INSTRUCTION MANUAL
VURMAK

OPERATING INSTRUCTION

Project Name : VANGUARD2

CHAPTER 1

PRINCIPLE OF OPERATION

1. PRINCIPLE OF OPERATION

Apart from starting the machinery and operating the suction arm, the shipunloader works completely automatic.
All the process is controlled by PLC.

The system performs 2 (two) tasks simultaneously

1.1 Filling transfer Kettle-1

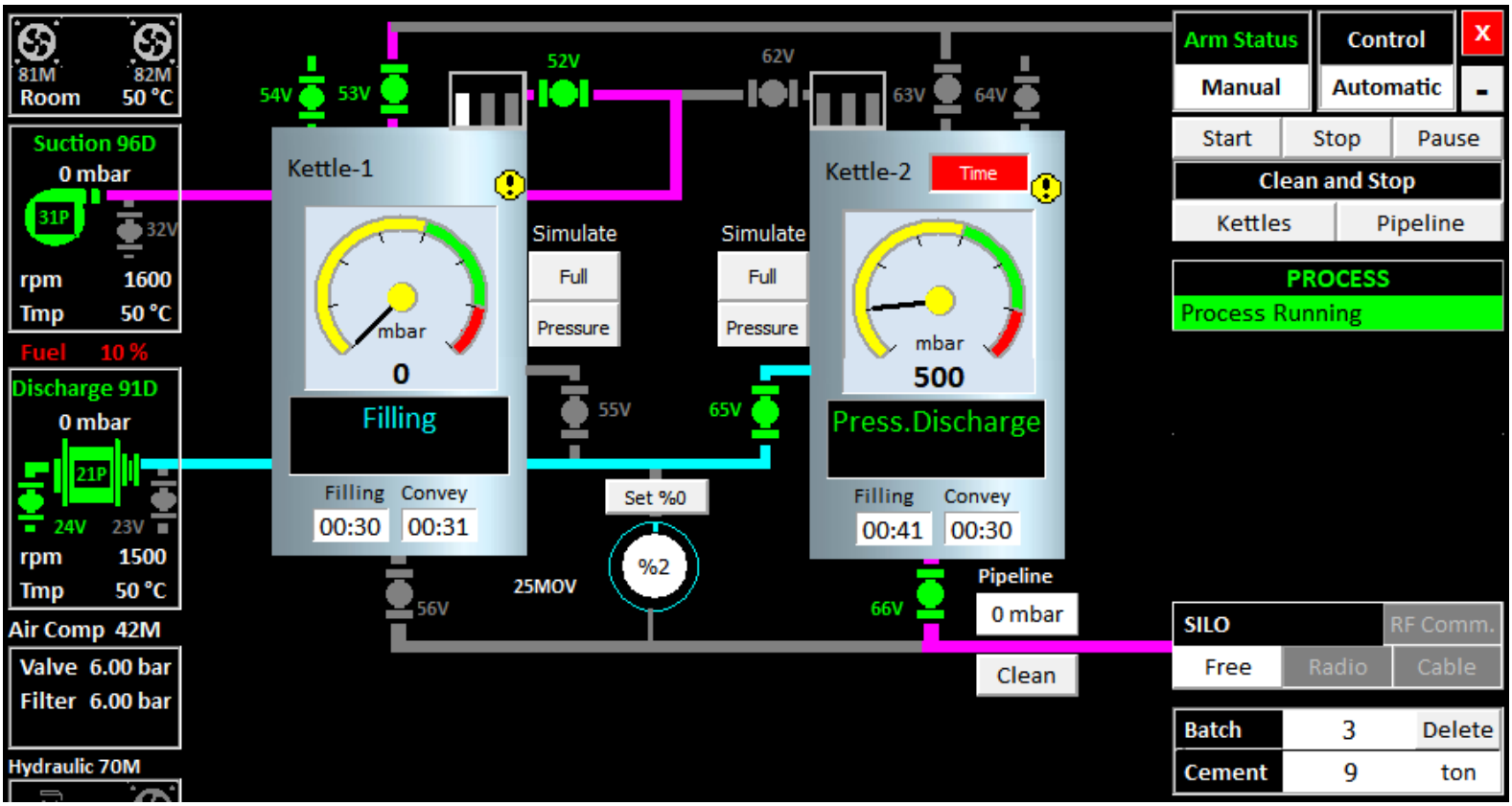
1.2 Discharge transfer Kettle-2

After completing this cycle the process is reversed to

Filling transfer Kettle-2

Discharge transfer Kettle-1

1.1 Filling transfer Kettle-1



To start the filling process the control system opens first suction air valve (52V) and cement inlet valve 53V of transfer kettle-1.
After receiving the open signals from those valves, controller closes vacuum blower relief valve (32V) and the suction air creates a sub-atmospheric pressure inside of the kettle-1.

This effect will cause the suction of a cement/air mixture from the hold of the ship into the transfer kettle-1.
The filter system fitted on the top of the kettle-1 separates the unloaded material from the suction air. The clean air leaves the kettle trough valve (52V) and the cement drops down by its gravity into the kettle.

When the level of the cement collected into the kettle-1 reaches to the level tester, a FULL signal is sent to the control system.

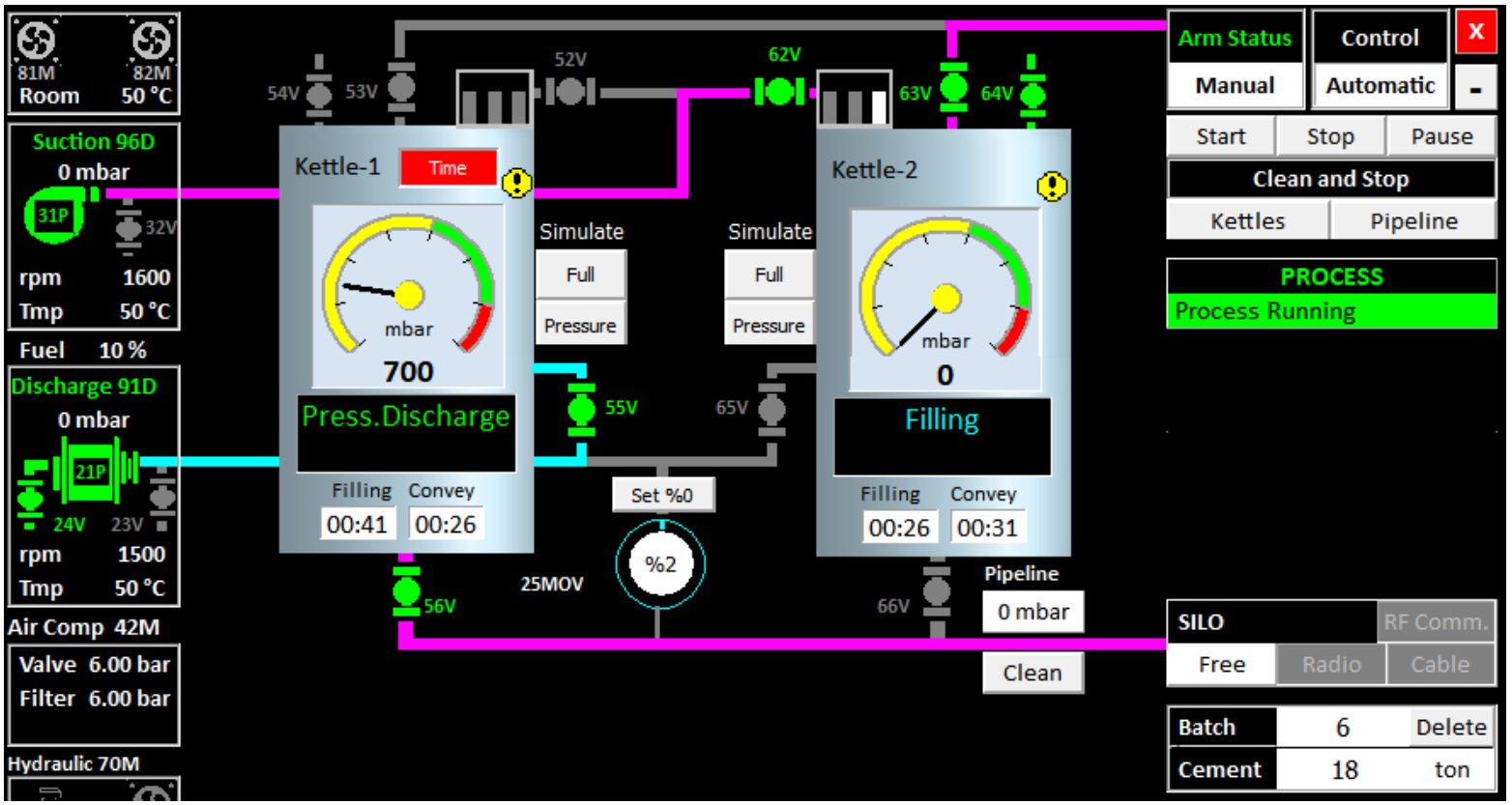
The filling process will continue until the controller receives one of the signals

- Kettle FULL signal received from level tester
- Kettle FULL signal received from Simulation FULL button.
- High differential pressure signal
- After the filling time displayed on kettle-1 reaches the maximum suction time defined on page Menu > Settings > Kettles Settings> MAX SUCTION TIME.

After receiving the Filling process ended information the controller checks the status of transfer kettle-2.

- If transfer kettle-2 is empty and ready for “Filling process”, controller opens first suction air inlet valve (62V) and cement inlet valve 63V of the kettle-2, closes the valves (52V, 53V), and switches over kettle-1and changes its status to “Ready for Discharge”.
- If the transfer kettle-2 still at “Discharge process” the controller opens the relief valve (32V) of the vacuum pump, closes the valves (52V, 53V), switches over kettle-1and changes its status to “Ready for Discharge”

1.2 Emptying Transfer Kettle-1



The “Discharge process” is performed in three states:

- “Pressurizing” state :
  The controller opens first the convey air inlet valve (54V) of the transfer kettle1 and closes the relief valve (23V) of the discharge compressor. The air blown from the compressor into the kettle-1 increase the pressure inside of the kettle and starts fluidization effect at the conic part of the bottom.

- “Pressure discharge” state :
  After the pressure built up in the kettle-1 reaches to the “DISCHARGE START PRESSURE” level defined at Page
  Menu > Settings /Kettles settings, the controller opens the cement discharge valve (55V). The effect of the high pressure into the transfer kettle will cause the cement to be blown out of the kettle.

Controller continuously controls the pressure inside of the kettle.
If the pneumatic conveying pipeline is blocked the pressure of the kettle-1 or the pipeline will starts rising. In that case, the control system opens slowly the extra air motor operated proportional valve (25MOV).
Extra air will be blown to the discharge pipe and will apply an extra force to remove the blocked cement in the pipeline.

- "End of the discharge" state
  The pressure of the kettle will drop depending to the level of the cement inside of the kettle. When the pressure reaches to "DISCHARGE END PRESSURE" level defined at the page
  Menu > Settings > Kettles settings, the controller opens the by-pass valve (23V) of the discharge compressor and closes the convey air inlet valve (55V) of transfer kettle-1.
  switches over kettle-1 and sets its status to "Ready for Filling".

CHAPTER 2

TRANSFERRING
AND
POSITIONING THE UNLOADER

2. TRANSFERRING AND POSITIONING THE UNLOADER

1. Before transferring and positioning the unloader along the dock, the arm has to be swung back and folded over the unit.
   Be sure the dock can withstand the unloader's empty weight of approx... 50 tons excluding truck.

2. The trailer has to be positioned perpendicular to the ship.

3. When the unit is in position it must be jacked-up and leveled first by using manual parking jacks.

4. By starting the hydraulic pump the hydraulic pressure will be available for operating the jacking cylinders of the stabilizer beams.

5. The hydraulic pressure can be used for jacking or suction arm control by changing the position of the selector manual valve placed near the hydraulic oil tank.
   The one end-position of the selector valve is for jacking position and the other end-position is for suction arm control. Take care that the valve is always in one of the end-positions.
   To be able to operate the jacking cylinders the selector manual valve should be placed to jacking position.

6. The stabilizer beams must be placed correctly and the trailer must be leveled parallel to the ground by using water balance scale mounted near the hydraulic control block of the jacks.

7. After obtaining a balance of the trailer, the hydraulic selector valve can be put in the suction arm control position.

CHAPTER 3

STARTING PROCEDURE

3. STARTING PROCEDURE

3.1 SWITCHES ON THE CONTROL PANEL

Emergency Stop Button
By activating the emergency switch all activities and the diesel engines will be stopped immediately

Control Voltage Switch
The Control Voltage Switch starts PLC.

Alarm Reset Button
By pressing alarm reset button all the passive alarms will be deleted from the memory of the CPU.

Auxiliary Air Compressor Start/Stop Switch
By selecting (1) position if 400VAC voltage is available the air compressor will start running.

Arm Control Selector Switch
By selecting Auto position, the arm will be operated through the remote control unit by Wi-Fi or Ethernet cable connection.
By selecting Manual position, the arm will be operated from the hydraulic control block mounted on the suction arm.

3.2 STARTING SEQUENCE

1. Before starting the machine it should be checked that the unit is correctly balanced and supported.

2. All the hoses and the equipment disconnected for maintenance or transportation should be connected, fuel lines opened, oil levels checked.

3. De-activate the entire emergency stop buttons fitted on four stabilizer beams, the control panel and on remote control.

4. Turn Control Voltage Switch to ON position to start control voltage

5. Wait until the program is displayed on the screen of the computer

6. Press Reset button until all the alarms disappear.

7. On the control panel turn the auxiliary air compressor switch to ON position to start the air compressor.
   Wait until the compressor fills air tanks.

8. Start Suction motor and wait until the motor completes the startup period.

9. Before start the discharge motors press again the alarm reset button. Start Discharge motors and wait until the motors complete their startup periods.

10. Switch ON the remote control. Wait until the control program appears on the screen. From the control program, select Wi-Fi or Ethernet option. It will take a few minutes to load the program from the main PC. After the unloader program is monitored on the screen of the remote control switch (PC-Remote) selector switch to Remote.

Check the connection status of remote control from the right bottom corner of the screen.
For be able to operate the arm from the remote control the message shown has to be DAQ_with a green color.

The fault messages are

- Arm Man
  Suction arm control is set to Manual Mode from the switch on the control panel. In that case, the arm can be controlled only from the hydraulic block fitted on the suction arm.

- DAQ Err

Communication fault between arm motion joysticks and PLC.

- DAQ Unknown:
  The position of the Remote/Pc selector switch on the remote control is the middle position.

- DAQ PC Err
  Shows there is a communication error between remote control Arduino Program and PLC.

3.3 OPERATING INSTRUCTIONS FOR THE SUCTION ARM

1. After the engines and their attached equipment have been started proper operation of the equipment should be checked.
2. be sure that the ship is properly moored and cannot be drift against the arm.
3. Place the suction arm into the hold of the ship. Avoid any contact with the structure of the ship. Make sure that the arm is not stuck behind frames.
4. Operate the suction arm with slow movements. Avoid any sudden loads on the arm.
5. During the operation keep the suction arm properly angled and do not submerge the nozzle too much in the cement.
6. During cleaning period make sure that the suction nozzle does not touch at the bottom of the hold.
7. Never make any slewing motion while the suction nozzle is immersed in the cement or when resting on the quay.
8. To start the unloading process presses the switch of the remote control towards ON position for a few seconds.

CHAPTER 4

INTERRUPTING AND ENDING PROCEDURE

4. INTERRUPTING AND ENDING PROCEDURE

4.1 ENDING UNLOADING PROCESS

To stop the unloading process in a correct way first the cement in the system should be cleaned.

4.1.1 CLEAN KETTLES AND STOP

Raise the suction arm nozzle from the cement in the hold of the ship. Press “Kettle Clean” button on the process page while the unloading process is running. The normal discharge cycles will continue. Blowing only clean air through the suction arm will clean remaining cement inside the hose and pipe. The cement in the transfer kettles will be blown out by discharge process.

After repeating this several times, the complete system is blown through by clean air.

4.1.2 CLEAN PIPELINE AND STOP

Press “Pipeline Clean” button on the process page while the unloading process is running.

- The suction and discharge processes stop.
- The pressure regulation valve (25MOV) opens and the discharge pump relief valve (23V) closes. The blow air clean pipeline.
- At the end of the pipeline cleaning the unloading process stops.

4.2 INTERRUPTING PROCEDURE

Interrupting the process can be done in the following ways.

<u>From Process Page</u>

Switching the” Process button” will interrupt the operation of the unloader. All machinery will keep on running. The unloading process will restart by switching one more time the “Process Button”.

<u>From Remote Control</u>

Switching the” Process button” on STOP will interrupt the operation of the unloader. All machinery will keep on running. The process will restart by switching one, more time the “Process Button”.

CHAPTER 5

CONTROL PROGRAM

5. CONTROL PROGRAM

Apart from starting the machinery and operating the suction arm, the ship unloader works completely automatic. All processes that are executed are controlled by a PLC.

The interfaces to the PLC are through a control screen fitted in the door of the control panel and a screen fitted on the remote control.
The same control program runs on the main PC and remote control PC.
The operator can control the ship unloader from those control screens.
The main PC fitted on the door of the control panel is equipped by a touch screen.

The control screens have a display, which is used to shown different pages with information about operation of the unloader, alarm indications, settings, etc. by means of the buttons of the screen, the various pages can be selected, the unloader can be controlled and settings can be changed.

5.1 INFORMATION LINE AT THE BOTTOM OF THE SCREEN

CPU STATUS:

Shows the communication speed between PC and PLC.

If there is no communication between Main PC and PLC, the color of the button changes to red.

ALARM BUTTON:

Shows the status of the alarms by different colors which are

- White color indicates no alarm
- Red color indicates the alarm exists and it is inspected by the operator.
- Red blinking color indicates a new alarm

On click Active alarm list is displayed on the screen.

ALARM DISPLAY PANEL:

Display all the active alarms of the unloader.

RESET BUTTON:

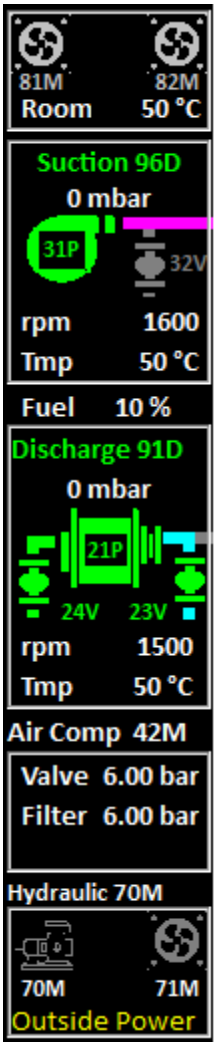
Reset alarms

PASSWORD

Password entry for administrator and manager. For be able to make some of the settings changes the operator needs manager password.

5.2 INFORMATION COLUMN ON THE LEFT SIDE OF THE SCREEN

The status of the equipment is shown by using different colors.



MACHINERY ROOM STATUS:
Shows the room cooling fans status and temperature of the room.
If the temperature is close to High room temperature fault level
Defined at page Menu > Settings > Machinery Room Settings
Yellow color will indicate Room temperature alarm
If the temperature is high then High room temperature fault level
Red color will indicate Room temperature fault.

By click label ‘Room’ on the screen
Menu > Info > Machinery Room status page is displayed.

The status of the cooling fans (81M and 82M) is shown by colors

- Aqua color indicates that the fan is running,
- Red color indicates the fault
- Silver color : Stopped
- Blinking Aqua/Red color indicates the fan has a return fault. From the fault section check the faults FA_RFAN1_R or FA_RFAN2_R.

By clicking the fan symbol operator can start and stop the cooling fans.

SUCTION PUMP AND DIESEL ENGINE STATUS
By click the label ‘Suction 96D’ on the screen
Menu > Info > Diesel engine Suction status page is displayed.

By click the blower symbol on the screen
Menu > Info > Suction pump status page is displayed.

The status of the diesel engine and blower are shown by colors

- Yellow color indicates the diesel engine runs at idle speed,
- Green color indicates the diesel engine runs at operation speed defined at page Menu > Settings > Diesel engine suction
- Red color indicates the fault of diesel engine or blower.

Suction pressure, diesel engine rpm and diesel engine temperature are monitored on the screen.

- Yellow color indicates the alarm,
- Red color indicates the fault.

Suction pump relief valve (32V) status is shown by

- Red color : valve Fault
- Green color : valve open
- Gray color : valve closed
- Blinking color : the position of the valve is unknown.

At manual mode by clicking the valve symbol operator can open and close the valve.

FUEL LEVEL INDICATOR Indicates the fuel level of the diesel engines.

BLOW PUMP AND DIESEL ENGINE STATUS

By click the label ‘Discharge 91D’ on the screen
Menu > Info > Diesel engine Discharge status page is displayed.

By click the blow pump symbol on the screen
Menu > Info > Discharge pump status page is displayed.

The status of the diesel engine and blow pump are shown by colors

- Yellow color indicates that the diesel engine runs at idle speed,
- Green color indicates the diesel engine runs at operation speed defined at Page Menu > Settings > Diesel engine suction
- Red color indicates the fault of diesel engine or blower.

Discharge pressure, diesel engine rpm and diesel engine temperature are monitored on the screen.

- Yellow color indicates the alarm,
- Red color indicates the fault.

Blow pump relief valve (23V) status is shown by

- Red color : valve Fault
- Green color : valve open
- Gray color : valve closed
- Blinking color : the position of the valve is unknown.

Blow pump air inlet valve (24V) status is shown by

- Red color : valve Fault
- Green color : valve open
- Gray color : valve closed
- Blinking color : the position of the valve is unknown.

At manual mode by clicking the valve symbol operator can open and close the valves.

AIR COMPRESSOR

Shows the auxiliary air compressor status.
The pressures of the air tank for valves and the air tank for filters are monitored on the screen.

- Yellow color indicates low pressure alarm,
- Red color indicates low-pressure fault of the tanks.

On click the label ‘Air Comp. 42M, the Menu > Status > Air compressor status page is displayed.

HYDRAULIC

Shows the hydraulic system status.
The color of the pump symbol shows the status of the hydraulic pump.

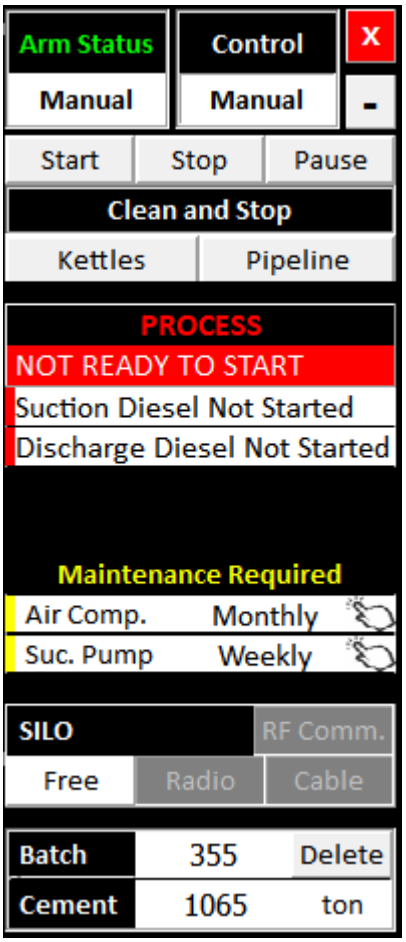
- Green color indicates the pump is running,
- Red color indicates fault
- Silver color indicates the engine is stopped
- Blinking Green/Red color indicates the pump has a return fault.
  From the fault section, check the fault FA_HP_R

The color of the fan symbol shows the status of the oil-cooling fan.

- Green color indicates the fan is running,
- Red color indicates fault,
- Silver color indicates the fan is stopped
- Blinking Green/Red color indicates the fan has a return fault.
  From the fault section, check the fault FA_HPF_R

5.3 INFORMATION COLUMN ON THE RIGHT SIDE OF THE SCREEN

ARM STATUS



Indicates the remote control status by below mentioned indications

Ethernet

Suction arm control is set to Ethernet mode from the mode selector switch on the control panel. In that case, the arm can be controlled only from the Wi-Fi or Ethernet remote control.

Arm Cable

Suction arm control is set to Cable mode from the mode selector switch on the control panel. In that case, the arm can be controlled only from the cable remote control

Arm Man

Suction arm control is set to Manual Mode, by turning the position of the arm control mode selector switch in the middle, no selection is made.
In that case, the arm can be controlled only from the hydraulic block fitted on the suction arm.

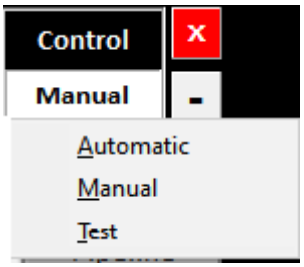
DAQ Err

The communication fault between Arduino microprocessor inside of the remote control and PLC.

DAQ PC

The communication fault between Arduino program installed in the remote PC and PLC

CONTROL SYSTEM STATUS



On click, the status line of the control system a mode selection window is displayed. The operator can change the mode by click his selection.
If the control system cannot set the operator selection mode the faults for this selection is displayed on the screen.

PROCESS BUTTONS

- Process Start Button
  If the system is not ready to start, the indication “Not Ready” warn the operator. The alarm, which prevent to start the processes are displayed on the screen.
  If the system status is ready to start
  suction and discharge processes start together.

- Process Stop Button
  If the operator click on stop button, suction and discharge processes stop. The diesel engines continue running.

- Process Pause Button
  If the operator click on pause button, suction and discharge processes stop. The process switches to pause mode.
  To cancel the pause mode operator has to click again on the pause button.

- Kettles Clean and Stop Button
  See chapter 4.1.1 ENDING PROCEDURE / CLEAN KETTLES AND STOP

- Pipeline Clean and Stop Button
  See chapter 4.1.2 ENDING PROCEDURE / CLEAN PIPELINE AND STOP

- Pipe Cleaning Process Start/Stop Button
  Starts pipe cleaning process by setting extra air motor operated valve (25V) position at FULL OPEN. After certain time the line pressure comes under normal condition the control system close the valve (25V) and stops pipe cleaning process.

- Kettles Cleaning Process Start/Stop Button
  Starts Kettle Cleaning Process. The normal discharge cycles will continue. Blowing only clean air through the conveying pipeline cleans The discharge system.

- Manual Filter Cleaning Process Start/Stop Button
  When the operation is stopped starts the filters cleaning process.

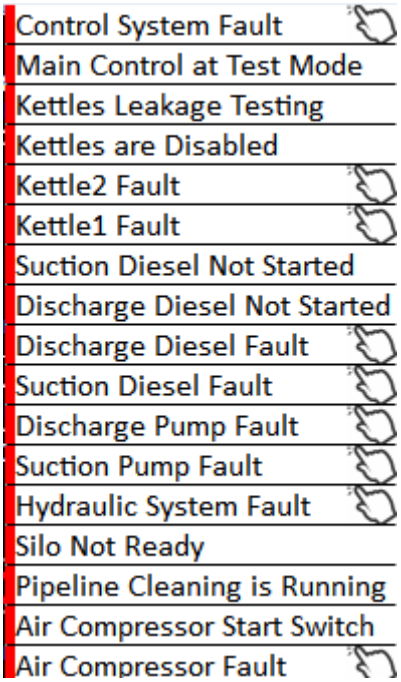
PROCESS STATUS INDICATOR

Shows the status of the process which are:

- Ready to start
- Not ready to start
- Paused
- Process running
- Will stop after cleaning

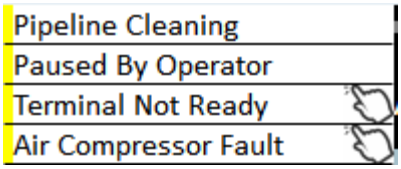
PROCESS FAULTS INDICATIONS

If the system is not ready to start, the info line “Not Ready” warn the operator. The alarms, which prevent to start the processes, are displayed.

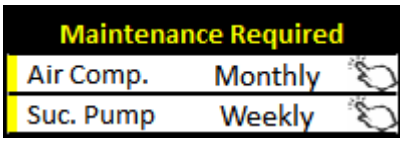


PROCESS PAUSE INDICATIONS

If the system is at pause mode the indication paused, warn the operator. The pause alarms are displayed.



MAINTENANCE INDICATIONS



Suction Blower maintenance periods are

- Every week
- Every month
- Every three months
- Every six months
- Every Year
- Every two year
- Every three years

Discharge pump maintenance periods are

- Every week
- Every month
- Every six months
- Every Year
- Every three years

Diesel Suction maintenance periods are

- Every week
- Every month
- Every six months
- Every Year
- Every three years

Diesel Discharge maintenance periods are

- Every week
- Every month
- Every six months
- Every Year
- Every three years

Air compressor maintenance periods are

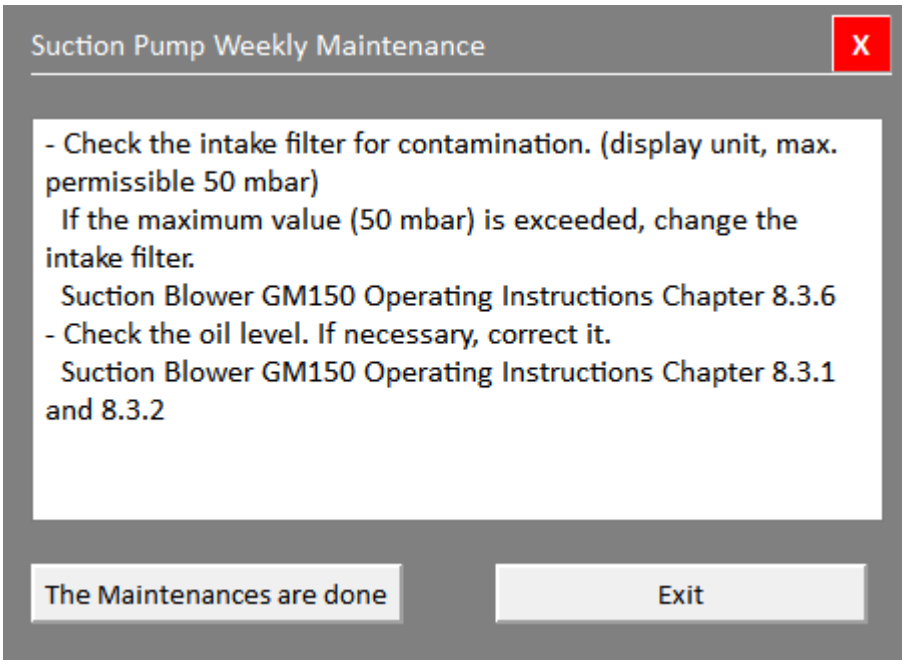
- Every month
- Every two months

Suction arm maintenance periods are

- Every day
- Every week
- Every year

The indication shows the equipment has a maintenance requirement.

On click, the indication maintenance page is displayed.



To click on the “The maintenances are done” button needs supervisor permission.

On click the button, the control system accepts that all the maintenances are done, closes the indication.

SILO COMMUNICATION

Free Mode

At free mode the controller accept the silo is ready.

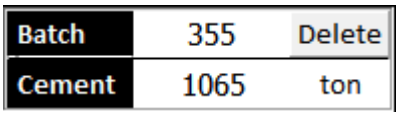
Cable mode

If there is a cable connection between terminal and unloader, by pressing on cable button communication from cable alternative is selected.
If the terminal is ready for loading operation the color of the button change to green else it is red.

Radio mode

If there is a Wi-Fi connection between terminal and unloader, by pressing on radio button communication from radio alternative is selected.
If the terminal is ready for loading operation the color of the button change to green else it is red.

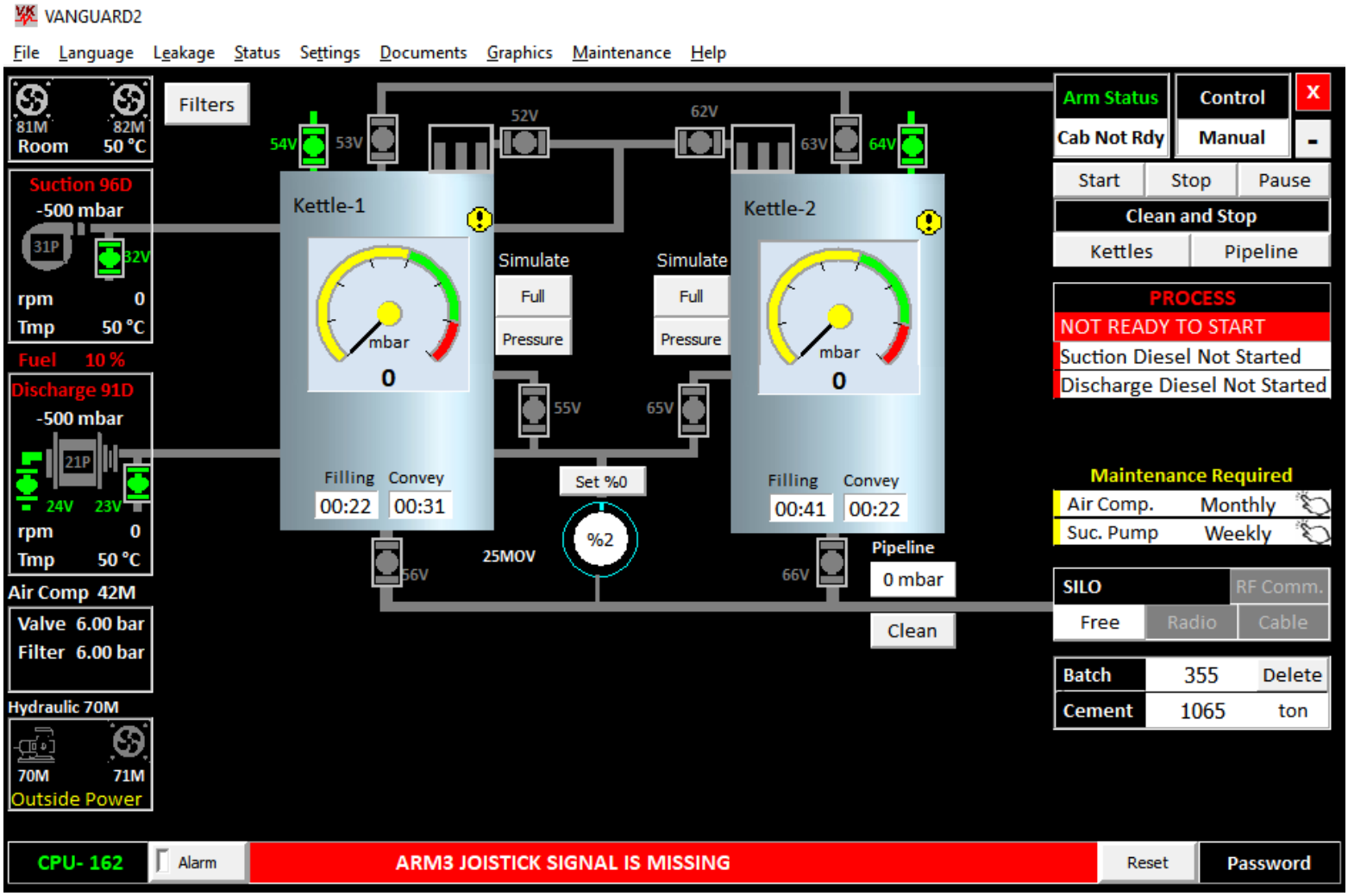
BATCH INDICATOR



Indicates the number of kettle batch conveyed to the silo.

From the kettle capacity defined at page
Menu > Settings > Kettles the controller calculates the approx... cement quantity.

5.4 PROCESS PAGE



On the process page, the conveying process (suction and discharge) can be monitored and controlled. It shows a schematic layout of the system, with indications of the valves that are controlled by the control system, pressures, etc.

By means of the buttons of the control screen, different processes can be selected and some set points can be simulated. All valves that are controlled by the control system are shown on the screen. The color can show the position of the valve (open or closed) but can also indicate a valve failure.

The unloading processes can be controlled by process switches, which control the overall conveying process and, independently, the suction and discharge process.

For each kettle, two simulate buttons are provided. With these buttons, set points that the control system uses to switch over to a next step can be simulated, before the actual set points are reached.

On this page are the following buttons:

- Manual Pipeline Cleaning Start/Stop Button
  Starts pipe cleaning process by setting extra air motor operated valve (25V) position at FULL OPEN. After certain time the line pressure drops under normal condition the control system close the valve (25V) and stops pipe cleaning process.

- Manual Filter Cleaning Process Start/Stop Button
  When the operation is stopped starts the filters cleaning process.

- Simulation Full Button of Kettle-1
  Simulates Kettle-1 as full and stops the suction process.

- Simulation On Press Button of Kettle-1
  Simulates Kettle-1 as on pressure.

- Simulation Full Button of Kettle-2
  Simulates Kettle-2 as full and stop the suction process.

- Simulation On Press Button of Kettle-2
  Simulates Kettle-2 as on pressure.

- Manuel Mode Start/Stop Buttons of all of the pneumatic valves
  The pneumatic valve can be open and close by clicking on the symbol of the valve on the screen.
  To start manually the valves then status of the unloader on the information line1 has to be at MANUAL MODE with color yellow.
  If the color of MANUEL MODE is red on click the list of faults or locking which prevent the system to be set to MANUEL MODE will be listed on the screen.

On this page is the following information about the process

- Suction System Status
- Pressure Gauge of vacuum pump
- Discharge System Status
- Pressure Gauge of discharge compressor
- Pipe line Pressure
- Pressure gauge of kettle-1 pressure
- Differential pressure of kettle-1 at filling process
- Suction and discharge time of kettle-1
- Filter cleaning process of kettle-1 filter elements
- Kettle-1 status
- Level tester status of kettle-1
- Pressure gauge of kettle-2 pressure
- Differential pressure of kettle-2 at filling process
- Suction and discharge time of kettle-2
- Filter cleaning process of kettle-2 filter elements
- Kettle-2 status
- Level tester status of kettle-2
- Auxiliary air compressor status
- Auxiliary air compressor outlet pressure gauge
- Pressure of the air tank of filter cleaning process
- Pressure of the air tank of valves operation
- Room temperature gauge
- Room Cooling fan status
- Status of the pneumatic valves of the unloader

  The status of the pneumatic valves are shown by different colors

  - Green : Open
  - Black : Gray
  - Red : Alarm
  - Yellow : Unknown status

CHAPTER 6

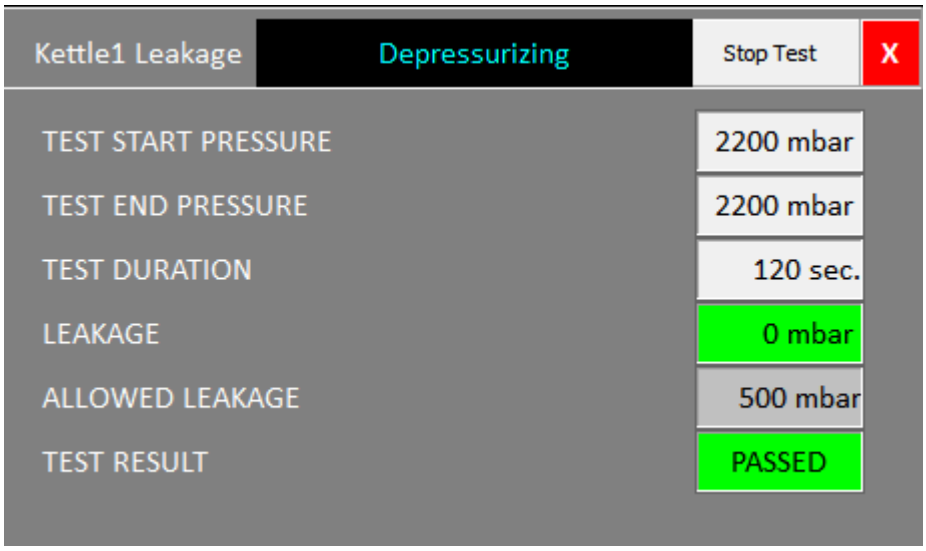
MENU

6. MENU

6.1 Menu / File

6.2 Menu / Language

6.3 MENU / LEAKAGE TEST PAGE



Leakage test is perfumed at three (three) stages, which are:

Pressurizing state

The controller open the convey air inlet valve, the air of the discharge compressors blows into the kettle. When the pressure point into the kettle reaches at 2000 mbar, the convey air inlet valve closes and pressurizing stage ends, Leakage testing stage starts.

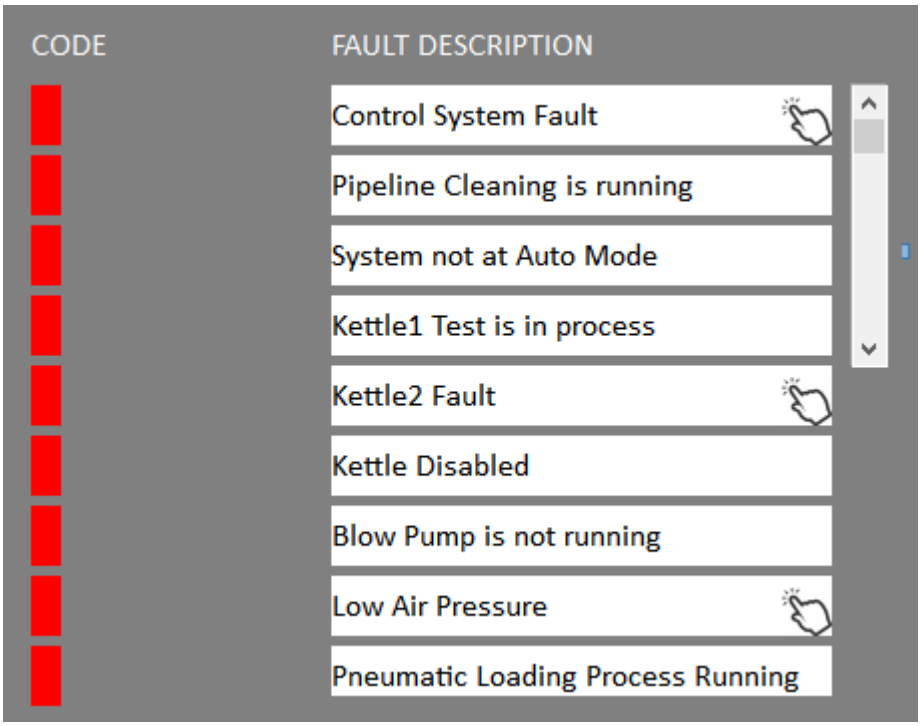
Leakage testing state

The test start pressure is displayed on the “start pressure” box. The actual pressure into the kettle is displayed continuously on the “end pressure” box.

The test duration is 120 sec. At the end of this time, “Leakage testing stage” ends. The controller checks the pressure leakage of the kettle from start pressure end pressure difference.

If the leakage is higher than 500mbar, the test result is failed.

If the leakage is lower than 500 mbar the test result is accepted.

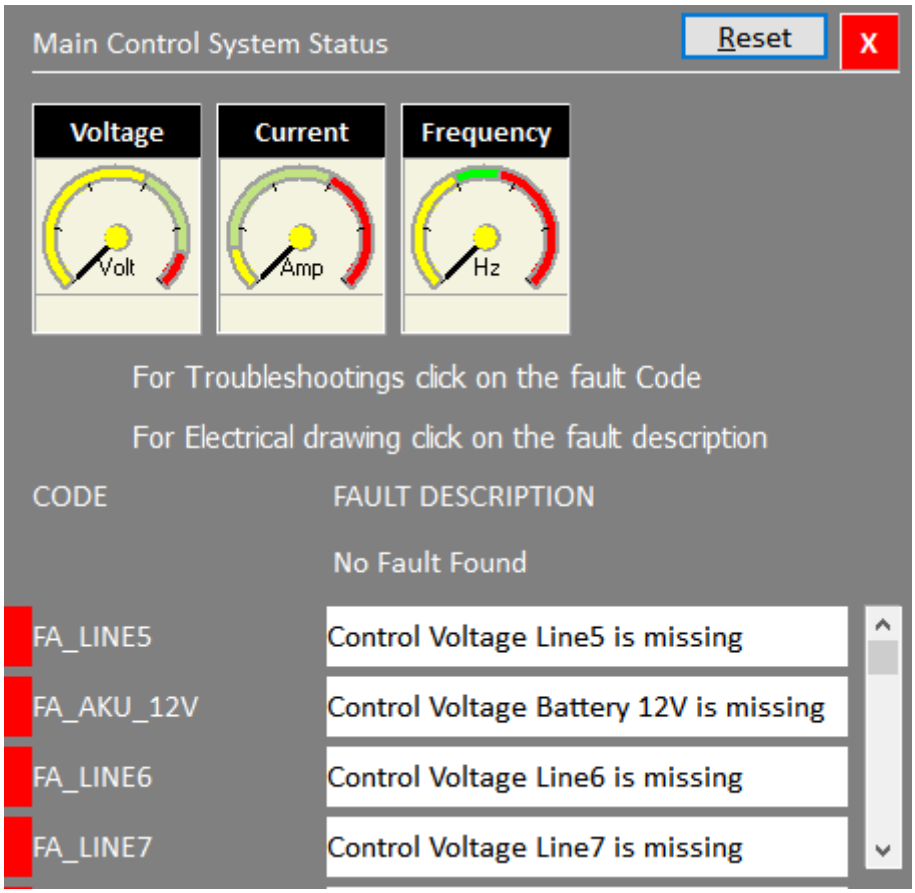


On this screen, the preconditions for start the leakage test are showed for each kettle separately. All the information about the leakage test and the results are monitored.

If the preconditions are ready the operator can start the kettle leakage test program by right click on start button.

6.4 MENU / STATUS PAGES

6.4.1 CONTROL SYSTEM STATUS



Voltage gauge
This gauge shows the voltage of the generator set.

Current gauge
This gauge shows the current of the generator set.

Frequency gauge
This gauge shows the frequency of the generator set.

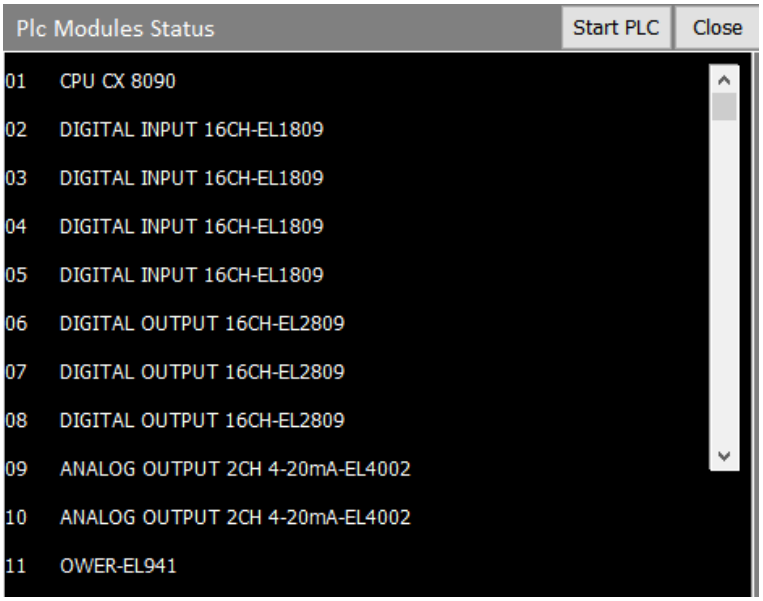
Control System alarms
For the faults troubleshooting, go to section 7.Alarms and Alarm list and check the alarm code.

Alarm indication is given when generator set voltage is too low.

6.4.2 PLC MODULES STATUS

On this page the state of the PLC modules are monitored.

- Red color indicates the the Plc module is not at operation mode.
- If the Plc is at Stop mode by clicking Start PLC button, the CPU status will be switched to run mode.



6.4.3 AIR COMPRESSOR STATUS

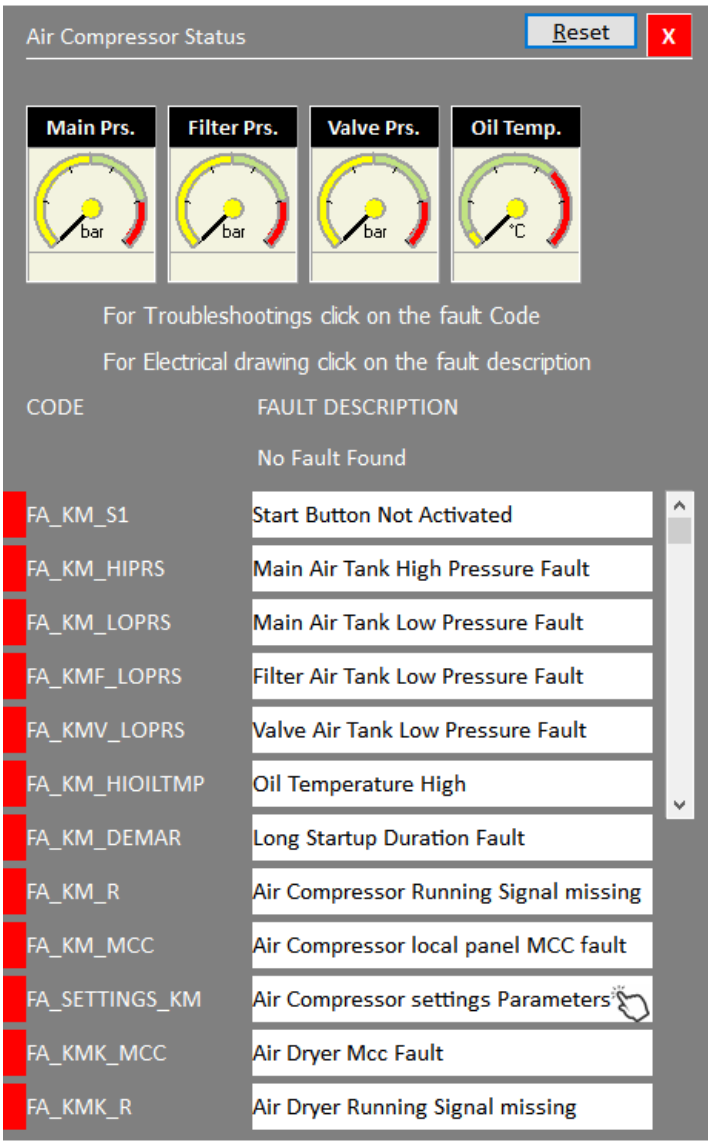
<u>Main pressure gauge</u>
This gauge shows the actual outlet air pressure of the air compressor

<u>Filters air tank pressure gauge</u>
This gauge shows the actual air pressure of the air tank reserved for the cleaning of the filter elements.

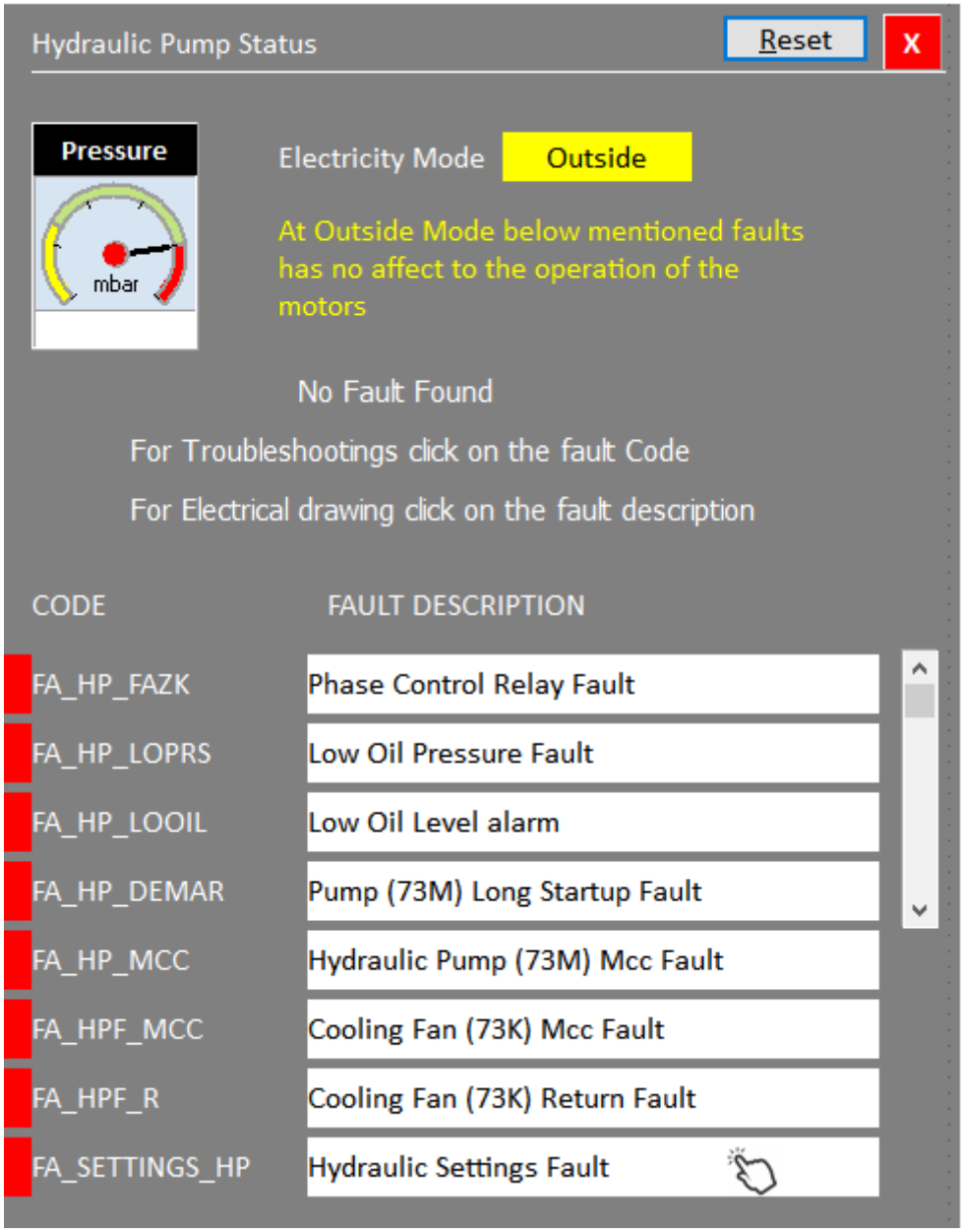
<u>Valves air tank pressure gauge</u>
This gauge shows the actual air pressure of the air tank reserved for the operation of the valves

<u>Oil temperature gauge</u>
This gauge shows the temperature of the oil.

Auxiliary Air compressor alarms
For the faults go to section 7.Alarms and Alarm list and check the alarm code.



6.4.4 HYDRAULIC SYSTEM STATUS



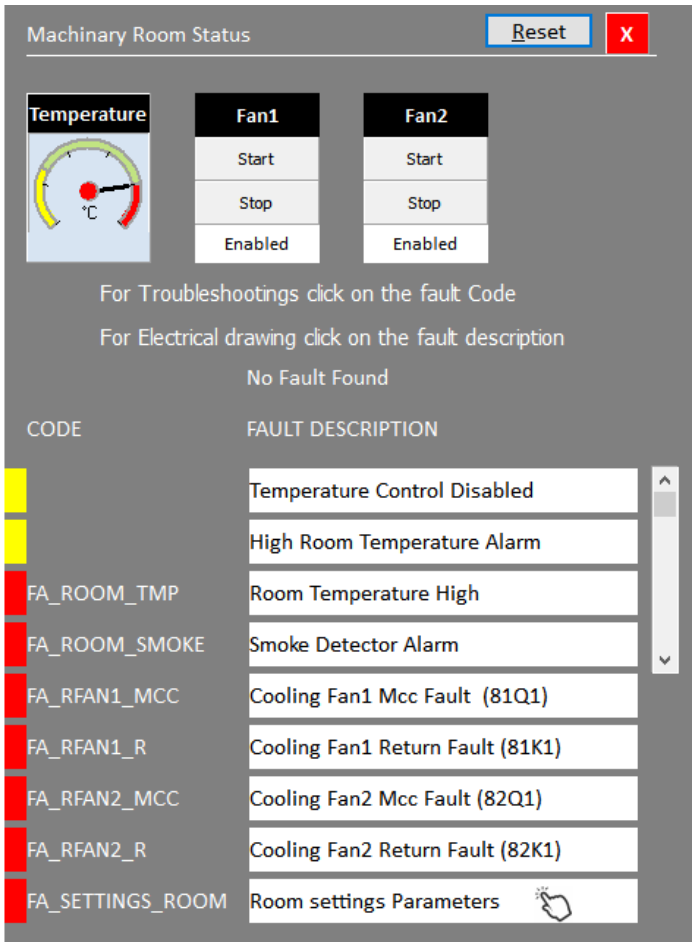
Hydraulic pressure gauge

This gauge shows the hydraulic oil pressure of the pump.

Hydraulic System alarms

For the faults go to section 7.Alarms and Alarm list and check the alarm code.

6.4.5 MACHINERY ROOM STATUS



Room Temperature gauge

This gauge shows the temperature of the machinery room.

Cooling Fan1 Start/Stop Button

If the temperature control of the machinery room is disabled, the fans start running during the suction or discharge motors are running.

The operator can start the cooling fan by click on start button and stop by click on stop button.

Cooling Fan2 Start/Stop Button

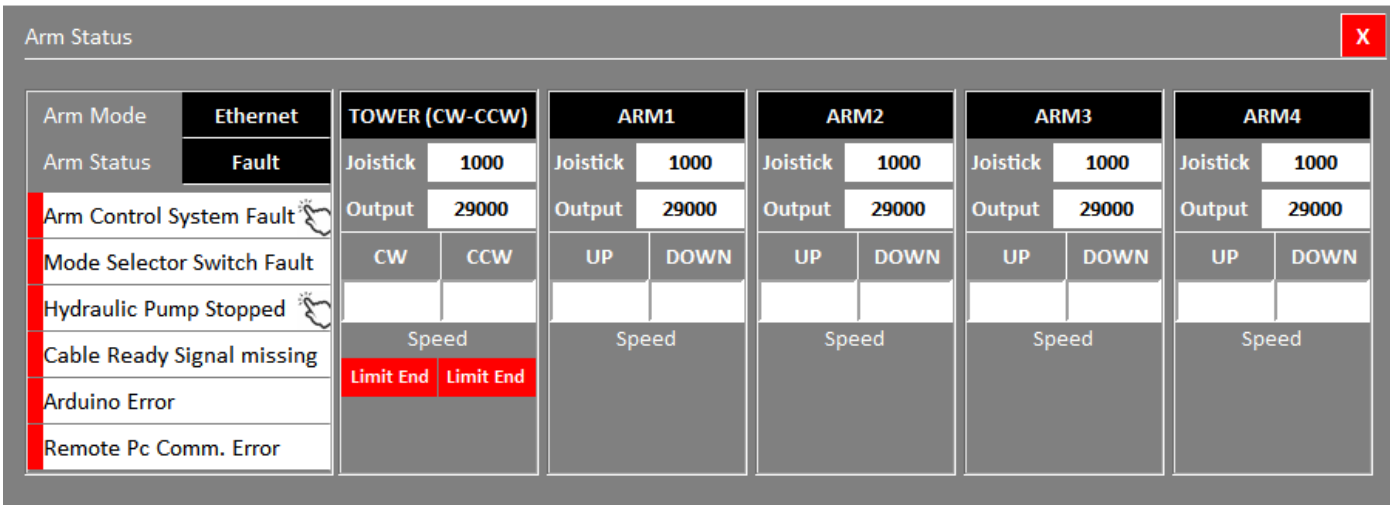
If the temperature control of the machinery room is disabled, the fans start running during the suction or discharge motors are running.

The operator can start the cooling fan by click on start button and stop by click on stop button.

Machine room Faults

For the faults go to section 7.Alarms and Alarm list and check the alarm code.

6.4.6 SUCTION ARM STATUS



Operation

Operation is the mode where the operator can move and rotate the sections of the arm from remote control joysticks. The hydraulic pump should be at running status. The remote control should be active.

If the hydraulic system is at operation state the color of the button is green, else the color of the button is red. By pressing the button “Operation”, the list of the interlocks and faults which prevent the arm to be set to operation mode is displayed on the screen.

Test

Test is the mode where the operator can check the input signals received from remote control joysticks the output command sent to the hydraulic valves of the sections. The hydraulic pump should be stopped.

If the hydraulic system is at Test state the color of the button is green, else the color of the button is red. By pressing the button “Test”, the list of the interlocks and faults which prevent the arm to be set to test mode is displayed on the screen.

Alarm indicator – Arm control system fault

Alarm indication is given when there is a control system fault. By pressing on the indication the page Menu > Status > Control system status is displayed.

Alarm indicator – Mode selector switch fault

Alarm indication is given when the selector switch Ethernet and Cable modes signals are both actives. Replace the selector switch.

Alarm indicator – Hydraulic pump stopped
Alarm indication is given when the hydraulic pump is stopped.

Alarm indicator – Cable ready signal is missing
Alarm indication is given when the selector switch is at cable mode and remote control cable ready signal is missing.

Alarm indicator – Arduino error
Alarm indication is given when the microprocessor Arduino in the remote control is not active.

Alarm indicator – Remote Pc Communication error
Alarm indication is given when the Arduino test program at the remote control is not running.

Section Tower (CW-CCw)

Joystick
The analogue signal received from tower rotation joystick is displayed.

Output
The analogue output signal sent to hydraulic valve/s of the tower rotation is displayed.

CW
When the tower is slewing to clock wise the color is green.
If the tower clock wise rotation is inhibit, the color is red.

CCW
When the tower is slewing to counter clock wise the color is green.
If the tower counter clock wise rotation is inhibit, the color is red.

Alarm indicator – Limit End for CW
Alarm indication is given when the tower reaches to the end limit switch on clockwise direction.

Alarm indicator – Limit End for CCW
Alarm indication is given when the tower reaches to the end limit switch on counter clockwise direction.

Speed Button for CW
By pressing speed button, the operator sets the speed of the tower on clockwise direction by entering a parameter between 0-100.

Speed Button for CCW
By pressing speed button the operator sets the speed of the tower on counter clockwise direction by entering a parameter between 0-100.

Section Arm-1

Joystick
The analogue signal received from Arm section-1 joystick is displayed.

Output
The analogue output signal sent to hydraulic valve/s of the arm section-1 hydraulic valve rotation is displayed.

UP
When the arm section-1 is raising up the color is green.
If there is inhibit for arm section-1 on direction up the color is red.

DOWN
When the arm section-1 is up the color is green.
If there is inhibit for arm section-1 on direction down the color is red.

Speed Button for UP
By pressing speed button, the operator sets the up direction speed of the arm section-1 by entering a parameter between 0-100.

Speed Button for DOWN
By pressing speed button, the operator sets the down direction speed of the arm section-1 by entering a parameter between 0-100.

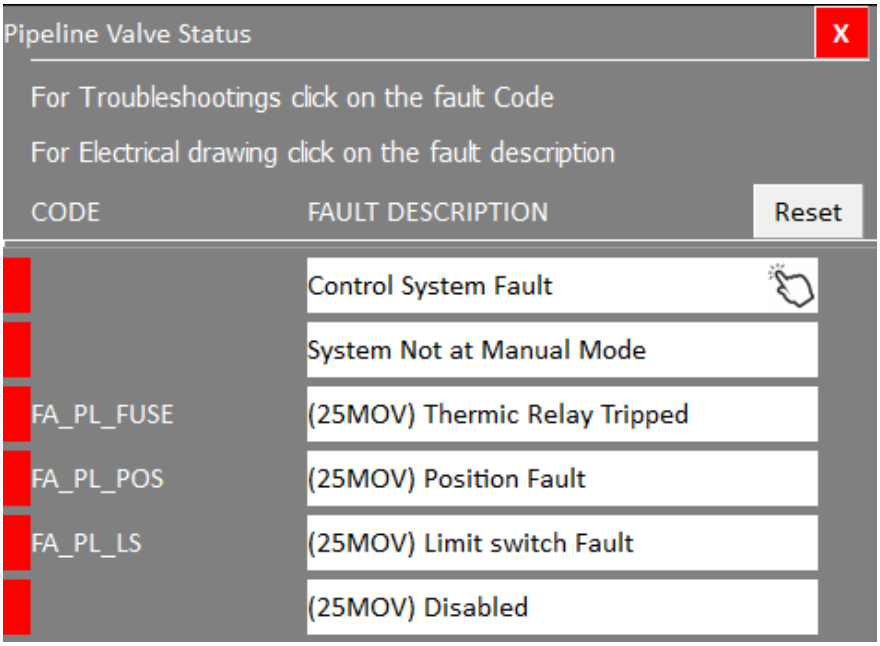
Section Arm-2
Same procedure of section Arm1

Section Arm-3
Same procedure of section Arm1

Section Arm-3
Same procedure of section Arm1

6.4.7 PIPELINE REGULATION VALVE STATUS

The actual faults of the pipeline regulation valve are monitored on the screen
For the faults go to section 7.Alarms and Alarm list and check the alarm code.

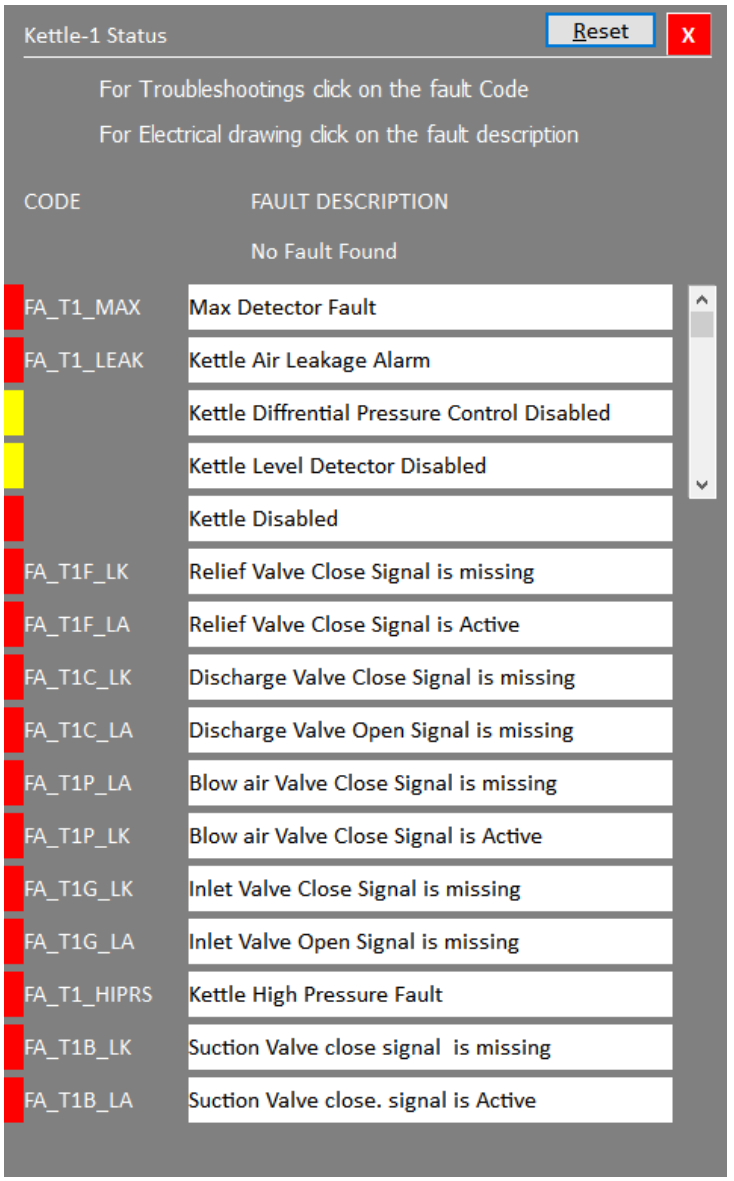


6.4.8 KETTLE-1 STATUS

Kettle-1 Faults
For the troubleshooting of the faults go to section 7.Alarms and Alarm list and check the alarm code.

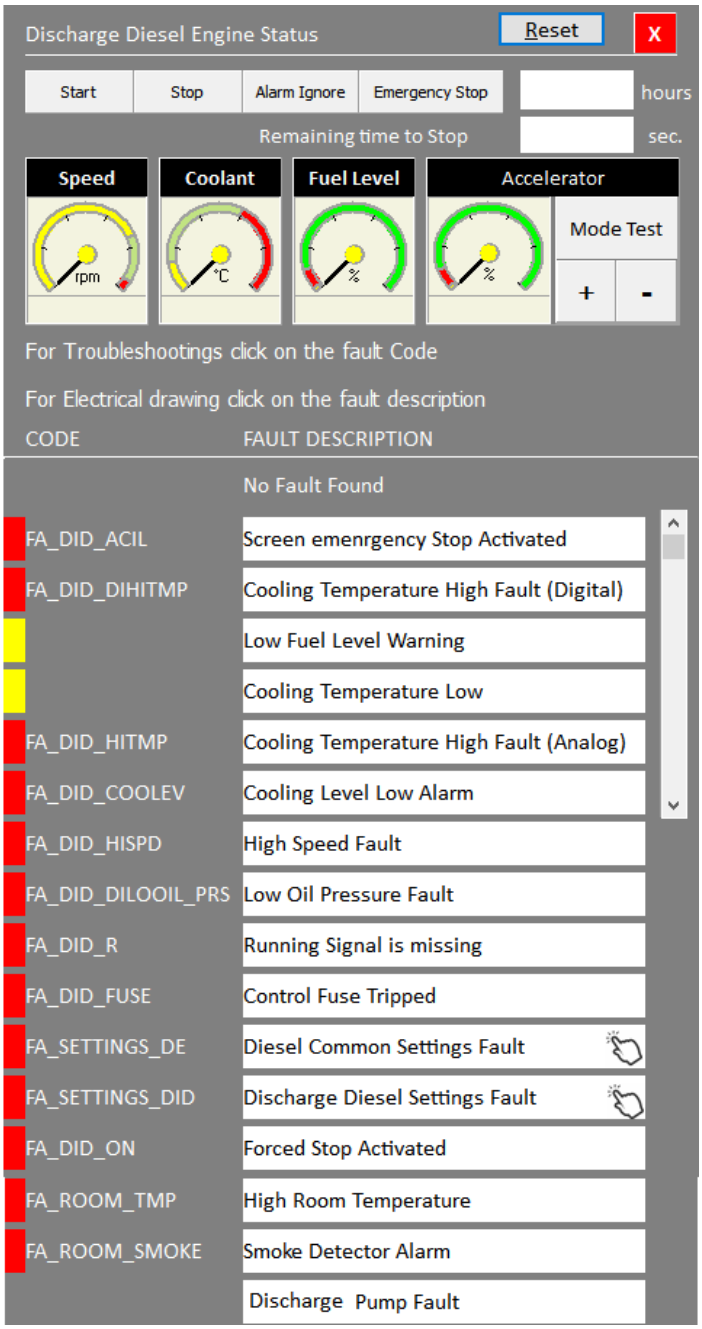
6.4.9 KETTLE-2 STATUS

Kettle-2 Faults
For the troubleshooting of the faults go to section 7.Alarms and Alarm list and check the alarm code.



6.4.10 DIESEL ENGINE (DISCHARGE) STATUS PAGE

On this page, the following information about the diesel engine is monitored.



STATUS OF THE DIESEL ENGINE
The actual status of the engine as running, fault or stopped is monitored.

START BUTTON
Starts engine. The engine runs at idle speed until the coolant temperature raise to the level defined at page Menu > Settings > Diesel Engine common settings >engine low temperature level.

STOP BUTTON
The speed of the engine drops to the idle speed and continue running during the time defined at Menu > Settings > Diesel Engine common settings > Idle speed running duration

ALARM IGNORE BUTTON
If the engine coolant temperature is high, on click the button the controller ignores the fault.

EMERGENCY STOP BUTTON
The engine stops immediately.

ENGINE WORKING HOURS
Indicates the working hours of the diesel engine. This indication helps to the operator for planning the maintenance of the engine.

MODE TEST BUTTON
If the engine is not running, on click the test button operator set the accelerator to test mode. By click (+) and (-) buttons the position of the accelerator changes.

SPEED GAUGE
Monitor the speed of the engine.

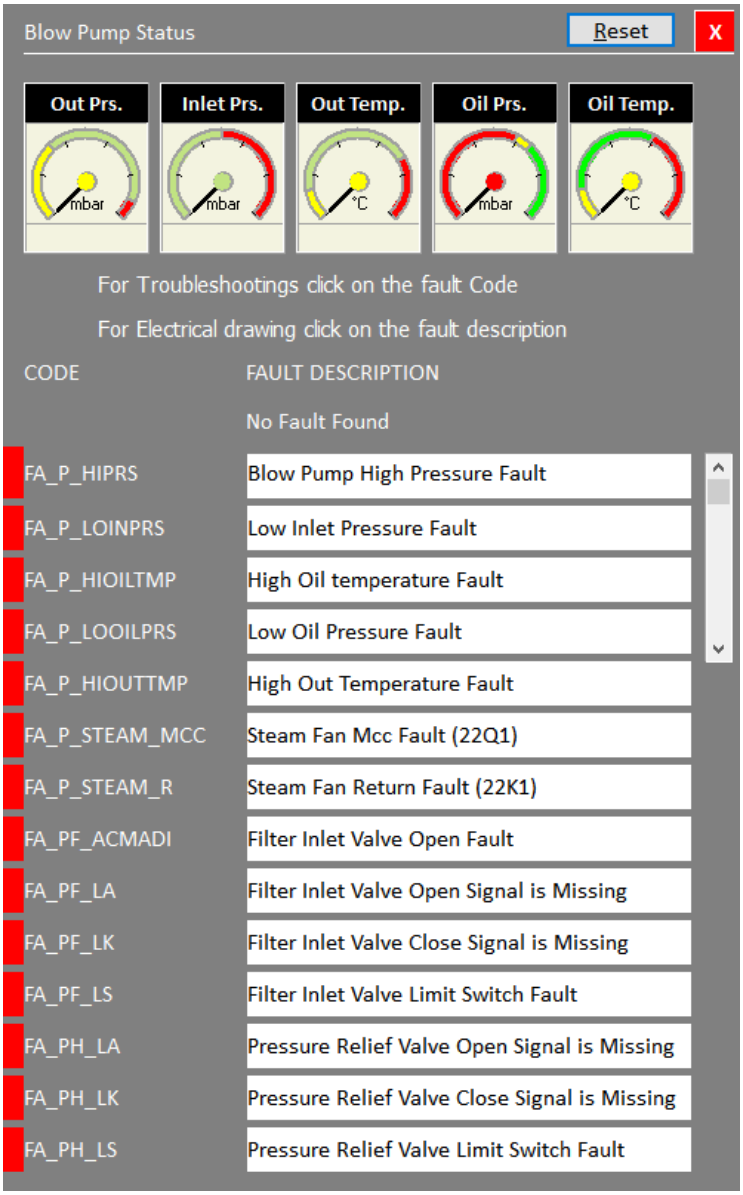
COOLANT TEMPERATURE GAUGE
Monitor the temperature of the engine.

FUEL LEVEL GAUGE
Monitor the level of the fuel tank.

ACCELARATOR POSITION GAUGE
Monitor the position of the accelerator

FAULT LIST
The list of the faults, which has effect the engine, is shown on the picture.
For the troubleshooting of the faults go to section 7.Alarms and Alarm list and check the alarm code.

6.4.11 BLOW PUMP STATUS PAGE



OUT PRESSURE GAUGE

Monitor the out pressure of the pump.

INLET PRESSURE GAUGE

Monitor the İNLET pressure of the pump.

OUT TEMPERATURE GAUGE

Monitor the out air temperature of the pump.

OIL PRESSURE GAUGE

Monitor the oil pressure of the pump.

OIL TEMPERATURE GAUGE

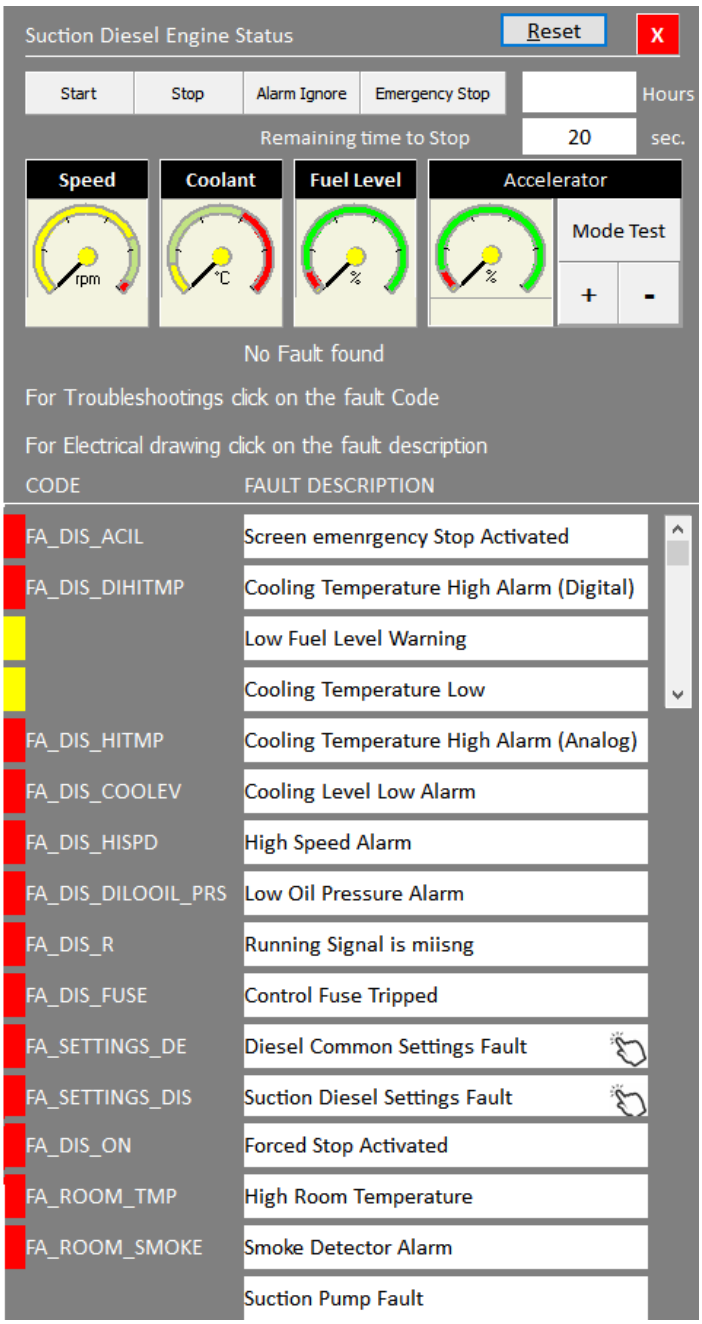
Monitor the oil temperature of the pump.

FAULT LIST

The list of the faults, which effect the pump, is shown on the picture.
For the troubleshooting of the faults go to section 7.Alarms and Alarm list and check the alarm code.

6.4.12 DIESEL ENGINE (SUCTION) STATUS PAGE

On this page, the following information about the diesel engine is monitored.



STATUS OF THE DIESEL ENGINE
The actual status of the engine as running, fault or stopped is monitored.

START BUTTON
Starts engine. The engine runs at idle speed until the coolant temperature raise to the level defined at page Menu > Settings > Diesel Engine common settings >engine low temperature level.

STOP BUTTON
The speed of the engine drops to the idle speed and continue running during the time defined at Menu > Settings > Diesel Engine common settings > Idle speed running duration

ALARM IGNORE BUTTON
If the engine coolant temperature is high, on click the button the controller ignores the fault.

EMERGENCY STOP BUTTON
The engine stops immediately.

ENGINE WORKING HOURS
Indicates the working hours of the diesel engine. This indication helps to the operator for planning the maintenance of the engine.

MODE TEST BUTTON
If the engine is not running, on click the test button operator set the accelerator to test mode. By click (+) and (-) buttons the position of the accelerator changes.

SPEED GAUGE
Monitor the speed of the engine.

COOLANT TEMPERATURE GAUGE
Monitor the temperature of the engine.

FUEL LEVEL GAUGE
Monitor the level of the fuel tank.

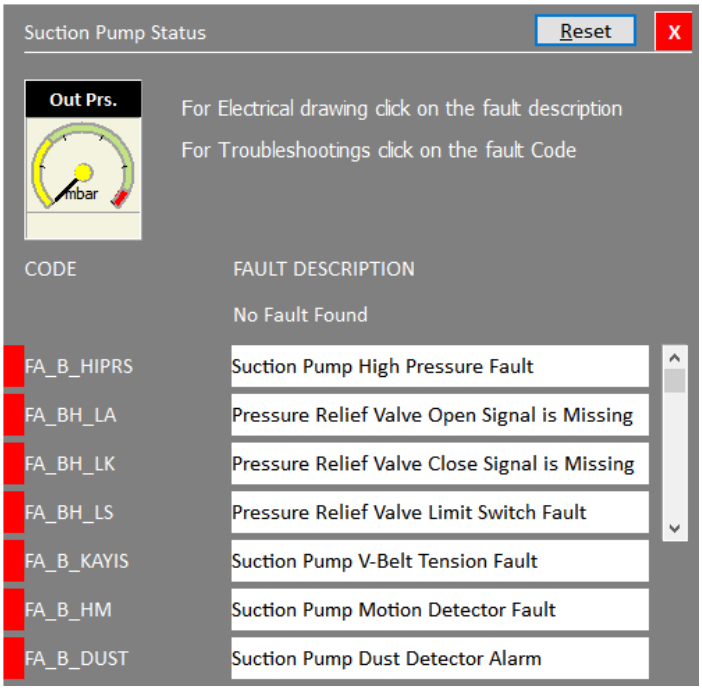
ACCELARATOR POSITION GAUGE
Monitor the position of the accelerator

FAULT LIST
The list of the faults, which has effect the engine, is shown on the picture.
For the troubleshooting of the faults go to section 7.Alarms and Alarm list and check the alarm code.

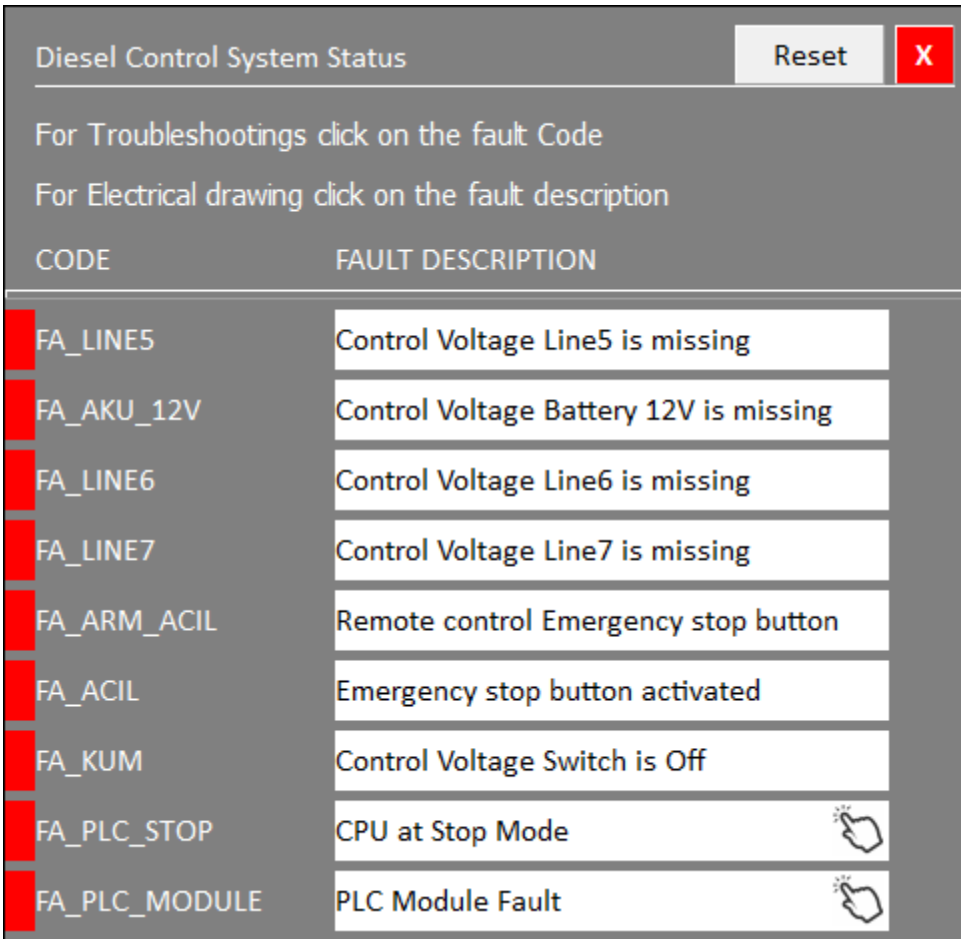
6.4.13 SUCTION PUMP STATUS PAGE

PRESSURE GAUGE
Monitor the pressure of the pump.

FAULT LIST
The list of the faults, which effect the pump, is shown on the picture.
For the troubleshooting of the faults go to section 7.Alarms and Alarm list and check the alarm code.



6.4.14 DIESEL CONTROL SYSTEM STATUS



The faults which prevent to start diesel engines are monitored on the screen.

For the troubleshooting of the faults go to section 7.Alarms and Alarm list and check the alarm code.

6.5 MENU / SETTINGS PAGES

6.5.1 SYSTEM SETTINGS PAGE

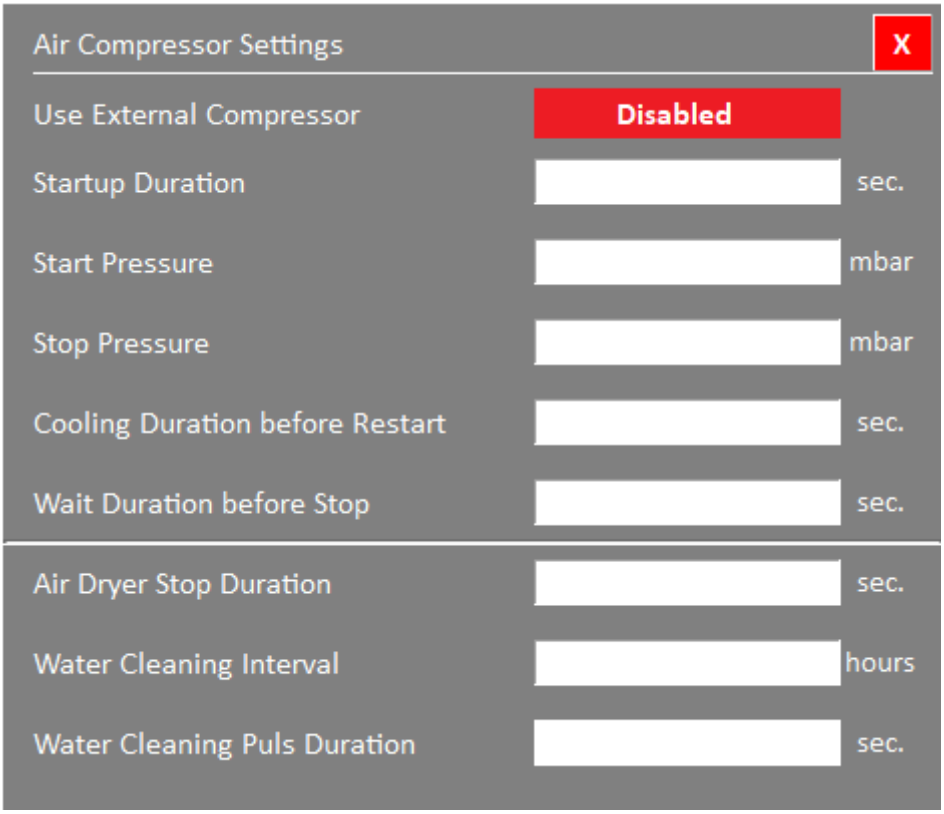
Mcc Low Voltage Level

Defines the fault level of the generator set.

Siren duration

Defines the maximum running time of the siren.

6.5.2 AIRCOMPRESSOR SETTINGS PAGE



Use external compressor

If use external compressor is enabled, the Mcc fault, return fault of the compressor are ignored.

Startup Duration

Defines the time the engine will complete the startup procedure.
The running bypass signal is received from its contactor.

Start Pressure:

Defines the pressure point at which the air compressor will start loading air tanks.

Stop Pressure:

Defines the pressure point at which the air compressor will open the pressure relief valve.

Cooling duration before restart:

Defines the cooling time of the compressor before start running

Wait duration before stop:

If the tanks are pressurized and the pressure relief valve is open, the air compressor drive wait the defined time before stopping the drive.

Air dryer stop duration:

When the air compressor stops, air dryer continue running until the end of defined time.

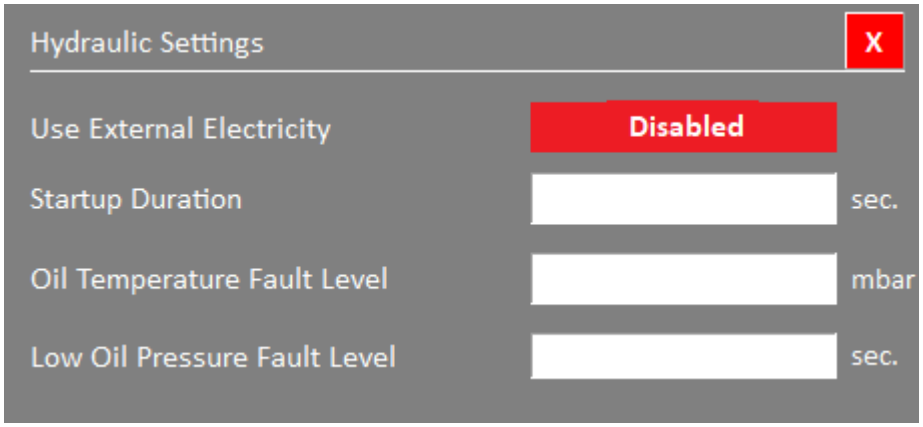
Water cleaning interval

A water accumulate inside of the air tanks because of the compressed air.
During the jet pulse cleaning, the water drops damage the filter bags.
To prevent this effect, at defined period the air tank empty the water of the tank.

Water cleaning pulse duration

Defines the opening duration of the air tank-emptying valve during water cleaning process.

6.5.3 HYDRAULIC SETTINGS PAGE



Use external electricity

Hydraulic pump local panel can be powered from external power. If use external electricity is enabled, the Mcc fault, return fault of the pump motor are ignored.

Startup Duration

Defines the time the engine will complete the startup procedure. The running bypass signal is received from its contactor.

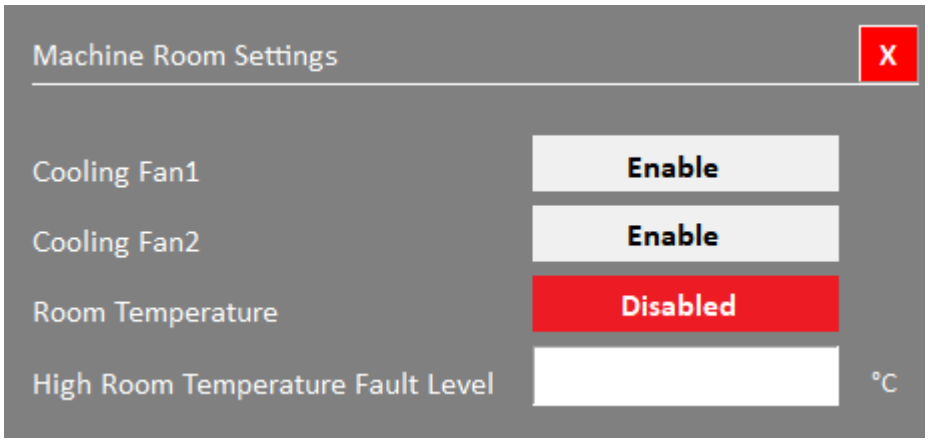
Oil temperature fault level (if available)

Defines the fault level of the hydraulic oil temperature.

Low oil pressure fault level (if available)

Defines the fault level of the hydraulic pressure.

6.5.4 MACHINERY ROOM SETTINGS PAGE



Cooling Fan1 Enable/Disabled

In case of fault, the operator can disable the cooling fan. Cooling fan stops running.

Cooling Fan2 Enable/Disabled

In case of fault, the operator can disable the cooling fan. Cooling fan stops running.

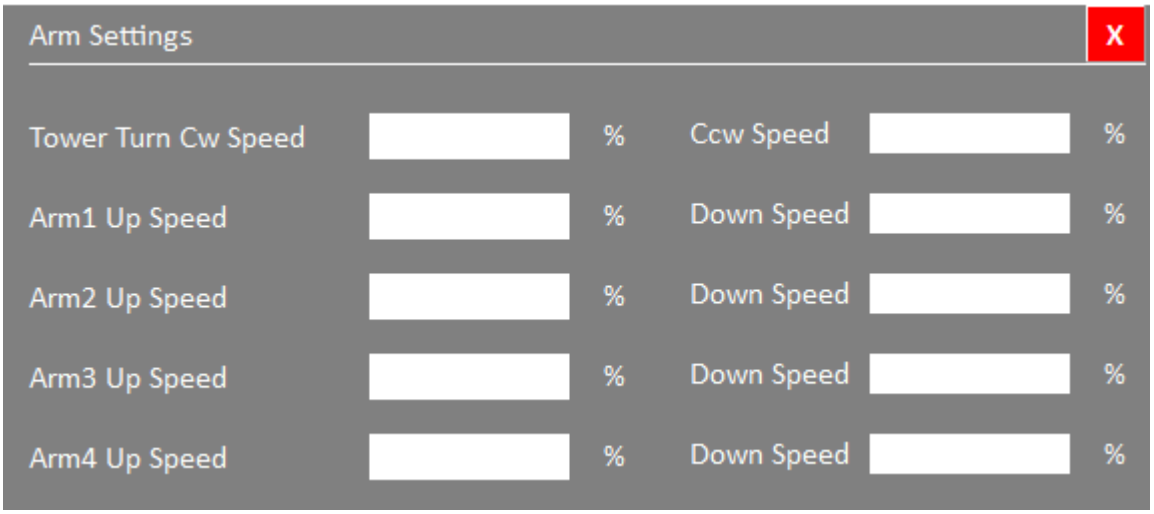
Room temperature Enable/Disabled

Cooling fans starts running by high room temperature alarm. If the room temperature is disabled, the fans start running with diesel engines.

Room temperature Enable/Disabled

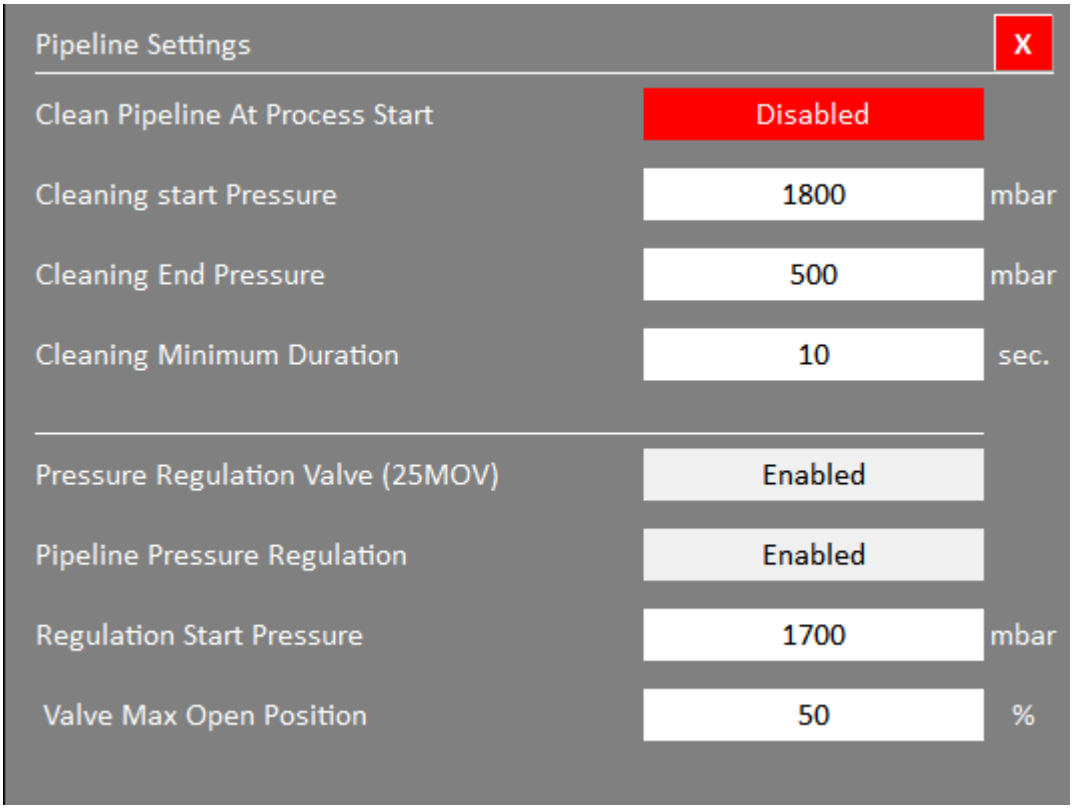
Defines the fault level of the room temperature, which will stop the process.

6.5.5 ARM SETTINGS PAGE



The section of the arms are operated from the remote control joystick analog signals.
By settings the speed of the sections, the operator can reduce or increase the speed of the arm.

6.5.6 PIPELINE SETTINGS PAGE



Clean pipeline at process start

If it is enabled, each time the operator starts unloading process, first the valve (25MOV) opens and clean pipeline then the unloading process starts.

Cleaning start pressure

During the discharge process if the pipeline is blocked, the pressure of the pipeline and the kettle increases.

This parameter defines the start pressure of the pipeline cleaning.

Cleaning end pressure

Cleaning pipeline process continue until the pressure of the pipe drops to the level defined.

Cleaning minimum duration

Even the pipeline pressure drops to the cleaning end pressure level, pipeline cleaning continue until the end of defined parameter.

Pressure regulation valve (25MOV) Enable/Disable

Before disable, the pressure regulation valve be sure that the valve is closed. If the valve is disabled, it will not react to pipeline pressure.

Pipeline pressure regulation Enable/Disable

If the pipeline pressure regulation is disabled, the valve (25MOV) will not react to regulate the pipeline pressure.

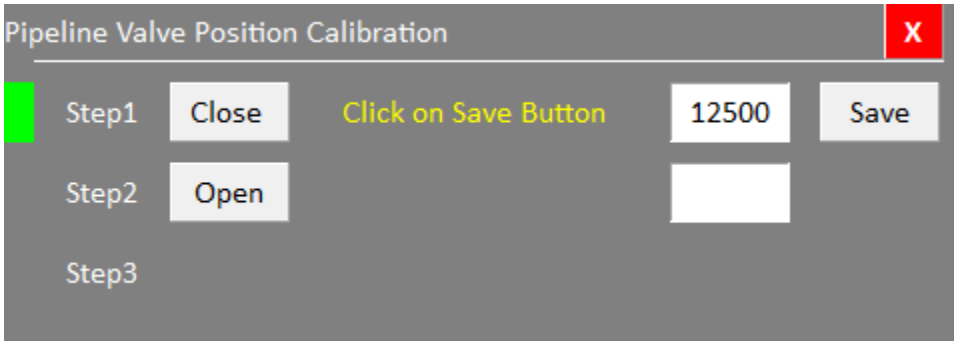
Regulation start pressure

During the discharge if the pressure of the pipeline increase to defined level the controller opens slowly the valve (25MOV) and send an extra air to the pipeline for regulating the pressure.

Valve Max Open position

Define the maximum opening position of t the valve (25mOV) during pressure regulation.

6.5.7 PIPELINE REGULATION VALVE POSITIN CALIBRATION



Perform position calibration of the valve following the instructions.

6.5.8 KETTLES SETTINGS PAGE

Discharge start pressure

Defines the pressure level of the kettles where the emptying process "Pressurizing" state will be ended and "pressure discharge" state will be started. Discharge valve opens.

Discharge end pressure

Defines the pressure level of the kettles where the emptying process will be ended. Discharge valve closes.

Discharge middle pressure

Defines the pressure level of the kettles where the level of the cement drops to the half level of the kettles.

Minimum convey time

Defines the minimum convey time of the discharge process. Even the pressure of the kettles drop to discharge end pressure level, discharge continue until the end of defined parameter.

Maximum suction time

Defines the time at where the filling process will end.

Maximum pressurizing time

Defines the maximum duration of the “Pressuring state” of the emptying process. At the end of this period if the pressure inside of the kettles does not reach to “Discharge start pressure” point the system give a FA_Tx_LEAK alarm.
This alarm alarm indicates the kettle has a leakage.

Kettle capacity

The capacity of the kettles changes by the characteristics of the bulk. This parameter helps to the operator calculate approx. quantity of cement unloaded from the vessel according to the number of batches conveyed to the terminal.

Kettles cleaning cycle

If the operator ends the process by pressing clean kettles and stop button, the cleaning of the kettles continue until the end of defined parameter.

Filter cleaning interval

Define the interval of filter cleaning pulses.

Filter pulse duration

Defines the pulse duration of the filter cleaning

Filter cleaning stop delay

Filter cleanings continue running after the unloading process stops. The parameter defines the cleaning number of each bags after the process.

Filter differential pressure fault level

Defines the differential pressure level where the filling process will be ended.

Differential pressure reaction time

Defines the time between high differential pressure signal and the moment the controller accepts it as an alarm.

6.5.9 KETTLE-1 SETTINGS PAGE

Kettle-1 Enable/Disable

Because of kettle leakage or faults, the operator can disable kettle-1 and continue to the operation with the kettle-2. In that case, the capacity of the unloader will be half of its nominal capacity.

Kettle-1 Max sensor Enable/Disable

If the level tester of kettle-1 is not working properly, the operator can disable the level control of the kettle-1.
In that case, the control system will get FULL signal from the maximum suction time or the high differential pressure signal, until the level tester is repaired or replaced.

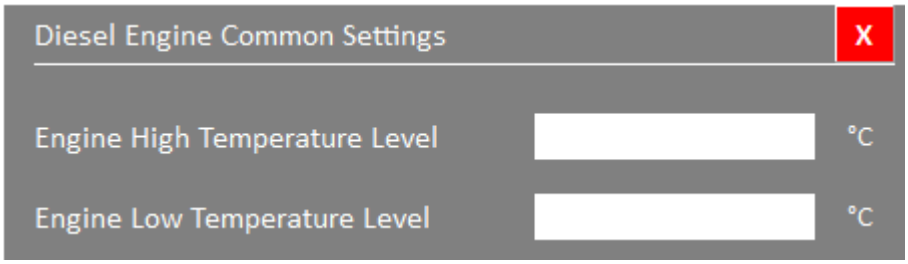
Kettle-1 Diff.Pressure control Enable/Disable

If the differential pressure switch of the kettle-1 is not working properly, the operator can disable this control. In that case, the differential pressure alarm will be ignored until the switch is replaced.

6.5.10 KETTLE-2 SETTINGS PAGE

Same of Kettle-1.

6.5.11 DIESEL ENGINES COMMON SETTINGS PAGE



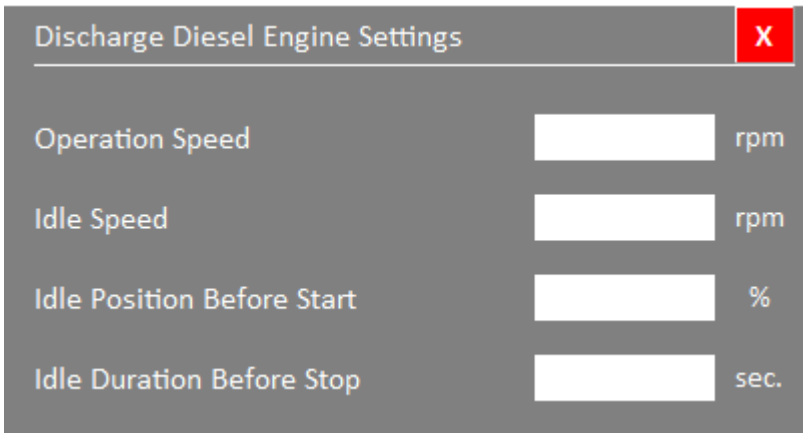
Engine high temperature level

Define the temperature level where the controller will stop the engine.

Engine low temperature level

Define the temperature level where the controller will wait at idle speed until the temperature raise until the defined parameter.

6.5.12 DIESEL ENGINES (DISCHARGE) SETTINGS PAGE



Operation speed

Define the speed of the engine during unloading process.

Idle speed

When the operator stops the engine, the speed drops to idle speed at defined parameter

Idle position before start

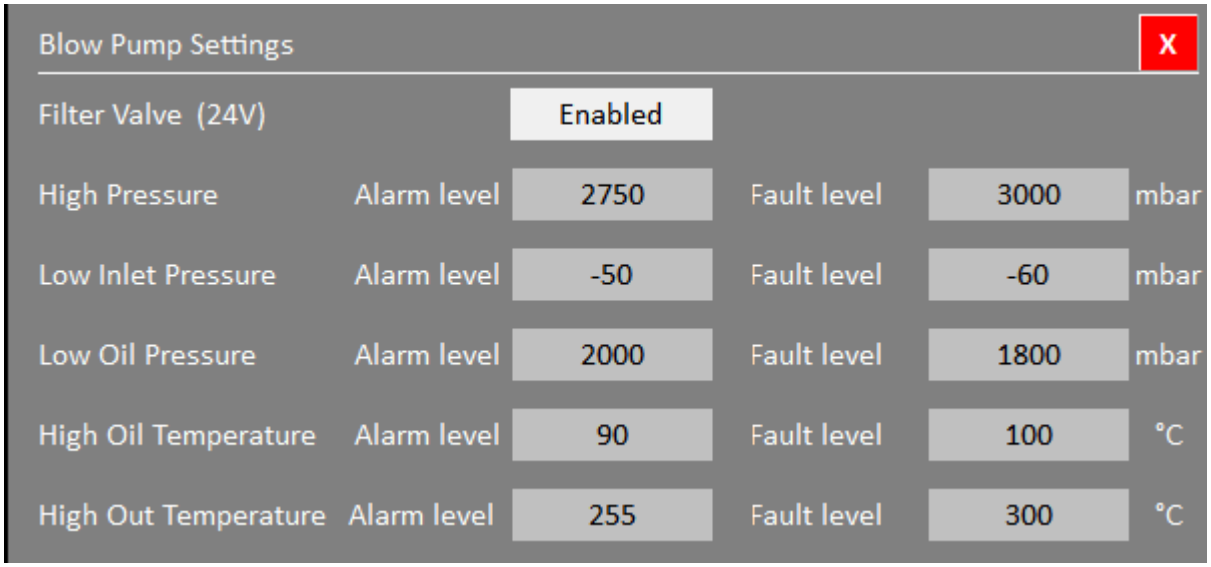
Define the position of the accelerator before starting the engine.

Idle duration before stop

When the operator stops the engine, the speed drops to idle speed and continue running until the end of the time defined at the parameter.

Define the position of the accelerator before starting the engine.

6.5.13 DISCHARGE PUMP SETTINGS PAGE



Filter Valve (24V) Enable /Disable

Before disable the valve (24V), you should be sure that the valve is at open position. In case of mal function, the operator can disable filter valve (24V) of the blow compressor.

Alarm and Fault levels of the protection sensors

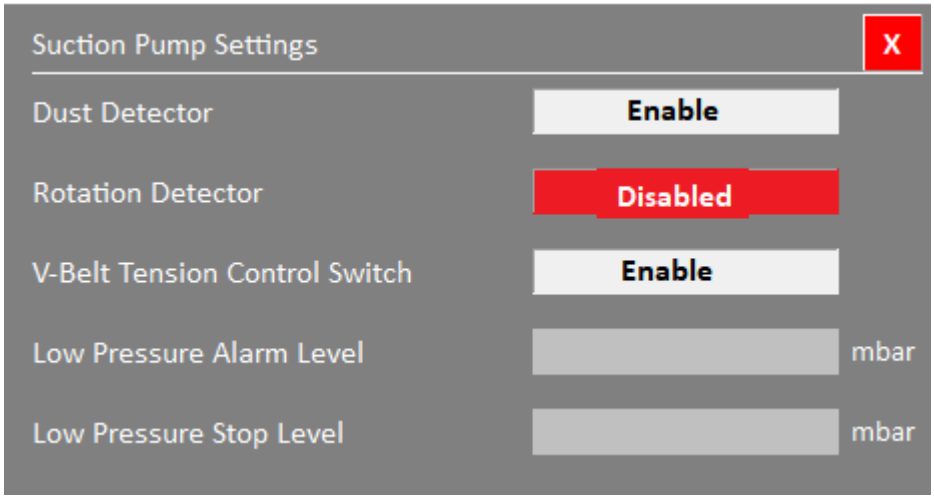
Monitors the alarm and fault level of the protection sensors.

The operator has no authorization to change those parameters.

6.5.14 DIESEL ENGINES (SUCTION) SETTINGS PAGE

Same of diesel engine (discharge) settings.

6.5.15 SUCTION PUMP SETTINGS PAGE



Dust detector enable/disable

If the dust sensor is not working properly, the operator can disable the dust control function until the sensor is repaired or changed.

Rotation detector enable/disable

If the rotation detector of the suction pump is not working properly, the operator can disable this control until the detector is repaired or replaced.

V-belt tension control switch enable/disable

If the loose belt switch of the suction pump is not working properly, the operator can disable this control until the switch is repaired or replaced.

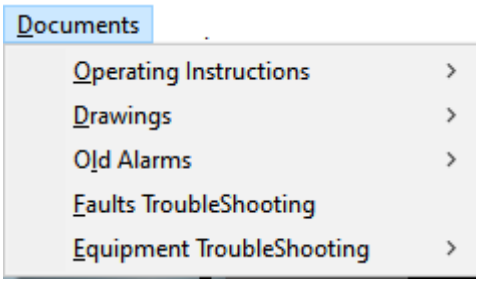
Low-pressure alarm level

Monitors the low-pressure alarm level of the suction pump.
The operator has no authorization to change this parameter.

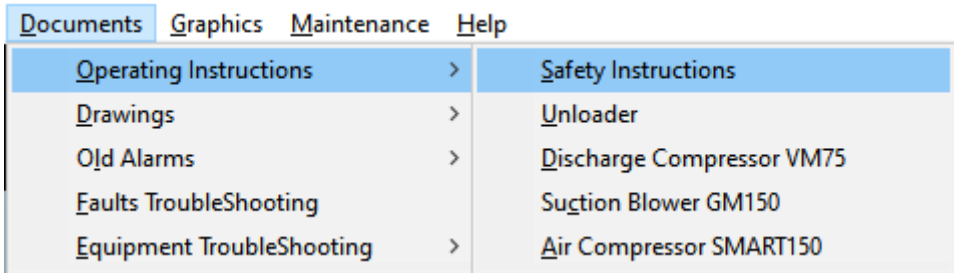
Low-pressure fault level

Monitors the low-pressure fault level of the suction pump.
The operator has no authorization to change this parameter.

6.6 DOCUMENTATION



6.6.1 OPERATING INSTRUCTIONS



The available operation instructions are

6.6.1.1 Safety Instruction

6.6.1.2 Unloading operating instructions

6.6.1.3 Discharge compressor VM75 operating instructions

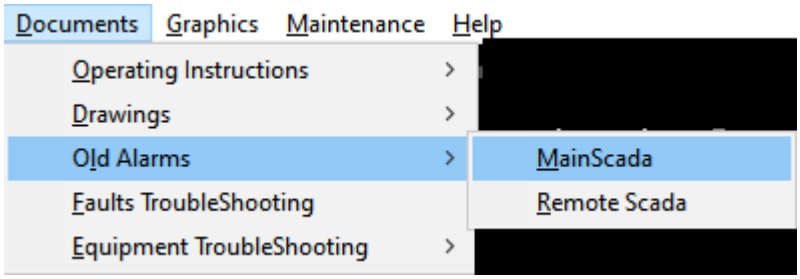
6.6.1.4 Suction blower GM150 operating instructions.

6.6.1.5 Air compressor SMART150 operating instruction

6.6.2 DRAWINGS

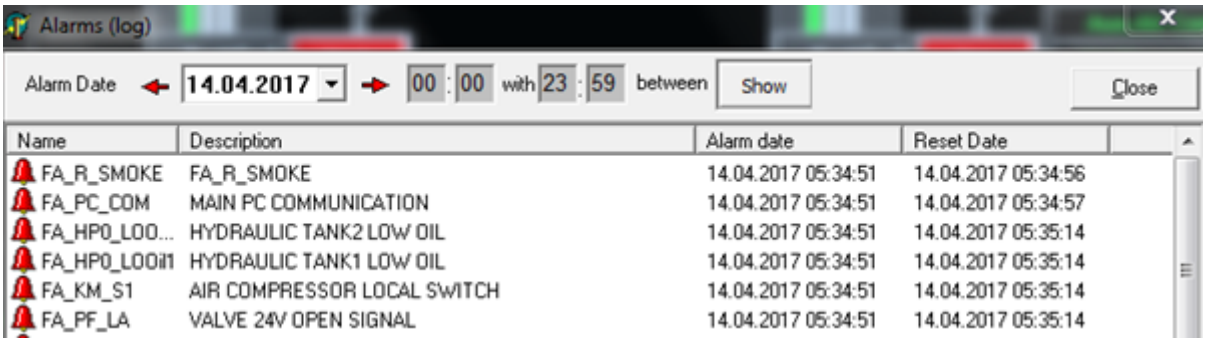
6.6.2 Electrical drawing

6.6.3 OLD ALARMS



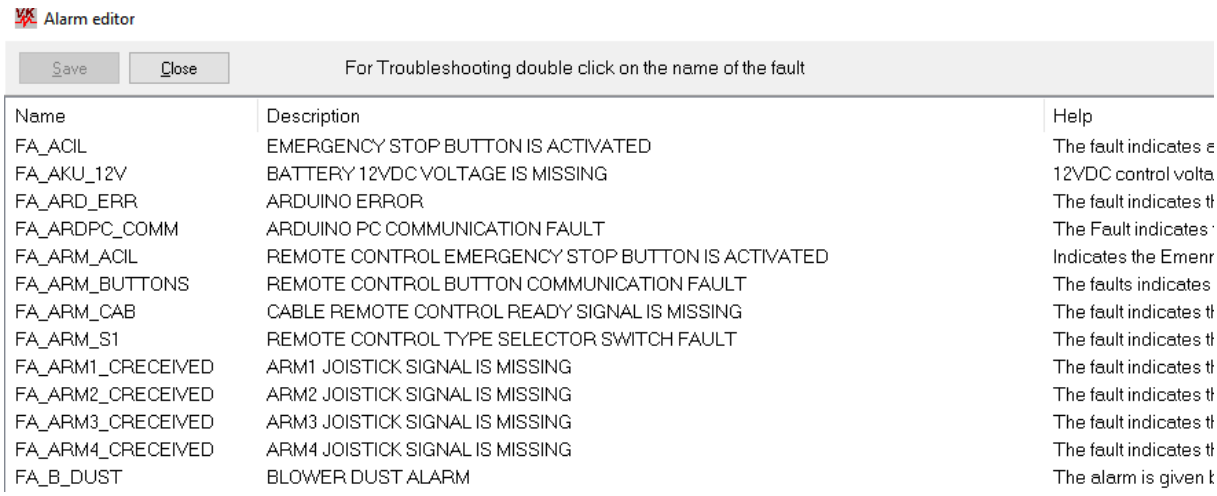
6.6.3.1 OLD ALARMS SAVED BY MAIN SCADA

6.6.3.2 OLD ALARMS SAVED BY REMOTE SCADA

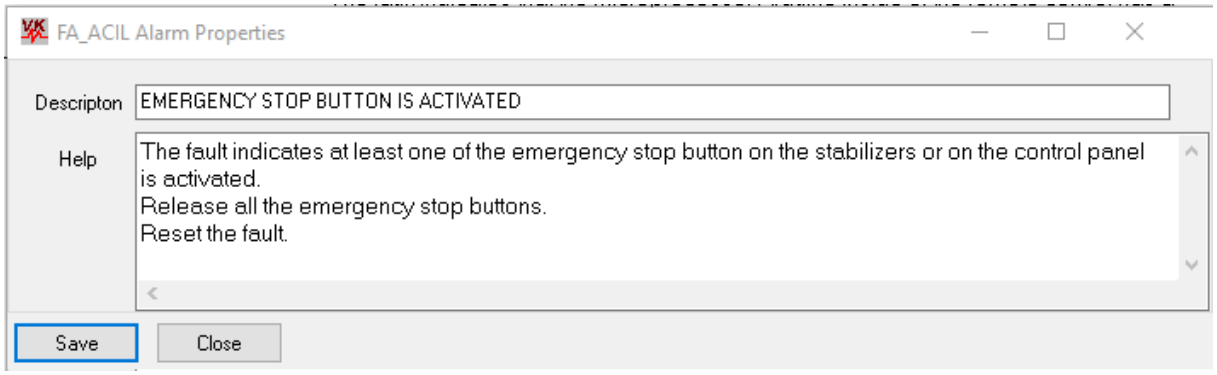


The alarm list of the previous 30 days can be displayed on the screen by selecting the date and the time interval.

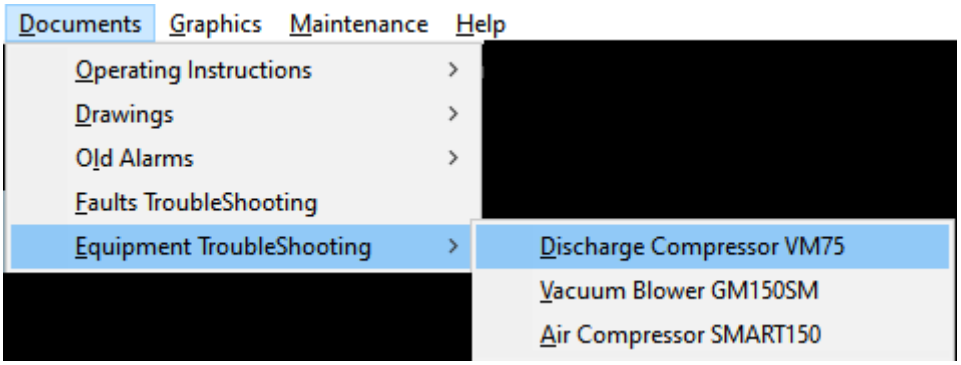
6.6.4 FAULTS TROUBLESHOOTING



Monitors the list of the faults.
On click on the fault name troubleshooting page of the alarm is displayed.



6.6.5 EQUIPMENT TROUBLESHOOTING



On click the sub-item, the troubleshooting published by the manufacturer is displayed on the screen.

6.7 GRAPHICS

6.7.1 Kettles Pressure Chart

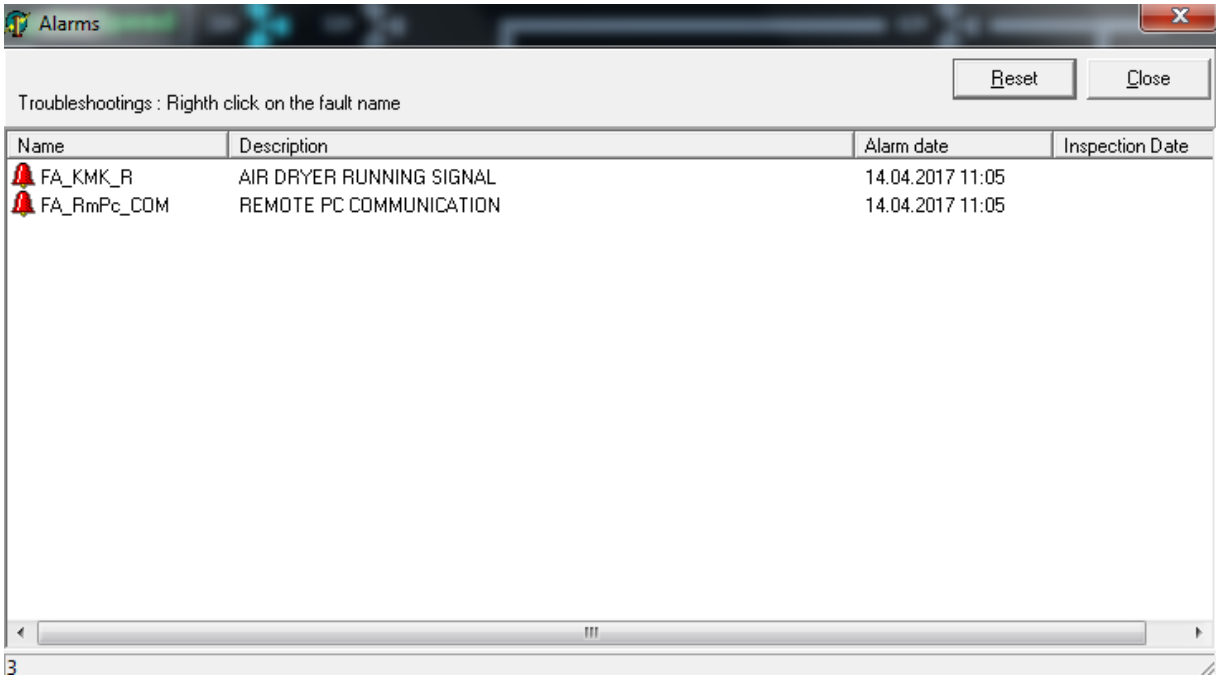
Kettles pressure chart of last 30 days can be displayed on the screen by selecting date and time interval.
Kettles pressure chart shows the pressure of the kettles during filling and discharge process.
This charts give an idea about the operator capacity about using suction arm and the pressure leakage of kettles.

CHAPTER 7

ALARMS

7. ALARMS

7.1 Alarm Page



The list of the active alarms is listed on the screen by name, alarm description, alarm time and alarm inspection time. By right click on the fault name the trouble-shooting page of this alarm appears on the screen.

Even if all care has been taken during operation, there is always a small possibility of malfunctioning of some equipment. In this case the controller will automatically take the necessary precautions to prevent any further harm to the other parts of the system and warns the operator by a displaying the message of malfunction on the screen of the remote control.

After solving the problem by pressing on “Reset” button the process will restart where it has stopped.

7.2 FAULT LIST (By alphabetic order)

FA_ACIL	The fault indicates at least one of the emergency stop button on the stabilizers or on the control panel is activated. Release all the emergency stop buttons. Reset the fault.
FA_AKU_12V	12VDC control voltage in the control panel is missing. Check the fuse 19Q1. Check the cable 19CAB1.
FA_ARD_ERR	The fault indicates that the microprocessor Arduino inside of the remote control has a fault.
FA_ARDPC_COMM	The Fault indicates the Arduino communication program is not running. Switch off and restart the remote control.
FA_ARM_ACIL	Indicates the Emergency stop button of the remote control is activated. Release the button. Reset the fault.
FA_ARM_BUTTONS	The faults indicates the signal of the remote control buttons is missing. Call Vurmak for help.
FA_ARM_CAB	The fault indicates that the cable type remote control ready signal is missing. Turn the remote control selector switch to Cable mode. Plug the remote control cable on the socket. Reset the alarm.
FA_ARM1_CRECEIVED	The fault indicates the arm1 joystick signal is missing. Turn the Ethernet/cable selector switch to Ethernet. Restart remote control. If the fault continue Call Vurmak for help.
FA_ARM2_CRECEIVED	The fault indicates the arm2 joystick signal is missing. Turn the Ethernet/cable selector switch to Ethernet. Restart remote control. If the fault continue Call Vurmak for help.

FA_ARM3_CRECEIVED	The fault indicates the arm3 joystick signal is missing. Turn the Ethernet/cable selector switch to Ethernet. Restart remote control. If the fault continue Call Vurmak for help.
FA_ARM4_CRECEIVED	The fault indicates the arm4 joystick signal is missing. Turn the Ethernet/cable selector switch to Ethernet. Restart remote control. If the fault continue Call Vurmak for help.
FA_B_DUST	The alarm is given by the dust sensor of the blower and indicates some of the filter bags are damaged. Check if there is dust coming from blower relief valve. If yes check and replace damaged the filters bags of the kettles. If no check the function of the dust sensor, if it is damaged replace.
FA_B_HIPRES	The fault indicates high pressure of the suction pump. This error may be due to the suction pump relief valve opening late. At manual mode check the opening duration of the valve. Check the function of the pressure transmitter, if damaged replace.
FA_B_HM	During the blower is running speed control sensor (31HM) send a running signal to the PLC. The fault indicates that the signal is missing. Check the speed control sensor alignment. Check the wiring between speed control sensor and the PLC address. If it is damaged, replace the sensor.
FA_B_KAYIS	The looseness of the V-belts is controlled by the limit switch (31LS) placed under the pump chassis. If the belts are too loose, the pump chassis will touch the limit switch and give an error. Check the belts; replace them if they are too long. Check the limit switch; replace it if it is damaged...

FA_BH_LA	The fault indicates the pressure relief valve of the suction blower is trying to open but the open signal is missing. Check troubleshooting of FA_BH_LA from Menu > Documents > Faults troubleshooting.
FA_BH_LK	The fault indicates the pressure relief valve of the suction blower is trying to close but the close signal is missing. Check troubleshooting of FA_BH_LK from Menu > Documents > Faults troubleshooting
FA_BH_LS	The valve (32V) is the suction pump relief valve. The valve has open and close limit switches. The fault indicates that close and open signals are both actives. Calibrate the limit switches.
FA_DID_ACIL	The fault indicates at the Diesel (Discharge) status page, the operator clicked on emergency stop button. To release the fault click again on the button. Reset the alarm.
FA_DID_COOLEV	The fault indicates the water level of the discharge diesel engine radiator is low. Correct the level of the water. Check the function of level sensor (91SS1), If damaged replace the sensor.
FA_DID_DIHITMP	The fault indicates the cooler temperature of the discharge diesel engine is high. Check the cooler temperature. If the cooler level of the radiator is low, correct it. The signal is received from temperature sensor 91TS. Check the temperature sensor. If damaged replace.
FA_DID_DILOOIL_PRS	The fault indicates the oil pressure of the discharge diesel engine is low. The signal is detected by the pressure switch (91PS). Check the sensor, if damaged replace it.

FA_DID_FUSE	The fault indicates the fuse (91F1) of the discharge diesel acceleration is tripped. Check if there is short circuit or not. Set the fuse. Reset the alarm.
FA_DID_HISPD	The speed of the discharge diesel engine is measured through a speed sensor 91CS. The fault indicates the speed of the engine is high.
FA_DID_HITMP	The fault indicates the temperature of the discharge diesel engine measured though the analog transmitter (91TT) is high. Check the level of the cooler, if necessary correct it. Check the analog sensor, if damaged replace it.
FA_DID_ON	The fault indicates that the forced stop of the discharge diesel engine is activated. Check the faults of the diesel engine. Reset the alarm.
FA_DID_R	The fault indicates the speed of the discharge diesel engine is zero. Check the speed sensor (91CS) alignment of the engine.
FA_DIS_ACIL	The fault indicates at the Diesel (suction) status page, the operator clicked on emergency stop button. To release the fault click again on the button. Reset the alarm.
FA_DIS_COOLEV	The fault indicates the water level of the suction diesel engine radiator is low. Correct the level of the water. Check the function of level sensor (96SS1), If damaged replace the sensor.
FA_DIS_DIHITMP	The fault indicates the cooler temperature of the suction diesel engine is high. Check the cooler temperature. If the cooler level of the radiator is low, correct it. The signal is received from temperature sensor 96TS. Check the temperature sensor. If damaged replace.

FA_DIS_DILOOIL_PRS	The fault indicates the oil pressure of the suction diesel engine is low. The signal is detected by the pressure switch (96PS). Check the sensor, if damaged replace it.
FA_DIS_FUSE	The fault indicates the fuse (96F1) of the suction diesel acceleration is tripped. Check if there is short circuit or not. Set the fuse. Reset the alarm.
FA_DIS_HISPD	The speed of the suction diesel engine is measured through a speed sensor 96CS. The fault indicates the speed of the engine is high.
FA_DIS_HITMP	The fault indicates the temperature of the suction diesel engine measured though the analog transmitter (96TT) is high. Check the level of the cooler, if necessary correct it. Check the analog sensor, if damaged replace it.
FA_DIS_ON	The fault indicates that the forced stop of the suction diesel engine is activated. Check the faults of the diesel engine. Reset the alarm.
FA_DIS_R	The fault indicates the speed of the suction diesel engine is zero. Check the speed sensor (96CS) alignment of the engine.
FA_HP_DEMAR	The hydraulic pump (70M) is starts with a star/triangle contactor system. The fault indicates that at the end of startup duration defined at Menu > Settings > Hydraulic Pump > Startup duration the bypass signal of the contactor (70K2) is not received from PLC. Check the settings of the timer (70ZR). If the timer is damaged, replace it.
FA_HP_FAZK	The fault indicates the alarm of the Phase control relay (70FZ1) inside of the hydraulic local panel - Check low voltage status - Check missing phase status - Check phase sequence status

FA_HP_LEAK	
FA_HP_LOOIL	The fault indicates the oil level in the hydraulic oil tank is low. Check the oil level, if necessary correct it. Check the level sensor (70SS) if damaged replace.
FA_HP_LOPRS	The fault indicates the oil pressure of the hydraulic pump is lower then Low oil pressure fault level defined at Menu > Settings > Hydraulic Pump. Check the oil pressure transmitter (71P) if damaged replace the transmitter.
FA_HP_MCC	The fault indicates that the hydraulic pump overload relay (70Q1) in the hydraulic local panel is tripped. Check the motor. Set the overload relay to ON and reset the alarm.
FA_HPF_MCC	The fault indicates that the hydraulic pump cooling fan overload relay (71Q1) in the hydraulic local panel is tripped. Check the motor. Set the overload relay to ON and reset the alarm.
FA_HPF_R	While the hydraulic pump-cooling fan is running the contactor (71K1) should be energized. The contactor sends a run signal to the PLC from its auxiliary contact. The fault indicates that the run signal of the contactor is missing. Check if the contactor is energized or not. It should be energized. If the contactor is energized (It should be energized) Check 24VDC at both connectors of the auxiliary contacts. Check the wiring between the auxiliary contact of the contactor and the PLC input address.

FA_KM_DEMAR	The air compressor (42M) starts with a star/triangle contactor system. The fault indicates that at the end of startup duration, defined at Menu > Settings > Air compressor > Startup duration. The bypass signal of the contactor (42K2) is not received from PLC. Check 24VDC voltage at the auxiliary contacts of (42K2). Check the wring between auxiliary contact and PLC input address. Check the settings of the timer (42ZR). If the timer is damaged, replace it.
FA_KM_HIOILTMP	The fault indicates the air compressor high oil temperature fault. The oil temperature is measured by 42PT1 sensor. Check the sensor, if damaged replace it.
FA_KM_HIPRS	The fault indicates high pressure in the air compressor main air tank. Go to Menu > Settings > air compressor settings and Check the air compressor stop pressure The air pressure of the tank is measured by the sensor 42P1. Check the sensor if damaged replace it.
FA_KM_LOPRS	Insufficient control air pressure in the main air tank of the compressor. From Menu > Info > Air compressor faults check the status of the compressor and fix the faults. Check the pneumatic system for leakage The air pressure of the tank is measured by the sensor 42P1. Check the sensor if damaged replace it.
FA_KM_MCC	The fault indicates that the air compressor overload relay (42Q1) in the electrical panel is tripped. Check the motor. Set the overload relay to ON and reset the alarm.

FA_KM_R	The fault indicates that the running signal of the compressor is missing. Check troubleshooting of FA_KM_R from Menu > Documents > Faults troubleshooting.
FA_KM_S1	The fault indicates that the air compressor start switch (42S1) on the control panel is turned '0' position: Turn the switch to '1' position.
FA_KMF_LOPRS	Insufficient control air pressure in the filter air tank of the compressor. Check the pressure of the main tank of the air compressor. Check if the air compressor is running or not. If not running From Menu > Info > Air compressor faults check the status of the compressor and fix the faults. If running Check if the manual valve of the tank is open. Check the pneumatic system for leakage The pressure of the filter air tank is measured by the sensor (41P1) Check the sensor, if damaged replace it.
FA_KMK_MCC	The fault indicates that the air compressor dryer overload relay (43Q1) in the electrical panel is tripped. Check the motor. Set the overload relay to ON and reset the alarm.
FA_KMK_R	The fault indicates that the running signal of the air dryer is missing. Check troubleshooting of FA_KMK_R from Menu > Documents > Faults troubleshooting

FA_KMV_LOPRS	Insufficient control air pressure in the valve air tank of the compressor. Check the pressure of the main tank of the air compressor. Check if the air compressor is running or not. If not running From Menu > Info > Air compressor faults check the status of the compressor and fix the faults. If running Check if the manual valve of the tank is open. Check the pneumatic system for leakage The pressure of the filter air tank is measured by the sensor (41P2) Check the sensor, if damaged replace it.
FA_KUM_RDY	The control voltage switch on the control panel is turned to OFF position or the emergency stop is activated
FA_LINE1	220VAC control voltage L1 in the electrical panel is missing.
FA_LINE5	24VDC control voltage L5 is missing. Check the fuse 19F5
FA_LINE6	12VDC control voltage L6 is missing. Check the fuse 19F6
FA_LINE7	24VDC control voltage L7 is missing. Check the fuse 19F7
FA_MCC_HIHZ	The fault indicates that the frequency of the 400VAC system is high
FA_MCC_LOHZ	The fault indicates that the frequency of the 400VAC system is low
FA_MCC_LOVOLT	The fault indicates that the 400VAC system voltage is low.
FA_MCC_MISPH	The fault indicates that the 400VAC system has missing phase.

FA_MCC_PHSEQ	The fault indicates 400vAC system phases sequence is wrong.
FA_P_HIOILTMP	The fault indicates that the discharge pump oil temperature is high. The temperature sensor is 21PT1.
FA_P_HIOUTTMP	Discharge compressor out air temperature is high. The temperature sensor is 21PT2
FA_P_HIPRS	The fault indicates high pressure of blow pump. This error may be due to the blow pump relief valve opening late. At manual mode, check the opening time of the valve.
FA_P_LOINPRS	The fault indicates that the inlet air pressure is low. Clean the inlet air filter.If necessary replace it. The pressure sensor is 21P1.
FA_P_LOOILPRS	The fault indicates the discharge pump oil pressure is low. The oil pressure sensor code is 21P3.
FA_P_STEAM_MCC	The fault indicates that the blow compressor steam pump overload relay (22Q1) in the hydraulic local panel is tripped. Check the motor. Set the overload relay to ON and reset the alarm.
FA_P_STEAM_R	The fault indicates that the running signal of the steam pump of the blow pump is missing. Check troubleshooting of FA_P_STEAM_R from Menu > Documents > Faults troubleshooting
FA_PF_LA	The valve (24V) is the blow pump filter inlet valve The fault indicates the valve is trying to open but the open signal is missing. Check troubleshooting of FA_PF_LA from Menu > Documents > Faults troubleshooting.
FA_PF_LK	The valve (24V) is the blow pump filter inlet valve The fault indicates the valve is trying to close but the open signal is missing. Check troubleshooting of FA_PF_LK from Menu > Documents > Faults troubleshooting.

FA_PF_LS	The valve (24V) is the blow pump filter inlet valve. The valve has open and close limit switches. The fault indicates that close and open signals are both actives. Calibrate the limit switches.
FA_PH_LA	The valve (23V) is the blow pump relief valve. The fault indicates the valve is trying to open but the open signal is missing. Check troubleshooting of FA_PH_LA from Menu > Documents > Faults troubleshooting.
FA_PH_LK	The valve (23V) is the blow pump relief valve. The fault indicates the valve is trying to close but the close signal is missing. Check troubleshooting of FA_PH_LK from Menu > Documents > Faults troubleshooting.
FA_PH_LS	The valve (23V) is the blow pump relief valve. The valve has open and close limit switches. The fault indicates that close and open signals are both actives. Calibrate the limit switches.
FA_PL_FUSE	The fault indicates that the pipeline pressure regulation valve (25MOV) in the electrical panel is tripped. Check the motor. Set the overload relay to ON and reset the alarm.
FA_PL_LS	The valve (25MOV) is the pipeline pressure regulation motor operated valve. The valve has open and close limit switches. The fault indicates that close and open signals are both actives. Calibrate the limit switches.
FA_PL_POS	The valve (25MOV) is the pipeline pressure regulation motor operated valve. The fault indicates that the position indication of the valve is wrong. Go to Menu > Settings > Pipeline Regulation Valve Position calibration page. Perform position calibration of the valve following the instructions.

FA_PLC_MODULE	The fault indicates that some of the modules of PLC is not working at operation mode and send a fault message to the controller. Go to Menu > Info > Plc Status page The modules, which are not at operation mode, are shown by red color. Check 24VDC voltage on block. Check connection between PLC and block. Consult VURMAK for assistance.
FA_PLC_STOP	The fault indicates that PLC is at stop status. Go to Menu > Info > Plc Modules status page Restart PLC
FA_RFAN1_MCC	The fault indicates that the room cooling fan1 overload relay (81Q1) in the electrical panel is tripped. Check the motor. Set the overload relay to ON and reset the alarm.
FA_RFAN1_R	The fault indicates that the running signal of the room fan1 motor is missing. Check troubleshooting of FA_RFAN1_R from Menu > Documents > Faults troubleshooting
FA_RFAN2_MCC	The fault indicates that the room cooling fan2 overload relay (82Q1) in the electrical panel is tripped. Check the motor. Set the overload relay to ON and reset the alarm.
FA_RFAN2_R	The fault indicates that the running signal of the room fan2 motor is missing. Check troubleshooting of FA_RFAN2_R from Menu > Documents > Faults troubleshooting
FA_ROOM_SMOKE	The alarm is given by the smoke detectors (83SS1-83SS2) installed inside of the diesel container. Stop all the activities of the systems. Check diesel container
FA_ROOM_TMP	The fault is given by the temperature sensor (83TT) installed inside of the diesel container. Stop the diesel engine. Check the diesel container temperature.

FA_SETTINGS_ARM	The fault indicates that some of the parameters of the arm settings are not defined. Go to Menu > Settings > Arm Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SETTINGS_B	The fault indicates that some of the parameters of the suction pump settings are not defined. Go to Menu > Settings > Suction pump Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SETTINGS_DE	The fault indicates that some of the parameters of the diesel engines settings are not defined. Go to Menu > Settings > Diesel engine common Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SETTINGS_DID	The fault indicates that some of the parameters of the diesel (discharge) settings are not defined. Go to Menu > Settings > Diesel discharge Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SETTINGS_DIS	The fault indicates that some of the parameters of the diesel suction settings are not defined. Go to Menu > Settings > Diesel suction Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SETTINGS_HP	The fault indicates that some of the parameters of the Hydraulic settings are not defined. Go to Menu > Settings > Hydraulic Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SETTINGS_KETTLES	The fault indicates that some of the parameters of the kettles settings are not defined. Go to Menu > Settings > Kettles Settings Undefined parameters are shown by red color. Define missing parameters.

FA_SETTINGS_KM	The fault indicates that some of the parameters of the air compressor settings are not defined. Go to Menu > Settings > Air compressor Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SETTINGS_P	The fault indicates that some of the parameters of the discharge pump settings are not defined. Go to Menu > Settings > Discharge pump Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SETTINGS_PIPELINE	The fault indicates that some of the parameters of the pipeline settings are not defined. Go to Menu > Settings > Pipeline Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SETTINGS_ROOM	The fault indicates that some of the parameters of the machinery room settings are not defined. Go to Menu > Settings > Machinery room Settings Undefined parameters are shown by red color. Define missing parameters.
FA_SYS_SETTINGS	The fault indicates that some of the parameters of the system settings are not defined. Go to Menu > Settings > System Settings Undefined parameters are shown by red color. Define missing parameters.
FA_T1_HIPRS	The fault indicates high pressure inside of the kettle1. The late closing time of the blow air inlet valve (55V) can be the cause of the fault. Check the closing time of the valve. If it is long, it can be because of the damage of the inner liner of the valve. Replace the valve. The pressure of the kettle is measured by pressure transmitter (51P1) Check the pressure transmitter, if damaged replace it.
FA_T1_LEAK	The fault is given if the kettle pressure is not reach to the Discharge start pressure in a period, defined at

	Pneumatic Loading system Menu > Settings > Kettles Settings The alarm indicates air leakage from kettle1
FA_T1_MAX	The fault indicates at the end of the discharge the level sensor (50SS) inside of the kettle1 is still sending max signal. Check and clean the level sensor. If damaged replace the level sensor
FA_T1B_LA	The valve (52V) is Kettle1 suction air valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T1B_LA from Menu > Documents > Faults troubleshooting.
FA_T1B_LK	The valve (52V) is Kettle1 suction air valve. The fault indicates that the valve is trying to close, but the closed signal is missing. Check troubleshooting of FA_T1B_LK from Menu > Documents > Faults troubleshooting.
FA_T1C_LA	The valve (56V) is Kettle1 cement discharge valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T1C_LA from Menu > Documents > Faults troubleshooting.
FA_T1C_LK	The valve (56V) is Kettle1 cement discharge valve. The fault indicates that the valve is trying to close, but the closed signal is missing. Check troubleshooting of FA_T1C_LK from Menu > Documents > Faults troubleshooting.
FA_T1F_LA	The valve (54V) is Kettle1 pressure relief valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T1F_LA from Menu > Documents > Faults troubleshooting.
FA_T1F_LK	The valve (54V) is Kettle1 pressure relief valve. The fault indicates that the valve is trying to close, but the closed signal is missing.

	Check troubleshooting of FA_T1F_LK from Menu > Documents > Faults troubleshooting.
FA_T1G_LA	The valve (53V) is Kettle1 cement inlet valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T1G_LA from Menu > Documents > Faults troubleshooting.
FA_T1G_LK	The valve (53V) is Kettle1 cement inlet valve. The fault indicates that the valve is trying to close, but the closed signal is missing. Check troubleshooting of FA_T1G_LK from Menu > Documents > Faults troubleshooting.
FA_T1P_LA	The valve (55V) is Kettle1 blow air inlet valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T1P_LA from Menu > Documents > Faults troubleshooting.
FA_T1P_LK	The valve (55V) is Kettle1 blow air inlet valve. The fault indicates that the valve is trying to close, but the closed signal is missing. Check troubleshooting of FA_T1P_LK from Menu > Documents > Faults troubleshooting.
FA_T2_HIPRS	The fault indicates high pressure inside of the kettle2. The late closing time of the blow air inlet valve (65V) can be the cause of the fault. Check the closing time of the valve. If it is long, it can be because of the damage of the inner liner of the valve. Replace the valve. The pressure of the kettle is measured by pressure transmitter (61P1) Check the pressure transmitter, if damaged replace it.
FA_T2_LEAK	The fault is given if the kettle pressure is not reach to the Discharge start pressure in a period, defined at Pneumatic Loading system Menu > Settings > Kettles Settings

	The alarm indicates air leakage from kettle2
FA_T2_MAX	The fault indicates at the end of the discharge the level sensor (60SS) inside of the kettle2 is still sending max signal. Check and clean the level sensor. If damaged replace the level sensor
FA_T2B_LA	The valve (62V) is Kettle6 suction air valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T2B_LA from Menu > Documents > Faults troubleshooting.
FA_T2B_LK	The valve (62V) is Kettle2 suction air valve. The fault indicates that the valve is trying to close, but the closed signal is missing. Check troubleshooting of FA_T2B_LK from Menu > Documents > Faults troubleshooting.
FA_T2C_LA	The valve (66V) is Kettle2 cement discharge valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T2C_LA from Menu > Documents > Faults troubleshooting.
FA_T2C_LK	The valve (66V) is Kettle2 cement discharge valve. The fault indicates that the valve is trying to close, but the closed signal is missing. Check troubleshooting of FA_T2C_LK from Menu > Documents > Faults troubleshooting.
FA_T2F_LA	The valve (64V) is Kettle2 pressure relief valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T2F_LA from Menu > Documents > Faults troubleshooting.
FA_T2F_LK	The valve (64V) is Kettle2 pressure relief valve. The fault indicates that the valve is trying to close, but the closed signal is missing. Check troubleshooting of FA_T2F_LK from Menu > Documents > Faults troubleshooting.

FA_T2G_LA	The valve (63V) is Kettle2 cement inlet valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T2G_LA from Menu > Documents > Faults troubleshooting.
FA_T2G_LK	The valve (63V) is Kettle2 cement inlet valve. The fault indicates that the valve is trying to close, but the closed signal is missing. Check troubleshooting of FA_T2G_LK from Menu > Documents > Faults troubleshooting.
FA_T2P_LA	The valve (65V) is Kettle2 blow air inlet valve. The fault indicates that the valve is trying to open, but the closed signal is still active. Check troubleshooting of FA_T2P_LA from Menu > Documents > Faults troubleshooting.
FA_T2P_LK	The valve (65V) is Kettle2 blow air inlet valve. The fault indicates that the valve is trying to close, but the closed signal is missing. Check troubleshooting of FA_T2P_LK from Menu > Documents > Faults troubleshooting.