

LLC water level control

INSTALLATION - OPERATION - MAINTENANCE

Z0628617_B ISSUED 07/2018

READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.



contents

Note

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

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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

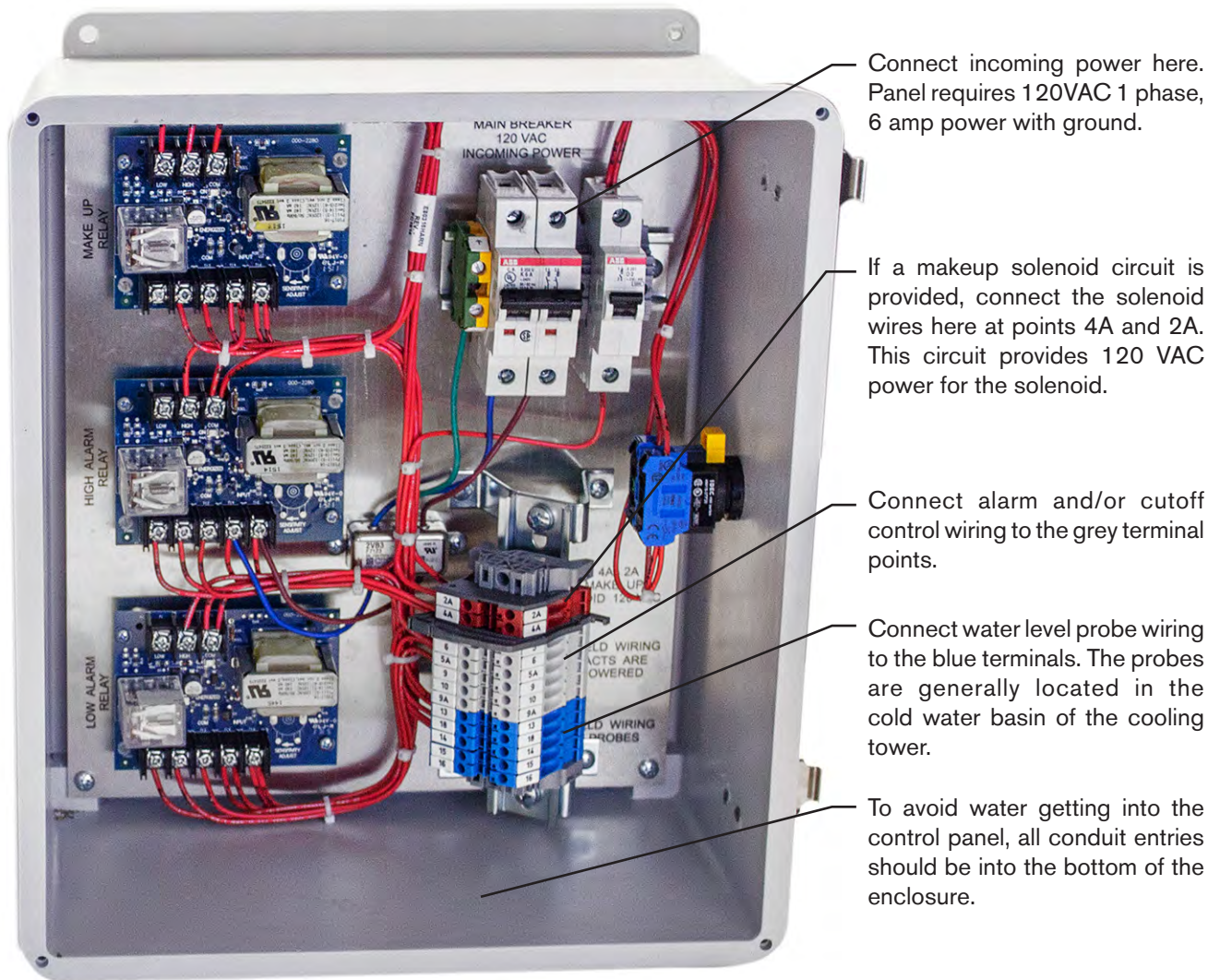
The following safety issues should be addressed by those responsible for installation, maintenance or repair of the tower and controls:

- 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



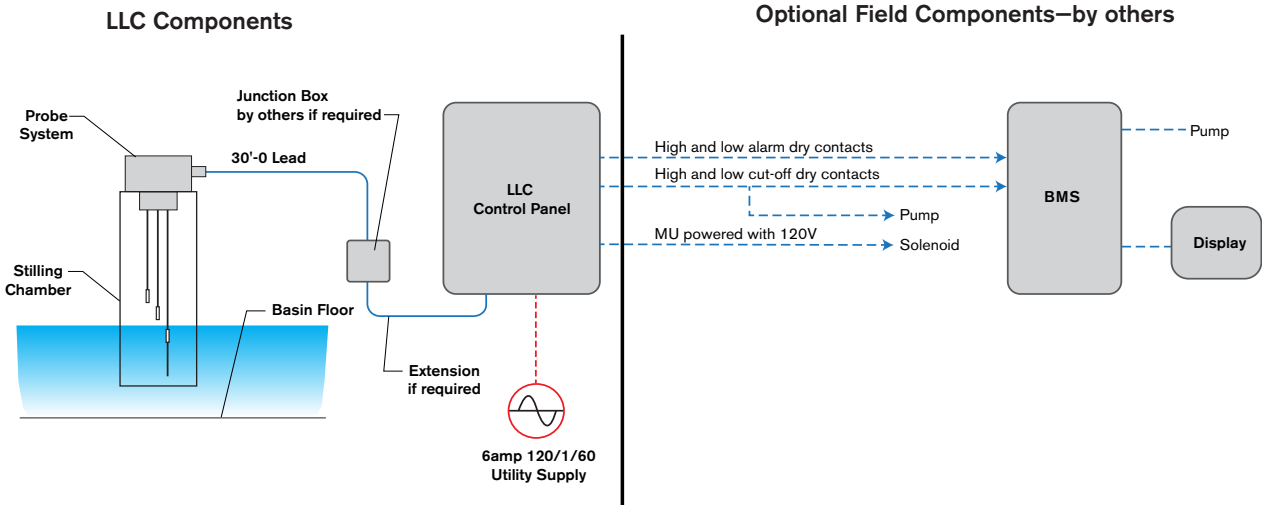
Note: If the control panel is furnished with a water makeup selector switch located on the right-hand side of the enclosure:

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.

description

SYSTEM DIAGRAM



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

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

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 sensor probes located in the cold-water basin of the cooling tower.

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.

operation

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.

Water Makeup Function

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

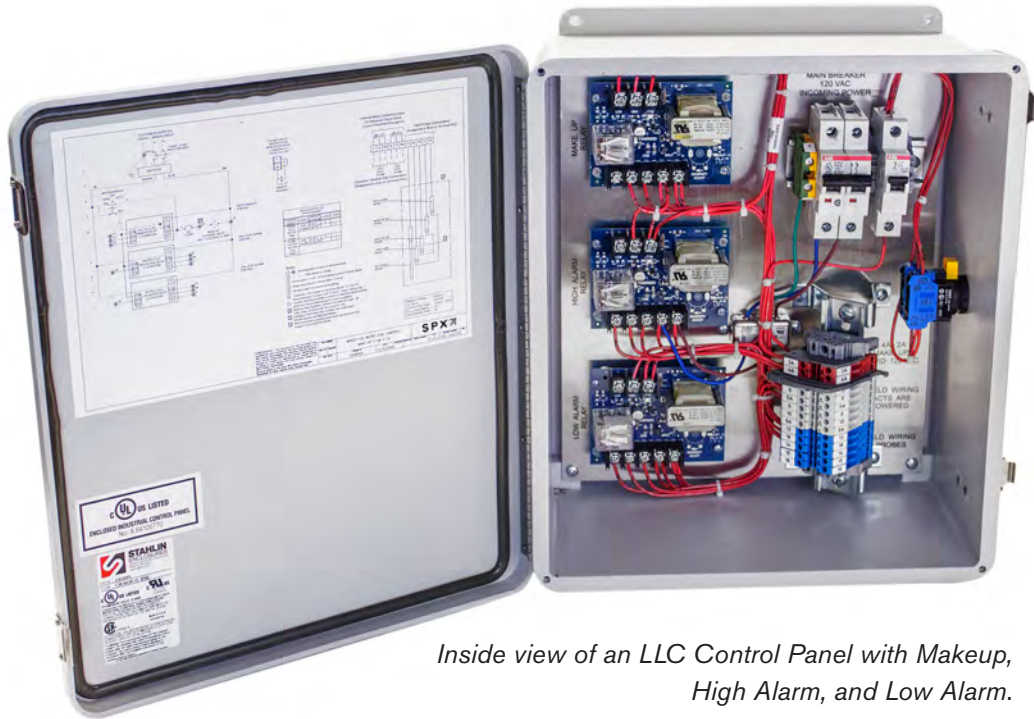
The circuitry for water makeup in the LLC control panel provides an independent circuit breaker for direct connection to a 110-120VAC water solenoid valve. This added feature allows customer installation without having to provide an additional power circuit to energize the solenoid. The solenoid is connected 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 an 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 30 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

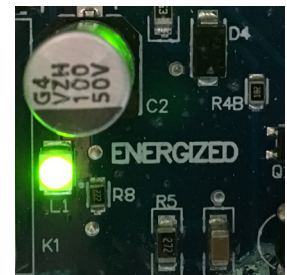
The next three pages are simplified illustrations representing the sequence of operation for each type of circuit card:

Page 10 – Makeup

Page 11 – High Alarm – High Cutoff

Page 12 – Low Alarm – Low Cutoff

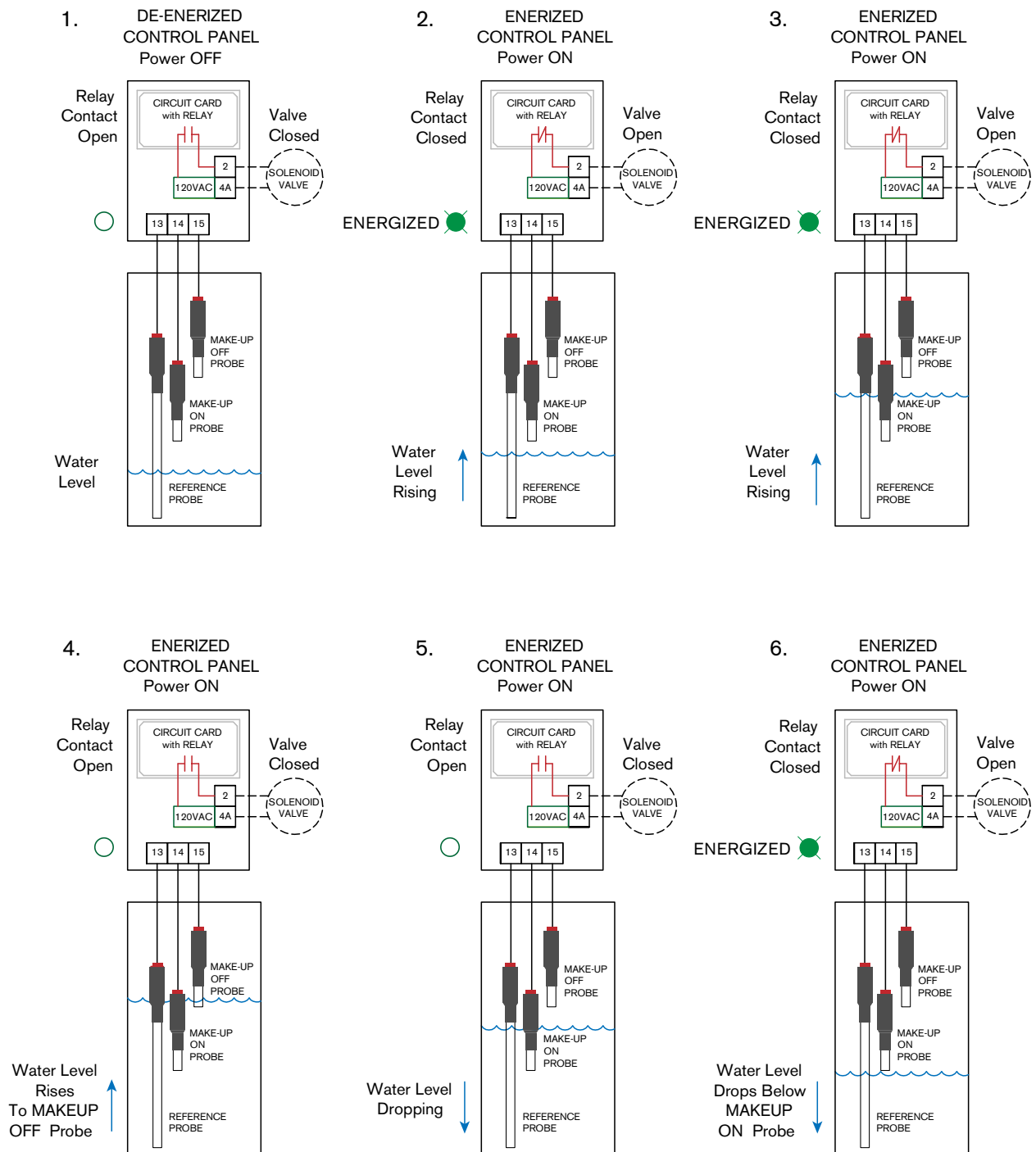
Each relay circuit card has two green indicator lights. The ON light indicates the card is powered and ready to function. The ENERGIZED light indicates when the probe system is functioning and should be used when troubleshooting.



operation

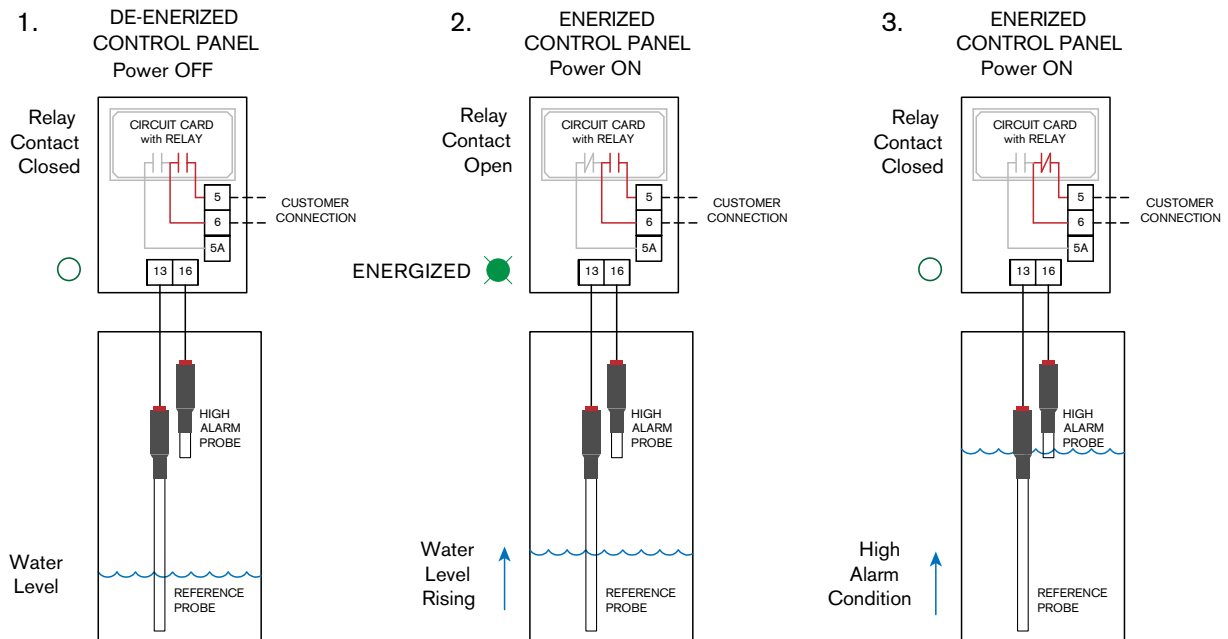
Water Makeup Control – Sequence of Operation – B Card

Selector Switch in AUTO Position

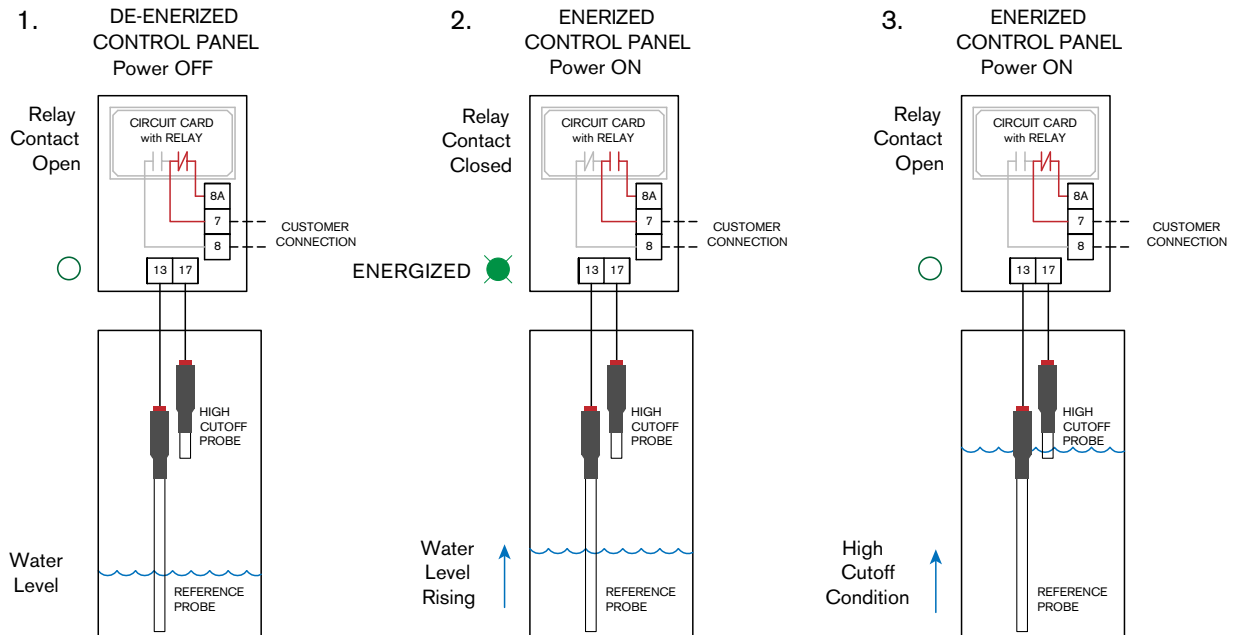


operation

High Level Alarm – Sequence of Operation – B Card

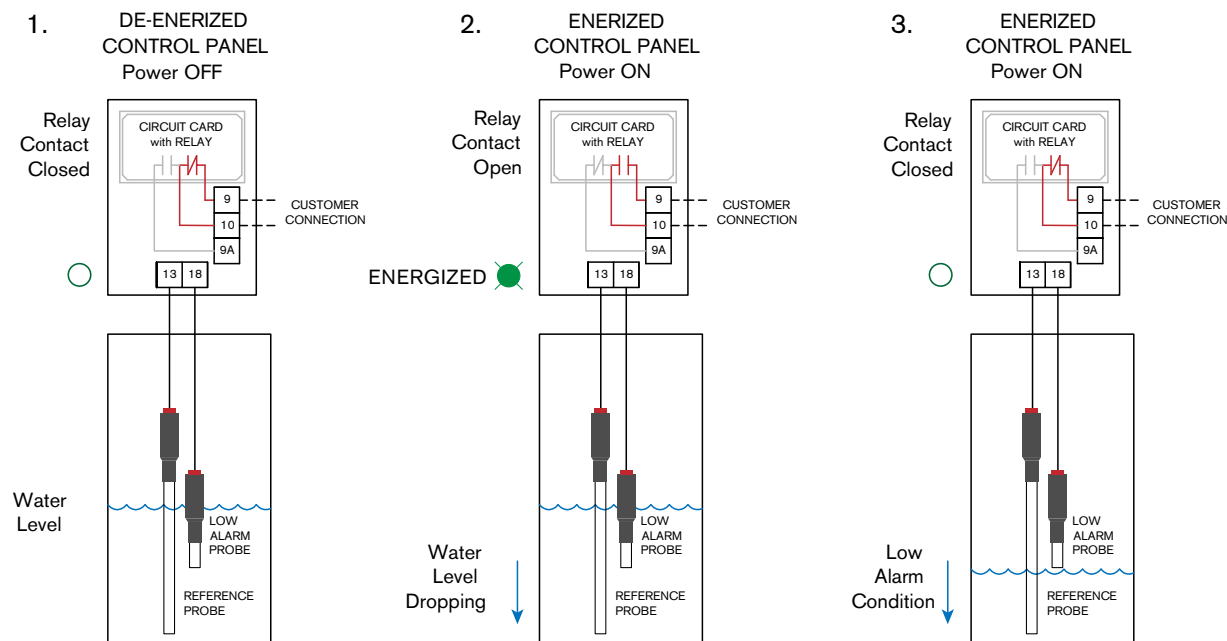


High Level Cutoff – Sequence of Operation – B Card

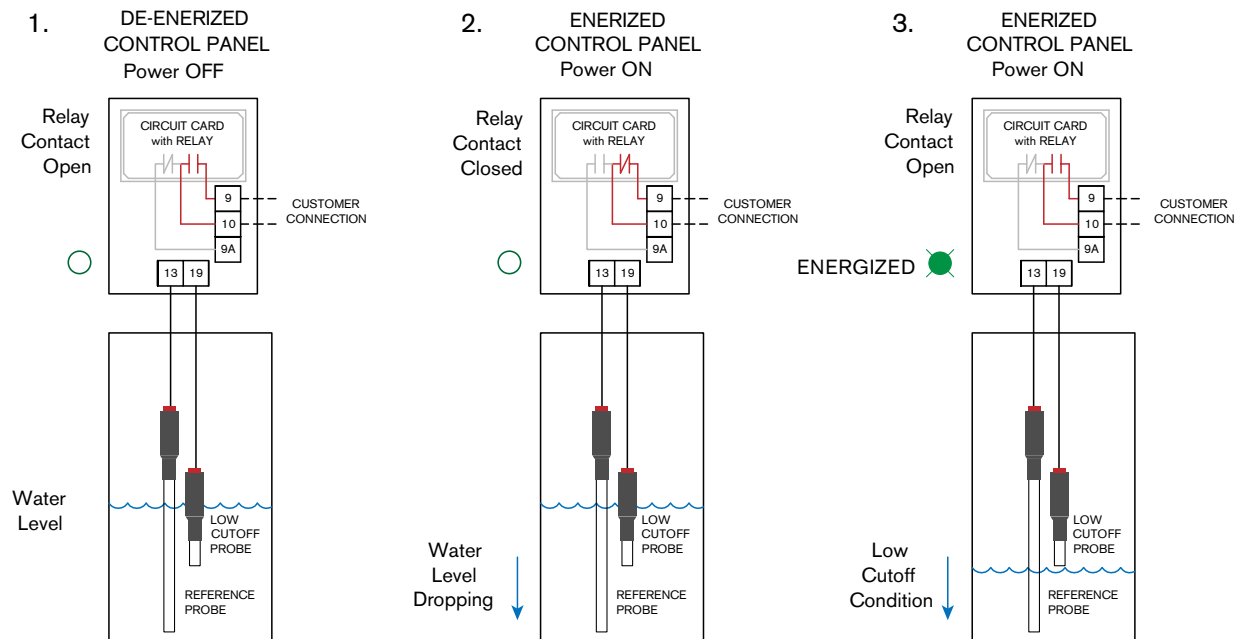


operation

Low Level Alarm – Sequence of Operation – A Card



Low Level Cutoff – Sequence of Operation – A Card



troubleshooting

The control panel has been tested before shipment and most issues lie outside of the control panel e.g. proper probe connections to the control panel and probe tip level heights in the basin of the cooling tower.

In an effort to troubleshoot the system please check the following:

- Check probe heights in the stilling chamber. The levels may be factory set but if in question contact your Marley sales representative for level height information. Probe wire height is secured using an adjustable cord grip located inside the conduit box located on top of the stilling chamber.
- Check if probe wires are connected correctly at the user terminal strip located inside the control panel. Each probe wire is printed with an identifying number on the black insulation of the wire every few inches. For example the reference probe is always #13 and needs to be connected to terminal point #13 in the control panel.
- If probe wires are extended in the field, check to make sure the extension wire is numbered correctly and connections are secure.
- After time, contaminants may build up on the probe tips. Clean tips with an abrasive cleaning pad and make sure the tips are screwed in making a good connection.
- If provided, the make-up selector switch on side of the control panel must be in AUTO position

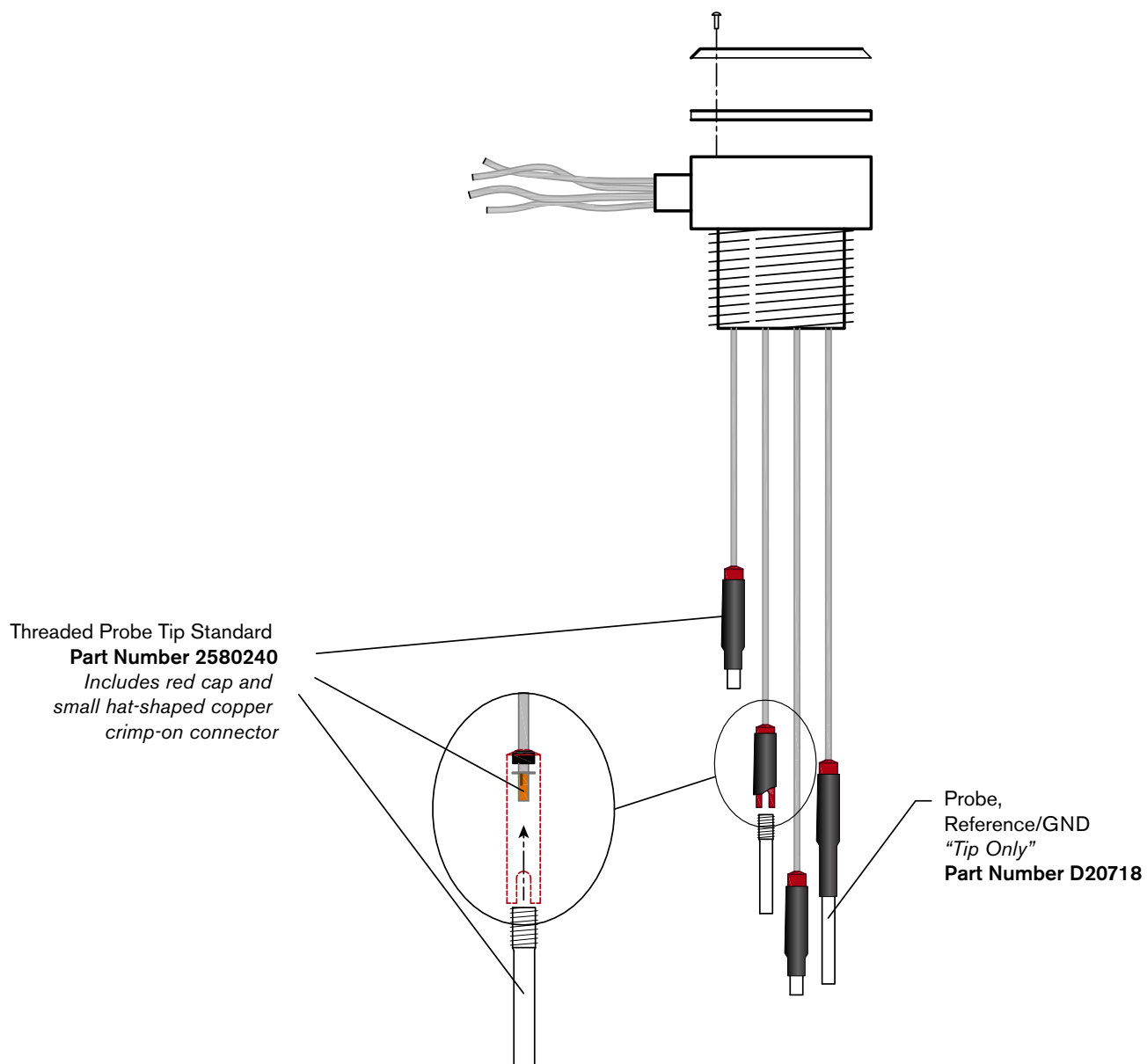
Checking the power circuit for the makeup solenoid

- Rotate the selector switch to the HAND position. The solenoid should energize allowing makeup water to flow into the cooling loop. Inside the control panel is a single-pole circuit breaker which must be in the ON position to power the circuit.

Checking control panel functionality

- To determine the control panel works as designed check the green LED lights on each circuit card and watch the relays change state in the clear cased relays located on each level card. Refer to the charts on pages 10 through 12 for LED light sequence of operation.
- Another method is to remove probe wiring from the terminal strip and simulate water level by using jumper wires at the probe terminal points. For example a jumper wire from #13 to #16 would indicate high-water alarm.

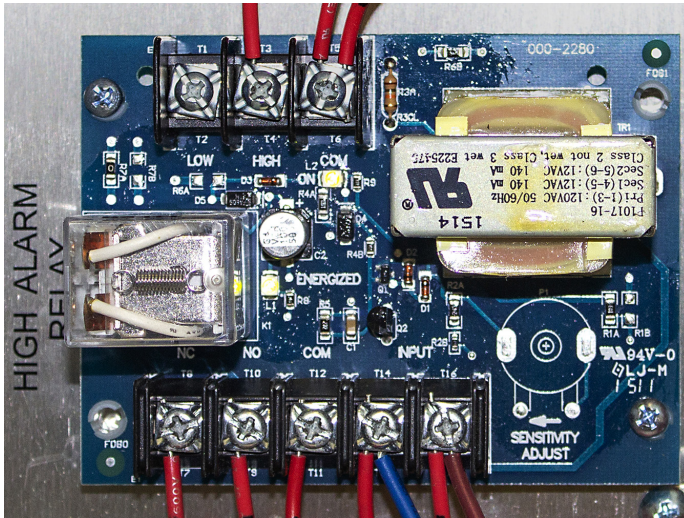
parts list



Electrode Probe Assembly

Additional part numbers can be found on the next page

parts list



Relay Circuit Card

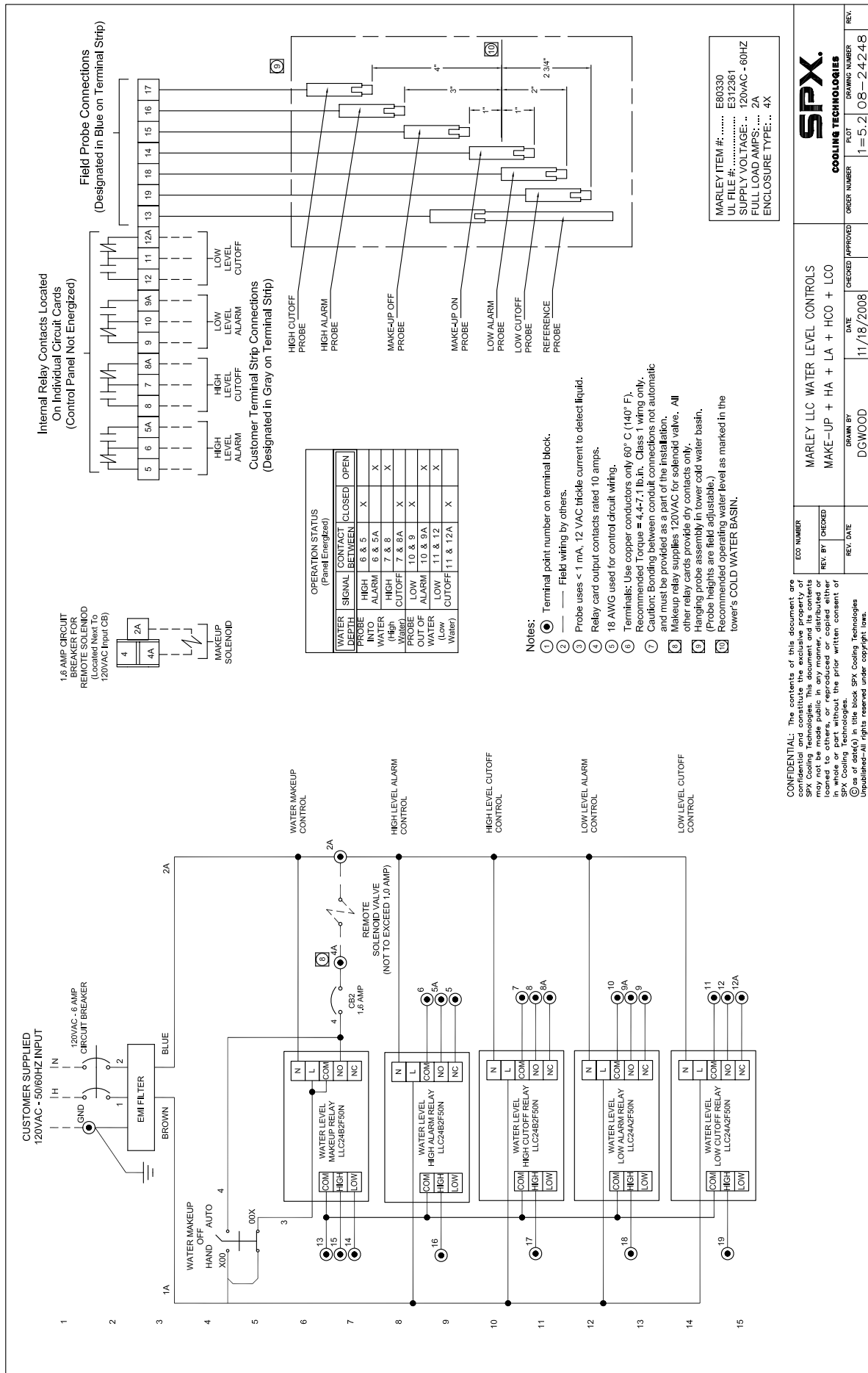
Part Number **D55194** – Used for Makeup, High Alarm and High Cutoff (LLC24B2F50N)

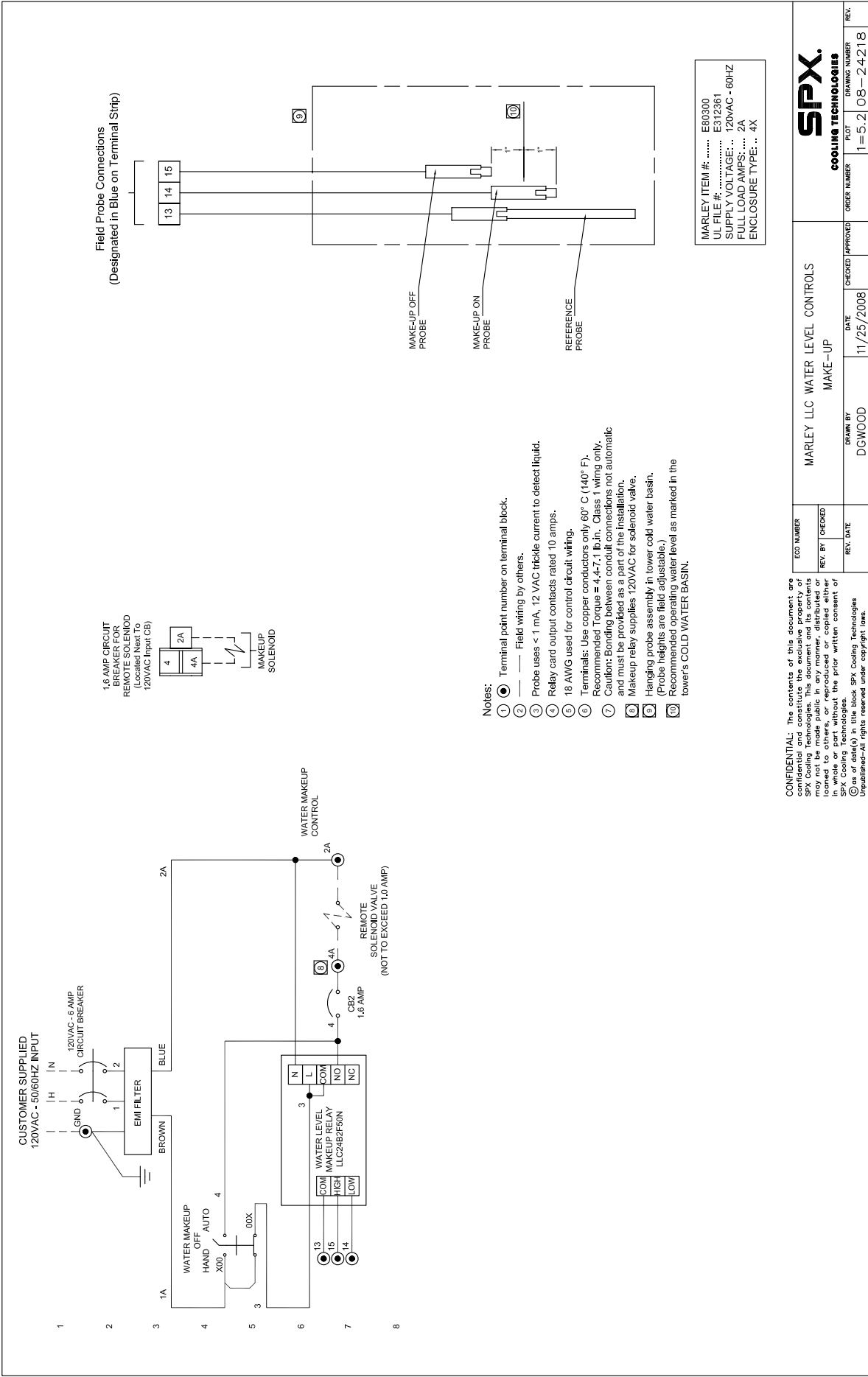
Part Number **D55195** – Used for Low Alarm and Low Cutoff (LLC24A2F50N)

Part Number	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 30 ft wire)
D20711	Standard Probe Sensor (Complete with tip and 30 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)
2580240	Standard Probe Sensor 3.5" Stainless Steel Tip
D20718	Reference / GND Probe Sensor 6" Stainless Steel Tip
203887	Terminal Blocks Kit (2 Gray, 2 Blue and 1 End)
D81756	EMI Filter
D20707	Reference Marked #13
2220852	Makeup On Marked #14
2220854	Makeup Off Marked #15
2220855	High Alarm Marked #16
2220856	High Cutoff Marked #17
2220857	Low Alarm Marked #18
2220859	Low Cutoff Marked #19
C74516	Generic Level No Wire #

wiring diagrams – contents

Drawing Number	Description	Page
08-24248	Makeup High Alarm High Cutoff Low Alarm Low Cutoff	17
08-24233	Makeup High Alarm Low Alarm	18
08-24218	Makeup	19
08-24219	High Alarm	20
08-24220	Low Alarm	21
08-24221	High Cutoff	22
08-24222	Low Cutoff	23
08-24230	High Cutoff Low Alarm	24
08-24231	Low Cutoff Low Alarm	25
08-24232	High Cutoff Low Cutoff	26
08-24228	High Cutoff High Alarm	27
08-24229	Low Cutoff High Alarm	28
08-24225	Makeup High Cutoff	29
08-24224	Makeup Low Alarm	30
08-24223	Makeup High Alarm	31
08-24234	Makeup High Alarm High Cutoff	32
08-24235	Makeup High Alarm Low Cutoff	33
08-24236	Makeup High Cutoff Low Alarm	34
08-24237	Makeup Low Alarm Low Cutoff	35
08-24238	Makeup High Cutoff Low Cutoff	36
08-24239	High Alarm High Cutoff Low Alarm	37
08-24240	High Alarm Low Alarm Low Cutoff	38
08-24241	High Alarm High Cutoff Low Cutoff	39
08-24242	High Cutoff Low Alarm Low Cutoff	40
08-24243	Makeup High Alarm High Cutoff Low Alarm	41
08-24244	Makeup High Alarm Low Alarm Low Cutoff	42
08-24245	Makeup High Alarm High Cutoff Low Cutoff	43
08-24246	Makeup High Cutoff Low Alarm Low Cutoff	44
08-24247	High Alarm High Cutoff Low Alarm Low Cutoff	45





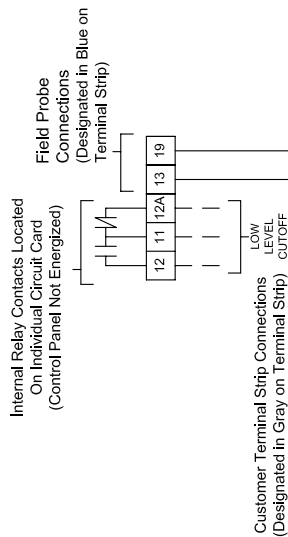
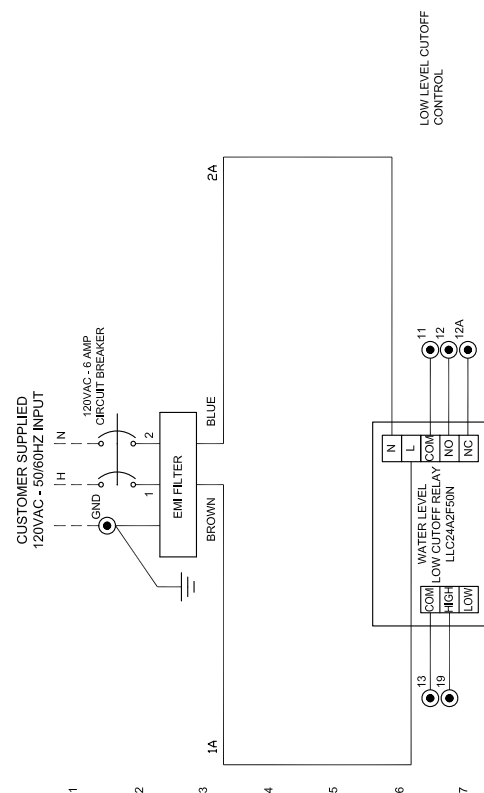
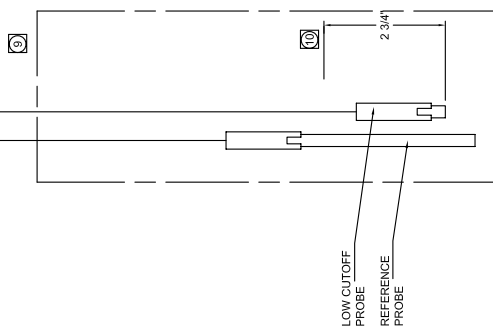




TABLE 1 OPERATION STATUS (Power Applied)				
WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
PROBE OUT OF WATER (Low Water)	LOW CUTOFF	11 & 12 11 & 12A		X



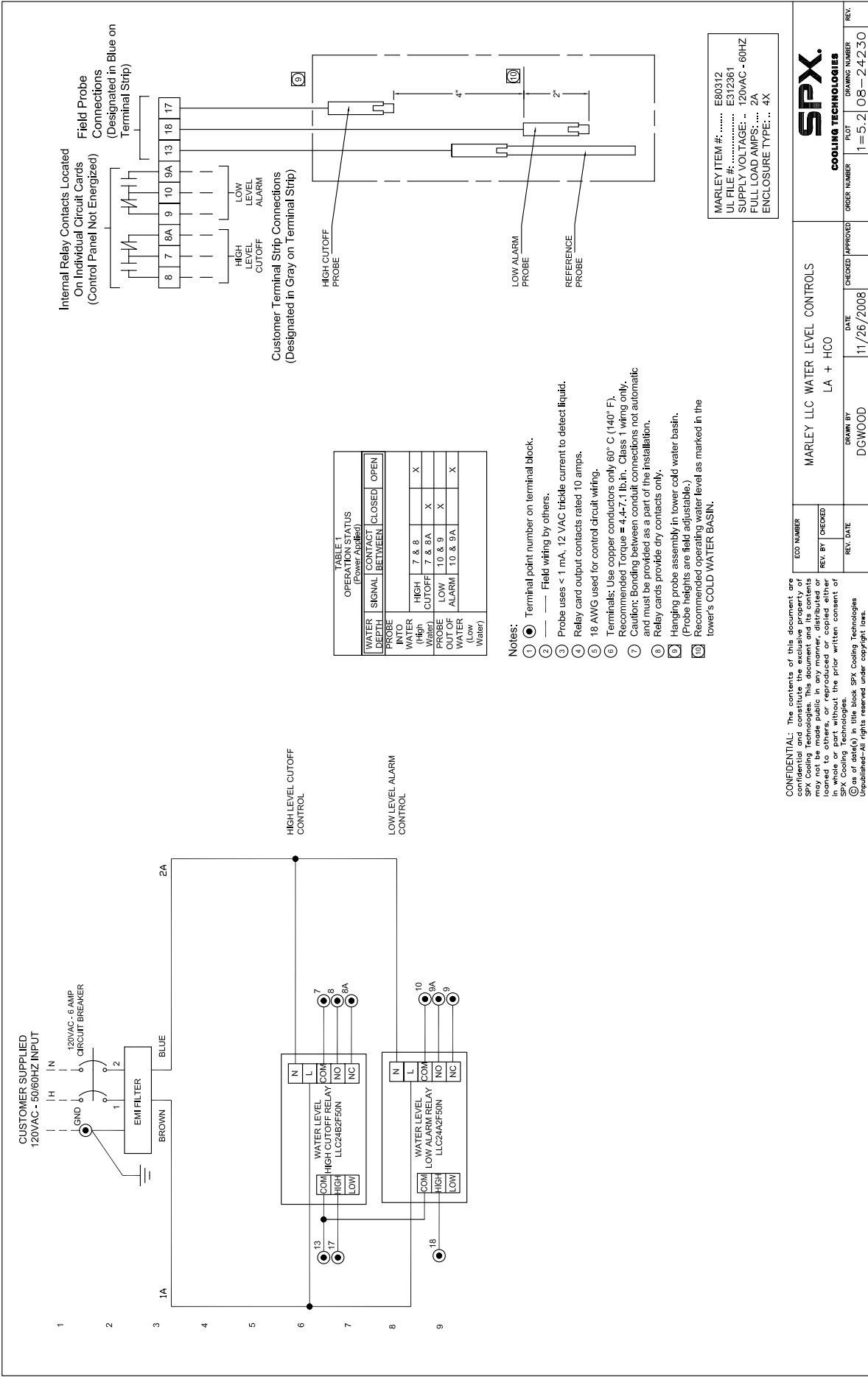
- Notes:
- 1  ——— Field wiring by others.
- 2  ——— Field wiring by others.
- 3 Probe uses < 1 mA, 12 VAC (rctle current to detect liquid).
- 4 Relay card output contacts rated 10 amps.
- 5 18 AWG used for control circuit wiring.
- 6 Terminals: Use copper conductors only 60° C (140° F).
- 7 Recommended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

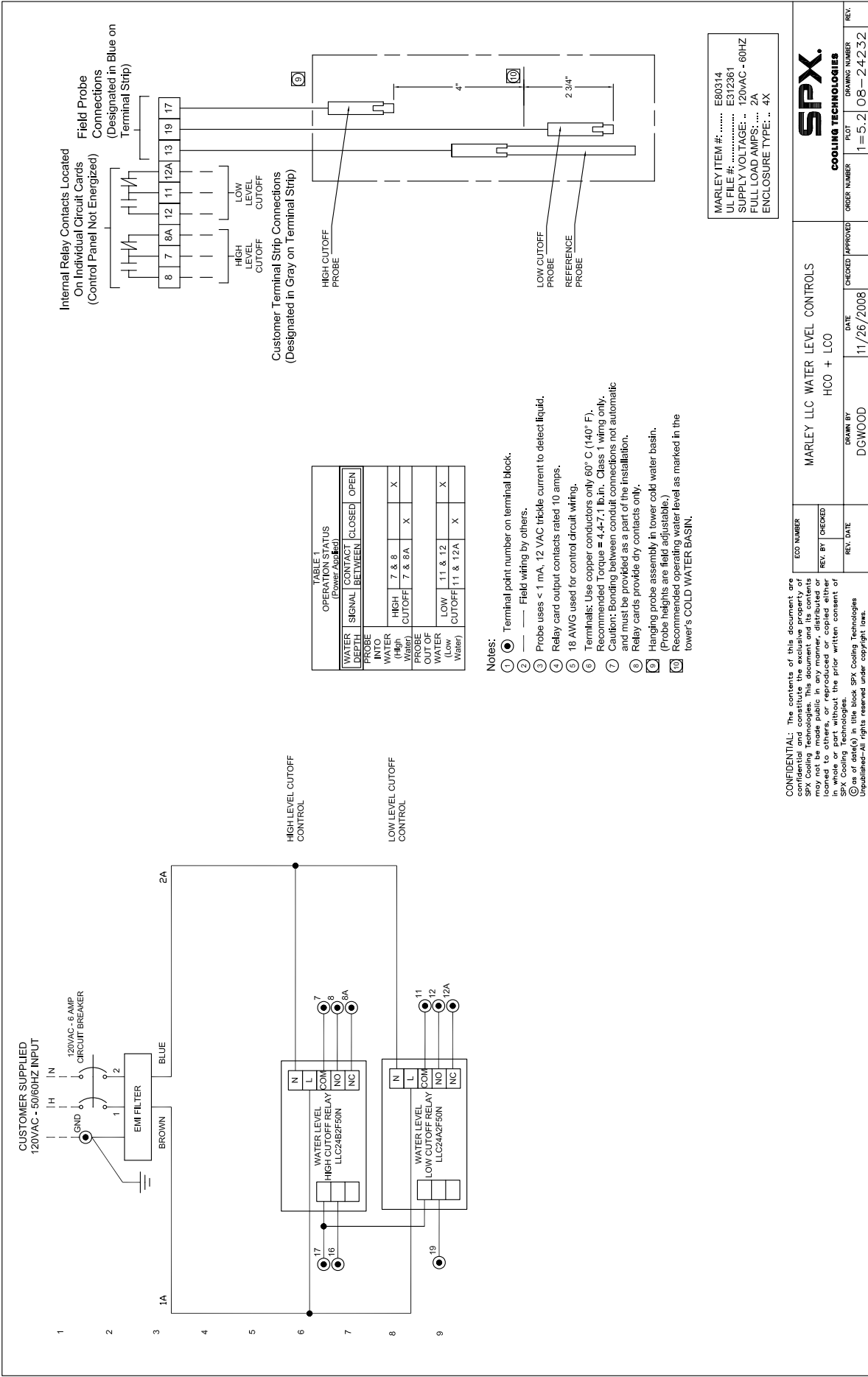
MARLEY ITEM #:	E80304
UL FILE #:	E312361
SUPPLY VOLTAGE:	120VAC - 60HZ
FULL LOAD AMPS:	2A
ENCLOSURE TYPE:	4X

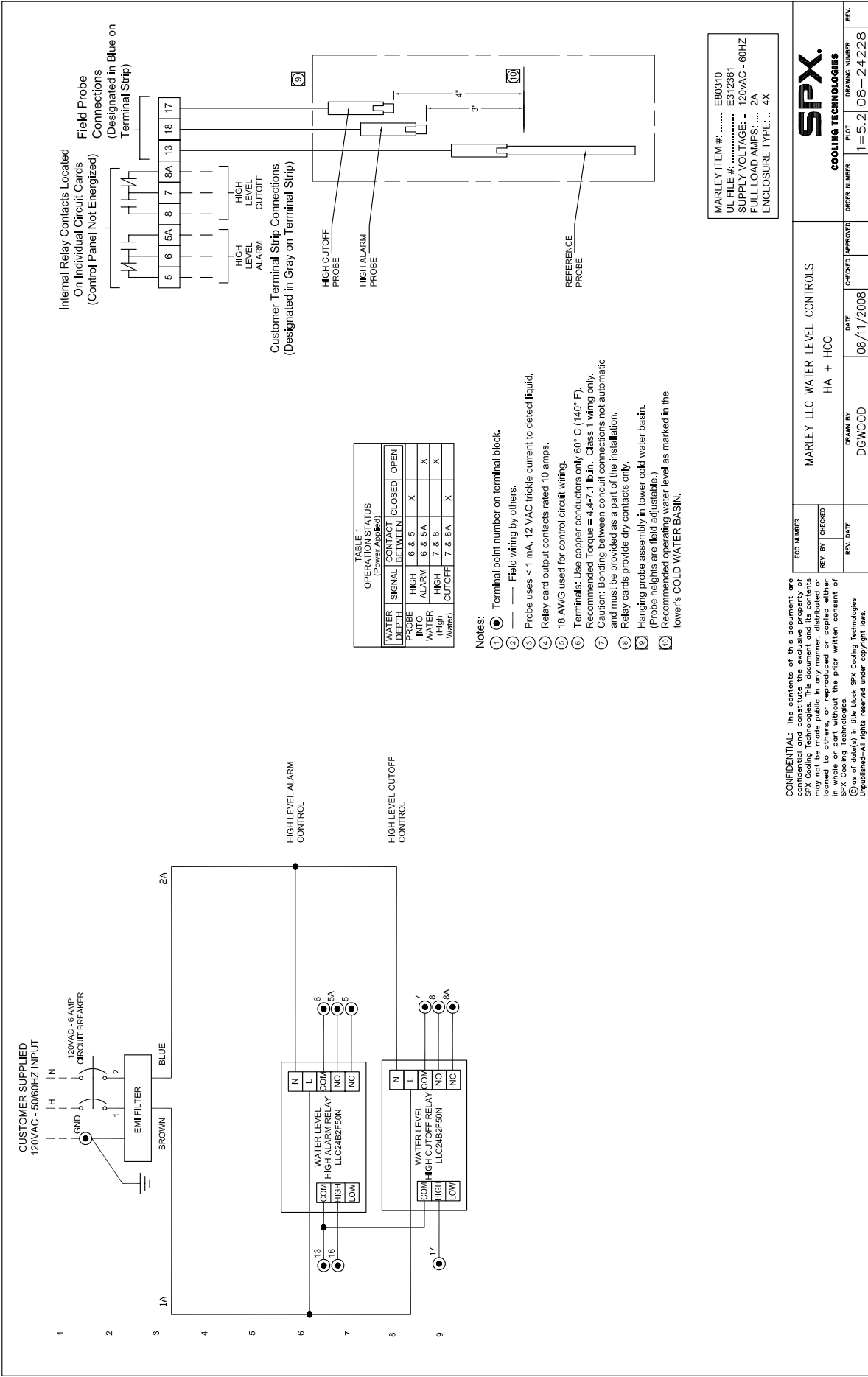
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ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS											
REV. BY		CHECKED		LOW LEVEL CUTOFF									
REV. DATE		DRAWN BY		DATE		CHECKED	APPROVED	ORDER NUMBER	FLOT	DRAWING NUMBER	REV.		
		DGWOOD		08/25/2008					1=5.2	08-24222			







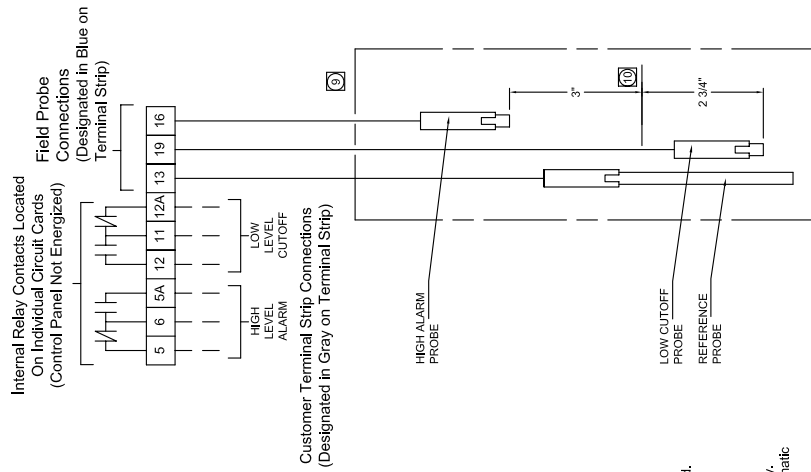
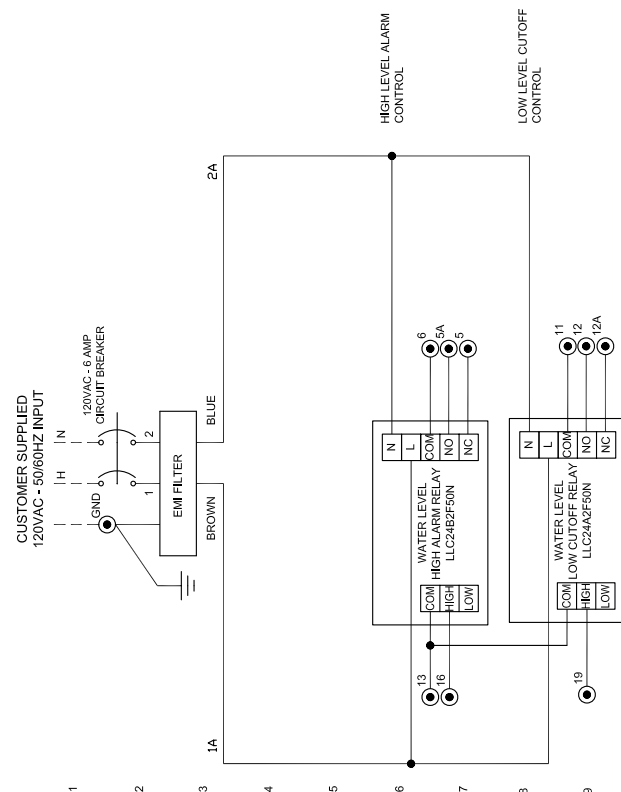


TABLE 1 OPERATION STATUS (Power Applied)					
	WATER DEPTH	SIGNAL	CONTACT HIGH	CLOSED	OPEN
PROBE	INTO	ALARM	6 & 5	X	
WATER	INTO		6 & 5A		X
(High Water)					
PROBE	OUT OF WATER				
(Water)					
		LOW CUTOFF	11 & 12 11 & 12A		X


Notes:

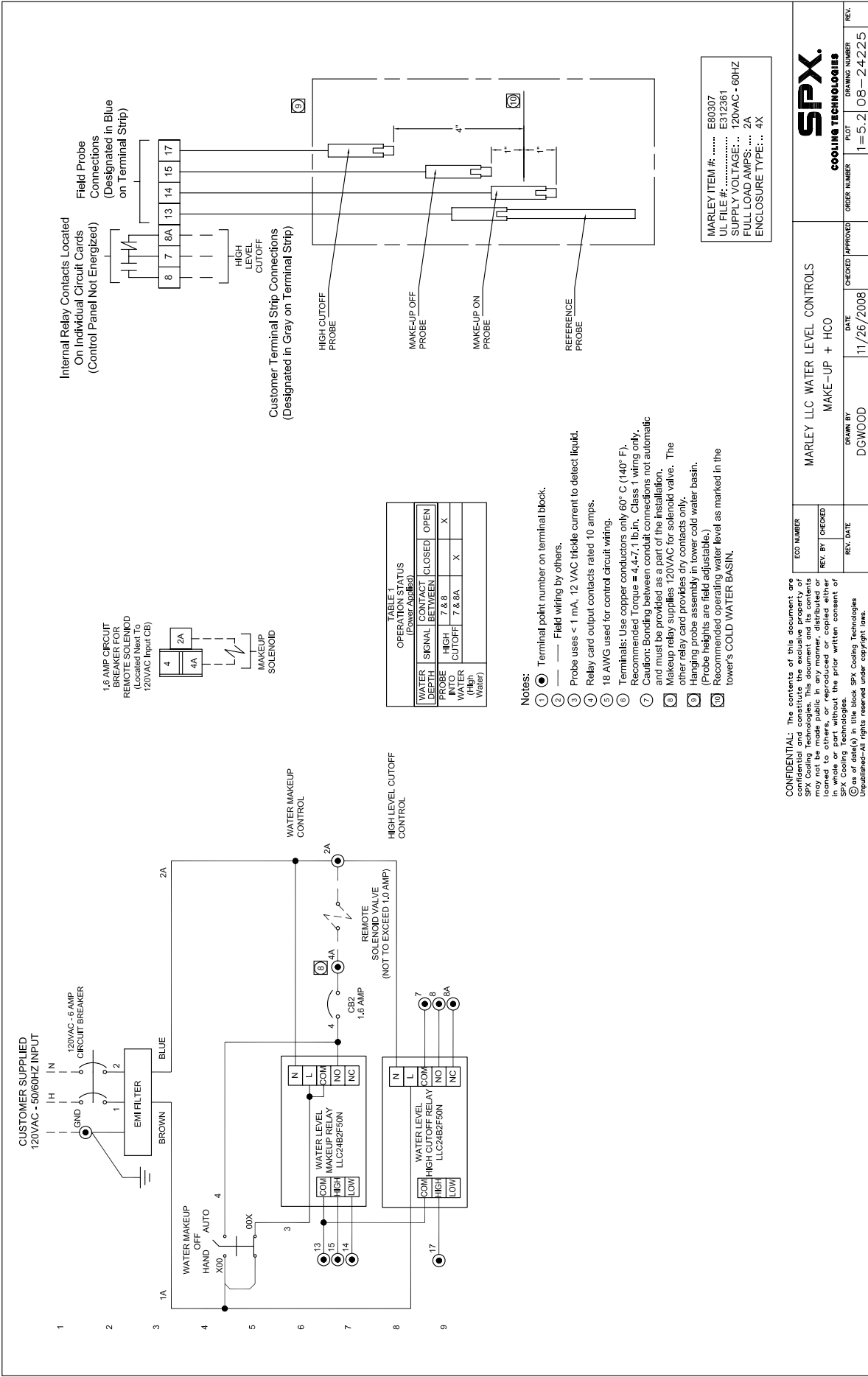
- | | | |
|----|---|--|
| 1 | ● | Terminal point number on terminal block. |
| 2 | — | Field wiring by others. |
| 3 | | Probe uses < 1 mA, 12 VAC trickle current to detect liquid. |
| 4 | | Relay output for contacts rated 10 amps. |
| 5 | | 18 AWG used for control circuit wiring. |
| 6 | | Terminals: Use copper conductors only, 60° C (140° F). |
| 7 | | Recommended Torque = 4.4-7.1 lbf-in. Class 1 wiring only. |
| 8 | | Caution: Bonding between conduit connections not automatic and must be provided as a part of the installation. |
| 9 | | Relay cards provide dry contacts only. |
| 10 | | Hanging probe assembly in lower cold water basin. (Probe heights are field adjustable.) |
| 11 | | 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

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



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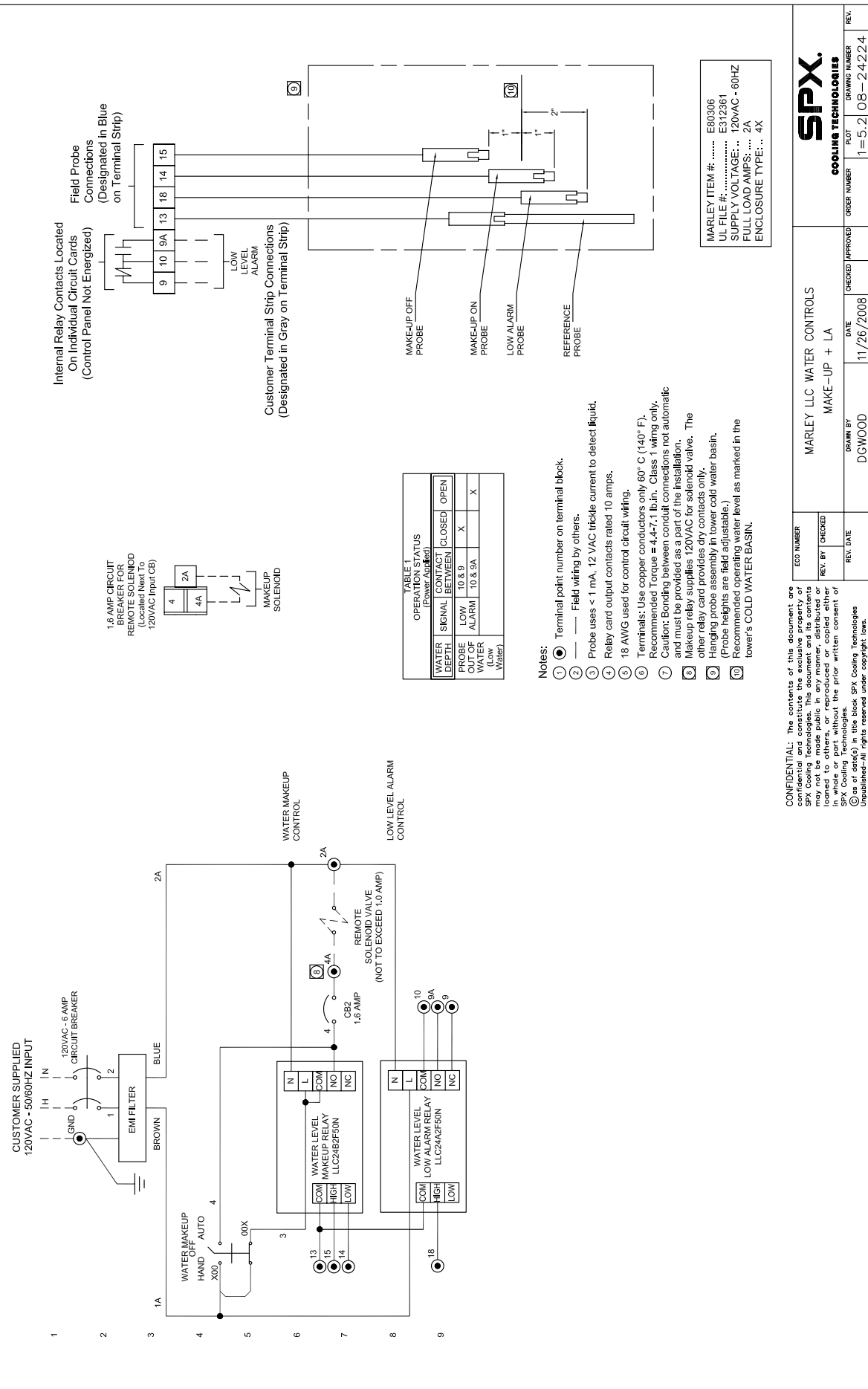
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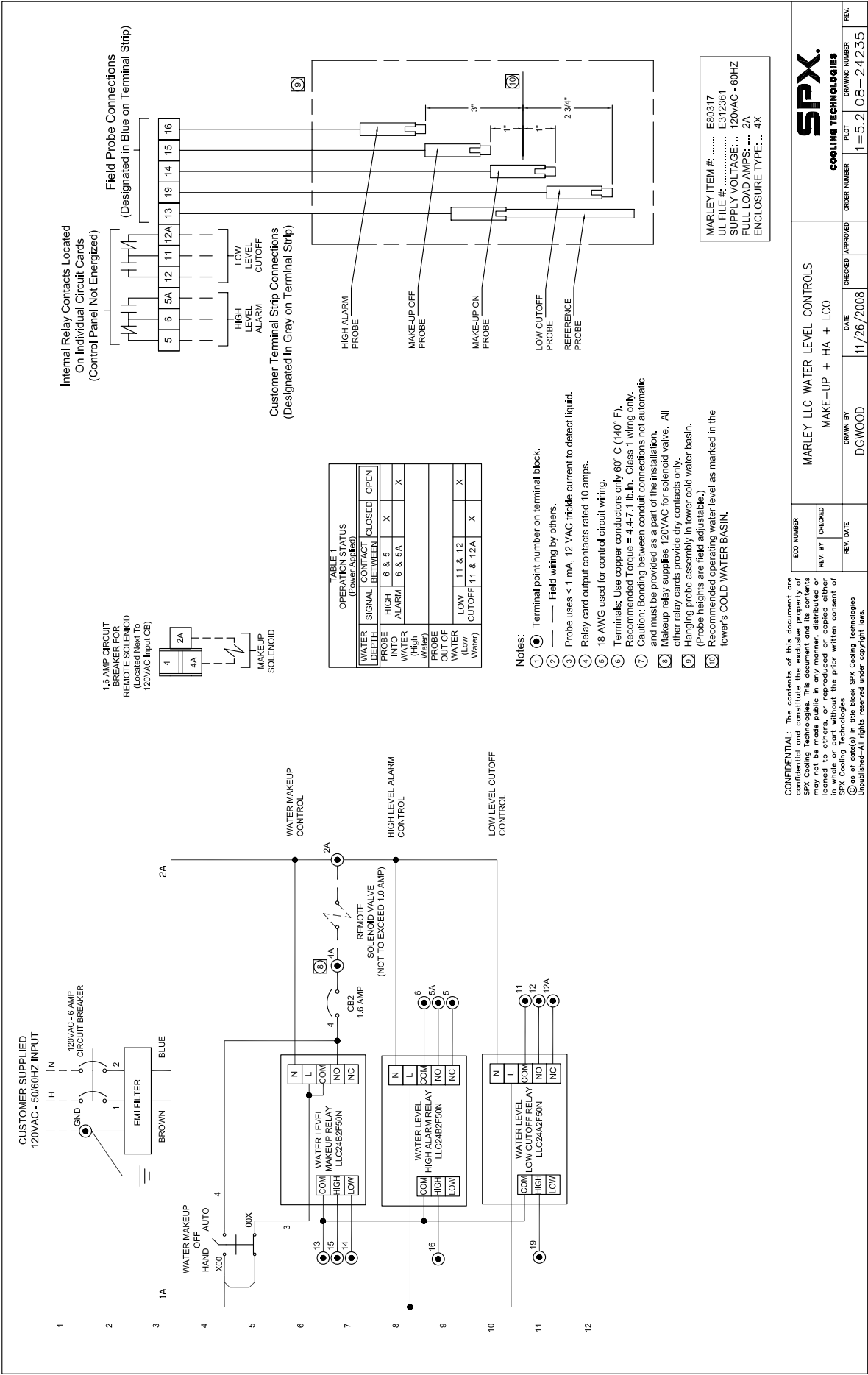
COOLING TECHNOLOGIES

MARLEY LLC WATER LEVEL CONTROLS

MAKE-UP + HCO

ECO NUMBER	REV. BY	CHECKED	DATE	APPROVED	ORDER NUMBER	LOT	DRAWING NUMBER	REV.
			11/26/2008		DGWOOD		1=5.2 08-24225	

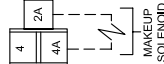
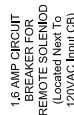




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ECO NUMBER		MARLEY LLC WATER LEVEL CONTROLS	
REV. BY	CHECKED	MAKE-UP + HA + LCO	
REV. DATE	DATE	CHECKED	APPROVED
11/26/2008	11/26/2008	DGWOOD	1=5.2 08-24235
REV. 1	REV. 1	REV. 1	REV. 1

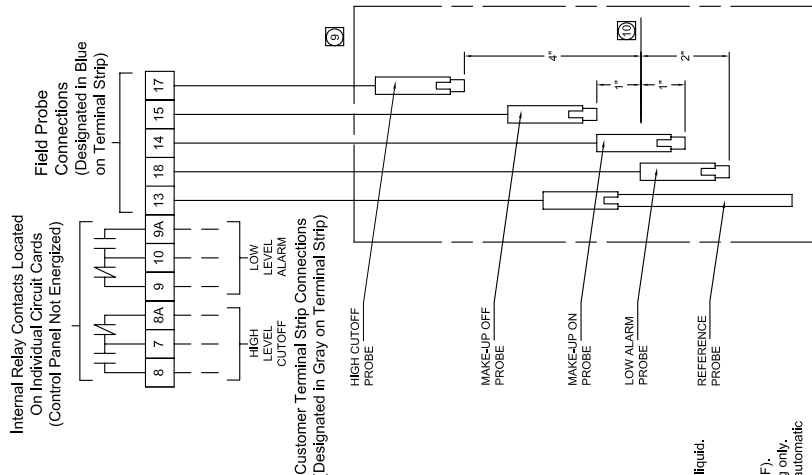
SPX.
COOLING TECHNOLOGIES



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

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 = 4.47-1.1 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 contact only.
- 9 Hanging probe assembly in lower 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 -
FULL LOAD AMPS: 2A
ENCLOSURE TYPE: ... 4X

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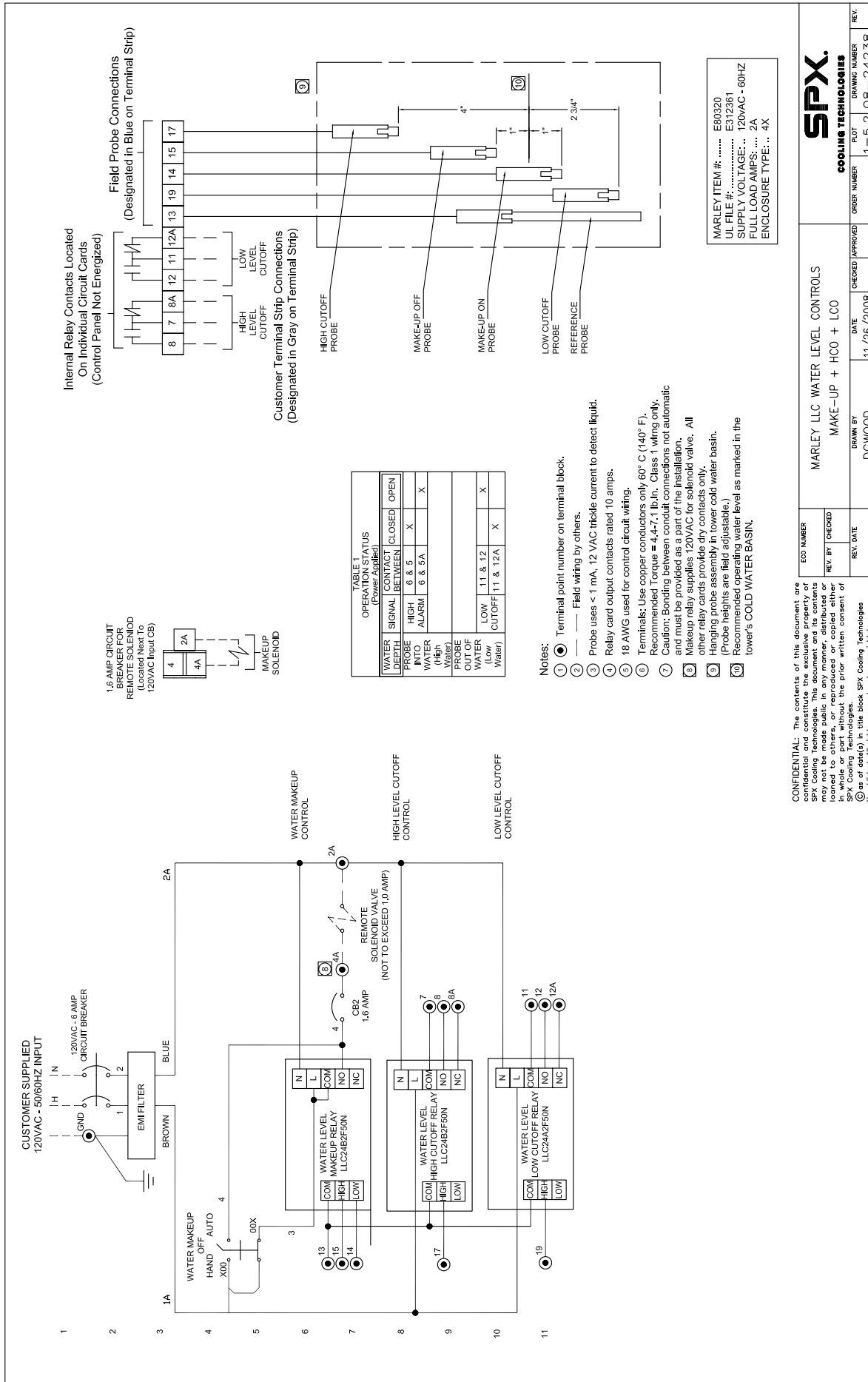
ECO NUMBER	MARLEY LLC WATER LEVEL CONTROLS							
REV. BY	CHECKED	MAKE-UP LA + HCO						
REV. DATE	DRAWN BY	DATE	CHECKED	APPROVED	ORDER NUMBER	PLLOT	DRAWING NUMBER	REV.
	DGWOOD	11/26/2008				1=5.2	08-24236	

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COOLING TECHNOLOGIES

PLOT	DRAWING NUMBER
1=5.2	08-2423





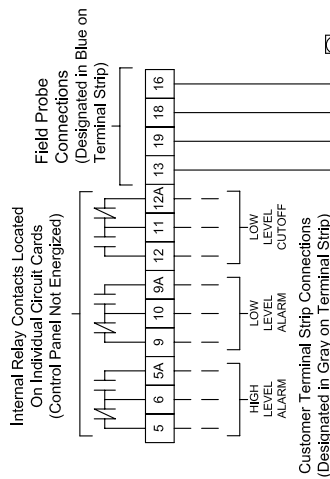




TABLE 1 OPERATION STATUS (Power Applied)						
	WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN	
PROBE	WATER	HIGH	6 & 5	X		
INTO	WATER	ALARM	6 & 5A		X	
(High Water)						
PROBE	LOW		10 & 9	X		
OUT OF	ALARM		10 & 9A		X	
WATER			11 & 12		X	
(Low Water)			CUTOFF 11 & 12A	X		

Notes:

- 1  Terminal point number on terminal block.
- 2 — — Field wiring by others.
- 3  Relay card with < 1 mA, 12 VAC trickle current to detect liquid.
- 4 Probe uses output contact 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 lbf-in. Class 1 wiring only.
- 7 Caution: Bonding between consult 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.

9 Hanging probe assembly in tower cold water basin.
(Probe heights are field adjustable.)

(Probe heights are field adjustable.)

Recommended operating water level as marked in the

tower's COLD WATER BASIN.

Abstract

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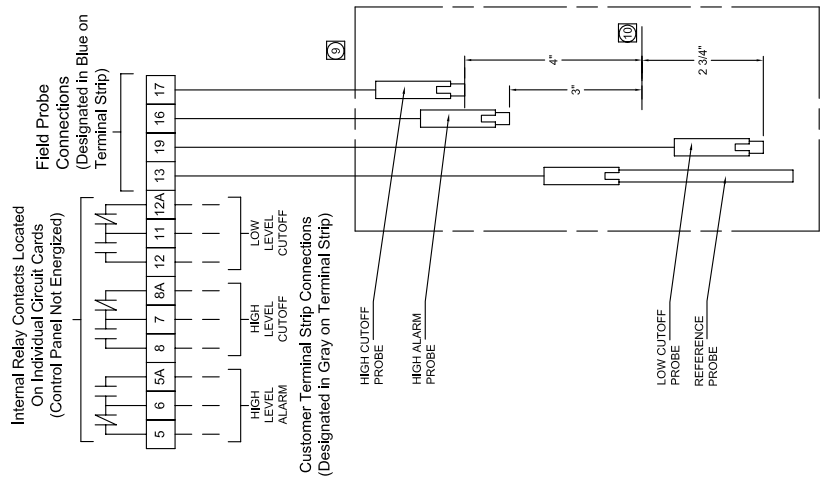
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X₂Ln



$$\text{HA} + \text{LA} + \text{LCO}$$

COOLING TECHNIQUES

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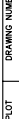
	WATER DEPTH	SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
	PROBE	HIGH	6 & 5	X	
	INTO	ALARM	6 & 5A		X
	HIGH	HIGH	7 & 8		X
	(Water)	CUTOFF	7 & 8A	X	
	PROBE				
	OUT OF				
	WATER	LOW	11 & 12		X
	(Low Water)	CUTOFF	11 & 12A	X	

- 1  Terminal input number on terminal block.
- 2  Field wiring by others.
- 3 Probe uses < 1 mA, 12 VAC triac 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 together control circuit 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 lower cold water basin. (Probe heights are field adjustable.)
- 10 Recommended operating water level as marked in the lower's COLD WATER BASIN.

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

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

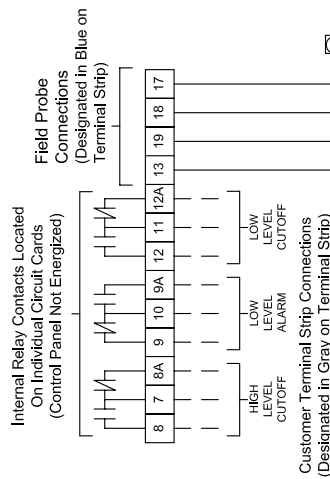


		TABLE 1 OPERATION STATUS (Power Applied)			
		SIGNAL	CONTACT BETWEEN	CLOSED	OPEN
WATER DEPTH	PROBE				
INTO					
WATER (High Water)		HIGH CUTOFF	7 & 8		X
PROBE		LOW	10 & 9	X	
OUT OF WATER		ALARM	10 & 9A		X
WATER (Low Water)		LOW	11 & 12		X
		CUTOFF	11 & 12A	X	

Notes:

- 1 Terminal point number on terminal block.
- 2 — Fiekl wiring by others.
- 3 Probe uses < 1 mA, 12 VAC trickle current to detect liquid.
- 4 Relay card output, 12 VAC 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 cards provide dry contacts only.
- 9 Hanging probe assembly in lower 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 #: E31236
SUPPLY VOLTAGE: .. 120VAC
FULL LOAD AMPS: ... 2A
ENCLOSURE TYPE: .. 4X

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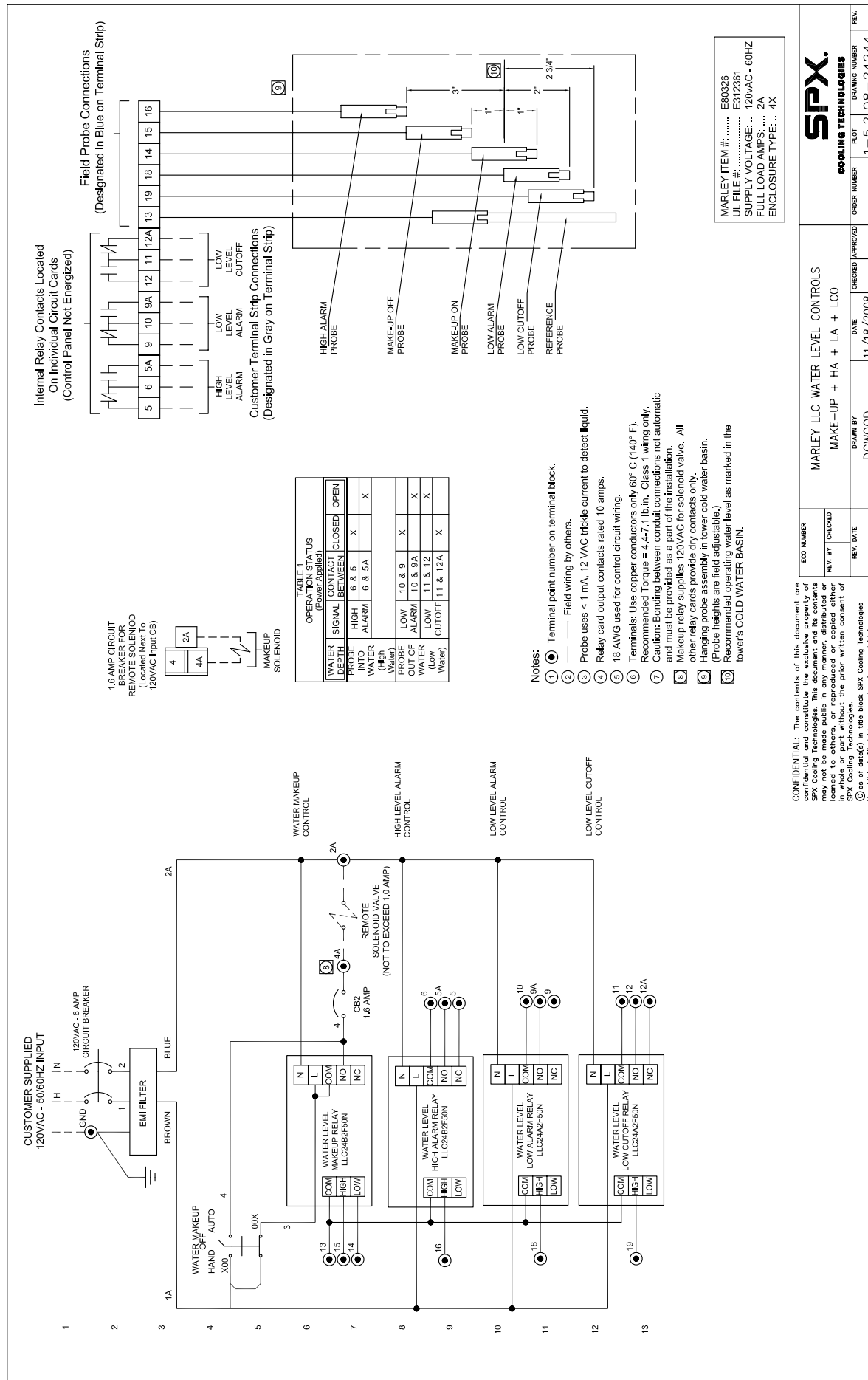
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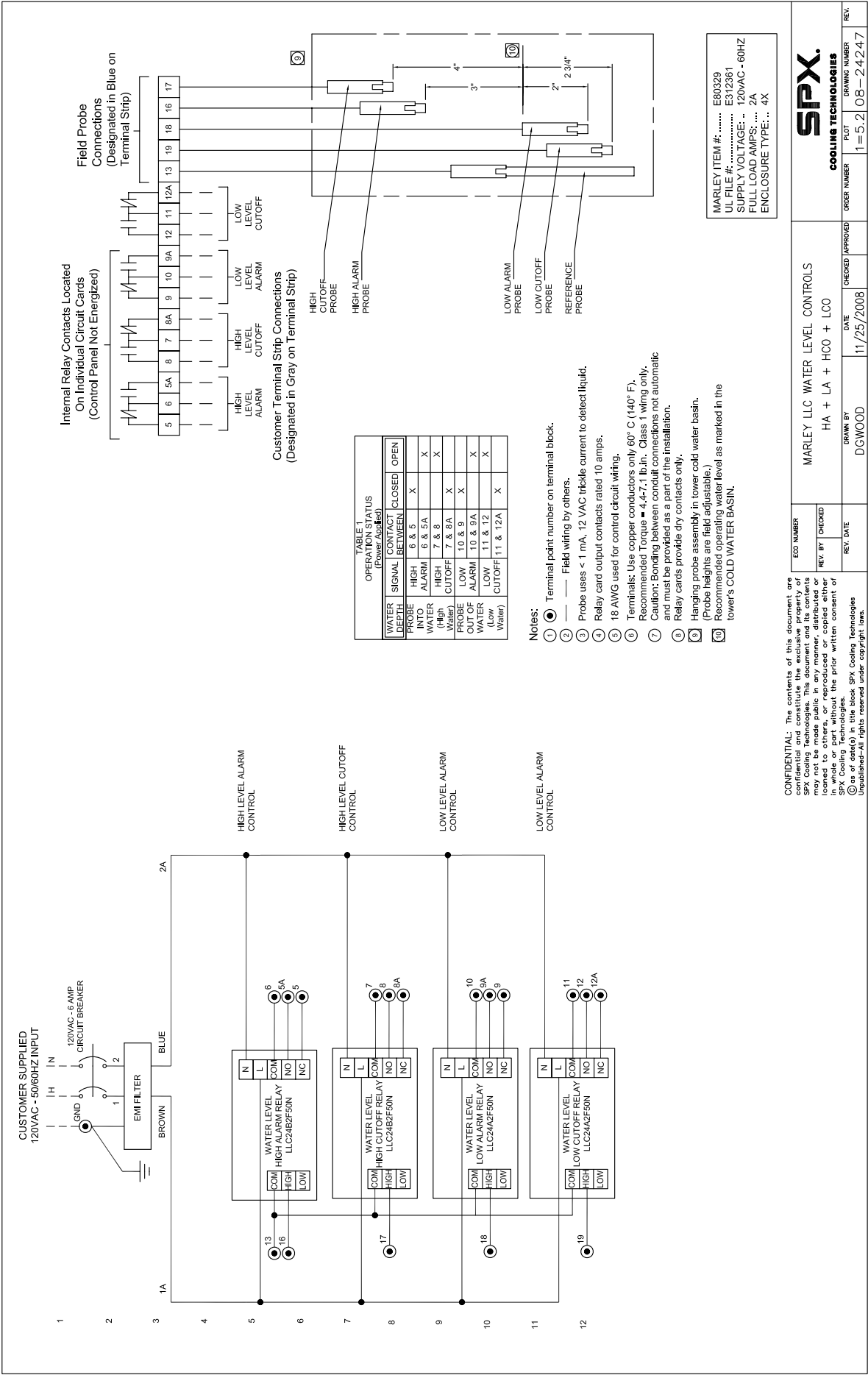
PLOT	DRAWING NUMBER	REV.
1=5.2	08-24242	



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ECO NUMBER	MARLEY LLC WATER LEVEL CONTROLS
REV. BY	MAKE-UP + HA + LA + LCO
REV. DATE	11/18/2008
DRWN BY	DGWOOD
CHECKED	APPROVED
ORDER NUMBER	1=5.2 08-24244
REV.	REV.





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MARLEY LLC WATER LEVEL CONTROLS
HA + LA + HCO + LCO

ECO NUMBER
REV. BY
REV. DATE

ORDER NUMBER
CHECKED
APPROVED

DRAWN BY
DATE
11/25/2008

1=5.2 08-2424.7

LLC water level control

USER MANUAL

SPX COOLING TECHNOLOGIES, INC.

7401 WEST 129 STREET
OVERLAND PARK, KS 66213 USA
913 664 7400 | spxcooling@spx.com
spxcooling.com

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