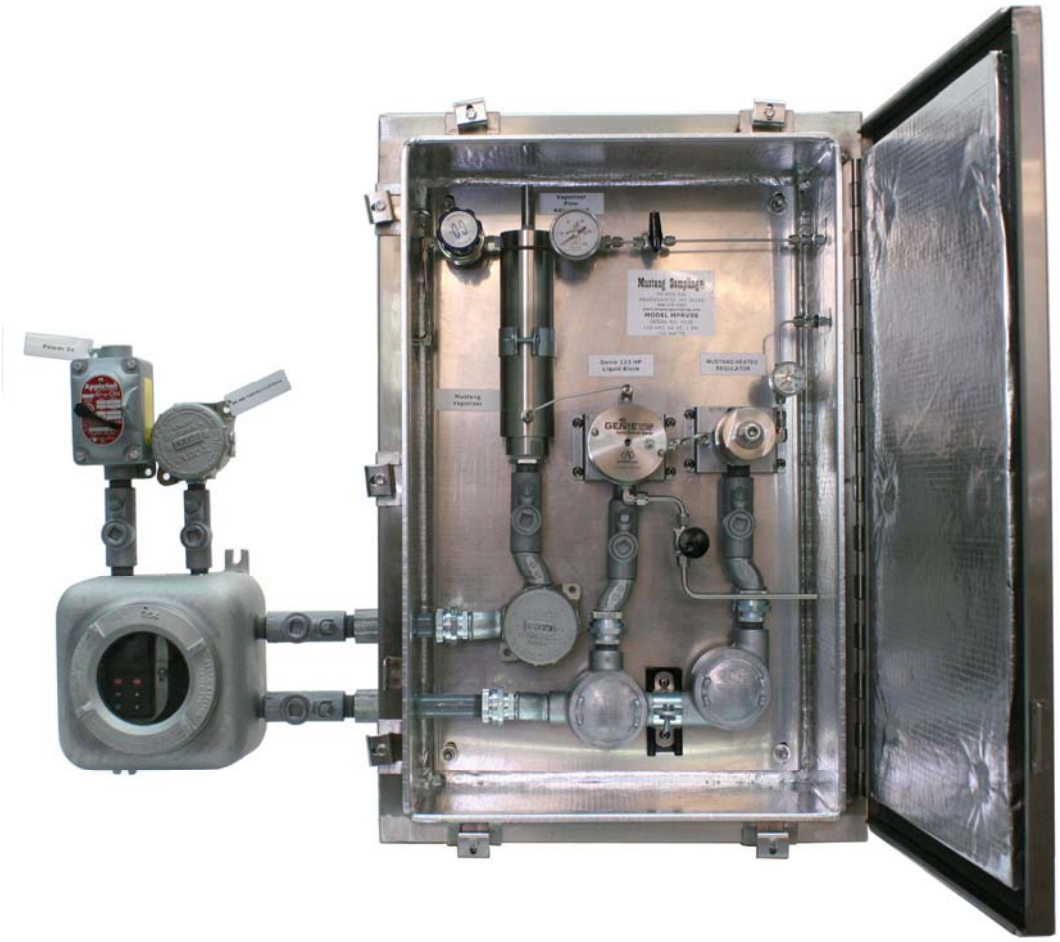
Mustang Sampling®

Installation, Operation, & Maintenance Manual

Mustang® Pressure Regulating Vaporizer Sampling System

MODEL: MPRVSS, MPRVSSJR



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Manufactured by
Valtronics, Inc. for
Mustang Sampling, LLC

Revision: 002.2

Issue Date: 9/30/2014

File Name: MIOM-MPRVSS

Systems and equipment are subject of Patents: US7162933, AU2005260719, CA2573120, EP05769462.2, US7882729, AU2006216870, CA2605119, CN200680013386.3, EP06735575.0. Other Patents Pending

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SAFETY WARNINGS

Failure to abide by any of the safety warnings could result in serious injury or death.

- Sealing fitting must be installed with access allowing the dams to be made and the sealing compound to be properly poured
- Electrical power must be "OFF" before and during installation and maintenance or personal injury may result.
- Do not exceed any equipment pressure ratings.
- Surface temperatures will approach temperature limit specified in technical specifications. Gloves may be required for handling or adjustment.
- Select a mounting location so that the enclosure will not be subjected to impact by heavy objects. Impacts can damage enclosed devices.
- The hazardous location information specifying class and group listing on each instrument enclosure is marked on the nameplate of each enclosure.
- All unused conduit openings must be plugged. Plugs must be a minimum of 1/8" thick and engage a minimum of 5 full threads.
- Use care to prevent dirt, grit, or other foreign material from lodging on threads. If any such material settles on these threads, clean them with an approved solvent (to avoid the possibility of an explosion, oxidation, and corrosion, do not use gasoline or similar solvent), then relubricate with an approved thread lubricant.

PRODUCT FEATURES

The Mustang® Pressure Regulating Vaporizer Sampling System is a technology designed to vaporize liquid providing a fresh sample to a continuous online analyzer. The MPRVSSJR is available where economy is of priority with the controller located within the cabinet and no liquid block.

This system is designed with enhanced sample quality, through controlled vaporization and remixing, and gas sample pressure reduction.

In order for the analyzer to meet its stated accuracy, the Mustang® Pressure Regulating Vaporizer Sampling System ensures the sample to the analyzer is in a stable composition. The single-path design is suitable for sample conditioning where redundancy is not a concern.

- Analytically Accurate™
- Continuous gas flow design eliminating post-vaporization hydrocarbon liquid dropout
- Accurate and reliable representative sample for your analytical device
- Installs at gas stripping facilities and where heavier hydrocarbon measurements are required

TECHNICAL SPECIFICATIONS-MPRVSS

MAOP	3750 psig (359 bar)
Proportional Temperature Control Range	0-300°F (-18-148°C)
Port Sizes	1/4" female NPT
Conduit Connection	3/4" female NPT
Electrical Classification	Class 1, Div 1 & 2, Groups B, C, D, T3
Power Rating	**Option 1:** 120 VAC, 815 Watts, 50/60 Hz, +/- 10% **Option 2:** 208 VAC, 815 Watts, 50/60 Hz, +/- 10% **Option 2:** 230 VAC, 815 Watts, 50/60 Hz, +/- 10%
Wetted Materials	Machined parts: 316 stainless steel/NACE compliant All other metal parts: SS/NACE compliant (Other materials available upon request)

TECHNICAL SPECIFICATIONS-MPRVSSJR

MAOP	3750 psig (359 bar)
Proportional Temperature Control Range	0-320°F (-18-160°C)
Port Sizes	1/4" female NPT
Conduit Connection	3/4" female NPT
Electrical Classification	Class 1, Div 1 & 2, Groups B, C, D, T3
Power Rating	**Option 1:** 120 VAC, 615 Watts, 50/60 Hz, +/- 10% **Option 2:** 208 VAC, 615 Watts, 50/60 Hz, +/- 10% **Option 2:** 230 VAC, 615 Watts, 50/60 Hz, +/- 10%
Wetted Materials	Machined parts: 316 stainless steel/NACE compliant All other metal parts: SS/NACE compliant (Other materials available upon request)

INSTALLATION INSTRUCTIONS

NOMENCLATURE

- MAOP—Maximum Allowable Operating Pressure
- LNG—Liquid Natural Gas
- BTU—British Thermal Unit

TOOLS REQUIRED

- Standard Hand Tools
- Battery Powered Impact Wrench

Directions for mounting the Enclosure

Valtronics Solutions MPRVSS & MPRVSS Jr.

Warning: Disconnect all power before starting

- 1. 2. The unit backplane must be mounted in an enclosure with a rating of no less than Nema 4X.
  2. Our standard MPRVSS/MPRVSS Jr. enclosure has four 7/16" open or closed ears.
  3. The7/16" coarse bolt (Grade 5) has a tensile strength of 12800 lbs. X 4 = 51200 lbs.
  4. The weight of the enclosure (25 Lbs.) plus the MPRVSS (85lbs.), total 110 lbs.
  5. The mprvss is the heavier of the two.
  6. Grade 5 bolts have a 49 lb. assembly toque dry. Don't over tighten.

INSTALLATION INSTRUCTIONS

• Verify that NGL supply is shut off.
• Verify that power to the cabinet is off.
• Make sure that the RS485 wiring between controllers is disconnected. Each controller must have a separate address established before connecting together.
• Install the Watlow supplied software (EZ-Zone Configurator) on a laptop or other computer.
• Connect to the first Watlow controller using the supplied RS-485 adapter (B&B Electronics Model 485SD9 TB). Plug the adapter into the serial port. Select the serial port on the computer to be used (i.e. Com 1-COM4). The other end connects to the RS-485 terminals on the first controller . See electrical schematic.
• On the computer, start program "EZ-Zone Configurator."
• Turn power on to the controllers
• Establish communication with the first Watlow controller.
• Set its address to "1."
• Set the vaporizer temperatures et point to the recommended temperature.
• Initially set the vaporizer temperature at the temperature specified within the equation of state analysis and phase curve..
• Move the communications connection to the second controller and establish communications.
• Set its address to "2."

- Set the regulator temperature set point to the required temperature. (Preset at factory based on Phase Curve).
- Flow Adjustor preset at factory. (Normal setting 1/4 turn).
- Initially set the heated regulator and liquid block temperature at the temperature specified within the equation of state analysis and phase curve.
- Connect the RS-485 circuits together in parallel and ensure that communication to both controllers is established on the computer.
- For all other Watlow parameter settings, refer to the EZ-Zone User's Manual.
- Slowly turn the NGL flow to full open to the sample conditioning cabinet.
- Monitor the input pressure to the vaporizer and adjust to maintain approximately 5-0 psig (—bar).
- One NGL is being vaporized, monitor the vaporizer temperature to verify that the controller is maintaining the set point temperature.
- Monitor the heated regulator to verify that the controller is maintaining the set point temperature.
- Verify the flow to the remote gas chromatograph or analyzer is about 50 ccm.
- Once the flow is correctly established to the analyzer or gas chromatograph, document the flow value. Do not adjust the flow value unless a calibration check is made on the analyzer.

OPERATION INSTRUCTIONS

- The Mustang® Pressure Regulating Vaporizer Sampling System (MPRVSS & MPRVSSJR) utilizes a single path electrically heated vaporizer to change liquid hydrocarbons (NGL) to a vapor for BTU chromatograph analysis. A key prerequisite to sample conditioning is to ensure the liquid hydrocarbons do not pre-vaporize before entering the heated vaporizer.
- Pre-vaporization of the sample causes two-phase flow of the components and is an unstable mixture which produces erroneous results when analyzed and must be avoided.
- The NGL enters the sample conditioning system under system pressure to a pressure reducing regulator which reduces the liquid pressure down to approximately 50 psig (3.4 bar). It then flows vertically downward in the heated vaporizer. The liquid hydrocarbons expand in volume as they become gas.
- From the vaporizer, the sample gas at appropriate temperature, goes to a heated Genie® Series 123 liquid block (MPRVSS only) which keeps any liquid from the rest of the system. From the liquid block, the gas goes through a heated pressure regulator which reduces the pressure to approximately 20 psig (1.3 bar) for most chromatograph inputs or less pressure for most other analyzers. The output of the regulator routes to a gas chromatograph/ analyzer usually through heated tubing to ensure that hydrocarbon dew point dropout does not occur. Sizing of the heat traced tubing is important for maintained temperature and flow considerations to ensure a fresh conditioned sample to the analyzer.
- Temperature control of the vaporizer, heated regulator, and liquid bock are accomplished via a dual Watlow controller. The first controller is for the vaporizer. The second controller controls the temperature of the heated regulator and also heats the liquid block. Temperature inputs are from Type J thermocouples and the controllers utilize PI control to provide outputs to the heater elements. Communications to both controllers is via RS485 protocol.

MAINTENANCE INSTRUCTIONS

- Once system is operational, no routine maintenance is required.
- Monitoring of flow and temperature values is recommended at least annually.

RECOMMENDED SPARE PARTS

SOME PARTS ARE VOLTAGE DEPENDENT

DESCRIPTION	ITEM #	QTY
Vaporizer (MV)	11307	1
Thermocouple	14965	1
120 VAC Cartridge Heater (MHR/133HP)	6000	2
208 VAC Cartridge Heater (MHR/133HP)	11304	2
230 VAC Cartridge Heater (MHR/133HP)	11304	2
120 VAC Cartridge Heater (MV)	16838	1
208 VAC Cartridge Heater (MV)	19385	1
230 VAC Cartridge Heater (MV)	20955	1
Thermal Over Temp Switch (140°C)	14543	2
Regulator (MHR, MJTHR)	11881	1

GENERAL ARRANGEMENT–MPRVSS

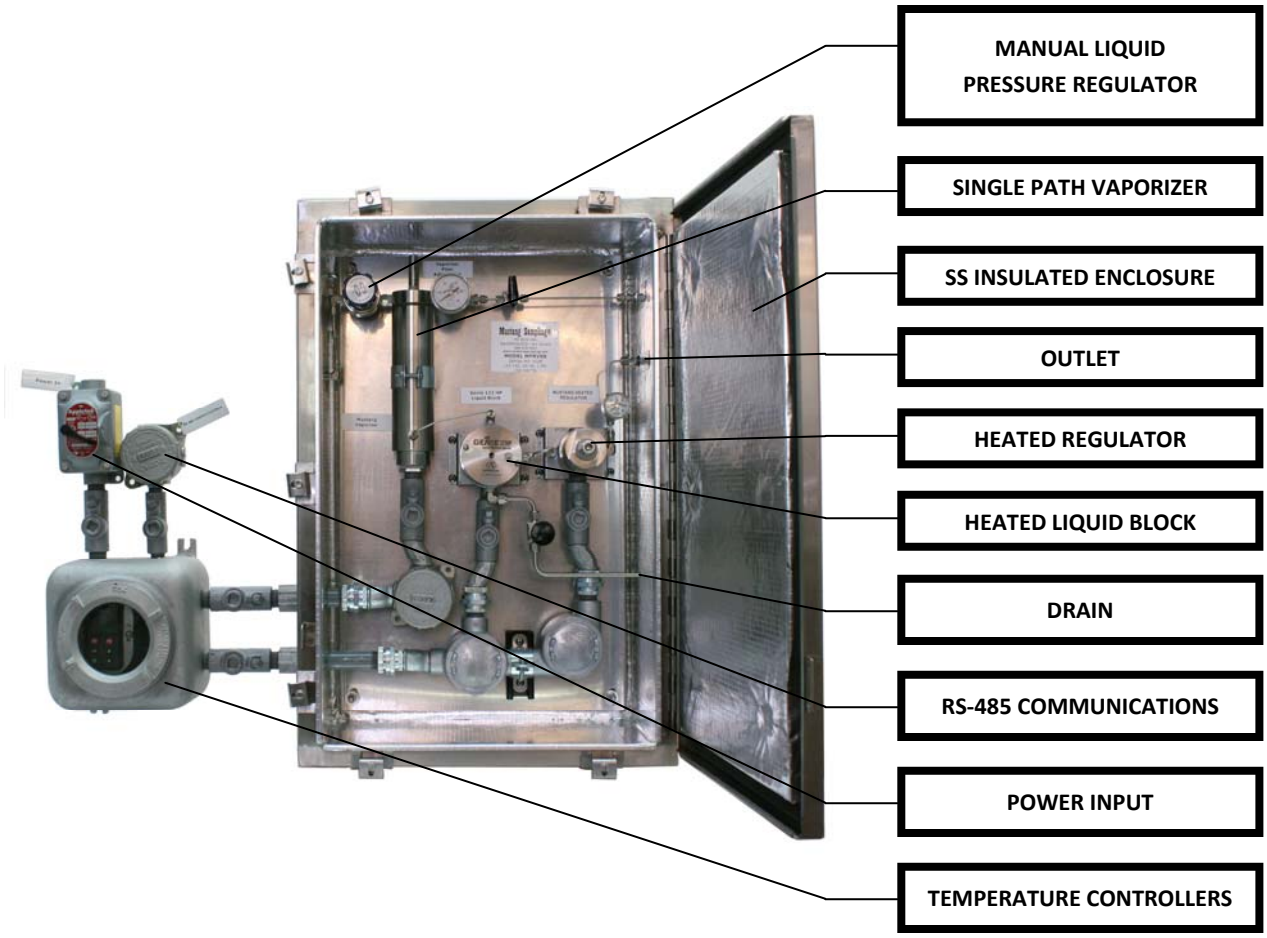
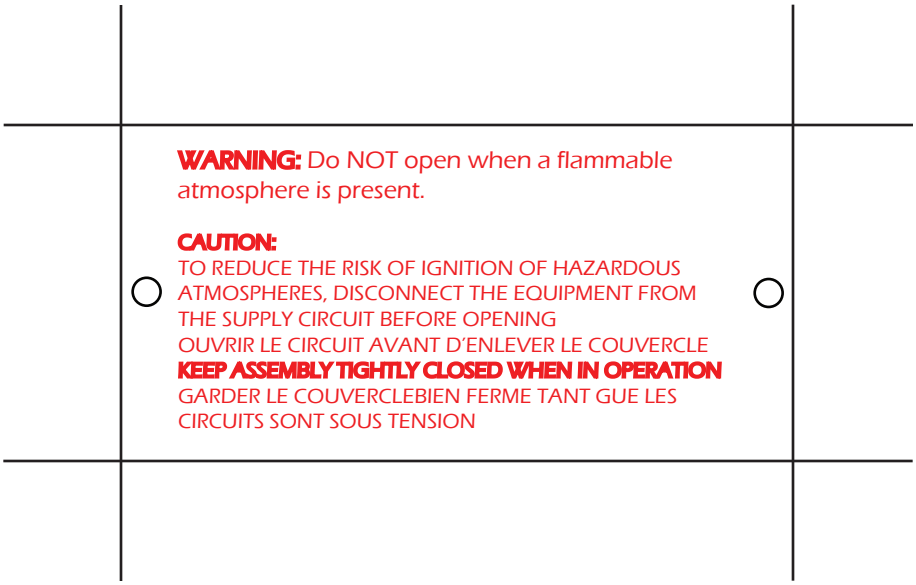


Fig. 1



NOTES:
Tag is mounted on the outside front of unit
Tags are marked on aluminum or stainless steel by etching or sublimation means.
Dimensions are 3.5 x 1.75 with 1/8 attachment holes on both ends.
Attach label and warning tags with stainless steel wire 18 awg or larger.

DWG#: MPAC-WARN

REV#: 0

REVISION HISTORY:

NOTES:

P.O. BOX 490
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PRODUCT DIMENSIONS—MPRVSS

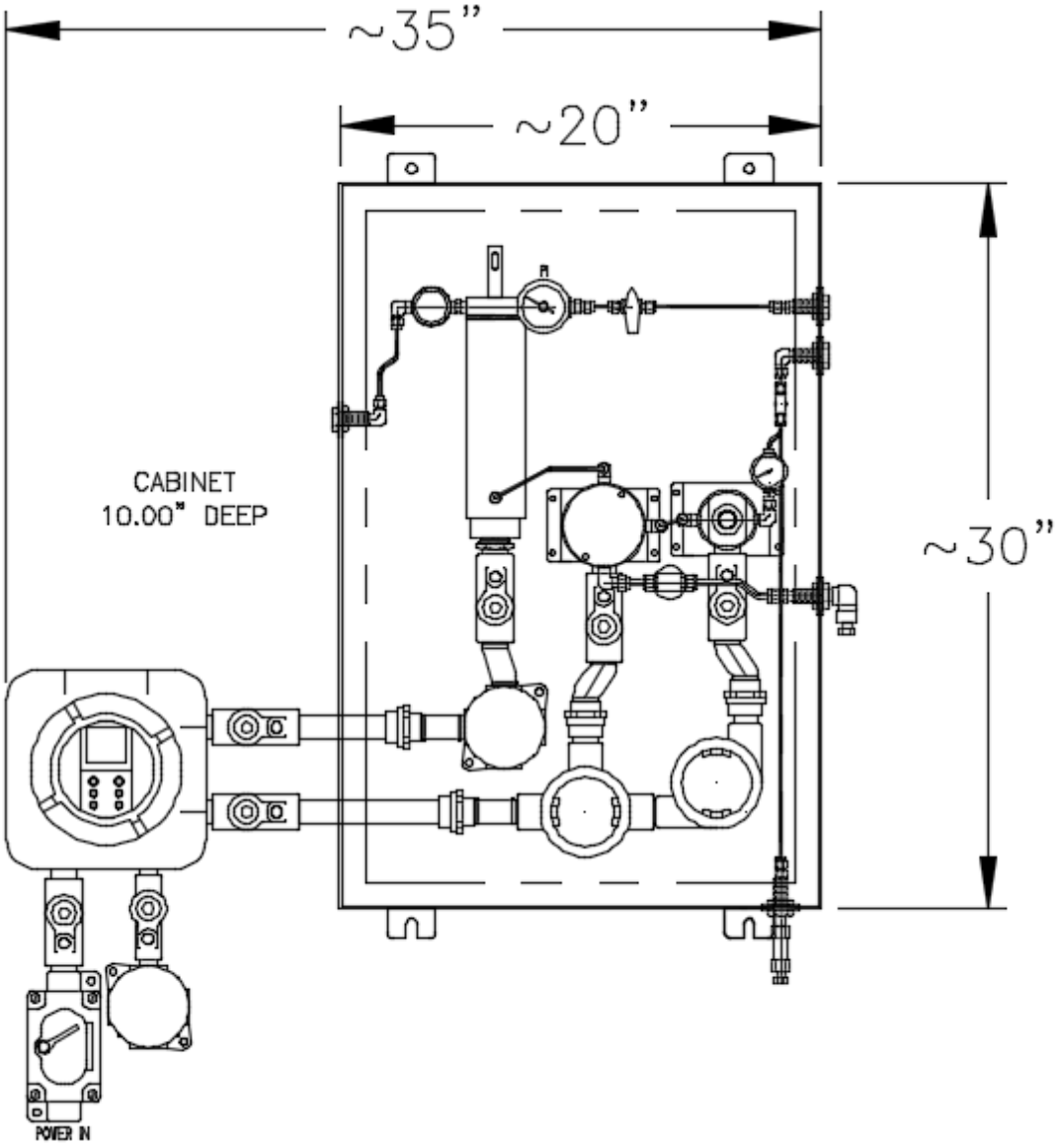

Fig. 2—MST-MPRVSS_06j

PROCESS & INSTRUMENT DIAGRAM—MPRVSS

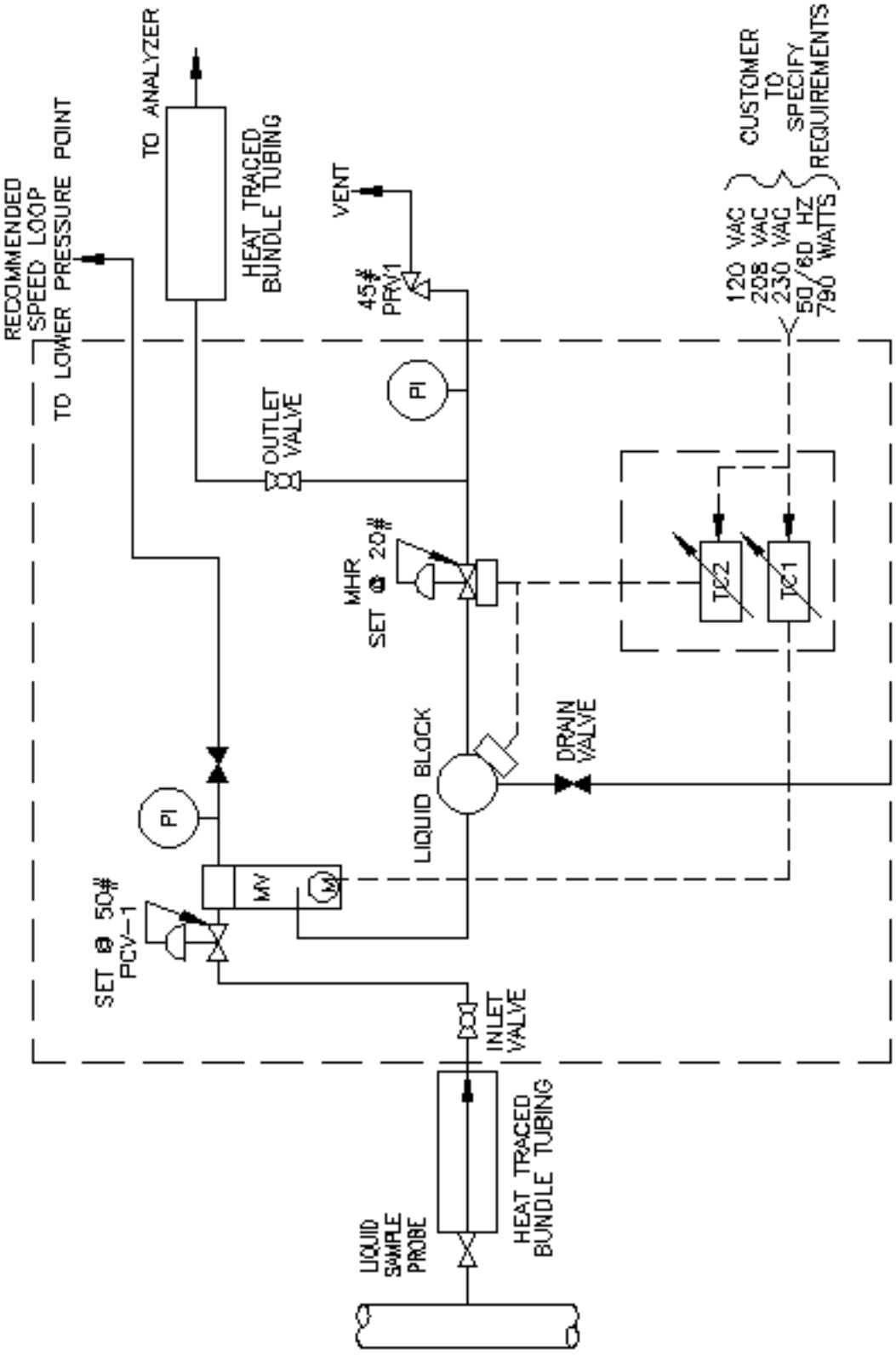

Fig. 3

ELECTRICAL SCHEMATIC—MPRVSS

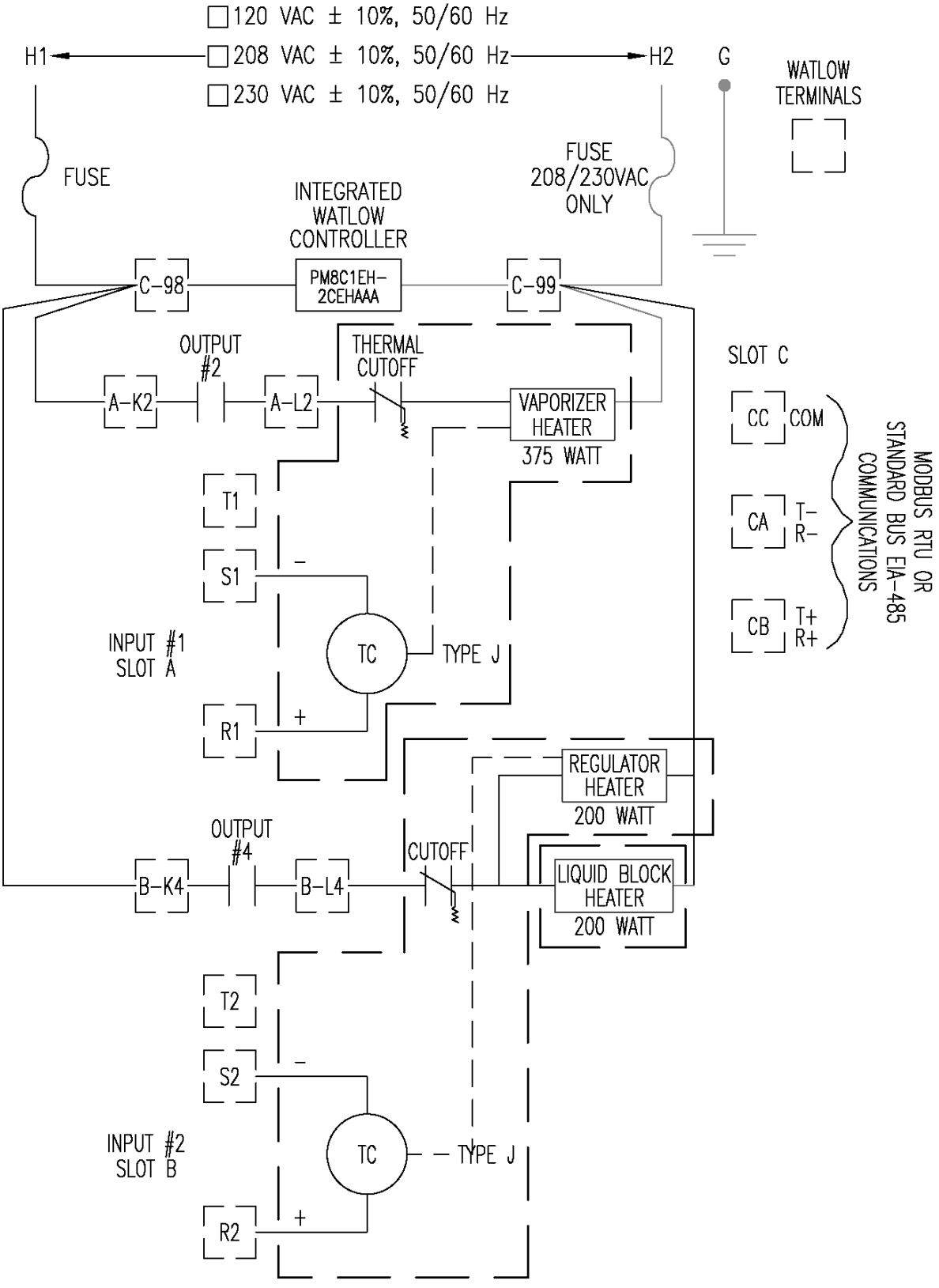

Fig. 4

WIRING DIAGRAM—MPRVSS 120 VAC

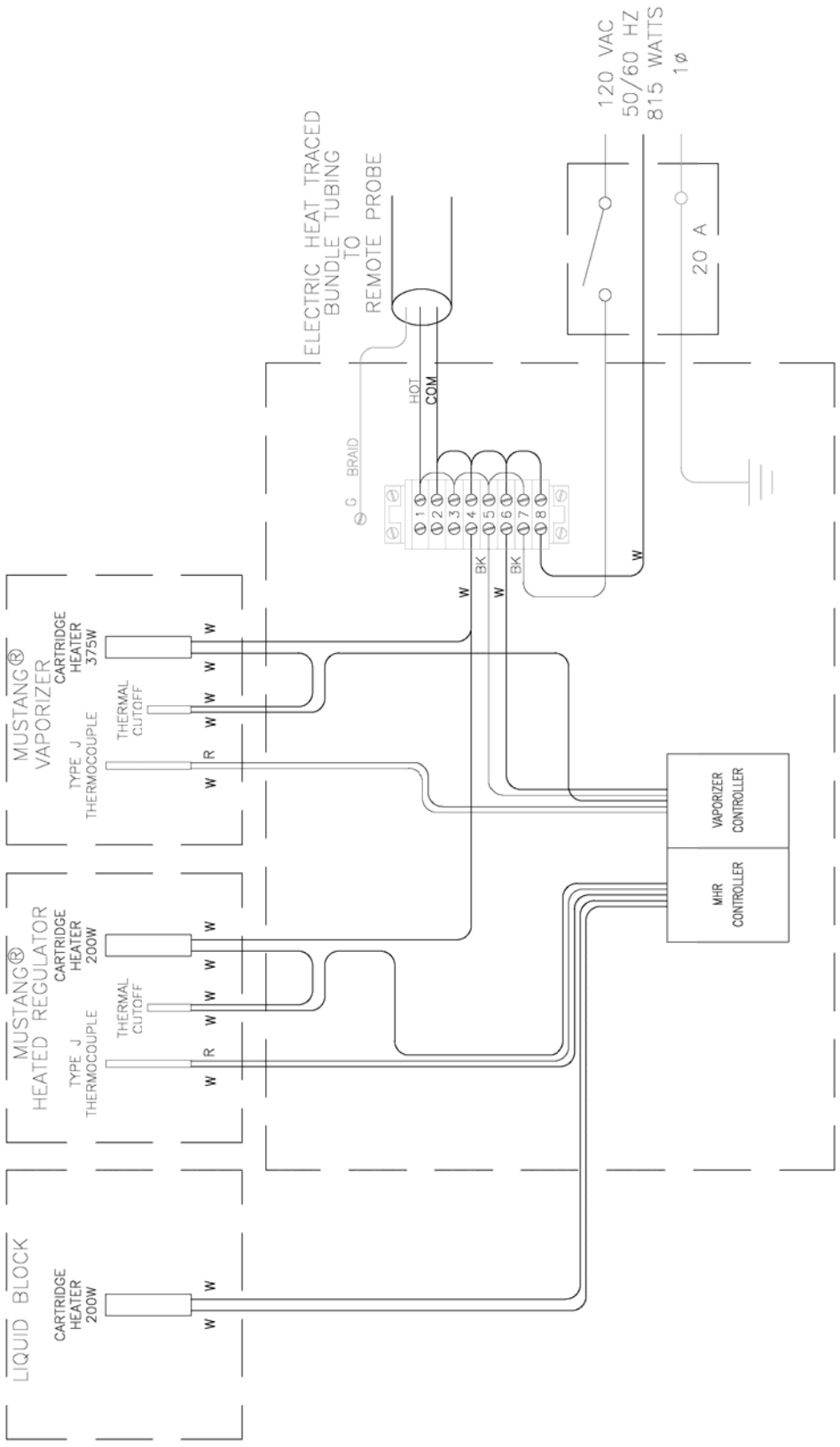

Fig. 5—DWG# MST-MPRVSS_05b

WIRING DIAGRAM—MPRVSS 208/230 VAC

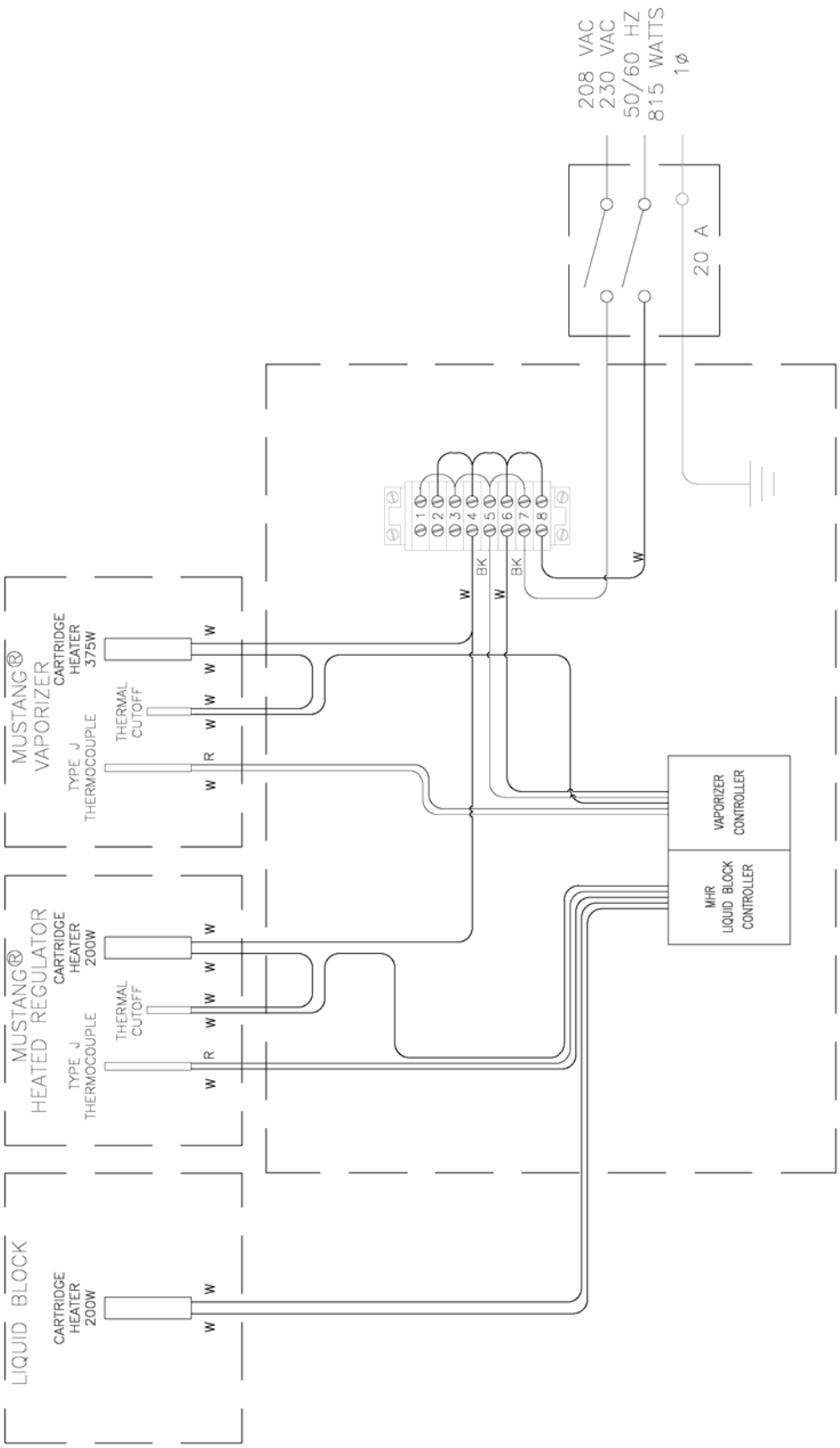

Fig. 6—DWG# MST-MPRVSS_05a

GENERAL ARRANGEMENT–MPRVSSJR

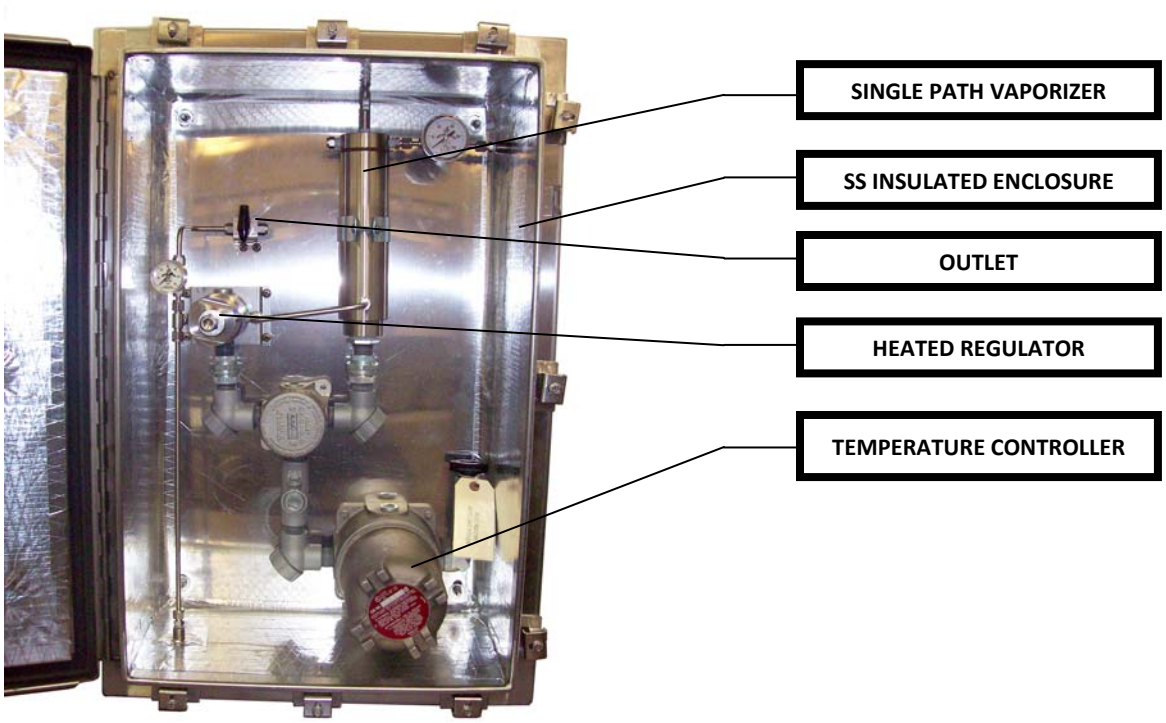

Fig. 7

PRODUCT DIMENSIONS—MPRVSSJR

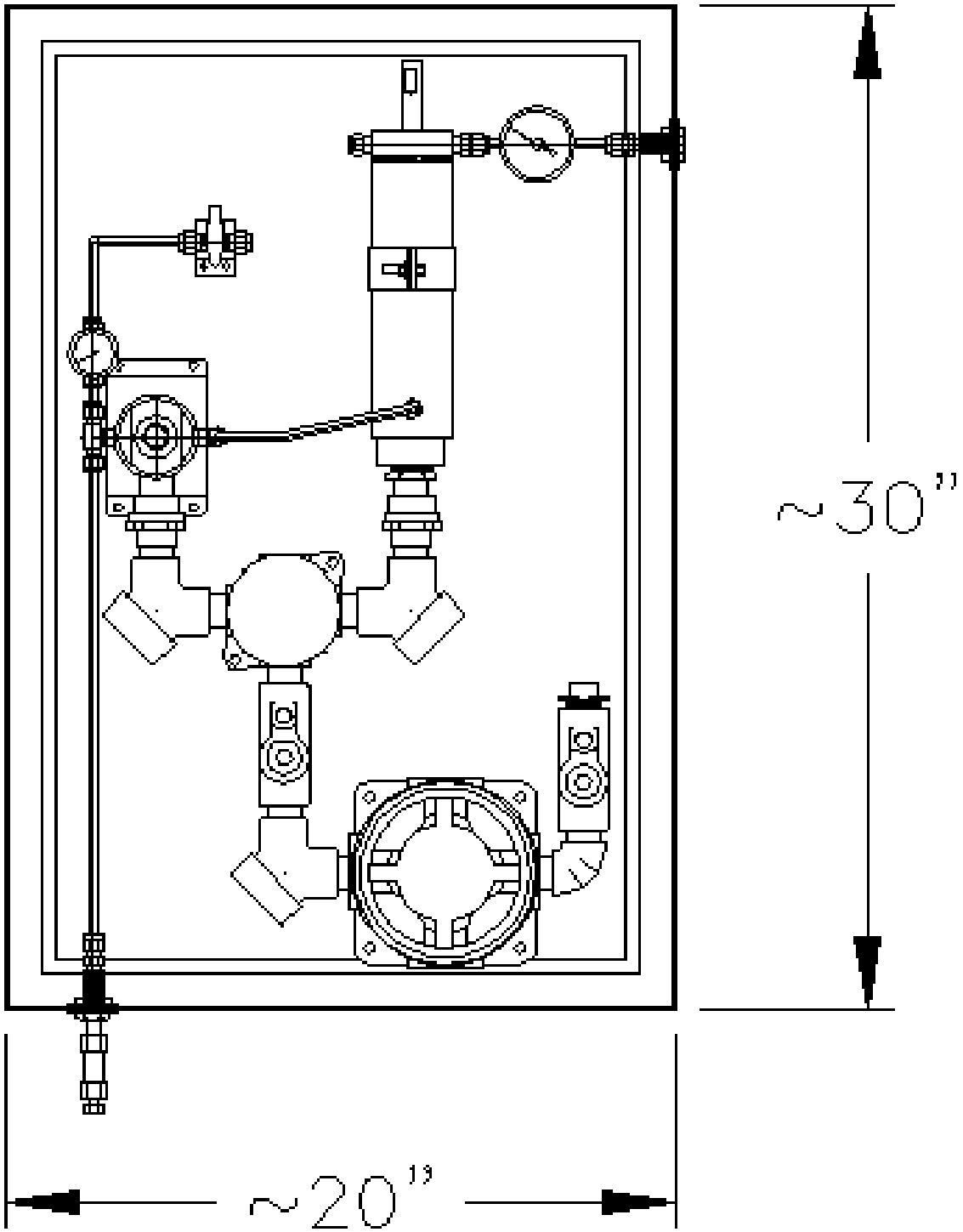

Fig. 8

PROCESS & INSTRUMENT DIAGRAM—MPRVSSJR

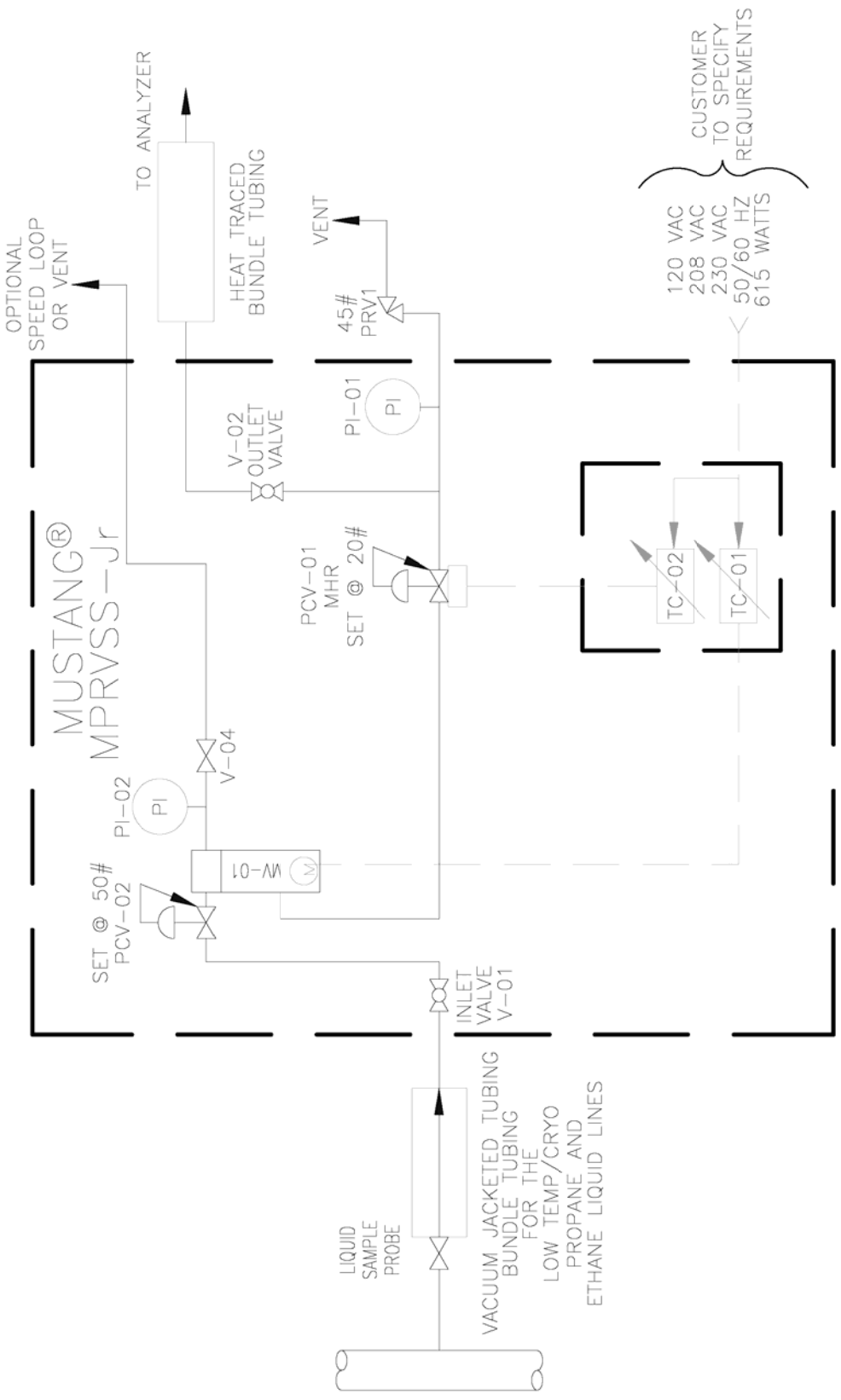

Fig. 9—DWG# MST-VPR-MPRVSSJR_07b

ELECTRICAL SCHEMATIC—MPRVSSJR

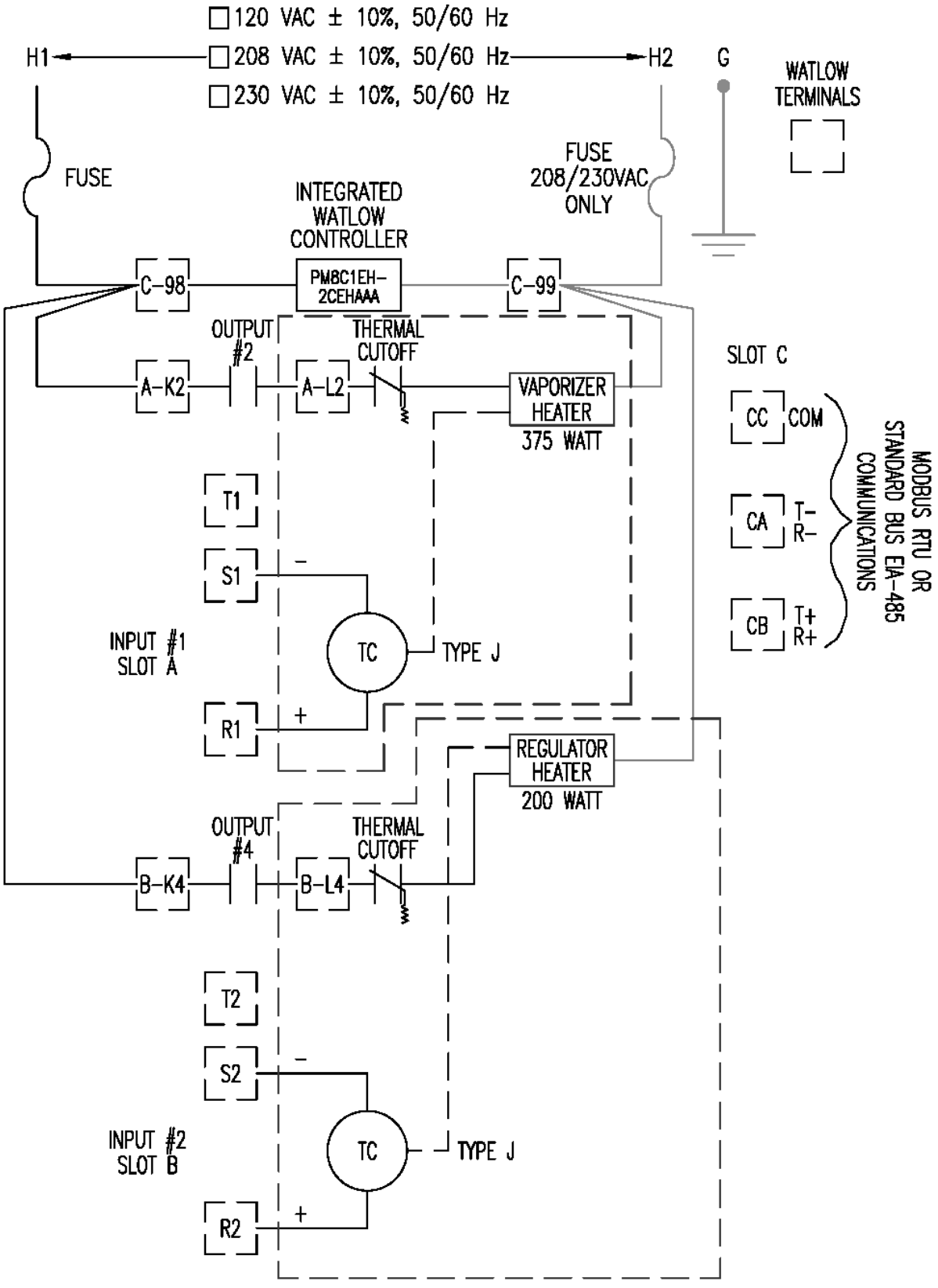

Fig. 10—DWG# MST-MPRVSSJR_07a

WIRING DIAGRAM—MPRVSSJR 120 VAC

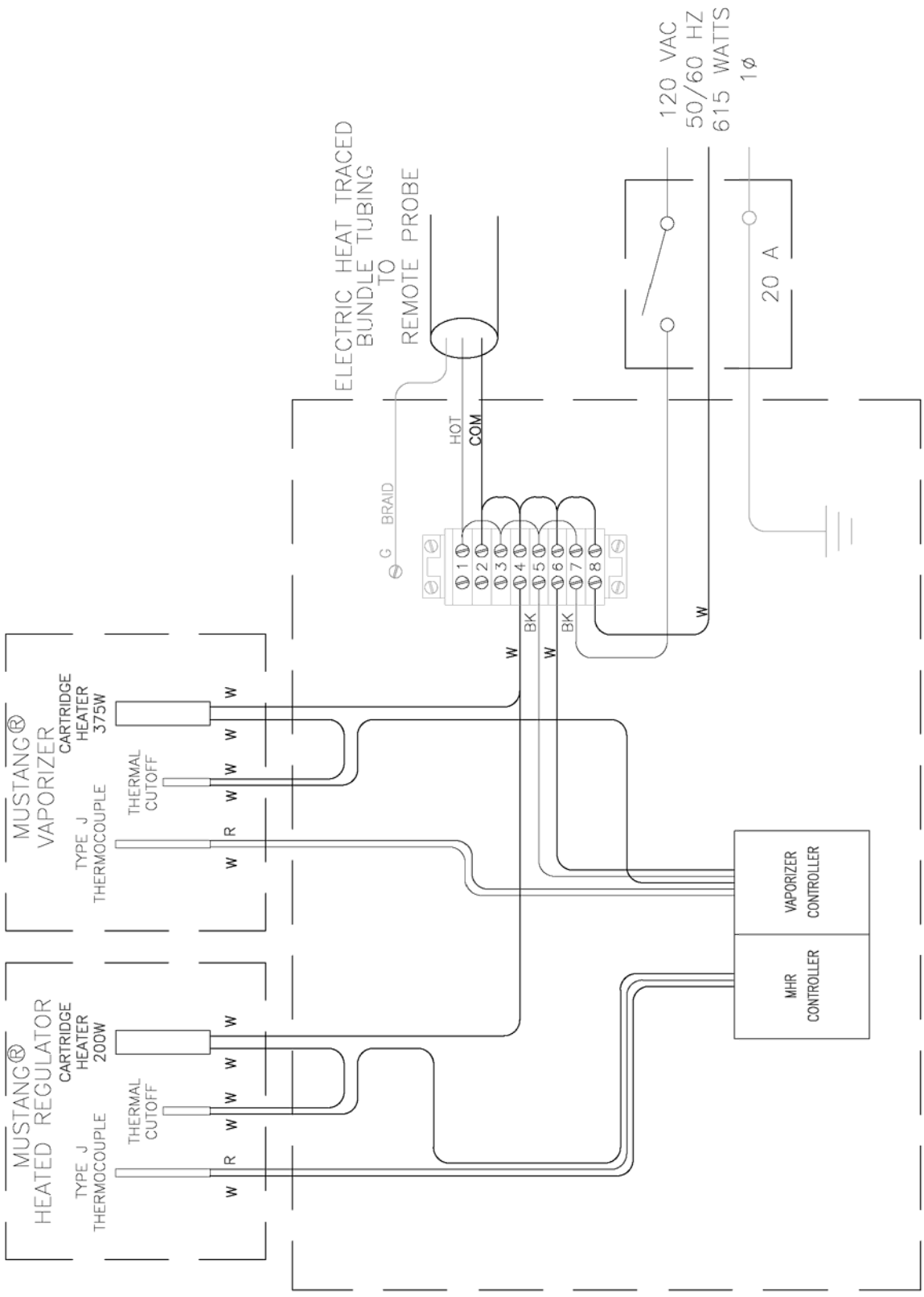

Fig. 11—DWG# MST-MPRVSSJR_05a

WIRING DIAGRAM—MPRVSSJR 208/230 VAC

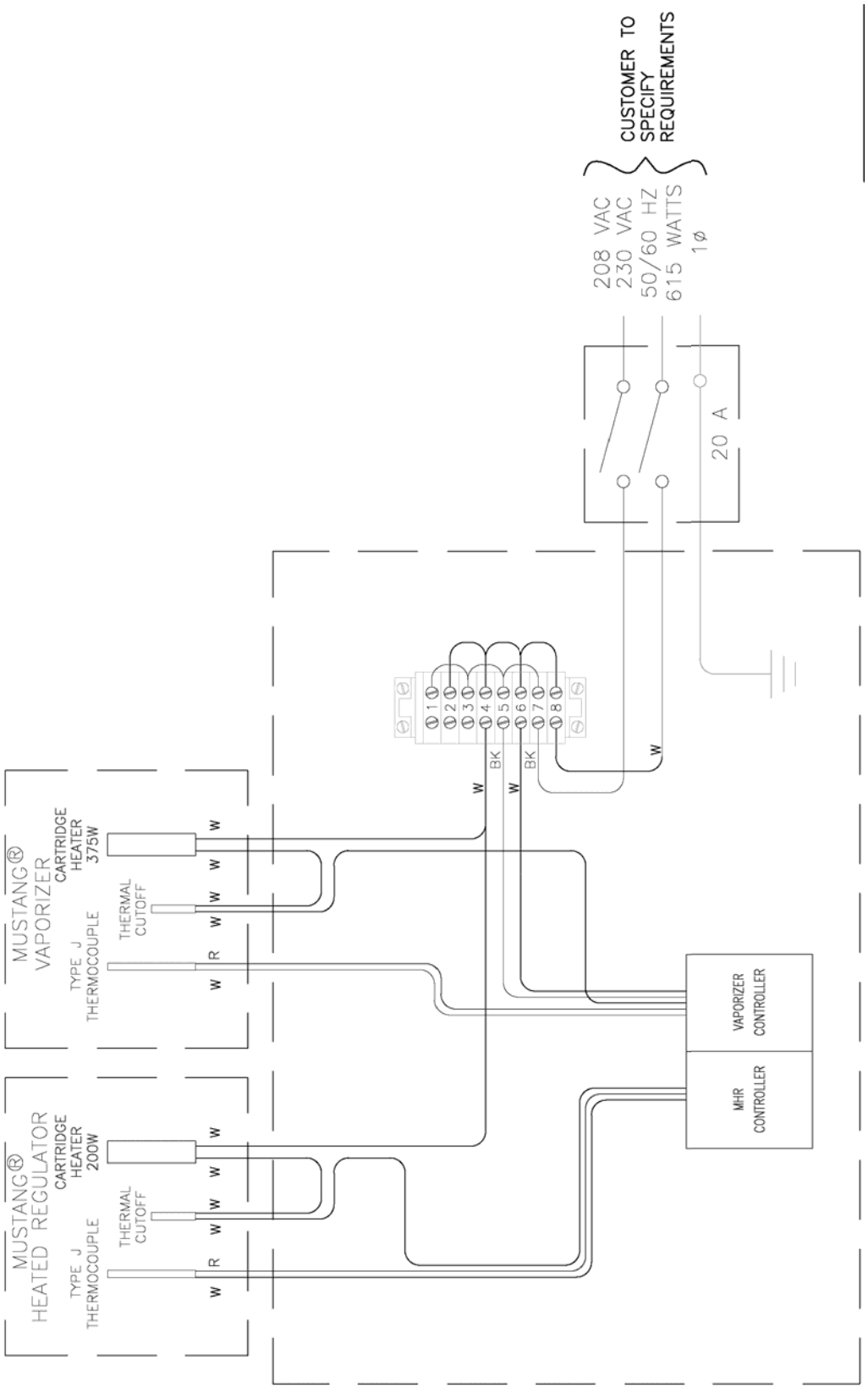

Fig. 12

This will will be located on the enclosure door when the MPRVSS and MPRVSS Jr are mounted.