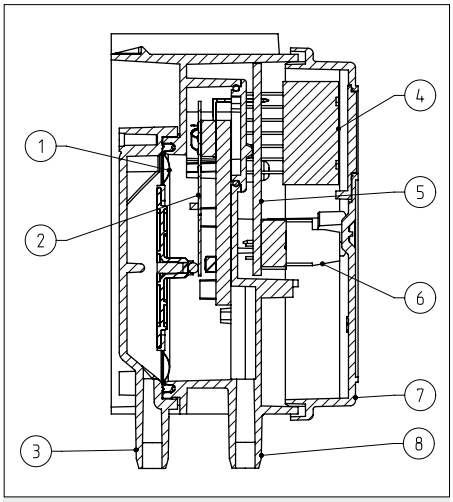
P003 (699)

Relative, vacuum- and differential pressure transmitter

-1 ··· +1 mbar / 0 ··· 0.3 - 50 mbar

Technical overview

The differential pressure transmitters of the Type 699 series incorporate a proven ceramic fulcrum lever technology.
They deliver adjusted and temperature-compensated sensor signals, available as standard voltage or current outputs. They are ideal for registering low air flow in air conditioning systems and for the measurement of fine pressures in laboratory, environmental and clean-room applications.



Legend to cross-section drawing

1 Diaphragm
2 Sensor element
3 P1 Pressure connection (higher pressure / minor Vacuum)
4 LCD-Display (option)
5 Amplified electronics
6 Connection terminals
7 Cover
8 P2 Pressure connection (higher pressure / major Vacuum)

The distinct advantages

- Compact construction
- Fast, easy mounting.
  Housing incorporates integral bracket for wall or ceiling mounting. Snap-on cover with a single screw
- Available with LCD display = additional configurations all version acording to order code selection table
- Filter function
- Adjustable measurement range
- Switchable output signals
- Switchable response curve (linear or root-extracted)
- Zero point resettable (reset button)
- Full scale adjustable
- Attractive price / performance ratio
- Application at over and low pressure range possible

Medium

Air and neutral gases

Pressure range

±0.5 mbar
±1 mbar
0 ... 1 – 50 mbar

Tolerable overload on one side

Application at over pressure range
100 mbar auf P1, 4 mbar auf P2

Application at low pressure range
-4 mbar auf P1, -100 mbar auf P2

Rupture pressure

2 x overload at ambient temperature
1.5 x overload at 70 °C

Setting range

Zero point resettable by reset button

Full scale adjustable by DIP-Switch and additional individual adjustable with Turbopoti

Materials in contact with medium

Housing: Polycarbonate PC
Diaphragm: Silicone
Sensor: Al_2O_3 (96%) / glass

Temperature

Medium and ambient	0 … +70 °C
Storage	-10 … +70 °C
No condensation	

Output / Power supply

3-wire

0 ... 10 V	13.5… 33 VDC / 24 VAC ±15%
0 ... 20 mA	13.5… 33 VDC / 24 VAC ±15%
4 ... 20 mA	13.5… 33 VDC / 24 VAC ±15%

2-wire

4 ... 20 mA	8.0 … 33 VDC

Additional adujustable by software (with LCD-Display only)

0 ... 5 V	6.5… 33 VDC / 24 VAC ±15%

Load

3-wire

0 … 10 V	> 10 kOhm
0 … 20 mA	< 500 Ohm
4 … 20 mA	< 500 Ohm

2-wire
4 … 20 mA $< \frac{\text{supply voltage} - 8\ V}{0.02\ A}$ [Ohm]

Current consumption

At nominal pressure

3-wire

0 … 10 V	< 10 mA
0 … 20 mA	< 30 mA
4 … 20 mA	< 30 mA

2-wire

4 … 20 mA	20 mA
Backlight LCD-Display	30 mA

Dynamic response

Suitable for dynamic measurements

Response time	< 20 ms
Load cycle	< 10 Hz

Filter

Filter response time switchable by 0.2 / 1 / 5 / 20 seconds

Electrical connection

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

Polarity reversal protection

Short circuit proof and protected against polarity reversal. Each connection is protected against crossover up to max. supply voltage.

Protection standard

Without cover	IP 00
With cover	IP 54 or IP 65

Pressure connections

Connection pipe ∅ 6.2 mm

Installation arrangement

Recommended and factory adjustment: Vertical, with pressure connections downwards

Mounting

Mounting bracket (integrated in case)

Display

LCD display
doublespaced - per 8 digit alphanumeric (3-wire with backlight)

Adjustability

Optional version self configurable serveral parameter (see order code selection table)

Tests / Admissions

UL
CE conform

Weight

With display	approx.100 g
Without display	approx. 90 g

Packaging

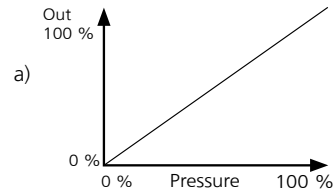
Single packaging in cardboard

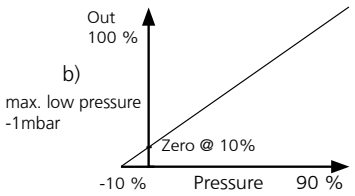
Accuracy

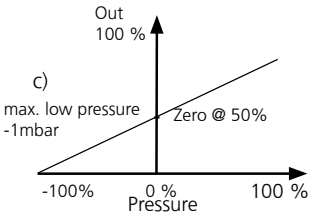
Parameter		Unit	±0.5 mbar	1 mbar	3 mbar	5 mbar	10 - 50 mbar
Tolerance zero point[1)]	max.	% fs	±1.0	±1.0	±0.7	±0.7	±0.7
Tolerance full scale[1)]	max.	% fs	±1.0	±1.0	±0.7	±0.7	±0.7
Resolution		% fs	±0.2	±0.2	±0.1	±0.1	±0.1
Total of linearity, hysteresis and repeatability	max.	% fs	±1.0	±1.0	±1.0	±1.0	±0.6
Logn therm stability acc. to DIN EN 60770		% fs	±1.0	±1.0	±1.0	±1.0	±1.0
TC zero point[2)]	typ.	% fs/10K	±0.2	±0.2	±0.2	±0.1	±0.1
TC zero point [2)]	max.	% fs/10K	±1.0	±1.0	±0.5	±0.4	±0.4
TC sensitivity [2)]	typ.	% fs/10K	±0.3	±0.3	±0.2	±0.1	±0.1
TC sensitivity [2)]	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 TC z.p. / TC z.p. 0 … 70 °C

Pressure range types







Order code selection table

						699.	X	X	X	X	X	X	X	X	X	X
Pressure range switchable	(see pressure ranges)						9									
	Pressure range of 0 % bis 100% FS				Diagramm a)			1								
	Pressure range of -10 % bis 90% FS				Diagramm b)			2								
	Pressure range of -100 % bis 100% FS				Diagramm c)			3								
Pressure range (switchable)	mbar (hPa)	Pa	mmWS	inH_2O												
(all pressure ranges for low pressure applicable, too)	0 … 0.3/**0.5**	30/**50**	3/**5**	0.1/**0.2**	minimal operating pressure = -50 Pa				0							
	0 … 0.3/0.5/**1**	30/50/**100**	3/5/**10**	0.1/0.2/**0.3**	minimal operating pressure = -100 Pa				1							
	0 … 0.5/1/**3**	50/100/**300**	5/10/**30**	0.3/0.5/**1**	minimal operating pressure = -50 Pa				2							
	0 … 1/3/**5**	100/300/**500**	10/30/**50**	0.5/1/**2**	minimal operating pressure = -50 Pa				3							
	0 … 3/5/**10**	300/500/**1000**	30/50/**100**	1/2/**3**	minimal operating pressure = -50 Pa				4							
	0 … 5/10/**16**	500/1000/**1600**	50/100/**160**	2/3/**5**	minimal operating pressure = -50 Pa				5							
	0 … 10/16/**25**	1000/1600/**2500**	100/160/**250**	3/5/**10**	minimal operating pressure = -50 Pa				6							
	0 … 16/25/**50**	1600/2500/**5000**	160/250/**500**	5/10/**20**	minimal operating pressure = -50 Pa				7							
Unit of pressure	mbar									0						
	hPa									4						
	Pa									2						
	kPa									5						
	mmWS									6						
	inH_2O									3						

- Pressure ranges in grades (version dual DIP-Switch; without Display) — *Adjustability 1*
- 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) — *Adjustability 2*
- 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) — *Adjustability 3*

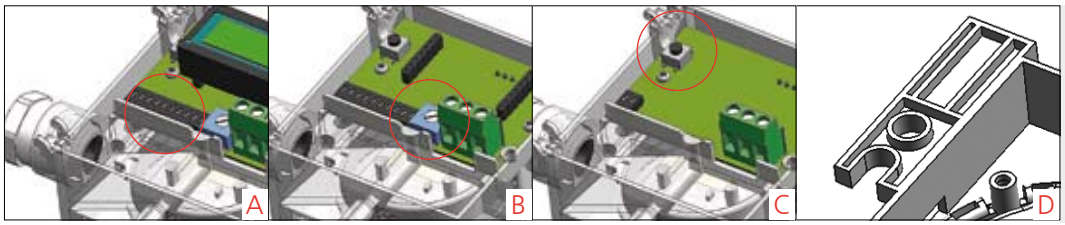
Output signal/ Adjustment	Linear	without Filter		x							1		0			
	Linear	with Filter (transposable)			x						2					
	Square root extracted	without Filter		x							4		0			
	Square root extracted	with Filter (transposable)			x						3					
Output and power supply	0 … 10 V	13.5 … 33 VDC / 24 VAC ± 15 %	3-wire									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				
	4 … 20 mA	8.0 … 33 VDC	2-wire									5				
	Output signal complimentary selectabel, at delivery no pre-adjustment				x						2	6				
Display doublespaced – 8 digit	without			x	x								0			
	in pressure unit chosen above					x							1			
	in % fs					x							2			
Pressure connections / Pressure orifices	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		
	Connection pipe Ø 6.2 mm	pressure orifices on P1 and P2												4		
Acessories/ Connection Kit	IP 54 without														0	
	P 54: With connection kit (metal), 90° angled	including tube 2 m long (Set 1)													1	
	IP 54: With connection kit (plastic), straight	including tube 2 m long (Set 2)													2	
	IP 65: Without														3	
	IP 65: With connection kit (metal), 90° angled	including tube 2 m long (Set 1)													4	
	IP 65: With connection kit (plastic), straight	including tube 2 m long (Set 2)													5	
Variation (optional)	Indicate W and state on order	(e.g. W0…9mbar/Out1…10V)														W

Accessories

		Order number
Connection kit for vent duct (metal), 90° angled	including tube 2 m long (Set 1)	104312
Connection kit for vent duct (plastic), straight	including tube 2 m long (Set 2)	100064
DIN-rail mounting adaptor		112854

[1)] For changing diaphragm see "Installation arrangement"

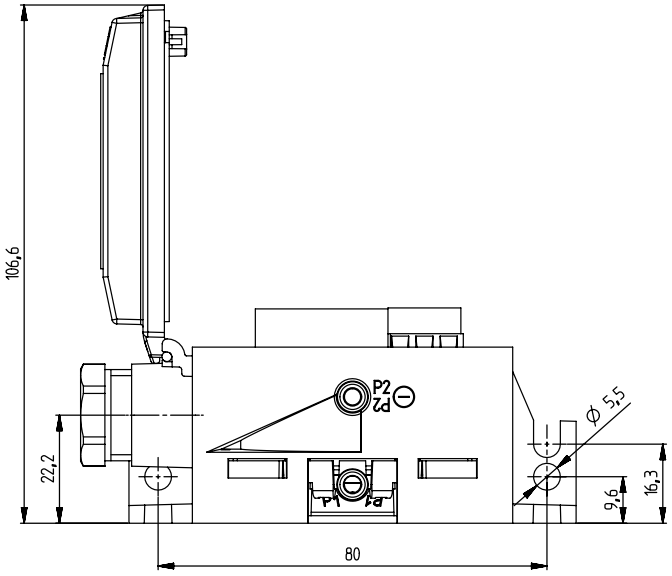
[2)] TC = Temperature coefficient

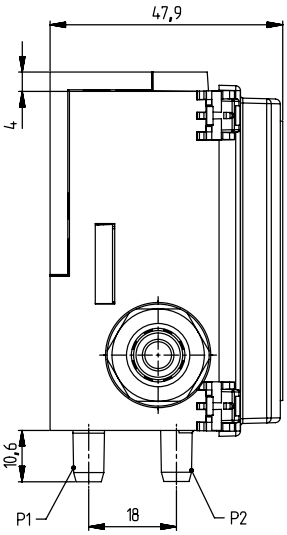


Version

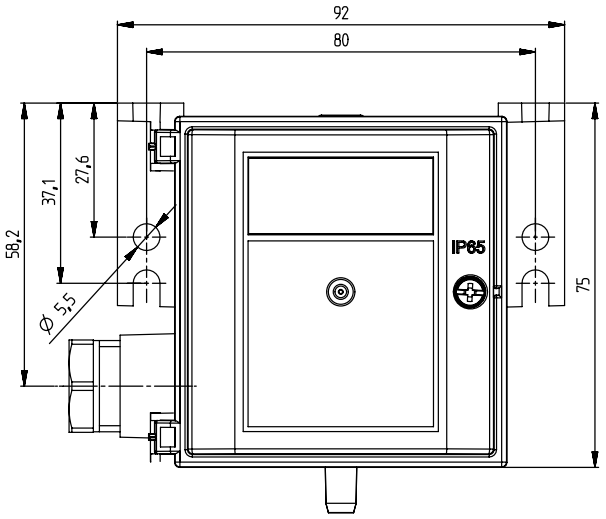
A - Tenfold DIP-Switch
B - Turbo-Potentiometer
C - Zero point reset
D - Housing with built-in fixing brackets

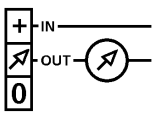
Dimensions in mm



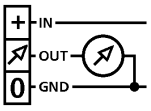


Electrical connections

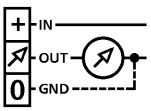




2 wire



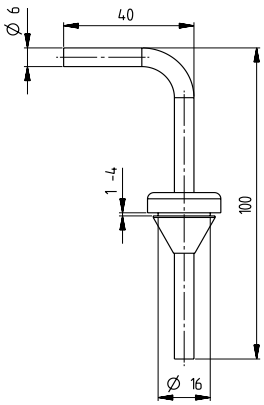
3 wire



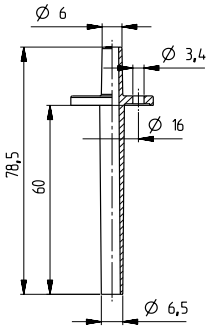
Universal-operating
2 and 3 wire

Accessories

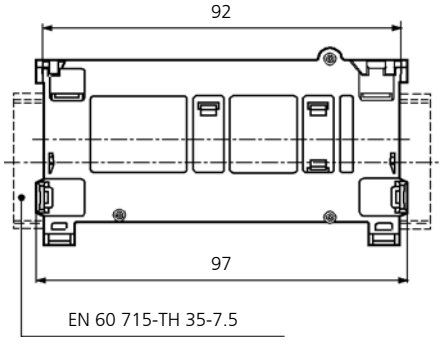
Set 1

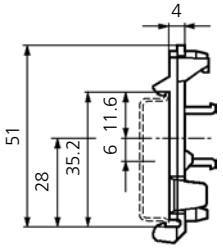


Set 2



DIN-rail mounting adapter





Electromagnetic compatibility

CE conformity according EN 61326-2-3.