

Melt Pressure Sensor

Type 4096A..., 4097A...

for Extrusion, 0 ... 10 or 4 ... 20 mA

The melt pressure sensor Type 409/97A... allows constant measuring of the melt pressure during extrusion. Because no pressure transmitting medium such as mercury or oil is used, this sensor is ideal for all types of materials including foodstuffs and medical products.

- Output signal for general purposes
- Contamination of the extruded material with mercury or oil is excluded
- The rugged diaphragm even withstands abrasive materials
- Short response time for the acquisition of high frequency pressure fluctuations
- Temperature measurement available as an option

Description

The extrusion pressure sensor Type 4096/97A... contains a silicon measuring element which operates according to the piezoresistive principle. This element operates reliably even at high temperatures, and can thus be located directly behind the diaphragm; therefore, it is not necessary to use pressure transmitting devices or media such as push rods, oil or mercury. The diaphragm can thus be given a much more rugged construction without compromising accuracy and hysteresis.

This rugged diaphragm construction makes it possible to use a bronze or copper wire brush for cleaning purposes at maximum operating temperature without the risk of damaging the sensor in any way. The solid state design resulting in the high natural frequency of >2 kHz allows measurement of high frequency pressure fluctuations. In order to guarantee its use in existing measuring systems as well as open and closed loop control systems, the sensor is equipped with an 80% shunt-mode calibration function. Any necessary zero balancing can be carried out with an accessible potentiometer in the sensor circuitry.

Application

Melt pressure monitoring plays a key role in extrusion or compounding. In conjunction with temperature, it provides information on the condition of the melt no matter whether this involves pipe, cable, blown film, plate, profile or blow mold extrusion or compounding. Pressure and temperature measure-



ment of the melt improves production consistency when it is linked to the machine control system, and it also protects the equipment against excessive pressure and mold breakage both in thermoplastics and elastomers.

Pressure, temperature and dimensions of the extruded material or homogeneity of the compound are linked to one another in direct proportion. At the same time, software recordings help to optimize the manufacturing process in relation to quality costs and material used.

As a result of their design, the sensor Types 4096/97A... are ideal for use in foodstuffs packaging, food processing for medical products and also for compounding materials with special approvals such as FDA etc.. Contamination with oil or mercury is absolutely excluded.

Technical data

Pressure range: from store	bar	0 ... 350, 0 ... 500, 0 ... 700, 0 ... 1000
other pressure ranges on request	bar	to 2000
Pressure max.		1,5 x full scale
Full scale output FSO	V DC	0 ... 10
	mA	4 ... 20 (two-wire)
Adjustable zero range	% FSO	<±10
End point linearity	% FSO	±1
Repeatability	%	±0,1
Calibration value	% FSO	80 (±0,5)
Output resistance (0 ... 10 V)	Ω	10
Load resistor (i = 20 mA)	Ω	≤500
I = 20 mA bei 24 V DC		
Insulation resistance (at 500 V)	MΩ	200
Supply voltage	V DC	8 ... 30
Compensated temperature range	°C	25 ... 300
Operating temperature max.		
Diaphragm (short period)	°C	350
Electronic circuitry	°C	85
Frequency range (-3 dB)		
4 ... 20 mA	kHz	0 ... 2
0 ... 10 V DC	kHz	0 ... 3
Material: diaphragm, shank		17-4PH W Nr. 1.4542
Fitting hole	4096A...:	1/2" 20 UNF
	4097A...:	M18 x 1,5
Tightening torque	Nm	30 ... 35
Connection (compatible with 6-pin Bendix connector)		ITT Canon KPT 2E 10-6P-Ex-C
Degree of protection		
Standard connector (sensor)		IP65

Accessories

- Connecting cable
Type 4793A2; 2 m, Type 4793A5; 5 m,
Type 4793A10; 10 m, Type 4793Asp spec. length
(6-pin plug-in connector - free end)
- Compensation lead (Type J)
Type 2291A5; 5 m, Type 2291A10; 10 m
- Service kit Type 4190 for sensors with
1/2" 20 UNF thread (Type 4096A...)
- Service kit Type 4191 for sensors with M18x1.5
thread (Type 4097A...)
- Digital panel indicator Type 4626A...
- Dummy sensor Type 4175/77

Scope of delivery

- Fastening clip Art. No. 7.050.059
- Operating instructions

Ordering key

Fitting hole

1/2" -20 UNF	6
M18 x 1,5	7

Standard type	A
Special manufacture (consecutive numbering of the following items)	Q

Measuring range 0 ... 350 bar	03
Measuring range 0 ... 500 bar	05
Measuring range 0 ... 700 bar	07
Measuring range 0 ... 1000 bar	10
Customer specific pressure ranges <350 bar >1000 bar (up to 2000 bar on request)	

Connector version

Standard connector (IP65)	A
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Shank length

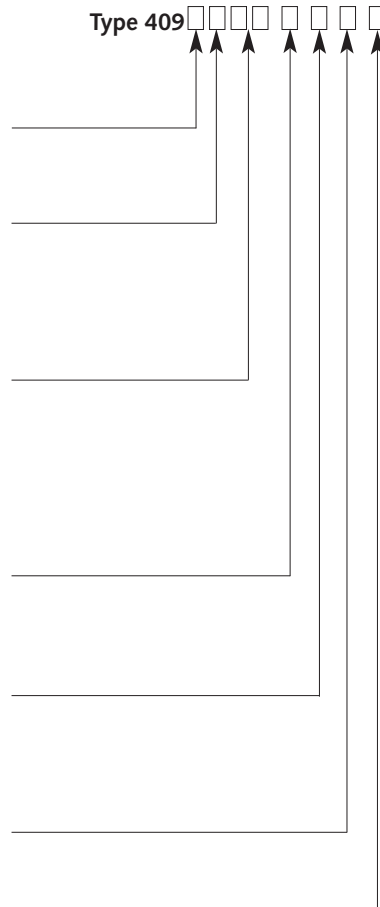
Rigid shank L = 152.4 mm (6") and flexible cable (IP67) L = 457.2 mm (18")	F
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Output signal

4 ... 20 mA	4
0 ... 10 V DC	0

With thermocouple (option)	J
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Type 409



Dimensions of the fitting aperture

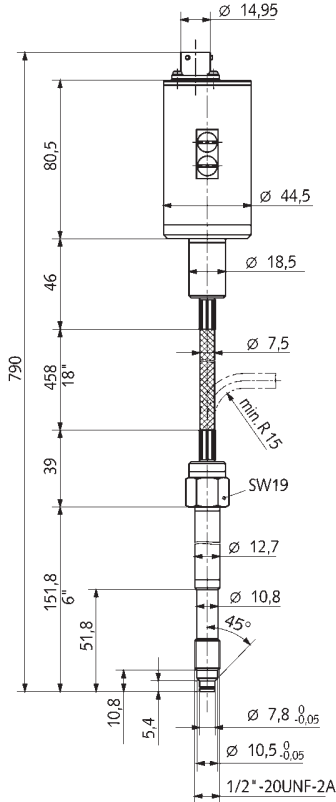


Fig. 1: Type 4096A... AF

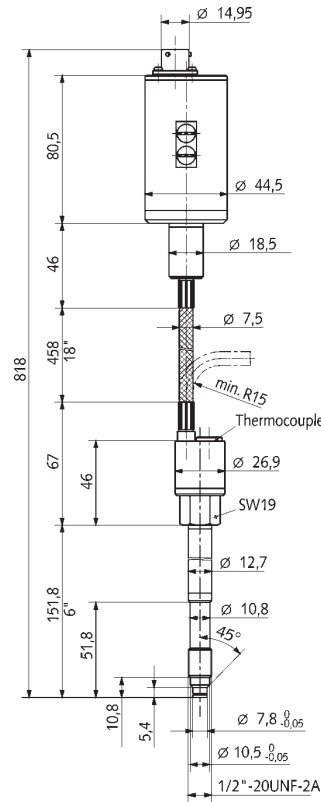


Fig. 2: Type 4096A... AFJ

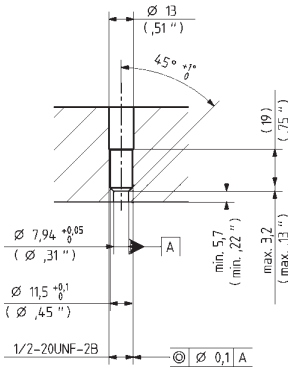


Fig. 3: Measuring bore for Type 4096A...

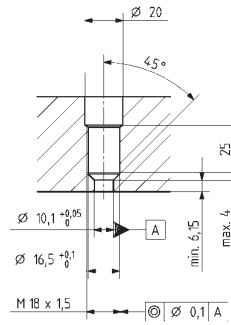


Fig. 4: Measuring bore for Type 4097A...

000-011e-07.02 (DB03.4096Ae)

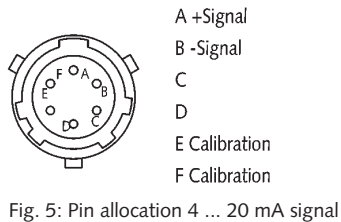


Fig. 5: Pin allocation 4 ... 20 mA signal

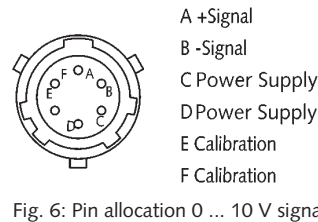


Fig. 6: Pin allocation 0 ... 10 V signal