



# EcoPUC A

Display unit for pneumatic pumps

## Operation manual

MCU00002EN, V04

F30300001, F30300002, F30300003




### Information about the document

This document describes the correct handling of the product.

- Read the document prior to every activity.
- Prepare the document for the application.
- Pass on the product only together with the complete documentation.
- Always follow safety instructions, handling instructions and specifications of every kind.
- Illustrations can deviate from the technical construction.

### Validity range of the document

This document describes the following products:

F30300001 <b>EcoPUC A (Basic)</b>	
F30300002 <b>EcoPUC A RA (Basic Plus)</b>	
F30300003 <b>EcoPUC A RA BUS (Advanced)</b>	

### Applicable documents

- MPU00002\* - Operating instructions **EcoPump HP** (horizontal piston pump)
- MPU00003\* - Operating Instructions **EcoPump VP** (vertical piston pump)
- MPU00022\* - Operating Instructions **EcoPump VP** (vertical piston pump)
- MPU00026\* - Operating Instructions **EcoPump VP** (vertical piston pump)



An asterisk (\*) in the document number replaces the symbol of the language variant.

### Hotline and Contact

If you have queries or would like technical information, please contact your dealer or sales partner.

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# 1 Product overview

## 1.1 Overview

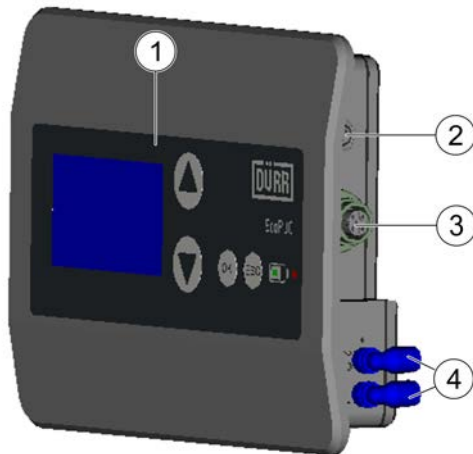


Fig. 1: At a glance

- 1 Operator interface
- 2 Connection for proximity switch with reed switch
- 3 Profibus-PA connection
- 4 Control air connection



- Item 3 is only valid for the variant F30300003.
- Item 4 is only valid for the variants F30300002 and F30300003.

## 1.2 Short description

The **EcoPUC A** (in the following “display unit”) is a display unit for pneumatic pumps in industrial paint systems.

Depending on the version, the display unit has a proximity switch with reed switch, a control valve and a Profibus PA connection ↪ 3.1 “Design”.

# 2 Safety

## 2.1 Presentation of Notes

The following notes can appear in this instruction:



### DANGER!

High risk situation that can lead to serious injuries or death.



### WARNING!

Medium risk situation that can lead to serious injuries or death.



### CAUTION!

Low risk situations that can lead to minor injuries.



### NOTICE!

Situations that can lead to material damage.



### ENVIRONMENT!

Situations that can lead to environmental damage.



Additional information and recommendations.

## 2.2 Intended Use

### Use

The display unit is designed for use in industrial paint systems. The display unit can be used for monitoring the following products:

- **EcoPump HP**
- **EcoPump VP**

The display unit is used for registering the strokes and double strokes of a piston pump for delivering flammable, fluid coating materials that are solvent- or water-based.

The display unit may be used in explosive areas of Ex zones 1 and 2.

Use the display unit only within the approved technical data ↪ 13 “Technical data”.

Only use the display unit within the approved connection parameters for Profibus PA (only valid for F30300003) ↪ 13.2 “Connections”.

The display unit has been designed for use with **EcoPump HP** and **EcoPump VP**. Dürr Systems recommends using approved components only:

- Proximity switch with reed switch
- Current limitation for Profibus PA
- Battery (for type, see ↪ 13.6 “Type plate”)

The coating material complies with explosion group IIB. The coating material must not chemically react with aluminum.

### Misuse

Wrong use of the display unit presents a risk of injury:

Examples of wrong use are:

- Use in explosive areas Ex zone 0
- Setting up of processes generating strong voltages in close proximity of the display unit
- Operation without grounding of the housing
- Modification of original parts and genuine spare parts
- Operation by unqualified personnel ↪ 2.4 “Staff qualification”
- Use of components without approval by Dürr Systems

**Ex labeling**

**Ex** II 2G Ex ib IIB T4

- II - Device group II: all areas except mining
- 2G - Device category 2 for gaseous ex-atmosphere
- Ex - Device conforms to an ignition protection category.
- ib - Ignition protection category: Fail-safe Device is suitable for Ex zones 1 and 2.
- IIB - Explosion group
- T4 - Temperature class

**Number of the examination certificate of EU type-approval testing**

TPS 16 ATEX 41626 007 X

**2.3 Safety signs**

The security marking is on the rear side of the housing.

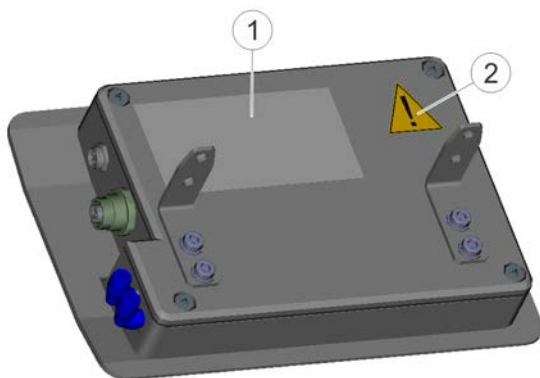


Fig. 2: Safety Signs

- 1 Warning notice
- 2 Warning sign

**2.4 Staff qualification**

**! WARNING!**

**Inadequate qualification**

Wrong estimation of dangers can cause serious injury or death.

- Only sufficiently qualified persons may execute all work.
- Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a “+”.

This document is intended for qualified personnel in industry and craftsmanship.

**Cleaning staff**

The cleaning staff receives regular instructions from the operator about the following contents:

- Using the product
- Handling cleaning tools
- Handling cleaning agents
- Technical Measures for occupational safety and health

**Electrician**

Electricians assemble, install, service and repair electrical systems in a professional manner.

Furthermore, electrical engineers have the following knowledge:

- Guidelines, Standards and Rules of Engineering
- Local conditions
- Electrical Systems and Their Loading Limits
- Technical Measures for occupational safety and health

**Mechanic**

The mechanic is trained specifically for the field of work in which he works.

Furthermore, he has the following knowledge:

- Guidelines, Standards and Rules of Engineering
- Local conditions
- Technical Measures for occupational safety and health

The mechanic is responsible for the following activities on equipment and components:

- Assembly
- Waiting
- Maintenance
- Disassembly

**Operator**

The operator is trained specifically for the field of work in which he works.

Furthermore, the operator possesses the following knowledge:

- Technical Measures for occupational safety and health

The operator is responsible for the following work:

- Operate and monitor the system/ product.
- Introduce measures in the event of faults.
- Clean system/ product.

**+ additional qualification explosion protection**

In addition to the knowledge of the various specialist fields, the mechanic has knowledge of regulations and safety measures when working in potentially explosive areas.

Dürr Systems offers special product training for ↪ "Hotline and Contact".

### 3 Design and Function

#### 3.1 Design

The display unit is available in three versions:

Description and material number	Connections	Power supply	Operations/displays
<b>EcoPUC A</b> F30300001	<ul style="list-style-type: none"> <li>▪ Proximity switch with reed switch</li> </ul>	<ul style="list-style-type: none"> <li>▪ Battery</li> </ul>	<ul style="list-style-type: none"> <li>▪ Flow rate</li> <li>▪ Wear monitoring</li> </ul>
<b>EcoPUC A RA</b> F30300002	<ul style="list-style-type: none"> <li>▪ Proximity switch with reed switch</li> <li>▪ Control air</li> </ul>	<ul style="list-style-type: none"> <li>▪ Battery</li> </ul>	<ul style="list-style-type: none"> <li>▪ Flow rate</li> <li>▪ Wear monitoring</li> </ul>
<b>EcoPUC A RA BUS</b> F30300003	<ul style="list-style-type: none"> <li>▪ Proximity switch with reed switch</li> <li>▪ Control air</li> <li>▪ Profibus PA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Battery (only in the case of uninterrupted bus connection)</li> <li>▪ Profibus PA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Flow rate</li> <li>▪ Wear monitoring</li> </ul>

#### 2.5 Personal protective equipment

When working in explosive areas, the protective clothing, including gloves, must meet the requirements of EN 1149-5. Footwear must meet the requirements of ISO 20344 and IEC 61340-4-3. The volume resistivity must not exceed 100MΩ.

Wear the specified personal protective equipment when working. Provide the following personal protective equipment:



**Anti-Static Safety Boots**

Protect feet from crushing, falling items and slipping on slippery ground.

Moreover, anti-static safety boots reduce electrostatic charge by discharging the electrostatic charges.



**Protective workwear**

Tight fitting workwear with low tear strength, tight sleeves and no hanging parts.

### 3.2 Front

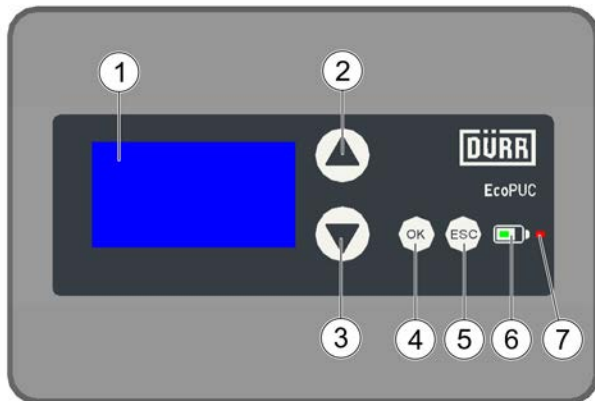


Fig. 3: Front

- 1 Display
- 2 UP button
- 3 DOWN button
- 4 OK button
- 5 Escape button
- 6 Battery indicator
- 7 Status LED

### 3.3 Rear

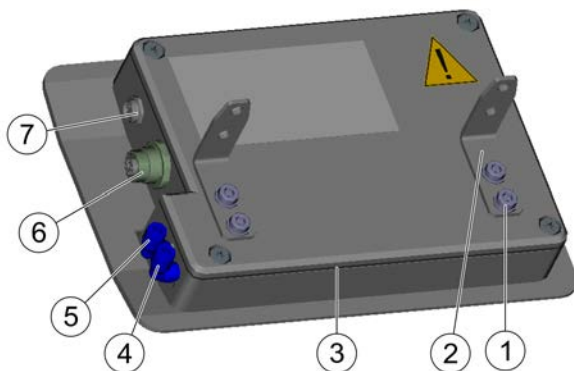


Fig. 4: Rear

- 1 Screws
- 2 Fastening angle
- 3 Seal
- 4 Control air inlet (F30300002 and F30300003)
- 5 Control air outlet (F30300002 and F30300003)
- 6 Profibus-PA connection (F30300003)
- 7 Connection for proximity switch with reed switch

### 3.4 Interior view

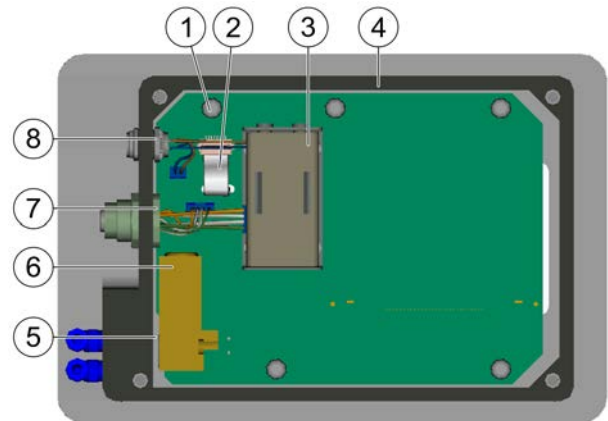


Fig. 5: Interior view

- 1 Screws
- 2 Membrane keypad connection
- 3 Battery
- 4 Seal
- 5 Valve seal
- 6 Control valve (F30300002 and F30300003)
- 7 Profibus PA connection (F30300003)
- 8 Connection for proximity switch with reed switch

### 3.5 Profibus PA

Only valid for the variant F30300003

The bus parameters valid for all connected devices are set on the master.

Standard settings of the bus parameters ↗ 13.4 "Operating values"

The device profile of the display unit is defined in a device master data file (GSD). The device profile must be integrated in the master. This provides the master with general device information e.g. the data format expected by the display unit.

The display unit is a DPv0 slave and supports DPv0 specifications.

#### Data exchange

For description of the Profibus data exchange, refer to appendix ↗ "Profibus data exchange".



### 3.6 Pneumatic unit

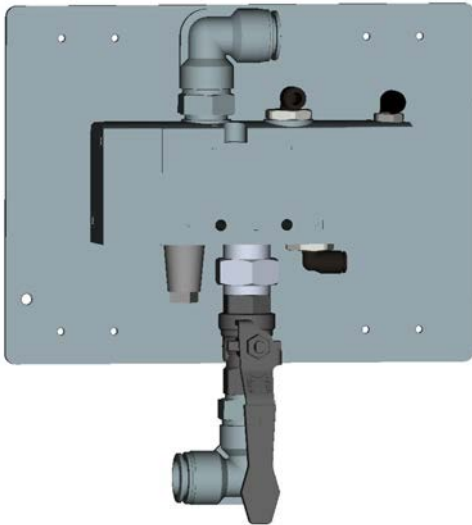


Fig. 6: Pneumatic unit

The pneumatic unit is installed between display unit and pump. The pneumatic unit has a 5/2 working valve (1). The working valve (1) ensures that the pump is supplied with sufficient compressed air. The working valve (1) is required as the 3/2 control valve (2) of the display unit is unable to supply the pump with sufficient compressed air.

The pneumatic unit is available as accessory ↪ 14.3 “Accessories”.  
Schematic representation, see also ↪ “Wiring diagram”

## 4 Transport, scope of supply and storage

### 4.1 Unpacking

Personnel:

- Operator

Protective equipment:

- Protective workwear
- Anti-Static Safety Boots

1. Check the display unit packaging for damage.  
⇒ Immediately notify the customer service of any damage ↪ “Hotline and Contact”.

2. **DANGER!**  
**Danger of explosion from static charges on plastic film and foils**

Plastic wrapping of the display unit:

- Remove before entering the explosive area.
- Remove prior to commissioning.

**ENVIRONMENT!**

Environmental damage due to wrong disposal

3. Keep packaging material for storage or transport.
4. Check unpacked display unit for damage.
5. Transport display unit to the assembly location.

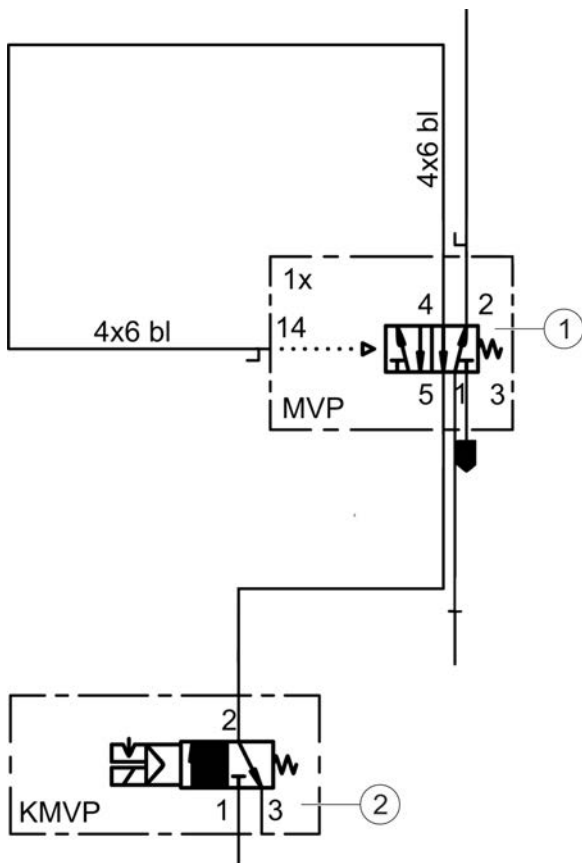


Fig. 7: Schematic representation



## 4.2 Scope of delivery

The scope of supply includes the following components:

- Display unit
- Battery
- Proximity switch with reed switch
- Fastening bracket for **EcoPump VP** or **EcoPump HP**

1. Inspect delivery on receipt for completeness and integrity.
2. Report defects immediately ↪ “Hotline and Contact”.

## 4.3 Handling of packaging material

### ENVIRONMENT!

#### Incorrect disposal

Incorrectly disposed packaging material can damage environment.

- Dispose of material no longer required in an environment-friendly manner.
- Observe local disposal specifications.

## 4.4 Storage

Requirements for the warehouse:

- Do not store outdoors.
- Store in a dry and dust-free place.
- Do not expose to aggressive media.
- Protect from solar radiation.
- Avoid mechanical vibrations.
- Temperature: -30° C to 65°C
- Relative humidity: 35% to 90%

Remove the battery from the housing before storing the display unit ↪ 12.2 “Disassembly”.

## 4.5 Transport

Personnel:

- Mechanic

Protective equipment:

- Protective workwear
- Anti-Static Safety Boots

Requirements:

- Ensure that all the hoses and lines have been removed ↪ 12.2 “Disassembly”.
- Display unit is disassembled ↪ 12.2 “Disassembly”.

1. Use the original packing for transporting. If the original packing is no longer available, the packing used must meet the following requirements:
  - Comprehensive protection from vibrations
  - Protection from dirt
  - Protection from moisture

## 5 Assembly

### 5.1 Safety recommendations

#### WARNING!

##### Explosion danger due to electrostatic charge

The housing can become electrostatically charged. Electrostatic discharge can cause sparks. In an explosive atmosphere, these sparks can prove to be the source of ignition for an explosion. Serious injury and death could be the consequence.

- Bolt the housing without insulating layers with a grounded metal component.
- Do not use plastic underlays (e.g. rubber buffer) for assembly.
- Assembly on insulating components is not allowed.
- Wear specified protective equipment.

#### WARNING!

##### Explosion danger due to work at the display unit

Working on the display unit in an explosive atmosphere can cause fire or an explosion. Serious injury and death could be the consequence.

- Conduct work on the display unit only in the workshop, outside of Ex zones.

### 5.2 Assembly

#### 5.2.1 Insert battery

#### WARNING!

##### Danger of explosion due to battery replacement

Replacing a battery in explosive atmosphere can cause fire or an explosion. Serious injuries and death can be the consequence.

- Only replace battery outside the Ex zone.

**WARNING!**

**Fire and explosion hazard due to damaged battery**

Damaged batteries can cause a fire or explosion. Serious injury and death could be the consequence.

- Protect batteries against mechanical influences such as impacts, blows, or falling.
- Remove damaged batteries from the housing.
- Dispose of damaged batteries properly.
- Notes of a damaged battery are:
  - Bloated battery
  - Deformed battery
  - Outgassed or leaked battery
  - Greasy film on the battery
  - Exterior deposits in the area of the pole
- Always wear gloves when touching greasy or leaking batteries.

**EX WARNING!**

**Explosion danger due to contamination**

If the display unit is not properly sealed, contaminants can reach interior of the device. Dirt inside the device (e.g. on the board) can trigger short-circuits. It can cause fire or an explosion. Serious injury and death could be the consequence.

- Do not use leaking display unit in explosive areas.
- Replace damaged seals.
- If the interior of the device is contaminated, have the display unit cleaned only by Dürr Systems ☞ "Hotline and Contact".

**EX WARNING!**

**Danger of explosion due to damaged board**

Changing the battery can damage the board. Damages to the board can cause short circuit. It can cause fire or an explosion. Serious injuries and death can be the consequence.

- Do not touch the board when changing the battery.
- ESD protective measures are required, in order not to damage the board.

Personnel:

- Mechanic
- + additional qualification explosion protection

Requirements:

- Ensure a non-explosive atmosphere.

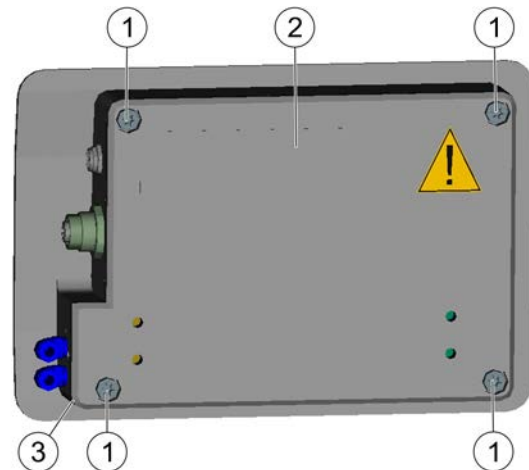


Fig. 8: Rear of device

1. Unscrew screws (1) on the housing lid (2).
2. Remove housing lid (2) and seal (3).

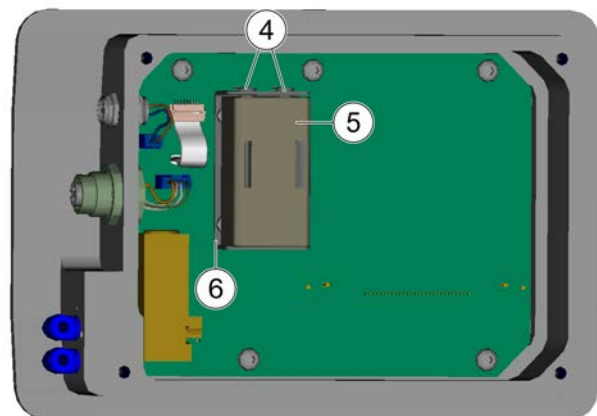


Fig. 9: Insert battery

3. i For specifications of the battery, refer to ☞ 14.1 "Replacement parts".  
Fit battery (5) at an angle to the poles (4).
4. Push battery down into the battery housing (6).
5. Check seal for damage before assembly. If seal is damaged, use a new seal.
6. Place seal (3) and housing lid (2) onto the housing.
7. Fasten screws (1).

### 5.2.2 Assembling the display unit

**CAUTION!**

**Falling down of the display unit**

If the display unit is not attached to the pump, the display unit may fall down. Simply leaning the display unit at the pump is not permitted. This may cause injuries.

- Attach display unit to the pump by using fastening brackets.
- Wear specified protective equipment.

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots

Requirements:

- Ensure a non-explosive atmosphere.

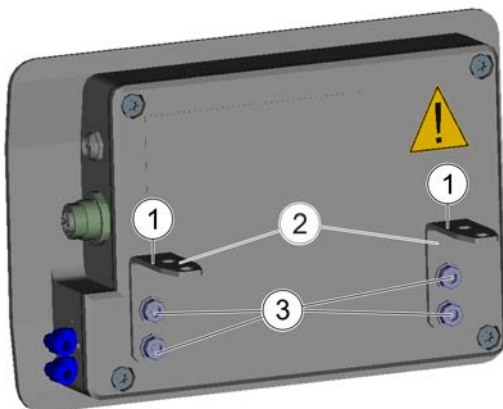


Fig. 10: Assemble fastening bracket

1. Assemble fastening bracket (2) to the display unit by using screws (3).

**i** The bores (1) on the fastening bracket are intended for attaching the display unit onto **EcoPump HP** or **EcoPump VP**.

2. Attach display unit to the pump.

**i** For more information regarding the assembly, see the relevant operating instructions of **EcoPump HP** and **EcoPump VP** → “Applicable documents”.

### 5.3 Connecting

#### 5.3.1 Grounding the display unit

**EX WARNING!**

**Sparks due to electrostatic discharge**

If the display unit is not properly grounded or the potential equalization fails, components may get charged electrostatically. Electrostatic discharge can cause sparks that in explosive atmosphere can cause a fire or an explosion. Serious injury and death could be the consequence.

- Ground Display unit as specified.
- Check connection of grounding cable.
- Measure volume resistivity.

Personnel:

- Electrician
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots

Requirements:

- Ensure a non-explosive atmosphere.

1. Ground the display unit:

- Via the connection to the pump
- Via a separate grounding line if no pump is used.

**Checking grounding**

2. Measure and document volume resistivity.

#### 5.3.2 Connect reed switch

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots

Requirements:

- Ensure a non-explosive atmosphere.

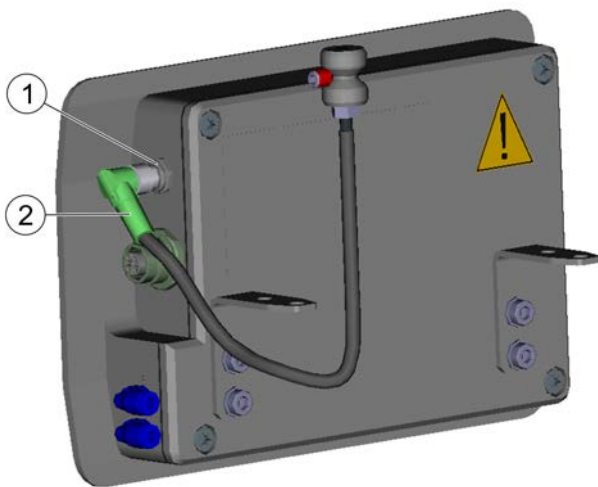


Fig. 11: Connect reed switch

**⚠ WARNING!**

**Danger of explosion due to unsuitable replacement parts**

If you use replacement parts that do not comply with the specifications of the ATEX guidelines, the replacement parts can cause explosions in an explosive atmosphere. Serious injury and death could be the consequence.

- Use only proximity switch with reed switch from Dürr Systems.

1. Insert proximity switch with reed switch (2) in the bushing (1).

**i** For how to restore the connection to **EcoPump HP** or **EcoPump VP**, see associated operating instructions ↪ “Applicable documents”.

**5.3.3 Connecting the power supply**

Personnel:

- Electrician
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots

Requirements:

- Ensure a non-explosive atmosphere.

**Power supply through battery**

1. Insert battery ↪ 5.2.1 “Insert battery”.

⇒ Power supply is connected.

**Power supply through Profibus PA**

**i** Only valid for the variant F30300003

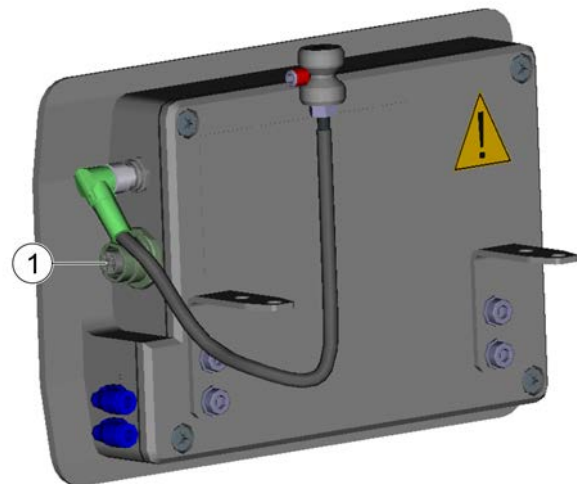


Fig. 12: Connect Profibus PA plug

2. Insert Profibus PA plug into the bushing (1). Observe connection parameters when selecting the Profibus PA supply device ↪ 13.2 “Connections”.  
⇒ Power supply is connected.

### 5.3.4 Connect compressed air supply

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots

Requirements:

- Ensure a non-explosive atmosphere.

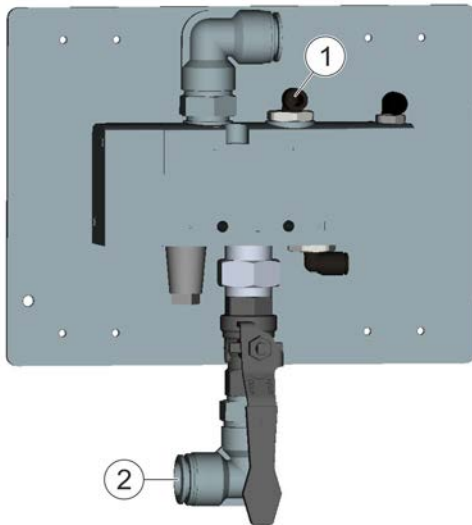


Fig. 13: Pneumatic unit

1. Connect pneumatic unit to the pump.

For further information on connecting to the pump, see the pump operating instructions under “Applicable documents”.

2. Connect hose of the control air inlet (1) to the pneumatic unit.
3. Connect hose of the control air outlet (2) to the pneumatic unit.

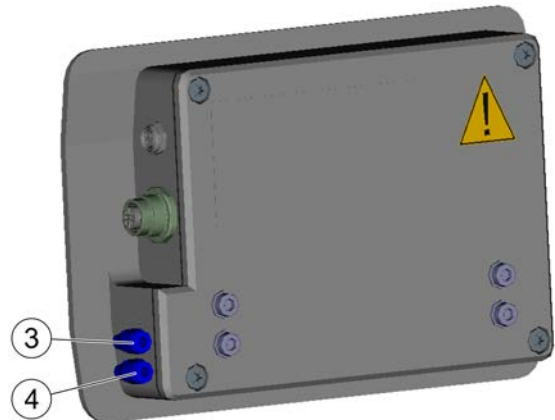


Fig. 14: Display unit

4. Connect hose of the control air outlet (3) to the display unit.
5. Connect hose of the control air inlet (4) to the display unit.  
⇒ Compressed air supply is connected.

For wiring diagram of the pneumatic unit, see “Wiring diagram”

## 6 Visualizer

### 6.1 Controls and displays

#### Controls



Fig. 15: Controls

Item	Key	Function	Example
1	UP	Increase High	<ul style="list-style-type: none"> <li>▪ Increase value.</li> <li>▪ Enter previous menu.</li> </ul>
2	DOWN	Decrease Below	<ul style="list-style-type: none"> <li>▪ Decrease value.</li> <li>▪ Enter next menu.</li> </ul>
3	OK	Confirm	<ul style="list-style-type: none"> <li>▪ Select menu.</li> <li>▪ Confirm value.</li> <li>▪ Acknowledge error message.</li> </ul>
4	ESC	Return	<ul style="list-style-type: none"> <li>▪ Cancel entry.</li> <li>▪ Change to the next upper menu level.</li> </ul>

Controls

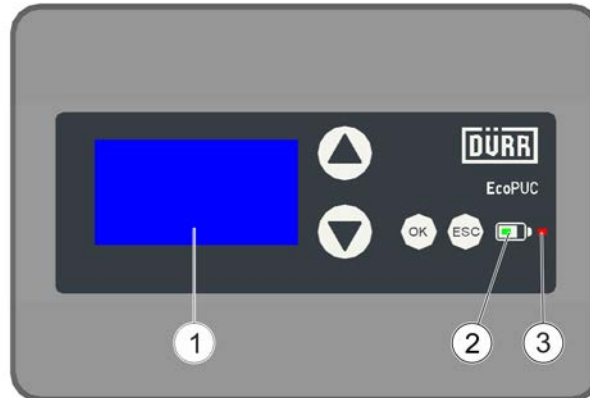


Fig. 16: Controls

- 1 Display
- 2 Battery
- 3 Error LED

LED	Color	Activity	Operating status
Battery	-	None	Power supply through battery
	Green	Lights up continuously	Power supply through Profibus PA (only valid for F30300003)
		Lights up for 2 seconds	Battery level low
		Quickly flashes 5 times	Battery level very low: ▪ Change battery.
Error	-	None	Display unit switched off or not ready for operation
	Red	Flashes continuously	Battery voltage too low, display unit cannot start.
		Flares up briefly every 4 seconds	Display unit ready for operation, no errors present.
		Flares up briefly every second	At least one error is present.

6.2 Menus

6.2.1 Overview

The display unit has the following menus:

- Main menu (system status)
- Actual parameter
- Set parameter
- Maintenance

6.2.2 Main menu

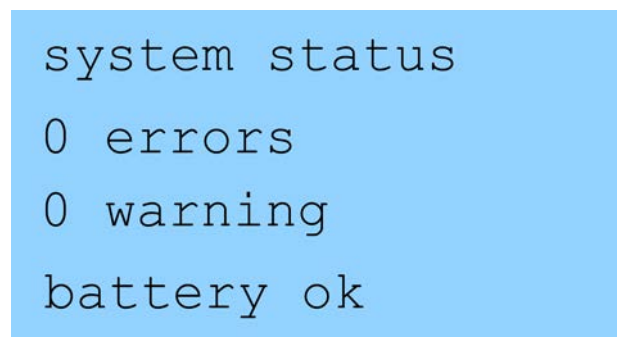


Fig. 17: Main menu (system status)



The number of the current error and warnings is displayed in the main menu.

1. Acknowledge errors and warnings by pressing [OK].
  - ⇒ Error LED turns out.

Errors and warning that were not saved can be recognized from:

- Flashing behavior of the error LED
- Message on the display

**Error**

The following errors are displayed:

- Dry run
- Communication (only valid for F30300003)
- Reed switch
- Control valve

Communication errors are only displayed after a Profibus PA connection (only valid for F30300003).

- Connect Profibus PA.
  - ⇒ 5.3.3 “Connecting the power supply”

**Warnings**

The following warnings are displayed:

- Maintenance due
- Battery low

Disconnection from power supply deletes the internal memory for errors and warnings.

- Disconnect from power supply.
  - ⇒ 12.2.5 “Remove battery”

**6.2.3 Actual parameter**

**6.2.3.1 Overview**

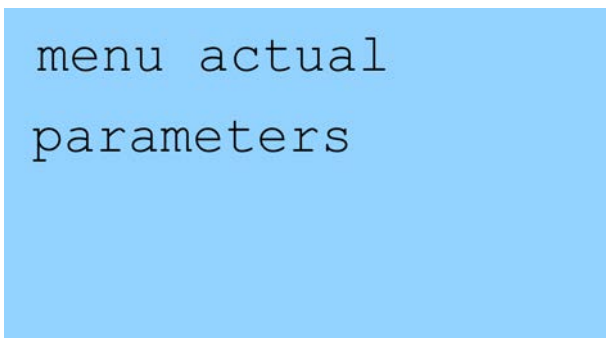


Fig. 18: Actual parameters menu

The following settings and displays are present:

- Displacement volume in l/min
- Displacement volume in gal/min
- Double stroke frequency in DH/min
- Number of strokes in total
- Number of strokes since last maintenance
- Date and clock time

**6.2.3.2 Double stroke counting and displacement volume**

The reed switch records double strokes. The reed switch emits a pulse per executed double stroke. The displacement volume in l/min and gal/min is calculated based on the double stroke frequency, using the “double stroke volume” parameter. The “Double stroke volume” is set in the “Set parameter” menu.

**6.2.4 Set parameter**

**6.2.4.1 Overview**

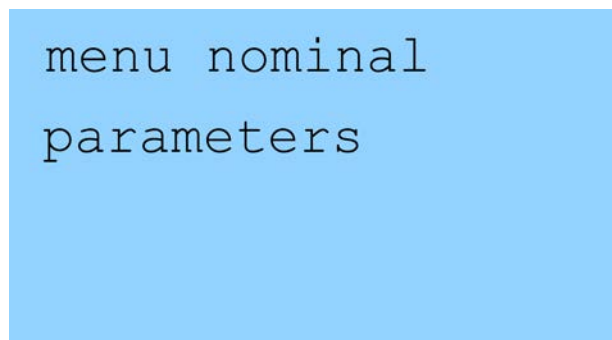


Fig. 19: Set parameters menu

The following settings and displays are present:

- Double stroke volume
- Dry run protection threshold value (only valid for F30300002 and F30300003)
- Activate/ deactivate dry run protection (only valid for F30300002 and F30300003)
- Maintenance interval
- Volumetric measurement double stroke rate (only valid for F30300002 and F30300003)
- Language
- Battery warning threshold value
- Display disabling time
- Switching the display illumination on/off
- Profibus slave address (only valid for F30300003)
- Access mode remote controlled/local/both (only valid for F30300003)
- Date and clock time

### 6.2.4.2 Parameter input

Personnel:


- Operator

#### Parameter input by using the menu


1. In the main menu, select the required parameters by using [UP] or [DOWN].
2. Confirm with [OK].
  - ⇒ Selected parameter is blinking.


In case of numerals, the individual decimal places are changed successively. The relevant place is blinking.

3. Change parameter by using [UP] or [DOWN].
4. Confirm selection with [OK].
  - ⇒ The parameter has been changed.

 The entry can be aborted by using [ESC].

#### Parameter input by using Profibus PA


 Only valid for the variant F30300003

For further information, refer to  “Profibus process data”

Parameters are only incorporated in the following cases:

- Output parameter has changed in comparison with the previous DataExchange notification.
- Output parameters do not all have the value zero.
- Access mode “both” or “remote controlled” is set.

### 6.2.4.3 Dry run protection

 Only valid for the variants F30300002 and F30300003

The display unit calculates a double stroke frequency (DH/min). The double stroke frequency is compared to a stored threshold value. If the threshold value is crossed, the error LED flashes.

Personnel:


- Operator
1. Select “*Dry run protection*” in the Set parameters menu.
  2. Confirm with [OK].
    - ⇒ The dry run protection function is active.

In addition, the control valve of the display unit is activated.

**With pneumatic unit:** The control valve interrupts the air supply of the pump, in order to protect it from a dry run.

**Without pneumatic unit:** The control valve controls the working valve. The working valve interrupts the air supply of the pump, in order to protect it from a dry run.

3. Acknowledge error LED by pressing [OK].
  - ⇒ The control valve is again deactivated.

 The control valve has a high power consumption. Promptly acknowledge and remove dry run error, to preserve battery service life.

Remove dry run error:

- Check material supply to the pump.

### 6.2.4.4 Languages

Personnel:

- Operator
1. Select “*Language*” in the Set Parameter menu.
  2. Confirm with [OK].
    - ⇒ The selection flashes.
  3. Set the desired language using [UP] or [DOWN].
  4. Confirm with [OK].
    - ⇒ The language is set.

### 6.2.4.5 Display illumination

Personnel:

- Operator

Switching off the display illumination reduces the power consumption.

1. Select “*Display illumination*” in the Set parameter menu.
2. Confirm with [OK].
  - ⇒ The selection flashes.
3. Select the desired illumination setting using [UP] or [DOWN].
  - Automatic: If no key is pressed, the illumination switches off after the time set in the “Display deactivation time” menu.
  - Always off: Illumination is always switched off.

**i** If you press [ESC] for 5 seconds, the display illumination is switched off manually. Pressing any key will switch on the display illumination again. Pressing the key will not trigger any further action.

### 6.2.4.6 Access mode

**i** Only valid for the variant F30300003

Personnel:

- Operator
1. Select “Access mode” in the Set parameters menu.
  2. Enable selection with [OK].  
⇒ The selection flashes.
  3. Select the desired access mode using [UP] or [DOWN].
    - Locally: Edit parameters on the display unit.
    - Remote controlled: Edit parameters through Profibus PA.
    - Both: Edit parameters on the display unit or through Profibus PA.
  4. Confirm with [OK].

**i** The “Access mode” parameter can always be edited through the display unit or via the Profibus PA. The “Implement volumetric measurement” and “Carry out maintenance” functions are only possible locally on the display unit.

### 6.2.4.7 Setting Date and Clock Time

Personnel:

- Operator
1. Select “Date and time” in the Set parameters menu.
  2. Press [OK].  
⇒ The selection flashes.
  3. Change the numerical value using [UP] or [DOWN].
  4. Confirm the changed numerical value using [OK].

**i** If the power supply was interrupted, set date and clock time again.

### 6.2.4.8 Profibus slave address.

**i** Only valid for the variant F30300003

The slave address of the display unit is by default set to 0008.

- Change slave address ↪ 6.2.4.2 “Parameter input”.

### 6.2.4.9 Energy saving mode

**i** Only valid for the variants F30300001 and F30300002

If the following conditions are fulfilled, the energy saving mode is enabled automatically:

- Control valve is not active.
- Volumetric measurement process is not active.
- Maintenance process is not active.
- No keys have been pressed.

Activating energy saving mode manually:

- Press [ESC] key for 5 seconds.

The energy saving mode is deactivated under the following conditions:

- Keep the [ESC] key pressed for 5 seconds.
- Warnings or error messages have appeared.

In the energy saving mode, the monitoring function continues to be active.

## 6.2.5 Maintenance

### 6.2.5.1 Overview

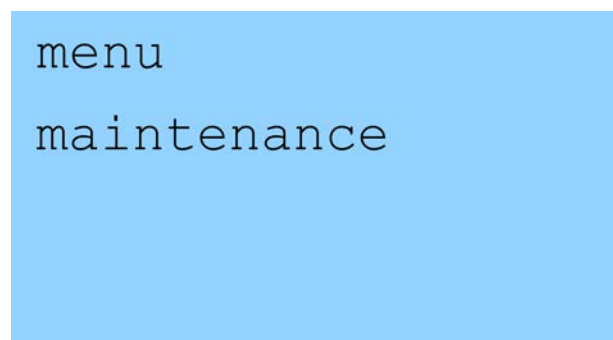


Fig. 20: Maintenance menu

The following values can displayed and selected in the “Maintenance” menu:

- Device version
- Implement volumetric measurement
- Carry out maintenance.

### 6.2.5.2 Device version

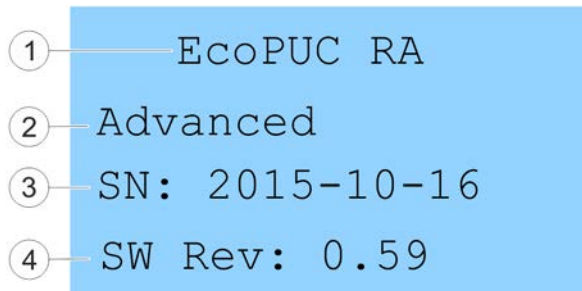



Fig. 21: Device version (example)

- 1 Product name
- 2 Type (Basic, Basic Plus, Advanced)
- 3 Serial number
- 4 Software version


### 6.2.5.3 Implement volumetric measurement


 Only valid for the variants F30300002 and F30300003

Personnel:

- Operator
  - + additional qualification explosion protection
1. Select “*Carry out volumetric measurement*” in the Maintenance menu.
  2. Confirm with [OK].
  3. Set container below the volumetric measurement opening of the pump.
  4. Click [OK] to confirm “Start volumetric measurement?”
    - ⇒ If the pump is at a standstill, the volumetric measurement process starts. The double strokes are displayed.
  5. After the volumetric measurement:
    - Check volumetric measurement quantity. The volumetric measurement quantity depends on the pump version and the number of double strokes.
    - If the volumetric measurement quantity is not correct, check the pump for wear → “Applicable documents”.

If an error occurs during the volumetric measurement process, the process is aborted.

 Abort the process manually, using the [ESC] key.

 If the battery level is very low, the volumetric measurement process will not start.

### 6.2.5.4 Carry out maintenance

Personnel:

- Operator
- + additional qualification explosion protection

Requirements:


- Compressed air supply is switched off and secured against being switched on again. Depressurize the system.
- Maximum value of the double stroke in the “Maintenance interval” menu is reached.
- Display of the “Maintenance due” warning on the display


1. Confirm “*Carry out maintenance*” in the Maintenance menu, by pressing [OK].
2. Click [OK] to confirm “Start maintenance?”
  - ⇒ Maintenance is enabled.
3. Perform maintenance work.
4. Press [OK] when maintenance is over.
  - ⇒ The message “Maintenance concluded” is displayed.

The warning “Maintenance due” and the counter in the “Maintenance interval” menu are reset.

Dry run monitoring continues to be active during the maintenance.

If an error occurs during the maintenance, the process is aborted.

 Abort the process manually by using the [ESC] key.

 If the battery level is very low, the maintenance process will not start.

## 7 Commissioning

### 7.1 Safety Instructions

**EX WARNING!**

#### Explosion danger due to contamination

If the display unit is not properly sealed, contaminants can reach interior of the device. Dirt inside the device (e.g. on the board) can trigger short-circuits. It can cause fire or an explosion. Serious injury and death could be the consequence.

- Do not use leaking display unit in explosive areas.
- Replace damaged seals.
- If the interior of the device is contaminated, have the display unit cleaned only by Dürr Systems ↪ "Hotline and Contact".

**EX WARNING!**

#### Sparks due to electrostatic discharge

If the display unit is not properly grounded or the potential equalization fails, components may get charged electrostatically. Electrostatic discharge can cause sparks that in explosive atmosphere can cause a fire or an explosion. Serious injury and death could be the consequence.

- Check connection of grounding cable.
- Measure volume resistivity.

**EX WARNING!**

#### Danger due to electrostatic charge

If you happen to leave loose parts in the working area, sparks can ignite the explosive atmosphere. Serious injuries or death can result.

- Before commissioning, ensure that there are no loose parts in the working area, such as tools.

### 7.2 General notes

Personnel:

- Operator
- + additional qualification explosion protection

Checks before commissioning:

- Display unit is correctly attached to the pump.
- Compressed air supply is connected.
- Power supply is connected.
- Performance values are maintained.
- Reed switch is connected to the display unit.
- All suitable aids (e.g. tools) have been removed out of the danger zone.

## 7.3 Commissioning

### 7.3.1 Setting operating parameters

Personnel:

- Operator
- + additional qualification explosion protection

Requirements:

- Operating conditions correspond to the specifications ↪ 13.3 "Operating conditions".
- Connections are connected ↪ 13.2 "Connections".
- Performance values correspond to the specifications ↪ 13.4 "Operating values".

1. Activate dry run protection ↪ 6.2.4.3 "Dry run protection".
2. Adjust double stroke volume ↪ 6.2.4.2 "Parameter input".
3. Set language ↪ 6.2.4.4 "Languages".
4. Set Profibus slave address ↪ 6.2.4.8 "Profibus slave address".
5. Set date and clock time ↪ 6.2.4.7 "Setting Date and Clock Time".

## 8 Operation

### 8.1 Safety recommendations

**EX WARNING!**

#### Explosion danger due to contamination

If the display unit is not properly sealed, contaminants can reach interior of the device. Dirt inside the device (e.g. on the board) can trigger short-circuits. It can cause fire or an explosion. Serious injury and death could be the consequence.

- Do not use leaking display unit in explosive areas.
- Replace damaged seals.
- If the interior of the device is contaminated, have the display unit cleaned only by Dürr Systems ↪ "Hotline and Contact".

**EX WARNING!**

#### Sparks due to electrostatic discharge

If the display unit is not properly grounded or the potential equalization fails, components may get charged electrostatically. Electrostatic discharge can cause sparks that in explosive atmosphere can cause a fire or an explosion. Serious injury and death could be the consequence.

- Check connection of grounding cable.
- Measure volume resistivity.

## 8.2 General notes

Personnel:

- Operator
- + additional qualification explosion protection

Checks during operation:

- Ensure that no condensation occurs on the device.
- Operating conditions correspond to the specifications ↪ 13.3 “Operating conditions”.

## 8.3 Switching on

Personnel:

- Operator
- + additional qualification explosion protection

Requirements:

- Reed switch is connected ↪ 5.3.2 “Connect reed switch”.
- Compressed air supply is connected ↪ 5.3.4 “Connect compressed air supply”.

1. Connect the power supply ↪ 5.3.3 “Connecting the power supply”:
  - In the case of F30300001 and F30300002 through the battery
  - In the case of F30300003 via Profibus PA or battery
 ⇒ Display unit switches on. Power supply is being checked ↪ 8.5 “Voltage check”.

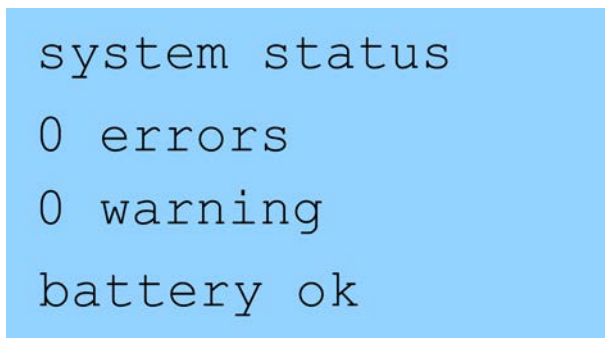


Fig. 22: Main menu

2. The display unit starts.
  - ⇒ The main menu is displayed.

## 8.4 Switching off

Personnel:

- Operator
- + additional qualification explosion protection

1. Disassemble the power supply ↪ 12.2 “Disassembly”:

- In the case of F30300001 and F30300002 through the battery
- In the case of F30300003 via Profibus PA and battery
  - ⇒ Display unit switches off.

## 8.5 Voltage check

### Battery check

When the display unit switches on, the power supply of the battery is being checked. If the battery voltage is <7.5V, the display unit does not start. The error LED flashes ↪ 6.1 “Controls and displays”. This prevents from switching on again with empty battery.

### Battery check during operation

When in battery operation, the battery status is monitored every 10 minutes.

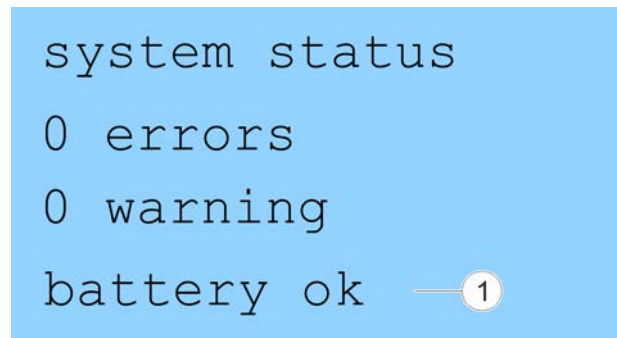


Fig. 23: Battery status

The battery status (1) is displayed in the main menu.

1. If display is disabled:
  - Press any key.
  - ⇒ Battery status is displayed by the battery LED.
  - If the battery is weak, the display will show a warning.
2. Acknowledge the warning by pressing [OK].
  - ⇒ The display in the main menu and via LED do not change on acknowledgment.
3. If the battery is completely or almost empty:
  - Replace battery ↪ 5.2.1 “Insert battery”.

A warning is displayed in the following cases:

- Battery voltage  $\leq 7.5V$
- Estimated remaining capacity  $\leq 20\%$ 
  - Remaining capacity value can be adjusted ↪ 6.2.4.2 “Parameter input”.

Warnings are not deleted automatically. If the battery is changed or the power supply is interrupted, the warning is reset.



### Profibus PA check

Only valid for the variant F30300003

When the display unit switches on, the power supply of the Profibus PA is being checked. The threshold value is 6.5V.

If the power supply is via Profibus PA, the battery voltage is not monitored. Only the Profibus PA power supply is monitored.

### 8.6 Bleed pump

If the dry run protection of the pump is activated, the pump is not any longer supplied with compressed air. The pump turns off. For switching on the pump again, the pump must be vented using a ball valve.

Personnel:

- Mechanic

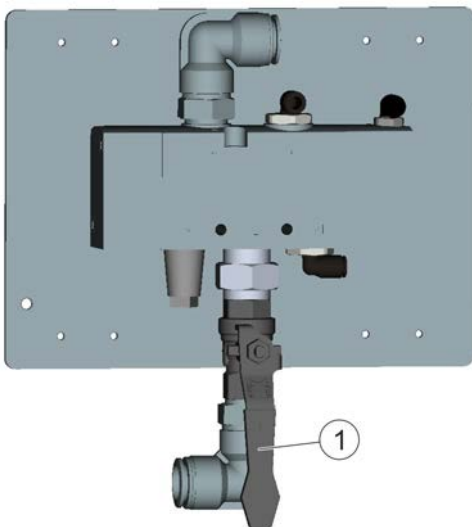


Fig. 24: Pneumatic unit

1. Turn ball valve (1) on the pneumatic unit by 90° to the right.
  - ⇒ Pump is vented. The working valve of the pneumatic unit switches to home position 2. Pump starts again.

## 9 Cleaning

### 9.1 Safety recommendations

**WARNING!**

#### Explosion danger due to penetrating cleaning agent

If cleaning agent enters the housing, it can cause short circuits. It can cause fire or an explosion. Serious injury and death could be the consequence.

- Clean housing only by using a piece of cloth wetted with a detergent.
- Do not use solvents.
- Have heavily soiled devices repaired by Dürr Systems ↪ “Hotline and Contact”.

### 9.2 Cleaning

Personnel:

- Cleaning staff

Protective equipment:

- Protective workwear
- Anti-Static Safety Boots

Requirements:

- Power supply is switched off and secured against being switched on again.
- Compressed air supply is switched off and secured against being switched on again.

1. Clean the housing using suitable cleaning agent ↪ 13.7 “Operating and auxiliary materials”.
2. Clean the operator interface using suitable cleaning agent ↪ 13.7 “Operating and auxiliary materials”.

Display and LEDs must always be free from contamination.



## 10 Maintenance

### 10.1 Safety notes

**WARNING!**

**Explosion danger due to contamination**

If the display unit is not properly sealed, contaminants can reach interior of the device. Dirt inside the device (e.g. on the board) can trigger short-circuits. It can cause fire or an explosion. Serious injury and death could be the consequence.

- Do not use leaking display unit in explosive areas.
- Replace damaged seals.
- If the interior of the device is contaminated, have the display unit cleaned only by Dürr Systems ↪ "Hotline and Contact".

**WARNING!**

**Danger of explosion due to battery replacement**

Replacing a battery in explosive atmosphere can cause fire or an explosion. Serious injuries and death can be the consequence.

- Only replace battery outside the Ex zone.

### 10.2 Maintenance schedule

Interval	Maintenance work
If necessary	Replace battery ↪ 5.2.1 "Insert battery". If a warning message is displayed on the display, change the battery.

For further information, refer to ↪ 6.2.5 "Maintenance"

## 11 Faults

For e error message and warnings, see ↪ 6.2.2 "Main menu"

**WARNING!**

**Danger due to electrostatic charge**

If you happen to leave loose parts in the working area, sparks can ignite the explosive atmosphere. Serious injuries or death can result.

- Before commissioning, ensure that there are no lose parts in the working area, such as tools.

**NOTICE!**

**Dry run (only EcoPUC A RA)**

Dry run protection cannot be guaranteed if the battery is flat. Property damage and production disruptions can result.

- If the warning message is displayed on the operator interface, change battery immediately.

## 12 Disassembly and Disposal

### 12.1 Safety recommendations

**WARNING!**

**Danger of explosion due to battery replacement**

Replacing a battery in explosive atmosphere can cause fire or an explosion. Serious injuries and death can be the consequence.

- Only replace battery outside the Ex zone.

**EX WARNING!**

**Explosion danger due to contamination**

If the display unit is not properly sealed, contaminants can reach interior of the device. Dirt inside the device (e.g. on the board) can trigger short-circuits. It can cause fire or an explosion. Serious injury and death could be the consequence.

- Do not use leaking display unit in explosive areas.
- Replace damaged seals.
- If the interior of the device is contaminated, have the display unit cleaned only by Dürr Systems ↪ "Hotline and Contact".

**12.2 Disassembly**

**12.2.1 Disconnect compressed air supply**

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Protective workwear
- Anti-Static Safety Boots

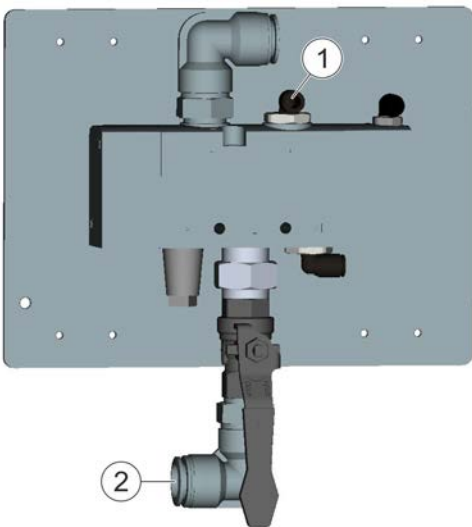


Fig. 25: Pneumatic unit

1. Pull off hoses (1) and (2).

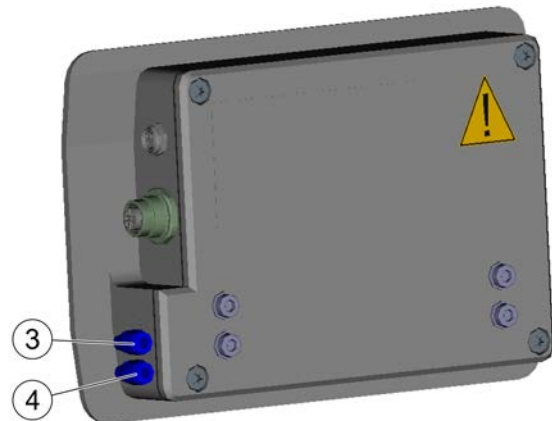


Fig. 26: Display unit

2. Pull off hoses (3) and (4).  
⇒ Compressed air supply is disconnected.

**12.2.2 Disassembling reed switch**

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots

Requirements:

- Ensure a non-explosive atmosphere.

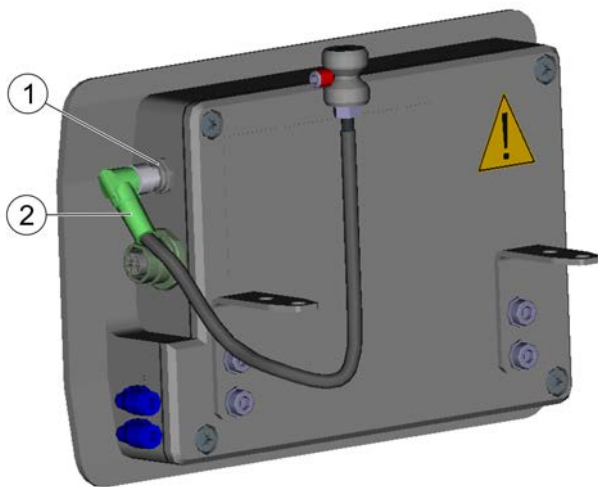


Fig. 27: Pull out reed switch

1. Pull proximity switch with reed switch (2) out of the bushing (1).  
 ⇒ Reed switch is disassembled.

For how to release the connection from **EcoPump HP** or **EcoPump VP**, see associated operating instructions ↪ “Applicable documents”.

### 12.2.3 Disassembling Profibus PA

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots

Requirements:

- Ensure a non-explosive atmosphere.

Only valid for the variant F30300003

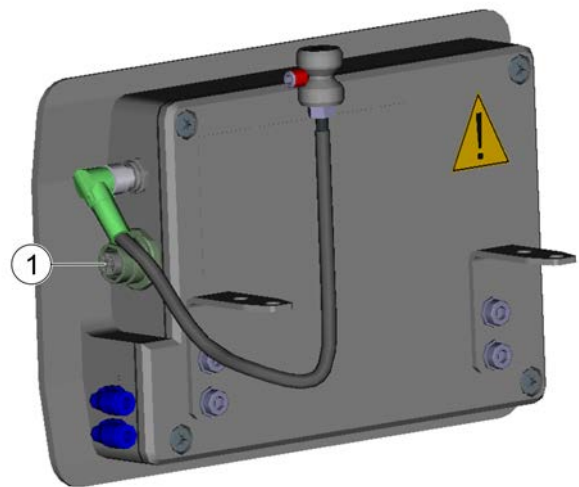


Fig. 28: Pull out Profibus PA plug

1. Pull Profibus PA plug out of the bushing (1).  
 ⇒ Power supply is disconnected.

### 12.2.4 Assemble display unit

Disassemble the display unit from the pump, refer to the associated operating instructions for **EcoPump HP** or **EcoPump VP** ↪ “Applicable documents”.

#### Disassemble fastening bracket

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Anti-Static Safety Boots

Requirements:

- Ensure a non-explosive atmosphere.

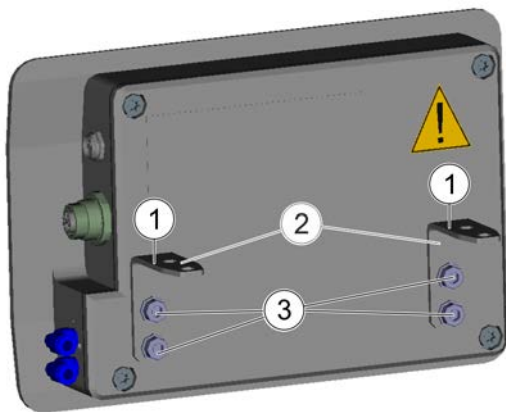


Fig. 29: Remove fastening bracket

1. Unscrew screws (2) on den fastening brackets (1).
2. Remove fastening bracket (1).

Once the display unit is disassembled from the pump, place the display unit in a safe area or store it. For storage requirements, refer to [4.4 "Storage"](#)

### 12.2.5 Remove battery

Personnel:

- Mechanic

#### **WARNING!**

##### **Fire and explosion hazard due to damaged battery**

Damaged batteries can cause a fire or explosion. Serious injury and death could be the consequence.

- Protect batteries against mechanical influences such as impacts, blows, or falling.
- Remove damaged batteries from the housing.
- Dispose of damaged batteries properly.
- Notes of a damaged battery are:
  - Bloated battery
  - Deformed battery
  - Outgased or leaked battery
  - Greasy film on the battery
  - Exterior deposits in the area of the pole
- Always wear gloves when touching greasy or leaking batteries.

#### **ENVIRONMENT!**

##### **Improper disposal of batteries**

Batteries can contain environmentally-unfriendly pollutants and valuable raw materials. Their improper disposal threatens the environment and prevents reuse.

- Do not dispose of batteries in household waste.
- Return batteries to collection points or send them back to Dürr Systems.
- In case of doubt, refer to the local disposal authorities.



Batteries can be marked with the symbol according to the guideline 2006/66/EC. The symbol shows a crossed out wastebin on wheels. The symbol indicates that the return of batteries to collection points is free and is legally prescribed.

Requirements:

- Display unit is disassembled [↪ 12.2.4 "Assemble display unit"](#).
- Ensure a non-explosive atmosphere.

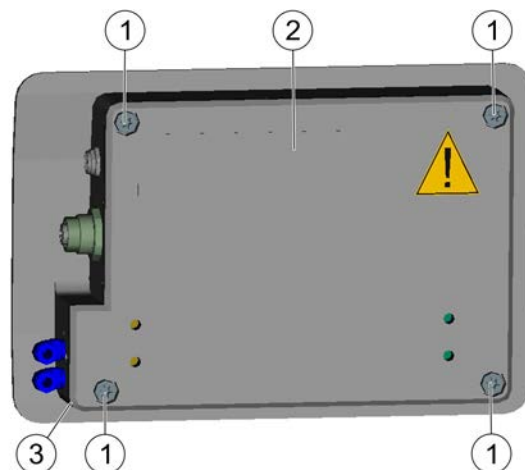


Fig. 30: Dismantling housing lid

1. Unscrew screws (1) on the housing lid (2).
2. Remove housing lid (2) and seal (3).

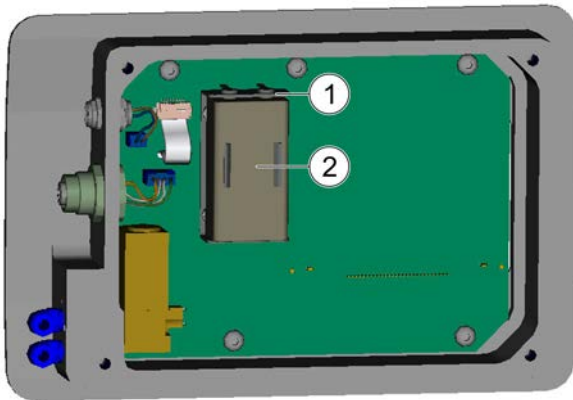


Fig. 31: Remove battery

3. Remove battery (2) from the battery housing (1).
4. Dispose of old batteries properly.
5. Place seal (3) and housing lid (2) onto the housing again.
6. Fasten screws (1).

### 12.3 Disposal

#### ENVIRONMENT!

##### Improper waste disposal

Improper waste disposal threatens the environment and prevents re-use and recycling.

- Clean components before their disposal.
- Always dispose of components in accordance with their characteristics.
- Collect leaked out utilities and auxiliaries completely.
- Dispose of work equipment soaked in coating materials or operating substances according to the disposal provisions in force.
- Dispose of utilities and auxiliaries according to the disposal provisions in force.
- In case of doubt, refer to the local disposal authorities.

## 13 Technical data

### 13.1 Dimensions and weight

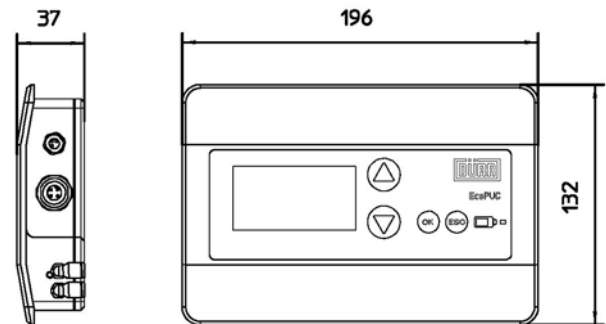


Fig. 32: Dimensions

Details	Value
Height	132 mm
Length	196 mm
Width	37 mm
Weight	approx. 1 kg

### 13.2 Connections

#### Electric connections

- Battery
- Profibus PA (only valid for F30300003)

#### Approved batteries

Detail	Value
Energizer	LA522
GP Batteries	GP CR-V9 U = 9 V

#### Profibus PA connection parameters

Detail	Value
$U_i$	15V
$I_i$	247mA
$P_i$	1.95W
$C_i$	5nF
$L_i$	10 $\mu$ H
Transfer rate	45.45kBit/s

The Profibus output must be fail-safe according to Ex ib IIB or Ex ia IIB.

**Pin assignment**

Reed switch		
Denomination	Function	Color
PIN1	Sensor +	Brown
PIN3	Sensor -	Blue
PIN4	Not connected	Black

Profibus		
Denomination	Function	Color
PIN1	Data +	Orange
PIN2	Not connected	-
PIN3	Data -	Blue
PIN4	Not connected	Screen

**Compressed air connection**

Detail	Value
Compressed air connection	4mm Push In

**13.3 Operating conditions**

Detail	Value
Operating temperature, min.	5 °C
Operating temperature, max.	50 °C
Relative humidity, min.	35 %
Relative humidity, max.	90%
Protection type	IP20

**13.4 Operating values**

Details	Value
Control valve switching cycles	5 million
Transfer rate	45.45 kBit/s
Switching frequency of the control valve, max.	2 Hz
Input pressure, min.	6 bar
Input pressure, max.	8 bar
Compressed air temperature, max.	50 °C
Battery voltage	9 V

**13.5 Compressed air quality**

- Purity classes in accordance with ISO 8573-1: 1:4:1
- Limitations for purity class 4 (pressure dew point max.):
  - $\leq -3^{\circ}\text{C}$  at 7bar absolute
  - $\leq +1^{\circ}\text{C}$  at 9bar absolute
  - $\leq +3^{\circ}\text{C}$  at 11bar absolute

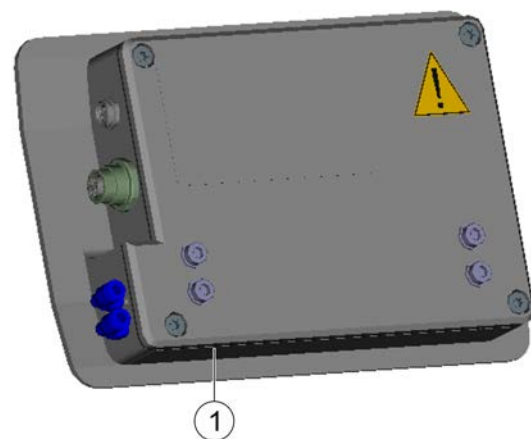
**13.6 Type plate**


Fig. 33: Position of type plate

The type plate (1) shows the following details:



- Product denomination
- Material number
- Year of manufacture
- EX labeling
- Operating temperature (min./max.)
- Hardware version
- Profibus PA (only valid for F30300003)
- CE labeling
- Manufacturer
- QR code

**13.7 Operating and auxiliary materials**

Cleaning agents	
Denomination	Specification
Housing, display and LEDs	Solvent-free household cleaning agents

## 14 Replacement parts, tools and accessories

### 14.1 Replacement parts

Description	Illustration	Material number
Battery Lithium 9V, 800mAh		E36010046
Proximity switch with reed switch		E07030350

### 14.2 Tools

There are no special tools available for this product.

### 14.3 Accessories

Description	Illustration	Material number
Pneumatic unit		F30920021
Fastening bracket for EcoPump HP		M19102342
Fastening bracket for EcoPump VP		M19102343
Profibus PA cable	-	E09060594
Profibus PA coupler	-	E52010010
DP-Master for B&R control	-	E52010011

### 14.4 Order

 **WARNING!**

**Unsuitable replacement parts in explosive areas**

Replacement parts not compliant with the specifications of the ATEX guidelines can cause explosions in an explosive atmosphere. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

 **WARNING!**

**Unsuitable replacement parts**

Replacement parts of third-party suppliers may possibly not be able to hold the loads. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

Ordering replacement parts, tools and accessories as well as information on products that are listed without order number → "Hotline and Contact".



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Appendix

## A Profibus data exchange



Only valid for F30300003

The master sends a query to the slave, which the slave answers.

The notification types for data interchange are as follows:

- RdOutputData (Query nominal values.)
- RdInputData (Query actual values.)
- DataExchange (Querying actual values. Change nominal values except date and time.)  
DataExchange takes place cyclically. The parameters received through it are only incorporated in the following cases:
  - Output parameter has changed in comparison with the previous DataExchange notification.
  - Output parameters do not all have the value zero.
  - Access mode “both” or “remote controlled” is set ↪ 6.2.4 “Set parameter”.

If a parameter is changed via the display unit during the execution of DataExchange, the next DataExchange notification is not overwritten immediately.

Other notification types:

- SetPrm (Set device parameters. Set date and clock time.)
- GetDiag (Request diagnosis data.)
- ChkCfg (check configuration.)
- GetCfg (Read configuration.)
- SetSlaveAddr (If an invalid slave address is set, change the address. Not supported.)

The type of notifications is important for communication design. They must be replaced in a defined pattern.

Parameters that are additionally transferred in the SetPrm notification are defined in the GSD file. Parameters are selected in the Master (e.g. Proficaptain).

B Profibus process data



Only valid for F30300003

Parameter	Access via Profibus	Byte no.	Parameter type (Profibus)	Unit	Meaning/representation
Stroke volume	Read and write	0 to 1	DataExchange, Outputdata	ml	Representation in l: "65.535 l"
Dry run protection threshold value		2 to 3		DH/min	"65535 DH/min"
Dry run protection enabled		4		-	0 = "inactive" / 1 = "active"
Stroke maintenance interval		5 to 8		-	"4294967295 DH"
Volumetric measurement stroke rate		9 to 10		-	"65535 DH"
Language		11		-	"English" / "German" / ...
Battery warning threshold value		12		%	"99 %"
Disabling time		13		See	"255 s"
Display illumination mode		14		-	0 = "Always off" / 1 = "automatically"
Access mode		15		-	0 = "both" / 1 = "local" / 2 = "remote controlled"
Displacement volume [l/min]	Read	0 to 1	DataExchange, Inputdata	0.1 l/min	Representation in l: 6553.5 l/min
Displacement volume [gal/min]		2 to 3		0.1 gal/min	Representation in gal: 6553.5 l/min
Number of strokes total		4 to 7		-	"4294967295"
Number of strokes since last maintenance		8 to 11		-	"4294967295"
Stroke frequency = Number of strokes per minute		12 to 13		DH/min	"65535 DH/min"
Volumetric measurement implemented		14		-	0 = "no" / 1 = "yes"
Maintenance is implemented		15		-	0 = "no" / 1 = "yes"
Error		16		-	No error ... all errors
Date and time, year	Read and write once	17	DataExchange, Inputdata; DeviceParameter	-	Representation as "2099"
Date and time, month		18		-	"12"
Date and time, day		19		-	"31"
Date and time, hour		20		-	"23"
Date and time, minute		21		-	"59"
Date and time, second		22		-	"59"
Profibus: Slave address	-	-	-	-	"126"



## C Profibus standard parameters



Only valid for F30300003 with a Profibus-DP Master with DP-/PA coupler

Details	Value
Master address	1
Tslot	640 tBit
Tsdr, max.	400 tBit
Tsdr, min.	11 tBit
Tset	95 tBit
Tquiet	0 tBit
Trdy	11 tBit
Ttr	28864 tBit
Tid1	225 tBit
Tid2	400 tBit
Gap factor	10
Retry limit	1

D Wiring diagram

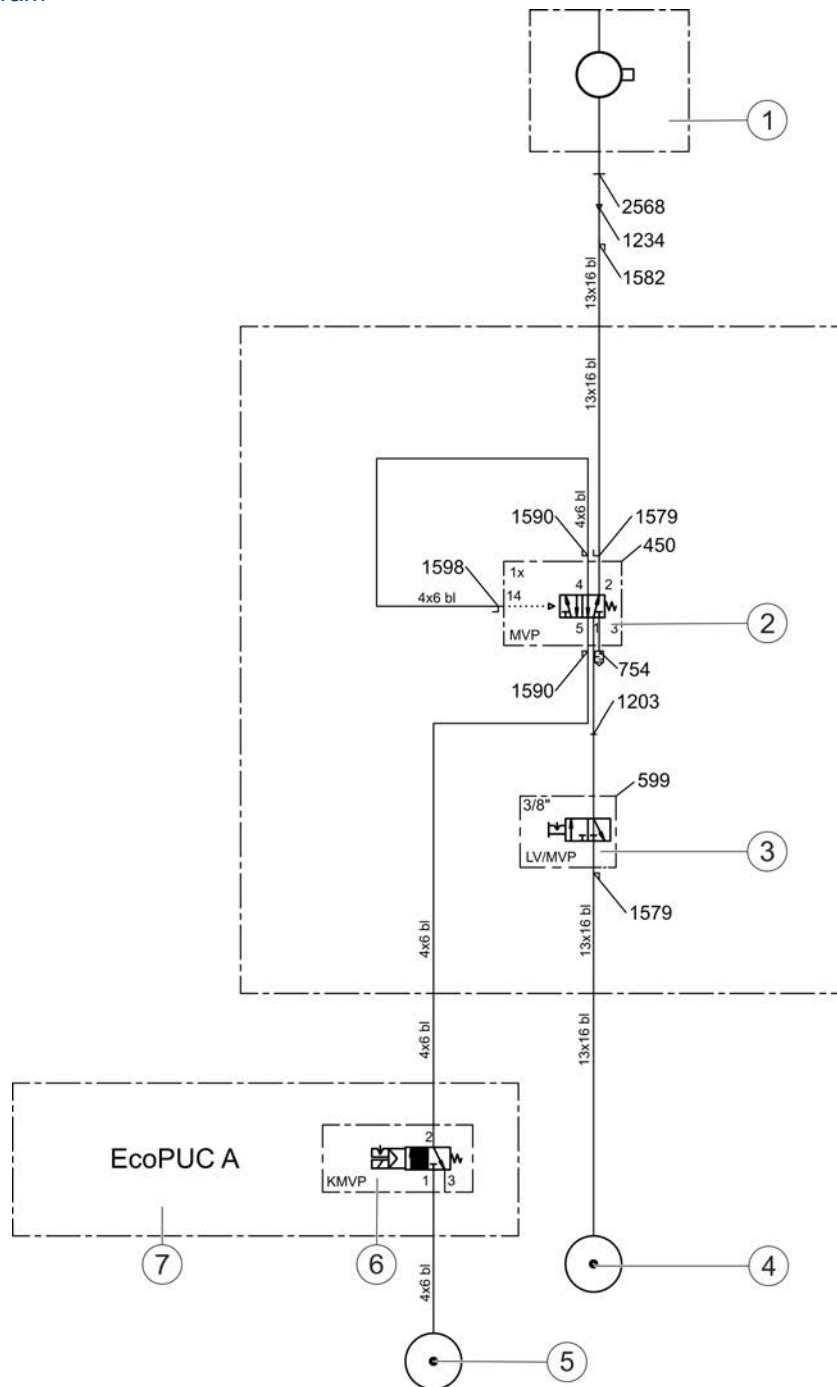



Fig. 34: Wiring diagram of the pneumatic unit


- |                            |                     |
|----------------------------|---------------------|
| 1 Pump material supply MVP | 5 Control air P2    |
| 2 5/2 working valve        | 6 3/2 control valve |
| 3 Ball valve               | 7 Display unit      |
| 4 Control air P1           |                     |





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