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Melt Pressure Sensor

Type 4086A..., 4087A...

for Extrusion, 3,33 mV/V

The sensor Type 4086/87A... 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.

In most applications, the sensor can be used as a direct replacement for liquid-filled strain gage sensors and is compatible with many existing measuring devices.

- Compatible with all common pressure measuring sensors
- Contamination of the extruded material with mercury or oil is excluded
- The rugged diaphragm withstands even abrasive materials
- Short response time for the acquisition of high frequency pressure fluctuations



Description

The extrusion pressure sensor Type 4086/87A... 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; it is therefore 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. For high temperature applications or applications in confined spaces, a choice can be made between a rigid shank or a flexible connection between sensor and electronic circuitry. In addition to standard lengths, special lengths are also possible.

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 measurement of the melt improves production consistency when it is linked to the machine control system. Moreover, the equipment is protected 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 4086/87A... 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.

000-008e-07.02 (DB03.4086Ae)

This information corresponds to the current state of knowledge. Kistler reserves the right to make technical changes. Liability for consequential damage resulting from the use of Kistler products is excluded.

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Technical data

Pressure range: from stor	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	mV/V	3,33 (±3 %)
Zero point	% FSO	<±5
End point linearity	% FSO	±1
Repeatability	%	±0,1
Thermal zero point drift	%FS	±5
Thermal sensitivity drift	%	±3
Calibration value	% FSO	80 (±0,5)
Impedances		
Input	Ω	400
Output	Ω	200
Supply voltage (not suitable for carrier frequency amplifiers)	VDC	10 (±25 %)
Insulation resistance (at 500 V)	MΩ	200
Compensated temperature range	°C	25 ... 300
Operating temperature max.		
Diaphragm (short period)	°C	350
Electronic circuitry	°C	85
Frequency range (-3 dB)	kHz	0 ... 2
Material: diaphragm, shank		17-4PH W No. 1.4542
Fitting hole	4086A...:	1/2" 20 UNF
	4087A...:	M18x1,5
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)		IP 65

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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 4086A...)
- Service kit Type 4191
  for sensors with M18x1.5 thread (Type 4087A1)
- Digital panel indicator Type 4626A1
- Dummy sensor Type 4175/77

Scope of delivery

- Fastening clip (flexible type only) Art. No. 7.050.059
- Operating instructions

Bestellschlüssel **Type 408** □□ □□ □ □ □

Fitting hole	
$^1/_2$″-20 UNF	**6**
M18x1,5	**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 on request	
Connector version Standard connector (IP65)	**A**
Shank length, rigid shank only on request l = 152,4 mm (6″) IP65	**2**
Rigid shank L=152,4 mm (6″) and flexible cable (IP 67) L= 457,2 mm (18″)	**F**
With thermocouple (option) on request	**J**

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Dimensions of the fitting aperture

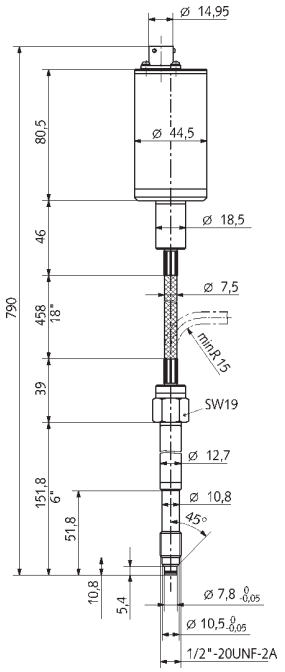


Fig. 1: Type 4086A... AF

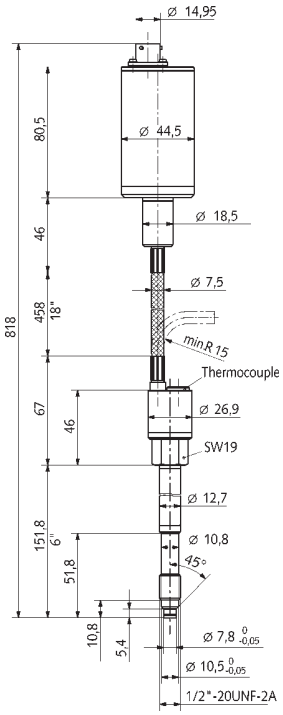


Fig. 2: Type 4086A... AFJ

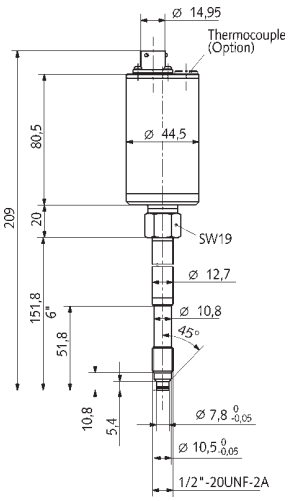


Fig. 3: Type 4086A...A2J

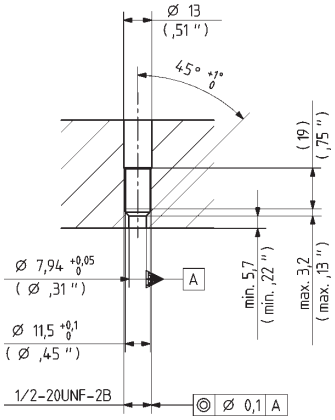


Fig. 4: Measuring bore for Type 4086A...

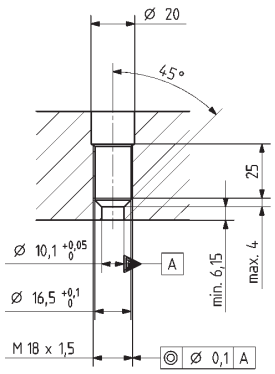


Fig. 5: Measuring bore for Type 4087A...

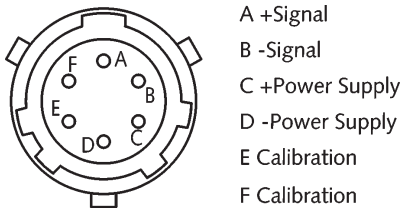


Fig. 6: Pin allocation

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