DIP

Measuring amplifier and controller

Installation and operating instructions

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English (GB) Installation and operating instructions

Original installation and operating instructions

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Warning

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

Note

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

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. General information

These installation and operating instructions contain all information important for users of the DIP:

- 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.

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.

3. Identification

3.1 Nameplate

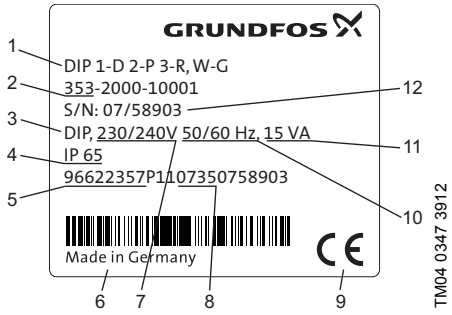

Fig. 1 Nameplate, DIP

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

3.2 Type key

Type key example: DIP 1-D 2-P 3-R W-H.

Example:	DIP	1-D	2-P	3-R	W	-H

Measuring amplifier and controller

DIP	Dosing Instrumentation Pool

Input parameter 1

D	Chlorine (Cl_2) or chlorine dioxide (ClO_2) or ozone (O_3)

Input parameter 2

P	pH

Input parameter 3

R	Redox (ORP)

Mounting

W	Wall-mounted

Supply voltage

G	1 x 230/240 V, 50/60 Hz
H	1 x 115/120 V, 50/60 Hz

4. Applications

The DIP instrument amplifier and controller is suitable for measuring chlorine (Cl_2), chlorine dioxide (ClO_2) and/or ozone (O_3), pH and redox potential and for controlling these concentrations using appropriate final control elements within the possible applications described in this manual.

As an option the CAN / RS 232 converter 95702009 can be used to connect the DIP to a programmable logical controller (PLC).

As an option the Grundfos AquaVision II visualisation system can be used to visualise the DIP on a PC.

Warning

Other applications are considered non-approved and are not permissible. Grundfos cannot be held liable for any damage resulting from incorrect use.

5. Safety

5.1 Obligations of owner

The owner agrees that only persons complying with these requirements are allowed to work with the DIP instrument amplifier and controller:

- 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 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.

5.2 Avoidance of danger

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!

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

Do not open 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 DIP!

6. Technical data

6.1 General data

Power consumption	Approximately 15 VA
Permissible ambient temperature	0 °C to +45 °C
Permissible storage temperature	-20 °C to +65 °C
Permissible air humidity	Maximum 90 % at 40 °C (non-condensing)
Weight	2 kg
Enclosure	Plastic (ABS)

6.2 Electronics

Electronics	16-bit microprocessor
Display	2 high-resolution graphics LCD with background light
Relay outputs	3 alarm relays, 4 controller relays (250 V/6 A, maximum 550 VA), 1 standby relay
Signal inputs	Controller stop, water sensor
Signal outputs	6 analog outputs 0/4 to 20 mA, maximum load 500 Ω
Freely adjustable analog outputs for measured values	• chlorine, chlorine dioxide, ozone • pH • redox • temperature
Continuous control (0/4-20 mA) for measured values	• chlorine, chlorine dioxide, ozone (left display) • pH (right display)

6.3 Controller functions

Control functions	Limit contact, P, PI, PID: two-position controller (pulse frequency or interpulse period controller), three-position step controller with/without feedback potentiometer, continuous controller
Limiting value	(Limit contact) 0 to 100 % of measuring range (in physical unit of the measured value)
Setpoints	0 to 100 % of measuring range (in physical unit of the measured value)
Proportional band X_p	0.1 to 3000 % (P-share)
Reset time T_n	1 to 3000 seconds, resolution one second (I-share)
Derivative time T_v	1 to 1000 seconds, resolution one second (D-share)
Minimum pulse length	0.1 to 10 seconds (with three-position step controller)
Minimum operating time	0.1 to 10 seconds (with interpulse period controller)
Interpulse period	1 to 100 seconds (with interpulse period controller)
Maximum pulse frequency	1 to 180 pulses per minute (with pulse frequency controller)
Hysteresis	0 to 50 % of the measuring range (in physical unit of the measured value)
Constant load	0 to 50 % (with interpulse period, pulse frequency, continuous or three-position step controller)
Maximum dosing flow	Base load dosing up to 100 % of full-scale value (with interpulse period or pulse frequency controller, three-position step controller with return to zero point)
Motor runtime	10 to 240 seconds resolution 1 second (with three-position step controller without return to zero point)
Effective direction	Can be set to upward or downward
Control relays	Can be set to pulse-interpulse control, pulse frequency control or limit contact
Output continuous controller	0-20 mA / 4-20 mA

6.4 Measuring ranges

Cl_2	**ClO_2**	**O_3**	**pH**	**Redox (ORP)**
[mg/l]	**[mg/l]**	**[mg/l]**	**[pH]**	**[mV]**
0.00 - 0.50	0.00 - 0.50	0.00 - 0.50	0.00 - 14.00	-1500 to +1500
0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	2.00 - 12.00	0-1000
0.00 - 2.00	0.00 - 2.00	0.00 - 2.00	5.00 - 9.00	
0.00 - 5.00	0.00 - 5.00	0.00 - 5.00		
0.0 - 10.0	0.0 - 10.0			
0.0 - 30.0	0.0 - 50.0			

Note

With the menu function "others", the measuring range can be set to any range within the limits listed above.

7. Installation

7.1 Transport and storage

- Transport the DIP carefully, do not drop!
- Store at dry and cool location.

7.2 Unpacking

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

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

7.3 Installation requirements

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

Caution If you do not observe the installation requirements, the device may be damaged!
The measurements may not be correct.

7.4 Installation of enclosure

Warning

Switch off the power supply before installing the DIP!

Enclosure class IP65 is only guaranteed if the front panel is fitted and the appropriate cable glands or dummy caps are used.

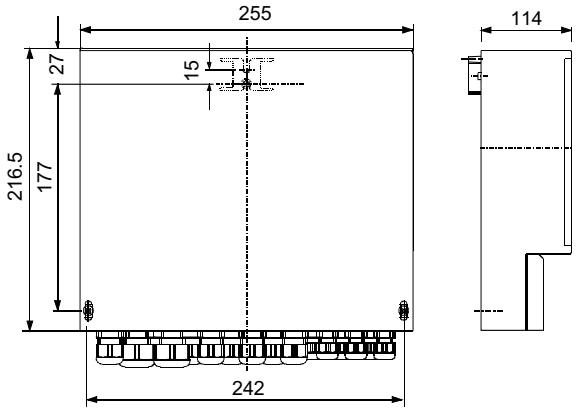

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Fig. 2 Drilling diagram

1. Drill three holes (∅8) as shown on the drilling diagram stamped on the back of the unit and insert the supplied dowels.
2. Insert the upper middle screw and screw it down.
3. Attach the attachment eye (at the rear of the enclosure) to the screw.
4. Remove the front panel (cover of terminals).
5. Insert the two lower screws and secure the device by tightening the screws.
6. Mount the front panel of the enclosure.

Caution Do not damage the gasket!
The gasket must be fitted exactly!

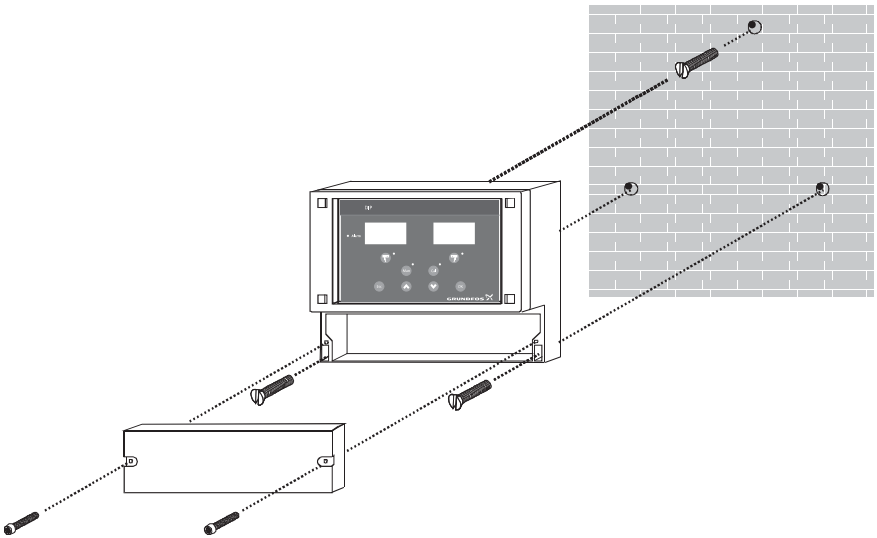

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Fig. 3 Mounting drawing

8. Electrical connections

Warning

Switch off the power supply before installing!

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

Warning

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

Observe the local safety regulations!

Protect the cable connections and plugs from corrosion and humidity.

Before connecting the power supply cable, check that the power supply 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!

Refer to the connection diagram!

Route the input, current output and power supply cables in separate ducts.

Enclosure class IP65 is only guaranteed if the terminal cover is correctly sealed! Do not damage the terminal cover gasket!

Caution The gasket on the terminal cover must be positioned precisely!

Do not damage the gasket!

Note Unused terminals remain open.

1. Remove the terminal cover on the front of the device.
2. Use the appropriate cable feedthroughs and tighten the screws carefully.
3. Connect the cables used to the terminals according to the DIP terminal assignment.
4. Close the terminal cover again with correctly positioned gasket.

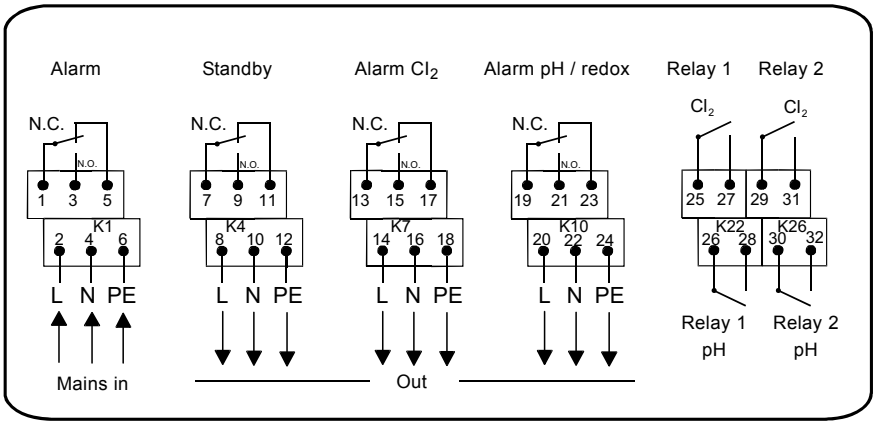

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Fig. 4 Terminals

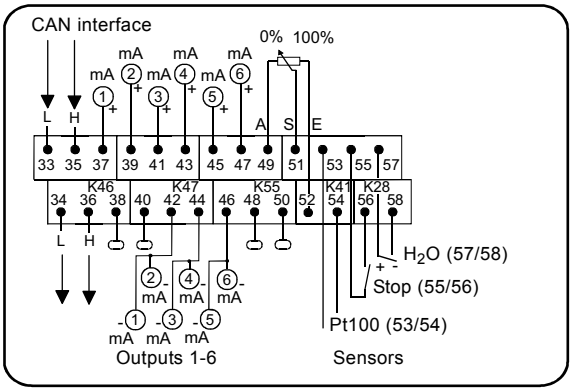

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Fig. 5 Output and sensor terminals

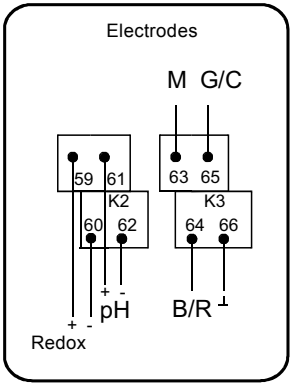

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Fig. 6 Electrode terminals

Legend of terminals

Pos.	Description
Alarm	Group alarm relay
Standby	Relay for standby operation
Alarm Cl_2	Alarm relay for chlorine/chlorine dioxide/ozone
Alarm pH	Alarm relay for pH and redox
N.O.	Normally open (relays for alarm/ standby)
N.C.	Normally closed (relays for alarm/ standby)
Relays	Relay 1, 2 for chlorine/chlorine dioxide/ozone and relay 1, 2 for pH
Mains in	Input for power supply
(Mains) out	Output for power supply (for peripherals)
CAN interface	CAN bus interface
A S E	Feedback potentiometer 0-100 % start (**A**nfang) / wiper (**S**chleifer) / end (**E**nde)
Outputs	**Current outputs**
1	Chlorine, chlorine dioxide, ozone
2	pH
3	Redox
4	Temperature
5	Continuous controller for chlorine, chlorine dioxide and ozone (left display)
6	Continuous controller for pH (right display)
Sensors	**Signal inputs for sensors**
Pt100	Temperature sensor (53/54)
H_2O	Water sensor (57/58)
Stop	Controller stop (55/56)
Electrodes	**Measuring cells, electrodes and single-rod measuring chains**
M	Measuring electrode (AQC-D1/ -D11/-D2/-D12/-D3/-D13)
B/R	Reference electrode (AQC-D1/-D11/ -D2/-D12/-D3/-D13)
G/C	Counter electrode (AQC-D1/-D11/ -D2/-D12/-D3/-D13)
Earth	AQC-D1/-D11/-D2/-D12/-D3/-D13
mV	Connection of redox electrode
pH	Connection of single-rod measuring chain for pH

8.1 Connection of measuring cells

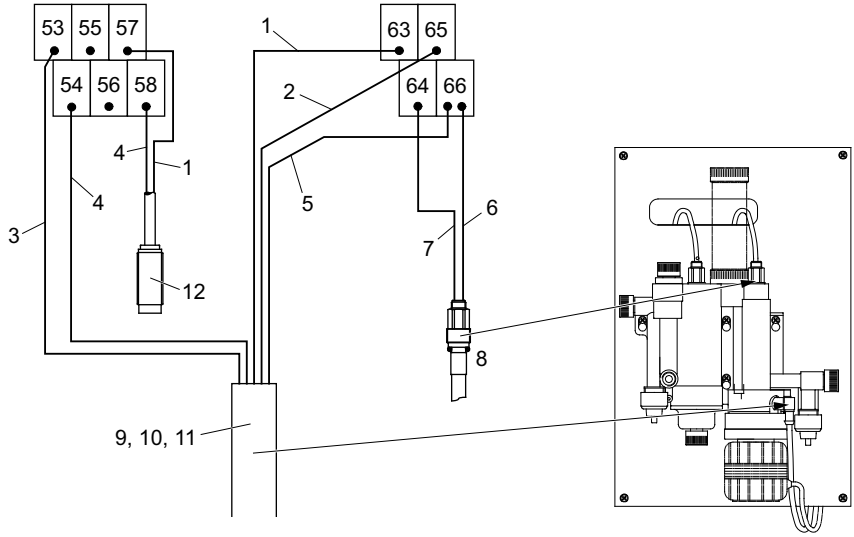

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Fig. 7 Wiring diagram for measuring cells AQC-D1/-D2/-D3

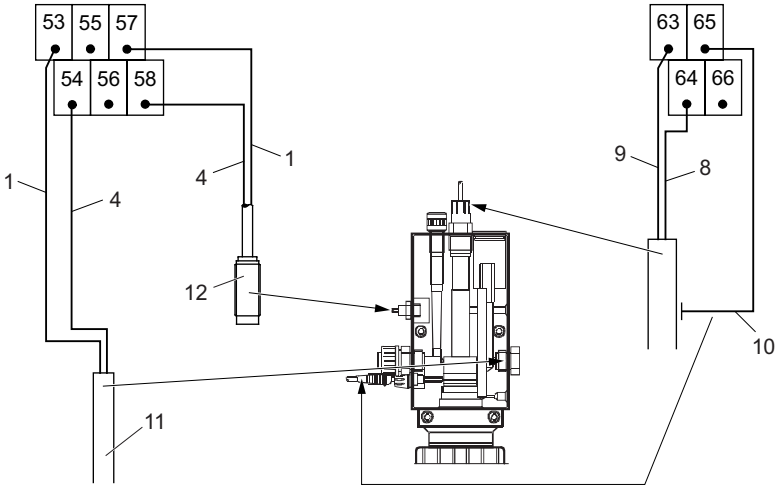

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Fig. 8 Wiring diagram for measuring cell AQC-D11

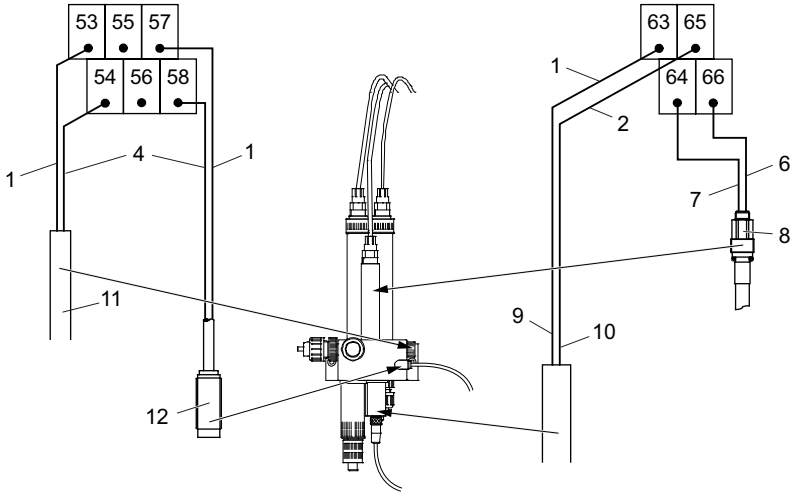

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Fig. 9 Wiring diagram for measuring cell AQC-D12

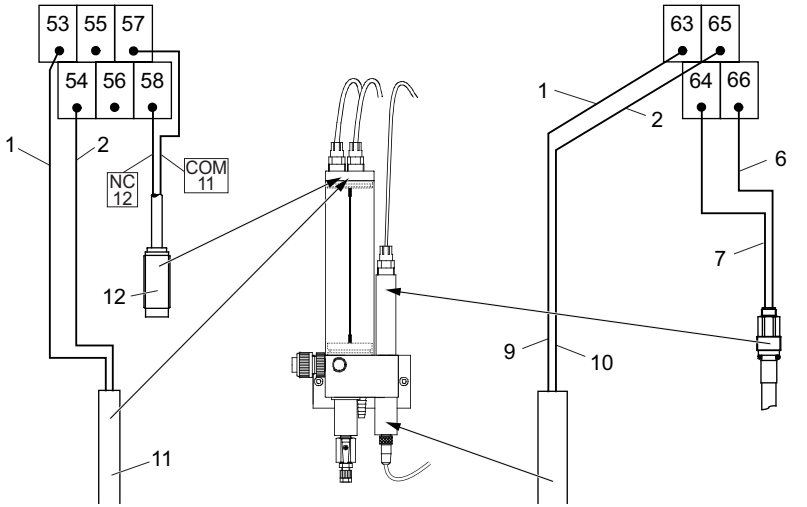

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Fig. 10 Wiring diagram for measuring cell AQC-D13

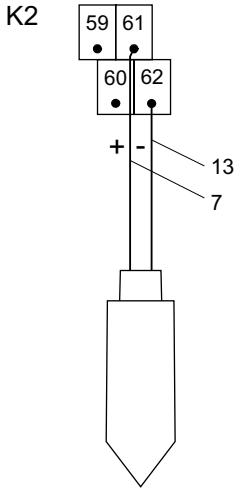

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Fig. 11 Wiring diagram for single-rod measuring chain for pH

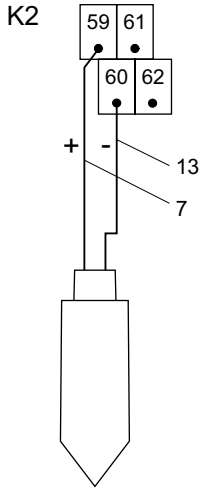

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Fig. 12 Wiring diagram for redox electrode

Pos.	Description
1	Brown
2	White
3	Black
4	Blue
5	Screen
6	Outer conductor (screen)
7	Inner conductor
8	Reference electrode
9	Measuring electrode
10	Counter electrode
11	Pt100 temperature sensor
12	Water sensor
13	Outer conductor

Flip switch at the right-hand side above the terminal strip

- Left flip switch: CAN matching the resistor for the connection of 1 to 12 DIP: If the DIP is the last connected device of measurement and control at the CAN interface, the CAN matching resistor must be switched on ("2", to the left)!
  - – Flip switch to the left (2): ON
  - – Flip switch to the right (1): OFF.
- Right flip switch: must be switched to "2" for Grundfos measuring cells (flip switch to the left)!

8.2 Power supply connection

1. Connect the protective conductor (PE) to terminal 6.
2. Connect the neutral conductor (N) to terminal 4.
3. Connect the phase (L1) to terminal 2.

Switch the device on and off by switching the power supply accordingly. The device itself does not feature a separate power switch.

8.3 Relay outputs

Note

The connection of the relay outputs depends on the application as well as the device controlled. Therefore the connections described below should only be considered as guidelines.

With inductive loads (also 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 free-wheeling diode in parallel to relay or contactor.

Caution

The relay outputs must be provided with a corresponding back-up fuse!

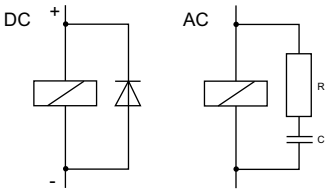


Fig. 13 Suppressor circuit, DC / AC

9. Operation

9.1 Control and display elements

The DIP has a self-explaining and easy-to-handle plain-text control panel.

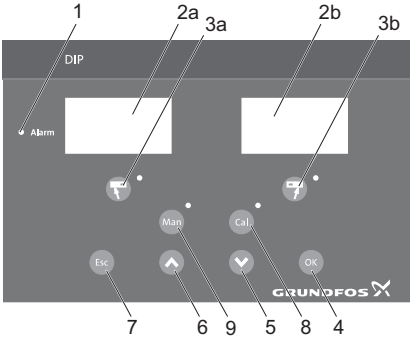


Fig. 14 Control and display elements

Pos.	Description
Control elements	
1	Red alarm LED • Flashes in case of faults or incorrect entries.
2a	Left display for chlorine, chlorine dioxide, ozone, temperature
2b	Right display for pH, redox
Buttons for selection of displays (corresponding LED illuminates in yellow)	
3a	Selection of left display (chlorine, chlorine dioxide, ozone, temperature)
3b	Selection of right display (pH, redox)
Operator buttons	
4	**[OK]** button: • Changes to the next menu. • Confirms the selected line or value.
5	**[Down]** button: • Moves one line downward. • Decreases values.
6	**[Up]** button: • Moves one line upward. • Increases values.
7	**[Esc]** button: • Returns to the previous menu. – The data which were input last are not changed.
Function buttons with yellow LED	
8	**[Cal]** button: • Switches between calibration and measuring modes. – In calibration mode, the corresponding LED illuminates.
9	**[Man]** button: • Switches between automatic and manual modes. – In manual mode, the corresponding LED illuminates.

9.2 First commissioning

After switching on the unit and after the start indication:

- In the left display, the "Language" menu appears ("Language" is indicated alternating in the implemented language versions).
- In the right display, the indication "program version" appears.

As a standard, the left display is activated. The LED beside the select button for the left display (3a) illuminates in yellow.

1. Select operator"s language.
2. Select the corresponding line using the [Up] or [Down] button, and press [OK].
   After that the indication level appears.

9.3 Afterwards

The indications always appear in the last selected language.

After the start indications in both displays, the unit shows the measured values of the last selected measurements (e.g. left display: chlorine; right display: pH).

1. If necessary, press the select button (3a) for the left display. The corresponding LED illuminates in yellow.
2. Press [OK] to go to the main menu for chlorine, chlorine dioxide, ozone (left display).

9.4 Setup (exclusively on the left display)

The basic setting is made only on the left display. The LED beside the left select button should illuminate in yellow.

1. In the main menu, select "Setup" using the [Up] or [Down] button, and press [OK].
2. If necessary, enter the code number to achieve full rights.
3. Parameters: Select the desired measured value.
   – With measurement of chlorine, switch the measurement/compensation of pH and/or temperature on/off.
   – With the other measured values, switch the measurement/compensation of temperature on/off.
   – Switch the redox measurement on/off.
4. Select the measuring cell for chlorine (Cl_2), chlorine dioxide (ClO_2), ozone (O_3)
   – AQC-D1/-D11: with motor drive for cleaning
   – AQC-D2/-D12/-D3/-D13: with hydromechanical drive for cleaning.
5. Set the measuring ranges.
   See section *6.4 Measuring ranges*.
6. Select and configure the controller for chlorine (Cl_2), chlorine dioxide (ClO_2), ozone (O_3). With measurement of chlorine, chlorine dioxide and ozone, two kinds of three-point step control can be selected:
   – "with feedback": Regulated quantity is set back to zero if controller stops (manual operation).
   – "without feedback": Regulated quantity remains at the last position, if controller stops.
7. Select and configure the controller for pH.
8. Water deficiency sensor: Switch the sample-water deficiency sensor on/off, if necessary. Measuring cell AQC-D2/-D12: Water sensor has to be switched on!
9. Date/time: Set the actual time, if necessary.
10. Code function: Enter the code numbers, if this is desired:
    – Enter the code to achieve full rights. Allows access to all menus and functions for one hour.
    – Enter the code to achieve calibration rights. Allows access to calibration and to manual operation for one hour.
    – If no code was entered before, all menus can be accessed without restrictions and are not protected!
11. Current outputs: Set the current loops.
12. CAN-Interface: Up to twelve device addresses can be allocated.
13. Press [Esc] to return to the main menu.

9.5 Main menu

Setting of the controller parameters and the alarm values (on both displays)

1. Press the select button for the required display.
2. Select "controller" using the [Up] or [Down] button, and press [OK].
   – If necessary, enter the code number to achieve full rights (access to all menus and functions for one hour).
   – Set the controller parameters for the selected and configured controllers.
   – If required, start adaptation and access adaptation result.
3. Select "Alarm" using the [Up] or [Down] button, and press [OK].
   – If necessary, enter the code number to achieve full rights (access to all menus and functions for one hour).
   – Set the alarm values.

9.6 Calibration (Cal) on both displays

Note

For chlorine measurement with pH compensation, first calibrate the pH value (right display). As for the calibration of the chlorine value, the calibrated pH value is necessary.

1. Press the select button for the required display.
2. Press [Cal] to switch to the calibration function.
3. If necessary, enter the code number to achieve calibration rights (or full rights).
4. After switching to the calibration function, the LED next to the [Cal] button illuminates in yellow.
   – The first line shows the selected measured value, i.e. chlorine.
5. Use the [Up] or [Down] button to select the line "measured value".
6. Enter the photometrically or analytically measured reference value or select one of the proposed buffer solutions, and press [OK].

• Only with measurement of pH:
   – After having entered the reference values and pressed [OK], the device automatically switches to "temperature".
   – Enter the actual temperature of the buffer solutions, and press [OK].

Further details about calibration with buffer solutions are available in the manual of the corresponding measuring cells.

7. After that the applied sensor data are automatically read in and calibrated.
   – Immediately after calibration the result of the calibration is indicated automatically; slope of the sensor (and with pH measurement: additionally the asymmetry potential of the single-rod measuring chain).
8. "Cal cycle": After selecting "cal. cycle", a countdown function starts, which activates the alarm "calibrate sensor" after a determined period of time.

9.7 Manual mode (Man) on both displays

1. Press the select button for the required display.
2. Press the [Man] button to switch to manual operation.
   – The LED next to the [Man] button illuminates in yellow.
3. If necessary, enter the code number to achieve calibration rights (or full rights)
   – access to the calibration function (Cal) and the manual operation (Man) for one hour (with full rights access to all menus and functions for one hour).
4. Run the pre-configured controllers manually. See section *9.9 Control fields in the display*.

9.8 Diagnosis menu "Service" on both displays

1. Press the select button for the required display.
2. In "main menu", select "service" using the [Up] or [Down] button, and press [OK].
   – Check the data of the last 10 calibrations and of the controller settings (measurement of disinfection media or pH).
   – Check the functioning of current outputs/relays/ display.
   – Call up rpm water sensor (only for measuring cell AQC-D2/-D12).

9.9 Control fields in the display

The control fields for pH and temperature measurement and/or compensation are indicated in the bottom right-hand corner of the display, if the corresponding functions were switched on before.

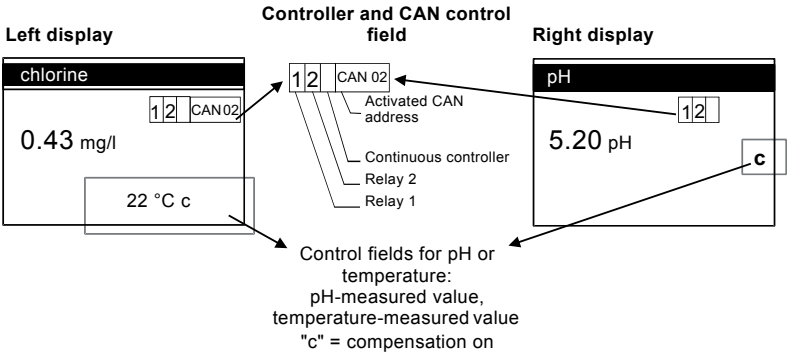


Fig. 15 Control fields in the display

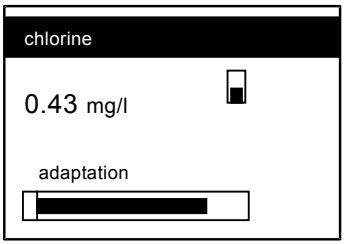
Depending on the configuration of the selected controllers, the corresponding controller control fields are indicated in the top right-hand corner of the display:

- Relay 1/2: with pre-configured limit contacts / two-position controllers: empty field with relay "off", filled (inverted) field with relay on.
- With pre-configured continuous controller: A black bar indicates the current dosing flow: empty field at 0 %, half-filled field at 50 % and filled field at 100 %.

9.10 Adaptation

An adaptation can be started to simplify the setting of the controller parameters. The adaptation is only available for PI and PID controllers.

1. Start adaptation in the "controller" menu (main menu) under "adaptation" by pressing "start".
   – Return to display "measured value" automatically.
   – A black bar on the display indicates the adaptation process (see fig. 16: chlorine measurement with adaptation continuous controller).
   – The LED next to the [Man] button flashes during the whole adaptation.



TM03 6715 3912

Fig. 16 Display: Adaptation

The configured controllers can only be adapted separately.

- On upward control, the measuring value has to be more than 10 % (pH: 1.5 %) below the set point.
- On downward control, the measuring value has to be more than 10 % (pH: 1.5 %) above the set point.
- In case of a fault, the message "Starting conditions false" is shown directly after the start.
- The message "Adaptation successful" is shown after ending the adaptation.

2. Press [OK] or [Esc] to quit.
   – The determined controller settings will be automatically adapted by the parameterisation of the controller. They are displayed in the adaptation menu under "Adapt. result".
   – If the adaptation was not successful, the message "Adaptation failed" is shown.
3. Press [OK] or [Esc] to quit.

The adaptation may be stopped:

- if an error message was shown during the adaptation.
- if the controller is switched to manual operation.
- if the down time was more than one hour.
- if the total measuring time was more than two hours.

In case of an additional modification of the setpoint, the controller settings will be automatically compensated.

Note

With selected temperature/redox measurement the temperature value, redox value and temperature compensation will not be displayed during the adaptation.

9.11 Software overview

Note

Provided that the code numbers for access right have been set, some menus (and submenus) as well as the functions Cal and Man are protected against unauthorised access.

Main menus

- See section *Controller (left + right displays)*
- See section *Alarm (left + right displays)*
- See section *Service (left + right displays)*
- See section *Setup (only left display)*.

Function buttons

- Cal, see section *Calibration function (left + right displays)*
- Man, see section *Manual operation (left + right display)*.

Controller (left + right displays)

full rights needed

- Relay 1/2
  – controller parameters for chlorine, chlorine dioxide, ozone (left display)
  – controller parameters for pH (right display).
- Continuous controller
  – controller parameters for chlorine, chlorine dioxide, ozone (left display)
  – controller parameters for pH (right display).

Alarm (left + right displays)

full rights needed

- Alarm settings
  – alarm values (switching points)
  – effective direction
  – hysteresis
  – alarm delay
- Dosing time monitoring
  – maximum dosing time (at constant dosing flow level of 100 %)
- Dosing stop for redox
  – adjustment with the right display
  – input of the limit values (mV) for chlorine, chlorine dioxide or ozone for dosing stop.

Service (left + right displays)

- calibration logbook
  - – calibration data (the last 10 calibrations)
  - – measured value
- calling up the controller settings
- function test of current outputs
- function test of relays
- function test of display.

Setup (only left display)
full rights needed

- selecting language
- parameters: measured values
- selecting measuring cell
- selecting measuring range
- controller parameters for chlorine, chlorine dioxide, ozone
- controller parameters for pH
- switching water sensor on/off
- time setting
- code function
- display contrast
- saving user settings
- re-activating user settings
- resetting to factory settings (code 6742)
- current output: assignment of current outputs to measuring ranges
- CAN interface
- program version.

Calibration function (left + right displays)
calibration rights needed

- calibration of selected parameters
  - – chlorine, chlorine dioxide, ozone (left display)
  - – pH (right display).

Manual operation (left + right display)
calibration rights needed

- Run the pre-configured controllers manually
  - – chlorine, chlorine dioxide, ozone (left display)
  - – pH (right display).

10. 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 product DIP, to which the declaration below relates, is 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 das Produkt DIP, auf das sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmt.

FR: Déclaration de conformité UE
Nous, Grundfos, déclarons sous notre seule responsabilité, que le produit DIP, auquel se réfère cette déclaration, est conforme aux Directives du Conseil concernant le rapprochement des législations des États membres UE relatives aux normes énoncées ci-dessous.

PL: Deklaracja zgodności UE
My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasz produkt DIP, którego deklaracja niniejsza dotyczy, jest zgodny z następującymi dyrektywami Rady w sprawie zbliżenia przepisów prawnych państw członkowskich.

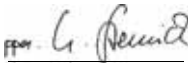
RU: Декларация о соответствии нормам ЕС
Мы, компания Grundfos, со всей ответственностью заявляем, что изделие DIP, к которому относится нижеприведённая декларация, соответствует нижеприведённым Директивам Совета Евросоюза о тождественности законов стран-членов ЕС.

- 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 number 95707095)..

Pfinztal, 1st March 2018



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