Humidity & Temperature

Product Line
"Thanks to the variety of our products we can offer you the best solution for your humidity and temperature measurements."

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Made in Germany
Flexible Output Signals

Three analogue output signals are available for a user-defined combination of the measured variables (relative humidity, temperature, absolute humidity, mixing ratio, dew point).

Every device comes with a USB port (RS232 and RS485 optionally available) for downloading the data, configuring analogue signals 0..1V, 0..5V, 0..10V as well as 4..20mA three-wire and specifying the measurement range. Besides the analogue outputs readings can be downloaded using control commands.

Robust Housing

The transducer’s electronic circuits are integrated in a robust aluminium housing that is protected against dust and splash water according to protection class IP65.

High Humidity Applications

If dewing frequently occurs during measurements it is advised to use the DKRF676. It incorporates an integrated sensor heating, constantly keeping the sensor above condensation point.

An additional external temperature probe ensures the calculation of not only the dew point but also the relative humidity value.
Models
DKRF670 Industrial Series

DKRF671
Transducer for wall mounting
Used in clean rooms, production halls, greenhouses etc.
Range: -40...+60°C, 0...100% RH
Protection class: IP65

DKRF673
Transducer for direct process integration with a flexible sensor cable
Range: -40...+120°C, 0...100% RH
Pressure resistant probe up to 2 bar
Flexible sensor cables 2m, 5m, 10m or custom-made length up to 100m, protection class IP65

DKRF676
Transducer for high humidity applications. Sensor heats up subject to the ambient humidity keeping it above condensation point.
Range: -40...+120°C, 0...100% RH
2 flexible sensor cables up to 100m

Option: Digital Display
The devices can be delivered with an optional LCD with blue backlight. It displays the current values and their respective units.

Additional Temperature Probe
DKRF670 Series transducers can be equipped with an additional temperature probe. With the DKRF676 it is required for correct air temperature and relative humidity measurements compensating for the heated measuring head. For other models it can be used as an additional external probe for temperature measurements. The DS-G probe is intended for medium temperature (even in liquids) while the ETM1-G magnetic surface probe is designed for surface temperature. Both probes have a measuring range of -40...+240°C.
**Accessories**

**DKRF670 Industrial Series**

<table>
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<th>Flange for 673 and 676:</th>
<th>Mounting flange (l=300mm) for installation in ducts or pipes</th>
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<td>Radiation/Rain Protector TR351</td>
<td>d=77 mm, h=108 mm (optional)</td>
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### Order Code

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<td>DKRF673</td>
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<tr>
<td>DKRF676</td>
<td>DKRF676-AA-KL-O1-O2-O3-XX-AL-RS</td>
<td>WB = Wet-bulb temperature (-40...80°C)</td>
</tr>
<tr>
<td>(The additional temperature probe uses the same cable length as the humidity probe)</td>
<td>X = Mixing ratio (0...30g/kg)</td>
<td></td>
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<td>AA =Analogue Output</td>
<td>- 01 = 0...1VDC</td>
<td>O2 = Option2</td>
</tr>
<tr>
<td></td>
<td>- 05 = 0...5VDC</td>
<td>STD = Relative humidity (0...100%RH)</td>
</tr>
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<td></td>
<td>- 10 = 0...10VDC</td>
<td>ABS = Absolute humidity (0...30g/m³)</td>
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<td>- 020 = 0...20mA</td>
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<td>WB = Wet-bulb temperature (-40...80°C)</td>
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<td>X = Mixing ratio (0...30g/kg)</td>
<td></td>
</tr>
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<td>- 2000 = 2m cable</td>
<td>O3 = Option3</td>
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<td>TP = Dew point (-5...+60 °C)</td>
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<td>WB = Wet-bulb temperature (-40...80°C)</td>
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<td>X = Mixing ratio (0...30g/kg)</td>
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If you require a different measuring range the device can be configured exempt from charges ex works or you can manually reconfigure the device via USB. Please specify the requested measuring range when placing your order.

All DKRF670 transducers are fitted with a USB port.
Specifications DKRF670 Industrial Series

Relative Humidity
Sensor type: capacitive CMOSens sensor element
Measuring range: 0...100% RH
Response time: 4 seconds without filter, 15 seconds with filter

% RH vs %RH

Temperature
Sensor type: High precision platinum measuring resistor
Measuring range:
DKRF671: -40...+60°C
DKRF673, 676: -40...+120°C
External temp. probe:
DS-G Sensor: -40...+240°C
EU-G Sensor: -40...+240°C
Response time: ca. T63/T90: 18 sec/100 sec,
without filter, with light air movement,
step: 27 -> 37°C
Storage temperature: DKRF670 Series: -40...+60°C

°C vs °C

Calculated Variables
The calculated variables absolute humidity, dew point, mixing ratio and wet-bulb temperature are provided by the interface by default and can also be displayed through the analogue outputs.

Certificate of Calibration: included in delivery

General Technical Data
Dimensions: see figure

Outputs
3x Analogue output: 0...1V, 0...5V, 0...10V, 0...20mA, 4...20mA (three-wire)
USB port: (Micro-USB Type B) Configuration / programming, data readout e. g. with PC or notebook etc.
RS485 port: DC isolated RS485 interface, optional
RS232 port: Through interface, optional
Alarm output: Optional, Alarm relay (60V/0.5A), potential-free

Probes:
Standard probe head DKRF673/676 for humidity and temperature
d=13mm
Additional temperature probe DS-G d=4mm

Probe head: Stainless steel 1.4571
Current consumption and supply voltage:
Output: 0...1V 6...35VDC, 2.5 mA
Output: 0...5V 6...35VDC, 2.5mA
Output: 0...10V 11...35VDC, 3.0 mA
Output: 4...20mA 11...35VDC, 22mA/Output
Max load: max. 500 Ohm
Load for voltage output: 0...1V -> min. 2kOhm
0.5V/0...10V -> min. 10kOhm
Dimensions: 160 x 90 x 60mm
Protection class: IP65 (NEMA 4)
Cable gland: 2x PG7 for output signal, 1x PG7 for sensor cable
Cable cross section: 0.25...1.5mm²
Humidity/Temperature Transducers
DKRF470 Series for Sophisticated Applications

Designed for Demanding Applications
The DKRF470 Series of transducers was designed for sophisticated measurement applications such as in process automation, HVAC in public swimming pools or greenhouses. Based on the latest capacitive sensor technology the devices provide a precise and yet affordable solution to a variety of your measuring tasks. They are extremely resistant to dust as well as most chemicals and provide high accuracy and reliability (+/- 1.8% RH/+/-0.3°C).

A traceable Certificate of Calibration (ISO9001) as well as DKD Certificates can be provided.

The Special Probe ...
of our DKRF47x Series is pluggable and exchangeable. It provides a calibrated digital output signal and can be reordered with a Certificate of Calibration.

SK470 replaceable, calibrated probe for DKRK471/472/473 (right).

SK474 replaceable, calibrated probe for DKRF474 (left). DNV inspection document optional.

That is why you don’t need to send back your device for recalibration thus avoiding downtimes. The entire measuring chain can be checked with digital CalSticks.

Robust Housing
The transducer’s electronic circuits are integrated in a robust aluminium housing that is protected against dust and splash water according to protection class IP65. This makes it perfectly suitable even for applications in wet areas such as public swimming pools, environmental chambers or in the food industry.

Flexible Output Signals
Two analogue output signals are available for a user-defined combination of the measured variables (relative humidity, temperature, absolute humidity, mixing ratio, dew point). Analogue signals 0..1V, 0..5V, 0..10V as well as 4..20mA two- or three-wire type are selectable.

Features
- Exchangeable, digital probe
- High accuracy
- 5 models for various requirements
- Two analogue outputs allow for a user-defined combination of measurement variables
- Extra fast response time (4 seconds)
- LCD optional
- Robust aluminium housing
Models
DKRF470 Series

**DKRF471**
Transducer for wall mounting. Suitable for operation in clean rooms, laboratories, greenhouses and museums.
Measurement range: -40...+60°C, 0...100% RH
Protection class: IP65
Exchangable digital probe SK473.

**DKRF472**
Designed for duct installation such as in pipelines, ventilation ducts or environmental chambers.
Measurement range: -40...+80°C, 0...100% RH
Protection class: IP65
Exchangable digital probe SK473.

**DKRF473**
Transducer for direct process integration e. g. in HVAC applications, environmental chambers, drying plants etc.
Measurement range: -40...+80°C, 0...100% RH
Flexible sensor cable 2m, 5m or custom-made up to 100m
Protection class: IP65
Exchangable digital probe SK473.

**DKRF473-EXT**
For higher temperatures and with small probe (d=8mm, l=40mm). Range: -40...+120°C, 0...100% RH
Flexible sensor cable 2m, 5m or custom-made up to 100m. Exchangeable cable and probe (MK473).

**DKRF473-EXT-XXS**
with extra small dimensions (d=4mm, l=20mm), flexible sensor cable 2m, 5m.
Range: -40...+120°C, 0...100% RH.

**DKRF473-EXT-D**
Pressure-resistant probe for up to 30bar with M8 thread (optional G1/2”), (see figure for dimensions), Range: -40...+120°C, 0...100% RH.

**DKRF474**
Designed for measurement tasks in pressurised environments of up to 100 bar (pressure condensation point), can be used at up to 80°C.
Exchangeable probe SK474.

**Digital Display (Optional)**
All models of the DKRF470 Series are available with a LCD (blue backlight) which displays the current readings and their respective units.
Order Code

The following order code applies to the various models of the DKRF470 Series

- AA = Analogue output  - 01 = 0...1VDC
- 05 = 0...5VDC
- 10 = 0...10VDC
- 020 = 0...20mA
- 420Z = 4...20mA two-wire
- 420D = 4...20mA three-wire

-KL = Cable length
-2000 = 2m cable
-5000 = 5m cable
(Other sizes on request)

-OPT1 = Option1
- STD = Channel1 rel. humidity
- ABS = Abs. humidity (0...30g/m³)
- TP = Dew point (-5...+60 °C)
- WB = Wet-bulb temperature (-40...80°C)
- X = Mixing ratio (0...30g/kg)

-OPT2 = Option2
- STD = Channel2 Temperature
- ABS = Abs. humidity (0...30g/m³)
- TP = Dew point (-5...+60 °C)
- WB = Wet-bulb temperature (-40...80°C)
- X = Mixing ratio (0...30g/kg)

-XX = Display
- MD = with LCD
- OD = without LCD

Special requests:
If you require a different measuring range the device can be configured ex works. Please specify the requested measuring range when placing your order.

-MKL (only DKRF472)
-215 = Length of probe head 215mm
-300 = 300mm
-500 = 500mm

Calculated and Derived Values

While measuring humidity and temperature the microprocessor controls of the probes allow for a calculation of other parameters.

These are: dewpoint, absolute humidity, wet-bulb temperature and mixing ratio. The variables are provided at the analogue output and shown on the display.

Accessories

DKRF470 Series

1. **Flange 400:** Mounting flange (l=300mm) for installation in ducts/pipes
2. **WM400:** Wall mount for DKRF473 stainless steel angle joint with screw fitting
3. **TR351:** Radiation/transducers Rain Protector
- d=77 mm, h=108 mm
4. **Filter 400:** Filter cap for additional protection against dust or liquids.

Driesen + Kern GmbH
Specifications DKRF470 Series

**Relative Humidity**
- Sensor type: Capacitive sensor element
- Range: 0..100% RH
- Response time: 4 seconds without filter, 15 seconds with filter

**Temperature**
- Sensor type: Semi-conductor sensor
- Range:
  - DKRF471: -40... +60°C
  - DKRF472, 473, 474: -40... +80°C
  - DKRF473-EXT/XXS/EXTD: -40...+120°C
- Storage temp.: DKRF470 Series: -40... +60°C
- Response time: approx. 35 seconds

**Outputs**
- 2x Analogue output: 0..1V, 0..5V, 0..10V, 0..20mA, 4..20mA (three-wire), 4..20mA (two-wire)

**Calculated Variables**
- Absolute humidity, dew point, mixing ratio
- Measurement range: see page 9, other measurement ranges on request

**General Technical Data**
- Current consumption and supply voltage:
  - Output: 0..1V 6...25VDC, 1.5mA
  - Output: 0..5V 6...25VDC, 1.5mA
  - Output: 0..10V 11...25VDC, 1.9 mA
  - Output: 4-20mA 11...25VDC, 22mA/Output
- Max. load: max. 500 Ohm
- Load for voltage output: 0..1V -> min. 2kOhm
  - 0..5V/0..10V -> min. 10kOhm
- Housing: Aluminium AlSi12 DIN 1725
- Protection class: IP65 (NEMA 4)
- Cable gland: PG9 for the output signal
  - PG7 for the sensor cable
- Cable cross section: 0.25...1.5mm²
Humidity/Temperature Transducers

DKRF420/420-XS for Flush Mounting

Specifications

- **Measuring range:**
  - Relative humidity: 0...100% RH
  - Temperature: -40 ... +80°C

- **Dimensions:**
  - d=49.8mm, h=30mm
  - Mounting plate: d=71mm, h=4.9mm

- **Supply Voltage/Current Consumption**
  - Output: 0..1V  3.0...25VDC, 800µA
  - Output: 0..5V  6.0...25VDC, 1.5 mA
  - Output: 0..10V  11...25VDC, 1.9 mA
  - Load for voltage output: > 2KOhm
  - Output: 4..20mA three-wire  11...25VDC, 2x 22 mA
  - Output: 4..20mA two-wire  11...25VDC, max. 2 x 20 mA
  - Max. Load: 500 Ohm

- **Response time:**
  - 1/e (63%): 35 seconds

- **Supply voltage:** 12-24 VDC or 12-24VAC
- **Design:** round PCB, d=49.8mm,
- **Sensor fitting:** plug-in type at the front
- **Sensor type:** Digital, calibrated sensor in stainless steel sleeve (d=8mm, l= ca. 35mm)

Humidity & Temperature Transducer

The DKRF420 and DKRF420-XS are transducers for humidity and temperature and come with an analogue output. The DKRF420-XS is the smaller and even more inconspicuous model. Their benefits become evident when used in museums and historic buildings or in pharmaceutical and medical laboratories.

The transducer’s electronic components completely immerse into the flush-mounted box (required mounting depth: 30 mm). It is covered by a mounting plate and can be plastered leaving only the small stainless steel probe stick out of the wall.

Exchangeable Probe

The DKRF420 and DKRF420-XS respectively feature a precise sensor which offers long-term stability and a measurement accuracy of ±1.8% and ±0.3°C. It is easy to maintain and can be exchanged or replaced without recalibration at a reasonable price without removing the entire transducer.

Order Code

The following order code applies to the DKRF420 Series

- DKRF420-AA-KL
- DKRF420-XS-AA-KL

AA =Analogue output
  - 01 = 0...1VDC
  - 05 = 0...5VDC
  - 10 = 0...10VDC
  - 420Z = 4...20mA two-wire
  - 420D = 4...20mA three-wire

Note: The DKRF420Z and DKRF420D cannot operate with the probe connected directly. Both devices require a sensor cable.

-KL = Cable length
  - -DC = without cable
  - -2000 = 2m cable
  - -5000 = 5m cable
  - -Xxxx = customized

Driesen + Kern GmbH
Flush Mounting Sensors
DKRF425, Available for Several Product Ranges

With their Flush Mounting Line Driesen+Kern GmbH offer a selection of sensors for building automation. The probes fit into standard flush-mounted boxes and are compatible to switch product ranges of several manufacturers. This makes them well suited for integration in existing building concepts.

The sensors measure temperature, humidity, CO2 concentration and light intensity (further details regarding CO2 and light intensity can be found in the separate data sheet). Both analogue output and an optional switching output are available. The standard models are configured for products of Gira and Busch-Jaeger. Compatibility with other products available on request.

Flush-mounted Module for RH
Humidity/Temperature

Temperatur and humidity are the most important measurement parameters for ventilation and air conditioning of buildings. They are essential for the well-being of the people inside. The diagram shows the relationship between room temperature and humidity for the thermal comfort at a medium surface temperature of 19.5 to 23°C and up to 0.2m/s flow of air. At lower temperatures the plane representing the comfort zone will shift to the right.

The humidity sensor DKRF-425 for flush mounting measures relative humidity and temperature in the air. It gives out a signal of 0...10V which corresponds to 0...100% and 0...50°C respectively.

It works well in living areas, offices, conference rooms and centres etc. The latest, long-term stable sensor technology of the flush-mounted sensor ensures precise measurements for many years without the need for recalibration.

Specifications
Supply: 12...35 VDC / 12...24 VAC
Relative Humidity:
Measuring range: 0...100% RH (non-condensing)
Accuracy: see diagram
Output: 0...10V (0...1V/5V optional)
Temperature:
0...50°C
Accuracy: see diagram
Output: 0...10V (0...1V/5V optional)

Order Code
The following order code applies to the DKRF425 sensors DKRF425-AA-MOD-FC
AA = Analogue output
- 01 = 0...1V
- 05 = 0...5V
- 10 = 0...10V
MOD = Model
- GS5 = Gira System55
FC = Colour code
- RS = Pure white, silk-matt
- R = Pure white, glossy
- CG = Creme, glossy
- SM = Matte silver
Humidity/Temperature Probe
DKRF415 with Analogue Output - Robust & Pressure-resistant

For High Demands

The DKRF415 humidity/temperature probe was specifically designed to work in areas with elevated pressure levels and in vacuum.

The probe’s operating range is 0...100% RH and it tolerates temporary condensation. It delivers accurate readings (up to ±1.8%RH / ±0.3°C) even when working in compressed air up to 2 bar.

Two separate analogue outputs each provide a linear signal of 0...1V, 0...5V, 0...10V. A passive output for temperature (PT100/PT1000) is additionally available.

Applications
The DKRF415 humidity/temperature probe provides reliable readings even in challenging environmental conditions:
* Compressed Air Systems
* Engine Test Benches
* Industrial Automation Technology
* Incubators
* Artificial Weathering / Climate Chambers
* Greenhouses

Low Maintenance

The probe features a high-precision sensor (SHT75DK) with long-term stability which can be delivered as a completely calibrated spare part. In addition, the probe can be calibrated and adjusted with the MHT Series HumidityChecks (see page 25).

Digital Output

In addition to the analogue outputs the DKRF415 offers an RS485 port through which up to 255 probes can be linked together as a network. The signals can be converted for processing through an RS232 or USB interface. Both interfaces provide access for scaling the analogue outputs as well as calibrating or adjusting the transducer.

Calculated Variables

In addition to the variables relative humidity and temperature the transducer also provides calculated variables such as dew point, absolute humidity and mixing ratio. These variables can be output either digitally or through the analogue outputs.

Features

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<th>Feature</th>
<th>Details</th>
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<tr>
<td>Compact, pressure-resistant humidity and temperatur transducer</td>
<td></td>
</tr>
<tr>
<td>Exchangeable high-precision sensor</td>
<td>(±1.8%RH / ±0.3°C without recalibration!)</td>
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<tr>
<td>Tolerates temporary condensation</td>
<td></td>
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<tr>
<td>2xOutput (0...1V, 0...5V, 0...10V) or passive PT100/PT1000 output</td>
<td></td>
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<tr>
<td>Operating range -40...+80°C</td>
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<tr>
<td>Low power consumption, cost-efficient</td>
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</tbody>
</table>
Specifications

Supply: 11...35VDC
Current consumption: approx. 2mA
Output: 0...1V/0...5V/0...10V
Settling time: 80 msec
Output load: > 2KOhm
Refresh (output): 1x per second
Response time: 1/e (63%) 4 seconds (without filter)
15 seconds (with filter)
1 Sinter filter, included in delivery

Outputs:
- RS485 port for configuration/calibration as well as data transfer
- USB or RS232 interface optionally available

Humidity
- Analogue output for rel. humidity or calculated variable can be selected upon ordering or later configured through the interface

Temperature
- Analogue output for temperature or passive PT100/PT1000 output

Order Code
The following order code applies to the DKRF415

DKRF415-AA-KL-OPT1-OPT2

- AA = Analogue output
  - 01 = 0...1VDC
  - 05 = 0...5VDC
  - 10 = 0...10VDC
  - RS232 = RS232
  - USB = USB

- KL = Cable length
  - 2000 = 2m cable
  - 5000 = 5m cable
  - 10000 = 10m cable

- OPT1 = Option 1
  - STD = Rel. humidity (0...100%RH)
  - ABS = Abs. humidity (0...30g/m³)
  - TP = Dew point (-5...+60 °C)
  - WB = Wet-bulb temp. (-40...80 °C)
  - X = Mixing ratio (0...30g/kg)

- OPT2 = Option 2
  - STD = Temperature (-40...+80°C)
  - ABS = Abs. humidity (0...30g/m³)
  - TP = Dew point (-5...+60 °C)
  - WB = Wet-bulb temp. (-40...80°C)
  - X = Mixing ratio (0...30g/kg)
  - PT100 = PT100 (2-wire)*
  - PT1000 = PT1000 (2-wire)*

* When choosing PT100 or PT1000 one active analogue output is inapplicable.
The second output will still be set to the predefined value of AA.

Special requests:
If you require a different measuring range the device can be configured ex work. Please specify the requested measuring range when placing your order!

Accessories:
DKRF41500032 Compression fitting PG13,5/metal
DKRF41500045 Cert. of Calibration (rel. humidity+temp.)
DKRF41500300 Interface RS485→RS232
DKRF41500310 Interface RS485→USB

Humidity
- Measuring range: 0...100% RH
- Accuracy: see diagram
- Output signal: 0...1VDC/0...5V/0...10V

Temperature
- Measurement range: -40...+80°C
- Accuracy: see diagram
- Output signal: 0-1VDC/0-5V/0-10V (or passive PT100/PT1000)

Pressure tolerance: 300 mbar - 2 bar
Interface: RS485, addressable
- RS232 w. converter
- USB w. converter

Dimensions: d=13mm, l=200mm
Housing: Stainless steel
Cable length: Plug-in PVC cable
- 2m, 5m or 10m
Wires: open cable ends
(Connector optional)
Miniaturized Humidity/Temperature Probe
DKRF417 for Compressed Air Applications up to 30 bar

Designed for High Pressure Applications

The DKRF417 humidity and temperature transducer is the best choice for measurements at very high pressure levels. It is pressure-resistant up to 30 bar. Thanks to its small dimensions and M8 thread it is very well suited for applications within compressed air lines with small diameter.

The probe’s operating range is 0...100% RH and it tolerates temporary condensation. It delivers highly accurate readings of up to ±1.8%RH / ±0.3°C.

Two separate analogue outputs each provide a linear signal of 0...1V, 0...5V, 0...10V.

Applications

The DKRF417 humidity/temperature probe provides reliable readings even in challenging environmental conditions:
* Compressed Air Systems
* Engine Test Benches
* Industrial Automation Technology

Digital Output

In addition to the analogue outputs the DKRF417 offers an RS485 port through which up to 255 probes can be linked together as a network.

Humidity/temperature probe DKRF417 can be used in compressed air systems, among other applications

The signals can be converted for processing through an RS232 or USB interface. Both interfaces provide access for scaling the analogue outputs as well as calibrating or adjusting the transducer.

Calculated Variables

In addition to the variables relative humidity and temperature the transducer also provides calculated variables such as dew point, absolute humidity and mixing ratio. These variables can be output either digitally or through the analogue outputs.

Features

<table>
<thead>
<tr>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact, pressure-resistant transducer for relative humidity and temperature</td>
</tr>
<tr>
<td>M8 thread</td>
</tr>
<tr>
<td>Pressure-resistant up to 30 bar</td>
</tr>
<tr>
<td>Tolerates temporary condensation</td>
</tr>
<tr>
<td>2x Output (0...1V, 0...5V, 0...10V)</td>
</tr>
<tr>
<td>Operating range -40...+80°C</td>
</tr>
<tr>
<td>Low power consumption, cost-efficient</td>
</tr>
</tbody>
</table>
Specifications

Supply: 11...35VDC
Current consumption: approx. 2mA
Output: 0...1V/0...5V/0...10V
Settling time: 80 msec
Output load: > 2KOhm
Refresh (output): 1x per second
Response time: 1/e (63%) 4 seconds
Outputs: RS485 port for configuration/calibration as well as data transfer USB or RS232 interface optionally available

Humidity
Analogue output for rel. humidity or calculated variable can be selected upon ordering or later configured through the interface

Temperature
Measurement range: -40...+80°C
Accuracy: see diagram
Output signal: 0-1VDC/0-5V/0-10V (or passive PT100/PT1000)
Pressure tolerance: 0...30bar
Interface: RS485, addressable RS232 w. converter USB w. converter

Order Code

The following order code applies to the DKRF417
DKRF417-AA-KL-OPT1-OPT2
AA = Analogue output
- 01 = 0...1VDC
- 05 = 0...5VDC
- 10 = 0...10VDC
- RS232 = RS232
- USB = USB
-KL = Cable length
-2000 = 2m cable
-5000 = 5m cable
-10000 = 10m cable
-OPT1 = Option1
STD = Rel. humidity (0...100% RH)
ABS = Abs. humidity (0...30g/m³)
TP = Dew point (-5...+60 °C)
WB = Wet-bulb temp. (-40...+80 °C)
X = Mixing ratio (0...30g/kg)
-OPT2 = Option2
STD = Temperature (-40...+80°C)
ABS = Abs. humidity (0...30g/m³)
TP = Dew point (-5...+60 °C)
WB = Wet-bulb temp. (-40...+80°C)
X = Mixing ratio (0...30g/kg)

Special requests:
If you require a different measuring range the device can be configured ex work. Please specify the requested measuring range when placing your order!

Accessories:
DKRF41500045 Certificate of Calibration (relative humidity and temperature)
DKRF41500300 Interface RS485—>RS232
DKRF41500310 Interface RS485—>USB
Low-Cost Humidity/Temperature Probe
DKRF400 with Analogue Output

Applications
The humidity / temperature probe DKRF400 was designed for applications where cost-efficient solutions and high accuracy are essential:

* HVAC
* Weather Stations
* Data Logger
* Automation Processes
* Environmental Chambers/Climate Cabinets
* Measuring Instruments

Reasonably Priced and Precise
The DKRF400 probe can operate within a range of 0...100% RH and offers an accuracy of ±1.8% RH between 20 to 80% RH. Even in rough conditions beyond this range it provides very accurate readings.

The DKRF400 standard probe can operate at a temperature range of -40...+80°C whereas the DKRF-EXT’s range is expanded to +120°C. The probe’s accuracy is ±0.3°C at 25°C.

Two separate analogue outputs each provide a linear signal of 0...1V/0...5V or 0...10V.

Miniaturized Design
The DKRF400 probe distinguishes itself through its miniaturised and robust design. The probe’s small dimensions (d=8mm, l=101mm) permit its use in a variety of applications. The housing is made of stainless steel and can be equipped with cables of different sizes.

The EXT model has a stepped sensor head and can operate at temperatures of up to 120°C.

The EXT-D model features a pressure-resistant sensor head for up to 30bar with an M8 thread. Range: -40...+120°C, 0...100%RH

The EXT-OSS model comes without the protective sleeve, thus making it suitable for measurements in confined spaces. Dimensions: 13.5 x 3.1 x 5.08mm.

Features

<table>
<thead>
<tr>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miniaturized sensor design combines relative humidity and temperature</td>
</tr>
<tr>
<td>Exchangeable high-precision probe (±1.8%RH / ±0.3°C without recalibration!)</td>
</tr>
<tr>
<td>2x Analogue output (0...1V, 0...5V, 0...10V)</td>
</tr>
<tr>
<td>Fast response time (4 seconds)</td>
</tr>
<tr>
<td>Low power consumption --&gt; perfectly suitable for data loggers!</td>
</tr>
<tr>
<td>Large measuring range (-40...+120°C)</td>
</tr>
<tr>
<td>Reasonably priced</td>
</tr>
<tr>
<td>Robust plug-in probe made from stainless steel</td>
</tr>
</tbody>
</table>

Low Maintenance
The probe features the miniaturised sensor SHT75DK which can be delivered as a calibrated spare part.

The plug-in sensor can be exchanged without recalibration on site by the user or maintenance personnel.
Specifications

**Humidity**
- **Measuring range:** 0...100% RH

**Temperature**
- **Measuring range:**
  - DKRF400: -40...+80°C
  - DKRF400-EXT/EXT-D: -40...+120°C
- **Probe dimensions:** d=8mm, l=101mm
- **Housing:** Stainless steel
- **Weight:** 12 g
- **Cable:** PVC
- **Weight (w. 2m cable):** 62 g
- **Wires:** Open cable ends (connectors optional)
- **Supply:**
  - Output: 0...1V: 3.0...30V DC, 800µA
  - Output: 0...5V: 6.0...30V DC, 1.5 mA
  - Output: 0...10V: 11...30V DC, 1.9 mA
- **Settling time:** 80 msec
- **Output load:** > 2KΩ
- **Refresh (output):** 1x per second
- **Response time:** 4 seconds (without filter)
  - 15 seconds (with filter, 1 Filter 400 included in delivery)

**Also available:**
- Extra cables: see DKRF400-Digital datasheet for further details
- Tp, X, Wb, AbsF, WindChill: Optional outputs for dew point, mixing ratio, wet-bulb temperature, abs. Humidity and WindChill are available on request.
- **Accessories**
  - Flansch400: Mounting flange (l=300mm) for installation in ducts or pipes (see image on page 9).
  - WM400: Wall mount for DKRF400, elegant stainless steel angle joint (see image on page 9).
- **Spare parts**
  - Filter400: Replacement filter for DKRF400
  - SHT75DK: Replacement sensor for DKRF400

**Order Code**

The following order code applies to the DKRF400-Serie

<table>
<thead>
<tr>
<th>Standard probe</th>
<th>Probe with external sensor head</th>
<th>Probe with pressure-resistant sensor head</th>
</tr>
</thead>
<tbody>
<tr>
<td>DKRF400</td>
<td>DKRF400-EXT</td>
<td>DKRF400-EXT-D</td>
</tr>
</tbody>
</table>

AA = Analogue output
- 01 = 0...1V
- 05 = 0...5V
- 10 = 0...10V

-KL = Cable length
-2000 = 2m cable
-5000 = 5m cable

Other cable sizes on request.
Humidity/Temperature Probe
DKRF400-Digital with Digital Output
Models DKRF400-RS232 · DKRF400-RS485 · DKRF400-USB

Applications

The humidity/temperature probe DKRF400 is available as one of three models with digital outputs. On offer are RS232, RS485 and USB connectors. Each model can be easily connected to existing devices and facilities with the respective interface. The output provides a standard ASCII stream with basic protocols.

* Computers
* Hand-held Instruments
* Industrial Controls
* Ethernet Modules
* Web Servers
* Data Loggers
* Weather Stations
* Environmental Chambers/Climate Cabinets

Precise Measurements

The DKRF400 probe was specifically designed for applications which require small dimensions yet very high accuracy and fast response times.

All three models are available in EXT- and EXT-D design (see page 17, DKRF400 with Analogue Output).

The probe’s measurement range goes from 0..100%RH and it operates at temperatures between -40..+80°C. The -EXT model has an enhanced temperature limit of +120°C which is achieved by a temperature-resistant cable allowing for the sensor to operate remote from the probe body. Its accuracy is up to ±1.8% RH and ±0.3°C.

Connection to a Computer

Through the various digital interfaces the probe can easily be connected to industrial control systems or a computer:

- The DKRF400 can easily be connected to the RS232 interface of a PC. Power supply is then provided by the computer. Communication can be established with the Windows Terminal Server which makes the current readings accessible. The DKRF400-RS232 cable can be as long as 100 m.

- The DKRF400-USB probe can be directly connected to the USB port of your computer. It will be detected automatically and set up for communication. Using USB hubs up to 127 probes can be connected to a single computer.

Building a Network with RS485

The RS485 interface offers a cost-efficient solution for the addressable networking of up to 255 DKRF400-RS485 probes, e. g. in industrial plants. The maximum admissible cable length is up to 800 m. A basic protocol allows for the separate download and automatisation of the sensors.

Features

- Miniaturized sensor design combines relative humidity and temperature
- Calculated variables: dew point, absolute humidity, wet-bulb temperature, mixing ratio
- Digital output for direct connection to a PC, Ethernet module or other devices
- Adressable thanks to RS485 interface
- High-precision probe (±1.8%RH / ±0.3°C)
Specifications

Humidity
Measuring range: 0...100% RH
Accuracy: see diagram

Temperature
Measuring range:
DKRF400  -40...+80°C
DKRF400-EXT/EXT-D -40...+120°C
Accuracy: see diagram

Calculated Variables
The following variables can be calculated from the relative humidity and temperature data:

Absolute humidity
Dew point
Mixing ratio
Wet-bulb temperature
WindChill (optional)

Probe dimensions: d=8mm, l=101mm
Housing: Stainless steel
Sensor cable (DKRF400-EXT): PUR
Cable length: 2m, 5m (standard)

The probe features the miniaturized sensor SHT75DK which can be delivered as a calibrated spare part.

The plug-in sensor can be exchanged without recalibration on site by the user or maintenance personnel.

Power supply:
DKRF400-RS232  5-25 VDC
DKRF400-USB  Directly through USB interface
DKRF400-RS485  3-25 VDC

Current consumption:
DKRF400-RS232  < 6.5mA
DKRF400-RS485  < 400μA
DKRF400-USB  < 30mA (max)

Settling time: 80 msec

Refresh rate (output) max. 1x per second
Response time:1/e (63%) 4 sec (without filter)
15 sec (with filter)

Order Code
Standard probe with RS232 interface
(2 m cable) DKRF400-RS232-2000
(5 m cable) DKRF400-RS232-5000

Standard probe with RS485 interface
(2 m cable) DKRF400-RS485-2000
(5 m cable) DKRF400-RS485-5000

Standard probe with USB interface
(2 m cable) DKRF400-USB-2000
(5 m cable) DKRF400-USB-5000

Use the code -EXT or -EXT-D to order the model with the external sensor head.
E.g. DKRF400-EXT-RS232-2000
Humidity/Temperature Probe
DKRF410-XS / DKRF410-XXS
Extra Small Diameter

Micro Sensor for Humidity and Temperature

The Micro Sensor DKRF410 is available as one of two models which are especially suitable for humidity and temperature measurements in areas difficult to access such as insulation, concrete walls, floor screed, product and packaging tests.

The DKRF410 probe has a range of 0...100% RH and offers an accuracy of up to ±2% RH. At the same time temperature measurements with a range of -40...+80°C can be undertaken.

Two separate analogue outputs each provide a linear signal of 0...1V/0...5V or 0...10V.

Applications

The humidity / temperature Probe DKRF410 qualifies for a variety of applications:

* Physical and Biological Surveys for the Construction Industry
* Construction Drying and Assessment of Water Damage
* Museums
* Environmental Studies (e. g. Botanical Applications)
* Environmental Chambers / Climate Cabinets
* Drying Chambers / Incubators

Features

Micro Probe for humidity and temperature
Model XS with thin probe tube (d=4.7mm)
Model XXS with cable probe (d=4mm)
2x Analogue output (0...1V, 0...5V, 0...10V)
Fast response time
Low power consumption --> perfectly suitable for the use with data loggers!
Large temperature range (-40...+80°C)
Specifications

Measuring Range:
Humidity: 0...100% RH (all models)
Temperature: -40..+80°C (410XS)
-40..+80°C (410XXS with cable V)
-40..+120°C (410XXS with cable G)

Output signal: 0...1V / 0...5V / 0...10V

If you require a 4-20 mA output signal the DKRF 473 industrial transmitter can be used with the -XS and -XXS probe. The DKRF410 is also available with digital outputs (RS232, USB, RS485). See the DKRF400-Digital sheet for further details.

Probe dimensions: See figure
Housing: Stainless steel
Cable: PVC
Length of cable probe (XXS): 2m
Cable length: 2m, 5m
Wires: Open cable ends
(Connectors optional)

Supply:
Output: 0...1V 3.0...30VDC, 800µA
Output: 0...5V 6.0...30VDC, 1.5 mA
Output: 0...10V 11...30VDC, 1.9 mA

Settling time: 80 msec
Ouput load: > 2KOhm
Refresh rate (output) 1x per second
Response time:1/e (63%) 4 seconds

Order Code

The following order code applies to the DKRF410 probe:

DKRF410-M-AA-KM-KL-V

M = Model/Design: XS - probe or XXS- probe
AA = Analogue output: 01 = 0...1VDC
05 = 0...5VDC
10 = 0...10VDC
PT= PT100, passive
(only DKRF410-XS)
KM= Cable material:
V = PVC max 80°C
G = PFA max 120°C
KL = Cable length:
2000 = 2m cable
5000 = 5m cable
Other sizes on request.
V = Versions number: V2 product update 2012

Also available:
Tp, X, Wb,
AbsF, WindChill:

Optional outputs for dew point, mixing ratio, wet-bulb temperature, abs. humidity und WindChill are available on request.

Accessories:

Calibration Kit MHT (Basic or Professional)

The Basic Calibration Kit contains of 3 Humidity Checks (11.3%, 33.1%, 75.5%), while the Professional Kit comes with 6 Humidity Checks (0.8%, 11.3%, 33.1%, 54.4%, 75.5%).
Micro-Modules for Humidity/Temperature
DKRF4001/DKRF4002 (CMOS-UART) for OEM Applications

Micro Modules

The DKRF4001 and DKRF4002 micro-modules are specifically designed to be used in OEM application fields. The DKRF4001 provides two calibrated linear outputs for 0...1/0...5/0...10 VDC. The DKRF4002 module offers a CMOS-UART interface for digital communication. Communication relies on standard parameters of the serial port interface (9600 baud, 8, N, 1; duplex, bidirectional). The sensor modules can perform measurements at 0...100%RH and between -20...+80°C.

Protective Filter Cap

The modules can operate even under rough conditions. The standard filter cap protects the sensor against dust and liquids.

Optional Terminal

By default, the micro module provides soldering joints. A connection terminal is also optionally available.

Order Code

The following order code applies to the DKRF4001/4002 modules: DKRF MOD-AA-MB-C

MOD = Output:
- 4001 = Analogue output, standard accuracy
- 4001P = Analogue output, improved accuracy
- 4002 = Digital output, standard accuracy
- 4002P = Digital output, improved accuracy

AA = Analogue Output:
- 01 = 0...1VDC
- 05 = 0...5VDC
- 10 = 0...10VDC
- 00 = without analogue output

MB = Measuring range:
- 2080 = Range -20...+80°C
- xxxx = Range of probe

C = Connection
- STD = Soldering points
- AK = Terminal
- SL = Plug-in connection

Specifications

Relative Humidity Accuracy

DKRF4001/4002

DKRF4001-P/4002-P

Temperature Accuracy

DKRF4001

DKRF4002

DKRF4001-P

DKRF4002-P

Relative humidity DKRF 4001/DKRF4002

DAC resolution: 0.04% RH

Temperature DKRF 4001

Measurement range: -20...+80°C

Accuracy: ±0.6°C @ 25°C Standard

±0.4°C @ 25°C only DKRF4001-P

DAC resolution: 0.04°C

Temperature DKRF 4002

Measurement range: -20...+80°C

Accuracy: ±0.4°C @ 25°C Standard

(±0.3°C @ 25°C only DKRF4002-P)

Analogue output (DKRF4001): 0...1V / 0...5V / 0...10V

Supply DKRF4001:
Output: 0.1V 3.0...25VDC, 3mA
Output: 0.5V 6.0...25VDC, 3.5 mA
Output: 0.10V 11...25VDC, 4 mA

Supply: DKRF4002:
5.0...25VDC, 400µA

Optionally available variables: dewpoint, absolute humidity

Driesen + Kern GmbH
Low-Cost Humidity/Temperature Probe

DKRF4050/DKRF4060

Well-priced and Compact

With the DKRF4050 and DKRF4060 Driesen+Kern GmbH well-priced instrument for humidity and temperature. With its G3/8” connection thread the compact cable probe (d=24.5mm, l=46mm) can easily be installed in plants and facilities. Alternatively, an extension for the probe is available with which the probe can be attached to a compression fitting.

Two models are available:

The DKRF4050 with 2 linear analogie outputs 0...1V/0...5V or 0...10V and the DKRF4060 with a CMOS-UART interface. As standard, the probes deliver readings for relative humidity and temperature. Output of other calculated variables such as dew point, absolute humidity or wet-bulb temperature can also be configured.

Features

- Capacitive humidity probe with excellent accuracy
- Analogue output signals 0...1V/5V/10V (4050)
- Digital CMOS-UART interface (4060)
- Designed for low-cost integration
- Drift-free and long-term stable sensor

Specifications

- Dimensions: d=24.5mm , l=46mm
- Probe tube (optional) d=23.5mm, l=200mm
- Connection cable: 4 wire, PUR, (2m,5m)
- DKRF4050 Analogue Probe
  - Measuring range: -20...+80°C
  - Analogue output: 0...1V/0...5V/0...10V
  - Supply (0...1V) 3.0...25VDC, 3mA
  - Supply (0...5V) 6.0...25VDC, 3.5mA
  - Supply (0...10V) 11...25VDC, 4 mA
  - DAC resolution: 0.04%RH / 0,04°C
- DKRF4060 Digital Probe
  - Measuring range: -20...+80°C
  - Supply: 5.0...35VDC, 400μA
  - Logic level: 0 = 0V, 1= 2.5V
  - Communication: 9600 baud, 8 bits, no parity, 1 stopbit, no flux control
  - Output format: automatically after power on reset [-]xxx.xx_°C     TAB xxx.xx_%CRLF
- Command Function
  - Meter [CR]: Sends sensor data for humidity and temperature once
  - MeterMode [CR]: Periodically sends sensor data for humidity and temperature every 2 seconds
  - S [CR]: Stops MeterMode

Order Code

<table>
<thead>
<tr>
<th>Order Code: DKRF40X0-A-KL</th>
</tr>
</thead>
<tbody>
<tr>
<td>X= 5= Analogue output 6= RS232-CMOS-UART</td>
</tr>
<tr>
<td>A= 01 = 0... 1 VDC 05 = 0... 5 VDC 10 = 0...10 VDC 00 = RS232-CMOS-UART</td>
</tr>
<tr>
<td>KL= 2000 = 2 meter 5000 = 5 meter</td>
</tr>
</tbody>
</table>
Humidity/Temperature Probe

The DKRF300 and DKRF300-0835 probes are based on the combined humidity and temperature Sensor SHT75 by Sensirion.

Their filter protects the sensor against splash water and dust. Being of robust design the stainless steel probe body offers additional protection.

This humidity/temperature sensor provides the digital two-wire signal by Sensirion (see SHT75DK data sheet for further information).

### Specifications

- **DKRF300**
  - Temperature Accuracy: **±0.3°C**
  - Relative Humidity Accuracy: **±1.8%RH**

- **DKRF300-0835**
  - Temperature Accuracy: **±0.3°C**
  - Relative Humidity Accuracy: **±1.8%RH**

### Features

- Combined miniature sensor for humidity and temperature
- Exchangeable high-precision probe + dust filter (±1.8%RH / ±0.3°C without recalibration!)
- Calibrated digital output signal through two-wire interface
- Fast response time (4 seconds)
- Low power consumption
- Large temperature range -40...+120°C
- Robust plug-in probe made of stainless steel (DKRF300) or miniaturized probe with connection cable (DKRF300-0835)

### Accessories

- Mounting flange, Certificate of Calibration, Calibration Kit MHT, Radiation/Rain protector TR351 for outdoor use,
- Cable: 2m, 5m or customised
Miniaturized Sensor

The DKRF310XS and DKRF310XXS probes are based on the combined humidity and temperature Sensor SHT21 by Sensirion (see separate data sheet for further details). The sensor can either be integrated into a miniaturized small stainless steel sleeve (D=4mm, L=20mm) or be delivered as a tube probe. It provides an I²C output signal (description in SHT21 data sheet).

Specifications

<table>
<thead>
<tr>
<th>% RH</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-40°C</td>
</tr>
<tr>
<td>10</td>
<td>-20°C</td>
</tr>
<tr>
<td>20</td>
<td>0°C</td>
</tr>
<tr>
<td>30</td>
<td>20°C</td>
</tr>
<tr>
<td>40</td>
<td>40°C</td>
</tr>
<tr>
<td>50</td>
<td>60°C</td>
</tr>
<tr>
<td>60</td>
<td>80°C</td>
</tr>
<tr>
<td>70</td>
<td>100°C</td>
</tr>
<tr>
<td>80</td>
<td>120°C</td>
</tr>
</tbody>
</table>

Features

- Miniaturized sensor for humidity and temperature
- Excellent accuracy (+2%RH / ±0.3°C without recalibration!)
- Calibrated digital output signal through I²C interface
- Fast response time (4 seconds)
- Low power consumption
- Temperature range -40...+80°C (120°C on request)

Accessories

Certificate of Calibration, Calibration Kit MHT

Avoid mould formation indoors by measuring in walls.

Measure within the spaces between the tiles to monitor wall drying processes.
Humidity Calibration Kit MHT
Available as Basic or Professional Kit

On-Site Calibration of Your Instruments
The MHT Series Humidity Checks allow you to test and calibrate a variety of humidity measuring instruments such as probes, hand-held instruments or transducers.
The Humidity Check contains a saturated salt solution which maintains an equilibrium humidity within the cartridges for every salt solution.
The equilibrium humidity of each salt solution has been agreed upon in international interlaboratory comparison. Using different salts it is possible to manufacture reference cartridges for the entire measurement range of 0...100%RH.

Independent of Orientation
The MHT Humidity Checks were designed to be used in the field as well as in laboratories. They are small, handy and can operated in any position. This allows you to calibrate humidity probes without removing them from their respective facilities.

Special adapters for probes with different diameters hermetically seal the Humidity Checks during calibration.

Features
- Calibration of humidity probes independent of orientation
- Accuracy of up to ±2% RH viable
- Miniaturized climate chambers
- Hermetically sealed by universal adapter
- Certificate of Calibration available

Order Code
The following MHT Humidity Checks are available:

Single MHT Humidity Checks
Order no.: MHT0  Humidity Check 0.8 % RH
Order no.: MHT11  Humidity Check 11.3 % RH
Order no.: MHT33  Humidity Check 33.1 % RH
Order no.: MHT54  Humidity Check 54.0 % RH
Order no.: MHT75  Humidity Check 75.5 % RH
Order no.: MHT97  Humidity Check 97.5 % RH

Basic Calibration Kit:
Order no.: MHT00050 3 Humidity Checks (MHT11, MHT33, MHT75)

Professional Calibration Kit:
Order no.: MHT00051 6 Humidity Checks (MHT0, MHT11, MHT33, MHT54, MHT75, MHT97)

Included in delivery are:
- Calibration manual,
- 1x universal adapter for 7...13 mm, carrying case with insulation material for stable temperature conditions and fixation during calibration.

Also available:
- Humidity Check Certificate of Calibration
  - Order no.: MHT00040 for MHT Humidity Checks
  - Order no.: MHT00041 for the Basic Kit
  - Order no.: MHT00042 for the Professional Kit
- Adapter for probes with different diameters, with compression fitting:
  - Order no.: MHT00255 Universal adapter (Probe diameter 4...7 mm)
  - Order no.: MHT00260 Universal adapter