



Title: Sanitization of Ultrafiltration Distribution System

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1.0 OBJECTIVE

1.1 To describe a procedure for the sanitization of Ultra filtration Distribution System.

2.0 SCOPE

2.1 This procedure applies to the Engineering department.

3.0 RESPONSIBILITY

3.1 Engineering

4.0 ACCOUNTABILITY

4.1 Plant Head

5.0 REFERENCE (S)

5.1 In-house.

6.0 PROCEDURE

6.1 INITIAL FLUSHING AND SANITIZATION OF THE ULTRAFILTRATION SYSTEM

As the UF cartridge is shipped moist, an initial flux is required each time a new cartridge is used.

A) INITIAL FLUSHING

- a) Fill up the tank with DM water.
- b) Keep V -2003, 2005, 2006 fully open. Close all other valves.
- c) Keep the reject and permeate stream to drain.
- d) Start the system. Slowly close the valve V –2005 to bring the normal pressure. Flush approx. 500 liters of water through the system.
- e) Stop the pump and drain the tank.

B) SYSTEM SANITIZATION



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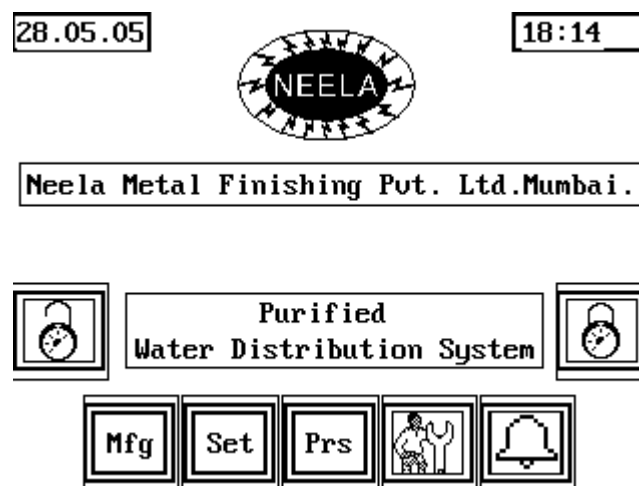
- Close valve V 2001. Fill up the tank with fed filtered water.
- Add 5 % of Hydrogen Peroxide or other chemical.
- Close valves KV-2001 and close V -2006 and keep the system in recirculation mode.
- Switch on the pump and slowly open valve V-2003 and adjust the position of valve V-2005
- Run in this mode for 30 minutes.
- Stop the system
- Drain entire system and flush the system as the procedure given in (a) initial flushing above.

In order to preserve the performance of the UF cartridge as well as to maintain a low bacteriological count in permeate water, it is necessary to sanitize the system on a regular basis (once a week minimum)

IF THE SYSTEM IS TO BE SANITIZED WITH HOT WATER SANITIZATION REPEAT THE ABOVE PROCEDURE AND TURN ON THE HEATER INSTEAD OF ADDING CHEMICAL IN THE TANK

THE SYSTEM IS NOW READY FOR PRODUCTION MODE

- Turn on the main power supply to the panel by means of starter switch at side of control panel.
- Turn on the MCB inside the control panel for powering the PLC and MMI
- The following screen will be displayed on the MMI (Refer Fig no 1)



(Fig 1)

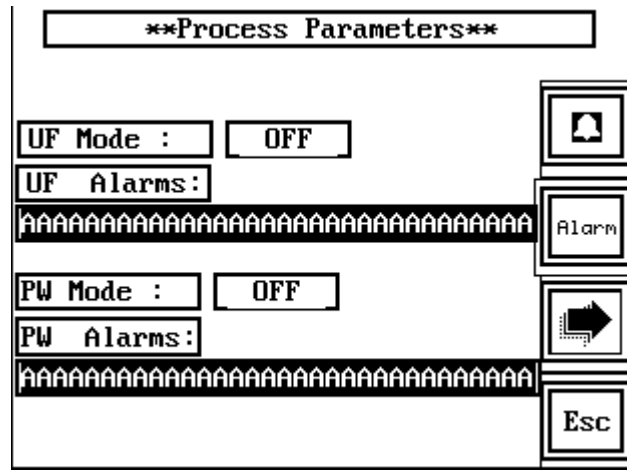
- Make sure the utilities (i.e. comp. Air and steam) are available to the system at reqd. pressure and temperature respectively.



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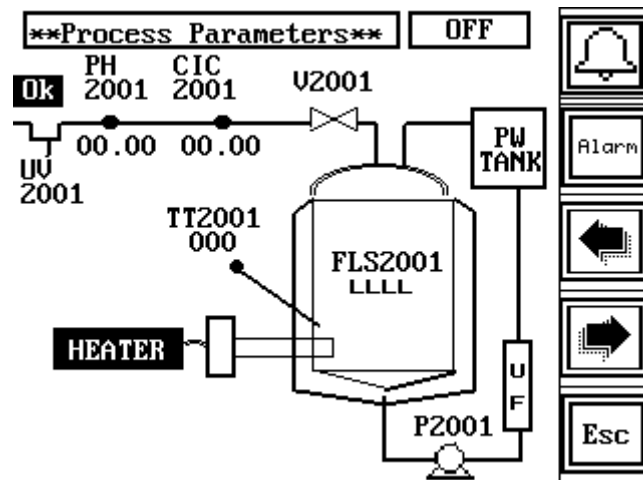
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- Make sure all the pump suction and discharge valves are kept open.
- Make sure the MCB for the pumps are turned on inside the control panel.
- Put the UF and Distribution system in AUTO mode with the help of selector switch (AUTO / OFF / MANUAL) on the panel door.
- Press the PRS button on the main page of the MMI to display the various systems incorporated in the control panel (Refer Fig 2)



(Fig 2)

- Press the NEXT button to move onto the next screen, which shows the P & ID of the UF distribution system. (Refer Fig 3)






(Fig 3)



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- The P&ID in the MMI show the position from where the data are collected along with their values.
- It shows which valves are actuated and which pumps are running.
- To display the process values and set values of conductivity, temperature and PH for UF distribution system press the next button on the MMI screen. It also shows which mode the system is working in (i.e. AUTO/MANUAL). (Refer Fig 4)

Process Parameters		OFF	
Parameter	SU	PU	Alarm
CIC2001 us/cm	00.00	00.00	
PH2001 LSP	00.00	00.00	
PH2001 HSP	00.00		Esc
TT2001 C		000	

(Fig 4)

- Press the NEXT button to move onto next screen, which shows the SANITIZATION page. (Refer Fig 5)

Process Parameters		OFF	
Sanitization :	OFF		Alarm
Parameter	SU	PU	
TT2001 C	000	000	
Time mins	000	000	Esc

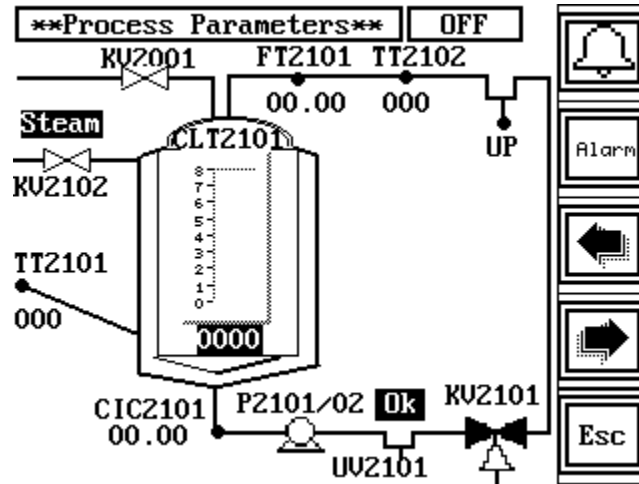
(Fig 5)

- To display the values of conductivity, temperature, Flow rate and tank level for distribution system press the next button on the screen in which the P&ID of the distribution system is shown. It also shows which mode the system is working in (i.e. AUTO/MANUAL). (Refer Fig 6)



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(Fig 6)

- The P&ID in the MMI show the position from where the data are collected along with their values.
- It shows which valves are actuated and which pumps are running.
- To display the process values and set values of conductivity, temperature, flow and tank level for distribution system press the next button on the MMI screen. It also shows which mode the system is working in (i.e. AUTO/MANUAL). (Refer Fig 7)

Process Parameters		OFF
Parameter	SU	PU
CLT2101 Ltrs		0000
CIC2101 us/cm	00.00	00.00
CIC2101 Time	000	000
FT2101 L m3/hr	00.00	00.00






(Fig 7)

- Press the NEXT button to move onto next screen, which shows the process and the set values for other parameters. (Refer Fig 8)








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Process Parameters		OFF	
Parameters	SU	PU	
TT2101 C		000	
TT2102 C	000	000	
			

(Fig 8)

- Press the NEXT button to move onto next screen, which shows the SANITIZATION page. (Refer Fig 9)

Process Parameters		OFF	
Sanitization :	OFF		
Parameter	SU	PU	
TT2102 C	000	000	
Time Min	000	000	

(Fig 9)

- Press NEXT button once more to go to PRINTER setup page. (Refer Fig 10)







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Print Parameters	
Page Length	00
Print Interval Min	00
Print Lapsed Min	00
Print	No



Printer Setting
Baud Rate:19200
Data Bit:8
Parity:None



(Fig 10)

- To start printing data shown on the screen press printout button once and the screen shows printout select button. (I.e. YES/NO)
- To change condition press INCREMENT and DECREMENT buttons and then press ENTER button to save the changes.
- To come out of this page press PREVIOUS button repeatedly until you come to the main screen of PROCESS menu and press ESC button to come to main MMI screen.
- To calibrate the values collected by PLC, press MFG button (Refer Fig 11)

Design Parameters	
UF Water Distribution	
CIC2001 FS us/cm	00.00
PH2001 FS	00.00



(Fig 11)

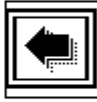

- Press the NEXT button to enter other Full scale Values of the system (Refer Fig 12)



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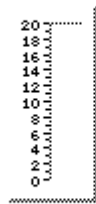
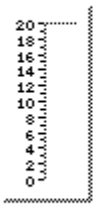
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Design Parameters			
Purified Water Distribution			
CLT2101	FS	Ltrs	0000
CIC2101	FS	us/cm	00.00
FT2101	FS	m3/hr	00.00

(Fig 12)

- Enter the corresponding full scale and zero scale values as per the specifications of the sensor or the instrument.
- After entering the value press ESC button to return to the main screen.
- To set the values of various parameters for which controlling action is to be done, press SET button. (Refer Fig 13)

Set Value			
PH2001 LSP		PH2001 HSP	
			
00.00		00.00	

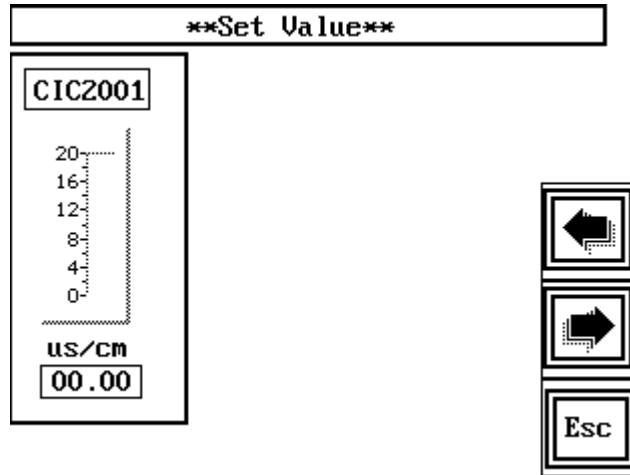
(Fig 13)

- The screen shows the various values of the set parameters in FIGURES as well as BAR.
- To change any of the set parameters press on that particular value and the next screen shows enter PASSWORD.
- After entering the correct password again press the parameter that is to be changed and the screen will ask for the new setpoint.
- Enter the new set point and press enter to save the changes.
 - Press NEXT button for more set values display. (Refer Fig 14)



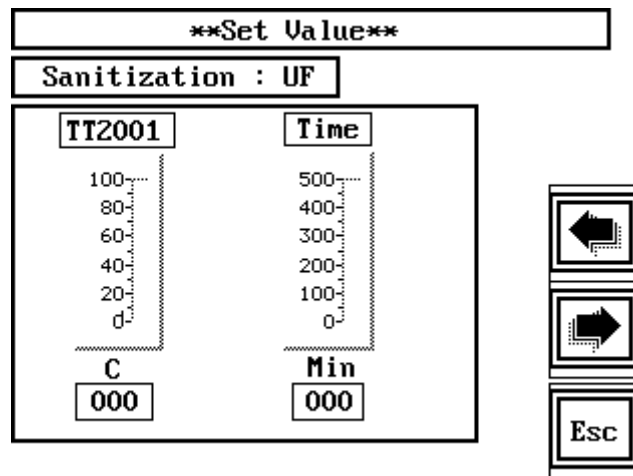
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(Fig 14)

- Press NEXT button for more set values display. (Refer Fig 15)



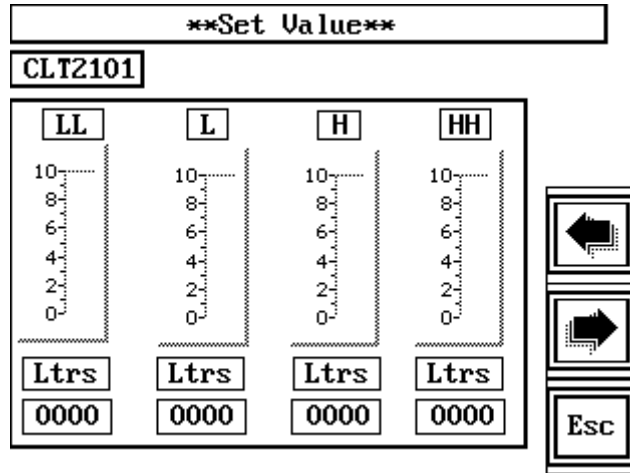
(Fig 15)

- Press NEXT button for more set values display. (Refer Fig 16)



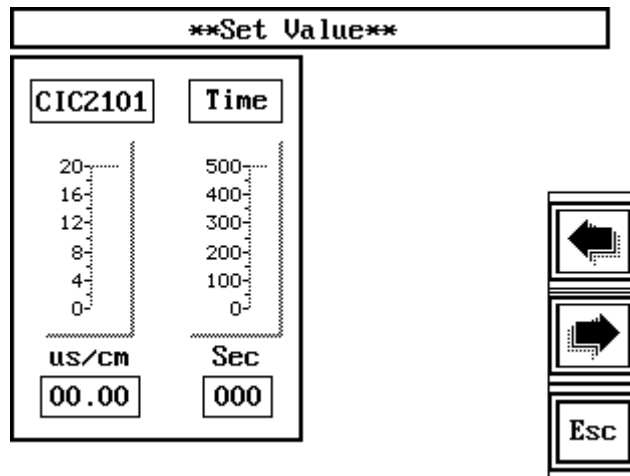
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(Fig 16)

- Press NEXT button for more set values display. (Refer Fig 17)



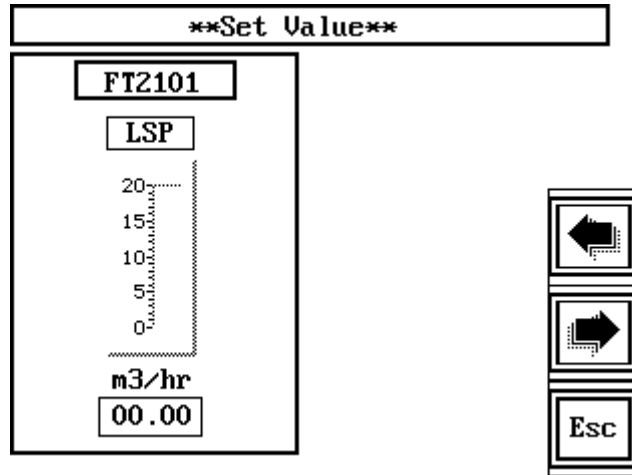
(Fig 17)

- Press NEXT button for more set values display. (Refer Fig 18)



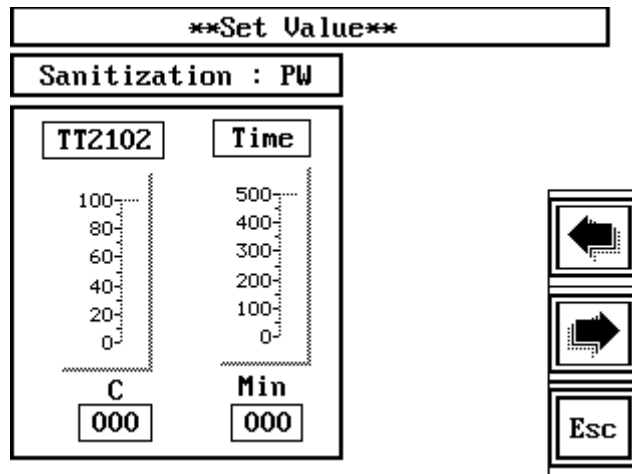
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(Fig 18)

- Press NEXT button for more set values display. (Refer Fig 19)



(Fig 19)


- Press NEXT button for more set values display. (Refer Fig 20)




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Set Value	
Hysterisis Temp C	0
Hysterisis Cond us/cm	00.00







(Fig 20)

- To come out of this menu press ESC button.
- To check whether the PLC is working or not, Press the MAINTAINANCE button on the main screen. (Refer Fig 1)
- After pressing the MAINTAINANCE button the screens will show the input output signals from the PLC. The screen shows INPUT CHECKS. This screen displays what signals are been fed to the PLC (i.e. values of parameter data logging levels, auto/manual mode, sanitization, alarms etc). (Refer Fig 21)

Input Check	
Auto Mode UF	OFF
Sanit Mode UF	OFF
FLS2001 HH	OFF
FLS2001 Med	OFF
FLS2001 LL	OFF
UV2001	OFF





(Fig 21)


- Press the NEXT button and the screen shows INPUT CHECKS. (Refer Fig 22)



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Input Check	
Auto Mode PW	OFF
Sanit Mode PW	OFF
UV2101	OFF



(Fig 22)

- Press the NEXT button and the screen shows OUTPUT CHECKS. (Refer Fig 23)

Output Check	
U2001	OFF
Heater	OFF
KU2001 Valve	OFF
P2001 Pump	OFF
P2001/02 Pump	OFF
KU2101 Valve	OFF
KU2102 Valve	OFF



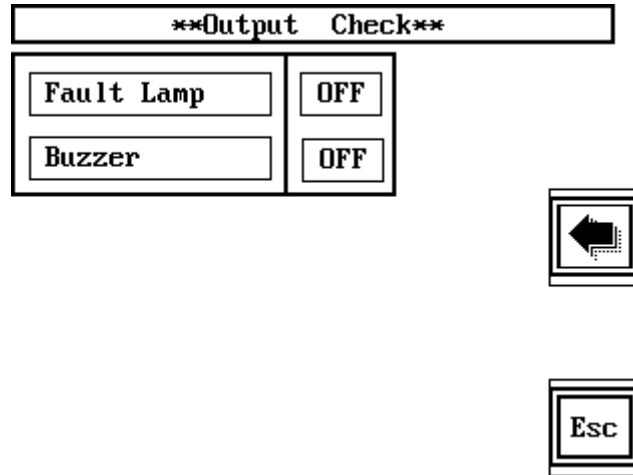
(Fig 23)

- Press the NEXT button and the screen shows OUTPUT CHECKS. (Refer Fig 24)




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(Fig 24)

- This screen shows the status of actuated valves and the system.
- This particular menu is to check the functioning of the PLC.
- Press ESC to come back to the main screen.
- Whenever an alarm is instigated an icon is displayed in all the screens on the top left corner and the alarm switch keeps flashing on the panel door.
- To Accept The Alarm Goto PRS menu and press the  Icon.
- Press that fault icon to see what fault has occurred in the system. It disappears as soon as the fault is rectified.
- Before putting the system in auto mode, make sure that suction and discharge valves of pumps are fully open.
- Always maintain dripping flow of water to pump seal cooling.
Never throttle the suction valve of the pumps.



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7.0 HISTORY

7.1 Details are given below.

SOP No.	REASON FOR CHANGE	EFFECTIVE DATE

8.0 **ABBREVIATIONS:** The abbreviations used in the SOP are as follows:

- 8.1 SOP - Standard Operating Procedure
- 8.2 No. - Number
- 8.3 QA - Quality Assurance