

Technical brochure

Pressure Transmitter

Type AKS 32 and AKS 33



AKS 32 and AKS 33 are pressure transmitters that measure a pressure and convert the measured value to a standard signal:

- 1 → 5 V d.c. or 0 → 10 V d.c. for AKS 32
- 4 → 20 mA for AKS 33

A robust design makes the AKS very suitable for application within a number of fields e.g.

- Air conditioning systems
- Refrigeration plant
- Process control
- Laboratories

Features

Highly developed sensor technology means high pressure regulation accuracy, a very important factor in the precise and energy-economic capacity regulation of refrigeration plant.

- Temperature compensation for LP and HP pressure transmitters, developed specially for refrigeration plant:
LP: $-30 \rightarrow +40^{\circ}\text{C}$ (≤ 16 bar)
HP: $0 \rightarrow +80^{\circ}\text{C}$ (> 16 bar)
- Compatibility with all refrigerants incl. ammonia means less stock and greater application flexibility.
- Built-in voltage stabiliser, i.e. the AKS pressure transmitters can be powered from an unregulated voltage supply of any output within given limits.
- Effective protection against moisture means that the sensor can be mounted in very harsh environments, e.g. in the suction line encapsulated in an ice block.

- Robust construction gives protection against mechanical influences such as shock, vibration and pressure surge. AKS sensors can be mounted direct on to the plant.
- No adjustment necessary. With the highly developed sensor technology and sealed gauge principle, the accuracy of the factory setting is maintained independent of variations in ambient temperature and atmospheric pressure. This is very important when ensuring evaporating pressure control in air conditioning and refrigeration applications.
- EMC protection according to EU EMC-directive (CE-marked)
- UL approved
- Polarity protected inputs.

Pressure Transmitter, Type AKS 32 and AKS 33

Technical data

Performance

Accuracy	±0.3% FS (typ.)/±0.8% FS (max.)
Non-linearity (Best fit straight line)	< ±0.2% FS
Hysteresis and repeatability	≤ ±0.1% FS
Thermal zero point shift	≤ ±0.1% FS/10K (typ.) ≤ ±0.2 %FS/10K (max.)
Thermal sensitivity (span) shift	≤ ±0.1% FS/10K (typ.) ≤ ±0.2 %FS/10K (max)
Response time	< 4 ms
Max. working pressure	See ordering table
Burst pressure	min. 300 bar

Electrical specifications for AKS 33, 4 - 20 mA output signal

Rated output signal	4 to 20 mA
Supply voltage, V_{supply} (polarity protected)	10 to 30 V d.c.
Voltage dependency	< 0.05% FS/10 V
Current limitation (linear output signal up to 1.5 × rated range)	28 mA
Max. load, R_L	$R_L \leq \frac{V_{\text{supply}} - 10 \text{ V}}{0.02 \text{ A}} [\Omega]$

Electrical specifications for AKS 32, 0 - 10 V d.c. output signal

Rated output signal (short-circuit protected)	0 to 10 V d.c.
Supply voltage, V_{supply} (polarity protected)	15 to 30 V d.c.
Supply current consumption	< 8 mA
Supply voltage dependency	< 0.05% FS/10 V
Output impedance	< 25 Ω
Load resistance, R_L	$R_L \geq 15 \text{ k}\Omega$

Electrical specifications for AKS 32, 1-5 V d.c. output signal

Rated output signal (short-circuit protected)	1 to 5 V d.c.
Supply voltage, V_{supply} (polarity protected)	9 to 30 V d.c.
Supply current consumption	< 5 mA
Supply voltage dependency	< 0.05% FS/10 V
Output impedance	< 25 Ω
Load resistance, R_L	$R_L \geq 10 \text{ k}\Omega$

Environmental conditions

Operating temperature range (ambient temp.)	-40 to 85°C		
Max. media temperature [°C]	115 - 0.35 × amb. temp.		
Compensated temperature range	LP: -30 to +40°C / HP: 0 to +80°C		
Transport temperature range	-50 to 85°C		
EMC - Emission	EN 61000-6-3		
EMC - Immunity	Electrostatic discharge	Air 8 kV	EN 61000-6-2
		Contact 4 kV	EN 61000-6-2
	RF field	10 V/m, 26 MHz - 1 GHz	EN 61000-6-2
	conducted	3 V_{rms} , 150 kHz - 30 MHz	EN 61000-6-2
	Transient	burst 4 kV (CM)	EN 61000-6-2
	surge 1 kV (CM,DM)	EN 61000-6-2	
Insulation resistance	> 100 M Ω at 100 V d.c.		
Vibration stability	Sinusoidal	20 g, 25 Hz - 2 kHz	IEC 60068-2-6
	Random	7,5 g_{rms} , 5 Hz - 1 kHz	IEC 60068-2-34, IEC 60068-2-36
Shock resistance	Shock	500 g / 1 ms	IEC 60068-2-27
	Free fall		IEC 60068-2-32
Enclosure	Plug version		IP 65 - IEC 60529
	Cable version		IP 67 - IEC 60529

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Technical data (continued)

Approvals

UL recognized for sale in the USA and Canada	Electrical safety	File no. E310 24
	Explosive safety	File no. E227388
CE marked according to the EMC directive		89/ 336/ EC
Ex approval for sale in Europe		ATEX Ex II3GEx-nA II AT3
Gost Pocc		DK A Я 45. B05936

Mechanical characteristics

Housing material and material in contact with medium	EN 10088-1. 1.4404 (AISI 316L)
Weight	0.3 kg

Ordering

AKS 32, version 1 → 5 V

Operating range bar	Max. working pressure PB bar	Compensated temperature range °C	Code no.			
			EN 175301-803, plug Pg 9			
			$\frac{1}{4}$ NPT ¹⁾	G $\frac{3}{8}$ A ²⁾	$\frac{1}{4}$ flare ³⁾	
LP	-1 → 6	33	-30 → +40	060G2000	060G2004	060G2068
	-1 → 12	33	-30 → +40	060G2001	060G2005	060G2069
HP	-1 → 20	40	0 → +80	060G2002	060G2006	060G2070
	-1 → 34	55	0 → +80	060G2003	060G2007	060G2071
	-1 → 50	100	0 → +80			060G2155

AKS 32, version 0 → 10 V

Operating range bar	Max. working pressure PB bar	Compensated temperature range °C	Code no.			
			EN 175301-803, plug Pg 9			
			$\frac{1}{4}$ NPT ¹⁾	G $\frac{3}{8}$ A ²⁾	$\frac{1}{4}$ flare ³⁾	
LP	-1 → 5	33	-30 → +40		060G2038	
	-1 → 9	33	-30 → +40	060G2013	060G2036	060G2082
HP	-1 → 24	40	0 → +80	060G2014	060G2037	060G2083
	-1 → 39	60	0 → +80	060G2080	060G2079	060G2084

AKS 33, version 4 → 20 mA

Operating range bar	Max. working pressure PB bar	Compensated temperature range °C	Code no.						
			EN 175301-803, plug Pg 9			Cable			
			$\frac{1}{4}$ NPT ¹⁾	G $\frac{3}{8}$ A ²⁾	$\frac{1}{4}$ flare ³⁾	$\frac{1}{4}$ NPT ¹⁾	G $\frac{3}{8}$ A ²⁾	$\frac{1}{4}$ flare ³⁾	
LP	-1 → 5	33	-30 → +40	060G2112	060G2108	060G2047			
	-1 → 6	33	-30 → +40	060G2100	060G2104	060G2048		060G2120	
	-1 → 9	33	-30 → +40	060G2113	060G2111	060G2044			060G2062
	-1 → 12	33	-30 → +40	060G2101	060G2105	060G2049	060G2117		
HP	-1 → 20	40	0 → +80	060G2102	060G2106	060G2050	060G2118		
	-1 → 34	55	0 → +80	060G2103	060G2107	060G2051	060G2119		060G2065
	0 → 16	40	0 → +80	060G2114	060G2109				
	0 → 25	40	0 → +80	060G2115	060G2110	060G2045		060G2127	060G2067

¹⁾ $\frac{1}{4}$ -18 NPT

²⁾ Thread ISO 228/1 - G $\frac{3}{8}$ A (BSP)

³⁾ $\frac{1}{16}$ -20 UNF

Is also available in US-version (1 → 6 V) and with $\frac{1}{8}$ -27 NPT connection. Please contact Danfoss

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Accessories

AKS 32, AKS 33

Description	Code no.
Mounting bracket	060G0213

Dimensions and weights

Version with EN 175301-803 plug

Cable version

Pressure connection	1/4-18 NPT	G 3/8 A ISO 228/1	1/4 in. flare 7/16-20 UNF
L [mm]	16	18	16.5
L ₁ [mm]	122	127	122.5

Weight
approx. 0.3 kg

Bracket