



STEFFES

CUSTOMER FOCUSED. SOLUTION DRIVEN. FIELD PROVEN.



INSTALL MANUAL



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PRODUCT DESCRIPTION

Origin™ by Steffes is an all-electric, large volume, central heat pump, domestic water heating system specifically designed for multi-family building projects with decarbonization design goals. Steffes brings 30+ years of experience in energy storage, HVAC, and system manufacturing to provide this advanced heat pump water heating technology in an integrated solution. Designed as a packaged system, Origin™ takes the complexity and cost out of a projects’ domestic hot water system design and installation. Our team of engineers stand ready to aid in the application and engineering design support to integrate Origin™ systems into domestic water heating projects.


- Systems are sized to accommodate a range of apartment configurations.
- 8 ½ feet deep by 9 ½ feet high and either 12, 16, or 20 feet long (length depends upon number of storage tanks).
- Sized for different geographies including cold climates.
- Modularized into three sections:
 1. Heat Pump Interface Section: contains piping connections to remote heat pump water heater(s).
 2. Tank Section: contains storage tanks, swing tank, and expansion tank.
 3. Building Interface Section: contains water pumps, mixing valve, and controls panel.


SAFETY PRECAUTIONS


Recognize these symbols as safety precautions:


It is important, both for your personal safety and to avoid possible damage to the equipment and your property, that you observe the safety instructions given following these symbols.


**W
A
R
N
I
N
G**


**HAZARDOUS VOLTAGE: Risk of electric**

**Risk of fire.**

**Risk of explosion.**

**SCALD HAZARD**

**ARC FLASH and SHOCK HAZARD**

**HEAVY LOAD and CRUSH HAZARD**

BUILT-IN SAFETY DEVICES

Origin incorporates safety devices to ensure normal operating temperatures are maintained. The chart below describes these safety devices.

Device Name	Function	Location in System
Pressure Relief Valve	Relieve excessive water pressure in primary loop.	Bottom of each heat pump module. Quantity 1-3 depending on model.
Pressure Relief Valve	Relieve excessive water pressure in secondary loop.	Upper front of each storage tank. Quantity 1-3 depending on model.
Temperature & Pressure Relief Value	Relieve excessive water pressure or temperature in secondary loop.	Top of swing tank.
Fuses	Prevent over current on electrical circuits.	All distributed low voltage loads, and all distributed high voltage loads with exception of swing tank.

IMPORTANT

- The equipment described herein is intended for installation by a qualified technician in compliance with applicable local, state, and national codes and requirements.
- To ensure proper installation and operation of this equipment, read all instructions prior to attempting to assemble, install, operate, maintain, or repair. Inspect all parts for damage prior to installation and start-up.
- This manual should be retained by the owner upon completion of the installation and made available to service personnel as required.
- These installation instructions are only to be used as a guideline. It is the purchaser's/installer's responsibility to assess the suitability of this product for their specific installation.
- This appliance is not to be used by persons (including children) with reduced physical, sensory, or mental capabilities or lack of experience and knowledge, unless they have been given supervision and instruction concerning the use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

- **Disclaimer:** In compiling this manual, Steffes has used its best judgement based upon information available but disclaims any responsibility or liability for any errors or miscalculations contained herein, or any revisions hereof, or which result, in whole or in part, from the use of this manual or any revisions hereof.

After the equipment is installed, Steffes disclaims any responsibility or liability for mold/mildew growth and/or any damages caused by either. We strongly recommend that the user follow the moisture, mold, and mildew prevention guidelines of the Environmental Protection Agency (EPA), available at <http://www.epa.gov>.

MODEL CODE INFORMATION

The Model Code for the Origin product is derived using the following table. To ensure proper sizing of equipment, use the Steffes Sizing Tool or contact a Steffes Sales Representative.

SERIES NUMBER		HEAT PUMP QTY	HEAT EXCHANGER PLATES	STORAGE VOL		SWING VOL	SWING CAPACITY	VOLTAGE
G10	-	3	A	15	-	50	H	S
G10-Origin 1.0		1 – QTY 1	A-52 Plate	05-500gal		25-250gal	A-12kW	S-208 3φ
		2 – QTY 2	B-128 Plate	07-750gal		50-500gal	B-18kW	
		3 – QTY 3		10-1000gal			C-30kW	
				12-1250gal			D-36kW	
				15-1500gal			E-45kW	
							F-54kW	
							G-60kW	
							H-72kW	

CLEARANCES

Physical dimensions and clearances must be taken into consideration when choosing a location. Steffes recommends a 4' clearance on all sides of Origin.

NOTE: Follow all applicable local, state, and national codes and regulations.

RIGGING AND LIFTING

Origin is designed to be moved with an even 4-point lift rigging with spreader bars. All rigging and lifting MUST be conducted by a qualified technician.

There are 2 types of anchors on the Origin frame.

1. Brackets with a pin and pipe are for lift rigging and as an anchor point. Lift rigging should only be applied to these brackets with pin and pipe.
2. Brackets with no pin and pipe are to be used as anchoring only. Do NOT use these brackets for lifting.

Designated lift points, anchor points and required rigging are shown below:

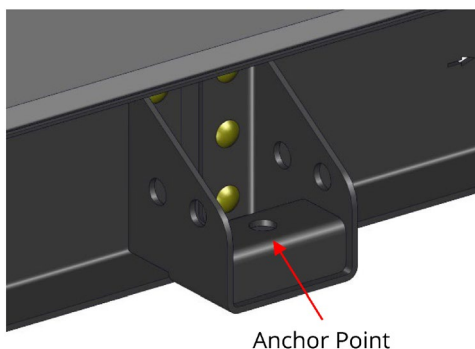
NOTE: Follow all applicable local, state, and national codes and regulations.

Volume Options with Rigging Dimensions

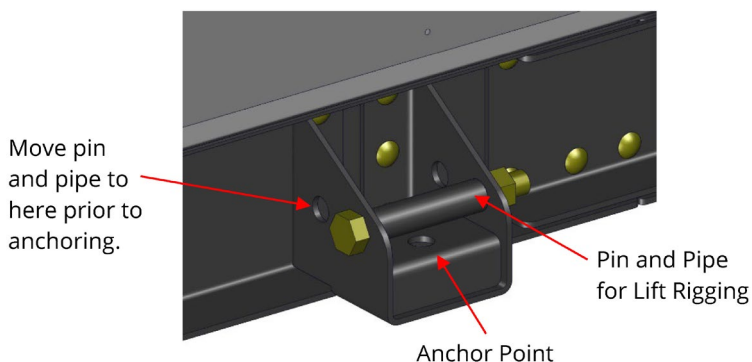
	Storage Volume (gal)	A (in)	B (in)
Option 1	500	73	99.5
Option 2	750/1000	73	
Option 3	1250/1500	121	

**NOTE: Option is based on storage volume shown as the 5th and 6th digit in the model number.
Example: Model 102B12506S = Option 3**

Anchor Only

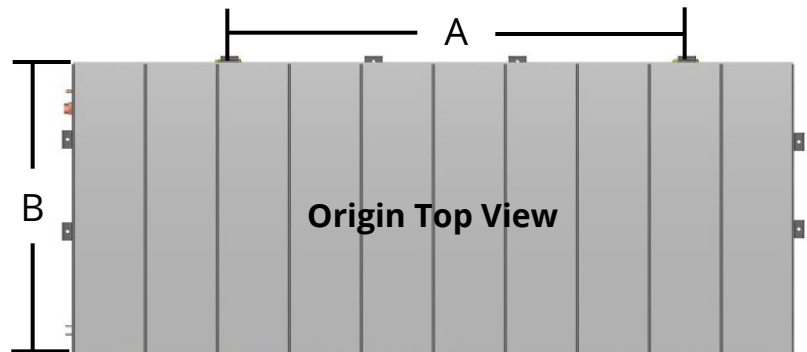


Lift Rigging and Anchor

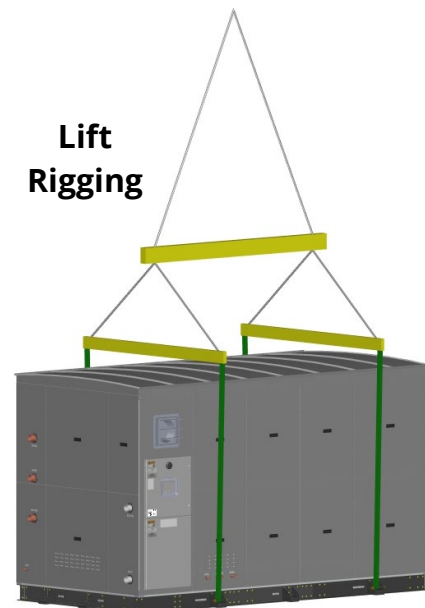


WARNING

HEAVY OBJECT and CRUSH HAZARD: Risk of personal injury or death. Do use care to keep objects, hands, and/or body parts clear of the system when lifting.



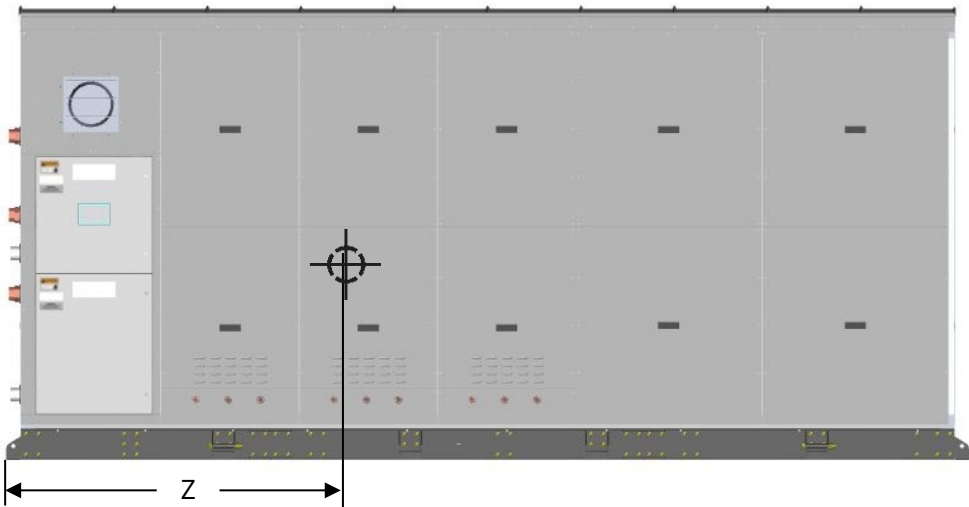
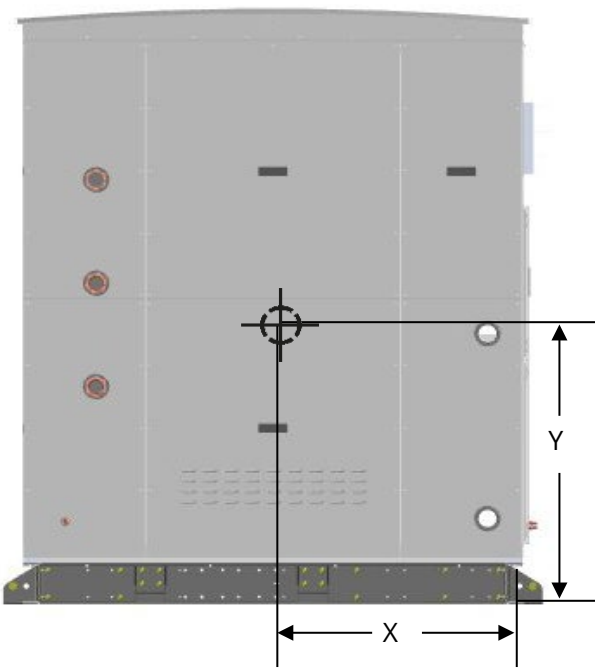
Lift Rigging



ANCHORING AND SEISMIC

Origin must be installed on a flat and properly sized pad. Each installation of Origin shall be evaluated by an experienced structural engineer for proper pad sizing and seismic strength. Seismic anchors are integrated into the Origin base frame. Seismic anchor locations are shown in the Rigging and Lifting section.

All Origin internal components have been third party evaluated and approved for use for lateral seismic load factor of 1.08. Any other installations with seismic conditions that fall outside the listed approvals must be evaluated by an experienced structural engineer.



	X (in)	Y (in)	Z (in)	Weight - Dry (lbs)	Mass Weight - Wet (lbs)
Option 1	44	53	83	9,000	15,500
Option 2	44	53	97	11,100	24,100
Option 3	44	53	115	13,200	30,400

NOTE: The weights listed are approximate and may vary with the model code selected.

FIELD PLUMBING CONNECTIONS

Origin has multiple field installed plumbing connections. Connections **MUST** be installed by a licensed plumber. Refer to field plumbing connection diagrams in this section for details.

Origin contains multiple pressure relief valves which require discharge lines. These discharge lines **MUST**:

- Be field connected from the outlet on the side of Origin with no intervening valve and directed downward to a safe point of discharge.
- Allow complete drainage of the discharge line.
- Be independently supported and securely anchored to avoid applied stress on the outlet.
- Be as short and straight as possible.
- Terminate freely to atmosphere where any discharge is clearly visible and is at no risk of freezing.
- Be constructed of a material suitable for the application.
- Be, over its entire length, of a pipe size equal to or greater than that of the outlet.

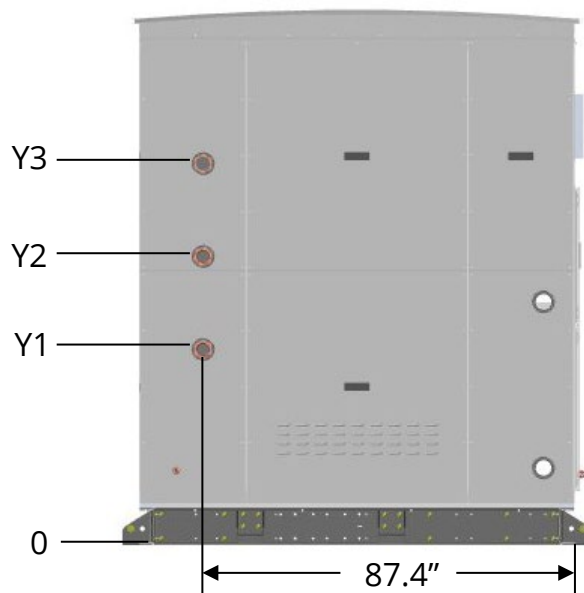
NOTE: A ball valve should be installed on each of the three pipes shown for routine service work and removal from service.



WARNING

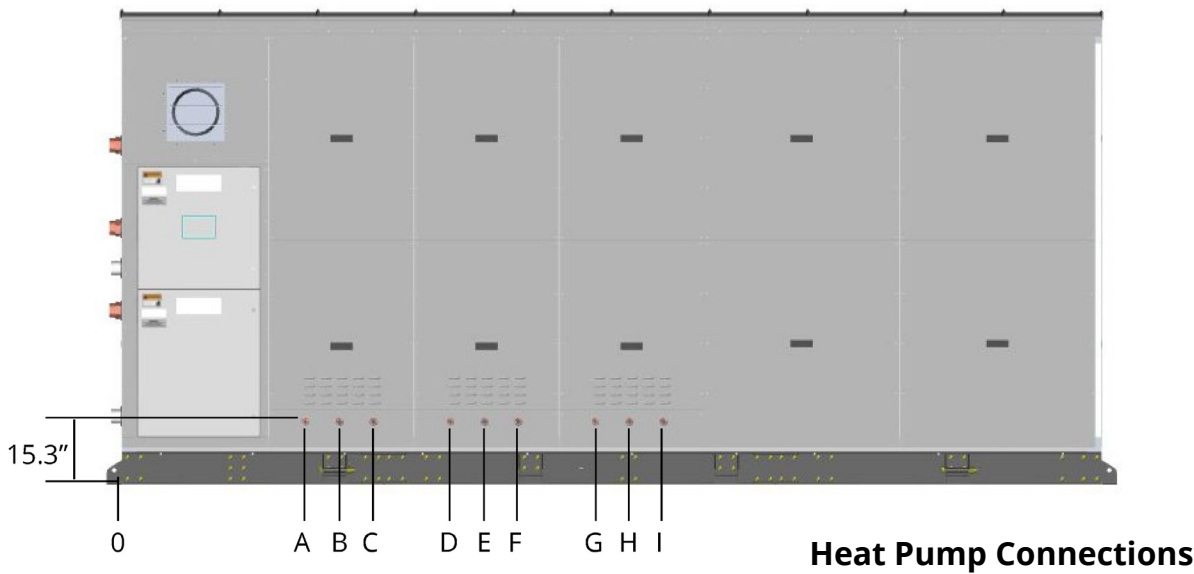
SCALD HAZARD: Water temperatures over 125°F (52°C) can cause severe burns instantly or death from scalds. If operating this device at temperatures exceeding 125°F (52°C), a mixing valve must be in place and adjusted properly. Minimum and maximum water temperature requirements vary depending upon local, state, and national codes and regulations. Follow all codes and regulations to ensure proper operation and safety.

Risk of discharge hot water and /or steam. Can cause personal injury or property damage. During operation, the pressure relief valve may discharge large amounts of steam and/or hot water. To reduce the potential for bodily injury or property damage, install a discharge line.



	Dimensions to Zero (0) in inches	Plumbing Connection	Connection Size and Type
Y1	42.4	HOT WATER RETURN	3" MNPT
Y2	62.6	COLD WATER IN	3" MNPT
Y3	82.8	HOT WATER OUT	3" MNPT

FIELD PLUMBING CONNECTIONS CONTINUED



When Available		Plumbing Connection	Dimensions to Zero (0) in inches
1+ HP	A	3/4" MNPT PSV OUTLET	47.5
	B	1" MNPT HPWH RETURN	55.5
	C	1" MNPT HPWH HOT IN	63.5
2+ HP	D	3/4" MNPT PSV OUTLET	81.9
	E	1" MNPT HPWH RETURN	90.1
	F	1" MNPT HPWH HOT IN	98.4
3+ HP	G	3/4" MNPT PSV OUTLET	117
	H	1" MNPT HPWH RETURN	125.3
	I	1" MNPT HPWH HOT IN	133.6

Origin 500-gallon water storage tanks have a manway that is required per ASME code. This manway is shipped with enough bolt tension for the initial water fill but must be adjusted to remain watertight under full pressure. Use the following procedure for finishing manways.

NOTE: *Water may leak slightly in-between steps. At any point bolts may be tightened evenly to stop the leak. Use care when adjusting to prevent the manway cover from falling into the tank.*

1. Check alignment of manway cover. The manway cover must be centered in hole. This may shift in shipping.
2. Tighten the manway bolts evenly.
3. Fill the system with water.
4. When the system is at operating pressure, re-tighten bolts evenly.
5. When the system is at operating temperature, re-tighten bolts evenly.

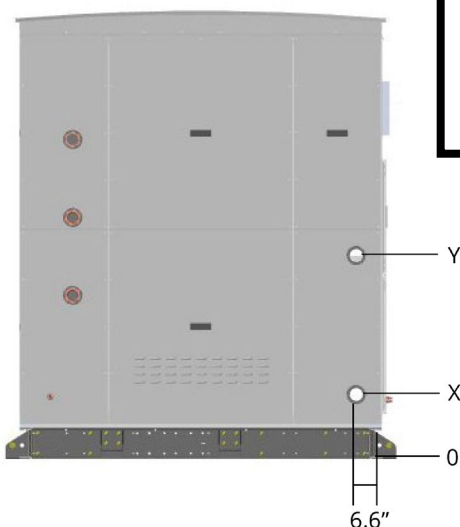


Manway cover prior to adjustment.

FIELD ELECTRICAL CONNECTIONS

Origin is wired for connection to 208 VAC, 3-phase, 4-wire. All field electrical connections must be installed by a licensed electrician. Route incoming power to Origin through a field installed fused disconnect and into the electrical compartment. The fuse should be a Class RK1 and sized accordingly. Wiring information and Maximum Over Current Protection information for fuse sizing are shown below.

The lugs that the field wiring will land on are UL specified and have an allowable wire size of #6 to 250kcmil. These conductors can be copper or aluminum and should be tightened to 31.1 N*m (275 lbf*in) for all wire sizes.



		Dimensions to Zero (0) in inches	Connection Size and Type
X	Line Voltage	16.6	3" MNPT
Y	Low Voltage	52.8	3" MNPT

NOTE: Follow all applicable local, state, and national codes and regulations.

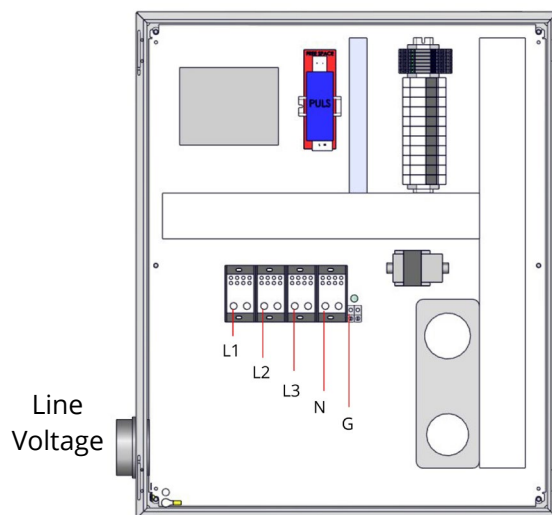
Model Code 6 th Digit	Full Load Amps (FLA)	Minimum Circuit Ampacity (MCA)	Maximum Over Current Protection (MOCP)
A - 12kW	43	54	60
B - 18kW	60	75	75
C - 30kW	93	117	125
D - 36kW	110	137	150
E - 45kW	135	169	175
F - 54kW	160	200	200
G - 60kW	177	221	250
H - 72kW	210	262	300

NOTE: The FLA, MCA, MOCP are calculated based on the model code and other internal loads.

WARNING

HAZARDOUS VOLTAGE: Risk of electric shock, injury, or death. Do not energize the system until installation is complete.

ARC FLASH and SHOCK HAZARD: Appropriate PPE and Tools Required when working on this equipment. Failure to comply can result in injury or death.

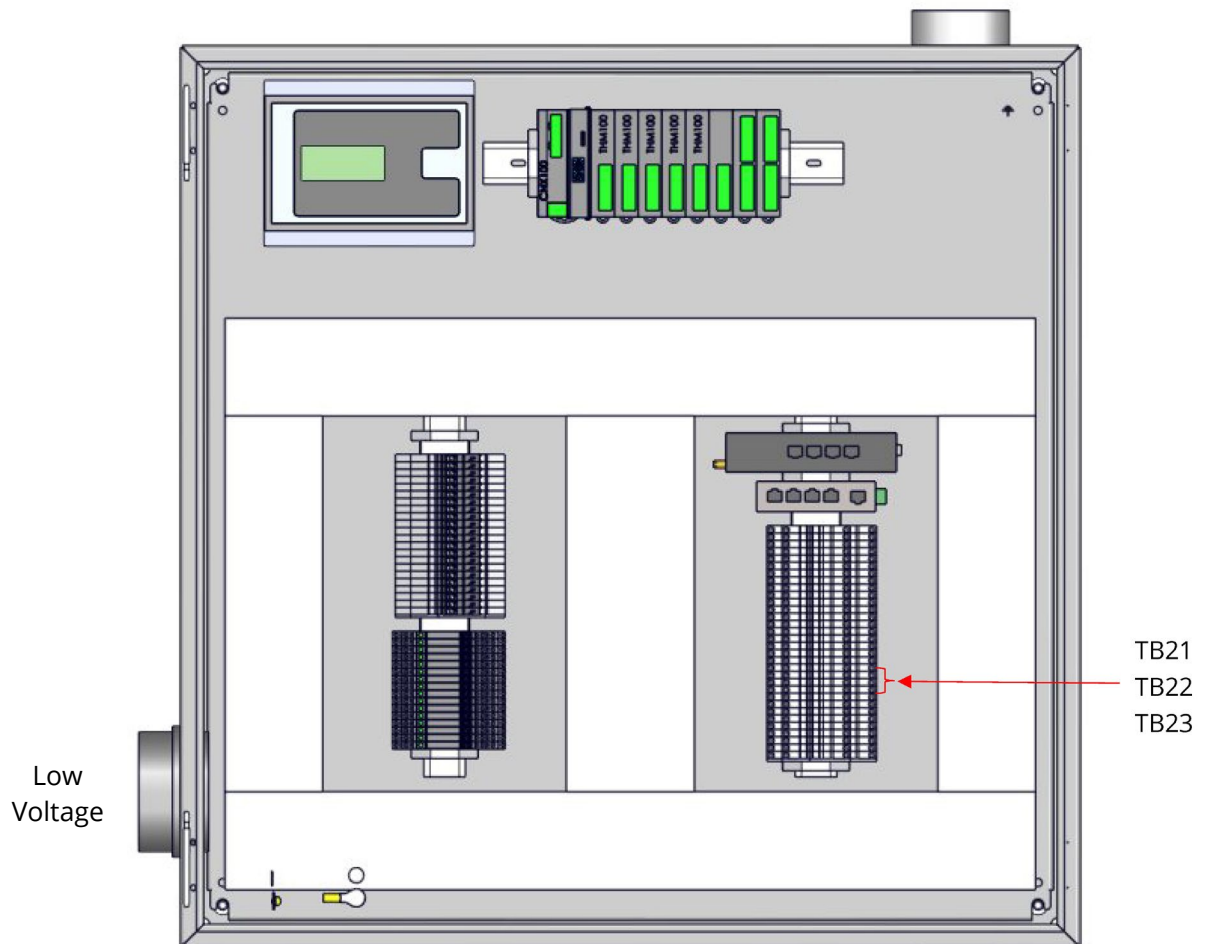


FIELD ELECTRICAL CONNECTIONS CONTINUED

Origin will close a dry contact for each heat pump during a heat call. The dry contact signal is to be sent to each respective heat pump. The Origin low voltage controller has a double terminal block for each dry contact. These terminal blocks will be on the right side of the right most terminal strip.

- HP1 thermo On/Off connects to TB21 top & bottom.
- HP2 thermo On/Off connects to TB22 top & bottom.
- HP3 thermo On/Off connects to TB23 top & bottom.

NOTE: To ensure proper operation and safety, low voltage wires **MUST** never enter any line voltage enclosure.



INITIAL START-UP


Origin contains a local digital PLC controller. Upon initial start-up, the model code must be entered into the controller to ensure proper operation. For information on advanced settings, visit www.steffes.com.

NOTE: Use copper or aluminum conductors rated for 60°C or higher for field connection.

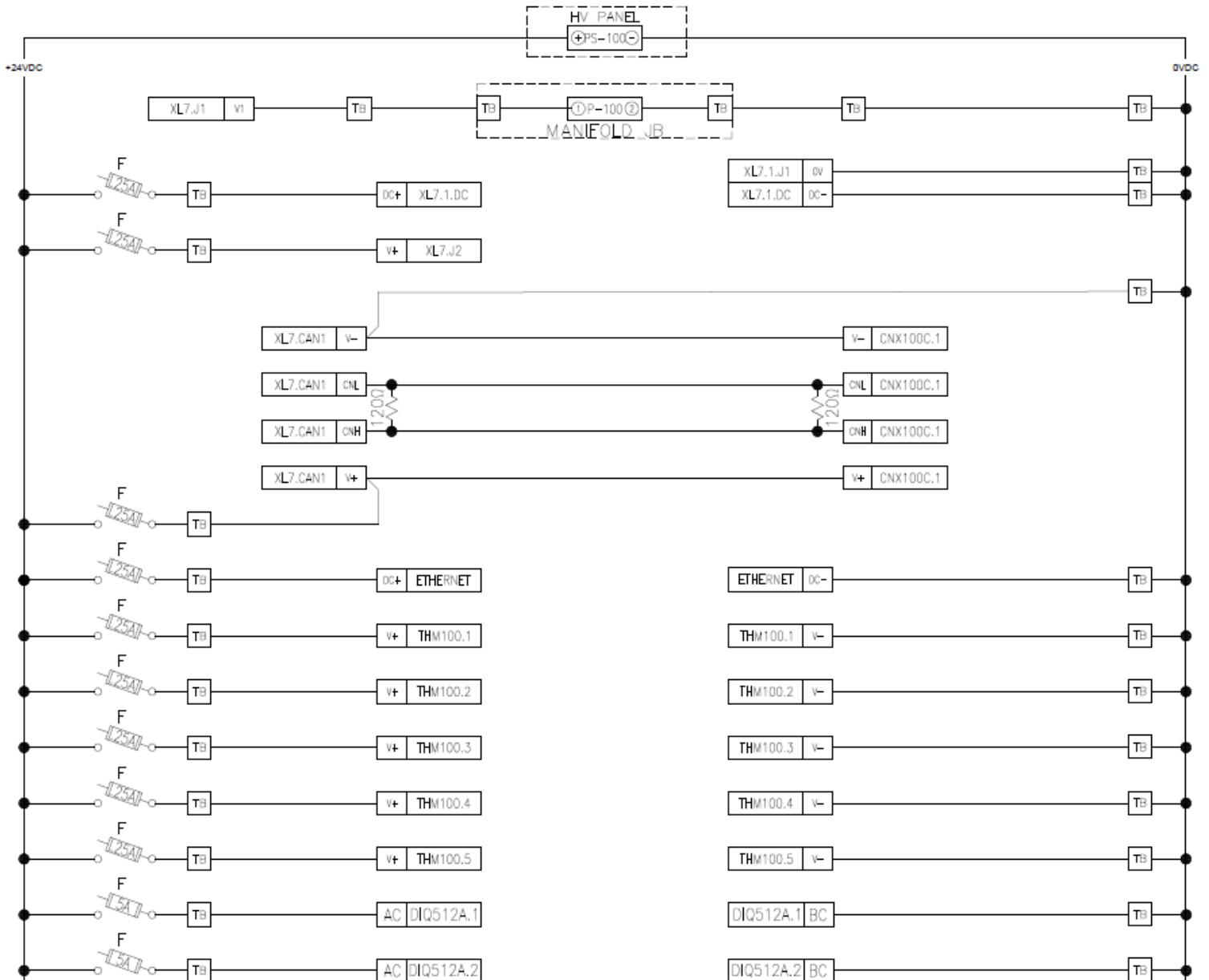
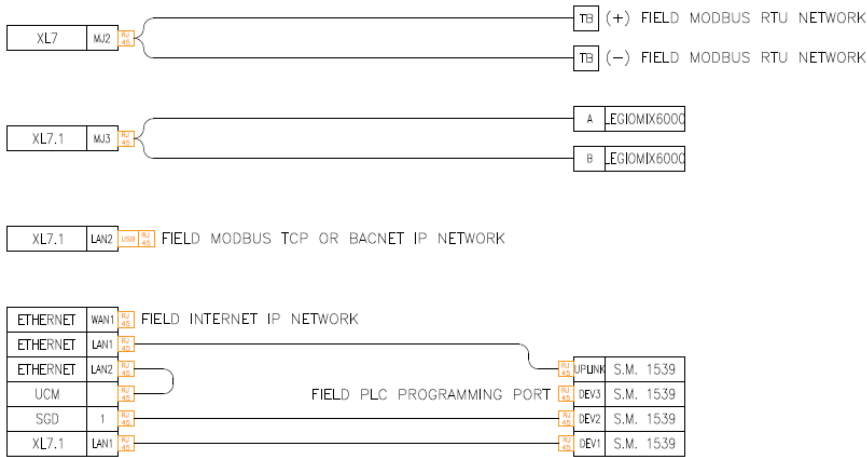


INTERNAL LOW VOLTAGE WIRING DIAGRAMS

Low Voltage Controls, Communications, and I/O 1 of 5

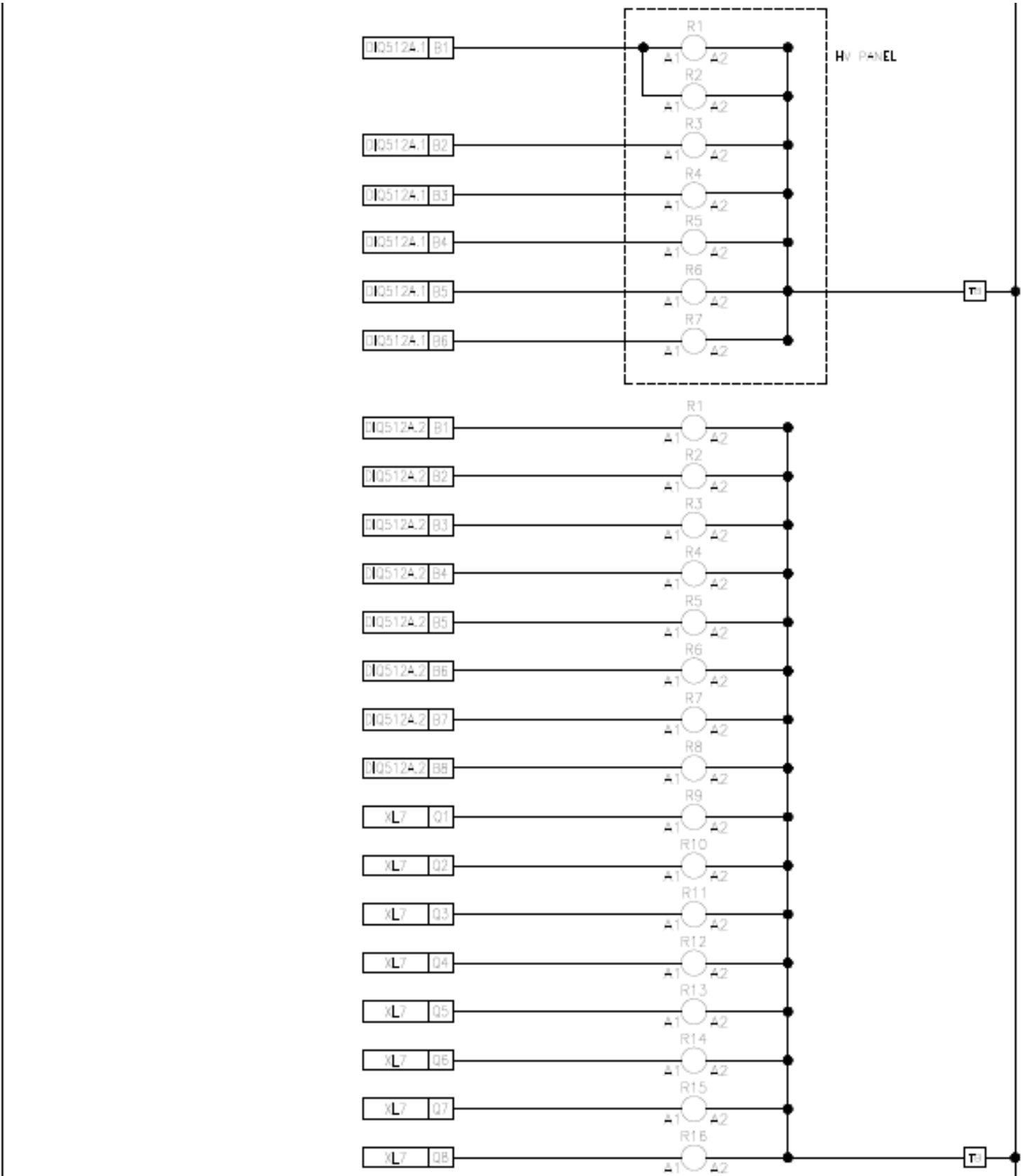

WARNING

HAZARDOUS VOLTAGE:
 Risk of electric shock. Can cause injury, or death. System may be connected to more than one branch circuit. Disconnect power to all circuits before servicing.



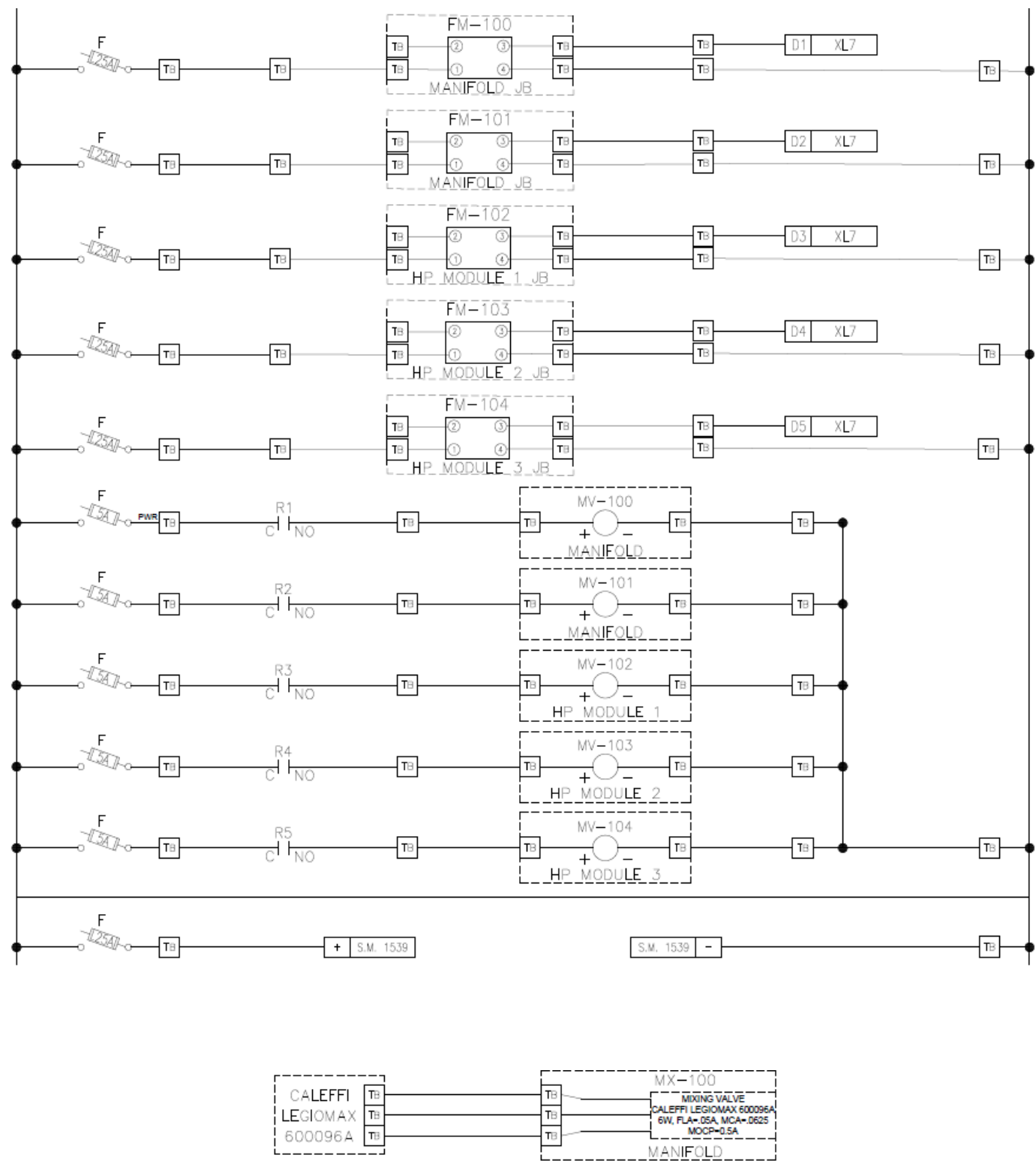
INTERNAL LOW VOLTAGE WIRING DIAGRAM

Low Voltage Controls, Communications, and I/O 2 of 5



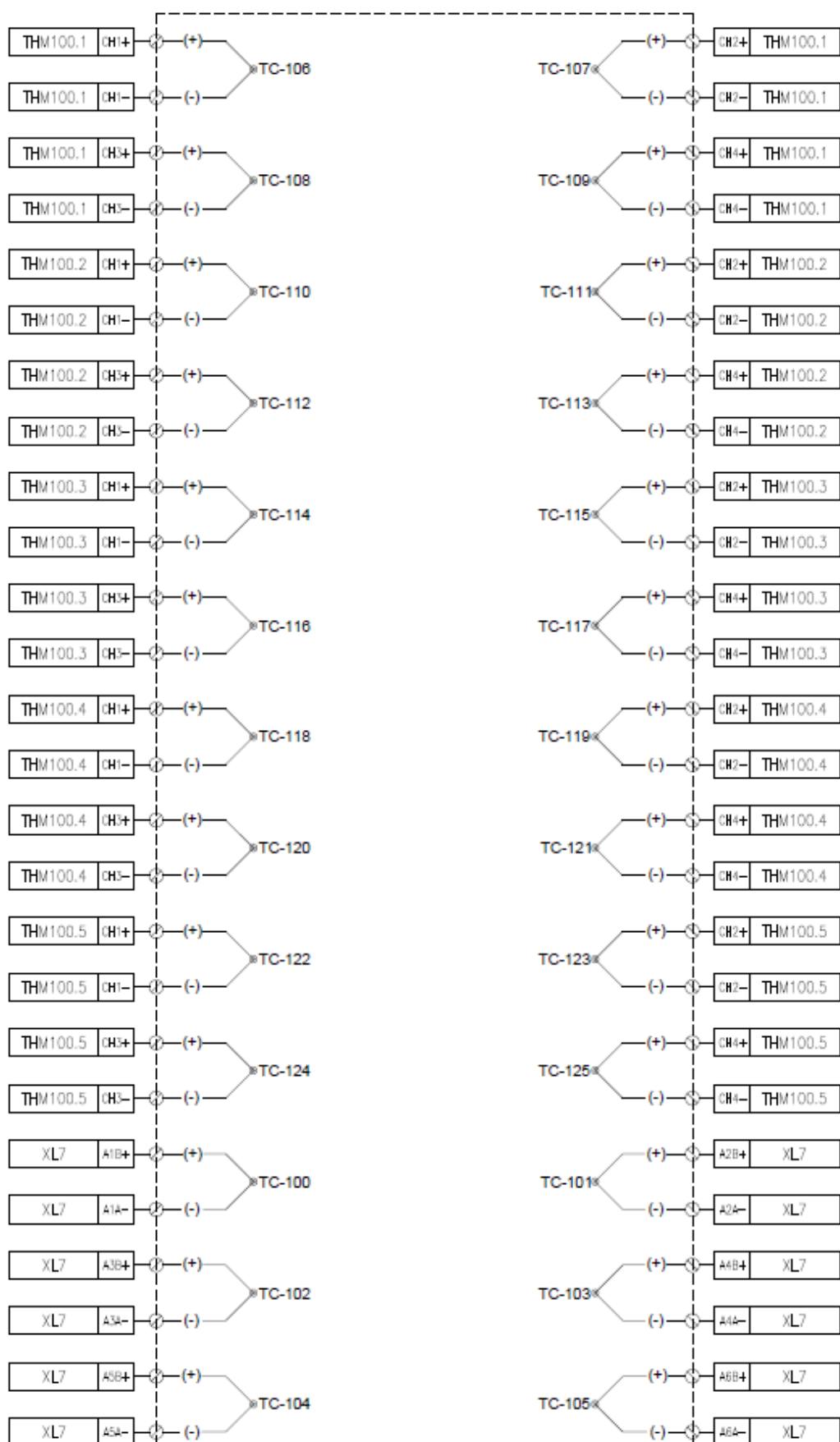
INTERNAL LOW VOLTAGE WIRING DIAGRAM

Low Voltage Controls, Communications, and I/O 3 of 5



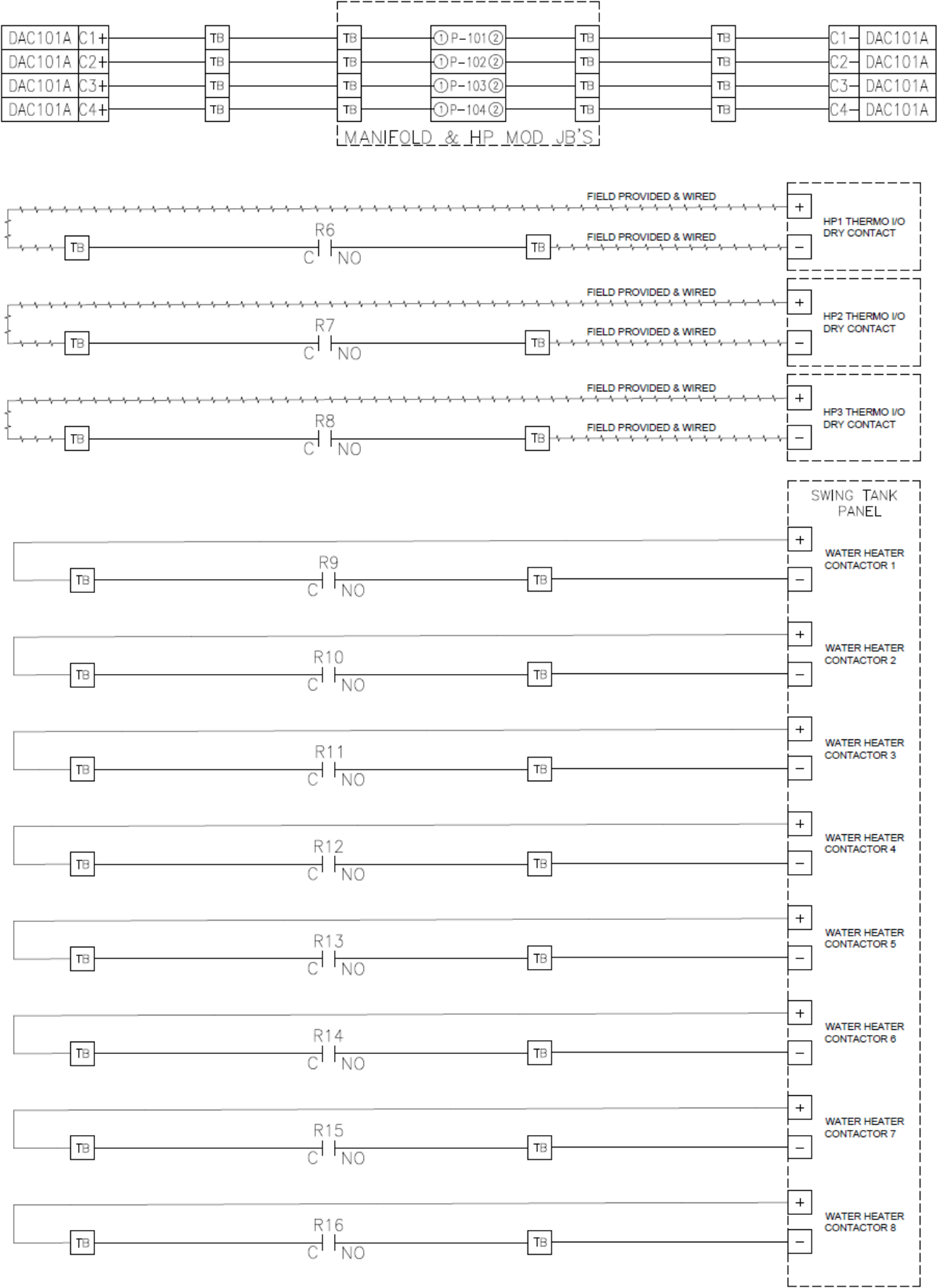
INTERNAL LOW VOLTAGE WIRING DIAGRAM

Low Voltage Controls, Communications, and I/O 4 of 5



INTERNAL LOW VOLTAGE WIRING DIAGRAM

Low Voltage Controls, Communications, and I/O 5 of 5



WARRANTY

Steffes warrants for a period of five (5) years following delivery, limited to seven (7) years from date of manufacture, of any goods provided under this Agreement that the goods purchased hereunder will be of merchantable quality, free from defects in material and workmanship, and that the goods provided will be new and conform to the mechanical and performance specifications referenced in any drawings provided by Steffes. Customer shall promptly provide notice to Steffes of any goods which do not comply with such warranty.

THE WARRANTIES SET FORTH HEREIN ARE STEFFES' SOLE AND EXCLUSIVE WARRANTIES, AND THEY ARE MADE IN LIEU OF ALL OTHER WARRANTIES. THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, WHETHER ARISING BY OPERATION OF LAW, STATUTE, USAGE OF TRADE, CUSTOM, COURSE OF DEALING OR PERFORMANCE, THE PARTIES' CONDUCT OR OTHERWISE, FOR ANY PRODUCTS, SERVICES OR OTHER ITEMS SOLD OR FURNISHED BY STEFFES. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, AND EXCEPT TO THE EXTENT EXPRESSLY STATED HEREIN, STEFFES DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND, EXCEPT TO THE EXTENT EXPRESSLY STATED HEREIN, THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS DOCUMENT. STEFFES SHALL NOT BE LIABLE FOR ANY LOSSES, CLAIMS, DAMAGES OR LIABILITY RELATING TO LOST PROFITS OR OTHER CONSEQUENTIAL, INCIDENTAL, EXEMPLARY, PUNITIVE OR INDIRECT DAMAGES IN CONNECTION WITH OR RELATING TO GOODS PROVIDED HEREUNDER.

If the goods fail to meet the warranty requirements set forth herein, as mutually agreed by both Parties, excluding goods which have been subject to misuse, abuse, negligence, accident, improper maintenance or improper operations, Steffes shall: repair or replace the product or part(s) only which prove to be defective under normal use. The Customer shall be responsible for any labor costs associated with the repair or replacement of the product or part(s), including the cost of returning the defective product or part(s) to Steffes.

This Warranty is void if the product is moved from the premises in which it was originally installed. This Warranty shall not apply to any product or part which has been altered in any respect, or improperly installed, serviced or used, or has been subject to accident, negligence, abuse or misuse.

The Customer assumes all risk and liability whatsoever resulting from the use of this device. In no event shall Steffes be liable for any indirect, special or consequential damages or lost profits. This Limited Warranty contains the complete and exclusive statement of Steffes' obligations with respect to this device and any parts thereof. The provisions hereof may not be modified in any respect except in writing signed by a duly authorized officer of Steffes.

Thank you for purchasing Steffes Origin. We welcome your comments relating to Origin and this manual. Enjoy your new purchase!



3050 Hwy 22 North • Dickinson, ND 58601-9413 USA • www.steffes.com

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