



Differential pressure transmitter

Relative and differential pressure transmitter

Type 699

The type 699 transmitters are available in switchable pressure ranges and with or without display. The full-version includes customer specific adjustment possibilities. Especially developed sensors for each pressure range ensure accurate long term stable measurement and the large variety of options provide the perfect platform for use in air conditioning technology as well as for fine measurement in the industrial and medical environment.



Pressure range

-1 ... 1 mbar /

0 ... 0.3 – 50 mbar

- + Available with or without LCD display
- + Adjustable measurement range
- + Switchable output signals
- + Switchable response curve (linear or root-extracted)
- + Resettable Zero Point (Reset button)
- + Full scale adjustable
- + Attractive price / performance ratio
- + Application at over and low pressure range possible
- + Fast, easy mounting. Housing incorporates integral bracket for wall or ceiling mounting

Technical overview

Pressure range

Relative and differential -1 ... 1 mbar / 0 ... 0.3 – 50 mbar

Operating conditions

| | | |
|--------------------------------|-------------------------------------|--------------------------------------|
| Medium | | Air and neutral gases |
| Temperature | Medium / ambient | 0 ... +70 °C |
| | Storage | -10 ... +70 °C |
| | No condensation | |
| Tolerable overload on one side | Application at over pressure range | ≤ 3 mbar P1 = 50 mbar P2 = 4 mbar |
| | | > 3 mbar P1 = 100 mbar P2 = 4 mbar |
| | Application at under pressure range | ≤ 3 mbar P1 = -4 mbar P2 = -50 mbar |
| | | > 3 mbar P1 = -4 mbar P2 = -100 mbar |
| Rupture pressure | ambient temperature | 2 x overload |
| | 70 °C | 1.5 x overload |

Materials in contact with medium

| | |
|-----------|--|
| Sensor | Ceramic Al ₂ O ₃ (96%) |
| Diaphragm | Silicone |
| Housing | Polycarbonat PC |

Electrical overview

| | Output ¹⁾ | Power supply ¹⁾ | Load | Current consumption ²⁾ |
|------------------------------|--|-------------------------------|---|-----------------------------------|
| 2 wire | 4 ... 20 mA | 8.0 ... 33 VDC | $< \frac{\text{supply voltage} - 2V}{202A}$ (Ohm) | < 20 mA |
| | 0 ... 10 V | 13.5 ... 33 VDC / 24 VAC ±15% | > 10 kOhm | < 10 mA |
| 3 wire | 0 ... 20 mA | 13.5 ... 33 VDC / 24 VAC ±15% | < 500 Ohm | < 30 mA |
| | 4 ... 20 mA | 13.5 ... 33 VDC / 24 VAC ±15% | < 500 Ohm | < 30 mA |
| | 0 ... 5 V ³⁾ | 6.5 ... 33 VDC / 24 VAC ±15% | > 10 kOhm | < 10 mA |
| Filter | | | Response time switchable by | off / 0.2s / 1s / 5s / 20s |
| Polarity reversal protection | Short circuit proof and protected against polarity reversal. Each connection is protected against crossover up to max. supply voltage. | | | |

Dynamic response

| | |
|---------------|---------|
| Response time | < 20 ms |
| Load cycle | < 10 Hz |

Protection standard

| | |
|---------------|-------|
| Without cover | IP 00 |
| With cover | IP 54 |
| | IP 65 |

Display

| | | |
|---------------|---|--------------------------|
| LCD Display | Double spaced | per 8 digit alphanumeric |
| Module MODBUS | At additional backlight LCD-Display 30 mA current consumption | |
| | RTU RS-485 | |

Ranges of adjustment

The zero point is adjustable by reset button.
The Full scale is adjustable by DIP-Switch and additional by the turbopot.

Adjustability

Optional version with self configurable parameters (see order code selection table)

Electrical connection

Screw terminals for wire and stranded conductors up to 1.5 mm²
Cable gland with built-in strain relief PG11

Pressure connection

Connection pipe Ø 6.2 mm

Mounting instructions

Installation arrangement Recommendation: Vertical, (Factory calibration) with pressure connections downwards
Mounting Mounting bracket (integrated in case)

Tests / Admissions

UL
Electromagnetic compatibility CE-conformity acc. EN 61326-2-3

Weight

Without display ~ 90 g
With display ~ 100 g

Packaging

Single packaging in cardboard
Multiple packaging 20 / 40 / 120

¹⁾ Adjustable by DIP-Switch

²⁾ At nominal pressure

³⁾ Additional adjustable by software (with LCD-Display only)

Accuracy

| Parameter | Unit | ±0.5 mbar | 0 ... 1 mbar | 0 ... 3 mbar | 0 ... 5 mbar | 0 ... 10 - 50 mbar |
|--|---------------|-----------|--------------|--------------|--------------|--------------------|
| Tolerance zero point | max. % fs | ±1.0 | ±1.0 | ±0.7 | ±0.7 | ±0.7 |
| Tolerance zero full scale | max. % fs | ±1.0 | ±1.0 | ±0.7 | ±0.7 | ±0.7 |
| Resolution | % fs | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 |
| Total of linearity, hysteresis and repeatability | max. % fs | ±1.0 | ±1.0 | ±1.0 | ±1.0 | ±0.6 |
| Long term stability acc. to DIN EN 60770 | % fs | ±1.0 | ±1.0 | ±1.0 | ±1.0 | ±1.0 |
| TC zero point ¹⁾ | typ. % fs/10K | ±0.2 | ±0.2 | ±0.2 | ±0.1 | ±0.1 |
| TC zero point ¹⁾ | max. % fs/10K | ±1.0 | ±1.0 | ±0.5 | ±0.4 | ±0.4 |
| TC sensitivity ¹⁾ | typ. % fs/10K | ±0.3 | ±0.3 | ±0.2 | ±0.1 | ±0.1 |
| TC sensitivity ¹⁾ | max. % fs/10K | ±0.6 | ±0.6 | ±0.5 | ±0.5 | ±0.2 |

- no additional root-extracted errors

Test conditions:

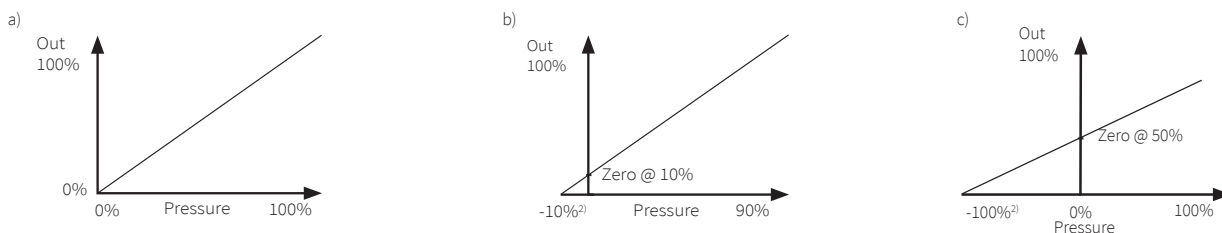
25 °C, 45% rF, Power supply 24 VDC

- For changing diaphragm position, compensable with zero point reset

TC z.p. / TC z.p. 0 ... 70 °C

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--|--|--|--------------------|-------------|---------|---|-----|---|---|---|----|
| Order code selection table | | 699. | X | X | X | X | X | X | X | X | X |
| Pre-adjustment | max. range | 9 | | | | | | | | | |
| | middle range (factory setting) | B | | | | | | | | | |
| | min. range (factory setting) | C | | | | | | | | | |
| Signal range selectable | Pressure range of 0 % to 100% fs | | 1 | | | | | | | | |
| | Pressure range of -10 % to 90% fs | | 2 | | | | | | | | |
| | Pressure range of -100 % to 100% fs | | 3 | | | | | | | | |
| Pressure range selectable | mbar (hPa) | | | | | | | | | | |
| | Pa | | | | | | | | | | |
| | mmWS | | | | | | | | | | |
| | inH₂O | | | | | | | | | | |
| | under pressure max. | | | | | | | | | | |
| | 0 ... 0.3/0.5 | 30/50 | 3/5 | 0.1/0.2 | -50 Pa | 0 | | | | | |
| | 0 ... 0.3/0.5/1 | 30/50/100 | 3/5/10 | 0.1/0.2/0.3 | -100 Pa | 1 | | | | | |
| | 0 ... 0.5/1/3 | 50/100/300 | 5/10/30 | 0.3/0.5/1 | -50 Pa | 2 | | | | | |
| 0 ... 1/3/5 | 100/300/500 | 10/30/50 | 0.5/1/2 | -50 Pa | 3 | | | | | | |
| 0 ... 3/5/10 | 300/500/1000 | 30/50/100 | 1/2/3 | -50 Pa | 4 | | | | | | |
| 0 ... 5/10/16 | 500/1000/1600 | 50/100/160 | 2/3/5 | -50 Pa | 5 | | | | | | |
| 0 ... 10/16/25 | 1000/1600/2500 | 100/160/250 | 3/5/10 | -50 Pa | 6 | | | | | | |
| 0 ... 16/25/50 | 1600/2500/5000 | 160/250/500 | 5/10/20 | -50 Pa | 7 | | | | | | |
| Pressure unit | mbar | | | | | 0 | | | | | |
| | hPa | | | | | 4 | | | | | |
| | Pa | | | | | 2 | | | | | |
| | kPa | | | | | 5 | | | | | |
| | mmWS | | | | | 3 | | | | | |
| inH ₂ O | | | | | 6 | | | | | | |
| Output signal / adjustment | Linear | without Filter | dual DIP-Switch | | | 1 | | 0 | | | |
| | | with Filter (transposable) | tenfold DIP-Switch | | | 2 | | | | | |
| | Square root extracted | without Filter | dual DIP-Switch | | | 4 | | 0 | | | |
| | | with Filter (transposable) | tenfold DIP-Switch | | | 3 | | | | | |
| Output / power supply | 0 ... 10V | 13.5 ... 33 VDC / 24 VAC ± 15 % | (3 wire) | | | | | 1 | | | |
| | 0 ... 20 mA | 13.5 ... 33 VDC / 24 VAC ± 15 % | (3 wire) | | | | | 3 | | | |
| | 4 ... 20 mA | 13.5 ... 33 VDC / 24 VAC ± 15 % | (3 wire) | | | | | 4 | | | |
| | | 8.0 ... 33 VDC | (2 wire) | | | | | 5 | | | |
| | Output signal complimentary selectable, at delivery no pre-adjustment | | | | | 9 | | 2 | 6 | | |
| Option | without display | | | | | | | | | 0 | |
| | with display in pressure unit chosen above | | | | | | | | | 1 | |
| | with display in % fs | | | | | | | | | 2 | |
| | with module MODBUS | | | | | | 2,3 | 1 | 3 | | |
| Pressure connection / Pressure orifices | Connection pipe Ø 6.2 mm | without pressure orifice | | | | | | | | 1 | |
| | | pressure orifice on P1 | | | | | | | | 2 | |
| | | pressure orifice on P2 | | | | | | | | 3 | |
| | | pressure orifice on P1 and P2 | | | | | | | | 4 | |
| Accessories / Connection Kit | IP 54 | without | | | | | | | | | 0 |
| | | with connection kit (metal), 90° angled including tube 2 m long (Fig. 1) | | | | | | | | | 1 |
| | | with connection kit (plastic), straight including tube 2 m long (Fig. 2) | | | | | | | | | 2 |
| | IP 65 | without | | | | | | | | | 3 |
| | | with connection kit (metal), 90° angled including tube 2 m long (Fig. 1) | | | | | | | | | 4 |
| | with connection kit (plastic), straight including tube 2 m long (Fig. 2) | | | | | | | | | 5 | |
| Pressure range variation (optinal) | Indicate W and state range on order (e.g.: W0 ... + 8mbar/OUT1...6V) | | | | | | | | | 9 | 1 |
| | | | | | | | | | | | W |

Range of characteristic line



¹⁾ TC = Temperature coefficient

²⁾ under pressure max. acc. order code selection table = -50 Pa/ 100 Pa

Depending on the version parameters are adjustable by customer

| | |
|---------------------------------|--|
| Version | Variable parameters |
| Dual DIP-Switch | Pressure ranges in grades |
| Tenfold DIP-Switch | Pressure ranges in grades; stepless adjustable with Turbo-Poti / output signals / filter (off / on) / response curve (linear / root extracted) |
| Tenfold DIP-Switch with Display | Pressure ranges in grades; stepless adjustable with Turbo-Poti / pressure units / pressure range character / output signals; additional 0 ... 5 V / filter (off / 0.2s / 1s / 5s / 20s) / response curve (linear / root extracted) / backlight (off / 5min / on) |

Accessories (supplied loose)

| | | Order number |
|--|----------------------------------|--------------|
| Connection kit for vent duct (metal), 90° angled | including tube 2 m long (Fig. 1) | 104312 |
| Connection kit for vent duct (plastic), straight | including tube 2 m long (Fig. 2) | 100064 |
| DIN-rail mounting adaptor (Fig. 3) | | 112854 |
| Module MODBUS | | 117305 |
| Calibration certificate | | 104551 |

Dimensions in mm / Electrical connections

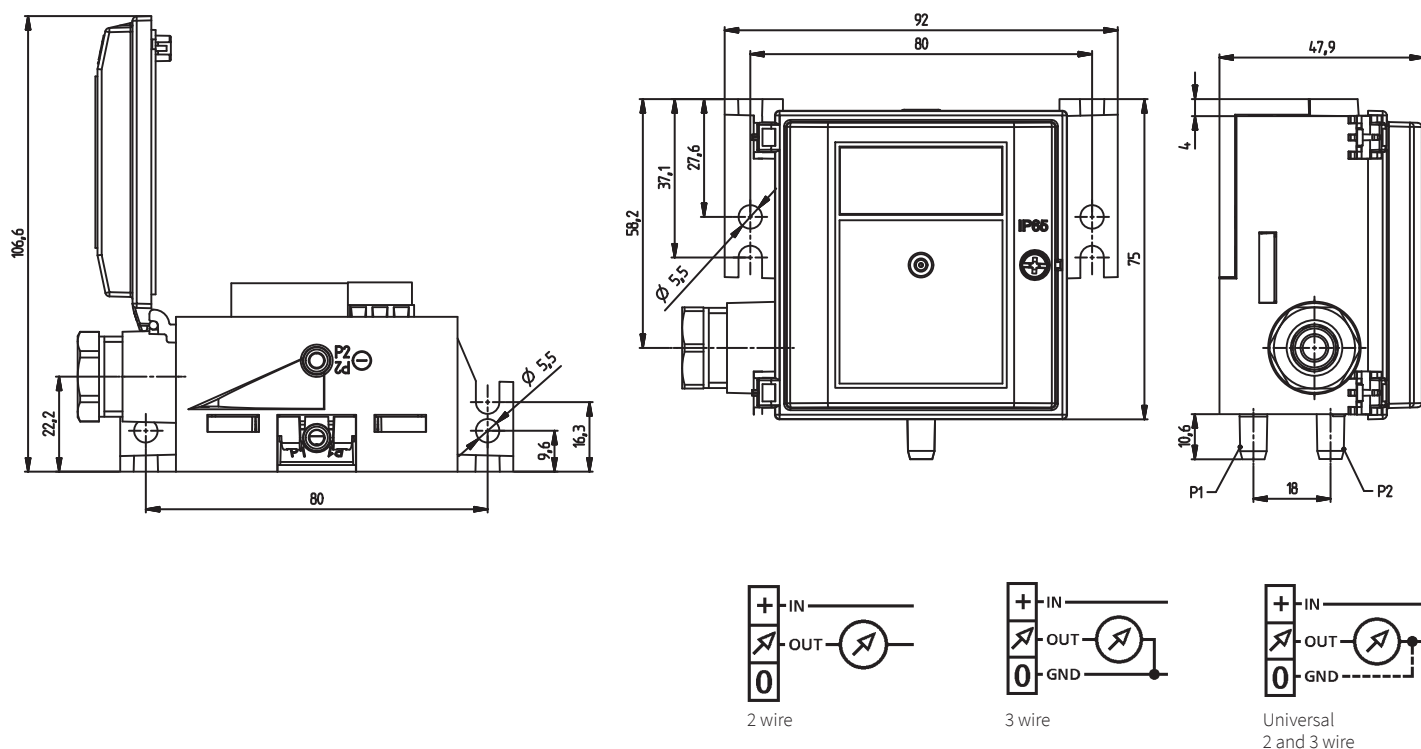


Fig. 1

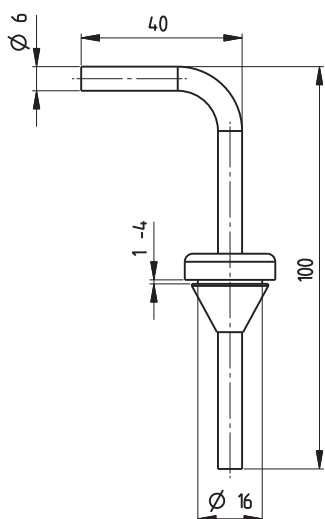


Fig. 2

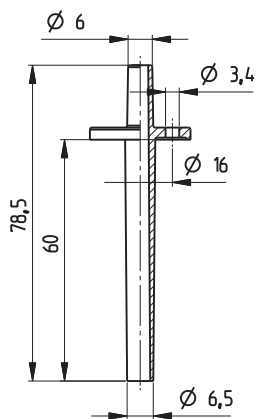
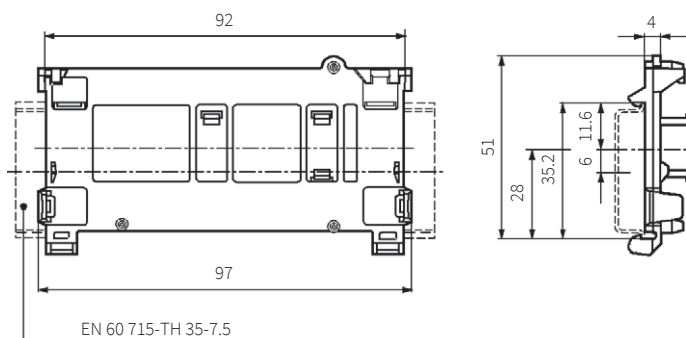


Fig. 3



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