

<b>E-M-HF62-V1_11</b> Document code	Rotronic AG Bassersdorf, Switzerland Unit
<b>HygroFlex HF62 Humidity Temperature Transmitters: User Guide</b> Document title	<b>Instruction Manual</b> Document Type Page 1 of 27

# HygroFlex HF62 Humidity Temperature Transmitters

## User Guide



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## Applicability:

This manual applies to all instruments of the HF62 series with firmware version 1.x, where 1.x can be 1.0, 1.1, etc. Changes to the last digit of the version number reflect minor firmware changes that do not affect the manner in which the instrument should be operated.

## 1 Overview

The HF62 series are 2-wire transmitters designed for fixed installation in industrial applications. The HF62 features two fully independent 2-wire, loop powered measuring circuits placed in a single enclosure (2 x 4...20 mA current signal). One of the circuits corresponds to relative humidity or to the dew or frost point. The other circuit corresponds to temperature. As an option, the HF62 is available with a 4-wire Pt 100 RTD directly connected to a terminal block. In this case, the electronics of the HF62 consist of just one circuit corresponding to humidity.

Depending on the model, the HF62 can measure environments within the range of 0 to 100 %RH and -100 to 150°C (-148 to 302°F). The electronics operating range is limited to -40...60 °C (-10...60°C with the optional LC display).

The HF62 features well proven sensors and a robust housing. Digital signal processing ensures consistent product performance and also facilitates the task of field maintenance with features such as potentiometer free – digital calibration.

Based on the ROTRONIC AirChip 3000 digital technology the HF6 offers the following functions:

- User configurable settings
- Calculation of the dew or frost point
- Humidity temperature calibration and adjustment
- Simulator mode
- Automatic humidity sensor test and drift compensation
- Sensor failure mode
- Data recording

The ability for the user to easily update the AirChip 3000 firmware means that the HF62 transmitter can be kept up-to-date regarding any future functionality improvement.

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## 2 Models

### 2.1 Ordering codes

Transmitters with analog output signals: HF62 (2 x 2 wire)								
1	2	3	4	5	6	7	8	Circuit type, supply voltage and output signal type
HF624-								2 x 2-wire (loop powered), 10 to 28 VDC, 4...20 mA
<b>Installation type / Mechanical configuration</b>								
	2							Probe separated by 2 m cable, 15 x 100 mm
	D							Duct mount (through wall), probe 15 x 208 mm
	W							Wall mount, probe 15 x 85 mm
<b>Parameters (analog outputs)</b>								
		P					X X	Humidity (0...100 %RH) + direct 4-wire Pt100 RTD
		B						Humidity (0...100 %RH) and Temperature (see range below)
		H	X	X				Humidity only (0...100 %RH)
		T						Temperature only (see range below)
		1	X	X				Humidity & Dew / Frost point (see range below)
		A						Dew / Frost point and Temperature (see range below)
<b>Standard temperature output ranges</b>								
			1	X				0...50 °C
			2	X				10...40 °C
			3	X				-40...60 °C
			4	X				-30...70 °C
			5	X				-40...85 °C
			6	X				0...100 °F
			7	X				0...200 °F
			8	X				0...300 °F
<b>Standard temperature output ranges</b>								
			9	X				-50...200 °F
			S	T				Custom range. Specify when ordering
		P	P	3				Pt 100 1/3 class B, 4-wire direct connection
		P	P	5				Pt 100 1/5 class B, 4-wire direct connection
		P	P	A				Pt 100 1/10 class B, 4-wire direct connection

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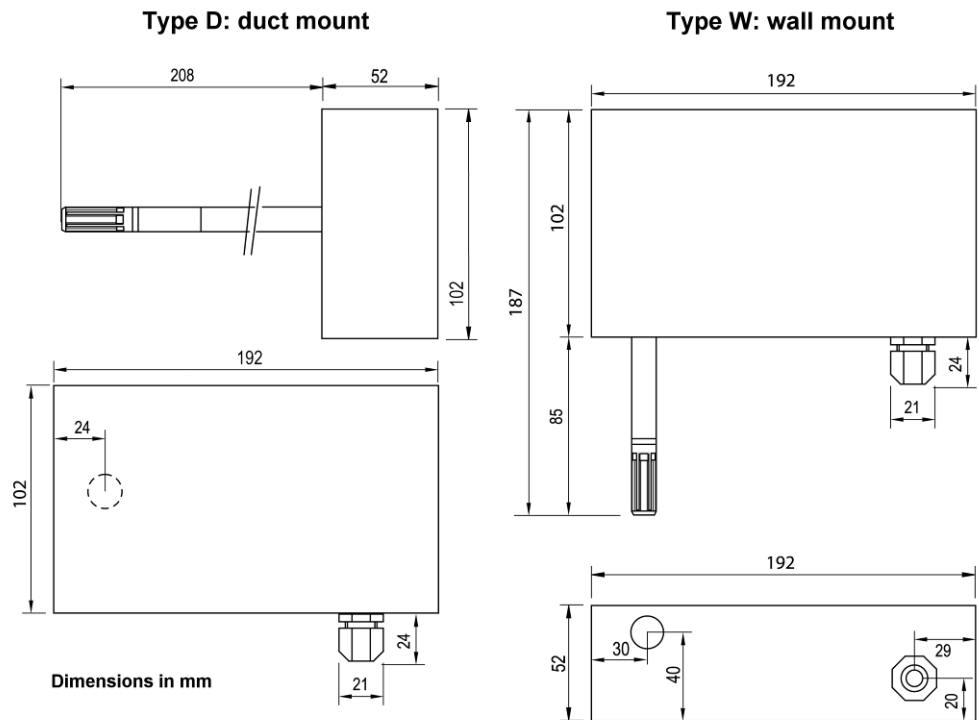
1	2	3	4	5	6	7	8	
								<b>Optional keypad and display</b>
				D				Keypad and display (no backlight)
				X				No keypad and display
								<b>Probe length options (except wall mount configuration)</b>
					S			Standard length
					1			Standard length + 150 mm
					2			Standard length + 300 mm
					3			Standard length + 450 mm
					4			Standard length +600 mm
								<b>Cable fittings</b>
						1		1x M16 cable grip
						3		1x ½" conduit adapter
								<b>Standard dew / frost point output ranges</b>
							X X	No calculated parameter
							B X	-50...50 (°C / °F - as per temperature output range)
							C X	-50...100 (°C / °F - as per temperature output range)
							D X	-50...200 (°C / °F - as per temperature output range)
							S C	Custom range. Specify when ordering

**Notes:**

- Output 1: relative humidity or dew point
- Output 2: temperature
- The enclosure of all HF62 models is designed to be installed in the horizontal position
- Cable grips are located at the bottom of the enclosure
- Conduit adapters are located on top of the enclosure
- The dew / frost point range uses the same unit (°C or °F) as the temperature output. The factory default setting is frost point below freezing.
- Custom range: be sure to clearly specify the desired range at the time of the order. When a special range has been ordered, the letters ST and SC are used in columns 4 and 7 in the above table. These generic codes will be replaced with a specific code only for quantity and repeat orders

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## 2.2 Mechanical configurations and dimensions



## 2.3 Display and keypad option



The upper line of the LC display corresponds to relative humidity or dew / frost point and the bottom line corresponds to the temperature measured by the Pt100 RTD used to provide a compensation for the effect of temperature on the humidity sensor.

It is important to note the following:

- The HF62 uses a separate circuit to generate the temperature analog signal. The temperature measured by this circuit is not shown on the LC display
- The LC display works only when the HF62 humidity measuring circuit is powered and the output loop of this circuit is closed

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The display can be configured to show a trend indicator on each line:

- ▲: increasing value
- ▼: decreasing value

In the event of an alarm the display shows the symbol [ ! ] to the right of the value.

For instructions see the following HW4 manual: **E-M-HW4v2-F2-008**.

## 3 General description

### 3.1 Power supply

Each independent circuit of the HF62 (measuring circuit 1 and measuring circuit 2) requires a supply voltage of 10...28 VDC - depending on the load connected to each circuit. If so desired, the same voltage source may be used for both circuits. For any of the two circuits, the minimum supply voltage can be determined as follows:

$$V_{\min} = 10 \text{ V} + (0.02 \times \text{Load}^*) \quad * \text{Load resistance in ohms.}$$

For the maximum load of 500 Ω, the minimum supply voltage is 10 + (0.02 x 500) = 20 VDC. The maximum current consumption is 20 mA per circuit in use.

### 3.2 Measuring circuits and measured parameters

Circuit 1 of the HF62 measures relative humidity with a ROTRONIC Hygromer<sup>®</sup> IN1 capacitive sensor and uses the data from a Pt100 RTD to apply a correction for the effect of temperature on the humidity sensor.

Circuit 2 of the HF62 uses a separate Pt100 RTD to measure temperature.

### 3.3 Calculated parameters

Using the ROTRONIC HW4 software, measuring circuit 1 of the HF62 can be configured by the user to calculate either the dew point or the frost point.

### 3.4 Analog output signals

By default, the output signal of the HF62 measuring circuit 1 corresponds to humidity. With the ROTRONIC HW4 software the output signal provided by this circuit can be made to correspond to either relative humidity or to the calculated parameter.

By default, the output signal of the HF62 measuring circuit 2 corresponds to temperature and this setting should not be changed by the user.

If so desired, the analog output signal from any of the two independent circuits can also be disabled.

Using the ROTRONIC HW4 software, the scale of each analog output signal can be set within the numerical limits of -999.99 and 9999.99.

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### 3.5 Service connectors

The HF62 consists of two fully independent measuring circuits and the HF62 has two separate mini-USB type service connectors, each corresponding to a separate UART interface.

#### Circuit 1 (humidity):

The service connector of circuit 1 can be accessed without opening the enclosure and allows connecting the HF62 either to a PC running the ROTRONIC HW4 software or to a probe input of another instrument that is compatible with the HygroClip 2 (HC2) probes. In both cases a service cable is required. See "Maintenance" for the location of this service connector and for the type of service cable to be used.

#### Circuit 2 (temperature):

Both the Pt 100 RTD temperature sensor and associated electronics used by circuit 2 are very stable and should not require any adjustment after the initial factory adjustment. The service connector of circuit 2 is not designed to be accessed by the user and is located inside the enclosure on the PCB mounted inside the gray top-half of the enclosure.

### 3.6 Sensor protection (dust filter)

The probe of the HF62 requires a filter to protect the sensors against dust particles and high air velocity.

**Wall mount models:** the probe of the HF62 is equipped with a slotted cap with a Polyethylene insert

**Duct mount and cable probe models:** the probe of the HF62 is equipped with a with a metal filter base mod. NSP-ME. The filter cartridge must be ordered separately (see Accessories 11.6). Filter cartridge mod. SP-M15 is suitable for most applications.

### 3.7 Direct RTD option

As an option, the HF62 can be ordered with the Pt100 RTD normally used by measuring circuit 2 directly connected by 4-wires to a terminal block located on the transmitter PCB. In this case, the electronics of the HF62 consist of just one circuit corresponding to humidity.

## 4 User configurable settings and functions

The HF62 ships configured as specified on the customer order. Models with analog outputs can be installed and used just as any conventional humidity and temperature transmitter and most users will never need to use the HF62 configurable settings and functions. Models with a digital interface generally require some configuration by the user.

Making use of the HF62 configurable settings and functions is entirely up to the user and the appropriate settings depend on the user application. We have provided below a short description of the HF62 functions and also indicated the factory default settings.

**IMPORTANT: the HF62 functions are limited to circuit 1 only (humidity and temperature measured by the Pt100 RTD used to compensate the humidity sensor).**



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## 4.1 Function overview

MEASUREMENT ACCURACY AND RELIABILITY	
AirChip 3000 Functions	Description
▶ Humidity / temperature adjustment	<ul style="list-style-type: none"> <li>○ 1-point or multi-point humidity calibration or adjustment</li> <li>○ 1-point or 2-point temperature calibration or adjustment</li> <li>○ Generate a time stamp for calibrations and adjustments</li> <li>○ Retain and view last adjustment date and adjustment values</li> <li>○ Generate calibration and adjustment protocols</li> </ul>
▶ Automatic humidity sensor test and optional drift compensation	<p>Tests the humidity sensor for drift caused by contaminants and can be used to automatically apply a correction. The test is automatically carried out at regular intervals of time. Can be configured, enabled, or disabled</p> <p>The humidity sensor status can be verified either with the HW4 software or with the instrument display (if available) and is shown as Good, SQ-tuned (corrected for drift) or Bad (defective)</p>
▶ Data recording	<p>The data recording function differs from a true data logging function in the sense that the AirChip 3000 does not time stamp the data. This data recording function can be used to investigate events such as a sensor malfunction as well as to retrieve data that would otherwise be lost</p> <ul style="list-style-type: none"> <li>○ Start or stop data recording - up to 2000 value pairs (%RH and temperature). Starting a recording session erases all previously recorded data</li> <li>○ The recording mode and log interval can be specified</li> <li>○ When the device is powered off, the recording session is paused but not ended. As long as the recording session has not been ended, the device automatically resumes recording data when powered up again</li> <li>○ The recorded data can be downloaded to a PC with the HW4 software, time stamped and viewed</li> </ul>

MEASUREMENT LOOP VALIDATION	
AirChip 3000 Functions	Description
▶ Simulator mode	Used to make the HF62 generate fixed values for the humidity, temperature and calculated parameter. Can be configured, enabled or disabled

DEVICE SAFEGUARDS	
AirChip 3000 Functions	Description
▶ Device write protection	Used to protect the HF62 with a password to prevent unauthorized digital access by a digital user. Can be configured, enabled or disabled
▶ Internal menu access from keypad	Used to prevent accidental changes to the HF62 settings and temperature-humidity adjustment by disabling the MENU key on the optional keypad. Can be enabled or disabled

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PROCESS PROTECTION / PROTECTION OF OTHER DEVICES	
AirChip 3000 Functions	Description
▶ Limit humidity output to 100 %RH	Used to prevent the humidity signal from exceeding 100 %RH when condensation forms on the sensor. Can be enabled or disabled
▶ Out-of-limit value alarm	Used to specify the normal range for humidity, temperature and the calculated parameter depending on the user application. Can be configured, enabled or disabled  Out-of-limit values trigger a digital alarm which can be also be seen on the optional display
▶ Bad sensor alarm	Built-in function. Cannot be disabled  A bad humidity or temperature sensor triggers a digital alarm which can be also be seen on the optional display
▶ Fail safe mode	Used to specify a "safe" fixed value for humidity and for temperature in the event of a sensor failure. Can be configured, enabled or disabled

## 4.2 Factory default settings

### Notes:

- Configuration of the HF62 by the user and access to its functions requires a PC with the ROTRONIC HW4 software (version 2.1.1 or higher) installed. Service cable AC3006 or AC3009 is used to connect the HF6 service connector to a USB port of the PC.
- Settings and functions that can also be either partially or fully accessed from the optional keypad are marked with the letter **K** (see also Operation > Internal Menu).

Configurable Settings		Factory default
Unit system (Metric or English)	<b>K</b>	As per ordering code
Psychrometric calculation		As per ordering code
Output 1 parameter, scale and unit		As per ordering code (%RH or DP)
Output 2 parameter, scale and unit		Temperature, unit as per ordering code
Display resolution (optional)		1 decimal
Displayed parameters	<b>K</b>	As per ordering code
Trend indicator (display)		Enabled
Device name		Instrument model

Functions		Factory default
Humidity / temperature adjustment	<b>K</b>	
Device write protection		Disabled
Menu access from keypad		Enabled
Limit humidity output to 100 %RH		Enabled
Out-of-limit value digital / display alarm		Disabled
Data recording	<b>K</b>	Enabled (loop mode – 10 min. interval)
Automatic humidity sensor test		Disabled

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Functions	Factory default
Humidity sensor drift compensation	Disabled
Fail safe mode	Disabled
Simulator mode	Disabled

- For a detailed description of all AirChip 3000 / HF62 main functions see document **E-T-AC3000-DF-V1**
- Instructions regarding the configuration of the HF62 and access to its functions are provided in the following manuals:
  - E-M-HW4v2-F2-008**
  - E-M-HW4v2-Main** (§ 6.5)
  - E-M-HW4v2-DR-001**
  - E-M-HW4v2-A2-001**
  - E-M-AC3000-CP**
- The factory default setting for dew / frost point calculation is frost point below freezing

## 5 Mechanical installation

### 5.1 General guidelines

Relative humidity is extremely dependent on temperature. Proper measurement of relative humidity requires that the probe and its sensors be at exactly the temperature of the environment to be measured. Because of this, the location where you choose to install the probe can have a significant effect on the performance of the instrument. The following guidelines should guarantee good instrument performance:

- a) **Select a representative location:** install the probe where humidity, temperature and pressure conditions are representative of the environment to be measured.
- b) **Provide good air movement at the probe:** air velocity of at least 200 ft/ minute (1 meter/second) facilitates adaptation of the probe to changing temperature.
- c) **Avoid the following:** (1) Close proximity of the probe to a heating element, a cooling coil, a cold or hot wall, direct exposure to sun rays, etc. (2) Close proximity of the probe to a steam injector, humidifier, direct exposure to precipitation, etc. (3) Unstable pressure conditions resulting from excessive air turbulence.
- d) **Immerse as much of the probe as possible in the environment to be measured.**
- e) **Prevent the accumulation of condensation water at the level of the sensor leads.** Install the probe so that the probe tip is looking downward. If this is not possible, install the probe horizontally.

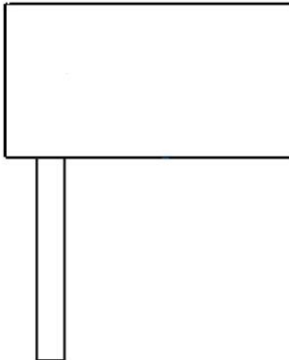
### 5.2 HF62 enclosure

The HF62 enclosure consists of a base and a cover held together with 4 screws. To open the enclosure, use a metric 3 mm hex key. Prior to re-assembling the enclosure, verify that the red seal is sitting properly in its groove on the base.

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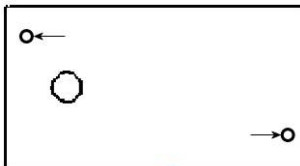
### 5.3 Installation of the enclosure and probe

#### *Mounting position of the enclosure*



The enclosure of the HF62 is designed to be mounted in a horizontal position as illustrated here for the HF62 type W

#### *Mounting hardware for the enclosure (HF62 type W or with cable probe)*



**Method 1:** The HF62 is supplied with 2 screws, 2 drywall anchors and two rubber washers. The base of the enclosure has 2 screw-wells (see drawing) that are normally closed at the bottom. Use the template provided with the HF62 to drill mounting holes in the wall and insert the drywall anchors. Place a rubber washer on each screw. Insert a screw in each well and push to open the bottom of the well.



**Method 2:** When a DIN-rail (35 mm / 1 3/8") is available use part **AC5002** (not included). This is a DIN-rail mounting kit consisting of 2 clamps that attach to the back of the enclosure with the screws provided.

#### *Mounting hardware for the probe (HF62 type D or with cable probe)*



Use parts **AC1303-M** (compression fitting) and **AC1305** (flange) to hold and seal the probe when mounted through a wall (see Accessories).

- The enclosure of the HF62 type D does not require any additional support.
- The enclosure of the HF62 with cable probe can be installed in the same manner as the enclosure of the HF62 type W.

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## 6 Electrical installation

### 6.1 General wiring guidelines

#### ***Power supply wiring***

Heavy machinery and instrumentation should not share the same power supply wiring. If this cannot be avoided, noise filters and surge protectors should be used. Most UPS devices have those features already integrated.

#### ***General guidelines for signal cables***

The following guidelines are derived from European Standard EN 50170 for the transmission of signals by copper wires. When planning an installation, the rules provided by EN 50170 should be followed under consideration of local circumstances to determine the position of machines and equipment.

All ROTRONIC products are tested for Electromagnetic Compatibility according to EMC Directive 2004/106/EG and following European standards:

- EN 61000-6-1: 2001, EN 61000-6-2: 2005
- EN 61000-6-3: 2005, EN 61000-6-4: 2001 + A11

Whenever the level of electromagnetic interference is expected to be high, both the instruments and signal cables should be placed as far away as possible from the source of interference.

In general, signal cables should be installed in bundles or channels / conduits, separate from other cables as indicated in the table below:

<ul style="list-style-type: none"> <li>• Bus signals such as RS485</li> <li>• Data signals for PCs, printers etc.</li> <li>• shielded analog inputs</li> <li>• unshielded direct current (&lt;= 60V)</li> <li>• shielded process signals (&lt;= 25 V)</li> <li>• unshielded alternate current (&lt;= 25V)</li> <li>• coaxial cables for CRT monitors</li> </ul>	<b>in common bundles or channels / conduits</b>
<ul style="list-style-type: none"> <li>• direct current from 60 V to 400 V (unshielded)</li> <li>• alternate current from 25V to 400 V (unshielded)</li> </ul>	<b>in separated bundles or channels / conduits, without minimum distance</b>
<ul style="list-style-type: none"> <li>• direct and alternate current &gt; 400 V (unshielded)</li> <li>• Telephone lines</li> <li>• lines leading into EX-rated areas</li> </ul>	<b>in separated bundles or channels / conduits, without minimum distance</b>

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### Lightning protection

Cabling in areas with a risk of lightning requires a lightning protection. For cabling underground in between buildings, we recommend the use of special fiber optic cables. If this is not possible, use copper cables that are suitable for underground installation.

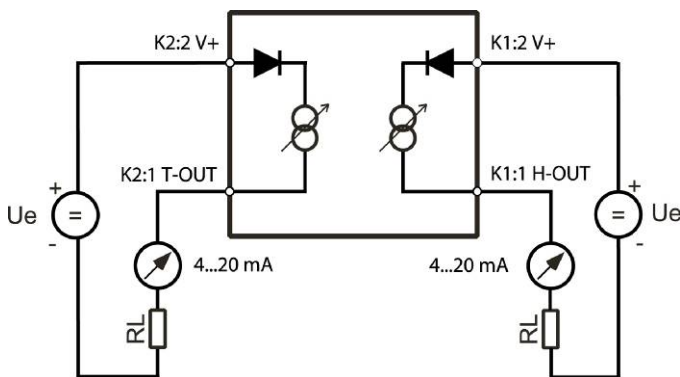
## 6.2 Cable grip and cable specifications

The HF62 is supplied either with one M16 sealing cable grip or with a ½" conduit adapter. The M16 cable grip provides effective sealing only with cables having the proper outside diameter. Preferably, use a cable with an outside diameter of 6 to 7 mm (0.236 to 0.275 inch) with 18 AWG wires.

## 6.3 Wiring

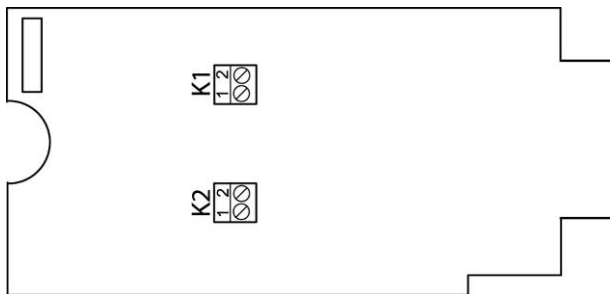
### 6.3.1 HF62 standard: 2 x 2-wire, loop powered transmitter

#### Electrical diagram



The maximum permissible cable length connecting the HF62 to other devices is determined by the total resistance resulting from the addition of the cable resistance and that of the devices connected in series with the unit. On each circuit, this resistance should not exceed 500 ohms.

#### Terminal block diagram



Terminals	Description
K1-1: H-OUT	Relative humidity or dew point (+) OUT-1
K1-2: V+	Power supply: 10...28 VDC (+)
Terminals	Description
K2-1: T-OUT	Temperature output (+) OUT-2
K2-2: V+	Power supply: 10...28 VDC (+)

**Note:** connect the + of the power supply to each of the V+ terminals (K1-1 and K2-1). These terminals are not internally connected.

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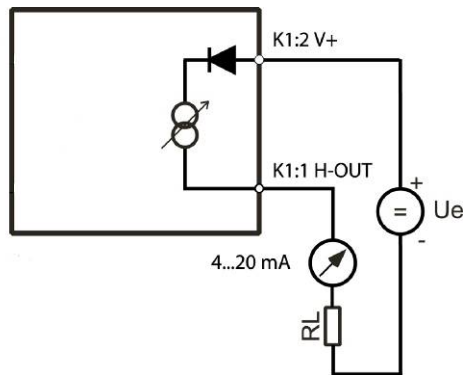
### Measuring humidity or temperature only

Operation of the HF62 does not require both current loops to be closed. When using the HF62 to measure either humidity only or temperature only, power and close only the loop that is being used. Any unused output of the HF62 can be disabled with the ROTRONIC HW4 software.

- Model with LC display: the humidity loop must be closed for the display to operate.

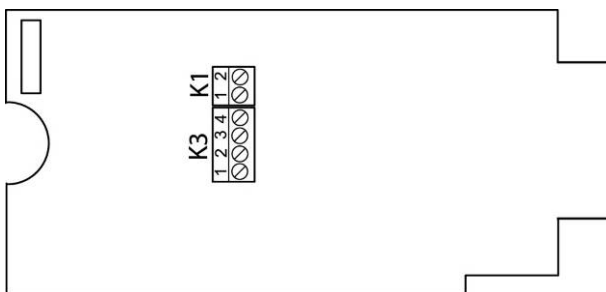
### 6.3.2 HF62 with direct RTD option: 2-wire, loop powered transmitter

#### Electrical diagram



The maximum permissible cable length connecting the HF62 to other devices is determined by the total resistance resulting from the addition of the cable resistance and that of the devices connected in series with the unit. This resistance should not exceed 500 ohms.

#### Terminal block diagram



Terminals	Description
K1-1: H-OUT	Relative humidity or dew point (+) OUT-1
K1-2: V+	Power supply: 10...28 VDC (+)

Terminals	Description
K3-1	Pt100 direct - S
K3-2	Pt100 direct - AS
K3-3	Pt100 direct - AR
K3-4	Pt100 direct - R

### 6.3.3 Grounding

We generally recommend grounding the (-) side of the power supply, especially if the electronics will be subjected to a low humidity environment (35 %RH or less).

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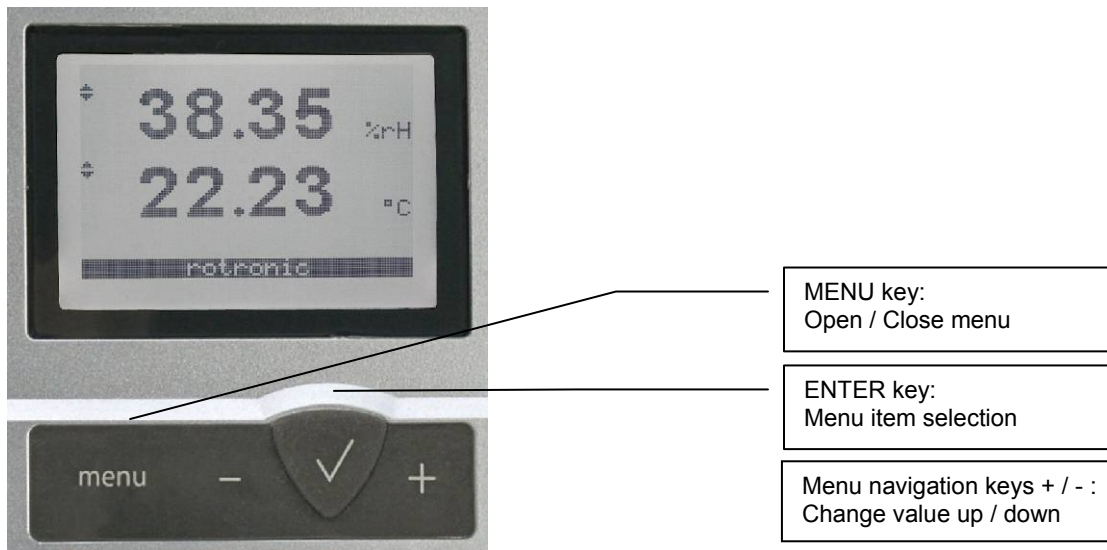
## 7 Operation

If so desired, use the HW4 software to configure the HF62. Complete the mechanical and electrical installation and simply power up the HF62.

### 7.1 Internal menu (optional keypad and display)

#### IMPORTANT:

- The data shown on the LC display of the HF62 as well as the internal menu are generated exclusively by circuit 1 of the HF62 (humidity measuring circuit).
- The temperature data shown on the display as well as settings and functions such as temperature adjustment, data recording, etc. correspond to the Pt100 RTD used by circuit 1 to compensate the effect of temperature on the humidity sensor.
- Data from circuit 2 (temperature) is not shown on the display and the internal menu of this circuit is not accessible to the user.
- Both the LC display and keypad operate only when circuit 1 (humidity) is powered and the output loop is closed.



**Note:** Unauthorized access to the menu can be prevented by disabling the “display menu” setting (use the HW4 software > Device Manager > Display)



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Main Menu	Menu Items	Selections / Information	Notes
<b>Settings</b>			
	<b>Unit</b>	°C / °F	Temperature / dew or frost point
	<b>Record</b>	On / Off	Data recording (max. 2000 values)
<b>Device Information</b>			
	<b>Version</b>	Firmware version	
	<b>Serial Nbr</b>	Serial number	
	<b>Address</b>	RS-485 address	
	<b>Type</b>	Device type	
	<b>Name</b>	Device name	User defined
	<b>SensorTest</b>	Humidity sensor status	Off / Good / SQ-Tuned / Bad
<b>Humidity Adjust</b>			
	<b>RefValue</b>	Humidity reference value	± 0.1 %RH steps
	<b>&lt;Adjust&gt;</b>		1-point adjustment only (offset)
<b>Temperature Adjust</b>			
	<b>RefValue</b>	Temperature reference value	± 0.1 °C steps
	<b>&lt;Adjust&gt;</b>		1-point adjustment only (offset)

- **Record:** both the recording mode (start / stop and the log interval cannot be changed from the menu and are as configured with the ROTRONIC HW4 software
- **SensorTest:** Off means that the humidity sensor has not been tested due to the configuration settings of the test. For a description of the automatic humidity sensor test and drift compensation (SQ-tuning) see documents **E-T-AC3000-DF-V1** and **E-M-HW4v2-F2-008**

## 7.2 Displayed parameters (optional keypad and display)

When the menu is not active, press the ENTER key to change which humidity parameter is shown on the first line of the display:

- Relative humidity
- Dew / frost point (when the calculated parameter is enabled)

## 8 Maintenance

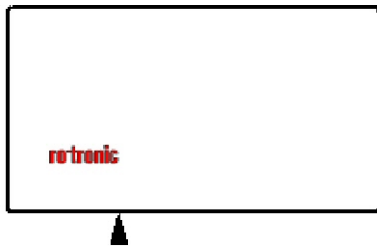
### 8.1 Service cable

- Cable AC3006 is used to connect circuit 1 (humidity) of the HF62 to a USB port of a PC running the ROTRONIC HW4 software.
- As an alternative, cable AC2001 is used to connect circuit 1 (humidity) of the HF62 to a probe input of the HP23 hand-held calibrator. For service purposes, the HP23 offers essentially the same functionality as the HW4 software.

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## 8.2 Location of circuit 1 (humidity) service connector

The service connector (mini-USB type) can be accessed without opening the enclosure after removing the small red sealing cover.



The service connector is located at the bottom of the enclosure (black arrow)

## 8.3 Periodic calibration check

The HF62 consists of two fully independent measuring circuits and the HF62 has two separate mini-USB type service connectors, each corresponding to a separate UART interface.

### 8.3.1 Circuit 1 (humidity):

Long term stability of the ROTRONIC Hygromer humidity sensor is typically better than 1 %RH per year. For maximum accuracy, calibration of the HF62 should be verified every 6 to 12 months. Applications where the probe of the HF62 is exposed to significant pollution may require more frequent verifications.

#### a) Procedure for adjusting circuit 1 of the HF62 from the optional keypad

The optional keypad of the HF62 allows a 1-point adjustment of temperature (see note below) or humidity against a reference. A 1-point adjustment has the effect of adding the same offset to all measured values. A multi-point adjustment is not possible from the keypad and requires using either a PC with the HW4 software installed or another instrument such as the HP23 hand-held calibrator.

*Note: this is the temperature value measured by the Pt100 RTD used by circuit 1 to compensate the effect of temperature on the humidity sensor. This should not be confused with the temperature value measured independently by circuit 2 of the HF62.*

- When the parameter to be adjusted is stable, press the MENU key to show the internal menu on the display
- Use the (-) key to select either H-Adjust or T-Adjust and press the ENTER key
- Make sure that the text line beginning with RefValue is highlighted and press the ENTER key
- Use the (+) or (-) key to change the reference value as desired
- Use the (-) key to highlight the Adjust text line and press the ENTER key
- The HF62 confirms the adjustment with the message "Adjust OK"
- Press the MENU key twice to exit the menu and return the HF62 to normal operation

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**b) Procedure for adjusting circuit 1 of the HF62 with the ROTRONIC HW4 software:**

- Use cable AC3006 to connect the service connector of circuit 1 of the HF62 to a USB port of a PC with the HW4 software installed. Note that the ROTRONIC USB driver must be installed on the PC as explained in the HW4 manual **E-M-HW4v2-Main**.
- Start HW4 on the PC and search for the HF62 (HW4 Main Menu Bar > Devices and Groups > Search for USB Masters).
- After finding the HF62 with HW4, expand the device tree to see the HF62 functions. Select Probe Adjustment.
- For further instructions see HW4 manual **E-M-HW4v2-A2-001**

**8.3.2 Circuit 2 (temperature):**

Both the Pt 100 RTD temperature sensor and associated electronics used by circuit 2 are very stable and should not require any adjustment after the initial factory adjustment. The service connector of circuit 2 not designed to be accessed by the user and is located inside the enclosure on the PCB mounted inside the gray half of the enclosure.

**8.4 Cleaning or replacing the dust filter**

Depending on the conditions of measurement, the filter should be checked from time to time. Corroded, discolored or clogged filters should be replaced.

- If the probe has a removable cartridge, simply replace the cartridge (leave the metal base on the probe).



- If the probe has a plastic slotted cap with a built-in filter element follow these instructions:

1) Unscrew the filter from the probe and pull it straight away, in the alignment of the probe, so as not to catch the humidity and temperature sensors.

2) Before putting on a new dust filter, check the alignment of both sensors with the probe. The wires that connect the sensors to the probe are very thin and bend easily. If necessary, correct the alignment by tapping the sensor very gently with a smooth object such as a small plastic rod. Do not use sharp pliers or tweezers as this could puncture the sensor and do not pull hard on the sensor.

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## 9 Firmware updates

Firmware updates will be available on the ROTRONIC website for downloading. Firmware files are given a name that shows both to which device the file applies and the version number of the firmware. All firmware files have the extension HEX.

Procedure for updating the firmware:

- Use cable AC3006 to connect the service connector of the HF62 circuit 1 to a USB port of a PC with the ROTRONIC HW4 software installed. Note that the ROTRONIC USB driver must be installed on the PC as explained in the HW4 manual **E-M-HW4v2-Main**.
- Copy the firmware update file from the ROTRONIC website to the PC.
- Start HW4 software on the PC and search for the HF62 (HW4 Main Menu Bar > Devices and Groups > Search for USB Masters).
- After finding the HF62, expand the device tree to see the HF62 functions. Select Device Manager. In the Device Manager menu bar select Tools > Firmware Update. For instructions see document **E-M-HW4v2-F2-008**

**Note:** *The firmware of circuit 2 of the HF62 should be updated by the factory or by an authorized representative.*

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## 10 Technical data

### 10.1 Specifications

General	HF62
Device type	Humidity temperature transmitter with analog output signals
Circuit type	Two independent 2-wire, loop powered circuits
Mechanical configuration types	D and W

Power supply and connections	HF62
Supply voltage (VDD)	10...28VDC V min = 10 V + (0.02 x Load*) *Load resistance in ohms.
Nominal current consumption (low voltage models)	2 x 20 mA
Cable fittings	Terminal block and M16 cable grip or ½" conduit adapter
Polarity protection (low voltage models)	Protective diode on V+

Humidity measurement	HF62
Sensor	ROTRONIC Hygromer <sup>®</sup> IN1
Measuring range	0...100 %RH
Measurement accuracy at 23 °C	±1.0 %RH
Repeatability	0.3 %RH
Long term stability	< 1 %RH / year
Sensor time constant	Typical 10 sec, 63% of a 35 to 80 %RH step change (1m/sec air flow at sensor)

Temperature measurement	HF62
Sensor	Pt100 RTD, IEC 751 1/3 class B
Measuring range limits	-100...150 °C / -148...302 °F
Measurement accuracy at 23 °C	±0.2 °C
Repeatability	0.05°C
Long term stability	< 0.1°C / year
Sensor time constant	Typical 4 sec, 63% of a step change (1m/sec air flow at sensor)

Calculated parameters	HF62
Psychrometric calculations	Dew or frost point (user configurable option)

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<b>Start-up time and data refresh rate</b>	<b>HF62</b>
Start-up time	3.4s (typical)
Data refresh rate	3.4s (typical)

<b>Configurable analog outputs</b>	<b>HF62</b>
Output 1	Can be made to correspond to any parameter
Factory default parameter	Relative humidity or dew / frost point
Factory default scale	As per ordering code
Output 2	Can be made to correspond to any parameter
Factory default parameter	Temperature
Factory default scale	As per ordering code
Output 1 and Output 2	
Signal type	4...20 mA
User configurable scaling limits	-999.99 ... +9999.99 engineering units
Maximum offset at bottom of signal range	no offset
Short circuit tolerant	Yes
Maximum external load	500 $\Omega$
Minimum external load	0 $\Omega$

<b>Service connector</b>	<b>HF62</b>
Interface type	UART
Maximum service cable length	5 m (16.4 ft)

<b>General specifications</b>	<b>HF62</b>
Optional display	LC, 1 or 2 decimals resolution, no backlight, trend and alarm indication
Probe material	Polycarbonate
Probe dust filter material	Polyethylene
Housing material	ABS
Housing protection grade	IP 65
Physical dimensions	See Models
Weight	300 g (10.6 oz)

<b>Conformity with standards</b>	<b>HF62</b>
CE / EMC immunity	EMC Directive 2004/108/EG: EN 61000-6-1: 2001, EN 61000-6-2: 2005 EN 61000-6-3: 2005, EN 61000-6-4: 2001 + A11
Solder type	Lead free (RoHS directive)
Fire protection class	Corresponds to UL94-HB
FDA / GAMP directives	compatible

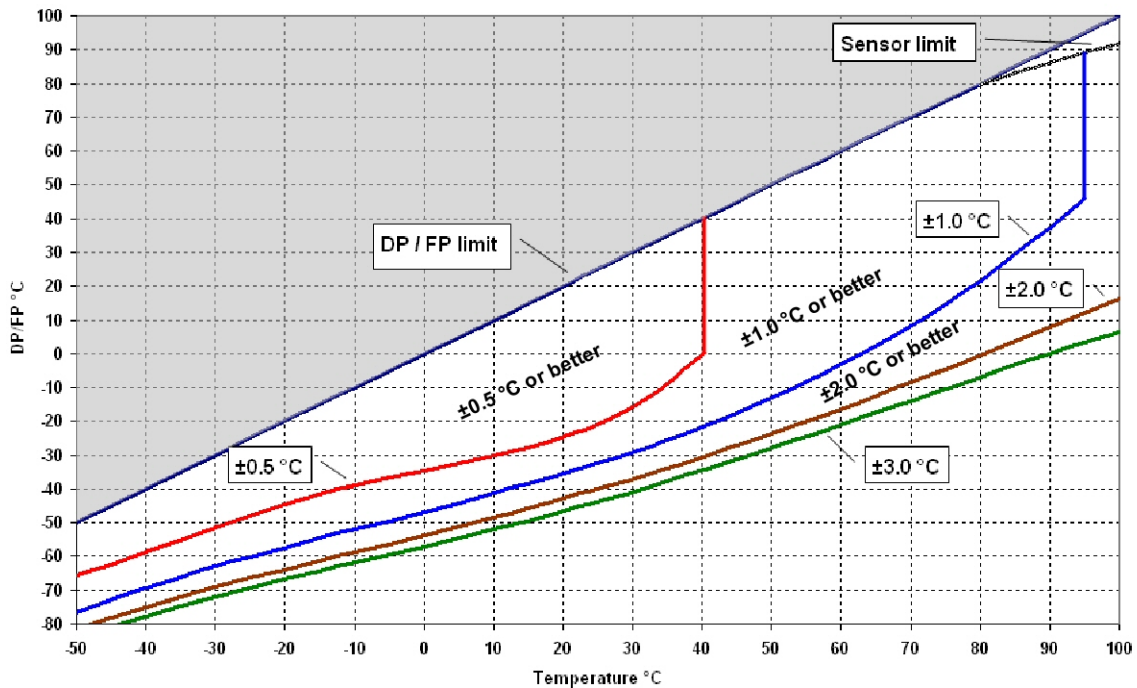
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Environmental limits	HF62
Storage and transit	-50...+70 °C / -20...+70 °C (models with display), 0...100 %RH, non condensing
Operating limits at electronics	-40 ... +60 °C / -10...+60 °C (models with display), 0...100 %RH, non condensing
Temperature limits at probe	-100...+150 °C (valid for type D and type 2 – cable probe)
Maximum humidity at sensor	100 %RH up to 80 °C (176 °F) 75 %RH at 100 °C (212 °F) 45 %RH at 125 °C (260 °F) 15 %RH at 150 °C (302 °F)
Maximum air velocity at probe	40 m/s (7,870 ft /min) – depends on dust filter type
Critical environments	Humidity sensor: as per DV04-14.0803.02 - Critical chemicals

## 10.2 Dew point accuracy

The HF62 can be configured to calculate either the dew point or frost point based on the measurement of relative humidity and temperature. The accuracy of this conversion varies, depending on the humidity and temperature conditions as shown in the graph below:

DPI/FP Accuracy



**Example:** at a temperature of 20 °C, a frost point value of -25 °C is measured with an accuracy of  $\pm 0.5$  °C or better.

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## 11 Accessories

### 11.1 Configuration and communication software

The ROTRONIC HW4 software (version 2.1.0 or higher) allows configuring the HF62. HW4 is compatible with Windows XP, Vista and NT4 with SP6a or higher. For more details see separate instruction manual provided with the software.

Order Code	Description
<b>HW4-E</b>	HW4 software, Standard Edition ( single user)
<b>HW4-P</b>	HW4 Professional Edition, ERES regulations compliant (FDA / GAMP), multi user

### 11.2 Service cables

Order Code	Description	
<b>AC3006</b>	Mini-USB service connector (UART) to a PC USB port. Cable electronics convert UART interface to USB interface. Approximate length: 1.7 m  HF6 must be powered	
<b>AC2001</b>	Mini-USB service connector (UART) to 7-pin probe connector of the HP23 hand-held calibrator or other instrument with display and keypad. Approximate length: 1.7 m  HF6 must be powered	



#### IMPORTANT:

- Prior to using cable AC3006 the ROTRONIC USB driver must be installed on the PC (available from the HW4 CD or from [www.rotronic-humidity.com](http://www.rotronic-humidity.com). For installation instructions see document **E-M-HW4v2-Main** (§ 6.3).



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### 11.3 Mounting hardware

Order Code	Description	
<b>AC5002</b>	DIN-rail mounting kit consisting of 2 clamps that attach to the back of the enclosure with the screws provided.  DIN-rail (35 mm / 1 3/8") not included	
<b>QMA-15</b>	Consists of mounting flange (AC1305) and compression fitting (AC1303-M) for 15 mm / 0.6" diameter probe.  Use for tough wall installation of the HF6 type D  Maximum temperature 200 °C (392°F)	


### 11.4 Calibration accessories

Order Code	Description
<b>EA00-SCS</b>	0.5 %RH humidity std, SCS cert., pack of 5
<b>EA05-SCS</b>	5 %RH humidity std, SCS cert., pack of 5
<b>EA10-SCS</b>	10 %RH humidity std, SCS cert., pack of 5
<b>EA20-SCS</b>	20 %RH humidity std, SCS cert., pack of 5
<b>EA35-SCS</b>	35 %RH humidity std, SCS cert., pack of 5
<b>EA50-SCS</b>	50 %RH humidity std, SCS cert., pack of 5
<b>EA65-SCS</b>	65 %RH humidity std, SCS cert., pack of 5
<b>EA80-SCS</b>	80 %RH humidity std, SCS cert., pack of 5
<b>EA95-SCS</b>	95 %RH humidity std, SCS cert., pack of 5
<b>ER-15</b>	Calibration device for 15mm diameter probes


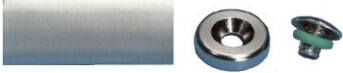

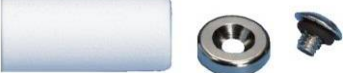
For instructions regarding the ROTRONIC humidity standards and calibration devices see document **E-M-CalBasics**.

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## 11.5 Dust filters for wall mount models

Order Code	Slotted cap	Filter insert	
NSP-PCB-PE	Polycarbonate, black	Polyethylene	
NSP-PCB-WM		Wire mesh	
NSP-PCB-TF		Teflon	

## 11.6 Dust filter parts for duct mount and cable probe models

Order Code	Description	
NSP-ME	Filter base Nickel plated brass HC2 thread Filter Cartridge not included	
SP-M15	Wire mesh filter cartridge Use with NSP-ME or SP-MSB15	
SP-S15	Sintered steel filter cartridge Use with NSP-ME or SP-MSB15	
SP-T15	Teflon filter cartridge Use with NSP-ME or SP-MSB15	

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## 12 Supporting documents

Document File Name	Contents
<b>E-T-AC3000-DF-V1</b>	AirChip 3000 Description and Main Functions
<b>E-M-HW4v2-DIR</b>	List of the HW4 manuals
<b>E-M-HW4v2-Main</b>	HW4 software version 2: General instructions and functions common to all devices
<b>E-M-HW4v2-F2-008</b>	HW4 software version 2: Device Manager - HF6 transmitters
<b>E-M-HW4v2-A2-001</b>	HW4 software version 2: Probe Adjustment function AirChip 3000 devices
<b>E-M-HW4v2-DR-001</b>	HW4 software version 2: Data Recording Function AirChip 3000 Devices
<b>E-M-AC3000-CP</b>	AirChip 3000 Communication Protocol
<b>E-M-CalBasics</b>	Temperature and humidity calibration basics
<b>E-T-HumiDefs</b>	Humidity Definitions Instructions for using the ROTRONIC humidity standards

**Note:** All document file names have an extension corresponding to the document release number (example of a first release: E-M-HW4v2-Main\_10). This extension is not shown in the above table.

## 13 Document releases

Doc. Release	Date	Notes
_10	Dec. 5, 2008	Original release
_11	Feb. 4, 2009	Deleted service cables AC3008 and AC3009 Reference to HW4 manuals: changed the file name of all documents such as E-M-HW4v2.1-Main to E-M-HW4v2-Main