



Product Manual

This user manual will help you in knowing all the unique features of the RO con including installation, operation and programming procedure in a step by step manner. Please keep this handy manual for easy reference.

INTRODUCTION

The model RO Con is the new generation of RO automation control panel, which has highly intelligent advance microcontroller, which controls the complete operating logic of RO water treatment process. These panels are ideally suited for small and medium sized RO plants. The panel takes 9 inputs from 1) Low pressure switch (LPS) 2) High pressure switch (HPS) 3) Permeate tank level switch 4) Raw water tank level switch 5) Conductivity and 6) Auxiliary input 1 7) Auxiliary input 2 these two inputs can be configured as RWLVL/RL2/ORP/DOSING or OFF/ 8) Flow sensor input1 9) Flow sensor input 2. Panel also controls the four outputs namely 1) Raw water pump (RWP) 2) High pressure pump (HPP) 3) Flushing solenoid valve 4) Dosing pump. The advance microcontroller logic also takes care of the required motor protection such as overload, dry running and phase failure from supply side.



IMPORTANT FEATURES OF RO 11 PANEL

1. Total RO automation controls by new generation advance microcontroller.
2. Operating supply range 100Vac – 280Vac \pm 5% at 50Hz.
3. Two line 16 characters LCD shows all necessary messages.
4. All Ro process and indication shows on mimic diagram with indication.
5. Industrial standard 4 key operation.
6. Separate power ON/OFF switch.
7. Easy and user-friendly setting navigation having only one 4 digit site settable password.
8. Site settable flow constant range 05-3000 pulse/liter.
9. Separate flow indication on RO panel.
10. Inbuilt hour- meter up to 9999 hours and 59 minute.
11. Inbuilt flow totalizer up to 9999999 liter.
12. Inbuilt flow tachometer up to 9999999 liter with easy reset facility.
13. Raw water pump dryrun auto start timer up to 10 min – 720 min.
14. Easy interface with auto multiport valve.
15. Easy web based monitoring and control on gsm model
16. Very unique self- checks facility which makes the trouble shooting easy.
17. Easy to use SMS based android application for gsm model



OPTIONAL FEATURES AVAILABLE IN R011 PANEL

- 1) RO 11 E with gsm
- 2) RO 11 E with temperature measurement of Permeate tank
- 3) RO 11 E with water level controller
- 4) RO 11 E with pressure measurement

OPERATING LOGIC

Keep “Panel Power on” switch in ON mode, if the level of permeate tank is low then raw water pump starts and the reject solenoid valve will open for a programmed time for flushing the membrane. After the flush time is over the advance microcontroller will check for low pressure input LPS signal, if the signal is ON, the high pressure pump will start after the set de-bounce time. The de-bounce time helps in avoiding unnecessary chattering of the high pressure pump contactor due to initial dipping in the suction pressure.

This panel is also equipped to suit the application with auto multiport valve treatment and gsm connectivity.



STARTING SEQUENCE

After switching ON the power supply of the RO controller, it checks for the following inputs

- 1) If the level of the permeate tank is low, the raw water pump will starts and the reject solenoid valve will open for a pre programmed time period.
- 2) After flushing is over the advance microcontroller will check for low pressure input signal (LPS), if the signal is ON, the high pressure pump will starts after the set de-bounce time.

STOPPING SEQUENCE

Under following condition RO controller will stop its operation.

1. If power ON switch kept in OFF mode.
2. If auto/manual switch operate on manual mode.
3. If treated water tank becomes full.
4. If high pressure switch is ON.

TRIP SEQUENCE AND CASUSES



Under following condition RO controller will trip

1. Overload: Raw water pump(RWP) / High pressure pump (HPP)
2. Dry run: High pressure pump(HPP) / High pressure pump (HPP)
3. EHC (extreme high current) : High pressure pump (HPP) / Raw water pump(RWP)
4. Conductivity above the set limit.
5. Auxiliary 1 & 2 inputs activated

If any of the above condition occurs, then high pressure pump stops (HPP) and Raw water pump (RWP), flushing solenoid valve will open for a pre programmed time.

PARAMETER SETTING

RO control panel has an industrial standard 4-key interface which makes the parameter setting very easy and user- friendly.

4-key function

- 1) **Auto/Manual key:** This key used to run the RO controller in automatic mode or manual mode
- 2) **↑/Flush/RWP:** This key used for increment the settable parameter and in manual mode this key can be use to ON/OFF the raw water pump (RWP)
- 3) **↓/HPP/Reset:** This key used for decrement the settable parameter and in manual mode this key can use to ON/OFF the high pressure pump (HPP)
(Note: HPP pump ON only when RWP ON)
This key also has a reset function at fault condition.
4. **Setting /Accept:** With this key you can enter the setting menu and store the settable parameter.

SETTING METHODE

1. Put on the 'Auto/Manual' switch in manual mode, after completing the system OFF process press "Setting/Accept' switch till display shows Enter password.
2. Use '↑'arrow key for increment the number and '↓' arrow key for curser shifting to the next position. Operator password is 1234 (menu 1 to 6) & master password is xxxx (menu 1 to 27) with dealer.
3. After entering the four digit password press 'Accept' key. If password ok, Ro controller enters in the setting mode or if password is wrong display shows invalid and allows entering password again.
Using '↑'arrow and '↓' arrow key scroll the setting menu and 'Accept' key is used to select the parameter and store the selected parameter setting.



MENU DESCRIPTION FOR SETTING

1. RWP OL & DRY:

Set the overload and dry run trip current of raw water pump (RWP).

2. HPP OL & DRY:

Set the overload and dry run trip current of high pressure pump (HPP).

3. HPP OPRN delay

Set the high pressure pump (HPP) de-bounce ON/OFF time delay.

4. Conductivity

Set the conductivity alarm set point and alarm ignore time delay

5. Tank float: RW tank float/TW tank float

Set the treated water tank float signal ON/OFF

6. LPS & HPS SW

Set the low pressure switch (LPS) and high pressure switch (HPS) signal ON/OFF

7. RWP trip delay

Set the overload and dry run trip time delay of raw water pump (RWP).

8. HPP trip delay

Set the overload and dry run trip time delay of high pressure pump (HPP).

9. DRY Auto-start timer for RWP

Set the dry run auto start function of raw water pump (RWP)

10. Flushing VLV (on timer)

Set the reject solenoid valve ON time duration

11. Auto flushing (interval valve ON)

Set the auto flushing time interval and reject solenoid valve ON time duration at the time of auto flushing.

12. Flow constant

Set the flow constant pulse count per liter for flow sensor.

Flow sensor LED functions as follows: 1. Flow on = Blinking 2. Flow off = continuous ON 3.

Flow sensor setting off = off.

13. Aux IP1 & IP2

Set the auxiliary input 1 & 2 as follows

OFF- Disable the auxiliary input.

RW/LVL – set as raw water tank float (for RO 11 Model)

ORP – set as ORP alarm input

DOSING – set as dosing input



(NOTE: if auto MPV operation selected then aux I/P1 and aux I/P2 automatically configured as RL2 and RL1)

14. MPV operation

Set the auto multiport valve operation ON/OFF.

15. Configure O/P (output)

Set the raw water pump (RWP), high pressure pump (HPP) and reject solenoid valve output ON/OFF.

16. Auxiliary O/P (output)

Set the auxiliary output as follows

OFF- disable the auxiliary output

Alarm- output will be ON at the time of every fault condition

DOSING- Connect the dosing pump, output on with the hpp

Pump ON- Output will be On with RWP especially used in pretreatment with AMPV

17. SPP ON/OFF- Only in model 13/33/133/333

ON: SPP protection on.

OFF: SPP Protection OFF or bypass

18. New password

Set the 4- digit new password for parameter setting

Note:

1. Parameter 19 to 27 is in auto fault testing section.
2. Display scroll on & off facility

When plant is on, press setting switch for 5 secs to start and stop the scroll, you can also use ↑ & ↓ switch to change display matter!!!

SETTING CHART

Setting parameter 1 – 6 available with password 1234.

SR.NO	Parameter	Range	Default
1	RWP OL & DRY (Raw water pump overload & dry run trip current)	Overload : 1A - 16A Dry run : OFF 1A- 16A	4A OFF
2	HPP OL & DRY (High pressure pump over load & dry run trip current)	Overload : 1A - 16A Dry run : OFF 1A- 16A	4A OFF
3	HPP OPRN delay (High pressure pump on time)	(De bounce) On delay: 01-99sec HPP OFF delay: 01-99 sec	15sec 15sec



	delay)		
4	Conductivity (High conductivity alarm & ignore time delay)	Alarm:OFF-01-200uSM Ignore time: 01-60min	80uSM 02min
5	TW(permeate) tank float RW tank float (Permeate tank & raw water tank float setting)	Float signal : ON/OFF Float signal : ON/OFF	ON ON
6	LPS & HPS SW (Low pressure & high pressure switch on/off)	LPS signal : ON/OFF HPS signal: ON/OFF	ON ON

Setting parameter 7- 27 available with password 0852

SR.NO	Parameter	Range	Default
7	RWP trip delay (Raw water pump over load & dry run trip time delay)	Overload : 01- 30 sec Dry run : 01-180 sec	15 sec 180 sec
8	HPP trip delay (High pressure pump over load & dry run trip time delay)	Overload : 01- 30 sec Dry run : 01-180 sec	15 sec 180 sec
9	DRY auto- start timer for RWP (If raw water pump is off because of dry run it will automatically start after set time delay)	Operation: ON/OFF Time: Off-5-720min	OFF OFF
10	Flushing VLV (ON timer) (Flushing valve on time duration)	Time: Off-5-100sec	15sec
11	Auto flushing interval	Operation: ON/OFF Interval Period: 01-720min Valve ON time: 05-100sec	OFF 60min 15sec
12	Flow constant (Set flow pulse count per liter for flow sensor)	Pulse per/ liter:OFF-05-3000	OFF
13	Aux IP1 & IP2 (Set the auxiliary input1 & 2)	Aux IP1: OFF ORP Aux IP2: OFF ORP	OFF OFF
14	MPV operation (To ON/OFF multiport valve)	Operation : ON/OFF	OFF



	operation)		
15	Configure OP (To configure panel outputs)	RWP OP : ON/OFF HPP OP: ON/OFF Solenoid OP: ON/OFF	ON ON ON
16	Auxiliary O/P (Set auxiliary output from options)	OFF Alarm Dosing	OFF
18	Change Password (To change panel setting password)	4 digit password	1234

TERMINAL CONNECTION

MPV	
C	NO



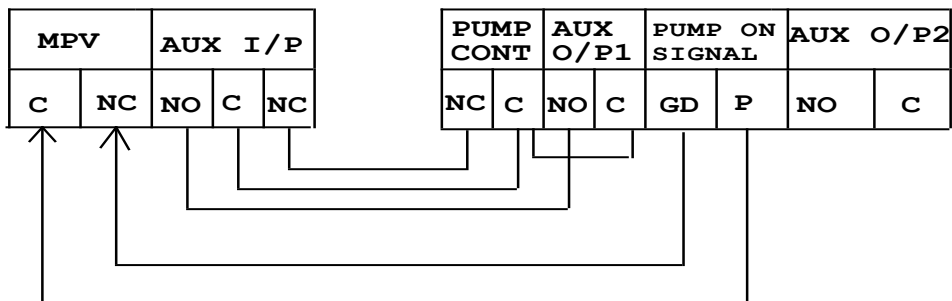
														RW FLOAT								FLOW1		
														NO	C							R	G	B
INPUT		HPP		RWP		FLUSH VALVE		DOSING		LPS		HPS		TW FLOAT		AUX I/P			CONDUCTIVITY SENSOR		FLOW2			
P	N	P	N	P	N	P	N	P	N	NO	C	NO	C	NO	C	NO	C	NO	R	B	R	G	B	

WIRING CONNECTIONS IN CASE OF AUTO MULTIPOINT VALVE



PANEL INPUT TERMINALS

MPV TERMINALS



Note: Connections for flushing solenoid valve is directly for terminal P for phase and N for neutral. Ensure solenoid valve coil voltage is 230VAc & valve is normally closed type.

SR NO	TERMINAL	DISCRIPTION	CONNECTION
1	HPP	High pressure pump	P – phase N- Neutral
2	RWP	Raw water pump	P – phase N- Neutral
3	FLUSH VALVE	Flushing solenoid valve	P – phase N- Neutral
4	DOSING	Dosing Pump	P – phase N- Neutral
5	LPS	Low pressure switch	C – Common No- normally open
6	HPS	High pressure switch	C – Common No- normally open
7	RW FLOAT	Raw water tank float switch	C – Common No- normally open
8	TW FLOAT	Permeate tank float switch	C – Common No- normally open
9	AUX I/P	Auxiliary input	C – Common No- normally open
10	CONDUCTIVITY SENSOR	Conductivity sensor	R – RED B – BLACK
11	FLOW 1	Flow sensor 1	R – RED G – Green B – BLACK
12	FLOW 2	Flow sensor 2	R – RED G – Green B – BLACK
13	MPV	Multi port valve	C – Common No- normally open

AUTO FAULT TESTING

RO con controller provides a very unique self check facility which makes the trouble shooting very easy.

Self check

1. Put on the ‘Auto/Manual’ switch in manual mode, after completing the system OFF process press ‘Setting/Accept’ switch till display shows enter password.
2. Use ‘↑’ arrow key for increment the number and ‘↓’ arrow key for curser shifting to the next position.



3. After entering the four digits password press 'Setting/Accept' key. If password is Ok RO controller enter in setting mode or if password is wrong display shows invalid and allows entering password again.

Using up arrow and down arrow key scroll the setting menu and accept is use to select the self check menu.

19. Check RWP relay O/P: In this menu you can ON and OFF the RWP relay output using ↑ and ↓ key also display the RWP current.

20. Check HPP relay: In this menu you can ON and OFF the HPP relay output using ↑ and ↓ key also display the HPP current.

21. Check Solo relay: In this menu you can ON and OFF the solenoid relay output using ↑ and ↓ key.

22. Check float: In this menu you can check the float signal high and low.

23. Check LPS & HPS: In this menu you can check the LPS and HPS switch signal high and low.

24. Check Aux1 I/P: In this menu you can check the Aux1 IP signal high and low.

25. Check Flow: In this menu you can flow sensor working.

26. Cal Conducti/TDS(conductivity calibration): In this menu you can calibrate the conductivity sensor with actual conductivity reading.

27. Check Aux O/P: In this menu you can ON and OFF the third relay output using using ↑ and ↓ key.

28. Escape: In this menu you can exit from setting menu.

TROUBLESHOOTING CHART

SR NO	LED BLINKING	MESSAGE ON DISPLAY	CAUSE AND ACTION
1	Fault	Fault: Overload	When current crosses the set trip current 1.Check cause of increase current 2.Check overload trip current
2	Fault	Fault: Dryrun	When current goes below the set trip current If tank is empty If current transformer is faulty
3	Fault	Fault: RWP EHC	If RWP motor current is 2 times more than normal rating please check the motor
4	Fault	Fault: HPP EHC	If HPP motor current is 2 times more than normal rating please check the motor



5	Fault & LPS	Fault: LPS	LPS not connected Pressure lower than set value Increase pressure or reduce set point
6	Fault & HPS	Fault: HPS	Pressure higher than set value Reduce pressure or reduce set point
7	Fault & conductivity	Fault: Conducti	High conductivity in the line or set point is low in that case increase the set point
8	Flow	Flow rate remains zero on display	Check sensor connecting wiring Check flow sensor setting Remove sensor from line and check for any obstacle
9	RWT Empty	RWT Empty	Check for water in RWT Check float Connection
10	Product Tank full	Fault: TW full Product tank full	Check water in treated tank(product tank) Check float connection
11	Fault	Dosing Tank Empty	Check dosing tank level Check Aux I/P connection
12	Fault	ORP Alarm	Check Aux I/P connection Check external ORP unit
13	Display Dead	Panel Display OFF	Check presence of power at input Check power on switch position Check fuse on bottom pcb If vlown replace with 1 amp fusw Check any loose FRC cable between top and bottom PCB

RO 11 WITH GSM MODEL SMS CHART

SR.NO	ACTION	SMS
1	Add MASTER mobile no.	*xxxxM<10-digit mobile no># Ex: *1234M9822012345#
2	Add Authorized user no.	*xxxxA<10-digit mobile no># Ex: *1234A9822012345#
3	Add web no for android application	*xxxxZ<10-digit mobile no># Ex: *1234Z9822012345#
4	Model Detail	*xxxxMODEL# Ex: *1234MODEL#



5	Delete Mobile no	*xxxxLD<10-digit mobile no># Ex: *1234D9822012345#
6	Set Unit Number	*xxxxUNxxxx# Ex: *1234UN1111#
7	Authorized user no list	*xxxxL# Ex: *1234L#
8	Reset Fault	*xxxxRST# Ex: *1234RST#
9	Parameter Setting Detail	*xxxxPSD# Ex: *1234PSD#
10	Sms Service Deactive	*xxxxSMSD# Ex: *1234SMSD#
11	Sms Service Active	*xxxxSMSA# Ex: *1234SMSA#
12	Factory Reset	*xxxxFR# Ex: *1234FR#
13	Log Interval for web in minute	*xxxxLOGxxx# Ex: *1234LOG5#
14	Password Change	*xxxxNPxxxx# Ex: *1234NP4321#
15	Help	*xxxxH# Ex: *1234H#
16	RWP Overload current in amp	*xxxxRWPOLxx.x# Ex: *1234RWPOL12.3#
17	RWP Dry run current in amp	*xxxxRWPDRYxx.x# Ex: *1234RWPDRY12.3#
18	HPP Overload current in amp	*xxxxHPPOLxx.x# Ex: *1234RWPOL12.3#
19	HPP Dry run current in amp	*xxxxHPPDRYxx.x# Ex: *1234RWPDRY12.3#
20	RWP Overload Trip time in seconds	*xxxxRWPOLTTxx# Ex: *1234RWPOL50#
21	RWP Dry run Trip time in seconds	*xxxxRWPDRYTTxx# Ex: *1234RWPOL50#
22	HPP Overload Trip time in seconds	*xxxxHPPOLTTxx# Ex: *1234HPPOL50#
23	HPP Dry run Trip time in seconds	*xxxxHPPDRYTTxx# Ex: *1234HPPOL50#
24	HPP On Delay	*xxxxHPPONDxxx#



		Ex: *1234HPPOND50#
25	HPP Off Delay	*xxxxHPPOFFDxxx# Ex: *1234HPPOFFD50#
26	SPP ON	*xxxxSPPON# Ex: *1234SPPON#
27	SPP OFF	*xxxxSPPOFF# Ex: *1234SPPOFF#
28	Check Flow/Production	*xxxxCFP# Ex: *1234CFP#
29	Reset Flow Meter	*xxxxRFM# Ex: *1234RFM#
30	High Conductivity Alarm	*xxxxCONDAxxx# Ex: *1234CONDA001#
31	Conductivity Trip Time in minute	*xxxxCONDTTxx# Ex: *1234CONDTT00#
32	Flush Time	*xxxxFLUSHTxxx# Ex: *1234FLUSHT000#
33	Auto Flush ON	*xxxxAFLUSHON#Ex: *1234AFLUSHON#
34	Auto Flush OFF	*xxxxAFLUSHOFF# Ex: *1234AFLUSHOFF#
35	Auto Flush Time in seconds	*xxxxAFLUSHTxxx# Ex: *1234AFLUSHT001#
36	Auto Flush Delay in minute	*xxxxAFLUSHDxxx# Ex: *1234AFLUSHD001#
37	Set clock time	*xxxxSCTHH:MM/DD/MM/YY# Ex: *123410:15/22/04/16#

NOTE: 1. Unit will always send you SMS when it is read and acted upon by unit so always check for SMS feedback 2. SMS from unit is the best way to know status at site on real time basis 3. Some times sms is not received by use due to balance in the sim, network or server congestion problem by service provider 4. Manufacturer/ Distributor/ Dealer will not be responsible for any direct indirect loses caused or misused by the user for any other application than indented.

NECESSARY AND SAFETY INFORMATION

- Don't open unit while supply is present.
- Don't touch open wires.
- Don't keep open wires to avoid short circuit.
- Don't store the device in dusty, dirty areas.
- Don't use harsh chemicals to clean the device.