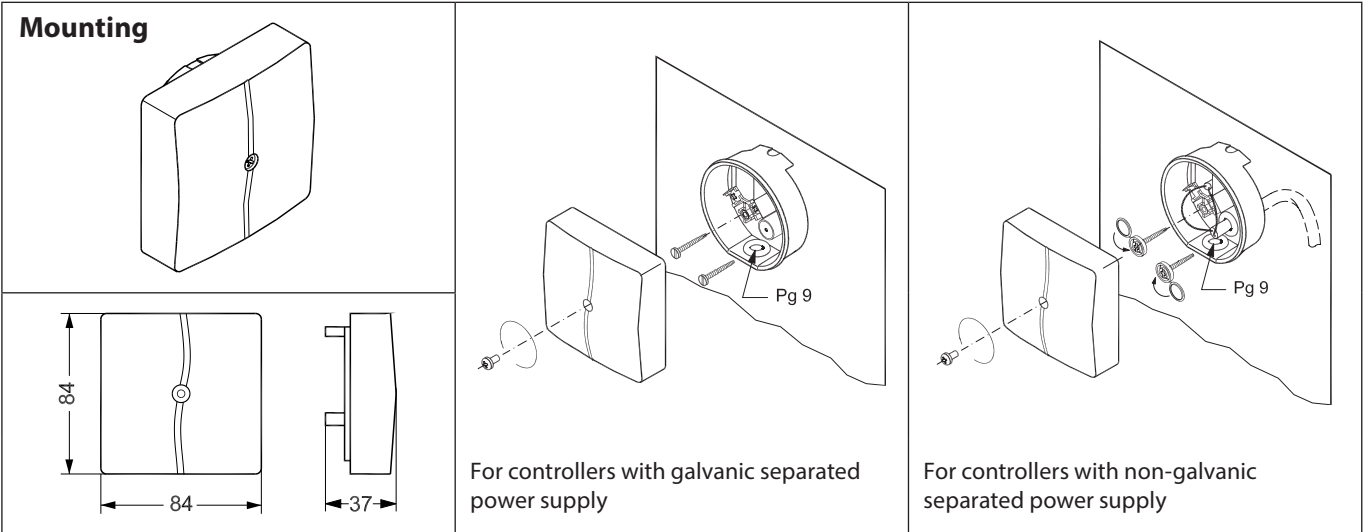


## Installation Guide

# Temperature Sensor Type AK-HS 1000

084R8011



084R8011

## Calibration

In order to achieve an accuracy better than  $\pm 1$  K of the temperature controlled, the accuracy of the sensor and the connecting cables must be better than  $\pm 0.6$  K.

All sensors have a measuring accuracy below  $\pm 0.45$  K within the HACCP defined temperature range of  $-30$  °C to  $+20$  °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  
 $\rho$  = Specific resistance of the material [ $\Omega/\text{m}/\text{mm}^2$ ]  
 L = The length of the wire [in m there and back]  
 q = Cross-section of the wire [ $\text{mm}^2$ ]

Example:

$\rho = 0.018$   
 $L = 10 \text{ m} \times 2 = 20 \text{ m}$   
 $q = 0.75 \text{ mm}^2$

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

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

It is herewith approved that AK-HS 1000 product sensors for temperature logging in combination with the HACCP certified ADAP-KOOL® controllers comply with EN 13485 in respect to temperature monitoring according to the EC regulation. 2005/37/EC.



**HACCP**  
comply with EN 441

### 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 +20 °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 according to EN 60751 Class B

**Cable Connection:** AK temperature sensors are two-wire devices, (Cable: 2 x 0.22 ~ 1.5 mm<sup>2</sup>). All connections are interchangeable

**Enclosure:** IP54 [Materials: Cover: ABS / Base: Polycarbonate (PC)] thereby protecting the sensor against heat radiation from external ambient

Nordborg 2014-11-20

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:** \_\_\_\_/\_\_\_\_/\_\_\_\_