



Liquid Level Controller



Operating Instruction

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OVERVIEW



DIN 70mm

Salient features

- Used for two tank & single tank conductive liquid level monitoring
- Pump protection from dry run and overflow condition
- Specially designed sensors
- Adjustable trip & recovery time delay settings
- 6A SPDT output relay (resistive)
- Manual start switch facility
- Liquid levels & Trip indication LED's
- Selectable suction & delivery mode in single tank operation

Ordering information

Product code	Supply voltage	Certification
LLCA-2M-1-U-CE	85 - 270V AC/DC	CE

SAFETY RECOMMENDATION

All safety related modifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not used in a manner specified by the manufacturer it might impair the protection provided by the equipment. If there is physical damage to the unit then do not use it.

Read complete instructions prior to installation and operation of the unit.

- **Caution**

- Ensure the connection as per terminal diagram.
- To be handled only by authorized and technical person.
- Do not install any heat sources like burner, electric arc, etc near unit.
- Install as near to the starter as possible.
- The sensor prods are suspended from the top opening of the water tank in a suitable PVC conduct piping. Metal pipes should not be used.
- The sensor prods should not be wall mounted on metallic water tank.

SPECIFICATION

Technical specifications	
Auxiliary supply	85 - 270V AC/DC
Frequency	50Hz/60Hz
Power consumption	4VA max.
Input sensor	Stainless steel prods
Trip setting	According to the levels of sensor placed in the tank.
Trip time delay	0.5-10 sec
Recovery time	0.5-10 sec
Reset	Automatic
Time accuracy	±5% of set value
Output specification	Relay rating: 1 N/O (Resistive) NO: 10A@277V AC / 28V DC NC: 6A@277V AC
Mechanical specifications	Dimension: 35x90x60mm Mounting: 35mm DIN Rail mount Screw tightening torque: 0.5N.m Length of insulation to be removed before insertion of conductor into the terminal: 6-7mm
Environmental specifications	- Indoor use - Altitude of up to 2000 meters - Pollution degree 2 - Over voltage category II - Impulse withstand voltage: 4kV - Degree of protection: IP20 for terminal IP40 for casing IP50 for faceplate
Storage temperature	-20 to 70 °C
Humidity	Up to 95% RH, non-condensing
Weight	Sensor: 50 gm each Unit: 100 gm
Certification	IEC60947-5-1

APPLICATIONS

- This product protects the motor from dry run condition; thus ensures durability
- The automatic sensing of levels and controlling algorithm ensures 24 hours liquid level supply without any kind of interruption, which fortunately saves liquid & human efforts.
- This device operates with sensors which are specially designed to monitor the conductive liquid level in tanks. These sensors are safe, electrically isolated from mains, plastic moulded & non-corrosive so it lasts longer.

Mode selection & Operation

This product operates in following modes:

- Single tank mode:
 - Suction logic - Single level, Two level
 - Delivery logic - Single level, Two level
- Dual tank mode

Function of single tank mode (suction or delivery logic)

When product is to be used with Single Tank Mode with Suction/Delivery Logic,

- Sensors P4, P5 & P6 are not connected/kept open.
- Lower & upper liquid level measurement is done with sensor P2 & P3 respectively, considering P1 as reference.

Function of two tank mode (suction and delivery logic)

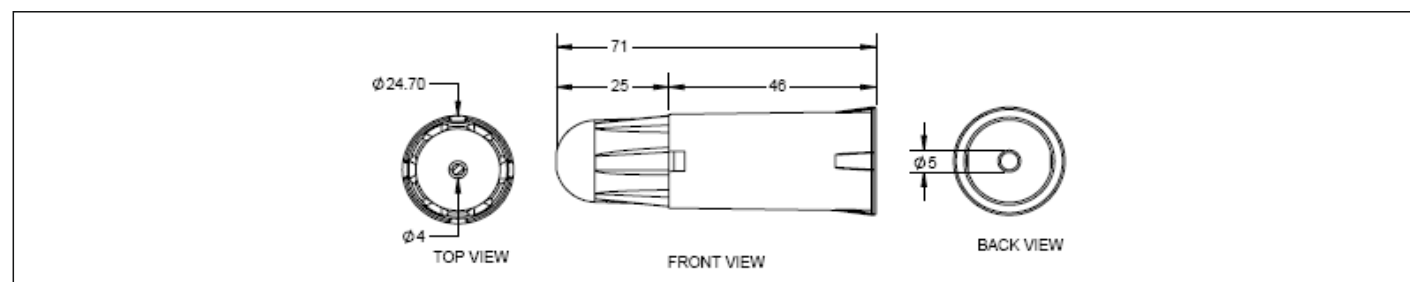
When product is to be used in two tank logic,

- The system starts up whenever liquid is to be supplied to delivery tank and suction tank has sufficient level to supply it & it stops when the liquid reaches its maximum level in the delivery tank or if the suction tank reaches its minimum level.
- P1 is considered reference for suction tank & measurement is done with sensor P2 & P3 for two level and with sensor P2 for single level.
- Similarly for delivery tank, P4 is considered as reference & measurement is done with sensor P5 & P6 for two level and sensor P5 for single level.

Input sensor

- This product is to be used with Selec sensor prod only.
- The Selec sensor prod has a bolting arrangement for connecting a suitable cable and it is to be suspended from top opening of the liquid tank.
- Sensor material: Stainless steel

Input sensor dimensions

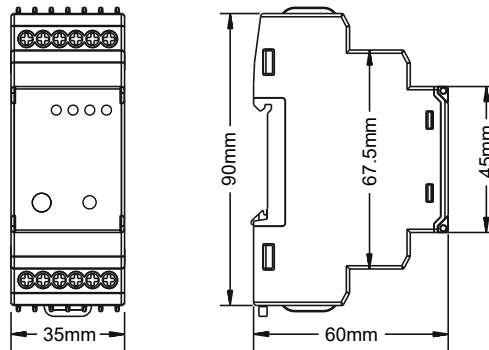


LED indication chart

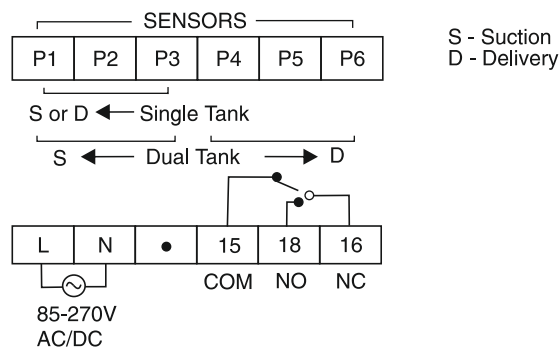
LED color	Notation	Indication
Green	ON	Power ON
Yellow1	S	Suction tank level indication
Yellow2	D	Delivery tank level indication
Red	R	Relay indication

INSTALLATION

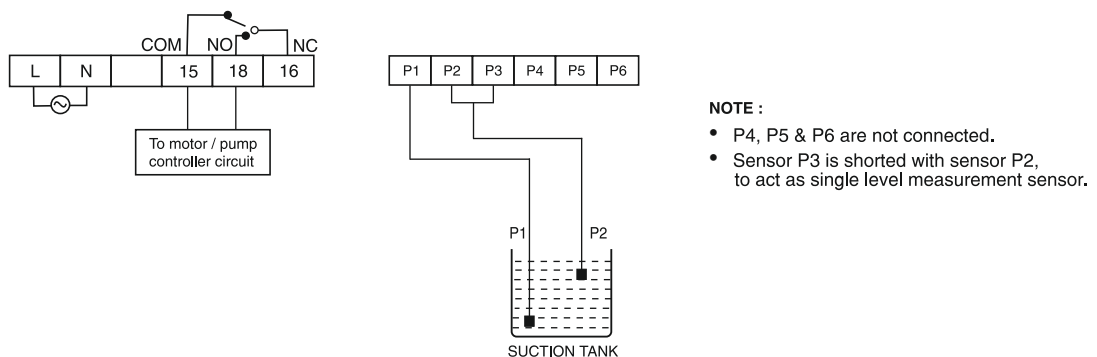
Mechanical installation / Dimensions



Terminal connection



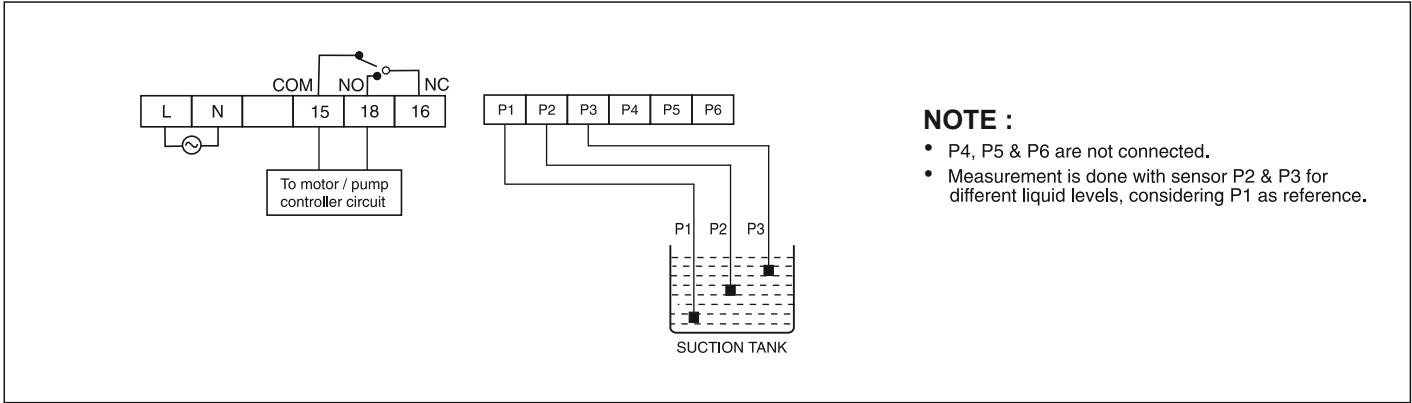
Single tank single level_suction logic



Testing chart

Sr. No.	P1	P2= P2+P3	Trip Status	LED1	LED2	LED3	LED4
				Power ON	Suction	Delivery	Relay
1	IN	OUT	OFF	ON	Fast Blinking	OFF	OFF
2	IN	IN	ON	ON	ON	OFF	ON

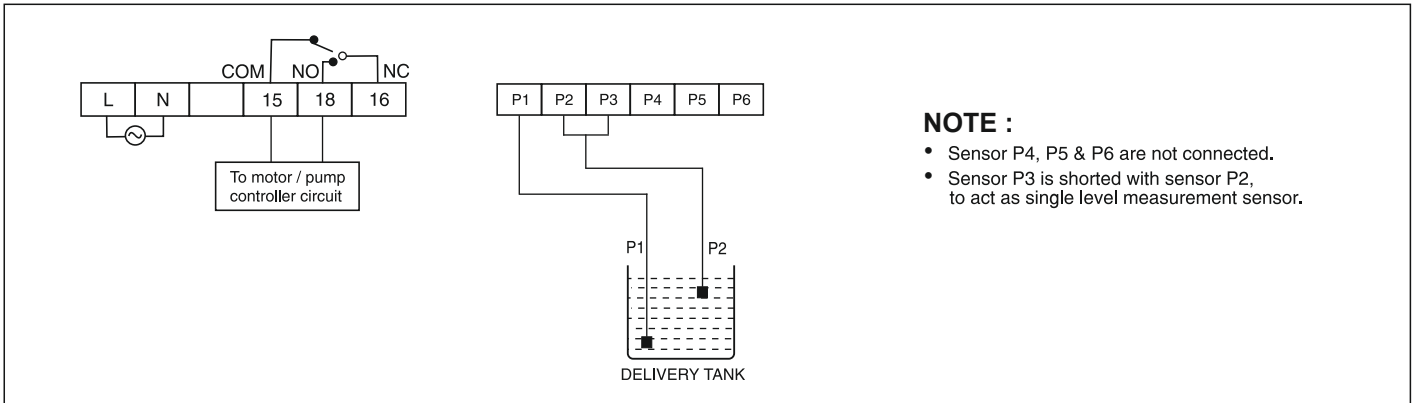
Single tank two level_suction logic



Testing chart

Sr.No.	P1	Sensor condition		Trip Status	LED1	LED2	LED3	LED4
		P2	P3		Power ON	Suction	Delivery	Relay
1	IN	OUT	OUT	OFF	ON	Fast Blinking	OFF	OFF
2	IN	IN	OUT	OFF	ON	Slow Blinking	OFF	OFF
3	IN	IN	IN	ON	ON	ON	OFF	ON
4	IN	IN	OUT	ON	ON	Slow Blinking	OFF	ON
5	IN	OUT	OUT	OFF	ON	Fast Blinking	OFF	OFF

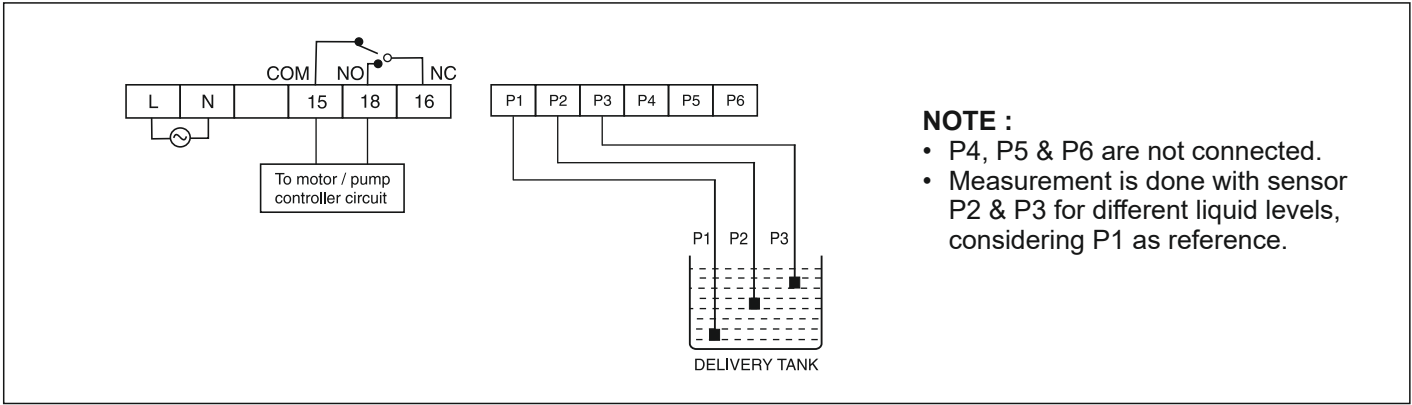
Single tank single level_delivery logic



Testing chart

Sr. No.	P1	P2= P2+P3	Trip Status	LED1	LED2	LED3	LED4
				Power ON	Suction	Delivery	Relay
1	IN	OUT	ON	ON	OFF	Fast Blinking	ON
2	IN	IN	OFF	ON	OFF	ON	OFF

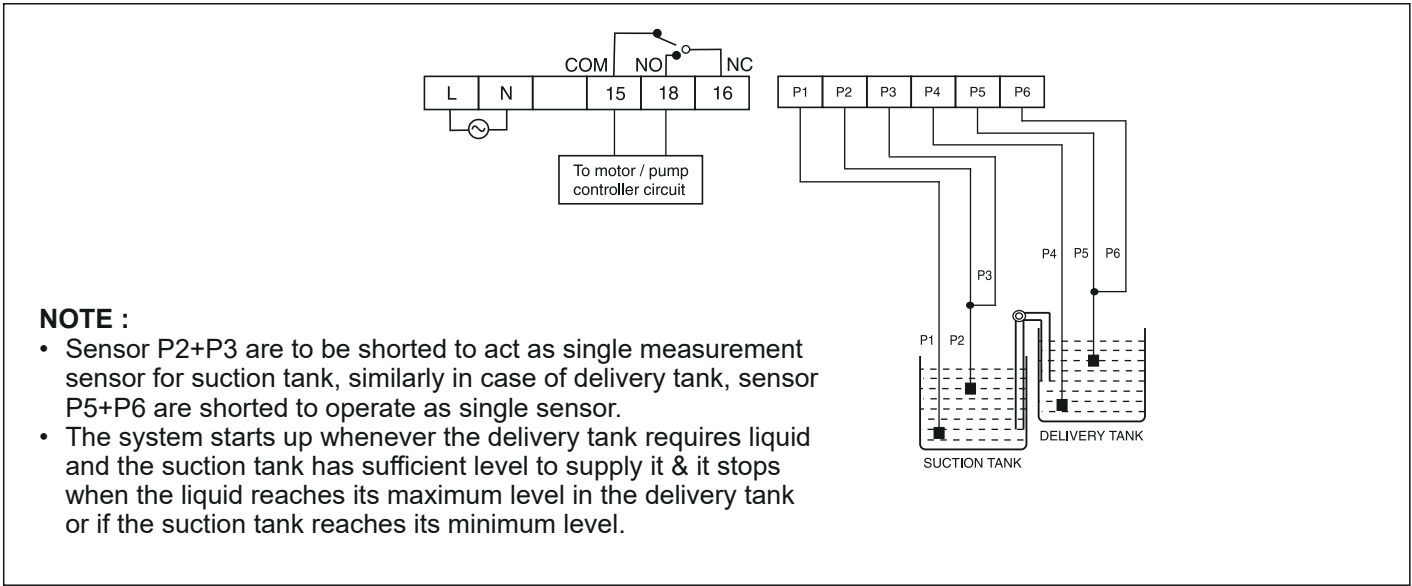
Single tank two level_delivery logic



Testing chart

Sr.No.	P1	Sensor condition		Trip Status	LED1	LED2	LED3	LED4
		P2	P3		Power ON	Suction	Delivery	Relay
1	IN	OUT	OUT	ON	ON	OFF	Fast Blinking	ON
2	IN	IN	OUT	ON	ON	OFF	Slow Blinking	ON
3	IN	IN	IN	OFF	ON	OFF	ON	OFF
4	IN	IN	OUT	OFF	ON	OFF	Slow Blinking	OFF
5	IN	OUT	OUT	ON	ON	OFF	Fast Blinking	ON

Two tank single level



Testing chart

Sr.No.	Sensor condition				Trip Status	LED1	LED2	LED3	LED4
	P1 (Ref1)	P2 = P2+P3	P4 (Ref2)	P5 = P5+P6		Power ON	Suction	Delivery	Relay
1	IN	OUT	IN	OUT	OFF	ON	Fast Blinking	Fast Blinking	OFF
2	IN	IN	IN	OUT	ON	ON	ON	Fast Blinking	ON
3	IN	IN	IN	IN	OFF	ON	ON	ON	OFF
4	IN	OUT	IN	IN	OFF	ON	Fast Blinking	ON	OFF

Two tank two level

NOTE :

- The system starts up whenever the delivery tank requires liquid and the suction tank has sufficient level to supply it & it stops when the liquid reaches its maximum level in the delivery tank or if the suction tank reaches its minimum level.
- P1 is considered reference for suction tank & measurement is done with sensor P2 & P3 at different liquid levels. Similarly for delivery tank, P4 is considered as reference & measurement is done with sensor P5 & P6 at different liquid levels.

Sr.No.	Suction			Delivery			Trip Status	LED1	LED2	LED3	LED4
	Sensor condition							Power ON	Suction	Delivery	Relay
	P1(Ref1)	P2	P3	P4(Ref1)	P5	P6					
1	IN	OUT	OUT	IN	OUT	OUT	OFF	ON	Fast Blinking	Fast Blinking	OFF
2	IN	IN	OUT	IN	OUT	OUT	OFF	ON	Slow Blinking	Fast Blinking	OFF
3	IN	IN	IN	IN	OUT	OUT	ON	ON	ON	Fast Blinking	ON
4	IN	IN	OUT	IN	IN	OUT	ON	ON	Slow Blinking	Slow Blinking	ON
5	IN	IN	IN	IN	IN	OUT	ON	ON	ON	Slow Blinking	ON
6	IN	IN	IN	IN	IN	IN	OFF	ON	ON	ON	OFF
7	IN	IN	OUT	IN	IN	IN	OFF	ON	Slow Blinking	ON	OFF
8	IN	OUT	OUT	IN	IN	IN	OFF	ON	Fast Blinking	ON	OFF
9	IN	OUT	OUT	IN	IN	OUT	OFF	ON	Fast Blinking	Slow Blinking	OFF

Manual start switch: If liquid level in lower tank is greater than low level & liquid level in upper tank is below high level then by pressing a switch, relay can be switched ON manually. Trip & recovery time delay is not applicable with manual start switch operation

WARRANTY / LIMITATIONS OF LIABILITY

Selec warrants the products to be free from defects in the materials and workmanship for a period of one year (or other period specified, if any) from the date of sale by Selec.

The warranty does not apply to defects resulting from any action of the buyer, including but not limited to improper handling, operating the product outside the specification limits or unauthorized disassembling / altering of the product. The warranty shall be VOID if the product shows evidence of having been tampered or being damaged due to usage in corrosive environment; or current, heat, moisture or vibration; improper specification; wrong usage in an application; misuse or other operating conditions outside of Selec's control.

Selec shall not be responsible for special, indirect or consequential damages, loss of profits or commercial loss in any way connected with the products, whether such claim is based on contract, warranty, negligence or strict liability.

In no event shall the responsibility of Selec for any act exceed the individual price of the product on which liability is asserted.

In no event shall Selec be responsible for warranty or other claims regarding the products unless Selec's analysis confirms that the products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification or repair.

CONFIGURATION SETTING

To enter configuration mode, all the sensors should be disconnected from unit or should be out of water. Either of the three modes i.e Single Tank (Suction), Single Tank (Delivery), Two Tank (Suction & Delivery) can be selected. Default mode is Two Tank (S&D).

Step	Condition	START Key	LED INDICATION (Once entered config mode)				Duration
			ON	S	D	R	
1	Enter Configuration	Press for 5sec	ON	Blink	Blink	Blink	3 sec
2	Mode Selection	Press key to switch between modes					10 sec
		1. Two Tank (S&D)	ON	ON	ON	OFF	
		2. Single tank (S)	ON	ON	OFF	OFF	
		3. Single tank (D)	ON	OFF	ON	OFF	
3	Exit Configuration	-	ON	Blink	Blink	Blink	3 sec
4	After 10secs unit will auto exit configuration mode, considering mode present during the time of exit for further operation						

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