**VERTIV.**

# Liebert® XDP™

50 & 60 Hz, 160kW Nominal Capacity;
Model Revision 5 or higher

User Manual

**Technical Support Site**

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures. For additional assistance, visit https://www.VertivCo.com/en-us/support/

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# IMPORTANT SAFETY INSTRUCTIONS

## SAVE THESE INSTRUCTIONS

This manual contains important safety instructions that should be followed during the installation and maintenance of the Liebert XDP. Read this manual thoroughly before attempting to install or operate this unit.

Only qualified personnel should move, install or service this equipment.

Adhere to all warnings, cautions, notices and installation, operating and safety instructions on the unit and in this manual. Follow all operating and user instructions.

Follow all local codes.

⚠ **WARNING! Risk of arc flash and electric shock. Can cause equipment damage or death.**

**Disconnect all local and remote electric power supplies and wear protective equipment per NFPA 70E before working within electric control enclosure. Failure to comply can cause serious injury or death.**

**Customer must provide earth ground to unit, per NEC, CEC and local codes, as applicable.**

**Before proceeding with installation, read all instructions, verify that all the parts are included and check the nameplate to be sure the voltage matches available utility power.**

**The Liebert iCOM microprocessor does not isolate power from the unit, even in the Unit Off mode. Some internal components require and receive power even during the Unit Off mode of Liebert iCOM control.**

**The line side of the disconnect switch on the front of the unit contains live high-voltage.**

**The only way to ensure that there is NO voltage inside the unit is to install and open a remote disconnect switch. Refer to unit electrical schematic.**

**Follow all local codes.**

⚠ **WARNING! Risk of unit falling over. Can cause property damage, injury or death.**

**The XDP is top-heavy. Use extreme caution and care when moving and installing this unit.**

⚠ CAUTION: Risk of piping and component rupture. Can cause equipment damage or injury.

System is pressurized. Relieve pressure through access valve before working on unit. System is pressurized. Relieve pressure through access valve before working on unit. Closing service valves may isolate liquid refrigerant, causing high pressure and rupture of piping. Do not close valves without following recommended procedures for repair, maintenance and replacement of components. Install pressure relief valves in field piping that may become isolated by service valves.

Risk of improper installation and/or startup. Can cause injury, equipment damage, or warranty cancellation. Read and follow completely the installation and start up instructions that are factory supplied with the unit

⚠ CAUTION: Risk of contact with hot surfaces. Can cause injury.The pump motors are extremely hot during unit operation. Allow sufficient time for them to cool before working within the unit cabinet. Use extreme caution and wear protective gloves and arm protection when working on or near the pump motors.

⚠ CAUTION: Risk of sharp edges, splinters and exposed fasteners. Can cause injury.Only properly trained and qualified personnel wearing appropriate safety headgear, gloves, shoes and glasses should attempt to move, lift, remove packaging from or prepare the unit for installation.

**NOTICE**

Risk of leaking chilled water lines. Can cause equipment and building damage.

Lines and joints must be inspected regularly. Improper installation, application and service practices can result in water leakage from the unit. Water leakage can result in severe property damage and loss of critical data center equipment. Do not locate unit directly above any equipment that could sustain water damage. Vertiv recommends installing monitored leak detection equipment for the unit and supply and return lines.

**NOTICE**

Risk of overhead interference. Can cause unit and/or building damage.

The unit may be too tall to fit through a doorway while on the skid. Measure the unit and doorway heights and refer to the installation plans to verify clearances prior to moving the unit.

**NOTICE**

Risk of damage from forklift. Can cause unit damage.

Keep the forklift tines level and at a height suitable to fit below the skid and unit to prevent exterior and underside damage.

**NOTICE**

Risk of improper storage. Can cause unit damage.

Keep the Liebert XDP upright, indoors and protected from dampness, freezing temperatures and contact damage.

NOTE: This document is intended to be used together with site specific documentation and documentation for other parts of the system (heat rejection devices and cooling modules).

NOTE: Before any action that could cause a disturbance in the XD system's cooling function is begun, the facility manager MUST be informed. In addition, after the action is taken and the work is finished, the facility manager MUST be informed.

Figure 1.1   Model number nomenclature
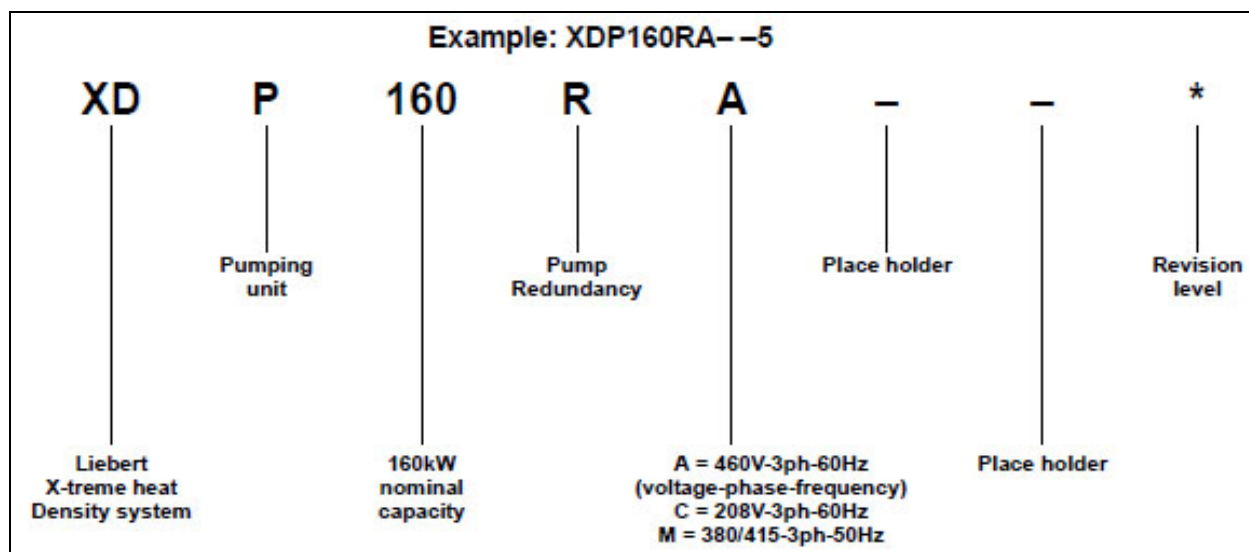
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# 1 PRODUCT DESCRIPTION

## 1.1 General Product Information

### 1.1.1 Product/System Description

Liebert's XDP refrigerant distribution unit is an interface between the building chilled water system and the cooling modules in the Liebert XD system. It is designed to circulate and control refrigerant to the cooling modules that are in the room with heat-producing equipment. The Liebert XDP is rated for 160kW (546,000BTU/H) of cooling.

The Liebert XDP consists of a cabinet that includes a heat exchanger, circulating pump(s), control valve, receiver, controls, valves and piping.

The Liebert XDP monitors room conditions and prevents coil condensation by maintaining the refrigerant being pumped to the cooling modules at a temperature above the room's dew point.

All functions, such as switching pumps (if applicable), controlling refrigerant temperature, etc., are automatic.

**Figure 1.1  Liebert XDP components**
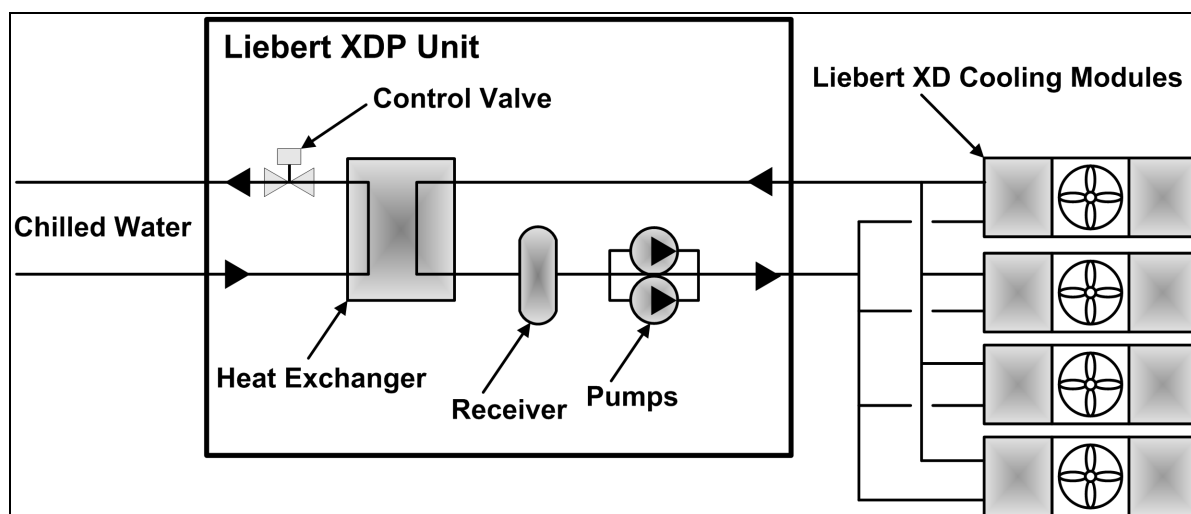


### 1.1.2 Minimum Load

The Liebert XDP's minimum recommended operating load is 30% of system nominal capacity. The Liebert XDP160 is rated for 160kW (546,000BTU/H) of cooling, therefore the system's minimum recommended load is 48kW (163,800BTU/H). Loading below this value can unfavorably affect system operation. Consult the factory for any loading below this recommendation.

To achieve the minimum recommended load, the capacity of all connected modules must total at least 48kW (163,800BTU/H). Seethe following table..

Table 1.1   Number of Liebert XD cooling modules required to achieve at least 48kW (163,800 BTU/H) load

| | Liebert XD Module Type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | XDCF10 | XDV8 | XDV10 | XDO16 | XDO20 | XDH20 | XDH32 | XDR20 |
| Number of Liebert XD cooling modules required to achieve at least 48kW (163,800BTU/H) load | 5 | 6 | 5 | 3 | 3 | 3 | 2 | 3 |

## 1.2  Equipment Inspection

When the unit is delivered, inspect all items for visible and concealed damage. Damage should be immediately reported to the carrier and a damage claim filed with a copy sent to Vertiv and to your sales representative.

## 1.3  Equipment Handling

⚠ WARNING! Risk of unit falling over. Can cause injury or death.

The Liebert XDP is top-heavy. Use extreme caution when moving and installing this unit. Use lifting equipment that is rated for the weight of the unit by an OSHA-certified rating organization. See Table 8.1   on page 89 for unit weights. Personnel should be properly trained and certified to move and rig equipment.

⚠ CAUTION: Risk of sharp edges, splinters and exposed fasteners. Can cause injury .

Only properly trained and qualified personnel wearing appropriate safety headgear, gloves, shoes and glasses should attempt to move, lift, remove packaging from or prepare the unit for installation.

### 1.3.1  Handling the Liebert XDP While it is on Skid and Packaged

- Always keep the unit upright, indoors and protected from damage.
- If possible, transport the unit using a forklift truck. Otherwise use a crane with belts or cables. In either case, do NOT press on the top edges of the packaging.
- If using a forklift, make sure the forks (if adjustable) are spread to the widest allowable distance to still fit under the skid.
- When moving the skidded unit with a forklift truck, do not lift the unit any higher than 6" (152mm). If circumstances require the unit to be lifted higher than 6" (152mm), great care must be exercised and all by-standing personnel are to be no closer than 20 feet (6m) from the lift point of the unit.

**NOTICE**

Risk of structural interference. Can cause equipment or building damage.

While on the skid, the unit is too tall (83" [2108mm] overall height) to fit through a standard doorway. Any attempt to move the unit, while skidded, through a standard doorway will cause damage to the unit and to the building.

**NOTICE**

Risk of damage from forklift. Can cause unit damage.

Keep tines of the forklift level and at a height suitable to fit below the skid and/or unit to prevent exterior and/or underside damage.

**NOTICE**

Risk of improper storage. Can cause unit damage.

Keep the Liebert XDP upright, indoors and protected from dampness, freezing temperatures and contact damage.

**NOTICE**

Risk of overtightening securing straps. Can cause damage to panels.

Place a protective material between the straps of the piano jacks and the unit. Ensure that the straps are not tightened to a point of damaging panels.

### 1.3.2  Unpacking the Liebert XDP

1.  Remove the exterior stretch wrap packaging from the unit, exposing the protective corner and side packaging planks.
2.  Remove and set aside filter dryer kit.
3.  Remove the corner and side packaging planks from the unit, exposing the bag over the unit. The bag may remain in place for dust and panel protection or removed for immediate unit installation.
4.  Remove the bag from the unit when ready to remove the skid for installation.

**Figure 1.2   Unpacking the Liebert XDP**
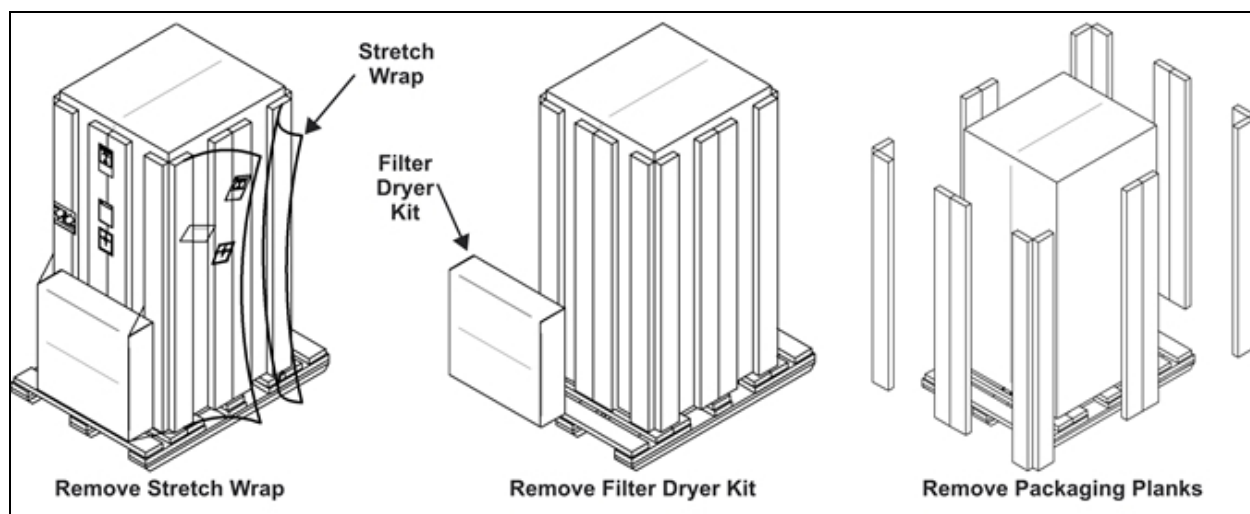
### 1.3.3 Removing the Unit from the Skid Using a Forklift

1. Align the forklift with either the front or rear side of the unit.

   Make sure the tines of the forklift are locked to the widest position.

   Use the center of gravity indicators to determine the entry points for the tines. The tines must be equally spaced on either side of the center of gravity indicator.

2. Insert the tines of the forklift under the unit.

   Make sure the tines are level. The tines must be low enough to fit under the unit without damaging it.

   Make sure the tines extend beyond the opposite side of the unit.

3. Remove the 12 lag bolts and two brackets that secure the unit to the skid.

**NOTE: Each lag bolt is 1-1/2" (38mm) long. They can be removed with a 9/16" socket or wrench.**

4. Lift the unit to a height that it is not being support by the skid.
5. Move the skid from under the unit.

**Figure 1.3   Use a forklift to remove the Liebert XDP from the skid**



Fit the forklift tines under the Liebert XDP.

The forklift tines must be equally spaced on either side of the center of gravity indicator.

Move the forklift forward until the tines are fully under the unit.
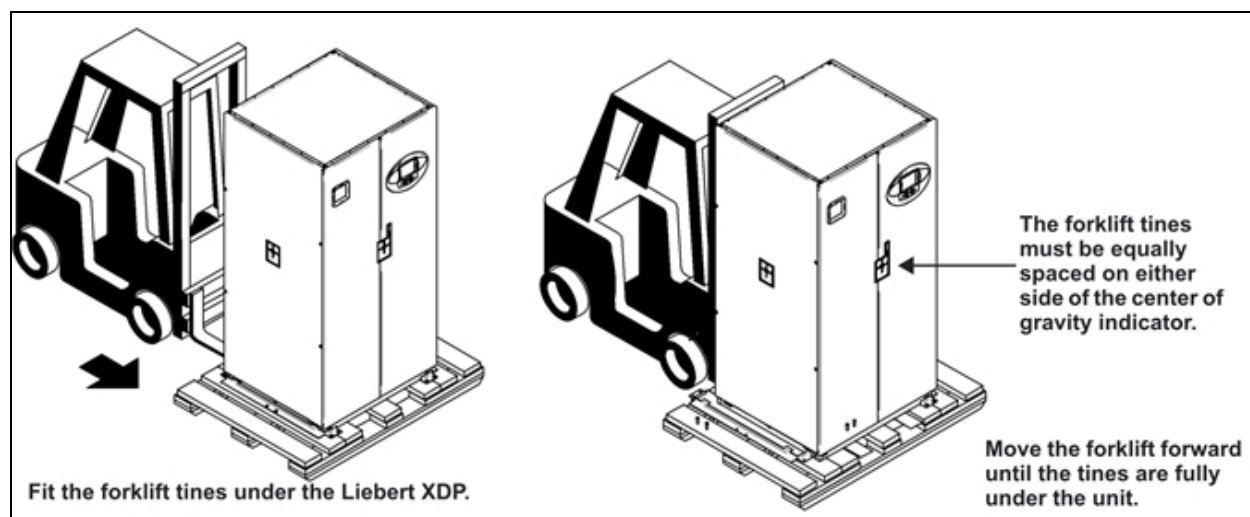
### 1.3.4 Removing the Unit from the Skid using Rigging

1. Use the center of gravity indicators on the unit to position the slings. The slings must be equally spaced on either side of the center of gravity indicator. Refer to Figure 1.4   on the facing page.
2. Place slings under the unit using spaces provided between the skid deck boards.

**NOTE: Unit is shown without outer packaging. These instructions may be applied with the outer packaging in place**

3. Use spreader bars or an equivalent method to ensure proper protection of the unit.
4. Ensure that the panels, if attached, are well protected from the slings.

NOTE: If rigging is to be used to move the unit closer to the site for installation, place one or two horizontal straps around the unit and vertical straps at mid height.

5. Remove the 12 lag bolts and two brackets that secure the unit to the skid.

NOTE: Each lag bolt is 1-1/2" (38mm) long. They can be removed with a 9/16" socket or wrench.

6. Lift the unit off of the skid to an elevation point where the skid is not supporting the weight of the unit.
7. Remove the skid from under the unit.

Figure 1.4   Removing the unit from the skid using rigging
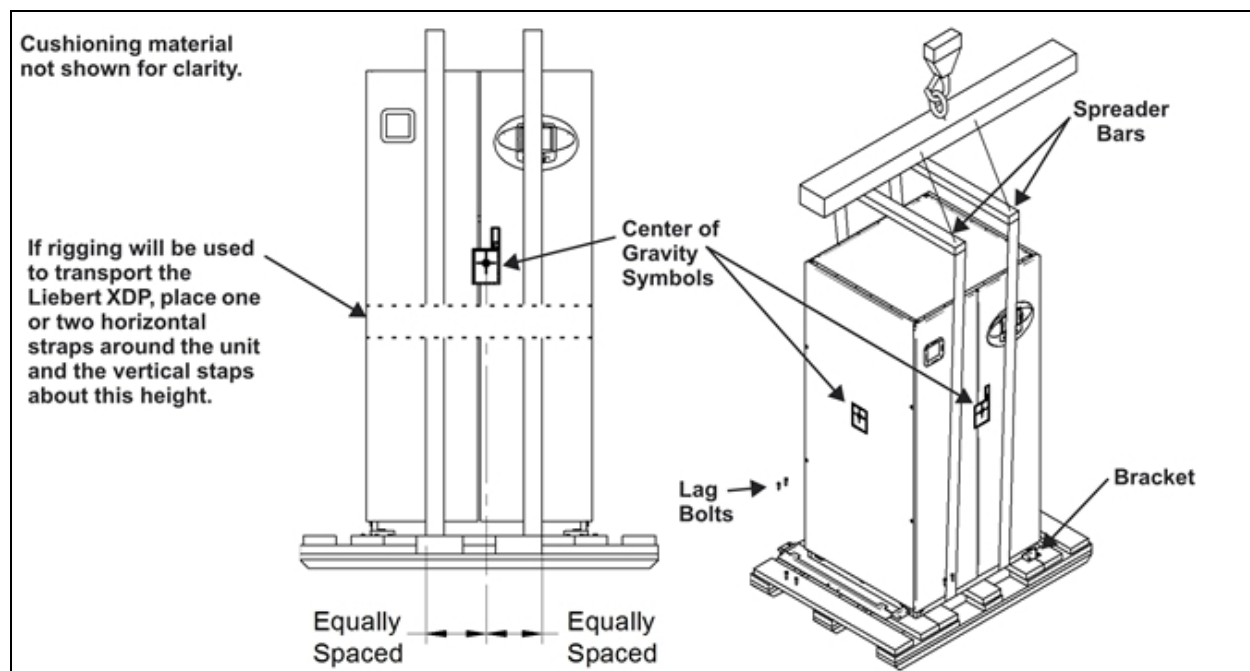


### 1.3.5  Moving the Liebert XDP Using Piano Jacks

1. Elevate the Liebert XDP with a lifting mechanism, such as a forklift or rigging.
1. Position one piano jack at each end of the Liebert XDP.
2. Lower the unit to a height suitable for placing it on the piano jacks.
3. Put protective material between the Liebert XDP and the piano jacks and straps.
4. Secure the Liebert XDP to the piano jacks.
5. Release the the Liebert XDP from the straps securing it to the lifting mechanism and move the mechanism away from the unit.

Using the piano jacks, at least two properly trained and qualified personnel can move the unit.

Figure 1.5   Securing the Liebert XDP to piano jacks



Using a forklift to put a Lieb-ert XDP on piano jacks

Using rigging to put a Lieb-ert XDP on piano jacks

Liebert XDP Secured to piano jacks
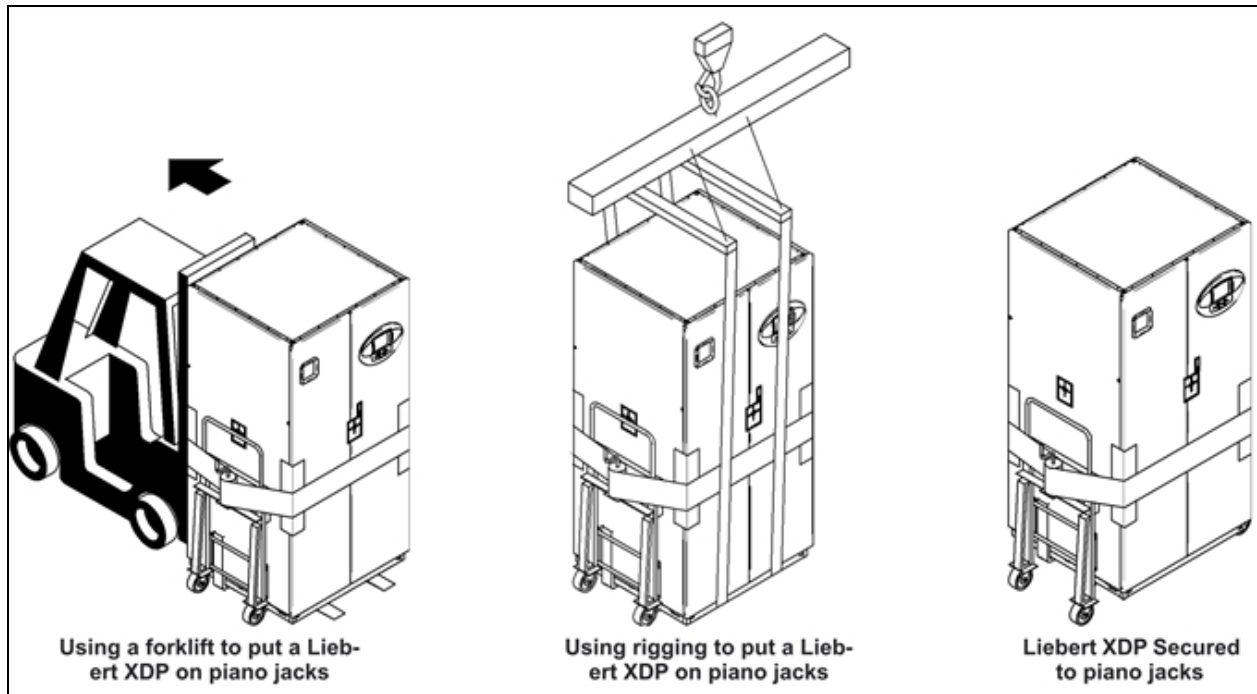
### 1.3.6   Removing the Unit from the Piano Jacks

1. Lower the Liebert XDP as far as the piano jacks will allow.
2. Undo all strapping holding the piano jacks to the unit.
3. Lift one end of the Liebert XDP off one piano jack with a pry bar or similar device, taking care not to damage the unit's cabinet.
4. Repeat step 3 to remove the piano jack from under the opposite end of the Liebert XDP.
5. Remove all material used to protect the unit from the piano jacks and strapping.

# 2 INSTALLATION

## 2.1 Mechanical Considerations

### 2.1.1 Positioning the Liebert XDP

Install the Liebert XDP according to the site specific documentation and secure the unit to the floor.

The Liebert XDP can be installed near a wall or another Liebert XDP. However, there must be at least 3 feet (92cm) clearance in front of the Liebert XDP as service access for components in the unit.

For additional technical information, refer to the System Design and Configuration Document for the Liebert XD™ System, SL-16655. The document is available in electronic format at Vertiv's Web site, www.VertivCo.com, as well as from your local Vertiv representative.

**Figure 2.1   Dimensions**
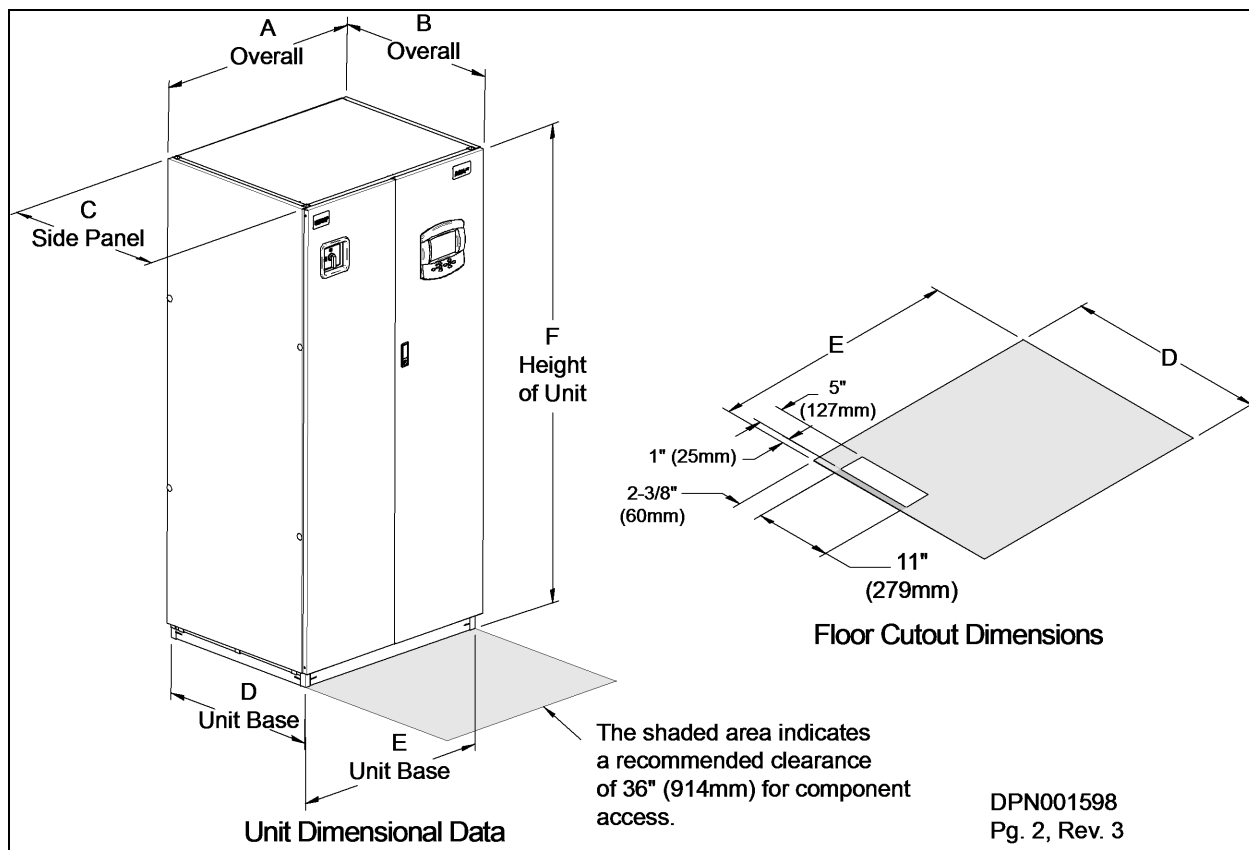


**Table 2.1   Liebert XDP Dimensions**

| Model 50/60Hz | Dimensional Data, inches (mm) | | | | | | Shipping Weight, lb. (kg) | |
|---|---|---|---|---|---|---|---|---|
| | A | B* | C | D | e | H | Domestic | Export |
| XDP160 | 38 (965) | 34 (864) | 33-1/8 (841) | 33 (838) | 36 (914) | 78 (1981) | 1020 (462) | 1083 (491) |
| * The dimension does not include the bezel of the disconnect switch. | | | | | | | | |

## Figure 2.2  Piping access points



To first cooling module
or bypass flow controller **

Close this
valve during
normal
operation

Install replaceable filter dryer assembly
in liquid supply line B.

* Orientation
determined
by installer.

A - Return from Liebert XD
Cooling Modules

B - Supply to Liebert XD Cooling Modules

17-1/4"
(438mm)

16-1/8"
(409.6mm)

Emerson recommends field-installation
of shutoff valves at these points to permit
isolating the Liebert XDP for maintenance

10" (254mm)

19"
(483mm)

Dimensions are
approximate
and subject to change
without notice.

* Allow 8" (204mm) clearance for filter replacement.
** To ensure ensure all refrigerant flow is filtered,
   install the filter dryer assembly between the discharge
   line of the Liebert XDP and the first bypass flow controller
   or the first Liebert XD cooling module.

D - Chilled Water Return
    To Chilled Water Source

C - Chilled Water Supply
    From Chilled Water Source

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## Table 2.2  Unit piping outlet connection sizes, inches, OD Cu

| Model | Pipe Connection Point | | | |
|---|---|---|---|---|
| 50/60 Hz | A | B | C | D |
| XDP160 | 2-1/8 | 1-1/8 | 2-5/8 | 2-5/8 |

## 2.2  Electrical Considerations

Make sure the actual supply voltage and frequency correspond to the voltage and frequency indicated on the Liebert XDP's rating plate. The unit must be installed in accordance with national wiring regulations.

Connect cables for high voltage supply to the electrical box in the Liebert XDP according to Figure 2.5  on page 16 and make sure that the phases are correctly connected.

⚠️ **WARNING! Risk of electric shock. Can cause injury or death.**

**Disconnect all local and remote electric power before working within the unit**

⚠️ **WARNING! Risk of electrical shock, short circuit and/or control malfunction. Can cause equipment damage, injury or death.**

**Damage to wiring or components can make unit unsafe to operate.**

**Use caution when installing wiring to prevent damage to factory wiring.**

**Install protective bushings in wiring knockouts as required to protect wiring from sharp edges.**

**Do not disturb factory wiring or route field-installed wiring over electrical terminals.**

**Use NEC Class 1 wiring for all hazardous voltage electrical power supplies.**

**Check and retighten** all **wiring connections before starting the unit.**

### 2.2.1  Connecting High-Voltage Cables

1. Turn the Liebert XDP's disconnect switch to the Off position (see Figure 2.3  on the next page). Open the front doors and push down on the enclosure cover latch to open the hazardous voltage enclosure cover.

**Figure 2.3   Front view of Liebert XDP and electrical enclosure**



Disconnect Switch

Liebert iCOM User Interface

Enclosure Cover Latch

Hazardous Voltage Enclosure Cover

Front of Liebert XDP

Hazardous Voltage Enclosure Cover

DPN001598
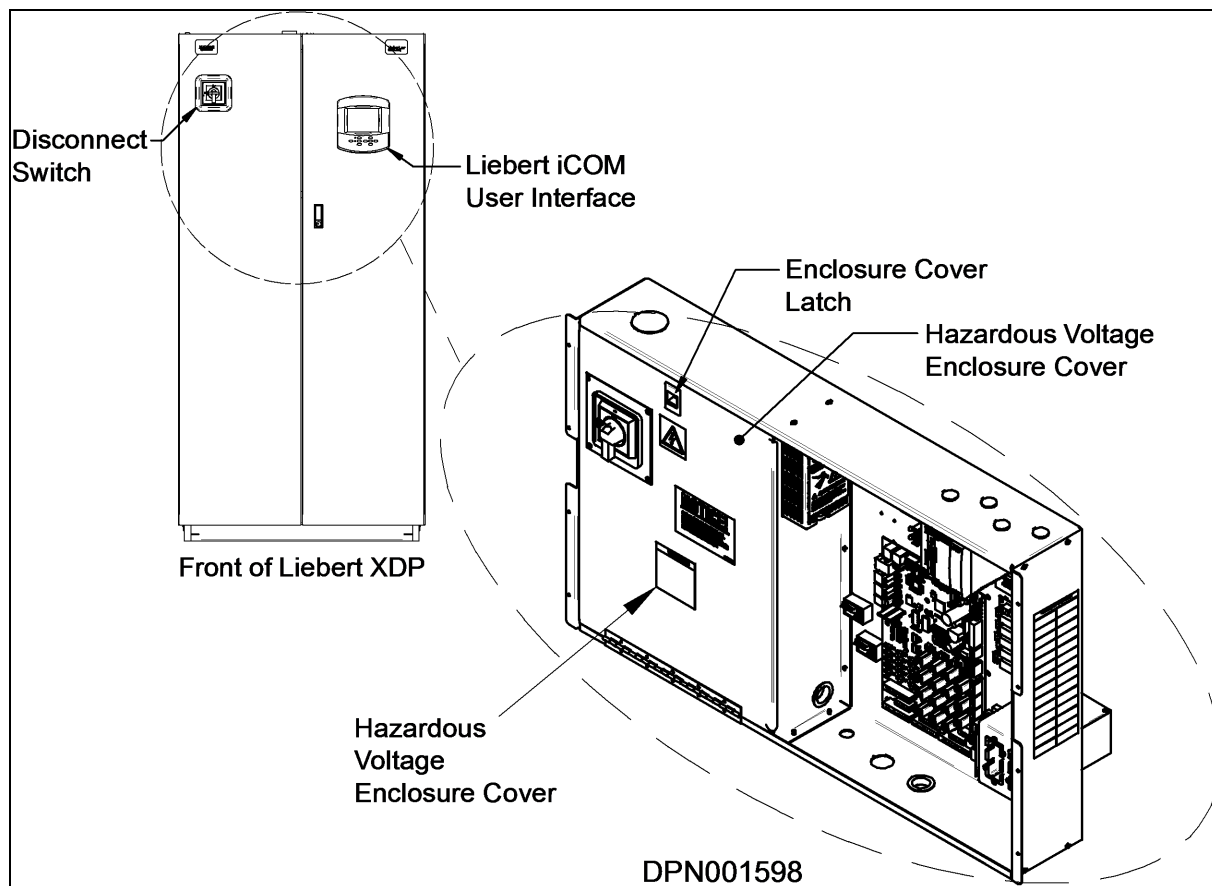
2.  Determine which knockouts in the electrical enclosure will be used and remove them (see Figure 2.4   on the facing page).

**Figure 2.4   Electrical enclosure knockout location for hazardous voltage wiring**

Liebert XDP Input
Power Knockout

DPN002313
Enclosure Cover Not Shown for Clarity        Rev. 0
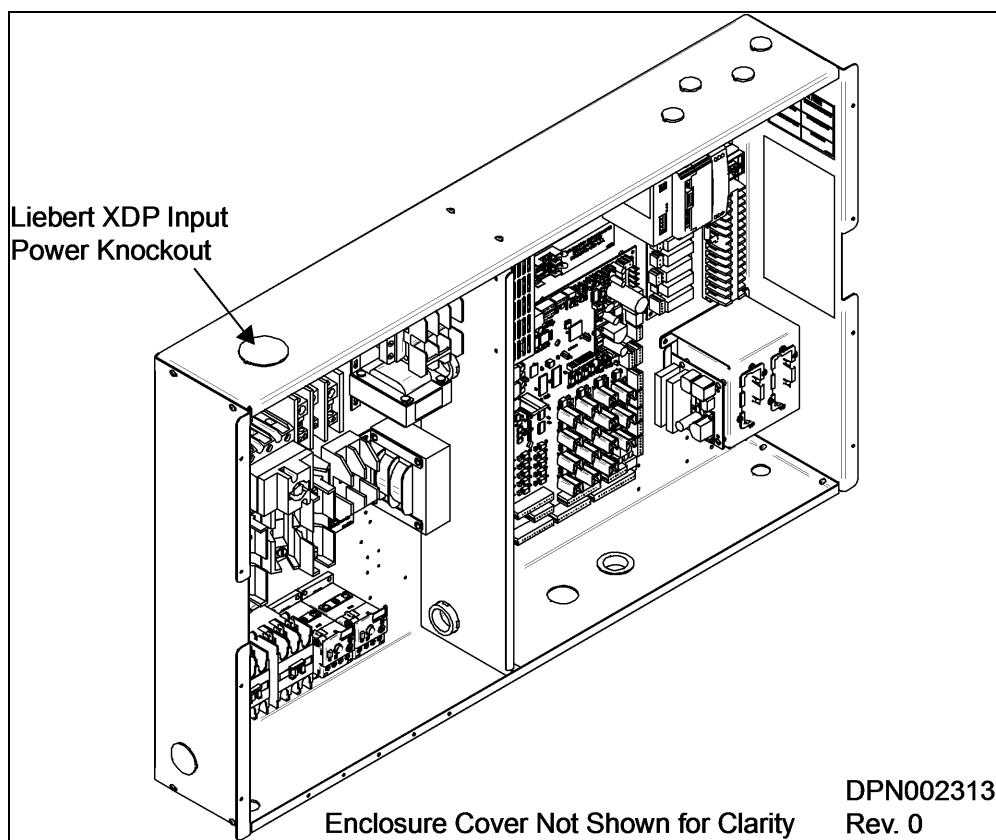
3.  Route the input hazardous voltage electrical power wiring through the top left knockout (see Figure 2.4   above) to the disconnect switch L1, L2 and L3 (see Figure 2.5   on the next page and Figure 2.6   on the next page). Observe proper phasing.

4.  Connect the ground wire to the ground lug (see Figure 2.5   on the next page and Figure 2.6   on the next page), which is in the middle left of the enclosure.

Figure 2.5   High voltage connections—60Hz
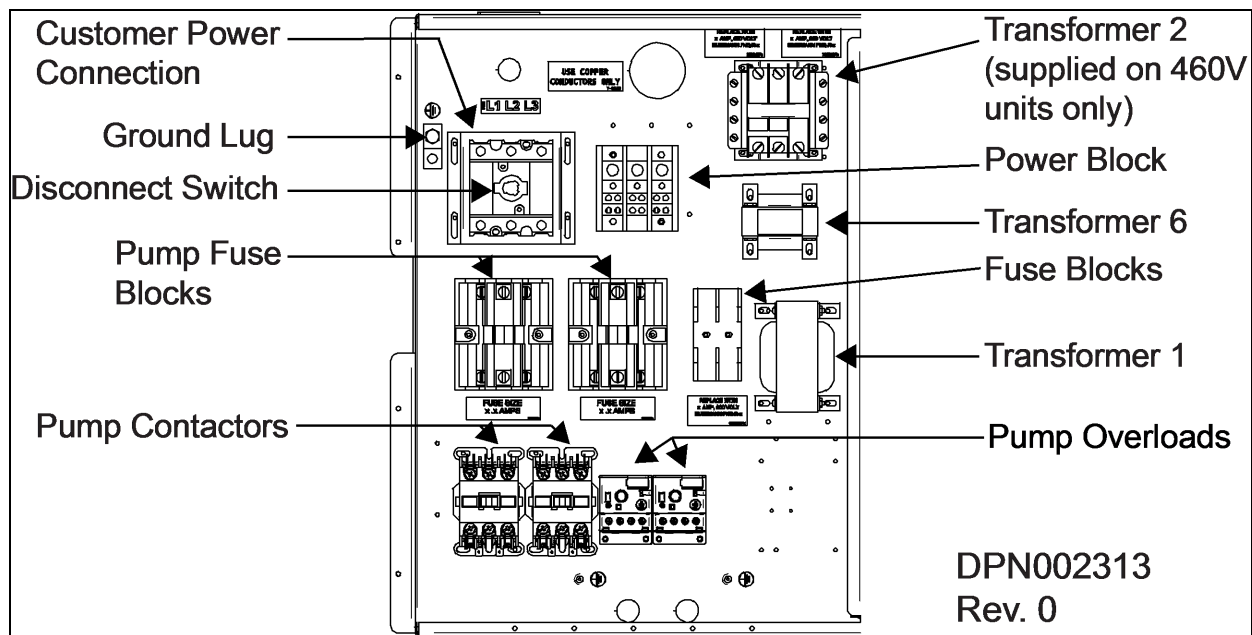


Figure 2.6   High voltage connections—50Hz
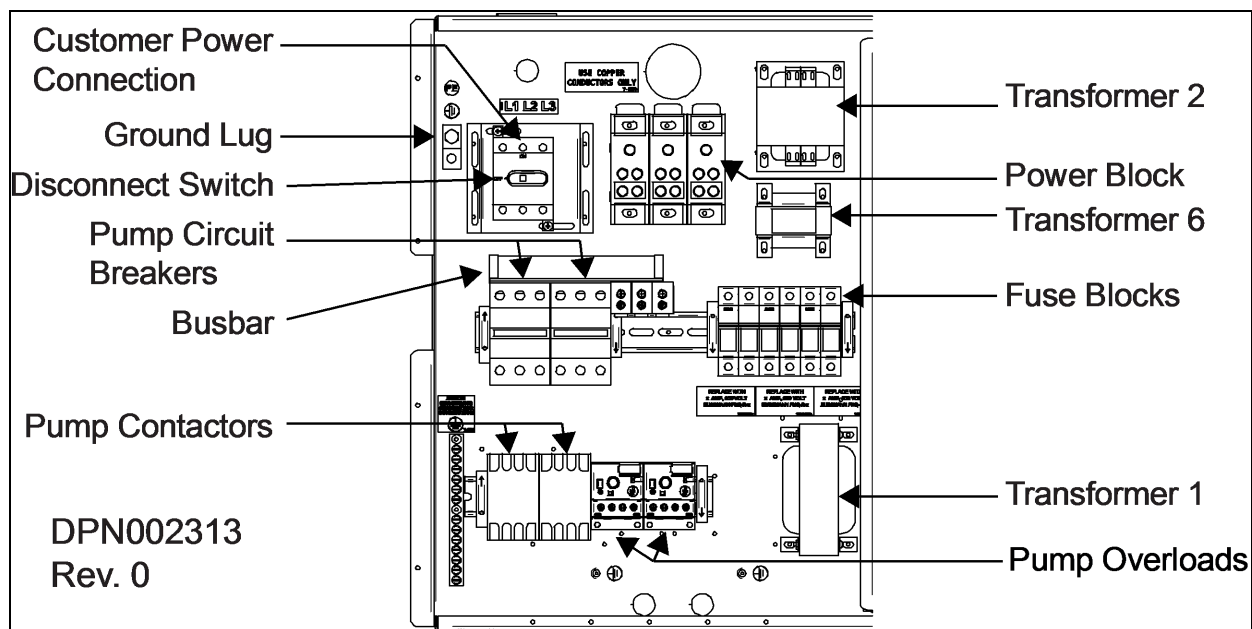


## 2.2.2  External Pump Overloads

The Liebert XDP is shipped with external pump overload with trip point settings and DIP switch settings for normal operations. The trip points are in increments of 0.25A and should not be changed from the factory settings. For 460V, the trip point is set at 1.5A (Figure 2.7   on the facing page). For 208V, the trip point is set at 2.7A (Figure 2.8   on the facing page). See Figure 2.9   on page 18 for factory DIP switch settings for normal operation with reset mode set as automatic and Trip Class 20.

Figure 2.7   460V factory setting external pump overload trip point
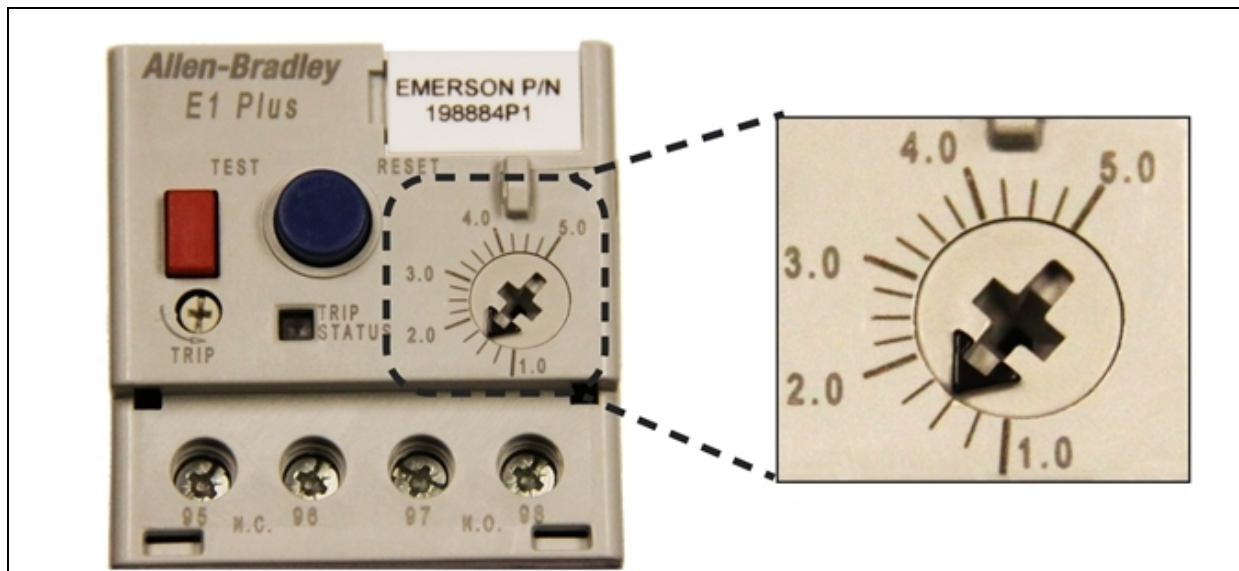


Figure 2.8   208V factory setting external pump overload trip point
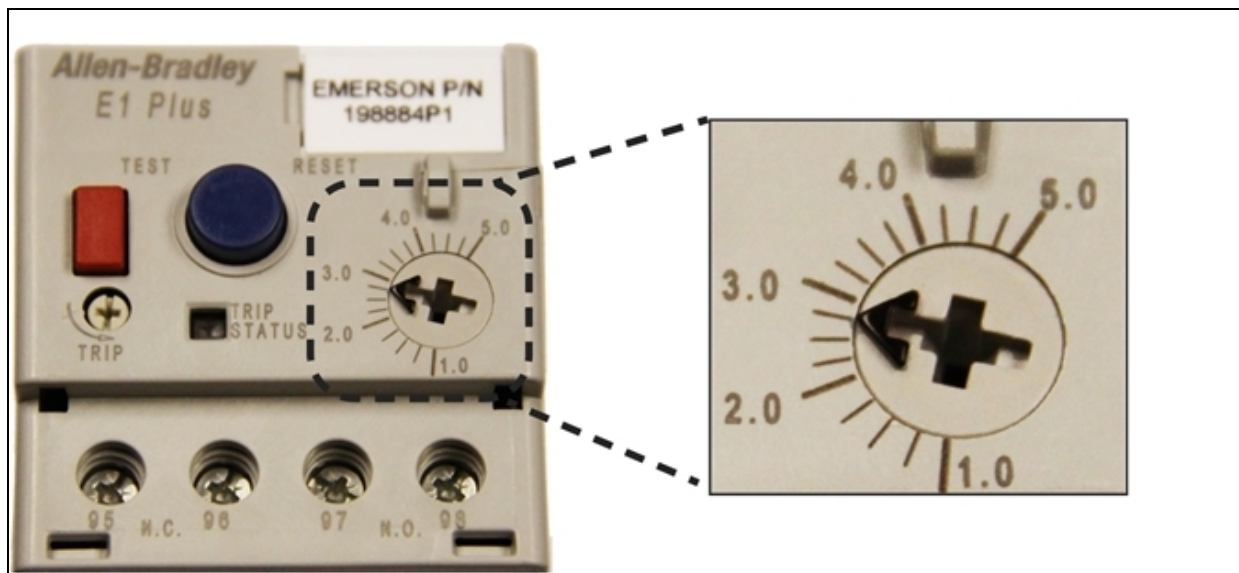
**Figure 2.9   Factory DIP switch settings**
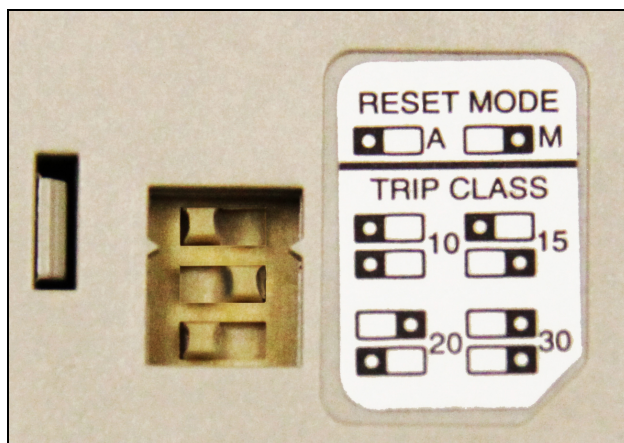


### 2.2.3  Extra Low Voltage (ELV) Connections

Extra Low Voltage power output is 30V and 100VA or less.

1.  Turn off all unit power before connecting cables or wires. Failure to do so may damage this equipment (refer to Figure 2.10   below).

2.  Route low voltage electrical connections through the appropriate knockouts as indicated below.

**Figure 2.10   Electrical enclosure knockout locations for Extra Low Voltage**
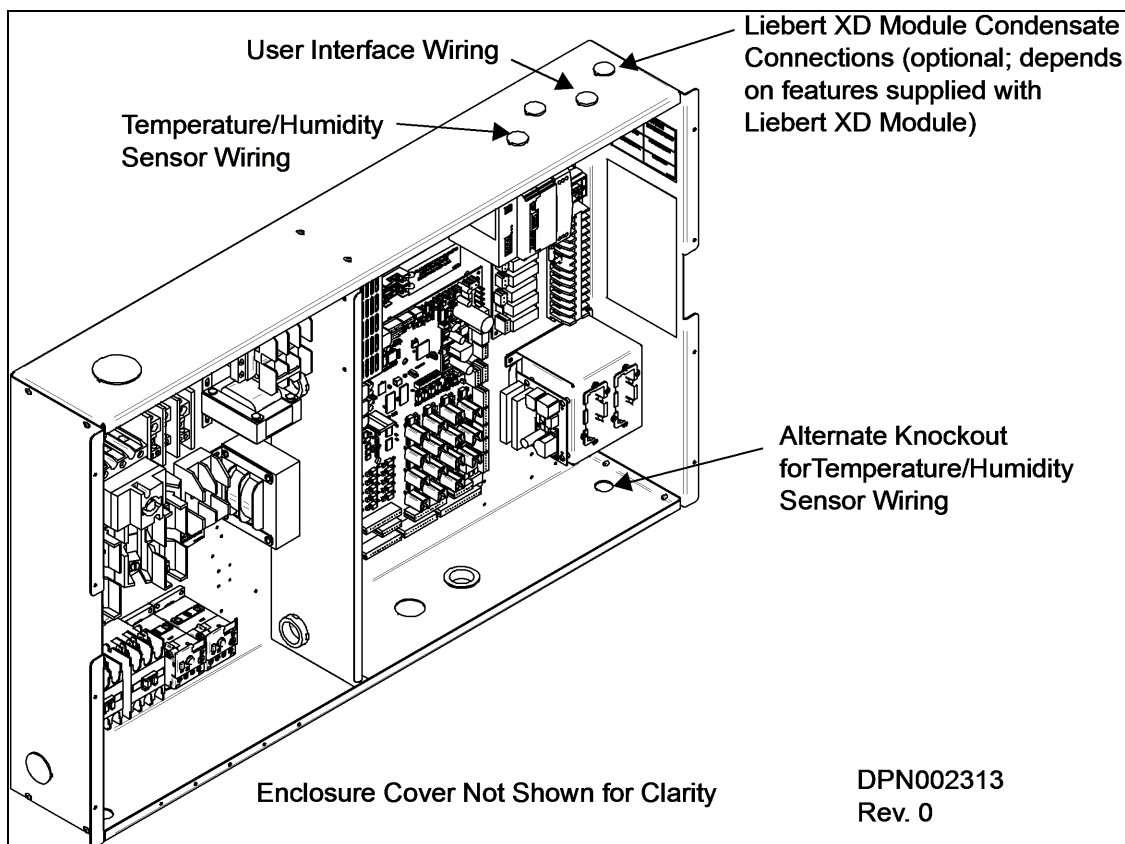
## Figure 2.11 Connecting the remote temperature/humidity sensors



1. See unit electrical schematic, installation and user manuals.
2. Cables "A" and "B" provided with each unit. Only one is used as follows: Liebert IntelliSlot-based communications - Cable "A" is preconnected to P65 on microprocessor and input/output board and P65 on Liebert IntelliSlot power supply non-Liebert IntelliSlot-based communications - Vable "B" is pre-connected to Terminals 77 and 78 but must be exchanged with Cable "A" at P65 on the microprocessor and input/output board.
3. Install applicable Liebert IntelliSlot cards.
4. Both cables (P64 and P66) are required.
5. It is not necessary to connect ground coupling on end of cable connected to Sensor "A" or Sensor "B."

6. A crossover coupler is provided for unit-to-unit (U2U) networking. Unplug the red cable from P64 on the microprocessor and input/output board and connect to one side of the crossover coupler. The first customer connection point is to P64 on the microprocessor and input/output board. The second customer connection point is to the other side of the crossover coupler. This connects the microprocessor and input/output board and display to the private U2U network.
7. The remote sensors are interchangeable as to which connects to the Liebert XD cooling module and which connects to P2 on CAN Iso.
8. Field-install cables with factory-installed ferrite beads (when provided, typical two places). Each cable must make three passes through the ferrite bead. Locate the ferrite bead on top of the electric box. See instruction sheet provided with the cable assembly.
9. Factory-installed ferrite bead (when provided). Cable passes through ferrite bead three times.

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## 2.2.4 DIP Switch and Jumper Settings for Remote Sensors

The Liebert XDP is shipped with jumpers and DIP switch settings for normal operation. See Figure 2.12 below.

**Figure 2.12 DIP switch and jumper settings**
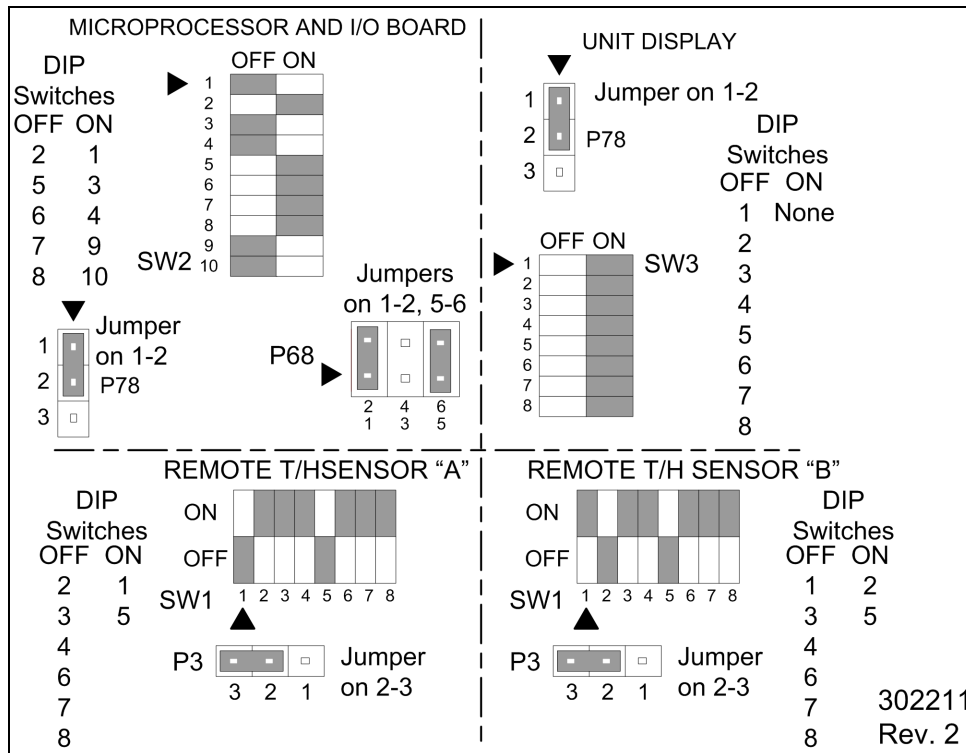
**Figure 2.13   Unit-to-unit networking connections**
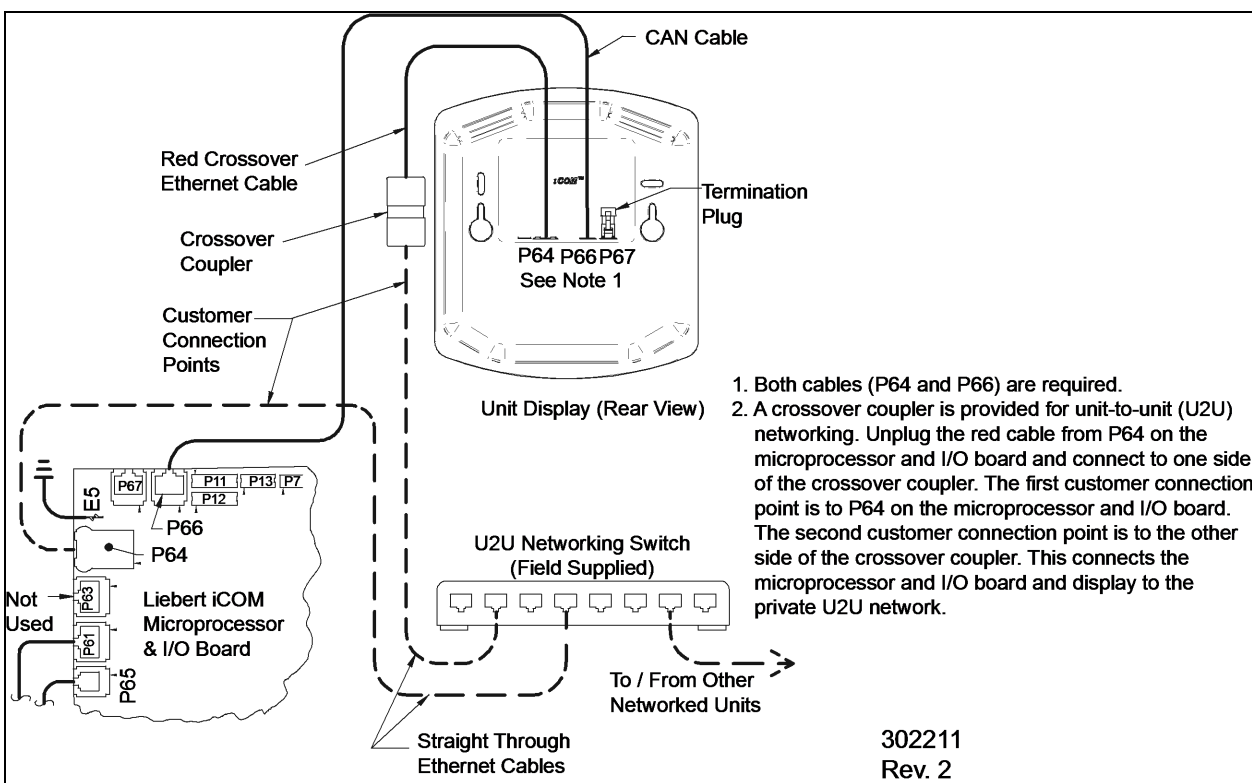


## 2.3  Field Connections—Optional for All Units

- Connect field wiring from the optional Liebert XD cooling module condensation detection circuit to terminal strip locations COMM. (24) and H2O (51).
- Connect optional field wiring from remote devices to remote alarm device, common alarm outputs, site monitor and remote shutdown, if applicable. See terminal strip descriptions in Figure 2.14   on the next page.

Figure 2.14   Liebert XDP extra low voltage field connections points

Figure 2.14   Liebert XDP extra low voltage field connections points
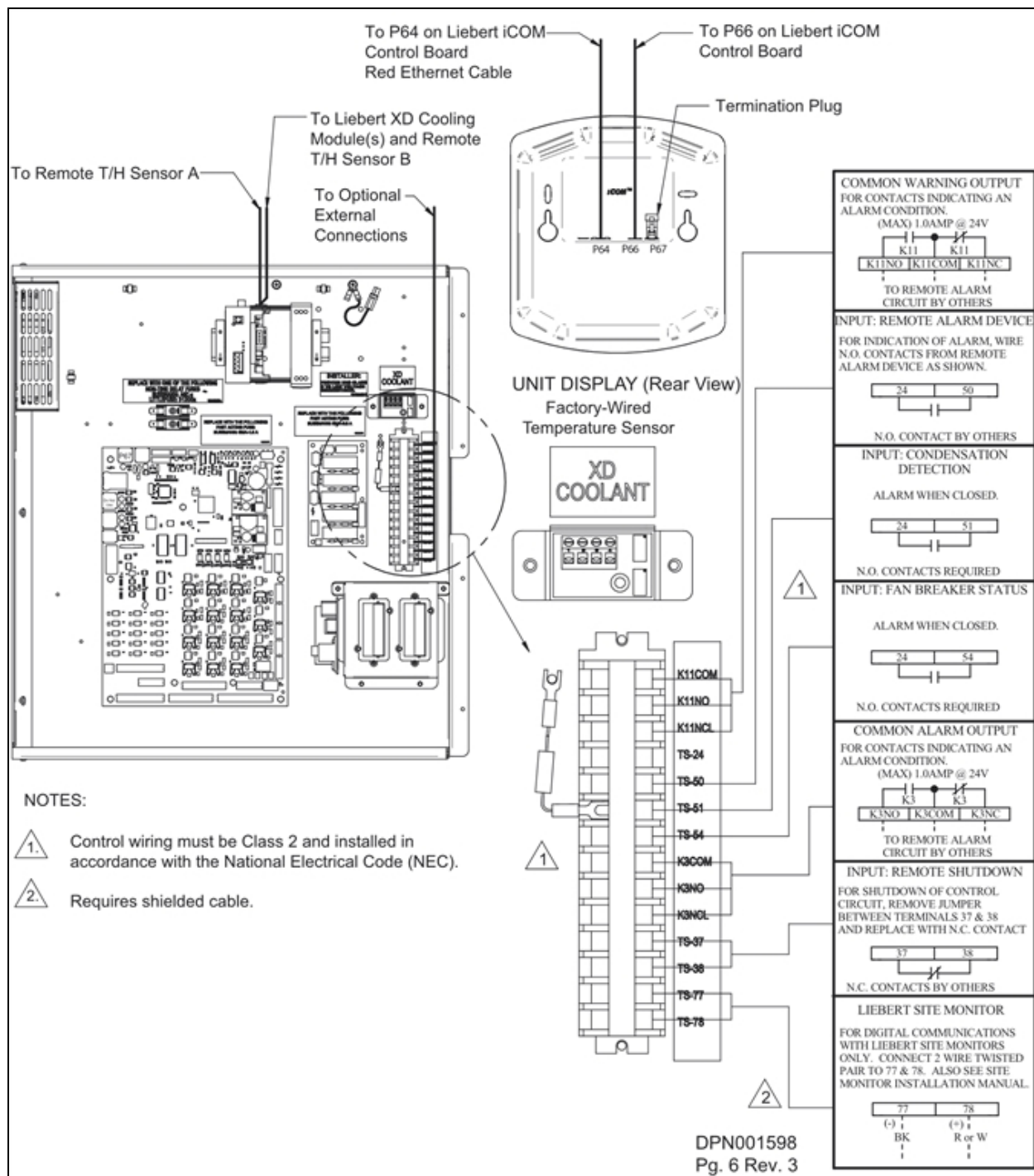
## 2.4  Remote Sensor Installation—Proper Placement

Placement of the two remote temperature/humidity sensors is critical to effective cooling of the conditioned space.

The remote sensors must be installed in areas where conditions are representative of the space conditioned by the Liebert XDP. Vertiv recommends installing the sensors in different areas near the cooling modules served by the Liebert XDP. If the return air side of the primary air mover, such as a Liebert DS, represents the conditions where the Liebert XD cooling modules are located, one sensor could be placed there. Vertiv suggests placing the other sensor on the wall opposite the heat load area (see Figure 2.15 below for guidance).

Do not install the sensors where ambient air might cause false readings, for example, near unsealed doors or windows, or areas with stagnant air.

1.  Unpack the two remote temperature/humidity sensors and cables.

    One sensor is labeled Sensor A and the other Sensor B. The sensor cables are interchangeable; each bears labels indicating Sensor End and Unit End.

2.  Connect the Sensor End of one of the supplied sensor cables to P66 on Sensor A (see Figure 2.11 on page 19).

3.  Connect the Unit End of the sensor cable to P67 on the Liebert iCOM input/output board inside the Liebert XDP. Secure the ring terminal on the cable shield to the electric box adjacent to P67 (see Figure 2.11 on page 19).

4.  Connect the Sensor End of the second sensor cable to P66 on Sensor B (see Figure 2.11 on page 19).

5.  Connect the Unit End of the cable to P67 on the Liebert iCOM display (see Figure 2.11 on page 19). Secure the ring terminal on the cable shield to the grounding screw adjacent to P67.

Figure 2.15  Suggested remote sensor placement



Heat Load Area

Sensor A
or
Sensor B

Liebert XD
unit may be
in room
or outside it

Place remaining sensor in air return of any Liebert Precision Cooling unit on opposite side of room.

Illustration depicts one possible installation.
Actual number of Liebert DS units may vary.
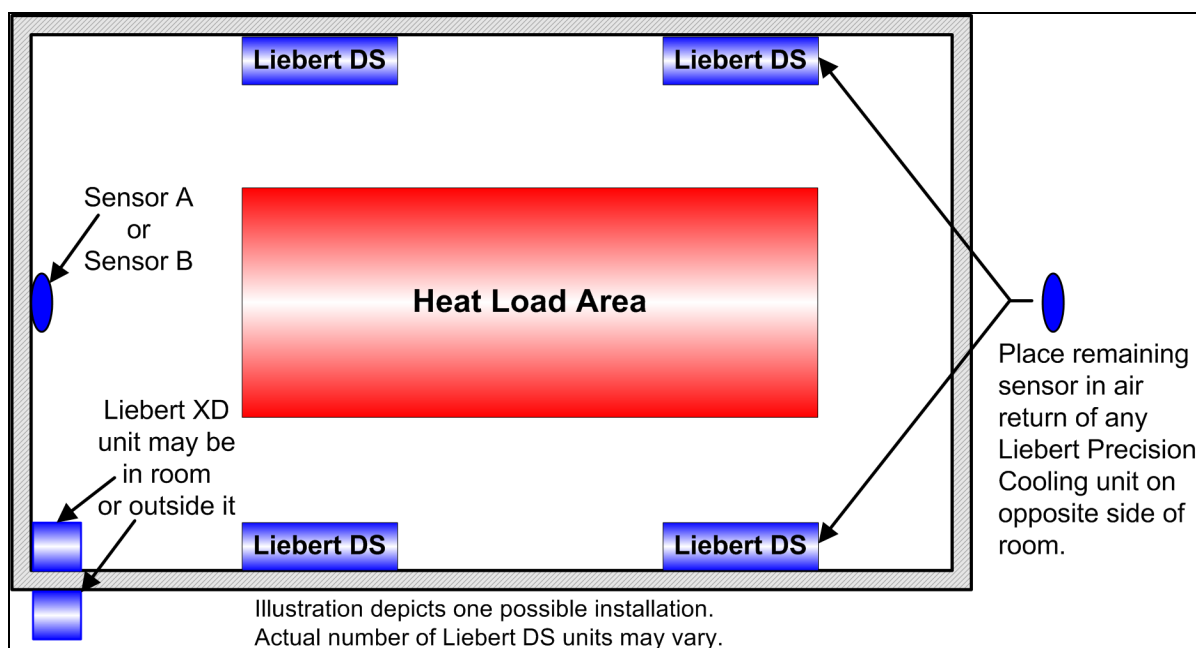
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# 3 PIPING

## 3.1 European Union Fluorinated Greenhouse Gas Requirements

Stationary air conditioning, refrigeration, heat pump equipment and stationary fire protection systems in the European Community market and operating with fluorinated greenhouse gases (f-gas), such as R407C, R134a, R410A, must comply with the F-Gas Regulation: (EC) No. 842/2006 (F-gas). The regulation prohibits, among other actions, venting fluorinated greenhouse gases to the atmosphere.

The F-Gas Regulation requires operators to use all measures that are technically feasible and do not entail disproportionate cost to prevent leakage of these gases, to test for leakage regularly and to recover f-gas before disposing of equipment, as well as during service and maintenance.

Refer to the full regulation for additional details.

## 3.2 Connection Sizes

The copper pipe connections on the Liebert XDP are:

| | |
|---|---|
| Building Chilled Water Supply | 2-5/8" OD |
| Building Chilled Water Return | 2-5/8" OD |
| Refrigerant Supply | 1-1/8" OD |
| Refrigerant Return | 2-1/8" OD |

### 3.2.1 Recommended Pipe Size

Connect the main pipes between the Liebert XDP and the Liebert XD cooling modules according to site specific documentation and the configuration guide for the Liebert XD system.
Elbows and restrictions must be minimized to get good fluid flow.

Table 3.1
Supply, return pipe sizes for refrigerant loop

| Pipe Function | Size / Equivalent Pipe Length |
|---|---|
| Liebert XDP supply line, from Liebert XDP supply to farthest Liebert XD cooling module | 1-1/8" OD for lengths up to 60 feet |
| | 1-3/8" OD for lengths over 60 but less than 175 feet |
| Liebert XDP return line, from farthest Liebert XD cooling module to Liebert XDP return | 2-1/8" OD for lengths up to 60 feet |
| | 2-5/8" OD for lengths over 60 but less than 175 feet |
| From any model Liebert XDO/Liebert XDH supply to supply line of Liebert XDP | 1/2" OD for lengths up to 10 feet |
| | 7/8" OD for lengths over 10 but less than 25 feet |
| From any model Liebert XDO/Liebert XDH return to return line of Liebert XDP | 7/8" OD for lengths up to 10 feet |
| | 1-1/8" OD for lengths over 10 but less than 25 feet |
| From any model Liebert XDV/Liebert XDCF supply to supply line of Liebert XDP | 1/2" OD for lengths up to 10 feet |
| | 5/8" OD for lengths over 10 but less than 35 feet |
| From any model Liebert XDV/Liebert XDCF return to return line of Liebert XDP | 5/8" OD for lengths up to 10 feet |
| | 7/8" OD for lengths over 10 but less than 35 feet |

## 3.3 Liebert XDP Interconnection with Liebert XD Cooling Modules

All piping must be ASTM (American Society for Testing and Materials) Type ACR copper pipe.

The Liebert XDP may be connected to Liebert XD cooling modules with either Liebert's XD prefabricated piping assembly or with rigid, off-the-shelf piping. In either setup, piping for the Liebert XD system is arranged in a manner similar to piping for a chilled water system. Liebert XD cooling modules are connected in parallel between main return and supply pipes going to and from the Liebert XDP/Liebert XDC. Figure 3.1 below represents a typical configuration. For piping details, refer to Liebert's XD System Design Manual, SL-16655, available at Vertiv's Web site: _www.VertivCo.com_. **The guidelines provided for pipe size must be strictly followed. Failure to size the main lines and connection lines adequately may result in reduced cooling capacity. The critical aspects of pipe sizing are related to refrigerant volume and pressure drop. Each must be minimized.**

**Figure 3.1   Liebert XD system diagram**
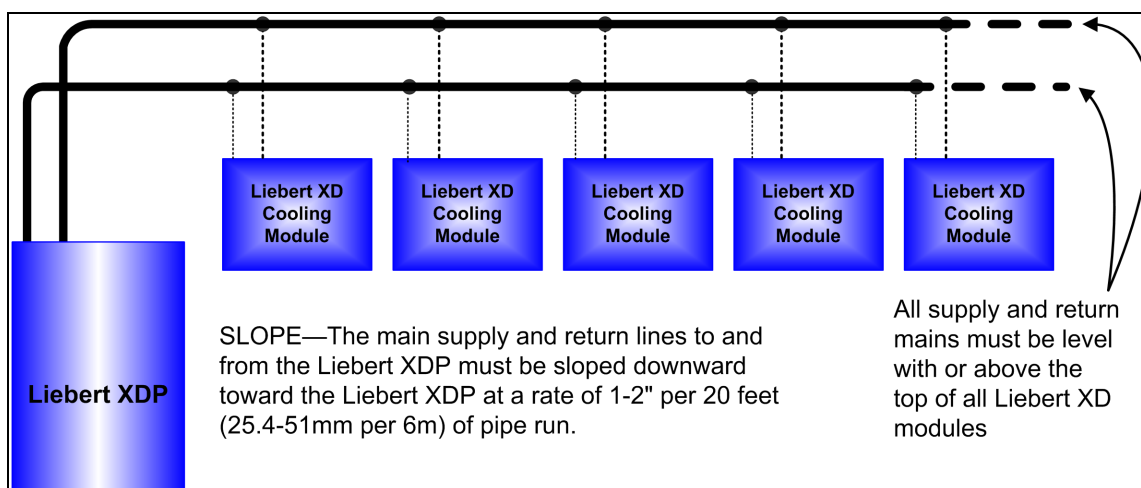


## 3.4 Piping Installation Methods

The assembly and connection means used for piping in the Liebert XD system are similar to those used for conventional refrigeration systems. All piping should be installed with high-temperature brazed joints. Soft soldering is not recommended.

During brazing, the lines must be filled with flowing dry nitrogen to prevent excessive oxidation and scale formation inside the piping. Prevailing good refrigeration practices must be employed for piping supports, leak testing, dehydration and charging. Failure to use good system practices may result in damage to the system. Refer to the ASHRAE refrigeration handbook for general good-practice refrigeration piping.

Insulate all piping lines to prevent condensation in applications where the dew point approaches the R-134a refrigerant temperature.

Vertiv recommends venting the pressure relief valve for the R-134a outside the conditioned space where it is open to the atmosphere. The R-134a side relief valve is inside the Liebert XDP unit at the top of the receiver.

### 3.4.1 Piping Installation—R-134a Pumped Circuit

Vertiv recommends venting the relief pressure valve of the Liebert XDP (located at the top of the receiver) outside of the conditioned space where it is open to the atmosphere.

### 3.4.2 Piping Mains

All refrigeration piping mains connected to the Liebert XD cooling module, both supply and return, should be installed with a downward pitch toward the Liebert XDP of 1-2" for every 20 feet (25.4-51mm per 6m) of pipe run.

Install a 20-40 mesh strainer on the chilled water supply to the Liebert XDP. The strainer is needed to prevent particles in the chilled water from entering the Liebert XDP's heat exchanger.

### 3.4.3 Bypass Flow Controller

Three bypass flow controllers are required to ensure that the Liebert XDP pumps operate within the optimum range. These devices are added to the field piping and simulate the flow of additional cooling modules.

Each bypass flow controller must be installed with one shutoff valve to allow the controller to be disabled when cooling modules are added to a Liebert XD system.

Bypass flow controllers should be connected between the main supply and the main return lines of the field piping. The connection points to the main supply and return lines should be in a convenient and accessible location between the Liebert XDP/Liebert XDC and the first Liebert XD module in the circuit. See Figure 3.2 on the next page andFigure 3.3 on the next page for piping details of the bypass flow controller.

Refer to Table 3.2 below to determine the number of bypass flow controllers that must be open to provide proper refrigerant flow based on the total nominal cooling capacity of the cooling modules in each Liebert XD system.

Table 3.2
Bypass flow controllers for a Liebert XDP-based system

| System Load kW Cumulative Module Model Size | Required Number of Open Bypass Flow Controllers |
| --- | --- |
| | Liebert xdp |
| 48 to 63 | 3 |
| 64 to 95 | 2 |
| 96 to 127 | 1 |
| 128 to 160 | 0 |

**Figure 3.2   Bypass flow controller details, dimensions**
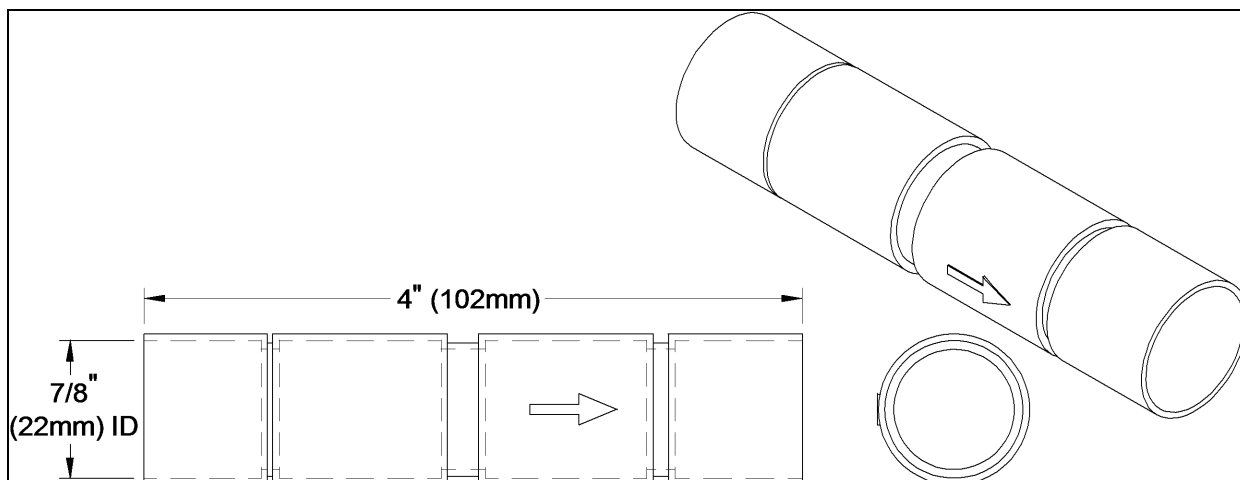


**Figure 3.3   Bypass flow controller arrangement**
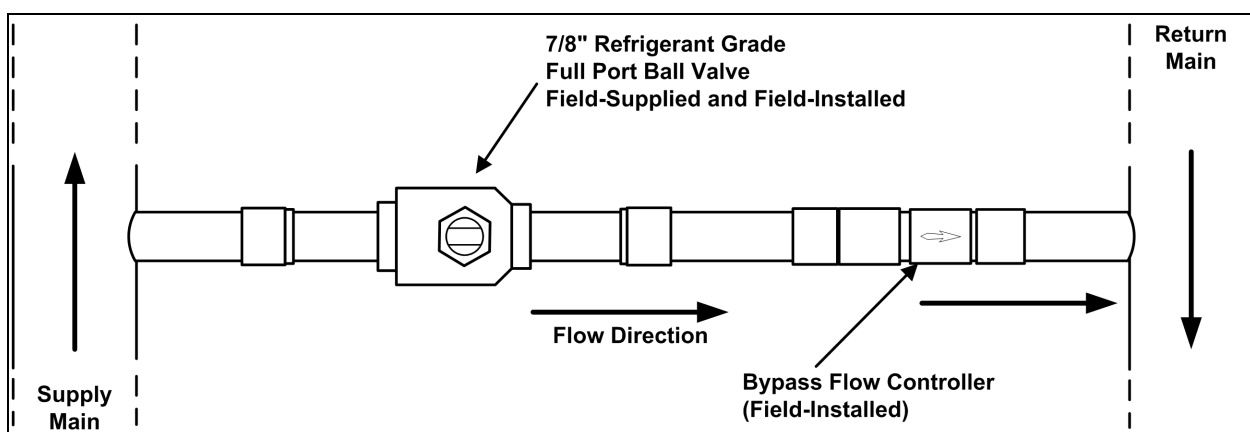
**Figure 3.4   Bypass flow controller piping**
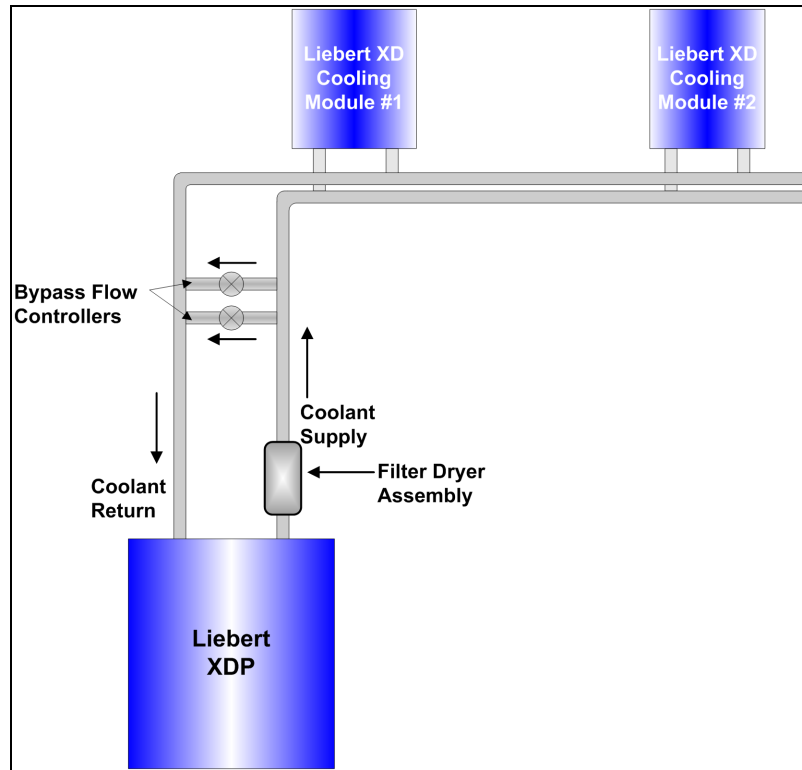


## 3.5  Piping Details—Shutoff/Isolation Valves

Isolation valves must be installed on the Liebert XDP's refrigerant circuit to permit maintenance on the unit (see Figure 3.5   on the next page).

**Figure 3.5 General piping details**
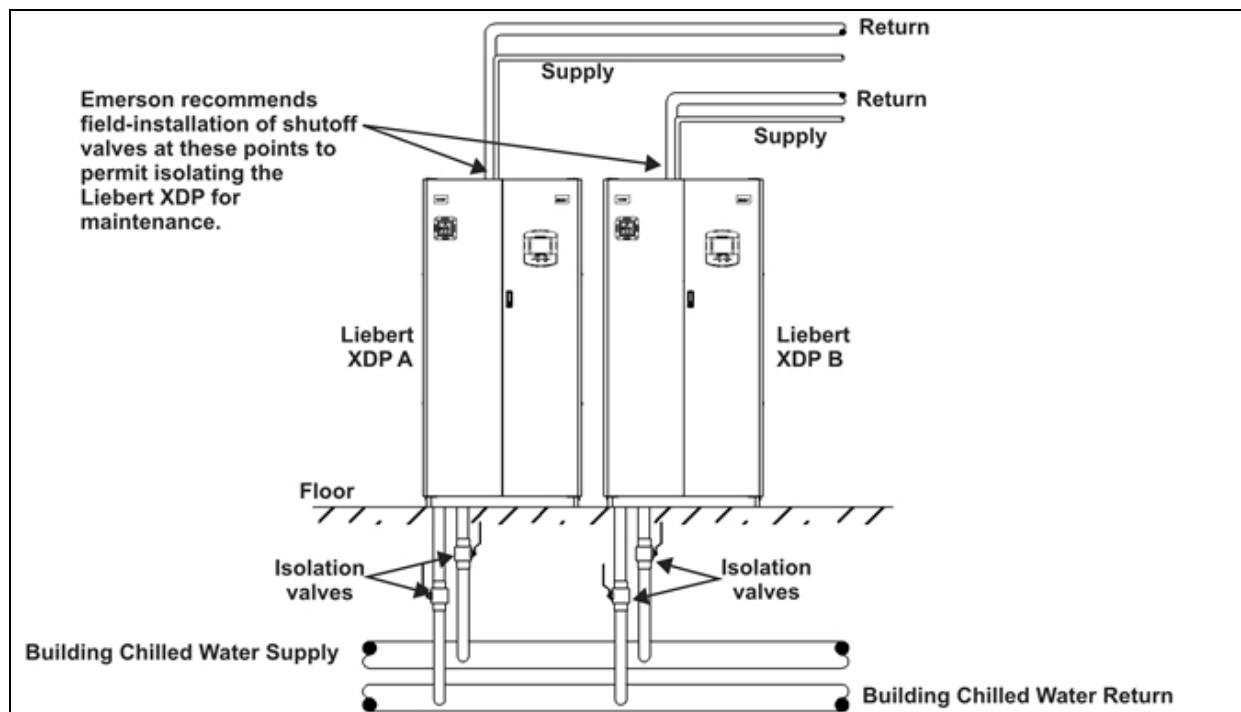


## 3.5.1 Evacuation and Leak Check—R-134a Pumped Circuit

1. Open all service valves, including those outside the Liebert XDP.
2. Attach a jumper hose from one of the Schrader valve fittings on a pump outlet before the check valve to a Schrader valve fittings after the check valve.
3. Place 150psig (1034kPa; 10.34 bars) of dry nitrogen with a tracer of R-134a in the system.

**NOTICE**

Risk of overpressurization. Can cause equipment damage.

Do not exceed 150 psig (1034 kPa; 10.34 bars) in the R-134a circuit.

4. Check the system for leaks with a suitable leak finder on the pumps' suctions lines.
5. After completion of the leak testing, release the test pressure (per local code) and connect to vacuum pump(s) at the Schrader valves.
6. After pulling a deep vacuum for four hours, check the vacuum level and, if it has not changed, break the vacuum with dry nitrogen.
7. Pull a second vacuum to 250 microns or less. Recheck the vacuum level after 2 hours.

## 3.5.2 Insulation

**NOTE: Do not insulate piping before checking it for leaks. Insulating pipes before checking them for leaks would prevent easy detection of leaks.**

Insulate all piping between the Liebert XDP and its connected cooling modules to prevent condensation where the piping passes through non-conditioned areas.

## 3.6 Filling the Pumped Circuit—R-134a

Using a refrigerant pump or cylinder heater pads will speed the charging process.

1. Connect a charging manifold to the service port of the receiver outlet valve or to the suction and discharge side of the pump.
2. Purge the hoses.
3. Calculate the amount of R-134a refrigerant needed to charge the system, using the values in Table 3.3  below, Table 3.4  on the next page, Table 3.5  on the next page and Table 3.6  on the next page; for assistance, refer to Calculating Refrigerant Charge—Example on page 33. The section includes a worksheet to calculate system refrigerant charge requirements.
4. Weigh in the calculated charge.
5. After adding the calculated charge, allow the system to sit 15 to 30 minutes to reach equilibrium. Observe the refrigerant level through the sight glasses of the receiver. The level should be above the second sight glass at a minimum when the Liebert XDP is off.
6. If the refrigerant level is improper, the charge must be adjusted.

   If the level is too high or too low, recalculate the required charge and reduce or increase the amount as needed to reach the proper level.

NOTE: All lengths in Table 3.3  below, Table 3.4  on the next page and Table 3.5  on the next page are actual pipe lengths, not equivalent pipe lengths.

NOTE: System refrigerant volume calculations derived from Table 3.3  below, Table 3.4  on the next page, Table 3.5  on the next page and Table 3.6  on the next page are based on a fully loaded system. Additional charge may be required for lightly loaded systems.

**Table 3.3**
System R-134a charge for a Liebert XDP with any model Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF/Liebert XDR

| Refrigerant Charge, lb. (kg) | Per Liebert XD Unit (Excludes Connector Lines to and from Liebert XD Cooling Module) |
|---|---|
| 1.41 lb. (0.64 kg) | Liebert XDCF |
| 5.32 lb. (2.41 kg) | Liebert XDH |
| 3.55 lb. (1.61 kg) | Liebert XDO |
| 157 lb. (71.2 kg) | Liebert XDP |
| 4 lb. (1.8 kg) | Liebert XDR |
| 2.32 lb. (1.05 kg) | Liebert XDV |

## Table 3.4
System refrigerant charge for the supply and return mains

| Refrigerant Charge, lb/foot (kg/m) | Supply/Return Main Length and Diameter |
|---|---|
| 0.45 (0.67) | Main supply actual length per 1-1/8" OD copper tubing |
| 0.68 (1.01) | Main supply actual length per 1-3/8" OD copper tubing |
| 0.28 (0.42) | Main return actual length per 2-1/8" OD copper tubing |
| 0.43 (0.64) | Main return actual length per 2-5/8" OD copper tubing |

Before beginning, verify that the system is not equipped with pre-charged Liebert XD Flex Pipe.

## Table 3.5
R-134a refrigerant charge for hard-piped connector lines to and from any model
Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF/Liebert XDR

| Refrigerant Charge, lb/foot (kg/m) | Hard-Piped Connector Length and Diameter |
|---|---|
| 0.08 (0.12) | 1/2" OD Liebert XDO/Liebert XDH/Liebert XDV/Liebert XDCF/Liebert XDR supply connector actual length |
| 0.13 (0.19) | 5/8" OD copper tubing Liebert XDV/Liebert XDCF supply connector actual length |
| 0.26 (0.39) | 7/8" OD Liebert XDO/Liebert XDH/Liebert XDR supply connector actual length |
| 0.02 (0.03) | 5/8" OD copper tubing Liebert XDV/Liebert XDCF return connector actual length |
| 0.04 (0.06) | 7/8" OD copper tubing Liebert XDV/Liebert XDCF return connector actual length |
| 0.04 (0.06) | 7/8" OD copper tubing Liebert XDH/Liebert XDO/Liebert XDR return connector actual length |
| 0.07 (0.1) | 1-1/8" OD copper tubing Liebert XDH/Liebert XDO/Liebert XDR return connector actual length |

## Table 3.6
R-134a refrigerant charge for Flex Pipe connector lines to and from any model
Liebert XDO/Liebert XDH/Liebert XDV/Liebert XDCF/Liebert XDR

| Refrigerant Charge lb. (kg) | Metal Flex Pipe Connector Length |
|---|---|
| Supply Line Diameter 1/2" | |
| 0.3 lb. (0.14) | 4 ft. Flex Pipe Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF/Liebert XDR supply |
| 0.5 lb. (0.23) | 6 ft. Flex Pipe Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF/Liebert XDR supply |
| 0.7 lb. (0.32) | 8 ft. Flex Pipe Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF/Liebert XDR supply |
| 0.8 lb. (0.36) | 10 ft. Flex Pipe Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF supply/Liebert XDR |
| Return Line Diameter 5/8" | |
| 0.01 lb. (0.01) | 4 ft. Flex Pipe existing Liebert XDV systems |
| 0.02 lb. (0.01) | 6 ft. Flex Pipe existing Liebert XDV systems |
| 0.03 lb. (0.01) | 8 ft. Flex Pipe existing Liebert XDV systems |
| 0.03 lb. (0.01) | 10 ft. Flex Pipe existing Liebert XDV systems |

**Table 3.6  R-134a refrigerant charge for Flex Pipe connector lines to and from any modelLiebert XDO/Liebert XDH/Liebert XDV/Liebert XDCF/Liebert XDR (continued)**

| Refrigerant Charge lb. (kg) | Metal Flex Pipe Connector Length |
|---|---|
| Return Line Diameter 1" | |
| 0.13 lb. (0.06) | 4 ft. Flex Pipe Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF/Liebert XDR supply |
| 0.2 lb. (0.09) | 6 ft. Flex Pipe Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF/Liebert XDR supply |
| 0.27 lb. (0.12) | 8 ft. Flex Pipe Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF/Liebert XDR supply |
| 0.33 lb. (0.15) | 10 ft. Flex Pipe Liebert XDH/Liebert XDO/Liebert XDV/Liebert XDCF/Liebert XDR supply |

### 3.6.1  Calculating Refrigerant Charge—Example

Using Table 3.3  on page 31,Table 3.4  on the previous page,Table 3.5  on the previous page andTable 3.6 on the previous page, calculate the refrigerant charge of the individual sections of your Liebert XD system. Add the calculated charge amounts to determine the amount of R-134a refrigerant required for one system combining a Liebert XDP with Liebert XD cooling modules (Liebert XDCF, Liebert XDH, Liebert XDO and Liebert XDV). The example below combines one Liebert XDP with 20 Liebert XDV8 cooling modules.

**Table 3.7**

Calculating refrigerant charge—example

| Components | Number of Units or Piping Length, feet | Pounds Per Component | Total, lb. |
|---|---|---|---|
| Liebert XDP | 1 | 157 | 157 |
| Liebert XDV8 Cooling Modules | 20 | 2.32 | 46.4 |
| Supply Main, 1-1/8" | 100 | 0.45 | 45 |
| Return Main, 2-1/8" | 100 | 0.28 | 28 |
| Liebert XDV 1/2" supply Liebert XD Flex Pipes | 20 | 0.8 | 16 |
| Liebert XDV 5/8" return Liebert XD Flex Pipes | 20 | 0.03 | 0.6 |
| | | Total | 293 |

**Table 3.8**

Worksheet to calculate refrigerant charge

| Components | Number of Units or Piping Length | Pounds Per Component | Total |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | Total | |

## 3.7 Checklist for Proper Installation

1. Unpack and check received material.
2. Position the Liebert XDP and secure it to the floor.
3. Wire high voltage connections.
4. Wire low voltage connections.

**NOTICE**

Risk of unintended pump start. Can cause equipment damage.

Do not install the pump fuses for 60Hz units until the system is fully charged with refrigerant. Do not remove the locking mechanisms from 50Hz circuit breakers until the system is fully charged with refrigerant. Operating the pumps without a full refrigerant charge can result in equipment damage.

5. Connect the building chilled water piping to the Liebert XDP.
6. Connect the Liebert XD cooling module piping to the Liebert XDP with slope.
7. Check the system for leaks.
8. Hold a vacuum on the system.
9. Fully charge the system with refrigerant. Refer to section 5.2.
   ___a. For 60Hz models, install pump fuses.
   ___b. For 50Hz models, remove locking mechanism from circuit breakers and place the circuit breaker switch to the "ON" position.
10. Make sure that all piping has proper insulation.

# 4 LIEBERT ICOM CONTROL—FIRMWARE VERSION XP1.00.010.STD

## 4.1 Liebert iCOM Components and Functions

The Liebert iCOM controller layout is shown in Figure 4.1  below; the keyboard functions are defined in Table 4.1  on the next page.

**Figure 4.1  Liebert iCOM display components**
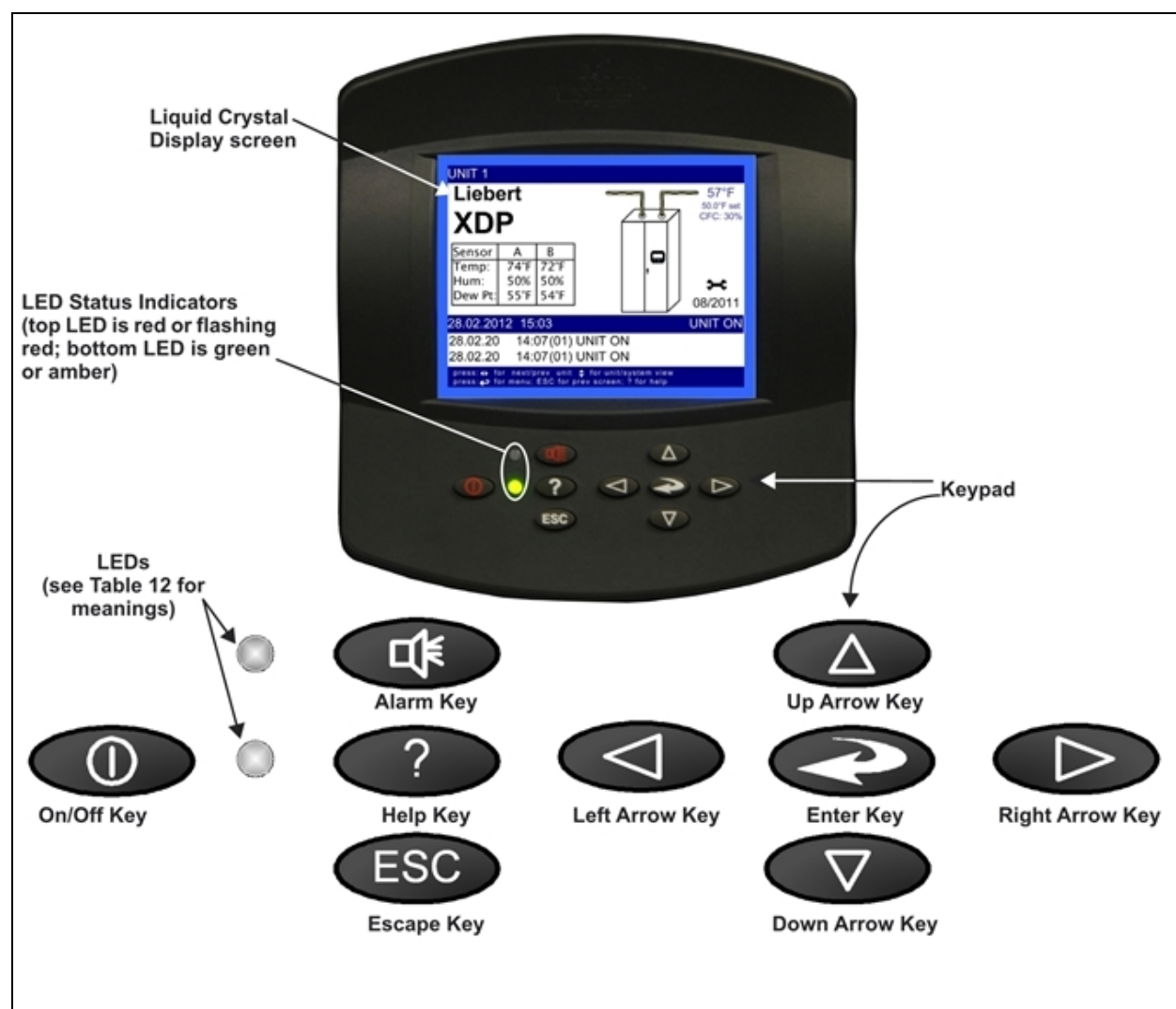
## Table 4.1
Keyboard icons and functions
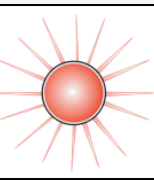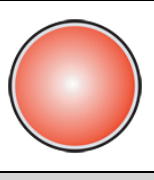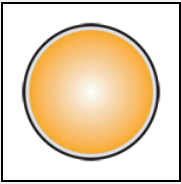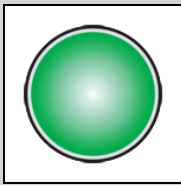
| Icon | Key Name | Function |
|---|---|---|
|  | On/Off Key | Controls the operational state of the cooling unit. |
|  | Alarm Key | Silences an alarm. |
|  | Help Key | Accesses integrated Help menus. |
|  | ESCape Key | Returns to the previous display view. |
|  | Enter Key | Confirms all selections and selects icons or text. |
|  | Increase Key (Up Arrow) | Moves upward in a menu or increases the value of a selected parameter. |
|  | Decrease Key (Down Arrow) | Moves downward in a menu or reduces the value of a selected parameter. |
|  | Left and Right Arrow Keys | Navigates through text and sections of the display. |
|  | Upper LED | Blinking Red—Active, unacknowledged alarm exists |
|  | | Solid Red—Active, acknowledged alarm exists |

Table 4.1 Keyboard icons and functions (continued)

| Icon | Key Name | Function |
|------|----------|----------|
|  | Lower LED | Amber—Power is available to the unit; unit is NOT operating |
|  | | Green—Unit is operating with no alarms |

## 4.2 Display Lamp Indicators

- The Green lamp will be On only when the Liebert XDP is On and running with no alarms.
- The Red lamp will be On if the unit is On and running with an active alarm, or if the unit is shut down because of an alarm.
- The Red lamp will flash while an alarm is being annunciated. The Red lamp will stop flashing and the beeper in the display will stop beeping when the ALARM SILENCE / ? key is pressed.
- The Amber lamp will be On if the Liebert XDP has been shut down at the I/O switch or if the unit has been shut down by an alarm condition.

## 4.3 Navigating Through the Liebert iCOM Display

Liebert iCOM displays icons and text for monitoring and controlling your Liebert cooling unit. The Liebert iCOM's home screen is shown in Figure 4.2 on the next page.

**Figure 4.2   Liebert iCOM default home screen**
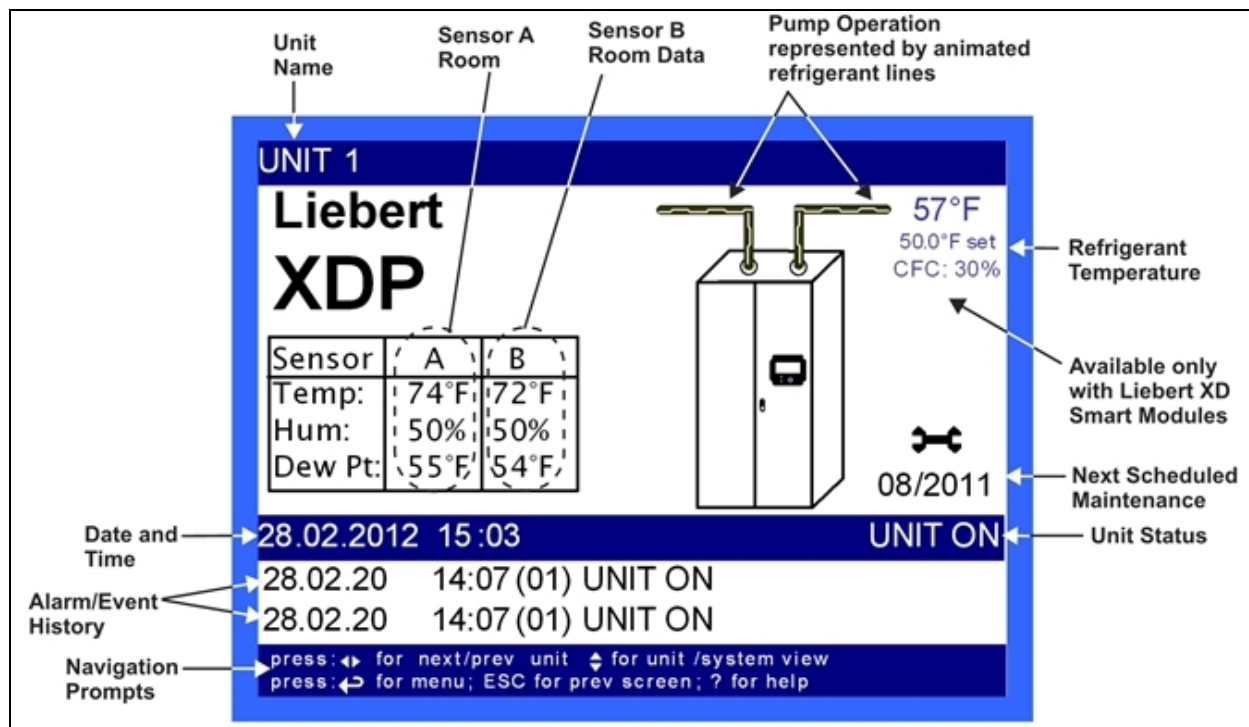


## 4.3.1   Accessing Menus and Settings

### Viewing Data

No password is required to view data or settings.

To view data:

1.  From the home screen, press the **Enter** key to view the User Menu (see  on page 42).
2.  Press **Enter** again to highlight the first icon.
3.  Use the keyboard's arrow keys to move to the icon for the data you wish to view.
4.  Once that icon is highlighted, press **Enter** again to open that menu.
    - If a password is required, see Entering the Password on the facing page.
    - If a menu has more than one screen, the Liebert iCOM display will have text at the top similar to this: *(page 1 of 2)*.
5.  Press **Enter** to select the first line of data.
6.  Use the **Up** and **Down** arrow keys to scroll to the desired data point.
7.  Press **ESC** to move back to higher level menus.

## 4.3.2   Cooling Module Overview

The Liebert iCOM will display an overview of all connected cooling modules. It does not display a system view, which would include units other than the cooling modules.

**NOTE: The Liebert iCOM control screens display a setting to select a system view, but the Liebert XDP does not support a system view.**

To display an overview of all connected cooling modules:

1. At the default home screen on the Liebert iCOM, press the down arrow. This will display the first 10 modules' outlet temperature and capacity levels. Press ESC to return to the unit view.

**Figure 4.3   Cooling module overview, first 10 modules**
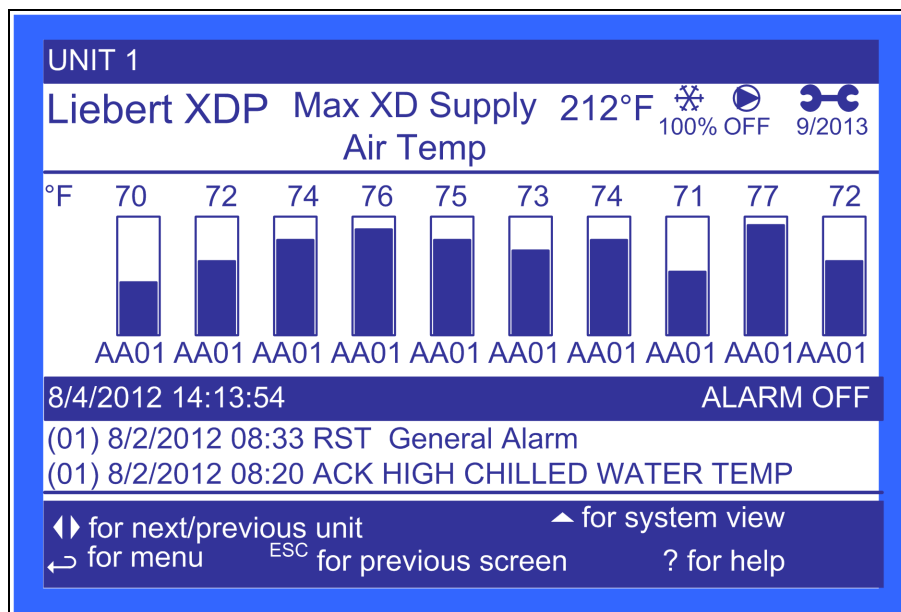


2. Press the down arrow button again to display the next 10 modules' outlet temperature and capacity levels.
3. Press ESC to return to the default home screen.

### 4.3.3  Entering the Password

Most settings in the Liebert iCOM are protected by a factory-set password, 1490. To enter the password:

1. From the home screen, press the **Enter** key to view the User Menu (see  on page 42).
2. Press **Enter** again to highlight the first icon.
3. Use the keyboard's arrow keys to move to the icon for the data you wish to change.
4. Once that icon is highlighted, press **Enter** again to open that menu.
5. Press **Enter** to highlight the Password line.
6. With the Password line highlighted, press **Enter** to highlight the first digit in the password
7. Enter the password, 1490.

   Use the **Up** and **Down** arrow keys to select a numeral for the first digit of the password.

   Move to the next digit of the password with the **Right** arrow key.

   Select the numerals for all four digits with the same process.

8. After all four digits of the password have been entered, press the **Enter** key.

**NOTE: Do not press the ESC key or the Liebert iCOM will move to the previous screen and the password must be re-entered before changes may be made.**

Figure 4.4   Entering the password
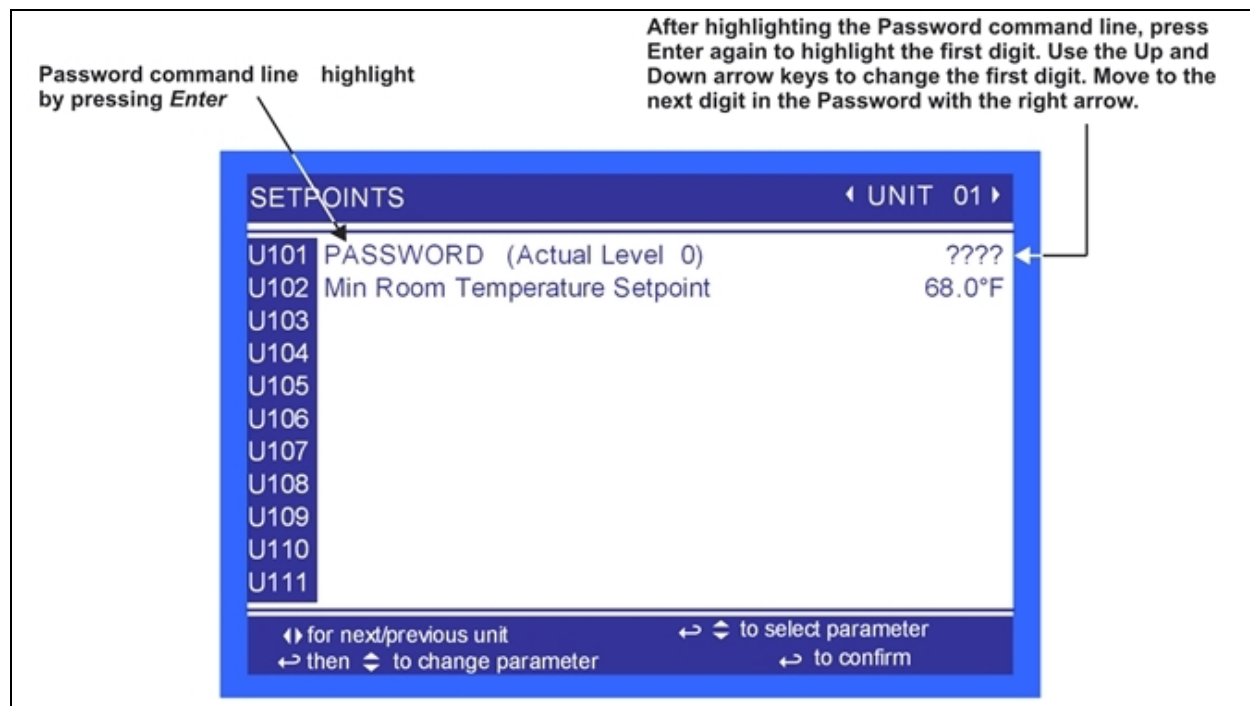


## 4.4  Changing Liebert iCOM's Display Settings

No password is required to change the way Liebert iCOM displays data. The Display Setup controls how the unit shows data, such as temperature, date and time.

To change the display settings:

1.  From the home screen, press the **Enter** key to view the User Menu (see  on page 42).
2.  Press **Enter** again to highlight the first icon.
3.  Use the keyboard's arrow keys to move to the Display Setup icon.
4.  Once that icon is highlighted, press **Enter** again to open that menu.
5.  Press the **Enter** key to select the first setting.

    Either change that setting or navigate to another setting with the **Up** and **Down** arrow keys.

6.  Once the desired setting is highlighted, press the **Enter** key to access that parameter's display setting options.
7.  Use the **Up** and **Down** arrow keys to make changes.
8.  Press the **Enter** key to accept the changes.
9.  Press the **ESC** key twice to return to Liebert iCOM's user menu.

**Figure 4.5  Display setup screen**
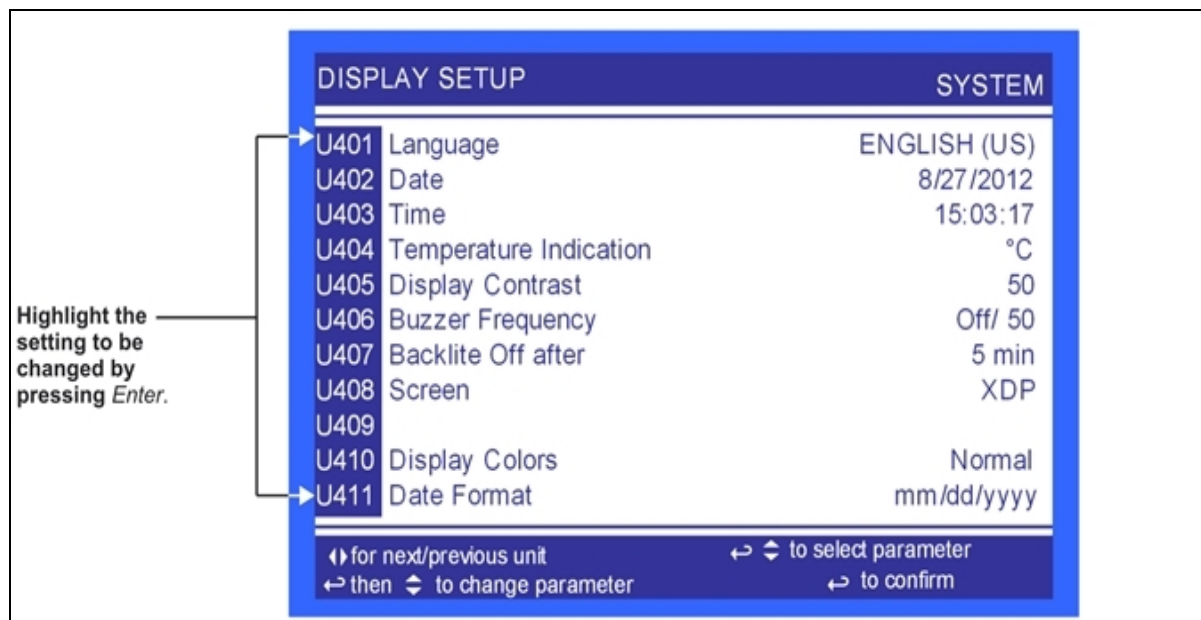


## 4.5  Changing Operational Settings

Changes to the Liebert XDP's operation settings in the **Set Alarms** and **Setpoints** menus require a password.

1. From the home screen, press the **Enter** key to view the User Menu (see  on the next page).
2. Press **Enter** again to highlight the first icon.
3. Use the keyboard's arrow keys to move to the icon for the data you wish to change.
4. Once that icon is highlighted, press **Enter** again to open that menu.

   If a password is required, see Entering the Password on page 39.

5. After entering the password, use the **Up** and **Down** arrow keys to scroll to and highlight the operational setting to be changed.
6. Press **Enter** to highlight the values for that setting.
7. Use the **Up** and **Down** arrow keys to change the value.
8. Press **Enter** to accept the change. (The value will no longer be highlighted.)
9. Press **ESC** to deselect the operational setting. (The setting will no longer be highlighted.)
10. Press **ESC** again to move to previous screens.

## 4.6  Graphical Data Record

The Graphical Data Record charts the average temperature from Sensors A and B and the supply refrigerant temperature.
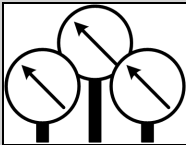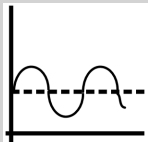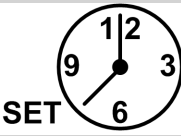
The temperature scales can be changed to expand or compress the data.

The time scale also can be altered to any of several selectable values.

NOTE: Changing the time scale eliminates all previous graphical data and the unit will begin recording new data.

## 4.7 Liebert iCOM User Menu Icons and Legend

Table 4.2  Liebert iCOM User Menu Icons Descriptions

| item | description | item | description |
|---|---|---|---|
| °C / °F % RH SET | Setpoints - View and change operational setpoints | SET ALARMS | Set Alarms - Allows user to change settings for alarms |
| (spare parts list icon) | Spare Parts List - Contains spare parts available on site | (sensor data icon) | Sensor Data - Shows readings of sensors; View Only |
| EVENT LOG | Event Log - Lists last 400 events and alarms. View Only | ⚠ ACTIVE ALARMS | Active Alarms - Lists all current alarms; View Only |
| (graphic data record icon) | Graphic Data Record - Displays average temperature from Sensors A and B, the average dewpoint from Sensors A and B, the supply refrigerant temperature and the supply refrigerant control point graphs; Data is View Only; Display scale is adjustable | SET (clock icon) | Display Setup - Change settings for display: language and time |
| (binoculars icon) | View Network - Shows status of all connected units; View Only | 1234h | Total Run Hours - Records the run time of all components and allows setting of limits on run time; View Only |
| XDIO | XDIO - Displays readings for the individual smart modules; View Only | (service contacts icon) | Service Contacts - Contains key contact information for service |

NOTE: Menu shows icons only; text is explanatory and does not appear on the Liebert iCOM display.

**Figure 4.6   Liebert XDP User Menu screen**
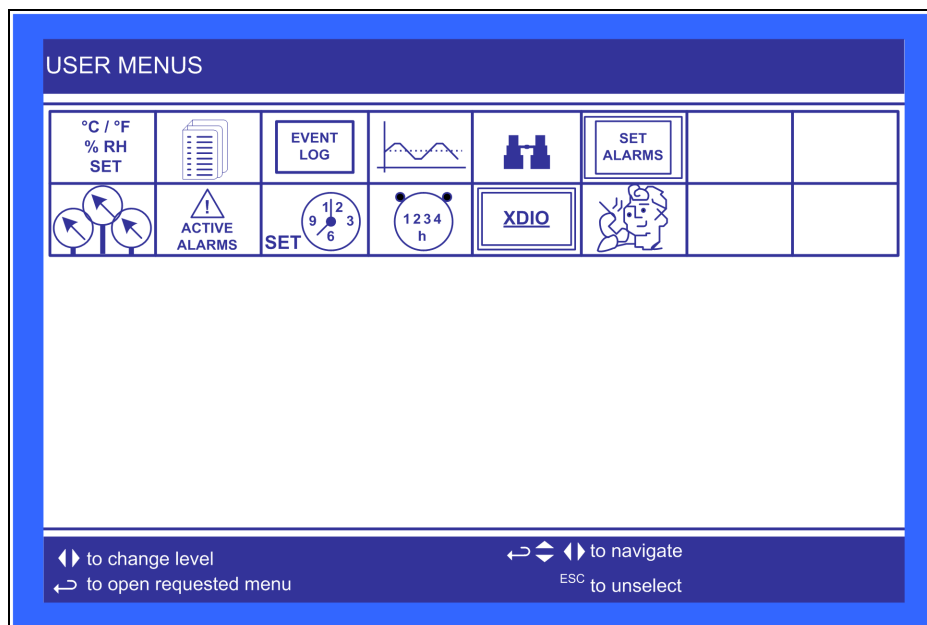


## 4.8  Liebert iCOM User Menu Screens

User menus report general cooling unit operations and status. User menu screens employ a coding that begins with "U" and is followed by parameters and information, such as settings. Gaining access to some User menu screens requires entering a password; the User Menu password is **1490**.

Check *www.VertivCo.com* for the latest Liebert iCOM user manual updates, SL-18835.

**Figure 4.7   Setpoints screen**
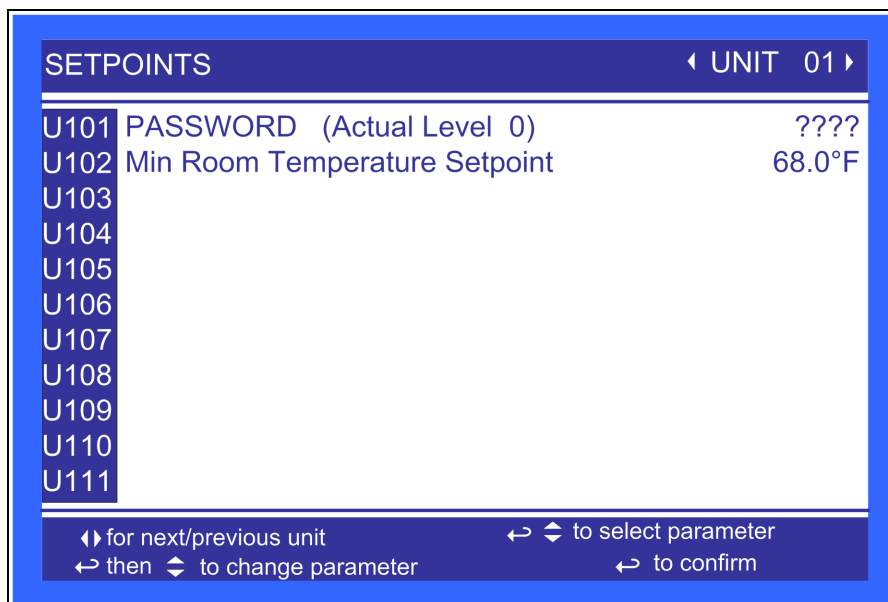
**Min Room Temperature Setpoint**—Sets the minimum room temperature the unit will attempt to maintain. If the temperature falls below this point, the unit will raise the refrigerant temperature to reduce the amount of cooling.

The setting is intended to keep the room temperature above the setpoint. Without a proper setpoint, the Liebert XDP can lower the room temperature too much, depending on the room dew point and load. This setpoint will reduce the cooling to keep the room temperature above this desired temperature.

**NOTE: This is not a true room temperature setpoint. The Liebert XDP has no heaters; it will try to cool as much as possible. If the Liebert XDP is able to cool the room to this setpoint, it will reduce its cooling action to try to keep the room temperature at or above this setpoint.**

The default setting is 60°F (15.6°C). The range is 50-80°F (10-27°C).

For optimal cooling performance, the minimum temperature setpoint should be at least 1-2° below the expected temperature at the remote sensors, which may affect placement of the remote sensors. If the minimum temperature setpoint is set above the typical remote temperature sensor reading, it will reduce the Liebert XD cooling output and, in extreme cases, cause erratic Liebert XD performance.

## Spare Parts

Spare Parts—The spare parts lists contains a detailed description and part number that can be used to order parts for the unit. These part numbers are specific to each model and option installed on the unit.

## Event Log

Event Log—The event log displays all events and actions that have been generated by the unit. When multiple units are networked you will see the event log of the whole system. Each event shows the unit that generated the alarm, time and date stamp, a description and the event type.

**Figure 4.8 Set Alarms screen**

```
SET ALARMS (page 1 of 1)                    ◄ UNIT   01 ►

U201  PASSWORD    (Actual Level  0)                ????
U202  High Room Air Temperature                  80.0°F
U203  Low Room Air Temperature                   55.0°F
U204  High Room Dewpoint                         65.0°F
U205  High Refrigerant Temperature               80.0°F
U206
U207  High Chilled Water Temperature             60.0°F
U208
U209
U210
U211

   ◄► for next/previous unit          ↵ ▲▼  to select parameter
   ↵ then ▲▼ to change parameter              ↵  to confirm
```
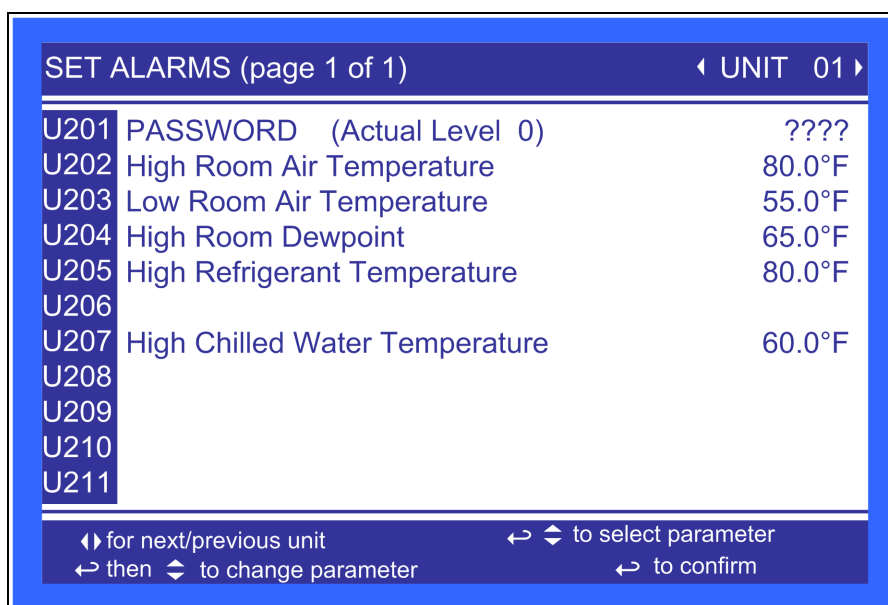
**High Room Air Temperature**—Sets the threshold where a high room temperature alarm will occur, based on the actual reading from either remote Sensor A or B. The range for the high room air temperature alarm is 33.8-95°F (1-35°C); the default is 80.0°F (26.7°C).
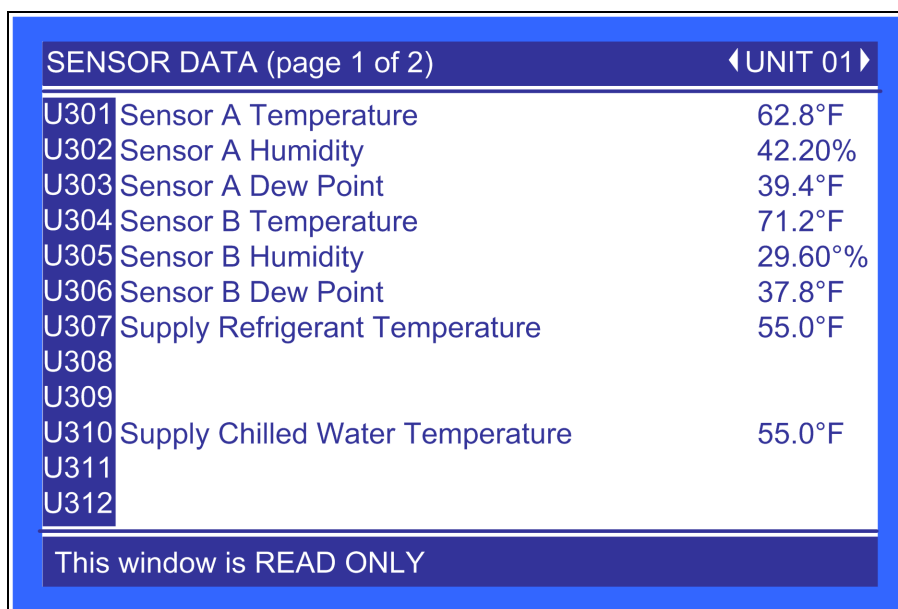
**Low Room Air Temperature**—Sets the threshold where a low room temperature alarm will occur, based on the actual reading from either remote Sensor A or B. The range for the high room air temperature alarm is from 33.8 to 95°F (1 to 35°C); the default is 55.0°F (12.8°C).

**High Room Dewpoint**—Sets the threshold where a high room dew point alarm will occur, based on the calculated values from either remote Sensor A or remote Sensor B. The range for the high room dew point alarm is from 33.8 to 95°F (1 to 35°C); the default is 65°F (18.3°C).

**High Refrigerant Temperature**—Sets the threshold where a high refrigerant temperature alarm will occur based on the actual reading from the supply refrigerant sensor. The supply refrigerant temperature is from the Liebert XDP to the modules. The range for the high supply refrigerant temperature alarm is from 33.8 to 95°F (1 to 35°C); the default is 80°F (26.7°C).

**High Chilled Water Temperature**—Sets the threshold where a high chilled water temperature alarm will occur based on the actual reading from the supply chilled water sensor. The range for the high chilled water temperature is from 33.8 to 95°F (1 to 35°C); the default is 60°F (15.6°C).

**Figure 4.9   Sensor Data screen, page 1 of 2**



**Sensor A Temperature**—Displays the temperature of the remote CAN Temp Humidity sensor designated as Sensor A.

**Sensor A Humidity**—Displays the humidity of the remote CAN Temp Humidity sensor designated as Sensor A.

**Sensor A Dew Point**—Displays the dew point of the remote CAN Temp Humidity sensor designated as Sensor A.

**Sensor B Temperature**—Displays the temperature of the remote CAN Temp Humidity sensor designated as Sensor B.
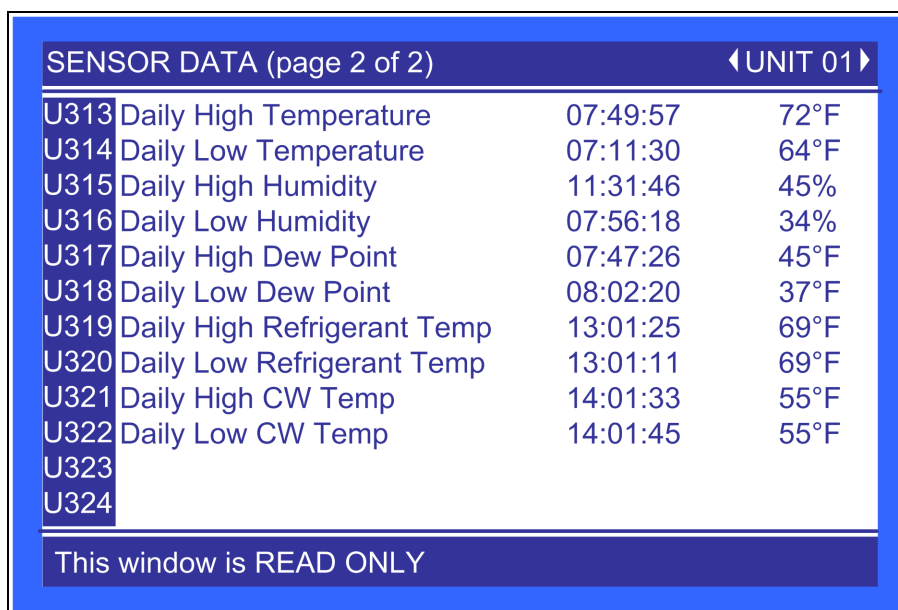
**Sensor B Humidity**—Displays the humidity of the remote CAN Temp Humidity sensor designated as Sensor B.

**Sensor B Dew Point**—Displays the dew point of the remote CAN Temp Humidity sensor designated as Sensor B.

**Supply Refrigerant Temperature**—Displays the actual supply refrigerant temperature from the Liebert XDP to the modules.

**Supply Chilled Water Temperature**—Displays the actual the Supply Chilled Water temperature to the Liebert XDP.

**Figure 4.10   Sensor Data screen, page 2 of 2**

| SENSOR DATA (page 2 of 2) | | ◀UNIT 01▶ |
|---|---|---|
| U313 Daily High Temperature | 07:49:57 | 72°F |
| U314 Daily Low Temperature | 07:11:30 | 64°F |
| U315 Daily High Humidity | 11:31:46 | 45% |
| U316 Daily Low Humidity | 07:56:18 | 34% |
| U317 Daily High Dew Point | 07:47:26 | 45°F |
| U318 Daily Low Dew Point | 08:02:20 | 37°F |
| U319 Daily High Refrigerant Temp | 13:01:25 | 69°F |
| U320 Daily Low Refrigerant Temp | 13:01:11 | 69°F |
| U321 Daily High CW Temp | 14:01:33 | 55°F |
| U322 Daily Low CW Temp | 14:01:45 | 55°F |
| U323 | | |
| U324 | | |
| This window is READ ONLY | | |

**Daily High Temperature**—Shows the highest temperature in a rolling 24 hour period for either remote Sensor A or remote Sensor B.

**Daily Low Temperature**—Shows the lowest temperature in a rolling 24 hour period for either remote Sensor A or remote Sensor B.

**Daily High Humidity**—Shows the highest humidity in a rolling 24 hour period for either remote Sensor A or remote Sensor B.

**Daily Low Humidity**—Shows the lowest humidity in a rolling 24 period for either remote Sensor A or remote Sensor B.

**Daily High Dew Point**—Shows the highest dew point in a rolling 24 hour period for either remote Sensor A or remote Sensor B.

**Daily Low Dew Point**—Shows the lowest dew point in a 24 hour period for either remote Sensor A or remote Sensor B.

**Daily High Refrigerant Temperature**—Shows the highest supply refrigerant temperature in a rolling 24 hour period from the Liebert XDP to the modules.

**Daily Low Refrigerant Temperature**—Shows the lowest supply refrigerant temperature in a rolling 24 hour period from the Liebert XDP to the modules.

**Daily High Chilled Water Temperature**—Shows the highest chilled water supply temperature being delivered to the Liebert XDP in a rolling 24 hour period.

**Daily Low Chilled Water Temperature**—Shows the lowest chilled water return temperature being delivered to the Liebert XDP in a rolling 24 hour period.

**Figure 4.11  Display Setup screen**



```
DISPLAY SETUP                              SYSTEM

U401  Language                         ENGLISH (US)
U402  Date                                8/27/2012
U403  Time                                 15:03:17
U404  Temperature Indication                     °F
U405  Display Contrast                           30
U406  Buzzer Frequency                      Off/ 50
U407  Backlite Off after                      5 min
U408  Screen                              Unit View
U409
U410  Display Colors                         Normal
U411  Date Format                        mm/dd/yyyy

  ◀▶ for next/previous unit          ↩ ▲▼  to select parameter
  ↩ then ▲▼  to change parameter        ↩  to confirm
```

**Language**—Sets the language on the display. Changing this setting changes all menu parameters to the selected language.

**Date**—Sets the internal date of the unit. If this unit is connected to other units with the unit-to-unit network connection, each unit will reflect the last date set.

**Time**—Sets the internal time of the unit. If this unit is connected to other units with the unit-to-unit network connection each unit will reflect the last time set.

**Temperature Indication**—Selects the actual and setpoint temperature scale. Selecting C will set the unit to display in Celsius and F will set the unit to display in Fahrenheit.

**Display Contrast**—Changes the contrast of the display to adjust for different viewing angles, low light and bright light conditions. As the display ages, the contrast may require adjustment for viewing.

**Buzzer Frequency**—Changes the audible noise frequency of the built-in buzzer. The buzzer will sound when its frequency is being adjusted, easing selection of a frequency easily detected when an alarm occurs.

**Backlite Off After**—Controls how long the back-light remains active when the display is unused. When the buttons on the front display have not been pressed for the time selected in this parameter, the back-light will turn Off, extending the life of the display and saving energy.

**Screen**—Controls the screen layout. The Liebert XDP has one view, Unit View.

**Display Colors**—Selects the background color. Inverted sets the display to show white font with blue background and Normal sets a white background with blue font.

**Date Format**—Date format changes the month, day and year arrangement shown on the front display and on event time stamps.

**Figure 4.12 Module Status screen, page 1 of 20**
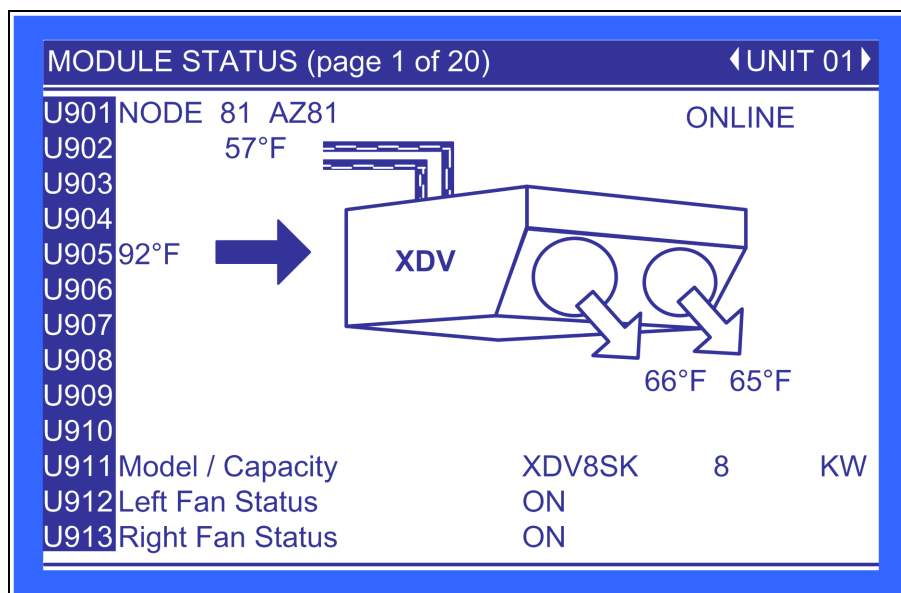


**Module Node ID**—The location within the CANbus. Each module's ID is factory-set to 80 and is automatically changed during setup; requires no user action.

**Module Labels**—A four-character label consisting of two letters and two numerals. This is the standard nomenclature for Data Center Grid assignment of racks. Additionally, the module's location can be denoted with 10 characters, either letters or non-alphanumeric characters from a built-in list. Either or both labels can be used and are entered using the Module Setup found in the Service menu (S910).

**Module Status**—Indicates whether the smart module is connected to the CANbus.

**Figure 4.13  Liebert XDV Smart Module Status screen**



```
MODULE STATUS (page 1 of 20)              ◀UNIT 01▶
U901 NODE  81  AZ81                    ONLINE
U902        57°F
U903
U904
U905 92°F         ➡        XDV
U906
U907
U908
U909                               66°F  65°F
U910
U911 Model / Capacity          XDV8SK      8      KW
U912 Left Fan Status           ON
U913 Right Fan Status          ON
```
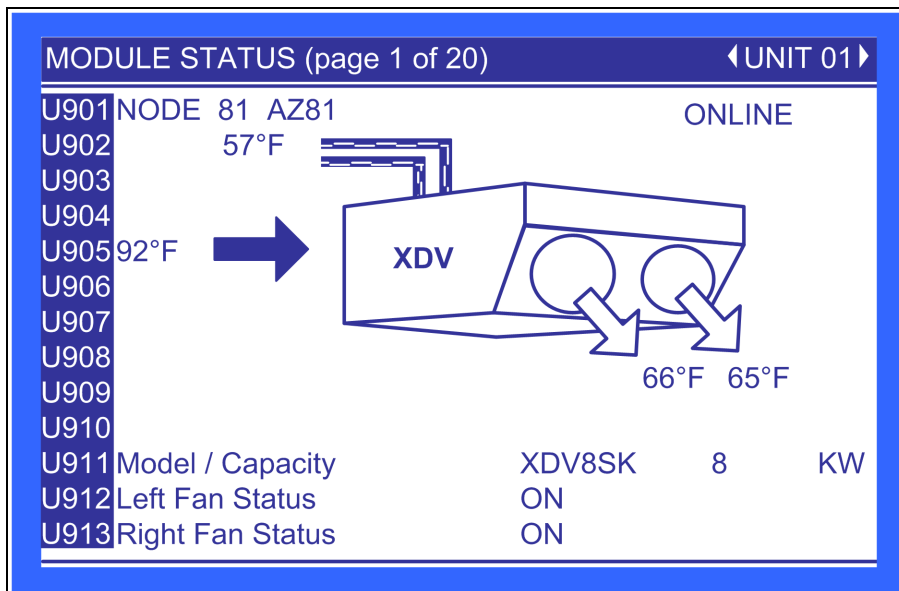
**U905**—Displays the temperature of the air entering the Liebert XDV.

**U908**—Displays the temperature of the air leaving the right and left fan of the Liebert XDV.

**U911**—Displays the module type and calculated local module capacity; possible module types are XDV8SK, XDV8SS, XDV8ST, XDV10SK, XDV10SS and XDV10ST.

**U912**—Displays the left fan status; possible values are ON and OFF.

**U913**—Displays the right fan status; possible values are ON, OFF and ON ECON. ON ECON indicates that only one fan is On.

**Figure 4.14  Liebert XDH Smart Module Status screen—each bank shown separately**



```
MODULE STATUS (page 1 of 20)              ◀UNIT 01▶
U901 NODE  82  AA82                    ONLINE
U902        57°F
U903
U904        98°F    ➡        XDH
U905                         TOP/
U906
U907        98°F    ➡        BOTTOM      ⇨   73°F
U908
U909
U910
U911 Model / Capacity          XDH32SK     15     KW
U912 Middle Fan Status         ON
U913 Top and Bottom Fan Status ON
```
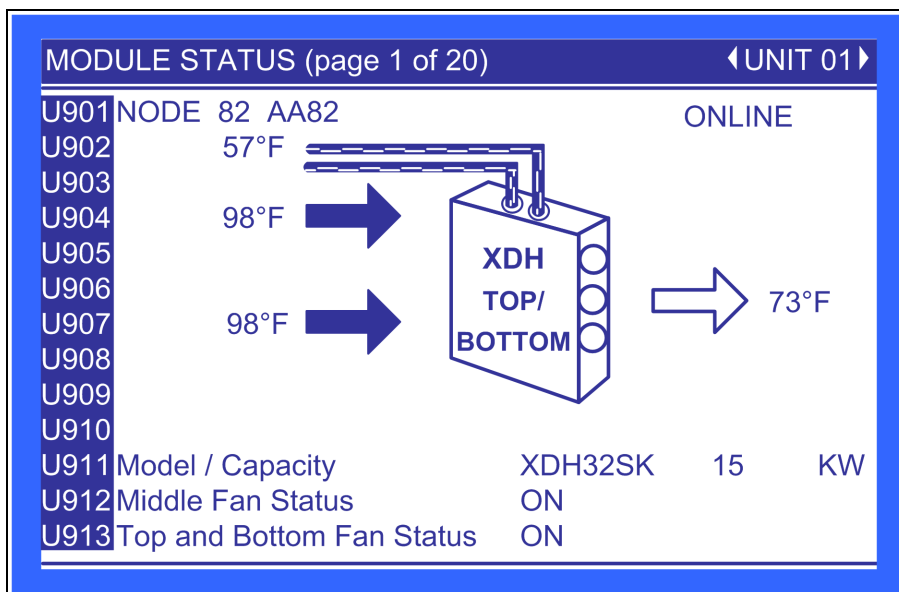
**U904**—Displays the temperature of the air entering the top of the bank of the Liebert XDH.

**U905**—Displays the temperature of the air leaving the Liebert XDH.

**U907**—Displays the temperature of the air entering the bottom of the bank of the Liebert XDH.

**U911**—Displays the module type and calculated local module capacity; possible module types are XDH20SK, XDH20SS, XDH32SK and XDH32SS.

**U912**—Displays the middle fan status; possible values are ON and OFF.

**U913**—Displays the top and bottom fans' status; possible values are ON, OFF and ON ECON. (ON ECON indicates that two fans have been turned On.)

**Figure 4.15  Liebert XDO Smart Module Status screen**
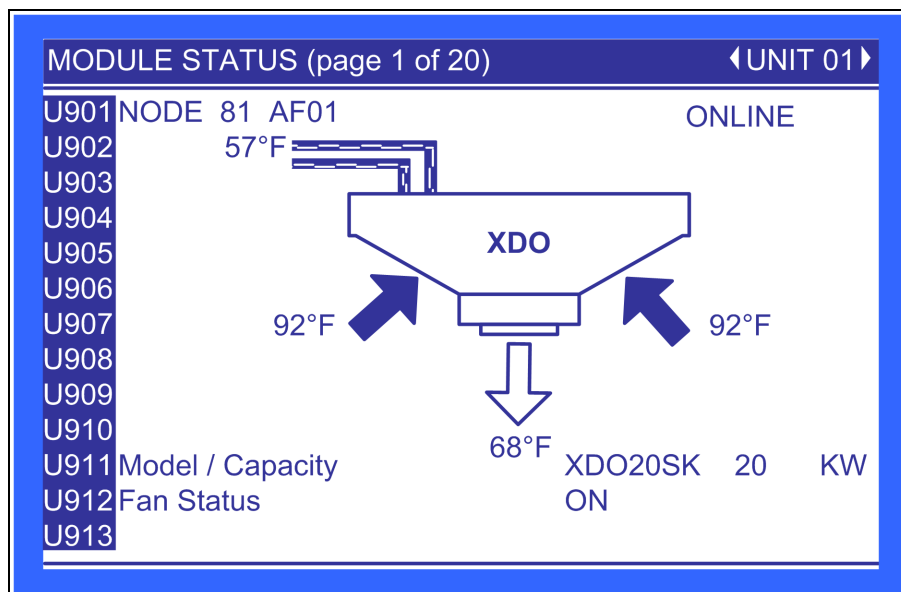


**U907**—Displays the temperature of the air entering from the right and left of the Liebert XDO.

**U910**—Displays the temperature of the air leaving the Liebert XDO.

**U911**—Displays the module type and calculated local module capacity; possible module types XDO16SK, XDO16SS and XDO20SS.

**U912**—Displays the fan status; possible values are ON and OFF.

**Figure 4.16   Total Run Hours screen**

```
┌─────────────────────────────────────────────────┐
│ TOTAL RUN HOURS                      ◀UNIT 01▶    │
│ ┌─────────────────────────────────────────────── │
│ │U501              Actual Hours           Limit   │
│ │U502 Pump 1           454                   0    │
│ │U503 Pump 2           413                   0    │
│ │U504                                             │
│ │U505                                             │
│ │U506                                             │
│ │U507                                             │
│ │U508                                             │
│ │U509                                             │
│ │U510                                             │
│ │U511                                             │
│ └─────────────────────────────────────────────── │
│   ◀▶ for next/previous unit    ↵ ⬍ to select parameter │
│   ↵ then  ⬍ to change parameter       ↵ to confirm     │
└─────────────────────────────────────────────────┘
```

The parameter shows the actual hours Pump 1 and Pump 2 have operated and the maximum time Pump 1 can operate before the next maintenance.

## 4.9 Liebert iCOM Service Menu Icons and Legend

Table 4.3   Liebert iCOM Service Menu Icons Descriptions

| Icon | description | icon | description |
|---|---|---|---|
| °C / °F<br>% RH<br>SET | Setpoints - View and change operational setpoints | (sensor calibration icon with +/-) | Sensor Calibration/Setup - Set up and calibrate sensors for site |
| (book and pencil icon) | Unit Diary - Shows all program changes and maintenance performed, | NETWORK | Network - Set up or alter network setting |
| +<br>WELLNESS | Maintenance/Wellness Settings - Shows all maintenance records, calculates next maintenance date | SET UP (setup icon) | Options Setup - Enter specific settings for various options |
| (wrench icon)<br>SERVICE | Diagnostics/Service Mode - Enter Diagnostics/Service Mode for troubleshooting and repair | XDIO | Smart Module - Setup of alarms and events. Set temperature limits for supply and return sensors. Label smart modules, view firmware version |
| SET ALARMS | Set Alarms - Change settings for alarms | (service contact icon) | Service Contacts - Contains key contact information for service |

NOTE: Menu shows icons only; text is explanatory and does not appear on the Liebert iCOM display.

**Figure 4.17   Liebert XDP Service Menu screen**
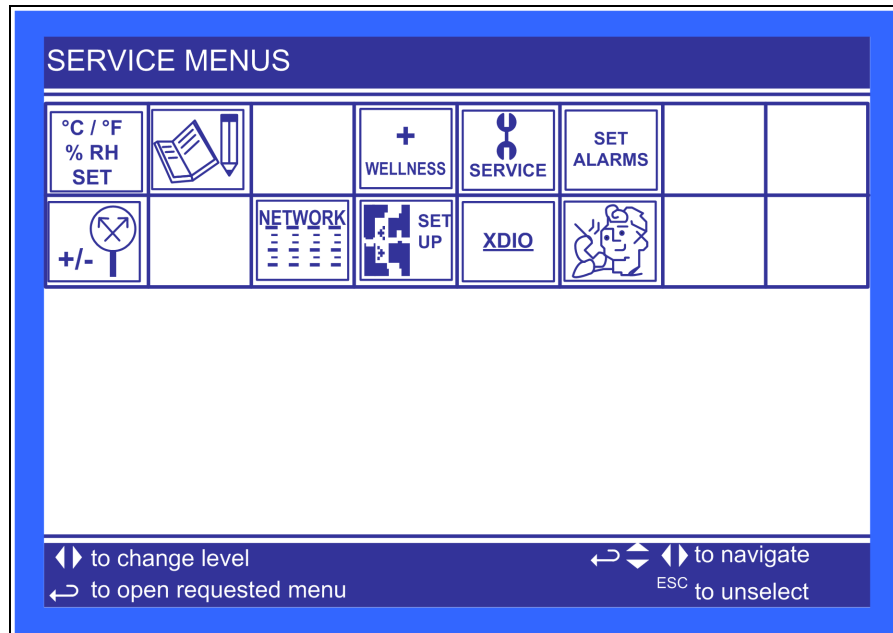


## 4.10  Liebert iCOM Service Menu Screens

Service menus allow customized settings for site operations. Service Menu screens employ a coding that begins with "S" and is followed by parameters and information, such as settings. Gaining access to most Service Menus requires entering a password; the Service Menu password is **5010**; see Entering the Password on page 39 for assistance.

The Liebert iCOM control firmware is being updated constantly. As a result, the Service Menu parameters in this manual may be slightly different from what is shown on a cooling unit's display. Check *www.VertivCo.com* for the latest Liebert iCOM user manual updates.

**Figure 4.18   Setpoints screen**

```
┌─────────────────────────────────────────────────────┐
│ SETPOINTS                            ◀UNIT 01▶        │
│ S101 PASSWORD   (Actual Level  0)            ????     │
│ S102 Min Room Temperature Setpoint         60.0°F     │
│ S103 Temperature  Control Type          Intelligent   │
│ S104 Temperature Proportional Band          7.0°F     │
│ S105 Temperature Integration Tiime            min     │
│ S106 Temperature Derivative                   sec     │
│ S107 Dewpoint Margin                        4.0°F     │
│ S108 Minimum Control Point                 50.0°F     │
│ S109 Min Percent Cooling Setpoint            10%      │
│ S110                                                  │
│ S111                                                  │
│                                                       │
│ ◀▶ for next/previous unit      ↵ ▲▼ to select parameter│
│ ↵ then   ▲▼ to change parameter     ↵ to confirm      │
└─────────────────────────────────────────────────────┘
```

**Min Room Temperature Setpoint**—Sets the minimum room temperature the unit will attempt to maintain. If the temperature falls below this point, the unit will raise the refrigerant temperature to reduce the amount of cooling. Adjustable from 50 to 80°F (10.0 to 26.7°C), the factory default setting is 60°F (15.6°C).

**NOTE: This is not a true room temperature setpoint. The Liebert XDP has no heaters; it will try to cool as much as possible. If the Liebert XDP is able to cool the room to this setpoint, it will reduce its cooling action to try to keep the room temperature at or above this setpoint.**

For optimal cooling performance, the minimum temperature setpoint should be 1-2° below the expected temperature at the remote sensors, which may affect placement of the remote sensors. If the minimum temperature setpoint is set above the typical remote temperature sensor reading, it will reduce the Liebert XD cooling output and, in extreme cases, cause erratic Liebert XD performance.

**Temperature Control Type**—Selects the type of control the system will use to activate cooling. The Liebert iCOM control has three temperature control types: Proportional, PI and Intelligent. The factory default is Intelligent.

> **Proportional**—If Proportional Control is selected, the percent cooling requirement is determined by the difference between the air temperature sensor reading and the temperature setpoint. As the air temperature rises above the temperature setpoint, the percent cooling required increases proportionally (from 0 to 100%) over half the programmable temperature proportional band. The percent heating requirement (0 to 100%) is determined the same way when the air temperature falls below the setpoint.

> **PI**—If PI Control is selected, the percent cooling requirement is calculated by adding together two individual terms, proportional and integral. The proportional term is calculated in a manner similar to the previously described Proportional control. The integral term (sometimes called reset action) is calculated by measuring how much and for how long the air temperature has been above or below the setpoint. If the actual air temperature is above the setpoint, the percent requirement is slowly but continuously increased until the total is sufficient to bring the return room air back to the setpoint.

**Intelligent**—If Intelligent Control is selected, the air temperature is controlled at or near the setpoint. The percent temperature adjustment required is calculated based on logic that is programmed into the control. These rules simulate the actions that would be taken by a human operator manually controlling the system.

**Temperature Proportional Band**—Adjusts the activation points of compressors or rate of change based on the actual sensor values deviation from setpoint. The smaller this number the faster the compressors and valve(s) will increase capacity. Too small of a number may cause the unit to short cycle the compressors or excessively reposition the valve. This parameter is adjustable from 1.8 to 54.0°F (1.0 to 30.0°C). The factory default setting is 7.0°F (3.9°C).

**Temperature Integration Time**—Temperature integration takes into consideration the amount of time the actual temperature has deviated from the setpoint. The larger this deviation is the longer the unit will wait before corrective action is taken to achieve the setpoint. This parameter is adjustable from 0 to 15 minutes. The factory default is 0.

**Temperature Derivative Time**—Monitors the rate of change and will reduce or increase the amount of corrective action based on the actual temperature increasing or decreasing toward the temperature setpoint. This parameter is adjustable from 0-900 seconds. The factory default is 0.

**Dewpoint Margin**—Selects the difference between the room dew point and the refrigerant temperature control point. This parameter is adjustable from 4.0 to 10.0°F (2.2 to 6.0°C). The factory default setting is 4.0°F (2.2°C).

**Minimum Control Point**—Sets the minimum supply refrigerant temperature the Liebert XDP will maintain. This parameter is adjustable from 40 to 80°F (4.4 to 27.0°C). The factory default is 55°F (12.8°C).

**Min Percent Cooling Setpoint**—Selects the lowest percent call for cooling during normal operations. Whenever the unit is not in startup mode or OFF, the percent call for cooling cannot go below this value. The parameter is adjustable from 5 to 30%. The factory default is 15%.

**Figure 4.19   Maintenance—Basic Settings screen, page 1 of 7**

**Maintenance Frequency Per Year**—Sets the number of expected maintenance visits in a one year time span.

**Max Bonus**—Increases the time until the next required maintenance. Service personnel should assign a bonus when a service visit finds all components working optimally.

**Max Penalty**—Decreases the time until the next maintenance cycle. Service personnel should assign a penalty when a service visit finds excessive wear on components.
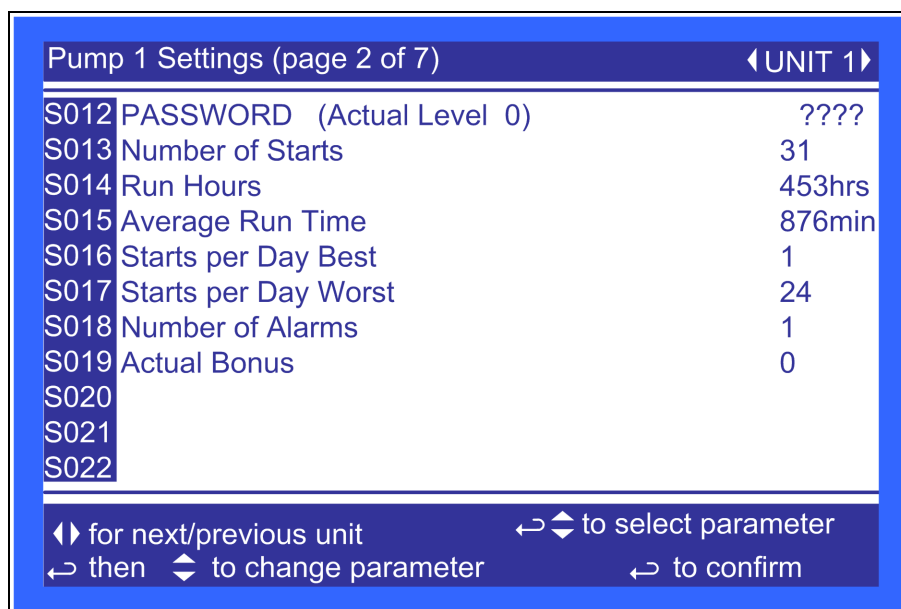
**Last Maintenance**—Date set during the service call. It also indicates to other service personnel the date of the last visit.

**Service Engineer**—Provides a label for the service representative to list either the company name or representative's name.

**Confirm PM**—Confirms that the service representative has completed the preventive maintenance and resets the next maintenance date.

**Calculated Next Maintenance**—Provides a date to for the next expected maintenance based on the last preventive maintenance performed (Confirm PM), component starts, run hours and the penalty or bonus set in the Liebert iCOM control.

Figure 4.20   Maintenance—Pump 1 Settings screen, page 2 of 7



Number of Starts—Shows the number of starts for the unit's Pump 1.

Run Hours—Shows the number of run hours for the unit's Pump 1.

Average Run Time—Shows the average run time of the unit's Pump 1.

Starts per Day Best—Displays the lowest number of starts in a rolling 24 hour period for Pump 1.

**Starts per Day Worst**—Displays the highest number of starts in a rolling 24 hour period for Pump 1.

Number of Alarms—Displays the number of alarms that have occurred with the unit's Pump 1.

**Actual Bonus**—Displays the actual calculation of wellness for the unit's Pump 1. The unit will always take the value from the worst component for the next maintenance indication.

Figure 4.21   Maintenance—Pump 2 Settings screen, page 3 of 7

```
┌─────────────────────────────────────────────────────────┐
│ Pump 2 Settings (page 3 of 7)               ◀UNIT 1▶     │
│ ─────────────────────────────────────────────────────── │
│ S023 PASSWORD   (Actual Level  0)              ????      │
│ S024 Number of Starts                          2         │
│ S025 Run Hours                                 0hrs      │
│ S026 Average Run Time                          0min      │
│ S027 Starts per Day Best                       1         │
│ S028 Starts per Day Worst                      24        │
│ S029 Number of Alarms                          1         │
│ S030 Actual Bonus                              0         │
│ S031                                                     │
│ S032                                                     │
│ S033                                                     │
│ ─────────────────────────────────────────────────────── │
│ ◀▶ for next/previous unit        ↩▲▼ to select parameter │
│ ↩ then  ▲▼ to change parameter        ↩ to confirm       │
└─────────────────────────────────────────────────────────┘
```

**Number of Starts**—Shows the number of starts for the unit's Pump 2.

**Run Hours**—Shows the number of run hours for the unit's Pump 2.

**Average Run Time**—Shows the average run time of the unit's Pump 2.

**Starts per Day Best**—Displays the lowest number of starts in a rolling 24 hour period for Pump 2.

**Starts per Day Worst**—Displays the highest number of starts in a rolling 24 hour period for Pump 2.

**Number of Alarms**—Displays the number of alarms that have occurred with the unit's Pump 2

**Actual Bonus**—Displays the actual calculation of wellness for the unit's Pump 2. The unit will always take the value from the worst component for the next maintenance indication.

**Figure 4.22   Maintenance screens, pages 4 through 7**
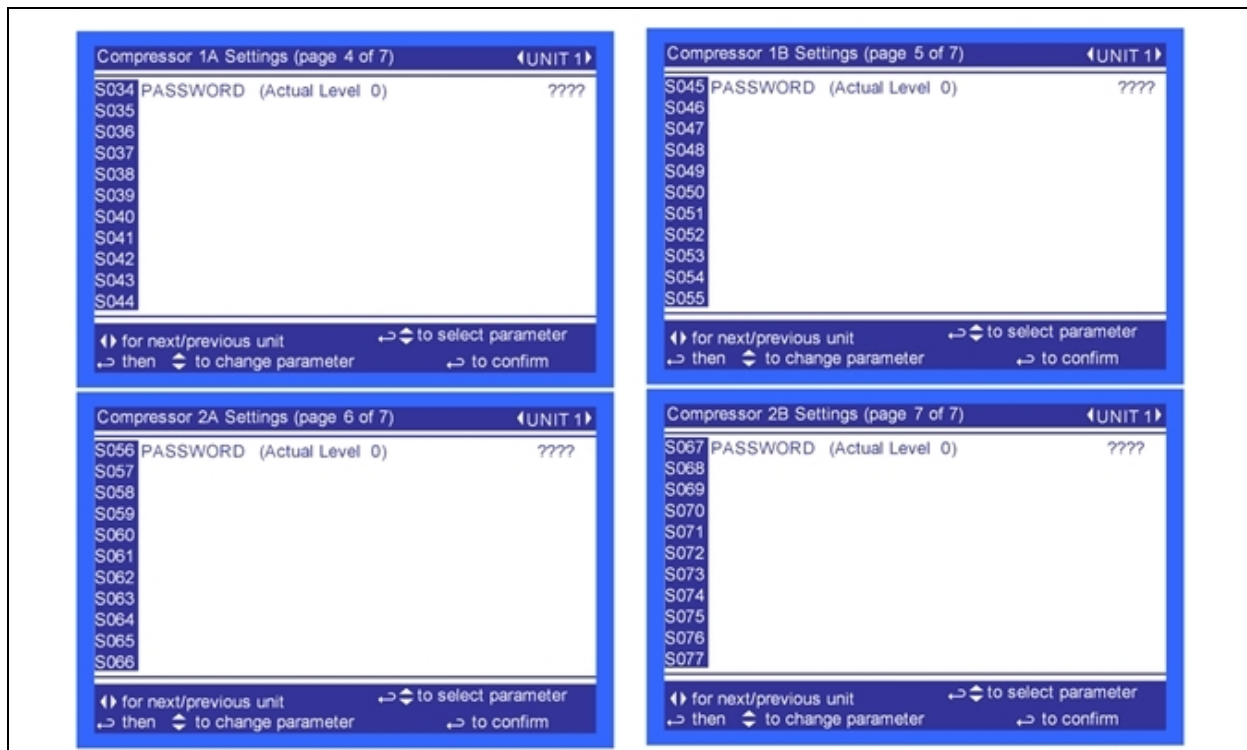


Pages 4 through 7 apply only to the Liebert XDC. No Liebert XDP parameters are present.

**Figure 4.23   Diagnostics/Service Mode screen, page 1 of 6**
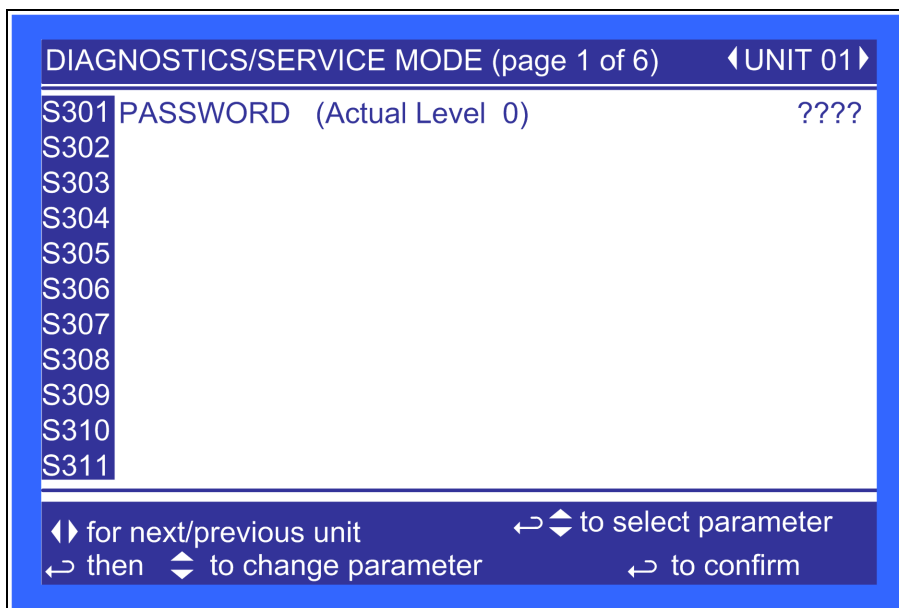


Page 1 applies to the Liebert XDC only. No Liebert XDP parameters are present.

**Figure 4.24   Diagnostics/Service Mode screen, page 2 of 6**

```
┌─────────────────────────────────────────────────────────┐
│ DIAGNOSTICS/SERVICE MODE (page 2 of 6)      ◀UNIT 01▶    │
│ S312 PASSWORD   (Actual Level  0)                  ????  │
│ S313 Manual Mode                                     No  │
│ S314 Pump 1                                         Off  │
│ S315 Pump 2                                         Off  │
│ S316                                                     │
│ S317 3P Start Completed/Active                   No No   │
│ S318 3P Actuator Input Request                  30.00%   │
│ S319 3P Actuator Position                          30%   │
│ S320 3P Actuator Open                              Off   │
│ S321 3P Actuator Close                             Off   │
│ S322 Valve Feedback                                30%   │
│                                                          │
│ ◀▶ for next/previous unit      ↵⬍ to select parameter    │
│ ↵ then  ⬍ to change parameter        ↵ to confirm        │
└─────────────────────────────────────────────────────────┘
```

**Manual Mode**—Used to place the Liebert iCOM control in manual mode. This is the initial setting necessary to activate any of the following items. When the Liebert iCOM is not in manual mode, each service menu item shows the current status of each parameter.

**Pump 1**—Starts the unit's Pump 1.

**Pump 2**—Starts the unit's Pump 2.

**3P Start Active/Complete**—Displays if the startup routine is active, and if it is completed.

**3P Actuator Input Request**—Shows the % call for cooling.

**3P Actuator Position**—Sets the position of the actuator 0-100% in manual mode.

**3P Actuator Open**—Opens the 3P actuator when set to ON in manual mode.

**3P Actuator Close**—Closes the 3P actuator when set to ON in manual mode

**Valve Feedback**—Opens the valve % in manual mode.

**Figure 4.25   Diagnostics/Service Mode screen, page 3 of 6**

```
┌────────────────────────────────────────────────────────────┐
│ DIAGNOSTICS/SERVICE MODE (page 3 of 6)      ◀UNIT 01▶        │
│ S323 PASSWORD   (Actual Level  0)                    ????    │
│ S324                                                         │
│ S325                                                         │
│ S326                                                         │
│ S327                                                         │
│ S328                                                         │
│ S329                                                         │
│ S330                                                         │
│ S331                                                         │
│ S332                                                         │
│ S333                                                         │
│                                                              │
│ ◀▶ for next/previous unit       ↵▲▼ to select parameter     │
│ ↵  then  ▲▼ to change parameter      ↵ to confirm           │
└────────────────────────────────────────────────────────────┘
```
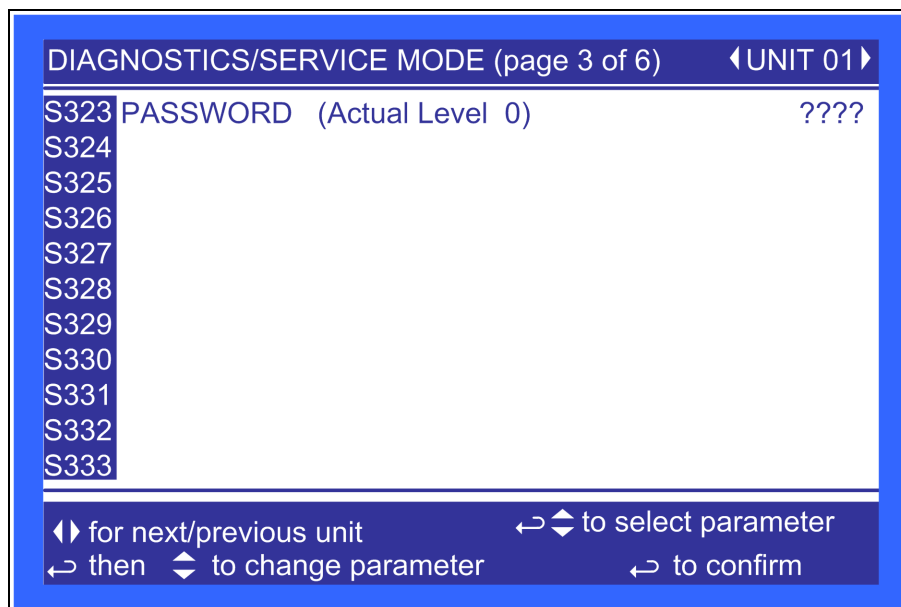
Page 3 applies to the Liebert XDC only. No Liebert XDP parameters are present.

**Figure 4.26   Diagnostics/Service Mode screen, page 4 of 6**

```
┌────────────────────────────────────────────────────────────┐
│ DIAGNOSTICS/SERVICE MODE (page 4 of 6)      ◀UNIT 01▶        │
│ S334 PASSWORD   (Actual Level  0)                    ????    │
│ S335                                                         │
│ S336                                                         │
│ S337 Manual Mode Control Type                        Full    │
│ S338 Manual Deviation                                12%     │
│ S339 Analog Output Ramp 1                            30%     │
│ S340 Analog Output Ramp 2                            0%      │
│ S341 Analog Output Ramp 3                            60%     │
│ S342 Analog Output Ramp 4                            58%     │
│ S343 Alarm Relay                                     Off     │
│ S344 Warning Relay                                   Off     │
│                                                              │
│ ◀▶ for next/previous unit       ↵▲▼ to select parameter     │
│ ↵  then  ▲▼ to change parameter      ↵ to confirm           │
└────────────────────────────────────────────────────────────┘
```

**Manual Mode Control Type**—Not currently used.

**Manual Deviation**—Not currently used.

**Analog Output Ramp 1**—Sets the value of Analog Output 1 value as a percentage. The factory default for the Liebert XDP is the Valve % Open.

**Analog Output Ramp 2**—Sets the value of Analog Output 2 value as a percentage. The factory default for the Liebert XDP is the Call for Cooling.

**Analog Output Ramp 3**—Sets the value of Analog Output 3 value as a percentage. The factory default for the Liebert XDP is the CW Temp.

**Analog Output Ramp 4**—Sets the value of Analog Output 4 value as a percentage. The factory default for the Liebert XDP is the refrigerant temperature.

**Alarm Relay**—Used to activate the Liebert iCOM's common alarm relay output.

**Warning Relay**—Used to activate the Liebert iCOM's warning relay output.

**Figure 4.27   Diagnostics/Service Mode screen, page 5 of 6**



**Status Remote Shutdown**—Displays the status of the unit's remote shutdown input.

**Status Fan Failure**—Displays the status of the dry contact to communicate fan failure at a module. (The dry contacts are not used to communicate a fan failure alarm when using CANbus.)

**Status Diff Press Switch 1**—Displays the status of the differential pressure switch.

**Status Customer Input 1**—Displays the status of the customer input 1 alarm.

**Status Condensation Detect**—Displays the status of the dry contact to communicate condensate detection at a module.

**Status Unit Ready**—Shows unit status when a secondary device, such as a fire detection system, is employed.

**Figure 4.28   Diagnostics/Service Mode screen, page 6 of 6**

```
┌─────────────────────────────────────────────────────────────┐
│ DIAGNOSTICS/SERVICE MODE (page 6 of 6)      ◀UNIT 01▶         │
│ S356 PASSWORD   (Actual Level  0)                   ????      │
│ S357                                                          │
│ S358                                                          │
│ S359                                                          │
│ S360                                                          │
│ S361                                                          │
│ S362                                                          │
│ S363                                                          │
│ S364                                                          │
│ S365                                                          │
│ S366                                                          │
│                                                               │
│  ◀▶ for next/previous unit        ↩▲▼ to select parameter    │
│  ↩ then   ▲▼ to change parameter       ↩ to confirm          │
└─────────────────────────────────────────────────────────────┘
```
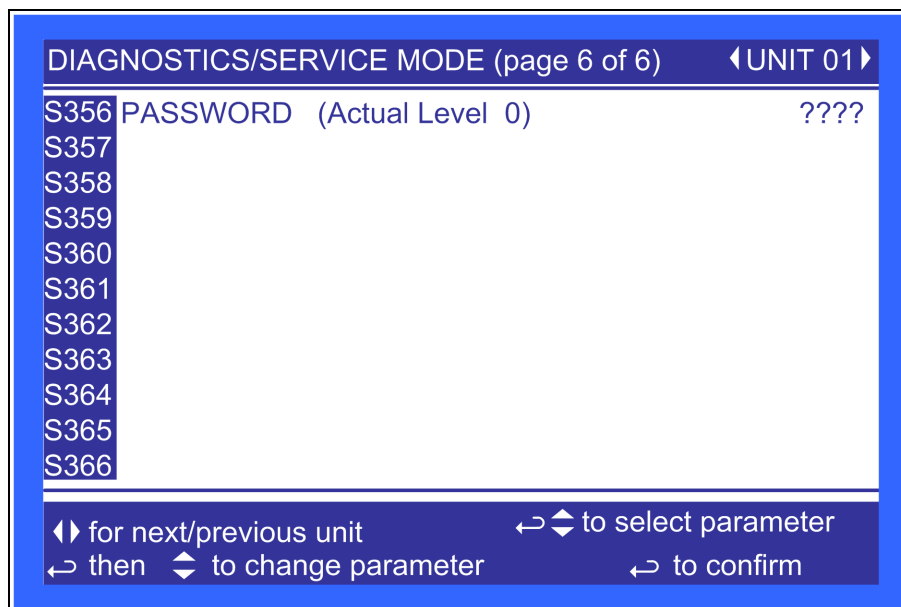
Page 6 applies to the Liebert XDC only. No Liebert XDP parameters are present.

**Figure 4.29   Set Alarms screen, page 1 of 7**

```
┌─────────────────────────────────────────────────────────────┐
│ SET ALARMS (page 1 of 7)                    ◀UNIT 01▶         │
│ S201 PASSWORD   (Actual Level  0)                   ????      │
│ S202 High Room Air Temperature                    88.0°F     │
│ S203 Low Room Air Temperature                     55.0°F     │
│ S204 High Room Dewpoint                           65.0°F     │
│ S205 High Refrigerant Temperature                 80.0°F     │
│ S206                                                          │
│ S207 High Chilled Water Temperature               60.0°F     │
│ S208                                                          │
│ S209                                                          │
│ S210                                                          │
│ S211                                                          │
│                                                               │
│  ◀▶ for next/previous unit        ↩▲▼ to select parameter    │
│  ↩ then   ▲▼ to change parameter       ↩ to confirm          │
└─────────────────────────────────────────────────────────────┘
```
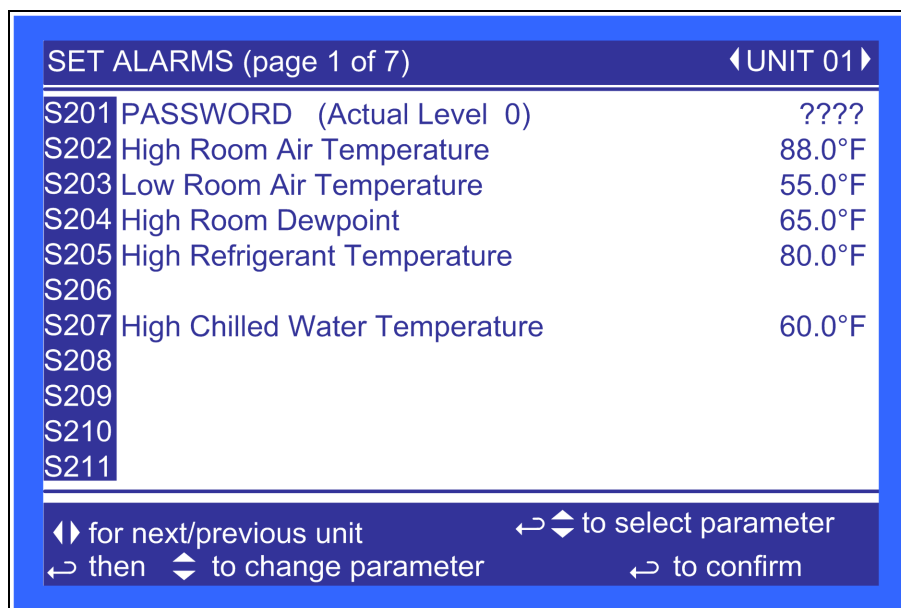
**High Room Air Temperature**—Sets the threshold for a high room air temperature alarm. The range for the high room air temperature alarm is from 33.8 to 95°F (1 to 35°C); the default is 80°F (26.7°C).

**Low Room Air Temperature**—Sets the threshold for a low room air temperature alarm. The range for the low room air temperature alarm is from 33.8 to 95°F (1 to 35°C); the default is 55°F (12.8°C).

**High Room Dewpoint**—Sets the threshold for a return high dew point alarm. The range for the high room dew point alarm is from 33.8 to 95°F (1 to 35°C); the default is 65°F (18.3°C).

**High Refrigerant Temperature**—Sets the threshold for a high a refrigerant temperature alarm. The range for the high supply refrigerant temperature alarm is from 33.8 to 95°F (1 to 35°C); the default is 80°F (26.7°C).

**High Chilled Water Temperature**—Sets the threshold chilled water temperature for a supply high chilled water temperature alarm. The range for the high supply refrigerant temperature alarm is from 33.8 to 95°F (1 to 35°C); the default is 60°F (15.6°C).

**Figure 4.30   Set Alarms screen, page 2 of 7**

```
SET ALARMS (page 2 of 7)                    ◀UNIT 01▶

S212 PASSWORD   (Actual Level  0)                  ????
S213 Customer Input 1                        Water Alarm
S214 Customer Input 1 active when                 Closed
S215
S216
S217
S218
S219
S220
S221 WARNING ACTIVATES ALARM RELAY                    Yes
S222 Reset Disabled Alarms                             No

 ◀▶ for next/previous unit        ↩‡ to select parameter
 ↩ then   ‡ to change parameter          ↩ to confirm
```
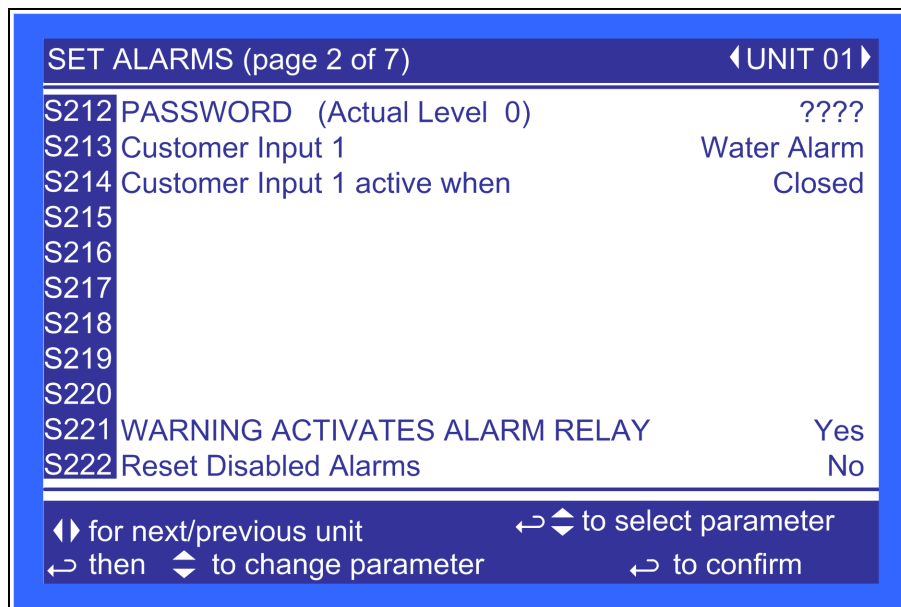
**Customer Input 1**—Selects the device and operation of the customer input. Each event reflects a different alarm and possible action to the unit. Selectable options are:

Call Service

C-Input

Water

Smoke

**Customer Input 1 active when**—Selects whether the Customer Input 1 input is normally closed or normally open.

**WARNING ACTIVATES ALARM RELAY**—Sets the alarm relay (K3) to activate when a warning occurs.

**Reset Disabled Alarms**—Resets disabled events.

The Set Alarm Screens (Figure 4.31   on the next page throughFigure 4.35   on page 68) permit setting the operation of an active alarm. Each event can be enabled or disabled and can be set to operate as an alarm, warning or message. The delay is the time the control waits before reporting the event.

**Alarm**: Annunciates the buzzer, triggers a monitoring event, triggers the alarm relay and flashes the red LED on the display.

**Warning**: Annunciates the buzzer, triggers a monitoring event, shows the event in the event viewer / front display and flashes the red LED on the display.

**Message**: Shows the event in the event viewer and on the front display.

**Figure 4.31  Set Alarms screen, page 3 of 7**

```
 SET ALARMS (page 3 of 7)                        ◀UNIT 01▶
 S223 PASSWORD   (Actual Level  0)                      ????
 S224                                 DELAY   EN-DIS   TYPE
 S225 HIGH TEMP SENSOR A                 30   ENABLE   ALM
 S226 LOW TEMP SENSOR A                  30   ENABLE   ALM
 S227 HIGH TEMP SENSOR B                 30   ENABLE   ALM
 S228 LOW TEMP SENSOR B                  30   ENABLE   ALM
 S229 HIGH DEWPOINT                      30   ENABLE   ALM
 S230 SENSOR A FAILURE                        ENABLE   ALM
 S231 SENSOR B FAILURE                        ENABLE   ALM
 S232 HIGH CHILLED WATER TEMP            30   ENABLE   ALM
 S233 SUPPLY CW SENSOR FAILURE                ENABLE   ALM
 S234
 S235

 ◀▶ for next/previous unit          ↵‡ to select parameter
 ↵ then   ‡ to change parameter          ↵ to confirm
```

**HIGH TEMP SENSOR A**—Enables or disables the High Temperature Sensor A event, which occurs when the reading from Sensor A is above the user-specified alarm setpoint. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**LOW TEMP SENSOR A**—Enables or disables the Low Temperature Sensor A event, which occurs when the reading from Sensor A is below the user-specified alarm setpoint. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**HIGH TEMP SENSOR B**—Enables or disables the High Temperature Sensor B event, which occurs when the reading from Sensor B is above the user-specified alarm setpoint. Sets how the event is reported as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**LOW TEMP SENSOR B**—Enables or disables the Low Temperature Sensor B event, which occurs when the reading from Sensor B is below the user-specified alarm setpoint. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**HIGH DEWPOINT**—Enables or disables the High Dewpoint event, which occurs when the calculated dew point at Sensor A or Sensor B is above the user-specified alarm setpoint. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**SENSOR A FAILURE**—Enables or disables the Sensor A Failure event, which occurs when the control no longer senses a signal from Sensor A. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**SENSOR B FAILURE**—Enables or disables the Sensor B Failure event, which occurs when the control no longer senses a signal from Sensor B. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**HIGH CHILLED WATER TEMP**—Enables or disables the High Chilled Water Temp event, which occurs when the reading from Supply Chilled Water Sensor is above the user-specified alarm setpoint. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**SUPPLY CW SENSOR FAILURE**—Enables or disables the Supply CW Sensor Failure Failure event, which occurs when the control no longer senses a signal from Supply CW Sensor. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**Figure 4.32  Set Alarms screen, page 4 of 7**

```
SET ALARMS (page 4 of 7)                    ◄UNIT 01►

S236 PASSWORD   (Actual Level  0)                    ????
S237                               DELAY   EN-DIS   TYPE
S238 HIGH REFRIGERANT TEMP            30   ENABLE   ALM
S239 LOW REFRIGERANT TEMP             30   ENABLE   ALM
S240 SUPPLY REFRIGERANT SENSOR             ENABLE   ALM
S241 LOSS OF FLOW PUMP 1                   ENABLE   ALM
S242 LOSS OF FLOW PUMP 2                   ENABLE   ALM
S243 PUMP SHORT CYCLE                      ENABLE   ALM
S244
S245
S246
S247 CONTROL VALVE FAILURE                 ENABLE   ALM
S248

◄► for next/previous unit              ↵‡ to select parameter
↵ then   ‡ to change parameter            ↵ to confirm
```

**HIGH REFRIGERANT TEMP**—Enables or disables the High Refrigerant Temp event, which occurs when the reading from supply refrigerant temperature sensor is above the user-specified alarm setpoint. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**LOW REFRIGERANT TEMP**—Enables or disables the Low Refrigerant Temp event, which occurs when the reading from supply refrigerant temperature sensor is below the user-specified alarm setpoint. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**SUPPLY REFRIGERANT SENSOR**—Enables or disables the Supply Refrigerant Sensor event, which occurs when the control no longer senses a signal from the Supply Refrigerant Sensor. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**LOSS OF FLOW PUMP 1**—Enables or disables the Loss of Flow Pump 1 event, which occurs when Pump 1 is commanded to run and the differential pressure switch does not sense differential pressure. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**LOSS OF FLOW PUMP 2**—Enables or disables the Loss of Flow Pump 2 event, which occurs when Pump 2 is commanded to run and the differential pressure switch does not sense differential pressure. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**PUMP SHORT CYCLE**—Enables or disables the Pump Short Cycle event, which occurs when flow is not established by either pump for 30 minutes. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**CONTROL VALVE FAILURE**—Enables or disables the Control Valve Failure event, which occurs when the chilled water control valve has been commanded by the control to open or close and no change is detected by the valve position signal. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**Figure 4.33  Set Alarms screens, pages 5 and 6**
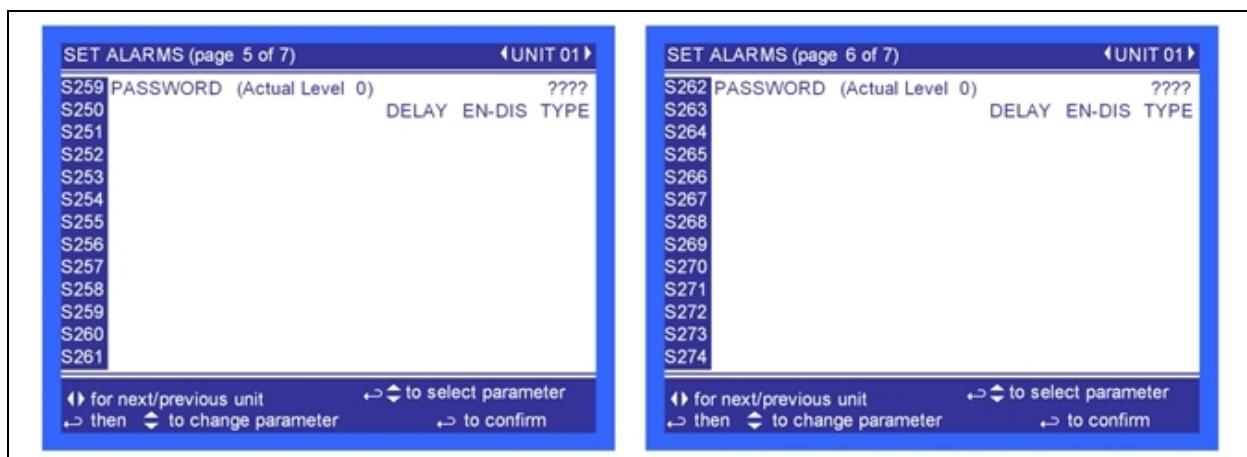


Pages 5 and 6 apply to the Liebert XDC only. No Liebert XDP parameters are present.

**Figure 4.34   Set Alarms screen, page 7 of 7**

```
┌────────────────────────────────────────────────────────┐
│ SET ALARMS (page 7 of 7)                  ◀UNIT 01▶      │
│ ┌──────────────────────────────────────────────────────┐│
│ │S275 PASSWORD   (Actual Level  0)                 ????  ││
│ │S276                           DELAY   EN-DIS   TYPE    ││
│ │S277                                                    ││
│ │S278 CONDENSATION DETECTED       3    ENABLE   ALM      ││
│ │S279 FAN FAILURE                 3    ENABLE   ALM      ││
│ │S280 CUSTOMER INPUT 1            5    ENABLE   ALM      ││
│ │S281 SMOKE DETECTED              5    ENABLE   ALM      ││
│ │S282 WATER UNDER FLOOR           5    ENABLE   ALM      ││
│ │S283 UNIT X DISCONNECTED              ENABLE   WRN      ││
│ │S284 WORKING HRS EXCEEDED             ENABLE   WRN      ││
│ │S285 CALL SERVICE                5    ENABLE   ALM      ││
│ │S286 LOSS OF POWER                    ENABLE   WRN      ││
│ │S287                                                    ││
│ └──────────────────────────────────────────────────────┘│
│ ◀▶ for next/previous unit      ↵⬍ to select parameter   │
│ ↵ then   ⬍ to change parameter      ↵ to confirm        │
└────────────────────────────────────────────────────────┘
```

CONDENSATION DETECTED—Enables or disables the Condensation Detected event, which occurs when water is detected at a Liebert XD cooling module. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

FAN FAILURE—Enables or disables the Fan Failure event, which occurs when a fan failure occurs at a Liebert XD cooling module. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

CUSTOMER INPUT 1—Enables or disables the Customer Input 1 event, which occurs when 24VAC is applied to the input. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

SMOKE DETECTED—Enables or disables the Smoke Detected event, which occurs when the Customer Input 1 is configured for "Smoke Detected" and 24VAC is applied to the input. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**NOTE: This is not a room smoke detector and is not intended to replace external smoke detectors.**

WATER UNDER FLOOR—Enables or disables the Water Under Floor event, which occurs when the Customer Input 1 is configured for "Water Under Floor" and 24VAC is applied to the input. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

UNIT X DISCONNECTED—Not currently used.

WORKING HOURS EXCEEDED—Enables or disables the Working Hrs Exceeded event, which occurs when a component has exceeded the user-specified limit. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

CALL SERVICE—Enables or disables the Call Service event, which occurs when the Customer Input 1 is configured for "Call Service" and 24VAC is applied to the input. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

LOSS OF POWER—Enables or disables the Loss of Power event, which occurs when the unit is On and operational and the 24VAC power to the control is lost. Sets how the event is reported: as an alarm, a warning or a message. Specifies how long the control waits before reporting the event.

**Figure 4.35   Sensor Calibration/Setup screen, page 1 of 3**

```
┌────────────────────────────────────────────────────────────┐
│ SENSOR CALIBRATION/SETUP (page 1 of 3)        ◄UNIT 01►      │
├────────────────────────────────────────────────────────────┤
│ S601 PASSWORD   (Actual Level  0)              ????          │
│ S602 Temperature Sensor A                      +0.0°F        │
│ S603 Calibrated Temperature Sensor A           70.3°F        │
│ S604 Humidity Sensor A                         +0.0°F        │
│ S605 Calibrated Humidity Sensor A              38.3%         │
│ S606 Temperature Sensor B                      +0.0°F        │
│ S607 Calibrated Temperature Sensor B           72.3°F        │
│ S608 Humidity Sensor B                         +0.0°F        │
│ S609 Calibrated Humidity Sensor B              35.6%         │
│ S610                                                         │
│ S611                                                         │
├────────────────────────────────────────────────────────────┤
│ ◄► for next/previous unit          ↵▲ to select parameter   │
│ ↵ then  ▲ to change parameter         ↵ to confirm          │
└────────────────────────────────────────────────────────────┘
```

**Temperature Sensor A**—Adjusts the temperature reading from the actual remote CAN Temp Humidity sensor designated as Sensor A to compensate for any error of the sensor or to match other sensors in the room.

**Calibrated Temperature Sensor A**—Displays the adjusted temperature value of the remote CAN Temp Humidity sensor designated as Sensor A. This value is the actual sensor reading plus or minus the offset Temperature Sensor A.

**Humidity Sensor A**—Adjusts the humidity reading from the actual remote CAN Temp Humidity sensor designated as Sensor A to compensate for any error of the sensor or to match other sensors in the room.

**Calibrated Humidity Sensor A**—Displays the adjusted humidity value of the remote CAN Temp Humidity sensor designated as Sensor A. This value is the actual sensor reading plus or minus the offset Humidity Sensor A.

**Temperature Sensor B**—Adjusts the temperature reading from the actual remote CAN Temp Humidity sensor designated as Sensor B to compensate for any error of the sensor or to match other sensors in the room.

**Calibrated Temperature Sensor B**—Displays the adjusted temperature value of the remote CAN Temp Humidity sensor designated as Sensor B. This value is the actual sensor reading plus or minus the offset Temperature Sensor B.

**Humidity Sensor B**—Adjusts the humidity reading from the actual remote sensor designated as Sensor B to compensate for any error of the sensor or to match other sensors in the room.

**Calibrated Humidity Sensor B**—Displays the adjusted humidity value of the remote CAN Temp Humidity sensor designated as Sensor B. This value is the actual sensor reading plus or minus the offset Humidity Sensor B.

**Figure 4.36 Sensor Calibration/Setup screen, page 2 of 3**

```
┌─────────────────────────────────────────────────────┐
│  SENSOR CALIBRATION/SETUP (page 2 of 3)    ◄UNIT 01► │
│ ┌─────────────────────────────────────────────────┐ │
│ │S612 PASSWORD   (Actual Level  0)          ????   │ │
│ │S613 Supply Refrigerant Sensor            +0.0°F  │ │
│ │S614 Calibrated Supply Refrigerant Sensor  58.5°F │ │
│ │S615                                              │ │
│ │S616                                              │ │
│ │S617 Supply Chilled Water Sensor          +0.0°F  │ │
│ │S618 Calibrated Supply Chilled Water Sensor 60.1°F│ │
│ │S619                                              │ │
│ │S620                                              │ │
│ │S621                                              │ │
│ │S622                                              │ │
│ └─────────────────────────────────────────────────┘ │
│  ◄► for next/previous unit      ↵▲▼ to select parameter │
│  ↵ then  ▲▼ to change parameter       ↵ to confirm   │
└─────────────────────────────────────────────────────┘
```

**Supply Refrigerant Sensor**—Adjusts the temperature reading from the actual supply refrigerant sensor to compensate for any error of the sensor.

**Calibrated Supply Refrigerant Sensor**—Displays the adjusted temperature value of the supply refrigerant sensor. This value is the actual sensor reading plus or minus the offset Supply Refrigerant Sensor.

**Supply Chilled Water Sensor**—Adjusts the temperature reading from the actual supply chilled water sensor to compensate for any error of the sensor.

**Calibrated Chilled Water Sensor**—Displays the adjusted temperature value of the supply chilled water sensor. This value is the actual sensor reading plus or minus the offset Supply Chilled Water Sensor.

**Figure 4.37   Sensor Calibration/Setup screen, page 3 of 3**

```
SENSOR CALIBRATION/SETUP (page 3 of 3)        ◀UNIT 01▶

S623  PASSWORD   (Actual Level  0)                      ????
S624  Supply Refrigerant Sensor 0%                     30.0°F
S625  Supply Refrigerant Sensor 100%                   90.0°F
S626
S627
S628
S629
S630
S631
S632
S633

 ◀▶ for next/previous unit          ↵⬍ to select parameter
 ↵  then    ⬍  to change parameter          ↵  to confirm
```

**Supply Refrigerant Sensor 0%**—Allows the sensor reading to be calibrated at the lowest reading of the sensor. This calibration changes the start point of the sensor reading.

**Supply Refrigerant Sensor 100%**—Allows the sensor reading to be calibrated at the highest reading of the sensor. This calibration changes the end point of the sensor reading.

**Figure 4.38   System/Network Setup screen—System, page 1 of 2**

```
SYSTEM/NETWORK SETUP (page 1 of 2)                SYSTEM

S801  PASSWORD   (Actual Level  0)                      ????
S802  Number of Connected Units                            1
S803
S804
S805
S806
S807
S808
S809  Configuration Safe                    OK           No
S810  Network Safe                          OK           No
S811  SW Version                      XP1.00.010.STD

 ◀▶ for next/previous unit          ↵⬍ to select parameter
 ↵  then    ⬍  to change parameter          ↵  to confirm
```

**Number of Connected Units**—Shows the number of displays connected. This is always 1.

**Configuration Safe**—Saves or loads configuration settings for the display that have been modified from the factory defaults to an internal file that can be downloaded/uploaded using the Liebert iCOM Service Tool. Selecting Save will write the settings to the internal storage file and selecting Load will write the settings from the internal storage file to the application software. The internal file is updated automatically every 12 hours.

**Network Safe**—Saves or loads network settings for the display that have been modified from the factory defaults to an internal file that can be downloaded/uploaded using the Liebert iCOM Service Tool. Selecting Save will write the settings to the internal storage file and selecting Load will write the settings from the internal storage file to the application software.

**SW Version**—Contains the application software version loaded onto the Liebert iCOM display.

**Figure 4.39   System/Network Setup screen—System, page 2 of 2**

```
SYSTEM/NETWORK SETUP (page 2 of 2)              SYSTEM
S812 PASSWORD   (Actual Level  0)                     ????
S813 IP Address                           192.168.254.003
S814 Netmask                              255.255.255.000
S815 Gateway                                0.000.000.000
S816 MAC                                 00:00:68:19:40:C7
S817 U2U Protocol                                      GBP
S818 U2U Address                                        33
S819 U2U Group                                           1
S820
S821 Bootloader Variables            OK              No
S822

Attention: any changes done on these parameters
must be followed by a 'Save+Reboot' command.
```

**IP Address**—Contains the network address of the display. This address must be unique on the network. The factory default is 192.168.254.003.

**Netmask**—Defines which part of the IP address is used for the network. The factory default is 255.255.255.000.

**Gateway**—A network point that acts as an entrance to another network. The factory default is 0.000.000.000.

**MAC**—A unique hardware identifier for the Ethernet device. The following parameters (U2U Protocol, U2U Address and U2U Group) are for displaying other networked Liebert XDPs. The Liebert XDP does not perform Teamwork Operations.

**U2U Protocol**—This is always set to GBP.

**U2U Address**—A unique identifier for each display on the network. Display addresses range from 33 to 64. Each display on the U2U network must have a different U2U address. Not currently used.

**U2U Group**—Used to create zones or groups within a U2U network. Once a group number is selected, the display will see only other devices with the same group number. The group number can be changed to view other devices in different groups. Not currently used.

**Bootloader Variables**—Indicates the bootloader has changed since it was last loaded. This parameter should only be activated by an authorized service person.

**Figure 4.40   System/Network Setup screen—Unit, page 1 of 2**

```
SYSTEM/NETWORK SETUP (page 1 of 2)        ◄UNIT 01►

S823 PASSWORD   (Actual Level  0)                    ????
S824 Monitoring Address                                 3
S825
S826
S827 Unit Name                                       UNIT
S828
S829
S830
S831 Configuration Safe              OK            No
S832 Network Safe                    OK            No
S833 SW Verson                        XP1.00.008.STD

◄► for next/previous unit        ↵⬍ to select parameter
↵ then  ⬍  to change parameter        ↵  to confirm
```

**Monitoring Address**—Sets the address used by the Liebert IntelliSlot® cards. This is set to 3 at the factory and should not be changed.

**Unit Name**—Identifies the unit from the local or remote display. This label will show at the top right of every screen that has monitoring or configuration of that unit

**Configuration Safe**—Saves or loads configuration settings for the control board that have been modified from the factory defaults to an internal file that can be downloaded / uploaded using the Liebert iCOM Service Tool. Selecting "Save" will write the settings to the internal storage file and selecting "Load" will write the settings from the internal storage file to the application software. The internal file is updated every 12 hours automatically.

**Network Safe**—Saves or loads network settings for the control board that have been modified from the factory defaults to an internal file that can be downloaded / uploaded using the Liebert iCOM Service Tool. Selecting "Save" will write the settings to the internal storage file and selecting "Load" will write the settings from the internal storage file to the application software.

**SW Version**—Contains the application software version loaded onto the Liebert iCOM.

**Figure 4.41 System/Network Setup screen—Unit, page 2 of 2**

```
┌──────────────────────────────────────────────────────────┐
│ SYSTEM/NETWORK SETUP (page 2 of 2)          ◀UNIT 01▶     │
│ S834 PASSWORD   (Actual Level  0)                   ????  │
│ S835 Monitoring Protocol                       Velocity V4│
│ S836 IP Address                          192.168.254.003  │
│ S837 Netmask                             255.255.255.000  │
│ S838 Gateway                               0.000.000.000  │
│ S839 MAC                               00:00:68:19:9B:42  │
│ S840 U2U Protocol                                    GBP  │
│ S841 U2U Address                                      1   │
│ S842 U2U Group                                        1   │
│ S843 Bootloader Variables           OK              No    │
│ S844 Static RAM                     OK              No    │
│                                                            │
│ Attention: any changes done on these parameters           │
│ must be followed by a 'Save+Reboot' command.              │
└──────────────────────────────────────────────────────────┘
```

**Monitoring Protocol**—Selects the monitoring protocol. Velocity V4 is the factory default which will provide communications to the Liebert IntelliSlot housing. IGMnet will activate the 77/78 terminals for communication to the Liebert SiteLink(-E). Liebert Hironet is only used on Liebert HPM units.

**IP Address**—Contains the network address of the display. This address must be unique to every other device on the network. The factory default is 192.168.254.003.

**Netmask**—Defines which part of the IP address is used for the network. The factory default is 255.255.255.000.

**Gateway**—A gateway is a network point that acts as an entrance to another network. The factory default is 0.000.000.000.

**MAC**—The MAC address is a unique hardware identifier of the Ethernet device.

The following parameters (U2U Protocol, U2U Address and U2U Group) are for displaying other Liebert XDPs that are networked. The Liebert XDP does not perform Teamwork Operations.
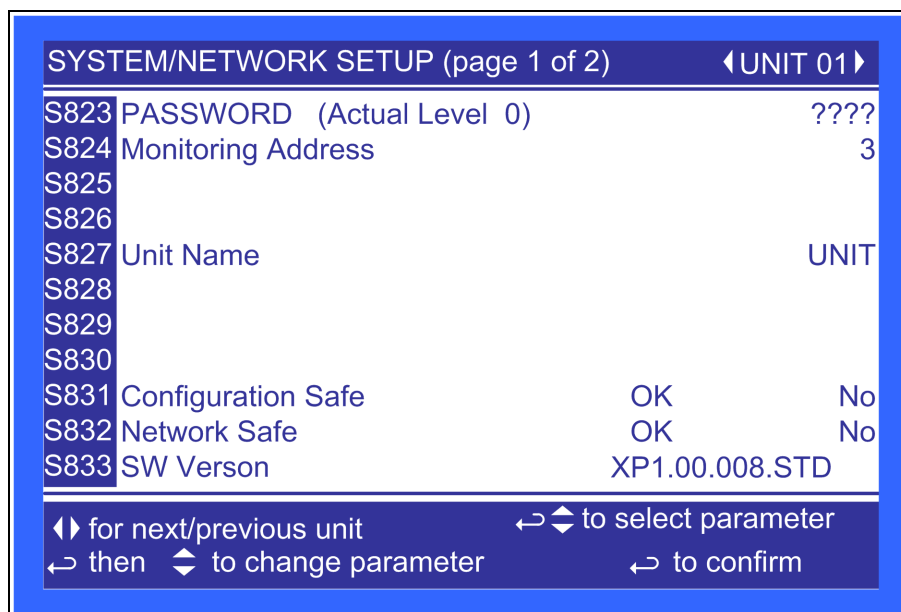
**U2U Protocol**—Always set to GBP.

**U2U Address**—Unique identifier for each display on the network. Display addresses range from 1 to 32. Each display on the U2U network must have a different U2U address. Not currently used.

**U2U Group**—Creates zones or groups within a U2U network. Once a group number is selected the display will only see other devices with the same group number. The group number can be changed to view other devices in different groups. Not currently used.

**Bootloader Variables**—Indicates if there has been a change to the boot loader since it was last loaded. This parameter should only be activated by authorized service personnel.

**Static RAM**—Allows service personnel to clear and reboot the RAM of the control board. Only Vertiv service personnel should perform this function.

Figure 4.42   Options Setup screen, page 1 of 2

```
OPTIONS SETUP (page 1 of 2)                    ◀UNIT 01▶
S401 PASSWORD   (Actual Level  0)                     ????
S402 Autorestart Enabled                              Yes
S403 Single Unit Auto Restart                        5sec
S404 Unit Start Sequence Delay                       1sec
S405 Control Delay Time                              1sec
S406 Pump Start Time Delay                          10sec
S407 Pump Wait Time Delay                           10sec
S408 Pump Off Time Delay                             5sec
S409
S410 Pump Short Cycle Delay                         30min
S411

◀▶ for next/previous unit           ↵⬍ to select parameter
↵  then   ⬍  to change parameter         ↵  to confirm
```

**Autorestart Enabled**—Restarts the unit after a power cycle when set to Yes. When this parameter is set to No, the unit will not restart after a power cycle.

**Single Unit Auto Restart**—Sets a time delay for the unit to restart when the Auto Restart Enabled is set to Yes. The delay begins once the boot process has completed. This parameter allows units to be staggered On to reduce the amount of simultaneous power consumption after a loss of power.

**Unit Start Sequence Delay**—Not currently used.

**Control Delay Time**—Not currently used.

**Pump Start Time Delay**—Sets a time delay to ensure that refrigerant begins flowing when the pump starts. If refrigerant does not begin flowing before the user-set delay expires, the pump will be turned Off.

**Pump Wait Time Delay**—Sets the pump wait time delay to prevent the pump from continuing to run when refrigerant is not flowing. If a pump is running normally and refrigerant flow is lost, the pump will stay On for the specified time trying to re-establish refrigerant flow. If refrigerant flow resumes during the specified interval, the pump will continue operating. If the wait time expires and refrigerant flow has not resumed, the pump will shut down.

**Pump Off Time Delay**—Sets the length of time a pump will remain off when refrigerant flow is interrupted or stops. After the time delay has expired, the control will try to restart the pump.

**Lead Pump**—Sets which pump is the active pump. It can be set to PUMP 1 or PUMP 2. The control will operate the respective pump unless a loss of flow condition occurs. On a LOSS OF FLOW condition, the control will switch to the standby pump after the LOSS OF FLOW alarm time delay has elapsed and the LOSS OF FLOW alarm has been annunciated. The default is PUMP 1.

**Pump Short Cycle Delay**—Sets the time to lock Off the unit if it is unable to establish refrigerant flow within this set amount of time.

Figure 4.43   Options Setup screen, page 2 of 2

```
┌──────────────────────────────────────────────────────────┐
│ OPTIONS SETUP (page 2 of 2)                    ◀UNIT 01▶   │
│ ┌──────────────────────────────────────────────────────┐ │
│ │S412│PASSWORD  (Actual Level  0)              ????      │
│ │S413│Valve Start Open                         30%       │
│ │S414│Valve Start TD                           90sec     │
│ │S415│3P Actuator Runtime                      70sec     │
│ │S416│3P Actuator Direction                    Direct    │
│ │S417│Unit Off Valve % Open                    30%       │
│ │S418│                                                   │
│ │S419│                                                   │
│ │S420│                                                   │
│ │S421│                                                   │
│ │S422│                                                   │
│ └──────────────────────────────────────────────────────┘ │
│  ◀▶ for next/previous unit         ↵▲▼ to select parameter│
│  ↵ then   ▲▼ to change parameter         ↵ to confirm     │
└──────────────────────────────────────────────────────────┘
```
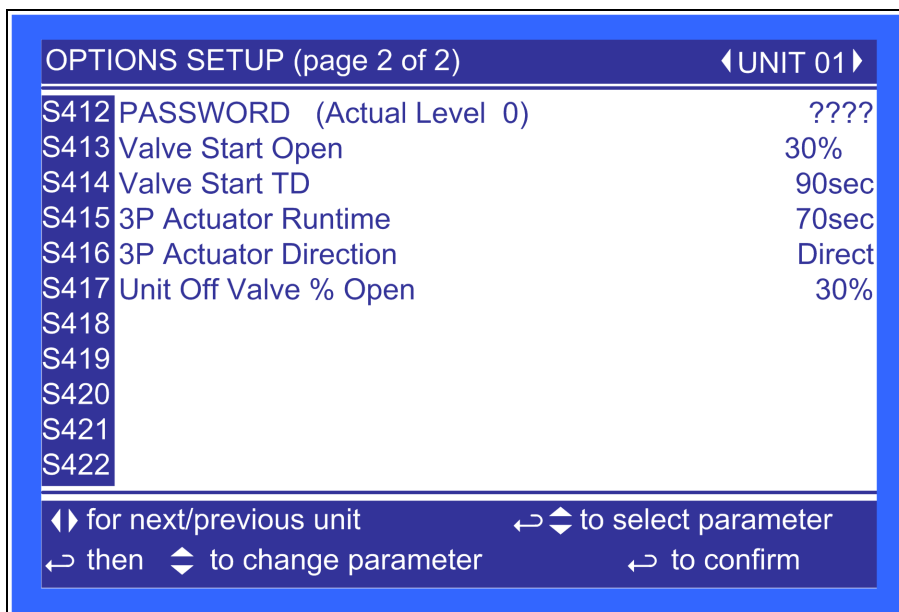
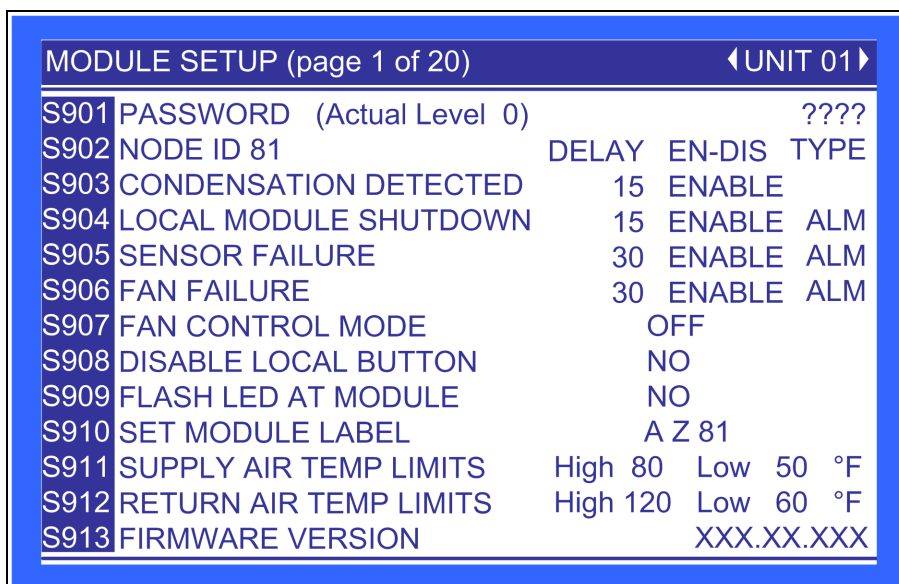**Valve Start Open**—Sets position of the valve when the unit starts.

**Valve Start TD**—Sets a time interval for the unit to complete startup and enter into normal operation.

**3P Actuator Runtime**—If Valve Control is selected for "Time" then this parameter sets the travel time of the valve to determine the full open and closed position of the valve. This parameter is set at the factory, based on the valve manufacturer's specifications.

**3P Actuator Direction**—Sets if the valve is a "Direct" or "Reverse" acting valve.

**Unit Off Valve % Open**—Sets the valve position when the unit is Off.

Figure 4.44   Module Setup screen, page 1 of 20

```
┌──────────────────────────────────────────────────────────┐
│ MODULE SETUP (page 1 of 20)                    ◀UNIT 01▶   │
│ ┌──────────────────────────────────────────────────────┐ │
│ │S901│PASSWORD  (Actual Level  0)                ????    │
│ │S902│NODE ID 81              DELAY   EN-DIS  TYPE       │
│ │S903│CONDENSATION DETECTED     15   ENABLE             │
│ │S904│LOCAL MODULE SHUTDOWN     15   ENABLE   ALM        │
│ │S905│SENSOR FAILURE            30   ENABLE   ALM        │
│ │S906│FAN FAILURE               30   ENABLE   ALM        │
│ │S907│FAN CONTROL MODE              OFF                  │
│ │S908│DISABLE LOCAL BUTTON         NO                    │
│ │S909│FLASH LED AT MODULE          NO                    │
│ │S910│SET MODULE LABEL             A Z 81                │
│ │S911│SUPPLY AIR TEMP LIMITS   High  80  Low  50  °F     │
│ │S912│RETURN AIR TEMP LIMITS   High 120  Low  60  °F     │
│ │S913│FIRMWARE VERSION             XXX.XX.XXX            │
│ └──────────────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────────────┘
```

This screen selects the operation of an active alarm for each smart module. Each event can be enabled or disabled and can be set to operate as an alarm, a warning or a message. The delay is the time the control waits before reporting the event.

> **Alarm**: Annunciates the buzzer, triggers a monitoring event, triggers the alarm relay and flashes the red LED on the display.

> **Warning**: Annunciates the buzzer, triggers a monitoring event, shows the event in the event viewer/front display and flashes the red LED on the display.

> **Message**: Shows the event in the event viewer and on the front display.

**Fan Control Type**—Sets the fan control mode. Values can be OFF, ON, ON ALL and TEMP CNTL.

**Disable Local Button**—Disables the push button on the front of the smart module. To disable the push button, set the parameter to YES. To re-enable the push button, set the parameter to NO.

**Flash LED at Module**—Flashes the LED on the smart module when set to Yes.

**Set Module Label**—A four-character label consisting of two letters and two numerals. This is the standard nomenclature for Data Center Grid assignment of racks. Additionally, the module's location can be denoted with 10 characters, either letters or non-alphanumeric characters from a built-in list. Either or both labels can be used and are entered using this screen.

**Supply Air Temp Limit**—Sets the high and low supply air temperature to from the module. An alarm will occur if the temperature falls outside the limits.

**Return Air Temp Limit**—Sets the high and low return air temperature to from the module. An alarm will occur if the temperature falls outside the limits.

**Firmware Version**—Displays the firmware version installed on the smart module.

**Figure 4.45   Module Setup screen, page 1 of 20**



```
MODULE SETUP (page 1 of 20)                        ◀UNIT 01▶
S901 PASSWORD   (Actual Level  0)                        ????
S902 NODE ID 81                      DELAY   EN-DIS  TYPE
S903 CONDENSATION DETECTED             15   ENABLE
S904 LOCAL MODULE SHUTDOWN             15   ENABLE   ALM
S905 SENSOR FAILURE                    30   ENABLE   ALM
S906 FAN FAILURE                       30   ENABLE   ALM
S907 FAN CONTROL MODE                       OFF
S908 DISABLE LOCAL BUTTON                   NO
S909 FLASH LED AT MODULE                    NO
S910 SET MODULE LABEL                       A Z 81
S911 SUPPLY AIR TEMP LIMITS      High  80   Low   50   °F
S912 RETURN AIR TEMP LIMITS      High 120   Low   60   °F
S913 FIRMWARE VERSION                       XXX.XX.XXX
```

# 5 START THE LIEBERT XDP WITH LIEBERT ICOM

## 5.1 Checklist for Liebert XDP Startup

⚠️ CAUTION: Risk of piping and component rupture. May cause equipment damage or injury. Closing service valves may isolate liquid refrigerant, causing high pressure and rupture of piping. Do not close valves without following recommended procedures for repair, maintenance and replacement of components. Install pressure relief valves in field piping that may become isolated by service valves.

**NOTICE**

Risk of unintended pump start. Can cause equipment damage.

Do not install the pump fuses for 60Hz units until the system is fully charged with refrigerant. Do not remove the locking mechanisms from 50Hz circuit breakers or place in the On position until the system is fully charged with refrigerant. Operating the pumps without a full refrigerant charge can result in equipment damage.

NOTE: The Liebert XDP160 requires a minimum load of 48kW (163,800BTU/H) before the system can be commissioned. This load can be supplied by actual user load in racks, by independent load banks or by the "Load Bank Testing" service of Vertiv Services. To achieve the minimum load requirements, the capacity of all connected modules must total at least 48kW (163,800BTU/H). See 1.1.2 on page 5.

NOTE: Before any action that could cause a disturbance in the Liebert XD system's cooling function is begun, the facility manager MUST be informed. In addition, after the action is taken and the work is finished, the facility manager MUST be informed.

1. Verify that bypass flow controllers were installed (if applicable), see Table 3.2 on page 27.
2. Verify that the minimum load level of 48kW (163,800BTU/H) is present.
3. Check all isolation ball valves in the Liebert XDP and Liebert XD cooling module and verify that all are open.
4. Check rotation of the Liebert XDP's pumps. Rotation should be counterclockwise and in the same direction as the arrow. See Figure 5.1 on the next page for arrow location on the pump.

**Figure 5.1  Liebert XDP pump rotation determination**



5. Check rotation of fans on Liebert XD cooling module units.
6. Verify that air is being discharged into the cold aisle.
7. Confirm that the total calculated refrigerant R-134a amount has been properly charged into the system (see Filling the Pumped Circuit—R-134a on page 31).
8. Confirm that the remote temperature/humidity sensors provided have been installed in optimal locations (see Remote Sensor Installation—Proper Placement on page 22)

**The Liebert XDP system is now ready to be turned ON.**

## 5.2  Starting the Liebert XDP with Liebert iCOM Controller

The Liebert XDP is started, stopped and controlled through the Liebert iCOM controller. Figure 4.1  on page 35 shows the Liebert iCOM keypad.

1. Turn the Liebert XDP On with the user interface (I/O button). The factory-setting defaults Liebert XD module fans to On. When the Liebert XDP is turned On, the Liebert XD modules' fans will turn On. Allow the system to attempt to start for at least 2 minutes.

   If the Liebert XDP pump cannot maintain flow and continues to switch over due to starting difficulties, refer to Troubleshooting on page 85. After remedying the problem, proceed to step 2.

2. If constant flow is established, wait until the Liebert XDP has been operating for 10-15 minutes, then verify that the refrigerant level in the receiver sight glass is between the second and third level (see Figure 5.2 below). Add or remove charge, if necessary.

**NOTICE**

Risk of operation with low refrigerant charge. Can cause equipment damage.

Operating the Liebert XDP with refrigerant levels below the bottom sight glass can cause permanent pump damage.

3. Check pressure differential functionality:

The Liebert XDP system should be On. If it is Off:

a. Turn the Liebert XDP On via user interface (I/O button). The factory-setting defaults Liebert XD module fans to On. When the Liebert XDP is turned On, the Liebert XD modules' fans will turn On.

**If no "Loss of Flow" alarm is present**—This suggests that there is flow. Test the pressure differential by closing the ball valve on either the suction line or discharge line to stop the flow.
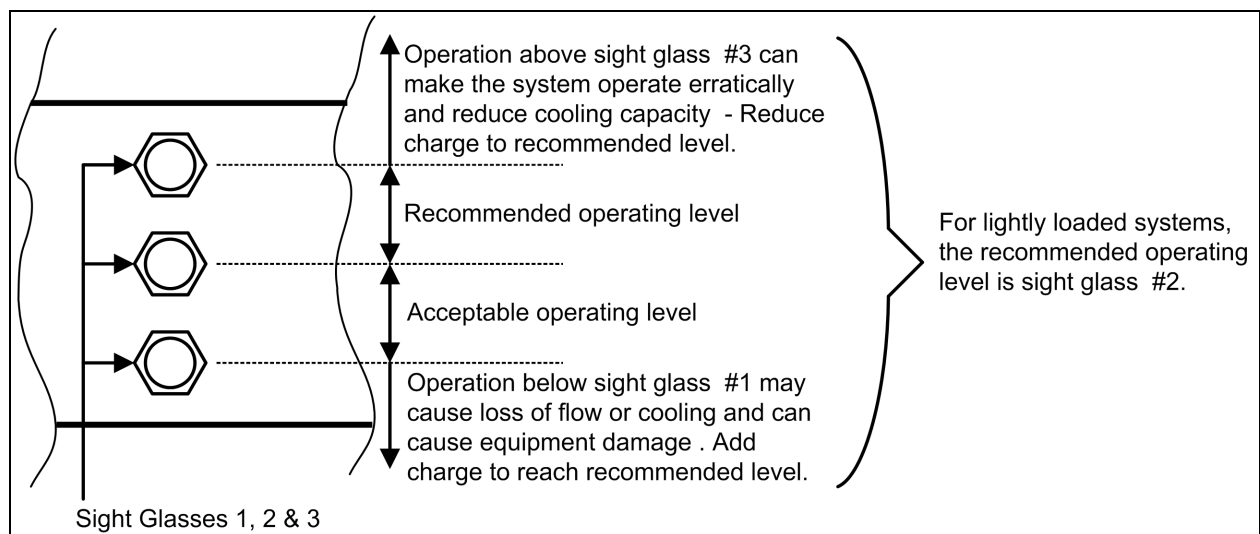
This should prompt an alarm for "loss of flow on P1." This alarm confirms that the switch has opened on low pressure (below 6 psi; 41kPa; 0.41 bars).

**If a "Loss of Flow" alarm is present**—This suggests that there is no flow. Verify that this is correctly annunciated by looking at the sight glass in the receiver. If a true no-flow condition exists, the level will not move.

However, **if there is flow, but the differential reading is faulty**, the level will slowly drop, indicating flow, while the loss of flow alarm is annunciated.

Check the pressure differential physically by making sure that the electrical connections are properly connected. Then check the pressure differential electrically by making sure that the unit has 24VAC across it.

**Figure 5.2  System R-134a liquid level at 160kW load**



Operation above sight glass #3 can make the system operate erratically and reduce cooling capacity - Reduce charge to recommended level.

Recommended operating level

Acceptable operating level

Operation below sight glass #1 may cause loss of flow or cooling and can cause equipment damage . Add charge to reach recommended level.

For lightly loaded systems, the recommended operating level is sight glass #2.

Sight Glasses 1, 2 & 3

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# 6 ALARM DESCRIPTIONS AND SOLUTIONS

## 6.1 Alarm Descriptions

NOTE: Alarms must be acknowledged before they can be reset. To acknowledge or silence an alarm, press the ALARM key one time. This will silence the alarm; the red LED will remain illuminated until the alarm is reset.

CALL SERVICE—Activated when Customer Input 1 is configured for "Call Service" and 24VAC is applied to the input. This alarm is reset when the 24VAC is removed.

CONDENSATION DETECTED (optional)—Activated when water is detected at a cooling module. A 24VAC signal is applied to the condensation input on the control board using a pair of twisted wires or the alarm is sent via CANbus communication. When this alarm is active, the control will raise its refrigerant control point by 4°F (2.2°C). This alarm will reset when the alarms is acknowledged and the signal stops being sent from CANbus or condensation input. The alarm can also be reset by cycling the power. The main power must be cycled to remove the 4°F (2.2°C) offset.

CONTROL VALVE FAILURE—Activated when the chilled water control valve has been commanded to open or close by the control and no change is detected by the valve position signal. The alarm is reset when the main power is cycled.

CUSTOMER INPUT 1—Activated when a 24VAC signal is applied to the customer alarm input on the control board. This alarm will reset when the 24VAC signal stops being sent from the customer alarm input. WATER UNDER FLOOR, SMOKE DETECTED, CALL SERVICE, and COMP LOCK PD are possible designations for this alarm; they are set with the Unit Code.

FAN FAILURE (optional)—Activated when a 24VAC signal is applied to the fan failure input on the control board using a twisted pair of wires or the alarm is sent via CANbus communication. This alarm will reset when the alarms is acknowledged and the signal stops being sent from CANbus or fan failure input. The alarm can also be reset by cycling the power.

HIGH CW TEMP—Activated when the Supply CW sensor reads the chilled water temperature above the user-specified alarm setpoint. This alarm will reset when the reading from the refrigerant temperature sensor drops 5°F (2.8°C) below the user-specified setpoint and the alarm has been acknowledged.

HIGH DEW POINT—Activates when the calculated dew point at either Sensor A or B exceeds the user-specified alarm setpoint. The alarm will reset when the calculated room dew point from both Sensor A and Sensor B is 2°F (1.1°C) below the setpoint and the alarm has been acknowledged.

HIGH REFRIGERANT TEMP—Activated when the refrigerant temperature sensor reads the refrigerant temperature above the user-specified alarm setpoint. This alarm will reset when the reading from the refrigerant temperature sensor drops 2°F (1.1°C) below the user-specified setpoint and the alarm has been acknowledged.

HIGH TEMP SENSOR A—Activated when the reading from Sensor A is above the user-specified alarm setpoint. The alarm will reset when the reading from Sensor A drops 2°F (1.1°C) below the setpoint and the alarm has been acknowledged.

HIGH TEMP SENSOR B—Activated when the reading from Sensor A is above the user-specified alarm setpoint. The alarm will reset when the reading from Sensor A drops 2°F (1.1°C) below the setpoint and the alarm has been acknowledged.

LOSS OF FLOW PUMP 1—Activated when Pump 1 is commanded to run and the differential pressure switch does not sense differential pressure (set at 6 psi; 41kPa; 0.41 bars). After attempting to start Pump 1 three times, the Liebert XDP will automatically switch to the other pump to establish flow. This alarm will reset when flow has been established on Pump 1 and the alarm has been acknowledged.

LOSS OF FLOW PUMP 2—Activated when Pump 2 is commanded to run and the differential pressure switch does not sense differential pressure (set at 6 psi; 41kPa; 0.41 bars). After attempting to start Pump 2 three times, the Liebert XDP will automatically switch to the other pump to establish flow. This alarm will reset when flow has been established on Pump 2 and the alarm has been acknowledged.

LOW MEMORY—Activated when the control board is low in memory resources. This alarm rests automatically as soon as memory consumption falls below the threshold.

LOW REFRIGERANT TEMP—Activated when the supply refrigerant temperature sensor temperature reading drops below the higher of the two calculated dew points, assuming that neither Sensor A or Sensor B has a sensor failure alarm. This alarm will reset when the refrigerant temperature sensor reads the refrigerant temperature above both of the two calculated dew points and the alarm has been acknowledged. This alarm can lock the unit Off. If this occurs, the main power must be cycled, or the Low Refrig Temp Alarm Code in the Service Diagnostics menu must be reset to 0.

LOW TEMP SENSOR A—Activated when the reading from Sensor A drops below the user-specified alarm setpoint. The alarm will reset when the reading from Sensor A rises 2°F (1.1°C) above the setpoint and the alarm has been acknowledged.

LOW TEMP SENSOR B—Activated when the reading from Sensor B drops below the user-specified alarm setpoint. The alarm will reset when the reading from Sensor B rises 2°F (1.1°C) above the setpoint and the alarm has been acknowledged.

NODEX CONDENSATION DETEC—Activated when condensation is detected on a smart module at CAN node ID X, where X is a value ranging from 81 to 100. This alarm resets when condensate is no longer detected. The main power must be cycled off to remove the 4°F (2.2°C) offset value.

NODEX FAN FAILURE—Activated when a fan failure occurs on a smart module at CAN node ID X, where X is a value ranging from 81 to 100. The alarm will rest when the fan returns to normal operation.

NODEX LOCAL SHUT DOWN—Activated when a smart module at CAN node ID X, where X is a value ranging from 81 to 100, has been shut down by an external signal. This alarm will reset when the remote shutdown input is deactivated.

NODEX RETURNAIR TEMPLIMT—Activated when the return air temperature (entering air temperature to the module) exceeds the user-specified return air temperature range on a smart module at CAN node ID X, where X is a value ranging from 81 to 100. This alarm will reset when the return air temperature return to with the user-specified range.

NODEX SENSOR FAILURE—Activated when a smart module at CAN node ID X, where X is a value ranging from 81 to 100, stops receiving a signal from one or more of its supply air, return air, or refrigerant temperature sensors. This alarm will reset when signals are detected from the module's sensors.

NODEX SUPPLYAIR TEMPLIMT—Activated when the supply air temperature (temperature of the air leaving the module) exceeds the user-specified supply air temperature range on a smart module at CAN node ID X, where X is a value ranging from 81 to 100. This alarm will reset when the return air temperature return to with the user-specified range.

PUMP SHORT CYCLE—Activated when the Liebert XDP is trying to establish flow (differential pressure) and is unable to do so. The Liebert XDP will attempt three times to establish flow on a pump before trying the other pump. The control will keep cycling three times on one pump, then three times on the other pump until it is able to establish flow (differential pressure). If this cycling occurs for 30 minutes and the Liebert XDP still does not establish flow, a PUMP SHORT CYCLE alarm will be present. This alarm will shut down the Liebert XDP. To reset this alarm, the main power must be cycled.

RAM/BATTERY FAIL—Activated when the RAM backup battery or the RAM itself has failed. This requires a hardware replacement.

SENSOR A FAILURE—Activated when the controls no longer senses a signal from Sensor A. This alarm will reset when the signal is returned and the alarms has been acknowledged.

SENSOR B FAILURE— Activated when the controls no longer senses a signal from Sensor B. This alarm will reset when the signal is returned and the alarm has been acknowledged.

SMOKE DETECTED—Activated when the Customer Input 1 is configured for "Smoke" and 24VAC is applied to the input. This alarm is reset when the 24VAC is removed.

**NOTE: This is not a room smoke detector and is not intended to replace external smoke detectors.**

SUPPLY CW SENSOR FAILURE—Activated when the control no longer senses a signal from the Supply CW sensor. This alarm will reset when the signal is returned.

SUPPLY REFRIGERANT SENSOR FAILURE—Activated when the control no longer senses a signal from the supply refrigerant sensor. This alarm will reset when the signal is returned.

UNIT CODE MISSING—Activated when a valid unit code has not been entered and saved. To reset, enter valid unit code, save and execute.

WATER UNDER FLOOR—Activated when Customer Input 1 is configured for "Water Alarm" and 24VAC is applied to the input. This alarm is reset when the 24VAC is removed.

## 6.2 Warning Descriptions

LOSS OF POWER—Activated when the unit is On and operational and 24VAC power to the control is lost. This alarm will be emitted when power is restored to the control. The Liebert XDP will restart at a user-defined time delay after power is restored. Once activated, the alarm will remain activated for 30 minutes.

PUMP 1 HRS EXCEED—Activated when the Pump 1 Actual Hours exceeds the user-specified limit. To reset, Actual Hours must be reset to 0.

PUMP 2 HRS EXCEED—Activated when the Pump 2 Actual Hours exceeds the user-specified limit. To reset, Actual Hours must be reset to 0.

## 6.3 System Shutdown Causes

### Unit Is Off By Refrig Sens Fail

The control has lost its signal from the refrigerant temperature sensor. The control has no way of controlling the refrigerant temperature, so the unit is shut off. Main power (disconnect switch) must be turned Off, then back On to clear this alarm.

### Unit Is Off By High CW Temp

The entering chilled water temperature is too high to keep the refrigerant pump(s) running normally. If a HIGH CW TEMP alarm occurs and the refrigerant pump loses flow (differential pressure), then the Liebert XDP will go into a pre-chill mode. The Liebert XDP can attempt to start again only if the entering chilled water temperature drops below the HIGH CW TEMP setpoint.

## Unit Is Off By Pump Short Cycle

The control was unable to get a pump started upon startup or after a loss of differential pressure. The control looks at the SHORT CYCLE time delay. If it cannot establish differential pressure within that amount of time, the unit is shut down. Main power (disconnect switch) must be turned Off, then back On to clear this alarm.

## Unit Is Off By Low Refrig Temp

The control was unable to raise the refrigerant temperature to the calculated refrigerant temperature control point. The unit is shut down because if the control cannot raise the refrigerant temperature to the calculated refrigerant temperature control point, water may condense on the refrigerant piping and receiving coils. Main power (disconnect switch) must be turned Off, then back On to clear this alarm.

# 7 TROUBLESHOOTING

**Table 7.1**

Troubleshooting the Liebert XDP

| Symptom | Possible Cause | Check or Remedy |
|---|---|---|
| Pump will not energize | No main power | Check L1, L2 and L3 for rated voltage. |
| | Loose electrical connections | Tighten connections. |
| | Overloads tripped | Allow pump to cool. Check amp draw. Confirm that the external pump overload trip point settings are correct. See External Pump Overloads on page 16 |
| | Tripped circuit breaker | Check circuit breaker to pump(s). |
| | Incorrect phase wiring | See Checklist for Liebert XDP Startup on page 77. |
| Pump will not start or run | No chilled water | Check and verify that there is supply chilled water to the Liebert XDP. |
| | Isolation valve(s) on pump suction and/or discharge is closed. | Open all isolation valves completely during normal operation. |
| | Supply chilled water is too high | Check and verify that the chilled water temperature setpoint is at 50°F (10°C) or lower and that there is flow on the chilled water side. |
| | Liebert XD cooling modules are Off | Check Liebert XD cooling modules to make sure that they are On prior to starting the Liebert XDP. |
| | Low Refrigerant Temperature (high dew point) | Check alarm(s) history on Liebert XDP. The Liebert XDP was operating below the dew point for a significant amount of time. Check humidity in conditioned space, lower humidity if necessary to allow Liebert XDP to operate at a lower temperature. (Disconnect must be switched to Off then back On to allow Liebert XDP to reset itself). |
| | Pressure switch not making contact | Check both differential pressure settings. If not within 6 psi, ±1 psi (41kPa, ±7kPa; 0.41 bars, ±0.07bars) then manually change accordingly. |
| | Not enough charge | See Checklist for Liebert XDP Startup on page 77. |
| Pump will not start | Chilled water valve not closing completely. | Wait at least 10 minutes before calibrating. Access the Advanced Menu>Factory Settings>Calibrate Actuator. Contact Liebert Services for assistance, 1-800-543-2778. |
| Pump noisy | Cavitation due to vapor in pump | Check for adequate charge in system, refer to the User's Manual. Checklist for Liebert XDP Startup on page 77 |
| | Worn motor bearings | Replace pump |
| | Pump is rotating in reverse | See Checklist for Liebert XDP Startup on page 77. |

**Table 7.1  Troubleshooting the Liebert XDP (continued)**

| Symptom | Possible Cause | Check or Remedy |
|---|---|---|
| Liebert XDP (Pump) suddenly stops | Low Refrigerant Temperature | Check humidity of the room along with the location of remote sensors. Make sure that the sensors are not in a cold area where there is insufficient air flow for accurate, representative readings.<br><br>Chilled Water temperature is too cold.<br><br>Load is too light. |
| | Loss of power | When power is restored, the Liebert XDP will automatically restart. |
| | Clogged filter dryer and/or impeller | Clean out debris |
| | Leak in system - loss of charge | Check the entire system for leaks with a refrigerant sniffer. Repair as necessary. |
| | Low Chilled Water Temperature Alarm and Loss of Flow Pump X Alarm | Check supply chilled water temperature. |
| | Supply Refrigerant Sensor Failure Alarm | Check wiring. |
| | | Call service. |
| Clogged filter dryer and/or impeller | Debris or other contaminants in refrigerant | Replace. |
| Pipe rattle | Loose pipe connections | Check pipe connections. |
| Chilled water valve not working | Motor operates but valve won't open | Check linkage for adjustment and be sure that it is tight on the valve. |
| | No 24 VAC power to motor | Check for 24 VAC between P52-1 and P52-4. |
| | No signal from control | Check 24 VAC at P22-1 (close) or P22-3 (open). |
| | Motor not operating | Unplug P22 from the board. Jumper P22-5 to P52-4 for grounding, then jumper P22-1 to P52-1 to drive close. Remove jumper to close and then jumper P22-3 to P52-1 to drive open. If motor fails to work, replace it. |
| Motor burnout | Check control panel for welded contactor contacts or welded overload contacts | Replace defective components. |

Table 7.1  Troubleshooting the Liebert XDP (continued)

| Symptom | Possible Cause | Check or Remedy |
|---|---|---|
| Main 24VAC fuse trips | Shorts or loose connections | Check the wiring connections of the 24VAC circuit. |
| | Faulty circuit board | Replace the circuit board. |
| Unstable pump operation | R-134a pump loop overcharged | While pump is running R-134a receiver level must be within recommended levels (see Figure 5.2   on page 79). |
| | R-134a pump loop undercharged | |
| | Filter Dryer clogged | See Clogged filter dryer and/or impeller on the previous page symptom and remedy. |
| Room becomes too warm | Liebert XDP is off | Check status of the Liebert XDP at the user interface. Turn system On at I/O button if system is Off. |
| | High dew point | Check temperature and relative humidity (RH) of room. Lower RH setpoint if necessary to lower dew point. At normal room temperature of 68°F (20°C), the RH should be set to 50% or lower. |
| | Liebert XD cooling modules are Off | Check Liebert XD cooling modules to make sure that they are On before starting the Liebert XDP. |
| | Minimum room temperature setpoint is too high | Check the setpoint in the User Setpoints menu (see Figure 4.18   on page 54). |
| | Temperature/humidity sensors incorrectly placed | Place the sensor on the return air side of the primary air mover (eg., Liebert DS). Do not install the sensor near unsealed doors, windows or similar areas. |

# 8 MAINTENANCE

The Liebert XD system components require little maintenance when proper fluid levels are maintained and proper startup and operation procedures are followed. The following tasks should be performed at the intervals stated:

1. Clean or replace chilled water strainer annually. Adjust accordingly based on purity of chilled water.
2. Check sight glass level of receiver every 4-6 weeks. During normal operation, the level should be at or above the second sight glass.
3. Check system for leaks every 4-6 weeks.

## 8.1 Fluorinated Greenhouse Gas Requirements

Stationary air conditioning, refrigeration, heat pump equipment and stationary fire protection systems in the European Community market and operating with fluorinated greenhouse gases (f-gas), such as R407C, R134a, R410A, must comply with the F-Gas Regulation: (EC) No. 842/2006 (F-gas). The regulation prohibits, among other actions, venting fluorinated greenhouse gases to the atmosphere.

The F-Gas Regulation requires operators to use all measures that are technically feasible and do not entail disproportionate cost to prevent leakage of these gases, to test for leakage regularly and to recover f-gas during equipment service and maintenance and before disposing of equipment.

Refer to the full regulation for additional details.

# 9 SPECIFICATIONS

### Table 8.1
Liebert XDP160 specifications

| Models | XDP160RC--5 | XDP160RA--5 | XDP160RM--5 |
|---|---|---|---|
| Cooling Capacity, Nominal | 160kW / 46 Tons, 60Hz | | 140kW / 40 Tons, 50Hz |
| | Each capacity is based on 45ºF (7ºC) entering water temperature and 140gpm (530lpm) water flow rate. Capacity is reduced when glycol mixtures are used in place of 100% water. | | |
| Minimum Load | 30% of nominal system capacity or 48kW (163,800BTU/H) | | |
| Electrical Requirements | | | |
| Input | 208V/3ph/60Hz | 460V/3/ph60Hz | 380/415V/3ph/50Hz |
| Full Load Amps | 3.9A | 2.1A | — |
| Dimensions, inches (mm) | | | |
| Height – Unit only | 78 (1981) | | |
| Height – As shipped | 83 (2108) | | |
| Width | 38 (965) | | |
| Depth | 34 (864) | | |
| Weight, lb (kg) | | | |
| Unit only | 851 (386) | | |
| Shipping weight | Domestic: 1020 (462); Export: 1083 (491) | | |
| Installed, with refrigerant and chilled water | 1068 (484) | | |
| Pipe Connections | | | |
| Refrigerant supply to Liebert XD cooling module | 1-1/8" OD, Cu | | |
| Refrigerant return from Liebert XD cooling module | 2-1/8" OD, Cu | | |
| Chilled water supply and return | 2-5/8" OD, Cu | | |
| Control valve | 2-way, 2" nominal; 35 PSIG close-off pressure rating; 150 PSIG maximum allowable pressure | | |
| Pressure Drop – Chilled Water Side | 20 psig (137kPa, 1.38bar), with 140 gpm (530lpm) water flow rate, control valve fully open | | |
| Temperature Rise – Chilled Water Side at rated flow, °F (°C) | 8.0 (4.4) | | 6.9 (3.8) |
| Number of Liebert XD cooling units connected, maximum (minimum) | | | |
| Liebert XDCF10 | 16 (5) | | |
| Liebert XDH20 | 8 (3) | | |

**Table 8.1  Liebert XDP160 specifications (continued)**

| Models | XDP160RC--5 | XDP160RA--5 | XDP160RM--5 |
|---|---|---|---|
| Liebert XDH32 | 5 (2) | | |
| Liebert XDV8 | 20 (6) | | |
| Liebert XDV10 | 16 (5) | | |
| Liebert XDO16 | 10 (3) | | |
| Liebert XDO20 | 8 (3) | | |
| Liebert XDR20 | 8 (3) | | |
| Cabinet Exterior Finish | Black, matte finish, heat-fused powder coat | | |
| Operating Ambient Temperature, Maximum, °F (°C) | 86 (30) | | |
| Agency | | | |
| Approvals | CSA 60Hz | | — |

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