

Introduction



Temperature sensors AKS and ESM are temperature dependent resistance sensors. The sensor unit consists of a platinum element the resistance value of which changes proportionally with the temperature. Except for one type of PT 500 ohm sensor all sensors are Pt 1000 ohm units.

The sensors are offered in two series:

1. AKS
2. ESM

Sensors in the AKS series are mainly for commercial and industrial refrigeration plant use where the requirements on grade of enclosure and temperature range are high. Sensors in the ESM series are mainly for use in air conditioning and comfort applications where the design of the sensor housing is important.

The sensors are adjusted and meet the tolerance requirements of DIN IEC 751 class B.

Technical data

Type	Sensor / sensor body	Connection / cable	Enclosure	Time constant τ in seconds
AKS 11	Top part: PPO (Noryl)	PVC-kabel, 2 × 0.2 mm ²	IP 67	3 ¹⁾
AKS 15	Bottom: Stainless steel			10 ²⁾
AKS 21A	18/8 stainless steel tube	Fire-resistive silicone rubber cable 2 × 0.2 mm ²	IP 67	35 ³⁾
AKS 21M				6 ¹⁾
AKS 21W	Sensor pocket: 18/8 stainless steel tube	Fire-resistive silicone rubber cable 2 × 0.2 mm ²	IP 56	18 ¹⁾
	Weld nipple: Free cutting steel			
	Thread nipple: Free cutting steel			
	Top part: 18/8 - 18/12 stainless steel			
AKS 21D	Terminal box: Aluminium - brass	Terminal box	IP 56	50 ³⁾
ESMT	Cover: ABS-plastic	Terminal box	IP 43	400 ³⁾
	Bottom: PC (polycarbonate)			
ESMA	Cover: PBTB (polyester)	Terminal box	IP 44	3 ²⁾
	Bottom: PA (polyamide)			
ESMU	Pocket: Copper	DIN 43650	IP 65	2 ¹⁾
ESMR	Cover: ABS-plastic	Terminal box	IP 32	50 ³⁾
	Bottom: PA (polyamide)			

¹⁾ Agitated liquid.
²⁾ Clamped to pipe.
³⁾ Air 4 m/s.

Technical data

Resistance values, Pt 1000 ohm

°C	ohm	°C	ohm
0	1000.0		1000.0
1	1003.9	-1	996.1
2	1007.8	-2	992.2
3	1011.7	-3	988.3
4	1015.6	-4	984.4
5	1019.5	-5	980.4
6	1023.4	-6	976.5
7	1027.3	-7	972.6
8	1031.2	-8	968.7
9	1035.1	-9	964.8
10	1039.0	-10	960.9
11	1042.9	-11	956.9
12	1046.8	-12	953.0
13	1050.7	-13	949.1
14	1054.6	-14	945.2
15	1058.5	-15	941.2
16	1062.4	-16	937.3
17	1066.3	-17	933.4
18	1070.2	-18	929.5
19	1074.0	-19	925.5
20	1077.9	-20	921.6
21	1081.8	-21	917.7
22	1085.7	-22	913.7
23	1089.6	-23	909.8
24	1093.5	-24	905.9
25	1097.3	-25	901.9
26	1101.2	-26	898.0
27	1105.1	-27	894.0
28	1109.0	-28	890.1
29	1112.8	-29	886.2
30	1116.7	-30	882.2
31	1120.6	-31	878.3
32	1124.5	-32	874.3
33	1128.3	-33	870.4
34	1132.2	-34	866.4
35	1136.1	-35	862.5
36	1139.9	-36	858.5
37	1143.8	-37	854.6
38	1147.7	-38	850.6
39	1151.5	-39	846.7
40	1155.4	-40	842.7
41	1159.3	-41	838.8
42	1163.1	-42	835.0
43	1167.0	-43	830.8
44	1170.8	-44	826.9
45	1174.7	-45	822.9
46	1178.5	-46	818.9
47	1182.4	-47	815.0
48	1186.3	-48	811.0
49	1190.1	-49	807.0
50	1194.0	-50	803.1

Resistance values, Pt 500 ohm

°C	ohm	°C	ohm
0	500.0	0	500.0
1	502.9	-1	498.1
2	503.9	-2	496.1
3	505.9	-3	494.2
4	507.8	-4	492.2
5	509.8	-5	490.2
6	511.7	-6	488.3
7	513.7	-7	486.3
8	515.6	-8	484.4
9	517.6	-9	482.4
10	519.5	-10	480.5
11	521.5	-11	478.5
12	523.4	-12	476.5
13	525.4	-13	474.6
14	527.3	-14	472.6
15	529.3	-15	470.6
16	531.2	-16	468.7
17	533.2	-17	466.7
18	535.1	-18	464.8
19	537.0	-19	462.8
20	539.0	-20	460.8
21	540.9	-21	458.9
22	542.9	-22	456.9
23	544.8	-23	454.9
24	546.8	-24	453.0
25	548.7	-25	451.0
26	550.6	-26	449.0
27	552.6	-27	447.0
28	554.5	-28	445.1
29	556.4	-29	443.1
30	558.4	-30	441.1
31	560.3	-31	439.2
32	562.3	-32	437.2
33	564.2	-33	435.2
34	566.1	-34	433.2
35	568.1	-35	431.3
36	570.0	-36	429.3
37	571.9	-37	427.3
38	573.9	-38	425.3
39	575.8	-39	423.4
40	577.6	-40	421.4
41	579.7	-41	419.4
42	581.6	-42	417.5
43	583.5	-43	415.4
44	585.4	-44	413.5
45	587.4	-45	411.5
46	589.3	-46	409.5
47	591.2	-47	407.5
48	593.2	-48	405.5
49	595.1	-49	403.5
50	597.0	-50	401.6

Extension of sensor cables

When extending a sensor cable, the new resistance value of the longer cable may give rise to indication error.

It is recommended that the total cable resistance should not exceed 2 ohm corresponding to an indication error of 0.5°C (Pt 1000 ohm).

Typical resistance values for cables

- 2,4 ohm/100 m for core cross-sectional area of 0.75 mm².
- 1,2 ohm/100 m for core cross-sectional area of 1.50 mm².
- 0,7 ohm/100 m for core cross-sectional area of 2.50 mm².

Ordering

Symbol	Type	Description	Temperature range °C	Cable length m	Code no.
	AKS 11	Surface and duct sensor	-50 to +100	3,5	084N0003
				5.5	084N0005
				8.5	084N0008
	AKS 15 ¹⁾	Surface and duct sensor	-50 to +100	3.5	084N0023
	AKS 21A	Surface sensor with clip	-70 to +180	2.5	084N2007
		Surface sensor with screened cable and clip	-70 to +180	2.0	084N2024
	AKS 21M	Multipurpose sensor	-70 to +180	2.5	084N2003
	AKS 21W	Immersion sensor with cable and sensor pocket, weld version	-70 to +180	2.5	084N2017
		Immersion sensor with terminal box and sensor pocket for weld version	-70 to +180		084N2016

¹⁾ Pt 500 ohm

Symbol	Type	Description	Temperature range °C	Thread in.	Code no.		
					Pocket length		
					100 mm	160 mm	250 mm
	AKS 21W	Immersion sensor with terminal box and sensor pocket with thread	-70 to +160	R ½ ¹⁾	084N2026	084N2027	084N2028
				NPT ½	084N2031	084N2032	084N2033
	AKS 21D	Duct sensor	-40 to +80			084N2035	084N2037
	ESMU	Immersion sensor, cobber	0 to +120	G ½ A ¹⁾	084N1052		084N1053
	ESMU	Immersion sensor, AISI 316 steel	0 to +120	G ½ A ¹⁾	084N1050		084N1051
	ESMT	Outdoor temperature sensor	-30 to +50			084N1012	
	ESMA	Surface sensor	0 to +120			084N1004	
	ESMR	Room sensor	0 to +40			084N1016	

¹⁾ To ISO 7/1

Ordering

Spare parts and accessories

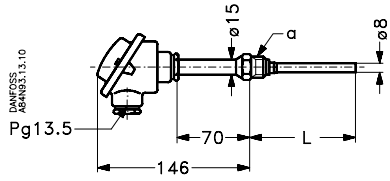
Symbol	Description	Code no.	
	Sensor with 2.5 m cable for AKS 21W weld / thread pocket	084N2043	
	Sensor pocket for AKS 21W weld version	084N2040	
	Sensor pocket for AKS 21W with NPT 1/2 thread	084N2045	
	Accessory bag, AKS 21W weld version containing: - rubber gasket - seal plug - heat-conducting compound - gasket	084N2117	
	Pocket for ESMS, tin-plated copper, R 1/2 1)	100 mm long 084N0251	
	Pocket for ESMS, stainless steel, G 1/2 A 1)	100 mm long	084N1080
		250 mm long	084N1081
	Pocket for AKS 21A/M, brass, G 1/2 A 2)	100 mm long 084N1082	
	Pocket for AKS 21A/M, stainless steel, G 1/2 A 2)	250 mm long 084N1083	

1) To ISO 7/1
2) To ISO 228/1

Dimensions and weights

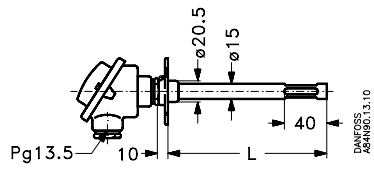
<p>AKS 11, 15</p> <p>Weight: 70 g</p>	<p>Sensor for AKS 21W</p> <p>Weight: 125 g</p>
<p>AKS 21A, AKS 21M</p> <p>Weight: 70 g</p>	<p>Pocket for AKS 21W</p> <p>Weight: 125 g</p>
<p>AKS 21W in welded version</p> <p>Weight: 250 g</p>	<p>AKS 21W for welding with terminal box</p> <p>Weight: 400 g</p>

Dimensions and weights
(continued)



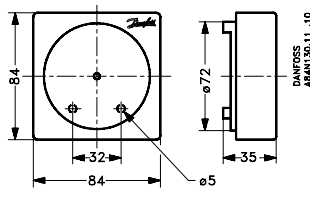
AKS 21W with thread

L mm	a in.	Weight g
100	R 1/2 or NPT 1/2	225
160	R 1/2 or NPT 1/2	250
250	R 1/2 or NPT 1/2	300

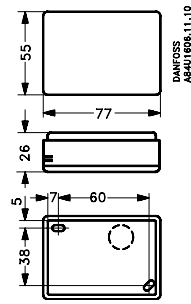


AKS 21D

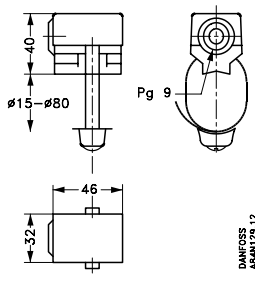
L mm	Weight g
100	225
160	250
250	300



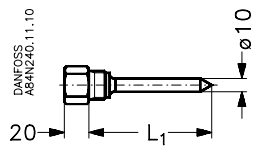
ESMT Weight: 80 g



ESMR Weight: 60 g

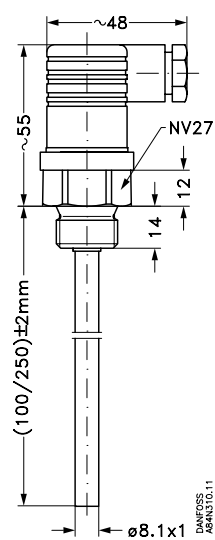


ESMA Weight: 60 g

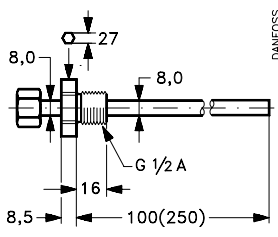


Pocket for ESMU

L mm	Weight g
100	225
250	300



ESMU



Pocket for AKS 21 A/M

L mm	Weight g
100	225
250	300

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DK-6430 Nordborg
Denmark