BARTEC

HYGROPHIL F

HYF 5674

Operating Instructions

459316MDHEN A V2
01/2025

en

IMPORTANT!

READ CAREFULLY BEFORE USE!

KEEP FOR FUTURE REFERENCE!

BARTEC BENKE GmbH will not accept any liability for damage caused by failure to observe the manual or the safety instructions.

When translated into other languages, the German version of the manual must be regarded as definitive.

Should you have any queries, please contact the address below.

Bartec Benke GmbH
Borsigstraße 10
21456 Reinbek, Germany

Tel.: +49 (0) 40 72703-500
Fax: +49 (0) 40 72703-363

e-mail: service-pat@bartec.com
service-bsf@bartec.com
Internet: www.bartec.de

Contents

1 General Information

The following sections contain information on this operating manual, the symbols used, liability limitations and points of contact in customer service.

1.1 Information on the operating manual

This operating manual provides important information on handling the device. Adherence to all provided safety and operating instructions is the prerequisite for work safety.

- The operating manual is an integral part of the device and must be stored in the immediate vicinity of the device so as to be accessible for operating personnel at all times.

- If the device is handed over to a third party, the operating manual must also be handed over.

For the purposes of clarity, the figures in this operating manual are not necessarily true to scale and may deviate slightly from the actual device model.

As well as the instructions, all other documents contained in the customer folder apply. Observe the safety instructions listed there! An overview can be found in the table of contents in the customer folder.

1.2 Explanation of symbols

Warnings

Warnings are indicated in this operating manual by symbols. The warnings are introduced with signal words indicating the degree of danger at hand.

Observe the instructions under all circumstances and work with care to avoid accidents, injuries to personnel and damage to property.

DANGER	
	**... indicates an immediate hazard which, if not avoided, will result in serious injury or death.**

WARNING	
	**... indicates a possible hazard which, if not avoided, could result in serious injury or death.**

CAUTION	
	**... indicates a possible hazard which, if not avoided, could result in minor injuries.**

NOTICE
... indicates a possible hazard which, if not avoided, could result in damage to equipment or property.

Tips and recommendations

NOTICE	
	**... indicates useful tips and recommendations as well as information for efficient and trouble-free operation.**

1.3 Duties of the operator

The device is used in commercial enterprises. The operator of the device therefore has a legal obligation to ensure work safety. The operator is responsible for ensuring that the device is always in a technically perfect working condition. Therefore the following applies:

- The operator must ensure that all maintenance intervals specified in this operating manual are adhered to.
- The operator must have all safety equipment inspected regularly to ensure it is fully functional and complete.

1.4 Limitation of liability

All specifications and instructions in this operating manual have been compiled under due consideration of the applicable norms and regulations and the latest technological standards as well as our many years of experience and expertise.

The manufacturer assumes no liability for damage due to the following:

- Failure to observe the instructions in the operating manual
- Improper use
- Use of untrained personnel
- Structural modifications made without prior consent
- Technical modifications
- Use of non-approved replacement parts

The actual scope of delivery of special models can differ from the explanations and diagrams used in this manual if additional options are ordered or due to the latest technical changes.

Otherwise, the obligations agreed upon in the delivery contract, the general terms and conditions and the delivery terms of the manufacturer apply, as well as any legal regulations valid at the time the contract was concluded.

1.5 Copyright

The operating manual is to be treated confidentially. It is intended exclusively for personnel engaged to work with the device. Making the operating manual available to third parties is not permitted without the manufacturer's written consent.

NOTICE	
	**The information, texts, diagrams, images and other illustrations of the contents are copyright protected and subject to commercial protective rights. Every instance of misuse may result in prosecution.**

1.6 Replacement parts

WARNING	
	**Risk of injury due to incorrect replacement parts!** Incorrect or defective replacement parts can result in damage, faults or total failures as well as impairments to safety. FOR THIS REASON: ☝ Only use spare parts from BARTEC BENKE.

Obtain replacement parts from authorized dealers or directly from BARTEC BENKE. For the address, see *section 1.7 “Customer service” on page 6*.

1.7 Customer service

Should you require any technical information, our customer service department will be happy to help you.

You can find information on the responsible contact partner at any time by telephone, fax, e-mail or on the Internet.

Furthermore, our employees are always eager to receive any new information and experiences arising from use and which could be valuable for the improvement of our products.

Service address

BARTEC BENKE GmbH
Borsigstraße 10
21456 Reinbek, Germany

Tel.: +49 (0) 40 72703-500
Fax: +49 (0) 40 72703-363

E-mail: service-pat@bartec.com
service-bsf@bartec.com

Internet: www.bartec.de

2 Safety

This section provides an overview of all important safety aspects for optimal protection of personnel as well as safe and trouble-free operation.

Failure to observe the operating and safety instructions in this manual can result in considerable dangers.

This chapter describes all the safety and warning signs in line with the risk assessment. The measures for avoiding the respective dangers are described in detail in this chapter. The following chapter will only present the safety and warning signs in shortened form.

2.1 Intended use

In combination with the moisture measurement sensor type L166X (sensor for short) and the fiber optic cable combination cable type 1631-11X, the evaluation unit HYF 5674 is used to measure trace moisture in gases and liquids. The device is only to be used for stationary operation and in **non-explosive atmosphere**. Please also note the instructions for use described in the operating instructions for the L1661 sensor.

Do not make any modifications to the device. Only use spare parts from BARTEC BENKE. Otherwise additional hazard may arise for which the safety fittings cannot provide sufficient protection.

When using the device in a way not provided from BARTEC BENKE or given in this manual, the protection of the device can be lost.

The power cable must not be replaced by another cable which is inadequate dimensioned.

For more information about the environment of the device refer to *chapter 4 “Design and function” on page 23*.

2.2 Instructions for the safe usage of the device

- The HYF 5674 evaluation unit may only be operated in a non-explosive area. The associated sensor, on the other hand, may be used in an area where there is a risk of explosion. To ensure the separation of the areas, the HYF 5674 evaluation unit is equipped with a channel card (Ex i) type 5674-100. The sensor is

connected to this plug-in card. You can find all the necessary instructions for correct installation in this manual and in the operating instructions for the humidity measurement sensor.

- For use in North America/Canada (CSA): Please also refer to the safety manual for the 5674-100 Channel Card (Ex i) IOM_01_03_468876MDHEN_Vx_5674_100_Manual.

- Only use BARTEC sensors of the types L166x.

WARNING	
	**Danger of explosion due to use wrong humidity measrement sensors** The explosion protection of the sensor is not available, if you use a wrong sensor. FOR THIS REASON: ☝ Only use BARTEC humidity measurement sensors. ☝ Follow the instructions in the user manual of the channel card (Ex i) and the L166x sensor for correct installation.

- Only use BARTEC-fiber-optic cables of the type 1631-11X.

- Make sure that the cables of the intrinsically safe circuit (input/ output AI and RTD of the 5674-100 Channel Card) are correctly laid. Do not lay the BARTEC-fibre-optic cable (blue) together with power supply cables in joint cable channels. Make sure there is a sufficient distance from electromagnetic interference fields! To prevent any potential equalization currents, tie the port of the shielding to GND at only one place.

- **Before switching off the device quit the software (see software manual of the HYF 5674) and disconnect the power cable.**

- Signal circuits connected to the device must be adequately isolated from mains or other hazardous circuits as defined in the IEC 61010-1 standard.

2.3 Correct handling of fiber optic cables and connectors

- Clean the connector end faces and fiber optic couplings before connecting. The DIN IEC 62627 standard describes cleaning procedures for fiber optic connectors. Use cleaning agents from well-known suppliers to clean plugs and follow the cleaning instructions.
- Check the cleaning status with a fiber microscope to ensure the transmission of the sensor readings. Contaminated plugs can significantly falsify the measurement results.
  ATTENTION! Turn off the light source before inspecting the fiber with a handheld microscope to avoid eye damage.
- The use of an immersion fluid in the connector to increase reflection attenuation is prohibited!
- Do not touch the end face of the connector or coupling to prevent residues of grease or moisture on the fiber optic cable.
- Also avoid contact with clothing to prevent soiling.

Anti-rotation device

To ensure perfect contact between the end faces, connectors are equipped with an anti-rotation device.

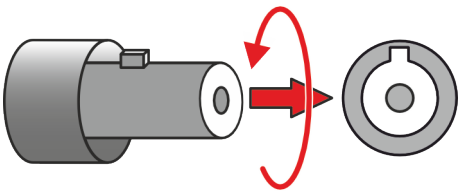

Figure 2.1: Anti-rotation device

- **To do this, you must always have visual contact with the coupling! We strongly recommend pulling the unit out of the rack for easier access to the back of the unit.**
- Provide adequate lighting.
- Carefully insert the plug straight into the coupling.
- Place the connector so that the nose on the connector pin is inserted into the groove of the coupling. Turn the plug about ¼ turn until the nose clicks into place and the connection is made.
- Once physical contact has been established, the optical connector works reliably in the long term as long as it is not opened and plugged in again. **If it is still necessary, clean the front surfaces as described above.**

2.4 Dangers and risks

The following section names residual risks that have been established in a risk analysis.

- Adhere to the safety instructions and observe the warnings in the following sections of this operating manual to reduce health risks and avoid dangerous situations.

DANGER

Danger of death due to electrical current!

Touching voltage-conducting parts poses an immediate life-threatening hazard. Damage to the insulation or to individual components can cause fatal injury.

FOR THIS REASON:

- If the insulation is damaged, immediately disconnect the power supply and have the damage repaired.
- Have work on the electrical systems performed only by electricians.
- For all work on the electrical systems, switch off the voltage and test that the circuit is voltage-free.
- In addition to the device's power supply, all external voltages of signal and control lines must also be free of voltage.
- Prior to any maintenance, cleaning and repair work, switch off the power supply and secure it against being switched back on again.
- Keep moisture away from voltage-conducting parts. This could otherwise result in a short-circuit.

CAUTION

Damage due to improper transport!

Improper transport can result in considerable material damage.

FOR THIS REASON:

- When unloading the packaged items during delivery or during in-house transport, exercise caution and observe the symbols and instructions on the packaging.
- Remove the packaging only immediately prior to assembly.

CAUTION	
	**Danger of tripping due to dirt and objects left lying around!** Dirt deposits and objects left lying around constitute slipping and stumbling hazards and can cause injuries. FOR THIS REASON: ☝ Always maintain a clean and orderly work area. ☝ Remove objects that are no longer required. ☝ Draw attention to stumbling hazards with yellow and black marking tape.

CAUTION	
	**Environmental damage due to incorrect disposal!** Packaging materials are valuable raw materials and can in many cases be reused or expediently processed and recycled. FOR THIS REASON: ☝ Dispose of packaging materials in an environmentally sound manner. ☝ Observe the locally applicable disposal regulations. Have a specialist company handle the disposal if needed.

WARNING	
	**Danger of injury due to improperly performed maintenance work** Improper maintenance can lead to serious personal injury and material damage. FOR THIS REASON: ☝ Before starting work, ensure there is adequate space for the work. ☝ If components were removed, make sure they are remounted correctly, reinstall all fastening elements and observe the specified screw tightening torques.

WARNING	
	**Danger of injury due to incorrect dismantling work** Stored residual energy, components with sharp edges, points and corners in and around the analyzer or on the required tools can cause injuries. FOR THIS REASON: ☝ Before starting work, ensure there is adequate space for the work. ☝ Use caution when handling open, sharp-edged components. ☝ Dismantle the components in a professional manner. Remember that some components may be very heavy. Use lifting gear if necessary. ☝ Secure components so that they cannot fall down or tip over. ☝ Should you have any questions, contact the manufacturer.

2.4.1 Potential equalization

All metallic parts and the components including the pipework are grounded with the frame or via the equipotential bonding rail by design. Observe the following instructions:

- The external potential equalization connection must be connected with the on-site equipotential bonding rail during the installation.
- The entire on-site potential equalization system must be inspected.
- All external conductive parts have a ground connection or are structurally connected with each other.

2.4.2 Ex i circuits

The Ex i circuits are analog signals for temperatures and pressures. The Ex i signals are routed within the combination cable to the sensor. The Ex i characteristics can be found on the 5674-100 channel card, inside the electrical drawing or safety manual (see *chapter 3 “Technical data” on page 15*).

The calculations of the Ex i circuits can be provided as required. Please request these from BARTEC BENKE (for contact information, see *chapter 1.7 “Customer service” on page 6*).

2.5 Personnel requirements

All personnel who may work on the device, the system or component/components must be sufficiently trained and familiar with the device, system or component/components.

2.5.1 Qualifications

The operating manual refers to the following qualifications for various task areas:

Operator

An operator has been instructed on the assigned tasks and on the potential dangers in case of improper behavior. He only operates the device.

Service technician

Service technicians have specialist training, knowledge and experience and are aware of the relevant standards and regulations, meaning that they can perform work on **electrical systems** and detect and avoid any possible dangers.

Only service technicians are allowed to open the device for maintenance purposes. Therefore the device has to be in the state “seperated from net”.

Electricians are trained for the special locations in which they work and are aware of the relevant standards and regulations.

They are also familiar with all standards and regulations relevant to explosion protection, in particular, but not limited to, all sections of IEC 60079 [***Explosive atmosphere***].

2.5.2 General requirements

Completed instruction must be logged and confirmed by the persons responsible for instruction and by the persons receiving instruction.

Employees must be persons who can be expected to perform their work reliably. Persons whose reactions are impaired, e.g. by drugs, alcohol or medication, are not permitted.

When selecting employees, observe the age and occupation-specific regulations applicable at the location of deployment.

3 Technical data

Parameter	Description/Specification
Variants	1 channel (AC or DC) Multi channel 1, 2, 3 (AC or DC)
Layout	Hygrophil F: 19"-Slide-in device with front door Hygrophil F: Ex d Enclosure Hygrophil F: Table Device
Lifetime	Max. 10 years, depending on application, environmental conditions and maintenance/repair
Method	Optical. Signal evaluation of the Fabry-Perot interferometer using a spectrometer Correlative to the reference method
Measuring range Gas: Liquid:	 -80 to +20 °C dewpoint (DT) 1 ppmw to saturation (for now only liquids that are not fully miscible with water)
Accuracy Gas: Liquid:	 ±1 K ±5 % to ±15 % of the measured value (depending on the measured value and the saturation concentration of the liquid)
Repeatability Gas: Liquid:	 ±0.2 K ±1 % to ±3 % of the measured value (depending on the measured value and the saturation concentration of the liquid)
Measuring mode	Continuous
Measuring time / Channel switching	1 channel system < 5 s 3 channel system < 15 s (all results)
Heatup time first start	Typical 30 min.

Parameter	Description/Specification
Electrical specifications	
Rated voltage	AC: 110–230 V AC ±10 % 1-ph.; 50–60 Hz DC: 9–32 V DC, typ. 24 V DC
Rated current	AC: typ. 0.2 A, max. 0.32 A DC: typ. 1.9 A, max. 3.5 A
Power consumption	typ. 45 W max. 75 W (AC), 60 W (DC)
Fuses	External customer fuses: AC: ≤ 16 A DC: ≤ 10 A Internal device fuses: AC: 2x T 1 A/250 V DC: no fuse, short-circuit-proof
Power in connection type	AC: (IEC 60320) C14 inlet for connector C13, inclusive power cord EU (type F CEE 7/7) or US/CA power cord (NEMA 5-15), power cord length: 2 m DC: 3pin terminal connector for customer cable
Others	Reverse polarity protection (DC), line filter (AC), Overvoltage Category II
Additional installation recommendations	Type 3 surge protection

Parameter	Description/Specification
Environmental conditions	
Requirements for the installation site	Untypical vibrations and shocks in the vicinity of the device must be avoided. In this case, the device is e.g. by vibration dampers to isolate against vibration and shock. The distance between the device and components that cause strong mechanical vibrations (e.g. motors) should be as large as possible. The device can be installed and used in the following conditions: - only used indoor in dry conditions. - altitude maximum 2000 m. - in environments with degree of pollution 2 according to DIN EN 61010-1.
Ambient temperature Operation: Storage:	 5 to 50 °C (AC) 5 to 45 °C (DC) typical 15 to 25 °C -20 to 60 °C
Maximum relative humidity	80 %
Ingress protection (IP)	Front, top, side: IP40 Back, bottom: IP20
Others	No wet area

Parameter	Description/Specification
EX safety data- intrinsically safe input / output (5674-100 channel card)	
AI	
Connector location	AI 4-20 mA (1–4)
Intrinsic safety (IS)	[Ex ia IIC Ga]
Case: passive sensor 0 to 20 mA connected	
Terminal	4 (+24 V), 2 (IN+)
Maximum voltage U_o	28 V
Maximum current I_o	93 mA
Maximum power P_o	0.65 mW
Maximum resistance R	300 Ω
Maximum connectable capacitance C_o	83 nF
Maximum connectable inductance L_o	3 mH
Internal capacitance C_i	negligible small (between I.S. wires)
Internal Inductance L_i	negligible small
Safety-related maximum voltage	28 V (non mains)
if capacitance and inductance are present at the same time:	C_o: 83 nF L_o: 0.2 mH
Case: Active 0..20mA sensor connected (external I.S. circuit)	
Terminal	2 (IN+), 1 (IN-)
Maximum voltage U_o	28 V
Maximum current I_o	≈ 0 mA
External IS voltage U_i	30 V
External IS current I_i	120 mA
External IS capacitance C_i	≈ 0 nF
External IS Inductance L_i	≈ 0 µH

Parameter	Description/Specification
RTD	
Connector location	RTD (1–4)
Intrinsic safety (IS)	[Ex ia IIC Ga]
Terminal	4 (I+), 3 (IN+), 2 (IN-), 1 (GND)
Maximum voltage U_o	6.7 V
Maximum current I_o	30 mA
Maximum power P_o	50 mW
Maximum resistance R	230 Ω
Maximum connectable capacitance C_o	15.4 µF
Maximum connectable inductance L_o	38 mH
Internal capacitance C_i	2.5 µF
Internal Inductance L_i	0.3 mH
Safety-related maximum voltage	28 V (no mains)
if capacitance and inductance are present at the same time:	C_o (a, b, c): 0.30 µF, 0.2 µF, 0.1 µF L_o (a, b, c): 0.01 mH, 0.1 mH, 0.15 mH
LED	
Connector location	5674-100 channel card – LED
Intrinsic safety (IS)	[Ex op is]
Maximum radiation power P	676 µW
Wavelength λ	820 Nm

Parameter	Description/Specification
Signal inputs / outputs (electrical specification)	
Analog inputs (5674-100 channel card Ex i AI input)	**Case:** Active pressure sensor connected to terminals 2 (IN+), 1 (IN-): internal resistance (load) = approx. 100 Ω **Case:** Passive pressure sensor connected to terminals 4 (+24 V), 2 (IN+): maximum load 630 Ω (without cable) for 400 m combination cable = 566 Ω for 800 m combination cable = 502 Ω Preferred pressure sensor Wika IS-3: load = (10 V / 0.02 A) + (combination cable length * 0.16 Ω) sensor only = 500 Ω
Analog outputs (5674-110 relay connection card)	6 outputs, 0/4 to 20 mA, maximum load 1000 Ω, active, reference potential 0 V/ground, short-circuit proof connection: clamp 1-12
Digital outputs (5674-110 relay connection card)	6 potential-free changeover contacts potential-free changeover contact via relay connector: clamp 13-30 30 VDC: max. 2 A, max. 60 W 50 VAC: max. 1.2 A, max. 60 VA
Auxiliary voltage output (5674-110 relay connection card)	24 V DC, max. 500 mA connection: clamp 31–33 (+24 V DC, GND)
Modbus RTU (5674-110 relay connection card)	RS485, baud-rate 1200–11520 connection: clamp 34–36 (Modbus GND, (A)-, (B)+)
Signal outputs (logical specification)	
Analog outputs	8 selectable channels (TT, SP, WL, VP, RH, DT, FP, PPMv, PPMw, MC etc.)
Digital outputs	6 outputs (error channel n, limitation channel n)
User interface	
Display	7” touch display (800 x 480 pixels, 4:3)
Customer interface	
Hardwired	Terminal 1–30
Modbus RTU	Terminal 34–36
Modbus TCP/IP (option)	MB TCP connection, RJ45
USB 3.0 (front side)	Type A, for backups/updates and maintenance
Ethernet	LAN connection, RJ45, for remote access by customer and maintenance
Others	Upon request

Parameter	Description/Specification
Dimensions	
Dimensions (W x H x L)	449 x 176 x 255 mm
Weight	8 kg
Space requirements	for 19" Rack 4U, leave at least 1U space underneath for cooling
Options	
Number of measurement channels	1 = standard; 3 = option
Modbus RTU	Customer interface, RS485/422
Modbus TCP/IP	Customer interface
Remote maintenance interface	Ethernet
Standards	
Case ingress protection	EN/IEC 60529
EMC	EN 61000-6-2, EN 61000-6-4, EN 61326-1, EN 55011, FCC 47 CFR part 15 B
Device standard	EN/IEC/UL/CSA 61010-1
CB Scheme	Yes
Marking	cTUEVus, CE
Marking (5674-100 Ex i channel card)	cCSAus, IECEx, ATEX

4 Design and function

This chapter provides an overview of the most important functions and the design of the analyzer.

4.1 Overview

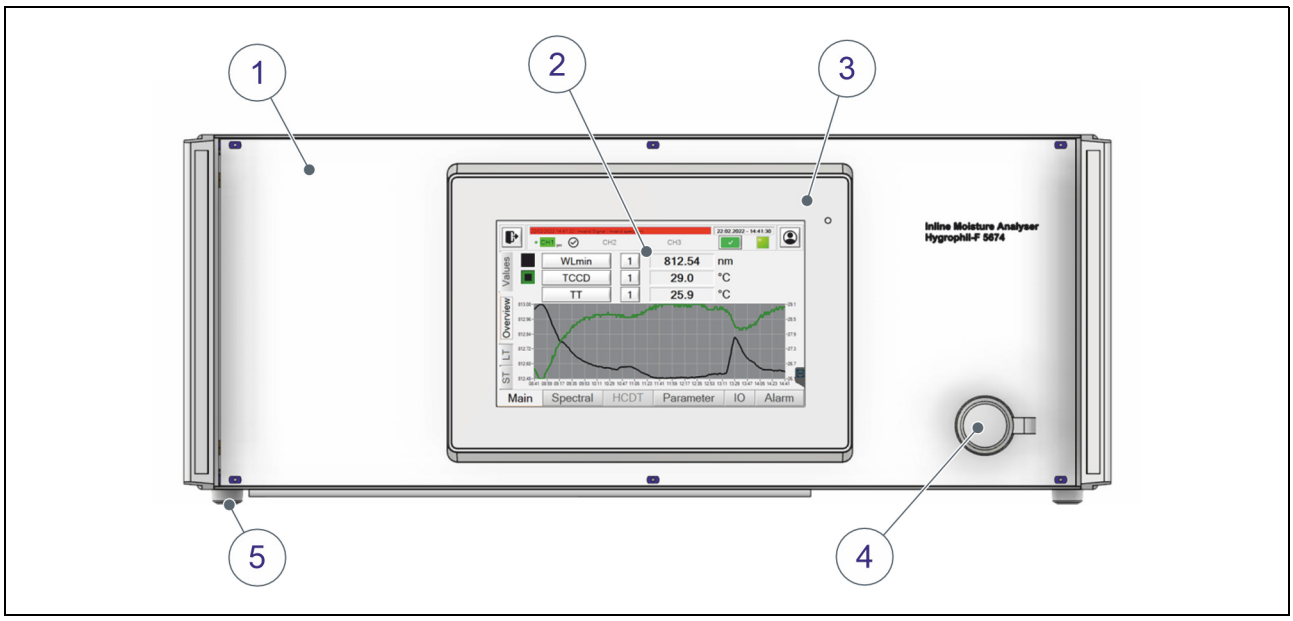

Figure 4.1: Device overview front side

1. 19“ rack (4 rack units)
2. Touch panel (HYF 5674 *MACS* software)
3. 7“ Windows touch panel PC
4. USB (updates/backups)
6. Feet (optional)

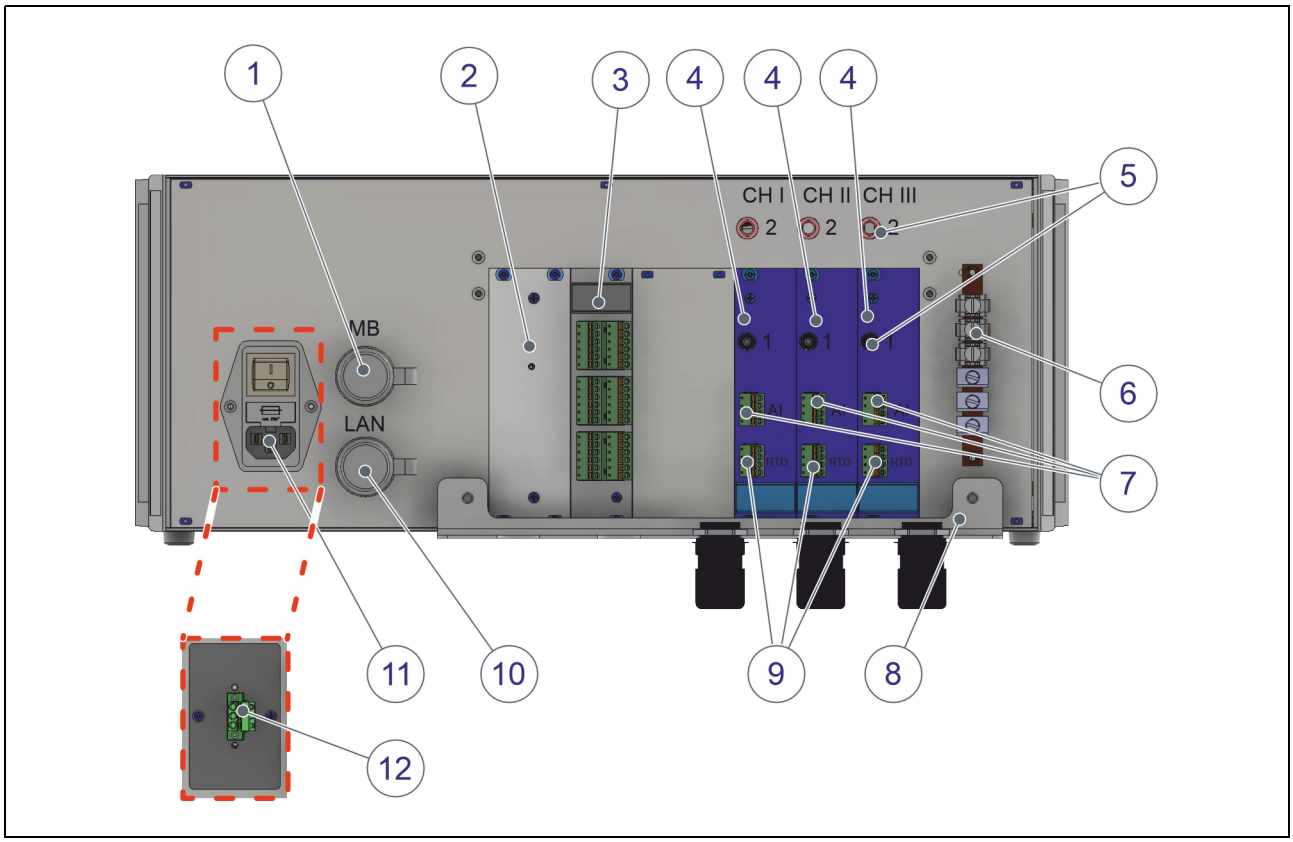

Figure 4.2: Device overview front side and inside

1. MB (LAN: Modbus TCP)
2. IO2010mini (state LED)
3. Relay connection card (AO, DO, 24V, Modbus RTU)
4. Channel card Ex i 1-3
5. Fiber optic connection for sensor L166x (2: input; 1: output)
6. Grounding bar (and shield)
7. Pressure sensor (0/4 to 20mA)
8. Cable clamp rail (option)
9. PT100 for sensor L166x (temperature)
10. LAN 1 (remote)
11. AC 110-230V (AC option)
12. DC 9-36V (DC option)

4.2 Brief description

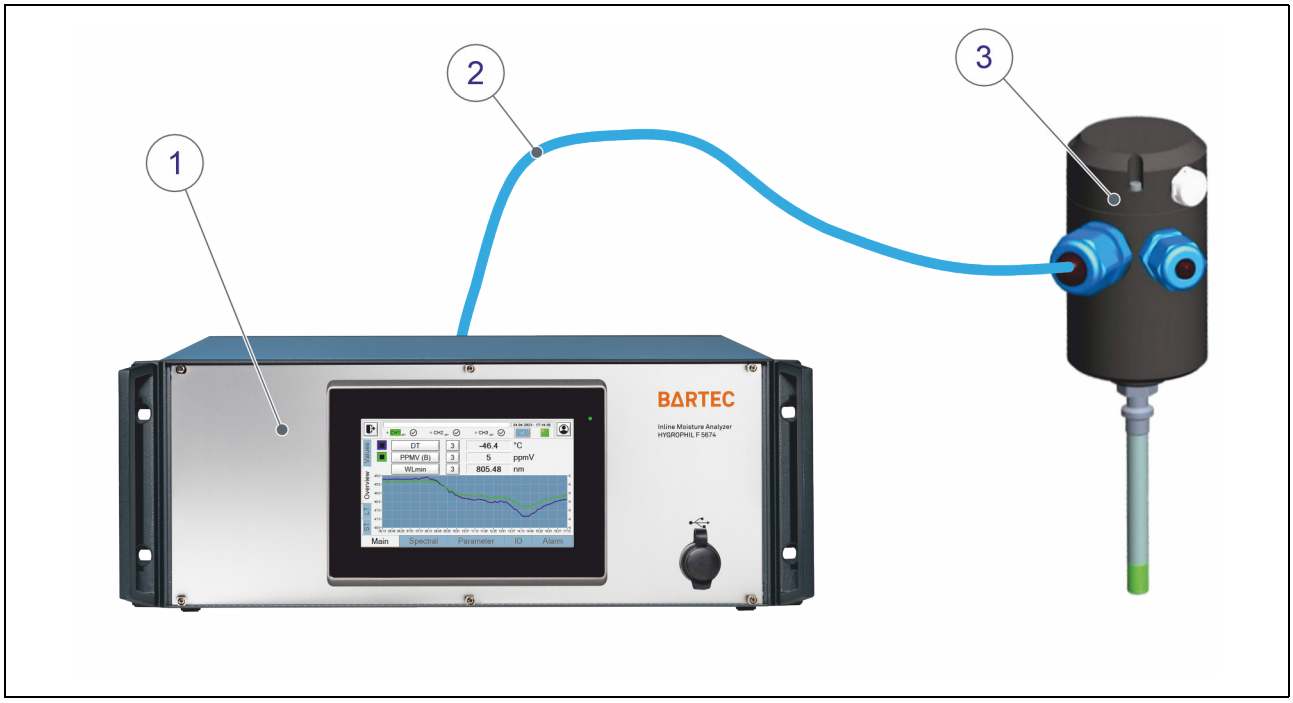

Figure 4.3: Main components HYF 5674, sensor and fiber optic combination cable

1. HYF 5674 evaluation unit
2. Fiber optic combination cable Type 1631-11X
3. Sensor (optionally with pressure sensor - connection in the combination cable)

The HYF 5674 is a microprocessor-controlled evaluation unit based on Microsoft Windows. In combination with the associated sensor and the type 1631-11X fiber optic cable, it is used to measure trace moisture in gases and liquids.

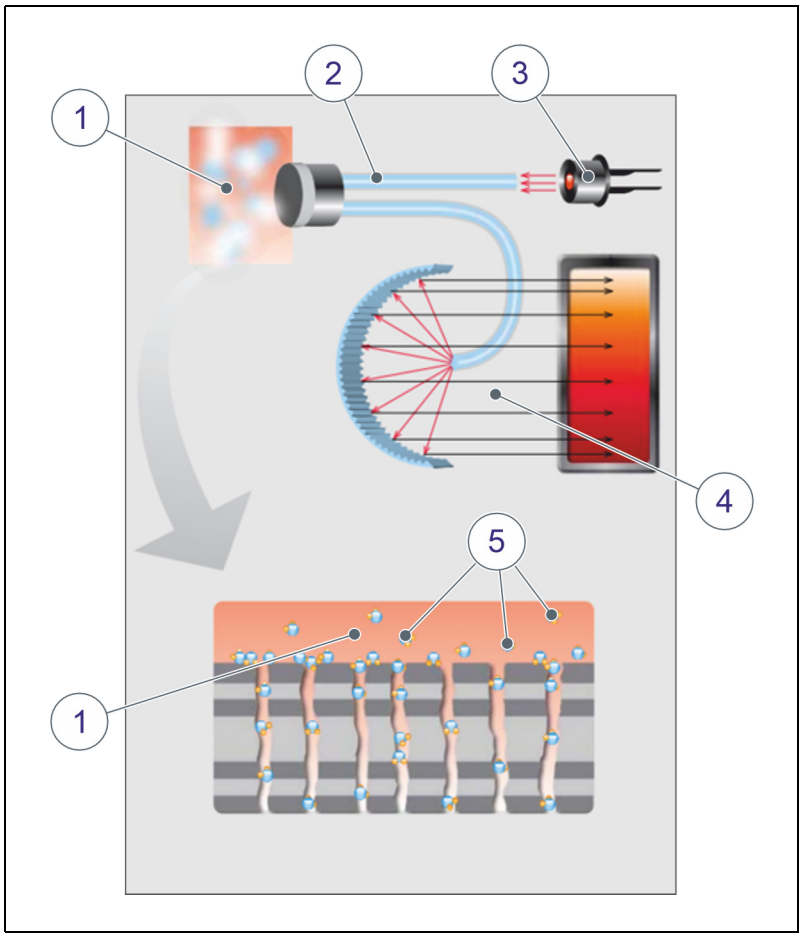

Figure 4.4: Illustration Fabry-Pérot interferometer

The principle of this correlative moisture measurement technique is an optical measuring principle based on that of a Fabry-Pérot interferometer.

The core of this measurement technique is a moisture-sensitive sensor element consisting of several microporous layers with alternating high and low refractive index **(1)**. This sensing element is an optical resonator consisting of two highly reflective thin-film mirrors with layers consisting of two different materials and with pores whose size is selective for water.

Light of a certain wavelength is generated by a light source **(3)** and coupled into the sensor element via an optical fiber cable **(2)**. Depending on the water vapor partial pressure of the measuring medium, water molecules **(5)** adsorb and desorb in the porous layer system. This leads to a change in the refractive index of the porous layer system and to a shift in the wavelength of the incident light. This shift is detected by a spectrometer **(4)** and can be assigned to a dew point or moisture content.

As part of this moisture measurement technology, the HYF 5674 evaluation unit contains

- an LED as a light source,
- a spectrometer as a detector and
- the necessary intelligence for control and data processing.

Via an optical channel switching integrated in the HYF 5674 evaluation unit, up to 3 humidity values can be queried sequentially at 3 different sensors/measuring points.

For more information, *see the sensor L1661 operating manual*.

5 Installation

5.1 General

- Before installing the evaluation unit, make sure that your supply voltage is within the allowed range of the device (see *chapter 3 “Technical data” on page 15*).
- The shield ground bar should be connected to your potential equalization system.

  Remove the guard caps from the tip of the sensor, the light waveguide connectors and the ports on the back of the evaluation unit.

  Pay particular attention to the note in *section 2.3 “Correct handling of fiber optic cables and connectors” on page 9*.
- It can happen that the sensor electromagnetically charges the plastic housing. Use only a damp cloth to clean the enclosure.
- To ensure air ventilation leave at least 1U space underneath (if installed in a 19" rack) and enough space behind the device for the air vents. Do not block the air intakes underneath the device.

5.2 Arrangements for EMC

- Connect the shield of cables to the ground bar provided for this purpose.
- Connect the grey shield cable from the BARTEC fibre-optic cable to the ground bar or fix the fibre-optic cable directly on the ground bar to connect the shield.
- For all shielded cables between HYGROPHIL F and a sample system (SCS), always apply the shielding only to one side (Ex i). Observe the current electronic plans in your customer file. In the sample system, the cables are already re-fabricated.
- The shielding cannot be applied there.
- You can use ferrite noise filters for signal cables in case of EMC problems. If you need some, you can order them from BARTEC BENKE. (see *chapter 1.7 “Customer service” on page 6*).

5.3 Installing the HYF 5674

- It is not necessary to ground the device because the grounding is realized via the power cable.
- Additionally you can connect the grounding cable to the grounding bar on the backside (see *Figure 4.2 on page 24*).
- Connect the power cable to the device (see *Figure 4.2 on page 24*).
- Install the device in a 19" rack (4 rack units) (see *Figure 4.1 on page 23*).

5.4 Connections

Sensor

For installing the sensor please refer to the *manual for the sensor* and follow the described instructions.

HYF 5674-100 Channel card

The following illustration shows the connector coding of the channel card:

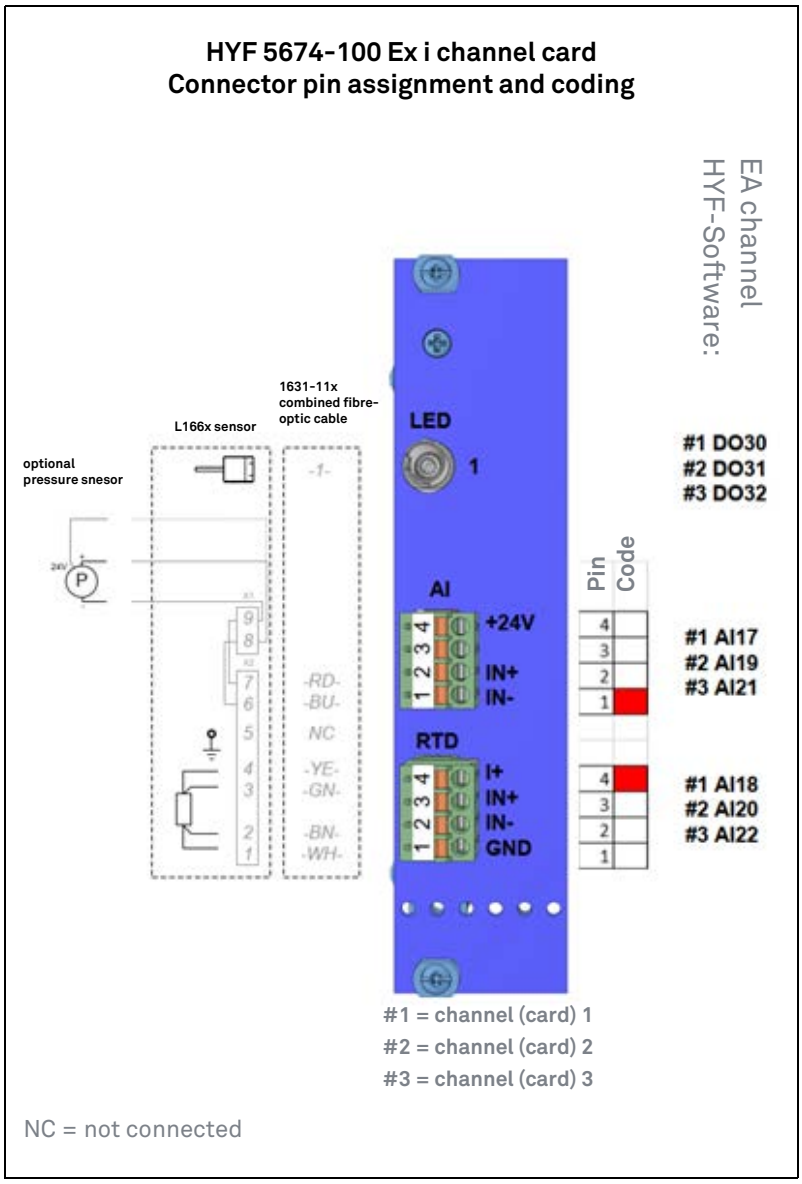

Figure 5.1: Channel card connector coding

To connect the channel card, please also refer to the *HYF 5674-100 channel card* (468876MDHEN) guide and follow the instructions described there.

HYF 5674-110 relay connection card (customer interface)

The following illustration shows the connector pin assignment of the relay connection card:

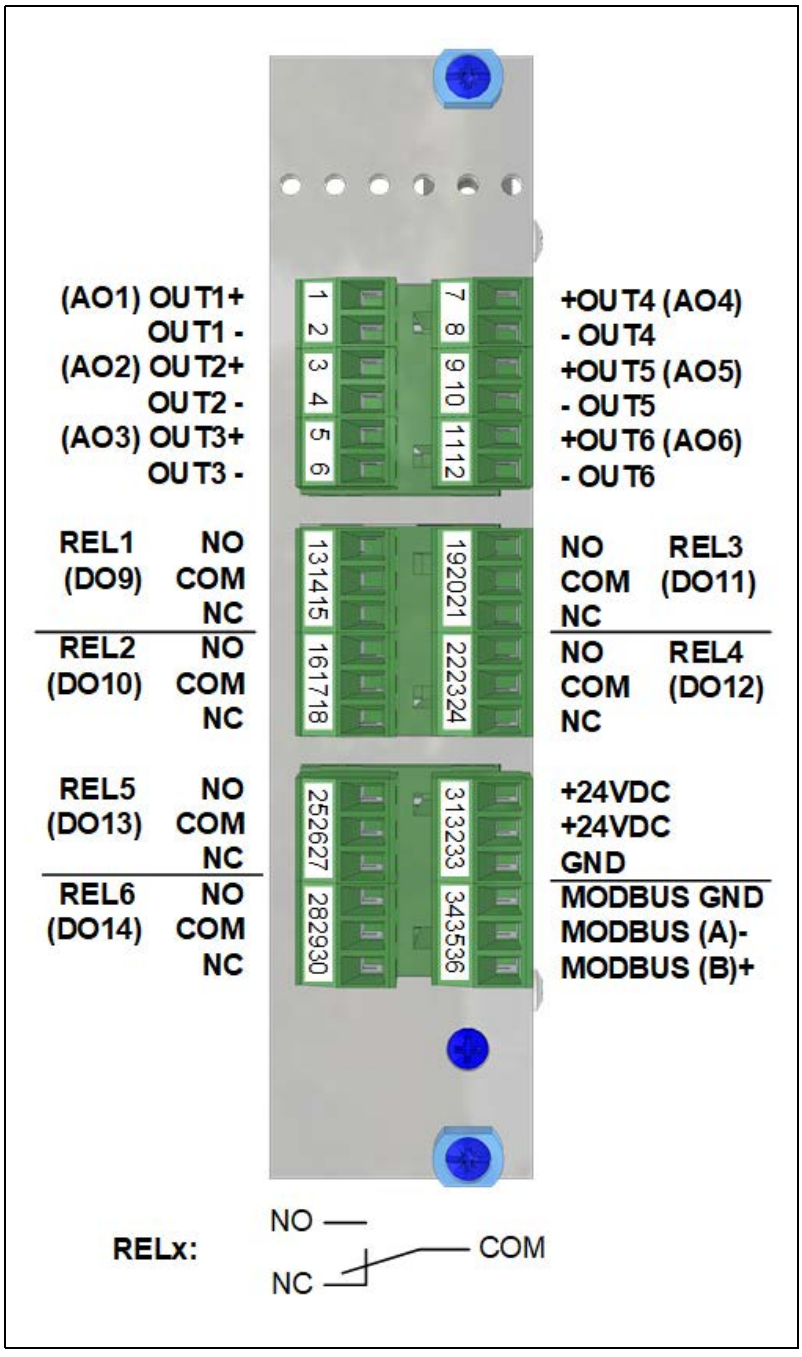

Figure 5.2: Relay connection card pin assignment

6 Maintenance

6.1 Maintenance plan

The maintenance plan provides an overview of the most important maintenance work. The sections below describe the maintenance work in detail.

If increased wear is detected at regular inspections, shorten the required maintenance intervals according to the actual degree of observed wear.

If you have questions on maintenance work and intervals, contact us at our service address (see *page 6*).

WARNING	
	**Risk of injury due to incorrect replacement parts!** Incorrect or defective replacement parts can result in damage, faults or total failures as well as impairments to safety. FOR THIS REASON: ☝ Only use spare parts from BARTEC BENKE. ☝ See *chapter 2 Safety "Intended use"*.

6.2 Cleaning the touchscreen and other components

Cleaning the touchscreen

NOTICE	
	**Only use detergent or monitor cleaning foam as a cleaning agent.** **Do not clean the touchscreen with aggressive solvents or scouring agents and do not clean with compressed air or steam cleaners.**

- Quit the software (*see software manual of the HYF 5674*).
- Switch off the device. Disconnect the power cable.
- Moisten the cleaning cloth.
- Spray the cleaning agent onto the cleaning cloth and not directly onto the touchscreen.
- Clean the touchscreen with the cleaning cloth.
- Switch the device on again.

Cleaning other components

- Do not clean painted or plastic surfaces and seals with aggressive solvents, scouring agents, high pressure cleaners or steam cleaners.
- Only use cleaning cloths and soap suds for cleaning.
- Make sure that no moisture can penetrate voltage-conducting parts.

6.3 Checking the safety systems

Procedure

- Check the safety equipment using the following table:

Inspection table

Safety equipment	Target condition
Ground	Connected No corrosion Firm seat see *chapter 2.4.1 “Potential equalization” on page 12*

6.4 Replacing a defective card

CAUTION	
	**Danger of damage due to electrostatic discharge!** The device or the electronic components could be damaged by touching it without protection against electrostatic discharge. FOR THIS REASON: ☝ Wear suitable protection against electrostatic discharge to avoid damaging the device and electronic components.

☝ **You cannot replace or repair any card or part without opening the device.**
If you try to open the device you will void the warranty. Only BARTEC BENKE service staff or personnel trained by BARTEC BENKE may carry out repairs on the device on site.

☝ **Send the device to BARTEC BENKE so that the warranty is not void.**
Our customer service will replace the defective card and send the device back to you.

7 Dismantling

At the end of its service life, the device must be dismantled and disposed of in an environmentally friendly manner.

Personnel

- Dismantling is only to be performed by specialists for potentially explosive atmospheres.
- Have work on the electrical system performed only by electricians.

WARNING	
	**Danger of injury due to incorrect dismantling work.** Stored residual energy, components with sharp edges, points and corners in and around the analyzer or on the required tools can cause injuries. FOR THIS REASON: ☝ Avoidance measures see *chapter 2 “Safety” on page 7*.

7.1 Preparing for dismantling

☝ Switch off the device and secure it against being switched on again.

☝ Discharge the remaining residual energies.

☝ Remove and dispose of operating materials and residual processing materials in an environmentally friendly manner.

7.2 Disconnecting electrical connections

- Carried out only by a qualified electrician.

DANGER	
	**Danger of death due to electrical current!** Touching voltage-conducting parts poses an immediate life-threatening hazard. Damage to the insulation or to individual components can cause fatal injury. ☝ Avoidance measures see chapter 2 “Safety”.

☝ Disconnect the device completely frim the mains and unplug it.

7.3 Disposal

Disassemble the device in accordance with the applicable work safety and environmental protecting regulations. Recycle the dismantled components:

- Scrap metals.
- Send plastic elements for recycling.
- Dispose of remaining components sorted by material properties.

CAUTION	
	**Environmental damage due to incorrect disposal.** Improper disposal pollutes the environment. FOR THIS REASON: - Have electric scrap, electronic components, lubricants and other auxiliary media disposed of only by authorised specialist companies. They are subject to the rules on special waste treatment.

The local municipal authority or special waste management companies provide information on environmentally friendly disposal.

8 Index

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