



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 <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	$< \frac{\text{supply voltage} - 0.2 \text{ V}}{0.02 \text{ A}}$ [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
	IP 54
With cover	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 mm<sup>2</sup>  
Cable gland with built-in strain relief PG11

### Pressure connection

Connection pipe	Ø 6.2 mm
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### 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

<sup>1)</sup> Adjustable by DIP-Switch

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

<sup>3)</sup> 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 <sup>1)</sup>	typ. % fs/10K	±0.2	±0.2	±0.2	±0.1	±0.1
TC zero point <sup>1)</sup>	max. % fs/10K	±1.0	±1.0	±0.5	±0.4	±0.4
TC sensitivity <sup>1)</sup>	typ. % fs/10K	±0.3	±0.3	±0.2	±0.1	±0.1
TC sensitivity <sup>1)</sup>	max. % fs/10K	±0.6	±0.6	±0.5	±0.5	±0.2

- no additional root-extracted errors

Test conditions:

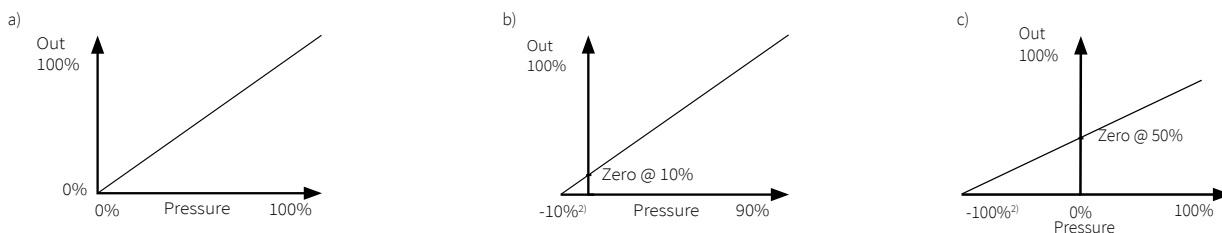
25 °C, 45% rF, Power supply 24 VDC

- 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	
<b>Order code selection table</b>		699.	X	X	X	X	X	X	X	X	X	
<b>Pre-adjustment</b>	max. range	9										
	middle range (factory setting)	B										
	min. range (factory setting)	C										
<b>Signal range selectable</b>	Pressure range of 0 % to 100% fs		1									
	Pressure range of -10 % to 90% fs		2									
	Pressure range of -100 % to 100% fs		3									
<b>Pressure range selectable</b>	<b>mbar (hPa)</b>	<b>Pa</b>	<b>mmWS</b>	<b>inH<sub>2</sub>O</b>	<b>under pressure max.</b>							
	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							
<b>Pressure unit</b>	mbar					0						
	hPa					4						
	Pa					2						
	kPa					5						
	mmWS					3						
inH <sub>2</sub> O					6							
<b>Output signal / adjustment</b>	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						
<b>Output / power supply</b>	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				
<b>Option</b>	without display									0		
	with display in pressure unit chosen above									1		
	with display in % fs									2		
	with module MODBUS					2,3	1	3				
<b>Pressure connection / Pressure orifices</b>	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	
<b>Accessories / Connection Kit</b>	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		
<b>Pressure range variation (optinal)</b>	Indicate W and state range on order (e.g.: W0 ... + 8mbar/OUT1...6V)											
	9	1									W	

## Range of characteristic line



<sup>1)</sup> TC = Temperature coefficient

<sup>2)</sup> 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

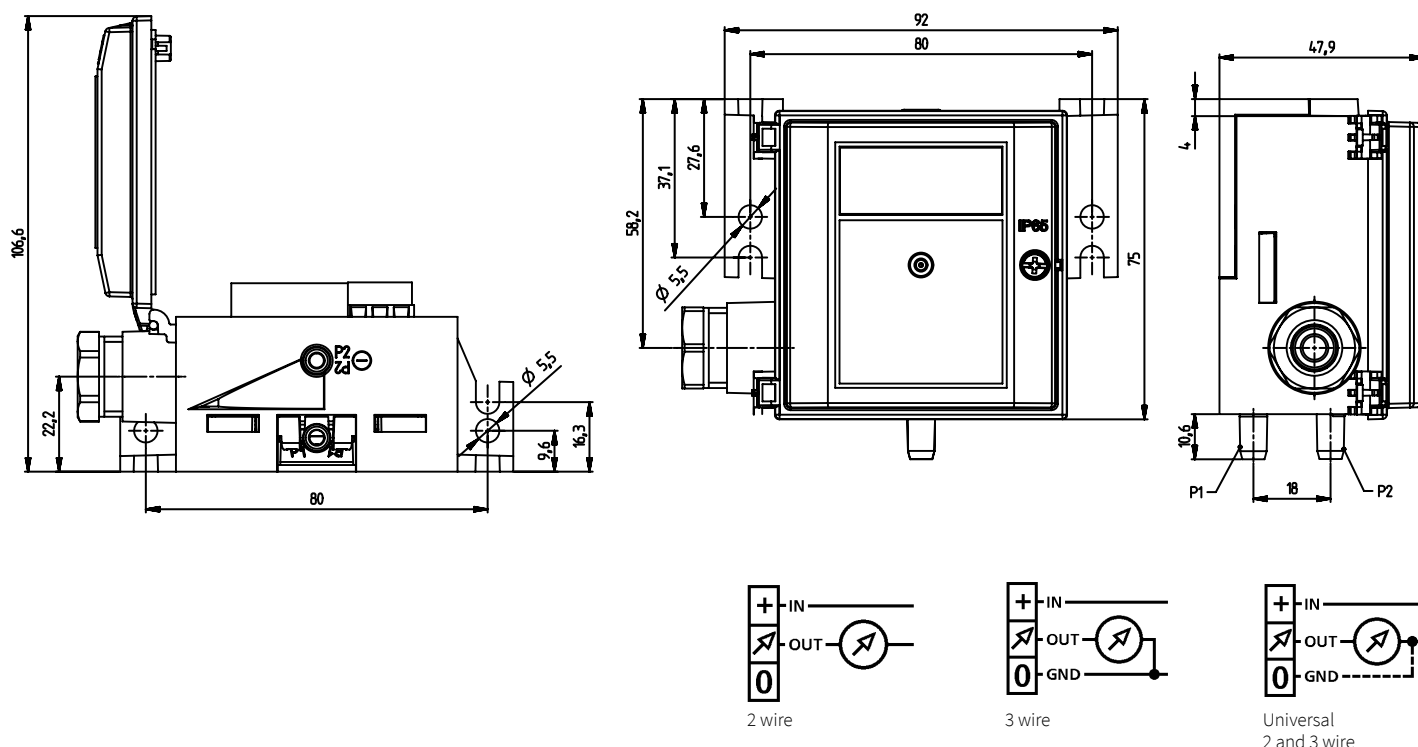


Fig. 1

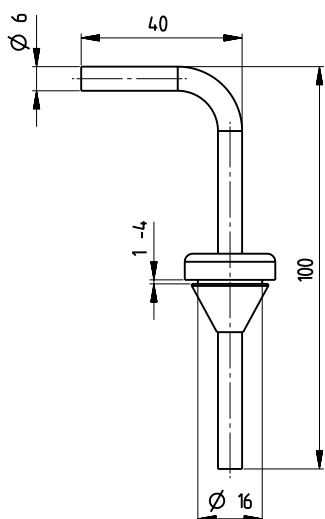


Fig. 2

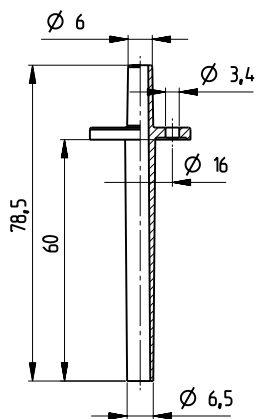
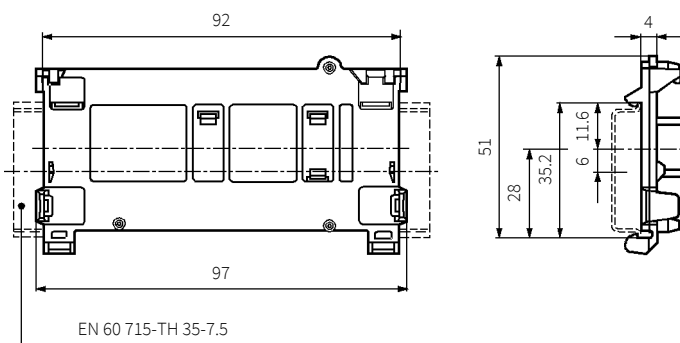


Fig. 3



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