

HiPerForm[®] III

Control Panel

with Water Works Box

INSTALLATION AND OPERATION MANUAL

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MUELLER

HiPerForm III with Water Works Box

INSTALLATION AND OPERATION MANUAL

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Section 1.0 – Introduction

1.1 GENERAL

The Mueller® HiPerForm® III refrigeration and cleaning control is custom-designed and manufactured to provide programmable and automated push-button timing of the cleaning, cooling, and agitation cycles. A digital temperature display and automatic temperature alarm system informs the operator of safe milk temperatures.

Durable construction and enhanced control circuitry ensures maximum cooling and energy efficiency, superior automation, and long-term reliability.

1.2 TECHNICAL SUPPORT

This manual provides the basic installation and operating information to ensure safe and optimum performance of the HiPerForm III control system. Please contact your local Mueller sales and service representative if you require additional technical assistance pertaining to installation or operating procedures.

Manufacturer's support is available by contacting:

Paul Mueller Company

Dairy Farm Equipment Service Department

1600 West Phelps Street • Springfield, Missouri 65802

Telephone: 1-800-756-5991 • 1-800-MUELLER (683-5537)

Fax: 1-800-436-2466 • Email: DFEtechService@paulmueller.com

1.3 REGULATORY REQUIREMENTS

It is the responsibility of the purchaser and installer to seek the necessary regulatory pre-approval of an installation, ensuring the site and method of installation meet all regulations for the locality.

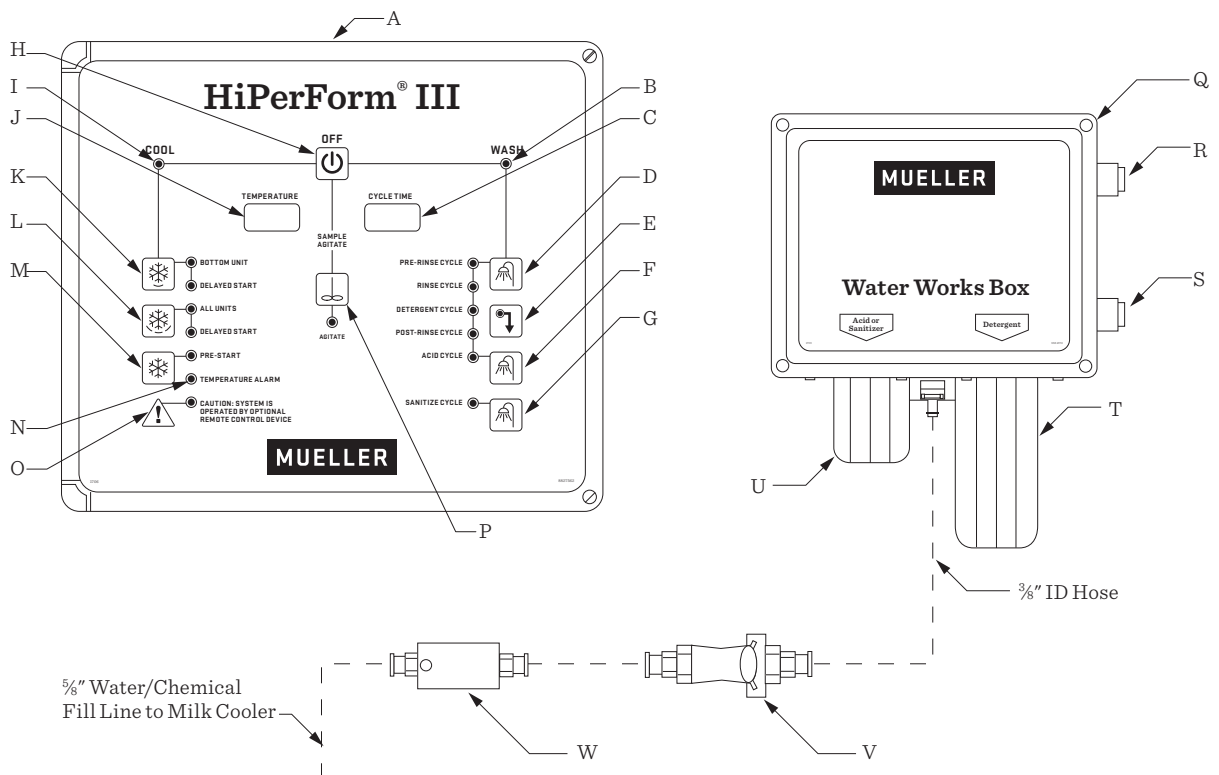
Local, state, and/or county regulations pertaining to the installation, operation, and service of the equipment may vary and must be followed accordingly.

Installation and service must be performed by authorized service technicians who have the proper training and certification to install and service refrigeration and electrical equipment.

1.4 HIPERFORM III CONTROL CABINET AND MILK COOLER COMPONENTS

- | | |
|---|--|
| A. HiPerForm III Control Box Assembly | M. Pre-Start Cooling Switch/Indicator |
| B. Wash Cycle LED | N. Temperature Alarm Indicator |
| C. Wash/Cool/Cycle Time Display | O. Communication LED |
| D. Detergent Switch/Indicator | P. Sample Agitation Switch/Indicator |
| E. Advance Switch | Q. Water Works Box |
| F. Acid Switch/Indicator | R. Hot Water Solenoid |
| G. Sanitize Switch/Indicator | S. Cold Water Solenoid |
| H. Off Switch/Indicator | T. Detergent Jar |
| I. Cool LED | U. Acid/Sanitize Jar |
| J. Temperature Display | V. Fill Line Disconnect, $\frac{3}{8}$ " x $\frac{5}{8}$ " |
| K. Bottom Unit Cooling Switch/Indicator | W. Flow Control Orifice |
| L. All Units Cooling Switch/Indicator | |

FIGURE 1: HIPERFORM III CONTROL CABINET AND MILK COOLER COMPONENTS



Section 2.0 – Installation



IMPORTANT: Paul Mueller Company cannot be held responsible for technical problems, damage, or product loss when competitive or non-factory authorized parts/components are applied in conjunction with Mueller equipment.

2.1 CRATE REMOVAL



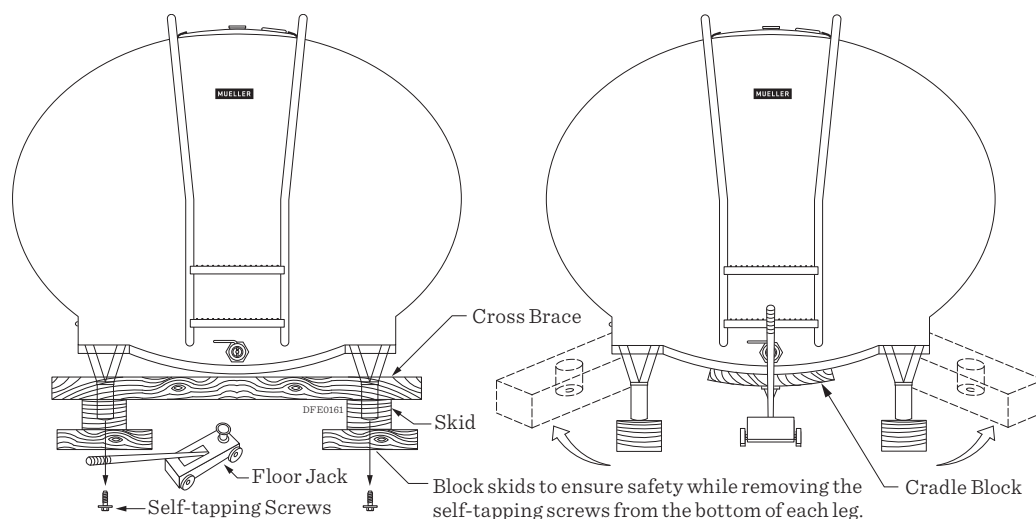
IMPORTANT: Equipment used to move or lift the milk cooler must be rated for the weight of the milk cooler. Approximate weights are provided in Section 8.

1. Remove any open-type crating and the packaged parts. Do not remove the skids attached to the milk cooler legs at this time.
2. Inspect the milk cooler and report any damage to the transportation carrier. File a claim immediately if the milk cooler is damaged. If the interior of the milk cooler is entered for inspection, soft, protective boot covers should be worn to avoid damage to the internal surfaces of the milk cooler.
3. Move the milk cooler into the milk house and position it to meet all regulatory requirements for the locality.
4. Once in place, the skids can be removed.

2.2 SKID REMOVAL

1. Raise one end of the milk cooler with the floor jack placed beneath the skid's cross brace. Securely block the skid to ensure safety and stability while removing the self-tapping screws from the bottom of each leg.
2. Lower the milk cooler and repeat the procedure on the opposite end.
3. Remove cross-bracing members, leaving the two skids under the milk cooler's legs.
4. Raise one end of the milk cooler with a floor jack and wooden-cradle block. Pivot the skids away from the milk cooler. Lower the milk cooler and repeat the procedure for the other end.

FIGURE 2: SKID REMOVAL



2.3 SITE REQUIREMENTS

It is the responsibility of the installer and/or purchaser to provide adequate electrical service, water supply, floor drains, and footer foundations for the installation. Failure to do so can cause non-warranted structural damage to the milk cooler and/or costly service problems for the user.

2.4 HOT WATER REQUIREMENTS

A water heating device with adequate storage and temperature recovery capacity must be provided to wash the milk cooler and milking equipment simultaneously. The water heater should be capable of supplying water temperatures of 160–170°F (71–76.6°C) during the detergent wash cycle.



PROHIBITION: To prevent non-warranted expansion damage to the milk cooler, the maximum wash water temperature shall not exceed 170°F (76.6°C). Installation sites that require water temperatures in excess of 170°F (76.6°C) should install a tempering valve, such as the Watts series LFN170-M3, which is available for purchase at most plumbing supply houses, to regulate the milk cooler wash water temperature at 170°F (76.6°C) or below.

2.5 WATER SUPPLY PRESSURE

Water supply pressure to the milk coolers wash system must be maintained between 20 and 60 psig.

2.6 ELECTRICAL REQUIREMENTS

The HiPerForm III control system requires a 200, 208–240/50–60/1 power supply, fused at 15 amps maximum. Install lockable disconnect within view of the HiPerForm III control between 0.6 and 1.9 meters from floor level and in accordance with CE Standard EN60947-3. See Section 3 for detailed wiring schematics.

Electrical installation requirements for the refrigeration units should be obtained from the installation and operation manual specific to the refrigeration unit(s) being installed.

NOTE: All wiring to be performed in accordance with the National Electrical Code and/or regulatory agency for the installation locality. All wiring that enters the HiPerForm III control box must be sealed with cord grips or liquid-tight conduit connectors.

2.7 FOUNDATION REQUIREMENTS



IMPORTANT: Due to varying geographical soil conditions, contact a local civil engineer for footer, concrete, and foundation requirements that will adequately support the weight of the milk cooler when filled to maximum capacity.

The following information is required to determine the foundation requirements:

1. A drawing showing the layout location of the milk cooler legs. See Section 8.
2. A drawing describing the proposed installation layout.
3. Gross weight of the milk cooler when filled to maximum capacity.

FORMULA 1: GROSS WEIGHT OF MILK COOLER

Net Weight (lb)* + (Capacity in US Gallons x 8.6) = Gross Weight (lb)

Net Weight (kg)* + (Capacity in Liters x 1.0305) = Gross Weight (kg)

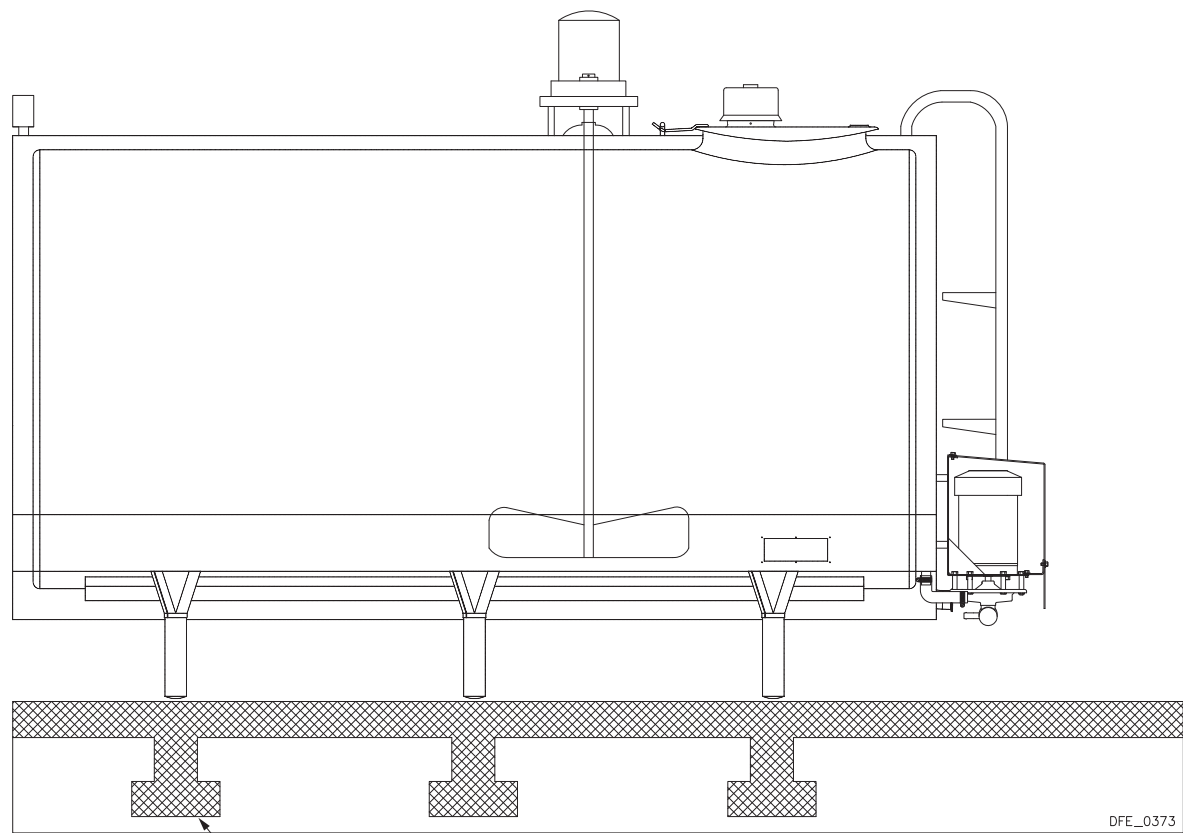
Example: 2,000-gallon Mueller milk cooler filled to maximum capacity.
 2,356 lbs + (2,000 x 8.6) = 19,556 lbs
 1,069 kg + (7,570 x 1.0305) = 8,870 kg

**Section 8 provides approximate net weights of Mueller milk coolers.*



IMPORTANT: Mueller warrants to the original purchaser/user that the Mueller factory calibration of a Mueller milk cooler will not be affected (i.e., exceed the tolerances prescribed by the National Institute of Standards and Technology) by distortion or structural change for a period of five (5) years from the date of installation or sixty-six (66) months from the date of shipment from the Company factory, whichever occurs first. The Company's obligation shall be limited to the correction of the calibration only, and does not cover reimbursement of product loss. This warranty will not apply if distortion is caused by changes in the floor or foundation on which the milk cooler is installed. Refer to the Mueller milk cooler warranty card for complete warranty information.

FIGURE 3: FOUNDATION REQUIREMENTS



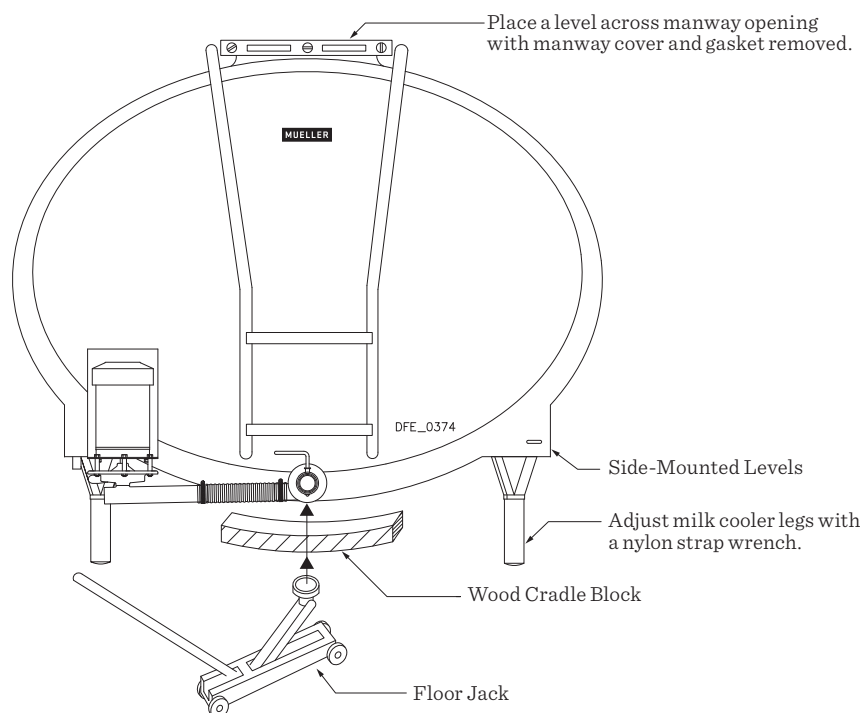
Contact a local civil engineer for footer and foundation requirements.

2.8 LEVELING THE MILK COOLER

With the assistance of a floor jack and protective wooden cradle block, level the milk cooler as described in the following steps:

1. Adjust the inner legs off the floor until the proper pitch is obtained with the four corner legs.
2. Place a carpenter's level across the brim of the manway opening and level the milk cooler by adjusting the corner legs with a nylon strap wrench. Legs may be extended by turning the legs counterclockwise, and retracted by turning the legs clockwise.
3. Using the levels located on the side of the cooler, adjust each end of the milk cooler until the proper height and pitch is obtained. (The milk cooler should pitch $\frac{1}{2}$ " per foot towards the outlet valve.)
4. Using a certified Seraphin, add the exact volume of water indicated for the "Set-Up Reading" on the calibration chart.
5. Adjust the final pitch of the milk cooler, matching the calibration gauge reading with the "Set-Up Reading" on the calibration chart.
6. When the front and back corner legs are positioned properly, the inner legs should be extended firmly against the floor.
7. Ensure that the final location and position complies with all regulations for the installation locality, including the proper height of the milk outlet and the proper dimensions beneath and around the milk cooler.

FIGURE 4: LEVELING THE MILK COOLER



2.9 BULK HEAD INSTALLATION

If the milk cooler is bulkheaded through a wall, the wall must be free-standing and not load bearing against the milk cooler.

A weather shield kit, Part No. 93750, is required for agitator(s) that are located exterior of the milk house wall. See Figures 5 and 8, and Section 2.11 for additional installation instructions.

FIGURE 5: AGITATOR WEATHER SHIELD

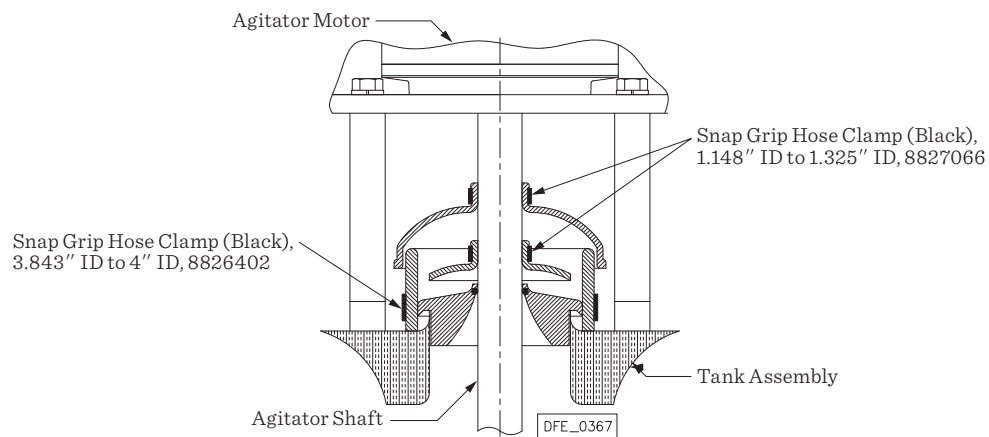
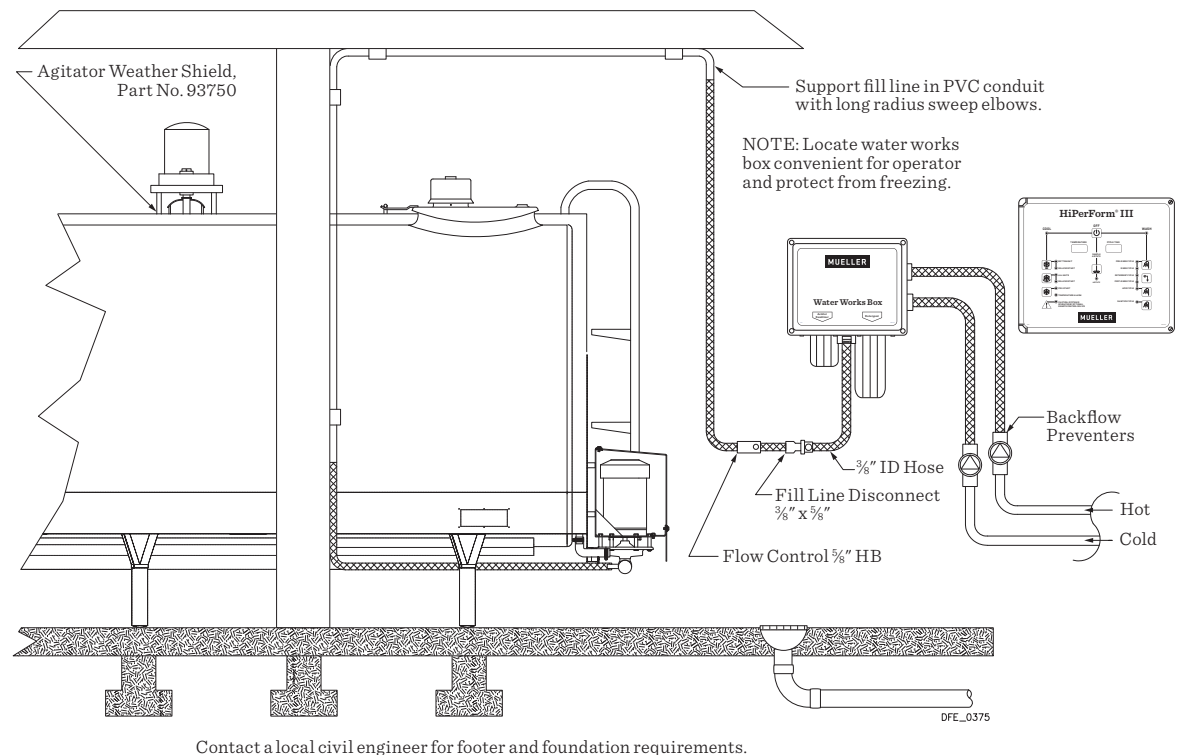


FIGURE 6: BASIC BULK HEAD INSTALLATION

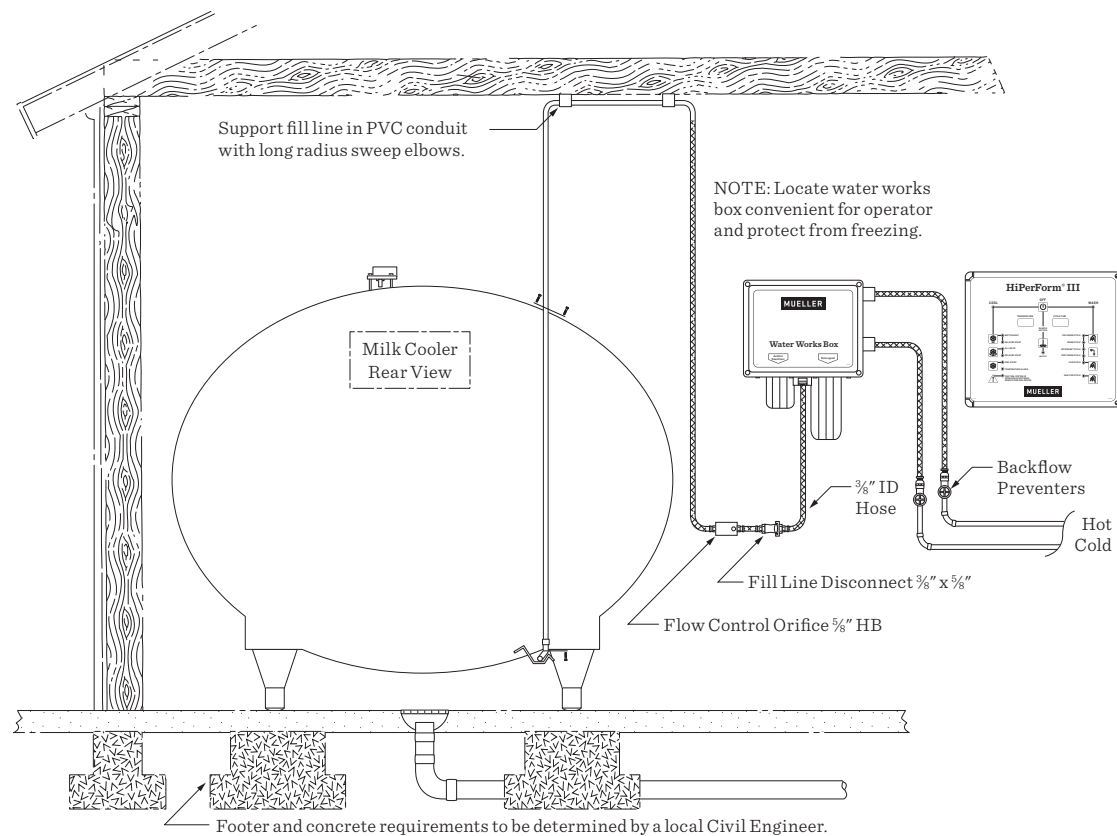


2.10 MILK ROOM INSTALLATION

Ensure proper clearances between the milk cooler and other obstacles or equipment as required by the regulations in your locality. Special attention should be placed on floor drain locations, high-traffic and working areas, and ease of access for the operators.

The milk cooler parts box includes two stainless steel brackets to secure the water/chemical fill line to the rear head of the milk cooler, Part Nos. 8823254 (top) and 8823253 (bottom). Each bracket is supplied with 1.125" rubber grommets that provide support for the water/chemical fill hose inside of the .75" PVC conduit. See Figure 7.

FIGURE 7: MILK ROOM INSTALLATION



2.11 AGITATOR ASSEMBLY INSTALLATION

1. Remove the protective plastic shipping wrap and position the agitator shaft (Item 7) up through the opening in the top of the milk cooler. Slip the neoprene shield (Item 8) over the end of the agitator shaft. **Soft, protective boot covers should be worn to avoid damage to the internal and external surfaces of the cooler during this procedure.**
2. Position the spacer sleeves (Item 3) on the studs located on the top of the cooler. Apply Never-Seez® to the shaft end (Item 7) and threads of the cap screws (Item 1). Slip the agitator shaft through the agitator drive and secure in place with cap screws (Item 1), lock washers (Item 2), and spacer sleeves (Item 3).

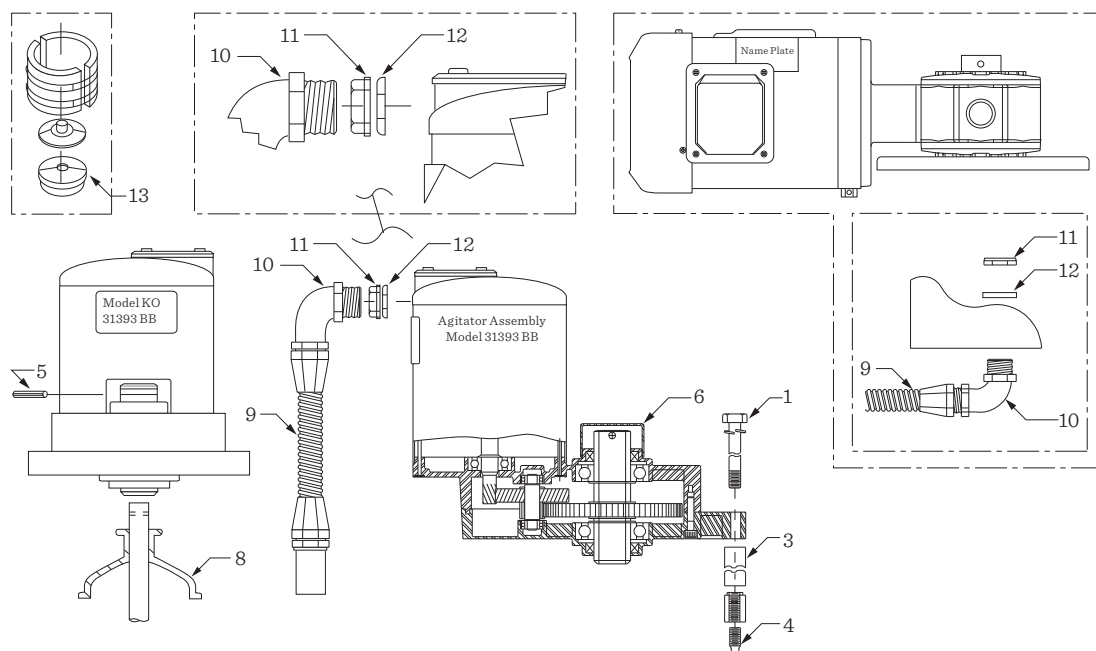
2.11 AGITATOR ASSEMBLY INSTALLATION (CONTINUED)

3. Align the hole in the agitator shaft with the hole in the output shaft of the agitator drive and insert the roll pin (Item 5).
4. Place the cap (metal cap for heavy duty agitator, Item 6) over the top of the output shaft after assembly.
- 5a. **Model KO:** Thread the 90° liquid-tight conduit fitting (Item 10) through the plastic nut (Item 11) with the flat washer flange facing the motor. Slip the cut gasket (Item 12) over the threads and thread the assembly into the agitator motor. Insert the 3-wire cable through the straight conduit fitting, conduit, and 90° fitting installed in the motor. Thread the straight liquid-tight conduit fitting into the full coupling attached to the milk cooler. Connect L1 and L2 as shown on the wiring schematic in motor, secure the ground wire under the grounding screw in the motor housing. Ensure clockwise rotation as viewed from the top of the drive.
- 5b. **Heavy Duty Agitator:** Insert the 90° liquid tight conduit fitting (Item 10) into the electrical junction box on the motor. Slip the gasket (Item 12) over the threads and secure the fitting into the junction box using the plastic nut (Item 11). Insert the 3-wire cable through the straight conduit fitting, conduit, and 90° fitting installed in the motor. Thread the straight liquid-tight conduit fitting into the full coupling attached to the milk cooler. Connect L1 and L2 as instructed on wires in the electrical junction box on the motor. Secure the ground wire under the ground screw in junction box. Ensure clockwise rotation as viewed from the top of the drive.
6. The optional agitator weather shield (Item 13) must be installed on all agitators that are located outside of the milk room.



IMPORTANT: Transporting a milk cooler with the agitator assembly and/or paddle assembly installed may result in non-warranted damage to the milk cooler. Do not transport a milk cooler with the agitator assembly and/or paddle assembly installed.

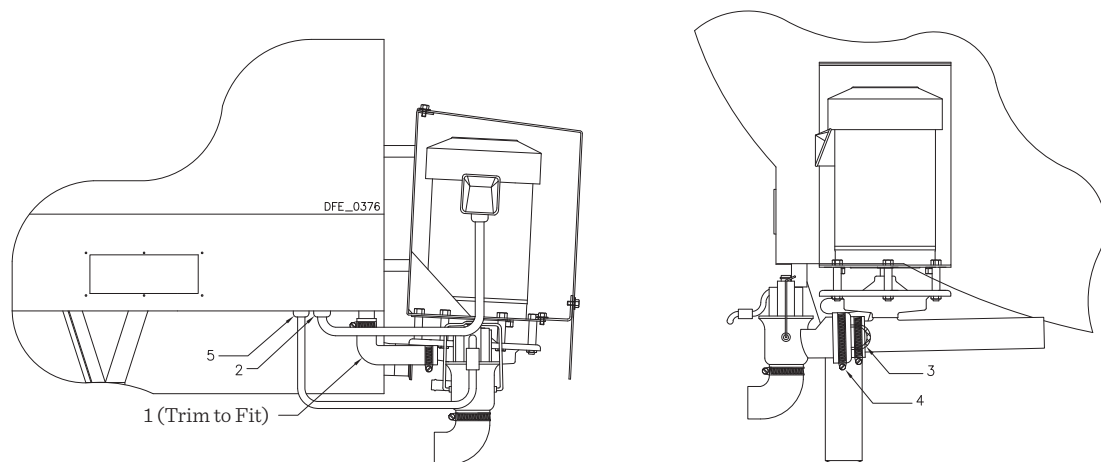
FIGURE 8: AGITATOR INSTALLATION



2.12 PUMP ASSEMBLY AND ELECTRIC DRAIN INSTALLATION

1. Trim the rubber elbow (item 1) for proper fit and connect between the discharge fitting on the pump assembly and the wash line in the milk cooler.
2. Install the cord grip (item 2) in the plugged opening located under the left side of milk cooler.
3. Thread the 3-wire cord marked “pump motor” through the cord grip.
4. Install a cord grip in the motor electrical enclosure.
5. Thread the 3-wire cord through pump motor cord grip and wire motor per the electrical schematic attached to the motor.
6. Install the stainless steel screen (item 3) in the rubber adapter (item 4) and clamp the electric drain valve in position with the two stainless steel hose clamps.
7. Install the cord grip (item 5) in the plugged opening located under the left side of milk cooler.
8. Thread the cord from the 24-VAC electric drain valve coil through the cord grip and, using wire nuts, connect to the cord marked “drain valve,” located behind the stainless steel cover plate on the left side of the milk cooler.
9. The 24-VAC electric drain valve coil must be installed in the upright vertical position.
10. Reattach the stainless steel cover plate and tighten all cord grips and liquid-tight conduit fittings.

FIGURE 9: PUMP ASSEMBLY AND ELECTRIC DRAIN INSTALLATION



2.13 INSTRUCTIONS FOR MOUNTING THE HIPERFORM III CONTROL BOX ENCLOSURES

1. Install the HiPerForm III control box in a location where it is easily accessible for the operator and protected from excessive wash down.
2. Install the water works box in an area protected from freezing with easy access to the chemical storage drums.

2.14 WATER LINE CONNECTIONS

1. Connect the backflow preventers and hot and cold water fill hoses between the water supply valves and water solenoid valves located in the right side of the water works box. See Figure 10.
2. Route the fill line hose between the water works box and fill nipple located on the wash pump assembly.
3. Insert the flow control orifice and fill line disconnect in the fill line hose at a location easily accessible for the operator. See Figure 11.

NOTE: The fill line disconnect should be separated when cooling or storing milk.

**FIGURE 10: HIPERFORM III FLOW CONTROL ORIFICE
(FOR ELECTRIC DRAIN VALVE OPERATION ONLY)**

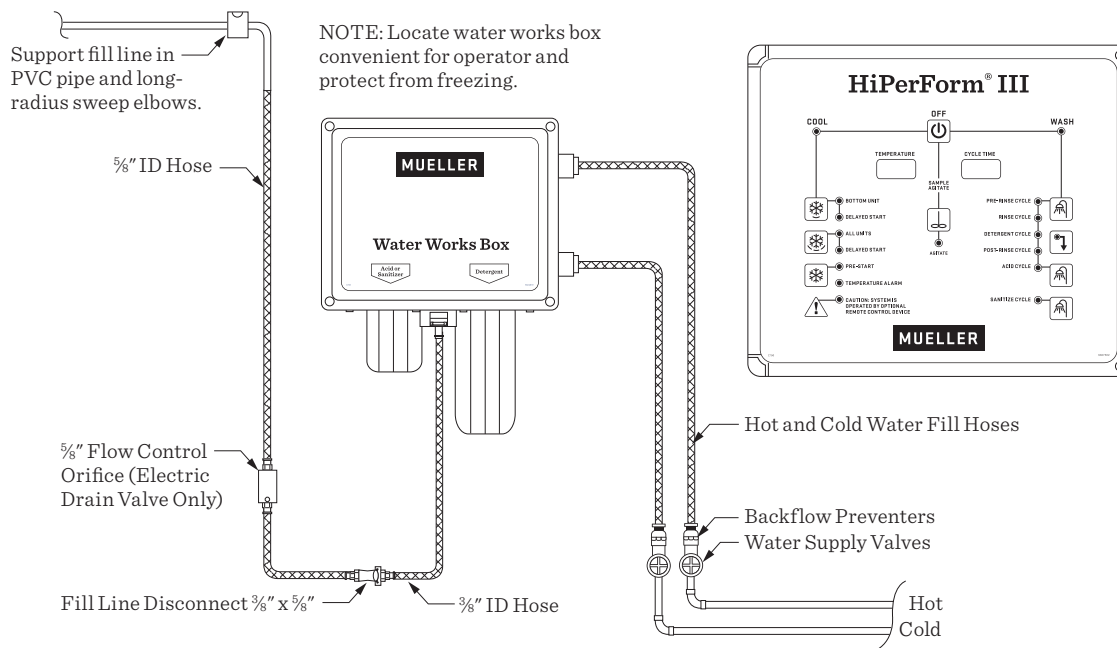
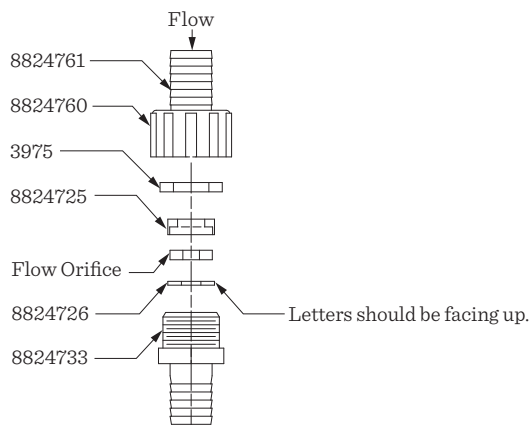


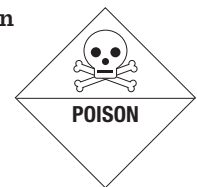
FIGURE 11: FLOW ORIFICE HOUSING



2.15 CHEMICAL AND CLEANING CAUTIONS



- Wear protective clothing and eye protection when handling caustic chemicals!
- Always observe the chemical manufacturer's precautions, warnings, and usage recommendations!
- Store all chemicals in a location protected from freezing, unauthorized access, and direct sunlight.
- Request a copy of the Material Safety Data Sheet (MSDS) for each cleaning chemical in use. Keep these readily available and be familiar with the first aid instructions and emergency contacts in case of a chemical accident or spill.
- Keep all chemicals out of reach of children.
- Only use cleaning solutions and materials specifically recommended for stainless steel and approved for food handling equipment.
- Never use more chemical than called for by the chemical manufacturer's instructions. Excessive use of cleaning chemicals can corrode and cause permanent damage to the stainless steel.
- Do not sanitize your milk cooler with solutions containing in excess of 200 parts per million of chlorine. This can cause permanent damage and corrosion to the stainless steel.
- Never mix any chlorine containing compounds with acid. This can result in damage to the stainless steel and can generate a hazardous gas dangerous to your health.
- Never wash the milk cooler with water temperatures exceeding 170°F (76.6°C).
- Never allow tools, clamps, or other wet objects to lie on the surface of the milk cooler.
- Keep all surfaces of the milk cooler clean.
- Never use abrasive materials on the stainless steel.
- Never put cleaning chemicals in an empty milk cooler.
Always have water in the cooler first for proper chemical dilution.
- The milk cooler's vent assembly must be in place at all times.
This milk cooler is not designed for pressure or vacuum applications. Severe damage can occur if not properly ventilated.
- Before entering the milk cooler, disconnect power to the agitator, remove and retain manway cover latch, and remove footwear that could scratch the stainless steel.
An additional person must be present for safety purposes during confined entry.
- Always open the manway cover for additional venting while the milk cooler is being emptied.
- Inspect the milk cooler ladder hardware on a regular basis. Never climb a ladder in need of repair.



2.16 MANWAY WASH TUBE INSTALLATION

The manway wash tube provides positive wash of the manway opening and cover. The tube is inserted in the stainless steel nipple in the top of the milk cooler and held in place with a stainless steel pin. Refer to Figure 12 for detailed installation procedures.

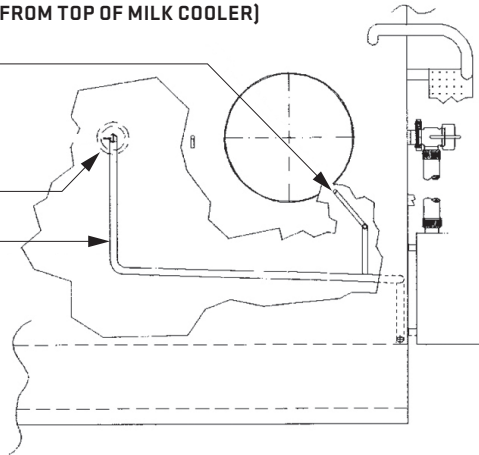
FIGURE 12: MANWAY WASH TUBE

WASH TUBE ORIENTATION (VIEWED FROM TOP OF MILK COOLER)

Manway wash tube must be oriented towards the center of the manway during installation.

Spray Dish

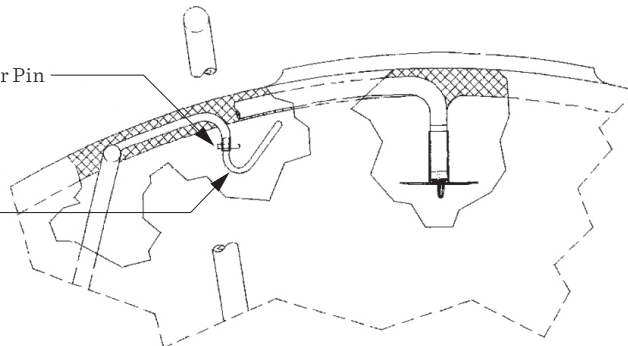
Internal CIP Line



MANWAY WASH TUBE (INTERNAL MODELS)

Stainless Steel Keeper Pin

Manway Wash Tube with Diffuser

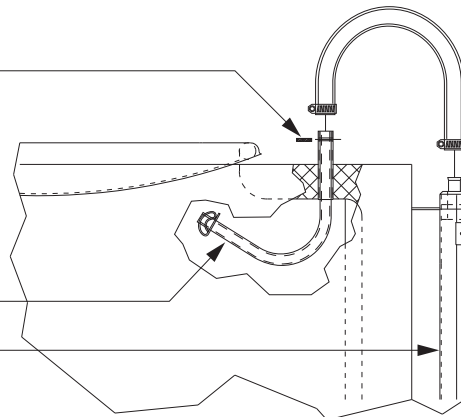


MANWAY WASH TUBE (EXTERNAL MODELS WITH OPTIONAL EXTERNAL GAUGE)

Stainless Steel Dowel Pin

Manway Wash Tube with Diffuser

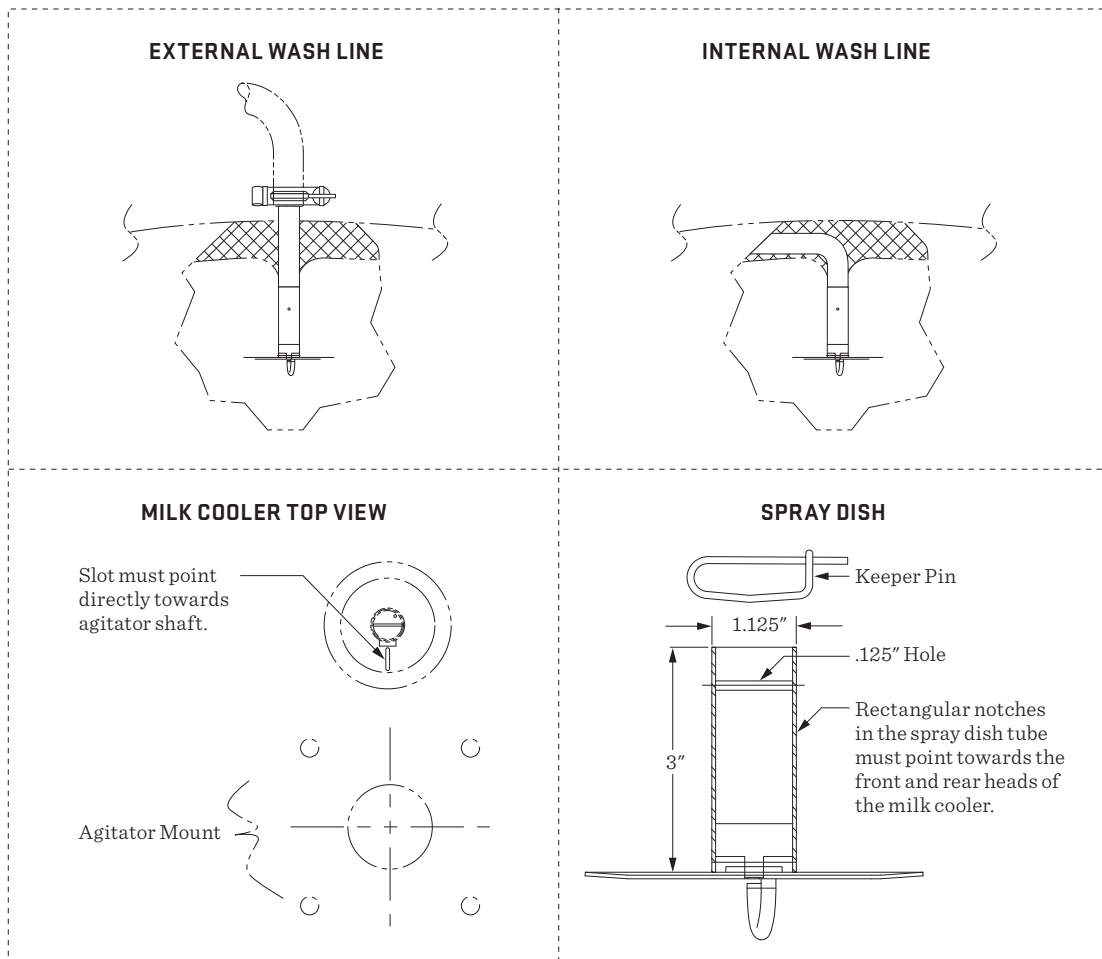
Optional External Gauge



2.17 SPRAY DISH INSTALLATION

The spray dishes connect to the internal or external clean-in-place (CIP) wash line with a stainless steel keeper pin. Check for proper spray dish installation and orientation during the installation and start-up inspection. The rectangular notch cut across the bottom of the spray dish tube must face the front and rear heads of the milk cooler and the slot cut in the bottom of the dish must point towards the center of the agitator shaft. See Figure 13.

FIGURE 13: SPRAY DISH ORIENTATION



2.18 MILK COOLER VENT ASSEMBLY INSTALLATION

Install the milk cooler vent assembly by rotating the vent assembly clockwise and allow the retaining straps to engage in the retaining lugs. See Figure 14.

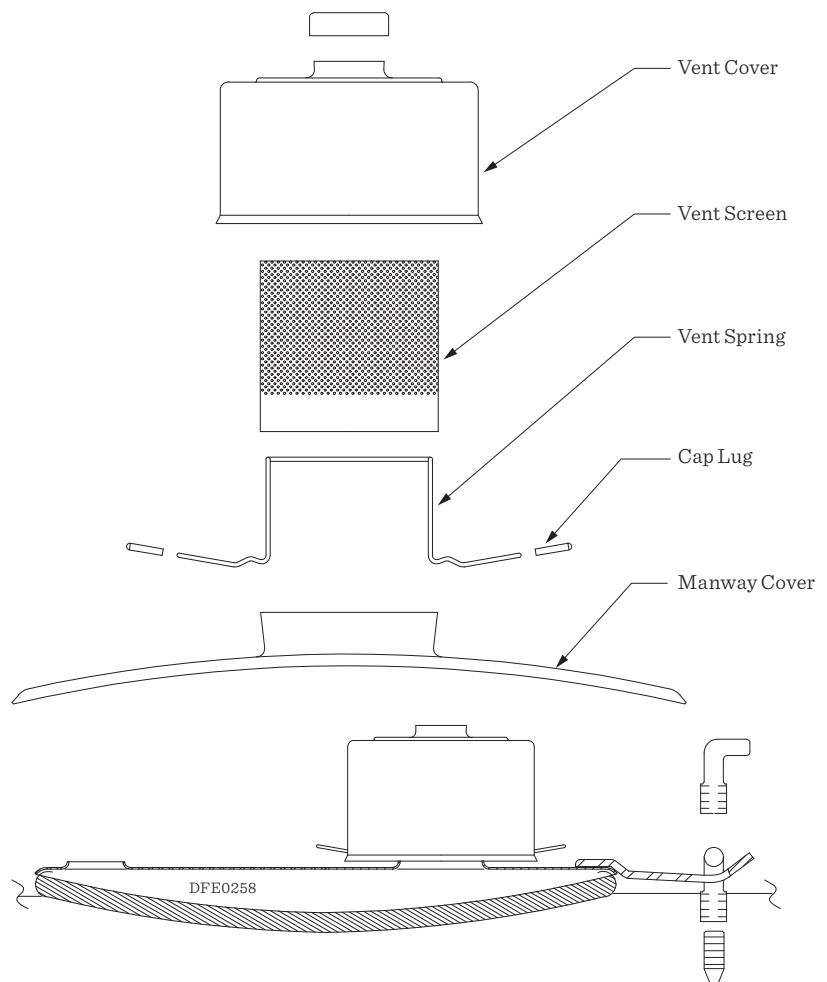


IMPORTANT: The vent for the milk cooler must be in place at all times. The vent prevents contaminants from entering the milk cooler and provides proper air flow to prevent internal damage resulting from vacuum or pressurization when the milk cooler is washed or emptied. Mueller Model “O,” “OE,” “OH,” and “OHF” milk coolers are designed for operation at normal atmospheric pressure only.

FIGURE 14: MILK COOLER VENT ASSEMBLY

<p>⚠ CAUTION</p> <p>VENT ASSEMBLY MUST BE OVER MILK INLET AT ALL TIMES.</p>
<p>⚠ MISE EN GARDE</p> <p>LE MONTAGE DE VENTILATION DOIT ÊTRE AU DESSUS DE L'ENTRÉE DU LAIT EN TOUT TEMPS.</p>
<p>⚠ ¡PRECAUCIÓN!</p> <p>EL ENSAMBLE DE RESPIRACIÓN DEBE ESTAR SOBRE LA ENTRADA DE LECHE EN TODO MOMENTO.</p>

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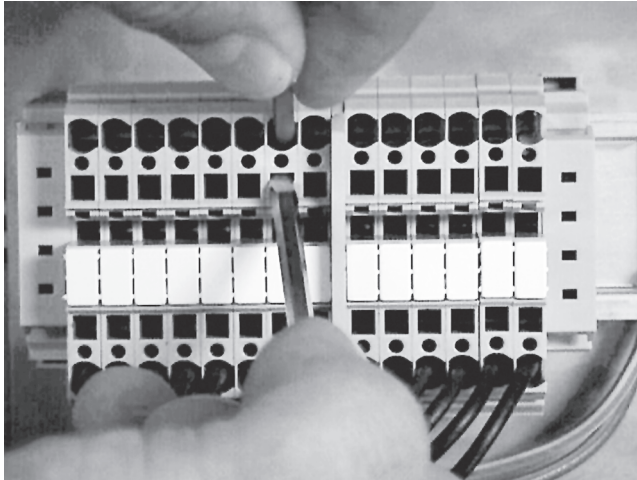


Section 3.0 – Electrical Wiring

3.1 FIELD ELECTRICAL CONNECTIONS AT MILK COOLER'S REAR JUNCTION BOX

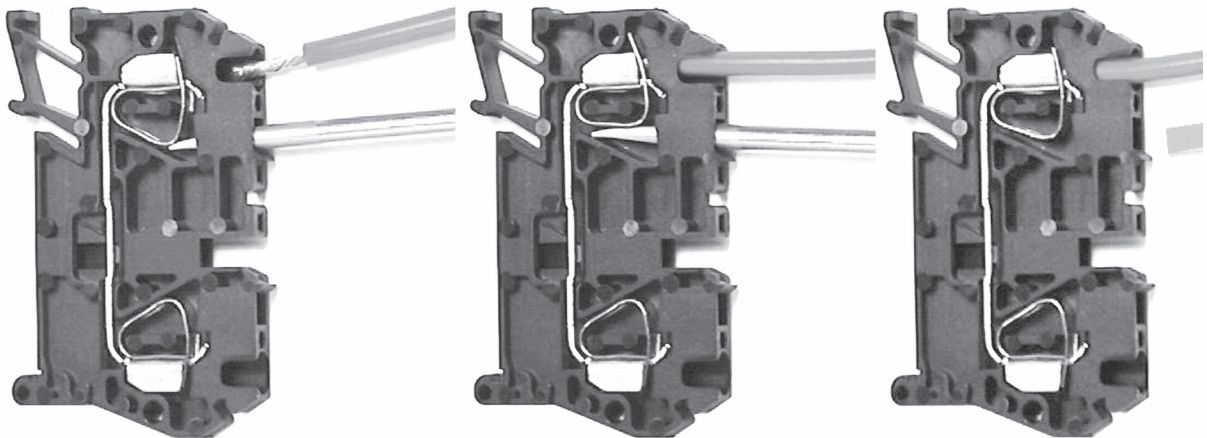
The rear junction box is factory equipped with a quick connect terminal strip for simple field electrical connections. See Figure 15.

FIGURE 15: MILK COOLER ELECTRICAL TERMINAL STRIP AT REAR JUNCTION BOX



To make electrical connections to the quick connect terminal strip:

1. Disconnect all power supplies.
2. Strip .375" (10 mm) of insulation off each conductor.
3. Open the quick-connect terminal connection by inserting a 3mm screwdriver into the bottom of socket "A."
4. Following the electrical schematics, insert the correct conductor into terminal connection "B" and remove the screwdriver, allowing the quick-connect terminal to close on the conductor.

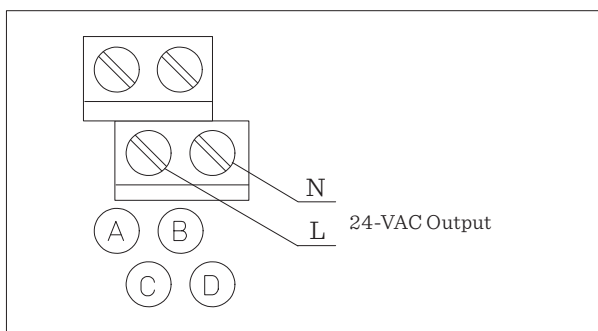


3.2 RELAY OUTPUT WIRING

The Mueller HiPerForm III control may be wired to provide 24-VAC output, dry switch closure, or any combination of the two. Please refer to the following diagrams for wiring procedures.

For installations requiring 24-VAC output, the 24-VAC signal is available by connecting to the bottom two terminals, C and D.

FIGURE 16: 24-VAC OUTPUT



For installations requiring dry switch closure type output, connect to terminals A and B.

FIGURE 17: DRY SWITCH CLOSURE OUTPUT

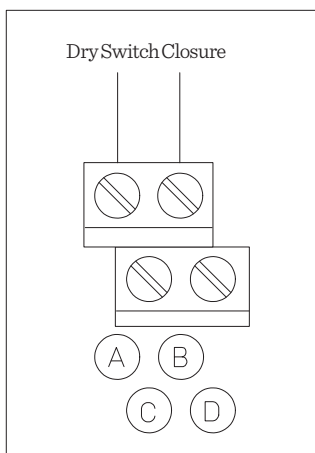


FIGURE 18: ELECTRICAL SCHEMATIC WWB (ENLARGED SCHEMATIC ATTACHED IN BACK)

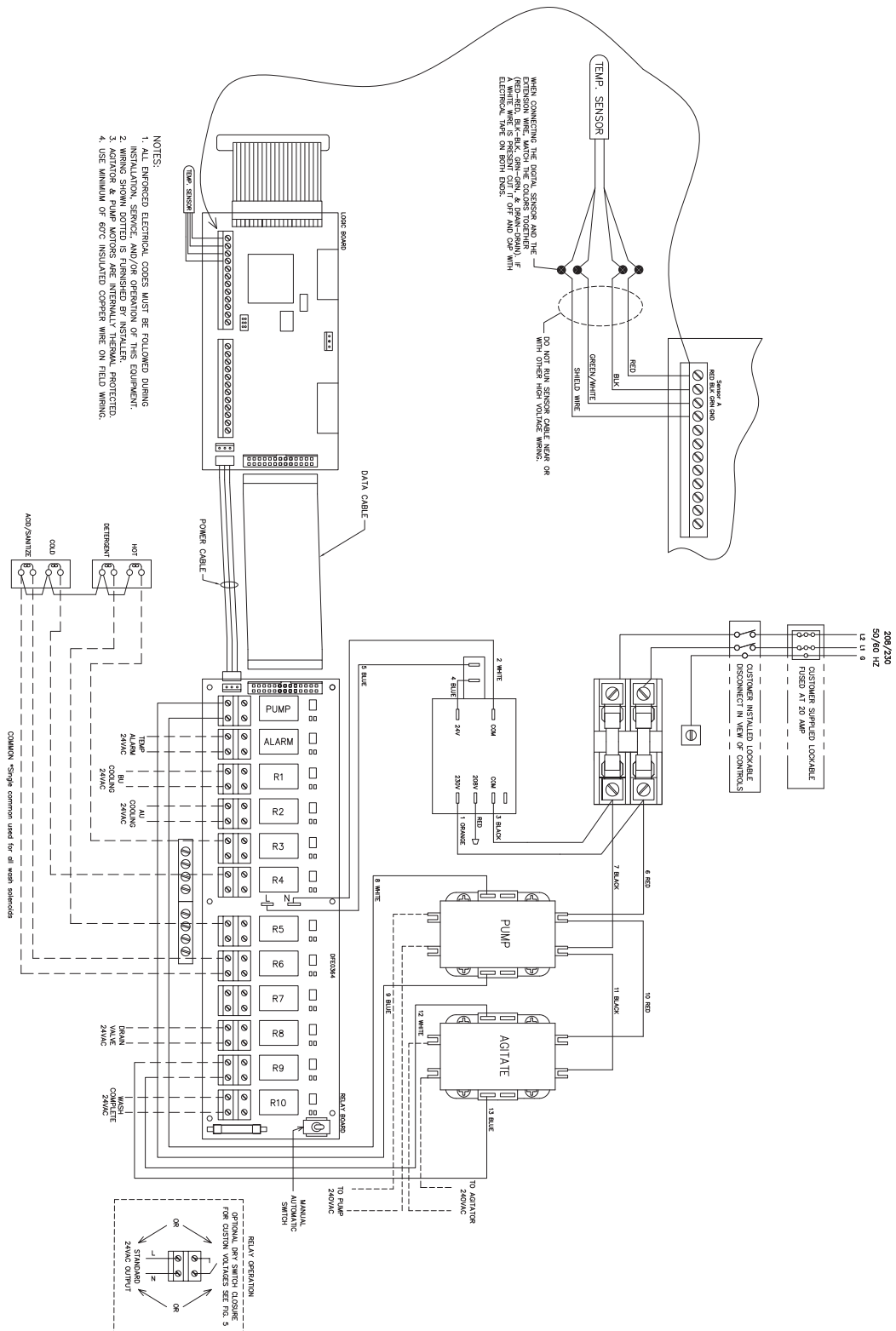


FIGURE 19: ELECTRICAL SCHEMATIC ADB (ENLARGED SCHEMATIC ATTACHED IN BACK)

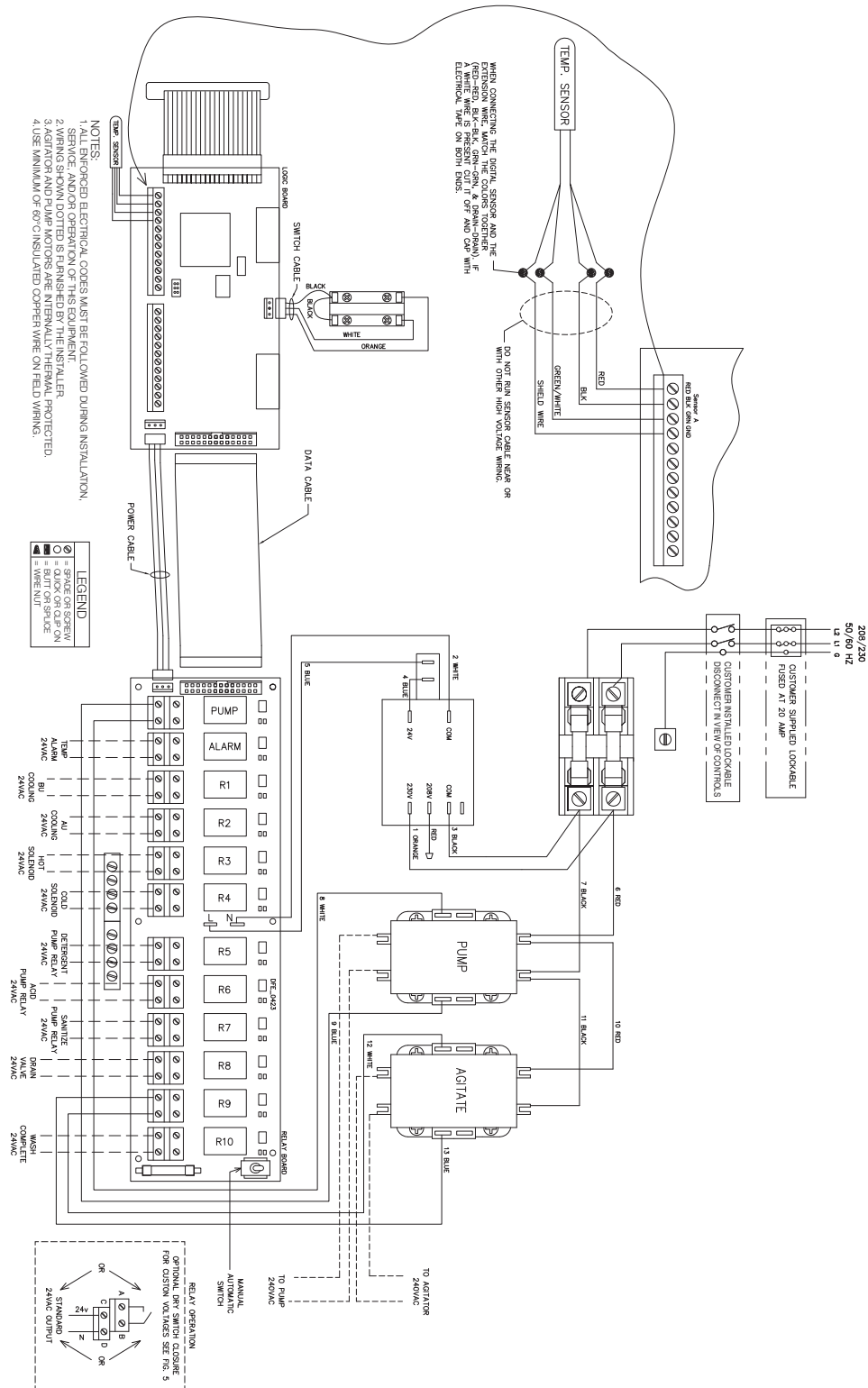


FIGURE 20: INTERNAL CONDUIT RACEWAYS OF MILK COOLER

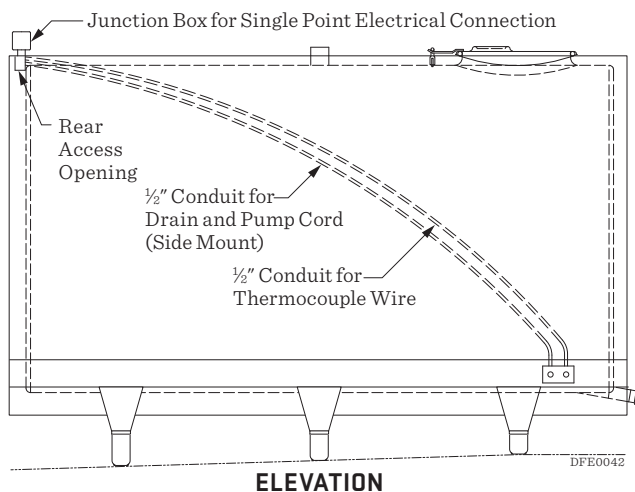
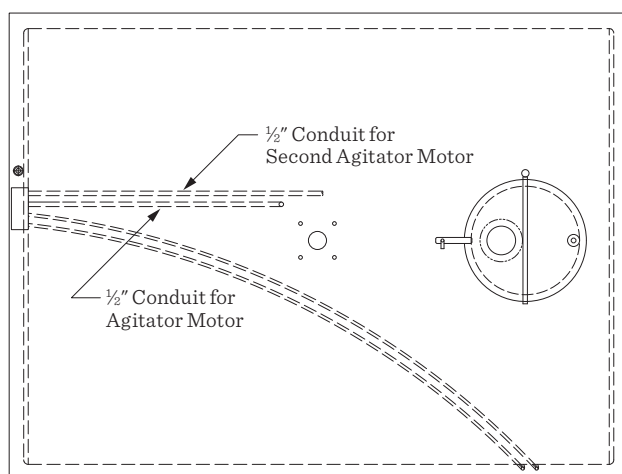
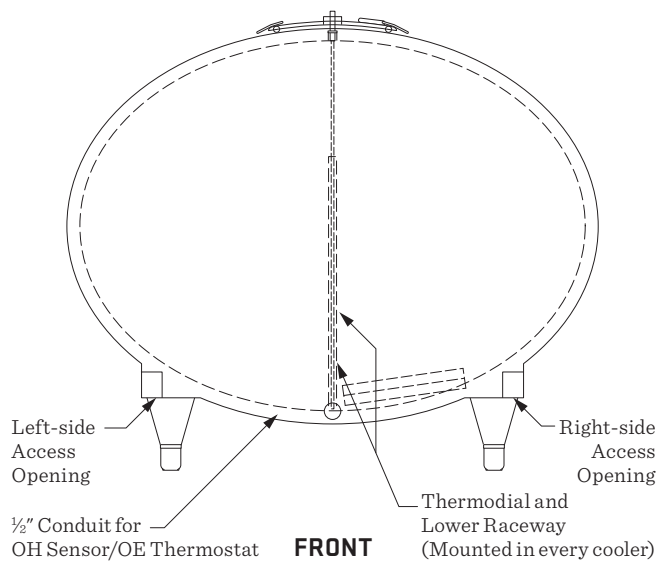


FIGURE 21: ELECTRICAL SCHEMATIC, WASH PUMP MOTOR

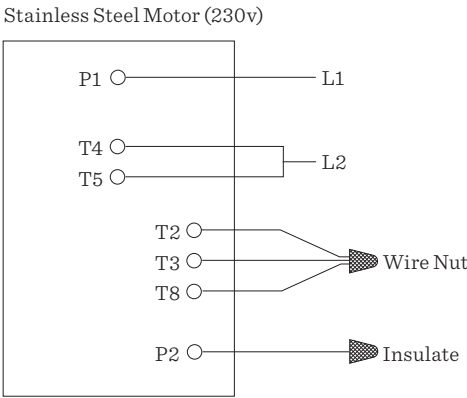
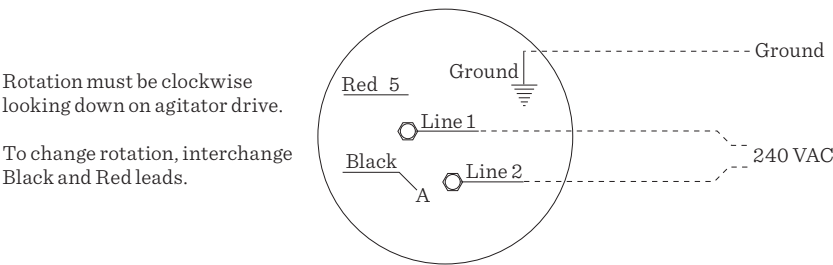


FIGURE 22: ELECTRICAL SCHEMATIC, AGITATOR MOTOR(S)



Section 4.0 – HiPerForm III Temperature Control

4.1 HIPERFORM III TEMPERATURE CONTROL AND DIGITAL SENSOR

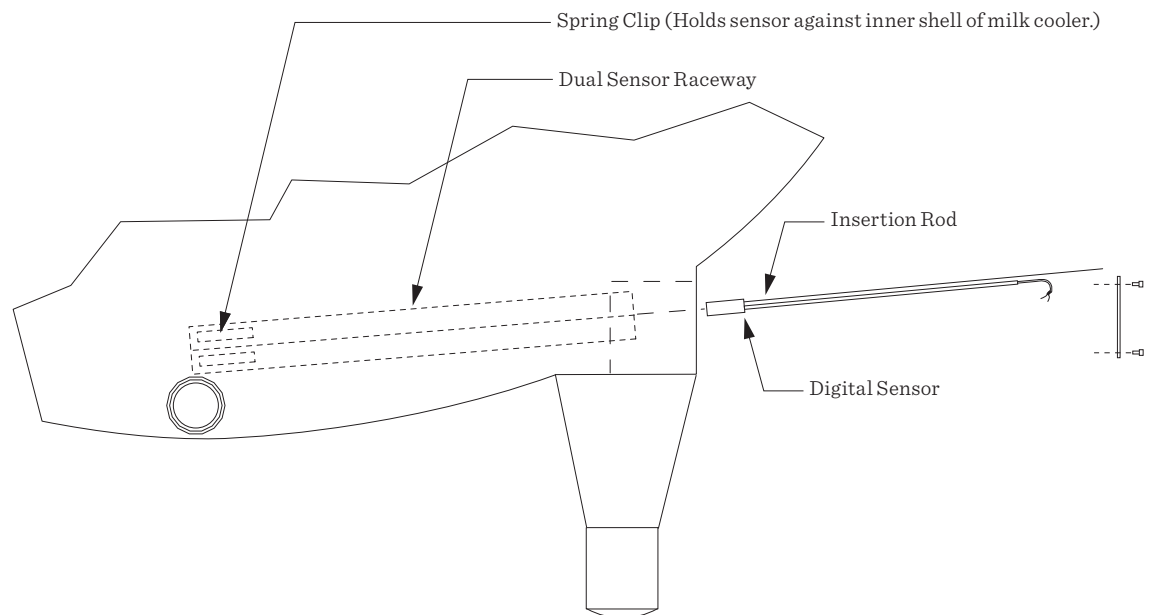
The HiPerForm III control uses an electronic temperature control and digital sensor. The following installation and calibration procedures are very important to ensure accurate sensing of the milk temperature.

4.2 HIPERFORM III SENSOR INSTALLATION

Install the sensor in the front sensor raceway of the milk cooler as follows:

1. Fabricate an insertion rod using a five-foot piece of 10-gauge solid wire by forming a $\frac{3}{8}$ " open loop on one end. See Figure 23.
2. Slip the loop of the insertion rod over the sensor wire and push the sensor down the raceway until it seats into the spring clip at the end of the sensor raceway.
3. Being careful not to pull the sensor from the spring clip, withdraw the insertion rod from the sensor raceway. See Figure 23.

FIGURE 23: HIPERFORM III DIGITAL SENSOR INSTALLATION



4.3 HIPERFORM III DIGITAL SENSOR WIRING

1. Splice the sensor cable to the shielded extension cable at the right front access opening. Use sealing splice crimp connectors (Part No. 8825009). Do not strip the insulation from the single conductors. Fully insert two like-colors into the splice and pinch closed with pliers. Splice green to green, red to red, and black to black.



IMPORTANT: Cut the white wire and aluminum foil wrap back to the cable jacket and insulate with electrical tape at the right front access opening. The foil and drain wire must be insulated so that it does not make contact with the stainless steel shell of the milk cooler! See Figure 24.

2. Route the shielded extension cable (Part No. 8824887) through either the internal or external conduit.



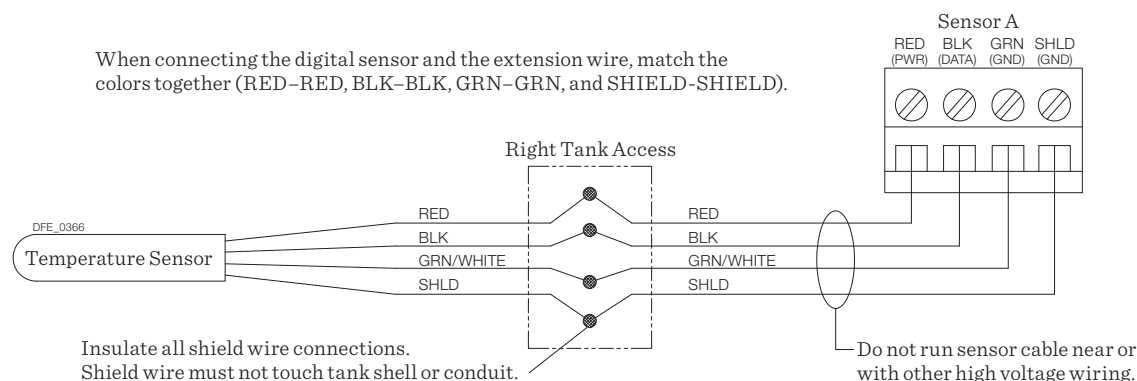
IMPORTANT: The shielded wire provided by Paul Mueller Company must be used to ensure the proper conductor capacitance.

3. Route to the HiPerForm III enclosure. Do not route with other high-voltage cables or route sensor conduit parallel in close proximity with other high-voltage conduits.
4. Route the shielded cable into the bottom of the HiPerForm III enclosure and cut the white wire and aluminum foil wrap back to the cable jacket.
5. Connect the red, black, green, and drain wires to the proper terminal connections at the bottom of the HiPerForm III logic board located on the door.



IMPORTANT: If the temperature display shows “??” (question mark, question mark) you have a poor connection at the splice or a miss-wire of the sensor circuit.

FIGURE 24: HIPERFORM III DIGITAL SENSOR WIRING



Section 5.0 – HiPerForm III Program Parameters

5.1 PROGRAMMING COOLING PARAMETERS

To program the cooling mode parameters, place the HiPerForm III in off mode by pressing the “OFF” switch.

NOTE: If a robotic interface control is installed and connected to the HiPerForm III, the “Robot and Tank Communication Active” switch must be E-stopped and turned off by pressing and holding this switch for five seconds before programming parameters in the HiPerForm III.

Press and hold (for approximately five seconds) the hidden switch behind the roman numeral “III” at the top right of the HiPerForm III control switch overlay until “*COL*” (cooling mode), “*USH*” (wash mode), or “*rob*” (robotic interface mode) is displayed in the right cycle time display. Press and release the hidden switch “III” until “*COL*” is displayed in the right cycle time display. “*COL*” indicates that you are in the cooling programming parameters.

NOTE: If no switches are pressed within 60 seconds, the HiPerForm III will revert back to the off mode and abort the programming mode.

To program the cooling mode parameters, ensure “*COL*” (cooling mode) is selected with the hidden switch “III” and displayed in the right cycle time display. Next, press and release the “Bottom Unit” switch to sequence through the cooling parameter codes outlined in Section 5.2, “Cooling Mode Parameter Table.”

To change the values of a specific parameter option, press the “All Units” switch to increase parameter values and the “Pre-Start” switch to decrease parameter values. Once the proper parameter value selection is made, advance to the next parameter code with the “Bottom Unit” switch.



IMPORTANT: Once all values are properly programmed, press and release the “Sanitize Cycle” switch to enter and retain the new values and revert back to the off mode.

5.2 COOLING MODE PARAMETER TABLE

No.	Parameter Code	Parameter Code Description	Parameter Option(s)	Operational Description
1	<i>bud</i>	Bottom Unit Delay (Bottom Unit Delayed Start LED – Flash)	0–120	Starts the programmed “Bottom Unit” delay after pressing the “Bottom Unit” switch once when in cooling mode. Pressing the “Bottom Unit” switch a second time will override the delay.
2	<i>rud</i>	All Units Delay (All Units Delayed Start LED – Flash)	0–999	Starts the programmed “All Units” delay after pressing the “All Units” switch once when in cooling mode. Pressing the “All Units” switch a second time will override all delays. NOTE: If the “All Units” switch is the first switch activated in the cooling mode, the “Bottom Unit” delay will activate (flash) and start timing and the “All Units” delay will flash but not start timing until the “Bottom Unit” delay has expired. Pressing the “All Units” switch a second time will prematurely end the “Bottom Unit” delay and the “All Units” delay. “Bottom Unit” and All Units” will be active on temperature setpoint.
3	<i>p5c</i>	Pre-Start Cooling Cycle (Pre-Start Cooling LED)	30/60	Selects a 30- or 60-minute timer for selected refrigeration units (“Bottom Unit” or “All Units”) with a fixed temperature setpoint of 34°F (1.1°C). If no units have been selected (i.e., “Bottom Unit” or “All Units”), the “Pre-Start” switch will start the “Bottom Unit” only. Initiated by pressing the “Pre-Start” switch twice; pressing a third time will abort “Pre-Start.”
4	<i>p5a</i>	Pre-Start Agitation Cycle (Pre-Start Agitate LED)	30/60	Selects a 30- or 60-minute timer for agitation (“Bottom Unit” and/or “All Units” will operate from programmed setpoint and differential). Initiated by pressing the “Pre-Start” switch once.
5	<i>F-C</i>	Degree F or C Selection	F/C	Selects temperature scale.
6	<i>cal</i>	Calibration of Temperature Sensor	–35 to 36°F (–20 to 20°C)	Adjust the calibration of the digital temperature sensor in 1 degree increments.
7	<i>SP1</i>	Setpoint Temperature, Bottom Unit	34 to 42°F (1.1 to 5.5°C)	Determines the temperature that “Bottom Unit” switch off, unless “Pre-Start” cooling has been selected, at which time the setpoint will be 34°F (1.1°C) until the “Pre-Start” cooling timer expires. (Relay board output number R1.)
8	<i>dF1</i>	Temperature Differential 1	2 to 4	Determines the degrees above the setpoint temperature (SP1) that the “Bottom Unit” restarts. (Relay board output number R1.)
9	<i>SP2</i>	Setpoint Temperature, All Units	34 to 42°F (1.1 to 5.5°C)	Determines the temperature that “All Units” switch off, unless “Pre-Start” cooling has been selected, at which time the setpoint will be 34°F (1.1°C) until the “Pre-Start” cooling timer expires. (Relay board output number R2.)
10	<i>dF2</i>	Temperature Differential 2	2 to 4	Determines the degrees above the setpoint temperature (SP2) that the “All Units” restarts. (Relay board output number R2.)
11	<i>IR</i>	Interval Agitation Timing (Agitate LED)	1/5, 3/18, or 3/30	Selects interval agitation timing of 3 minutes on and 18 or 30 minutes off whenever the selector switch is in the cooling mode.
12	<i>SA</i>	Sample Agitation Timing (Agitate LED)	1–30	Selects the duration of agitator sample time when the “Sample Agitate” switch has been activated.
13	<i>lad</i>	Temperature Alarm Delay (High Temperature Only)	0–240	Number of minutes the high temperature alarm (>44°F/6.6°C) is delayed after onset of first milking and initiating the first cooling cycle. Eliminates nuisance high temperature alarms when first milking is entering the milk cooler. The “Temperature Alarm” delay timer is reset when the system is moved to off or wash modes. Alarm relay output on relay board will not be active during this delay time. Does not delay low temperature alarms (<34°F/1.1°C).
14	<i>hld</i>	High Temperature Alarm Delay	1–60	Number of minutes the milk temperature must remain at or above a high temperature condition (above 44°F/6.6°C) before the high temperature alarm is energized. Designed to eliminate nuisance high temperature alarms with installations that bottom fill and momentarily pump hot milk pass the temperature sensor.

5.3 PROGRAMMING WASH PARAMETERS

To program the wash mode parameters, place the HiPerForm III in the off mode by pressing the “OFF” switch.

NOTE: If a robotic interface control is installed and connected to the HiPerForm III, the “Robot and Tank Communication Active” switch must be E-stopped and turned off by pressing and holding this switch for five seconds before programming parameters in the HiPerForm III.

Press and hold (for approximately five seconds) the hidden switch behind the roman numeral “III” at the top right of the HiPerForm III control switch overlay until “*COL*” (cool mode), “*USH*” (wash mode), or “*rob*” (robotic interface mode) is displayed in the right cycle time display. Press and release the hidden switch “III” until “*COL*” is displayed in the right cycle time display. “*USH*” indicates that you are in the wash programming parameters.

NOTE: If no switches are pressed within 60 seconds, the HiPerForm III will revert back to the off mode and abort the programming mode.

To program the wash mode parameters, ensure “*USH*” (wash mode) is selected with the hidden switch “III” and displayed in the right cycle time display.

Next, press and release the “Pre-Rinse” switch to sequence through the wash parameter codes outlined in the wash mode parameter tables, Sections 5.4 and 5.5.

Example: The first parameter to check or change is the “*con*” parameter, with options to select whether the control box will be utilized as an auto-dosing box, “*Rdb*” (Model “OHF” only), a wall-mount water works box, “*ubb*” with an electric drain valve, or a Mueller Matic® box, “*nrb*” for use with a water-operated drain valve.

To change values of a specific parameter option, press the advance cycle switch to increase parameter values and the “Acid Cycle” switch to decrease parameter values. Once the proper parameter value selection is made, advance to the next parameter code with the “Pre-Rinse” switch.



IMPORTANT: Once all values are properly programmed, press and release the “Sanitize Cycle” switch to enter and retain the new values and revert back to the off mode.

5.4 WASH MODE PARAMETER TABLE FOR ADB OR WWB

HiPerForm III ADB/WWB Wash Parameters (See Section 5.5 for Water Operated Drain.)				
ADB/WWB	<i>c o n</i>	Selects wash control type.	<i>R d b</i> or <i>u u b</i>	
ADB/WWB	<i>d r P</i>	Selects normally open or normally closed drain valves.	"NO/NC"	
ADB/WWB	<i>t o t</i>	Total wash time.	"XXX" Min.	
ADB/WWB	<i>t A t</i>	Total acid time.	"XXX" Min.	
ADB/WWB	<i>t S t</i>	Total sanitize time.	"XXX" Min.	
ADB/WWB	<i>d L y</i>	Wash delay.	"0 to 120" Min.	
ADB/WWB	<i>F L t</i>	Wash fill time.	"3 to 20" Min.	
ADB/WWB	<i>H - C</i>	Mix temperature ratio for warm water cycles.	"25-50%"	
ADB/WWB	<i>d r n</i>	Drain time (Drain LED).	"1 to 10" Min.	
ADB/WWB	<i>r i ?</i>	Selects option of a pre-rinse to help remove milk residue.	"Yes/No"	
ADB/WWB	<i>r 1 t</i>	Rinse number 1 temperature (Pre-Rinse Cycle LED).	"CLD/WRM/HOT"	
ADB/WWB	<i>r 1 c</i>	Rinse number 1 circulation time (Pre-Rinse Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/WWB	<i>r 2 t</i>	Rinse number 2 temperature (Rinse Cycle LED).	"CLD/WRM/HOT"	
ADB/WWB	<i>r 2 c</i>	Rinse circulation time (Rinse Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/-----	<i>R u t</i>	Acid wash temperature, super wash option on ADB only (Acid Cycle LED).	"CLD/WRM/HOT"	
ADB/-----	<i>R u c</i>	Acid wash circulation time, super wash option on ADB only (Acid Cycle and Circulation LED).	"2 to 10" Min.	
ADB/WWB	<i>d u t</i>	Detergent wash temperature (Detergent Cycle LED).	"HOT"	
ADB/WWB	<i>d u c</i>	Detergent circulation time (Detergent Cycle and Circulation LED).	"2 to 10" Min.	
ADB/WWB	<i>L o t</i>	Low wash temperature notification.	80-140°F (26.5-60°C)	
ADB/WWB	<i>r 3 t</i>	Rinse number 3 temperature (Post Rinse Cycle LED)	"CLD/WRM/HOT"	
ADB/WWB	<i>r 3 c</i>	Rinse number 3 circulation time (Post Rinse Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/WWB	<i>R r ?</i>	Selects automatic 5th cycle (acid rinse) during full wash selection (Acid Cycle LED).	"Yes/No"	
ADB/WWB	<i>R r t</i>	Acid rinse temperature (Acid Cycle LED).	"CLD/WRM"	
ADB/WWB	<i>R r c</i>	Acid rinse circulation time (Acid Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/WWB	<i>r 4 ?</i>	Rinse number 4 acid post rinse (Post Rinse LED if "Yes").	"Yes/No"	
ADB/WWB	<i>r 4 t</i>	Rinse number 4 temperature acid post rinse (Post Rinse Cycle LED).	"CLD/WRM/HOT"	
ADB/WWB	<i>r 4 c</i>	Rinse number 4 circulation time acid post rinse (Post Rinse Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/WWB	<i>S r t</i>	Sanitize rinse temperature (Sanitize Cycle LED).	"CLD/WRM"	
ADB/WWB	<i>S r c</i>	Sanitize circulation time (Sanitize Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/-----	<i>d u P</i>	Detergent wash dosing pump time (Detergent Cycle LED).	"0-600" Sec.	
ADB/-----	<i>R u P</i>	Acid wash dosing pump time (Acid Cycle LED).	"0-600" Sec.	
ADB/-----	<i>R r P</i>	Acid rinse dosing pump time (Acid Cycle LED).	"0-600" Sec.	
ADB/-----	<i>S r P</i>	Sanitize rinse dosing pump time (Sanitize Cycle LED).	"0-600" Sec.	

5.5 WASH MODE PARAMETER TABLE FOR MUELLER MATIC (MMB)

HiPerForm III MMB Wash Parameters with Water Operated Drain				
MMB	<i>con</i>	Selects wash control type.	<i>onb</i>	
MMB	<i>dr</i>	Selects drain valve type.	"HYD"	
MMB	<i>ut</i>	Selects wash timer emulation.	"A/B"	
MMB	<i>tut</i>	Total wash time.	"40/80"	
MMB	<i>tat</i>	Total acid time.	"20/40"	
MMB	<i>tst</i>	Total sanitize time.	"10/20"	
MMB	<i>dly</i>	Wash delay.	"0 to 120" Min.	
MMB	<i>flt</i>	Water fill time.	"8.0/16.0"	
MMB	<i>drt</i>	Drain time (Drain LED).	"2.0/4.0"	
MMB	<i>r1p</i>	Rinse number 1 pre-rinse) (Pre-Rinse LED if "Yes").	"Yes/No"	
MMB	<i>r1t</i>	Rinse number 1 temperature (Pre-Rinse Cycle LED).	"CLD"	
MMB	<i>r1c</i>	Rinse number 1 circulation time (Pre-Rinse Cycle and Circulation LED).	"1.0/2.0"	
MMB	<i>r2t</i>	Rinse number 2 temperature (Rinse Cycle LED).	"HOT"	
MMB	<i>r2c</i>	Rinse circulation time (Rinse Cycle and Circulation LED).	"2.0/4.0"	
MMB	<i>dwt</i>	Detergent wash temperature (Detergent Cycle LED).	"HOT"	
MMB	<i>dwc</i>	Detergent circulation time (Detergent Cycle and Circulation LED).	"4.0/8.0"	
MMB	<i>lut</i>	Low wash temperature notification.	80–140°F (26.5–60°C)	
MMB	<i>r3t</i>	Rinse number 3 temperature (Post-Rinse Cycle LED).	"HOT"	
MMB	<i>r3c</i>	Rinse number 3 circulation time (Post-Rinse Cycle and Circulation LED).	"2.0/4.0"	
MMB	<i>Arp</i>	Selects automatic 5th cycle acid rinse during full wash selection (Acid Cycle LED).	"Yes/No"	
MMB	<i>Art</i>	Acid rinse temperature (Acid Cycle LED).	"CLD"	
MMB	<i>Arc</i>	Acid rinse circulation time (Acid Cycle and Circulation LED).	"2.0/4.0"	
MMB	<i>Srt</i>	Sanitize rinse temperature (Sanitize Cycle LED).	"CLD"	
MMB	<i>Src</i>	Sanitize circulation time (Sanitize Cycle and Circulation LED).	"2.0/4.0"	

5.6 PROGRAMMING (OPTIONAL) ROBOTIC INTERFACE CONTROL PARAMETERS

To program the robotic interface control parameters, place the HiPerForm III in the off mode by pressing the “OFF” switch.

NOTE: If a robotic interface control is installed and connected to the HiPerForm III, the “Robot and Tank Communication Active” switch must be E-stopped and turned off by pressing and holding this switch for five seconds before programming parameters in the HiPerForm III.

Press and hold (for approximately five seconds) the hidden switch behind the roman numeral “III” at the top right of the HiPerForm III control switch overlay until “*CL*” (cool mode), “*USH*” (wash mode), or “*rob*” (robotic interface mode) is displayed in the right cycle time display. Press and release the hidden switch “III” until “*rob*” is displayed in the right cycle time display. “*rob*” indicates that you are in the robotic interface control programming parameters.

NOTE: If no switches are pressed within 60 seconds, the HiPerForm III will revert back to the off mode and abort the programming mode.

To program the robotic interface control parameters, ensure “*rob*” (robotic interface control mode) is selected with the hidden switch “III” and displayed in the right cycle time display.

Next, press and release the “Pre-Rinse” switch to sequence through the robotic interface control codes outlined in Section 5.7, “Robotic Interface Code Parameter Table.”

Example: The first parameter that needs checked or changed is the “*rc*” parameter. This parameter selects if you have a robotic interface control installed, “Yes/No.”



IMPORTANT: If the optional robotic interface control is not being used, the “*rc*” parameter must be programmed as “No.”

To change values of a specific parameter option, press the advance cycle switch to increase parameter values and the “Acid Cycle” switch to decrease parameter values. Once the proper parameter value selection is made, advance to the next parameter code with the “Pre-Rinse” switch.



IMPORTANT: Once all values are properly programmed, press and release the “Sanitize Cycle” switch to enter and retain the new values and revert back to the off mode.

5.7 ROBOTIC INTERFACE CONTROL PARAMETER TABLE

No.	Parameter Code	Parameter Code Description	Parameter Option(s)	Operational Description
1	<i>r/c</i>	Optional robotic interface control.	<i>YES</i> <i>no</i>	Select “Yes” if optional robotic interface control is installed, otherwise select “No.”
2	<i>COL</i>	Selects bottom unit relay output (R1) or all units relay output (R2).	<i>bu</i> <i>au</i>	Determines if robotic interface control will engage “Bottom Unit” only with programmable delay or “All Units” with combined delays of “Bottom Unit” and “All Units” for cooling mode. If “Bottom Unit” is selected, Smart I/O must be wired to Input #1; if “All Units” is selected, Smart I/O must be wired to input #2. See Smart I/O wiring schematic.
3	<i>AUT</i>	Auxiliary tank option.	<i>YES</i> <i>no</i>	Selects if there is an auxiliary tank installed (i.e., Tank 1 and Tank 2). Currently select “No” as this option is not finalized with Lely, the robotic control supplier.
4	<i>tud</i>	Tank wash switch delay (minutes).	<i>1-75</i>	Determines how many minutes (1–75) the robotic interface control “Start Auto Tank Wash” switch is delayed for user input from truck driver after selecting “Open Tank Outlet Valve” switch. This setting should be programmed for the number of minutes it takes the truck driver to perform his/her pick-up procedures, locking out the “Start Auto Tank Wash” switch until the pick-up procedure is complete. To override “Start Auto Tank Wash” switch delay, press and hold the “Start Auto Tank Wash” switch for 10 seconds.
5	<i>CAP</i>	Critical alarm pulse (seconds).	<i>0-60</i>	If set for zero seconds and if the robotic interface control goes into an alarm state, output #7 (robot alarm) at the Smart I/O will be a continuous signal. If programmed for 15 seconds and the robotic interface control goes into an alarm state, output #7 (robot alarm) at the Smart I/O will provide a 15-second on and a 15-second off signal until the alarm is acknowledged and resolved. Current recommendation by Lely is zero seconds.



IMPORTANT: If the optional robotic interface control is not being utilized, the “*r/c*” parameter must be programmed as “No.”

5.8 TEST PROGRAM FOR HIPERFORM III RELAY OUTPUTS

The HiPerForm III has a built-in test program for service technicians to test the program revision, displays, LEDs, and relay outputs on the relay board. The test program will allow the technician to cycle through all of the relay outputs and validate if the relay and component are operating.

1. To enter the test program, press the “OFF” switch on the HiPerForm III and E-stop the “Robot and Tank Communication Active” switch by pressing and holding this switch for 5 seconds before entering the test programming.
2. Press and hold the “Pre-Start” switch. After 15 seconds, the temperature display will show “*55*” and the cycle time display will show the software version number (i.e., “*1.0.0*”).
3. Press and release the wash advance key once and the temperature display will show “*5E*” and the cycle time display will show the digital temperature sensor version number (i.e., “*20*”).
4. Press and release the wash advance key again and all segments of the alpha numeric displays will illuminate. This will validate that all segments are working on the 7-segment displays.
5. Press and release the wash advance key again and all LED lights will be illuminated for verification.
6. Press and release the wash advance key again and “Input One” on the logic board can be checked. The temperature display window will show “*1 P 1*” and the cycle time window will show “*0 P 0*” for open and “*1 5*” for closed.
7. Press and release the wash advance key again and “Input Two” on the logic board can be checked. The temperature display window will show “*1 P 2*” and the cycle time window will show “*0 P 0*” for open and “*1 5*” for closed.
8. Press and release the wash advance key again and the temperature display window will show “*r 1*” and “*r 1*” relay output (“Bottom Unit”) on the HiPerForm III relay board will energize.
9. Continue pressing and releasing the wash advance key to cycle through the remaining relays as shown in the table below, Section 5.9. After “*RL*” is selected, the control will advance back to the off mode.

5.9 TEST MODE RELAY TABLE

<i>r 1</i>	Condensing unit 1 relay coil.	<i>r 7</i>	Sanitize solenoid (WWB) or sanitize pump (ADB) relay coil.
<i>r 2</i>	Condensing unit 2 relay coil.	<i>r 8</i>	Drain valve relay coil.
<i>r 3</i>	Hot solenoid relay coil.	<i>r 9</i>	Agitator relay coil.
<i>r 4</i>	Cold solenoid relay coil.	<i>r 10</i>	Wash complete relay coil.
<i>r 5</i>	Detergent solenoid (WWB) or detergent pump (ADB) relay coil.	<i>P n P</i>	Wash pump relay coil.
<i>r 6</i>	Acid solenoid (WWB) or acid pump (ADB) relay coil.	<i>RL</i>	Alarm relay coil.

Section 6.0 – Chemical Dosing with HiPerForm III Water Works Box

6.1 DETERMINING CHEMICAL USAGE

Chemical usage will vary depending on the make and manufacturer, the amount of water required for each cycle, and the water quality. It is very important to have your chemical supplier test the water supply and determine the proper usage and concentrations of each specific chemical. This information should be posted on a cleaning chart near the milk cooler.



IMPORTANT NOTE: Improper chemical usage can cause non-warranted and non-repairable damage to your stainless steel milk cooler. Chemicals should be purchased from a reputable source that specializes in the proper application and usage of dairy cleansers for clean-in-place (CIP) applications.

6.2 CHEMICAL CAUTIONS (ADDITIONAL CAUTIONS ARE LISTED IN SECTION 2.15)



- Proper safety precautions must be followed when handling chemicals.
- Read and abide by all Material Safety Data Sheets (MSDS), labels, instructions, warnings, and health hazard information provided by the chemical manufacturer.
- Eye, face, and skin protection should be worn at all times!
- Without proper dilution, chemicals can damage the stainless steel milk cooler.
- NEVER mix chemicals—a deadly gas may be created.
- Ensure that all drains are properly trapped to prevent mixed chemical gasses from re-entering the workplace.
- Store chemicals in an area protected from freezing and out of direct sunlight.
- Store chemicals in an area that prevents access by children or unauthorized individuals.



6.3 DETERMINING WATER USAGE REQUIREMENTS

The Mueller HiPerForm III is fully programmable for wash water fill and drain time through the wash program setup. See Section 5 for programming.

Three factors must be considered when determining the amount of water required during the wash cycle:

- a. The first requirement is to ensure there is sufficient water to prevent cavitation of the wash pump. See Section 6.4 for minimum water requirements.
- b. The second requirement is to ensure that there is sufficient water to maintain a minimum drain temperature of 115°F (46°C) at the end of the hot detergent wash cycle. The volume of water required to satisfy the minimum drain temperature will vary depending on the surface area and temperature of the milk cooler and the inlet supply water temperature. The installation technician will need to adjust the fill water volume until the minimum drain temperature is achieved for the hot-detergent cycle.
- c. The third requirement is to ensure that there is sufficient drain time between cycles. This is to prevent chemical mixing and redeposit of materials on the milk cooler surface.

6.4 MINIMUM WATER REQUIREMENTS (PER CYCLE) TO PREVENT CAVITATION

Cooler Model	Liters	U.S. Gallons
400–1,000	37.9	10.0
1,350–2,000	56.8	15.0
2,700–3,000	60.6	16.0
4,000–5,000	75.7	20.0
6,000–8,000	113.6	30.0

6.5 DETERMINING ACTUAL WATER USAGE

To estimate the actual water usage:

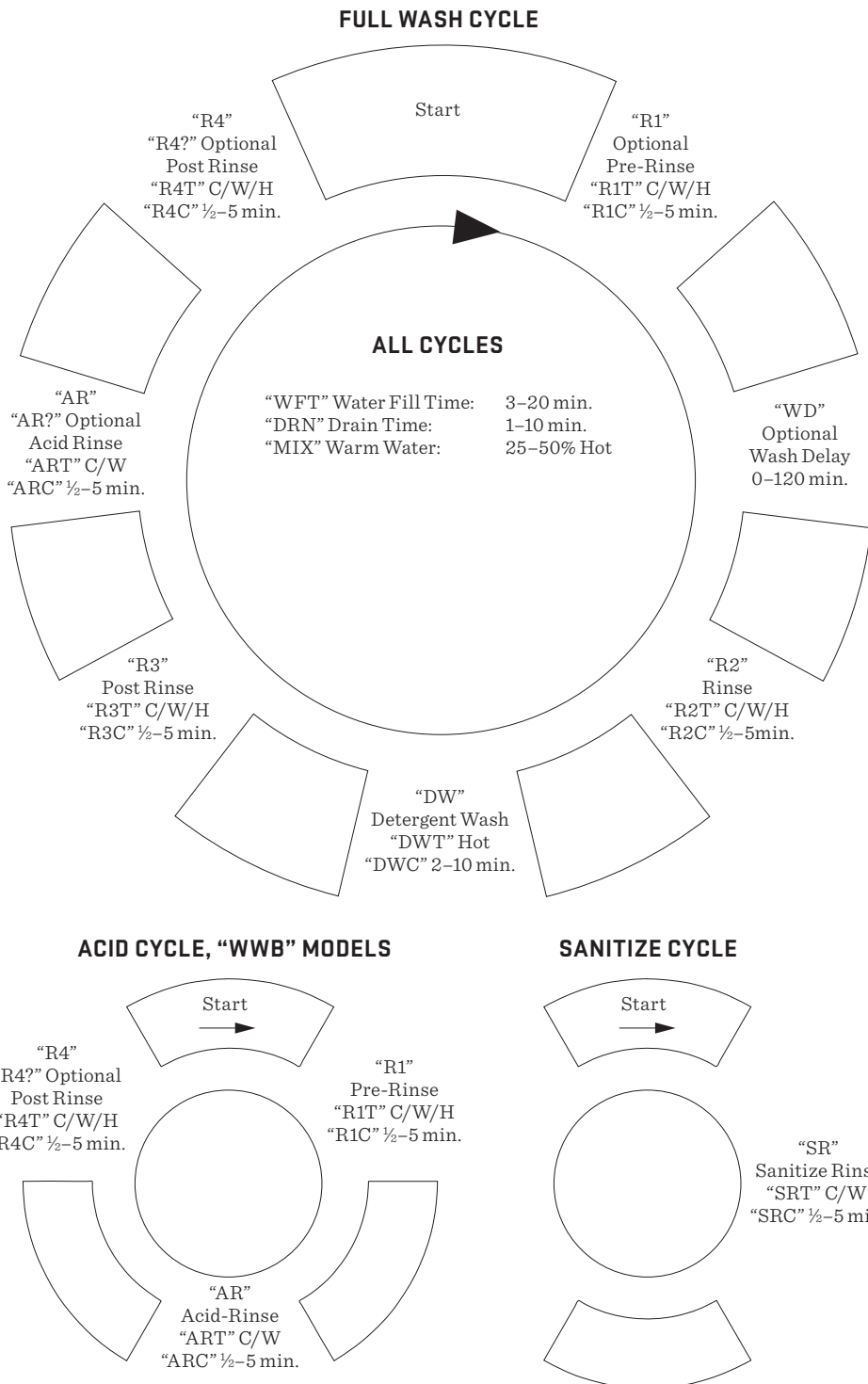
1. Measure the customer's water supply pressure.
2. Determine the programmed wash fill time (FLt) from Section 5.
3. Refer to calculated water usage provided in Section 6.6.

6.6 CALCULATED WATER USAGE (FILL-TIME/SUPPLY PRESSURE)

Measured Fill-Time (Minutes)	Measured Water Supply Pressure (psig)							
	15 psig		20 psig		30–50 psig		60 psig	
	Liters	Gallons	Liters	Gallons	Liters	Gallons	Liters	Gallons
3.00	35.89	9.48	42.59	11.25	48.83	12.90	51.10	13.50
4.00	47.85	12.64	56.78	15.00	65.11	17.20	68.14	18.00
5.00	59.81	15.80	70.98	18.75	81.39	21.50	85.17	22.50
6.00	71.77	18.96	85.17	22.50	97.66	25.80	102.21	27.00
7.00	83.73	22.12	99.37	26.25	113.94	30.10	119.24	31.50
8.00	95.70	25.28	113.56	30.00	130.22	34.40	136.27	36.00
9.00	107.66	28.44	127.76	33.75	146.50	38.70	153.31	40.50
10.00	119.62	31.60	141.95	37.50	162.77	43.00	170.34	45.00
11.00	131.58	34.76	156.15	41.25	179.05	47.30	187.38	49.50
12.00	143.54	37.92	170.34	45.00	195.33	51.60	204.41	54.00
13.00	155.50	41.08	184.54	48.75	211.60	55.90	221.45	58.50
14.00	167.47	44.24	198.73	52.50	227.88	60.20	238.48	63.00
15.00	179.43	47.40	212.93	56.25	244.16	64.50	255.52	67.50

FIGURE 25: WASH CYCLE TIMING SEQUENCE

The HiPerForm III provides several programming options for the wash cycles.



Section 7.0 – Operating Instructions

7.1 GENERAL

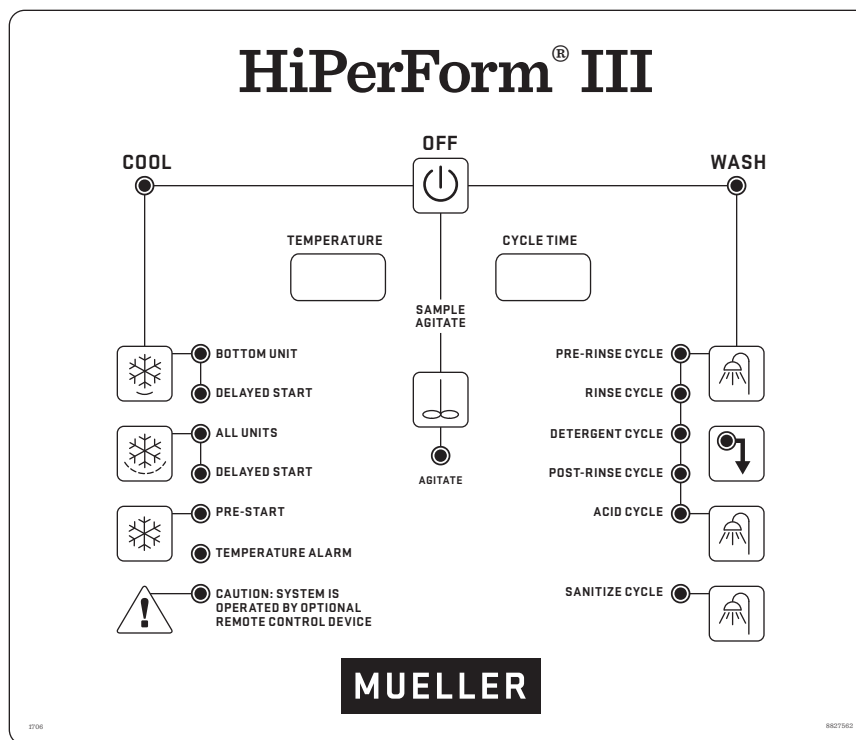
The HiPerForm III control system is designed for easy, touch-of-a-button operation with simple visual notification of each operational mode with bright, LED indicators.

Please locate the enclosed plastic laminated reference chart, Part No. 8827492, near the HiPerForm III control. This will provide unfamiliar operators with a quick reference to the basic operation and features of the HiPerForm III control system.



IMPORTANT: All Mueller bulk milk coolers are able to be cleaned-in-place (CIP-able). However, the outlet valve on this cooler must be manually cleaned prior to the sanitize cycle. All equipment must be washed and sanitized before first use from Paul Mueller Company.

FIGURE 26: HIPERFORM III OPERATING CONTROLS



7.2 OFF SWITCH

Press the “OFF” switch for E-stop, the off mode, when the milk cooler is not in use, in sample agitation mode, or prior to initiating the programming mode as described in Section 5.

7.3 COOLING BOTTOM UNIT SWITCH

1. Press the cooling “Bottom Unit” switch once to initiate the time-delayed start of the bottom refrigeration unit(s). See Section 5.2, “*bud*” (bottom unit delay, adjustable from 0–120 minutes). The “Delayed Start” LED will flash until the time delay has expired. After the time delay has expired, the “Bottom Unit” LED will illuminate and the bottom refrigeration unit(s) output relay will energize if the temperature control is calling for cooling. See Section 5.2, “*SP1*” (setpoint 1) and “*dF1*” (differential 1).
2. Pressing the cooling “Bottom Unit” switch a second time will bypass the programmable time delay and immediately start the bottom refrigeration unit(s).
3. To cancel the bottom unit or all refrigeration unit(s), press the “OFF” switch.

7.4 COOLING ALL UNITS SWITCH

1. Press the cooling “All Units” switch once to initiate the time-delayed start of the side refrigeration unit(s). See Section 5.2, “*Aud*” (all units delay, adjustable from 0–999 minutes). The “Delayed Start” LED will flash until the time delay has expired. After the time delay has expired, the “All Units” LED will illuminate and the all units refrigeration output relay will energize if the temperature control is calling for cooling. See Section 5.2, “*SP2*” (setpoint 2) and “*dF2*” (differential 2).

NOTE: The time delay for cooling “All Units” will not start timing until the cooling bottom unit time delay expires.

2. Pressing the cooling “All Units” switch a second time will bypass the programmable time delay and immediately start the bottom and side refrigeration units.
3. To cancel the bottom unit or all refrigeration unit(s), press the “OFF” switch.

NOTE: If the “Bottom Unit” delay and the “All Units” delay are properly programmed to ensure the evaporators have adequate milk coverage prior to expiration of the programmable cooling delays, it is possible to bypass the cooling “Bottom Unit” switch and start the initial cooling mode by pressing the cooling “All Units” switch first. This initiates the time-delayed start of the bottom unit(s). Once the “Bottom Unit(s)” delay expires, the “All Units” time delay will initiate. See example below.

Example: The “Bottom Unit” delay, “*bud*,” is programmed for 30 minutes and the “All Units” delay, “*Aud*,” is programmed for 180 minutes. Pressing the cooling “All Units” switch once will start the time-delayed start of the bottom refrigeration unit(s) and flash of the “Bottom Unit(s)” delayed start LED.

In 30 minutes, the “Bottom Unit” LED will illuminate and the bottom refrigeration unit(s) will energize if the milk temperature is at or above the temperature control setpoint, “*SP1*,” plus the differential, “*dF1*.”

After the 30-minute “Bottom Unit” delay expires, the 180-minute “All Units” delay will start timing and flash the “All Units” delayed start LED. 180 minutes after the “All Units” delay expires, the “All Units” LED will illuminate and the “All Units” refrigeration output will energize if the milk temperature is at or above the “All Units” temperature control setpoint, “*SP2*,” plus the differential, “*dF2*.”

7.5 PRE-START SWITCH

1. With cooling “Bottom Unit” and/or cooling “All Units” in the automatic cool position, press the “Pre-Start” switch once to initiate pre-start agitate, an automatic override of the agitator(s), for 30 or 60 minutes. See Section 5.2, “*P5A*.”
2. Press the “Pre-Start” switch a second time to initiate pre-start cooling, an automatic override of the agitator(s) and refrigeration unit(s), for 30 or 60 minutes. After the programmed time period expires, the refrigeration unit(s) will return to the normal cooling mode. This feature will pre-cool and blend the milk to 34°F (1.1°C) at the onset of the second, third, or fourth milkings. See Section 5.2, “*P5C*.”
3. Press the “Pre-Start” switch a third time to cancel the pre-start feature.

7.6 TEMPERATURE ALARM LED

1. The “Temperature Alarm” LED gives a visual indication of milk temperature conditions. If the temperature alarm is flashing, the milk temperature is either below 34°F (1.1°C) or above 44°F (6.6°C).



IMPORTANT: The HiPerForm III has two new programming parameters for the temperature alarm, which includes a temperature alarm delay, “*LAd*,” and a high temperature delay, “*Ht d*.” See steps 2 and 3.

2. The temperature alarm delay, “*LAd*,” allows the installer to program a 0–240 minute delay of the high temperature alarm (>44°F/6.6°C) at the onset of the first milking. This delay timer starts when the “Bottom Unit” or “All Units” switch is selected the first time after wash or off modes. See Section 5.2.
3. The high temperature delay, “*Ht d*,” allows the installer to program a 0–60 minute “active on delay” of the high temperature alarm (>44°F/6.6°C). This delay timer is designed to eliminate nuisance high temperature alarms with milk cooler installations that bottom fill and momentarily pump hot milk past the temperature sensor in the milk cooler. For an example, if the high temperature delay, “*Ht d*,” is programmed for four minutes, the milk temperature at the milk cooler temperature sensor must remain above 44°F/6.6°C for a period of four minutes prior to sending an active high temperature alarm. See Section 5.2. If this parameter is programmed for zero minutes, the temperature alarm is deactivated. Program for at least one minute.
4. A remote alarm is also incorporated into the relay board inside of the control box. This is a 24-VAC output that can be connected to a remote lamp or buzzer. The remote alarm flashes when milk is below 34°F (1.1°C) or above 44°F (6.6°C) and on solid between 34°F and 44°F. See wiring schematic for remote alarm wiring.

7.7 WASH CYCLE SWITCH (LOCATED TO THE RIGHT OF THE PRE-RINSE CYCLE TEXT)

The HiPerForm III is designed for fully programmable wash options including water fill, drain, circulation, and chemical dispensing times. During the detergent wash cycle, the cycle time display will numerically count down the remaining time to complete the wash cycle. See programmable options in Sections 5.1–5.5 and wash charts. Pressing the (top) wash cycle switch offers multiple programming options:

1. “Pre-Rinse (Optional) — Rinse — Detergent — Post Rinse.”
2. “Pre-Rinse (Optional) — Rinse — Detergent — Post Rinse — Acid/Sanitize.”
(This option is recommended by Paul Mueller Company.)

7.7 WASH CYCLE SWITCH (CONTINUED)

3. “Pre-Rinse (Optional) — Rinse — Detergent — Post Rinse — Acid/Sanitize — Post Rinse.”
4. A programmable 0–120 minute delayed start is available to allow sufficient recovery time for the water-heating device. If a time delay is programmed, the program will perform the pre-rinse cycle and then delay for the programmed time of 0–120 minutes. After the delay expires, the wash cycle will continue with the rinse, detergent, post rinse, and acid/sanitize cycles. See programmable options for wash delay, “dL 9,” in Section 5.4.
5. Incorporated into the detergent wash cycle is a low water temperature alarm, “L 0L.” The “L 0L” takes a temperature reading during the detergent drain cycle and if this reading is below the programmed low water temperature setting, “L 0L” will be displayed in the cycle time display at the end of the wash cycle. This is only an indicator of low detergent wash water temperature; all wash cycles function normally. When the HiPerForm III is turned to the off position, the alarm is cleared. See “L 0L” programmable options in Section 5.4.
6. To cancel a wash cycle, press the “OFF” switch.

7.8 ADVANCE SWITCH

1. The HiPerForm III incorporates an “Advance” switch to advance through the wash cycles. The “Advance” switch is intended for service and testing of cycles and is not intended to shorten wash times.
2. Press once to advance to drain of current cycle. This allows water and chemicals to be drained before the next cycle can be started to prevent mixing of chemicals in the milk cooler.

7.9 ACID CYCLE SWITCH

1. At the end of a complete wash cycle or with the HiPerForm III in the off position, press the “Acid Cycle” switch once to start a “Pre-Rinse — Acid Wash” cycle.
2. To cancel and reset the acid wash, press the “OFF” switch.

7.10 SANITIZE CYCLE SWITCH

1. At the end of a complete wash cycle or with the HiPerForm III in the off position, press the “Sanitize Cycle” switch once to start a sanitize cycle. There are no pre-rinses or post rinses on the sanitize cycle.
2. To cancel and reset the sanitize cycle, press the “OFF” switch.

7.11 AGITATE SAMPLE SWITCH

1. With the HiPerForm III in the off position, press the “Sample Agitate” switch once to start the agitator(s) for milk sampling. The agitator(s) will operate for the programmed period of one to 30 minutes and shut off automatically. Recommended sample agitation time is five minutes for milk coolers less than 2,000 gallons, ten minutes for 2,000- to 8,000-gallon milk coolers, and 15–30 minutes for vertical silos greater than 8,000 gallons. See Section 5.2.
2. The sample agitation time will display in the “Cycle Time” window and count down to zero minutes.
3. To cancel “Sample Agitate,” press the switch a second time.

7.12 MILK TEMPERATURE DISPLAY

The milk temperature display provides a digital readout of the product temperature. To ensure calibration accuracy and safe product holding temperatures, check and compare the actual product temperature with an accurate secondary thermometer on a regular basis. See Section 5.2, Calibration “*LR*.”

7.13 CYCLE TIME DISPLAY

1. The “Cycle Time” display is intended to show refrigeration run time and wash timer count down.
2. During the cooling cycle, the “Cycle Time” display will show the accumulated run time of the bottom refrigeration unit(s) in $\frac{1}{10}$ hours. The run time will continue to accumulate until the HiPerForm III is turned to the off position.
3. During the wash cycles, the “Cycle Time” display will count down the time remaining in the wash and display a flashing “0” when the wash cycle is complete. Switching the HiPerForm III to “OFF” will clear the display.
4. The “Cycle Time” display is also used to display the parameter settings while programming the HiPerForm III.

7.14 COOLING OVERRIDE SWITCH (FOR AUTHORIZED SERVICE TECHNICIAN USE ONLY)



WARNING! Risks of electrical shock exist. Failure to disconnect power from HiPerForm III control before servicing may result in death or serious injury. Service should be performed by an authorized service technician only.

1. The HiPerForm III has an emergency override switch located inside the enclosure. This will override the temperature control and engage the bottom refrigeration unit(s) (Relay R1) and agitator(s) in an emergency situation. The emergency override only activates the 24-VAC output, not the dry switch closure.
2. To access and activate this switch, turn the power off to the HiPerForm III control box, open the door and move this switch to the “Manual” position. Close the door, secure the door screws, and reapply power.



IMPORTANT: There will be no automatic temperature control in the “Manual Override Position.” When the product temperature is at a safe holding temperature, turn the power supply off to the HiPerForm III control. (This switch is for authorized Mueller Technician use only.)

Section 8.0 – HiPerForm III Equipment Markings

8.1 LABEL NO. 8822229, LOCK OUT



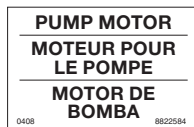
8.2 LABEL NO. 8820482, CAUTION: DISCONNECT POWER AND RETAIN LATCH



8.3 LABEL NO. 8820623, WARNING SYMBOL: ELECTRICAL



8.4 LABEL NO. 8822584, PUMP MOTOR WIRE MARKER



8.5 LABEL NO. 8802375, AGITATOR(S) WIRE MARKER



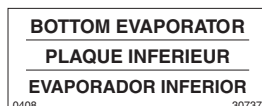
8.6 LABEL NO. 3791, HOT WATER VALVE MARKER



8.7 LABEL NO. 3792, COLD WATER VALVE MARKER



8.8 LABEL NO. 30737, BOTTOM TEMP-PLATE®



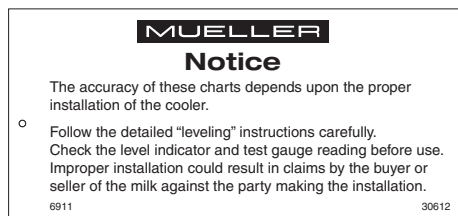
8.9 LABEL NO. 8823013, WARNING: DISCONNECT POWER BEFORE SERVICING



8.10 LABEL NO. 8801150, WARNING: DISCONNECT POWER BEFORE SERVICING



8.11 LABEL NO. 30612, NOTICE: CHART ACCURACY



8.12 LABEL NO. 8820677, GROUND SYMBOL



8.13 LABEL NO. 8820454, DRY NITROGEN HOLDING CHARGE

<p align="center">IMPORTANT</p> <p>THIS EQUIPMENT CONTAINS A HOLDING CHARGE OF DRY NITROGEN GAS. SLOWLY RELEASE PRESSURE THROUGH SERVICE PORTS OR SCHRADER VALVES BEFORE REMOVING FITTINGS.</p> <p>EVACUATE THE SYSTEM TO 500 MICRONS BEFORE CHARGING WITH REFRIGERANT. DISCARD THIS TAG UPON CHARGING SYSTEM WITH REFRIGERANT AND APPLY A SYSTEM REFRIGERANT SPECIFICATION DECAL.</p> <p><u>NOTE: IT IS THE TECHNICIAN'S RESPONSIBILITY TO COMPLY WITH ALL CURRENT REFRIGERANT USAGE REGULATIONS.</u></p> <p align="right"><small>(11/94) 8820454</small></p>

8.14 LABEL NO. 8822705, CANADIAN AND U.S. CERTIFICATION




8.15 LABEL NO. 30890, MUELLER CONTROL BOX DATA TAG

PAUL MUELLER COMPANY					
PRODUCT					
<input type="text"/>					
MODEL NUMBER	PART NUMBER	SERIAL NUMBER			
<input type="text"/>	<input type="text"/>	<input type="text"/>			
VOLTS	HERTZ	PHASE	LRG MOTOR AMPS	FLA	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
<input type="text"/>					
DISCONNECT MAIN POWER SUPPLY BEFORE SERVICING. ROMPRE LE CABLE DE DISTRIBUTION AVANT DE REPARER.					
<small>17706</small>	<small>30890</small>				

8.16 LABEL NO. 30166, CAUTION: VENT MUST BE OVER MILK INLET

<p>⚠ CAUTION</p> <p>VENT ASSEMBLY MUST BE OVER MILK INLET AT ALL TIMES.</p>	
<p>⚠ MISE EN GARDE</p> <p>LE MONTAGE DE VENTILATION DOIT ÊTRE AU DESSUS DE L'ENTRÉE DU LAIT EN TOUT TEMPS.</p>	
<p>⚠ ¡PRECAUCIÓN!</p> <p>EL ENSAMBLE DE RESPIRACIÓN DEBE ESTAR SOBRE LA ENTRADA DE LECHE EN TODO MOMENTO.</p>	
<small>0408</small>	<small>30166</small>

8.17 LABEL NO. 8805299, WARNING: HCFC CLASS II REFRIGERANT
(TO BE APPLIED AFTER INSTALLATION)

<div><h1>WARNING</h1></div>
<p>THIS EQUIPMENT CONTAINS R-22 HYDROCHLOROFLUOROCARBON (HCFC CLASS II)</p> <p>A SUBSTANCE THAT, IF RELEASED INTO THE ENVIRONMENT, WILL CONTRIBUTE TO A SERIOUS PUBLIC HEALTH AND ENVIRONMENTAL PROBLEM BY DEPLETING THE OZONE LAYER. OZONE LAYER DEPLETION INCREASES THE RISK OF SKIN CANCER AND OTHER DISEASES IN HUMANS AND IS HARMFUL TO PLANT AND ANIMAL LIFE.</p> <p>THIS EQUIPMENT SHALL BE SERVICED AND DISPOSED OF ONLY IN ACCORDANCE WITH THE OZONE DEPLETING SUBSTANCES REGULATION - CLEAN ENVIRONMENT ACT.</p> <p>N.B. This regulation is consolidated to September 30, 1992.</p> <p>LE PRÉSENT ÉQUIPEMENT CONTIENT R-22 HYDROCHLOROFLUOROCARBON (HCFC CLASS II)</p> <p>UNE SUBSTANCE QUI, LORSQU'ÉMISE DANS L'ENVIRONNEMENT, CONSTITUE UN SÉRIEUX DANGER À LA SANTÉ PUBLIQUE ET À L'ENVIRONNEMENT EN APPAUVRISANT LA COUCHE D'OZONE. L'APPAUVRISSMENT DE LA COUCHE D'OZONE AUGMENTE LES RISQUES DE CANCER DE LA PEAU ET D'AUTRES MALADIES CHEZ LES HUMAINS ET CONSTITUE UN DANGER À LA VIE VÉGÉTALE ET ANIMALE.</p> <p>LE PRÉSENT ÉQUIPEMENT EST MIS EN SERVICE ET N'EST ÉLIMINÉ QU'EN CONFORMITÉ DU RÉGLEMENT SUR LES SUBSTANCES APPAUVRISANT LA COUCHE D'OZONE - LOI SUR L'ASSAINISSEMENT DE L'ENVIRONNEMENT.</p> <p>N.B. Le présent règlement est refondu au 30 septembre 1992.</p> <p>ESTE EQUIPO CONTIENE FLUOROCARBURRO HIDROCLORADO R-22 (HCFC CLASS II)</p> <p>(Escriba el nombre de la substancia empobrecedora de la capa de ozono.)</p> <p>UNA SUBSTANCIA QUE, SI SE SUELTA AL MEDIO AMBIENTE, CONSTITUIRA UN SERIO PELIGRO PARA EL AMBIENTE Y LA SALUD PUBLICA AL EMPOBRECE LA CAPA DE OZONO. EL EMPOBRECIMIENTO DE LA CAPA DE OZONO AUMENTA EL RIESGO DE CANCER A LA PIEL Y OTRAS ENFERMEDADES EN LOS SERES HUMANOS Y ES TAMBIEN DAÑINO PARA LA VIDA DE LAS PLANTAS Y LOS ANIMALES.</p> <p>EL MANTENIMIENTO Y LA ELIMINACION DE ESTE EQUIPO SOLO SE PODRA REALIZAR EN CUMPLIMIENTO CON LAS NORMAS SOBRE LAS SUBSTANCIAS EMPOBRECEDORAS DE LA CAPA DE OZONO - LEY PARA LA CONSERVACION DEL AMBIENTE LIMPIO.</p> <p>N.B. La presente norma se ha consolidado hasta el 30 de septiembre de 1992.</p>
8805299

8.18 LABEL NO. 8822558, MUELLER MILK COOLER DATA TAG

<input type="radio"/> PAUL MUELLER COMPANY		<input type="radio"/>	
<h2>Milk Cooler</h2>		SERIAL NUMBER	DATE OF MANUFACTURE
MODEL AND NOMINAL CAPACITY	CALIBRATED CAPACITY U.S. GALLONS	EVAPORATOR DESIGN WORKING PRESSURE PSI	REFRIGERANT
VOLTS	TWO WIRES WITH GROUND HERTZ	PHASE	AGITATOR
		FLA	PUMP
		MINIMUM CIRCUIT AMPACITY	PUMP
<p>THIS COOLER IS DESIGNED FOR EVERYDAY OR EVERY-OTHER-DAY PICKUP. THE MAXIMUM RATE MILK CAN ENTER THE COOLER AND MEET THE COOLING REQUIREMENTS OF 3-A SANITARY STANDARDS FOR FARM MILK COOLING AND HOLDING TANKS, NUMBER 13-11, IS _____ U.S. GALLONS PER HOUR FOR EVERYDAY PICKUP AND _____ U.S. GALLONS PER HOUR FOR EVERY-OTHER-DAY PICKUP. WHEN MILK ENTERS THE COOLER AT THE MAXIMUM RATE, THE MINIMUM CONDENSING UNIT CAPACITY IS _____ BTU/HR AT _____ °F SATURATED SUCTION TEMPERATURE. THE AGITATOR OF THIS COOLER IS DESIGNED THAT IT MUST BE IN CONTINUOUS OPERATION _____ MINUTES BEFORE REMOVING A PRODUCT SAMPLE. THE AGITATOR OF THIS TANK IS DESIGNED SO THAT THE PORTION OF THE AGITATOR SHAFT OUTSIDE OF THE FARM TANK DOES NOT HAVE TO BE IN THE MILK ROOM WHEN USED WITH AN EXTERNAL WEATHER SHIELD.</p> <p><small>The cooling performance specified above is based upon use of the largest condensing unit recommended for this cooler. Smaller condensing units may be used, but at reduced fill rates. For electrical characteristics of the condensing unit, refer to the data plate on the condensing unit. This cooler is designed for use with a Mueller® cooling control and wash system. Contact your Mueller dealer for assistance in condensing unit sizing.</small></p>			
FOR OUTDOOR USE		NUMBER 13-11	
1708		8822558	
1-800-MUELLER WWW.PAULMUELLER.COM			

8.19 LABEL NO. 8802777, CAUTION: DO NOT SANITIZE

<div><h2>CAUTION</h2></div> <p>DO NOT SANITIZE YOUR COOLER WITH SOLUTIONS CONTAINING IN EXCESS OF 200 PARTS PER MILLION OF CHLORINE. DO NOT MIX SANITIZERS OR ANY CHLORINE CONTAINING SUBSTANCES WITH ACID AS THIS WILL RESULT IN DAMAGE TO THE STAINLESS STEEL SURFACE AND CAN GENERATE A GAS THAT IS LETHAL TO YOUR HEALTH. DO NOT EXCEED 170 F (76 C) DURING THE WASH CYCLES.</p>	<div><h2>MISE EN GARDE</h2></div> <p>NE PAS ASSAINIR VOTRE BASSIN REFRIGÉRISEUR AVEC DES SOLUTIONS QUI CONTIENNENT PLUS DE 200 PARTIES PAR MILLION DE CHLORE. NE PAS MÉLANGER LES ASSAINISSEURS OU DU CHLORE CONTENANT DES SUBSTANCES AVEC ACIDE CAR CECI CAUSERA DES DOMMAGES À LA SURFACE EN ACIER INOXYDABLE ET PEUT PROVOQUER UN GAZ NÉFASTE À VOTRE SANTÉ. LA TEMPÉRATURE DU CYCLE DE LAVAGE NE DOIT PAS EXCÉDER 170 F (76 C).</p>	<div><h2>¡PRECAUCIÓN!</h2></div> <p>NO SANITIZE SU TANQUE CON SOLUCIONES QUE CONTENGAN MAS DE 200 PPM DE CLORO. NO MEZCLE SANITIZANTES Ó SUBSTANCIAS QUE CONTENGAN CLORO, CON ÁCIDO, YA QUE ESTO DAÑARÁ LA SUPERFICIE DEL ACERO INOXIDABLE Y PUEDE LIBERAR UN GAS QUE ES LETAL PARA SU SALUD. DURANTE LOS CICLOS DE LAVADO NO EXCEDA LOS 76°C (170°F).</p>
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Section 9.0 – Safety



NOTE: SEE ALL SAFETY, WARNING, AND CAUTION LABELS DISPLAYED IN SECTION 8.

9.1 GENERAL

1. The Mueller milk cooler and HiPerForm III control system should be operated by qualified personal who are familiar with the equipment and instructions.
2. Improper handling, operation, or service of the equipment, cleaning chemicals, and/or electricity can create a health hazard and possible non-warranted damage to the equipment.
3. An authorized Mueller Service Representative who is trained and certified in electrical and refrigeration work must perform all service.



CAUTION: The equipment can start automatically! Use extreme caution when servicing. All guards and covers must be in place during operation to prevent mechanical and electrical hazards.

9.2 MANWAY SAFETY

The Mueller milk cooler manway cover is supplied with a lock-out cover to prevent entry during operation. Ensure that this is securely locked during operation.

In the need to enter the milk cooler for inspection or maintenance follow the “Confined Entry” laws and perform the following steps:



WARNING: Failure to perform the following steps can present personal injury due to live moving parts and possible electrical shock.

1. Disconnect and lock-out the main power supply to the milk cooler prior to entry.
2. Remove the milk cooler manway lock and locking strap and retain during entry.
3. Detach the milk cooler manway cover and place in secure location.

9.3 LADDER SAFETY

Mueller direct-mounted milk cooler ladders are designed and constructed to meet or exceed OSHA regulations. Mueller’s welded ladder construction of stainless steel and anti-skid steps provides a safe ladder that requires little maintenance. However, any ladder may pose a safety risk if not properly used or maintained.

Proper use of the fixed ladder system will contribute significantly to safety. Haste, sudden movements, lack of attention during use, ladder condition (worn or damaged), and physical condition contribute to falls. Footwear employed by the user may also contribute to falls. Improper climbing posture which creates user clumsiness on the ladder may also cause falls. Ladders shall be routinely inspected to ensure they meet the criteria set forth by the American National Standards Institute (ANSI) and Occupational Safety and Health Act (OSHA).

9.3 LADDER SAFETY (CONTINUED)

A. Inspection

ANSI and OSHA recommend performing the following checklist before each use:

1. Inspect ladder for missing or damaged components.
2. Inspect thoroughly for loose, worn, or broken fasteners.
3. Keep ladder free of any foreign materials.
4. Inspect all ladder welds to ensure they are secure and free of cracks.
5. Inspect all mounting hardware to ensure that it is tight, secure, and free of wear.

B. Proper Use

1. When ascending/descending a ladder, the user shall face the ladder and maintain a three-point contact at all times. Three-point contact consists of two feet and one hand or two hands and one foot, which is safely supporting user's weight when ascending/descending ladders.
2. The user shall not carry tools or equipment while ascending/descending a ladder. Both hands and arms shall remain free for climbing. Hand tools shall be carried in a pouch holster or otherwise secured, to help avoid creating a hazard. Alternative methods, other than being carried by the ladder user, shall be implemented to handle materials and supplies.
3. The user shall never jump or slide down from a ladder or climb more than one step/rung at a time.
4. Keep body centered between side rails at all times.
5. Do not overreach the ladder.
6. Do not use a ladder when impaired with a medical condition or influenced by any drug.

Section 10.0 – Scheduled Maintenance

10.1 GENERAL

With milk quality being dependent upon adequate cooling and system cleanliness, it is recommended that the owner, in conjunction with a knowledgeable service technician, develop a preventative maintenance schedule before using the equipment during which all milk cooler components shall be inspected for proper cleaning and operation. It is important to understand that the frequency of inspections will vary depending on the environmental conditions surrounding the installation and may be unique to each dairy. General guidelines include, but are not limited to, the following:

10.2 SCHEDULED MAINTENANCE GUIDELINES: THIRTY (30) DAY INTERVALS

- **Evaluate, repair and/or replace parts as needed.**¹
- Confirm 115°F minimum water temperature during detergent wash cycle at detergent drain.
- Confirm 170°F maximum wash water temperature at inlet.²
- Confirm correct pH of chemicals and PPM of chlorine.
- Inspect ladder for damage or wear. (See Section 9.3, “Ladder Safety.”)
- Check milk temperature display accuracy.

10.3 SCHEDULED MAINTENANCE GUIDELINES: SIXTY (60) DAY INTERVALS

- **Evaluate, repair and/or replace parts as needed.**¹
- Confirm correct operation of condenser fan on air cooled refrigeration units, and identify irregular noise which could indicate motor or fan blade failure.
- Inspect condenser coils on air cooled refrigeration units for excessive dirt accumulation and clean with approved copper/aluminum coil cleaner as required.
- Visually inspect the internal walls of milk cooler and other product contact surfaces for protein, fat, or mineral deposits. If surfaces are not clean, consult a knowledgeable service technician for necessary adjustments to the cleaning cycle, water supply, or chemicals used.

10.4 SCHEDULED MAINTENANCE GUIDELINES: NINETY (90) DAY INTERVALS

- **Evaluate, repair and/or replace parts as needed.**¹
- Inspect rubber and rubber-like components (such as manway gasket and outlet valve gaskets) for cracking, tearing, discoloration, loss of elasticity, or inking. Replace as needed.
- Check agitator drives for noise, leakage, and correct clockwise rotation.
- Check agitator mounting hardware ensuring all bolts are tight and secure.
- Check water solenoid fill screens for contamination or restriction.

10.5 SCHEDULED MAINTENANCE GUIDELINES: ANNUAL INTERVALS

- **Evaluate, repair and/or replace parts as needed.**¹
- Perform refrigeration system cooling performance survey.¹
- Perform wash system performance survey.¹

¹ All inspection, repair, and service of electrical and refrigeration components should be performed by a Paul Mueller Company Authorized Dairy Farm Equipment Dealer using Mueller® trained and certified Service Technicians.

² Any equipment problem which could result from exceeding this limit will be considered outside the scope of the Paul Mueller Company warranty and the sole responsibility of the owner.



IMPORTANT: Paul Mueller Company cannot be held responsible for technical problems, damage, or product loss when competitive or non-factory authorized parts/components are applied in conjunction with Mueller equipment.

Section 11.0 – Disposal

11.1 GENERAL

If the milk cooler and controls are removed from the installation site, ensure the materials, refrigerants, and chemicals are handled and/or disposed of according to applicable codes and regulations.

11.2 CHEMICAL DISPOSAL

All detergents, acids, sanitizers, refrigerants, and oils can be harmful and toxic to the environment if not properly disposed of. Consult each chemical label and comply with all local environmental regulations and agencies.

11.3 SOLID COMPONENT DISPOSAL

The milk cooler's basic components consist of steel, copper, rubber, and plastics which may be separated and recycled. The CFC-free foam insulation should be disposed of according to local environmental regulations and agencies.

Please complete for future service reference:

Mueller Authorized Dealer:

Name:

Address:

Phone:

Contact:

End User/Owner:

Name:

Address:

Phone:

Contact:

Please record the selected program options:

HiPerForm III ADB/WWB Wash Parameters				
ADB/WWB	<i>con</i>	Selects wash control type.	<i>Rdb</i> or <i>uub</i>	
ADB/WWB	<i>drP</i>	Selects normally open or normally closed drain valves.	"NO/NC"	
ADB/WWB	<i>tut</i>	Total wash time.	"XXX" Min.	
ADB/WWB	<i>tAt</i>	Total acid time.	"XXX" Min.	
ADB/WWB	<i>tSt</i>	Total sanitize time.	"XXX" Min.	
ADB/WWB	<i>dLy</i>	Wash delay.	"0 to 120" Min.	
ADB/WWB	<i>Ft</i>	Wash fill time.	"3 to 20" Min.	
ADB/WWB	<i>H-C</i>	Mix temperature ratio for warm water cycles.	"25-50%"	
ADB/WWB	<i>drn</i>	Drain time (Drain LED).	"1 to 10" Min.	
ADB/WWB	<i>rip</i>	Selects option of a pre-rinse to help remove milk residue.	"Yes/No"	
ADB/WWB	<i>rit</i>	Rinse number 1 temperature (Pre-Rinse Cycle LED).	"CLD/WRM/HOT"	
ADB/WWB	<i>ric</i>	Rinse number 1 circulation time (Pre-Rinse Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/WWB	<i>rit</i>	Rinse number 2 temperature (Rinse Cycle LED).	"CLD/WRM/HOT"	
ADB/WWB	<i>ric</i>	Rinse circulation time (Rinse Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/-----	<i>Rut</i>	Acid wash temperature, super wash option on ADB only (Acid Cycle LED).	"CLD/WRM/HOT"	
ADB/-----	<i>Ruc</i>	Acid wash circulation time, super wash option on ADB only (Acid Cycle and Circulation LED).	"2 to 10" Min.	
ADB/WWB	<i>dut</i>	Detergent wash temperature (Detergent Cycle LED).	"HOT"	
ADB/WWB	<i>duc</i>	Detergent circulation time (Detergent Cycle and Circulation LED).	"2 to 10" Min.	
ADB/WWB	<i>Lut</i>	Low wash temperature notification.	80-140°F (26.5-60°C)	
ADB/WWB	<i>rit</i>	Rinse number 3 temperature (Post Rinse Cycle LED)	"CLD/WRM/HOT"	
ADB/WWB	<i>ric</i>	Rinse number 3 circulation time (Post Rinse Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/WWB	<i>Ar?</i>	Selects automatic 5th cycle (acid rinse) during full wash selection (Acid Cycle LED).	"Yes/No"	
ADB/WWB	<i>Art</i>	Acid rinse temperature (Acid Cycle LED).	"CLD/WRM"	
ADB/WWB	<i>Arc</i>	Acid rinse circulation time (Acid Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/WWB	<i>rit</i>	Rinse number 4 acid post rinse (Post Rinse LED if "Yes").	"Yes/No"	
ADB/WWB	<i>rit</i>	Rinse number 4 temperature acid post rinse (Post Rinse Cycle LED).	"CLD/WRM/HOT"	
ADB/WWB	<i>ric</i>	Rinse number 4 circulation time acid post rinse (Post Rinse Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/WWB	<i>St</i>	Sanitize rinse temperature (Sanitize Cycle LED).	"CLD/WRM"	
ADB/WWB	<i>Sc</i>	Sanitize circulation time (Sanitize Cycle and Circulation LED).	"0.5 to 5" Min.	
ADB/-----	<i>dut</i>	Detergent wash dosing pump time (Detergent Cycle LED).	"0-600" Sec.	
ADB/-----	<i>Rut</i>	Acid wash dosing pump time (Acid Cycle LED).	"0-600" Sec.	
ADB/-----	<i>Art</i>	Acid rinse dosing pump time (Acid Cycle LED).	"0-600" Sec.	
ADB/-----	<i>St</i>	Sanitize rinse dosing pump time (Sanitize Cycle LED).	"0-600" Sec.	

MUELLER HIPERFORM III SERVICE REFERENCE FORM: PROGRAMMABLE FEATURES

Please record the selected program options:

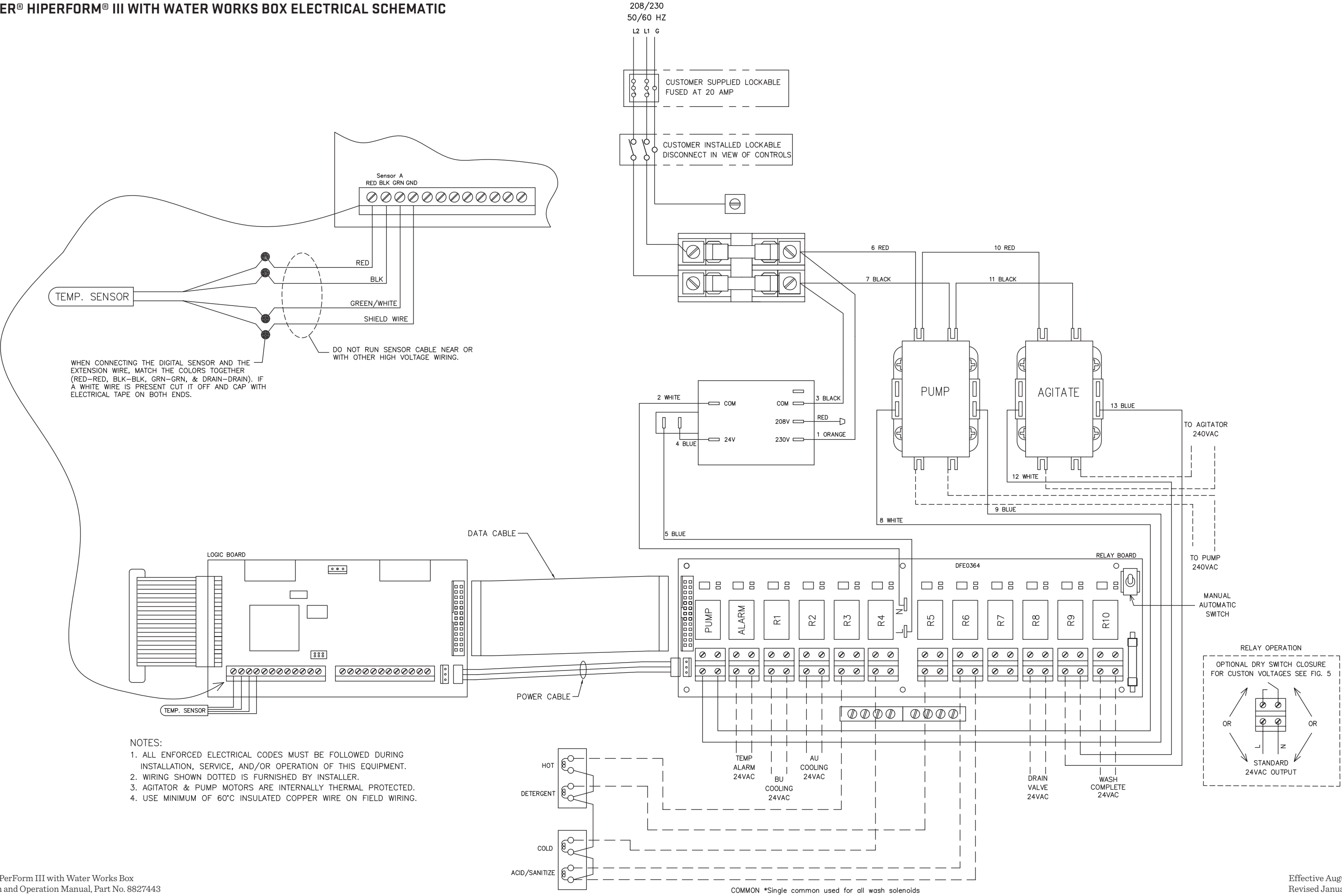
HiPerForm III MMB Wash Parameters with Water Operated Drain				
MMB	<i>con</i>	Selects wash control type.	<i>nnb</i>	
MMB	<i>dr</i>	Selects drain valve type.	"HYD"	
MMB	<i>ut</i>	Selects wash timer emulation.	"A/B"	
MMB	<i>twt</i>	Total wash time.	"40/80"	
MMB	<i>tAt</i>	Total acid time.	"20/40"	
MMB	<i>tSt</i>	Total sanitize time.	"10/20"	
MMB	<i>dLy</i>	Wash delay.	"0 to 120" Min.	
MMB	<i>FLt</i>	Water fill time.	"8.0/16.0"	
MMB	<i>drn</i>	Drain time (Drain LED).	"2.0/4.0"	
MMB	<i>r 1?</i>	Rinse number 1 pre-rinse (Pre-Rinse LED if "Yes").	"Yes/No"	
MMB	<i>r 1t</i>	Rinse number 1 temperature (Pre-Rinse Cycle LED).	"CLD"	
MMB	<i>r 1c</i>	Rinse number 1 circulation time (Pre-Rinse Cycle and Circulation LED).	"1.0/2.0"	
MMB	<i>r 2t</i>	Rinse number 2 temperature (Rinse Cycle LED).	"HOT"	
MMB	<i>r 2c</i>	Rinse circulation time (Rinse Cycle and Circulation LED).	"2.0/4.0"	
MMB	<i>dwt</i>	Detergent wash temperature (Detergent Cycle LED).	"HOT"	
MMB	<i>dwc</i>	Detergent circulation time (Detergent Cycle and Circulation LED).	"4.0/8.0"	
MMB	<i>Lwt</i>	Low wash temperature notification.	80–140°F (26.5–60°C)	
MMB	<i>r 3t</i>	Rinse number 3 temperature (Post-Rinse Cycle LED).	"HOT"	
MMB	<i>r 3c</i>	Rinse number 3 circulation time (Post-Rinse Cycle and Circulation LED).	"2.0/4.0"	
MMB	<i>Ar ?</i>	Selects automatic 5th cycle acid-rinse during full wash selection (Acid Cycle LED).	"Yes/No"	
MMB	<i>Art</i>	Acid rinse temperature (Acid Cycle LED).	"CLD"	
MMB	<i>Arc</i>	Acid rinse circulation time (Acid Cycle and Circulation LED).	"2.0/4.0"	
MMB	<i>Srt</i>	Sanitize rinse temperature (Sanitize Cycle LED).	"CLD"	
MMB	<i>Src</i>	Sanitize circulation time (Sanitize Cycle and Circulation LED).	"2.0/4.0"	

MUELLER HIPERFORM III SERVICE REFERENCE FORM: PROGRAMMABLE FEATURES

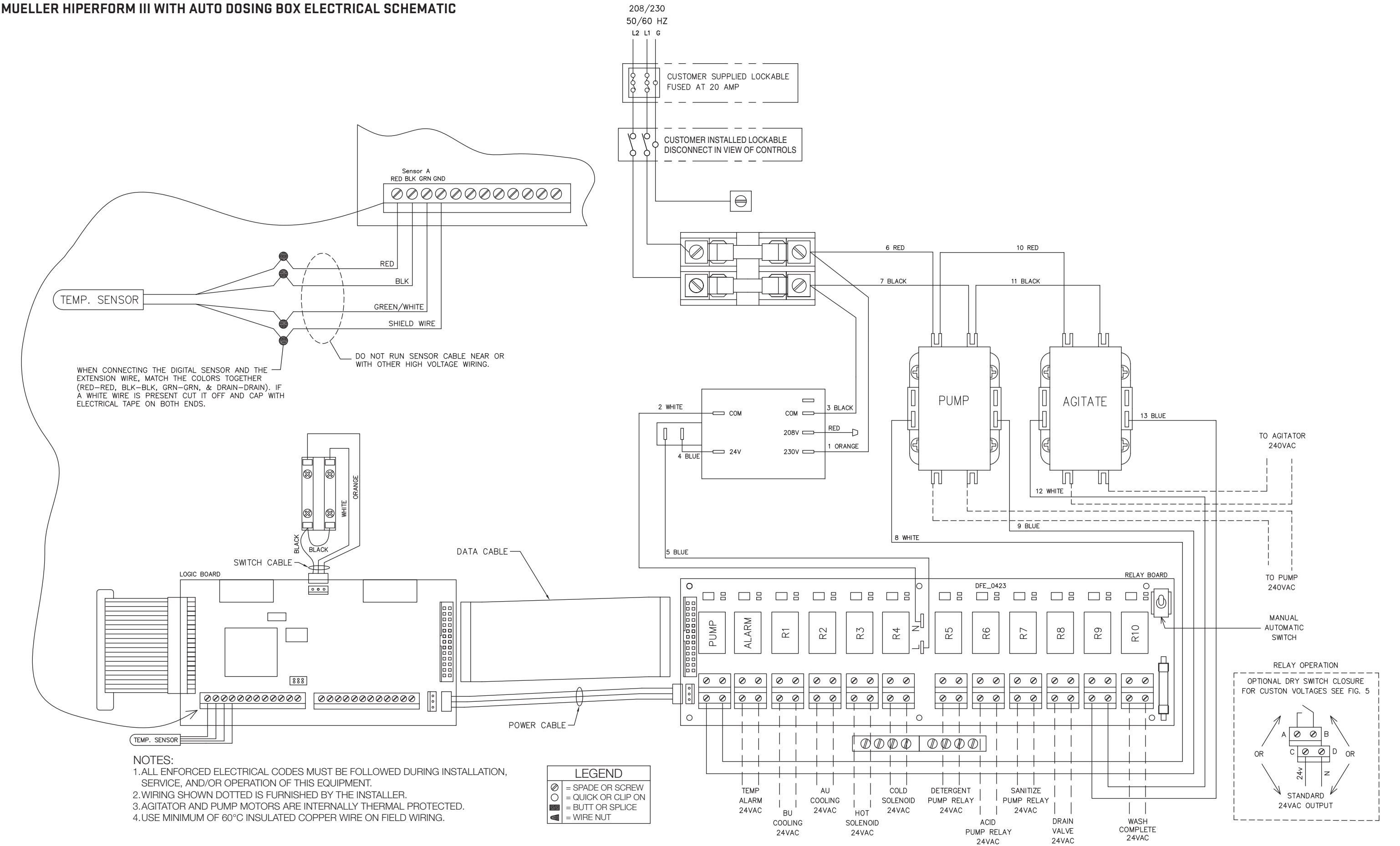
Please record the selected program options:

HiPerForm III Cooling Mode Parameter Table					
No.	Parameter Code	Parameter Code Description	Parameter Option(s)	Operational Description	
1	<i>bud</i>	Bottom Unit Delay (Bottom Unit Delayed Start LED — Flash)	0–120	Starts the programmed “Bottom Unit” delay after pressing the “Bottom Unit” switch once when in Cooling mode. Pressing the “Bottom Unit” switch a second time will override the delay.	
2	<i>Rud</i>	All Unit Delay (All Units Delayed Start LED — Flash)	0–999	Starts the programmed “All Unit” delay after pressing the “All Units” switch once when in Cooling mode. Pressing the “All Units” switch a second time will override all delays. NOTE: If the “All Units” switch is the first switch activated in the Cooling mode, the “Bottom Unit” delay will activate (flash) and start timing and the “All Units” delay will flash but not start timing until the “Bottom Unit” delay has expired. Pressing the “All Units” switch a second time will prematurely end the “Bottom Unit” delay and the “All Units” delay. “Bottom Unit” and All Units” will be active on temperature setpoint.	
3	<i>PSC</i>	Pre-Start Cooling Cycle (Pre-Start Cooling LED)	30/60	Selects a 30- or 60-minute timer for selected refrigeration units (“Bottom Unit” or “All Units”) with a fixed temperature setpoint of 34°F (1.1°C). If no units have been selected (i.e., “Bottom Unit” or “All Units”), the “Pre-Start” switch will start the “Bottom Unit” only. Initiated by pressing the “Pre-Start” switch twice; pressing a third time will abort “Pre-Start.”	
4	<i>PSA</i>	Pre-Start Agitation Cycle (Pre-Start Agitate LED)	30/60	Selects a 30- or 60-minute timer for agitation (“Bottom Unit” and/or “All Units” will operate from programmed setpoint and differential). Initiated by pressing the “Pre-Start” switch once.	
5	<i>F-C</i>	Degree F or C Selection	F/C	Selects temperature scale.	
6	<i>CL</i>	Calibration of Temperature Sensor	–35 to 36°F (–20 to 20°C)	Adjust the calibration of the digital temperature sensor in 1 degree increments.	
7	<i>SP1</i>	Setpoint Temperature “Bottom Unit”	34 to 42°F (1.1 to 5.5°C)	Determines the temperature that “Bottom Unit” switch off, unless “Pre-Start” Cooling has been selected, at which time the setpoint will be 34°F (1.1°C) until the “Pre-Start” Cooling timer expires. (Relay board output number R1.)	
8	<i>DF1</i>	Temperature Differential 1	2 to 4	Determines the degrees above the setpoint temperature (SP1) that the “Bottom Unit” restarts. (Relay board output number R1.)	
9	<i>SP2</i>	Setpoint Temperature “All Units”	34 to 42°F (1.1 to 5.5°C)	Determines the temperature that “All Units” switch off, unless “Pre-Start” Cooling has been selected, at which time the setpoint will be 34°F (1.1°C) until the “Pre-Start” Cooling timer expires. (Relay board output number R2.)	
10	<i>DF2</i>	Temperature Differential 2	2 to 4	Determines the degrees above the setpoint temperature (SP2) that the “All Units” restarts. (Relay board output number R2.)	
11	<i>IR</i>	Interval Agitation Timing (Agitate LED)	1/5, 3/18, or 3/30	Selects interval agitation timing of 3 minutes on and 18 or 30 minutes off whenever the selector switch is in the Cooling mode.	
12	<i>SA</i>	Sample Agitation Timing (Agitate LED)	1–30	Selects the duration of agitator sample time when the “Sample Agitate” switch has been activated.	
13	<i>LRd</i>	Temperature Alarm Delay (High Temperature Only)	0–240	Number of minutes the High Temperature Alarm (>44°F/6.6°C) is delayed after onset of first milking and initiating the first cooling cycle. Eliminates nuisance High Temperature Alarms when first milking is entering the milk cooler. “Temperature Alarm” delay timer is reset when the system is moved to Off or Wash modes. Alarm relay output on relay board will not be active during this delay time. Does not delay Low Temperature Alarms (<34°F/1.1°C).	
14	<i>HRd</i>	High Temperature Alarm Delay	1–60	Number of minutes the milk temperature must remain at or above a High Temperature condition (above 44°F/6.6°C) before the High Temperature Alarm is energized. Designed to eliminate nuisance High Temperature Alarms with installations that bottom fill and momentarily pump hot milk pass the temperature sensor.	

MUELLER® HIPERFORM® III WITH WATER WORKS BOX ELECTRICAL SCHEMATIC



MUELLER HIPERFORM III WITH AUTO DOSING BOX ELECTRICAL SCHEMATIC



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