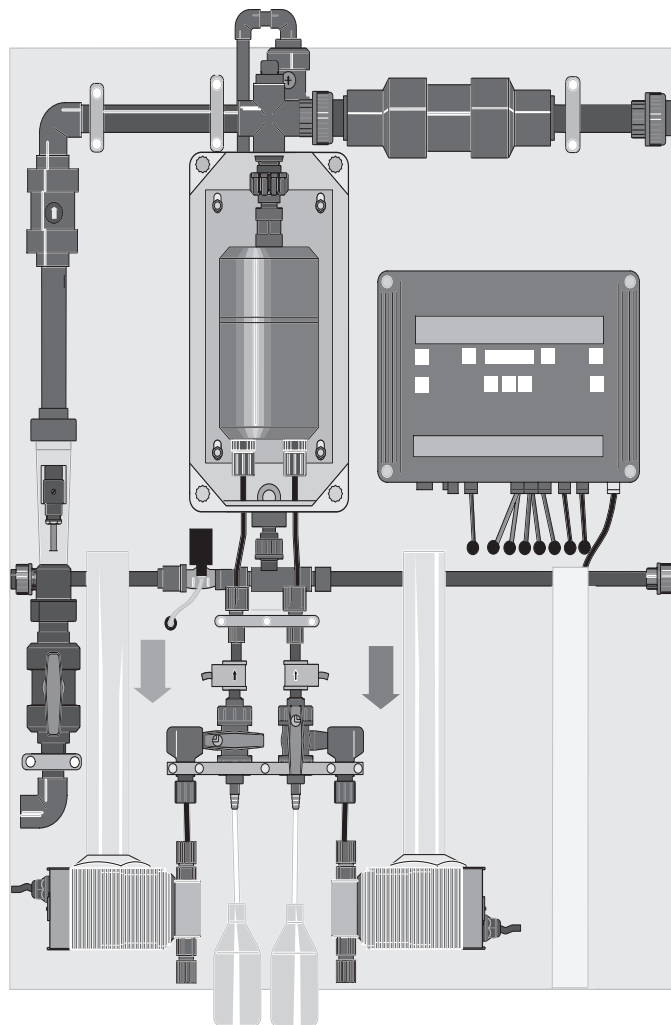


# Operating Instructions

## ProMinent Chlorine Dioxide Systems

### Bello Zon® Type CDVb

#### Part 1



CDVb

Please enter the system identity code here

**For safe and correct operation of the Bello Zon® system, Parts 1 and 2 of the Operating Instructions are required. They are both only valid when used together.**

**Please read all the operating instructions first. Please keep them for your information. The warranty becomes invalid if damage is incurred because of errors made during installation.**

**Publishing Details**

Operating Instructions  
Bello Zon® Type CDVb, Part 1  
© ProMinent Dosiertechnik GmbH, 2003

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For safe and correct operation of the Bello Zon® system, Parts 1 and 2 of the operating instructions are required.  
They are valid only when used together.

Please read all the operating instructions first. Please keep them for your information  
The warranty becomes invalid if damage is incurred because of errors made during installation.

### General User Instructions

Please read the following user instructions. If you are familiar with them you will make better use of the operating instructions.

In the text the following are emphasised in particular:

- lists
- working instructions

Instructions for operational procedures:

### NOTE

Notes should make your work easier.

Safety instructions are marked with pictograms:



### WARNING

Indicates a potentially dangerous situation. If you do not avoid this you could endanger your life or suffer serious injury as a result.



### CAUTION

Indicates a potentially dangerous situation. If you do not avoid this you could suffer slight or minor injury or material damage.



### IMPORTANT

Indicates a potentially dangerous or damaging situation. If you do not avoid this your property may be damaged as a consequence.

### Information for the operator

Contains information and quotations from the German guidelines for the operator's area of responsibility. They in no way relieve the operator of his/her responsibility, they only act as a reminder of certain problems or make the operator aware of these. They lay claim neither to completeness, nor to validity for each country and type of application, nor to being totally up to date.

The version number of the hardware and software is shown on the control unit display. The hardware version is shown before the oblique stroke and the software after, e.g. 02 / 3.13). When making complaints or additions to the Bello Zon® system, please quote the version number as well as the identity code.

## 1 Storage and transportation

The Bello Zon® CDV Chlorine dioxide equipment is always delivered in wooden packaging. Before storage or transportation the Chlorine dioxide system must always be emptied.

Environmental conditions for storage and transportation:

Temperature: -10 °C to +40 °C  
 Humidity: < 92 % relative air humidity, non-condensing  
 Miscellaneous: protect from sunlight

In addition to the identity code options the delivery also includes:

- a flushing device (see Section 4.1.6)
- a venting valve for the main water line or bypass
- the Accessories and Spare Parts Kit (mounting material and PG threaded connectors)
- labels for suction lances/suction assembly sets
- warning labels (see Section 3)

Weight of despatched items (without packaging)

Bypass design / system type		CDV 15...60	CDV 120	CDV 220	CDV 600	CDV 2000
Bypass without pre-mixing and without bypass monitoring	kg	18	19.2	55	57	125
Bypass with pre-mixing and without bypass monitoring	kg	20	21.2	57.4	67	138.5
Bypass without pre-mixing and with bypass monitoring	kg	19	20.2	56.5	58	127
Bypass with pre-mixing and with bypass monitoring	kg	21	22.2	58.9	68	140.5
Bypass with pre-mixing and with bypass monitoring and with stainless steel bypass pump	kg	41.3	42.5	79.2	94.3	172.3
Bypass pump	kg	18.5	18.5	18.5	24.5	30
Wall bracket bypass pump	kg	1.8	1.8	1.8	1.8	1.8

## 2 Requirements of the Installation Location



### WARNING

**Please observe national and local regulations.  
 The system operator is responsible for adhering to these regulations.**

Requirements of the installation location:

- The Chlorine dioxide system must not be installed in the open air.
- The Chlorine dioxide system must be secure against unauthorised access.
- The location of the Chlorine dioxide system must offer protection against the sun, frost and be well ventilated.
- Where the room temperature is below 10 °C, heated cladding must be used if possible.
- There must be unobstructed access when bringing component containers to the system.
- An escape route must be provided.
- An even, vertical wall must be provided for the installation of the Bello Zon® system.
- A water tap must be provided.
- A ground waste pipe must be provided.
- A mains connection is required.

### Information for the operator

Below are listed some points regarding these regulations which are applicable in Germany:

- the Accident Prevention Regulation "Chlorination of Water", Regulation 8.15, April 1979 (being revised)
- "Dosing Systems for Chlorine Dioxide", DVGW Information Sheet W 624, DVGW e.V, Eschborn, 10/1996
- "Chlorine Dioxide in Water Treatment", DVGW Worksheet W 224, DVGW e.V, Eschborn, 04/1986, ISSN 0176-3504
- the guidelines for the protection of raw water against impurities (§ 19 Water Conservation Law – WHG, version of 23.9.1986)
- the Dangerous Substances Regulation, in particular § 17 (General Protection Obligation) and § 20 (Operating Instructions see also the Accident Prevention Regulation § 9).

These regulations require that:

- a) The site of installation must offer **protection against frost** and it must be **possible to lock** the room. There must be a **ventilation system** available.  
(Note: The room temperature must not fall below 10 °C otherwise the formation of the chlorine dioxide becomes too slow.)
- b) The site must not be a **work room**, where people are always present.

Except in cases where:

- *the system is necessary for the process taking place there and*
  - *only the quantities of chemicals necessary for work progress are present and*
  - *the system and the chemicals are protected against unauthorised access.*
- c) The room must be separated from other rooms by a **fire-retardant** partition (danger of spontaneous combustion from dried sodium chlorite solution, NaClO<sub>2</sub>).

With the exception of:

- *only dilute sodium chlorite solution (7.5 %) is used and*
  - *there are only small quantities of sodium chlorite solution in the equipment and*
  - *the chemicals are held in bunds.*
- d) In order to remove spillage of chemicals safely, a mains water supply with a **water tap** and **drainage** should be provided in the installation room. Chemical spills should be washed away immediately with water.



### WARNING

► **Chemicals must never be allowed to run together.**

- e) There should be provision of **an escape route**.
- f) The installation room should be **marked** as such.  
(Note: see Section 3 "Installation")
- g) **Mobile chlorine dioxide systems** must not be installed in locked rooms, if they are protected appropriately from access by unauthorised persons.
- h) The chlorine dioxide system must not be installed **in the open air**.

### 3 Assembly



#### IMPORTANT

**The system must be easily accessible for maintenance and servicing.**

The accessories set supplied with the equipment contains the necessary bolts, rawlplugs, washers, as well as nuts (accessory set = bag with PG threaded connectors etc.)

- ▶ The Bello Zon® system should be fixed to a suitable, even and vertical wall as near as possible to the point of injection (for measurement specification sheets, see Appendix)
- ▶ The height of the installed equipment should be such that:
  - the LCD control unit display can be easily read
  - there is enough room for the component containers under the bracket
  - the fluid level of the full component containers is under the dosing pumps (see measurement specification sheets for the container height for Bello Zon®-components)
  - the maximum priming lift of the dosing pumps is not exceeded.

Maximum priming lift of the dosing pumps in m WG:

CDVb	15	35	60	120	220	600	2000
	1.8	2.2	2.5	3	3	3	3

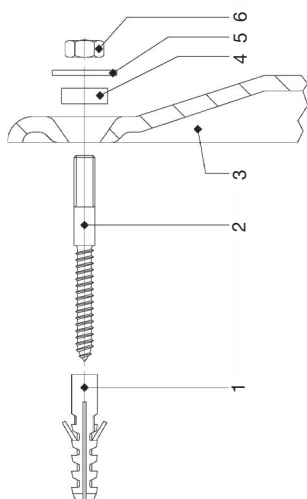


Fig. 1: Bracket attachment  
CDV 15-120

- 1 Dowel
- 2 Screw
- 3 Bracket
- 4 Washer (plastic)
- 5 Washer
- 6 Hexagonal nut
- 7 Protective cap

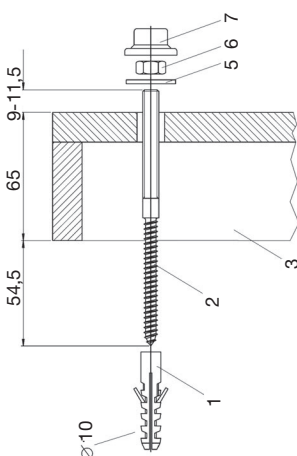


Fig. 2: Bracket attachment  
CDV 220-2000

**Chlorine dioxide systems**  
**Entry for authorised**  
**persons only**



These two signs should be placed together **at the entrances** to rooms in which the Bello Zon® chlorite component is stored or used:

**Sodium chlorite**  
**NaClO<sub>2</sub>**



Put this sign **in rooms**, where Sodium chlorite (Bello Zon® chlorite) is handled:

These are storage and decanting areas for the chemical tanks, which are connected to the Bello Zon® systems.

**Containers and equipment should not**  
**be interchanged**

**Sodium chlorite + acid =**  
**highly poisonous Chlorine dioxide gas**

**HIGHLY DANGEROUS**

## 4 Installation



### IMPORTANT

Please observe national and local regulations.

### 4.1 Hydraulic installation



### WARNING

- Only use PVC pipes for the bypass line.  
Chlorine dioxide is very harmful to other materials. Danger of fracture.  
Poisonous chlorine dioxide fumes can escape.
- Only use PVC pipes with PN 16 (bar) for the bypass line.
- The bypass line of the Bello Zon® system should not be subjected to negative pressure. Otherwise this could result in an uncontrolled extraction of chemicals. Strong negative pressure and the simultaneous formation of gas/water mixture phases can result in chlorine dioxide gas emission. In unfavourable circumstances the critical gas concentration of 300 g/m³ may be exceeded and there could be an explosion in the bypass line.

The following components should essentially be installed hydraulically:

- Bypass line
- Flow generator unit for bypass line
- Point of injection
- Mixer (if available)
- Flushing device
- Suction lances / suction assemblies
- Water supply suction device

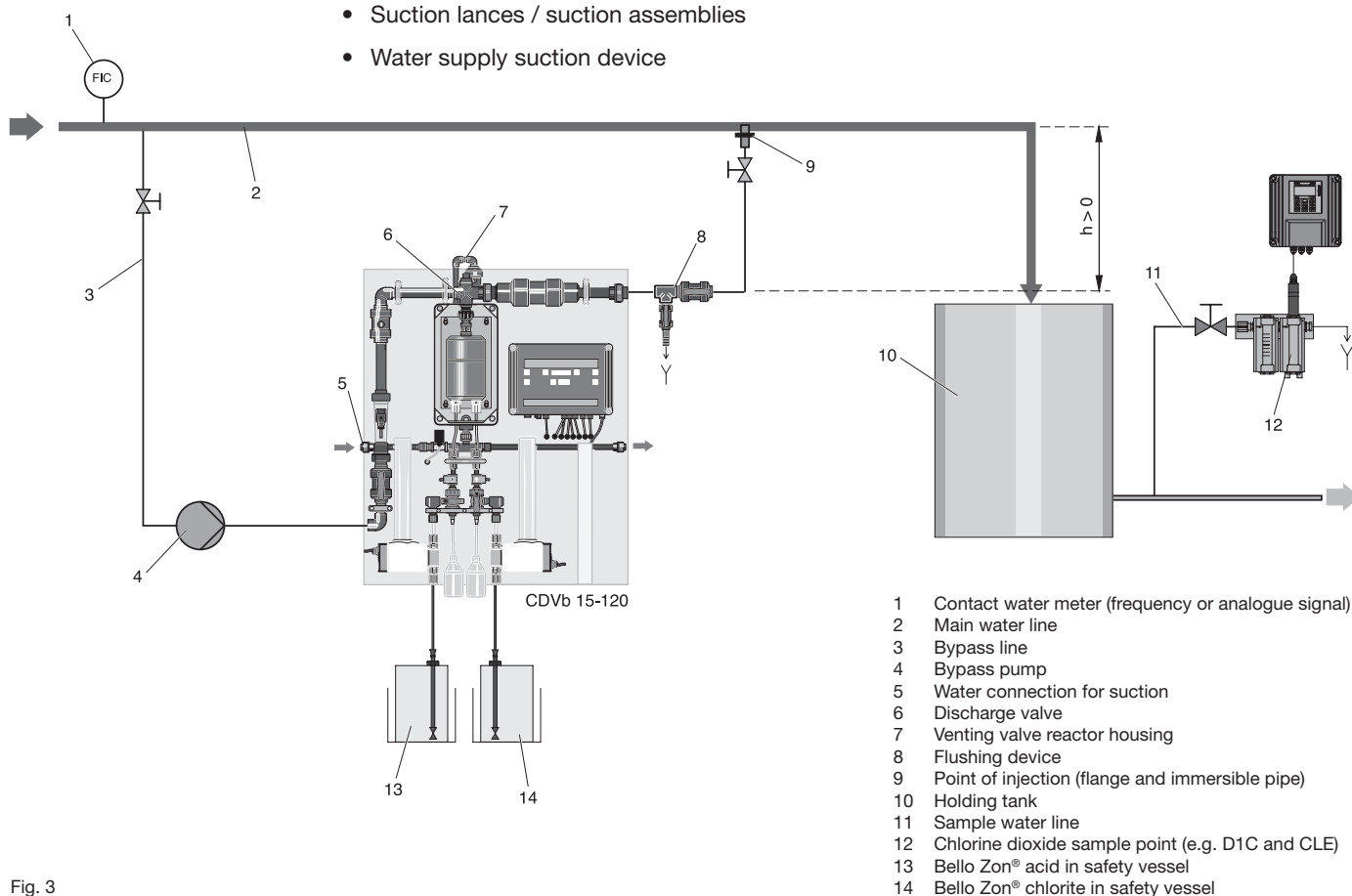


Fig. 3



#### 4.1.1 Bypass line

The bypass line is either fed from the main water line or supplied separately. The purpose of the bypass line is to dilute the chlorine dioxide concentration of the chlorine dioxide solution from the reactor from approximately 20 g/l (= 20,000 ppm) to approximately 0.1-0.2 g/l (= 100-200 ppm) and to transport this solution to the point of injection.



##### **WARNING**

- Only use PVC pipes for the bypass line.  
Chlorine dioxide seriously damages other materials. Danger of fracture. Poisonous chlorine dioxide fumes can escape
- Only use PVC pipes with PN 16 (bar) for the bypass line.
- The maximum permitted system operating pressure of 8 bar must not be exceeded. There should be no pressure surges.
- Check that all the threaded connectors of the bypass line are properly screwed on to the bracket. Some threaded connectors are removed in the factory for transportation.
- There must not be any particles of dirt in the bypass water. They could block a flowmeter or a subsequently installed mixer.

#### 4.1.2 Safety devices for the bypass line



##### **WARNING**

- The bypass line must be installed such that negative pressure can never arise either when inactive or in the event of a defect. Otherwise the reactor could explode if the chlorine dioxide solution in the reactor is subjected to negative pressure.
- The bypass line flow must be monitored so that dosing can be turned off if there is no water flow. As a rule the bypass flow is monitored using the flowmeter on the Bello Zon® system and the control unit.
- For CDV systems without bypass monitoring, the operator must ensure that during dosing of chlorine dioxide there is always a sufficient flow through the bypass. Otherwise an unacceptably high concentration of chlorine dioxide can build up in the bypass line. In the event that the bypass line is not completely filled with water, a critical gas phase can form and cause an explosion in the bypass line. E.g. use a flowmeter with minimum contact.

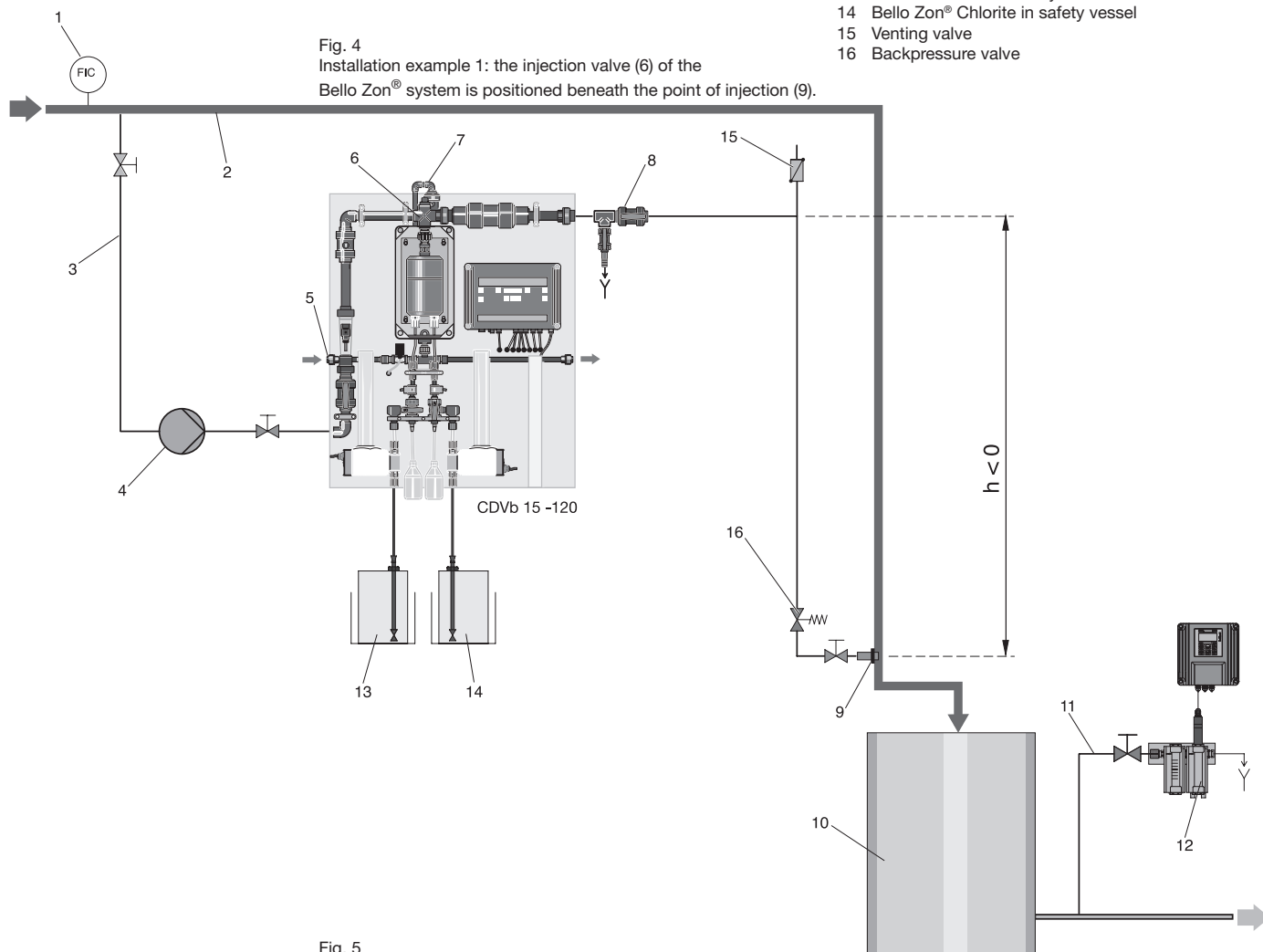
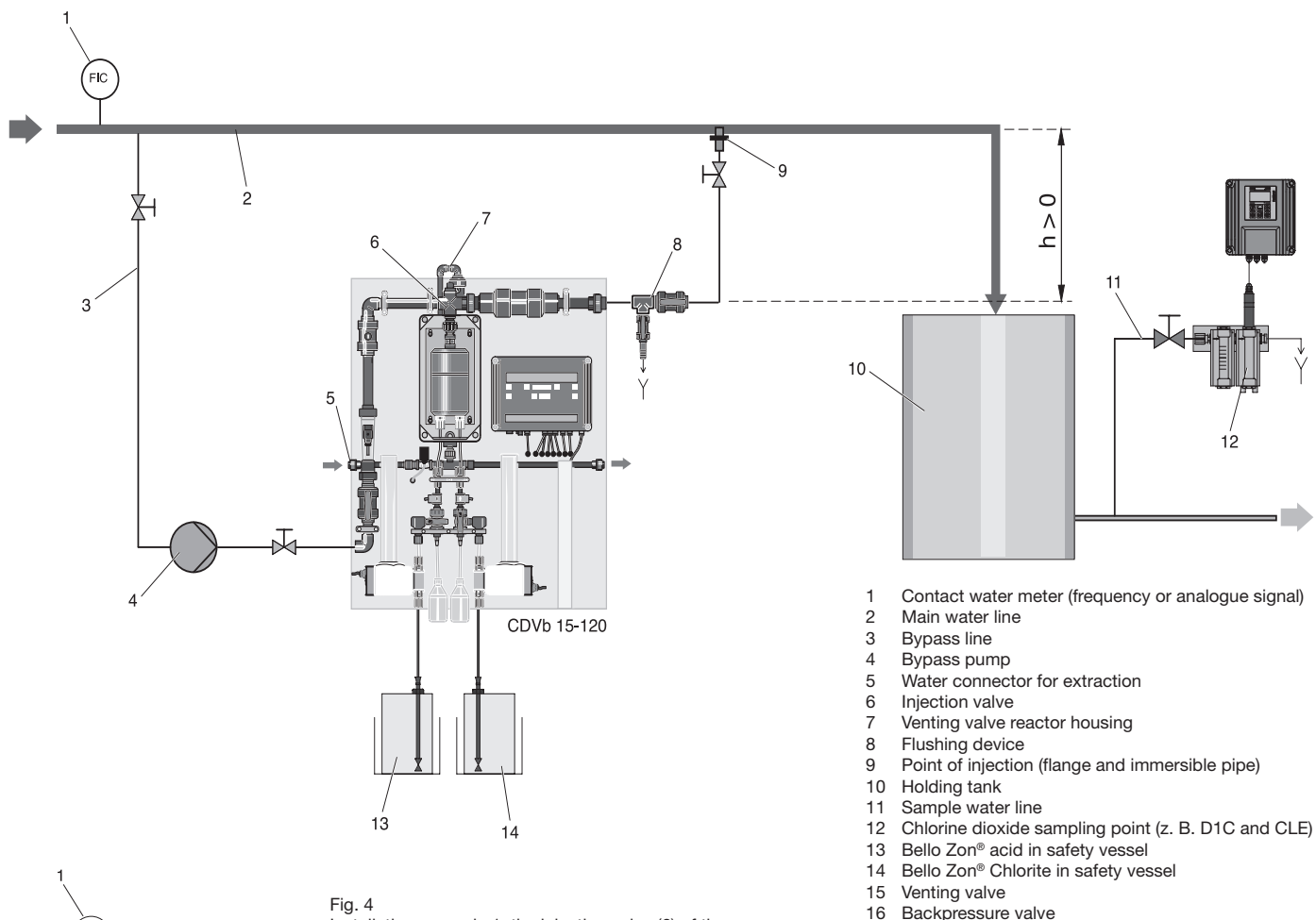
Max. operating pressure: 8 bar

Type	Bypass line	Diameter (mm)
CDVb 15 - CDVb 600	DN 25	32
CDVb 2000	DN 40	50

There is a particular danger of negative pressure primarily whenever:

- in the main water line (with a large diameter) there is a reversal in flow direction (non-return valves are never 100 % watertight).
- the main water line drains away beneath the injection valve of the Bello Zon® system,
- the bypass line is very long, particularly when this drains away below, i.e. the injection valve of Bello Zon® system is situated above the point of injection ( $h = \text{negative}$ , see Fig. 5).

Depending on the application and the conditions at the installation site, the chlorine dioxide system must have the full complement of safety accessories.



If in any doubt fit the bypass line with

- a backpressure valve at the end of the bypass line, shortly before the point of injection (opening pressure > 1.5 bar) (see Fig. 5, no. 16). Use a design which is not affected by backpressure, so that functioning is maintained even with increased backpressure.
- a venting valve on the highest point of the bypass line (see Fig. 5, No. 15 in the delivery, order no: 1001260).

#### 4.1.3 Flow generator for the bypass line

In order to generate flow in the bypass line, the following may be installed as an alternative:

- a flow regulator into the main water line (e.g. slide valve, spring-loaded or weighted non-return valve)
- a bypass water pump into the bypass line in front of the Bello Zon® system (in so doing the bypass pump can be locked using the control unit of the Bello Zon® system ).

When installing a bypass pump it is recommended that a slanted seat valve be fitted (order No. 1001877) at the mouth of the Bello Zon® system.

#### 4.1.4 Point of injection

Fit an "immersible pipe" at the point of injection in the main water line (to minimise corrosion):

- |   |                   |
|---|-------------------|
| • up to nominal width DN 80 of the main water line                  | Order no. 1001823 |
| • up to nominal width DN 80 of the main water line, with ball valve | Order no. 1018754 |
| • from nominal width DN 100 of the main water line                  | Order no. 1001822 |
| • from nominal width DN 100 of the main water line, with ball valve | Order no. 1018753 |

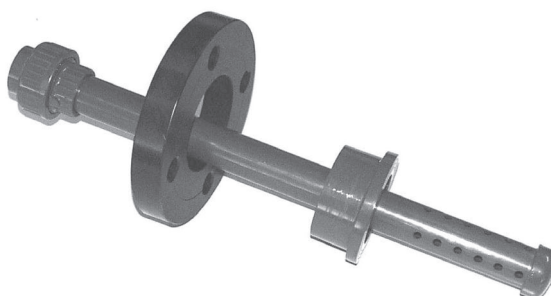


Fig. 6

With bottle cleaning machines, the bypass line is normally fed back directly into the cold water zone tank. A discharge valve should be fitted on to the tank connection:

- |  |                  |
|--|------------------|
| • Discharge valve  | Order no. 803713 |
| • Cold water tank connection: 1" external thread; union nut, stainless steel | Order no. 805273 |
| • Insert   | Order no. 805288 |

#### 4.1.5 Mixer



#### WARNING

**With negative pressure in the bypass line and simultaneous formation of gas/water mixture phases, chlorine dioxide gas emission can occur. In unfavourable circumstances the critical gas concentration of 300 g/m³ may be exceeded and there could be an explosion in the mixer.**

- ▶ The outlet tube of the mixer should therefore be positioned ascending up to the point of injection (9) as shown in Fig. 4.
- ▶ If the outlet tube to the point of injection needs to be a descending position, then the formation of negative pressure has to be avoided by fitting a venting valve (cf. Fig. 5, no. 15).

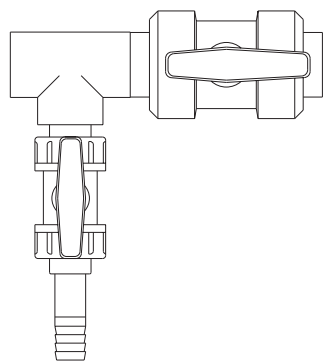


Fig. 7

For recirculation systems, there is usually no need for a premixer in the bypass line. For all "once-through systems", a premixer in the bypass line is necessary (particularly if no reservoir is connected in the main water line as a holding tank). In order to achieve homogenous mixing, if need be install an additional mixer in the main water line. System types CDVb 15 to CDVb 120 can be supplied with a pre-fitted mixer on the bracket (according to the relevant identity code version).

### 4.1.6 Flushing device

The flushing device, which is also supplied must be fitted into the bypass line behind the Bello Zon® system to enable the reactor to be emptied for maintenance work. (see Figs. 7, 4 and 5).

Exception:

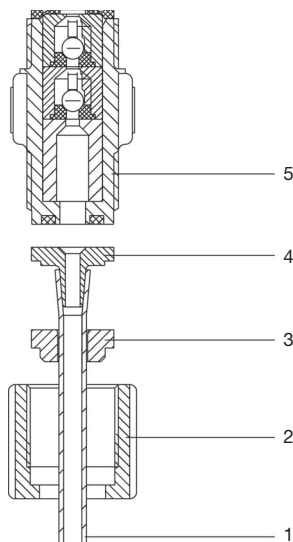
The flushing device need not be installed if large quantities of chlorine dioxide solution can be metered from the reactor into the whole system without the concentration there being increased beyond the desired levels.

### 4.1.7 Suction lances/suction assemblies



#### IMPORTANT

- Only use 2-stage suction lances.
  - Only use suitable hoses and connection sets.
  - Ensure that the correct parts for the acid side and the chlorite side are used.
- ▶ The suction lances should not be put into the component containers at this stage.
  - ▶ Adjust the length of each suction lance (later the foot valve must float just above the bottom in the container )
  - ▶ Please stick the labels "acid" and "chlorite" (included in the delivery) on to the heads of the suction lances or suction tubes ("acid", is red and on the left and "chlorite" is blue and on the right) so they are clearly visible
  - ▶ Adjust the suction tubes so that later they are always ascending and tension free
  - ▶ Pull the union nut and the clamp ring over the suction hose (see Fig. 8)
  - ▶ Push the end of the hose as far as it will go over the socket
  - ▶ Attach the socket to the suction valve of the pump
  - ▶ Press the suction hose on to the socket and tighten the union nut
  - ▶ Give the suction hose a quick pull and tighten the union nut again.



- 1 Suction hose
- 2 Union nut
- 3 Compression ring
- 4 Hose socket
- 5 Suction valve pump

Fig. 8

### 4.1.8 Water supply suction device

For safety reasons the air in the reactor cabinet is regularly extracted using a suction device (consisting of injector and solenoid valve).



#### WARNING

- The line must always conduct water – even when the system is not operational. Therefore the bypass line must not be used.
  - The injector needs a separate water supply (water pressure 1 – 6 bar), water quality: drinking water, free of chlorine dioxide, and containing no particles).
- ▶ Introduce a PVC pipe DN 10 from the water line to the system
  - ▶ introduce a PVC pipe DN 10 from the system to the drain (always descending with a free run out)

### 4.1.9 Instructions regarding the supply of chemicals

#### 4.1.9.1 Chemical containers connected directly to the Bello Zon® system

**WARNING**

- The fill levels of the chemical containers must not lie above the Bello Zon® system or the point of injection.

Otherwise this could result in an uncontrolled extraction of chemicals. Subsequently where there is strong negative pressure and formation of a gas/water mixture phases at the same time, there may be chlorine dioxide gas emission. Under unfavourable circumstance the critical gas concentration of 300 g/m<sup>3</sup> may be exceeded and there could be an explosion in the bypass line.

- The fill levels of the chemical containers must not be situated above the Bello Zon® system or the point of injection.

Otherwise chemicals could escape if there is a leakage on the suction side of the dosing pump.

- Chemical containers which are attached directly to the Bello Zon® system should not be larger than 1000 l. If larger quantities of chemicals are needed, a tank farm which is hydraulically separated plus surge tanks are necessary (see the next section).

**4.1.9.2 Tank farm**

Where large amounts of chemicals are used, it might be necessary to have a tank farm.

**WARNING**

- Please observe the local regulations for tank farms (e.g. in Germany the WHG (Water Conservation Law)).
- The tank farms must be clearly marked (acid = red, chlorite = blue).
- When filling the tank farms care must be taken that acid and chlorite are not mixed. Otherwise this could immediately cause a Chlorine dioxide phase in the particular tank, which is potentially explosive.

Chemicals can be identified most easily using litmus paper: acid produces the colour red, chlorite produces a blue colour like the chemical identification system on the Bello Zon® system. Different connection systems (adapters) to acid or chlorite tanks are no guarantee of complete protection. In this respect the operator bears a particular responsibility, since the consequences of an accident increase with the size of the tank farm.

- The tank farm must be separated hydraulically from the Bello Zon® system using a surge tank otherwise this could result in an uncontrolled extraction of chemicals. An automatic isolation valve is an inadequate substitute (differences in level produce differences in priming pressure) and is not practical from the point of view of corrosion.

**4.2 Electrical installations****WARNING**

- It should be possible to switch off chlorine dioxide systems by means of an emergency switch. This emergency switch must be positioned in an easily accessible, safe location near the door of the operating room of the chlorine dioxide system. It should be marked as such. The emergency switch must operate the electric supply unit to which the system is connected, without using any voltage.
- While the Bello Zon® system is operating, there must be sufficient flow guaranteed in the bypass line. Otherwise a potentially explosive chlorine dioxide gas phase can arise in the components of the system. It is best to monitor the flow in the bypass line with a flowmeter with minimum contact, so that dosing is switched off if there is no water running through.

**IMPORTANT**

- A protection device against overload and short circuit must be installed for the Bello Zon® system.
- For all additional cable connections only use flexible cables (contact water meter,... )

## Wiring the control unit



### IMPORTANT

- Only qualified staff may open the control unit.
- Before opening the device, please ensure that there is no voltage across the control device or connected to it.  
For this purpose e.g. install a repair switch, which can be sealed off.

### NOTE

Seal excess cut-outs which have been removed with blanking plugs from the accessories set.

Open housing:

- remove the four flat head screws, take off the front part and put it into the "parking" position (see Fig. 9).

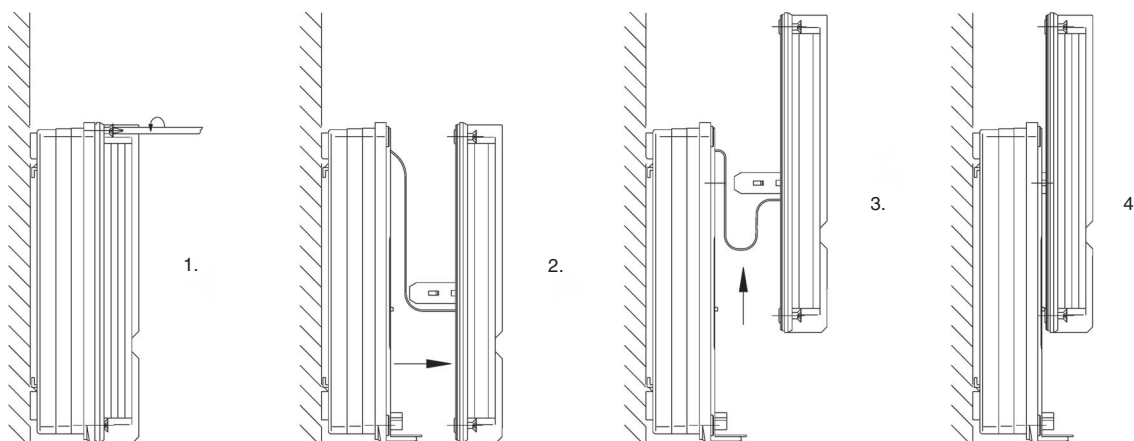


Fig. 9

Remove the cut-outs:

- Mark the cut-outs needed on the underside of the back section for (see Fig. 10)
- the mains cable
- the level monitor
- for other possible options (according to the active code)

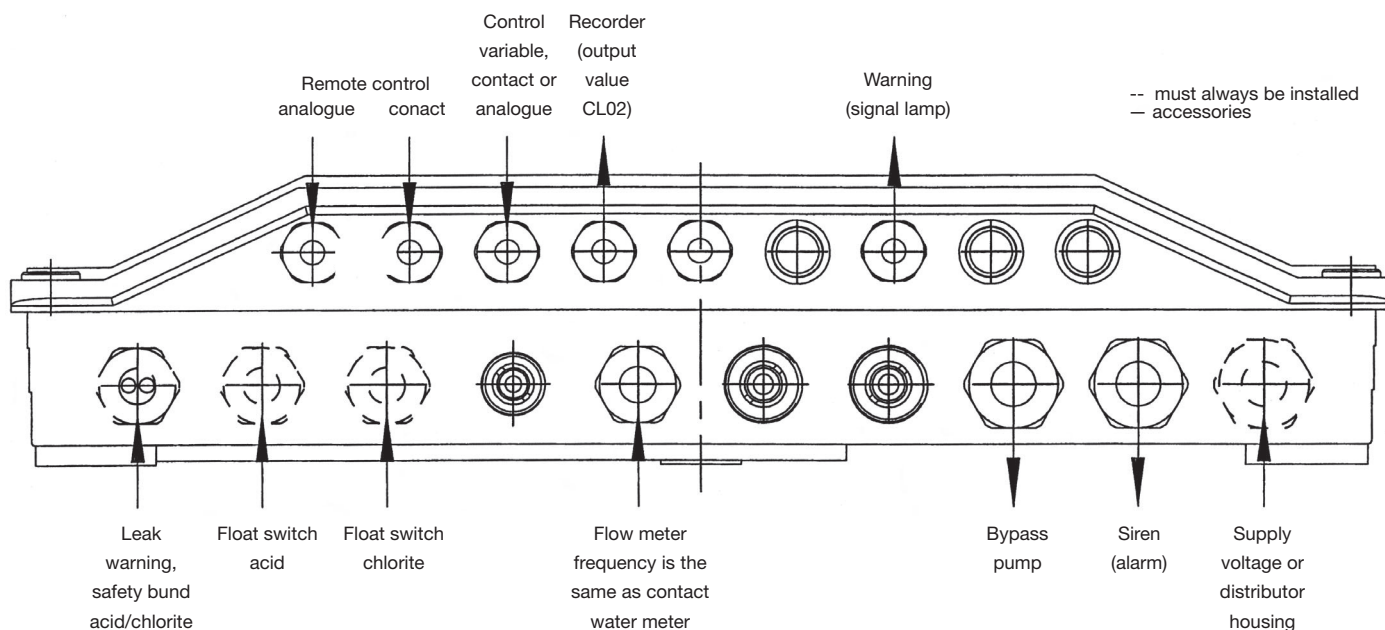


Fig. 10

- remove the cut-outs which have been marked for the PG9 /PG 11 threaded connectors with a screwdriver (see ① and ② Fig. 11)

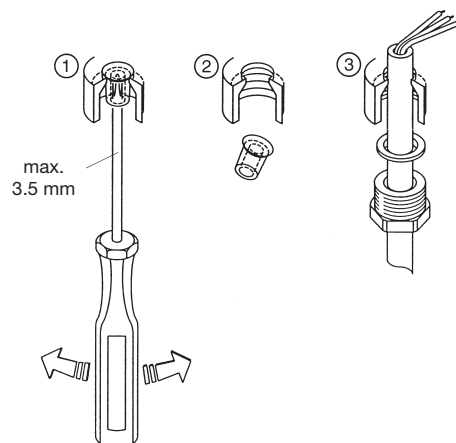


Fig. 11

- remove the cut-outs which have been marked for the PG 7 threaded connectors with a set of water pump tongs using a supporting surface (e.g. coin see ① Fig. 12)



### IMPORTANT

**Always work with a clean supporting surface as the sealing surfaces are situated in the area around the cut-outs.**

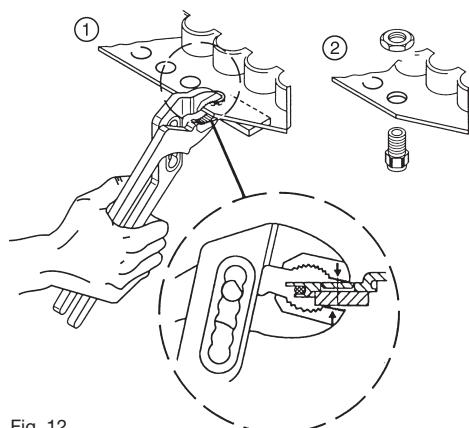


Fig. 12

Fitting the PG threaded connectors:

### NOTE

Fit the rear PG 9 / PG 11 threaded connectors first (for space reasons).

Fit the PG 9 / PG 11 threaded connectors (see ③, Fig. 11)

- for the PG 9 threaded connectors with double feed through (accessories "Leak warning") push the threaded connector on to the cable, guide it into the tapped hole and screw in.

Fit the PG 7 threaded connectors (see ③, Fig. 12)

- With the PG 7 threaded connectors just push the cable over these
- push the screws through the threaded connectors and fix on the top with a locking nut (see ②, Fig. 12)
- tighten the terminal screws of the threaded connectors until the cables are fixed.

### Install bypass pump

### NOTE

For electrical power capacities of > 0.6 kW use a protection device.

### Connect mains cable



#### **IMPORTANT**

- ▶ The mains voltage is only connected once the equipment is in service.
- ▶ The feed line must be a flexible electrical cable with 3 x 1 mm<sup>2</sup> diameter.

#### **NOTE**

- When a bypass pump is used, the control unit can supply it with mains voltage. In so doing the bypass pump is interconnected at the same time with the production of Chlorine dioxide.
- To differentiate between two cables which are the same (e.g. supply voltage of the dosing pumps) they are labelled differently with identification rings.  
("A " for acid, "C" for Chlorite).

### Installation of cables

- ▶ shorten the leads to the correct length and remove approximately 7 mm of the insulation
- ▶ squeeze the end ferrules of the core
- ▶ connect the leads in accordance with the terminal connection plans (see Appendix)
- ▶ tighten the terminal screws of the threaded connectors sufficiently so that they are flush.

### Install emergency switch



#### **WARNING**

It should be possible to turn off chlorine dioxide systems with an emergency cut out switch. This emergency cut out switch must be in an easily accessible, safe place near the door of the operating room of the chlorine dioxide system and should be marked as such. The emergency cut out switch must operate the electrical supply unit to which the system is connected, without any voltage.

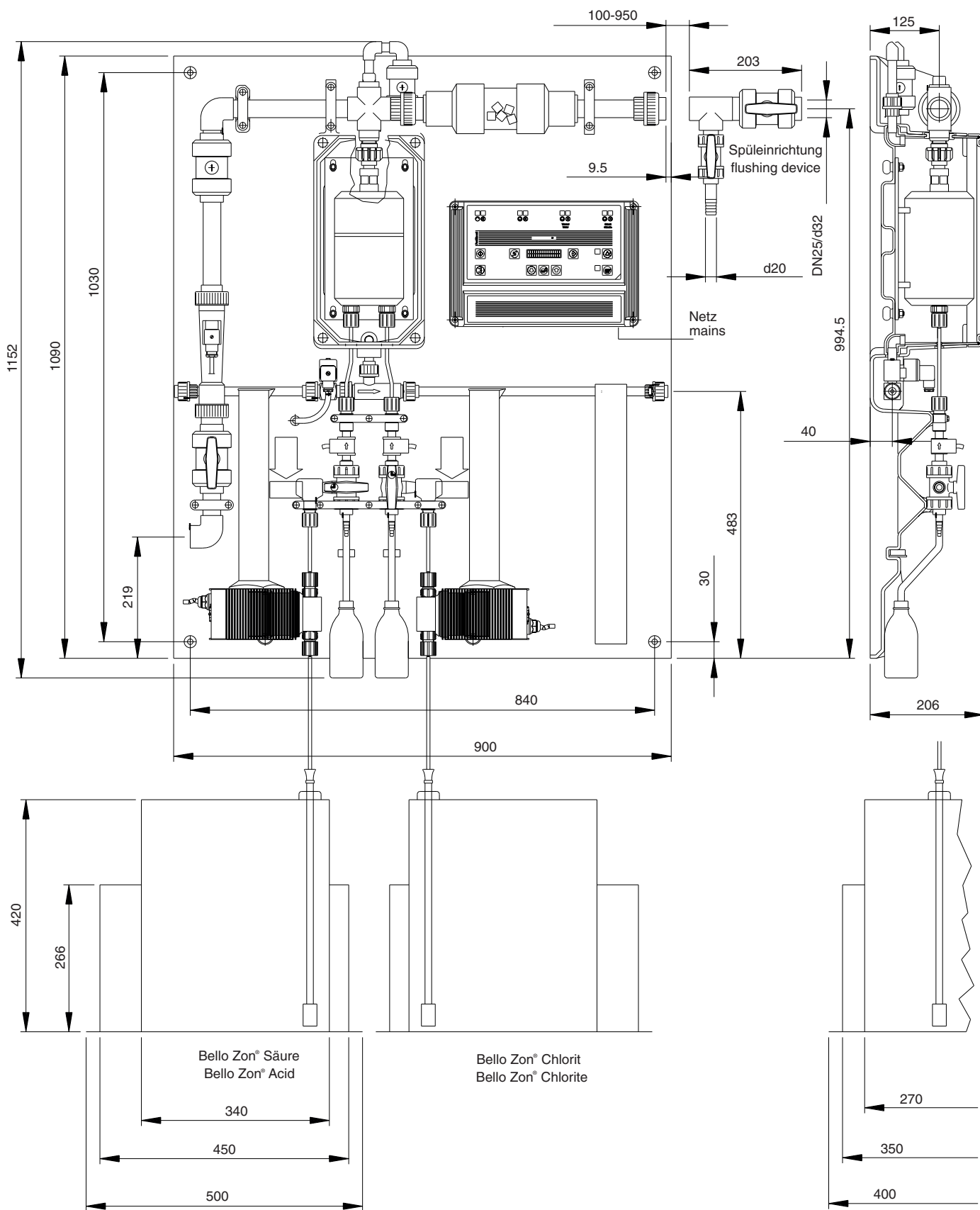
- ▶ Install an emergency cut out switch into the mains cable.

**The Bello Zon® system is now ready for operation by a ProMinent service engineer (see Part 2 of the Operating Instructions)**



# Appendix

## Specification CDVb 15 - 120



## Table of terminal layout / plug-in card

### Table of terminal layout / plug-in card

Terminals	Connection	Plug-in card layout	Plug-in card
<b>Basic unit</b>			
11(+)(BN), 12(-)(BK)	Contact input 2-stage level switch acid EMPTY		
13(+)(BU)	Contact input 2-stage level switch acid EARLY WARNING		
15(+)(BN), 16(-)(BK)	Contact input 2-stage level switch Chlorite EMPTY		
39(+)(BU)	Contact input Level switch Chlorite EARLY WARNING		
17(+)(BN), 18(-)(BK)	Contact output Pump acid (control)		
19(+)(BN), 20(-)(BK)	Contact output Pump Chlorite (control)		
21(+)(BN), 22(-)(BK)	Digital input Dosage monitoring acid	} Insert point 12 Plug-in card digital input Bello Zon®	Order no. 725275.5 Board no. 725273.7
22(+)(BN), 23(-)(BK)	Digital input Dosage monitoring, Chlorite		
39(+)(BU)	Contact input 2-stage level switch Chlorite EARLY WARNING		
41(+), 42(-)	Contact input Regulating variable input, contact (e.g. D1C)		
43(+), 44(-)	Contact input Contact flow meter		
54(BN), 55(BU), 56(GN)YE	Power relay Solenoid valve (extraction)		
58(BN), 59(BU), 60(GN)YE	Power relay Bypass pump		
61, 63	Power relay Alarm		
64(N)(BU), 65(L1)(BN)	Power relay Signal light (warning)		
67(BN), 68(BU), 69(GN)YE	Pump acid (supply voltage)		
71(BN), 72(BU), 70(GN)YE	Pump Chlorite (supply voltage)		
L1(BN), N (BU), PE (GN)YE	Supply voltage		
<b>Options</b>			
1(E), 2(-), 3(+)	Digital input (Namur) Flowmeter, frequency	Insert point 1 Plug-in board digital input three-wire	Order no. 725321.4 Board no. 725273.7
2(+), 3(-) Order no.:725236.4	Normal signal input (mA) Flowmeter, analogue	Insert point 1 Board current input B	Board no. 713407.5
4(+), 5(-)	Normal signal output (mA) Recorder (flow value)	Insert point 2 Board current output B	Order no. 725240.6 Board no. 725234.9
6(V+), 7(+), 8(-)	Normal signal input (mA) Regulating variables input, analogue (external controller)	Insert point 3 Plug-in card current input B	Order no. 725236.4 Board no. 713407.5
9(+), 10(-)	Normal signal output (mA) Recording chart (regulating variable)	Insert point 4 Plug-in card current output B	Order no. 725240.6 Board no. 725234.9
27(V+), 28(+), 29(-)	Normal signal input (mA), remote control analogue (e.g control room)	Insert point 5 Plug-in card current input B	Order no. 725236.4 Board no. 713407.5
30(+), 31(-)	Digital input Remote control, contact (e.g. control room)	Insert point 6 Plug-in card digital input three-wire	Order no. 725321.4 Board no. 725273.7
32(+), 33(-) Order no.:725321.4	Digital input Bypass flow monitoring Variable area flowmeter	Insert point 7 Board digital input three-wire	Board no. 725273.7
35(+), 36(-)	Normal signal output (mA) Recorder ( Value ClO <sub>2</sub> )	Insert point 8 Plug-in card current output B	Order no. 725240.6 Board no. 725234.9
<b>Accessories</b>			
47(+), 48(-)	Digital input Safety vessel acid (leakage monitoring)	Insert point 9 Board digital input	Order no. 725275.5 Board no. 725273.7
48(-), 49(+)	Digital input Safety vessel chlorite (leakage monitoring)	Bello Zon®	

## Electrical Technical Data

Average power consumption in W

CDVb	15 - 220
230 V / 115 V	62
24 V	52
*	762

\* with stainless steel bypass pump, only 230 V

## Control

### Voltage supply

Nominal voltage: 230 V AC, 50/60 Hz  
115 V AC, 50/60 Hz  
24 V DC

Fuses: Miniature fuse 5 x 20 mm  
for 200 ... 240 V: 0.2 A super inert, Order no. 712057  
for 100 ... 120 V: 0.4 A inert, Order no. 712021  
for 24 V: 1.25 A inert, Order no. 712032

## NOTE

The fuse is situated in a bayonet mounting fuse holder, on the right in the terminal area of the control unit (see terminal connector plan).

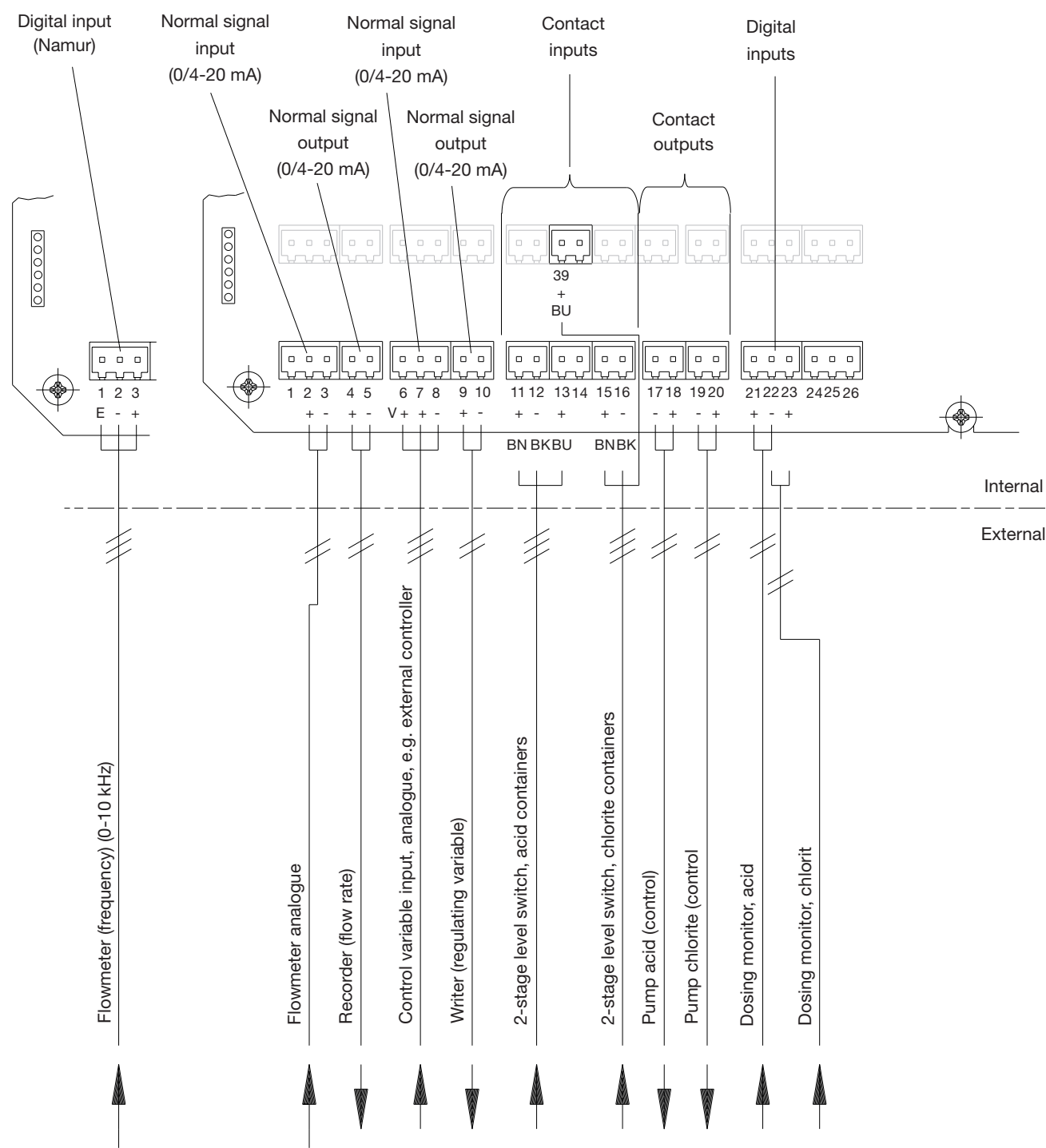
## Inputs

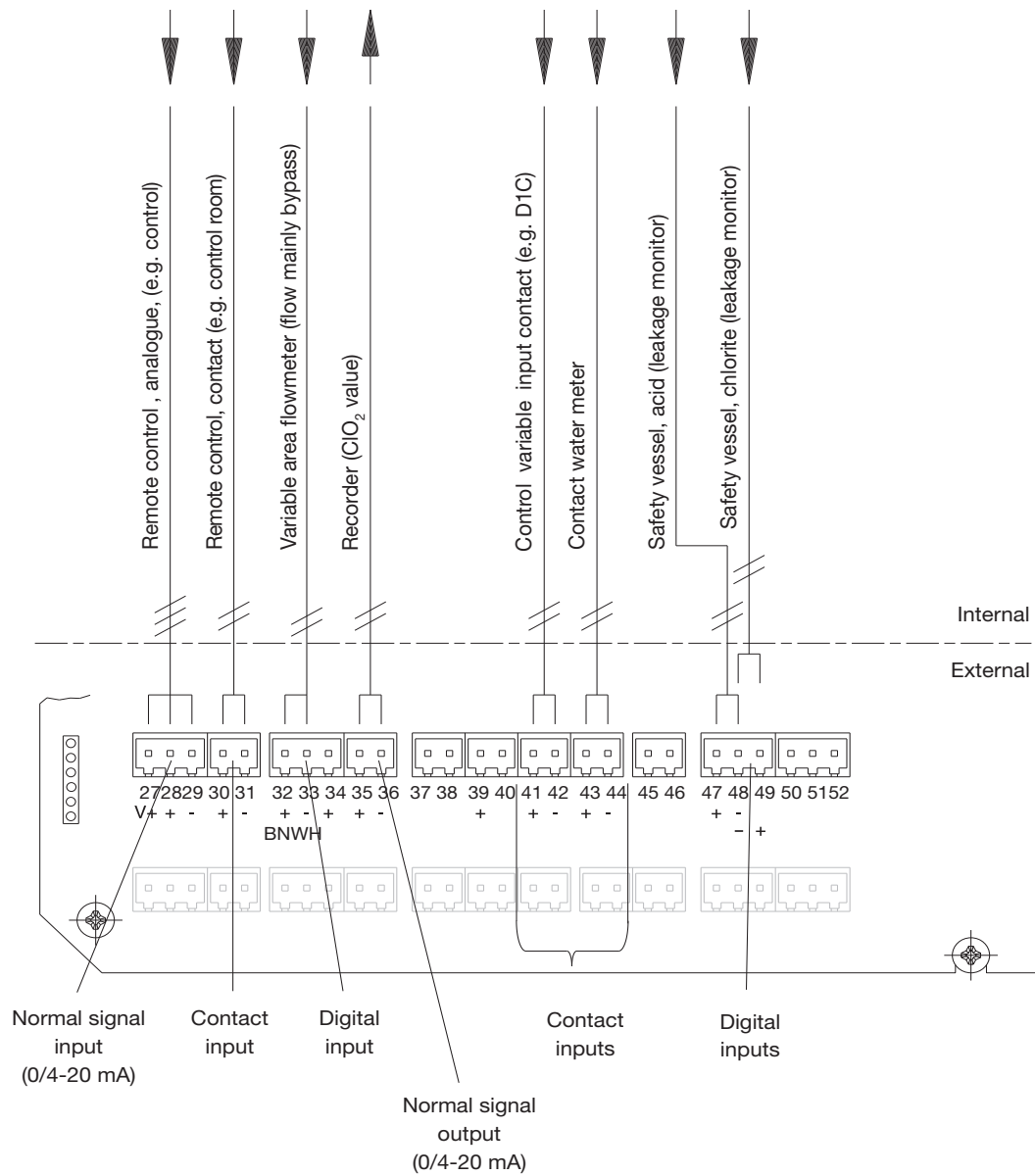
- Contact inputs:  
for contacts or switching transistors:  
Open circuit voltage: 24 V  $\pm$  1 V  
Input resistance: 3.5 k $\Omega$   
Switching point: 12 V  $\pm$  4 V
- Digital inputs (two-wire):  
Inputs: follows DIN 19 234 (Namur)  
supplied open circuit voltage: 8.2 V  
Switching points: Junction low – high ohmic: 6.6 mA  
Junction high / low ohmic: 6.4 mA
- Digital inputs – three-wire  
like two-wire but with additional  
voltage supply: 8.2 V
- Normal signal inputs (mA)  
0/4...20 mA, potential-free  
(Insulation voltage: 500 V)  
Precision: 1 % of the current input area  
Resolution of A/D conversion: 11 bit

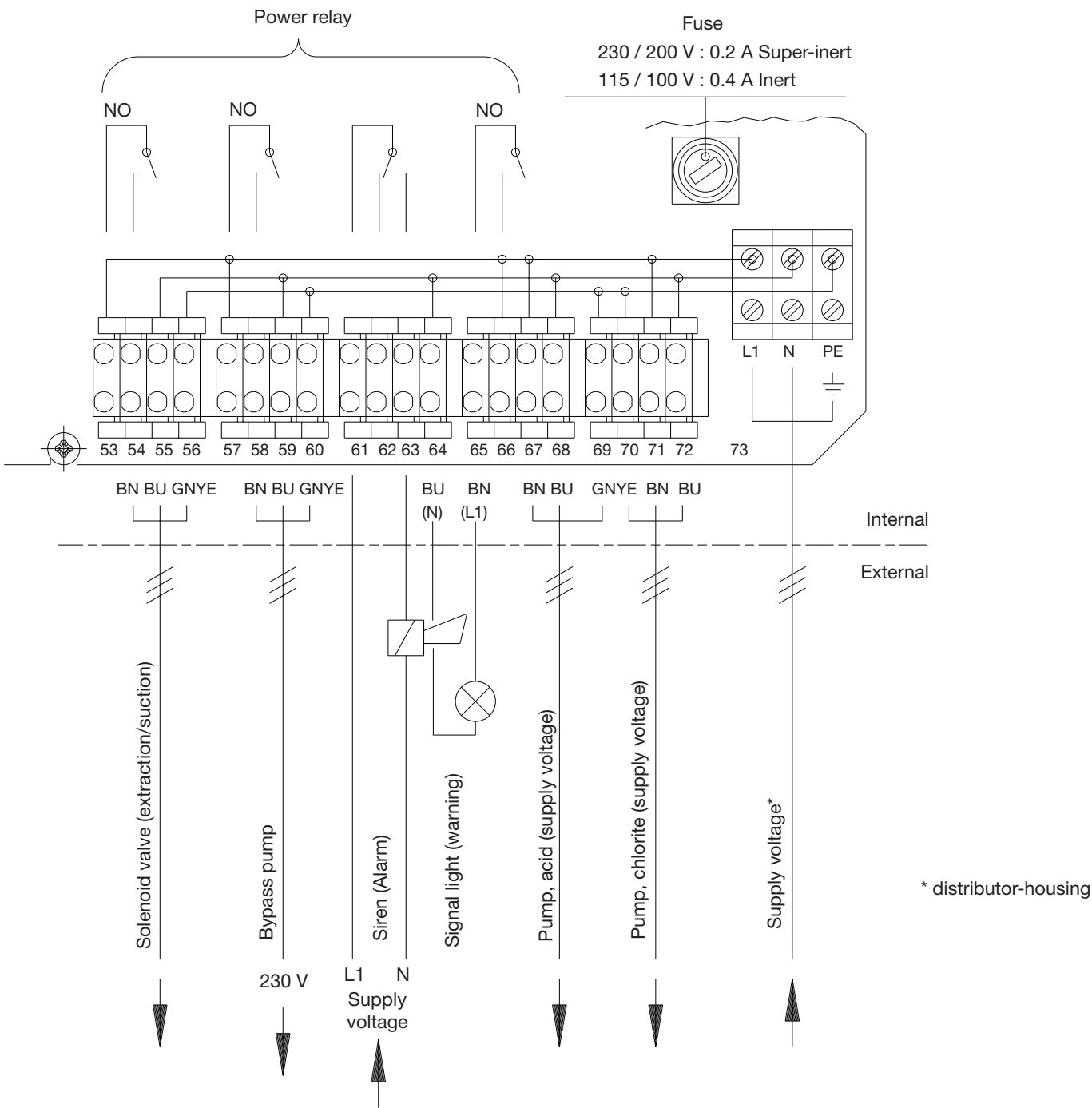
## Outputs:

- Digital outputs (relay contacts):  
Reed relay for pump control  
Type of contact: Normally open contact  
Load capacity: 24 V DC / 50 mA (ohmic)  
mech. life time: > 100 x 10<sup>6</sup> Switching cycles  
Closing time: 100 ms  
Frequency: 0...120 / min
- Power relay:  
Type of contact: two-way contact  
Load capacity: 250 V AC / 3 A / 700 VA  
mech. life time: > 20 x 10<sup>6</sup> Switching cycles  
For inductive loads carry out RC circuit protection.
- Normal signal outputs (mA)  
0/4...20 mA, potential-free  
maximum burden: 600  $\Omega$

Terminal connection plan

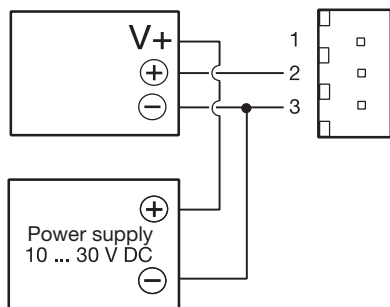




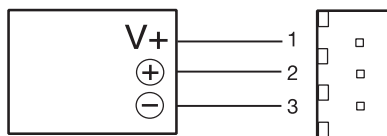


### Terminal connection for analogue flowmeter

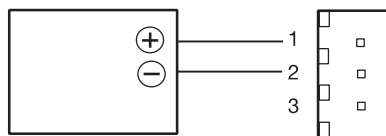
A sensor (active), 0 ... 20 mA  
(externally supplied)



B sensor (active), 4 ... 20 mA  
(internally supplied)



C sensor  
(passive), 4 ... 20 mA



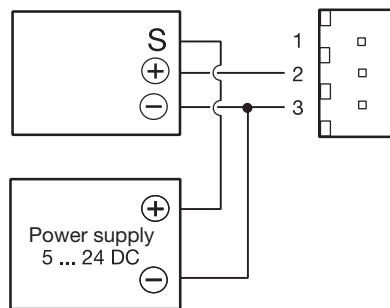
A		B		C	
active		active		passive	
externally supplied		internally supplied			
AKTIVxxx0xxxx		AKTIVxxx4xxxx		AKTIVxxx4xxxx	
Connecting lead	Terminal	Connecting lead	Terminal	Connecting lead	Terminal
Sensor	CDV	Sensor	CDV	Sensor	CDV
V+ (external supply)	does not apply	V+	1	+	1
+	2	+	2	-	2
- (external supply)	3	-	3	does not apply	does not apply

#### NOTE

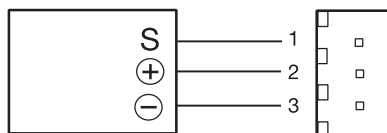
For active types, an external supply is more beneficial.

### Terminal connection for digital flowmeters

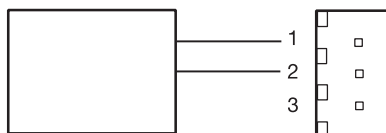
A sensor (active)  
(externally supplied)



B sensor (active)  
(internally supplied)



C sensor (passive)  
(contact flowmeter)



\* in compliance with the specification of the flowmeter

A		B		C	
active		active		passive	
externally supplied		internally supplied			
large pulse frequency		large pulse frequency		no pulse frequency	
AKTIVExxxFxxxx		AKTIVExxxFxxxx		AKTIVExxxKxxxx	
Connecting lead	Terminal	Connecting lead	Terminal	Connecting lead	Terminal
Sensor	CDV	Sensor	CDV	Sensor	CDV
Signal E	1	Signal E	1	same	43
- (external supply))	2	-	2	same	44
+	does not apply	+	3	does not apply	does not apply

#### NOTE

For active types an external supply is more favourable.