Rotronic HF520-EX Humidity and Temperature Transmitter Instruction Manual

Contents

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Rotronic HF520-EX Humidity and Temperature Transmitter

Specifications

- **Model:** HYGROFLEX5-EX & HYGROCLIP2-EX
- **Supply Voltage for Humidity (Hyg):** +20V to +28V
- **Supply Voltage for Temperature (Temp):** +20V to +28V
- **Signal Range for Humidity (Sig_Hyg):** +2V to +10V
- **Signal Range for Temperature (Sig_Temp):** +2V to +10V
- **Current Consumption:** 32mA
- **Zener Barrier:** 2x 6v2, 1x 5v6 Galvanic Isolation LCD Optional Zone 0 and Zone 1 Compatibility

Product Usage Instructions

- **Commissioning**
  - HygroFlex5-EX operates on a 2-wire circuit and loop-powered. Supply voltage should be between 10V to 28V DC depending on the load connected. Ensure proper supply voltage for correct operation.
- **Grounding**
  - Ground the HygroFlex5-EX device via the ground connection provided on the housing to ensure safety and proper functioning.
- **Starting the Device**
  - The device requires approximately 1 minute for the startup process. After about 20 seconds, “Please wait” will appear on the display. The analog signals increase to around 21mA during this time. The device will start operating and set the analog outputs to the measured values after the first measuring interval.
- **Service Connector**

- The service connector allows connection to a PC running Rotronic HygroSoft software. Use a service cable and connect it to the UART interface with a mini-USB connector. Do not connect directly to a USB port; always use the service cable AC3006 for connection.

FAQs

- **Q: What is the maximum supply voltage for the device?**
  - **A:** The supply voltage range for both humidity and temperature is between +20V to +28V.
- **Q: How long does the device take to start up?**
  - **A:** The device requires approximately 1 minute for the entire startup process.
- **Q: Can I connect the service interface directly to a USB port?**
  - **A:** No, always use the service cable AC3006 to connect the service interface to a PC running Rotronic HygroSoft software.

OVERVIEW

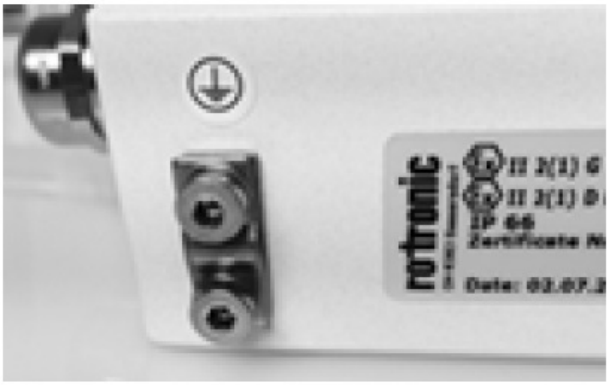
- The HygroFlex5-EX is a humidity/temperature transmitter for fixed installation mounting in applications that require high measurement accuracy.
- The transmitters are compatible with all Rotronic ATEX sensors from the AirChip 3000 series. Standard sensors must not be used. The operating temperature range of the electronics is limited to -40…60 °C (-10…60 °C with optional LCD).
- Further information can be found at ProcessSensing.com or **rotronic.com**, or scan the QR code to access the Rotronic online manual with further explanations.

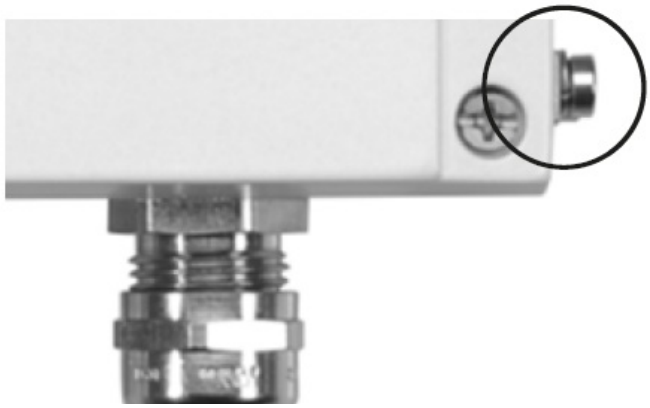
COMMISSIONING

- HygroFlex5-EX (2-wire circuit, loop-powered): 10…28 VDC depending on the depending on the loads connected to the outputs. The minimum supply voltage can be determined as follows:
- V min = 10 V + (0.02 A x load*) *load resistance in ohms.
- For the maximum load of 500 Ω, the minimum supply voltage is 10 V + (0.02 A x 500 Ω) = 20 VDC. If both output circuits are closed, the maximum current consumption is consumption is 40 mA during operation. The device must be correctly closed during operation to ensure explosion protection.

GROUNDING

- The HygroFlex5-EX must be grounded via the ground connection on the housing.





STARTING THE DEVICE

- The device needs approx. 1 minute for the entire start-up process.
- After approx. 20 seconds, “Please wait” appears on the display.
- During this time, both analog signals increase to approx. 21 mA.
- The device then starts operation andthe analog outputs are set to the corresponding measured value after the first measuring interval.

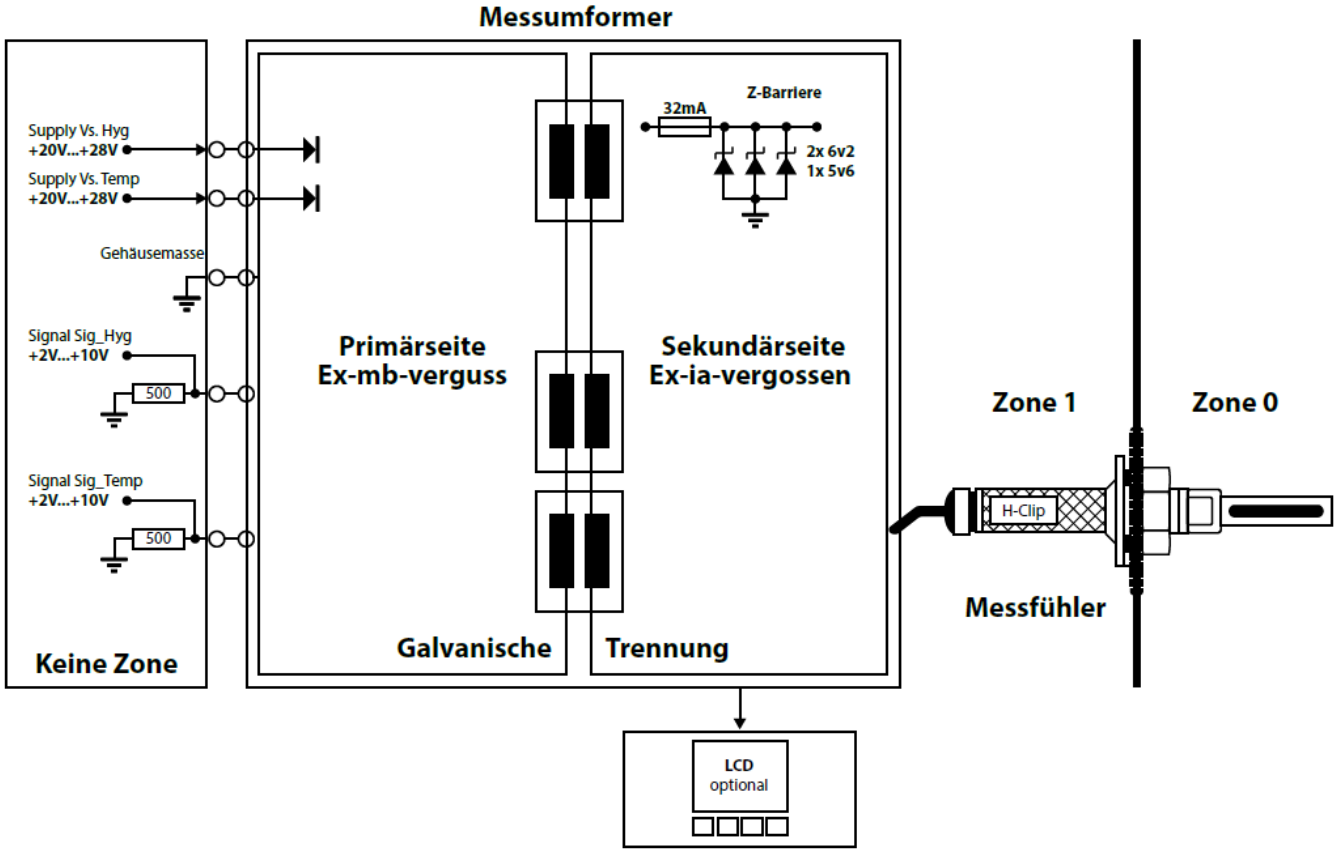
SERVICE CONNECTOR

- The service connector (UART interface with a mini-USB connector) enables the HygroFlex5-EX to be connected to a PC running the Rotronic HygroSoft software.
- A service cable is required. See chapter “Maintenance” for the location of the service connector and the type of service cable.

WARNING:

- The service interface is a UART interface with a mini-USB connector. Do not connect the service interface directly to a USB port, but only via service cable AC3006!
- The service interface is located inside the device. To access it, the device cover must be removed after loosening the 4 screws. The device must not be located in an explosive zone during service work!

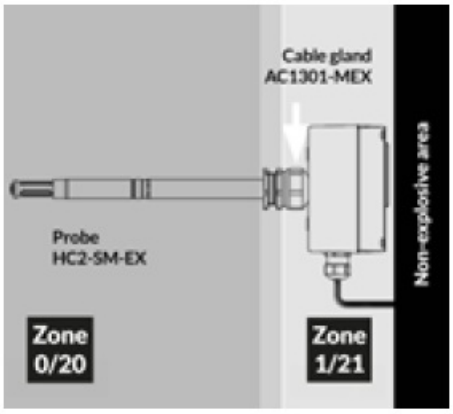
ELECTRICAL SCHEME



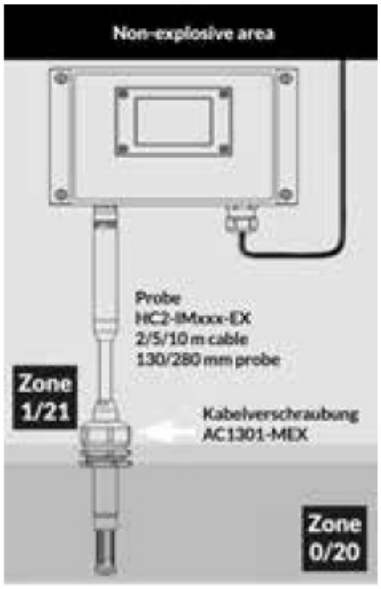
COMMISSIONING

Wall mounting

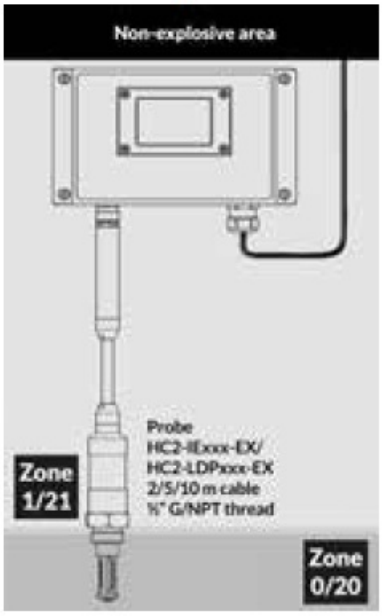
Duct mounting



Wall mounting with cable sensor



Wall mounting with screw-in sensor



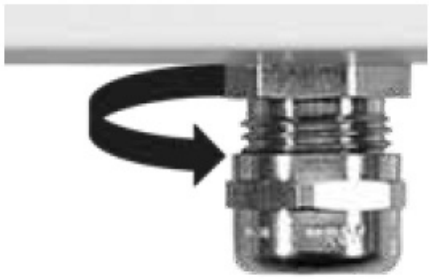
VERDRAHTUNG

According to EN60079-14 per ATEX, no SELV device is required for the power supply (SELV supply = with limited transients). The measuring transducer can also be operated with only one closed measuring loop.

Connection terminals		
Permitted conductor cross-section (rigid)	**Permitted conductor cross-section (flexible)**	**Stripping length**
0.2 mm²…4 mm²	0.2 mm²…2.5 mm²	10 mm

Clamps	**Description**
K1: CH1-	Relative humidity output 1 (4…20 mA)
K1: CH1+	Power supply: 10…28 VDC
K2: CH2-	Temperature output 2 (4…20 mA)
K2: CH2+	Power supply: 10…28 VDC

Cable gland
Clamping range 4.5 – 10 mm (nicht armiertes Kabel)
Tightening torque 10 Nm



PERIODIC CHECK (CALIBRATION) OF THE SENSOR

- The PT-100 RTD temperature sensor used in the probe and the electronics are very stable over the long term and generally require no further calibration after the initial factory adjustment. The long-term stability of the hygrometer humidity sensor from Rotronic is generally better than 1%rh per year.
- For maximum accuracy, the calibration of the sensor should be checked every 6 to 12 months. Applications where the sensor is exposed to significant contamination may require more frequent checks.
- **Note:** The HygroClip 2 sensor cannot be adjusted when connected to the
- HygroFlex5-EX transmitter.

REPAIR

- Do not repair defective appliances yourself. The appliance must be sent to the manufacturer’s service center for repair.

REPLACEMENT FILTER

- Steel sintered filter: SP-FN15

POWER SUPPLY

- There are two separate connections for the humidity and temperature sensors.
- The measuring device connections include the power supply and sensor signal.
- The supply voltages of the two sensors may be different because they are decoupled via two internal diodes.
- The device can also be operated with only one loop.

Device input voltage

- USupply = 20 V…28VDC [24 V +/- 15%]

Maximum Power

- ISupply max.= 50 mA [sum of both input currents]

Resistance

- RM = 0…500 Ω [measuring voltage 0V…10V]

Ambient temperature range

- Measuring sensor: TA = [- 40 °C…+ 85 °C]
- Transmitter with LCD: TA = [- 10 °C…+ 60 °C]
- Transmitter without LCD: TA = [- 40 °C…+ 60 °C]

The usual ATEX standards only apply for normal temperature [-20 °C…+40 °C] and for a pressure range of [0.8 bar…1.1 bar]. The extended temperature range must be noted on the rating plate.

INPUT PROTECTION CIRCUIT

The device is protected against reverse polarity by two diodes. In addition, two Z-transit diodes protect against static and transient overvoltages. These measures are not required by ATEX. However, they have been implemented as supplementary protective measures that are easy to realize.

UM = 28 V DC Supply circuit sensor*

- **Maximum output voltage:** UO ≤ 6.6 V
- **Maximum output current:** IO ≤ 82 mA
- **Maximum output power:** PO ≤ 485 mW
- **Capacity:** CO = 22 µF
- **Inductance:** Lo = 2 µH

HC2-LDPxxx-EX Sensor circuit*

- **Maximum input voltage:** UI ≤ 6.6 V
- **Maximum input current:** II ≤ 82 mA
- **Maximum input power:** PI ≤ 485 mW
- **Internal capacitance:** CI = 19 µF
- **Internal inductance:** LI = 0

All other sensors Sensor circuit*

- **Maximum input voltage:** UI ≤ 6.6 V
- **Maximum input current:** II ≤ 82 mA
- **Maximum input power:** PI ≤ 485 mW
- **Internal capacitance:** CI = 15 µF
- **Internal inductance:** LI = 0

Type of ignition protection intrinsic safety Ex ia IIC.

ATEX-DATA

Measuring probe	**For operating temperature Tamb = [-40…+60 °C]**
 II 1/2 G Ex ia IIC T5 Ga/Gb	Zone 0, gas, intrinsically safe, temp. 100°C
 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 operating temperature Tamb = [-40…+85 °C]**
 II 1/2 G Ex ia IIC T4 Ga/Gb	Zone 0, gas, intrinsically safe, temp. 130 °C
 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 installation in zone partition 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 installation in zone partition wall)	

Transmitter	**For operating temperature Tamb = [-40…+60 °C] (without LCD) For operating temperature Tamb = [-10…+60 °C] (with LCD)**
 II 2(1) G Ex eb mb [ia Ga] IIC T5 Gb	Zone 1, 2, gas, (intrinsically safe), Temp. 100 °C
 II 2(1) D Ex tb [ia Da] IIIC T80°C Db	Zone 21, 22, dust, (intrinsically safe), Temp. 80 °C
IP66	IP protection 66
(2(1) – 2: Zone 1, (1): contains circuits that may be routed in Zone 0) (Ex e mb [ia Ga] several types of protection: Ex-e, Ex-mb, and output Ex-ia)	

Complete system
 II 1/2 G Ex eb ia mb IIC T5 Ga/Gb
 II 1/2 D Ex ia tb IIIC T80°C Da/Db

NAMEPLATE INFORMATION

Manufacturer Company	Rotronic AG, CH-8303 Bassersdorf
Type Description	HF520-EX
Series number	< Number >
Measurement probe	II 1/2 G Ex ia IIC T5…T4 Ga/Gb II 1/2 G Ex ia IIC T5… T4 Ga/Gb, IP66
Measuring transmitter	II 2(1) G Ex eb mb [ia Ga] IIC T5 Gb II 2(1) D Ex tb [ia Da] IIIC T80 °C Db IP66
Certification organisation	Electrosuisse, Fehraltorf (CH)
Certificate no.	SEV 14 ATEX 0107 IECEx SEV 14.0002 CML 22UKEX3190
Date	30.01.2024
Operating temperature range	Tamb = [-10 °C…+60 °C] with LCD Tamb = [-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 UKCA 2503

- ProcessSensing.com.
- Rotronic.com.

Documents / Resources

	Rotronic HF520-EX Humidity and Temperature Transmitter [pdf] Instruction Manual HF520-EX Humidity and Temperature Transmitter, HF520-EX, Humidity and Temperature Trans mitter, Temperature Transmitter, Transmitter

References

- Measurement Solutions International
- User Manual