mounted directly in a plastic or metallic case by using O-ring. ME600 sensors are designed in such a way so that temperature changes and pressure overloads do not cause loss in reliability. Metallux ME600 sensors ensure optimal linearity across the entire range of measurement and minimize effects of hysteresis.
Metallux ME600 family substitutes ME662, ME663, ME651 and ME667 families

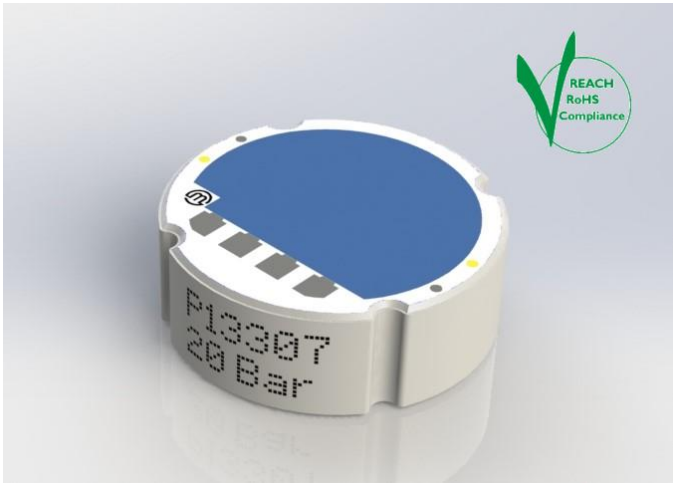
FEATURES

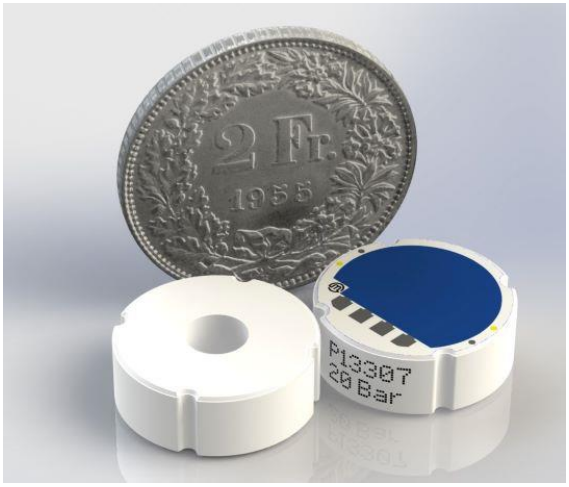
Excellent resistance to corrosion and abrasion

Optimized for high pressure applications

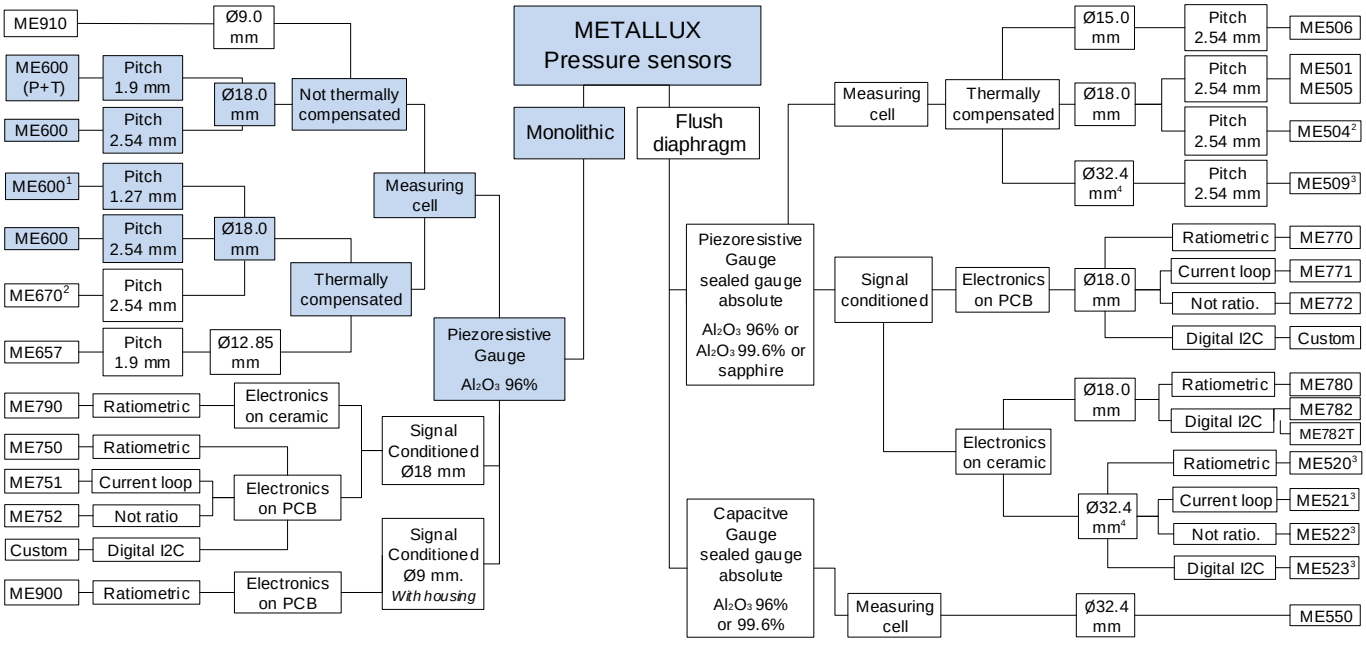
Easy mounting

Customizable





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

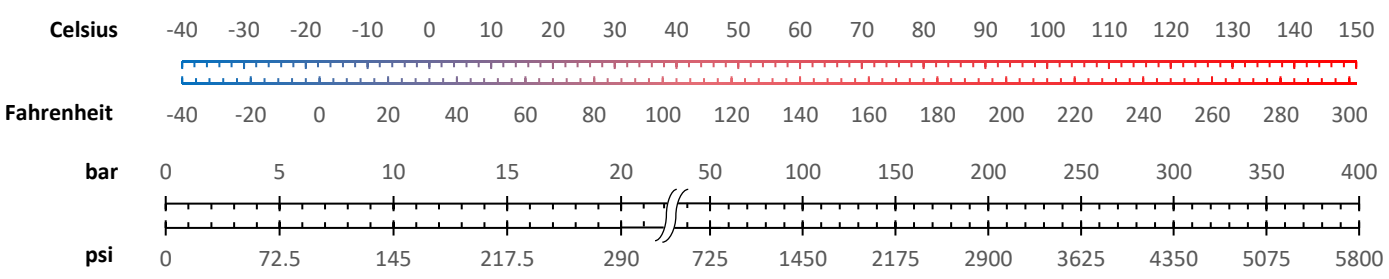
Parameters	Units	Description
Sensor type	-	Monolithic, gauge
Technology	-	Piezoresistive
Material	-	Ceramic Al_2O_3 96%
Weight	g	≤ 5 (ceramic cell only)
Response time	ms	≤ 1
Supply voltage range	VDC	2...30
Offset	mV/V	See ordering code, other available on request
Current consumption	mA	≤ 1.3 @ 10V
Operating temperature	°C	-40...+135 (-40 °F...+275 °F) [1]
Storage temperature	°C	-40...+150 (-40 °F...+302 °F) [1]
Bridge impedance	kΩ	11 ± 30%
Compliant with	-	REACH, RoHS, Conflict Minerals free

Nominal pressure FSO	bar	2	5	10	20	50	100	200	250	400	600
	psi [2]	*29*	*73*	*145*	*290*	*725*	*1450*	*2900*	*3625*	*5800*	*8700*
Overload pressure	bar	4	10	20	40	100	200	300	375	500	750
	psi [2]	*58*	*145*	*290*	*580*	*1450*	*2900*	*4350*	*5440*	*7250*	*10875*
Burst pressure	bar	8	20	35	60	140	300	400	500	650	900
	psi [2]	*116*	*290*	*507*	*870*	*2030*	*4350*	*5800*	*7250*	*9425*	*13050*
Vacuum capability	bar	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	psi [2]	*-14.5*	*-14.5*	*-14.5*	*-14.5*	*-14.5*	*-14.5*	*-14.5*	*-14.5*	*-14.5*	*-14.5*
Sensitivity [3]	mV/V	1.8...3.4	2.0...3.5	2.4...4.0	2.8...4.2	2.7...4.0	2.0...3.2	1.8...3.3	1.5...3.0	1.5...3.0	1.5...2.5
Accuracy [4] (typ./max.)	%FS	0.15/0.5	0.15/0.30	0.15/0.30	0.15/0.30	0.25/0.60	0.50/1.00	0.50/1.00	0.50/1.00	0.60/1.20	0.60/1.20
Cavity diameter	mm	9.7	9.7	9.7	9.7	9.7	5.6	5.6	5.6	5.6	5.6
Thermal offset shift (typ./max.)	%FS/K	± 0.025 / ± 0.05 +25 °C...+85 °C (+77 °F...+185 °F) Not compensated ± 0.005 / ± 0.02 +25 °C...+85 °C (+77 °F...+185 °F) Compensated									
Thermal span shift	%FS/K	Min. - 0.030 Typ. -0.016 Max. 0 -40 °C...+135 °C (-40 °F... / ... +275 °F)									
Reliability tests [5]	-	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) 1 million 0 bar to P_{nom} pressure cycles									

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

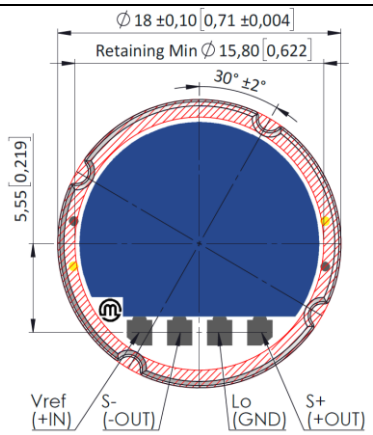
1. Temperature limits depend on connection type, see box "Other types available" on page 4.
2. Psi values for reference only.
3. The sensitivity of each production batch is constant, within the indicated range and with minimal dispersion.
4. Accuracy = $\sqrt{\text{NonLinearity}^2+\text{Hysteresis}^2+\text{NonRepeatability}^2}$, terminal based.
5. All technical characteristics will remain within indicated ranges performing the above-mentioned reliability tests.

Conversion tools

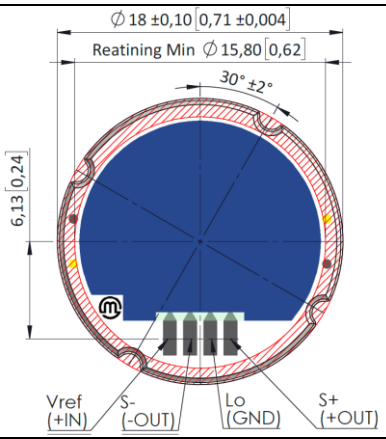


Mechanical drawings and electrical schematics

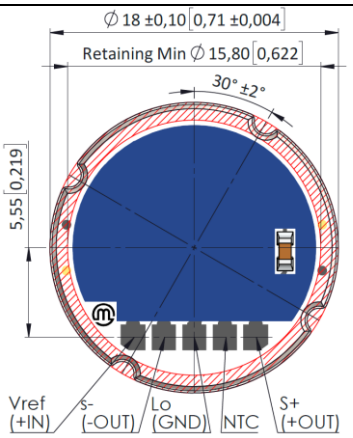
Pitch 2.54 mm (0.100 inches), top view



Pitch 1.27 mm (0.050 inches), top view



Pitch 1.90 mm (0.075 inches), top view (with NTC)



Notes

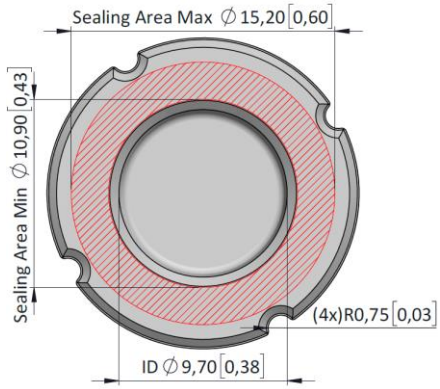
Pad dimensions :

2.54 mm pitch version : 1.60 x 1.60 [0.063 x 0.063], option not available with temperature sensor mounted

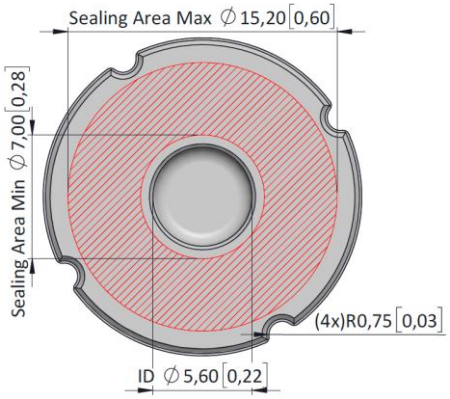
1.27 mm pitch version : 0.87 x 2.00 [0.034 x 0.079]], option not available with temperature sensor mounted

1.90 mm pitch version : 1.50 x 1.60 [0.059 x 0.063], only with temperature sensor mounted

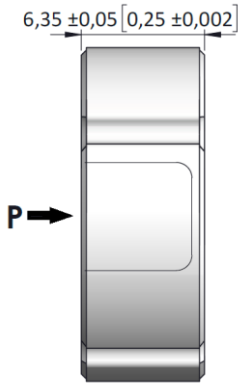
Bottom view (Pnom < 100 bar)



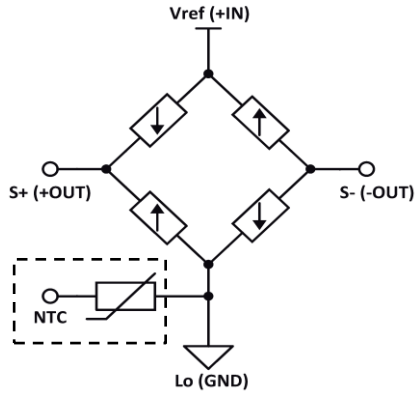
Bottom view (Pnom ≥ 100bar)



Side view



Schematic



Notes

Temperature sensor options :

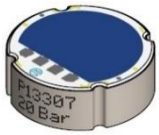
Type 1, NTC SMD 10 kΩ ±1%, β = 3435 K
Type 2, PT100 SMD 100 Ω +3850 ppm/K F0.3 or 0.1
Type 9, customization on request

Note: temperature sensor response time depends on housing and measured fluid

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

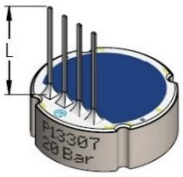
Electrical terminations

Example: type 0, pre-tinned soldering pads



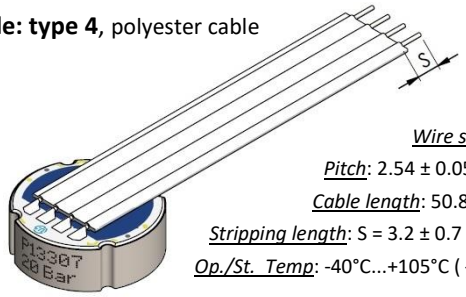
Pitch: 2.54 ± 0.05 [0.1 ± 0.002]
Maximum tin thickness: 0.3 [0.01]
Op. Temp: -40°C...+135°C (-40 °F...275 °F)

Example: type 2, pins L = 13,0 ± 0,5 [0,35 ± 0,02]



Pitch: 2.54 ± 0.05 [0.1 ± 0.002]
Pin section: 0.51 x 0.25 [0.02 x 0.01]
Pin length: L = 9.0 ± 0.5 [0.35 ± 0.02]
Op./St. Temp: -40°C...+135°C (-40 °F...275 °F)

Example: type 4, polyester cable



Wire section: AWG24
Pitch: 2.54 ± 0.05 [0.1 ± 0.002]
Cable length: 50.8 ± 2 [2 ± 0.08]
Stripping length: S = 3.2 ± 0.7 [0.13 ± 0.028]
Op./St. Temp: -40°C...+105°C (-40 °F...221 °F)

Other types available

Type 1, pins L = 9 ± 0.5 [0.51 ± 0.02] (only for pitch 2.54 mm)
Type 3, silicon single wire, 50.8 mm, Op./St. Temp: -20°C...+135°C
Type 5*, PVC flat cable, 50.8 mm, Op./St. Temp: -20°C...+105°C
Type 6, NOMEX™ flat cable, 50.8 mm, Op./St. Temp: -20°C...+105°C
Type 9, customization on request

**PVC flat cables always have 1.27 mm pitch, independently from pads' pitch*

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

Ordering code

			ME600 ___	_	_	_	_	_
Pressure range								
	0…2 bar		002					
	0…5 bar		005					
	0…10 bar		010					
	0…20 bar		020					
	0…50 bar		050					
	0…100 bar		100					
	0…200 bar		200					
	0…250 bar		250					
	0…400 bar		400					
	0…600 bar		600					
	Others on request	(please specify)	999					
Offset								
	-0.1 ±0.1 mV/V	[negative]		0				
	0.0 ±0.1 mV/V	[neutral]		1				
	+0.1 ±0.1 mV/V	[positive]		2				
	Others on request	(please specify)		9				
Temperature compensation								
	Not compensated	[TC0 ≤ ±0.05 %FS/K]			0			
	Compensated	[TC0 ≤ ±0.02 %FS/K]			1			
	Compensated and selected	[TC0 ≤ ±0.01 %FS/K]			2			
	Others on request	(please specify)			9			
Temperature sensor on board (not available with thermal offset shift compensated versions)								
	Without					0		
	NTC SMD	[RES0635 – NTC 10K 1% 0603 3435K]				1		
	PT100 SMD	[RES1058 – PTS0603 + 3850ppm/K F0.3]				2		
	Others on request	(please specify)				9		
Termination pitch								
	2.54 mm	[Not available if temp. sensor is mounted]					0	
	1.90 mm	[Only with temperature sensor mounted]					1	
	1.27 mm	[Not available if temp. sensor is mounted]					2	
	Others on request	(please specify)					9	
Termination type								
	Pre-tinned pads	[2.54/1.90/1.27]						0
	Pins - 9mm	[2.54/1.90/-]						1
	Pins - 13mm	[2.54/-/-]						2
	Silicone single wires 52 mm	[2.54/1.90/1.27]						3
	POLYESTER Flat Cable 50.8 mm	[2.54/-/-]						4
	PVC Flat Cable 50.8 mm	[2.54/1.90/1.27]						5
	NOMEX™ cable 50.8 mm	[2.54/1.90/-]						6
	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)