

Description

All pressure transmitters contain piezo-resistive silicon sensor elements from AKTIV SENSOR's clean room.

The electronics compensates non-linearity and temperature errors and provides an precise calibrated output signal.

Due to the highly integrated electronics, the T series shows a high immunity against electromagnetic interferences (EMI).

A rugged stainless steel casing protects the transmitter in harsh environments.

Various versions of electrical connection are available.

Features

RoHS compliant

Compact stainless steel casing (G1/8")
Protection IP54, IP65 or IP68

Versions without casing for customers assembly (M5, M6), protection IP00

Absolute pressure (e.g. barometrical)

Relative pressure
(positive, negative, symmetrical)

Rated pressure from 100mbar to 25bar

Measured media for absolute pressure:
Air, non-aggressive process gases
(moisture 0 - 85%r.h. without dew)
Unsuitable for substances which react to
glass, silicon, stainless steel, gold,
silicone glue or silicone gel

Measured media for relative pressure:
Air, process gases (moisture 0 - 100% r.h.),
water, oil, petroleum, ...
Unsuitable for substances which react to
glass, silicon, stainless steel or silicone glue

Output proportional to pressure:
0.5 - 4.5V, 1.0 - 9.0V, 4 - 20mA
Other values upon request

Defined output at sensor failure



Applications

Hydraulics and pneumatics

Compressors, pumps

Medical technology

Automatic control

Liquid level indication

Household applications

Environmental protection

Water management

CAU-T precision pressure transmitters 2nd generation

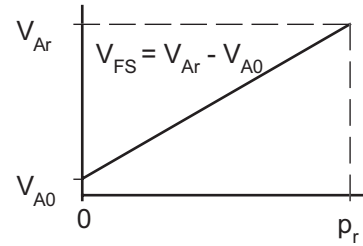
Calibrated and temperature compensated



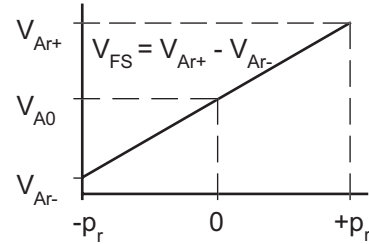
Technical data voltage output

Absolute maximum ratings	Symbol	Unit	Min.	Max.			
Storage temperature	T_{st}	°C	-40	105			
Operating temperature	T_a	°C	-30	85			
Compensated range	type TN type TE	T_c	°C	0	70		
				-20	85		
Overload factor	p_{ov}/p_r		1.5	-			
DC break down voltage	V_{is}	V	500	-			
Supply voltage for output	V_{CC}	V					
VRTx L (10 - 90% V_{CC})						2.7	5.5
V4Tx L (0.5 - 4.5V)						4.75	5.5
V4Tx H (0.5 - 4.5V)						7.5	30
V8Tx H (1.0 - 9.0V)						12.5	30
Supply current ($I_A = 0$)	I_{CC}	mA		7			
Signal output current	I_A	mA		2			
Output signal at sensor failure	V_{ERR}	V		0.01			

Simple output



Symmetrical output



Data @ $T_a = 25^\circ\text{C}$, $I_A < 0.1\text{mA}$ VR/4L: $V_{CC} = 5\text{V}$, V4/8H: $V_{CC} = 15\text{V}$	Symbol	Unit	Simple output			Symmetrical output		
			Min.	Typ.	Max.	Min.	Typ.	Max.
Offset	V_{A0}	V/V	0.097	0.1	0.103	0.497	0.5	0.503
VR (10 - 90% V_{CC})								
V4 (0.5 - 4.5V)								
V8 (1.0 - 9.0V)			0.97	1.0	1.03	4.97	5.0	5.03
Span at rated pressure p_r	V_{FS}	V/V	$V_{FS} = V_{Ar} - V_{A0}^{1)}$			$V_{FS} = V_{Ar+} - V_{Ar-}^{1)}$		
VR (10 - 90% V_{CC})			0.797	0.8	0.803	0.797	0.8	0.803
V4 (0.5 - 4.5V)			3.985	4	4.015	3.985	4	4.015
V8 (1.0 - 9.0V)			7.97	8	8.03	7.97	8	8.03
Non-linearity ²⁾	L	%FS ¹⁾		± 0.1	± 0.25		± 0.25	± 0.5
Response time	t_{10-90}	ms		1			1	
Temperature hysteresis ³⁾		%FS ¹⁾		± 0.1	± 0.5		± 0.1	± 0.5
Supply voltage rejection (except VR)	SVR	%FS/V ¹⁾			0.01			0.01

Data in temperature range VR/4L: $V_{CC} = 5\text{V}$, V4/8H: $V_{CC} = 15\text{V}$	Symbol	Unit	Standard (TN: 0..70°C)			Extended (TE: -20..85°C)		
			Min.	Typ.	Max.	Min.	Typ.	Max.
Temperature coefficient of offset ⁴⁾	TCV_{A0}	%FS/K ¹⁾						
$p_r < 0.25\text{bar}$								
$p_r \geq 0.25\text{bar}$				± 0.015	± 0.03			
Temperature coefficient of span ⁴⁾	TCV_{FS}	%FS/K ¹⁾		± 0.015	± 0.03		± 0.008	± 0.015

¹⁾ Span (Full Scale) $FS = V_{FS}$, $V_{A0} = V_A(0)$, $V_{Ar} = V_{Ar+} = V_A(+p_r)$, $V_{Ar-} = V_A(-p_r)$, $p_r =$ rated pressure

²⁾ Non-linearity (including hysteresis), determined with the end point method

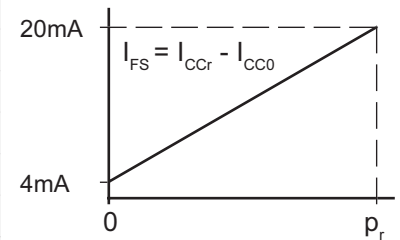
³⁾ Determined during temperature cycles in operating temperature range (cycles with 1K/min)

⁴⁾ Applied for compensated temperature range T_c

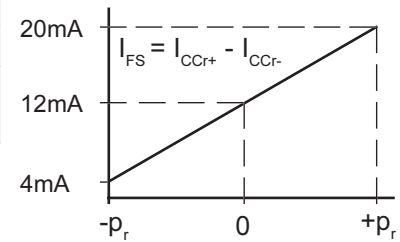
Technical data current output

Absolute maximum ratings	Symbol	Unit	Min.	Max.	
Storage temperature	T_{st}	°C	-40	105	
Operating temperature	T_a	°C	-30	85	
Compensated range	type TN type TE	T_c	°C	0	70
				-20	85
Overload factor	p_{ov}/p_r		1.5		
DC break down voltage	V_{is}	V	500		
Supply voltage	V_{CC}	V	10	30	
Output signal at sensor failure	I_{ERR}	mA		3	
Current limit ($p \gg p_r$)	I_{CCmax}	mA	23		
Working resistance <i>max. $R_L = (V_S - 10V)/0.02A$</i>	R_L	Ohm		1000	

Simple output



Symmetrical output

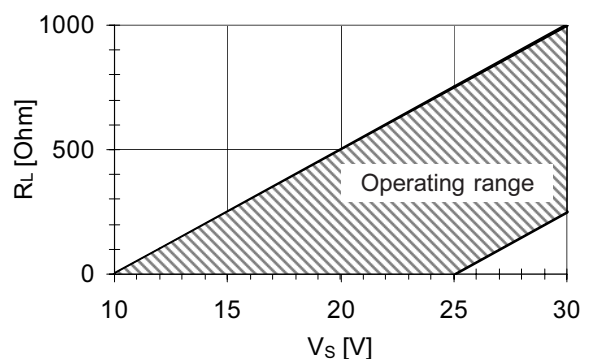
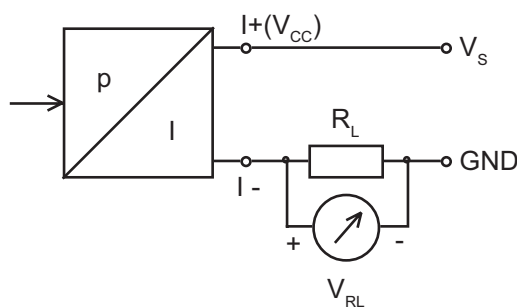


Data @ $T_a = 25^\circ\text{C}$, $R_L = 100\text{Ohm}$, $V_{CC} = 15\text{V}$	Symbol	Unit	Simple output			Symmetrical Output		
			Min.	Typ.	Max.	Min.	Typ.	Max.
Output signal offset $I_{CC0} = I_{CC}(p=0)$	I_{CC0}	mA	3.92	4	4.08	11.92	12	12.08
Output signal span	I_{FS}	mA	$I_{FS} = I_{CC}(p_r) - I_{CC}(p=0)$ ¹⁾			$I_{FS} = I_{CC}(+p_r) - I_{CC}(-p_r)$ ¹⁾		
			15.92	16	16.08	15.92	16	16.08
Non-linearity ²⁾	L	%FS ¹⁾		± 0.1	± 0.25		± 0.25	± 0.5
Response time	t_{10-90}	ms		1			1	
Temperature hysteresis ³⁾		%FS ¹⁾		± 0.1	± 0.5		± 0.1	± 0.5
Supply voltage rejection	SVR	%FS/V ¹⁾			0.01			0.01

Data in temperature range $R_L = 100\text{Ohm}$, $V_{CC} = 15\text{V}$	Symbol	Unit	Standard (TN: 0..70°C)			Extended (TE: -20..85°C)		
			Min.	Typ.	Max.	Min.	Typ.	Max.
Temperature coefficient of offset ⁴⁾ $p_r < 0.25\text{bar}$ $p_r \geq 0.25\text{bar}$	TCI_{CC0}	%FS/K ¹⁾		± 0.015	± 0.05		± 0.008	± 0.015
Temperature coefficient of span ⁴⁾	TCI_{FS}	%FS/K ¹⁾		± 0.015	± 0.03		± 0.008	± 0.015

¹⁾ Span (Full Scale) $FS = I_{FS}$, $I_{CC0} = I_{CC}(0)$, $I_{CCr} = I_{CCr+} = I_{CC}(+p_r)$, $I_{CCr-} = I_{CC}(-p_r)$, p_r = rated pressure

²⁾³⁾⁴⁾ See page 2



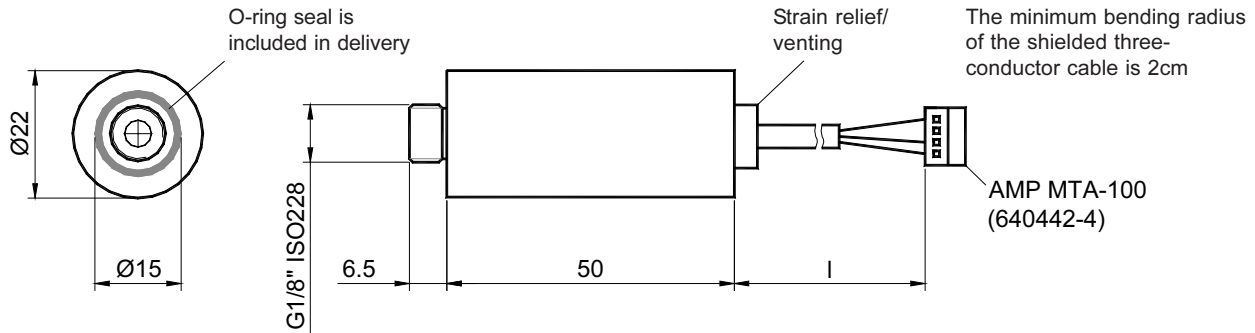
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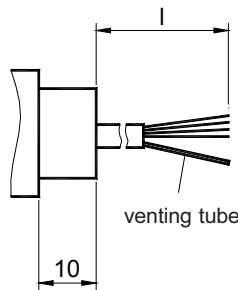
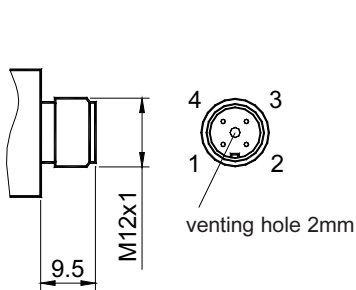
Dimensioned drawings and terminal assignment

Transmitters in stainless steel casing F - type K: With cable (IP54)



type S: M12 locking plug (IP65)

type T: cable (IP68, e.g. immersion probe)



Included in delivery:
Shielded four-conductor cable
with modified (venting) female
M12 locking plug

Shielded four-conductor cable
4xAWG24 + shield wire with
TPE venting tube. Cable jacket
is Santoprene. The minimum
bending radius is 2cm!

Electrical connection voltage output	Symbol	type K pin (color)	type S pin (color)	type T color
Supply voltage	V_{CC}	1 (red)	1 (brown)	red
Ground	GND	4 (black)	3 (blue)	blue
Output signal (referenced to GND)	V_A	3 (brown)	2 (white)	white
Ground (Kelvin guidance)	GND	-	4 (black)	black
Current output				
Positive supply	$I + (V_{CC})$	1 (red)	1 (brown)	red
Negative supply	$I -$	4 (black)	3 (blue)	blue

Miswiring protection	VRL	V4L	V4H	V8H	C4H
Reversed supply voltage	no	no	yes	yes	yes
Supply voltage at output	yes	yes	yes	no	not applicable
Short-circuit-proof output	no	no	no	no	not applicable

Please take note:

In case of using relative pressure transmitters ensure the pressure equalisation to the environment. Both during operation and storage keep the end of the cable away from any condensate and fluids. To avoid irreparable damage it is absolutely imperative to connect the coloured wires or marked pins in the correct manner as described in this data-sheet.

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06/2006

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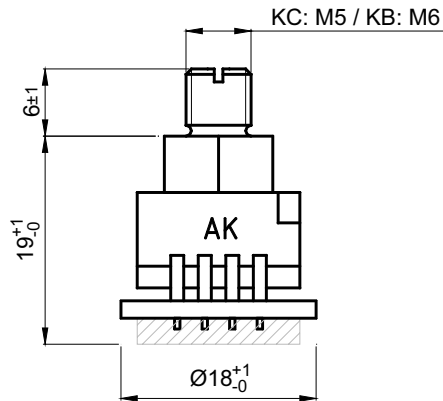
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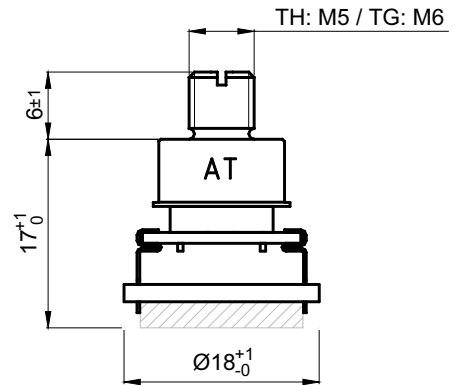
Dimensioned drawings and terminal assignment

Transmitters without casing

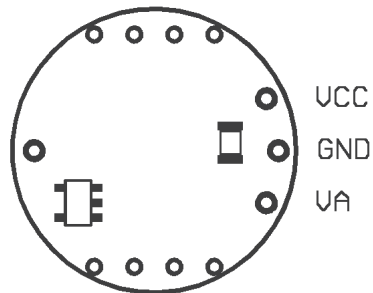
types KB, KC for relative pressure



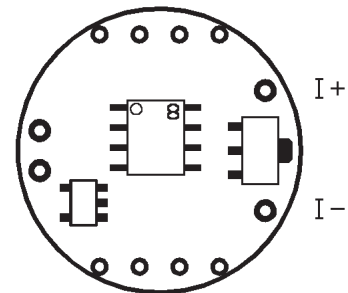
types TG, TH for absolute pressure



PCB for voltage output VR/4/8
(view to soldering side)



PCB for current output C4
(view to soldering side)



Please take note:

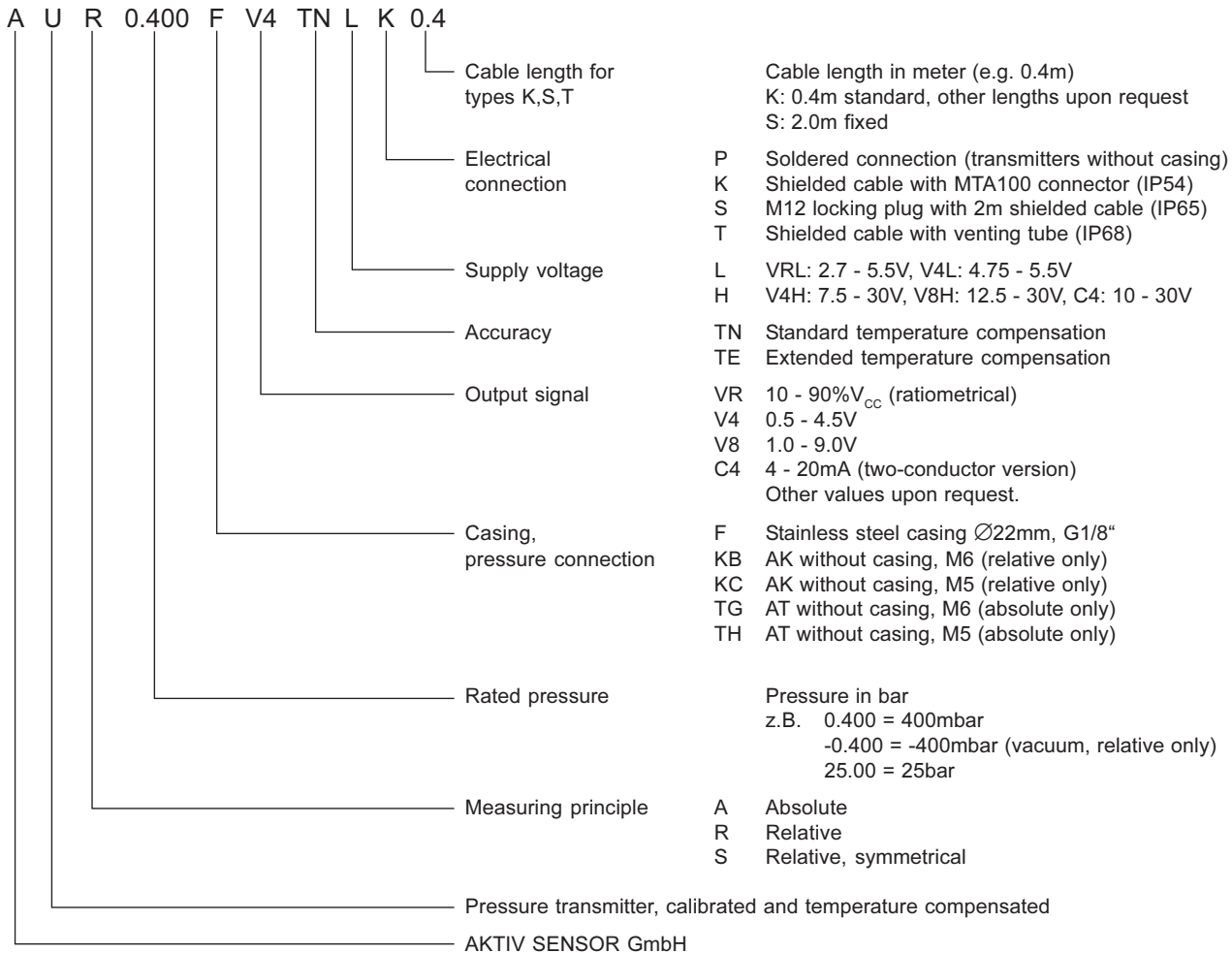
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Component and order numbers



Available rated pressures [bar] (others upon request)	0.100	0.160	0.250	0.400	0.600	1.000	1.600	2.500	4.000	6.000	10.00	16.00	25.00
AUA - Absolute			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
AUR - Relative	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
AUS - Relative symmetrical	✓	✓	✓	✓	✓	✓							

Relative pressure transmitters also available with negative (vacuum) range.

Matching accessories are listed in the accessories datasheet

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