Next Generation ASTERO
With Bluetooth Connectivity

ASTERO *nxt*

Overall size : 235 (horizontal) X 260 (vertical) X 130 (depth)mm

Cutout size : 190 (horizontal) X 222 (vertical) mm

Abbreviations used:

RWP:Raw Water Pump
MF :Micron Filter
HPP: High Pressure Pump
RSV:Reject Solenoid Valve
PFR:Permeat Flow Rate
IFR:Inlet Flow Rate
RFR:Reject Flow Rate
AUX IP:Auxiliary Input
AUX OP:Auxiliary output
SET PT:Set Point
OVL CRT:Overload Current
DRY RUN CRT:Dry run current
IND:Indian (MPV)
SENSR POSN: Flow Sensor Position
TW LEVEL SW;Treated Water level switch
LO PRESS SW:Low Pressure Switch
HI PRESS. SW;High pressure Switch
HP FLUSHING:High Pressure Flushing
LPS:Low Pressure Switch
HPS:High Pressure Switch
RWT:Raw Water Tank
TWT:Treated Water Tank
FLUSH VLV:Flushing Valve
CNDUCTIVITY:Conductivity
INL:Inlet
REJ:Reject
UNBL:Unbalance
FLUSH OPRN:Flush Opertion
MPV:Multiport valve
SERV TIM:Service time
CHN:Chinease (MPV)
DOSLV:Dosing Level
RWLVL:Raw water level
UV IP:Ultraviolet Input

Maximum recommended HP ratings:

Panel Configration:	**11**	**13**	**33**
Raw water Pump:	2HP Single phase	2 HP Single phase	5 HP Three phase
High Pressure Pump:	3 HP Single phase	5 HP Three phase	5 HP Three phase

Solenoid valve: Normally closed type(230 V A.C.) Client's Scope.

Terminal Connections:

FLOW 2			FLOW 1		
B	G	R	B	G	R

RL 1		RL 2		DOS LVL		RWT FLOTY		TWT FLOTY		LPS		HPS	
C	NO	C	NO	C	NC	C	NC	C	NC	C	NO	C	NO

ALARM		FLUSH SOV		HPP		RWP	
NO	C	NO	C	NO	C	NO	C

Note:Colour coded cables are used for outputs RWP,HPP,FLUSH SOV as per mentioned below..

PANEL Configuration

11

FLUSH SOV		HPP		RWP	
R	V	G	R	Y	O

13

FLUSH SOV		HPP		RWP	
R	V	G	R	Y	O

33

FLUSH SOV		HPP		RWP	
R	V	G	R	Y	R

COLOUR CODING :

COLOUR CODING:: R:RED V:VIOLET G:GREEN Y:YELLOW O:ORANGE

Automation Philosophy:

ASTERO nxt has lots of new generation features like bluetooth besides conventional level & pressure inputs. An intutive user interface allows not so technosavy local operator to do critical settings easily. These panels are ideally suited for small and medium sized RO plants and they possess improved, elegant & patented design.

The Astero nxt panel has 7 switch inputs

Low Pressure Switch (LPS), High Pressure Switch (HPS) ,

Treated Water Tank Floaty (TWT FLT), Raw Water Tank Floaty (RWT FLT),

Dosing Tank Low Level (DOS LVL),

And AMPV inputs OR can be configured as ORP / UV fault.

ASTERO nxt can measure quality & quantity of RO permeate water as it has built in Conductivity sensor and 2 inputs for Flow sensor.

And it controls

Raw water pump (RWP), High pressure pump (HPP),

Reject solenoid valve (RSV), Doser

ALARM PULSE.

The advanced electronics also takes care of the required motor protection such as **over load, dry running, single phasing etc.**ASTERO nxt is so intelligent that it restarts the plant after 15 minutes when it is tripped with overload and will monitor pump currents, if those are normal,plant will run continuously else respective pump will be tripped & Alarm output will be energized.

Operating Logic:

Upon switching ON power supply of the panel, if the level of the permeate tank is low & raw water tank level is high, the raw water pump will start and the reject solenoid valve will open for a programmed time (flush the membrane). After the flush time is over, the processor will check for low pressure input. If the input is ON (short), 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 due to initial dip in the suction pressure.

This panel is also equipped to suit the applications with AUTO MULTIPORT VALVE in pretreatment.In that case Auxiliary input 3 & 4 are automatically configured as RL2 & RL1 respectively. ASTERO nxt has built in PULSE output which can initiate filter backwash based on time.

OPERATION OF THE PANEL:

Starting Sequence: After switching ON power supply of the panel if all level inputs are OK,Raw Water Pump will start and reject solenoid valve will open for the programmed time period.After flush time is over, the processor will check for low pressure input. If input is ON (short), HPP (High Pressure Pump) will start after the set debounce time.

Stopping Sequence: Under following conditions processor will stop its operation.

1. If STOP button is pressed. 2.If treated water tank is full(open)
3. If high pressure switch is ON(short) 4.If raw water tank is empty (short)
5. Dry run,Single phasing,Overload.

If any one of the above condition occurs, then HPP stops (If HP Flushing is OFF) Reject solenoid valve will open for the programmed time.RWP stops & STATUS is displayed on MIMIC.Press start button to resume operation.

KEYS SIGNIFICANCE:

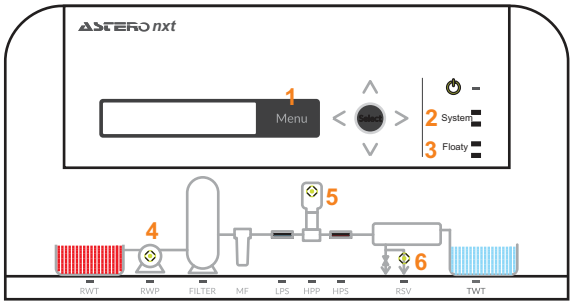


FIG. 1

Use the keys available on mimic as shown in FIG.1 for setting of the panel as per given instructions.

> : This Left Arrow key is used to move the curser forward.

< : This Right Arrow key is used to move the curser backward.

∧ : This Up Arrow key is used to move curser upward and increse the value.

∨ : This Down Arrow key is used to move curser downward and decrese the value.

: This Select key is used to select the routine or to save the set value .

: This standby key is used to switch on/off the panel except while setting.

1 : This MENU key is used to end the routine or to exit the operation .

2 : This system key is used to select system mode (Auto/Manual).

3 : This Floaty key is used to enable (Auto) of disable (bypass) TWT Floaty.

4 : This RWP Key is multifunction key and is used in following ways :
Single press operation : Check Current of RWP in Auto mode.
Start/Stop RWP in manual mode
Press & hold operation : Set RWP overload current in Auto mode

5 : This HPP Key is multifunction key and is used in following ways :
Single press operation : Check Current of HPP in Auto mode.
Start/Stop HPP in manual mode
Press & hold operation : Set HPP overload current in Auto mode

6 : This RSV Key is multifunction key and is used in following ways :
Single press operation : Start/Stop FSV in manual mode
Press & hold operation : Set Flush time in Auto mode

How to change system mode (AUTO/MANUAL) ?

Panel has an AUTO/MANUAL facility.To switch the mode user has to press 'SYSTEM' KEY. The LED indication will be on as per selected mode.

Upon power on in manual mode display will show 'MANUAL MODE ON'.In this mode only inputs will get bypassed & pump protection like Overload,Single phasing will be there.Use 'RWP' KEY to switch ON/OFF the Raw water pump & 'HPP' KEY to switch ON/OFF the High pressure pump.

Note:High pressure pump can be started only if Raw water pump is ON.

TO VIEW THE FACTORY SETTINGS	
Key Pressed	**Display**
MENU	VIEW?
Display scrolls through all the settings set by factory.	
SELECT	TW LEVEL SW : ON
	HI PRESS SW : ON
	LO PRESS SW:ON TIME:015
	AUX IP 1:
	AUX IP 2:
	AUX IP 3:
	AUX IP 4:
	RWP CNTRL:OFF
	AUX OP:ALARM
	SETTINGS? **
SELECT (if SYSTEM is in AUTO mode)	SCROLL?
SELECT	SCROLL?ON
Why to make scroll ON/OFF ? This scrolling facility provided to the users who want to see flow rate,volume,operation hour mains voltage along with plant status & conductivity in scrolling.If user want to see only conductivity & plant status on display during plant operation they have to make scroll off.	
Display scrolls through all the settings set by factory.	
SELECT	COND/TDS?
SELECT	DISP: µSM
Use ∧ key to make it PPM if required	DISP: PPM
SELECT	SET PT:(IF CNTRL OPRN:ON. SEC 1.4)
SELECT	SET PT:500(Previously set value)
Use **<** ,**>**,∧,∨ keys to set desired value	
SELECT	DELAY
SELECT	DELAY:010(Previously set value)
What is this delay time and set point ? Set point is the value of conductivity beyond which the system will trip. Delay is the time up to which the increase in conductivity will be ignored during start up.	
Use **<** ,**>**, ∧,∨ key to set desired value	
SELECT	EXIT?
SELECT	QUIT?
SELECT	QUIT?
TO SET OVERLOAD CURRENTS(SEC--1.1)	
Why to set overload current? When the motor draws more current than the normal running current then it is said to be an overload current which is an abnormal condition which leads to motor burns or failures. To take care of it we set overload currents, the panel trips when the current drawn by the motor is more than the overload current value set by us (20% more than actual running current) **How to know normal(actual) running motor current?** There are two methods (1)With the Clamp Meter check the output currents of individual phases(R/Y/B).(2) Using our control panel Refer section 1.7	
KEY PRESSED FOR 3 sec	**DISPLAY**
RWP	RWP OVL CRT? 04.0(Factory set value)
Use < ,>,∧,∨ keys to set desired value & press SELECT key	

KEY PRESSED FOR 3 sec	DISPLAY
HPP	HPP OVL CRT? 04.0(Factory set value)
Use <,>,∧,∨ keys to set desired value & press SELECT key	
RSV	FLUSHING VLV: TIME:015 S(Factory set value)
Use <,>,∧,∨ keys to set desired value & press SELECT key	
** If SYSTEM is in MANUAL mode.	
SELECT	RWP OVL CRT?
SELECT	RWP OVL CRT?04.0
Use < ,>,∧,∨ keys to set desired value & press SELECT key	
SELECT	HPP OVL CRT?
SELECT	HPP OVL CRT?04.0
Use < ,>,∧,∨ keys to set desired value & press SELECT key	
SELECT	EXIT ?
SELECT	SCROLL ?
TO SET DRY RUN CURRENTS(SEC--1.2)	
Why to set Dry Run current? **If the pump is running without any water, is termed as motor dry running and current drawn by the motor is lesser than the normal running current.** **The controller avoids the dry running of motor by tripping the RWP / HPP.** **Dry running can lead to pump failures and therefore there is a need to trip pump/motor in such a condition** **How to know dry running motor current?** **Run the motor without any load and check the phase currents with Clamp meter.** **The set point must be kept between normal running current and actual dry running current**	
Press **<** & **>** KEYS SIMULTANEOUSLY	PASSWORD:000
ENTER PASSWORD 123 USING **<,>,∧ ∨** KEYS	
SELECT	RWP UNBAL:
SELECT	RWP UNBAL: 040(Previously set value)
USE **<,>**,∧,∨ KEYS TO SET DESIRED VALUE	
SELECT	HPP UNBL:
SELECT	HPP UNBL:040(Previously set value)
USE **<,>**,∧,∨ KEYS TO SET DESIRED VALUE	
SELECT	DRY RUN OPRN:
SELECT	DRY RUN OPRN:OFF(Previously set status)
USE **∧** KEY TO MAKE IT ON	DRY RUN OPRN:ON
SELECT	RWP DRY CRT?
SELECT	RWP DRY CRT? 01.5(Factory settings)
USE **<,>**,∧,∨ KEYS TO SET DESIRED VALUE	
SELECT	HPP DRY CRT?
SELECT	HPP DRY CRT? 01.5(Factory setting)
USE **<,>**,∧,∨ KEYS TO SET DESIRED VALUE	
SELECT	AUTO RESTART?
SELECT	AUTO RESTART? OFF(Previously set status)
What is AUTO RESTART ? **Once the pump go dry running and if Auto Restart is ON then the motor starts automatically after set time is elapsed else we have to start the motors manually.**	
USE **∧** KEY TO MAKE IT ON	AUTO RESTART? ON
SELECT	TIME : 015 m(Previously set value)

USE **<,>**,^,v KEYS TO SET DESIRED VALUE	
SELECT	QUIT?
SELECT	***PLANT STATUS***
CONDUCTIVITY CALIBRATION (SEC--1.3)	
Why to calibrate? **If there is mismatch between actual and required value of conductivity then there is need for recalibration.For that 1) Dip the sensor in standard known solution and set the required value.** **Ex.If actual value is 400µs/cm and required value is 450µs/cm then calibrate as:**	
Press **<** & **>** KEYS SIMUTANEOUSLY	PASSWORD:000
ENTER PASSWORD 234 USING **<,>**,^ ,**v** KEY	
SELECT	CND FACTOR?
SELECT	CND FACTOR?1.00
USE **<,>**, ^, **v** TO SET DESIRED VALUE	
SELECT	COND. OFFSET?
SELECT	COND. OFFSET? 000
USE **<,>**,^ , **v** KEY TO SET DESIRED VALUE	
SELECT	QUIT?
SELECT	***PLANT STATUS***
TO CONFIGURE INPUTS (SEC--1.4)	
Panel has 7 inputs (switch type) available i.e.LPS,HPS,LEVEL SWITCH(Permeate floaty) **AUX I/P 1,2,3,4:-Can be set as RWLVL/ORP/DOSLVL/UV IP/REMOT or OFF.** **Incase of FILTER WITH AUTO MULTIPORT VALVE pretreatment** **The AUX I/P 3 and AUX I/P 4 automatically configured as RL2 & RL1.** **Conductivity and two Flow sensor I/P.**	
Press **<** & **>** KEYS SIMUTANEOUSLY	PASSWORD:000
ENTER PASSWORD 678 USING <,>, ^,v KEYS	
SELECT	HP FLUSHING:
SELECT	HP FLUHING:OFF (Previously set status)
What is HP FLUSHING? Normally flushing is done by RWP during starting and stopping of system. Incase High pressure flushing is required then make HP FLUSHING ON.	
USE **^** KEY TO MAKE IT ON	HP FLUHING:ON (Previously set status)
SELECT	CNDUCTIVITY:
SELECT	CNDUCTIVITY:ON
USE **v** KEY TO MAKE IT OFF if not required	
SELECT	CONTROL OPRN:OFF(Previously set status)
What is CONTROL OPRN? **This is an interlock for conductivity,when the conductivity exceeds set maximum value then panel trips showing HI CONDUCTIVITY on display if CONTROL OPRN is On else it neglects value of conductivity.** **One can set desired set point in factory settings option.**	
USE **^** KEY TO MAKE IT ON if required	
SELECT	FLOW SENSORS:
SELECT	NO OF SENSORS:
SELECT	NO OF SENSORS:2 (Previously set value)
USE **^** KEY TO MAKE IT 0 or 1(According to number of sensors connected)	
SELECT	SENSOR CONST :
SELECT	SENSR 1 FACTOR
SELECT	SENSR 1 FACTOR 060.0 (Previously set value)

Use <,>,Λ,V keys to alter this value (put the Factor mentioned on sensor)	
SELECT	SENSR 2 FACTOR
SELECT	SENSR 2 FACTOR 060.0 (Previously set value)
SELECT	EXIT?
SELECT	SENSR2 POSN:
SELECT	SENSR 2 POSN:INL(INLET)
Use Λ KEY TO SELECT IT AS REJ i.e. Reject	
SELECT	QUIT?
SELECT	AUX OP:
SELECT	AUX OP:ALARM

What is this ?
Its an Auxiliary output which can be configured as :
ALARM(will be ON in case of any fault)
DOSING PUMP(will be ON along with HPP)
PMP ON (will be ON with RWP)

USE Λ KEY TO SET DESIRED	
SELECT	TW LEVEL SW:
SELECT	TW LEVEL SW:ON(Factory set status)
USE Λ KEY TO MAKE IT OFF	IF NO CONTROL REQUIRED
SELECT	LO PRESS SW:
SELECT	LO PRESS SW:ON(Factory set status)
USE Λ KEY TO MAKE IT OFF IF LPS needs to be bypassed	
SELECT	LO PRESS. DBNCE(IF ONLY LPS IS ON)
SELECT	LO PRESS. DBNCE TIME:015 S

What is this time?(in seconds)
This is the debounce time,which hwlps in avoiding unnecessary chattering of High pressure pump contactor due to initial dipping in the suction pressure. The High pressure pump will start after set debounce time.

USE <,>,Λ,V KEYS TO SET DESIRED TIME	
SELECT	LPS TRIP:
SELECT	LPS TRIP:03(Previously set value)

What is LPS TRIP Time?(In minutes max 60 m & min 03 m)
This is the time after which RWP will trip after LOW PRESSURE fault with message 'LO PRESS TRIP' on display.

SELECT	HI PRESS SW:
SELECT	HI PRESS SW:ON(Factory set status)
USE Λ KEY TO MAKE IT OFF IF HPS needs to be bypassed	
SELECT	AUX. IP1:
SELECT	AUX. IP1:DOSLV(FACTORY Setting)
USE Λ,V KEY TO SET RWLVL/ORP/REMOT/UV IP/OFF	
SELECT	AUX. IP2:
SELECT	AUX. IP1:RWLVL(FACTORY Setting)
USE Λ,V KEY TO SET ORP/REMOT/UV IP/OFF	
SELECT	AUX. IP3:
SELECT	AUX. IP4:

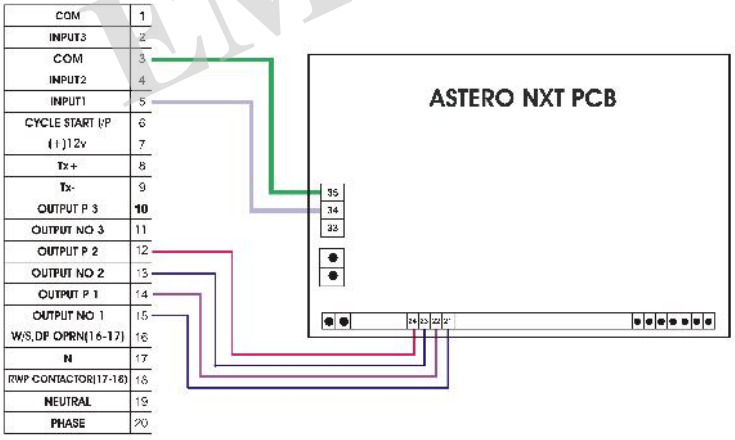
AUX I/P 3 & 4 will be automatically configured as RL2 & RL1 if MPV CNTRL is ON in password 084.To configure AUX I/P as ORP/REMOT/UV IP,make MPV CNTRL OFF.

SELECT	QUIT?
SELECT	PLANT STATUS
TO CONFIGURE OUTPUT (SEC--1.5)	
Press**<** & **>** SIMUITANEOUSLY	PASSWORD:000
ENTER PASSWORD 191 USING **<,>,∧,∨** KEY	
SELECT	MP TYPE:
SELECT	MP TYPE:1-3
USE UP **<,>**, **∧** , **∨** KEY TO MAKE IT 1-1/3-3 as per panel configuration.	
SELECT	RWP CNTRL:
SELECT	RWP CNTRL:OFF(Factory set status)
What is RWP CNTRL(CONTROL) ? If one make RWP CONTROL ON then one can start and stop RWP/RO independently	
USE **∧** KEY TO MAKE IT ON	RWP CNTRL:ON
SELECT	QUIT?
SELECT	***PLANT STATUS***
TIME BASED AUTOFLUSHING SETTINGS (SEC--1.6)	
What is time based autoflushing? Normally Astero panel has facility of flushing during starting and stopping of panel but if somebody wants to flush besides this on timely manner this feature also provided with us.For that you have to make FLUSH OPRN ON and provide span between flush time for which flushing should go on.	
Press **<** & **>** KEYS SIMUITANEOUSLY	PASSWORD:000
ENTER PASSWORD 345 USING **<,>,∧,∨** KEY	
SELECT	FLUSH OPRN:
SELECT	FLUSH OPRN:OFF(Previously set status)
USE **∧** KEY TO MAKE IT ON	FLUSH OPRN:ON
SELECT	FLUSH DELAY:
SELECT	TIME: 060 m(Previously set value)
USE **<,>**,**∧** , **∨** KEYS TO SET DESIRED VALUE	
SELECT	FLUSH TIME:
SELECT	TIME: 015 m(Previously set value)
SELECT	QUIT?
SELECT	**PLANT STATUS**
CURRENT CHECKING(SEC--1.7)	
What is CURRENT CHECKING feature? **If you want check the normal running currents of motor then use this feature**	
PRESS **<** & **>** KEYS SIMUTANEOUSLY	PASSWORD:000
ENTER PASSWORD 456 USING **<,>**, **∧** , **∨** KEYS	
SELECT	SELECT PUMP ?
USE RWP/HPP KEY TO SELECT PUMP OF WHICH CURRENT HAS TO BE CHECKED	
RWP/HPP KEY	RWP/HPP R:00.0 B:00.0 **
**Incase of single phase RWP/HPP pump display will show R:00.0 and for three phase pump display shows both R:00.0 & B:00.0 as mentioned above. USE RWP/HPP key to switch off the respective pump.	
SELECT	MANUAL STOP
PRESS (START/STOP) KEY TO START THE PLANT.	

TO CONFIGURE AUTOMPV(SEC--1.7)	
PRESS < & > KEYS SIMULTANEUSLY	PASSWORD:000
ENTER 084 USING <,>,Λ,V KEYS SIMULTANEUSLY	
SELECT	MPV CONTRL :
SELECT	MPV CONTRL:ON (Previously set status)
USE Λ KEY TO MAKE IT OFF IF ON One has to configure AUX OP as PMPON when there is AMPV in pretreatment.	
SELECT	MPV TYPE:
SELECT	MPV TYPE:IND
USE Λ KEY TO MAKE IT CHN	MPV TYPE:CHN
SELECT	SERV TIM: m
SELECT	SERV TIM: 0010 m
USE <, >,Λ,V KEYS TO SET DESIRED TIME	
SELECT	QUIT?
SELECT	
Note:For all settings procedures. In each setting routine,the changes done are finally stored when user pressed Select key once.	

Wiring Diagram for AMPV connections.

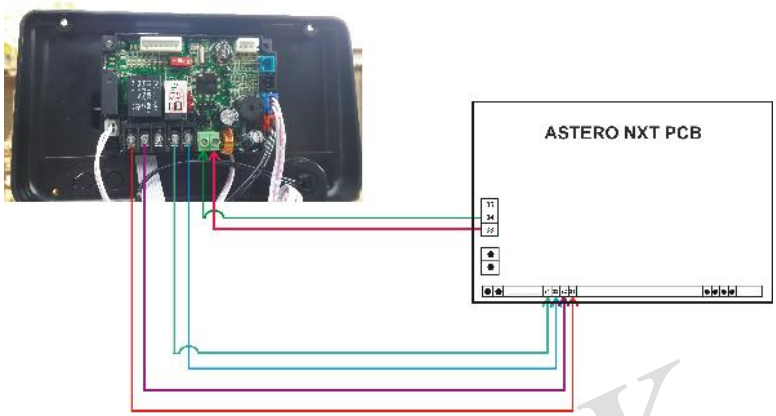
CONNECTION DIAGRAM BETWEEN ASTERO NXT PANEL AND E-VOLVE (INITIATIVE ENGINEERING)



Settings in AMPV in Password 084:
1.Set "AUX OP1" as "PUMP\SOLV OP"
2.Set "AUX OP2" as "ON DURING CYCLE"
3.Set "AUX OP3" as "Pulse Input"

Settings in Panel:
1.Make MPV CNTRL ON
2.Set MPV TYPE as INDIAN
3.Set service time

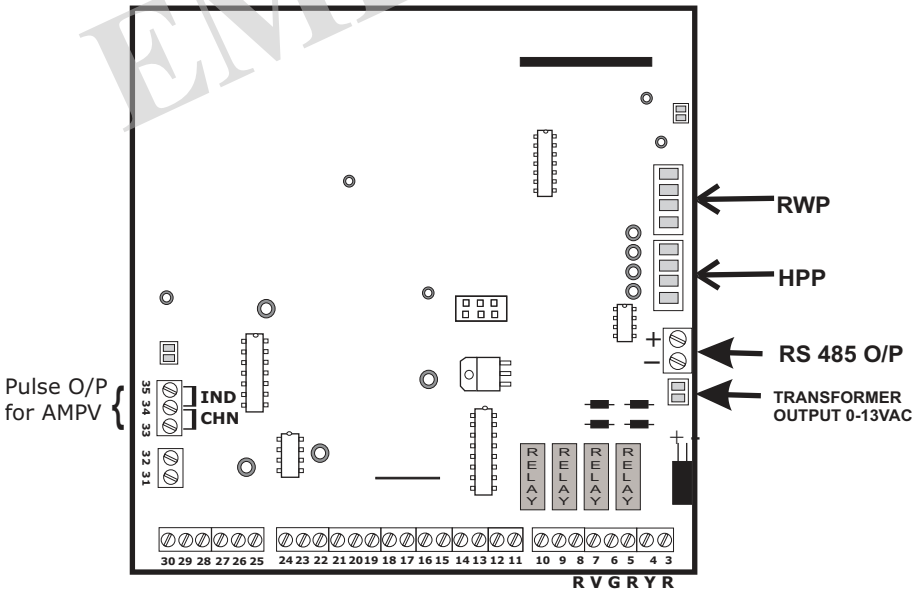
Wiring between RUNXIN AMPV & Astero NXT Panel



Required settings in PANEL in PASSWORD 678:
1) Make MPV CNTRL ON
2) Set MPV TYPE as INDIAN
3) Set service time (in minutes)

Required settings in VALVE :
1) Signal Output Mode 6: 01
2) Backwash & Rinse Time

Connections on PCB:



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	HIGH PRESSURE!!	■ Pressure higher than the set value. Reduce the pressure or increase the set point.
		■ Check, is it C NO contact? If not make it.
—	RW TANK EMPTY!!	■ Actually tank is empty.
		■ Check, is it C NC contact? If not make it.
FLOATY (level)	TW TANK FULL!!	■ 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.
RWP	RWP OVERLOAD	■ More current than the normal ratings. Set Overload current accordingly.
		■ Motor is drawing more current than normal. Check Motor
	RWP SINGLE PH	■ If there is mismatch between the R-Y-B phase currents drawn by the pump. Increase the phase unbalance value.
	RWP DRY RUNNING	■ If current drawn by the pump is less than the set value. If tank is empty. SET current as given in instructions section. ***Refer:section1.2***
HPP	HPP OVERLOAD	More current than the normal rating. Set Overload current accordingly. ***Refer:section1.1***
		■ Motor is drawing more current than normal. Check Motor
	HPP SINGLE PH	■ If there is mismatch between the R-Y-B phase currents drawn by the pump. Increase the phase unbalance value.
	HPP DRY RUNNING	■ If current drawn by the pump is less than the set value. SET current as given in instructions section. ***Refer:section1.2***
	FR : 0000 (Flow remains zero)	■ Remove sensor from line & check for any obstacle.Check FR by blowing into sensor.
		■ Check connections.

QUICK REFERENCES

Sr. No	Password	Feature	Section	Page No
1	123	Dry run current setting	1.2	7
2	234	Conductivity Calibration	1.3	8
3	345	Time base auto flushing	1.6	10
4	—	Overload Current Setting	1.1	6
5	678	Input Configuration	1.4	8
6	191	Output Configuration	1.5	10
7	456	Current Checking	1.7	10
8	084	Configure AUTO MPV	1.8	11

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