SJE RHOMBUS

NEX Series®
Grinder Control Panel

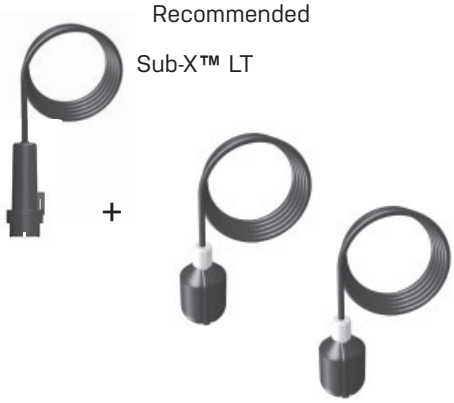
Single Phase 3-Wire Grinder Pump Control Panel

Installation Instructions and
Operation/Troubleshooting Manual

c UL us LISTED

Level Sensor options
For ordering information, please see our catalog pages at www.sjerhombus.com

Recommended



⚠ WARNING!

ELECTRICAL SHOCK HAZARD
Disconnect all power sources before servicing. Failure to do so could result in serious injury or death.

This control panel must be installed and serviced by a licensed electrician in accordance with the National Electric Code NFPA-70, state and local electrical codes. UL Type 4X enclosures are for indoor or outdoor use.

Warranty void if panel is modified.

? For information regarding operation, available options, or servicing questions, please call SJE Rhombus Technical Support.

SJE Rhombus offers a five-year limited warranty.
For complete terms and conditions, please visit www.sjerhombus.com.

Products returned must be cleaned, sanitized, or decontaminated as necessary prior to shipment to ensure that employees will not be exposed to health hazards in handling said material. All applicable laws and regulations shall apply.

Manufactured by: SJE Rhombus

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www.sjerhombus.com

PN 1108974F 10/25

Specifications

Input Voltage: 240V, 60Hz Single Phase **Operating Temperature:** 14°F to 122°F (-10°C to 50°C) **Pump Rating:** 1-2HP, 230/240V, 1 Ph, 3-wire **Electronic OL Range:** 5-20A **Pump Circuit Breaker:** 25A	**Enclosure:** 10 x 8 x 4 inch (25.4 x 20.3 x 10.2 cm) NEMA 4X thermoplastic **Control/Alarm Fuse Rating:** 1A, 250V **Auxiliary Alarm Contacts:** N.O. 1A, 120 VAC Max	**Inputs:** 2 or 3 float switches (normally open) 4-20mA level transmitter Seal Fail Thermal cutout

PART	DESCRIPTION
1108954	NEX SERIES® GRINDER 1 PH SMPLX - 71B
1108955	NEX SERIES® GRINDER 1 PH SMPLX - 87A
1108956	NEX SERIES® GRINDER 1 PH SMPLX - 53U
1108957	NEX SERIES® GRINDER 1 PH SMPLX - 58E
1108958	NEX SERIES® GRINDER 1 PH SMPLX - 67C
1108959	NEX SERIES® GRINDER 1 PH SMPLX - 52B
1110466	NEX SERIES® GRINDER 1 PH SMPLX - 54R/72P
1108960	NEX SERIES® GRINDER 1 PH SMPLX - 54A
1108961	NEX SERIES® GRINDER 1 PH SMPLX - 57A
1108962	NEX SERIES® GRINDER 1 PH SMPLX - 70A
1108963	NEX SERIES® GRINDER 1 PH SMPLX - NC

Standard Capacitor Kits

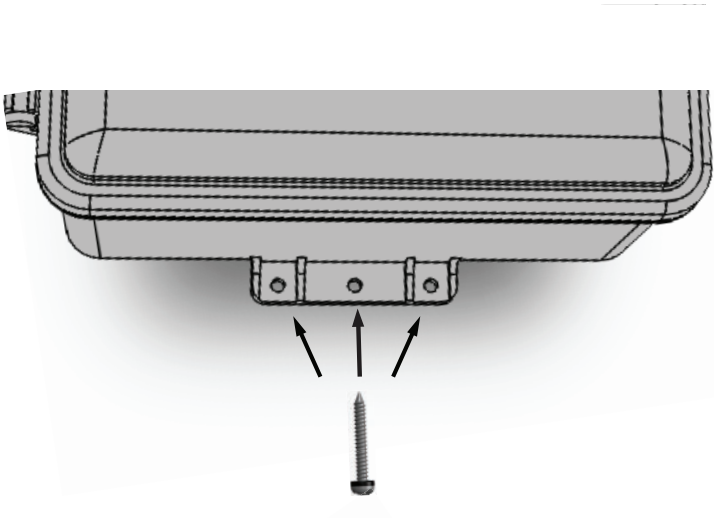
CAP KIT[1]	MANUFACTURER	PUMP MODEL	PUMP HP/FLA	START CAPACITOR		RUN CAPACITOR		START	PUMP	CONTROL/ ALARM
			230/240VAC, 1PH	PART	RATING	PART	RATING	RELAY	CB	FUSE
71B	**ASHLAND PUMP**	AGP-HC-200M2E-35	2HP/18A	1035273	189-227uF	1018625	45uF	1095711	25A	2A
87A	**CHAMPION PUMP**	CPG2023DSL	2HP/15A	6001392	189-227uF	1003829	45uF	1027125	25A	2A
53U	**CRANE PUMPS & SYSTEMS**	ZSGV2072L	2HP/15A	1031380	216-259uF	6000593	30uF	1095711	25A	2A
58E	**FRANKLIN ELECTRIC**	IGP-M231	2HP/13.9A	1004027	270-324uF	1003041	50uF	1105489	25A	2A
67C	**LIBERTY PUMPS**	LSG202M-C	2HP/15A	1002979	216-259uF	1003041	50uF	1030453	25A	2A
52B	**PENTAIR / HYDROMATIC**	HPG200M2-2	2HP/15.6A	1003704	124-156uF	1036323	15uF	1010515	25A	2A
54R/72P	**FE MYERS / HYDROMATIC**	VS20-21/HVS200M	2HP/13.5A	1003704	130-156uF	1018626	30uF	1010515	25A	2A
54A	**PENTAIR / FE MYERS**	WG20-21	2HP/12.5A	1003704	124-156uF	1027640	20uF	1010515	25A	2A
70A	**WAYNE / BLUE ANGEL**	BARDSGP1-2021	2HP/14.5A	1004027	270-324uF	6000593	30uF	1010515	25A	2A
57A	**ZOELLER**	E841	2HP/17.2A	1003705	161-193uF	1003829	45uF	1003828	25A	2A
NC[2]	**ANY**	2W PUMP	5-20A	NA	NA	NA	NA	NA	25A	2A

[1]Data subject to change. Consult pump manufacturer for updated motor data and capacitor kit requirements.
[2]NC model has no capacitors and no start relay. It is only suitable for 2-wire pumps with built-in capacitors.

Mounting the Control Panel

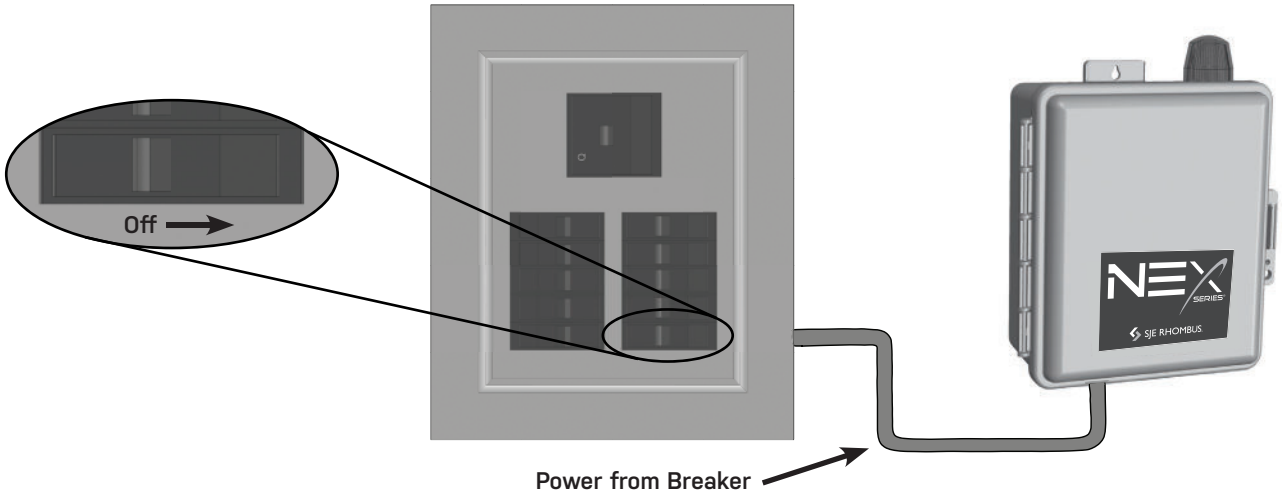
1 Install top fastener using appropriate anchor.

2 Install bottom fastener(s) using appropriate anchors.

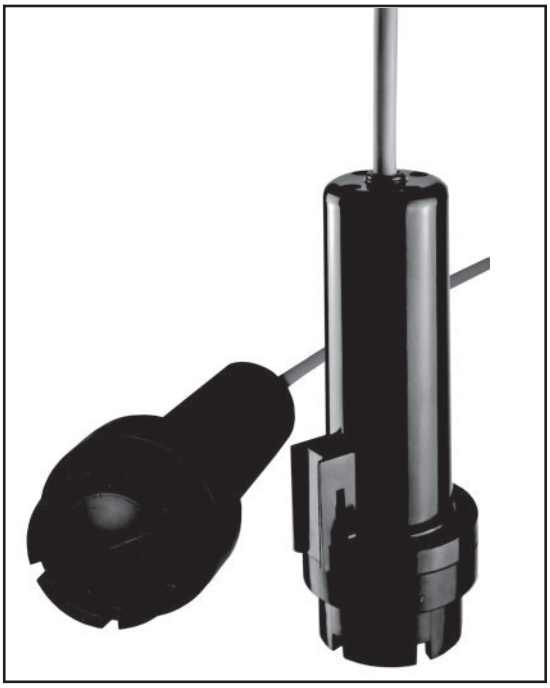


⚠WARNING!

Not suitable for installation in hazardous locations.
Not suitable for installation with circuit extensions into hazardous locations.
Conduits from the tank must be sealed by approved sealant to prevent moisture and gas from entering the control panel.
Ensure all supply power to the control panel is turned OFF before installing or servicing the Sub-X™ LT sensor, float switches or pumps in the tank. Failure to do so could result in serious or fatal shock.

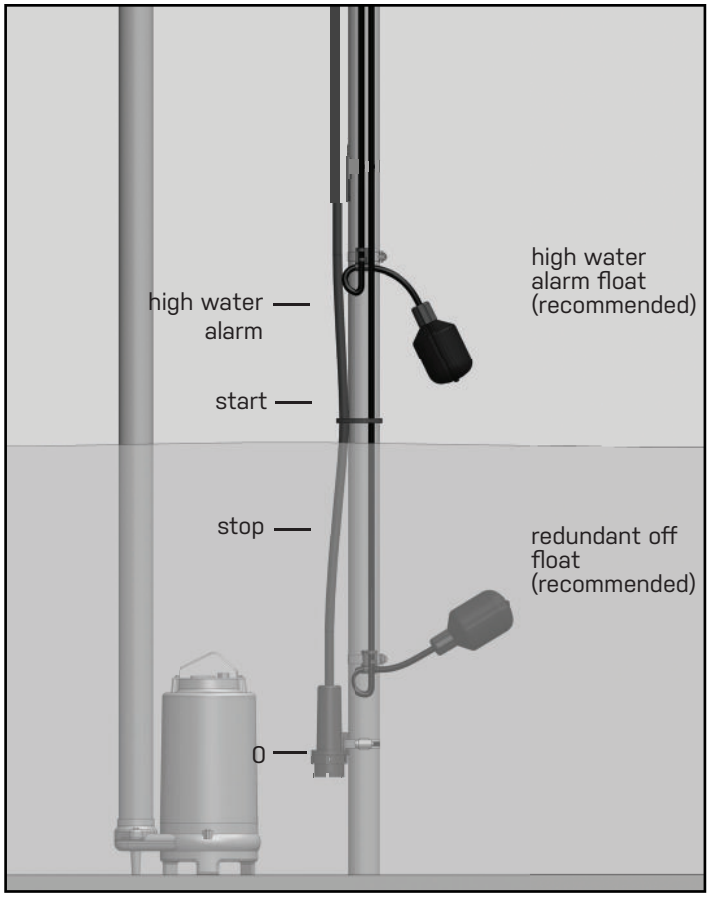


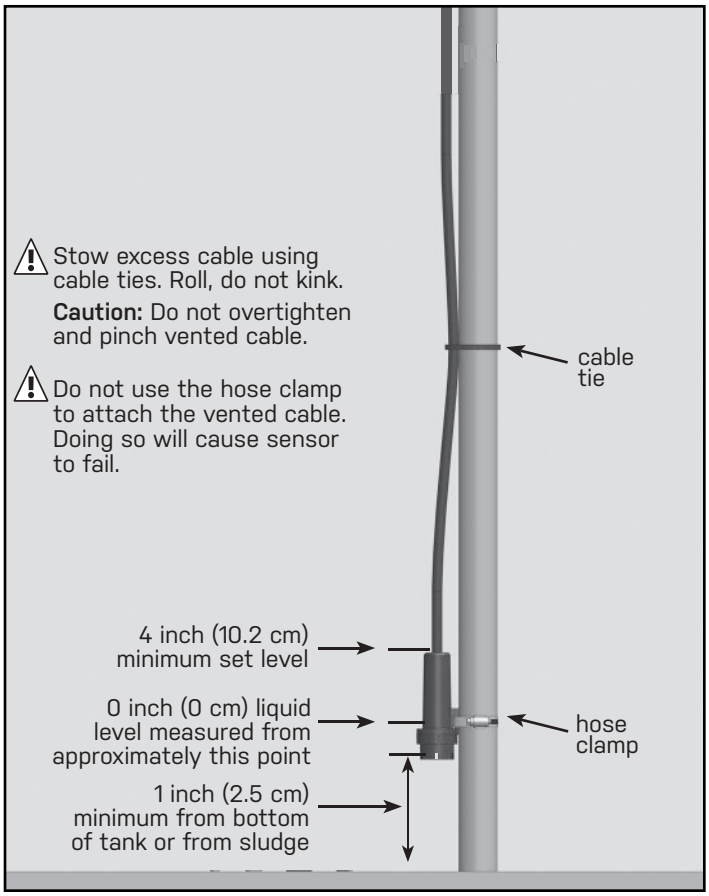
Sub-X™ LT Level Transmitter Installation



Installing the Sub-X™ LT Transmitter & Recommended Float Switches

The control panel operates with a Sub-X™ LT level transmitter and 1 or 2 back-up float switches. The transmitter operates the Pump Start, Stop and Alarm functions. The back-up float switches are for redundant off and high-level alarm. Alternatively, the control panel can be controlled solely with 3 float switches: Stop / Start / High level.

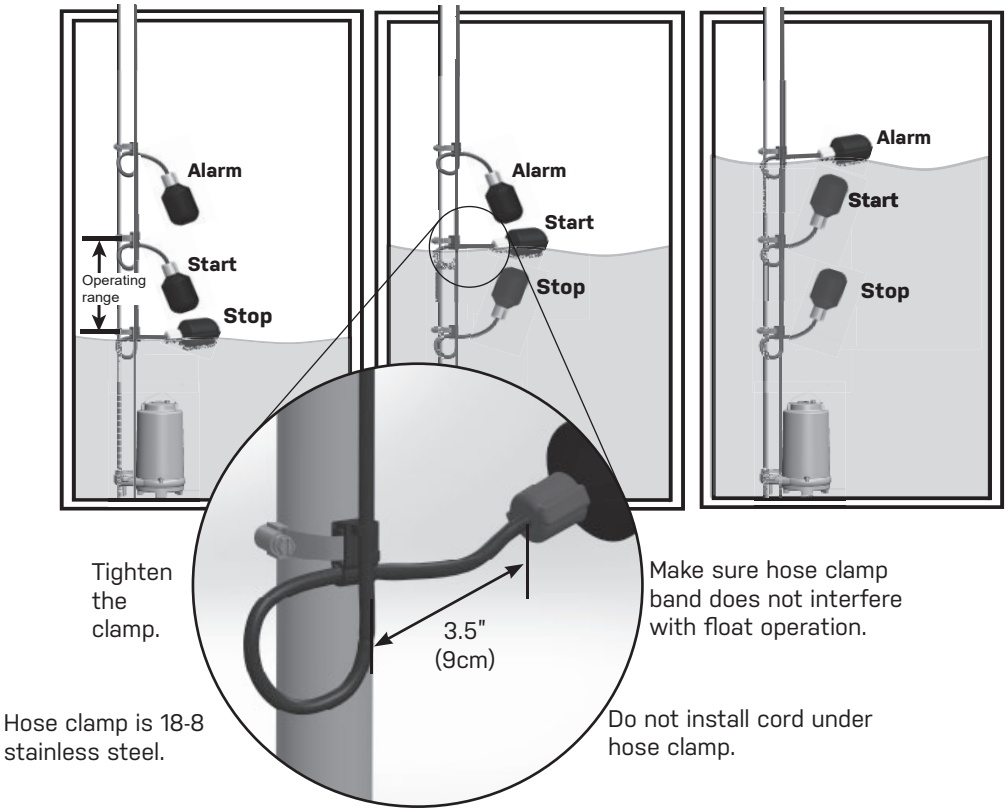




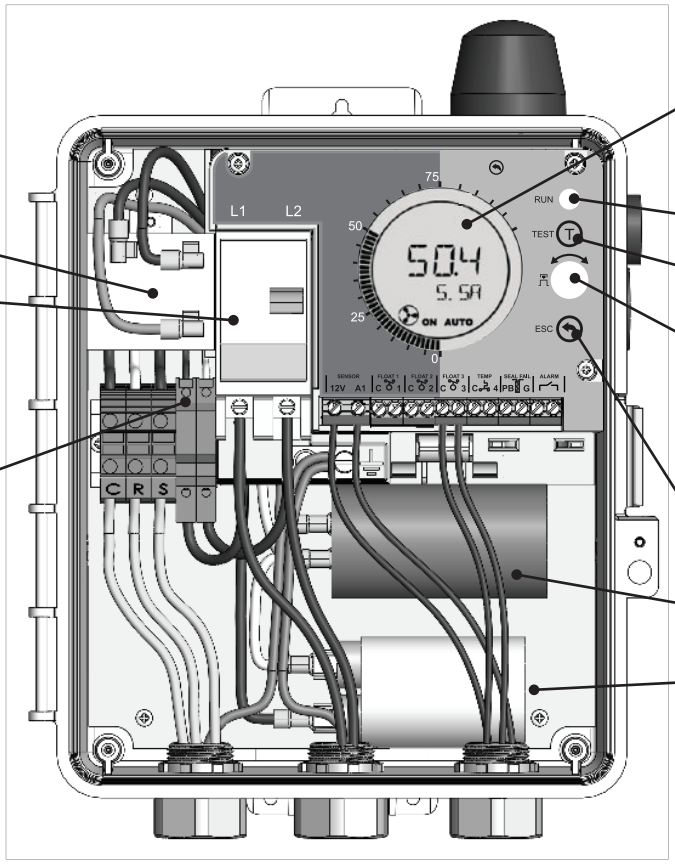
3x Float Switch Installation

Floats require free range of motion.
They must not touch each other or any equipment in the pump chamber.

Pipe Clamp Mounting - Float Operation



Wiring



Start Relay

Circuit Breaker
The pump circuit has a thermal-magnetic circuit breaker that provides pump disconnect and branch circuit protection.

Control/Alarm Power
Provides a separate incoming power or jumper from pump incoming power.

LCD Display
LCD display shows reading, pump amp reading, pump on indicator.

Pump Run Light

Pump Test Switch
Run pump manually.

Rotary Encoder Push Button
Rotate to scroll menu settings. Press to select the desired setting.

ESC Button
Exit without saving or jump to previous display.

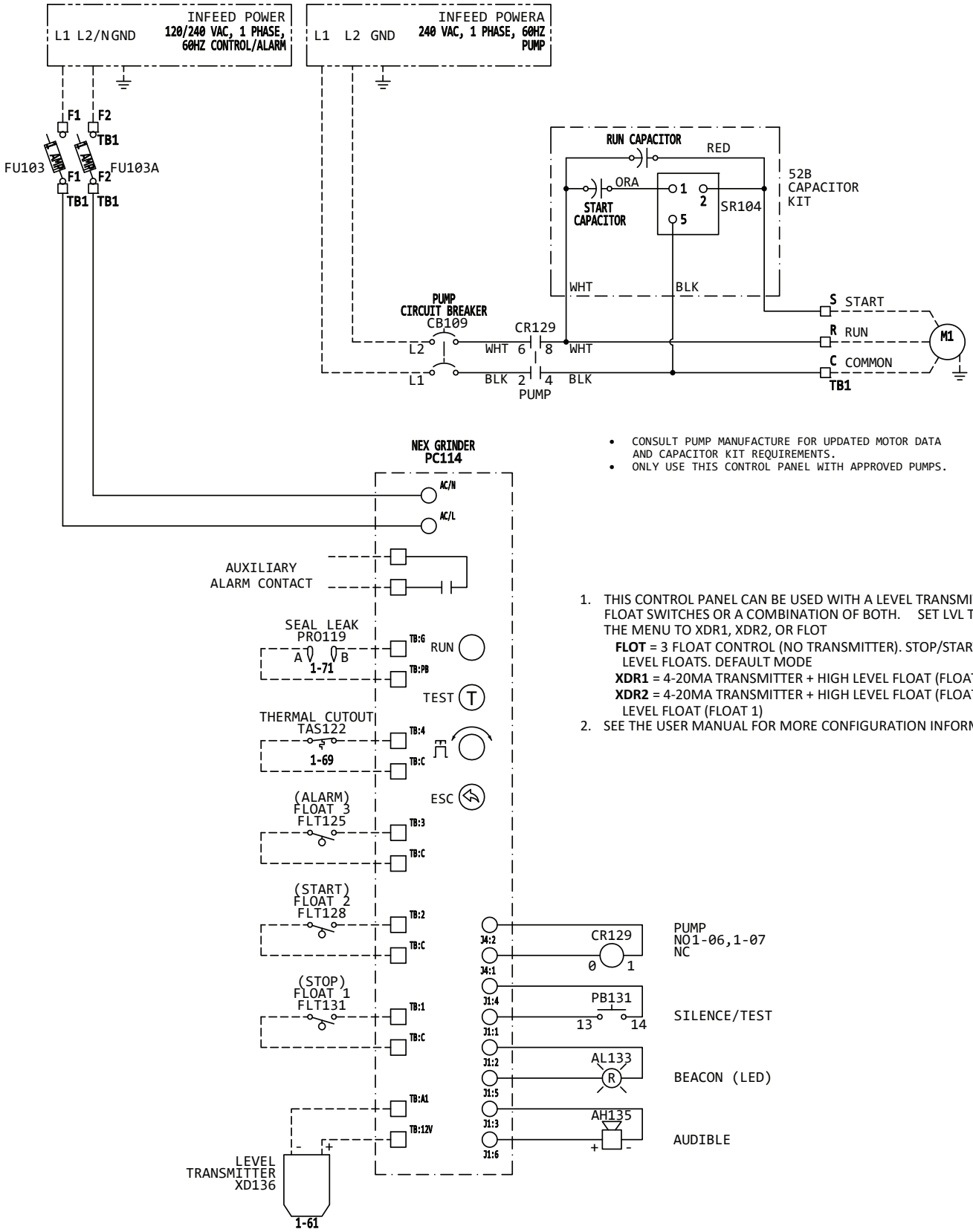
Start Capacitor
(Varies with model.)

Run Capacitor
(Varies with model.)

Pump Connection | Incoming Power | Level Transmitter & Float Switches

NOTE: Do not run the level transmitter or float switch cables in the same conduit as the pump cable.

Connections

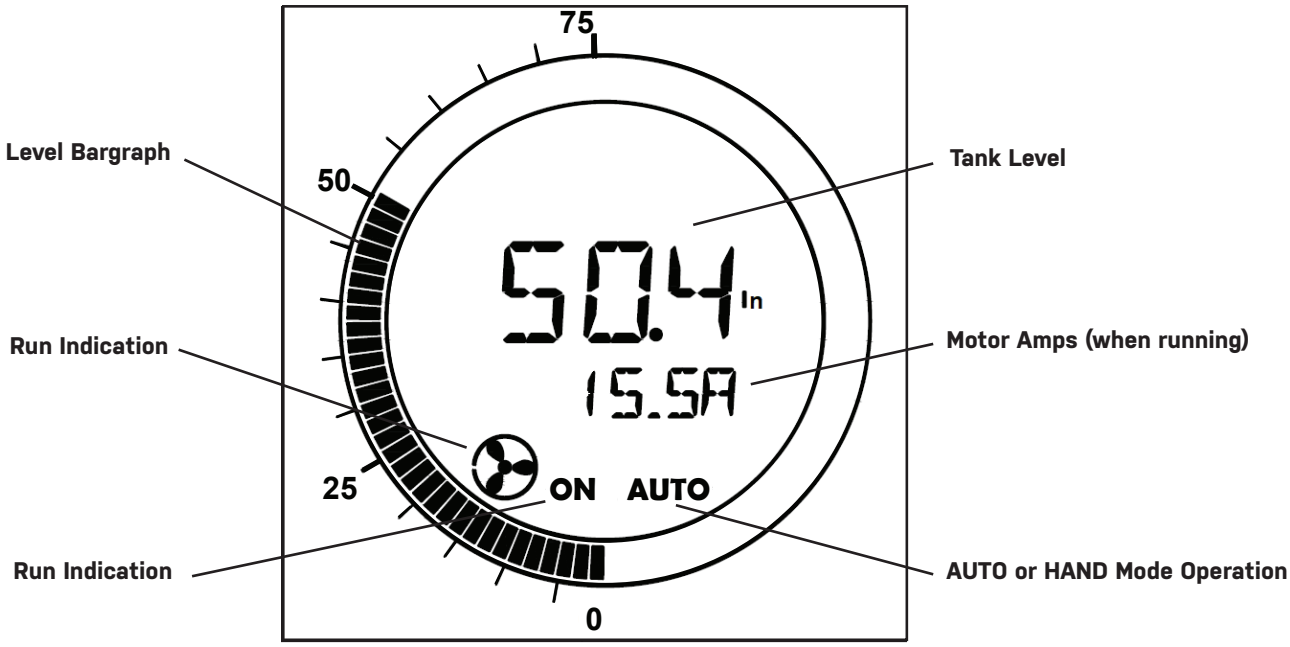


- CONSULT PUMP MANUFACTURE FOR UPDATED MOTOR DATA AND CAPACITOR KIT REQUIREMENTS.
- ONLY USE THIS CONTROL PANEL WITH APPROVED PUMPS.

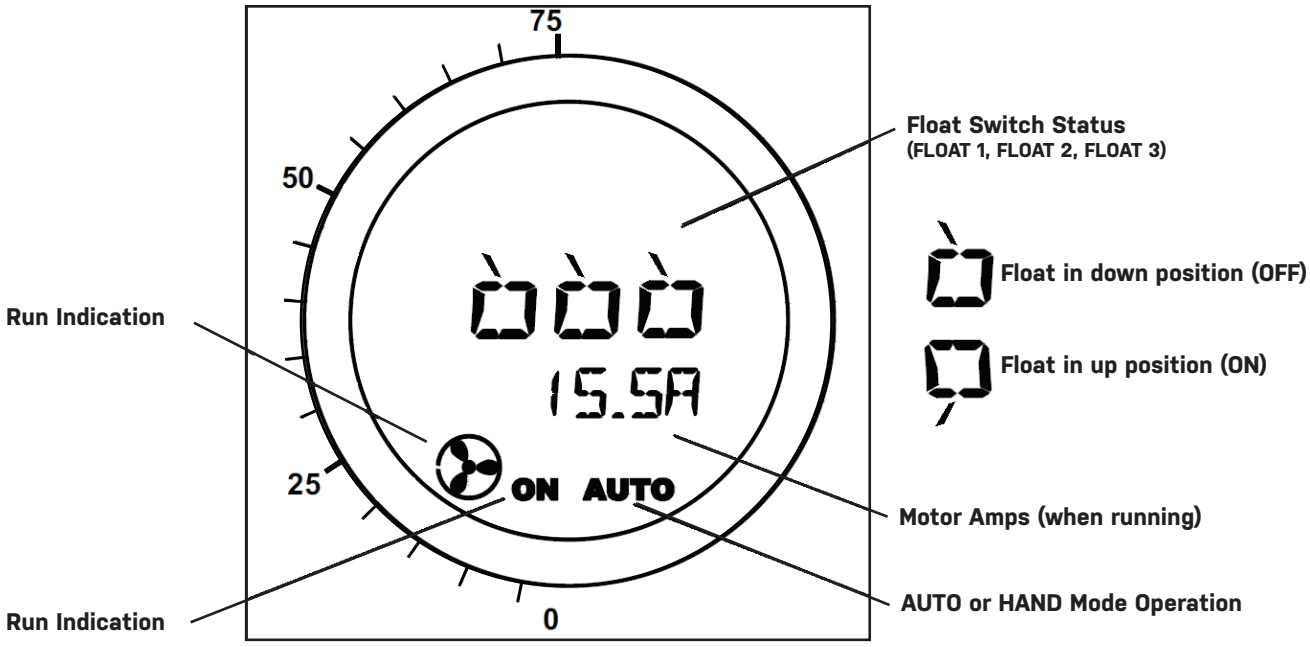
1. THIS CONTROL PANEL CAN BE USED WITH A LEVEL TRANSMITTER OR FLOAT SWITCHES OR A COMBINATION OF BOTH. SET LVL TYPE IN THE MENU TO XDR1, XDR2, OR FLOT
   FLOT = 3 FLOAT CONTROL (NO TRANSMITTER). STOP/START/HIGH LEVEL FLOATS. DEFAULT MODE
   XDR1 = 4-20MA TRANSMITTER + HIGH LEVEL FLOAT (FLOAT 3)
   XDR2 = 4-20MA TRANSMITTER + HIGH LEVEL FLOAT (FLOAT 3) + LOW LEVEL FLOAT (FLOAT 1)
2. SEE THE USER MANUAL FOR MORE CONFIGURATION INFORMATION.

Main Screen

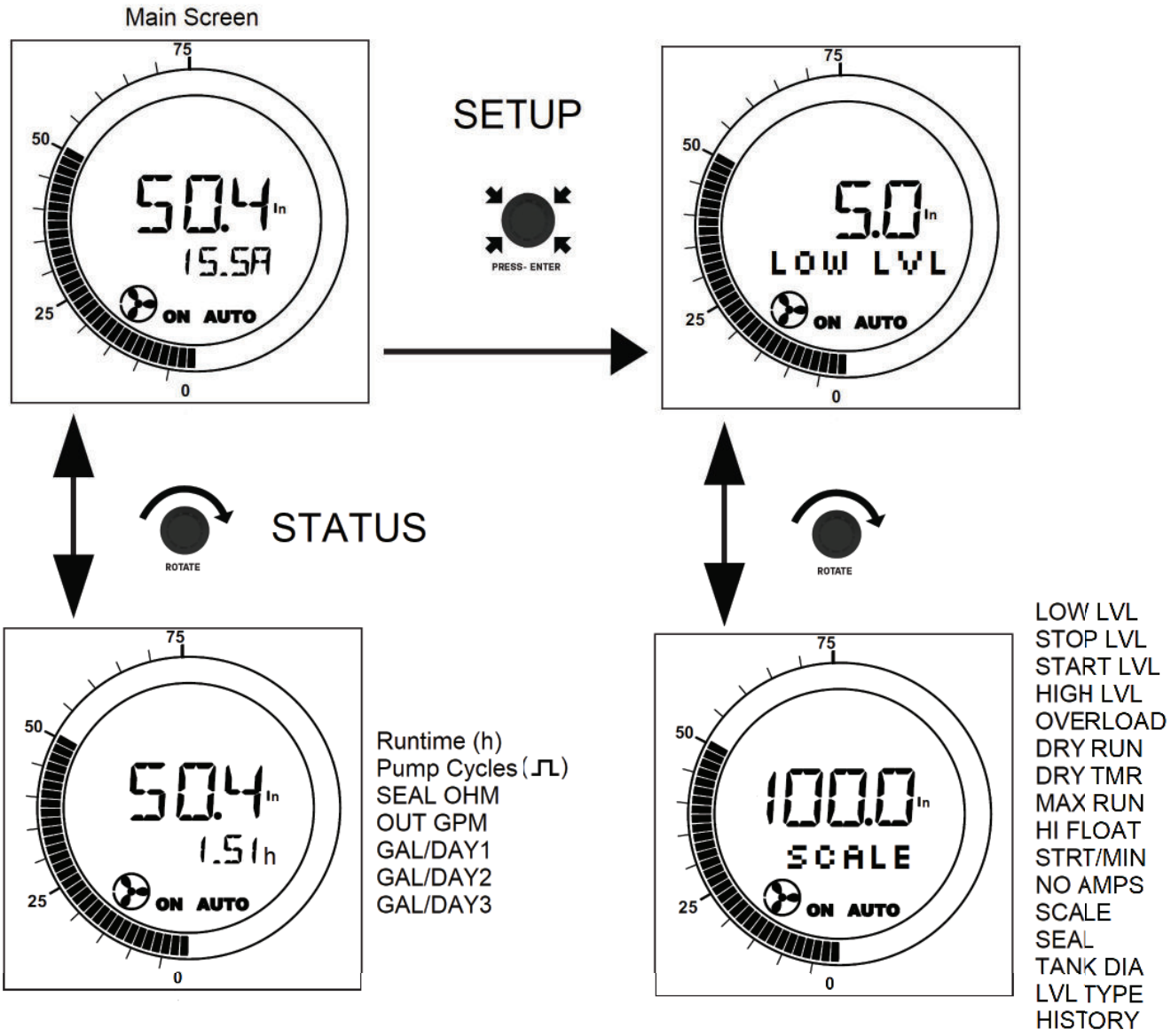
Level Transmitter Mode
XDR1 & XDR2 (See LVL Type on page 10)



Float Switch Mode
(FLOT)



Navigation



Press ESC to back out of a menu item or to return to the Main Screen.

STATUS:

- Pump total run-time is displayed when the pump is OFF. (In XXX.XX hours)
- Pump total run cycles is incremented every time the pump starts.
- SEAL OHM: Measured resistance value from the seal probe.
- OUT GPM: Pump discharge flow rate (in XDR1 and XDR2 modes only (See LVL Type on page 10)).
- GAL/DAY1: Volume pumped in the last 24 hours.
- GAL/DAY2: Volume pumped 2 days ago.
- GAL/DAY3: Volume pumped 3 days ago.

Notes: If there is no operation for 20 seconds, the display will return to the main screen.
Push and hold the ESC button 4 seconds to reset alarms manually.

Parameter Settings

Item	Description	Default	Range Min	Range Max	Unit	Function
LOW LVL	Low Level	20.0	0.0	100.0 (SCALE value)	In	Low Level alarm. XDR1 or XDR2 Mode only. If the level drops below the "LOW LVL" value the pump will stop and a "LOW LVL" alarm will be displayed.
STOP LVL	Stop Level	40.0	0.0	100.0 (SCALE value)	In	Stop level. In XDR1 or XDR2 Mode only. The pump will RUN when the level rises above the "START LVL" value and continue to RUN until the level drops below the "STOP LVL" value. Set START<STOP. The "STOP" should be at least 4" below the "START" value.
STRT LVL	Start Level	60.0	0.0	100.0 (SCALE value)	In	Start level. In XDR1 or XDR2 Mode only. The pump will RUN when the level rises above the "START LVL" value and continue to RUN until the level drops below the "STOP LVL" value. Set START<STOP. The "STOP" value should be at least 4" below the "START" value.
HIGH LVL	High Level	70.0	0.0	100.0 (SCALE value)	In	High Level alarm. XDR1 or XDR2 Mode only. If the level rises above the "HIGH LVL" value, the "HIGH LVL" alarm will be displayed. This is the high-level transmitter alarm. Not to be confused with the "HI FLOAT" alarm which is triggered by the high-level float switch.
OVERLOAD	Pump F.L.A. Setting	15.0	5.0	20.0	A	Set to the motor F.L.A. (Full Load Amps) value as listed on the motor nameplate. The pump will stop if it is pulling excessive amps, and the "OVERLOAD" alarm will be displayed. The controller will reset the fault automatically after a cooling period. The controller will reset this fault 4 times automatically before requiring a manual reset.
DRY RUN	Dry Run Amps	0.0	0.0	20.0	A	Pump DRY RUN protection. Set this value lower than the normal pump operating amps. Example: Motor Running amps = 12.0A. Set to "0.0" to disable this function (Default). Verify this function if it can be done safely by testing the pump in both dry run and dead head conditions for a short time. This fault automatically resets after a 10-minute delay or if high level float switch turns ON.
DRY TMR	Dry Run Timer	10	2	9999s	Sec	Time delay before stopping the pump on "DRY RUN" as the amps are lower than the "DRY RUN" amps value. Timer value is in seconds (s).
MAX RUN	Max Cycle Run Time	20	OFF	999	Min	0= OFF (Disabled). The pump run cycle is longer than the preset timer set in MAX RUN. Stops the pump. Set to 20 minutes by default. Adjust or disable if necessary. Resets Automatically when Stop Float is open, LO FLOAT, HI FLOAT, or HI LVL fault is active.
HI FLOAT	Pump Run Timer on High Float Alarm	10	0	9999s	Sec	High Level Float Pump RUN timer. The pump will start and run continuously as long as the High-Level Float is ON. When the float turns OFF, this timer begins to count down and the pump will stop when the timer is done. This feauture has a built-in five second delay before starting the pump.
STRT/MIN	Max Starts/ Minute	6	1	10	/	Rapid cycle protection. Enter the maximum allowable pump starts per minute. If the number of starts is exceeded, the display will show "RDP CYCL" and a manual reset is required for the pump to start again.
NO AMPS	No Amps Detection	ON	ON	ON, OFF	/	No amps detection function informs the user of the thermal switch trip internal to the motor. Allow the motor to cool and it will start again automatically. This detection function is disabled when set to "OFF".

Parameter Settings - Continued

Item	Description	Default	Range Min	Range Max	Unit	Function
SCALE	Level Sensor Max Range (20mA)	100.0	100.0	420.0	/	Enter the range of the level transmitter. This is the level in inches that corresponds to the 20 mA signal.
SEAL	Seal Fail Sensor Set Point	10K	1K	250K	kOhms	Enter the resistance threshold for seal failure. A SEAL FLT alarm will be displayed on the screen when the measured resistance drops below this value.
TANK DIA	Tank Diameter	6.0'	2.0'	12.0'	Feet	Only available on XDR1 and XDR2. Display flow (GPM) on the main screen after ETM and CC.
LVL TYPE	Level Sensor Type	XDR2	XDR1	XDR1, XDR2, FLOT	/	See below.

Warning! The overload setting must be set to match the motor FLA prior to running the pump. Do not operate with an incorrect overload setting.

LVL TYPE

XDR1 (Level Transmitter + 1 Back-up float)

In this mode, a 4-20mA level transmitter is required (Connect to SENSOR. 12V and A1 terminals).
Float 3 = HIGH LEVEL alarm (back-up float. Connect to C and 3 terminals).
During normal operation, the pump will run based on the level transmitter reading and the Start and Stop level settings.
If Float 3 is activated, the horn and beacon will turn on and "HI FLOAT" will be displayed on the screen.
The pump will operate when this float is up and continues to run for 10 sec (or value set in HI FLOAT) after the float drops. This pump operation occurs regardless of the state of the transmitter level status.
Float 1 and Float 2 are unused and inactive.

Recommended

XDR2 (Level Transmitter + 2 Back-up floats)

In this mode, a 4-20mA level transmitter is required (Connect to SENSOR. 12V and A1 terminals).
FLOAT 1 = LOW LEVEL alarm (back-up float. Connect to C and 1 terminals).
FLOAT 3 = HIGH LEVEL alarm (back-up float. Connect to C and 3 terminals).
During normal operation, the pump will run based on the level transmitter reading and the Start and Stop level settings.
If FLOAT 3 is activated, the horn and beacon will turn on and "HI FLOAT" will be displayed on the screen.
The pump will operate when this float is up and continues to run for 10 sec (or value set in HI FLOAT) after the float drops. This pump operation occurs regardless of the state of the transmitter but will stop if FLOAT 1 (LOW LEVEL) switch is OFF for more than 3 seconds.
"LO FLOAT" is displayed on the screen.
FLOAT 2 is unused and inactive.

FLOT (Float switches only)

In this mode, a 4-20mA level transmitter is not required. (12V and A1 terminals are not used).
FLOAT 1 = STOP (C and 1 terminals)
FLOAT 2 = START (C and 2 terminals)
FLOAT 3 = HIGH LEVEL (C and 3 terminals)
The pump will operate when the STOP and START floats are up and will continue running until both are OFF.
When FLOAT 3 (HIGH LEVEL) is activated, the horn and beacon will turn on and "HI FLOAT" will be displayed on the screen.
The pump will operate when this float is up and continues to run for 10 sec (or value set in HI FLOAT) after the float drops. This pump operation occurs regardless of the state of the other floats.

For 2 float operation.
Connect wide angle float to FLOAT 1 (C and 1 terminals)
Add jumper from FLOAT 1 (1) to FLOAT 2 (2)

Alarms

Fault	Action	Reset	Delay	Troubleshooting
OVERLOAD	Stop Pump	Manual / Auto		Pump motor overload. Will reset automatically 4 times. Manual reset after. Check pump, running voltage, amps, and overload setting.
LOW LVL	None	Auto	3 sec	4-20mA level is less than LOW LVL setpoint.
HIGH LVL	None	Auto	3 sec	4-20mA level is greater than HIGH LVL setpoint. Ignored if XDR is shorted.
SEAL FLT	None	Manual	5 sec	The resistance between SEAL FAIL terminals drops below the value set in SEAL.
THERMAL	Stop pump	Auto	2 sec	TEMP terminal is OPEN. Add a jumper when not used.
HI FLOAT	None	Auto	5 sec	HI FLOAT is UP. The pump will start, overriding XDR OPEN, XDR SHRT, DRY RUN, and MAX RUN, and continue to run for HI FLOAT seconds after high level float drops.
LO FLOAT	Stop pump	Auto	3 sec	In XDR2 level type with the LO FLOAT down.
FLOAT SQ (Float out of sequence error)	None	Manual / Auto	1 sec	In"FLOT" mode. If High Level is ON and FLOAT1 or FLOAT2 is down. If stop float is OFF and start float is ON. Check floats, float cable, and junction box. Replace if necessary. The FLOAT SQ alarm will auto-reset if: All floats are OFF, Then Stop Float turns ON Then Start Float turns ON
XCDR SC	Stop pump	Auto		>21mA. The level transmitter is shorted. Check cable for damage or water in a junction box.
XDCR OPN	Stop pump	Auto		<3mA. The level transmitter circuit is open. Check cable for damage or loose connections.
DRY RUN	Stop pump	Manual / Auto		Measured motor Amps is lower than preset value in DRY RUN for longer than DRY TMR. Check the stop float operation or level transducer and setting for pump STOP. Stop the pump. Wait for 10 min timer, then Auto-reset. Below is the automatic reset method: Reset after 10 minutes (fixed). Reset when the high-level float turns ON Manual reset: Cycle power or Hold ESC button for 3 sec (or whatever we have for duration for reset)
RAPID CL	Stop pump	Manual		If pump cycles more frequently than "Starts Per Min". Check level sensor settings. Pump will run if the high-level float turns ON.
MAX RUN	Stop pump	Manual / Auto		The pump run cycle is longer than the preset timer set in MAX RUN. Stop the pump. High level float will Auto Reset and run the pump. Set to 20 minutes by default. Adjust or disable if necessary. Resets automatically when Stop Float is open, LO FLOAT, HI FLOAT, or HI LVL fault is active.
NO AMPS	None	Auto	1 sec	Pump not detecting any amps. CB trip or Thermal switch open in pump windings. If pump reading is <0.5A dry will not activate.

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