

Software Manual

Control Panel for Hybrid Units

**Models: MU421
MU422
BW 4
BW7**



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1. Description

This software manual describes the operation of the control panel of the advanced Single Booster unit (SB and SBHL).

The advanced SB unit is operated via the control panel (see below illustration).

1. OFF
Button (1) switches OFF the unit.
2. ON/STANDBY
Button (2) switches ON the unit.
3. ERROR
Error light indicator (3).
4. NAVIGATION BUTTONS
The four "arrow" navigation buttons (4) are used for navigation in the display menu. Pressing the "OK" button activates the menu and confirms any activity displayed.
5. DISPLAY



2. Display layout



(1)

When switched on the display will show an arrow symbol in the top right corner equivalent to the active navigation buttons on the control board.

The arrows illustrate that it is possible to scroll up and down between the menus. Scrolling to the right makes it possible to enter a value. Set the value scrolling up (+) or down (-) to set the value higher or lower accordingly. Confirm by pressing ok.

(2)

A letter combination for easy reference in connection with service work will appear in the top right corner of the display.

3. Modes

3.1 Power On

The very first time the unit is switched on, we recommend setting date and time in the Setup menu, settings, display EP. If date and time is not set, date and time will count from the pre-set default date and time.



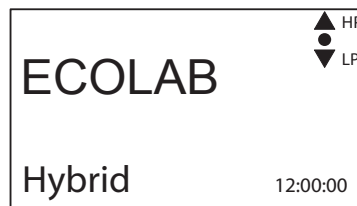
Set date and time using navigation buttons.



Confirm by pressing OK button.

3.2 Standby

The start up display will look as the one below.



Display for SB model with High- and Low pressure - Select either HP or LP using arrows up & down.

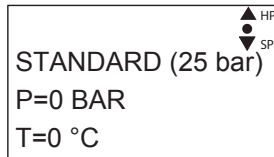
3.3 Run Mode

3.3.1 Single Booster with high and low pressure

The following screen displays will appear when the unit is in Run Mode.



Screen display for High pressure unit in Run Mode.
Scroll down to return to STANDARD pressure.



Screen display STANDARD pressure.
Scroll up to choose HP and scroll down to choose LP.



Screen display for Low Pressure unit in Run Mode.
Scroll up to return to STANDARD pressure.

Please note that you will remain in HIGH or LOW pressure Run Mode until otherwise is selected.

3.4 Power Off



When the unit is off the display will only show a small dot in the top right corner.

In Off mode it is possible to access all menus without the pump running by pressing the OK button on the panel.

Dot is equivalent to the OK confirm button on the panel.

3.5 Error/Warning



In case of an error, “ERROR” will appear on the display screen.

Press the OFF button to switch of unit.

If the error remains when the unit is switched ON again, please Press right arrow to see current error.

In case of a warning, “WARNING” will appear on the display screen. When a warning is detected the machine will either stop or run with limited performance until the cause of the warning has been improved (eg. inlet pressure).

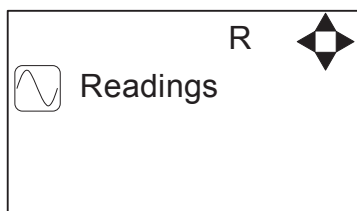
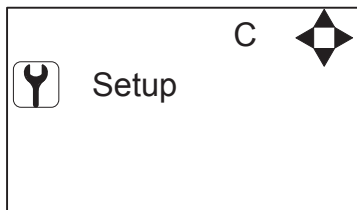
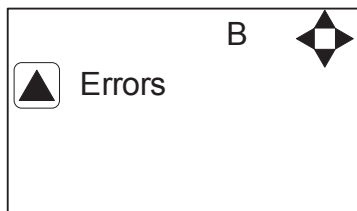
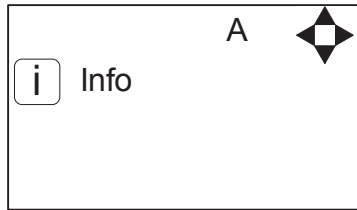
To see further error/warning list and possible cause and remedy go to section 5.2.

4. Content of Main- and Submenus

The control panel contains the below main menu screen displays.

Scroll between the menus using the navigation buttons.

Each main menu contains submenu which will be described subsequently.

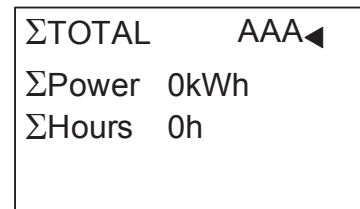
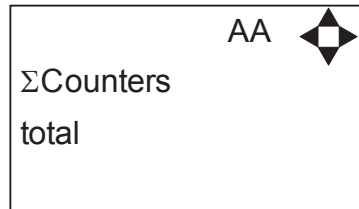
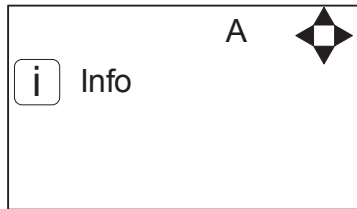


5. Overview of Main- and Sub-menus

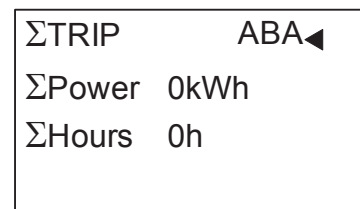
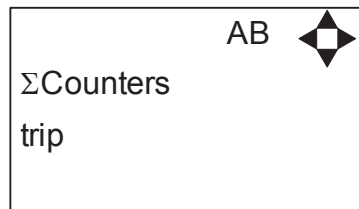
<p><u>1. Info (A)</u></p> <ul style="list-style-type: none">1 Σ Counters total (AA)2 Σ Counters trip (AB)3 Service center(AD)4 Machine info (AE) <p><u>2. Errors (B)</u></p> <p><u>3. Setup (C) (default password 6802)</u></p> <p><u>1 Password (CA)</u></p> <p><u>2 Settings (E)</u></p> <ul style="list-style-type: none">Post run time (ED)Dry run level (EE)Standard pressure (ER)High pressure (EA)Low pressure (EB)Startup method (EY)Pressure start level(EX)Startup delay (EW)Quick Start level (EC)Auto block trig level (EN)Auto off delay (EZ)Acceleration time (EU)Date & Time (EP)Service text (EJ)Inverter power (EO)Backlight intensity (EI)Display contrast (EV)User password (EL)Standard settings (EK) <p><u>3 Languages & units (F)</u></p> <ul style="list-style-type: none">Language (FA)Units (FB) <p><u>4 Supply Tank (H)</u></p> <ul style="list-style-type: none">Tank control OFF (HA)LLA Detect Delay (HB) <p><u>5 Communication (I)</u></p> <ul style="list-style-type: none">Get Errorlog by cable (IA)Get Errorlog by infrared (IB)Firmware Upgrade by cable (IC)Firmware Upgrade by infrared (ID) <p><u>6. I/O Settings (J)</u></p> <ul style="list-style-type: none">Output 1 (JA)Output 2 (JB)Input (JC) <p><u>7. Installation (K)</u></p> <ul style="list-style-type: none">Install password (KA) <p><u>8 Resets (D)</u></p> <ul style="list-style-type: none">Reset trip counters(DA)	<p><u>4. Readings (R)</u></p> <ul style="list-style-type: none">Pump state (RA)Pump-top pres. (RB)Pump-top temp (RC)Supply pressure (RD)Supply temp. (RE)Flow Status (RF)
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5.1 Content of the Info menu

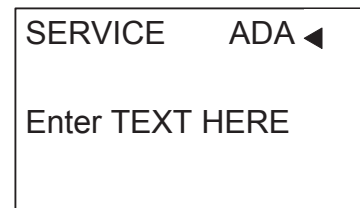
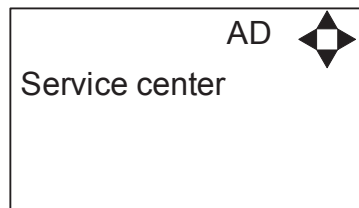
Please note that the Info menu is only for display – all data must be typed in via the setup menu!



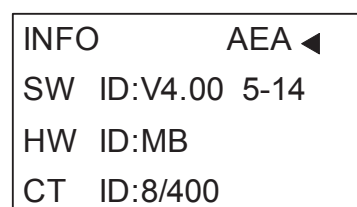
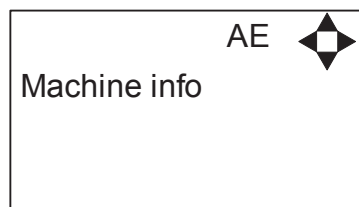
Displays accumulated consumption of power and operation hours.



Displays accumulated consumption of power and operation hours. To reset the trip counter go to the setup menu.



Displays name and tel. no. of service technician.



This display view is only ment as an example, SW ID and CT ID shows the current SW version.

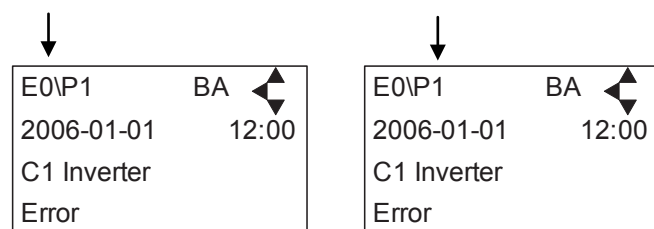
Displays Software version and Pump size, machine configuration and controller software version/ID.

5.2 Content of the Errors menu – CAUSE & REMEDY

Example of Error log screen display:

All error occurrences will be stamped with date and time.

E indicates Error number. P indicates Pump number.



The error log stores up to 1000 occurrences. When max. memory is reached, the errors will be deleted according to "First in" First out" principle.

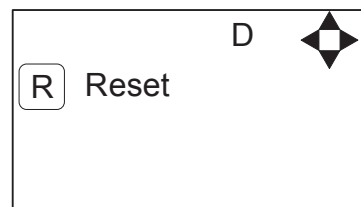
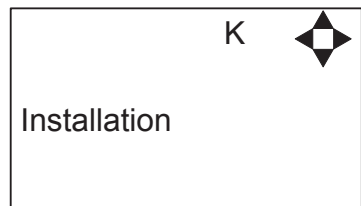
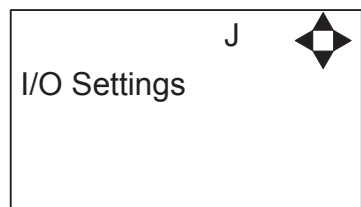
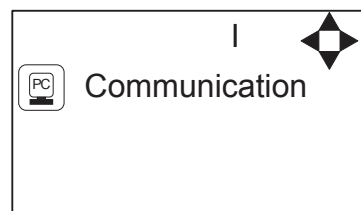
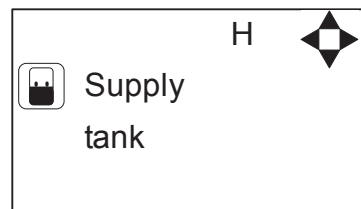
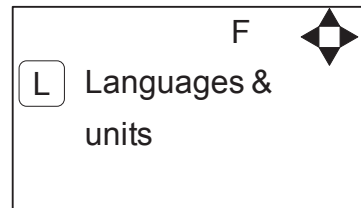
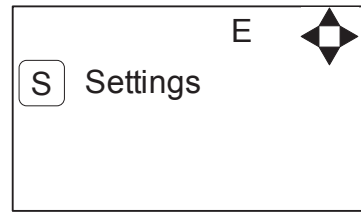
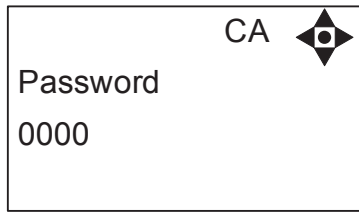
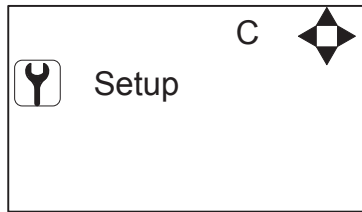
5.2.1 Error List

Error	Cause	Remedy
C1 Inverter Error	1. Frequency inverter in error state	1. Switch off the power on the service switch. Wait 180 sec. Switch on the unit again. If error still occurs, please contact your local service technician.
C2 Low Supply Pressure	1. Insufficient water supply	1. Secure sufficient water supply pressure. 2. Check inlet filter for impurities/rinse filter 3. Contact your local service technician.
C3 High Water Temp.	1. Water pump top temperature is above 80° 2. Water consumption is too low (pump column has been overheated)	1. Lower the inlet water temp. (max 70°C) 2. Secure sufficient water consumption 3. Contact your local service technician.
C4 High Motor Temp.	1. Insufficient cooling of motor 2. The ambient temperature is above 40°	1. Secure that all air channels are open and not blocked by impurities 2. Lower ambient temperature
C5 High Supply Temp.	1. Water inlet temperature is above 70°	1. Lower the water temp. (max 70°C) 2. Contact your local service technician.
C6 Low Sensor Supply Voltage	1. Voltage supply for sensors too low	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C7 No Response Error	1. No communication between display and control board	1. Contact your local service technician.
C8 Low Tank Level	1. Insufficient water supply 2. Water supply valve not open	1. Check correct water supply 2. Secure sufficient air supply to valve 3. Contact your local service technician.
C9 High Tank Level	1. Water supply valve not closed	1. Secure sufficient air supply to the valve. 2. Contact your local service technician.
C11 Warning Cri. Inlet press.	1. Insufficient water supply 2. Booster will return to standby mode after 20 sec. If this error occurs 3 times within 20 min. Error C2 occurs.	1. Secure sufficient water supply or reduce consumption 2. Check inlet filter for impurities/rinse filter 3. Contact your local service technician.
C13 Warning Low inlet press.	1. Insufficient water supply. The machine will keep on working as always, but the maximum speed of the pump will be reduced until sufficient inlet pressure is present.	1. Secure sufficient water supply or reduce consumption 2. Check inelt filter for impurities/Rinse filter


C14 Warning leakage start	1. Booster start condition changed to flow, due to leakage in pipe	1. Check for leakage in pipe system. 2. Press "off" button 3. If error reoccurs, contact your local service technician.
C20 Low Sensor Signal P-Pumptop	1. Pressure signal from pumptop sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C21 Low Sensor Signal T-Pumptop	1. Temperature signal from pumptop, sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C22 Low Sensor Signal P-Inlet	1. Pressure signal form inlet sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C23 Low Sensor Signal T-Inlet	1. Temperature signal from inlet sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C24 Low Sensor Signal block	1. Signal from block sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C25 Low Sensor Signal flow	1. Signal from flow sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C30 High Sensor Signal P-Puump-top	1. Pressure signal from pumptop sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C31 High Sensor Signal T-Pumptop	1. Temperature signal from pumptop sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C32 High Sensor Signal P-Inlet	1. Pressure signal from inlet sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C33 High Sensor Signal T-Inlet	1. Temperature signal from inlet sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C34 High Sensor Signal block	1. Signal from block sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C35 High Sensor Signal flow	1. Signal from flow sensor, out of range	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C40 Sensor Load Pumptop Sensor	1. Supply voltage for pumptop sensor too low. 2. Pumptop sensor using too much current	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C41 Sensor Load Inlet sensor	1. Supply voltage for inlet sensor too low 2. Inlet sensor using too much current	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C42 Sensor Load Block sensor	1. Supply voltage for block sensor too low 2. Block sensor using too much current	1. Press "off" button 2. If error reoccurs, contact your local service technician.
C43 Sensor Load Flow sensor	1. Supply voltage for flow sensor too low 2. Flow sensor using too much current	1. Press "off" button 2. If error reoccurs, contact your local service technician.


5.3 Content of the Setup sub menu Settings


The Setup Main menu contains the below submenus, which will be described subsequently.




5.4 Content of Setup menu

CA 
 Password
 0000


E 
 S Settings


ED 
 Post run
 Time: 20 sec.

EDA 
 Post run
 Time: 20 sec.


Password Note: Default user password is 6802. Enter the settings menu to change the default password. To avoid unintended access to the system the your local service technician. can insert a blocking preventing access to the password controlled menus.


Set Post run time.


EE 
 Dry run
 level: 0.5 bar


EEA 
 Dry run
 level: 0.5 bar

Set dry run level.


ER 
 Standard
 pressure: 25 bar


ERA 
 Standard
 pressure: 25 bar

EA 
 High
 pressure: 25 bar


EAA 
 High
 pressure: 25 bar


Set high pressure.

EB 
 Low
 pressure: 12 bar


EBA 
 Low
 pressure: 12 bar


Set low pressure.


EY 
 Startup
 Method: Pressure


EYA 
 Set Startup
 Method: Pressure


EX 
 Pressure Start
 Level: 8 bar

EXA 
 Set Pres. Start
 Level: 8 bar


EW 
 Startup
 Delay: 10 sec


EWA 
 Set Startup
 Delay: 10 sec.

EC 
 Quick start
 level: Off

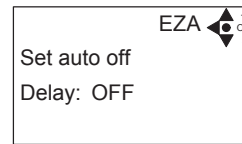
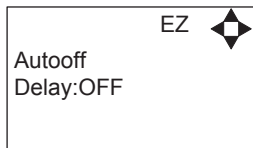
ECA 
 Quick start
 level: Off

Set Quick start level.

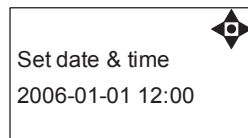
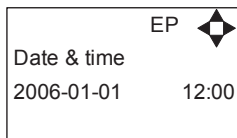
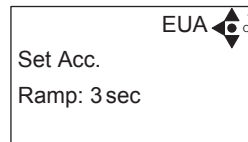
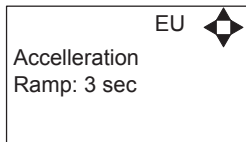
EN 
 Autoblock trig
 Level: 50 l/min

ENA 
 Autoblock trig
 Level: 50 l/min

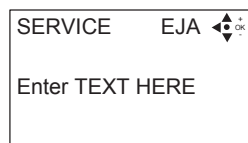
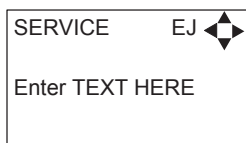
Set trigger level for automatic block



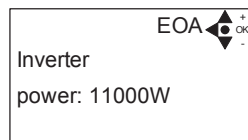
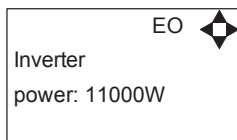
Set standard pressure.



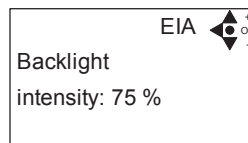
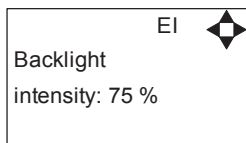
Set date and time



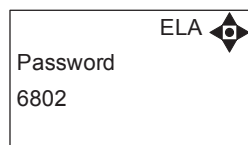
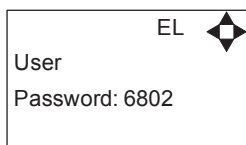
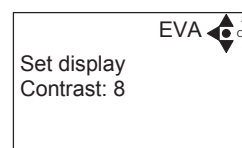
Enter name and tel. no of Your local service technician.



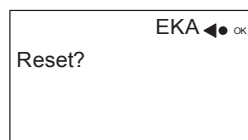
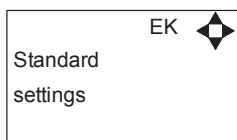
Set rated power of frequency inverter



Set the backlight intensity.

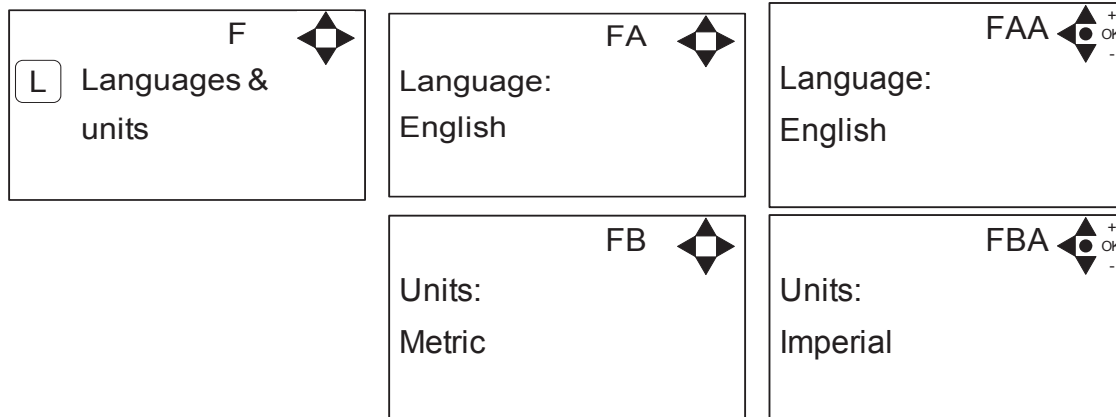


Create new user password (default 6802).

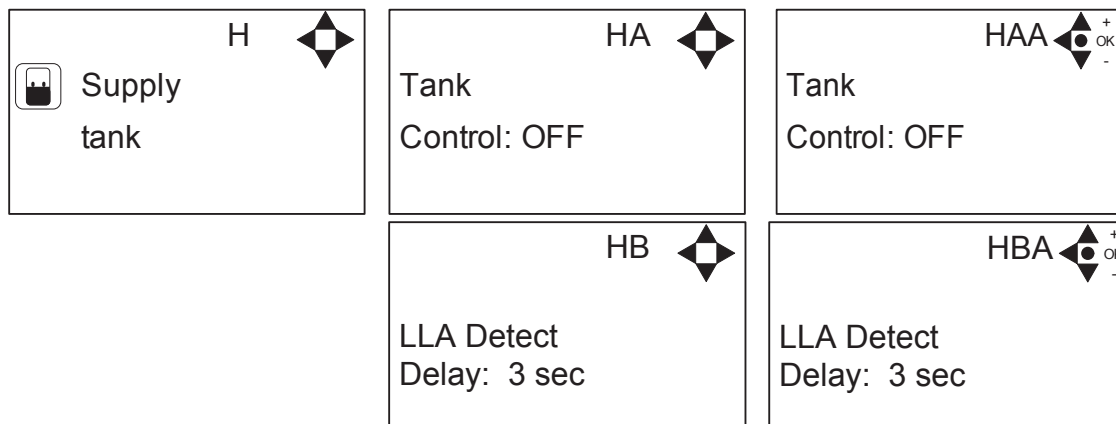


Reset to standard factory settings.

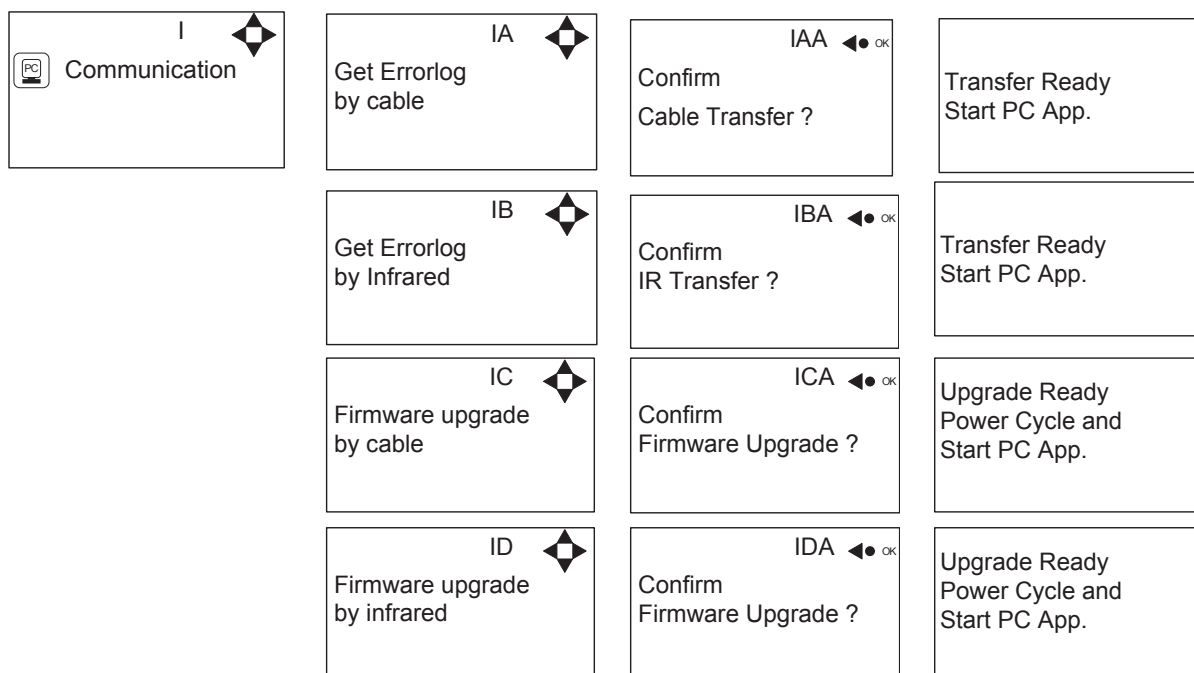
5.4.1 Submenu Language & Units



5.4.2 Submenu Supply tank

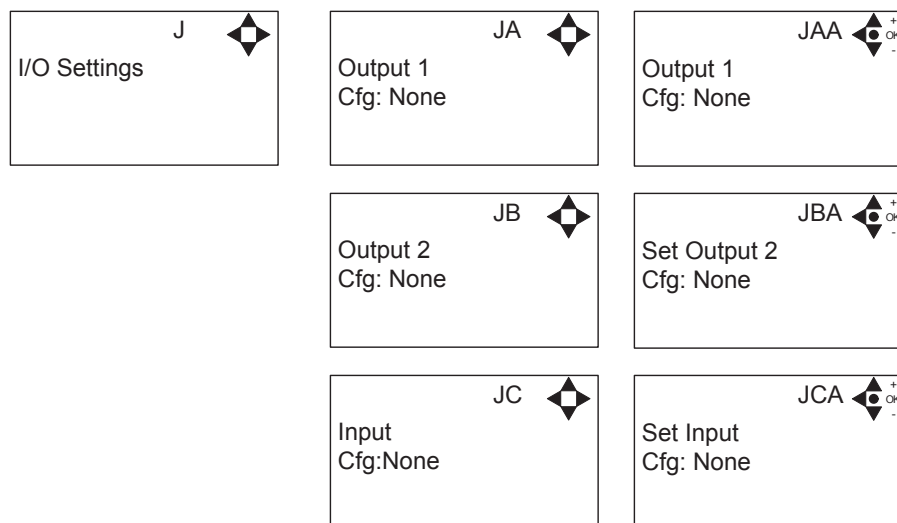


5.4.3 Submenu Communication*



*For the use of authorized Your local service technician only.

5.4.4 Submenu I/O Settings



Output 1 options:

- None – No function
- Error – Active if an error are detected
- Run/Stop – Active if booster is running and not active when it is stopped.
- Standby /off - active if booster is running or in standby.

Output 2 options:

- None – No function
- Delay start – Gives a signal at this port, before starting the pump.
The length of the delay is set in the settings menu, startup delay.
This function could for instance be used to secure start up of prepressure pump before starting the unit.

Input

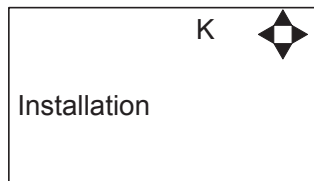
- None – No function
- Release – unit unable to start before this signal is present.
- Setpoint – Output pressure is controlled by external voltage source.
- Chem. Low - Low level in chemistry can

Maximum ratings:

Out 1			
Blocking voltage	VDC	40	*
Load current	mA	250	*
Out 2			
Blocking Voltage	VDC	350	*
Load current	mA	100	*
Input Port (IN)			
Input voltage	Volt	12	
Release signal enable	Volt	>5	

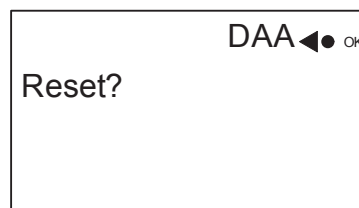
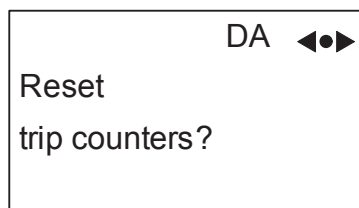
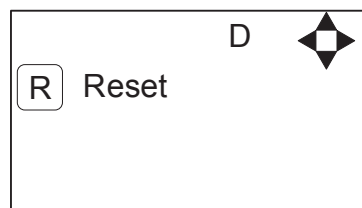
*Controller version V6B or higher

5.4.5 Submenu Installation

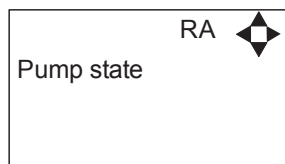
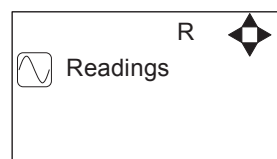


* For the use of authorised Your local service technician only.

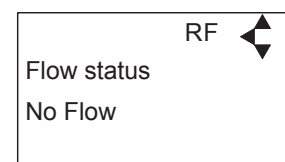
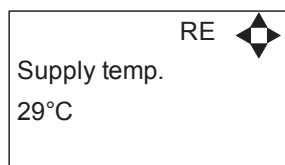
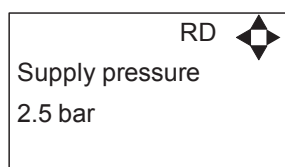
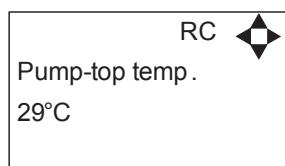
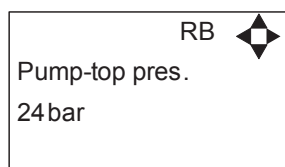
5.4.6 Submenu Reset



5.5 Content of Readings



Output frequency of frequency inverter.



6. Upgrade Firmware

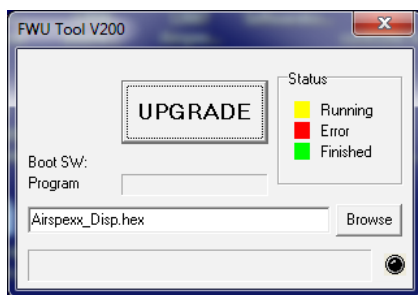
Upgrading from software version 4.10 or higher

6.1 Upgrade using USB Cable

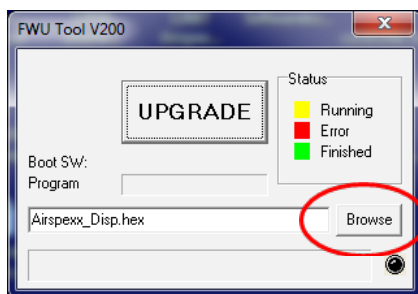
1. Connect USB cable (Item No. 110001526) to PC USB port (Remove other USB cables connected to PC)
2. Connect Display cable to USB cable
3. In the menu go to, Setup->"password"->Communication-> Firmware upgrade by cable->Confirm Firmware upgrade and press "OK"
4. Display should now be looking like this:

Upgrade Ready
Power Cycle and
Start PC App.

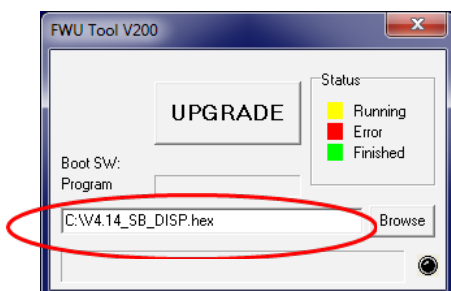
5. Disconnect display from usb cable and connect it again (Power cycle)
6. Make sure the Green "ON" led and the red "OFF" led at the display is both on, display is blank
7. Startup PC program FWU200.exe (can be downloaded from Nilfisk Food website)
8. Window should be looking like this



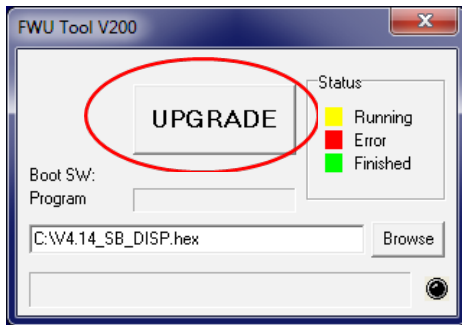
9. Press "Browse" button



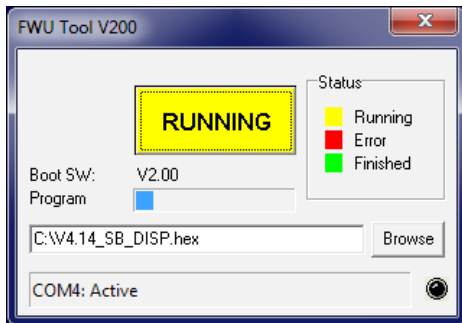
10. Select the file you will use for upgrade. Software File can be downloaded from Nilfisk Food website. The name of the file should end with ".hex". Ex V4.14_SB_DISP.hex
11. When the file is located press "Open" in browser window
12. The file name will now be written in file text line



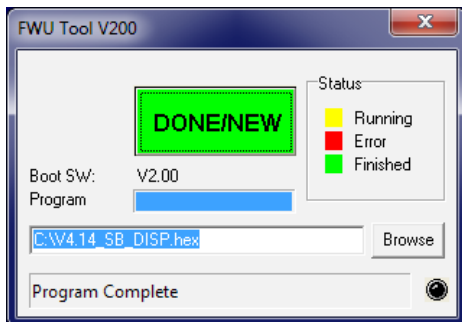
13. Press UPGRADE button in FWU 200 tool



14. After a short while the FWU tool should start upgrading, the upgrade button should turn Yellow and change to "RUNNING"



15. The progress bar "Program" must go to the end before the upgrade is complete (less than 1 minute)
16. When the upgrade is complete the FWU tool should be looking like this, Button turns Green and text changes to "DONE/NEW"



17. Now the display is upgraded
18. To verify software version in display, in the menu go to, Info->Machine info
19. Here you will find display software version and control software version. SW ID "Display software", HW ID "type of device", CT ID Controller board software(if display is not connected to a control board, control software will be 0/300)

6.2 Upgrade using IrDA Cable

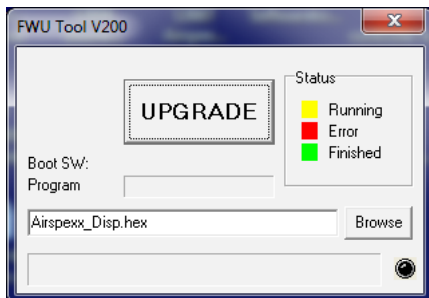
1. Connect power to equipment
2. In the menu go to, Setup->"password"->Communication-> Firmware upgrade by Infrared->Confirm Firmware upgrade and press "OK"
3. Display should now be looking like this:

Upgrade Ready
Power Cycle and
Start PC App.

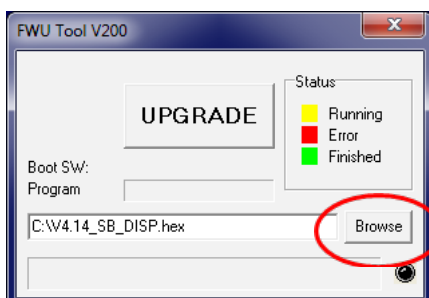
4. Turn Off equipment and turn it on again (Power cycle)
5. Make sure the All three led's are on (Green "ON", red "ERROR" and red "OFF") and the display is blank
6. Connect Irda module (Item No. 110001558) to PC USB port
7. Place Irda module on display module like this



8. Startup PC program FWU200.exe (can be downloaded from Nilfisk Food website)
9. Window should be looking like this

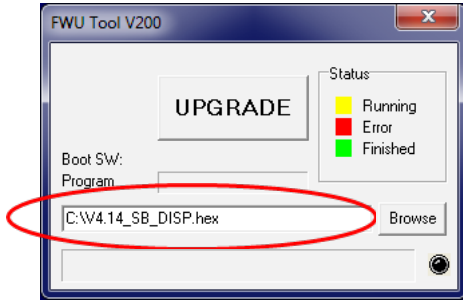


10. Press "Browse" button

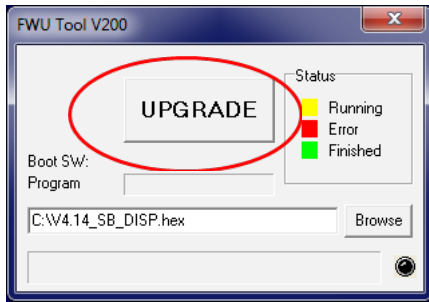


11. Select the file you will use for upgrade. Software File can be downloaded from Nilfisk Food website. The name of the file should end with ".hex". Ex V4.14_SB_DISP.hex
12. When the file is located press "Open" in browser window

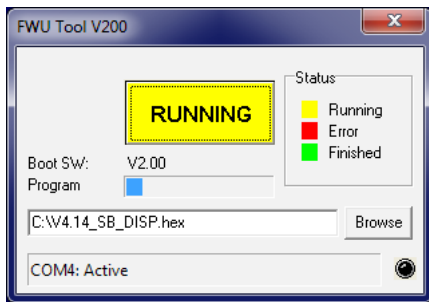
13. The file name will now be written in file text line



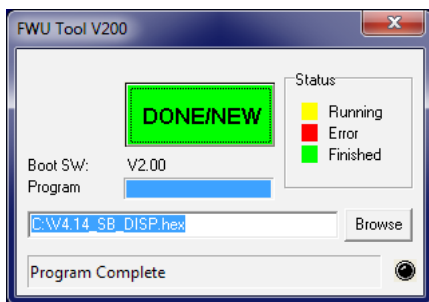
14. Press UPGRADE button in FWU 200 tool



15. After a short while the FWU tool should start upgrading, the upgrade button should turn Yellow and change to "RUNNING"



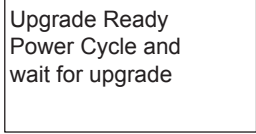
16. The progress bar "Program" must go to the end before the upgrade is complete (less than 1 minute)
17. When the upgrade is complete the FWU tool should be looking like this, Button turns Green and text changes to "DONE/NEW"



18. Now the display is upgraded
19. To verify software version in display, in the menu go to, Info->Machine info
20. Here you will find display software version and control software version. SW ID "Display software", HW ID "type of device", CT ID Controller board software(if display is not connected to a control board, control software will be 0/300)

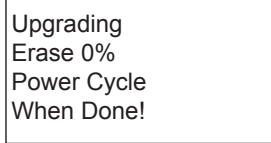
6.3 Upgrade Controller Board

1. Make sure display is connected to controller
2. Power up equipment
3. In the menu go to, Setup->"password"->Communication-> Upgrade Controller->Confirm upgrade and press "OK"
4. Display will now look like this:



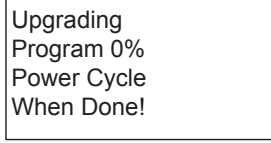
Upgrade Ready
Power Cycle and
wait for upgrade

5. Turn off power to equipment and turn it back on (Power cycle)
6. After power on display will look like this:



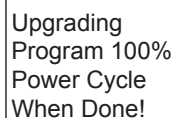
Upgrading
Erase 0%
Power Cycle
When Done!

7. When Erasing reaches 100%, the display will automatically start to program control board "Erase" is changed to "Program"



Upgrading
Program 0%
Power Cycle
When Done!

8. Program will now start to count from 0% to 100%
9. When program reaches 100%, the programming is complete
10. The display will be looking like this



Upgrading
Program 100%
Power Cycle
When Done!

11. Turn Off equipment and turn it on again (Power cycle)
12. Now the control PCB is upgraded
13. To verify software version in display, in the menu go to, Info->Machine info
14. Here you will find display software version and control software version. SW ID "Display software", HW ID "type of device", CT ID Controller board software

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