BARTEC

HYGROPHIL F 5674

HYF 5674

Safety Instructions

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en

Read this manual carefully before installing and using the device. 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 operating manual must be regarded as definitive.

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

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1 General information

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

1.1 Information on the operating manual

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

- ► Furthermore, the local accident prevention regulations and general safety instructions for the device's area of application must be observed.
- ► Read the operating manual carefully before beginning any work! It 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 applicable national standards and laws must be observed.

In addition to the work safety instructions in this operating manual, the safety, accident prevention and environmental protection regulations appropriate to the area of application must be observed.

In addition to this, 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.

The operator must make the necessary safety equipment available to personnel.

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.

Reproductions of any type - including excerpts - as well as the application and/or imparting of the content is prohibited without a written statement from the manufacturer. Infringements will be met with a claim for compensatory damages. The right to make further claims is reserved.

1.6 Replacement parts

WARNUNG

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 5.

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

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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

The sensor of the device is designed exclusively for measuring the moisture or trace humidity at low dew-point temperatures in flammable gases and liquids. For more information about the sensor, please *refer to the manual of the sensor*. The device is only to be used for stationary operation **and in non-explosive atmosphere**.

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 18. **Please completely read the manual to be able to understand and use the device properly.**

2.2 Instructions for the safe usage of the device

§ The humidity measurement sensor of the types L166x is installed in the partition wall of the zone which in accordance to the definitions of device group II requires category 1 equipment (zone 0). The Hygrophil F 5674 analyzer is equipped with a plug-in card. The humidity measurement sensor is connected to this channel card (Ex i) Type 5674-100. You can find all the necessary instructions for correct installation in the operating instructions for the channel card (Ex i) and the operating instructions for the humidity measurement sensor.

§ Only use BARTEC humidity measurement sensor 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.

§ 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.

§ In the construction of the humidity measurement sensor, epoxy resins are used. They are usually resistant to the mediums mentioned in the resistance list (*see the following table*). In case of application as category 1 equipment in other mediums, the resistance has to be checked separately.

List of resistance for application of category-1-equipment	
Alkohole	alcohols, generally
Ammoniak NH_3	ammonia
Argon	
Äthanol	ethyl alcohol
Chlor	chlorine
Distickstoff-Monoxid	
Druckluft	compressed air
Erdgas	natural Gas
Ester	ester
Flüssigkeiten	liquids, generally

List of resistance for application of category-1-equipment	
Flußsäure H	hydrofluoric acid
Helium	
Hexan	hexane
Kerosin	kerosens
Kohlendioxid CO_2	carbondioxide
Kohlenmonoxid CO	carbonmon¬oxide
Kohlenwasserstoffe	hydro carbons, generally
Krypton	
Lachgas	Nitrous oxide
Methan	methane
Methanol	methyl alcohol
Methylenchlorid	
Naphtha	naphtha
Narkosegas	narcotic gas
Neon	
Propan	propane
Raffineriegas	refinery gas
Sauerstoff	oxygen
Schwefelhexafluorid SF_6	
Schwefelwasserstoff	hydrosulphide
SF_4	
Silikonöl Dämpfe	Silicon vapours
Stickoxid	nitric oxide
Stickstoff	nitrogen
Toluol	
Vinylacetat	
Wasserstoff	hydrogen
Xenon	
Xylol	

2.3 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.

Electrical current

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

Transporting the device

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.

Dirt and objects left lying around

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.

Handling packaging materials

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.

Improperly perfomed maintenance

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.

Incorrect dismantling work

WARNING

Danger of injury due to incorrect dismantling work

Stored residual energy, components with sharp edges, points and corners in and around the device 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.

2.3.1 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.
- The coatings of the insulation are special versions of conductive connections.
- Every coating section must be grounded. The sections are always to be connected with each other via 2-pole potential connection, **never directly using adhesive surfaces or similar**. Non-coated areas or gaps in the coated areas are permitted providing they do not exceed a size of 20 cm².
- Coatings that are detached, damaged or were removed due to repair work must be replaced. You can order corresponding prefabricated coating strips through our customer service.

2.3.2 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 L166x sensor. The Ex i characteristics can be found on the 5674-100 channel card, inside the electrical drawing or safety manual. 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 5*).

2.4 Personnel requirements

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

2.4.1 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***].

2.4.2 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

Object	Description
Variants	· 1 channel (AC or DC) · mutli 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. 15 years, depending on application, environmental conditions and maintenance/repair
Method	Measuring sensor L1661 · Optical. Signal evaluation of the Fabry-Perot interferometer using a spectrometer · correlative to the reference method (dew point mirror)
Measuring range	Measuring sensor L1661 Dew point (DT): -80 … +20 °C ± 1K
Measuring mode	Measuring sensor L166x · cyclic
Measuring time / cycle time	Measuring sensor L166x · 1 Ch. System < 5 s · 3 Ch. System < 15s (all results)
Heatup time first start	Typical 30 min.
Electrical specifications	
Rated voltage	AC: 110..230 VAC ±10% 1Ph.; 50..60 Hz DC: 9..32 VDC, typ. 24 VDC
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 1A/250V DC: no fuse, short-circuit-proof
Power in connection type	AC: (IEC 60320) C14 inlet for connector C13, power cord EU (Type F CEE 7/7) or US/CA (NEMA 5-15) included, 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

Object	Description
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	Operating: 5 to 50 °C (AC) 5 to 45 °C (DC) typ. 15 to 25 °C Storage: -20 to 60 °C
Max rel. Humidity	80 %
Ingress protection (IP)	Front, Top, Side IP40 Back, Bottom IP20
EX safety data– intrinsically safe input / output	
Environmental conditions	outdoor, -20 °C to +70 °C, 5000m max.
AI	
Connector location	5674-100 Channel Card - AI 4-20mA (1-4)
Intrinsic Safety (IS)	[Ex ia IIC Ga]
Case: passive sensor 0 to 20 mA connected	
Terminal	4 (+24V), 2 (IN+), 1 (IN-)
Max. voltage U_o	28 V
Max. current I_o	93 mA
Max. power P_o	0.65 mW
Max. resistance R	300 Ω
Max. connectable capacitance C_o	83 nF
Max. connectable inductance L_o	3 mH
Internal capacitance C_i	negligible small (between I.S. wires)
Internal inductance L_i	negligible small

Object	Description
Safety-related maximum voltage	253 V
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-)
Max. voltage U_o	28 V
Max. current I_o	≈ 0 mA
External I.S. voltage U_i	30 V
External I.S. current I_i	120 mA
External I.S. capacitance C_i	≈ 0 nF
External I.S. inductance L_i	≈ 0 µH
RTD	
Connector location	5674-100-channel card – RTD (1–4)
Intrinsic Safety (IS)	[Ex ia IIC Ga]
Terminal	4 (I+), 3 (IN+), 2 (IN-), 1 (GND)
Max. voltage U_o	6,7 V
Max. current I_o	30 mA
Max. power P_o	50 mW
Max. resistance R	230 Ω
Max. connectable capacitance C_o	15,4 µF
Max. connectable inductance L_o	38 mH
Internal capacitance C_i	2,5 µF
Internal inductance L_i	0,3 mH
Safety-related maximum voltage	253 V
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	

Object	Description
Connector location	5674-100 Channel Card - LED
Intrinsic Safety (IS)	[Ex op is]
Max radiation power P	676 µW
Wave length λ	820 nm
Signal outputs (electrical specification)	
Analog outputs	6 outputs, 0/4 to 20 mA, maximum load 1000 Ω, active, reference potential 0 V / ground, short-circuit proof Connector: Clamp 1-12
Digital outputs	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	24 VDC, max. 500 mA Connector: Clamp 31-33 (+24VDC, GND)
Modbus RTU	RS485, baudrate 1200-11520 Connector: Clamp 34-36 (Modbus GND, (A)-, (B)+)
Signal outputs (logical specifikation)	
Analog outputs	8 frei wählbare Kanäle (TT, SP, WL, VP, RH, DT, FP, PPMv, PPMw, MC usw.)
Digital outputs	6 Ausgänge (Fehlerkanal n, Begrenzungskanal n)
User interface	
Display	7” touch display (800 x 480 pixel, 4:3)
Customer interface	
Hardwired	Terminal 1-30
Modbus RTU	Terminal 34-36
Modbus TCP/IP (Option)	Port MB TCP, RJ45
USB 3.0 (Front)	Type A, for backups / updates and service
Ethernet	Port LAN, RJ45, for remote access customer and service

Object	Description
Other	Upon request
Measures	
Measures (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 Channel Card Ex i)	cCSAus, IECEx, ATEX

4 Design and function

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

4.1 Overview

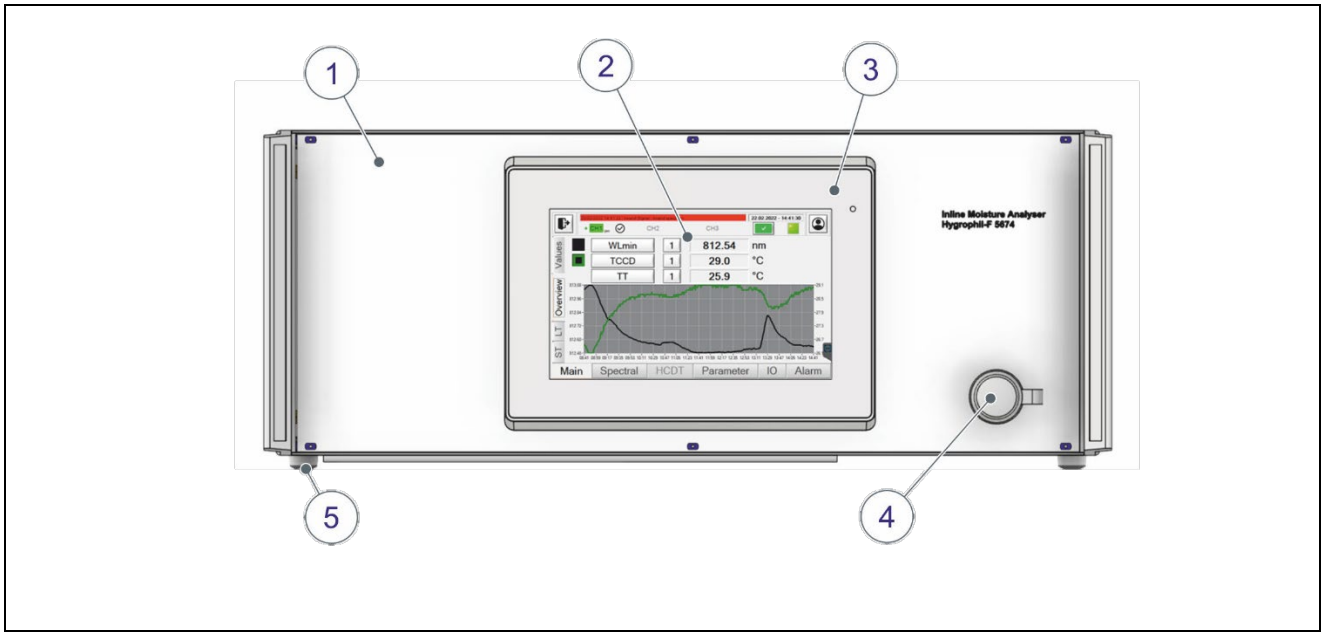

Figure 4-1: Device overview front side

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

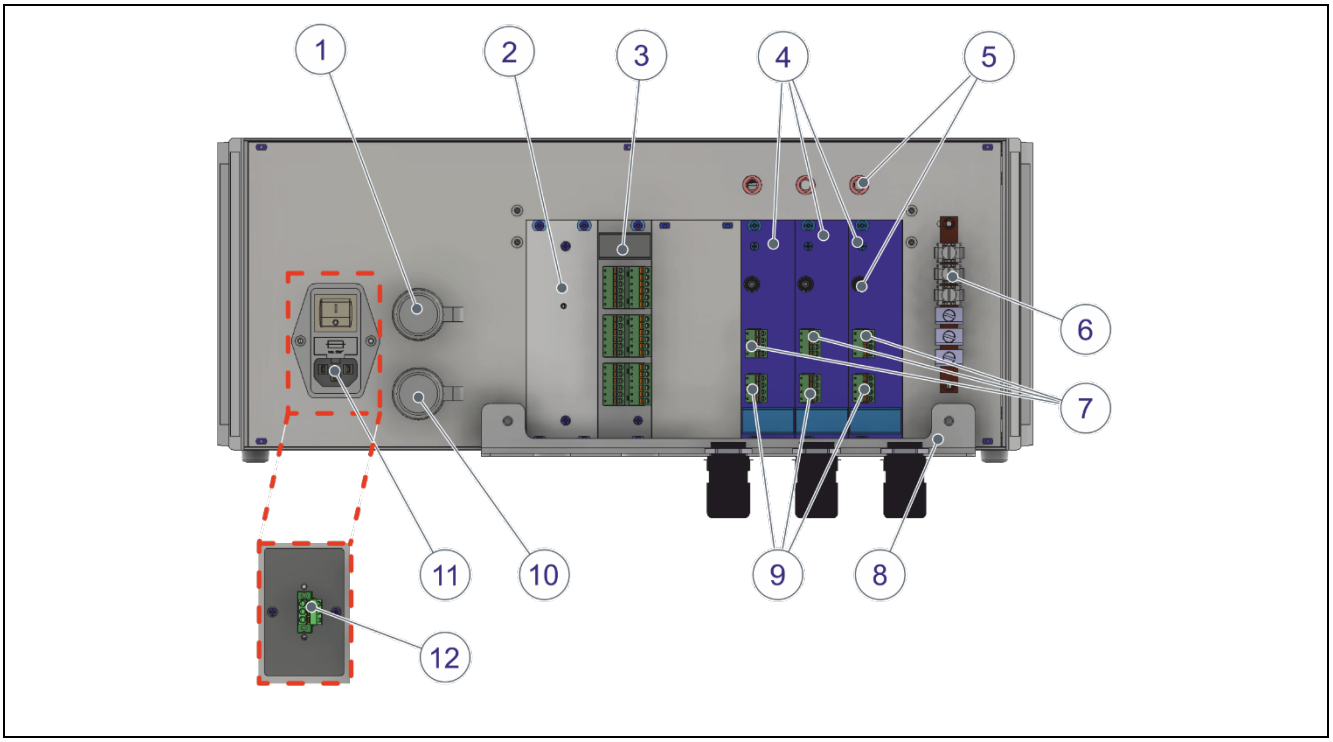

Figure 4-2: Device overview front side and inside

1. LAN 1 (remote)
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
6. Grounding bar (and shield)
7. PT100 for sensor L166x (temperature)
8. Cable clamp rail
9. Pressure sensor (0/4 to 20mA)
10. LAN 2 (Modbus TCP)
11. AC 110-230V (AC Option)
12. DC 9-36V (DC Option)

4.2 Brief description

HYF 5674 is a high-quality, microprocessor-controlled fiber-optic hygrometer for measuring the moisture or trace humidity at low dew- point temperatures in gases and liquids.

It works in multi-channel operation with a temperature-compensated fiber-optic sensor developed especially for measuring the moisture content in gas mixtures and liquids.

4.3 Measurement of water dew point temperature (gas humidity)

The water dew point is measured with the HYGROPHILR F and a moisture sensor. The moisture sensor, type L166x, consists of a robust multi-layer of optically high and low refractive layers connected to 2 fiber-optic cables. Due to a special thermal coating technique, pores with the diameter of a water molecule are generated on the layer.

Due to the moisture equilibrium content, water is deposited in the layer and changes the refractive index of the irradiating light (air: 1.00/water 1.33). Within the layer system this results in a wavelength shift in proportion to the moisture prevailing in the medium. This shift is measured by the evaluation unit and assigned to a dew point. The sensor probe makes measurements which are temperature compensated (by the integrated PT100).

In short, the HYF 5674 works in conjunction with a combination sensor which fiber-optically determines the moisture content and measures the temperature in the medium with a PT100. Apart from the extremely robust construction of the sensor, it is above all else, the measurement technique which offers several decisive advantages.

Some of the advantages of this patented measuring method are as follows:

§ High measuring confidence, including precision, reproducibility and low hysteresis.

§ Long-term stability of the sensor (no drift!)

§ Measurement is possible on the high-pressure side (pressure dew point!)

§ Application in explosive areas (zone 0 and higher)

§ Simple installation and upgrading (Swagelok, Parker ...)

The L166x was developed especially for natural gas applications and is now applied in trace moisture measurement for a large number of different gases and liquids.

Due to the usage of high-quality materials, the sensor is extremely robust and resistant to most media.

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).
- The shield groundbar 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.
- The Humidity measurement sensor L166x involve the risk of an electromagnetic charging of the plastic casing! Only use a moistened cloth to clean the casing!
- If the L166x is installed in pressure lines or pressure vessels, make sure the appropriate specifications (pressure vessel regulation DruckbehV, TRG, GasHL-VO, TRGL, ...) are complied with!
- The L166x sensor has to be included in the respective tightness and pressure tests.
- Usually an adapter with a screw thread is applied between the double-ferrule swage fitting of the humidity measurement sensor and the facility. On the facility side at least 5 threads of this adapter must be operative.
- Mounting the double-ferrule swage fitting:
  - First rotate the nut fingertight. If necessary tighten the nut by using a spanner until the measurement tube will not turn by hand.
  - Mark the nut in the 6 o´clock position.
  - While holding the fitting body steady with a spanner tighten the nut with a second spanner one and one-quarter turns to the 9 o´clock position (see also section 3.3.3).
- 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 refabricated.

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 5*).

5.3 Installing the HYF 5674

- ► It is not neccesary 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 19*).
- ► Connect the power cable to the device (*see Figure 4-2 on page 19*).
- ► Install the device in a 19“ rack (4 rack units)
  (*see Figure 4-1 on page 18*).

5.4 Connections

Sensor L166x

For installing the sensor please refer to the manual for the *L166x sensor* and follow the described instructions.

Channel card HYF 5674-100

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

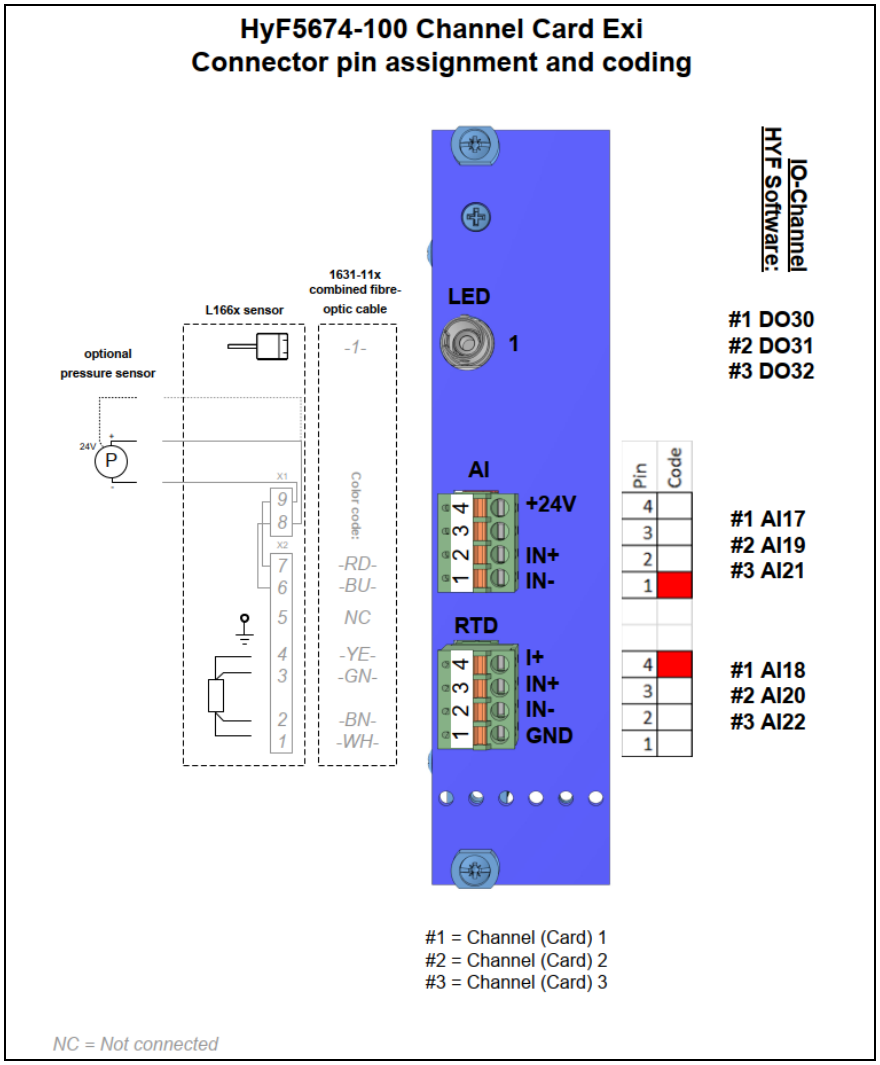

Figure 5-1: Channel card connector coding

For connecting the channel card please also refer to the manual for the *channel card HYF 5674-100* and follow the described instructions.

Relay connection card HYF 5674-110 (Customer Interface)

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

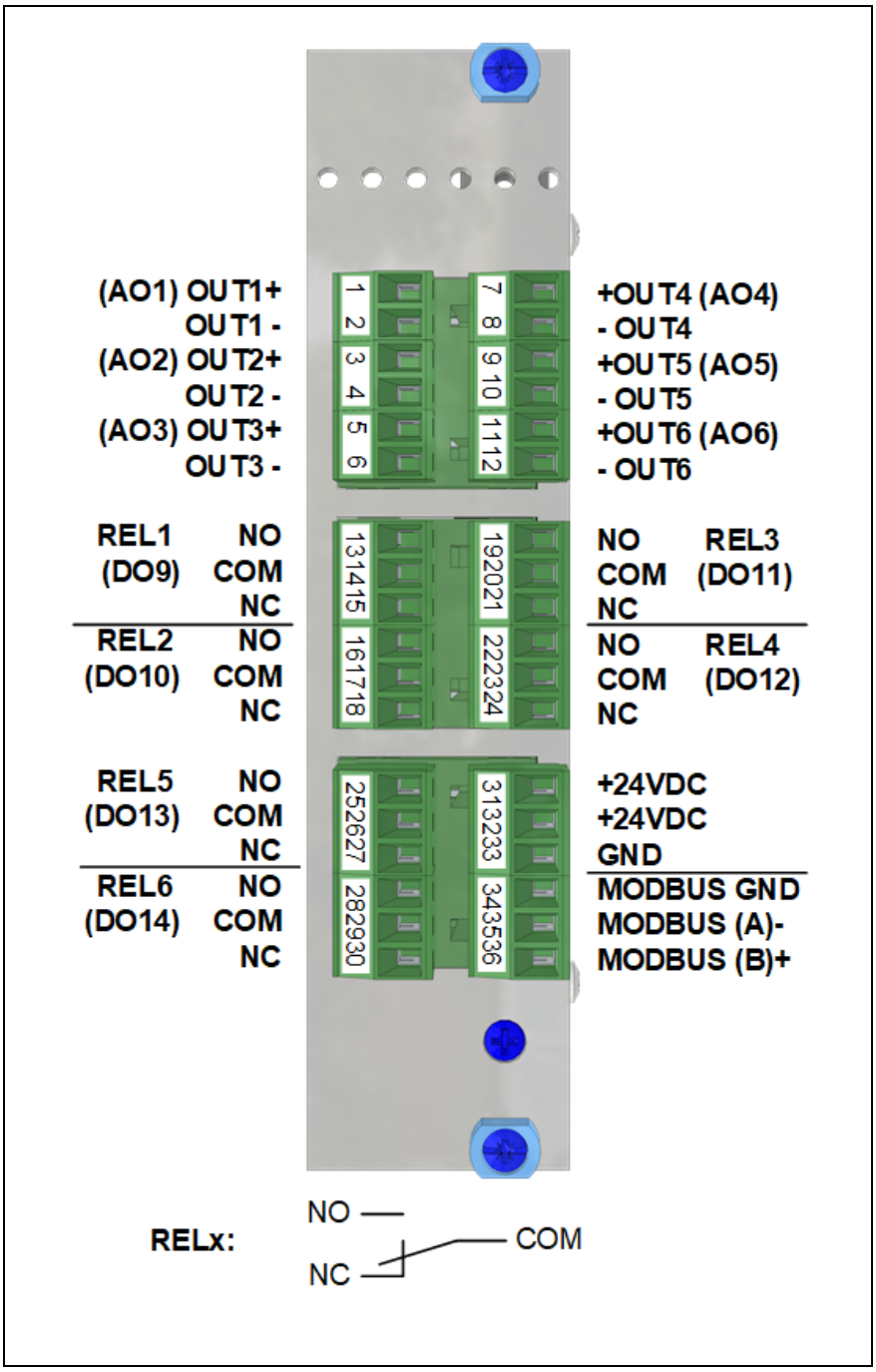

Figure 5-2: Relay connection card pin assignment

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 neccessary.

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 5).

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 2.1 “Inteded 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 5673*).
- ► 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 equipment

Procedure

To check the safety equipment:

► Check the safety equipment using the following table.

Inspection table

Safety equipment	Target condition
Ground	§ Connected § No corrosion § Firm seat *see chapter 2.3.1 "*Potential equalization*" on p. 11*

6.4 Replacing a defective card

Safety hints

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 service staff or personnel trained by Bartec 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.