

# Relative, and differential pressure transmitter type 699

Pressure range

-1 ... 1 mbar / 0 ... 0.3 – 50 mbar



The type 699 transmitters are available in switchable pressure ranges and with or without digital device. 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.

- Fast, easy mounting. Housing incorporates integral bracket for wall or ceiling mounting
- 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

## 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<br>Application at low pressure range | P1 = 100 mbar<br>P1 = -4 mbar<br>P2 = 4 mbar<br>P2 = -100 mbar |
| Rupture pressure               | ambient temperature<br>70 °C  | 2 x overload<br>1.5 x overload                                 |

### Materials in contact with medium

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

### Electrical overview

|                              | Output <sup>1)</sup>   | Power supply <sup>1)</sup>    | Load   | Current consumption <sup>2)</sup> |
|------------------------------|--|-------------------------------|--|-----------------------------------|
| 2 wire                       | 4 ... 20 mA  | 8.0 ... 33 VDC                | $< \frac{\text{supply voltage} - 8 \text{ V}}{0.02} \text{ [Ohm]}$ | < 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 <sup>3)</sup>  | 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 |
| At additional backlight LCD-Display 30 mA current consumption |               |                          |

### 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 mm<sup>2</sup>  
Cable gland with built-in strain relief PG11

### Pressure connection

Connection pipe Ø 6.2 mm

### Mounting instructions

|                          |                 |   |
|--------------------------|-----------------|---|
| Installation arrangement | Recommendation: | Vertical, 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

## 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 <sup>4)</sup>                      | typ. % fs/10K | ±0.2      | ±0.2         | ±0.2         | ±0.1         | ±0.1               |
| TC zero point <sup>4)</sup>                      | max. % fs/10K | ±1.0      | ±1.0         | ±0.5         | ±0.4         | ±0.4               |
| TC sensitivity <sup>4)</sup>                     | typ. % fs/10K | ±0.3      | ±0.3         | ±0.2         | ±0.1         | ±0.1               |
| TC sensitivity <sup>4)</sup>                     | max. % fs/10K | ±0.6      | ±0.6         | ±0.5         | ±0.5         | ±0.2               |

- no additional root-extracted errors  
- For changing diaphragm position, compensable with zero point reset

Test conditions: 25 °C, 45% rF, Power supply 24 VDC  
TC z.p. / TC z.p. 0 ... 70 °C

<sup>1)</sup> Adjustable by DIP-Switch  
<sup>4)</sup> TC = Temperature coefficient

<sup>2)</sup> At nominal pressure

<sup>3)</sup> Additional adjustable by software (with LCD-Display only)

**Order code selection table**

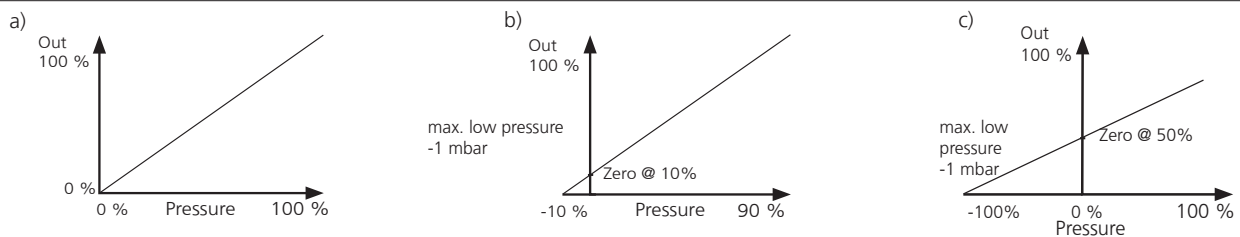
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|  |  |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   |                        |
|--|--|---------------------------------|-------------|-------------------------|---------------|---|---|--|--|---|---|--|--|--|--|--|--|--|---|---|------------------------|
| <b>Pre-adjustment</b>  | max. range   |                                 | 9           |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   |                        |
|  | middle range   |                                 | B           |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   |                        |
|  | min. range   |                                 | C           |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   |                        |
| <b>Pressure range switchable</b>   | Pressure range of 0 % bis 100% fs  |                                 |             |                         |               |   |   |  |  | 1 |   |  |  |  |  |  |  |  |   |   |                        |
|  | Pressure range of -10 % bis 90% fs   |                                 |             |                         |               |   |   |  |  | 2 |   |  |  |  |  |  |  |  |   |   |                        |
|  | Pressure range of -100 % bis 100% fs   |                                 |             |                         |               |   |   |  |  | 3 |   |  |  |  |  |  |  |  |   |   |                        |
| <b>Pressure range (switchable)</b>   | <b>mbar (hPa)</b>  | <b>Pa</b>                       | <b>mmWS</b> | <b>inH<sub>2</sub>O</b> |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   |                        |
|  | 0 ... 0.3/0.5  | 30/50                           | 3/5         | 0.1/0.2                 | <sup>1)</sup> |   |   |  |  |   | 0 |  |  |  |  |  |  |  |   |   |                        |
|  | 0 ... 0.3/0.5/1  | 30/50/100                       | 3/5/10      | 0.1/0.2/0.3             | <sup>2)</sup> |   |   |  |  |   | 1 |  |  |  |  |  |  |  |   |   |                        |
|  | 0 ... 0.5/1/3  | 50/100/300                      | 5/10/30     | 0.3/0.5/1               | <sup>1)</sup> |   |   |  |  |   | 2 |  |  |  |  |  |  |  |   |   |                        |
|  | 0 ... 1/3/5  | 100/300/500                     | 10/30/50    | 0.5/1/2                 | <sup>1)</sup> |   |   |  |  |   | 3 |  |  |  |  |  |  |  |   |   |                        |
|  | 0 ... 3/5/10   | 300/500/1000                    | 30/50/100   | 1/2/3                   | <sup>1)</sup> |   |   |  |  |   | 4 |  |  |  |  |  |  |  |   |   |                        |
|  | 0 ... 5/10/16  | 500/1000/1600                   | 50/100/160  | 2/3/5                   | <sup>1)</sup> |   |   |  |  |   | 5 |  |  |  |  |  |  |  |   |   |                        |
|  | 0 ... 10/16/25   | 1000/1600/2500                  | 100/160/250 | 3/5/10                  | <sup>1)</sup> |   |   |  |  |   | 6 |  |  |  |  |  |  |  |   |   |                        |
| 0 ... 16/25/50   | 1600/2500/5000   | 160/250/500                     | 5/10/20     | <sup>1)</sup>           |               |   |   |  |  | 7 |   |  |  |  |  |  |  |  |   |   |                        |
| <b>Pressure unit</b>   | mbar   |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 0 |                        |
|  | hPa  |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 4 |                        |
|  | Pa   |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 2 |                        |
|  | kPa  |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 5 |                        |
|  | mmWS   |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 3 |                        |
|  | inH <sub>2</sub> O   |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 6 |                        |
| – Pressure ranges in grades (version dual DIP-Switch; without Display)   |  |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | <b>Adjustability 1</b> |
| – Pressure ranges in grades; stepless adjustable with Turbo-Poti I output signals I Filter (off / 1s) I response curve (linear / root extracted) (Version tenfold DIP-Switch; without Display)   |  |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | <b>Adjustability 2</b> |
| – Pressure ranges in grades; stepless adjustable with Turbo-Poti I pressure units I pressure range character I output signals; additional 0 ... 5V Filter (off / 0.2s / 1s / 5s / 20s) I response curve (linear / root extracted) I Backlight (off / 5s / on) (Version tenfold DIP-Switch; with Display) |  |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | <b>Adjustability 3</b> |
| <b>Output signal / adjustment</b>  | Linear   | without Filter                  |             |                         | X             |   |   |  |  |   |   |  |  |  |  |  |  |  | 1 | 0 |                        |
|  | Linear   | with Filter (transposable)      |             |                         |               | X |   |  |  |   |   |  |  |  |  |  |  |  | 2 |   |                        |
|  | Square root extracted  | without Filter                  |             |                         | X             |   |   |  |  |   |   |  |  |  |  |  |  |  | 4 | 0 |                        |
|  | Square root extracted  | with Filter (transposable)      |             |                         |               | X |   |  |  |   |   |  |  |  |  |  |  |  | 3 |   |                        |
| <b>Output / power supply</b>   | 0 ... 10 V   | 13.5 ... 33 VDC / 24 VAC ± 15 % |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 1 |                        |
|  | 0 ... 20 mA  | 13.5 ... 33 VDC / 24 VAC ± 15 % |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 3 |                        |
|  | 4 ... 20 mA  | 13.5 ... 33 VDC / 24 VAC ± 15 % |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 4 |                        |
|  | 4 ... 20 mA  | 8.0 ... 33 VDC                  |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 5 |                        |
| <b>Display doublespaced – 8 digit</b>  | Output signal complimentary selectabel, at delivery no pre-adjustment          |                                 |             |                         |               | X |   |  |  | 9 |   |  |  |  |  |  |  |  | 2 | 6 |                        |
|  | without  |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 0 |                        |
|  | in pressure unit chosen above  |                                 |             |                         |               |   | X |  |  |   |   |  |  |  |  |  |  |  |   | 1 |                        |
| <b>Pressure connection / Pressure orifices</b>   | in % fs  |                                 |             |                         |               |   | X |  |  |   |   |  |  |  |  |  |  |  |   | 2 |                        |
|  | Connection pipe Ø 6.2 mm without pressure orifice                              |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | 1                      |
|  | Connection pipe Ø 6.2 mm pressure orifice on P1                                |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | 2                      |
|  | Connection pipe Ø 6.2 mm pressure orifice on P2                                |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | 3                      |
| <b>Accessories / Connection Kit</b>  | Connection pipe Ø 6.2 mm pressure orifice on P1 and P2                         |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   | 4 |                        |
|  | IP 54 without  |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | 0                      |
|  | IP 54 with connection kit (metal), 90° angled including tube 2 m long (Fig. 1) |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | 1                      |
|  | IP 54 with connection kit (plastic), straight including tube 2 m long (Fig. 2) |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | 2                      |
|  | IP 65 without  |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | 3                      |
|  | IP 65 with connection kit (metal), 90° angled including tube 2 m long (Fig. 1) |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | 4                      |
| <b>Pressure range variation</b>  | IP 65 with connection kit (plastic), straight including tube 2 m long (Fig. 2) |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | 5                      |
|  | Indicate W and state range on order (e.g.: W0 ... + 8mbar/OUT1...6V)           |                                 |             |                         |               |   |   |  |  |   |   |  |  |  |  |  |  |  |   |   | W                      |

**Accessories <sup>3)</sup>**

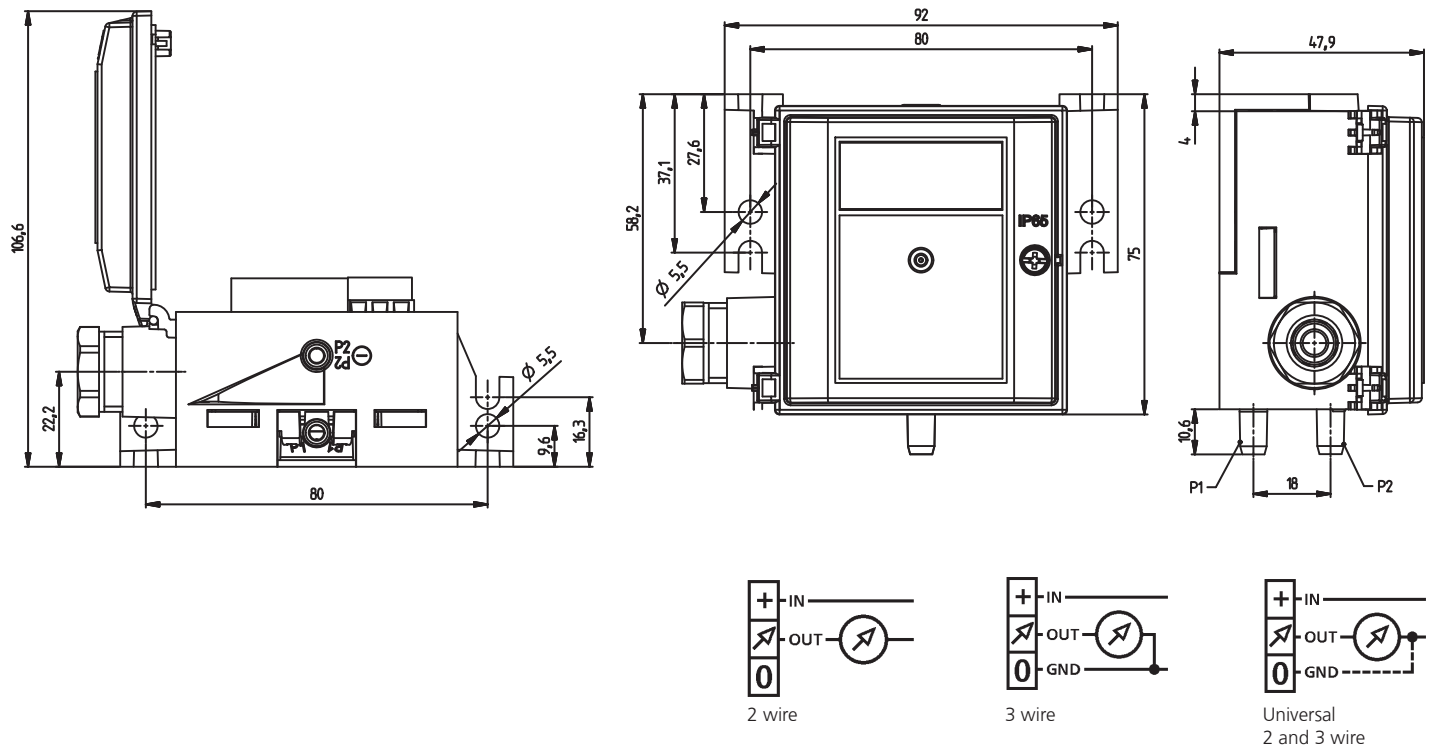
|  |                                  |              |        |
|--|----------------------------------|--------------|--------|
| Connection kit for vent duct (metal), 90° angled | including tube 2 m long (Fig. 1) | Order number | 104312 |
| Connection kit for vent duct (plastic), straight | including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

**Pressure range types**



<sup>1)</sup> minimal operating pressure = -50 Pa      <sup>2)</sup> minimal operating pressure = -100 Pa      <sup>3)</sup> Accessories supplied loose

## Dimensions in mm / Electrical connections



## Accessories

Fig. 1

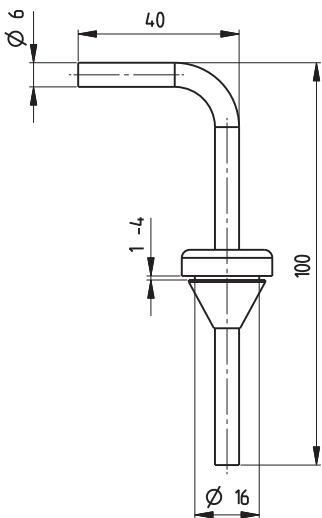


Fig. 2

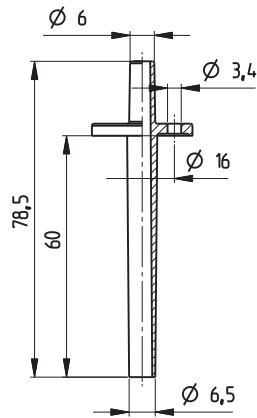


Fig. 3

