REFRIGERATION AND AIR CONDITIONING

Mounting

84
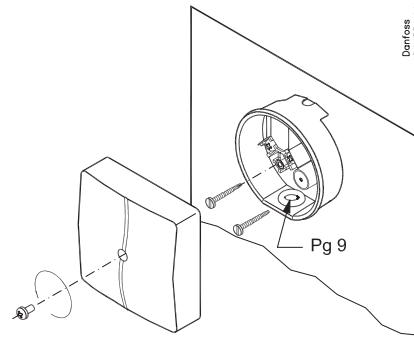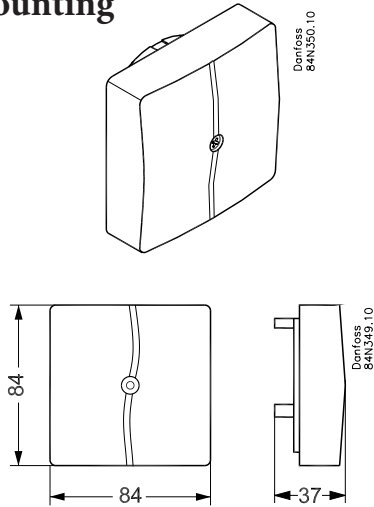
84

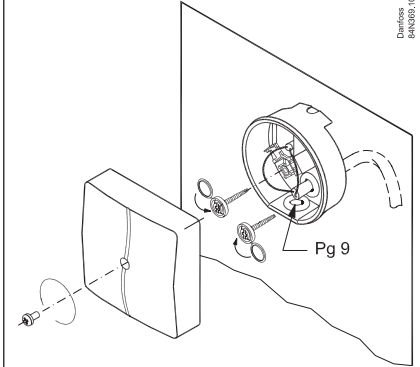37

For controllers with galvanic separated power supply

Pg 9

For controllers with non-galvanic separated power supply

Pg 9

Calibration Certificate

It is herewith approved that the ADAP-KOOL® HACCP temperature sensor type AK-HS 1000 is manufactured in accordance to ISO 9002 directives and EN 60751, Class B standards and comply to EN ISO 20953.
Sensors are regularly taken out of production and verified towards the product specifications.

This certification applies to the sensor only. For the controller a separate certification is relevant. As the measuring accuracy rate of the controller is better than ±0.4 K, it is important that the accuracy rate of the sensor plus cable does not exceed 0.6 K by which an absolute measuring accuracy better than 1 K is achieved (on reference conditions) and thereby the system fulfils the HACCP requirements.

All sensors have a measuring accuracy below ±0.45 K within the HACCP defined temperature range of -30 °C to +15 °C. This is why it is essential that the cable resistance does not exceed 0.15 K.

The cable resistance expressed in Kelvin can be calculated by using the formula below:

$$R = \frac{\rho \times L}{3.85 \times q}$$

R = Cable resistance expressed in Kelvin
ρ = Specific resistance of the material
L = The length of the wire (in m there and back)
q = Cross-section of the wire [mm^2]

Example:
ρ = 0.018
L = 10 m x 2 = 20 m
q = 0.75 mm^2

$$R = \frac{0.018 \times 20}{3.85 \times 0.75} = 0.12 \text{ K}$$

Pt 1000 ohm / 0°C

°C	ohm	°C	ohm
0	1000.0	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
35	1136.1		
40	1155.4		
45	1174.7		
50	1193.9		

Certificate of Performance

EU Directive 178 (2006) for Food Quality (HACCP) product temperature

Name and Address of Manufacturer within the European Community
Danfoss A/S
Nordborgvej 81
DK 6430 Nordborg
Denmark

Description of Equipment
Product Temperature sensor for refrigerated cabinets and cold rooms requiring monitoring for HACCP documentation and alarm.

Technical Summary

Temperature Range:	-30°C to +15°C
Accuracy:	+/- 0,3°C at 0°C and +/- 0,005°C x temp
Time Constant:	T90 = 3-15 mins.
Sensor Type:	Platinum-based sensors, Pt-1000 Ohm at 0°C
Cable Connection:	AK temperature sensors are two-wire devices, (Cable: 2 x 0.22 ~ 1.5 mm^2). All connections are interchangeable.
Enclosure:	IP54 [Materials: Cover: ABS / Base: Polycarbonate (PC)] thereby protecting the sensor against heat radiation from external ambient
General:	The basic sensor contains a platinum element with a characteristic that complies with EN 60751 Class B. Product simulation compound surrounds the sensor element ensuring response time better that min. requirement in EN ISO 20953, while the product is readily accessable for annual calibration check according to in-store HACCP procedures.

Temperature Accuracy and Calibration Confirmation
In accordance to ISO 9002 directives and EN 60751, Class B standards.

Danfoss A/S declares under sole responsibility that the product type AK-HS 1000, to which this declaration relates, is in conformity with the above calibration and accuracy when delivered from our factory, and will provide stable and accurate temperature illustration, provided it is used according to our instructions.

Nordborg 2011-09-29
_____
Place and date of issue

Thomas Matzen
_____
Production Quality Manager

To be completed by Installer/Contractor for site HACCP Manager Reference and Documentation

This AK-HS 1000 has been applied to the following application:

Location Name/Address: _____

Cabinet / Cold Room Reference: _____

Installer / Contractor name: _____

Signed: _____

Date: _____/_____/_____