

Melt Pressure Measuring Chain

Type 4013A..., 4015A...

for Injection Molding Machines or Hot Runner Systems up to 350 °C

Industrial measuring chain consisting of a melt pressure sensor with integrated cable, extension cable and an amplifier adjusted for the measurement of melt pressure up to 3000 bar, with a nozzle temperature of up to 350 °C in the injection unit of injection molding machines.

- Melt temperature up to 350 °C
- Melt pressure up to 3000 bar
- Records even the shortest pressure spikes
- Contains no transmission media
- Abrasion-resistant diaphragm
- Pressure and temperature measurement

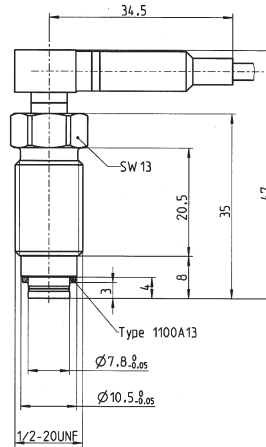
Description

This sensor can measure pressure and temperatures simultaneously. The measuring chain, consisting of amplifier and sensor, is aligned in the factory before delivery. The amplifier is equipped either with an output voltage of 0-10 V or an output current of 4-20 mA as the output signal for pressure and temperature. The sensor consists of a very stable and high-temperature-proof silicon sensor element, which operates according to the piezoresistive principle. It is located directly behind the extremely rugged diaphragm which is made of 17-4PH (W No. 1.4542) steel. The design of the sensor requires no transmission medium and has very good stability under load.

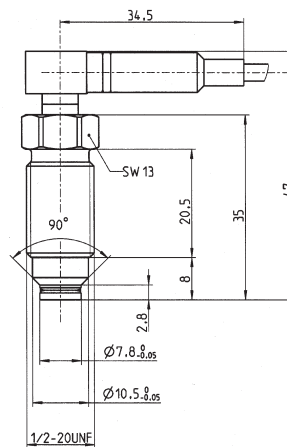
Application

This measuring chain is intended primarily for use in the nozzle of injection molding machines or hot runner systems, where melt pressures up to 3000 bar and melt temperatures of 350 °C occur. The pressure recorded in the nozzle or in the hot runner shows the pressure conditions during the injection and plasticizing phases. The time lag characterizing indirect measuring systems such as hydraulic pressure or screw displacement force measurements does not occur with this sensor.

This measuring chain is ideal for controlling injection, holding pressure and plasticizing phases. Fluctuations in viscosity of the melt can also be detected by simultaneously measuring pressure and temperature. The sensor is distinguished by great longevity and reliability.



Type 4013A...



Type 4015A...



Technical Data

Sensor

| | | |
|--|---------|--------------|
| Measuring range | bar | 0 ... 3000 |
| Overload | bar | 3500 |
| Operating temperature range: | | |
| Sensor | °C | 0 ... 350 |
| Cable | °C | 0 ... 300 |
| Connector | °C | 0 ... 200 |
| Compensation temperature range | °C | 150 ... 350 |
| Tightening torque (see Operating Instructions) | Nm | 45 |
| Material | | |
| Sensor diaphragm | 17-4 PH | W-Nr. 1.4542 |
| Sensor case | 17-4 PH | W-Nr. 1.4542 |

Measuring chain with analog amplifier Type 4618A... or 4670A

| | | |
|---|-------|-----------|
| Supply voltage | VDC | 18 ... 30 |
| Current consumption | | |
| Type 4618A... | mA | <60 |
| Operating temperature, electronic circuitry | °C | 0...60 |
| Full scale output signal (pressure) | VDC | 0 ... 10 |
| or | mA | 4 ... 20 |
| Cut-off frequency with voltage output (-3 dB) | kHz | 40 |
| Cut-off frequency with current output (-3 dB) | kHz | 9 |
| End point linearity | % FSO | ±1 |
| Repeatability | % FSO | ±0.2 |
| Thermal zero offset 150 ... 350 °C | % FSO | ±3 |
| Thermal sensitivity change 150 ... 350 °C | % | ±3 |
| Temperature signal | mV/°C | 10 |
| Temperature accuracy | °C | ±5 |

Measuring chain with digital amplifier Type 4620A...

| | | |
|---|-------|-----------|
| Supply voltage | VDC | 18 ... 30 |
| Current consumption | | |
| Type 4620A... | mA | 120 |
| Operating temperature, electronic circuitry | °C | 0...60 |
| Full scale output signal (pressure) | VDC | 0 ... 10 |
| or | mA | 4 ... 20 |
| Cut-off frequency with voltage output (-3 dB) | kHz | 0,2 |
| Cut-off frequency with current output (-3 dB) | kHz | 0,2 |
| End point linearity | % FSO | ±0,25 |
| Repeatability | % FSO | ±0,2 |
| Thermal zero offset | % FSO | ±1 |
| Thermal sensitivity change | % | ±0,5 |
| Temperature signal | mV/°C | 28,6 |
| Temperature accuracy | °C | ±3 |

000-405e-09.02 (DB03.4013Ae)

Scope of Delivery Including Accessories

- Sensor
- Amplifier
or
or
- Cable
- Connector

Type
4013A.../4015A...
(incl. cable 2 m with connector)
4618A...
4670A...
4620A...
4767A..
1500A57

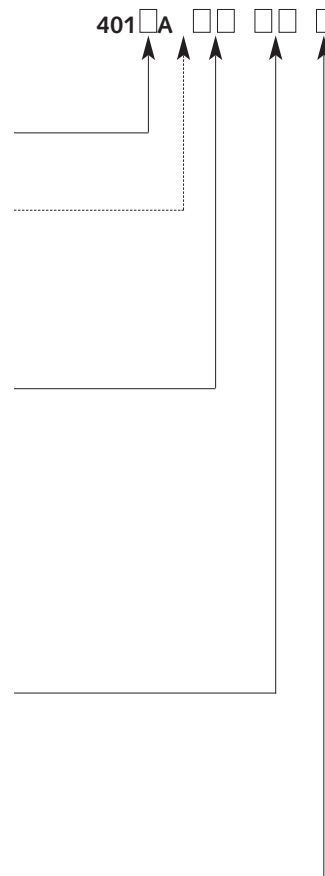
Optional Accessories

- Set of accessories
- Dummy sensor (for Type 4015A...)
- Dummy sensor (for Type 4013A...)
- Dualmonitor
(suitable only for sampling rates <10 Hz)
- «Contflow» software for amplifier
Type 4620A...

Type
4190
4179
4181
4801B
4795

Ordering Key

| | |
|---|-----|
| Sensor with flat seal | 3 |
| Sensor with conical seal | 5 |
| Customer-specific sensor | Qxx |
| Extension connecting cable for 4618A..., 4620A... | |
| Type 4757A2 (l = 2 m) | 02 |
| Type 4757A5 (l = 5 m) | 05 |
| Type 4757Asp (l = ...m) | sp |
| Extension connecting cable for 4670A... | |
| Type 4771A2 (l = 2 m) | M2 |
| Type 4771A5 (l = 5 m) | M5 |
| without extension cable | 00 |
| with analog amplifier | |
| Type 4618A0 (pressure signal 0 ... 10 V and 4 ... 20 mA) | A0 |
| Type 4618A2 (pressure signal 0 ... 10 V Temp. 10 mV/°C) | A2 |
| Type 4618A4 (pressure signal 4 ... 20 mA Temp. 10 mV/°C) | A4 |
| Type 4670A (pressure signal 0 ... 10 mA Temp. 10 mV/°C) | M0 |
| Extension cable always required | |
| with digital amplifier (<200 Hz) | |
| Type 4620A1 (voltage output for pressure and temperature) | D1 |
| Type 4620A2 (customer-specific configuration, see page 5/5) | D9 |
| Customer-specific measuring ranges (on request) | Qxx |



Dimensions

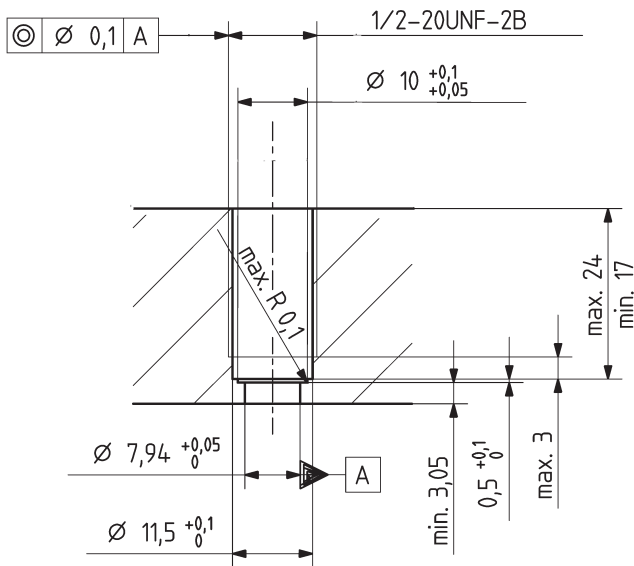


Fig. 1: Dimensions of measuring bore Type 4013A...

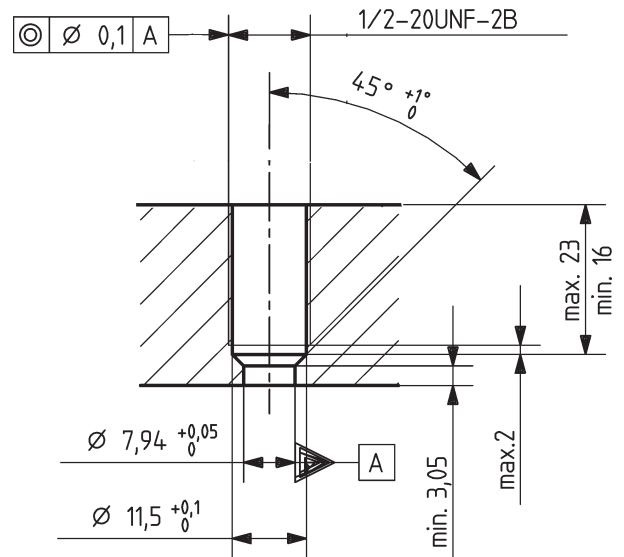


Fig. 2: Dimensions of measuring bore Type 4015A...

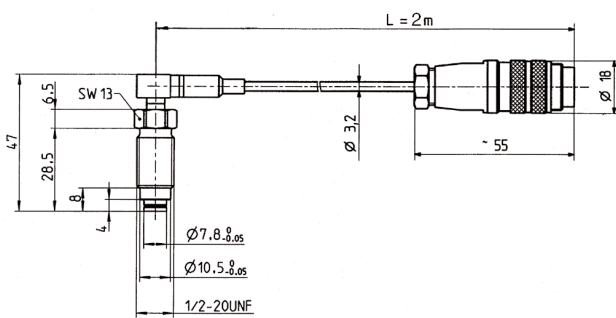


Fig. 3: Dimensional drawing Sensor Type 4013A...

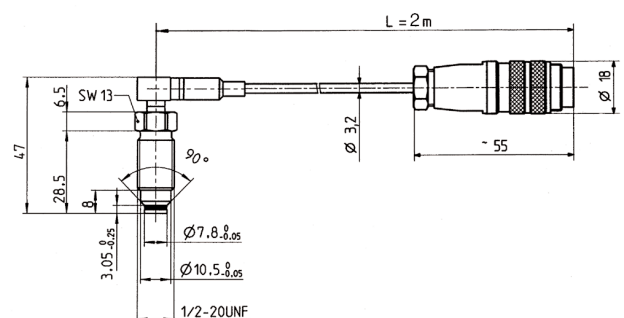


Fig. 4: Dimensional drawing Sensor Type 4015A...

000-405e-09.02 (DB03.4013Ae)

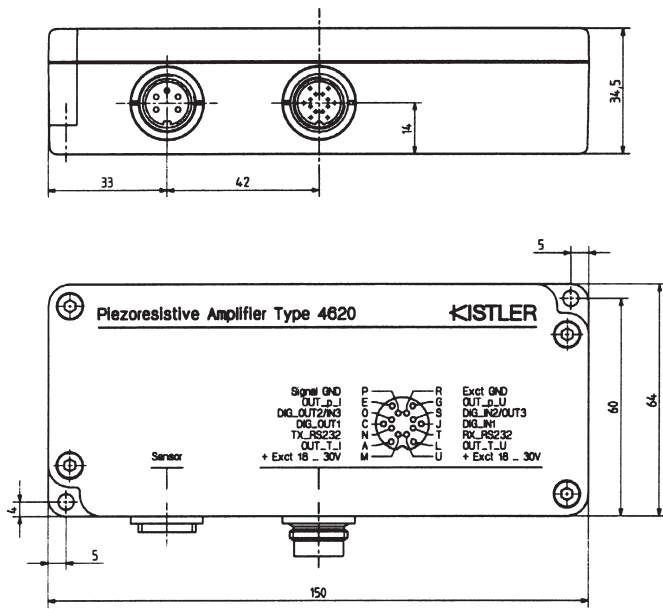


Fig. 5: Case Type 4620A...

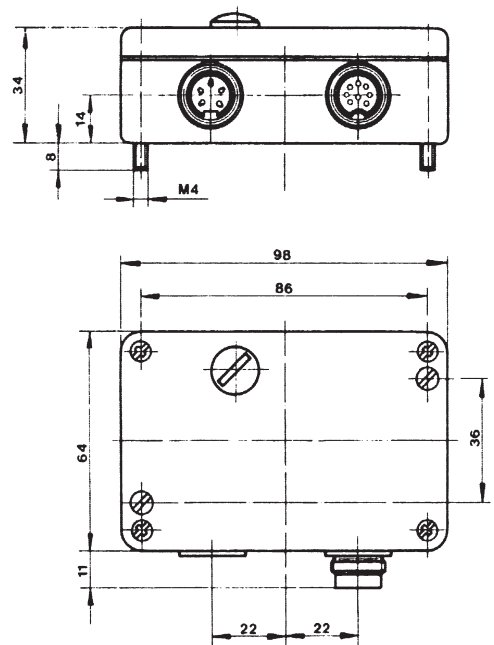


Fig. 6: Case Type 4618A...

Amplifier Module 4670A with Mother Board

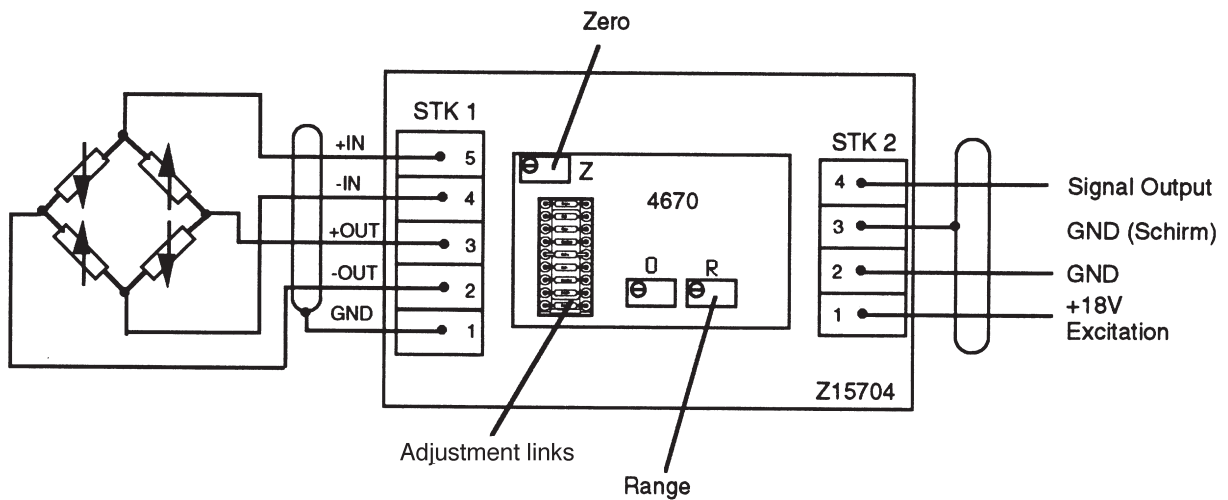
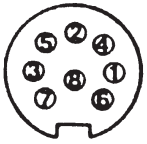


Fig. 7: Terminal pin allocation

000-405e-09.02 (DB03.4013Ae)

Amplifier Pin Allocations



Output (4618A0)

- 1 Limit switch 1 Collector
- 2 GND
- 3 Limit switch 2 Collector
- 4 Signal 0 ... 10 V
- 5 Signal 4 ... 20 mA
- 6 Limit switch 1 Emitter
- 7 Limit switch 2 Emitter
- 8 +18 ... +30 VDC

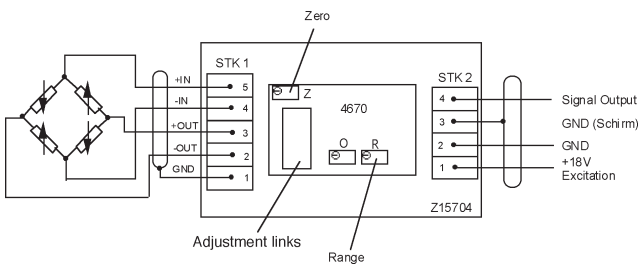
Output (4618A2)

- 1 Limit switch 1 Collector
- 2 GND
- 3 Limit switch 2 Collector
- 4 Signal 0 ... 10 V
- 5 Temperature Signal 10 mV/K
- 6 Limit switch 1 Emitter
- 7 Limit switch 2 Emitter
- 8 +18 ... +30 VDC

Output (4618A4)

- 1 Limit switch 1 Collector
- 2 GND
- 3 Limit switch 2 Collector
- 4 Signal 4 ... 20 mA
- 5 Temperature Signal 10 mV/K
- 6 Limit switch 1 Emitter
- 7 Limit switch 2 Emitter
- 8 +18 ... +30 VDC

Fig. 1: Pin allocations at output Type 4618A...



Output (4670A) STK2

- 1 +18 ... +30 VDC
- 2 GND
- 3 GND Schirm
- 4 Signal Out

STK 1 (Sensor)

- 1 GND
- 2 OUT -
- 3 OUT +
- 4 IN -
- 5 IN +

Fig. 2: Pin allocations at output Type 4670A...

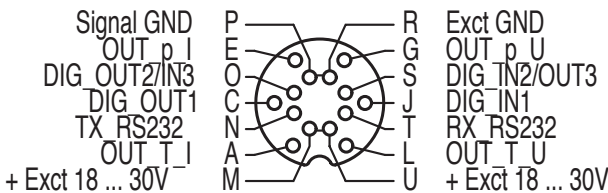


Fig. 3: Pin allocations at output Type 4620A...

Process Data for Version 401xAxxD9:

Available selections

| Parameter | | Standard Setting | Adjusted Setting | Option Minimum | Option Maximum |
|--|-------|------------------------|------------------|-----------------------|------------------------|
| Compensated temperature range (standardized output 0 ... 350 °C = 0 ... 10 V or 4 ... 20 mA) | | 25 ... 350 °C | | 25 °C | 350 °C |
| Output temperature | | 4 ... 20 mA | | 4 ... 20 mA | 0 ... 10 V |
| Output pressure | | 4 ... 20 mA | | 4 ... 20 mA | 0 ... 10 V |
| Set pressure values [bar] | lower | 0 % FS ¹⁾ | | 0 % FS ²⁾ | 40 % FS ²⁾ |
| | upper | 100 % FS ¹⁾ | | 60 % FS ²⁾ | 100 % FS ²⁾ |
| Pressure switching limits [in % range of set pressure value] | lower | 10 % | | 0 % | 80 % |
| | upper | 90 % | | 20 % | 100 % |

¹⁾ FS represents the value of the range in the ordering key

²⁾ The range between the lower and upper pressure value must be min. 50 %

000-405e-09.02 (DB03.4013Ae)