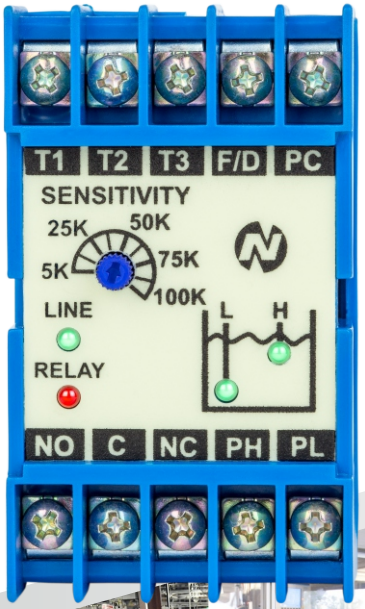
NASSAR® ELECTRONICS

SINCE 1973

User Manual

LIQUID LEVEL
CONTROL RELAY
MODEL EN-3P



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Description

The EN-3P is a dual-probe conductive liquid level control designed to monitor the levels of conductive liquid and control the actuation of pumps or valves to regulate levels. It is also suitable for protecting submersible pumps against dry running or protecting tanks from an"overflow". This device can also be used to control dosing of liquids in mixing processes and to protect heating elements in the event of non immersion.
The sensitivity can be adjusted within the range of 5KΩ to 100KΩ by rotating the knob on the unit. This sets the level at which the relay determines whether liquid is present at the probe or not.
The EN-3P is dual voltage, it can be used with either 120 or 220 VAC.

Voltage supply

DANGER!

Potentially hazardous voltages are present. Electrical shock can cause death or serious injury. Installation should be done by qualified personnel following all National, State & Local Codes.

BE SURE TO REMOVE ALL POWER SUPPLYING THIS EQUIPMENT BEFORE CONNECTING OR DISCONNECTING THE WIRING.
READ THE INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE.
KEEP THIS MANUAL FOR FUTURE REFERENCE.

To use a 220 VAC voltage supply use the terminals T1 and T3. To use a 120 VAC voltage connect the supply to terminals T1 and T2. After the supply voltage is connected the green LINE LED will turn ON.

Operation

PUMP DOWN (DRAIN) APPLICATION
The relay energizes when the liquid level comes in contact with the high probe (PH) and remains energized until the liquid level falls below the lower probe (PL). To use this application place a wire between terminals F/D and PC.

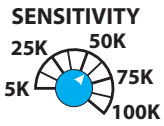
Features

- **Controls Level of Conductive Liquids in Pump Up (Fill) or Pump Down (Drain) Applications.**
- **Adjustable Sensitivity from 5K to 100K ohms.**
- **Dual Voltage 120 or 220 VAC Supply.**
- **LED Status Indication.**
- **Protects Pumps from Dry Running.**

PUMP UP (FILL) APPLICATION
The relay energizes when the liquid level falls below the low probe (PL) and remains energized until the liquid level comes in contact with the high probe (PH). To use this application leave terminals F/D and PC disconnected.

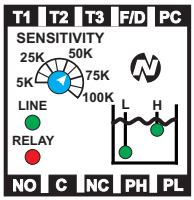
PUMP DRY RUNNING PROTECTION
To protect the pump from dry running use the same connections as the Pump Down (Drain) application and connect the contact between NO and C in series with the pump starter control.

SENSITIVITY ADJUSTMENT
To adjust the sensitivity within the range of 5KΩ to 100KΩ rotate the knob on the unit. This sets the level at which the relay determines whether liquid is present at the probe or not. For water it's recommended to set the sensitivity adjustment at 50K Ω. To set the sensitivity follow the next procedure:



Install the probes in the liquid deposit. If the probes aren't submerged in the liquid and their LED indicators are turned ON, then increase the sensitivity level until they are turned OFF.

Submerge the probes in the liquid and check if their LED indicators are turned ON. If the probe LED indicators aren't turned ON, decrease the sensitivity level until they are.

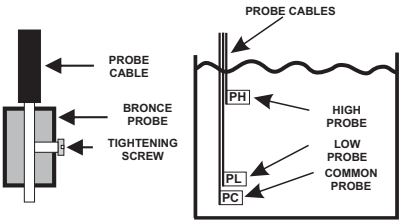


LED Indicators

LINE: Supply voltage connected.
Relay: Output relay is closed.
H: The high probe (PH) is submerged in the liquid.
L: The low probe (PL) is submerged in the liquid.

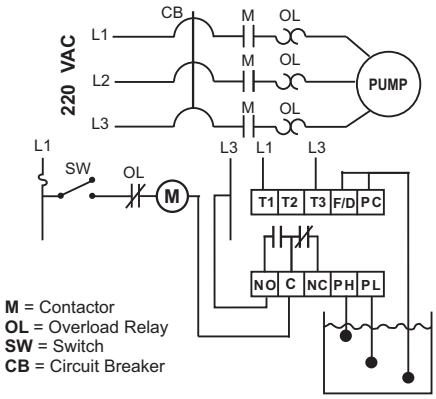
Probe installation

1) Use cable size 12 to 18 AWG to wire the probes.
2) Use 3 different cable colors to prevent a mixup with the probes.
3) The probe PC should not be more than 8 inches below from probe PL.
4) The probe PH should not be more than 48 feet higher than probe PL.



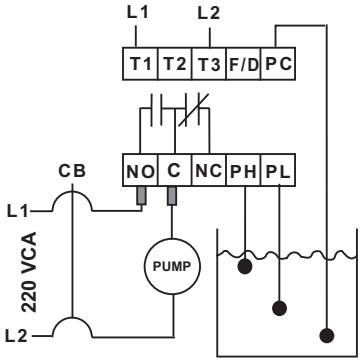
Typical example of connection

OPERATION WITH A STARTER

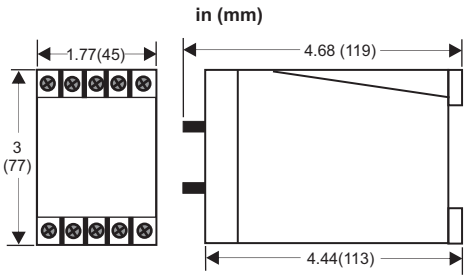


DIRECT OPERATION WITHOUT AN EXTERNAL STARTER

Only for single phase pumps



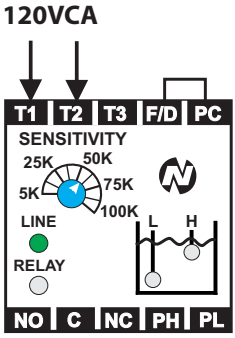
Dimensions



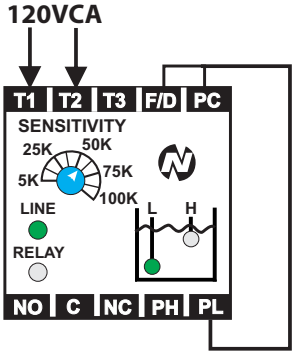
Testing the EN-3P

If the EN-3P is not operating correctly please follow the next steps to verify if the installation is correct:

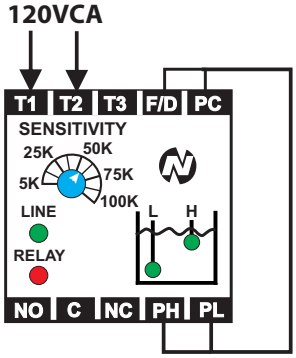
1.- Connect the 120 VCA voltage supply to terminals T1 and T2, the green LINE LED should turn ON. Use a wire to connect terminal F/D with terminal PC.



2.- Connect terminals F/D and P/C with terminal PL, the L (Low Probe) LED should turn ON.



3.- Connect terminals F/D, P/C and PL with terminal PH. The H (High Probe) LED and the red RELAY LED should turn ON and the output contact between NO and C should be closed. Use a multimeter to measure the continuity between NO and C to make sure the contact is closed.



If the EN-3P operated correctly when following this steps, but continues experiencing problems with the operation it indicates that the problem is not the EN-3P. The problem comes from the installation or an issue with the wiring, common issues with the installation or wiring include:

A.- A bad connection with the cables.
B.- A bad connection with the probes.
C.- The liquid resistance is too high (above 100K ohms).

Specifications

PROBE VOLTAGE	24 V DC
PROBE CURRENT	0.36 mAmp. DC
LIQUID RESISTANCE SENSITIVITY	Adjustable from 5K to 100K ohms.
MAXIMUM PROBE CABLE LENGTH	1640 feet (500m)
MAXIMUM POWER CONSUMPTION	3 Watts
CONTACT RATING	NO 12 Amp. , NC 8 Amp.
DIRECT OPERATION CONTACT RATING	1.5 HP Max. @ 220 V, 3/4 HP Max. @ 120 V.
OUTPUT CONTACT LIFE	10,000,000 Max. , 200,000 at direct operation.
WEIGHT	14 ounces (392g)
VOLTAGE SUPPLY	120/220 V AC ± 10% 50/60 Hz

*Specifications subject to change without notice.

WARRANTY

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