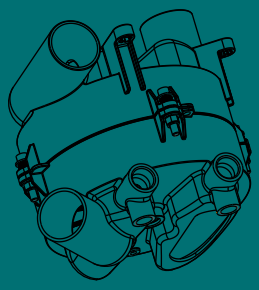
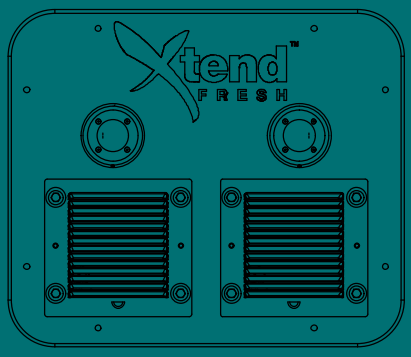
Carrier TRANSICOLD United Technologies

Container Refrigeration





OPERATIONS, SERVICE, AND PARTS MANUAL
for
XtendFRESH

T–366

XtendFRESH

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SAFETY SUMMARY

GENERAL SAFETY NOTICES

The following general safety notices supplement specific warnings and cautions appearing throughout this manual. These recommended precautions must be understood and applied during operation and maintenance of the equipment covered herein. The general safety notices are presented in the following sections labeled: First Aid, Operating Precautions, and Maintenance Precautions. A listing of specific warning and cautions appearing elsewhere in the manual follows the general safety notices. Additional notices for Worker Safety, and High Voltage Safety are also included.

FIRST AID

An injury, no matter how slight, should never go unattended. Always obtain first aid or medical attention immediately.

OPERATING PRECAUTIONS

Always wear safety glasses.

Keep hands, clothing and tools clear of the evaporator and condenser fans.

No work should be performed on the container unit until all circuit breakers and start–stop switches are turned OFF, and power supply is disconnected.

In case of severe vibration or unusual noise, stop the container unit and investigate.

MAINTENANCE PRECAUTIONS

Be sure power is turned OFF before installation of XtendFRESH Transport option. Tag circuit breaker and power supply to prevent accidental energizing of circuit. Do not bypass any electrical safety devices, e.g. bridging an overload, or using any sort of jumper wires.

Problems with the system should be diagnosed, any necessary repairs performed by qualified service personnel.

When performing any arc welding on the container unit or refrigerated compartment, disconnect all wire harness connectors from the modules in the control box. Do not remove wire harness from the modules unless you are grounded to the container unit frame with a static safe wrist strap.

⚠ WARNING

In case of electrical fire, open circuit switch and extinguish with CO_2 (never use water).

SPECIFIC WARNING AND CAUTION STATEMENTS

To help identify the hazards presented on the container unit labels and explain the level of awareness each one carries, an explanation is given with the appropriate consequences:

DANGER - means an immediate hazard that WILL result in severe personal injury or death.

WARNING - means to warn against hazards or unsafe conditions that COULD result in severe personal injury or death.

CAUTION - means to warn against potential hazard or unsafe practice that could result in minor personal injury, product or property damage.

The following safety statements are applicable to the XtendFRESH Transport unit used with any container unit and appear elsewhere in this manual.

These recommended precautions must be understood and applied during operation and maintenance of the equipment covered herein.

⚠ WARNING

High voltage safety: Always turn OFF the container unit circuit breakers (CB-1 & CB-2) and disconnect main power supply before working on moving parts.

⚠ WARNING

High voltage safety: Installation requires wiring to the main container unit circuit breaker, CB1. Make sure the power to the container unit is OFF and power plug disconnected before beginning installation.

⚠ WARNING

High voltage safety: Do not attempt to remove power plug(s) before turning OFF start-stop switch (ST), container unit circuit breaker(s) and external power source.

WARNING

Make sure the power plugs are clean and dry before connecting to power receptacle.

CAUTION

Use care when cutting wire ties to avoid nicking or cutting wires.

CAUTION

Use proper ESD precautions when handling electrostatic sensitive devices.

HIGH VOLTAGE SAFETY

The XtendFRESH Transport unit is equipped with a Power Supply Printed Circuit Board Assembly which supplies DC power to the XtendFRESH unit. The power supply runs on 480VAC power. Ensure the AC power supply is OFF, and disconnect the power connector from the power harness prior to performing any maintenance to the XtendFRESH unit.

SECTION 1
INTRODUCTION

1.1 INTRODUCTION

This Technical Supplement contains information specific to the Carrier Transicold XtendFRESH™ atmosphere control option. This supplement is to be used in conjunction with the separately bound Operation and Service Manual and Service Parts List for your particular model.

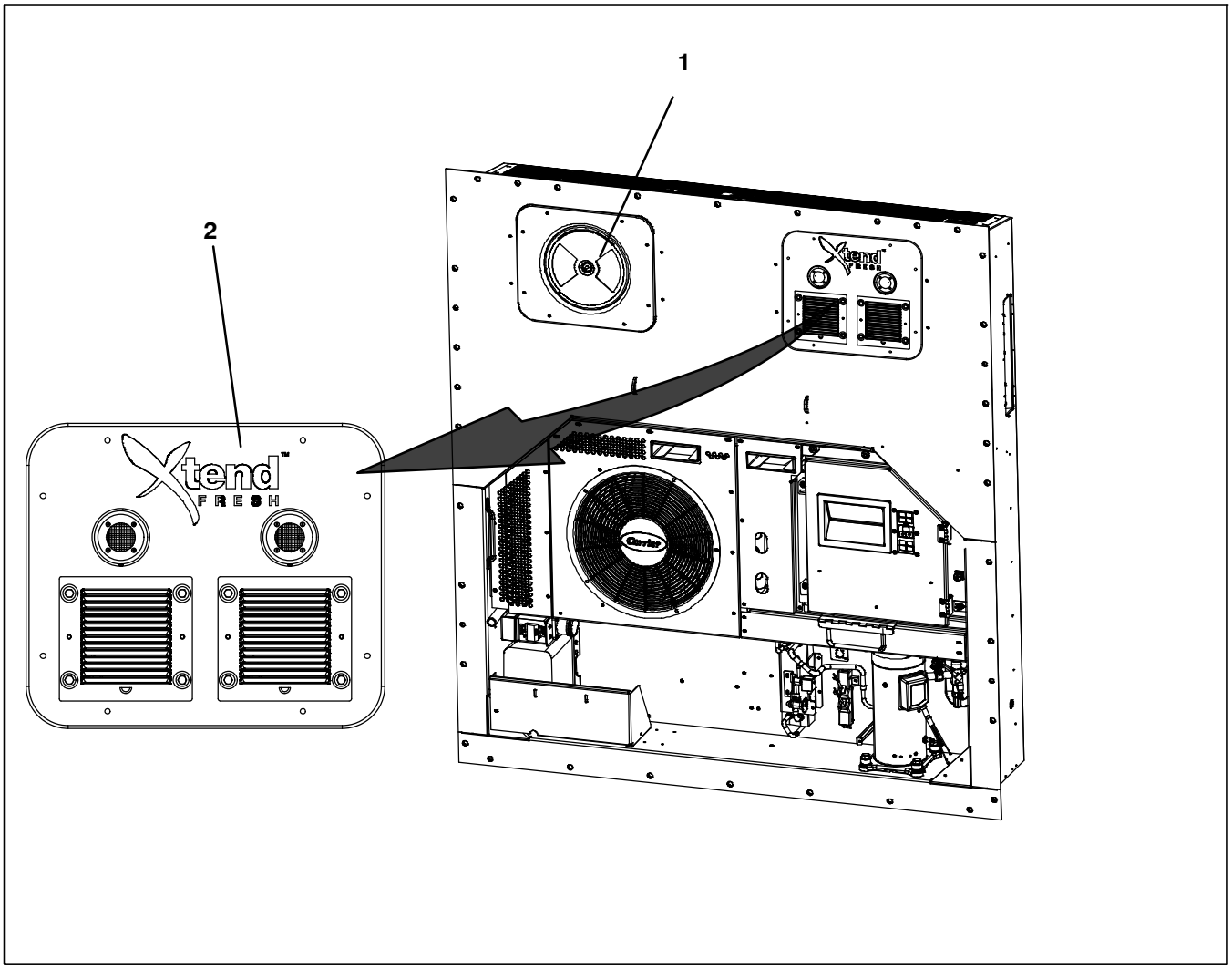
Carrier Transicold's exclusive XtendFRESH option is a modular system. The system's ability to control the container atmosphere is done with the use of a CO_2 and Ethylene scrubber. This in turn results in an increase in shelf life and enables longer cargo routes for certain high respiring, perishable commodities.

SECTION 2
DESCRIPTION

2.1 GENERAL DESCRIPTION

2.1.1 Refrigeration Unit – Front Section

The unit is designed so that the majority of the components are accessible from the front, see Figure 2-1. A manually operated venting system is located in the upper left access panel. Behind the left access panel are located CO_2 and O_2 sensors. The right access panel contains integrated components of the XtendFRESH system. This panel may be removed to allow entry into the evaporator section where the CO_2 scrubber and other components are located.



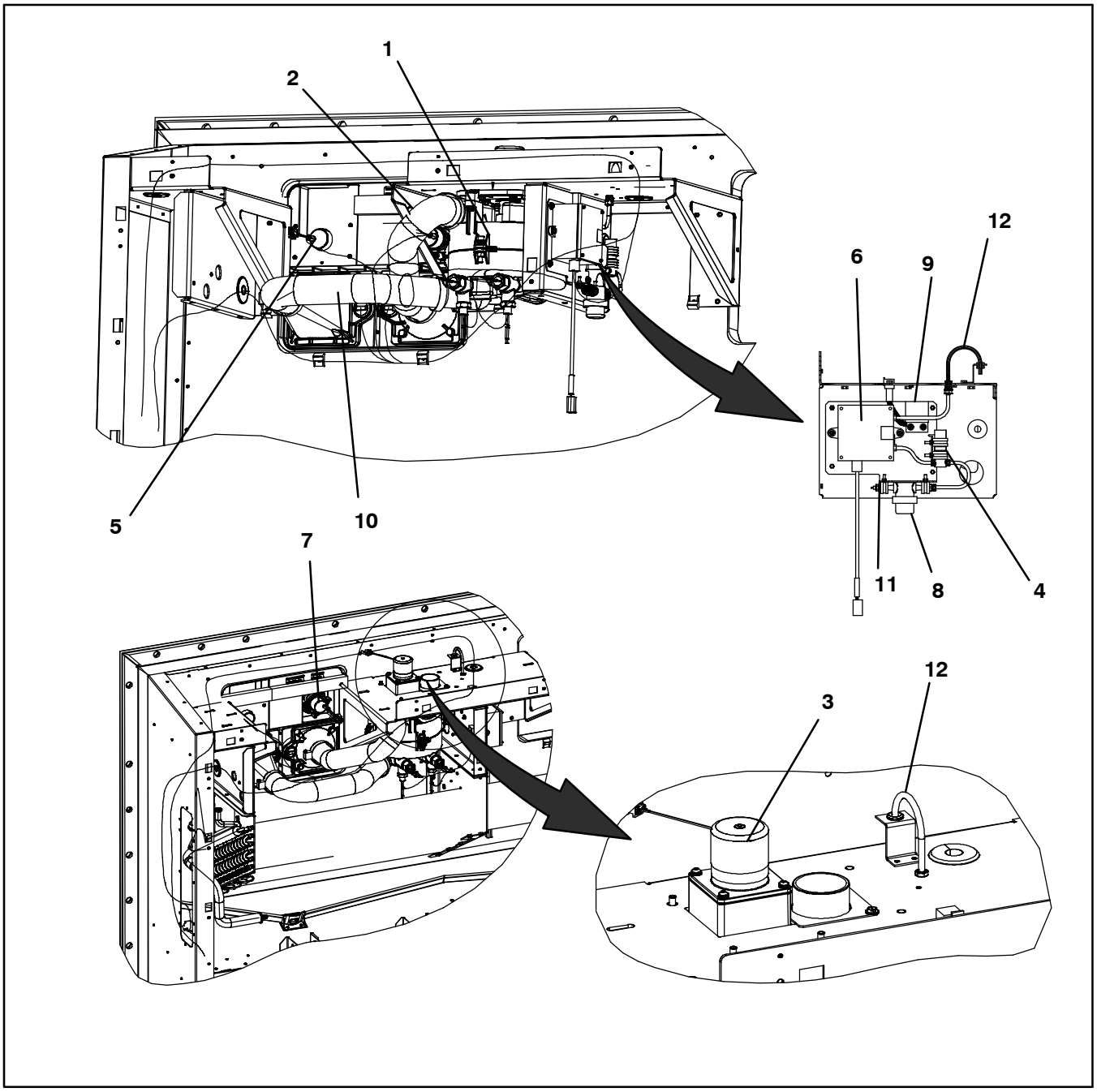
1. Fresh Air Panel
2. XtendFRESH Panel

Figure 2-1 Refrigeration Unit – Front

2.1.2 Evaporator Section

Components of the XtendFRESH system are mounted in the evaporator section in addition to the standard refrigeration unit components. These components include (see Figure 2–2) the XtendFRESH Scrubber Assembly, Motor Assembly, Fresh Air Panel and Sensor Package.

Air from within the container is passed through the filter to the O_2 and CO_2 sensors. Data is then supplied to the controller. The controller calculates O_2 and CO_2 values in order to maintain the preset values.



1. Scrubber Filter Assembly
2. Desorb Out Hose
3. CO_2 Scrubber Motor
4. O_2 Sensor
5. Fresh Air Solenoid (In)
6. CO_2 Sensor
7. Fresh Air Out Solenoid
8. Air Sample Filter
9. O_2 Amplifier
10. Desorb In Hose
11 O_2 /CO_2 Inlet
12 O_2 /CO_2 Outlet

Figure 2-2 Evaporator Section Components

SECTION 3
MICROPROCESSOR

3.1 TEMPERATURE CONTROL MICROPROCESSOR SYSTEM

The temperature control Micro-Link 3 microprocessor system (see Figure 3–1) consists of a key pad, display module, the control module (controller) and interconnecting wiring. The controller houses the temperature control software and the DataCORDER software. The temperature control software functions to operate the unit components as required to provide the desired cargo temperature and humidity. The DataCORDER software functions to record unit operating parameters and cargo temperature parameters for future retrieval. Refer to the Operation and Service manual for your particular unit for overall control descriptions. Control descriptions for the XtendFRESH option are contained herein.

The key pad and display module serve to provide user access and readouts for the XtendFRESH system. The functions are accessed by key pad selections and viewed on the display module.

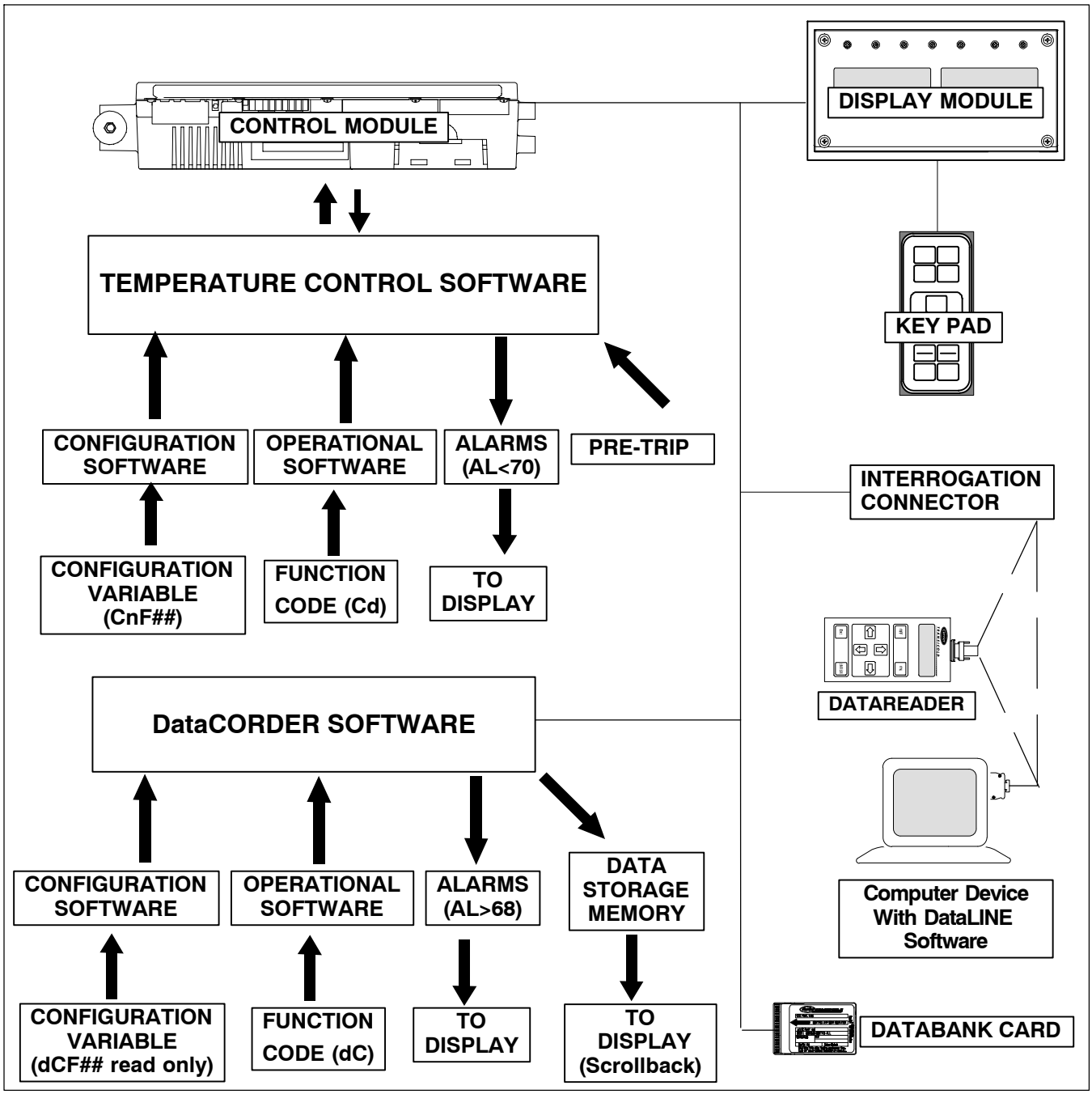
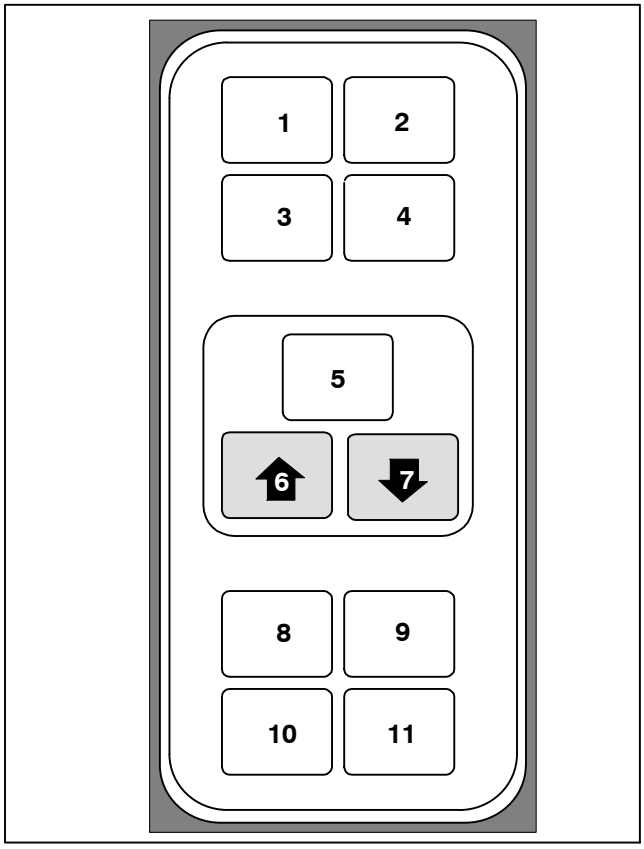


Figure 3–1 Temperature Control System

3.1.1 Key Pad

The key pad (Figure 3–2) is mounted on the right-hand side of the control box. The key pad consists of eleven push button switches that act as the user's interface with the controller. Descriptions of the switch functions are provided in Table 3–1.



1. Code Select
2. Pre-Trip
3. Alarm List
4. Manual Defrost/ Interval
5. ENTER
6. UP Arrow
7. DOWN Arrow
8. Return/Supply
9. Celsius/Fahrenheit
10. Battery Power
11. Alt. Mode

Figure 3–2 Key Pad

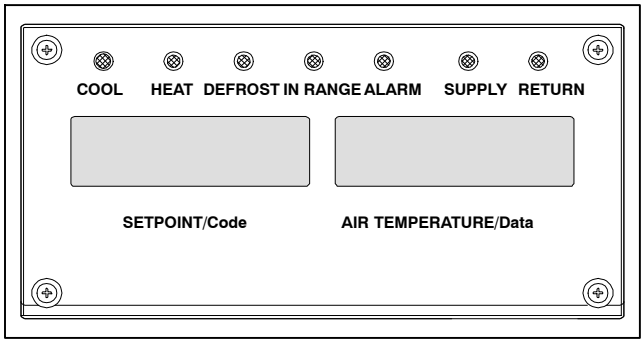


Figure 3–3 Display Module

3.1.2 Display Module

The display module (Figure 3–3) consists of two five digit displays and seven indicator lights.

Table 3–1 Key Pad Function

KEY	FUNCTION
Code Select	Accesses function codes.
Pre-Trip	Displays the pre-trip selection menu. Discontinues pre-trip in progress.
Alarm List	Displays alarm list and clears the alarm queue.
Manual Defrost/ Interval	Displays selected defrost mode. Depressing and holding the Defrost interval key for five (5) seconds will initiate defrost using the same logic as if the optional manual defrost switch was toggled on.
Enter	Confirms a selection or saves a selection to the controller.
Arrow Up	Change or scroll a selection upward Pre-trip advance or test interruption.
Arrow Down	Change or scroll a selection downward. Pre-trip repeat backward.
Return/ Supply	Displays non-controlling probe temperature (momentary display).
Celsius / Fahrenheit	Displays alternate English/Metric scale (momentary display). When set to F, pressure is displayed in psig and vacuum in "/hg." "P" appears after the value to indicate psig and "i" appears for inches of mercury. When set to C, pressure readings are in bars. "b" appears after the value to indicate bars.
Battery Power	Initiate battery backup mode to allow set point and function code selection if AC power is not connected.
ALT. Mode	This key is pressed to switch the functions from the temperature software to the DataCORDER Software. The remaining keys function the same as described above except the readings or changes are made to the DataCORDER programming.

3.1.3 Controller

The Micro-Link 3 controller is a dual module microprocessor. It is fitted with test points, harness connectors and a software card programming port.

3.2 CONTROLLER SOFTWARE

The controller software is a custom designed program that is subdivided into configuration software and operational software.

3.2.1 Configuration Variables

The unit configuration is a listing of the components and options that are installed in the unit and available for use by the operational software. The configuration variables for XtendFRESH are Cnf 70 and 71.

NOTE

If the present controller software does not contain XtendFRESH data, the controller must be updated with the correct model number (i.e 69NT40--551--114) using the PCMCIA programming card. To activate XtendFRESH, configuration Cnf70 must be turned “on”. The selection options are “in”, or “Out”. To turn “on” XtendFRESH, code is set to “in”.

To activate XtendFRESH, configuration Cnf70 must be set to “in”. The selection options are “Out” and “In”. Cnf71 is used to set the default operating mode of XtendFRESH after Pre−Trip and Trip Start operations. The selection options are “OFF” and “ON”. If set to “ON”, XtendFRESH will be automatically activated after a Pre−Trip or Trip Start operation.

3.2.2 Operational Software

The operational software is the actual operation programming of the controller which activates or deactivates components in accordance with current unit operating conditions and operator selected modes of operation.

3.2.3 Operational Software (Function Codes)

The function codes are specific parameters for operation or a visible display of component conditions. The function codes for XtendFRESH are Cd43 and Cd44. Cd43 is used to select the mode of operation and the associated parameters, OFF, XTEND, TEST. Cd44 displays the XtendFRESH values for the CO_2 and O_2 sensor. For instructions on setting the XtendFRESH system, refer to Section 4.

3.3 MODES OF OPERATION

The operation for the refrigeration system is unchanged by the XtendFRESH system. The XtendFRESH system is a separate independent system that is controlled by the microprocessor.

3.4 CONTROLLER ALARMS

Alarm display is an independent controller software function. If an operating parameter is outside of the expected range or a component does not return the correct signals back to the controller, an alarm is generated. The XtendFRESH alarms are AL10 and AL29. Alarm AL10 “O2 or CO2 Sensor Failure” is triggered anytime the O2 or CO2 sensor reading is outside of the normal operation range, after an initial signal was detected. Alarm AL29 “XtendFRESH Alarm” is activated whenever the CO2 or O2 levels are outside of the upper or lower limits respectively, for more than 90 minutes after the unit has been in range. The alarm is triggered off when the levels return to within the normal range.

3.5. UNIT PRE−TRIP DIAGNOSTICS

Pre-Trip Diagnostics is an independent controller function that suspends normal refrigeration controller activities and provides preprogrammed test routines. The test routines include Auto Mode testing, which automatically performs a pre programmed sequence of tests, or Manual Mode testing, which allows the operator to select and run any of the individual tests.

3.6. XTENDFRESH SENSOR CALIBRATION

Sensor calibration is performed by activating calibration mode, which is an option under Cd43 test mode. O2 sensor calibration consists of an air calibration (using fresh air). CO2 sensor calibration only consists of an air calibration procedure, using fresh air.

SECTION 4

OPERATION

4.1 INTRODUCTION

This section addresses the additional operating requirements for the XtendFRESH System. No operating parameters are changed except for XtendFRESH settings. For information pertaining to the operation of the refrigeration system, refer to the Operation and Service Manual for your particular model.

4.2 OPERATION

The XtendFRESH system scrubs the internal cargo air. During the process CO2 and ethylene are removed. The system maintains pre-set values for oxygen and carbon dioxide by opening and closing of automated air vents or fresh air exchange across the scrubber assembly.

4.3 XTENDFRESH INITIALIZATION

Following a 90 second delay after power up the controller will check for the presence of a carbon dioxide sensor and oxygen sensor. When detection is confirmed the controller will resume the previous XtendFRESH mode of operation before power interruption. If one of the sensors is not detected the only modes of operation available will be Test, and OFF. If the unit prior to power interruption was operating in XtendFRESH mode and one of the sensors is not detected the controller will activate the AL10 alarm condition to alert the user.

4.4 PRE–TRIP INSPECTION

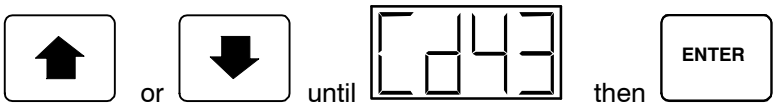
Pre–trip testing of the XtendFRESH system is perform via function code 43. During the pre–trip inspection the technician will verify operation by visual observation during this test.

4.5 SYSTEM START–UP PROCEDURE

To start the system, do the following:

a. Press the “CODE SELECT” key.

b. Press the “UP or DOWN“arrow key until “Cd43“ is displayed, then press “ENTER”.



c. Press the “UP or DOWN“ arrow key to access the desired mode of operation. When the desired mode of operation is displayed press the enter key to access the sub menu parameters.

4.6 XTENDFRESH OPERATION

The modes of operation are: XTEND, TEST, OFF. Within each of these modes of operation are sub menus that have selectable parameters. Not all parameters are available in each sub menu.

4.6.1 Operational Parameters

CO_2 Set Point (CO2SP) – is the maximum level of carbon dioxide that is allowed for the cargo. The range is from 0% to 19% in 1% increments, the default setting is 5%.

O_2 Set Point (O2SP) – is the minimum level of O_2 that is allowed for the cargo. The range is from 3% to 21% in 1% increments, the default setting is 10%.

4.6.2 Modes of Operation

a. OFF

A setting of “OFF“ will disable all XtendFRESH operations. The XtendFRESH vents will be closed and the scrubber will remain off. This will be the default mode anytime a frozen mode of operation has been selected. Whenever a frozen setpoint is selected the current XtendFRESH setting will be saved.

b. TEST

“TEST” mode allows the operator to test system operation of the mechanical components and the calibration of the sensors.

Upon entering test mode there are two options available (TEST, and Cal). Each of the different modes is explained in detail below. Use the up or down arrows keys to select either the TEST, or CAL option.

TEST MODE When TEST is shown in the display, pressing the “ENTER” key will energize the Fresh Air Solenoids for eight seconds. After the eight seconds the contactor will start the blower fans and the scrubber motor to turn. After completion of the TEST, the unit will return to the previous mode of operation.

When “CAL” is shown in the display Pressing the “ENTER” key will activate an additional sub menu for CO2 sensor calibration (COCAL) or O2 Sensor calibration (O2CAL). Use the up or down arrows keys to select the option.

NOTE

It is required that the calibration procedure only be performed during pre−trip or when the container has been fully vented.

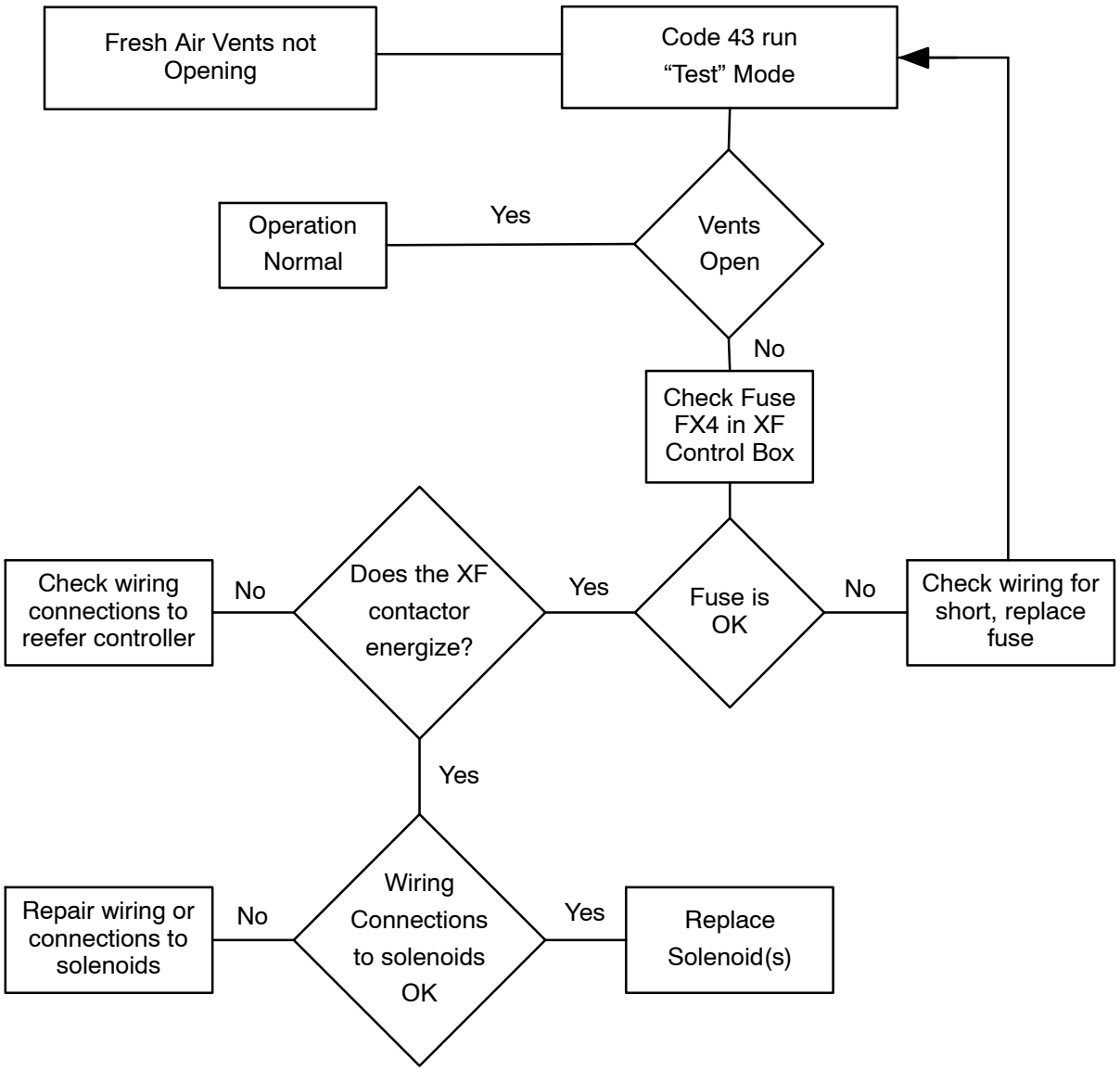
CO2 Sensor Calibration (COCAL) − Pressing and holding the “ENTER” key while “COCAL” is displayed will activate the calibration sequence. When “Epty box” is displayed confirm the box is empty by pressing and holding the “ENTER” key until the calibration begins. This will energize high speed evaporator fans and the fresh air vents will be opened. “CAL” will be flashed on the display during calibration along with a 10 minute countdown timer.

Oxygen Sensor Air Calibration (AirCL) − Pressing and holding the “ENTER” key while “AirCL” is displayed will enter the sub menu for the calibration sequence. When “Epty box” is displayed, confirm the box is empty by pressing and holding the “ENTER” key until the calibration timer begins. This will energize high speed evaporator fans and the fresh air vents will be opened. “CAL” will be flashed on the display during calibration along with a 10 minute countdown timer.

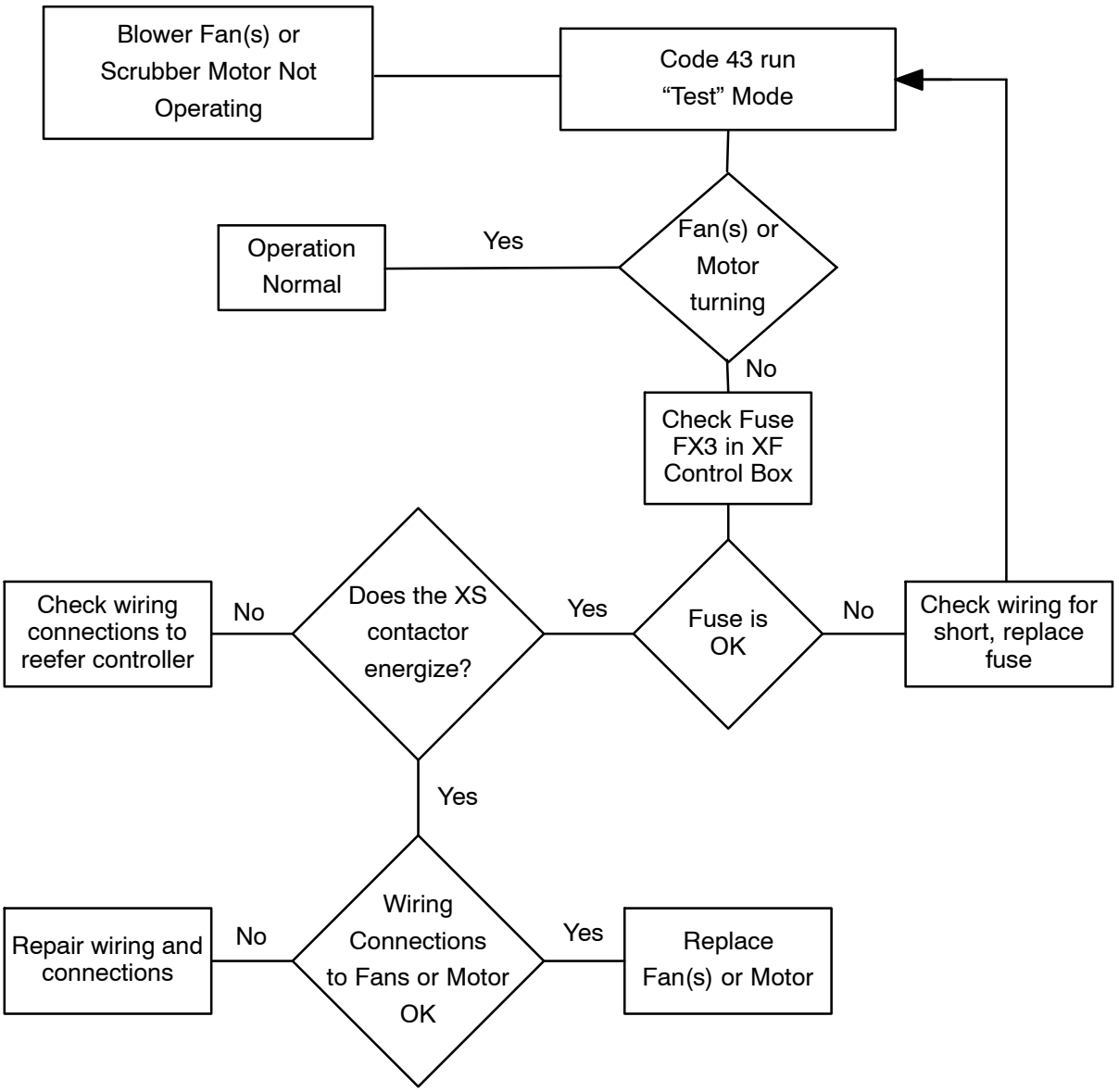
SECTION 5

TROUBLESHOOTING

CONDITION	POSSIBLE CAUSE	REMEDY/REFERENCE SECTION
5.1 ALARM		
AL10	Check O_2 sensor	Check wiring, 4.6.2
	Check CO_2 sensor	Check wiring, 4.6.2
AL29	Check scrubber motor operation	Perform Pre−Trip Inspection
	Check CO_2 sensor	Check wiring, 4.6.2
5.2 XtendFRESH NOT OPERATING		
Air Vent (s) Not Opening		



Blower Fan(s) Not Operating



SECTION 6

SERVICE

WARNING

Before servicing unit, make sure the start-stop switches (CAS and ST) are in the OFF position. Unit circuit breakers (CB-1 and CB-2) and external power sources are turned OFF and tagged to prevent accidental energizing of circuits.

WARNING

Low oxygen levels inside the container, ventilate before entering. Stay away from doors while venting.

NOTE

Prior to performing service work, a thorough review and understanding of the entire manual is recommended.

6.1 MAINTENANCE SCHEDULE

UNIT		OPERATION	REFERENCE SECTION
YES	NO		
a. Pre−Trip			
X		Pre−Trip Inspection − before starting.	Section 6.8
X		Verify container meets leak specification.	Section 6.9
X		Inspect air intake filters.	Section 6.2
X		Replace poly sheet curtain.	Section 6.10
X		Calibrate O_2 and CO_2 sensors.	Section 4.6.2
a. Bi−annually			
X		Replace air sample filter.	Section 6.3
X		Replace panel air filters.	Section 6.2
a. Every 3 Years			
X		Replace scrubber cartridge.	Section 6.6.3

6.2 AIR INTAKE FILTER

a. Removing the Panel Air Filters

1. Remove the louvered panels from the right−hand side refrigeration evaporator access panel, see Figure 6 −1, by removing the bolts (#1/4−24 x -), flat washers (#10), and Mylar washers.

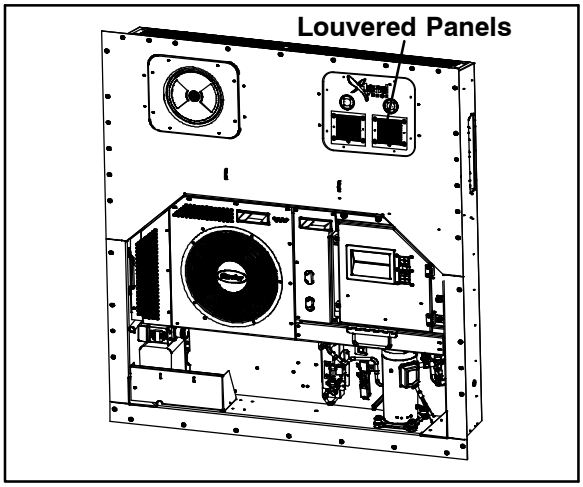


Figure 6 −1 XtendFRESH Panel

2. Loosen four bolts (#10−32) that secure the brackets holding the air intake filter in place.

3. Remove the panel air filters (See Figure 6 –2).

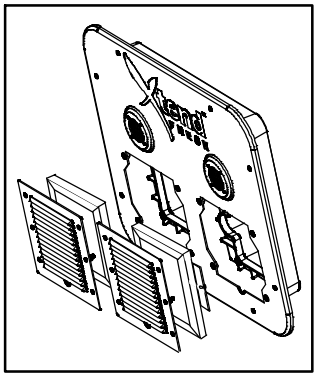
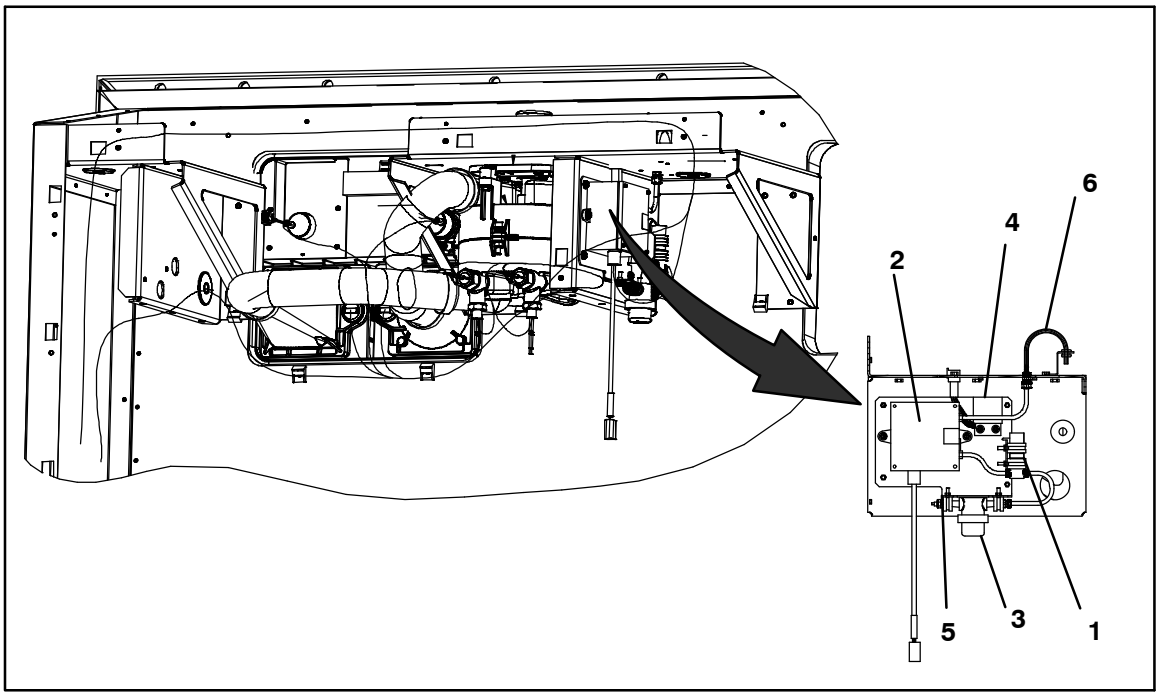


Figure 6 –2 Filters

b. Replacing the Panel Air Filters

1. Install the air intake filter by reversing the above steps. Be sure to install the filters in the correct air flow direction. The filter's wire mesh must be facing towards the inside of the container.

6.3 AIR SAMPLE FILTER



1. O_2 Sensor
2. CO_2 Sensor
3. Air Sample Filter
4. O_2 Amplifier
5. O_2/CO_2 Inlet
6. O_2/CO_2 Outlet

Figure 6 –3 O_2/CO_2 Assembly

WARNING

Low oxygen levels inside the container, ventilate before entering. Stay away from doors while venting.

a. Removing the Air Sample Filter Element

When replacing the air sample filter element it can be accessed in two ways: through the left–hand side evaporator access panel or through the inside of the container by lowering the upper evaporator panel (see Figure 6 –4).

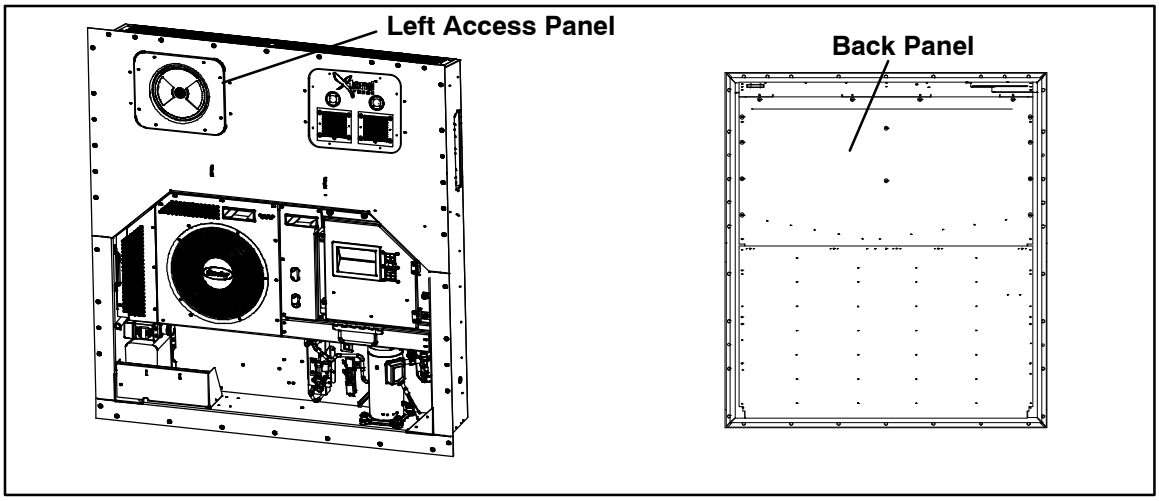


Figure 6 –4 Left Access Panel and Back Panel (Inside of Container)

WARNING

Make sure power to the unit is OFF and the power plug is disconnected and tagged before servicing.

1. Follow container venting procedures before performing any maintenance on the air sample filter element.
2. By hand, unscrew and remove the filter cup from the bottom of the air sample filter assembly (**Figure 6 –5**).
3. Remove the filter element from the filter assembly.

b. Replacing the Air Sample Filter Element

1. Install the air sample filter element by reversing the above steps.

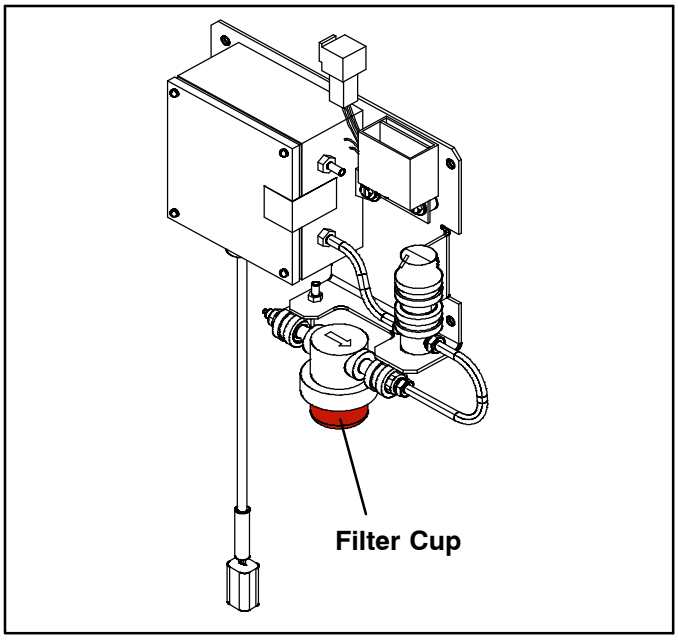


Figure 6 –5 Filter Cup

6.4 OXYGEN SENSOR

a. Removing the Oxygen Sensor

When replacing the oxygen sensor it can be accessed in two ways: through the left−hand side evaporator access panel or through the inside of the container by lowering the upper evaporator panel (see Figure 6 −4).

WARNING

Make sure power to the unit is OFF and the power plug is disconnected and tagged before servicing.

1. Follow container venting procedures before performing any maintenance on the oxygen sensor (Refer to **Figure 6 −6**).
2. Remove the cushion clamp and screws that secure the oxygen sensor.
3. Cut the wire tie that secures the wiring to the oxygen sensor body.
4. Unplug the wiring connector from the receptacle.
5. Remove the oxygen sensor from the oxygen sensor housing.

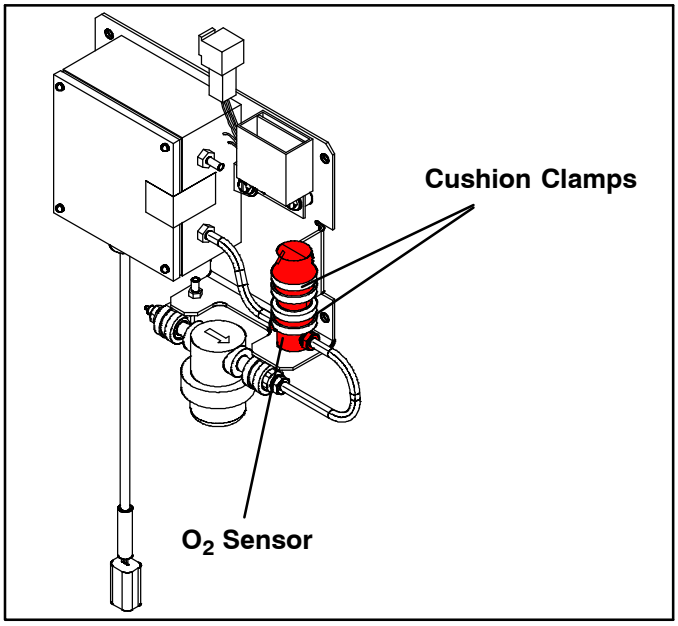


Figure 6 −6 O_2 Sensor

a. Replacing the Oxygen Sensor

1. Install the oxygen sensor by reversing the above steps.
2. Calibrate the oxygen sensor, following the test procedure in Section 4.6.2.

6.5 CARBON DIOXIDE SENSOR

a. Removing the CO_2 Sensor

When replacing the CO_2 sensor it can be accessed in two ways: through the left−hand side evaporator access panel or through the inside of the container by lowering the upper evaporator panel (see Figure 6 −4). Refer to Figure 6 −3 for the physical location of the CO_2 sensor.

WARNING

Make sure power to the unit is OFF and the power plug is disconnected and tagged before servicing.

1. Follow container venting procedures before performing any maintenance on the CO_2 sensor.
2. Remove the electrical connector and the inlet and outlet tubes from the body of the sensor (Item 2, Figure 6 −3).
3. Loosen the screws which holds the CO_2 sensor to the fan deck bracket.
4. Install replacement CO_2 sensor by reversing steps 2 and 3.

5. Calibrate the Co2 sensor, following the test procedure in Section 4.6.2.

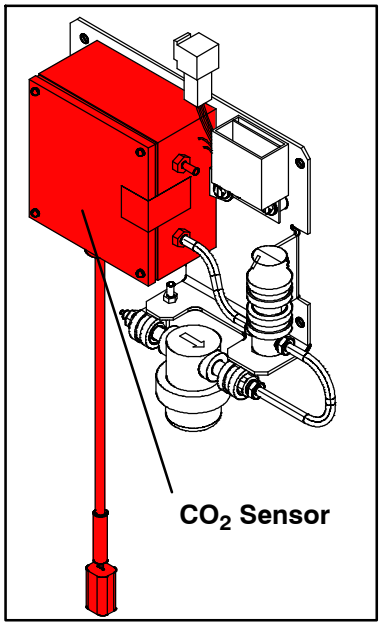


Figure 6 –7 CO_2 Sensor

6.6 XTENDFRESH ACCESS PANEL

WARNING

Always turn OFF the unit circuit breaker (CB–1) and disconnect main power supply before working near moving parts.

6.6.1 Removing the XtendFRESH access panel

1. Remove the upper right access panel (see Figure 6 –1) by removing the mounting bolts and T.I.R locking device.
2. Pull the access panel out slightly in order to disconnect the hoses from the panel.
3. Reach inside of the unit and remove the Ty–Rap securing the panel wires.
4. Unplug the fresh air solenoids and the blower connections.
5. Set the panel aside to make any necessary repairs.

6.6.2 Re–installing the XtendFRESH access panel

1. Plug in the fresh air solenoids and the blower connection.
2. Reach inside of unit and secure the wiring with Ty–Raps to prevents chafing or interference with the evaporator fan.
3. Attach hoses to the access panel according to Figure 6 –8.

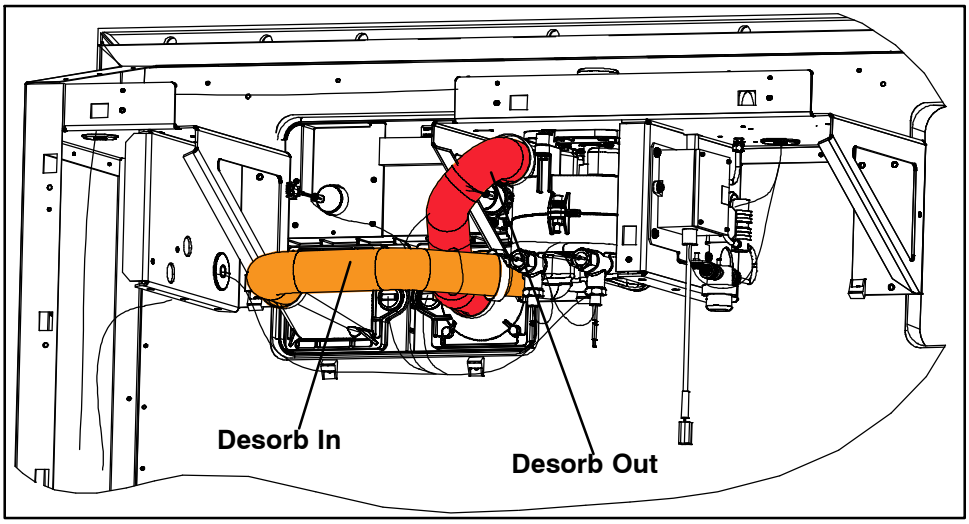


Figure 6 –8 Hose Locations

4. Replace access panel, making sure panel does not leak. Re−attach T.I.R. Locking device if used.

6.6.3 Removing the Scrubber Housing

When replacing the Scrubber it can be accessed through the inside of the container. Refer to Figure 6 −9 for the physical location of the Scrubber.

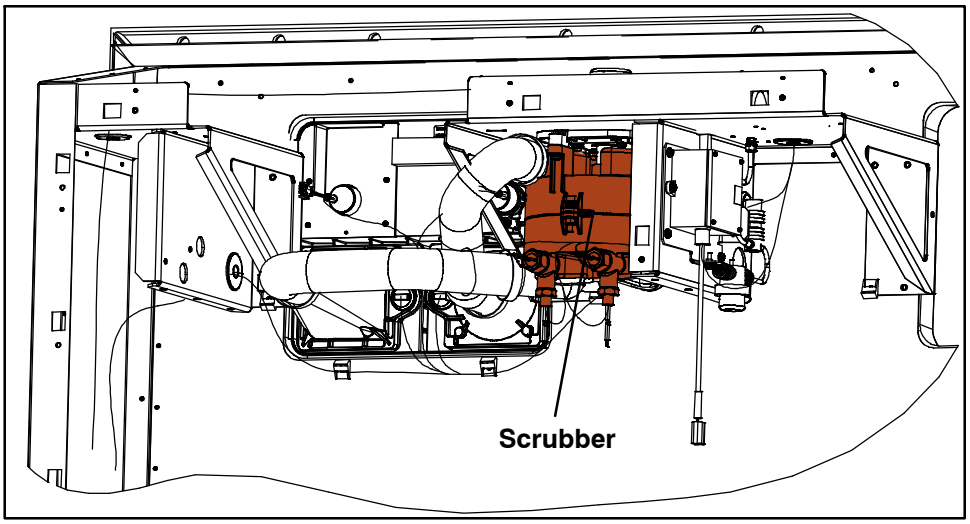


Figure 6 −9 Hose Locations

1. Start by lowering the back panel (see Figure 6 −4).
2. Unplug the heaters and thermistors from the scrubber housing.
3. Remove the two (2) bolts securing the scrubber in place, and turn the housing counterclockwise 10 degrees to remove the scrubber housing.

6.6.4 Installing the Scrubber Housing

1. Align the scrubber shaft in the slot of the coupling attached to the motor. [Note: It will aid in the installation if the shaft coupling (on top of the shaft) is loose to help self align. It will tighten during motor rotation.]
2. The scrubber requires a 10 degrees clockwise turn in order to secure the back portion into the mounting tabs as shown in Figure 6 −10.

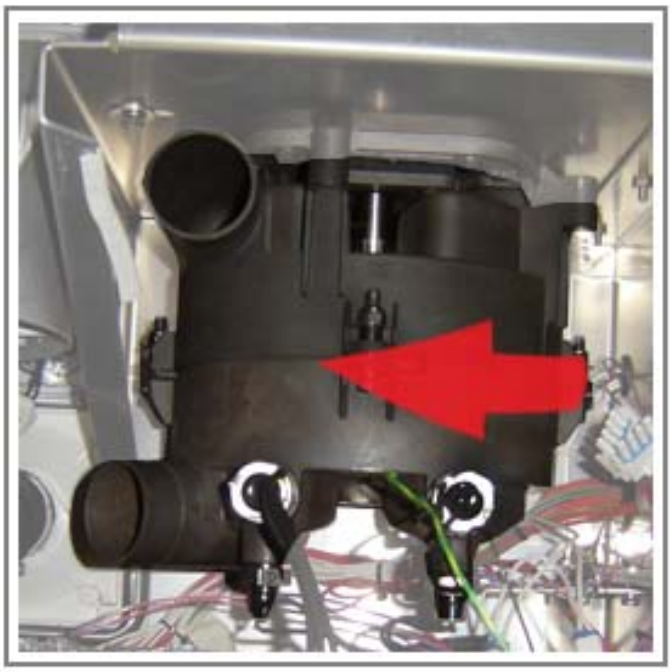


Figure 6 −10 Scrubber Housing

3. After turning into position secure the front of the filter assembly using hex head bolts (2) lock washers (2) and flat washers (2).

6.7 FRESH AIR SOLENOID

a. Replacing the Fresh Air Solenoid(s)

1. Remove the right−hand evaporator panel (see procedure 6.6.1).
2. There are two solenoids in the panel. The one on the right, as facing the panel from the back requires the removal of a cover plate to access the four mounting screws. Remove the four (4) 10−24 mounting screws.
3. Remove the 10−24 nuts and replace the defective solenoid reversing steps 1−3.

6.8 PRE−TRIP

Confirm the following settings:

1. Configuration code CnF70 is set to “in” and CnF71 is set to “on”.
2. Set the O_2 and CO_2 set points in Function Code 43 (see Section 4.6).

a. In Function Code 43 make sure the band value is set to 1%.

3.Close Upper Air Exchange Vents

4. Plug drain holes and fill defrost drain hose with water.
5. Box leak rate to be greater than or equal to eight minutes from two inches water gauge to one inch water gauge before and after the unit is loaded. This will aid in O_2 control. Make sure there is a curtain installed. Perform Box Leak Test as per Section 6.9.

6.9 CONTAINER PREPARATION

Inspection.

Check the rear container doors and door handles for proper operating condition. Check for proper installation of labels on the container and refrigeration unit. Always visually check the inside of the container for occupants prior to closing the doors.

WARNING

Performing service on, or entering a loaded container unit can be extremely dangerous. Refer to the Safety section of this manual before servicing or entering the container.

WARNING

HAZARDOUS ATMOSPHERE INSIDE, LOW OXGEN INSIDE CONTAINER CAN CAUSE DEATH.

Some units may be equipped with two connection ports on the front of the unit, see Figure 6 −11. One is used for pressurizing the container and the other is used for a pressure gauge hookup to monitor leakage rates.

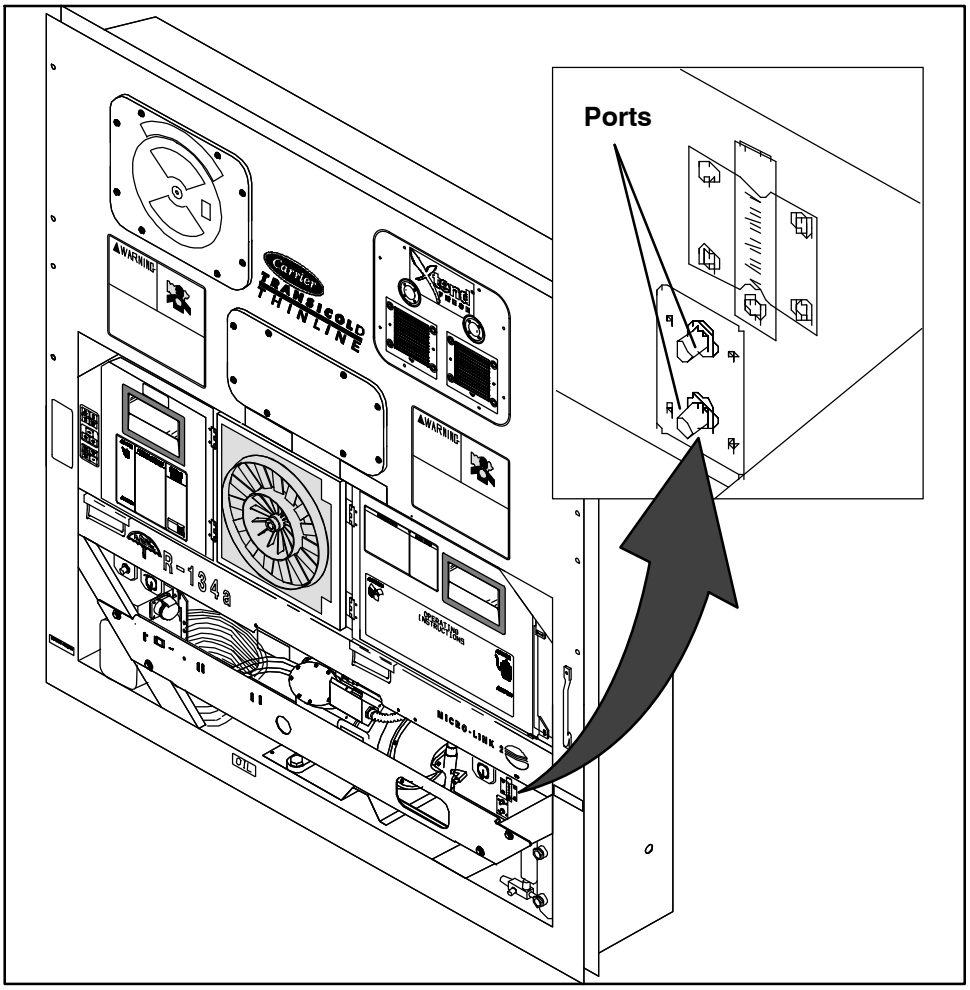


Figure 6 –11 Container Leakage Test Ports (not available on all units)

1. Install container curtain as per Section 6.10.
2. For static testing the acceptable leakage rate at 0.5 inch water gauge (12.55mm) is 100 scfh (2.8 cmh) or less.
3. For pressure decay testing, measure the time required for the pressure to decay from 2.0 inches water gauge (38mm) to 1.0 inch water gauge (25mm). The acceptable time span is 8 minutes or more for a 40 foot container and 4 minutes or more for a 20 foot container. If either test results in unacceptable leakage rates, then sealing of the container is required. These leakage rates must be maintained or the system will not be able to reach its set points. Some areas to check for leaks are:
    - Check for installation of poly sheet curtain
    - Check the unit drain line. Fill with water, if necessary.
    - Check the unit access panels.
    - Check unit/container box joint. Caulk if necessary.
    - Inside the container, check floor drains, check floor to side wall joint, floor to front bulkhead joint, side wall to front bulkhead joint and ceiling to front bulkhead.
    - Check XtendFRESH solenoids.
    - Check XtendFRESH hose connections.

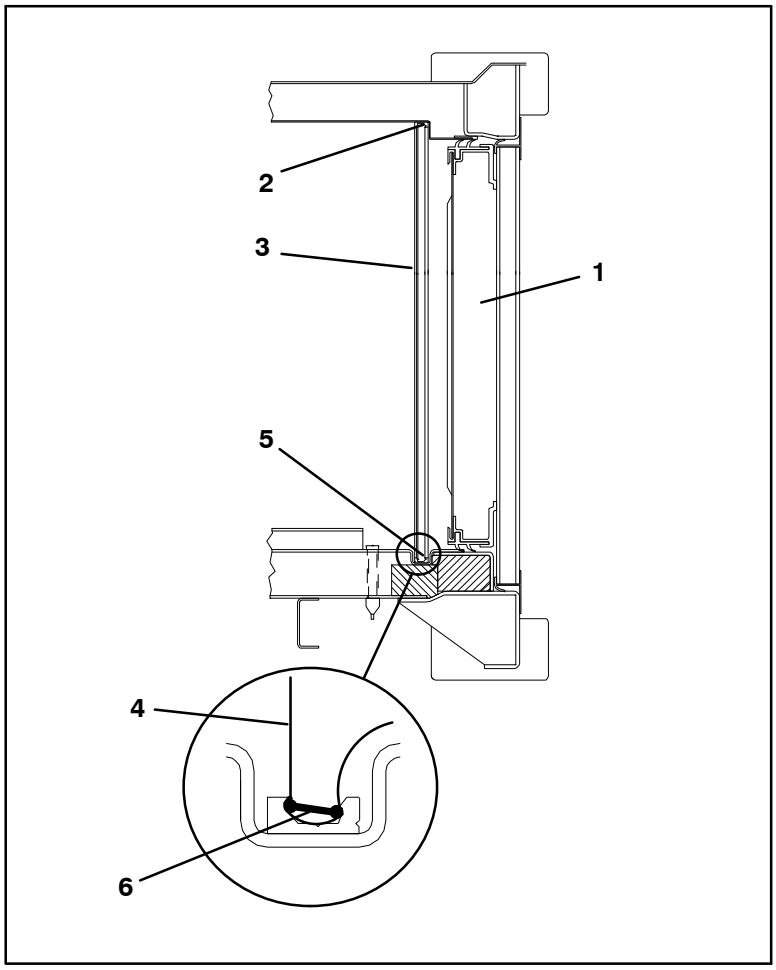
6.10 CONTAINER CURTAIN

WARNING

Low oxygen levels inside the container, ventilate before entering. Stay away from doors while venting.

a. Installing the curtain

1. Open the rear doors of the container.
2. Fully unfold the door curtain package and hold it up to the container opening.
3. Standing outside the container, start at the midpoint of the upper ribbon channel. Insert the curtain (poly sheet) and the ribbon into the ribbon channel. Finish inserting the curtain across the entire upper ribbon channel.
4. Insert the curtain into the side channels, finishing the procedure by inserting the curtain into the bottom ribbon channel. Eliminate any folds or wrinkles that can lead to air leakage. Check to be sure that the ribbon is completely inserted and the curtain is secure.



1. Rear Door
2. Upper Ribbon Channel
3. Side Ribbon Channel
4. Curtain (Poly Sheet
5. Bottom Ribbon Channel
6. Ribbon

Figure 6 –12 Installation of Container Curtain

SECTION 7

ELECTRICAL WIRING SCHEMATIC AND DIAGRAMS

7.1 INTRODUCTION

This section contains an Electrical Schematics and Wiring Diagrams for a basic unit with XtendFRESH.

Refer to the Operation and Service manual for your particular unit for actual schematic and wiring diagram information on components outside the XtendFRESH system.

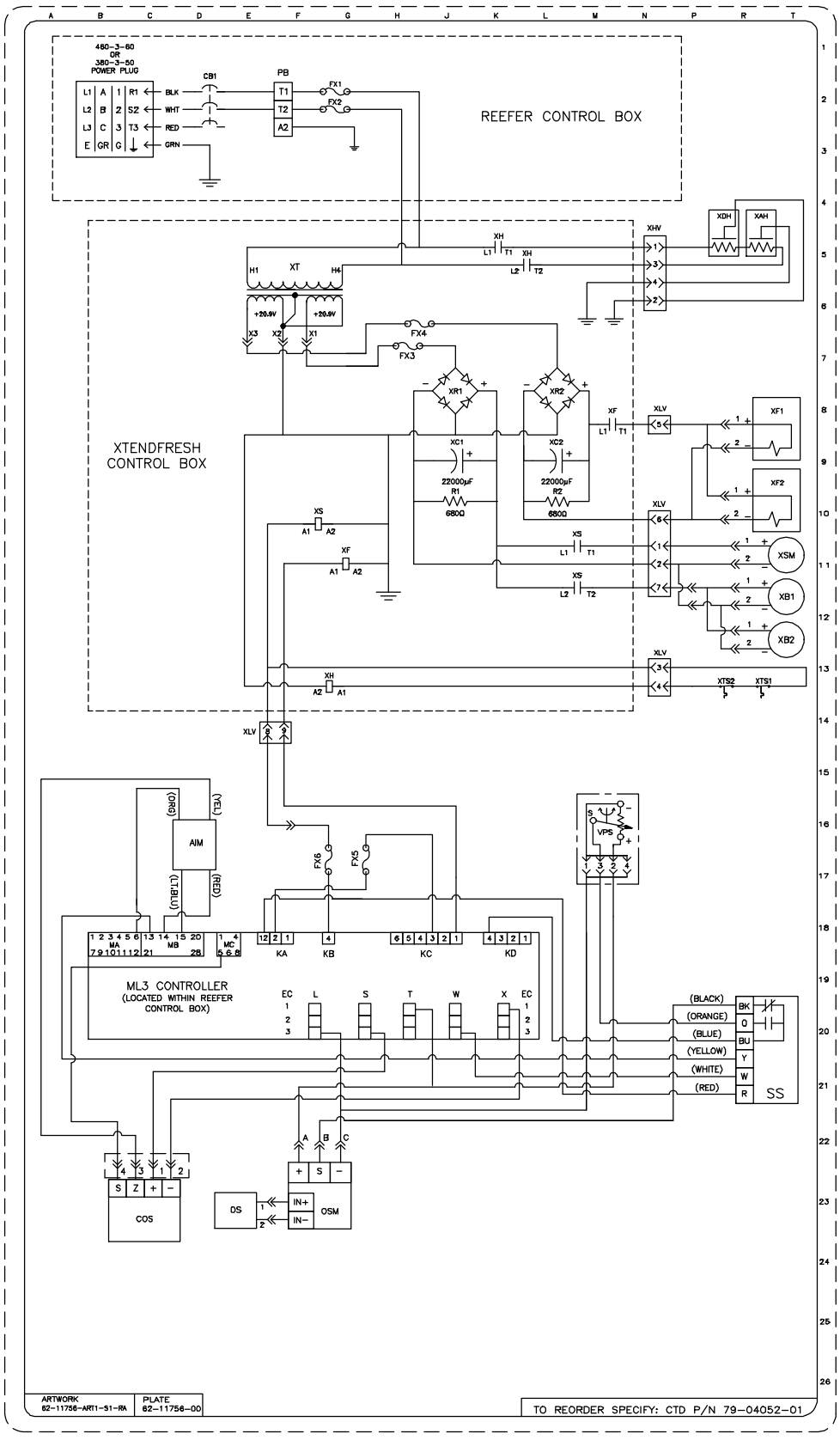


Figure 7–1. Electrical Schematic

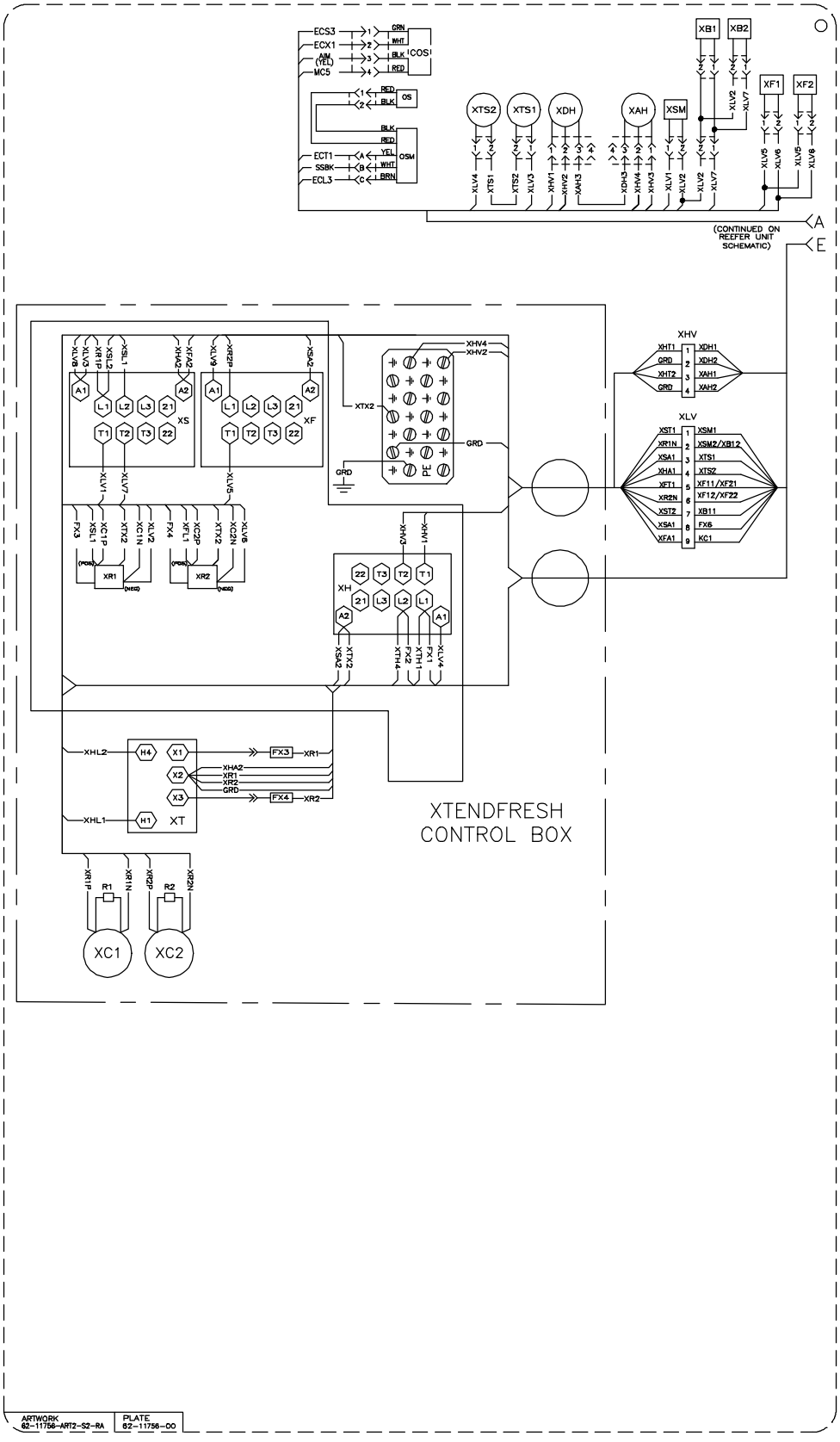


Figure 7–2. Electrical Wiring Diagram – Sheet 1 of 2

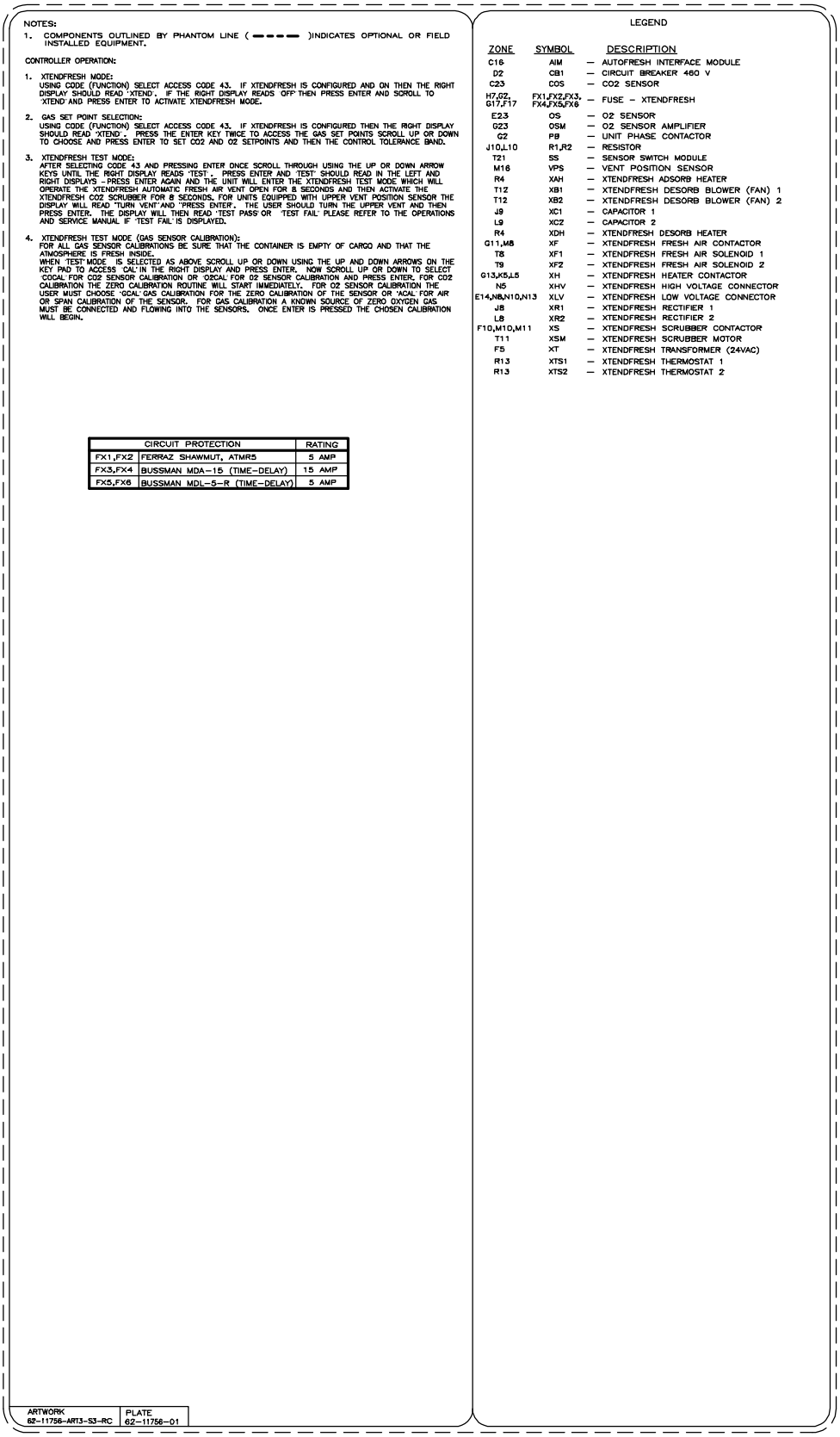


Figure 7–2. Electrical Wiring Diagram – Sheet 2 of 2

SECTION 8

SERVICE PARTS LIST

8.1 ORDERING INSTRUCTIONS

All orders and inquiries for parts must include: Parts Identification Number **(PID)**, Model Number, Unit Serial Number, Part Number, Description of part as shown on list and Quantity required. Address all correspondence for parts to the following address:

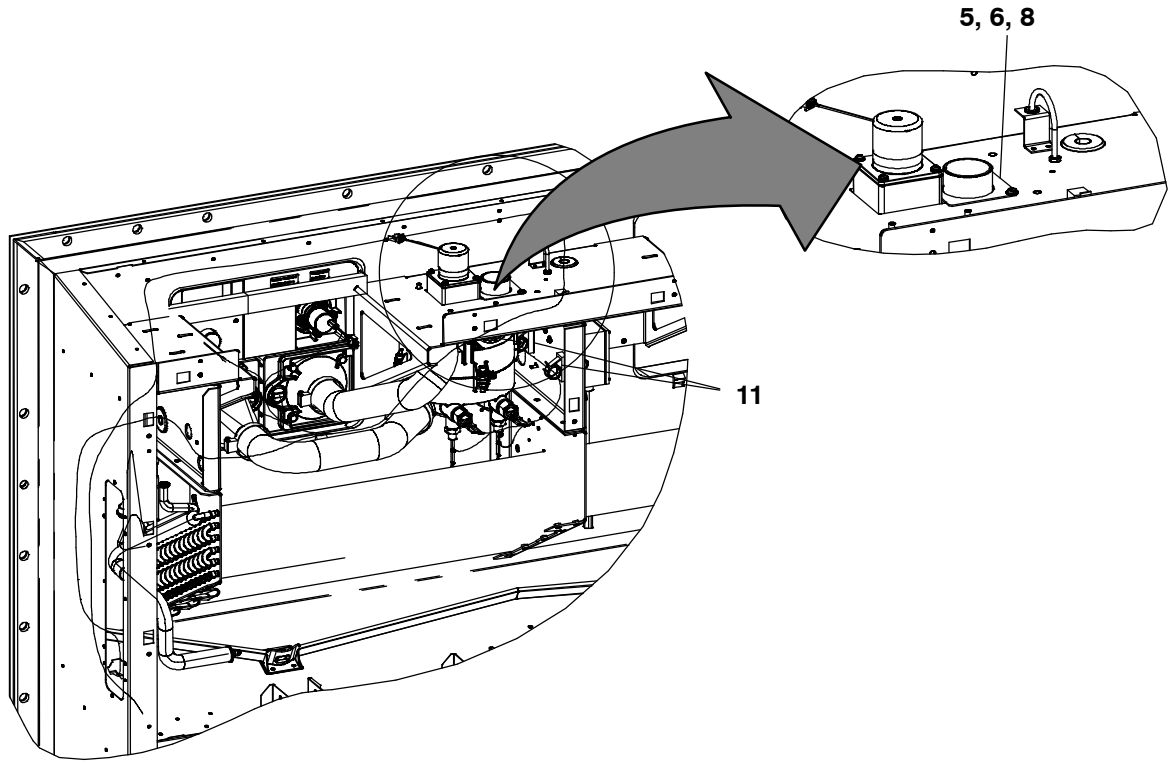
CARRIER TRANSICOLD DIVISION
Replacement Components Group, TR-20
P.O. Box 4805, Syracuse, New York 13221
or FAX to: (315) 432-3778

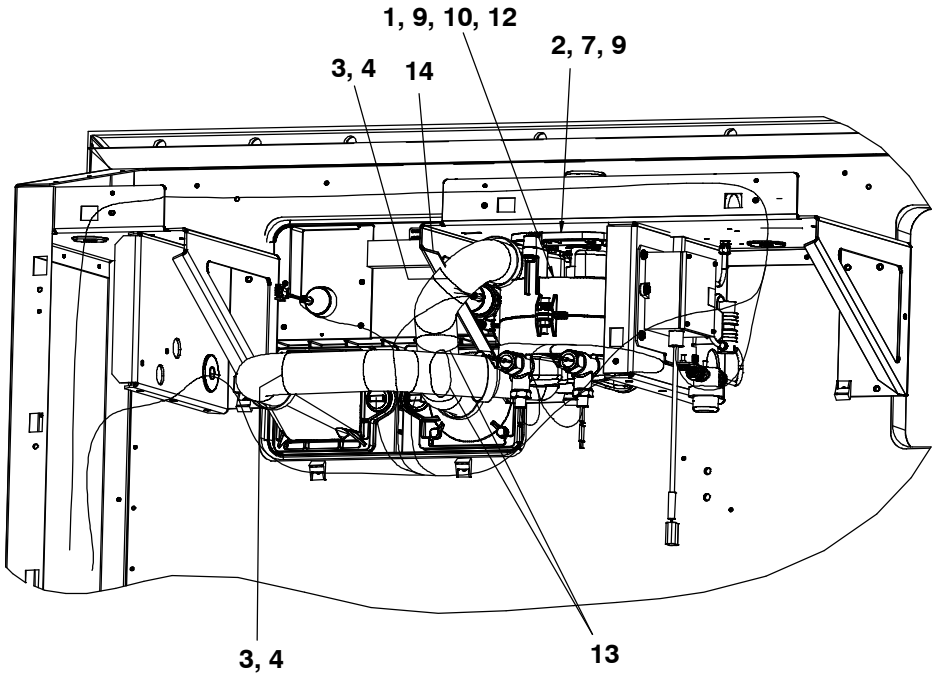
8.2 LETTER DESIGNATIONS

The following letter designations are used to classify parts throughout this list:

A/R = *As Required*
N/A = *Not Available*
NS = *Not shown in illustration*
NSS = *Not sold separately* – Order next higher assembly or kit
PID = *Parts Identification Number* – essential to identify unit configuration.
PL = *Purchase Locally*
SST = *Stainless Steel* – 300 Series unless otherwise specified.
SV = *Suffix SV* – added to part number designates service replacement part.

8.3 XtendFRESH



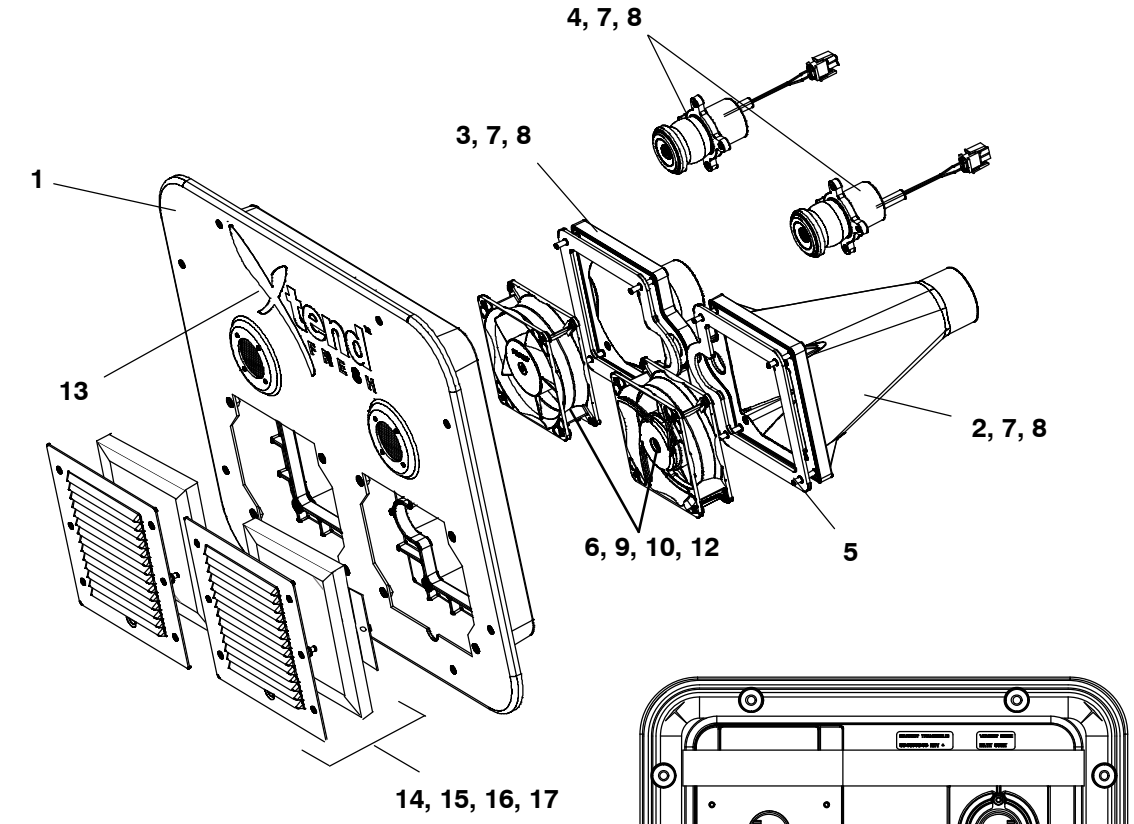


77–01713

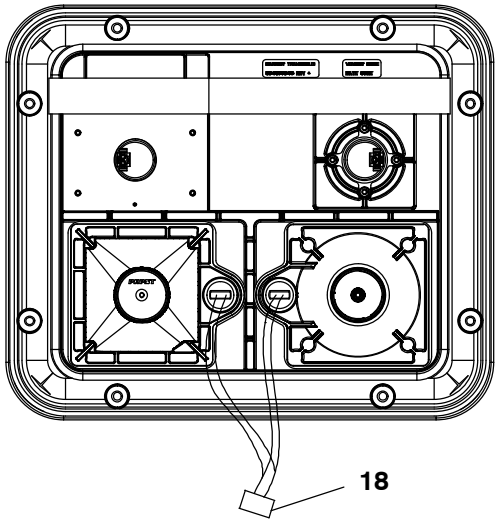
8.3 XtendFRESH – Continued			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	79–04044–00	Filter Assembly, XtendFRESH	1
2	79–04028–00	Motor Assembly	1
3	58–04994–00	Hose, Desorb In/Out	2
4	44–00045–05	Clamp, Hose, 2.06–3.00 Worm Type	4
5	68–17357–00	Plate, Cover, .063 Thick Aluminum	1
6	66–U–1–5321–8	Washer, Plain, #10 Type A	6
7	66–U–1–5321–7	Screw, Cap Hexhead, 1/4–20 x 1	4
8	66–U–1–5371–6	Screw, Machine Hexhead, #10–24 x .750 Slotted	6
9	66–U–1–5321–7	Washer, Plain, 1/4 W Type A	12
10	66–U–1–5361–47	Bolt, Machine Hexhead, 1/4–20x.1.25 Long	2
11	44–00361–00	Clip, Retaining, .88–1.00 Wire Mounting	2
12	34–00663–11	Washer, Lock, 1/4 Spring	2
13	66–U–1–3882–3	Wire Tie, 1/16 –4.0 Self Locking	4
14	66CH–1–1172–19	Trim, Flexible 4 inch	1

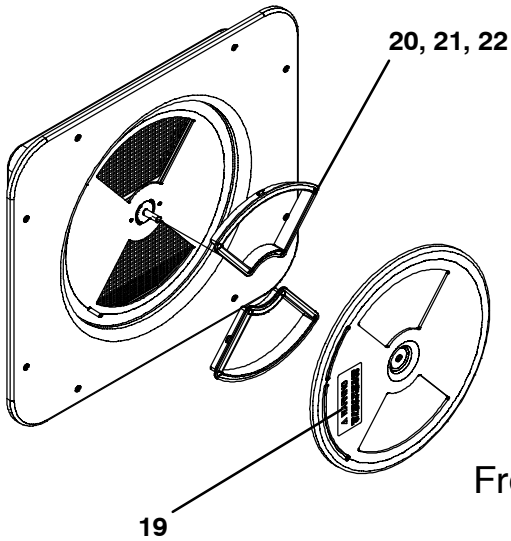
77-01713

8.4 PANEL ASSEMBLIES



XtendFRESH Panel





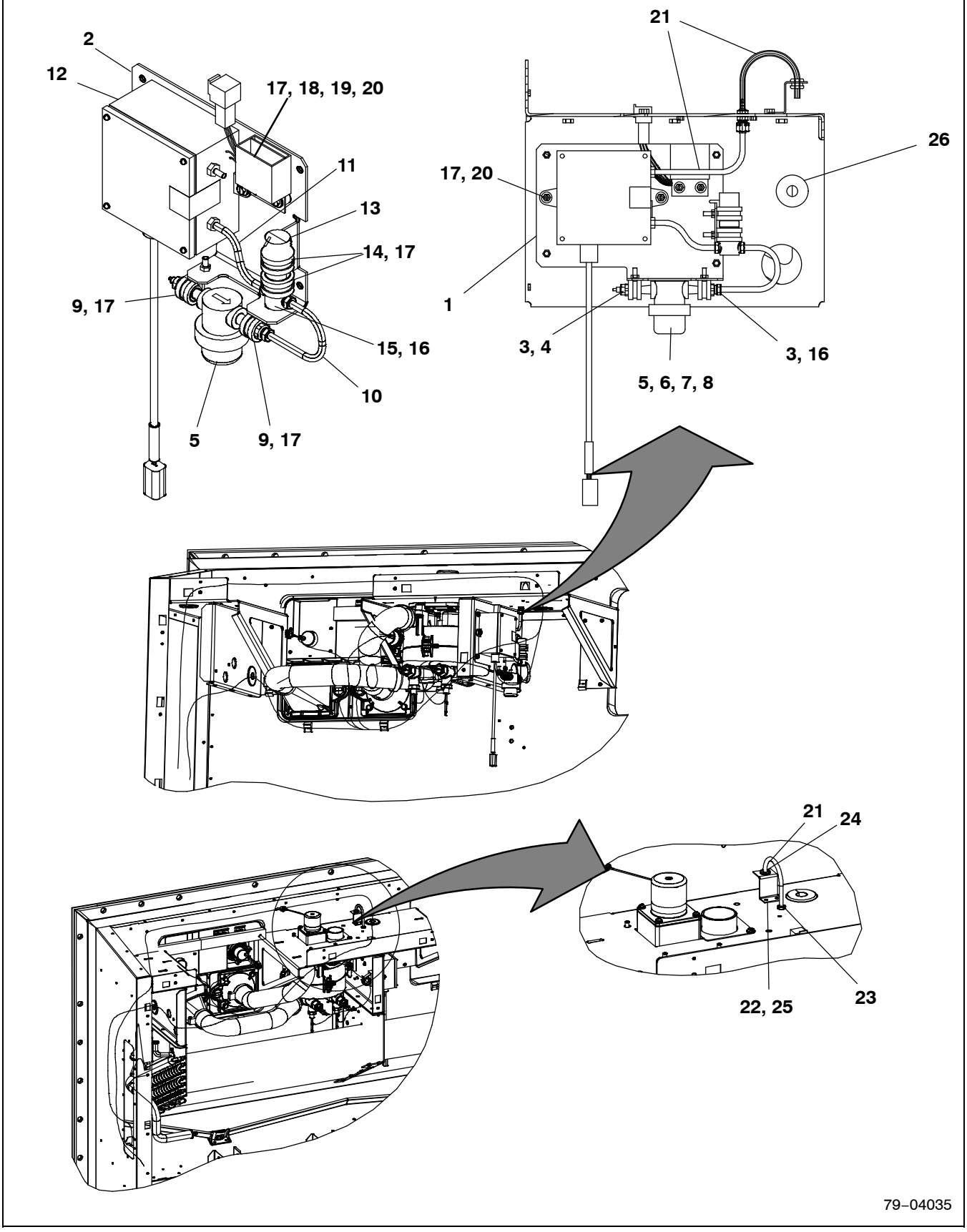
Fresh Air Panel

79–0403

8.4 PANEL ASSEMBLIES – Continued			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	79–04043–00	Panel Assembly, XtendFRESH	1
2	58–04999–00	Duct, Desorb In	1
3	58–05002–00	Duct, Desorb Out	1
4	79–04033–00	XtendFRESH Solenoid Valve Assembly	2
5	42–00775–00	Gasket	2
6	38–00631–00	24VDC Fan	2
7	34–00795–09	Nut, Self Lock, 10–32	16
8	34–00662–09	Washer, Plain, #10 Medium .032 Thick	20
9	34–00662–08	Washer, Plain, #8 Medium .032 Thick	8
10	34–01146–04	Washer, Lock, M4 Spring	8
11	42–00237–00	Gasket, .26 x .5 Half Round	1
12	34–01197–45	Screw Hexhead, M4–0.7 x 45	8
13	62–11762–00	Label, XtendFRESH Logo	1
14	79–04037–00	Filter Assembly	2
15	34–06053–18	Washer, RTNG, .250 Inner Diameter x 1.000 Outer Diameter	8
16	34–06212–17	Washer, Plain 1/4 W Type A	8
17	34–66627–00	Screw, Cap Hexhead 1/4–20 x 1.00 TIR	8
18	22–66656–38	Wire Harness, XtendFRESH Fans	1
19	62–66692–00	Label	1
20	79–04064–00	Fresh Air Panel Assembly Includes:	1
21	58–66674–00	Collar	2
22	58–66643–00	Gasket	2

79-04043

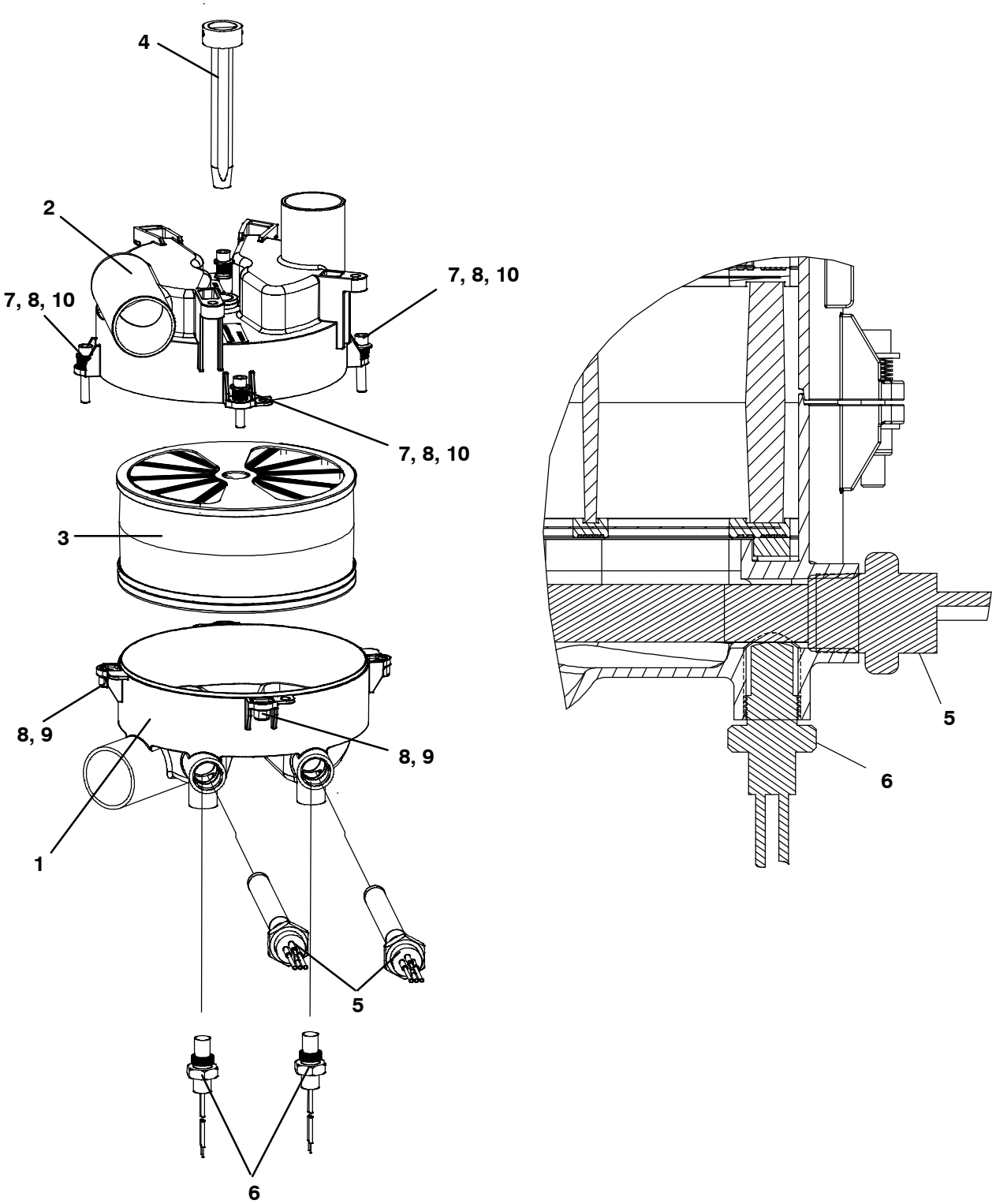
8.5 SENSOR ASSEMBLY



8.5 SENSOR ASSEMBLY			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	68–17351–00	Sensor Assembly Includes:	1
2	68–17351–00	Plate .090 Thick Aluminum	1
3	40–00297–00	Coupling, x Pipe Thread	2
4	40–00108–03	Coupling, Half Union	1
5	30–00415–01	Filter Assembly, Sample Air, NPT	1
6	30–00415–20	Bowl	1
7	30–00415–21	Gasket	1
8	30–00415–22	Filter	1
9	34–00373–07	Tube Clamp, .62 Diameter Cushion	2
10	58–04497–05	Tube, 1/4 inch Outside Diameter x 5.00 inch L	1
11	58–04497–06	Tube, 1/4 inch Outside Diameter x 3.25 inch L	1
12	10–00398–01	Sensor, Carbon Dioxide	1
13	10–00344–01	Sensor, Oxygen	1
14	34–00373–61	Tube Clamp, .88 Diameter Cushion	2
15	48–00297–00	Housing (02 Sensor)	1
16	KA–70PP–048	Fitting, Hose, Inside Diameter BARB x NPT	3
17	66–U–1–5371–6	Screw, Machine Hexhead, #10–24 x .50 Slotted	8
18	12–00346–01	Relay, Amplifier, O2 Sensor	1
19	58–04152–01	Washer, Spacer, 8M (0.315 inches)	2
20	66–U–1–5321–8	Washer, Plain, #10 Type A	4
21	58–04497–01	Tube, 1/4 Outer Diameter x 6.25 Long	2
22	68–14739–00	Bracket, .063 Thick Aluminum	1
23	40–00640–00	Union, Bulkhead, Double BRB/Comp Align	1
24	58–00065–84	Grommet, .25 x .50 x .187 Panel	1
25	34–00928–20	Rivet, Blind, .125 Diameter .126–.250	2
26	66–U–1–1571–14	Grommet, .50 Inner Diameter x 1.50 Outer Diameter	1

79-04035

8.6 SCRUBBER ASSEMBLY

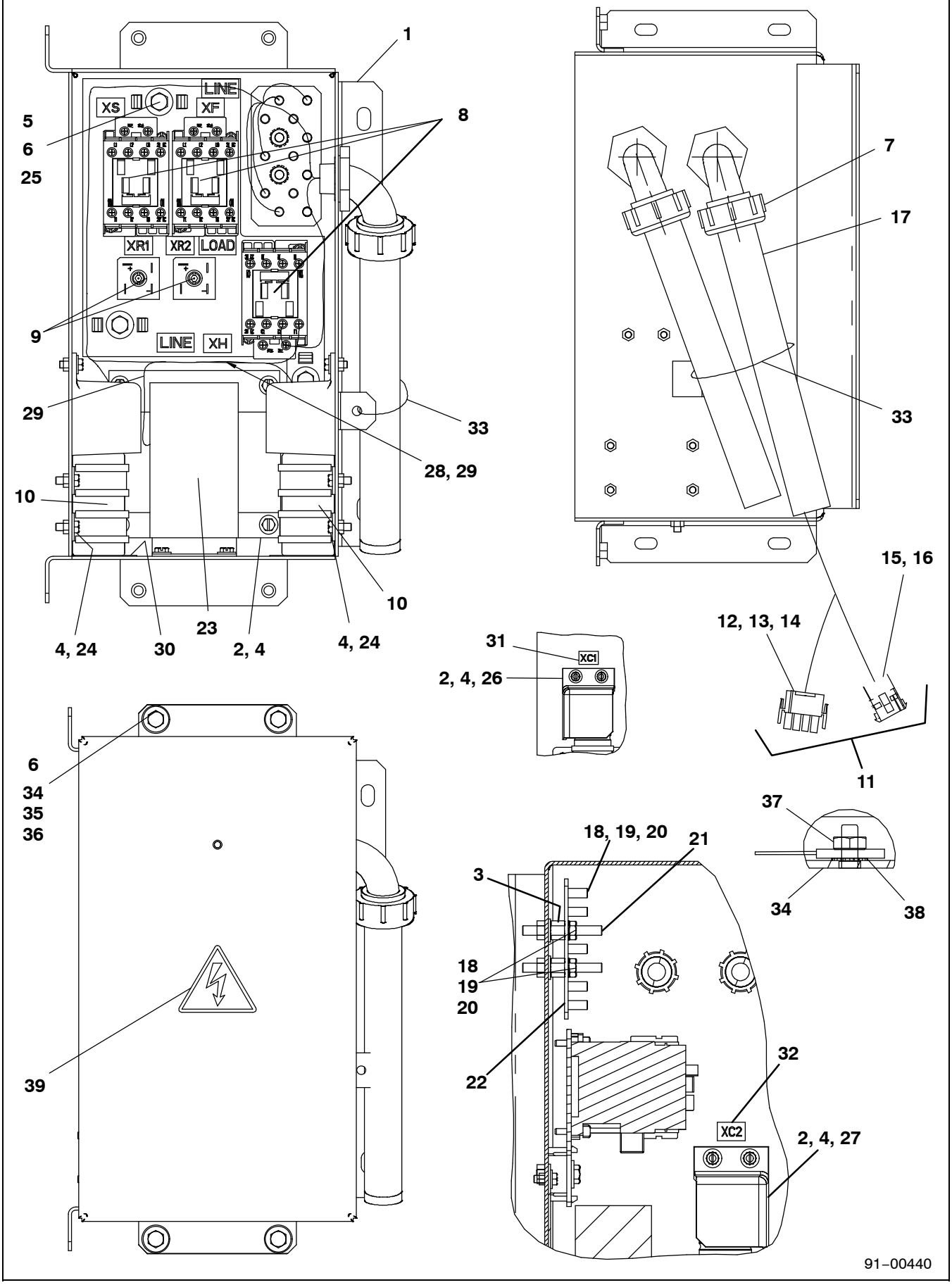


79–04044

8.6 SCRUBBER ASSEMBLY – Continued			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	48–00468–00	Bottom Housing	1
2	48–00469–00	Top Housing	1
3	76–00868–00	Scrubber Filter Assembly Includes:	1
	NSS	Scrubber Filter	1
	NSS	Plate, Seal, XtendFRESH	2
	NSS	Gasket, Seal	2
4	79–04029–00	Shaft Assembly	1
5	24–02028–00	Heater, 230VAC	2
6	12–00731–00	Thermostat	2
7	34–06099–22	Screw, cap sch, 5/16–18 x 1.75	4
8	66–U–1–5321–4	Washer, Plain, 5/16 N Type A	8
9	34–00667–12	Nut, Self Lock, 5/16–18	4
10	73–00228–00	Spring, Multi–Wave	4

79-04044

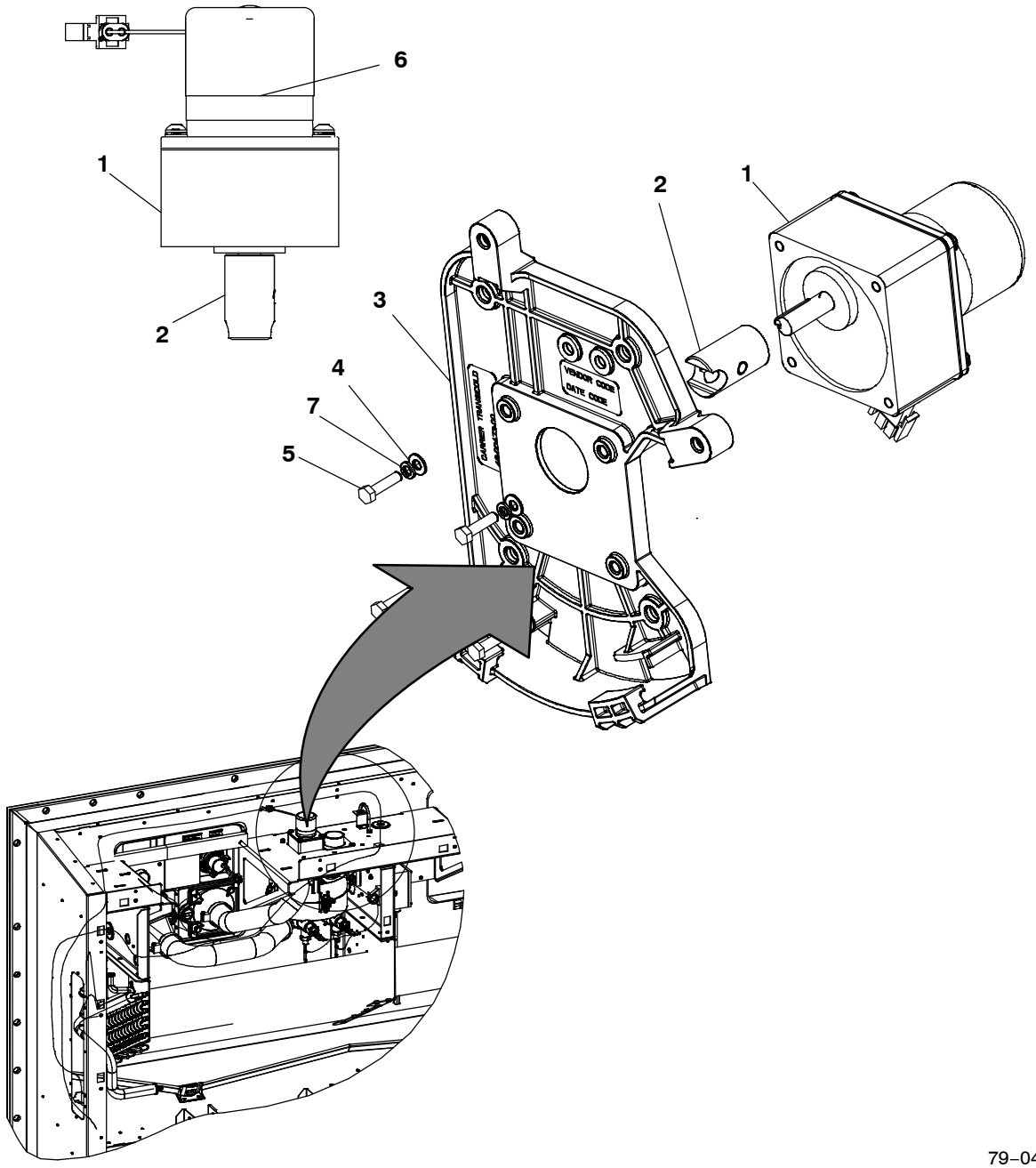
8.7 WIRING ASSEMBLY



8.7 WIRING ASSEMBLY – Continued			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	86–05037–00	Box Assembly, Welded	1
2	66–U–1–5321–8	Washer, Plain #10 Type A	10
3	66–U–1–5321–3	Washer, Plain N Type A	2
4	66–U–1–5371–7	Screw, Machine Hexhead, #10–24 x .500 Slotted	18
5	34–00655–08	Screw, Cap Hexhead, –20 x 1.00	3
6	66–U–1–5321–7	Washer, Plain, W Type A	7
7	22–04287–00	Connector, 3 90 Degree Elbow	2
8	10–00431–00	Contactor	3
9	10–01120–00	Rectifier	2
10	10–00495–00	Capacitor	2
11	91–00440–00	High Voltage Wire Harness Includes:	1
12	22–01997–16	Connector, Male, AMP Plug HSG 4 CIRC	1
13	22–01997–17	Seal, AMP Wire SEAL 4 CIRC	1
14	22–01997–18	Seal, Interface Seal 4 CIRC	1
15	22–01997–11	Connector, Female, AMP CAP HSG, 9 CIRC	1
16	22–01997–13	Seal, AMP Wire Seal 9 CIRC	1
17	66SC0603AA0090	Spiral Conduit, 3 inch x 9.00 Long	2
18	66–U–1–5501	Protective Coat, Corrosion Inhibitor	
19	AT–39JA–171	Nut, Hex, –20	7
20	AU–27JR–171	Washer, Lock, External Tooth	7
21	66–U–1–9592–13	Standoff, –20 x 0.375 Long	2
22	68–86230–00	Strap Assembly, GRD, All Populated	1
23	10–00497–00	Transformer, Base Unit	1
24	66–U–1–5732–20	Clamp, Tube, 1.38 Diameter, 2Holemtg	4
25	91–00447–00	Wire Harness, XtendFRESH	1
26	58–05009–00	Cover, Shield	1
27	58–05009–01	Cover, Shield	1
28	66NS1201CD0020	Sleeve, 75 Inner Diameter x 2.00 Long	1
29	66–U–1–3882	Wire Tie, 1/16–1–3/4 Self Locking	2
30	58–04026–107	Protector	2
31	62–10530–41	Label, .75 x .50 “XC1”	1
32	62–10530–42	Label, .75 x .50 “XC2”	1
33	58–00969–00	Wire Tie, 2.80 Diameter Double Loop	1
34	79–04039–00	Door Assembly, XtendFRESH Control Box	1
35	66–U–1–5361–25	Screw, Cap Heshead, –20 x .75	4
36	34–06053–00	Washer, .250 Inner Diameter x .800 Outer Diameter	4
37	34–00665–09	Nut, Hex, #10–32	1
38	AU–27JR–131	Washer, Lock, #10 External Tooth	1
39	62–03957–04	Decal Warning, High Voltage	1
40	22–00060–35	Fuse (Not Shown)	2
41	22–01661	Fuse Holder (Not Shown)	2

91-00440

8.8 MOTOR ASSEMBLY



79–04028

ITEM	PART NUMBER	DESCRIPTION	QTY
1	54–00672–00	24 VDC Motor	1
2	48–00474–00	Motor Coupling	1
3	48–00473–00	Motor Plate	1
4	34–00662–09	Washer, Plain #10 Medium .032 Thick	4
5	34–60000–20	Screw, Machine Hexhead, M5 x 20mm (.787)	4
6	58–05010–00	Cap, End Motor	1
7	34–01146–05	Washer, Lock, M5 Spring	4

79-04028

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Part Number Index

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