

Melt Pressure Measuring Chain

Type 4021B...

with 1/2" 20 UNF thread, for pressures up to 3 000 bar

Industrial measuring chain consisting of a melt pressure sensor with integral or removable cable, and amplifier designed to match the sensor.

Operating range 0 ... 3 000 bar and 0 ... 350°C

- Melt temperature up to 350°C
- Melt pressure up to 3 000 bar
- Records even extremely short duration pressure peaks
- Does not contain any transmission medium
- Abrasion-resistant diaphragm
- Measuring chain with pressure and temperature measurement

Description

This measuring chain can be used to measure pressure and temperature simultaneously. It consists of a factory-calibrated sensor, cable and amplifier. The sensor has a very stable, high temperature resistant, piezoresistive, silicon measuring element immediately behind a diaphragm of robust steel 1.4542 (for high pressure sensor) or steel alloy 2.4692 (for low pressure sensor).

Application

The measuring chain is designed to record the melt pressure in injection molding machines and hot-runner systems. It is also suitable for static pressure measurements in polymer pumps or other applications. The sensor can be mounted directly in the flow of material. This has the advantage of eliminating the time lag characterizing indirect measuring systems and enabling direct measurement of the process parameters determining product quality. Integration of the measurement signals into the machine's control system to record or control production processes provides a practical means of enhancing production efficiency.



Technical data

Amplifier

Supply voltage	V	18 ... 30
Current consumption	mA	<50
Frequency range of amplifier (-3 dB)	kHz	1
Offset correction range	%FSO	50
Output signal, pressure (depending on measuring range)		
Voltage output	V	0 ... 10
Current output	mA	4 ... 20
Output signal, temperature		
Voltage 0 ... 350° = 0 ... 3.5 V	mV/K	10
Current output 0 ... 350°C = 4 ... 11 mA	µA/K	20

Measuring chain

Measuring range (high-pressure sensors >1 000 bar)	bar	0 ... 3 000
Measuring range (low-pressure sensors ≤1 000 bar)	bar	0 ... 1 000
Overload (high-pressure sensors >1 000 bar)	bar	3 500
Overload (low-pressure sensors ≤1 000 bar)	bar	1 500
Fatigue life	load change	>2.5 · 10 ⁶

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Operating temperature range

Sensor	°C	0 ... 350
Sensor cable	°C	0 ... 300
Extension cable (Between sensor and amplifier)	°C	0 ... 80
Amplifier	°C	0 ... 60
Compensation temperature range	°C	25 ... 350
Sensor cable connection and cable for version H0 ... 2 (with plug)	°C	0 ... 150°C

Requirements for structure material of measuring bore (Nozzle body)

		Min.	Max.
Hardness	HRC	40	55
Tensile strength	Mpa	1 200	1 820

Material

Sensor diaphragm (high-pressure sensors >1,000 bar)	W-No.	1.4542
Sensor diaphragm (low-pressure sensors ≤1,000 bar)	W-No.	2.4692
Sensor case	W-No.	1.4542

Accuracy measuring chain

Repeatability	%FSO	<0.1
Linearity	%FSO	±0.5
Pressure hysteresis	%FSO	<0.8
Thermal zero shift	%FSO	<±0.5*
Thermal sensitivity change	%FSO	<±0.5
Natural frequency	kHz	>165
Acceleration sensitivity	bar/g	<0.1
Degree of protection of measuring chain		IP65
Temperature accuracy	°C	±5

* For Type 4021B02... and Type 4021B05... up to 300°C

Amplifier

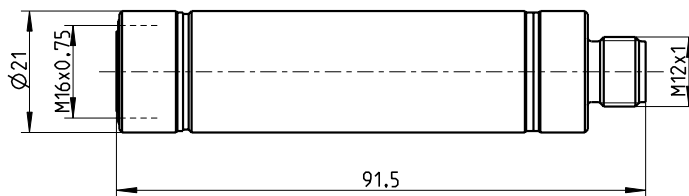
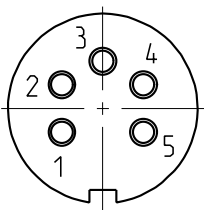


Fig. 1: Dimensions

Pin allocation

Sensor connection

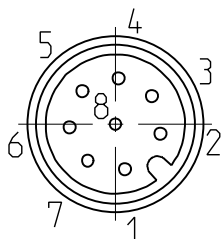
Binder series 723/Amphenol series C091D/Lumberg series 0306, 5 pole female



Pin	Signal	Wire color at cable ducts
1	+IN	black
2	-IN	white
3	n.c.	yellow
4	-OUT	blue
5	+OUT	red

Connection of supply and output signals

M12x1 industrial connector, 8 pole male



#	Signal	Cable Type 1787A5 wire color
1	Exct. GND	white
2	Signal GND	brown
3	Tare	green
4	Pressure signal 0 ... 10 V (for P1) or 4 ... 20 mA (for P2)	yellow
5	Temp. signal 10 mV/K (for P1) or 20 µA/K (for P2)	grey
6	res.	pink
7	res.	blue
8	+Exct. (18 ... 30 V)	red

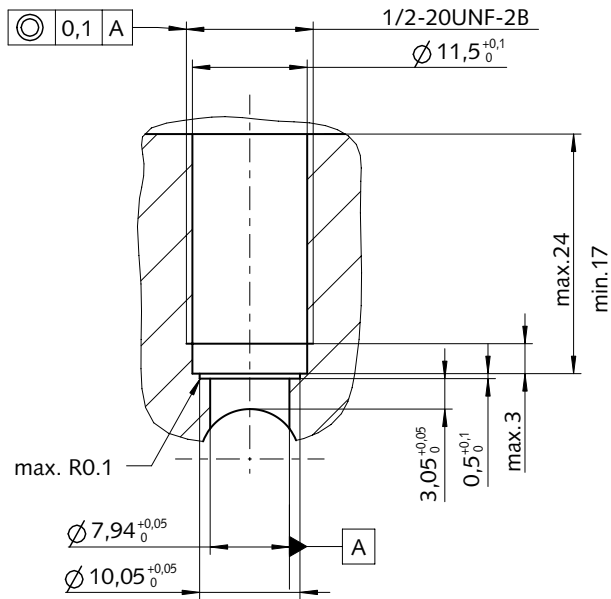


Fig. 2: Dimensions of mounting hole

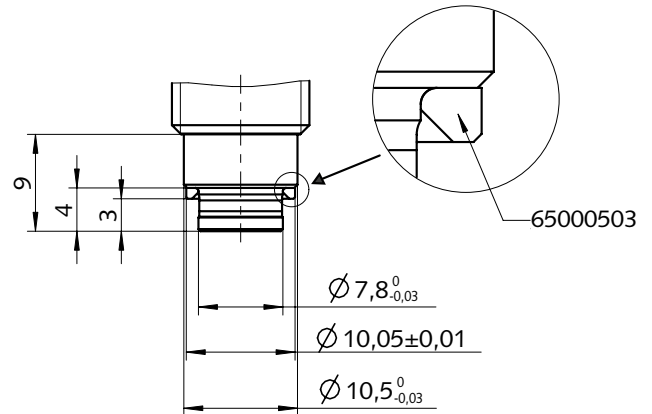


Fig. 3: Installation of sealing ring Mat. No. 65000503

Sensor versions

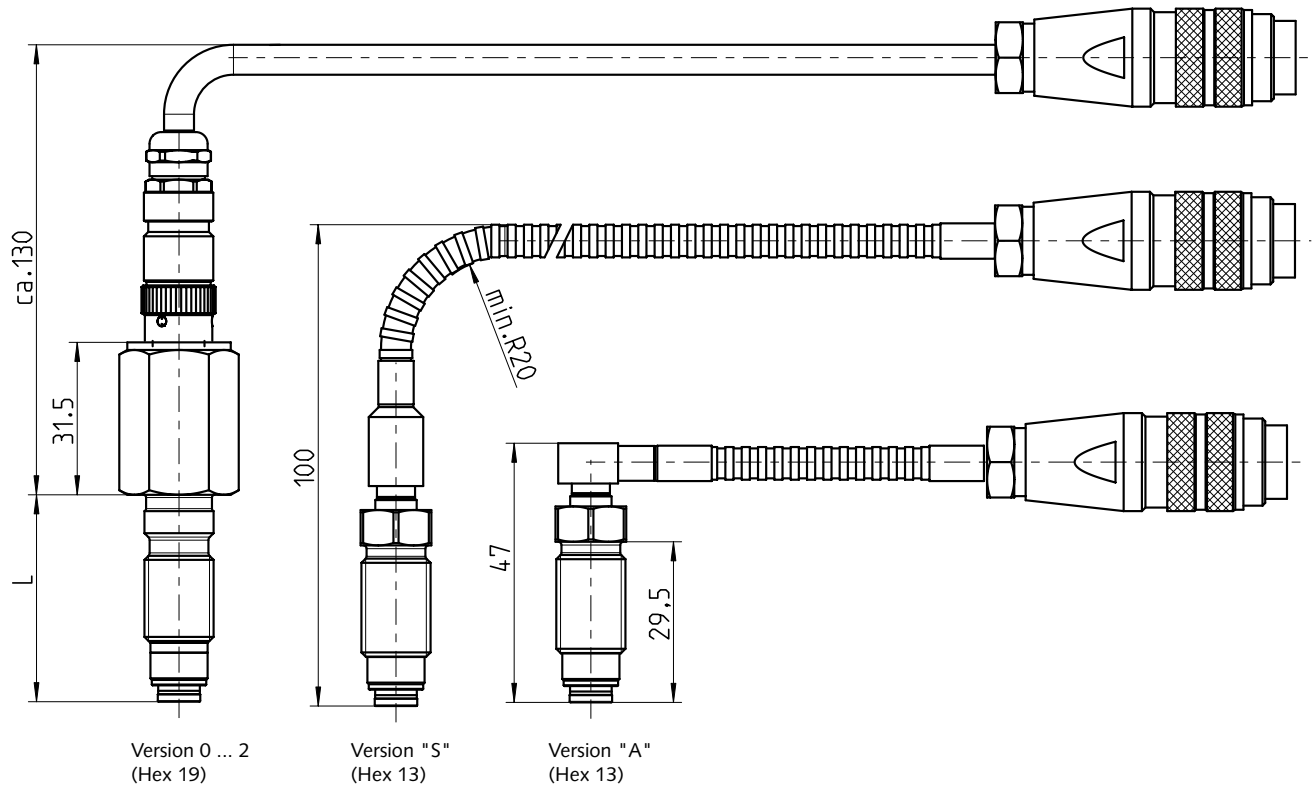


Fig. 4: Versions

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Included accessories

- Sensor as ordered with factory-fitted seal ring
- Amplifier matched to sensor
- Clamping bracket for amplifier
- Calibration certificate

Type/Mat. No.

4187A1
4021-WBS-MB

Optional accessories

- Seal ring (spare part)
- Connecting cable, measuring chain/machine
- Extension cable between sensor and amplifier
- Connection cable for sensor and amplifier (only for shaft variants H0, H1 and H2)
- Amplifier fixing element
- Dummy sensor for sensor hole
- Torque wrench
- Fork wrench insert, 13 mm A/F
- Fork wrench insert, 19 mm A/F
- Service kit for cleaning hole
- Extraction tool for seal ring (out of bore)

Type/Mat. No.

65000503
1787A...
4757A...
4790A1
4187A1
4181
1300A11
1300A137
1300A45
4193A
4193Q02

Ordering key

Type 4021B H

Low pressure:

Measuring range 0 ... 200 bar	02
Measuring range 0 ... 500 bar	05
Measuring range 0 ... 1 000 bar	10

High pressure:

Measuring range 0 ... 2 000 bar	20
Measuring range 0 ... 3 000 bar	30

Connector, shaft L = 38 mm, cable 1 m	0
Connector, shaft L = 94 mm, cable 1 m	1
Connector, shaft L = 152 mm, cable 1 m	2
Straight, integral cable 1 m	S
Angular, integral cable 1 m	A

Amplifier, voltage output	P1
Amplifier, current output	P2

