# Conex® DIS-G

Gas warning controller

Installation and operating instructions


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**Original installation and operating instructions**

## CONTENTS



Warning

These complete installation and operating instructions are also available on www.Grundfos.com.

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

## 1. Symbols used in this document

Warning

If these safety instructions are not observed, it may result in personal injury.

Caution

If these safety instructions are not observed, it may result in malfunction or damage to the equipment.

Note

Notes or instructions that make the job easier and ensure safe operation.

## 2. Device settings

Note the key settings for the Conex® DIS-G.

**General settings**

**No. of sensors**

☐ 1
☐ 2

**Automatic sensor test**

☐ Yes
☐ No

**Interval for automatic sensor test**

_____ days

**Limit 2 confirmable**

☐ Yes
☐ No

Delay for limit 2

_____ s

Assignments for alarm relay

☐ Sensor 1 limit 1
☐ Sensor 1 limit 2
☐ Sensor 2 limit 1
☐ Sensor 2 limit 2
☐ Sensor error

Current outputs

☐ 0-20 mA
☐ 4-20 mA

**Parameters**

**Sensor 1**

**Limit 1**

_____ ppm

**Limit 2**

_____ ppm

**Hysteresis**

_____ ppm

**Sensor 2**

**Limit 1**

_____ ppm

**Limit 2**

_____ ppm

**Hysteresis**

_____ ppm

## 3. General information

These installation and operating instructions contain all information important for users of the Conex® DIS-G gas warning controller:

- technical data
- instructions on commissioning, use and maintenance
- safety information.

Should you require further information or should you encounter problems that are not handled in sufficient depth in this manual, please contact Grundfos Water Treatment.

We shall be pleased to support you with our comprehensive know-how in the fields of measuring and control technology as well as water treatment.

We always welcome suggestions on how to optimise our installation and operating instructions to satisfy our customers.

## 4. Applications

The Conex® DIS-G gas warning controllers are used to evaluate suitable sensors for monitoring the concentration of chlorine ($Cl_2$), chlorine dioxide ($ClO_2$) or ozone ($O_3$) and to trigger warning and protective systems in the framework of the possible uses described in this manual with the sensor types listed here.

Caution

The Conex® DIS-G cannot be used for measuring a gas concentration continuously or for control according to the German MAK standard regarding maximum allowable concentration. Use only calibrated gas measuring devices for measuring gas concentration.

Ensure a sufficient safety level when setting the limit values for the Conex® DIS-G.

Warning

Other applications are not approved and not permitted. Grundfos cannot be held liable for any damage resulting from incorrect use.

## 5. Safety

This manual contains general instructions that must be observed during installation, operation and maintenance. This manual must therefore be read by the installation engineer and the relevant qualified personnel/operators prior to installation and start-up and must be available at the installation location of the Conex® DIS-G at all times.

Not only the general safety instructions described in this section must be observed, but all special safety instructions that are provided in the other sections.

### 5.1 Risks when safety instructions are not observed

If safety instructions are not observed, it may result in personal injury or damage to the Conex® DIS-G. If safety instructions are not observed, this may lead to the loss of any claims for damages.

If individual safety instructions are not observed, this may cause for example the following damage:

- failure of specified methods for recording gas concentrations and secondary safety equipment
- harm to humans from exposure to electrical, mechanical and chemical influences.

### 5.2 Obligations of the owner/operations manager

The owner/operations manager must ensure that persons working with the described device fulfil these requirements:

- They are acquainted with the regulations concerning working safety and accident prevention.
- They have been trained in use of the device.
- They have read and understood the warning information and handling symbols.

The owner/operations manager is also responsible for ensuring that this manual is kept in the immediate vicinity of the device and is always available for the operating personnel and that the local safety regulations are observed when setting the limit values for the sensors.

### 5.3 Avoidance of danger

Warning

Do not use the device for monitoring constant concentrations. The device is designed for detecting leaks.

Warning

Installation and connection of the device and the associated supplementary components must only be carried out by authorised personnel!

The local safety regulations must be observed!

Warning

Switch off the power supply before connecting the power supply cable and relay contacts!

Do not dismantle the device! Maintenance and repair must only be carried out by authorised personnel!

Caution

The mounting location must be selected so that the housing is not subjected to mechanical loading.

Check that all settings are correct before starting up the device!

#### 5.3.1 Safety instructions for the operator

Damage caused by electrical energy must be prevented. For more details, see for example the regulations of the VDE, the German Association for Electrical, Electronic and Information Technologies, and the local power supply company.

#### 5.3.2 Safety instructions for maintenance, inspection and installation work

The operator is responsible for ensuring that all maintenance, inspection and installation work is carried out by authorised and qualified personnel, who have been adequately trained by reading the installation and operating instructions.

All safety and protective equipment must be immediately restarted or put into operation once work is complete.

Observe the points described in the initial start-up section prior to subsequent start-up.

# 6. Identification

## 6.1 Nameplate

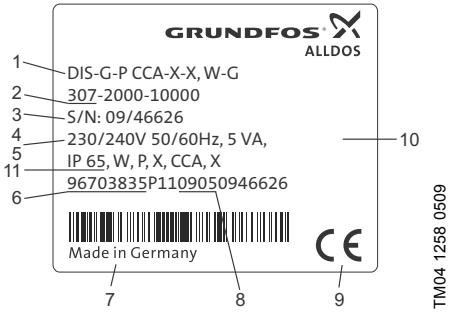


**Fig. 1** Nameplate, Conex® DIS-G

| Pos. | Description |
|---|---|
| 1 | Type designation |
| 2 | Model |
| 3 | Serial number |
| 4 | Voltage [V] |
| 5 | Frequency [Hz] |
| 6 | Product number |
| 7 | Country of origin |
| 8 | Year and week of production |
| 9 | Marks of approval, CE mark, etc. |
| 10 | Power consumption [VA] |
| 11 | Enclosure class |

### 6.2 Type key, gas warning controllers

Example: DIS-G, 1-D/A/HC 2-D/A/HC, W-G

| Example: | | DIS-G | 1-D/A/HC | 2-D/A/HC | W | -G |
|---|---|---|---|---|---|---|
| **Conex® gas warning system** | | | | | | |
| DIS-G | Dosing Instrumentation Standard with gas detection | | | | | |
| **Sensor 1** | | | | | | |
| D | Chlorine gas/chlorine dioxide gas/ozone gas | | | | | |
| A | Ammonia gas | | | | | |
| HC | Hydrochloric acid gas | | | | | |
| **Sensor 2** | | | | | | |
| D | Chlorine gas/chlorine dioxide gas/ozone gas | | | | | |
| A | Ammonia gas | | | | | |
| HC | Hydrochloric acid gas | | | | | |
| **Mounting** | | | | | | |
| W | Wall-mounted | | | | | |
| P | Panel-mounted | | | | | |
| **Voltage** | | | | | | |
| G | 1 x 230/240 V, 50/60 Hz | | | | | |
| H | 1 x 115/120 V, 50/60 Hz | | | | | |

### 6.3 Type key, gas warning systems, prepacked (with sensors and sensor equipment)

Example: DIS-G-P, CCA-X-X, W-G

| Example: | | DIS-G | -P. | CCA- | X- | X. | W | -G |
|---|---|---|---|---|---|---|---|---|
| **Conex® gas warning system** | | | | | | | | |
| DIS-G | Dosing Instrumentation Standard with gas detection | | | | | | | |
| P | Prepacked | | | | | | | |
| **Sensor 1** | | | | | | | | |
| CCA | Chlorine gas/chlorine dioxide gas, amperometric measurement | | | | | | | |
| OA | Ozone gas, amperometric measurement | | | | | | | |
| CLP | Chlorine gas, potentiostatic measurement | | | | | | | |
| CDP | Chlorine dioxide gas, potentiostatic measurement | | | | | | | |
| OP | Ozone gas, potentiostatic measurement | | | | | | | |
| AP | Ammonia gas, potentiostatic measurement | | | | | | | |
| HCP | Hydrochloric acid gas, potentiostatic measurement | | | | | | | |
| **Sensor 2** | | | | | | | | |
| CCA | Chlorine gas/chlorine dioxide gas, amperometric measurement | | | | | | | |
| OA | Ozone gas, amperometric measurement | | | | | | | |
| CLP | Chlorine gas, potentiostatic measurement | | | | | | | |
| CDP | Chlorine dioxide gas, potentiostatic measurement | | | | | | | |
| OP | Ozone gas, potentiostatic measurement | | | | | | | |
| AP | Ammonia gas, potentiostatic measurement | | | | | | | |
| HCP | Hydrochloric acid gas, potentiostatic measurement | | | | | | | |
| **Option** | | | | | | | | |
| B | Battery backup | | | | | | | |
| X | No battery backup | | | | | | | |
| **Mounting** | | | | | | | | |
| W | Wall-mounted | | | | | | | |
| P | Panel-mounted | | | | | | | |
| **Voltage** | | | | | | | | |
| G | 1 x 230/240 V, 50/60 Hz | | | | | | | |
| H | 1 x 115/120 V, 50/60 Hz | | | | | | | |

# 7. Product description and accessories

- The device offers high-precision measuring of chlorine, chlorine dioxide and ozone.
  - comprehensive limit value functions
  - comprehensive alarm functions
  - error message function for indication of non-functioning sensors.

## 7.1 General description

The Conex® DIS-G is a gas warning controller for monitoring gas concentrations, for example in storage or dosing rooms. With a maximum of two independently connected sensors, the gas concentration of chlorine, chlorine dioxide or ozone can be displayed and monitored. Amperometric sensors (sensor discs) are connected directly to the Conex® DIS-G.

The sensor $Cl_2$ / $ClO_2$ does not provide selective measurement. In case both substances are present, the measured value includes both.

The measuring parameter does not have to be set in the software (or device). It is selected using the corresponding sensor.

Each of the two sensors is provided with electrically isolated current outputs to output the measured concentration, two electrically isolated limit value transmitters and an alarm relay to control the warning and safety equipment.

The Conex® DIS-G meets high safety requirements through permanent sensor monitoring and alarm relays.

**How the system operates**

- The gas sensors generate a current proportional to the gas concentration in the air.
- The Conex® DIS-G gas warning controller
  - amplifies the sensor current
  - triggers an initial warning, for example when the first limit value is exceeded
  - activates the relevant warning and safety equipment when the second limit value is exceeded
  - outputs the measured concentration at both sensors as a 0 (4)-20 mA signal via the current outputs (for example for recording).

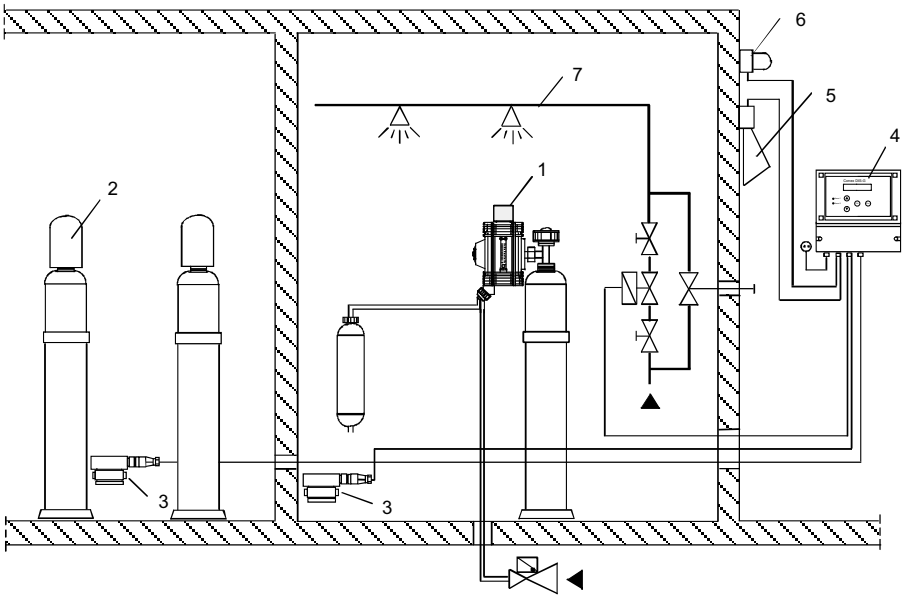


**Fig. 2** Gas warning system, example of an application

| Pos. | Description |
|---|---|
| 1 | Gas dosing unit |
| 2 | Gas container |
| 3 | Gas sensor |
| 4 | Conex® DIS-G gas warning controller |
| 5 | Horn |
| 6 | Flashing warning system |
| 7 | Sprinkling installation |

**The complete gas warning system comprises:**

- gas sensors in the gas container and gas dosing unit area
- the Conex® DIS-G gas warning controller
- warning and safety equipment: horn, flashing warning system, sprinkling installation.

## 7.2 Dimensional sketches

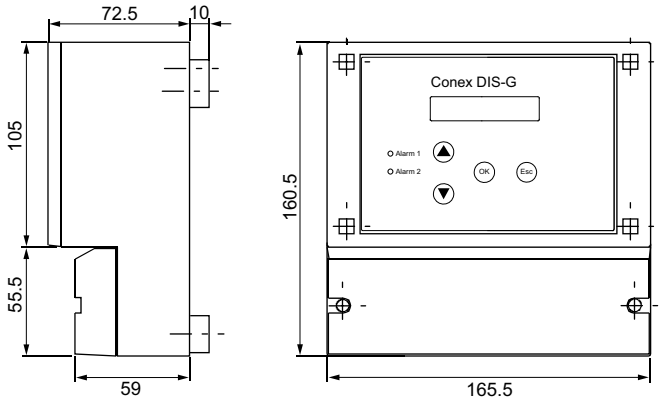


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**Fig. 3** Conex® DIS-G

## 8. Technical data

**Caution** Observe the permissible temperature range of the sensors!

**Note** Observe the accuracy of the sensor!

| | |
|---|---|
| Electronics | I2C bus technology |
| Accuracy | ± 1 % |
| Display | LCD, 2 lines, 2 x 16 characters |
| Display languages | German, English and French |
| Indication mode | In ppm for measured values of both sensors |
| Permissible temperatures | • Operation: 0 to +45 °C<br>• Storage: -20 to +65 °C |
| Permissible relative air humidity | Maximum 90 % at 40 °C (no condensation) |
| Power supply | • 230/240 V - 10 %/+ 10 % (50/60 Hz)<br>• 115/120 V - 10 %/+ 10 % (50/60 Hz) |
| Power consumption | Approximately 5 VA |
| Material (enclosure) | ABS, resistant to chemicals |
| Enclosure class | IP65 for wall-mounting enclosure |
| Weight | Approximately 0.8 kg |
| Connections | Screw terminals for cables up to maximum 2.5 $mm^2$ |
| Safety functions | Permanent sensor monitoring or automatic sensor test, interval between tests adjustable from 0.5 to 14 days |

### 8.1 Signal inputs and outputs

| | |
|---|---|
| Relay outputs | Five relay outputs, NO (normally open); maximum 250 V/6 A, maximum 550 VA ohmic load<br>• two relays for the limit values of each of the two sensors<br>• one alarm relay; free assignment to the limit values or to sensor test (see below. |
| Signal inputs | • Two measured value inputs (for amperometric sensors 1 and 2) |
| Signal outputs | • Two current outputs (0) 4-20 mA, maximum load of 400 Ω, assigned to the 0-5 ppm range |

### 8.2 Setting ranges for alarms / limit values

| | |
|---|---|
| Switching point for limit values | • Limit value 1 (preliminary warning if exceeded) can be set to any value within the measuring range.<br>• Limit value 2 (warning if exceeded) can be set to any value within the measuring range.<br>• Limit value 2 can be delayed between 0-200 seconds.<br>• Hysteresis: 0 - 0.5 ppm.<br>• Limit value 1 and 2 can be acknowledged. The acknowledgement is stored in a list of events. |
| Alarm relay | The alarm relay can be assigned to any of the limit values and/or the sensor test. |

## 8.3 Sensors

**Amperometric sensor disc $Cl_2$, $ClO_2$ and $O_3$**

Connection via 2-wire cable 0.5 $mm^2$ with single screen. Maximum length (maximum distance between the sensor disc and gas warning controller): 100 metres.

91835237 (314-011) / 96687714 (314-013) include the wall housing with sensor disc.

### 8.3.1 Measuring parameter and working range for amperometric sensors

| Measuring parameter | Measuring range | Accuracy | Temperature range | Product number |
|---|---|---|---|---|
| | [ppm] | [%] | [°C] | |
| $Cl_2$, $ClO_2$ | 0.00 - 5.00 | ± 10 | +5 to +45 | 91835237 (314-011) |
| $O_3$ | 0.00 - 5.00 | ± 10 | +5 to +45 | 96687714 (314-013) |

Note

The measuring ranges depend on the set sensors and cannot be modified.

# 9. Installation

Warning

Before assembling, disconnect the power supply!

Enclosure class IP65 is only guaranteed if the terminal covers are closed and the appropriate cable glands or dummy caps fitted.

## 9.1 Transport

Caution Risk of malfunction or damage to the Conex® DIS-G! Do not drop the device.

### 9.1.1 Delivery

The Conex® DIS-G is delivered in a cardboard box. Leave the device in the packaging during transport and intermediate storage.

### 9.1.2 Return

Return the Conex® DIS-G in its original packaging or equivalent.

Caution Risk of malfunction or damage to the Conex® DIS-G! Grundfos accepts no liability for damage caused by incorrect transportation or missing or unsuitable packaging of the device!

## 9.2 Intermediate storage

Permissible storage temperature: -20 °C to +65 °C

Note For information on storing the sensors, see the manual of the gas sensors.

## 9.3 Unpacking

1. Check the device for damage.
   Install as soon as possible after unpacking.
2. Do not install or connect damaged devices!

Note Retain the packing material or dispose of it according to local regulations.

## 9.4 Installation requirements

**Conex® DIS-G**

- Dry room
- Room temperature: 0 °C to +45 °C
- Vibration-free location.

**Sensors**

- Dry room.
  - Avoid the sensor getting wet! Make sure to locate it outside the range of the sprinkling installation.
- Room temperature according to the technical data for the relevant sensor.
- Vibration-free location.
- Protect the sensor from direct heat, sunlight and strong draughts!

Note For additional information on sensor installation, see the manual of the gas sensors.

Caution Gas sensors should not be mounted close to major sources of interference such as large machines, etc.

Caution If these assembly requirements are not observed, there may be damage to the measuring device or incorrect measurements!

## 9.5 Installation of the Conex® DIS-G

Warning

Switch off the power supply before installing!

Enclosure class IP65 is only guaranteed if the terminal covers are closed and the appropriate cable glands or dummy caps fitted.

1. Drill three holes (∅8 mm) as shown in the diagram, and insert the supplied dowels.
2. Unscrew the terminal cover on the device.
3. Tighten the upper middle screw (A).
4. Place the device on this screw (A).
5. Secure the device through the enclosure using the two other screws (B).
6. Replace the terminal cover.

Caution

Enclosure class IP65 is only guaranteed if the terminal cover is correctly sealed!

Do not damage the terminal cover gasket!

The terminal cover gasket must fit exactly!

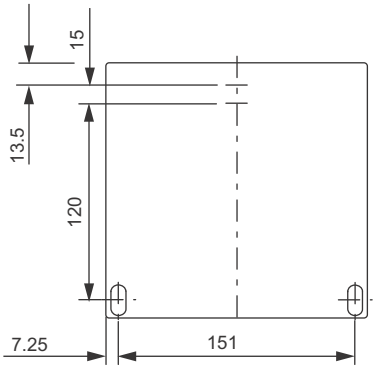


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**Fig. 4** Drilling diagram of the Conex® DIS-G

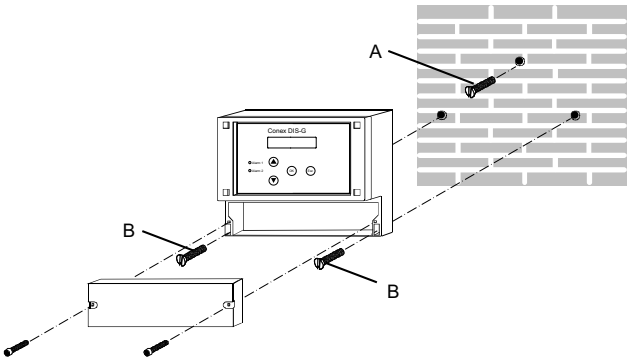


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**Fig. 5** Mounting drawing

## 10. Commissioning / electrical connections

Warning

Switch off the power supply before installing!

Enclosure class IP65 is only guaranteed if the terminal covers are closed and the appropriate cable glands or dummy caps fitted.

Warning

Switch off the power supply before connecting the power supply cable and the relay contacts! For safety reasons, the protective conductor must be connected correctly!

Observe the local safety regulations!

Protect the cable connections and plugs against corrosion and moisture.

Before connecting the power supply cable, check that the supply voltage specified on the nameplate corresponds to the local conditions!

An incorrect supply voltage may destroy the device!

**Caution** To guarantee electromagnetic compatibility (EMC), the input and current output cables must be screened.

Connect the screening to the screen ground on one side.

Refer to the wiring diagram! Route the input, current output and power supply cables in separate cable channels.

Enclosure class IP65 is only guaranteed if the terminal cover is correctly sealed!

**Caution** Do not damage the terminal cover gasket!

The terminal cover gasket must fit exactly!

**Note** Unused terminals must remain open.

1. Remove the terminal cover on the front of the device.
2. Use the appropriate cable entries, and tighten the screws carefully.
3. Connect the cables used to the terminals according to the Conex® DIS-G terminal assignment.
4. Close the terminal cover again with correctly positioned gasket.

## 10.1 Conex® DIS-G terminal assignment

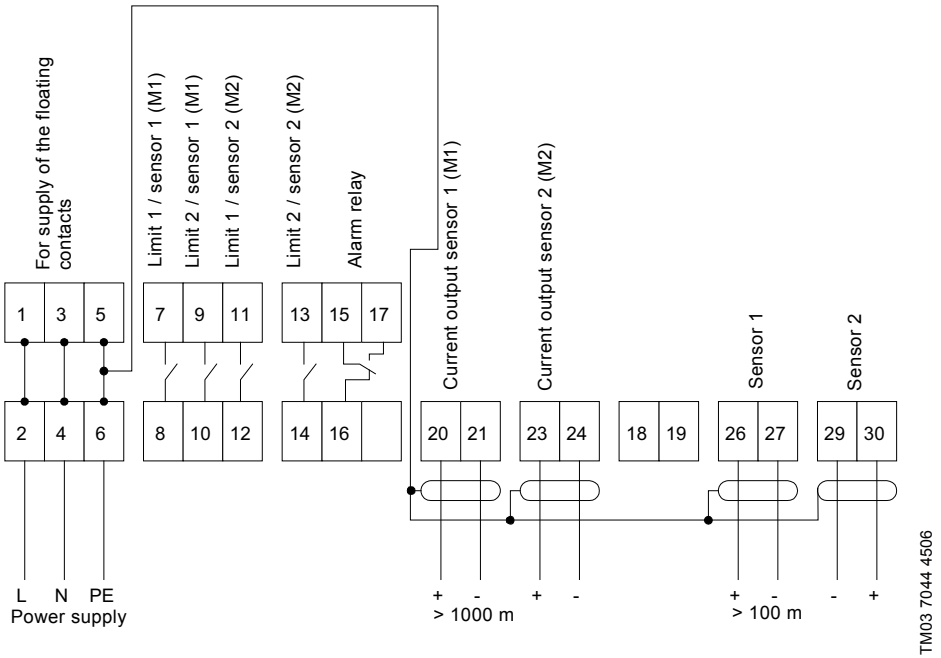


**Fig. 6** Conex® DIS-G terminal

## 10.2 Power supply connection

Caution

Before connecting, check that the values for the supply voltage and frequency correspond to the values on the nameplate.

**Voltage supply for Conex® DIS-G:**

- Connect the protective conductor (PE) to terminal 6.
- Connect the neutral conductor (N) to terminal 4.
- Connect the phase (L) to terminal 2.

Note

Switch the device on and off by switching the power supply on and off accordingly. The device itself is not equipped with a separate on/off switch.

**Voltage supply for electrically isolated relay contacts:**

- Connect the protective conductor (PE) to terminal 5.
- Connect the neutral conductor (N) to terminal 3.
- Connect the phase (L) to terminal 1.

## 10.3 Relay outputs

Note: The connection of the relay outputs depends on the application and the final control elements used. Therefore the connections described below should only be considered as guidelines.

With inductive loads (including relays and contactors), interference suppression is necessary. If this is not possible, protect the relay contacts using a suppressor circuit as described below.

- With AC voltage:

| Current up to | Capacitor C | Resistor R |
|---|---|---|
| 60 mA | 10 nF, 275 V | 390 Ω, 2 W |
| 70 mA | 47 nF, 275 V | 22 Ω, 2 W |
| 150 mA | 100 nF, 275 V | 47 Ω, 2 W |
| 1.0 A | 220 nF, 275 V | 47 Ω, 2 W |

- With DC voltage: Connect the free-wheeling diode in parallel to the relay or contactor.

Caution: Provide the relay outputs with a corresponding backup fuse!

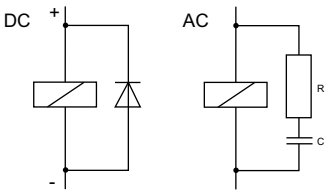


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**Fig. 7** Suppressor circuit DC / AC

## 10.4 Current output

Connection via 2-wire cable with single screen. Maximum length: 1000 metres.

Caution: Ensure correct polarity!
Maximum load: 400 Ω

The current output can be set to one of the two standard ranges "0-20 mA" or "4-20 mA".

**Output 1: sensor 1**

This current output emits the displayed measured value as an analog current signal.

Use of current signal for measured values:

- As input signal for another indicator.

1. Connect the + conductor to terminal 20.
2. Connect the - conductor to terminal 21.
3. Connect the screen to the protective earth conductor (PE).

**Output 2: sensor 2**

This current output emits the displayed measured value as an analog current signal.

Use of current signal for measured values:

- As input signal for another indicator

1. Connect the + conductor to terminal 23.
2. Connect the - conductor to terminal 24.
3. Connect screen to the protective earth conductor (PE).

## 10.5 Connection of sensors

Caution: Connect the screening to screen ground on one side only!

### 10.5.1 Amperometric sensors

Connection via 2-wire cable 0.5 $mm^2$ with single screen. Maximum length (maximum distance between the sensor disc and gas warning controller): 100 metres.

**Cables for amperometric gas sensors**

| Description | Product number |
|---|---|
| Connection cable for amperometric gas sensors, 10 metres | 96725670 (321-130/10) |
| Connection cable for amperometric gas sensors, 20 metres | 96725672 (321-130/20) |
| Connection cable for amperometric gas sensors, 50 metres | 96725673 (321-130/50) |

The wire colours refer to Grundfos cable.

Sensor 1:

- Connect the brown wire (+) to terminal 26.
- Connect the white wire (-) to terminal 27.
- Connect the screen to PE.

Sensor 2:

- Connect the brown wire (+) to terminal 30.
- Connect the white wire (-) to terminal 29.
- Connect the screen to PE.

# 11. Operation

## 11.1 Initial start-up

Note

If a sprinkling installation is connected, first shut off the water supply. On initial start-up, the relevant limit value may be exceeded during the sensor start-up routine, which may trigger the sprinkling installation.

**Preparations for start-up**

1. Check that all electrical connections are correct.
2. Switch on the power supply.
3. Familiarise yourself with the operation of the Conex® DIS-G.
4. Make all necessary settings, and note them down.
5. Check that all settings are correct.
6. Check that all connected warning and safety equipment is ready for operation.
   – The device is now ready for operation.

## 11.2 Control and display elements

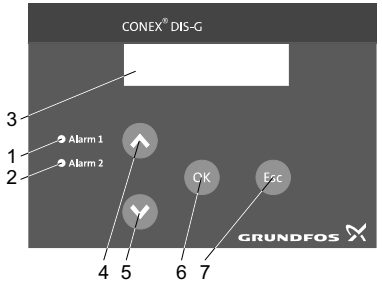


**Fig. 8** Display of Conex® DIS-G

| Pos. | Description |
|---|---|
| **Display elements** | |
| 1 | Sensor 1 LED<br>• Flashes if one of the limit values of sensor 1 is exceeded.<br>• Lights up continuously, if a fault in sensor 1 has been detected. |
| 2 | Sensor 2 LED<br>• Flashes if one of the limit values of sensor 2 is exceeded.<br>• Lights up continuously, if a fault in sensor 2 has been detected. |
| 3 | Display<br>• In the display mode, it shows actual measured values and possible error messages.<br>• In the menu mode, it shows adjustable parameters. |
| **Operating buttons** | |
| 4 | [Up] button<br>• Increases values.<br>• Navigates in display mode. |
| 5 | [Down] button<br>• Decreases values.<br>• Navigates in display mode. |
| 6 | [OK] button<br>• Saves changed values.<br>• Navigates in menu mode. |
| 7 | [Esc] button<br>• Exits the entering of values without saving any changes.<br>• Exits menu. |

Note

If you want to change a value considerably, hold down the button to increase the setting speed dynamically.

## 11.3 Operating modes

**Display mode:** This is the standard operating mode. The device automatically starts up in this operating mode. In this operating mode it is possible to:

– read current measured values

– read error messages.

**Menu mode:** This operating mode has three submenus:

- Parameter menu: In this menu it is possible to:
  – set all parameters which are important for normal operation of the device
  – change to the Configuration and Test functions menus.
- Configuration menu: In this menu it is possible to adjust the basic settings of the device. In general, this is the only menu that is necessary for the first commissioning.
- Test functions menu: In this menu it is possible to:
  – check the functioning of all relays and therefore also the connected warning and protection systems
  – check the functioning of the current outputs for the measured values
  – see the software version of the device.

## 11.4 Configuration / basic settings

If a sprinkling installation is connected, first shut off the water supply. On initial start-up, the relevant limit value may be exceeded during the sensor start-up routine, which could trigger the sprinkling installation.

**Note**

The measuring parameter does not have to be set in the software (or device). It is selected using the corresponding sensor.

M1 or M2 stands for measured value 1 (coming from sensor 1) or measured value 2 (coming from sensor 2).

### 11.4.1 Changing to the "Configuration" menu

One of the following menus is displayed in the display mode.

| Measured value |
| --- |
| x.xx ppm |

| | |
| --- | --- |
| M1 | x.xx ppm |
| M2 | x.xx ppm |

1. Press [OK] to change to the "Parameter" menu.
2. Press [OK] several times until the "Configuration" menu is displayed.

| Configuration |
| --- |
| OFF |

3. Press the [Up] button to set "Configuration ON".
4. Press [OK] to change to the "Configuration" menu.

| *Configuration* |
| --- |

### 11.4.2 Selecting operating language

This item appears first in the "Configuration" menu and does not need to be selected.

| Language |
| --- |
| English |

1. Select the desired language by pressing the [Up] or [Down] button.

Possible values:

- English
- French
- German.

2. Confirm by pressing [OK].

### 11.4.3 Selecting the number of connected sensors

| No. of sensors |
| --- |
| 1 sensor |

1. Select the number of connected sensors by pressing the [Up] and [Down] buttons.

Possible values:

- 1 sensor (default setting)
- 2 sensors.

2. Confirm by pressing [OK].

### 11.4.4 Selecting the operating mode of the current outputs

| mA signal |
| --- |
| 0-20 mA |

1. Select the desired operating mode by pressing the [Up] and [Down] buttons.

Possible values:

- 0-20 mA (default setting)
- 4-20 mA.

2. Confirm by pressing [OK].

### 11.4.5 Selecting the assignments of the alarm relay

| | |
|---|---|
| M1 - limit 1 | |
| Alarm relay | ON |

| | |
|---|---|
| M1 - limit 2 | |
| Alarm relay | ON |

| | |
|---|---|
| M2 - limit 1 | |
| Alarm relay | ON |

| | |
|---|---|
| M2 - limit 2 | |
| Alarm relay | ON |

| | |
|---|---|
| Sensor fault | |
| Alarm relay | OFF |

M2 - limit 1 / - limit 2 are only displayed if the device is set to "2 sensors".

1. For each item, select whether the alarm relay should be activated if the corresponding limit value is exceeded or if a sensor fault occurs by pressing the [Up] and [Down] buttons.
2. Confirm each item by pressing [OK].

**Note** The alarm relay can be assigned to all five events. All combinations are possible.

### 11.4.6 Setting the confirmability of limit value 2

If limit value 2 is exceeded by one of the two sensors, a sprinkling installation is usually triggered, for example to bond the leaking chlorine.

Normally the relay for limit value 2 remains activated until the measured value drops down below limit value 2. However, it may be necessary to switch off the sprinkling installation for example to implement countermeasures. In this case, limit value 2 can be set to allow confirmation.

"Confirm" means that the relay for limit value 2 is deactivated (and therefore also the connected sprinkling installation) even though the risk caused by the increased gas concentration remains.

Warning

Mortal danger!

Use this function only if you are certain that no large gas breakout has occurred!

| | |
|---|---|
| Limit 2 | |
| to receipt | OFF |

1. Select whether limit value 2 should be confirmable or not by pressing the [Up] or [Down] button.
2. Confirm by pressing [OK].

### 11.4.7 Adjusting the zero point of the sensors

Warning

If you apply this function incorrectly, measurement faults may occur, or the measurements may not be correct!

The sensor may have a deviation from its zero point, i.e. it indicates a concentration although no gas is present in the air. To correct this, the zero point of the sensor can be adjusted.

A zero deviation of up to 0.5 ppm can be corrected. In case of higher deviations, the sensor is defective and must be replaced.

To carry out a zero adjustment:

1. Position the sensor in an ***absolutely gas-free environment***.
2. Proceed as follows.

Warning

Never carry out the zero adjustment in the room which is to be monitored by the sensor!

Caution

A gas concentration which may be present in this environment would otherwise be subtracted as an offset from the measured value in the future!

| | |
|---|---|
| 0-point | |
| adjustment | OFF |

3. Press the [Up] button.

| | |
|---|---|
| 0-point | |
| adjustment | ON |

4. Press [OK].
   – The actual stored value of the zero point adjustment is displayed.

| | |
|---|---|
| 0-point | M1 |
| stored | x |

5. Press [OK].

| | |
|---|---|
| 0-point | M1 |
| adjustment | OFF |

6. Press the [Up] button.

| | |
|---|---|
| 0-point | M1 |
| adjustment | ON |

7. Press [OK].
   – The new value of the zero point adjustment is displayed.

| | |
|---|---|
| 0-point | M1 |
| stored | y |

8. Press [OK].

| | |
|---|---|
| 0-point | M1 |
| adjustment | OFF |

9. Press [OK].
   – If the device is set to "2 sensors", the same procedure follows for sensor 2.

| | |
|---|---|
| 0-point | M2 |
| stored | x |

10. Press [OK].

| | |
|---|---|
| 0-point | M2 |
| adjustment | OFF |

11. Press the [Up] button.

| | |
|---|---|
| 0-point | M2 |
| adjustment | ON |

12. Press [OK].
   – The new value of the zero point adjustment is displayed.

| | |
|---|---|
| 0-point | M2 |
| stored | y |

13. Press [OK].

| | |
|---|---|
| 0-point | M2 |
| adjustment | OFF |

14. Press [Esc] to change to the "Parameter" menu.

### 11.4.8 Factory setting

| | |
|---|---|
| Factory setting | |
| | OFF |

Caution

Only use this function if you are aware of the consequences. All device settings are lost and must be re-entered!

See section *13.1 Resetting the device to factory settings*.

## 11.5 Basic settings in the "Parameter" menu

### 11.5.1 Changing to the "Parameter" menu

One of the following menus is displayed in the display mode.

| Measured value |
| --- |
| x.xx ppm |

| | |
| --- | --- |
| M1 | x.xx ppm |
| M2 | x.xx ppm |

1. Press [OK] to change to the "Parameter" menu.

| *Parameter* |
| --- |

### 11.5.2 Carrying out a manual sensor test

Before the first commissioning, it is possible to carry out a sensor test to check the functioning of the sensors.

This item appears first in the "Parameter" menu and does not need to be selected.

| Sensor test | |
| --- | --- |
| manual | OFF |

1. Press the [Up] button and then [OK]. Then the sensor test is carried out.

| Sensor test... |
| --- |
| - - - - - - - - - - - - - - - - |

   – A progress bar is displayed while the sensor test is carried out.
   – After this, the device returns to the display mode.
   – If a sensor fault has been detected, the corresponding LED will be on continuously.

To read the message:

1. Press the [Down] button.
   – The following message is displayed:

| Sensor test |
| --- |
| fault M1 |

   – If a fault in sensor 1 has been detected.

| Sensor test |
| --- |
| fault M2 |

   – If a fault in sensor 2 has been detected.
2. Check the sensor and cabling, and replace damaged parts, if necessary.
3. Carry out a manual sensor test again.

To proceed after a sensor test, change to the "Parameter" menu again. See section *11.5.1 Changing to the "Parameter" menu*.

### 11.5.3 Setting automatic sensor test

The device offers the possibility to carry out automatic sensor tests at regular intervals.

| Test period |
| --- |
| OFF |

1. Press the [Up] button to set "Test period ON"
2. Press [OK].

| Test period |
| --- |
| 1 day |

3. Select the desired testing interval by pressing the [Up] or [Down] button.
   – Adjusting range: 0.5 to 14 days
   – Default setting: 1 day.
4. Confirm by pressing [OK].
   – Now the sensors are tested automatically at the selected interval.

### 11.5.4 Setting the limit values for the sensors

Warning
When setting the limit values, the local safety regulations must be observed!

| M1 - limit 1 |
| --- |
| 1.50 ppm |

| M1 - limit 2 |
| --- |
| 3.00 ppm |

| M2 - limit 1 |
| --- |
| 1.50 ppm |

| M2 - limit 2 |
| --- |
| 3.00 ppm |

M2 - limit 1 / - limit 2 are only displayed if the device is set to "2 sensors".

1. For each item, set the limit value to the desired value by pressing the [Up] and [Down] buttons.
   – Adjusting range: 0 - 4.99 ppm.
2. Confirm each item by pressing [OK].

### 11.5.5 Setting the hysteresis for the limit values

A hysteresis can be set for the limit values of each sensor (the sensors are set separately, but the hysteresis of the two limit values of one sensor is equal).

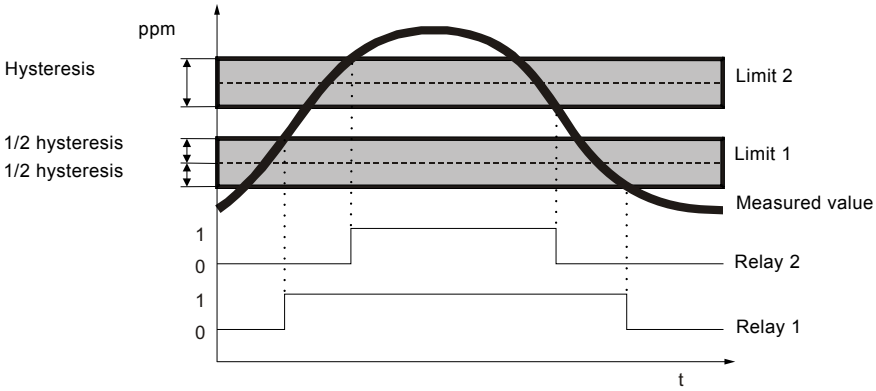


**Fig. 9** Distribution of hysteresis

| M1 - hysteresis |
|---|
| 0.00 ppm |

| M2 - hysteresis |
|---|
| 0.00 ppm |

"M2 - hysteresis" is only displayed if the device is set to "2 sensors".

1. For each item, set the hysteresis to the desired value by pressing the [Up] and [Down] buttons.
   – Adjusting range: 0 - 0.5 ppm
   – Suggested setting: 0.2 ppm.
2. Confirm each item by pressing [OK].

### 11.5.6 Setting the delay time for limit value 2

If limit value 2 is exceeded by one of the two sensors, a sprinkling installation is usually triggered to bond the leaking chlorine.

To prevent the immediate triggering of alarm activities when the value is exceeded only briefly, a delay time can be entered. When limit value 2 is exceeded, the relay for limit value 2 is only activated once this delay time has elapsed.

The alarm delay time begins when the measured value for a sensor exceeds its value for limit value 2.

The switching of the relay for limit value 2 and the switching of the alarm relay is being delayed (if the alarm relay is assigned to this limit value).

| Time delay | |
|---|---|
| limit 2 | 90 s |

1. Adjust the desired delay time by pressing the [Up] or [Down] button.
   – Adjusting range: 0 to 200 seconds
   – Default setting: 90 seconds.
2. Confirm by pressing [OK].

## 11.6 Commissioning

1. Check if all electrical connections are correct.
2. Switch on the power supply.
   – Now the device carries out a sensor test. See section *11.7.3 Sensor faults*.
3. Check if all settings are correct.
   – Now the device is ready for use.

## 11.7 Reading measured values and error messages

During operation, the measured values and possible error messages can be read:

– sensor test fault
– exceeding of limit values.

### 11.7.1 Reading measured values

In the display mode, the actual measured values can always be read. One of the following menus is displayed.

| Measured value |
|---|
| x.xx ppm |

– If one sensor is connected.

| M1 | x.xx ppm |
|---|---|
| M2 | x.xx ppm |

– If two sensors are connected.

### 11.7.2 Reading error messages

- In the display mode, change to the next error messages by pressing the [Down] button.
  - If more than one error message occurs, they are displayed one after the other in the following order:

| Sensor test<br>fault M2 |
|---|

| Sensor test<br>fault M1 |
|---|

| M2 - limit 2<br>exceeded |
|---|

| M2 - limit 1<br>exceeded |
|---|

| M1 - limit 2<br>exceeded |
|---|

| M1 - limit 1<br>exceeded |
|---|

The error messages are only displayed if the corresponding error has occurred.

### 11.7.3 Sensor faults

If a sensor fault has been detected, the corresponding LED will light up continuously.

To read the message:

1. Press the [Down] button.
   - The following message is displayed:

| Sensor test<br>fault M1 |
|---|

   - If a fault in sensor 1 has been detected.

| Sensor test<br>fault M2 |
|---|

   - If a fault in sensor 2 has been detected.
2. Check the sensor and cabling, and replace damaged parts, if necessary.
3. Carry out a manual sensor test again.

### 11.7.4 Exceeding limit values

If a limit value of a sensor is exceeded, the following occurs:

- The LED of the relevant sensor flashes.
- The limit relay switches.
- If the alarm relay is assigned to the exceeded limit value, it switches as well.
- The relay for limit value 2 and, if assigned, the alarm relay will switch once the delay time is over.

To read the message:

1. In display mode, change to the next items by pressing the [Down] button.
   - For example if a limit value is exceeded, the following message appears:

| M1 - limit 1<br>exceeded |
|---|

   - Here limit value 1 of sensor 1 is exceeded.

**Confirming limit value 2**

If the exceeding of limit value 2 is set as confirmable, it is possible to confirm the error message. The relay for limit value 2 and the connected warning and protection devices such as the sprinkler system will be deactivated.

See section *11.4.6 Setting the confirmability of limit value 2*.

Warning

Mortal danger! Use this function only if you are certain that no large gas breakout has occurred!

To confirm the exceeding of limit value 2:

1. In the display mode, change to the next items by pressing the [Down] button until the message of the exceeded limit value 2 appears.

| M1 - limit 2<br>exceeded |
|---|

2. Press [OK] to confirm the error message.

| M1 - limit 2<br>confirmed |
|---|

   - Now the relay for limit value 2 and connected warning and protection devices such as the sprinkler system are switched off.
3. Remedy the cause of the exceeded limit value.

## 12. Fault finding

Note: In case of measurement faults, see the manual of the gas sensors.

| Fault | Cause | Remedy |
|---|---|---|
| 1. No display following start-up. | a) No power supply. | Connect the power supply. |
| 2. Display permanently at zero. | a) Open circuit in cable between sensor and gas warning device. | Check the connection cable, and establish connection. |
| 3. Display with measured value unsteady. | a) Interferences on cable from sensor. | Check that the display is properly connected. |
| | | Route the cable separately from the power supply cables. |
| | b) Sensor faulty. | Replace the sensor. |
| 4. Sensor fault when switched on. | a) Sensor not connected. | Connect the sensor. |
| | b) Cable faulty. | Replace the cable. |
| | c) Sensor faulty. | Replace the sensor. |

## 13. Maintenance

The device is maintenance-free.

Repairs can only be carried out in the factory by authorised personnel.

### 13.1 Resetting the device to factory settings

Caution: Only use this function if you are aware of the consequences. All device settings are lost and must be re-entered!

Note: Do not disconnect the device from the power supply during reset!

#### 13.1.1 Changing to the "Configuration" menu

One of the following menus is displayed in the display mode.

| Measured value |
| --- |
| x.xx ppm |

| | |
| --- | --- |
| M1 | x.xx ppm |
| M2 | x.xx ppm |

1. Press [OK] to change to the "Parameter" menu.

| *Parameter* |
| --- |

2. Press [OK] several times until the "Configuration" menu is displayed.

| Configuration |
| --- |
| OFF |

3. Press the [Up] button to set "Configuration ON".
4. Press [OK] to change to the "Configuration" menu.

| *Configuration* |
| --- |

#### 13.1.2 Resetting to factory settings

1. Press [OK] several times until the "Factory setting" menu is displayed.

| Factory setting |
| --- |
| OFF |

2. Press the [Up] button to set "Factory setting ON".
3. Press [OK].

| | |
| --- | --- |
| Factory setting | |
| confirm | NO |

   – For safety reasons, the reset function must be confirmed. If you are certain that you want to reset the device, do the following:
4. Press the [Up] button to set "Factory setting confirm YES".
5. Press [OK].
   – The device is now returned to the original factory setting.

Caution: Before re-commissioning, check all parameters, and set them according to your application!

### 13.2 Test functions

The "Test functions" menu provides several possibilities to check the device and the connected warning and protection devices.

#### 13.2.1 Changing to the "Test functions" menu

One of the following menus is displayed in the display mode.

| Measured value |
| --- |
| x.xx ppm |

| | |
| --- | --- |
| M1 | x.xx ppm |
| M2 | x.xx ppm |

1. Press [OK] to change to the "Parameter" menu.

| *Parameter* |
| --- |

2. Press [OK] several times until the "Test functions" menu is displayed.

| Test functions |
| --- |
| OFF |

3. Press the [Up] button to set "Test functions ON".
4. Press [OK] to change to the "Test functions" menu.

| *Test functions* |
| --- |

#### 13.2.2 Checking the relays

The first item appears in the "Test functions" menu and does not need to be selected.
Press [OK] to change to the following items.

| M1 - limit 1 |
| --- |
| OFF |

| M1 - limit 2 |
| --- |
| OFF |

| M2 - limit 1 |
| --- |
| OFF |

| M2 - limit 2 |
| --- |
| OFF |

| Alarm relay |
| --- |
| OFF |

The relays for sensor 2 can even be tested if the device is set to "1 sensor".

**Caution** When switching on a relay, the connected warning and protection device will also be activated!

1. For each item, press the [Up] button to switch the corresponding relay on.
   – When switched on, the relay and the connected warning and protection device will be activated.
   – If this does not happen, check the connected warning and protection device as well as the cabling.
2. Press the [Up] button again to switch the corresponding relay off.

#### 13.2.3 Checking the current outputs

**Note** If the displayed values cannot be measured, the current output is defective.

**Note** The current output for measured value 2 can even be checked if the device is set to "1 sensor".

**Checking the current outputs for measured value 1**

1. Press [OK] to change to the items.

| M1 - mA signal |
| --- |
| 10 mA |

If the device is set to 0-20 mA.

| M1 - mA signal |
| --- |
| 12 mA |

If the device is set to 4-20 mA.

   – Now the displayed current (10 mA or 12 mA) should be present at the current output for measured value 1.
2. Check this with a suitable measuring device.
3. Press the [Up] button to change to the next current output.

| M1 - mA signal |
| --- |
| 20 mA |

   – Now 20 mA should be present at the current output for measured value 1.
4. Check this with a suitable measuring device.
5. Press the [Up] button to change to the next current output.

| M1 - mA signal |
| --- |
| 0 mA |

If the device is set to 0-20 mA.

| M1 - mA signal |
| --- |
| 4 mA |

If the device is set to 4-20 mA.

   – Now the displayed cur-rent (0 mA or 4 mA) should be present at the current output for measured value 1.
6. Check this with a suitable measuring device.

**Checking the current outputs for measured value 2**

1. Press [OK] to change to the following items and check as described above.

#### 13.2.4 Software version

1. Press [OK] to change to the item.

| *Service info* | |
| --- | --- |
| Vx.xx | dd.mm.yyyy |

   – Now the software version is displayed.

## 14. Disposal

This product or parts of it must be disposed of in an environmentally sound way. Use appropriate waste collection services. If this is not possible, contact the nearest Grundfos company or service workshop.

# Declaration of conformity

## GB: EU declaration of conformity

We, Grundfos, declare under our sole responsibility that the products Conex® DIA-G, DIS-G, DIS-D, DIS-PR, to which the declaration below relates, are in conformity with the Council Directives listed below on the approximation of the laws of the EU member states.

## DE: EU-Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass die Produkte Conex® DIA-G, DIS-G, DIS-D, DIS-PR, auf die sich diese Erklärung beziehen, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmen.

## ES: Declaración de conformidad de la UE

Grundfos declara, bajo su exclusiva responsabilidad, que los productos Conex® DIA-G, DIS-G, DIS-D, DIS-PR a los que hace referencia la siguiente declaración cumplen lo establecido por las siguientes Directivas del Consejo sobre la aproximación de las legislaciones de los Estados miembros de la UE.

## FR: Déclaration de conformité UE

Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits Conex® DIA-G, DIS-G, DIS-D, DIS-PR, auxquels se réfère cette déclaration, sont conformes aux Directives du Conseil concernant le rapprochement des législations des États membres UE relatives aux normes énoncées ci-dessous.

## GR: Δήλωση συμμόρφωσης ΕΕ

Εμείς, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα Conex® DIA-G, DIS-G, DIS-D, DIS-PR, στα οποία αναφέρεται η παρακάτω δήλωση, συμμορφώνονται με τις παρακάτω Οδηγίες του Συμβουλίου περί προσέγγισης των νομοθεσιών των κρατών μελών της ΕΕ.

## HR: EU deklaracija sukladnosti

Mi, Grundfos, izjavljujemo s punom odgovornošću da su proizvodi Conex® DIA-G, DIS-G, DIS-D, DIS-PR, na koja se izjava odnosi u nastavku, u skladu s direktivama Vijeća dolje navedene o usklađivanju zakona država članica EU-a.

## IT: Dichiarazione di conformità UE

Grundfos dichiara sotto la sua esclusiva responsabilità che i prodotti Conex® DIA-G, DIS-G, DIS-D, DIS-PR, ai quale si riferisce questa dichiarazione, sono conformi alle seguenti direttive del Consiglio riguardanti il riavvicinamento delle legislazioni degli Stati membri UE.

## LT: ES atitikties deklaracija

Mes, Grundfos, su visa atsakomybe pareiškiame, kad produktai Conex® DIA-G, DIS-G, DIS-D, DIS-PR, kuriems skirta ši deklaracija, atitinka žemiau nurodytas Tarybos Direktyvas dėl ES šalių narių įstatymų suderinimo.

## NL: EU-conformiteitsverklaring

Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat de producten Conex® DIA-G, DIS-G, DIS-D, DIS-PR, waarop de onderstaande verklaring betrekking heeft, in overeenstemming zijn met de onderstaande Richtlijnen van de Raad inzake de onderlinge aanpassing van de wetgeving van de EU-lidstaten.

## PL: Deklaracja zgodności UE

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze produkty Conex® DIA-G, DIS-G, DIS-D, DIS-PR, których deklaracja niniejsza dotyczy, są zgodne z następującymi dyrektywami Rady w sprawie zbliżenia przepisów prawnych państw członkowskich.

## PT: Declaração de conformidade UE

A Grundfos declara sob sua única responsabilidade que os produtos Conex® DIA-G, DIS-G, DIS-D, DIS-PR, aos quais diz respeito a declaração abaixo, estão em conformidade com as Directivas do Conselho sobre a aproximação das legislações dos Estados Membros da UE.

## RO: Declaraţia de conformitate UE

Noi Grundfos declarăm pe propria răspundere că produsele Conex® DIA-G, DIS-G, DIS-D, DIS-PR, la care se referă această declaraţie, sunt în conformitate cu Directivele de Consiliu specificate mai jos privind armonizarea legilor statelor membre UE.

## RS: Deklaracija o usklađenosti EU

Mi, kompanija Grundfos, izjavljujemo pod punom vlastitom odgovornošću da je proizvod Conex® DIA-G, DIS-G, DIS-D, DIS-PR, na koji se odnosi deklaracija ispod, u skladu sa dole prikazanim direktivama Saveta za usklađivanje zakona država članica EU.

## RU: Декларация о соответствии нормам ЕС

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия Conex® DIA-G, DIS-G, DIS-D, DIS-PR, к которым относится нижеприведённая декларация, соответствуют нижеприведённым Директивам Совета Евросоюза о тождественности законов стран-членов ЕС.

## TR: AB uygunluk bildirgesi

Grundfos olarak, aşağıdaki bildirim konusu olan Conex® DIA-G, DIS-G, DIS-D, DIS-PR ürünlerinin, AB Üye ülkelerinin direktiflerinin yakınlaştırılmasıyla ilgili durumun aşağıdaki Konsey Direktifleriyle uyumlu olduğunu ve bununla ilgili olarak tüm sorumluluğun bize ait olduğunu beyan ederiz.

- Low Voltage Directive (2014/35/EU)*.
  Standard used:
  EN 61010-1:2011-07.
- EMC Directive (2014/30/EU).
  Standards used:
  EN 61326-1:2013,
  EN 61000-3-2:2015,
  EN 61000-3-3:2014.
- RoHS Directives (2011/65/EU and 2015/863/EU).
  Standard used: EN 50581:2012.

* Only for products with operating voltage > 50 VAC or > 75 VDC.

This EU declaration of conformity is only valid when published as part of the Grundfos installation and operating instructions (publication numbers 96709884, 95716767, 96681460, 96798355, 96681484, 95716759).

Pfinztal, 1st March 2018

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Person authorised to compile technical file and empowered to sign the EU declaration of conformity.

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