

Documentation of the parylene machine control software V2.1 for SN 120159

Main picture | 22.09.2020 09:20:02

F2 Main picture | F3 Programs | F4 Diagram | F5 Alarmlist | F6 Archive | F7 Settings | F8 Maintenance

Operating mode
 Automatic | Manual

Automatic
 Program: Prog1
 F10 Start | F11 Stop

Preparation 00:07:21 hh:mm:ss
 Coating 00:11:33 hh:mm:ss
 Cooling 00:00:00 hh:mm:ss
 Waiting 00:00:00 hh:mm:ss
 Venting 00:00:00 hh:mm:ss
 Total duration: 00:18:55 hh:mm:ss

Controller
 ON | OFF
 EMERGENCY OFF

Rotary drive
 Enable | Set speed: 80 % | Position Error

Heating circuits

Si	Do	Pyro	Pyro	Pressure pump
Set temperature: SP 40 °C	Set temperature: SP 40 °C	Set temperature: SP 40 °C	Set pressure: SP 2.000 mbar	Set temperature: SP 40 °C
Actual temperature: CV 40 °C	Actual temperature: CV 40 °C	Actual temperature: CV 0 °C	Actual pressure: CV 984.87 mbar	Actual temperature: CV 40 °C
		PWM 0 %		LOW

Pressure chamber: 9.85E+2 mbar
 984.876

Pressure pump: 1.00E-2 mbar

Date: 22.09.2020

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1. General

The described software is for the control of a parylene machine.

The software allows the input of all necessary parameters, and shows all interesting process parameters during the process (process picture and diagram).

There are two operating facilities:

- Manual mode
- Automatic mode

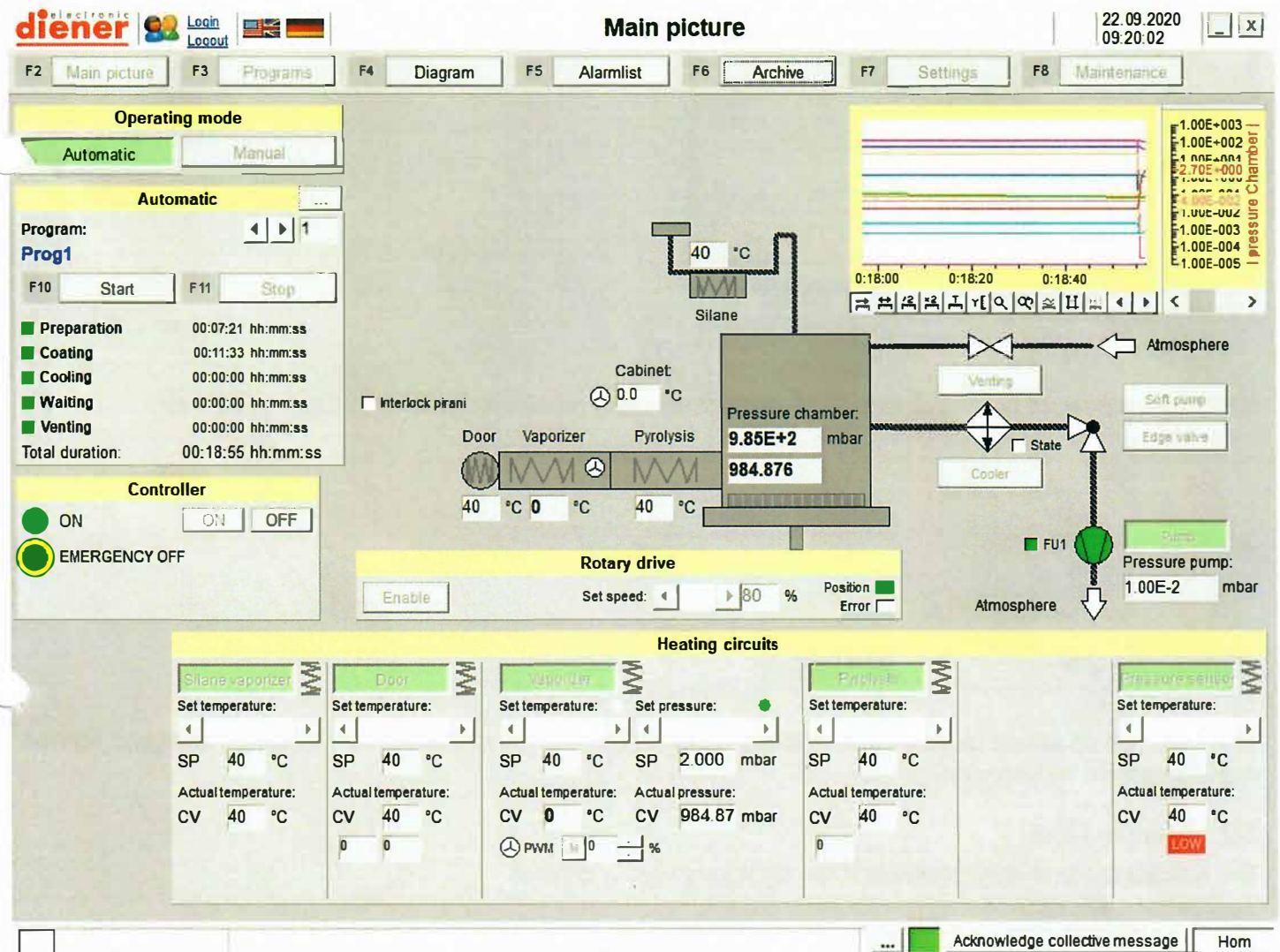
2. System requirements

To run the software you need an IBM compatible PC (standard PC, industrial PC) and the operating system or Windows XP or Windows 7.

3. Operating modes

3.1. Manual mode

The manual mode will be shown after entering the password. The following picture appears:



3.1.1 Login / Logout

If the button 'Login...' (F9) is pressed the following dialog appears:



The default password for the setter is "PRS".

If the right password is entered and OK is pressed the main picture is shown in the following way:

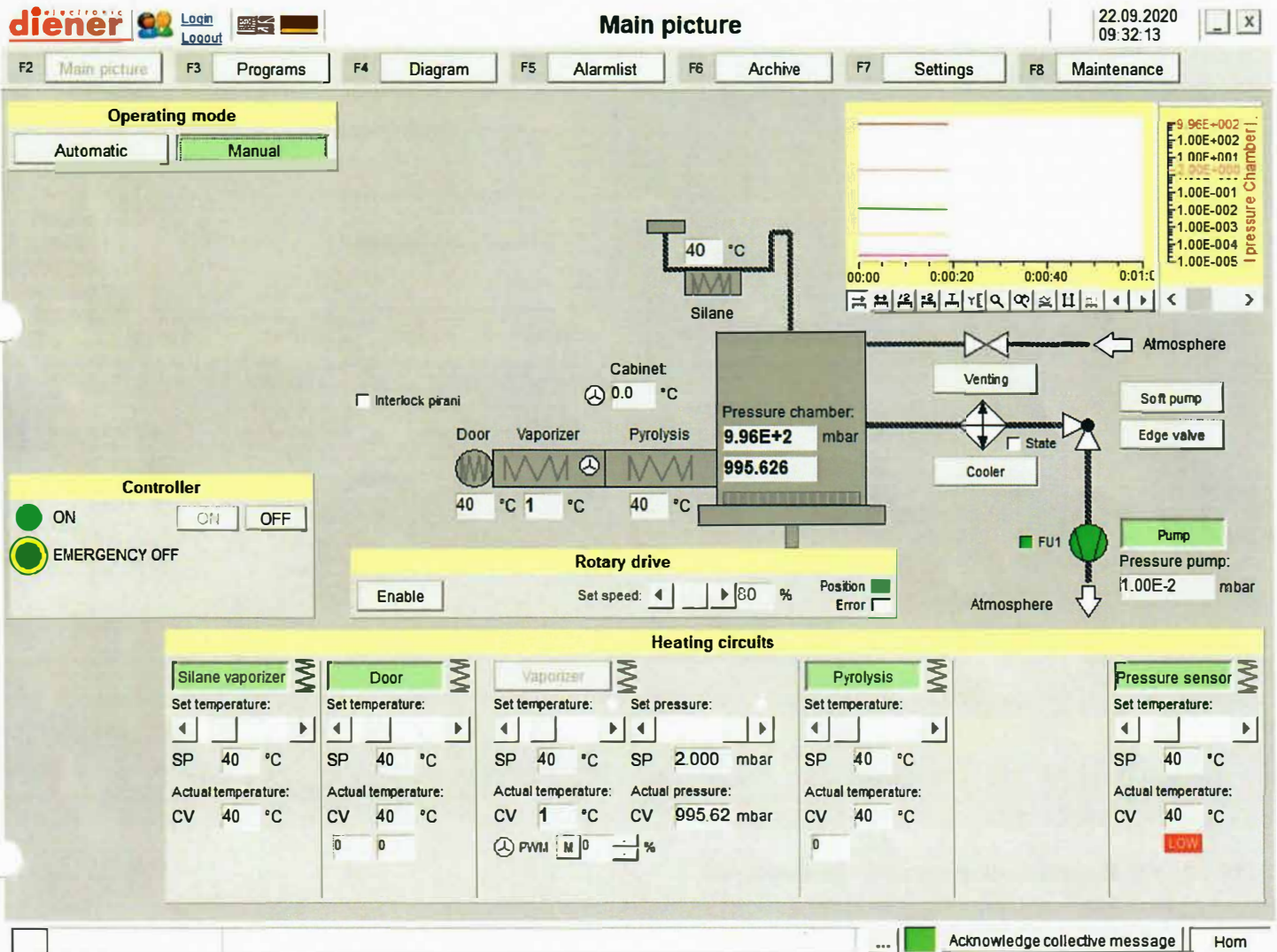
3.2 Operating Modes



There are two operation modes, automatic and manual. The manual mode is only for inauguration and service and is protected by password.

3.2.1 Manual Mode

The manual mode is only available if the right password is entered.



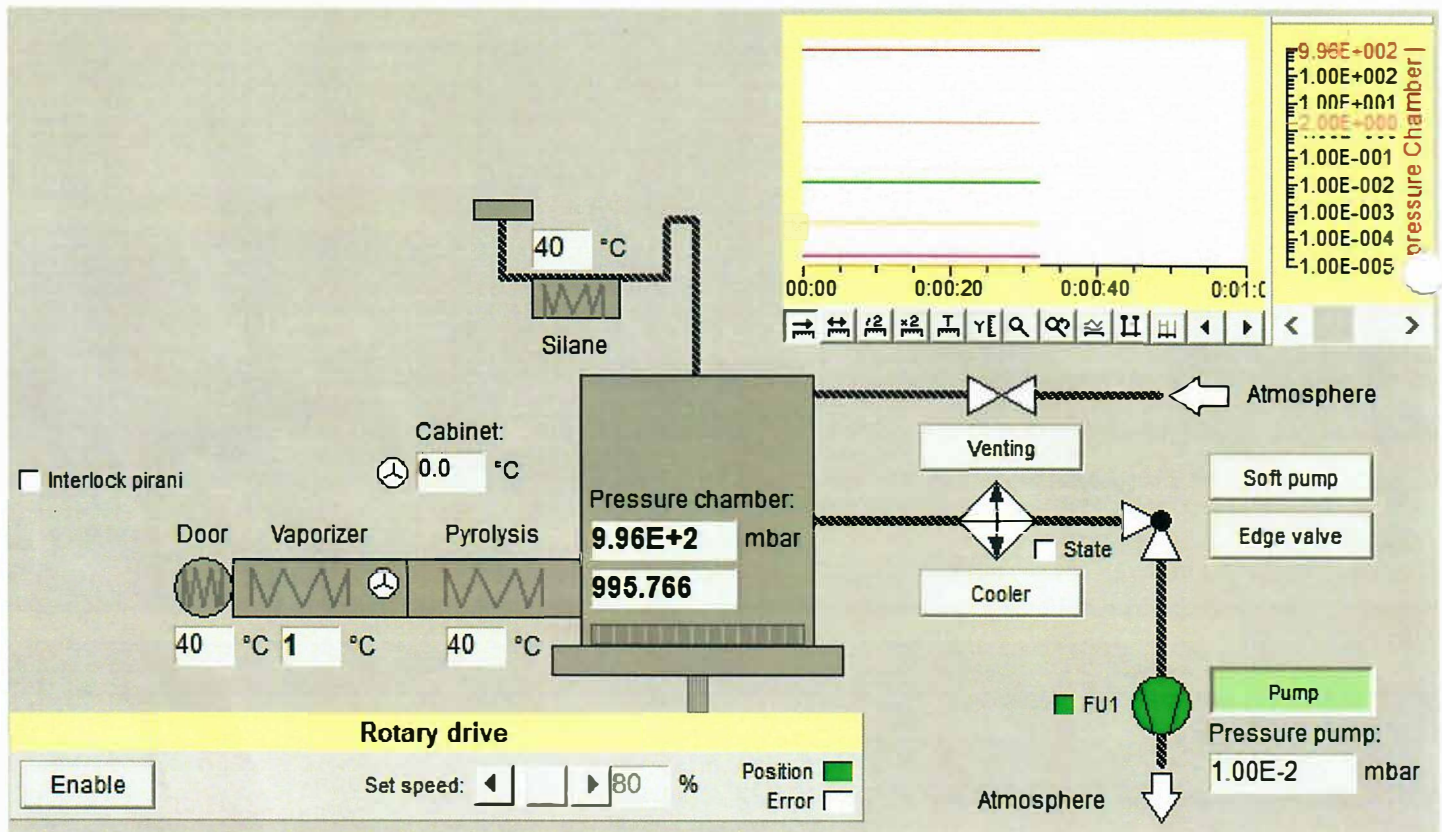
Now the manual mode can be used (CTRL+ M Manual).

In the manual mode all operating parameters in the process figure can be entered.

For example the edge valve can be switched manual etc..

Locked control elements show, that the belonging actions cannot be done caused by actual process conditions or safety reasons. (E.g. as long as the edge valve is open, it is not allowed to flush the chamber).

3.2.1.1 Chamber and pump stand



The state of the interlock pirani will be displayed.

Actual temperatures and pressures are displayed.

Rotary drive:

Set rotation speed can be set.

“Enable” enables the moving of the rotary drive.

If the supervisory time will be exceeded (→Settings) the alarm light “Error” is blinking red.

In the manual mode, the venting valves can be switched (if process conditions allow this).

The heatings for door, chamber, pyrolysis and vaporizer will be observed. If one or more of these temperatures are different to the default values an entry in the →alarmlist appears.

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In the manual mode the edge valve and the soft pump valve can be switched on/or off.

The pump switches on automatically with starting the machine (control on).

Soft pump can be chosen.

The state of the limit switches for the edge valve are visualized (O = open, C = closed).

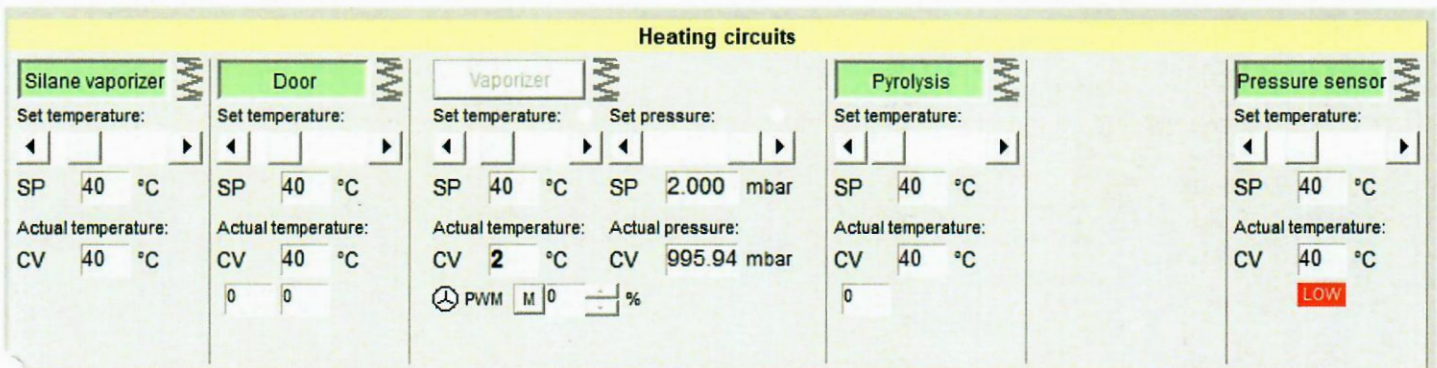
Pressure pump will be displayed.

3.2.1.2 Heating circuits

Each heating circuit can be switched on or off separately.

For each heating circuit set temperature can be set and actual temperature will be displayed.

The fans can be switched on or off.

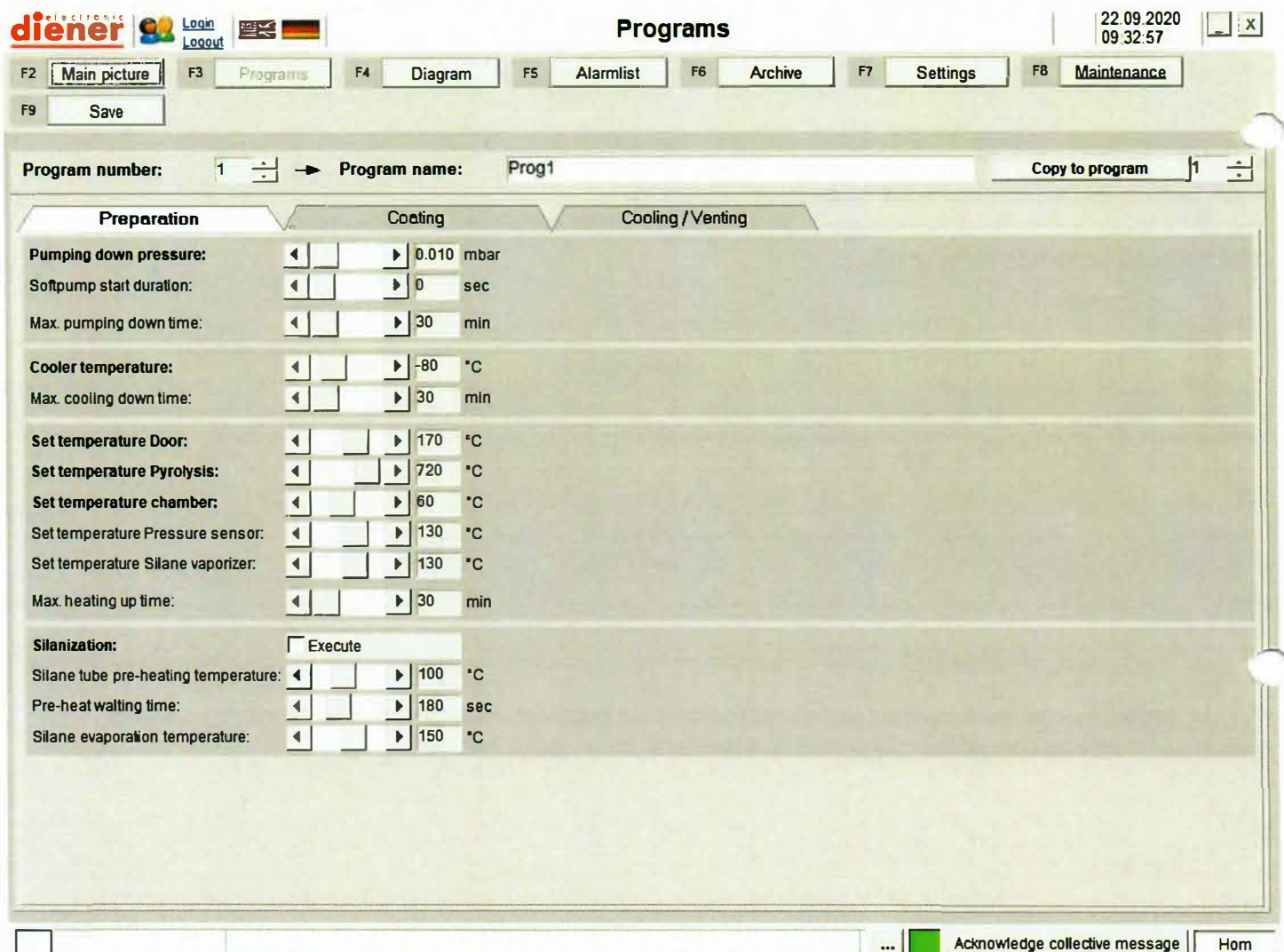


For the vaporizer can be input a set temperature and a set pressure. Control software decides on which parameter it will be controlled (displayed on visualization by green indicator).

3.2. Automatic mode

For the automatic mode the software PRS offers the opportunity to program different processes through the process parameters.

With the function F3 Programs these processes will be created. Creating processes is only possible, if the user is logged in (password).



100 program places are prepared, in which each program number is belonging to a program name.

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Creating of a program will be done in the following sequence:

1. Preparation period
2. Coating period
3. Cooling/Venting

Program number:	<input type="text" value="1"/>	→	Program name:	<input type="text" value="Prog1"/>	Copy to program	<input type="text" value="1"/>
-----------------	--------------------------------	---	---------------	------------------------------------	-----------------	--------------------------------

If the content of an already built program should be copied to another program, the program which should be copied is to choose. Then it can be specified in which program it should be copied.

3.2.1. Preparation period

Pumping down pressure:	◀ ▶	0.010	mbar
Softpump start duration:	◀ ▶	0	sec
Max. pumping down time:	◀ ▶	30	min
Cooler temperature:	◀ ▶	-80	°C
Max. cooling down time:	◀ ▶	30	min
Set temperature Door:	◀ ▶	170	°C
Set temperature Pyrolysis:	◀ ▶	720	°C
Set temperature chamber:	◀ ▶	60	°C
Set temperature Pressure sensor:	◀ ▶	130	°C
Set temperature Silane vaporizer:	◀ ▶	130	°C
Max. heating up time:	◀ ▶	30	min
Silanization:	<input type="checkbox"/> Execute		
Silane tube pre-heating temperature:	◀ ▶	100	°C
Pre-heat waiting time:	◀ ▶	180	sec
Silane evaporation temperature:	◀ ▶	150	°C

At this point the input of the Pumping down pressure and the maximum pumping down time will be made. If this time will be exceeded an error message and an entry in the *Alarm list* appears.

Softpump start duration can be set.

Cooler temperature and maximum cooling down time can be set.
 If this time will be exceeded an error message and an entry in the *Alarm list* appears.

Set temperature door, set temperature pyrolysis, set temperature chamber, set temperature pressure sensor and set temperature silane vaporizer can be set.

Tolerance for the temperatures is 10°C plus and minus within 10 seconds.

Further maximum heating up time can be set.
 If this time will be exceeded for one or more elements the respectively error message and an entry in the *Alarm list* appears.

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For silanization it can be selected, if it should be executed.

If it will be executed, following parameters can be set:

- Silane tube pre-heating temperature
- Pre-heat waiting time
- Silane evaporation temperature

3.2.2. Coating period

Pump valve: <input type="text" value="Edge valve"/>		Max. pressure deviation Vaporizer:		Minimum active time:	
		Warning: + <input type="text" value="0.020"/> mbar <input type="text" value="10"/> sec			
		Abort: + <input type="text" value="0.050"/> mbar <input type="text" value="10"/> sec			
Vaporizer:		Max. temperature deviation Door:		Minimum active time:	
Set pressure:		Warning: +/- <input type="text" value="10"/> °C <input type="text" value="10"/> sec			
P1 <input type="text" value="0.040"/> mbar <input type="text" value="0"/> min		Abort: +/- <input type="text" value="20"/> °C <input type="text" value="10"/> sec			
P2 <input type="text" value="0.040"/> mbar <input type="text" value="0"/> min					
Set temperature:		Max. temperature deviation Post-Pyro:		Minimum active time:	
T1 <input type="text" value="160"/> °C <input type="text" value="0"/> min		Warning: +/- <input type="text" value="10"/> °C <input type="text" value="10"/> sec			
T2 <input type="text" value="160"/> °C <input type="text" value="0"/> min		Abort: +/- <input type="text" value="20"/> °C <input type="text" value="10"/> sec			
T3 <input type="text" value="0"/> min					
T4 <input type="text" value="0"/> min					
		Max. temperature deviation Pressure sensor:		Minimum active time:	
		Warning: +/- <input type="text" value="10"/> °C <input type="text" value="10"/> sec			
		Abort: +/- <input type="text" value="20"/> °C <input type="text" value="10"/> sec			
Minimum coating duration: <input type="text" value="0"/> min		Max. temperature deviation Chamber:		Minimum active time:	
Maximum coating duration: <input type="text" value="120"/> min		Warning: +/- <input type="text" value="10"/> °C <input type="text" value="10"/> sec			
Set rotation speed rotary drive: <input type="text" value="80"/> %		Abort: +/- <input type="text" value="20"/> °C <input type="text" value="10"/> sec			
		Max. temperature deviation Silane vaporizer:		Minimum active time:	
		Warning: +/- <input type="text" value="10"/> °C <input type="text" value="10"/> sec			
		Abort: +/- <input type="text" value="20"/> °C <input type="text" value="10"/> sec			
		Max. cooler temperature:		Minimum active time:	
		Warning: +/- <input type="text" value="-70"/> °C <input type="text" value="10"/> sec			
		Abort: +/- <input type="text" value="-60"/> °C <input type="text" value="10"/> sec			

Pump valve can be selected (edge valve or soft pump).

For vaporizer set pressure and set temperature can be set.

Setpoint pressure and setpoint temperature (with the associated times) can be specified for the vaporizer in the form of ramps.

Minimum and Maximum coating duration can be set.

If this time will be exceeded an error message and an entry in the *Alarm list* appears.

Set rotation speed for rotary drive can be set.

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For following temperatures a warning and a abort temperature can be set:

- Maximum temperature deviation vaporizer
- Maximum temperature deviation door
- Maximum temperature deviation Post-Pyro
- Maximum temperature Pressure sensor
- Maximum temperature deviation Chamber
- Maximum cooler temperature

The minimum active time min means, the time which the respectively value has to be out of ranges before an alarm will be generated.

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3.2.3. Cooling /Venting

Vaporizer cooling down temperature:	◀	□	▶	40	°C
Waiting time until venting:	◀	□	▶	15	min
Venting time:	◀	□	▶	60	sec
<input type="checkbox"/> Switch off pump at end of process					

Vaporizer cooling down temperature must be set.

Waiting time until venting and venting time must be set.

Switch off pump at end of process can be selected.

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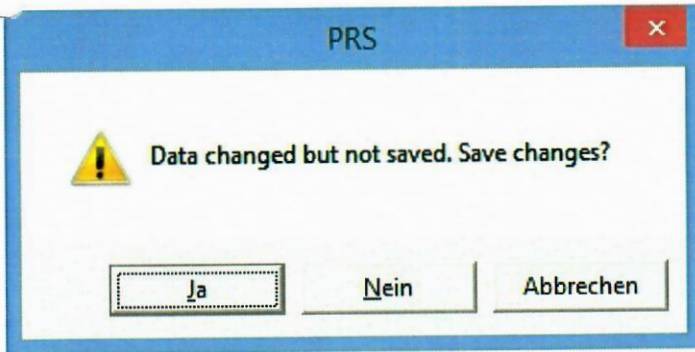
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3.2.4. Saving of programs

The program parameters can be saved with *F9 Save*. With this saving **all** programs will be saved, not only the actual created program.

If the program window will be left without saving the actual changes, the following message box appears:

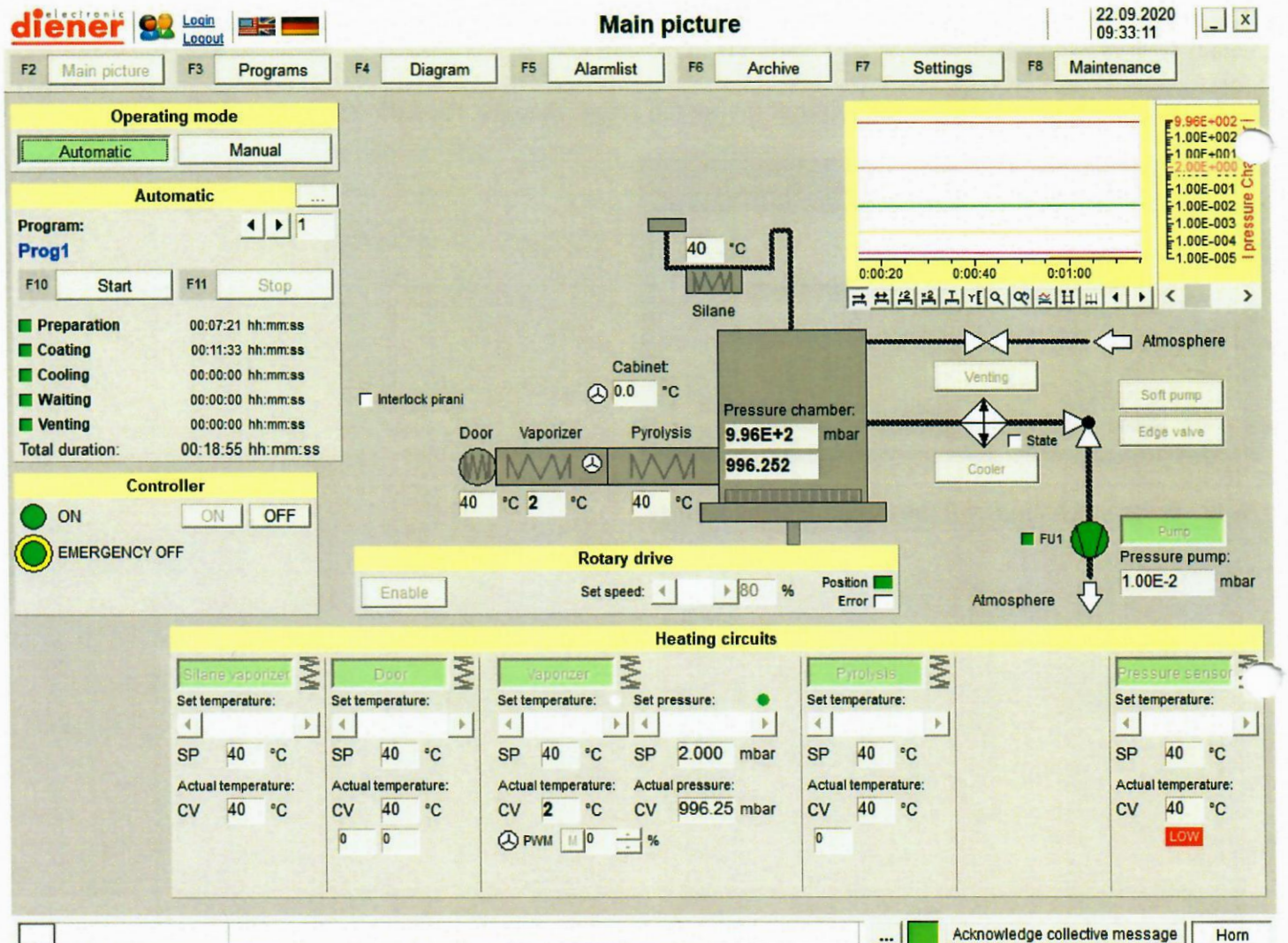


Note: Program changes will be effective after saving!

4. Operating

4.1. Start of the automatic mode

After creating the process in the picture *F3 Programs* it can be changed back in the *main picture (F1)*.



A program can be chosen by the program number; the corresponding program name will be shown.

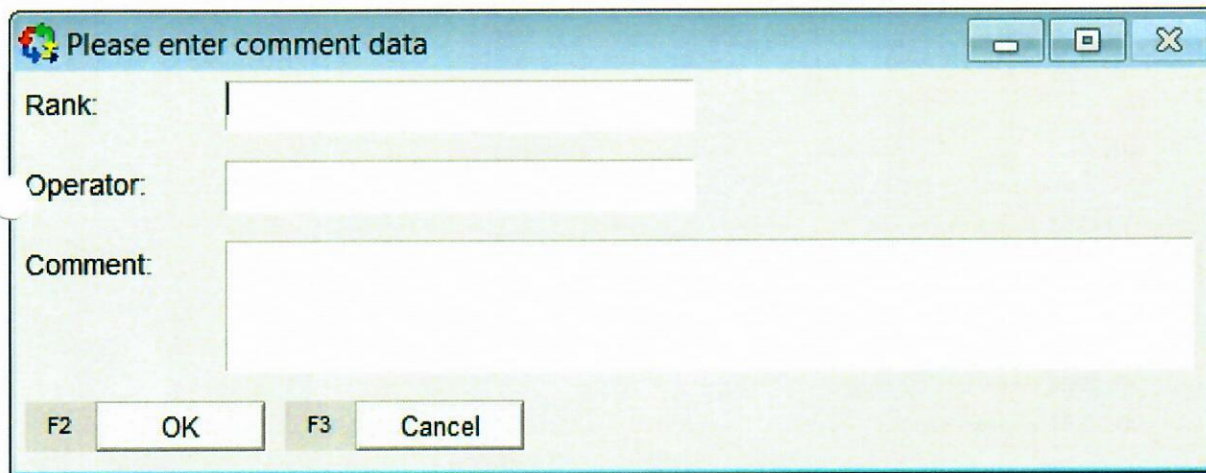
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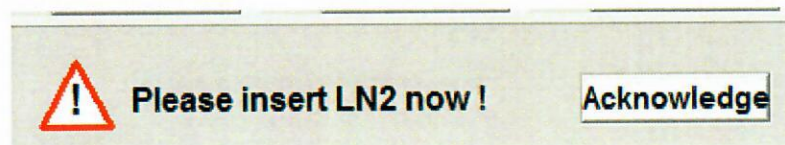
If an automatic program should be started, the button “start” must be pressed and the following dialogue appears:



The image shows a Windows-style dialog box with the title "Please enter comment data". It contains three input fields: "Rank:", "Operator:", and "Comment:". At the bottom, there are two buttons: "OK" (with F2 above it) and "Cancel" (with F3 above it). The dialog box has standard minimize, maximize, and close buttons in the top right corner.

Rank and operator must be filled out, then the button F2”OK” can be pressed and the chosen program will be started.

If liquid nitrogen should be inserted, the following message appears:



If “Acknowledge” is pressed the process goes on.

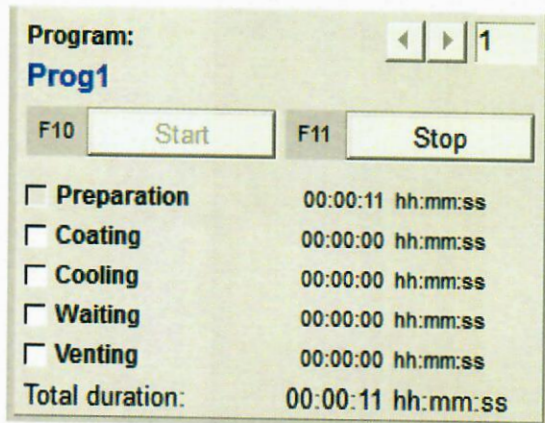
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Under the heading „process stage” the actual process step is displayed by green blinking. Near the actual process step the actual passed step time is displayed.



If button “...” is pressed the following picture with detailed information will be displayed:

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The screenshot shows a software window titled 'Auto...' with standard window controls (minimize, maximize, close). The window displays a program configuration for 'Prog1'. The program is divided into several stages, each with a duration and a list of components to be controlled. The 'Preparation' stage is currently active, indicated by a green square. The 'Coating' stage is also visible but not active. The 'Total duration' is shown as 00:00:03. At the bottom, a status bar indicates 'PUMPING PRESSURE <0.1 MBAR'.

Stage	Duration	Components
Preparation	00:00:03 hh:mm:ss	<input type="checkbox"/> Pressure Chamber <input type="checkbox"/> Temperature Door <input type="checkbox"/> Temperature Vaporizer <input type="checkbox"/> Temperature Pyrolysis <input type="checkbox"/> Temperature Sensor <input type="checkbox"/> Temperature Silane vaporizer <input type="checkbox"/> Temperature Cooler
Coating	00:00:00 hh:mm:ss	<input checked="" type="checkbox"/> Pressure Chamber <input checked="" type="checkbox"/> Temperature Door <input checked="" type="checkbox"/> Temperature Vaporizer <input checked="" type="checkbox"/> Temperature Pyrolysis <input checked="" type="checkbox"/> Temperature Sensor <input checked="" type="checkbox"/> Temperature Silane vaporizer <input checked="" type="checkbox"/> Temperature Cooler
Cooling	00:00:00 hh:mm:ss	
Waiting	00:00:00 hh:mm:ss	
Venting	00:00:00 hh:mm:ss	
Total duration:	00:00:03 hh:mm:ss	

5 PUMPING PRESSURE <0.1 MBAR

Stop stops the actual process, it stops exactly at the point the stop-button is pressed. If a possible evacuated chamber should be vented, it is necessary to change to the manual mode.

The breaking off will also be done if a critical error occurred. An error will be displayed by the red blinking of the error lamp. The corresponding error message can be looked up in the *Alarm list*.

During the process runs, the ready lamp is steady green.

If the process has finished the ready lamp will change from green to white (off).

End of process: The process will be finished successfully, if maximum temperature is reached and the current pressure value is below or equal to the pumping down pressure.

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4.2. Error messages/Alarmlist

Pid	Date and time	Message text	Event	Program	Charge
A	25.04.2017 15:35:39	The maximum evacuation duration has been exceeded	Came	Par C Standard	
A	25.04.2017 15:35:39	The maximum door heating duration has been exceeded	Came	Par C Standard	

In the alarm list (to reach with *F5 Alarm list*) all appeared alarms/errors will be listed with date and time of its appearing.

With red letters the incoming alarm/error will be shown and in green letters the gone of the alarm/error.

The horn can be switched on or off.

The alarm list is divided in new list, old list and chronicle.

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The alarm list contents on the right margin a menu bar. With this menu bar the different lists can be displayed, alarms can be acknowledged.

4.2.1 New list

In the new list are all new and not acknowledged alarms listed. The new list can be displayed with the button  in the menu bar of the alarm list.

Pid	Date and time	Message text	Event	Program	Charge
A	25.04.2017 15:35:39	The maximum evacuation duration has been exceeded	Came	Par C Standard	
A	25.04.2017 15:35:39	The maximum door heating duration has been exceeded	Came	Par C Standard	

The following alarms can appear:

- Internal error occurred! Please inform service!
- Communication error Mini-IO control board 1!

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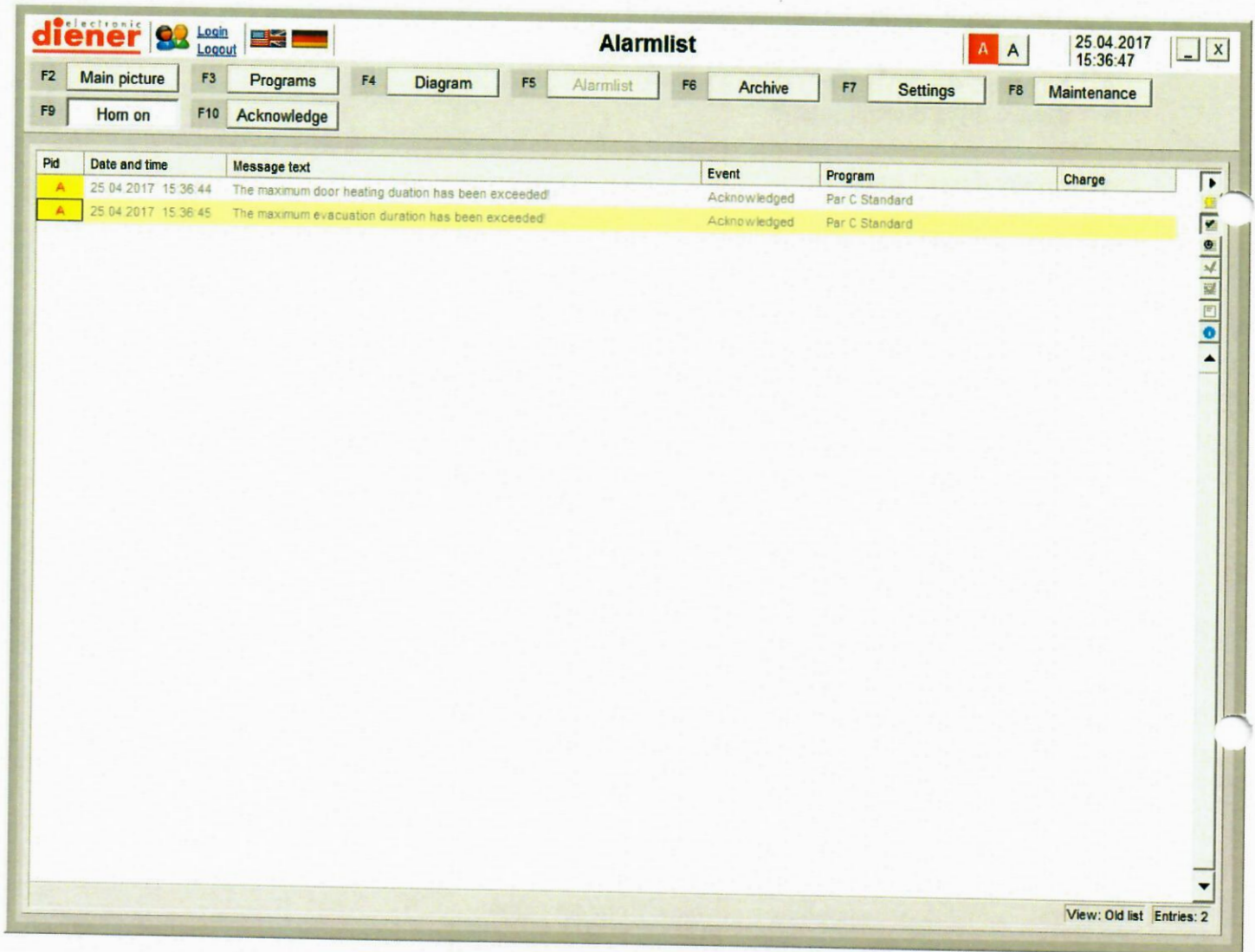
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- Communication error Mini-IO control board 2!
- Emergency-off has been pressed or control is OFF!
- Air monitor reports no compressed air!
- The temperature of the recipient is too high!
- Motor safety device for pump released!
- Rotary drive doesn't rotate!
- Cooler doesn't cool!
- The operator stopped the process!
- The maximum evacuation duration has been exceeded!
- The maximum cooling duration has been exceeded!
- The maximum door heating duration has been exceeded!
- The maximum chamber heating duration has been exceeded!
- The maximum pyrolysis heating duration has been exceeded!
- The maximum pressure sensor heating duration has been exceeded!
- The maximum silane vaporizer heating duration has been exceeded!
- The actual chamber pressure is too high!
- The actual cooler temperature is too high!
- The actual door temperature deviates too much!
- The actual chamber temperature deviates too much!
- The actual pyrolysis temperature deviates too much!
- The actual pressure sensor temperature deviates too much!
- The actual silane vaporizer temperature deviates too much!
- The maximum coating duration has been exceeded!
- The actual chamber pressure is very high!
- The actual cooler temperature is very high!
- The actual door temperature deviates from set value!
- The actual chamber temperature deviates from set value!
- The actual pyrolysis temperature deviates from set value!
- The actual pressure sensor temperature deviates from set value!
- The actual silane vaporizer temperature deviates from set value!

4.2.2 Old list

In the old list all alarms listed, which are acknowledged but still activ.

The old list can be displayed with the button  in the menu bar of the alarm list.




The screenshot shows the 'Alarmlist' window with a menu bar and a table of alarm entries. The menu bar includes buttons for 'Main picture', 'Programs', 'Diagram', 'Alarmlist', 'Archive', 'Settings', 'Maintenance', 'Hom on', and 'Acknowledge'. The table displays two entries, both acknowledged.

Pid	Date and time	Message text	Event	Program	Charge
A	25.04.2017 15:36:44	The maximum door heating duration has been exceeded!	Acknowledged	Par C Standard	
A	25.04.2017 15:36:45	The maximum evacuation duration has been exceeded!	Acknowledged	Par C Standard	

View: Old list Entries: 2

4.2.3 Chronicle

The chronicle contents the last 100 alarms (came, gone and acknowledged) in chronological order. The chronicle can be displayed with the button  in the menu bar of the alarm list.



The screenshot shows the 'Alarmlist' window with a menu bar at the top containing buttons for 'Main picture', 'Programs', 'Diagram', 'Alarmlist', 'Archive', 'Settings', 'Maintenance', 'Horn on', and 'Acknowledge'. The 'Alarmlist' button is highlighted. The main area displays a table of 10 alarm entries. The first entry is highlighted in yellow, and the last entry is highlighted in red. The table columns are: Pid, Date and time, Message text, Event, Program, and Charge. The status 'A' is shown in the top right corner, along with the date and time '25.04.2017 15:36:59'. At the bottom right, it says 'View: Chronicle Entries: 10'.

Pid	Date and time	Message text	Event	Program	Charge
A	23.04.2017 10:12:20	Internal error occured! Please inform service!	Came	Prog1	
A	23.04.2017 10:12:25	Communication error Mini-IO control board 1	Came	Prog1	
A	23.04.2017 10:12:25	Communication error Mini-IO control board 2	Came	Prog1	
A	23.04.2017 10:13:55	Internal error occured! Please inform service!	Came	Prog1	
A	23.04.2017 10:14:06	Motor safety device for pump released!	Came	Prog1	
A	23.04.2017 10:14:34	Internal error occured! Please inform service!	Went	Prog1	
A	25.04.2017 15:35:39	The maximum evacuation duration has been exceeded!	Came	Par C Standard	
A	25.04.2017 15:35:39	The maximum door heating duration has been exceeded!	Came	Par C Standard	
A	25.04.2017 15:36:44	The maximum door heating duration has been exceeded!	Acknowledged	Par C Standard	
A	25.04.2017 15:36:45	The maximum evacuation duration has been exceeded!	Acknowledged	Par C Standard	

5. Settings

At the point *F7 Settings* there will be made the settings, which not depend on the process but depend on the machine and the customer.

The screenshot shows the 'Settings' window of the Diener control system. The interface includes a top navigation bar with function keys (F2-F12) and a main content area divided into several numbered sections:

- 1 Heatings:** Configures base temperatures (40 °C) and actual temperature calculations for Door, Vaporizer, Pyrolysis, Chamber, Pressure sensor, and Silane vaporizer.
- 2 Temperature sensors:** Sets scaling minimum and maximum values for Door 1/2, Vaporizer, Chamber 1/2, Pyrolysis 1/2/3, Cooler, Pressure sensor, Cabinet, and Silane vaporizer.
- 3 Fans:** Configures PWM for Vaporizer and Case, with switch-on temperatures of 40 °C and 50 °C respectively.
- 4 Equipment:** Checks for the installation of various components like Emergency off relays, Soft pump, Butterfly valve, Cooler output, PCS, Motor safety device, and Overtemp recipient.
- 5 Rotary drive:** Sets the direction (Fixed) and monitoring interval (60 sec).
- 6 System:** Configures automatic saving and data export paths (c:\PARYLENE_V2), startup language (Deutsch), touch screen status, and RS485 interface settings.

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5.1 Heatings

1		Heatings	
		Base temperature:	Actual temp. calculation:
Door	<input type="text" value="40"/>	40 °C	<input type="text" value="Maximum value T1-T2"/>
Vaporizer	<input type="text" value="40"/>	40 °C	
Pyrolysis	<input type="text" value="40"/>	40 °C	<input type="text" value="Maximum value T1-T3"/>
Chamber	<input type="checkbox"/>		
Pressure sensor	<input checked="" type="checkbox"/>	<input type="text" value="40"/>	40 °C
Silane vaporizer	<input checked="" type="checkbox"/>	<input type="text" value="40"/>	40 °C

The base temperature for door, the vaporizer, the pyrolysis, the chamber, the pressure sensor, the silane vaporizer and the silane pipe (if heating is installed) can be set.

The base temperature is the temperature, which will be adjusted if control is on and if no automatic process is running (stand by).

For door, pyrolysis and chamber the actual temp. calculation can be chosen (will be done by the supplier or service staff).

5.2 Temperature sensors

2		Temperature sensors			
		Scaling min:		Scaling max:	
Door 1:	<input checked="" type="checkbox"/>	<input type="text" value=""/>	<input type="text" value="0"/>	°C	<input type="text" value="200"/>
Door 2:	<input checked="" type="checkbox"/>	<input type="text" value=""/>	<input type="text" value="0"/>	°C	<input type="text" value="200"/>
Vaporizer:		<input type="text" value=""/>	<input type="text" value="0"/>	°C	<input type="text" value="200"/>
Chamber 1:	<input type="checkbox"/>				
Chamber 2:	<input type="checkbox"/>				
Pyrolysis 1:	<input checked="" type="checkbox"/>	<input type="text" value=""/>	<input type="text" value="0"/>	°C	<input type="text" value="800"/>
Pyrolysis 2:	<input type="checkbox"/>				
Pyrolysis 3:	<input type="checkbox"/>				
Cooler:	<input checked="" type="checkbox"/>	<input type="text" value=""/>	<input type="text" value="-200"/>	°C	<input type="text" value="350"/>
Pressure sensor:	<input checked="" type="checkbox"/>	<input type="text" value=""/>	<input type="text" value="0"/>	°C	<input type="text" value="200"/>
Cabinet:	<input checked="" type="checkbox"/>	<input type="text" value=""/>	<input type="text" value="0"/>	°C	<input type="text" value="200"/>
Silane vaporizer:	<input checked="" type="checkbox"/>	<input type="text" value=""/>	<input type="text" value="0"/>	°C	<input type="text" value="800"/>

For all temperature sensors scaling minimum and maximum value can be set.

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5.3 Fans

3 Fans	
Vaporizer	<input checked="" type="checkbox"/> PWM Switch on temp: <input type="text" value="25"/> °C
Case	Switch on temp: <input type="text" value="35"/> °C

Switch on temperatures for vaporizer and case can be set.

If vaporizer should be controlled by PWM, it must be selected. Selection will be done by the supplier or service staff.

5.4 Equipment

4 Equipment	
<input type="checkbox"/> Emergency off relais installed	<input type="checkbox"/> Door switch installed
<input checked="" type="checkbox"/> Soft pump installed	<input type="checkbox"/> Vacuum switch installed
<input type="checkbox"/> Butterfly valve installed	<input type="checkbox"/> Compressed air installed
<input checked="" type="checkbox"/> Cooler output installed	<input type="checkbox"/> Edge valve limit switches installed
<input type="checkbox"/> PCS installed	<input checked="" type="checkbox"/> Motor safety device installed
Pmin: <input type="text" value="0.1"/> mbar	<input type="checkbox"/> Overtemp. recipient installed
Pressure sensor chamber:	<input type="text" value="VGC301 (Log 1-8)"/>
Pressure sensor pump:	<input checked="" type="checkbox"/> <input type="text" value="VGC301 (Log 1-8)"/>

Equipment selection will be done by the supplier or service staff.

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5.5 Rotary drive

5 Rotary drive	
Direction:	<input type="text" value="Fixed"/>
Monitoring:	<input checked="" type="checkbox"/> <input type="button" value="◀"/> <input type="text" value=""/> <input type="button" value="▶"/> <input type="text" value="60"/> sec

For the rotary drive the supervisory time and direction can be set.

5.6 System

6 System

Automatic saving:
 Perform at end of process Monthly saving in sub directory (YYYY-MM)
Path: c:\PARYLENE_V2

Automatic data export:
 Perform at end of process Monthly saving in sub directory (YYYY-MM)
Path: c:\PARYLENE_V2

Startup language: English

Touch screen:

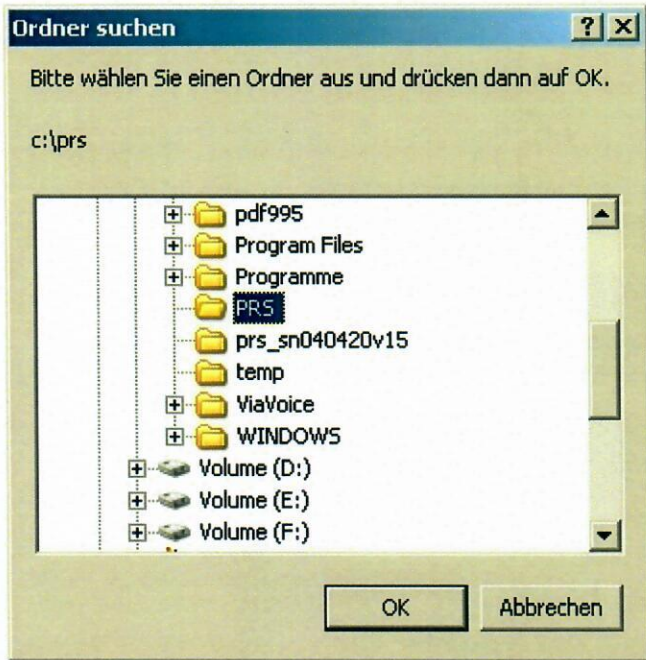
Comment input:
 Automatic query at start of program
 Automatic query at end of program

Interface: 1: COM3 2: COM3 **RS485 address:** 1: 1 2: 2

At this point it can be chosen, if the data should be saved after the end of process and in which directory it should be written.

Also the automatic data export, which allows reading the exported data with other programs like Excel, can be chosen.

The data will be exported in the tsv/csv format. If the option “Perform at end of process” is chosen, a directory for the saved data can be chosen. A click on the button “...” opens the following dialog:



Also the option “monthly saving in sub directory (JJJJ-MM) can be chosen. If this option is chosen, a file with the format JJJJ-MM (e.g. 2004-10 for October 2004) will be monthly created. In this file all exported data of one month are saved.

The automatic protocol printout of end of process can also be activated. If this option is activated, it will be printed a protocol at the end of process.

Settings for the comment can be made at this point.

Startup language can be chosen.

Touchscreen usage can be chosen.

The interface, where the controller is connected, must be chosen.

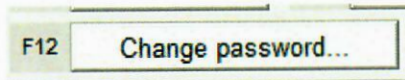
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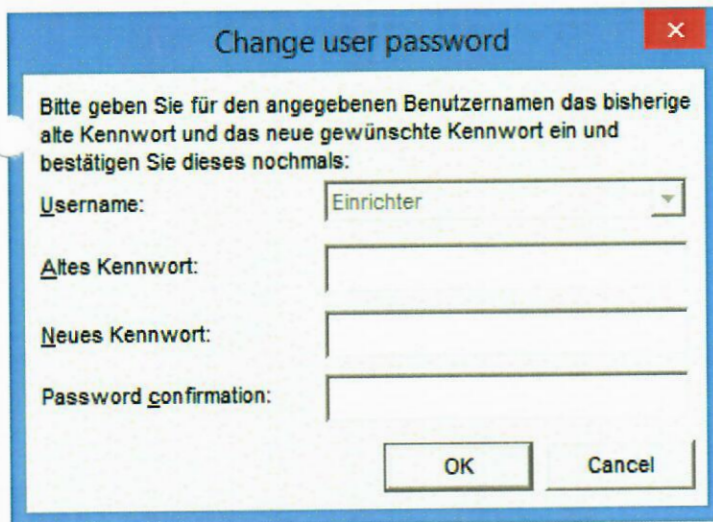
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5.7 Password



The password can be changed:



Change user password

Bitte geben Sie für den angegebenen Benutzernamen das bisherige alte Kennwort und das neue gewünschte Kennwort ein und bestätigen Sie dieses nochmals:

Username: Einrichter

Altes Kennwort:

Neues Kennwort:

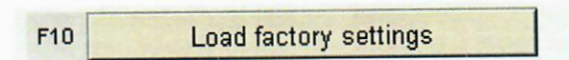
Password confirmation:

OK Cancel

5.8 Save

All settings can be saved with *F9 save*.

5.9 Load factory settings



If the settings have been changed and saved inadvertently, the factory settings (delivery state) can be loaded any time.

6. Diagram

6.1. Settings




All process parameter are shown over the process time, each parameter has its own Y-axis.

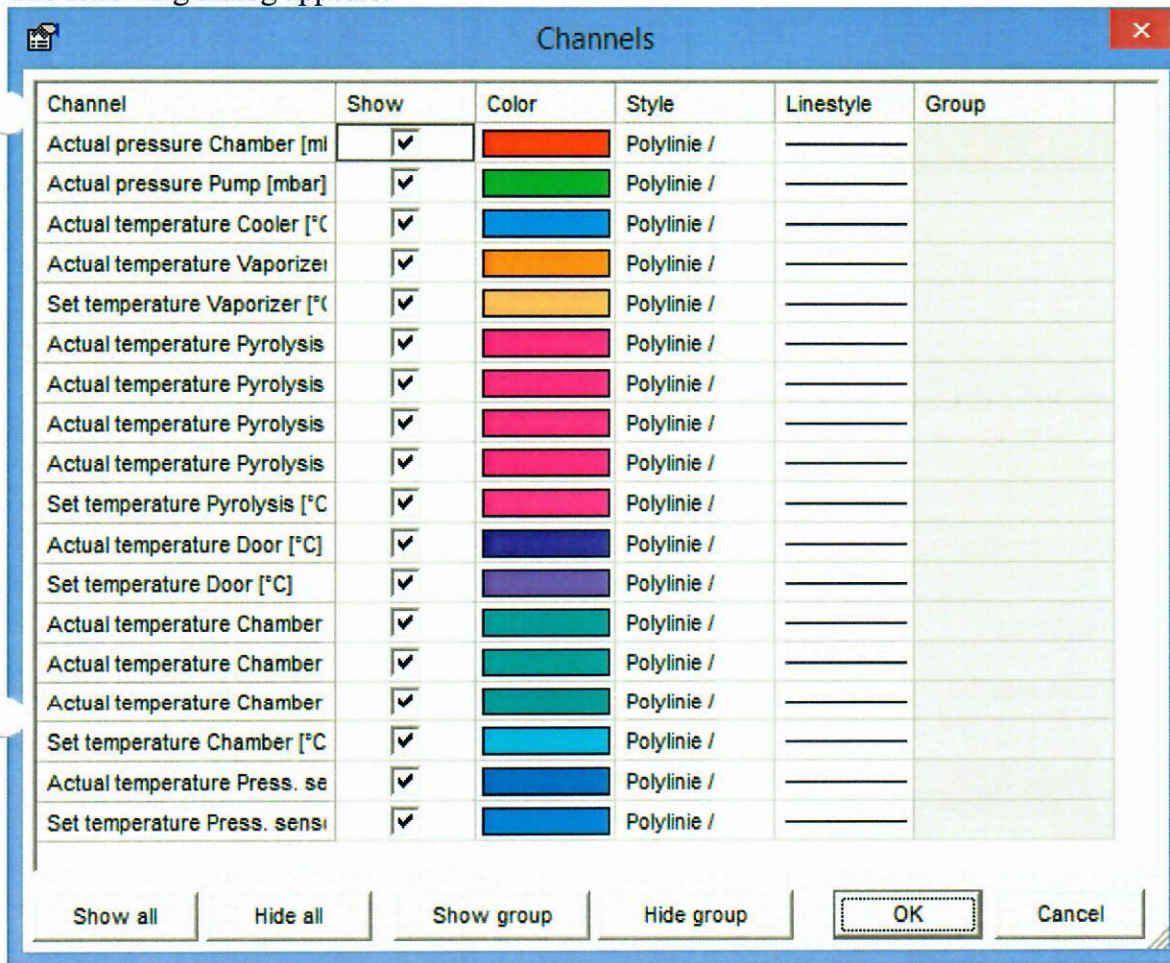
The displayed channels and Y-axes can be adapted arbitrary, there are different dialogues available:

6.1 Channel dialogue

The **channel dialogue** could be displayed in following ways:

Double-click on the area of the diagram, where the channels appears (cursor changes) or right mouse button in an empty space in the legend area of „Properties“ or click the symbol  in the diagram

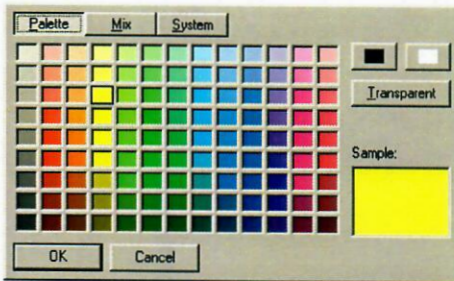
The following dialog appears:



Channel: The displayed signals are listed.

Show: If the signal should be shown in the diagram it must be signed.

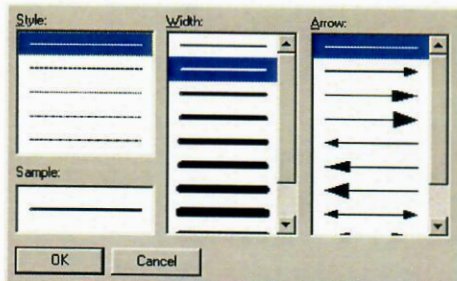
Color: Every signal assigns its own colour. To change the colour double click on the colour area. The colour dialog opened and you can assign the colours to the signal.



Style: The style of the lines will be chosen at this point.

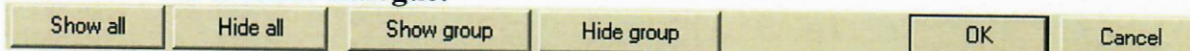


Line style: The line style can also be changed in the same way. Double click on the respectively line and the line dialog appears:



Group: Signal can be put in groups.

Toolbar of the channel dialogue:



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Show all: Shows all signals in the diagram.

Hide all: All signals will be hidden.

Show/hide group: If Signals are put into a group, this group can be shown or hidden.

6.2 Y-axis dialogue

The **single Y-axis dialogue** could be displayed in following ways:

Double-click on the area of the diagram, where the Y-axis appears (cursor changes) or right mouse button „Properties“.

The following dialog appears:

Y-axis

Label: Act. pressure [mbar]

Display value min: 0.001

Display value max: 1000

Scaling: LIN LOG

Display format: AUTO 100.0 1E02 0..1

Precision: 2

Others: Show grid
 Show zero line

OK Cancel

Label: Name of the Y-axis.

Display value min/max: Minimum value and maximum value of the indicating range of the y-axis can be changed arbitrarily. But make sure that the minimum value in logarithmic display is greater than 0.

Scaling: Scaling can be linear or logarithmic.

Display format: The format for the signals can be shown in 4 different formats:

- AUTO: The format, which corresponds best to the data type of the deposit variable.
- FLOAT: Floating point number
- EXP: Exponential number

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- BOOL: Bool (0/1 or TRUE/FALSE)

Precision: Number of fractional digit, which are displayed.

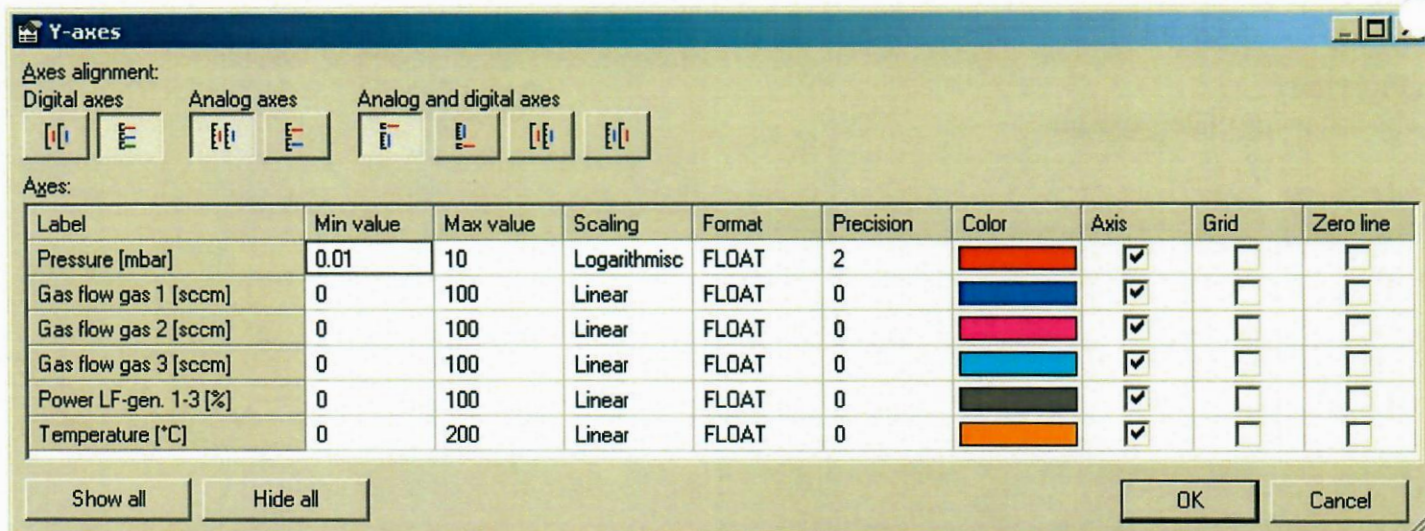
Others: It can be chosen if grid and/or zero line should be shown.

6.3 Y-axes dialogue

The **Y-axes dialogue** could be displayed in following ways:

Click the symbol  in the diagram-toolbar:

The following dialog appears:



Y-axes

Axes alignment:

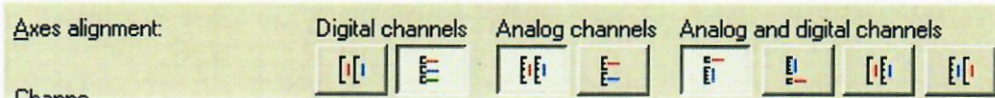
Digital axes Analog axes Analog and digital axes

Axes:

Label	Min value	Max value	Scaling	Format	Precision	Color	Axis	Grid	Zero line
Pressure [mbar]	0.01	10	Logarithmic	FLOAT	2		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gas flow gas 1 [sccm]	0	100	Linear	FLOAT	0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gas flow gas 2 [sccm]	0	100	Linear	FLOAT	0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gas flow gas 3 [sccm]	0	100	Linear	FLOAT	0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power LF-gen. 1-3 [%]	0	100	Linear	FLOAT	0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temperature [°C]	0	200	Linear	FLOAT	0		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Show all Hide all OK Cancel

6.3.1 Axes alignment:



The digital channels can be displayed either overlaid side by side or separately one above the other. The analog channels can be displayed either overlaid side by side or separately one above the other.

The analog and digital channels can be arranged in the following ways:

- Digital axes above and analog axes below
- Analog axes above and digital axes below
- Digital axes left and analog axes right
- Analog axes left and digital axes right

6.3.2 Axes

The displayed signals are listed.

6.3.3 Minimum/Maximum value

Minimum value and maximum value of the indicating range of the y-axis can be changed arbitrarily. But make sure that the minimum value in logarithmic display is unequal to 0.

6.3.4 Scaling

Scaling can be linear or logarithmic. To change between these two kinds of scaling, you have to double click on the area. After that a combo box will open and you can choose the scaling kind.

6.3.5 Format

The format for the signals can be shown in 4 different formats:

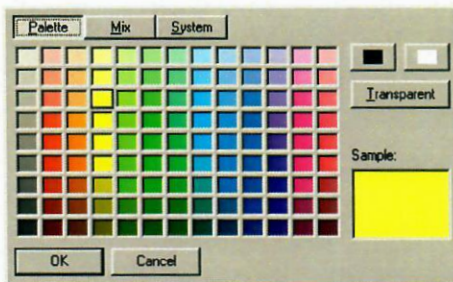
- AUTO: The format, which corresponds to the data type of the deposit variable.
- FLOAT: Floating point number
- EXP: Exponential number
- BOOL: Bool (0/1 or TRUE/FALSE)

6.3.6 Precision

Number of fractional digit, which are displayed.

6.3.7 Colour

Every axis assigns its own colour. To change the colour double click on the colour area. The colour dialog opened and you can assign the colours to the signal.



6.3.8 Y-Axis

The label y-axis allows the choice of displaying each signal in the diagram.

6.3.9 Grid

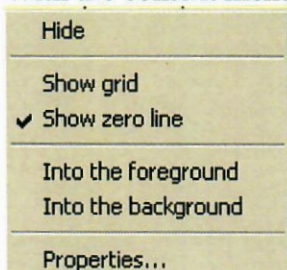
The label grid allows the selection of displaying a grid for each signal in the diagram.

6.3.10 Zero line

The label zero allows the selection of displaying a zero line for each signal in the diagram.

6.3.11 Context menu

With the context menu (right mouse button) further settings can be done:



Hide: Hiding the y-axis, where the cursor is located (appearing will be done with properties...)

Show grid: Grid will be displayed

Show zero line: Zero line will be displayed

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Into the foreground: The chosen y-axis will be displayed as first in the foreground, the others move correspondingly into the background.

Into the background: The chosen y-axis will be displayed as last in the background, the others move correspondingly into the foreground.

Properties: The property dialog of the y-axes will be shown.

6.3.12 Function of the diagram

At the lower range of the diagram there is a function bar.



In this function bar there are 10 buttons and 1 scrollbar.



This button is used for auto scroll on/off. If this button is pressed, the diagram is automatically scrolled, and always the actual record is shown in the visible area.

Remove this button and the scrollbar can be used to regard the history of the process.

Recording of data will not be stopped. If the auto scroll button will be pressed again the actual data will be shown in the diagram.



This button is used for auto scaling on/off. If the data record is wider than the screen width, it will be scaled on the half screen width. After the time of one hour, the autoscaling is stopped and the diagram will only be auto scrolled.



This button is used for „Halve time axis range (zoom in)". The time intervals will be smaller and the curve will be wider.



This button is used for „Double time axis range (zoom out)". The time interval will be bigger and the curve will be smaller.



This button is used for adjusting time axis. The following dialog appears:

T-axis

Label: Process time [hh:mm:ss]

Start timestamp: +00:00:00,000

End timestamp: +00:00:10,000

Display interval: 000 days 00 hours 00 minutes 10 seconds

Others: Show grid

OK Cancel

The visible range will be adjusted with this dialog, every possible time range can be displayed.



This button is used for the y-axis-dialogue (see above).



This button is used for free zooming on/off.

With pressed left mouse key an arbitrary range can be dragged. If the mouse button will be let off, this range will be displayed maximized.



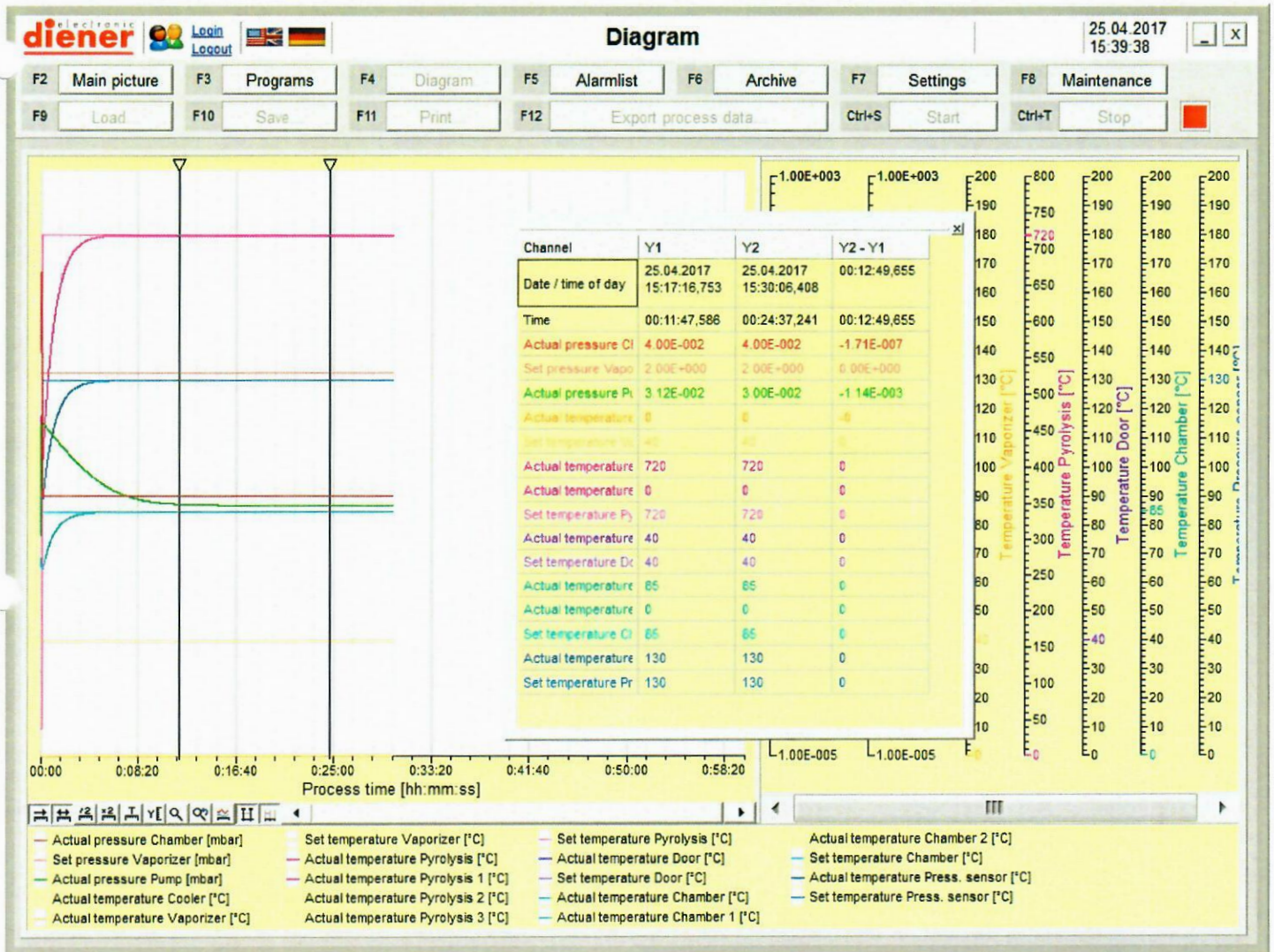
This button is used for restore previous zoom.



This button is used for ruler on/off.

If this button is pressed, two rulers appear in the diagram (at the left and right margin). As well a table is shown where the actual values of the signals between the two rulers are displayed. On this way each signal can be measured.

The rulers can be moved very simply. The mouse will be moved above the ruler until the cursor changes. With pressed left mouse button the rulers can be moved.





This button is used for "Grid on/off".

- Actual pressure Chamber [mbar]	- Actual temperature Pyrolysis [°C]	- Set temperature Door [°C]	- Set temperature Press. sensor [°C]
- Set pressure Vaporizer [mbar]	- Actual temperature Pyrolysis 1 [°C]	- Actual temperature chamber [°C]	- Actual temperature Silane vaporizer [°C]
- Actual pressure Pump [mbar]	- Actual temperature Pyrolysis 2 [°C]	- Actual temperature chamber 1 [°C]	- Set temperature Silane vaporizer [°C]
- Actual temperature Cooler [°C]	- Actual temperature Pyrolysis 3 [°C]	- Actual temperature chamber 2 [°C]	- Actual temperature Silane pipe [°C]
- Actual temperature Vaporizer [°C]	- Set temperature Pyrolysis [°C]	- Set temperature chamber [°C]	- Set temperature Silane pipe [°C]
- Set temperature Vaporizer [°C]	- Actual temperature Door [°C]	- Actual temperature Press. sensor [°C]	

For all signals, which will be achieved, it will be made a legend automatically.
 If one signal should be hidden or shown, the mouse cursor has to be moved above the corresponding signal name until the cursor changes and then double clicking the left mouse button.

6.3.13 Functions of the diagram in the manual mode



These functions of the diagram are only available in the manual mode.
 Data logging can be started and stopped manual. If data are logged, they can be saved as an arbitrary name (F10 Save). Saved data can be loaded with F9 (Load). Saved data only can be loaded if data logging is stopped.
 Actual displayed data can be printed (F11 Print).
 Manual logged process data can be exported (→ 7.3 Export process data).

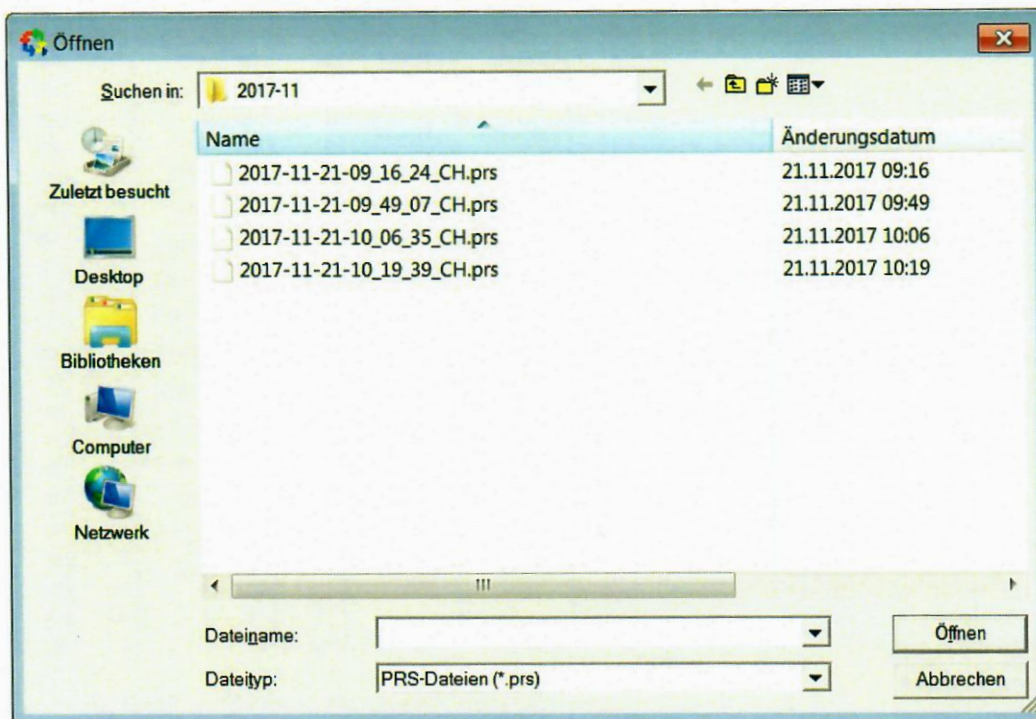
7. Archive

In the archive all saved processes including file info can be shown each time.



7.1 Load...

F9 Load... the „File open dialog“ appears and a file can be chosen and loaded.
If a file is very large (Process time ≤ 24 h) the loading time could be longer (≥ 5 minutes).
At this time the software PRS do not react on inputs, but the active process is still running.
It will be better to load large files only if the process is stopped.



In the saved file are the diagram data and the file info. They can be chosen with the registers below.
The function of the archive diagram is the same as in the online-diagram.

7.2. Print

The loaded diagram, or alarm list or file info (depending on which is actual visible) will be printed on the installed printer.

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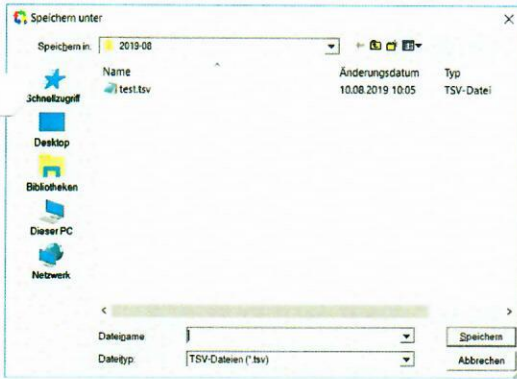
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7.3. Export all data

All data are export in a tsv. File.
File name can be chosen:



Example for a tsv.file:

```
testov - Editor
Datei Bearbeiten Format Ansicht Z
PARYLENE V2.0
Dateiname: C:\Parylene_V2\2019-08\test.tsv
Prozessanfang: 10.08.2019 - 09:43:32
Prozessende: 10.08.2019 - 09:47:06
Charge:
Bearbeiter:
kommentar:
Preparation
Pumping down pressure: 0.010 mbar
Softpump start duration: 0 sec
*.x. pumping down time: 30 min
  .x. temperature: -80 °C
  .x. cooling down time: 30 min
Set temperature Door: 170 °C
Set temperature Pyrolysis: 720 °C
set temperature chamber: 60 °C
set temperature pressure sensor: 130 °C
Max. heating up time: 30 min
Coating
Pump valve: Edge valve
Set position butterfly valve: 100 %
set pressure: 0.040 mbar
Set temperature: 160 °C
Minimum coating duration: 0 min
Maximum coating duration: 120 min
Set rotation speed rotary drive: 80 %
Max. pressure deviation Vaporizer:
Warning: 0.02 mbar / 10 sec
Abort: 0.05 mbar / 10 sec
Max. temperature deviation Door
Warning: 10 °C / 10 sec
Abort: 20 °C / 10 sec
Max. temperature deviation Post-Pyro:
Warning: 10 °C / 10 sec
Abort: 20 °C / 10 sec
Max. temperature deviation Chamber:
Warning: 10 °C / 10 sec
Abort: 20 °C / 10 sec
Max. temperature deviation Pressure sensor:
Warning: 10 °C / 10 sec
Abort: 20 °C / 10 sec
Max. cooler temperature:
Warning: -70 °C / 10 sec
Abort: -60 °C / 10 sec
Cooling / Venting
Vaporizer cooling down temperature: 50 °C
Waiting time until venting: 15 min
```

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7.4 Export Process data

At this point all process data or some single process data can be exported.

Export archive data

File name: _____

Start timestamp: 10.08.2019 09:43:32,317

End timestamp: 10.08.2019 09:47:06,576

Period of time: 000 days 00 hours 03 minutes 34 seconds

Channels:

Actual pressure Chamber [mbar]	<input checked="" type="checkbox"/>
Set pressure Vaporizer [mbar]	<input checked="" type="checkbox"/>
Actual pressure Pump [mbar]	<input checked="" type="checkbox"/>
Actual temperature Cooler [°C]	<input checked="" type="checkbox"/>
Actual temperature Vaporizer [°C]	<input checked="" type="checkbox"/>
Set temperature Vaporizer [°C]	<input checked="" type="checkbox"/>
Actual temperature Pyrolysis [°C]	<input checked="" type="checkbox"/>
Actual temperature Pyrolysis 1 [°C]	<input checked="" type="checkbox"/>
Actual temperature Pyrolysis 2 [°C]	<input checked="" type="checkbox"/>
Actual temperature Pyrolysis 3 [°C]	<input checked="" type="checkbox"/>
Set temperature Pyrolysis [°C]	<input checked="" type="checkbox"/>

Select all channels | Deselect all channels | OK | Cancel

A file name must be entered for the exported data.

The data will be exported in the *.tsv-format. This format can be imported e.g. in EXCEL or ORIGIN.

It can be also entered the start date, start time, end date and end time for the exporting data.

In the lower range of the dialog appears the channel list with all available channels. It can be selected all channels, ranges of channels or single channel for the export.

8. Maintenance

Maintenance | 22.09.2020 09:34:28

F2 Main picture F3 Programs F4 Diagram F5 Alarmlist F6 Archive F7 Settings F8 Maintenance F9 Save

1 General

Maintenance interval: 6 months
Next maintenance: 21.03.2021
Confirmation: Maintenance done
Info: Last maintenance: 22.09.2020
Number of processes: 1
Operating hours: 85

2 Oil change

Oil change intervals: 500 hours
Current state: 32 hours
Confirmations: Oil changed

3 Backup

Backup data... Restore data...

4 Diagnosis

Inputs and outputs Leakage rate measuring...

5 Information

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... Acknowledge collective message Home

The maintenance parameters can be entered in this mask and the current values will be displayed.

As soon as maintenance must be done (maintenance of the whole plant or oil change of a pump) a red flashing text appears in the main picture.

8.1. General

The most important general parameter is the maintenance interval (input in months).

The screenshot shows a software interface for maintenance settings. At the top, a yellow header bar contains the number '1' and the title 'General'. Below this, the interface is divided into two columns. The left column contains: 'Maintenance interval:' with a numeric input field set to '6' and the unit 'months'; 'Next maintenance:' with a date dropdown menu showing '20.10.2017'; and 'Confirmation:' with a button labeled 'Maintenance done'. The right column contains: 'Info:' with 'Last maintenance:' dropdown menu showing '23.04.2017'; 'Number of processes:' with a numeric input field set to '5'; and 'Operating hours:' with a numeric input field set to '17'.

The date of the next maintenance is displayed. If the maintenance is done, it must be confirmed by the button “maintenance done” and the date of the next necessary maintenance will be calculated and displayed. Also the date of the last maintenance is displayed and the number of all done processes and operating hours.

8.2. Oil change

The screenshot shows a software interface for oil change settings. At the top, a yellow header bar contains the number '2' and the title 'Oil change'. Below this, the interface is divided into three sections. The left section is labeled 'Oil change intervals:' and contains 'Pump:' with a numeric input field set to '500' and the unit 'hours'. The middle section is labeled 'Current state:' and contains a numeric input field set to '12' and the unit 'hours'. The right section is labeled 'Confirmations:' and contains a button labeled 'Oil changed'.

The oil change interval of the pump can be entered here. As soon as an oil change has been done, it must be confirmed with the “oil changed” confirmation button.

8.3 Backup

The screenshot shows a software interface for backup settings. At the top, a yellow header bar contains the number '3' and the title 'Backup'. Below this, there are two buttons: 'Backup data...' and 'Restore data...'.

To save the actual settings and programs the button “Backup data” can be pressed. Then the following dialog will appear, in which the directory for the backup data can be chosen.

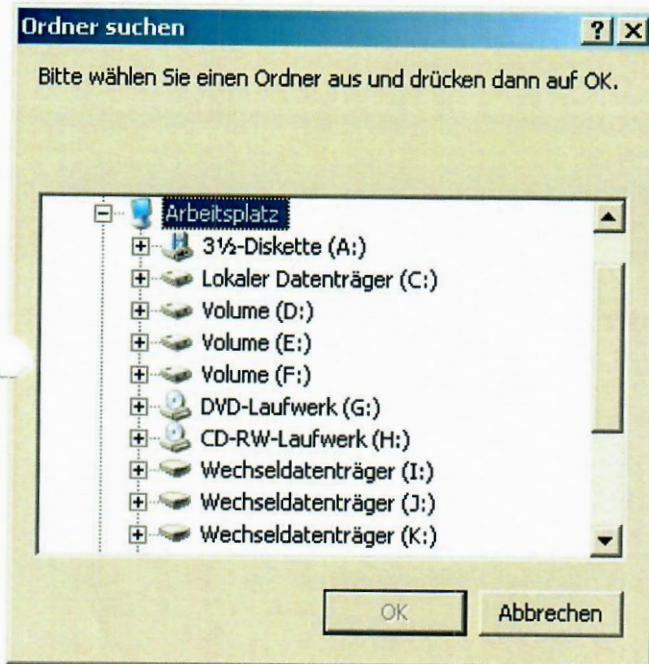
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diener

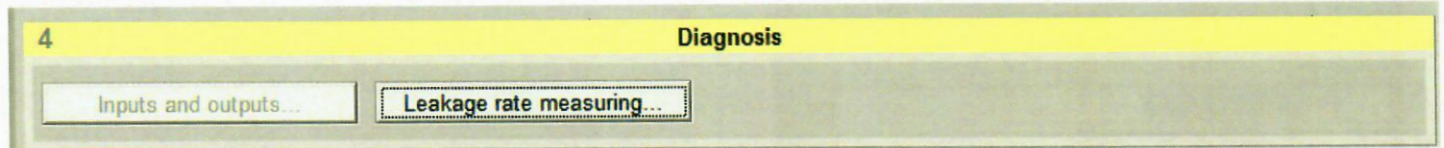
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If the button „Restore data...“ is pressed the same dialog appears, to select the directory in which the backup data should be loaded and the data will be restored.

8.4 Leakage rate measuring



To do a leakage rate measuring the button “Leakage rate measuring” has to be pressed. The following mask appears:

Min. pumping down pressure:	<input type="text" value="0.100"/>	mbar	
Min. pumping down duration:	<input type="text" value="000:10:00"/>	hhh:mm:ss	
Measuring duration:	<input type="text" value="000:30:00"/>	hhh:mm:ss	
Chamber volume:	<input type="text" value="8.0"/>	l	
	<input type="button" value="Start"/>	<input type="button" value="Stop"/>	<input type="checkbox"/>
Actual duration:	<input type="text" value="000:00:00"/>	hhh:mm:ss	
Leakage rate:	<input type="text" value="0"/>	mbar* l / sec	

The pumping down pressure, the duration of measuring and the chamber volume must be input. Then the measuring can be started. During the measuring the actual duration is displayed, after the measuring the leakage rate will be displayed.

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In the manual mode the edge valve and the soft pump valve can be switched on/or off.

The pump switches on automatically with starting the machine (control on).

Soft pump can be chosen.

The state of the limit switches for the edge valve are visualized (O = open, C = closed).

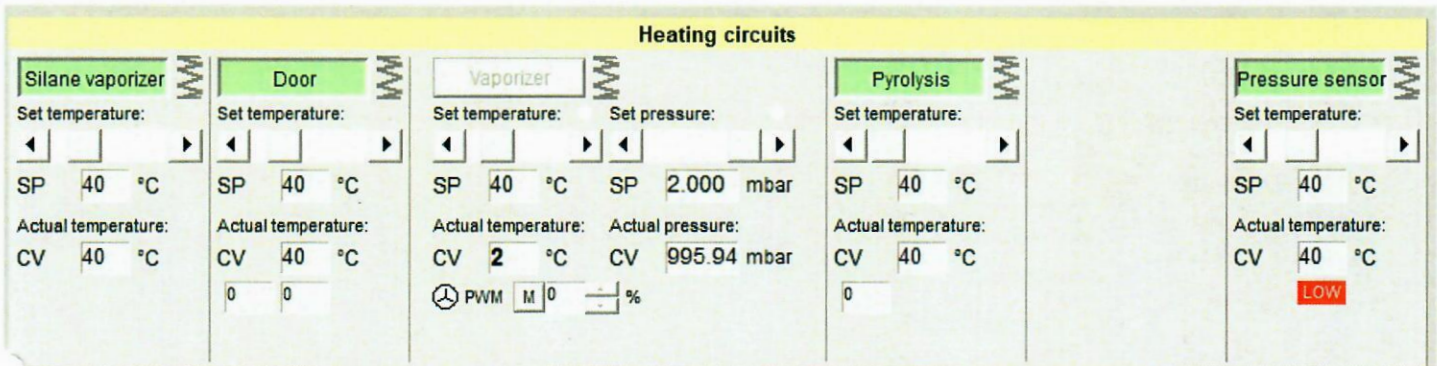
Pressure pump will be displayed.

3.2.1.2 Heating circuits

Each heating circuit can be switched on or off separately.

For each heating circuit set temperature can be set and actual temperature will be displayed.

The fans can be switched on or off.



For the vaporizer can be input a set temperature and a set pressure. Control software decides on which parameter it will be controlled (displayed on visualization by green indicator).

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8.5 Information

5	Information
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9. Quitting the software

To quit the software PRS the button "X" (right upper edge) have to be clicked.
All programs and settings will be saved.