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Extru-Sys Measuring Chain

Type 4090B.../4091B...

for Extrusion

The melt pressure measuring chain Type 4090/91B... allows constant measuring of the melt pressure during extrusion. The unique silicon measuring chain, operating according to the piezoresistive principle, is located directly behind a solid, rugged diaphragm. 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. The rugged diaphragm even withstands abrasive materials. The melt pressure measuring chain Type 4090/91B... comprises the amplifier Type 4618A..., the digital compensating amplifier Type 4620A... for greater accuracy or the dual monitor Type 4801B... and the sensor.



- A single element measures pressure and, optionally, temperature as well.
- Contamination of the extruded material with mercury or oil is excluded
- Rugged diaphragm permits application in abrasive materials
- Short response time for the acquisition of high frequency pressure fluctuations
- Greater accuracy from digital compensation in the amplifier Type 4620A... or 4801B...
- CE compliance according to the directive 89/336/EEC

Description

The melt pressure measuring chains Type 4090/91B... contain a silicon measuring element which operates according to the piezoresistive principle. This element supplies reliable measurements 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 full 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. Each sensor has its own characteristic which is compensated. With digital compensation – as when using the amplifiers Type 4620A... and Type 4801B... – a microprocessor calculates a correction function with the sensor-specific information obtained during measurement. Superimposing the correction function on the original sensor values achieves a considerably greater degree of accuracy than with analog compensation.

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; it also protects the equipment against excessive pressure and extruder die 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 for example Typ 4795 Co Flow help to optimize the manufacturing process in relation to quality, costs and material used.

As a result of their design, the measuring chains Types 4090/91B... 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.

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Technical data

Pressure range: from store	bar	0 ... 350, 0 ... 500, 0 ... 700, 0 ... 1000
Other pressure ranges on reques	bar	<350 ... 2000
(Pressure ranges below 350 bar not available for Type 4618A...)		
Sensor data		
Pressure max.		1,5x full scale
Temperature range at the sensor	°C	25 ...300
Operating temperature max.		
Diaphragm (short period)	°C	to 350
Connector	°C	to 200
Fitting hole	4090B...:	1/2" -20 UNF
	4091B...:	M18 x 1,5
Material: diaphragm, shank		17-4PH/W.No. 1.4542
Tightening torque on fitting	Nm	30 ... 35
Connection (compatible with 6 pin Bendix connector)		
Degree of protection (sensor)		IP65
Measuring chain with analog amplifier 4618A...		
End point linearity	% FSO	<±1
Repeatability	% FSO	<±0,2
Thermal zero offset	% FSO	<±3
Thermal sensitivity change	% FSO	<±3
Full scale output		
Pressure and temperature	mA	4 ... 20
	V DC	0 ... 10
Supply voltage	V DC	18 ... 30
Operating temperature, electronic	°C	0 ... 60
Measuring chain with digital amplifier Type 4620A		
End point linearity	% FSO	<±0,25
Repeatability	% FSO	<0,1
Full scale output		
Pressure and temperature	mA	4 ... 20
	V DC	0 ... 10
Supply voltage	V DC	18 ... 30
Measuring rate	Hz	300
Operating temperature, electronic circuitry	°C	0 ... 60
Measuring chain with dual monitor Type 4801B		
End point linearity	% FSO	<±0,25
Repeatability	% FSO	<0,1
Full scale output		
Pressure and temperature	mA	4 ... 20
	V DC	0 ... 10
Supply voltage	V DC	24 (Rack-mounted)
	V AC	230/115 +15/-22% (Desktop)
Measuring rate	Hz	10

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Ordering key

Type 409□B□□ □□□ □□ □□

Fitting hole	
1/2" -20 UNF	0
M18 x 1,5	1

Measuring range 0 ... 100 bar (not in store) only with amplifier 4620 and 4801 available	01
Measuring range 0 ... 200 bar (not in store) only with amplifier 4620 and 4801 available	02
Measuring range 0 ... 350 bar (Types in store)	03
Measuring range 0 ... 500 bar (Types in store)	05
Measuring range 0 ... 700 bar (Types in store)	07
Measuring range 0 ... 1000 bar (Types in store)	10
Measuring range 0 ... 1400 bar (not in store) on demand	14
Measuring range 0 ... 2000 bar (not in store) on demand	20

Standard connector IP 65	A
Sealed connector IP 67	H

Shank length (no shank)	0
Shank length (1/2 standard shank)	1
Shank length (standard shank 114 mm)	2
Shank length (2 standard shank)	3

Tapering seal (Flat seal on demand)	K

Cable 4790 A2 Length 2 Meter	2
Cable 4790 A5 Length 5 Meter	5
Cable 4790 A10 Length 10 Meter	7
Cable 4790sp Length special	9
Analog compensated without cable and Amplifier only for Amplifier 4618A0	A
Digital compensated without cable and Amplifier	D
Compensation without cable without Amplifier for Dual Monitor 4801B	B

Analog compensating amplifier Type 4618A0 with pressure output 0 ... 10 V/4 ... 20 mA	A0
Analog compensating amplifier Type 4618A2 output 0 ... 10 V	A2
Analog compensating amplifier Type 4618A4 output 4 ... 20 mA	A4
Digital compensating amplifier Type 4620A1 with pressure and temperature output	D1
Digital compensating amplifier Type 4620A2 with special adjustments (check page 4/5)	D9
Dual Monitor Type 4801B100 Rack version	B0
Dual Monitor Type 4801B200 Desktop	B1
Dual Monitor Type 4801B110 Rack version with analogue Out	B2
Dual Monitor Type 4801B111 Rack version with analogue Out with interface	B3
Dual Monitor Type 4801B210 Desktop with analogue Out	B4
Dual Monitor Type 4801B211 Desktop with analogue Out with interface	B5
Dual Monitor Type 4801B101 Rack version with interface	B6
Dual Monitor Type 4801B201 Desktop with interface	B7

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Accessories

- Service kit Type 4190 for sensors with 1/2″ 20 UNF thread (Type 4090B...)
- Service kit Type 4191 for sensors with M18 x 1,5 thread (Type 4091B...)
- Dummy sensor Type 4175 and 4177
- Software Co Flow Type 4795 in addition with amplifier 4620

Scope of delivery

Measuring chain for extrusion Type 4090B.../4091B... consisting of:

- Sensor Type 4090B... or Type 4091B...
- Cable Type 4790A...
- Amplifier Type 4618A... or Type 4620A... or Type 4801B
- Operating instructions

Notes for appendix 409xBxxxxxxxD9: **Auswahlmöglichkeiten**

Parameter		**Standard settings**	Customized values	Option minimum	Option maximum
Compensated Temperature range (standart Out 0 ... 300 °C = 0 ... 10 V or 4 ... 20 mA)		25 ... 300 °C		25 °C	300 °C
Output	active	4 ... 20 mA		4 ... 20 mA	0 ... 10 V
Adjusted pressure range [bar/psi]	low	**0 % FS** [1]		0 % FS [2]	40 % FS [2]
	high	**100 % FS** [1]		60 % FS [2]	100 % FS [2]
Pressure switching point % FS	low	**10 %**		0 %	80 %
[% of span of adj. pressure range]	high	**90 %**		20 %	100 %

[1] FS corresponds to the value specified in the ordering code.

[2] The range lower and upper adjusted pressure should be at least 50 % FS.

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Dimensions of the fitting aperture

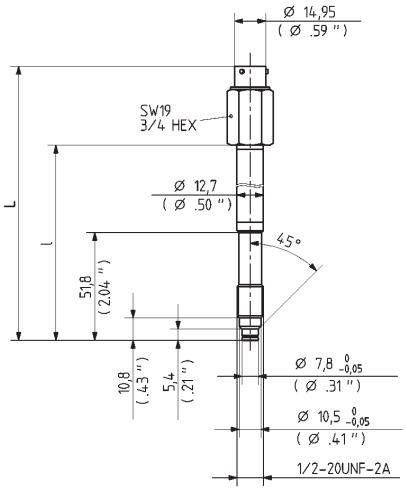


Fig. 1: Type 4090B...

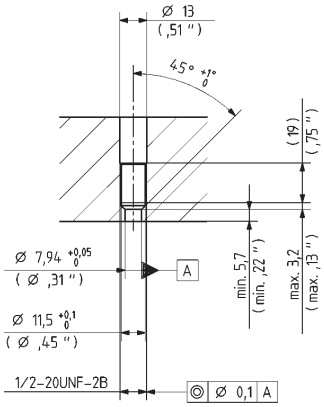


Fig. 2: Measuring bore for Type 4090B

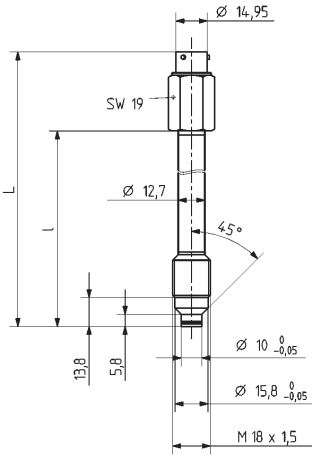


Fig. 3: Type 4091B...

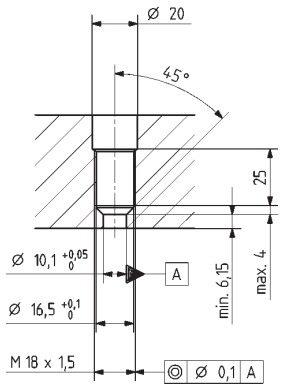


Fig. 4: Measuring bore for Type 4091B

Overall length L	l	Order designation
76 mm (3")	38 mm (no shank)	0
132 (5,25")	94 mm (1/2 shank)	1
190 (7,5")	152 mm (standard shank 114 mm)	2
304 (10,5")	266 mm (2 shank)	3

other dimensions on demande

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