STOELTING®
A VOLLRATH® COMPANY

Model U421-I2A & U431-I2A
SERVICE MANUAL

Manual No. 513721 Rev.0

This manual provides basic information about the machine. Instructions and suggestions are given covering its operation and care.

The illustrations and specifications are not binding in detail. We reserve the right to make changes to the machine without notice, and without incurring any obligation to modify or provide new parts for machines built prior to date of change.

DO NOT ATTEMPT to operate the machine until instructions and safety precautions in this manual are read completely and are thoroughly understood. If problems develop or questions arise in connection with installation, operation, or servicing of the machine, contact Stoelting.

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A VOLLRATH® COMPANY

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A Few Words About Safety

Safety Information

Read and understand the entire manual before operating or maintaining Stoelting equipment.

This manual provides the operator with information for the safe operation and maintenance of Stoelting equipment. As with any machine, there are hazards associated with their operation. For this reason safety is emphasized throughout the manual. To highlight specific safety information, the following safety definitions are provided to assist the reader.

The purpose of safety symbols is to attract your attention to possible dangers. The safety symbols, and their explanations, deserve your careful attention and understanding. The safety warnings do not by themselves eliminate any danger. The instructions or warnings they give are not substitutes for proper accident prevention measures.

If you need to replace a part, use genuine Stoelting parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

Safety Alert Symbol:

This symbol Indicates danger, warning or caution. Attention is required in order to avoid serious personal injury. The message that follows the symbol contains important information about safety.

Signal Word:

Signal words are distinctive words used throughout this manual that alert the reader to the existence and relative degree of a hazard.

WARNING

The signal word “WARNING” indicates a potentially hazardous situation, which, if not avoided, may result in death or serious injury and equipment/property damage.

CAUTION

The signal word “CAUTION” indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury and equipment/property damage.

CAUTION

The signal word “CAUTION” not preceded by the safety alert symbol indicates a potentially hazardous situation, which, if not avoided, may result in equipment/property damage.

NOTE (or NOTICE)

The signal word “NOTICE” indicates information or procedures that relate directly or indirectly to the safety of personnel or equipment/property.

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SECTION 1
DESCRIPTION AND SPECIFICATIONS

1.1 DESCRIPTION

The Stoelting U421-I2A and U431-I2A floor model machines are pressure fed. They are equipped with fully automatic controls to provide a uniform product.

This manual is designed to assist qualified service personnel with troubleshooting and repairing the U421-I2A and the U431-I2A.

NOTE

These machines are offered with two types of spigot handles, swing gate and pull-down. The swing gate style is opened by moving the handle to the left and must be closed when finished dispensing. The pull-down style is opened by pulling downwards and are self-closing.

Figure 1-1 Model U431-I2A

Figure 1-1 Model U421-I2A

1.2 SPECIFICATIONS

	Air Cooled U421-I2A & U431-I2A		Air Cooled Remote U421-I2A & U431-I2A		Water Cooled U421-I2A & U431-I2A	
Dimensions	**Machine**	**with crate**	**Machine**	**with crate**	**Machine**	**with crate**
width	26-3/4'' (67,9 cm)	34'' (86,4 cm)	26-3/4'' (67,9 cm)	34'' (86,4 cm)	26-3/4'' (67,9 cm)	34'' (86,4 cm)
height	68-3/4'' (174,6 cm)	78'' (198,1 cm)	67-3/4'' (172,1 cm)	78'' (198,1 cm)	67-1/2'' (171,5 cm)	78'' (198,1 cm)
depth	39-1/2'' (100,3 cm)	48'' (121,9 cm)	39-3/4'' (101,0 cm)	48'' (121,9 cm)	39-1/2'' (100,3 cm)	48'' (121,9 cm)
Weight	785 lbs (356,0 kg)	935 lbs (424,1 kg)	760 lbs (344,7 kg)	908 lbs (411,8 kg)	760 lbs (344,7 kg)	908 lbs (411,8 kg)
Electrical	**1 PH**	**3 PH**	**1 PH**	**3 PH**	**1 PH**	**3 PH**
circuit ampacity (per barrel)	32A	20A	36A Left / 31A Right	20A	32A	20A
overcurrent protection device (per barrel)	50A	30A	50A Left / 45A Right	30A	50A	30A
	The machine requires one dedicated electrical circuit per barrel.					
Compressor	Two - 19,000 Btu/hr Cabinet - 1,300 Btu/hr Compressor (R-134a)					
Drive Motor	Two - 2 hp					
Cooling	Air cooled units require 6" (15,2 cm) air space on all sides and open at the top.		Remote air cooled requires two remote condensers and two precharged line sets.		Water cooled units require 1/2" N.P.T. water and drain fittings. Maximum water pressure of 130 psi. Minimum water flow rate of 3 GPM per barrel. Ideal EWT of 50°-70°F. The machine requires 6" (15,2 cm) air space on all sides for the cabinet refrigeration system.	
Mix Storage	Up to six 5-gallon bags					
Freezing Cylinder Volume	Two - 1.33 gallon (5,03 liters)					

Menu	Display	U421 I2A & U431 I2A
Basic	Enable Control	Temp/Temp
	CutOut Consist Offset	5
	CutIn Consist Offset	55
	CutIn Temp	40 °F
	CutOut Temperature	12 °F
	Cycles In Serve Mode	50
Advanced	Standby On Time	10 sec
	Standby Off Time	360 sec
	Standby Time	120 min
	Stir On	10 sec
	Stir Off	1200 sec
	Sleep 2 CutIn	70 °F
	Sleep 2 CutOut	54 °F
	Default Off Time	900 sec
Storage	Storage Refrigeration	Active
	Storage CutIn	39 °F
	Storage CutOut	36 °F
	Storage Offset	2 °F
	Storage Off Time	4 min
	Storage On Time	360 sec
	Storage Max On	10 min
	Storage Recovery	1 min
	Storage Too Warm	50 °F
	Storage Too Warm	2 hr

	U421-I2A & U431-I2A
Refrigerant	R-404A
Charge	A/C - 48 oz W/C - 36 oz Remote - 224 oz
Suction Pressure	19-21 psig
Discharge Pressure at 80ºF Ambient	A/C - 235-240 psig W/C - 225-235 psig
	Cabinet
Refrigerant	R-134A
Charge	8 oz
EPR Valve	32-34 psig

1.3 COMPONENT SETTINGS

Following are the settings for the components in the U421-I2A and U431-I2A machines.

A. COMPRESSOR WINDINGS

When testing the compressor windings the resistance through the windings should be as follows:

Compressor	Electrical	S to C	R to C
282106	1 PH 60Hz	1.34Ω	0.94Ω
282107	3 PH 60Hz	1.53Ω	1.21Ω
282108	3 PH 50Hz	3.81Ω	1.33Ω

B. CAPACITORS

Refer to the following table for the capacitance of all the capacitors in the machine:

		Rating	
Capacitor	**Part**	**MFD**	**VAC**
Cab Compressor	230667	80 MFD	220 VAC
Compressor - Run	231047	45 MFD	370 VAC
Compressor - Start	230638	88-106 MFD	330 VAC
Drive Motor - Run	231075	30 MFD	370 VAC
Drive Motor - Start	230622	200 MFD	250 VAC
Fan Motor	230654	5 MFD	400 VAC
Pump Motor	1171960	15 MFD	370 VAC

C. PUMP PRESSURE SWITCH

The pump pressure switch, located in the cabinet, maintains 21-24 psig in the mix line.

D. TEMPERATURE CONTROL SENSOR

The following table shows the relationship between the thermistor resistance and the suction line temperature.

°F	Resistance
-22	176950
-20	165200
-18	154300
-16	144200
-14	134825
-12	126125
-10	118050
-8	110550
-6	103550
-4	97075
-2	91025
0	85400
2	80150
4	75275
6	70725
8	66475
10	62500
12	58800
14	55325
16	52100
18	49075
20	46250
22	43600
24	41125
26	38800
28	36625
30	34575
32	32675
34	30875
36	29175
38	27600

°F	Resistance
40	26100
42	24725
44	23400
46	22175
48	21000
50	19900
52	18875
54	17900
56	17000
58	16125
60	15325
62	14550
64	13825
66	13150
68	12500
70	11875
72	11300
74	10750
76	10250
78	9750
80	9300
82	8850
84	8450
86	8050
88	7675
90	7325
92	7000
94	6675
96	6375
98	6100
100	5825

SECTION 2
REFRIGERATION SYSTEM

2.1 REFRIGERATION SYSTEM

The U421-I2A and U431-I2A have three separate refrigeration systems; one for each freezing cylinder and one for the cabinet.

The freezing cylinder systems are designed for use with R404A refrigerant and the cabinet system is designed for use with R134A refrigerant. The proper charges are indicated on the information plate.

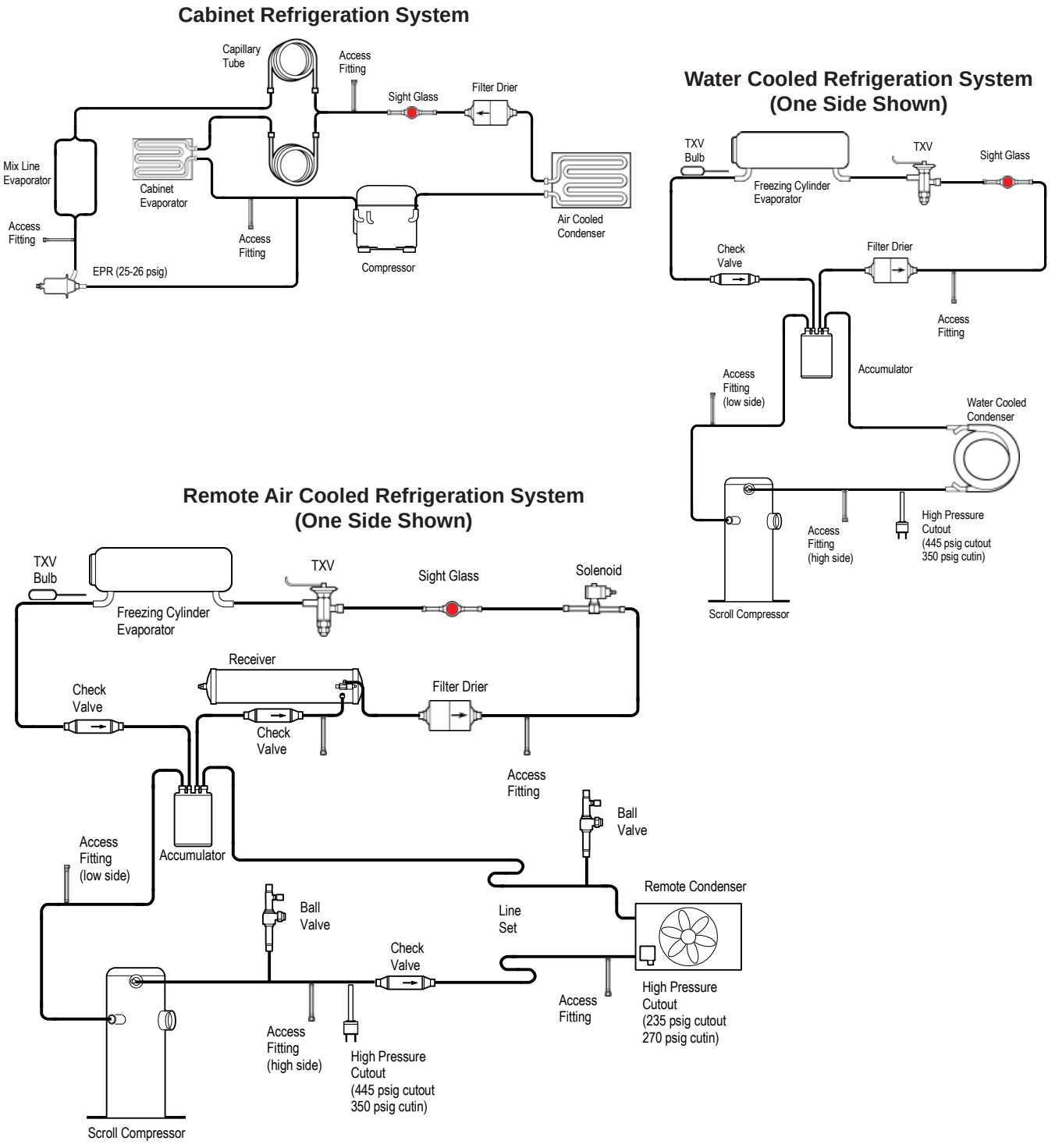


Figure 2-1 U421-I2A and U431-I2A Refrigeration Systems

2.2 REFRIGERANT RECOVERY AND EVACUATION

Refer to the following procedures to properly recover and evacuate the refrigeration system. Do not purge refrigerant into the atmosphere.

NOTE

For qualified service personnel only. Anybody working with refrigerants must be certified as a Technician TYPE I as required by 40 CFR 82 Subpart F and hold all State and/or local refrigerant handling certifications. In addition, all handling, storage, and disposal of refrigerants must be in accordance with Environmental Protection Agency (EPA) guidelines and standards and all State and local guidelines and standards.

⚠ WARNING

Hazardous voltage

Make sure the machine is off when disassembling for servicing. The machine must be disconnected from electrical supply before removing any access panel. Failure to disconnect power before servicing could result in death or serious injury.

A. REFRIGERANT RECOVERY

1. Disconnect the machine from electrical supply before removing any panels for servicing.
2. Remove all panels.
3. Connect the recovery unit to the suction and discharge service valves of the compressor.
4. Operate the recovery unit per manufacturer's instructions

B. EVACUATING THE REFRIGERATION SYSTEM

1. Close any open ports in the refrigeration system.
2. Connect a vacuum gauge to one of the Schrader valves next to an evaporator.
3. Connect the evacuation unit to the suction and discharge service valves of the compressor.
4. Evacuate the system until the gauge reads 300 microns of mercury (300µ Hg) for 5 continuous minutes.
5. If the system does not maintain a standing vacuum test with the vacuum pump off (gauge increases towards atmosphere), find the leak, fix it, and evacuate again.

2.3 REFRIGERANT CHARGING

Refer to the following procedures to properly charge the refrigeration system. Stoelting recommends liquid refrigerant charging.

NOTE

For qualified service personnel only. Anybody working with refrigerants must be certified as a Technician TYPE I as required by 40 CFR 82 Subpart F and hold all State and/or local refrigerant handling certifications. In addition, all handling, storage, and disposal of refrigerants must be in accordance with Environmental Protection Agency (EPA) guidelines and standards and all State and local guidelines and standards.

A. Ensure the electrical supply has been removed before continuing.

B. If the system has been opened or if there was a leak, refer to Section 2.2 - Refrigerant Recovery and Evacuation to evacuate the system prior to charging.

C. Refer to machine's information plate for total charge requirements.

NOTE

The refrigeration system of the O231 is critically charged. Be sure to charge the system to the weight listed on the machine's information plate.

D. For liquid refrigerant charging, connect refrigerant cylinder to the discharge Schrader valve of the compressor.

E. Add the proper amount of refrigerant according to the machine's information plate.

2.4 COMPRESSOR

The U421-I2A and U431-I2A have two scroll compressors for the freezing cylinders and one hermetic reciprocating compressor for the cabinet.(Refer to Figure 2-2 and 2-3).

A. WINDING TEST

To test the motor windings for possible problems, perform the following steps:

A. Disconnect the machine from electrical supply before removing any panels for servicing.

B. Remove the panels to gain access to the compressor terminals.

C. Pull the compressor connector plug off of the compressor.

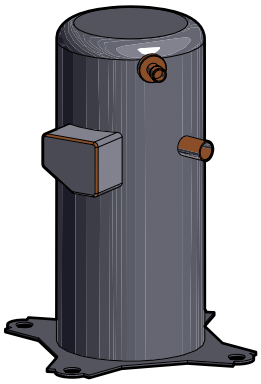


Figure 2-2 Freezing Cylinder Compressor

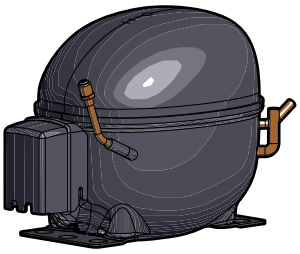


Figure 2-3 Cabinet Compressor

D. Test windings with an ohmmeter and refer to the following table:

Compressor	Electrical	S to C	R to C
282106	1 PH 60Hz	1.34Ω	0.94Ω
282107	3 PH 60Hz	1.53Ω	1.21Ω
282108	3 PH 50Hz	3.81Ω	1.33Ω

Cabinet compressor resistances are as follows:

S to C: 16.4Ω

R to C: 10.2Ω

F. To check if windings are shorted to ground, connect one ohmmeter lead to a bare metal part on the compressor (such as any copper line leading to or from the compressor) and check terminals C, R, and S.

B. COMPRESSOR REMOVAL

A. Disconnect the machine from electrical supply before removing any panels for servicing.

B. Remove the back and side panels.

C. Disconnect the electrical plug from the compressor.

D. Recover refrigerant charge per the instructions in Section 2.2.

E. Leave the suction and discharge ports open to prevent pressure buildup during compressor removal.

F. Remove six inches of insulating tubing on the suction line going to the compressor and unsweat the suction and discharge line from the compressor.

G. Cap or plug the refrigeration system if the compressor will not be replaced immediately (within 10 minutes) to prevent contamination.

H. Remove the four nuts and washers from the base of the compressor.

I. Remove the compressor from the machine.

J. Remove the four rubber compressor mounts from the compressor.

K. Crimp and braze all open ports of the old compressor.

NOTE

A compressor returned to Stoelting with any open ports void the warranty. ALWAYS crimp and braze ports on a compressor that has been removed.

C. COMPRESSOR INSTALLATION

A. Make sure the machine is disconnected from the electrical supply before servicing.

B. Install the four rubber mounts on the compressor.

C. Install the compressor into the machine, fitting the base over the four bolt holes.

D. Install the four washers and nuts onto the bolts and tighten securely.

E. Remove all tubing plugs from the replacement compressor.

NOTE

The compressor plugs protect the compressor from moisture in the air. Do not remove the plugs until you are ready to install. The compressor must not be opened to the atmosphere for more than 10 minutes.

F. Leave the suction and discharge ports open to prevent pressure buildup. Braze the suction and discharge line to the compressor.

G. Connect the electrical plug to the compressor.

H. Replace the drier per the instructions in Section 2.8.

I. Evacuate the system per the instructions in Section 2.2

J. Recharge the system per the instructions in Section 2.3.

K. Replace the insulating tubing on the suction line.

2.5 CONDENSER

The U421-I2A and U431-I2A are available with either an air-cooled, water-cooled, or air cooled remote condenser. The capacity of the machine is directly related to keeping the condenser clean and free of debris.

The air-cooled condenser is a copper tube and aluminum fin type. The machine must have a minimum of 6" of clearance on all sides for proper air flow.

The water-cooled condenser is a tube and shell type. This condenser requires cool, clean water to function properly. Inlet and discharge lines must be 1/2" ID minimum.

The remote air cooled condenser must have enough clearance for proper airflow. Refer to the remote condenser documentation for details.

CONDENSER TESTING

The condenser can be checked for leaks using the bubble test or using a leak detector.

2.6 VALVES

A. THERMOSTATIC EXPANSION VALVE (TXV)

The Thermostatic Expansion Valve (TXV) is used to meter the refrigerant to the freezing cylinder evaporator. It does so by maintaining a constant pressure in the evaporator. The self-regulating TXV is preset by the manufacturer and adjustment is not recommended. Figure 2-4.

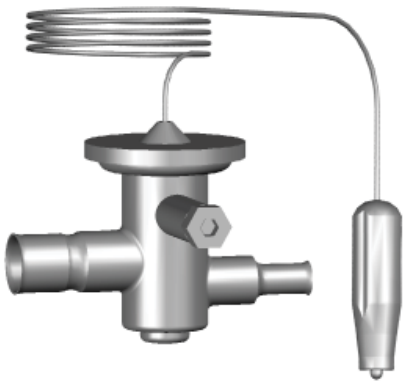


Figure 2-4 TXV

TXV TESTING & ADJUSTMENT

NOTE

The bulb has an indent which must be positioned against the tubing. Good contact between the bulb and the suction line is necessary for proper operation of the valve. The bulb must also be well insulated.

A. Connect a gauge to the Schrader valve on the suction line.

B. Connect a thermocouple to the suction line next to the evaporator.

C. Immediately before the refrigeration cycle ends, the gauge should read between 19-21 psig. The superheat should be 7-10°F.

D. If the pressure reading is higher than expected and the superheat is low, check to see if there is an overcharge of refrigerant.

E. If the pressure reading is lower than expected and the superheat is high, check to see if there is a low refrigerant charge or if there is a restriction in the system.

NOTE

The TXV is the LAST component to adjust in the refrigeration system.

F. The TXV can be adjusted after the steps above are completed. When adjusting, do not turn the valve over 1/4 turn (90°). Turn the valve stem clockwise to increase the superheat or counterclockwise to decrease the superheat.

TXV REMOVAL

A. Remove the side panel.

B. Remove bulb from suction line exiting from the evaporator.

C. Recover refrigerant charge per instructions in Section 2.2.

D. Leave the suction and discharge ports open to prevent pressure buildup during TXV removal.

E. Remove any insulation from the TXV and immediate surrounding lines.

F. Apply a heat sink (wet cloth) to the valve dome (Figure 2-5).

G. Unsweat the TXV and remove.

H. Cap or plug the refrigeration system if the TXV will not be replaced immediately (within 10 minutes) to prevent contamination.

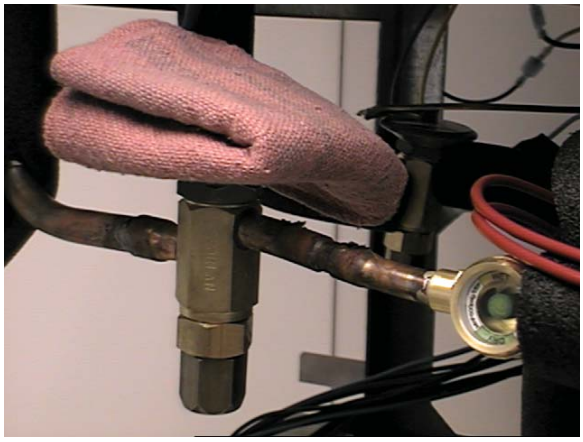


Figure 2-5 TXV Removal

TXV REPLACEMENT

To replace the TXV, perform the following procedures:

A. Position the TXV with a heat sink into the system.

B. With the suction and discharge ports open, braze the TXV into the system using appropriate brazing material.

C. Remove the heat sink from the TXV.

D. Install bulb on suction line exiting the evaporator using existing clamp. The bulb has an indent which must be placed against the tubing.

NOTE

Good contact between the bulb and the suction line is necessary for proper operation of the valve. The bulb must also be well insulated.

E. Tighten clamp to 20 in/lb using a torque wrench.

F. Replace insulation to the TXV and surrounding lines.

G. Replace the drier per the instructions in Section 2.8.

H. Evacuate the system per the instructions in Section 2.2.

I. Recharge the system per the instructions in Section 2.3.

B. CHECK VALVE

The machine has 2 magnetic check valves (Refer to Figure 2-6). Each valve is positioned in the suction line and prevents backflow of refrigerant into the evaporator. If there is reversed flow, the product in the freezing cylinder softens and liquid refrigerant can flood into the compressor on startup.

If a check valve needs to be replaced, use a heat sink (wet cloth) when installing the new valve to prevent damage.

Figure 2-6 Check Valve

C. HIGH PRESSURE CUTOUT

There is a high pressure cutout for each freezing cylinder (Fig 2-7) and one for the cabinet refrigeration (Fig 2-8). The high pressure cutout stops the compressor if the discharge pressure reaches the cutout, 445 psig for the freezing cylinders and 405 psig for the cabinet.

The high pressure cutout for the freezing cylinders automatically reset. The cutout for the cabinet refrigeration is a manual reset located behind the back panel.

Figure 2-7 High Pressure Cutout Freezing Cylinders

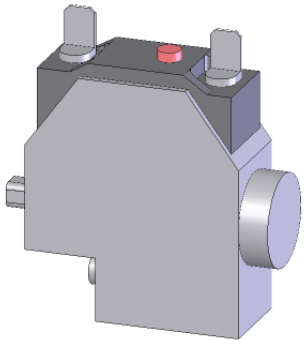


Figure 2-8 High Pressure Cutout Cabinet Refrigeration

HIGH PRESSURE CUTOUT TEST

A. Connect a gauge to the Schrader valve on the discharge line.

B. Disconnect cooling:

In a water-cooled machine, shut off the water supply.

In an air-cooled machine, shut off the fan motor in the IntelliTec2 control. Refer to Section 4.6 for details.

For the cabinet fan, disconnect the fan motor.

C. High pressure cutout should trip when pressure reaches 445 psig ±9 in the freezing cylinder system and 405 psig in the cabinet system.

HIGH PRESSURE CUTOUT REMOVAL

A. Remove the side panel.

B. Recover refrigerant charge per instructions in Section 2.2.

C. Leave the suction and discharge ports open to prevent pressure buildup during removal.

D. Unsweat capillary tube from suction line.

E. Cap or plug the refrigeration system if the high pressure cutout will not be replaced immediately (within 10 minutes) to prevent contamination.

F. Disconnect terminals from high pressure cutout.

HIGH PRESSURE CUTOUT REPLACEMENT

A. With the suction and discharge ports open, braze the capillary tube to the discharge line.

C. Replace the drier per the instructions in Section 2.8.

D. Braze bulb into place on suction line.

E. Evacuate the system per the instructions in Section 2.2.

F. Recharge the system per the instructions in Section 2.3.

G. Connect the terminals to the high pressure cutout.

H. Attach the high pressure cutout using the two screws with star washers.

D. EVAPORATOR PRESSURE REGULATOR (EPR)

There is one EPR in the refrigeration system (Refer to Figure 2-9). It is located on the suction line of the cabinet evaporators and regulates evaporator refrigerant pressure.

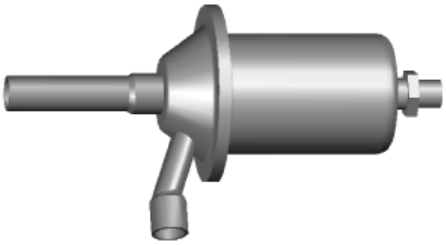


Figure 2-9 EPR Valve

EPR TEST AND ADJUSTMENT

Adjustment to the EPR must be made when the cabinet refrigeration is running

A. Disconnect the machine from electrical supply before removing any panels for servicing.

B. Remove the rear panel.

C. Connect a gauge to the Schrader valve on the suction line between the cabinet evaporator and the EPR.

D. Connect power to the machine.

E. Turn the machine on by pressing the Main Power Off/On button. Listen for the cabinet compressor to start.

F. The gauge should read 32-34 psig. If it does not, then adjustment is needed.

G. Remove the plastic cap and loosen the locknut on the EPR. Using a small screwdriver, turn the adjustment screw counterclockwise 1/2 turn, then adjust as necessary. Turn the valve stem clockwise for higher pressure or counterclockwise for lower pressure.

H. Allow the system to stabilize for 5 minutes to ensure pressure remains stable.

EPR REMOVAL

A. Remove the rear panel.

B. Recover refrigerant charge per instructions in Section 2.2.

C. Leave the suction and discharge ports open to prevent pressure buildup during EPR removal.

D. Unsweat the EPR and remove.

E. Cap or plug the refrigeration system if the EPR will not be replaced immediately (within 10 minutes) to prevent contamination.

EPR REPLACEMENT

To replace the EPR, perform the following procedures:

A. Apply a heat sink (wet cloth) to the EPR.

B. With an open port, braze the EPR into the system.

C. Remove the heat sink from the hot gas bypass.

D. Replace the filter drier. Refer to Section 2.8 for details.

E. Evacuate and recharge system per instructions in Section 2.2.

E. WATER VALVE (WATER COOLED MODELS ONLY)

The water valve monitors refrigerant pressure and opens on an increase of pressure. The opening point pressure is the refrigerant pressure required to lift the valve disc off the valve seat. (Figure 2-10)

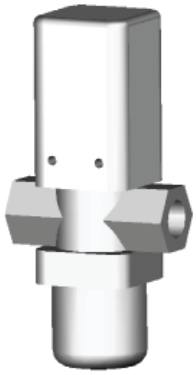


Figure 2-10 Water Valve

WATER VALVE ADJUSTMENT

A. Remove the lower front panel and side panel.

B. Connect a gauge to the compressor discharge Schrader valve.

C. Connect the machine to the electrical supply, start the refrigeration cycle, and read the pressure.

D. The proper gauge reading should be 225-235 psig. The exit water temperature should be 95-107°F.

E. If the water temperature and high side pressure are too low, the opening point pressure should be increased to slow the water flow. Turn the adjustment screw counterclockwise.

F. If the water temperature and high side pressure are too high, the opening point pressure should be decreased to increase the flow of water. Turn the adjustment screw clockwise.

WATER VALVE REMOVAL

The water valve is connected to the refrigeration system by capillary tube brazed to the discharge line.

A. Turn off and disconnect the water supply. Blow out the water lines with compressed air or CO_2.

B. Recover refrigerant charge per instructions in Section 2.2.

C. Leave the suction and discharge ports open to prevent pressure buildup during water valve removal.

D. Unsweat the capillary tube from the discharge line.

E. Cap or plug the refrigeration system if the water valve will not be replaced immediately (within 10 minutes) to prevent contamination.

F. Remove the clamps from the water lines at the valve.

G. Remove the two screws holding the water valve to the frame and remove the valve.

WATER VALVE REPLACEMENT

To replace the water valve, perform the following procedures:

A. Position the water valve and attach to the frame using the two screws.

B. Install the water lines onto the valve with hose clamps.

C. Leave the suction and discharge ports open to prevent pressure buildup during water valve installation.

D. Braze the capillary tube into the system.

E. Connect the water supply line and turn on the water supply.

F. Check for leaks in the water lines. If there are no leaks, turn off the water supply.

G. Replace the filter drier. Refer to Section 2.8 for details.

H. Evacuate and recharge system per instructions in Section 2.2.

I. Turn on the water and check for leaks in the water lines with the refrigeration system running.

J. Adjust the valve as necessary.

2.7 SOLENOID (AIR COOLED REMOTE ONLY)

Solenoid valves are installed on the freezing cylinder liquid lines in air cooled remote machines. A solenoid valve has a magnetic coil that, when energized, lifts a plunger and allows refrigerant to flow. The solenoids are activated by the IntelliTec2 control and determine which evaporator receives refrigeration.

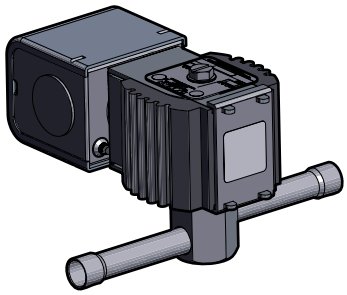


Figure 2-11 Solenoid Valve

ACTIVATING A SOLENOID

To activate a solenoid, follow these steps:

A. From the Current Status screen, press the right arrow, SET, then the SEL button to access the technician level on the control.

B. Navigate to the Left Output Control or Right Output Control menu which is located under Utilities in the Testing and Manual Operation screen. Refer to Section 4 for details.

C. Activate the solenoid by moving the cursor to the Liquid Solenoid option and pressing the SET button.

NOTE

Any energized component will deenergize after leaving the Testing and Manual Operations menu.

SOLENOID TESTING

The following test will check if a liquid line solenoid has a leaking valve seat. The power to the solenoid is disconnected and refrigerant flow is monitored through the system. If the valve seat does not leak, the suction pressure during the test will be low.

A. Attach a gauge to the Schrader valve on the suction line.

B. From the Current Status screen, press the right arrow, SET, then the SEL button to access the technician level on the control.

C. Navigate to the Left Output Control or Right Output Control menu which is located under Utilities in the Testing and Manual Operation screen. Refer to Section 4 for details.

D. Activate the compressor by moving the cursor to the compressor option and pressing the SET button.

E. The gauge should read well below 21 psig after 1 minute.

F. A leaking valve seat may also show frost on the liquid line tubing just past the solenoid and before the evaporator.

SOLENOID MAGNETIC COIL REMOVAL

A. Remove the side panel.

B. Disconnect the electrical wires.

C. Remove the retainer screw from the top of the solenoid and pull the magnetic coil off.

SOLENOID MAGNETIC COIL INSTALLATION

To replace the magnetic coil, perform the following procedures:

A. Push the coil on to the solenoid valve stem.

B. Connect the two electrical wires to the magnetic coil.

C. Make sure there isn't any foam insulation between the valve coil and valve body. Trim any excess insulation.

D. Install retainer screw onto top of coil.

SOLENOID VALVE REMOVAL

A. Identify and disconnect the two wires from the solenoid coil.

B. Remove the retainer holding the coil to the solenoid body and remove the coil.

C. Recover refrigerant charge per instructions in Section 2.2.

D. Remove insulation around valve and attached refrigeration lines.

E. Apply heat sinks (wet cloth) to the insulated refrigerant lines near the valve.

F. Leave a port open to prevent pressure buildup during solenoid removal

G. Unsweat the solenoid and remove.

H. Cap or plug the refrigeration system if the solenoid valve will not be replaced immediately (within 10 minutes) to prevent contamination.

SOLENOID VALVE REPLACEMENT

To replace the solenoid, perform the following procedures:

A. Position the new solenoid with the arrow pointing toward the direction of refrigerant flow.

B. Apply a heat sink (wet cloth) to the solenoid valve.

C. With the suction and discharge ports open, braze the solenoid into the system.

D. Remove the heat sink from the valve.

E. Replace insulation around valve.

F. Replace the filter drier. Refer to Section 2.8 for details.

G. Evacuate and recharge system per instructions in Section 2.2.

2.8 FILTER DRIER

The filter drier must be replaced every time the refrigeration system is opened for service. A new filter drier improves operation of the entire refrigeration system by stopping the circulation of moisture and by removing harmful contaminants (Refer to Figure 2-11).

Figure 2-12 Filter Drier

FILTER DRIER REMOVAL

A. Recover refrigerant charge per instructions in Section 2.2.

B. Cut the refrigeration line as close to the filter drier as possible and remove drier.

C. Cap or plug the refrigeration system if the drier will not be replaced immediately (within 10 minutes) to prevent contamination.

D. Cap the ends of the drier using the plugs from the new drier.

NOTE

The drier must be capped to prevent moisture from the environment

FILTER DRIER REPLACEMENT

A. Position the filter drier so the arrow is pointing toward the direction of refrigerant flow (pointing away from the condenser).

B. Apply a heat sink (wet cloth) to the filter drier.

C. With the suction and discharge ports open, braze the filter drier into the system.

D. Evacuate the system per instructions in Section 2.2.

E. Recharge the system per instructions in Section 2.3.

SECTION 3
ELECTRICAL AND MECHANICAL CONTROL SYSTEMS

NOTE

The wiring diagram is available in Section 5.

3.1 INTELLITEC2 CONTROL

The IntelliTec2 control consists of three main components; a control board, a display board and a membrane switch (touchpad).

The control board is modular and consists of a program board and a relay board. Refer to the IntelliTec2 manual for details.

3.2 CONTACTORS

The U421-I2A and U431-I2A have a total of six contactors. Each side of the machine has a contactor for the compressor, drive motor and IntelliTec2 control. The contactor for the IntelliTec2 provides power to the fan motor (in air-cooled machines) and the condensing unit for the cabinet.

The compressor and drive motor contactors are mounted to their respective evaporator and the IntelliTec2 contactors are located in the header panel.

The IntelliTec2 control sends electronic signals to trigger the contactors. Separate signals are used to control each drive motor contactor and each compressor contactor. The signals to the contactors are staggered, so the drive motor always starts three seconds before the compressor. By staggering the starting and stopping of the drive motor, maximum starting torque is available and voltage spikes are reduced.

A. CONTACTOR TESTS

The following tests help determine if a contactor is working properly.

1. Listen for the contactor to close. When the spigot is opened or the Push To Freeze button is pressed, the drive motor contactor closes. After three seconds, the compressor contactor closes.
2. Check to ensure contactor is receiving signal. Read voltage across the coils of the contactor during a freezing cycle. Voltage should be about 230V. If there is no voltage reading, refer to Section 4 Troubleshooting.

3.3 DRIVE MOTOR

The U421-I2A and U431-I2A have two drive motors which rotate the auger assemblies. Internal, normally closed, centrifugal switches start the drive motors. The motors have an internal thermal overload.

A. DRIVE MOTOR TEST

1. Turn the machine off by pressing the Main Power Off/On button and disconnect the machine from the electrical supply.

⚠ WARNING

Hazardous voltage

Make sure the machine is off when disassembling for servicing. The machine must be disconnected from electrical supply before removing any access panel. Failure to disconnect power before servicing could result in death or serious injury.

2. Remove the back panel and a side panel.
3. Loosen the belt tension adjustment nut and remove the belt (Refer to Figure 3-1).

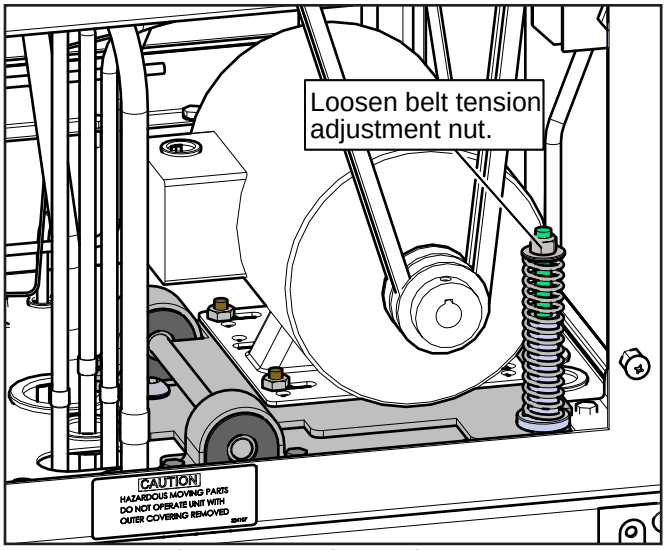


Figure 3-1 Belt Tension Nut

4. Connect power to the machine.
5. Turn the machine on by pressing the Main Power Off/On button.
6. Press the right arrow, SET, then the SEL button to access the technician level on the control.
7. Activate the drive motor through the Left Output Control or Right Output Control menus which are located under Utilities in the Testing and Manual Operation screen. Refer to the IntelliTec2 manual for details.

8. Go to the Test Monitoring screen under Utilities. The motor current should be as follows:

   Single Phase Machines: 6.1-6.3 Amps

   Three Phase Machines: 4.0-4.2 Amps

NOTE

The motor amps are based on 230VAC supply voltage.

9. After the test, stop the motor by exiting the Testing and Manual Operation section. Turn the machine off and disconnect from the electrical supply.
10. Install the belt and tighten the tension nut.
11. Use a Burroughs Belt Tension Gauge to set the tension for the drive belt. Set the belt tension to 55-60 lbs.
12. Using a straightedge, align the drive motor pulley with the speed reducer pulley. Align the pulley if necessary.

B. DRIVE MOTOR REMOVAL

1. Disconnect machine from electrical supply before removing any panels for servicing.
2. Remove the back panel and the side panel.
3. Remove the electrical cover plate from the back of the motor.
4. Identify (mark) wires and remove them from the motor.
5. Remove the tensioning nut and tensioning assembly. Then remove the belts. (Refer to Figure 3-2)

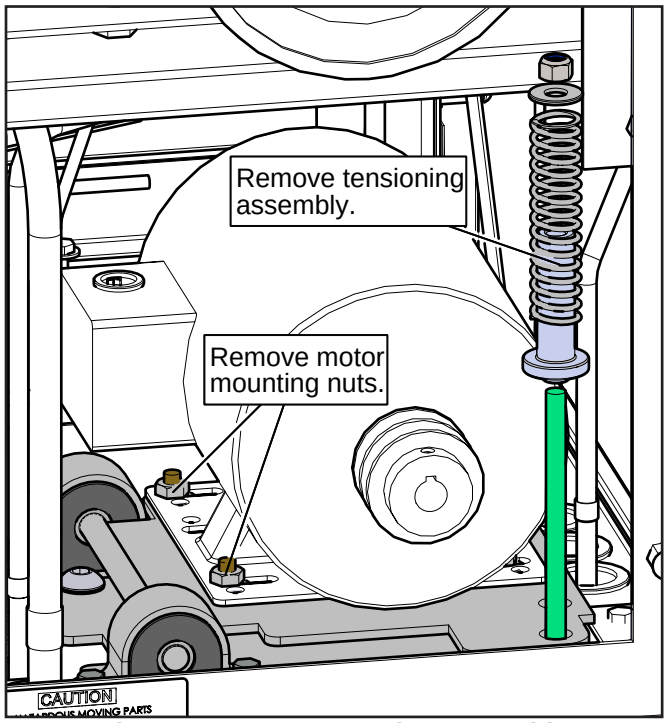


Figure 3-2 Motor Mounting Assembly

6. Remove the motor mounting nuts and remove the motor.
7. Loosen the two allen head screws from the pulley.
8. Remove the pulley and key from the motor shaft.

C. DRIVE MOTOR INSTALLATION

1. Place the motor onto the mounting bolts and install the mounting nuts.
2. Place the pulley and key on the motor shaft.

NOTE

Do not tighten the pulley screws until after the belt tension has been properly adjusted.

3. Install the tensioning assembly.
4. Install the belt and tighten the tension adjustment nut.
5. Use a Burroughs Belt Tension Gauge to set the tension for the drive belt. Set the belt tension to 55-60 lbs.
6. Using a straightedge, align the drive motor pulley with the gearbox pulley. Tighten the two allen head screws.
7. Install wiring according to wiring diagram (located behind the left side panel). Install electrical cover plate on the motor.
8. Install back and side panels.

3.4 CAPACITORS

The compressor start and run capacitors are only on single phase machines. They are in the electrical box behind the back panel.

The start and run capacitors for the drive motors are mounted directly onto each motor body.

A. CAPACITOR TEST

1. Disconnect machine from electrical supply before removing any panels for servicing.
2. Remove a lead from one of the capacitor terminals.
3. Using insulated pliers, discharge the capacitor by connecting a 20KΩ 5W resistor across the terminals.

NOTE

Discharge the capacitor even if there is a bleeder resistor across the terminals. There may be an open in the bleeder resistor preventing it from working properly.

4. Disconnect the bleeder resistor from the circuit.
5. Measure the capacitance across the terminals. The results should be as follows:

		Rating	
Capacitor	**Part**	**MFD**	**VAC**
Cab Compressor	230667	80 MFD	220 VAC
Compressor - Run	231047	45 MFD	370 VAC
Compressor - Start	230638	88-106 MFD	330 VAC
Drive Motor - Run	231075	30 MFD	370 VAC
Drive Motor - Start	230622	200 MFD	250 VAC
Fan Motor	230654	5 MFD	400 VAC
Pump Motor	1171960	15 MFD	370 VAC

B. CAPACITOR REPLACEMENT

1. Disconnect machine from electrical supply before removing any panels for servicing.
2. Remove leads from the capacitor terminals.
3. Using insulated pliers, discharge the capacitor with a 20KΩ 5W resistor across the terminals.

NOTE

Discharge the capacitor even if there is a bleeder resistor across the terminals. There may be an open in the bleeder resistor preventing it from working properly.

4. Pull the capacitor out of its holder and replace.
5. Connect the leads to the terminals of the new capacitor.

3.5 GEARBOX

A. GEARBOX INSPECTION

Inspect the gearbox and listen for unusual noise. A grinding sound generally indicates a bad gear.

B. GEARBOX REMOVAL

1. Disconnect machine from electrical supply before removing any panels for servicing.

⚠ WARNING

Hazardous voltage

Make sure the machine is off when disassembling for servicing. The machine must be disconnected from electrical supply before removing any access panel. Failure to disconnect power before servicing could result in death or serious injury.

2. Remove the back panel and the side panel.
3. Remove the belts.
4. Remove the bolts holding the gearbox assembly and remove it.

C. GEARBOX INSTALLATION

1. Place the gearbox in position from the rear of the machine. Fasten the bolts through the gearbox to the rear of the barrel.
2. Mount the pulley on the gearbox shaft and align with the motor pulley, then tighten the allen head screws.
3. Install the belt.
4. Use a Burroughs Belt Tension Gauge to set the tension for the drive belt. Set the belt tension to 55-60 lbs.
5. Using a straightedge, align the drive motor pulley with the gearbox pulley. Tighten the two allen head screws.

3.6 CONDENSER FAN MOTOR (AIR-COOLED ONLY)

The fan motor is connected to a toggle switch mounted to the evaporator behind the right side panel. The switch is connected to a buck-boost transformer. The switch must be set to the correct position based on input voltage.

The buck-boost transformer is connected to an overload protector. This protects against the switch being in the wrong position, a faulty switch and/or wiring issues.

A. CHECK VOLTAGE

1. With the machine connected to power and the main power on, press the right arrow, SET, then the SEL button to access the technician level on the control.
2. Go to the Performance screen. Refer to the IntelliTec2 manual for details.
3. If the Input Voltage listed on the Performance screen is 215VAC or less, set the toggle switch to 208. If the voltage is above 215VAC, set the toggle switch to the 230.

NOTE

The voltage reading must be taken to ensure the fan motor works properly.

B. FAN MOTOR REPLACEMENT

1. Disconnect machine from electrical supply before removing any panels for servicing.
2. Remove the right side panel and the header panel.
3. Trace and disconnect the fan motor wires behind the header panel.
4. Remove the fan guard and the fan motor assembly.
5. Remove the torx screws from the fan guard.
6. Remove the bolts holding the fan guard to the condenser shroud.

C. FAN MOTOR INSTALLATION

1. Rotate the fan motor so the mounting holes are lined up with the holes in the fan guard.
2. Install the fan to the fan guard using the torx screws.
3. Move the fan and fan guard into place.
4. Install the fan guard to the shroud with the four bolts.
5. Wire the fan motor according to the wiring diagram. The buck-boost transformer must be connected if necessary (see above regarding checking voltage).

3.7 CAB CONDENSER FAN MOTOR

A. FAN MOTOR REPLACEMENT

1. Disconnect machine from electrical supply.
2. Remove the drawers from the cab.
3. Disconnect the evaporator drain tube and remove the two thumb screws on the evaporator cover. Pull the cover off and set aside.
4. Remove the tubes from the mix transfer line and air line.
5. Remove the two thumbscrews on the fan shroud and tilt the shroud downwards.
6. Pull thermistor out of the clip and thread it up through the hole in the fan shroud.
7. Remove the fan shroud by tilting forward and pulling down.
8. Remove the four fan bracket thumbscrews and disconnect wires (Refer to Figure 3-3).

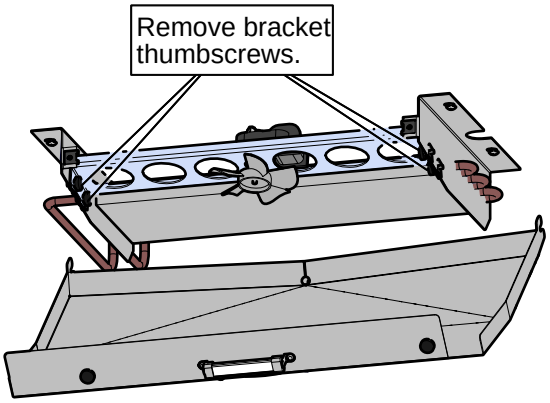


Figure 3-3 Fan Bracket

9. Connect the wires to the new fan motor.
10. Attach the two screws to the fan motor bracket.
11. Tilt the fan shroud and move it into place.
12. Thread thermistor through hole in fan shroud and attach it to the clip.
13. Install fan shroud into cab with the four screws.
14. Install evaporator cover with the two thumb screws.
15. Install all tubes and replace the drawers.

3.8 SWITCHES

A. SPIGOT SWITCH

The spigot switch is a normally closed, held open switch. When a spigot is pulled, the spigot switch sends a signal to the IntelliTec2 control to start the auger drive and refrigeration system. This signal moves the control to “Serve Mode”, or if it already is in “Serve Mode”, it resets the cycle count. After serving product, the IntelliTec2 continues a freezing cycle until the product reaches consistency.

SPIGOT SWITCH TEST - ADJUSTMENT

NOTE

Adjustments to the spigot switch should be done after the product is at consistency in “Serve Mode” or when the machine is empty.

1. Open the spigot slowly and listen for a click when the spigot switch closes.
2. The clicking sound should be within the first 1/2” of the spigot glide movement (Refer to Figure 3-4). If the switch does not close, an adjustment may be necessary.

NOTE

The center spigot on the U431-I2A has two switches; one for each side. When testing the center spigot, there should be two audible clicks occurring almost simultaneously.

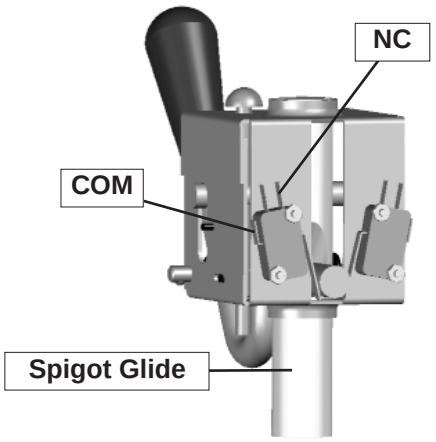


Figure 3-4 Spigot Cam Assembly (Center Spigot)

SPIGOT SWITCH TESTING - ELECTRICAL

1. Disconnect the switch from the circuit by unplugging the connectors.
2. Check resistance readings across the common (COM) and normally closed (NC) terminals. When the spigot is closed, the resistance should show an open. When the spigot is opened, the switch closes and the resistance should be 0 ohms.

SPIGOT SWITCH ADJUSTMENT

1. Turn the machine off by pressing the Main Power On/Off button.
2. Remove the header panel.
3. Loosen the bolts on the spigot switch.
4. Using a pencil, mark the spigot glide 1/4" from the spigot housing.
5. Adjust the switch to activate when the plastic glide reaches the mark.
6. Fully tighten the retaining bolts and remove mark from spigot glide.

SPIGOT SWITCH REPLACEMENT

1. Remove the header panel.
2. Remove the dispense rate adjuster knob located below the header panel. (Refer to Figure 3-5)

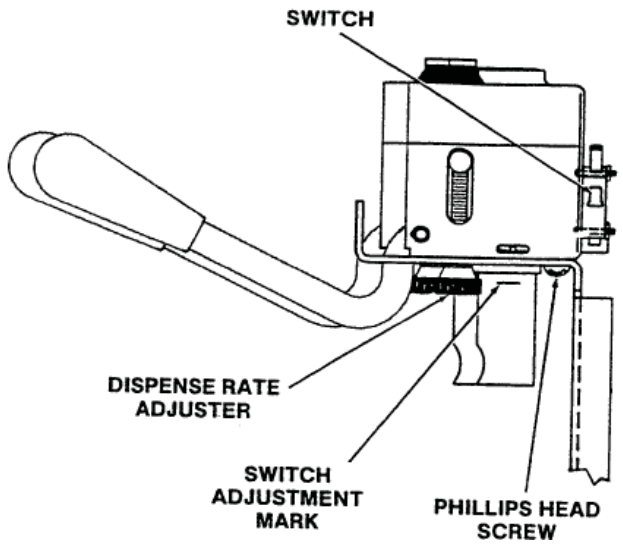


Figure 3-5 Spigot Switch Replacement

3. Remove the two Phillips head screws that attach the spigot cam assembly to the panel. Remove the assembly.
4. Disconnect the connector from the switch and remove the switch..
5. Install the replacement switch onto the handle assembly. Do not fully tighten the retaining screws at this time.
6. Using a pencil, mark the spigot glide 1/4" from the spigot housing. Adjust the switch to activate when the spigot handle moves the glide to the mark.
7. Fully tighten the retaining screws.
8. Attach the connector to the spigot switch.
9. Position the spigot handle assembly in the electrical box and fasten securely with the two Phillips head screws.
10. Replace the dispense rate adjuster knob and tighten.
11. Replace the header panel and secure with the two Phillips head screws.

B. PUMP PRESSURE SWITCH

The pump pressure switch maintains 21-24 psig in the mix line.

PUMP PRESSURE SWITCH TEST

1. Turn off the pump motor.
2. Open the spigot to relieve air pressure in the system.
3. Connect a gauge between the 1/4" ID tubing and pump outlet in the cab.
4. Turn on the pump motor.
5. The motor should cutout when the gauge reads 24 psig ±1.
6. Open the spigot and monitor the gauge. The motor should cutin when the gauge reads 21 psig ±1.

3.9 TEMPERATURE CONTROL SENSOR

The temperature control sensor is a thermistor used to sense the temperature of the suction line. As the suction line temperature increases, the internal resistance of the thermistor decreases. Refer to Figure 3-8 for the relationship between sensor resistance and temperature. The IntelliTec control board monitors this value. In “Serve Mode”, when the temperature of the sensor equals the Cut In T value on the control, a freezing cycle starts.

When troubleshooting a sensor, refer to the wiring diagram and remove the wires from the control board. Measure the resistance of the sensor and compare it with the sensor resistance table. If the resistance is not within this range, replace it.

°F	Resistance	°F	Resistance
-22	176950	40	26100
-20	165200	42	24725
-18	154300	44	23400
-16	144200	46	22175
-14	134825	48	21000
-12	126125	50	19900
-10	118050	52	18875
-8	110550	54	17900
-6	103550	56	17000
-4	97075	58	16125
-2	91025	60	15325
0	85400	62	14550
2	80150	64	13825
4	75275	66	13150
6	70725	68	12500
8	66475	70	11875
10	62500	72	11300
12	58800	74	10750
14	55325	76	10250
16	52100	78	9750
18	49075	80	9300
20	46250	82	8850
22	43600	84	8450
24	41125	86	8050
26	38800	88	7675
28	36625	90	7325
30	34575	92	7000
32	32675	94	6675
34	30875	96	6375
36	29175	98	6100
38	27600	100	5825

Figure 3-6 Temperature Sensor Resistance (10K Ohms)

SECTION 4
TROUBLESHOOTING

4.1 ERROR CODES

When the machine experiences a problem, one of the following error codes is displayed on the control panel. Each error code directs you to the system location of the malfunction.

ERROR CODE	MALFUNCTION
2	High Torque
3	Run Time
4	Clean
5	Freezing Cylinder Sensor
6	Hopper Sensor (single hopper machines)
7	Drive Motor
8	Cab Sensor
9	High Pressure Cutout
10	Ambient Sensor
11	Prime
12	Left Storage Sensor
13	Right Storage Sensor
21	Spigot Open Time

To return the machine to normal operation, any error causing condition must be corrected and the freezing cylinder must be turned off and on again using the On/Off Left or On/Off Right button.

4.2 TROUBLESHOOTING

ERROR CODE 2 - HIGH TORQUE

If the control panel displays a High Torque Error (E2), the drive motor is running at a high load for 10 or more seconds. When an E2 occurs, the machine goes into Sleep 3 Mode. In Sleep 3 Mode the compressor operates enough to ensure the product temperature never increases above 40ºF. The drive motor does not operate in Sleep 3 Mode. After the error is cleared and the power cycled, the machine returns to normal operation.

Very low and/or fluctuating supply voltages typically cause this error. The error can also be caused by faulty motor or starting components which could produce a high amp draw.

ERROR CODE 3 - RUN TIME

The Run Time Error (E3) occurs when the control senses that the compressor is not operating properly. It does this by monitoring the cutin parameter. If the CutIn Consistency is not met within the specified time, a Run Time Error is displayed.

When an E3 occurs, the machine goes into Sleep 3 Mode. In Sleep 3 Mode the compressor operates enough to ensure the product temperature never increases above 40ºF. The drive motor does not operate in Sleep 3 Mode. After the error is cleared and the power cycled, the machine returns to normal operation.

When a Run Time Error occurs check the refrigeration system to make sure it is cooling

ERROR CODE 4 - CLEAN

If the machine is left in the Clean Mode for more than 10 minutes, the control panel displays a Clean Error (04). This condition does not reflect a problem with the machine itself. The Clean Error has been programmed into the controller as a safeguard to protect the machine from potential damage caused by the machine being accidentally left in "Clean Mode". To clear the Clean Error, press the On/Off button for the cylinder to turn it off then back on.

ERROR CODE 5 - FREEZING CYLINDER SENSOR

The Freezing Cylinder Sensor Error (E5) indicates a failure of the barrel sensor or a sensor that is out of range. If the control panel displays an E5, press the On/Off button for the cylinder to turn it off then back on. If the control panel still displays the error code, refer to the machine's wiring diagram and the Temperature Sensor Table. Check each lead of the sensor to ground for continuity. If continuity is found, replace the sensor. To check the resistance of the sensor, place a thermocouple on the suction line at the exit of the freezing cylinder. Compare temperature and sensor resistance with the table as reference. If measured value does not coincide with a value on the table (± 500 ohms), replace the sensor.

NOTE

When the machine encounters a Freezing Cylinder Sensor Error, the machine automatically runs on Consistency-Consistency. This mode allows the operator to continue serving product until the machine can be serviced.

°F	Resistance	°F	Resistance
-22	176950	40	26100
-20	165200	42	24725
-18	154300	44	23400
-16	144200	46	22175
-14	134825	48	21000
-12	126125	50	19900
-10	118050	52	18875
-8	110550	54	17900
-6	103550	56	17000
-4	97075	58	16125
-2	91025	60	15325
0	85400	62	14550
2	80150	64	13825
4	75275	66	13150
6	70725	68	12500
8	66475	70	11875
10	62500	72	11300
12	58800	74	10750
14	55325	76	10250
16	52100	78	9750
18	49075	80	9300
20	46250	82	8850
22	43600	84	8450
24	41125	86	8050
26	38800	88	7675
28	36625	90	7325
30	34575	92	7000
32	32675	94	6675
34	30875	96	6375
36	29175	98	6100
38	27600	100	5825

Figure 7-1 Temperature Sensor Resistance (10K Ohms)

ERROR CODE 6 - HOPPER SENSOR

The Hopper Sensor Error (E6) will not occur on the U421-I2A or U431-I2A.

ERROR CODE 7 - DRIVE MOTOR

If the control panel displays a Drive Motor Error (E7), the control does not sense the drive motor. When an E7 occurs, the machine goes into Sleep 3 Mode. In Sleep 3 Mode the compressor operates enough to ensure the product temperature never increases above 40ºF. The drive motor does not operate in Sleep 3 Mode. After the error is cleared and the power cycled, the machine returns to normal operation.

Press the On/Off button for the cylinder to turn it off then back on. If the error returns, use the machine's wiring diagram and check connections at the IntelliTec2™ control and at the motor. An E7 may also be the result of a faulty drive motor contactor.

ERROR CODE 8 - CAB SENSOR

A Cab Sensor Error (E8) indicates a cabinet temperature sensor failure. This error also appears if the sensor is out of range. To remedy this error, press the On/Off button for the cylinder to turn it off then back on. If the control panel still displays the error condition code, refer to the wiring diagram and the Temperature Sensor Table. Check each lead of the sensor to ground for continuity. If continuity is found, replace the sensor. Place a thermocouple in the cabinet evaporator discharge airstream (outlet air flow). Compare temperature to sensor resistance using the table as reference. If Cutin/Cutout values do not coincide with the values on the table, replace the sensor.

ERROR CODE 9 - HIGH PRESSURE CUTOUT

High Pressure Cutout Errors (E9) are usually caused by a dirty or inefficient condenser. If the control panel displays an E9, press the On/Off button for the cylinder to turn it off. Wait for 8-10 minutes for the machine pressures stabilize and an the internal timer to expire then press the On/Off button for the cylinder to turn it back on.

In air cooled condenser models, check the air filter to make sure it is clean. Replace or clean the filter as required. Check for proper air clearance around the machine. Refer to the machine's Owner's Manual for clearances. Check the condenser for blockage, and be sure condenser fan is functioning.

On water cooled condenser models, check for proper water flow through the condenser coil.

After the cause of the error is determined and corrected, press the On/Off button for the cylinder to turn it off then back on.

ERROR CODE 10 - AMBIENT SENSOR

The Ambient Temperature Sensor Error (E10) indicates a failure of the condenser air inlet temperature sensor or if the sensor is out of range. If the control panel displays an E10, press the On/Off button for the cylinder to turn it off then back on. If the control panel still displays the error condition code, refer to the machine's wiring diagram and the Temperature Sensor Table. Check each lead of the sensor to ground for continuity. If continuity is found, replace the sensor. To check the resistance of the sensor, place a thermocouple at the condenser air inlet. Compare temperature and sensor resistance with the table as reference. If measured value does not coincide with a value on the table (± 400 ohms), replace the sensor.

ERROR CODE 11 - PRIME

The Prime Error (E11) occurs when the pressure switch does not shut off the pump after an extended period of continuous running. This usually occurs if there is a leak in the hose or if there is a low mix condition. The error can also indicate a bad pressure switch.

ERROR CODE 12 - LEFT HOPPER SENSOR

The Left Hopper Sensor Error (E12) will not occur on the U421-I2A or U431-I2A.

ERROR CODE 13 - RIGHT HOPPER SENSOR

The Right Hopper Sensor Error (E13) will not occur on the U421-I2A or U431-I2A.

ERROR CODE 16 - ROTATE HOSE

The Rotate Hose Error (E16) occurs when the Hose Service Limit has been met.

Rotate or replace the pump hose and reset the hose service time by pressing and holding the Pump button until the reset message appears on the Current Status Screen.

ERROR CODE 21 - SPIGOT OPEN TIME

The Spigot Open Time Error (E21) occurs when the spigot is open continuously for 10 minutes. The machine goes into Sleep 3 mode when an E21 occurs.

If the control panel displays and E21, make sure the spigot handle is fully closed. The switch can be held open if the spigot body and front door were not assembled correctly or lubricated.

Test the spigot switch and replace if necessary. Check that the spigot assembly is operating correctly.

4.3 TROUBLESHOOTING - MACHINE

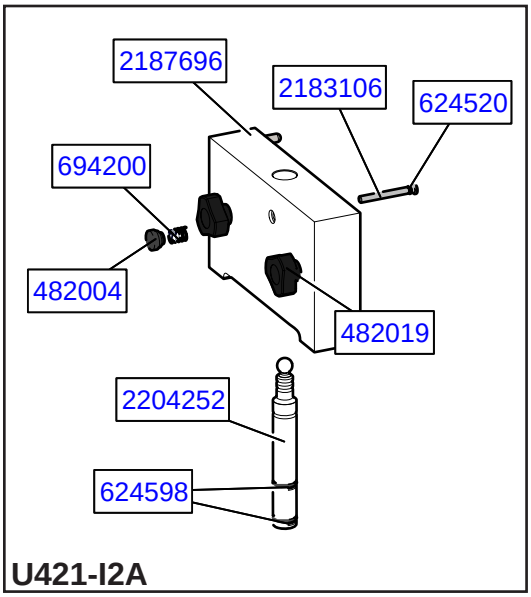
PROBLEM	POSSIBLE CAUSE	REMEDY
Machine does not run.	1 Power to machine is off.	1 Supply power to machine.
	2 Freeze-up (auger will not turn).	2 Turn machine off for 15 minutes, then restart.
	3 Front door not in place.	3 Assemble front door in place.
Machine will not shut off.	1 Refrigeration problem.	1 Check system. (See Section 3)
Product is too firm.	1 CutOut Consistency setting too high	1 Adjust the CutOut Consistency (Refer to IntelliTec2 manual)
Product is too soft.	1 No vent space for free flow of cooling air.	1 A minimum of 6” of air space on the sides and back.
	2 Condenser is dirty.	2 Clean the condenser. (Refer to operators manual)
	3 CutOut Consistency setting too low	3 Adjust the CutOut Consistency (Refer to IntelliTec2 manual)
	4 Auger is assembled incorrectly.	4 Remove mix, clean, reassemble, sanitize and freeze down.
	5 Refrigeration problem.	5 Check system. (See Section 3)
Product does not dispense.	1 No mix in cabinet.	1 Add mix to the cabinet.
	2 Drive motor overload tripped.	2 Wait for automatic reset. (If condition continues, see section 3.)
	3 Drive belt failure.	3 Replace drive belt.
	4 Freeze-up (Auger will not turn).	4 Turn off cylinder, wait for 15 minutes, then restart.
Drive belt slipping or squealing.	1 Worn drive belt.	1 Replace drive belt.
	2 Freeze-up (Auger will not turn).	2 Turn off cylinder, wait for 15 minutes, then restart.
	3 Not tensioned properly.	3 Adjust belt tension
Rear auger seal leaks.	1 Outside surface of rear auger seal is lubricated.	1 Clean lubricant from outside of rear seal and thoroughly clean rear of freezing cylinder. Lubricate inside of seal and reinstall.
	2 Rear seal missing or damaged.	2 Check or replace.
	3 Seal o-ring missing, damaged or installed incorrectly.	3 Check or replace.
	4 Worn or scratched auger shaft.	4 Replace auger shaft.
Front door leaks.	1 Front door knobs are loose.	1 Tighten knobs.
	2 Spigot parts are not lubricated.	2 Refer to operators manual.
	3 Chipped or worn spigot o-rings.	3 Replace o-rings.
	4 O-rings or spigot installed wrong.	4 Remove spigot and check o-ring.
	5 Inner spigot hole in front door nicked or scratched.	5 Replace front door.

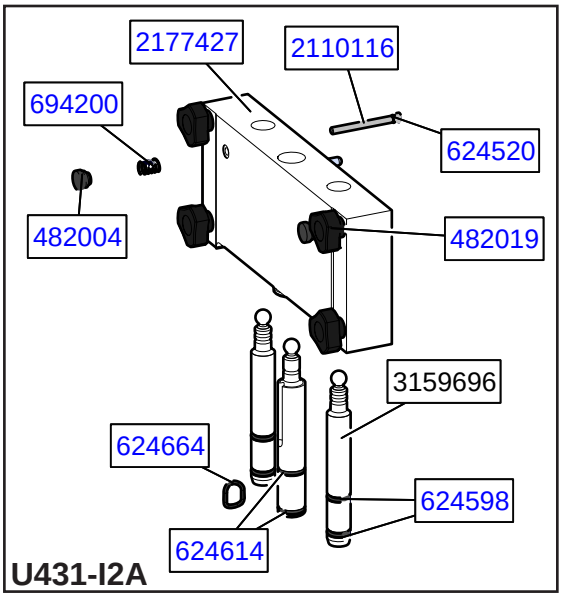
SECTION 5
REPLACEMENT PARTS

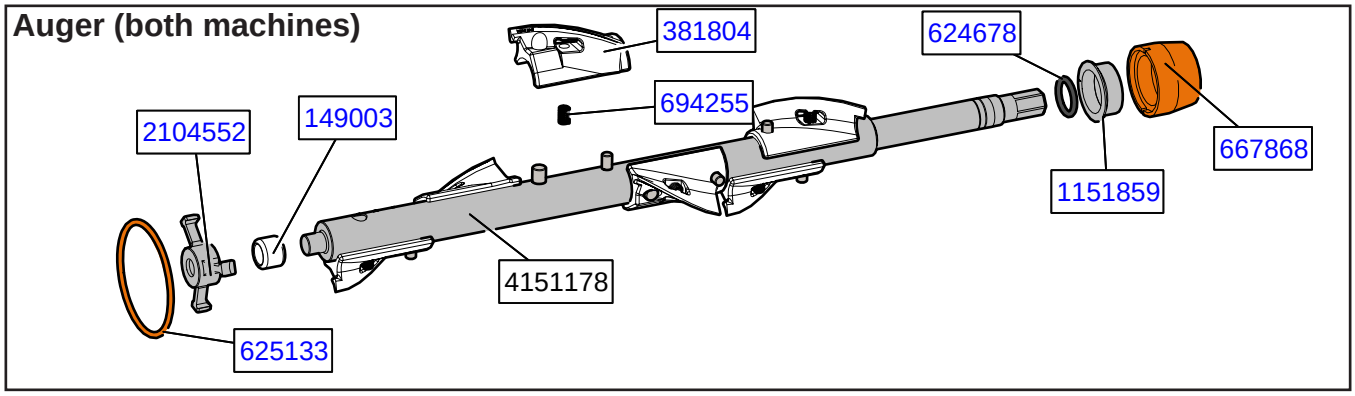
5.1 BRUSHES, DECALS, AND LUBRICATION

Part	Description	Quantity U421	Quantity U431
C-1000-26C	Decal - Made In USA	1	1
208135	Brush - 4” X 8” X 16” (Barrel)	1	1
208380	Brush - 1/4” X 3” X 14”	1	1
208387	Brush - 1/2” X 5” X 24”	1	1
208465	Brush - 1” X 3-1/2” X 18”	1	1
208467	Brush - 3/8” X 1” X 5”	1	1
208485	Brush - 66” Long	1	1
232741	Cap - Rosette (6-Point Teardrop) (Translucent) (Standard)	3	3
324065	Decal - Water Inlet	1	1
324107	Decal - Caution Hazardous Moving Parts	1	1
324125	Decal - Danger Electric Shock Hazard	1	1
324141	Decal - Caution Rotating Blades	1	1
324200	Decal - High Pressure Cut-Out	1	1
324208	Decal - Attention Refrigerant Leak Check	1	1
324509	Decal - Cleaning Instructions	1	1
324548	Decal - Adequate Ventilation 6”	1	1
324566	Decal - Wired According To	1	1
324803	Decal - Domed Stoelting Logo (Purple) (Large) (Header Panel)	1	
324859	Decal - Domed Dairy Queen Logo (Header Panel)	1	1
324888	Decal - Fan Motor Reset	1	1
324901	Decal - Transformer Switch	1	1
324909	Decal - USB Port	1	1
324932	Decal - Thermistor ID	1	
325023	Decal - Stoelting (Black) (Large) (Header Panel)	1	1
325024	Decal - Stoelting (Black) (Small) (Drip Tray Support)	1	1
325025	Decal - Pump In	1	1
325026	Decal - Pump Out	1	1
325028	Decal - 1/2” Silver Round	1	1
325032	Decal - White Glove Service	1	1
325033	Decal - Caution Heavy Object	1	1
325044	Decal - DQ Serial Number	1	1
508053	Lubricant - Total Blend (50 Packets)	1	1
513709	Manual - Operators (DQ)		1
513711	Manual - Operators (DQ)	1	
513713	Manual - Operators (Non DQ)	1	1
1177990-SV	Caster Kit - 4” (Set Of 4)	1	1

5.2 AUGER SHAFT AND DOOR PARTS

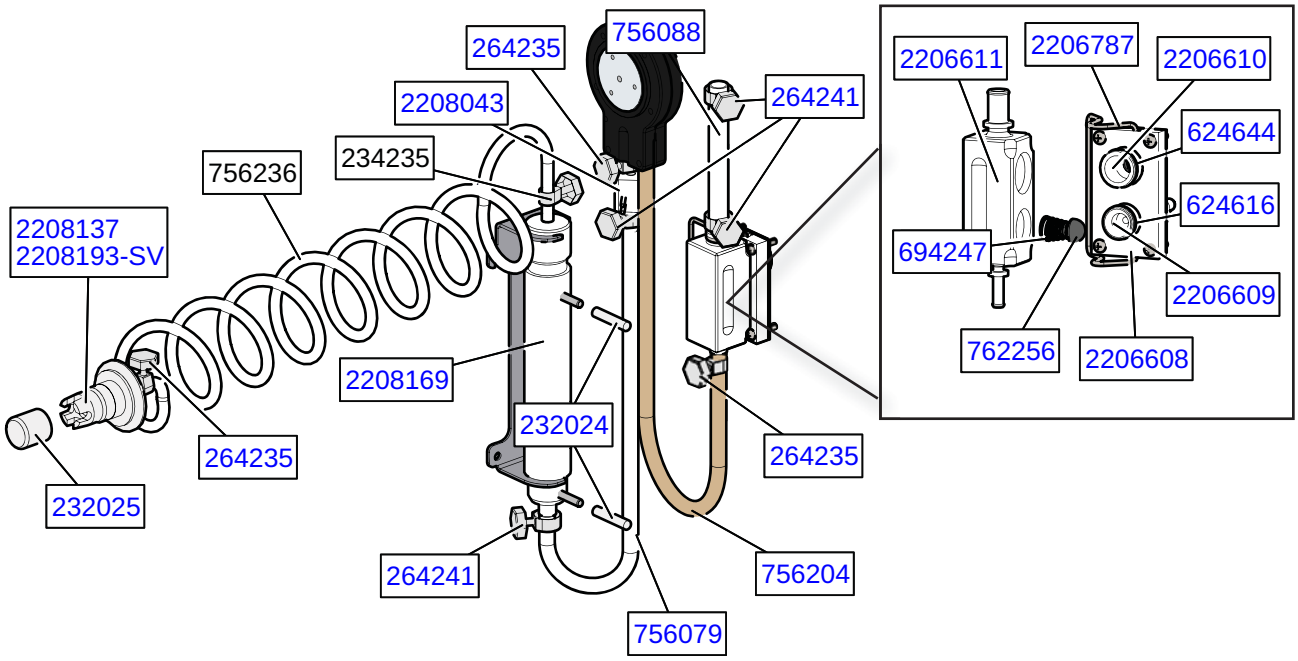






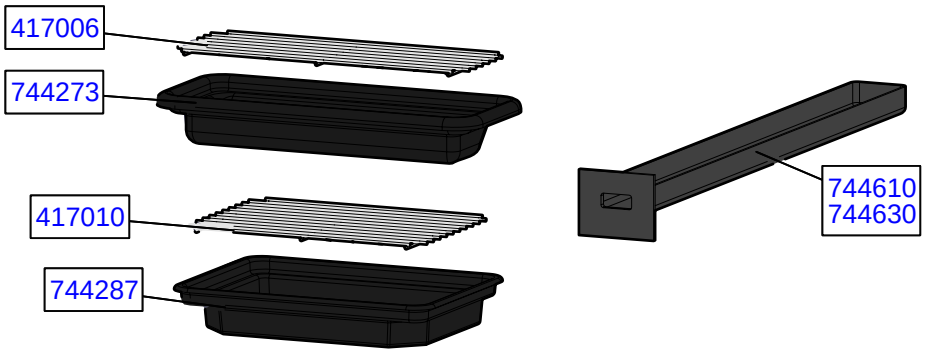
		Quantity	
Part Number	**Description**	**U421**	**U431**
149003	Bushing - Front Auger Support	2	2
381804	Auger Flight	12	12
482004	Knob (Air Bleed Valve)	3	3
482019	Knob - Front Door (Black)	4	4
624520	O-Ring - Air Bleed Valve - Black	2	2
624598	O-Ring - Spigot Body - Black	4	4
624614	O-Ring - Top & Bottom Center Spigot - Black		2
624664	O-Ring - Middle Center Spigot - Black		1
624678	O-Ring - Rear Seal - Black	2	2
625133	O-Ring - Front Door - Black	2	2
667868	Seal - Rear Auger (Orange)	2	2
694200	Spring - Air Bleed Valve	2	2
694255	Spring - Auger Flight	12	12
1151859	Adapter - Rear Seal (Code 1)	2	2
2104552	Support - Front Auger	2	2
2110116	Valve - Air Bleed		2
2177427	Front Door		1
2183106	Valve - Air Bleed	2	
2187696	Door - Front w/Pins	2	
2187811	Spigot Body - Center		1
2187812	Spigot Body - Outer		2
2204252	Spigot Body	2	
4151178	Auger Shaft	2	2

5.3 CAB TUBING



Part Number	Description	Quantity U421	Quantity U431
266018	Clip - “J” (Hose Holder) (Cab)	2	2
232024	Cap - Manifold	4	4
232025	Cap - Bag Adapter	4	4
264235	Clamp - Metal (1/4” ID Tubing)	-	-
264241	Clamp - Metal (1/2” ID Tubing)	-	-
396216	Gasket - Manifold to Cab Wall	2	2
624619-5	O-Ring - Air Inlet Base (5 Pack)	2	2
624644-5	O-Ring - Pressure Switch (5 Pack)	2	2
653020	Screw - Thumb (Wire Basket)	4	4
694247	Spring - Check Valve	2	2
717962	Switch - Pressure	2	2
756079	Tubing - 3/8” ID - Clear - Mix Line (25’ Increments) (Per Inch) (Cab)	2	2
756088-12	Tubing - 1/2” I.D. - Clear - Mix Line (Pre-Cut 12” Piece)	2	2
756204	Tubing - 1/4” ID - Pump (50’ Box Only) (Per Inch)	-	-
756204-24	Tubing - 1/4” ID - Pump (Pre-Cut 24” Piece)	2	2
756236-03	Tubing - Coiled (Pre-Cut 3 Ft. Piece) (Each)	6	6
762256	Check Valve - Manifold (Cab)	2	2
764000	Check Valve (Duckbill) (Mix Bag Adapter) (Cab)	6	6
1183283	Fitting - Barbed - Air Inlet (Cab)	2	2
2206405	Plug & Cord Assembly w/Shrink Wrap (Low Mix) (Cab)	2	2
2206608	Manifold Mounting Plate (In-Wall Manifold Assembly)	2	2
2206609	Air Inlet Base (In-Wall Manifold Assembly)	2	2
2206611	Check Valve Block	2	2
2206787	Wire Clip (In-Wall Manifold Assembly)	2	2
2208043	In-Line Sensor Kit	2	2
2208032	Mix Bag Manifold (Stationary)	2	2
2208137	Mix Bag Adapter w/Check Valve (Plastic)	6	6
2208193-SV	Mix Bag Adapter w/Check Valve (Stainless)	6	6
2208169	Manifold - Mix Collection (Manifold Only)	2	2
2208043	Sensor - Mix	2	2

5.4 TRAYS

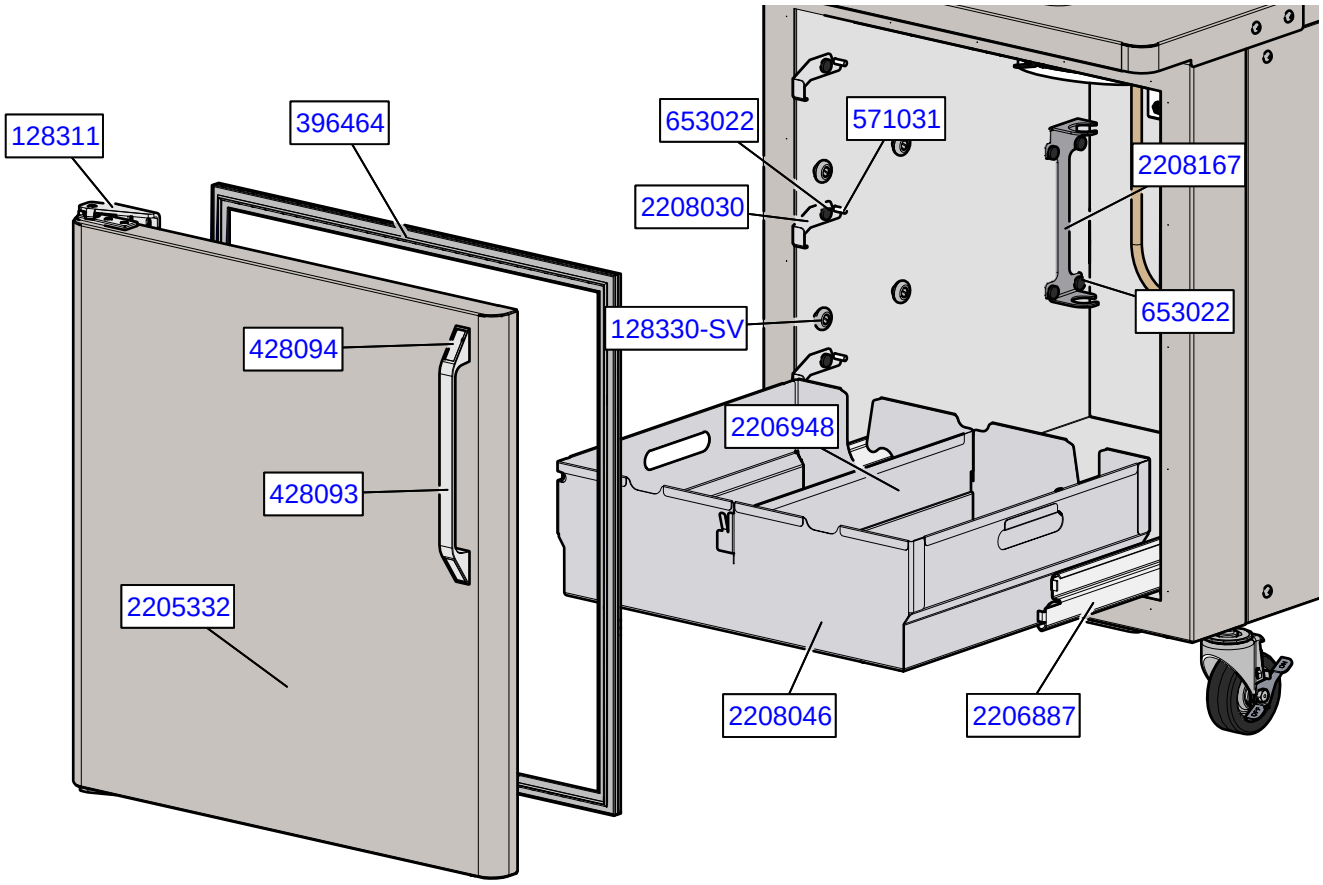


Part Number	Description	Quantity U421	Quantity U431
417006	Insert - Drip Tray (Vinyl Coated Metal)		1
417010	Insert - Drip Tray	2	
744273	Tray - Drip		1
744287	Tray - Drip (Black)	2	
744610	Tray - Drain w/Magnet (Ser. #0 - #6536208P)	-	-
744614	Tray - Condensate Pan (Under Cab)	1	1
744630	Tray - Drain w/o Magnet (Ser. #6536308P Plus)	1	1
2206858	Insert - Drip Tray (Louvered Stainless) (For #744273 Drip Tray)		1

5.5 PANELS & SCREWS

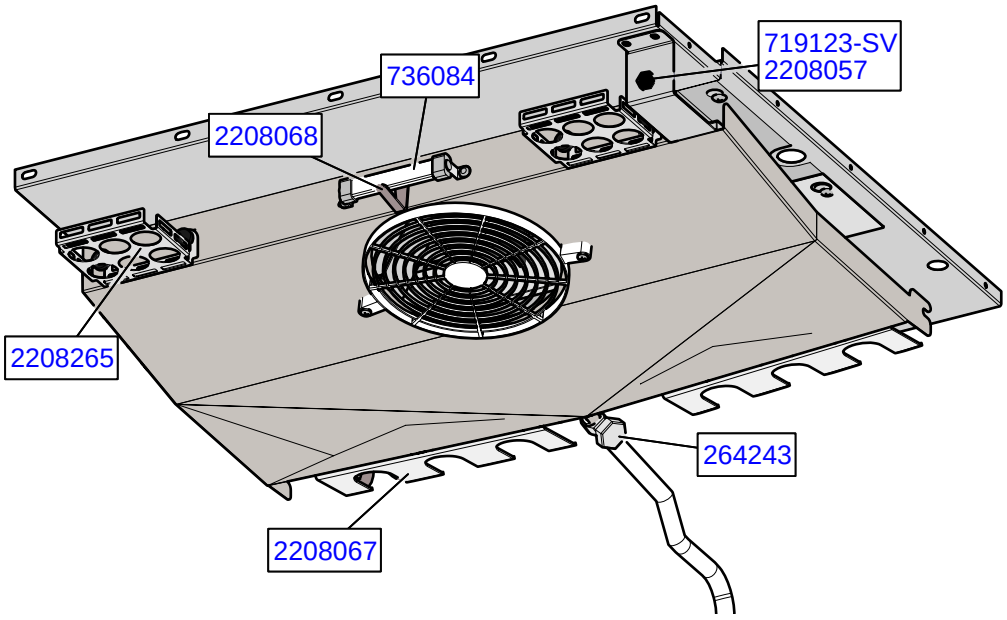
Part Number	Description	Quantity U421	Quantity U431
647653	Screw - Panel (Header & Drip Tray Support)	-	-
647899	Screw - Panel (Side, Rear & Drip Tray Support Sides)	-	-
649114	Screw - Panel (Front)		-
701009	Standoff - Panel (Metal 7/8” Threaded) (Upper Frame Sides - 8)	8	8
701029	Standoff - Panel (Metal 1/2” Threaded) (Upper Rear Frame - 2 & Cab Frame Sides/Rear - 12)	14	14
1154886	Cover Plate (Drain Tray) (R.H. Side Panel)	1	
2202935	Panel - Top (Water-Cooled & Air-Cooled Remote)	1	1
2202936	Panel - Top (Air-Cooled Self Contained) (1 PH, 50/60 Hz)	1	1
2202939-SV	Panel - Lower Side (R.H. & L.H)	2	2
2203101	Panel - Header (DQ)	1	
2203401	Panel Only - Header (DQ / Gate Style Handle)		1
2203404-SV	Panel - Rear (Air-Cooled Self Contained)	1	1
2203405	Panel - Upper R.H. Side	1	1
2203406-SV	Panel - Upper L.H. Side	1	1
2203414	Panel - Front Shroud		1
2203576	Panel - Rear Top (Air-Cooled Remote)	1	1
2203577	Panel - Rear Bottom (Air-Cooled Remote)	1	1
2203608	Panel Only - Header (Non DQ)		1
2203708	Panel Only - Header (Non DQ)	1	
2204514-SV	Panel - Rear (Water-Cooled)	1	1
2205333	Panel Assembly - Header (Includes Panel, Display Board & Membrane Switch) (DQ / Gate Style)		1
2205334	Panel Assembly - Header (DQ) (Includes Panel, Display Board & Membrane Strip Switch)	1	
2205335	Panel Assembly - Header (Non DQ) (Includes Panel, Display Board & Membrane Strip Switch)	1	
2205336	Panel Assembly - Header (Includes Panel, Display Board & Membrane Switch) (Non DQ / Gate Style)		1
2208147	Panel - Drip Tray Support		1
2208171	Panel - Drip Tray Support	1	

5.6 CABINET



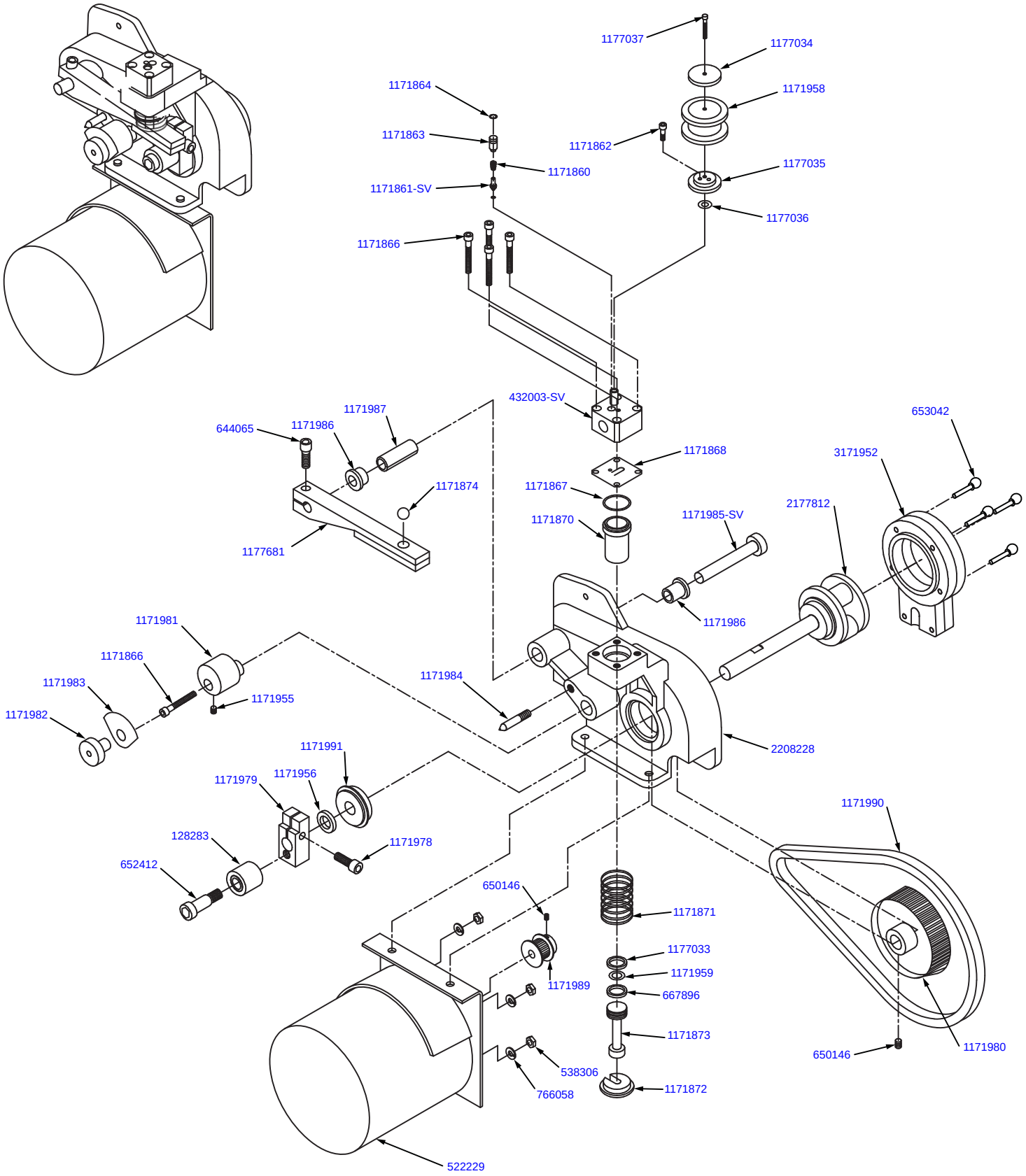
Part	Description	Quantity U421	Quantity U431
128311	Hinge - Door (Top & Bottom) (Cab)	1	1
128330-SV	Bearing Assembly (Bearing & Nut) (12 Required) (Cab)	12	12
396464	Gasket - Door (Cab)	1	1
428093	Handle - Cab Door (Cab)	1	1
428094	Handle Insert - Cab Door (Cab)	1	1
571031	Pin - Mix Container Drawer (Cab)	3	3
653022	Screw - Thumb (Drawer Latch, Mix Manifold) (Cab)	11	11
2205332	Door Assembly (Door, Handle & Gasket) (Cab)	1	1
2206887	Drawer Slide - R.H.	3	3
2206888	Drawer Slide - L.H.	3	3
2206948	Drawer Divider (Stainless)	3	3
2208030	Drawer Latch	3	3
2208045	Drawer Asembly (includes Drawer, Divider & Ball Bearings) (Stainless)	3	3
2208046	Drawer Only (Stainless)	3	3
2208161	Drawer Tub (Plastic)		
2208162	Drawer Divider (Plastic)		
2208164	Drawer Assembly (includes Drawer, Plastic Tub, Plastic Divider & Ball Bearings) (Stainless)	3	3
2208165	Drawer Only (For Plastic Tub) (Stainless)		
2208167	Mix Bag Manifold Mount - Swivel (L.H.)	1	1
2208170	Mix Bag Manifold Mount - Swivel (R.H.)	1	1

5.7 CABINET EVAPORATOR



Part	Description	Quantity U421	Quantity U431
162053	Blade - Fan (#355005 Evaporator) (Cab)	1	1
264243	Clamp - Metal (3/8” ID Tubing) (Cab)	1	1
266090	Clip - LED Light Strip	1	1
355005	Evaporator (Angled)	1	1
493000	LED Light Strip	1	1
522000	Motor - Fan (#355005 Low Profile Evaporator)	1	1
719123-SV	Switch Only - Cab Door (Cab)	1	1
736084	Thermometer (Cab)	1	1
2208057	Switch Assembly - Cab Door	1	1
2208067	Mix Bag Adaptor Rack	2	2
2208068	Mix Bag Adaptor Hook (Attached to Cab Evaporator)	1	1
2208265	Mix Bag Cap Holder	2	2

5.8 PUMP PARTS

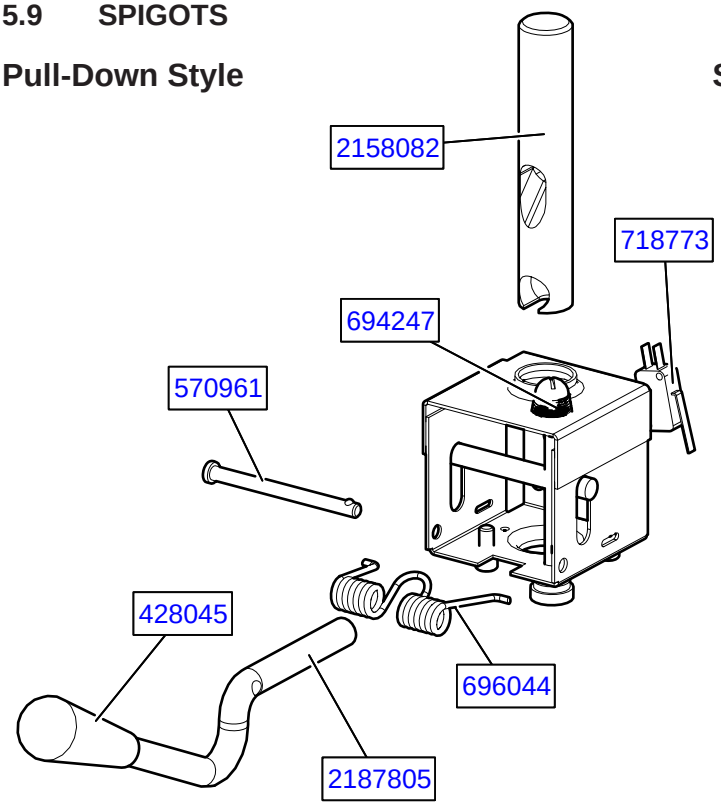


5.8 PUMP PARTS (CONTINUED)

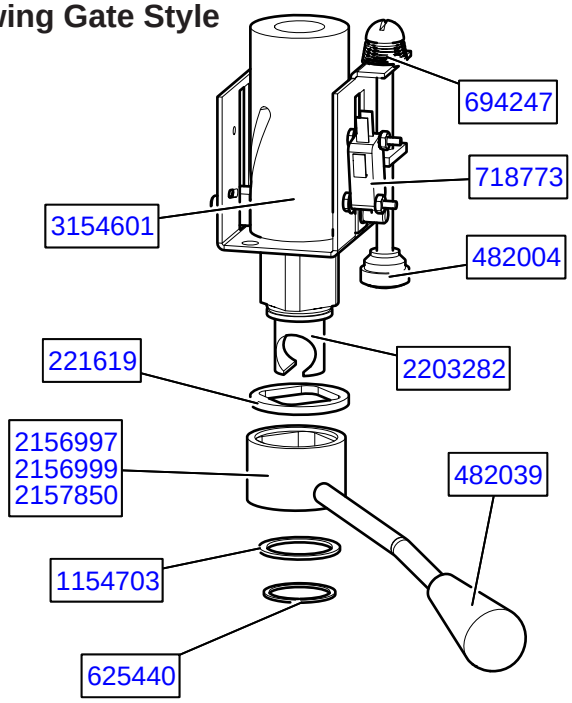
Part Number	Description	Quantity U431	Quantity U421
128283	Crank Arm Roller Assy (Requires #652412) (Cab)	2	2
432003-SV	Valve Head Only w/Tubes (Pump) (Cab)	2	2
522229	Motor - Pump (w/Capacitor) (Cab)	2	2
538306	Nut - Motor Mounting (Cab)	8	8
644065	Screw - Rocker Arm (Cab)	2	2
650146	Set Screw - Pulley (Cab)	2	2
652412	Screw - Shoulder (Crank Arm Roller Assembly) (Cab)	2	2
653042	Screw - Thumb (Cover Clamp) (Cab)	8	8
667896	Seal - Bumper (Piston) (Pump) (Cab)	2	2
756067	Tubing - 1/4” ID - Clear - Air Line (Per Inch) (Cab)	17x2	17x2
762258	Check Valve - Air Line - Red/White	2	2
766058	Washer - Lock - Motor Mounting (Cab)	8	8
778027	Wrench - Allen (Cab)	2	2
1171860	Spring - Check Valve (Pump) (Cab)	2	2
1171861-SV	Needle Valve w/O-Ring (Pump) (Cab)	2	2
1171862	Screw - Air Filter Retainer (Cab)	2	2
1171863	Valve Guide (Pump) (Cab)	2	2
1171864	O-Ring - Needle Valve (Pump) (Cab)	2	2
1171866	Screw - Valve Head (Cab)	10	10
1171867	O-Ring (Pump Cylinder Sleeve) (Cab)	2	2
1171868	Reed Valve (Pump) (Cab)	2	2
1171870	Cylinder Sleeve (Pump) (Cab)	2	2
1171871	Spring - Piston (Cab)	2	2
1171872	Piston Spring Seat (Cab)	2	2
1171873	Piston (Pump) (Cab)	2	2
1171874	Ball Bearing - Single (Pump Rocker Arm) (Cab)	2	2
1171955	Set Screw - Eccentric (Cab)	2	2
1171956	Washer - Crank Arm - Nylon (Cab)	2	2
1171958	Filter - Air (Pump) (Cab)	2	2
1171959	O-Ring (Piston) (Pump) (Cab)	2	2
1171960	Capacitor - Pump Motor (Cab)	2	2
1171978	Screw - Crank Arm (Cab)	2	2
1171979	Crank Arm (Cab)	2	2
1171980	Pulley - Large (Pump) (Cab)	1	1
1171981	Eccentric (Cab)	2	2
1171982	Knob - Crank Arm Overrun Setting (Cab)	2	2
1171983	Dial - Crank Arm Overrun Setting (Cab)	2	2
1171984	Pointer - Crank Arm Overrun Setting (Cab)	2	2
1171985-SV	Dowel Pin and Collar Assembly (Cab)	2	2
1171986	Flange Bearing - Rocker Arm (Cab)	4	4
1171987	Wick - Rocker Arm (Cab)	2	2
1171989	Pulley - Small (Cab)	2	2
1171990	Belt (Pump) (Cab)	1	1
1171991	Ball Bearing (Roller Assembly / Crank Arm)	2	2
1172864	Valve Body - Outer (Check Valve Assembly) (Cab)	2	2
1177033	Bumper Ring (Piston) (Pump) (Cab)	2	2
1177034	Air Filter Retainer - Top (Cab)	2	2
1177035	Air Filter Retainer - Bottom (Cab)	2	2
1177036	Washer - Air Filter Retainer (Cab)	2	2
1177037	Screw - Air Filter (Cab)	2	2
1177681	Rocker Arm (Cab)	2	2
2177812	Roller Carrier Assembly Kit (Cab)	-	-
2208048	Pump Assembly w/Motor	2	2
2208228	Pump Body Casting (Cab)	2	2
3171952	Cover - Clamp (Two Piece Black) (Cab)	2	2

5.9 SPIGOTS

Pull-Down Style

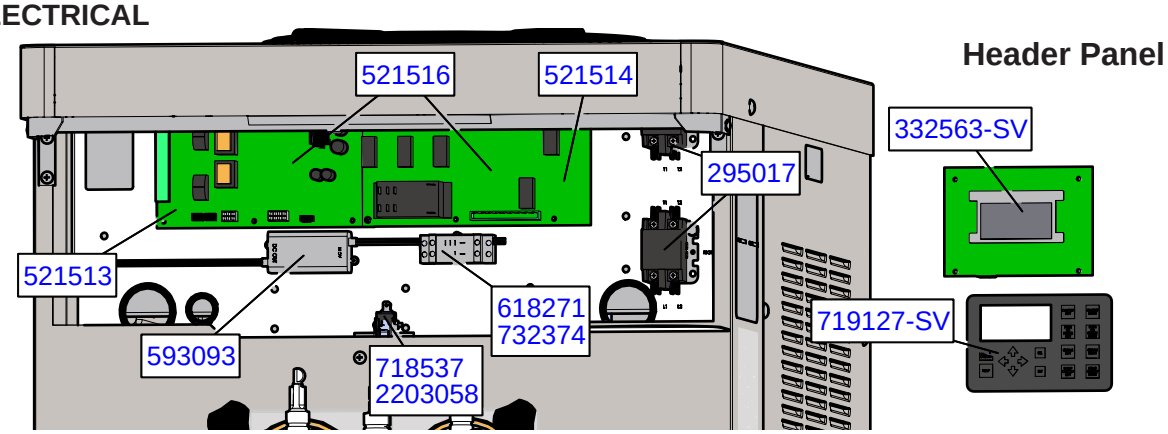


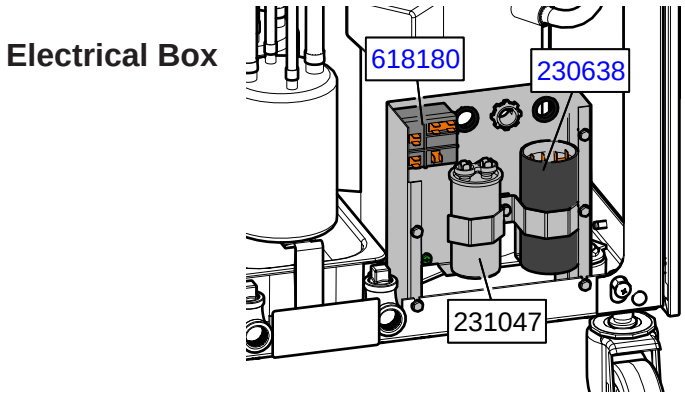
Swing Gate Style



Part	Description	Quantity U421	Quantity U431
221619	Bushing - Spacer (Spigot Handle)		3
428045	Knob - Spigot Handle (Black) (Non DQ)		3
428081	Handle Assembly - L.H. (27°) (Non DQ)		1
428082	Handle Assembly - R.H. (27°) (Non DQ)	2	1
428083	Handle Assembly - Center (27°) (Non DQ)		1
482004	Knob (Dispense Rate Adjustment)	2	3
482039	Knob - Spigot Handle (DQ / Gate Style)	2	3
570961	Pin - Cotterless Clevis (Spigot Cam)		3
625440	Retaining Ring - Spigot Handle		3
694247	Spring - Cone (Spigot Cam)		3
696044	Spring - Torsion (Spigot Cam)	2	3
718773	Switch - Spigot	2	3
1154703	Washer (Spigot Handle)		4
2156997	Handle Weldment - Center (DQ / Gate Style)		3
2156999	Handle Weldment - Left (DQ / Gate Style)		1
2157850	Handle Weldment - Right (DQ / Gate Style)		1
2158082	Spigot Cam / Adapter - Socket (White Plastic) (Non DQ)	2	3
2187805	Handle - Spigot (Handle Only) (Non DQ)	2	3
2203282	Spigot Cam / Adapter - Socket (Stainless) (DQ)	2	3
2203653	Cam Assembly - Spigot (DQ / Gate Style) (Left)		1
2203654	Cam Assembly - Spigot (DQ / Gate Style) (Right)		1
2203655	Cam Assembly - Spigot (DQ / Gate Style) (Center)		1
2204727	Handle Only (DQ / Gate Style)	2	
3154601	Spigot Cam Only (DQ)		3

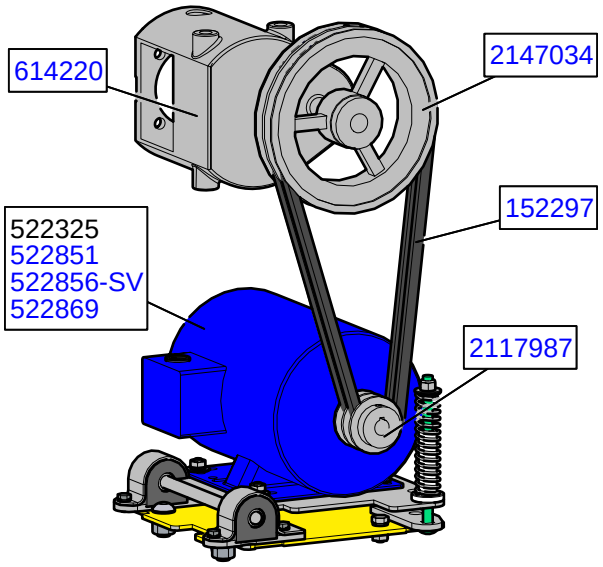
5.10 ELECTRICAL





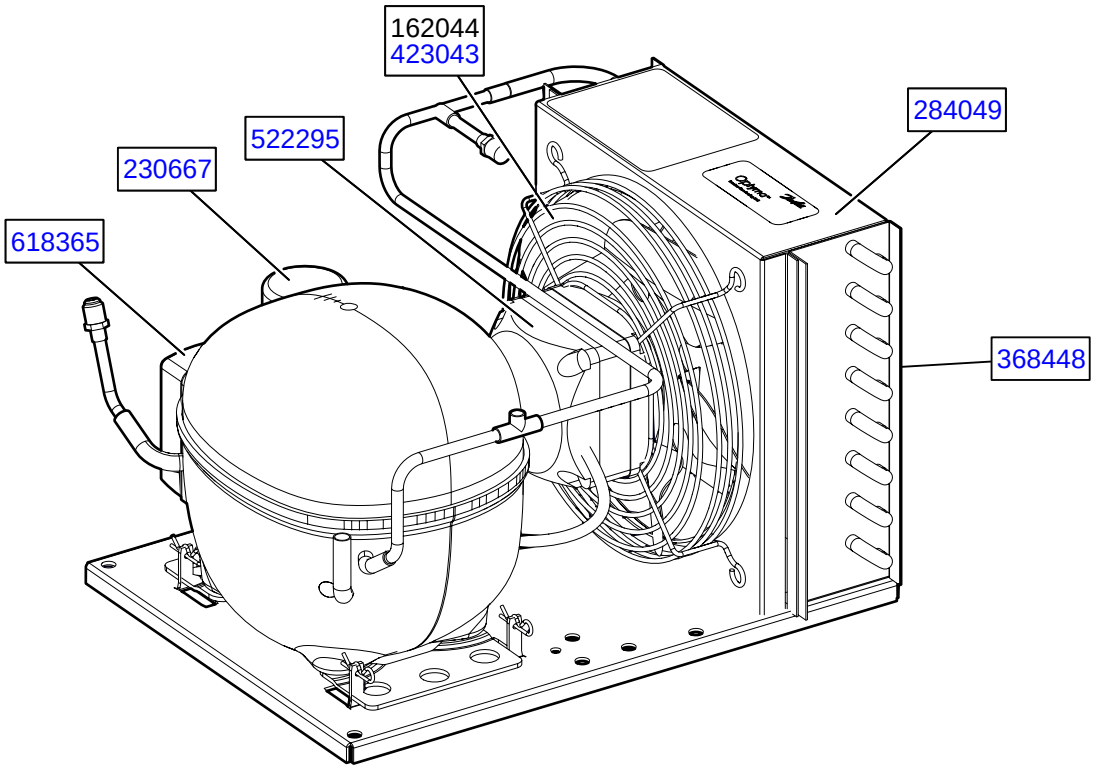
Part	Description	Quantity U421	Quantity U431
229148	Cable - IntelliTec2 (Control Board to Display Board)	1	1
229158	USB Cable Extension	1	1
230638	Capacitor - Start (#282106 & #282108 Compressors)	2	2
231047	Capacitor - Run (#282106 & #282108 Compressors)	2	2
232452	Plug - USB (Rubber Push-In)	1	1
292353	Connector - 9 Pin Phoenix (#521513 Board)	1	1
292354	Connector - 8 Pin Phoenix (#521514 Board)	1	1
292355	Connector - 9 Pin Phoenix (#521514 Board)	1	1
292356	Connector - 6 Pin Phoenix (#521514 Board)	1	1
292357	Connector - 6 Pin Phoenix (Low Mix) (#521513 Board)	1	1
292358	Connector - 6 Pin Molex (Thermistor) (#521513 Board)	1	1
292359	Connector - 8 Pin Molex (Switch Input) (#521513 Board)	1	1
295017	Contactor (45CG20AG) (IntelliTec2)	2	2
332563	Board - Display Module (Display Only)	1	1
431278	Harness - Board Service	1	
431279	Harness - Board Service		1
521435	WiFi Module (-WF Models Only)	1	1
521513	Board - Program / Power (IntelliTec2)	1	1
521514	Board - Relay (IntelliTec2)	1	1
521516	Board - Program / Relay (IntelliTec2)	1	1
593093	Power Supply - LED Light	1	1
618180	Relay (#282082, #282106 & #282108 Compressors)	2	2
618271	Plug-In Relay (New Cab Units)	1	1
718537	Switch - Limit (Door Safety)	1	1
719127-SV	Switch - Membrane Strip (Touchpad & Ribbon)	1	1
732374	Socket - Plug In Relay (New Cab Units)	1	1
2203058	Switch Assembly - Door Interlock		1
2205318	Switch Assembly - Door Interlock	2	

5.11 MOTOR



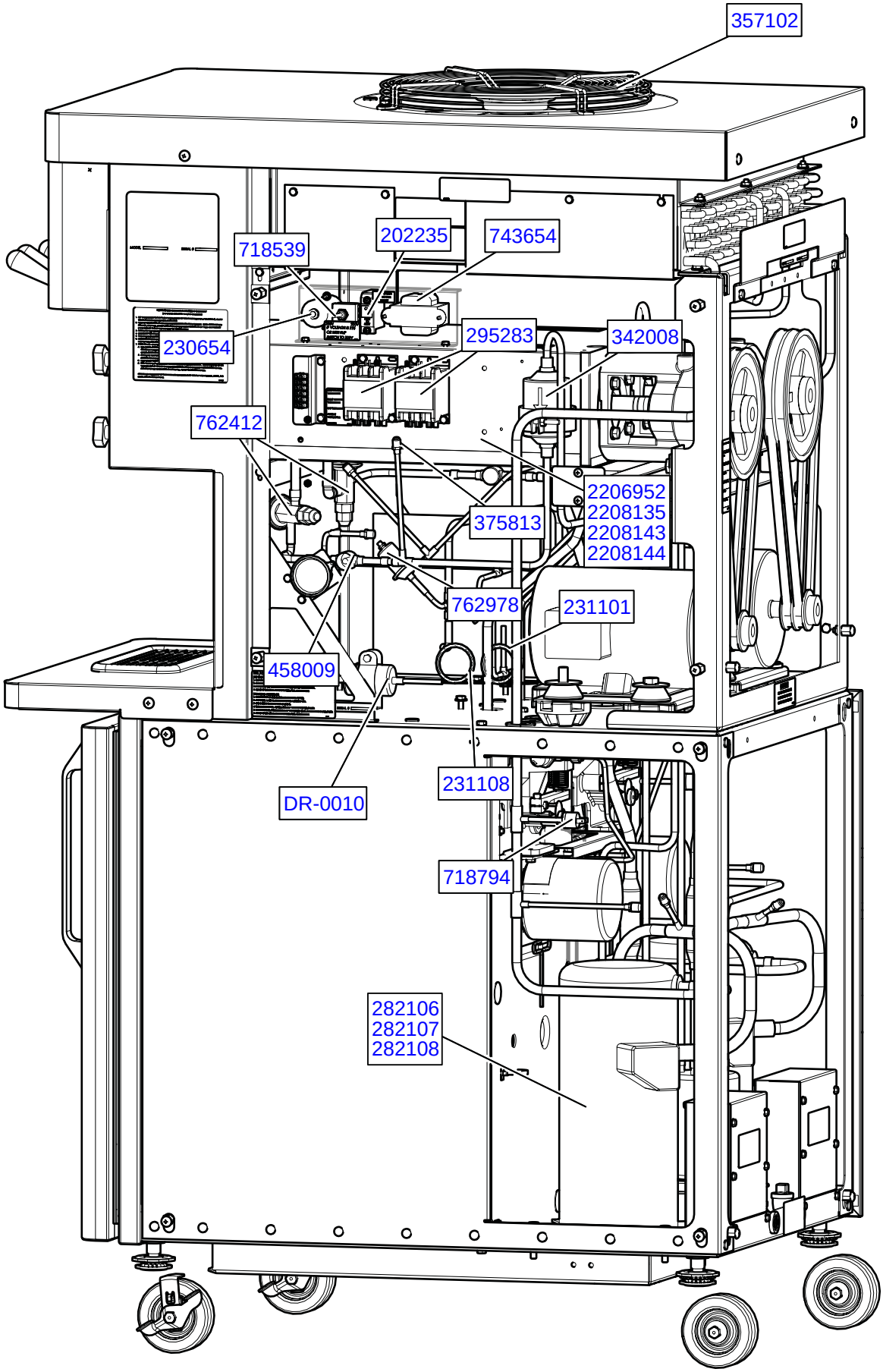
Part	Description	Quantity U421	Quantity U431
152297	Belt - Smooth (A37KC) (50/60 Hz)	4	4
230622	Capacitor - Start (#522856 Motor)	2	2
231075	Capacitor - Run (#522856 Motor)	2	2
522324	Motor - Drive (3 PH, 60 HZ) (Internal Overload)	2	2
522851	Motor - Drive (1 PH) (50 Hz) (w/Capacitors)		2
522856-SV	Motor - Drive w/Capacitors (1 PH) (60 Hz)	2	2
522869	Motor - Drive (3 PH) (60 Hz) (External Overload)	2	2
614220	Speed Reducer (60 Hz)	2	2
2117987	Pulley - Drive Motor (1PH, 50/60 Hz)	2	2
2147034	Pulley - Speed Reducer (1PH, 50/60 Hz)	2	2

5.12 CABINET CONDENSING UNIT



Part Number	Description	Quantity U421	Quantity U431
162044	Blade - Fan (#285073 Condensing Unit) (Cab)	1	1
230667	Capacitor - Start (#285073 Condensing Unit) (Cab)	1	1
231101	Cap Tube Only (Mix Line) (Cab)	1	1
231108	Cap Tube Only (Cab)	1	1
284049	Condenser (#285073 Condensing Unit) (Cab)	1	1
285073	Condensing Unit (Cab)	1	1
368448	Filter - Air (Cab Condenser)	1	1
423043	Guard - Fan (#285073 Condensing Unit) (Cab)	1	1
522295	Motor - Fan (#285073 Condensing Unit) (Cab)	1	1
618365	Relay - Start (#285073 Condensing Unit) (Cab)	1	1

5.13 SIDE VIEW



5.13 SIDE VIEW (CONTINUED)

Part	Description	Qty (per unit) U421	U431
DR-0010	Drier - Filter (1/4” OD) (Cab Condenser)	1	1
202235	Circuit Breaker	1	1
230654	Capacitor (Fan Motor)	1	1
231101	Cap Tube Only (Mix Line) (Cab)	1	1
231108	Cap Tube Only (Cab)	1	1
266165	Clip - Thermistor (#672798)	2	2
282106	Compressor - 1 PH - 60 Hz	2	2
282107	Compressor - 3 PH - 60 Hz	2	2
284107	Condenser (Air-Cooled)	1	1
284115	Condenser - Swedge (Water-Cooled)	2	2
285073	Condenser (Cab)	1	1
342008	Drier (Liquid Line)	2	2
357102	Motor - Fan (Air-Cooled Condenser) (Includes Blade & Guard)	1	1
368469	Filter (Air-Cooled Condenser) (2 Required)	2	2
375813	Access Valve Fitting (Mix Line) (Cab)	7	7
422074	Grommet - Rubber (High Pressure Cutout)	1	1
458009	Sight Glass	2	2
522898	Motor - Fan (115/220-240V, 50/60 Hz, 1 PH) (Air-Cooled Condenser)	1	1
618231	Relay - Overload (#522869 & #522853 Drive Motor)	2	2
672798	Thermistor Sensor (Cab/Barrel) (Yellow)	4	4
718539	Switch - Toggle (Transformer Voltage Selector)	1	1
718686	Switch - Pressure (High Pressure Cutout) (Cab)	1	1
718794	Switch - High Pressure Cutout	2	2
743654	Transformer - Booster	1	1
762412	Valve - Expansion (Sporlan) (Ser. #41711 Plus)	2	2
762978	Valve - EPR (Cab)	1	1
763181	Valve - Water	1	1
2206952	Evaporator Assembly (New Cab Units & DQ / Gate Style Handle)		1
2208135	Evaporator Assembly (Non DQ)		1
2208143	Evaporator Assembly - L.H. (New Cab Units)	1	
2208144	Evaporator Assembly - R.H. (New Cab Units)	1	

5.14 AIR-COOLED REMOTE CONDENSERS

Part	Description	Qty (per unit) U421	U431
162067	Blade - Fan (Air-Cooled Condenser)	1	1
202031	Circuit Breaker - Fan Motor Reset (Air-Cooled Remote)	1	1
342026	Drier - Receiver to Evaporator (Air Cooled Remote)	1	1
495002	Line Set (35 ft.)	1	1
522261	Motor - Fan (#2183464 Remote Condensing Unit)	1	1
608010	Receiver (Air-Cooled Remote)	1	1
718065	Switch - Fan Cycling (Air Remote Condenser)	1	1
762599	Valve - Head Master (Air-Cooled Remote)	1	1
762604	Valve - Solenoid (Liquid Line) (Air-Cooled Remote Only)	1	1
762611	Valve - Ball (Air-Cooled Remote Only)	1	1
762612	Valve - Shut Off (Air-Cooled Remote Only)	1	1
2187002	Front Shroud (Air-Cooled Remote)	1	1

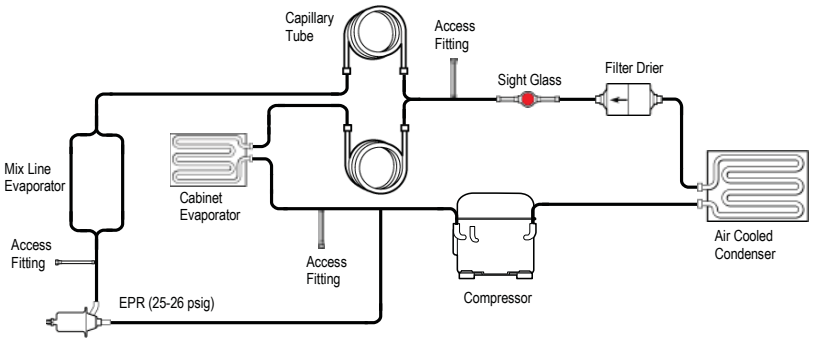
5.15 KITS AND MISCELLANEOUS

Part Number	Description	Quantity U421	Quantity U431
236067	Card - Cleaning Instruction	1	1
244138	Caster - Non-Locking (4”) (Each)	1	1
244139	Caster - Locking (4”) (Each)	1	1
624677-5	O-Ring - Spigot Extension - Black (5 Pack)	1	1
1172867	Check Valve Kit - Mix Line (Cab)	1	1
1177436	Air Compressor Kit (Includes Piston & Cylinder Sleeve, Needle Valve, Valve Guide & O-rings/Springs) (Cab)	1	1
1177606	Check Valve Kit - Air Compressor (Reed Valve, Needle Valve, Valve Guide, O-Rings & Spring) (Cab)	1	1
2157903	O-Ring & Small Parts Kit	1	1
2177072	Extension - Spigot - 1.5” (0.88” Opening)	1	1
2177073	Extension - Spigot - 2.5” (0.88” Opening)	1	1
2177074	Extension - Spigot - 3.2” (0.88” Opening)	1	1
2177917	Brush Kit	1	1
2208061	Extension - Spigot - 3.2” (0.75” Opening)	1	1
2208095	O-Ring & Bearing Kit	1	
2208159	Sanitizer Extension Kit (Cab)	1	1
2208277	O-Ring & Bearing Kit		1
2208468	Maintenance Kit - Semi-Annual		1
2208469	Maintenance Kit - Annual		1
2208470	Maintenance Kit - Quarterly		1
2208649	Maintenance Kit - Annual		1

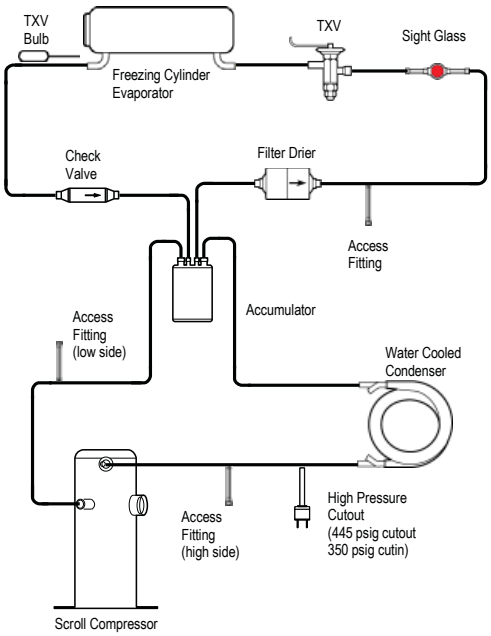
SECTION 6
REFRIGERATION DIAGRAM AND WIRING DIAGRAMS

6.1 REFRIGERATION DIAGRAMS

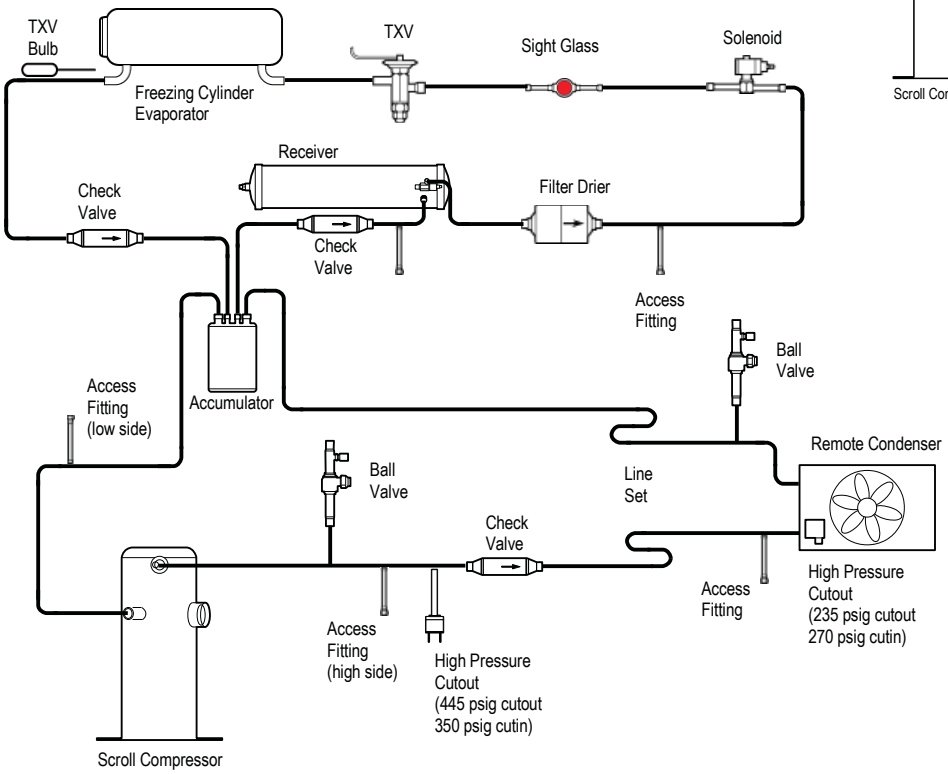
Cabinet Refrigeration System



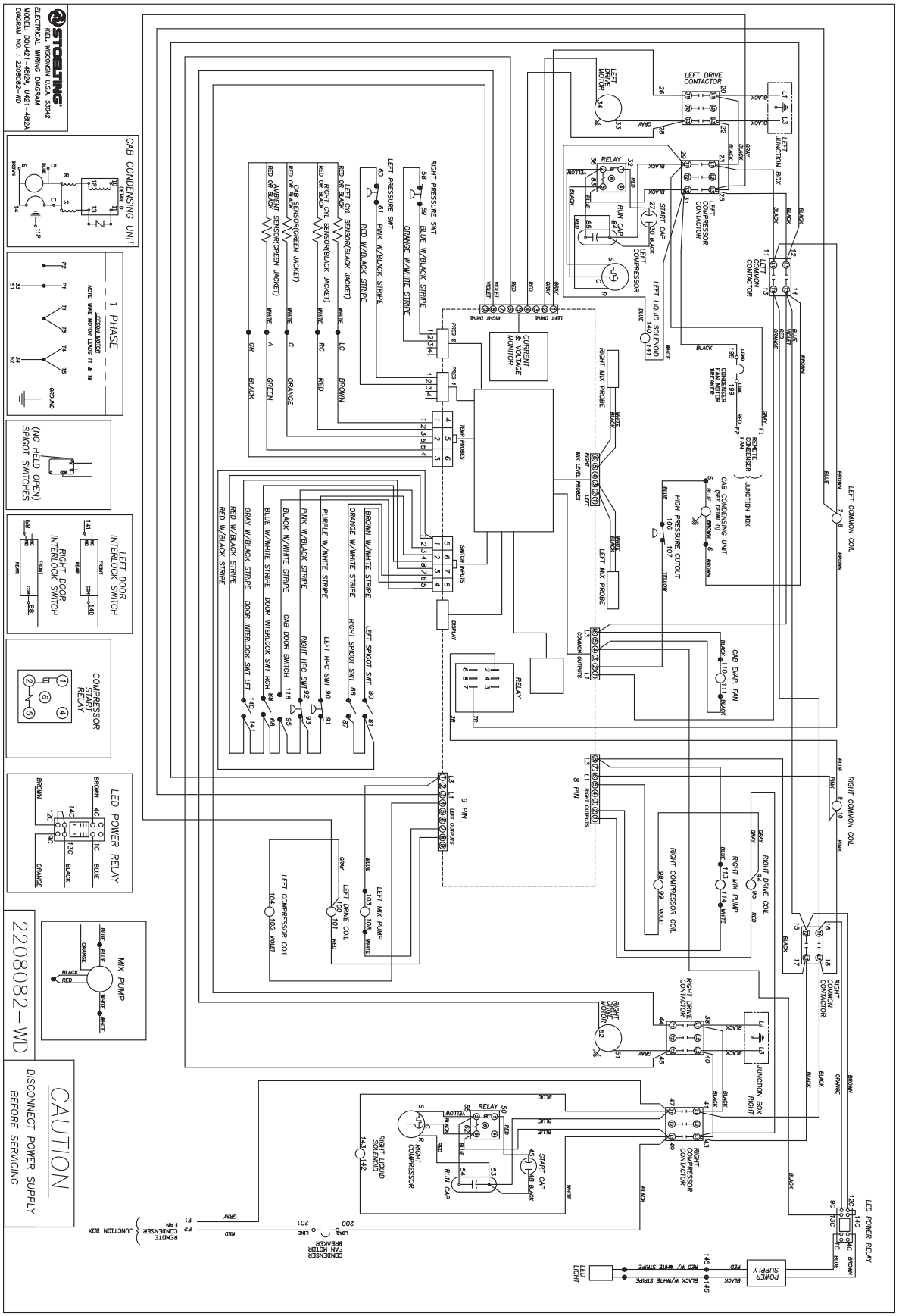
Water Cooled Refrigeration System (One Side Shown)

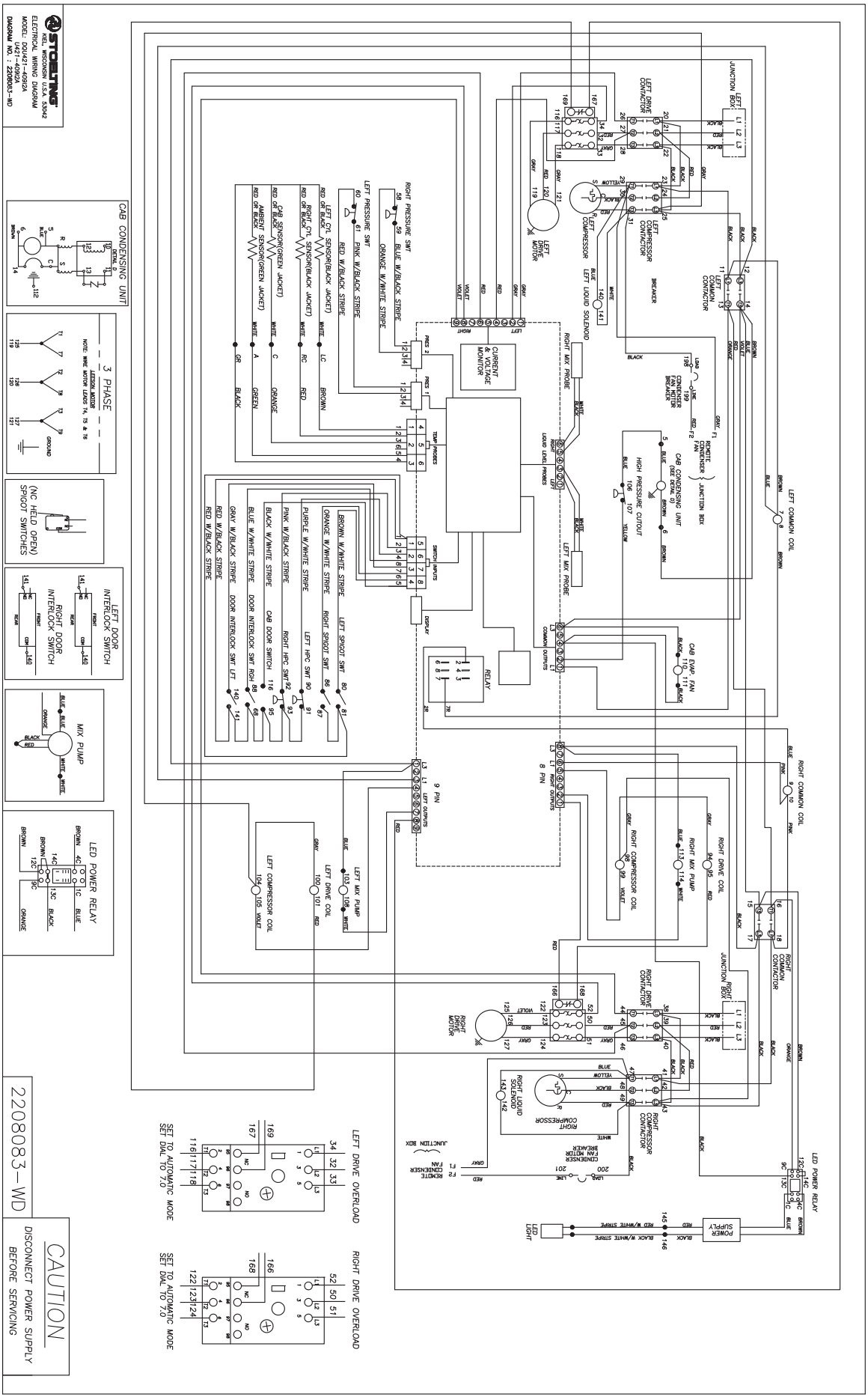


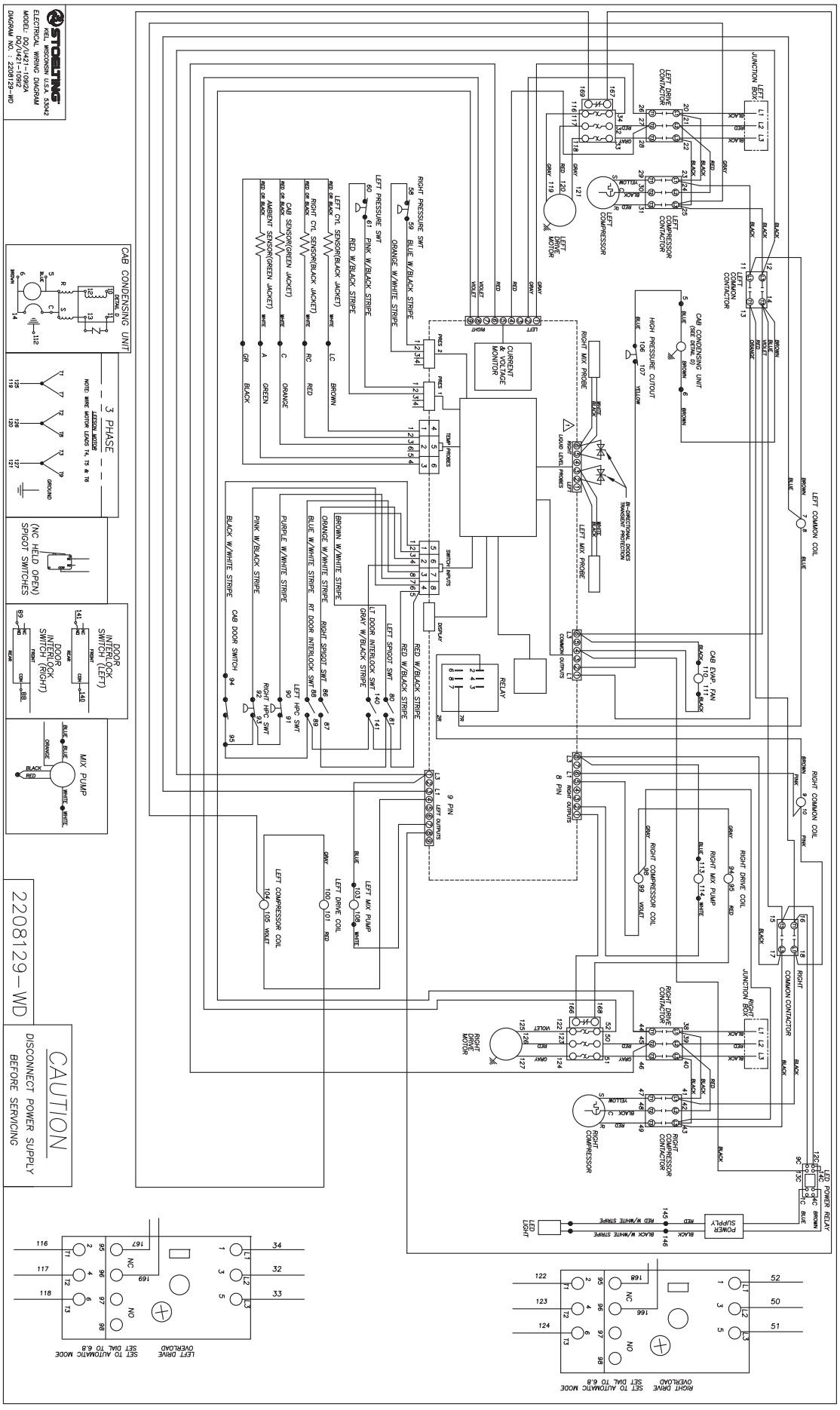
Remote Air Cooled Refrigeration System (One Side Shown)

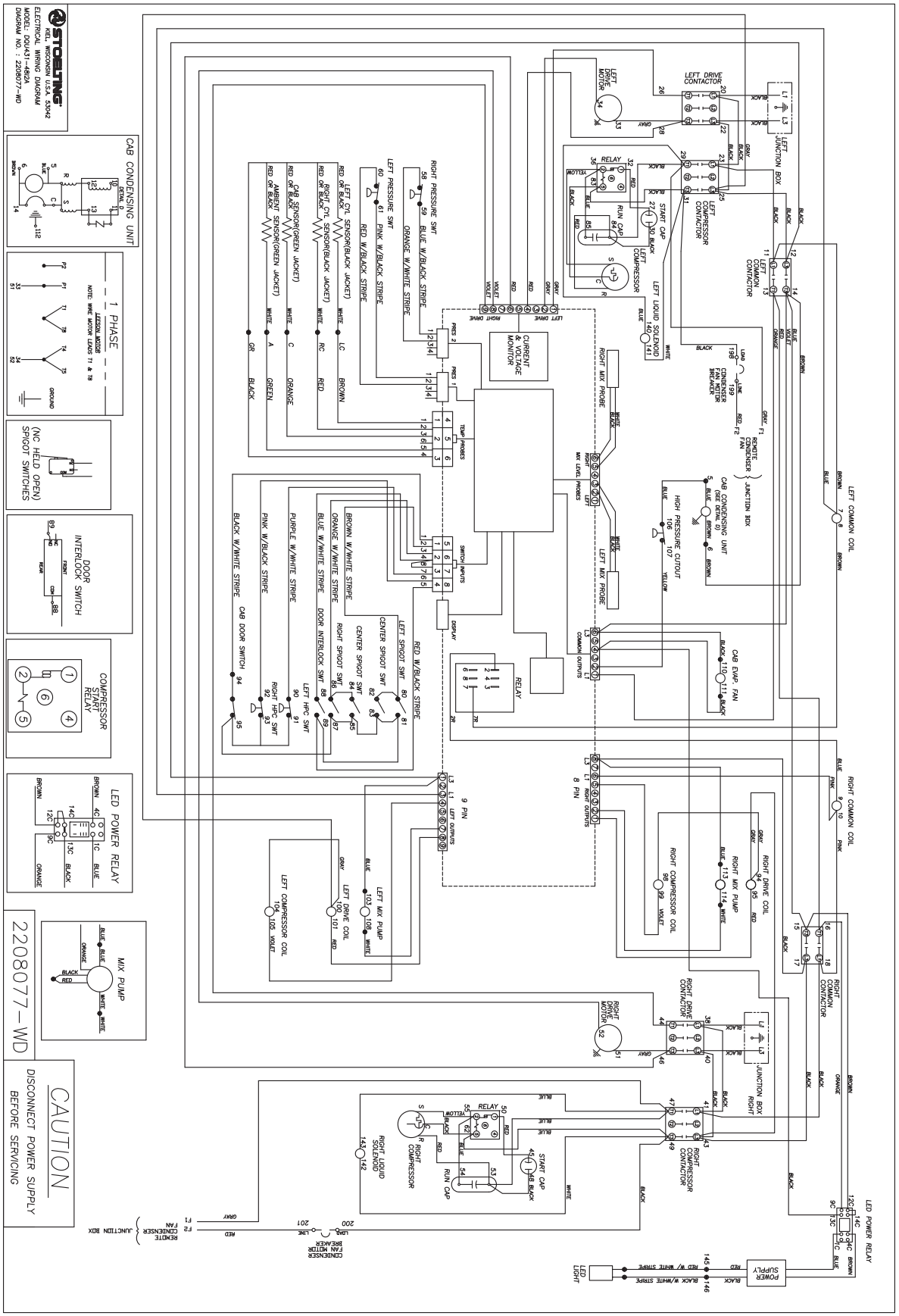


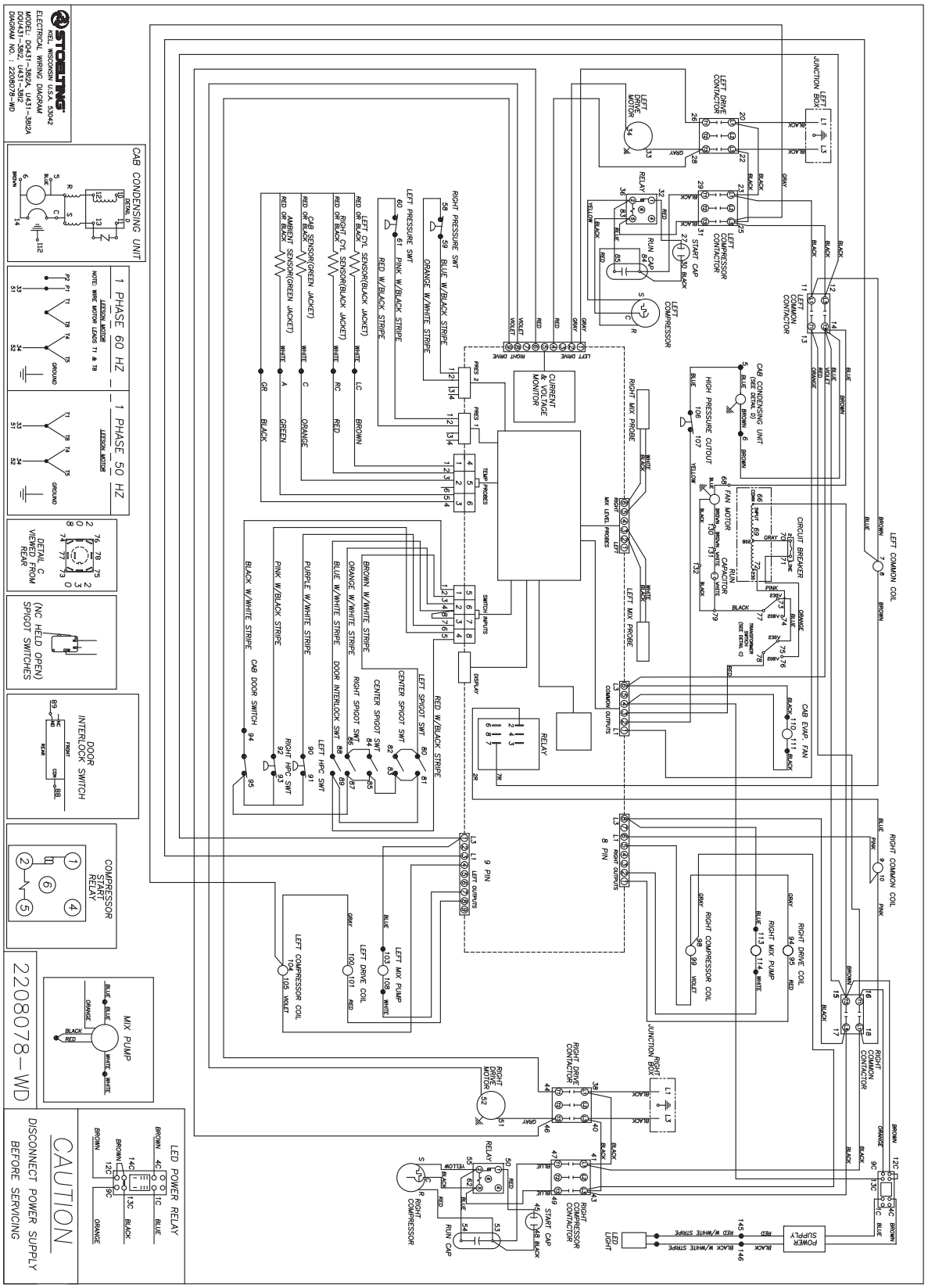
6.2 WIRING DIAGRAMS

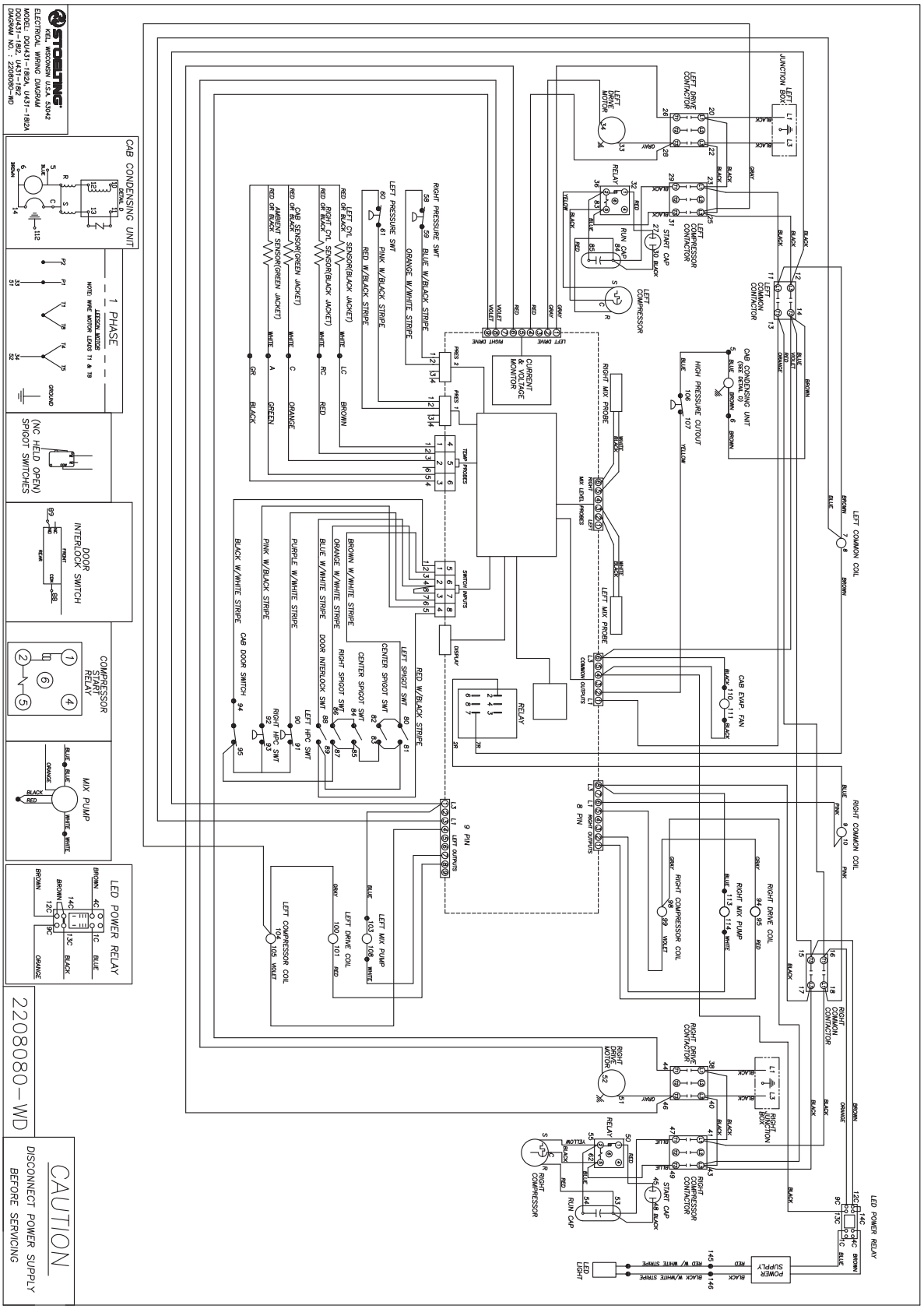


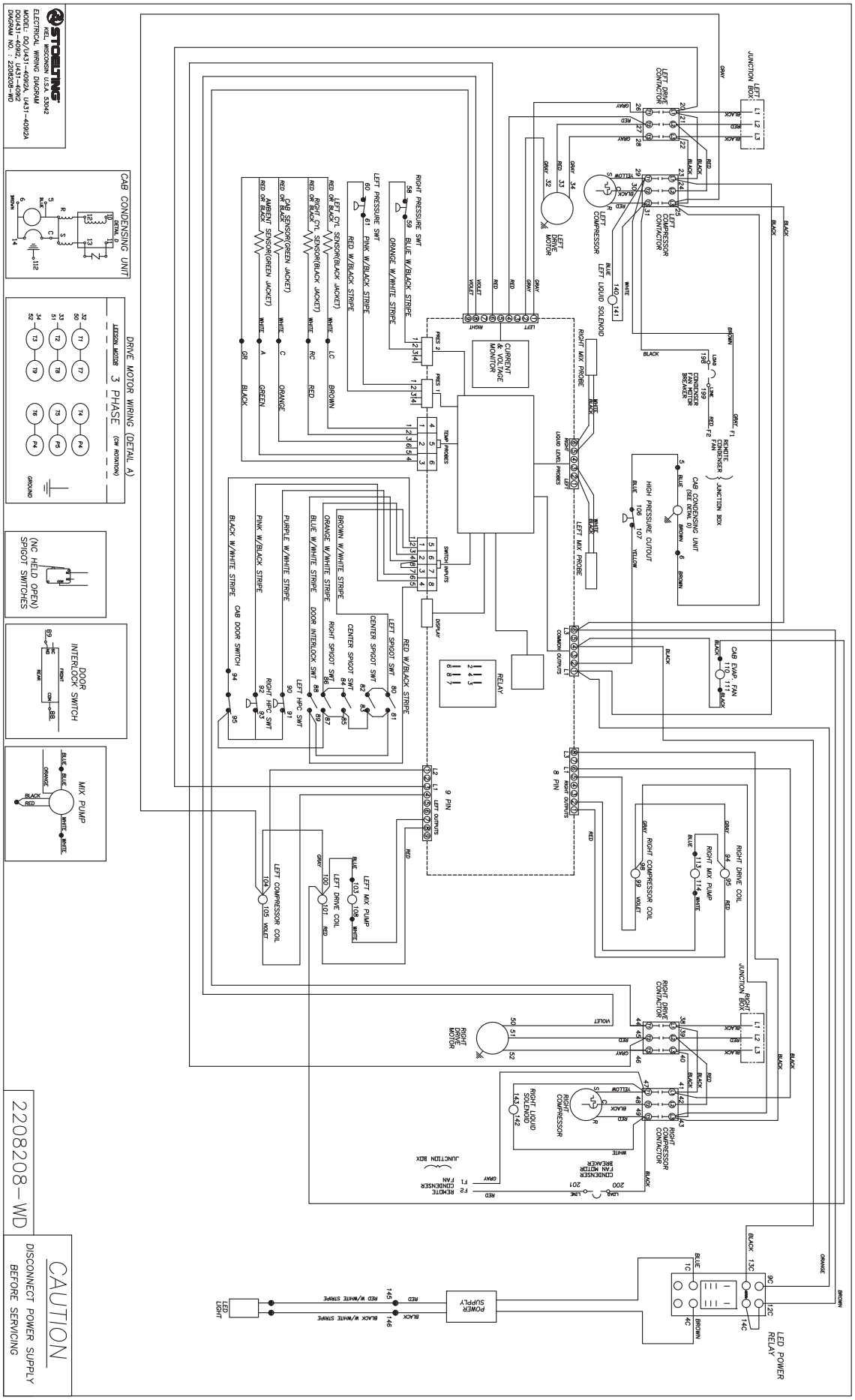

STOELTING
ELECTRICAL WIRING DIAGRAM
MODEL: DQU421-409I2A
U421-409I2A
DIAGRAM NO. : 2208083-WD
2208083-WD
CAUTION
DISCONNECT POWER SUPPLY
BEFORE SERVICING
CAB CONDENSING UNIT
3 PHASE
LEFT DOOR INTERLOCK SWITCH
RIGHT DOOR INTERLOCK SWITCH
MIX PUMP
LED POWER RELAY
LEFT DRIVE OVERLOAD
RIGHT DRIVE OVERLOAD
SET TO AUTOMATIC MODE SET DIAL TO 7.0
JUNCTION BOX
LEFT COMMON COIL
RIGHT COMMON COIL
LEFT COMMON CONTACTOR
RIGHT COMMON CONTACTOR
LEFT COMPRESSOR CONTACTOR
RIGHT COMPRESSOR CONTACTOR
LEFT COMPRESSOR
RIGHT COMPRESSOR
LEFT DRIVE MOTOR
RIGHT DRIVE MOTOR
LEFT LIQUID SOLENOID
RIGHT LIQUID SOLENOID
CURRENT & VOLTAGE MONITOR
LEFT MIX PROBE
RIGHT MIX PROBE
LEFT PRESSURE SWT
RIGHT PRESSURE SWT
HIGH PRESSURE CUTOUT
CAB CONDENSING UNIT
REMOTE CONDENSER FAN
CAB EVAP. FAN
LEFT DRIVE COIL
RIGHT DRIVE COIL
LEFT MIX PUMP
RIGHT MIX PUMP
LEFT COMPRESSOR COIL
RIGHT COMPRESSOR COIL
RELAY
DISPLAY
POWER SUPPLY
LED LIGHT
LEFT CTL SENSOR(BLACK JACKET)
RIGHT CTL SENSOR(BLACK JACKET)
CAB SENSOR(GREEN JACKET)
LEFT SPIGOT SWT
RIGHT SPIGOT SWT
LEFT HPC SWT
RIGHT HPC SWT
CAB DOOR SWITCH
DOOR INTERLOCK SWT LFT
DOOR INTERLOCK SWT RGH
BREAKER
CONTACTOR BREAKER
8 PIN
9 PIN
LEFT OUTPUTS
RIGHT OUTPUTS
COMMON OUTPUTS
SWITCH INPUTS
TEMP PROBES
LIQUID LEVEL PROBES
PRES 1
PRES 2
LEGEND MOTOR
NOTE: WIRE MOTOR LEADS T4, T5 & T6
GROUND
(NC HELD OPEN) SPIGOT SWITCHES

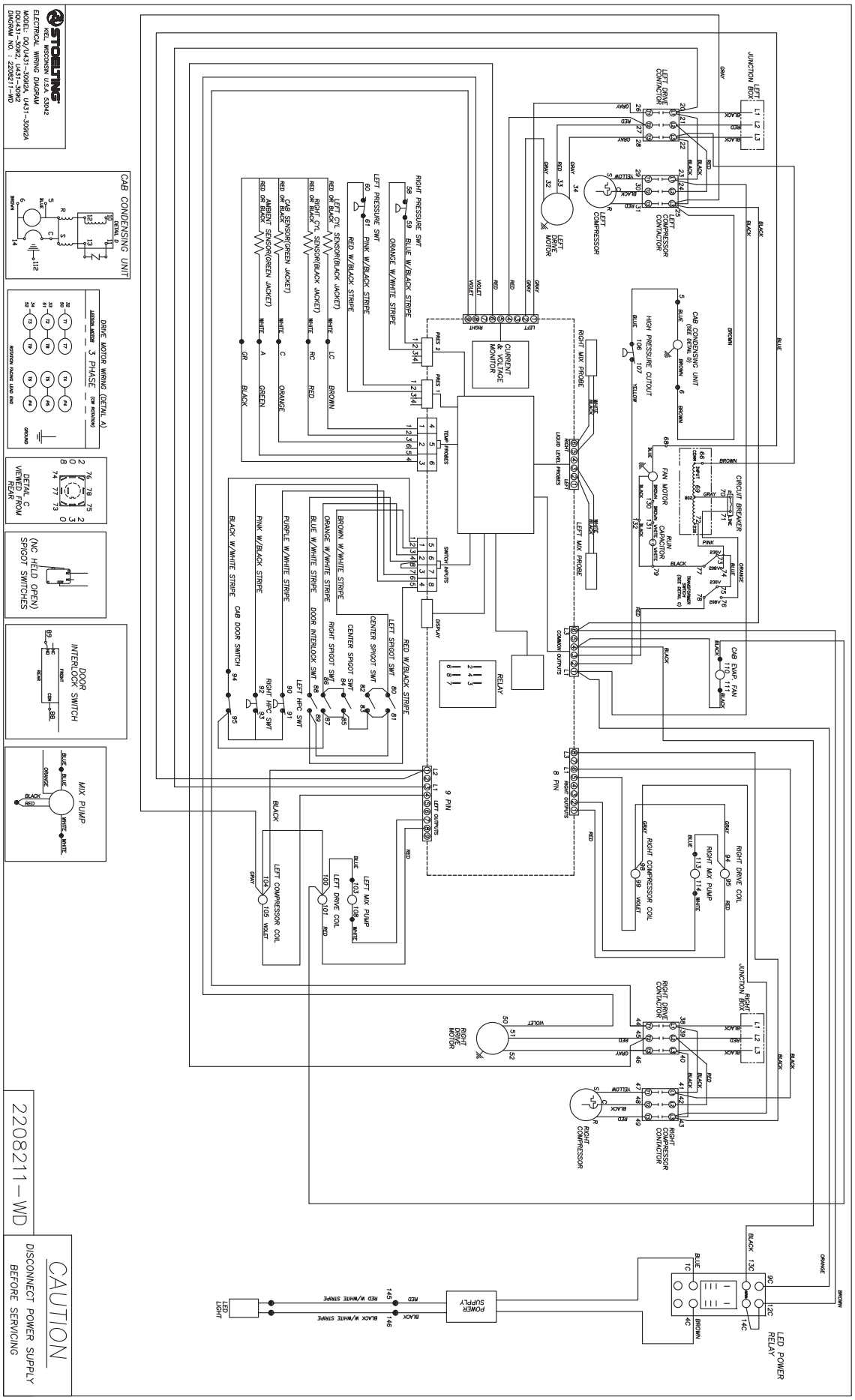

STOELTING
KIEL, WISCONSIN U.S.A. 53042
ELECTRICAL WIRING DIAGRAM
MODEL: DQ(U421-109I2A
DIAGRAM NO. : 2208129-WD
CAB CONDENSING UNIT
3 PHASE
(NC HELD OPEN)
SPIGOT SWITCHES
DOOR INTERLOCK SWITCH (LEFT)
DOOR INTERLOCK SWITCH (RIGHT)
MIX PUMP
2208129-WD
CAUTION
DISCONNECT POWER SUPPLY
BEFORE SERVICING
LEFT COMMON COIL
RIGHT COMMON COIL
LEFT DRIVE CONTACTOR
LEFT COMPRESSOR CONTACTOR
LEFT COMMON CONTACTOR
LEFT COMPRESSOR
LEFT DRIVE MOTOR
RIGHT DRIVE CONTACTOR
RIGHT COMPRESSOR CONTACTOR
RIGHT COMMON CONTACTOR
RIGHT COMPRESSOR
RIGHT DRIVE MOTOR
JUNCTION BOX
CAB CONDENSING UNIT
HIGH PRESSURE CUTOUT
CAB EVAP. FAN
CURRENT & VOLTAGE MONITOR
RIGHT MIX PROBE
LEFT MIX PROBE
BI-DIRECTIONAL DIODES TRANSIENT PROTECTION
RIGHT PRESSURE SWT
LEFT PRESSURE SWT
RIGHT CYL SENSOR(BLACK JACKET)
LEFT CYL SENSOR(BLACK JACKET)
CAB SENSOR(GREEN JACKET)
AMBIENT SENSOR(GREEN JACKET)
RELAY
DISPLAY
SWITCH INPUTS
COMMON OUTPUTS
RIGHT OUTPUTS
LEFT OUTPUTS
9 PIN
8 PIN
LEFT MIX PUMP
RIGHT MIX PUMP
LEFT DRIVE COIL
RIGHT DRIVE COIL
LEFT COMPRESSOR COIL
RIGHT COMPRESSOR COIL
LD POWER RELAY
LD LIGHT
POWER SUPPLY
LEFT DRIVE OVERLOAD
RIGHT DRIVE OVERLOAD
SET TO AUTOMATIC MODE
SET DIAL TO 6.8
LEFT COMPRESSOR
RIGHT COMPRESSOR
LEFT DOOR INTERLOCK SWT
RIGHT DOOR INTERLOCK SWT
LEFT HPC SWT
RIGHT HPC SWT
CAB DOOR SWITCH
LEFT SPIGOT SWT
RIGHT SPIGOT SWT
LEFT MIX PUMP
RIGHT MIX PUMP
LEFT COMPRESSOR COIL
RIGHT COMPRESSOR COIL
LEFT DRIVE COIL
RIGHT DRIVE COIL


STOELTING
KIEL, WISCONSIN U.S.A. 53042
ELECTRICAL WIRING DIAGRAM
MODEL: DDU431-48I2A
DIAGRAM NO. : 2208077-WD
CAB CONDENSING UNIT
1 PHASE
NOTE: WIRE MOTOR LEADS T1 & T8
(NC HELD OPEN) SPIGOT SWITCHES
DOOR INTERLOCK SWITCH
COMPRESSOR START RELAY
LED POWER RELAY
MIX PUMP
2208077-WD
CAUTION
DISCONNECT POWER SUPPLY BEFORE SERVICING
LEFT DRIVE MOTOR
LEFT DRIVE CONTACTOR
LEFT JUNCTION BOX
RELAY
START CAP
RUN CAP
LEFT COMPRESSOR CONTACTOR
LEFT COMPRESSOR
LEFT LIQUID SOLENOID
COMMON CONTACTOR
LEFT COMMON COIL
CONDENSER FAN MOTOR BREAKER
REMOTE CONDENSER FAN
JUNCTION BOX
CAB CONDENSING UNIT (SEE DETAIL D)
HIGH PRESSURE CUTOUT
CAB EVAP. FAN
RIGHT PRESSURE SWT
LEFT PRESSURE SWT
RIGHT MIX PROBE
LEFT MIX PROBE
CURRENT & VOLTAGE MONITOR
TEMP PROBES
SWITCH INPUTS
DISPLAY
RELAY
CAB SENSOR(GREEN JACKET)
AMBIENT SENSOR(GREEN JACKET)
LEFT CYL SENSOR(BLACK JACKET)
RIGHT CYL SENSOR(BLACK JACKET)
CENTER SPIGOT SWT
RIGHT SPIGOT SWT
LEFT SPIGOT SWT
DOOR INTERLOCK SWT
LEFT HPC SWT
RIGHT HPC SWT
CAB DOOR SWITCH
RED W/BLACK STRIPE
BROWN W/WHITE STRIPE
ORANGE W/WHITE STRIPE
BLUE W/WHITE STRIPE
PURPLE W/WHITE STRIPE
PINK W/BLACK STRIPE
BLACK W/WHITE STRIPE
ORANGE W/WHITE STRIPE
BLUE W/BLACK STRIPE
PINK W/BLACK STRIPE
8 PIN
9 PIN
LEFT OUTPUTS
RIGHT OUTPUTS
COMMON OUTPUTS
RIGHT DRIVE MOTOR
RIGHT DRIVE CONTACTOR
RIGHT JUNCTION BOX
RIGHT COMMON CONTACTOR
RIGHT COMMON COIL
RIGHT DRIVE COIL
RIGHT MIX PUMP
RIGHT COMPRESSOR COIL
RIGHT COMPRESSOR CONTACTOR
RIGHT COMPRESSOR
RIGHT LIQUID SOLENOID
START CAP
RUN CAP
LEFT MIX PUMP
LEFT DRIVE COIL
LEFT COMPRESSOR COIL
CONDENSER FAN MOTOR BREAKER
REMOTE CONDENSER FAN
JUNCTION BOX
POWER SUPPLY
LED LIGHT

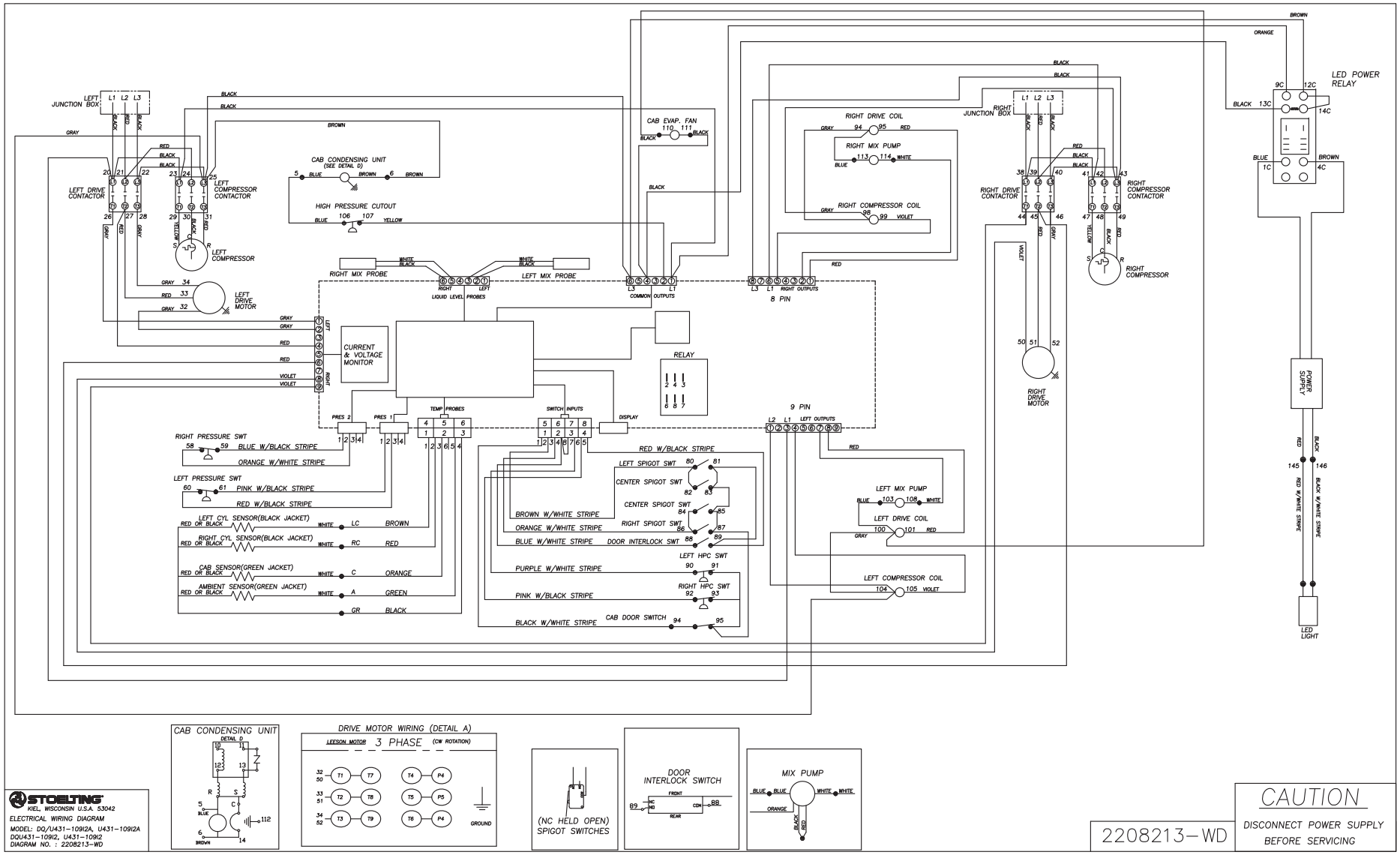

STOELTING
KIEL, WISCONSIN U.S.A. 53042
ELECTRICAL WIRING DIAGRAM
MODEL: DQ431-38I2A, U431-38I2A
DQU431-38I2, U431-38I2
DIAGRAM NO.: 220807B-WD
CAB CONDENSING UNIT
1 PHASE 60 HZ
1 PHASE 50 HZ
NOTE: WIRE MOTOR LEADS T1 & T8
DETAIL C VIEWED FROM REAR
(NC HELD OPEN) SPIGOT SWITCHES
DOOR INTERLOCK SWITCH
COMPRESSOR START RELAY
MIX PUMP
220807B-WD
LED POWER RELAY
CAUTION
DISCONNECT POWER SUPPLY BEFORE SERVICING
LEFT COMMON COIL
RIGHT COMMON COIL
LEFT COMMON CONTACTOR
RIGHT COMMON CONTACTOR
LEFT DRIVE MOTOR
RIGHT DRIVE MOTOR
LEFT DRIVE CONTACTOR
RIGHT DRIVE CONTACTOR
LEFT COMPRESSOR CONTACTOR
RIGHT COMPRESSOR CONTACTOR
LEFT COMPRESSOR
RIGHT COMPRESSOR
START CAP
RUN CAP
RELAY
JUNCTION BOX
LEFT BOX
RIGHT JUNCTION BOX
CIRCUIT BREAKER
FAN MOTOR
CAPACITOR
TRANSFORMER
CAB EVAP. FAN
CAB CONDENSING UNIT
HIGH PRESSURE CUTOUT
CURRENT & VOLTAGE MONITOR
LEFT MIX PROBE
RIGHT MIX PROBE
LEFT PRESSURE SWT
RIGHT PRESSURE SWT
CAB DOOR SWITCH
LEFT SPIGOT SWT
CENTER SPIGOT SWT
RIGHT SPIGOT SWT
DOOR INTERLOCK SWT
LEFT HPC SWT
RIGHT HPC SWT
LEFT MIX PUMP
RIGHT MIX PUMP
LEFT DRIVE COIL
RIGHT DRIVE COIL
LEFT COMPRESSOR COIL
RIGHT COMPRESSOR COIL
LEFT OUTPUTS
RIGHT OUTPUTS
COMMON OUTPUTS
SWITCH INPUTS
TEMP PROBES
MIX LEVEL PROBES
DISPLAY
LED LIGHT
POWER SUPPLY


STOELTING
KIEL, WISCONSIN U.S.A. 53042
ELECTRICAL WIRING DIAGRAM
MODEL: DQU431-1812A, U431-1812A
DQU431-1862, U431-1862
DIAGRAM NO.: 2208080-WD
CAB CONDENSING UNIT
1 PHASE
NOTE: WHT MOTOR LEADS T1 & T8
GROUND
(NC HELD OPEN) SPIGOT SWITCHES
DOOR INTERLOCK SWITCH
COMPRESSOR START RELAY
MIX PUMP
LED POWER RELAY
2208080-WD
CAUTION
DISCONNECT POWER SUPPLY BEFORE SERVICING
JUNCTION BOX
LEFT DRIVE CONTACTOR
LEFT DRIVE MOTOR
LEFT COMPRESSOR CONTACTOR
RUN CAP
START CAP
LEFT COMPRESSOR
LEFT COMMON CONTACTOR
LEFT COMMON COIL
CAB CONDENSING UNIT
HIGH PRESSURE CUTOUT
CAB EVAP FAN
RIGHT MIX PROBE
LEFT MIX PROBE
CURRENT & VOLTAGE MONITOR
RIGHT PRESSURE SWT
LEFT PRESSURE SWT
TEMP PROBES
MIX LEVEL PROBES
SWITCH INPUTS
DISPLAY
RELAY
COMMON OUTPUTS
RIGHT OUTPUTS
LEFT OUTPUTS
9 PIN
8 PIN
RIGHT COMMON COIL
RIGHT COMPRESSOR COIL
RIGHT DRIVE COIL
RIGHT MIX PUMP
LEFT MIX PUMP
LEFT DRIVE COIL
LEFT COMPRESSOR COIL
RIGHT DRIVE CONTACTOR
RIGHT DRIVE MOTOR
RIGHT JUNCTION BOX
RIGHT COMMON CONTACTOR
RIGHT COMPRESSOR CONTACTOR
RIGHT COMPRESSOR
POWER SUPPLY
LED LIGHT
LED POWER RELAY
CENTER SPIGOT SWT
LEFT SPIGOT SWT
RIGHT SPIGOT SWT
DOOR INTERLOCK SWT
LEFT HPC SWT
RIGHT HPC SWT
CAB DOOR SWITCH
LEFT CYL SENSOR(BLACK JACKET)
RIGHT CYL SENSOR(BLACK JACKET)
CAB SENSOR(GREEN JACKET)
AMBIENT SENSOR(GREEN JACKET)


STOELTING
ELECTRICAL WIRING DIAGRAM
MODEL: DQU431-409I2A, U431-409I2A
DQU431-409I2, U431-409I2
DIAGRAM NO.: 2208208-WD
CAB CONDENSING UNIT
DRIVE MOTOR WIRING (DETAIL A)
3 PHASE
(CW ROTATION)
GROUND
(NC HELD OPEN) SPIGOT SWITCHES
DOOR INTERLOCK SWITCH
MIX PUMP
2208208-WD
CAUTION
DISCONNECT POWER SUPPLY BEFORE SERVICING
JUNCTION BOX
LEFT DRIVE CONTACTOR
LEFT COMPRESSOR CONTACTOR
LEFT COMPRESSOR
LEFT DRIVE MOTOR
LEFT LIQUID SOLENOID
CURRENT & VOLTAGE MONITOR
RIGHT MIX PROBE
LEFT MIX PROBE
CONDENSER FAN MOTOR BREAKER
REMOTE CONDENSER FAN
HIGH PRESSURE CUTOUT
CAB CONDENSING UNIT
CAB EVAP. FAN
RELAY
RIGHT DRIVE COIL
RIGHT MIX PUMP
RIGHT COMPRESSOR COIL
RIGHT DRIVE CONTACTOR
RIGHT COMPRESSOR CONTACTOR
RIGHT COMPRESSOR
RIGHT LIQUID SOLENOID
RIGHT DRIVE MOTOR
LEFT MIX PUMP
LEFT DRIVE COIL
LEFT COMPRESSOR COIL
LED POWER RELAY
POWER SUPPLY
LED LIGHT
RIGHT PRESSURE SWT
LEFT PRESSURE SWT
LEFT CYL SENSOR(BLACK JACKET)
RIGHT CYL SENSOR(BLACK JACKET)
CAB SENSOR(GREEN JACKET)
AMBIENT SENSOR(GREEN JACKET)
CURRENT & VOLTAGE MONITOR
TEMP PROBES
LIQUID LEVEL PROBES
SWITCH INPUTS
DISPLAY
RELAY
COMMON OUTPUTS
RIGHT OUTPUTS
LEFT OUTPUTS
CENTER SPIGOT SWT
LEFT SPIGOT SWT
RIGHT SPIGOT SWT
DOOR INTERLOCK SWT
LEFT HPC SWT
RIGHT HPC SWT
CAB DOOR SWITCH


STOELTING
ELECTRICAL WIRING DIAGRAM
MODEL: DQU431-309I2, U431-309I2A
DQU431-309I2, U431-309I2A
DIAGRAM NO.: 220211-WD
CAB CONDENSING UNIT
DRIVE MOTOR WIRING (DETAIL A)
3 PHASE
DETAIL C VIEWED FROM REAR
(NC HELD OPEN) SPIGOT SWITCHES
DOOR INTERLOCK SWITCH
MIX PUMP
220211-WD
CAUTION
DISCONNECT POWER SUPPLY BEFORE SERVICING
JUNCTION BOX LEFT
LEFT DRIVE CONTACTOR
LEFT COMPRESSOR CONTACTOR
LEFT COMPRESSOR
LEFT DRIVE MOTOR
CAB CONDENSING UNIT
HIGH PRESSURE CUTOUT
FAN MOTOR
CIRCUIT BREAKER
RUN CAPACITOR
TRANSFORMER
CURRENT & VOLTAGE MONITOR
RIGHT MIX PROBE
LEFT MIX PROBE
RIGHT PRESSURE SWT
LEFT PRESSURE SWT
LEFT CYL SENSOR(BLACK JACKET)
RIGHT CYL SENSOR(BLACK JACKET)
CAB SENSOR(GREEN JACKET)
AMBIENT SENSOR(GREEN JACKET)
DISPLAY
RELAY
CAB EVAP. FAN
LEFT SPIGOT SWT
CENTER SPIGOT SWT
RIGHT SPIGOT SWT
DOOR INTERLOCK SWT
LEFT HPC SWT
RIGHT HPC SWT
CAB DOOR SWITCH
LEFT MIX PUMP
LEFT DRIVE COIL
LEFT COMPRESSOR COIL
RIGHT DRIVE COIL
RIGHT MIX PUMP
RIGHT COMPRESSOR COIL
JUNCTION BOX RIGHT
RIGHT DRIVE CONTACTOR
RIGHT COMPRESSOR CONTACTOR
RIGHT COMPRESSOR
RIGHT DRIVE MOTOR
LED POWER RELAY
POWER SUPPLY
LED LIGHT

U431-109I2A



STOELTING
KIEL, WISCONSIN U.S.A. 53042
ELECTRICAL WIRING DIAGRAM
MODEL: DQ/U431-109I2A, U431-109I2A
DQU431-109I2, U431-109I2
DIAGRAM NO. : 2208213-WD

2208213-WD

CAUTION
DISCONNECT POWER SUPPLY
BEFORE SERVICING