Ⓓ Ⓖⓑ Ⓕ Ⓡⓤ 6000-3190-0000-1XX **31900-2018 V102** 04/2018

HYGRASGARD® **KFF-xx**
HYGRASGARD® **KFTF-xx**

S+S REGELTECHNIK

Ⓓ Bedienungs- und Montageanleitung

Kanal-Feuchte- und Temperaturfühler (±1,8% / ±2,0%),
incl. Montageflansch, kalibrierfähig,
mit Mehrbereichsumschaltung und aktivem/passivem Ausgang

Ⓖⓑ Operating Instructions, Mounting & Installation

Duct humidity and temperature sensors (±1,8% / ±2,0%),
including mounting flange, calibratable,
with multi-range switching and active/passive output

Ⓕ Notice d'instruction

Sonde d'humidité et de température (±1,8% / ±2,0%),
pour montage en gaine, y compris bride de montage, étalonnable,
avec commutation multi-gamme et sortie active/passive

Ⓡⓤ Руководство по монтажу и обслуживанию

Датчик влажности и температуры канальный (±1,8%/±2,0%),
вкл. присоединительный фланец, калибруемый,
с переключением между несколькими диапазонами
и активным/пассивным выходом

KFF-SD/KFTF-SD (±2,0%)
mit Schnappdeckel
with snap-on lid
avec couvercle emboité
с защелкивающейся крышкой

KFF/KFTF (±2,0%)
KFF-20/KFTF-20 (±1,8%)
ohne Display
without display
sans écran
без дисплея

KFF-20/KFTF-20 (±1,8%)
mit Display
with display
avec écran
с дисплеем

KFF/KFTF (±2,0%)
mit Display
with display
avec écran
с дисплеем

S+S REGELTECHNIK

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HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

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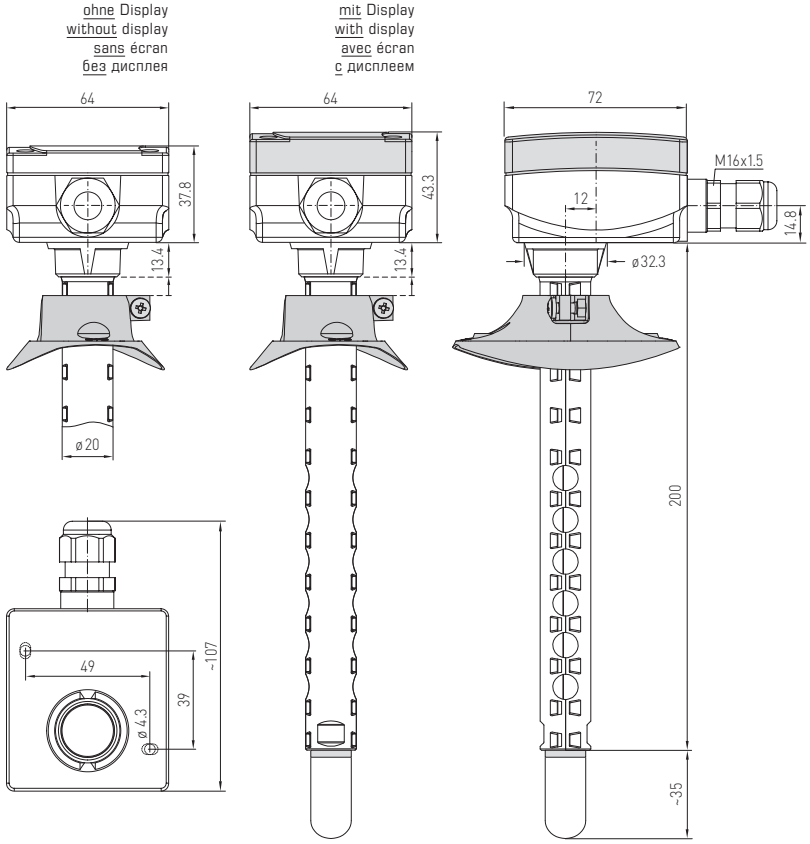
Maßzeichnung
Dimensional drawing
Plan coté
Габаритный чертеж

KFF/KFTF
KFF-20/KFTF-20
(Тур 1)



SF-M
Metall-Sinterfilter (optional)
Metal sinter filter (optional)
Filtre fritté en **métal** (en option)
Металлокерамический фильтр (опция)

SF-K
Kunststoff-Sinterfilter (Standard)
plastic sinter filter (standard)
Filtre fritté en matière **synthétique** (standard)
сменный **пластиковый** спеченный фильтр (стандартное исполнение)

MFT-20-K
Montageflansch aus Kunststoff
Mounting flange, plastic
Bride de montage en matière plastique
Присоединительный фланец из пластика

Calibratable duct humidity-/temperature sensor **HYGR**ASGARD® **KFF-SD/KFTF-SD** (± 2.0%),
with plastic sinter filter (optional metal sinter filter), enclosure made from impact-resistant plastic with snap-on lid.

Calibratable duct humidity/temperature sensor **HYGR**ASGARD® **KFF/KFTF** (± 2.0%) or **KFF-20/KFTF-20** (± 1.8%),
with plastic sinter filter (optional metal sinter filter), enclosure made from impact-resistant plastic with quick-locking screws,
with / without optional display.

It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % r. H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. Fine adjustment by the user is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	0...100 % r. H. (output corresponding to 0 -10 V or 4...20 mA)
Permissible air humidity:	< 95 % r. H., non-precipitating air
Deviation, humidity:	**KFF / KFTF / KFF-SD / KFTF-SD:** typically **± 2.0** % (20...80 % r. H.) at +25 °C, otherwise ± 3.0 % **KFF-20 / KFTF-20:** typically **± 1.8** % (10...90 % r. H.) at +25 °C, otherwise ± 2.0 %
Output, humidity:	0 -10 V for U variant 4 ... 20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with 4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 0 -10 V or 4...20 mA)
Ambient temperature:	storage –35...+85 °C; operation –30...+75 °C, non-precipitating
Deviation, temperature:	± 0.2 K at +25 °C
Output, temperature:	0 -10 V or 4 ... 20 mA or Ohm value
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws on circuit board
Enclosure:	plastic, UV-stabilised, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), enclosure cover for display is transparent!
Enclosure dimensions:	**KFF / KFTF / KFF-20 / KFTF-20 / KFF-SD / KFTF-SD without display:** 72 x 64 x 37.8 mm (Typ 1) **KFF / KFTF with display:** 72 x 64 x 43.3 mm (Typ 1) **KFF-20 / KFTF-20 with display:** 26 x 90 x 50 mm (Typ 2)
Cable gland:	M 16 x 1.5, including strain relief, exchangeable, max. inner diameter 10.4 mm
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection Ø 20 mm, NL = 235 mm, v_{max} = 30 m/s (air) (on request, optional **stainless steel,** Ø 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60730)
Protection type:	**KFF-SD / KFTF-SD:** **IP 43** (according to EN 60529) enclosure only! **KFF / KFTF / KFF-20 / KFTF-20:** **IP 65** (according to EN 60529) enclosure only!
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	**display with illumination,** for displaying ACTUAL temperature and / or ACTUAL humidity **KFF / KFTF** (Typ 1)**:** two-line, cutout approx. 36 x 15 mm (W x H) **KFF-20 / KFTF-20** (Typ 2)**:** three-line, cutout approx. 70 x 40 mm (W x H)

HYGRASGARD® **KFF-SD** – Humidity sensors (±2.0%), *Standard*
HYGRASGARD® **KFTF-SD** – Humidity and temperature sensors (±2.0%), *Standard*

Type/WG01	Measuring Range/Readout Humidity	Temperature	Output Humidity	Temperature	Item No.
KFF-SD-I					**IP43 (active)**
KFF-SD-I	0...100% r.H.	–	4...20mA	–	1201-3182-0000-029
KFF-SD-U					**IP43 (active)**
KFF-SD-U	0...100% r.H.	–	0-10V	–	1201-3181-0000-029
KFTF-SD-I					**IP43 (active)**
KFTF-SD-I	0...100% r.H.	–35...+75°C –35...+35°C 0...+50°C 0...+80°C	4...20mA	4...20mA	1201-3182-1000-029
KFTF-SD-U					**IP43 (active)**
KFTF-SD-U	0...100% r.H.	(4x as above)	0-10V	0-10V	1201-3181-1000-029

HYGRASGARD® **KFF** – Humidity sensors (±2.0%), *Standard*
HYGRASGARD® **KFTF** – Humidity and temperature sensors (±2.0%), *Standard*

Type/WG01	Measuring Range/Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.
KFF-I						**IP65 (active)**
KFF-I	0...100% r.H.	–	4...20mA	–		1201-3112-0000-029
KFF-I DISPLAY	0...100% r.H.	–	4...20mA	–	■	1201-3112-0200-029
KFF-U						**IP65 (active)**
KFF-U	0...100% r.H.	–	0-10V	–		1201-3111-0000-029
KFF-U DISPLAY	0...100% r.H.	–	0-10V	–	■	1201-3111-0200-029
KFTF-I						**IP65 (active)**
KFTF-I	0...100% r.H.	(4x as above)	4...20mA	4...20mA		1201-3112-1000-029
KFTF-I DISPLAY	0...100% r.H.	(4x as above)	4...20mA	4...20mA	■	1201-3112-1200-029
KFTF-U						**IP65 (active)**
KFTF-U	0...100% r.H.	(4x as above)	0-10V	0-10V		1201-3111-1000-029
KFTF-U DISPLAY	0...100% r.H.	(4x as above)	0-10V	0-10V	■	1201-3111-1200-029

HYGRASGARD® **KFTF-Uxx** – Humidity and temperature sensors (±2.0%), *Standard*

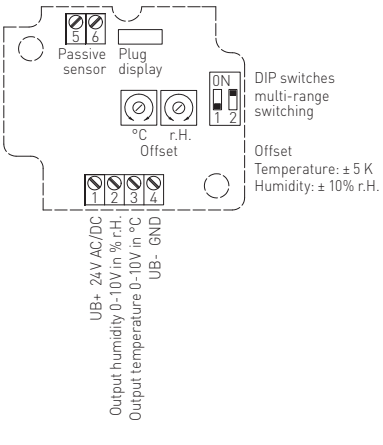
Type/WG01	Measuring Range/Readout Humidity	Temperature	Output Humidity	Temperature	Item No.
KFTF-U xx	**Pt, Ni, LM235Z, NTC**				**IP65 (active/passive)**
KFTF-U PT100	0...100% r.H.	(4x as above)	0-10V	0-10V + Pt100	1201-3111-2001-029
KFTF-U PT1000	0...100% r.H.	(4x as above)	0-10V	0-10V + Pt1000	1201-3111-2005-029
KFTF-U NI1000	0...100% r.H.	(4x as above)	0-10V	0-10V + Ni1000	1201-3111-2009-029
KFTF-U NITK	0...100% r.H.	(4x as above)	0-10V	0-10V + Ni1000TK5000	1201-3111-2010-029
KFTF-U LM235Z	0...100% r.H.	(4x as above)	0-10V	0-10V + LM235Z, 10mV/K	1201-3111-2021-029
KFTF-U NTC1,8K	0...100% r.H.	(4x as above)	0-10V	0-10V + NTC1,8kOhm	1201-3111-2012-029
KFTF-U NTC10K	0...100% r.H.	(4x as above)	0-10V	0-10V + NTC10kOhm	1201-3111-2015-029
KFTF-U NTC20K	0...100% r.H.	(4x as above)	0-10V	0-10V + NTC20kOhm	1201-3111-2016-029

HYGRASGARD® **KFF-20** – Humidity sensors (± 1.8 %), *Premium*
HYGRASGARD® **KFTF-20** – Humidity and temperature sensors (± 1.8 %), *Premium*

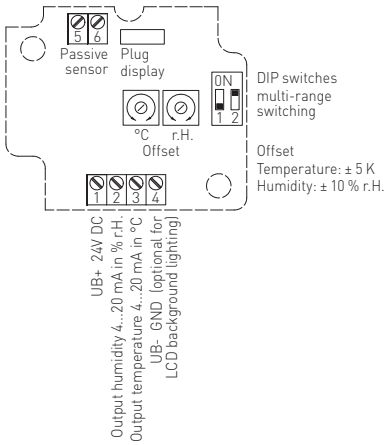
Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.
KFF-20-I						**IP65 (active)**
KFF-20-I	0...100 % r.H.	–	4...20 mA	–		1201-3112-0000-030
KFF-20-I TYR-2 DISPLAY	0...100 % r.H.	–	4...20 mA	–	■	1201-8112-0400-030
KFF-20-U						**IP65 (active)**
KFF-20-U	0...100 % r.H.	–	0-10 V	–		1201-3111-0000-030
KFF-20-U TYR-2 DISPLAY	0...100 % r.H.	–	0-10 V	–	■	1201-8111-0400-030
KFTF-20-I						**IP65 (active)**
KFTF-20-I	0...100 % r.H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-3112-1000-030
KFTF-20-I TYR-2 DISPLAY	0...100 % r.H.	(4x as above)	4...20 mA	4...20 mA	■	1201-8112-1400-030
KFTF-20-U						**IP65 (active)**
KFTF-20-U	0...100 % r.H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-030
KFTF-20-U TYR-2 DISPLAY	0...100 % r.H.	(4x as above)	0-10 V	0-10 V	■	1201-8111-1400-030

Accessories		
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100

Schematic diagram **KFTF-xx-U** (Tyr1)



Schematic diagram** **KFTF-xx-I** (Tyr1)



3-wire connection **KFF-xx-U**

1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Free
4 –UB-GND

2- or 3-wire connection* **KFF-xx-I (Transmitter)**

1 +UB 24V DC
2 Output humidity in % r.H. 4...20mA
3 Free
4 –UB-GND (optional for backlighting)

4- or 6-wire connection **KFTF-U (passive temperature sensor)**

1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Output temperature in °C 0-10V
4 –UB-GND

5 Passive element
6 e.g. Pt1000, Ni1000, LMZ235Z

4-wire connection **KFTF-xx-U**

1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Output temperature in °C 0-10V
4 –UB-GND

3- or 4-wire connection** **KFTF-xx-I (Transmitter)**

1 +UB 24V DC
2 Output humidity in % r.H. 4...20mA
3 Output temperature in °C 4...20mA
4 –UB-GND (optional for backlighting)

4- or 6-wire connection **KFTF-I (passive temperature sensor)**

1 +UB 24V DC
2 Output humidity in % r.H. 4...20mA
3 Output temperature in °C 4...20mA
4 –UB-GND (optional for backlighting)

5 Passive element
6 e.g. Pt1000, Ni1000, LMZ235Z

3-wire connection **KFF-SD-U**

1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Free
4 –UB-GND

2-wire connection **KFF-SD-I (Transmitter)**

1 +UB 24V DC
2 Output humidity in % r.H. 4...20mA
3 Free
4 Free

4-wire connection **KFTF-SD-U**

1 +UB 24V AC/DC
2 Output humidity in % r.H. 0-10V
3 Output temperature in °C 0-10V
4 –UB-GND

3-wire connection **KFTF-SD-I (Transmitter)**

1 +UB 24V DC
2 Output humidity in % r.H. 4...20mA
3 Output temperature in °C 4...20mA
4 Free

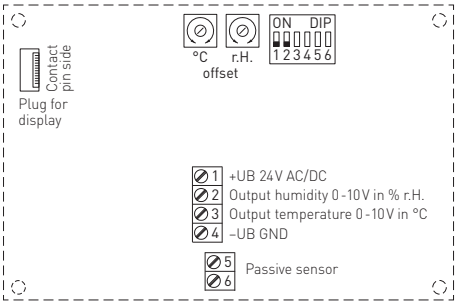
* 2-wire connection for devices with/without display (not illuminated)
3-wire connection for devices with illuminated display

** 3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

At the I **variant th**e humidity path must necessarily be connected!

Schematic diagram

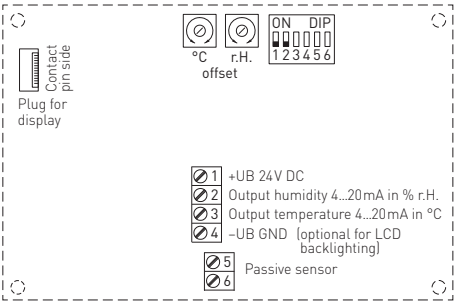
KFTF-20-U with display (Tyr2)



DIP 3, 4, 5, 6 are not assigned!

Schematic diagram**

KFTF-20-I with display (Tyr2)



DIP 3, 4, 5, 6 are not assigned!

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
– 35 … + 75 °C	**ON**	**ON**
– 35 … + 35 °C	OFF	OFF
0 … + 50 °C (default)	OFF	**ON**
0 … + 80 °C	**ON**	OFF

Temperature table
MR: –35 …+75 °C

°C	**U_A** in V	**I_A** in mA
– 35	0.0	4.0
– 30	0.5	4.7
– 25	0.9	5.5
– 20	1.4	6.2
– 15	1.8	6.9
– 10	2.3	7.6
– 5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35 …+35 °C

°C	**U_A** in V	**I_A** in mA
– 35	0.0	4.0
– 30	0.7	5.1
– 25	1.4	6.3
– 20	2.1	7.4
– 15	2.9	8.6
– 10	3.6	9.7
– 5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0 …+50 °C

°C	**U_A** in V	**I_A** in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0 …+80 °C

°C	**U_A** in V	**I_A** in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0 …100 % r.H.

% r.H.	**U_A** in V	**I_A** in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

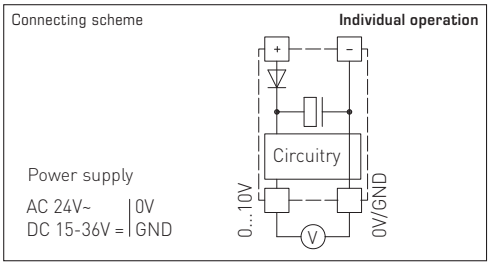
(GB) HYGRASGARD® KFF/KFTF (±2,0%), KFF-20/KFTF-20 (±1,8%)

SUPPLY VOLTAGE:

For operating voltage reverse polarity protection, a one-way rectifier or reverse polarity protection diode is integrated in this device variant. This internal one-way rectifier also allows operating 0-10V devices on AC supply voltage.

The output signal is to be tapped by a measuring instrument. Output voltage is measured against zero potential (0V) of the input voltage!

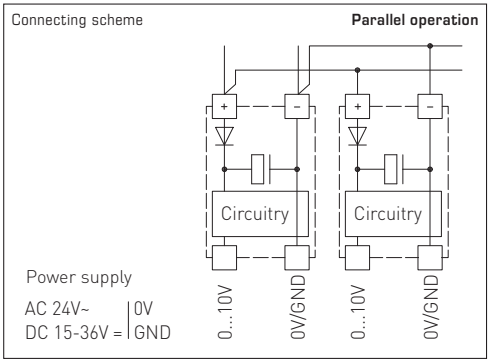
When this device is operated on **DC supply voltage**, the operating voltage input UB+ is to be used for 15...36V DC supply and UB– or GND for ground wire!



When several devices are supplied by one 24V **AC voltage supply**, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (–) (= reference potential) are connected together (in-phase connection of field devices). All outputs of field devices must be referenced to the same potential!

In case of reversed polarity at one field device, a supply voltage short-circuit would be caused by that device. The consequential short-circuit current flowing through this field device may cause damage to it.

Therefore, pay attention to correct wiring!

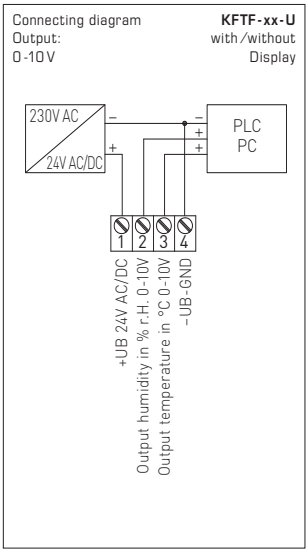


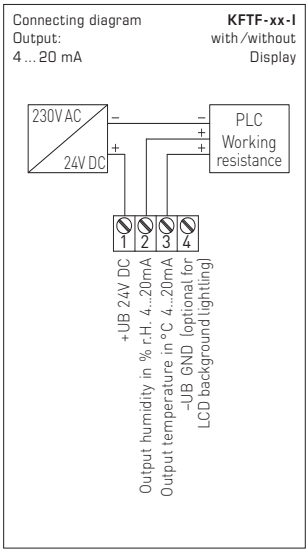
NOTE

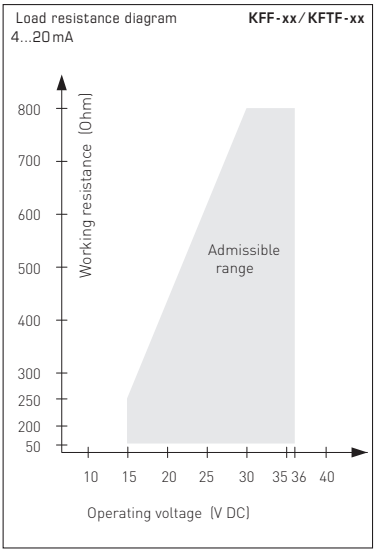
At transmitters with current output the humidity output (Pin 2) must categorically be connected!

NOTE

For 4...20mA devices, DC voltage must be used (without residual ripple, see permissible range of load resistance diagram). Do not use pulsating DC voltage.







(GB) General notes

- This device may only be used in pollutant-free non-precipitating air without above-atmospheric or below-atmospheric pressure at the sensor element.
- On outdoor and duct sensors, the sinter filter of the senor element protects the humidity sensor against potential dust exposure. In case of pollution/contamination, this filter should be cleaned on a regular basis.
- Dust and pollution falsify measurement results and are to be avoided. Slight pollution and dust sediments can be removed by using compressed air.
- Touching the humidity element is under any circumstances to be avoided, as that would result in considerable mismeasurements.
- In case of pollution, we recommend cleaning and recalibration in the factory.
- In any case, the sensor must not get in contact with chemicals or other cleaning agents.
- The relative humidity of 0...100% is indicated by an output signal of 0-10V or 4...20mA. The device operating range covers 10.0...99.9% r.H. Outside of that range, mismeasurements or increased deviations may occur.
- When several sensors (0-10V) are connected to one voltage supply of 24V AC, correct polarity must be regarded as otherwise the alternating voltage source may be short-circuited.
- The voltage outputs are short-circuit proof. Applying overvoltage or voltage supply to the voltage output will destroy the device.
- If this device is operated beyond the specified range, all warranty claims are forfeited.

Our "General Terms and Conditions for Business" together with the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" (ZVEI conditions) including supplementary clause "Extended Retention of Title" apply as the exclusive terms and conditions.

In additionIn addition, the following points are to be observed:

- These instructions must be read before installation and putting in operation and all notes provided therein are to be regarded!
- Devices must only be connected to safety extra-low voltage and under dead-voltage condition. To avoid damages and errors the device (e.g. by voltage induction) shielded cables are to be used, laying parallel with current-carrying lines is to be avoided, and EMC directives are to be observed.
- This device shall only be used for its intended purpose. Respective safety regulations issued by the VDE, the states, their control authorities, the TÜV and the local energy supply company must be observed. The purchaser has to adhere to the building and safety regulations and has to prevent perils of any kind.
- No warranties or liabilities will be assumed for defects and damages arising from improper use of this device.
- Consequential damages caused by a fault in this device are excluded from warranty or liability.
- These devices must be installed by authorised specialists only.
- The technical data and connecting conditions of the mounting and operating instructions delivered together with the device are exclusively valid. Deviations from the catalogue representation are not explicitly mentioned and are possible in terms of technical progress and continuous improvement of our products.
- In case of any modifications made by the user, all warranty claims are forfeited.
- This device must not be installed close to heat sources (e.g. radiators) or be exposed to their heat flow. Direct sun irradiation or heat irradiation by similar sources (powerful lamps, halogen spotlights) must absolutely be avoided.
- Operating this device close to other devices that do not comply with EMC directives may influence functionality.
- This device must not be used for monitoring applications, which serve the purpose of protecting persons against hazards or injury, or as an EMERGENCY STOP switch for systems or machinery, or for any other similar safety-relevant purposes.
- Dimensions of enclosures or enclosure accessories may show slight tolerances on the specifications provided in these instructions.
- Modifications of these records are not permitted.
- In case of a complaint, only complete devices returned in original packing will be accepted.

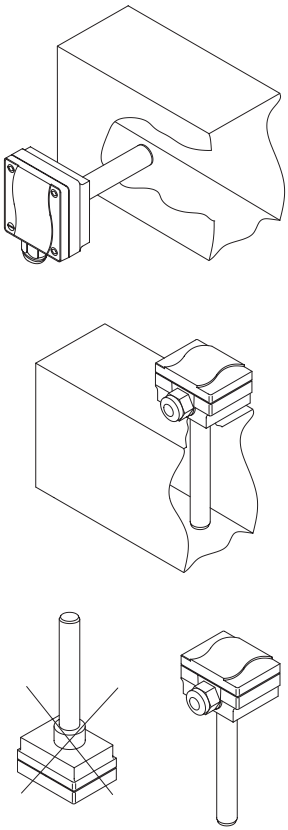
These instructions must be read before installation and putting in operation and all notes provided therein are to be regarded!

HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

S+S REGELTECHNIK

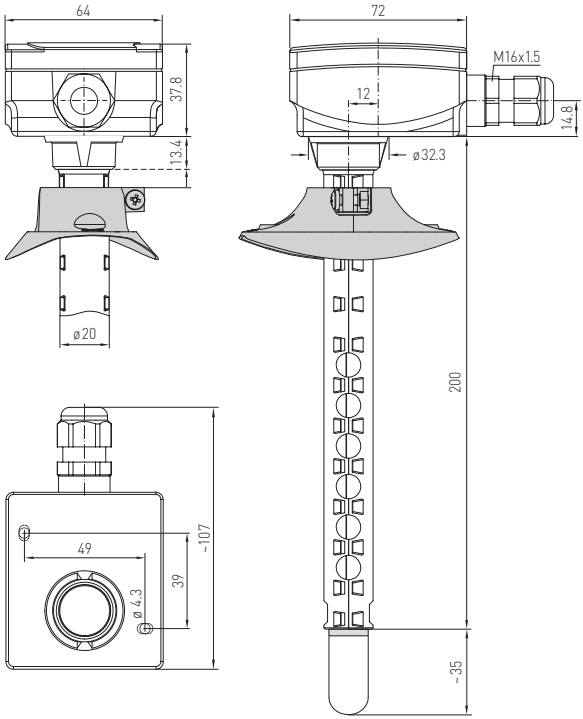
Montageschema
Mounting diagram
Schéma de montage
Схема монтажа

KFF-xx
KFTF-xx



Maßzeichnung
Dimensional drawing
Plan coté
Габаритный чертеж

KFF-SD
KFTF-SD
(Typ 01)



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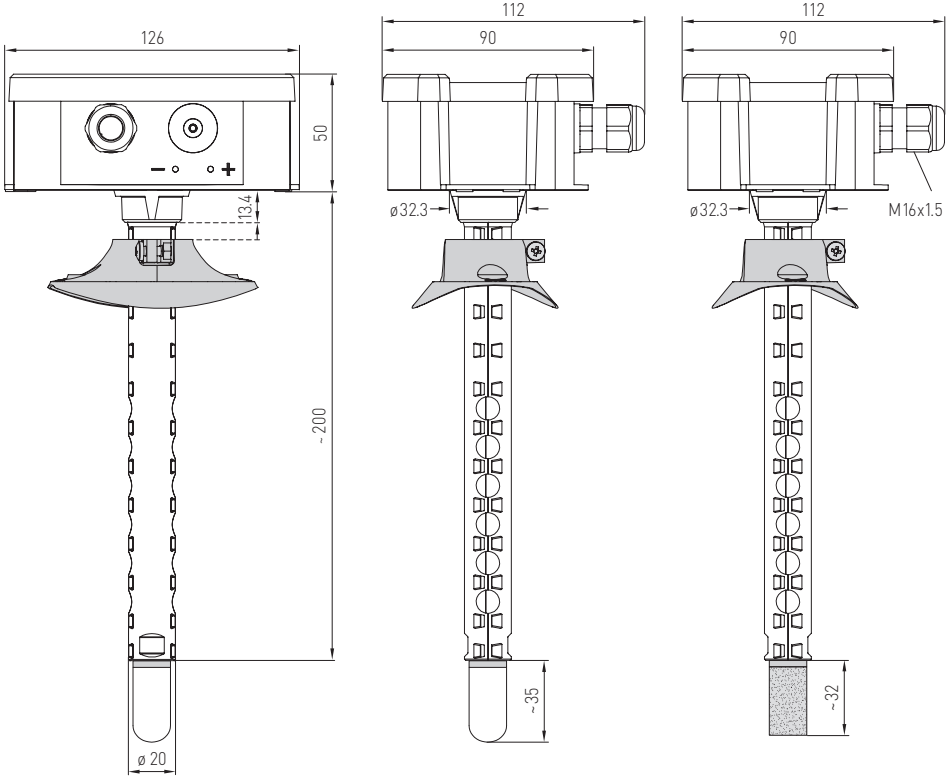
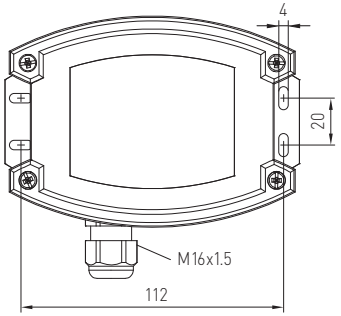
HYGRASGARD® KFF-20
HYGRASGARD® KFTF-20

S+S REGELTECHNIK

Maßzeichnung
Dimensional drawing
Plan coté
Габаритный чертеж

KFF-20 / KFTF-20 (± 1,8%)
mit Display
with display
avec écran
с дисплеем
(Tyr 2)





SF-M (Tyr1 / Tyr2)
Metall-Sinterfilter (optional)
Schutzrohr aus Edelstahl
(optional auf Anfrage)

Metal sinter filter (optional)
Protective tube stainless steel
(optional on request)

Filtre fritté en **métal** (en option)
Tube de protection en acier inox
(en option et sur demande)

Металлокерамический фильтр (опция)
с защитной трубкой из
высококачественной стали
(опционально по запросу)