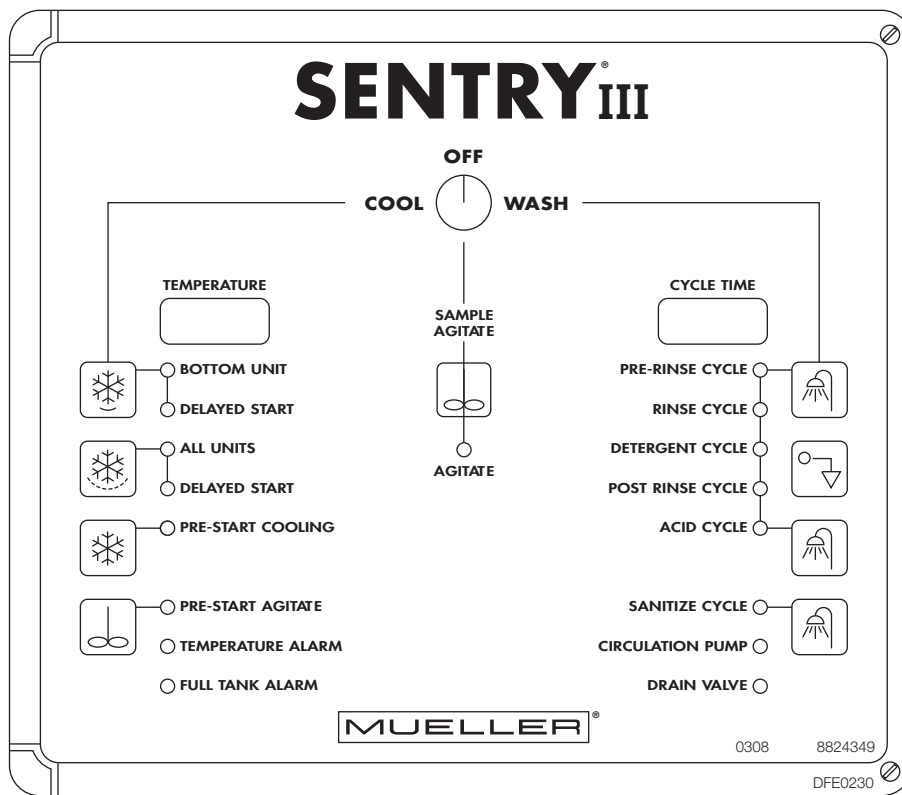


SENTRY® III

WITH WATER WORKS BOX

INSTALLATION AND OPERATION MANUAL



Part No. 8824899

Effective June 3, 2004
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THE MILK COOLING SYSTEMS SPECIALISTS™



SENTRY® III WITH WATER WORKS BOX INSTALLATION AND OPERATION MANUAL

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SECTION 1.0 - INTRODUCTION

1.1 General

The Mueller® Sentry® 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 large 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 Sentry 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
P.O. Box 828
Springfield, Missouri 65801
Telephone: (417) 575-9000 • 1-800-MUELLER (683-5537)

1.3 Regulatory Requirements

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

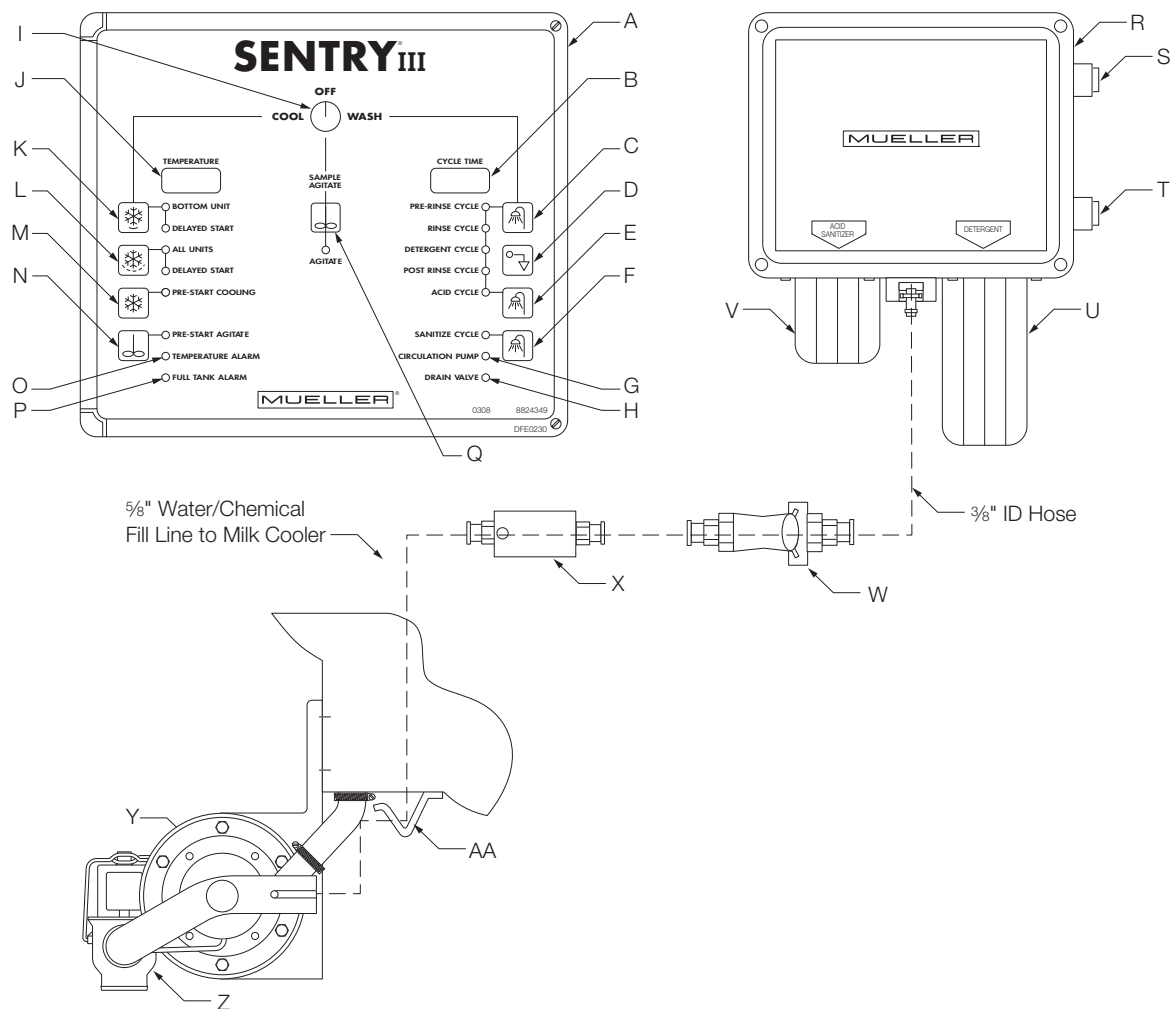
Local, state, and/or county regulations pertaining to the installation, operation, and service of the equipment may vary and must be followed accordingly.

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 Sentry III Control Cabinet and Milk Cooler Components

- | | |
|---|--|
| A. Sentry III Control Box Assembly | O. Temperature Alarm Indicator |
| B. Wash/Cool/Cycle Time Display | P. Full Tank Alarm (Optional) |
| C. Detergent Switch/Indicator | Q. Sample Agitation Switch/Indicator |
| D. Advance Switch | R. Water Works Box |
| E. Acid Switch/Indicator | S. Hot Water Solenoid |
| F. Sanitize Switch/Indicator | T. Cold Water Solenoid |
| G. Circulation Pump Indicator | U. Detergent Jar |
| H. Drain Valve Indicator | V. Acid/Sanitize Jar |
| I. Cool/Off/Wash Switch | W. Fill Line Disconnect, $\frac{3}{8}$ " x $\frac{5}{8}$ " |
| J. Temperature Display | X. Flow Control Orifice |
| K. Bottom Unit Cooling Switch/Indicator | Y. Wash Pump Assembly |
| L. All Units Cooling Switch/Indicator | Z. Electric Drain Valve |
| M. Pre-Start Cooling Switch/Indicator | AA. External Trough - Raceway |
| N. Pre-Start Agitation Switch/Indicator | |

Figure 1 - Sentry 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



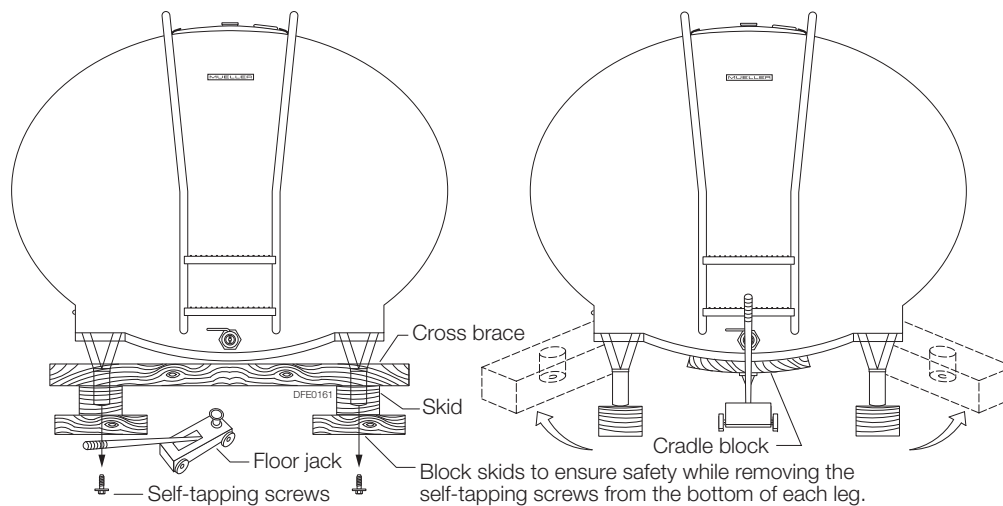
IMPORTANT: Equipment used to move or lift the milk cooler must be rated for the weight of the milk cooler. Approximate weights are provided in Section 8.

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 Sentry 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 Sentry III control between 0.6m and 1.9m 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 Sentry 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)

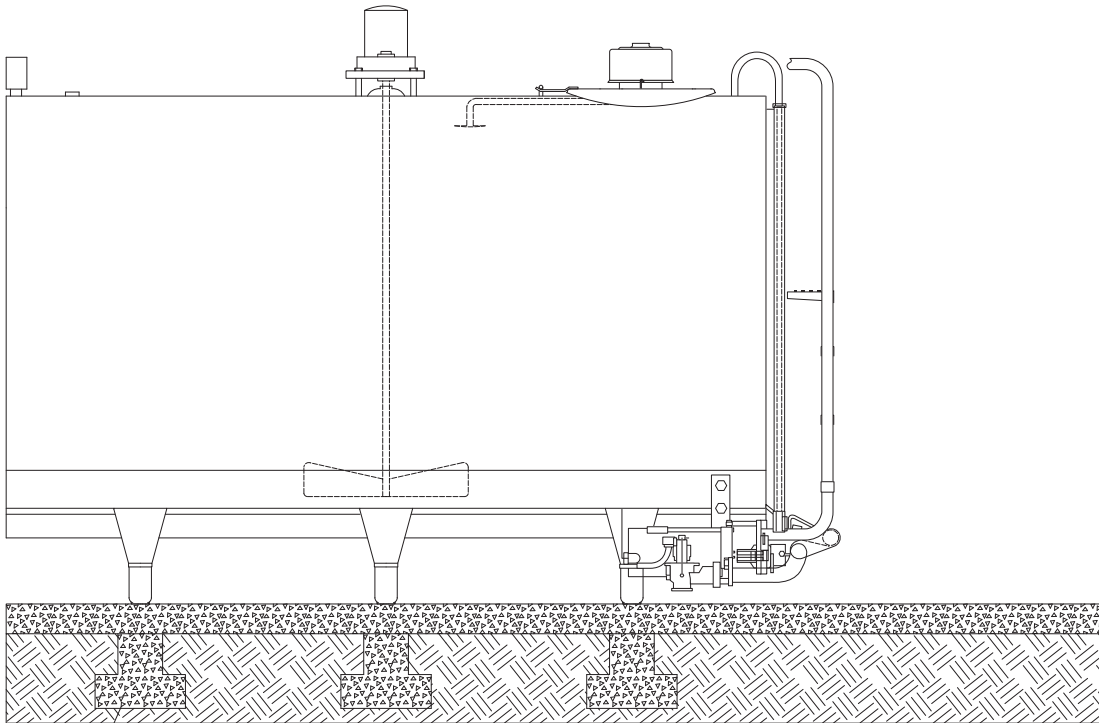
Example: 2,000 gallon Mueller milk cooler filled to maximum capacity.
2,356 lbs + (2,000 x 8.6) = 19,556 lbs
1,069 kg + (7,570 x 1.0305) = 8,870 kg

*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



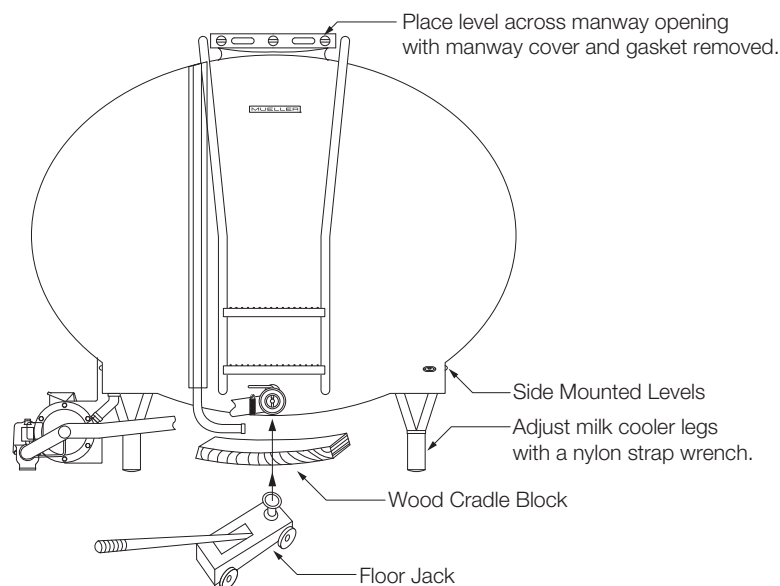
Contact a local civil engineer for footer and foundation requirements.

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 1/4" 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. Mueller offers an optional steel-formed structural support channel that may be installed in masonry walls to prevent the wall from bearing load on the milk cooler. Contact Mueller's Sales Department for availability and pricing.

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

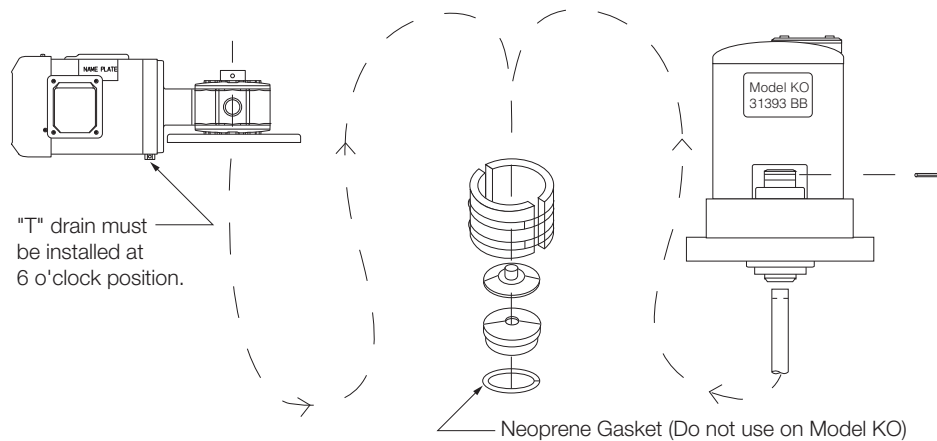
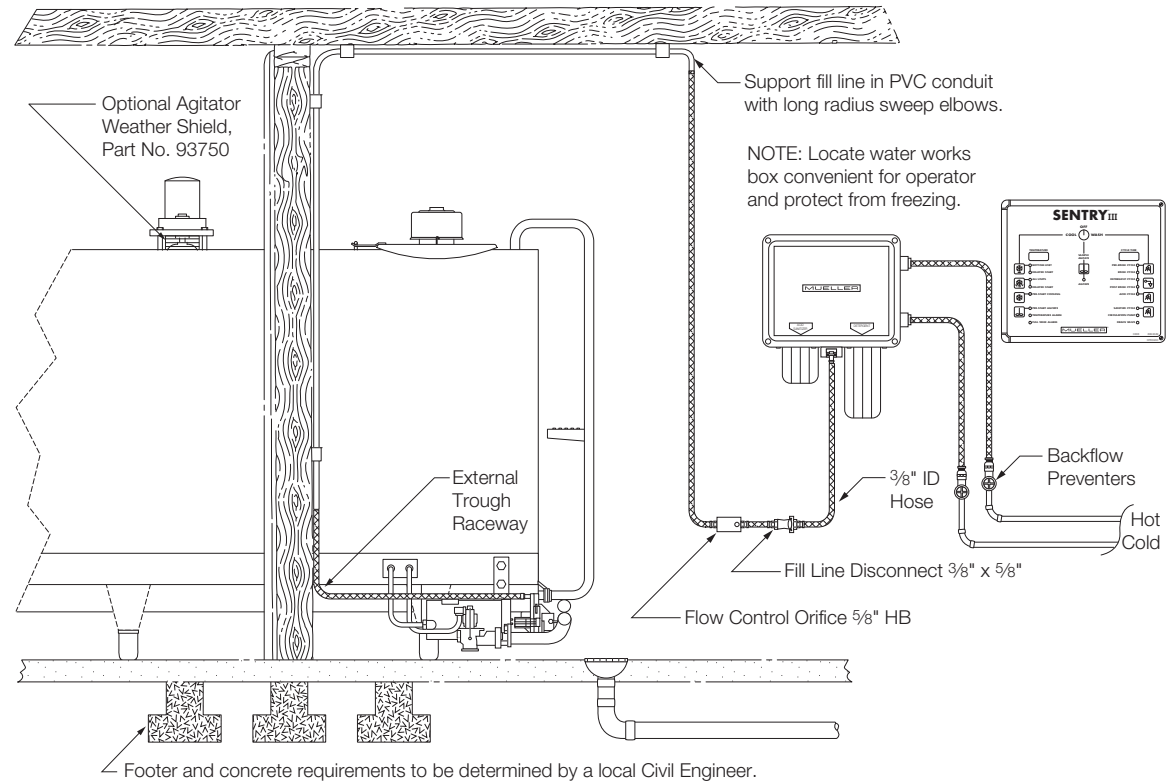


Figure 6 - Basic Bulk Head Installation

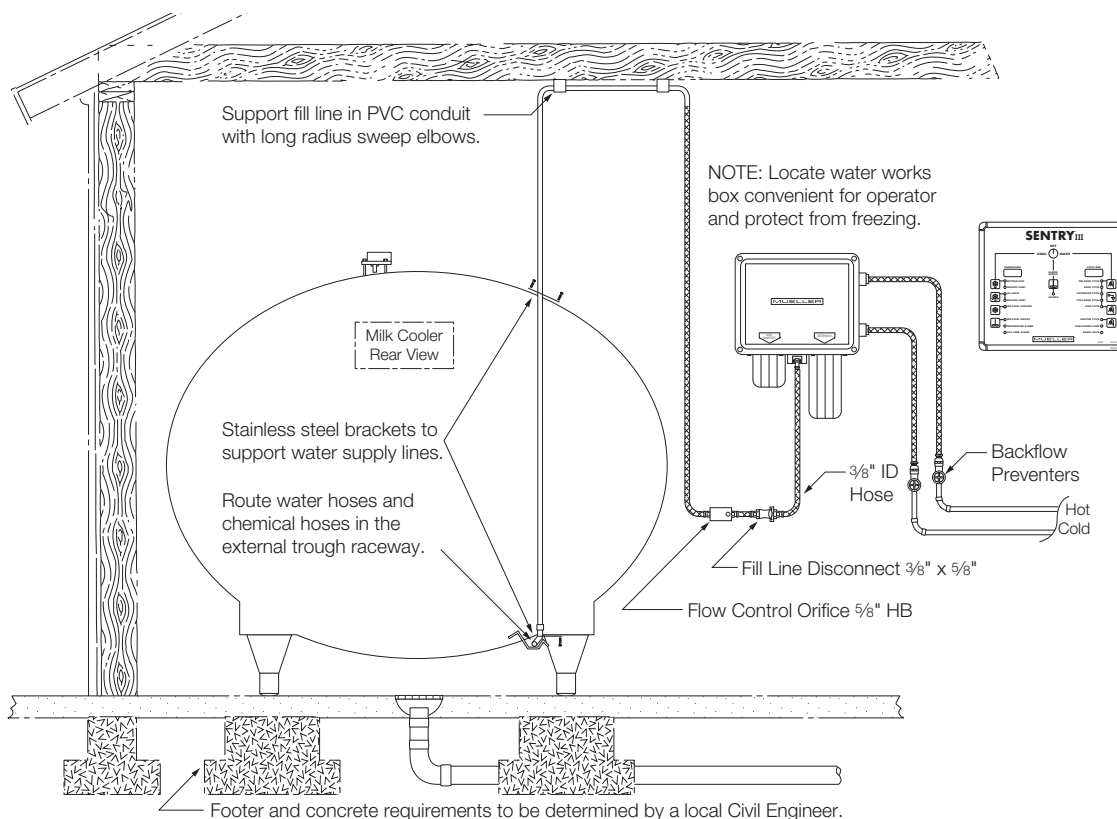


2.10 Milk Room Installation

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, which provides a method to support the water/chemical fill hose inside of .75" PVC conduit. See Figure 7.

Figure 7 - Milk Room Installation



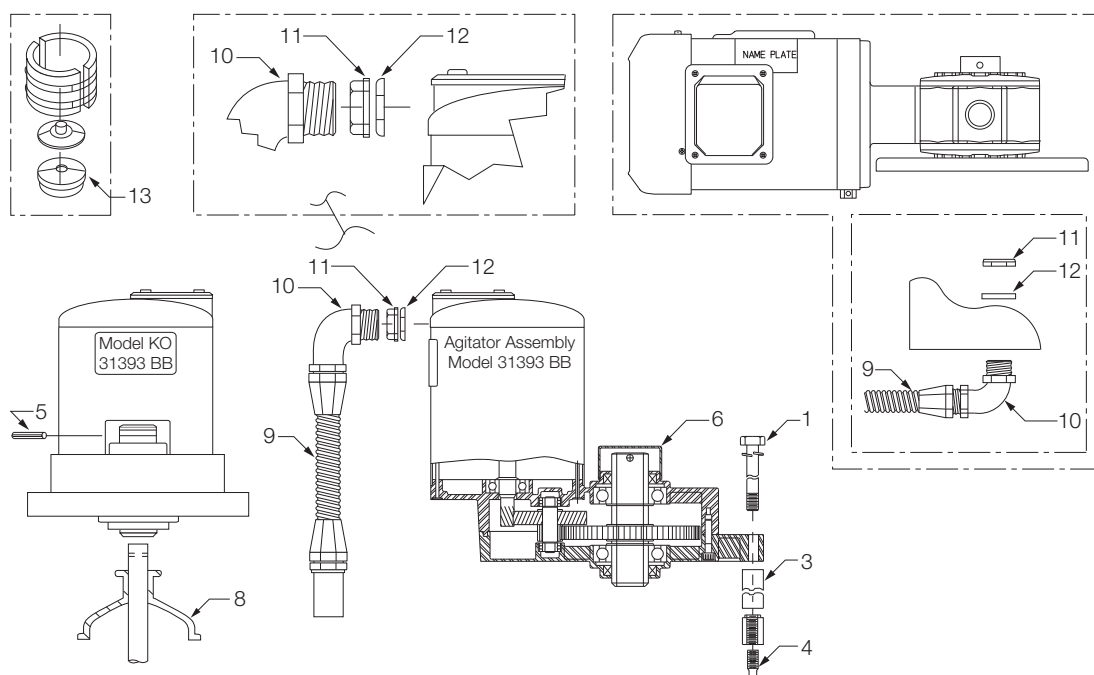
2.11 Agitator Assembly Installation

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 blue plastic 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 and 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.

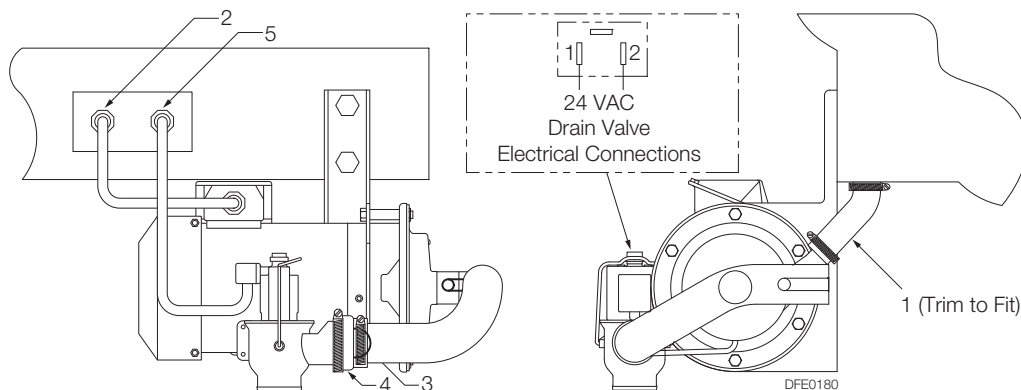
Figure 8 - Agitator Installation



2.12 Pump Assembly and Electric Drain Installation

1. Bolt the pump assembly and electric motor to the left front corner of the milk cooler. See Figure 9.
2. 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.
3. Install the cord grip (Item 2) in the stainless steel cover plate located on the left side of milk cooler.
4. Thread the 3-wire cord (marked pump motor) through the cord grip.
5. Install a cord grip in the motor electrical enclosure.
6. Thread the 3-wire cord through pump motor cord grip and wire motor per the electrical schematic attached to the motor.
7. 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.
8. Install the cord grip (Item 5) in the stainless steel cover plate located on the left side of milk cooler.
9. Thread the cord (marked drain valve) through the cord grip and wire to terminal numbers 1 and 2 at the 24-vac electric drain valve coil.
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 Sentry III Control Box Enclosures

1. Install the Sentry III control box in a location where it is easily accessible for the operator and protected from excessive wash down.
2. Install EMC electrical filter in the supply voltage to the Sentry III. See Figure 15.
3. Install the water works box in an area protected from freezing and within easy access to the chemical storage drums.

2.14 Water Line Connections

1. Connect the backflow preventors 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. See Figures 6 and 7.
3. Insert the flow control orifice and fill line disconnect in the fill line hose at a location easily accessible for the operator. See Figures 6, 7, 10, and 11.

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

Figure 10 - Sentry III Control Box Installation and Water Connections

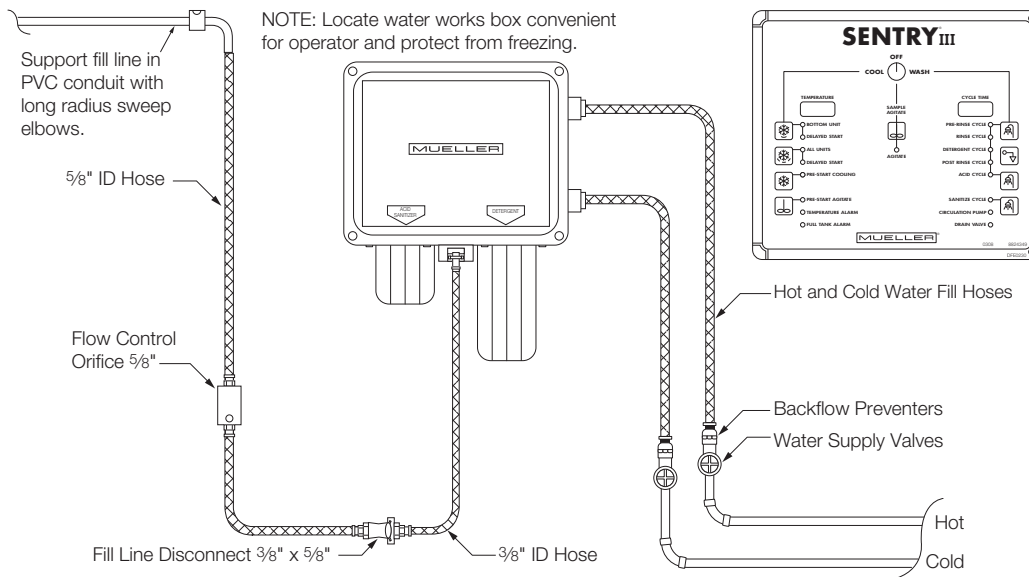
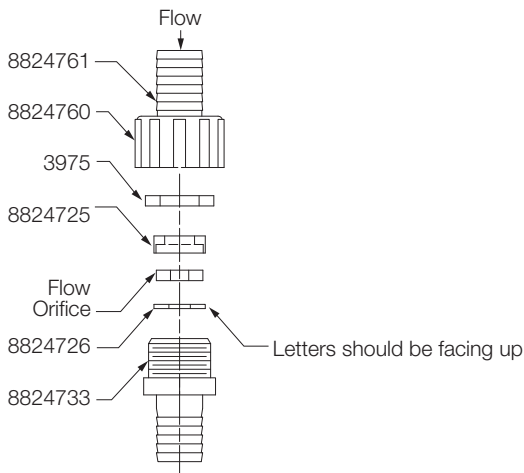


Figure 11 - Flow Orifice Housing



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.
- Wear eye protection, rubber gloves, and aprons when handling chemicals.
- Follow all instructions, warnings, and health hazard information provided by chemical manufacturer.
- 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 wear soft, protective boot covers to avoid damaging the internal and external surfaces of the cooler. An additional person must be present for safety purposes during confined entry.
- Always open 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 which is 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.

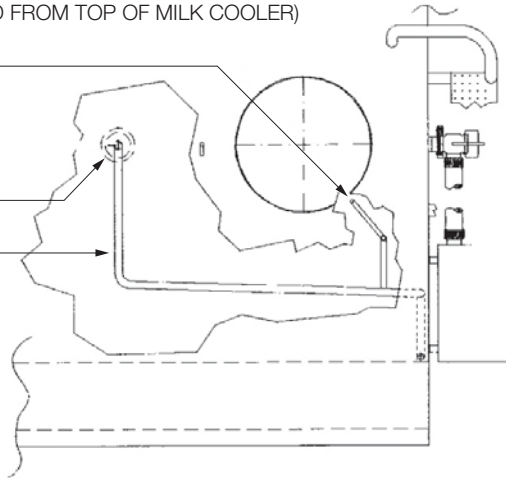
Figure 12 - Manway Wash Tube

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

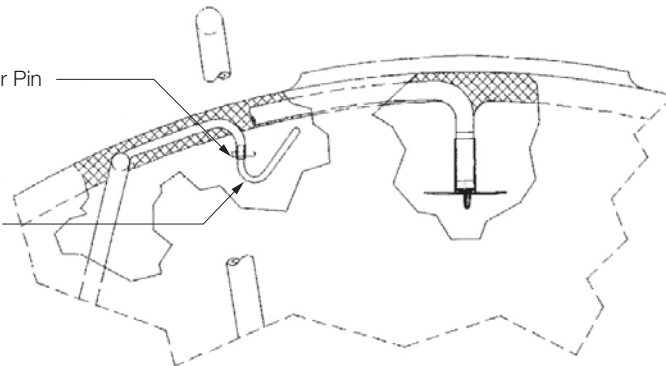
Internal CIP Line



MANWAY WASH TUBE (INTERNAL MODELS)

Stainless Steel Keeper Pin

Manway Wash Tube with Diffuser

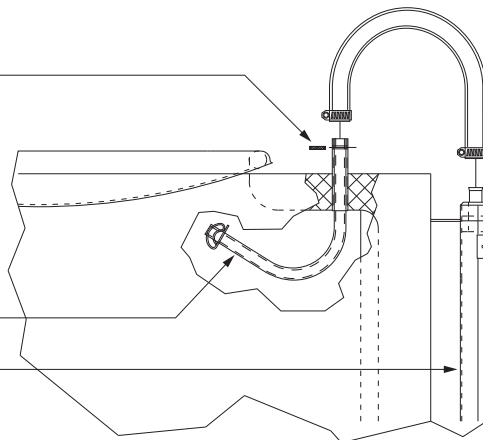


MANWAY WASH TUBE (EXTERNAL MODELS WITH OPTIONAL EXTERNAL GAUGE)

Stainless Steel Dowel Pin

Manway Wash Tube with Diffuser

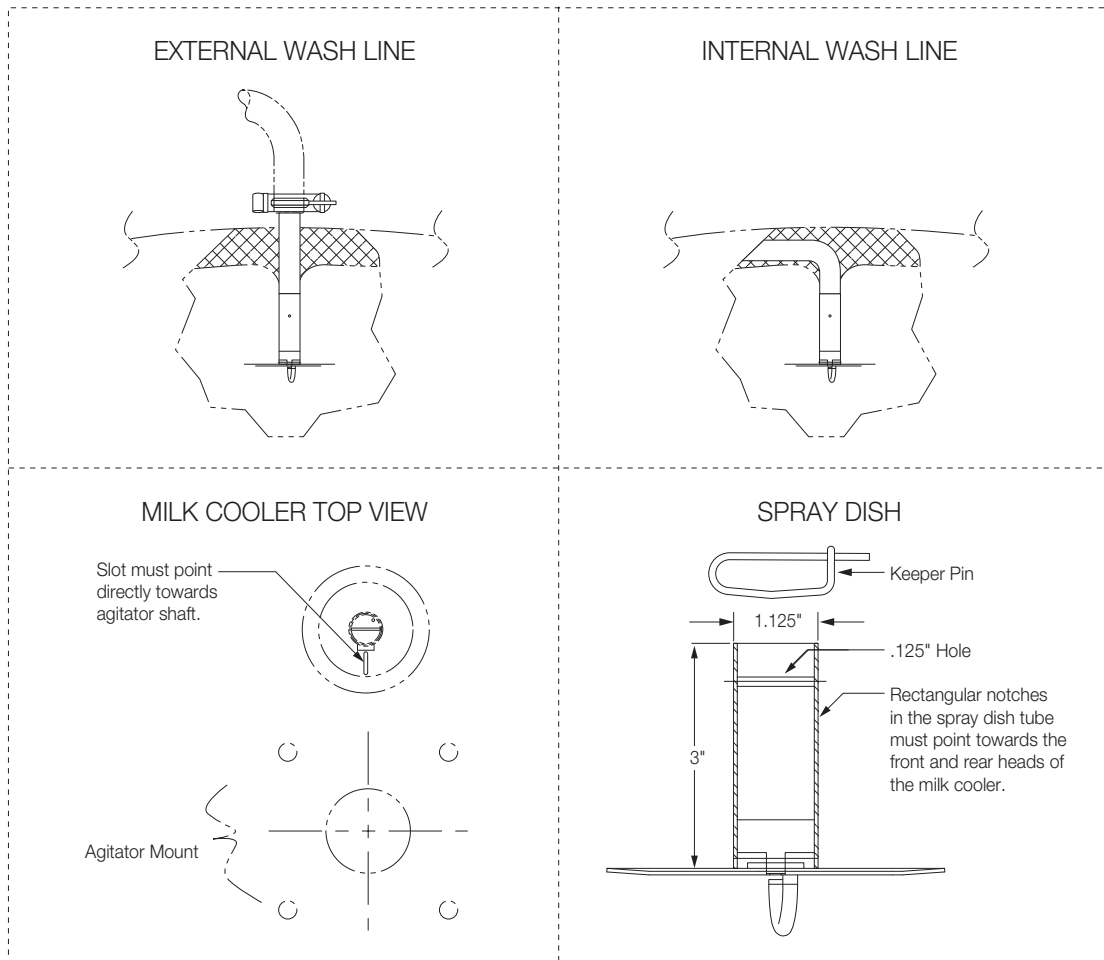
Optional External Gauge



2.17 Spray Dish Installation

The spray dishes connect to the internal or external 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



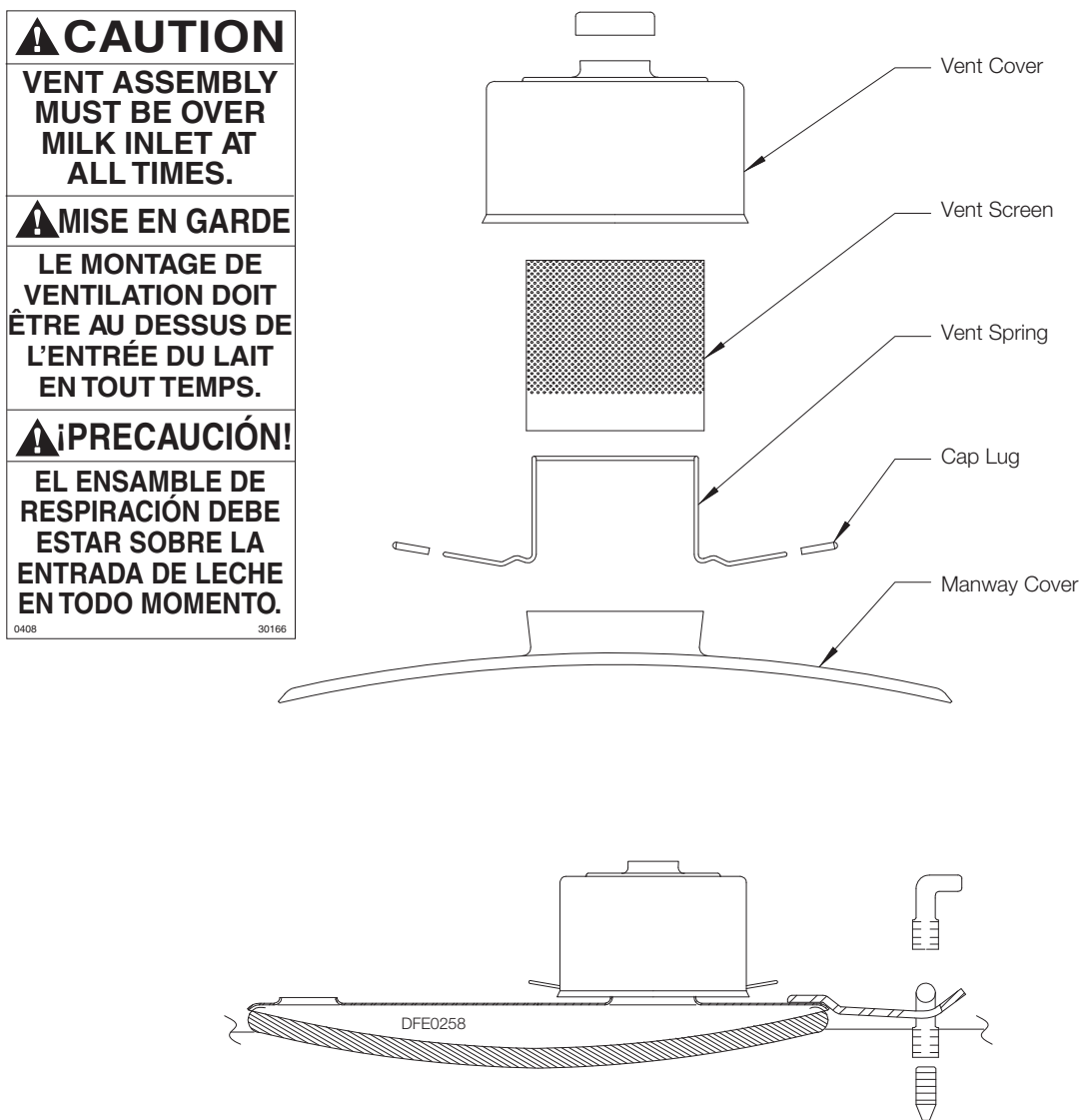
2.18 Milk Cooler Vent Assembly Installation

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

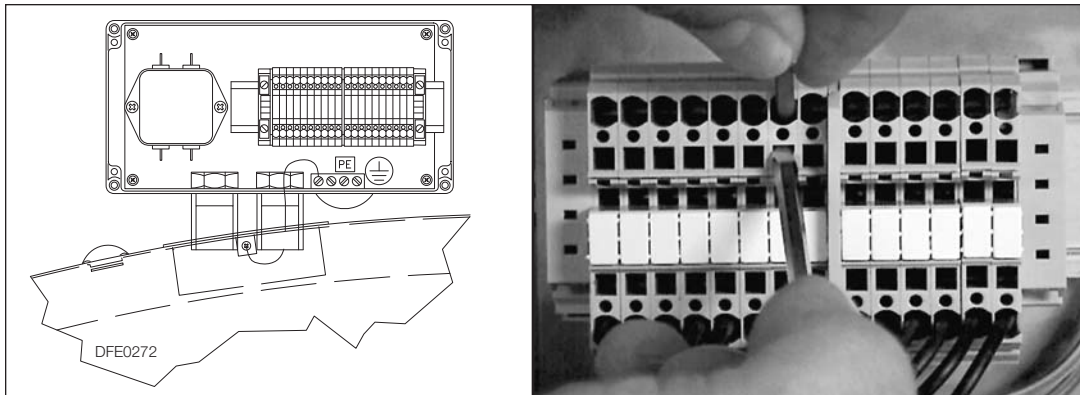


SECTION 3.0 - ELECTRICAL WIRING

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 3-mm 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.



Figure 16 - Electrical Schematic: Rear Junction Box

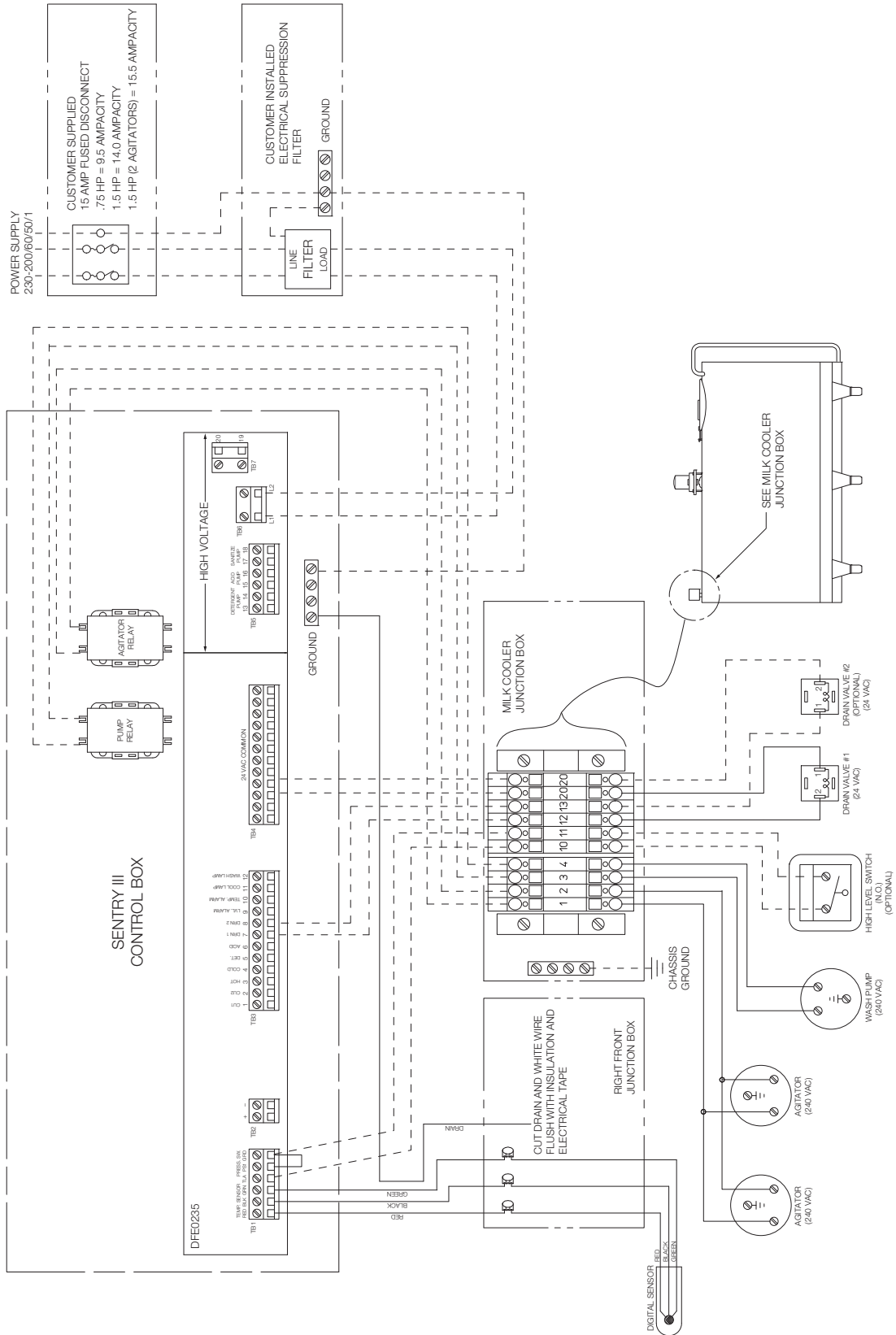


Figure 17 - Internal Conduit Raceways of Milk Cooler

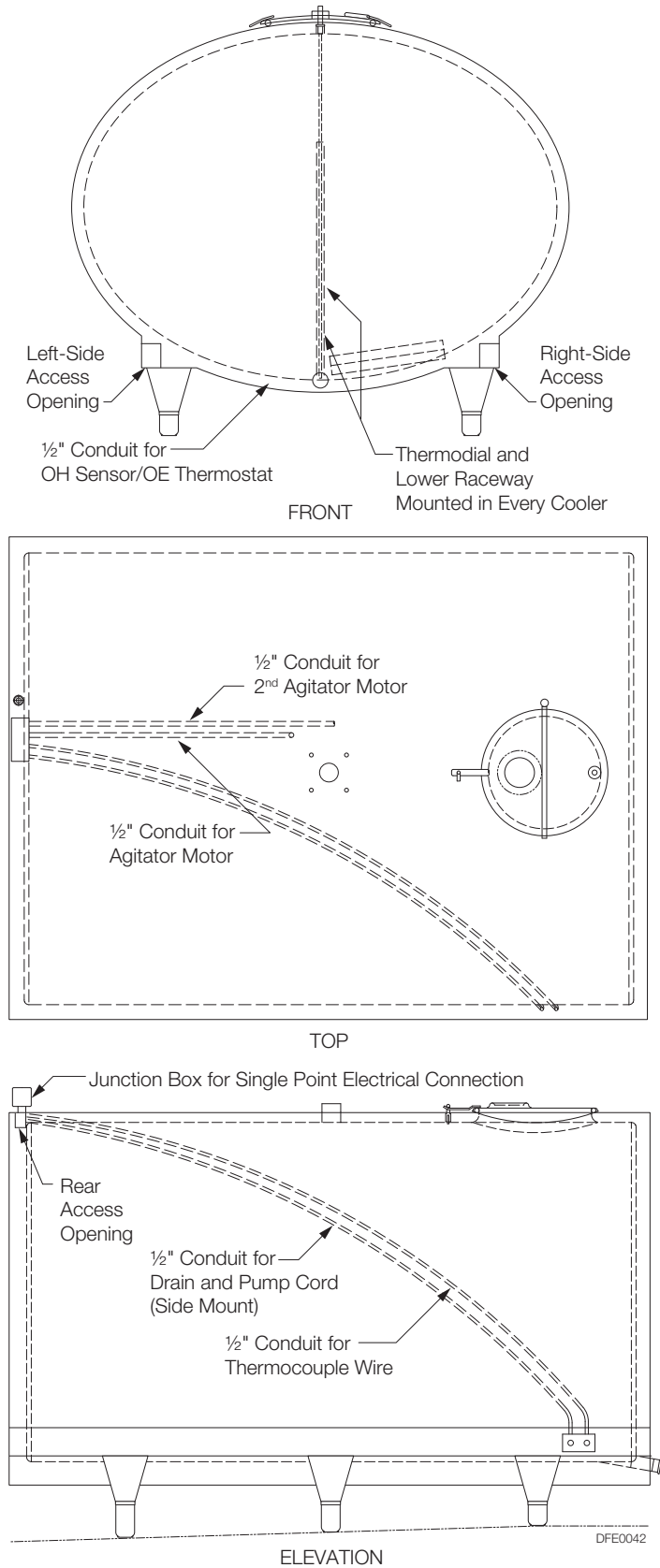


Figure 18 - Electrical Schematic, Field Wiring: Condensing Units and Water Works Box (Enlarged Schematic Attached in Back)

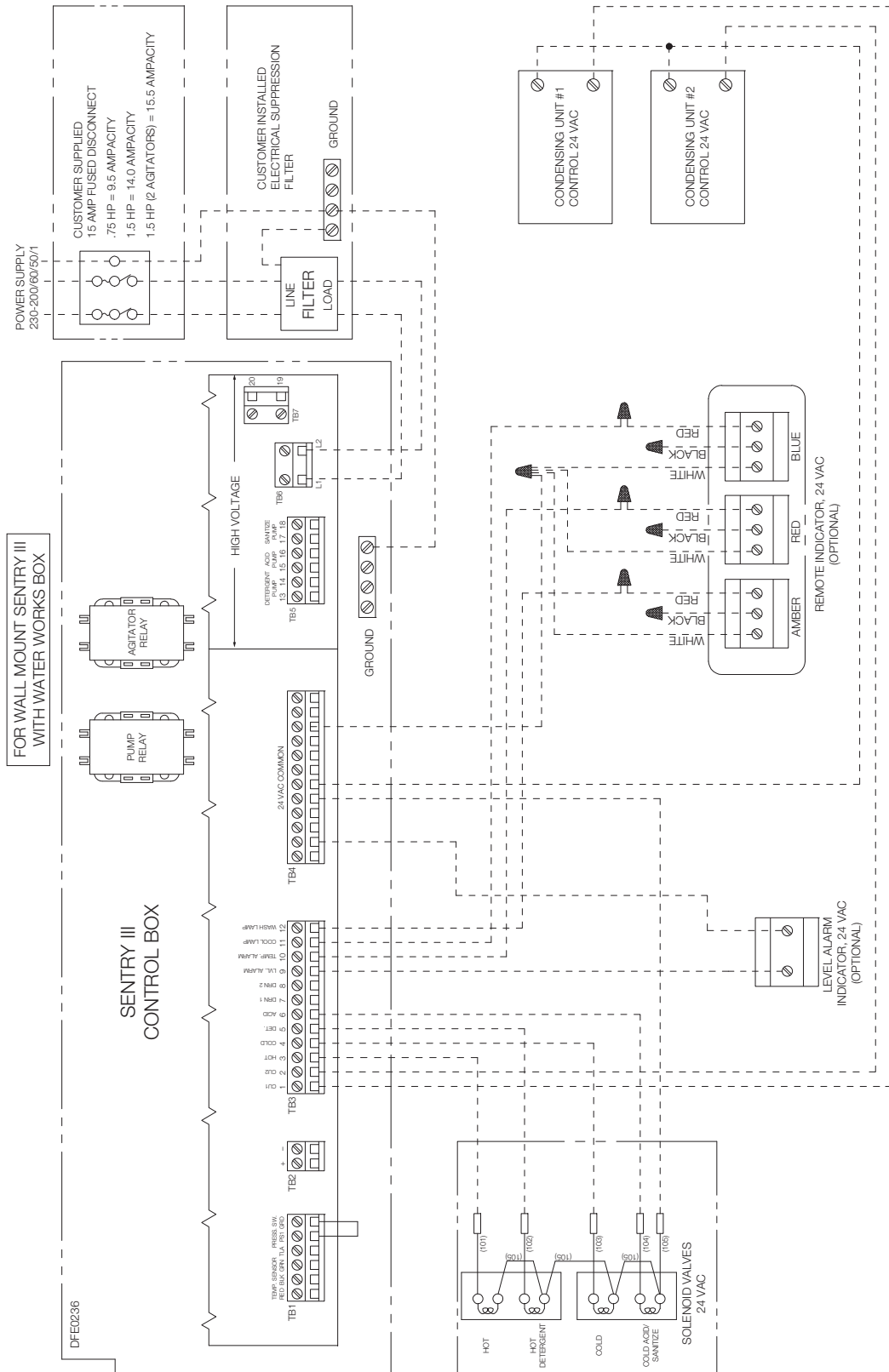


Figure 20 - Electrical Schematic: Wash Pump Motor

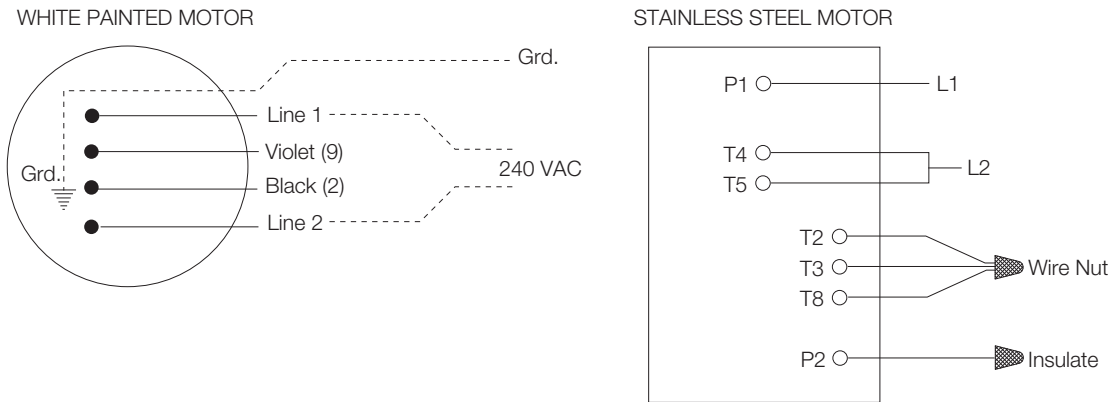
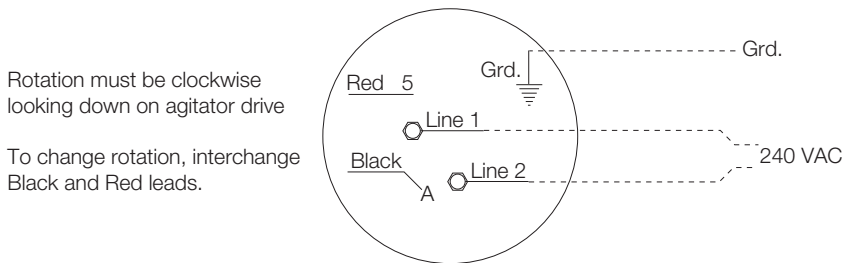


Figure 21 - Electrical Schematic: Agitator Motor(s)



SECTION 4.0 - SENTRY III TEMPERATURE CONTROL

4.1 Sentry III Temperature Control and Digital Sensor

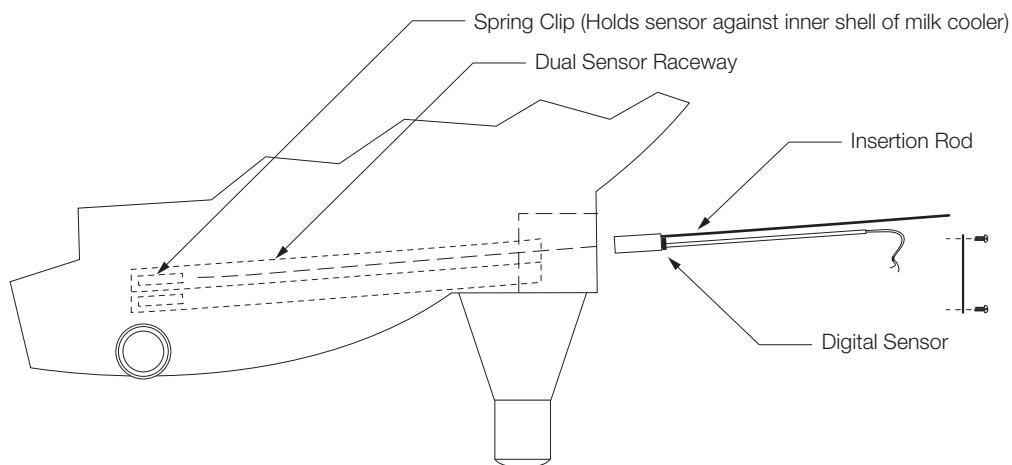
The Sentry III control uses an electronic temperature control and digital sensor. The following installation and calibration procedures are very important to ensure accurate sensing of the milk temperature.

4.2 Sentry III Sensor Installation

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

1. Fabricate an insertion rod from a 5-foot piece of 10-gauge solid wire by forming a $\frac{3}{8}$ " open loop on one end. See Figure 22.
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 Figures 23 and 24.

Figure 22 - Sentry III Digital Sensor Installation



4.3 Wall Mounted Sentry 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, drain wire (bare 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 23.

2. Route the shielded extension cable (Part No. 8824887) through the internal conduit to the left access opening.

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

3. Exit the rear top junction box in a separate conduit and route to the Sentry 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 Sentry III enclosure and cut the white wire and aluminum foil wrap back to the cable jacket.

IMPORTANT: Do not cut off the drain wire. The drain wire must connect to the earth ground inside the Sentry III cabinet. See Figure 23.

4. Connect the red, black and green wires to the proper terminal connections at the bottom left corner of the Sentry III relay board.

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

Figure 23 - Sentry III Digital Sensor Wiring

When connecting the digital sensor and the extension wire together in the right front junction box, match the colors together (red-red, black-black, and green-green). If a white wire is present, cut it off and cap with electrical tape on both ends.

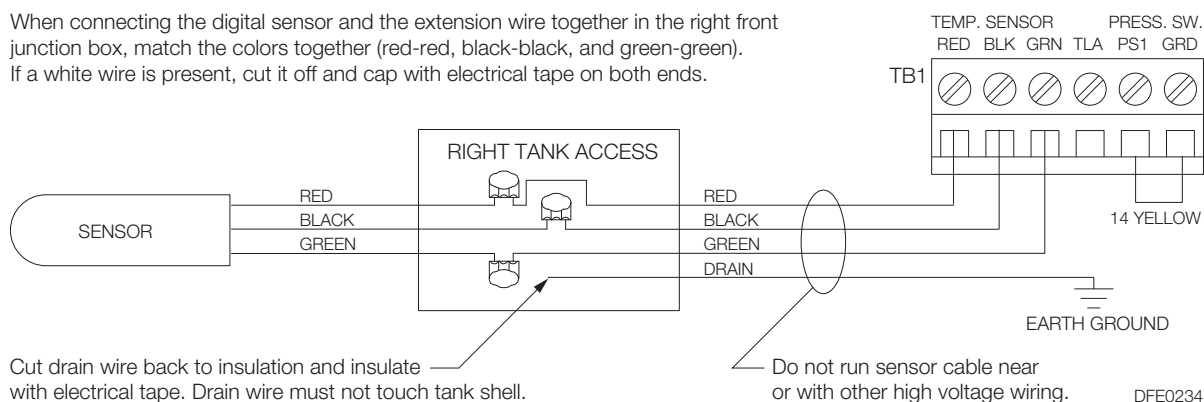
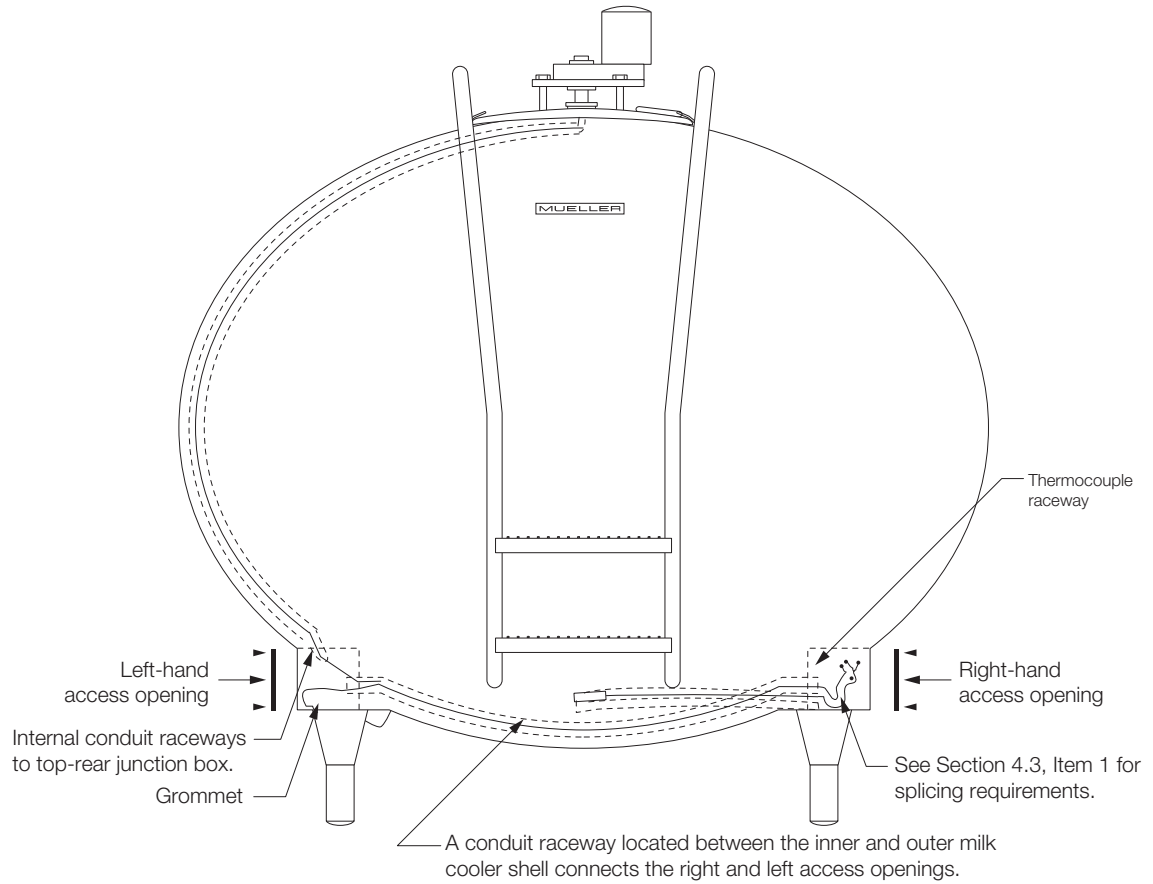


Figure 24 - Sentry III Digital Sensor Wiring



SECTION 5.0 - SENTRY III PROGRAM PARAMETERS

5.1 View Cooling Parameters

In viewing mode the parameters cannot be changed, they may only be viewed. To view the cooling parameters, place the “COOL/OFF/WASH” switch in the “OFF” position. Press and hold the “Bottom Unit” switch until “COL” is displayed in the temperature display, when the “Bottom Unit” switch is released “BUD” will be displayed in the temperature display and the programmed delay will be displayed in the cycle time display. See Section 5.2, “Cooling Parameters,” for program acronyms and range.

Press the “All Units” switch to cycle through the program parameters. The parameter will be displayed in the “Temperature” display and the value will be displayed in the “Cycle Time” display. After viewing parameters the control will revert back to normal operating mode after being left idle for 30–60 seconds. See Section 5.2, “Cooling Parameters.”

5.2 Cooling Parameters

NO.	Control Model(s)	Parameter Code	Parameter Code Description	Parameter Option(s)	Operational Description
1	ADB/WWB	BUD	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 “Cool” mode. Pressing the “Bottom Unit” switch a second time will override the delay.
2	ADB/WWB	AUD	All Unit Delay (All Units Delayed Start LED - flash)	0–300	Starts the programmed “All Unit” delay after pressing the “All Units” switch once when in “Cool” mode. Pressing the “All Units” switch a second time will override the delay. NOTE: If the “All Units” switch is the first switch activated in the “Cool” 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 start the timing of the “All Unit Delay.” If the “All Units” switch is pressed a third time, the “All Units Delay” will prematurely end and “Bottom and All Units” will be active on temperature setpoint.
3	ADB/WWB	PSC	Pre-Start Cooling Cycle (Pre-Start Cooling LED)	30/60	Selects a 30 or 60 minute timer for selected refrigeration units (“Bottom” or “All”) with a fixed temperature setpoint of 34°F (1.1°C). If no units have been selected (ie. “Bottom” or “All”) the pre-start switch will start the “Bottom Unit” only.
4	ADB/WWB	PSA	Pre-Start Agitation Cycle (Pre-Start Agitate LED)	30/60	Selects a 30 or 60 minute timer for agitation (“Bottom” and/or “All Units” will operate from programmed setpoint and differential).
5	ADB/WWB	F/C	Degree F or C Selection	F/C	Selects temperature scale
6	ADB/WWB	CAL	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	ADB/WWB	SPT	Setpoint Temperature	34 to 42°F (1.1 to 5.5°C)	Determines the temperature that “Bottom” and “All Units” switch off, unless “Pre-Start Cool” has been selected at which time the setpoint will be 34°F (1.1°C) until the “Pre-Start Cooling” timer expires.
8	ADB/WWB	DIF	Temperature Differential	2 to 4	Determines the degrees above the setpoint temperature that the “Bottom” and/or “All Units” restart.
9	ADB/WWB	IAG	Interval Agitation Timing (Agitate LED)	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 “Cool” mode.
10	ADB/WWB	SAG	Sample Agitation Timing (Agitate LED)	5 or 10	Selects the duration of agitator sample time when the “Sample Agitate” switch has been activated.
11	ADB/WWB	N/A	Full Tank Alarm (LED)	N/A	If the “TLA” and “GND” are made with a switch closure, the “Full Tank Alarm” LED will activate until the switch closure is opened.
12	ADB/WWB	N/A	Temperature Alarm (LED)	N/A	LED flashes when in the “Cool” mode if temperature is 44°F (6.6°C) or above and/or 34°F (1.1°C) or below. (“Remote Temperature Lamp” will flash at these conditions and remain illuminated when the temperature is within the parameters above.)
13	ADB/WWB	N/A	Remote Cool Lamp	N/A	Output for “Remote Cool Lamp” will duplicate the “Bottom Unit Delayed Start LED” and the “Bottom Unit LED”

5.3 View Washing Parameters

In viewing mode the parameters cannot be changed, they may only be viewed. To view the washing parameters, place the “COOL/OFF/WASH” switch in the “OFF” position. Press and hold the “Full Wash” switch until “WSH” is displayed in the cycle time display. The “Cycle Time” display will show which configuration the control is programmed for, “WWB” for wall mount water box, “ADB” for auto-dosing box or “MMB” for Mueller Matic® box. See Sections 5.4 and 5.5, “Washing Parameters,” for program acronyms and range.

Press the “Advance” key to cycle through the program parameters. The parameter will be displayed in the “Temperature” display and the value will be displayed in the “Cycle Time” display. After viewing parameters, the control will revert back to normal operating mode after being left idle for 30–60 seconds. See Section 5.4, “Washing Parameters for ADB and WWB.”

5.4 Washing Parameters for ADB or WWB

NO.	Control Model(s)	Parameter Code	Parameter Code Description	Parameter Option(s)	Operational Description
1	ADB/WWB	CON	Selects Wash Control Type	ADB/WWB/MMB	"Auto-Dosing Box" or "Water Works Box" or "Mueller Matic Box"
2	ADB/WWB	DRP	Drain Valve Polarity	"NO"/"NC"	Selects normally open or normally closed drain valves (factory Mueller drain valves are of the normally open variety)
3	ADB/WWB	TWT	Total Wash Time	"XXX" Min.	Accumulative time required to complete entire "Full Wash Cycle" (recorded in minutes)
4	ADB/WWB	TAT	Total Acid Time	"XXX" Min.	Accumulative time required to complete entire "Acid Cycle" (recorded in minutes)
5	ADB/WWB	TST	Total Sanitize Time	"XXX" Min.	Accumulative time required to complete entire "Sanitize Cycle" (recorded in minutes)
6	ADB/WWB	WD	Wash Delay	"0 to 120" Min.	Full Wash Option Only - Determines length of time delay (for water heater recovery) between the end of the "Pre-Rinse (R1) Drain Cycle" and start of the "Rinse Fill Cycle (R2)" (1 minute increments)
7	ADB/WWB	WFT	Wash Fill Time	"3 to 20" Min.	Sets the length of all independent fill times in 1/2 minute increments
8	ADB/WWB	MIX	Mix temperature ratio for "Warm" water cycles	"25-50%"	Adjust the duration of the hot water solenoid "on" time in relationship to the cold water solenoid "on" time
9	ADB/WWB	DRN	Drain Time (Drain LED)	"1 to 10" Min.	Sets the length of all independent drain times in 1/2 minute increments
10	ADB/WWB	R1?	Rinse No. 1 (Pre-Rinse) (Pre-Rinse LED if "Yes")	"Yes/No"	Selects option of a "Pre-Rinse" to help remove milk residue
11	ADB/WWB	R1T	Rinse No. 1 Temperature (Pre-Rinse Cycle LED)	"CLD/WRM/HOT"	Selects "Cold", "Warm", or "Hot" water fill temperature
12	ADB/WWB	R1C	Rinse No. 1 Circulation Time (Pre-Rinse Cycle and Circulation LED)	"0.5 to 5" Min.	Programs the duration of the wash pump circulation time for the specific cycle 1/2 minute increments
13	ADB/WWB	R1D	Rinse No. 1 Drain Selection (Pre-Rinse Cycle and Drain LED)	"DR1/DR2"	Selects which drain will open at the end of the Pre-Rinse Cycle (DR1 or DR2) NOTE: DR2 output will remain energized (closed) for the duration of all wash cycles with the exception of the drain immediately after the Pre-Rinse Cycle if DR2 is selected in parameters. If DR2 is selected, DR1 will remain energized (closed) when DR2 opens for the Pre-Rinse drain
14	ADB/WWB	R2T	Rinse No. 2 Temperature (Rinse Cycle LED)	"CLD/WRM/HOT"	Selects "Cold", "Warm", or "Hot" water fill temperature
15	ADB/WWB	R2C	Rinse Circulation Time (Rinse Cycle and Circulation LED)	"0.5 to 5" Min.	Programs the duration of the wash pump circulation time for the specific cycle 1/2 minute increments
16	ADB/-----	AWT	Acid Wash Temperature, Super Wash option on ADB only (Acid Cycle LED)	"CLD/WRM/HOT"	Selects "Cold", "Warm", or "Hot" water fill temperature
17	ADB/-----	AWC	Acid Wash Circulation Time, Super Wash option on ADB only (Acid Cycle and Circulation Pump LED)	"2 to 10" Min.	Programs the duration of the wash pump circulation time for the specific cycle 1/2 minute increments
18	ADB/WWB	DWT	Detergent Wash Temperature (Detergent Cycle LED)	"HOT"	Fixed "Hot" water fill temperature
19	ADB/WWB	DWC	Detergent Circulation Time (Detergent Cycle and Circulation LED)	"2 to 10" Min.	Programs the duration of the wash pump circulation time for the specific cycle 1/2 minute increments
20	ADB/WWB	LWT	Low Wash Temperature Notification	80-140°F (26.5-60°C)	Programs the "Low Wash Temperature" indicator (If Detergent cycle water temperature at time of drain is below the "LWT" programmed setting, Cycle Time Display will flash "LWT" at the end of the wash cycle)
21	ADB/WWB	R3T	Rinse No. 3 Temperature (Post Rinse Cycle LED)	"CLD/WRM/HOT"	Selects "Cold", "Warm", or "Hot" water fill temperature
22	ADB/WWB	R3C	Rinse No. 3 Circulation Time (Post-Rinse Cycle and Circulation LED)	"0.5 to 5" Min.	Programs the duration of the wash pump circulation time for the specific cycle 1/2 minute increments
23	ADB/WWB	AR?	Selects automatic 5th cycle (Acid-Rinse) during full wash selection (Acid Cycle LED)	"Yes/No"	If "Yes", "Full Wash" has a 5th cycle "Acid Rinse"; If "No", "Full Wash" ends with "Post-Rinse"
24	ADB/WWB	ART	Acid-Rinse Temperature (Acid Cycle LED)	"CLD/WRM"	Selects "Cold" or "Warm" water fill temperature
25	ADB/WWB	ARC	Acid-Rinse Circulation Time (Acid Cycle and Circulation LED)	"0.5 to 5" Min.	Programs the duration of the wash pump circulation time for the specific cycle 1/2 minute increments
26	ADB/WWB	R4?	Rinse No. 4 (Acid Post-Rinse) (Post Rinse LED if "Yes")	"Yes/No"	Selects option of a "Cold" water "Post-Rinse" after the "Acid-Rinse" cycle
27	ADB/WWB	R4T	Rinse No. 4 Temperature (Acid Post Rinse) (Post Rinse Cycle LED)	"CLD/WRM/HOT"	Selects "Cold", "Warm", or "Hot" water fill temperature
28	ADB/WWB	R4C	Rinse No. 4 Circulation Time (Acid Post Rinse) (Post Rinse Cycle and Circulation LED)	"0.5 to 5" Min.	Programs the duration of the wash pump circulation time for the specific cycle 1/2 minute increments
29	ADB/WWB	SRT	Sanitize Rinse Temperature (Sanitize Cycle LED)	"CLD/WRM"	Selects "Cold" or "Warm" water fill temperature
30	ADB/WWB	SRC	Sanitize Circulation Time (Sanitize Cycle and Circulation LED)	"0.5 to 5" Min.	Programs the duration of the wash pump circulation time for the specific cycle 1/2 minute increments
31	ADB/-----	DWP	Detergent Wash Dosing Pump Time (Detergent Cycle LED)	"0-600" Sec.	Programs the duration of the Detergent Wash chemical dosing pump in 1-second increments. NOTE: Timing prematurely ends when water fill time expires.
32	ADB/-----	AWP	Acid Wash Dosing Pump Time (Acid Cycle LED)	"0-600" Sec.	Programs the duration of the Acid Wash (Super Wash) chemical dosing pump in 1-second increments. NOTE: Timing prematurely ends when water fill time expires.
33	ADB/-----	ARP	Acid Rinse Dosing Pump Time (Acid Cycle LED)	"0-600" Sec.	Programs the duration of the Acid Rinse chemical dosing pump in 1-second increments. NOTE: Timing prematurely ends when water fill time expires.
34	ADB/-----	SRP	Sanitize Rinse Dosing Pump Time (Sanitize Cycle LED)	"0-600" Sec.	Programs the duration of the Sanitize Rinse chemical dosing pump in 1-second increments. NOTE: Timing prematurely ends when water fill time expires.

5.5 Washing Parameters for MMB

No.	Control Model	Parameter Code	Parameter Code Description	Parameter Option(s)	Operational Description
1	MMB	CON	Selects Wash Control Type	ADB/WWB/MMB	"Auto-Dosing Box" or "Water Works Box" or "Mueller Matic Box"
2	MMB	DR	Selects Drain Valve Type	"HYD"	Fixed at Hydraulic, or water operated, drain
3	MMB	WT	Selects Wash Timer Emulation	"A/B"	Sets wash timer: A=36 minutes, B=72 minutes
4	MMB	TWT	Total Wash Time	"40/80"	"A" timer = 40 Min. "B" timer =80 Min. (Times reflect R1?≠No)
5	MMB	TAT	Total Acid Time	"20/40"	"A" timer = 20 Min. "B" timer =40 Min.
6	MMB	TST	Total Sanitize Time	"10/20"	"A" timer = 10 Min. "B" timer =20 Min.
7	MMB	WD	Wash Delay	"0 to 120" Min.	Full Wash Option Only - Determines length of time delay (for water heater recovery) between the end of the "Pre-Rinse (R1) DRAIN Cycle" and start of the "Rinse Fill Cycle (R2)" (1 minute increments)
8	MMB	WFT	Water Fill Time	"8.0/16.0"	"A" timer = 8.0 Min. "B" timer =16.0 Min. (Fill time includes pump run times)
9	MMB	DRN	Drain Time (Drain LED)	"2.0/4.0"	"A" timer = 2.0 Min. "B" timer =4.0 Min.
10	MMB	R1?	Rinse No. 1 (Pre-Rinse) (Pre-Rinse LED if "Yes")	"Yes/No"	Selects option of a "Pre-Rinse" to help remove milk residue
11	MMB	R1T	Rinse No. 1 Temperature (Pre-Rinse Cycle LED)	"CLD"	Fixed "Cold" water fill temperature
12	MMB	R1C	Rinse No. 1 Circulation Time (Pre-Rinse Cycle and Circulation LED)	"1.0/2.0"	"A" timer = 1.0 Min. "B" timer =2.0 Min.
13	MMB	R2T	Rinse No. 2 Temperature (Rinse Cycle LED)	"HOT"	Fixed "Hot" water fill temperature
14	MMB	R2C	Rinse Circulation Time (Rinse Cycle and Circulation LED)	"2.0/4.0"	"A" timer = 2.0 Min. "B" timer =4.0 Min.
15	MMB	DWT	Detergent Wash Temperature (Detergent Cycle LED)	"HOT"	Fixed "Hot" water fill temperature
16	MMB	DWC	Detergent Circulation Time (Detergent Cycle and Circulation LED)	"4.0/8.0"	"A" timer = 4.0 Min. "B" timer =8.0 Min.
17	MMB	LWT	Low Wash Temperature Notification	80-140°F (26.5-60°C)	Programs the "Low Wash Temperature" indicator (If Detergent cycle water temperature at time of drain is below the "LWT" programmed setting, Cycle Time Display will flash "LWT" at the end of the wash cycle)
18	MMB	R3T	Rinse No. 3 Temperature (Post Rinse Cycle LED)	"HOT"	Fixed "Hot" water fill temperature
19	MMB	R3C	Rinse No. 3 Circulation Time (Post-Rinse Cycle and Circulation LED)	"2.0/4.0"	"A" timer = 2.0 Min. "B" timer =4.0 Min.
20	MMB	AR?	Selects automatic 5th cycle (Acid-Rinse) during full wash selection (Acid Cycle LED)	"Yes/No"	If "Yes", "Full Wash" has a 5th cycle "Acid Rinse"; If "No", "Full Wash" ends with "Post-Rinse"
21	MMB	ART	Acid-Rinse Temperature (Acid Cycle LED)	"CLD"	Fixed "Cold" water fill temperature
22	MMB	ARC	Acid-Rinse Circulation Time (Acid Cycle and Circulation LED)	"2.0/4.0"	"A" timer = 2.0 Min. "B" timer =4.0 Min.
23	MMB	SRT	Sanitize Rinse Temperature (Sanitize Cycle LED)	"CLD"	Fixed "Cold" water fill temperature
24	MMB	SRC	Sanitize Circulation Time (Sanitize Cycle and Circulation LED)	"2.0/4.0"	"A" timer = 2.0 Min. "B" timer =4.0 Min.

5.6 Programming Cooling Parameters

To enter the programming mode, place the "COOL/OFF/WASH" switch in the "OFF" position. Press and hold the Roman numeral "III" (to the right of the "SENTRY" text) until "COL" and "WSH" displays in the alpha numeric screens.

Press the "Bottom Unit" switch to enter into the cooling parameter programming. The temperature display will show the program parameter and the cycle time will show the parameter setting. See Section 5.2, "Cooling Parameters," for program options.

To view different parameters, use the "All Units" switch to advance to the next parameter and use the "Bottom Unit" switch to move back to the previous parameter. Once a parameter has been selected to change, use the "Pre-Start Cooling" switch to increase the displayed value in the cycle time display or the "Pre-Start Agitation" switch to decrease the value.

5.6 Programming Cooling Parameters (Continued)

If no key is pressed for 30–60 seconds, the control will revert back to normal operation mode.

Example: With the rotary switch in the “OFF” mode, press and hold the Roman numeral “III” until “COL” and “WSH” are displayed. Press the “Bottom Unit” switch and the display window will show “BUD” and the delay time that is programmed. Press and release the “All Unit” switch until “SPT” is displayed in the temperature display. This is the setpoint for refrigeration to shut off; use the “Pre-Start Cooling” switch to increase the displayed value in the cycle time display or the “Pre-Start Agitate” switch to decrease the value.

After programming is complete on the cooling parameters, press the Roman numeral “III” to return to automatic operation, or if no key is pressed for 30–60 seconds, the control will revert back to normal operation mode.

5.7 Programming Washing Parameters

To enter the programming mode, place the “COOL/OFF/WASH” switch in the “OFF” position. Press and hold the Roman numeral “III” (to the right of the “SENTRY” text) until “COL” and “WSH” displays in the alpha numeric screen.

Press the “Detergent Wash” switch to enter into the wash parameter programming. The temperature display will show the program parameter and the cycle time will show the parameter setting. See Sections 5.4 and 5.5, “Wash Parameters,” for programming options.

To view different parameters, use the “Advance” switch to advance to the next parameter and use the “Detergent Wash” switch to move back to the previous parameter. Once a parameter has been selected to change, use the “Acid Cycle” switch to increase the displayed value in the cycle time display or the “Sanitize Cycle” switch” to decrease the value.

Example: The first parameter that needs checked or changed is the “CON” parameter. This parameter selects how the control box will be utilized as either an auto-dosing box (ADB, “OHF” only), a wall mount water works box (WWB), or as a retrofit replacement of an older Mueller Matic style wash control utilizing a water operated drain valve (MMB).

With the rotary switch in the “OFF” mode, press and hold the Roman numeral III until “COL” and “WSH” are displayed. Press the “Detergent Wash” switch and the display windows will show “CON” and either WWB, ADB, or MMB. Press the “Acid Cycle” switch or the “Sanitize Cycle” switch to cycle between MMB, WWB, and ADB.

After selecting the control type, continue through the wash parameters. After programming is complete on the wash parameters, press the Roman numeral III to return to the normal operation, or if no key is pressed for 30–60 seconds, the control will revert back to normal operating mode.

5.8 Test Program

The Sentry 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 place the rotary switch in the “OFF” position, press and HOLD the “Pre-Start Agitate” switch. After 15 seconds, the temperature display will show “TST” and the cycle time display will show the software version number.
2. Release the “Pre-Start Agitate” and all segments of the alpha numeric displays will illuminate. This will validate that all segments are working on the 16 segment displays.
3. Press and release the advance key once, all of the LED lights will be illuminated.
4. Press and release the advance key again and the level alarm input can be checked. The temperature display will show “LVL” and the cycle time will show “OPN” for open or “CLS” for closed. If no level switch is installed, use a jumper wire from “GND” to “LVL” on TB1 terminal block to simulate a closed level alarm.
5. Press and release the advance key again and the water pressure switch can be checked. The temperature display will show “PSW” and the cycle time will show “OPN” or “CLS”.

NOTE: The water pressure switch is optional on “OHF” front-mount controls, and must be jumpered if no switch is used.

6. Press and release the advance key again, “K1” will be displayed in the temperature window and condensing unit number one will be energized.
7. Continue pressing and releasing the advance key to cycle through relays K1 through K17. After K17, the control will revert back to normal operation mode.

Listed below are the relay outputs and corresponding component(s):

K1	Condensing Unit No. 1	K10	Temperature Alarm (Remote)
K2	Condensing Unit No. 2	K11	Cool Lamp (Remote)
K3	Hot Solenoid	K12	Wash Lamp (Remote)
K4	Cold Solenoid	K13	Agitator Relay Coil
K5	Detergent Solenoid (Water Works Box)	K14	Pump Relay Coil
K6	Acid Solenoid (Water Works Box)	K15	Detergent Pump (240vac)
K7	Drain 1	K16	Acid Pump (240vac)
K8	Drain 2	K17	Sanitize Pump (240vac)
K9	Level Alarm (Remote)		

NOTE: Relays K1-K14 output is 24-vac and K15-K17 are 240-vac.

SECTION 6.0 - CHEMICAL DOSING WITH SENTRY III WATER BOX

6.1 Determining Chemical Usage

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

There are three factors that 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 Table 2 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.

Table 2 - Minimum Water Requirements (Per Cycle) to Prevent Cavitation

Cooler Model	Liters	U.S. Gallons
400 - 1000	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

6.4 Determining Actual Water Usage

To estimate the actual water usage:

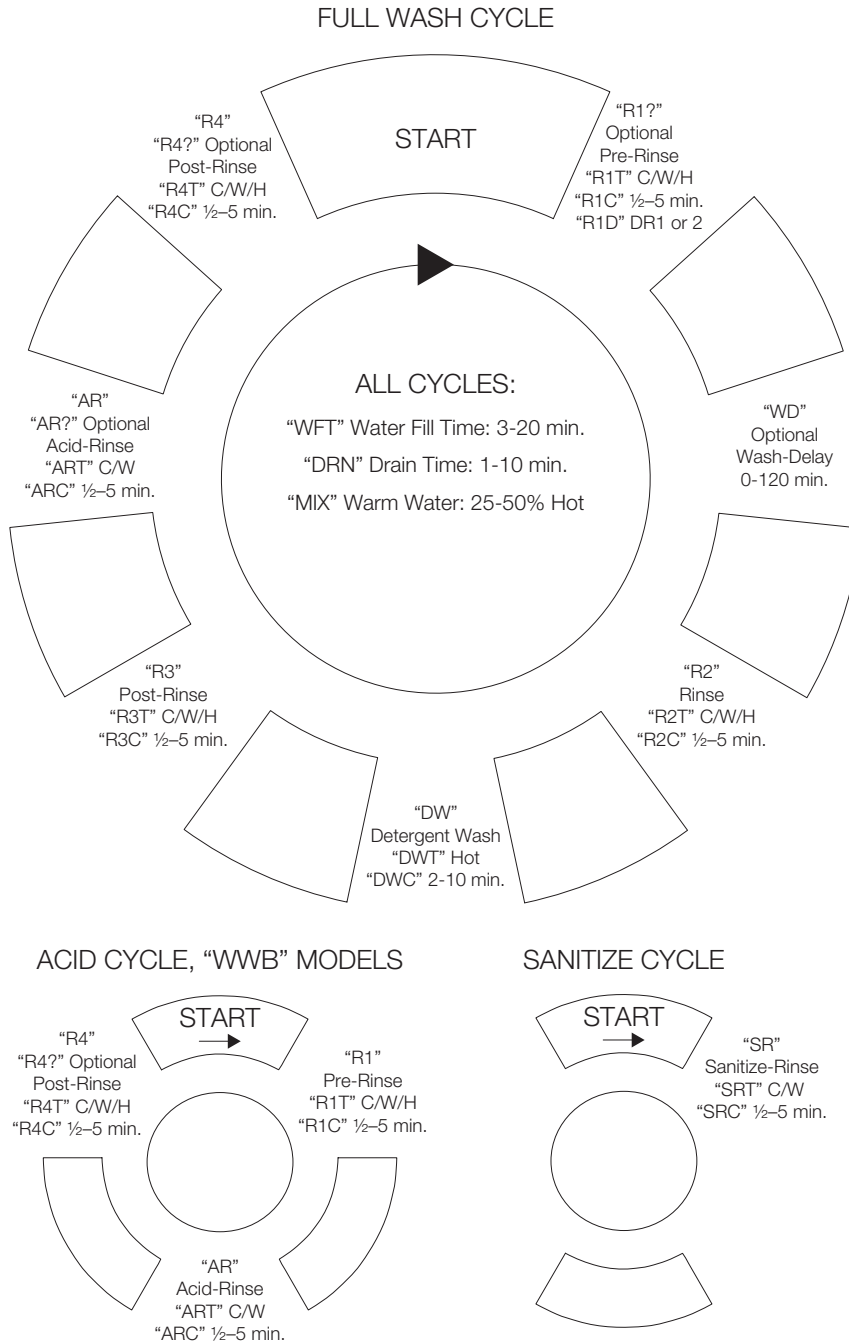
1. Measure the customer's water supply pressure.
2. Determine the programmed wash fill time "WFT" from Section 5.4, Item No. 6.
3. Refer to the calculated water usage provided in Table 3.

Table 3 - 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 Sentry III provides several programming options for the wash cycles.



SECTION 7.0 - OPERATING INSTRUCTIONS

7.1 General

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

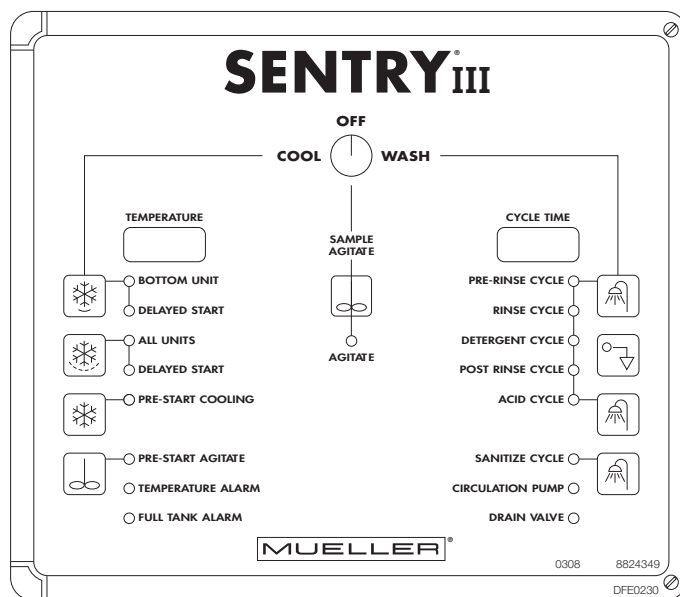
Please locate the enclosed plastic laminated reference chart, Part No. 8824908, near the Sentry III control. This will provide unfamiliar operators with a quick reference to the basic operation and features of the Sentry III control system.

NOTE: Wash cap located on left side of cabinet must be disconnected during milk cooling and storage modes. Wash cap to be connected only during wash modes.



IMPORTANT NOTE: 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 - Sentry III Operating Controls



7.2 Cool/Off/Wash Rotary Selector Switch

Select “COOL” for cooling modes, “OFF” for sample agitation and programming or when the milk cooler is not in use, and “WASH” for cleaning modes.

7.3 Cooling Bottom Unit Switch

1. When the rotary selector switch is placed in the cool mode the interval agitation is started. Press the “Cooling Bottom Unit” switch once to initiate the time-delayed start of the bottom refrigeration unit(s). 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) will energize if the temperature control is calling for cooling. The programmable time delay may be adjusted between 0-120 minutes. See programming section for adjustment.

7.3 Cooling Bottom Unit Switch (Continued)

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 or all refrigeration unit(s), turn the “COOL/OFF/WASH” rotary switch to the “OFF” position.
4. 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 rotary selector switch is turned to the “OFF” position.

7.4 Cooling All Units Switch

1. With the rotary selector switch in the “COOL” position, press the “Cooling All Units” switch once to initiate the time-delayed start of the side refrigeration unit(s). The “Delayed Start” LED will flash until the time delay has expired. The programmable time delay may be adjusted between 0-300 minutes. See programming section for adjustment.

NOTE: The time delay for the “Cooling All Units” will not start timing until the “Cooling Bottom Unit” time delay expires.

2. After the “Cooling All Units” time delay has expired the “All Units” LED will illuminate and the side refrigeration unit(s) will energize if the temperature control is calling for cooling.
3. Pressing the “Cooling All Units” switch a second time will bypass the programmable time delay and immediately start the bottom and side refrigeration units.
4. To cancel the bottom or all refrigeration unit(s), turn the “COOL/OFF/WASH” rotary switch to the “OFF” position.

7.5 Pre-Start Cooling Switch

1. With the rotary selector switch in the “COOL” position and “Cooling Bottom Units” and/or “Cooling All Units” in the automatic cool position, press the “Pre-Start Cooling” switch once to initiate an automatic override of the agitator(s) and refrigeration unit(s). The “Pre-Start Cooling” mode may be programmed for 30 or 60 minutes. See programming section for adjustment.
2. After the programmed time period expires, the refrigeration unit(s) will return to the normal cooling mode.
3. 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.
4. To cancel “Pre-Start Cooling” press the switch a second time.

7.6 Pre-Start Agitator Switch

1. With the rotary selector switch in the “COOL” position and “Cooling Bottom Units” and/or “Cooling All Units” in the automatic cool position, press the “Pre-Start Agitator” switch once to initiate manual agitation for programmed period of 30 or 60 minutes. See programming section for adjustment.
2. This feature blends the warm incoming milk at the onset of the second, third, or fourth milkings.
3. To cancel “Pre-Start Agitation” press the switch a second time.

7.7 Temperature Alarm LED

1. The temperature alarm 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).
2. 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. See wiring schematic for remote alarm wiring.

7.8 Full Tank Alarm LED

1. The “Full Tank Alarm” is a visual indication of a full tank of milk. This alarm must be incorporated with a level switch installed in the milk cooler to indicate the milk cooler is full.
2. A remote “Full Tank Alarm” is also incorporated into the relay board inside of the control box. This is a 24vac output that can be connected to a remote lamp or buzzer. See wiring schematic for remote alarm wiring.

7.9 Detergent Cycle Switch

The Sentry III is designed for fully programmable wash options including water fill, drain, pump 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 and wash charts.

1. With the rotary switch in the “WASH” position, press the “Detergent” cycle switch.

The “Detergent” cycle offers multiple programming options:

- “PRE-RINSE – RINSE – DETERGENT – POST RINSE”
 - “PRE-RINSE – RINSE – DETERGENT – POST RINSE – ACID/SANITIZE”
 - “PRE-RINSE – RINSE – DETERGENT – POST RINSE – ACID/SANITIZE – POST RINSE”
2. A programmable 0 to 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, then delay for the programmed time. After the delay expires, the “WASH” cycle will continue with the “Rinse,” “Detergent,” “Post-Rinse,” and “Acid/Sanitize” cycles. See programmable options for “WD.”
 3. At the end of the cycle the display will flash “0”, this indicates the wash is complete and another function may be started.

7.9 Detergent Cycle Switch (Continued)

4. Also incorporated into the “Detergent” wash cycle is a low-water temperature alarm (“LWT”). The “LWT” takes a temperature reading during the “Detergent” drain cycle. If this reading is below the programmed “LWT” at the end of the “WASH” cycle, “LWT” will be displayed in the “Cycle Time” display. This is only an indicator of low detergent wash temperatures; all wash cycles function normally. When the rotary switch is turned to the “OFF” position, the alarm is cleared. See programmable options for “LWT.”
5. To cancel and reset the “WASH” cycle, turn the “COOL/OFF/WASH” rotary switch to the “OFF” position.

7.10 Advance Switch

1. The Sentry III incorporates an advance switch to advance through the cycles. The advance switch is intended for service and testing of cycles and 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.

7.11 Acid Cycle Switch

1. With the rotary selector switch in the “WASH” position, press the “ACID” cycle switch once to start a “PRE-RINSE – ACID – WASH – RINSE” cycle.
2. To cancel and reset the “ACID WASH,” turn the “COOL/OFF/WASH” rotary switch to the “OFF” position.

7.12 Sanitize Cycle

1. With the rotary selector switch in the “WASH” 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, turn the “COOL/OFF/WASH” rotary switch to the “OFF” position.

7.13 Circulation Pump

The “Circulation Pump” LED is a visual indicator of when the wash water circulation pump is energized.

7.14 Drain Valve

The “Drain Valve” LED is a visual indicator of when the drain valve is open during the wash cycles.

7.15 Agitate Sample Switch

1. With the rotary selector switch in the “OFF” position, press the “Agitate Sample” switch once to start the agitator(s) for milk sampling. The agitator(s) will operate for the programmed period of 5 or 10 minutes, and shut off automatically. See Sections 5.2, item 10.
2. To cancel “Agitate Sample” press the switch a second time.

7.16 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 Program Parameter “CAL”

7.17 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 rotary selector switch is turned to the “OFF” position.
3. During the wash cycles, the “Cycle Time” display will count down the time remaining in the wash cycle and display a flashing “0” when complete. Turning the rotary switch to the “OFF” position will clear the display.
4. The “Cycle Time” display is also utilized to display the parameter settings while programming the Sentry III.

7.18 Cooling Override Switch (FOR AUTHORIZED SERVICE TECHNICIAN USE ONLY)



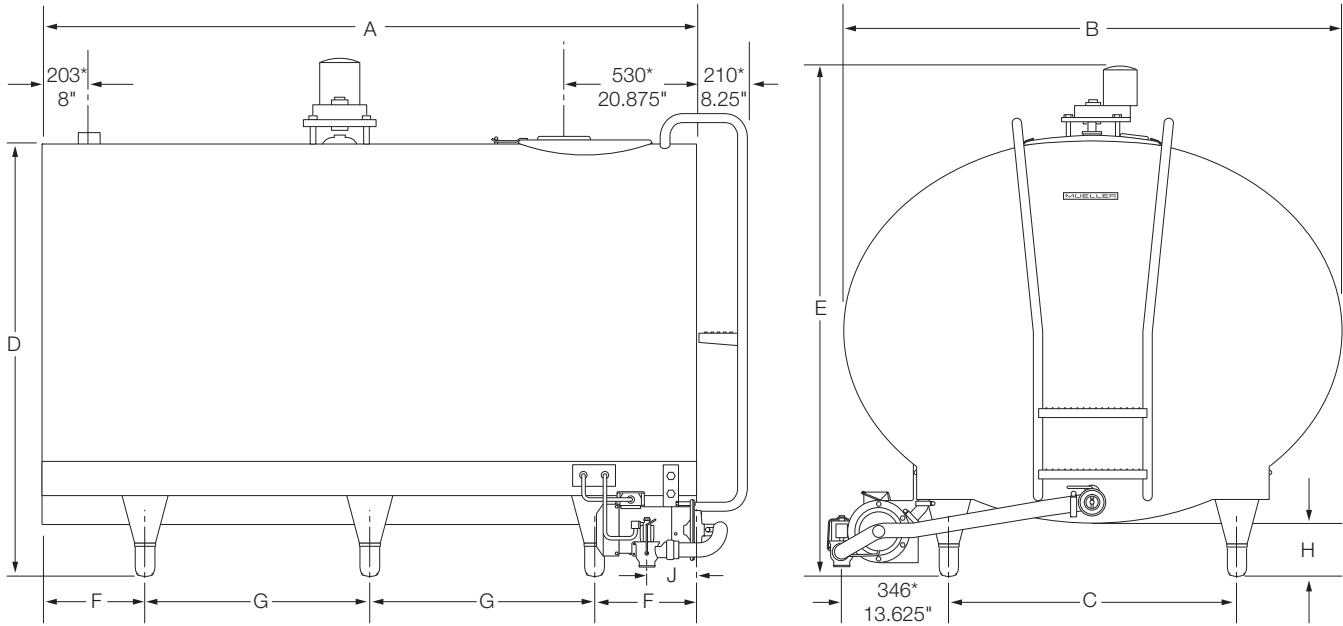
WARNING! Risk of electrical shock. Failure to disconnect power from Sentry III control before servicing may result in death or serious injury. Service should be performed by an authorized service technician only.

1. The Sentry III has an emergency override switch located inside the enclosure. This will override the temperature control and several other components and engage the bottom refrigeration unit(s) and agitator(s) in an emergency situation.
2. To access and activate this switch, turn the power off to the Sentry 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 NOTE: There will be no automatic temperature control in the “Manual Over-Ride Position.” When the product temperature is at a safe holding temperature, turn the power supply off to the Sentry III control. (This switch is for authorized Mueller Technician use only.)

SECTION 8.0 - WEIGHTS AND DIMENSIONS



8.1 English Weights and Dimensions

Dimensions not to be used for construction unless certified.

Model	Capacity ¹ (gal)	A (in)	B (in)	C (in)	D (in)	E (in)	F (in)	G (in)	H ² (in)	J (in)	No. of Legs	Weight ³ (Empty)
O-500	500	78	61	37.25	51	63.75	18	42	4-5	8.25	4	934
O-600	600	90	61	37.25	51.25	64	18	54	4-5	8.25	4	1,044
O-800S	800	80	71.25	50	60.75	73.5	18	44	4-8	8.25	4	1,284
O-1000S	1,000	102	71.25	50	61.25	74	18	33	4-8	8.25	6	1,530
O-1000D	1,000	102	71.25	50	61.25	74	18	33	4-8	8.25	6	1,576
O-1350	1,350	102	80	48.25	69.125	82	18	33	7-9	8.25	6	1,770
O-1600	1,600	120	80	48.25	69.5	82.25	18	42	7-9	8.25	6	1,988
O-2000	2,000	155	80	48.25	70.25	83	17.5	40	7-9	8.25	8	2,432
O-2700	2,700	155	90.5	55	79	91.625	17.5	40	7-9	8.25	8	3,220
O-3000	3,000	176	90.5	55	79.375	92.25	18	35	7-9	8.25	10	3,792
O-4000	4,000	196	97.625	58	86.25	99	18	32	7-9	8.25	12	5,982
O-5000	5,000	196	108	62	93.675	106.25	18	32	7-9	5.375	12	6,282
O-6000	6,000	196	119	72	99.375	112.25	12.25	24.5	7.9	5.375	16	6,792
O-7000	7,000	196	127	78	106.5	119.25	12.25	24.5	7-9	5.375	16	6,912
O-8000	8,000	228	126.3125	78	107.125	119.25	12	25.5	7-9	5.375	18	7,744

¹Actual calibration capacity may exceed certified capacity.

²Minimum and maximum clearance under the milk cooler with standard adjustable legs.

³Approximate weight measured in pounds (includes agitator(s), pump assembly, and controls).

8.2 Metric Weights and Conversions

Dimensions not to be used for construction unless certified.

Model	Capacity ¹ (liters)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H ² (mm)	J (mm)	No. of Legs	Weight ³ (Empty)
O-500	1,893	1981.2	1549.4	946.2	1295.4	1619.3	457.2	1066.8	101-127	209.6	4	424
O-600	2,271	2286.0	1549.4	946.2	1301.8	1625.6	457.2	1371.6	101-127	209.6	4	474
O-800S	3,028	2032.0	1809.8	1270.0	1543.1	1866.9	457.2	1117.6	101-203	209.6	4	582
O-1000S	3,785	2590.8	1809.8	1270.0	1555.8	1879.6	457.2	838.2	101-203	209.6	6	694
O-1000D	3,785	2590.8	1809.8	1270.0	1555.8	1879.6	457.2	838.2	101-203	209.6	6	715
O-1350	5,110	2590.8	2032.0	1225.6	1755.8	2082.8	457.2	838.2	178-229	209.6	6	803
O-1600	6,057	3048.0	2032.0	1225.6	1765.3	2089.2	457.2	1066.8	178-229	209.6	6	902
O-2000	7,571	3937.0	2032.0	1225.6	1765.3	2108.2	444.5	1016.0	178-229	209.6	8	1,103
O-2700	10,221	3937.0	2298.7	1397.0	2006.6	2333.6	444.5	1016.0	178-229	209.6	8	1,461
O-3000	11,356	4470.4	2298.7	1397.0	2016.1	2343.2	457.2	889.0	178-229	209.6	10	1,720
O-4000	15,142	4978.4	2479.7	1473.2	2190.8	2514.6	457.2	812.8	178-229	209.6	12	2,713
O-5000	18,927	4978.4	2743.2	1574.8	2371.7	2698.8	457.2	812.8	178-229	136.5	12	2,849
O-6000	22,712	4978.4	3022.6	1828.8	2524.1	2851.2	311.2	622.3	178-229	136.5	16	3,081
O-7000	26,498	4978.4	3225.8	1981.2	2705.1	3029.0	311.2	622.3	178-229	136.5	16	3,135
O-8000	30,283	5791.2	3208.3	1981.2	2721.0	3029.0	304.8	647.7	178-229	136.5	18	3513

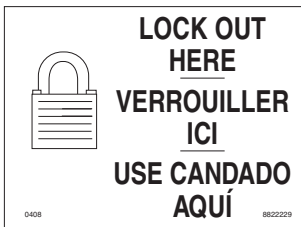
¹Actual calibration capacity may exceed certified capacity.

²Minimum and maximum clearance under the milk cooler with standard adjustable legs.

³Approximate weight measured in kilograms (includes agitator(s), pump assembly, and controls).

SECTION 9.0 - SENTRY III EQUIPMENT MARKINGS

9.1 Label No. 8822229, Lock Out



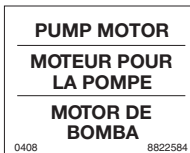
9.2 Label No. 8820482, Caution: Disconnect Power and Retain Latch



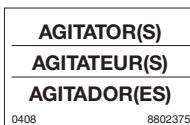
9.3 Label No. 8820623, Warning Symbol: Electrical



9.4 Label No. 8822584, Pump Motor Wire Marker



9.5 Label No. 8802375, Agitator(s) Wire Marker



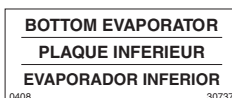
9.6 Label No. 3791, Hot Water Valve Marker



9.7 Label No. 3792, Cold Water Valve Marker



9.8 Label No. 30737, Bottom Temp-Plate



9.9 Label No. 8823013, Warning: Disconnect Power Before Servicing

⚠ WARNING	
DISCONNECT CONTROL CABINET FROM MAIN POWER SUPPLY BEFORE SERVICING.	
⚠ AVERTISSEMENT	
DÉBRANCHER L'ARMOIRE DE COMMANDE DE LA SOURCE ÉLECTRIQUE PRINCIPALE AVANT D'EFFECTUER LA MAINTENANCE.	
⚠ ¡ADVERTENCIA!	
CORTE EL SUMINISTRO PRINCIPAL DE CORRIENTE ELÉCTRICA ANTES DE DAR SERVICIO AL GABINETE DE CONTROL.	
0408	8823013

9.10 Label No. 8801150, Warning: Disconnect Power Before Servicing

⚠ WARNING	
DISCONNECT BOTH CONDENSING UNIT AND CONTROL CABINET FROM MAIN POWER SUPPLY BEFORE SERVICING.	
⚠ AVERTISSEMENT	
DÉBRANCHEZ L'UNITÉ RÉFRIGÉRANTE ET LA BOÎTE DE CONTRÔLE DU SYSTÈME D'ALIMENTATION ÉLECTRIQUE AVANT DE RÉPARER.	
⚠ ¡ADVERTENCIA!	
DESCONECTE LAS UNIDADES DE CONDENSACIÓN Y EL GABINETE DE CONTROL DEL SUMINISTRO ELÉCTRICO PRINCIPAL ANTES DE DAR SERVICIO.	
0408	8801150

9.11 Label No. 8822225, CE Data Tag (U.K. Models Only)

Year of Construction Année de fabrication Año de fabricación	<input type="text"/>	CE
Model Number Numéro de modèle Número de modelo	<input type="text"/>	
Serial Number Numéro de série Número de serie	<input type="text"/>	
Noise Level Niveau de bruit Nivel de ruido	<input type="text"/>	
Weight Poids Peso	<input type="text"/>	
0408	8822225	

9.12 Label No. 8820410, Data Tag (U.K. Models Only)

PAUL MUELLER COMPANY MILK COOLER			
MODEL	PART NO.	SERIAL NO.	
<input type="text"/>	<input type="text"/>	<input type="text"/>	
NOMINAL CAPACITY		WEIGHT, EMPTY	
<input type="text"/> litres		<input type="text"/> kg	
VOLTS	HERTZ	PHASE	F.L.A.
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
NOTE: For electrical characteristics of condensing unit, refer to condensing unit data plate.			
ISO PERFORMANCE CLASS		REFRIGERANT	
<input type="text"/>		<input type="text"/>	
8820410			

9.13 Label No. 30612, Notice: Chart Accuracy

MUELLER®	
Notice	
<p>The accuracy of these charts depends upon the proper installation of the cooler.</p>	
<p>Follow the detailed "leveling" instructions carefully. Check the level indicator and test gauge reading before use. Improper installation could result in claims by the buyer or seller of the milk against the party making the installation.</p>	
6911	30612

9.14 Label No. 8820454, Dry Nitrogen Holding Charge

IMPORTANT	
<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>	
(11/94) 8820454	

9.15 Label No. 8822705, Canadian and U.S. Certification



9.16 Label No. 30890, Mueller Control Box Data Tag

MUELLER					
PRODUCT					
<input type="text"/>					
MODEL NUMBER	PART NUMBER	SERIAL NUMBER			
<input type="text"/>	<input type="text"/>	<input type="text"/>			
VOLTS	HERTZ	PHASE	LRG MTR 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.					
0007		30890			

9.17 Label No. 8820677, Ground Symbol



9.18 Label No. 30397, Stainless Steel Symbol



9.19 Label No. 30166, Caution: Vent Must Be Over Milk Inlet

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

9.20 Label No. 8822558, Mueller Milk Cooler Data Tag

MUELLER		MILK COOLER	
Model & Nominal Capacity	U.S. Gallons Calibrated Capacity	Serial Number	Refrigerant
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
TWO WIRES WITH GROUND Volts Hertz	Phase	Agitator FLA	Pump
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Evaporator Design Working Pressure (PSI)	Note: 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.		
<input type="text"/>	This cooler is designed for every-day or every-other-day pickup. The maximum rate at which milk can enter the cooler and meet the cooling requirements of the 3-A Sanitary Standards for Farm Milk Cooling and Holding Tanks, Number 13-10, is _____ U.S. gallons per hour for every-day 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.		
Note: 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. Contact your Mueller dealer for assistance in condensing unit sizing.			
FOR OUTDOOR USE			
0902 PAUL MUELLER COMPANY • SPRINGFIELD, MISSOURI U.S.A. • OSCEOLA, IOWA U.S.A. • LICHTENVOORDE, NETHERLANDS 8822558			

9.21 Label No. 8802777, Caution: Do Not Sanitize

⚠ CAUTION	⚠ MISE EN GARDE	⚠ ¡PRECAUCIÓN!
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.	NE PAS ASSAINIR VOTRE BASSIN REFROIDISSEUR 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 INOXIDABLE ET PEUT PROVOQUER UN GAZ NÉFASTE À VOTRE SANTÉ. LA TEMPÉRATURE DU CYCLE DE LAVAGE NE DOIT PAS EXCÉDER 170 F (76 C).	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).

SECTION 10.0 - SAFETY



Safety/Alert: See all safety, warning, and caution labels displayed in Section 9.

10.1 General

1. The Mueller milk cooler and Sentry 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.
4. **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.
5. Protective boot covers should be worn to avoid non-warranted damage to the internal and external surfaces of the milk cooler.

10.2 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.

10.3 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. The 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).

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 11.0 - PREVENTATIVE MAINTENANCE

11.1 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, for 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:

11.2 Preventative 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 10.3, “Ladder Safety.”)
- Check milk temperature display accuracy.

11.3 Preventative 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.

11.4 Preventative 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.

11.5 Preventative 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 Mueller 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 Mueller 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 12.0 - DISPOSAL

12.1 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.

12.2 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.

12.3 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.



Sentry® III Service Reference Form Programmable Features

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:

SENTRY III ADB/WWB WASH PARAMETERS				
ADB/WWB	CON	Selects Wash Control Type	ADB/WWB	ADB
ADB/WWB	DRP	Selects normally open or normally closed drain valves	"NO/NC"	
ADB/WWB	TWT	Total Wash Time	"XXX" Min.	
ADB/WWB	TAT	Total Acid Time	"XXX" Min.	
ADB/WWB	TST	Total Sanitize Time	"XXX" Min.	
ADB/WWB	WD	Wash Delay	"0 to 120" Min.	
ADB/WWB	WFT	Wash Fill Time	"3 to 20" Min.	
ADB/WWB	MIX	Mix temperature ratio for "Warm" water cycles	"25 - 50%"	
ADB/WWB	DRN	Drain Time (Drain LED)	"1 to 10" Min.	
ADB/WWB	R1?	Selects option of a "Pre-Rinse" to help remove milk residue	"Yes/No"	
ADB/WWB	R1T	Rinse No. 1 Temperature (Pre-Rinse Cycle LED)	"CLD/WRM/HOT"	
ADB/WWB	R1C	Rinse No. 1 Circulation Time (Pre-Rinse Cycle and Circulation LED)	"0.5 to 5" Min.	
ADB/WWB	R1D	Rinse No. 1 Drain Selection (Pre-Rinse Cycle and Drain LED)	"DR1/DR2"	
ADB/WWB	R2T	Rinse No. 2 Temperature (Rinse Cycle LED)	"CLD/WRM/HOT"	
ADB/WWB	R2C	Rinse Circulation Time (Rinse Cycle and Circulation LED)	"0.5 to 5" Min.	
ADB/-----	AWT	Acid Wash Temperature, Super Wash option on ADB only (Acid Cycle LED)	"CLD/WRM/HOT"	
ADB/-----	AWC	Acid Wash Circulation Time, Super Wash option on ADB only (Acid Cycle and Circulation Pump LED)	"2 to 10" Min.	
ADB/WWB	DWT	Detergent Wash Temperature (Detergent Cycle LED)	"HOT"	
ADB/WWB	DWC	Detergent Circulation Time (Detergent Cycle and Circulation LED)	"2 to 10" Min.	
ADB/WWB	LWT	Low Wash Temperature Notification	80-140°F (26.5-60°C)	
ADB/WWB	R3T	Rinse No. 3 Temperature (Post Rinse Cycle LED)	"CLD/WRM/HOT"	
ADB/WWB	R3C	Rinse No. 3 Circulation Time (Post Rinse Cycle and Circulation LED)	"0.5 to 5" Min.	
ADB/WWB	AR?	Selects automatic 5th cycle (Acid-Rinse) during full wash selection (Acid Cycle LED)	"Yes/No"	
ADB/WWB	ART	Acid-Rinse Temperature (Acid Cycle LED)	"CLD/WRM"	
ADB/WWB	ARC	Acid-Rinse Circulation Time (Acid Cycle and Circulation LED)	"0.5 to 5" Min.	
ADB/WWB	R4?	Rinse No. 4 (Acid Post-Rinse) (Post Rinse LED if "Yes")	"Yes/No"	
ADB/WWB	R4T	Rinse No. 4 Temperature (Acid Post Rinse) (Post Rinse Cycle LED)	"CLD/WRM/HOT"	
ADB/WWB	R4C	Rinse No. 4 Circulation Time (Acid Post Rinse) (Post Rinse Cycle and Circulation LED)	"0.5 to 5" Min.	
ADB/WWB	SRT	Sanitize Rinse Temperature (Sanitize Cycle LED)	"CLD/WRM"	
ADB/WWB	SRC	Sanitize Circulation Time (Sanitize Cycle and Circulation LED)	"0.5 to 5" Min.	
ADB/-----	DWP	Detergent Wash Dosing Pump Time (Detergent Cycle LED)	"0-600" Sec.	
ADB/-----	AWP	Acid Wash Dosing Pump Time (Acid Cycle LED)	"0-600" Sec.	
ADB/-----	ARP	Acid Rinse Dosing Pump Time (Acid Cycle LED)	"0-600" Sec.	
ADB/-----	SRP	Sanitize Rinse Dosing Pump Time (Sanitize Cycle LED)	"0-600" Sec.	

Sentry® III Service Reference Form, Programmable Features - Page 2

Please record the selected program options:

SENTRY III MMB WASH PARAMETERS			
MMB	CON	Selects Wash Control Type	ADB/WWB/MMB
MMB	DR	Selects Drain Valve Type	"HYD"
MMB	WT	Selects Wash Timer Emulation	"A/B"
MMB	TWT	Total Wash Time	"40/80"
MMB	TAT	Total Acid Time	"20/40"
MMB	TST	Total Sanitize Time	"10/20"
MMB	WD	Wash Delay	"0 to 120" Min.
MMB	WFT	Water Fill Time	"8.0/16.0"
MMB	DRN	Drain Time (Drain LED)	"2.0/4.0"
MMB	R1?	Rinse No. 1 (Pre-Rinse) (Pre-Rinse LED if "Yes")	"Yes/No"
MMB	R1T	Rinse No. 1 Temperature (Pre-Rinse Cycle LED)	"CLD"
MMB	R1C	Rinse No. 1 Circulation Time (Pre-Rinse Cycle and Circulation LED)	"1.0/2.0"
MMB	R2T	Rinse No. 2 Temperature (Rinse Cycle LED)	"HOT"
MMB	R2C	Rinse Circulation Time (Rinse Cycle and Circulation LED)	"2.0/4.0"
MMB	DWT	Detergent Wash Temperature (Detergent Cycle LED)	"HOT"
MMB	DWC	Detergent Circulation Time (Detergent Cycle and Circulation LED)	"4.0/8.0"
MMB	LWT	Low Wash Temperature Notification	80-140°F (26.5-60°C)
MMB	R3T	Rinse No. 3 Temperature (Post Rinse Cycle LED)	"HOT"
MMB	R3C	Rinse No. 3 Circulation Time (Post- Rinse Cycle and Circulation LED)	"2.0/4.0"
MMB	AR?	Selects automatic 5th cycle (Acid-Rinse) during full wash selection (Acid Cycle LED)	"Yes/No"
MMB	ART	Acid-Rinse Temperature (Acid Cycle LED)	"CLD"
MMB	ARC	Acid-Rinse Circulation Time (Acid Cycle and Circulation LED)	"2.0/4.0"
MMB	SRT	Sanitize Rinse Temperature (Sanitize Cycle LED)	"CLD"
MMB	SRC	Sanitize Circulation Time (Sanitize Cycle and Circulation LED)	"2.0/4.0"

SENTRY III COOLING PARAMETERS (COL)			
ADB/WWB	BUD	Bottom Unit Delay (Bottom Unit Delayed Start LED - flash)	0-120
ADB/WWB	AUD	All Unit Delay (All Units Delayed Start LED - flash)	0-300
ADB/WWB	PSC	Pre-Start Cooling Cycle (Pre-Start Cooling LED)	30/60
ADB/WWB	PSA	Pre-Start Agitation Cycle (Pre-Start Agitate LED)	30/60
ADB/WWB	F/C	Degree F or C selection	F/C
ADB/WWB	CAL	Calibration of temperature sensor	"-20" to "+20"
ADB/WWB	SPT	Setpoint Temperature	34-42F/1.1-5.5C
ADB/WWB	DIF	Temperature Differential	1 to 3
ADB/WWB	IAG	Interval Agitation Timing (Agitate LED)	3/18 or 3/30
ADB/WWB	SAG	Sample Agitation Timing (Agitate LED)	5 or 10

Sentry Information:

Part Number/Model: _____

Serial Number: _____

Milk Cooler Information:

Part Number/Model: _____

Serial Number: _____

Comments:

Figure 18 - Electrical Schematic - Field Wiring of Condensing Units and Water Works Box

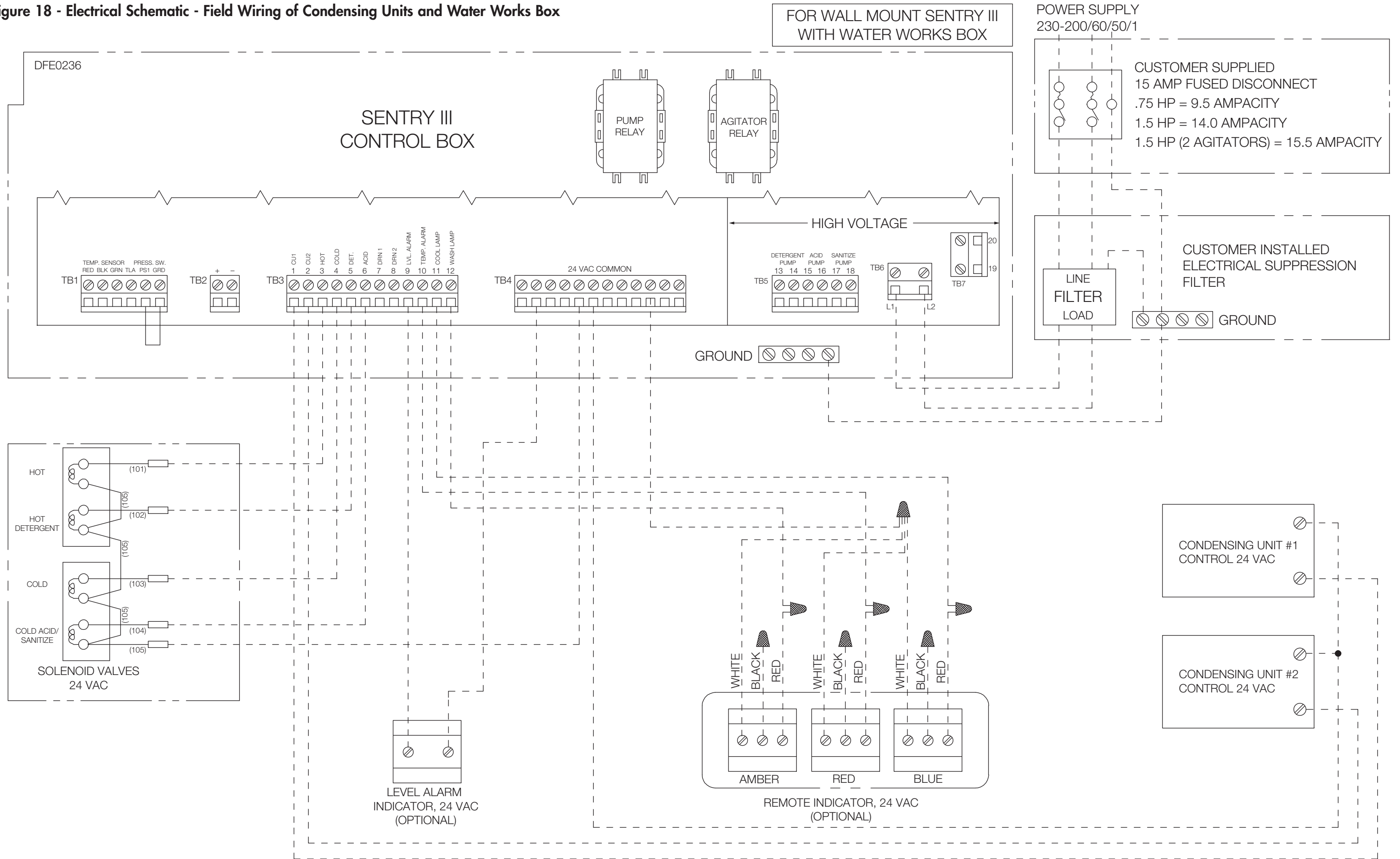
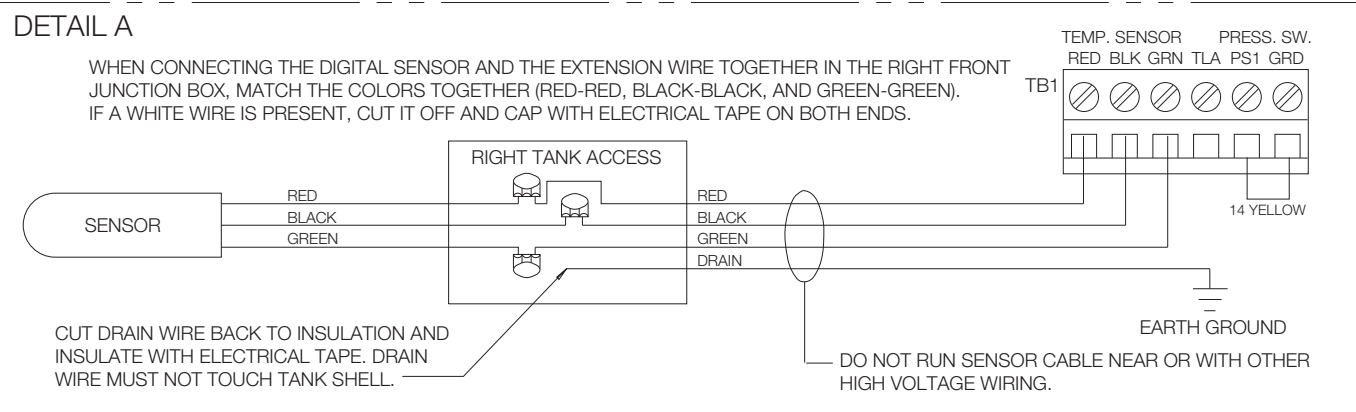
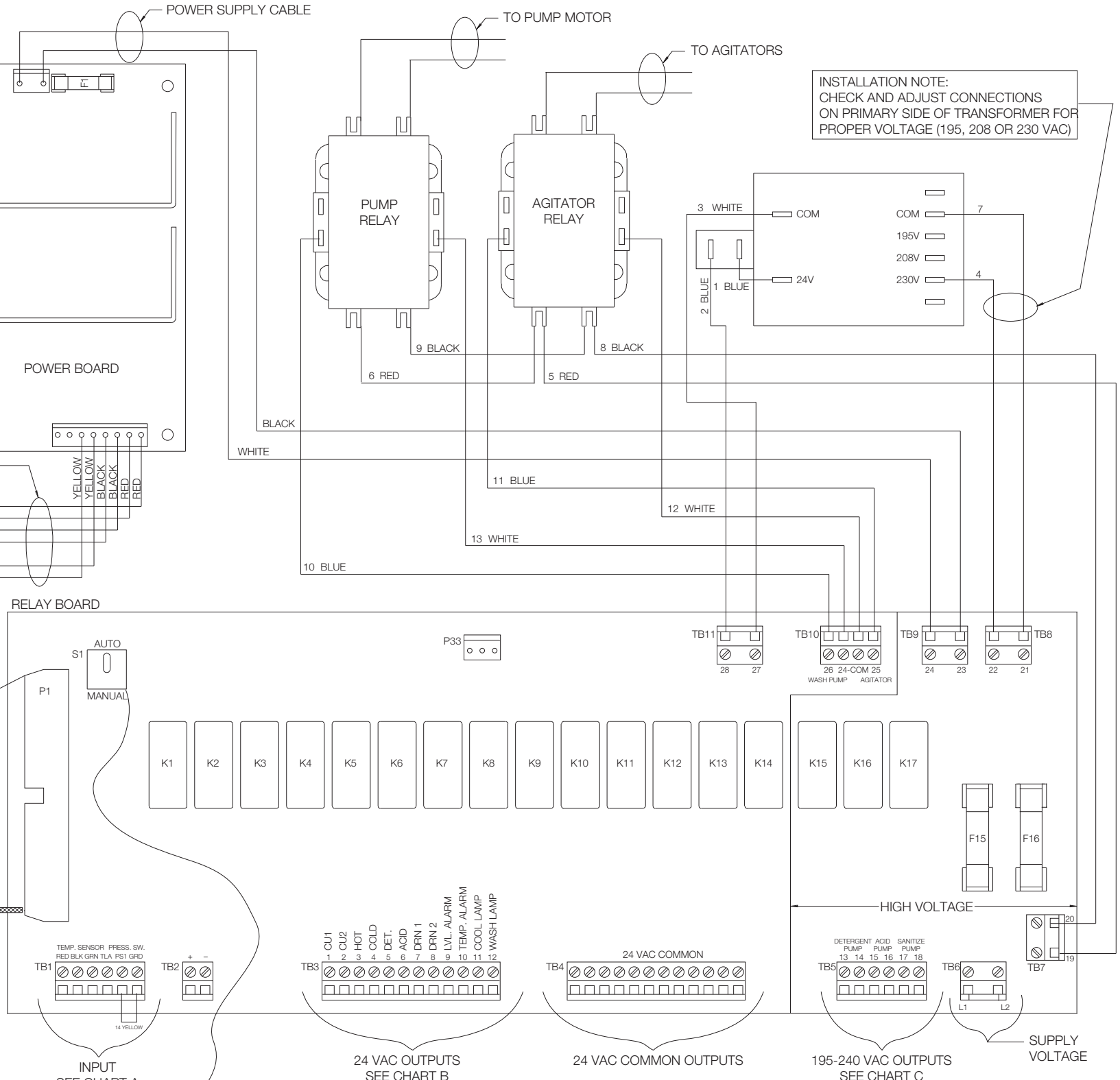
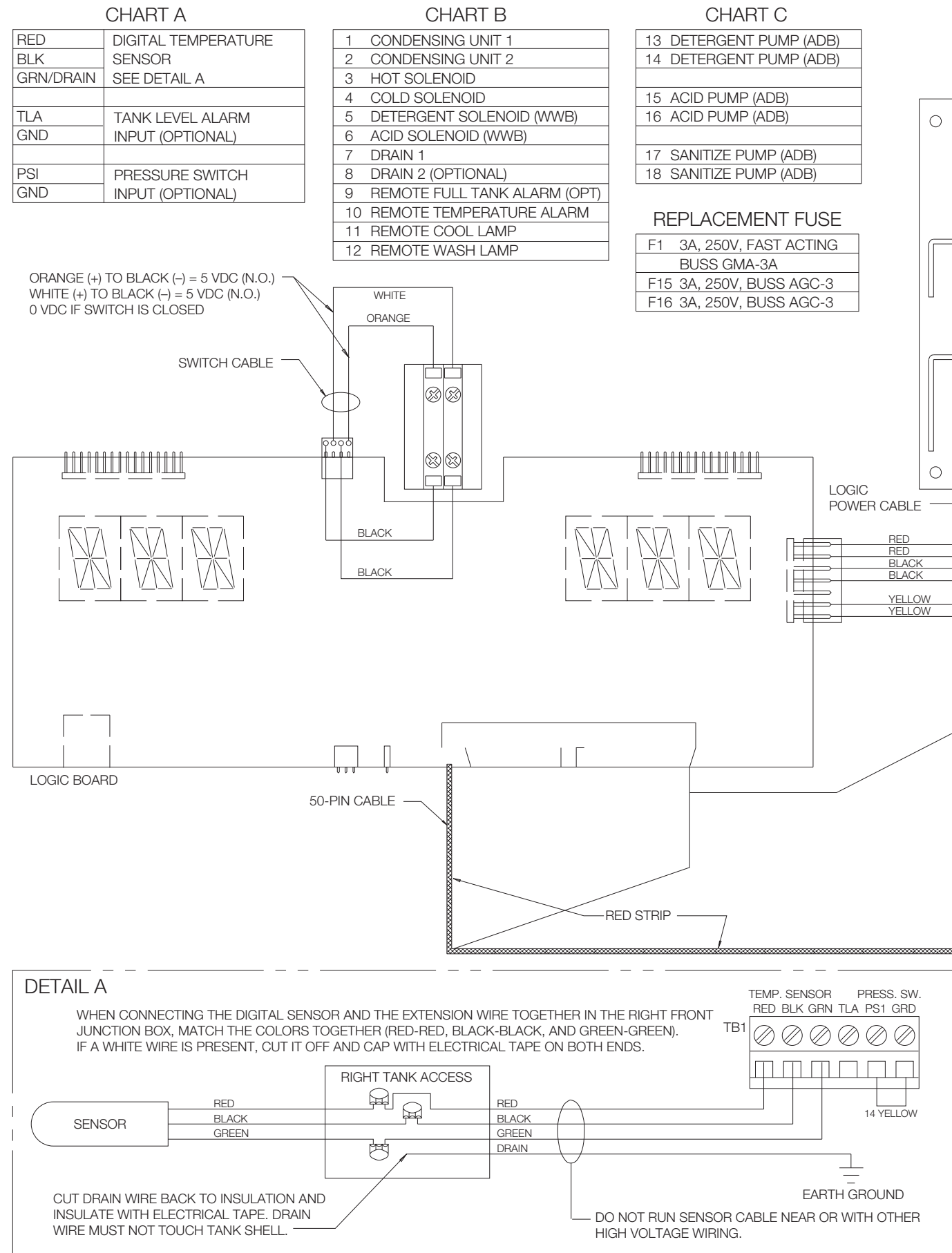


Figure 19 - Electrical Schematic - Factory Wiring



WARNING! RISK OF ELECTRICAL SHOCK. CAN CAUSE INJURY OR DEATH. DISCONNECT ALL REMOTE ELECTRIC POWER SUPPLIES TO THE SENTRY III CONTROL CABINET BEFORE SERVICING.



IMPORTANT NOTE: THE MANUAL OVERRIDE SWITCH IS ONLY TO BE UTILIZED BY AN AUTHORIZED SERVICE TECHNICIAN. IF THE MANUAL OVERRIDE IS UTILIZED, THERE IS NO TEMPERATURE CONTROL TO SHUT OFF THE REFRIGERATION. WHEN PRODUCT TEMPERATURE IS AT A SAFE HOLDING TEMPERATURE, TURN OFF THE POWER SUPPLY TO THE SENTRY III CONTROL.

MUELLER®

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