HygroFlex5-EX
Humidity & Temperature Transmitter

Instruction Manual

Contents

1 General Information

This document is available in other languages on the website www.rotronic.com.

This manual applies to all devices in the HygroFlex5-EX series with firmware version 3.0 and later. Changes to the last digit of the version number reflect minor firmware changes that do no affect the manner in which the device works.

1.1 About This Manual

This instruction manual provides information on installation, operation and maintenance of the HygroFlex5-EX humidity and temperature transmitter.

1.2 Document Versions

Document Version	Date	Notes
V1_01	February 2014	Original release
V1_02	June 2014	Various additions
V1_05	July 2014	Additions by electrosuisse (certification body)
V1_06	July 2014	Linguistic amendments
V1_07	January 2015	Stylistic improvements
V1_08	June 2015	Probe: Extension of Tamb to +85°C. New temperature class: T4 or 110°C
V1_09	July 2015	Material identification
V1_10	October 2015	Graphic Adaption
V1_11	April 2017	Electro schematic, analog outputs description Corrections chapter: 5.2 ; 5.3 ;11
V1_12	April 2018	Add new pictures on page 10.
V1_13	March 2020	Correcting description for the connection of the Terminals on page 13

1.3 Supporting Documents

Document File Name	Contents
E-M-HW4v3-DIR	List of HW4 manuals
E-M-HW4v3-Main	HW4 software version 3.4: General instructions and functions common to all devices
E-M-CalBasics	Principles of temperature and humidity calibration Instructions on use for ROTRONIC humidity standards
E-T-HumiDefs	Humidity definitions
DV04-14.0803.02	Critical chemicals

Note: All document file names have an extension corresponding to the document release number (example: E-M-HW4v3-Main_15). This extension is not shown in the above table.

2   Overview

The HygroFlex5-EX series of humidity & temperature transmitters is designed for fixed installation in applications where high measurement accuracy is required. The transmitters can be used with all ROTRONIC ATEX probes in the AirChip 3000 series. Standard probes may not be used.

The HygroFlex5-EX has two analog current outputs for relative humidity, temperature or a derived parameter, e.g. dew point, enthalpy, mixing ratio, etc. The HygroFlex5-EX transmitter has an internal digital service interface. Digital communication with a PC allows simultaneous monitoring of three parameters: relative humidity, temperature and calculated value. The HygroFlex5-EX can measure within the ranges of 0 to 100 %RH and 100 to 200°C (-148 to 392°F). The working temperature range of the electronics is limited to -40 ... 60°C (-10 ... 60°C with optional LCD).

The probes are equipped with proven, durable sensors.

- User-configurable adjustments
- Calculation of humidity parameters such as dew point or frost point
- Interchangeable probes for humidity and temperature calibration and adjustment outside Ex zones
- Simulator mode
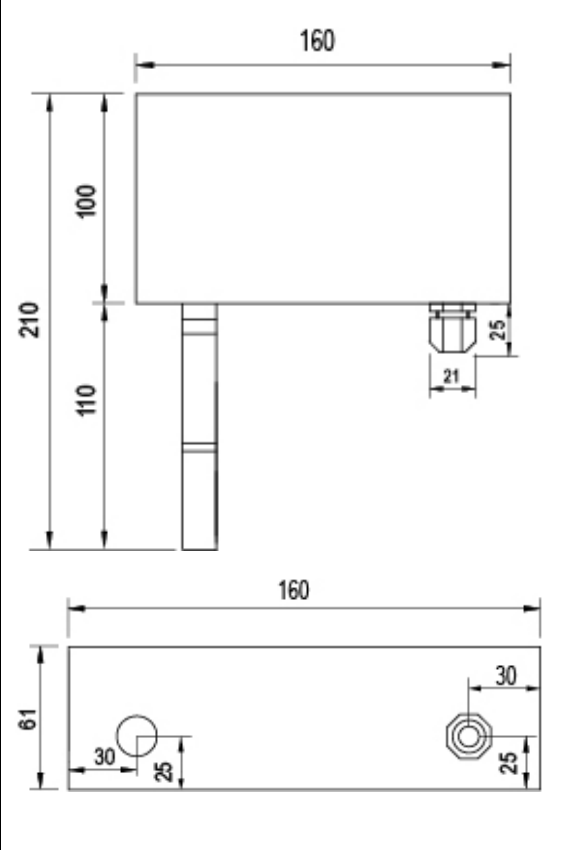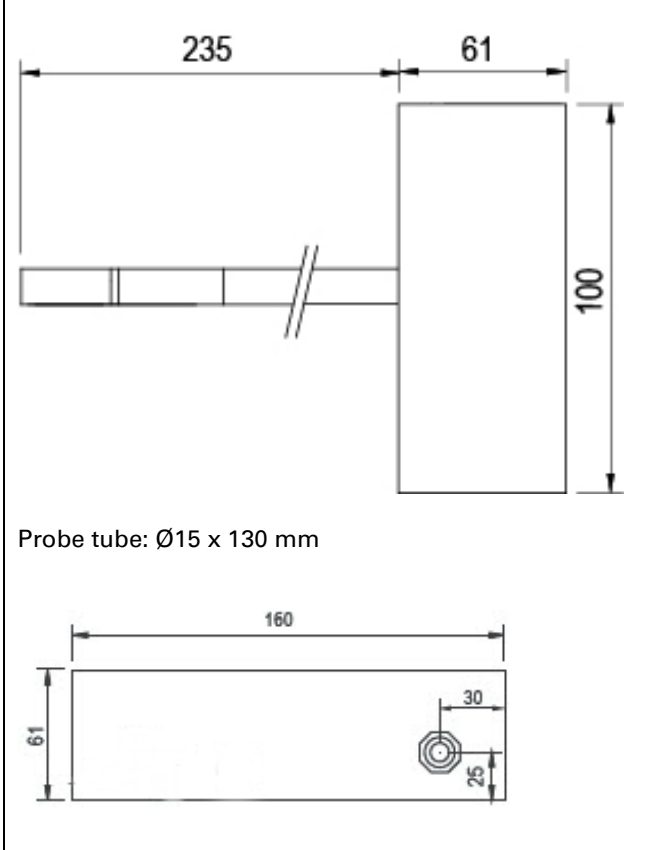
Simple updating of the firmware for both the HygroFlex5-EX transmitter as well as the Hygroclip-2 probe keeps the devices in the HygroFlex5-EX series up to date with improved functionality.
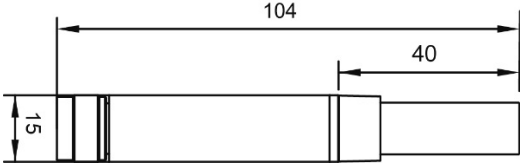
Note:
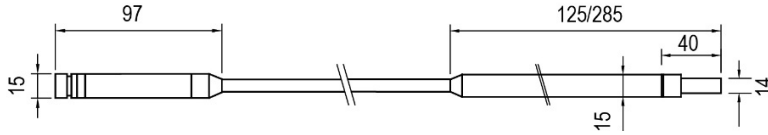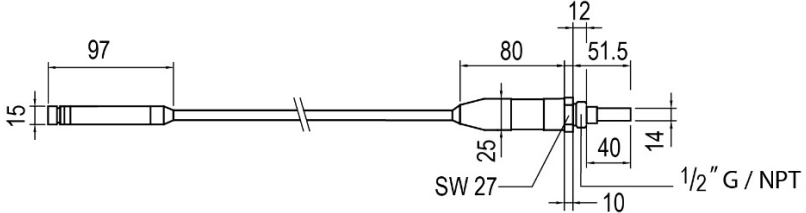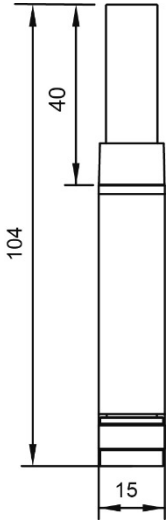- The housings for all types with display are designed for horizontal mounting.

2.1 Mechanical Configurations and Dimensions

Wall Version HF520-EX-Wxxxxxxx	Duct Version HF520-EX-Dxxxxxxx
	  Probe tube: Ø15 x 130 mm

Wall Version Combinable with Probe

HC2-SM-EX

HC2-IM102-EX (cable probe 2 m, probe length 125 mm)
HC2-IM105-EX (cable probe 5 m, probe length 125 mm)
HC2-IM110-EX (cable probe 10 m, probe length 125 mm)
HC2-IM302-EX (cable probe 2 m, probe length 285 mm)
HC2-IM305-EX (cable probe 5 m, probe length 285 mm)
HC2-IM310-EX (cable probe 10 m, probe length 285 mm)

HC2-IE102-EX (screw-in probe with 1/2'' G thread, cable length 2 m)
HC2-IE105-EX (screw-in probe with 1/2'' G thread, cable length 5 m)
HC2-IE110-EX (screw-in probe with 1/2'' G thread, cable length 10 m)
HC2-IE302-EX (screw-in probe with 1/2'' NPT thread, cable length 2 m)
HC2-IE305-EX (screw-in probe with 1/2'' NPT thread, cable length 5 m)
HC2-IE310-EX (screw-in probe with 1/2'' NPT thread, cable length 10 m)

Duct Version Combinable with Probe:

HC2-SM-EX

2.2   Display and Keypad Option

The optional LCD does not have a backlight.

The first line of the display shows the relative humidity and the second line the temperature (or a calculated value, e.g. dew point, frost point, ...).

The display can be configured to show a trend indicator at the start of every line:

▲: Increasing value
▼: Decreasing value

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

3 General Description

3.1 Commissioning

HygroFlex5-EX (two-wire current loop, loop-powered): 10 ... 28 VDC depending on the loads connected to the outputs. The minimum supply voltage can be calculated as follows:

V min = 10 V + (0.02 A x load*)   *Load resistance in ohms.

The minimum supply voltage for the maximum load of 500 Ω is 10 V + (0.02 A x 500 Ω) = 20 VDC. If both output circuits are closed, the maximum current consumption is 40 mA.

The device must be properly closed when in operation in order to achieve explosion protection.

3.2 Calculated Parameters

The HygroFlex5-EX reads out the data of the connected probe.
The user can configure the HygroFlex5-EX with the ROTRONIC HW4 software to calculate one of the following parameters:

o Dew point (Dp) above and below freezing point
o Frost point (Fp) below freezing point and dew point above freezing point
o Wet-bulb temperature (Tw)
o Enthalpy (H)
o Vapor concentration (Dv)
o Specific humidity (Q)
o Mixing ratio by weight (R)
o Vapor concentration at saturation (Dvs)
o Vapor partial pressure (E)
o Vapor saturation pressure (Ew)

Note: Some of the above-mentioned parameters depend on the value of the atmospheric air pressure.
The user can define a fixed atmospheric air pressure value with the ROTRONIC HW4 software.

3.3 Analog Output Signals

Using the ROTRONIC HW4 software, each of the two analog output signals can be assigned to one of the following parameters:

• Measured relative humidity (%RH)
• Measured temperature (°C/°F)
• Calculated parameter (see 3.2)

The scale of each analog output can be set within the numerical limits of -999.99 and 9999.99.
The analog output signals are generated by 16-bit D/A converters.

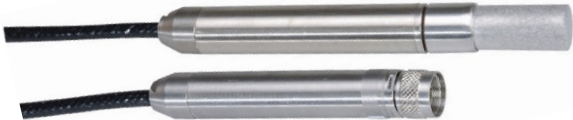## 3.4 Service Connector

The service connector (UART interface with mini-USB port) allows connection of the HygroFlex5-EX
to a PC running the ROTRONIC HW4 software. A service cable is needed for this. See chapter 7 "Maintenance" for the location of the service connector and the type of service cable.

• The service connector is used for configuration and for updating the firmware of the HygroFlex5-EX.

3.5 Probes

The HygroFlex5-EX may only be operated with the following ATEX probe models:

HC2-SM-EX (standard probe)	HC2-IM102-EX (cable probe 2 m, probe length 125 mm) HC2-IM105-EX (cable probe 5 m, probe length 125 mm) HC2-IM110-EX (cable probe 10 m, probe length 125 mm) HC2-IM302-EX (cable probe 2 m, probe length 285 mm) HC2-IM305-EX (cable probe 5 m, probe length 285 mm) HC2-IM310-EX (cable probe 10 m, probe length 285 mm)
HC2-IE102-EX (screw-in probe with 1/2'' G thread, cable length 2 m) HC2-IE105-EX (screw-in probe with 1/2'' G thread, cable length 5 m) HC2-IE110-EX (screw-in probe with 1/2'' G thread, cable length 10 m) HC2-IE302-EX (screw-in probe with 1/2'' NPT thread, cable length 2 m) HC2-IE305-EX (screw-in probe with 1/2'' NPT thread, cable length 5 m) HC2-IE310-EX (screw-in probe with 1/2'' NPT thread, cable length 10 m)	HC2-LDP102-EX (low-dew point probe -60…20, screw-in probe with 1/2" G thread, cable length 2 m) HC2-LDP-105-EX (low-dew point probe -60…20, screw-in probe with 1/2" G thread, cable length 5 m) HC2-LDP-110-EX (low-dew point probe -60…20, screw-in probe with 1/2" G thread, cable length 10 m)

3.6 Function Overview

Outputs	
Functions	**Description**
► Humidity and temperature measurement	The connected probe is read out digitally and its measured values shown and outputted at the analog outputs.

Measurement Loop Validation	
Functions	**Description**
► Operation in simulator mode	Generation of fixed values for humidity, temperature and the calculated parameter. Can be configured, enabled or disabled.

Safety	
Functions	**Description**
► Write protection	Protection against unauthorized digital access. Can be configured, enabled or disabled.
► Menu access from keypad	Used to prevent accidental or unauthorized changes to the system settings by disabling the MENU key. Can be enabled or disabled
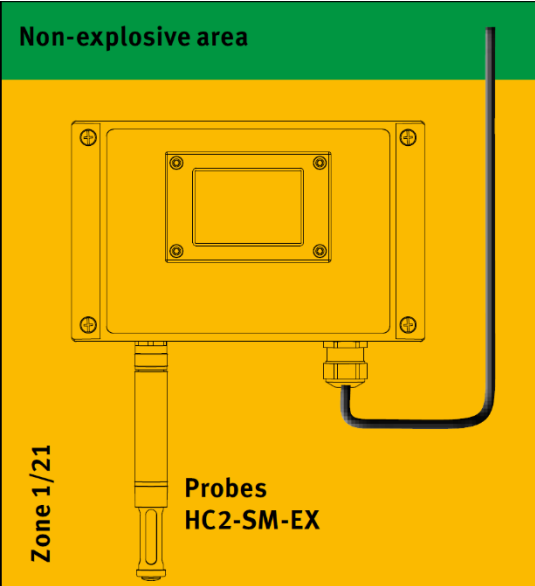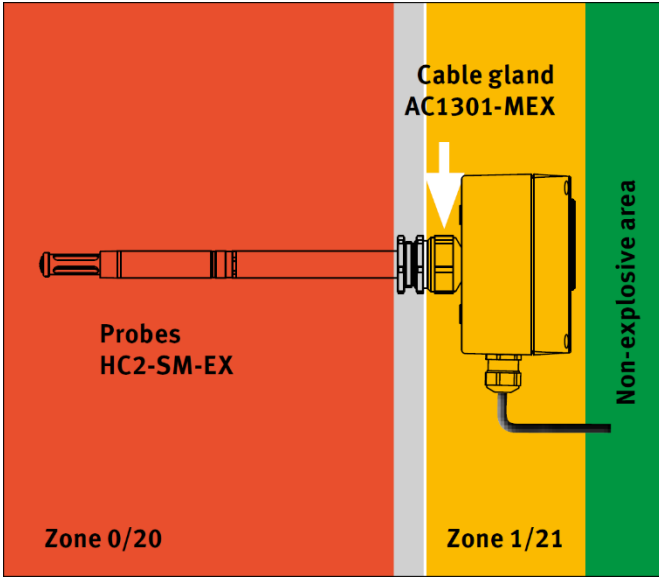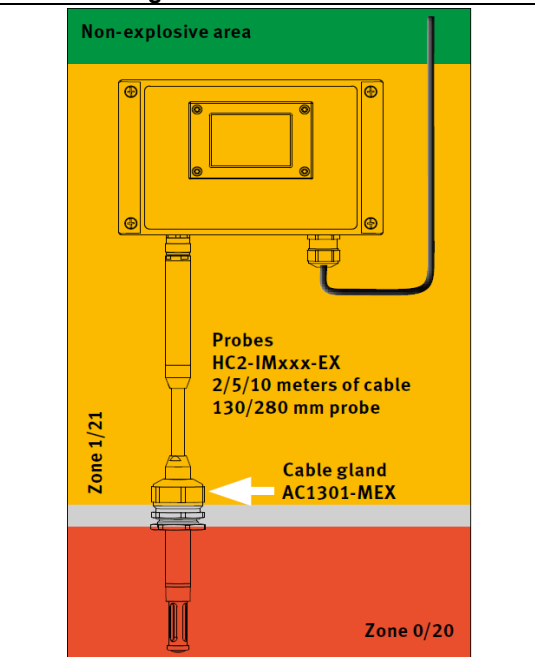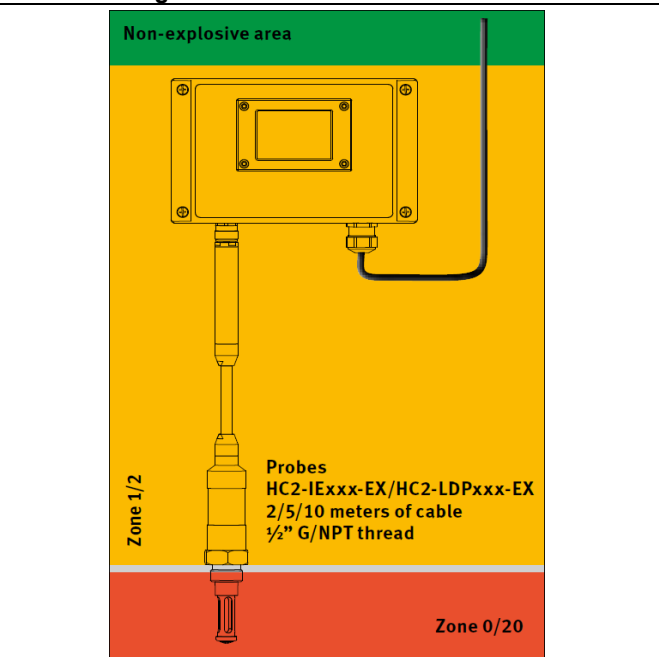
PROCESS PROTECTION / PROTECTION OF OTHER DEVICES	
Functions	**Description**
► Limit humidity to 100 %RH	This function prevents the humidity signal from exceeding 100 %RH when condensation forms on the sensor. Can be enabled or disabled
► Out-of-limit value alarm	Used to define the normal range for humidity, temperature and the calculated parameter, dependent on the application. Out-of-limit values trigger a digital alarm. Can be configured, enabled or disabled.
► Fixed value on alarm	Used to define a fixed output value for temperature or humidity in the event of a defective sensor or quality alarm. Can be configured, enabled or disabled.

4 Mechanical Mounting / Dismounting

4.1 Zone Plan

Applies to gas (Zone 0/1/2) and dust (20/21/22)

Wall Mounting	Duct Mounting
	  Use the accessory AC1301-MEX (mounting gland for 15 mm ATEX probes) for zone separation.
Wall Mounting With Cable Probe	**Wall Mounting With Screw-In Probe**
  Use the accessory AC1301-MEX (mounting gland for 15 mm ATEX probes) for zone separation.	 The screw-in probe itself sees to zone separation.

4.2   General Guidelines

Relative humidity is very dependent on temperature. Proper measurement of relative humidity requires
that the probe and its sensor have exactly the same temperature as the environment that is to be measured.
For this reason, the location where the probe is installed can have a significant influence on the measuring
accuracy of the device.
The following guidelines should guarantee good device performance:

a) **Select a representative location**: install the probe where humidity, temperature and pressure conditions
   are representative of the environment to be measured.

b) **Ensure there is good air movement at the probe**: an air velocity of at least 1 meter/second
   (200 ft/minute) facilitates quick adaptation of the probe to changing temperature.

c) **Avoid the following:**
   (1) Close proximity of the probe to a heating element, cooling coil, cold or hot walls,
       direct exposure to sunlight, etc.
   (2) Close proximity of the probe to a steam injector, humidifier, direct exposure to precipitation, etc.
   (3) Unstable pressure conditions resulting from high air turbulence.

d) **Immerse as much of the probe as possible in the environment to be measured.**

e) **Prevent an accumulation of condensation water in the area of the sensor leads.**
   For this, operate the probe with the probe tip pointing downwards. If this is not possible,
   install the probe horizontally.

4.3   Housing

The housing consists of a base and a cover held together with four screws.
A size 4 flat-tip screwdriver or size 3 cross-tip screwdriver should be used to mount and dismount the cover.

4.4   Mounting of the HygroFlex5-EX (Duct Mounting)

HygroFlex5-EX type D (D=Duct)
With / Without keypad and display

Mounting Hardware

The mounting gland (AC1301-MEX) was
developed for fastening of the probe tube
of the HF520-EX type D to a duct. The
HF520-EX requires no further support.

4.5   Mounting of the HygroFlex5-EX (Wall Mounting)

HygroFlex5-EX type W (W=Wall)
With / Without keypad and display

5   Electrical Installation

5.1   General Guidelines for Wiring
Power Supply Wiring

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

General Guidelines for Signal Cables

The following guidelines are derived from the 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 the EMC Directive 2014/30/EU. Please see for more details Conformity on the Rotronic website.

Whenever the level of electromagnetic interference is expected to be high, both the devices 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 (see table on page 13):

• Bus signals such as RS485 • Data signals for PCs, printers etc. • Shielded analog inputs • Unshielded direct current (<= 60 V) • Shielded process signals (<= 25 V) • Unshielded alternating current (<= 25 V) • Coaxial cables for CRT monitors	**in common bundles or channels / conduits**
• Direct current from 60 V to 400 V (unshielded) • Alternating current from 25 V to 400 V (unshielded)	**in separated bundles or channels / conduits, without minimum distance**
• Direct and alternating current > 400 V (unshielded) • Telephone lines • Lines leading into EX-rated areas	**in separated bundles or channels / conduits, without minimum distance**

5.2   ATEX Guidelines for Wiring

According to EN60079-14. According to ATEX, no SELV Power Supply is required. (SELV supply= with limited transients).

5.3   Wiring

5.3.1   *HygroFlex5-EX: Two-Wire Current Loop, Loop-Powered Transmitter*

Connection Terminals

Terminals	Description
K1: CH1-	Rel. Humidity Output 1 (4…20 mA)
K1: CH1+	Power supply: 10 ... 28 VDC
K2: CH2-	Temperature Output 2 (4…20mA)
K2: CH2+	Power supply: 10 ... 28 VDC

Only Humidity or Only Temperature Measurement

The transmitter can also be operated with only one closed measurement loop.

5.3.2 *Electrical schematic*
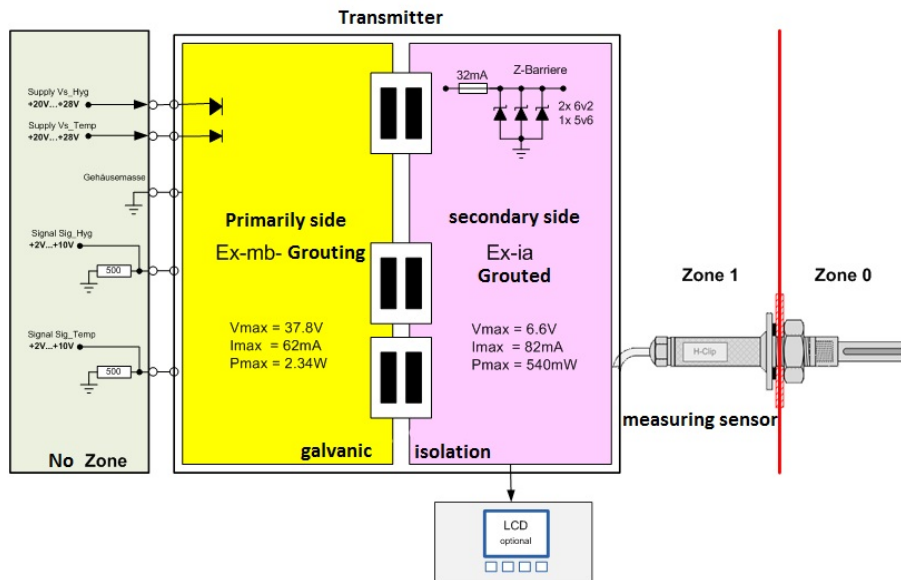
5.3.3 *Grounding*

The HygroFlex5-EX must be grounded with the ground connection on the housing.
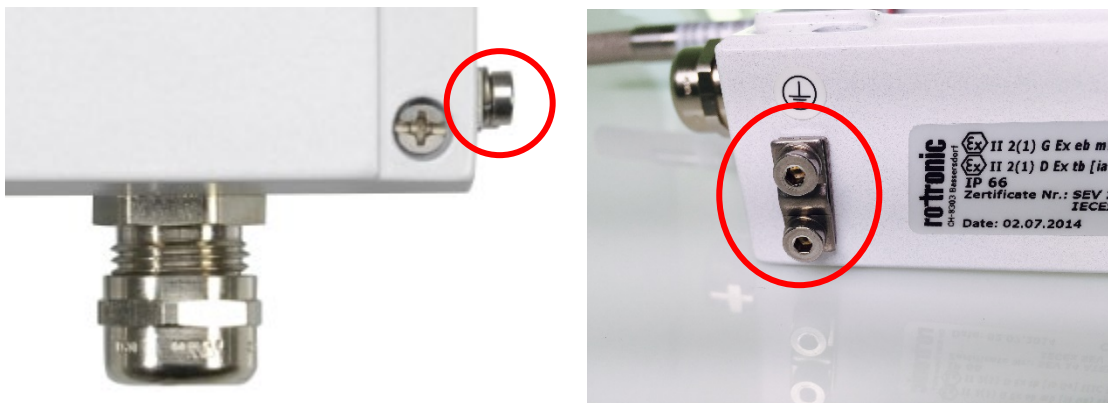
6 Operation

For safe and reliable operation, the device must be mounted as described in chapter 4 and the housing cover properly closed.

6.1 Starting the Device

The device needs about one minute to boot. The message "Please wait" appears in the display after about 20 seconds. In this time both analog signals rise to about 21 mA. The device then starts operation and the analog outputs adjust to the relevant measured value after the first measurement interval.

6.2   Internal Menu (Optional Keypad and Display)

Note: Unauthorized use of the menu can be prevented by locking the setting "Display Menu?" (using the HW4 software > Device Manager > Display).

MENU button: open / close menu

ENTER button: select menu point

Menu navigation buttons: navigation
Change value: increase / decrease
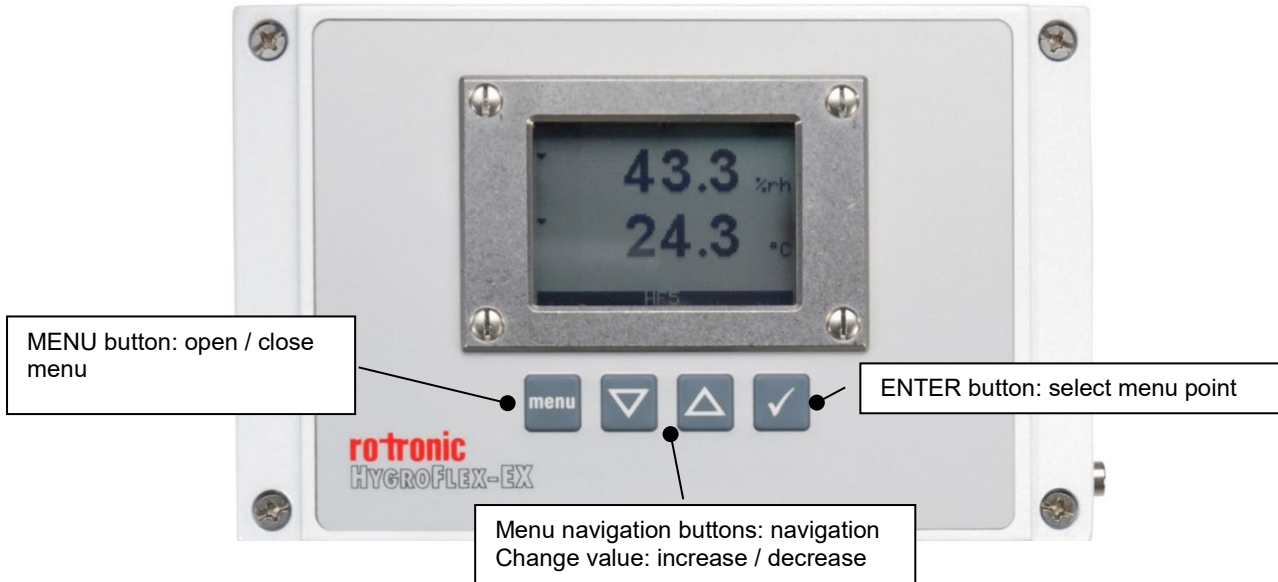
HygroFlex5-EX Transmitter:

Main Menu	Menu Points	Selection / Information	Notes
Device Settings			
	Units	Metric / English	
	Contrast	High / Low	LCD contrast adjustment
	Trend	On / Off	Trend indicator in display
Device Information			
	Version	Firmware version	
	Serial Nbr	Serial number	
	Address	RS-485 address	
	Type	Device type	
	Name	Device name	User defined
Probe Information			
	Version	Firmware version	
	Serial Nbr	Serial number	
	Address	RS-485 address	
	Name	Device name	User defined

6.3   Displayed Parameters (Optional Keypad and Display)

If the menu is not active, press the ENTER button to change to the parameters that are to be shown in the display.

o   Relative humidity and temperature
o   Relative humidity, temperature and calculated parameter (if the calculated parameter is enabled)

7 Maintenance

7.1 Service Cable

The service cable AC3006 is used to connect the HygroFlex5-EX to a USB port of a PC running the ROTRONIC HW4 software.

7.2 Location of the Service Connector (Mini-USB)

**WARNING**: The service interface encircled in red is a UART interface with a mini-USB connector.
Do not connect the service interface directly with a USB port, but only with a service cable AC3006!

WARNING:
The service interface is located inside the housing. To access it, unscrew the four screws of the device cover and remove the cover. The device may not be in an explosive zone during service work!
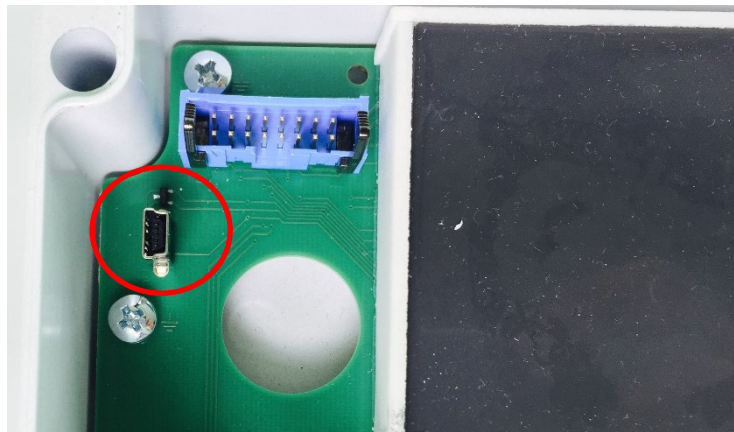
7.3 Periodic Check (Calibration) of the Probe

The Pt-100-RTD temperature sensor and electronics used in the probe have very high long-term stability and do not normally need to be calibrated again after initial factory calibration.

The long-term stability of the Hygromer humidity sensor from ROTRONIC is normally better than 1 %RH per year. For maximum accuracy, the calibration of the probe should be checked every six to 12 months. Applications in which the probe is exposed to considerable contamination could require more frequent checks.

Note: **The HygroClip-2 probe cannot be adjusted when connected to the HygroFlex5-EX transmitter.**

7.4 Cleaning and Replacement of the Dust Filter

See document **E-M-HC2 Probes-V1_26**.

7.5 Checking Output Signal Transmission

If wanted, the transmission of the output signals of the HygroFlex5-EX can be checked with the simulator function. The HW4 software is needed to enabled and configure this function. When this function is enabled, the HygroFlex5-EX generates fixed digital and analog signals as defined by the user.

7.6 Repair

It is not possible for the user to repair device faults himself. The device must be sent to a ROTRONIC service center for repairs.

8   Firmware Updates

Firmware updates are available for downloading on the ROTRONIC website. Firmware files are given names that show to which device type the file applies and the version number of the firmware. All firmware files have the extension HEX/ROF.

Procedure for updating the firmware:

- Connect the HygroFlex5-EX service connector to a USB port of a PC running the ROTRONIC HW4 software V3.4 or higher with the service cable AC3006.
- Copy the firmware update file from the ROTRONIC website to the PC.
- Start the HW4 software on the PC and look for HF5 (HW4 Main Menu Bar > Devices and Groups > Search for USB Masters).
- After finding the HF5, expand the device tree to see the HF5 functions. Select Device Manager.
  In the menu bar of the Device Manager, select Tools > Firmware Update.

9   Technical Data

9.1   Specifications

General	HygroFlex5-EX
Device type	Humidity & temperature transmitter with analog output signals
Circuit type	Two-wire current loop 4 ... 20 mA
Mounting types	D (duct) and W (wall)

Power Supply and Connections	HygroFlex5-EX
Supply voltage (VDD)	10 ... 28 VDC V min = 10 V + (0.02 A x load*) *Load resistance in ohm.
Rated current consumption	2 x 20 mA
Electrical connections	Connections: Ex-e terminals(0.2…2.5 mm^2) Cable gland: 16 x 1.5 (Ø cable 4.5…7 mm)
Polarity protection	Protective diode on V+

Calculated Parameters	HygroFlex5-EX
Psychrometric Parameters	Dew point (Dp) above and below freezing point Frost point (Fp) below freezing point and dew point above freezing point Wet bulb temperature (Tw) Enthalpy (H) Vapor concentration (Dv) Specific humidity (Q) Mixing ratio by weight (R) Vapor concentration at saturation (Dvs) Vapor partial pressure (E) Vapor saturation pressure (Ew)

Startup Time and Data Refresh Rate	HygroFlex5-EX
Startup time	<60 s
Data refresh rate	20 s - 240 s, adjustable with HW4 V3.4 and higher

Configurable Analog Outputs	HygroFlex5-EX
Output 1	Can be assigned to every parameter
Default parameter	Relative humidity or calculated parameter
Default range	Per order code
Output 2	Can be assigned to every parameter
Default parameter	Temperature or calculated parameter
Default range	Per order code
Output 1 and output 2	
Signal type	4…20 mA (current loop)
User-configurable range limits	-999.99 ... +9999.99 units
Short circuit tolerant	Yes
Max. load resistance	500 Ω
Min. load resistance	0 Ω

Service Connector	HygroFlex5-EX
Interface type	UART
Max. length of service cable	5 m (16.4 ft)

General Specifications	HygroFlex5-EX
Optional display	LC, resolution 1 or 2 decimals, no backlight, trend and alarm indicators
Probe material	Stainless steel (1.4301)
Probe dust filter material	Sintered steel filter (1.4401)
Housing material	Aluminum
Housing protection grade	IP 66
Dimensions	See Models
Weight	800 g

Conformity with Standards	HygroFlex5-EX
CE / EMC immunity	EMC-Directive 2014/30/EU, ATEX-Directive 2014/34/EU
Solder type	Lead free (RoHS-Directive 2015/863/EU)
FDA / GAMP directives	Compatible

Environmental Limits	HygroFlex5-EX
Storage and transit	-50 ... +70 °C / -20 ... +70 °C (models with display), 0 ... 100 %RH, non-condensing
Operating limits at electronics	-40 ... +60 °C / -20 ... +60 °C (models with display), 0 ... 100 %RH, non-condensing
Temperature limits at probe	Depends on probe model
Maximum humidity at sensor	100 %RH to 80 °C (176 °F) 75 %RH at 100 °C (212 °F) 45 %RH at 125 °C (257 °F) 15 %RH at 150 °C (302 °F)
Maximum air velocity at probe	20 m/s (3935 ft /min)
Critical environments	Humidity sensor: per **DV04-14.0803.02** - Critical chemicals

10   Accessories

10.1   Configuration and Communication Software

The ROTRONIC HW4 software (version 3.4.0 or higher) allows configuration of the HygroFlex5-EX. HW4 is compatible with Windows XP, 7 and 10. For further details, see the separate instruction manual provided with the software.

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

10.2   Service Cable

Order Code	Description	
AC3006	Mini-USB service connector (UART) to the USB port of a PC. Cable electronics to convert UART interface to USB interface.	

10.3   Replacement Filter

Sintered steel filter: **SP-FN15**

11 ATEX Data

11.1 Ignition Protection Category, Type

Measurement probe with HygroClip: **For Zone 0/20**
Transmitter: **Complete transmitter for Zone 1/2 and 21/22**

The following ATEX approval according to IEC is fulfilled:

Device group **II** for explosive atmospheres (not mining)

Probe: For application temperature T_{amb} = [-40 … +60 °C]

⟨Ex⟩ **II 1/2 G Ex ia IIC T5 Ga/Gb**   Zone 0, gas, intrinsically safe, temp. 100°C

⟨Ex⟩ **II 1/2 D Ex ia IIIC T80°C Da/Db**   Zone 20, dust, intrinsically safe, temp. 80°C
IP66   IP protection 66

Or

For application temperature T_{amb} = [-40 … +85 °C]

⟨Ex⟩ **II 1/2 G Ex ia IIC T4 Ga/Gb**   Zone 0, gas, intrinsically safe, temp. 130°C

⟨Ex⟩ **II 1/2 D Ex ia IIIC T110°C Da/Db**   Zone 20, dust, intrinsically safe, temp. 110 °C
IP66   IP protection 66

(1/2 - 1: Zone 0 and 2: Zone 1 suitable for mounting in zone separation wall)
(Ga - very high protection level (Zone 0), Gb - high protection level (Zone 1))
(Da - very high protection level (Zone 0), Db - high protection level (Zone 1))
(Ga/Gb, Da/Db suitable for mounting in zone separation wall)

Transmitter: For application tempearture T_{amb} = [-40 … +60 °C] (without LCD) and
For application temperature T_{amb} = [-10 … +60 °C] (with LCD)

⟨Ex⟩ **II 2(1) G Ex eb mb [ia Ga] IIC T5 Gb**   Zone 1, 2, gas, (intrinsically safe), temp. 100°C

⟨Ex⟩ **II 2(1) D Ex tb [ia Ga] IIIC T80°C Db**   Zone 21, 22, dust, (intrinsically safe), temp.80°C
IP66   IP protection 66

(2(1) - 2: Zone 1, (1): contains electric circuits that may exist in Zone 0)
(Ex e mb [ia Ga] multiple ignition protection categories: Ex-e, Ex-mb and output Ex-ia)

Complete system: ⟨Ex⟩ **II 1/2 G Ex eb ia mb IIC T5 Ga/Gb**

⟨Ex⟩ **II 1/2 D Ex ia tb IIIC T80°C Da/Db**

11.2 ATEX-Relevant Standards

The following European standards are relevant for the product:
CENELEC - European Committee for Electrotechnical Standardization

EN 60079–0	Part 0:	Equipment – General requirements Construction, testing, marking
EN 60079–7	Part 7:	Equipment protection by increased safety **"e"**
EN 60079–11	Part 11:	Equipment protection by intrinsic safety **"i"**
EN 60079–14	Part 14:	Electrical installations design, selection and erection
EN 60079–18	Part 18:	Equipment protection by encapsulation **"m"**
EN 60079–26	Part 26:	Equipment with equipment protection level (EPL) Ga Zone 0 requirements (EPL - Equipment protection level)
EN 60079–31	Part 31:	Equipment dust ignition protection by enclosure **"t"**

11.3 Nominal Data

Power supply:

There are two separate connections available for the humidity and temperature sensors. The device connections comprise power supply and sensor signal. The supply voltages for the two sensors may be different because they are isolated by two internal diodes. The device can also be operated with only one loop.

Device input voltage:	U_{Supply}	**= 20 V … 28 VDC [24 V +/- 15%]**
Maximum current:	$I_{Supply\ max.}$	**= 50 mA [Sum of both input currents]**
Load impedance:	R_M	**= 0…500 Ω [Measurement voltages 0 V…10 V]**

Ambient temperature range:

- **Measurement probe:** T_A = [- 40 °C ... + 85 °C]
- **Transmitter with LCD:** T_A = [- 10 °C … + 60 °C]
- **Transmitter without LCD:** T_A = [- 40 °C … + 60 °C]

The normal ATEX standards only apply for normal temperatures [-20 °C … +40 °C]
and for a pressure range of [0.8 bar…1.1 bar]. The extended temperature range must
be marked on the product identification label.

Input protection circuit:

The device is protected against polarity reversal by two diodes. In addition to this, two Z-Transil diodes protect against static and transient overvoltages. These measures are not required by ATEX. They were, however, implemented as easily realizable additional protective measures.

11.4   Product Identification Label

Manufacturer: Rotronic AG, CH-8303 Bassersdorf
Type designation: HF520-EX
Serial number: < Number >

Measurement probe: ⟨Ex⟩ II 1/2 G Ex ia IIC T5…T4 Ga/Gb

                           ⟨Ex⟩ II 1/2 D Ex ia IIIC T80 °C…T110 °C Da/Db
                           IP66

Transmitter: ⟨Ex⟩ II 2(1) G Ex eb mb [ia Ga] IIC T5 Gb

                           ⟨Ex⟩ II 2(1) D Ex tb [ia Ga] IIIC T80°C Db
                           IP66

Certification body and certificate no.:   Electrosuisse, Fehraltorf (CH)
                           SEV 14 ATEX 0107
                           IECEx SEV 14.0002

Date: 25.03.2020

Operating temperature range: T_{amb} = [-10 °C … +60 °C] with LCD
                           T_{amb} = [-40 °C … +60 °C] without LCD

In: [20 VDC … 28 VDC], 2 W
Out: [4 mA … 20 mA], 2-wire current loop

Symbols: CE 1258