



Q-Drive-Alpha

Drive Device

Operation Manual



Translation of operation manual

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1 General

Read this operating manual carefully before putting the Q-Drive-Alpha into operation. See the data in the operating manual. Keep the operating manual close at hand in the vicinity of the Q-Drive-Alpha.

1.1 Manufacturer and Service

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47228 Duisburg, Germany

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Fax: +49 (0) 2065 89205-40
E-mail: Quantex.GeneralSupport@PSGDover.com
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1.2 Exclusion of liability

This device is not suitable for use as an autonomous automatic device. Monitor operation of the device at all times.

The device is not intended for resale.

1.3 Presentation conventions

This operating manual uses the following presentation conventions:

Running text contains descriptions and explanations.

- First level bulleted lists are preceded by dots and list elements.
 - Second level bulleted lists are preceded by circles and list elements belong to a first-level element.
- ▶ Handling instructions are indicated by an arrow and guide your actions.
Handling instructions are listed in the order in which they are performed.

⚠ WARNING NOTICES – Warning notices warn against dangers and give handling instructions to avoid the danger. (Further information can be found in chapter Warning notices on page 4.).

1.4 Version history

Edition	Contents and revisions
2023-07	• first edition

2 Safety

This chapter contains important information for safe operation of the Q-Drive-Alpha.

2.1 Intended use

- Application testing of the Quantex pumps QX25 and QX2.
- For indoor use only.
- For laboratory use only.
- For use by qualified laboratory staff only.

2.2 Prohibited use

- Use in a private environment.
- Use outdoors.
- Industrial use.
- Application testing of other pumps than those described in this manual.

2.3 Warning notices

These warning notices warn against dangers. Heed the warning notices to avoid dangers.

- ⚠ DANGER** – Danger of fatal or severe injuries.
- ⚠ WARNING** – Warning against possibly fatal or severe injuries.
- ⚠ CAUTION** – Beware of minor injuries.
- ATTENTION** – Property damages.

2.4 Personnel requirements

The device may only be installed, commissioned, maintained and repaired by appropriate trained personnel. The personnel must have the relevant skills for the kind of work to be performed.

The following groups of individuals may work with the device:

- technicians or engineers

The following groups of individuals may service the device:

- technicians or engineers

The owner must ensure that all the information in this operating manual is fully available to all persons who work with the pump at all times.

2.5 Residual risks

Observe the valid rules for the protection of accidents and protection measures.

⚠ WARNING – Danger of being pulled in or caught up in the rotating shaft. Do not work with the device with loose, long hair or loose clothing. Only operate the Q-Drive-Alpha when a pump is mounted.

3 Description

3.1 Drive unit

The drive unit features the following:

- powerful stepper motor
- programmable control unit
- touch screen user interface
- robust stainless-steel outer case
- drive adapter for Quantex pump QX2

3.2 Scope of delivery

- drive unit
- adapter
- power supply unit
- plug lead

The pumps are available separately.

3.3 Technical data

Power supply unit	
Input voltage	100-240 V AC
Output voltage	24 V DC
Output current	3.75 A
Rated power	90 W
Efficiency	89 %
Drive	
Rated DC voltage	24 V DC
Direct current	3.5 A
Environment	
IP protection class	20*
Storage and operating temperature	5 - 40 °C

Tab. 1: Motor and drive unit operating limits

*splash protection against vertical spillage. In case of fluid spillage, please switch off the drive unit immediately, disconnect it from the power supply and dry it off.

4 Assembly/installation

4.1 Transport and storage

The device is generally shipped ready to use and packed.

⚠ WARNING – Only store the device under the conditions specified in chapter Technical data, page 6.

- ▶ Leave the device in its packing until it is used.
- ▶ Protect the device from wet, cold, soiling, UV radiation and mechanical influences.
 - consistently aired, dust and vibration-free room
 - storage only under the conditions specified in the technical data
 - no exposure to heat (sunlight, heating)

4.2 Installation/removal

An adapter for driving QX2 pumps is included.

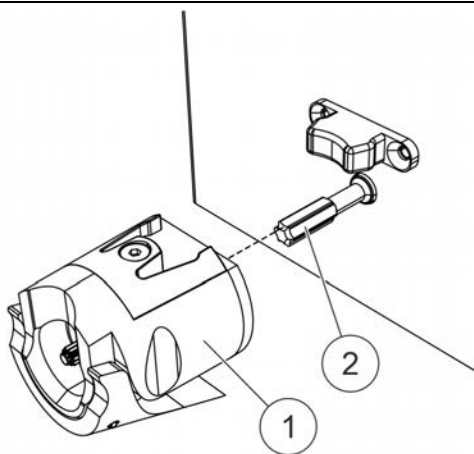
⚠ DANGER – Electric current. Switch the drive off or disconnect the power supply before installing the pump or the adapter.

4.3 QX2 pump

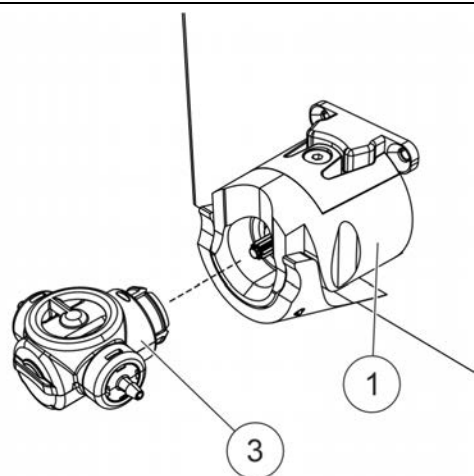
An adapter for driving QX2 pumps is included.

⚠ DANGER – Electric current. Switch the drive off or disconnect the power supply before installing the pump or the adapter.

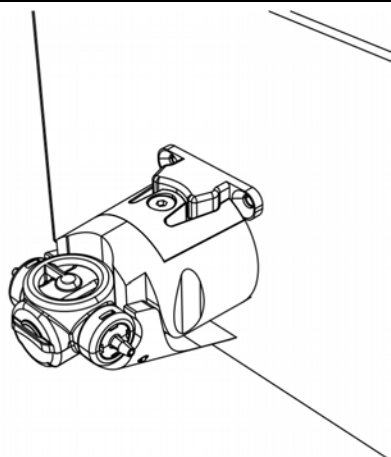
Installing the QX2 pump:



- Push the adapter (1) onto the steel drive shaft (2).



- Plug the pump (3) onto the adapter (1).
-

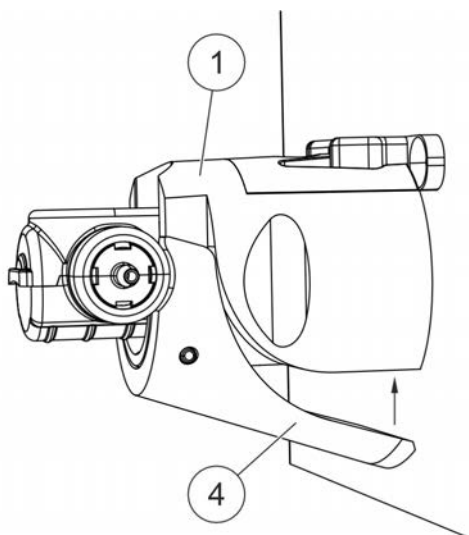


- When the adapter and pump are connected to the device, select the QX2 pump on the “Pump Selection” screen (see Pump Selection, page 16).

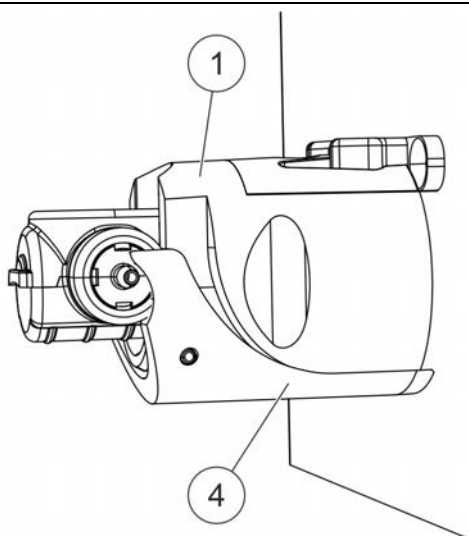
NOTE – The parameter selection should now be green. If the selection screen is blue, press the “Pump Select” button on the workspace (see Workspace, page 17) to return to the Pump Selection.

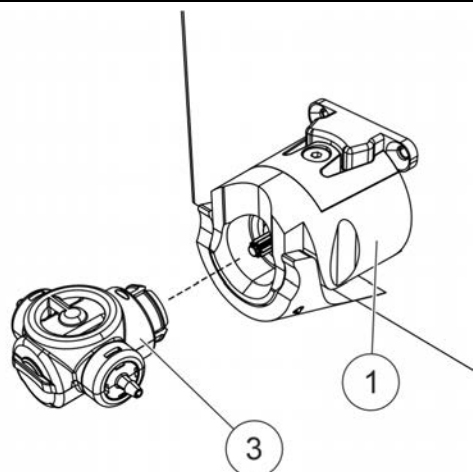
Removing the QX2 pump:

- Press the lever (4) on the adapter (1).

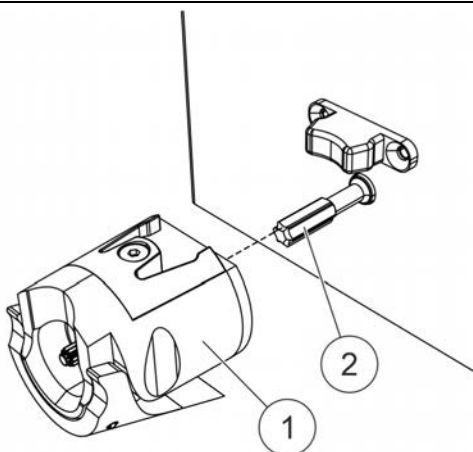


- The pump is released when the lever (4) is touching the adapter (1).





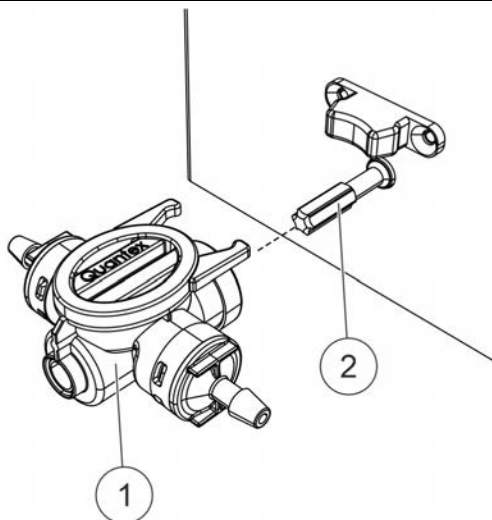
- Remove the pump (3) from the adapter (1).



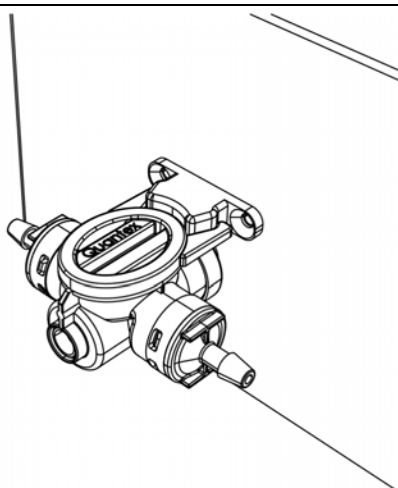
- Take the adapter (1) off the steel drive shaft (2).

4.4 QX25 pump

Installing the QX25 pump:



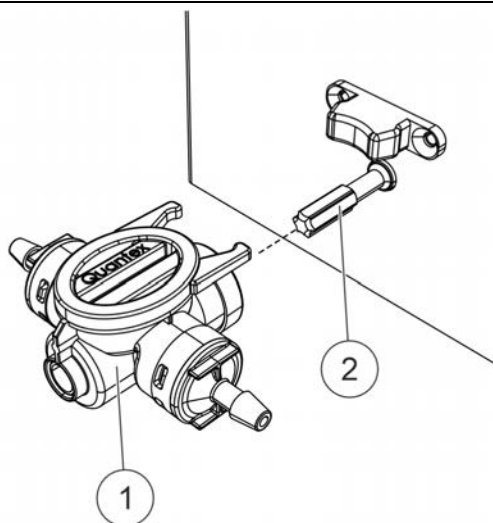
- Push the pump (1) onto the steel drive shaft (2).



- When the pump is connected to the device, select the QX25 pump on the "Pump Selection" screen (see Pump Selection, page 16).

NOTE – The parameter selection should now be blue. If the selection screen is green, press the "Pump Select" button on the workspace (see Workspace, page 17) to return to the Pump Selection.

Removing the QX25 pump:



- Remove the pump (1) from the steel drive shaft (2).

4.5 Connections

4.5.1 Drive shaft

The QX25 pump or the adapter for the QX2 pump is connected by a steel drive shaft. Other pump or adapter types are not permitted.

4.5.2 Electric cables

The electrical connection is made with 24 V and 3.5 A.

⚠ DANGER – Electric current, fatal electric shock. Only connect the device to a suitable power supply unit.

NOTE – Only operate the device on the specified voltage to avoid damage.

► Only use an original power supply unit.

4.5.3 Pump pipes

NOTE – Please see the “Product Index 2023 - QuantexTM” brochure for information about the individual pumps.

⚠ WARNING – If the pressure can rise above the maximum permissible pressure of the pump, a pressure relief valve or automatic pressure cut-out is required.

Connect the pump with pipes and hoses like this:

- suction side
 - pipes are adequately dimensioned Too small a pipe cross-section and/or an unfavourable mechanical flow design (e.g. many pipe elbows) can lead to a reduced pump performance and to cavitation.
 - pipes withstand the vacuum pressure and do not collapse
 - pipes withstand the fluid temperatures
- pressure side
 - pipes are adequately dimensioned
 - for the pumping and operating pressure
 - the operating and fluid temperature

5 Commissioning

Use only the included power supply unit (4). Plug this into the socket (2) at the rear of the device and switch it on with the main switch (1).

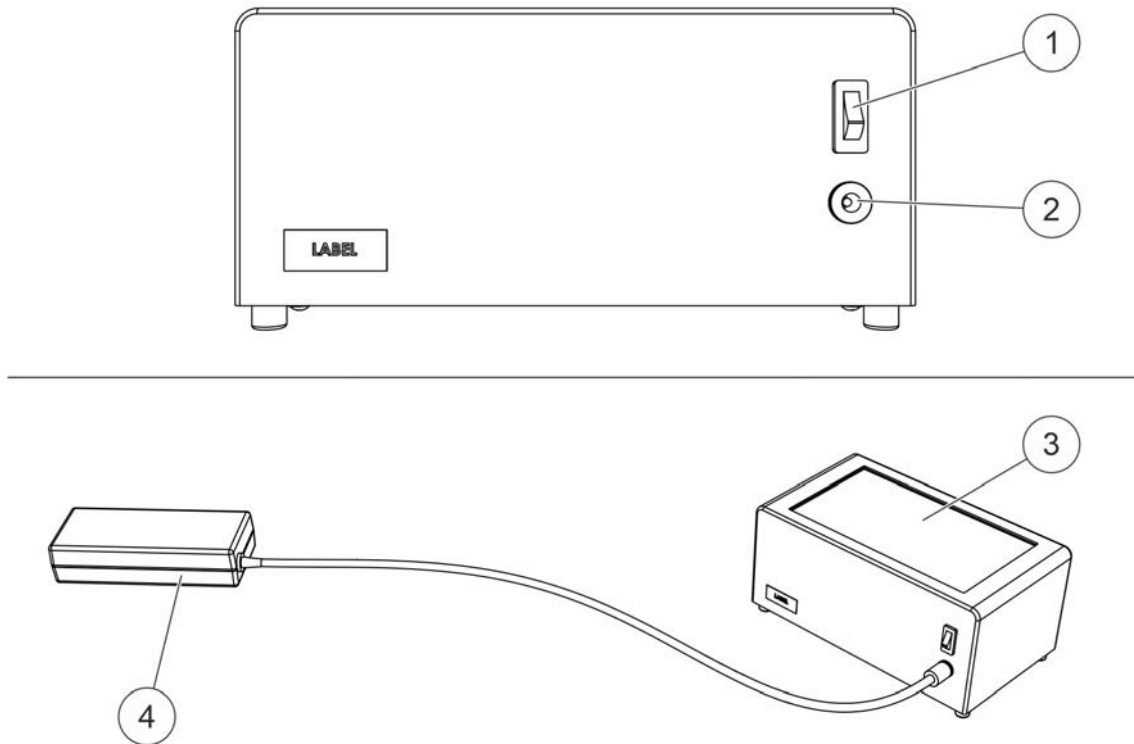


Fig. 1: Power supply unit connection

A logo and the firmware version are displayed on the screen (3) first before the “Pump Selection” screen appears (see Pump Selection, page 16).

6 Operation

6.1 Software manual

6.1.1 Splash screen

Here, you will find the version number of the firmware that runs on the drive unit.



Fig. 2: Splash screen

6.1.2 Pump Selection

Select the pump connected to the drive unit after starting.

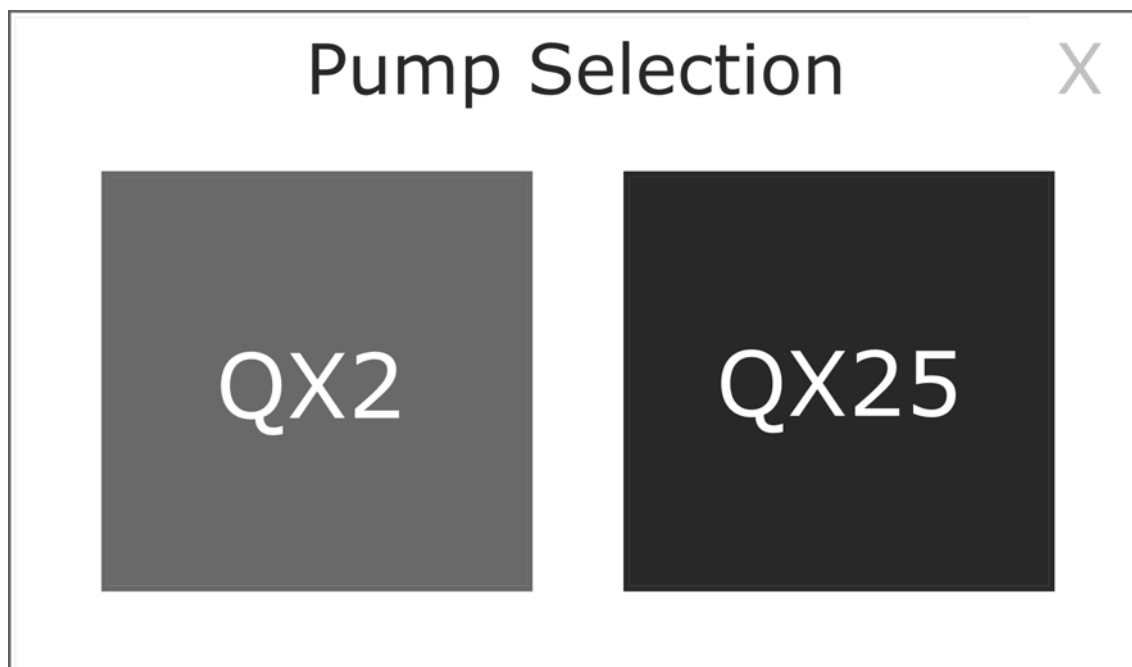


Fig. 3: Pump Selection

6.1.3 Workspace

The workspace appears after selecting the pump.

The currently set parameters of the pump program are displayed here. Use the buttons to open the respective sub-menu (see Parameter menus, page 18).

Press the “Pump Select” button to return to the Pump Selection (see Pump Selection, page 16).

NOTE – When changing the pump type, the workspace of the program also changes.

The program can be started with the “Accept” button (see Run Program, page 24).

Summary [1*] QX25			
Flow Rate 5.0 ml/min	Dose Volume 50 ml	Loops 99 cycles	Reverse 3 revs
Calibration 0.73 ml/rev	Pump Select QX25	Loop Pause 10 seconds	Prime
File	Units	Accept	

Fig. 4: Workspace

Parameters menu	Setting
Flow Rate	Pump speed
Dose Volume	Target volume of the fluid that is output per cycle/loop
Loops	Number of program repetitions (pumped total volume = loops * dose volume)
Reverse	Number of pump rotations in the opposite direction to normal flow (used to close valves which reduce the hose pressure)
Calibration	Application volume per revolution
Loop Pause	Pause between loops when several loops are set

6.1.4 Parameter menus

You can adapt the different settings in the sub-menus of the individual parameters which you select in the workspace (see Workspace, page 17). The units used for the parameters can be adapted with the “Units” button (see Units, page 23).

Flow Rate (ml/min)			1.234
7	8	9	Units
4	5	6	Clear
1	2	3	Cancel
.	0	⌫	Accept

Fig. 5: “Flow Rate” parameter menu

If invalid values are entered, an error message is displayed:

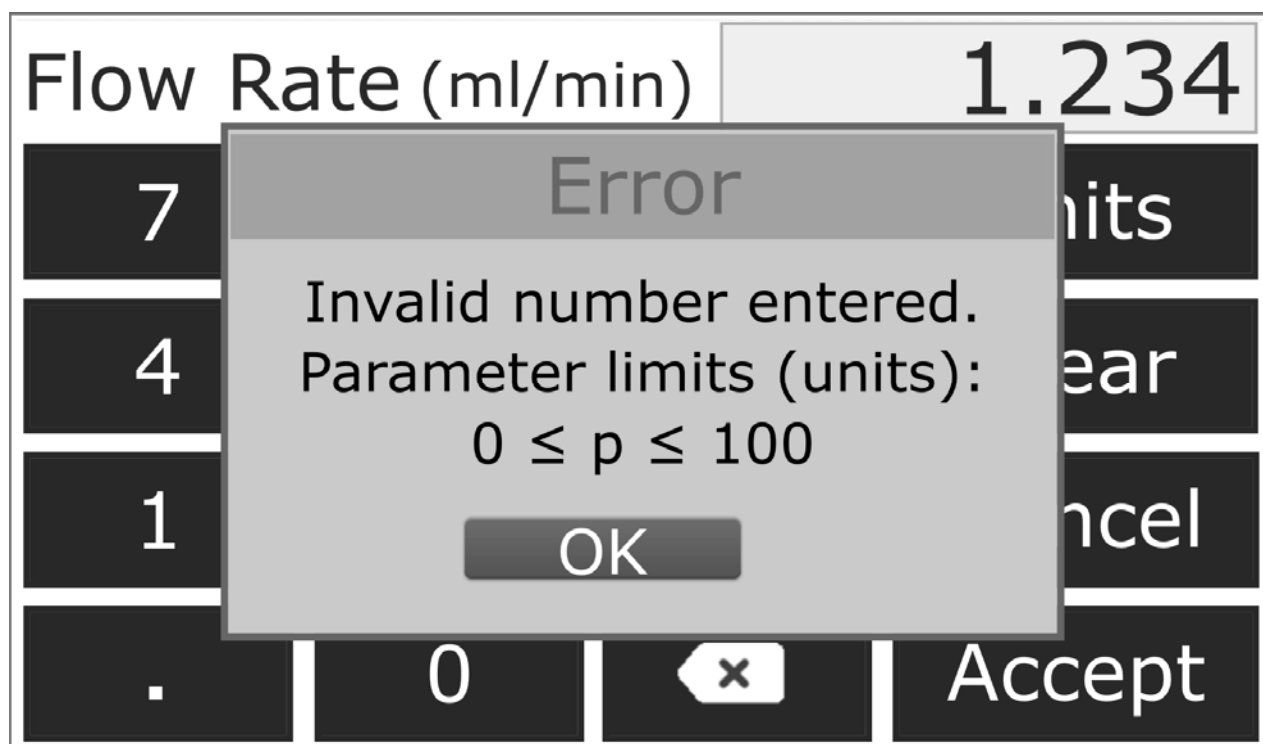


Fig. 6: Error message in the parameter menu

6.1.5 Prime Mode

Press the “Prime” button on the workspace (see Workspace, page 17) to control the pump in Prime Mode. The indications “Prime Right” and “Prime Left” refer to the direction of flow shown by the arrow on the button. The speed can be increased or reduced respectively with the “up” and “down” arrows.

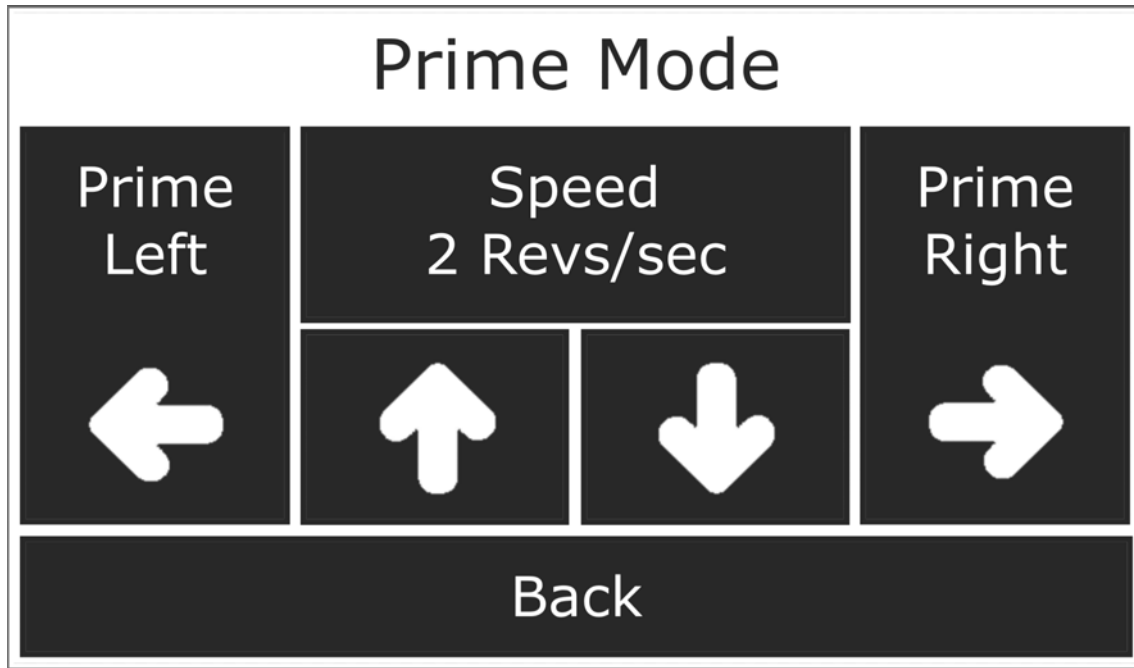


Fig. 7: Prime Mode

6.1.6 File

Press the “File” button on the workspace (see Workspace, page 17) to save the parameter settings or load already saved parameters. Seven file slots are available for loading and saving programs.

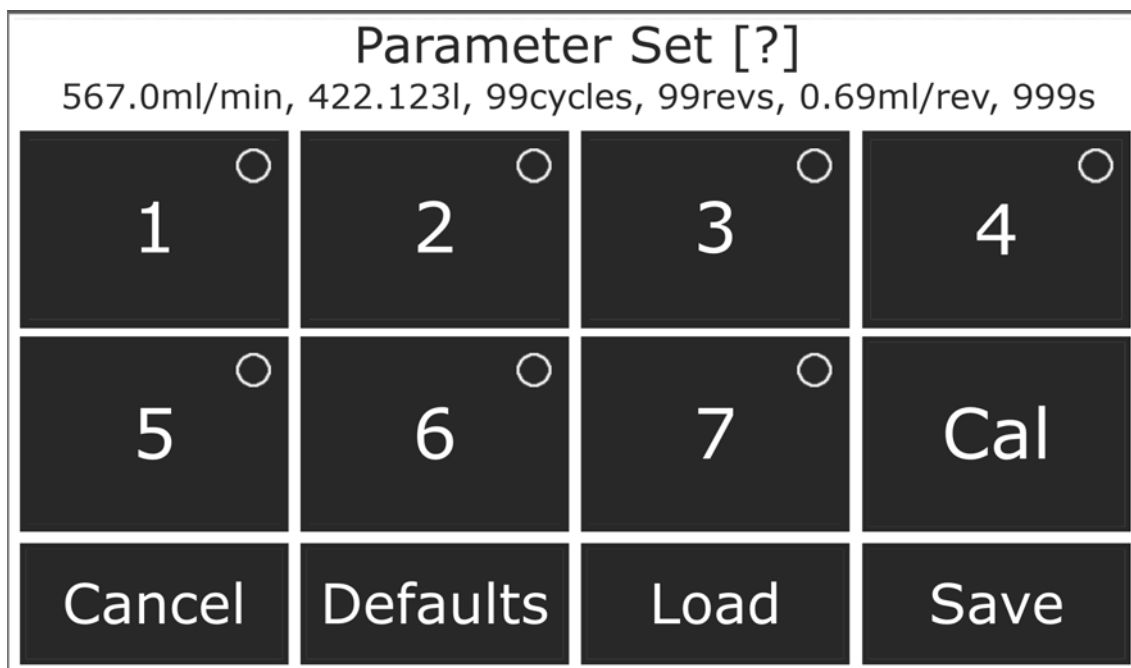


Fig. 8: File

Option/display	Meaning
blue dot	empty file slot
white dot	file slot contains data
red dot	current program
“Defaults”	Load standard settings All unsaved information is lost.
“Load”	Parameters of the selected file slot are loaded if data are available.
“Save”	Save current parameters to file slot This overwrites all data already saved at this file slot.

A * after a parameter display means that this value has not yet been saved. In this case, a warning is displayed when a program is to be loaded:

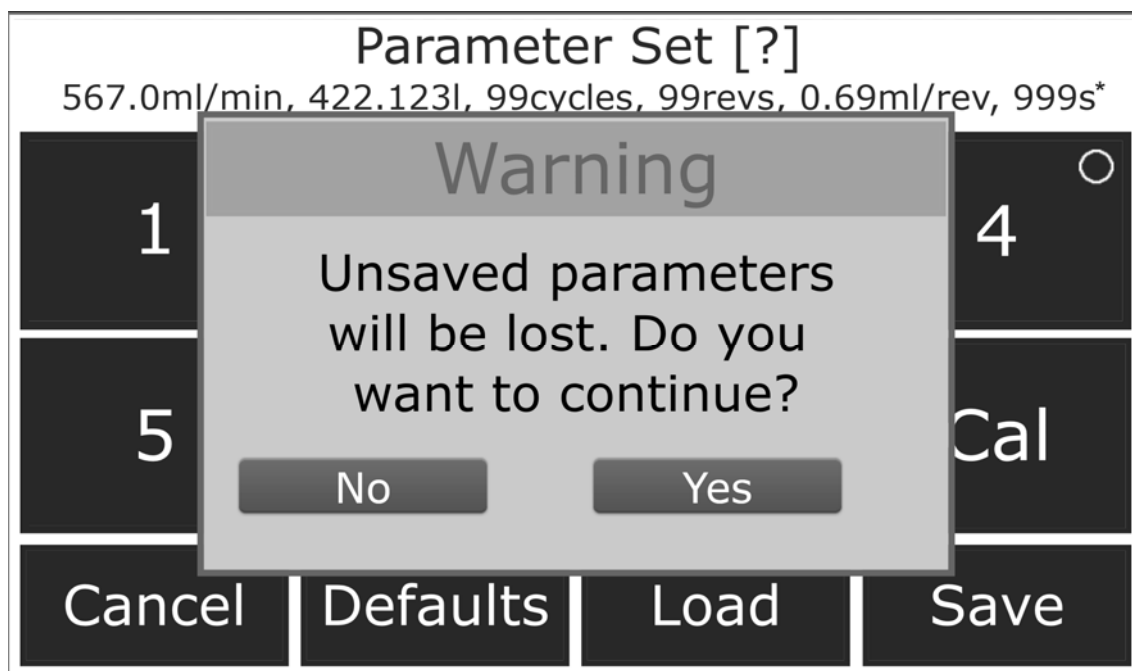
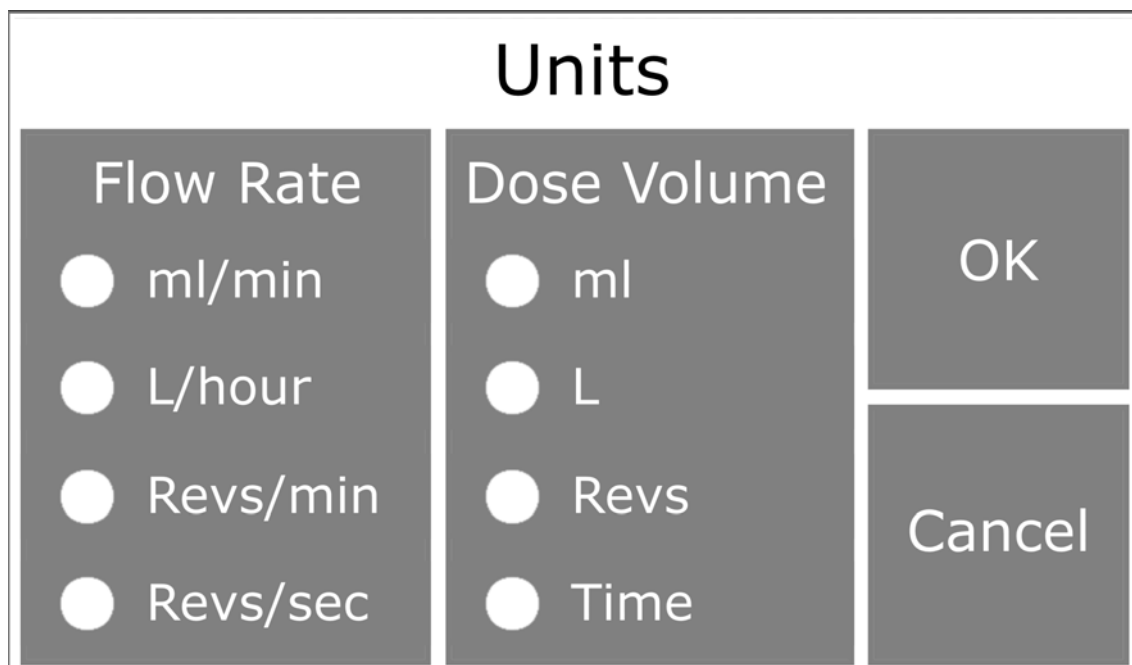


Fig. 9: Warning - Unsaved changes

Current settings are not lost in the Power Cycling.

6.1.7 Units

Press the “Units” button on the workspace (see Workspace, page 17) or in one of the parameter menus (see Parameter menus, page 18) to change the unit formats for the program parameters.



The image shows a dialog box titled "Units". It is divided into three main sections. The left section is titled "Flow Rate" and contains four radio button options: "ml/min", "L/hour", "Revs/min", and "Revs/sec". The middle section is titled "Dose Volume" and contains four radio button options: "ml", "L", "Revs", and "Time". The right section contains two buttons: "OK" at the top and "Cancel" at the bottom.

Units		
Flow Rate ☐ ml/min ☐ L/hour ☐ Revs/min ☐ Revs/sec	Dose Volume ☐ ml ☐ L ☐ Revs ☐ Time	OK Cancel

Fig. 10: Units

6.1.8 Run Program

⚠ WARNING – Danger of being pulled in or caught up in the rotating shaft. Do not work with the device with loose, long hair or loose clothing. Only operate the Q-Drive-Alpha when a pump is mounted.

A summary of the current selection is displayed first when “Accept” is selected (see Workspace, page 17). Check whether the total time and total volume are as expected and select “Run”. This confirms the program and the pump motor is started.

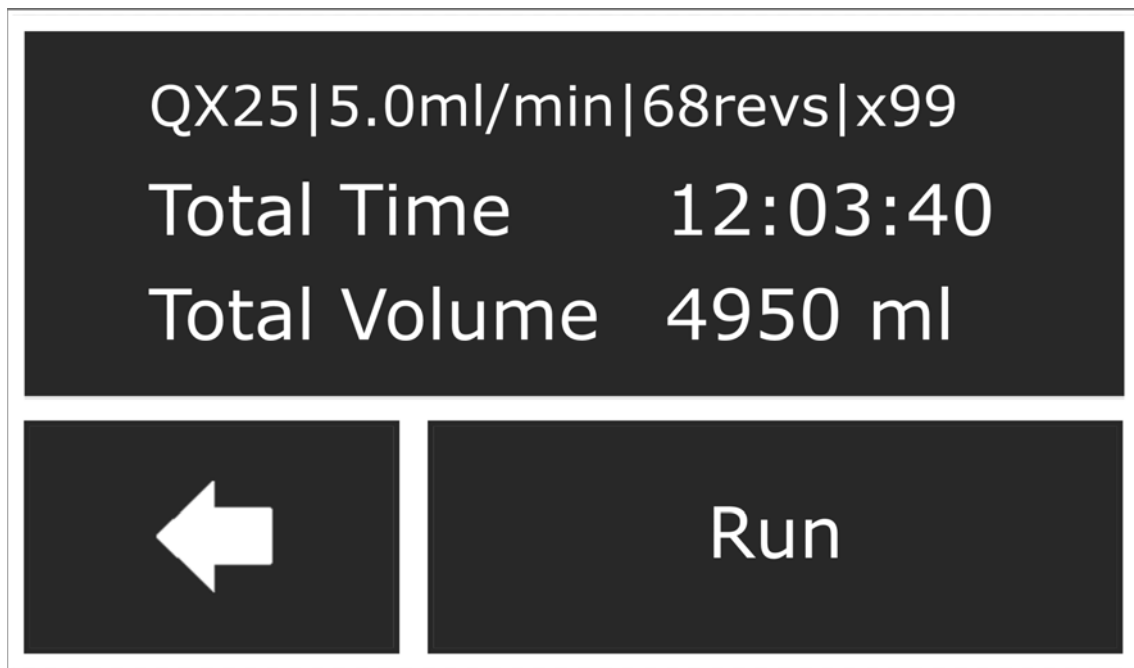


Fig. 11: Summary of the selection

A countdown is displayed whilst the motor is running. You can stop the program with the “Stop” button.



Fig. 12: Countdown

A summary of the run is displayed when the test has stopped.



Fig. 13: Message - Test Stopped

If an error occurs, the program is stopped automatically and the following message appears:

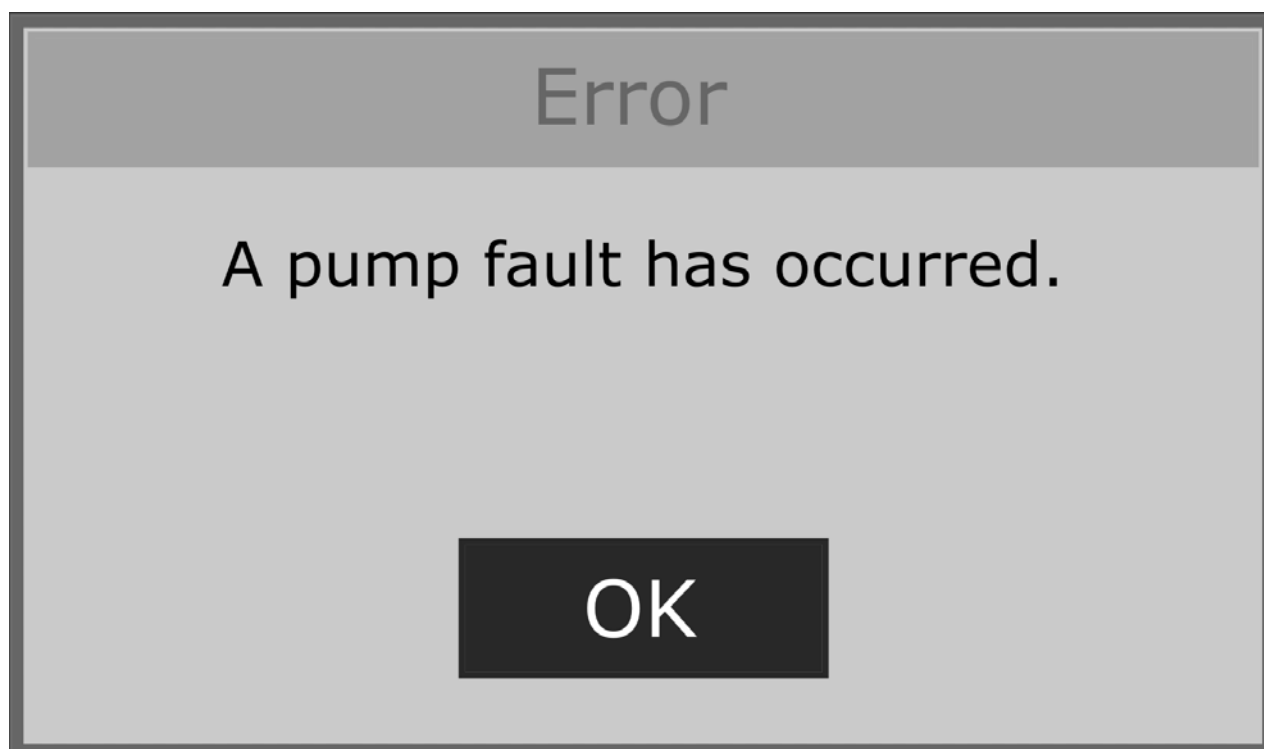


Fig. 14: Error - pump fault

7 Disposal

The device basically consists of the following materials:

Component	Material
outer case	stainless steel
base plate	acetal
cooling air ducting	nylon (printed)
screen	glass and electronic components
fastenings	stainless steel
feet	NBR rubber
PCB	electronic components

Tab. 2: Installed materials

Improper disposal of materials (e.g. metals, plastics, electrical and electronic modules) leads to environmental pollution. Recycle materials in an environmentally friendly way.

Consult the manufacturer about taking them back. See also Manufacturer and Service, page 3.

Alternatively, you can also have disposal carried out by a commercial disposal company and in accordance with national regulations.

The device is marketed under the WEEE number 97509452.

8 Glossary

- adapter
component to enable the use of QX2 pumps on the Q-Drive-Alpha
- operating pressure
pressure reached by the pump on normal operation
- Drive Device
device for testing the Quantex QX2 and QX25 pumps
- pumping pressure
pressure generated by the pump
- fluid
fluid that is pumped through the pump
- power supply unit
electronic component for supplying power to the Q-Drive-Alpha
- stepper motor
powerful motor with electronic speed and force control
- programmable control unit
electronic component which performs various tasks by programming
- touch screen
electronic component for display and operation. Operation is performed by touching the elements shown on the display



Subject to modifications, 2023-07 (first edition)

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