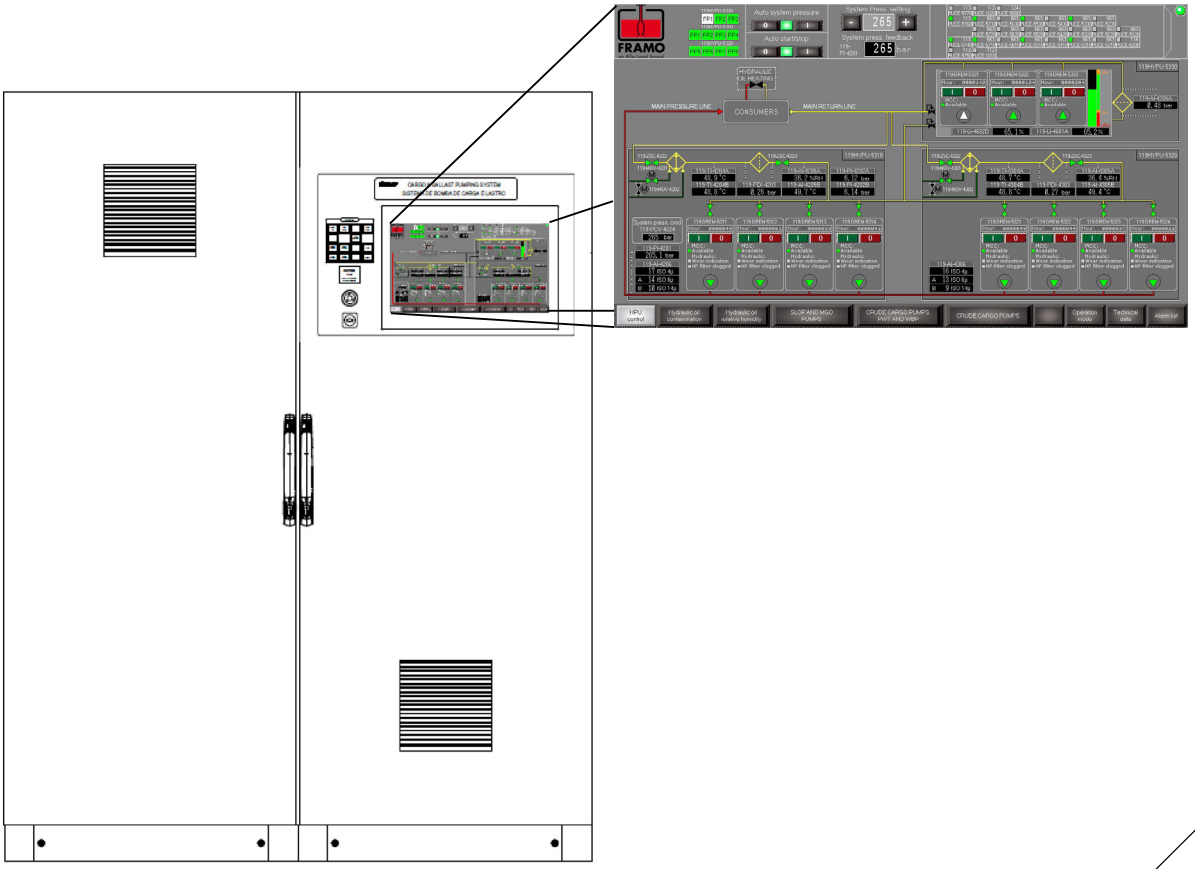
Framo

Framo Control Panel HMI

No. 0143-0867-4
01.11.2018/KVa

Instruction / Operation Manual

FRAMO
an Alfa Laval brand



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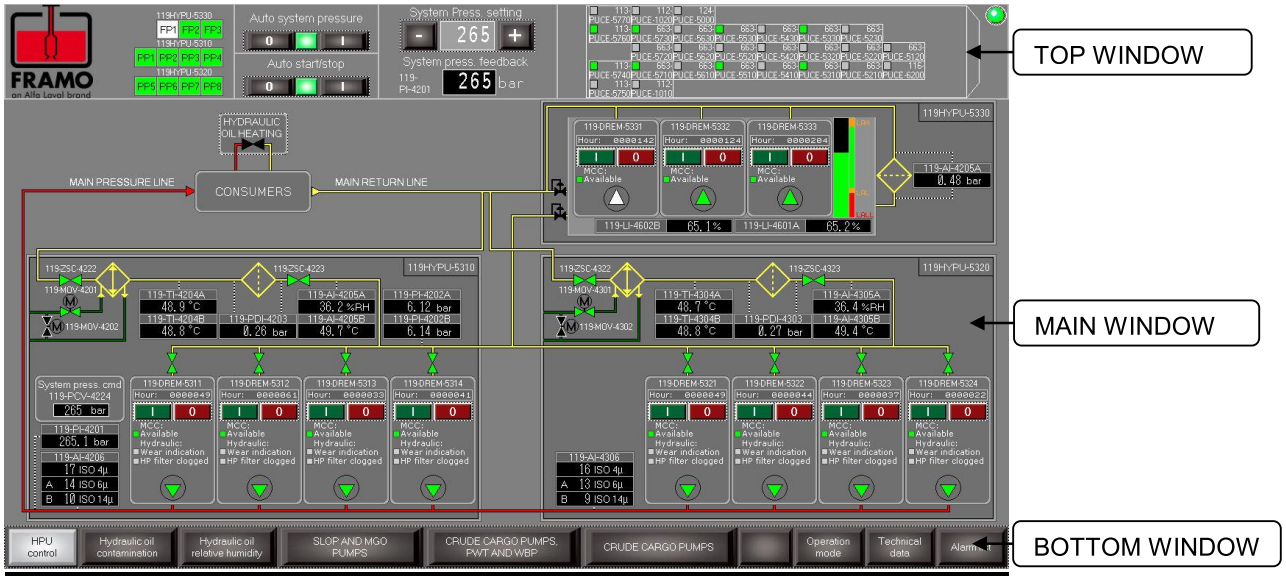
1 Preface

The Framo system is built up as one system, comprising of HPU and pumps.

The main operator station is ICSS, however the system can also be operated locally from the Framo UCP.
The UCP is provided with a 19” color touch display HMI (human-machine interface) communicating with a PLC (Programmable Logic Controller), routing all command- and feedback signals.

ICSS communicates with the Framo UCP through redundant MODBUS TCP links.

2 Screen layout



The screen is divided into three windows:

Top window: Hydraulic system information, pump status.

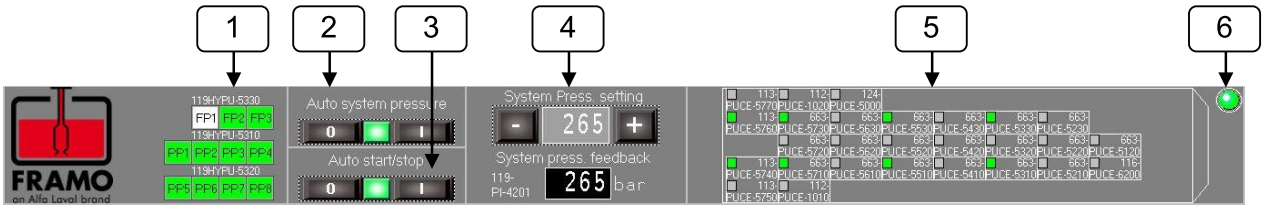
Main windows:

1. Monitoring and control of Hydraulic power unit (HPU).
2. Hydraulic oil contamination graph.
3. Hydraulic oil relative humidity graph.
4. Slop and MGO pump control
5. Crude cargo pumps, PWT and WBP control.
6. Crude cargo pumps control.
7. Operation mode selection.
8. Technical data.
9. Alarm list.

Bottom window: Selection of main windows.

The top and bottom windows are displayed continuously regardless of operator's selection of main windows.

3 Top window

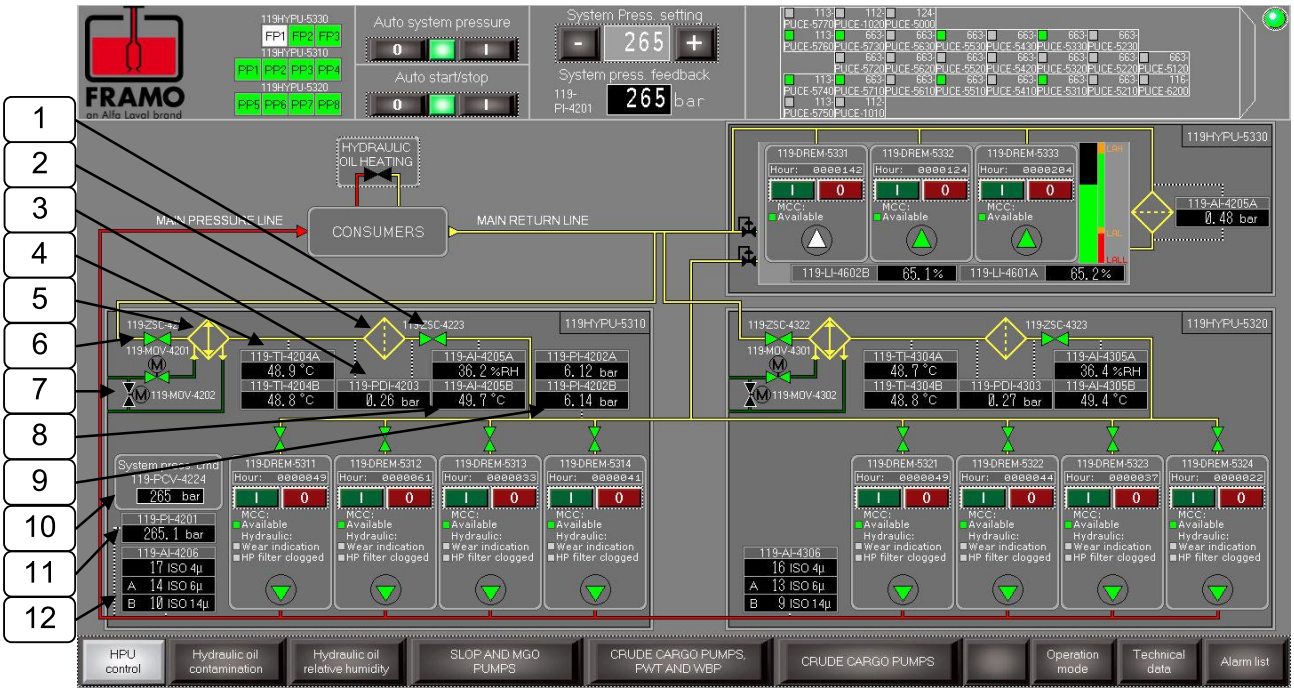


1) Running status for hydraulic power packs and feed pumps.
2) Auto / manual system pressure command.
   Regulates system pressure to 25 bar above the highest pressure feedback for hydraulic driven pumps.
3) Auto start / stop of power packs based on calculated oil flow required.
4) System pressure command and feedback. Increase/decrease command by ± 1 bar or numeric keypad input (pop-up by pressing the numeric field).
5) Location and running status of pumps.
6) Alarm lamp.

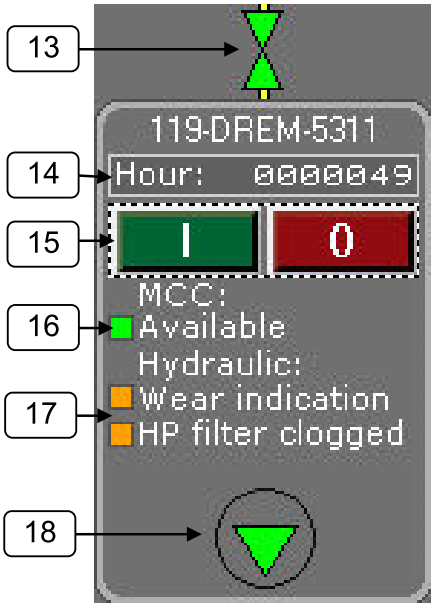
When the system is in remote mode (ICSS control), this message appears in the top window.

4 Main windows

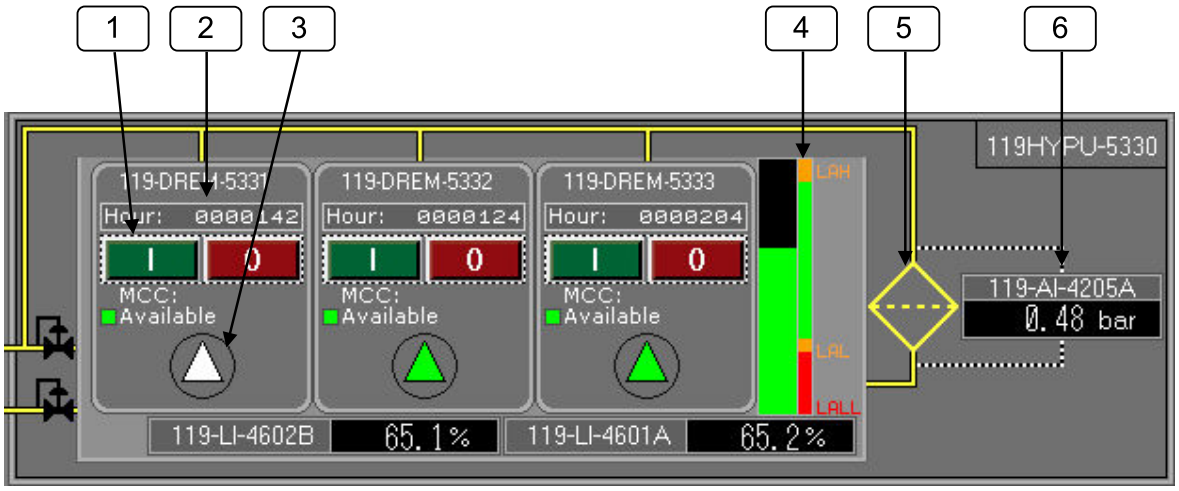
- 4.1 HPU Control



1) Return line valve status.
2) Hydraulic oil filter.
3) Hydraulic oil filter Δ pressure.
4) Hydraulic oil temperature.
5) Hydraulic oil cooler.
6) Return line valve status.
7) Cooling and bypass valves.
8) Hydraulic oil relative humidity.
9) Feed pressure.
10) System pressure command.
11) System pressure feedback.
12) Hydraulic oil contamination.
13) Suction valve status.
14) Power pack running hours.
15) Power pack start / stop.
16) Available from MCC.
17) Power pack hydraulic status.
18) Power pack status.

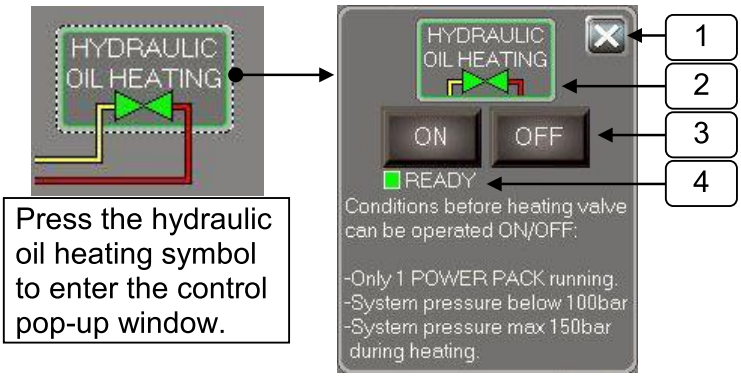


Feed pumps:



1) Feed pump control, start / stop.
2) Feed pump running hours
3) Feed pump status.
4) Hydraulic oil level.
5) Kidney filter.
6) Kidney filter Δ pressure.

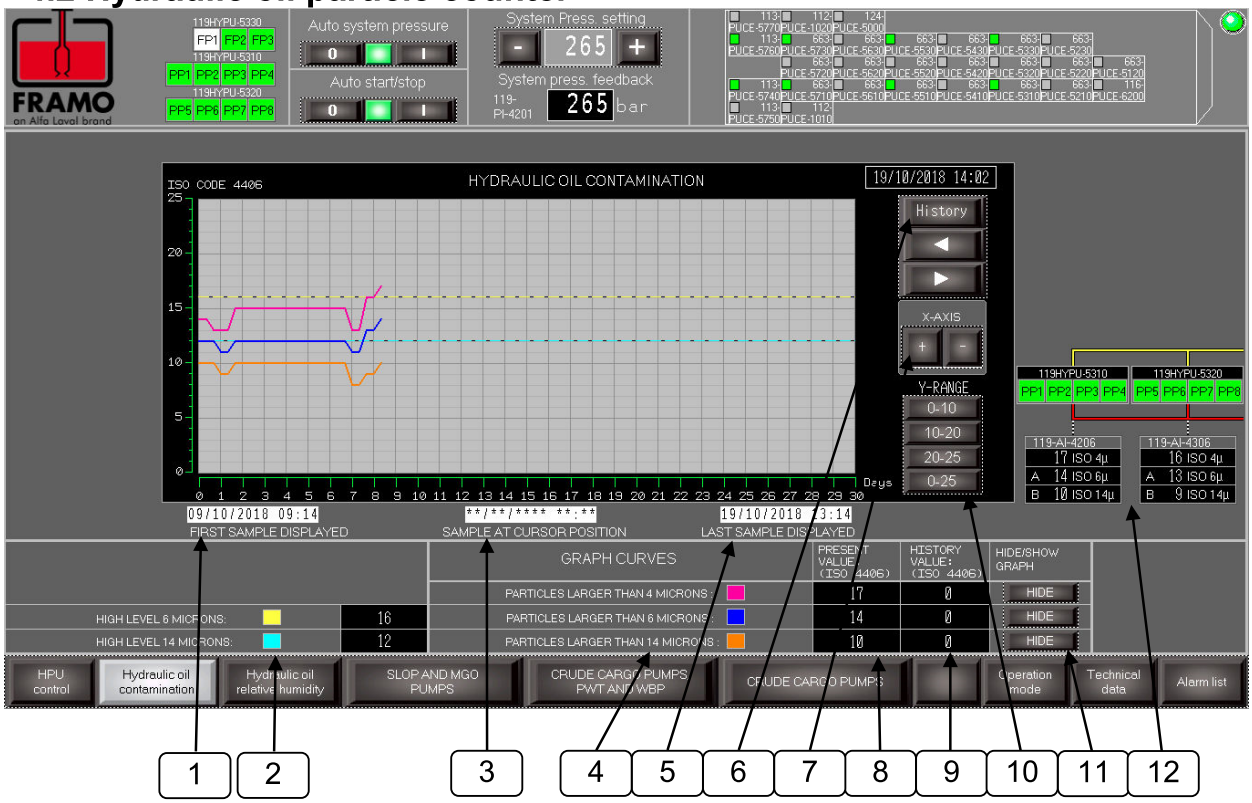
Heat mode:



Press the hydraulic oil heating symbol to enter the control pop-up window.

1) Exit control pop-up window.
2) Hydraulic oil heating status.
3) Control heating, on / off.
4) Ready to activate hydraulic oil heating.

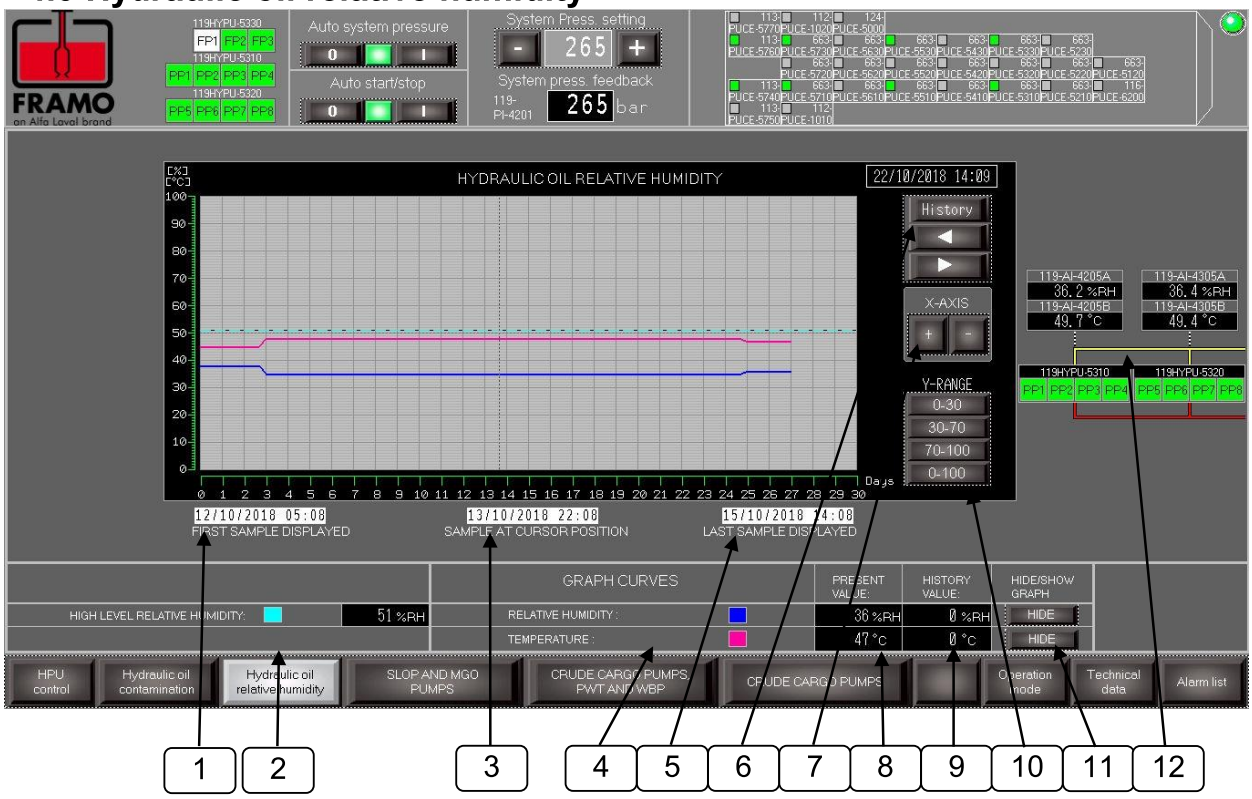
- 4.2 Hydraulic oil particle counter



The graph shows the last 30 days of operating time. Earlier trend data can be displayed in "History mode". Graph is updated only during operation of HPU, once an hour.
X-axis can be zoomed, 0-3.75 days to 0-30 days.

1) Time and date for first sampling shown in graph.
2) Alarm limits.
3) Time and date for cursor (When in historic mode).
4) Graph colors.
5) Time and date for present sampling shown in graph.
6) Chang to historical mode.
7) Zoom X-axis.
8) Present numeric value (graph data).
9) Historical numeric value (when in historic mode).
10) Zoom Y-axis.
11) Hide graphs.
12) Present value HPU A and HPU B.

- 4.3 Hydraulic oil relative humidity



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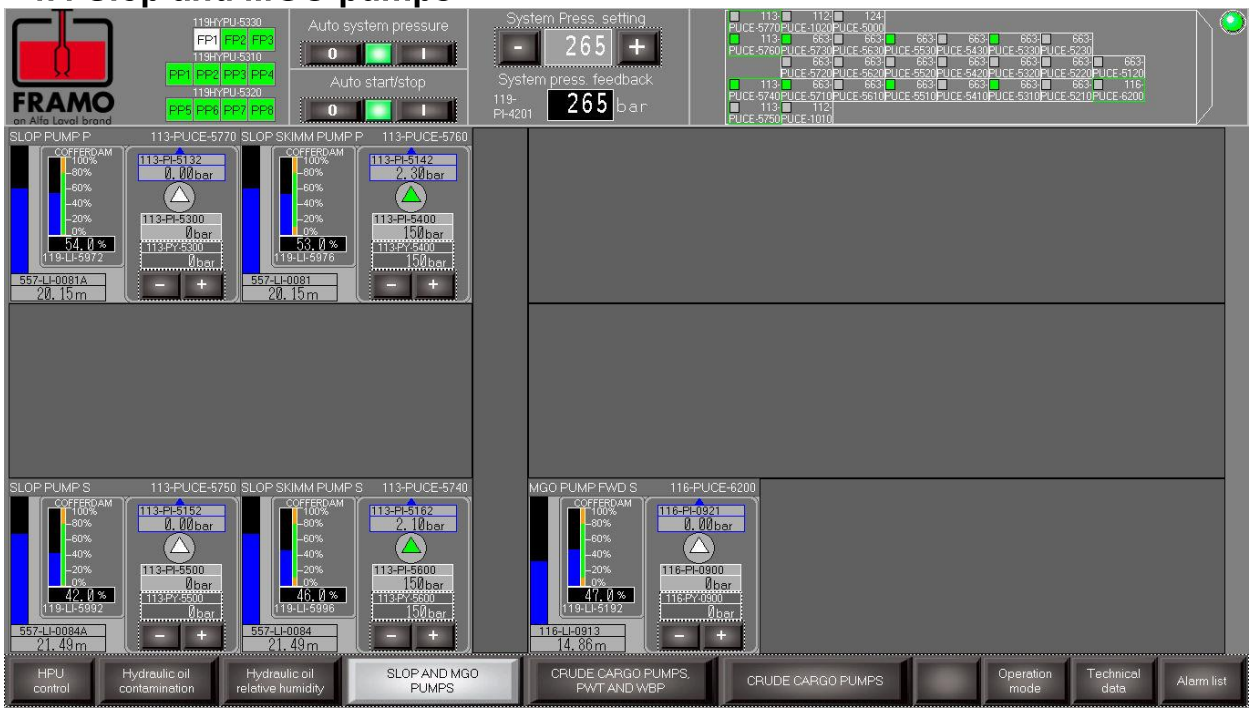
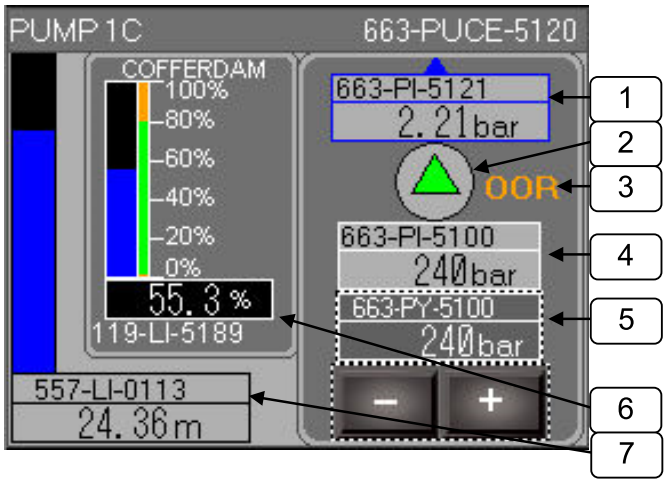
6) Chang to historical mode.
7) Zoom X-axis.
8) Present numeric value (graph data).
9) Historical numeric value (when in historic mode).
10) Zoom Y-axis.
11) Hide graphs.
12) Present value HPU A and HPU B.

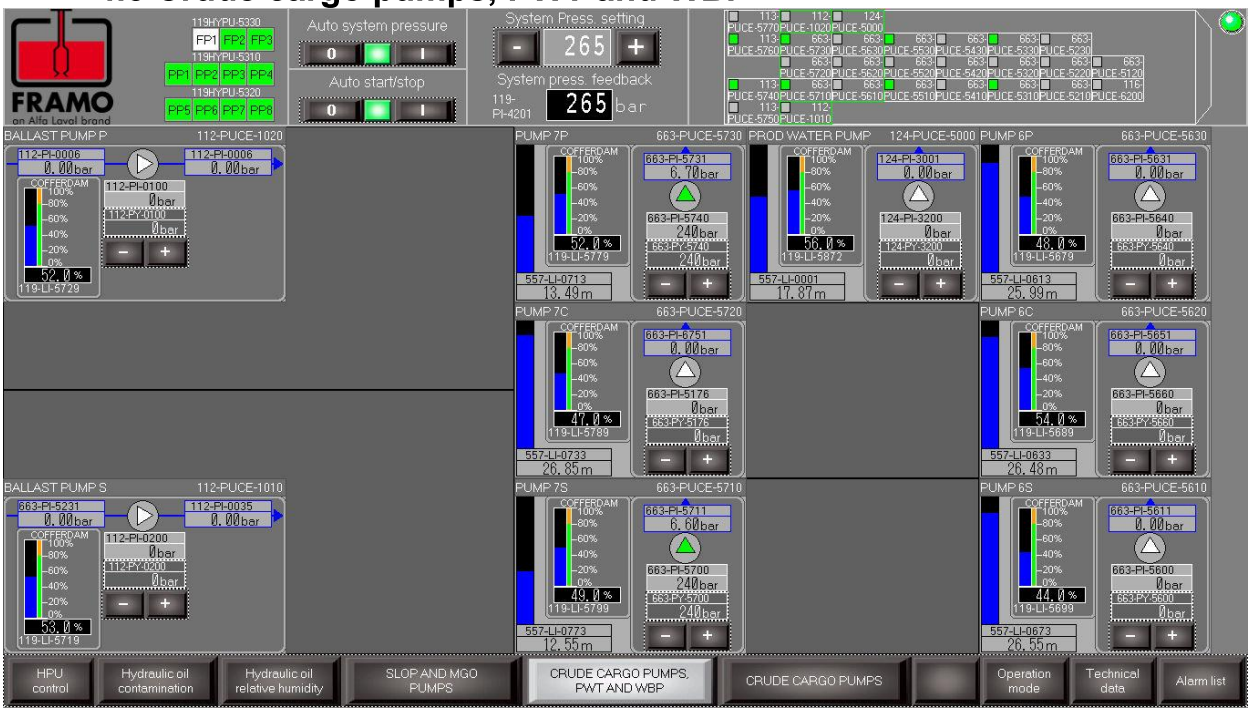
- 4.4 Slop and MGO pumps

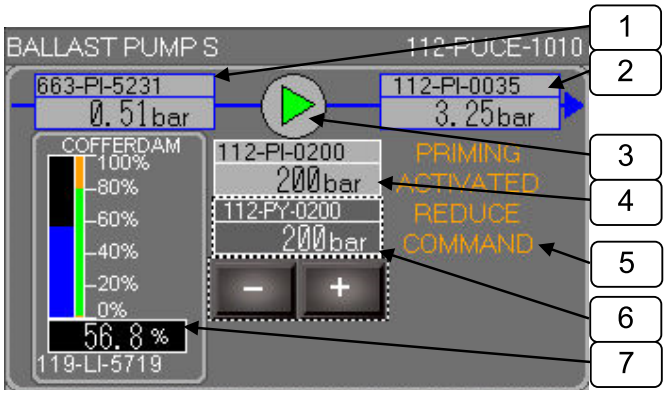




1) Pump discharge pressure.
2) Pump status.
3) Out of range operation warning.
4) Pump hydraulic feedback.
5) Pump hydraulic command. Increase/decrease command by ± 1 bar or numeric keypad input (pop-up by pressing the numeric field).
6) Cofferdam level monitoring.
7) Tank level.

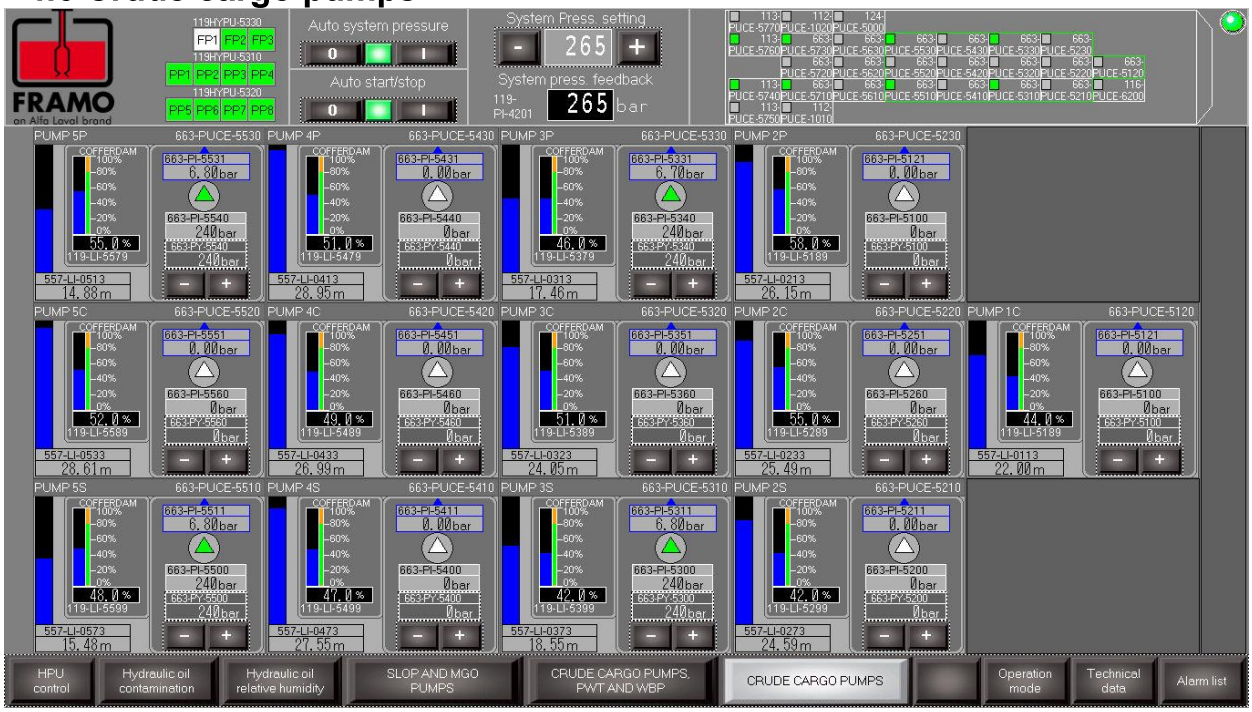
- 4.5 Crude cargo pumps, PWT and WBP

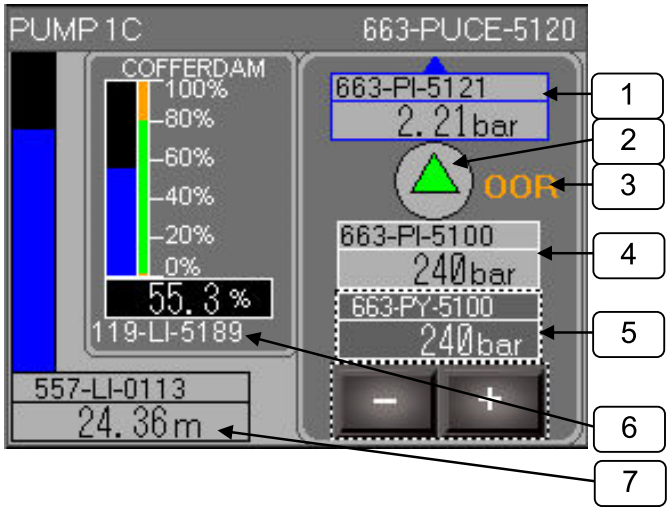




1) Pump suction pressure.
2) Pump discharge pressure.
3) Pump status.
4) Pump hydraulic feedback.
5) Priming activated info.
6) Pump hydraulic command. Increase/decrease command by ± 1 bar or numeric keypad input (pop-up by pressing the numeric field).
7) Cofferdam level monitoring.

- 4.6 Crude cargo pumps

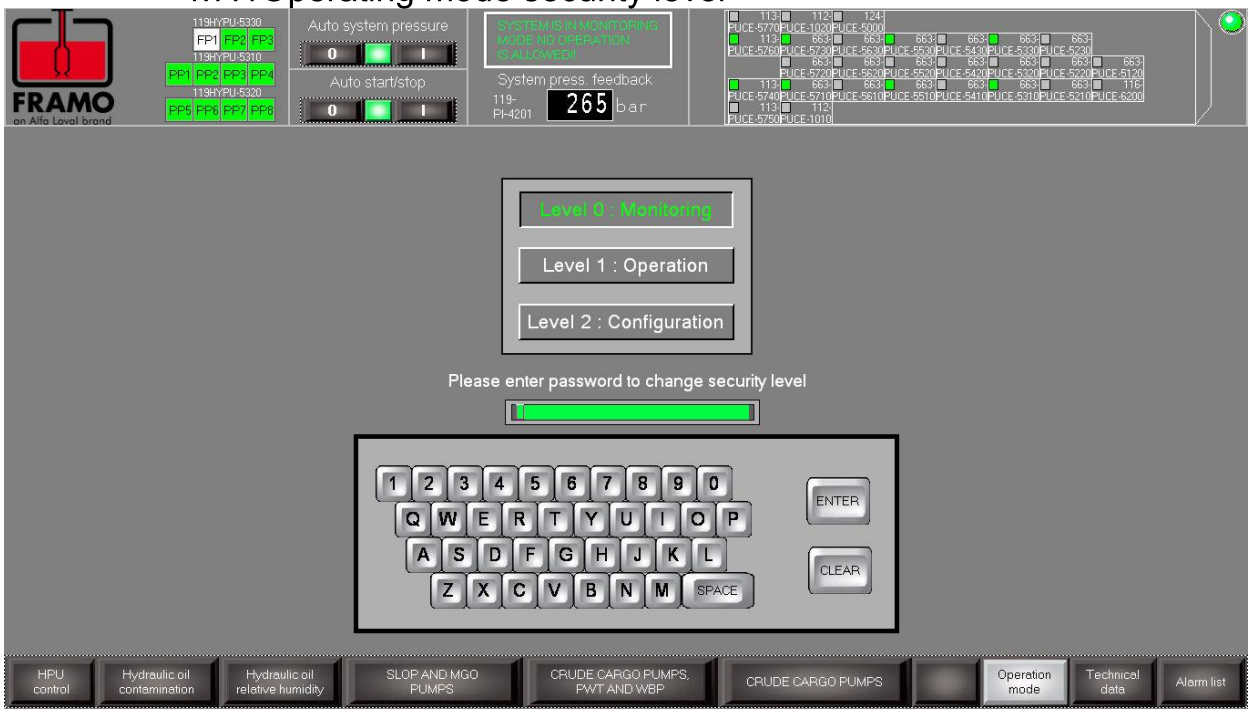




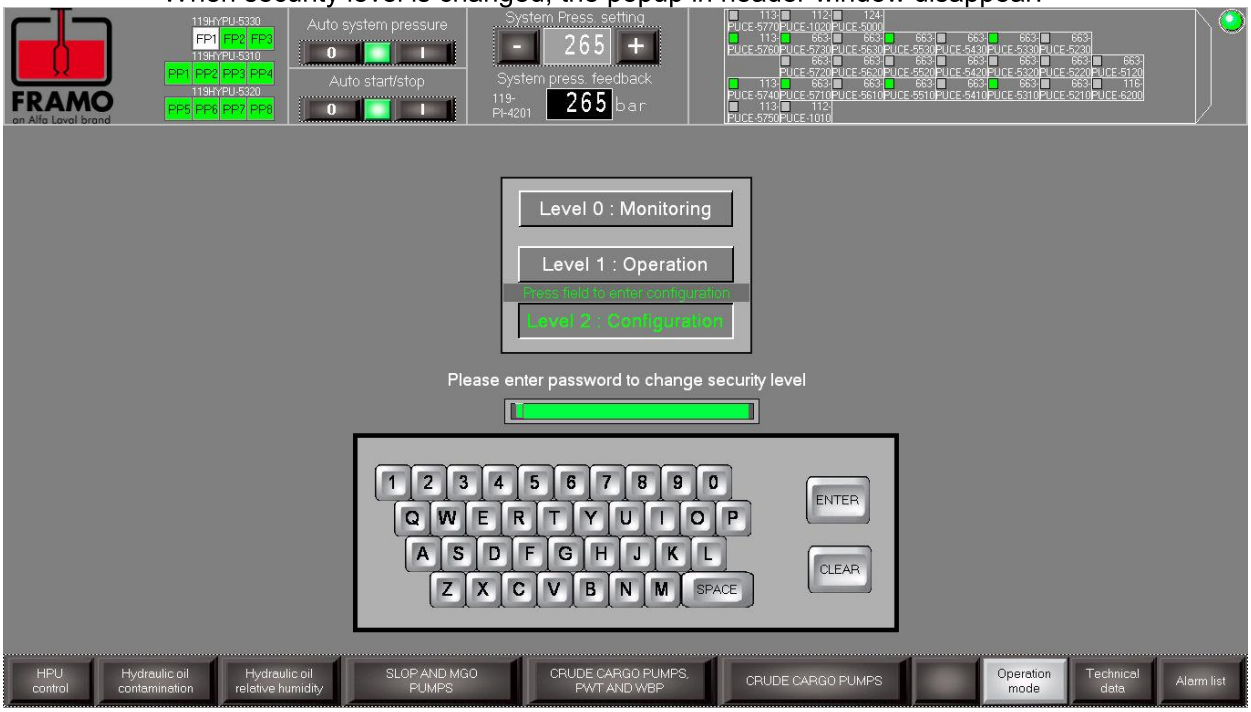
1) Pump discharge pressure.
2) Pump status.
3) Out of range operation warning.
4) Pump hydraulic feedback.
5) Pump hydraulic command. Increase/decrease command by ± 1 bar or numeric keypad input (pop-up by pressing the numeric field).
6) Cofferdam level monitoring.
7) Tank level.

- 4.7 Operation mode

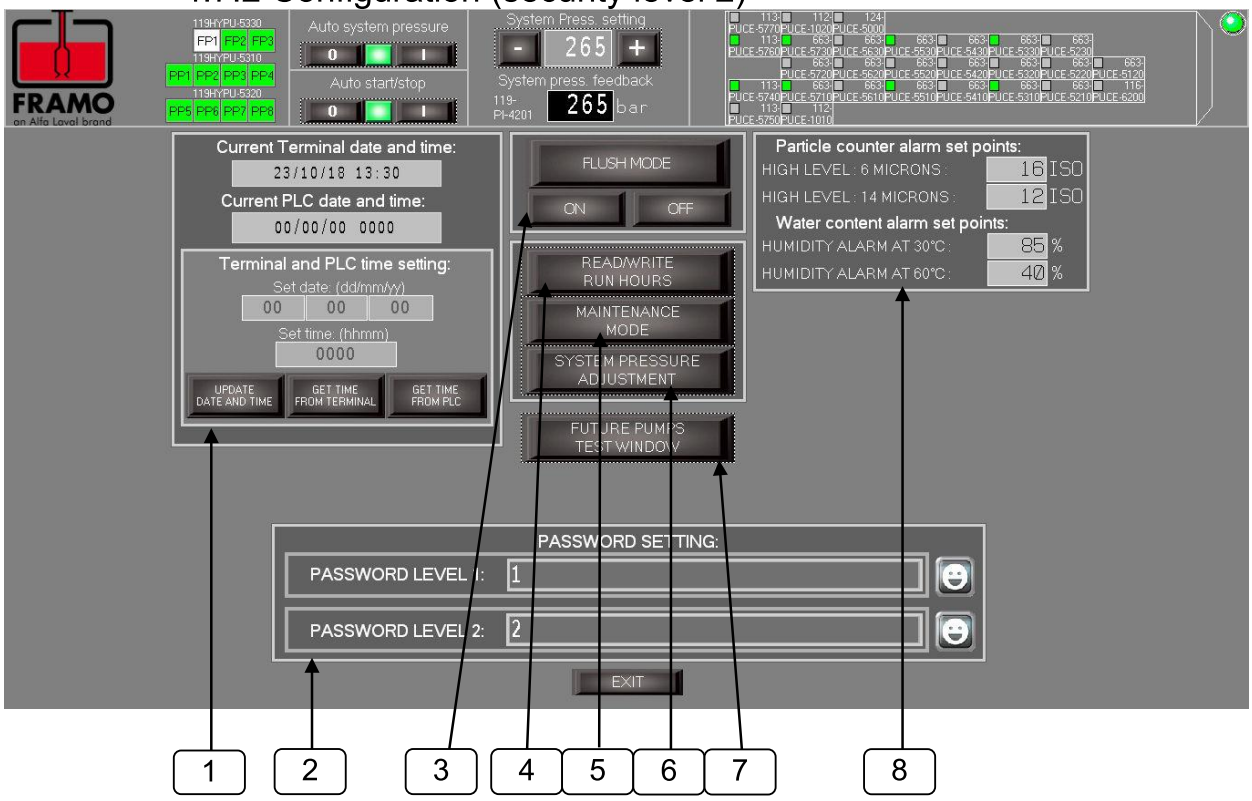
- 4.7.1Operating mode security level



When security level is changed, the popup in header window disappear.

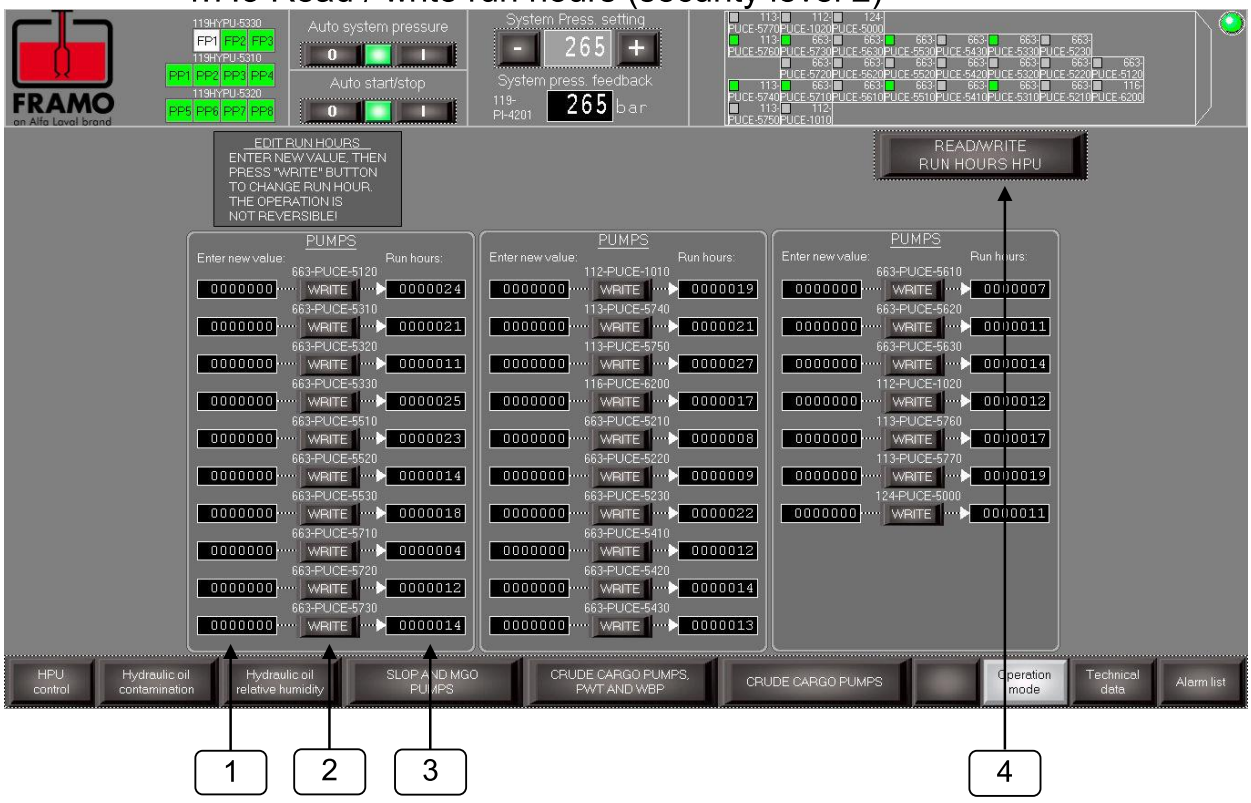


- 4.7.2 Configuration (security level 2)



1) Manually setting of new time and date. Press input field to enter new value, or select time from terminal or PLC. During normal operation, time will be automatically synchronized with ICSS time.
2) Press input field to enter new password for security level 1 and 2.
3) Activate / deactivate flush mode.
4) Press to enter read write run hours window.
5) Press to enter maintenance mode window.
6) Press to enter system pressure adjustment window.
7) Press to enter future pumps test window. (Only to be used for signal testing.)
8) Particle counter and water content alarm set point.
   Press input field to enter new value.

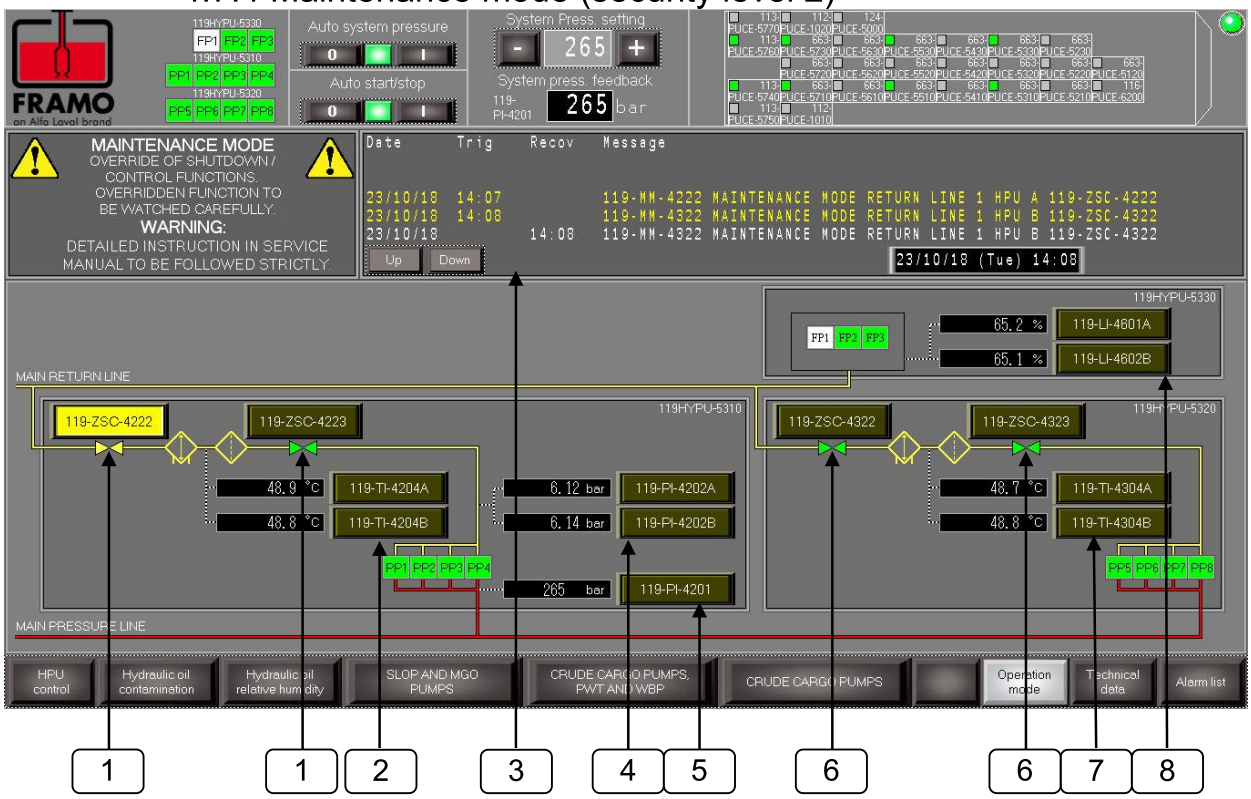
- 4.7.3 Read / write run hours (security level 2)



1) Press numeric field to enter new value.
2) Press to write new value to hour counter
3) Hour counter value.
4) Read / write run hours HPU.

This operation is not reversible! The function is only to be used to set the correct hour counter value after PLC software update or changing of equipment.

- 4.7.4 Maintenance mode (security level 2)

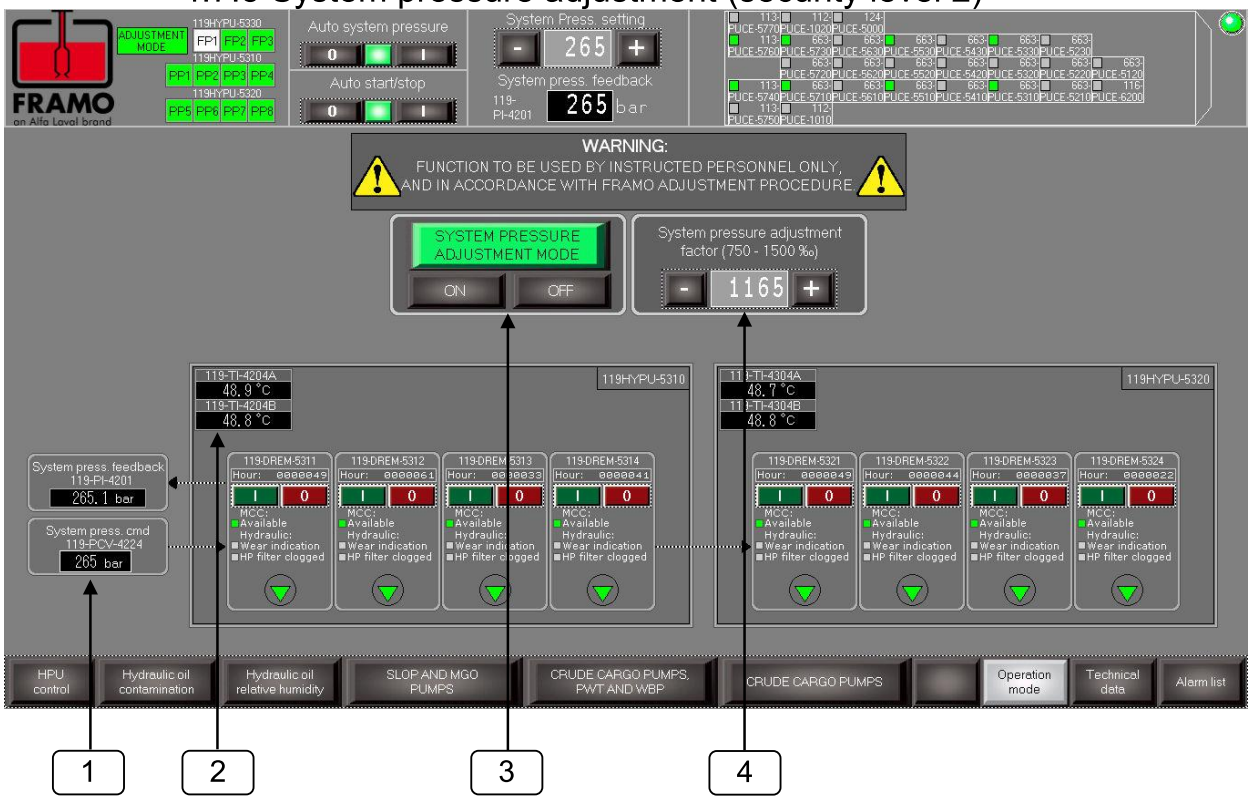


1) Maintenance mode valve position return line HPU A.
2) Maintenance mode hydraulic oil temperature HPU A.
3) Event log for maintenance mode.
4) Maintenance mode hydraulic feed pressure.
5) Maintenance mode system pressure.
6) Maintenance mode valve position return line HPU B
7) Maintenance mode hydraulic oil temperature HPU B.
8) Maintenance mode hydraulic oil level.

For duplicated transmitters (A/B):
One transmitter in maintenance mode, will transfer functions from transmitter in maintenance mode, to the other transmitter. Both transmitters in maintenance mode, will override trip and alarm functions controlled by the transmitters.

Maintenance mode is indicated whit flashing yellow numeric display or symbol and message in the alarm list.

- 4.7.5 System pressure adjustment (security level 2)



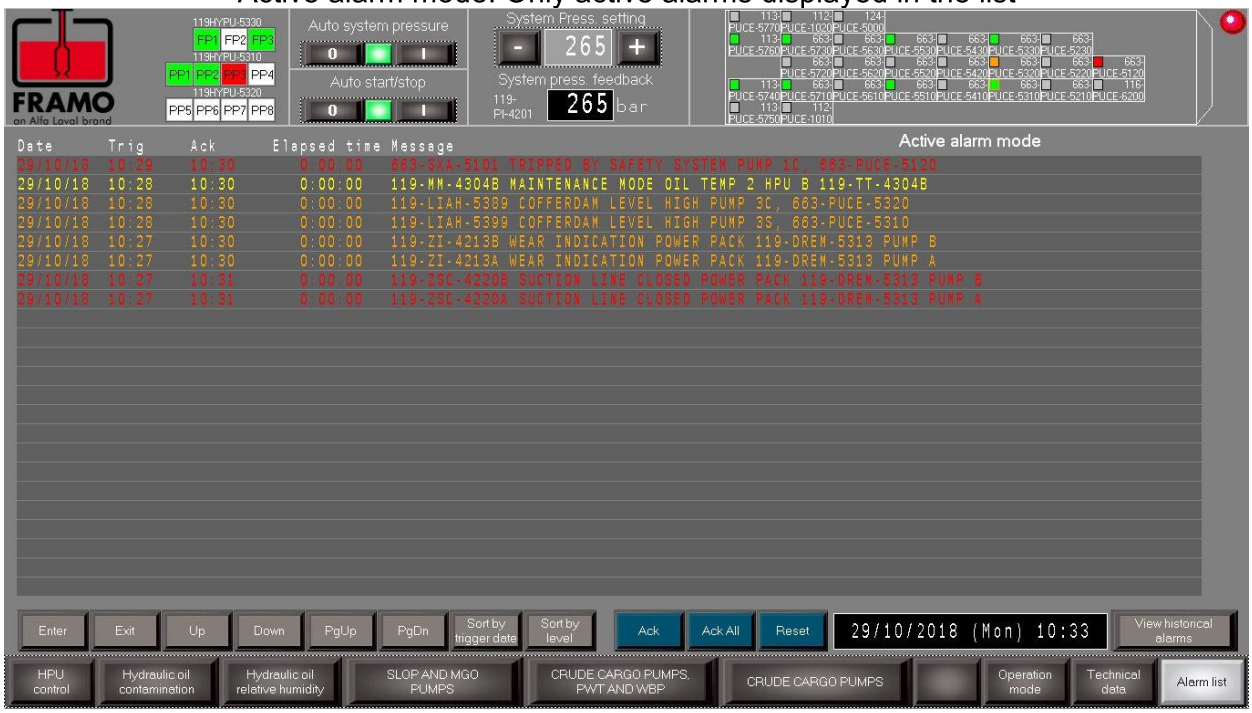
1) System pressure feedback and command value.
2) Hydraulic oil temperature.
3) System pressure adjustment mode on / off.
4) System pressure adjustment factor. Press numeric field to enter new value

This operation is only to be set by qualified personnel, and according to Framo adjustment procedure. The function is only to be used to set the correct system pressure value after PLC software update or changing of equipment.

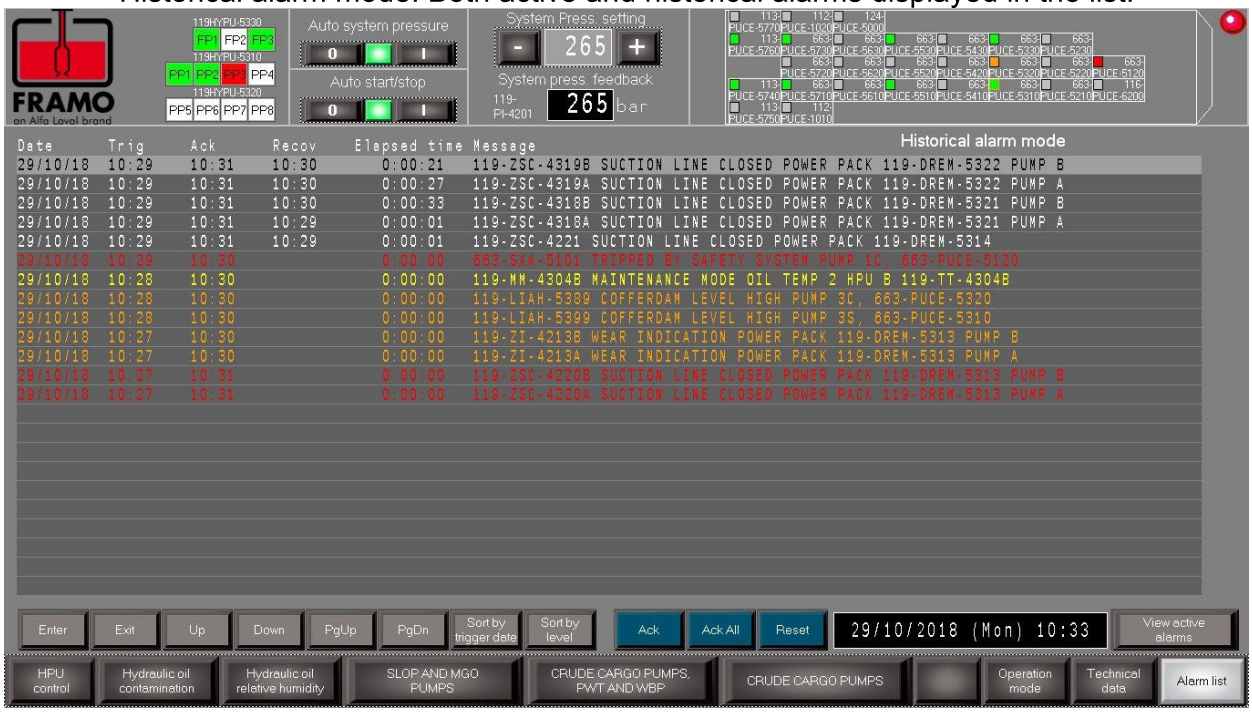
- 4.8 Technical data

- 4.9 Alarm list

Active alarm mode: Only active alarms displayed in the list

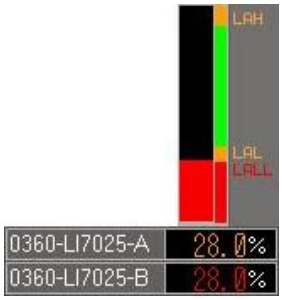


Historical alarm mode: Both active and historical alarms displayed in the list.

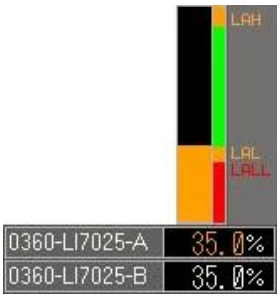


5 Operation and symbol Details

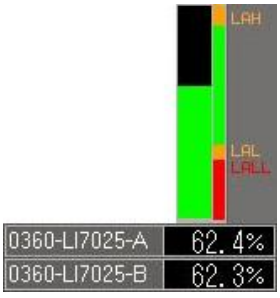
- 5.1 Hydraulic oil tank level



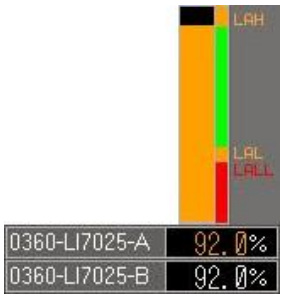
Oil level low low.
*Flashing red.



Oil level low.
*Steady orange.



Normal state.
*Green bar and white numeric.



Oil level high.
*Steady orange.

- 5.2 Valves

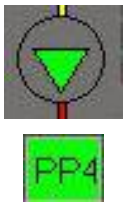
Valve open.
*Green

Valve closed.
*Red

Valve maintenance mode
*Flashing yellow

- 5.3 Power pack symbol

Power pack standby.
*White



Power pack running.
*Steady green when loaded.
*Flashing green when unloaded.

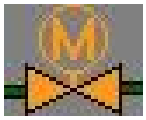
Power pack trip.
*Flashing red

- 5.4 Hydraulic oil cooling and bypass valves

Open
*Green

Closed
*Black

Not open
Not closed
*Blue



Failure
*Flashing orange

- 5.5 Hydraulic oil filter

Normal state.
*Yellow.

Failure state.
*Flashing orange.
-Filter clogged.

- 5.6 Numeric value display

Normal state.
* White

Warning alarm.
* Flashing orange.

Trip alarm.
* Flashing red.

Manual override.
* Flashing yellow.

- 5.7 Pump symbol

Pump standby.
* White / gray.

Pump running.
* Green.

Pump trip.
* Flashing red

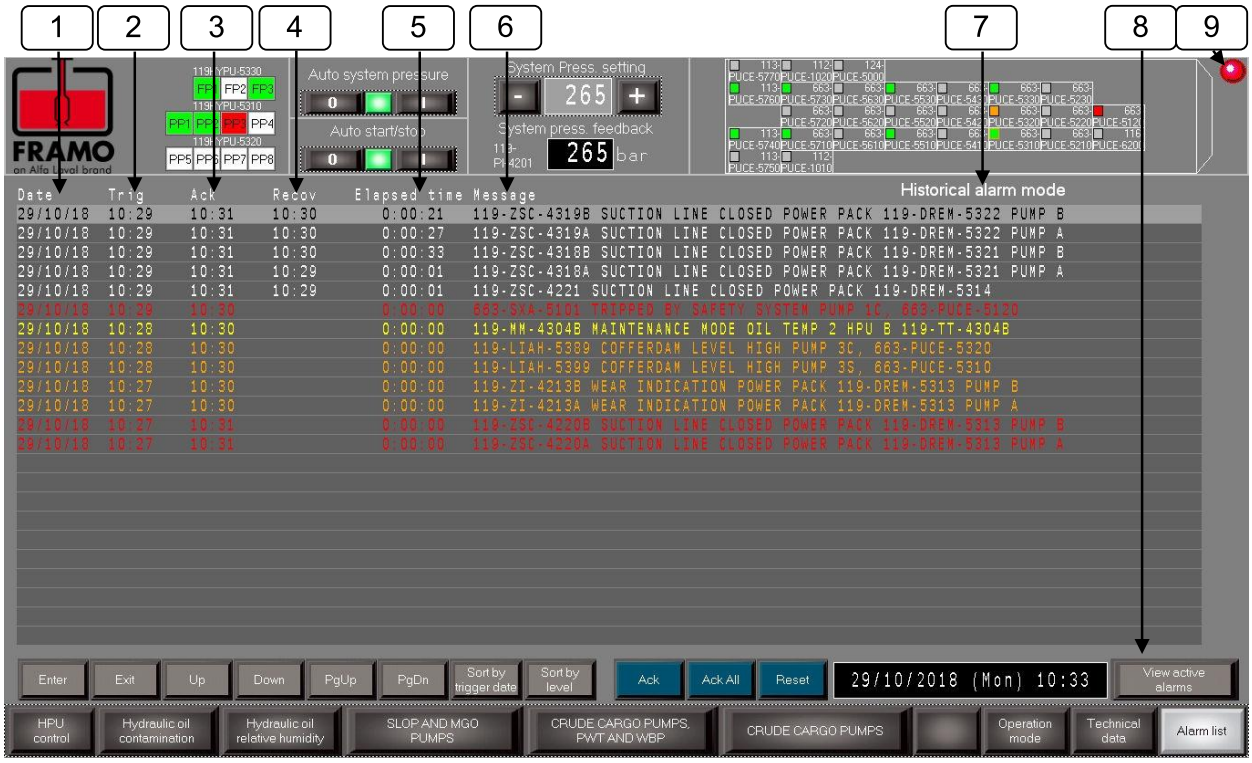
Pump stanby

Pump running

Pump warning.
* Flashing orange.

- 5.8 Alarm list

When an alarm appears in the system, the text on the alarm list button and the alarm lamp in the right top window are flashing red, until the alarm is acknowledged.



1) Date when the alarm was initiated
2) Time when the alarm was initiated
3) Time when the alarm was acknowledged.
4) Time when the alarm was recovered.
5) Elapsed time before alarm was recovered.
6) Alarm description.
7) Alarm list mode. (Active / Historical)
8) Switch between active and historical mode.
9) Alarm lamp, green if no alarm, red if alarm, flashing red if unaccepted alarm

Warning alarm triggered	*flashing orange
Shutdown alarm triggered	*flashing red
Maintenance mode enabled	*flashing yellow
Warning alarm acknowledge	*steady orange
Shutdown alarm acknowledge	*steady red
Maintenance mode acknowledge	*steady yellow
Recovered alarms	*steady white

To navigate the alarm list, the operator first has to access the list by pressing “ENTER”.