

Room humidity and temperature sensors, on-wall,  
calibrateable, with active/passive output, series Odin I

RFF/RFTF  
Odin I

## APPLICATION:

For HVAC sector, accuracy 3 % r.H.

The calibrateable humidity/temperature sensor measures the relative humidity and temperature of air and other non-aggressive gases. It is used in refrigeration, air conditioning, and clean room technology, in residential rooms, offices, hotels, technical rooms, meeting rooms and convention centres. It converts the measurands humidity and temperature into standard signals of 0-10V or 4...20mA. 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 temperature and humidity. A capacitive sensor is used as measuring element for humidity measurement.

## TECHNICAL DATA:

Power supply:..... 24V AC/DC for U variant  
15...36V DC for I variant,  $R_L$  depending on working resistance

Sensors: ..... capacitive humidity sensor with integrated temperature sensor,  
dew-proof, small hysteresis, high long-term stability

## HUMIDITY:

Measuring range, humidity:..... 0...100% r.H.  
(output corresponding to 0-10 V or 4...20 mA or Ohm value)

Operating range, humidity:..... 10...90% r.H.

Deviation, humidity: .....  $\pm 3\%$  r.H. (40...60%); at +20°C, otherwise  $\pm 5\%$  r.H.

Output, humidity:..... 0-10 V by U variant,  
4...20 mA by I variant, (transmitter  $R_L < 500 \Omega$ )

## TEMPERATURE:

Measuring range, temperature:... 0...+50°C  
(output corresponding to 0-10V or 4...20mA)

Operating range, temperature:... 0...+50°C

Deviation, temperature: .....  $\pm 0.8K$  (RFF/RFTF-U),  $\pm 0.8K$  (RFF/RFTF-I)  
at 20°C under standard conditions

Output, temperature: ..... 0-10V or 4...20mA or Ohm value

Ambient temperature:..... storage -25...+50°C, operation -5...+55°C

Electrical connection: ..... 2-, 3-, or 4-wire connection (see connecting diagram),  
0.14-1.5 mm<sup>2</sup> via terminal screws on circuit board

Enclosure:..... plastic, material ABS,  
colour pure white (similar RAL9010),  
stainless steel enclosure optional

Dimensions:..... 79 x 81 x 26 mm (Odin I)  
95 x 97 x 30 mm (Odin II)  
75 x 75 x 25 mm (stainless steel)

Installation:..... wall mounting or on in-wall flush box  $\varnothing 55$  mm, base with 4 holes  
for mounting on vertically or horizontally installed flush boxes,  
with predetermined breaking point for on-wall cable entry

Long-term stability:.....  $\pm 1\%$  per year

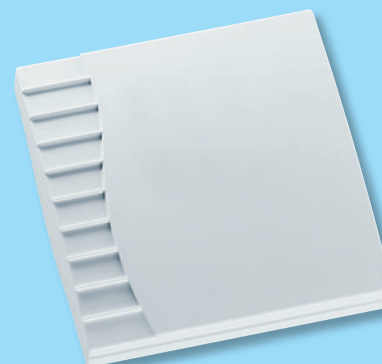
Protection class: ..... III (according to EN 60730)

Protection type:..... IP30 (according to EN 60529)

Standards:..... CE conformity, electromagnetic compatibility  
according to EN 61326+A1+A2,  
EMC directive 89/336/EWG

Optional:..... 8-digit display, cutout 36x14 mm (WxH),  
for displaying actual temperature and/or actual humidity

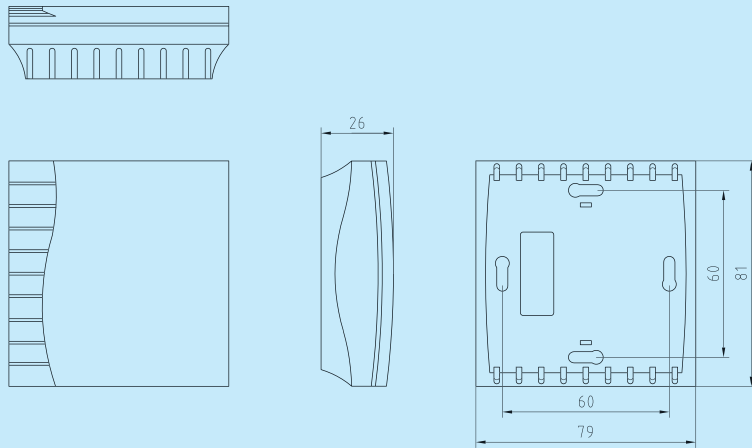
ACCESSORIES: ..... see last chapter



Dimensional drawing

Enclosure **Odin I**  
RFF/RFTF

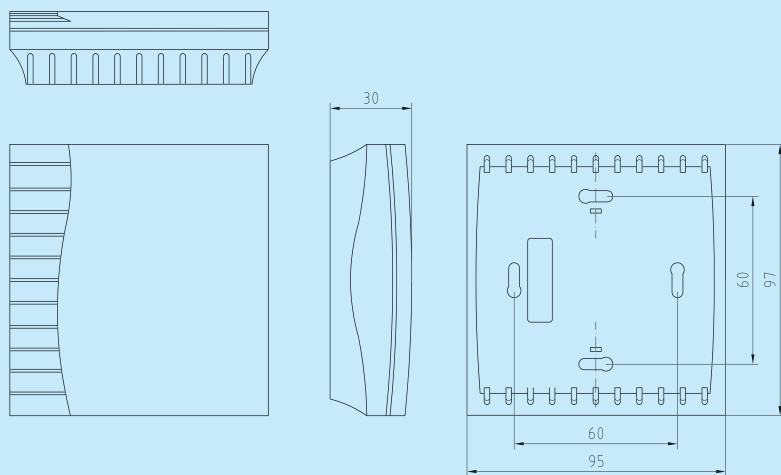
RFF/RFTF  
Odin I  
with display



Dimensional drawing

Enclosure **Odin II**  
RFF/RFTF

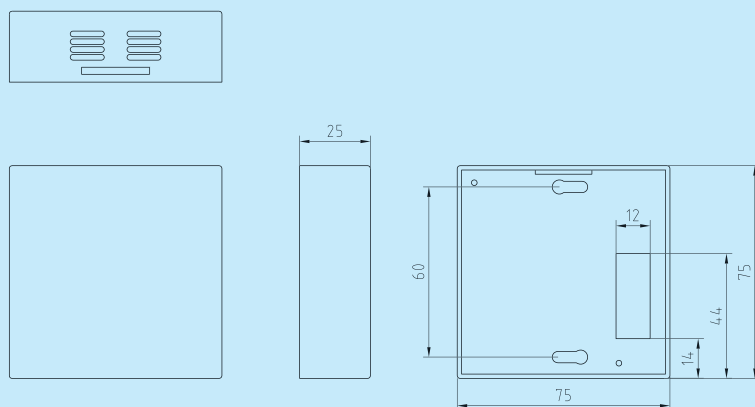
RFF/RFTF  
Odin II



Dimensional drawing

Enclosure **stainless steel**  
RFF/RFTF

RFF/RFTF  
with stainless  
steel enclosure



**Connecting diagram RFF-U**

- 1 UB-GND
- 2 UB+supply voltage 24V AC / DC
- 4 Output humidity in r. H. 0-10V

**Connecting diagram RFF-I (Transmitter)**

- 1 Supply voltage 15-36V DC
- 2 Output humidity in r. H. 4-20mA

**Connecting diagram RFTF-U (Passive temperature sensor)**

- 1 UB-GND
- 2 UB+supply voltage 24V AC / DC
- 4 Output humidity in r. H. 0-10V
- 7 Passive element
- 8 e. g. Ni1000, Pt100, Pt1000, LM235Z

**Connecting diagram RFTF-U with display RFTF-U with display**

- 1 UB-GND
- 2 UB+supply voltage 24V DC
- 4 Output humidity in r. H. 0-10V
- 6 Output temperature 0-10V

**Connecting diagram RFTF-I (Transmitter) RFTF-I (Transmitter)**

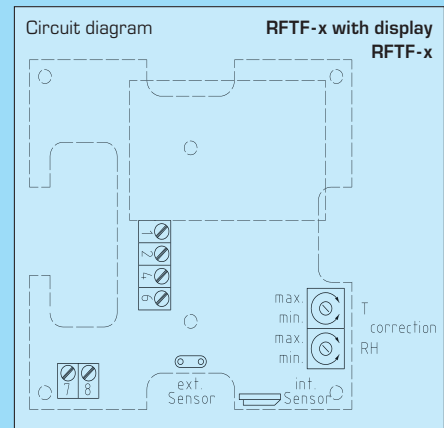
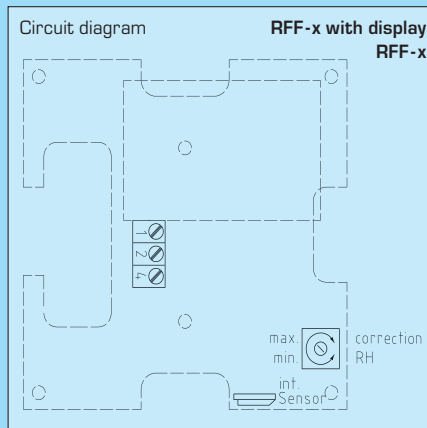
- 1 Supply voltage 15-36V DC
- 2 Output humidity in r. H. 4-20mA Ri < 500 Ohm
- 3 Output temperature 4-20mA Ri < 500 Ohm

**Connecting diagram RFTF-I (Passive temperature sensor) RFTF-I (Passive temperature sensor)**

- 1 Supply voltage 15-36V DC
- 2 Output humidity in r. H. 4-20mA Ri < 500 Ohm
- 7 Passive element
- 8 Ni 1000, Pt 100, Pt1000, LM235Z

**Connecting diagram RFTF-I with display RFTF-I with display**

- 1 UB-GND
- 2 UB+supply voltage 24V DC
- 4 Output humidity in r. H. 4-20mA
- 6 Output temperature 4-20mA



HYGRASGARD® RFTF-U, x:  
Output: Humidity active, temperature passive

Type/WG1	Range Humidity (relative)	Range Temperature	Output Humidity (relative)	Output Temperature (passive)
RFTF-U, Pt100	0...100% r.H.	0...50 °C	0-10V	Pt100
RFTF-U, Pt1000	0...100% r.H.	0...50 °C	0-10V	PT1000
RFTF-U, Ni1000	0...100% r.H.	0...50 °C	0-10V	Ni1000
RFTF-U, Ni1000TK5000	0...100% r.H.	0...50 °C	0-10V	Ni1000TK5000
RFTF-U, NTC 1,8 k	0...100% r.H.	0...50 °C	0-10V	NTC 1,8 k Ohm
RFTF-U, NTC 10 k	0...100% r.H.	0...50 °C	0-10V	NTC 10 k Ohm
RFTF-U, NTC 20 k	0...100% r.H.	0...50 °C	0-10V	NTC 20 k Ohm
RFTF-U, LM235 Z	0...100% r.H.	0...50 °C	0-10V	LM235Z, 10mV/K



Humidity table Range: 0...100% r.H.

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

Temperature table Range: 0...+50°C

°C	Output voltage in V	Output current in mA
0	0	4.0
5	1	5.6
10	2	7.2
15	3	8.8
20	4	10.4
25	5	12.0
30	6	13.6
35	7	15.2
40	8	16.8
45	9	18.4
50	10	20.0

**HYGRASGARD® RFF and RFTF:****Output: Temperature and humidity active**

Type/WG1	Range humidity (relative)	Range temperature	Output humidity (relative)	Output temperature
RFF-I	0...100% r.H.	-	4...20 mA	-
RFF-U	0...100% r.H.	-	0-10V	-
RFTF-I	0...100% r.H.	0...50 °C	4...20 mA	4...20 mA
RFTF-U	0...100% r.H.	0...50 °C	0-10V	0-10V
RFTF-stainless steel enclosure				

**HYGRASGARD® RFF and RFTF with display:****Output: Temperature and humidity active**

Type/WG1	Range/display humidity (relative)	Range/display temperature	Output humidity (relative)	Output temperature
RFF-I-Display	0...100% r.H.	-	4...20 mA	-
RFF-U-Display	0...100% r.H.	-	0-10V	-
RFTF-I-Display	0...100% r.H.	0...50 °C	4...20 mA	4...20 mA
RFTF-U-Display	0...100% r.H.	0...50 °C	0-10V	0-10V