

Translation of the original
operating instructions

Process gas analyser INCA4003



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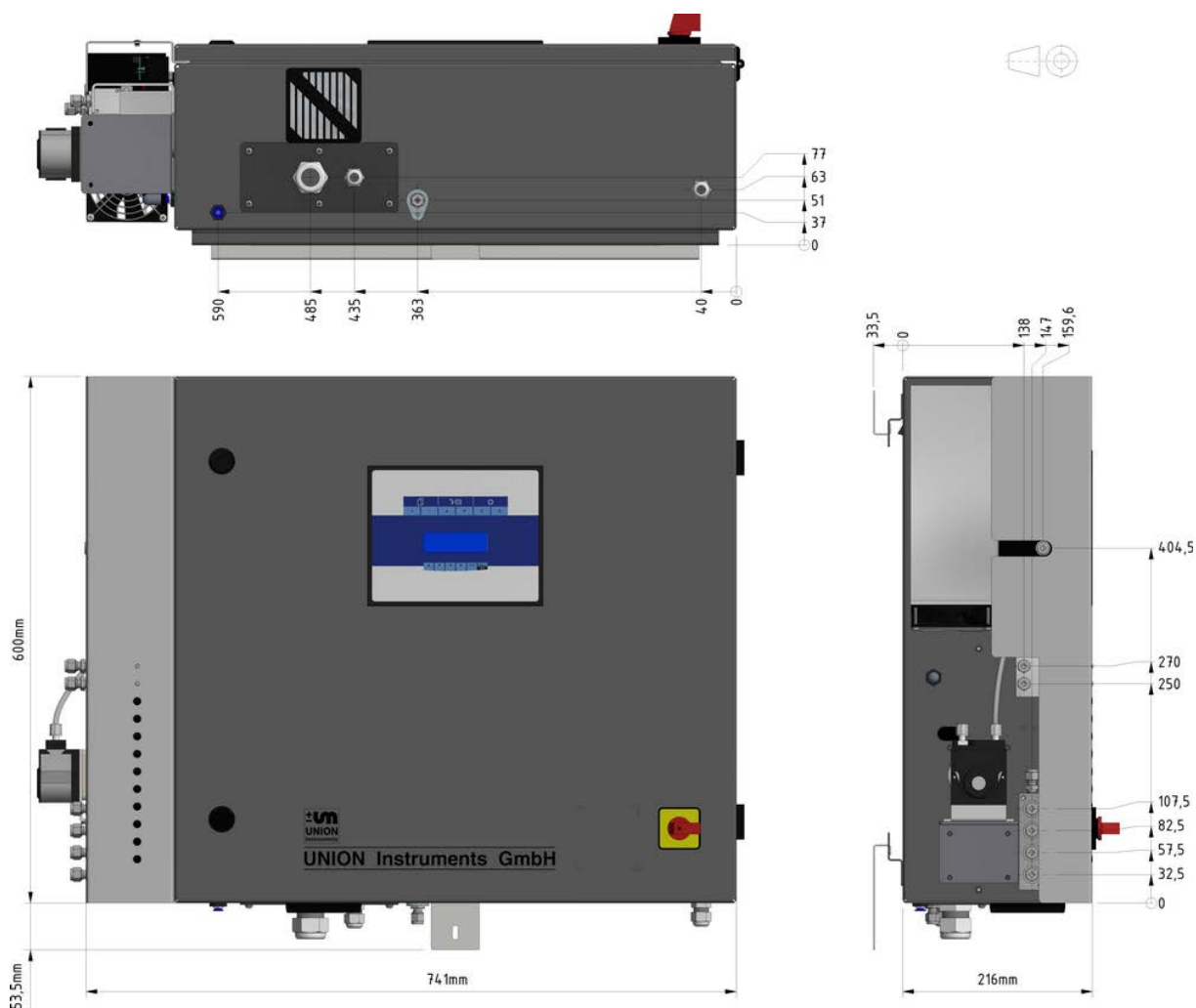
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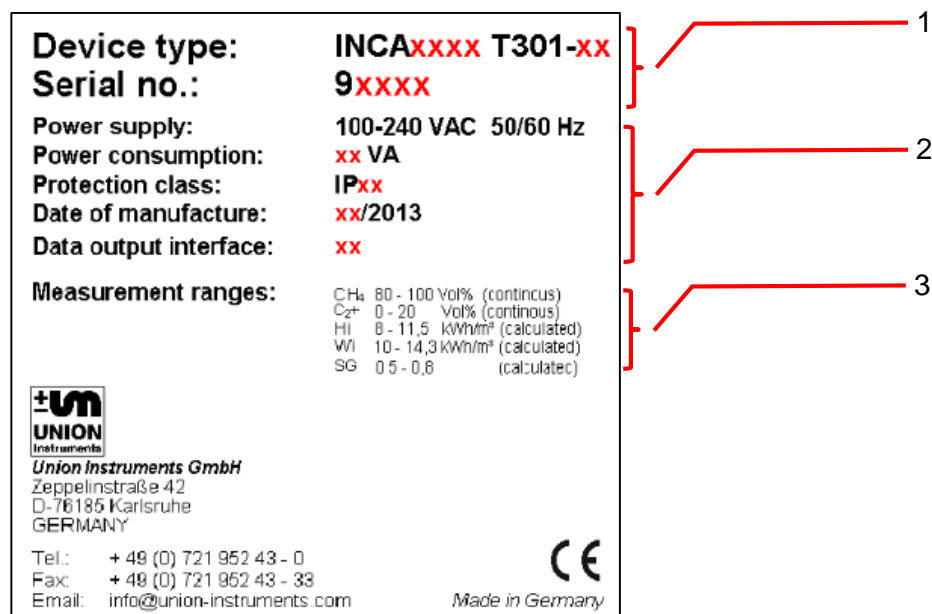
Dimensions



Measuring ranges and measuring accuracy

Refer to type plate on device also attached data and information.

Example of Measuring ranges on type plate:



The type plate contains the following information:

- Device type:** INCAxxxx T301-xx
- Serial no.:** 9xxxx
- Power supply:** 100-240 VAC 50/60 Hz
- Power consumption:** xx VA
- Protection class:** IPxx
- Date of manufacture:** xx/2013
- Data output interface:** xx
- Measurement ranges:**
 - CH₄: 80 - 100 Vol% (continuous)
 - C₂H₂: 0 - 20 Vol% (continuous)
 - HI: 8 - 11,5 kWh/m³ (calculated)
 - WI: 10 - 14,3 kWh/m³ (calculated)
 - SG: 0,5 - 0,8 (calculated)

Red brackets and numbers 1, 2, and 3 point to the following sections:

- 1: Device type and Serial no.
- 2: Power supply, Power consumption, Protection class, Date of manufacture, and Data output interface.
- 3: Measurement ranges.

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CE Made in Germany

Fig. 1.1: Type plate (exemplary)

1. Device description
2. Technical Information
3. Measurement ranges

Technical data

Gas inlets

Number of measuring points:	1 – 4 electrical ball valves
Calibration inlets:	1
Purge gas inlets:	1
Gas connections:	Clamp ring connection 6 mm
Max. distance between measuring point and analyser:	10 m
Max. gas inlet pressure:	20 mbar relative (optional 300 mbar)
Min. gas inlet pressure:	-100 mbar relative
Flame arrester:	ATEX certification G IIC
Relative gas humidity:	≤ 100% (condensate possible)
Condensate trap:	yes

Calibration gas

Calibration interval:	manual or automatic (configurable between one hour and up to several weeks)
Duration of calibration:	10 minutes (recommended by the manufacturer)
Gas consumption:	5 l/calibration

Power supply

Voltage:	100 - 240 V 50/60 Hz
Power consumption:	250 VA max.
Protection class:	I
Degree of protection	IP20

Interfaces

Relay:	3
Dig. interface:	RS232
Field bus:	optional
Optional relay:	optional
Remote Control Unit:	optional

Sample gas cooler

Cooling principle:	thermoelectric
Dew point:	3 - 30 °C adjustable
Condensate drain:	Hose pump

Ambient conditions

Operating temperature:	5 - 45°C
Humidity:	0 - 95 % relative humidity
Ambient pressure:	900 - 1250 hPa (0.9 - 1.2 bar)
Storage temperature:	-20 - 60°C

Weight

Weight:	up to 30 kg
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ATTENTION

When using the process gas analyser in other ambient conditions, consult UNION Instruments GmbH for additional measures.

Table of contents

1	EU Declaration of Conformity.....	9
2	Safety notes	11
2.1	Warnings and symbols	11
2.2	Fundamentals of proper use	12
2.3	Personnel and qualifications	12
2.4	Safety notes	13
2.4.1	General notes on safety	13
2.4.2	Notes regarding special hazards	13
2.5	Regular operator training	13
2.6	Workplace hazard analysis	14
3	Safety equipment.....	15
3.1	Main switch.....	15
3.2	Safety equipment.....	15
3.2.1	Door - not electronically queried.....	15
3.2.2	Ventilator monitoring	15
3.3	Markings and warnings.....	16
4	Connections.....	17
	Connection of process gas and electric ball valve.....	18
4.1	Accessories	19
5	Transport, setup and acceptance.....	21
5.1	Transport.....	21
5.2	Ambient conditions	22
5.2.1	Storage conditions.....	22
5.3	Set up and connection	22
5.4	Setup site	22
5.4.1	Wall attachment	23
5.4.2	Process gas	24
5.4.3	Electrical connection	25
5.4.4	Electrical interfaces	25
5.4.5	Operator safety precautions	32
5.5	Startup after setup	32
5.6	Documentation	32
6	Startup /switching on	33
7	Description of the workplaces/operating elements	35
7.1	Workplaces	35
8	Operation	37
8.1	Description of display	38
8.1.1	Using the membrane keypad.....	38
8.1.2	Displayarea	39
8.2	Available displays	39
8.2.1	Menu structure	40
8.2.2	Navigate with the arrow keys left ◀ and right ▶	41
8.2.3	Navigation with arrow keys up ▲ and down ▼	42
8.2.4	Navigation with ESC and MENU	43
8.2.5	Measurement display	44
8.2.6	Measuring channel display	44
8.2.7	Saved measured values	45
8.2.8	Display in the warmup phase	45
8.2.9	Select language	46
8.2.10	Password	47

9	Decommissioning/switching off	49
10	Maintenance.....	51
10.1	Preparations	51
10.2	Maintenance work/Inspection	52
11	Troubleshooting	55
11.1	Preparations	55
11.2	Changing/replacing fuses	56
11.3	Messages/malfunctions on the display.....	56
11.3.1	Display of messages/malfunctions.....	56
11.3.2	Visualizing the error list	56
11.3.3	Troubleshooting list	56
12	Service	57
13	Associated documents	59
14	Disposal	61
15	Spare parts.....	63
16	Annex	64
	EU Declaration of Conformity Flame arrester.....	65
	Index	67
	Table of figures	68

1 EU Declaration of Conformity



Der Hersteller / The manufacturer

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erklärt hiermit, dass folgend bezeichnete Produkte / hereby declares, that following named products:

Produktbezeichnung:	Gasanalysator	Gerätegruppe:	INCA4000
Product name	Gas Analyzer	device group	INCA4000

konform sind mit den Anforderungen, die in der EU – Richtlinie festgelegt sind / are compliant with the requirements as defined in the EU directive:

2014/30/EU	Elektromagnetische Verträglichkeit
2014/30/EU	Electromagnetic compatibility
2014/35/EU	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen
2014/35/EU	Electrical equipment designed for use with certain voltage limits

Angewandte harmonisierte Normen / Used harmonized standards:

EN 61010-1:2010	Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 1: Allgemeine Anforderungen; Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements
EN 61326-1:2013	Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV-Anforderungen - Teil 1: Allgemeine Anforderungen Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

Name des Dokumentationsbevollmächtigten:	Schlichter
Name delegate of documentation	

Adresse des Dokumentationsbevollmächtigten:	siehe Adresse des Herstellers
address delegate of documentation	see address of manufacturer

Bei einer nicht autorisierten Änderung des Gerätes verliert diese Erklärung ihre Gültigkeit. / Any unauthorized modification of the device results in invalidity of this declaration.

2 Safety notes

2.1 Warnings and symbols

In the operating instructions, the following names and symbols are used to denote particularly important information:

	<div data-bbox="395 577 464 640"></div> <div data-bbox="491 577 820 640">DANGER</div>
	<p>Immediate danger that can lead to serious physical injury or death.</p>

	<div data-bbox="395 824 464 887"></div> <div data-bbox="491 824 858 887">WARNING</div>
	<p>Potentially hazardous situations that can lead to serious injury or death.</p>

	<div data-bbox="395 1072 464 1135"></div> <div data-bbox="491 1072 920 1135">ATTENTION</div>
	<p>Potentially hazardous situations that can lead to minor physical injury. This can also be used for property damage.</p>

<div data-bbox="240 1400 363 1458"></div>	<div data-bbox="395 1357 604 1420">NOTE</div>
	<p>Denotes information that can make it easier to handle the process gas analyser or help prevent property damage.</p>

2.2 Fundamentals of proper use

The process gas analyser serves to identify gases and their quality in biogas, crude biogas, lean gas and biomethane.


Applications are biological process optimisation during motor control, controlling preparation systems, analysing biogas, landfill gas and gas from purification plants.

The gas analyser is not suitable for determining the workplace threshold or lower explosion limit.

In the case of toxic and explosive gases, observe the safety instructions at the setup site.

The process gas analyser is permanently installed and is intended for use inside closed rooms in a sufficient quantity of clean ambient air.

Any other use is considered improper. The manufacturer is not liable for the resulting damage; the associated risk is borne by the installer, fitter, operator or user. Only certified professionals may alter the process gas analyser (mechanical, electrical or pneumatic modifications).



	 WARNING
	<p>Proper use includes following these operating instructions. In addition to the following safety notes, always follow the safety instructions of the linked system components.</p> <p>Additional equipment or accessories that are not installed, delivered or manufactured by UNION Instruments GmbH require the approval of UNION Instruments GmbH as the manufacturer! Otherwise the guarantee expires.</p>

2.3 Personnel and qualifications




Gas connections and work on the electrical equipment of the process gas analyser may only be performed by a professional while observing safety regulations.

2.4 Safety notes

2.4.1 General notes on safety

	 WARNING
	<p>The process gas analyser may only be operated when all of the protective equipment is available and operable.</p> <p>Additional safety notes:</p> <p>☞ <i>before the corresponding chapters!</i></p>

2.4.2 Notes regarding special hazards

 	 WARNING
	<ul style="list-style-type: none"> • After installation, all gas conducting parts must be checked for leaks according to national regulations. • All repairs that require the protective covering to be opened may only be performed by trained personnel. • Sensors can contain sulphuric acid. This may leak in case of improper use. Protect from contact with skin and eyes.

2.5 Regular operator training

	NOTE
	<p>Country-specific regulations about regular user training by the operator must be observed, in particular training on handling gases and electrical equipment.</p>

2.6 Workplace hazard analysis

	<h1>NOTE</h1>
<p>Depending on the national regulations, the operator must perform a workplace hazard analysis, if applicable independent of the CE mark for this process gas analyser.</p>	


Technical developments can give rise to deviations from these operating instructions. If you require additional information or if particular problems arise that are not fully addressed in this manual, please contact the following address:

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3 Safety equipment

3.1 Main switch

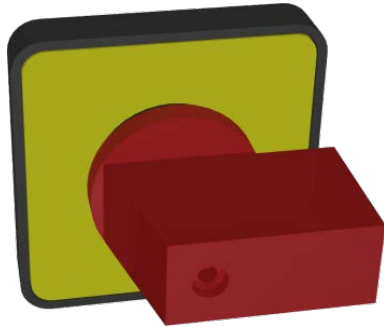


Fig. 3.1: Main switch (exemplarisch)

3.2 Safety equipment

3.2.1 Door - not electronically queried

- Door of the process gas analyser.

3.2.2 Ventilator monitoring

If the housing fan fails, the process gas analyser is de-energized. The power supply unit and fan monitor control still have power.

3.3 Markings and warnings

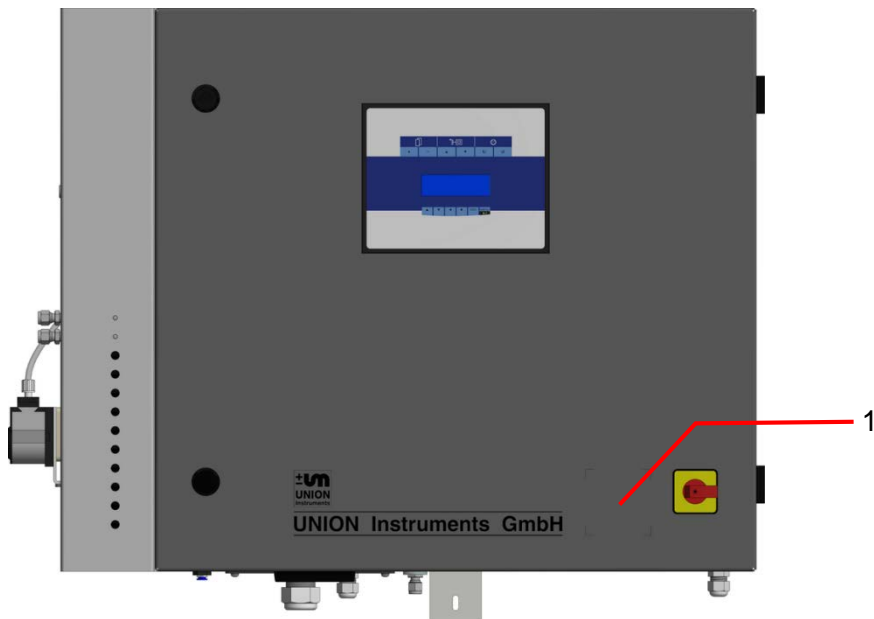


Fig. 3.2: Markings and warnings

1. Type plate



Fig. 3.3: Warning in housing

4 Connections

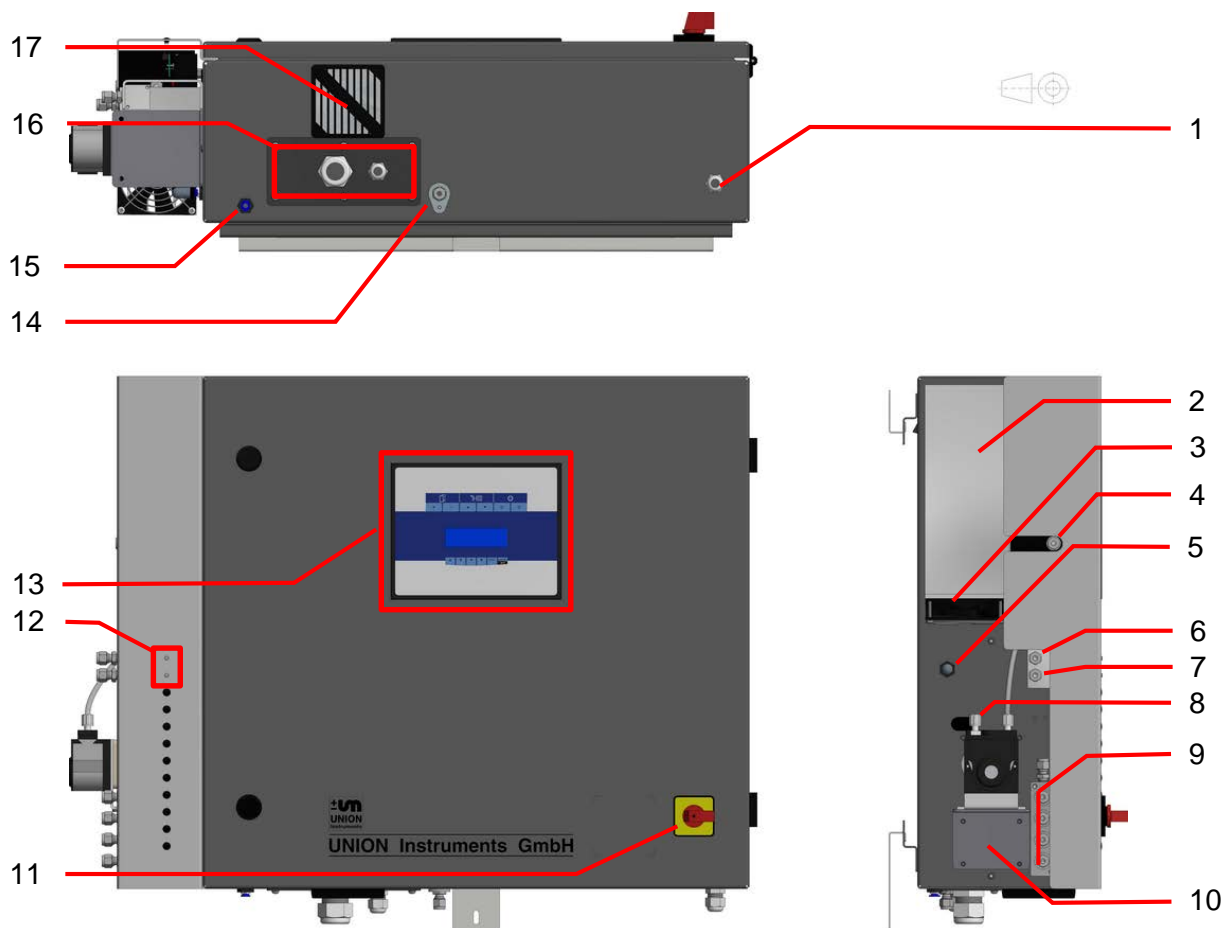


Fig. 4.1: Product description

- | | |
|-------------------------------|--|
| 1. Power supply cable bushing | 10. Hose pump |
| 2. Gas cooler | 11. Main Switch |
| 3. Gas cooler fan | 12. Solenoid valve display, inlet on/off |
| 4. Input gas cooler | 13. Operating element |
| 5. Intake air filter | 14. Output process gas |
| 6. Input calibration gas | 15. Output pressure regulator leakage |
| 7. Input purge gas | 16. Cable bushings |
| 8. Condensate pump connection | 17. Fan |
| 9. Input process gas | |



NOTE

Up to 4 process gas lines can be connected.

Connection of process gas and electric ball valve

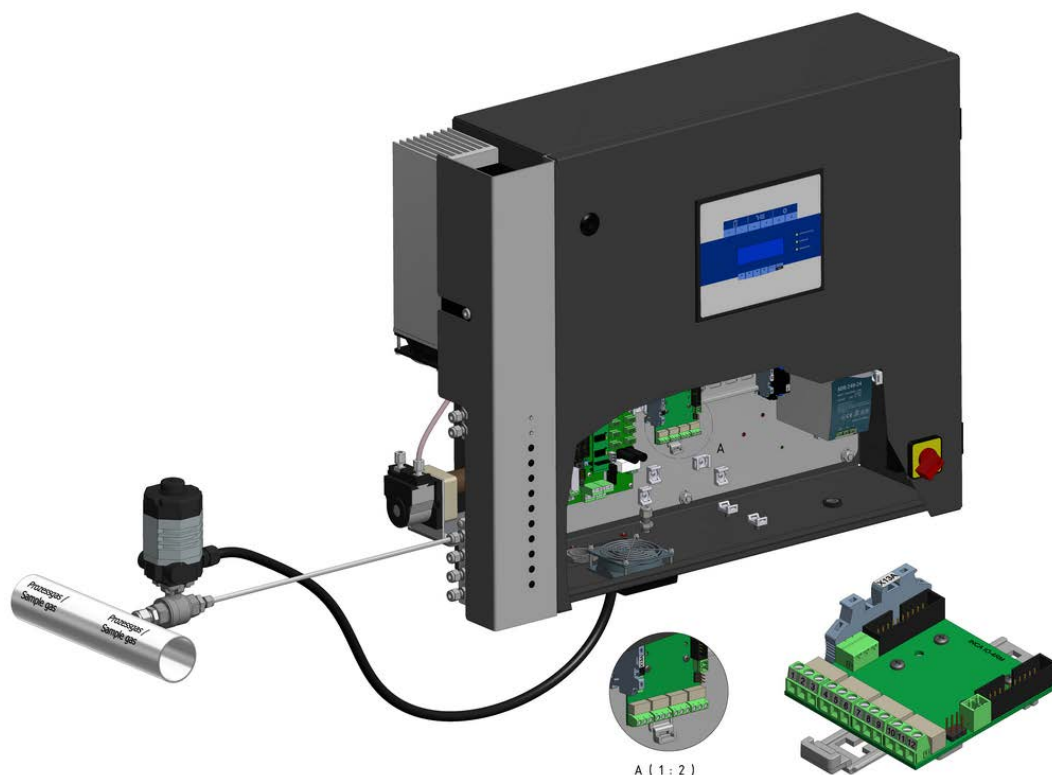






Fig. 4.2: Connection of process gas and electric ball valve

Observe the following during installation:


- Mount ball valves directly at withdrawal point.
- Diameter of outgoing line at ball valve 6 mm.
- The process gas line must not overcome larger height differences.
- Install the lines to the process gas analyser frost-free.

	 <h1 style="margin: 0;">WARNING</h1>
	<p>Closing ball valves!</p> <p>If the process gas analyser is switched off or after a failure of the power supply, ball valves are without power supply.</p> <p>Valves must be closed manually! Observe the operating instructions of the ball valves.</p>




4.1 Accessories

	<div data-bbox="395 353 462 421"></div> <div data-bbox="491 353 858 421"><h1>WARNING</h1></div> <p data-bbox="395 459 699 488">Risk of injury/defective!</p> <p data-bbox="395 504 1433 609">Use of non-approved accessories can cause defects and be hazardous. This will render the warranty null and void. The operator is then liable for any damage that may occur.</p> <p data-bbox="395 622 1417 689">Only use original accessories or accessories that have been approved by Union Instruments GmbH.</p>
---	--

5 Transport, setup and acceptance



	<h1>NOTE</h1>
	<p>Generally, the process gas analyser is started up by Union Instruments GmbH or service technicians.</p> <p>If it is not transported, set up and started up by Union Instruments GmbH (for example in-house transportation and resale), coordinate the appropriate procedure with Union Instruments GmbH (<i>Chapter 12 Service</i>).</p>

5.1 Transport

 	 <h1>WARNING</h1>
	<p>Possible injury from the process gas analyser tipping over or falling from pallets and load carrying equipment.</p> <ul style="list-style-type: none"> • At least two persons are required to unpack and transport the analyser (for weight see technical data)! • Check the load bearing capacity and condition of the slinging equipment and carefully attach it. • Never stand under suspended loads.

	<h1>NOTE</h1>
	<p>In case of damage during transport from improper handling, the carrier should perform a damage report within seven days (railway, post office, freight forwarder).</p>

5.2 Ambient conditions

	 ATTENTION
	<p>Ambient conditions during storage and set up.</p> <p>Observe the stipulated ambient conditions. Contact Union Instruments GmbH if the process gas analyser has been stored for more than three months or needs to be operated or stored under ambient conditions other than those specified.</p>

5.2.1 Storage conditions

If condensation water freezes in the process gas analyser, this can cause defects. Protect the process gas analyser against frost when putting it into storage.

Ambient temperature:	-20 - 60°C
Humidity:	0 - 95% relative humidity
Ambient pressure:	700 - 1400 hPa (0.7 - 1.4 bar)

5.3 Set up and connection

5.4 Setup site

The setup site for the process gas analyser must satisfy the following conditions:

- Clean dry room (with the exception of INCA5000/INCA6000)
- No direct exposure to sun
- Protect from climate influences with a heater or air conditioning if necessary
- Insure a clean, sufficient amount of ambient air for undistorted measurements
- Ensure that the loadbearing capacity of the wall is sufficient

	 WARNING
	<p>Leaking process gas can pose a hazard and needs to be discharged by the operator into a safe environment.</p>

5.4.1 Wall attachment

The process gas analyzer is intended for wall installation. The wall brackets are permanently attached to the housing.

The wall on which the process gas analyser is to be installed needs to be sufficiently stable to bear its weight.
Attach process gas analyser to brackets.



Fig. 5.1: Wall attachment

5.4.2 Process gas

NOTE





- The connecting parts need to be clean and free of residue. Impurities can enter the process gas analyser and cause incorrect measurements and/or damage.
- The inlet pressure for the gas connections must not exceed the pressure specified on the instruction sticker on the process gas analyser.
- Each connection needs to be carefully checked for leaks. If there are any leaks, the system will draw air, and the measurements will be incorrect.
- Do not use sealing compound to seal the gas connections as this can lead to inaccurate measurements. Use PTFE sealing tape.
- Only use suitable pipes.
- Use a separate line to drain off the condensate.





ATTENTION


The process gas must be free of condensate and dust if the process gas analyser has no gas preparation system (or gas cooler).

5.4.3 Electrical connection

	 DANGER
	<p>Danger from electrical shock!</p> <p>Only a trained electrician may modify the electrical equipment of the process gas analyser in accordance with the relevant guidelines.</p> <p>When the process gas analyser has been opened, the parts identified by the adjacent symbol may still be live even when the master switch has been turned off. If necessary, disconnect the process gas analyser from the power supply.</p>

5.4.4 Electrical interfaces

	 WARNING
	<p>Untrained personnel starting the process gas analyser may endanger people and equipment.</p> <p>Only trained service technicians may start up the analyser.</p>

	NOTE
	<p>Only operate relay with functional extra low voltage.</p> <p>Do not connect to the power supply.</p>

Power Supply Connections



Fig. 5.2: Power Supply X2 with fuses

1. Power supply connections

Connect the process gas analyser to the power supply in accordance with national regulations via L1, N and PE.

Electrical Interfaces

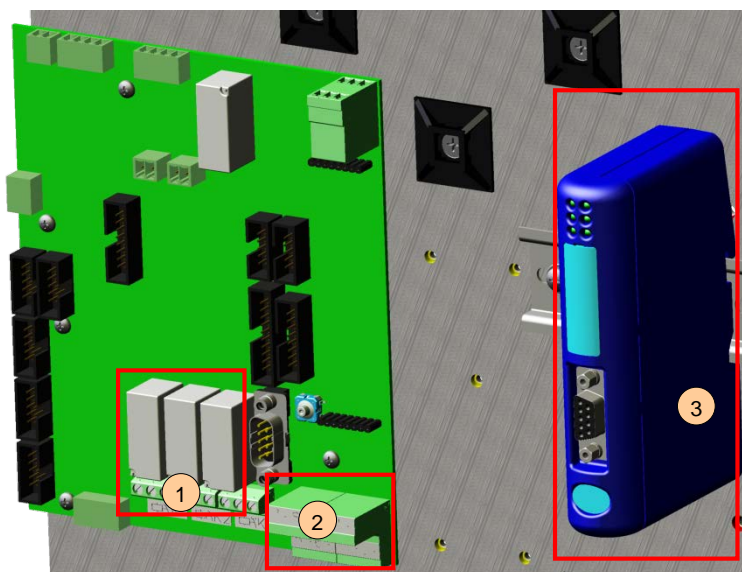


Fig. 5.3: Electrical interfaces

Item No.	Designation
1	Relay X10A <i>Fig. 5.4 and 5.5!</i>
2	Analogue outputs X11A (optional) <i>Fig. 5.6</i>
3	Profibus module X12 (optional)

Relay

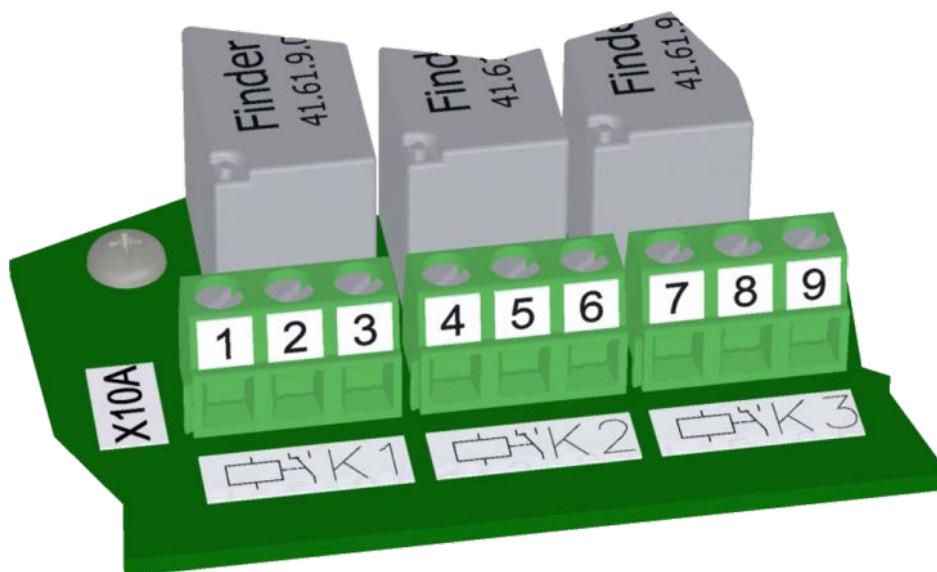


Fig. 5.4: Relay X10A, outputs K1 – K3

Item No.	Designation	Function
1	Relay K1	Operation
2	Relay K2	Failure (inverted)
3	Relay K3	OFF

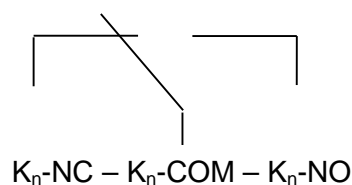



Fig. 5.5: Relay X10A terminal assignment

left - middle: normally closed
right - middle: normally open



NOTE

Only operate relay with functional extra low voltage.
Do not connect to the power supply.

Maximum load of the relay connections 30VDC / 1A.

Analogue outputs

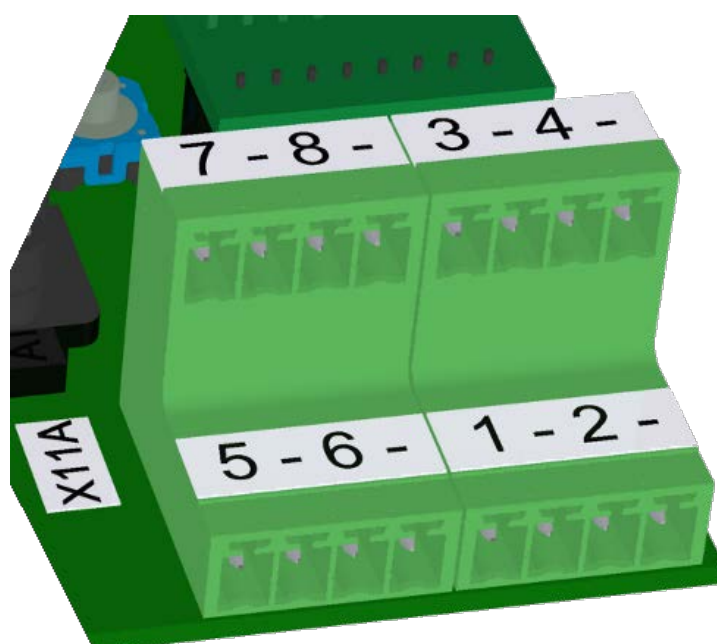


Fig. 5.6: Analogue outputs X11A, connections

Item No.	Function	Item No.	Function (2-channel device)
1	Output 1 – signal/signal 4-20 mA	5	Output 5 – signal/signal 4-20 mA
-	1 GND	-	5 GND
2	Output 2 – signal/signal 4-20 mA	6	Output 6 – signal/signal 4-20 mA
-	2 GND	-	6 GND
3	Output 3 – signal/signal 4-20 mA	7	Output 7 – signal/signal 4-20 mA
-	3 GND	-	7 GND
4	Output 4 – signal/signal 4-20 mA	8	Output 8 – signal/signal 4-20 mA
-	4 GND	-	8 GND

Assignment of analog interface configurable with Software INCACtrl.

The load resistor is 500 ohm.

Remote Control Unit RCM

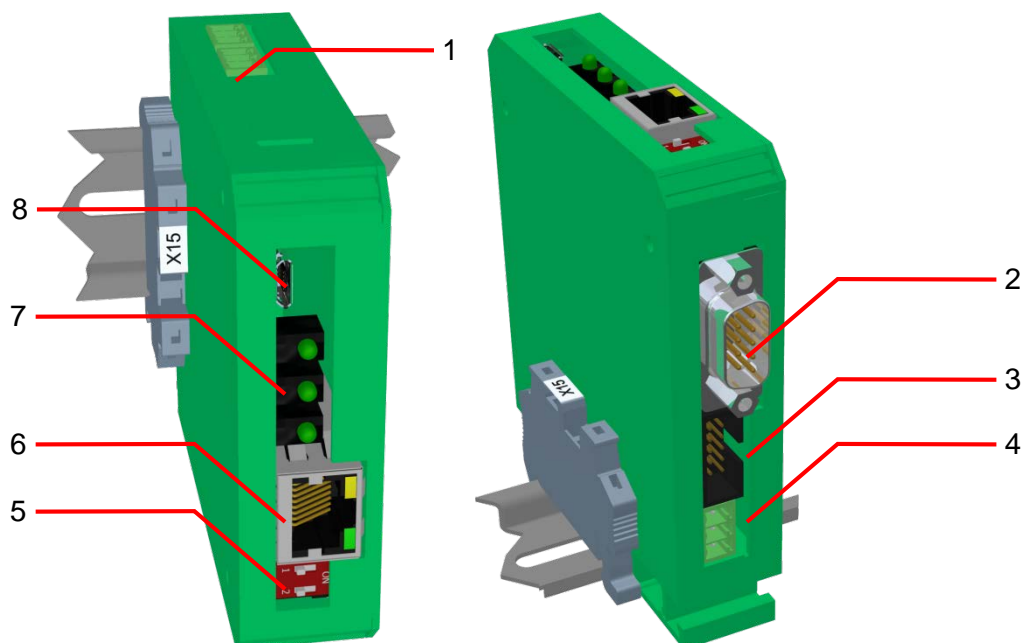


Fig. 5.7: Remote Control Unit RCM X15

Pos.- No.	Description
1	bus, connecting internal power supply
2	internal, RS232 connection for PCB-AddOn (Display) via null modem cable
3	connection Fieldbus coupler
4	bus, connecting internal power supply
5	DIP switches
6	Ethernet
7	status LED, LED 1- USB active, LED 2- Fieldbus active, LED 3 - Ethernet active (from top to bottom)
8	Micro-USB, local connection to PC, if used no connection via Ethernet/Fieldbus

Communication module for integration into Ethernet networks to communicate and operate the process gas analyser.

DHCP is enabled as factory setting, RCM received IP - address automatically from a DHCP server. Manual assignment of IP address with separate software (example: "DeviceInstaller", Lantronix).

Default Settings:

IP over DHCP	On
Port	10001
Protocol	TCP/IP
RS232	115200 bit/s, 8 data bit, 1 stop bit, no parity bit
MAC address	refer to label on RCM.

Electric Ball Valves

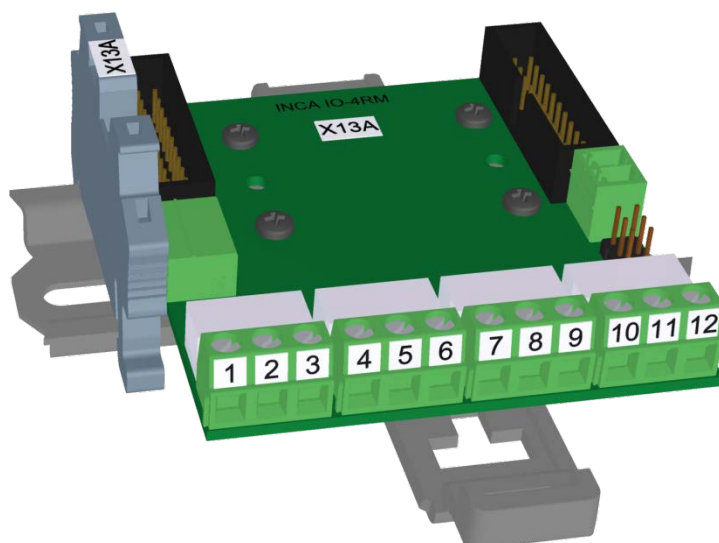





Fig. 5.8: Relay X13A, Connections ball valves

The electrical connections for the ball valves are established from the left with the first relay - channel 1 – to the right (channel 2 to channel 4). The first two terminals of each relay are assigned in each case.

Pos.-No. X13A	Channel	cable of ball valve
.1	1	red
.2		black
.3		- -
.4	2	red
.5		black
.6		- -
.7	3	red
.8		black
.9		- -
.10	4	red
.11		black
.12		- -



Maximum load of the relay connections 30VDC / 1A.

5.4.5 Operator safety precautions


 	<div data-bbox="304 329 1359 443"> WARNING</div> <ul style="list-style-type: none">• The operator needs to provide suitable safety equipment for the process gas analyser to reliably prevent individuals from being injured from gas leaks.• Any leaking process gas needs to be diverted into a safe environment.• Identify the exit point of the diverted gas with a warning.• Danger of tripping due to improperly installed supply lines.
--	---

Install the supply lines in a suitable manner.



5.5 Startup after setup


	<div data-bbox="304 956 1359 1070"> WARNING</div> <p>Untrained personnel starting the process gas analyser may endanger people and equipment.</p> <p>Only trained service technicians may start up the analyser.</p>
---	---


5.6 Documentation

	<div data-bbox="304 1391 1359 1505">NOTE</div> <p>Union Instruments GmbH recommends keeping a maintenance manual and documenting all jobs and tests.</p>
---	---

6 Startup /switching on

	 <h1 style="margin: 0;">ATTENTION</h1>
	<p>To establish operational readiness, including of the linked system components, according to the corresponding operating instructions.</p>

	<h1 style="margin: 0;">NOTE</h1>
	<p>The following table contains highly abbreviated steps for starting up after a long downtime.</p> <p>To turn on the process gas analyser after a short downtime, a few steps can be omitted: <i>☞ right column!</i></p>

Steps	Startup	Turning on
Check whether the ambient conditions (☞ <i>Technical Data chapter on page 5!</i>) meet the requirements.	X	X
Check that the process gas analyser has been fastened securely.	X	
Check that the device is suitable for the process gas.	X	
Check that the process gas is correct.	X	
Check that the gas connections are correct and tight.	X	X
Check the integrated filters (water/fine filter) for condensate, if necessary.	X	X
Check, if necessary, that the calibration gas is correct.	X	X
Establish/switch on the operator energy and media supply.	X	X
Check the voltage.	X	
Open shut-off valves.	X	X
Turn on the master switch.	X	X
Make sure the linked system components are ready to start.	X	X
 If the process gas analyser was only switched off temporarily, production can be resumed.		

7 Description of the workplaces/operating elements



NOTE

This chapter only discusses the elements used by normal operators to operate the process gas analyser.

7.1 Workplaces

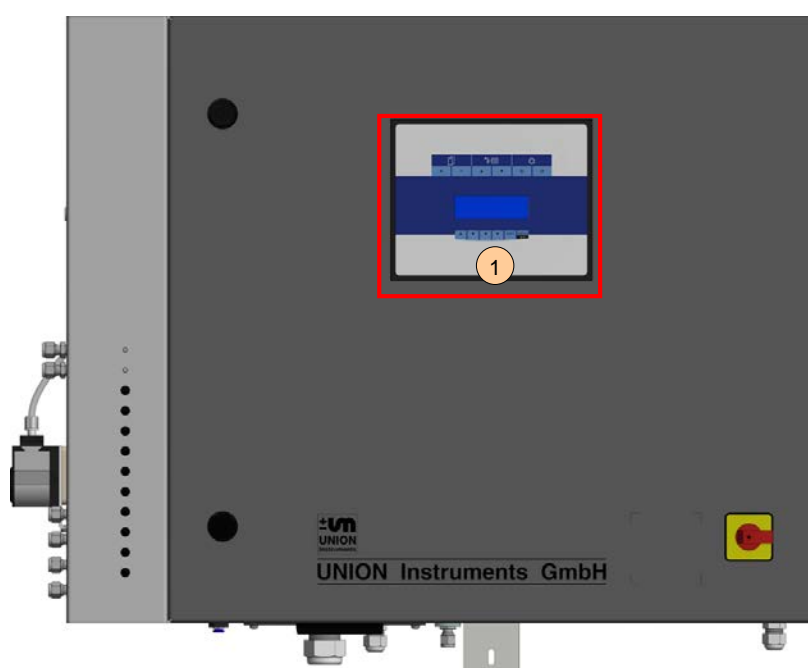


Fig. 7.1: Workplaces

Item No.	Designation	Function/Activity
1	Display with status LED	Display status.

Display status LED

The following states are displayed through those LEDs:





LED Operation		
Output state		Description
	flashing	Device functionality OK (even Service might be pending)
	flashing	Device functionality is affected by errors, Service message pending
	flashing	Device stopped by fatal error, Error pending

Fig. 7.2: Status LED

8 Operation

	<div data-bbox="395 421 464 479"></div> <div data-bbox="491 421 858 479"><h1>WARNING</h1></div> <div data-bbox="395 521 1445 633"><p>Danger of injury!</p><p>Only use the process gas analyser when all lines have been installed and checked for leaks according to national regulations.</p></div>
---	--

8.1 Description of display

8.1.1 Using the membrane keypad

The software controls are operated using a membrane keypad. The displayed buttons can be selected by pressing the key. The menu structures are intentionally flat to enable quick access to functions.

ATTENTION

Damage to the membrane keypad!

The membrane keypad may be damaged if you use other objects to operate it apart from your fingers.

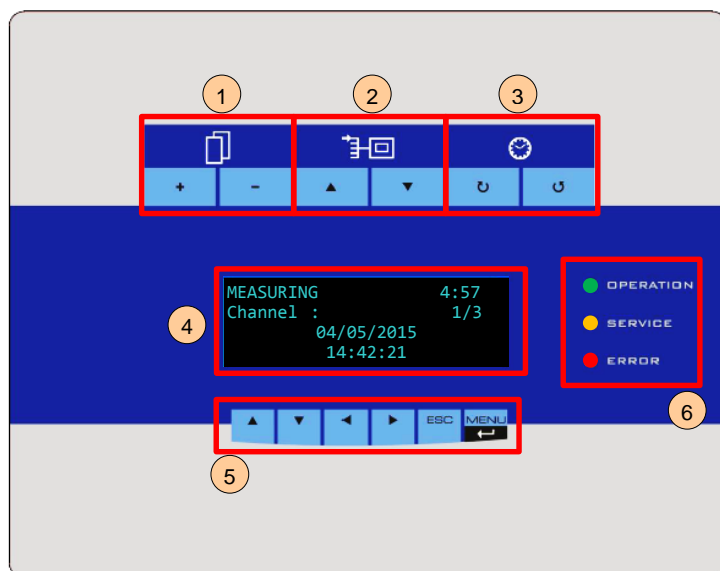


Fig. 8.1: Operating elements

Item No.	Designation	Function
1	Measurement display	Display the current sensor measurements.
2	Measuring channel display	Display the current channel measurements.
3	Saved measured values	Switch between the last 10 saved measured values.
4	Display	Display values, times and measurement results
5	Menu keys	Navigating the menu structure
6	Status LED	Display state of device

8.1.2 Displayarea

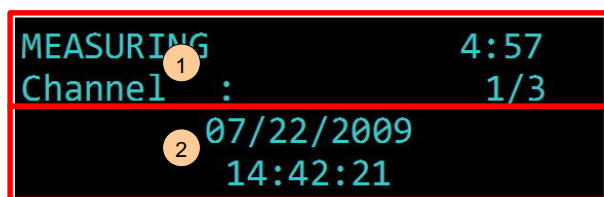



Fig. 8.2: Display area

Item No.	Designation	Function
1	Top display area	Display the status and channel information
2	Bottom display area	Switch between various measured values with the arrow keys (▼▲▶◀).

8.2 Available displays

	<h1>NOTE</h1>
	<p>The available displays and corresponding functions are described below. The navigation path to the displays is indicated by the menu and function keys in the chapter headings.</p> <p>The control system is based on the structure shown below.</p>

8.2.1 Menu structure



NOTE

If some of the menu items (framed in red) are changed, this can subsequently influence the measurement results.

Main menu

Settings

Language

Password

Output data

Screen change

Parameter

ABC built-in

EC meas. Cycle¹⁾

Purge time¹⁾

Commands

Start measurement

Stop measurement

Restart System

Clear messages

Calib. purge gas

Calib. gas 1

Calib. gas 2¹⁾

Reset cal.-data

Test (gas 1)

Abort calib.

Check OK

System info

Version firmware

System messages

The menu structure refers to firmware version V1.08.

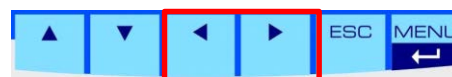
¹⁾ only available for certain device configurations

8.2.2 Navigate with the arrow keys left ◀ and right ▶

```
MEASURING 4:57
Channel : 1/3
07/22/2009
14:42:21
```

- The display indicates that the measuring status is active.

```
MEASURING 4:55
Channel : 1/3
CO2 : 20.8 vol%
CH4 : 30.8 vol%
```



- Switch between the measurements by pressing the left ◀ and right ▶ keys.

```
MEASURING 4:53
Channel : 1/3
H2S :* 23 ppm
O2 :* 20.8 vol%
```

The asterisk (*) indicates that a saved value is being displayed. The values are updated in the display depending on the measuring status.

With continuous measurement, an asterisk is not displayed since the value is measured and updated continuously.

8.2.3 Navigation with arrow keys up ▲ and down ▼



NOTE

To navigate with the arrow keys up ▲ or down ▼, use the left ◀ and right ▶ arrow keys to select the display in which the date and time are shown.

```
MEASURING          4:57
Channel :          1/3
          07/22/2009
          14:42:21
```

```
MEASURING          4:53
Channel :          1/3
Err      :          0 Errors
MSGs     :          7 Messages
```

```
MEASURING          4:50
Channel :          1/3
pAir     :          1.8 mbars
pGas     :          0.3 mbars
```

```
MEASURING          4:45
Channel :          1/3
T_IR     :          49.2 °C
TCool    :          5.3 °C
```

```
MEASURING          4:45
Channel :          1/3
TCase    :          49.2 °C
Tout     :          5.3 °C
```

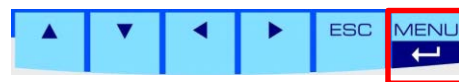


- Press the up ▲ and down ▼ keys to display other data.
- "Err" displays the number of saved errors.
- "MSGs" shows the number of saved messages.
- "pLuft" and "pGas" are the differential pressures measured for the individual gas pathways (air and process gas) in the process gas analyser.
- "T_IR" is the current temperature of the infrared measuring unit.
- "TCool" is the current temperature of the gas cooler.
- "TCase" is the current temperature in the housing.
- "Tout" is the current ambient temperature.

8.2.4 Navigation with ESC and MENU

```

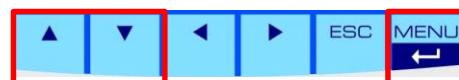
Main menu
  Settings
  Parameters
  ▼ Commands
  
```



- With the MENU key to the main menu.

```

Settings
  Language
  Password
  ▼ Cal. purge gas
  
```



- Select the submenu with the up ▲ and down ▼ keys.
- Confirm the selection by pressing the MENU key.



- Press the ESC key in the menu to go one level higher.

8.2.5 Measurement display

MEASURING 4:32
Channel : 1/3
07/22/2009
14:42:21



- Select the individual measurements with the plus + or minus - keys.

O₂ (Channel 1)
* 10.0 vol%

H₂S (Channel 1)
* 31 ppm

The asterisk (*) indicates that a saved value is being displayed. The values are updated in the display depending on the measuring status.

With continuous measurement, an asterisk is not displayed since the value is measured and updated continuously.

8.2.6 Measuring channel display

MEASURING 4:12
Channel : 1/3
07/22/2009
14:42:21



- Use the up ▲ or down ▼ keys to select the individual channels.

O₂ (Channel 1)
* 10.0 vol%

O₂ (Channel 2)
* 14.0 vol%



8.2.7 Saved measured values

```
MEASURING          4:12
Channel :          1/3
                   07/22/2009
                   14:42:21
```

```
O2 (Channel 1)
* 10.0 vol%
01 08/03/2009-12:21
```

```
O2 (Channel 1)
* 12.0 vol%
02 08/03/2009-11:21
```



- Press the forward  or back  key to step through the last saved measured values.
- The measured values are identified by the count/date/time.

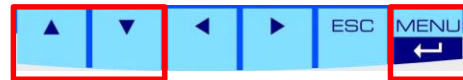
8.2.8 Display in the warmup phase

```
WARM-UP           *
T(IR) : 49.2°C - OK
---
T(POX) : 0x0400 -
```

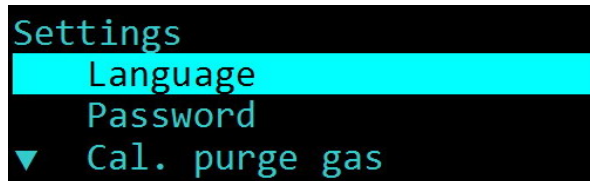
The figure shows the display during the warm-up phase. In the figure, the infrared electronics, T(IR), have reached operating temperature. Depending on the type of sensor, this is 49°C or 64°C. The Parox sensor, T(POX), is not ready. Once it reaches its operating temperature, the display shows T(POX)=0x0000 and OK.

Devices with sensors that do not require a specific operating temperature start without a warm-up phase and start measuring immediately when switched on.

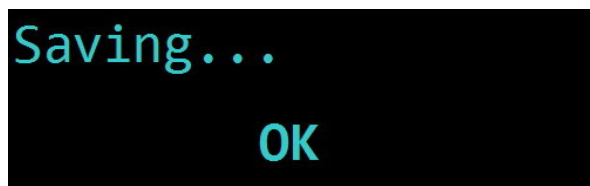
8.2.9 Select language





- Select the language with the ▼▲ keys.
- Confirm the selection by pressing the MENU key.



Available languages: German, English, Italian and Spanish



8.2.10 Password

	<div style="background-color: yellow; padding: 5px; border: 1px solid black;">  <h1 style="margin: 0;">ATTENTION</h1> </div> <p>The password has a maximum of four characters. If you forget the password, you cannot change the configuration.</p>
---	--

```

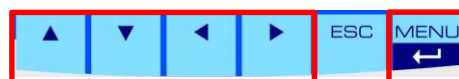
Main menu
  Settings
  Parameters
  ▼ Commands
  
```

```

Password
  15
  
```



```



Saving...
  OK
  
```




- Enter the password using the ▼ ▲ ► ◀ keys.
- Confirm the entry by pressing the MENU key.

9 Decommissioning/switching off

	 <h1 style="margin: 0;">ATTENTION</h1>
	<p>To decommission the process gas analyser and the linked system components according to their operating instructions.</p>

	<h1 style="margin: 0;">NOTE</h1>
	<p>The following table contains the steps for decommissioning the analyser for a long period.</p> <p>If you only wish to switch off the process gas analyser temporarily, a few steps can be omitted:  Switch off <u>column</u>!</p>



Steps	Turn off	Decommissioning
Disconnect the device from the process, close the line professionally.	X	X
Rinse the process gas analyser with ambient air. (Start calibration with purge gas)		X
Shut down the linked system components.	X	X
Turn of the master switch.	X	X
 If you only wish to switch off the process gas analyser temporarily, follow the procedure here to the end!		
If required, disconnect / switch off the operator's energy and media supply and the signal transmission professionally.		X
If advantageous, pack process gas analyser.		X






10 Maintenance

The measuring quality of the process gas analyser can only be ensured if the service intervals are maintained.


10.1 Preparations

The feed lines to linked system components can be closed for servicing purposes. Once operation has been resumed, they need to be reopened.

	 DANGER
	<p>Serious risk of injury from electricity.</p> <ul style="list-style-type: none"> • Parts of the process gas analyser labelled with this symbol may still be live even when the main switch has been switched off. If necessary, disconnect the process gas analyser from the power supply. • Switch off the main fuse and if necessary, secure it to prevent it from switched back on. • Only a trained electrician may work on the electrical equipment of the process gas analyser.

   	 WARNING
	<p>Serious risk of injury from exiting gas.</p> <ul style="list-style-type: none"> • Switch off the process gas analyser, and also linked system components if required, before carrying out maintenance work. • The gas connections may only be established by trained personnel. Follow the applicable guidelines at the installation site.

10.2 Maintenance work/Inspection

	NOTE
	<p>The maintenance work must be carried out in accordance with the inspection and maintenance schedule! The type and extent of the wear depends on the individual application and operating conditions. All intervals specified are therefore for guidance only.</p>

Upon reaching the inspection intervals, this will be shown in the display. Conduct and document testing. Through menu confirm that validation was done: MENU→COMMANDS→Check OK→ [Enter]

Inspection	Interval (recommended)	
------------	---------------------------	--

Weekly inspection

Purge gas inlet unobstructed (particularly in case of frost)	weekly	
Exhaust gas line unobstructed (particularly in case of frost)	weekly	

Quarterly inspection

Calibrate device according to manufacturer's specifications, message in display "Service [Typ] ZERO", "Service [Typ] SPAN", "Service [Typ] MID"	every 3 months, latest annually or when required	
---	--	--

Half-yearly inspection

Check integrated filter in the device	every 6 months	
Check compressed air supply ¹⁾ (negative pressure during "drainage")	every 6 months	
Check lines for condensate (including all integrated filters)	every 6 months	
Check gas inlets and clean professionally if necessary	every 6 months	
Check fan	every 6 months	
Check ejector pump ¹⁾	every 6 months	
Check inlet filter (inlet ambient air, filter mat, ventilator)	every 6 months	
Check Peltier cooler ¹⁾	every 6 months	
Check fan of Peltier cooler ¹⁾	every 6 months	

Yearly inspection


Check air and gas pump ¹⁾ (by performing a purge gas calibration)	yearly	
--	--------	--

¹⁾ if installed

Maintenance/Replacing components	Interval (recommended)	
Half-yearly service and after commissioning		
Check and, if necessary, update firmware version	every 6 months	
Save the current configuration with INCACtrl	every 6 months	
Annual service		
Replace integrated filters	every 12 months	
2-yearly service		
Replace pump hoses	every 24 months	
Replace flame arrester ¹⁾	every 24 months	
8-yearly service		
Replace integrated pressure reducer	every 8 years	
If necessary		
Replace gas-delivering pumps	if necessary	
Replace sensor, lifetime depends on sensor type, message in display "Service [Typ] age" or "Service [Typ] usage"	if necessary	





¹⁾ if installed

11 Troubleshooting

	<h1>NOTE</h1>
	<p>A distinction is made between the following categories:</p> <p>Possibility of the measured values:</p> <p>Measured values that deviate from the anticipated range</p> <ul style="list-style-type: none"> ☞ <i>last maintenance!</i> ☞ <i>maintenance manual!</i> <p>Faults:</p> <p>Faults during operating process</p> <p>For remedy: ☞ <i>Section 11.2, p. 56</i></p>

11.1 Preparations

The feed lines to linked system components can be closed for servicing purposes. Once operation has been resumed, they need to be reopened.

  	 <h1>WARNING</h1>
	<p>Serious risk of injury from electricity and exiting gas.</p> <ul style="list-style-type: none"> Switch off the process gas analyser, and also linked system components if required, before carrying out maintenance work. Switch off the main fuse and if necessary, secure it to prevent it from switched back on. Only a trained electrician may work on the electrical equipment of the process gas analyser. Parts of the process gas analyser labelled with this symbol may still be live even when the main switch has been switched off. If necessary, disconnect the process gas analyser from the power supply.

11.2 Changing/replacing fuses


Fuses may only be exchanged by an electrician or service professional. Choose the type approved by Union.

11.3 Messages/malfunctions on the display

11.3.1 Display of messages/malfunctions

If errors occur during operation, the control system automatically switches to overview to display priority messages.

11.3.2 Visualizing the error list



NOTE

The following list contains errors and messages that are visually displayed.

Troubleshooting measures:

☞ *Troubleshooting list!*

Measures required are assigned via column [☞ *no.*].


Error text	Error message	☞ No.
0x30D	Minimum pump pressure not reached, Sensor EC, Pressure Air	1
0x30E	Minimum pump pressure not reached, Sensor EC, Pressure Gas	2
Additional	All additional	3

11.3.3 Troubleshooting list

The following list contains causes of faults.

No.	Description
1	Inlet air filter for ambient air clogged (Fig. 4.1)
2	Process gas outlet blocked, for example frozen (Fig. 4.1) Process gas inlet closed (Fig. 4.1) - too much condensate in the line
3	Contact service ☞ <i>Chapter 12!</i>

12 Service

	<div data-bbox="391 414 606 488">NOTE</div> <p>If you have any questions Union Instruments GmbH will be happy to assist. In case of orders or technical questions, please have the customer number, telephone number for return calls, the type and number of the process gas analyser (see the type plate) and the required spare parts and parts list numbers to hand.</p>
---	---

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Germany



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support@union-instruments.com



<http://www.union-instruments.com>

13 Associated documents

- Declaration of Conformity for flame arrester ¹⁾
- Operating and service log
- Service documentation, optional
- Operating Instructions Ball Valves

¹⁾ if installed

14 Disposal

Following decommissioning, the analyser can be returned to Union Instruments GmbH.

Suggestion, have Union Instruments GmbH dispose of the process gas analyser.



	<div data-bbox="395 555 464 616"></div> <div data-bbox="491 555 858 616"><h1>WARNING</h1></div> <div data-bbox="395 656 1433 689"><p>Serious risk of injury from electricity and exiting gas in the process gas analyser.</p></div>
---	---

Before disassembly, disconnect the process gas analyser from the energy supply.

If necessary, purge the gases.

	<div data-bbox="395 1001 603 1064"><h1>NOTE</h1></div> <div data-bbox="395 1104 1337 1171"><p>Observe the national regulations on disposing of machines and operating materials!</p></div> <div data-bbox="395 1182 1123 1216"><p>Grade the parts according to group and recycle properly.</p></div>
---	--

15 Spare parts

	 WARNING
	<p>The use of non-approved spare parts (such as parts from other manufacturers, parts with different specifications, replicas of used and wear parts) can cause defects and be hazardous. This will render the warranty null and void. The operator is liable for any damage that occurs as a result.</p> <p>When replacing standard components, only use identical components by the original manufacturer. If components are discontinued or components by different manufacturers are used, request the manufacturer approval by Union Instruments GmbH.</p>

Spare parts can be ordered from Union Instruments GmbH:

☞ *Chapter 12 Service.*

Note the type and number (☞ *type plate*) of the process gas analyser.

If necessary, find and make a note of the order number (☞ *Applicable documents*).

Order part.

16 Annex

EU Declaration of Conformity Flame arrester

EU – Konformitätserklärung EU – declaration of conformity



Der Hersteller / The manufacturer

Union Instruments GmbH
Zeppelinstrasse 42
76185 Karlsruhe

erklärt hiermit, dass folgend bezeichnete Produkte / hereby declares, that following named products:

Produktbezeichnung:	Flammensperre	Gerätetyp:	Typ 21_01_25
Product name	Flame arrester	Device type	Type 21_01_25
Explosionsgruppe:	⊕ G IIC	EG-Baumusterprüfbescheinigung:	IBExU07ATEX2107 X
Explosion group:	⊕ G IIC	EC-type examination certificate:	IBExU07ATEX2107 X

Benannte Stelle für Baumusterprüfung / notified body for type examination:
IBExU Institut für Sicherheitstechnik GmbH, Fuchsmühlenweg 7, 09599 Freiberg, Germany, Nr.: 0637

Benannte Stelle für QS – Überwachung / notified body for QA-Assesment:
TÜV Product Service GmbH, Ridlerstraße 65, 80339 München, Germany, Nr.: 0123

konform sind mit den Anforderungen, die in der EU – Richtlinie festgelegt sind / are compliant with the requirements as defined in the EU directive:

2014/34/EU Richtlinie für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen

2014/34/EU Directive on equipment and protective systems intended for use in potentially explosive atmospheres

Angewandte harmonisierte Normen / Used harmonized standards:

EN 1127-1:2011 Explosionsfähige Atmosphären - Explosionsschutz - Teil 1: Grundlagen und Methodik
Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology

EN 16852:2010 Flammendurchschlagsicherungen - Leistungsanforderungen, Prüfverfahren und Einsatzgrenzen
Flame arresters - Performance requirements, test methods and limits for use

Bei einer nicht autorisierten Änderung des Gerätes verliert diese Erklärung ihre Gültigkeit. / Any unauthorized modification of the device results in invalidity of this declaration.

Die Erklärung gilt nur in Verbindung mit den zusätzlichen Bedingungen für die sichere Verwendung gemäß EG Baumusterprüfbescheinigung. Auszüge siehe Seite 2. / The declaration applies only in connection with the additional conditions for safe use subject to EC-type examination certificate, summary see page 2.

Karlsruhe, den 16.06.2016



Geschäftsführer / general manager

EU – Konformitätserklärung

EU – declaration of conformity



Auflagen zum Betrieb der Flammensperre

Die Flammensperre ist ausschließlich für die Anwendung in Verbindung mit den UNION Prozessgas-Analysegeräten INCA, Modelle INCA3000, INCA4000, INCA5000, INCA6000 für Biogas bestimmt. Sie dient zur Flammendurchschlagsicherheit des Prozessgaseingangs.

Montage

Es dürfen nur die von UNION mitgelieferten Rohrverschraubungen verwendet werden. Keine Rohrleitungen größer DN 10 (1/4") anschließen. Die Montage ist auf Dichtheit zu prüfen.

Wartung und Überwachung im Betrieb

Gemäß Wartungsplan der UNION Prozessgas-Analysegeräten INCA ist die Detonationssicherung alle 24 Monate auszuwechseln.

Werden die nachfolgenden Wasserfallen, Leitungen wegen Verschmutzung durch Kondensat gereinigt oder gewechselt, muss die Detonationssicherung ausgewechselt werden.

Operation of the flame arrester

The intended use of the flame arrester in conjunction with the UNION process gas analyser INCA, Type INCA3000, INCA4000, INCA5000, INCA6000 is the flame arresting of the process gas inlet.

Assembly

Only be connected with the included fittings, supplied by UNION. Not to be connected with pipes larger than a nominal diameter of 10 mm. The assembly is to be checked for leaks.

Maintenance and Monitoring

According to the maintenance plan of the UNION process gas analyser INCA the flame arrester is to be replaced every 24 months.

If the following water traps or pipelines are replaced or cleaned in case of contamination by condensate, the flame arrester must be replaced.

Index

A	
Accessories	19
Ambient conditions	22
C	
Connecting the process gas analyser	22
Connections.....	17
Contact	
Service	57
Union Instruments GmbH.....	14
D	
Decommissioning	49, 61
Display.....	39
Displays	39
Disposal.....	61
E	
Electrical connection	25
Electrical interfaces.....	25
Error elimination.....	55
EU Declaration of Conformity	
Flame arrester	65
EU Declaration of Conformity.....	9
I	
Inspection	52
L	
load resistor	29
M	
Main Switch	15
Maintenance	51
Maintenance work.....	52
Measurement display	44
Measuring channel display	44
N	
Navigation with arrow keys	41, 42
Navigation with ESC and MENU	43
O	
Operating elements	35
Operation	37
Membrane keypad	38
with arrow keys	41, 42
with ESC and MENU.....	43
P	
Password	47
Personnel and qualifications.....	12
Process gas	24
Proper use.....	12
S	
Safety equipment	15
Safety notes	11, 13
Saved measured values	45
Select language.....	46
Service	57
Setting up the process gas analyser	22
Setup site	22
Spare parts.....	63
Startup	33
Symbols	11
T	
Transport.....	21
Troubleshooting.....	55
W	
Wall attachment.....	23
Warm-up phase.....	45
Warnings	11
Workplaces	35

Table of figures

Fig. 1.1:	Type plate (exemplary).....	4
Fig. 3.1:	Main switch (exemplarisch)	15
Fig. 3.2:	Markings and warnings	16
Fig. 3.3:	Warning in housing	16
Fig. 4.1:	Product description	17
Fig. 4.2:	Connection of process gas and electric ball valve	18
Fig. 5.1:	Wall attachment	23
Fig. 5.2:	Power Supply X2 with fuses.....	26
Fig. 5.3:	Electrical interfaces.....	27
Fig. 5.4:	Relay X10A, outputs K1 – K3.....	28
Fig. 5.5:	Relay X10A terminal assignment	28
Fig. 5.6:	Analogue outputs X11A, connections.....	29
Fig. 5.7:	Remote Control Unit RCM X15	30
Fig. 5.8:	Relay X13A, Connections ball valves	31
Fig. 7.1:	Workplaces	35
Fig. 7.2:	Status LED.....	36
Fig. 8.1:	Operating elements.....	38
Fig. 8.2:	Display area	39