/ ***LLC Water Level Control*** *System* /

User Manual 09-1366

Marley®
AN SPX BRAND

Contents

Note

This manual contains vital information for the proper installation and operation of your cooling tower. Carefully read the manual before installation or operation of the tower and follow all instructions. Save this manual for future reference.

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.

⚠ Warning

Indicates presence of a hazard which can cause severe personal injury, death or substantial property damage if ignored.

⚠ Caution

Indicates presence of a hazard which will or can cause personal injury or property damage if ignored.

Note

Indicates special instructions on installation, operation or maintenance which are important but not related to personal injury hazards.

Introduction

These instructions are intended to assure that field connections are completed properly and the control system operates for the maximum time possible. Since product warranty may depend on your actions, please read these instructions thoroughly prior to operation.

If you have questions about the operation and/or maintenance of this control system and you do not find the answers in this manual, please contact your Marley sales representative.

⚠ Warning

Hazard of electrical shock or burn. Be sure to turn off power to the panel before servicing. If working on equipment out of site of panel disconnect, lockout using standard lockout procedure.

Safety First

The Marley control system uses UL listed components installed in accordance with the National Electric Code. The location of the cooling tower and field installation of the control system can affect the safety of those responsible for installing, operating or maintaining the tower and controls. However, since SPX Cooling Technologies does not control the tower location, or field installation, we cannot be responsible for addressing safety issues that are affected by these items.

⚠ Warning

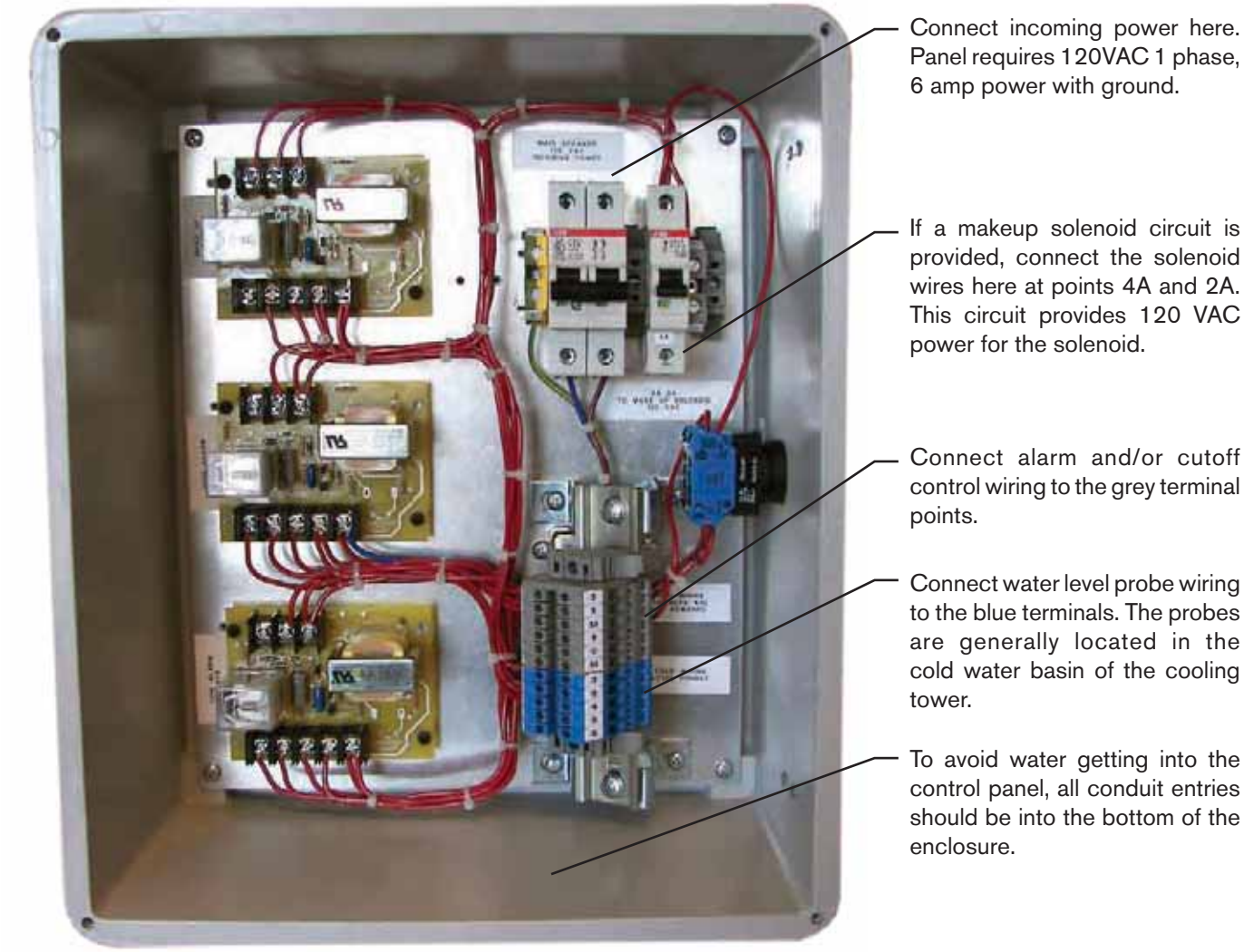
The following safety issues should be addressed by those responsible for installation, maintenance or repair of the tower and controls:

- ***Access to and from the control panel (including the customer supplied main disconnect/branch circuit protection.)***
- ***Proper grounding of electrical control circuits.***
- ***Sizing and protection of branch circuits feeding the control panel.***
- ***Qualification of persons who will install, maintain and service the electrical equipment.***

These are only some of the safety issues that may arise in the design and installation process. Marley strongly recommends that you consult a safety engineer to be sure that all safety considerations have been addressed.

Other safety issues are addressed in literature supplied with your tower. You should closely review the literature prior to installing, maintaining or repairing your tower.

Quick Start Guide



Connect incoming power here. Panel requires 120VAC 1 phase, 6 amp power with ground.

If a makeup solenoid circuit is provided, connect the solenoid wires here at points 4A and 2A. This circuit provides 120 VAC power for the solenoid.

Connect alarm and/or cutoff control wiring to the grey terminal points.

Connect water level probe wiring to the blue terminals. The probes are generally located in the cold water basin of the cooling tower.

To avoid water getting into the control panel, all conduit entries should be into the bottom of the enclosure.

Note

If the control panel is furnished with a water makeup selector switch located on the right-hand side of the enclosure:

HAND: position: Solenoid will energize.

OFF: position: Solenoid is de-energized

AUTO: Solenoid will operate depending on water level in relation to water probe height.

Operation

Description

The Liquid Level Control systems are used to accomplish five different functions:

- **Water Makeup**
- **High Water Alarm**
- **Low Water Alarm**
- **High Water Cutoff**
- **Low Water Cutoff**

The most common application of a water level control system is water makeup. The system regulates the amount of water in the tower basin and keeps it within normal operating levels. This makeup system is used to control a remotely installed water solenoid valve. When the water level drops below a prescribed, preset level, the solenoid valve is energized by the control system to fill the basin to its proper level.

High and low water alarms can be utilized to give warnings associated with abnormal operating water levels. To provide indication of these types of alerts, the control system provides dry contacts to interface with various digital control systems or can be connected to user supplied alarm indicators to signal when corrective action is required.

Low-water cutoffs are commonly used to protect pumps from operating without sufficient water. When used in unattended operating environments, the low-water cutoff is configured to shut the pump off, thus preventing costly repairs. Dry contacts can be wired directly in series with pilot duty controls or to digital control systems to initiate the shutdown of protected equipment during low-water situations.

Operation

The LLC water level control system consists of special purpose liquid sensing relays on one or more individual circuit cards connected to a probe assembly located in the cold-water basin. Each circuit card contains one relay and external signaling is provided by each of these special purpose cards. The individual relay provides a “Form C” normally open and normally closed dry contact. The circuit card activates the relay using “through the water” continuity by way of the senor probes located in the cold-water basin of the cooling tower.

Operation

Utilizing water's ability to conduct electricity, a circuit path can be established between one probe tip and the other. Current conducts through the water across probes of dissimilar length. One common or reference probe is present in all systems and is shared by all functions of the system. This probe can be identified by its length. It is the longest probe in the system and extends the deepest into the basin. The current path is routed between all other probe tips and this one "common". When the water level reaches the shorter probe, the circuit is completed and the relay responds, opening or closing relay contacts corresponding to a fixed level. For low-level control, the ground reference probe and a slightly shorter probe provide the circuit. When the water level drops below this tip, the continuity between this probe and the reference probe is interrupted and the relay contacts transfer. The distance from the tip of the low probe to the floor of the basin determines the minimum water level that is allowed before an alarm is produced or pump operation is interrupted.

The number of additional probes is determined by the individual application. As an example, in a "water makeup" system there are three probes. One reference and two standard or short-tipped probes. The tip of the reference probe is normally positioned slightly above the basin floor with the additional probe tips positioned at different heights dictated by their specific function. The Makeup system would have one probe at a height to begin or start filling the basin and another positioned higher to complete or stop filling. A probe for a High Alarm or High Cutoff would be positioned at a level to activate when the basin water exceeds its normal operating level and logically a Low Alarm or Low Cutoff would be positioned to detect a low water level nearer the bottom of the basin. Again, signaling is achieved in two ways. High Level and Makeup cards react when the water provides a completed circuit or continuity between its sensor and the reference probe. The second type of signal is for Low Level detection. The Low Level cards react when the water is not present and opens the circuit or disrupts the current flow between its probe and the reference.

A water level control system can be configured to meet various combination requirements. Since one individual circuit card is responsible for each function, the size and circuitry varies in proportion to the number of operations desired. For example, a water level makeup control will require a control panel with one circuit relay card and three probes. A system configured for water makeup that includes a high alarm and a low alarm, will require three circuit cards and five probes–one circuit card for the water makeup option, one for high operation and one for low.

Operation

Water Makeup Function

A system is designed for alarms and/or cutoff indication only would not be equipped with the water makeup function.

The circuitry for water makeup in the LLC control panel provides an independent circuit breaker for direct connection to a 110-120VAC water solenoid valve. This added feature allows customer installation without having to provide an additional power circuit to energize the solenoid. The solenoid is connected to terminals 2A and 4A as represented on the control's specific wiring diagram.

Purpose and Function of the HAND-OFF-AUTO Switch

Located on the right side of the control's enclosure is a HAND-OFF-AUTO switch. This switch is used primarily at cooling tower startup and in maintenance procedures where the tower basin is empty or has been drained. When the tower's basin needs to be manually filled, the switch is placed in the HAND position. This selection bypasses the probe assembly's feedback and directly energizes the solenoid valve connected to the water supply. Once the cooling tower basin is filled, the switch is placed in the AUTO position to allow the adjusted probe assembly to monitor and sustain the proper operating level. Placing the switch in the OFF position completely interrupts any monitoring or fill action normally provided by the LLC control panel. Normal tower operation depends upon the HAND-OFF-AUTO switch being positioned in the AUTO mode at all times.

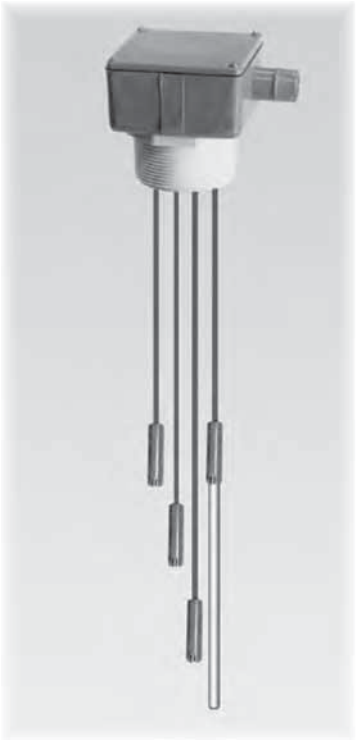
Operation

Inside view of a LLC Control Panel with Makeup, High Alarm, and Low Alarm.

Internal Components of the LLC Control Panel

LLC control panels are built to UL and CUL standards and are designed to provide the numerous configurations needed for cooling tower applications. All LLC control panels include a main circuit breaker with an additional circuit breaker and a HAND-OFF-AUTO switch provided when the system includes a water makeup circuit. The additional circuit breaker provides an exclusive control circuit for a 120VAC water solenoid valve. High and low circuit relay cards and the appropriate terminal connections comprise the rest of the components necessary for the specific configuration. The raised terminal strip provides easier access to make the necessary connections of the water probe assembly and customer interface.

Operation



Stainless Steel Electrode Probe Assembly

The electrode probe tips are stainless steel suspended from a noncorrosive PVC enclosure box with 20 feet of wire for each probe. A galvanized or stainless steel stilling chamber is installed over the probes to calm the water for accurate readings.

Illustrations Describing Operation Sequence

The next three pages are simplified illustrations representing the sequence of operation for each type of circuit card.

- **Page 10 – Makeup**
- **Page 11 – High Alarm**
- **Figure 3 – Low Alarm**
- **Figure 4 – High Cutoff**
- **Figure 5 – Low Cutoff**

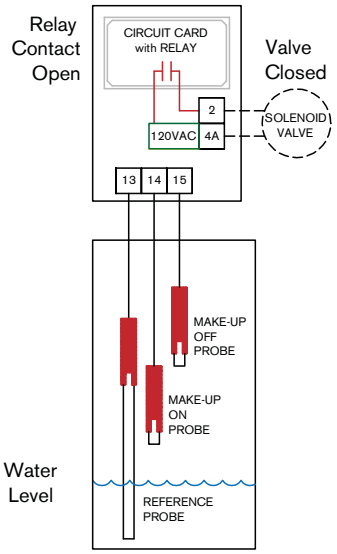
Note

Reference is the one common probe to the total system configuration.

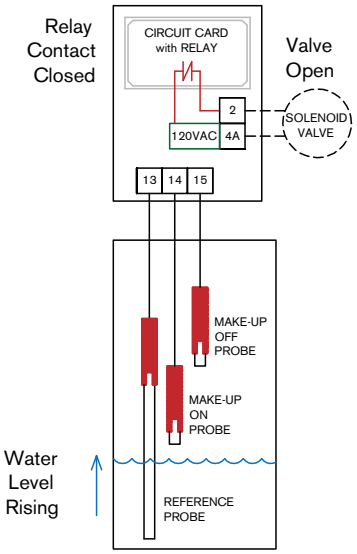
Operation

Water Makeup Control – Sequence of Operation

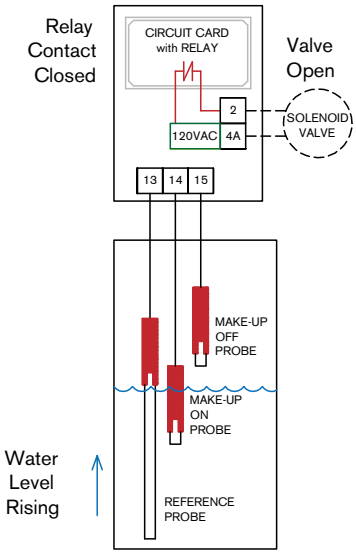
1. DE-ENERIZED CONTROL PANEL Power OFF



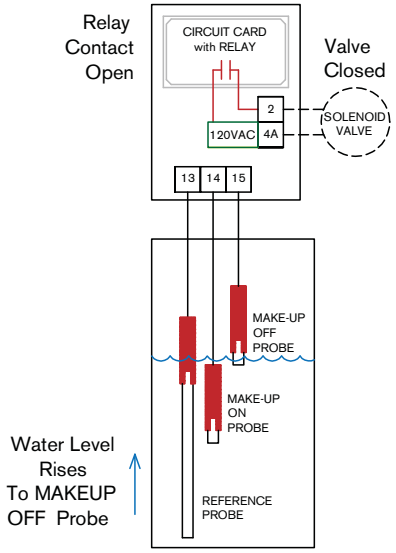
2. ENERIZED CONTROL PANEL Power ON



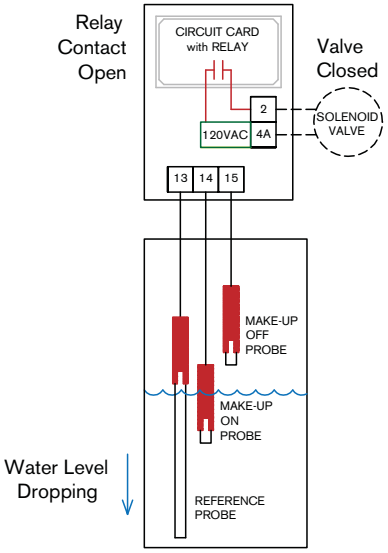
3. ENERIZED CONTROL PANEL Power ON



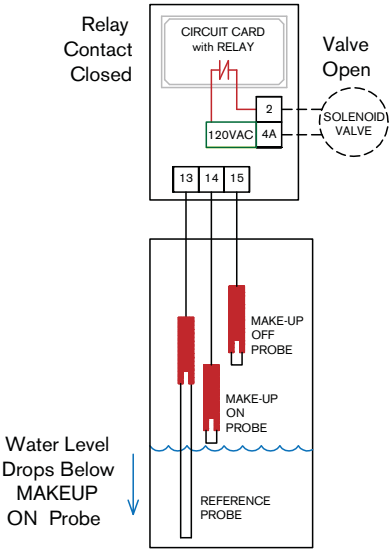
4. ENERIZED CONTROL PANEL Power ON



5. ENERIZED CONTROL PANEL Power ON

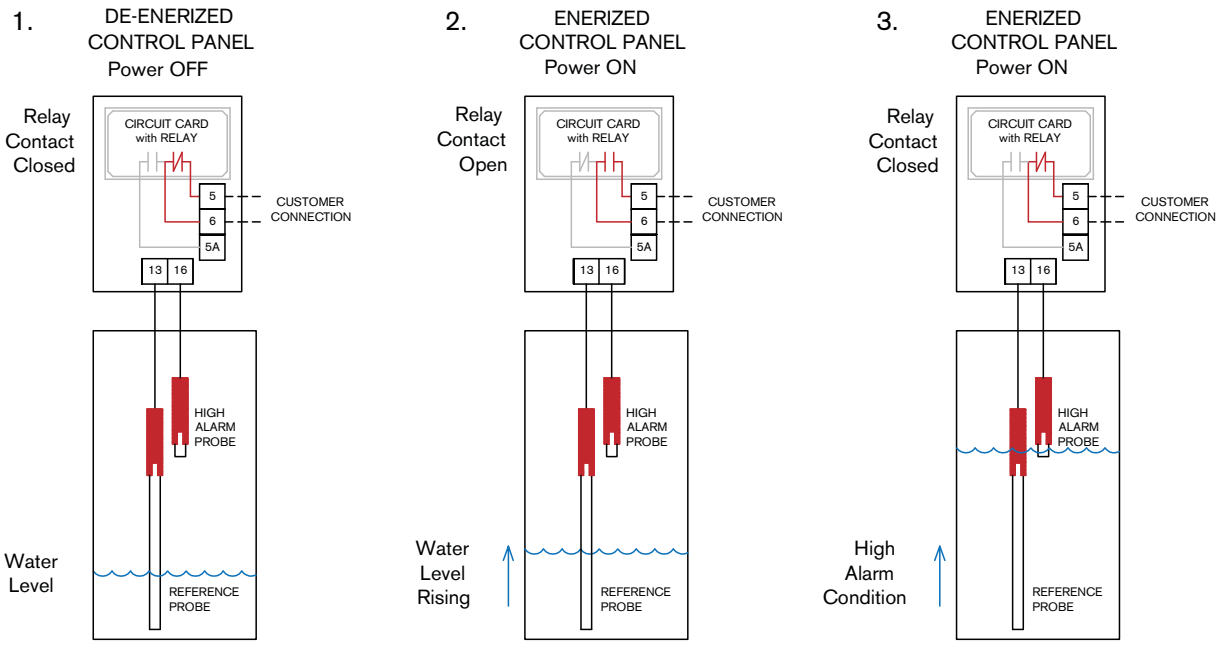


6. ENERIZED CONTROL PANEL Power ON

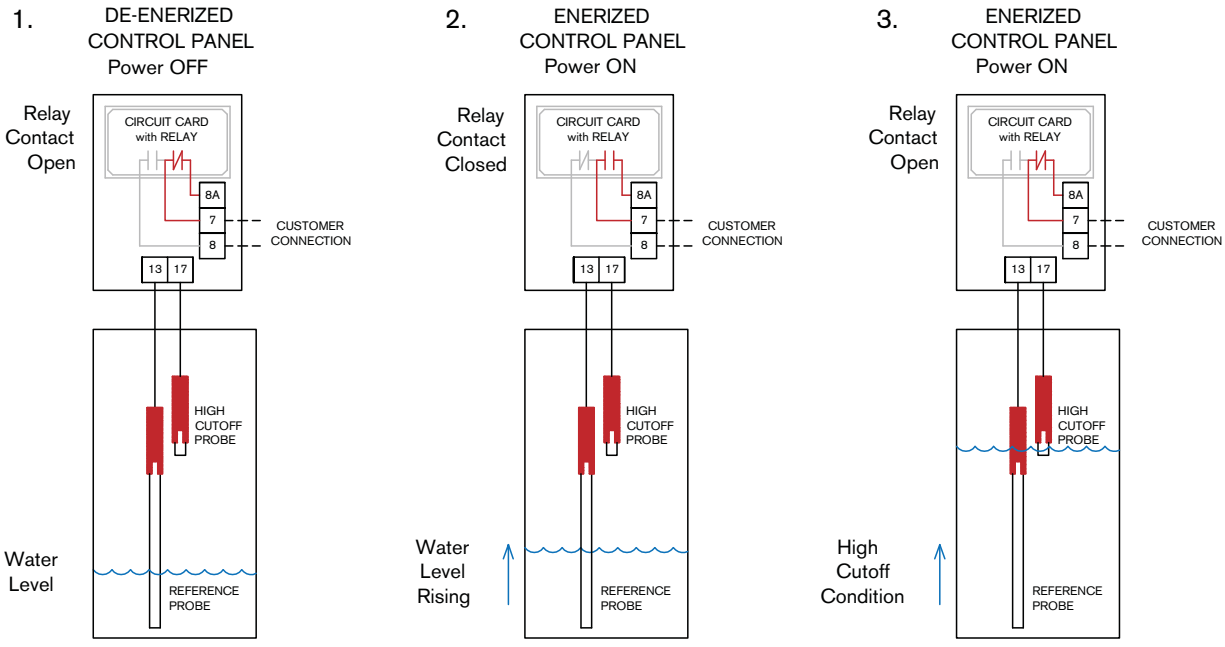


Operation

High Level Alarm – Sequence of Operation

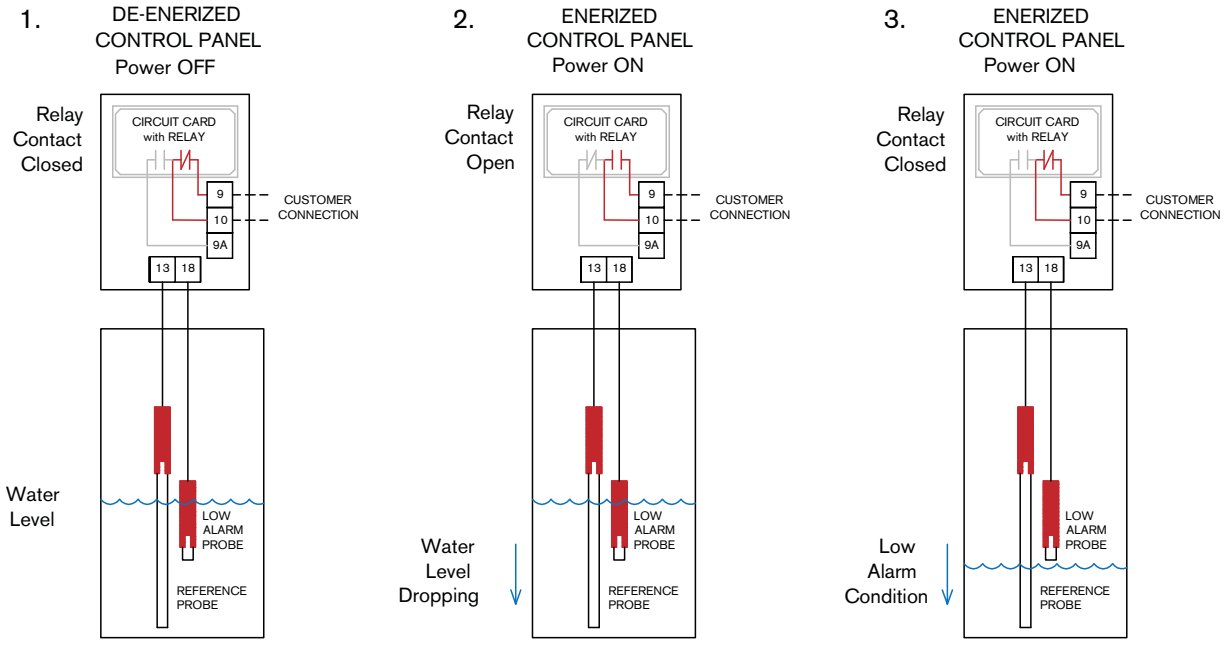


High Level Cutoff – Sequence of Operation

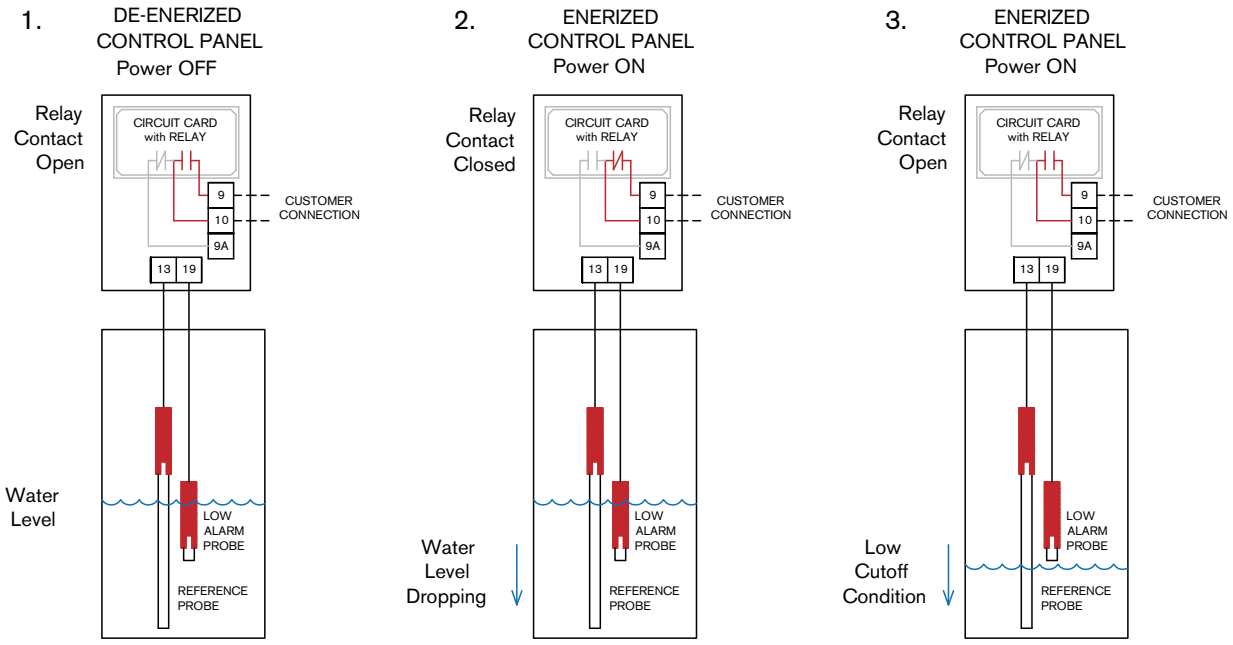


Operation

Low Level Alarm – Sequence of Operation



Low Level Cutoff – Sequence of Operation

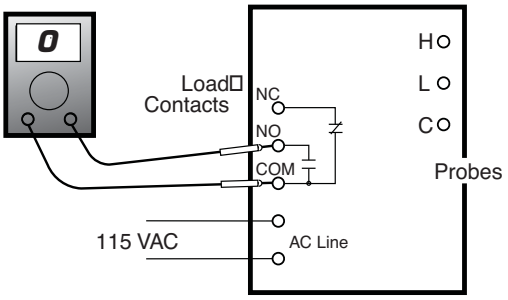


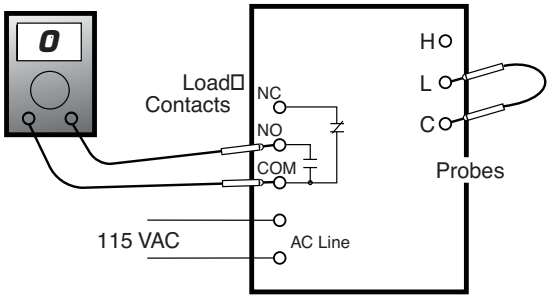
Checkout Procedure

Water Makeup, High Alarm and High Cutoff – Circuit Card LLC24B2F50N

If an individual circuit relay card is suspected of causing a problem, use one of the next two checkout procedures to verify its' condition. The first procedure is used when checking the Makeup, High Alarm or High Cutoff cards.

The second procedure, on the next page, is used to check a Low Alarm or Low Cutoff card. Perform each step as directed.





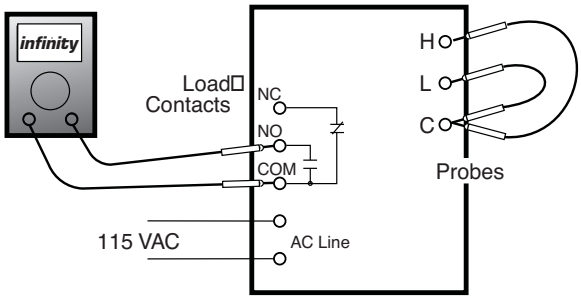
Step1

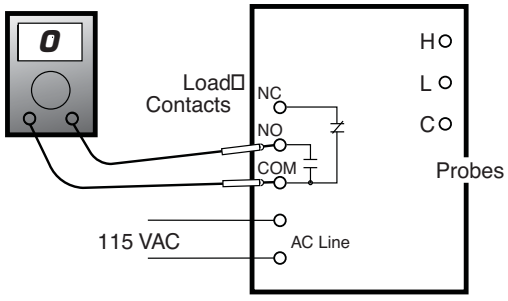
1–Disconnect all wires from relay card. Connect power to the relay.

2–Connect ohmmeter across contacts **COM** and **NO**. Meter should read 0 ohms (closed contact).

Step 2

1. Attach a jumper to **C** and **L** (probe terminals). Meter should still read 0 ohms.





Step 3

1. Touch a jumper to the **H** and **C** terminals. Meter should read "infinity" (open contact).
2. Remove the jumper from **H** to **C**, leaving the jumper from **L** to **C** in place. Contacts should remain open.

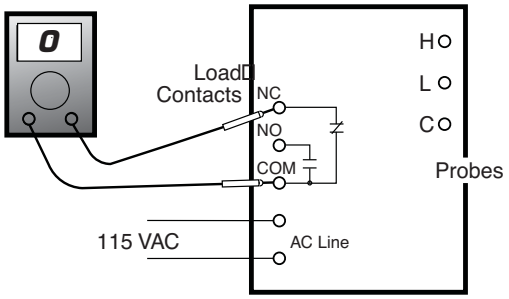
Step 4

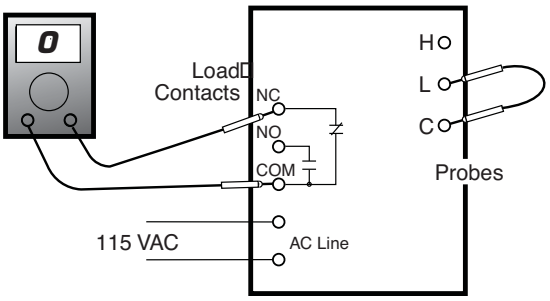
1. Remove the jumper from **L** to **C**. Meter should read 0 ohms, indicating contacts have closed.

Note–Check out procedure for card LCC24BF50N (Makeup, High Alarm and High cutoff) Uses N.O. (normally open) contacts verses N.C for card LCC24Af50N. See next Page.

Checkout Procedure

Low Alarm and Low Cutoff – Circuit Card LLC24A2F50N





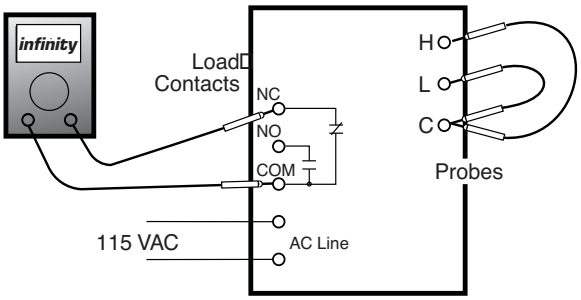
Step1

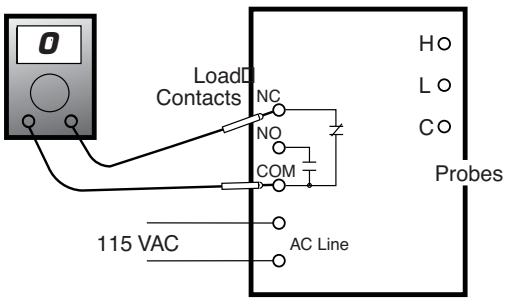
1–Disconnect all wires from relay card. Connect power to the relay.

2–Connect ohmmeter across contacts **COM** and **NC**. Meter should read 0 ohms (closed contact).

Step 2

1. Attach a jumper to **C** and **L** (probe terminals). Meter should still read 0 ohms.





Step 3

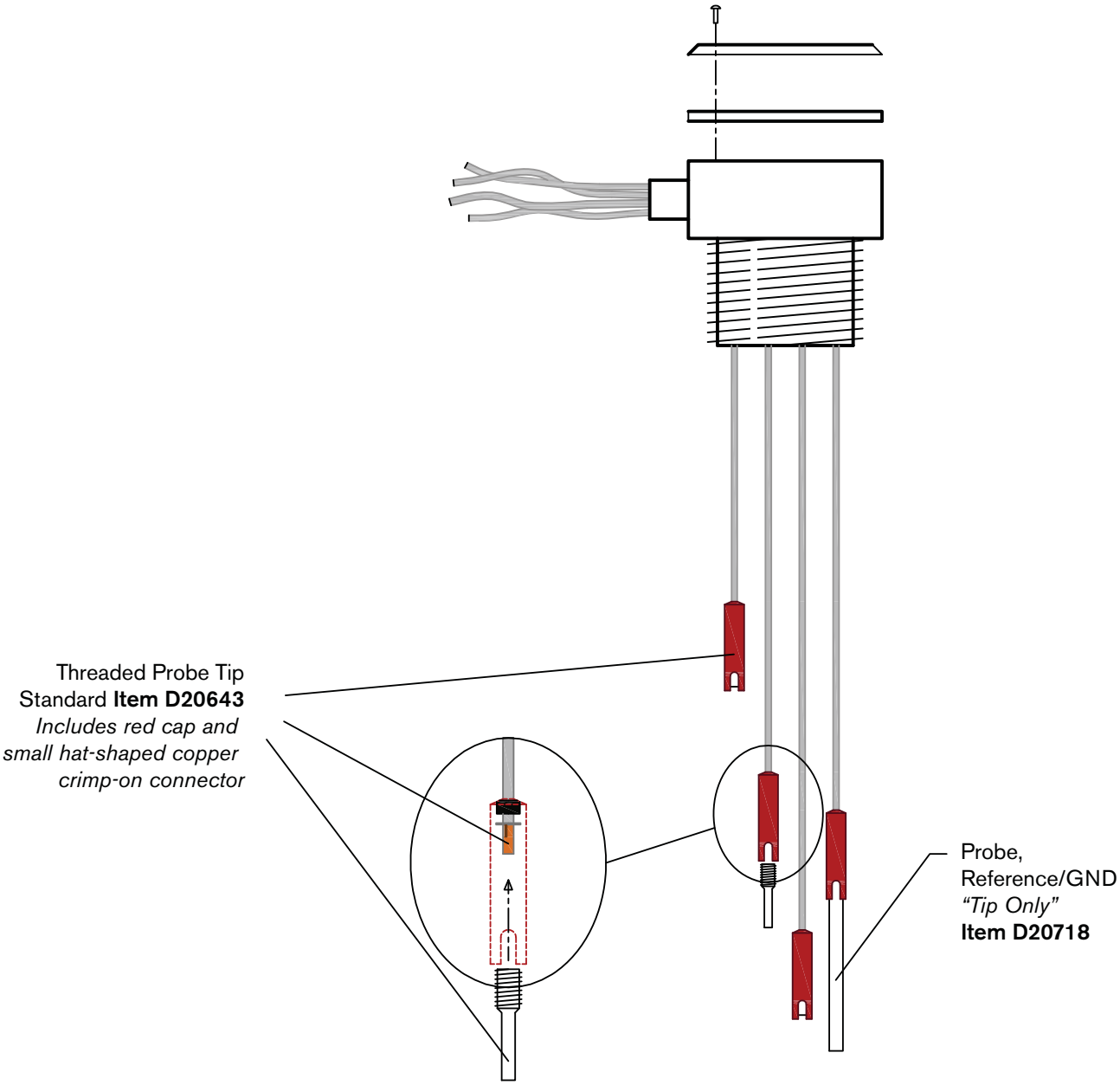
1. Touch a jumper to the **H** and **C** terminals. Meter should read “infinity” (open contact).
2. Remove the jumper from **H** to **C**. Contacts should remain open.

Step 4

1. Remove the jumper from **L** to **C**. Meter should read 0 ohms, indicating contacts have closed.

Note–Check out procedure for card LCC24AF50N (Low Alarm and Low Cutoff) uses N.C. (normally closed) contacts verses N.O. for card LCC24BF50N. See previous page.

Parts List



Electrode Probe Assembly

Additional part numbers can be found on the next page

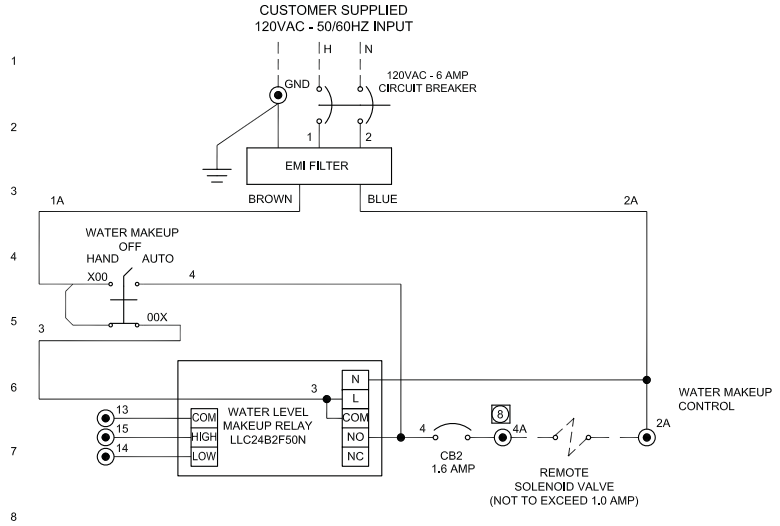
Parts List

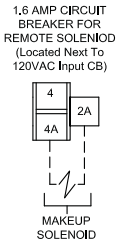
Relay Circuit Card

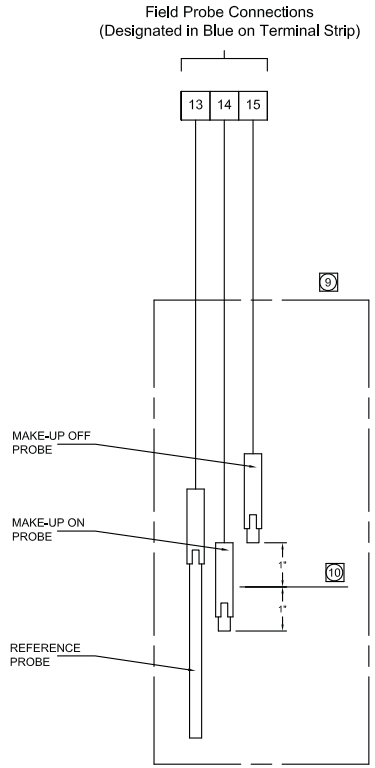
Item number **D55194** – Used for Makeup, High Alarm and High Cutoff (LLC24B2F50N)

Item number **D55195** – Used for Low Alarm and Low Cutoff (LLC24A2F50N)

Marley Item	Description
2038884	H-O-A Switch
D55194	Makeup Relay Card
D55194	High Alarm Relay Card
D55194	High Cutoff Relay Card
D55195	Low Alarm Relay Card
D55195	Low Cutoff Relay Card
C74516	Standard Probe Sensor (Complete with tip and 20 ft wire)
D20711	Standard Probe Sensor (Complete with tip and 50 ft wire)
D20707	Reference / GND Probe Sensor (Complete with tip and 20 ft wire)
D20712	Reference / GND Probe Sensor (Complete with tip and 50 ft wire)
D20643	Standard Probe Sensor Stainless Steel Tip
D20718	Reference / GND Probe Sensor Stainless Steel Tip
203887	Terminal Blocks Kit (2 Gray, 2 Blue and 1 End)
D81756	EMI Filter





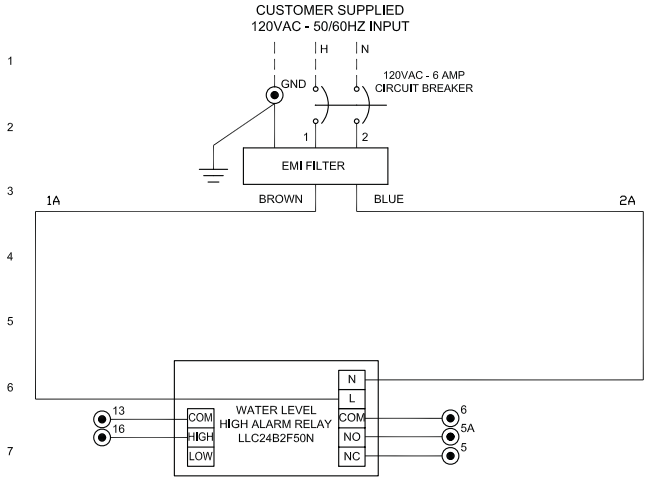


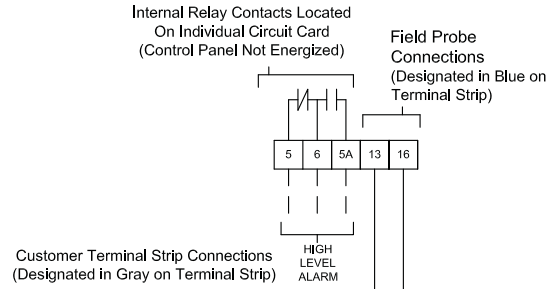
Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #:	E80300
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/25/2008				1=5.2	08–24218	





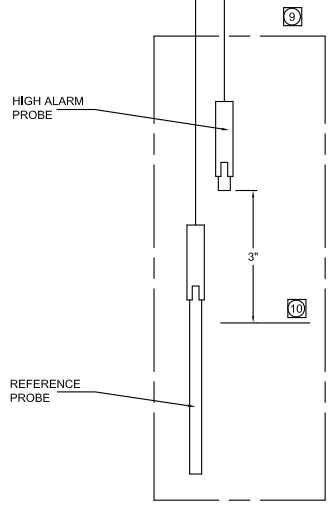


TABLE 1
OPERATION STATUS
(Power Applied)

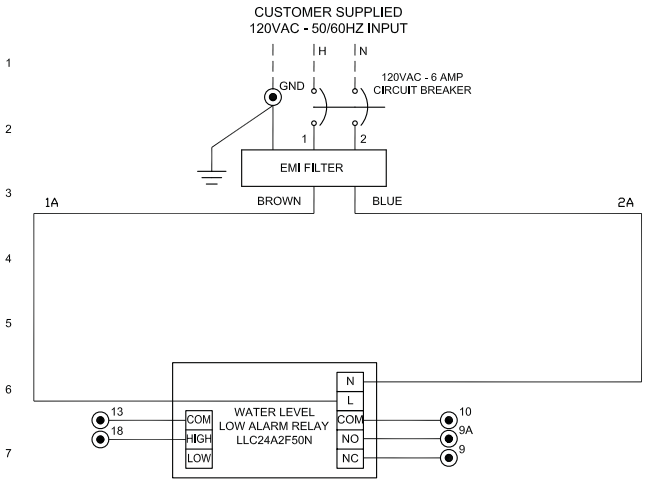
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X

Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay card provides dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80301
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	HIGH LEVEL ALARM							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/25/2008				1=5.2	08–24219	



LOW LEVEL ALARM CONTROL

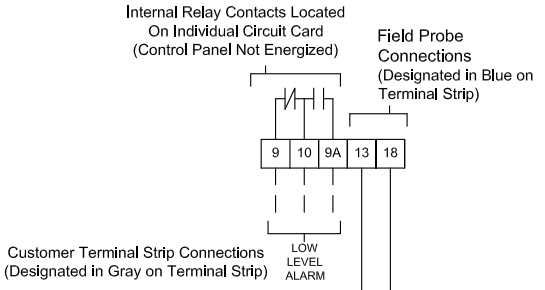
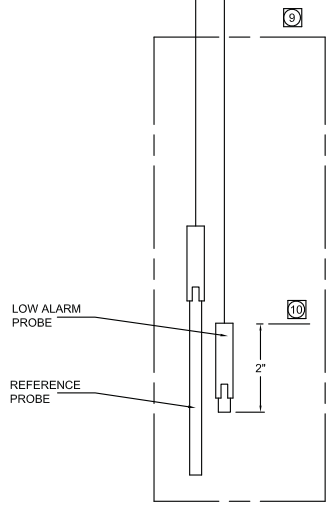


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X

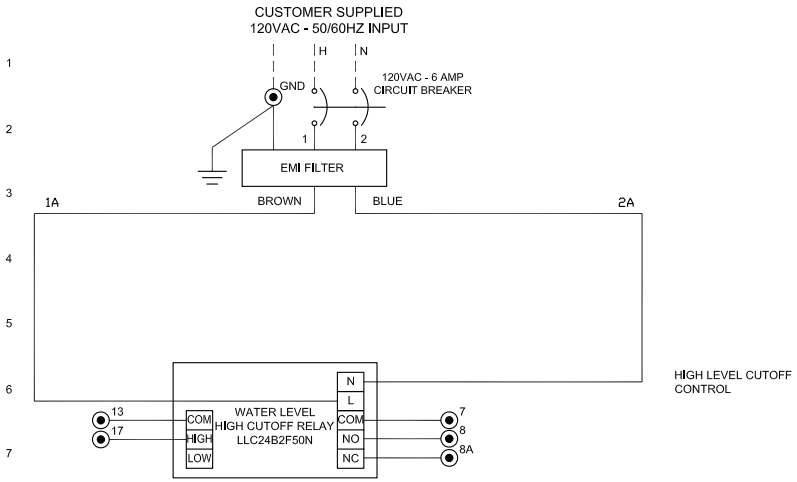


Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay card provides dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #:	E80302
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	LOW LEVEL ALARM							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/25/2008				1=5.2	08–24220	



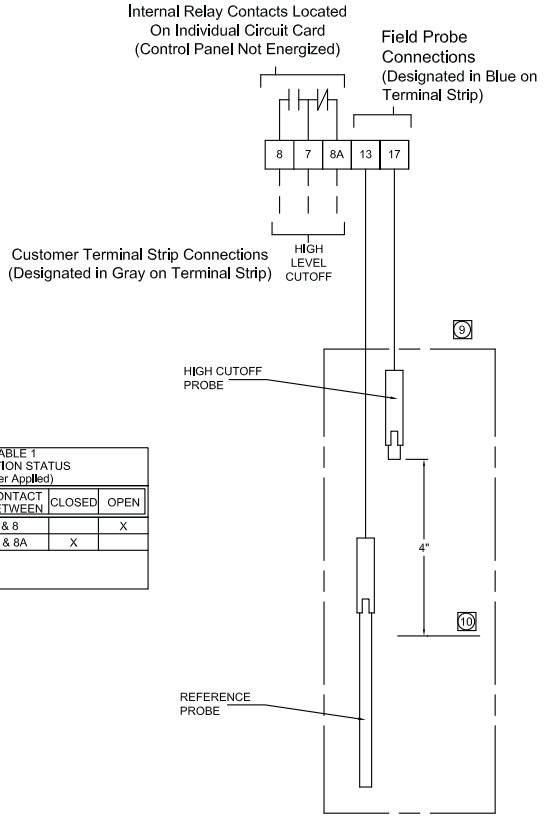


TABLE 1
OPERATION STATUS
(Power Applied)

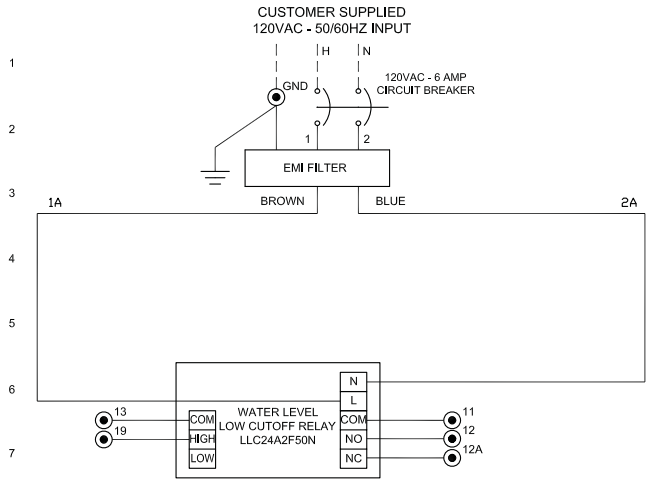
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	

Notes:

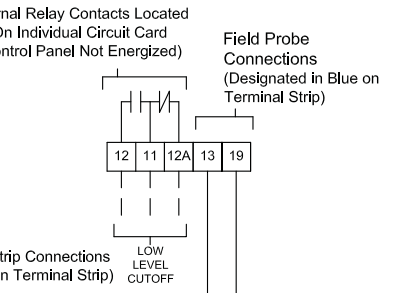
1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the Installation.
8. Relay card provides dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80303
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	HIGH LEVEL CUTOFF							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/28/2008				1=5.2	08-24221	



LOW LEVEL CUTOFF
CONTROL



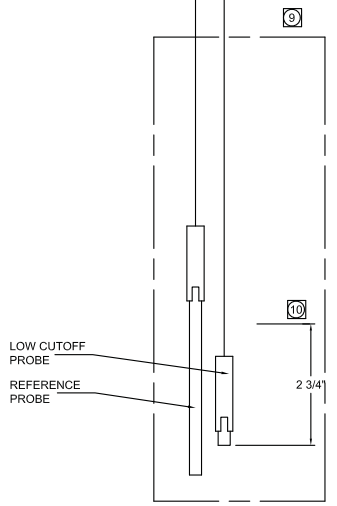


TABLE 1
OPERATION STATUS
(Power Applied)

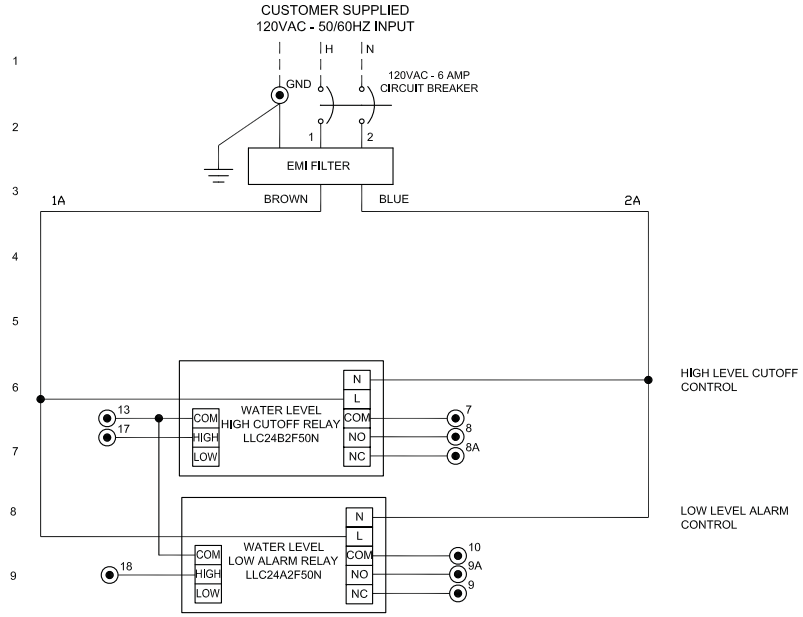
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE OUT OF WATER (Low Water)	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

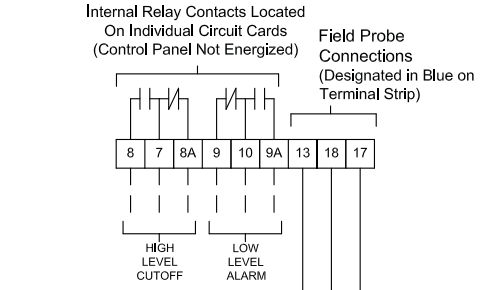
Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wiring only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay card provides dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80304
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	LOW LEVEL CUTOFF							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	08/25/2008				1=5.2	08–24222	





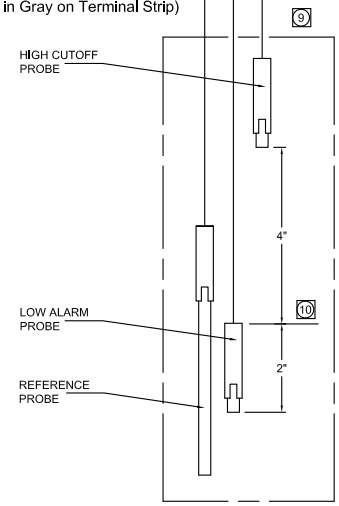


TABLE 1
OPERATION STATUS
(Power Applied)

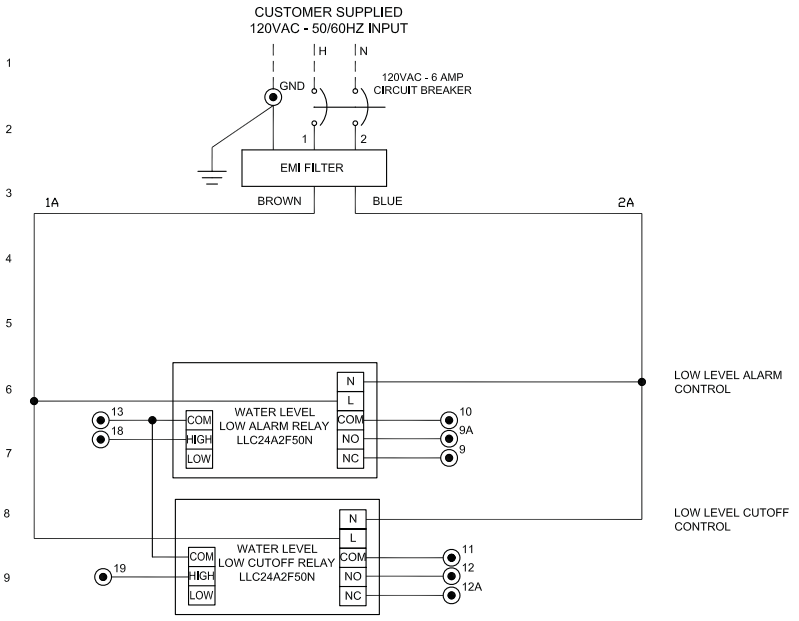
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)				
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X

Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80312
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS LA + HCO				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED								
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08-24230	



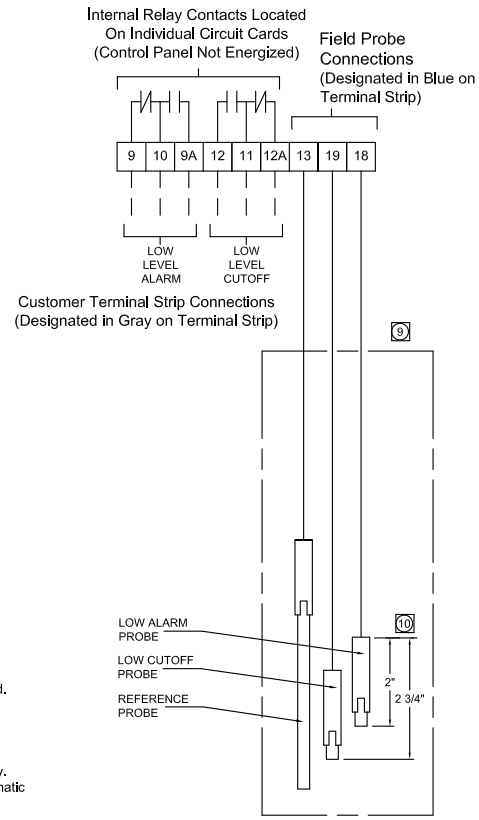


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X
	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #:	E80313
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	LA + LCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–242231	

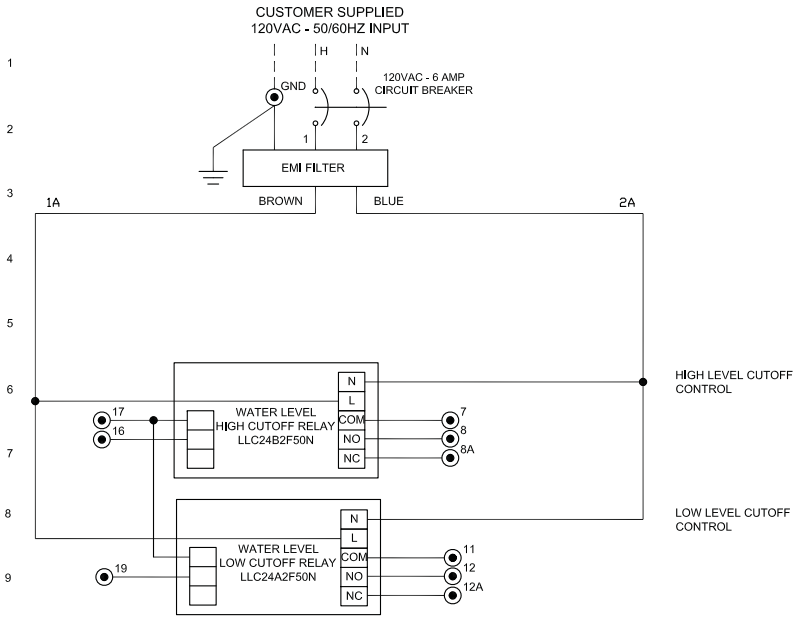
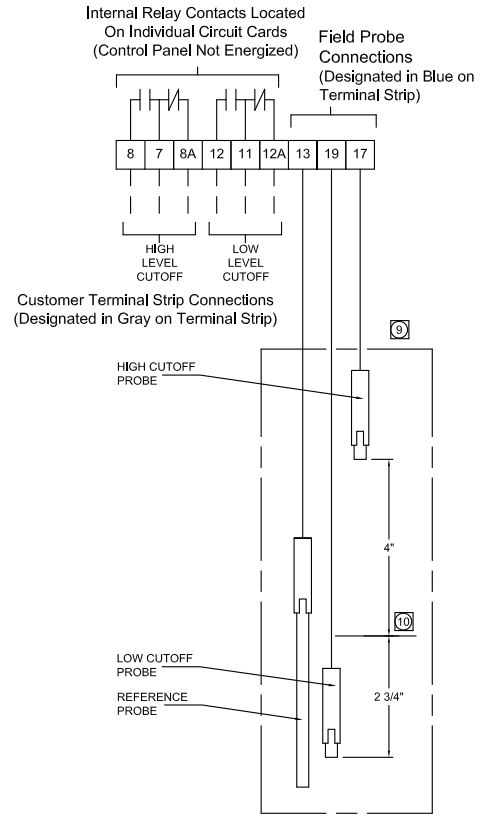


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

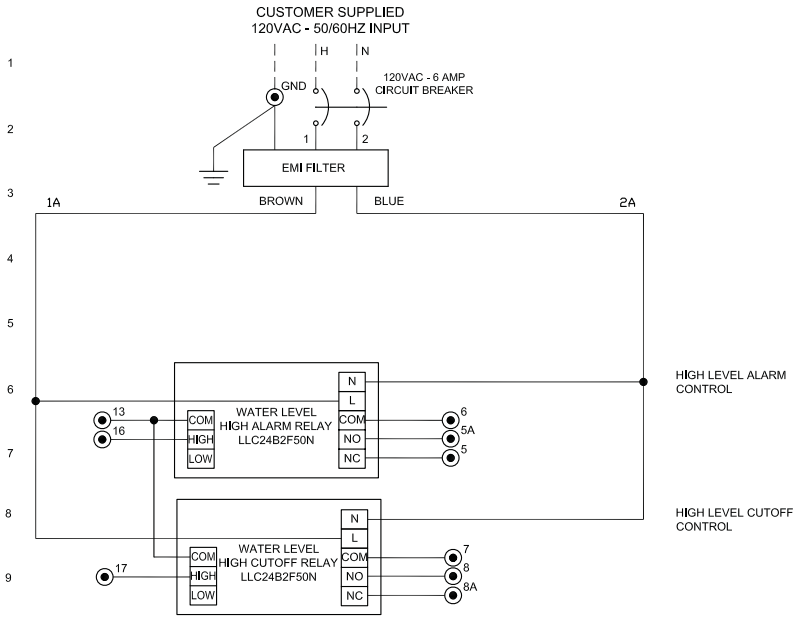
Notes:

1. ◉ Terminal point number on terminal block.
2. — — — — Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.



MARLEY ITEM #:	E80314
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS HCO + LCO				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED								
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24232	



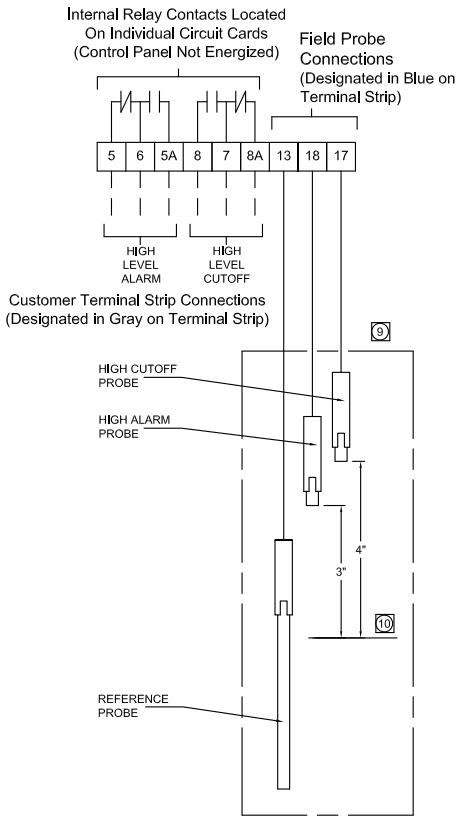


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	

Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #:	E80310
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS HA + HCO				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED								
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	08/11/2008				1=5.2	08–24228	

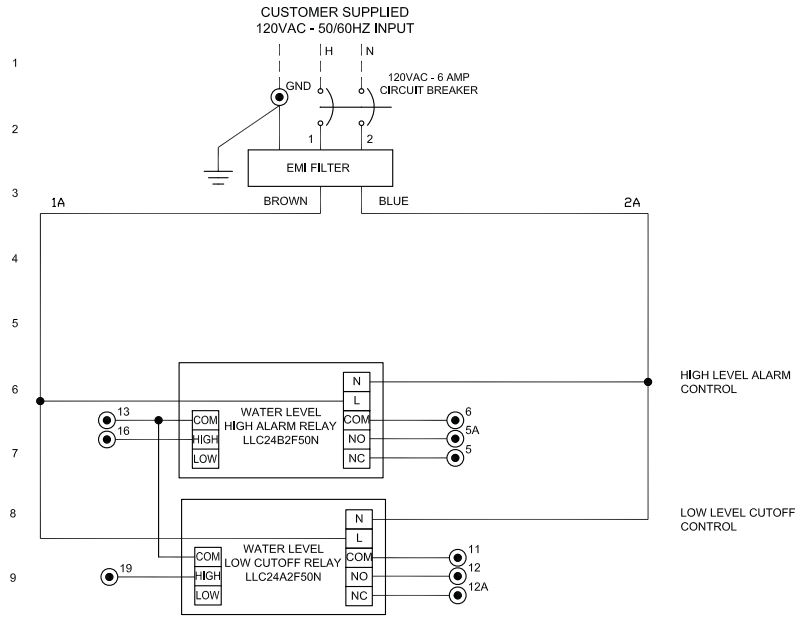
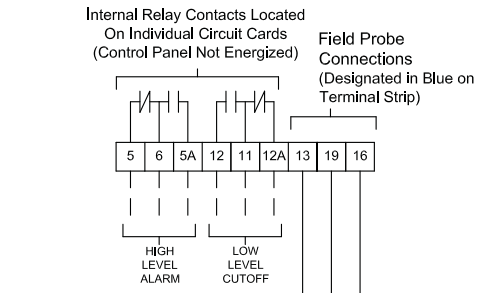


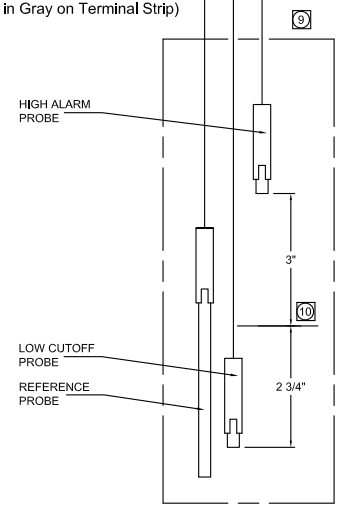
TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
PROBE OUT OF WATER (Low Water)	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

Notes:

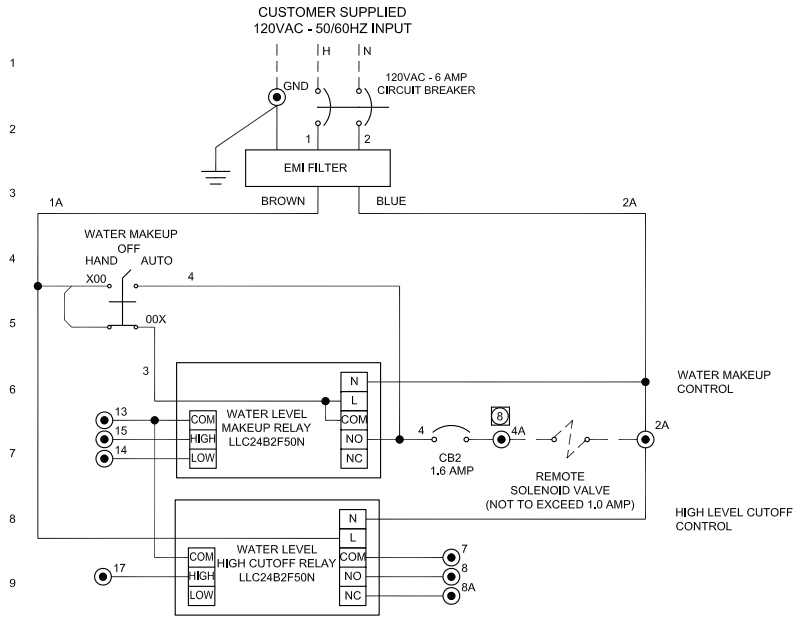
1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

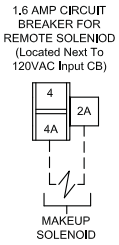




MARLEY ITEM #:	E80311
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		WATER LEVEL CONTROL SYSTEM				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	HA + LCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24229	





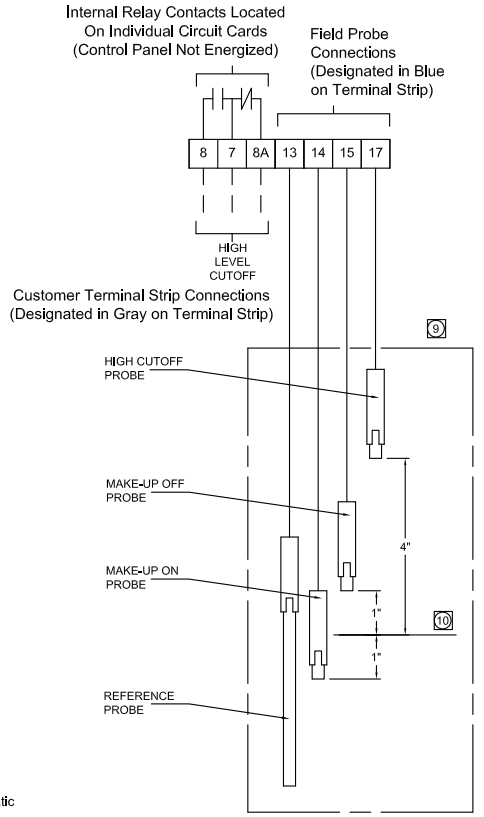


TABLE 1
OPERATION STATUS
(Power Applied)

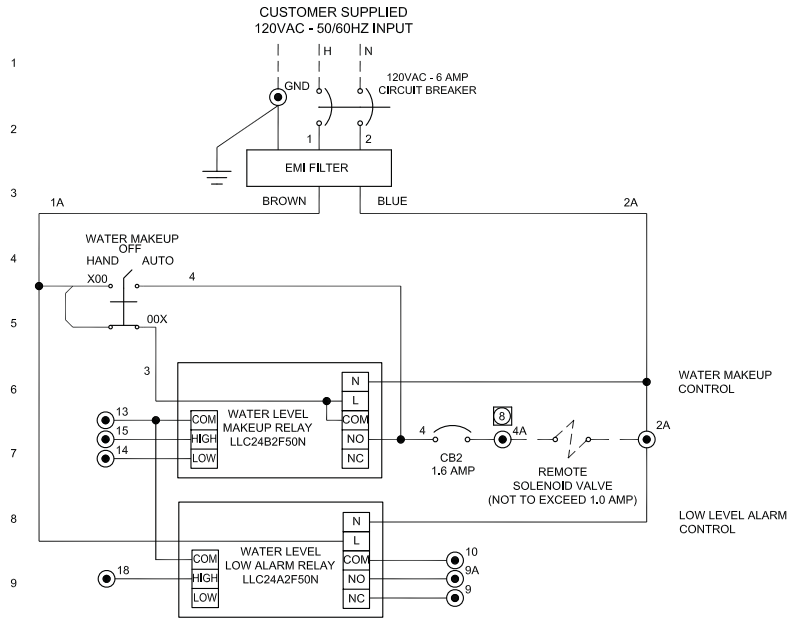
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	

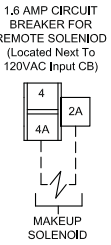
Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. The other relay card provides dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #:	E80307
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP + HCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24225	





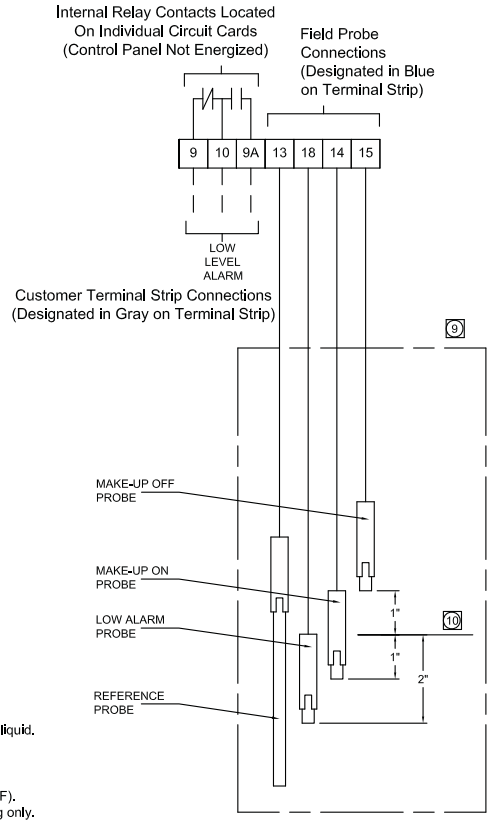


TABLE 1
OPERATION STATUS
(Power Applied)

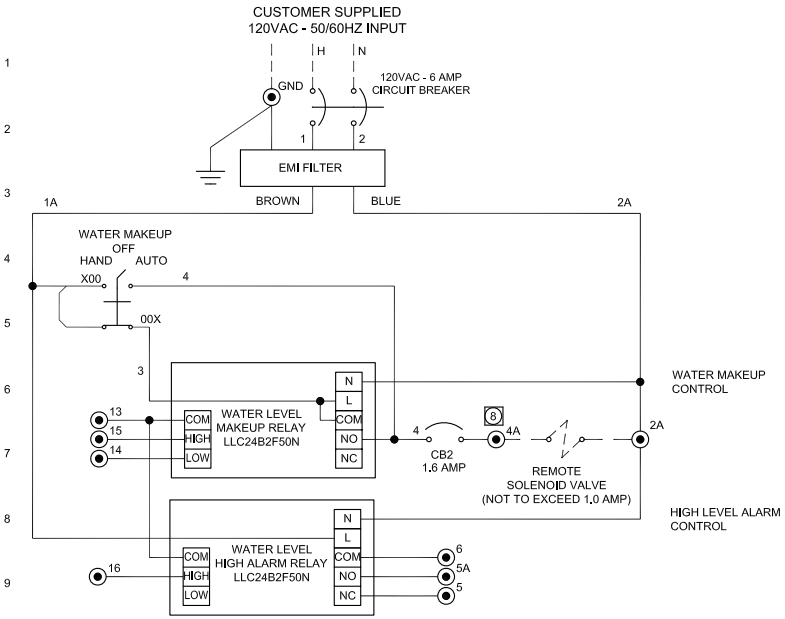
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X

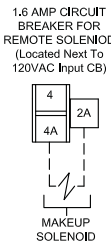
Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. The other relay card provides dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #:	E80306
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP + LA							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24224	





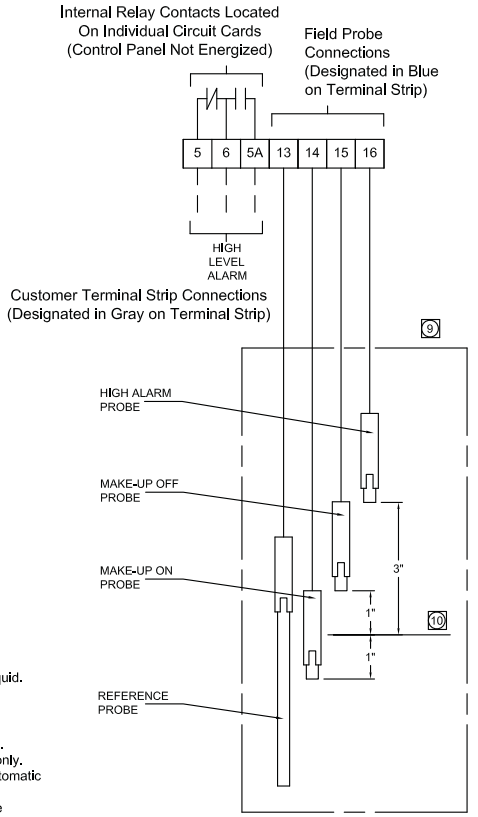


TABLE 1
OPERATION STATUS
(Power Applied)

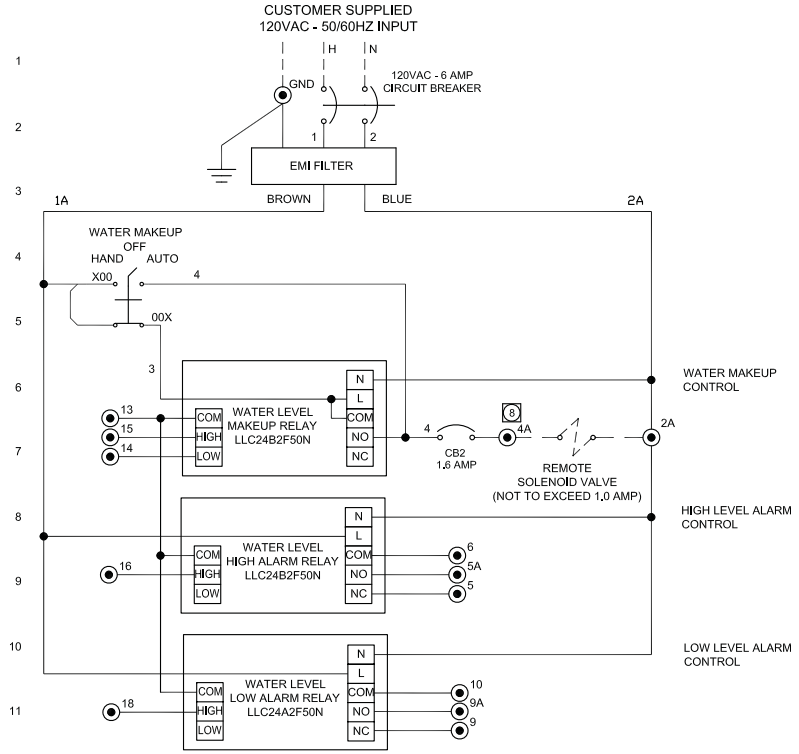
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X

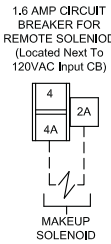
Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. The other relay card provides dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80305
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP + HA							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24223	

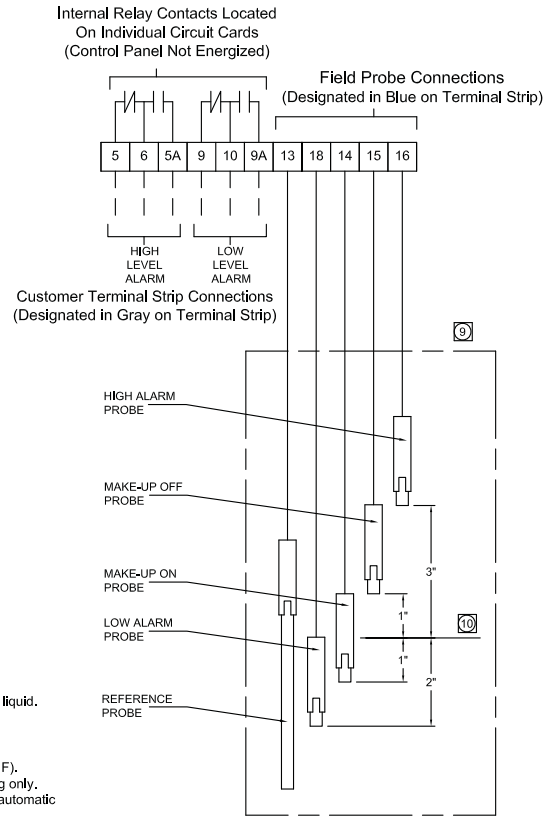




OPERATION STATUS (Panel Energized)				
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X

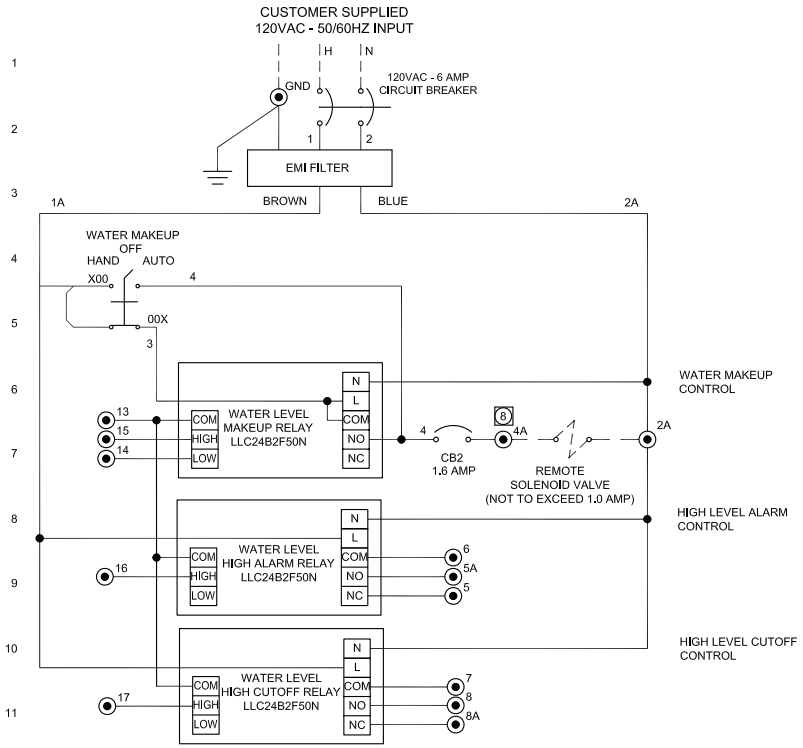
Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.



MARLEY ITEM #:	E80315
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP + HA + LA							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/3/2008				1=5.2	08–24233	



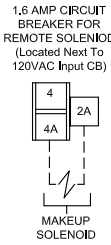
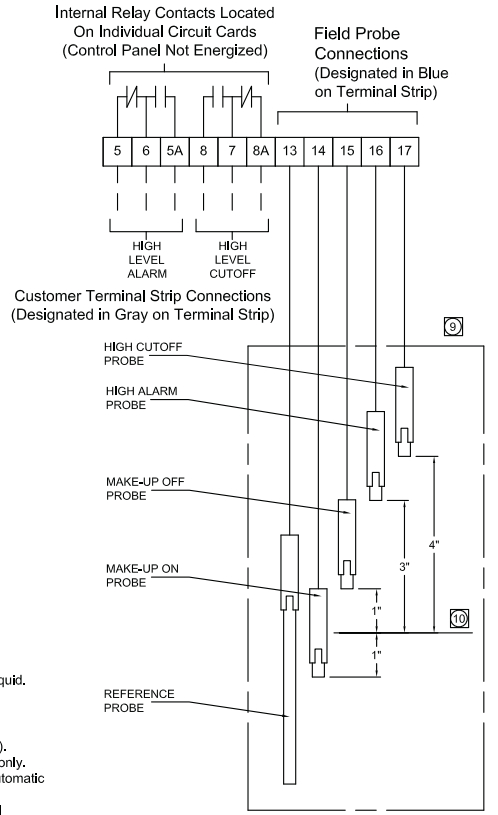


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	

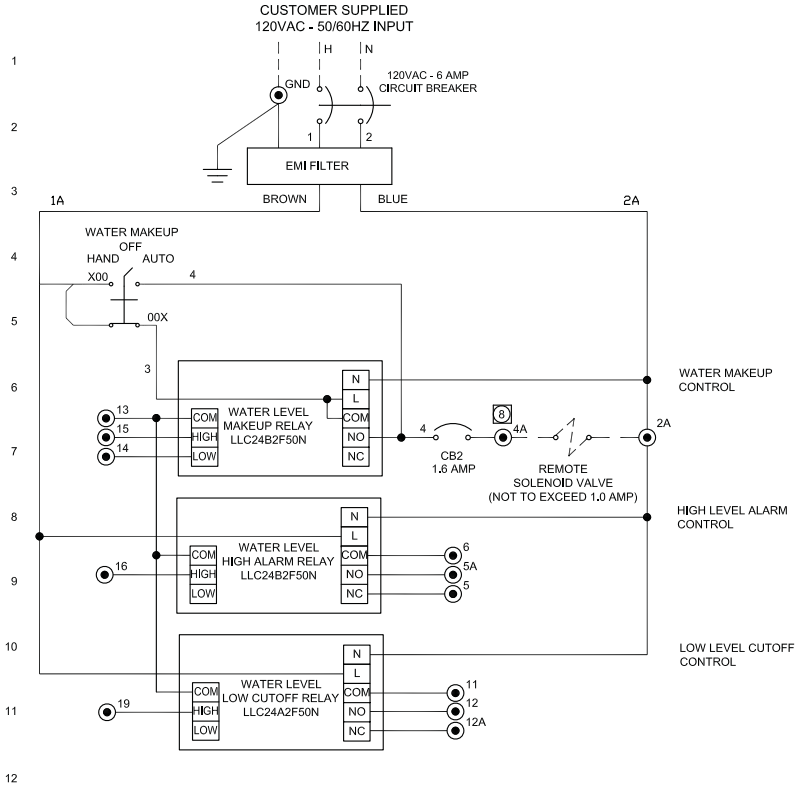
Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.



MARLEY ITEM #:	E80316
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP + HA + HCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24234	



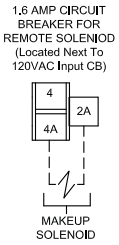
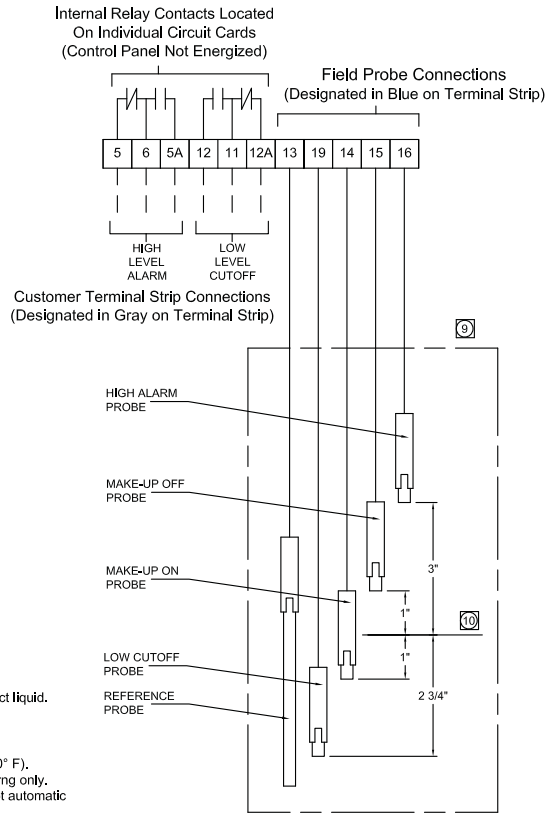


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
PROBE OUT OF WATER (Low Water)	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

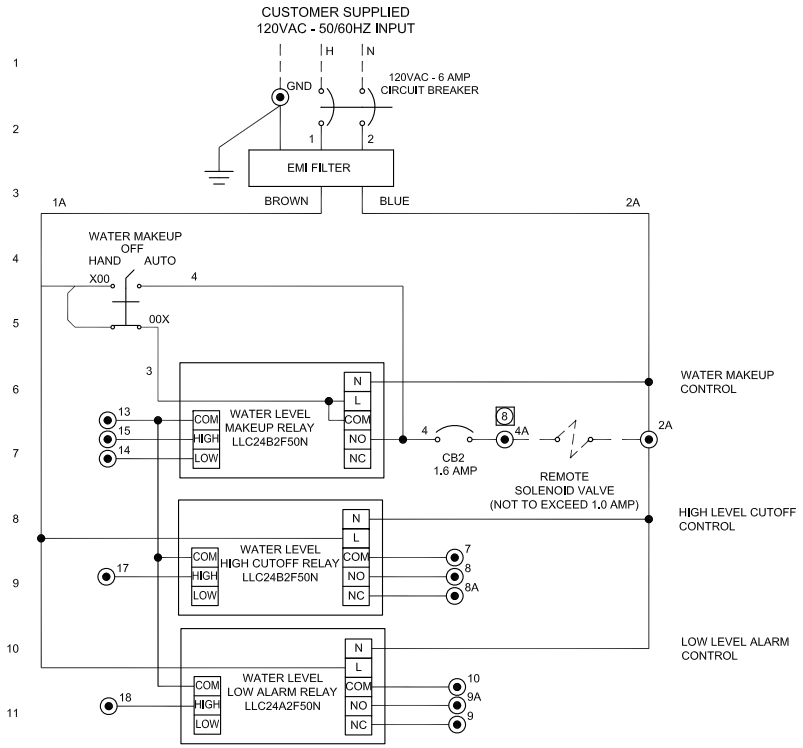
Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.



MARLEY ITEM #: E80317
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP + HA + LCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24235	



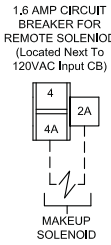
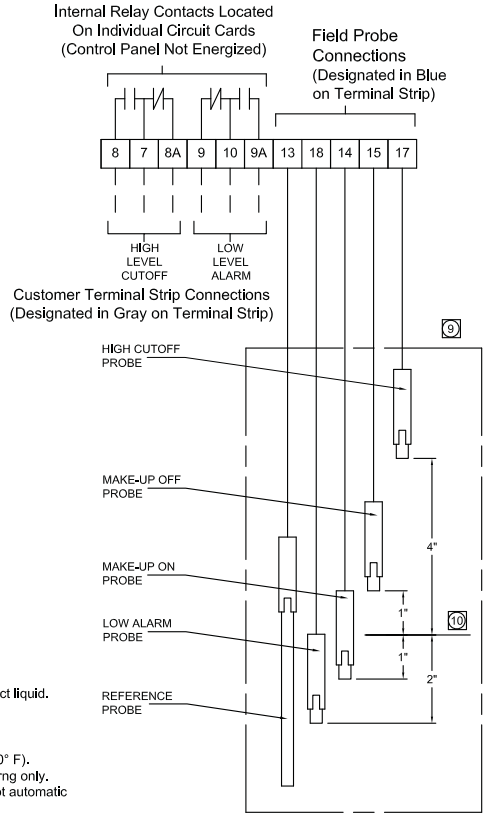


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X

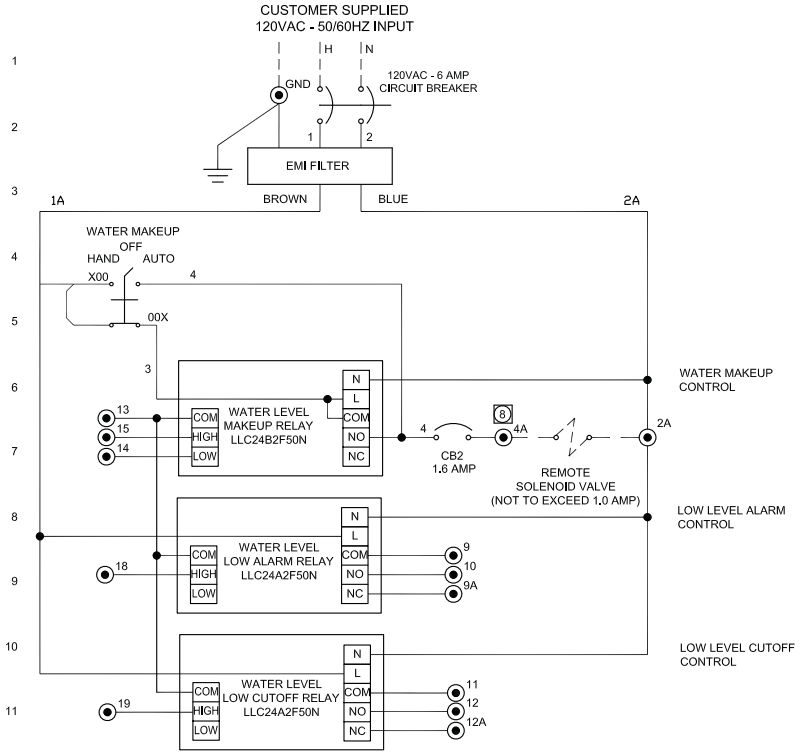
Notes:

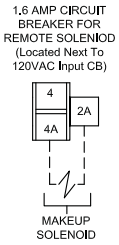
1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.In. Class 1 wlrng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.



MARLEY ITEM #:	E80318
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES		
REV. BY	CHECKED	MAKE–UP LA + HCO						
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24236	





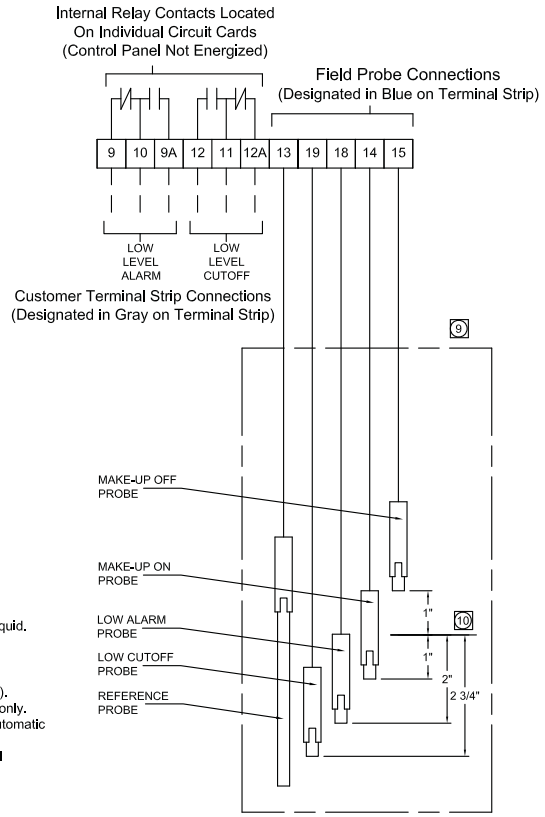


TABLE 1
OPERATION STATUS
(Power Applied)

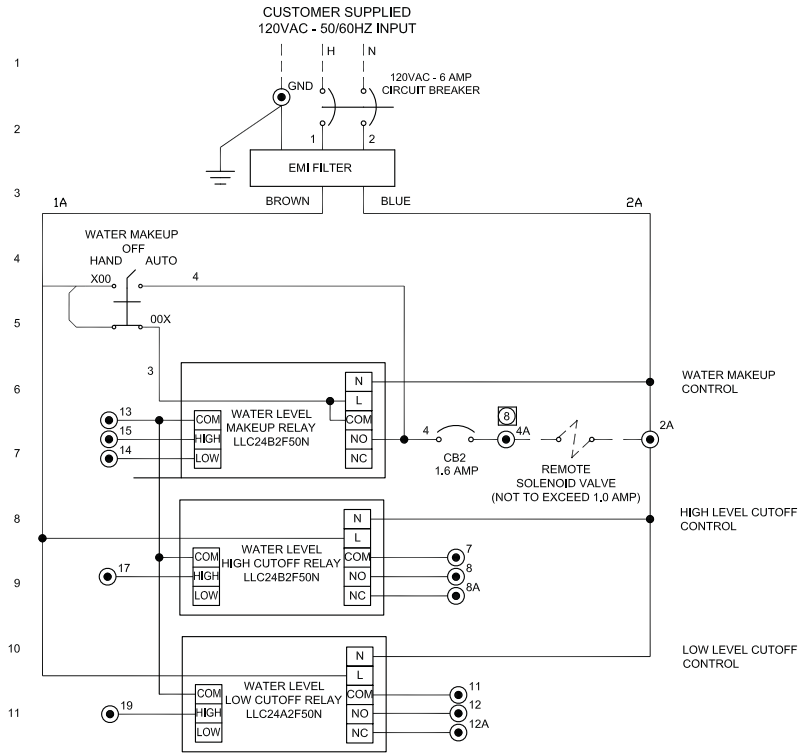
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X
	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wiring only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80319
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS						
REV. BY	CHECKED	MAKE–UP + LA + LCO				SPX COOLING TECHNOLOGIES		
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/25/2008				1=5.2	08–24237	



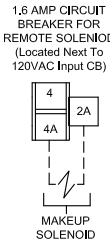
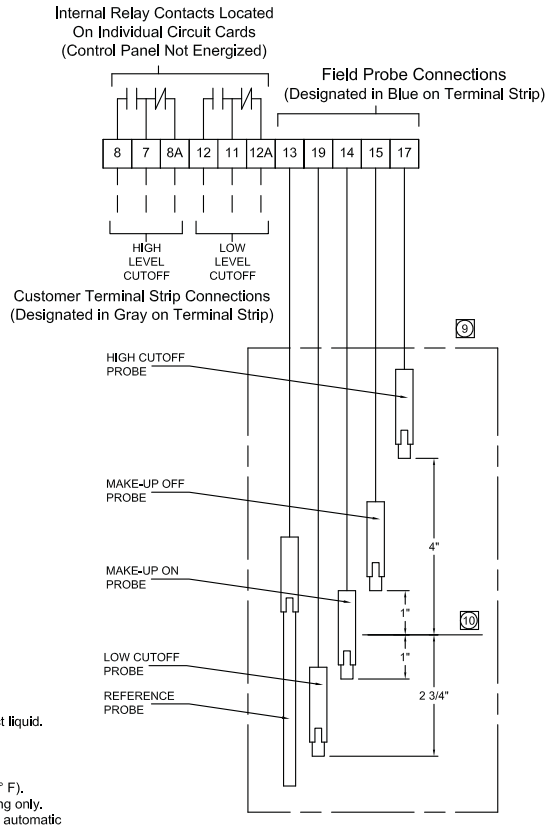


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
PROBE OUT OF WATER (Low Water)	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.In. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.



MARLEY ITEM #:	E80320
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS MAKE–UP + HCO + LCO				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED								
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24238	

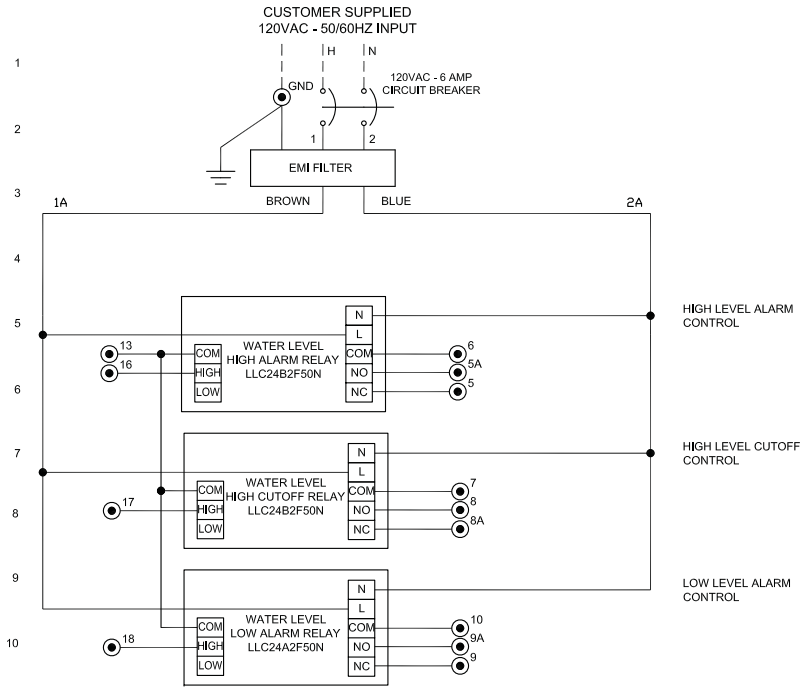
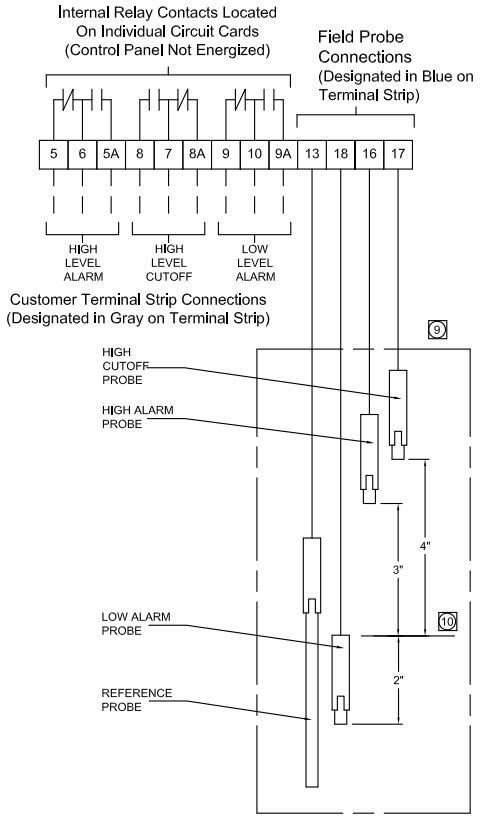


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X

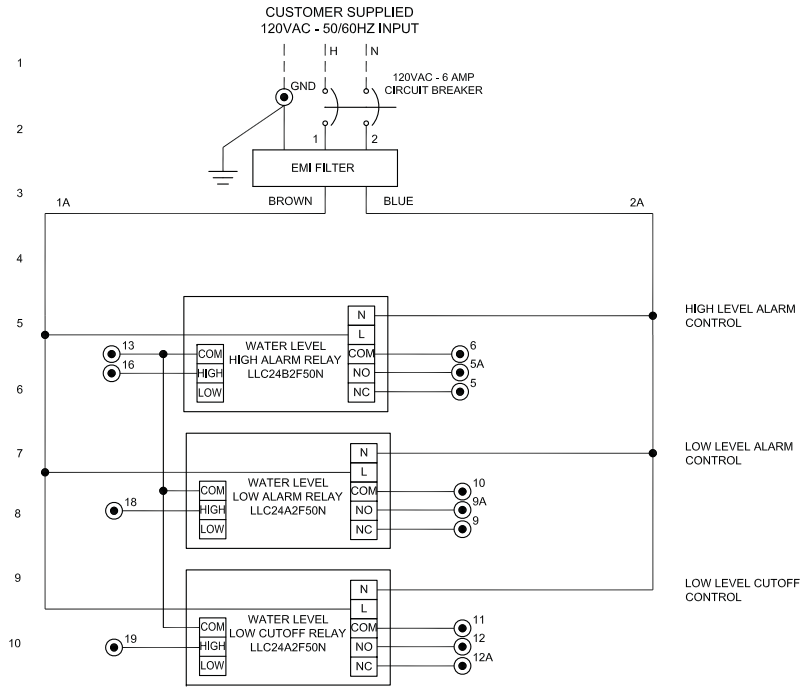
Notes:

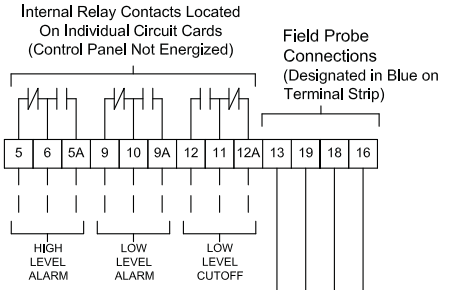
1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.



MARLEY ITEM #:	E80321
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	HA + LA + HCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24239	





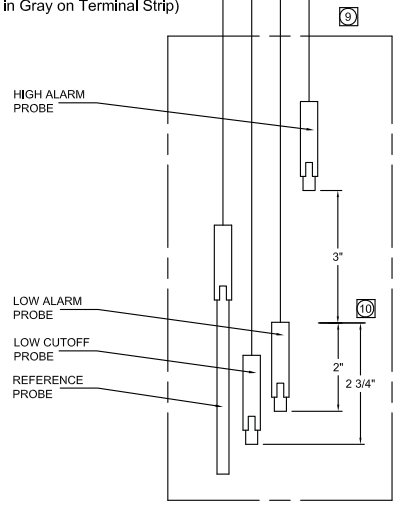


TABLE 1
OPERATION STATUS
(Power Applied)

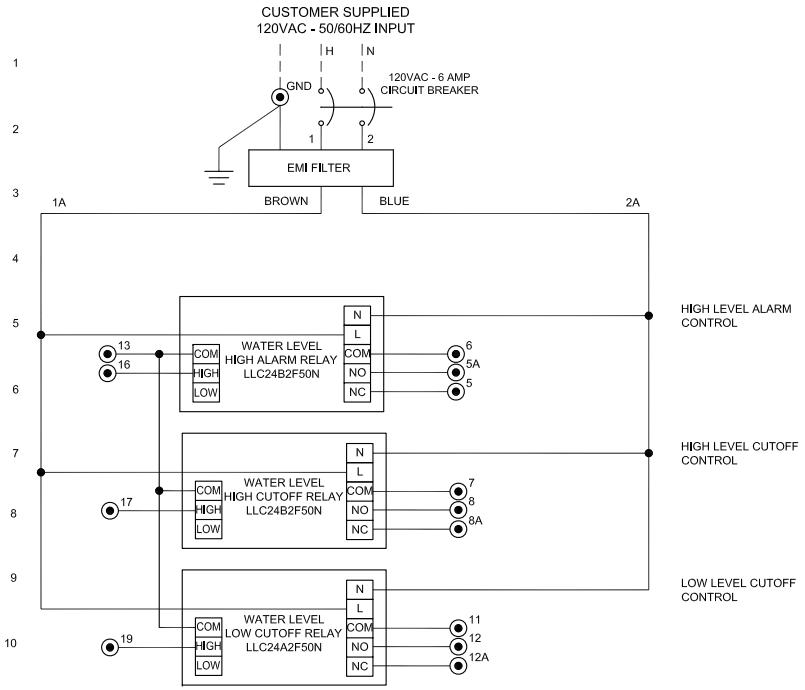
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X
	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

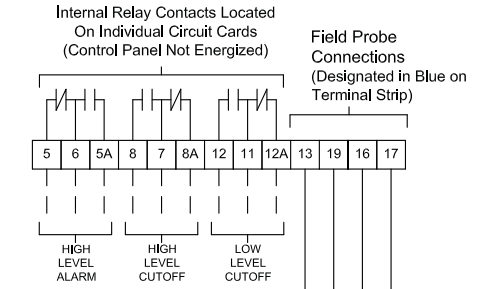
Notes:

(1) ◉ Terminal point number on terminal block.
(2) —— —— Field wiring by others.
(3) Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
(4) Relay card output contacts rated 10 amps.
(5) 18 AWG used for control circuit wiring.
(6) Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
(7) Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
(8) Relay cards provide dry contacts only.
[9] Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
[10] Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80322
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS HA + LA + LCO				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED								
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08-24240	





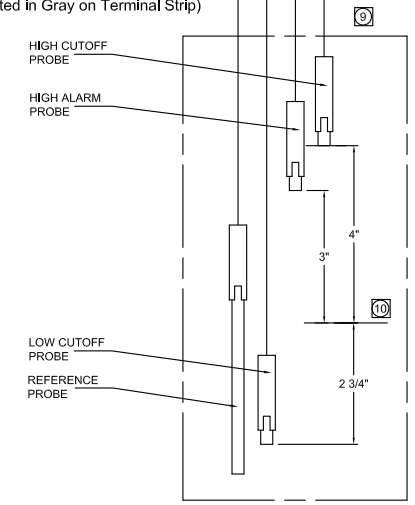


TABLE 1
OPERATION STATUS
(Power Applied)

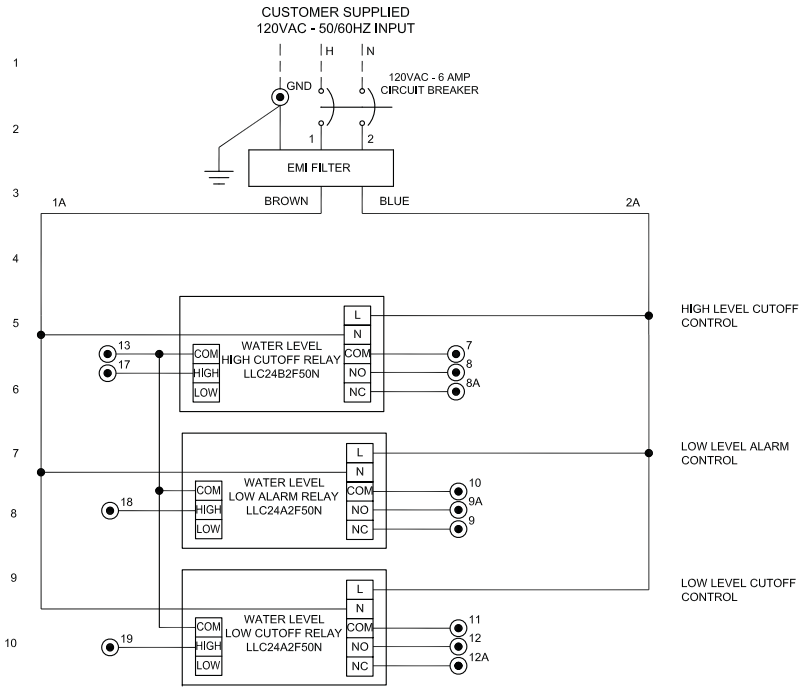
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

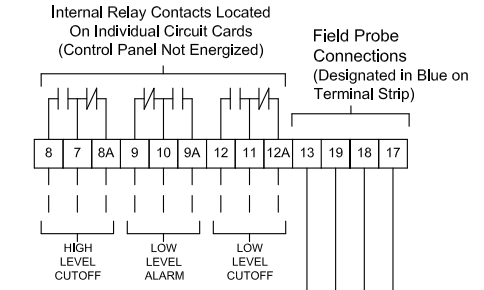
Notes:

(1) ◉ Terminal point number on terminal block.
(2) — — Field wiring by others.
(3) Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
(4) Relay card output contacts rated 10 amps.
(5) 18 AWG used for control circuit wiring.
(6) Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
(7) Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
(8) Relay cards provide dry contacts only.
[9] Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
[10] Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80323
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	HA + HCO + LCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24241	





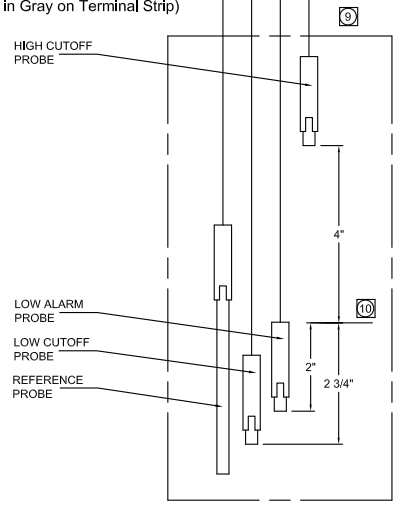


TABLE 1
OPERATION STATUS
(Power Applied)

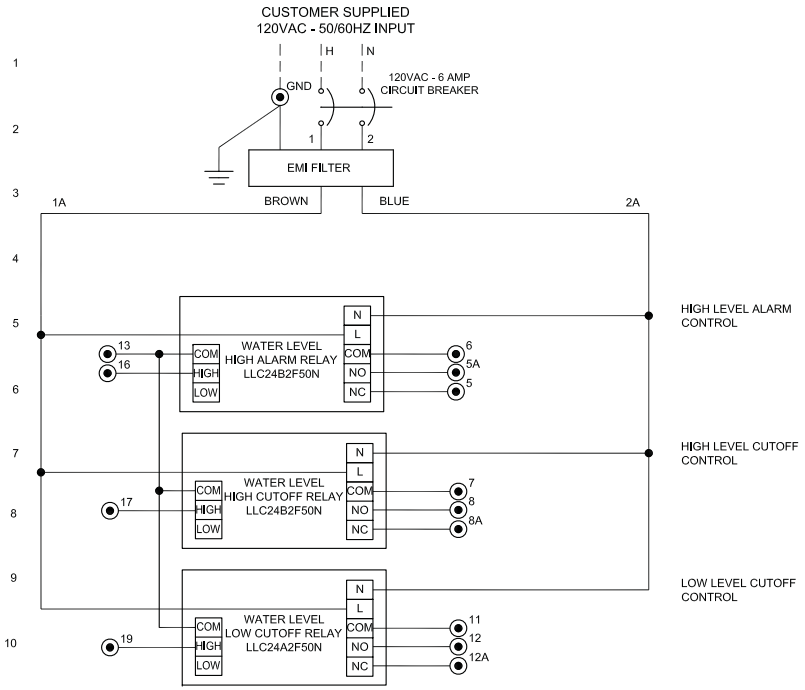
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X
	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

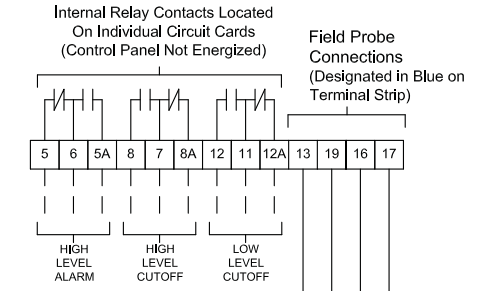
Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80324
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATERE LEVEL CONTROLS						
REV. BY	CHECKED	LA + HCO + LCO				SPX COOLING TECHNOLOGIES		
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24242	





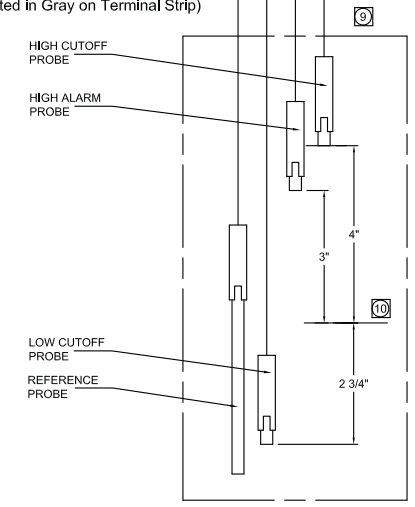


TABLE 1
OPERATION STATUS
(Power Applied)

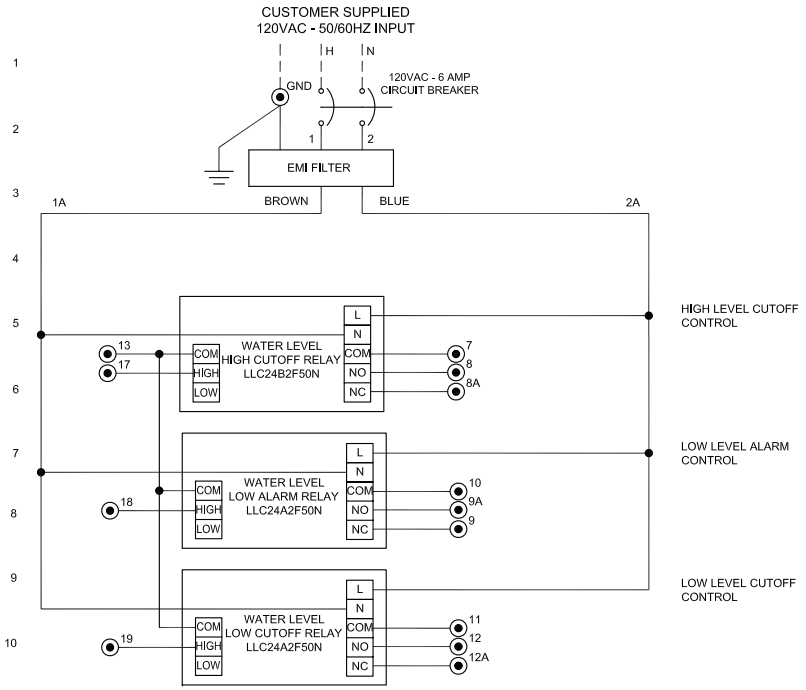
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

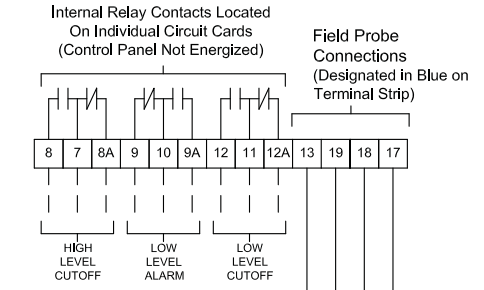
Notes:

(1) ◉ Terminal point number on terminal block.
(2) — — Field wiring by others.
(3) Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
(4) Relay card output contacts rated 10 amps.
(5) 18 AWG used for control circuit wiring.
(6) Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
(7) Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
(8) Relay cards provide dry contacts only.
(9) Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
(10) Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80323
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	HA + HCO + LCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08-24241	





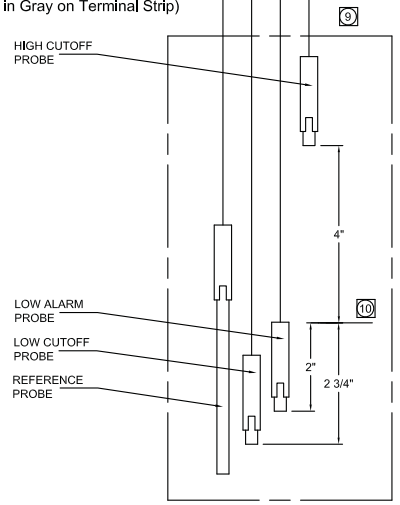


TABLE 1
OPERATION STATUS
(Power Applied)

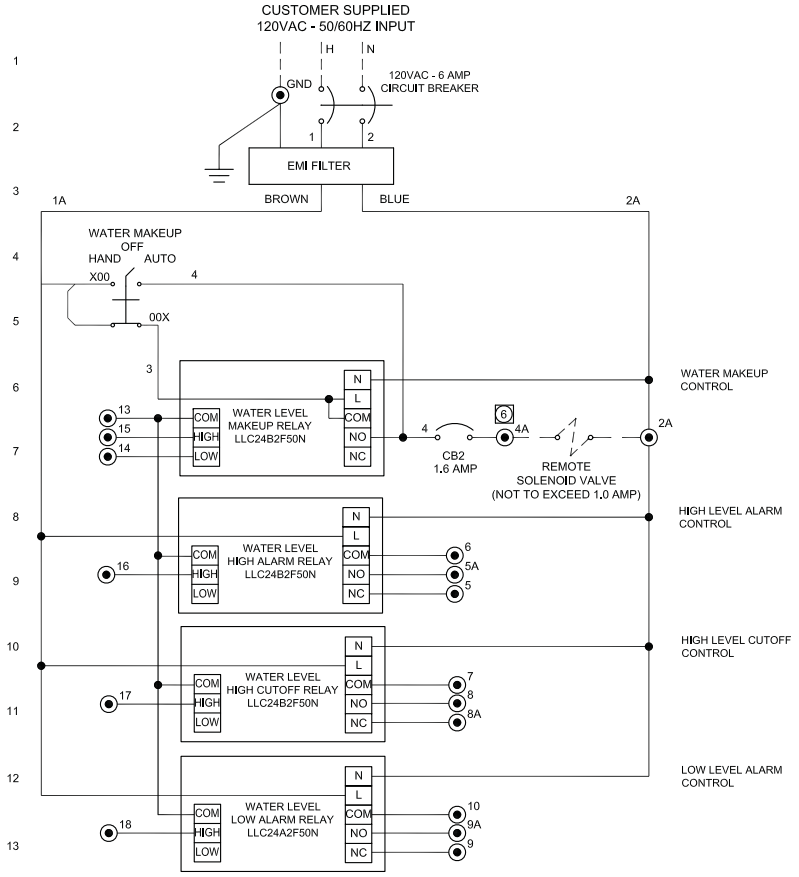
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X
	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

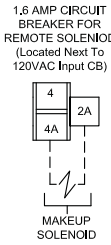
Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #:	E80324
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATERE LEVEL CONTROLS				SPX COOLING TECHNOLOGIES		
REV. BY	CHECKED	LA + HCO + LCO						
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/26/2008				1=5.2	08–24242	





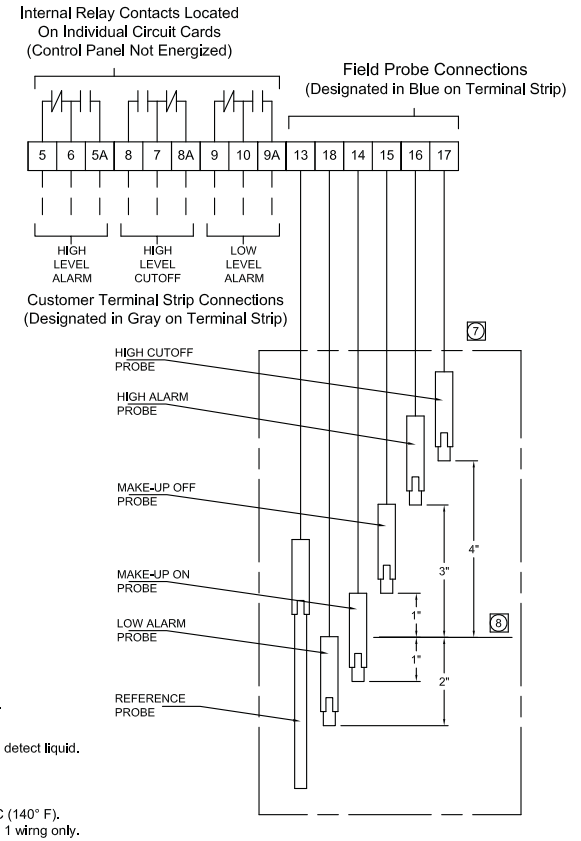


TABLE 1
OPERATION STATUS
(Power Applied)

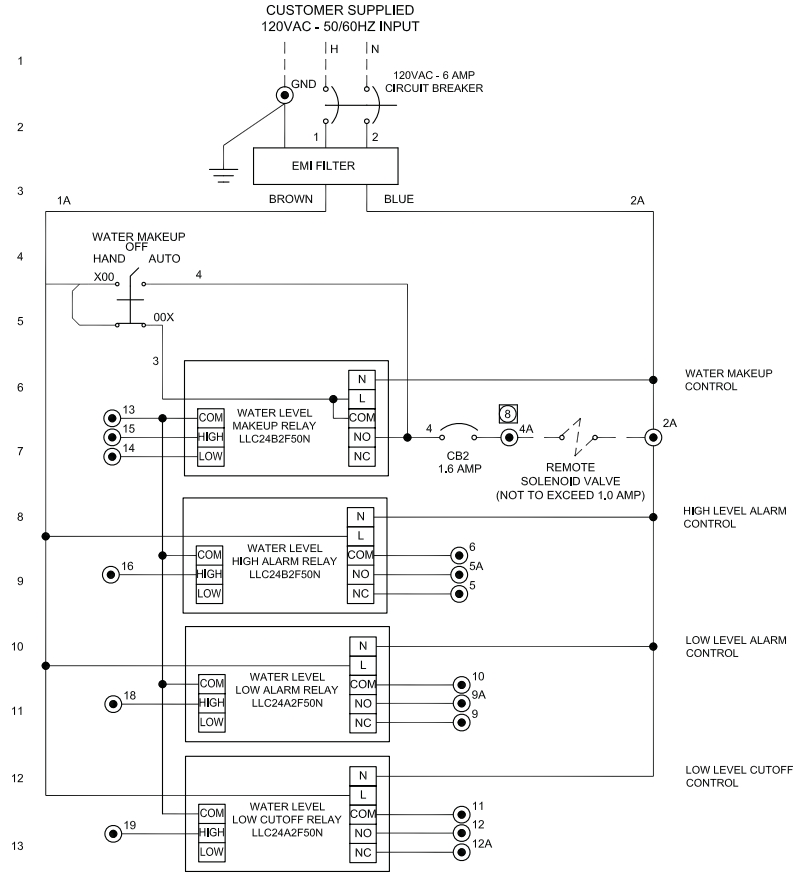
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X

Notes:

1. ● Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80325
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP + HA + LA + HCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	08/11/2008				1=5.2	08–24243	



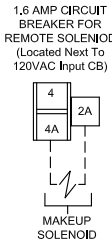
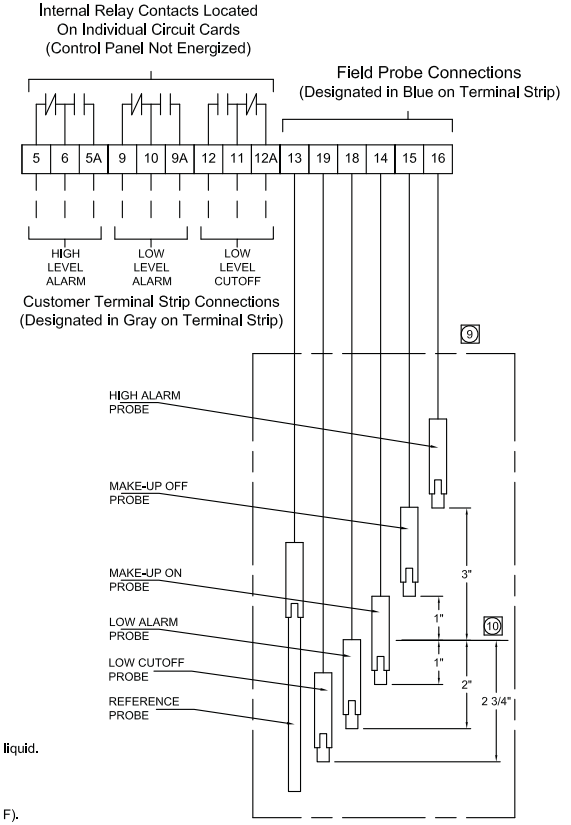


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X
	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

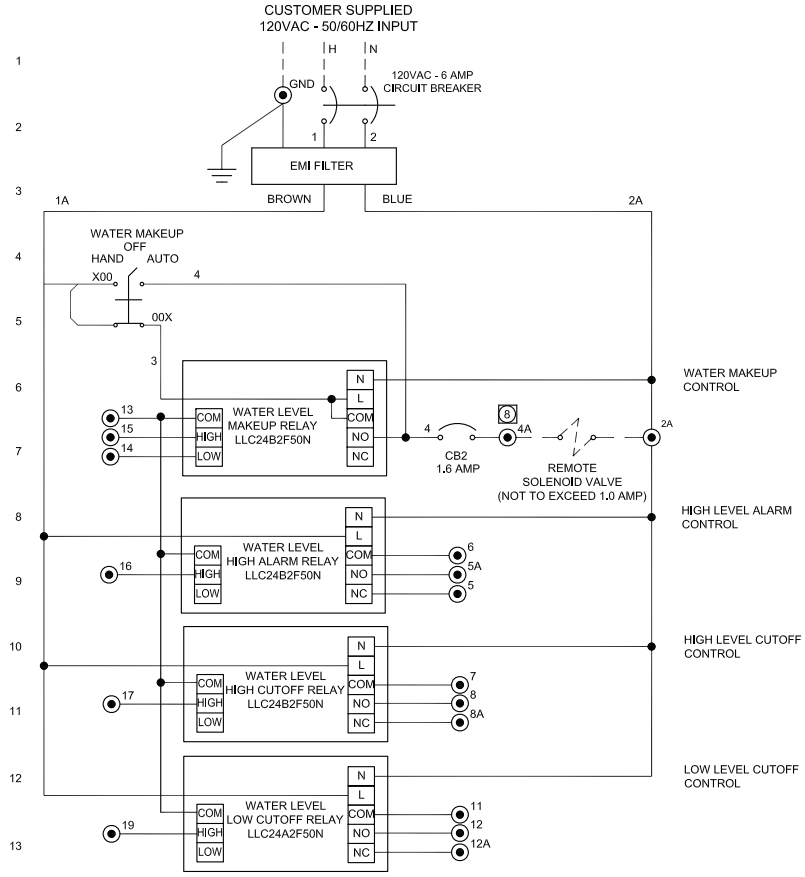


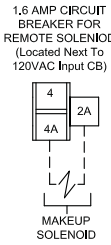
Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #:	E80326
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP + HA + LA + LCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/18/2008				1=5.2	08–24244	





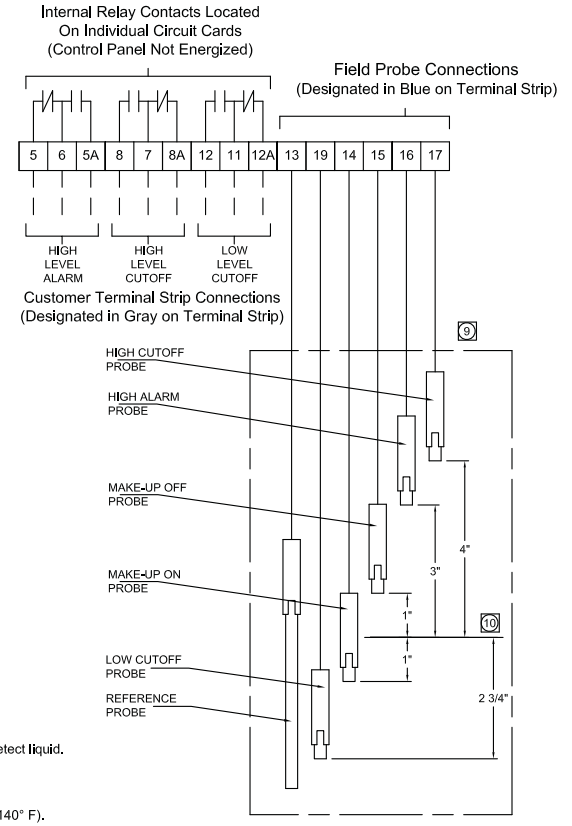


TABLE 1
OPERATION STATUS
(Power Applied)

WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80327
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES		
REV. BY	CHECKED	MAKE–UP + HA + HCO + LCO						
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
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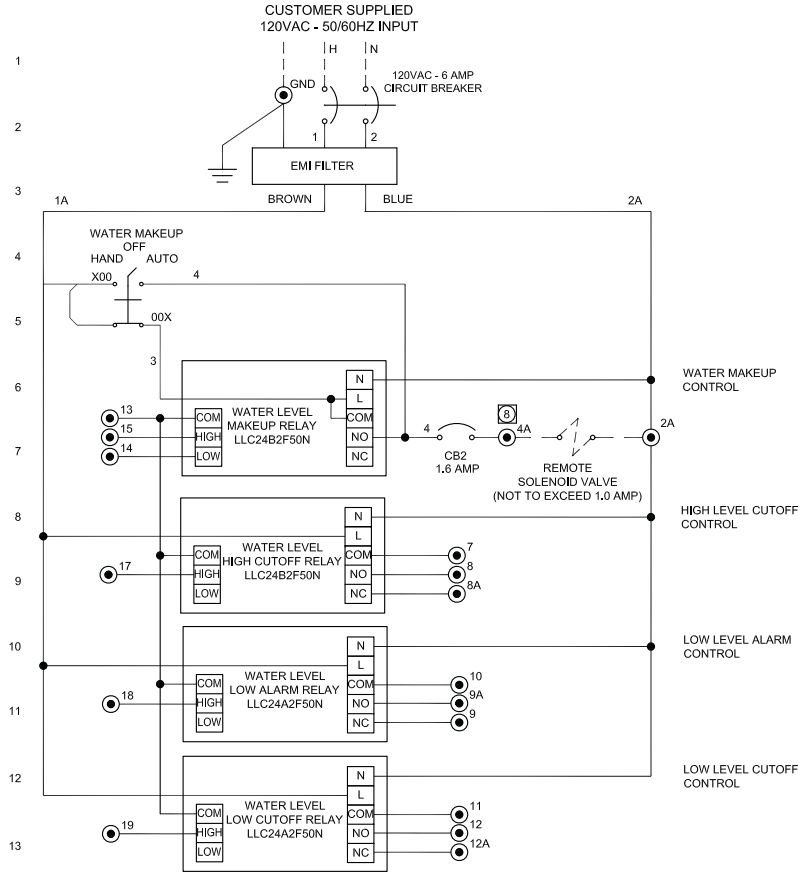
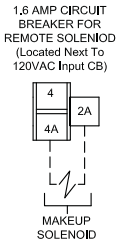




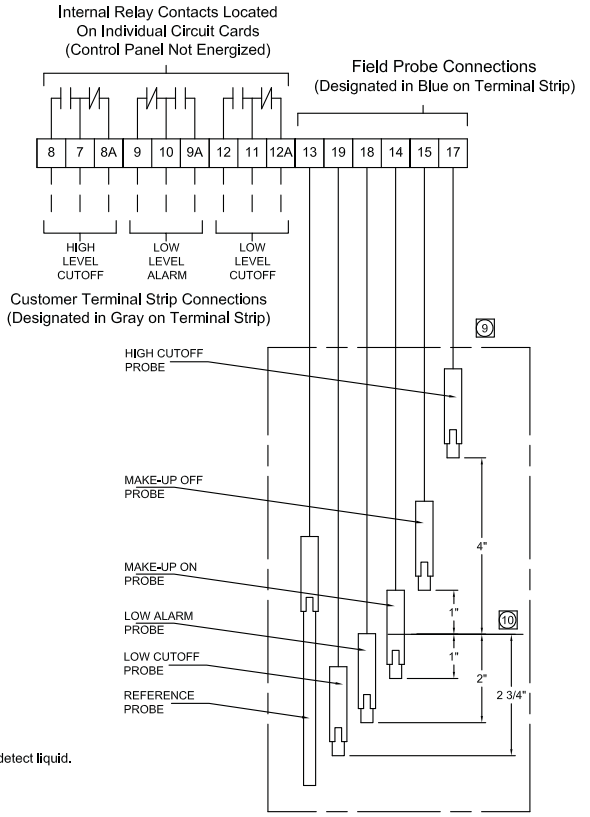


TABLE 1
OPERATION STATUS
(Power Applied)

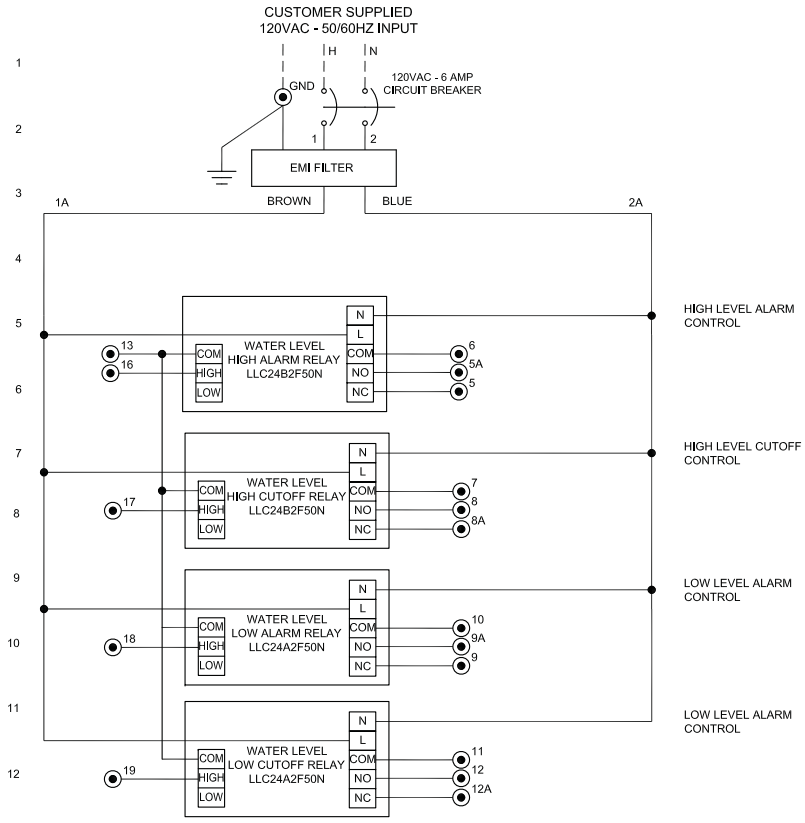
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X
	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

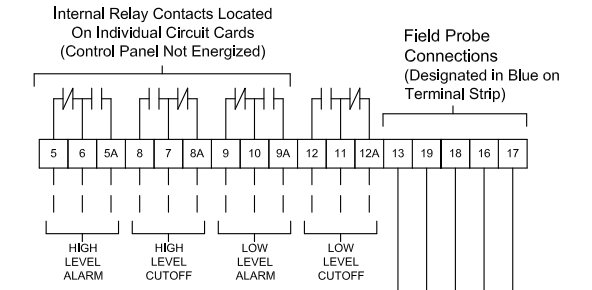
Notes:

1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80328
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	MAKE–UP + LA + HCO + LCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/25/2008				1=5.2	08–24246	





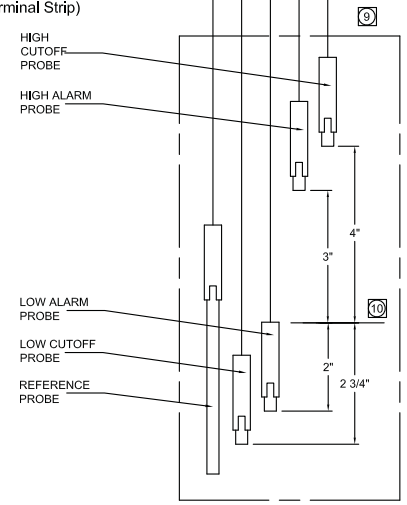


TABLE 1
OPERATION STATUS
(Power Applied)

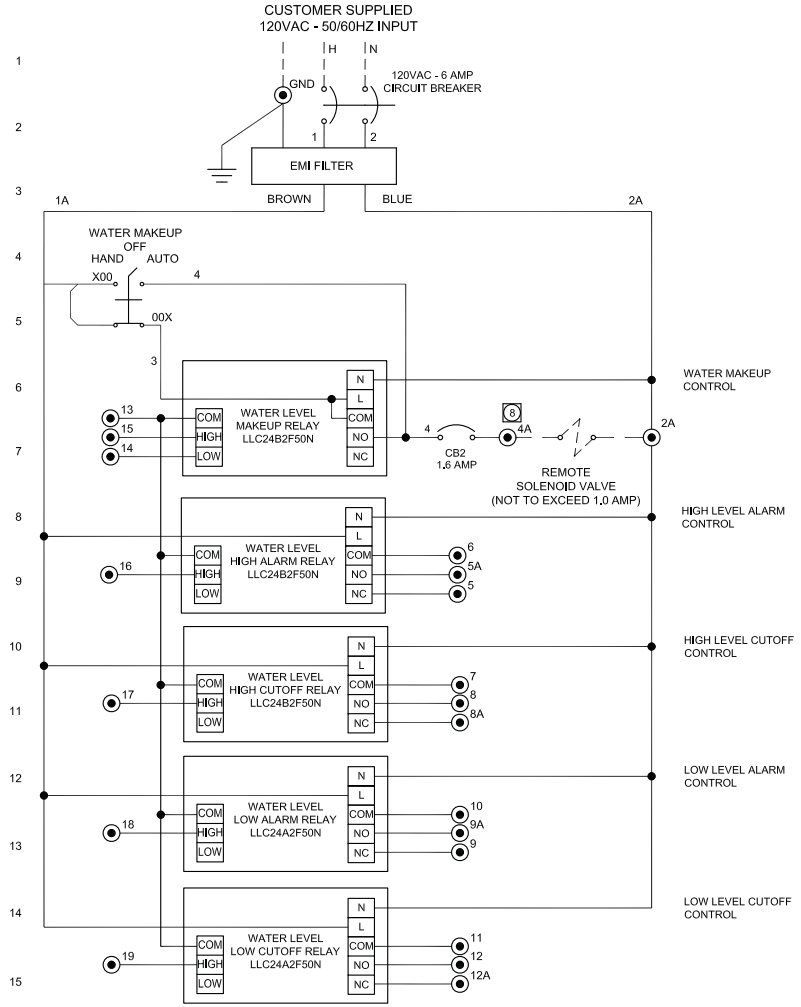
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X
	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

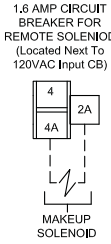
Notes:

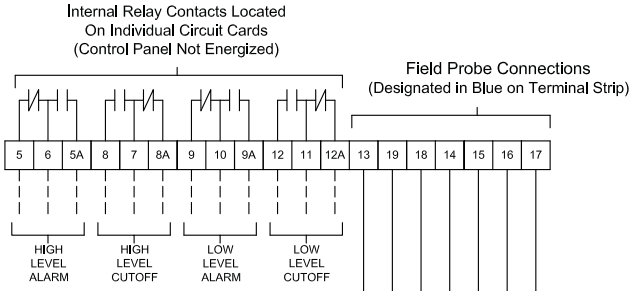
1. ◉ Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #: E80329
UL FILE #: E312361
SUPPLY VOLTAGE: .. 120vAC - 60HZ
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: .. 4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES			
REV. BY	CHECKED	HA + LA + HCO + LCO							
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/25/2008				1=5.2	08–24247	







OPERATION STATUS (Panel Energized)				
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE INTO WATER (High Water)	HIGH ALARM	6 & 5	X	
		6 & 5A		X
	HIGH CUTOFF	7 & 8		X
		7 & 8A	X	
PROBE OUT OF WATER (Low Water)	LOW ALARM	10 & 9	X	
		10 & 9A		X
	LOW CUTOFF	11 & 12		X
		11 & 12A	X	

Notes:

1. Terminal point number on terminal block.
2. —— —— Field wiring by others.
3. Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
4. Relay card output contacts rated 10 amps.
5. 18 AWG used for control circuit wiring.
6. Terminals: Use copper conductors only 60° C (140° F). Recommended Torque = 4.4-7.1 lb.in. Class 1 wirng only.
7. Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation.
8. Makeup relay supplies 120VAC for solenoid valve. All other relay cards provide dry contacts only.
9. Hanging probe assembly in tower cold water basin. (Probe heights are field adjustable.)
10. Recommended operating water level as marked in the tower's COLD WATER BASIN.

MARLEY ITEM #:	E80330
UL FILE #:	E312361
SUPPLY VOLTAGE: ..	120vAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE: ..	4X

ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS				SPX COOLING TECHNOLOGIES		
REV. BY	CHECKED	MAKE–UP + HA + LA + HCO + LCO						
REV. DATE		DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLOT	DRAWING NUMBER	REV.
		DGWOOD	11/18/2008				1=5.2	08–24248	

SPX®

COOLING TECHNOLOGIES

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