Instruction Manual

HBTS-TR – Temperature Transmitter/Sensor
With 4-20mA output for temperature measurement in refrigeration systems

Introduction

HBTS-TR is a temperature sensor conforming to DIN 60751, with 4-20mA transmitter signal. The measuring range can be configured with the HB-TOOL. The sensor is designed for the refrigeration industry where servicing of the electronics can be carried out without emptying refrigerant from the system. The sensor is delivered with a sensor well 60- or 90-mm long and 6 mm diameter.
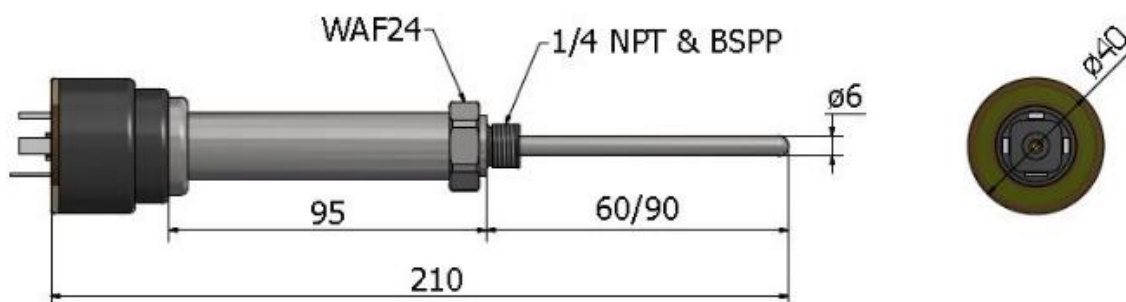
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Safety Instructions

CAUTION! Always read the instruction manual before commencing work! Heed all warnings to the letter! Installation of the sensory requires technical knowledge of both refrigeration and electronics. Only qualified personnel should work with the product. The technician must be aware of the consequences of an improperly installed sensor and must be committed to adhering to the applicable local legislation.

If changes are made to type-approved equipment, this type approval becomes void. The product's input and output, as well as its accessories, may only be connected as shown in this guide. HB Products assumes no responsibility for damages resulting from not adhering to the above.

Explanation of the symbol for safety instructions. In this guide, the symbol below is used to point out important safety instructions for the user. It will always be found in places in the chapters where the information is relevant. The safety instructions and the warnings, must always be read and adhered to.

	CAUTION! Refers to a possible limitation of functionality or risk in usage.
	NOTE! Contains important information about the product and provides further tips.
	The person responsible for operation must commit to adhering to all the legislative requirements, preventing accidents, and doing everything so as to avoid damage to people and materials.

Intended use, terms of use. The temperature sensor is designed for continuous measurement of temperature in refrigeration systems. If the sensor is to be used in a different way and if the operation of the product in this function is determined to be problematic, prior approval must be obtained from HB Products.

Prevention of collateral damage Make sure that qualified personnel assess any faults and take necessary precautions before attempting to make replacements or repairs, so as to avoid collateral damage.
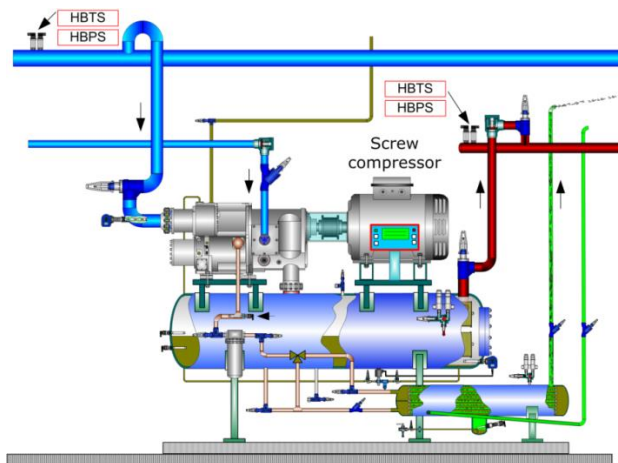
Disposal instructions: The sensor is constructed so that the modules can easily be removed and sorted for disposal.

Technical Data

Connection:
Connector: DIN 43 650 MV PLUG

Output:
Temperature output: 4-20mA, (-50 to +150°C)
Sensor class: DIN B - cl. 1/3 (Pt1000)
Sensor for threading: 3-wire

Installation conditions:
Ambient temperature: -30…50°C
Refrigerant temperature: -50…+130°C (150°C peak)
Max. operational pressure: 150 bar
Waterproof rating: IP65
Vibrations: IEC 68-2-6 (4g)
Certifications:
EMC Emission: EN61000-3-2
EMC Immunity: EN61000-4-2

Mechanical specifications:
Thread connection - sensor well: 1/4" NPT or BSP
Sensor well dimensions: Ø6 – 60/90 mm
Materials – mechanical parts: AISI304

Application Examples

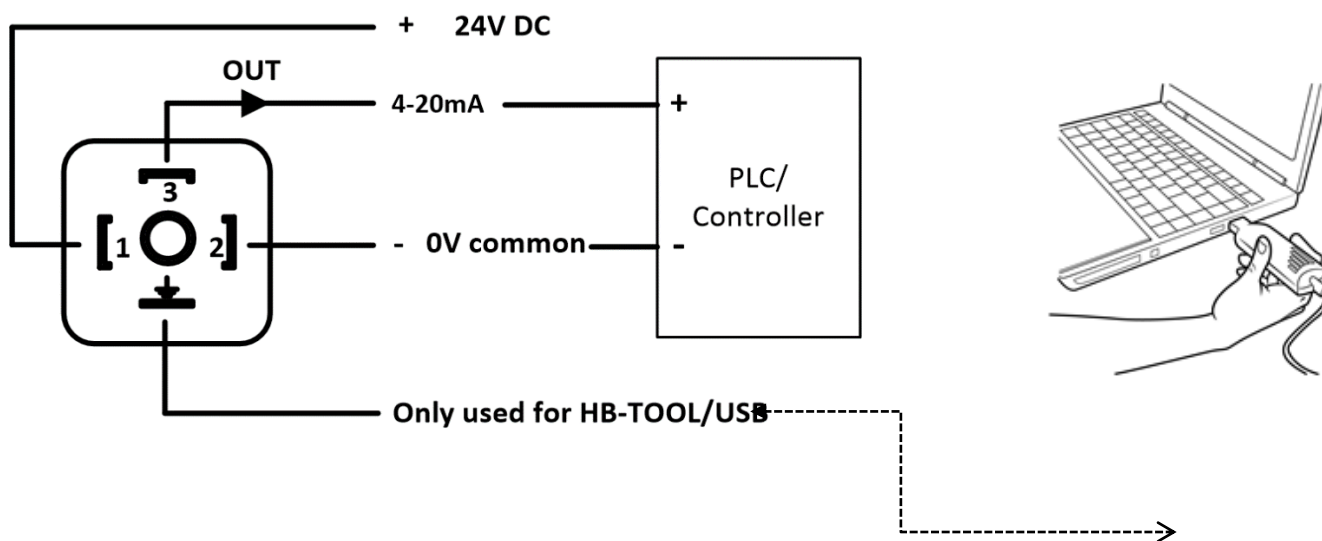The sensor is designed for temperature measurement of refrigerant in industrial refrigeration systems:

Installation Instructions

The following applies to system design:
1)   Can be installed both horizontally and vertically
2)   The sensor can be installed and supplied with a standard unshielded cable. If the EMC is higher than described in EN 61326, a shielded cable must be used.

Electric connection

+ 24V DC

OUT

4-20mA → PLC/Controller **+**

- 0V common → **-**

Only used for HB-TOOL/USB

Installation of HB Configuration Tool

Sensor configuration

The sensor can be configured using a PC, a M12-USB cable and a DIN 4 pin/M12 adapter to fit the M12 cable. The adapter is available from HB Products

The software can be downloaded freely on the HB Products web page at this link: http://www.hbproducts.dk/da/software/hb-tool.

The configuration data can be stored in the sensor and will be there until erased without power connection—just like you store data on a memory stick. When you change a value /setting there will be put a check mark next to it and that indicates you have changed something and need to store the data in the sensor.

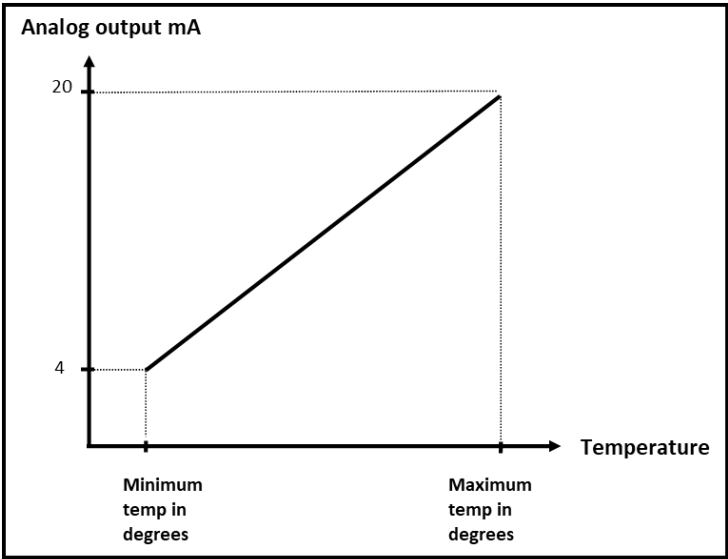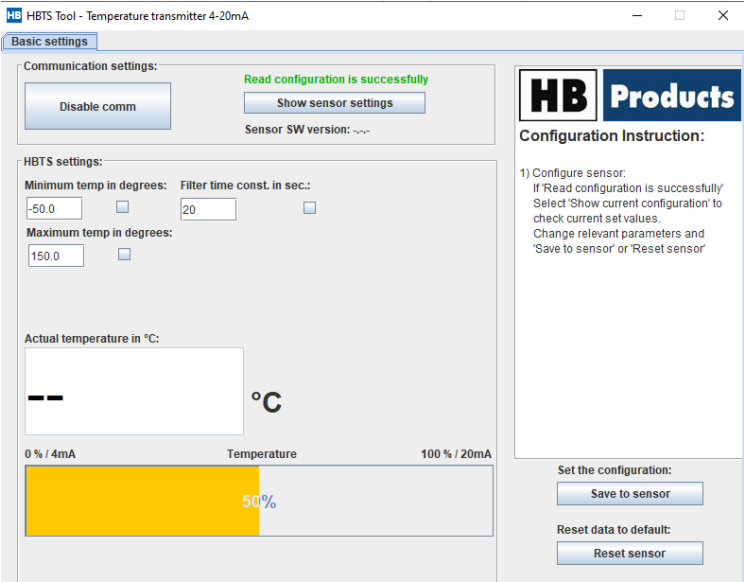DIN/M12 connector
Order code: HBxC-Adapt-
DIN/M12

USB configuration cable used for con-
necting all sensors with M12 con-
nector to a pc with the HB tool

order code HBxC-USB

Sensor setup

The sensor is pre-defined with measuring range from -50°C to 150°C and works without additional configuration. However you can get a more granular signal by reducing the range. The temperature sensor is easy to configure, only the range and the filter time can be adjusted. The mA output is linear to the range. 4 mA is transmitted for the minimum temperature and 20mA for maximum. The filter time can be set between 0 and 200 seconds. A high number will smoothen the signal and make changes slower.

When the setting is typed in, you click on the "save to sensor" button and the settings are stored, on the sensor.

The minimum and maximum temperature can be modified in the tool to get a more accurate and granular output if that is needed
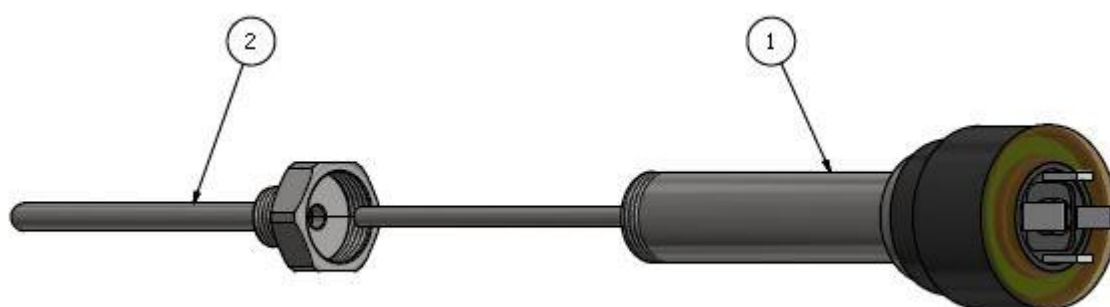
Accessories:

Converter Plug M12/TR order code;   HBxC-Adapt-DIN/M12
HB-USB cable order code: HBxC-USB

Sensor Repair

The sensor electronics can be separated from the sensor pocket, and the system can be serviced without evacuating the system. The electronic part can also be ordered as a separate item.

Spare Parts

Complete part no.	Length of sensor pocket	Spare electronic
HBTS-TR/PT1000/BSP/60	60	HBTS-TR/PT1000/60-EL
HBTS-TR/PT1000/BSP/90	90	HBTS-TR/PT1000/90-EL
HBTS-TR/PT1000/NPT/60	60	HBTS-TR/PT1000/60-EL
HBTS-TR/PT1000/NPT/90	90	HBTS-TR/PT1000/90-EL

Further Information

For further information, please visit our website, www.hbproducts.dk, or send an email to: support@hbproducts.dk.

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