

Pressure Booster System

Installation/Operating Manual

Hydro-Unit Utility Line

Hydro-Unit Utility Line F
Hydro-Unit Utility Line VC
Hydro-Unit Utility Line SVP



CE

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Original operating manual Hydro-Unit Utility Line

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Glossary

Accumulator

Pressure losses may occur in the piping downstream of the pressure booster system as a result of losses due to leakage. The accumulator serves to compensate for pressure losses and minimises the frequency of starts of the pressure booster system.

Certificate of decontamination

A certificate of decontamination is enclosed by the customer when returning the product to the manufacturer to certify that the product has been properly drained to eliminate any environmental and health hazards arising from components in contact with the fluid handled.

Dry running protection

Dry running protection devices prevent the pump from being operated without the fluid to be handled, which would result in pump damage.

IE3

Efficiency class to IEC 60034-30: 3 = Premium Efficiency (IE = International Efficiency)

IE4

Efficiency class to IEC TS 60034-30-2:2016 = Super Premium Efficiency (IE = International Efficiency)

IE5

Efficiency class to IEC TS 60034-30-2:2016 = Ultra Premium Efficiency (IE = International Efficiency)

Manual mode

Direct operation on the power supply network, independently of the control unit.

Switchgear and controlgear assembly

Control cabinet with one or several control units / switchgears and electrical equipment.

1 General

1.1 Principles

This operating manual is valid for the type series and variants indicated on the front cover.

The operating manual describes the proper and safe use of this equipment in all phases of operation.

The name plate indicates the type series, the main operating data and the serial number. The serial number uniquely describes the product and is used as identification in all further business processes.

In the event of damage, immediately contact your nearest Duijvelaar Pompen B.V. service facility to maintain the right to claim under warranty.

1.2 Software changes

The software has been specially created for this product and thoroughly tested. Making changes or additions to the software or parts of the software is prohibited. This does not, however, apply to software updates by Duijvelaar Pompen B.V. .

1.3 Installation of partly completed machinery

To install partly completed machinery supplied by Duijvelaar Pompen B.V. refer to the sub-sections under Servicing/Maintenance.

1.4 Target group

This operating manual is aimed at the target group of trained and qualified specialist technical personnel. [⇒ Section 2.3, Page 10]

1.5 Other applicable documents

Table 1: Overview of other applicable documents

Document	Contents
Sub-supplier product literature	Operating manuals and other product literature describing accessories and integrated machinery components

1.6 Symbols

Table 2: Symbols used in this manual

Symbol	Description
✓	Conditions which need to be fulfilled before proceeding with the step-by-step instructions
▷	Safety instructions
⇒	Result of an action
⇔	Cross-references
1. 2.	Step-by-step instructions
	Note Recommendations and important information on how to handle the product

1.7 Key to safety symbols/markings

Table 3: Definition of safety symbols/markings

Symbol	Description
 DANGER	DANGER This signal word indicates a high-risk hazard which, if not avoided, will result in death or serious injury.
 WARNING	WARNING This signal word indicates a medium-risk hazard which, if not avoided, could result in death or serious injury.
 CAUTION	CAUTION This signal word indicates a hazard which, if not avoided, could result in damage to the machine and its functions.
	General hazard In conjunction with one of the signal words this symbol indicates a hazard which will or could result in death or serious injury.
	Electrical hazard In conjunction with one of the signal words this symbol indicates a hazard involving electrical voltage and identifies information about protection against electrical voltage.
	Machine damage In conjunction with the signal word CAUTION this symbol indicates a hazard for the machine and its functions.

2 Safety



All the information contained in this section refers to hazardous situations.

In addition to the present general safety information the action-related safety information given in the other sections must be observed.

2.1 General

- This operating manual contains general installation, operating and maintenance instructions that must be observed to ensure safe operation of the system and prevent personal injury and damage to property.
- Comply with all the safety instructions given in the individual sections of this operating manual.
- The operating manual must be read and understood by the responsible specialist personnel/operators prior to installation and commissioning.
- The contents of this operating manual must be available to the specialist personnel at the site at all times.
- Information and markings attached directly to the product must always be complied with and kept in a perfectly legible condition at all times. This applies to, for example:
 - Arrow indicating the direction of rotation
 - Markings for connections
 - Name plate
- The operator is responsible for ensuring compliance with all local regulations not taken into account.

2.2 Intended use

- The pressure booster system must only be operated within the operating limits described in the other applicable documents.
- Only operate pressure booster systems which are in perfect technical condition.
- Do not operate partially assembled pressure booster systems.
- The pressure booster system must only handle the fluids described in the product literature of the respective design variant.
- Never operate the pressure booster system without the fluid to be handled.
- Observe the information on minimum flow rates specified in the product literature (to prevent overheating, bearing damage, etc).
- Observe the maximum flow rates indicated in the data sheet or product literature (to prevent overheating, cavitation damage, bearing damage, etc).
- Do not throttle the flow rate on the suction side of the pressure booster system (to prevent cavitation damage).
- Consult the manufacturer about any other modes of operation not described in the product literature.

2.2.1 Prevention of foreseeable misuse

- Never exceed the permissible application and operating limits specified in the data sheet or product literature regarding temperature, etc.
- Observe all safety information and instructions in this manual.

2.3 Personnel qualification and personnel training

- All personnel involved must be fully qualified to install, operate, maintain and inspect the product this manual refers to.
- The responsibilities, competence and supervision of all personnel involved in transport, installation, operation, maintenance and inspection must be clearly defined by the operator.
- Deficits in knowledge must be rectified by means of training and instruction provided by sufficiently trained specialist personnel. If required, the operator can commission the manufacturer/supplier to train the personnel.
- Training on the pressure booster system must always be supervised by specialist technical personnel.

2.4 Consequences and risks caused by non-compliance with this manual

- Non-compliance with these operating instructions will lead to forfeiture of warranty cover and of any and all rights to claims for damages.
- Non-compliance can, for example, have the following consequences:
 - Hazards to persons due to electrical, thermal, mechanical and chemical effects and explosions
 - Failure of important product functions
 - Failure of prescribed maintenance and servicing practices
 - Hazard to the environment due to leakage of hazardous substances

2.5 Safety awareness

In addition to the safety information contained in this operating manual and the intended use, the following safety regulations shall be complied with:

- Accident prevention, health regulations and safety regulations
- Safety regulations for handling hazardous substances
- Applicable standards, directives and laws

2.6 Safety information for the operator/user

- Fit protective equipment (e.g. contact guards) supplied by the operator for hot, cold or moving parts, and check that the equipment functions properly.
- Do not remove any protective equipment (e.g. contact guards) during operation.
- Eliminate all electrical hazards. (In this respect refer to the applicable national safety regulations and/or regulations issued by the local energy supply companies.)
- If stopping the pump does not increase potential risk, fit an emergency-stop control device in the immediate vicinity of the pump (set) during pump set installation.

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2.7 Safety information for maintenance, inspection and installation

- Modifications or alterations of the pressure booster system are only permitted with the manufacturer's prior consent.
- Use only original spare parts or parts authorised by the manufacturer. The use of other parts can invalidate any liability of the manufacturer for resulting damage.
- The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual.
- Carry out work on the pressure booster system during standstill only.
- The pump casing must have cooled down to ambient temperature.
- Pump pressure must have been released and the pump must have been drained.

- When taking the pressure booster system out of service always adhere to the procedure described in the manual.
- Decontaminate pressure booster systems which handle fluids posing a health hazard.
- As soon as the work has been completed, re-install and/or re-activate any safety-relevant and protective devices. Before returning the product to service, observe all instructions on commissioning.
- Make sure the pressure booster system cannot be accessed by unauthorised persons (e.g. children).
- Prior to opening the device, pull the mains plug and wait for at least 10 minutes.

2.8 Unauthorised modes of operation

Always observe the limits stated in the product literature.

The warranty relating to the operating reliability and safety of the pressure booster system supplied is only valid if the equipment is used in accordance with its intended use.

[⇒ Section 2.2, Page 9]

2.9 Electromagnetic compatibility (EMC)

2.9.1 Interference emission requirements

The EN 61800-3 EMC product standard is relevant for electric variable speed drives/control systems. It specifies all pertinent requirements and refers to the relevant generic standards for complying with the EMC Directive.

Frequency inverters are commonly used by operators as a part of a system, plant or machine assembly. It should be noted that the operator bears all responsibility for the final EMC properties of the equipment, plant or installation.

A prerequisite or requirement for complying with the relevant standards or the limit values and inspection/test levels referenced by them is that all information and descriptions regarding EMC-compliant installation be observed and followed.

In accordance with the EMC product standard, the EMC requirements to be met depend on the purpose or intended use of the frequency inverter. Four categories are defined in the EMC product standard:

Table 4: Categories of intended use

Category	Definition	Limits to EN 55011
C1	Frequency inverters with a supply voltage under 1000 V installed in the first environment (residential and office areas).	Class B
C2	Frequency inverters with a supply voltage under 1000 V installed in the first environment (residential and office areas) that are neither ready to be plugged in/connected nor are mobile and must be installed and commissioned by specialist personnel.	Class A, Group 1
C3	Frequency inverters with a supply voltage under 1000 V installed in the second environment (industrial environments).	Class A, Group 2
C4	Frequency inverters with a supply voltage over 1000 V and a nominal current over 400 A installed in the second environment (industrial environments) or that are envisaged for use in complex systems.	No borderline/boundary ¹⁾

The following limit values and inspection/test levels must be complied with if the generic standard on interference emissions applies:

¹ An EMC plan must be devised.

Table 5: Classification of installation environment

Environment	Generic standard	Limits to EN 55011
First environment (residential and office areas)	EN/IEC 61000-6-3 for private, business and commercial environments	Class B
Second environment (industrial environments)	EN/IEC 61000-6-4 for industrial environments	Class A, Group 1

The frequency inverter meets the following requirements:

Table 6: EMC properties of the frequency inverter

Power [kW]	Cable length [m]	Category to EN 61800-3	Limits to EN 55011
≤ 11	≤ 5	C1	Class B

The EN 61800-3 standard requires that the following warning be provided for drive systems that do not comply with category C1 specifications:

This product can produce high-frequency interference emissions that may necessitate targeted interference suppression measures in a residential or office environment.

2.9.2 Line harmonics requirements

The product is a device for professional applications as defined by EN 61000-3-2. The following generic standards apply when establishing a connection to the public power grid:

- EN 61000-3-2
for symmetric, three-phase devices (professional devices with a total power of up to 1 kW)
- EN 61000-3-12
for devices with a phase current of between 16 A and 75 A and professional devices from 1 kW up to a phase current of 16 A.

2.9.3 Interference immunity requirements

In general, the interference immunity requirements for a frequency inverter hinge on the specific environment in which the inverter is installed.

The requirements for industrial environments are therefore higher than those for residential and office environments.

The frequency inverter is designed such that the immunity requirements for industrial environments and, thus, the lower-level requirements for residential and office environments, are met and fulfilled.

The following relevant generic standards are used for the interference immunity test:

- EN 61000-4-2: Electromagnetic compatibility (EMC)
 - Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test
- EN 61000-4-3: Electromagnetic compatibility (EMC)
 - Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test
- EN 61000-4-4: Electromagnetic compatibility (EMC)
 - Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test
- EN 61000-4-5: Electromagnetic compatibility (EMC)
 - Part 4-5: Testing and measurement techniques – Surge immunity test
- EN 61000-4-6: Electromagnetic compatibility (EMC)
 - Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields

3 Transport/Storage/Disposal

3.1 Checking the condition upon delivery

1. On transfer of goods, check each packaging unit for damage.
2. In the event of in-transit damage, assess the exact damage, document it and notify Duijvelaar Pompen B.V. or the supplying dealer and the insurer about the damage in writing immediately.

3.2 Transport



DANGER

Pressure booster system tipping over

Risk of injury by falling pressure booster system!

- ▷ Never suspend the pressure booster system by its cable.
- ▷ Observe the applicable local accident prevention regulations.
- ▷ Observe the information on weights, centre of gravity and fastening points.
- ▷ Use suitable and permitted transport equipment, e.g. crane, forklift or pallet truck.
- ▷ To transport the pressure booster system, suspend it from the lifting tackle as illustrated.
- ▷ Attach the pressure booster system to crane lifting tackle as shown, or use a forklift or pallet truck to move the pallet.

- ✓ Transport equipment / lifting equipment suitable for the corresponding weight has been selected and is available.
 - ✓ If the control cabinet and pressure booster system need to be lifted separately from each other: Disconnect the power cables before lifting the pressure booster system / control cabinet.
1. Remove the packaging. Remove the caps from the connection openings.
 2. Check for any in-transit damage.
 3. Transport the pressure booster system to the place of installation.
 4. Detach the pressure booster system from the pallet using a suitable tool.

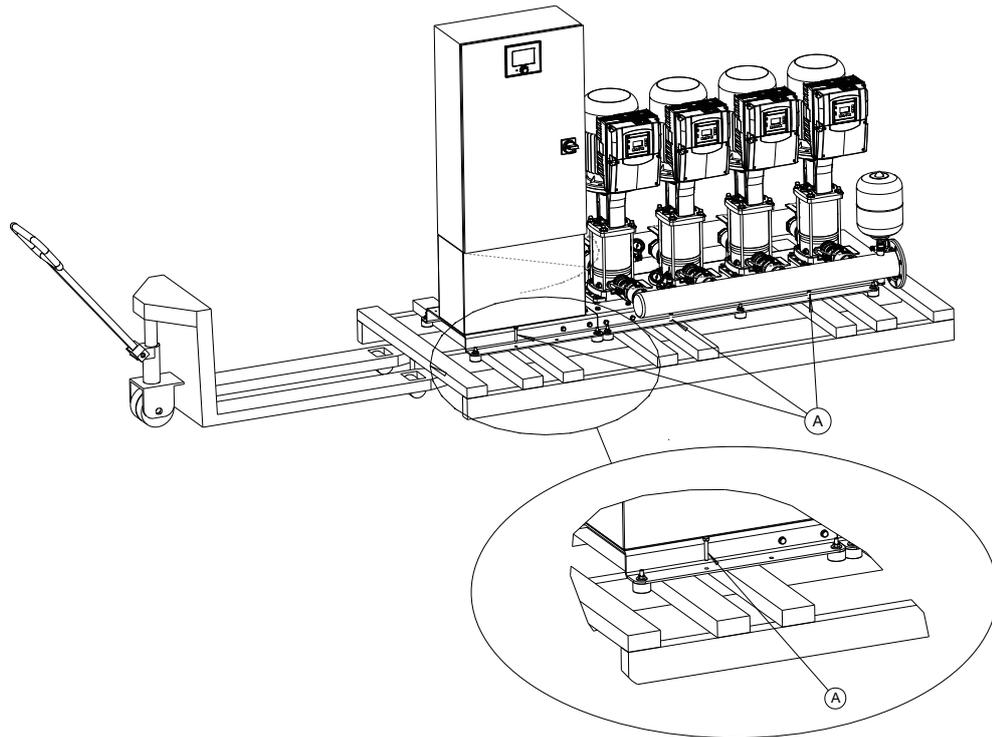


Fig. 1: Lifting the pressure booster system off the pallet

5. Undo bolts A between the pressure booster system and the pallet.
6. Attach lifting equipment to the pressure booster system.
7. Separate the pressure booster system from the wooden skids with a suitable tool. Lift the pressure booster system off. Dispose of the wooden skids.
8. Carefully place down the pressure booster system at the place of installation.

Example: Lifting the pressure booster system and control cabinet separately

If the control cabinet is too large and cannot be placed on the baseplate of the pressure booster system, the pressure booster system and control cabinet have to be lifted separately.

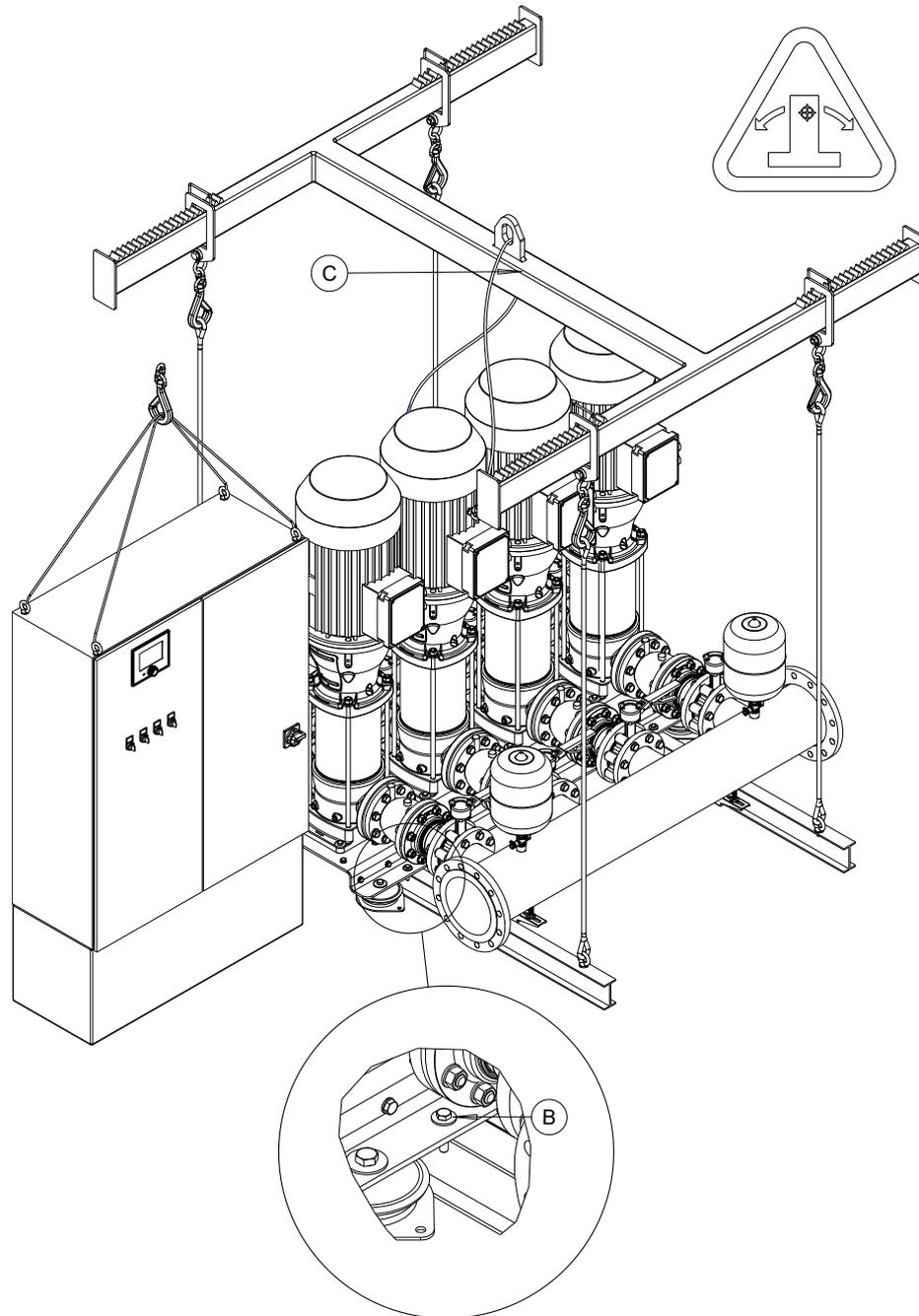


Fig. 2: Lifting the pressure booster system and control cabinet separately

✓ Before lifting the pressure booster system and control cabinet, disconnect the power cables.

1. Attach lifting beam to attachment points B (example) provided at the baseplate.
2. Use anti-tilting device C.

Example: Lifting the pressure booster system and control cabinet together on one baseplate

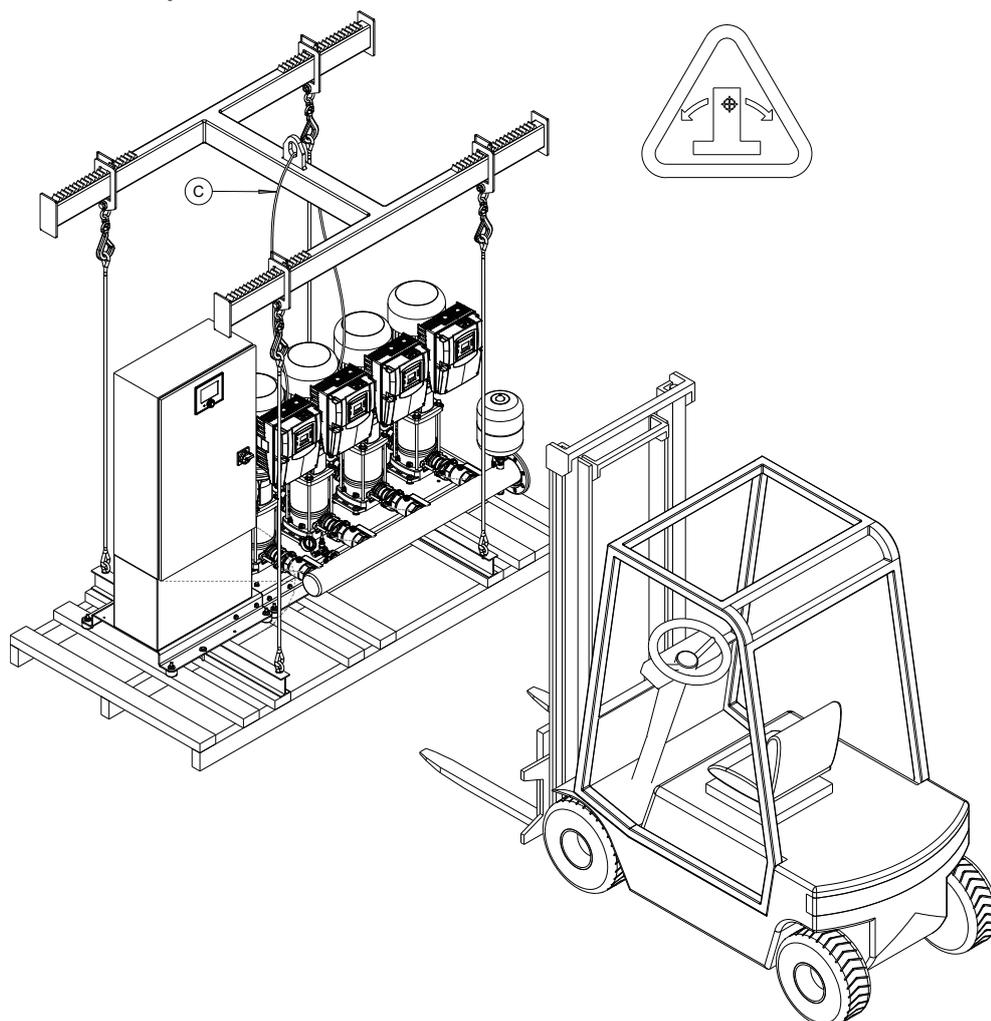


Fig. 3: Lifting the pressure booster system and control cabinet together on one baseplate

1. Use anti-tilting device C.

3.3 Storage/preservation



CAUTION

Damage during storage due to frost, moisture, dirt, UV radiation or vermin

Corrosion/contamination of pressure booster system!

- Store the pressure booster system in a frost-proof room. Do not store outdoors.



CAUTION

Wet, contaminated or damaged openings and connections

Leakage or damage of the pressure booster system!

- Only open the openings of the pressure booster system at the time of installation.

**NOTE**

Rotate the shaft by hand every three months, e.g. via the motor fan.

If commissioning is to take place some time after delivery, the following measures are recommended when storing the pressure booster system:

Store the pressure booster system in a dry, protected room where the atmospheric humidity is as constant as possible.

Table 7: Ambient conditions for storage

Ambient condition	Value
Relative humidity	50 % maximum
Ambient temperature	0 °C to +40 °C

- Frost-free
- Well-ventilated

3.4 Return to supplier

1. Drain the pressure booster system as per operating instructions.
2. Always flush and clean the pressure booster system, particularly if it has been used for handling noxious, explosive, hot or other hazardous fluids.
3. If the pressure booster system has handled fluids whose residues could lead to corrosion damage in the presence of atmospheric humidity or could ignite upon contact with oxygen, the pressure booster system must also be neutralised, and anhydrous inert gas must be blown through the pressure booster system to ensure drying.
4. Always complete and enclose a certificate of decontamination when returning the pressure booster system. [⇒ Section 12, Page 88]
Always indicate any safety and decontamination measures taken.

**NOTE**

If required, a blank certificate of decontamination can be downloaded from the following web site: www.dp.nl/certificates-of-decontamination

3.5 Disposal



WARNING

Fluids handled, consumables and supplies which are hot and/or pose a health hazard

Hazard to persons and the environment!

- ▷ Collect and properly dispose of flushing fluid and any fluid residues.
- ▷ Wear safety clothing and a protective mask if required.
- ▷ Observe all legal regulations on the disposal of fluids posing a health hazard.

1. Dismantle the pressure booster system.
Collect greases and other lubricants during dismantling.
2. Separate and sort the pump materials, e.g. by:
 - Metals
 - Plastics
 - Electronic waste
 - Greases and other lubricants
3. Dispose of materials in accordance with local regulations or in another controlled manner.



Electrical or electronic equipment marked with the adjacent symbol must not be disposed of in household waste at the end of its service life.

Contact your local waste disposal partner for returns.

If the used electrical or electronic equipment contains personal data, the operator is responsible for deleting it before the equipment is returned.

4 Description

4.1 General description

- Pressure booster system

4.2 Product information as per Regulation No. 1907/2006 (REACH)

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see <http://www.dp.nl/reach>.

4.3 Designation

Example: HU3 Utility Line DPV 15/8 C SVP

Table 8: Designation key

Code	Description	
HU	Hydro-Unit	
3	Number of pumps	
Utility Line	Type series	
DPV 15	Size	
	DPV 15	
8 C	Number of pump stages	
SVP	F	Fixed speed pressure booster system
	VC	Pressure booster system with cabinet-mounted variable speed system
	SVP	Pressure booster system with variable speed system and Su-PremE

4.4 Name plate

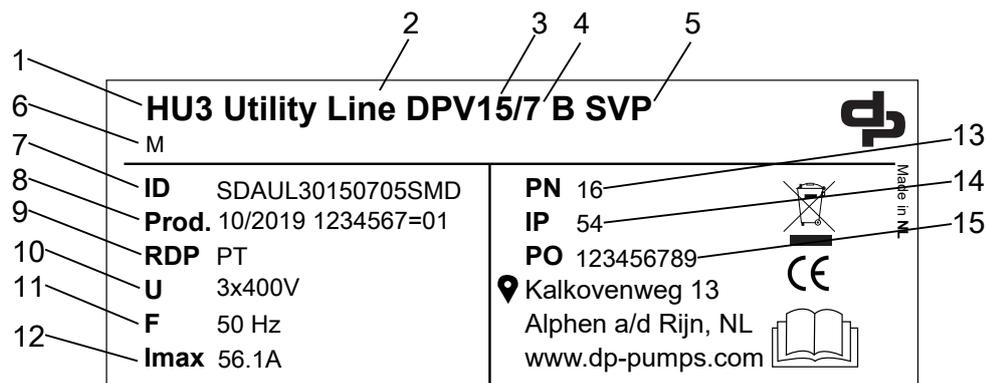


Fig. 4: Name plate (example)

1	Number of pumps	9	Dry running protection
2	Type series	10	Power supply voltage
3	Size	11	Power supply frequency
4	Number of pump stages	12	Maximum current input
5	Design	13	Max. operating pressure

6	Connection types [⇒ Section 4.6, Page 21]	14	Enclosure
7	Serial number	15	Order number
8	Month of production / year of production, consecutive number		

4.5 Design details

Design

- Compact system mounted on a common base frame
- 2 (F/SVP/VC) / 3 (F/SVP/VC) / 4 (F/SVP/VC) / 5 (SVP/VC) / 6 (SVP/VC) vertical high-pressure centrifugal pumps
- Hydraulic components made of stainless steel / brass
- Discharge side ball valve or shut-off butterfly valve per pump
- Integrated dry running protection

Utility Line F:

- DOL starting
- Power contactor per pump

Utility Line VC, SVP:

- With variable speed system
- One frequency inverter per pump

For inlet conditions F and M only:

- Check valve per pump
- Suction side ball valve or shut-off butterfly valve per pump

Installation

- Stationary dry installation

Drive

Utility Line F, VC:

- Electric motor
- Efficiency class IE3 to IEC 60034-30

Utility Line SVP:

- Magnetless synchronous reluctance motor
- Efficiency class IE4 / IE5 to IEC TS 60034-30-2:2016
- SuPremE

Automation

- Control unit (IP54 enclosure)
 - Sheet steel housing: colour RAL 7035
 - DP Control
 - Control panel (display, dial with key function, LED indicators, Bluetooth LE interface for app connection)
 - Modbus RTU
 - Lockable master switch (repair switch)
 - Motor protection switch per pump
 - Bluetooth LE interface for app connection DP Control App
 - LEDs for signalling the operating status

- 2 volt-free contacts on terminals are provided for reporting warnings and alerts.
- Manual-0-automatic selector switch per pump

4.6 Connection types (inlet conditions) of pressure booster systems

4.6.1 Connection type M (direct)

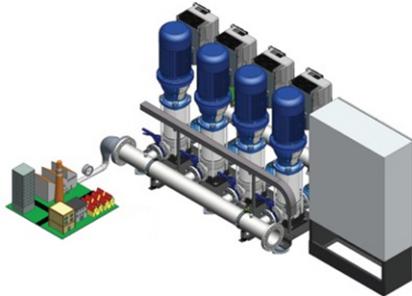


Fig. 5: Connection type M

In connection type M (Mains), the pump system is connected directly to the (usually municipal) water supply system, making use of the mains pressure supplied.

4.6.2 Connection type F

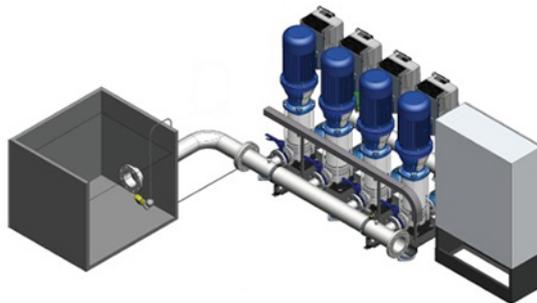


Fig. 6: Connection type F

Connection type F usually features a break tank (open to atmosphere) whose water level is higher than the pressure booster system inlet.

4.6.3 Connection type L

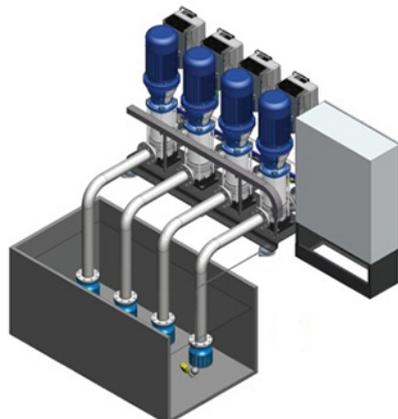


Fig. 7: Connection type L

Connection type L (Lift) features a break tank (open to atmosphere) arranged at a lower level whose water level is lower than the connection of the pump sets.

4.7 Configuration and function



Fig. 8: Configuration Utility Line VC

1	Control cabinet	4	Membrane-type accumulator
2	Control unit	5	Manifold
3	Pump	6	Baseplate

Design Fully automatic pressure booster system with two to six vertical high-pressure pumps (3) for ensuring the required supply pressure.

Function Utility Line F:

Two to four pumps are controlled and monitored by a microprocessor control unit (DP Control). The first pump is started up when the pressure falls below the set start-up pressure (setpoint minus half bandwidth). Additional pumps are sequenced in automatically in line with actual demand. When demand decreases, the pumps are sequenced out again as the stop pressure (setpoint plus half bandwidth) is reached. The pump that has been started up first will be stopped first. The pumps are automatically started up in a different order for each new cycle. This ensures equal distribution of pump operating hours. The actual pressure is measured by an analog pressure pressure transmitter. The function of this pressure transmitter is automatically monitored.

Utility Line VC, SVP:

Two to six pumps are controlled and monitored by a microprocessor control unit (DP Control). Each pump is operated on a frequency inverter and controlled by the control unit so as to ensure a constant discharge pressure of the pressure booster system. As the demand increases or decreases, pumps are started and stopped automatically. As soon as the demand increases again after one pump has been stopped, another pump which has not been in operation before is started up. When the last pump has been stopped and the demand increases again, the next pump in line is started up on a frequency inverter. The stand-by pump is also included in the alternating cycle.

The standard setting is for the pressure booster system to start automatically as a function of pressure. As long as the pressure booster system is in operation, the pumps are started and stopped as a function of demand (standard setting). In this way it is ensured that the individual pumps operate only in line with actual demand.

If the demand drops towards 0, the pressure booster system slowly runs down to the stop point.

If a pump has not been in operation for 24 hours, a test run is initiated for this pump.

4.8 Noise characteristics

The pressure booster system is available with different numbers and sizes of pumps. For the noise characteristics refer to the operating manual of the pump set. To calculate the expected total sound pressure level, add a defined value to the individual pump set's expected sound pressure level.

Table 9: Values for calculating the total expected sound pressure level

Number of pump sets	Value
	dB(A)
2	+ 3
3	+ 4,5
4	+ 6
5	+ 7
6	+ 7,5

Example Pressure booster system with 4 pump sets (value: + 6 dB(A))

Single pump = 48 dB(A)

48 dB(A) + 6 dB(A) = 54 dB(A)

The expected total sound pressure level of 54 dB(A) may develop when all 4 pump sets are running under full-load conditions.

4.9 Scope of supply

Depending on the model, the following items are included in the scope of supply:

Pressure booster system

- Two to six vertical high-pressure centrifugal pumps
- Discharge-side, direct-flow membrane-type accumulator, approved for drinking water
- 1 check valve and 2 shut-off valves per pump set to DIN / DVGW
- Pressure transmitter on the suction side and discharge side
- Pressure gauge
- Powder-coated / epoxy resin-coated steel baseplate

For DPV 2, DPV 4, DPV 6, DPV 10 and DPV 15:

- With oval flange
- Pressure booster system with rubber buffers

For DPV 25, DPV 40, DPV 60, DPV 85 and DPV 125:

- With round flange
- Pressure booster system with feet consisting of galvanised steel elements with a rubber insert
- Pressure booster system with level-adjustable feet consisting of galvanised steel elements with a rubber insert

Control unit

- IP54 enclosure
- Control panel (display, keys, LEDs, service interface)
- Transformer for control voltage
- Motor protection switch per pump
- Lockable master switch (repair switch)
- Terminal strip/terminals with identification for all connections

- Circuit diagram and list of electric components
- Connection for analog or digital dry running protection equipment
- Remote ON/OFF input

4.9.1 Inlet conditions, version M

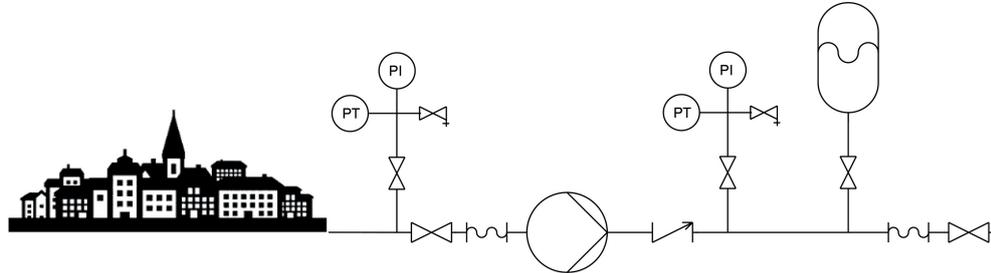


Fig. 9: M = Inlet side of pressure booster system connected to the municipal water supply, suction head operation

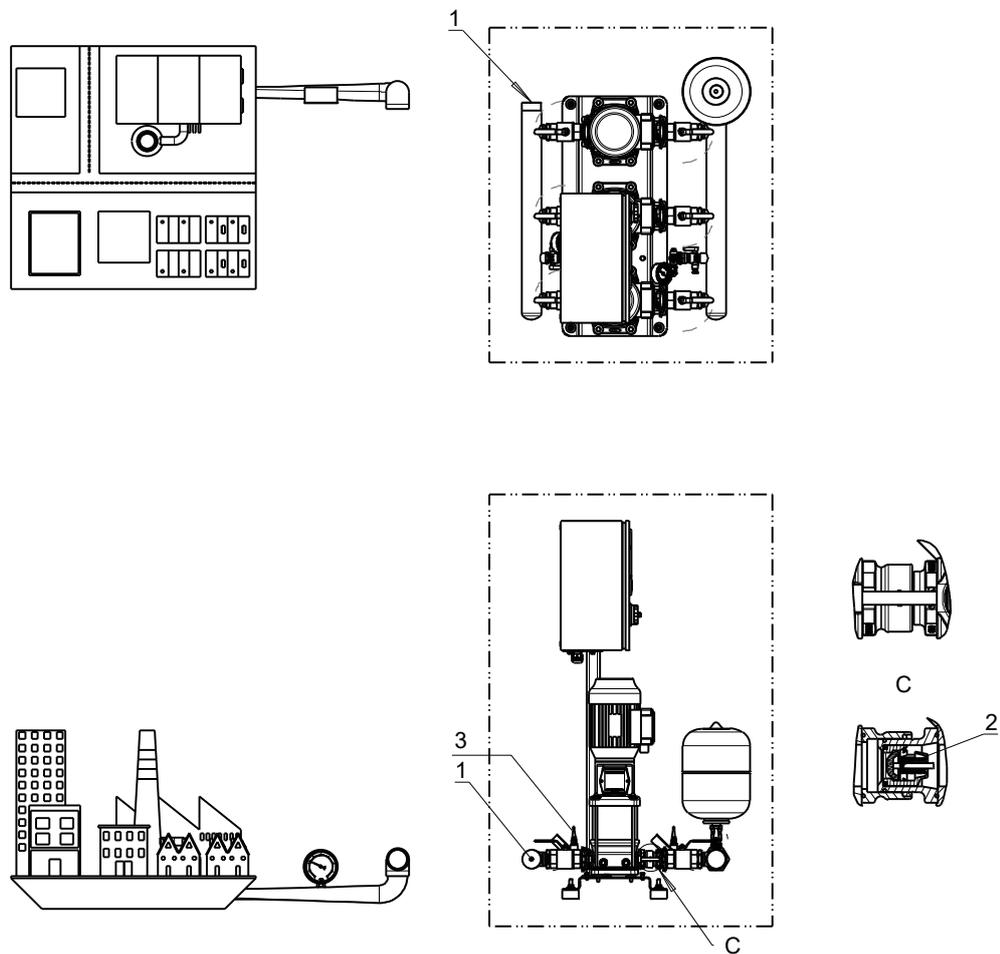


Fig. 10: Scope of supply for version M

1	Suction line (included in Duijvelaar Pompen B.V.'s scope of supply)
2	Lift check valve (included in Duijvelaar Pompen B.V.'s scope of supply)
3	Dry running protection (included in Duijvelaar Pompen B.V.'s scope of supply)

4.9.2 Inlet conditions, version F

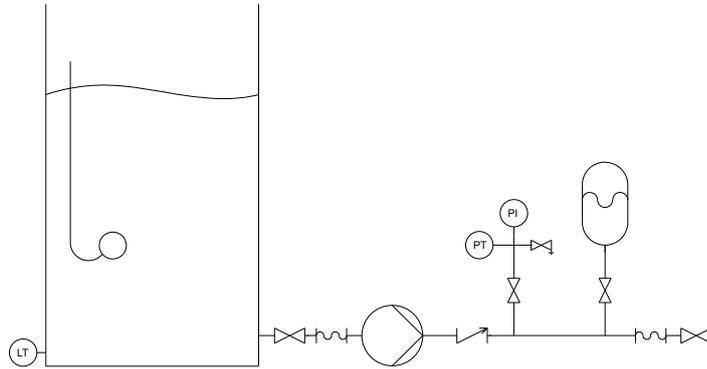


Fig. 11: F = Pressure booster system with break tank arranged on same level as pump, suction head operation

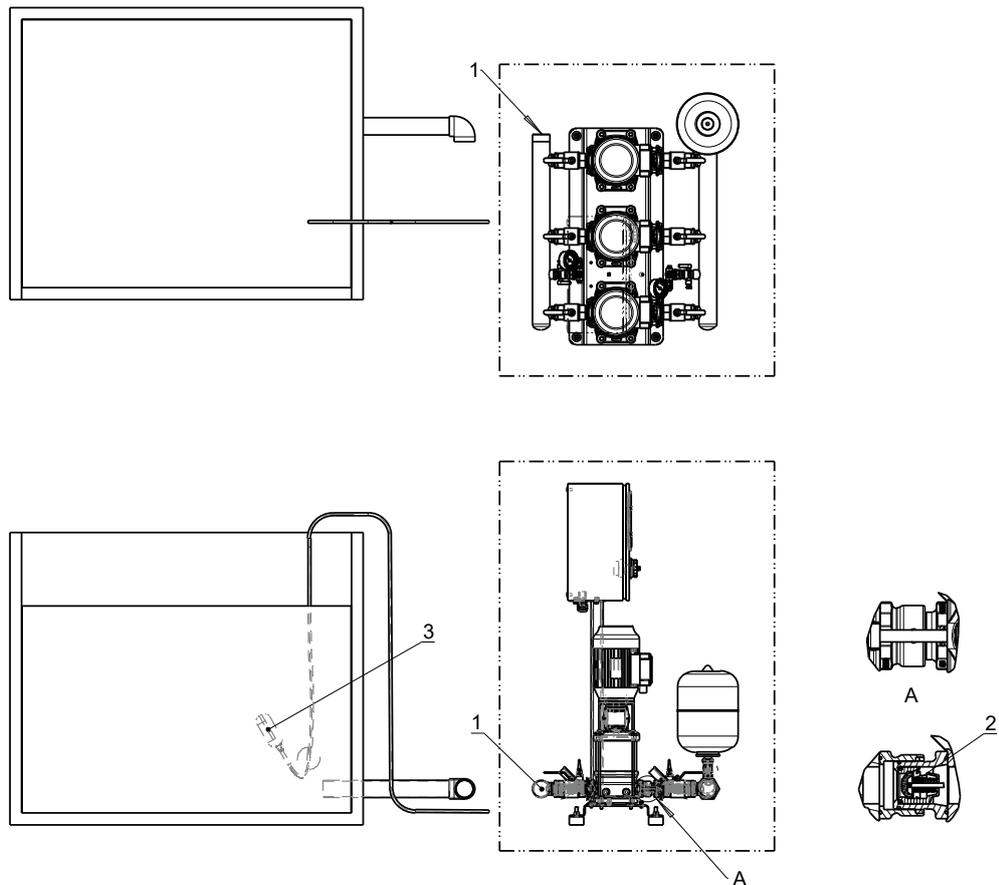


Fig. 12: Scope of supply, version F

1	Suction line (included in Duijvelaar Pompen B.V.'s scope of supply)
2	Lift check valve (included in Duijvelaar Pompen B.V.'s scope of supply)
3	Dry running protection (not included in Duijvelaar Pompen B.V.'s scope of supply)

4.9.3 Inlet conditions, version L

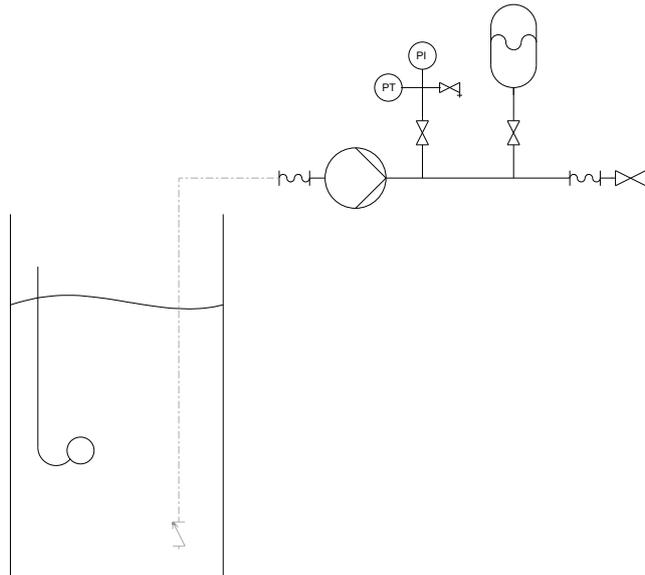


Fig. 13: L = Pressure booster system with break tank arranged at a lower level, suction lift operation

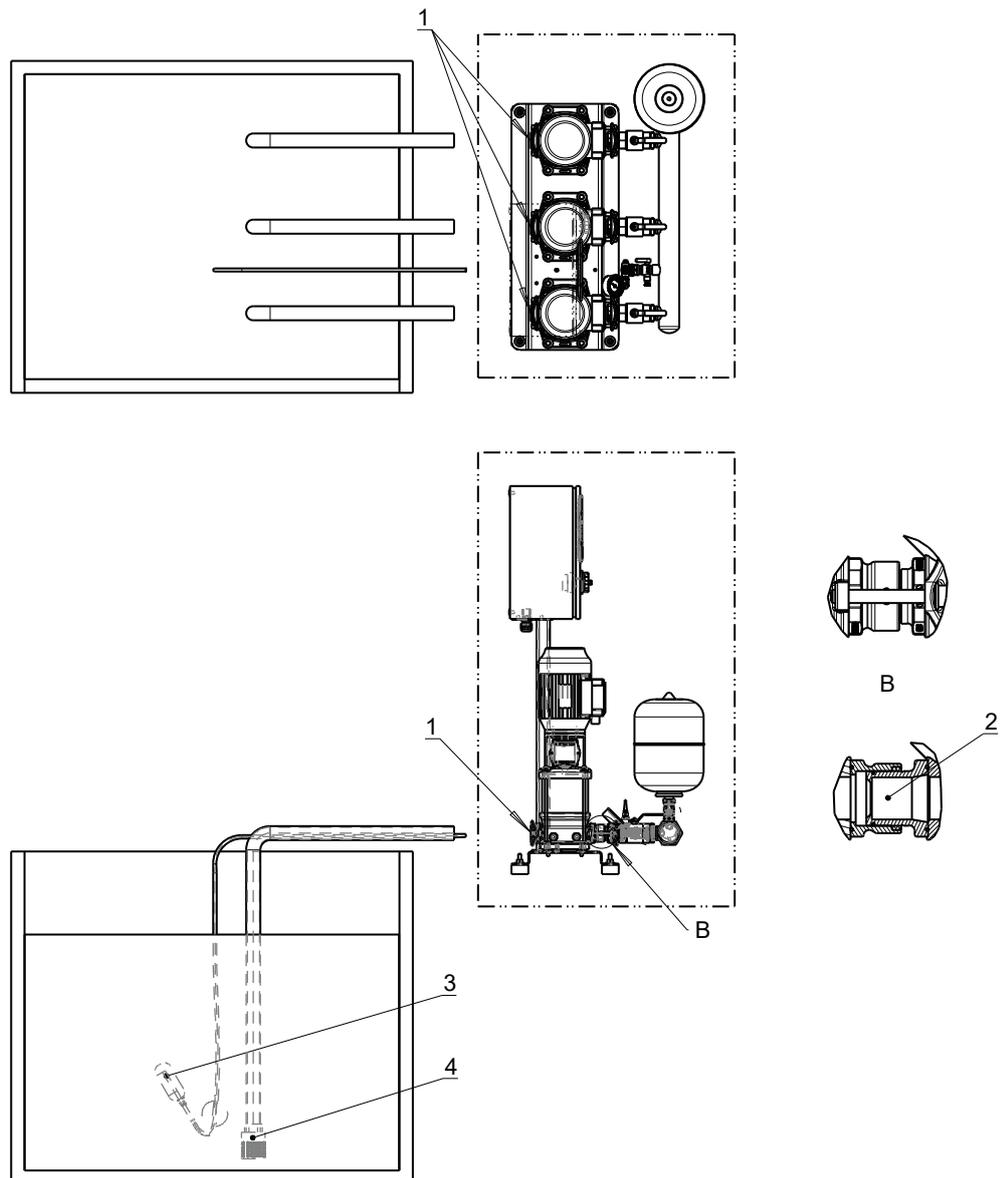


Fig. 14: Scope of supply, version L

1	Suction line (not included in Duijvelaar Pompen B.V.'s scope of supply)
2	Lift check valve (not included in Duijvelaar Pompen B.V.'s scope of supply)
3	Dry running protection (not included in Duijvelaar Pompen B.V.'s scope of supply)
4	Foot valve (not included in Duijvelaar Pompen B.V.'s scope of supply)

4.10 Dimensions and weights

For dimensions and weights refer to the outline drawing.

4.11 Terminal wiring diagram

For the terminal assignment refer to the circuit diagram.

4.12 Potential equalisation

A terminal marked with the earth symbol is provided at the power connection for connecting a PE conductor.

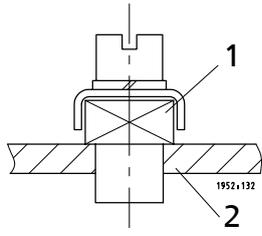


Fig. 15: PE connection

1	Earthing terminal	2	Location of power connection
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5 Installation at Site

5.1 Installation



WARNING

Installation on a mounting surface which is unsecured and cannot support the load

Personal injury and damage to property!

- ▷ Use a concrete of compressive strength class C12/15 which meets the requirements of exposure class X0 to EN 206 .
- ▷ The mounting surface must be set, even, and level.
- ▷ Observe the weights indicated.



NOTE

Do not install pressure booster systems next to sleeping or living quarters.



NOTE

The anti-vibration mounts provide adequate insulation against solid-borne noise.

Before beginning with the installation check the following:

- All structural work required has been checked and prepared in accordance with the dimensions in the outline drawing.
- The pressure booster system can be operated on the power supply network in accordance with the data on the name plate.
- The place of installation is frost-free.
- The place of installation can be locked.
- The place of installation is well-ventilated.
- The place of installation is well-lit.
- A suitably dimensioned drain connection (e.g. leading to a sewer) is available.
- If expansion joints are used, take note of their creep resistance. Expansion joints must be easily replaceable.

The pressure booster system is designed for a maximum ambient temperature of 0 °C to 30 °C at a relative humidity of 60 %.

5.2 Installing the pressure booster system



WARNING

Top-heavy pressure booster system

Risk of personal injury by pressure booster system tipping over!

- ▷ Pressure booster systems awaiting final installation must be secured against tipping over.
- ▷ Firmly anchor the pressure booster system.



NOTE

To prevent the transmission of piping forces and solid-borne noise, installing expansion joints with length-limiters is recommended.

For DPV 25, DPV 40, DPV 60, DPV 85 and DPV 125:

- ✓ The pressure booster system's packaging has been removed.
 - ✓ A suitable place of installation has been selected that meets the requirements.
 - ✓ Sufficient clearance in all directions is provided for servicing work.
1. Mark out the anchoring holes on the floor as shown in the outline drawing.
 2. Drill the holes (maximum diameter: 12 mm).
 3. Insert plug fixings of appropriate size.
 4. Place the pressure booster system in its correct installation position.
 5. Use suitable bolts to firmly anchor the pressure booster system.

For DPV 2, DPV 4, DPV 6, DPV 10 and DPV 15:

- ✓ The pressure booster system's packaging has been removed.
 - ✓ A suitable place of installation has been selected that meets the requirements.
 - ✓ Sufficient clearance in all directions is provided for servicing work.
1. Place the pressure booster system in its correct installation position.

5.3 Mounting the accumulator



CAUTION

Dirt in the pressure booster system

Damage to the pump sets!

- Clean the accumulator before filling it.

- ✓ The original operating manual of the pressure booster system is on hand.
1. Mechanically and electrically connect the accumulator in accordance with the original operating manual supplied.

5.4 Connecting the piping



CAUTION

Air pockets in suction line

Pressure booster system cannot prime!

- Lay the pipe with a continuously rising slope.

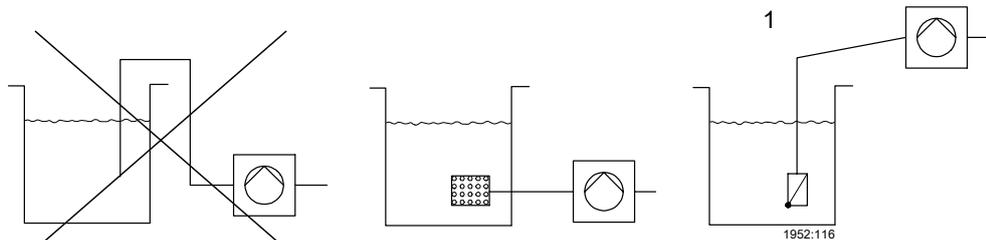


Fig. 16: Correct piping connection

1 | Suction lift operation

1. Mechanically support the suction head line on site to provide for absorption of mechanical forces.
2. Install the piping without transmitting any stresses and strains.
3. Connect the piping to the distribution lines on the inlet side and discharge side.

5.4.1 Fitting an expansion joint (optional)



DANGER

Sparks and radiant heat

Fire hazard!

- Take suitable precautions to protect the expansion joint if any welding work is carried out.



CAUTION

Leaking expansion joint

Flooding of installation room!

- Never use the expansion joint to compensate for misalignment or mismatch of the piping.
- Do not apply any paint to the expansion joint.
- Keep the expansion joint clean.
- Regularly check for cracks or blisters, exposed fabric or other defects.

- ✓ Sufficient clearance in all directions is provided for checking the expansion joint.
 - ✓ The expansion joint is not insulated along with the pipeline insulation.
1. Sufficient clearance in all directions is provided for checking the expansion joint.
 2. Install the expansion joint in the piping free of twist or distortion.
 3. Evenly tighten the bolts crosswise. The ends of the bolts must not protrude from the flange.

5.4.2 Fitting the pressure reducer (optional)



NOTE

A pipe length of approximately 600 mm must be provided on the inlet side to accommodate a pressure reducer, if necessary.



NOTE

A pressure reducer must be installed if the inlet pressure fluctuation is too high for the pressure booster system to operate as intended or if the total pressure (inlet pressure and shut-off head) exceeds the design pressure.

The inlet pressure (p_{in}) varies between 4 and 8 bar. A minimum pressure gradient of 5 m is required for the pressure reducer to function properly. This means that the pressure reducer must be mounted 5 m higher than the pressure booster system. The pressure drops by about 0.1 bar per metre of height difference. Alternatively, the pressure reducer can be subjected to a pressure of 0.5 bar.

Example $p_{in} = 4$ bar

Minimum pressure gradient = 5 m \pm 0.5 bar

Downstream pressure: 4 bar - 0.5 bar = 3.5 bar.

- ✓ A minimum pressure gradient of 5 m is available.
1. Install the pressure reducer in the pipe on the inlet side.

5.5 Electrical connection



⚠ DANGER

Electrical connection work by unqualified personnel

Danger of death from electric shock!

- ▷ Always have the electrical connections installed by a trained and qualified electrician.
- ▷ Observe regulations IEC 60364 .



⚠ WARNING

Incorrect connection to the mains

Damage to the power supply network, short circuit!

- ▷ Observe the technical specifications of the local energy supply companies.



NOTE

Installing a motor protection device is recommended.



NOTE

If a residual current device is installed, observe the operating manual for the frequency inverter.

Lightning protection

- Electrical installations must be protected against overvoltage (binding since 14 December 2018) (see DIN VDE 0100-443 (IEC 60364-4-44:2007/A1:2015, modified) and DIN VDE 0100-534 (IEC 60364-5-53:2001/A2:2015, modified)). Whenever modifications are made to existing installations, retrofitting a surge protective device (SPD) in accordance with VDE is mandatory.
- A maximum cable length of 10 metres should not be exceeded between the surge protective device (usually type 1, internal lightning protection) installed at the service entrance and the equipment to be protected. For longer cables, additional surge protective devices (type 2) must be provided in the sub-distribution board upstream of the equipment to be protected or directly in the equipment itself.
- The associated lightning protection concept must be provided by the operator or by a suitable provider commissioned by the operator. Surge protective devices can be offered for the control units on request.

Wiring diagram

The wiring diagrams are located in the control cabinet, which is where they must be stored. The product literature of the switchgear and controlgear assembly supplied with the system includes a list of the electrical components installed. When ordering spare parts for electrical components, always indicate the number of the wiring diagram.

Terminal assignment

For the terminal assignment refer to the wiring diagram.

5.5.1 Sizing the power cable

Determine the cross-section of the power cable based on the total rated power required.

5.5.2 Connecting the pressure booster system

- ✓ The pressure booster system can be operated on the power supply network in accordance with the data on the name plate.
- ✓ The wiring diagram is available.
- 1. Connect terminals L1, L2, L3, PE and N in accordance with the wiring plan.
- 2. Connect the potential equalisation conductor on the baseplate to the terminal with the earthing symbol.
 - ⇒ The earthing connection is located underneath the control cabinet. Optionally, a connection is located at the manifold.

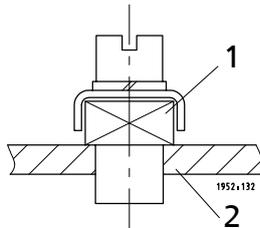


Fig. 17: Connecting the potential equalisation conductor

1	Earthing terminal	2	Baseplate
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- 3. Connect the remote ON/OFF input. [⇒ Section 5.5.3, Page 33]
- 4. Connect the dry running protection device. [⇒ Section 5.5.4, Page 33]

5.5.3 Connecting the remote ON/OFF input

- 1. Establish the connection in accordance with the wiring diagram.

5.5.4 Connecting the dry running protection device

- ✓ The original operating manual of the dry running protection device is on hand.
- 1. Fit the dry running protection device in accordance with the supplied original operating manual. Connect it in the control unit in accordance with the supplied original operating manual.

6 Commissioning/Start-up/Shutdown

6.1 Commissioning/Start-up

6.1.1 Prerequisites for commissioning/start-up



CAUTION

Pump set running dry

Damage to the pump set/pressure booster system!

- Use dry running protection. If the dry running protection terminal is disabled by means of a bridge, the operator shall assume responsibility for any dry running that might occur.

Ensure that the following requirements are met prior to commissioning/start-up :

- The pressure booster system has been flushed and disinfected in accordance with local requirements.
- The pressure booster system has been properly connected to the electric power supply and is equipped with all protection devices.
- All relevant VDE standards and/or regulations applicable in the country of use are complied with.
- The dry running protection device has been installed. [⇒ Section 5.5.4, Page 33]

6.1.2 Priming and venting the pressure booster system



CAUTION

Foreign matter in the piping

Damage to the pump / pressure booster system!

- Before commissioning/starting up or functional check running the pressure booster system, make sure that there is no foreign matter in the pressure booster system or piping.



CAUTION

Operation without the fluid to be handled

Damage to the pump sets!

- Prime the pressure booster system with the fluid to be handled.



NOTE

Prior to its delivery, the pressure booster system will be tested hydraulically with water and then drained again. For technical reasons the presence of some residual water is unavoidable.

Prior to commissioning/start-up observe EN 806. After prolonged standstill periods, flushing or professional disinfection is recommended. For extensive or branched piping systems, flushing the pressure booster system can be restricted to a limited area.



NOTE

Minor leakage of the mechanical seals during commissioning is normal and will cease after a short period of operation.

Have commissioning carried out by specialist Duijvelaar Pompen B.V. staff.

- ✓ The original operating manual of the pump set is on hand.
 - ✓ The pipe unions between the pump set and the piping have been re-tightened.
 - ✓ Flange connections have been firmly tightened.
 - ✓ The cooling air inlet openings and cooling air outlet openings at the motor are unobstructed.
 - ✓ All shut-off valves are open.
 - ✓ The pre-charge pressure of the accumulator has been checked.
[⇒ Section 8.3, Page 49]
 - ✓ The minimum flow rate has been observed. [⇒ Section 6.2.5, Page 38]
1. Set the master switch to 0; unlock all motor protection switches (if applicable).
 2. Provide connection to power supply.
 3. Open the vent plugs at the pump set in accordance with the supplied original operating manual of the pump set.
 4. Slowly open the inlet-side shut-off valve and prime the pressure booster system until the fluid to be handled escapes through the vent holes.
 5. Close and slightly tighten the pump vent plugs.
 6. Switch on all motor protection switches.
 7. If fitted, set the manual-0-automatic selector switches to “automatic”.
 8. Switch on the master switch.
 9. Open the discharge-side valve.
 10. When all pump sets have been run once, loosen the vent plugs again to let any remaining air escape while the pump is switched off.
 11. Close the vent plug.
 12. Check that the pump sets are running smoothly.
 13. Close the discharge-side valve in order to verify whether the pump sets reach the maximum shut-off head.
 14. Open the discharge-side valve.
 15. Set the dry running protection device.

6.1.3 Dry running protection

Pressure booster systems are fitted with a pressure transmitter as dry running protection device.

A float switch whose volt-free contact closes the circuit in upper float position can be connected to the control system as dry running protection. Follow the float switch manufacturer's instructions on how to set the float switch levels.

6.1.4 Start-up



NOTE

The pressure booster system is factory-set to the data indicated on the name plate.

- ✓ The pressure booster system has been primed and vented. [⇒ Section 6.1.2, Page 34]
1. Switch on the master switch.
- ⇒ The indicator lamp lights up, indicating the system's readiness for operation.

6.1.5 Checklist for commissioning/start-up

Table 10: Checklist

Steps to be carried out	Action	Done
1	Read the operating manual.	
2	Compare the power supply data against the name plate data.	
3	Check the earthing system/take measurements.	
4	Check the mechanical connection to the water mains. Re-tighten the flange and pipe unions.	
5	Prime and vent the pressure booster system from the inlet side.	
6	Check the inlet pressure.	
7	Check whether all cables are firmly connected to the terminals inside the control unit.	
8	Compare the settings of the motor protection switches with the name plate data and re-adjust if necessary.	
9	Check the start-up pressure and the stop pressure; re-adjust if necessary.	
10	Test the proper function of the dry running protection equipment. If not fitted, make a relevant note in the commissioning report.	
11	After the pump sets have been running for 5 to 10 minutes, vent them again.	
12	Set all switches to automatic.	
13	Check the pre-charge pressure.	
14	Enter any deviations from the name plate or order documentation in the commissioning report.	
15	Complete the commissioning report together with the operator/user and instruct the operator/user as to the function of the unit.	

6.2 Operating limits



⚠ DANGER

Non-compliance with operating limits

Damage to the pump set!

- Comply with the operating data indicated in the data sheet.
- Avoid operation against a closed shut-off element.
- Never operate the pump set outside the limits specified below.



⚠ DANGER

Non-compliance with operating limits for the fluid handled

Explosion hazard!

- Never use the pump to handle different fluids which might react chemically with each other.
- Never use the pump to handle a flammable fluid with a fluid temperature above the ignition temperature.

6.2.1 Frequency of starts

To prevent high temperature increases in the motor and impermissible loads on the pump, motor, seals and bearings, do not exceed a certain number of starts per hour. See original operating manual of the pump sets.

6.2.2 Ambient temperatures

Observe the following parameters and values during operation:

Table 11: Permissible ambient conditions

Ambient condition	Value
Ambient temperature	0 °C to +30 °C
Relative humidity	50 % maximum

6.2.3 Maximum operating pressure



CAUTION

Permissible operating pressure exceeded

Damage to connections and seals!

- Never exceed the operating pressure specified in the data sheet.

The maximum operating pressure equals 16, 25 or 40 bar, depending on the design variant. See name plate.

6.2.4 Fluid handled

6.2.4.1 Permissible fluids to be handled

- Clean fluids not chemically or mechanically aggressive to the pump materials
- Drinking water
- Service water
- Cooling water

6.2.4.2 Fluid temperature

Table 12: Temperature limits of the fluid handled

Permissible fluid temperature	Value
Maximum	+60 °C +25 °C to DIN 1988 (DVGW) ²
Minimum	0 °C

6.2.5 Minimum flow rate

Table 13: Minimum flow rate per pump in manual mode

Size	Minimum flow rate per pump
	[l/h]
DPV 2	200
DPV 4	400
DPV 6	600
DPV 10	1100
DPV 15	1900
DPV 25	2800
DPV 40	4600
DPV 60	6100
DPV 85	8500
DPV 125	12500

6.3 Shutdown

6.3.1 Stopping

1. Set the master switch to 0.
2. Set the manual-0-automatic selector switch to 0.

² Applies to the handling of drinking water (Germany and the Netherlands only)

6.3.2 Measures to be taken for shutdown

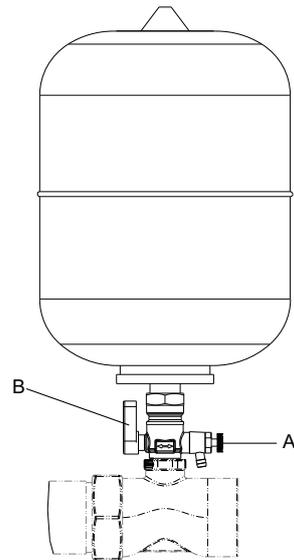


Fig. 18: Venting and draining the accumulator

A	Vent plug
B	Ball valve lever

- ✓ The pressure booster system has been switched off.
- 1. Turn the ball valve lever B by 45 degrees.
- 2. Open vent plug A at the accumulator.
 - ⇒ The pressure booster system is being vented and drained.
- 3. Close vent plug A at the accumulator.
- 4. Turn the ball valve lever B back into open position (upwards).

7 Operation

7.1 Control panel

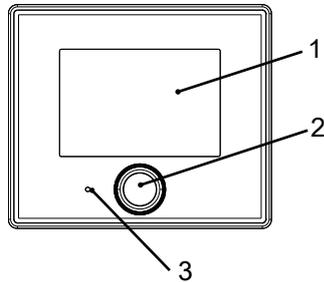


Fig. 19: Control panel

1	Screen [⇒ Section 7.1.1, Page 40]
2	Turn/push button [⇒ Section 7.1.2, Page 40]
3	Status LED [⇒ Section 7.1.3, Page 40]

7.1.1 Screen

To save power the screen is turned off automatically.

To turn on the screen push or turn the turn/push button arranged below the screen.

If a message is active, the screen also lights up and displays the current message ID as well as the system status.

7.1.2 Turn/push button

The turn/push button serves to make a selection on the screen. The initial movement of the turn/push button activates its function. The symbol selected on the screen flashes briefly.

Starting point The starting symbol is always the lock/unlock symbol.

Turning the turn/push button Turning the turn/push button makes all selectable symbols flash one after the other in a specific sequence, depending on the system configuration.

After the flashing cycle of all selectable symbols has been completed, the selection returns to the lock/unlock symbol.

To increase a value turn the turn/push button clockwise. To decrease a value turn the turn/push button anti-clockwise.

Pressing the turn/push button A selected symbol can be confirmed by pressing the turn/push button.

Depending on the symbol, a setting is displayed or a selection can be made.

7.1.3 Status LED

When the screen is not lit, the status LED shows that the system is energised and that the control unit is in operation. The LED is only lit when the screen is not. Based on a traffic light system, the colour indicates the system status.

Table 14: Explanation of the status LED

Colour of the status LED	Description
	Green (flashing) System in operation, no messages are active.
	Green (continuous) One or more information messages are active.
	Yellow (continuous) One or more warning messages are active (as well as any messages of a lower priority).
	Red (continuous) One or more alert messages are active (as well as any messages of a lower priority).

7.2 Symbols on the screen

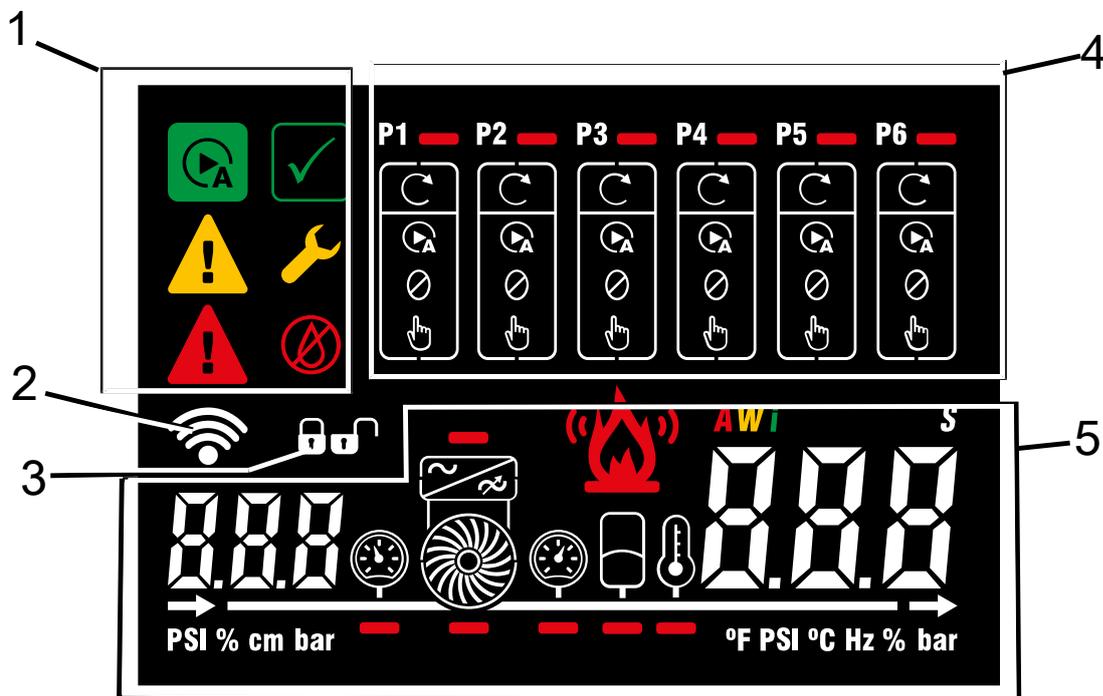


Fig. 20: Overview of all symbols on the screen

1	Operating status of the system [⇒ Section 7.2.1, Page 42]	2	Status of the Bluetooth connection
3	Locking/unlocking the screen	4	Operating status of the pump
5	Information on the system		

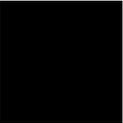
7.2.1 Operating status of the system

Table 15: Symbols for the operating status of the system

Symbol		Description
	Status OK	No warning messages or alert messages are active. Information messages may be present. The system is running without any problems.
	Warning	One or more warning messages are active (as well as any messages of a lower priority).
	Alert	One or more alert messages are active (as well as any messages of a lower priority).
	Manual reset possible	A message is active, waiting to be manually reset by the operator. To manually reset the message, unlock the display and select this symbol.
	Servicing required	The service interval timer has detected that the control unit has not been serviced within the defined interval.
	Lack of water	Lack of water has been detected. For more information see Section 11, list of messages, message 800.

7.2.2 Bluetooth connection

Table 16: Bluetooth connection status symbols

Symbol		Description
 Flashing	Looking for Bluetooth connection	The control unit has activated the wireless connection and is waiting for a request for connection.
 Continuous	Connected to the Bluetooth connection of a smartphone or tablet	The control unit is currently connected.
	Bluetooth connection disabled	The Bluetooth connection has been disabled. To activate it, press the turn/push button for five seconds.

7.2.3 Locking/unlocking the screen

Table 17: Symbols for locking/unlocking the screen

Symbol		Description
	Screen settings locked	No settings can be made but information can still be displayed, e.g. pump load. Error messages are limited to the selected part.
	Screen settings unlocked	Changes can be made on the screen.

7.2.4 Operating status of the pump

The following symbols are displayed per pump set in the system. E.g. for a system with four pump sets, P1, P2, P3 and P4 are displayed.

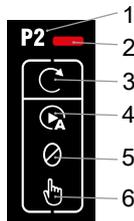


Fig. 21: Operating status of pump set P2

Table 18: Pump operating status symbols

Position	Refers to	Description
1	Pump set in the system	Symbols for a specific pump set (in this example pump set 2)
2	Active messages	One or more warning messages or alert messages are active for pump set 2.
3	Pump set running	Indicates whether the pump set is currently running. This symbol is extinguishes when the pump set has been stopped or is in idle state.
4	Automatic mode	The pump set is started up and stopped via the control unit (F system) or via a frequency inverter (VC and SVP systems).
5	Manual OFF	Pump start-up is locked. If a pump set is running, it will be stopped.
6	Manual ON	The pump set is started up manually. In the case of an F system, the pump is started up. In the case of a VC or SVP system, the pump starts running at a fixed frequency (fixed speed). The fixed frequency can be configured.

7.2.5 Information on the system

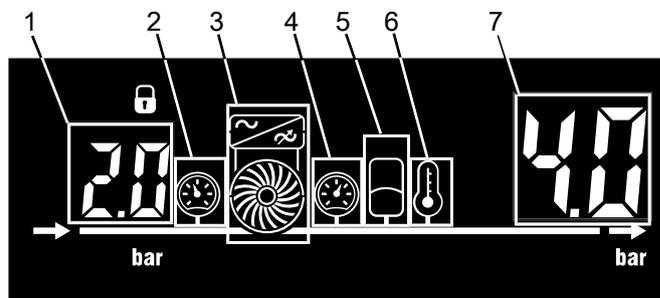


Fig. 22: Information on the system

Table 19: Symbols for information on the system

Position	Refers to	Description
1	Display for suction-side sensors	<p>Depending on the connected sensors the following values are displayed:</p> <ul style="list-style-type: none"> - Version with pressure gauge: Displays the pressure at the inlet of the pressure booster system. - Version with pressure switch / float switch / flow monitor: Displays the digital input signal Hi or Lo. <p>If several sensors are used, the values are displayed alternately.</p> <ul style="list-style-type: none"> - PIN display <ul style="list-style-type: none"> - For connecting the control unit to the mobile device. (The complete PIN is composed of this PIN and the PIN in position 7.) - Display of the firmware version (The total firmware version is composed of the numbers in this position and in position 7.)
2	Suction-side sensor	<p>The corresponding values are shown in position 1. The corresponding messages are shown in position 7.</p>
3	Display for the pump(s)	<p>If applicable, a frequency inverter is displayed in the upper area.</p> <ul style="list-style-type: none"> - The corresponding messages are shown in position 7. <p>The pump is displayed in the lower area. The impeller vanes of the pump displayed rotate when one or several pump sets in the system are running.</p> <ul style="list-style-type: none"> - The corresponding messages are shown in position 7.
4	Discharge-side sensor	The corresponding values and messages are shown in position 7.
5	Accumulator	The corresponding messages are shown in position 7.
6	Temperature measurement	The corresponding values and messages are shown in position 7.
7	Display for the discharge side	<ul style="list-style-type: none"> - Displays information on the selected pump set <ul style="list-style-type: none"> - Pump load - Pump speed - Pump-specific messages - Displays information on the pressure booster system <ul style="list-style-type: none"> - Discharge-side pressure - Temperature - Messages - PIN display <ul style="list-style-type: none"> - For connecting the control unit to the mobile device. (The complete PIN is composed of this PIN and the PIN in position 1.) - When the screen is unlocked - Display of the firmware version. (The complete firmware version is composed of this number and the number in position 1)

7.3 Operating the device via the control panel

The following functions are available on the control panel of the control unit:

- Unlocking the screen [⇒ Section 7.3.1, Page 45]
- Changing the operating mode [⇒ Section 7.3.2, Page 45]
- Resetting messages [⇒ Section 7.3.3, Page 45]
- Setting the setpoint [⇒ Section 7.3.4, Page 45]
- Activating the Bluetooth connection [⇒ Section 7.3.5, Page 46]
- Displaying the firmware version [⇒ Section 7.3.6, Page 46]

7.3.1 Unlocking the screen

When the screen is locked, no settings can be made. In this state, only information can be displayed.

1. Turn the turn/push button to select the *Locking/unlocking the screen* symbol. Then press the turn/push button.
 - ⇒ The symbol flashes.
2. Turn the turn/push button to select the *Open padlock* symbol. Then press the turn/push button.
3. Set the password to unlock the screen in the bottom right of the display. To do so, turn the turn/push button to select the required number for each digit. Press the turn/push button to confirm.



NOTE

The factory default password for unlocking the screen is 100. It can be changed via the app.

7.3.2 Changing the operating mode

- ✓ The screen has been unlocked. [⇒ Section 7.3.1, Page 45]
1. Select the symbol of the required pump, e.g. *Pump 1*. Press the turn/push button.
 - ⇒ The symbol of the current operating mode of this pump set starts flashing.
 2. Turn the turn/push button to select the symbol of the required operating mode.
 3. Press the turn/push button to confirm your selection.



Fig. 23: Information on the pump

7.3.3 Resetting messages

If a message is active for a part of the pressure booster system, a red bar is displayed next to the corresponding symbol.

If a message is active, the corresponding ID is displayed at the bottom right. [⇒ Section 10.3, Page 82] If several messages are active, the corresponding IDs are displayed alternately.

All messages can be reset at once via the control unit.

If individual messages need to be reset, this can only be done via the app.

- ✓ The screen has been unlocked. [⇒ Section 7.3.1, Page 45]
1. Select the *Manual reset possible* symbol. Press the turn/push button.
 - ⇒ All active messages are reset.

Messages that need to be reset manually can only be reset when their cause has been eliminated.

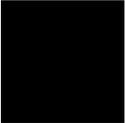
7.3.4 Setting the setpoint

The setpoint serves to select the required discharge-side pressure. The setpoint has to be set at the discharge-side sensor. [⇒ Section 7.2.5, Page 43]

- ✓ The screen has been unlocked. [⇒ Section 7.3.1, Page 45]
1. Select the *Discharge-side sensor* symbol. Press the turn/push button.
 - ⇒ Position 7 flashes and displays an S as well as the current setpoint.
 2. Turn the turn/push button to adjust the displayed setpoint in increments of 0.1.
 3. Press the turn/push button to confirm the displayed setpoint.

7.3.5 Activating the Bluetooth connection

Table 20: Bluetooth connection status symbols

Symbol		Description
 Flashing	Looking for Bluetooth connection	The control unit has activated the wireless connection and is waiting for a request for connection.
 Continuous	Connected to the Bluetooth connection of a smartphone or tablet	The control unit is currently connected.
	Bluetooth connection disabled	The Bluetooth connection has been disabled. To activate it, press the turn/push button for five seconds.

1. Press the turn/push button for a minimum of 5 seconds.

⇒ The *Bluetooth connection* symbol flashes. [⇒ Section 7.2.2, Page 42]

While the *Bluetooth connection* symbol flashes, the control unit can be connected to a wireless device.

An existing connection is displayed by a continuously lit *Bluetooth connection* symbol on the screen.

If no connection is established, the flashing *Bluetooth connection* symbol extinguishes after some time.

7.3.6 Displaying the firmware version

To display the firmware version [⇒ Section 7.2.5, Page 43] , proceed as follows.

1. Turn the turn/push button to select the *Locking/unlocking the screen* symbol. Then press the turn/push button.
 - ⇒ The symbol flashes.
2. Turn the turn/push button to select the *Servicing required* symbol.
 - ⇒ The firmware version is displayed on the bottom left and bottom right.

7.4 Operation via the app

Further configurations can only be made via the DP-Control app.

The app is available in the App Store or Google Play.

8 Servicing/Maintenance

8.1 General information/safety regulations



⚠ DANGER

Unintentional start-up of pressure booster system

Danger to life!

- De-energise the pressure booster system for any repair work or servicing work.
- Ensure that the pressure booster system cannot be re-energised unintentionally.



⚠ WARNING

Improper lifting/moving of heavy assemblies or components

Personal injury and damage to property!

- Use suitable transport devices, lifting equipment and lifting tackle to move heavy assemblies or components.



⚠ WARNING

Unqualified personnel performing work on the pressure booster system

Risk of personal injury!

- Always have repair and maintenance work performed by specially trained, qualified personnel.



CAUTION

Incorrectly serviced pressure booster system

Function of pressure booster system not guaranteed!

- Regularly service the pressure booster system.
- Prepare a maintenance schedule for the pressure booster system, with special emphasis on lubricants, shaft seals and pump couplings.

The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual.

- Observe the safety instructions and information.
- For any work on the pump (set) observe the operating manual of the pump (set).
- In the event of damage you can always contact Duijvelaar Pompen B.V. Service.
- A regular maintenance schedule will help avoid expensive repairs and contribute to trouble-free, reliable operation with a minimum of maintenance expenditure and work.
- Never use force when dismantling and reassembling the equipment.

8.1.1 Inspection contract

For inspection work and servicing work we recommend the Duijvelaar Pompen B.V. inspection contract. Contact your service partner for details.

8.2 Servicing/inspection

8.2.1 Supervision of operation



CAUTION

Increased wear due to dry running

Damage to the pump set!

- ▷ Never operate the pump set without liquid fill.
- ▷ Never close the shut-off element in the suction line and/or supply line during pump operation.



CAUTION

Impermissibly high temperature of fluid handled

Damage to the pump!

- ▷ Prolonged operation against a closed shut-off element is not permitted (heating up of the fluid).
- ▷ Observe the temperature limits in the data sheet and in the section on operating limits.

While the pump is in operation, observe and check the following:

- If activated, check the functional check run.
- Measure the actual start-up pressure and stop pressure of the pump sets with a pressure gauge. Compare the values with the specifications on the name plate.
- Compare the pre-charge pressure of the accumulator with the recommended data. [⇒ Section 8.3, Page 49]
- Check the rolling element bearings for running noises. Vibrations, noise and an increase in current input occurring during unchanged operating conditions indicate wear.
- Monitor the functions of auxiliary connections, if any.

8.2.2 Maintenance schedule

Table 21: Overview of maintenance work

Maintenance interval	Servicing/maintenance work
At least once a year	Check the pump sets for smooth running. Check the mechanical seal for integrity.
	Check the shut-off elements, drain valves and check valves for proper functioning and tightness.
	If fitted, clean the strainer in the pressure reducer.
	If fitted, check the expansion joints for any wear.
	Verify the pre-charge pressure. Check the accumulator for integrity. [⇒ Section 8.3, Page 49]
	Check the automatic switching functionality.
	Check the cut-in levels and cut-out levels.
	Check the inflow, inlet pressure, dry running protection and pressure reducer.

8.3 Setting the pre-charge pressure



WARNING

Wrong gas

Danger of poisoning!

- ▷ Use only nitrogen as cushion gas of the membrane-type accumulator.



CAUTION

Pre-charge pressure too high

Damage to the accumulator!

- ▷ Observe the manufacturer's product literature (see name plate or operating manual of the accumulator).

The accumulator's pre-charge pressure (p) must be lower than the set start-up pressure (p_E) of the pressure booster system.

The best storage volumes are achieved with the following settings (mean value):

- Value 0.9 at start-up pressure > 3 bar
- Value 0.8 at start-up pressure < 3 bar

Example 1 $p_E = 5$ bar

$$5 \text{ bar} \times 0.9 = 4.5 \text{ bar}$$

With a start-up pressure of 5 bar the pre-charge pressure of the accumulator must be 4.5 bar.

Example 2 $p_E = 2$ bar

$$2 \text{ bar} \times 0.8 = 1.6 \text{ bar}$$

With a start-up pressure of 2 bar the pre-charge pressure of the accumulator must be 1.6 bar.

Checking the pre-charge pressure

1. Close the shut-off elements fitted underneath the membrane-type accumulator.
2. Drain the membrane-type accumulator via the drain valve.
3. Remove and store the protective cap of the membrane-type accumulator valve.
4. Check the pre-charge pressure using suitable equipment (e.g. tyre pressure gauge).
5. Fit the protective cap of the membrane-type accumulator valve.

Filling the membrane-type accumulator

1. Remove and store the protective cap of the membrane-type accumulator valve.
2. Add nitrogen through the valve.
3. Fit the protective cap of the membrane-type accumulator valve.

8.4 Resetting dry running protection

If no flow is detected on the suction side and the pressure on the pressure side drops below the set value, the flow monitor stops the pressure booster system (lack of water). Depending on the system design, dry running protection must be reset manually.

Pressure switch and pressure transmitter

If dry running protection devices are available in the form of pressure switches or pressure transmitters, the system is reset automatically (self-reset).

Flow monitor To reset the dry running protection, set at least one pump set to manual mode.

Resetting via manual-0-automatic selector switch

1. Set the manual-0-automatic selector switch to manual for approx. 10 seconds.

Resetting via frequency inverter

- ✓ The original operating manual of the frequency inverter is on hand.
1. Set the pump set to manual mode for approx. 10 seconds via the frequency inverter's control unit. See the original operating manual of the frequency inverter.

9 Trouble-shooting

9.1 Trouble-shooting: pressure booster system



WARNING

Improper work to remedy faults

Risk of injury!

- For any work performed to remedy faults, observe the relevant information given in this operating manual and/or in the product literature provided by the accessories manufacturer.



NOTE

Please contact Duijvelaar Pompen B.V. Service before carrying out any work on the pump's internal parts during the warranty period. Non-compliance will lead to forfeiture of warranty cover and of any and all rights to claims for damages.

If problems occur that are not described in the following table, consultation with the Duijvelaar Pompen B.V. service is required.

- A Pressure booster system cuts out.
- B Pressure fluctuations on the discharge side.
- C Pressure booster system does not start up.
- D Pump running but not delivering water.
- E Insufficient delivery of pressure booster system.
- F Discharge-side pressure too low.
- G Discharge-side pressure too high.
- H Leakage at mechanical seal.
- I Motor/pump overheated.
- J Motor protection switch triggered.
- K Pressure booster system does not stop.
- L Excessive starting/stopping of pressure booster system.
- M Motor overheated.

Table 22: Trouble-shooting

A	B	C	D	E	F	G	H	I	J	K	L	M	Possible cause	Remedy ³⁾
X	-	X	-	-	-	-	-	-	-	-	-	-	Dry-running protection device not connected	Connect or bridge.
X	-	X	-	-	-	-	-	-	-	-	-	-	Mains supply interrupted	Check and remedy defect if possible.
X	-	X	-	-	-	-	-	-	X	-	-	X	Phase failure	Check individual phases and fuse.
X	-	X	-	-	-	-	-	-	X	-	-	X	Motor protection switch triggered or set incorrectly / pump seized.	Compare setting with the motor's rating plate data and set accordingly. Press reset key.
X	-	X	-	-	-	-	-	-	-	-	-	-	Control current fuse tripped.	Check control current fuse. Replace if required.
-	-	X	-	-	-	-	-	-	-	-	-	-	Lack of water	Check inlet pressure.
-	-	X	-	-	-	X	-	-	-	-	-	-	Inlet pressure higher than specified in the purchase order	Fit pressure reducer; contact the manufacturer.
-	-	-	-	X	X	X	-	X	X	X	-	-	Incorrect power supply; incorrect speed.	Check the mains power supply.

³⁾ Before any work on pressure-retaining components, release the pump set pressure and de-energise the pump set.

A	B	C	D	E	F	G	H	I	J	K	L	M	Possible cause	Remedy ³⁾
-	X	X	X	X	X	-	-	X	-	-	X	X	Shut-off valves fully or partially closed	Check, open as necessary.
-	-	-	X	X	-	-	-	X	-	X	-	X	Pump / piping not completely vented and/or primed.	Vent and prime.
-	-	-	X	X	X	-	-	X	X	X	-	X	Check valve in bypass line defective	Replace.
-	-	-	-	-	X	-	-	-	-	-	-	-	Insufficient inflow	Restore normal inflow. Connect accumulator.
-	-	-	-	-	X	-	-	X	X	-	-	X	Pump runs sluggishly.	Have pump repaired by a specialist.
-	-	-	-	-	-	-	X	-	-	-	-	-	Defective mechanical seal	Replace.
-	-	X	-	-	-	-	-	X	-	-	-	X	Incorrect pre-charge pressure of accumulator	Set correct pre-charge pressure. Replace membrane.
X	-	X	X	-	-	-	-	-	X	X	-	-	Inlet-side pressure switch defective or set incorrectly.	Check the value set at the pressure switch; adjust if required.
-	-	-	-	-	-	-	-	X	-	X	X	X	Defective time relay or time set incorrectly.	Check time relay. Correct minimum operating time if required.
-	-	-	-	-	-	-	-	-	-	-	-	X	System leaking.	Restore system integrity.
-	-	X	-	-	X	X	-	-	-	X	X	-	Discharge-side pressure switch defective or set incorrectly.	Check the value set at the pressure switch; adjust if required.
X	-	-	-	-	-	-	-	-	X	-	-	-	Intermittent voltage fluctuations	Press reset/fault acknowledgement key.
-	-	-	X	-	-	-	-	X	X	-	-	X	Defective check valve	Check and replace if necessary.
-	-	-	X	X	X	-	-	X	-	X	-	-	Pump running in the wrong direction of rotation.	Interchange two of the phases of the power supply.
-	-	-	X	-	X	-	-	-	-	X	X	-	Inlet pressure lower than specified in the purchase order	Connect suction-side inlet tank. Contact the manufacturer.
-	X	-	-	-	X	-	-	-	X	X	-	-	Water extraction higher than specified in the purchase order	Contact the manufacturer.

9.2 Trouble-shooting: frequency inverter



⚠ WARNING

Improper work to remedy faults

Risk of injury!

- ▷ For any work performed to remedy faults, observe the relevant information given in this operating manual and/or in the product literature provided by the accessories manufacturer.

If problems occur that are not described in the following table, consultation with the Duijvelaar Pompen B.V. service is required.

- A Mains fuse rating too small for the nominal mains current.
- B Motor does not start.
- C Motor running unevenly.
- D Max. speed not reached.
- E Motor running at maximum speed only.
- F Motor running at minimum speed only.
- G No/faulty 24 V supply.
- H Wrong direction of rotation of the motor.
- I Fault message/protective tripping.

Table 23: Trouble-shooting

A	B	C	D	E	F	G	H	I	Possible cause	Remedy
-	X	-	-	-	-	X	-	-	No voltage	Check the mains voltage; check the mains fuses.
-	X	-	-	-	-	-	-	-	No enable	Check enable via DIGIN-EN and system start.
X	-	-	-	-	-	-	-	-	Mains fuse rating too small for frequency inverter input current	Check configuration/selection of mains fuse.
-	-	-	X	-	-	-	-	-	No setpoint signal or setpoint set too low / drive overloaded and in i ² t control mode	Check setpoint signal and operating point.
-	-	-	-	X	-	-	-	-	Process-related persistent control deviation (actual value smaller than setpoint) or no actual value (e.g. due to broken wire)	Check setpoint signal/actual value signal. Check operating point. Check controller setting.
-	X	-	-	-	-	-	-	X	Permissible voltage range under-shot/exceeded	Check mains voltage; supply frequency inverter with required voltage.
-	-	-	-	-	-	-	X	-	Wrong direction of rotation setting	Change the direction of rotation.
-	-	X	X	-	-	-	-	X	Frequency inverter overloaded	Reduce the power input by lowering the speed; check the motor/pump for blockages.
-	X	-	-	-	-	-	-	X	Short circuit in control cable/pump blocked	Check/replace control cable connections. Remove the blockage manually.
-	-	X	X	-	-	-	-	X	Temperature of power electronics or stator winding too high	Reduce the ambient temperature. <ul style="list-style-type: none"> - Improve ventilation. - Clean cooling fins. - Ensure that the intake opening for the fans is not blocked. - Ensure that the fans are working properly. - Reduce the power input by changing the operating point (system-specific). - Check the permissible load and, if necessary, use external cooling.
-	-	-	-	-	-	X	-	X	24 V supply overloaded	Disconnect frequency inverter from the power supply and eliminate the cause of the overload.

A	B	C	D	E	F	G	H	I	Possible cause	Remedy
-	-	-	-	-	-	-	-	X	Dry running	Check the hydraulic system and rectify the fault on the frequency inverter.
-	-	-	X	-	X	-	-	X	Sensor signal error (e.g. broken wire)	Check sensor and sensor cable.
-	X	X	-	-	-	-	-	X	Phase failure (drive)	Check motor connection and stator winding.

10 Related Documents

10.1 General arrangement drawings with list of components

10.1.1 Hydro-Unit Utility Line with DPV 2, 4, 6, 10, 15

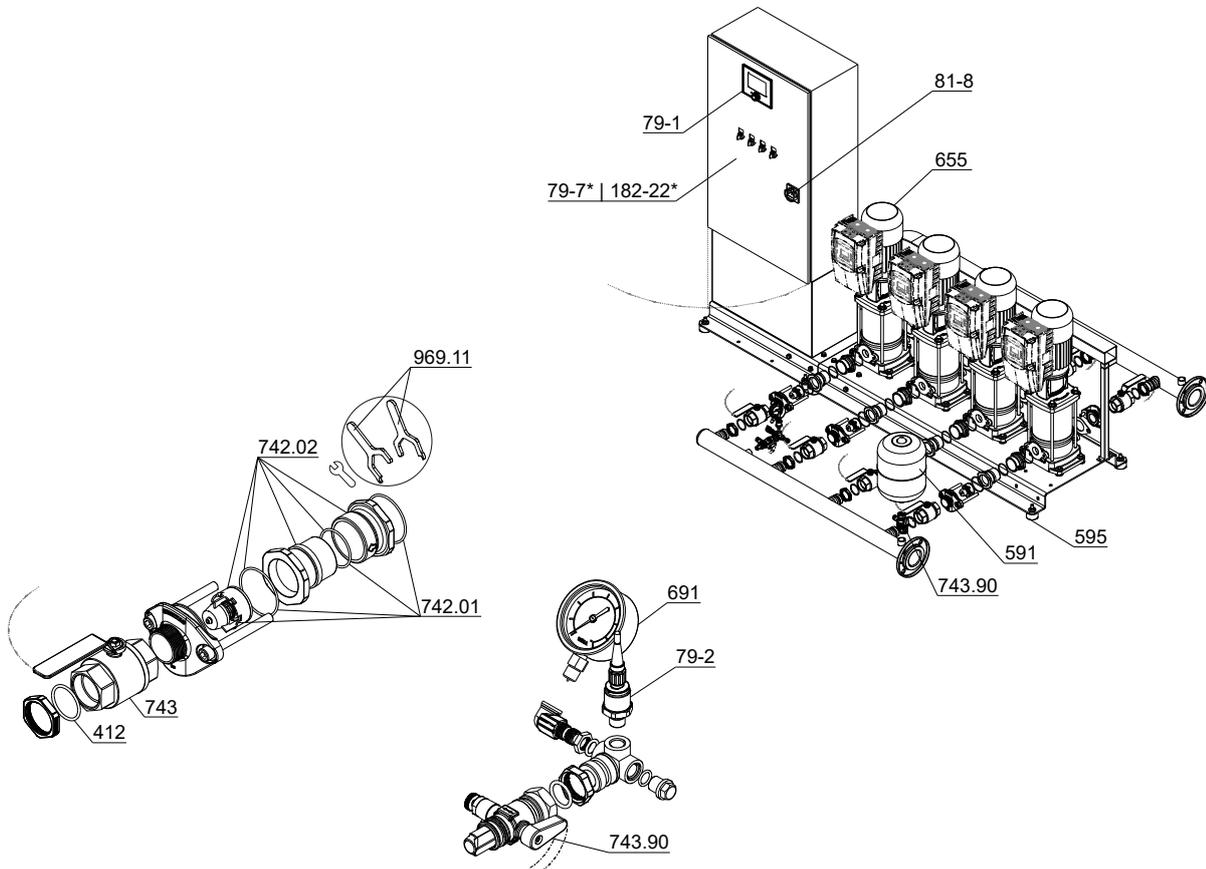


Fig. 24: Utility Line F/VC/SVP with DPV 2, 4, 6, 10, 15

Table 24: List of components

Part No.	Description	Part No.	Description
79-1	Automatic control unit	595	Anti-vibration pad
79-2	Measuring transducer	655	Pump
79-7	Display for Danfoss frequency inverter (* in control cabinet, only for Utility Line VC)	691	Pressure gauge
81-8	Kit-Master switch	742.01/.02	Lift check valve
182-22	Gateways for BACnet and Profibus (* in control cabinet)	743/743.90	Ball valve
412	O-ring	969.11	Tool
591	Membrane-type accumulator		

The individual parts of the pump set are shown in the product literature of the pump set.

10.1.2 Hydro-Unit Utility Line with DPV 25, 40, 60, 85, 125

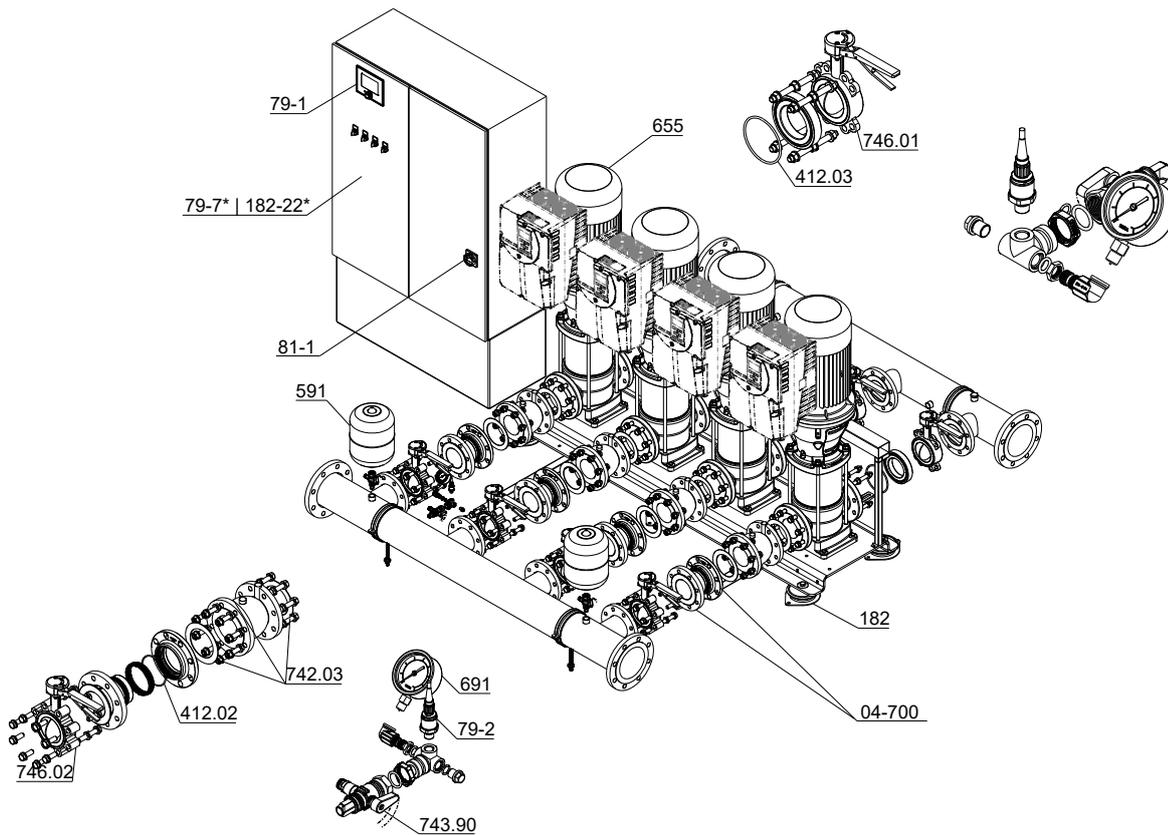


Fig. 25: Utility Line F/VC/SVP with DPV 25, 40, 60, 85 and DPV 125

Table 25: List of components

Part No.	Description	Part No.	Description
04-700	Flexible flange	412.02/03	O-ring
79-1	Automatic control unit	591	Membrane-type accumulator
79-2	Measuring transducer	655	Pump
79-7	Display for Danfoss frequency inverter (* in control cabinet, only for Utility Line VC)	691	Pressure gauge
81-1	Kit-Master switch	742.03	Lift check valve
182	Foot	743.90	Ball valve
182-22	Gateways for BACnet and Profibus (* in control cabinet)	746.01/02	Butterfly valve

The individual parts of the pump set are shown in the product literature of the pump set.



10.2 Parameter Lists

10.2.1 Configuration

10.2.1.1 System settings

Table 26: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1	Configuration	-	-	Everybody	Nobody	-
1-1	System	-	-	Everybody	Nobody	-
1-1-1	Information	-	-	Everybody	Nobody	-
1-1-1-1	Order number	Full text (max. 18 characters)	<empty>	Everybody	Service	-
1-1-1-2	Type series	Full text (max. 30 characters)	<empty>	Everybody	Service	-
1-1-1-3	Production number	Full text (max. 18 characters)	<empty>	Everybody	Service	-
1-1-1-4	System name (for Bluetooth)	Full text (max. 30 characters)	BOOSTERCONTROL	Everybody	Service	-
1-1-2	General	-	-	-	-	-
1-1-2-3	Operating mode	Operation on a frequency inverter Mains operation	Frequency driven	Everybody	Service	Y
1-1-2-4	Frequency inverter type	KSB PumpDrive2 (Eco) DP Var(+) Danfoss MicroDrive Danfoss MidiDrive Danfoss AquaDrive	PumpDrive2	Everybody	Service	Y
1-1-2-5	Frequency control type	Multiple pump configuration Single-pump configuration	Multi-pump operation	Everybody	Service	Y
1-1-2-6	Pump groups	Pump-group control Pump-group and jockey-pump control Base-load and peak-load pump control	Base-load pump control	Everybody	Service	Y
1-1-3	Number of pumps	-	-	Everybody	Nobody	-
1-1-3-1	Total number of pumps	1 ... 6	3	Everybody	Service	Y
1-1-3-2	Number of base load pumps	1 ... (number of pumps - number of peak-load pumps) if pump groups = base-load and peak-load pump control	Number of pumps	Everybody	Nobody	Y

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
	Number of base load pumps	1 ... (number of pumps - number of jockey pumps) if pump groups = jockey-pump control	Number of pumps	Everybody	Nobody	
1-1-3-3	Number of peak load pumps	0 ... (number of pumps - number of base load pumps)	0	Everybody	Service	Y
1-1-4	Maximum system load	-	-	Everybody	Nobody	-
1-1-4-1	Maximum number of pumps	0 ... number of all pumps	Number of all pumps	Everybody	Service	-
1-1-5	Manual-0-automatic mode	-	-	-	-	-
1-1-5-1	Manual-0-automatic mode of pumps	Internal via display	Internal via display	Everybody	Service	-
1-1-6	Fire alarm	-	-	-	-	-
1-1-6-1	Fire alarm mode	Disabled Enabled	Disabled	Everybody	Service	-
1-1-7	External On/Off	-	-	-	-	-
1-1-7-1	External On/Off mode	Disabled Enabled	Disabled	Everybody	Service	-
1-1-8	Membrane rupture detection	-	-	-	-	-
1-1-8-1	Membrane rupture detection	Disabled	Disabled	Everybody	Service	-
1-1-8-2	Digital input	-	-	Everybody	Nobody	-
1-1-8-3	Source	Water detection integrated Membrane rupture detection by external device	Water-detection on-board	Everybody	Service	-
1-1-8-4	Delay time membrane rupture detection	0 ... 99 s	10 s	Everybody	Service	-
1-1-8-5	Delay time reset	0 ... 99 s	2 s	Everybody	Service	-

10.2.1.2 Pump settings

Table 27: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1-2	Pumps	-		Everybody	Nobody	-
1-2-1	Base load pump	-		Everybody	Nobody	-
1-2-1-1	Pump data	-		Everybody	Nobody	-
1-2-1-1-5	Head 0	-	Pump data	Everybody	Service	-



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1-2-1-1-6	Head 1	-	Pump data	Everybody	Service	-
1-2-1-1-7	Head 2	-	Pump data	Everybody	Service	-
1-2-1-1-8	Head 3	-	Pump data	Everybody	Service	-
1-2-1-1-9	Head 4	-	Pump data	Everybody	Service	-
1-2-1-1-10	Head 5	-	Pump data	Everybody	Service	-
1-2-1-1-11	Head 6	-	Pump data	Everybody	Service	-
1-2-1-1-12	Flow rate 0	-	Pump data	Everybody	Service	-
1-2-1-1-13	Flow rate 1	-	Pump data	Everybody	Service	-
1-2-1-1-14	Flow rate 2	-	Pump data	Everybody	Service	-
1-2-1-1-15	Flow rate 3	-	Pump data	Everybody	Service	-
1-2-1-1-16	Flow rate 4	-	Pump data	Everybody	Service	-
1-2-1-1-17	Flow rate 5	-	Pump data	Everybody	Service	-
1-2-1-1-18	Flow rate 6	-	Pump data	Everybody	Service	-
1-2-1-1-19	Power 0	-	Pump data	Everybody	Service	-
1-2-1-1-20	Power 1	-	Pump data	Everybody	Service	-
1-2-1-1-21	Power 2	-	Pump data	Everybody	Service	-
1-2-1-1-22	Power 3	-	Pump data	Everybody	Service	-
1-2-1-1-23	Power 4	-	Pump data	Everybody	Service	-
1-2-1-1-24	Power 5	-	Pump data	Everybody	Service	-
1-2-1-1-25	Power 6	-	Pump data	Everybody	Service	-
1-2-1-1-26	NPSH 0	-	Pump data	Everybody	Service	-
1-2-1-1-27	NPSH 1	-	Pump data	Everybody	Service	-
1-2-1-1-28	NPSH 2	-	Pump data	Everybody	Service	-
1-2-1-1-29	NPSH 3	-	Pump data	Everybody	Service	-
1-2-1-1-30	NPSH 4	-	Pump data	Everybody	Service	-
1-2-1-1-31	NPSH 5	-	Pump data	Everybody	Service	-
1-2-1-1-32	NPSH 6	-	Pump data	Everybody	Service	-
1-2-1-1-33	Optimal flow rate	-	Pump data	Everybody	Service	-
1-2-1-1-34	Low-flow limit rate percentage	-	Pump data	Everybody	Service	-
1-2-1-2	Motor drive data To change a value the pumps must be set to 'Manual Off' (parameter 2-2)	-		Everybody	Nobody	-
1-2-1-2-1	Nominal power	-	Motor data	Everybody	Service	-
1-2-1-2-2	Nominal voltage	-	Motor data	Everybody	Service	-

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1-2-1-2-3	Nominal frequency	-	Motor data	Everybody	Service	-
1-2-1-2-4	Nominal current	-	Motor data	Everybody	Service	-
1-2-1-2-5	Nominal speed	-	Motor data	Everybody	Service	-
1-2-1-2-6	Nominal cos phi	-	Motor data	Everybody	Service	-
1-2-1-2-7	Slip compensation	-	Motor data	Everybody	Service	-
1-2-1-2-8	Minimum speed for function at stop	-	Motor data	Everybody	Service	-
1-2-1-2-9	Minimum motor speed	-	Motor data	Everybody	Service	-
1-2-1-2-10	Maximum motor speed	-	Motor data	Everybody	Service	-
1-2-1-2-11	Jog speed	-	Motor data	Everybody	Service	-
1-2-1-2-12	Ramp up time	-	Motor data	Everybody	Service	-
1-2-1-2-13	Ramp down time	-	Motor data	Everybody	Service	-
1-2-1-2-14	Jog ramp time	-	Motor data	Everybody	Service	-
1-2-1-2-15	Operating ramp time	-	Motor data	Everybody	Service	-
1-2-1-2-16	Minimum speed	-	Motor data	Everybody	Service	-
1-2-1-2-17	Maximum speed	-	Motor data	Everybody	Service	-
1-2-1-2-18	Torque limit	-	Motor data	Everybody	Service	-
1-2-1-2-19	Torque characteristics	[0] Constant torque [1] Variable torque [2] Auto Energy Optim. CT [3] Auto Energy Optim. VT	Motor data	Everybody	Service	-
1-2-1-2-20	Digital input 1	No function Control digital bit 0	Motor data	Everybody	Service	-
1-2-1-2-21	Digital input 2	No function Control digital bit 1	Motor data	Everybody	Service	-
1-2-1-2-22	Function input 1	[0] No operation [1] Reset [10] Reversing	Motor data	Everybody	Service	-
1-2-1-2-23	Function input 2	[0] No operation [1] Reset [2] Coast inverse	Motor data	Everybody	Service	-
1-2-1-2-24	Function input 3	[0] No operation [14] Jog	Motor data	Everybody	Service	-
1-2-1-2-25	Function input 4	[0] No operation	Motor data	Everybody	Service	-



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
	Function input 4	[2] Coast inverse [16] Preset bit 0	Motor data	Everybody	Service	
1-2-1-2-26	Function Relay 1	[0] No operation [1] Control ready [2] Drive ready [4] Enable / no warning [5] VLT running [6] Running / no warning [9] Alarm [10] Alarm or warning	Motor data	Everybody	Service	-
1-2-1-2-27	Function Relay 2	[0] No operation [1] Control ready [2] Drive ready [4] Enable / no warning [5] VLT running [6] Running / no warning [9] Alarm [10] Alarm or warning	Motor data	Everybody	Service	-
1-2-1-2-28	Control site	[0] Digital and control word [1] Digital only [2] Control word only	Motor data	Everybody	Service	-
1-2-1-2-29	Control timeout function	[0] Off [1] Freeze output [2] Stop [3] Jogging [4] Max. speed [5] Stop and trip	Motor data	Everybody	Service	-
1-2-1-2-30	Coasting select	[0] Digital input [1] Bus [2] Digital input and bus [3] Digital input or bus	Motor data	Everybody	Service	-
1-2-1-2-31	Start select	[0] Digital input [1] Bus	Motor data	Everybody	Service	-

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
	Start select	[2] Digital input and bus	Motor data	Everybody	Service	
		[3] Digital input or bus				
1-2-1-2-32	Reset mode	[0] Manual reset	Motor data	Everybody	Service	-
		[3] Automatic reset (max. 3 times)				
1-2-1-2-33	Motor speed unit	[0] RPM	Motor data	Everybody	Service	-
		[1] Hz				
1-2-1-2-34	Operating keys require login	OFF	ON	Everybody	Service	-
		ON				
1-2-1-2-35	Motor-PTC data analysis	OFF	ON	Everybody	Service	-
		ON				
1-2-1-2-36	Motor direction of rotation	Clockwise	Anti-clockwise	Everybody	Service	-
		Anti-clockwise				
1-2-1-2-37	Motor control method	[0] Asynchronous motor V/f control	SuPremE vector control	Everybody	Service	-
		[1] Asynchronous motor vector control				
		[4] SuPremE vector control				
1-2-1-2-38	Max. motor current in % of nominal motor current	-	OFF	Everybody	Service	-
1-2-1-2-39	I _{pt} Stop speed	-	OFF	Everybody	Service	-
1-2-1-2-40	I _{pt} Threshold value	-	OFF	Everybody	Service	-
1-2-1-2-41	Type of control	OFF (open-loop control)	OFF	Everybody	Service	-
1-2-1-2-42	Control point	Local	OFF	Everybody	Service	-
		Field bus				



10.2.1.3 Input / outputs

Table 28: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1-3	Inputs/outputs	-	-	Everybody	Nobody	-
1-3-1	Analog inputs Note: To change a function, the function first has to be removed by changing it to 'No function'. To set a function all pumps have to be set to "Manual OFF" (2-2).	-	-	Everybody	Nobody	-
1-3-1-1	Input 1	No function	None	Everybody	Service	-
1-3-1-2	Input 2	Pressure sensor on suction side				
1-3-1-3	Input 3 (extension board)	Pressure sensor on discharge side				
		Pressure sensor at tank				
		Setpoint				
1-3-2	Analog outputs Note: To change a function, the function first has to be removed by changing it to 'No function'. To set a function all pumps have to be set to "Manual OFF" (2-2).	-	-	Everybody	Nobody	-
1-3-2-1	Output 1	None	None	Everybody	Service	-
1-3-2-2	Output 2	Pump speed				
		Suction-side pressure				
		Discharge-side pressure				
		Tank-filling proportional valve				
		Tank-filling additional proportional valve				
		Tank level height				
1-3-3	Digital inputs Note: To change a function, the function first has to be removed by changing it to 'No function'. To set a function all pumps have to be set to "Manual OFF" (2-2).	-	-	Everybody	Nobody	-

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1-3-3-1	Input 1	No function	None	Everybody	Service	-
1-3-3-2	Input 2	Pressure switch				
1-3-3-3	Input 3	Float switch				
1-3-3-4	Input 4	Flow monitor				
1-3-3-5	Input 5	Failure motor circuit breaker pump 1				
1-3-3-6	Input 6	Failure motor circuit breaker pump 2				
1-3-3-7	Input 7	Failure motor circuit breaker pump 3				
1-3-3-8	Input 8	Failure motor circuit breaker pump 4				
1-3-3-9	Input 9	Failure motor circuit breaker pump 5				
1-3-3-10	Input 10	Failure motor circuit breaker pump 6				
1-3-3-16	Input 16 (extension board)	Manual mode at M-0-A switch pump 1				
1-3-3-17	Input 17 (extension board)	Manual mode at M-0-A switch pump 2				
1-3-3-18	Input 18 (extension board)	Manual mode at M-0-A switch pump 3				
		Manual mode at M-0-A switch pump 4				
		Manual mode at M-0-A switch pump 5				
		Manual mode at M-0-A switch pump 6				
		Automatic mode at M-0-A switch pump 1				
		Automatic mode at M-0-A switch pump 2				
		Automatic mode at M-0-A switch pump 3				
		Automatic mode at M-0-A switch pump 4				
		Automatic mode at M-0-A switch pump 5				
		Automatic mode at M-0-A switch pump 6				
		Over-temperature motor pump 1				
		Over-temperature motor pump 2				
		Over-temperature motor pump 3				
Over-temperature motor pump 4						
Over-temperature motor pump 5						
Over-temperature motor pump 6						
		Failure motor-circuit breaker rainwater pump 1				
		Failure motor-circuit breaker rainwater pump 2				
		Manual-mode at M-0-A-switch rainwater pump 1				



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
	Input 1	Manual-mode at M-0-A-switch rainwater pump 2	None	Everybody	Service	
	Input 2					
	Input 3	Automatic-mode at M-0-A-switch rainwater pump 1				
	Input 4	Automatic-mode at M-0-A-switch rainwater pump 2				
	Input 5					
	Input 6	Float switch in rainwater tank				
	Input 7	External On/Off				
	Input 8	Fire alarm				
	Input 9	Acknowledge all				
	Input 10	Alternative setpoint				
	Input 16 (extension board)	Triggered check run				
	Input 17 (extension board)	Emergency power operation				
	Input 18 (extension board)	Forced flushing				
		Module water quality sensor/monitoring				
		Membrane rupture detection				
		Leakage-detection by external device				
		Failure supply-valve				
		Failure additional supply-valve				
		Redundant system				
1-3-4	Digital outputs Note: To change a function, the function first has to be removed by changing it to 'No function'. To set a function all pumps have to be set to "Manual OFF" (2-2).	-	-	Everybody	Nobody	-

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1-3-4-1	Output 1	No function	None	Everybody	Service	-
1-3-4-2	Output 2	Start/stop pump 1				
1-3-4-3	Output 3	Start/stop pump 2				
1-3-4-5	Output 5 (extension board)	Start/stop pump 3				
1-3-4-6	Output 6 (extension board)	Start/stop pump 4				
1-3-4-7	Output 7 (extension board)	Start/stop pump 5				
1-3-4-8	Output 8 (extension board)	Start/stop pump 6				
1-3-4-9	Output 9 (extension board)	Pump running pump 1				
1-3-4-10	Output 10 (extension board)	Pump running pump 2				
1-3-4-11	Output 11 (extension board)	Pump running pump 3				
1-3-4-12	Output 12 (extension board)	Pump running pump 4				
		Pump running pump 5				
		Pump running pump 6				
		Pump fault pump 1				
		Pump fault pump 2				
		Pump fault pump 3				
		Pump fault pump 4				
		Pump fault pump 5				
		Pump fault pump 6				
		Tank filling solenoid valve				
		Tank filling additional solenoid valve				
		Flushing valve				
		Dry running protection active				
		Start/stop rainwater pump 1				
		Start/stop rainwater pump 2				
		Redundant system				
		Leakage detected				
		Tank level too high				
1-3-5	Analog input temperature	-	-	-	-	-
1-3-5-1	Analog input Pt100/Pt1000	Disabled	Disabled	Everybody	Service	-
		Enabled				
1-3-5-2	Selection of thermometer resistance	Pt100	Pt100	Everybody	Service	-
		Pt1000				



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1-3-5-3	Selection of thermometer function	Ambient temperature	Ambient temperature	Everybody	Service	-
		Water temperature				
1-3-7	Calibration	-	-	-	-	-
1-3-7-1	Sensors	-	-	-	-	-
1-3-7-1-1	Pressure sensor on suction side	-	-	-	-	-
1-3-7-1-1-1	Value at 4 mA	0 ... value at 20 mA	0	Everybody	Service	-
1-3-7-1-1-2	Value at 20 mA	Value at 0/4 mA ... 100 bar	10 bar	Everybody	Service	-
1-3-7-1-2	Pressure sensor on discharge side	-	-	-	-	-
1-3-7-1-2-1	Value at 4 mA	0 ... value at 20 mA	0	Everybody	Service	-
1-3-7-1-2-2	Value at 20 mA	Value at 0/4 mA ... 100 bar	16 bar	Everybody	Service	-
1-3-7-1-3	Pressure sensor at tank	-	-	-	-	-
1-3-7-1-3-1	Value at 4 mA	0 ... value at 20 mA	0	Everybody	Service	-
1-3-7-1-3-2	Value at 20 mA	Value at 0/4 mA ... 10 bar	0.306 bar	Everybody	Service	-
1-3-7-1-4	Setpoint	-	-	-	-	-
1-3-7-1-4-1	Value at 4 mA	0 ... value at 20 mA	0	Everybody	Service	-
1-3-7-1-4-2	Value at 20 mA	Value at 0/4 mA ... 100 bar	16 bar	Everybody	Service	-
1-3-7-2	Output signal	-	-	-	-	-
1-3-7-2-1	Suction-side pressure	-	-	-	-	-
1-3-7-2-1-1	Selection of output current range	0 ... 20 mA	4 mA ... 20 mA	Everybody	Service	-
		4 mA ... 20 mA				
1-3-7-2-1-2	Value at 0/4 mA	If selection ... = 0 mA ... 20 mA	0 ... value at 20 mA	Everybody	Service	-
1-3-7-2-1-3	Value at 20 mA	-	Value at 0/4 mA ... 100 bar	Everybody	Service	-
1-3-7-2-2	Discharge-side pressure	-	-	-	-	-
1-3-7-2-2-1	Selection of output current range	0 ... 20 mA	4 mA ... 20 mA	Everybody	Service	-
		4 mA ... 20 mA				
1-3-7-2-2-2	Value at 0/4 mA	If selection ... = 0 mA ... 20 mA	0 ... value at 20 mA	Everybody	Service	-
1-3-7-2-2-3	Value at 20 mA	-	-	Everybody	Service	-
1-3-7-2-4	Tank fill level	-	-	-	-	-
1-3-7-2-4-1	Selection of output current range	0 ... 20 mA	4 mA ... 20 mA	Everybody	Service	-
		4 mA ... 20 mA				
1-3-7-2-4-2	Value at 0/4 mA	If selection ... = 0 mA ... 20 mA	0 ... value at 20 mA	Everybody	Service	-
1-3-7-2-4-3	Value at 20 mA	-	Value at 0/4 mA ... 100 bar	Everybody	Service	-

10.2.1.4 Further configuration settings

Table 29: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1-4	Field bus	-	-	Everybody	Nobody	-
1-4-1	Modbus RTU	Disabled	Disabled	Everybody	Service	Y
		Enabled				
1-4-2	Slave address	1 ... 247	247	Everybody	Service	Y
1-4-3	Baud rate	9600 kBit/s	115200 kBit/s	Everybody	Service	Y
		19200 kBit/s				
		38400 kBit/s				
		57600 kBit/s				
		115200 kBit/s				
1-4-4	Parity	None	Odd	Everybody	Service	Y
		Odd				
		Even				
1-5	Bluetooth	-	-	-	-	-
1-5-1	Time for login	0 ... 600 s	150 s	Everybody	Service	-
1-6	Display	-	-	Everybody	Nobody	-
1-6-1	Time-out lighting	-	-	Everybody	Nobody	-
1-6-1-1	Time-out display	0 ... 24 h	10 min	Everybody	Service	-
1-6-1-2	Time-out display when message active	0 ... 60 min	10 sec	Everybody	Service	-
1-6-1-3	Screen lock time	0 ... 24 h	10 min	Everybody	Service	-
1-6-2	Units displayed	-	-	Everybody	Nobody	-
1-6-2-1	Pressure	bar	bar	Everybody	Service	-
		PSI				
1-6-2-2	Height	cm	cm	Everybody	Service	-
		%				
1-6-2-3	Temperature	°C	°C	Everybody	Service	-
		°F				
1-7	Time and date	-	-	Everybody	Nobody	-
1-7-1	Time	-	-	Everybody	Nobody	-
1-7-1-1	Hours	0 ... 23	0	Everybody	Service	-
1-7-1-2	Minutes	0 ... 59	0	Everybody	Service	-



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
1-7-1-3	Seconds	0 ... 59	0	Everybody	Service	-
1-7-2-1	Year	2019 ... 2099	0	Everybody	Service	-
1-7-2-2	Month	1 ... 12	1	Everybody	Service	-
1-7-2-3	Day	1 ... 31	1	Everybody	Service	-
1-7-2-4	Day of week	0 ... 6	0	Everybody	Service	-
1-8	Service required	-	-	Everybody	Nobody	-
1-8-1	Service interval	Disabled	Enabled	Everybody	Service	-
		Enabled				
1-8-3	Time interval for service required	0 ... 3650 d	540 d	Everybody	Service	-
		Enabled				
1-8-4	Reminder time for service interval expired	0 ... 3650 d	540 d	Everybody	Service	-
1-9	VFD bus	-	-	-	-	-
1-9-1	Baud rate	9600 kBit/s	38400 kBit/s	Everybody	Service	Y
		19200 kBit/s				
		38400 kBit/s				
		57600 kBit/s				
		115200 kBit/s				
1-9-2	Parity	None	Even	Everybody	Service	Y
		Odd				
		Even				

10.2.2 Settings

10.2.2.1 Pressure settings

Table 30: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2	Settings	-	-	Everybody	Nobody	-
2-1	Pressure	-	-	-	-	-
2-1-1	Setpoint	0 ... 99 bar	2 bar	Everybody	Display/customer	-
2-1-2	Bandwidth	0 ... 99 bar	0.05 bar	Everybody	Customer	-

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-1-3	Alternative setpoint	0 ... 99 bar	2.5 bar	Everybody	Customer	-
2-1-4	Alternative setpoint selection	Disabled	Disabled	Everybody	Customer	-
		Time enabled				
		Digital input enabled				
2-1-5	Alternative set-point start time (hours)	0 ... 24 h	0	Everybody	Customer	-
2-1-6	Alternative set-point start time (minutes)	0 ... 60 min	0	Everybody	Customer	-
2-1-7	Alternative set-point stop time (hours)	0 ... 24 h	0	Everybody	Customer	-
2-1-8	Alternative set-point stop time (minutes)	0 ... 60 min	0	Everybody	Customer	-
2-1-9	Additional setpoint increase	0 ... 1 bar	0.3 bar	Everybody	Customer	-
2-1-10	Minimum set-point	0 ... 99 bar	0 bar	Everybody	Service	-
2-1-11	Maximum set-point	0 ... 99 bar	99 bar	Everybody	Service	-

10.2.2.2 Pump operating mode

Table 31: Pump operating mode parameters

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-2	Pumps	-	-	Everybody	Nobody	-
2-2-1	Pump operating mode	-	-	Everybody	Nobody	-
2-2-1-1	Pump 1	Automatic	Manual-Off	Everybody	Display/Customer	-
		Manual-Off				
		Manual-On				
2-2-1-2	Pump 2	Automatic	Manual-Off	Everybody	Display/Customer	-
		Manual-Off				
		Manual-On				
2-2-1-3	Pump 3	Automatic	Manual-Off	Everybody	Display/Customer	-
		Manual-Off	Manual-Off			
		Manual-On				
2-2-1-4	Pump 4	Automatic	Manual-Off	Everybody	Display/Customer	-
		Manual-Off				
		Manual-On				
2-2-1-5	Pump 5	Automatic	Manual-Off	Everybody	Display/Customer	-



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
	Pump 5	Manual-Off	Manual-Off	Everybody	Display/Customer	
		Manual-On				
2-2-1-6	Pump 6	Automatic	Manual-Off	Everybody	Display/Customer	-
		Manual-Off				
		Manual-On				
2-2-2	Rainwater operating mode	-	-	Everybody	Nobody	-
2-2-2-1	Rainwater pump 1	Automatic	Manual-Off	Everybody	Customer	-
		Manual-Off				
		Manual-On				
2-2-2-2	Rainwater pump 2	Automatic	Manual-Off	Everybody	Customer	-
		Manual-Off				
		Manual-On				

10.2.2.3 Timers

Table 32: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-3	Timer	-	-	Everybody	Nobody	-
2-3-1	Start delay time	0 ... 99.9 s	3 s	Everybody	Service	-
2-3-2	Stop delay time	0 ... 99.9 s	3 s	Everybody	Service	-
2-3-3	Minimum runtime	0 ... 999 s	180 s	Everybody	Service	-
2-3-4	Minimum runtime correction step	0 ... 99 s (calculated due to operating mode)	10 s	Everybody	Service	-

10.2.2.4 Pump protection

Table 33: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-4	Pump protection	-	-	Everybody	Nobody	-
2-4-1	General	-	-	-	-	-
2-4-1-1	Minimum frequency	0 ... maximum frequency	60 Hz	Everybody	Service	-
2-4-1-2	Maximum frequency	Minimum frequency ... 150 Hz	100 Hz	Everybody	Service	-

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-4-1-4	Pump response to pressure sensor failure	Stop all pumps	Stop all pumps	Everybody	Service	-
		Freeze number of pumps running and speed				
		Run one pump at fixed speed				
		Run two pumps at fixed speed				
		Run three pumps at fixed speed				
		Run four pumps at fixed speed				
		Run five pumps at fixed speed				
		Run six pumps at fixed speed				
2-4-1-5	Pump response to pressure sensor failure	Stop all pumps	Stop all pumps	Everybody	Service	-
		Freeze number of pumps running				
		Run one pump				
		Run two pumps				
		Run three pumps				
		Run four pumps				
		Run five pumps				
		Run six pumps				
2-4-1-6	Pump speed on pressure sensor failure	0 ... 100%	0	Everybody	Service	-
2-4-2	Changeover within pump group	-	-	-	-	-
2-4-2-1	Changeover within pump group	Disabled	Enabled	Everybody	Service	-
		Enabled				
2-4-2-2	Maximum runtime	1 s ... 24 h	24 h / number of pumps	Everybody	Service	-
2-4-2-3	Over-/undersupply	Oversupply	Oversupply	Everybody	Service	-
		Undersupply				
2-4-2-4	Time of over-/undersupply	0 ... 60 s	0	Everybody	Service	-
2-4-2-5	Ramp up time	0 ... 60 s	0	Everybody	Service	-
2-4-2-6	Ramp down time	0 ... 60 s	0	Everybody	Service	-
2-4-3	Changeover from jockey pump to base load pumps	-	-	Everybody	Service	-
2-4-3-1	Over-/undersupply	Oversupply	Oversupply	Everybody	Service	-
		Undersupply				
2-4-3-2	Time of over-/undersupply	0 ... 60 s	10 s	Everybody	Service	-
2-4-4	Functional check run	-	-	-	-	-



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-4-4-1	Functional check run	Disabled	Enabled	Everybody	Service	-
		Enabled				
2-4-4-2	Function	Idle time dependent	Time-dependable	Everybody	Service	-
		Time-of-day configured				
		Triggered check run				
2-4-4-3	Duration	0 ... 600 s	10 s	Everybody	Service	-
2-4-4-4	Delay before re-starting	0: 00: 00: 00 ... 7: 00: 00: 00 d: hh: mm: ss	24 h	Everybody	Service	-
2-4-4-5	Time stamp for activation (hours)	Day of week, time	Mo, 12: 00: 00	Everybody	Service	-
2-4-4-6	Time stamp for activation (hours)	Day of week, time	Mo, 12: 00: 00	Everybody	Service	-
2-4-5	Short pressure deviations	-	-	-	-	-
2-4-5-2	Delay time for pump start	0 ... 60 s	0	Everybody	Service	-
2-4-5-3	Delay time for pump stop	0 ... 60 s	0	Everybody	Service	-
2-4-6	No-flow detection	-	-	Everybody	Service	-
2-4-6-1	Pump speed for activation	0% ... 100%	1	Everybody	Service	-
2-4-6-2	Time within bandwidth	0 ... 600 s	15 s	Everybody	Service	-
2-4-6-3	Step interval	0 ... 600 s	15 s	Everybody	Service	-
2-4-6-4	Step height of speed	1 % ... 50 %	0,03	Everybody	Service	-
2-4-6-5	Bandwidth	0 ... bandwidth	0.05 bar	Everybody	Service	-
2-4-6-6	Speed for stopping last pump	0% ... 100%	0	Everybody	Service	-
2-4-7	Dynamic pressure setpoint compensation	-	-	-	-	-
2-4-7-1	Dynamic pressure setpoint compensation	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-4-7-2	Maximum discharge-side pressure deviation	-10 bar ... 10 bar	0	Everybody	Service	-
2-4-8	Motor circuit breaker	-	-	-	-	-
2-4-8-1	Trigger active high/low	Active high	1: Active low	Everybody	Service	-
		Active low				
2-4-8-2	Trip delay	0 ... 99 s	1 s	Everybody	Service	-

10.2.2.5 System protection

Table 34: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-5	System protection	-	-	Everybody	Nobody	-
2-5-1	Dry running protection	-	-	Everybody	Nobody	-
2-5-1-1	Source	-	-	-	-	-
2-5-1-1-1	Source	No function	None	Everybody	Service	-
		Pressure sensor on suction side				
		Pressure sensor at tank				
		Pressure switch				
		Float switch				
		Flow monitor				
2-5-1-1-2	Delay time for system stop	0 ... 99 s	10 s	Everybody	Service	-
2-5-1-1-3	Delay time reset	0 ... 99 s	2 s	Everybody	Service	-
2-5-1-1-4	Maximum number of dry running protection events per hour	1 ... 10	3	Everybody	Service	-
2-5-1-1-5	Dry running protection stop delay	1 ... 5 s	1 s	Everybody	Service	-
2-5-1-2	Additional source	-	-	-	-	-
2-5-1-2-1	Additional source	No function	None	Everybody	Service	-
		Pressure sensor on suction side				
		Pressure sensor at tank				
		Pressure switch				
		Float switch				
		Flow monitor				
2-5-1-2-2	Delay time for system stop	0 ... 99 s	10 s	Everybody	Service	-
2-5-1-2-3	Delay time reset	0 ... 99 s	2 s	Everybody	Service	-
2-5-1-3	Pressure sensor on suction side	-	-	Everybody	Nobody	-
2-5-1-3-1	Minimum suction-side pressure for system stop	0 ... maximum pressure sensor range	1 bar	Everybody	Service	-
2-5-1-3-2	Minimum suction-side pressure for reset	Minimum suction-side pressure for stop ... Maximum pressure sensor range	1.5 bar	Everybody	Service	-
2-5-1-6	Flow monitor	-	-	-	-	-
2-5-1-6-2	Discharge pressure deviation	0 ... 10 bar	1 bar	Everybody	Service	-
2-5-2	Leakage detection	-	-	-	-	-



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-5-2-1	Leakage detection	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-5-2-2	Source	Water detection integrated	Water-detection on-board	Everybody	Service	-
		Leakage-detection by external device				
2-5-2-4	Position	Leakage of pump system	Leakage of pump system	Everybody	Service	-
		Overflow of tank				
2-5-2-5	Response	Message only	Message only	Everybody	Service	-
		Message and stop pumps				
		Message and close inlet valve				
		Message, close inlet valves and stop pumps				
2-5-2-6	Delay time leakage detection	0 ... 99 s	10 s	Everybody	Service	-
2-5-2-7	Delay time reset	0 ... 99 s	2 s	Everybody	Service	-
2-5-3	Hygienic functions	-	-	-	-	-
2-5-3-1	General	-	-	-	-	-
2-5-3-1-1	Hygienic functions	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-5-3-2	Temperature monitoring	-	-	-	-	-
2-5-3-2-1	Temperature monitoring	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-5-3-2-2	Maximum temperature	0 ... 70 °C	25 °C	Everybody	Service	-
2-5-3-2-3	Minimum temperature	0 ... 70 °C	5 °C	Everybody	Service	-
2-5-3-2-4	Response	Message	Message	Everybody	Service	-
		Flushing				
2-5-3-3	Water stagnation monitoring	-	-	-	-	-
2-5-3-3-1	Water stagnation monitoring	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-5-3-3-2	Source	Flow sensor	-	Everybody	Service	-
		Flow monitor				
		Flow rate estimation (frequency inverter)				
2-5-3-3-3	Time of stagnation	0 ... 7 d	24 h	Everybody	Service	-
2-5-3-3-4	Response	Message	Message	Everybody	Service	-
		Flushing with check run				
2-5-3-4	Forced flushing	-	-	-	-	-

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-5-3-4-1	Forced flushing	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-5-3-5	Flushing function	-	-	Everybody	Nobody	-
2-5-3-5-2	Minimum flushing time	0 ... maximum flushing time	10 s	Everybody	Service	-
2-5-3-5-3	Maximum flushing time	Minimum flushing time ... 999 s	60 s	Everybody	Service	-
2-5-3-5-4	Maximum flushing attempts in 24 hours	0 ... 10	5	Everybody	Service	-
2-5-3-5-5	Stop temperature for flushing	0 ... maximum temperature	20 °C	Everybody	Service	-
2-5-3-5-6	Flushing time for each pump	0 ... 999 s	10 s	Everybody	Service	-
2-5-4	Emergency power operation	-	-	Everybody	Nobody	-
2-5-4-2	Maximum system load	1 ... maximum number of pumps	1	Everybody	Service	-
2-5-4-3	Stop delay enabled/disabled	Disabled	Enabled	Everybody	Service	-
		Enabled				
2-5-5	Discharge pressure monitoring	-	-	Everybody	Nobody	-
2-5-5-1	High pressure alarm	-	-	Everybody	Nobody	-
2-5-5-1-1	Maximum discharge pressure	0 ... maximum pump head	Maximum pump discharge head	Everybody	Service	-
2-5-5-1-2	Delay time	0 ... 60 s	10 s	Everybody	Service	-
2-5-5-1-3	Selection of pump response	Message	Message	Everybody	Service	-
		Message and stop all pumps				
2-5-5-2	Low pressure alarm	-	-	Everybody	Nobody	-
2-5-5-2-1	Minimum discharge pressure	0 ... maximum pump head	0	Everybody	Service	-
2-5-5-2-2	Delay time	0 ... 60 s	10 s	Everybody	Service	-
2-5-5-2-3	Selection of pump response	Message	Message	Everybody	Service	-
		Message and stop all pumps				
2-5-6	Pipe filling function	-	-	-	-	-
2-5-6-1	Pipe filling function	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-5-6-2	Deviation from set-point	0 ... set-point	10	Everybody	Service	-
2-5-6-3	Ramp-step for increasing set-point	0 ... 10 bar	0.1 bar	Everybody	Service	-
2-5-6-4	Maximum time on ramp-step	0 ... 600 s	60 s	Everybody	Service	-
2-5-6-5	Maximum number of attempts	1 ... 10	3	Everybody	Service	-
2-5-7	Redundant system	-	-	-	-	-
2-5-7-1	Redundant system role	Master	Master	Everybody	Service	-



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
	Redundant system role	Slave	Master	Everybody	Service	
2-5-7-2	Redundant system scheduler	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-5-7-3	Redundant system scheduler - start time hours	0 ... 24 h	0	Everybody	Service	-
2-5-7-4	Redundant system scheduler - start time minutes	0 ... 60 min	0	Everybody	Service	-
2-5-7-5	Redundant system scheduler - stop time hours	0 ... 24 h	0	Everybody	Service	-
2-5-7-6	Redundant system scheduler - stop time minutes	0 ... 60 min	0	Everybody	Service	-

10.2.2.6 Accumulator

Table 35: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-6	Membrane-type accumulator	-	-	-	-	-
2-6-1	Pressure-vessel accumulation	Disabled	Disabled	Everybody	Customer	-
		Enabled				

10.2.2.7 Tank

Table 36: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-7	Tank	-	-	Everybody	Nobody	-
2-7-1	Drinking water	-	-	-	-	-
2-7-1-1	Drinking water filling	-	-	-	-	-
2-7-1-1-1	Drinking water filling	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-7-1-2	Tank level	-	-	-	-	-
2-7-1-2-4	Absolute height at 0 %	0 ... absolute height at 100 %	Position of sensor above tank bottom	Everybody	Service	-
2-7-1-2-5	Absolute height at 100 %	Absolute height at 0 % ... 2000 cm	200 cm	Everybody	Service	-

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-7-1-2-6	Position of sensor above tank bottom	0 ... level at 20 mA	20 cm	Everybody	Service	-
2-7-1-2-7	Low-water level	0 ... low-water reset level	0,1	Everybody	Service	-
2-7-1-2-8	Low-water reset level	Low-water level ... critical water level	0,15	Everybody	Service	-
2-7-1-2-9	Critical water level	Low-water level ... high-water level	0,3	Everybody	Service	-
2-7	Tank	-	-	Everybody	Nobody	-
2-7-1	Drinking water	-	-	-	-	-
2-7-1-1	Drinking water filling	-	-	-	-	-
2-7-1-1-1	Drinking water filling	Disabled	Disabled	Everybody	Service	-
		Enabled				
2-7-1-2	Tank level	-	-	-	-	-
2-7-1-2-4	Absolute height at 0 %	0 ... absolute height at 100 %	Position of sensor above tank bottom	Everybody	Service	-
2-7-1-2-5	Absolute height at 100 %	Absolute height at 0 % ... 2000 cm	200 cm	Everybody	Service	-
2-7-1-2-6	Position of sensor above tank bottom	0 ... level at 20 mA	20 cm	Everybody	Service	-
2-7-1-2-7	Low-water level	0 ... low-water reset level	0,1	Everybody	Service	-
2-7-1-2-8	Low-water reset level	Low-water level ... critical water level	0,15	Everybody	Service	-
2-7-1-2-9	Critical water level	Low-water level ... high-water level	0,3	Everybody	Service	-
2-7-1-2-10	Level for reset critical water level	Critical water level ... high-water level	0,35	Everybody	Service	-
2-7-1-2-11	Start tank filling level	Low level ... stop tank filling level	0,5	Everybody	Service	-
2-7-1-2-12	Additional start tank filling level	Low level ... start tank filling level	0,4	Everybody	Service	-
2-7-1-2-13	Additional stop tank filling level	Start tank filling level ... stop tank filling level	0,9	Everybody	Service	-
2-7-1-2-14	Stop tank filling level	Start tank filling level ... high-water level	1	Everybody	Service	-
2-7-1-2-15	Level for reset high-water level	Stop tank filling level ... high-water level	1,2	Everybody	Service	-
2-7-1-2-16	High-water level	Stop tank filling level ... according to sensor type or level at 20 mA	1,25	Everybody	Service	-
2-7-1-3	Tank filling	-	-	-	-	-
2-7-1-3-1	Inlet valve type	Tank filling on/off valve	Tank-filling on/off valve	Everybody	Service	-
		Tank filling proportional valve				
2-7-1-3-2	Minimum opening angle of valve	0 ... 100 %	0,1	Everybody	Service	-
2-7-1-3-3	Step width for valve actuation	0 ... 100 %	0,1	Everybody	Service	-
2-7-1-4	Additional tank filling	-	-	-	-	-
2-7-1-4-1	Additional tank filling	Disabled	Disabled	Everybody	Service	-
2-7-1-4-2	Inlet valve type	Tank filling additional solenoid valve	Additional tank-filling solenoid valve	Everybody	Service	-
		Tank filling proportional valve				



Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-7-1-4-3	Minimum opening angle of valve	0 ... 100 %	0,1	Everybody	Service	-
2-7-1-4-4	Step width for valve actuation	0 ... 100 %	0,1	Everybody	Service	-
2-7-1-5	Drinking water protection	-	-	-	-	-
2-7-1-5-1	Drinking water protection	Disabled Enabled	Enabled	Everybody	Service	-
2-7-1-5-2	Maximum time between usage of drinking water	0... 31 d	168 h	Everybody	Service	-
2-7-1-5-3	Response	Message only Message and flushing of inlet line	0: Message only	Everybody	Service	-
2-7-1-5-4	Time for flushing drinking water supply	0 ... 600 s	10 s	Everybody	Service	-
2-7-1-5-5	Overflow if high-water level is exceeded	Not allowed Allowed with message Allowed without message	Allowed without message	Everybody	Service	-
2-7-2	Rainwater	-	-	-	-	-
2-7-2-1	Rainwater filling	-	-	-	-	-
2-7-2-1-1	Rainwater filling	Disabled Enabled	Disabled	Everybody	Service	-
2-7-2-2	Rainwater pumps	-	-	Everybody	Nobody	-
2-7-2-2-1	Source for dry running protection of rainwater pump	No function Float switch at rainwater tank	None	Everybody	Service	-
2-7-2-2-3	Delay time for stop	0 ... 99 s	1 s	Everybody	Service	-
2-7-2-2-4	Delay time reset	0 ... 99 s	1 s	Everybody	Service	-
2-7-2-2-5	Number of rainwater pumps	1 ... 2	0	Everybody	Service	-
2-7-2-2-8	Maximum runtime	0 ... 3600 s	60 s	Everybody	Service	-
2-7-2-2-9	Changeover delay	0 ... 60 s	1 s	Everybody	Service	-
2-7-2-2-10	Maximum number of pump starts per hour	1/h ... 20/h	20/h	Everybody	Service	-
2-7-2-3	Tank level	-	-	Everybody	Nobody	-
2-7-2-3-1	Start level for rainwater tank filling	Start tank filling level drinking water ... stop tank filling level rainwater	0,6	Everybody	Service	-
2-7-2-3-2	Stop level for rainwater tank filling	Start tank filling level rainwater ... high-water level	1	Everybody	Service	-

10.2.2.8 Control algorithms

Table 37: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-8	Control algorithms	-	-	Service	Nobody	-
2-8-1	PID controller	-	-	-	-	-
2-8-1-1	Proportional constant	Value range according to controller	5	Service	Service	-
2-8-1-2	Integral constant	Value range according to controller	0	Service	Service	-
2-8-1-3	Differential constant	Value range according to controller	0	Service	Service	-
2-8-2	Input signals	-	-	Service	Nobody	-
2-8-2-1	Damping factor	Value range according to controller	TBD	Service	Service	-
2-8-3	System start-up time delay	-	-	-	-	-
2-8-3-1	System start-up time delay	0 ... 60 s	10 s	Service	Service	-
2-8-4	Multi-pump operation	-	-	-	-	-
2-8-4-1	Start flow rate	0 .. 100 %	0,95	Service	Service	-
2-8-4-2	Speed on percent	0 .. 140 %	1	Service	Service	-
2-8-4-3	Speed off percent	0 .. 90 %	0,5	Service	Service	-
2-8-4-4	Pump dynamic control	1 .. 100 %	0,3	Service	Service	-

10.2.2.9 Display

Table 38: Parameter

Parameter	Description	Value range and dependencies	Factory setting	Access level Read	Access level Write	Re-start required
2-10	Access	-	-	Everybody	Nobody	-
2-10-1	Display	-	-	Everybody	Nobody	-
2-10-1-1	Set password	000 ... 999	100	Service	Service	-
2-10-1-2	Max. login attempts	000 ... 255	3	Service	Service	-
2-10-1-3	Login cooldown	000 ... 1440	10	Service	Service	-



10.3 Messages

The following tables contain an overview of messages displayed by the control unit in alternation with the current system status in the bottom right corner of the screen.

Some messages have to be reset manually.

10.3.1 Messages for specific pumps

In the range from 100 to 699 the first digit stands for the pump number. The pump number can be between 1 and 6.

A message with the number 359, for example, indicates overload of the frequency inverter of pump 3.

Table 39: Messages for specific pumps

ID mes- sage	Para- meter	Description	Status	Reset mode (factory set- ting)
100	2-9-1-1	Failure motor circuit breaker pump 1	Warning	Manual
101	2-9-1-2	Manual ON pump 1	Warning	Auto
102	2-9-1-3	Manual OFF pump 1	Warning	Auto
103	2-9-1-4	Over temperature motor pump 1	Alert	Manual
150	2-9-2-1	Fault motor circuit breaker frequency inverter pump 1	Warning	Manual
151	2-9-2-2	Fault frequency inverter pump 1	Alert	Auto
152	2-9-2-3	Communication error frequency inverter pump 1	Alert	Auto
153	2-9-2-4	Incorrect check sum frequency inverter pump 1	Alert	Auto
154	2-9-2-5	Internal fault frequency inverter pump 1	Alert	Auto
155	2-9-2-6	Mains fault frequency inverter pump 1	Alert	Manual
156	2-9-2-7	Phase failure frequency inverter pump 1	Alert	Manual
157	2-9-2-8	Overvoltage frequency inverter pump 1	Alert	Auto
158	2-9-2-9	Undervoltage frequency inverter pump 1	Alert	Auto
159	2-9-2-10	Overload frequency inverter pump 1	Alert	Manual
160	2-9-2-11	Brake resistor frequency inverter pump 1	Alert	Manual
161	2-9-2-12	Temperature fault frequency inverter pump 1	Alert	Manual
162	2-9-2-13	AMA fault frequency inverter pump 1	Alert	Manual
163	2-9-2-14	Short circuit frequency inverter pump 1	Alert	Manual
164	2-9-2-15	Safety stop frequency inverter pump 1	Alert	Manual
165	2-9-2-16	Configuration invalid frequency inverter pump 1	Alert	Manual
200	2-9-3-1	Failure motor-circuit breaker pump 2	Warning	Manual
201	2-9-3-2	Manual ON pump 2	Warning	Auto
202	2-9-3-3	Manual OFF pump 2	Warning	Auto
203	2-9-3-4	Excessive temperature motor pump 2	Alert	Manual
250	2-9-4-1	Fault motor circuit breaker frequency inverter pump 2	Warning	Manual
251	2-9-4-2	Fault frequency inverter pump 2	Alert	Auto
252	2-9-4-3	Communication error frequency inverter pump 2	Alert	Auto
253	2-9-4-4	Incorrect check sum frequency inverter pump 2	Alert	Auto
254	2-9-4-5	Internal fault frequency inverter pump 2	Alert	Auto
255	2-9-4-6	Mains fault frequency inverter pump 2	Alert	Manual
256	2-9-4-7	Phase failure frequency inverter pump 2	Alert	Manual
257	2-9-4-8	Overvoltage frequency inverter pump 2	Alert	Auto
258	2-9-4-9	Undervoltage frequency inverter pump 2	Alert	Auto
259	2-9-4-10	Overload frequency inverter pump 2	Alert	Manual
260	2-9-4-11	Brake resistor frequency inverter pump 2	Alert	Manual
261	2-9-4-12	Temperature fault frequency inverter pump 2	Alert	Manual
262	2-9-4-13	AMA fault frequency inverter pump 2	Alert	Manual
263	2-9-4-14	Short circuit frequency inverter pump 2	Alert	Manual

ID mes- sage	Para- meter	Description	Status	Reset mode (factory set- ting)
264	2-9-4-15	Safety stop frequency inverter pump 2	Alert	Manual
265	2-9-4-16	Configuration invalid frequency inverter pump 2	Alert	Manual
300	2-9-5-1	Failure motor-circuit breaker pump 3	Warning	Manual
301	2-9-5-2	Manual ON pump 3	Warning	Auto
302	2-9-5-3	Manual OFF pump 3	Warning	Auto
303	2-9-5-4	Excessive temperature motor pump 3	Alert	Manual
350	2-9-6-1	Fault motor circuit breaker frequency inverter pump 3	Warning	Manual
351	2-9-6-2	Fault frequency inverter pump 3	Alert	Auto
352	2-9-6-3	Communication error frequency inverter pump 3	Alert	Auto
353	2-9-6-4	Incorrect check sum frequency inverter pump 3	Alert	Auto
354	2-9-6-5	Internal fault frequency inverter pump 3	Alert	Auto
355	2-9-6-6	Mains fault frequency inverter pump 3	Alert	Manual
356	2-9-6-7	Phase failure frequency inverter pump 3	Alert	Manual
357	2-9-6-8	Overvoltage frequency inverter pump 3	Alert	Auto
358	2-9-6-9	Undervoltage frequency inverter pump 3	Alert	Auto
359	2-9-6-10	Overload frequency inverter pump 3	Alert	Manual
360	2-9-6-11	Brake resistor frequency inverter pump 3	Alert	Manual
361	2-9-6-12	Temperature fault frequency inverter pump 3	Alert	Manual
362	2-9-6-13	AMA fault frequency inverter pump 3	Alert	Manual
363	2-9-6-14	Short circuit frequency inverter pump 3	Alert	Manual
364	2-9-6-15	Safety stop frequency inverter pump 3	Alert	Manual
365	2-9-6-16	Configuration invalid frequency inverter pump 3	Alert	Manual
400	2-9-7-1	Failure motor-circuit breaker pump 4	Warning	Manual
401	2-9-7-2	Manual ON pump 4	Warning	Auto
402	2-9-7-3	Manual OFF pump 4	Warning	Auto
403	2-9-7-4	Excessive temperature motor pump 4	Alert	Manual
450	2-9-8-1	Fault motor circuit breaker frequency inverter pump 4	Warning	Manual
451	2-9-8-2	Fault frequency inverter pump 4	Alert	Auto
452	2-9-8-3	Communication error frequency inverter pump 4	Alert	Auto
453	2-9-8-4	Incorrect check sum frequency inverter pump 4	Alert	Auto
454	2-9-8-5	Internal fault frequency inverter pump 4	Alert	Auto
455	2-9-8-6	Mains fault frequency inverter pump 4	Alert	Manual
456	2-9-8-7	Phase failure frequency inverter pump 4	Alert	Manual
457	2-9-8-8	Overvoltage frequency inverter pump 4	Alert	Auto
458	2-9-8-9	Undervoltage frequency inverter pump 4	Alert	Auto
459	2-9-8-10	Overload frequency inverter pump 4	Alert	Manual
460	2-9-8-11	Brake resistor frequency inverter pump 4	Alert	Manual
461	2-9-8-12	Temperature fault frequency inverter pump 4	Alert	Manual
462	2-9-8-13	AMA fault frequency inverter pump 4	Alert	Manual
463	2-9-8-14	Short circuit frequency inverter pump 4	Alert	Manual
464	2-9-8-15	Safety stop frequency inverter pump 4	Alert	Manual
465	2-9-8-16	Configuration invalid frequency inverter pump 4	Alert	Manual
500	2-9-9-1	Failure motor-circuit breaker pump 5	Warning	Manual
501	2-9-9-2	Manual ON pump 5	Warning	Auto
502	2-9-9-3	Manual OFF pump 5	Warning	Auto
503	2-9-9-4	Excessive temperature motor pump 5	Alert	Manual
550	2-9-10-1	Fault motor circuit breaker frequency inverter pump 5	Warning	Manual
551	2-9-10-2	Fault frequency inverter pump 5	Alert	Auto
552	2-9-10-3	Communication error frequency inverter pump 5	Alert	Auto
553	2-9-10-4	Incorrect check sum frequency inverter pump 5	Alert	Auto



ID mes- sage	Para- meter	Description	Status	Reset mode (factory set- ting)
554	2-9-10-5	Internal fault frequency inverter pump 5	Alert	Auto
555	2-9-10-6	Mains fault frequency inverter pump 5	Alert	Manual
556	2-9-10-7	Phase failure frequency inverter pump 5	Alert	Manual
557	2-9-10-8	Overvoltage frequency inverter pump 5	Alert	Auto
558	2-9-10-9	Undervoltage frequency inverter pump 5	Alert	Auto
559	2-9-10-10	Overload frequency inverter pump 5	Alert	Manual
560	2-9-10-11	Brake resistor frequency inverter pump 5	Alert	Manual
561	2-9-10-12	Temperature fault frequency inverter pump 5	Alert	Manual
562	2-9-10-13	AMA fault frequency inverter pump 5	Alert	Manual
563	2-9-10-14	Short circuit frequency inverter pump 5	Alert	Manual
564	2-9-10-15	Safety stop frequency inverter pump 5	Alert	Manual
565	2-9-10-16	Configuration invalid frequency inverter pump 5	Alert	Manual
600	2-9-11-1	Failure motor-circuit breaker pump 6	Warning	Manual
601	2-9-11-2	Manual ON pump 6	Warning	Auto
602	2-9-11-3	Manual OFF pump 6	Warning	Auto
603	2-9-11-4	Excessive temperature motor pump 6	Alert	Manual
650	2-9-12-1	Fault motor circuit breaker frequency inverter pump 6	Warning	Manual
651	2-9-12-2	Fault frequency inverter pump 6	Alert	Auto
652	2-9-12-3	Communication error frequency inverter pump 6	Alert	Auto
653	2-9-12-4	Incorrect check sum frequency inverter pump 6	Alert	Auto
654	2-9-12-5	Internal fault frequency inverter pump 6	Alert	Auto
655	2-9-12-6	Mains fault frequency inverter pump 6	Alert	Manual
656	2-9-12-7	Phase failure frequency inverter pump 6	Alert	Manual
657	2-9-12-8	Overvoltage frequency inverter pump 6	Alert	Auto
658	2-9-12-9	Undervoltage frequency inverter pump 6	Alert	Auto
659	2-9-12-10	Overload frequency inverter pump 6	Alert	Manual
660	2-9-12-11	Brake resistor frequency inverter pump 6	Alert	Manual
661	2-9-12-12	Temperature fault frequency inverter pump 6	Alert	Manual
662	2-9-12-13	AMA fault frequency inverter pump 6	Alert	Manual
663	2-9-12-14	Short circuit frequency inverter pump 6	Alert	Manual
664	2-9-12-15	Safety stop frequency inverter pump 6	Alert	Manual
665	2-9-12-16	Configuration invalid frequency inverter pump 6	Alert	Manual

10.3.2 Messages for additional devices

Table 40: Messages for additional devices

ID mes- sage	Para- meter	Description	Status	Reset mode (factory set- ting)
700	2-9-13-1	Suction-side pressure too low	Alert	Manual
701	2-9-13-2	Suction-side pressure too high	Alert	Manual
702	2-9-13-3	Fault pressure sensor suction side	Alert	Manual
703	2-9-13-3	Broken wire pressure sensor suction side	Alert	Manual
704	2-9-13-4	Short circuit pressure sensor suction side	Alert	Manual
720	2-9-14-1	Discharge-side pressure too low	Alert	Manual
721	2-9-14-2	Discharge-side pressure too high	Alert	Manual
722	2-9-14-3	Fault pressure sensor discharge side	Alert	Manual
723	2-9-14-4	Broken wire pressure sensor discharge side	Alert	Manual
724	2-9-14-5	Broken wire pressure sensor discharge side	Alert	Manual
725	2-9-14-6	Discharge-side pressure too low too often	Information	Auto
726	2-9-14-7	Discharge-side pressure too high too often	Information	Auto

ID mes- sage	Para- meter	Description	Status	Reset mode (factory set- ting)
740	2-9-15-1	Fault pressure sensor at tank	Alert	Manual
741	2-9-15-2	Broken wire pressure sensor at tank	Alert	Manual
742	2-9-15-3	Short-circuit pressure sensor at tank	Alert	Manual
750	2-9-16-1	Fault pressure sensor at tank	Alert	Auto
751	2-9-16-2	Broken wire pressure sensor at tank	Alert	Auto
752	2-9-16-3	Short-circuit pressure sensor at tank	Alert	Auto
760	2-9-17-1	Fault temperature sensor	Alert	Auto
761	2-9-17-2	Temperature too high	Alert	Manual
762	2-9-17-3	Temperature too low	Alert	Manual
770	2-9-18-1	Leakage of pump system	Alert	Manual

10.3.3 Messages for specific functions

Table 41: Messages for additional devices

ID mes- sage	Para- meter	Description	Status	Reset mode (factory set- ting)
800	2-9-19-1	Lack of water	Alert	Manual
801	2-9-19-2	Dry running protection too often within time frame	Information	Auto
810	2-9-20-1	Fault rainwater pump 1	Alert	Manual
811	2-9-20-2	Starts per hour exceeded rainwater pump 1	Warning	Auto
812	2-9-20-3	Manual OFF rainwater pump 1	Warning	Auto
813	2-9-20-4	Manual ON rainwater pump 1	Warning	Auto
814	2-9-20-5	Fault rainwater pump 2	Alert	Manual
815	2-9-20-6	Starts per hour exceeded rainwater pump 2	Warning	Auto
816	2-9-20-7	Manual OFF rainwater pump 2	Warning	Auto
817	2-9-20-8	Manual ON rainwater pump 2	Warning	Auto
818	2-9-20-9	All rainwater pumps OFF	Alert	Auto
819	2-9-20-10	Lack of rainwater	Warning	Auto
820	2-9-20-11	Use of drinking water	Information	Auto
830	2-9-21-1	Tank fill level too low	Alert	Auto
831	2-9-21-2	Tank fill level critical	Warning	Auto
832	2-9-21-3	Tank fill level too high	Alert	Auto
833	2-9-21-4	Overflow of tank	Alert	Manual
835	2-9-21-5	Flushing of inlet line	Information	Auto
837	2-9-21-6	Flushing of inlet line incomplete	Warning	Manual
838	2-9-21-7	Fault inlet valve	Alert	Manual
839	2-9-21-8	Fault additional inlet valve	Alert	Manual
850	2-9-22-1	Water stagnation	Warning	Manual
851	2-9-22-2	Flushing	Information	Auto
852	2-9-22-3	Flushing too often	Warning	Manual
860	2-9-23-1	Pipe filling active	Information	Auto
861	2-9-23-2	Maximum pipe filling attempts exceeded	Warning	Auto
862	2-9-23-3	Pipe filling failed	Alert	Auto
870	2-9-24-1	Membrane rupture detection	Alert	Manual
900	2-9-25-1	Several pumps OFF	Alert	Auto
901	2-9-25-2	External OFF	Alert	Auto
902	2-9-25-3	Fire alarm	Warning	Auto
903	2-9-25-4	Emergency power supply	Warning	Auto
904	2-9-25-5	Redundant system availability	Information	Auto
920	2-9-26-1	System flow estimation failed	Warning	Auto

ID mes- sage	Para- meter	Description	Status	Reset mode (factory set- ting)
950	2-9-27-1	Service required	Warning	Manual
960	2-9-28-1	Too many failed login attempts	Information	Auto
970	-	Database invalid	Alert	Manual
971	-	Database not compatible	Alert	Manual
972	2-9-29-1	Extension board not available	Alert	Manual
973	2-9-29-2	Overcurrent detected	Alert	Manual
974	2-9-29-3	Power failure	Information	Auto
975	2-9-25-4	Failure of real-time clock	Information	Auto
976	2-9-25-5	Display failure	Information	Auto

11 EU Declaration of Conformity

Manufacturer:

Duijvelaar Pompen
DP Pumps
Kalkovenweg 13
2401 LJ Alphen aan den Rijn (The Netherlands)

The manufacturer herewith declares that **the product**:

Hydro-Unit Utility Line (F, VC, SVP)

Type code: 40/2021 1000000-1 to 52/2025 9999999-9999

- is in conformity with the provisions of the following directives / regulations as amended from time to time:
 - Pump set: 2006/42/EC Machinery Directive
 - Electrical components⁴: 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
 - 2014/30/EU: Electromagnetic Compatibility (EMC)

The manufacturer also declares that

- the following harmonised international standards have been applied:
 - ISO 12100
 - EN 809
 - EN 60204-1
 - EN 806-2

Person authorised to compile the technical file:

Ron Bijman
Manager Competence Centre Products
Duijvelaar Pompen B.V.
Kalkovenweg 13
2401 LJ Alphen aan den Rijn (The Netherlands)

The EU Declaration of Conformity was issued in/on:

Alphen aan den Rijn, 1 July 2022



Ron Bijman
Manager Competence Centre Products
Duijvelaar Pompen B.V.
Kalkovenweg 13
2401 LJ Alphen aan den Rijn (The Netherlands)

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⁴ Where applicable

12 Certificate of Decontamination

Type:
Order number /
Order item number⁵⁾:
Delivery date:
Application:
Fluid handled⁵⁾:

Please tick where applicable⁵⁾:



Corrosive



Oxidising



Flammable



Explosive



Hazardous to health



Seriously hazardous to health



Toxic



Radioactive



Bio-hazardous



Safe

Reason for return⁵⁾:

Comments:
.....

The product / accessories have been carefully drained, cleaned and decontaminated inside and outside prior to dispatch / placing at your disposal.

We herewith declare that this product is free from hazardous chemicals and biological and radioactive substances.

For mag-drive pumps, the inner rotor unit (impeller, casing cover, bearing ring carrier, plain bearing, inner rotor) has been removed from the pump and cleaned. In cases of containment shroud leakage, the outer rotor, bearing bracket lantern, leakage barrier and bearing bracket or intermediate piece have also been cleaned.

For canned motor pumps, the rotor and plain bearing have been removed from the pump for cleaning. In cases of leakage at the stator can, the stator space has been examined for fluid leakage; if fluid handled has penetrated the stator space, it has been removed.

- No special safety precautions are required for further handling.
- The following safety precautions are required for flushing fluids, fluid residues and disposal:

.....
.....

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We confirm that the above data and information are correct and complete and that dispatch is effected in accordance with the relevant legal provisions.

.....
Place, date and signature

.....
Address

.....
Company stamp

⁵⁾ Required field

13 Commissioning Report

The pressure booster system specified below has been commissioned today by the undersigned, authorised Duijvelaar Pompen B.V. Service who created this report.

Pressure booster system details

Type series
Size
Serial number
Order No.

Purchaser/place of installation

Purchaser	Place of installation
Name
Address
.....

Operating data

For further data refer to the wiring diagram.

Start-up pressure p_E bar
Inlet pressure monitoring $p_{inl} - x$
(setting of inlet pressure switch)
Stop pressure p_A bar
Inlet pressure p_{inl} [bar]
Pre-charge pressure
of accumulator $p_{pre-charge}$ [bar]

The operator or operator's representative herewith confirms to have received instructions on how to operate and service the pressure booster system. The relevant circuit diagrams and operating instructions have been handed over.

Non-conformities found during commissioning	Deadline for remedial action
Non-conformity 1.....
.....
.....
.....

Name of Duijvelaar Pompen B.V. representative	Name of purchaser or representative
.....
Place	Date
.....



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