



Appendix 2B

MANUALS R1 (CONT.)

To be read in conjunction with document BH1422 Arunlea Private Water Supply Management Plan R2

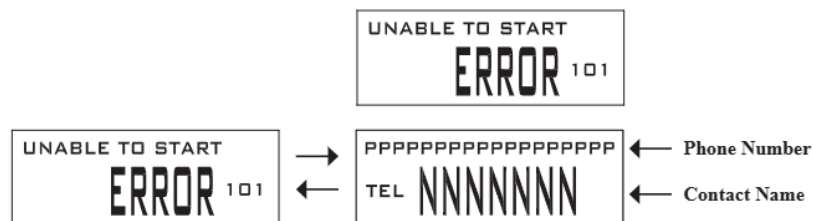
Date	Person reviewing	Actions
25.02.26	Simon Parsons	Added cover sheet

Power Loss

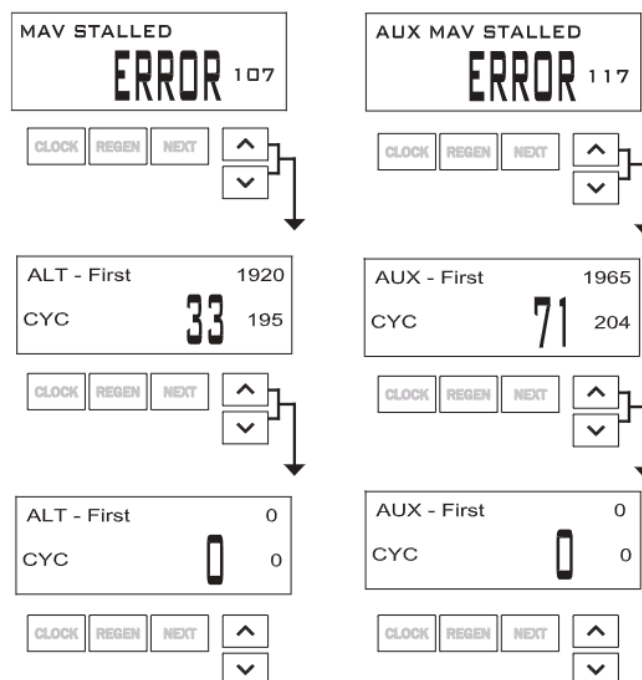
If the power goes out the system will keep time until the battery is depleted. If an extended power outage occurs, the time of day will flash on and off which indicates the time of day should be reset and the non rechargeable battery replaced. The system will remember the rest.

Error Message

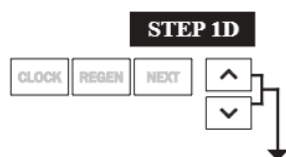
If the word "ERROR" and a number are displayed contact the OEM for help. This indicates that the valve was not able to function properly. If the number and banner text in the Contact Screens has been edited, the two displays below will alternate.



Whenever a MAV drive error occurs, press ▲ and ▼ for about 3 seconds until the Diagnostics MAV Drive History screen appears. Press ▲ or ▼ until the two screens of the MAV (ALT or AUX) with the drive error appear. After first reviewing the information contained in these screens, they must be cleared in order to restore proper MAV operation. Press ▲ and ▼ for about 3 seconds from either screen until this history is cleared. Pressing NEXT will return to the Error screen in the User Display, which is reset by pressing and holding NEXT and REGEN.



Diagnostics



STEP 1D – Press ▲ and ▼ simultaneously for three seconds. If screen in step 2D does not appear in 5 seconds the lock on the valve is activated. To unlock press ▼, NEXT, ▲, and CLOCK in sequence, then press ▲ and ▼ simultaneously for 3 seconds.



STEP 2D – Days, since last regeneration: This display shows the days since the last regeneration occurred. Press NEXT to go to Step 3D. Press REGEN to exit Diagnostics.



STEP 3D – Volume, since last regeneration: This display shows the volume of water that has been treated since the last regeneration. This display will equal zero if a water meter is not installed. Press NEXT to go to Step 4D. Press REGEN to return to previous step.



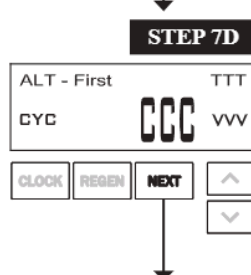
STEP 4D – Reserve History Volume used for last 7 days: If the valve is set up as a softener, a meter is installed and Set Volume Capacity is set to “Auto,” this display shows 0 day (for today) and the reserve capacity. Pressing ▲ will show day 1 (which would be yesterday) and the reserve capacity used. Pressing ▲ again will show day 2 (the day before yesterday) and the reserve capacity. Keep pressing ▲ to show the capacity for days 3, 4, 5 and 6. ▼ can be pressed to move backwards in the day series. This screen is not displayed if filter, time clock, meter immediate, alternator or volume override regeneration is selected. Press NEXT at any time to go to Step 5D. Press REGEN to return to previous step.



STEP 5D - Volume, 63-day usage history: This display shows day 0 (for today), day 1 (for yesterday), etc., and the volume of water treated that day. Press ▲ to show the volume of water treated for the last 63 days. If a regeneration occurred on the day the letter “R” will also be displayed. This display will show dashes if a water meter is not installed. Press NEXT at any time to go to Step 6D. Press REGEN to return to previous step.



STEP 6D – Flow rate, maximum last seven days: Use ▲ or ▼ to display the maximum flow rate in liters per minute that occurred in each of the last seven days. This display will equal zero if a water meter is not installed. Press NEXT to go to Step 7D. Press REGEN to return to previous step.



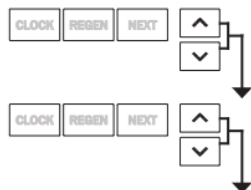
STEP 7D – MAV Drive History: Displays the drive time histories of all active MAV drives. Use ▲ or ▼ to review the history of all active MAV outputs. TTT – measured MAV drive time; VVV – measured MAV drive voltage; CCC – total number of drives (in or out); “-” indicates piston drive into MAV; “+” indicates piston drive out of MAV. NOTE: After a drive error occurs or a MAV is replaced, it is recommended that the diagnostics screen for that MAV be cleared. That is done by selecting the + or – screen for that MAV. Press and hold ▲ and ▼ for about 3 seconds. Failure to do this may result in inconsistent MAV operation.

Press NEXT to exit Diagnostics. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

When desired, all programming and information in Diagnostics may be reset to defaults when the valve is installed in a new location. To reset, press NEXT and ▼ simultaneously to go to the Softening/Filtering screen. Press ▲ and ▼ simultaneously to reset programming and diagnostic values. Screen will return to User Display.

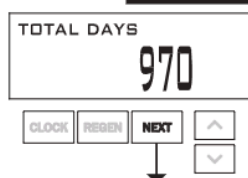
Valve History

STEP 1VH

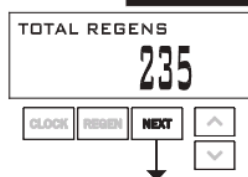
STEP 1VH – Press ▲ or ▼ simultaneously for three seconds and release. Then press ▲ and ▼ simultaneously and release. If screen in step 2VH does not appear in 5 seconds the lock on the valve is activated. To unlock press ▼, NEXT, ▲, and CLOCK in sequence, then press ▲ and ▼ simultaneously for 3 seconds and release. Then press ▲ and ▼ simultaneously and release.

STEP 2VH

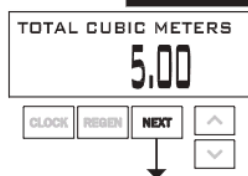
STEP 2VH – Software version: Displays current software version. Press NEXT to go to Step 3VH. Press REGEN to exit Valve History.

STEP 3VH

STEP 3VH⁵ – Days, total since start-up: This display shows the total days since startup. Press NEXT to go to Step 4VH. Press REGEN to return to previous step.

STEP 4VH

STEP 4VH – Regenerations, total number since start-up: This display shows the total number of regenerations that have occurred since startup. Press NEXT to go to Step 5VH. Press REGEN to return to previous step.

STEP 5VH

STEP 5VH – Volume, total used since start-up: This display shows the total cubic meters treated since startup. This display will equal zero if a water meter is not installed. Press NEXT to go to Step 6VH. Press REGEN to return to previous step.

STEP 6VH

STEP 6VH – Error Log: This display shows a history of the last 10 errors generated by the control during operation. Press ▲ and ▼ to view each error recorded. Press NEXT to exit Valve History. Press REGEN to return to previous step. XXXX = Indicates the position of the drive at the time of stall detection.

RETURN TO NORMAL MODE

⁵ Values in steps 3VH through 6VH cannot be reset.

System Controller Programming Manual for V3030 and V3030-01

Version X105.06 or greater

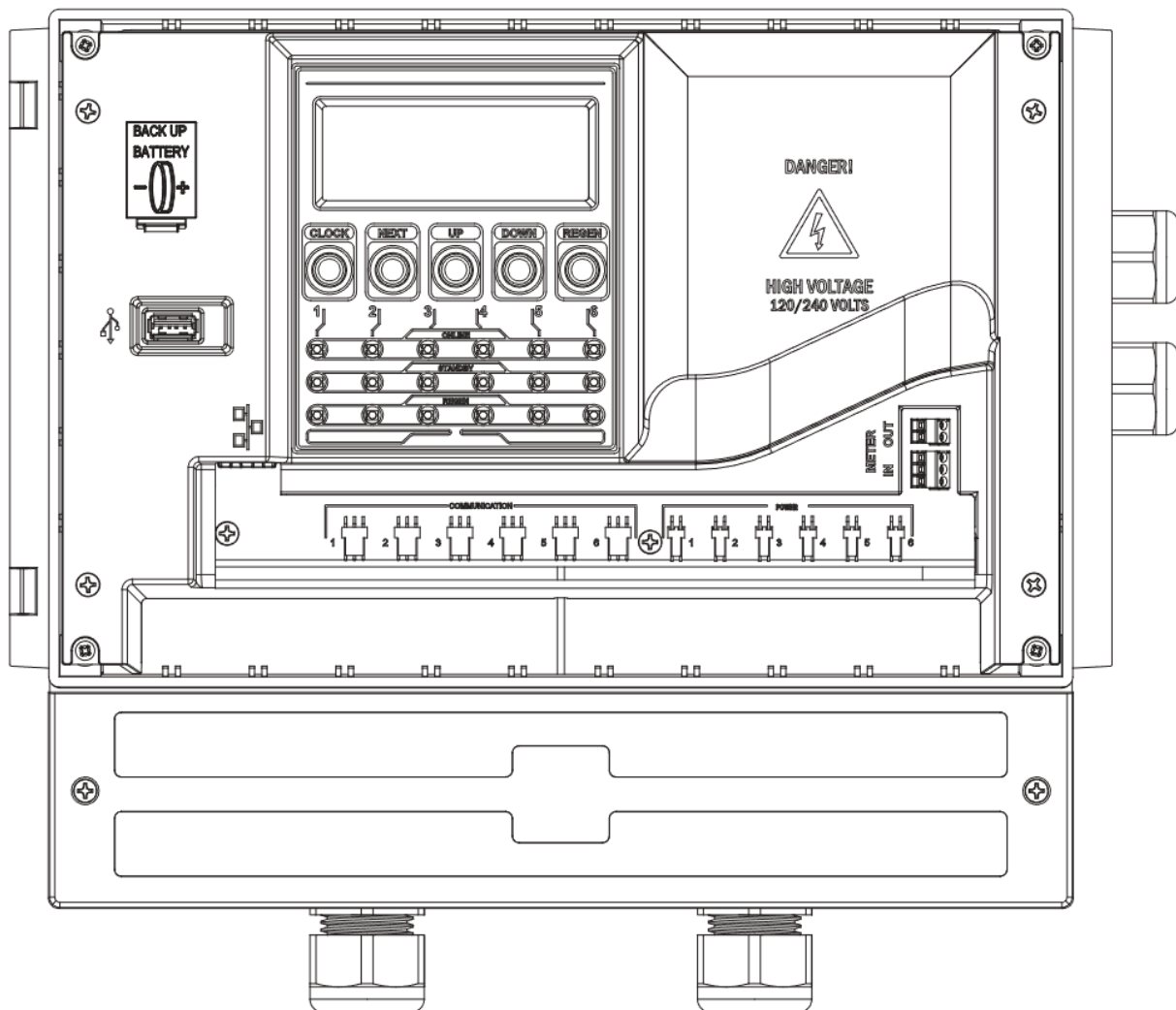
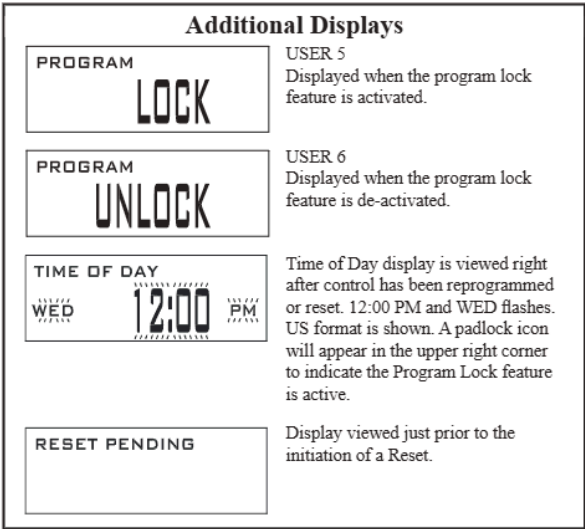
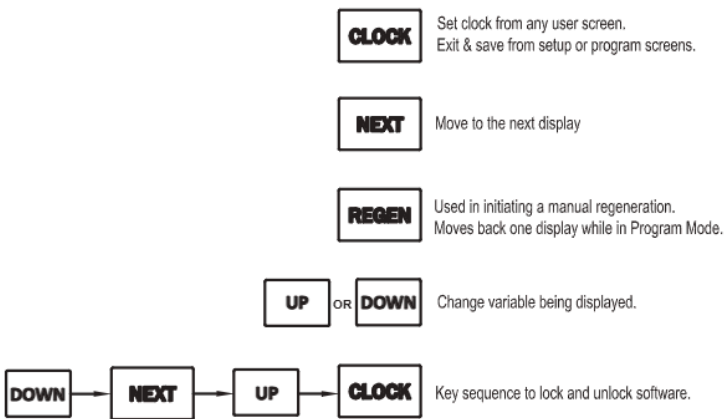


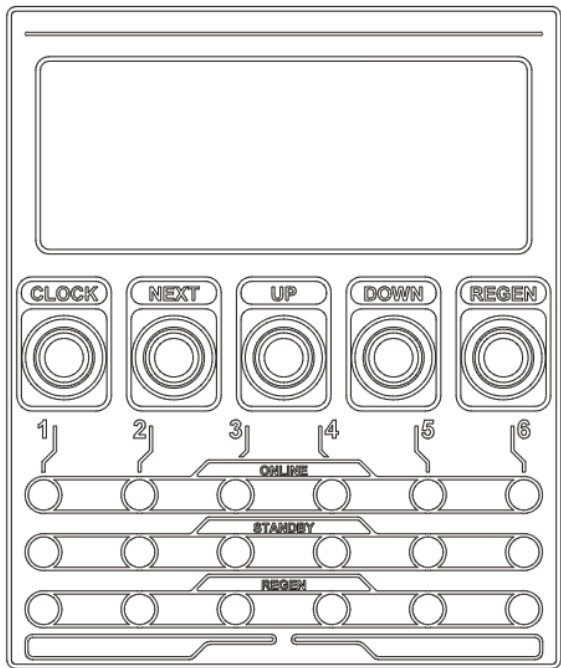
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General Button Operation and Other Displays



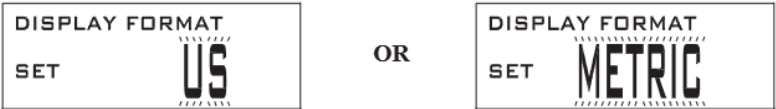
System Controller LED Functions



- Blue LED (ONLINE)** – Indicates which unit is the current “Lead” unit in the system. If the Blue LED is flashing then that Lead unit has lost communication with the System Controller. The Blue LED will also transfer to the unit that has the least capacity remaining with RANDOM and SERIES system types.
- Green LED (ONLINE)** – Indicates which unit that is currently On-line in the system. If the Green LED is flashing then that unit has lost communication with the System Controller.
- Orange LED (STANDBY)** – Indicates which unit that is currently in Stand-by in the system. If the Orange LED is flashing then that unit is detecting flow rate through its meter.
- Red LED (REGEN)** – Indicates which unit is currently in regeneration in the system. If the Red LED is flashing then that unit is in error.
- Green & Orange LEDS** – Indicates that a unit is transferring between On-line and Stand-by.
- Orange & Red (flashing) LEDS** – Indicates that a unit is in error and the MAV/ NHWBP valve is closed.
- Green & Red (flashing) LEDS** – Indicates that a unit is in error and the MAV/ NHWBP valve is open.

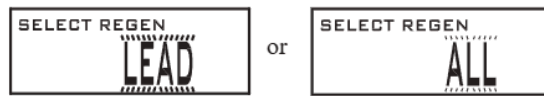
Display Format Settings

When the system controller is initially powered after a flash reprogramming, the display format of the control will need to be set. Select US Format for 12 hour AM/PM timekeeping and US volume units. Select Metric Format for 24 hour timekeeping and metric volume units.

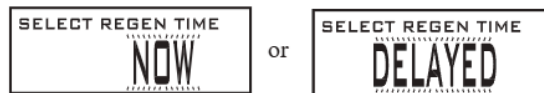


Manual Regeneration

When the REGEN button is held and then released the following display will be shown.



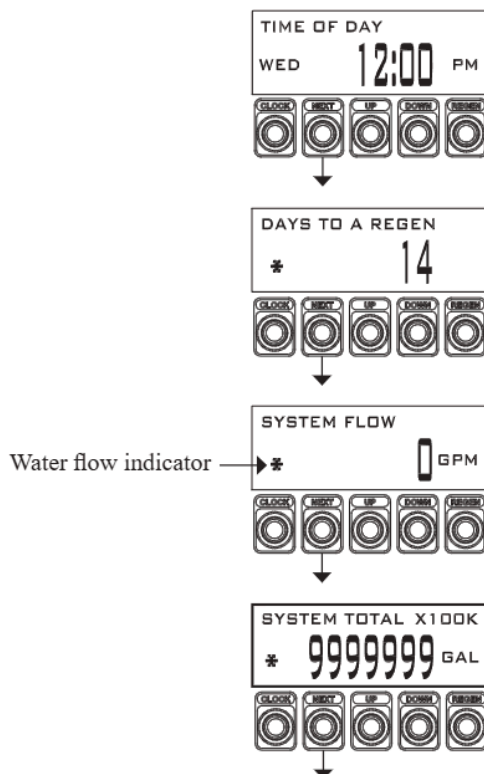
Use the UP or DOWN buttons to switch between “LEAD” or “ALL”. “LEAD” will regenerate the lead unit only (i.e. the blue led light on the system controller circuit board identifies which unit is the current lead unit). “ALL” will sequentially regenerate all the units in the system starting with the lead system. Press NEXT and select “NOW” for regeneration to begin immediately, or select “DELAYED” to schedule regeneration as set in Step 5SS.



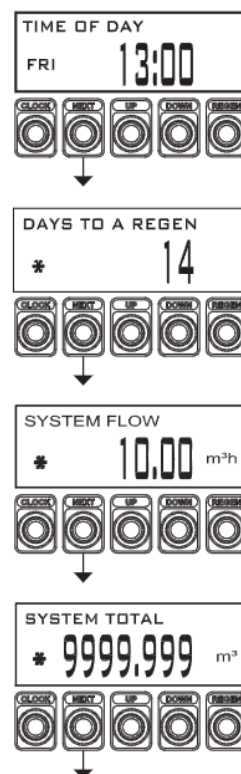
User Displays

When the system is operating, one of four displays may be shown: time of day, days remaining before a regeneration, current system flow rate and total system volume since last reset. With metric units set, these displays will appear somewhat different than the typical US format displays. Use NEXT to scroll between the screens.

Typical US Format Displays



Typical Metric Format Displays



Set Time of Day and Day of Week

The user can also set the Time of Day, year, month and day. Time of day should only need to be set if the battery has been depleted because of extended power outages or when daylight saving time begins or ends. If an extended power outage occurs, the time of day will flash on and off which indicates the time of day should be reset. The non-rechargeable battery should also be replaced.

After five minutes of inactivity Set Time of Day and Day of the Week will automatically be exited.



STEP 1U – Press CLOCK.



STEP 2U – Current Time (hour): Set the hour using the UP or DOWN buttons. Press NEXT to go to Step 3U. With metric units set, AM/PM indication will not appear and timekeeping will be shown in the 24 hour format.



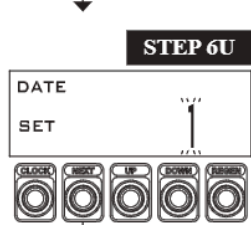
STEP 3U – Current Time (minutes): Set the minutes using the UP or DOWN buttons. Press NEXT to go to Step 4U.



STEP 4U – Current Day of the year: Set the year using the UP or DOWN buttons. Press NEXT to Step 5U.



STEP 5U – Current Month: Set the month using the UP or DOWN buttons. Press NEXT to Step 6U.



STEP 6U – Current Day of the Month: Set the day using the UP or DOWN buttons. Press NEXT to exit.

**RETURN TO
NORMAL MODE**

System Setup

Step 1

Verify that all required connections between the control valves and the System Controller have been properly made. For typical wiring, reference the V3115-46 System Controller Manual.

Step 2

After all wiring connections have been made and verified, plug the System Controller power cord into an approved electrical outlet with uninterrupted power.

Step 3

Program all control valves to the OEM's specifications for the application and size of the units. Control valves that have the default "AUTO" calculation feature currently set will need to be reprogrammed to a fixed treated water capacity, as determined from the ionic exchange capacity and compensated water hardness of the system. (It also may be desirable in some applications to add in an additional small reserve to this new fixed gallon capacity.) All control valves must be set for immediate regeneration and require the day override setting turned off. Control valves that need to regenerate with brine or some other solution need to be set up with a post fill regeneration cycle program. Reference the Programming and Front Cover Manual for the specific valve type for additional programming information.

Note: During the programming of each control valve, do not activate the System Controller feature; leave it turned off until all valves in the system have been programmed.

Step 4

After all control valves have been programmed, return to valve programming and set each control to now operate with the System Controller.

Step 5

Program the System Controller as required for proper operation with the control valves in the system.

Available System Types

Progressive Flow

Each control valve in the system will require a separate, individual meter to operate properly. In a Progressive Flow System a unit flow rate add-point must be set. This add-point is the flow rate at which one or more units will be brought on-line to meet flow demands. Units will be brought on-line after the system flow rate has passed this pre-set add-point and maintain that flow demand for 30 seconds. If the flow rate increases rapidly past the add-point by 120%, then units will be added immediately to meet the flow demand. Units will be taken off-line once flow rate demand falls below 90% of the unit add-point for 1 minute.

Alternator

Each control valve in the system will require a separate, individual meter to operate properly, unless the system is a 2 unit alternator where one meter (wired into the System Controller) can be used. In an Alternator system, one unit will always be in Standby or Regeneration, with all other units on-line. Alternator systems have unique logic that will automatically stagger the units based on capacities so that there will be enough capacity while one unit is in regeneration. For 2" control valve types, an additional screen setting in the System Controller is available to set a Pre-Service Alternator Rinse. When the lead unit has 10% or less remaining capacity, the next unit is rinsed before being brought online.

With 1", 1.25", and 1.5" control valve types there is a programming setting available for Delayed Rinse and Fill. If used, this feature must only be activated after you have first programmed the valve to function with the system controller. After all control valves have been programmed for system controller operation, return to valve programming and set each control to now operate with the Delayed Rinse and Fill feature. This setting will appear right after the system controller activation screen.

Random

Each control valve in the system will require a separate, individual meter to operate properly. All units will be on-line unless one unit is in regeneration. Only one unit will be allowed to regenerate at a time. Any given unit in the system may be allowed to regenerate when necessary.

Series

Each control valve in the system will require a separate, individual meter to operate properly. All units will be on-line unless one unit is in regeneration. Only one unit will be allowed to regenerate at a time. If any one unit flags a regeneration, that unit will be the first to go into regeneration, followed by all other units in series.

Error Handling/Communication Loss

Regardless of the system type set, if an error is detected or if communication is lost, system operation will not shut down completely. Instead, the system controller will continue to operate the system in as normal a manner as possible with the remaining units that are functioning properly.

For Example: If the system is a 4-unit alternator and Unit #2 has an error, the system would continue to operate as if it were a 3-unit alternator with the remaining units - #1, #3, and #4.

If a control valve is taken out of the system operation due to a unit error, the RED Status LED corresponding to this unit will flash and the System Controller will also display VALVE "X" REPORTED ERROR 412 message on the LCD to alert the operator. Once the valve error is cleared at that unit then the error screen and the associated flashing red LED will be automatically cleared. Should a unit lose communication, the GREEN Status LED for that unit will flash and the System Controller will also display a COMMUNICATION ERROR 412 message on the LCD to alert the operator. Once communication is re-established, the error screen and the associated flashing green LED will be automatically cleared by the controller.

COMMUNICATION ERROR 412

VALVE X REPORTED ERROR 412
--

When a valve error occurs the top line will be used to display which valve currently has reported the error.

System Setup Displays



STEP 1SS – Press NEXT and DOWN simultaneously for three seconds and release. If display in Step 2SS does not appear in 5 seconds the lock on the valve is activated. To unlock press DOWN, NEXT, UP and CLOCK in sequence, then press NEXT and ▼ simultaneously for three seconds and release.



STEP 2SS – Select the total number of units in the system. Available selections: 2, 3, 4, 5, 6, or WATER MONITOR. If the number of units is set for 2 – 6 then press NEXT to go to Step 3SS.

If WATER MONITOR is selected then Step 3SS, Step 5SS, Step 6SS, and Step 7SS will not appear during programming. WATER MONITOR mode will allow the System Controller to operate with an inline water meter. Press NEXT to go to Step 4SS.



STEP 3SS – Select valve type. Available selections: 1.0, 1.25, 1.5, or 2.0. Press NEXT to go to Step 4SS.



STEP 4SS – Select system meter calibration size. Available selections: 1.0, 1.25, 1.5, 2.0, 3.0 or Variable Meter (0.1 – 150.0 Pulses Per Gallon or Pulses Per Liter.) Press NEXT to go to Step 5SS.



STEP 5SS – Select system type. Available options are the following:
PROGRESSIVE FLOW: Individual metered regeneration with progressive flow operation. Selecting PROGRESSIVE FLOW and then pressing NEXT will show Step 5SSA which will allow setting of the maximum flow rate for a unit tank before another tank is brought on line.

ALTERNATOR: Always one tank off line. As another unit goes into regeneration the off line unit comes on line.

If ALTERNATOR is selected in Step 5SS and 2.0 was selected in Step 3SS, Step 5SSB will be shown.

RANDOM: All units are on line. When one unit goes into regeneration all other units are prevented from going into regeneration.

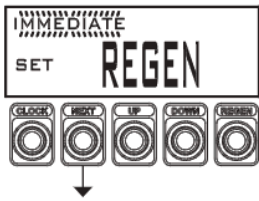
SERIES: If one unit goes into regeneration, the remaining units will regenerate in series until all units are regenerated.

Press NEXT to go to Step 6SS or CLOCK to exit.



OR



STEP 6SS

STEP 6SS – Set when regeneration will be allowed to start. The available settings are the following:

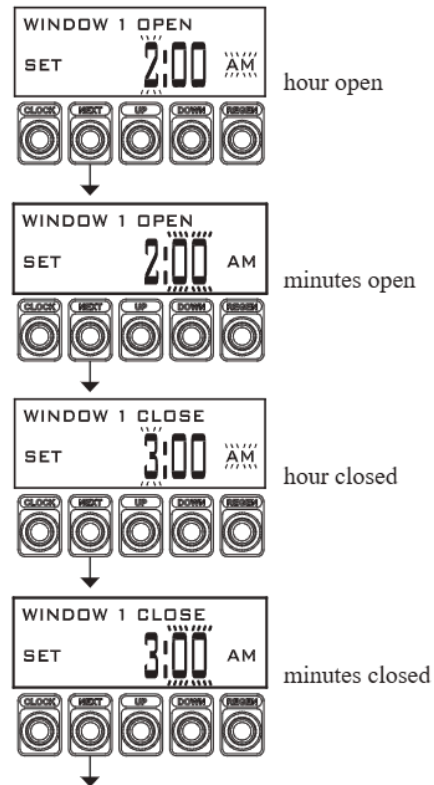
IMMEDIATE = Units regenerate immediately upon reaching 0 capacity.

DELAYED 1 WINDOW = One window of opportunity for regeneration to begin.

DELAYED 2 WINDOW = Two windows of opportunity for regeneration to begin.

DELAYED 3 WINDOW = Three windows of opportunity for regeneration to begin.

If DELAYED 1 WINDOW, DELAYED 2 WINDOW or DELAYED 3 WINDOW is selected a series of displays will be shown allowing to set the hours and minutes for when the window opens and closes. An example for DELAYED 1 WINDOW is shown. With metric units set, timekeeping will be shown in the 24 hour format. The UP or DOWN buttons are used to set the hours or minutes, pressing NEXT moves to the next display.

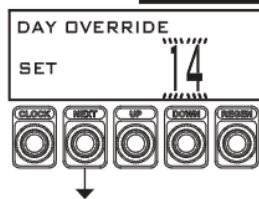


System Controller Operation with Delayed Regeneration Set

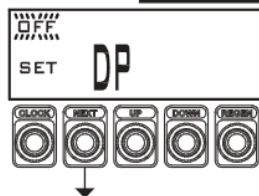
RANDOM and SERIES system types: If a delayed regeneration window is selected, any units that become exhausted and/or require regeneration will remain on-line pending regeneration until the delayed regeneration window time occurs.

PROGRESSIVE and ALTERNATOR system types: If a delayed regeneration window is selected and the Lead unit requires regeneration, the next unit in sequence will be brought on-line and the Lead unit status will be transferred. Once the new Lead unit status is established, the unit that requires regeneration will be allowed to go off-line (into Stand-by pending regeneration) until the next available delayed regeneration time window. Should another unit become exhausted and/or require regeneration, it must remain on-line until the previous unit has been fully regenerated. This is required to prevent the system from being overrun.

Press NEXT to go to Step 7SS.

STEP 7SS

STEP 7SS – Set the maximum number of days that may occur between regenerations. For system types Progressive, Alternator and Random only the unit with the least capacity remaining will be forced to regenerate per day interval. In a Series system type the unit with the least capacity will be forced to regenerate per day interval followed by all other units in series. Press NEXT to exit.

STEP 8SS

**RETURN TO
NORMAL
MODE**

STEP 8SS – If you are using a DP switch, it is possible to connect the DP switch to the Meter In connector. Look at the System Controller Exploded Parts View and Wiring for V3030 and V3030-01 manual for DP switch wiring to the Meter In connector.

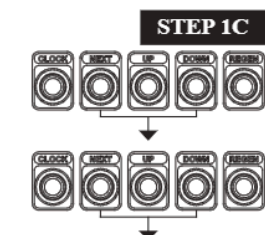
The following settings are available for the DP switch. If Water Monitor mode is selected in step 2SS, this menu will not be available.

OFF - DP switch input is not enabled. This is the default setting.

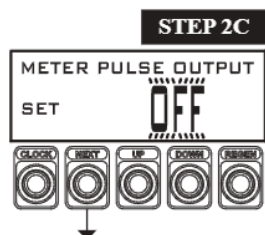
REGEN - After two minutes of switch closure, the lead unit will be scheduled for regeneration.

HOLD - While the switch is closed, no units will be regenerated.

Configuration Displays



STEP 1C – Press NEXT and DOWN simultaneously for approximately three seconds, then release. Press NEXT and DOWN simultaneously for approximately 3 seconds and release. If display in Step 2C does not appear in 5 seconds the lock on the valve is activated. To unlock press DOWN, NEXT, UP and CLOCK in sequence, then press NEXT and DOWN simultaneously for approximately three seconds and release. Then press NEXT and DOWN simultaneously for three seconds and release.



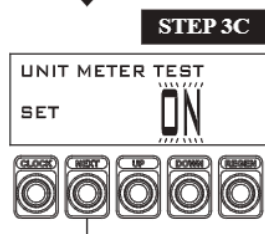
STEP 2C – Set Meter Pulse Output operation using UP or DOWN.

The available selections are:

US Format = OFF, 0.10, 0.25, 0.50, 0.75, 1.00, 2.00, 3.00, 4.00 and 5.00 Pulses Per Gallon

METRIC Format = OFF, 1, 5, 10, 25, 50 and 100 Pulses Per Liter

Press NEXT to go to Step 3C.



STEP 3C – Set Unit Meter Test ON or OFF using UP or DOWN.

- ON - Activates unit meter check logic
- OFF - Deactivates unit meter check logic

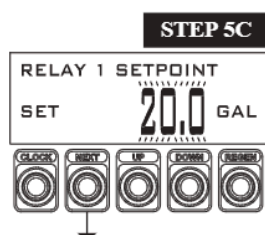
Press NEXT to go to Step 4C.



STEP 4C – Set Relay 1 TRIGGER operations using UP or DOWN. The choices are:

- VOLUME - Relay closes for the set duration for every set volume of system flow.
- ERROR - Relay closes whenever any system valve is in an error mode. Relay opens when error is reset.
- REGEN - Relay closes whenever any unit enters regeneration. Relay opens when the regeneration is complete.
- oFF - Deactivates this output.

Press NEXT to go to Step 5C.



STEP 5C – When Relay 1 is set to Volume, set Setpoint in Gallons or Liters using UP or DOWN.

Press NEXT to go to Step 6C1.



STEP 6C – Set Relay 1 Closure Duration in Minutes using UP or DOWN.

Press NEXT to go to Step 7C.



STEP 7C – Set Relay 2 TRIGGER operations using UP or DOWN. The choices are:

- VOLUME - Relay closes for the set duration for every set volume of system flow.
- ERROR - Relay closes whenever any system valve is in an error mode. Relay opens when error is reset.
- REGEN - Relay closes whenever any unit enters regeneration. Relay opens when the regeneration is complete.
- oFF - Deactivates this output.

Press NEXT to exit Configuration displays

RETURN TO NORMAL MODE

Relay #1 and #2 Output Setup (US Display Format)				
Setpoint Programming				
Mode	Setpoint	Range	Increment	Default
Volume	Gallons (GAL)	1 - 20 20 - 100	1 2	20
Duration Programming				
Mode	Duration	Range	Increment	Default
Volume	Minutes : Seconds	:01 - 1:00 1:00 - 10:00 10:00 - 500	0:01 0:05 1	3:00

Relay #1 and #2 Output Setup (Metric Display Format)				
Setpoint Programming				
Mode	Setpoint	Range	Increment	Default
Volume	Liters (l)	1.0 - 40.0 40.0 - 400 400 - 1,000	.5 1 10	50
Duration Programming				
Mode	Units	Range	Increment	Default
Volume	Minutes : Seconds	:01 - 1:00 1:00 - 10:00 10:00 - 500	0:01 0:05 1	3:00

Diagnostic Displays



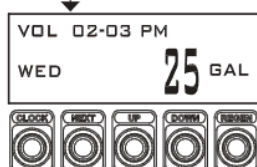
STEP 1D – Press UP and DOWN simultaneously for three seconds and release.



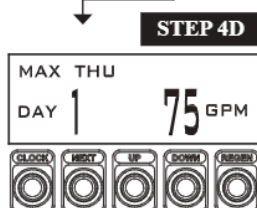
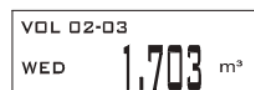
STEP 2D – Press UP or DOWN to scroll through the last 60 regenerations. Information displayed includes the unit, day and time of the regeneration. Press NEXT to go to Step 3D.



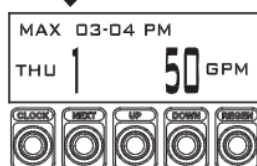
STEP 3D – Press UP or DOWN to view the daily treated water usage for the last 99 days. To view each day's hourly system usage, press and hold UP and DOWN on the day's usage to be viewed. When set to US, units are Gallons. When set to METRIC, units are m3. Press NEXT to go to Step 4D. Press REGEN to return to the previous step.



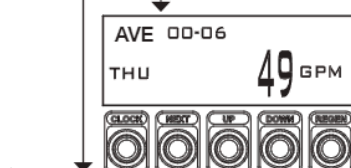
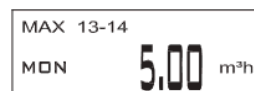
STEP 3DA – Press UP or DOWN to scroll through the treated water usage for each hour of the day selected. Press NEXT to go back to Step 3D.



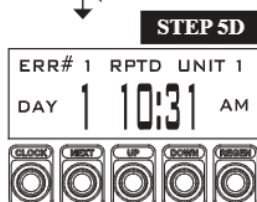
STEP 4D – Press UP or DOWN to view the maximum flow rate recorded for the last 99 days. To view each day's hourly maximum system flow rate, press UP and DOWN on the day's flow rate to be viewed. When set to US, units are GPM. When set to METRIC, units are m3/h. Press NEXT to go to Step 5D. Press REGEN to return to the previous step.



STEP 4DA – Press UP or DOWN to scroll through the maximum flow rate for each hour of the day selected. To view the average flow rate for a particular hour, in 6 minute increments, press UP and DOWN on the hour selected. Press NEXT to go back to Step 4D.

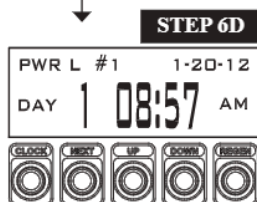


STEP 4DB – Press UP or DOWN to scroll through the average system flow rate for the selected hour, in 6 minute intervals. Press NEXT to return to Step 4DA.

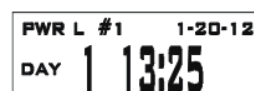


STEP 5D – Error Log.

Lists the last 20 valve errors or losses of communication that have occurred during system controller operation. Use arrows to scroll through the log. "DAY XX" indicates the number of days ago that this error actually occurred (if > 99 days this value will flash). Communication errors are noted in the display top line as "COM". For COM errors, a "-" will appear in the top line of this display to indicate that a communication loss occurred with the unit # indicated and was not restored, "+" will replace "-" to indicate that this loss was finally restored. Valve errors are noted in the display top line as "RPTD" which indicates that a valve error occurred with the unit # indicated and was not reset, "CLRD" will replace "RPTD" to indicate that this error was finally reset.

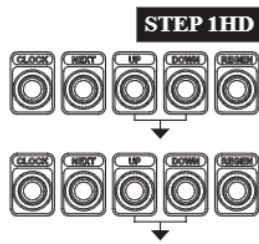


STEP 6D – Press UP or DOWN to view the last 20 power events. Press NEXT to exit Diagnostics. Press REGEN to return to the previous step.

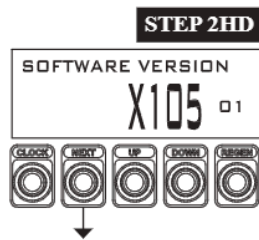


RETURN TO NORMAL MODE

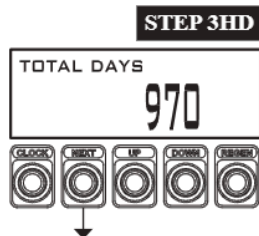
History Displays



STEP 1HD – Press UP and DOWN simultaneously for three seconds and release. Then press UP and DOWN simultaneously for three seconds and release. If display in Step 2HD does not appear in 5 seconds the lock on the valve is activated. To unlock press DOWN, NEXT, UP and CLOCK in sequence. Press NEXT and DOWN simultaneously for three seconds and release. Then press UP and DOWN simultaneously for three seconds and release.



STEP 2HD – Displays software rev level. Press NEXT to go to Step 3HD.



STEP 3HD – Displays total days since startup. Press NEXT to exit.

**RETURN TO
NORMAL MODE**

Data Extraction from System Controller

Data Extraction Procedure:

1. Ensure the USB memory device is formatted for the FAT32 file system and that the allocation unit size is set for 4096 bytes. To check on formatting plug USB into a computer, right click on drive and click on format.
2. Ensure that the System Controller is powered on.
3. Plug the USB memory device into the System Controller USB port.
4. During the extraction process, a series of status displays will appear. When the “USB COMPLETE” message appears, remove the USB device from the System Controller. This could take several minutes.
5. The extracted data can then be imported into the Clack Data Extraction spreadsheet.



USB 1 – Whenever a USB memory device is not inserted into a powered controller.



USB 2 – Whenever a USB memory device is inserted into a powered controller, there will be a delay before the system controller recognizes that the device is actually installed. Once this occurs, “DRIVE FOUND” will show on the top line of the display.



USB 3 – Whenever a USB memory device is inserted into a powered controller, and a valid network connection is active, this display will become active to indicate that the web page data for this control is currently being uploaded from the USB memory device into the controller. A percentage value will activate to indicate that this data is currently being saved by the control to the USB memory device.



USB 4 – Whenever a USB memory device is inserted into a powered controller, this display will become active to indicate that the configuration data for this control is currently being downloaded into the USB memory device from the controller. A percentage value will activate to indicate that this data is currently being saved by the control to the USB memory device.



USB 4 – Whenever a USB memory device is inserted into a powered controller, this display will become active to indicate that the diagnostic data for this control is currently being downloaded into the USB memory device from the controller. A percentage value will activate to indicate that this data is currently being saved by the control to the USB memory device.



USB 5 – Once the system controller begins writing data to the USB memory device, the top line of the display will read “SAVING USAGE” with a percentage value activating to indicate that this data is currently being saved by the control to the USB memory device.



USB 6 – Once the controller has finished writing data to the USB memory device, the display will show “COMPLETE”.

Flash Programming of System Controller

1. Ensure the USB memory device is formatted for the FAT32 File System. If not, consult the manufacturer of the USB memory device for the latest in formatting instructions.
2. Ensure that the System Controller is powered off.
3. Plug the USB memory device into the System Controller USB port.
4. Apply power to the System Controller.
5. The LCD backlight will appear blue; blue means “working”. The LCD will show no characters and all LEDs will remain off for the duration of programming. When the LCD turns green, the process is complete and successful.
6. Remove the power from the System Controller.
7. Remove the USB memory device from the System Controller.
8. Reapply power to the System Controller. Normal functionality should be present.

NOTE: On power-up, the software version will display. Verify the new program version.

Troubleshooting:

If the System Controller LCD backlight turns red at any time during the process, an error has occurred and the programming process has failed.

Common causes of programming failure are:

- A USB memory device is present on power-up and the avr32fwupgrade.uc3 file is not present
- The avr32fwupgrade.uc3 file is corrupt.



Flash Reprogramming Status Display

Blue Display = Control is being reprogrammed

Green Display = Control has been reprogrammed

Red Display = An error occurred during control reprogramming, and the reprogramming process has failed

Network Webpage Setup Procedure

1. Open the WEB.zip file.
2. Copy the “Web” folder to a USB memory device.
3. Ensure that the System Controller is powered on.
4. Plug the USB memory device into the System Controller USB port.
5. During the network web page setup process, a series of status displays will appear. When the “USB COMPLETE” message appears, remove the USB device from the System Controller.



USB 1 – Whenever a USB memory device is not inserted into a powered controller.



USB 2 - Whenever a USB memory device is inserted into a powered controller, there will be a delay before the system controller recognizes that the device is actually installed. Once this occurs, “DRIVE FOUND” will show on the top line of the display.



USB 3 – Whenever a USB memory device is inserted into a powered controller, and a valid network connection is active, this display will become active to indicate that the web page data for this control is currently being uploaded from the USB memory device into the controller. A percentage value will activate to indicate that this data is currently being saved by the control to the USB memory device.



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USB 6 – Once the controller has finished writing data to the USB memory device, the display will show “COMPLETE”.

Follow instructions for Network Configurations Displays.

Network Configuration Displays

Items that should be completed before going to the site:

Verify that the system controller circuit board has a MAC address on it.

Contact the company at which the installation will occur. Obtain the name, phone number and e-mail address for the following:

- The person who will be monitoring the web information from the system controller
- The Network Administrator

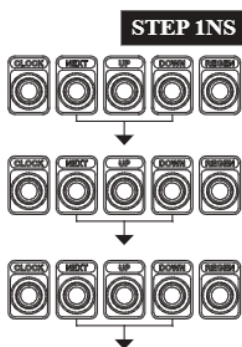
Tell the Network Administrator who will be monitoring the web pages and that the desktop or laptop they will be monitoring from must be connected to the same network connected to the system controller. The Network Administrator needs to provide the installer with a static IP address and a Subnet Mask that will be entered into the system controller software. The Network Administrator may request the MAC address. Both the static IP address and Subnet Mask consists of four sets of numbers separated by a decimal point. Each set or numbers may be 1 to 3 digits. The system controller can be updated with this information before reaching the installation site. If multiple system controllers are being installed at the same site a separate static IP address will be needed for each system controller and sometimes a separate Subnet Mask may be needed. If multiple system controllers are set up at the same sight it is recommended that the installer change the Host Name.

The unit is shipped from the factory without an Ethernet cable. Verify that there is an Ethernet outlet near where the system controller is going to be installed. A CAT5 or better Ethernet cable is required to connect the system controller to the Ethernet outlet.

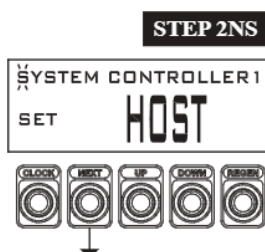
Give the person who will be monitoring the web information a copy of the document entitled “Web Page Displays” and the static IP address.

If a need arises where the software needs to be reflashed on to the system controller connected to an Ethernet cable the following will all have to be reentered:

- static IP address
- Subnet Mask
- Web pages



STEP 1NS – Press NEXT and DOWN simultaneously for approximately 3 seconds and release. If Step 2SS does not appear in 5 seconds, the Program Lock feature is activated. To unlock, press DOWN, NEXT, UP and CLOCK in sequence. Press NEXT and DOWN until Step 2SS appears. Press NEXT and DOWN until Step 2C appears. Then press NEXT and DOWN until Step 2NS appears.



STEP 2NS – Set the desired Host Name to identify this controller on the network. Pressing CLOCK will select the first letter, use UP or DOWN to change each letter. Press NEXT to forward to the next character. Press NEXT to go to Step 3NS. Press REGEN to return to the previous step.

STEP 3NS

STEP 3NS – DHCP Enable/Disable – Use UP or DOWN to select ON or OFF. If the System Controller is connected to a network that has a DHCP server, setting this option to ON will allow the System Controller to request the network settings. It is recommended to restart the system if changes are made to this setting.

Press NEXT to go to Step 4NS. Press REGEN to return to previous step.

STEP 4NS

STEP 4NS – IP Addressing – Set the proper static IP address. Each IP address has four sections separated by decimal points. Pressing CLOCK will select the first section of the address to be changed. Press UP or DOWN to adjust each section, using NEXT to advance to the next section. Press NEXT to go to Step 5NS. Press REGEN to return to the previous step.

STEP 5NS

STEP 5NS – Subnet Masking – Set the proper Subnet Mask. Each Subnet Mask has four sections separated by decimal points. The System Controller will only be able to communicate with other devices within the same subnet. Pressing CLOCK will select the first section of the address to be changed. Press UP or DOWN to adjust each section, using NEXT to advance to the next section. Press NEXT to go to Step 6NS. Press REGEN to return to the previous step.

STEP 6NS

STEP 6NS – Gateway Address – Set the proper Gateway Address. Each Gateway Address has four sections separated by decimal points. Pressing CLOCK will select the first section of the address to be changed. Press UP or DOWN to adjust each section, using NEXT to advance to the next section. Press NEXT to go to Step 7NS. Press REGEN to return to previous step.

STEP 7NS

STEP 7NS – MAC address – The controller's unique ID code that is set at the factory. This information is read-only for information purposes. Press NEXT to exit Network Configuration. Press REGEN to return to the previous step.

Modbus Information

Beginning with software version X105.01 and hardware platform Rev. 9, System Controllers will have the capability of interfacing to industrial automation systems using the Modbus TCP/IP (also known as Modbus-TCP) protocol on Ethernet. The Modbus TCP/IP listener uses port 502 to listen for and receive messages on Ethernet.

Holding Registers

Modbus Register	Description	Properties																																		
40001	Year	Read																																		
40002	Month	Read																																		
40003	Day	Read																																		
40004	Hour (24 Hour Format)	Read																																		
40005	Minute	Read																																		
40006	Seconds	Read																																		
40007	Days left until next regeneration	Read																																		
40008	System flow rate x 10 (GPM or LPM)	Read																																		
40009	System Total High Word (GAL or L)	Read																																		
40010	System Total Low Word (GAL or L)	Read																																		
40011	Error Code High Word Possible Values: <table><thead><tr><th>Description</th><th>Value</th></tr></thead><tbody><tr><td>Valve 1 Communication Error</td><td>0x0001</td></tr><tr><td>Valve 2 Communication Error</td><td>0x0002</td></tr><tr><td>Valve 3 Communication Error</td><td>0x0004</td></tr><tr><td>Valve 4 Communication Error</td><td>0x0008</td></tr><tr><td>Valve 5 Communication Error</td><td>0x0010</td></tr><tr><td>Valve 6 Communication Error</td><td>0x0020</td></tr><tr><td>Valve 1 Error Reported</td><td>0x0040</td></tr><tr><td>Valve 2 Error Reported</td><td>0x0080</td></tr><tr><td>Valve 3 Error Reported</td><td>0x0100</td></tr><tr><td>Valve 4 Error Reported</td><td>0x0200</td></tr><tr><td>Valve 5 Error Reported</td><td>0x0400</td></tr><tr><td>Valve 6 Error Reported</td><td>0x0800</td></tr><tr><td>Checksum Failure Error</td><td>0x1000</td></tr><tr><td>Version Number Mismatch Error</td><td>0x2000</td></tr><tr><td>Invalid MAC Error</td><td>0x4000</td></tr><tr><td>Valve No Flow Error</td><td>0x8000</td></tr></tbody></table>	Description	Value	Valve 1 Communication Error	0x0001	Valve 2 Communication Error	0x0002	Valve 3 Communication Error	0x0004	Valve 4 Communication Error	0x0008	Valve 5 Communication Error	0x0010	Valve 6 Communication Error	0x0020	Valve 1 Error Reported	0x0040	Valve 2 Error Reported	0x0080	Valve 3 Error Reported	0x0100	Valve 4 Error Reported	0x0200	Valve 5 Error Reported	0x0400	Valve 6 Error Reported	0x0800	Checksum Failure Error	0x1000	Version Number Mismatch Error	0x2000	Invalid MAC Error	0x4000	Valve No Flow Error	0x8000	Read
Description	Value																																			
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Invalid MAC Error	0x4000																																			
Valve No Flow Error	0x8000																																			

40012	Error Code Low Word Possible Values: <table><tr><th>Description</th><th>Value</th></tr><tr><td>Usage Checksum Failure Error</td><td>0x0001</td></tr><tr><td>Menu Checksum Failure Error</td><td>0x0002</td></tr><tr><td>SSU Checksum Failure Error</td><td>0x0004</td></tr><tr><td>SBT Checksum Failure Error</td><td>0x0008</td></tr><tr><td>Diagnostic Checksum Failure Error</td><td>0x0010</td></tr><tr><td>Extended Memory Failure Error</td><td>0x0020</td></tr><tr><td>Invalid Units Error</td><td>0x0040</td></tr><tr><td>Bad Clock Error</td><td>0x0080</td></tr><tr><td>Units Checksum Failure Error</td><td>0x0100</td></tr><tr><td>Fatal FRAM Error</td><td>0x0200</td></tr><tr><td>Data Flash Error</td><td>0x0400</td></tr><tr><td>Reserved</td><td>0x0800</td></tr><tr><td>Reserved</td><td>0x1000</td></tr><tr><td>Reserved</td><td>0x2000</td></tr><tr><td>Reserved</td><td>0x4000</td></tr><tr><td>Reserved</td><td>0x8000</td></tr></table>	Description	Value	Usage Checksum Failure Error	0x0001	Menu Checksum Failure Error	0x0002	SSU Checksum Failure Error	0x0004	SBT Checksum Failure Error	0x0008	Diagnostic Checksum Failure Error	0x0010	Extended Memory Failure Error	0x0020	Invalid Units Error	0x0040	Bad Clock Error	0x0080	Units Checksum Failure Error	0x0100	Fatal FRAM Error	0x0200	Data Flash Error	0x0400	Reserved	0x0800	Reserved	0x1000	Reserved	0x2000	Reserved	0x4000	Reserved	0x8000	Read
Description	Value																																			
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Reserved	0x1000																																			
Reserved	0x2000																																			
Reserved	0x4000																																			
Reserved	0x8000																																			
40013	Relay 1 Status Possible Values: <table><tr><th>Description</th><th>Value</th></tr><tr><td>Inactive</td><td>0</td></tr><tr><td>Active</td><td>1</td></tr></table>	Description	Value	Inactive	0	Active	1	Read																												
Description	Value																																			
Inactive	0																																			
Active	1																																			
40014	Relay 2 Status Possible Values: <table><tr><th>Description</th><th>Value</th></tr><tr><td>Inactive</td><td>0</td></tr><tr><td>Active</td><td>1</td></tr></table>	Description	Value	Inactive	0	Active	1	Read																												
Description	Value																																			
Inactive	0																																			
Active	1																																			
40015	Battery Status Possible Values: <table><tr><th>Description</th><th>Value</th></tr><tr><td>Good</td><td>0</td></tr><tr><td>Low</td><td>1</td></tr></table>	Description	Value	Good	0	Low	1	Read																												
Description	Value																																			
Good	0																																			
Low	1																																			

40016	Valve 1 Status Note: If using Water Monitor mode, all unit status flags will be 0. Possible Values:	Read
	Description	
	Value	
	Unit is not enabled (not part of the system)	
	0	
	Unit is Lead	
	1	
	Unit is not Lead but is Online	
	2	
	Unit is in Standby Mode	
	3	
	Unit is in Standby Mode but is seeing flow	
	4	
	Unit is in transition to Online	
	5	
	Unit is in transition to Standby	
	6	
	Unit is regenerating	
	7	
	Unit is transitioning to regeneration mode	
	8	
	Unit is in Rinse Mode	
	9	
	Unit is in Error	
	10	
	Unit is in no flow	
	11	
	Unit state is unknown	
	12	
40017	Valve 1 Flow Rate (GPM or LPM)	Read
40018	Valve 1 Capacity Remaining High Word (GAL or L)	Read
40019	Valve 1 Capacity Remaining Low Word (GAL or L)	Read
40020	Valve 2 Status (see Status Code Listing in Valve 1 Status Register)	Read
40021	Valve 2 Flow Rate (GPM or LPM)	Read
40022	Valve 2 Capacity Remaining High Word (GAL or L)	Read
40023	Valve 2 Capacity Remaining Low Word (GAL or L)	Read
40024	Valve 3 Status (see Status Code Listing in Valve 1 Status Register)	Read
40025	Valve 3 Flow Rate (GPM or LPM)	Read
40026	Valve 3 Capacity Remaining High Word (GAL or L)	Read
40027	Valve 3 Capacity Remaining Low Word (GAL or L)	Read
40028	Valve 4 Status (see Status Code Listing in Valve 1 Status Register)	Read
40029	Valve 4 Flow Rate (GPM or LPM)	Read
40030	Valve 4 Capacity Remaining High Word (GAL or L)	Read
40031	Valve 4 Capacity Remaining Low Word (GAL or L)	Read
40032	Valve 5 Status (see Status Code Listing in Valve 1 Status Register)	Read
40033	Valve 5 Flow Rate (GPM or LPM)	Read
40034	Valve 5 Capacity Remaining High Word (GAL or L)	Read
40035	Valve 5 Capacity Remaining Low Word (GAL or L)	Read
40036	Valve 6 Status (see Status Code Listing in Valve 1 Status Register)	Read
40037	Valve 6 Flow Rate (GPM or LPM)	Read
40038	Valve 6 Capacity Remaining High Word (GAL or L)	Read
40039	Valve 6 Capacity Remaining Low Word (GAL or L)	Read

40040	User Lock Possible Values: <table><tr><td>Description</td><td>Value</td></tr><tr><td>Disabled</td><td>0</td></tr><tr><td>Enabled</td><td>1</td></tr></table>	Description	Value	Disabled	0	Enabled	1	Read														
Description	Value																					
Disabled	0																					
Enabled	1																					
40041	Domestic/International Possible Values: <table><tr><td>Description</td><td>Value</td></tr><tr><td>Domestic</td><td>0x5A (90)</td></tr><tr><td>International</td><td>0xA5 (165)</td></tr></table>	Description	Value	Domestic	0x5A (90)	International	0xA5 (165)	Read														
Description	Value																					
Domestic	0x5A (90)																					
International	0xA5 (165)																					
40050	Start Regen Note: The system controller writes 0 to the register when a regen option is queued. Possible Values: <table><tr><td>Description</td><td>Value</td></tr><tr><td>Off</td><td>0</td></tr><tr><td>Lead</td><td>1</td></tr><tr><td>All</td><td>2</td></tr><tr><td>1</td><td>11</td></tr><tr><td>2</td><td>12</td></tr><tr><td>3</td><td>13</td></tr><tr><td>4</td><td>14</td></tr><tr><td>5</td><td>15</td></tr><tr><td>6</td><td>16</td></tr></table>	Description	Value	Off	0	Lead	1	All	2	1	11	2	12	3	13	4	14	5	15	6	16	Read/Write
Description	Value																					
Off	0																					
Lead	1																					
All	2																					
1	11																					
2	12																					
3	13																					
4	14																					
5	15																					
6	16																					

Revision History:

12/7/2017

COVER PAGE:

New drawing

Version X105.06 or greater

PAGE 11:

Added Step 8SS

PAGE 23:

Added to 40050 additional description/value

EXPRESS PRO - User Manual

MULTIFUNCTION ELECTRICAL PANEL FOR 1 TO 4 MOTORS



Exclusive Italian
Production

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1. INTRODUCTION

This manual must always accompany the relevant equipment and be kept at an accessible location for consultation by qualified technicians assigned for operation and maintenance of the system.

The installer/user is strongly recommended to carefully read all instructions and information in this manual before using the product, in order to avoid damage or improper use of the unit, which would also render the warranty null and void.

Before operating the equipment, carefully read the manual and follow all instructions provided.

The information and instructions in this manual refer to the standard use of this product; in the event of special circumstances, functions or applications not described in this document, please contact our service centre for assistance.

If technical assistance or spare parts are required, when contacting the manufacturer always specify the identification code of the model and construction number as stated on the data plate.

Our service centre is available for any requirement or clarification.

On receiving the goods, carry out an inspection immediately to ensure that the equipment has not been damaged during transport. If defects are found, the client should promptly notify, within 5 days of receiving the goods, our retailer or in the event of direct purchases, the manufacturer's service centre.



N.B. the information provided in this manual is subject to modifications without notice. The manufacturer shall not be held liable for any damage caused in relation to the use of these instructions, as they are provided for guidance only. Note that failure to observe the instructions provided in this manual may cause physical injury or damage to property.

It is understood that compliance with local provisions and/or statutory regulations in force is compulsory.

2. WARNINGS



The electrical panel must be used exclusively for the purpose and function as specified in design. Any other application or use is to be considered improper and therefore hazardous.

In the event of a fire in the place of installation or the surrounding area, avoid using water jets and use appropriate extinguishing equipment and means (powder, foam, carbon dioxide).

Install the equipment far from heat sources and in a dry and sheltered location according to the specified protection rating (IP).

The installation of a safety device is recommended to protect the panel power line in compliance with current electrical safety standards.

Before performing any work on the electrical panel or system, disconnect the electrical power supply.

No parts of the panel should be removed without an official authorisation from the manufacturer: any tampering with or changes to the unit will render all terms of the warranty null and void.

All installation and/or maintenance operations must be performed by a specialised technician who is fully aware of the currently applicable safety standards.

Ensure that the installation is connected to an efficient earthing system.

After completing the electrical connection, check that all electrical panel settings are correct to avoid automatic start-up of the electric pump.

The manufacturer declines all liability in the event of the following:

- Incorrect installation;
- Use by personnel not adequately trained in the correct use of the panel;
- Serious failure to perform scheduled maintenance;
- Use of non-original spare parts or parts not model-specific;
- Unauthorised modifications or interventions;
- Partial or total failure to observe instructions.

3. OVERVIEW

- Single-phase board power supply 100-240Vac 50/60Hz;
- Three-phase board power supply 310-450Vac 50/60Hz;
- Electronic board own consumption 3W;
- G/P1 and G/P2 normally open inputs for motor start-up;
- C-MIN-MAX inputs for single-pole level probes;
- T1 and T2 normally closed inputs for motor thermal switch (Klixon);
- G.A. normally open input for alarm activation;
- 4-20mA and 0-10V analog inputs;
- Digital outputs for motor overcurrent alarms, from G.A. input and probe input;
- Cumulative alarm output with voltage-free contacts (NC-C-NO resistive load - 5A / 250V);
- Cumulative alarm output, live (12Vcc / 100mA);
- DIP-SWITCH 1 display - NO/NC (G/P1 - G/P2 - G.A.) input reversal;
- DIP-SWITCH 2 display - Phase sequence control exclusion;
- DIP-SWITCH 3 display - Void;
- DIP-SWITCH 4 display - Fixed/pulse manual;
- Settable parameters:
 - Language;
 - Pump rotation activation;
 - Float start/stop function enable (self-holding)
 - Probe sensitivity,
 - Filling or emptying level probes;
 - Min level alarm activation;
 - Minimum voltage;
 - Maximum voltage;
 - Maximum motor current;
 - Minimum motor current;
 - Dry run control activation on minimum current;
 - Minimum current and timing automatic reset trigger;
 - Minimum current cyclic reset trigger;
 - Analog signal activation;
 - Analog signal type;
 - Analog signal unit of measurement;
 - Analog signal full scale;
 - Setpoint;
 - Motor start/stop threshold;
- SWITCH key (change screen/settings);
- AUTOMATIC key (or UP arrow);
- 0 'standby' key (or DOWN arrow);
- MANUAL key;
- Display: Volts, amps, analog signal, hours of operation, motor status and alarms;
- Missing or incorrect phase sequence check on power supply input;
- Emergency operation on analogue sensor failure;
- Protections of auxiliary circuits and motor with fuses;

- Door lock general disconnect switch (if any);
- Provision for start-up capacitors, single phase version (not included);
- Box in ABS, IP55;
- Ambient temperature: -5/+40 °C;
- Altitude a.s.l. 2000 m;
- Relative humidity 50% at 40 °C (condensate free).



CAUTION!

For further technical data, please refer to the nameplate on the control panel.

**General characteristics may vary if accessories are added to the standard product.
The addition of accessories may result in changes to the above description.**

4. INSTALLATION

Ensure that the mains power supply specifications match the voltage specified on the data plate of the electrical panel and connected motor, then provide an earthing connection before all other connections.

The power line must be protected by a residual current circuit breaker.

Tighten the electrical cables on the corresponding terminals using a suitable tool correctly sized to avoid the risk of damaging the fixing screws. Be extra careful if using an electric screwdriver.

The electrical panel is designed for wall-mounting using screws and plugs in the pre-drilled holes at the corners of the enclosure, or brackets where available.

Install the equipment in areas compliant with the protection rating and ensure that the box is kept intact when drilling the holes for fitting the cable clamps.

Avoid the use of multicore cables where there are wires connected to inductive loads and power cables and signal cables such as probes and digital inputs.

Keep connection cables as short as possible, preventing any twisting of cables which may be harmful due to inductive effects on the electronic equipment.

All wires used in the wiring must be suitably sized to withstand the power load.

5. LIGHT INDICATORS AND COMMANDS



Viewing and programming display unit.



Red LED: general alarm.



SETUP key (screen switch).

Pressing and holding it in the main screen for 3 seconds gives access to the settings menu.



Automatic key and UP arrow.



0 key and DOWN arrow.

Press for 5 seconds in the motor screen to reset the hour meter.



Manual key.



Pressing arrow and then MAN resets the current alarm after clearing the cause.

6. MAIN SCREEN PAGE

When the panel is switched on, the display unit shows the following sequence:



At the end of the boot up sequence, the main menu is displayed, as described below.



This screen page displays a general view of the motor and system status:

- 230 V Power supply voltage reading;
- 7.0 A Total absorbed current;
- 10,0B Analog input value (here, 10.0 bar);
- M1 = 1 Motor 1 active;
- M1 = 0 Motor 1 deactivated;
- M2 = 1 Motor 2 active;
- M2 = 0 Motor 2 deactivated;

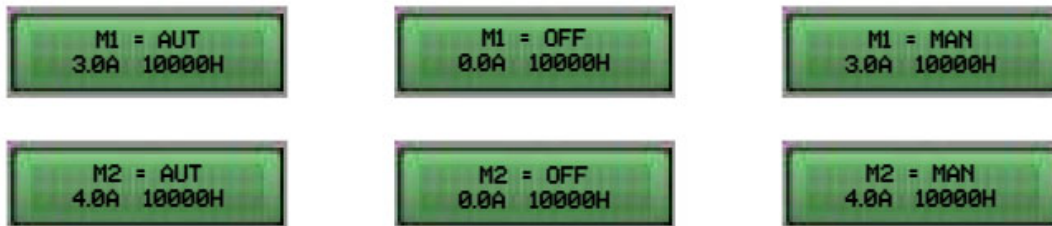
If no analogue sensors are used, no value for analogue input will be present in the main screen.

Only from this screen is it possible to access the settings menu by pressing and holding the **SETUP** key for 3 seconds.

7. MOTOR SCREEN PAGE

From the main screen, by pressing the **SETUP** key, access is obtained to the motor screen page where one can change the status of the selector (automatic - off - manual), view the absorption of each motor and view hours of operation.

Hours of operation can be reset upon motor replacement by pressing the **OFF** key for 5 seconds.



Press the **SETUP** key again to return to the main screen.

8. MAIN BOARD INPUTS AND OUTPUTS

T1	Normally open input for motor 1 Klixon (thermal switch). Jumper if not using this input.
T2	Normally open input for motor 2 Klixon (thermal switch). Jumper if not using this input.
C - MIN - MAX	Inputs for single-pole level probes Input for minimum level float (connection between C and MAX). Input for general enabling (connection between C and MAX). Jumper C and MAX if not using this input.
G/P1	Input for motor 1 activation. When rotation operation is active, the first alternating motor will start each time the input is opened and closed.
G/P2	Input for motor 2 activation. When rotation operation is active, each time the input is opened and closed it will start both motors regardless of the status of G/P1 input.
G.A.	Input for alarm trigger.
OUT ALARM (NC - C - NO)	Cumulative alarm output with voltage-free contacts (resistive load - 5A / 250V) for: - Probe level alarm. - G.A. Input alarm. - Dry run motor alarm. - Motor overcurrent alarm. - Motor overtemperature alarm. - Voltage too low alarm. - Voltage too high alarm. - Sequence or missing phase alarm. - Max level alarm.
BUZZ +/-	Alarm output, live (12Vcc / 100mA);

OUT MOTOR

SINGLE PHASE:

- L/S - Motor phase
- N/R - Motor idle
- AVV - Start with on board capacitor

THREE PHASE:

- T1 (contactor) - Motor phase U
 - T2 (contactor) - Motor phase V
 - T3 (contactor) - Motor phase W
-



Earthing.

9. EXPANSION INPUTS

9.1 RS485 expansion

A(-) – B(+)	Module for RS485 communication standard with MODBUS protocol
--------------------	--

9.2 Voltage-free contact expansion

O1 – O6	Module for 6 digital outputs 300mA 35V max for the signalling of: - O1: Motor 1 run - O2: Motor 2 run - O3: Overcurrent protection for motor 1 - O4: Overcurrent protection for motor 2 - O5: GA active alarm - O6: Probe/G.MIN active alarm
----------------	--

9.3 Probe input expansion for motor start

C – S1 ÷ S4	PRO-SL input module: - C – MIN – MAX (on main board): motor 1 start - C (expansion): common - S1 – S2 (expansion): probe for motor 2 start control - S3 – S4 (expansion): probe for max. level signalling
--------------------	---

9.4 Probe input expansion for water seepage into oil chamber

C – S4 ÷ S5	RL-H2O input module: - C: common (to be connected to earthing potential) - S4 (expansion): probe for motor 1 control - S5 (expansion): probe for motor 2 control
--------------------	--

9.5 Buffer battery device expansion

	PRODBT module for connection of 6V 1,2Ah buffer battery for maintaining control of alarm float and for signalling mains power supply failure
--	--

9.6 Bluetooth-WIFI expansion

Allows the panel to be connected to any device via Wi-Fi or Bluetooth to use the APP

10. SETTINGS MENU

To access the settings menu press and hold the **SETUP** key for 3 seconds.

DESCRIPTION OF PARAMETER	VALUE
LANGUAGE 0=ITA / 1=ENG / 2=FRA / 3=ESP / 4=DEU	0 - 4
DISPLAY BRIGHTNESS ON STANDBY This parameter allows to enter the brightness setting applied when the display is set to standby (wait 9 seconds for a preview).	0 - 9
KLIXON SELF-RESET This parameter defines the automatic or manual reset of the motor overtemperature alarm from Klixon.	AUTOMATIC MANUAL
ESPANSIONE POMPE This parameter defines whether the system provides the card for the 3rd and 4th pump.	Y / N
MINIMUM VOLTAGE Set by default to -10%. <i>(Altering operating limits beyond default parameters will immediately render the warranty null and void).</i>	207 (230) 360 (400)
MAXIMUM VOLTAGE Set by default to +10%. <i>(Altering operating limits beyond default parameters will immediately render the warranty null and void).</i>	253 (230) 440 (400)
MOTOR M1– M4 MAXIMUM CURRENT This parameter allows the maximum current limit of the motor to be set. Enter the maximum current value, increasing it by 10-15% with respect to the rated motor value. <i>Altering operating limits beyond the parameters stated on the model data plate will immediately render the warranty null and void.</i>	1 - ... A
MINIMUM CURRENT OR COS-FI CONTROL ACTIVATION This parameter allows the dry run control to be enabled by reading the absorbed motor current value or the cos-fi power factor.	CURRENT COS-FI

MOTOR M1– M4 MINIMUM CURRENT This parameter allows the MINIMUM motor current to be set below which the motor must stop due to dry run. By setting the current to 0, the minimum current dry run control is deactivated. Enable this parameter only if no floats or probes are in use for minimum level control.	0 - ... A
MINIMUM COS-FI OF MOTOR M1 – M4 (if cos-fi is enabled) This parameter allows the minimum motor cos-fi to be set below which the motor must stop due to dry run.	0 - 1
PUMP ROTATION ENABLE This parameter allows the pump changeover to be activated every time the floats or pressure switches are triggered. In addition, if the main pump is switched to thermal protection (overcurrent), the second pump is enabled (the START/STOP function is disabled with N).	Y or N
AUTOMATIC RESET FOR DRY RUN In the case of a dry run alarm (minimum cos-fi current) the panel can attempt an automatic reset, programmable in minutes. Four restart times can be set, whereby the system automatically restarts after stopping.	Y / N
AUTOMATIC RESET FOR DRY RUN TIME 1 First attempt to reset the dry run alarm (default: 5 minutes).	1 - 240 Min
AUTOMATIC RESET FOR DRY RUN TIME 2 Second reset attempt counting from the previous reset attempt (default: 10 minutes).	1 - 240 Min
AUTOMATIC RESET FOR DRY RUN TIME 3 Third reset attempt counting from the previous reset attempt (default: 20 minutes).	1 - 240 Min
AUTOMATIC RESET FOR DRY RUN TIME 4 Fourth reset attempt counting from the previous reset attempt (default: 30 minutes).	1 - 240 Min

CYCLIC RESET FOR DRY RUN Setting the <i>N</i> value stops automatic restarts after the fourth attempt, while setting the <i>S</i> value after the fourth attempt resumes the restart cycle starting from the fourth time that is set to an infinite time. The panel's dry run protection system restarts based on the programming time settings, and resets the restart cycle whenever the system detects the presence of water for more than 10 seconds.	Y / N
ANALOG SIGNAL ACTIVATION This parameter allows the input to be enabled with analog signal. (with analogue signal enabled, if sensor C and MAX fails, it functions as emergency stop and G/P1 as emergency start of pumps).	Y / N
TYPE OF ANALOG SIGNAL This parameter allows the type of panel input analog signal to be selected 2-wire active sensor: 0-10V: Terminal "A/B" = signal; Terminal "-" = negative; 4-20 mA: Terminal "+" = positive; Terminal "A/B" = signal; 3-wire active sensor: 0-10V: Terminal "+" = positive; Terminal "A/B" = signal; Terminal "-" = negative; 4-20 mA: Terminal "+" = positive; Terminal "A/B" = signal; Terminal "-" = negative;	0 = 0-10 V 1 = 4-20 mA
ANALOG SIGNAL UNIT OF MEASURE This parameter allows the unit of measure of the panel input analog signal to be selected: By selecting "bar", the panel works in PRESSURIZATION mode: the motors will be enabled when the analogue signal decreases compared to set point value (set point higher than start threshold).	"cm" / "m" "bar" NONE

EMPTYING OR FILLING ANALOG SIGNAL Visible if "PRESSURIZATION" is not activated. This parameter allows the operating logic of the analogue signal to be selected if "none", "cm", "m" have been selected as unit of measurement. In FILLING mode, the motors will be enabled when the analogue signal decreases compared to set point value (set point higher than start threshold). In EMPTYING mode, the motors will be enabled when the analogue signal increases compared to set point value (set point lower than start threshold).	FILLING EMPTYING
ANALOG SIGNAL FULL SCALE Visible if "PRESSURIZATION" is not activated. This parameter allows the full scale value of the analog sensor used to be selected.	0.0 - 999.9
SET POINT Visible if "PRESSURIZATION" is not activated. This parameter allows the set point to be maintained on the system to be set. The maximum settable value depends on the "ANALOG SIGNAL FULL SCALE VALUE" set in the previous parameter.	0.0 - 999.9
START THRESHOLD M1 – M4 Visible if "PRESSURIZATION" is not activated. This parameter allows the first motor restart value to be set as the analog signal decreases.	0.0 - 999.9
ALARM LEVEL THRESHOLD Visible if "PRESSURIZATION" is not activated. This parameter allows the alarm value to be set as the analog signal increases.	0.0 - 999.9

FILLING OR EMPTYING LEVEL PROBES This parameter enables selection of whether the C-MIN-MAX probe input is used in emptying or filling mode. In FILLING mode, the input is used to enable the system when water is not present. The C-MIN-MAX input must be open to enable the system. If a float-type on/off control is used, use C and MAX input. In EMPTYING mode, the input is used to enable the system when water is present. The C-MIN-MAX input must be closed to enable the system. If a float-type on/off control is used, use C and MAX input. <i>NB: If no minimum level control is used, jumper C and MAX input.</i>	FILLING EMPTYING
PROBE SENSITIVITY This parameter allows the probe sensitivity level to be adjusted.	1 - 9
FLOAT START/STOP FUNCTION ENABLE (self-holding) This parameter allows active pumps to be deactivated only on opening of the contact C and MAX (min./stop float). This function is only available with pump rotation enabled and is only used for emptying systems.	Y / N
MINIMUM LEVEL ALARM ACTIVATION This parameter allows the cumulative alarm output to be removed for minimum level.	Y / N
EXPANSION TYPE This parameter allows any added expansion to be removed. 0 = no expansion applied 1 = PRO6DO expansion (6 digital outputs) 2 = PROSL expansion (lever probes for motor start) 3 = PROSL expansion (water seepage probes into oil chamber) 4 = PROSL expansion (water seepage probes into oil chamber and stop motor)	0 - 3
MODBUS ADDRESSES	10

MAXIMUM NUMBER OF IGNITIONS PER HOUR M1 - M4 This parameter allows you to set the maximum number of engine starts in an hour beyond which the alarm is triggered. <u>If set to 0, control is not active</u>	0 - 30
ENGINE STOP FOR MAXIMUM IGNITION NUMBER ALARM This parameter allows the engine to be stopped if the alarm for the maximum number of starts per hour is triggered.	Y / N
NUMBER IGNITIONS PER HOUR M1 - M4 Only display of number of starts.	-
NETWORK REENTRY DELAY This parameter allows a fixed time from grid return to be activated before turning on the pumps if controls are active.	-
ALARM HISTORY Displaying the last 10 recorded alarms	

11. DIP-SWITCH SETTINGS DISPLAY

Set DIP-SWITCHES with the panel switched off.



11.1 DIP-SWITCH 1 - NO/NC (G/P1 - G/P2 - G.A.) input reversal

OFF ↓	Normally open inputs.
ON ↑	Normally closed inputs.

DIP-SWITCH 1 allows to invert the enabling of digital inputs G/P1 - G/P2 - G.A.

In the OFF position, normally open inputs enable the system to close the contact.

In the ON position, normally closed inputs enable the system to open the contact.

11.2 DIP-SWITCH 2 - Phase sequence control exclusion

OFF ↓	Missing or incorrect phase sequence check enabled.
ON ↑	Missing or incorrect phase sequence check disabled.

DIP-SWITCH 2 disables the missing or incorrect phase sequence check at the panel input.

In the OFF position, missing or incorrect phase sequence check is enabled.

In the ON position, missing or incorrect phase sequence check is disabled.

11.3 DIP-SWITCH 3 - Self-test

OFF ↓	Motor self-test disabled.
ON ↑	Motor self-test enabled.

DIP-SWITCH 3 enables motor self-test.

In the OFF position, self-test is disabled.

In the ON position, self-test is enabled.

Self-test has a fixed, non-adjustable time and will enable the pump, or pumps depending on the panel model, for 2 seconds every 48 hours.

A pump self-test can only be activated if the Automatic function of the panel is enabled.

11.4 DIP-SWITCH 4 - Manual push or impulse key

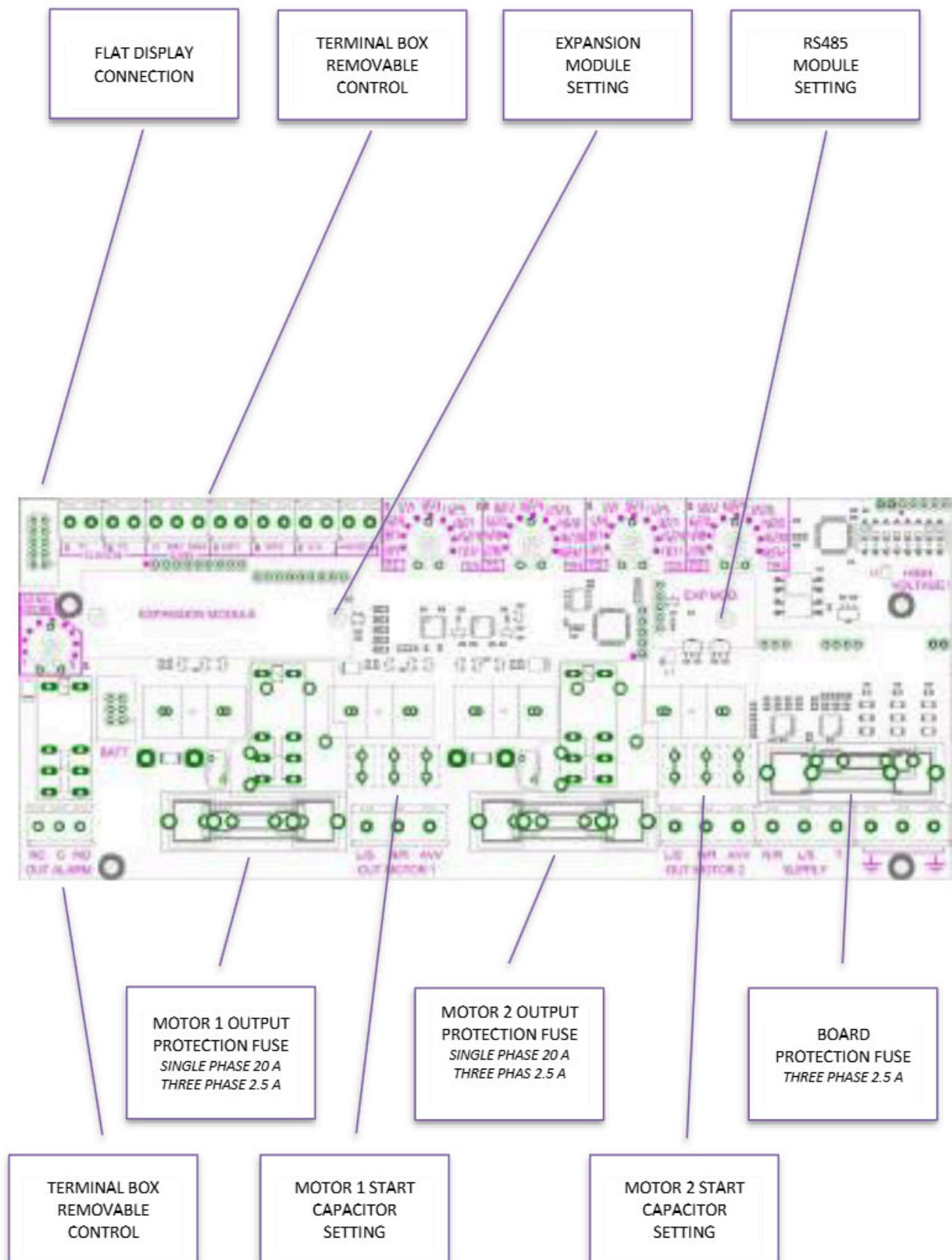
OFF ↓	Manual push key.
ON ↑	Manual impulse key.

DIP-SWITCH 4 sets operation of the manual key.

In the OFF position, the manual key enables the motor by holding the key down; when it is released, the motor stops.

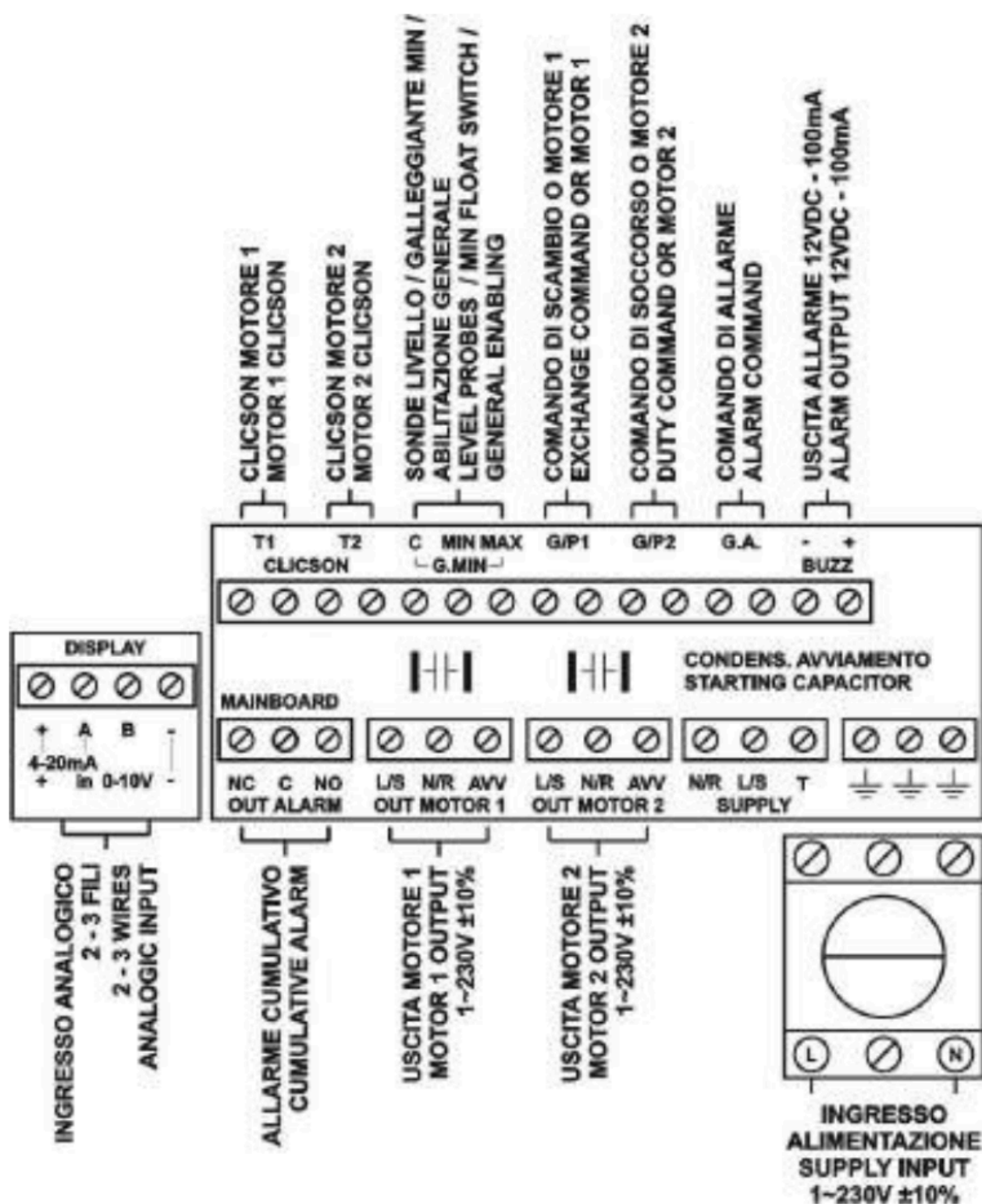
In the ON position, the manual key enables the motor at the first impulse and stops the motor at the next impulse.

12. BOARD SPECIFICATIONS

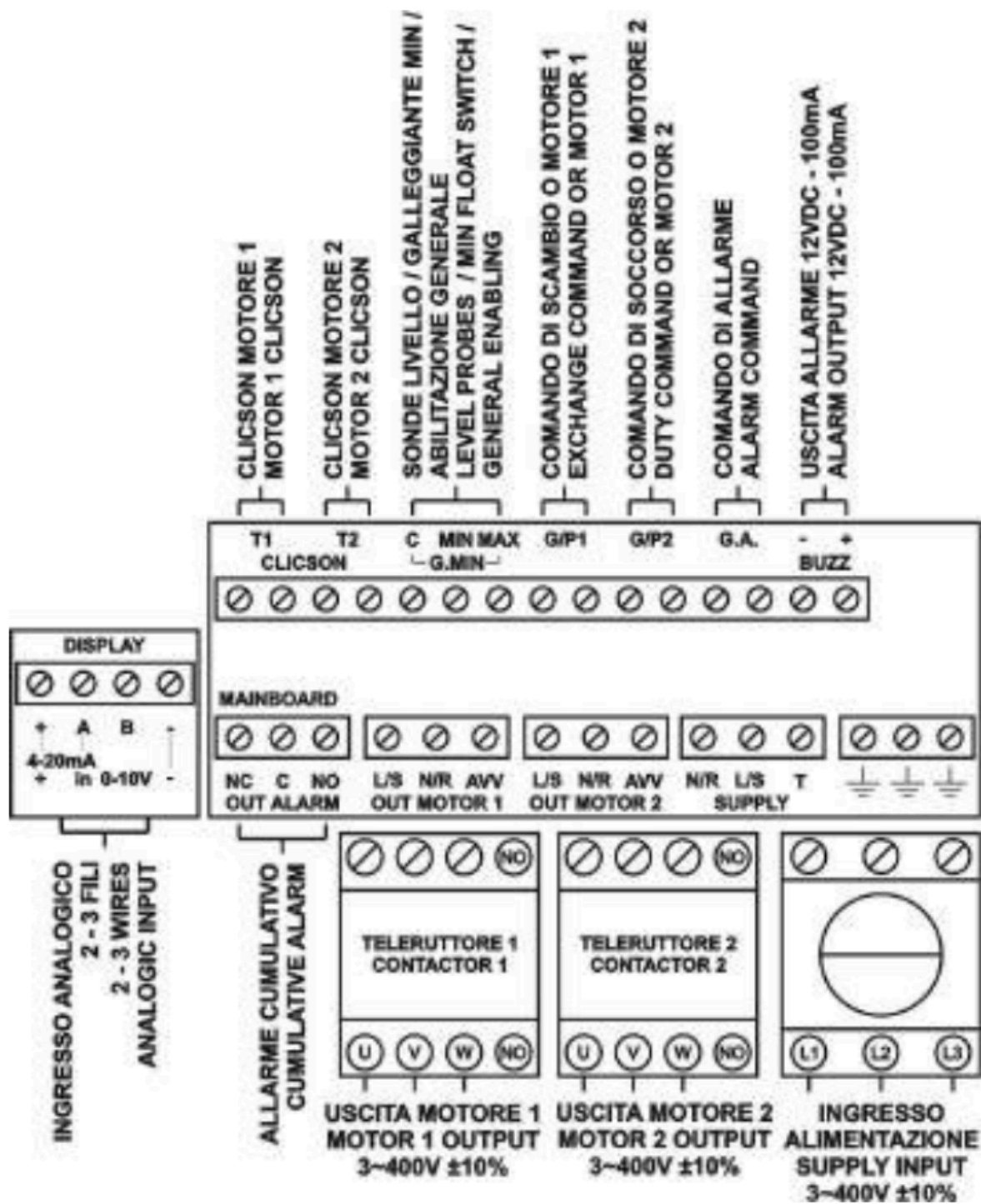


13. MAIN BOARD WIRING DIAGRAMS

13.1 EXPRESS PRO single phase (230V) wiring diagram



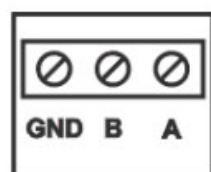
13.2 EXPRESS PRO three-phase (400V) wiring diagram



N.B.: On the three phase 230V version, the power supply and motors must be 3~230V.

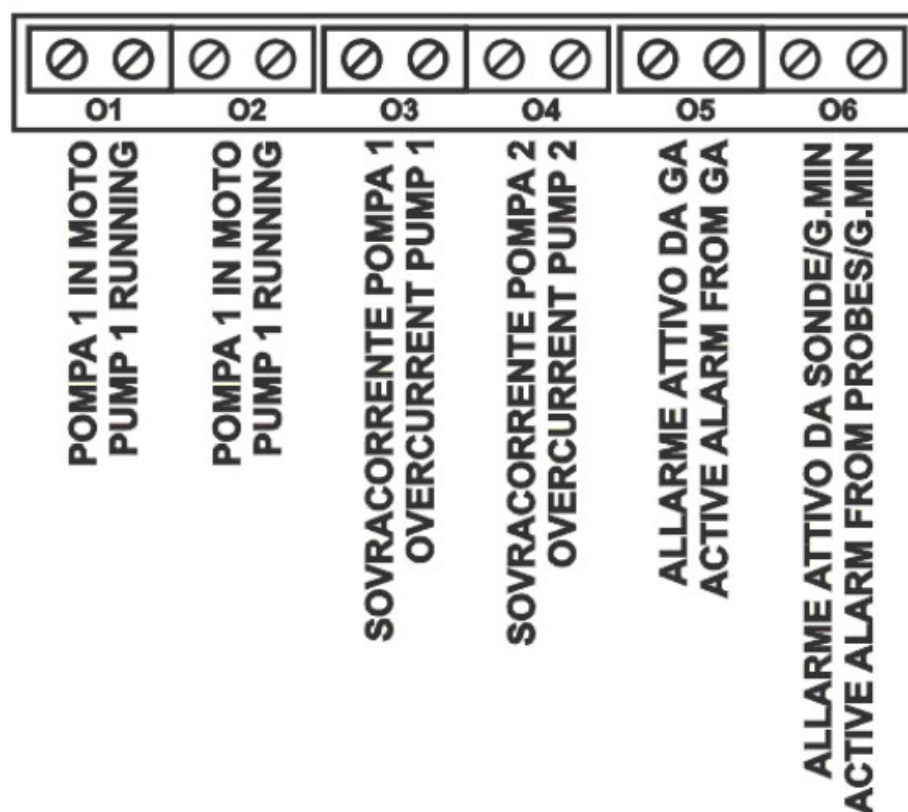
14. EXPANSION WIRING DIAGRAMS

14.1 RS485 expansion

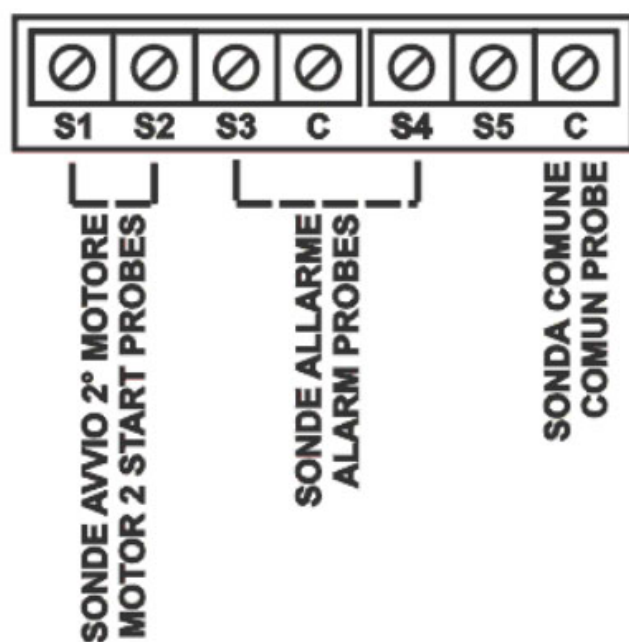


**CONNESSIONE RS485
RS485 CONNECTION**

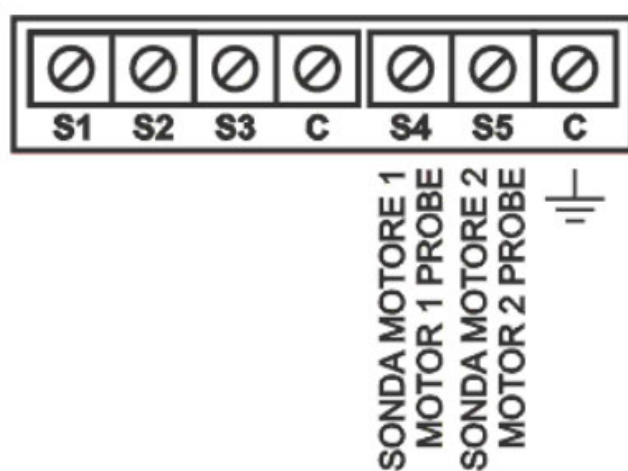
14.2 Voltage-free contact expansion



14.3 PRO-SL probe input expansion

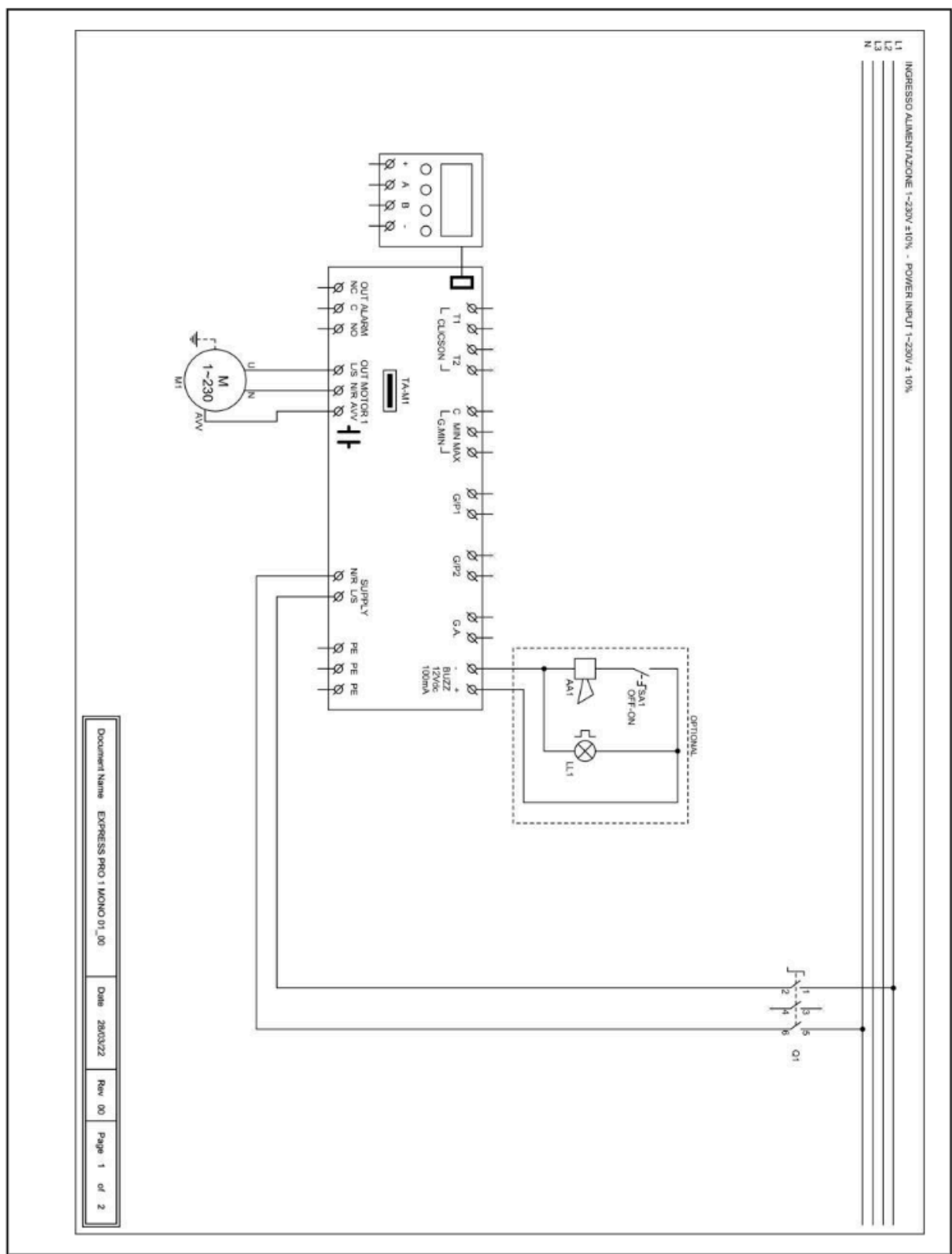


14.4 PRO-SL H2O probe input expansion

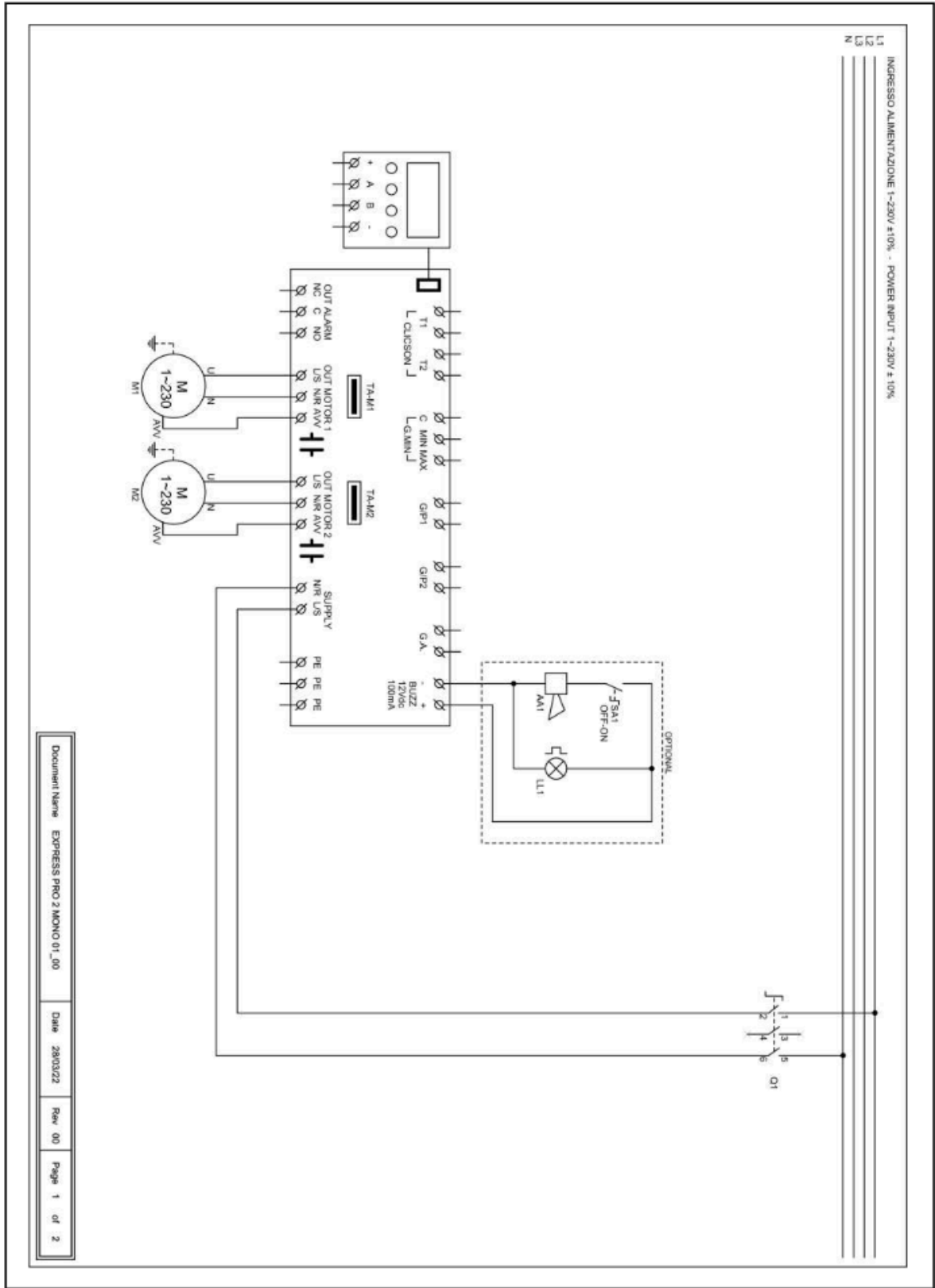


15. WIRING DIAGRAMS

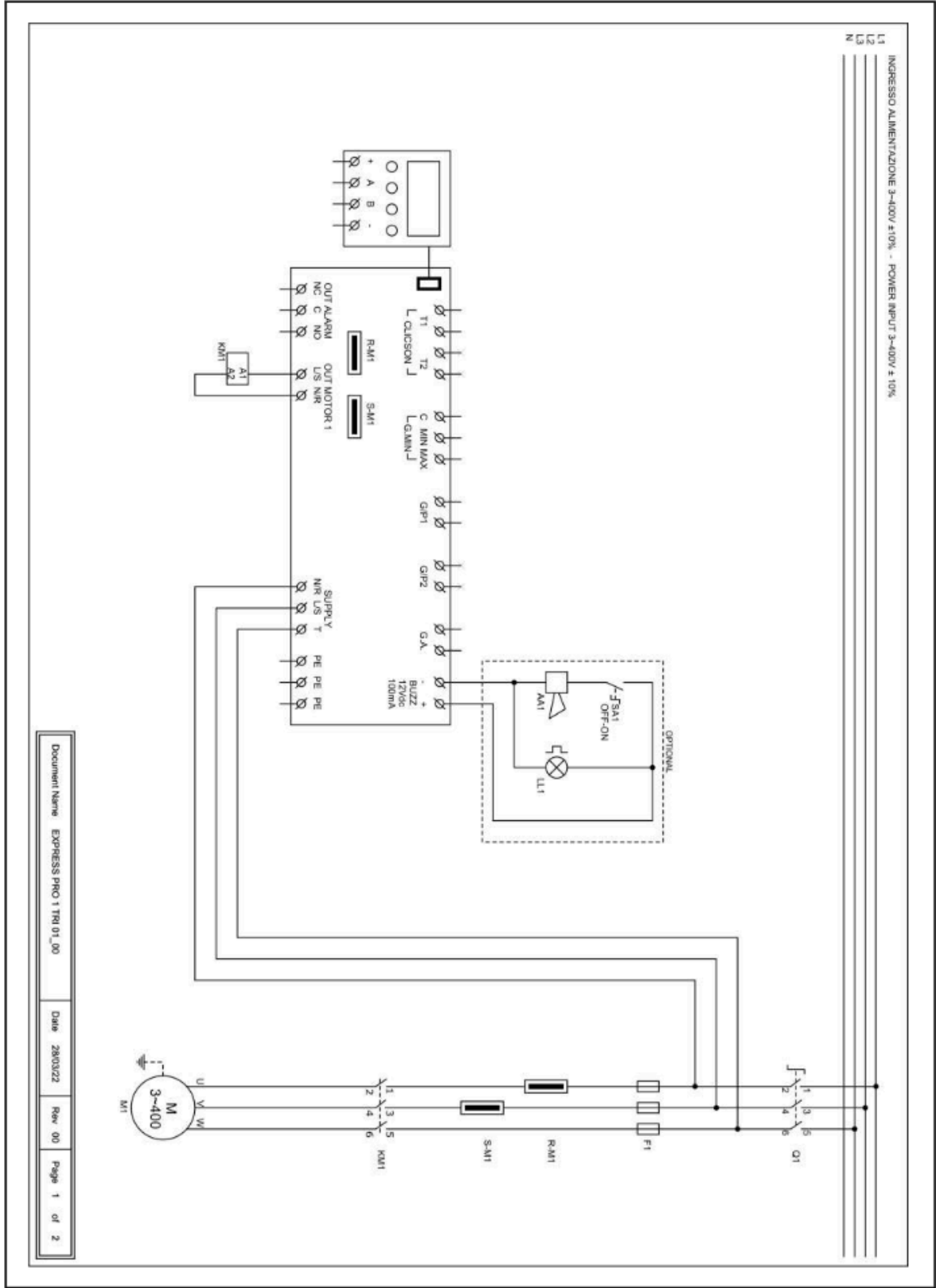
15.1 EXPRESS PRO 1 MONO



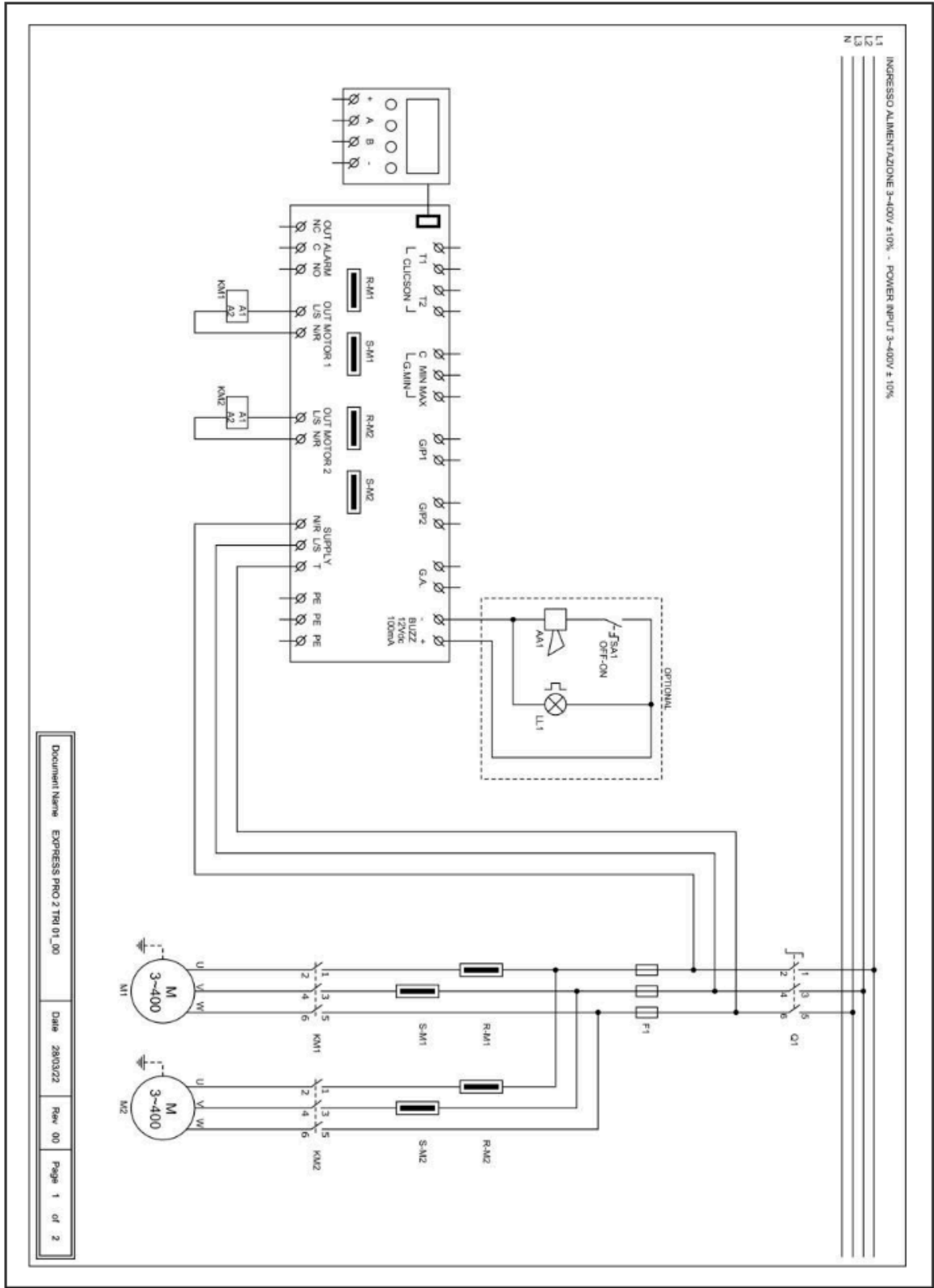
15.2 EXPRESS PRO 2 MONO



15.3 EXPRESS PRO 1 TRI



15.4 EXPRESS PRO 2 TRI



16. RS485 MODBUS ADDRESSES

MODBUS RTU RS485 9600 8N1

INDIRIZZO	REGISTER
0x100	Card serial number
0x101	Firmware version in tenths
0x102	Display type
0x103	Power type
0x104	Number of pumps
0x105	Board 1 voltage value in V
0x106	Board 2 voltage value in V
0x107	Current value in A/10 Pump 1
0x108	Current value in A/10 Pump 2
0x109	Current value in A/10 Pump 3
0x10A	Current value in A/10 Pump 4
0x10B	cosphi value in / 100 Pump 1
0x10C	cosphi value in / 100 Pump 2
0x10D	cosphi value in / 100 Pump 3
0x10E	cosphi value in / 100 Pump 4
0x10F	Dip-Switch status
0x110	Current value set Trimmer M1 MIN
0x111	Current value set Trimmer M2 MIN
0x112	Current value set Trimmer M3 MIN
0x113	Current value set Trimmer M4 MIN
0x114	Value set Trimmer SENS.
0x115	Analog signal value in tenths
0x116	MASTER board input status
0x117	SLAVE board input status
0x118	MASTER board expansion status
0x119	SLAVE board expansion status
0x11A	Output status
0x11B	Alarm status 2
0x11C	Alarm status 1
0x11D	Alarm history 1
0x11E	Alarm history 2
0x11F	Alarm history 3
0x120	Alarm history 4
0x121	Alarm history 5
0x122	Alarm history 6
0x123	Alarm history 7

0x124	Alarm history 8
0x125	Alarm history 9
0x126	Alarm history 10
0x127	Alarm history 11
0x128	Alarm history 12
0x129	Alarm history 13
0x12A	Alarm history 14
0x12B	Alarm history 15
0x12C	Alarm history 16
0x130	Alarm reset 2
0x131	Alarm reset 1
0x132	Alarm history reset
0x133	MANUAL command logic status
0x134	AUTOMATIC command logic status
0x135	Operating hours M1
0x136	Operating hours M2
0x137	Operating hours M3
0x138	Operating hours M4
0x139	Program to run
0x13A	CT type
0x13B	Language
0x13C	Standby display brightness
0x13D	Enabling factory name on panel
0x13E	Enabling panel name
0x13F	Self-reset klicson
0x140	Maximum current setting in A/10
0x141	Alarm inhibition time at start-up in s/10
0x142	Pump start delay time in s/10
0x143	Tempo ritardo spegnimento pompa in s/10
0x144	Pump shutdown delay time in s/10
0x145	Minimum current alarm delay time in s/10
0x146	Tempo ritardo allarme massima corrente in s/10
0x147	Maximum current alarm delay time in s/10
0x148	Pump current calibration 1
0x149	Pump current calibration 2
0x14A	Pump current calibration 3
0x14B	Pump current calibration 4
0x14C	Voltage board calibration 1
0x14D	Voltage board calibration 2
0x14E	Pump rotation enabling
0x14F	Alarm output enabling
0x150	Self-holding enabling

0x151	Probe sensitivity
0x153	Control box operation
0x154	Minimum level alarm enabling
0x155	Min voltage alarm threshold
0x156	Max voltage alarm threshold
0x157	Max alarm threshold current pump 1 in A/10
0x158	Max alarm threshold current pump 2 in A/10
0x159	Max alarm threshold current pump 3 in A/10
0x15A	Max alarm threshold current pump 4 in A/10
0x15B	Cosfi/current alarm selection
0x15C	Min alarm threshold cosfi pump 1 in /100
0x15D	Min alarm threshold cosfi pump 2 in /100
0x15E	Min alarm threshold cosfi pump 3 in /100
0x15F	Min alarm threshold cosfi pump 4 in /100
0x160	Min alarm threshold pump current 1 in A/10
0x161	Min alarm threshold pump current 2 in A/10
0x162	Min alarm threshold pump current 3 in A/10
0x163	Min Alarm threshold pump current 4 in A/10
0x164	Automatic reset for minimum current
0x165	Automatic reset time 1 in minutes
0x166	Automatic reset time 2 in minutes
0x167	Automatic reset time 3 in minutes
0x168	Automatic reset time 4 in minutes
0x169	Enable cyclic reset
0x16A	Enable analog signal
0x16B	Sensor Type Selection
0x16C	Selecting units of measurement
0x16D	Analogue signal operation
0x16E	Analogue sensor backscale in /10
0x16F	Set point in /10
0x170	Threshold 1 start/stop in /10
0x171	Threshold 2 start/stop in /10
0x172	Threshold 3 start/stop in /10
0x173	Threshold 4 start/stop in /10
0x174	Service mode
0x175	Scheduled maintenance due dates
0x176	Days since last maintenance
0x177	Scheduled maintenance alarm postponement days
0x178	Installed expansion type
0x17A	MODBUS address
0x17B	Multi-pump card enabling (EXPRESS only)
0x17C	Counter number of pump start-ups 1

0x17D	Counter number of pump start-ups 2
0x17E	Counter number of pump start-ups 3
0x17F	Counter number of pump start-ups 4
0x180	Maximum number of starts/h pump 1
0x181	Maximum number of starts/h pump 2
0x182	Maximum number of starts/h pump 3
0x183	Maximum number of starts/h pump 4
0x184	Enabling network return delay
0x185	Stop level
0x186	Alarm level
0x187	ATEX mode
0x188	WASTEK pressure sensor calibration in /10
0x189	Engine stop selection in case of max. acc/h alarm

17. ALARMS

DRY RUN ALARM

The detected minimum current value is lower than the programmed value and the panel stops the motor.

The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output.

The system resets automatically according to the times set during programming.

The alarm can still be reset manually by pressing the OFF key; the system can then be reset automatically.

MOTOR ALARM PROTECTION

The motor current absorption is higher than the set value and the panel stops the relevant motor.

The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output.

To reset the alarm manually, press the OFF key; the system can then be reset automatically.

OVERTEMPERATURE ALARM

The thermal switch (Klixon) has tripped on overtemperature.

The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output.

If Klixon self-reset is activated, the system automatically resets when the Klixon contact is closed; if the self-reset is disabled, when the Klixon contact is closed, press the "AUT" key and then restart the individual motors in alarm with "MAN".

If not used, close the motor Klixon input/s.

VOLTAGE TOO LOW

The measured mains voltage is too low (the motor stops).

The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output.

The system is reset automatically when voltage increases.

VOLTAGE TOO HIGH

The measured mains voltage is too high (the motor stops).

The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output.

The system is reset automatically when voltage decreases.

PHASE FAULT	The measured phase sequence is incorrect or one phase is missing (the motor stops). The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output. The system is reset automatically turning off and on the electrical panel after reconnecting the phase wires correctly.
MAX LEVEL ALARM	The float in the G.A. input detects the alarm for maximum level reached (motor does not stop). The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output. The system automatically resets itself when the alarm float is opened.
MIN LEVEL ALARM	The minimum level float, or the minimum level probes, detect the minimum level reached (the motor stops). The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output. The system automatically resets itself when the minimum level float or the minimum level probes are closed (this alarm can be disabled from the SERVICE menu).
ANALOG SENSOR ALARM	The analog sensor used is disconnected, wrongly connected or failed; The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output. The system is activated in emergency mode where C-MIN functions as an emergency stop and GP/1 as a start of all users not simultaneously. The system only resets when the analog sensor returns to normal conditions.
INFILTRATION MOTOR ALARM	Through PRO-SL expansion, the presence of water in the engine oil chamber is detected (the engine does not stop). The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output. The system automatically resets itself after the electric motor is serviced.

**ALARM
MAX. STARTS HOUR**

The set number of starts/hour has been exceeded.

If set, the alarm stops the motor

The display and the red LED flash, activating the cumulative alarm output and the 'BUZZ' output.

**ALARM
ANALOGUE LEVEL**

With analogue sensor activated, it indicates that the set alarm threshold has been reached;

in the event of PRESSURIZATION operation, the alarm stops the motors;

in the event of DRAIN operation, the alarm does not stop the motors;

in the event of FILL operation, the alarm does not stop the motors;

The display and the red LED flash, activating the cumulative alarm output and the "BUZZ" output.

The system automatically resets 5" after the set alarm level has returned.

18. SIZE TABLE

CODE	MODEL	MEASURES	TYPE
11630NB	EXPRESS PRO 1-Mono	195X245X120	PLASTIC
12630NB	EXPRESS PRO 2-Mono		
11630	EXPRESS PRO 1-Mono	310X240X185	PLASTIC
12630	EXPRESS PRO 2-Mono		
11633	EXPRESS PRO 1-Tri/7,5	310X240X185	PLASTIC
11634	EXPRESS PRO 1-Tri/11		
11635	EXPRESS PRO 1-Tri/15		
12633	EXPRESS PRO 2-Tri/7,5	310X240X185	PLASTIC
12634	EXPRESS PRO 2-Tri/11		
12635	EXPRESS PRO 2-Tri/15		
13630	EXPRESS PRO 3-Mono	390X310X230	PLASTIC
14630	EXPRESS PRO 4-Mono		
13633	EXPRESS PRO 3-Tri/7,5	500X400X235	METALIC
13634	EXPRESS PRO 3-Tri/11		
13635	EXPRESS PRO 3-Tri/15		
14633	EXPRESS PRO 4-Tri/7,5	700X500X235	METALIC
14634	EXPRESS PRO 4-Tri/11		
14635	EXPRESS PRO 4-Tri/15		

19. TROUBLESHOOTING

PROBLEM	CHECKS/SOLUTIONS
ALARM PHASE FAULT	• Check that all phases are available at the panel input. • Check and modify the phase sequence at the input of the door lock disconnect switch.
THE PANEL IS POWERED UP BUT THE MOTOR DOES NOT START	• Check that automatic operation is enabled on the motor screen. • Check input status and settings.
THE PANEL IS SET TO AUTOMATIC MODE BUT THE MOTOR DOES NOT START.	• Check input status and settings. • On the single phase model, check that the 230V~ voltage is present on the motor output terminals "L/S" and "N/R"; on the three-phase model check that the 400V~ voltage is present on terminals "L/S" and "N/R" and that the contactor winding is powered.
ON PUMP START-UP, THE THERMAL SWITCH TRIPS.	• Check the maximum current setting in the settings. • Check the motor current with a current clamp. • Check the motor status
AMPEROMETRIC INTERVENTION DOES NOT TRIP	• Check the maximum current setting in the settings.
THE PANEL IS IN MOTOR OVERTEMPERATURE ALARM STATUS	• Check that the over-temperature control is disabled if the motor/s is/are not fitted with a thermal switch. • Check the motor status
THE DISPLAY DOES NOT SWITCH ON	• Check that the FLAT connector is inserted correctly. • Ensure that the door lock is set to ON. • On the panel input, check that the voltages 230V~ or 400V~ are present between the SUPPLY mains input terminals. • Check that the fuses are efficient.
THE MAXIMUM START/HOUR ALARM IS TRIGGERED	• Hydraulic system undersized in relation to pump capacity(s). • Check float levels. • Check START/STOP motor(s) threshold settings • Activate START/STOP float function (self-holding)

cintropur®

W A T E R F I L T R A T I O N & T R E A T M E N T

Notice de montage, d'utilisation & d'entretien

Montage-, gebruiks- en onderhoudshandleiding

Montage-, Bedienungs- und Wartungsanleitung

Instructions for assembly, use and maintenance

Información de montaje, utilización y mantenimiento

Instrukcja montażu, użytkowania i konserwacji

Инструкция по монтажу и техническому обслуживанию

NW500 – 650 – 800 – 500TE





FR

NW 500 – 650 – 800 & NW 500 TE

Notice de montage, d'utilisation & d'entretien

1. Applications possibles

La gamme des filtres à eau CINTROPUR® NW 500 – 650 – 800 est conçue pour filtrer des eaux claires peu chargées de matières en suspension du type eau de ville, eau de pluie, eau de forage, eau de source. D'autres types de liquide non agressifs peuvent également être filtrés. Les domaines d'utilisation possibles se retrouveront en milieu industriel, collectif & agricole.

Les matériaux utilisés pour la fabrication du filtre sont compatibles avec la filtration de liquides alimentaires.

L'utilisation du NW 500 TE avec charbon actif est bien connue pour la dé-chloration, la disparition des odeurs, l'amélioration du goût, le traitement des pesticides et herbicides.

2. Description technique

La pose doit être réalisée dans les règles de l'art par du personnel qualifié. L'utilisation de ces filtres est soumise au respect des prescriptions techniques décrites dans le tableau ci-dessous :

		NW 500	NW 650	NW 800	NW 500 TE
Diamètre de raccordement		2"	2 ½ "	3 "	2"
Débit moyen (M³/H) avec	ΔP=0.2bar	18	25	32	2*
	ΔP=0.5bar	28	42	51	3.3*
Type de raccord		Filet ext.	Bride folle	Bride folle	Filet ext.
Pression de service (bar)		10	10	10	10
Pression max d'utilisation (bar)		16	16	16	16
Température max d'utilisation		50°C	50°C	50°C	50°C
Poids (Kg)		6.4	7	7.4	5.6
Tamis filtrant d'origine		25μ	25μ	25μ	25μ
Surface de filtration (cm²)		1288	1288	1288	-

* Valeur avec charbon actif CINTROPUR

3. Montage et manipulation

- L'emplacement idéal du filtre à eau CINTROPUR® sera directement à l'entrée de l'installation (après le compteur ou la pompe). Veillez à respecter le sens du passage du flux d'eau par rapport à la direction de la flèche sur la tête du filtre.
- Les filtres doivent être montés dans les règles de l'art : ils doivent être libres de contraintes mécaniques, avec les conduites amont et aval alignées. La longueur entre raccords ou entre brides doit être respectée afin de n'engendrer aucune traction ou compression sur celui-ci.
- Un réducteur de pression réduira efficacement la pression du réseau si celle-ci excède la pression de service. Un anti-coup de bélier est indispensable si ceux-ci sont présents sur l'installation.

• Equipement :

- **Standard** : comprend un jeu de 2 raccords filetés (NW 500 & 500TE) ou un jeu de 2 brides folles (NW 650 & NW 800), 2 manomètres (sauf version TE), un tamis filtrant de 25µ monté sur son support, une vanne de purge & une clé de démontage.
- **Les options possibles** sont le bol opaque, la fixation murale inox et les 2 joints plats d'étanchéité (à placer entre le collet de la bride et la contre bride).
- Les **manomètres** à bain glycérine livrés d'origine (excepté sur NW 500 TE) ont un filet standard ¼", le montage est réalisé à la clé (le cadran n'est pas une poignée à visser).
- La **fixation** sur la tête du filtre du support mural en inox se fera par les 2 molettes filetées prévues à cet effet. Pour une utilisation normale, un serrage de celles-ci à mains nues est suffisant pour un bon maintien.

• Pour les filtres à brides NW650 et NW800 :

- Le filtre est livré complet d'origine, prêt à être installé. Les brides doivent être montées au carré (avec les 2 trous supérieurs inscrits dans une ligne horizontale)
- Les brides sont conformes à la DIN EN 1092-1 PN-10 avec percements identiques à la EN 1092-1 PN-16.
- La bride du NW650 est à munir de 4 boulons M16, la bride du NW800 est à munir de 8 boulons M16.
- Ces boulons sont à serrer avec modération :
 - NW650 : joint plat pour max. 10 bars 40°C : 50 Nm.
 - NW650 : joint profilé pour max. 16 bars : 25 Nm.
 - NW800 : joint plat pour max. 10 bars 40°C : 30 Nm.
 - NW800 : joint profilé pour max. 16 bars : 15 Nm.
- L'étanchéité entre le collet de la bride CINTROPUR® NW 650 & 800 et la contre bride de l'installation est à assurer par un joint plat type EPDM-PN10 ou EPDM-PN16 de qualité (en option chez CINTROPUR ou disponible sur le marché).
- Les raccords livrés d'origine doivent obligatoirement être utilisés car le filet métrique de la tête ne permet pas d'accueillir d'autres raccords classiques du commerce. Ils sont en M76 X 2,8 sur le type NW 500 et 650 et M88 x 2,8 sur le type NW 800.

• Pour les filtres NW500 :

- Les écrous-raccords à visser sont livrés séparément dans l'emballage. Ils doivent être montés en vérifiant que les o-rings sont bien présents sur les embouts de la tête où ils sont vissés.
- L'étanchéité sur les raccords filetés du NW 500 sera obtenue avec tout type de produits du commerce. Préférez toutefois le chanvre + pâte Kolmat. Laissez un tour de filet libre sur le raccord du filtre pour une bonne amorce de la vanne ou du raccord de votre installation.
- Les raccords livrés d'origine doivent obligatoirement être utilisés car le filet métrique de la tête ne permet pas d'accueillir d'autres raccords classiques du commerce. Ils sont en M76 sur le type NW 500.
- L'étanchéité entre le raccord fileté et la tête de filtre est assurée par joint torique ; un serrage à 2 mains nues est suffisant pour de basses pressions. Pour des pressions plus élevées de l'ordre de 10 bars un serrage à la clé à ruban est recommandé. Une vérification d'étanchéité est requise à la mise en pression.

- Pour les filtres NW500, 650 et 800 :

- L'étanchéité entre la tête et le bol est assurée par un joint torique : un serrage léger avec la clé fournie est suffisant. La clé sert également au démontage.
- L'adaptateur de la vanne de purge (en partie inférieure) est monté d'usine avec un double joint d'étanchéité. Cet adaptateur peut tourner sur 360° sans causer de dommage au bol.
- Le support cylindrique du tamis filtrant est équipé aux 2 extrémités d'une hélice centrifuge et d'un couvercle d'étanchéité. Une vis de fixation maintient ceux-ci pour assurer une étanchéité parfaite entre l'eau à filtrer et l'eau filtrée. Un surmoulage de joint a été réalisé à cet effet. La manipulation de ces vis de fixation ne se fera qu'à mains nues (sans outil).
- Le montage de vannes d'isolement amont et aval sera conseillé pour plus de facilité lors de l'entretien du filtre.

- Pour les filtres en version TE :

- Le remplissage du bol du NW 500 TE par le produit de traitement (charbon actif, polyphosphate, ...) sera facilité en respectant les prescriptions reprises en annexe.
- Les modèles NW650TE & NW 800 TE n'existent pas en produit fini ; cependant ils peuvent être réalisés en remplaçant la vie interne «filtration» par le dispositif «tube+crépine».

4. Entretien

- Avant le démontage du bol, fermez les vannes amont – aval et lâchez la pression.

- Tamis filtrant :

- L'entretien et le changement du tamis filtrant sur eau potable est conseillé au minimum 3 fois par an et dans tous les cas à maximum 2 bar de perte de charge.
- Les tamis en 1, 5, 10, 25, 50 & 100µ sont prévus pour un usage unique. Un nettoyage de ceux-ci altérerait la structure de la fibre dégradant ainsi la finesse de filtration sélectionnée et fragiliserait le tamis pouvant mener à d'éventuelles déchirures.
- Les tamis nylon en 150 & 300µ sont eux conçus pour être nettoyés et réutilisés.

- Charbon actif :

- Le renouvellement de la charge de charbon actif sur eau potable pour NW 500 TE doit se faire tous les 90M³, dans les autres cas, au minimum tous les 3 mois.

- Hélice centrifuge et couvercle :

- Le système de fixation de l'hélice centrifuge sur le support cylindrique est pourvu de 4 encoches pour un bon positionnement ; veillez à le respecter avant le remontage.
- Avant de replacer le couvercle d'étanchéité sur le support cylindrique, veillez à ce que le tamis filtrant soit dégagé de la croix du renfort interne. Manipulez les vis de fixation de l'hélice et du couvercle uniquement à mains nues (l'intervention d'un outil les endommagerait).

- Le bol :

- Le filet du bol doit rester propre et graissé pour un montage et démontage aisé du bol dans le temps.
- Le joint torique entre tête et bol doit également rester propre et graissé pour une bonne étanchéité.
- Toutes les gorges et portée de joint torique (& joint plat) doivent restées propres et exemptes de bavures.

- Composant endommagé :

- Tout composant du filtre, même partiellement endommagé, doit être remplacé immédiatement afin d'assurer la bonne tenue à la pression et l'étanchéité de l'ensemble du filtre.

5. Garantie

La sélection d'excellentes matières premières pour produire chaque composant de votre filtre est la meilleure garantie pour vous donner une entière satisfaction pendant de nombreuses années d'utilisation. Si toutefois une défectuosité d'un composant liée à un défaut de fabrication devait se révéler, celle-ci serait couverte par un échange sous garantie du dit composant.

Pour plus d'informations sur les produits CINTROPUR, consultez www.cintropur.com



NL

NW 500 – 650 – 800 & NW 500TE

Montage-, gebruiks- en onderhoudshandleiding

1. Mogelijke toepassingen

Het gamma waterfilters CINTROPUR® NW500 – 650 – 800 is ontworpen om **helder water** met weinig zwevende stoffen zoals leidingwater, regenwater, putwater en/of bronwater te filteren.

Andere soorten, niet agressieve vloeistoffen, kunnen eveneens worden gefilterd. De mogelijke toepassingsdomeinen liggen in het industrieel, gemeenschaps- en landbouwmilieu.

De materialen die gebruikt worden voor de fabricage van de filter zijn voedselveilig en kunnen ingezet worden voor de filtering van **vloeibare levensmiddelen**.

Het gebruik van NW 500 TE met actieve kool staat bekend voor de dechlorering, het verdwijnen van geur, de smaakverbetering, de behandeling met pesticiden en herbiciden.

2. Technische eigenschappen

De filter wordt volgens de regels door een bevoegde persoon geplaatst. Het gebruik van deze filters is onderworpen aan de naleving van de technische voorschriften beschreven in onderstaande tabel:

		NW 500	NW 650	NW 800	NW 500 TE
Nominale aansluitingsdiameter		2"	2 ½ "	3 "	2"
Gemiddeld debiet (M³/H) met	ΔP=0.2 bar	18	25	32	2*
	ΔP=0.5 bar	28	42	51	3.3*
Type aansluiting		Koppeling	Losse flens	Losse flens	Koppeling
Bedrijfsdruk (bar)		10	10	10	10
Max. werkdruk (bar)		16	16	16	16
Max gebruikstemperatuur		50°C	50°C	50°C	50°C
Gewicht (Kg)		6.4	7	7.4	5.6
Filtervlies		25μ	25μ	25μ	25μ
Filteroppervlakte (cm²)		1288	1288	1288	-

*waarden met actieve kool

3. Montage en aansluiting

- De ideale plaatsing van CINTROPUR® waterfilters is aan de ingang van de installatie, onmiddellijk na de meter of de pomp. Zorg ervoor dat u de stroomrichting van de filter respecteert, steeds in de richting van de pijl op de filterkop.
- De filters moeten gemonteerd worden volgens de regels. Ze mogen geen mechanische belemmeringen vertonen en de leidingen stroomopwaarts en stroomafwaarts moeten horizontaal uitgelijnd zijn. De aansluiting op het waternet moet worden gerespecteerd om geen enkele tractie of compressie op de filter uit te oefenen.
- Een drukregelaar zal efficiënt de druk van het net beperken indien deze de bedrijfsdruk overstijgt. Een waterslagdemper is onontbeerlijk indien waterslag of drukschommelingen op de installatie zouden optreden.
- Uitrusting:
 - **Standaard:** omvat een set van 2 koppelingen (NW500 & NW500TE) of een set van losse flenzen (NW650 en NW800), 2 manometers (niet op NW500TE), een filtervlies van 25μ gemonteerd op zijn steun, een ontluchtingskraan en een demontagesleutel.
 - **Mogelijke opties** zijn de ondoorzichtige klok, de inox wandbevestiging en 2 platte dichtingen (tussen kraag en flens plaatsen).
 - De standaard geleverde **glycerinmanometers (niet op NW500TE)** hebben een schroefdraad van ¼". De montage wordt met de sleutel uitgevoerd (de behuizing is geen handvat om hem vast te schroeven!)
 - De bevestiging op de filterkop van de inox wandsteun gebeurt met de 2 hiervoor voorziene wartelwieljes met schroefdraad. Bij een normaal gebruik volstaat het vastzetten met de hand.

- Filters NW650 en NW800:
 - De filter wordt volledig en gereed voor montage geleverd.
 - De flenzen worden gemonteerd met de bouten met een offset van 45° ten opzichte van de horizontale en verticale as (met de 2 bovenste gaten horizontaal)
 - De flenzen zijn conform de DIN EN 1092-1 PN-10 met identieke doorboringen aan de EN 1092-1 PN-16
 - De NW650 flens is voorzien van 4 bouten M16 terwijl de NW800 flens met 8 bouten van M16.
 - Span deze bouten matig aan:
 - NW650: vlakke afdichting voor max. 10bar 40°C: 50Nm
 - NW650: profielafdichting voor max. 16 bar: 25Nm
 - NW800: vlakke afdichting voor max. 10 bar 40°C: 30Nm
 - NW800: profielafdichting voor max. 16 bar: 15Nm
 - De dichtheid tussen de flenskraag CINTROPUR® NW650 & NW800 en de tegenflens van de installatie dient te gebeuren door een vlakke afdichting van het kwaliteitsvolle type EPDM-PN10 of EPDM-PN16 (in optie bij Cintropur of op de markt verkrijgbaar).
 - De origineel geleverde aansluitingen moeten verplicht worden gebruikt wegens de metrische draad van de kop die geen andere klassieke aansluitingen in de handel toelaat. Ze zijn van het type M76 2x8 op de NW650 en M88 2.8 op de NW800.

- Filter NW500:
 - De koppelingen worden apart in de verpakking geleverd. Ze worden gemonteerd met de O-ringen op het kopuiteinde waarop ze geschroefd worden.
 - De afdichting op de koppeling wordt gemaakt met elk type product in de handel. De voorkeur gaat evenwel naar hennep en Kolmatpasta. Laat een draadomwenteling vrij op de koppeling voor een goede aanzet van de kraan of de aansluiting op uw installatie.
 - De filterkop is origineel voorzien van een schroefdraad van 2" en kan rechtstreeks aangesloten worden met een in de handel verkrijgbare aansluiting.
 - De originele koppelingen zijn verplicht voor gebruik omdat de metrische schroefdraad van de kop met geen andere klassieke aansluitingen uit de handel kan verbonden worden. Die zijn van het type M76 voor de NW500.
 - De afdichting tussen de koppeling en de filterkop is gemaakt met een O-ring. Het vastzetten met de hand volstaat voor de lage drukken. Voor hogere druk van 10 bar of meer, wordt het vastzetten aangeraden met een bandsleutel. De afdichting dient nagekeken te worden bij het onder druk zetten.

- Filters NW500, NW650 en NW800:
 - De afdichting tussen de filterkop en de klok wordt gemaakt met een O-ring. Het vastzetten met de hand is voldoende. De sleutel dient voor de demontage.
 - De adapter van de ontluftingskraan (het onderste gedeelte) wordt in de fabriek gemonteerd met een dubbele afdichting. Deze adapter kan 360° draaien zonder de klok te beschadigen.
 - De cilindervormige steun van het filtervlies is aan de 2 uiteinden uitgerust met een centrifugaal schroef en een afdichtingsdeksel. De rubberen inleg in de centrifugaal schroef en het deksel zorgt voor een perfecte dichting.
 - De montage van de afsluitkranen stroomopwaarts en -afwaarts wordt aangeraden voor meer onderhoudsgemak van de filter.

- Filters NW500TE:
 - Het vullen van de klok met het behandelingsproduct (actieve kool, polyfosfaat, ...) is gemakkelijker bij het volgen van de voorschriften uit de bijlage.
 - De modellen NW650TE en NW800TE bestaan niet als afgewerkt product; U krijgt het met het vervangen van de interne filtering met de combinatie buis en zeef.

4. Onderhoud

- Voor de demontage van de klok sluit u de kranen stroomopwaarts en –afwaarts en laat u de druk af.
- Filtervlies:
 - Het onderhoud en de vervanging van het filtervlies op drinkwater wordt minimum 3 maal per jaar aangeraden en in alle gevallen op maximum 2 bar drukverlies.
 - De filtervliezen van 1, 5, 10, 25, 50 & 100µ zijn gemaakt voor eenmalig gebruik. Een reiniging ervan zou de structuur van de vezel wijzigen en zo de geselecteerde filterfijnheid verslechteren en het filtervlies broos maken, wat kan leiden tot eventuele scheuren.
 - De nylon filtervliezen in 150 & 300µ zijn ontworpen voor reiniging en hergebruik.
- Klok:
 - De schroefdraad van de klok moet proper en gesmeerd blijven voor een gemakkelijke montage en demontage van de klok.
 - De O-ring tussen kop en klok moet eveneens proper en gesmeerd blijven voor een goede afdichting.
 - Alle groeven en draagvlakken van de O-ring (en platte dichting) moeten proper en zonder braam blijven.
- Actieve kool:
 - De vernieuwing van de lading actieve kool op het drinkwater voor NW500Te moet om de 90m³ gebeuren, in de andere gevallen minimum om de 3 maanden.
- Centrifugaal schroef en deksel:
 - Het bevestigingssysteem van de centrifugaal schroef op de cilindrische steun is voorzien van 4 inkepingen voor een goede positionering; gelieve dit te respecteren voor de montage.
 - Vooraleer het dichtheidsdeksel op de cilindrische steun terug te plaatsen, het filtervlies losmaken van het interne verstevigingskruis. De schroeven worden manueel bevestigd (een werktuig gebruiken zou die kunnen beschadigen).
- Beschadigd onderdeel:
 - Elk beschadigd filteronderdeel, zelfs indien maar gedeeltelijk beschadigd, moet onmiddellijk worden vervangen om de goede drukweerstand en de afdichting van het filtergeheel te verzekeren.

5. Waarborg

De selectie van uitstekende grondstoffen om elk onderdeel van uw filter te maken is de beste waarborg om u volledige voldoening te schenken tijdens de vele gebruiks jaren.

Indien evenwel een defect aan een onderdeel door een fabricagefout aan het licht zou komen, dan wordt dit gedekt door een omwisseling onder garantie van het onderdeel.

Voor meer informatie over de CINTROPUR®-producten, raadpleeg www.cintropur.com



NW 500 – 650 – 800 – 500TE

Montage-, Bedienungs- und Wartungsanleitung

1. Mögliche Anwendungen

Die Wasserfilter der Baureihe CINTROPUR® NW 280 – 340 – 400 sind für das Filtern von klarem Wasser, das nur schwach mit Schwebstoffen belastet ist, wie Leitungswasser, Regenwasser, Brunnen- und Quellwasser, bestimmt. Andere, nicht aggressive Flüssigkeiten können ebenfalls gefiltert werden. Zu den möglichen Anwendungsbereichen gehören die Industrie, öffentliche Einrichtungen und die Landwirtschaft.

Die eingesetzten Materialien, die für die Herstellung des Filters genutzt werden, sind für die Filtration von flüssigen Lebensmitteln geeignet.

2. Technische Beschreibung

Die Montage muss entsprechend den geltenden Regeln des Handwerks durch Fachpersonal vorgenommen werden. Der Einsatz dieser Filter ist den technischen Bestimmungen der beistehenden Tabelle unterworfen:

	NW 500	NW 650	NW 800	NW500TE
Anschlüsse	2"	2 1/2"	3"	2"
Anschlussart	Außengewinde	Überwurfflansch	Überwurfflansch	Außengewinde
Durchschnittlicher Durchfluss (M³/H) bei	$\Delta P = 0.2 \text{ bar}$ $\Delta P = 0.5 \text{ bar}$	18 28	25 42	32 51
Betriebsdruck (bar)	10	10	10	10
Maximaler Druck (bar)	16	16	16	16
Maximale Betriebstemperatur	50°C	50°C	50°C	50°C
Gewicht (Kg)	6.4	7	7.4	5.6
Serienmäßige Filterfeinheit	25µ	25µ	25µ	-
Fassungsvermögen Behälter	-	-	-	4.85l
Filterfläche (cm²)	1288	1288	1288	-

*Wert mit Cintropur Aktivkohle

3. Montage und Handhabung

- Die ideale Einbauposition des CINTROPUR® Wasserfilters befindet sich direkt am Eingang der Anlage (nach dem Wasserzähler oder der Pumpe). Achten Sie beim Einbau auf die Durchflussrichtung des Wassers in Bezug auf die Pfeilausrichtung am Kopf des Filters.
- Die Filter müssen entsprechend dem Stand der Technik montiert werden: sie müssen frei von mechanischen Spannungen sein und mit den Zuleitungen auf Wassereingangs- und Wasserausgangsseite entsprechend ausgerichtet sein. Die Länge zwischen den Anschlüssen müssen beachtet werden, um keinerlei Zug- oder Druckspannung auf diese auszuüben.
- Sollte der Netzdruck den Betriebsdruck übersteigen, so muss ein Druckminderer für entsprechende Abhilfe sorgen. Ist die Anlage Druckstößen ausgesetzt, muss zwingend eine druckstoßverhindernde Vorrichtung eingesetzt werden.
- Ausstattung:
 - Serienmäßig:** der Filter beinhaltet ein Set von 2 Gewindeanschlüssen (NW500 & NW500TE) oder einen Satz mit 2 Überwurfflanschen (NW650 & NW800), 2 Manometer (außer NW500TE), ein vormontiertes 25µm Filtervlies, ein Entleerungsventil und einen Demontageschlüssel.
 - Erweiterbare Optionen:** eine lichtundurchlässige Filterglocke, eine Wandhalterung aus Edelstahl und 2 Flachdichtungen (zwischen Flanschschulter und Gegenflansch).
 - Die original mitgelieferten **Glyzerin-Druckmanometer** verfügen über ein standardmäßiges 1/4" Gewinde. Für die Montage ist ein Schraubenschlüssel zu verwenden (die Druckanzeige darf nicht zum Verschrauben genutzt werden!).
 - Die Wandhalterung aus Edelstahl wird mit den 2 hierfür vorgesehenen Gewindeschrauben am Kopf des Filters befestigt. Bei normaler Anwendung genügt ein handfestes Anziehen dieser Gewindeschrauben für einen guten Halt.

- Filter NW 650 & NW 800:
 - Der Filter wird komplett und montagebereit geliefert.
 - Die Flansche müssen achsfrei montiert werden (beide obere Bohrungen auf einer horizontalen Linie)
 - Die Flansche entsprechen der DIN EN 1092-1 PN-10 mit der EN 1092-1 PN-16 entsprechenden Bohrungen.
 - Der NW 650 Flansch wird mit 4 und der NW 800 Flansch mit 8 M16-Schrauben montiert.
 - Die Schrauben dürfen nur leicht angezogen werden:
 - NW650: Flachdichtung für max. 10 bar 40°C: 50Nm
 - NW650: Profildichtung für max. 16 bar: 25Nm
 - NW800: Flachdichtung für max. 10 bar 40°C: 30Nm
 - NW800: Profildichtung für max. 16 bar: 25Nm
 - Die Dichtigkeit zwischen der Schulter des NW650 & 800 Flansches und dem Gegenflansch der Anlage muss mit einer hochwertigen EPDM-PN10 oder EPDM-PN16 Flachdichtung gewährleistet werden (bei Cintropur und im Handel verfügbar).
 - Die gelieferten Anschlüsse müssen zwingend verwendet werden, weil das metrische Gewinde des Kopfes keine anderen handelsüblichen Anschlüsse zulässt. Die von NW650 sind in M76x2.8, die von NW800 M88x2.8

- Filter NW500:
 - Die Anschlüsse und Überwurfmutter werden separat in der Verpackung mitgeliefert. Bei ihrer Montage muss darauf geachtet werden, dass die O-Ringe exakt auf die Endstücke des Filterkopfes, an die sie geschraubt werden, aufliegen.
 - Die Dichtigkeit der Anschlüsse wird mit handelsüblichen Produkten sichergestellt. Bevorzugt wird Hanf + Kolmat Paste. Eine Gewindedrehung am Anschluss des Filters freilassen, um ein ordnungsgemäßes Ansetzen des Das Originalgewinde des Filterkopfes kann direkt mit einem handelsüblichen Anschluss ausgestattet werden, da es sich um ein klassisches 2" Gewinde handelt.
 - Die gelieferten Anschlüsse müssen zwingend verwendet werden, weil das metrische Gewinde des Kopfes keine anderen handelsüblichen Anschlüssen zulässt. Sie sind in M76 auf der NW500 Ausführung.
 - Die Dichtigkeit zwischen dem Gewindeanschluss und dem Filterkopf wird mittels eines O-Rings sichergestellt; ein Anziehen mit bloßen Händen reicht im Falle von niedrigen Drücken aus. Bei höheren Drücken von mehr als 10 bar wird ein Anziehen mittels Rohrzanze empfohlen. Die Dichtigkeit muss bei Unterdrucksetzung des Filters überprüft werden.

- Filter NW500, NW650 & NW800:
 - Die Dichtigkeit zwischen dem Filterkopf und der Filterglocke wird durch einen O-Ring sichergestellt; ein handfestes Zudrehen ist ausreichend. Der mitgelieferte Filterschlüssel dient ausschließlich zur Demontage.
 - Der Adapter des Entleerungsventils (im unteren Bereich der Filterglocke) ist ab Werk mit einer Doppeldichtung montiert. Dieser Adapter kann um 360° gedreht werden ohne die Filterglocke zu beschädigen.
 - Der zylinderförmige Stützkörper des Filtervlieses ist jeweils an beiden Enden mit einer Zentrifuge und einem dichtenden Abschlussdeckel versehen. Zu diesem Zweck wurde eine dichtende Ummantelung vorgenommen.
 - Zur Vereinfachung des sachgemäßen Unterhalts des Filters wird die Montage von Absperrventilen auf Wassereingangs- und Wasserausgangsseite empfohlen.

- Filter NW500TE:
 - Die Befüllung des Behälters mit dem Behandlungsprodukt (Aktivkohle, Polyphosphat, ...) wird durch die Befolgung der im Anhang beschriebenen Anweisungen vereinfacht.
 - Die Modelle NW650TE und NW800TE werden nicht als fertige Produkte geliefert; allerdings können Sie durch den Ersatz der internen Filtereinheit durch die Vorrichtung „Rohr+Sieb“ verwirklicht werden.

4. Wartung

- Vor Ausbau der Filterglocke, die Absperrventile wassereingangs- und wasserausgangsseitig schließen und den Druck ablassen.
- Filtervlies:
 - Es wird empfohlen das Filtervlies bei Anwendungen im Trinkwasserbereich mindestens dreimal im Jahr und immer dann, wenn ein Druckverlust von 2 bar erreicht ist, zu warten und zu ersetzen.
 - Die Filtervliese in 1 – 5 – 10 – 25 – 50 – 100µm sind einmalig zu nutzen. Eine Reinigung dieser Filtervliese würde die Struktur der Fasern beschädigen und dementsprechend die gewünschte Filterfeinheit beeinträchtigen, sodass es das Vlies anfälliger macht und gegebenenfalls zerreißt.
 - Die Filtervliese in 150 + 300µm bestehen aus Nylon und sind für die Reinigung und Wiederverwendung vorgesehen.
- Die Filterglocke: das Gewinde der Glocke muss sauber und eingefettet bleiben, damit der Ein- und Ausbau dieser Glocke im Laufe der Zeit einfach bleibt.
 - Der O-Ring zwischen Filterkopf und Filterglocke sollte zwecks guter Dichtigkeit ebenfalls sauber und eingefettet bleiben.
 - Jede Nut und Kontaktfläche von O-Ringen muss sauber und gratfrei sein.
- Beschädigte Komponenten:
 - Alle, auch nur zum Teil beschädigte Komponenten des Filters, müssen sofort ausgetauscht werden um eine gute Druckbeständigkeit und Dichtigkeit des gesamten Filters zu gewährleisten.

5. Garantie

Die Auswahl bester Rohstoffe für die Herstellung eines jeden Bauteil Ihres Filters ist die beste Garantie dafür, dass Sie über viele Jahre mit Ihrem CINTROPUR® Wasserfilter zufrieden sein werden. Sollte doch mal aufgrund eines Herstellungsfehlers ein Defekt einer Komponente auftreten, so wird diese Komponente im Rahmen der für die fragliche Komponente geltenden Garantie ausgetauscht.

Weitere Informationen über die CINTROPUR® Produkte finden Sie unter www.cintropur.com



NW 500 – 650 – 800 – 500TE

Instructions for assembly, use and maintenance

1. Possible applications

The range of water filters CINTROPUR® NW 500-650-800-500TE is designed for filtering **clear water** slightly loaded with solid suspended particles, such as city water, rainwater, borehole water, spring water. Other types of non-aggressive liquids can also be filtered. The possible areas of use are in the industrial, the public and the agricultural sectors.

The materials used to manufacture the filters are suitable for **food products** and **drinking water**.

The use of the NW 500 TE with activated carbon is well known for dechlorinating, removal of odours, improvement of taste, reduction of pesticides and herbicides.

2. Technical description

The installation must be achieved according to the correct existing standards and by qualified personnel. These filters must be used in compliance with the technical requirements listed in the following table:

		NW 500	NW 650	NW 800	NW500TE
Diameter of pipe		2"	2 ½"	3"	2"
Type connection		External dread	Slip-on flange	Slip-on flange	External dread
Average flow rate (m³/h)	ΔP=0.2bar	18	25	32	2*
	ΔP=0.5bar	28	42	51	3.3*
Working pressure (bar)		10	10	10	10
Max. operating pressure (bar)		16	16	16	16
Maximum operating temperature		50°C	50°C	50°C	50°C
Weight (kg)		6.4	7	7.4	5.6
Standard filter sleeve		25 µ	25 µ	25 µ	-
Bowl volume (l)		-	-	-	4.85
Filtration surface (cm²)		1288	1288	1288	-

*value with activated carbon

3. Assembly and handling

- The ideal location for the CINTROPUR® water filter is directly at the point of entry (after the meter or after the pump). Make sure that the direction of the water flow corresponds to the direction of the arrow on the filter head.
- The filters must be fitted according to the state of the art procedures: they must be free of any mechanical stress, with the piping upstream and downstream aligned. The distance between the couplings must be correct to avoid any tension or compression stress on them.
- A pressure reducer will efficiently reduce the supply pressure if it exceeds the operating pressure. An anti-water hammer device is necessary in case it may occur on the installation.
- Equipment:
 - **Standard:** includes a set of 2 threaded connectors (NW 500 & 500TE) or a set of 2 slip-on flanges (NW 650 & NW 800), 2 pressure gauges (except the TE version), a 25µ filter screen fitted on its support, a purge valve and a spanner for disassembly.
 - **The possible options** are the opaque bowl, the stainless steel wall mount and the 2 flat sealing joints (for placing between the flange neck and the counter-flange).
 - The glycerine-filled **pressure gauges** supplied as standard (except on NW 500 TE) have a standard ¼" thread; fitting is done using a spanner (the dial is not to be used as a handle for screwing it in!).
 - Fixing the stainless steel wall mount to the filter head is done using the 2 thumbwheels provided for this purpose. For normal use, hand-tightening these is adequate for a good hold.

- NW650 and NW800:
 - The filter is supplied complete and ready to install.
 - The flanges must be fitted off-axis (with the 2 upper holes in a horizontal line)
 - The flanges are compliant with DIN EN 1092-1 PN-10 with holes identical to EN 1092-1 PN-16.
 - The flange of the NW650 requires 4 M16 bolts, and the flange of the NW800 requires 8 M16 bolts.
 - These bolts should be made moderately tight:
 - NW650: flat seal for max. 10 bar 40 °C: 50 Nm.
 - NW650: profiled seal for max. 10 bar: 25 Nm.
 - NW800: flat seal for max. 10 bar 40 °C: 30 Nm.
 - NW800: profiled seal for max. 10 bar: 15 Nm.
 - Water tightness between the flange of the CINTROPUR® NW 650 & 800 and the counter-flange of the installation must be provided by a flat seal of type EPDM-PN10 or EPDM-PN16 of good quality (as an option from CINTROPUR or available in the trade).
 - The original supplied couplings must be used because the metric thread of the head is not compatible with other standard couplings of the trade. They are of size M76x2,8 in type NW 500-650 and M88x2,8 in type NW 800.
- NW500:
 - The union nuts to be screwed on are supplied separately in the packaging. When they are fitted it must be checked that the O-rings are present on the end pieces of the head where they will be screwed on.
 - The tightness of the threaded connections of the NW 500 can be achieved with any of the usual trade products. However, the hemp and paste from Kolmat is to be preferred. Leave one thread turn free on the filter connector to provide a good start for the valve or connector of your installation.
 - The original supplied couplings must be used because the metric thread of the head is not compatible with other standard couplings of the trade. They are of size M76 in type NW 500.
 - The tightness between the threaded connector and the filter head is ensured by a sealing ring; hand-tightening with two hands is sufficient for low pressures. For higher pressures, around 10 bar, tightening with a strap wrench is recommended. Checking the tightness is required when pressurising.
- NW500, 650 and 800:
 - The tightness between the head and the bowl is ensured by an O-ring; tightening lightly with the supplied spanner is adequate. The spanner is also used for disassembly.
 - The purge valve adapter (in the lower part) is factory-fitted with a double sealing joint. This adapter can rotate through 360° without damaging the bowl.
 - The cylindrical support of the filter screen is fitted at the 2 ends with a centrifugal spinner and a sealing cover. A holding screw fixes them to ensure complete sealing between the water to be filtered and the filtered water. A joint overmould has been implemented to this end. Handling of these fixing screws is done using only the hands (no tools).
 - Fitting isolating valves upstream and downstream is advised for assisting maintenance of the filter.
- NW500TE:
 - Filling the bowl of the NW 500 TE with the treatment material (activated carbon, polyphosphate etc.) is made easier by following the rules stated in the appendix.
 - The models NW650TE & NW 800 TE do not exist as finished products; they can be made by replacing the internal filtration parts by the "tube + strainer" device.

4. Maintenance

- Before disassembling the bowl, close the upstream and downstream valves and release the pressure.
- Filter screen:
 - Maintenance and replacement of the filter screen used for drinking water is recommended at least 3 times per year and in any case before the pressure loss reaches 2 bar.
 - The filters graded 1, 5, 10, 25, 50 & 100 μ are intended for a single use. Cleaning them would change the structure of the fibre, so degrading the fineness of the selected filtering and making the filter more fragile, which could lead to tearing.
 - The nylon filters graded 150 & 300 μ are designed to be cleaned and re-used.
- Activated carbon:
 - Replacement of the activated carbon in the NW 500 TE for drinking water is necessary every 90 m³, and in other cases at least every 3 months.
- Centrifugal spinner and cover:
 - The system for holding the centrifugal spinner on the cylindrical support is provided with 4 slots for correct positioning; take note of this before refitting.
 - Before refitting the sealing cover on the cylindrical support, ensure that the filter screen is not touching the cross of the internal reinforcement. Handle the fixing screws of the spinner and the cover only with bare hands (using a tool would cause damage).
- The bowl:
 - The thread of the bowl must stay clean and greased for easy fitting and removal of the bowl during its life time.
 - The sealing ring between the head and the bowl must also remain clean and greased for good sealing.
 - All slots and O-ring seatings (& flat joint) must remain clean and without burrs.
- Damaged component:
 - Every component of the filter, even if only slightly damaged, must be replaced immediately to ensure good performance under pressure and water-tightness of the whole filter.

5. Warranty

The choice of high-quality raw materials for manufacturing each component of your filter is the best guarantee of giving you full satisfaction for many years of use.

If, nevertheless, a component develops a fault related to a manufacturing defect, this would be covered by a replacement of that component under guarantee. For further information about CINTROPUR products, go to www.cintropur.com



NW 500 – 650 – 800 – 500TE

Información de montaje, utilización y mantenimiento

1. Aplicaciones posibles

La gama de los filtros de agua CINTROPUR® NW 500 – 650 – 800 ha sido concebida para filtrar aguas claras poco cargadas de materiales en suspensión del tipo agua de la red pública, agua de lluvia, agua de pozo, agua de manantial. También pueden filtrarse otros tipos de líquidos no agresivos. Las áreas posibles de utilización se encuentran en el medio industrial, colectivo y agrícola. Los materiales utilizados para la fabricación del filtro son compatibles con la filtración de líquidos alimentarios.

La utilización del NW 500 TE con carbón activo es bien conocida para la **descloración**, la **eliminación de olores**, la **mejora del gusto** y el **tratamiento de los pesticidas y los herbicidas**.

2. Descripción técnica

La colocación debe ser realizada de forma adecuada por el personal cualificado. La utilización de estos filtros está sujeta al respeto de las prescripciones técnicas descritas en el siguiente cuadro:

		NW 500	NW 650	NW 800	NW500TE
Diámetro de conexión		2"	1 1/2"	3"	2"
Tipo conexión		Rosca ext.	Brida suelta	Brida Suelta	Rosca ext.
Caudal medio (m³/h) con	$\Delta P=0,2\text{bar}$	18	25	32	2*
	$\Delta P=0,5\text{bar}$	28	42	51	3.3*
Presión de servicio (bar)		10	10	10	
Presión máx. de utilización (bar)		16	16	16	
Temperatura máxima		50°C	50°C	50°C	
Peso (Kg)		2	2.35	2.65	
Tamiz filtrante		25 μ	25 μ	25 μ	
Superficie de filtración (cm²)		530	770	1010	

* Valor con carbón activo

3. Montaje y manipulación

- El emplazamiento ideal del filtro de agua CINTROPUR® será directamente en la entrada de la instalación (después del contador o de la bomba). Debe respetarse el sentido del paso del flujo de agua con relación a la dirección de la flecha en el cabezal del filtro.
- Los filtros deben montarse de forma adecuada: deben carecer de cargas mecánicas y tener los conductos aguas arriba y aguas abajo alineados. Debe respetarse la longitud entre conexiones o entre bridas con el fin de no engendrar ninguna tracción o compresión sobre los mismos.
- Un reductor de presión reducirá eficazmente la presión de la red si ésta excede la presión de servicio. Es indispensable un antigolpe de ariete si estos golpes de ariete están presentes en la instalación.
- Equipo:
 - **Estándar:** consta de un juego de 2 conexiones roscadas, 2 manómetros, un tamiz filtrante de 25 μ montado en su soporte, una válvula de purga y una llave de desmontaje.
 - **Las opciones posibles** son el vaso opaco y la fijación mural de acero inoxidable
 - **Los manómetros** de baño de glicerina entregados de origen tienen una rosca estándar de 1/4", el montaje se realiza con la llave (¡el cuadrante no es una empuñadura para atornillar!).
 - La fijación en el cabezal del filtro del soporte mural de acero inoxidable se hará mediante las 2 moletas roscadas previstas para ello. Para una utilización normal, un apriete a manos desnudas es suficiente.

- Para los filtros NW 650 y 800:
 - El filtro se entrega completo de origen, listo para ser instalado.
 - Las bridas deben montarse en cuadro (con los 2 orificios superiores inscritos en una línea horizontal)
 - Las bridas están en conformidad con la DIN EN 1092-1 PN-10 con perforaciones idénticas a la EN 1092-1 PN-16.
 - La brida del NW650 está provista de 4 pernos M16, la brida del NW800 está provista de 8 pernos M16.
 - Estos pernos deben apretarse con moderación:
 - NW650: junta plana para máx. 10 bar 40°C : 50 Nm.
 - NW650: junta perfilada para máx. 16 bar: 25 Nm.
 - NW800: junta plana para máx. 10 bar 40°C : 30 Nm.
 - NW800: junta perfilada para máx. 16 bar: 15 Nm.
 - La estanqueidad entre el cuello de la brida CINTROPUR® NW 650 & 800 y la contrabrida de la instalación debe quedar asegurada por una junta plana tipo EPDM PN10 o EPDM-PN16 de calidad (opcional en CINTROPUR o disponible en el mercado).
 - Deben utilizarse obligatoriamente las conexiones entregadas de origen, porque la rosca métrica del cabezal no permite acoger otras conexiones clásicas del comercio. Son de M76x2,8 en el tipo NW 500-650 y M88x2,8 en el tipo NW 800.
- Para los filtros NW 500:
 - Las tuercas racor para atornillar se entregan por separado en el embalaje. Deben ser montadas verificando que las juntas tóricas estén muy presentes en los extremos del cabezal donde se atornillan.
 - La estanqueidad en las conexiones roscadas de NW 500 se obtendrá con todo tipo de productos del comercio. Prefiera, no obstante, el cáñamo + pasta Kolmat. Deje libre una vuelta de rosca en la conexión del filtro para un buen cebo de la válvula o de la conexión de su instalación.
 - Deben utilizarse obligatoriamente las conexiones entregadas de origen, porque la rosca métrica del cabezal no permite acoger otras conexiones clásicas del comercio. Son de M76 en el tipo NW 500.
 - La estanqueidad entre la conexión roscada y el cabezal de filtro está asegurada por una junta tórica; un apriete a 2 manos desnudas es suficiente para presiones bajas. Para presiones más elevadas del orden de 10 bar, se recomienda un apriete con llave de cinta. Se requiere una comprobación de estanqueidad cuando se ponga en presión.
- Para los filtros NW 500, 650 y 800:
 - La estanqueidad entre el cabezal y el tazón está asegurada por una junta tórica: un ligero apriete con la llave proporcionada es suficiente. La llave también sirve para el desmontaje.
 - El adaptador de la válvula de purga (en la parte inferior) está montado de fábrica con una doble junta de estanqueidad. Este adaptador puede girar 360° sin causar daños al tazón.
 - El soporte cilíndrico del tamiz filtrante está equipado en los 2 extremos con una hélice centrífuga y una cubierta de estanqueidad. Un tornillo de fijación los mantiene para asegurar una estanqueidad perfecta entre el agua que hay que filtrar y el agua filtrada. Con este fin se ha realizado un sobremoldeo de junta. La manipulación de estos tornillos de fijación se hará sólo con las manos desnudas (sin herramientas).
 - Se aconseja el montaje de válvulas de aislamiento aguas arriba y aguas abajo para más facilidad en el momento del mantenimiento del filtro.
- Para los filtros NW 500TE:
 - El relleno del tazón del NW 500 TE por el producto de tratamiento (carbón activo, polifosfato) será facilitado respetando las prescripciones establecidas en el anexo.
 - Los modelos NW650TE y NW 800 TE no existen como producto acabado; sin embargo, pueden ser realizados reemplazando la vía interna de "filtración" por el dispositivo "tubo+colador".

4. Mantenimiento

- Antes del desmontaje del vaso, cierre las válvulas aguas arriba y aguas abajo y libere la presión.
- Tamiz filtrante:
 - Se aconseja el mantenimiento y el cambio del tamiz filtrante en agua potable por lo menos 3 veces al año y en todos los casos con un máximo de 2 bar de pérdida de carga.

- Los tamices de 1, 5, 10, 25, 50 y 100 μ están previstos para un uso único. Una limpieza de los mismos alteraría la estructura de la fibra degradando así la finura de la filtración seleccionada y debilitaría el tamiz, lo que podría provocar eventuales grietas.
- Los tamices de nylon de 150 y 300 μ han sido concebidos para ser limpiados y reutilizados.
- **Carbón activo:**
 - La renovación de la carga de carbón activo en agua potable para NW 500 TE debe hacerse cada 90M³, en los demás casos, por lo menos cada 3 meses.
- **Hélice centrífuga y cubierta:**
 - El sistema de fijación de la hélice centrífuga sobre el soporte cilíndrico está provisto de 4 muescas para un buen posicionamiento; procure respetarlo antes del remontaje.
 - Antes de reponer la cubierta de estanqueidad en el soporte cilíndrico, procure que el tamiz filtrante esté separado de la cruz del refuerzo interno. Manipule los tornillos de fijación de la hélice y de la cubierta únicamente con las manos desnudas (la intervención de una herramienta los dañaría).
- **El vaso :**
 - La rosca del vaso debe quedar limpia y engrasada para un montaje y desmontaje fáciles del vaso con el tiempo.
 - La junta tórica entre el cabezal y el vaso también debe estar limpia y engrasada para una buena estanqueidad.
 - Todas las ranuras y el asiento de la junta tórica (y junta plana) deben estar limpias y exentas de rebabas.
- **Componente dañado:**
 - Cualquier componente del filtro que esté dañado, aunque sólo sea parcialmente, debe ser sustituido inmediatamente con el fin de asegurar el buen comportamiento en presión y estanqueidad del conjunto del filtro.

5. Garantía

La selección de excelentes materias primas para producir cada componente del filtro es la mejor garantía para ofrecerle una entera satisfacción durante muchos años de uso.

En cualquier caso, si se detectara un problema con un componente asociado a un defecto de fabricación, éste quedaría cubierto con el recambio bajo garantía de dicho componente.

Para más información sobre los productos CINTROPUR, consulte www.cintropur.com

NW 280 – 340 – 400

Instrukcja montażu, użytkowania i konserwacji

1. Możliwe zastosowania

Seria filtrów do wody CINTROPUR® NW 500 - 650 - 800 przeznaczona jest do filtrowania wody czystej o niskiej zawartości zawieszin takiej jak wody miejskie, deszczowe, wody ze studni, wody źródłane. Inne ciecze nieagresywne również mogą być filtrowane. Możliwe dziedziny zastosowań to przemysł, rolnictwo i instalacje zbiorcze. Materiały stosowane do produkcji filtrów są zgodne z wymogami dla filtracji cieczy przeznaczonych do spożycia.

Korzystanie z NW 500 TE z zastosowaniem węgla aktywnego jest szeroko znane jako metoda odchlorowywania, usuwania nieprzyjemnych zapachów, poprawy smaku oraz oczyszczania z pestycydów i herbicydów.

2. Opis techniczny

Instalacja musi zostać wykonana zgodnie z obowiązującymi standardami przez wykwalifikowany personel. Filtry muszą być zastosowane zgodnie z poniższymi wymogami technicznymi:

		NW 500	NW650	NW 800	NW500TE
Średnica przyłącza		2"	1 ½"	3"	2"
Typ przyłącza		Zewnętrzny gwint	Kołnierz ruchomy	Kołnierz ruchomy	Zewnętrzny gwint
Średni przepływ (m³/h)	ΔP=0.2bar	18	25	32	2*
	ΔP=0.5bar	28	42	51	3.3*
Ciśnienie robocze (bar)		10	10	10	10
Maksymalne ciśnienie pracy (bar)		16	16	16	16
Maksymalna temperatura pracy		50°C	50°C	50°C	50°C
Waga (kg)		6.4	7	7.4	5.6
Standardowa dokładność filtracji		25 μ	25 μ	25 μ	-
Pojemność klosza (l)		-	-	-	4.85
Powierzchnia filtracji (cm²)		1288	1288	1288	-

* Wartość z węglem aktywnym

3. Montaż i użytkowanie

- Idealne miejsce montażu filtra CINTROPUR® to punkt doprowadzający wodę (za wodomierzem lub pompą). Upewnij się, że kierunek przepływu wody jest zgodny ze strzałką na głowicy filtra.
- Filtry muszą być zainstalowane zgodnie z obowiązującymi standardami: wolne od naprężeń mechanicznych, Orurowanie doprowadzające i odprowadzające wodę musi być wykonane współosiowo. Odległość między przyłączami musi być odpowiednia w celu uniknięcia naprężeń na przyłączach.
- Jeśli ciśnienie w instalacji przekracza zalecane ciśnienie pracy, należy zamontować reduktor ciśnienia. Jeśli w instalacji występują uderzenia hydrauliczne, niezbędny jest zbiornik wyrównawczy.
- Wyposażenie:
 - **Standardowe:** zawiera 2 gwintowane przyłącza, 2 manometry, 25 μ rękaw filtracyjny na supportcie, zawór spustowy i klucz.
 - **Opcje dodatkowe** nieprzeźroczysty klosz, uchwyt ścienny ze stali nierdzewnej.
 - Glicerynowe **manometry** dodawane do filtrów mają gwintowane przyłącze ¼"; montaż musi zostać wykonany przy użyciu klucza (nie należy używać tarczy manometru jako uchwytu do wkręcania).
 - Do zamontowania uchwytu ściennego ze stali nierdzewnej do głowicy filtra należy użyć 2 gwintowanych nakrętek z zestawu. Do normalnego użytkowania wystarczy dokręcić nakrętki ręką.
- Do filtrów NW650 - 800 :
 - Filtr dostarczany jest firmowo w komplecie, od razu gotowy do zainstalowania.
 - Kołnierze muszą być zamontowane na kwadracie (z dwoma górnymi otworami wpisanymi w linię poziomą)
 - Kołnierze są zgodne z normami DIN EN 1092-1 PN-10 z otworami identycznymi jak w EN 1092-1 PN-16.

- Kołnierz NW650 wymaga czterech śrub M16, kołnierz NW800 ośmiu śrub M16.
- Poniższe śruby powinny być dokręcone z umiarkowaną siłą:
 - NW650: uszczelka dla maks. 10 barów 40 ° C: 50 Nm
 - NW650: uszczelka kształtowa dla maks. 16 barów: 25 Nm
 - NW800: uszczelka dla maks. 10 barów 40 ° C: 30 Nm
 - NW800: uszczelka kształtowa dla maks. 16 barów: 15 Nm
- Szczelność pomiędzy szyjką kołnierza CINTROPUR ® 650 i NW 800 oraz przylgą instalacji zapewniona jest przez uszczelkę typu EPDM lub EPDM-PN10-PN16 wysokiej jakości (opcjonalnie do zakupu w CINTROPUR oraz dostępną powszechnie na rynku).
- Oryginalne złączki dostarczone firmowo absolutnie muszą być wykorzystane gdyż gwint metryczny głowicy nie pozwala na posłużenie się innymi przyłączami zwyczajowymi dostępnymi na rynku. Są to M76x2,8 dla typu NW 650 oraz M88x2,8 dla typu NW 800.
- Dla filtrów NW500:
 - Nakrętki do montażu dostarczane są oddzielnie w opakowaniu. Podczas ich instalacji winno się sprawdzić czy oringi znajdują się na głowicy gdzie powinny być przykręcone.
 - Szczelność złązek gwintowanych NW 500 mogą zapewnić wszystkie rodzaje produktów komercyjnych. Jednak najbardziej zaleca się zastosować konopie + pastę Kolmat. Należy pozostawić gwint luźny o jeden obrót na przyłączu filtra dla odpowiedniego nasadzenia zaworu lub przyłącza instalacji.
 - Oryginalne złączki dostarczone firmowo absolutnie muszą być wykorzystane gdyż gwint metryczny głowicy nie pozwala na posłużenie się innymi przyłączami zwyczajowymi dostępnymi na rynku. Są to M76 dla typu NW 500.
 - Szczelność pomiędzy gwintem i głowicą filtra zapewniana jest przez oring, mocowanie gołymi rękami (oboma) jest wystarczające dla niskich ciśnień. Dla wyższych ciśnień o wartościach około 10 barów, zalecane jest przykręcenie kluczem nasadowym. Sprawdzenie szczelności wymagane jest podczas włączenia ciśnienia.
- Dla filtrów NW500, 650 i 800:
 - Szczelność między głowicą i kłosem zapewniana jest przez oring: lekkie dokręcenie za pomocą dostarczonego klucza jest wystarczające. Klucz służy także do demontażu.
 - Adapter z zaworem spustowym (w dolnej części) jest fabrycznie wyposażony w podwójną uszczelkę. Adapter może być obracany o kąt 360 stopni bez obaw uszkodzenia kłosa.
 - Cylindryczna podpora wkładu filtrującego jest wyposażona na obu końcach w wirówkę i dekielkę uszczelniającą. Przytrzymuje ją klamra, aby zapewnić doskonałą szczelność pomiędzy wodą do przefiltrowania i już przefiltrowaną. Odlew przyłącza również wykonano z myślą o szczelności. Manipulowanie tymi wkrętami winno mieć miejsce tylko gołymi rękoma (bez narzędzi).
 - Zaleca się montaż zaworów odcinających przednich i tylnych dla większej wygody podczas konserwacji filtra.
- Dla filtrów wersji TE:
 - Napełnianie kłosa NW 500 TE wkładem technicznym (węglem aktywnym, polifosforanem, ...) będzie ułatwione przy postępowaniu zgodnie ze wskazówkami określonymi w załączniku.
 - Modele NW650TE i NW 800 TE nie istnieją jako gotowy produkt, jednak mogą być wykonane poprzez wymianę wewnętrznego mechanizmu filtracji przez „dyspozytor filtru”.

4. Utrzymanie

- Przed wyjęciem kłosa, zamknąć zawory przednie i tylne uwolnić ciśnienie
- Wkład filtrujący:
 - Czyszczenie i zmiana wkładu filtrującego wody pitnej zalecane są co najmniej 3 razy w roku i we wszystkich przypadkach spadku ciśnienia maksymalnie o 2 bary.
 - Wkłady 1, 5, 10, 25, 50 i 100µ są przeznaczone do jednorazowego użytku. Czyszczenie ich zmienia strukturę włókna co prowadzi do degradacji zdolności filtracji danego wkładu i osłabiając wkład może doprowadzić ostatecznie do jego rozdarcia.
 - Wkłady nylonowe 150 & 300µ przeznaczone są do czyszczenia i ponownego wykorzystania.
- Węgiel aktywny:
 - Wymiana wkładu węgla aktywnego do wody pitnej dla modelu NW 500 TE powinna mieć miejsce co 90M³ przepływu, a w innych przypadkach, co najmniej raz na trzy miesiące.
- Wirówka centryfugalna i dekielki:
 - System montażu wirówki na podporze cylindrycznej jest wyposażony w cztery nacięcia dla właściwego pozycjonowania, należy zwrócić na nie uwagę przy ponownym zakładaniu.
 - Przed ponownym umieszczeniem dekielka uszczelniającego na podporze cylindrycznej należy upewnić się, że wkład filtrujący jest odłączony od wewnętrznego zbrojenia krzyżowego. Manipulowanie

śrubami wirówki i dekielka winno mieć miejsce tylko gołymi rękami (użycie narzędzi doprowadzi do uszkodzenia).

- Kłosz:
 - Gwint kłosa powinien być czysty i naoliwiony dla łatwego i szybkiego montażu i demontażu kłosa
 - Oring pomiędzy głowicą i kłosem również powinien pozostawać czysty i naoliwiony dla zapewnienia dobrej szczelności.
 - Wszystkie rowki i powierzchnia osadzenia oringu (i uszczelki) muszą pozostać czyste i bez zadziorów.
- Uszkodzony element:
 - Każdy element filtra, nawet częściowo uszkodzony, należy natychmiast wymienić, aby zapewnić dobrą wytrzymałość na ciśnienie i szczelność całości filtra.

5. Gwarancja

Wybór najwyższej jakości materiałów do produkcji każdej części filtra jest gwarancją doskonałej jakości i wieloletniego użytkowania.

W przypadku wykrycia wady fabrycznej element zostanie wymieniony w ramach gwarancji.

Więcej informacji o produktach CINTROPUR na stronie www.cintropur.com.



RU

NW 500 – 650 – 800 и NW 500 TE

Инструкция по монтажу, эксплуатации и техническому обслуживанию

1. Возможные области применения

Серия фильтров для воды CINTROPUR® NW 500 – 650 – 800 разработана для фильтрации **чистой воды** с незначительным загрязнением взвешенными веществами, например, городской водопроводной воды, дождевой воды, воды со скважин, родниковой воды. Можно фильтровать также другие неагрессивные жидкости. Возможно применение в различных отраслях промышленности, коммунальном и сельском хозяйстве. Для изготовления фильтра используются материалы, разрешенные для фильтрации **пищевых жидкостей**.

Фильтр NW 500 TE с активированным углем нашел широкое применение для дехлорации, удаления запахов, улучшения вкуса, удаления пестицидов и гербицидов.

2. Техническое описание

Установку фильтра необходимо выполнять силами квалифицированного персонала с соблюдением соответствующих правил. При использовании этих фильтров необходимо обеспечить соответствие техническим требованиям, описанным в приведенной ниже таблице:

	NW 500	NW650	NW 800	NW500TE
Для сведения	2"	1 1/2"	3"	2"
Тип соединения	Наружная резьба	Свободный фланец	Свободный фланец	Наружная резьба
Средняя пропускная способность (м³/ч) при ΔP=0,2 бар	18	25	32	2*
Средняя пропускная способность (м³/ч) при ΔP=0,5 бар	28	42	51	3.3*
Рабочее давление (бар)	10	10	10	10
Максимальное рабочее давление (бар)	16	16	16	16
Максимальная температура	50°C	50°C	50°C	50°C
Вес (кг)	6.4	7	7.4	5.6
Фильтрационная сетка	25 μ	25 μ	25 μ	-
Объем чаши	-	-	-	4.85
Фильтрующая поверхность (см²)	1288	1288	1288	-

* Значение для активированного угля CINTROPUR

3. Монтаж и сопутствующие операции

- Идеальное место для фильтра воды CINTROPUR® - непосредственно на входе в систему (после счетчика или насоса). Необходимо учитывать направление движения потока воды по отношению к направлению, указанному стрелкой на головке фильтра.
- При установке фильтров необходимо соблюдать профессиональные правила: фильтры не должны испытывать механических напряжений, входящие и выходящие трубопроводы должны быть ровными. Необходимо соблюдать расстояние между муфтами и между фланцами, чтобы не вызвать их растяжения или сжатия.
- Редукционный клапан позволит понизить давление в сети, если оно превышает рабочее давление фильтра. Если в установке имеются водоподъемные машины, необходимо использовать противоударную защиту.
- Оборудование:
 - **Стандартное:** включает комплект из 2 резьбовых муфт (NW 500 и 500TE) или комплект из 2 свободных фланцев (NW 650 и NW 800), 2 манометра (кроме модели TE), фильтрационную сетку 25 мкм, закрепленную на своем основании, спускной клапан и ключ для монтажных работ.
 - **По выбору доступны** непрозрачная чаша, стенное крепление из нержавеющей стали и 2 плоские уплотнительные прокладки (для установки между шейкой фланца и контрфланцем).

- Глицериновые **манометры**, поставляемые в заводской сборке (кроме модели NW 500 TE) имеют стандартную резьбу $\frac{1}{4}$ ", их установка выполняется с помощью ключа (запрещено использовать циферблат в качестве рукоятки для завинчивания!).
- Прикрепление к головке фильтра стенного крепления из нержавеющей стали выполняется с помощью 2 резьбовых элементов, предусмотренных для этой цели. Для эксплуатации в обычных условиях достаточно затянуть их вручную, чтобы обеспечить надежное удержание фильтра
- **Для фильтров NW500, 650 и 800:**
 - Фильтр поставляется полностью собранным в заводских условиях, готовым к установке.
 - Фланцы необходимо крепить квадратом (с 2 верхними отверстиями, вписанными в горизонтальную линию)
 - Фланцы соответствуют стандарту DIN EN 1092-1 PN-10, просверленные отверстия выполнены по стандарту EN 1092-1 PN-16.
 - Фланец модели NW650 должен комплектоваться 4 болтами M16, фланец модели NW800 должен комплектоваться 8 болтами M16.
 - Болты необходимо затягивать умеренно:
 - NW650 : плоская прокладка для макс. 10 бар при 40°C: 50 Нм.
 - NW650 : профилированная прокладка для макс. 16 бар: 25 Нм.
 - NW800 : плоская прокладка для макс. 10 бар при 40°C: 30 Нм.
 - NW800 : профилированная прокладка для макс. 16 бар: 15 Нм.
 - Герметичность между шейкой фланца CINTROPUR® NW 650 и 800 и контрфланцем установки должна обеспечиваться при помощи высококачественной плоской уплотнительной прокладки типа EPDM-PN10 или EPDM-PN16 (по заказу в компании CINTROPUR или имеющая на рынке).
 - Необходимо обязательно использовать оригинальные муфты из комплекта поставки, так как метрическая резьба головки не совместима с другими классическими муфтами, доступными на рынке. Они имеют резьбу M76x2,8 для типа NW 650 и M88x2,8 для типа NW 800.
- **Для фильтров NW500:**
 - Муфты с гаечной резьбой поставляются отдельно в упаковке. При их установке необходимо проверять, чтобы на кончике головки, куда они навинчиваются, имелось уплотнительное кольцо.
 - Герметичность резьбовых муфт NW 500 может быть обеспечена любыми имеющимися на рынке изделиями. Тем не менее, предпочтительнее использовать пеньку + замазку Kolmat. Один оборот резьбы следует оставлять свободным, чтобы облегчить навинчивание на вентиль или фитинг установки.
 - Необходимо обязательно использовать оригинальные муфты из комплекта поставки, так как метрическая резьба головки не совместима с другими классическими муфтами, доступными на рынке. Они имеют резьбу M76 для типа NW 500.
 - Герметичность между резьбовой муфтой и головкой фильтра обеспечивается с помощью уплотнительного кольца; при низких давлениях достаточно затянуть 2 руками без использования инструмента. В случае давлений, превышающих 10 бар, рекомендуется затянуть муфту ключом. При подаче давления требуется проверить герметичность.
- **Для фильтров NW500, 650 и 800:**
 - Герметичность между головкой и чашей обеспечивается кольцевой уплотнительной прокладкой: достаточно слегка затянуть с помощью ключа, имеющегося в комплекте поставки. Этот же ключ используется при демонтаже.
 - переходник спускного клапана (в нижней части) смонтирован на заводе с двойной уплотнительной прокладкой. Этот переходник может поворачиваться на 360°, не причиняя повреждений чаше.
 - Цилиндрическое основание фильтрационной сетки оснащено на 2 концах центробежной спиралью и герметичной крышкой. Они удерживаются крепежным

винтом, чтобы обеспечить полную непроницаемость между фильтруемой и профильтрованной водой. Для этого стык заливается гидроизоляционным составом. Операции с этими винтами должны выполняться только вручную (без использования инструментов).

- Рекомендуется установить отсечные вентили до и после фильтра, чтобы облегчить уход за ним.

- **Для фильтров в исполнении TE:**

- Наполнение чаши фильтра NW 500TE действующим веществом (активированным углем, полифосфатами, ...) будет облегчено при соблюдении правил, приведенных в приложении.
- Модели NW650TE и NW 800 TE не существуют в виде законченного изделия; однако их можно получить, заменив внутренний винт «фильтрации» на устройство «трубка + сетчатый фильтр».

4. Техническое обслуживание

- Перед снятием чаши необходимо закрыть вентили до и после фильтра и сбросить давление.
- Фильтрационная сетка:
 - Рекомендуется выполнять операции по техобслуживанию и замене фильтрационной сетки в случае питьевой воды не менее 3 раз в год и во всех случаях, когда потеря давления превышает 2 бар.
 - Сетки 1, 5, 10, 25, 50 и 100 мкм предназначены для одноразового использования. При их чистке повреждается структура волокна, а также меняется тонкость фильтрации, а непрочность сетки может привести к ее разрывам.
 - Нейлоновые сетки 150 и 300 мкм можно чистить и использовать повторно.
- Активированный уголь:
 - Замена активированного угля для фильтра NW 500 TE в случае питьевой воды должна производиться после каждых 90 м³, в других случаях – не реже, чем 1 раз в 3 месяца.
- Центробежная спираль и герметичная крышка:
 - Система крепления центробежной спирали на цилиндрическом основании оснащена 4 насечками для правильного размещения; необходимо следить за этим при сборке.
 - Прежде чем вернуть герметичную крышку на ее место на цилиндрическом основании, необходимо проверить, чтобы фильтрационная сетка не цеплялась за крестовину внутреннего элемента жесткости. Отвинчивать и завинчивать крепежные винты спирали и крышки нужно только руками (при использовании инструмента они будут повреждены).
- Чаша
 - Резьбу чаши необходимо сохранять чистой и смазанной, это облегчит монтаж и демонтаж чаши.
 - Уплотнительное кольцо между головкой и чашей также должно быть чистым и смазанным, чтобы обеспечить надежную герметизацию.
 - Все выемки и опорная поверхность уплотнительного кольца (и плоской прокладки) должны оставаться чистыми и гладкими, без заусениц.
- Поврежденные детали:
 - Любую деталь фильтра, даже поврежденную только частично, необходимо заменять немедленно, чтобы обеспечить хорошую стойкость к давлению и герметичность всего фильтра.

5. Гарантия

Выбор превосходного сырья для изготовления каждой детали фильтра является лучшей гарантией полной удовлетворенности пользователя в течение долгих лет эксплуатации фильтра.

Если все же обнаружится изъян какой-либо детали, связанный с производственным дефектом, такая деталь будет гарантированно заменена.

Чтобы получить дополнительную информацию об изделиях CINTROPUR, см. www.cintropur.com

Installation, Operation & Maintenance Guide

Pallas CK

Filter Systems

Including

Mixed Media

Iron & Manganese

Including: Birm
 Filox
 Aquamandix

pH

Sediment

Including: Sand
 Turbidex
 Filter Ag

Carbon

Arsenic Removal



Contents

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Notes & Settings Record Sheet

Accessories

5303020084	System controller
5303024075	Bypass (suitable for 1" connections)
5303024084	Auxiliary Micro Switch (for 1" & 1¼" valves)
5303020005	Auxiliary Micro Switch (for 2" valves)
5303028632	Service Wrench
5303024087	Vertical Adaptor Assy (1" connections up to 14" vessel)
5303020765	No untreated water bypass for 1" & 1¼" valves
5303020095	No untreated water bypass for 1½" valves
5303020096	No untreated water bypass for 2" valves
5303029141	Motorised alternating valve (MAV) for 1" & 1¼" valves (Male / Male)
5303029140	Motorised alternating valve (MAV) for 1" & 1¼" valves (Male / Female)
5302036536	Motorised alternating valve (MAV) for 1½" valves 1.5" BSP
5303028622	Motorised alternating valve (MAV) for 2" valves 2" BSP
5303025584	DP Wire Harness two Pin 8' Long

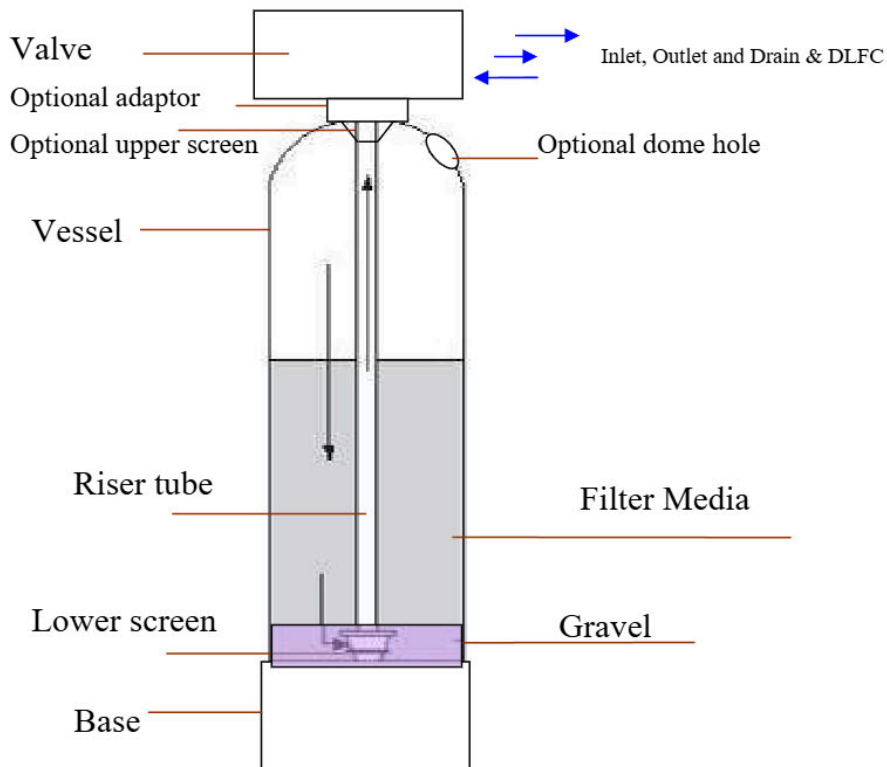
Thank you for purchasing this Filter System. We are sure that it will provide you with trouble free service for many years to come. Please use the following pages to assist you with the assembly and installation of your new system.

1. Unpacking

PLEASE USE THE ACCOMPANYING PACKING DOCUMENTS TO CHECK THAT ALL ITEMS ARE PRESENT AND CORRECT.

If any item is missing or damaged your carrier and supplier must be notified within 2 days of receipt if a claim is to be made.

The main parts of the system include:



2. Installation

Please observe the regulations concerning the installation of your filter system. Check that you have allowed space for access to the unit for possible future maintenance. This installation may require plumbing work and will require an electrical outlet to be fitted near the system. Only attempt this if you have the necessary skills.

2.1 Pre-installation checks

The area needs to be level, frost free, have access to electricity and an open drain. Check the incoming water quality is within any parameters specified for that media (see technical information later in the manual). In addition to this check the incoming water pressure is between 2 and 8 bar (preferably approx. 4 bar) and the water temperature is between 3°C and 45°C.

2.2 Fitting the Distribution System

Fit the bottom distribution system into the vessel – the bottom screen should be pre glued to the riser tube (fig A.1) (smaller systems). Alternatively if the system uses bottom laterals these need to be assembled inside the vessel (fig A.2), Move the vessel in its final position as it will be difficult to move once the media has been added.



Fig A.1



Fig A.2



Fig A.3

2.3 Adding the Media

Block the top of the riser tube to stop media getting down the tube.(see fig A.3). Add about 1/3 by volume of water to the vessel so when the media is poured in it doesn't damage the bottom distribution system. If you have been supplied gravel with your kit this should be added first so it covers the bottom distribution system. Add the other media supplied but make sure there is 30% free space left above the media so when the system is backwashed the media can expand into the space and the sediment and contaminants can be backwashed away (there may be media left over). See section 5.4 for more information on the Media.

Unblock the riser tube.

2.4 Fitting the Valve

Add a small amount of silicone grease to the valve outer and inner o-rings (fig A.4 & 5).



Fig A.4



Fig A.5

If a top screen is supplied this should be attached next. (Not always used)

Slide the valve onto the riser tube and gently push it down onto the vessel treads. Screw the valve on until you start to squeeze the main O ring and then finally give the valve a final tighten by tapping the rear side of the valve with the palm of your hand (fig A.6)

Fig A.6

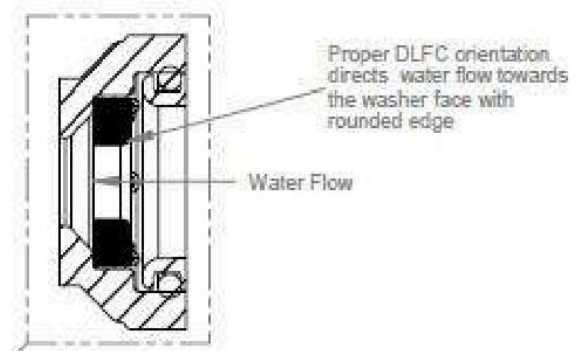


2.5 DLFC (drain line flow control)

This is possibly one of the most important components to check has been installed; this will control the backwash flow rate and ensure the system will continue to function correctly. The DLFC will either be fitted inside the drain line elbow, the 1" adaptor or in an external housing. The larger external DLFC may have more than one flow controls fitted to gain the required flow rate. See below pictures of the drain line housings.



3/4" Elbow drain line assy



1" External Straight drain line assy



1 1/2" External drain line assy



DLFC Insert

2.6 Electrical connection

To connect the power cable you need to firstly remove the cover then remove the drive bracket assembly by pressing up on the drive brackets release tabs and pulling towards you, the drive bracket including software can now be lifted away to reveal the back plate (fig A.7).



Fig A.7

When the drive plate has been removed, locate the knockout on the backplate. You can use a punch or a Phillips screwdriver to do this. (fig A.8)



Fig A.8

You can now re install the drive bracket into its original position. **Please make sure that this has been replaced correctly as this can cause problems at a later date.**



Fig A.9



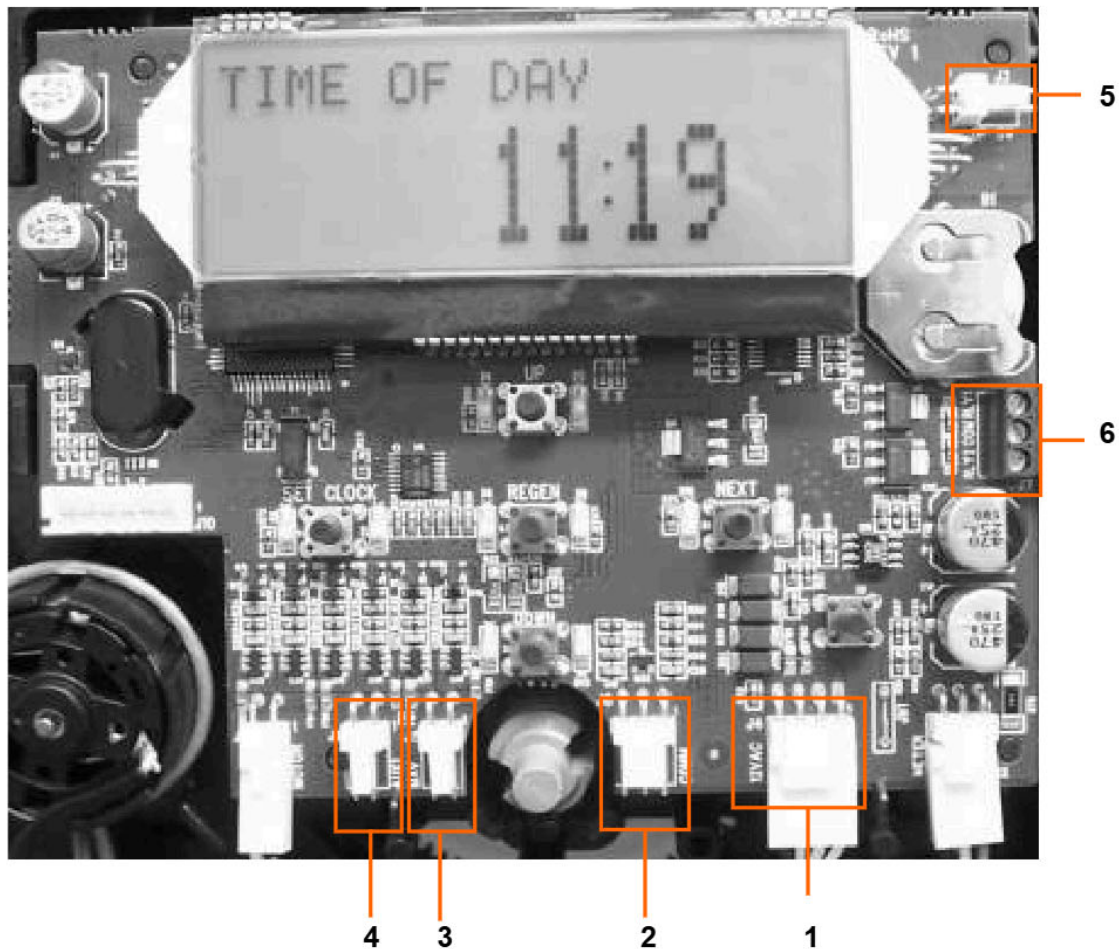
Fig A.10



Fig A.11

Remove the tabs at the bottom of the strain relief on the back side of the back plate (fig A.9).

You can now connect the power cable to the software board and any additional cables for the optional accessories available. After connecting the cables you can weave the wires through the strain relief (fig A.10) and fit the cover supplied (fig A.11)



- 1 Power (12VAC)
- 2 Communication cable (Comm Cable)
- 3 MAV (MAV)
- 4 AUX MAV (MAV)
- 5 DP connection (DP SW)
- 6 Relay connections (Relay 1 & 2)

When all connections have been made the power can be turned on and programming can take place.

Quick Start.

2.7 Programming the Valve

All adjustment should be made using the up and down arrows when the setting you wish to adjust is displayed on screen.

Set Time of Day.

Press **SET CLOCK**.

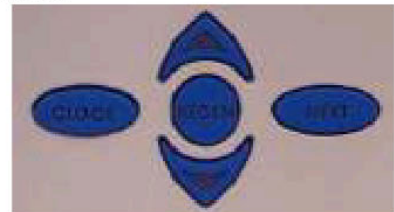
Adjust the hours and press **NEXT** to adjust the minutes, press **NEXT** to return to the normal **TIME** display.

2.8 Programming the valve in case of memory loss.

Should the programming have been lost in transit the following instructions in conjunction with the setting sheet will allow you to re set them.

When the power has been connected the valve will display the software number and initialise itself and then display **TIME**; you can then start to program the valve.

Selections are made using the **UP** and **DOWN** buttons until the required setting is displayed; after each setting press **NEXT** to continue.



Set the Time of Day (As above)

Step 1: Cycle Sequence.

Press **NEXT** and **DOWN** simultaneously for 3 seconds and release.

The screen will display SET SOFTENING flashing with an ORANGE screen!

Press **NEXT** and **DOWN** simultaneously for 3 seconds.

The screen should display SET 1.0in, adjust as necessary (see setting sheet page?) Press **NEXT** and set each setting accordingly until the display returns to **TIME**. (See notes where appropriate)

Step 2: System Setup.

Press **NEXT** and **DOWN** simultaneously for 3 seconds and release.

The screen will display SET SOFTENING flashing on an ORANGE screen. **Change this to FILTERING.**

The screen should display SET CYCLE 1, adjust as necessary (see setting sheet page?)

Press **NEXT** and set each setting accordingly until the display returns to **TIME**.

Step 3: Display Settings.

Press **NEXT** and **UP** simultaneously for 3 seconds and release.

SET DISPLAY with ENGLISH flashing on an ORANGE screen should appear. Press **NEXT**.

Adjust as necessary (see setting sheet page?) Press **NEXT** and set each setting accordingly; please pay particular attention to the Regen Days setting, the display will return to the time of day after setting the regen time (minutes) has been set

3.1 Identifying your system.

Your Filter will have an identification label fixed to the control valve; this will look similar to the picture shown here.

The information listed can be read as follows:

4202035013	Stock Number:	Manufacturers part number.
SNo 08090137	Serial No:	Serial No.
Mis	Id Code:	System type identification code.
0919-255-760	Configuration:	Vessel size, Valve type & Controller type.

Identify the settings from the charts in the programming section by looking at the vessel size and controller type.

The valve is supplied pre programmed!

**This includes any settings relevant to attached accessories where we have been requested to do so.
(This excludes settings that need to be done on site)**

The settings are listed in case there is a need to re program the unit.

If you have any concerns or worries following the setting procedure please contact your supplier who will help you through the set up procedure.

Using the above information to identify your system you can then select the relevant information from the setting notes and sheet on the following pages.

3.2 Generic notes for all systems.

Note 1

Valve A	Primary valve when using in Duplex configuration with MAV.
Valve B	Secondary valve when using in Duplex configuration with MAV.
Separate Source	Only used with MAV attached when backwashing from a separate source
No Hard Bypass	Only used with a no hard water bypass
Off	When none of the above are used

Note 2

Time (MAV only)	Allows auxiliary MAV to switch positions at a preset time in relation to the start time of regeneration for a preset duration
Separate Source	Only used with MAV attached when backwashing from a separate source
Off	When none of the above are used

Note 3

IMMED	Initiates an immediate regeneration after a 2 minute closure
DELAY	Initiates a regeneration at the preset regeneration time after a 2 minute closure
HOLD	Regeneration will be prevented from occurring while the DP connection is made

Note 4

When using a 1.5" valve you can choose to do the refill in Min or Kg

Note 5

AUTO	Automatically calculated reserve
OFF	Regeneration will be based solely on the override days
M³	A system volume can be entered

Note 6

Delayed Regen	Regeneration will occur at the preset time
Immediate Regen	Regeneration will occur immediately when the volume reached 0
Both	Regeneration occurs at the preset time when the volume falls below the reserve or the override days are reached; or after 10 min of no use when the volume capacity reaches 0

Note 7

REGEN TIME	Relay activates after a set time after the first regeneration cycle
Volume	Relay activates after a set number of litres have been used in service then deactivates after a period of time or no flow
REGEN VOLUME	Relay activates after a set number of litres have been used in service or regeneration then deactivates after a period of time or no flow
OFF	If none of the above are used

Note 8

REGEN TIME	Relay activates after a set time after the first regeneration cycle
VOLUME	Relay activates after a set number of litres have been used in service then deactivates after a period of time or no flow
REGEN VOLUME	Relay activates after a set number of litres have been used in service or regeneration then deactivates after a period of time or no flow
ERROR MONITOR	Relay closes when the valve enters an error mode
OFF	If none of the above are used

Note 9

OFF	Disables feature
TIME	Set the period of time you wish for the service display to come on (in 1/4 years)
M³	Set the volume between services for the service display to come on
BOTH	Allows both time and volume to be set

Note 10

Override days can be set to Off or 1 - 28 days if required

Start a manual Regen	Press and hold the REGEN button until the motor starts
Set a delayed regen	Press the REGEN button (REGEN TODAY will flash on screen) press the REGEN button again to clear
Advance through a regen	Press the REGEN button to move through the stages of a regeneration
Soft Reset	Press & Hold REGEN & NEXT for 3 seconds. (resets valve if in error)
Total Reset	Press & Hold REGEN & NEXT for 3 seconds, then press & hold the up & down buttons together for 3 seconds. (resets all history values)
Changing Service Display	Press NEXT to toggle through the service display options.

Reset or change name display.

Press Next & Up together (displays the language selected)
 Press Next 4 times until you reach (set regen time hour)
 Press Clock & Up together and the telephone number will be flashing
 Press the Up or Down buttons to start the first number flashing and use the Up or Down button to adjust the number; Press next after each one to move on.
 The cursor will then move to the first letter of the name; adjust this in the same way as above until complete, when you have entered the last letter press next until it goes back to the main display.

Reset or change the service period.

To reset the service period at any time use the following procedure.
 Press Next & Down together until the display changes to Orange and shows Softening or Filtering
 Press Next repeatedly until the display shows (SCHEDULE SERVICE IN ??? Days)
 Now Press the Up & Down Buttons together until the display period resets to the pre set period.
 This is the same for all service alarm settings TTIME, m³ or BOTH

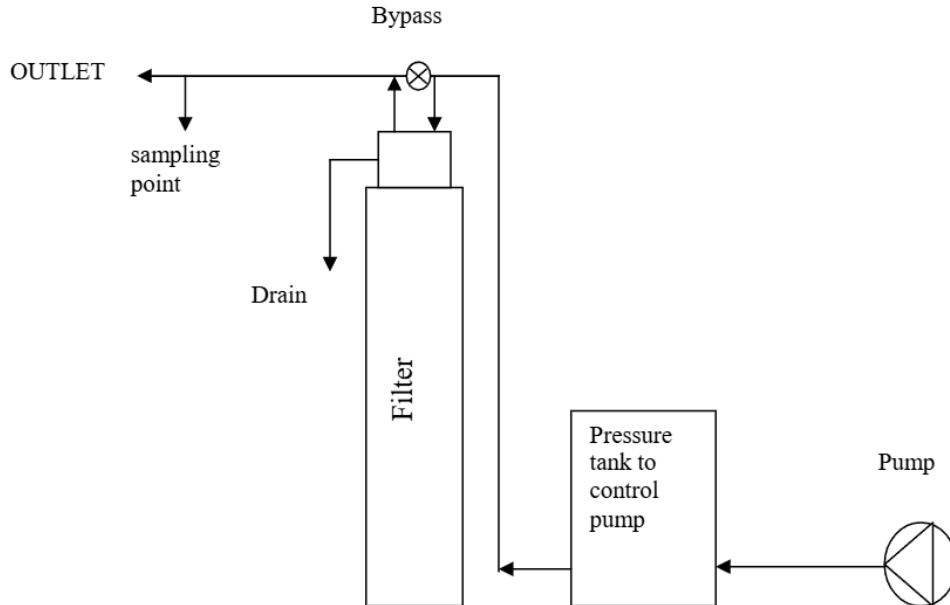
3.3 Setting Sheet

Pallas CK Filter System, (Time) pH, sediment, Birm, Arsenic, Aquamandix, Turbidex										
										Software version 300.01
Please apply the settings in the following sequence.										
Selections are made using the UP and DOWN buttons until the required setting is displayed.										
After each setting press NEXT to continue.										
Vessel Size	1044	1054	1252	1354	1465	1665	1865	2160	2469	3072 3672
Media Vol (Kg) pH		50	62	100	125	150	225	250	400	650 925
Media Vol (Kg) Sand/Aqua		50	75	100	125	150	225	250	400	625 900
Media Vol (Cuft) Turbidex		1	1.5	2	2.5	4	5	7	8	11 20
Media Vol (Kg) Arsenic	15		30	45	60	75	105	150	225	300
Media Vol (Cuft) Birm		1.5	2	2.5	3	3.5	5	6.5	9	15 20
Media Vol (1/2 Cuft) Filox		2	3	4	6	8	10	12	16	22 32
Media Vol (Kg Carbon)		20	25	35	50	63	85	100	150	200 300
Valves used	1"	1"	1"	1"	1"	1"	1"			
							1.25"	1.5"	1.5"	1.5"
								1.5"	2"	2" 2"
Step 1, Cycle Sequence,										
Press NEXT and DOWN simultaneously for 3 seconds and release.										
Screen will display SOFTENING flashing on an ORANGE screen.										
Press NEXT and DOWN simultaneously for 3 seconds, the screen will display SET 1.0in, Adjust to the turbine setting below.										
Set Valve Type	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.25	1.5	1.5 2 1.5 2
Set (ALT MAV)			Off							or (see note 1)
Set (AUX MAV)			Off							or (see note 2)
Set (Auxiliary input) DP			Off							or (see note 3)
Set Hardness										PPM (not used)
SET Cycle 1										Backwash
SET Cycle 2										Rinse
SET Cycle 3										2nd Backwash
SET Cycle 4										2nd Rinse
SET Cycle 3										END
Step 2, System Setup.										
Press NEXT and DOWN simultaneously for 3 seconds and release.										
Screen will display SOFTENING flashing on an ORANGE screen, Change this to FILTERING.										
Cycle 1 Backwash	5	5	5	5	5	5	5	5	5	5
Cycle 2 Rinse	3	3	3	3	3	3	3	3	3	3
Cycle 3 2nd Backwash	5	5	5	5	5	5	5	5	5	5
Cycle 4 2nd Rinse	3	3	3	3	3	3	3	3	3	3
Cycle 5 End										End
Set m³ Capacity			Off							or (see note 5)
Set Relay 1			Off							or (see note 7)
Set Relay 2			Off							or (see note 8)
Set Service Alarm			Time							or (see note 9)
Set Service Alarm			1.00 YR							Can be changed
Service Alarm			1.00 YR							Display only
Step 3, Display Settings.										
Press NEXT and UP simultaneously for 3 seconds and release.										
SET DISPLAY with ENGLISH flashing will appear on an ORANGE screen.										
Set Days Between Regens										3
Set Days Between Regens Arsenic										14
Regen (Hours)										Default 2:
Regen (minutes)										Default :00
Step 4. Set time of day,										
Press SET CLOCK										
Set hours using the up and down buttons.										
Set minutes using the up and down buttons.										31/05/2017

4. Commissioning the Filter

4.1 Introduction

With the system fully plumbed (see below) and the valve programmed commissioning can start.



4.2 Backwash

When the system is fully functional the backwash will happen at the pre-set time (see programming the valve section). However, running a manual backwash during commissioning is the best way of removing air from the system, bedding in the media and flushing the system.

Make sure the water inlet and outlet are closed. Press and hold the regeneration button for 5 seconds. The motor will turn and the piston will move to the backwash position. Slowly half open the water inlet to the system, and then slowly open the outlet to allow the air to be purged from the system. Once this has been done you can fully open the inlet and outlet and allow the system to continue through the backwash cycle, this will allow you to check for leaks and also purge any remaining air from the system. After a backwash the system will move through a short rinse cycle and then stop in the service position.

For new systems or after a media change it maybe necessary to run two backwashes to fully wash the media (check the water at the end of the backwash is running clear).

Note

Check the service and backwash flow rates (see technical information). If the service flow rates are exceeded or the backwash flow rate is not correct then the filter may not work correctly.

If during a backwash cycle you need to skip through the cycle this can be done in the following way. To skip to the next stage press the REGEN button.

4.3 Service

Water flows into the valve at the top, down through the media and then up through the 'riser' tube in the middle of the vessel. As the water travels through the media the contaminants are removed. The timer options are set to automatically self clean (backwash) and wash away any of the accumulated contaminants.

5. Routine Maintenance

The filter system is designed to run with the minimum of maintenance and does not normally require much adjustment.

Monthly

Check there is no sign of damage or leaks, check drain lines and power cables are still in good condition and not kinked.

Yearly

We recommend that a competent service engineer checks the system annually. The inlet and outlet pipes need to be rinsed, the drain line checked for degradation, and the system flushed through. The media should be checked, if pH it probably needs to be topped up.

The quality of the treated water needs to be checked regularly. How regularly depends on what the water is being used for eg drinking water or irrigation etc. If the water is being used for drinking water then it needs to be checked more regularly and the relevant Private Water regulations covers the sampling and testing routines for England this is "The Private Water Supplies Regulations 2009" No. 3101. However it is sensible to at least partially test the treated water every 3 months or so and certainly every 6 months to look for compliance. A competent water treatment company can help with this.

6. Technical Information

Note: Check the service and backwash flow rates (see technical information). If the service flow rates are exceeded or the backwash flow rate is not correct then the filter may not work correctly.

6.1 Process and Operating Data.

Birm

Vessel size	C1054	C1248	C1354	C1465	C1665	C1865	C2160	C2469	C3072	C3672
Service flow rate - m3/hr	0.6	0.9	1.0	1.2	1.6	2.0	2.7	3.6	5.6	8.0
Backwash flow rate - m3/hr	1.1	1.8	2.0	2.3	3.4	3.9	5.7	6.8	11.4	17.1

Birm can be used for iron and manganese removal by oxidation (up to 15ppm). It requires a pH of 7 or more for iron removal and pH 8 for manganese removal (it uses dissolved oxygen in the water to oxidise the metal). As it acts a catalyst it is not consumed so Birm doesn't require regenerating or topping up (does require backwashing). Birm also has the advantage of acting as a filter removing relatively high levels of turbidity. It is advised not to use Birm in combination with chlorination and the water should be free of oil, polyphosphates and hydrogen sulphide. Alkalinity should be greater than twice the sulphate and chloride level and the organic loading should be below 5ppm. If the pH of the water is too low pH correction maybe required by adding a pH correction media such as Juraperle or Corrosex. Birm requires a dissolved oxygen of at least 15% of the iron and manganese content to work.. Freeboard 30% to 50%

Filox

Vessel size	C1054	C1252	C1354	C1465	C1665	C1865	C2160
Service flow rate - m3/hr	2.0	2.7	3.3	4.0	5.3	5.7	6.1
Backwash flow rate - m3/hr	1.8	2.3	3.1	3.7	4.7	5.4	5.7

Filox can be used for iron and manganese and hydrogen sulphide removal by oxidation. It requires a pH of 7 or more for iron removal and pH 8 for manganese removal plus a dissolved oxygen level of at least 15% of the iron and manganese content. It needs a high backwash flow rate to remove the oxidised iron and manganese but can cope with high service flow rates. Filox can also cope with chlorinated water. NSF certified, Freeboard 30% to 50%

pH Media

Vessel size	C1054	C1248	C1354	C1465	C1665	C1865	C2160	C2469	C3072	C3672
Service flow rate - m3/hr	0.6	0.9	1.0	1.2	1.6	2.0	2.7	3.6	5.6	8.0
Backwash flow rate - m3/hr	1.1	1.8	2.0	2.3	3.4	3.9	5.7	6.8	11.4	17.1

Water with a pH below 7 is acidic and can damage copper pipe-work and heating systems. Raising the pH will neutralise the water stopping the corrosivity, removing the metallic taste. The pH is raised by passing the water through a vessel containing slowly dissolving calcium and magnesium salts. These salts slowly dissolve into the water 're-mineralising' the water and naturally raising the pH. Make sure that there is 30% freeboard.

Juraperle: a granular media made up of 99.4% calcium carbonate. It has a superior performance to limestone due to its micro-crystalline structure and dissolves very slowly. Juraperle is consumed and from time to time new media should be added.

Corrosex: a highly magnesium oxide salt and is used most effectively where the pH correction is substantial or the flow rate is high. In reality for a pH of less than 6 a 25% Corrosex, 75% Juraperle mix is ideal.

Sediment filters:

Sand

Vessel size	C1054	C1248	C1354	C1465	C1665	C1865	C2160	C2469	C3072	C3672
Service flow rate - m3/hr	0.6	0.9	1.0	1.2	1.6	2.0	2.7	3.6	5.6	8.0
Backwash flow rate - m3/hr	1.1	1.8	2.0	2.3	3.4	3.9	5.7	6.8	11.4	17.1

Sediment filters are needed when the water supply is cloudy or turbid. The particles in the water will block plumbing systems, leave unsightly staining, may contain toxic chemicals or bacteria. The easiest way to remove the particles is by passing the water through a media where the particles get stuck and allowing clear water to flow through. The particles can be periodically 'backwashed' away to drain.

Sand: The grade of sand is tightly controlled so only highest quality; triple washed 0.5 to 1mm size water treatment grade sand is used. Particles above 40 micron are typically trapped.

Filter Ag: Has a high surface area and complex flow path for a more efficient removal of suspended matter. Filter Ag is also lighter in weight than sand which reduces backwash flow rate. Particles down to 20 micron can be trapped. Filter Ag should be soaked for 24 hours before use.

Turbidex

Vessel size	C844	C1054	C1248	C1354	C1465	C1665	C1865	C2160	C2469	C3072
Service flow rate - m3/hr	0.9	1.5	2.19	2.50	2.9	3.8	4.8	6.6	8.6	13
Backwash flow rate m3/hr	1.2	1.9	2.7	3.1	3.6	4.8	5.7	8.2	10.7	17.4

Turbidex: A natural ore that has a more irregular surface than sand. Giving more efficient removal of suspended matter and means the equipment can be smaller. Particles down to 5 micron are typically removed. Filter Ag Plus is must be soaked for 24 hours before use.

Arsenic Removal Media

Vessel size	C1054	C1248	C1354	C1465	C1665	C1865	C2160	C2469	C3072	C3672
Service flow rate - m3/hr	1.1	1.5	1.8	2.0	2.6	3.2	4.5	5.9	9.2	13.5
Backwash flow rate m3/hr	1.3	1.9	2.2	2.4	3.3	4.2	5.6	7.3	11.5	16.5

Severn Trent worked to develop an arsenic removal media formulated to give a high arsenic removal capacity. The media is strong, reliable and easy to handle. Arsenic is trapped within the media and held even when it is backwashed. Typical life time of the media depends on arsenic levels and the amount of water used. A 1054 system with 1 bag of media (15 Kg) can typically be expected to treat 1500m³ of water at 50ug/l Arsenic .For a family of 4 the media should last about 6 years.

Pre-treatment may be necessary as the raw water must contain: Iron <200ug/l, Manganese: <50ug/l, Silica (SiO₂) <40mg/l, Phosphate: <200ug/l, pH: 6.5 to 8.5, suspended solids:<10mg/l.

Backwash frequency 14-28 days.

Activated Carbon

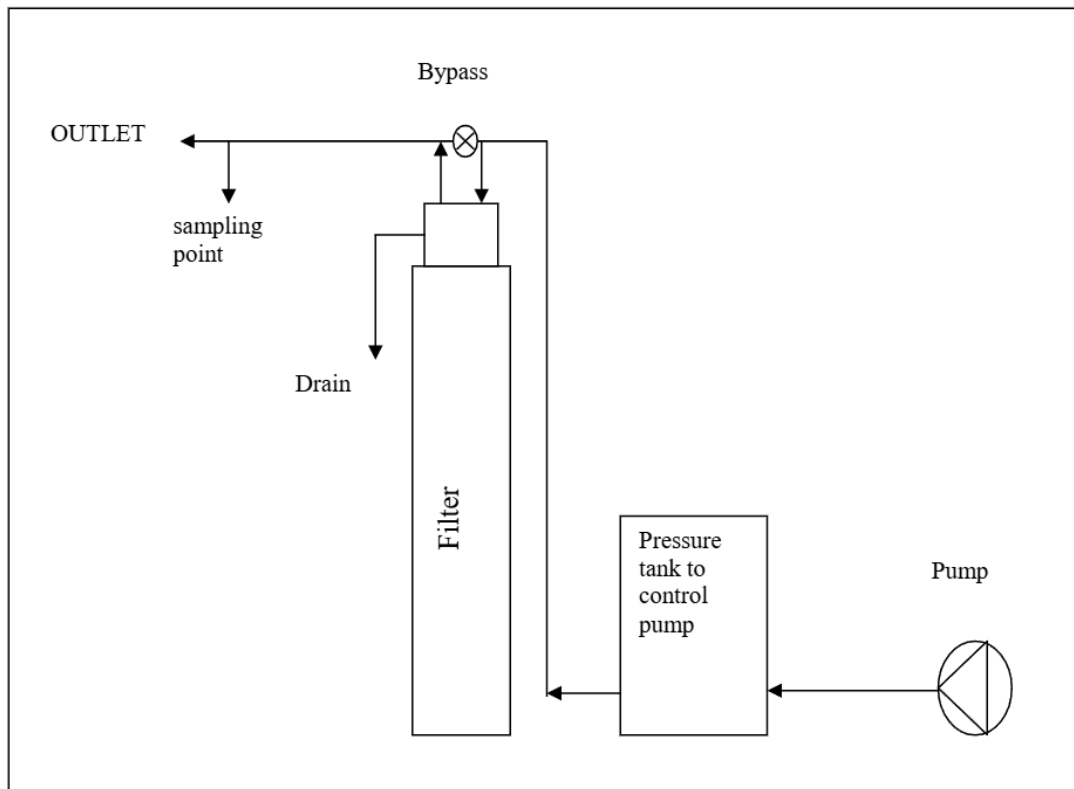
Vessel size	C1054	C1248	C1354	C1465	C1665	C1865	C2160	C2469	C3072	C3672
Service flow rate - m3/hr	1.1	1.5	1.8	2.0	2.6	3.2	4.5	5.9	9.2	13.5
Backwash flow rate m3/hr	1.3	1.9	2.2	2.4	3.3	4.2	5.6	7.3	11.5	16.5

Activated carbon (GAC) works by absorbing soluble pollutants onto its surface and holding them. Eventually all the pores are filled and the carbon needs to be replaced. GAC is used to reduce chlorine, natural colours and odours from water.

6.2 Standard Hydraulic Connections (BSP).

Valve	CK1	CK1.25	CK1.5	CK2
Inlet	1"	1.25"	1.5"	2"
Outlet	1"	1.25"	1.5"	2"
Drain	.75"	.75"	.75"	1.5"

6.3 Installation Layout



7. Troubleshooting

Troubleshooting

TC control valves do not have meters so shaded areas are not applicable for TC control valves

Problem	Possible Cause	Solution
1. No Display on PC Board	a. No power at electric outlet	a. Repair outlet or use working outlet
	b. Control valve Power Adapter not plugged into outlet or power cord end not connected to PC board connection	b. Plug Power Adapter into outlet or connect power cord end to PC Board connection
	c. Improper power supply	c. Verify proper voltage is being delivered to PC Board
	d. Defective Power Adapter	d. Replace Power Adapter
	e. Defective PC Board	e. Replace PC Board
2. PC Board does not display correct time of day	a. Power Adapter plugged into electric outlet controlled by light switch	a. Use uninterrupted outlet
	b. Tripped breaker switch and/or tripped OFI	b. Reset breaker switch and/or OFI switch
	c. Power outage	c. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	d. Defective PC Board	d. Replace PC Board
3. Display does not indicate that water is flowing. Refer to user instructions for how the display indicates water is flowing.	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Meter wire not installed securely into three pin connector	d. Verify meter cable wires are installed securely into three pin connector labeled METER
	e. Defective meter	e. Replace meter
	f. Defective PC Board	f. Replace PC Board
4. Control valve regenerates at wrong time of day	a. Power outage	a. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of regeneration set incorrectly	c. Reset regeneration time
	d. Control valve set at "on 0" (immediate regeneration)	d. Check programming setting and reset to NORMAL (for a delayed regen time)
	e. Control valve set at "NORMAL + on 0" (delayed and/or immediate)	e. Check programming setting and reset to NORMAL (for a delayed regen time)
5. Time of day flashes on and off	a. Power outage	a. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
6. Control valve does not regenerate automatically when the correct button(s) is depressed and held. For TC valves the buttons are ▲&▼. For all other valves the button is REGEN	a. Broken drive gear or drive cap assembly	a. Replace drive gear or drive cap assembly
	b. Broken Piston Rod	b. Replace piston rod
	c. Defective PC Board	c. Defective PC Board
7. Control valve does not regenerate automatically but does when the correct button(s) is depressed and held. For TC valves the buttons are ▲&▼. For all other valves the button is REGEN	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Incorrect programming	d. Check for programming error
	e. Meter wire not installed securely into three pin connector	e. Verify meter cable wires are installed securely into three pin connector labeled METER
	f. Defective meter	f. Replace meter
	g. Defective PC Board	g. Replace PC Board

Problem	Possible Cause	Solution
8. Hard or untreated water is being delivered	a. Bypass valve is open or faulty	a. Fully close bypass valve or replace
	b. Media is exhausted due to high water usage	b. Check program settings or diagnostics for abnormal water usage
	c. Motor not registering	c. Remove motor and check for rotation or foreign material
	d. Water quality fluctuation	d. Test water and adjust program values accordingly
	e. No regenerant or low level of regenerant in regenerant tank	e. Add proper regenerant to tank
	f. Control fails to draw in regenerant	f. Refer to Trouble Shooting Guide number 12
	g. Insufficient regenerant level in regenerant tank	g. Check refill setting in programming. Check refill flow control for restrictions or debris and clean or replace
	h. Damaged seal/stack assembly	h. Replace seal/stack assembly
	i. Control valve body type and piston type mix matched	i. Verify proper control valve body type and piston type match
	j. Fouled media bed	j. Replace media bed
9. Control valve uses too much regenerant	a. Improper refill setting	a. Check refill setting
	b. Improper program settings	b. Check program setting to make sure they are specific to the water quality and application needs
	c. Control valve regenerates frequently	c. Check for leaking fixtures that may be exhausting capacity or system is undersized
10. Residual regenerant being delivered to service	a. Low water pressure	a. Check incoming water pressure – water pressure must remain at minimum of 15 psi
	b. Incorrect injector size	b. Replace injector with correct size for the application
	c. Restricted drain line	c. Check drain line for restrictions or debris and clean
11. Excessive water in regenerant tank	a. Improper program settings	a. Check refill setting
	b. Plugged injector	b. Remove injector and clean or replace
	c. Drive cap assembly not tightened in properly	c. Re-tighten the drive cap assembly
	d. Damaged seal/ stack assembly	d. Replace seal/ stack
	e. Restricted or kinked drain line	e. Check drain line for restrictions or debris and or un-kink drain line
	f. Plugged backwash flow controller	f. Remove backwash flow controller and clean or replace
	g. Missing refill flow controller	g. Replace refill flow controller
12. Control valve fails to draw in regenerant	a. Injector is plugged	a. Remove injector and clean or replace
	b. Faulty regenerant piston	b. Replace regenerant piston
	c. Regenerant line connection leak	c. Inspect regenerant line for air leak
	d. Drain line restriction or debris cause excess back pressure	d. Inspect drain line and clean to correct restriction
	e. Drain line too long or too high	e. Shorten length and or height
	f. Low water pressure	f. Check incoming water pressure – water pressure must remain at minimum of 15 psi

Problem	Possible Cause	Solution
13. Water running to drain	a. Power outage during regeneration	a. Upon power being restored control will finish the remaining regeneration time. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	b. Damaged seal/ stack assembly	b. Replace seal/ stack assembly
	c. Piston assembly failure	c. Replace piston assembly
	d. Drive cap assembly not tightened in properly	d. Re-tighten the drive cap assembly
14. E1, Err - 1001, Err - 101 = Control unable to sense motor movement	a. Motor not inserted full to engage pinion, motor wires broken or disconnected	a. Disconnect power, make sure motor is fully engaged. check for broken wires, make sure two pin connector on motor is connected to the two pin connection on the PC Board labeled MOTOR. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. PC Board not properly snapped into drive bracket	b. Properly snap PC Board into drive bracket and then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Missing reduction gears	c. Replace missing gears
15. E2, Err - 1002, Err - 102 = Control valve motor ran too short and was unable to find the next cycle position and stalled	a. Foreign material is lodged in control valve	a. Open up control valve and pull out pinion assembly and seal/ stack assembly for inspection. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Mechanical binding	b. Check piston and seal/ stack assembly, check reduction gears, check drive bracket and main drive gear interface. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Main drive gear too tight	c. Loosen main drive gear. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	d. Improper voltage being delivered to PC Board	d. Verify that proper voltage is being supplied. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.

Problem	Possible Cause	Solution
16. E3, Err – 1003, Err – 103 = Control valve motor ran too long and was unable to find the next cycle position	a. Motor failure during a regeneration	a. Check motor connections then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	b. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	c. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
17. E4, Err – 1004, Err – 104 = Control valve motor ran too long and timed out trying to reach home position	a. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	a. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
18. Err -1006, Err – 106. Err - 116 = MAV/ SEPS/ NHBP/ AUX MAV valve motor ran too long and unable to find the proper park position Motorized Alternating Valve = MAV Separate Source = SEPS No Hard Water Bypass = NHBP Auxiliary MAV = AUX MAV	a. Control valve programmed for ALT A or b, NHBP, SEPS, or AUX MAV with out having a MAV or NHBP valve attached to operate that function.	a. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect. Then re-program valve to proper setting
	b. MAV/ NHBP motor wire not connected to PC Board	b. Connect MAV/ NHBP motor to PC Board two pin connection labeled DRIVE. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. MAV/ NHBP motor not fully engaged with reduction gears	c. Properly insert motor into casing, do not force into casing Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	d. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	d. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
19. Err – 1007, Err – 107. Err - 117 = MAV/ SEPS/ NHBP/ AUX MAV valve motor ran too short (stalled) while looking for proper park position Motorized Alternating Valve = MAV Separate Source = SEPS No Hard Water Bypass = NHBP Auxiliary MAV = AUX MAV	a. Foreign material is lodged in MAV/ NHBP valve	a. Open up MAV/ NHBP valve and check piston and seal/ stack assembly for foreign material. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Mechanical binding	b. Check piston and seal/ stack assembly, check reduction gears, drive gear interface, and check MAV/ NHBP black drive pinion on motor for being jammed into motor body. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.



Pallas CK Filter Settings Record	
Will only appear if certain settings are chosen	
Media Type	
Vessel Size	
Media Vol (Kg) pH	
Media Vol (Kg) Sand	
Media Vol (Cuft) Turbidex	
Media Vol (Kg) Arsenic	
Media Vol (Cuft) Birm	
Valve Type / Size	
Cycle Sequence Setup	
Valve Type	
Meter Size (If 2 selected above)	
Set (ALT MAV)	
Delayed Rinse / Fill	
Pre-service Rinse	
Set (AUX MAV)	
Aux Mav Setpoint	
Aux Mav Duration	
Set (Auxiliary input) DP	
Set Hardness	
SET Cycle 1	
SET Cycle 2	
SET Cycle 3	
SET Cycle 4	
SET Cycle 5	
SET Cycle 6	
SET Cycle 7	
SET Cycle 8	
SET Cycle 9	
SET Cycle 10	
Filter System Setup	
Set Type	FILTERING
Cycle 1 Time	
Cycle 2 Time	
Cycle 3 Time	
Cycle 4 Time	
Cycle 5 Time	
Cycle 6 Time	
Cycle 7 Time	
Cycle 8 Time	
Cycle 9 Time	
Set m ³ Capacity	
Set Type REGEN	
Set Relay 1	
Relay 1 Setpoint	
Relay 1 Duration	
Set Relay 2	
Relay 2 Setpoint	
Relay 2 Duration	
Service Alarm	
Installer Display Settings.	
Set Display	ENGLISH
Days Between Regen	
Regen Time (Hours)	
Regen Time (minutes)	



UV-C DISINFECTION
EQUIPMENT FOR THE TREATMENT OF DRINKING WATER

DOMESTIC SERIES

UV 405-412-440-450-480-550-80/2 LCD – LCD PLUS



MANUAL OF INSTALLATION, USE AND SERVICING



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1. Introduction

This manual is for the following models of LCD SERIES:

UV 405-412-440-450-480-550-80/2 LCD-LCD PLUS

This Pressure UV Systems is manufactured by **S.I.T.A. s.r.l.**

Warning: This equipment requires regular maintenance to ensure the requirements of the drinking water treated and the maintenance of the improvements as stated by the manufacturer.

These operating instructions contain important information for the operation and maintenance of the equipment.

Please ensure that these operating instructions are carefully read by all relevant persons before putting into operation, to ensure the safe use of the UV system. The operating instructions are an integral part of the equipment supply.

Before putting into operation, all the conditions necessary for safe operation of the equipment must be fulfilled.

The installation, commissioning and maintenance of the equipment should only be carried out by qualified personnel.

The equipment should only be operated by authorized personnel who have been trained accordingly.

No modifications should be made to the equipment without consulting S.I.T.A., as this could affect the safe operation of the unit. S.I.T.A. shall not be held responsible for damage resulting from unapproved modifications.



INSTRUCTION:

The operating instructions are to be kept where they will be accessible for operating and maintenance personnel.

2. General Principles and Safety Instructions

Information about UV irradiation:

The UV disinfection system of the LCD series have been planned specially for destroying harmful bacteria and viruses present in your water.

Their working is based on a physical principle which is a warranty of security: the output of ultra-violet irradiation.

The UV light given out by special mercury vapours lamps (UV-C rays $\lambda = 254\text{nm}$) is highly germicidal because it interacts with DNA and RNA, at a molecular level.

The deep bio-structural disorder caused by such irradiation interferes with the development and the ability of reproduction of every kind of micro-organism, making it harmless.

Generally it is better to mount a pre-filter before the UV sterilizer, in this way the impurities of every nature and consistence are kept.

This system comes to be necessary if we want to have a high degree of sterilization, infact the non-filtration and removal of suspended particles in the water has, as a consequence, a decrease of the sterilizer's efficiency.

If the water to be treated contains sulphydric acid or more than 0.3 p.p.m. of iron or filtrable solids, once passed through the sterilizer, it leaves a residual sediment on the quartz sleeve, which, therefore, must be periodically cleaned (the frequency depends on the quantity and quality of water treated).

General directions:

According to the European rules EN 60204-1 (safety of the set-up off the electrical equipment-general rules) the low tension electrical instruments (rule 2006/95/CE) must be connected to a current-tap provided with grounding.

Electrical Safety Instructions:



The lightning flash and arrowhead symbol is to alert the user to the presence of un-insulated "DANGEROUS VOLTAGE" within the enclosure. The equipment may only be opened if main supply is isolated. The main supply must not be restored as long as the equipment is open. This applies to both the electrical panel and the UV reactor vessel.

ATTENZIONE: Working on live equipment is forbidden.

UV Light Danger:



The light of ultra-violet lamps can cause serious burns to unprotected skin and eyes, therefore it is recommended not to connect it to the current tap without having before ensured the UV lamp in its housing and inserted the PVC cover.

Pressure Danger:

The UV chamber could be under water pressure. Max working pressure is 10 bar. UV chamber must be installed in accordance with our installation and commissioning instructions and used in accordance with operating and maintenance instructions.

ATTENTION: Ensure that system is depressurized before attempting any service or repair

Indications for the disposal:

We remind that, according to what is fixed by D.L.25 July 2005, № 151 "Accomplishment of directives 2002/CE, 2002/96/CE and 2003/108/CE, concerning the reduction of the use of dangerous substances in electric and electronic equipments, and the disposal of waste" both mercury vapours lamps and electrical panels, when no more used, must be considered as special waste, and in the same way disposed of.

To do that, it is possible to address to specialized centres for the recovery of dangerous materials, or to contact directly our technical department.

3. Instructions for installation and setting at work

General premise: The installation of the DOMESTIC SERIES disinfection units must be carried out by specialized staff, scrupulously following the instructions hereby given. It has been moreover considered necessary to give some general information about the electrical and water connections.

Cautions: check that the UV panel is not connected to the power supply and that the tap of the water to be treated is turned off.

- Connect the delivery of the water to be treated to the special water connection
- Turn on water and check for possible leaks in any part of the unit
- Connect the plug to the current tap
- Check that the disinfected water comes out and that the LEDS on the panel of the control board, signal the correct working

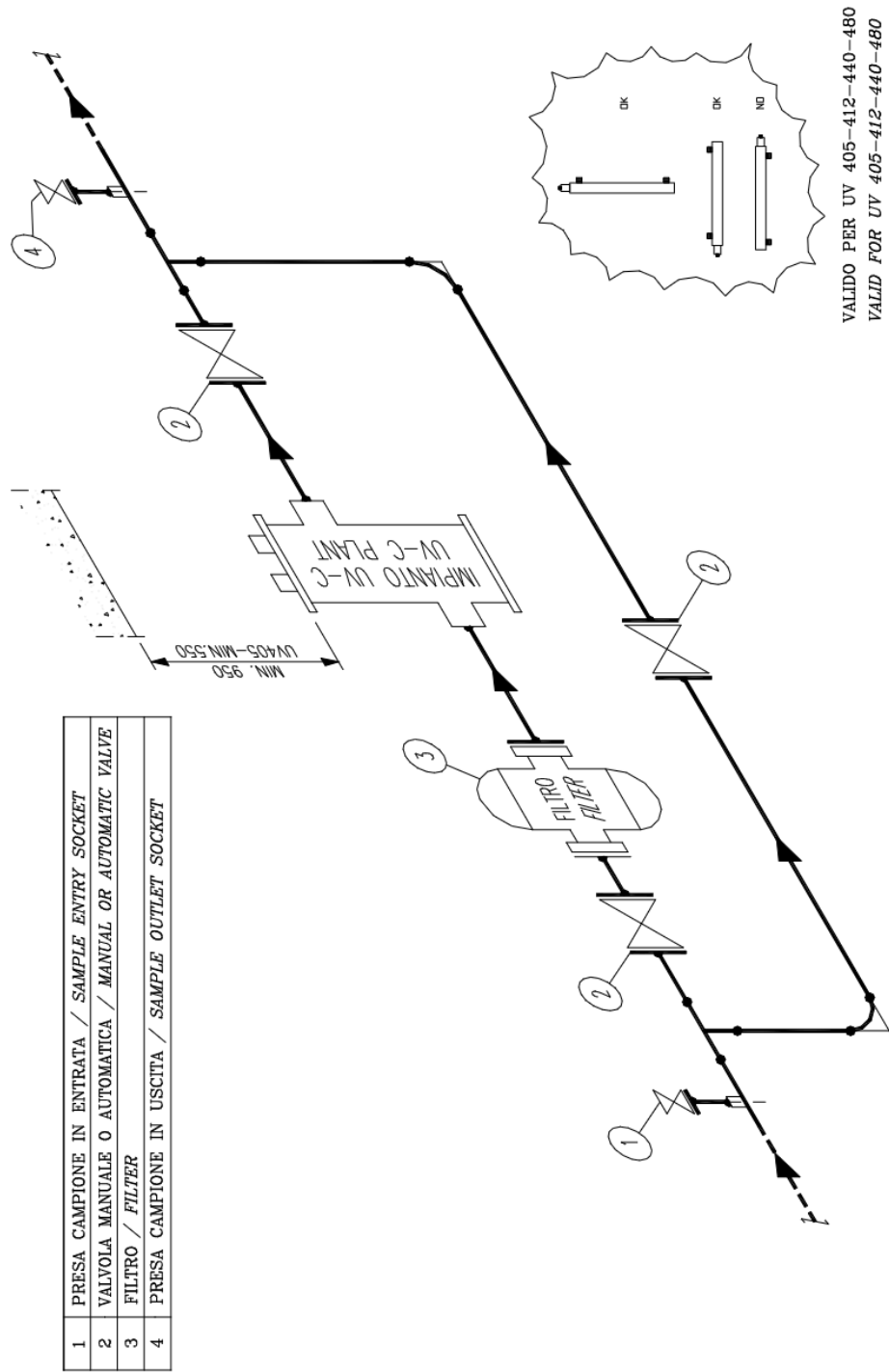
Let the disinfected water flow down to outlet for at least 10 minutes before using it, in order to make the possible impurities present in the unit drain out.

NOTE: it is recommended to install a water filter directly before the UV sterilizer in order to remove the suspended particles, eventually present in the water to be treated, which could limit the efficiency of sterilization.

CHECKS

The DOMESTIC SERIES is ready for producing disinfected water, once the connection to the water system and to the electrical grid is carried out. The unit works automatically, the electronical boards which control the signals reaching the control panel, allow the visualizing (or the sounding) of the correct working or of anomalies which may occur during the operating of the unit.

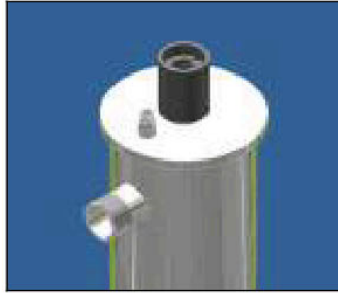
3.1 Suggested Installation Scheme



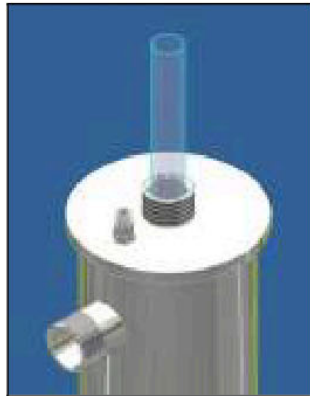
4. UV Chamber Installation

4.1 UV chamber assembling

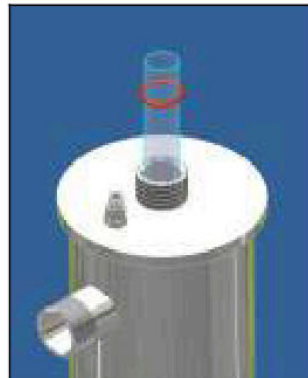
Mount the valves kit supplied with the system .
Unscrew the sleeve bolts:



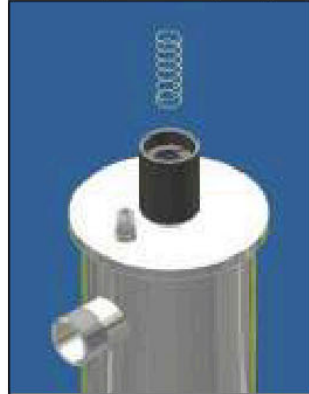
Insert the quartz sleeves carefully centring the spring at the bottom plate of the UV chamber:



Insert the o-ring Ø 23x4 into the quartz sleeve:

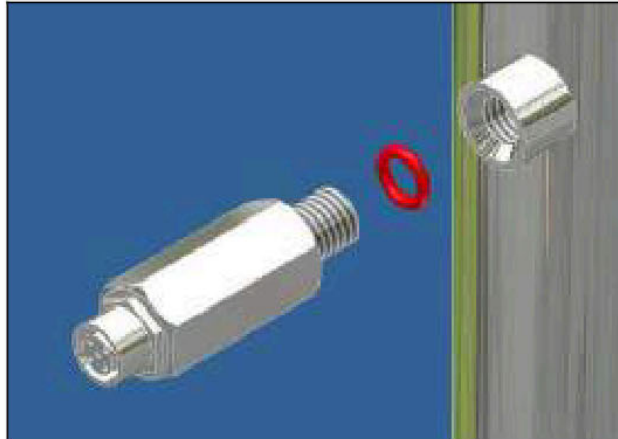


Screw again the sleeve bolts and insert the lamp holder spring into the sleeve:



In case of LCD PLUS UV system: Mount the o-ring (3043 type) on the probe holder and screw this one on the Ø ¼" bush welded in the middle part of the UV chamber.

Finally, connect the pertinent electrical cable:



Carry out the hydraulic test, verifying that the o-rings are watertight and that there're not water leaks outside the sleeve bolts or inside the quartz sleeves.

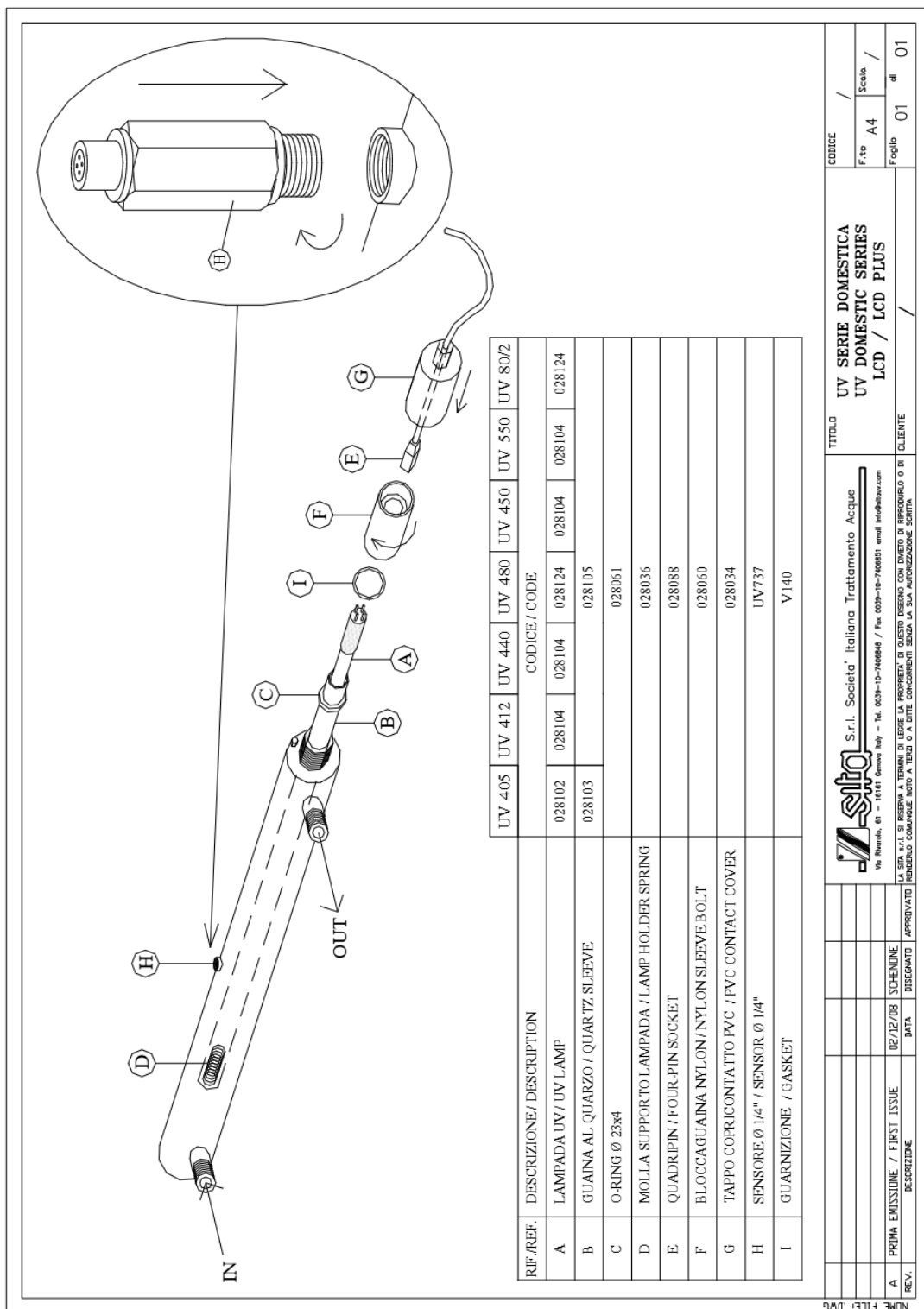
Insert the UVC lamp into the quartz sleeve:



Important!

Handle the lamps using gloves

4.2 UV Chamber Detailed Drawing



5. Electrical panel installation and operation

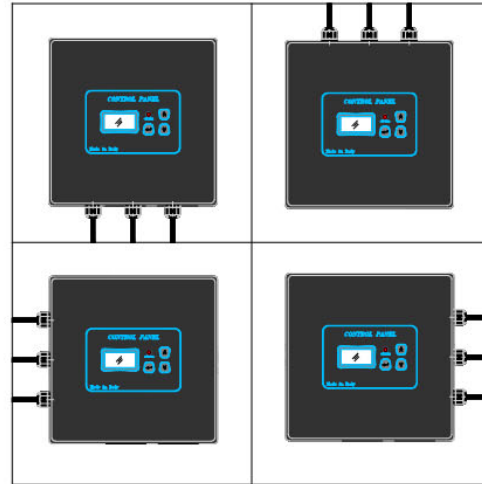
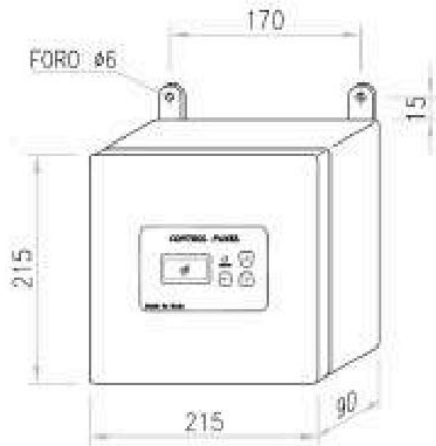
5.1 Control Panel Description



CONTROL PANEL	LCD (PLUS)
Material and colour	Black Polypropylene
Dimensions	215 x 215 x 90 mm
Protection class	IP 55 (IP 65 on request)
Ambient temperature range	5 – 45 °C
Power supply	230 V - 50/60 Hz (115V – 50/60 Hz on request)
Lamp cable	1 m
Power supply cable	1 m
Monitor display	LCD SITA
Hour meter	Yes for total system life
Resettable hour meter	Yes for lamp life control
Lamp function control	Yes
Alarm led	Yes
Free contact (NO - NC)	Yes – general alarm
230 V output (NO - NC)	Yes – general alarm
Remote ON/OFF contact	Yes (settable)
ON/OFF Timer	Yes (settable)
Reactor temperature measurement and alarm	Yes (°C) – settable value (shut off for high temperature) on PLUS MODELS
UV Irradiance measurement and alarm	Yes (% or W/m ² optional) – settable value on PLUS MODELS
4/20 mA output	Optional – for Irradiance and water temperature on PLUS MODELS
Audio alarm	Optional

5.2 Electrical panel installation and operation

The electrical panel of the LCD series is equipped with 2 fixing brackets for wall mounting. Rotating the panel cover the user can have the cable out on the desired sides of the panel.



Connect the lamp socket to the lamp and close the contact cover cap, then connect the power supply plug to the main supply.



Once connected to the power supply the UV lamp will light on.

Do the following at the first start up and on every lamp replacement:

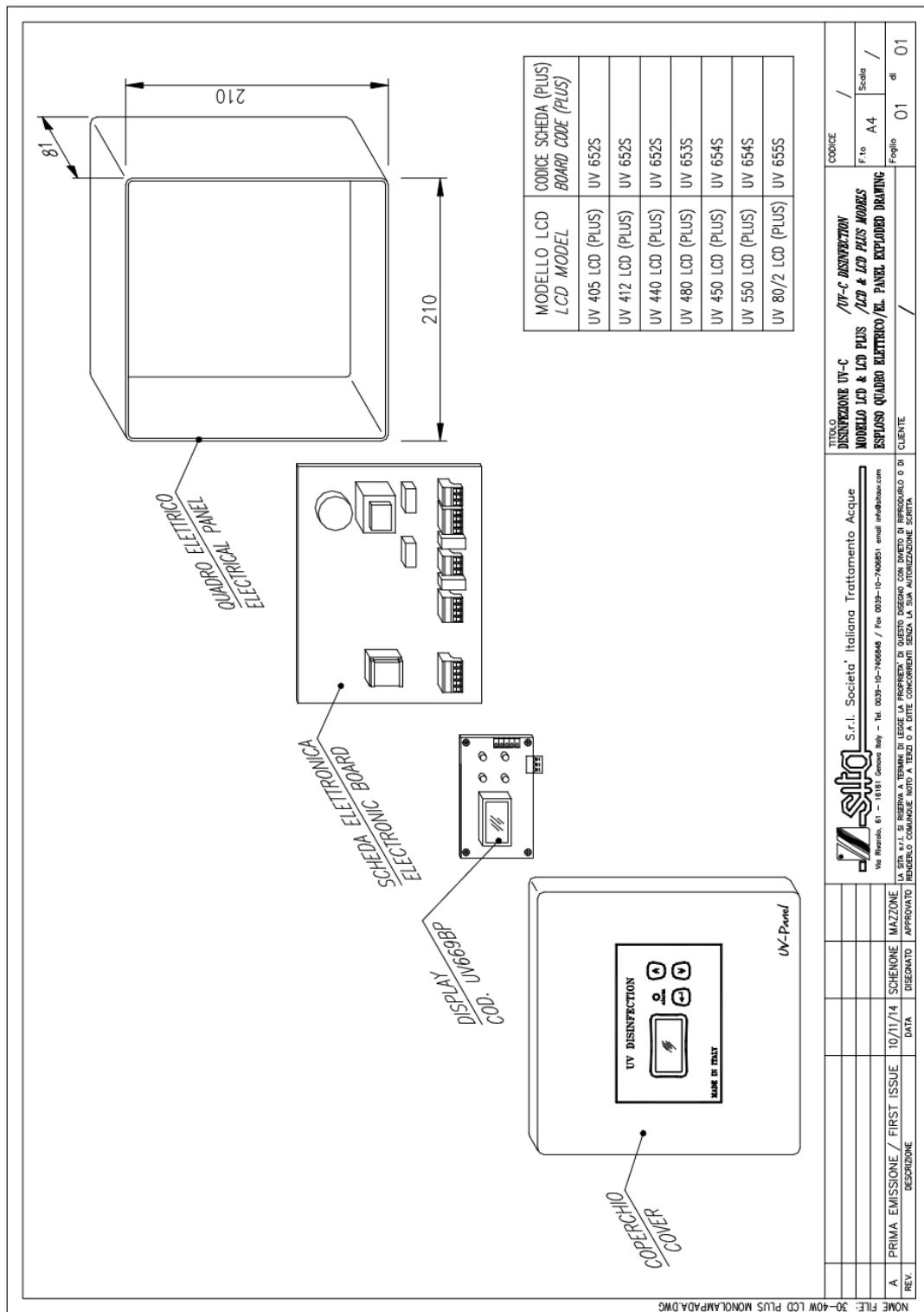
-) Activate the lamp life count down hour meter (see display description)
-) In case of LCD PLUS system with UV sensor then operate the sensor calibration. This operation must be done after at least 5 minutes from lamp start, with quartz sleeve clean, with sensor measuring window clean and with steady water flow.

5.3 Switch ON / Switch OFF the lamps

Because of the small power of the electrical panel this is not equipped with power selector. Therefore the panel is always powered but lamps can be switch ON/OFF in the following ways:

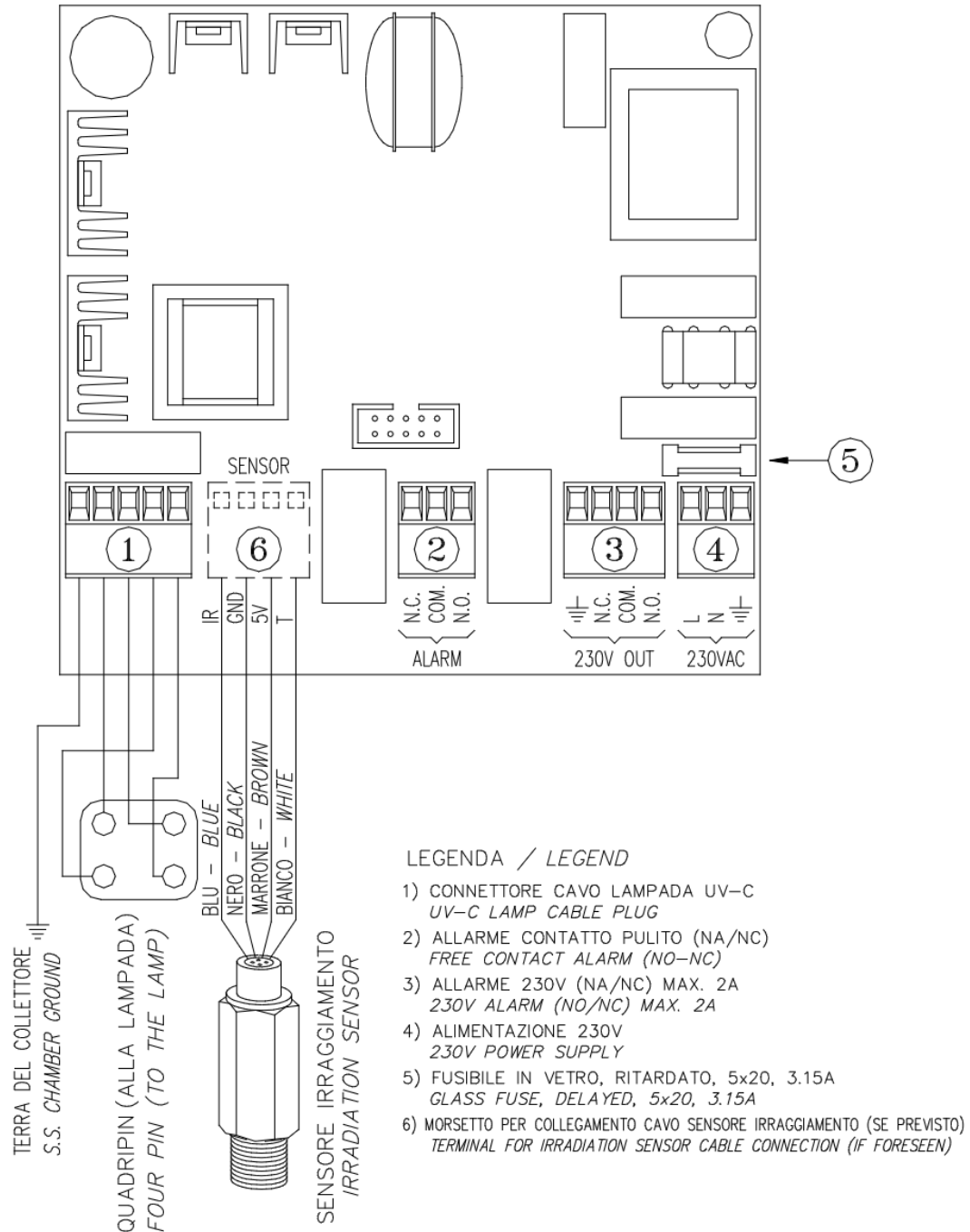
1. Keeping pushed the OK (◀J) button for 5 seconds (see display description)
2. Closing the remote ON/OFF contact (see electrical scheme)
3. Setting the timer (see display description)

5.4 Control Panel Detailed Drawing

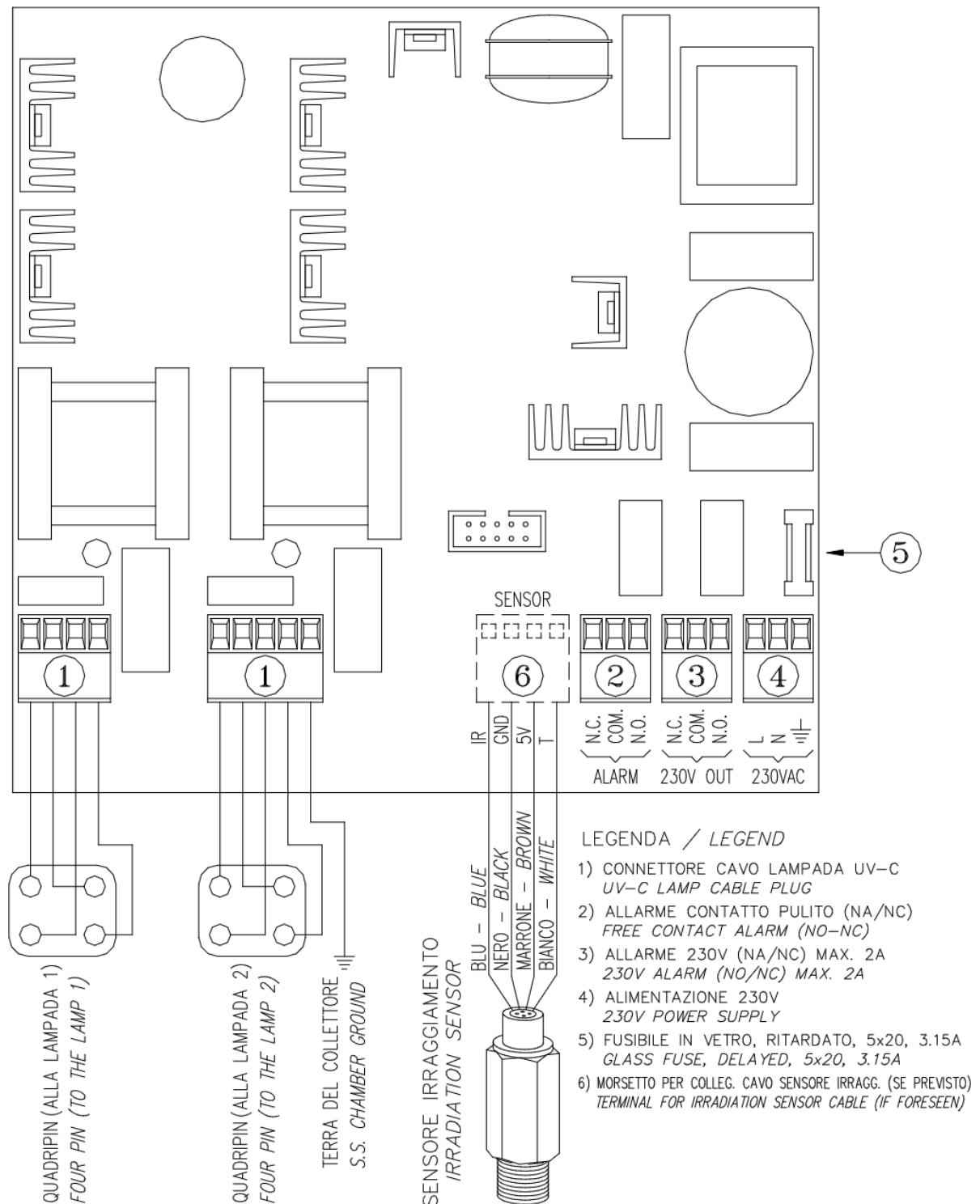


6. LCD Electrical Board Description

6.1 Single-lamp LCD electrical board description (UV 405, 412, 440, 480)



6.2 Two-Lamp LCD electrical board description (UV 450, 550, 80/2)



6.3 LCD Display board Description

Following are described the standard and optional terminals connection to the display board:

- It is possible to connect the sensor cable (usually this is connected on the main board).
- It is possible to connect the REMOTE ON/OFF contact, this is powered with 5Vdc that if closed to the RMT contact shuts of the lamps. The user can set the working of the remote ON/OFF contact by the display between N/O and N/C. The factory setting is N/O because it let the system working with nothing connected to the remote ON/OFF terminal.
- In case of LCD PLUS systems with optional 4/20 mA output then it's possible to connect to the 4/20 mA terminal. This signal is available for the water temperature and the UV irradiance.

The temperature signal has the following correspondence:

4mA = 0°C

20 mA = 100 °C

The irradiance signal has the following correspondence:

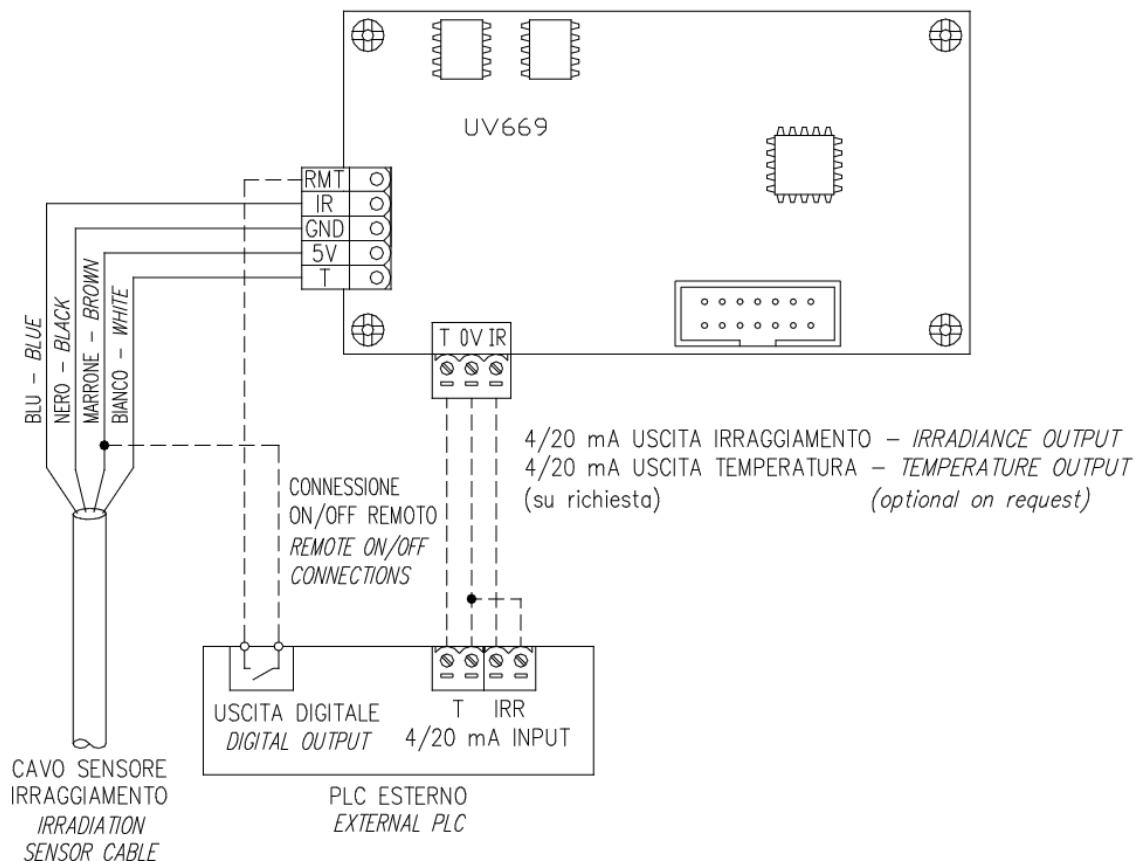
4mA = 0%

20 mA = Settable value on the display (factory setting 20 mA= 100%)



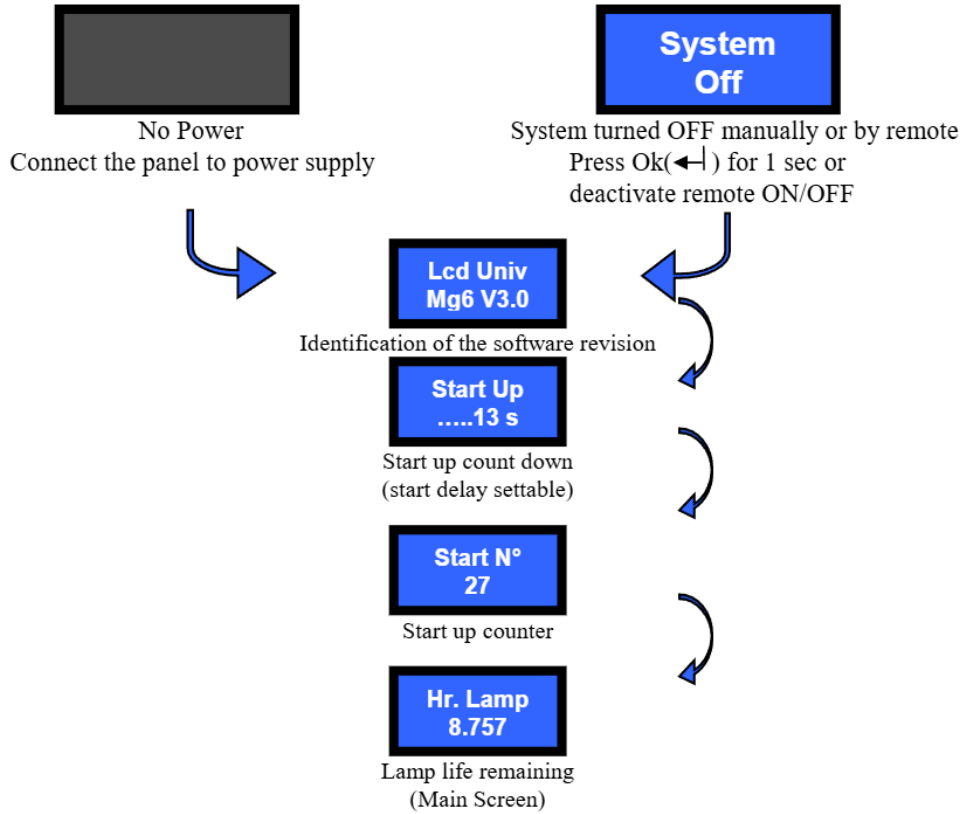
Important

The 4/20 mA output signal can work with a max load of 150 ohm

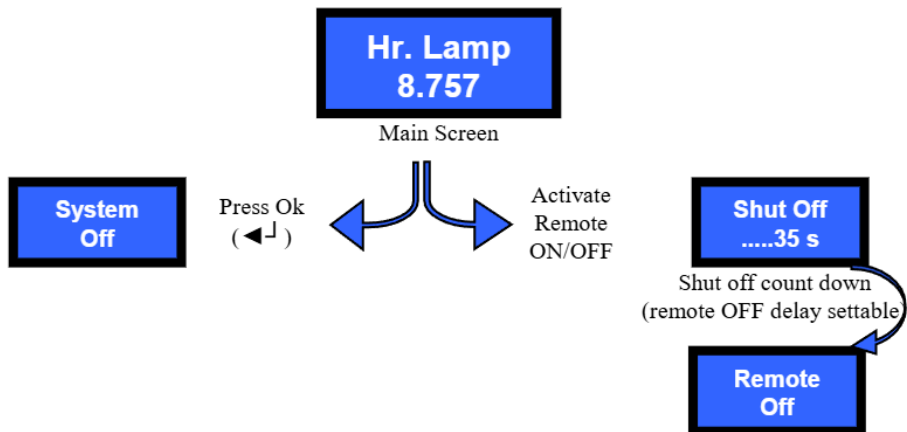


7. Display Information (Troubleshooting)

LCD DISPLAY MESSAGES – Start up:



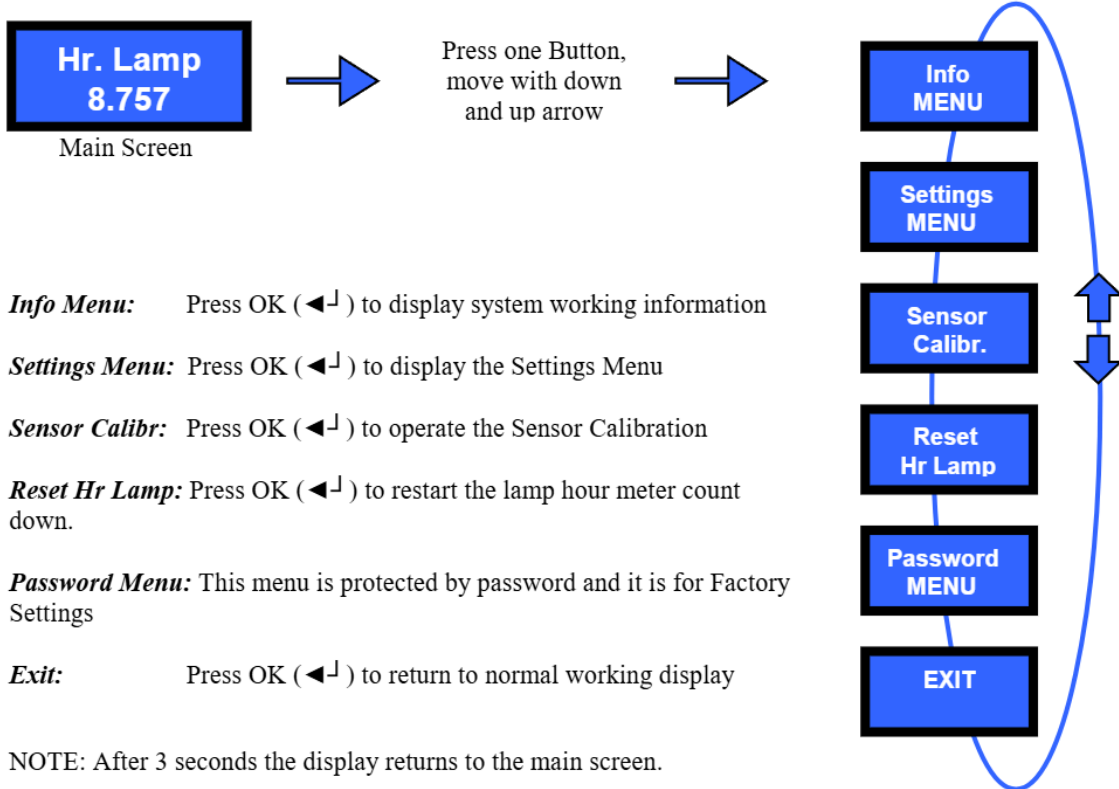
LCD DISPLAY MESSAGES – Shut Off:



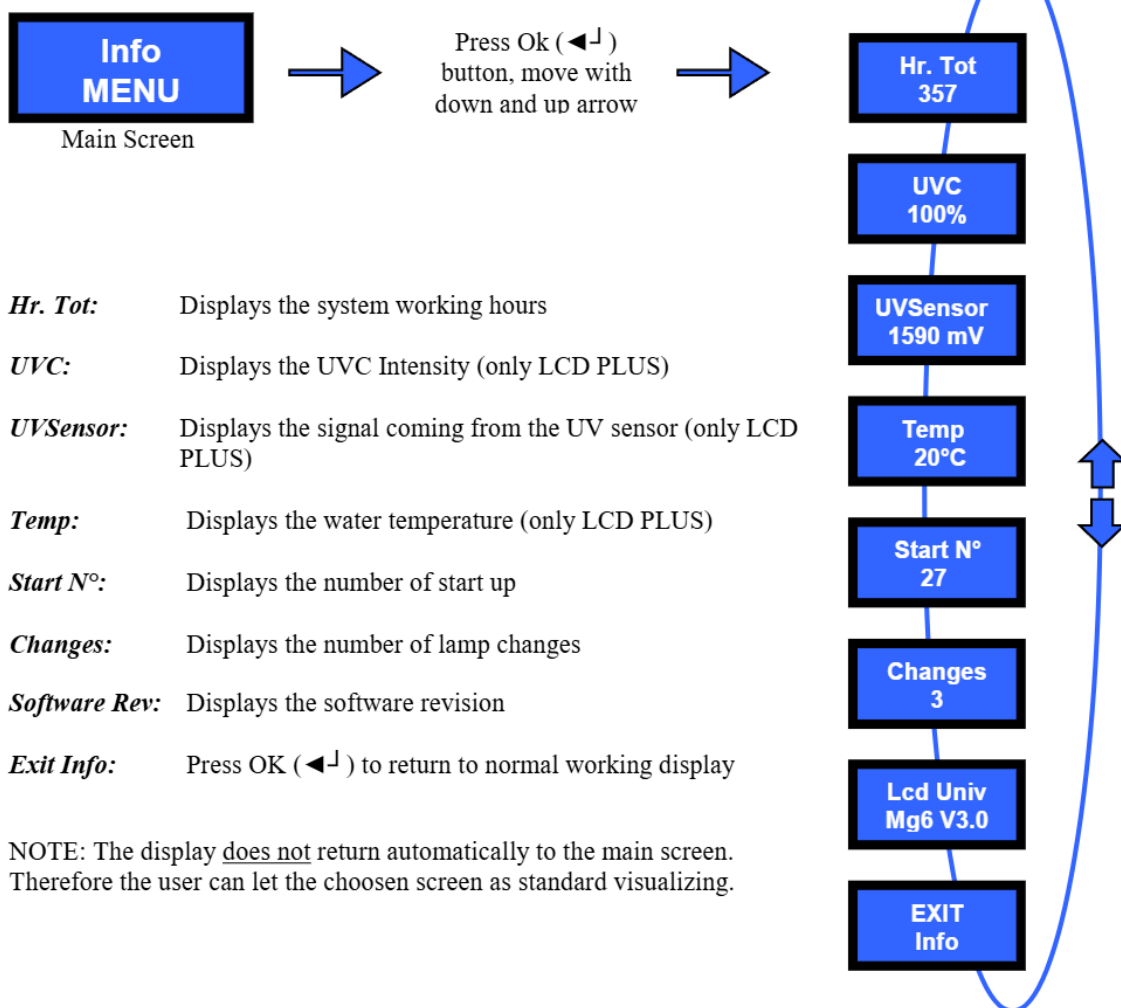
LCD DISPLAY MESSAGES – Main MENU:

The main MENU describes the main functions of the control Panel

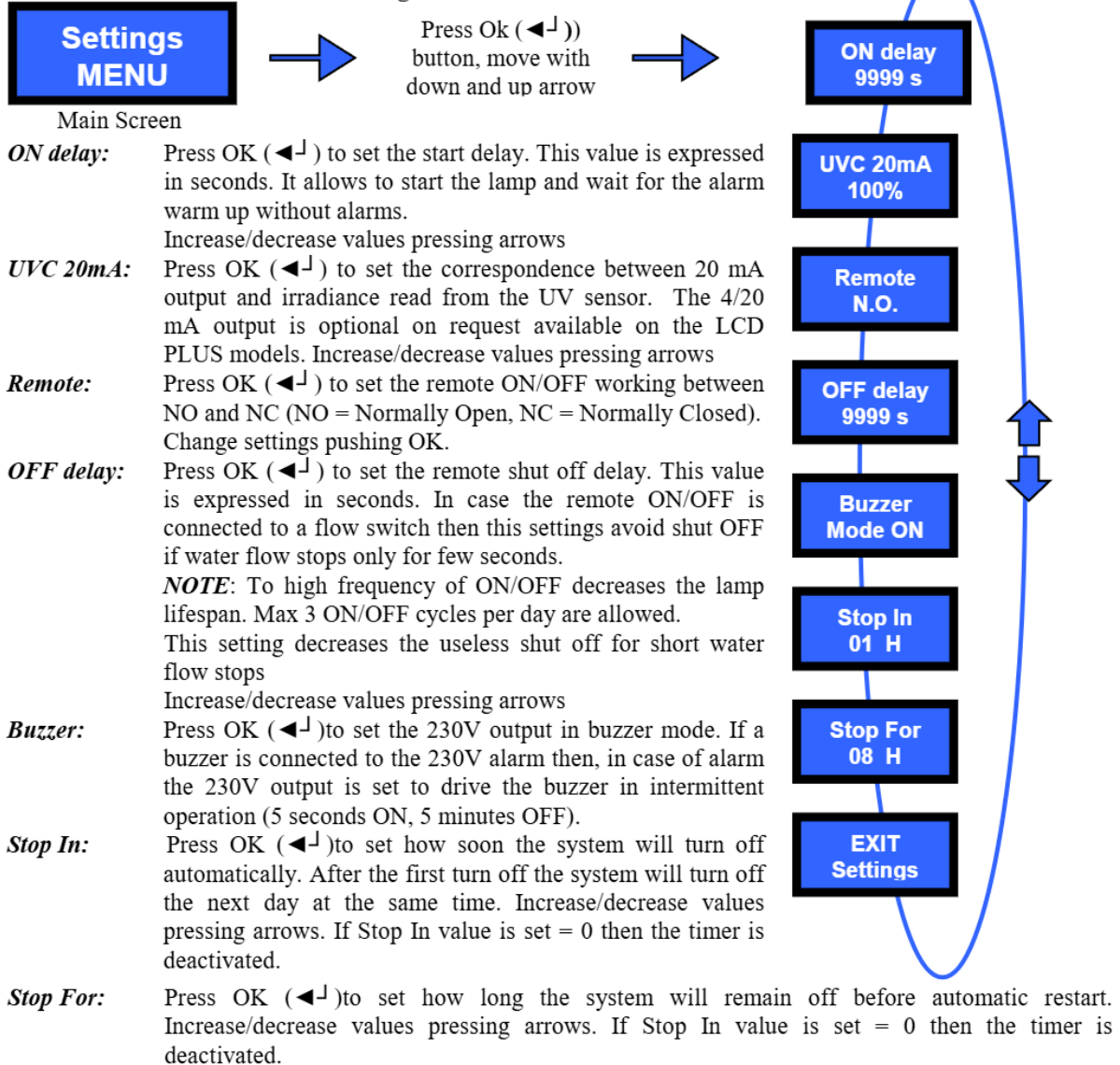
To enter the main menus push one of the 3 buttons. Move through the menus using up and down arrow buttons.



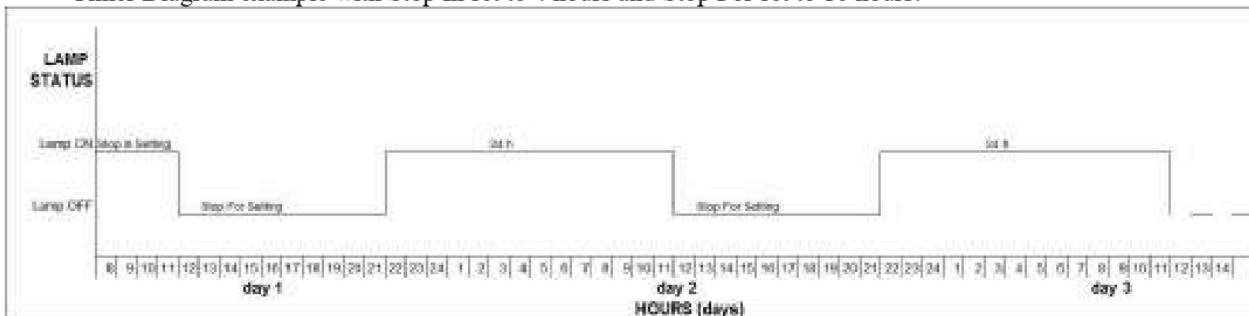
LCD DISPLAY MESSAGES – Info MENU:



LCD DISPLAY MESSAGES – Settings MENU:



Timer Diagram example with Stop In set to 4 hours and Stop For set to 10 hours:

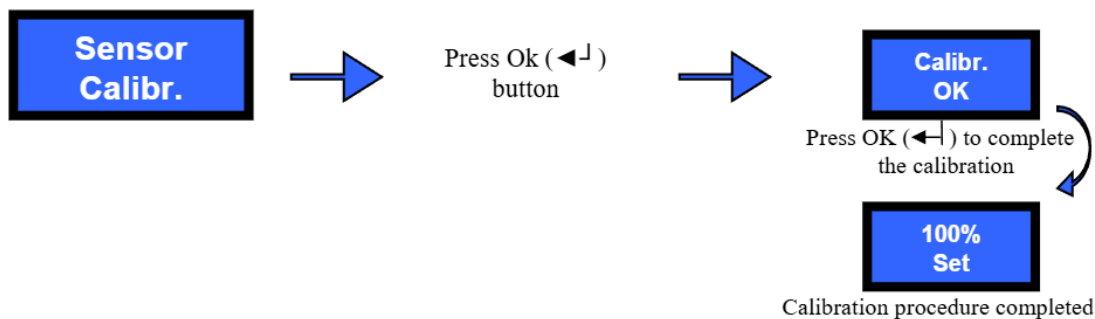


Exit: Press OK (↵) to return to normal working display

NOTE: After 3 seconds the display returns to the main screen.

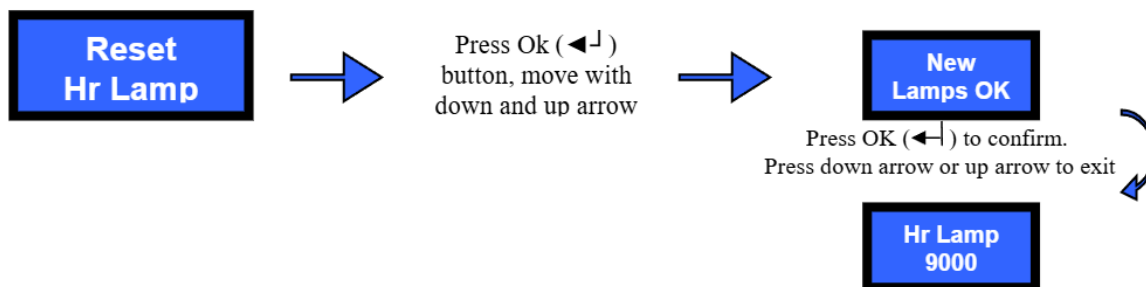
LCD DISPLAY MESSAGES – Sensor Calibr. (Only PLUS version):

This operation must be done at the first start up and on every lamp replacement, with quartz sleeves and sensor measuring window clean. Wait 5 minutes from the lamp start before operating the sensor calibration.



LCD DISPLAY MESSAGES –Reset Hr Lamp.:

This operation starts the count down of the lamp life hour meter. This operation must be done at the first lamp start and on every lamp replacement



LCD DISPLAY MESSAGES – Alarms/troubleshooting:



In case of any alarm the red LED is flashing.

List of alarms:



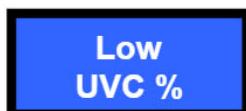
Indicates the lamp failure. If the system has 2 lamps the failed lamp is identified. Check:

- Connection to the lamp
- If lamp has failed
- If lamp starter has failed.



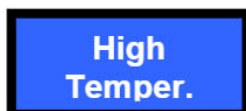
Indicates that the count-down hour meter of lamps life comes to zero. In such case replace the lamps and restart lamp hour.

Only for Plus



Indicates low irradiation. Check:

- If lamp life has expired
- If quartz sleeves are dirty
- If sensor windows is dirty
- If water quality has changed



Indicates high temperature in the UV chamber. This may happen when either there is no flow or there is air in the UV chamber. In such cases the system switches off.

Reset the alarm: Push OK (◀J) for 5 sec to put the system in standby then press OK (◀J) again to restart the UV system.

NOTE: In case of high temperature the panel turns off the lamp and this remains off even if temperature drops below the threshold level. This is necessary in case of no flow to avoid this cycling:

Lamp ON → High Temperature → lamp turned off → Temperature lower then threshold → lamp started again → High Temperature →

This can destroy the UV lamp, in case the user can accept this risk then ask the factory for setting change instructions.

LCD DISPLAY MESSAGES – Other Problems:



Display OFF in case of no electrical feeding or burned fuses

8. Maintenance

The UV System of DOMESTIC SERIES have been projected and realized by S.I.T.A. Srl with simple and functional principles which make the checking procedures and the periodical servicing particularly easy.

The main points which characterize the ordinary servicing are the following: check quarterly the quartz sleeves, which contain the UV lamps, in order to ensure the maximum disinfection, for the cleaning.

Maintenance work may only be carried out by personnel who have been trained and authorized for this work by the owner and/or user. The owner and/or user must ensure that the maintenance personnel are familiar with the safety measures and regulations, and that they also comply with them, in addition to having read and understood the operating instructions.

Only original replacement parts from the supplier must be used.

The following are the recommended service intervals for replacement parts:

UV lamp change - once per 9000 hours

UV quartz sleeve clean - frequency depends on the quality of the water

O-ring for quartz sleeve-once per year

Procedure for the UV lamp replacement (9000 h max.)

- 1) Disconnect the electrical box from the electrical power supply
- 2) Lift the cover slightly turning, carefully loosen the electrical 4-pins connection and extract the lamp from the quartz sleeve
- 3) Remove the lamp from the packing, handling it carefully by its ends or using gloves
- 4) Insert the new lamp into the quartz sleeve of the sterilizer
- 5) Connect the lamp to the electrical connection and put again the cover
- 6) Connect again the equipment.

Important!

For lamps replacement it is not necessary to stop the water flow and drain the UV chamber

Procedure for the quartz sleeve cleaning

- 1) Disconnect the electrical box from the electrical grid and turn off water
- 2) Remove the lamp, as for the replacement
- 3) Depressurized and drain the UV system
- 4) Unscrew the sleeve-bolt and extract the quartz sleeve with care
- 5) Clean the quartz sleeve by wiping it with a cloth soaked with an acid solution such as vinegar or lemon
- 6) Reassemble the sleeve being sure to center the guide-spring fixed on the bottom, put the o-ring on the quartz sleeve, then tighten the sleeve-bolt; place the o-ring in the seat of the sleeve-bolt, insert the sleeve inside it, till it leans, then screw on the S/S chamber.
- 7) Turn on water checking for eventual leaks
- 8) Mount again lamp, its electrical connection and cover
- 9) Turn on the UV system.

9. Warranty Conditions

WARRANTY CONDITIONS

SITA works in compliance with ISO 9001-2008 quality procedures and subjects all equipments to accurate checks and tests.

The SITA supplies and progressing are anyway guaranteed only in the limits of technical specifications and request and/or of the certificates and/or of the specific checks as agreed, for 24 months from the delivery date or 30 days from the purchase date, provided that eventual defects are stated as fixed by art. No. 1495 of the civil code.

The stainless steel chamber is covered by warranty of 5 years only if used for compatible liquids and correctly installed.

In no case the integral replacement of the product is foreseen and any responsibility of Sita is excluded for delays in the delivery of the goods to the customer, for claims of third parties towards the customer, for losses of goods, costs (installation, servicing and maintenance, transports, and so on) and damages of the customer due to the defect.

Moreover the product repaired or tampered by non-authorized third parties, and the product on which an intervention has been made for defect or for convenience tests, is excluded from the warranty.

Repairs are normally carried out in SITA warehouse or in authorized after-sales service centers signalled by SITA.

The warranty does not cover:

1. Accidental breakages due to the transport.
2. Breakages due to the use of equipments not in compliance with what is indicated on the use and maintenance manual or to carelessness.
3. Breakages to the connection to a power grid fed with a tension different than the foreseen one ($\pm 10\%$ of the nominal value as fixed by CEI rules)

DO NOT TAMPER THE ADHESIVE LABELS OF IDENTIFICATION

The adhesive label with the QC (Quality Control) number must be intact and readable; such number allows to enter the data bank of tests and to find the values obtained in the electrical test of the equipment.

The adhesive label with the S/N (Serial Number) number must be intact and readable; such number allows to enter the data bank of tests and to find the values obtained in the hydraulic test of the equipment.

In case of dispute the court of Genova will be competent.

10. Declaration of Conformity EC

Unit produced in the factory of:

S.I.T.A.
Società Italiana Trattamento Acque

EC DECLARATION OF CONFORMITY
--

The undersigned hereby declares, under full responsibility, that the unit:

UV DISINFECTION SYSTEM

DOMESTIC LCD SERIES

Mod. 405-412-440-450-480-550-80/2 LCD-LCD PLUS

Complies with what is foreseen by

2006/95/CE (low voltage directive)

2004/108/CE (electro-magnetical compatibility)

2002/95/CE (RoHS)

2002/96/CE (WEEE)

IEC -EN 60204-1 norms (safety of machinery-electrical equipment of machinery)

IEC -EN 55022 norms (characteristics of radio interference)

D.Lgs. 31/2001 (Implementation of Directive 98/83/CE on the quality of water intended
for human consumption)

97/23/CE (art.3 comm.3) (PED)

The validity of CE marking is subordinated to the equipment integrity. Any modification, if not authorized, will cancel the use of the CE marking. This will occur in case the relevant risks have not been previously analyzed by our Company, and a new EC Declaration of Conformity has been issued.

TOPAZ DIFFERENTIAL

PRODUCT INFO



Description

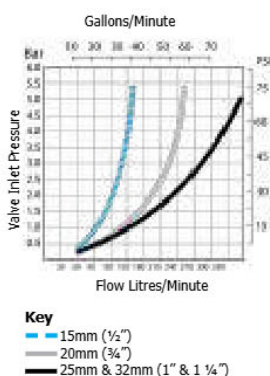
Topaz Differential valves are ideal for use in water tanks which are filled by a pressure system controlled water pump. The valve gives a level difference which is adjustable from 50mm up to 2.5m to minimise starting and stopping of the pumping system.

Applications

Maintaining Water Levels in:

- Water Storage Tanks
- Water Cisterns
- Irrigation Applications

Flow Graph



Principle of Operation

- The valve mounts at the top of the tank. It fits easily through a thin walled tank or screws into a threaded tank inlet.
- As the tank empties the weighted float travels down the cord until it hits the bottom stop. The valve then opens immediately to give a full flow.
- The valve now runs constantly and the weighted float rises until it hits the upper float stop. This lifts the arm and the valve shuts down.
- Observe the pressure that your pump runs at while the tank is filling. Set the pressure switch to turn the pump off at a pressure at least one bar above the running pressure.

Pressure Range

1 Bar – 10 Bar
(15psi-150 psi)

Features

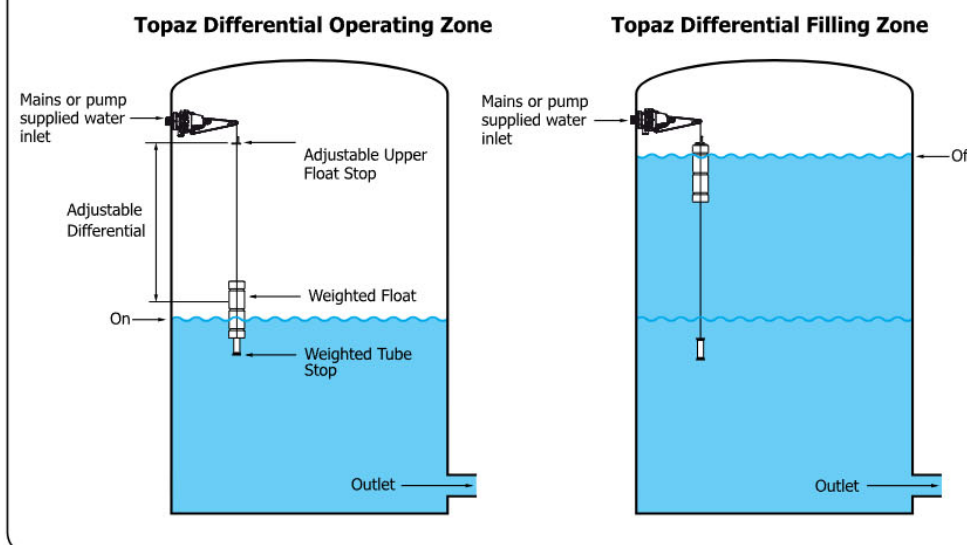
- High flow
- Start and stop levels can be easily adjusted to give water level differentials from 50mm to 2.5 m.
- Keeps pump operation to a minimum.
- Detach™ Valve Seal Access System for quick access to valve seal (**Patented**).
- Ideal for all makes and models of tanks.

Available Inlet Sizes

15mm (1/2")
20mm (3/4")
25mm (1")
32mm (1 1/4")

All supplied in Detach long tail thread with back nut.

Typical Installation

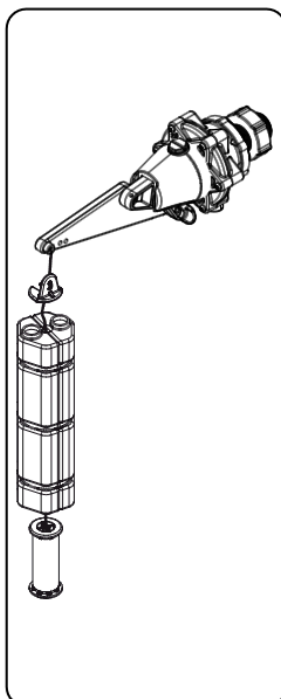


TOPAZ DIFFERENTIAL

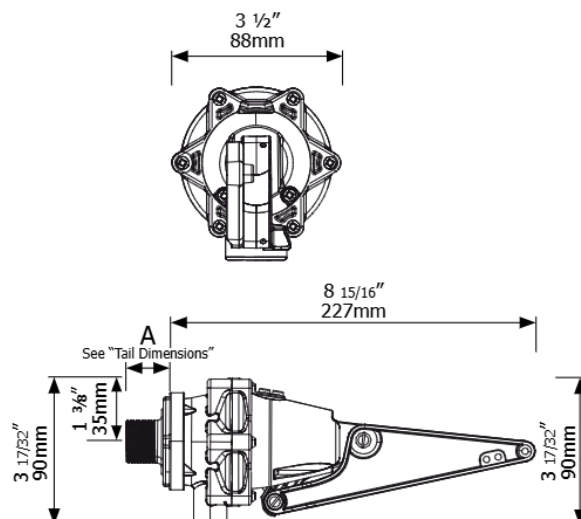
DIMENSIONS & MATERIALS



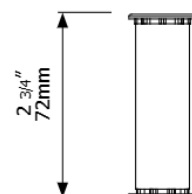
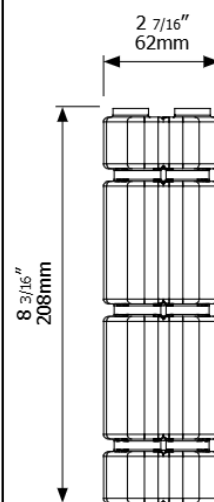
Differential



Topaz Dimensions



Float & Weight Dimensions



Tail Dimensions

Dimension A	mm	inches
15mm (1/2") Long Tail	100	3 15/16
20mm (3/4") Long Tail	46	1 13/16
25mm (1") Long Tail	62	2 7/16
32mm (1 1/4") Long Tail	67	2 21/32

Part	Material	Part	Material
Valve Body	Glass Filled Nylon	O'Rings	Nitrile
Yellow & White Internal Parts	Acetal	Float	HDPE
Filter	PP/Nylon	Float Cord	Polyester
Diaphragm	EPDM	Actuator / Arms & Caps	ABS
Seal	TPU		
Springs, Bolts, Nuts, Pin, Screws	304 Stainless Steel		

Maximum Operating Temperature

60°C, 140°F

NB: High Temperature models on request.

TOPAZ DIFFERENTIAL

PARTS IDENTIFICATION SHEET

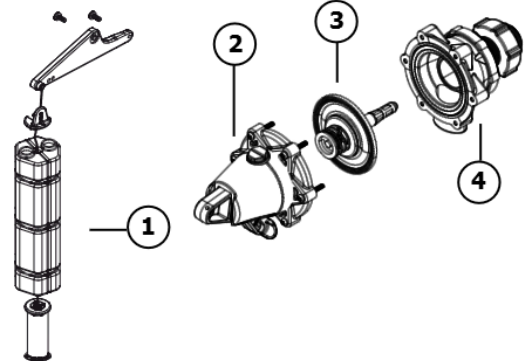


Differential



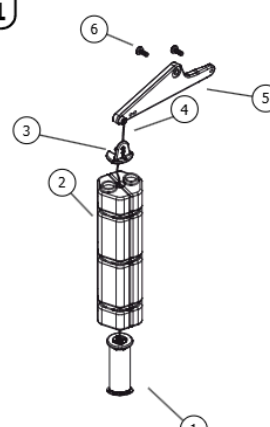


CODE: TPVD



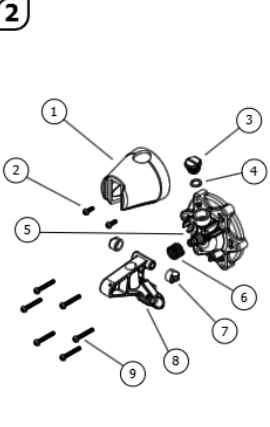
CODE	DESCRIPTION
1	TPPD1 Float, Arm & Weight Assembly
2	TPPD2 Cap & Actuator Assembly
3	TPP3 Diaphragm Assembly
4	Detach Base Assembly

1



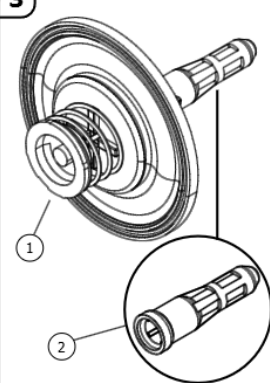
CODE	DESCRIPTION
1	TPPD1010 Weighted Tube Stop
2	TPPD1040 Weighted Float
3	TPPD1030 Upper Float Stop
4	TPPD1020 Cord
5	TPPD1050 Arm Extension
6	TPP1040 M5 x 12 Bolt

2



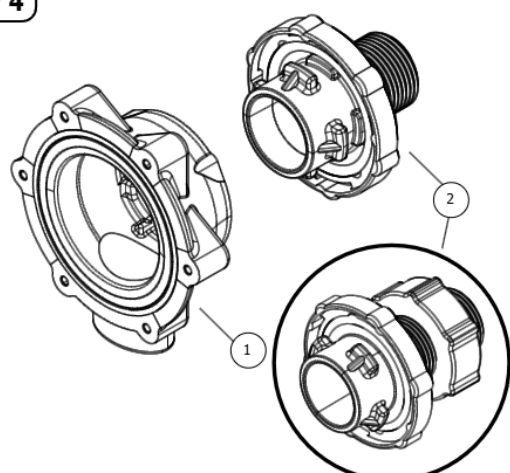
CODE	DESCRIPTION
1	TPPD2011 Actuator Cap
2	TPP2020 6g x 10 S/S Screw
3	TPP2030 Frost Pro Plug
4	TPP2040 Frost Pro O'ring
5	TPP2050 Valve Cap Assembly
6	TPPD2061 Damping Spring
7	TPP2080 Bearings (set of two)
8	TPP2090 Actuator Arm
9	TPP2100 6g x 25 S/S Screw

3



CODE	DESCRIPTION
1	TPP3 Diaphragm Assembly
2	TPP3010 Pilot Flow Filter (Fine)
	TPP3011 Pilot Flow Filter (Coarse)

4



NB: All Long Tail Assemblies are supplied with a Seal Washer and Backnut included

CODE	DESCRIPTION
1	DTP1 Detach Base
2	BSP Tails
	Short Tail Assembly (BSP)
DTP020	Detach Tail 20mm(3/4") Short
DTP025	Detach Tail 25mm(1") Short
DTP032	Detach Tail 32mm(1 1/4") Short
	Long Tail Assembly (BSP)
DTP015L	Detach Tail 15mm (1/2") Long
DTP020L	Detach Tail 20mm (3/4") Long
DTP025L	Detach Tail 25mm (1" bsp) Long
DTP032L	Detach Tail 32mm (1 1/4" bsp) Long
	NPT Tails
	Short Tail Assembly (NPT)
DTP0075	Detach Tail 3/4" npt
DTP0100	Detach Tail 1" npt
DTP0125	Detach Tail 1 1/4" npt
	Long Tail Assembly (NPT)
DTP0050L	Detach Tail 1/2" npt Long
DTP0075L	Detach Tail 3/4" npt Long
DTP0100L	Detach Tail 1" npt Long
DTP0125L	Detach Tail 1 1/4" npt Long

Operating Instructions

Reverse-Osmosis-System

UO 3000/3500/4000/5000/6000/7000/8500/10000 KR/FU



Illustration similar



Translation of the original instructions

Overview of contents

General Information	A
Transport and Storage	B
Technical data / Product description	C
Set-up and Assembly	D
Placing the system in service / Taking it out of service	E
Operation / Monitoring	F
Malfunctions	G
Maintenance	H
Preserving / Cleaning the system	I

Appendix

PID with components list	I
Circuit diagram	II
Control system manual	III

Imprint

All Rights Reserved.

The edition date on the cover sheet is definitive.

Subject to technical changes.

These Operating Instructions may not be translated into foreign languages, reprinted, saved on data media or otherwise duplicated except with the express written approval of the manufacturer.

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3.1	The principle of reverse osmosis.....	6
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1 Notes on using the Operating Instructions

Purpose:

The Operating Instructions are intended for users of the system and contain information on how to operate and maintain the system safely and reliably.

Availability:

The Operating Instructions must always be available at the place where the system is in use.

Subdivision:

The Operating Instructions consist of a number of chapters named by letters of the alphabet. An outline of all the chapters appears on Page 1.

The header and page numbering, along with the letter identifying each chapter, make it easier for you to orient yourself.

For information on the content of a specific chapter, please refer to the contents on the first page of that chapter.

Conventions/abbreviations:

OI	Operating Instructions
TD	Technical Documentation
RO	Reverse Osmosis
Permeate	Product water resulting from RO
Product	Product water from the UP system
CY	Conductivity
-	Enumerated items
	Steps to be performed

2 General safety information

2.1 Explanation of symbols and references



This symbol refers to an immediate danger that threatens the safety and life of persons. Failure to observe these notices will have severe consequences on health and safety, including life-threatening injuries.



This symbol refers to a possible danger that threatens the safety and life of persons. Failure to observe these notices may have severe consequences on health and safety, including life-threatening injuries.



This symbol refers to a possibly hazardous situation. Failure to observe these references may result in minor injuries and/or damage to property.



This symbol points out important information for working with the system in a proper manner. Failure to observe these references may result in malfunctions in the system or disturbances in the environment.

2.2 Additional safety requirements

Country-specific requirements, standards and regulations must be observed.

2.3 Usage in accordance with intended purpose

The RO-system is used to desalinate softened water. The system must only be operated with water supplied in accordance with the quality described in Chapter C and the operating parameters specified there.

The system must not be operated unless it is in proper working order. Any malfunctions must be rectified immediately.

2.4 Operating staff

Only persons who have read and understood these Operating Instructions are permitted to operate the system. When operating the system, it is particularly important to observe the safety information strictly.

2.5 Residual dangers



Water damage

To avoid accumulation of spills caused by leaks, the area in which the system is set up must be equipped with a floor drain and/or a leak monitoring system and corresponding alarm.

Electrical shock

Do not touch electrical components with wet hands.

Before performing tasks on parts of electrical system, disconnect the system from electrical power supply.

Mechanical force

Parts of the system are under excess pressure of up to 25 bar (g). Release the pressure from the system before repairs and maintenance tasks.

Hygiene-critical applications

Danger of contamination of system components due to non sufficient execution of cleaning / disinfection of the unit.

Adhere to the information provided regarding cleaning and disinfection.

2.6 Bringing the system to a stop in the event of an emergency

- ☞ Turn off the main switch
- ☞ Shut off the water supply

After remedying the damage:

- ☞ Open the water supply
- ☞ Turn on the main switch

2.7 Safety information for maintenance task

The operator must take pains to ensure that all maintenance, inspection and assembly tasks are performed by authorized and qualified professionals who have been sufficiently informed for the task at hand by thoroughly studying the Operating Instructions. These tasks must be properly performed by professionally trained staff member.

The system must be shut down and protected from being placed in operation again unintentionally before all repair and maintenance tasks. It is absolutely essential to observe the procedure described in these Operating Instructions for shutting down the system.

Before beginning tasks on the electrical equipment of the system, a check must confirm that power has been disconnected from the corresponding section of the system. In addition, the system must be secured to prevent it from being turned on again unintentionally.

Protective clothing suitable for the hazard at hand must be worn while performing the task. Immediately after the maintenance tasks are completed, all safety and protective equipment must be set back in place and functionality restored

2.8 Disposing of system parts and operating materials

When they need to be discarded, system parts must be disposed of according to local requirements including separately, if so required.

2.9 Unauthorized conversion and manufacturing replacement parts

Conversion or modification of the system is only permitted with the approval of the manufacturer. The same applies to making changes in the programming for the control system. Original replacement parts and accessories authorized by the manufacturer enhance safety. Use of other parts will void the warrantee.

2.10 Warrantee claims and liability

This product corresponds to the state of the art and was designed and manufactured in accordance with applicable rules of the technology, after which it was subjected to a quality control process.

If there should nevertheless be any grounds for complaint, please direct requests for replacement to the manufacturer of this product in accordance with the general terms and conditions of sale and delivery.

3 Basic principles of reverse osmosis systems

3.1 The principle of reverse osmosis

Osmosis is a process on which nearly all natural metabolic processes are based. If two solutions of varying concentrations are separated in a system by a semipermeable membrane, the solution with the higher concentration will always have a tendency to become more diluted. This process (osmosis) will continue until osmotic equilibrium is achieved.

In the process of reverse osmosis, the direction of the osmotic flow is reversed. To achieve this, pressure must be exerted on the concentrated solution. This pressure must be considerably greater than the osmotic pressure that arises due to the natural balancing of differing concentrations.

Synthetic membranes are used in water treatment systems that work on the principle of reverse osmosis. These membranes are permeable for water molecules. The content materials dissolved in the water are held back by the membranes. High pressure causes the concentrated solution (for example drinking water or process water) to flow through these membranes. The result is a separation of this solution into a partial flow with water in which the content materials that are held back are located (concentrate).

3.2 Calculation equations

$$\text{Yield [\%]} = \frac{\text{permeate output [l/h]} \cdot 100\%}{\text{feed water input [l/h]}}$$

$$\text{feed water input} = \text{Permeate output} + \text{concentrate output}$$

$$\text{Concentrate output [l/h]} = \frac{\text{permeate output [l/h]} \cdot 100\%}{\text{yield [\%]}} - \text{permeate output [l/h]}$$

$$\text{Desalinization rate [\%]} = \left[1 - \frac{C_{y \text{ permeate}}}{C_{y \text{ raw water}}}\right] \cdot 100\%$$

3.3 Dependencies of permeate output

The permeate output of the system depends on the particular feed water parameters like temperature, feed water pressure and salinity and thus may be lower.

The nominal output specified in the technical data (chapter C) refers to the corresponding design parameters.



Generally, when adjusting the unit, do not exceed max. permeate output and do not underrun min. amount of concentrate.

In addition the following applies to units with permeate output ≥ 600 l/h; do not underrun min. amount of concentrate recirculation.

In addition the following applies to units with permeate output of 120 - 500 l/h; do not exceed max. pump pressure.



Danger

If the system is operated at a higher feed water temperature than the design temperature; do not to exceed the maximum permeate output that is specified in the technical data (chapter C)!

3.4 Conductivity of first permeate



After switching on the RO system, permeate with high conductivity is produced for a short time. Therefore, assure that during the system design of the peripheral systems engineering a minimum running time of the RO system of at least 30 min per shifting process is guaranteed.

Transport and Storage

Units have to be transported in upright position and in its original packaging.



All units must be secured against slipping and falling over during transport!

The transport weight corresponds to the empty weight. For transport weights, please refer to the Technical Data in Chapter C.

Prior delivery, units are filled with preserving- and antifreeze mixture. Antifreeze agent is effective down to -10° Celsius. The unit can be damaged by frost. Because of this, the unit must be protected against frost and freezing during transport and storage.

The min. /max. storage temperature is 0 - 40°C.

The maximum storage duration for the units in their original packing is 12 months at 20 °C. After that, the preservative fluid must be rinsed out and replaced if necessary.

Contents Chapter C

1. Technical data.....	2
2 Usage limits.....	4
3. Product description.....	5
3.1 Rating plate	5
3.2 Working principle diagram	5
3.3 Functional description.....	5
3.4 Options.....	5

1. Technical data

System	UO 3000 KR	UO 3500 KR	UO 4000 KR	UO 5000 KR	UO 6000 KR	UO 7000 KR	UO 8500 KR	UO 10000 KR
Item-no.:	381 820	381 830	381 840	381 850	381 860	381 870	381 880	381 890
Control	RO 5000							
Feed water specification								
Feed water pressure min./max.	bar							
Pressure fluctuations (limit)	bar							
Temperature min./max.	°C							
Connections								
Feed water	DN	32	32	40	40	40	50	50
Permeate	DN	32	32	32	40	40	40	50
Concentrate	DN	25	32	32	32	32	32	32
Power consumption	kW	5,5	7,5			11,0		
Power connection	V/Hz	3x400/50						
Protection type	IP 54							
Output data								
Permeate outlet max. 1FI02	l/h	3000	3500	4000	5000	6000	7000	8500
Concentrate min. 3FI01	l/h	500	620	690	870	860	770	930
Concentrate backflow 3FI03	l/h	600	-	3600	3300	3000	2800	2500
Permeate backflow 3FI02	l/h	500	550	640	800	930	1150	1400
Pump pressure max.	bar	25						
Permeate counterpressure max.	bar	0.3; without permeate backflow						
Recovery	%	85			87		90	
Salt rejection rate	%	98,5						
Dimensions and weights								
Dimensions (HxWxD)	mm	1680x3490x710	1680x3500x710	1810x2850x710	1810x3870x790	1810x3680x790	1810x4880x790	1900x4150x840
Weight approx.	kg	400	450	520	570	680	800	1050
Environmental data								
Sound level max.	dB(A)	75						
Max. ambient temperature	°C	40						
Relative humidity (air)	%	<95, non-condensing						

Systems are designed for hardness stabilised drinking water without chlorine in accordance with the German Drinking Water Ordinance with a salt content of 1000 mg/l, a SiO₂-content of 10 mg/l and at a feed water temperature of 15 °C.

Technical data / Product description

System		UO 3000 KR/FU	UO 3500 KR/FU	UO 4000 KR/FU	UO 5000 KR/FU	UO 6000 KR/FU	UO 7000 KR/FU	UO 8500 KR/FU	UO 10000 KR/FU
Item-no.:		381 827	381 837	381 847	381 857	381 867	381 877	381 887	381 897
Control		RO 5000							
Feed water specification									
Feed water pressure min./max.	bar	2/4							
Pressure fluctuations (limit)	bar	± 0,5							
Temperature min./max.	°C	5/25							
Connections									
Feed water	DN	32		32	40		40	50	50
Permeate	DN	32		32	32		40	40	50
Concentrate	DN	25		32	32		32	32	32
Power consumption	kW	5,5				7,5			11,0
Power connection	V/Hz	3x400/50							
Protection type		IP 54							
Output data									
Permeate outlet max. 1FI02	l/h	3000	3500	4000	5000	6000	7000	8500	10000
Concentrate min. 3FI01	l/h	500	620	690	870	860	770	930	1110
Concentrate backflow 3FI03	l/h	600	-	3600	3300	3000	2800	2500	1700
Permeate backflow 3FI02	l/h	500	550	640	800	930	1150	1400	1640
Pump pressure max.	bar	25							
Permeate counterpressure max.	bar	0.3; without permeate backflow							
Recovery	%	85					87	90	
Salt rejection rate	%	98,5							
Dimensions and weights									
Dimensions (HxWxD)	mm	1640x3490x710	1650x3520x710	1810x2850x710	1810x2900x790	1810x3870x790	1810x3680x790	1810x4880x790	1900x4150x840
Weight approx.	kg	400	450	520	570	680	800	900	1050
Environmental data									
Sound level max.	dB(A)	75							
Max. ambient temperature	°C	40							
Relative humidity (air)	%	<95, non-condensing							

Systems are designed for hardness stabilised drinking water without chlorine in accordance with the German Drinking Water Ordinance with a salt content of 1000 mg/l, a SiO₂-content of 10 mg/l and at a feed water temperature of 15 °C.

2 Usage limits



In order to attain the life span of 3 years calculated for the membranes, reverse osmosis installations must be supplied, in accordance with the installation type, with softened water (types ND, KR, e.g.) or tap water with stabilised hardness level (type AS, e.g.) and run in compliance with the German Drinking Water Ordinance and the specifications below. Membranes are wearing parts. The degree of wear depends on the feed water quality and the operating conditions.

Parameter	Unit	Limit
Free chlorine *	mg/l	not detectable*
Iron **	mg/l	0.2
Manganese **	mg/l	0.05
Silicate ***	mg/l	10
SDI ⁴	-	3
pH level during operation ⁵		3.6-9.5
pH level during cleaning		2-12

The feed water must be free from substances that damage the membrane.

These are in particular:

- oxidants (e.g. free chlorine, ozone, hydrogen peroxide)
- surfactants (especially if cationic)
- biocides and inhibitors
- natural organic matter (NOM)

Additionally, the operating parameters for the reverse osmosis installations given in chapter C (Technical Data) apply. If the RO feed water is softened, the soft water quality is to be observed. If antiscalant is added for hardness stabilisation (i.e. when iron, manganese and silicate are stabilised at the same time), the manufacturer's specifications must be complied with. If necessary, the pH or the permeate output must be adjusted.

* Free chlorine (oxidants) corrodes the plastic membrane, especially if metal ions are present. This attack is irreversible and will cause a decrease of the salt retention rate while increasing the permeate conductance. This is why the feed water of the RO installation should not contain any free chlorine.

** Iron/manganese can be present in a dissolved or undissolved state. Undissolved iron or manganese should be removed by filtration. Dissolved iron/manganese can be oxidised and then removed by filtration or stabilised, for example, by means of an antiscalant. Iron/manganese deposits on the membranes can generally be removed by chemical cleaning.

*** Silicate may form solid deposits on the membranes which are hard to remove. The maximum silicate concentration in the RO concentrate should not exceed 100 mg/l if soft water is used. In RO installations, type KR, the maximum silicate concentration in the RO feed water is 10 mg/l for this reason.

⁴ The SDI is a sum parameter. It indicates the degree to which suspended matter will likely form deposits on the membrane. If the SDI > 3, prefiltration must be improved accordingly.

⁵ The pH level considerably influences the solubility of many water compounds. It may be necessary to modify the pH level in order to obtain the desired permeate yield or quality.

3. Product description

3.1 Rating plate

The rating plate is located on the front side of the system. It contains important information on the output and maximum operating parameters of the system. To ensure fast and problem-free processing of warranty claims, technical information or customer service, be sure to indicate the system type, item number and manufacturing number.

3.2 Working principle diagram

See the PID in the appendix.

3.3 Functional description

Softened feed water is fed in through a hardness monitoring device (optional) and a fine filter (5 µm filter unit) to the circuit pump unit. This unit pumps the water through the semipermeable membranes at high pressure. As a result of the high pressure, some of the water diffuses through the membranes. The result is purified water that is almost completely free of salts, colloids, germs and pyrogens. This water, which is led off, is referred to as the permeate. The salts that are held back are continually rejected into the wastewater channel with the RO concentrate. To arrive at a more economical yield and to cause water to flow over the membranes optimally, part of the concentrate is directed back in front of the circuit pump unit. The control unit of the system monitors and controls all important functions during permeate production and downtime.

3.4 Options

The options available for this installation(s) are described in the P&I diagram and in the list of components in the appendix of this manual.

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 1.2 Setting up the system.....2

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 3.2 Circuit diagram of the system.....4

 3.3 Connecting the power supply4

 3.4 Connecting the accessories / signal exchange.....4

1 Set-up

1.1 Requirements for the set-up location

- The space required for the system may be derived from the measurements specified in Chapter C. In addition, there should be 1.0 m in front of the system and 0.8 m of space on each side available for operating and maintaining the system.
- The room in which the system is set up must meet the environmental conditions specified in Chapter C.
- The set-up surface must be even and run horizontally.
- The room must be well ventilated and not exposed to freezing temperatures.
- To avoid accumulation of spills caused by leaks, the area in which the system is set up must be equipped with a floor drain and /or a leak monitoring system and corresponding alarm.
- The necessary electrical connections must be available on the construction side (see Chapter C) and must be located no more than 2 m away from the system.
- The feed water connection must be provided with a shut-off valve.
- There must be control air connection.

1.2 Setting up the system

- ☞ Unpack the system.
- ☞ Check over the delivery for completeness and transport damage.
Any deviations or damage must be reported to the manufacturer immediately.
- ☞ Move the system carefully to the place provided for it with a suitable lifting device.
- ☞ The system must be set up on a holding surface in accordance with the requirements of Chapter C

2 Water-side connections

2.1 Necessary qualifications of the assembly staff



The water-side connection must only be made by trained professional staff members. Observe general regulations (in German-speaking countries, DIN, DVGW, SVGW and ÖKGW) as well as local installation requirements while installing the system.

2.2 Making the hydraulic connections

Feedwater

- ☞ Remove the sealing disks from the screw connection in the inlet.
(sealing disks are not present in systems with flange connections)
- ☞ Connect the inlet

Permeate

- ☞ Remove the sealing disks from the screw connection in the permeate outlet.
(sealing disks are not present in systems with flange connections)
- ☞ Connect the permeate outlet with the consumer line

Concentrate

- ☞ Remove the sealing disk from the concentrate outlet.
(sealing disks are not present in systems with flange connections)
- ☞ lay the concentrate outlet to the wastewater drain



Prevent recontamination!
Do not connect the concentrate outlet piping with the wastewater drain directly.



During standstill times of the system the maximum back pressure of 0.3 bar must not be exceeded. The cross section of permeate piping by customer may only be one nominal width greater than the permeate output piping of the system. At a back pressure > 0.3 bar and the risk of permeate backflow, a check valve has to be installed into permeate piping. It is only allowed to install a shut-off valve into permeate piping, if also a relief valve is installed.

3 Electrical connection

3.1 Necessary qualifications of the assembly staff



Electrical connection tasks may only be performed by an electrician in accordance with the applicable country-specific regulations.

3.2 Circuit diagram of the system

The circuit diagram of the system is located in the appendix of this operating manual.

3.3 Connecting the power supply



Before connecting the power supply, make certain that the corresponding main switch is turned off. Make the power supply connection in the control cabinet with a fixed connection according to the circuit diagram.

- ☞ When using three-phase alternating current, ensure that the direction of the rotating field and the direction of rotation of the pump are of right-hand rotation.

3.4 Connecting the accessories / signal exchange

Connections for the

- Product container level
- Forced stop
- Combined malfunction

should be made according to the circuit diagram.



Active analogue output at the unit's controller; do not connect power (24 V DC) on the 4-20 mA analogue outputs.

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1.3	Adjusting the operating parameters	3
2	Taking the system out of service	3

1 Placing the system in service

1.1 Qualifications of the commissioning staff



The system must be placed in service by qualified professionals.



Before the system is placed in service, all screw connections must be retightened.

1.2 Rinsing out the preservative fluid



The preservative solution contains 1.5% sodium bisulfite, 20% glycerine and 2.5% sodium bicarbonate. Drain the preservation fluid out into the run-off channel, in accordance with applicable regulations governing pouring and draining.

- ☞ Connect the product permeate with run-off channel (at 1V11, 3V11, 3V12)
- ☞ Open pump control valve 1V04 (not at FC-controlled pumps), pressure control valve 1V05 (if existing), concentrate control valves 1V06 and 3V06 completely
- ☞ Switch on main switch
- ☞ Set the RO into operation (see Chapter F)
- ☞ Open Valves 1V01, 1V03 und 3V03 under control mode diagnosis
- ☞ Open feed water
- ☞ Set the system into operation (see Chapter F) **and rinse for minimum 45 minutes**
- ☞ Close Valves 1V01, 1V03 und 3V03 under control mode diagnosis



The higher permeate conductivity during the rinsing of the system can cause a shut-down of the system. In this case, quit the malfunction (see Chapter F) and continue rinsing.

1.3 Adjusting the operating parameters

- ☞ Adjust valve 1V04 (not at FC-controlled pumps), 1V05 (if existing), 3V05, 1V06 and 3V06 to middle position (50% open)
- ☞ Turn on system (see Chapter F)
- ☞ Adjust min. concentrate flow (see chapter C/2) at 3FI01 with valve 1V06/3V06
- ☞ Adjust concentrate backflow (see Chapter C/2) at 1FI03/3FI03 (if existing) with valve 1V05/ 3V05 (if existing)
- ☞ Adjust permeate flow (see Chapter C/2) at 1FI02 with valve 1V04 (not at FC-controlled pumps)
- ☞ FC-controlled pumps: Adjust permeate flow (see Chapter C/2) by adjusting the pump performance to the set point. Therefore use the operator buttons of the pump (▲ and ▼)
- ☞ If necessary readjust concentrate backflow with 1V05/3V05 (if existing) and concentrate flow with 1V06/3V06
- ☞ **Record the operating data of the system on a log sheet** (see Chapter H)
- ☞ Turn off the system
- ☞ Reconnect the permeate with the tank or consumer line
- ☞ Turn off the system
- ☞ Reconnect the permeate with the tank or consumer



Caution

In no event should the values specified in the technical data for permeate output, recovery, operating pressure and product output be exceeded.



The permeate output of the system depends on the temperature of the feed water. For further information, see Chapter A/3.3.

2 Taking the system out of service



Taking the system out of service refers to a down time of >30 days for the system. When the system is taken out of service, it must be preserved. For information on preserving the system, please see chapter I.

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2 Operating states4

3 Short description of the RO 5000 control system5

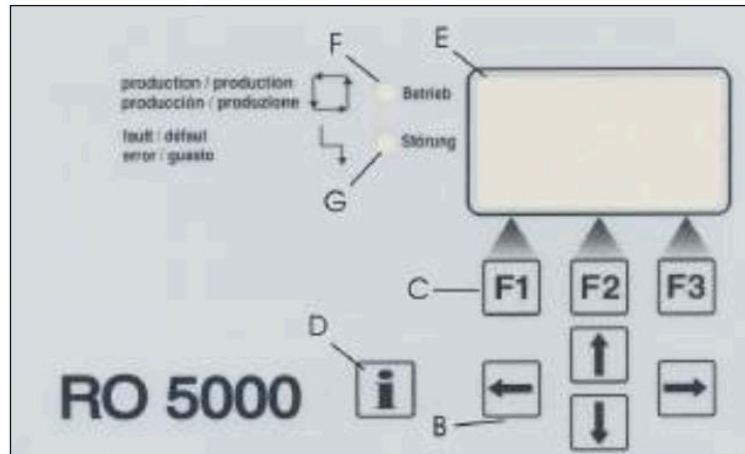
 3.1 Operating structure5

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1 Operating and display components



	Designation	Function
A	Main switch	The main switch is located on the left side of the switch cabinet - Turns the system on and off
B		- Scrolling through masks - Control of the cursor - Password entry
C	Function keys	Depending on the menu in question, the current function is displayed above the key as an icon in the display.
	F1	- ESC - Exit menu - Brings up logging
	F2	- Brings up operating level - Brings up log recording
	F3	- Confirmation of entries - Brings up the menu - Mask rolling On/Off
D	?	- brings up help text
E	Display	Display of: - date/time - the current operating state - operation parameters (CO, T) - operating hours - current messages/malfunctions
F	Operation LED (green)	Continuous: → System in operation Flashing: → Maintenance request
G	Malfunction LED (red)	Malfunction active



For additional information on the function and operation of the RO 5000 control unit, please refer to the RO 5000 control unit manual in the appendix of these Operating Instructions

1.1 Operating elements for pumps with frequency converter (if existing)

	Designation	Function
▲	arrow key up	Increasing of permeate flow option PKR: Increasing of setpoint value permeate flow
▼	arrow key down	Decreasing of permeate flow option PKR: Decreasing of setpoint value permeate flow

2 Operating states

Operation

⇒ Disposal

1V01 input valve opened, 1P01 pump in operation

1V02 permeate valve closed

Permeate is being rejected

⇒ Production

1V01 input valve opened, 1P01 pump in operation

1V02 permeate valve (when existing) opened

System is producing permeate

⇒ FC-Pump with Option PKR:

1V01 input valve opened, Pump 1P01 with permeate constant control, valve 1V02.2 opened

System is producing permeate

⇒ Displacement

1V01 input valve opened, 1V03 concentrated valve opened

After a set amount of time elapses, switch over to **tank full**

⇒ Tank full

Upper level input (terminal 31, 32) opened

System in standby until request about level active again

⇒ Discont. Rinsing

Time-controlled forced production if the operating state **tank full** has been active for the set time

⇒ Forced Stopp

Forced stop input (terminal 23, 24) opened

Product production interrupted until **Forced stop** input closed again

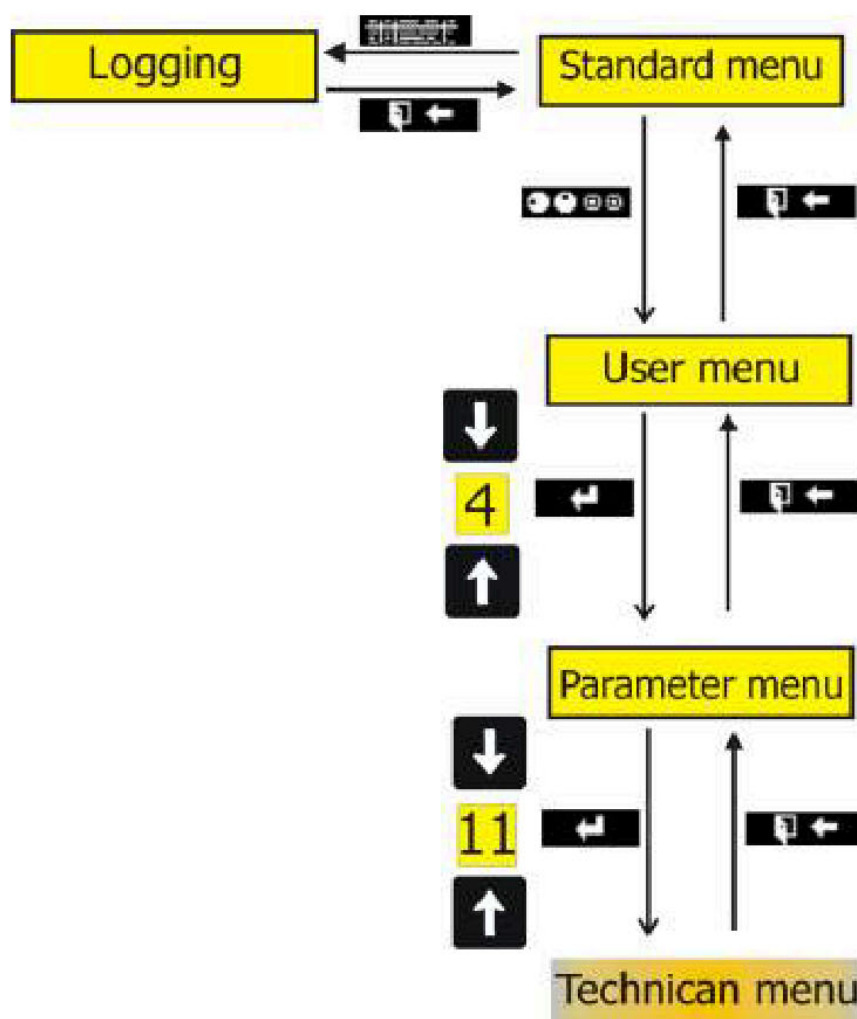
⇒ Disinfecting

System in operation **without any safety devices**

3 Short description of the RO 5000 control system

3.1 Operating structure

Operating and monitoring of the control system takes place on the following 5 menus



⇒ **Standard Level**

Rolling display of:

- date/time
- current operating state
- operation parameters (conductivity, temperature, salt rejection rate)
- operating hours
- current messages/malfunctions

⇒ **User level**

- change of operating mode
- setting of date / time
- selection of language
- setting begin of summer-/winter time
- information about system-/software version

⇒ **Parameter level**

- setting of times and limit values
- selection of fault reaction for hard water, limit value exceeded
- setting user password

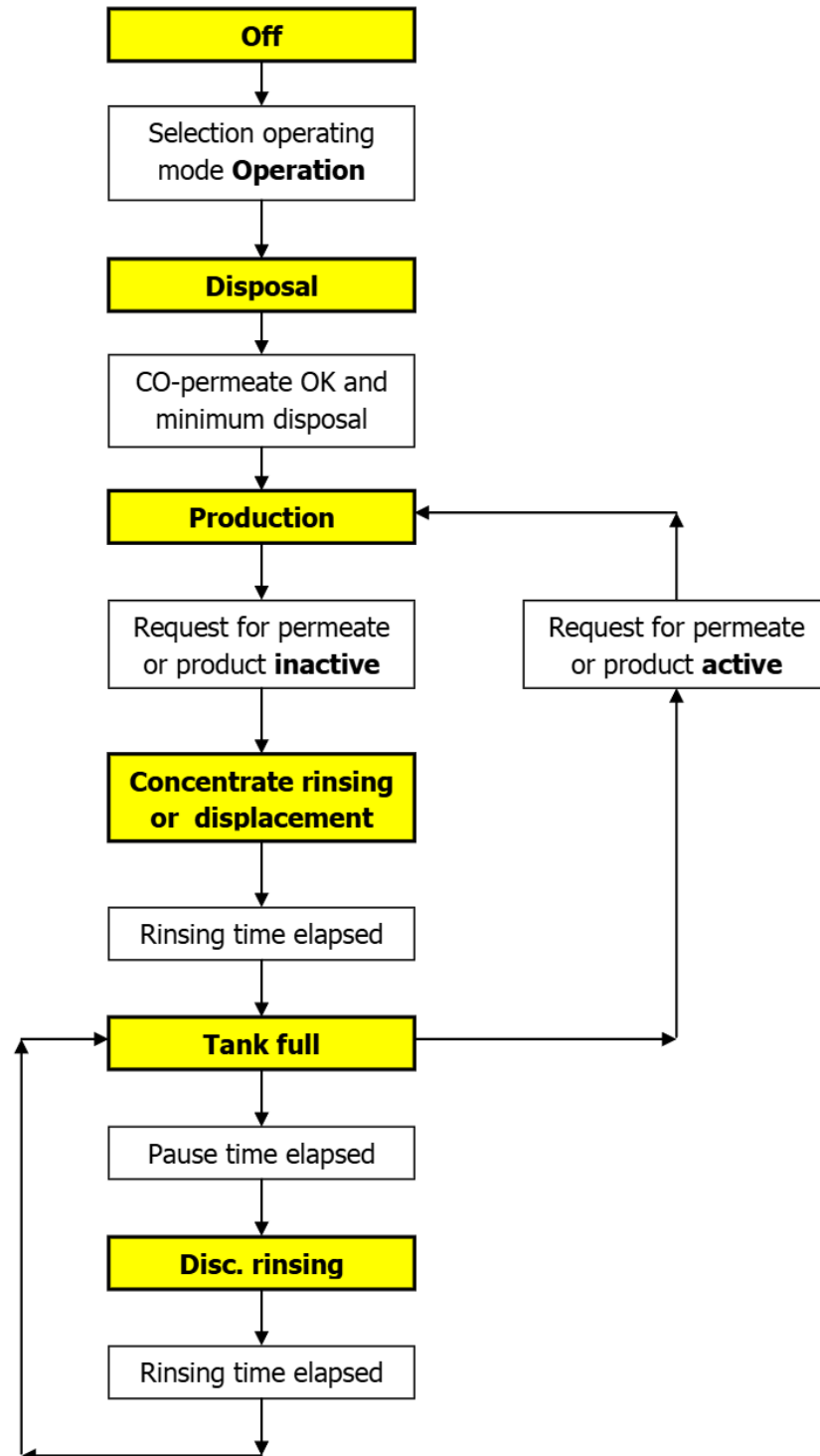
⇒ **Technican Level**

- system configuration settings
- calibration of inputs and analog outputs
- display and control of in- and outputs
- setting parameter of universal in-/outputs
- Chip card functions
- system reset
- setting technican password

⇒ **Logging**

- tabular display of data and malfunctions
- configuration of logging

3.2 Functional diagram



3.3 Change of operation state

Initial situation:

System in standard menu.



Brings up user menu.



Selection and call up menu point **< operating mode >**

Message **"change op. mode execute?"** appears.

Acknowledgement of entry.



Selection of operating state.

Message **"new operating mode all right?"** appears.



Confirmation of entry.

→ New operating state ist activ. System changes back to overview menu of user menu.



Change to standard menu.



To call up the operating states **production** and **disinfection** the system must be in operating state **off**.

3.4 Logging



For additional information on logging please refer to the RO 5000 control unit manual in the appendix of these Operating Instructions.

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1.3	Malfunction reset	3
1.4	Malfunction table.....	4

1 General information

The use of high-quality individual components and installing safety and monitoring equipment in our systems allows us to reach a very high level of operational availability.

If an operating malfunction should nevertheless arise, the error can easily be detected using the following malfunction table and the cause eliminated.

If serious malfunctions occur, please contact the manufacturer (see rating plate)

Only qualified professional personnel with the appropriate training should eliminate malfunctions, taking into consideration the safety requirement in Chapter A of these Operating Instructions!



Power must be disconnected from the system before beginning these tasks, and the system must be protected to ensure it is not turned on again unintentionally!

Pressure must be released from all lines.

1.1 Malfunction message to the manufacturer

To ensure effective help in resolving malfunctions, please have the following information on hand:

- Manufacturing number
- Item number
- System type
- Log sheets and maintenance sheets from the last 4 months

1.2 Malfunction display

- Red malfunction LED on the control system
- Display changes to fault mask and
- the fault message is displayed as text

1.3 Malfunction reset

The malfunction reset is realized by means of button **F3** in 2 steps:

- 1  Reset of the malfunction contact
- 2  Malfunction reset

Depending on the respective malfunction there are 3 types for reset:



- Automatic reset after the fault has been removed
- Manual reset independent of the existence of the fault
- Manual reset only possible, after the fault has been removed

Fault FC-Pump (if existing)

- ➔ **Switch Mainswitch On and Off**

1.4 Malfunction table

Malfunction	Cause	Remedy
Control display dark	Power supply interrupted	Make power supply connection
	63mA fuse SI1 defective	Replace the fuse in question
	4A fuse SI2 defective	
	Flat band cable between the motherboard and the display unplugged	Unscrew the front plate and plug the cable back in
	Control system defective	Replace the control system
Failure motor protection display:	Motor protection switch triggered (if present)	- Check the adjustment of the motor protection switch - Check the motor
	Fault FC-pump	- Check the motor - switch mains switch on and off
Failure hard water display:	Hard water sensor triggered (if present)	- Check the soft water quality - Check the sensor and replace if necessary
	Wire jumper defective	Restore the wire jumper
Low pressure display:	Feed water pressure too low	- Check the pressure difference on the softener - Increase the feed water pressure
	Filter blocked	Replace the filter candle
	Pressure switch defective	Replace the pressure switch
	1V01 input valve defective	Replace the valve
CO failure display:	Conductivity of feed water too high	Calculate desalinization rate Target: > 97%
	Desalinization rate too low	After consultation with the manufacturer: - Clean RO modules - Replace RO modules
permeate temperature too high display:	Permeate temperature is too high	Check temperature with hand measuring device
permeate temperature too low display:	Permeate temperature is too low	Check temperature with hand measuring device
EEPROM fail display:	Initialization error	Check parameters according to parameter overview (see control unit manual in the appendix of these Operating Instructions)
Malfunction LED is flashing:	System error Note morse code and contact service department.	Contact service department
System does not go into operation	Display shows Tank full even though the permeate tank is empty	Level switch defective
	System in operation	Pump defective
	Display shows Forced stop	Connected softener is in regeneration

Eliminating Malfunctions

Malfunction	Cause	Remedy
Permeate output too low	Feed water temperature too low	Calculate permeate output according to Chapter A3.3
	Permeate counterpressure too high	Check permeate line
	Modules blocked	After consultation with the manufacturer: - Clean RO modules - Replace RO modules
	Pump defective	Replace pump
red LED on FC-Pump is lit	Fault FC-Pump	- Check the motor - switch mains switch on and off

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1 Maintenance and monitoring tasks

1.1 Safety information



The operator must ensure that all maintenance, monitoring and assembly tasks are performed by authorized and qualified trained personnel.

The system must be shut down and protected from being placed in operation again unintentionally before all repair and maintenance tasks.

Before beginning tasks on the electrical systems and equipment, a check must confirm that power has been disconnected from the system.



In addition, the system must be secured to prevent it from being turned on again unintentionally.

Protective clothing suitable for the hazard at hand must be worn while performing the maintenance tasks.

Immediately after the maintenance tasks are completed, all safety and protective equipment must be set back in place and functionality restored.

1.2 General information

To ensure long-term problem free operation of the system, maintenance tasks must be performed at regular intervals and a record must be kept of operating parameters.

The record of operating parameters and maintenance tasks should be kept by the operator of the system himself.



Signing a maintenance contract with the supplier makes it possible for the supplier to take over the responsibility of performing regular maintenance tasks on the system.

A record book should be kept to record operating parameters. It is located in the appendix of these operating instructions. The purpose of this record keeping is to have continuous documentation of the operating parameters. This makes it easier to detect a drop in output or incorrect functionality of the system and then to eliminate the problem.

The documentation of maintenance tasks must be kept on the maintenance log that is provided for this purpose.

2 Logging operating parameters

The following parameters must be checked and recorded **weekly**:

Parameter	Measurement point/remarks
Operating hours	Control display
Residual hardness in soft water	Check with the hardness kit on the 1V07 tap
Conductivity of feed water	Verification with conductivity measurement device
Temperature of feed water	Verification with conductivity measurement device
Fine filter inlet pressure	1Pr01 pressure gauge
Fine filter outlet pressure	1Pr02 pressure gauge
Pump pressure	1Pr04 pressure gauge
Operating pressure	1Pr05/3Pr05 pressure gauge
Concentrate pressure	1Pr06 pressure gauge
Permeate output	1FI02 flow meter
Concentrate output	3FI01 flow meter
Concentrate recirculation	1FI03 flow meter
Permeate recirculation	3FI02 flow meter
Conductivity of permeate	Control display
Temperature of permeate	Control display
Desalinization rate	For calculation see Chapter A 3.2
Absence of leaks in the system	



Minor fluctuations in the conductivity of the permeate and permeate output are normal. The effect of the temperature or a fluctuating conductivity may be reasons for this.

When the desalinization rate drops below 97% or there is a drop in permeate output of about 10%, a concentrate rinse should be performed(**see chapter I**).

3 Maintenance



Maintenance tasks should be performed when needed, but no less often than at the maintenance specified intervals.

3.1 Maintenance tasks

The following maintenance task should be performed:

System part	Task to be performed	Maintenance interval
Fine filter	Replace the fine filter cartridges and clean the filter housing	-3 months -if the pressure drops by 0.8 bar
Pressure switch	Functional test by blocking off the feed water inlet → RO must switch off	-6 months
Sensor hardness monitoring device (if existing)	Replace sensor	- 12 months - after triggering of sensor
- Conductivity cell(s) - pH-sensor (if existing)	Check of parameters with reference device, if necessary new calibration	- on start-up - 1 year - if quality of feed water changes
Filter mat for control cabinet fan (if existing)	Check fouling factor and clean as required	- 1 month
	Replace filter mat	- 6 month
Accessories	see Operating Instructions in the appendix	

3.2 Performing a concentrate rinse (water brushing)

During a concentrate rinse, the increase in the flow of concentrate flows more strongly through the membrane(s). Because of this, soluble accretions are more readily removed and rinsed away.

The duration of a "water brushing" should be at least 60 minutes, and it should be performed as follows:

- ☞ Log record of actual values
- ☞ Open concentrate valves 1V06 and 3V06
- ☞ Open pressure control valves 1V05 and 3V05 (if existing)
- ☞ Allow to rinse for at least 60 minutes
- ☞ Adjust the operating parameters to the target values
- ☞ Log record of actual values

Note:

If the conductivity of the permeate does not improve permanently after a concentrate rinsing, a chemical cleaning of the membranes must be performed.

In this case, it is essential to contact the supplier to agree upon the further procedure!

Maintenance and Monitoring Tasks

Log sheet

Customer _____

System Type: _____

Item No.: _____

Placed in service on: _____

Date	R+I/ Measuring point	Value	Values when placed in service	Date	Date	Date	Date
Operating hours	Display/ Control	h					
Residual hardness of soft water	1V07	°dH					
Conductivity of feed water	1V07	µS/cm					
Temperature of feed water	1V07	°C					
Fine filter inlet pressure (1Pr01)	1Pr01	bar					
Fine filter outlet pressure (1Pr02)	1Pr02	bar					
Pump pressure (1Pr04)	1Pr04	bar					
Operating pressure (1Pr05/3Pr05)	1Pr06	bar					
Concentrate pressure (1Pr06)	1FI02	bar					
Permeate output (1FI02)	3FI01	l/h					
Concentrate output	1FI03	l/h					
Concentrate recirculation (1FI03)	1Q02	l/h					
Conductivity of permeate (1Q02)	3Q02	µS/cm					
Conductivity of permeate recirculation (3Q02)	Display/ Control	µS/cm					
Temperature of permeate	-	°C					
Desalinization rate	-	%					
Absence of leaks in the system	-						

Note:

Values of commissioning have to be logged, in order to **further performance evaluation** of the unit. Log the values weekly in copies of this log sheet. If there are **deviations** of more than **15%** to the commissioning values (e.g. operation pressure, differential pressure, permeate performance, desalination rate), the **supplier** has to be **contacted**.

Maintenance log

Customer: _____

System type: _____
Item No.: _____
Placed in service on: _____ CW _____

1. Quarter / year: _____

System part	CW 1	CW 2	CW 3	CW 4	CW 5	CW 6	CW 7	CW 8	CW 9	CW 10	CW 11	CW 12	CW 13
Fine filter													
Pressure switch													
Sensor hardness monitoring device													
Conductivity cell pH-sensor (if existing)													
Filter mat for control cabinet fan (if existing)													
Accessories													

Note: Each maintenance task must be documented with a date and the initials of the person performing the task.

Maintenance log

Customer: _____

System type: _____
Item No.: _____
Placed in service on: _____ CW _____

2. Quarter / year: _____

System part	CW 14	CW 15	CW 16	CW 17	CW 18	CW 19	CW 20	CW 21	CW 22	CW 23	CW 24	CW 25	CW 26
Fine filter													
Pressure switch													
Sensor hardness monitoring device													
Conductivity cell pH-sensor (if existing)													
Filter mat for control cabinet fan (if existing)													
Accessories													

Note: Each maintenance task must be documented with a date and the initials of the person performing the task.

Maintenance log

Customer: _____ System type: _____

Item No.: _____
Placed in service on: _____ CW _____

3. Quarter / year: _____

System part	CW 27	CW 28	CW 29	CW 30	CW 31	CW 32	CW 33	CW 34	CW 35	CW 36	CW 37	CW 38	CW 39
Fine filter													
Pressure switch													
Sensor hardness monitoring device													
Conductivity cell pH-sensor (if existing)													
Filter mat for control cabinet fan (if existing)													
Accessories													

Note: Each maintenance task must be documented with a date and the initials of the person performing the task.

Maintenance
and monitoring tasks

Maintenance log

Customer: _____ System type: _____

Item No.: _____
Placed in service on: _____ CW _____

4. Quarter / year: _____

System part	CW 40	CW 41	CW 42	CW 43	CW 44	CW 45	CW 46	CW 47	CW 48	CW 49	CW 50	CW 51	CW 52 (CW 53)
Fine filter													
Pressure switch													
Sensor hardness monitoring device													
Conductivity cell pH-sensor (if existing)													
Filter mat for control cabinet fan (if existing)													
Accessories													

Note: Each maintenance task must be documented with a date and the initials of the person performing the task.

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1 Preserving the system

1.1 General points



After 12 months at most the preserving agent should be flushed out and replaced if necessary. When the system is shut down for more than 30 days, it must be preserved. When it is put into operation again, please follow the procedure described in chapter E of this operating manual. Preservation / Cleaning is carried out by shut down of the system.



The preservative solution contains 1.5% sodium bisulfite, 20% glycerine and 2.5% sodium bicarbonate. The preserving solution should be fed into the drain in accordance with the directives that apply in the given case.

1.2 Preserving options

- ☞ Sodium bisulphite: preserving without antifreeze
- ☞ Sodium bisulphite + glycerine: preserving with antifreeze, to a temperature of - 10° C
- ☞ ready-to-use preserving agent incl. antifreeze (item. no. 530055)

1.3 Materials required

- ☞ Preserving tank with pump, shut-off – respectively drain-valve
- ☞ 3 connecting tubes
- ☞ Preserving/neutralization chemicals: sodium bisulphite (item no. 530058), glycerine (item no. 530024) and sodium bicarbonate (item no. 530197)
- ☞ Protective clothing (goggles, gloves, apron)

1.4 Connecting the preservation tank

- ☞ Switch off system
- ☞ Close the feed water inlet
- ☞ Set up the preservation tank at a height greater than that of the system, so as to ensure that the preserving solution will flow into the RO system without any difficulty
- ☞ Close off the valves 9V01 and 9V02 on the preservation tank
- ☞ The connecting tubes should be connected as follows:
 - Connect preservation-pump 9P01 with 1V10/1V12* cleaning connection
 - Set up a tube connection between preservation tank 9B01 and 1V12/3V12* concentrate cleaning connection
 - Set up a tube connection between preservation tank 9B01 and 1V11/3V11* permeate cleaning connection

* Connect the tubes with 1V12, 3V12 and 3V11 when flushing the concentrate stage

1.5 Preparing the preserving solution

Danger of fumes!



In handling cleaning chemicals, please have regard to the general instructions for avoidance of accidents and to what is stated in the relevant safety data sheet.

When pouring the chemicals into the preservation tank, protective clothing should be worn – protective goggles, rubber gloves and rubber apron.

- ☞ Charge the preservation tank with a quantity of soft water as specified in the table (see 1.7, depending on the size of the system).
- ☞ Check that the connections are adequately sealed.
- ☞ Prepare the preserving solution by adding the chemical sodiumbicarbonate (NaHCO_3), according to table 1.7, to the already filled in water in the preservation tank. Dissolve by stirring constantly.
- ☞ add the chemical sodiumbisulfite (NaHSO_3), according to table 1.7, in portions, stir constantly in order to prevent foaming
- ☞ add glycerine, according to table 1.7, stir constantly to homogenize the batch
- ☞ resp. fill the preservation tank with the ready-to-use preserving agent incl. antifreeze (item. no. 530055)

Important:

Chemicals should be added with caution – stir constantly.

1.6 General procedure

For the preservation of RO units of type UO-KR the RO stage will have to be preserved separately from the concentrate stage.

During preservation of the RO-stage the feed is passed via ball valve 1V10 und the effluent is discharged via 1V11 and 1V12.

For the preservation of the concentrate stage the feed is passed via ball valve 1V12 and the effluent is discharged via 3V11 and 3V12.



During preservation of the concentrate stage ball valve 1V09 must always be closed. An open ball valve 1V09 during preservation would lead to damage of the membranes of the RO-stage.

1.7 Executing the preservation procedure

- ☞ Put the three-way ball valves (1V11/ 3V11* and 1V12/ 3V12*) in "Flushing" position
- ☞ Open tap 1V10/ 1V12*
- ☞ When preserving the RO-stage open concentrate-regulation valve 1V06 and pressure-regulation valve 1V05 completely.
- ☞ When preserving the concentrate stage close 1V05, open 1V06 and 3V06
- ☞ Open the locking valve 9V01 on the preservation tank
- ☞ Switch on preservation-pump 9P01
- ☞ Let the preserving solution circulate for ten minutes
- ☞ Switch off the preservation-pump 9P01
- ☞ Close the locking valve 9V01 on the preservation tank
- ☞ Close tap 1V10/ 1V12*
- ☞ Detach the tube connections
- ☞ Close off feed water input and permeate and concentrate outlets with sealing disks
- ☞ Dispose of preserving solution (see 1.1 "General points")

* This applies to the procedure when preserving the concentrate stage

1.8 Composition of the preserving solution

	Permeate output of the system (l/h)	Soft water supply (l)	Sodium bisulphite powder (kg)	Glycerine (l)	Sodium- bicarbonate (kg)
item no.			530 058	530 024	530 197
conc. of chemicals			97%	86,5%	
conc. in preserving solution			1,5% w/w	20% v/v	2,5% w/w
	- 500	20	0,39	5,8	0,63
	550 - 1500	50	0,97	14,5	1,6
	1550 - 3500	100	1,93	29,0	3,1
	3550 - 9500	200	3,87	58,0	6,25
	9550 -12.000	250	4,84	72,5	7,8
	12.050 - 17.000	300	5,80	87	9,4
	17.050 – 20.000	400	7,74	116	12,5
	20.050 - 30.000	500	9,67	145	15,6



The pH value of the preserving solution is about 7.

2 Cleaning the system

2.1 General points

i If the conductivity of the permeate rises by as much as 15%, or if the permeate output falls by as much as 10%, it is recommended that the membrane modules should be cleaned.

There is a distinction to be made between two types of cleaning:

- 1.) Acid cleaning to remove carbonate and iron deposits
- 2.) Alkaline cleaning to remove organic impurities and silica scaling

Generally cleaning should be carried out in the following sequence alkaline → acid

Please discuss the type of cleaning with the manufacturer before carrying it out.



Cleaning solution should be disposed with in adherence to the local or country-specific requirements!

2.2 Materials required

- ☞ Cleaning tank 9B01 with pump 9P01 and locking valve 9V01, 9V02
- ☞ 3 connecting tubes
- ☞ Universal indicator paper, pH 0-14 (item no. 630074)
- ☞ Cleaning/ neutralising chemicals (see 2.6 "Cleaning solutions")
- ☞ Conductivity measurement device for comparative measurement
- ☞ Protective clothing (goggles, gloves, apron)

2.3 General procedure

For the cleaning of RO units of type UO-KR the RO stage will have to be cleaned separately from the concentrate stage. During cleaning of the RO-stage the feed is passed via ball valve 1V10 und the effluent is discharged via 1V11 and 1V12. For the cleaning of the concentrate stage the feed is passed via ball valve 1V12 and the effluent is discharged via 3V11 and 3V12.



During cleaning of the concentrate stage ball valve 1V09 must always be closed. An open ball valve 1V09 during cleaning would lead to damage of the membranes of the RO-stage.

2.4 Connecting the cleaning tank

- ☞ see section 1.4

2.5 Preparing the cleaning solution



Danger of fumes!

In handling cleaning chemicals, please have regard to the general instructions for avoidance of accidents and to what is stated in the relevant safety data sheet.

When pouring the chemicals into the cleaning tank, protective clothing should be worn – protective goggles, rubber gloves and rubber apron.

- ☞ Charge the cleaning tank with the quantity of soft water specified in the table.
- ☞ Check that the connections are adequately sealed
- ☞ Prepare the cleaning solution by adding the chemicals (as shown on table 2.6) to the cleaning tank.

Important:

Chemicals should be added with caution – stir constantly.

2.6 Executing the cleaning procedure

- ☞ Switch off the system
- ☞ Close the feed water inlet

Charging the system with the cleaning solution

- ☞ Put three-way ball valves 1V11/3V11* and 1V12/3V12* in "Cleaning" position
- ☞ Open tap 1V10/1V12*
- ☞ Close concentrate control valve 1V06 and pressure control 1V05 valve completely
- ☞ Open the locking valve 9V01 on the cleaning tank 9B01
- ☞ Switch on pump of cleaning tank 9P01

Application time for cleaning solution to be effective

- ☞ Let cleaning solution circulate for between **30 and 60 minutes**
- ☞ Switch off pump 9P01 of cleaning tank 9B01
- ☞ Close locking valve 9V01 on the cleaning tank 9B01
- ☞ Take notice of the sufficient contact time of **12h** for the alkaline cleansing agent A12
- ☞ Dispose of cleaning solution (see 1.1, "General points")
- ☞ Close tap 1V10/1V12*
- ☞ Detach tube connection between cleaning tank and RO system

Flushing out the system

- ☞ Open feed water inlet
- ☞ Switch on the RO system (see control manual)
- ☞ Flush out the system for **at least 45 minutes**. Here the flushing liquid that emerges should be disposed of a quantity at a time (see 1.1, "General points")
- ☞ Switch off RO system (see control manual)
- ☞ Detach the connecting tubes
- ☞ Reconnect permeate and concentrate outlets
- ☞ Put taps 1V11/3V11* and 1V12/3V12* back into operating position

* When flushing concentrate stage.



Do not terminate the cleaning procedure until the pH value of the concentrate is the same as the pH value of the feed water. Typical pH-value after neutralisation is about 6,5-9.



The temperature of the cleaning solution must not exceed 35° C.
If the pH value shows no further change between the input and outflow of the cleaning solution, the cleaning procedure may be terminated.



If cleaning of the RO-unit is carried out via a manual cleaning unit (MRA) , each component of the MRA (incl. pump) shows resistance against the cleansing detergents mentioned here.



Nevertheless, the MRA has to be rinsed clear after each cleaning. Use water to flush out any detergent residues. Finish rinsing when the rinsing water shows pH-neutrality.

2.7 Cleaning solutions

2.7.1 Acid cleaning

			optimal
	Permeate output of the system l/h)	Soft water supply (l)	Cleansing agent S2 (kg) alternatively citric acid
item no.			530 183
conc. of chemicals			100%
	- 500	50	1,0
	550 - 1500	100	2,0
	1550 - 3500	200	4,0
	3550 - 9500	300	6,0
	9550 - 12.000	400	8,0
	12.050 - 17.000	500	10,0
	17.050 - 20.000	700	14,0
	20.050 - 30.000	1000	20,0



Caution

The pH value of the cleansing agent solution is about 2. It should not be allowed to fall below this level. Note the safety data sheet of the cleansing agent

2.7.2 Alkaline cleaning

			optimal		alternatively	
			normal fouling	heavy fouling		
	Permeate output of the system (l/h)	Soft water supply (l)	Cleansing agent A12 1% (kg)	Cleansing agent A12 2% (kg)	Sodium- dodecylsulfate (g)	NaOH flakes (g)
item no.			530 177	530177	530 021	530027
conc. of chemicals			100%	100%	90%	100%
	- 500	50	0,5	1,0	15	50
	550 - 1500	100	1,0	2,0	30	100
	1550 - 3500	200	2,0	4,0	60	200
	3550 - 9500	300	3,0	6,0	90	300
	9550 -12.000	400	4,0	8,0	120	400
	12.050 - 17.000	500	5,0	10,0	150	500
	17.050 – 20.000	700	7,0	14,0	210	700
	20.050 - 30.000	1000	10,0	20,0	300	1000



Caution

The pH value of the preserving solution is 12 or thereabouts.
It should not be allowed to fall below this level.
Note the safety data sheet of the cleansing agent.



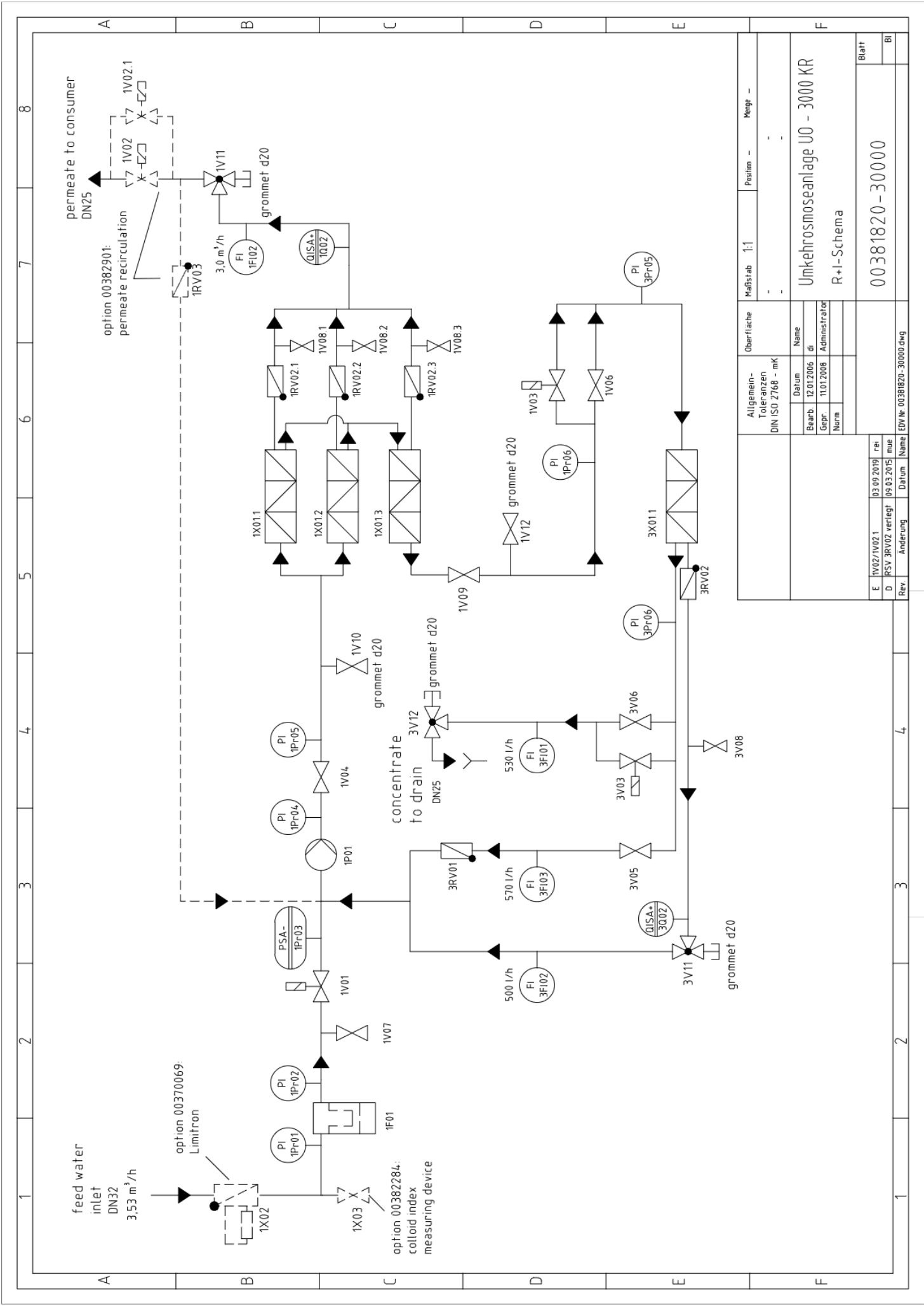
Note the following advices for the application of cleansing agent A12
The sufficient contact time for the alkaline cleansing agent A12 is 12h. After
cleaning procedure use either cleansing agent S2 or citric acid for
neutralization. The typical pH value after neutralization is about 6.5-9.

In case of extensive formation of foam during application of cleansing agent
A12, use defoam fluid. (item no. 530185)

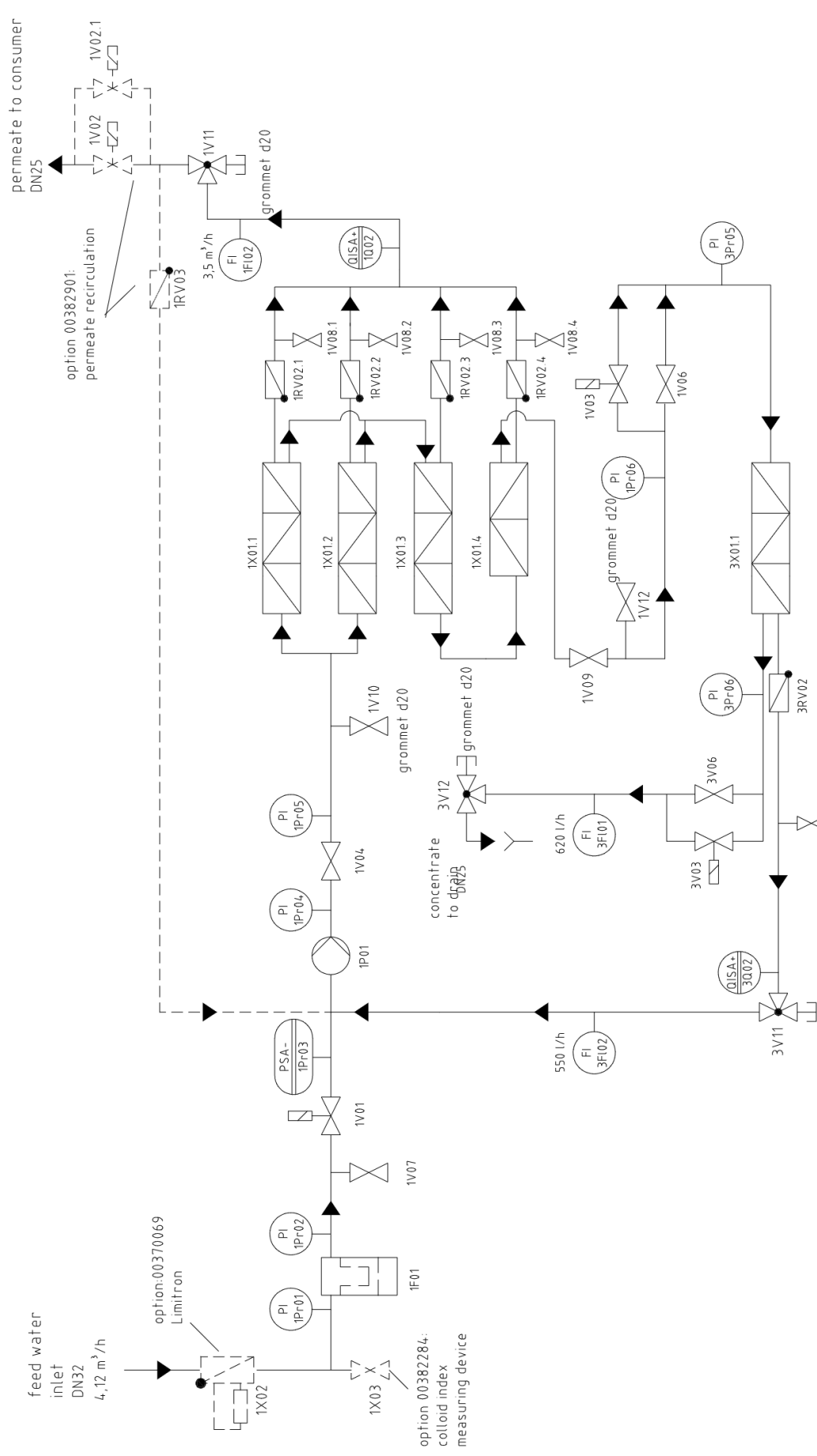


Caution

Use only this mentioned defoam liquid. Other defoam liquids may destroy the
RO-unit's membranes



Allgemein-Toleranzen DIN ISO 2768 - mK		Oberfläche		Maßstab	1:1	Position	-	Menge	-
Datum		Name							
Bearb.		12.01.2006		di					
Gepr.		11.01.2008		Administrator					
Norm									



Allgemein-Toleranzen DIN ISO 2768 - mK		Oberfläche		Maßstab	1:1	Position	-	Menge	-
Bearb.		Datum		Name		doe		-	
Gepr.		11.01.2008		Administration		-		-	
Norm									
F 1V02/1V02.1		03.09.2019		rei				Blatt	
E 3V05, 3F03, 3Rv01		13.12.2015		di		00381830-30000		Bl	
Rev.		Änderung		Name					

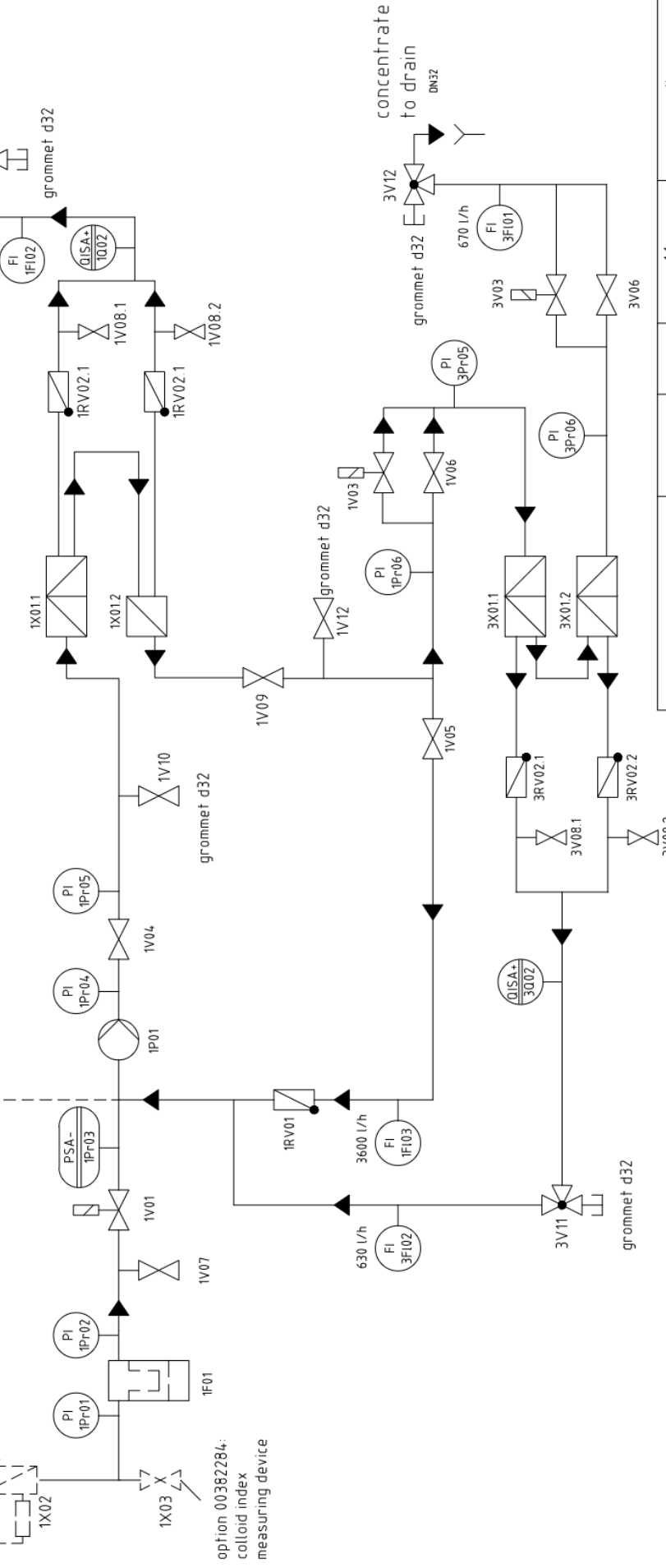
feed water
inlet
DN32
4,67 m³/h

permeate to consumer
DN32

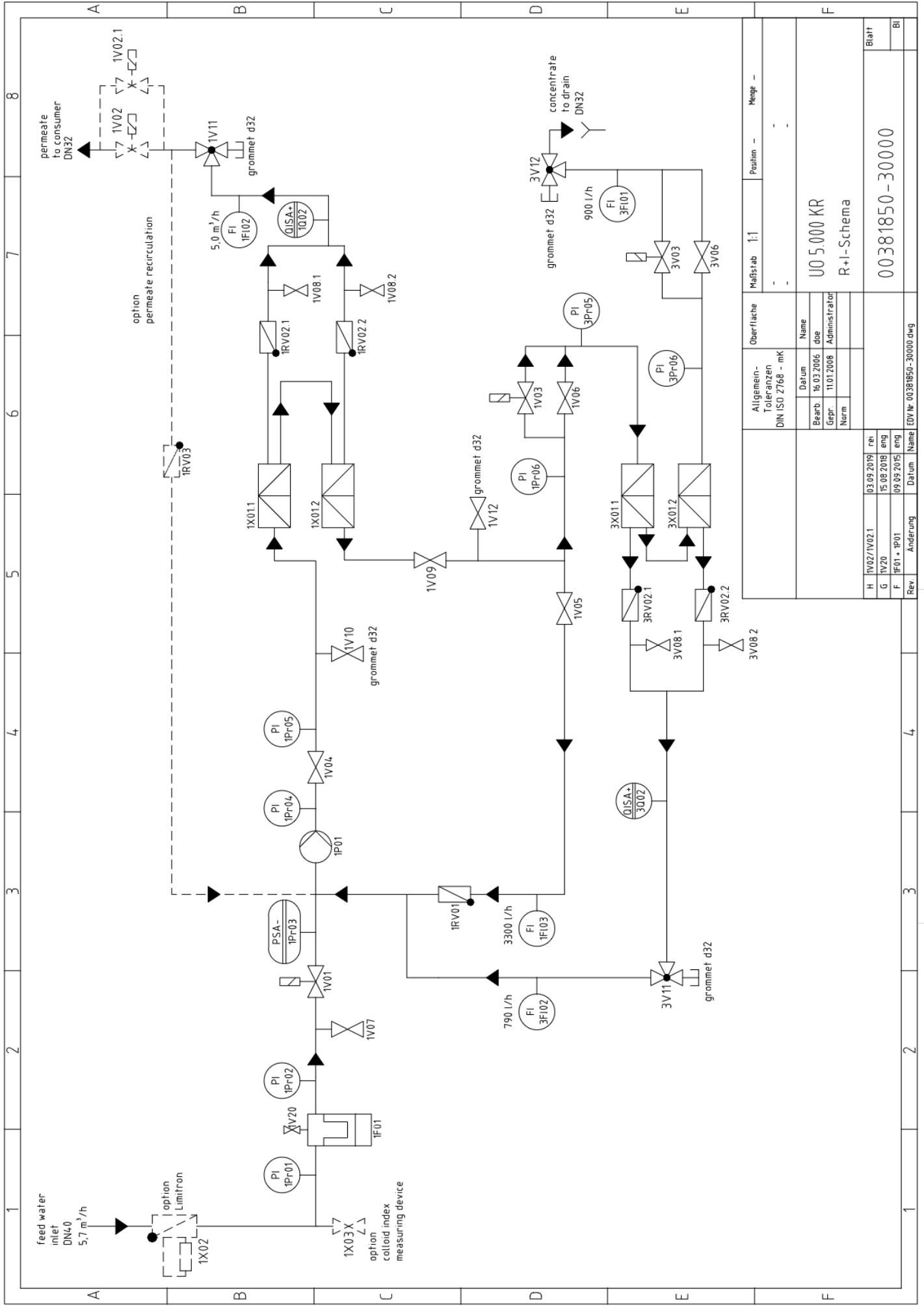
option 00382902:
permeate recirculation

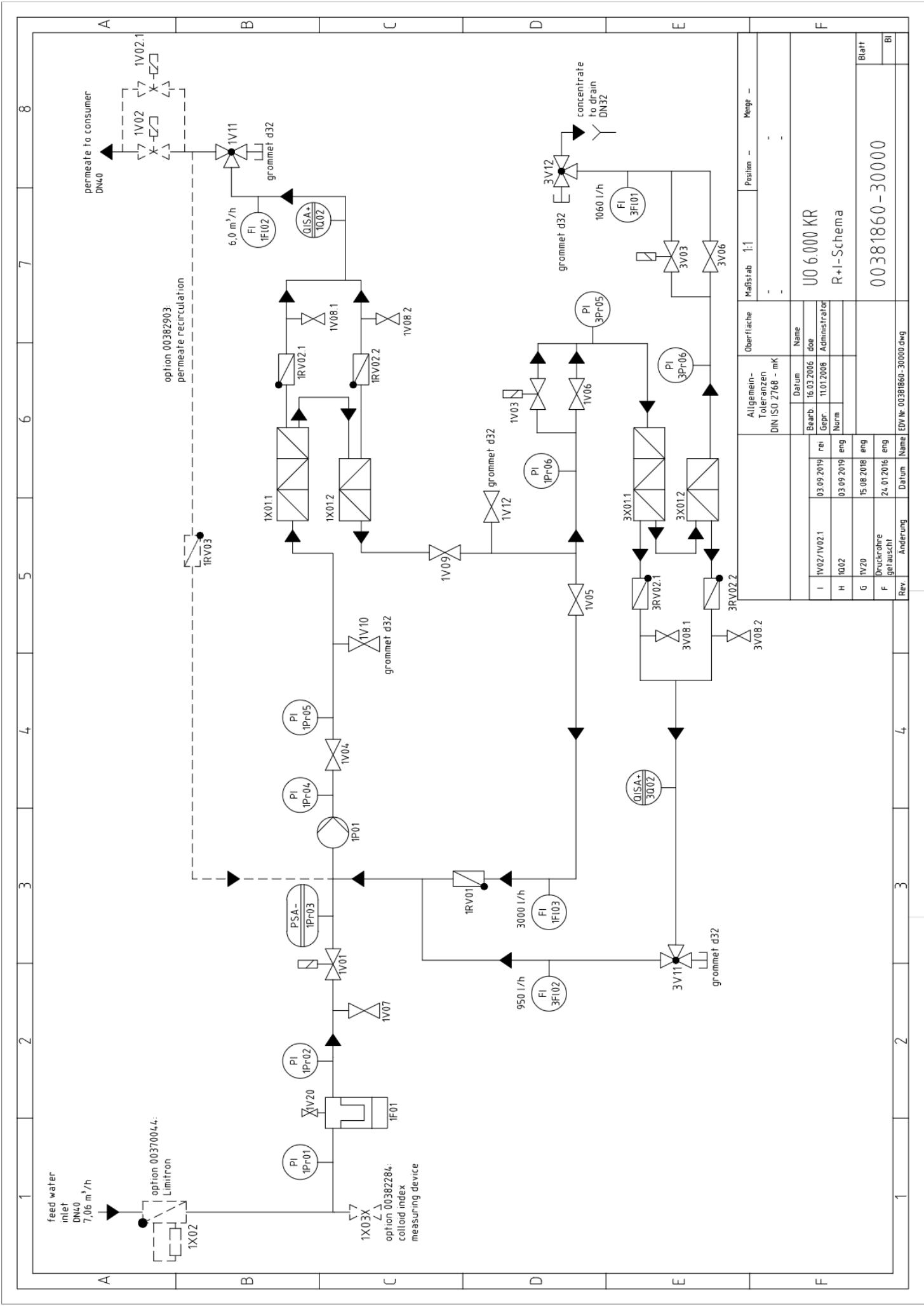
option 00370004:
Limitron

option 00382284:
colloid index
measuring device



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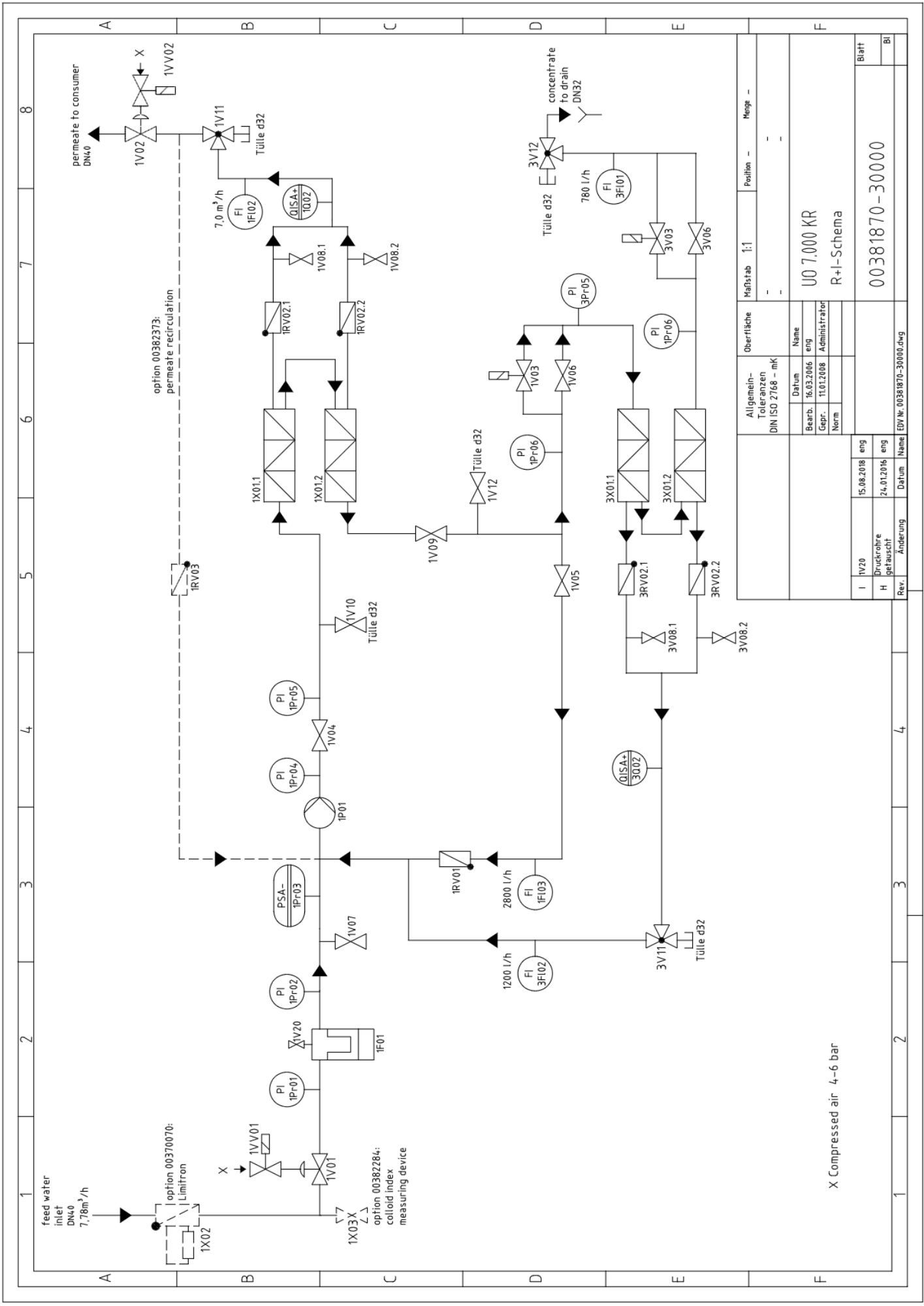
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G		1V20		15.08.2018		eng		eng	
F		Druckrohre getauscht		24.01.2016		eng		eng	
Rev.		Änderung		Datum		Name		-	

U0 6.000 KR
R+I-Schema

00381860-30000

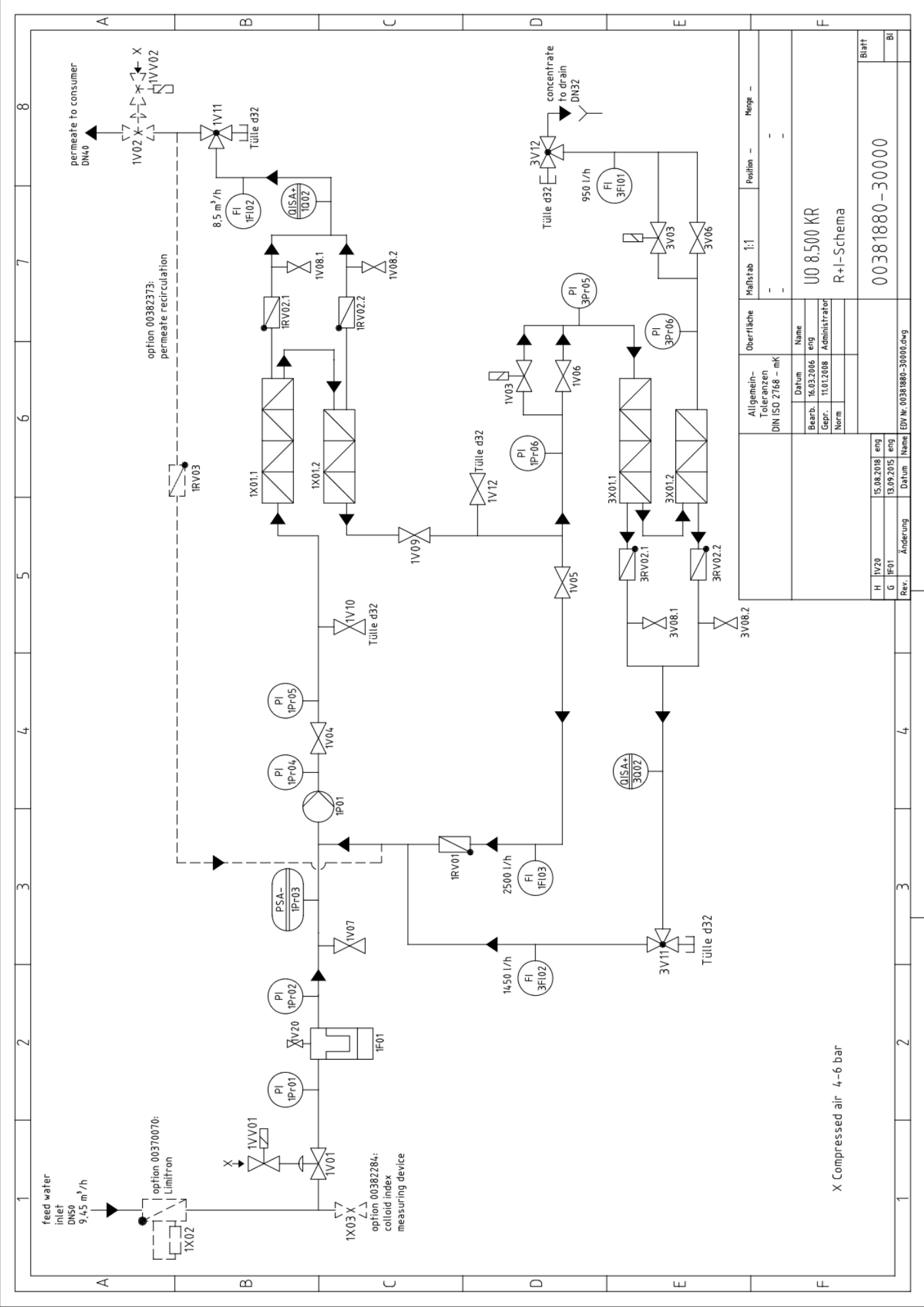
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EDV-Nr: 00381860-30000.dwg



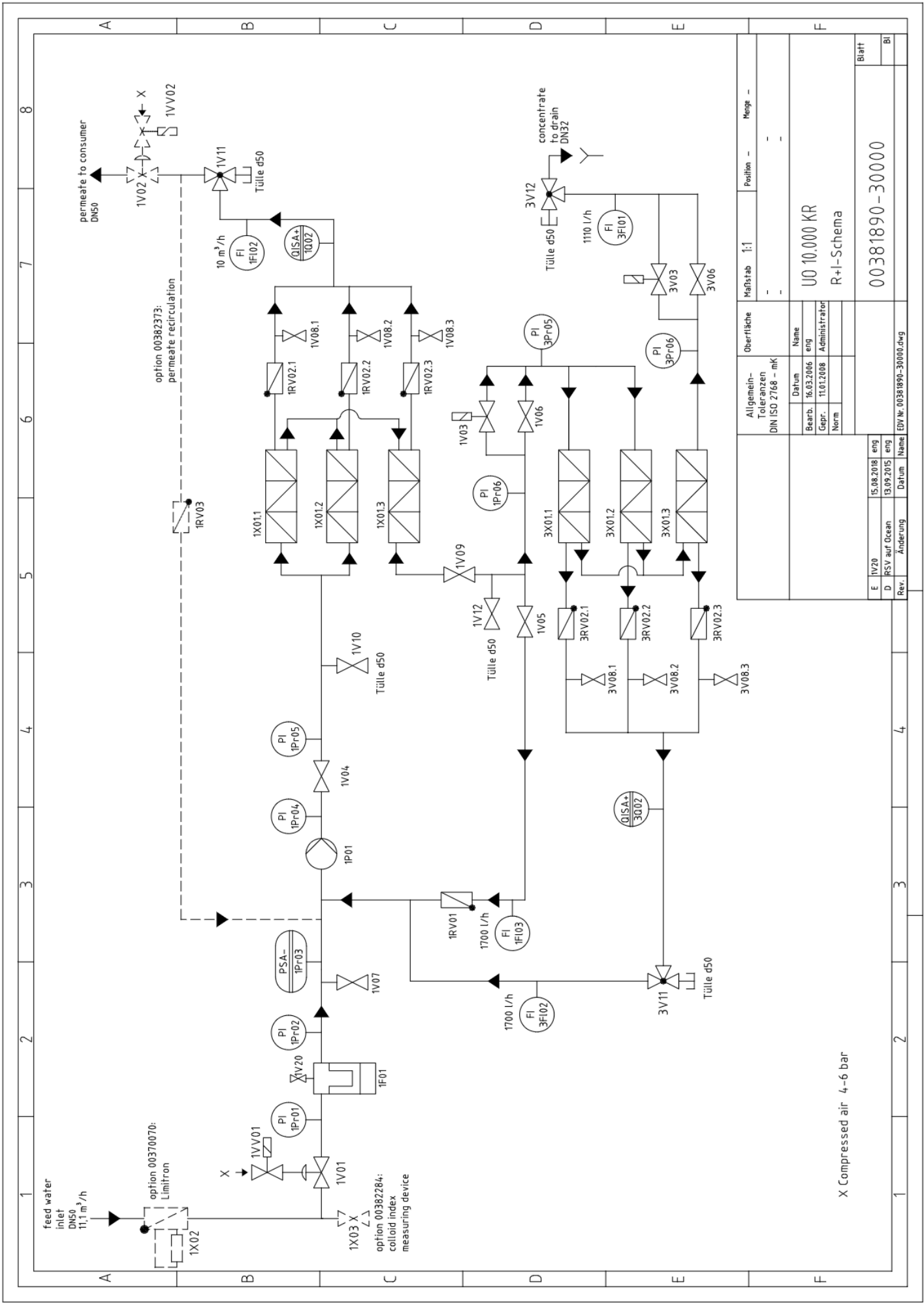
Allgemein-Toleranzen		Oberfläche		Maßstab		Position		Menge	
DN ISO 2768 - mK		-		1:1		-		-	
Bearb. 16.03.2006		Name eng		U0 7.000 KR		-		-	
Gepr. 11.01.2008		Administration		R+I-Schema		-		-	
Norm									
I 1V20		eng		15.08.2018		eng		00381870-30000	
H Druckrohre getauscht		eng		24.01.2016		eng		Blatt	
Rev. Änderung		Datum		Name		EDV Nr. 00381870-30000.dwg		Bl	

X Compressed air 4-6 bar



Allgemein-Toleranzen DIN ISO 2768 - mK		Maßstab	1:1	Position	-	Menge	-
Datum		Name		eng		-	
Bearb.		16.03.2006		eng		-	
Gepr.		11.01.2008		Administration		-	
Norm							
Rev.		Änderung	Datum	Name		EDV Nr. 00381880-30000.dwg	
H		1V20	15.08.2018	eng			
G		1F01	13.09.2015	eng			
Blatt				00381880-30000		Bl	
U0 8.500 KR		R+I-Schema					

X Compressed air 4-6 bar



Allgemein-Toleranzen DIN ISO 2768 - mK		Maßstab	1:1	Position	-	Menge	-
Datum		Name		eng		-	
Bearb.		16.03.2006		eng		-	
Gepr.		11.01.2008		Administration		-	
Norm							
Rev.		Änderung	Datum	Name		EDV Nr. 00381890-30000.dwg	
E		1V20	15.08.2018	eng			
D		RSV auf Ocean	13.09.2015	eng			
Rev.		Änderung	Datum	Name		EDV Nr. 00381890-30000.dwg	
U0 10.000 KR		R+I-Schema		00381890-30000		Blatt	
						Bl	

X Compressed air 4-6 bar

UO 3000 KR item-no. 00381820		component list	
PID	item-no.	description	
1F01	00 330 050	filter housing 10", Big Blue	
	00 335 101	filter cartridge 10", 5µm, Big Blue	
3FI01	00 580 035	flowmeter concentrate, 150-1600 l/h	
1FI02	00 580 043	flowmeter permeate, 400-4000 l/h	
3FI02	00 580 035	flowmeter concentrate recirculation,, 150-1600 l/h	
3FI03	00 580 035	flowmeter concentrate recirculation, 150-1600 l/h	
1P01	00 390 320	pump CR 5-32 DIN, 3x400V/50Hz, 5,5KW	
1Pr01	00 630 006	pressure gauge filter inlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr02	00 630 006	pressure gauge filter outlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr03	00 600 012	pressure switch FF4-8, 3/8"	
1Pr04	00 630 008	pressure gauge pump pressure, Ms, NG63, 1/4"h, 0-40 bar	
1Pr05	00 630 209	pressure gauge operation pressure, Ms, NG63, 1/4"h, 0-25 bar	
3Pr05	00 630 209	pressure gauge, MS, NG63, 0-25bar	
3Pr06	00 630 209	pressure gauge, MS, NG63, 0-25bar	
1Pr06	00 630 209	pressure gauge concentrate pressure, Ms, NG63, 1/4"h, 0-25 bar	
1Q02	00 100 011	conductivity measuring cell permeate 1½" - 200 µS/cm - 3 m	
3Q02	00 100 026	conductivity measuring nano filtrate 1½" - 2.000 µS/cm - 3 m	
3RV01	00 580 012	check valve PVC, 32DN25, PN16	
3RV02	00 405 135	check valve, DN15	
1V01	00 410 102	solenoid valve, 1¼", 0,2-16bar, 230V/50Hz	
1V03	00 410 107	solenoid valve Ms, ½", 230V/50Hz	
3V03	00 410 107	solenoid valve Ms, ½", 230V/50Hz	
1V04	00 415 050	ball valve VA, DN20	
3V05	00 415 003	ball valve VA, ½"	
1V06	00 415 016	concentrate regulating, needle valve VA, ¾"	
3V06	00 415 003	ball valve VA, ½"	
1V07	00 410 084	sampling	
1V08	00 405 050	sampling permeate	
3V08	00 405 050	sampling filtrate	
1V09	00 415 004	ball valve VA, ¾"	
1V10	00 415 004	ball valve VA, ¾"	
1V11	00 405 323	3 way ball valve PVC, 32DN25	
3V11	00 405 323	3 way ball valve PVC, 32DN25	
1V12	00 415 004	ball valve VA, ¾"	
3V12	00 405 323	3 way ball valve PVC, 32DN25	
1X01	00 400 177	vessel, GFK, 4040-3,	
	00 395 147	9xlow pressure element, 4040 HR	
3X01	00 400 177	vessel, GFK, 4040-3,	
	00 395 161	3xlow pressure element nano filtrate 4040	
	00 545 190	control with RO 5000, 5,5KW, UO xxx KR	
1RV02	00405 135	check valve , DN15	
option 00382901 permeate recirculation:			
1RV03	00 580 012	check valve PVC, 32DN25, PN16	
1V02	00 405 117	solenoid valve DN21, 1"AG	
1V02.1	00 405 117	solenoid valve DN21, 1"AG	
further optionen:			
1X02	00 370 069	hardness monitor Limitron 1"	
1X03	00 382 284	colloid index measuring device	

UO 3500 KR item-no. 00381830		component list	
PID	item-no.	description	
1F01	00 330 050	filter housing 10", Big Blue	
	00 335 101	filter cartridge 10", 5µm, Big Blue	
3FI01	00 580 035	flowmeter concentrate, 150-1600 l/h	
1FI02	00 580 043	flowmeter permeate, 400-4000 l/h	
3FI02	00 580 035	flowmeter concentrate recirculation,, 150-1600 l/h	
1P01	00 390 320	pump CR 5-32 DIN, 3x400V/50Hz, 5,5KW	
1Pr01	00 630 006	pressure gauge filter inlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr02	00 630 006	pressure gauge filter outlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr03	00 600 012	pressure switch FF4-8, 3/8"	
1Pr04	00 630 008	pressure gauge pump pressure, Ms, NG63, 1/4"h, 0-40 bar	
1Pr05	00 630 209	pressure gauge operation pressure, Ms, NG63, 1/4"h, 0-25 bar	
3Pr05	00 630 209	pressure gauge, MS, NG63, 0-25bar	
3Pr06	00 630 209	pressure gauge, MS, NG63, 0-25bar	
1Pr06	00 630 209	pressure gauge concentrate pressure, Ms, NG63, 1/4"h, 0-25 bar	
1Q02	00 100 011	conductivity measuring cell permeate 1½" - 200 µS/cm - 3 m	
3Q02	00 100 026	conductivity measuring nano filtrate 1½" - 2.000 µS/cm - 3 m	
3RV02	00 405 135	check valve, DN15	
1V01	00 410 102	solenoid valve, 1¼", 0,2-16bar, 230V/50Hz	
1V03	00 410 107	solenoid valve Ms, ½", 230V/50Hz	
3V03	00 410 107	solenoid valve Ms, ½", 230V/50Hz	
1V04	00 415 050	ball valve VA, DN20	
1V06	00 415 016	concentrate regulating, needle valve VA, ¾"	
3V06	00 415 003	ball valve VA, ½"	
1V07	00 410 084	sampling	
1V08	00 405 050	sampling permeate	
3V08	00 405 050	sampling filtrate	
1V09	00 415 004	ball valve VA, ¾"	
1V10	00 415 004	ball valve VA, ¾"	
1V11	00 405 323	3 way ball valve PVC, 32DN25	
3V11	00 405 323	3 way ball valve PVC, 32DN25	
1V12	00 415 004	ball valve VA, ¾"	
3V12	00 405 323	3 way ball valve PVC, 32DN25	
1X01	00 400 177	vessel, GFK, 4040-3, 24 bar, white	
	00 400 176	vessel, GFK, 4040-2, 24 bar, white	
	00 395 147	11x low pressure element, 4040 HR	
3X01	00 400 177	vessel, GFK, 4040-3, 24 bar, white	
	00 395 161	low pressure element nano filtrate 4040	
	00 545 190	control with RO 5000, 5,5KW, UO xxx KR	
1RV02	00 405 135	check valve permeate , DN15	
option 00382901 permeate recirculation:			
1V02	00 405 117	solenoid valve DN21, 1"AG	
1V02.1	00 405 117	solenoid valve DN21, 1"AG	
further options:			
1X02	00 370 069	hardness monitor Limitron 1"	
1X03	00 382 284	colloid index measuring device	

UO 4000 KR		component list	
item-no. 00381840			
PID	item-no.	description	
1F01	00 330 050	filter housing 10", Big Blue	
	00 335 101	filter cartridge 10", 5µm, Big Blue	
3FI01	00 580 035	flowmeter concentrate, 150-1600 l/h	
1FI02	00 580 046	flowmeter permeate, 600-6400 l/h	
3FI02	00 580 035	flowmeter concentrate recirculation, 150-1600 l/h	
1FI03	00 580 043	flowmeter concentrate recirculation, 400-4000 l/h	
1P01	00 390 343	pump CR 10-18 DIN, 3x400V/50Hz, 7,5KW	
1Pr01	00 630 006	pressure gauge filter inlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr02	00 630 006	pressure gauge filter outlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr03	00 600 012	pressure switch FF4-8, 3/8"	
1Pr04	00 630 008	pressure gauge pump pressure, Ms, NG63, 1/4"h, 0-40 bar	
1Pr05	00 630 209	pressure gauge operation pressure, Ms, NG63, 1/4"h, 0-25 bar	
3Pr05	00 630 209	pressure gauge, MS, NG63, 0-25bar	
3Pr06	00 630 209	pressure gauge, MS, NG63, 0-25bar	
1Pr06	00 630 209	pressure gauge concentrate pressure, Ms, NG63, 1/4"h, 0-25 bar	
1Q02	00 100 011	conductivity measuring cell permeate 1½" - 200 µS/cm - 3 m	
3Q02	00 100 026	conductivity measuring nano filtrate 1½" - 2.000 µS/cm - 3 m	
1RV01	00 580 012	check valve PVC, 32DN25, PN16	
3RV02	00 405 135	check valve , DN15	
1V01	00 410 102	solenoid valve, 1¼", 0,2-16bar, 230V/50Hz	
1V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
3V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
1V04	00 415 039	ball valve VA, DN40	
1V05	00 415 004	regulating valve - concentrate recirculation, ball valve VA, ¾"	
1V06	00 415 056	concentrate regulating, needle valveVA, 1"	
3V06	00 415 003	concentrate regulating, ball valve VA, ½"	
1V07	00 410 084	sampling	
1V08	00 405 050	sampling permeate	
3V08	00 405 050	sampling filtrate	
1V09	00 415 039	ball valve VA, DN40	
1V10	00 415 006	cleaning connection,ball valve 1¼"	
1V11	00 405 324	3 way ball valve PVC, 40DN32	
3V11	00 405 323	3 way ball valve PVC, 32DN25	
1V12	00 415 006	cleaning connection,ball valve 1¼"	
3V12	00 405 324	3 way ball valve PVC, 40DN32	
1X01	00 400 180	vessel, GFK, 8040-2, 25 bar	
	00 400 179	vessel, GFK, 8040-1, 25 bar	
	00 395 152	3xlow pressure element, 8040 HR	
3X01	00 400 176	vessel, GFK, 4040-2, 25 bar	
	00 395 161	low pressure element nano filtrate 4040	
	00 545 191	control with RO 5000, 7,5KW, UO xxx KR	
1RV02	00 405 364	check valve , DN25	
option 00382902 permeate recirculation:			
1RV03	00 580 013	check valve PVC, 40DN32	
1V02	00 405 117	solenoid valve DN21, 1"AG	
1V02.1	00 405 117	solenoid valve DN21, 1"AG	
further optionen:			
1X02	00 370 044	hardness monitor Limitron 1 ¼"	
1X03	00 382 284	colloid index measuring device	

UO 5000 KR		component list
item-no. 00381850		
PID	item-no.	description
1F01	00 300 193	filter housing 3x30" DN50
	00 335 067	filter cartridge, 30", 5 µm
3FI01	00 580 035	flowmeter 150-1600 l/h
1FI02	00 580 046	flowmeter 600-6400 l/h
3FI02	00 580 035	flowmeter 150-1600 l/h
1FI03	00 580 043	flowmeter 400-4000 l/h
1P01	00 390 448	pump CR 10-22, 3x400V/50Hz, 7,5KW
1Pr01	00 630 006	pressure gauge, 1/4"h, 0-10 bar
1Pr02		
1Pr03	00 600 012	pressure switch FF4-8, 3/8"
1Pr04	00 630 008	pressure gauge, 1/4"h, 0-40 bar
1Pr05	00 630 209	pressure gauge, 1/4"h, 0-25 bar
1Pr06		
3Pr05		
3Pr06		
1Q02	00 100 011	conductivity measuring cell permeate 1½" - 200 µS/cm
3Q02	00 100 026	conductivity measuring nano filtrate 1½" - 2.000 µS/cm
1RV01	00 580 012	check valve PVC
1RV02	00 405 364	check valve , DN25
3RV02	00 405 135	check valve , DN15
1V01	00 410 102	solenoid valve, 1¼", 230V/50Hz
1V03	00 410 260	solenoid valve, 1", 230V/50Hz
3V03		
1V04	00 415 039	ball valve VA
1V05	00 415 004	ball valve VA, ¾"
1V06	00 415 056	needle valve VA, 1"
3V06	00 415 017	needle valve VA, ½"
1V07	00 410 084	sampling
1V08	00 405 050	sampling
3V08		
1V09	00 415 039	ball valve VA
1V10/1V12	00 415 006	ball valve 1¼"
1V11	00 405 324	3 way ball valve PVC
3V11/3V12	00 405 323	3 way ball valve PVC
1V20	00 410 277	manual air vent
1X01	00 400 180	vessel, GFK, 8040-2
	00 395 152	low pressure element, 8040
3X01	00 400 176	vessel, GFK, 4040-2
	00 395 161	low pressure element nano filtrate 4040
	00 545 191	control with RO 5000, 7,5KW, UO xxx KR
option 00382902 permeate recirculation:		
1RV03	00 580 013	check valve PVC
1V02	00 405 117	solenoid valve 1"AG
1V02.1		
further optionen:		
1X02	00 370 044	hardness monitor Limitron 1 ¼"
1X03	00 382 284	colloid index measuring device

UO 6000 KR item-no. 00381860		component list	
PID	item-no.	description	
1F01	00 300 193	filter housing 3x30" DN50	
	00 335 067	filter cartridge, 30", 5 µm, 3 pieces	
3FI01	00 580 035	flowmeter concentrate, 150-1600 l/h	
1FI02	00 580 046	flowmeter permeate, 600-6400 l/h	
3FI02	00 580 035	flowmeter concentrate recirculation, 150-1600 l/h	
1FI03	00 580 043	flowmeter concentrate recirculation, 400-4000 l/h	
1P01	00 390 448	pump CR 10-22 DIN, 3x400V/50Hz, 7,5KW	
1Pr01	00 630 006	pressure gauge filter inlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr02	00 630 006	pressure gauge filter outlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr03	00 600 012	pressure switch FF4-8, 3/8"	
1Pr04	00 630 008	pressure gauge pump pressure, Ms, NG63, 1/4"h, 0-40 bar	
1Pr05	00 630 209	pressure gauge operation pressure, Ms, NG63, 1/4"h, 0-25 bar	
1Pr06	00 630 209	pressure gauge, MS, NG63, 0-25bar	
3Pr05	00 630 209	pressure gauge, MS, NG63, 0-25bar	
3Pr06	00 630 209	pressure gauge concentrate pressure, Ms, NG63, 1/4"h, 0-25 bar	
1Q02	00 100 011	conductivity measuring cell permeate 1½" - 200 µS/cm - 3 m	
3Q02	00 100 023	conductivity measuring nano filtrate 1½" - 2.000 µS/cm - 3 m	
1RV01	00 580 012	check valve PVC, 32DN25, PN16	
3RV02	00 405 135	check valve, DN15	
1V01	00 410 263	solenoid valve, 1¼", 0,2-16bar, 230V/50Hz	
1V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
3V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
1V04	00 415 039	ball valve VA, DN40	
1V05	00 415 004	regulating valve - concentrate recirculation, ball valve VA, ¾"	
1V06	00 415 056	concentrate regulating, needle valveVA, 1"	
3V06	00 415 003	concentrate regulating,ball valveVA, 1/2"	
1V07	00 410 084	sampling	
1V08	00 405 050	sampling permeate	
3V08	00 405 050	sampling filtrate	
1V09	00 415 039	ball valve VA, DN40	
1V10	00 415 006	cleaning connection,ball valve 1¼"	
1V11	00 405 324	3 way ball valve PVC, 40DN32	
3V11	00 405 323	3 way ball valve PVC, 32DN25	
1V12	00 415 006	cleaning connection,ball valve 1¼"	
3V12	00 405 324	3 way ball valve PVC, 40DN32	
1V20	00 410 277	manual air vent	
1X01	00 400 179	vessel, GFK, 8040-2,	
	00 400 180	vessel, GFK, 8040-3,	
	00 395 152	low pressure element, 8040 HR	
3X01	00 400 176	vessel, GFK, 4040-2, 25 bar	
	00 400 177	vessel, GFK, 4040-3, 25 bar	
	00 395 161	low pressure element nano filtrate 4040	
	00 545 191	control with RO 5000, 7,5KW, UO xxx KR	
1RV02	00 580 012	check valve , DN25	
option 00382903 permeate recirculation:			
1RV03	00 580 014	check valve PVC, 50DN40	
1V02	00 405 117	solenoid valve DN21, 1"AG	
1V02.1	00 405 117	solenoid valve DN21, 1"AG	
further optionen:			
1X02	00 370 044	hardness monitor Limitron 1 ¼"	
1X03	00 382 284	colloid index measuring device	

UO 7000 KR item-no. 00381870		component list	
PID	item-no.	description	
1F01	00 300 193	filter housing 3x30" DN50	
	00 335 067	filter cartridge 30", 5µm	
3F01	00 580 042	flowmeter concentrate, 200-2500 l/h	
1F02	00 580 047	flowmeter permeate, 1000-10000 l/h	
3F02	00 580 035	flowmeter concentrate recirculation, 150-1600 l/h	
1F03	00 580 043	flowmeter concentrate recirculation, 400-4000 l/h	
1P01	00 390 448	pump CR 10-22 DIN, 3x400V/50Hz, 7,5KW	
1Pr01	00 630 006	pressure gauge filter inlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr02	00 630 006	pressure gauge filter outlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr03	00 600 012	pressure switch FF4-8, 3/8"	
1Pr04	00 630 008	pressure gauge pump pressure, Ms, NG63, 1/4"h, 0-40 bar	
1Pr05	00 630 209	pressure gauge operation pressure, Ms, NG63, 1/4"h, 0-25 bar	
3Pr05	00 630 209	pressure gauge, MS, NG63, 0-25bar	
3Pr06	00 630 209	pressure gauge, MS, NG63, 0-25bar	
1Pr06	00 630 209	pressure gauge concentrate pressure, Ms, NG63, 1/4"h, 0-25 bar	
1Q02	00 100 011	conductivity measuring cell permeate 1½" - 200 µS/cm - 3 m	
3Q02	00 100 060	conductivity measuring nano filtrate 1½" - 50 mS/cm - 6 m	
1RV01	00 580 012	check valve PVC, 32DN25, PN16	
3RV02	00 405 135	check valve , DN15	
1V01	00 405 088	diaphragm valve type690, 230V/50Hz, NC	
1VV01	00 405 039	balanced solenoid valve Ms, ¼", 230V/50Hz, NC	
1V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
3V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
1V04	00 415 039	ball valve VA, DN40	
1V05	00 415 004	regulating valve - concentrate recirculation, ball valve VA, ¾"	
1V06	00 415 056	concentrate regulating, needle valve VA, 1"	
3V06	00 415 003	concentrate regulating, ball valve VA, ½"	
1V07	00 410 084	sampling	
1V08	00 405 050	sampling permeate	
3V08	00 405 050	sampling filtrate	
1V09	00 415 039	ball valve VA, DN40	
1V10	00 415 006	rinse connection, ball valve 1¼"	
1V11	00 405 325	3 way ball valve PVC, 50DN40	
3V11	00 405 323	3 way ball valve PVC, 32DN25	
1V12	00 415 006	rinse connection, ball valve 1¼"	
3V12	00 405 324	3 way ball valve PVC, 40DN32	
1V20	00 410 277	Handentlüfter 1/2"	
1X01	00 400 181	vessel, GFK, 8040-3,	
	00 395 152	low pressure element	
3X01	00 400 177	vessel, GFK, 4040-3,	
	00 395 161	low pressure element nano filtrate	
	00 545 191	control with RO 5000, 7,5KW, UO xxx KR	
1RV02	00 405 364	check valve , DN25	
option 00382373 permeate recirculation:			
1RV03	00 580 014	check valve PVC, 50DN40	
1V02	00 405 088	diaphragm valve type 690, 230V/50Hz, NC	
1VV02	00 405 039	balanced solenoid valve Ms, ¼", 230V/50Hz, NC	
further optionen:			
1X02	00 370 070	hardness monitor Limitron ¾"	
1X03	00 382 284	colloid index measuring device	

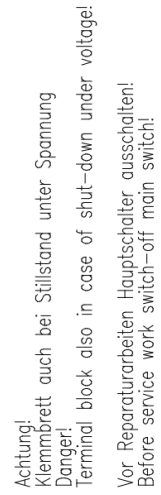
UO 8500 KR item-no. 00381880		component list	
PID	item-no.	description	
1F01	00 300 193	filter housing 3x30" DN50	
	00 335 067	filter cartridge 30", 5µm	
3FI01	00 580 042	flowmeter concentrate, 200-2500 l/h	
1FI02	00 580 047	flowmeter permeate, 1000-10000 l/h	
3FI02	00 580 042	flowmeter KR-recirculation, 150-1600 l/h	
1FI03	00 580 043	flowmeter concentrate recirculation, 400-4000 l/h	
1P01	00 390 351	pump CR 15-14 DIN, 3x400V/50Hz, 11KW	
1Pr01	00 630 006	pressure gauge filter inlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr02	00 630 006	pressure gauge filter outlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr03	00 600 012	pressure switch FF4-8, 3/8"	
1Pr04	00 630 008	pressure gauge pump pressure, Ms, NG63, 1/4"h, 0-40 bar	
1Pr05	00 630 209	pressure gauge operation pressure, Ms, NG63, 1/4"h, 0-25 bar	
3Pr05	00 630 209	pressure gauge, MS, NG63, 0-25bar	
3Pr06	00 630 209	pressure gauge, MS, NG63, 0-25bar	
1Pr06	00 630 209	pressure gauge concentrate pressure, Ms, NG63, 1/4"h, 0-25 bar	
1Q02	00 100 011	conductivity measuring cell permeate 1½" - 200 µS/cm - 3 m	
3Q02	00 100 026	conductivity measuring nano filtrate 1½" - 2.000 µS/cm - 3 m	
1RV01	00 580 012	check valve PVC, 32DN25, PN16	
3RV02.1	00 405 135	check valve DN15	
3RV02.2	00 405 135	check valve DN15	
1V01	00 405 111	diaphragm valve type690, DN50, NC	
1VV01	00 405 039	balanced solenoid valve Ms, ¼", 230V/50Hz, NC	
1V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
3V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
1V04	00 415 039	ball valve VA, DN40	
1V05	00 415 004	regulating valve - concentrate recirculation, ball valve VA, ¾"	
1V06	00 415 056	concentrate regulating, needle valve VA, 1"	
3V06	00 415 003	concentrate regulating, ball valve VA, ½"	
1V07	00 410 084	sampling	
1V08	00 405 050	sampling permeate	
3V08	00 405 050	sampling filtrate	
1V09	00 415 039	ball valve VA, DN40	
1V10	00 415 006	rinse connection, ball valve 1¼"	
1V11	00 405 325	3 way ball valve PVC, 50DN40	
3V11	00 405 323	3 way ball valve PVC, 32DN25	
1V12	00 415 006	rinse connection, ball valve 1¼"	
3V12	00 405 324	3 way ball valve PVC, 40DN32	
1V20	00 410 277	manual air vent	
1X01	00 400 182	vessel, GFK, 8040-4,	
	00 400 181	vessel, GFK, 8040-3,	
	00 395 152	low pressure element	
3X01	00 400 178	vessel, GFK, 4040-4,	
	00 400 177	vessel, GFK, 4040-3,	
	00 395 161	low pressure element nano filtrate	
	00 545 217	control RO 5000, 11KW, UO xxx KR	
1RV02	00 580 012	check valve permeate PVC, 32DN25	
option 00382373 permeate recirculation:			
1RV03	00 580 014	check valve PVC, 50DN40	
1V02	00 405 088	diaphragm valve type 690, 230V/50Hz, NC	
1VV02	00 405 039	balanced solenoid valve Ms, ¼", 230V/50Hz, NC	
further options:			
1X02	00 370 070	hardness monitor Limitron 1 ½"	
1X03	00 382 284	colloid index measuring device	

UO 10.000 KR item-no. 00381890		component list	
PID	item-no.	description	
1F01	00 300 194	filter housing 7x30" DN65	
	00 335 067	filter cartridge 30", 5µm	
3FI01	00 580 042	flowmeter concentrate, 200-2500 l/h	
1FI02	00 580 048	flowmeter permeate, 2000-20000 l/h	
3FI02	00 580 042	flowmeter KR-recirculation, 150-1600 l/h	
1FI03	00 580 043	flowmeter concentrate recirculation, 400-4000 l/h	
1P01	00 390 351	pump CR 15-14 DIN, 3x400V/50Hz, 11KW	
1Pr01	00 630 006	pressure gauge filter inlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr02	00 630 006	pressure gauge filter outlet, Ms, NG63, 1/4"h, 0-10 bar	
1Pr03	00 600 012	pressure switch FF4-8, 3/8"	
1Pr04	00 630 008	pressure gauge pump pressure, Ms, NG63, 1/4"h, 0-40 bar	
1Pr05	00 630 209	pressure gauge operation pressure, Ms, NG63, 1/4"h, 0-25 bar	
3Pr05	00 630 209	pressure gauge, MS, NG63, 0-25bar	
3Pr06	00 630 209	pressure gauge, MS, NG63, 0-25bar	
1Pr06	00 630 209	pressure gauge concentrate pressure, Ms, NG63, 1/4"h, 0-25 bar	
1Q02	00 100 011	conductivity measuring cell permeate 1½" - 200 µS/cm - 3 m	
3Q02	00 100 026	conductivity measuring nano filtrate 1½" - 2.000 µS/cm - 3 m	
1RV01	00 580 012	check valve PVC, 32DN25, PN16	
3RV02	00 405 135	check valve ,DN15	
1V01	00 405 111	diaphragm valve type690, DN50, NC	
1VV01	00 405 039	balanced solenoid valve Ms, ¼", 230V/50Hz, NC	
1V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
3V03	00 410 260	solenoid valve Ms, 1", 230V/50Hz	
1V04	00 415 065	ball valve VA, DN65	
1V05	00 415 004	regulating valve - concentrate recirculation, ball valve VA, ¾"	
1V06	00 415 056	concentrate regulating, needle valve VA, 1"	
3V06	00 415 003	concentrate regulating, ball valve VA, ½"	
1V07	00 410 084	sampling	
1V08	00 405 050	sampling permeate	
3V08	00 405 050	sampling filtrate	
1V09	00 415 039	ball valve VA, DN40	
1V10	00 415 007	rinse connection, ball valve 1½"	
1V11	00 405 326	3 way ball valve PVC, 63DN50	
3V11	00 405 323	3 way ball valve PVC, 32DN25	
1V12	00 415 007	rinse connection, ball valve 1½"	
3V12	00 405 324	3 way ball valve PVC, 40DN32	
1V20	00 410 277	manual air vent	
1X01	00 400 181	vessel, GFK, 8040-3,	
	00 395 152	low pressure element	
3X01	00 400 177	vessel, GFK, 4040-3,	
	00 395 161	low pressure element nano filtrate	
	00 545 217	control RO 5000, 11KW, UO xxx KR	
1RV02	00 405 364	check valve ,DN25	
option 00382373 permeate recirculation:			
1RV03	00 580 014	check valve PVC, 50DN40	
1V02	00 405 088	diaphragm valve type 690, 230V/50Hz, NC	
1VV02	00 405 039	balanced solenoid valve Ms, ¼", 230V/50Hz, NC	
further options:			
1X02	00 370 070	hardness monitor Limitron 1 ½"	
1X03	00 382 284	colloid index measuring device	

Beschreibung Description	R05000 / 5,5–7,5 kW / KR
	Versorgungsspannung supply voltage 3x400V/50Hz, N, PE
	Vorsicherung Fuse protection 20 A
	Steuerspannung control voltage 230 VAC
	Mind. Zuleitung mini. Power cable 5x6 mm ²
	max. Strom max. current siehe Seite see page 3

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RO5000_OUT

max. zul. Last
1100VA
max. allowed load
1100VA

Ausgänge potentialbehaltet
outputs with potential

Ausgänge
outputs

max. zul. Last
230V/50Hz/4A, 24V=/1A
max. allowed load 230V/50Hz/4A, 24V=/1A

Ausgänge potentialfrei
outputs potential-free

max. zul. Last
230V/50Hz/4A, 24V=/1A
max. allowed load 230V/50Hz/4A, 24V=/1A

Netz
main power

Versorgung
Ausgänge
supply
outputs

230V AC / 24V DC

U0-Pumpe 1
R0-pump 1

U0-Pumpe 2
R0-pump 2

MW3
Konzentrat
concentrate

MW2
Permeat
permeate

MW1
U0-Eingang
R0-input

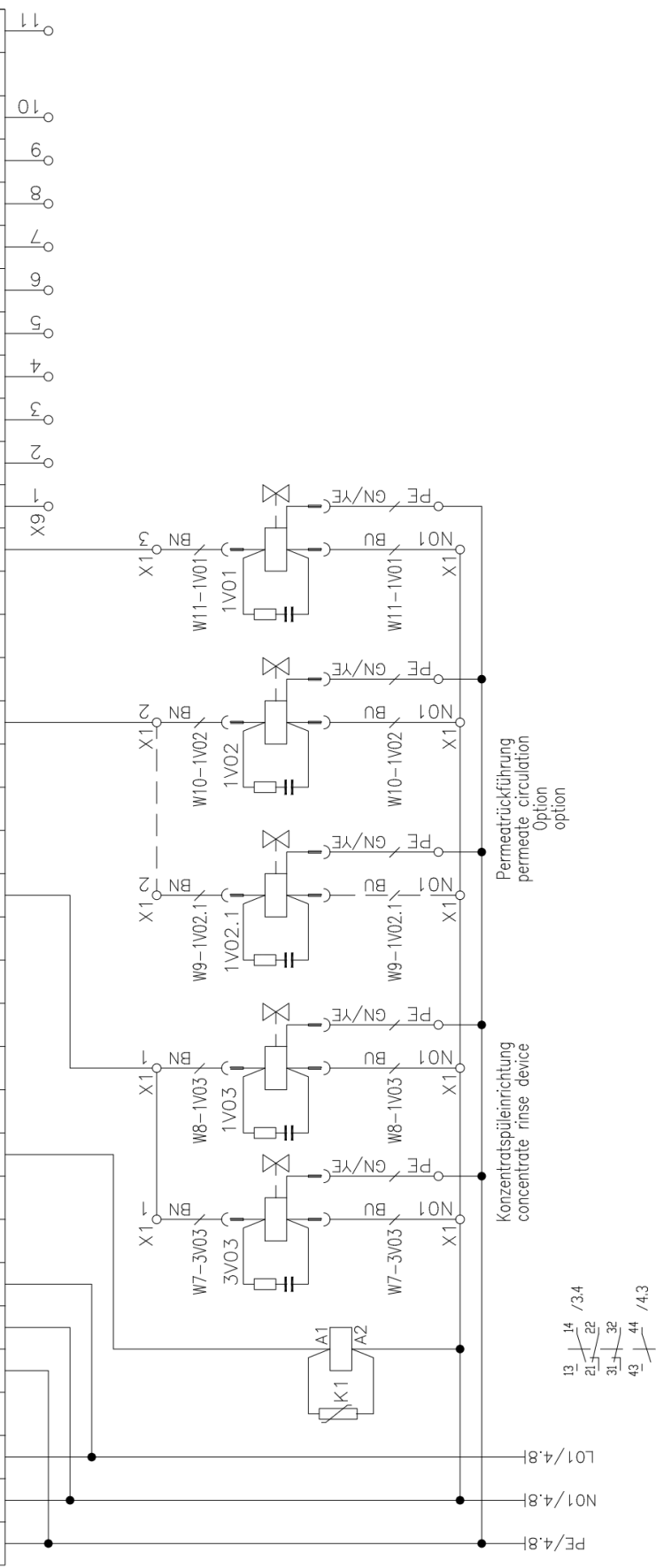
Universal
ausgang
universal
output

Universal
ausgang
universal
output 2

Sammelstör-
meldekontakt
collective fault
contact

Analog
ausgang
analog
output

			supply outputs			230V AC / 24V DC			IW3 concentrate			IW2 permeate			IW1 RO-input			universal output I			universal output Z			potential free: collective contact			potential free: potential-free			analog output				
PE	N	L	PE	N	L	PE	N	L	PE	N	L	PE	N	Ls	Lö	PE	N	Ls	Lö	PE	N	L	W	S	Ø	W	S	Ø	M	R	+			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	51	52	53

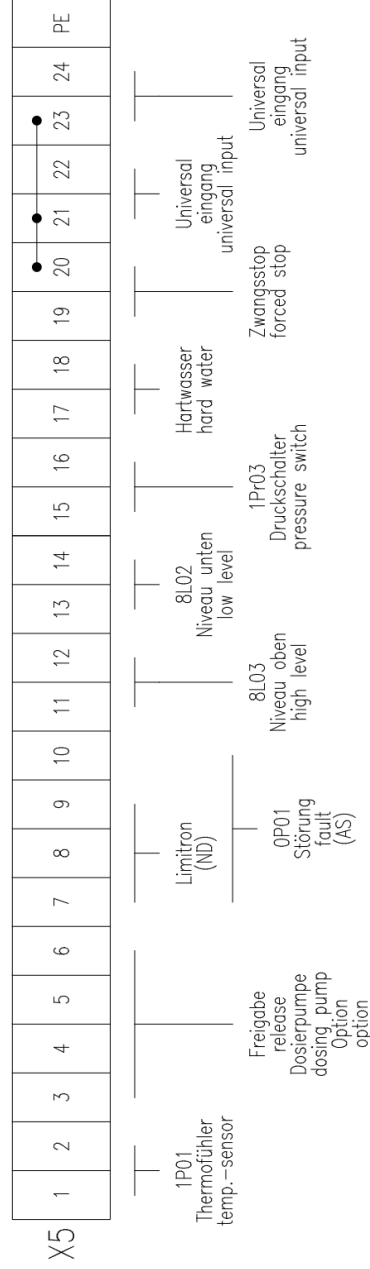
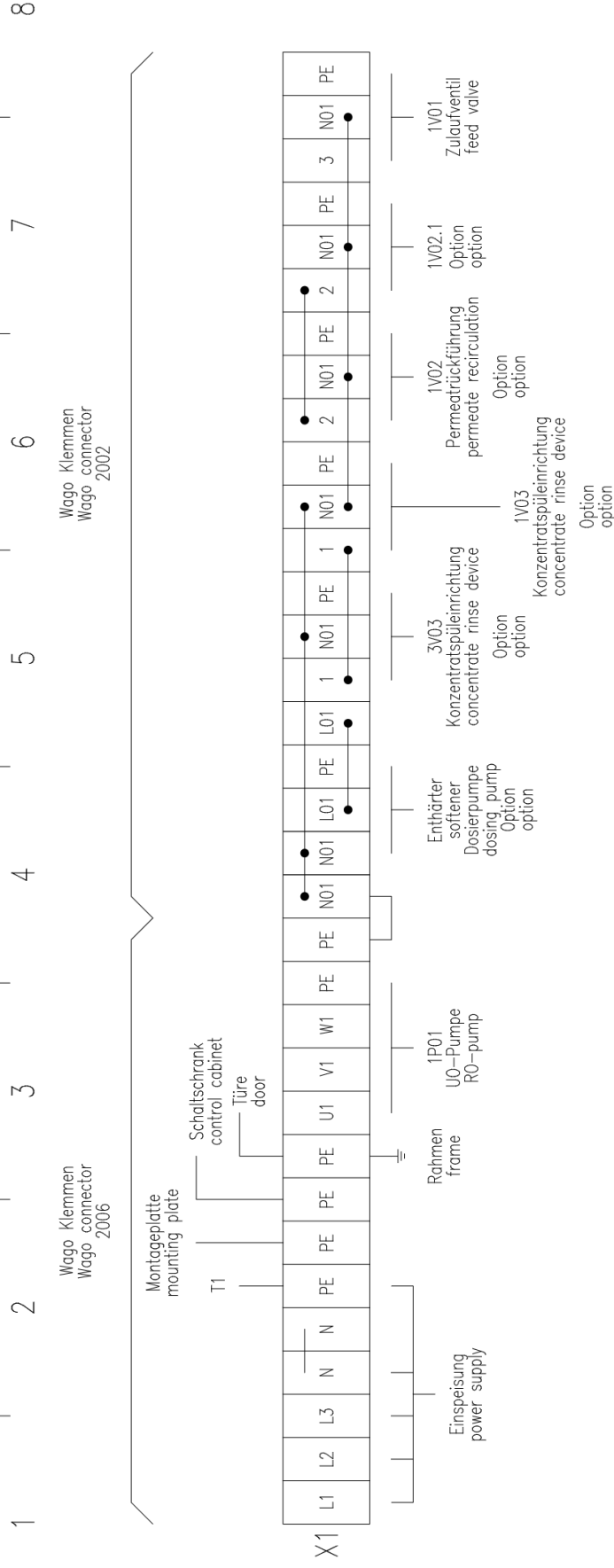


Revision	Datum	Name	Datum	Name	Anschlußbelegung RO5000 Terminals RO5000				Projektbez. R05000 / 5,5-7,5 kW /KR		Zeichnungsnr. 545190-01003	
a			11.09.17	Ay								
b			11.09.17	Tie								
c												
d												



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[illegible]



1	2	3	4	5	6	7	8	9	10	11	PE
Universal ausgang universal output 1			Universal ausgang universal output 2			Sammel störung collective fault alarm			Analog ausgang analog output		

						X9	Projektbez. R05000 / 5,5-7,5 kW /kR		=	
a					Datum	Name				
b						gez.	11.09.17	Ay		+
c								Tie		
d						gepr.	11.09.17			
								Auftragsnr.	Zeichnungsnr. 545190-01003	
						Bdtt	8			
							10			Bl.

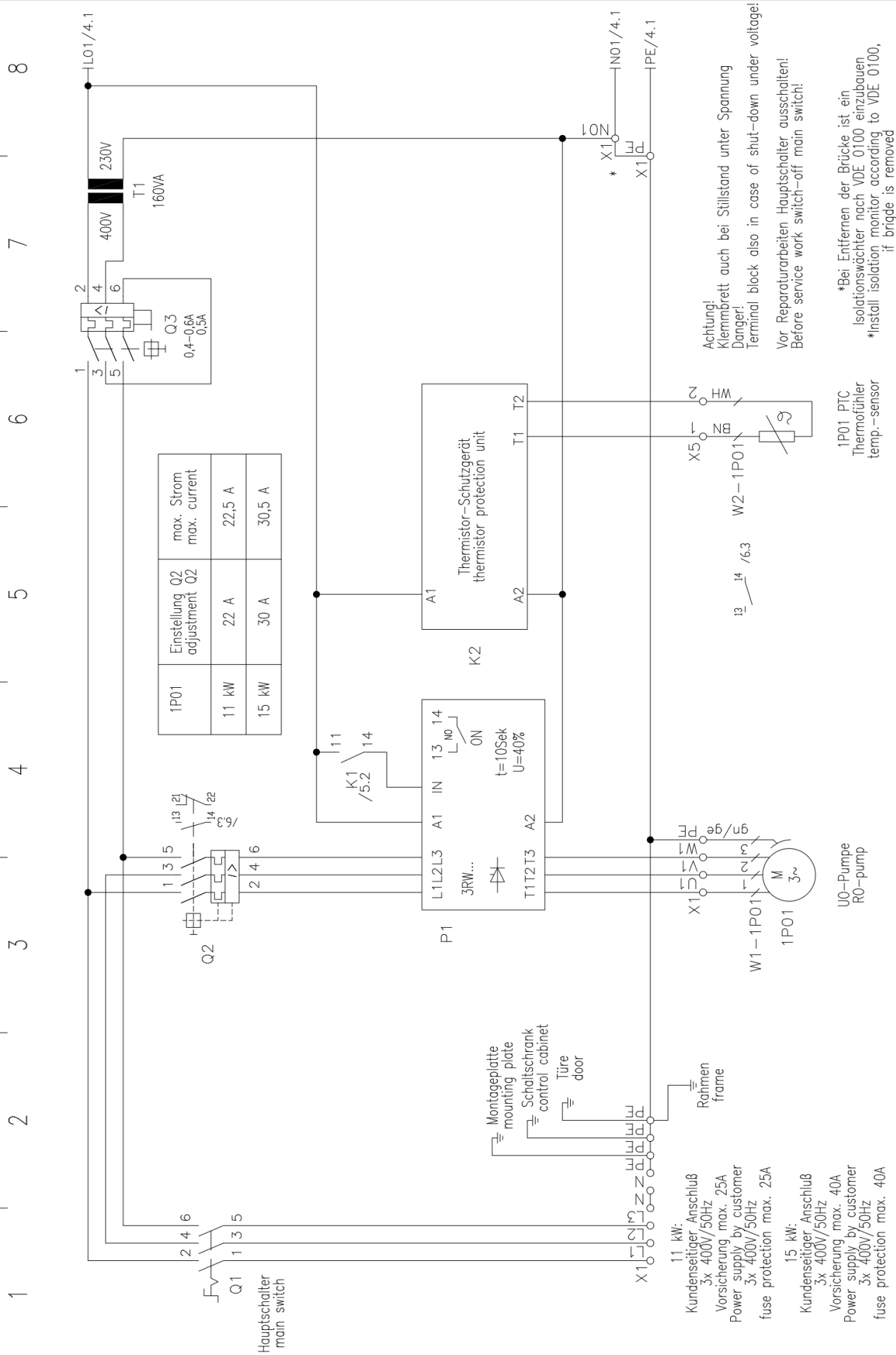


Age Group	Percentage
18-24	15%
25-34	25%
35-44	30%
45-54	20%
55-64	10%
65-74	5%
75-84	2%
85+	1%

[illegible]

Beschreibung Description	R05000 / 11-15 kW / KR
	Versorgungsspannung supply voltage 3x400V/50Hz, N, PE
	Vorsicherung Fuse protection siehe Seite see page 3
	Steuerspannung control voltage 230 VAC
	Mind. Zuleitung mini. Power cable 5x10 mm ²
	max. Strom max. current siehe Seite see page 3

[illegible]



Revision	Datum	Name	Datum	Name	Projektbez.	Hauptstromkreis main circuit		Zeichnungsnr.		Blatt
a			11.09.17	Ay	R05000 / 11-15 kW /KR			545217-01004		10
b	gez.				Auftragsnr.					3
c	gepr.		11.09.17	Tie						BL
d										

Achtung!
Klemmbrett auch bei Stillstand unter Spannung
Danger!
Terminal block also in case of shut-down under voltage!

Vor Reparaturarbeiten Hauptschalter ausschalten!
Before service work switch-off main switch!

*Bei Entfernen der Brücke ist ein Isolationswächter nach VDE 0100 einzubauen
*Install isolation monitor according to VDE 0100, if bridge is removed

1P01 PTC
Thermofühler
temp.-sensor

U0-Pumpe
RO-pump

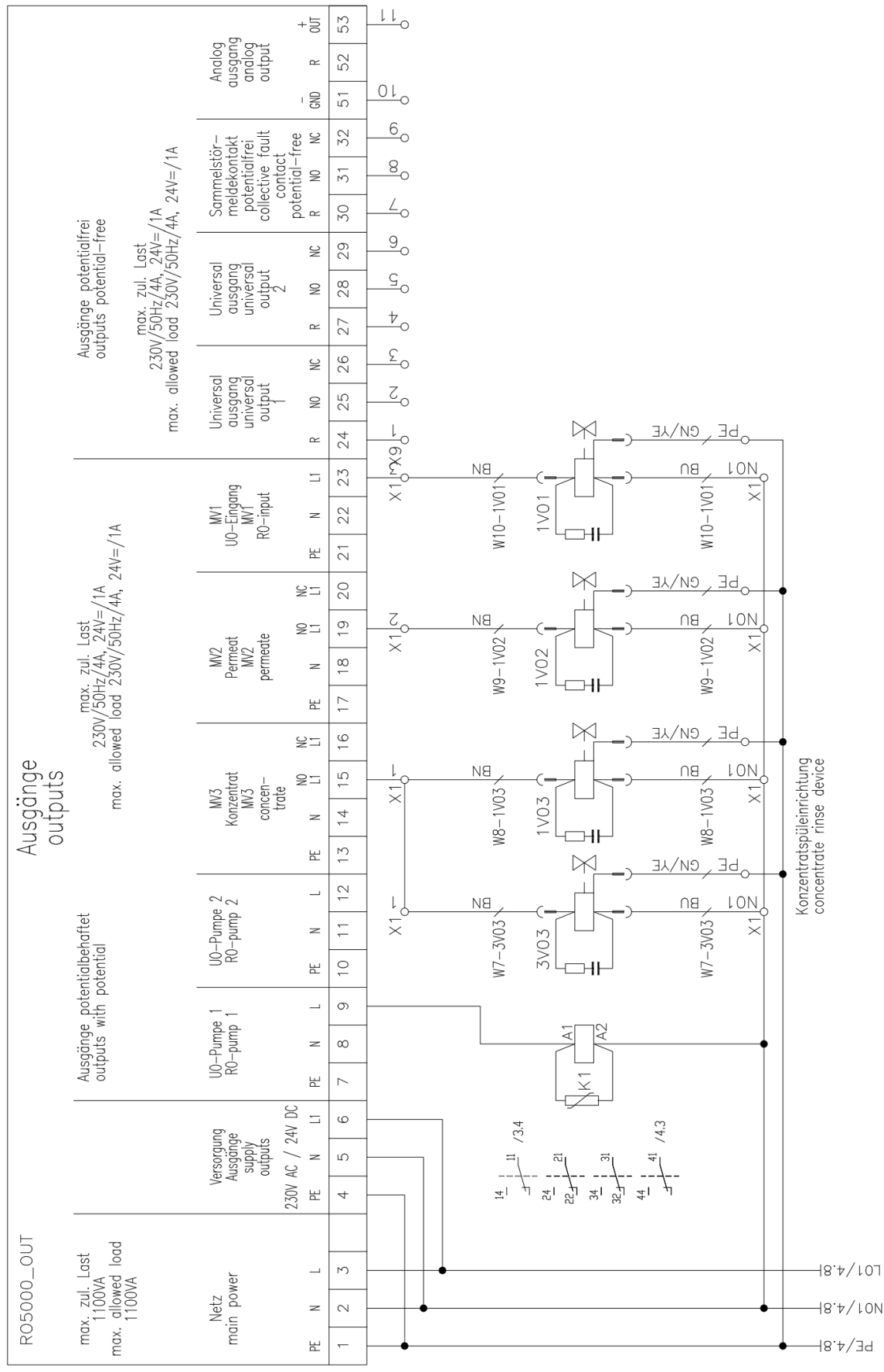
11 kW:
Kundenseitiger Anschluß
3x 400V/50Hz
Vorsicherung max. 25A
Power supply by customer
fuse protection max. 25A

15 kW:
Kundenseitiger Anschluß
3x 400V/50Hz
Vorsicherung max. 40A
Power supply by customer
fuse protection max. 40A



Age	Percentage
1	0
2	10
3	20
4	30
5	40
6	50
7	60
8	70

Age	Percentage
1	0
2	10
3	20
4	30
5	40
6	50
7	60
8	70



							Anschlußbelegung R05000 Terminals R05000		Projektbez. R05000 / 11-15 kW /KR	=	
a					Datum	Name			R05000	+	
b					gez.	Ay			Auftragsnr.		
c									Zeichnungs-nr.		Blatt 5
d					gepr.	Tie			545217-01004		Bl. 10



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Blatt	7
10	Bl.



Age Group	Percentage
18-24	15%
25-34	25%
35-44	30%
45-54	20%
55-64	10%
65-74	5%
75-84	2%
85+	1%

[illegible]

RO 5000

Technical Manual

Software: V 1.0.x

revisal	date	author	remarks / softwareversion
3	12/2004	Tie	
4	05/2013	Bvt	adding UniDA2/ V 1.0.x
5	02/2014	Bvt	amendment safety instructions 1.3
6	01/2015	Mü	Update connection assignment 2.6
7	07/2018	Rei	fine fuse customized

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1. General introduction

1.1 Abbreviations/explanations

The following abbreviations are used as part of the functional description:

CO	Conductivity
T	Temperatures
t	Times
BM	Basic module
EM	Expanded module

In addition, the following notation conventions are observed throughout the entire manual:

Type:	Notation:	Example:
Keys:	large + bold	LEFT, UP, DOWN
LEDs:	large + bold	OPERATION, MALFUNCTION
Inputs/outputs:	large + bold	INPUT VALVE
Operating parameters:	italic	<i>CO of unprocessed water, amount of water</i>
Operating modes:	large + underlined	<u>TURNED OFF, TURNED ON</u>
Operating states:	large + underlined	<u>AUTOMATIC, MANUAL</u>
Operating errors:	large + underlined	<u>SENSOR ERRORS</u>

1.2 Assembly/installation instructions

1.2.1 Requirements for installation

Since there are two "open" modules for the control system, it is absolutely essential to perform the installation in an appropriate housing. The housing to be used, as well as the system to be controlled must meet the following requirements:

- Use only housings that are suitable for the control system. Make certain that limit values for temperature and relative humidity are observed. The motherboards must not come in contact with splashed water or water from condensation. In addition, the regulations of the VDE [Association of German Engineers] must be observed.
- If a plastic housing is used, it must be adequately shielded in accordance with EMC guidelines.
- The maximum permissible load on the circuit outputs as well as the total output of the control device (see 2.5) must not be exceeded by consumers that are connected (for inductive loads, observe the phase angle).
- All inductive consumers (valves, motors, contactors, transformers) in the system must be equipped with suitable interference suppression elements (RC element, varistor, diode).
- If there are external devices with a high mains power interference level, these levels must be reduced with suitable measures or interference suppression measures must be taken on the power supply input of the control system (mains power filter).
- Avoid high mechanical loads as well as large jumps in temperature.

1.2.2 Assembly instructions

The following instructions must be observed while assembling the modules:

- The corresponding requirements (VDE, DIN, UVV, etc.) must be observed for all assembly/connection tasks.
- The original seal affixed during manufacturing (trimmer fastening), EPROM sticker) must not be opened or damaged. Otherwise any claims under the warranty will be rendered void.
- In the event of a defective control unit, it is essential to note the nature of the error (the effect produced by the error) before disassembling it. It will only be possible to repair the device (whether or not the warranty period has expired) if a description of the error is available.

1.3 Safety instructions

The following safety instructions must be observed when working with the control device:

- The operating instructions must have been fully read and understood before placing the unit in service.
- The technical data and limit values cited in the operating instructions must be observed on every occasion.
- The control device must only be operated by persons who have received appropriate training and instruction for this purpose.
- Repairs made to the control device must only be performed by qualified personnel. With the exception of the lithium battery (see 1.5), the control device does not contain any parts that the user needs to maintain. No changes of any type are permitted.
- The control device must only be used for the purpose and application for which it was intended.
- Diagnostics mode (see 4.2.7) makes it possible to directly manipulate all actuators (valves, pumps, etc.) without any safety-related interlock or monitoring. As a result, this function is available only on the technician level (password-protected) and may only be used by trained personnel.
- Do not perform any of your own troubleshooting on the control unit (warranty will be voided). Instead you should have this task performed by authorized service personnel. This is the only way to ensure safe and reliable operation of the system.
- After a protective device (melt fuse, motor protection switch) has been triggered, you should try to eliminate the cause of the fault (for example clean the pump), before making the protective device active again. Repeated trigger is always attributable to a sensor/actuator fault, which may under some circumstances cause damage to the control unit.
- Active analogue output; do not connect power (24V DC) on the 4-20 mA analogue outputs.



Failure to observe these instructions may result in damage to the control unit as well as the system attached to it, and may in some cases result in the warranty being voided.

1.4 Storage

The conditions specified under 2.5 apply to storage and transportation. If there are great changes in temperature from cold to hot, the central unit must be acclimated for several hours before being turned on to avoid moisture from condensation.

1.5 Maintenance

To store the correct time and log memory independently of the network, there is a standard commercial lithium button cell (type CR2430) in the basic module (see 2.2), which should be replaced after about 3 years (computing service life: about 8-10 years). To do this, proceed as follows:

1. Turn on the control unit
2. Select the "OFF" operating mode and wait until it has been reached.
3. Discharge the actual both to the switch cabinet ground
4. Remove the lithium cell from the compartment on the rear side of the CPU card of the basic module
5. Insert the new lithium cell

Contrary to customary procedure, this replacement takes place while the unit is turned on. This will prevent loss of data related to the real time or the log memory.

2. Hardware

2.1 Layout

The **basic module** consists of an **operator's station** (main processor, display, keyboard) and an **I/O unit** (sensor/actuator connection), that are held together with screws.

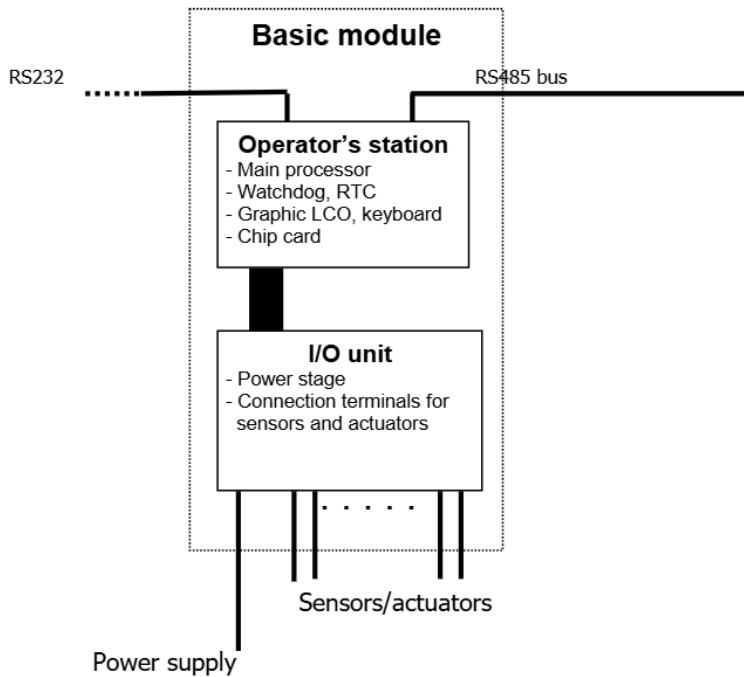


Fig. 1: System layout

2.2 Basic module operator's station

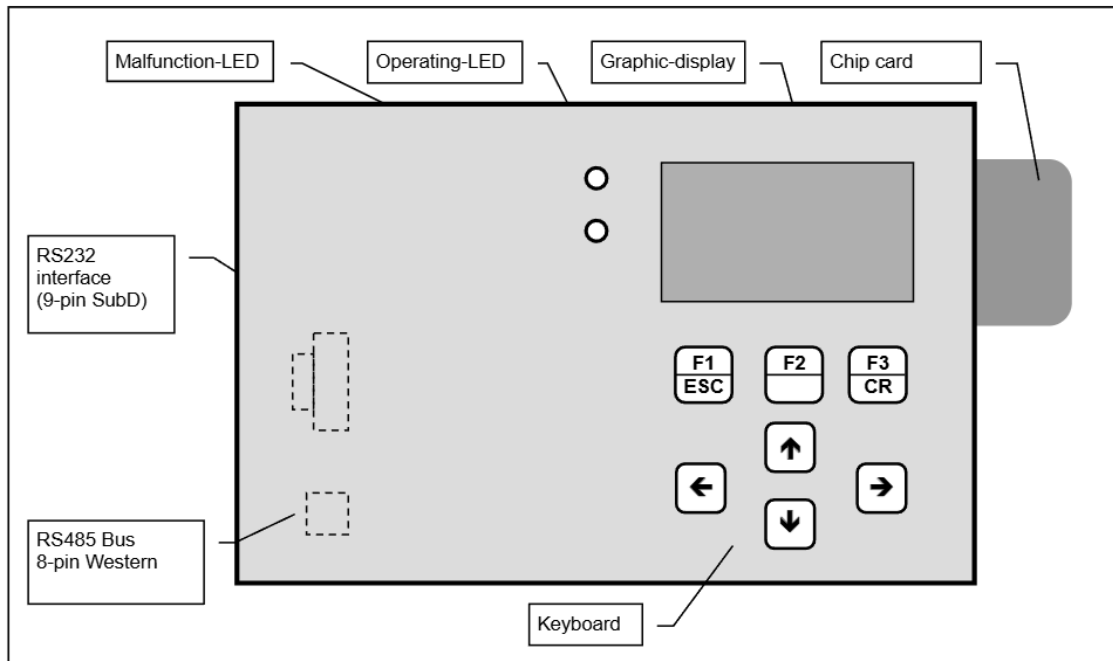


Fig. 2: Front layout of an operator's station

2.3 Basic module I/O unit

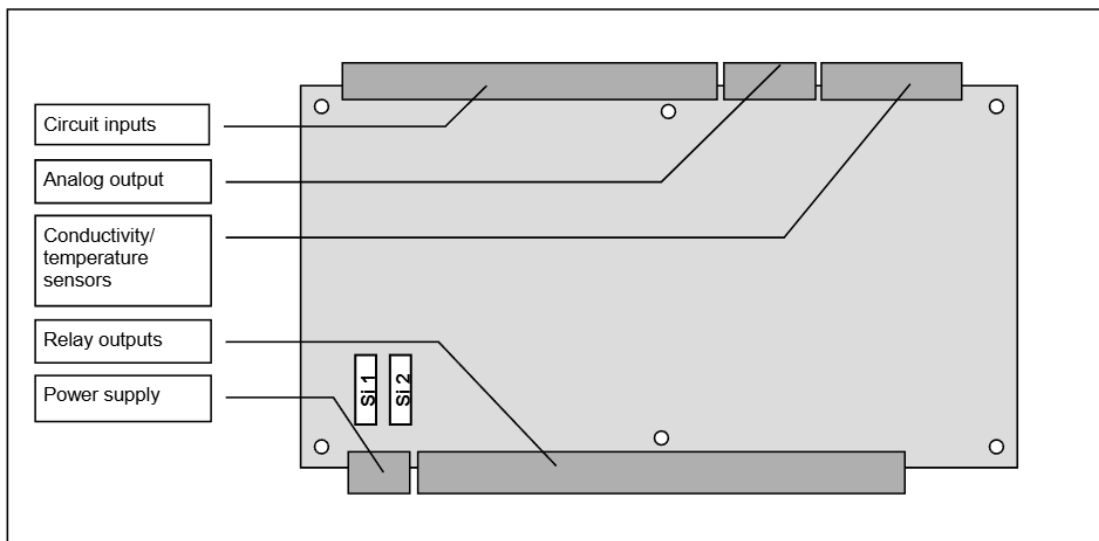


Fig. 3: Basic module I/O unit

2.4 Fuses

The I/O unit of the basic module includes the following safety fuses:

Description	Value	Position	Function
Si 1 basic module	100 mA, delayed	See 2.3	Fuse that protects the power supply to the processor
Si 2 basic module	5 A, delayed	See 2.3	Fuse that protects the power supply to the output stage

Table 1: Fuses

Replacing fuses:



Before replacing fuses, the power supply to the control unit must be turned off and it must be checked to ensure no current is present. Only fuses with the same electrical ratings should be used.

2.5 Connection specification

Technical rating data of the control system for operation as well as storage and transportation appears in the table below.

Description	Min.	Typ.	Max.	Unit	Notes
Power supply	205	230	250	V	AC
Rated output	6	7.5	9	VA	Without actuators/sensors at 22 V
Mains power frequency	47	50	53	Hz	
Circuit outputs					
Power supply			250	V	AC, from external source
Total current			4	A	Output total per module
Output current			4	A	per output
Circuit inputs (potential-loaded for PNP sensors, i.e. (+) switching)					
Power supply	18	24	28	V	DC, from internal source
Input current	6		9	mA	
Circuit inputs (potential-free)					
Input voltage	18	24	28	V	DC
Input current	6		9	mA	
Current outputs					
Output range	0		20	mA	
Accuracy		1		%	of range limit value
Temperature measurement					
Measurement range PT100	0		>100	°C	Three-wire connection
Measurement range KTY 1k	0		>100	°C	
Measurement error		1		%	of range limit value
CO measurement					
Measurement range unprocessed water	0		1000	µS/cm	
Measurement range, permeate	0		50	µS/cm	
T compensation range.	5		45	°C	
Measurement error		1.5		%	of range limit value
Ambient temperature	0	-	40	°C	in operation
Ambient temperature	-10	-	60	°C	for storage, transportation.
Rel. humidity	15	-	80	%	non-condensing

Table 2: Connection specification

Notes:



- The circuit outputs are designed for switching alternating currents up to a maximum of 4A or direct currents up to a maximum of 1A. The total load of all circuit outputs must not exceed 4A (AC mode) or 1A (DC mode) per module.
- When connecting inductive consumers, the appropriate suppression elements (use RC element, varistor or diode) must be provided. When switching capacitive consumers, the output current should be limited (resistance).

2.6 Connection assignment

2.6.1 Basis module

Terminal	Function	Type	Notes
1	Power supply voltage	PE	Used for power supply of the control unit (fuse protection: 63 mA)
2		230 V zero	
3		230V phase	
Distance (galv. insulation)			
4	Power supply input U1 for circuit outputs	PE	Used for power supply of the circuit outputs (fuse protection: 4 A)
5		24V/230V zero	
6		24V/230V Phase	
7	Pump 1	PE	
8		U1 zero	
9		U1 phase (normally open)	
10	Pump 2	PE	
11		U1 zero	
12		U1 phase (normally open)	
13	Concentrate valve MV3	PE	For solenoid valve or motor valve
14		U1 zero	
15		U1 phase (normally open)	
16		U1 phase (normally open)	
17	Permeate valve MV2	PE	For solenoid valve or motor valve
18		U1 zero	
19		U1 phase (normally open)	
20		U1 phase (normally open)	
21	Feed water valve MV1	PE	
22		U1 zero	
23		U1 phase (normally open)	
Distance (galv. insulation)			
24	Universal output 1	Root	
25		Normally open	
26		Normally closed	
27	Universal output 2	Root	
28		Normally open	
29		Normally closed	
30	Malfunction contact	Root	
31		Normally open	
32		Normally closed	
Distance (galv. insulation)			
33	Input power supply	Ground	20..24 V power supply voltage for circuit input.
34		Ground	
35	High level	+ input	
36		+ power supply	
37	Low level	+ input	
38		+ power supply	
39	Pressure switch	+ input	
40		+ power supply	
41	Motor protection	+ input	
42		+ power supply	
43	Hard water	+ input	
44		+ power supply	
45	Forced stop	+ input	
46		+ power supply	
Distance (galv. insulation)			
47	Universal input 1	- input, pot. free	For input voltages from 18 to 24 VDC
48		+ input, pot. free	
49	Universal input 2	- input, pot. free	For input voltages from 18 to 24 VDC
50		+ input, pot. free	

Terminal	Function	Type	Notes
Distance (galv. insulation)			
51	Universal current output 0/4...20 mA or 0-10V	Ground	With 51/52 jumper: voltage output, otherwise current output
52		Apparent ohmic resistance	
53		Output (against ground)	
54	CO/Temp combi-sensor unprocessed water / Q01, T01	Shield (ground)	
55		Temp. sensor A	
56		Temp. sensor B	
57		CO sensor A	
58		CO sensor B	
59	CO/Temp combi-sensor permeate / Q02, T02	Shield (ground)	
60		Temp. sensor A	
61		Temp. sensor B	
62		CO sensor A	
63		CO sensor B	
9-pin SubD (male)	RS232 interface	Ground	
		TxD transmitted data	
		RxD received data	

2.6.2 Connection assignment for RS232 data interface

This section describes the connection assignment of the RS232 interface. The interface corresponds to the PC/AT-RS232 interface (9-pin). In addition, the most important connection lines are illustrated.



It should be noted that the standard integrated RS232 interface must only be used by trained personnel for diagnostic purposes, and then only for short periods of time. For a permanent data connection, a galvanically insulated RS232 interface can optionally be retrofitted.

Pin assignment:

Contact	Des.	Function	Notes
1	-	-	
2	RxD	Data received (in)	
3	TxD	Data transmitted (out)	
4	DTR	Host ready message (out)	Connected with DSR internally
5	GND	Ground	
6	DSR	Output device ready message. (in)	Connected with DTR internally
7	RTS	Reception enable (out)	Not supported in standard configuration
8	CTS	Transmission enable (in)	
9	-	-	

Table 3: RS232 pin assignment

Layout of connection cables for the RS232 based on ... :

The pin types specified (m/f) refer to the data device, not to the connection cable.

Control device 9-pin. SubD, m.	PC conn./host 9-pin. SubD, m.	PC conn./host 25-pin SubD, m.	Modem 25-pin SubD, f.	Printer (serial) 25-pin SubD, f.
1	-	-	-	-
2 (RxD)	3 (TxD)	2 (TxD)	3 (TxD)	2 (TxD)
3 (TxD)	2 (RxD)	3 (RxD)	2 (RxD)	3 (RxD)
4 (DTR)	6 (DSR)	6 (DSR)	20 (DTR)	-
5 (GND)	5 (GND)	7 (GND)	7 (GND)	7 (GND)
6 (DSR)	4 (DTR)	20 (DTR)	6 (DSR)	-
7 (RTS)	8 (CTS)	5 (CTS)	4 (CTS)	-
8 (CTS)	7 (RTS)	4 (RTS)	5 (RTS)	4 (RTS)
9	-	-	-	-

Table 4: RS232 – layout of connection cable

Notes:

- In addition to the type of connection displayed, a three-wire connection is also possible for a PC connection host and modem. To do this, the DTR and DSR lines on the two data devices as well as the CTS and RTS should be connected to each other, so that 4 lines from data device to data device are eliminated.
- To connect a modem, the cable that came with the modem can generally be used directly.
- The connection to the printer may vary in some cases depending on the type of printer converter used. A converter must be operated in DTE mode (data terminal device).

2.7 Error diagnostics

The great majority of operating errors are detected by the control device and displayed as text messages. However, there are other internal sources of errors as well that cannot be displayed in text format for technical reasons.

The table below illustrates step by step error diagnostics. Each step (row in the table) consists of a question. If the answer to the question is **YES** you can follow along to the next step in the table. If the answer to a question is **NO**, on the other hand, an error is present. In this case the columns to the right contain possible causes of the error and information on how to eliminate it.

If the support of a service technician is required, this test should already have been performed to provide information on error steps and the status of the system to the technician.

Step	Question	Possible cause of error	Remedy for the error
1	Is the background lighting of the graphic display lit up? NO: → YES: The process power supply of the basic module is present. ↓	The module is not receiving any mains power supply. → Fuse F1 defective. → The connection cable between the I/O unit and the operator's station is not (completely) plugged in. → Display or other module defect. →	Check the mains power supply connection. Replace fuse F1. If fuse is triggered again, please contact the service department. Establish a proper connection. Report to service department.
2	Does the malfunction light flash after the unit is turned on, and is no operation possible? YES: → NO: ↓	Internal system error. In this case, the flashing code (Morse code) should be noted and reported to the service department. →	Report to service department.
3	Is there no message in the display indicating the unit was turned on? YES: → NO: ↓	Display or other module defect. →	Report to service department.
5	Control unit is ready for operation.		

Table 5: Error diagnostics

3.Data organization

Data in the control system is divided into groups. This ensures the highest level of flexibility and ease in replacing parts. For example it is possible to load operating parameters onto a device without having any effect on sensor calibration or the device ID.

Since changes in data structures are unavoidable when there are changes in the software, all data groups have identifications that provide information about their version. This prevents incompatible data from being exchanged when data is exchanged with the chip card.

The following data groups, which are relevant for the user, are stored on the EEPROM. This information is not lost when the power is turned off:

System data:

Data specific to the control unit such as device identification, location, hardware version, etc.

Parameter data:

System-specific data such as process parameters, settings, etc.

Calibration data:

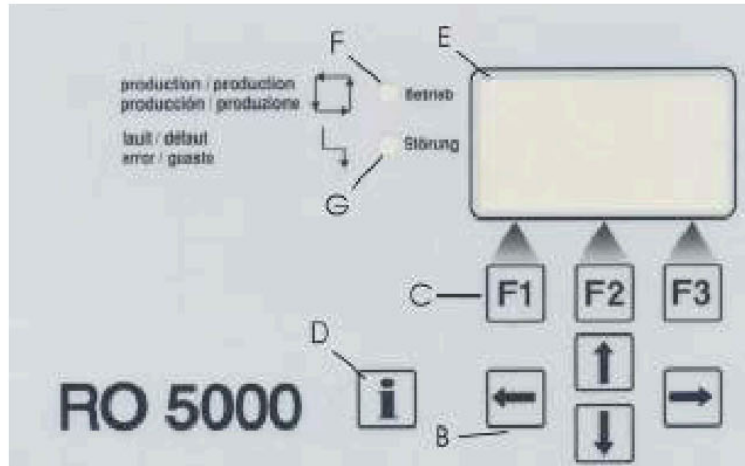
Sensor/actuator-specific data.

In addition, there is a **measurement data or log data** group for device-internal logging. In contrast to the data groups listed above, measurement data is stored cyclically in a special log RAM. This makes it possible to display or evaluate the status of the device or system subsequently. Depending on the amount of RAM present and the extent of measurement data to be recorded, the recording capacity of the log RAM may be up to 10,000 measurements.

For more information on logging, please see 4.2.9.

4. Operation

4.1 Control and display elements



	Name	Function
B		- Scrolling through masks - Control of the cursor - Password entry
C	Function keys	Depending on the menu in question, the current function is displayed above the key as an icon in the display.
		- ESC - Exit level/menu - Brings up logging
		- Brings up operating menu - Brings up log recording
		- Confirmation of entries - Brings up a menu - Mask rolling On/Off
D		- Brings up Help texts
E	Display	Display of: - Date/time - The current operating state - Operating parameters (CO, T) - Operating hours - Current messages/malfunctions
F	Operation LED (green)	Continuous --> System in operation Flashing: --> Maintenance request
G	Malfunction LED (red)	malfunction active

4.2 Basic principles of operation

4.2.1 Function keys

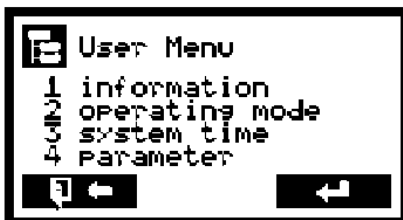
The majority of operating actions are performed with the function keys (**F1**, **F2**, **F3**). The function of the individual keys is assigned with the icons in the lower area of the display.

The icons that are used for the majority of operations are shown below:

	Exit function/menu, cancel entry (= Esc)
	Select function/menu, conclude entry (= Enter)
	Respond to question/decision with "Yes"
	Respond to question/decision with "No"
	Bring up log menu
	Bring up settings menu
	Turn off rolling masks
	Turn on rolling masks

The function key assignments (icons) that are used during the course of special functions are explained as part of the function description in question.

4.2.2 Menu selection



Mask 1: Menu selection

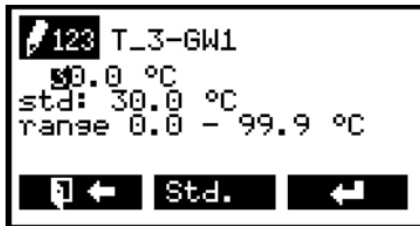
Menu items can be selected with the ► arrow located on the left edge of the display by using the ↑/↓ keys (scrolling is automatic for menus that are larger than the display). You can bring up the selected menu with **F3/Enter**.

Note:

- For the most part, menus are nested hierarchically, i.e., when you bring up a menu item, the system branches to an additional menu.
- You can generally exit a menu by pressing the **F1/Esc** key. This takes you back to the normal level.

4.2.3 Data editing

Editing is performed automatically with the editing mask described below.



Mask 2: Data editing

Mask layout:

Designation of parameter

Current parameter value

Default value

Permissible range of values

4.2.3.1 Procedure for data editing

The following keys are used for data editing:

  : Selection of the number to be edited

  : Setting of the desired value

 : Accepting the new parameter value

Note:

- Editing of alphanumeric characters (for example the adjusting the message text for universal inputs) takes place in a similar manner.

4.2.4 Access level authorization

Different menu ranges, functions and settings are locked by a four-digit numeric password. A distinction is made between the following hierarchical password levels (authorization levels):

Password level	Password designation	Status when delivered	Access authorization required for
1	User	"1234"	Access authorization level 1
2	Technician	"3456"	Access authorization level 2
3	Administrator	"7095"	Access authorization level 3

Password entry can be requested with the following mask.



Mask 3: Password entry

The corresponding password must be entered (see 4.2.3.1) according to the level displayed in the mask. If the correct password is entered, the program will continue with the function requested.

If an incorrect password is entered, or if the **F1** key is pressed, the function will be interrupted.

Note:

- The password can be changed in the Parameter menu and in the Technician menu.
- When entering a password for a given level, it is also possible to enter a password for a higher level. Since access authorization that remains in effect until the parameter menu is exited once it has been granted, there is no need to enter (higher) passwords for functions that extend further.

4.2.5 Confirmations

For reasons of safety and security, and to avoid improper operation, certain functions require confirmation before they are performed. The following mask is used for this purpose:



Mask 4: Input confirmation

Pressing the **F3/Enter** key causes the requested function to be performed. Pressing the **F1/Esc** key causes the function to be cancelled.

4.2.6 Calibration

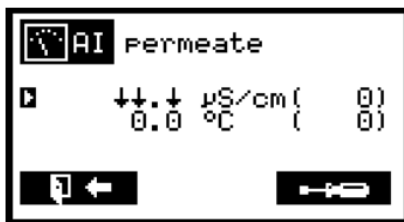
To compensate for measurement errors caused by fluctuations in sensors and measurement amplifiers, the analog inputs and outputs can be calibrated with the aid of reference measurements. In this process, the value of one lower and one upper known reference value are programmed using a Teach-in procedure and the range in between these values is filled in through linear interpolation.

Note:

- Precise calibration of the CO is only possible with a correct temperature measurement (of the corresponding sensor). In some cases, a temperature calibration must therefore be performed before a CO calibration.
- Teach-in for the lower and upper calibration points can be performed independently of each other.
- The value of the lower/upper calibration point must be less than 25% /more than 75% of the physical measurement range. Otherwise an error message will be generated, since it will be assumed there is a defect in the sensor or internal measurement amplifier.
- The calibration overview can also be used as a simple display of the logical measurement values and the converter value.
- If no reference variable/measurement devices are available, the calibration can also be set to an internal default value in extreme cases. The calibration reset can be performed separately for each measurement system in the respective calibration mask (with the $\rightarrow$ key) or globally for all analog inputs/outputs in the Technician menu item – System Reset – Calibration Data).

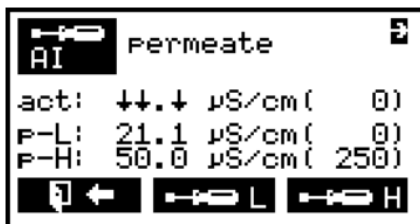
4.2.6.1 Calibration – analog input

After you bring up the calibration menu, the following overview mask of all analog inputs is displayed. In addition to the input designation, the current measurement value ("log.") and the raw converter value ("phys", in parentheses) are displayed.



Mask 5: Calibration – analog input, overview

The $\uparrow/\downarrow$ keys and the **F3** key can be used to select the input to be calibrated and to branch to the following calibration mask. The current measurement value as well as the lower and upper calibration points are displayed here as logical values and as raw converter values.



Mask 6: Calibration – analog input, adjustment

The calibration takes place in the following steps:

1. Assigning a reference value to the sensor. The value used for this purpose must be allowed to reach equilibrium for a sufficiently long period of time (until the converter value no longer changes).
2. Press the **F2/F3** key to adjust the lower or upper calibration point respectively.
3. Enter the measured value with the reference measuring device.
4. The new calibration point can be accepted by pressing the **F3** key.

4.2.6.2 Calibration – analog output

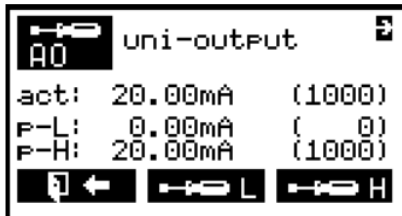
Output calibration is performed in a manner similar to input calibration. Since it is not possible to create an actual value "externally" in this case, however, there is an option for stimulating the output in the overview mask with the $\leftarrow/\rightarrow$ keys, i.e. setting it to the desired reference points.

Notes:

- The step width of the $\leftarrow/\rightarrow$ keys can be varied between x1, x10 and x100 with the **F2** key. The current step width is displayed correspondingly.
- To be able to adjust (calibrate) an output that is completely out of adjustment, the stimulation always affects the converter value and not the logical value.



Mask 7: Calibration – analog output, overview



Mask 8: Calibration – analog output, adjustment

The calibration takes place in the following steps:

1. Assigning a reference value with the aid of the $\leftarrow/\rightarrow$ keys while at the same time measuring the output value with an external reference measuring device.
2. Pressing the **F2/F3** key in order to adjust the lower/upper calibration point respectively.
3. Input of the real output value (see external reference measuring device) and input of this value (numeric editing).
4. The new calibration point can be accepted by pressing the **F3** key.

4.2.7 Hardware diagnostics

Hardware diagnostics allows for direct manipulation or display of the outputs and inputs of the control device.



PLEASE NOTE!!!

No sort of monitoring takes place within hardware diagnostics. It should therefore be used only by properly trained personnel.

4.2.7.1 Diagnostics – digital input

The following mask displays all digital inputs in binary form. You can use the $\leftarrow/\rightarrow/\uparrow/\downarrow$ keys to select one of the inputs with a cursor. The designation and actual status of this input will then be displayed in text format.



Mask 9: Diagnostics - digital input

4.2.7.2 Diagnostics – digital output

The following mask can be used for binary display and to manipulate all digital outputs. You can use the $\leftarrow/\rightarrow/\uparrow/\downarrow$ keys to select one of the inputs with a cursor. This input's designation and status will then be represented in verbal form. The **F2/F3** keys can be used to perform the manipulations. This function provides the technician with the possibility of testing the hardware.



Mask 10: Diagnostics - digital output

4.2.7.3 Diagnostics – analog input

Diagnostics of the analog inputs correspond to the Analog Input calibration menu (see 4.2.6.1).

4.2.7.4 Diagnostics – analog output

Diagnostics of the analog outputs correspond to the Analog Input calibration menu (see 4.2.6.2).

4.2.7.5 Diagnostics – pulse inputs

Diagnostics contains an overview list in which the states of all pulse inputs are displayed. No additional operation is possible.

4.2.8 Chip card

The chip card can be used to copy system data, parameter data and calibration data conveniently and to exchange it with other devices.

Before it can be used, the chip card must first be formatted. Then the entries must be created for the desired data

Note:

- If entries are not already present, they are copied automatically before copying.
- Only one entry can be created for each group on a card. Thus for example the parameters of multiple devices cannot be stored in parallel on a single card. Multiple cards would be required for this purpose.
- Since the storage space of the card is limited (for SLE4428 = 1 kByte) in some cases it may only be possible to store part of the data groups on one card at the same time.
- Since both the data version and the length of the group are stored in an entry when it has been created, the chip card must first be reformatted when a new data version is used.

The following menu is available for working with the chip card:



Mask 11: Chip card menu

The chip card status is displayed as follows in the upper right corner:

Status	Cause	Remedy
MISSING	No chip card is present, or it is not inserted completely	Insert the card completely
SWITCHED	Card inserted incorrectly/twisted	Insert the card correctly (chip must point at the motherboard)
UNKNOWN	Unknown chip card (for example a tel., Kv-, or EC card)	Use only cards of type SLE 4428 (Siemens)
N.FORM	Card is OK, but not formatted yet	Perform card formatting with the "Format" menu item. PLEASE NOTE!!! All data on the card will be deleted during this process
W.DEVICE	Card is OK, but has been used in connection with another device.	Perform card formatting with the "Format" menu item. PLEASE NOTE!!! All data on the card will be deleted during this process
OK	Card is OK	

Table 6: Chip card status

4.2.8.1 Copying from the control unit to the chip card

Before you can perform this operation, the card must be inserted and must have the status "OK" (otherwise see Table 6: Chip card status)

Data is copied **onto** the chip card in the following manner:

Example: Storing parameter data

1. Select the menu item **Parameter => card**.
2. If there is not yet any parameter entry on the chip card, the creation of the entry must be confirmed with the **F3** key.
3. There now follows a confirmation query, whether the parameter data already on the card should be overwritten.
4. Data can be copied onto the card with the **F3** key. The function can be interrupted with the **F1** key.

4.2.8.2 Copying from the chip card to the control system

Before you can perform this operation, the card must be inserted and must have the status "OK" (otherwise see Table 6: Chip card status)

Data is copied **from** the chip card in the following manner:

Example: Loading parameter data

1. Select menu item **Card => Parameters**. If there is no parameter data on the chip card, the process is interrupted with a message.
2. There now follows a confirmation query, whether the parameter data already in the control system should be overwritten.
3. Data can be copied onto the control system with the **F3** key. The function can be interrupted with the **F1** key.

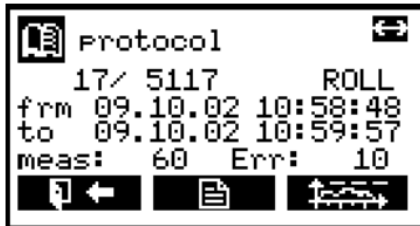
4.2.9 Logging

Logging runs permanently in the background and can record the following types of data:

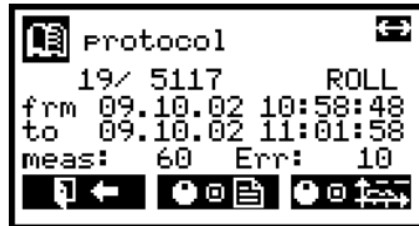
- States of the digital inputs and outputs
- Values of the analog inputs (conductivity, temperature)
- Value of the analog output
- Error messages

4.2.9.1 Input mask

After the log has been called up, the following mask first appears:



Mask 12: Log menu - page 1



Mask 13: Log menu - page 2

The following information is displayed in the input mask:

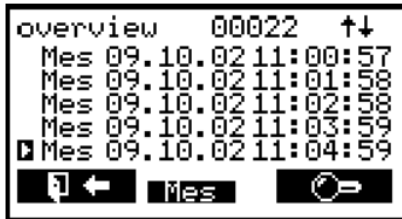
- The number of previously saved log data records / the maximum number that can be saved.
- Recording type (ROLL, FIXED or OFF):
 - ROLL** = Rolling recording. When the log memory has been written to until it is full, recording continues and the "oldest" data records will be deleted.
 - FIXED** = When the log memory has been written to until it is full, no further logging will take place.
 - OFF** = Logging is deactivated.
- Date and time of the "oldest" log data record (**from**).
- Date and time of the most recent log data record (**to**).
- Memory interval for logging with normal status.
- Memory interval for logging in the event of an error.

The following selection options are available for the user:

- **F1** key: Exit the log menu.
- **F2** key: Display the log data records.
- **F3** key: Graphic display of the log data records (optional).
- **←/→** Keys: Page switching, i.e. a new assignment is given to the **F2** key:
 - F2** key: Configuration mode for normal display.

4.2.9.2 Display of logging data records in normal display

The five last logging data records are always displayed when this screen appears.



Mask 14: Logging data record menu

The first value indicates the type of the logging data record:

MES = Normal measurement data record
 ErA = Error data record, error has occurred
 Er = Error data record, error persists (automatic recording after error interval)
 ErG = Error data record, error is gone, i.e. error is no longer present
 ErQ = Error data record, error has been manually acknowledged.

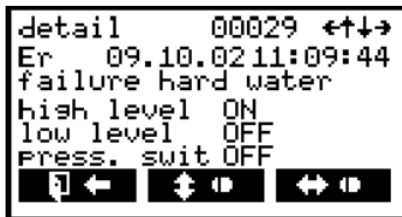
The following data specifies the date and the time of recording.

The following selection options are available:

- **F1** key: Back to the log menu.
- **F2** key: Change display mode. This determines which data records will be displayed. In Mode 1, all logging data records are displayed. In Mode 2, only error data records are displayed.
- **↑/↓**Keys: Switch back and forth between log data records (previous/next)
- **F3** key: Brings up a detailed display of the selected data record

4.2.9.3 Display of logging data records in the detailed display

Selected measurement data with corresponding values are displayed in the detailed display. The procedure for selecting measurement data is described in Section 4.2.9.5.



Mask 15: Log detailed view

The following selection options are available:

- **F1** key: Back to the overview display.
- **F2** key: Select step width for the **↑/↓** keys. There are 3 step widths 1, 5 and 20.
- **F3** key: Select step width for the **←/→** keys. There are 2 step widths 1, and 3.
- **↑/↓**Keys: Switch back and forth between log data records (previous/next)
- **←/→** Keys: Change between the recorded measurement values of a logging data record if available.

4.2.9.4 Display of logging data records in the graphic display

(Future option)

4.2.9.5 Configuration of logging data records

When you bring up the configuration menu, the following mask appears:



Mask 16: Log configuration menu

This mask allows you to select the recording mode as well as the display of time intervals for logging in normal mode and in the event of an error.

The following selection options are available:

- **F1** key: Back to the log menu.
- **F2** key: Display of all flags, inputs and outputs that can be stored.
- **↑/↓** keys: Switch to the previous/next parameter.
- **F3** key: Editing of the parameter value.

Selection of the log data to be stored:

After you have pressed the **F2** key, a list of recordable data appears.

- **F1** key: Back to the configuration display. A confirmation query appears here asking you whether the selection you have made should be kept, since logging memory may in some cases be deleted.
- **F2** key: Reset all selections made.
- **F3** key: Selects/deselects a piece of measurement data.
- **↑/↓/←/→** Keys: Switches to the next selectable measurement value (**←/→** with larger jump width).

4.2.10 SMS processing

The control device is able to send SMS to up to five different phone numbers in case of errors or warnings.

Condition: "Parameter → 14 SMS parameter → send SMS" is set to "On"

The SMS is sent to a "Short Message Service Centre" (SMSC) via an analog modem. The SMSC forwards the SMS to the network of the receiver number. There are SMSC, however, that can only send SMS within their own network.

A message consists of the following:

Installation identification/system time/system date/ error | warning

Example: „AB4567890/14:11:59/05.02.04/ demin.rate ST2“

The time indicates the start time of the sending process (→ occurrence of the 1st error + time delay).

All errors and warnings occurring before or within the SMS time delay will be considered by the SMS. As soon as the sending process starts, the SMS generated can no longer be changed. If the sending process fails (e.g. if the SMSC number is busy), the system tries twice to resend the SMS. If this still fails, the process is aborted and SMS are no longer sent until new errors or warnings occur.

4.2.10.1 "Send SMS"

With this option the SMS processing (in case of error/warning) can be switched "ON" or "OFF". If the "send SMS" option is switched off, the control device will not send any SMS via modem to the SMSC.

4.2.10.2 "Time delay"

This option determines how much time should pass before the first SMS is sent after the first warning or error. The greater the time delay is, the more error messages can be collected for an SMS.

4.2.10.3 "Send warning"

If warnings are to be notified via SMS as well, this parameter has to be set to "ON". Otherwise it must be set to "OFF".

4.2.10.4 "Provider"

This is the telephone number the control device uses to try to contact the SMSC forwarding the SMS to the message receiver. Please note that in case of an extension line a leading "0" must be dialed.

The result is the number the modem will dial!

There are SMSC able to send SMS into all telephone networks and others that can only send messages within their own network.

The following numbers have been tested by the manufacturer:

■ VIAG O2

001797673425 (with a leading "0" due to the extension line)

This provider sends SMS into all networks, though SMS processing takes up to 2 minutes and, from time to time, the provider can only be accessed upon several trials.

■ D1

001712521002 (with a leading "0" due to the extension line)

This SMSC serves only receivers within the D1 network. The time taken per SMS, however, is much shorter than with VIAG O2 and the access is much better as well.

These are the service numbers of some providers. Please note that, in the course of time, some of these numbers may change or be deactivated. In such cases, a new provider has to be looked for who is able to process SMS via modem using the protocol "TAP" (or "TAP 97", Telocator Alphanumeric Protocol).

4.2.10.5 "Receiver number 1 to 5"

The phone numbers of the receivers that are to be sent an SMS must be indicated in "REC. 1" to "REC. 5". Please take note that the leading "0" must always be replaced by the country code "49" (e. g. "0179xxx" → "49179xxx").

(These numbers are not called directly, but transmitted to the SMSC as target numbers.)

If a number consists only of "49" or text, the receiver will not be processed. It is also possible to deactivate a receiver by entering a character (not a digit) after the "49" (e. g. "49/79xxx").

5.Parameter list

Parameter setting level:

Menu	Parameter	Format/unit	Selection/ setting limits	Default setting	User setting
1 CO limit values					
	limit1 perm.	According to the selected measurement range		Meas. range 1: 20.0 Meas. range 2: 40.0 Meas. range 3: 1500	
↓	limit2 perm.	According to the selected measurement range		Meas. range 1: 30.0 Meas. range 2: 50.0 Meas. range 3: 1800	
	CO_3-GW1	According to the selected measurement range		Meas. range 1: 15.0 Meas. range 2: 5.0 Meas. range 3: 20.0 Meas. range 4: 40.0	
	CO_3-GW2	According to the selected measurement range		Meas. range 1: 2.0 Meas. range 2: 0.5 Meas. range 3: 30.0 Meas. range 4: 50.0	
2 T-limits					
	T-Perm_min	xx.x °C	0.0 - 99.9	5.0	
	T-Perm_max	xx.x °C	0.0 - 99.9	40.0	
	T_3-GW1	xx.x °C	0.0 - 99.9	30.0	
	T_3-GW2	xx.x °C	0.0 - 99.9	40.0	
3 timers					
	t-GW1-Delay	xxx s	0 - 999	60	
	t-GW2-Delay	xxx s	0 - 999	300	
	t-CO_3-GW1	xxx s	0 - 999	60	
	t-CO_3-GW2	xxx s	0 - 999	300	
	t-T-Delay	xxx s	0 - 999	60	
	t-hardw-delay	xxx s	0 - 999	10	
	t-press.low	xxx s	0 - 999	8	
	t-press.delay	xxx s	0 - 999	10	
F3	t-press.exist.	xxx s	0 - 999	60	
	t-rinse	xxx min	0 - 999	0	
	t-rinse-inter.	xxx h	0 - 999	0	
→	t-concentrate	xxx s	0 - 999	60	
	t-disp._min	xxx s	0 - 999	5	
	t-disp._max	xxx min	0 - 999	60	
	t-maint.	xxxxxx h	0 - 999999	3500	

Menu	Parameter	Format/unit	Selection/ setting limits	Default setting	User setting
4 sel. hard water			- shut-down - continue	shut-down	
5 sel.cond.high			- shut-down - continue	continue	
6 sel.T-high			- shut-down - continue	continue	
7 sel.CO_3 high			- shut-down - continue	continue	
8 sel.T_3 high			- shut-down - continue	continue	
9 sel. acknowl.			- Without password - With password	Without password	
10 sel. concentrate			- Displacement - Rinse	Displacement	
11 Technician level	Bring up Technician level				
12 operation	Display of operating hours				
13 user password		4-place code	0000 - 9999	1234	
14 SMS parameter					
	send sms		- On - Off	Off	
	delaytime	s	0 - 999	40	
	send warn.		- On - Off	Off	
	Provid.		max. 13 digits	001797673425	
	Rec.1		max. 13 digits	49	
	Rec.2		max. 13 digits	49	
	Rec.3		max. 13 digits	49	
	Rec.4		max. 13 digits	49	
	Rec.5		max. 13 digits	49	

Technician level:

Menu	Parameter	Format/unit	Selection/ Setting limits	Default setting	User setting
1 equipm. type			- RO - RO + EDI	RO	
2 text CO_3			Free setting option for display text	Empty text	
3 text T_3			Free setting option for display text	Empty text	
4 sel. sens.feed			- enabled - disabled	disabled	
5 sel. tank type			- With overflow - no overflow	With overflow	
6 pumps					
	sel. pumps		- series - alter.	series	
	pump change		- Tank full - time-contr.	Tank full	
	t-alternate	xxx min	0 - 999	480	
	t-delay-pump 2	xx s	0 - 99	5	
7 inputs					
	forced stop		- Normally closed - Normally open	NO	
	motor protection		- Normally closed - Normally open	NO	
	hard water		- Normally closed - Normally open	NO	
	press. switch		- Normally closed - Normally open	NO	
	min level		- disabl. - Normally closed - Normally open	disabl.	
	max level		- Normally closed - Normally open	NO	
	universal 1		- Normally closed - Normally open	NO	
	universal 2		- Normally closed - Normally open	NO	
8 range selection					
	CO-fewa	Meas. range 1 Meas. range 2 Meas. range 3	- 0.002 – 0.2 mS/cm - 0.02 – 2.00 mS/cm - 0.5 – 50.0 mS/cm	0.02 – 2.00	
	CO-perm.	Meas. range 1 Meas. range 2 Meas. range 3	- 0.5 - 50.0 µS/cm - 2 - 200 µS/cm - 20 - 2000 µS/cm	2 - 200	
	CO_3	Meas. range 1 Meas. range 2 Meas. range 3 Meas. range 4	- 100.0 – 1.0 MΩ cm - 10.0 – 0.1 MΩ cm - 0.5 - 50.0 µS/cm - 2 - 200 µS/cm	100 - 1	

Menu	Parameter	Format/unit	Selection/ Setting limits	Default setting	User setting
9 analog output					
	sel. outp. val.		- CO-feed water - CO-permeate - CO_3 - T-feed water - T-permeate - T_3	CO-permeate	
	sel. outp. type		0 - 20 mA/0 - 10 V 4 - 20 mA	4 - 20 mA	
	full		Depending on <i>sel. outp. val.</i> and evaluated measurement range		
10 meas./calibr					
analog output					
	uni output	%	p-L: 0 - 100 p-H: 0 - 100	0 100	
analog input					
	CO feed water		Depending on Measurement range		
	T feed water		Depending on Measurement range		
	CO permeate		Depending on Measurement range		
	T permeate		Depending on Measurement range		
	CO_3		Depending on Measurement range		
	T_3		Depending on Measurement range		
11 diagnosis					
	digital output		- LED operation - LED failure - DO_collect. fault - DO_pre-warning - DO_uni-output - DO_pump 1 - DO_pump 2 - DO_MV1 - DO_MV2 - DO_MV3		
	digital input		- DI_high level - DI_low level - DI_press. switch - DI_motor protection - DI_forced stop - DI_hard water - DI_uni input 1 - DI_uni input 2		
	analog output		0 - 20 mA		
	analog input		- AI_CO-feed water - AI_CO-permeate - AI_CO_3 - AI_T-feed water - AI_T-permeate - AI_T_3		

Menu	Parameter	Format/unit	Selection/ Setting limits	Default setting	User setting
12 chip card					
	Param. --> Card				
	Card --> Param.				
	Calib. --> Card				
	Card --> Calib.				
	Format card				
	Display contents				
13 universal IOs					
	uni-DI1-text		Free setting option for message text	Empty text	
	uni-DI1-rea.		- No response - Message only (like "1" in the malfunction matrix) - Turn off system (like tank full) - Emergency switch-off (NAZ) - System requirement	No	
	uni-DI1-active	Selection 1: disposal 0 / I prod. active 0 / I concentrate 0 / I disc. rinse 0 / I disinfection 0 / I forced stop 0 / I fail. hard water 0 / I failure CO 0 / I Selection 2: fail motor prot. 0 / I always enabled 0 / I		0 0 0 0 0 0 0 0 0 0 0	
	uni-DI1-delay.	xxx s	0 - 999	0	
	uni-DI2-text		Free setting option for message text	Empty text	
	uni-DI2-rea.		- No response - Message only (like "1" in the malfunction matrix) - Turn off system (like tank full) - Emergency switch-off (NAZ) - System requirement	No	
	uni-DI2-active	Selection 1: disposal 0 / I prod. active 0 / I concentrate 0 / I disc. rinse 0 / I disinfection 0 / I forced stop 0 / I fail. hard water 0 / I failure CO 0 / I Selection 2: fail. motor prot. 0 / I always enabled 0 / I		0 0 0 0 0 0 0 0 0 0 0	
	uni-DI2-delay.	xxx s	0 - 999	0	

