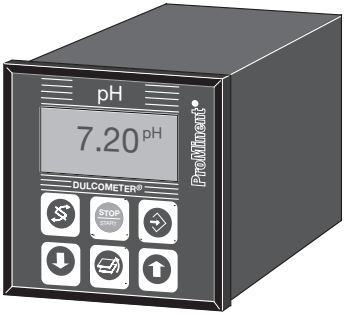
Operating Instructions

DULCOMETER® D1C

Part 1: Mounting and installation instructions for wall-mounted and control panel-mounted devices

G/GB/F/E



Typ/type D

DED1C1S001

Typ/type W

DED1C1W001

D1C A ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Identcode

Betriebsanleitung in deutsch
von Seite 1 bis 21

E

Operating Instructions in English
from Page 23 to Page 41

1 Contents / General User Information

Please completely read through these operating instructions. Do not discard!
The warranty shall be invalidated by damage caused by operating errors!

General User Information

Please read the following information carefully and thoroughly. Knowledge of this information will greatly increase the benefit you gain from the operating instructions.

Particular attention is drawn to:

- Lists
- ▶ Instructions

Setting menus

NOTE

The information provided in a note is intended to make your work easier.

and safety information:

WARNING

This symbol draws attention to possible hazardous situations. Disregard of this information may result in the direct threat to life and serious injuries.

CAUTION

This symbol draws attention to a possibly dangerous situation. Disregard of this information may result in serious injuries or damage to property.

IMPORTANT

This symbol is used to draw attention to possible damaging situations. Disregard of this information may result in damage to property.

SAFETY INFORMATION

CAUTION

- ***Please observe the parts of these operating instructions applicable to your specific type of equipment! Applicable parts are listed in the device identification/ID code list!***
- ***Correct measurement and metering is possible only with the probe in perfect working order! The probe must be calibrated/checked at regular intervals!***

  Probe failure may cause the uncontrolled metering of chemicals.

2 Device Identification / Identity Code

D1C	DULCOMETER® Controller Series D1C
W	Wall mounting
D	Control panel installation, 96 x 96 mm

	Operating voltage
0	230 V 50/60 Hz
1	115 V 50/60 Hz
2	200 V 50/60 Hz (control panel installation only)
3	100 V 50/60 Hz (control panel installation only)
4	24 V AC/DC

	Measured variable
B	Bromine (0.1...13 mg/l) (3rd quarter 2001)
C	Chlorine (0...0.5/2/10/20 mg/l)
L	Conductivity (0…20/200/2000 µS/cm; 0…20/200 mS/cm)
P	pH (0...14 pH)
R	Redox (-1000...1000 mV)
H	Hydrogen peroxide (1…20; 10…200; 100…2000 mg/l)
S	Standard signal (0/4-20 mA)
A	Peracetic acid (10…200; 100…2000 mg/l)
D	Chlorine dioxide (0...0.5/2/10/20 mg/l)
Z	Ozone (0...2 mg/l)
X	Dissolved Oxygen (0.1...10/20 ppm)
T	Temperature (0...100 °C)

	Connection of measured variable
1	Terminal, standard signal 0/4-20 mA (signal converters necessary for controllers with measured variable connection, standard signal 0/4-20 mA
2	SN6 connector for P or R
3	Terminal for L
4	Terminal PT 100 for T
5	Terminal mV for P or R

	Correction variable
0	None
1	pH for chlorine
2	Temperature for P, D, H, A or L via terminal
3	Temperature for P, D, H, A or L via standard signal 0/4-20 mA
4	manual temperature entry for P, H, A or L

	Feedforward control
0	None
1	Flow as standard signal 0/4-20 mA
2	Flow as frequency 0 - 500 Hz
3	Flow as frequency 0 - 10 Hz

	Control input
0	None
1	Pause

	Signal output
0	None
1	Standard signal 0/4-20 mA measured value
2	Standard signal 0/4-20 mA controlled variable
3	Standard signal 0/4-20 mA correction variable
4	2 standard signal outputs 0/4-20 mA, freely programmable (not for H, A)

	Power control
G	Alarm and 2 limit value relays
M	Alarm and 2 solenoid valve relays (pulse length control)
R	Alarm relay and actuator with feedback

	Pump control
0	None
2	Two pumps

	Control characteristic
0	None
1	Proportional control
2	PID control

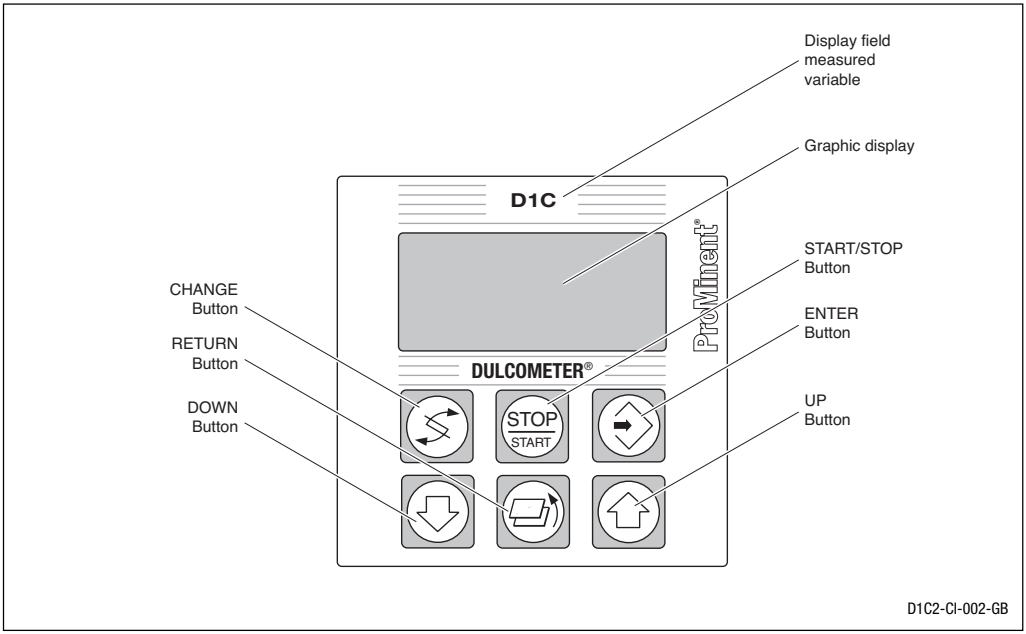
	Log output
0	None

	Language
D	German (E, F, N)
E	English (D, F, N)
F	French (D, E, N)
I	Italian (D, F, S)
N	Dutch (D, E, F)
S	Spanish (D, I, F)
P	Polish (D, E, A)
A	Swedish (D, E, P)
B	Portuguese (E, S, F)
U	Hungarian (P, A, E)
G	Czech

D1C A	___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Please enter the identity code of your device here.

3 Device Overview / Controls



	CHANGE button To change over within a menu level and to change from one variable to another within a menu point.
	START/STOP button Start/stop of control and metering function
	ENTER button To accept, confirm or save a displayed value or status. For alarm acknowledgement.

	UP button To increase a displayed numerical value and to change variables (flashing display).
	RETURN button To exit operating menu (back to start of relevant setting menu).
	DOWN button To decrease a displayed numerical value and to change variables (flashing display).

4 Functional Description

4.1 Brief functional description

The DULCOMETER® D1C is a device designed for measuring, displaying and controlling measures variables. With the corresponding expansion stage it can also process disturbance variables.

The measured variables to be processed are:

- pH, ORP
- Standard signal, Temperature
- Dissolved Oxygen
- Chlorine, ClO_2, Br, O_3
- Conductivity
- H_2O_2 , peracetic acid

4.2 Mechanical design

The DULCOMETER® D1C is supplied in versions suitable for control panel installation and wall mounting.

4.2.1 Control panel installation in accordance with DIN 43700 (96 x 96 mm)

The DULCOMETER® D1C is a device suitable for control panel installation in accordance with DIN 43700 with the format 96 x 96 mm, depth 140 mm. In this installation arrangement, the device is completely integrated in the control panel or installed in a housing. The device is electrically connected directly via terminals at the rear.

The terminals as well as an SN6 socket for pH or redox input project beyond the rear panel.

Retaining brackets for mounting the device in the control panel are provided on the housing.

The display pc-board with the graphic display is located at the front. It features 6 operating buttons and a transparent display window.

4.2.2 Wall mounting

The DULCOMETER® D1C W is suitable both for wall mounting as well as for installation in a control panel (control panel installation kit, Part No. 792908). The durable plastic housing is made up of an upper section and lower section. The graphic display and transparent display window are accommodated in the upper section while the lower section houses the processor, power supply and options board. The connection to the display is made by means of a ribbon cable. Electrical connection is made via the originally closed, punch-out cable leadthroughs on the underside of the housing. On devices with an SN6 input (dependent on identity code), the standard SN6 socket is located on the left-hand side. A wall mounting bracket is provided at the rear of the device to facilitate simple wall mounting.

4.3 Electrical design

The device processes an input signal while taking into consideration disturbance variables and operator inputs. The result is displayed and made available to other devices via a standard signal or a serial interface.

When equipped with corresponding actuators, the device can undertake control functions. It is designed to activate metering pumps, solenoid valves, servo motors with feedback as well as mA standard signal. The activation variable is recalculated every second.

The controller does not feature a separate power switch. It is therefore immediately ready for operation after being connected to the power supply.

The devices correspond to relevant requirements concerning electrical operating equipment. For this purpose, the following standards are complied with:

- Supply voltage in accordance with - DIN IEC 38
- Electrical safety in accordance with - EN 61010-1
- Emitted electromagnetic interference in accordance with - EN 55011 Gr. 1/Cl. A

5 Mounting / Installation

5.1 Safety information

WARNING

The device is suitable for installation in a control panel or in a corresponding housing (see accessories). The device must not be placed into operation if not installed as intended!

CAUTION

- ***The generally applicable safety precautions must be observed for installation. Corresponding national regulations must be complied with!***
- ***The operating instructions must be read through carefully before starting any installation and start-up procedures!***
- ***Only specially trained and qualified personnel are permitted to carry out electrical installation of the device!***
- ***The power ratings specified on the device must agree with those of the supply voltage!***
- ***The power connection line and the data lines must not be installed together with interference-prone lines! If low electrical disturbance cannot be guaranteed in the working environment, special interference suppression measures must be implemented! Severe disturbances can cause malfunctions through to irreparable damage of the device!***

5.2 Mounting description, mechanical

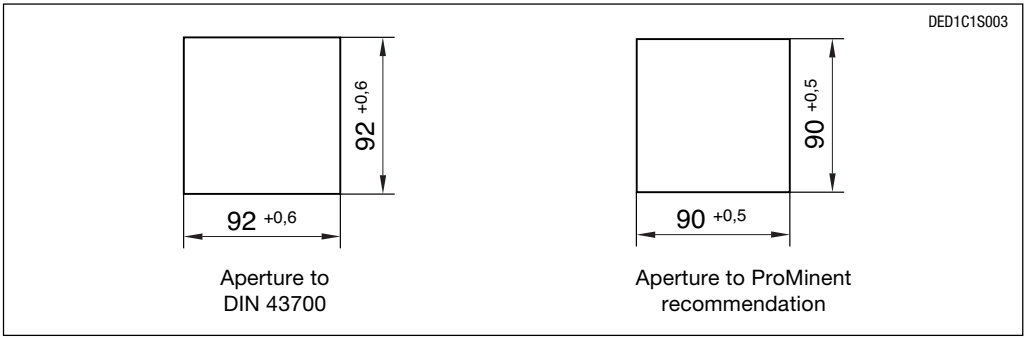
Please remove the protective film from the display!

5.2.1 Mounting DULCOMETER® D1C D (control panel installation)

This device is designed specifically for installation in a control panel. The housing corresponds to DIN 43700.

The aperture in the control panel for installing the device is defined in DIN 43700.

We recommend a smaller aperture. In this way, the device is held more securely in place (reduced lateral play) and the seal is pressed more evenly.



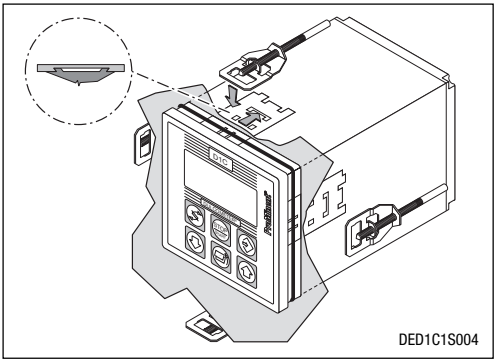
Aperture to DIN 43700

Aperture to ProMinent recommendation

To make aperture:

As an installation aid, a drill/punch template at a scale of 1:1 is provided with the device for the purpose of optimally positioning the device on the control panel.

- ▶ With the aid of a spirit level, align the template in the corresponding position on the control panel and secure in this position. Mark the corner points with a centre punch and drill out with a 6 mm Ø twist drill. Then saw out the intermediate web with a compass saw. Neatly rework the surfaces until the dimensions are within the specified tolerances.
- ▶ Cleanly deburr edges.
- ▶ Before fitting the device into the control panel aperture, check the position of the seal (must rest on front shoulder). Working from the outside, fit the device in the aperture, attach the retaining brackets and slide back as far as it will go. All four retaining brackets must be fitted otherwise the enclosure class IP54 will not be complied with.
- ▶ Using a suitable screwdriver, screw the threaded pins forward until the seal is evenly pressed all round.
- ▶ Check once again that the seal is fitted correctly, if necessary, release the threaded pins and correct the position.



5.2.2 Mounting DULCOMETER® D1C W (wall mounting)

NOTE

The device should be mounted in such a position as to facilitate easy read-off and operation (at eye-level where possible).

The device can be screwed directly onto the wall with the aid of the wall mounting bracket provided (drilling template enclosed).

Securing material for wall mounting:

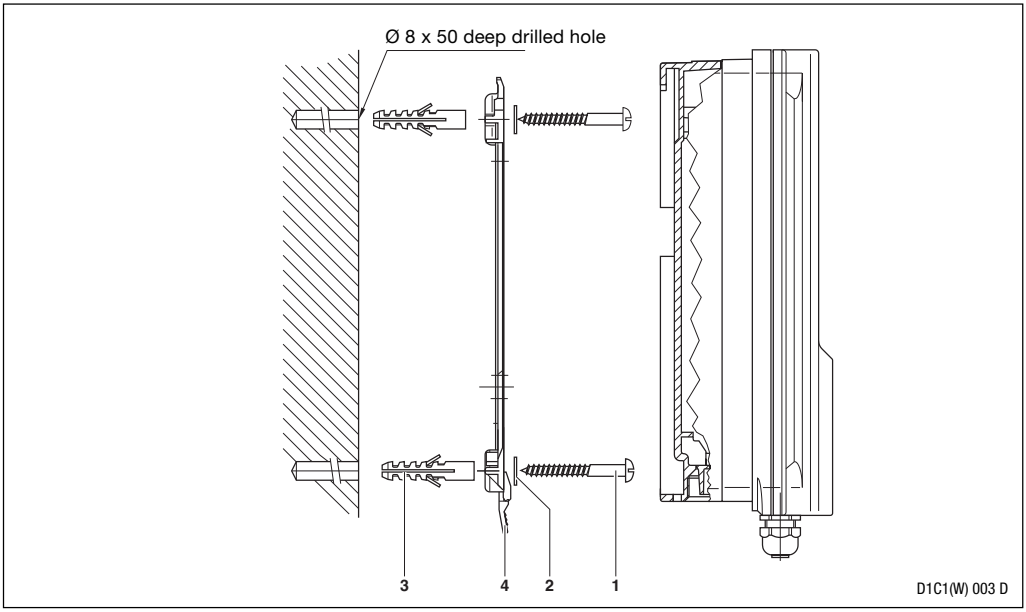
- Item **(1)** 3x button head screws 5x45
- Item **(2)** 3x U-washer 5.3
- Item **(3)** 3x plastic wall plug d8

The wall mounting bracket **(4)** can also be used as a drilling aid. For this purpose, set up the mounting bracket in the corresponding position on the wall.

NOTE

Take particular care when setting up to ensure that sufficient space is available for the purpose of installing the cables. A space of approx. 120 mm must be left at the top for the "park position".

Mark and drill the holes. Insert wall plugs **(3)** and secure mounting bracket with screws **(1)** and U-washers **(2)**. Mount device from above on mounting bracket, press slightly against the wall and slide upward by approx. 4 mm until it is heard to engage in position.



5.2.3 Control panel installation D1C W

A 4 mm wide flange acting as the stop for the control panel together with an all-round groove for a seal is provided on the perimeter of the device. When mounted in a control panel, the entire front section protrudes by approx. 35 mm from the control panel. The device is mounted from the outside in a prepared aperture in the control panel. The device can be secured to the control panel from the inside with the securing material provided.

Securing material for control panel installation:

- Item **(1)** 1x cellular rubber seal d3
- Item **(2)** 6x retaining bracket, galvanised steel
- Item **(3)** 6x PT self-tapping screw, galvanised

Procedure

Using the cut-out template provided, first mark the exact position of the device on the control panel. Where possible, it should be positioned at eye-level. Ensure sufficient space is left at the top to allow for the “park position”. Mark and drill the corners. Hole diameter 12 - 13 mm.

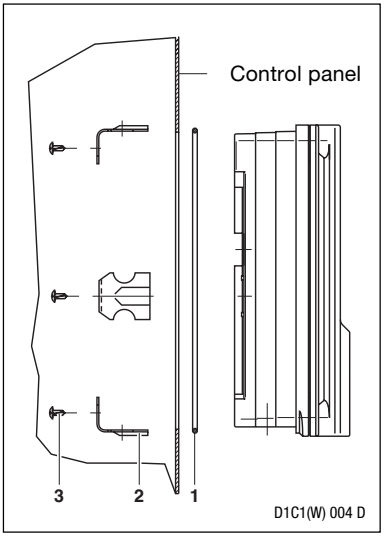
IMPORTANT

Dimensional deviations may occur as the result of photocopying the cut-out template.

Now make the aperture as specified in the drawing with the aid of a punch or compass saw. The control panel should be 2 - 3 mm thick. Before fitting the device in the aperture, evenly press the seal into the groove on the outside of the housing. With the aid of a second person if necessary, the controller can then be firmly secured with the retaining brackets and screws to the control panel.

Mounting with SN6 socket (depending on identity code)

Corresponding to the order, an SN6 input socket may be preassembled on the device. This socket must first be removed in order to facilitate installation in the control panel. For this purpose, open device as described under Point 5.3.



- ▶ By pressing the orange-coloured levers simultaneously, disconnect connection cable from terminals No. 11 and 12.
- ▶ Unscrew SN 6 socket (WAF 22) complete with O-ring.
- ▶ After installing the controller in the control panel, the SN6 socket can be re-fitted together with the coaxial cable and O-ring.

IMPORTANT

Ensure the O-ring is fitted correctly!

- ▶ Reconnect cable to terminals 11 and 12.

5.3 Electrical installation

WARNING

- ***Electrical connection must not be carried out before the device has been installed in the control panel!***
- ***The supply voltage must be disconnected when removing the device together with the connection lines!***
- ***Generally, the device may only be opened by qualified personnel.***
- ***Particular care must be taken before opening the device for the purpose of possible service work to ensure that no voltage is applied to the device and the voltage supply cannot be switched on while carrying out service work.***

IMPORTANT

Tie together stranded wires with cable ties at a distance of 30 mm from the terminals! If they work loose in the event of a defect, stranded wires carrying mains voltage must be prevented from coming in contact with low voltage terminals!

5.3.1 Electrical installation D1C D (control panel installation)

Terminals are provided at the rear of the device to facilitate electrical connection. The number and type of terminals depend on the type of device.

Not all devices are equipped with terminal row X1 (left).

Among other things, terminal row X2 (centre) serves the purpose of connecting the measured variable. The measured variables pH and redox can be connected directly to the terminals with SN6 connectors or, as other measured variables, via a mA signal. The jumper must be connected at terminals 9 and 10 of terminal row X2 if pH or redox probes are connected to SN6 connectors or to the terminal without connection of equipotential bonding!

Terminals rows XR1, XR2 and XR3 (right) serve the purpose of connecting power relays. The mains power connection XP is located at the bottom right. An earthing cable is not necessary.

The connectors XHK are provided for service purposes.

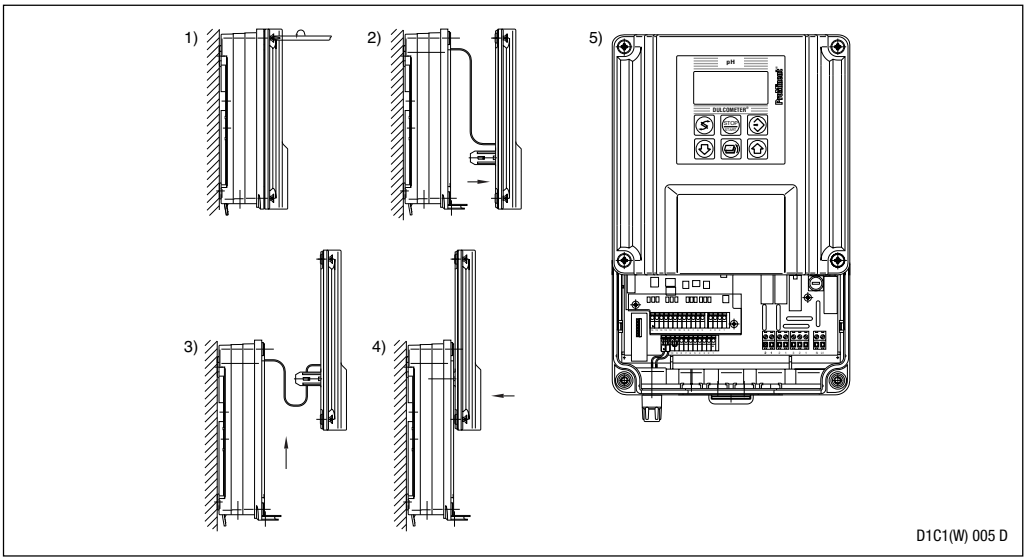
Refer to the terminal connection diagrams for the connection terminals (see Page 42-53).

5.3.2 Electrical installation D1C W (wall mounting)

Opening the housing

The device should only be opened when it is mounted on a wall or installed in a control panel.

- ▶ To open the housing, initially, the four captive countersunk screws must be released.
- ▶ The upper section is additionally locked to the bottom section by means of snap hooks. The housing can be opened by pulling the upper section forward thus releasing the snap hooks.
- ▶ With the aid of the two guide rails, the upper section can be moved to the approx. 100 mm higher “park position”. The fuse and all connection terminals are freely accessible in the park position.



Electrical installation for wall mounting

Initially, threaded holes must be broken out corresponding to the number of cables.

- Punch aids are provided to break out the individual threads.

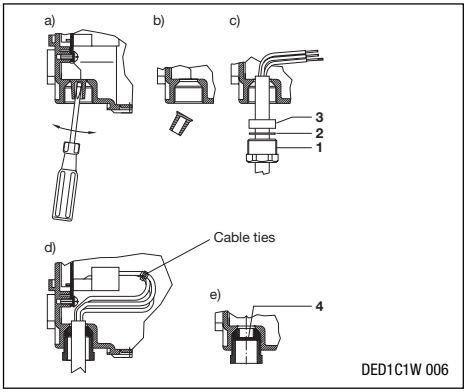


Fig. 1: Rear row

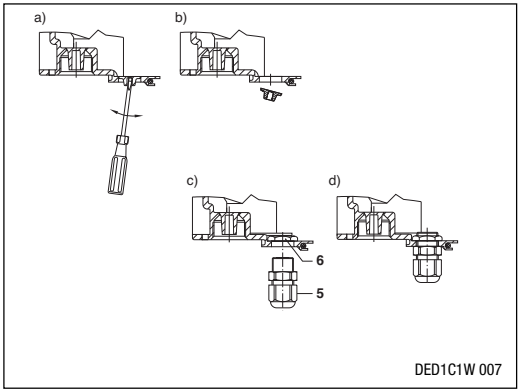


Fig. 2: Front row

- Use following tools to punch out holes:

Rear row (Fig. 1): Screwdriver DIN 5262-B, size 1 (Ø 4.5 mm)
Front row (Fig. 2): Screwdriver DIN 5262-B, size 0 (Ø 3.0 mm)

▶ Remove cable sheathing over a sufficient length (corresponding to length of terminals). Fit screwed gland **(1)**, thrust ring **(2)** and seal **(3)** over cable and insert in threaded hole.

▶ Screw in screwed gland and firmly tighten with WAF 19 spanner. Shorten stranded wires to the exact overall length, then strip approx. 7 mm insulation and connect to terminals corresponding to the electrical connection diagram.

▶ Core sleeves may be used for the stranded wires. If too many threaded holes are punched out, they can be closed off again with the dummy washers PG 11 **(4)** supplied with the device.

If the controller features an SN6 input (corresponding to identity code), the corresponding input socket is located in the rear row on the left side in a PG 11 threaded hole. Any ProMinent cable combination coax SN6 can be connected to this input.

Packing list, cable screwed glands

5x screwed gland	PG 11	Item **(1)**
5x thrust ring	PG 11	Item **(2)**
5x seal	PG 11 inside Ø 9 mm	Item **(3)**
3x seal	PG 11 inside Ø 7 mm	Item **(3)**
3x seal	PG 11 inside Ø 5 mm	Item **(3)**
2x seal	PG 11 inside Ø 4 mm	Item **(3)**
5x seal	PG 11 2 x Ø 5 mm	Item **(3)**
2x seal	PG 11 2 x Ø 4 mm	Item **(3)**
3x dummy washer	PG 11	Item **(4)**

Additionally for expansion version

4 Stck. 4x screwed gland	PG 7	Item **(5)**
4x lock nut	PG 7 brass, nickel-plated	Item **(6)**

The four additional cut-outs in the front row can be used for PG 7 screwed glands. All commercially available PG 7 screwed glands (suitable for type of enclosure IP65) with lock nut (brass, galvanised, nickel-plated) can be used as cable screw fittings.

Available from ProMinent under:

1x cable screwed gland PG 7, black	Part No. 703896
1x lock nut PG 7 brass, nickel-plated	Part No. 703819

▶ Fit lock nut PG 7 **(6)** on the inside and mount PG 7 screwed gland **(5)** from outside and firmly tighten (WAF 15).

Electrical connection for control panel installation

Normally, only the rear row of threaded holes should be used on devices mounted in a control panel. The front row (PG 7 cut-outs) are located outside the control panel. The cable screw fittings supplied with the device are not required for control panel installation. In this case, the individual stranded wires (without pull-relief and seal) are routed directly through the holes and connected to terminals corresponding to the electrical connection diagram. The holes are broken out as described above.

6 Technical Data

Temperature specifications D1C D	**Control panel installation**	**Wall mounting**
Permissible ambient temperature		
Basic version:	0 °C...50 °C	-5 °C...45 °C
Expansion version: with position feedback		
or with correction value via mA		
or with disturbance variable via mA	0 °C...45 °C	-5 °C...40 °C
D1C W		
Permissible ambient temperature		
Basic version:	-5 °C...50 °C	
Expansion version: with position feedback		
or with correction value via mA		
or with d isturbance variable via mA	-5 °C...40 °C	
Permissible storage temperature:	-10 °C...70 °C	

Material specifications / chemical resistance

Part	**Material**
Housing and frame D1C D	PPO GF 10
Housing D1C W	PPE GF 10
Rear panel D1C D	PPE GF 20
Membrane keypad	Polyester film PET
Seal	Cellular rubber CR
Inner seal, D1C D	Silicon-based sealing compound
Retaining bracket and screws	Galvanised, zinc-plated steel
M5 screws	A2

Chemical resistance:
The device is resistant to normal atmospheres in installation rooms.

Dimensions and weights

D1C D

96 x 96 mm in accordance with DIN 43700, depth 140 mm

Device weight without packing:	approx. 850 g
Gross weight of device with packing:	approx. 1200 g

D1C W

198 x 200 x 76 mm	(W x H x D) Wall mounting
198 x 200 x 35 mm	(W x H x D) Control panel installation, external
198 x 200 x 38 mm	(W x H x D) Control panel installation, internal

Device weight without packing:	approx. 1.2 kg
Net weight of device with packing:	approx. 2.0 kg

Electrical data

Probe input via terminals (X2.12 ... X2.9):

Input resistance:	$> 5 \times 10^{11}\ \Omega$
Input resistance of reference electrode with respect to chassis ground:	<1 kΩ
Input range:	±1 V
Accuracy:	±0.5 % of input range
Resolution:	0.0625 % of input range

Connection option for one equipotential bonding electrode (alternatively, two connection terminals are to be connected by a wire jumper).

Technical Data

Probe input via SN6 socket (X2.12 ... X2.9):	Input resistance:	10^{12} Ω
	Other data same as for “Probe input via terminals”	
Standard signal input (all measured variables) (X2.12 ... X2.9):	Input range:	0/4…20 mA (programmable)
	Input resistance:	50 Ω
	Accuracy:	0.5 % of input range
	Resolution:	0.014/0.012 mA
	Supply voltage and current for external electronics:	19 V ±1.5 V, 20 mA
Conductivity input via terminals (X2.12 ... X2.9):	2 electrode measuring cells via 2-conductors	
	2 electrode measuring cells via 4-conductors	
	4 electrode measuring cells via 4-conductors	
	Measuring range:	20, 200, 2000 μS/cm
		20, 200 μS/cm
	Measuring span:	1 : 100
	Cell constant:	0.006…12.0 cm^{-1} depending on measuring range
	Probe activation:	Sinusoidal 56 Hz or 2.7 kHz depending on measuring range
Pt 100 input (X2.8, X2.7):	Input range:	0 °C…100 °C
	Accuracy:	±0.5 °C
	Resolution:	0.1 °C
Frequency outputs (2 reed relays) for pump activation (X2.6, X2.5 and X2.4, X2.3):	Type of contact:	n/o contact noise-suppressed with Varistors
	Load capacity:	25 V peak, 0.100 A switching current
	Contact lifespan:	>50 x 10^6 switching operations at contact load 10 V, 10 mA
	Max. frequency:	8.33 Hz (500 strokes/min)
	Closing time:	100 ms
Standard signal output mA (X2.2, X2.1):	Galvanically isolated from remaining inputs and outputs	
	Insulation voltage:	500 V
	Output range:	0/4...20 mA (programmable)
	Max. load:	600 Ω current output 1
		400 Ω current output 2
	Accuracy:	0.5 % of output range referred to displayed value

Technical Data

Standard signal input for correction variable or disturbance variable mA (X1.16 ... X1.14):

Galvanically isolated from other inputs and outputs
Insulation voltage: 500 V
Input range: 0/4…20 mA (programmable)
Input resistance: 50 Ω
Accuracy: 0.5 % of input range
Resolution: 0.014/0.012 mA
Supply voltage and current for external electronics: 22 V ±1.5 V, 20 mA

Standard signal output mA (X1.13, X1.12):

Galvanically isolated from other inputs and outputs
Insulation voltage: 500 V
Output range: 0/4…20 mA (programmable)
Max. load: 600 Ω current output 1
400 Ω current output 2
Accuracy: 0.5 % of output range referred to displayed value

Digital input (X1.10, X1.9 and X1.7, X1.6):

Common reference potential and with RS interface but galvanically isolated from remaining inputs and outputs
Insulation voltage: 500 V
- Pause
- Disturbance variable up to 10 Hz or up to 500 Hz
(according to identity code/programmable)

Position feedback input (X1.3 ... X1.1):

Galvanically isolated from other inputs and outputs
Insulation voltage: 500 V
Potentiometer to be connected: 900 Ω...10 kΩ
Accuracy (not including potentiometer error): 1 % of input range
Resolution: 0.5 % of input range
Actuating time: min.: 25 s
max.: 180 s

Power relay output for controlled variable output (M, R) or limit value signalling (G) (XR1 and XR2):

Type of contact: Changeover contact, noise-suppressed with varistors
Load capacity: 250 V AC, 3 A, 700 VA
Contact lifespan: >20 x 10^6 switching operations

IMPORTANT

The supply voltage applied at relays XR1-XR3 must be identical to the supply voltage of XP.

Technical Data

Power relay output for alarm triggering (XR3):	Type of contact:	Changeover contact, noise-suppressed with varistors
	Load capacity:	250 V AC, 3 A, 700 VA
	Contact lifespan:	>20 x 10^6 switching operations

IMPORTANT

The supply voltage applied at relays XR1-XR3 must be identical to the supply voltage of XP.

Rated voltage (XP):	**100/200 V AC**, 50/60 Hz (D1C D only)
Maximum current intake:	150 mA at 100 V AC 75 mA at 200 V AC
Internal fuse protection with:	5 x 20 mm miniature fuse 160 mA, 250 V slow-blow
Rated voltage (XP):	**115/230 V AC**, 50/60 Hz
Maximum current intake:	140 mA at 115 V AC 70 mA at 230 V AC
Internal fuse protection with:	5 x 20 mm miniature fuse 160 mA, 250 V slow-blow
Rated voltage (XP):	**24 V DC or 24 V AC**, 50/60 Hz (operation with safety extra-low voltage only!)
Internal fuse protection with:	5 x 20 mm miniature fuse 315 mA, 250 V slow-blow

Maintenance / Repair

Safety information

WARNING

- ***The device or system must be disconnected from the power supply before starting any maintenance work. The DULCOMETER® D1C does not feature a separate power switch! The power supply must therefore be interrupted by means of an external master switch or by a main fuse. General safety regulations are applicable at all times!***

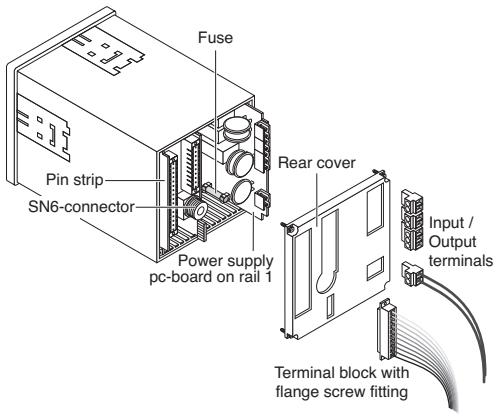
  Even when the voltage supply is switched off, mains power may still be applied at terminals XR 1-3!

- ***Only use fuses of the specified manufacturer!***
  Only use 5 x 20 mm miniature fuses!
  Fuse rating at mains voltage 100…240 V: 0.160 A slow-blow, Part No. 712048
  24 V: 0.315 A slow-blow, Part No. 712026

Fuse change D1C D:

The device can be opened from the rear. For this purpose:

- ▶ Release flange screw connections of plug-in terminal strips
- ▶ Unplug terminal strips together with electrical connections
- ▶ Release SN6 connector (if fitted) and unplug from socket
- ▶ Unscrew rear panel and remove; the captive screws are located on the rear cover
- ▶ The power board is located on the right-hand side (viewed from rear); pull out towards rear
- ▶ If necessary, remove fuse and replace by new fuse
- ▶ Take particular care when re-inserting the card to ensure that it is fitted in the same rail otherwise electrical connection to the display board will not be established
- ▶ Press card fully forward onto plug contacts
- ▶ Reinstall rear housing cover and firmly tighten
- ▶ Reconnect terminal strips with electrical lines to corresponding pin strips and firmly tighten.



Fuse change D1C W:

- The above-specified safety measures must be implemented (disconnection from mains!) before replacing the device fuse:

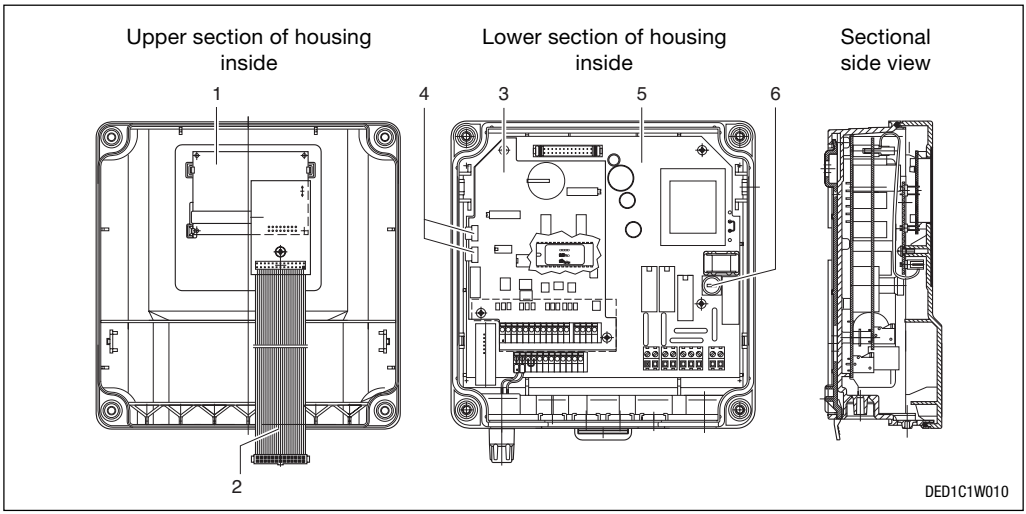
The mains power fuse is located in a closed fuse holder **(6)** in the terminal box.

▶ Open device and set in “park position”

▶ Release bayonet catches of fuse holder

▶ Remove fuse and replace by new fuse

▶ Lock bayonet catch and close housing



Item **(1)** Electrical assembly, display
Item **(2)** Ribbon cable
Item **(3)** Electrical assembly I/O/S
Item **(4)** Ribbon cable
Item **(5)** Electrical assembly, processor
Item **(6)** Fuse holder

8 Applicable Types of Enclosure / Standards

8.1 Electric shock and moisture protection (IP)

D1C D: Device in installed condition: Type of enclosure DIN 40050 - IP 54

D1C W: Device in sealed housing type of enclosure IP 65 in accordance with DIN VDE 0470 corresponding to EN 60529 and IEC 529
outer seal (control panel installation): type of enclosure IP 54 in accordance with DIN VDE 0470 corresponding to EN 60529 and IEC 529.

8.2 Electrical safety/interference suppression

EC low voltage guideline (73/23/EEC) consequently 93/44/EEC
EC EMC guideline (89/336/EEC) consequently 92/31/EEC being prepared
Supply voltage in accordance with DIN IEC 38
Electrical safety in accordance with EN 61010-1
Electromagnetic emitted interference in accordance with EN 55011 Gr. 1/Cl. B
Interference immunity in accordance with IEC 801-2, -3, -4 or DIN VDE 0843, Part 2, Part 3, Part 4 or EN 50082-2

EN 60335-1	Safety of electrical devices for household use
EN 50081-1	EMC, emitted interference, residential areas
EN 50082-2	EMC, emitted interference, industrial areas
EN 60555-2	EMC, reactions in power supply networks, harmonics
EN 60555-3	EMC, reactions in power supply networks, voltage fluctuations

8.3 Test in moist changeable climate

D1C D: Permissible relative humidity: max. 80 % (condensation not permitted)

WARNING

The device is not suitable for use in a moist changeable climate as there is no sealed housing and constant exchange of air!

D1C W: Moist changeable climate in accordance with FW DIN 50016.

9 Spare Parts / Accessories
10 Used Part Disposal

9 Spare Parts / Accessories

- Housing for wall mounting, including securing material, Order No. 790235
- Mounting kit for control unit installation, Order No. 792908
- Sensors, instrument leads, see product catalogue, chap. 6
- Measuring transducers, see product catalogue, chap. 5

10 Used Part Disposal

NOTE

Plastics and scrapped electronic components are special waste and must be recycled!

Used electronic components are accepted by municipal collection points set up by towns and municipal districts or ProMinent branches!

With the exception of the electrical assemblies, the design of the device comprised few mechanical parts. They are relatively easy to separate into specific materials; e.g. no metallic thread inserts were used in the housing. With the exception of the membrane keypad, these parts can be re-introduced to the material recycling system (see under Chap. 6 “Material Specifications”)!

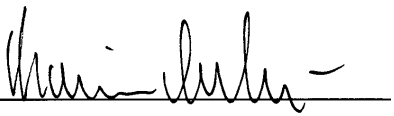
The membrane keypad is to be classified and disposed of in compliance with applicable municipal guidelines!

EC Declaration of Conformity

We,

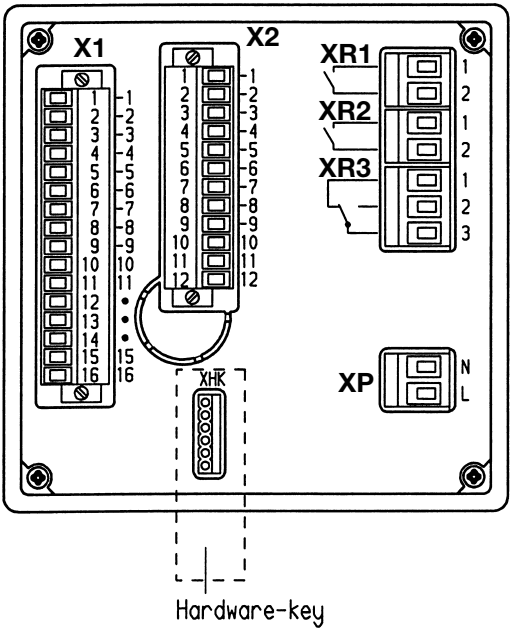
ProMinent Dosiertechnik GmbH
Im Schuhmachergewann 5 - 11
D - 69123 Heidelberg

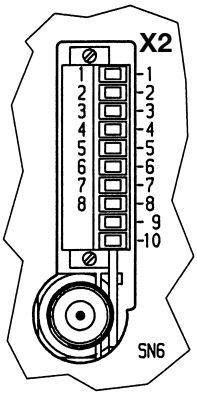
hereby declare that, on the basis of its functional concept and design and in the version brought into circulation by us, the product specified in the following complies with the relevant, fundamental safety and health stipulations laid down by EC directives.
Any modification to the product not approved by us will invalidate this declaration.

Product description :	***Measurement and control system, DULCOMETER***
Product type :	***D1C / D2C***
Serial number :	***see type identification plate on device***
Relevant EC regulations :	***EC - low voltage directive (73/23/EEC)*** ***EC - EMC - directive 89/336/EEC subsequently 92/31/EEC***
Harmonized standards used, in particular :	***EN 60335-1, EN 61010-1/2, EN 60204-1*** ***EN 50081-1/2, 50082-1, EN 55014-1/2*** ***EN 61000-3-2/3, EN 61000-6-2***
National standards and other technical specifications used, in particular :	
Date/manufacturer´s signature :	***11th December 2000*** 
The undersigned :	*Dr. Rainer V. Dulger, Executive Vice President R&D and Production*

Klemmenanordnung
Schalttafelgerät

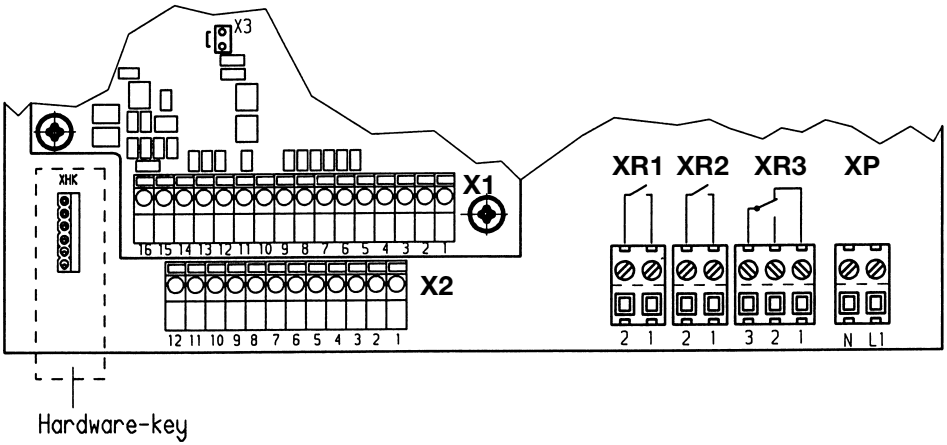
Terminal order
switchboard mounting





Klemmenanordnung Wandgerät

Terminal order
wall mounting



ACHTUNG

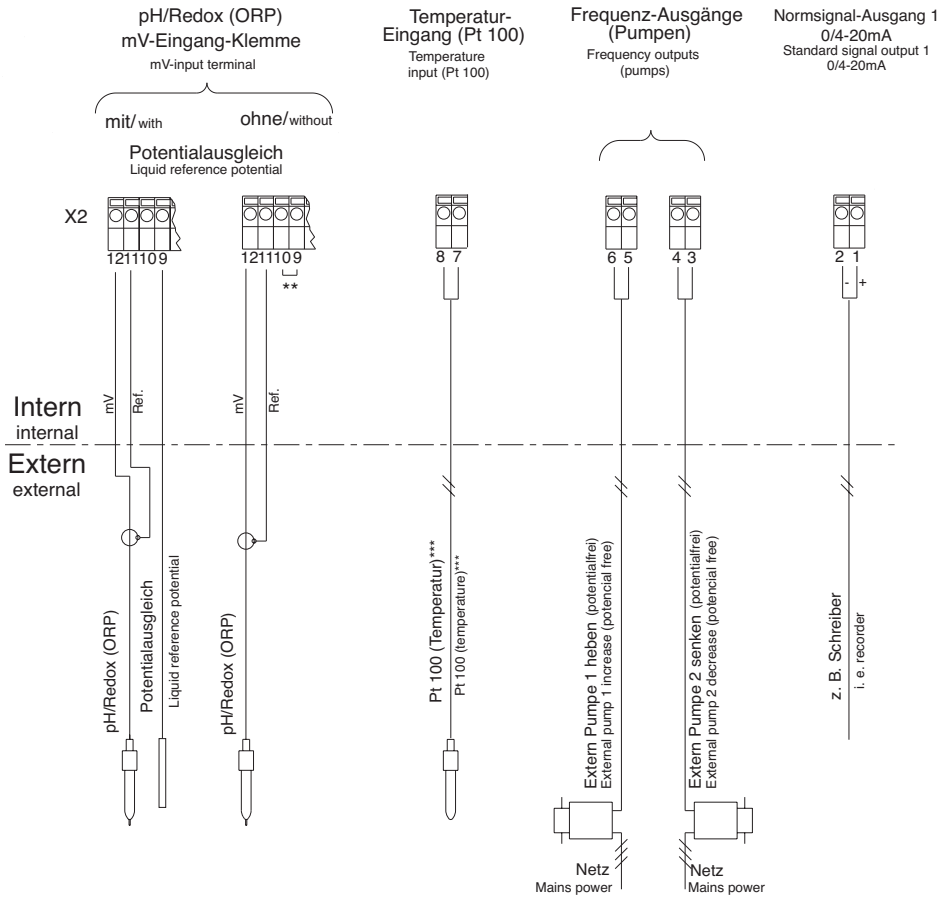
Nicht die Klemmenbezeichnungen von X2 und X1 verwechseln!

IMPORTANT

Do not confuse the terminal designations X2 and X1!

pH/Redox über Klemme / pH/ORP via terminals

Klemmenanschluss für pH / Redox über Klemme
Terminal connection for pH / ORP via terminals



**** ACHTUNG: Bei Anschluss der Sonde ohne Potenzialausgleich die Klemmen X2.9 u. X2.10 brücken.**

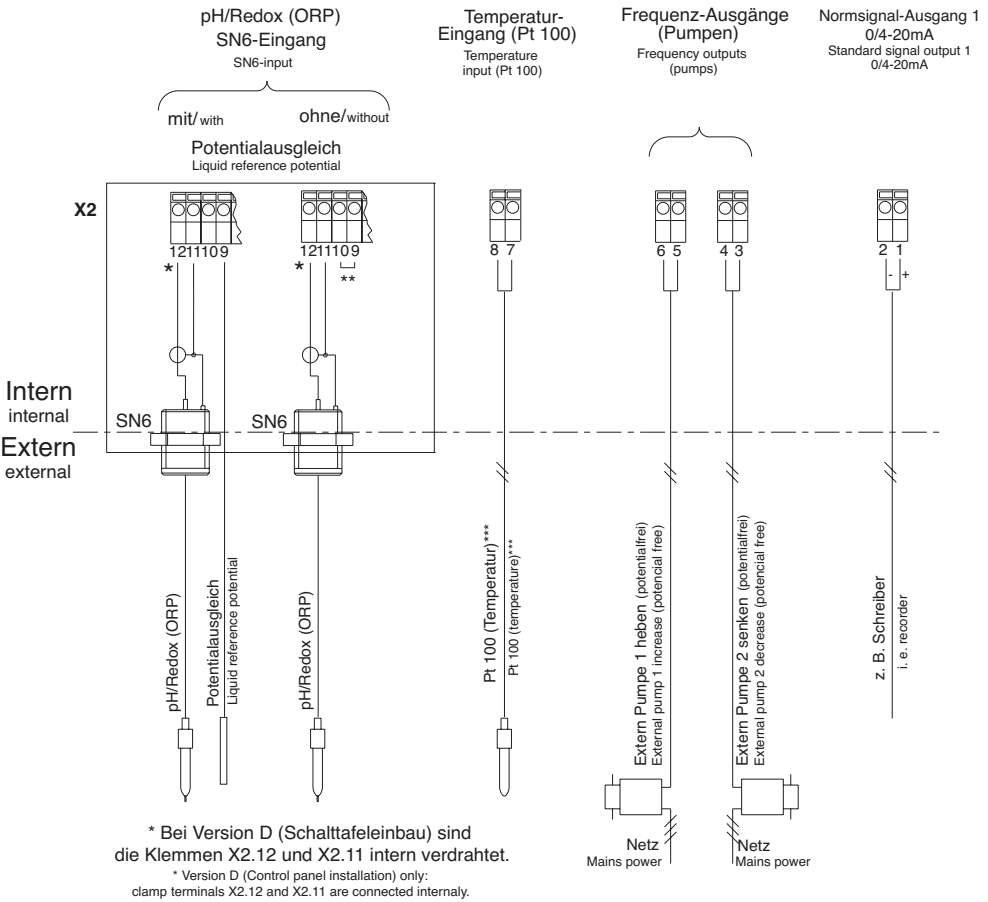
**** IMPORTANT: When connecting the electrode without liquid reference potential clamp terminal X2.9 and X2.10 have to be closed.**

*** Korrekturgröße für pH (vgl. auch S. 53)

*** Correction variable for pH (see also p. 53)

pH/Redox über SN6-Eingang / pH/ORP via SN6 socket

Klemmenanschluss für pH / Redox über SN6-Eingang
Terminal connection for pH / ORP via SN6 socket



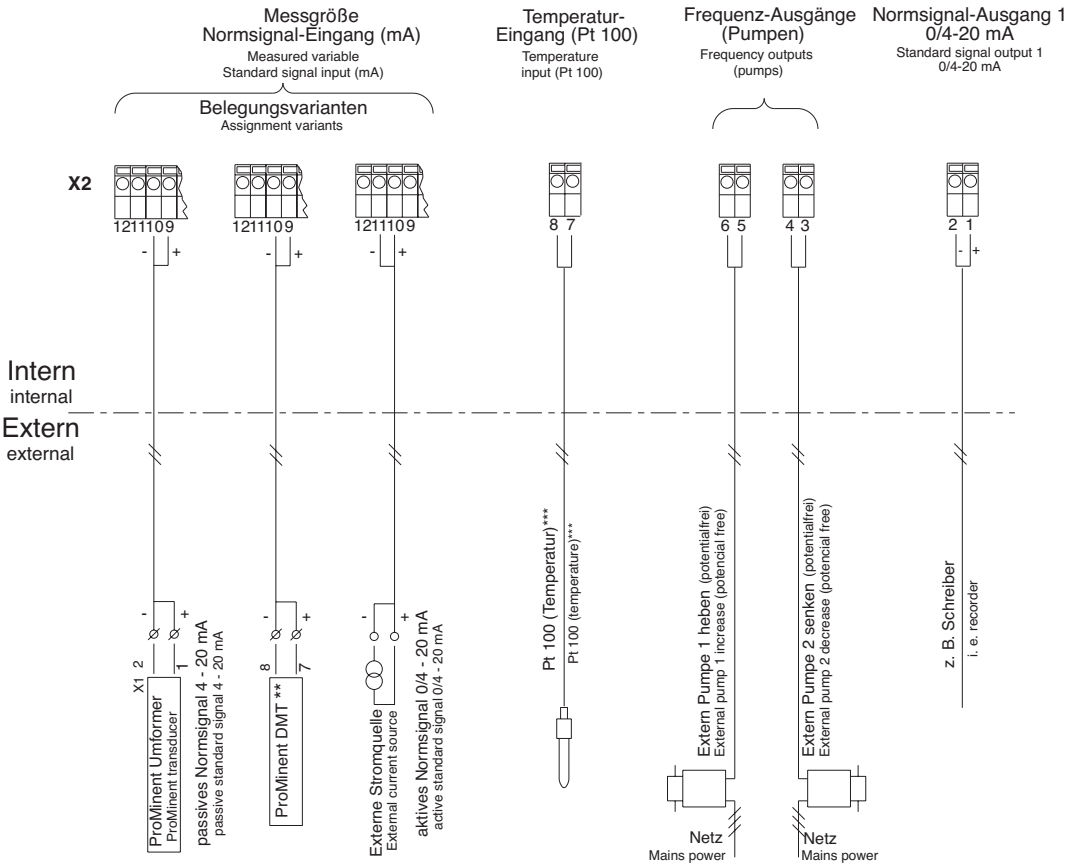
* Bei Version D (Schalttafeleinbau) sind die Klemmen X2.12 und X2.11 intern verdrahtet.
* Version D (Control panel installation) only: clamp terminals X2.12 and X2.11 are connected internaly.

**** ACHTUNG: Bei Anschluss der Sonde ohne Potenzialausgleich die Klemmen X2.9 und X2.10 brücken.**
**** IMPORTANT: When connecting the electrode without liquid reference potential clamp terminal X2.9 and X2.10 have to be closed.**

*** Korrekturgröße für pH (vgl. auch S. 53)
*** Correction variable for pH (see also p. 53)

F, Br_2, Cl_2, ClO_2, O_2, O_3, mA, mS/cm, pH*, Redox / ORP*, °C*

Klemmenanschluss für
Terminal connection for
F, Br_2, Cl_2, ClO_2, O_2, O_3, mA, mS/cm, pH*, Redox*, °C*



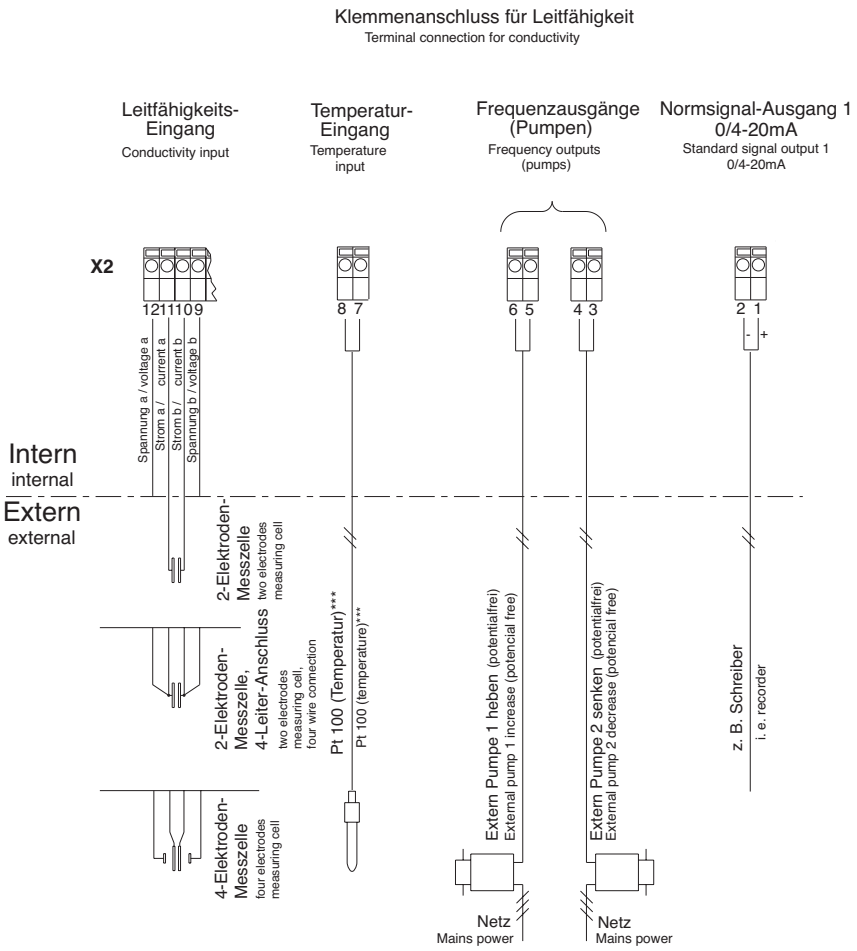
* Nur mit Umformer
* Only with transducer

** Siehe auch D1C, Teil 2 "Messbereich einstellen"
"Bereichzuordnung" und Betriebsanleitung DMT!

** See also D1C, part 2 "Measured value setting"-
"range adjustment" and operating instructions DMT!

*** Korrekturgröße für pH, ClO_2, mS/cm (vgl. auch S. 53)
***Correction variable for pH, ClO_2, mS/cm (see also p. 53)

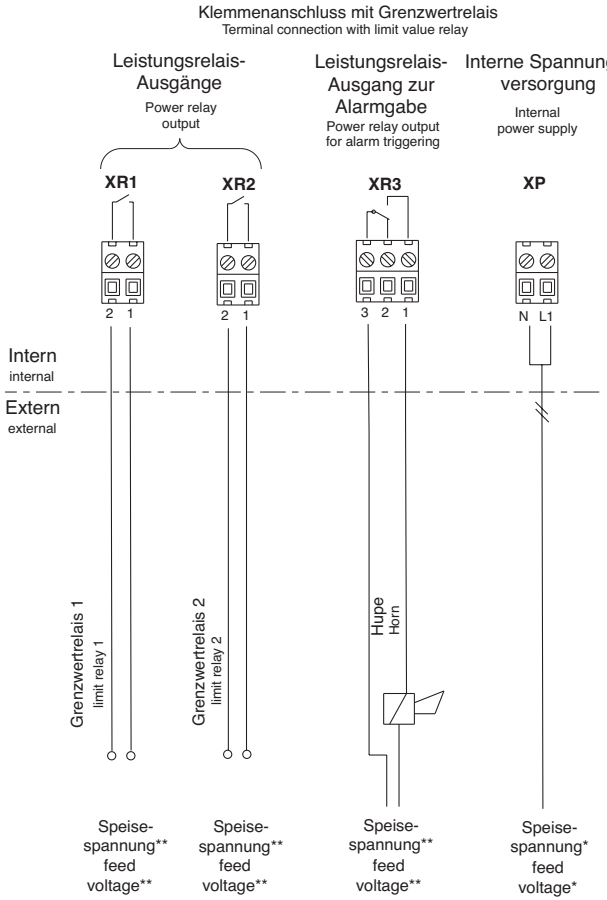
Leitfähigkeit / conductivity



*** Korrekturgröße für mS/cm (vgl. auch S. 53)

***Correction variable for mS/cm (see also p. 53)

mit Grenzwertrelais / with limit value relays



HINWEIS: zu Relais XR3: Das Gerät ist in betriebsbereitem Zustand und es steht kein Alarm an.

NOTE: to relay XR3: The device is shown ready and no alarm is present.

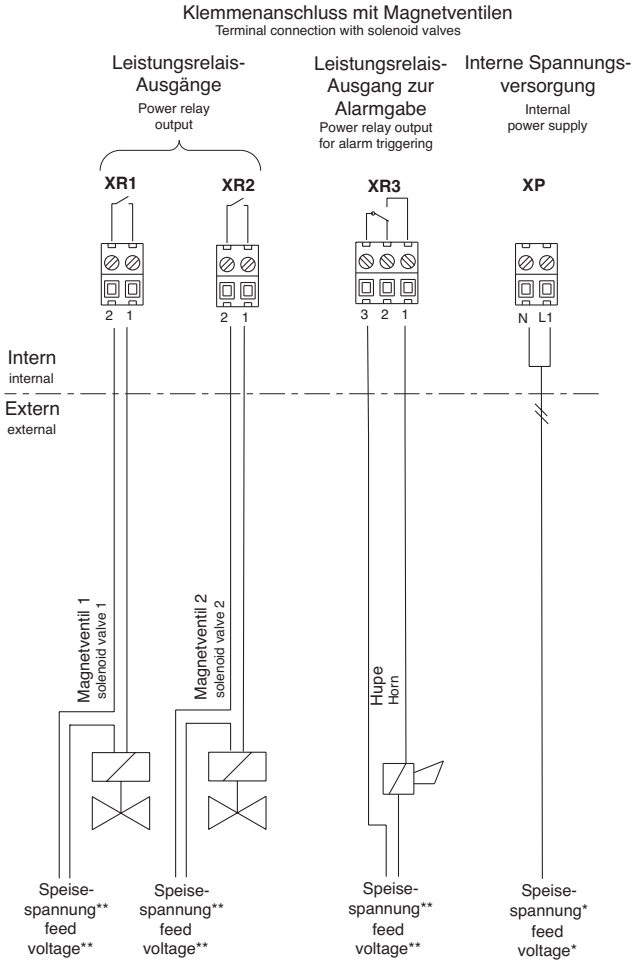
***** Bei 24 V DC ist die Polarität der Speisespannung ohne Bedeutung !

* With 24V DC polarity on feed voltage is not relevant !

**** ACHTUNG: Die Speisespannung, die an die Relais XR1 - XR3 gelegt wird, muss identisch mit der Speisespannung von XP sein!**

**** IMPORTANT: The feed voltage to be connected to the relays XR1 - XR3, has to be identically with the feed voltage of XP.**

mit Magnetventilen / with solenoid valves



HINWEIS: zu Relais XR3: Das Gerät ist in betriebsbereitem Zustand und es steht kein Alarm an.

NOTE: to relay XR3: The device is shown ready and no alarm is present.

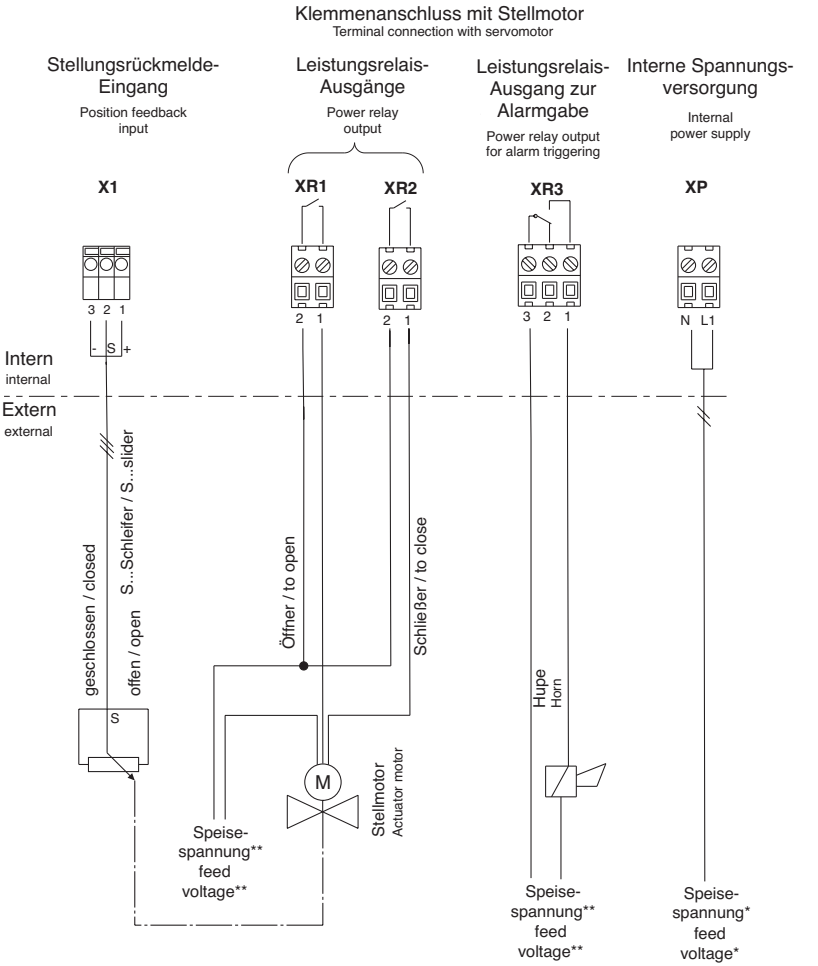
***** Bei 24 V DC ist die Polarität der Speisespannung ohne Bedeutung !

* With 24V DC polarity on feed voltage is not relevant !

**** ACHTUNG: Die Speisespannung, die an die Relais XR1 - XR3 gelegt wird, muss identisch mit der Speisespannung von XP sein!**

**** IMPORTANT: The feed voltage to be connected to the relays XR1 - XR3, has to be identically with the feed voltage of XP.**

mit Stellmotor / with servomotor



HINWEIS: zu Relais XR3: Das Gerät ist in betriebsbereitem Zustand und es steht kein Alarm an.

NOTE: to relay XR3: The device is shown ready and no alarm is present.

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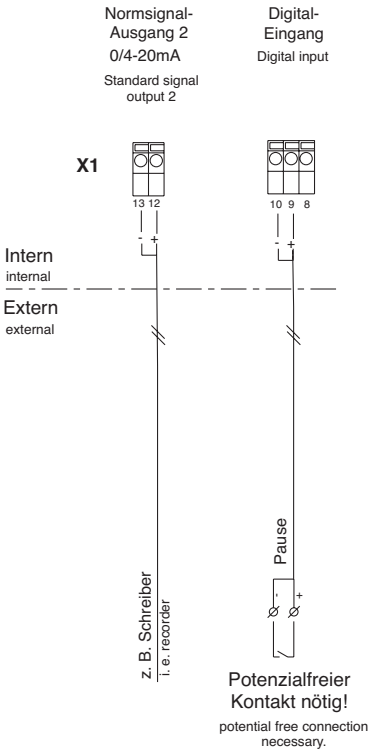
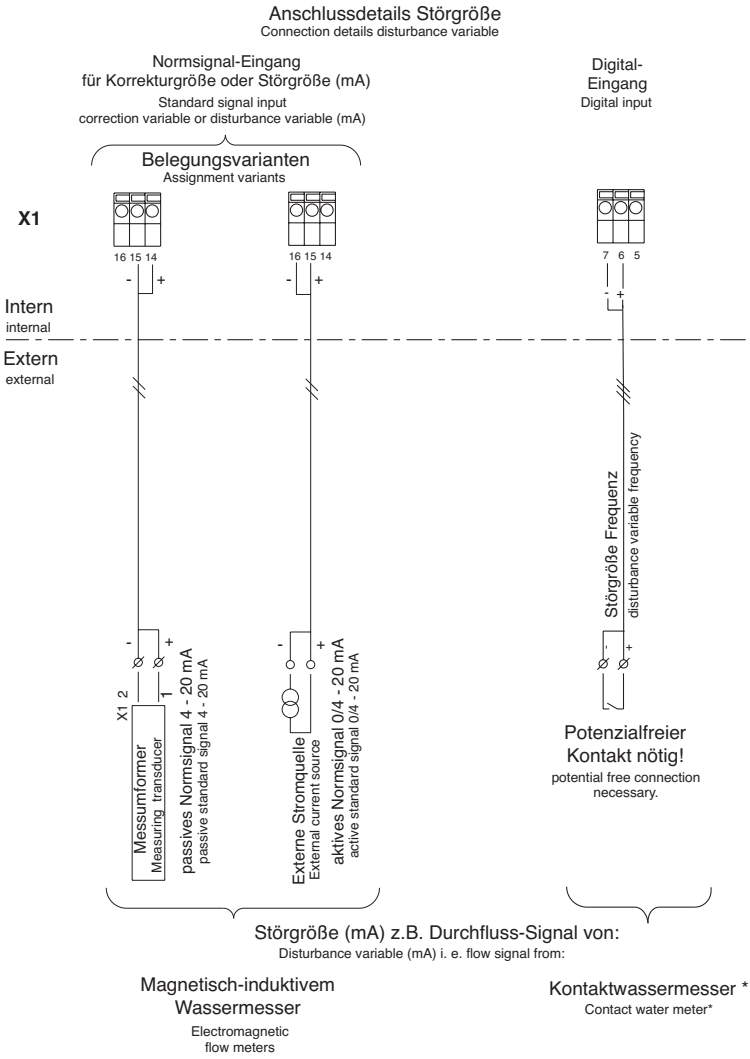
**** IMPORTANT: The feed voltage to be connected to the relays XR1 - XR3, has to be identically with the feed voltage of XP.**

mit Normsignal-Ausgang 2, mit Pause / with standard signal output 2, with pause

Anschlussdetails Normsignalausgang 2 / Digitaleingang Pause
Connection details Standard signal output 2 / Digital input pause



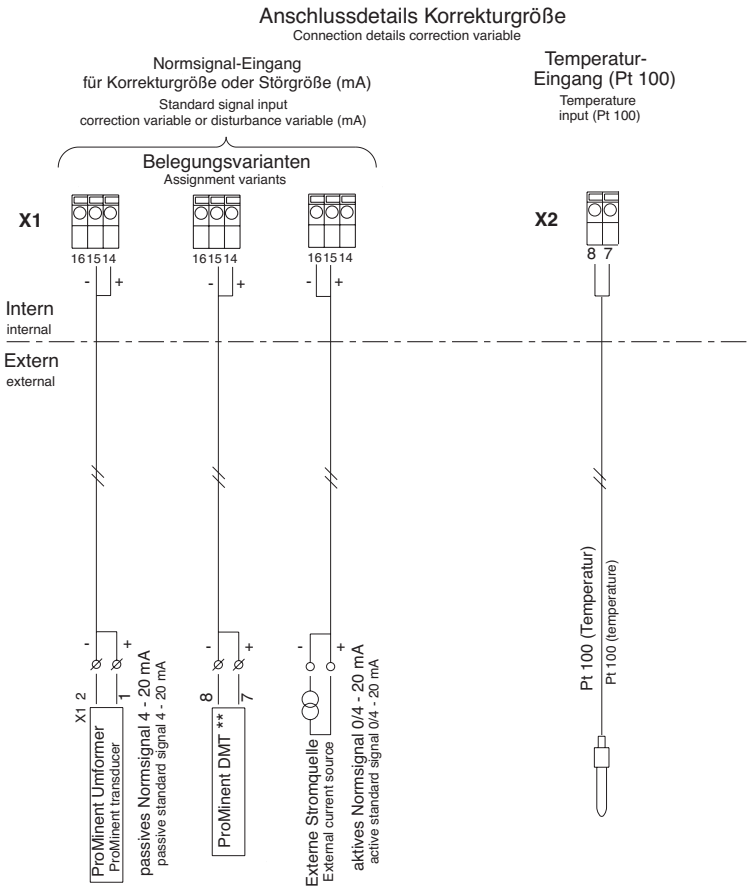
mit Störgröße / with disturbance variable



*** ACHTUNG: Maximalfrequenz beachten!**

*** IMPORTANT: Note maximum frequency.**

mit Korrekturgröße / with correction variable



** Siehe auch D1C, Teil 2 "Messbereich einstellen"
"Bereichzuordnung" und Betriebsanleitung DULCOMETER® DMT!

** See also D1C, part 2 "Measured value setting"-
"range adjustment" and operating instructions DULCOMETER® DMT!

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