Type MER180/181

OEM-PRESSURE SENSORS CERAMET ®MER180 / MER181

CERAMET is a piezoresistive sensor on a ceramic base. It is rugged, corrosion and abrasion resistant which makes it particularly suitable for industrial OEM applications. These sensors have a wide operating temperature range of -40 to 125°C combined with high stability and accuracy. These features make them ideal for process control purposes in industrial equipment manufacturing and instrumentation.
CERAMET allows **direct contact of the fluid with the measuring cell** and is easy to handle. Its small 18 mm diameter allows for easy installation into almost all applications. Sensors for absolute and relative pressure with ranges from **1 to 400 bar** are available.

- **Rugged ceramic cell design**
- **Trimmed zero balance**
- **Temperature compensated**
- **Excellent corrosion and abrasion resistance**
- **Shock and vibration resistant**
- **Wide operating temperature range**
- **Easy installation**
- **Competitive price**
- **Option - built-in NTC temperature sensor**



Description

The piezoresistive effect can be observed in a great variety of materials. On CERAMET, a special, proprietary piezoresistive material is applied onto a ceramic diaphragm by using thick film techniques. This gives high sensitivity and stability over a wide temperature range.

The pressure acts directly on the front face of the ceramic diaphragm. Therefore **almost any fluid** can be measured because ceramic offers unequalled resistance against aggressive media. The screen-printed resistors on the opposite face of the diaphragm are connected to a Wheatstone bridge. The element, with the diaphragm, is bonded onto a ceramic base plate. For absolute pressure sensors, the void between diaphragm and base plate is under vacuum while for relative pressure, the base plate has a vent. The output from the bridge is highly linear and the output signal is proportional to the excitation voltage.
The **sensor sensitivity of MER181** is normally **not trimmed.** The sensitivity is determined by statistically and the mean sensitivity is printed on the cell body.
With MER180 the sensitivity of the sensors can be individually trimmed depending on the pressure range between 1.6 and 4.5 mV/V. Therefore they are strain gauge compatible. With sensitivity trimming of the sensor, special care must be taken to the common mode voltage of the op-amp of the amplifier circuit.

All sensors normally are delivered with **trimmed zero balance**. Furthermore an additional compensation of **the thermal compensation** is **done**. If sensors are used in a very small temperature band, part of the trimming could be reduced to lower the cost.

000-096e-12.00 (DBA5.12e-12.00)

All information is the best representation of actual knowledge. All data is subject to change. Kristal does not assume any liability arising out of the application or use of any product or circuit described herein.

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Technical Data

Pressure Ranges

Ranges	bar abs./rel.	1	2	5	10	20	50	100[1]	250[1]	400[1]
Overload	bar	4	7	12	25	50	120	250	600	600
Thickness	mm ±0,10	6,15	6,25	6,30	6,35	6,50	6,70	6,70	7,05	7,30
Sensitivity	mV/V **untrimmed**	2,0-3,0	1,6-3,0	2,4-4,5	3,6-6,0	2,5-3,8	4,3-6,5	3,1-4,8	3,1-4,8	3,1-4,8
MER181		±25% within one batch								
Sensitivity	mV/V trimmed[2]	2,2	2,0	3,0	3,7	2,6	4,0	3,5	3,3	3,3
MER180										

Excitation:		5...30	VDC / stabilized	
Bridge resistance:		11	kΩ?	±20% typ.
Full scale signal:	untrimmed	1,6...6,5	mV/V	±1%FS (see table above)
Zero measurand output:		0...-0.2	mV/V	
		±0.2	mV/V	*optional*
Linearity, Hysteresis & Repeatability:		≤±0.2...0.4	%FSO typ.	
		≤±0.2	%FSO	*optional*
Stability:		±0.2	%FSO/a	@ 25°C typ.
		≤±0.4	%FSO/a	@ 25°C max.
Operating temperature range:		-40...+125	°C	
Thermal sensitivity shift:	0...70°C	≤±0.02	%/°C typ.	
Thermal zero shift:	0...70°C	≤±0.02	%FSO/°C typ.	
Temperature sensor NTC	surface resistivity:	1	kΩ/sq.	*Option*
	Beta:	-1800	kΩ	±20% (mean value @ -55...125°C)
Material:		Ceramic Al_2O_3 , 96%		
Dimensions:		ø 18 x 6.15 ... 7.30 ±0.1 mm		

Values correspond to reference temperature of 25°C.
Other pressure and temperature ranges available on request.

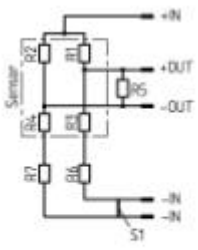
[1] only absolute pressure
[2] on special agreement with end user
[3] only with sensitivity untrimmed available

Ordering Code

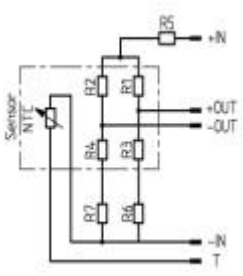
MER18 x x xxx **B** xxxx — MER 18x Cell ø18mm

- 0 ..... Sensitivity trimmed
- **1** ..... Sensitivity untrimmed
- **A**..... Absolute pressure
- **R**..... Relative pressure
- **1** ..... Measuring range
- **2** .....
- **5** .....
- **10**.....
- **20**.....
- **50**.....
- **100**..... abs. only[1]
- **250**..... abs. only[1]
- **400**..... abs. only[1]
- **B**..... Range in bar
- *V0xxx .... customized*

Option *NTC..... with NTC Thermistor*[3]

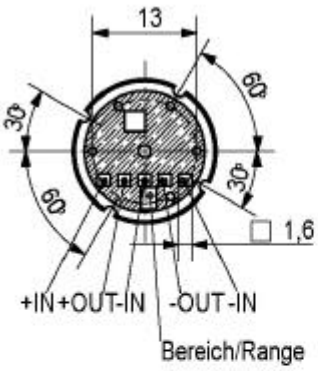


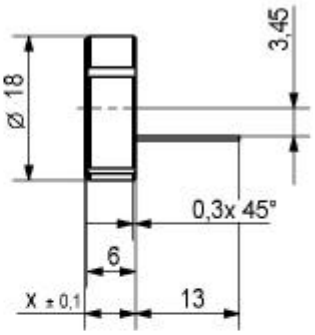
S1 = Schnitt/out
normal geschlossen
normally closed

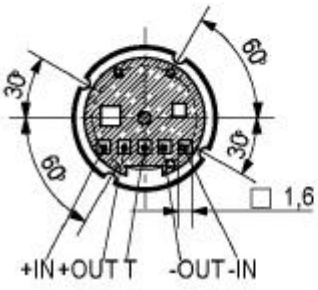


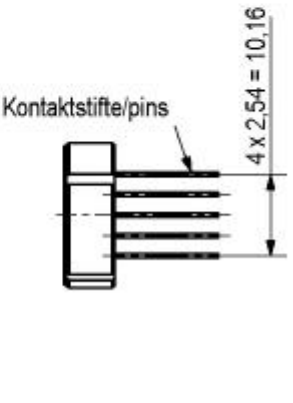
Schematic with NTC

Dimensions









Connection for temperature output
closed bridge only!

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