

TDS/EC controller (liquid density and conductivity meter)

EC measurement range: 0-9,999 ppm (ppm/cm)

TDS measurement range: 0-4,995 ppm (mg/l)

Temperature measurement range: 1-80 °C

Resolution: 0-9,999: 0.1 ppm, 1,000-9,999: 1 ppm

Accuracy: ±2% (of readout); Thermometer: ±1 °C

Temperature compensation: automatic (ATC) (1-60 °C)

Calibration: Pushbutton-actuated digital calibration

Setpoint: A set point with value set using the UP/DOWN button (within the specified range)

Standard setpoint: 10 ppm

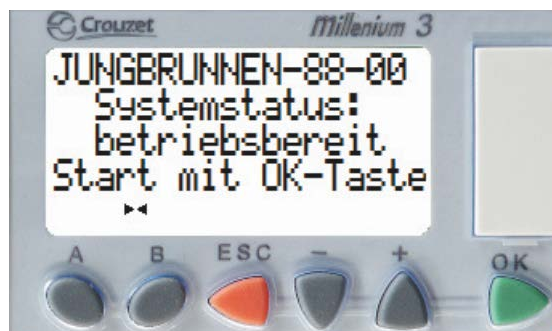
User Instructions

1. The controller is started up once the device begins to produce water.
2. Open the controller cover by gently pulling it down.
3. To change the temperature mode, press the °C/°F button once. This will toggle the temperature between degrees Fahrenheit and Celsius.
4. To switch between TDS and EC measurements, press and hold the MODE button. You can use it to toggle between ppm and µs.
5. When in standby mode, Jungbrunnen 88-00 will switch the controller off automatically. (There is no ON/OFF button.)

Setting the control setpoint (TDS)

1. Press the SET button once to set the controller setpoint (in order to activate the device or the relay). A blinking "SET" will appear on the temperature display.
2. Press the UP or DOWN button until the desired setpoint is reached. Pressing the button once increments or decrements the measured value by one unit. Holding the button will make the value change faster.
3. Press the SET button again to save the setpoint.
4. If the set value is exceeded, the relevant message shall be sent to the system control unit.

Menu A provides information on the operating status of the Jungbrunnen 88-00 module



The message in **Figure 1** is shown:

- after connection to 230 V mains.
- once permeate production is off*
- after accepting a fault in order to delete it*
- by pressing button A (in menu B)

* by pressing the ESC button.

Figure 1

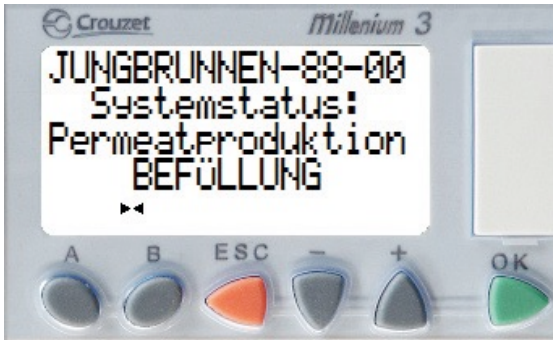


Figure 2

The message in **Figure 2** appears every time after start-up with the green OK button, provided that there has been a "request", i.e. the pressure switch has signalled that the permeate is required (contact closed).

Filling and venting the device is especially important if the device is without water or partially emptied, i.e. when it has been started up after changing the prefilter or other maintenance measures. It may take some time for the device to be vented and for initial pressure

required for safe operation of the pump to be established. The throttle valve should be fully opened to ensure proper venting. The pump is self-venting. Gurgling and sounds of flowing water can be heard.

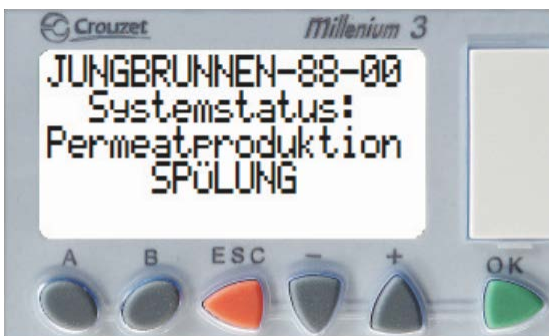


Figure 3

After reaching the appropriate pressure value, the message in **Figure 3 – Flushing** (Spülung) is displayed and, if the pressure continues to rise as indicated by the pressure gauge, the pump is switched on in a time-controlled manner.

If cavitation noises (which may be caused by trapped air) are heard, the flushing process must be aborted immediately by pressing the ESC key. After stopping, the unit can be restarted with the OK button.

The initial pressure monitor usually responds faster: air suddenly escapes, there is a pressure drop to which the pressure controller responds immediately, and the flushing process is aborted, while the screen shows the "No water" (Wassermangel) message. After stopping, restart the unit with the OK button.

If the pump is running smoothly without cavitation noises, the pressure at the membranes can be slowly increased up to ca. 13 bars. To this end, the throttle valve is operated by slowly and evenly turning the handle in the direction of the + arrow.

Once 13 bar membrane pressure has been reached, you are in the operating range. Rapidly decreasing values can be observed on the display of the conductivity monitor (->). The membranes need time to reach their filtering characteristics before the desired water quality with a sufficiently low salt content is achieved. Flow rate of the membranes depends on pressure and temperature. Working pressure can be adjusted at the throttle valve (up to a maximum of 20 bars). If 20 bars are exceeded (this includes pressure peaks not visible at the pressure gauge), the module is switched off and a fault message (->) is displayed.

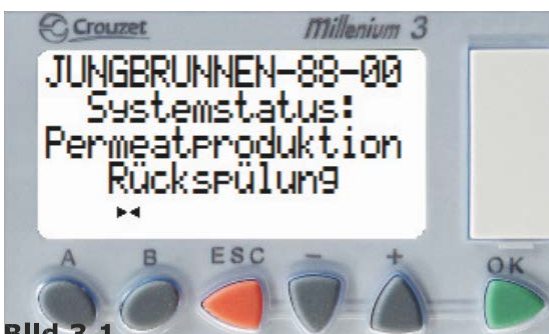


Figure 3.1

Permeate production

Consistent quality of the permeate is ensured by continuous measurement of its electrical conductivity as the equivalent of residual dissolved salts content. If the value selected on the conductivity meter (EC-) is exceeded, flushing is carried out; when it is reached again, permeate is released. The flushed permeate is not discarded but returned to the water system after prefiltration. The display shows "Backward flushing" (Rückspülung) as in **Fig. 3.1**. In addition to saving water, this process has the advantage of the permeate reaching the previously set conductivity value faster.

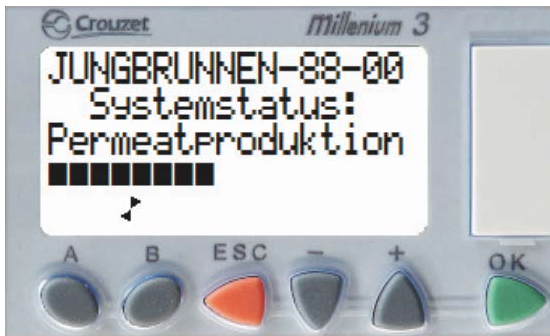


Figure 4

The permeate is pressed into adjacent storage tanks. The flow bar represents permeate flow. Permeate production is ended:

- by the pressure sensor, when full (5,6)
- by using the ESC button (1)
- in case of shutdown due to malfunction (7)

() Messages displayed after switching off

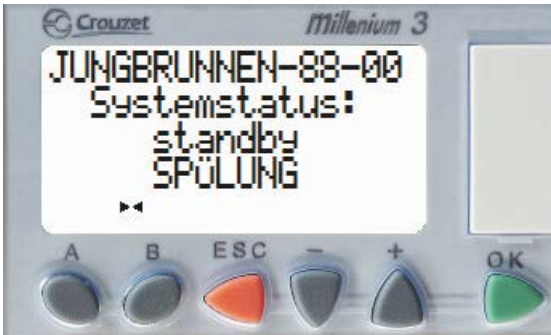


Figure 5
 The device is in standby mode
 The flush valve is open and the device is empty

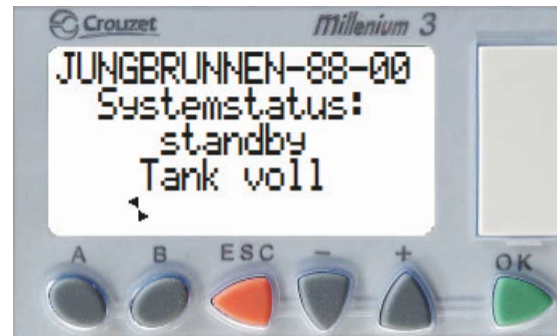


Figure 6
 Full tank (100%)

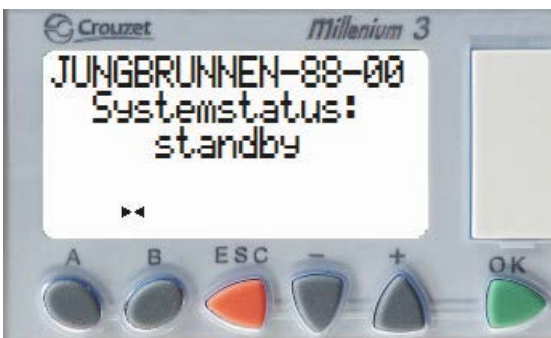


Figure 7
 The device is awaiting a request for permeate

Menu S provides information on shutdowns used to protect Jungbrunnen 88-00
 Sensors monitor and send information about device status to the device control system to prevent possible damage due to overload, component failure, or incorrect operation.



Figure 8

Separately fused and monitored voltage is supplied to all sensors to prevent faulty switching in the absence of a signal.



Figure 9

A screen in Menu S is called up and shutdown is performed automatically when a fault occurs. The display shows the cause and time of shutdown. The display has top priority. No other menu (A or B) can be called up until the fault message has been accepted. After confirming the fault by pushing the ESC key, the message in **Figure 1** (->) appears on the display and production can be resumed with the OK button.

For operation at membrane pressure of 20 bars, 2/3 of motor rated power are required. Triggering probably has mechanical or electrical causes.



Figure 10

The pump requires a certain minimum inlet pressure (-> Manual). Therefore, the pressure between prefilter outlet and pump inlet must be monitored. If the flow pressure upstream of the pump is too low, i.e. the volume of water for the pump is insufficient, flushing and permeate production are stopped. Water shortage may be caused by:

- escaping residual air during start-up,
- max. prefilter capacity already achieved,
- pressure fluctuations in supply lines.

The operating pressure must be monitored (**Figs. 11 and 12**) in order to protect the device, its components, lines, and pressure vessels against overload, possible bursting as well as excessive pressure and its consequences. The pump can generate pressures of up to 80 bars but membrane covers can withstand an operating pressure of 21 bars only!



Figure 11

The pressure gauge indicating membrane pressure is glycerine-filled to dampen vibrations. Occurring pressure peaks are not displayed. The following should also be taken into account when adjusting the membrane pressure:

If the pressure rises too quickly, the device may be shut down due to excessive pressure, even though the pressure gauge is still indicating a lower pressure due to greater damping. The medium temperature is decisive for the flow rate of the membranes.

If the temperature drops from approx. 12 to 10 °C, an increase in pressure of approx. 1 bar can be expected (with the same throttle setting).



Figure 12

Excessive permeate pressure can be caused, for example, by backflow in the permeate drainage system. It is possible that solenoid valves or shut-off valves have not opened.

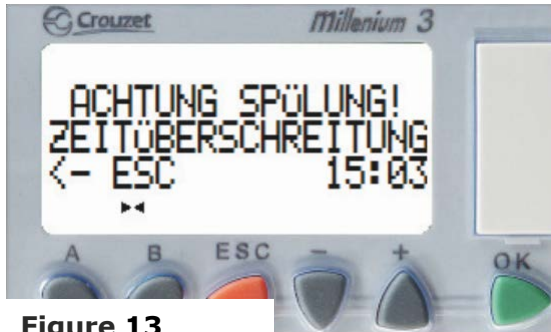


Figure 13

Figure 13

If the flushing time, limited to 5 minutes, has passed and the value has not been reached, the screen in **Fig. 13** is called up and permeate production is stopped.

If the displayed conductivity value is much greater than the setpoint, a defect cannot be ruled out.

If the actual value only slightly deviates from the target value, but does not reach it or drop below it, or if it is "oscillating" around the target value, you can try to improve the value by changing the membrane pressure.

A slight increase in the setpoint also helps.

Menu B provides information on operating data from the Jungbrunnen 88-00 module

The system control unit records or supports recording of the following data:

- [14] prefilter operating time
- [15] resetting and saving this data with date, necessary e.g. in filter replacement
- [16] operating time of the permeate production module
- [17] resetting and saving this data with date, necessary e.g. in filter replacement
- [17] pump data: how often it is started and how long it has been running (in days, hours, minutes)
- Date of commissioning at the customer's site (day, month, year)

With the exception of a fault and a fault screen being displayed, the menu B can be called up at any time by pressing the B button; to return to menu A, press the A button.



The figures referred to above

Wyżej wymienione



Figure 14

Rysunek



Figure 16

The screens from **Figures 13, 14 & 16** may be seen during production in progress – they show progress of the process. During production, the displayed flushing time must be 0 s. At constant medium temperature (displayed on the EC monitor) and constant membrane pressure, the quantity of permeate produced can be easily estimated based on the determined flow rate /T/p.

To reset operating hours (**Figs. 14, 16**), select the option in **Fig. 15** or **17** (reset for 14 → Fig. 15; reset for 16 → Fig. 17). This is useful for changing the prefilter.

Example: If the operating hours are reset immediately after replacing the filter, you can directly compare data of the “last filter operating cycle” with data of the current cycle: **Fig. 14** shows the current operating time of the device, “00002 hrs 52 min”. So the module has been in operation for 2:52 h since the filter replacement (“00000 hrs 00 min” after reset). **Fig. 15** shows current operating hours displayed before the reset in **Figure 14**, “00054:35” and the reset date, “11/03/2017”. This description for the example using **Figs. 14/15** applies to **Fig. 16/17** analogously.

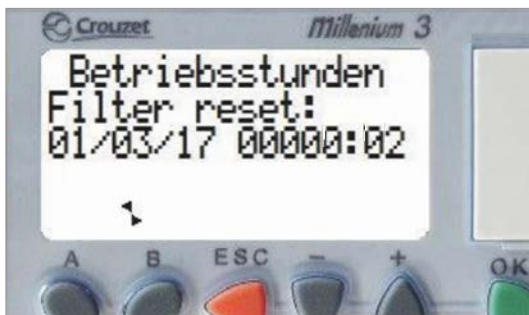


Figure 15



Figure: 17

Resetting:

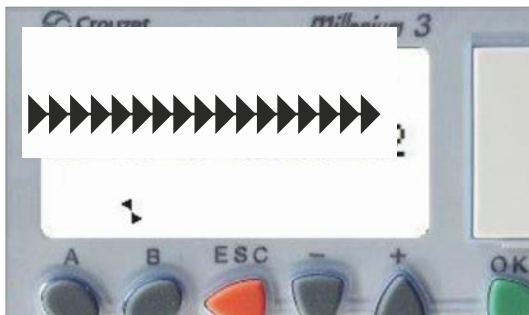
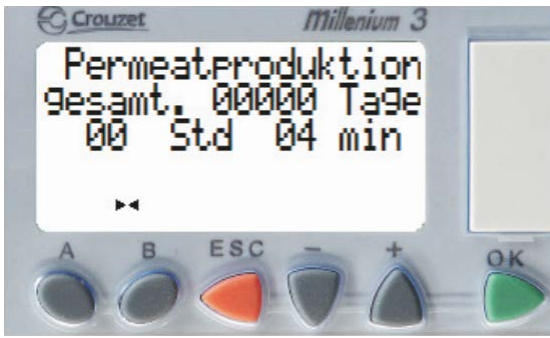


Figure 18

- Call up the screen from **Fig. 15** or **17**
- Press and hold keys [B] and [-] together!
- The displayed operating time has been deleted.
- There is a trend arrow running across the screen from left to right. When the bar is no longer displayed, you can release the buttons. The reset has been completed.
- As long as the bar is visible, the process can be cancelled by releasing the buttons.



The screen in **Figure 19** provides information on the total permeate produced by the device in days, hours, and minutes.

Figure 19



The screen in **Figure 20** provides information about how many times the pump has been turned on and how long it has been running, to be interpreted as follows: ("00013 x Pump ON") and ("Pump ON: 00002 days 06 hrs 31 min")

Figure 20



The commissioning date shown in **Fig. 21** is automatically saved during the first start-up at the customer's site when the required pump pressure is reached. Note: The unit is thoroughly tested at the factory. Data recorded during the tests is reset before delivery!

Figure 21

The Jungbrunnen 88-00 can optionally be retrofitted with a UVC (disinfection) lamp for permeate post-treatment.

This process takes place outside the device. Electrical ballast (EVG) is controlled and monitored by the PLC of the device. To this end, the EVG connecting cable must be connected to the cable from Jungbrunnen 88-00 by means of the supplied terminal box:

Wire 1 – Terminal 1; Wire 2 – Terminal 2; Wire 3 – Terminal 3.

UVC light is turned on when permeate is being released from Jungbrunnen or turned off when the permeate is no longer produced.



Pic. 1

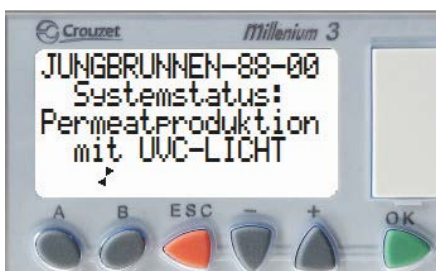
Operation of EVG is controlled. As long as the UVC light is on, the PLC receives feedback from EVG. If this feedback fails, permeate production is stopped and a fault message is displayed (Pic. 1).

You can choose to proceed with permeate production without UVC light (OK button)= -O or abort it (ESC button).



Pic. 2

Operating status of the UVC lamp is displayed alternately with the flow bar (Pic. 2) and (Pic. 3) or the "production w/o light" message (Pic. 4).



Pic. 3



Pic. 4