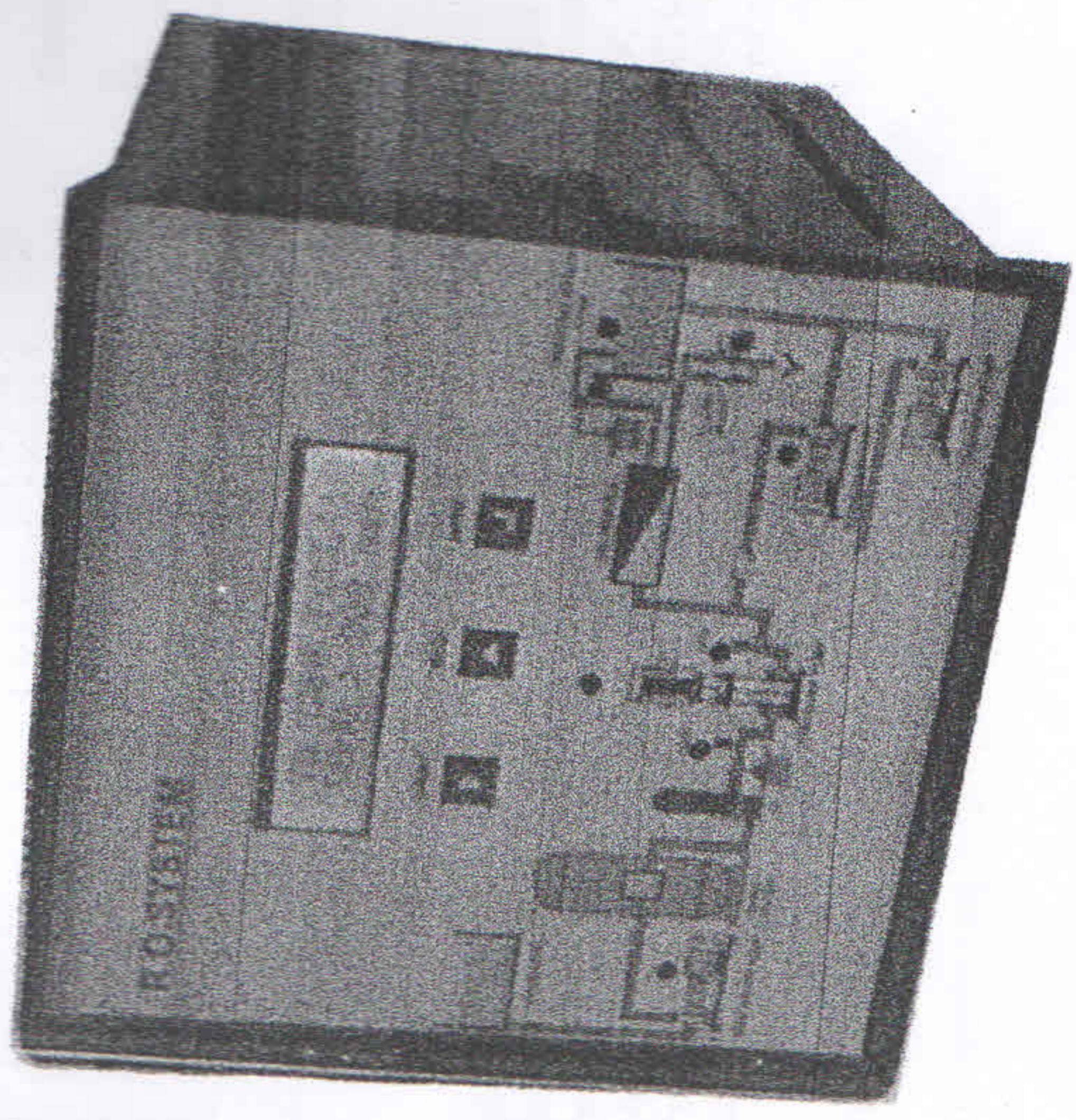


Sr. NO. - 14,03,RO33

# RO-MATIC

## LOGIC CONTROLLER



**Size:** 144(H) X 144(V) X 125(D) mm  
**Cutout size:** 138(H) X 138(V) mm

### TROUBLESHOOTING:

LED blinking	Message on display	Cause & Action
LPS	LOW PRESSURE	Check, is it C NO contact? If not make it. Pressure lower than set value. Increase pressure or reduce set point. LPS not connected
HPS	HI PRESSURE	Pressure higher than set value. Reduce pressure or increase set point
FLOATY	TW TANK FULL!!	Check, is it C NO contact? If not make it. Actually tank is full Floaty is not connected. Short floaty terminal by an external wire link. Check, is it C NC contact? If not make it.

### QUICK REFERENCE

SR. NO	PASSWORD	FEATURE	SECTION	PAGE NO.
1	084	Configure AUTO MPV	1.4	6
2	345	Time base flushing	1.3	6
3	678	Input Configuration	1.1	5

### IMPORTANT TERMS

- 1) AUTO FLUSH DELAY:**  
The PLC has an inbuilt clock and can flush the membrane after a preset time (of plants continuous operation).
- 2) FLUSHING TIME:**  
This is the time for which the Flushing will happen.

**Contact us:**  
 Embark  
 E-3, Manish park  
 Phase-3  
 off N.I.B.M. road  
 Kondhwa, Pune-48  
 Ph. 020-26831555  
 Email: embark1555@gmail.com

## TECHNICAL SPECIFICATIONS:

1) Size	144(H) X 144(V) X 125(D) mm
2) Cutout size	138(H) X 138(V) mm
3) Display	16 X 2 Alphanumeric backlit LCD
4) Settings	Through front panel keys(3 numbers)
5) Timings	Settable (Password protected)
6) Inputs	Total:11 6 (Potential free) 2 (Pulse input for Flow) 3(Analog Inputs:2 for pH & ORP 1 for Conductivity)
7) Outputs	8 (C NO) relay
8) Supply	230 VAC $\pm$ 15%

## GUARANTEE CERTIFICATE

We certify that the instrument mentioned above has been tested by us and is guaranteed for a period of 12 months from the date of dispatch. We undertake to make good by replacement or repair defects arising due to faulty design, material or workmanship within the above mentioned period. Provided that the part in respect to which the complaint is made, is sent at the purchaser's expense.

The warranty is valid subject to:

- The meter or part there of not being subject to alteration, accidents or misuse.
- The installation having been done as per our guidelines in the manual.

**Tested by:**

**Client:**

**Date of dispatch:**



## Automation Philosophy:

Logic Controller is ideally suited for medium sized RO plants. As the process is continuous and unlike Demineralization, RO does not require any frequent regeneration. The key to having a trouble free long-term operation of a well designed plant is

- To follow the sequence of starting and stopping,
- To automatically flush the membrane when required
- Trip the plant in case of
  - Low level in raw water tank
  - High pressure
  - High level in treated water tank
  - Conductivity, PH/ORP fault.
- Stop/Start plant based on levels in raw water and permeate water tank.
- Give alarm in case of any faults
- Protect the high pressure pump from running dry
- Avoid chattering of low-pressure switch during startups.
- Plant operating status known at any time

The Logic controller ensures that all the above process needs are ECONOMICALLY met. Most timings are settable at site.

Besides all the process needs one might need plant status & instruments readings to be displayed on a computer screen at a remote location(max 1.2km).Dedicated software provided along with the RO-MATIC ensures graphic viewing of the plant status & logging of all the parameters at a desired interval along with date & time.The log generated is in Microsoft Excel format which can be easily emailed /printed and used for plant operation analysis.

## Note:

- 1) The plant will start only if the TW tank level is low or the input is shorted.

### TERMINAL CONNECTIONS:

NO.	TERMINAL	DESCRIPTION	CONNECTION
1			P-Live
2	MAINS	INPUT SUPPLY	N-Neutral
3			E-Earth
4	XX	Not applicable	XX
5	ALRM	Alarm	C-Common
6			NO-Normally Open
7	CP	Cleaning Pump	C-Common
8			NO-Normally Open
9	DUMP	Dump valve	C-Common
10			NO-Normally Open
11	HPS	High pressure switch	NO-Normally Open
12	RWLVL	RWT level switch	NO-Normally Open
13	AUX I/P 2	PH/ORP/TP IP/RL1*	NO-Normally Open
14	COM	Input common	C-Common
15			R-Red
16	Flow Sensor2	Flow Sensor 2	G-Green
17			B-Black
18			GND
19	ANALOG INPUT2	4-20 mA Input 2	Current I/P
20			5V O/P
21	COND. SENSOR	Conductivity Sensor	R-Red
22			B-Black
23	RWP	Raw Water pump	C-Common
24			NO-Normally Open
25	HPP	High Pressure Pump	C-Common
26			NO-Normally Open
27	Flush	Flushing Solenoid Valve	C-Common
28			NO-Normally Open
29	DP	Dosing Pump	C-Common
30			NO-Normally Open
31	TP	Transfer Pump	C-Common
32			NO-Normally Open
33	LPS	Low Pressure Switch	NO-Normally Open
34	TWLVL	TW tank floaty	NO-Normally Open
35	Aux I/P 1	0-5V I/P/TP IP/RL2*	NC-Normally Closed
36	COM	Input common	NO-Normally Open
37			C-Common
38	Flow Sensor 1	Flow Sensor 1	R-Red
39			G-Green
40			B-Black
41	ANALOG INPUT1	4-20 mA Input 1	GND
42			Current I/P
43	Serial Comm	RS 485 O/P(Tx)	5V O/P
44			+
			-

\* When Auto MPV is ON(Password 084)

### HOW TO DO THE SETTINGS:

Upon switching ON the power supply the display shows-  
 and then status of plant. Follow the below instructions to set the required settings.

#### SECTION 1.1 INPUT CONFIGURATION

Key Pressed	Display
START & STOP simultaneously	PASSWORD:0000
Enter the password 070 using START & STOP keys.	
MENU	HP FLUSHING
MENU	HP FLUSHING:OFF
What is this HP Flushing? Use STOP key to make it ON	
Generally flushing is done with RWP but if somebody wants High pressure pump to be ON during Flushing then he has to make HP FLUSHING: ON	
MENU	TRANSFER PUMP
MENU	TRANSFER PUMP:OFF
Use STOP key to make it ON(If there is Transfer pump connected after the permeate tank)	
MENU	AUX PUMP:FLUSH PMP
It can be configured as CLEANING PUMP by pressing STOP key.	
What is use of this facility?	
If AUX PUMP is configured as FLUSH PUMP then each time during STOPPING it will flush the membrane with permeate water. If it is configured as CLEANING PUMP then one can ON/OFF the pump for cleaning the membrane(which is generally done when Permeate Flow is reduced by 10% for same inlet TDS)	
MENU	CONDUCTIVITY
MENU	CONDUCTIVITY:ON
MENU	CONTROL OPRN
MENU	CONTROL OPRN:OFF
Use STOP key to make it ON	
<b>What is CONTROL OPERATION?</b>	
This is an Interlock for CONDUCTIVITY. When conductivity exceeds set value then PLC trips saying HI CONDUCTIVITY on display if Control Operation is ON otherwise it will just say OVERRANGE.	
MENU	FLOW SENSORS
MENU	FLOW SENSORS NO.OF SENSORS:
MENU	FLOW SENSORS NO.OF SENSORS:2
The instrument has facility to connect two flow sensors directly to the terminal. If someone doesn't want to connect flow sensor then he can just make no. of sensors:0 with the help of STOP key.	
MENU	FLOW SENSORS SENSOR RESOL:0.1
MENU	FLOW SENSORS SENSOR2 POSN:INL
We can configure the sensor2 position as inlet or reject with STOP key.	
MENU	INST SENSORS:
MENU	INSTSENSORS: NO.OF SENSOR:

MENU	INST SENSORS: NO.OF INST:2
What is this facility for?	
The instrument has a facility to take two analog inputs(4-20mA current)& it can display pH & ORP in the line.It also has a set point facility for the ORP.(i.e. Whenever the ORP goes beyond set value Dump valve will open)If there is no transmitter in the field then one can make No OF INST:0 with STOP key.	
MENU	QUIT?
MENU	LO PRESS.I/P:
MENU	LO PRESS.I/P:ON
MENU	HI PRESS.I/P:
MENU	HI PRESS.I/P:ON
MENU	LEVEL I/P:
MENU	LEVEL I/P:ON
MENU	RW LEVEL I/P:
MENU	RW LEVEL I/P:ON
MENU	AUX I/P 1:
MENU	AUX I/P 1:DOS LVL
Use STOP key to make it TP/IP	
MENU	AUX I/P 2:
MENU	AUX I/P 2:PH/ORP
Use STOP key to make it TP/IP	
MENU	EXIT?
MENU	PLANT STATUS

**SECTION 1.3 TIME BASED FLUSHING**

START & STOP simultaneously	PASSWORD:000
Enter the password 345 using START & STOP keys.	
MENU	FLUSH OPRN:
MENU	FLUSH OPRN:
MENU	FLUSH OPRN: ON
MENU	FLUSH DELAY:
MENU	FLUSH DELAY:
MENU	FLUSH DELAY: 060 m
Use START & STOP key to set required time	
MENU	FLUSH TIME:
MENU	FLUSH TIME:
MENU	FLUSH TIME: 015 s
Use START & STOP key to set required time	
MENU	EXIT?
MENU	PLANT STATUS

**SECTION 1.4 MPV SETTINGS**

START & STOP simultaneously	PASSWORD:000
Enter the password 084 using START & STOP keys.	
MENU	MPV CONTROL?
MENU	MPV CONTROL?
Use STOP key to make it ON(Only if AUTO MPV is connected) In that case AUX I/P1 & AUX I/P2 will automatically configured as RL2 & RL1 input.	

**SECTION 1.5 SETTING THE SET POINTS:**

MENU	SCROLL?
MENU	SCROLL? OFF
MENU	SCROLL? OFF   Use STOP key to make it ON. DEF SCRIN:COND
Use STOP key to make it INST/FLOW	
MENU/STOP	PLANT STATUS/VIEW?
MENU	Display scrolls through previous settings
MENU	SETTINGS?
Use STOP key to make it ON	
MENU	FLUSHING VLV:
MENU	FLUSHING VLV: TIME:015 S

**WHAT IS THIS TIME?**

This is the time for which Flushing will happen.

MENU	LO PRESS SW:
MENU	LO PRESS SW: TIME:015 S

**WHAT IS THIS TIME?**

This is the debounce time which helps in avoiding unnecessary chattering of HPP due to initial dipping in the suction pressure. The high pressure pump will start after set debounce time.

MENU	EXIT?
STOP	COND/TDS
MENU	DISP:
MENU	DISP:µsm
Use STOP key to make it ppm	
MENU	EXIT?
MENU	ORP.SET
MENU	ORP SP
MENU	Previously set value.
Use START & STOP key to set required value	
MENU	ORP TRIP DLY
MENU	Previously set value
Use START & STOP key to set required value	
MENU	EXIT?
MENU	QUIT?
MENU	PLANT STATUS