

Data sheet

Pressure transmitter with ratiometric output signal AKS 32R and AKS 2050



AKS 32R is a ratiometric pressure transmitter that converts the measured pressure to a linear output signal. The output signal is relative to the supply voltage meaning that the min. pressure output will be 10% of the actual supply voltage and the max. pressure output will be 90% of the actual supply voltage.

At a supply voltage of 5 V, the output signal is:

- 0.5 V at min. pressure range
- 4.5 V at max. pressure range

The robust design and the ratiometric output signal makes the transmitter suitable for systems together with ratiometric A/D converters within a number of fields:

- A/C systems
- Refrigeration plant
- CO₂ plant
- Process control
- Laboratories

AKS 2050 is identical to AKS 32R but for high pressure and with pulse-snubber in the pressure connection.

Features

- Highly developed sensor technology means great regulation accuracy
- Fully digitally compensated
- Compatible with all refrigerants incl. ammonia and CO₂
- Built-in voltage stabilizer
- Effective protection against moisture
- Robust construction gives protection against mechanical influences such as shock, vibration, and pressure surge
- EMC protected in accordance with the EU EMC-directive (CE-marked)
- · Polarity protected inlets
- Output signal specially adjusted to ratiometric A/D-converters
- Sealed gauge measuring principle (pressure reference = 1013 mbar)
- UL approved
- For use in ATEX zone 2 explosive atmospheres



Technical data

Performance (EN 60770)

Accuracy (incl. Linearity, Lhystorasis and repeatability)	± 0.3% FS (typ.)		
Accuracy (incl. Linearity, Hysteresis and repeatability)	± 0.8% FS (max.)		
Non-linearity (best fit straight line)	< ± 0.2% FS		
Hysteresis and repeatability	≤ ± 0.1% FS		
Thormal zero point operation	≤ ± 0.1% FS/10K (typ.)		
Thermal zero point operation	≤ ± 0.2% FS/10K (max.)		
The served consists it is an exerting	≤ ± 0.1% FS/10K (typ.)		
Thermal sensitivity operation	≤ ± 0.2% FS/10K (max.)		
Response time	< 4 ms		
Max. working pressure	See table page 4		
Burst pressure	> 6 × FS		
Power-up time	< 50 ms		

Electrical specifications

Nominal output signal (short-circuit protection)	10 – 90% of [U _B]		
Supply voltage [U ₈] (polarity protected)	4.5 – 5.5 V DC at 5 V DC (nom.)		
Power consumption	< 5 mA at 5 V DC		
Ratiometricity	< 0.05% FS / 4.5 - 5.5 V		
Sink / source	< 1 mA		
Load [R _L] (load connected to ground)	$R_L \ge 10 \text{ k}\Omega$ at 5 V DC		

Environmental conditions

Sensor operating temperature range		Normal			-40 − 125 °C		
		ATEX Zone 2			-10 − 85 °C		
Media temperature range					-40 − 125 °C		
Compensated temperature range					See ordering		
Transport / storage temperature range					-50 − 85 °C		
EMC – Emission						EN 61000-6-3	
	Electrostatic		Air		8 kV	EN 61000-6-2	
	disc	discharge		act	4 kV	EN 61000-6-2	
FMC Immunity	DE	RF			10 V/m, 26 MHz – 1 GHz	EN 61000-6-2	
EMC – Immunity	KF			lucted	3 V _{rms} , 150 kHz – 30 MHz	EN 61000-6-2	
	Тион	ai a m t	Burst		4 kV (CM)	EN 61000-6-2	
	Transient		Surge	e	1 kV (CM, DM)	EN 61000-6-2	
Insulation resistan	ce					> 100 MΩ at 500 V DC	
\frac{1}{2}		Sinusoida	al 20 g, 25 H		z – 2 kHz	IEC 60068-2-6	
Vibration stability		Random		7.5 g _{rms} , 5 Hz – 1 kHz		IEC 60068-2-64	
Shock resistance		Shock	500 g /		ms	IEC 60068-2-27	
SHOCK resistance		Free fall		1 m		IEC 60068-2-32	
Enclosure (IP protection fulfilled together with mating connector)				IP65-IEC 60529			

Approvals

UL recognized for sale in the USA	Electrical safety	File no. E31024, E494625	
and Canada	Hazardous location	File no. E227388	
CE marked according to the EMC direc	2015/30/EU		
Ex evaluated for Zone 2 for sale in Euro	ATEX II 3G Ex na IIA T3 Gc		
For sale in Russia, Belarus and Kazakhst	EAC (EurAsian conformity)		



Technical data *(continued)*

Explosive atmospheres

Zone 2 applications

C C Ex II 3G

Ex nA IIA T3 Gc
-10 °C < Ta < + 85 °C

EN60079-0; EN60079-15

The products for ATEX Zone 2 are applicable in refrigeration applications employing any flammable refrigerants classified as IIA – please, refer to AKS installation guide. In ATEX Zone 2 applications at low temperatures the cable and plug must be protected against impact.

AKS other products can be used in end user applications employing the following flammable refrigerants:
A3: R290, R600, R600a, R1270,
A2L: R32, R444B, R452A/B, R454A/B/C, R455A, R1234zyef

IEC/EN 60335-2-89 (commercial refrigerating appliances) IEC/EN 60335-2-40 (electrical heat pumps, air-onditioners)

For other products not ATEX Zone 2 assessed, an ignition risk assessment has been conducted with reference to IEC/EN 60335-2-89 (commercial refrigerating appliances) and IEC/EN 60335-2-40 (electrical heat pumps, air-conditioners).

For countries where safety standards are not an indispensable part of the safety system, Danfoss recommends the installer to seek a third-party approval of the system containing flammable refrigerant. Note: Please, follow specific selection criteria stated in the data sheet for these particular refrigerants.

Mechanical characteristics

Electrical connection	EN 175301-803 plug / 2 m cable		
Wetted parts, material	EN10088-1-1.4404 (AISI 316L)		
Housing material	EN10088-1-1.4404 (AISI 316L)		
Refrigerants	DR3, DR55, DR7, HDR110, L40, R1234yf, R1234ze, R1270, R1290, R134a, R22, R227, R23, R290, R32, R404A, R407A, R407B, R407C, R407F, R410A, R413A, R417A, R422A, R422D, R427A, R438A, R444B, R447A, R448A, R449A, R449B, R450A, R452A/B, R454A/B/C R455A, R502, R507, R513A, R600, R600a, 717 (NH3), R744 (CO2), R1270		

Ordering

		Operating	Permissible	Compensated	Code no.				
	Туре	range [bar]	working pressure PB [bar]	temp. range [°C]	1/4 NPT 1)	G 3/8 A 2)	7/16-20 UNF Female	¾ solder	¹⁷ / ₁₆₋₂₀ UNF Female with deflator
		-1 – 12	33	-30 – 40	060G1037	060G1038	060G1036	060G3551	060G6323
	AKS 32R	-1 – 12	33	-30 – 40	-	-	060G6339 ⁴)	-	060G5961 ³)
سے	ANS SZN	-1 – 34	55	0 – 80	_	_	060G0090	060G3552	060G6341
		-1 – 34	55	0 – 80	-	-	060G6340 ⁴)	-	-
ਚ	AKS 2050	-1 – 59	100	-30 – 40	060G6342	060G5750	-	060G6408	_
		-1 – 99	150	-30 – 40	060G6343	060G5751	-	-	-
		-1 – 159	250	0 – 80	060G6344	060G5752	-	-	-
		olug with 5 m cab pressure transmit			060G1034 –				_
	Plug Pg 9						060G0008 -		

^{1) 1/4-18} NPT

²⁾ Thread ISO 228/1 - G 3/8 A (BSP)

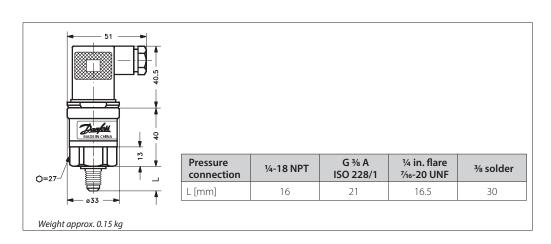
³⁾ Incl. Pg 9 plug

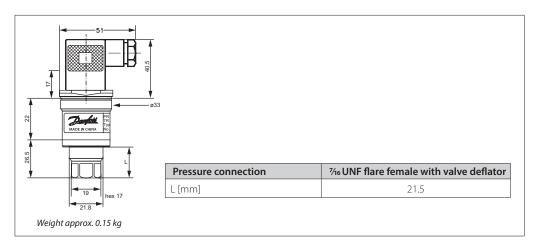


Electrical connections

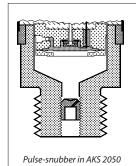
Type code	A1	A3 .
	3 2 2	The state of the s
	EN 175301-803-A Pg 9	2 m screened cable
Ambient temperature Ratiometric output, 10 - 90% of supply voltage	-40 − 125 °C	-30 − 85 °C
Electrical connection	Pin 1: + supply	Black: + supply
Ratiometric output,	Pin 2: ÷ supply / common	Blue: ÷ supply / common
10 - 90% of supply voltage	Pin 3: Signal	Brown: Signal

Dimensions and weight





Pulse-snubber, AKS 2050



Cavitation, liquid hammer and pressure peaks may occur in liquid filled systems with changes in flow velocity, e.g. fast closing of a valve or pump starts and stops.

The problem may occur on the inlet and outlet side, even at rather low operating pressures.

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ENGINEERING TOMORROW



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