

# ZX condensing unit





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# ZX platform CDU

## Disclaimer

Thank you for purchasing the ZX platform condensing unit from Copeland. ZX platform CDUs are the best in class within the capacity and operating range available in the market. ZX CDU is designed to operate reliably and to deliver high operating efficiencies in medium and low temperature refrigeration applications. It also provides constant monitoring of the compressor operating conditions and displays the running or fault conditions of the CDU. ZX platform CDUs have to be installed by following the industry trade practices for its safe and reliable operation. It is assumed that the CDU is selected, installed and serviced only by professionals. The user manual does not cover good industry practices which are essential on a refrigeration equipment installation. No responsibility can be accepted for damage caused by inexperienced or inadequately trained site technicians or improper installation design.

If in doubt, please consult your local sales office, quoting unit model and serial number as shown on each unit nameplate. In case of any ambiguity, the wiring diagram supplied with each unit takes precedence over the diagram in this manual.

## Introduction to ZX platform CDU

ZX medium temperature, ZXD digital medium temperature and ZXL low temperature series have been highly successful and enjoys proven success with its energy savings and customer-friendly electronic features. ZX, ZXD and ZXL CDUs have been applied by several well-known end-users and chain retailers. The ZX platform is also gaining wider acceptance in the global market and specific variants have been developed and exported to the USA and to the European and Middle East markets.

## Receiving your unit

All units are shipped with a holding charge of dry nitrogen inside at a low but positive pressure. Suitable labeling is prominently displayed on both the unit and the packaging. Service connectors are provided on the CDU service valve for the convenient checking of the integrity of the holding charge.

**Caution!** It is very important to check that this holding pressure exists at the time you receive each unit from us or our authorized representatives. Please inform us or our authorized representative if the holding charge is non-existent. Failure to do so could void the claim for other related system faults at a later period.

Transit damage is essentially an insurance claim and is not covered under manufacturing defect. It is also advisable to inspect the rest of the unit for obvious physical damage and inform us or our authorized representative in case any is discovered.

## ZX platform condensing unit was designed based on three factors demanded by industry users:

**Intelligent Store Solutions** – A most innovative approach to enterprise facility management, Copeland's Intelligent Store architecture integrates hardware and services, to provide retailers a single view into their entire network of facilities and understanding what facilities actually cost to operate and maintain.

The Intelligent Store architecture transforms data from store equipment and controls into actionable insights. Designed to deliver value in both new and existing stores, Copeland aims to help the retailers:

- Make better decisions on recourse investment for greatest impact
- Gain accurate feedback and customized service to your specific needs
- Reduce operational costs and boost the profitability at most convenience

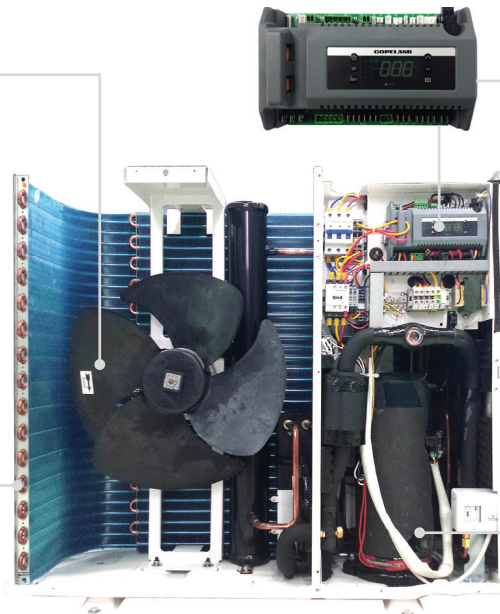
**Energy Efficiency** – Utilizing Copeland scroll compressor technology, variable speed fan motor, large capacity condenser coil and advanced control algorithms, energy consumption is significantly reduced. End-users can save more than 20% on annual energy costs rather than using hermetic reciprocating units.

**Reliability** – Combining the proven reliability of Copeland scroll compressors with advanced electronics controller and diagnostics, equipment reliability is greatly enhanced. Fault code alerts and fault code retrieval capabilities provide information to help improve speed and accuracy of system diagnostics. Integrated electronics provide protection against over-current, over-heating, incorrect phase rotation, compressor cycling, high pressure resets, low pressure cut-outs. It can also send out a warning message to an operator when there is a liquid floodback, which can prevent critical damage on the unit.

Intelligent store → Better decision-making  
 Highest efficiency → Lower energy bills  
 Reliability → Lower maintenance cost

Variable-speed fan motor and high efficiency fan blade

Optimized condenser coil for maximum heat transfer



**ZX and ZXL family**

Proprietary electronic algorithms present advantage on diagnose, communication, and protection purposes. They are also fundamental to control fan speed, optimizing energy performance for local seasonal ambient temperatures.

**ZXD family**

Capacity modulation to control precise room temperature and humidity.

Design features:

- With real time monitoring of compressor operating conditions
- Compressor reverse rotation protection
- Compressor over current protection
- Compressor internal motor protection trip
- Discharge gas over heat
- High pressure cut out
- Low pressure cut out (only on MT series)
- Refrigerant flood back
- Internal thermal sensor failure
- Intelligent store solution: communication for retail store monitoring
- Over voltage
- Under voltage

Copeland scroll compressor technology - high efficiency, ultra quiet, high reliability

Figure 1. ZX platform CDU features

**Nomenclature**

ZX	L	020	B	E	TFD	451
Unit family	Blank = medium temp L = Low temp D = digital medium temp	2.0 to 7.6 HP	Generation	E = Ester oil	PFJ = 220V/240V - 1ph - 50Hz TFD = 380V/420V - 3ph - 50Hz TF5 = 200V/230V - 3ph - 60Hz TF7 = 380 - 3ph - 60Hz	Bill of material
Base model					Electrical code	Bill of material

**Bill of material**

CDU family	ZX	ZXL	ZXD
BOM	451/551	451/551	451/551
Liquid line filter dryer	✓	✓	✓
Sight glass	✓	✓	✓
Oil separator	✓	✓	✓
Accumulator		✓	
Adjustable LP switch	✓	✓	
Fixed HP switch	✓	✓	✓
Fixed LP switch	✓		✓
CoreSense	✓	✓	✓
Intelligent store solution module	✓	✓	✓
Fan speed controller	✓	✓	✓
Circuit breaker	✓	✓	✓
Sound jacket	✓	✓	✓

Note: ACC-Accessory  
 BOM:  
 4xx - Chassis with door  
 5xx - Chassis without door

## Physical layout of unit

The following figures give an introduction to the physical layout of the ZX platform CDU

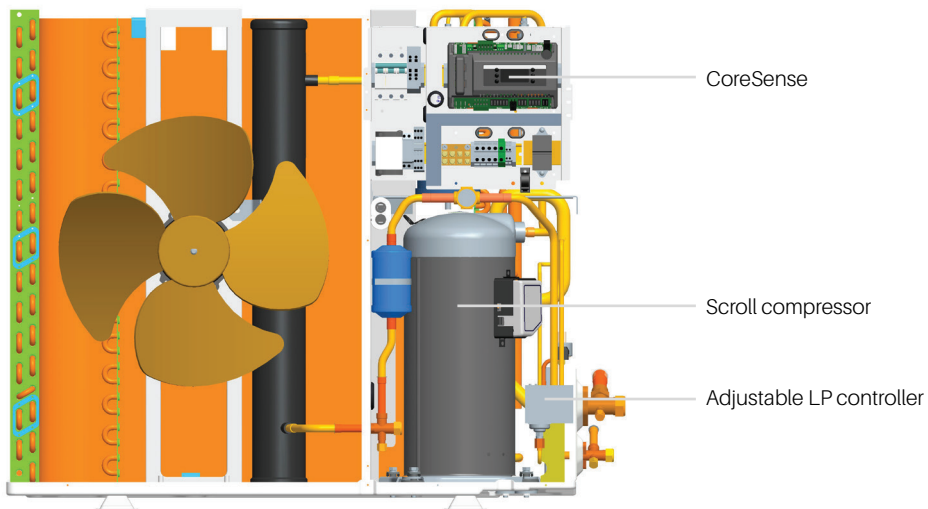


Figure 2. CoreSense and other components in ZX platform CDU

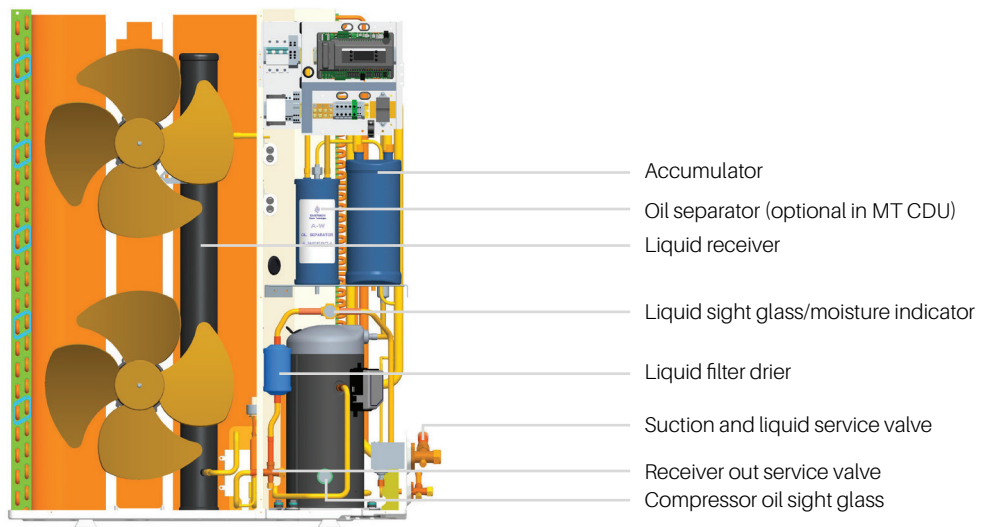


Figure 3. Major components of ZX platform CDU

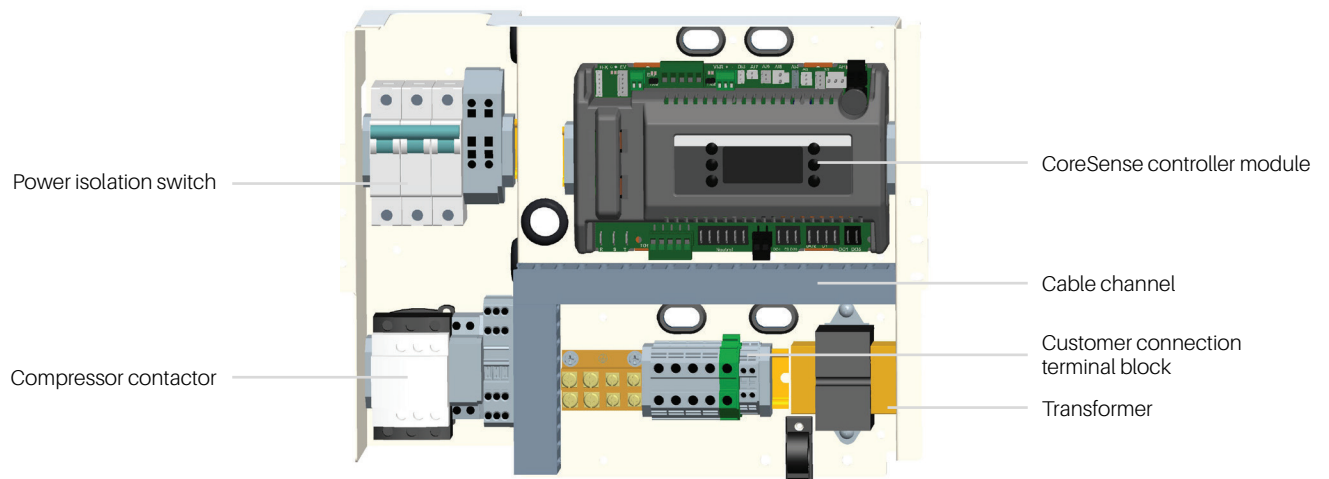


Figure 4. CoreSense and intelligent store module layout

## Product specification

For application envelope, envelope varies according to applications and refrigerants. Please refer to ZX platform product catalogue, product manual, or Copeland brand products selection software.

### Qualified refrigerants and oils

Refrigerant	Oil
R448 / R449 / R407F / R404A / R507 / R134a / R22	Emkarate RL 32 3MAF Mobil EAL Artic 22 CC

Oils are pre-charged in both compressor and oil separator. Total oil volume (liter) for each unit is shown in the table below:

ZX		ZXD		ZXL	
Model	BOM	Model	BOM	Model	BOM
	451		ALL		ALL
ZX020BE	1.68			ZXL020BE	1.06
ZX025BE	1.83			ZXL025BE	1.06
ZX030BE	1.83			ZXL030BE	1.06
				ZXL035BE	1.74
ZX040BE	2.33	ZXD040BE	1.74	ZXL040BE	1.74
ZX050BE	2.33	ZXD050BE	2.27	ZXL050BE	1.74
ZX060BE	2.16	ZXD060BE	2.27	ZXL060BE	2.27
ZX075BE	2.16	ZXD075BE	2.27	ZXL075BE	2.27
ZX076BE	2.16				

### CoreSense for ZX platform condensing unit








### LED descriptions

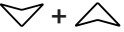



LED	Status	Description
	ON	Compressor1 is running
	Flashing	Compressor1 is ready to start
	ON	Compressor2 is running
	Flashing	Compressor2 is ready to start
	ON	Condensing fan is running
	ON	Digital compressor is unloading
	ON	Display with °C
	Flashing	Programmable mode

LED	Status	Description
	ON	Browsing the service menu
	Flashing	Browsing the fast access menu
	ON	A new alarm happened
	Flashing	Browsing the alarm menu
	ON	An alarm is occurring
	ON	Liquid line solenoid valve on
	-	Reserved




## Keyboard descriptions - single button

<b>SET</b>	Set	Display target set point; In programming mode, select a parameter or confirm an operation.
	Reset	Hold for 5 seconds to reset any lockouts if the current state of the controller allows for it to be reset.
	Up	Enter the fast access menu; In programming mode, browse the parameter codes or increases the displayed value.
	Down	In programming mode it browses the parameter codes or decreases the displayed value.
	Service	Enter the service and alarm menu.
	Defrost	Hold for 3 seconds to start a manual defrost or terminate an active defrost. (Not available at the moment).

## Keyboard descriptions - combined buttons



	Press and hold for about 3 seconds to lock (Pon) or unlock (PoF) the keyboard.
<b>SET</b> + 	Pressed together to exit programming mode or menu; under rtC and Par, this combination allows the user to go back to previous level.
<b>SET</b> + 	Pressed together for 3 seconds allows access to first level of programming mode.
<b>SET</b> + 	Pressed together for 3 seconds allows access to EXV manual setting.

## Controller display upon start-up









Step	Action	Phenomenon and description
1	Power on controller	All LEDs will light up for 3 seconds.
2		Firmware version will be displayed for 3 seconds.
3		Parameter setting file (bin file) identifier will be displayed for 3 seconds.
4		Normal display (actual suction temperature will be displayed on ZXD unit, condensing temperature will be displayed on ZX/ZXL unit)











## ZXD unit setting point modification

Step	Action	Phenomenon and description
1	Press " <b>SET</b> " > 3 seconds	Press SET button for 3 seconds, the measurement units (°C ) will flash together.
2	Press "  " or "  "	Modify the number.
3	Press " <b>SET</b> "	Press "SET" to confirm, the number will flash for 2 seconds (or wait for about 10 second to confirm).



## Pr1 parameter (1st level) browse and modification

Step	Action	Phenomenon and description
1	Press " <b>SET</b> " + 	Enter menu to select "PAR" (parameter) or "rtC"
2	Press "  " or "  "	Select "PAR (parameter)"
3	Press " <b>SET</b> "	Confirm, select, and browse Pr1 parameters
4	Press "  " or "  "	Browse Pr1 parameters
5	Press " <b>SET</b> "	View the actual number of the Pr1 parameters
6	Press "  " or "  "	Modify the actual number of the Pr1 parameters
7	Press " <b>SET</b> "	Press "SET" : The number will flash for 3 seconds and confirm the modification; Will go to the next Pr1 parameter.
8	Press " <b>SET</b> " + 	Exit (or exit automatically after waiting for 120 seconds)






## Adjusting condensing temperature set-point

Step	Action	Phenomenon and description
1	Press " <b>SET</b> " + 	Enter menu to select "PAr" (parameter) or "rtC"
2	Press "  " or "  "	Select "PAr (parameter)"
3	Press " <b>SET</b> "	Confirm, select, and browse Pr1 parameters
4	Press "  " or "  "	Browse to t18 parameter
5	Press " <b>SET</b> "	Enter password 321
6	Press "  " or "  "	Browse to parameter E39
7	Press " <b>SET</b> "	Enter desired condensing temperature
8	Press " <b>SET</b> "	The number will flash for 3 seconds and confirm the modifications; will go to the next parameter
9	Press " <b>SET</b> " + 	Exit (or exit automatically after waiting for 120 seconds)













## Quick access menu browse – sensors status and actual values

Step	Action	Phenomenon and description
1	Press "  "	Enter quick access menu, will display "P1P" (Press "Up" or "Down" to view other sensors)
2	Press " <b>SET</b> "	View the actual value of "P1P"
3	Press " <b>SET</b> "	Change to next Sensor code
4	Press " <b>SET</b> " +  "	Exit (or exit automatically after waiting for 60 seconds)
<p>Sensor code and values descriptions ("nP", "noP", or "nA" mean that the sensor does not exist; "Err" means that the sensor fails, out of range, disconnected, or does not configure correctly)</p>		<ul style="list-style-type: none"> <li>• <b>P1P</b>: suction pressure sensor (only for ZXD unit)</li> <li>• <b>P2t</b>: condensing temperature ((mid-coil) sensor</li> <li>• <b>P2P</b>: pressure sensor (not used)</li> <li>• <b>P3</b>: discharge line temperature sensor</li> <li>• <b>P4</b>: PHE vapor inlet temperature sensor</li> <li>• <b>P5</b>: PHE vapor outlet temperature sensor</li> <li>• <b>P6</b>: ambient temperature sensor</li> <li>• <b>P7</b>: temperature sensor (not used)</li> <li>• <b>SH</b>: PHE superheat</li> <li>• <b>oPP</b>: EXV opening step</li> <li>• <b>LLS</b>: the status of liquid line solenoid valve</li> <li>• <b>Std</b>: Condensing temperature setting point</li> <li>• <b>Aoo</b>: The percentage of the analog output</li> <li>• <b>dSo</b>: percentage of the PWM output driving the valve of the Digital Scroll compressor</li> <li>• <b>Lt</b>: min cold room temperature (may not be available)</li> <li>• <b>Ht</b>: max cold room temperature (may not be available)</li> <li>• <b>HM</b>: Time menu</li> </ul>


## Access alarm code (maximum of 50 record)

Step	Action	Phenomenon and description
1	Press "  "	Display "SEC"
2	Press " <b>SET</b> "	Display "A01"
3	Press "  "	Display alarm code in "A01"
4	Press "  "	Display "A02"
5	Press "  "	Display alarm code in "A02"
6	...	
7	Press " <b>SET</b> " +  "	Exit (or exit automatically after waiting for 15 seconds)

## Exact timing of the alarm

Step	Action	Phenomenon and description
1	Press "  "	Display "SEC"
2	Press " <b>SET</b> "	Display "A01"
3	Press "  "	Display alarm code in "A01"
4	Press " <b>SET</b> "	Display "Hr"
5	Press "  "	Display the alarm exact timing: hour
6	Press "  "	Display "Min"
7	Press "  "	Display the alarm exact timing: minute
8	Press "  "	Display "dAy"
9	Press "  "	Display the alarm exact timing: day
10	Press "  "	Display "Mon"
11	Press "  "	Display the alarm exact timing: month
12	Press "  "	Display "yEA"
13	Press "  "	Display the alarm exact timing: year
14	Press " <b>SET</b> " + 	Exit (or exit automatically after waiting for 15 seconds)

## Upload the program from the controller to hot-key

Step	Action	Phenomenon and description
1	Insert Hot-Key when the controller is ON	
2	Press "  "	The "uPL" message appears followed a by a flashing "End" label (Note: if display "Err", it means it fails to upload program to Hot-Key. Please restart the process.)
3	Press " <b>SET</b> "	"End" will stop flashing
4	Turn-off the controller and remove Hot-Key	
5	Turn-on the controller	

## Download the program from hot-key to controller

Step	Action	Phenomenon and description
1	Turn-off the controller	
2	Insert Hot-Key	
3	Turn-on the controller	The "doL" message will blink followed a by a flashing "End" label (Note: if display "Err", it means it fails to download program to the controller. Please restart the process.)
4		Controller will restart working with the new parameters after 10 seconds
5	Remove Hot-Key	

## Network wiring

### Copeland XWEB300D serial address - wiring

- Connect to the ModBUS network using cable with 2 or 3 shielded wires, minimum section 0.5mm<sup>2</sup> (e.g. BELDEN8772)
- Do not connect shield to ground.
- Do not connect the "Gnd" terminal.
- Remember to draw a map of the line. This will help you to find an error if something is wrong.
- RS485 devices are polarity sensitive.

### ZX CDU connected to XWEB300D

ZX CDU connected to the Copeland XWEB300D with the Intelligent Store Solution Module using RS485 ModBUS.

Connect the ZX CDU to the ModBUS network as shown in Figure 5. Connect the network cable to the three-terminal connector on the XWEB300D port that has been configured as ModBUS port (COM 12, 13, 14).

Connect port "13" of XWEB300D to port "D0485 +" of CoreSense and port "12" of XWEB300D to port "D1485 -" of CoreSense for RS485 communication.

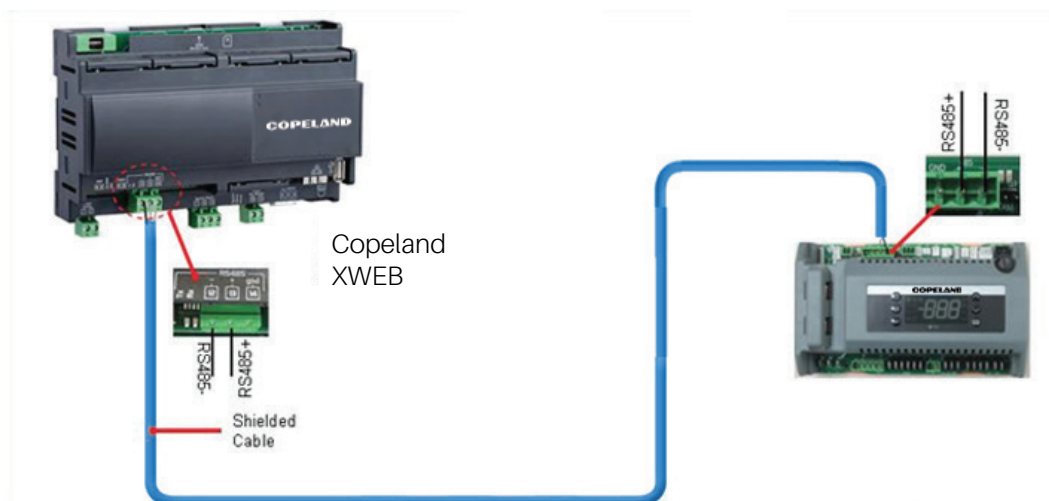


Figure 5. XWEB300D connected to the intelligent store solution module

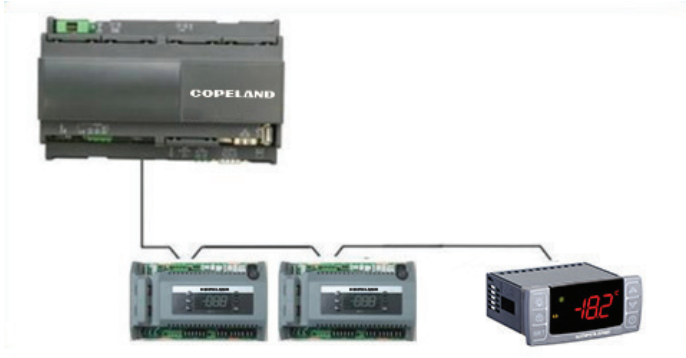


Figure 6. Correct network wiring

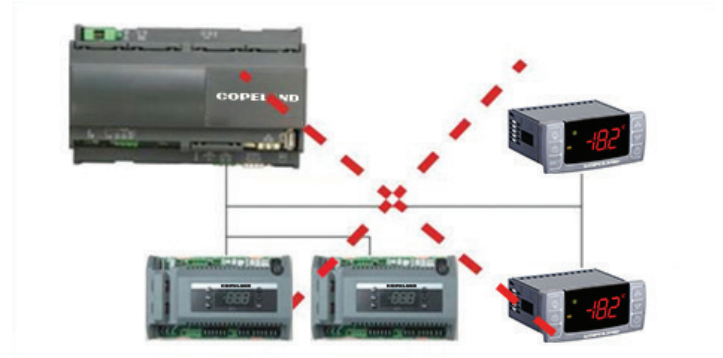


Figure 7. Incorrect network wiring

### **Termination resistor for XWEB300D**

If XWEB300D is placed at the beginning or at the end of the line, please install its termination resistor by adding a jumper in position 2. (JMP2 on the back side of the unit). Do not add the jumper if XWEB300D is placed in the middle of the RS485 line.

### **Copeland XWEB300D configuration for CoreSense**

XWEB300D is compatible with ZX CDU if XWEB has the library of ZX controller CoreSense (controller) model.

#### **Login into XWEB**

- Go to Information » Information
- If this is not present, follow the steps below.

**Open Copeland website <http://www.copeland.com/xweb300d-xweb500-xweb500d/eng/>, then login (register required)**

- Go to Support » System sw update » XWEB300D XWEB500 XWEB500D
- Download the upgrade package With your web-browser, login into XWEB
- Go to Information » System Update menu

#### **Provide the XW5 patch file**

Once file has been selected wait until the upgrade procedure ends (XWEB reboots) Verify the installation ended successfully by checking into the menu.

- Go to Information » Information for string

#### **Log in again and set up the ZX CDU**

- Go to Configuration » Devices drop-down menu
- Go to Actions » New
- Enter device name in the Name field (e.g. ZX CDU)
- Select "XCM25D" in the Model field
- Enter the ModBUS address in the RS 485 address field
  - Refer to setting of parameter "t01" in pr2 level in CoreSense (default setting is "1")
- Click New

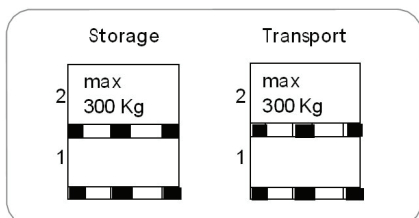
## Installation

Copeland ZX condensing units are delivered with a holding charge of neutral gas. The condensing unit should be located in such a place to prevent any dirt, plastic bag, leaves or papers from covering the condenser and its fins. The unit must be installed without restricting the airflow. A clogged condenser will increase the condensing temperature, thus reduce the cooling capacity, and lead to a high-pressure switch tripping. Clean the condenser fins on a regular basis.

## Condensing unit handling

### Transport and storage

Move ZX/ZXD/ZXL unit only with appropriate mechanical or handling equipment according to weight. Keep in the upright position. Do not stack single boxes on top of each other without pallet in any case. Keep the packaging dry at all times.



### Net weight

ZX		ZXD		ZXL	
Model	Weight (kg)	Model	Weight (kg)	Model	Weight (kg)
ZX020BE	76	ZXD040BE <sup>2</sup>	104	ZXL020BE	79
ZX025BE	79	ZXD050BE <sup>3</sup>	112	ZXL025BE	81
ZX030BE	79	ZXD060BE <sup>4</sup>	114	ZXL030BE	81
ZX040BE <sup>1</sup>	91	ZXD075BE <sup>5</sup>	122	ZXL035BE	93
ZX050BE	108			ZXL040BE	93
ZX060BE	112			ZXL050BE	106
ZX075BE	118			ZXL060BE	116
ZX076BE	121			ZXL075BE	121

Notes:

<sup>1</sup> 100 kg for models under 60 Hz TF5/7 and 50 Hz PFJ

<sup>2</sup> 109 kg for models under 60 Hz TF7

<sup>3</sup> 117 kg for models under 60 Hz TF7

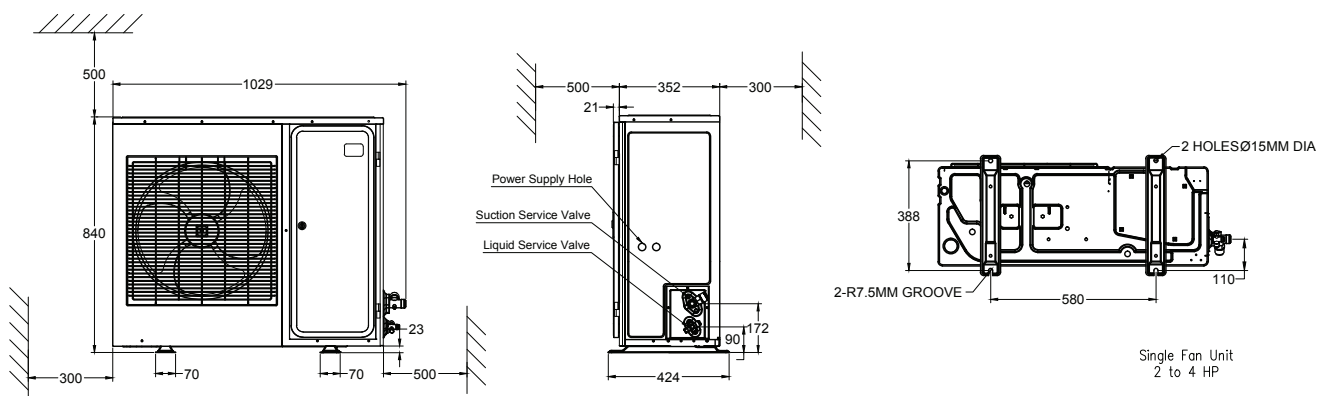
<sup>4</sup> 121 kg for models under 60 Hz TF7

<sup>5</sup> 127 kg for models under 60 Hz TF7

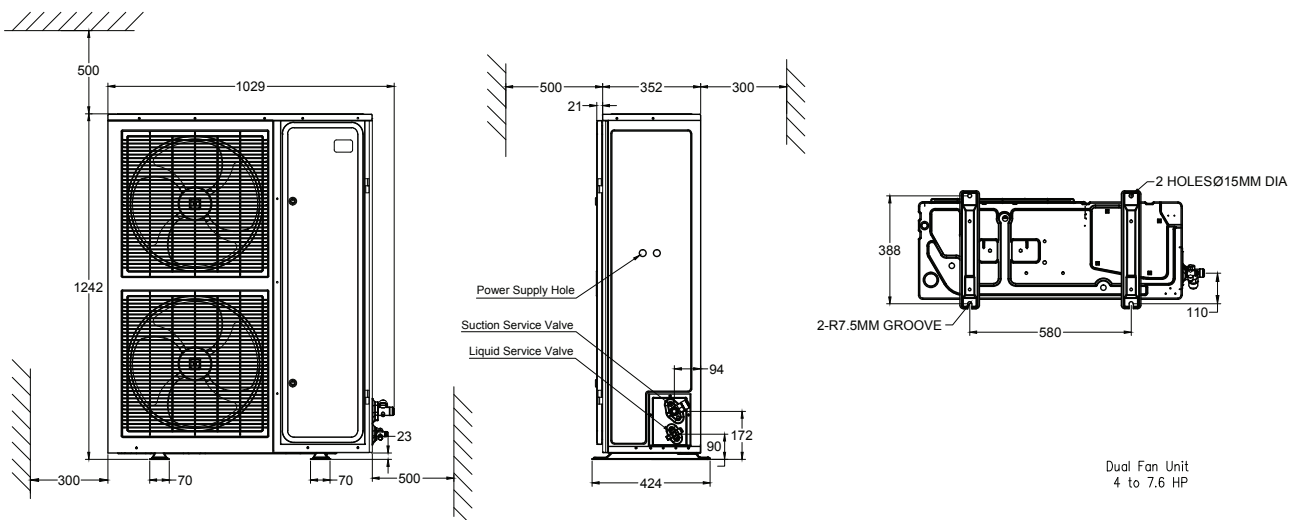
## Location and fixing

The unit should always be installed in a location that ensures clean air flow. It is recommended that a clearance of 300 mm from the wall (or the next unit) be maintained from the unit's left and rear panels whereas a clearance of 500 mm must be maintained from the unit's right, top and front panels (seen facing the front of the unit). Both service access and airflow have been considered in making these recommendations. Where multiple units are to be installed in the same location, the contractor needs to consider each individual case carefully. There can be many variations of unit quantities and available space and it is not the intention of this manual to go over these. Ideally, the unit should be mounted on a solid concrete slab with anti-vibration pads between unit feet and concrete. However the ZX condensing unit has also been designed for wall mounting on suitable brackets. Wall mounting brackets are not included. Another factor to consider in finding a good installation site is the direction of the prevailing wind. For example if the air leaving the condenser faces the prevailing wind, the air flow through the condenser can be impeded, causing high condensing temperatures ultimately resulting in reducing unit life. A baffle is a remedy for this situation.

### Fixing dimensions and distances - single fan unit



### Fixing dimensions and distances - dual fan unit





## Refrigeration piping installation

All interconnecting pipes should be of refrigeration grade, clean, dehydrated and must remain capped at both ends until installation. Even during installation, if the system is left for any reasonable period of time (say two hours), pipes should be re-capped to prevent moisture and contaminants from entering the system.

Do not assume that the service connection sizes on the unit (at the service valves) are the correct size to run your interconnecting refrigeration pipes. The service valve sizes have been selected for convenience of installation and in some cases (larger units) these may be considered too small. However for the very short pipe run within our units, these service connection sizes are adequate. All interconnecting pipes should be sized to satisfy the duty required.

Usually the suction line is insulated, but the liquid line is not. However the liquid line can pick up additional heat from the ambient and adversely affect the sub-cooling desirable for the liquid refrigerant before it enters the expansion valve.

The pipe should be sized to ensure optimum performance and good oil return. The sizing must also take into account the full capacity range through which this particular unit will need to operate.

Pipe runs should be kept as short as possible, using the minimum number of directional changes. Use large radius bends and avoid trapping of oil and refrigerant. This is particularly important for the suction line. The suction line should ideally slope gently towards the unit. Recommendation slope is 1/200~1/250. P traps, double risers and reduced pipe diameters may be required for suction lines where long vertical risers cannot be avoided. All pipes should be adequately supported to prevent sagging which can create oil traps. The recommended pipe clamp support distance is shown in the table.

Tube size	Max distance between 2 clamp support
12.7mm (1/2 inch)	1.20 m
16.0mm (5/8 inch)	1.50 m
22.0mm (7/8 inch)	1.85 m
28.5mm (1 1/8 inch)	2.20 m

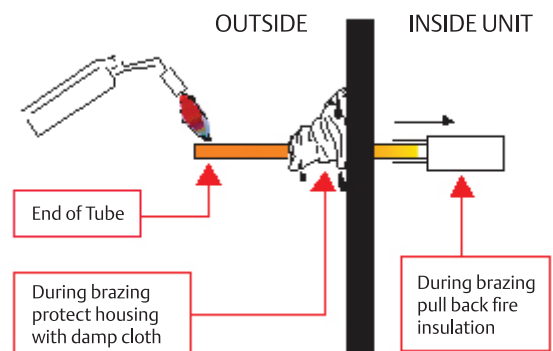
### ZXL liquid line insulation

ZXL liquid line should be insulated with a 19 mm insulation thickness. Temperature could be as low as -15°C.

### Brazing recommendations

Maintain a flow of oxygen-free nitrogen through the system at a very low pressure during brazing. Nitrogen displaces the air and prevents the formation of copper oxides in the system. If copper oxidization is allowed to form, the copper oxide material can later be swept through the system and block screens such as those protecting capillary tubes, thermal expansion valves, and accumulator oil return holes. This minimizes any entry of contaminants and moisture.

- Remove the liquid line connection cap.
- Then remove the suction connection cap.
- Open both valves midway. Care should be taken to avoid the holding charge from releasing too quickly.
- Be sure tube fitting inner diameter and tube outer diameter are clean prior to assembly.
- Since both tubes are extended from the condensing unit housing, we recommend insulating the housing by using a wet cloth on the copper tubing.
- Recommended brazing materials: a copper / phosphorous or copper / phosphorous / silver alloy rod should be used for joining copper to copper whereas to join dissimilar or ferric metals, use a silver alloy rod, either flux coated or with a separate.
- Use a double tip torch.



## **Expansion valve selection for low ambient application**

For systems expected to operate in varying ambient conditions – namely summer and winter temperatures – the expansion valve (TXV or EXV) sizing should take into consideration the maximum expected saturated condensing temperature at high ambient conditions (summer) and the minimum expected saturated condensing temperature, set at -25°C, during low ambient conditions (winter).

The chosen expansion valve's operating capacities should be well within these limits to ensure satisfactory system performance.

In the event that different expansion valves come up for the two conditions, the valve for low ambient condition should be selected. This means that at higher ambient, the valve will be oversized. However, if the valve at the high ambient is selected, it may be too small during low ambient condition.

## Thermal expansion valve selection guide

R22		R404A		R407A/F		
Tevap = -5°C Tamb = 43°C	50Hz Body - TIE-HW (802421)	60Hz Body - TIE-HW (802421)	50Hz Body - TIE-SW (802460)	60Hz Body - TIE-SW (802460)	50Hz Body - TIE-NW (802436)	60Hz Body - TIE-NW (802436)
ZX Model	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice
ZX020BE	TIO-002 (800535)	TIO-002 (800535)	TIO-002 (800535)	TIO-003 (800536)	TIO-001 (800534)	TIO-002 (800535)
ZX025BE	TIO-002 (800535)	TIO-002 (800535)	TIO-003 (800536)		TIO-002 (800535)	
ZX030BE	TIO-002 (800535)	TIO-003 (800536)	TIO-003 (800536)	TIO-004 (800537)	TIO-002 (800535)	TIO-003 (800536)
ZX040BE	TIO-003 (800536)	TIO-003 (800536)	TIO-004 (800537)	TIO-004 (800537)	TIO-003 (800536)	TIO-003 (800536)
ZX050BE	TIO-003 (800536)	TIO-004 (800537)	TIO-005 (800538)	TIO-005 (800538)	TIO-004 (800537)	TIO-004 (800537)
ZX060BE	TIO-004 (800537)	TIO-004 (800537)	TIO-005 (800538)	TIO-006 (800539)	TIO-004 (800537)	TIO-004 (800537)
ZX075BE	TIO-004 (800537)	TIO-004 (800537)	TIO-006 (800539)	TIO-006 (800539)	TIO-004 (800537)	TIO-004 (800537)
ZX076BE	TIO-004 (800537)		TIO-006 (800539)		TIO-004 (800537)	

R134A		
Tevap = -5°C Tamb = 43°C	50Hz Body - TIE-MW (802446)	60Hz Body - TIE-MW (802446)
ZX Model	Orifice	Orifice
ZX020BE	TIO-002 (800535)	TIO-002 (800535)
ZX030BE	TIO-003 (800536)	TIO-003 (800536)
ZX040BE	TIO-003 (800536)	TIO-004 (800537)
ZX050BE	TIO-004 (800537)	TIO-004 (800537)
ZX060BE	TIO-004 (800537)	TIO-005 (800538)
ZX075BE	TIO-004 (800537)	TIO-005 (800538)

### Selection at 30K subcooling

R22		R404A		R407A/F		
Tevap = -5°C Tamb = 43°C	50Hz Body - TIE-HW (802421)	60Hz Body - TIE-HW (802421)	50Hz Body - TIE-SW (802460)	60Hz Body - TIE-SW (802460)	50Hz Body - TIE-NW (802436)	60Hz Body - TIE-NW (802436)
ZXL Model	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice
ZXL020BE	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)
ZXL025BE	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)
ZXL030BE	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)	TIO-002 (800535)	TIO-001 (800534)	TIO-001 (800534)
ZXL035BE	TIO-001 (800534)	TIO-001 (800534)	TIO-001 (800534)	TIO-002 (800535)	TIO-001 (800534)	TIO-002 (800535)
ZXL040BE	TIO-001 (800534)	TIO-002 (800535)	TIO-001 (800534)	TIO-003 (800536)	TIO-002 (800535)	TIO-002 (800535)
ZXL050BE	TIO-002 (800535)	TIO-002 (800535)	TIO-001 (800534)	TIO-003 (800536)	TIO-002 (800535)	TIO-002 (800535)
ZXL060BE	TIO-002 (800535)	TIO-003 (800536)	TIO-003 (800536)	TIO-003 (800536)	TIO-002 (800535)	TIO-003 (800536)
ZXL075BE	TIO-002 (800535)	TIO-003 (800536)	TIO-003 (800536)	TIO-003 (800536)	TIO-003 (800536)	TIO-003 (800536)

Note: For the ZXD units, we recommend using Copeland Electronic Expansion Valves (EXV). The selection of the EXV will depend on the load profile on the ZXD unit. Please contact your local Copeland office for assistance on selection.

# Electrical connection

## Power supply

The ZX condensing unit electrical connection to the power supply must be made by qualified technicians, who should refer to the electrical diagrams located inside the electric connection panel. The units are designed for below power supply at  $\pm 10\%$  voltage tolerance. The circuit breaker must be switched off before opening the front panel.

BOM	Codes	HZ	Phase	Voltages
ALL	PFJ	50	1	220/240
ALL	TFD	50	3	380/420
ALL	TF7	60	3	380
401/451	TF5	60	3	230
471	TF5	60	3	200

## Electrical wiring

Before commissioning, ensure that neutral "N" wire is connected to the terminal block ("N" furthest to the right). After proper connection of the ZX condensing unit, the control LED on the power board and control board will light up. For more details, see wiring diagrams. Customers' wire size needs to be selected to allow for the maximum operation current of each unit.

Unit	Unit MOC (A)
ZX020BE-TFD	7.2
ZX030BE-TFD	8.6
ZX040BE-TFD	11.2
ZX050BE-TFD	14.5
ZX060BE-TFD	14.8
ZX075BE-TFD	16.6
ZX076BE-TFD	16.6
ZX020BE-TF5	12.1
ZX030BE-TF5	16.1
ZX040BE-TF5	23.1
ZX050BE-TF5	31.7
ZX060BE-TF5	30.7
ZX075BE-TF5	34.3
ZX020BE-TF7	8.0
ZX030BE-TF7	10.1
ZX040BE-TF7	13.7
ZX050BE-TF7	17.2
ZX060BE-TF7	17.4
ZX075BE-TF7	19.3
ZX020BE-PFJ	17.6
ZX025BE-PFJ	19.4
ZX030BE-PFJ	21.6
ZX040BE-PFJ	26.1

Unit	Unit MOC (A)
ZXL020BE-TFD	8.0
ZXL025BE-TFD	8.7
ZXL030BE-TFD	8.5
ZXL035BE-TFD	11.3
ZXL040BE-TFD	12.2
ZXL050BE-TFD	14.3
ZXL060BE-TFD	15.7
ZXL075BE-TFD	20.2
ZXL020BE-TF5	16.1
ZXL025BE-TF5	16.6
ZXL030BE-TF5	17.0
ZXL035BE-TF5	24.9
ZXL040BE-TF5	26.7
ZXL050BE-TF5	28.5
ZXL060BE-TF5	33.6
ZXL075BE-TF5	37.9
ZXL020BE-TF7	7.9
ZXL025BE-TF7	8.6
ZXL030BE-TF7	9.5
ZXL035BE-TF7	11.7
ZXL040BE-TF7	14.0
ZXL050BE-TF7	17.3
ZXL060BE-TF7	19.3

Unit	Unit MOC (A)
ZXL075BE-TF7	19.6
ZXD040BE-TFD	11.4
ZXD050BE-TFD	14.8
ZXD060BE-TFD	13.9
ZXD075BE-TFD	17.3
ZXD076BE-TFD	17.3
ZXD040BE-TF7	13.7
ZXD050BE-TF7	16.2
ZXD060BE-TF7	17.7
ZXD075BE-TF7	19.9

**Caution!** Unit should be powered on at all times except during service. Failure to do so can result in component failure.

# Start up and operation

## NextGen ZX start-up guide

Before commissioning, ensure that all valves on the condensing unit are fully opened.

**KEEP IN MIND:** For ZXL condensing units, liquid line MUST be insulated – at least ½" minimum insulation.

Careful selection of Expansion Valves due to the increased sub cooling effect by the Vapor Injection plate heat exchanger. See page 16 of this manual.

## Leak check

The unit has been leak tested and QA approved from the factory. However, due to handling and shipping the entire refrigeration system must be tested for leaks. Failure to carry out leak test can result to undesirable system performance.

### Step-by-step:

1. Open both the liquid and suction service valves.
2. Ensure the solenoid valve is energized and open.
3. Pressurize the system to 300 psig/21 Bar maximum with dry nitrogen.
4. Allow dry nitrogen to reach all parts of the system.
5. Check all joints and components using soap/ bubble test or with an electronic leak detector.
6. Wait for at least an hour to ensure the system is holding the pressure and is found to be leaked-proof, if the system loses any pressure over the course of 30 minutes to 1 hour, then it is a sure indication that the system is leaking.

If leak has been detected somewhere on the system, relief the pressure and repair the leak. For an effective installation, the system must be leak tight.

## System evacuation

Evacuating a refrigeration system serves two primary objectives: (1) remove noncondensables and (2) remove water vapor or dehydrate the system.

Air and moisture are detrimental to system operation. The successful long-term operation of the system depends on thoroughly conditioning them before charging with refrigerant and the losses associated with improper evacuation erodes system efficiency as well as costly for the installers.

A 2-stage vacuum pump along with a micron gauge is recommended in performing evacuation. The quality of vacuum is not determined by time – a micron gauge must be used since it is the only device that accurately reads the vacuum pressure during the evacuation process.

**REMINDER:** Do not use the system compressor as a vacuum pump and do not operate the compressor while the system is in vacuum.

Copeland recommends triple evacuation process (best practice) to be implemented on all our installations

### Step-by-step:

1. Open both the liquid and suction service valves.
2. Ensure the solenoid valve is energized and open.
3. Connect vacuum pump to the liquid and suction service valves.
4. Start the vacuum pump and then open the service valves.
5. Perform triple evacuation process as follows:
  - i. Vacuum until a pressure of 1,500 microns is reached — at which time the vacuum should be broken with the refrigerant to be used in the system through a drier until the system pressure rises to 2 psig
  - ii. Repeat this process again
  - iii. Evacuate the entire system to 500 microns

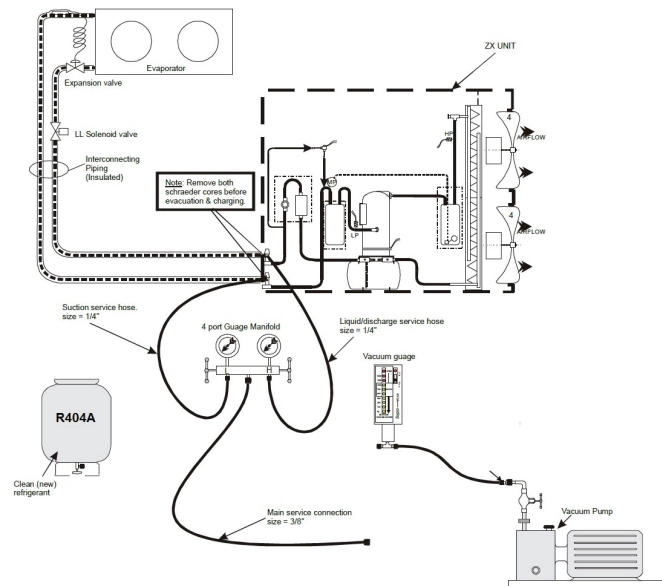
At this point, Valve Off the system, turn off vacuum pump then wait 30mins before checking the micron gauge readings:

  - Between 500 and 1,000 microns – evacuation is complete! Proceed with refrigerant charging.
  - Above 1,000 but below 5,000 microns – moisture was NOT completely removed.

**TO DO:** Re-evacuate the system until vacuum will hold

  - Above 5,000 microns – Indicates system leak or within the connections

**TO DO:** Search for the leak & carry-out repair procedures then perform triple evacuation process again.
6. The evacuation process is complete once vacuum quality is achieved. Then close the two manifold valves tightly. Close the pump main valve, and remove the vacuum pump.



6. The compressor can then be started, and the unit continued to be charged (with liquid refrigerant through the liquid service valve). The quantity of charge should always be measured. See note.

7. Turn off the unit and open the receiver outlet valve (which was almost fully closed earlier).

8. The system needs to be operated down to its design evaporating temperature before you can be sure the charge is correct. It is at this point that the normal refrigeration operational checks can be carried out - such as checking the liquid line sight glass for violent bubbles and the operating pressures.

In the event that the system is still short of refrigerant, repeat from step #5 onwards.

Refrigerant charging is regarded full/complete when the operating temperature of the system has been stable for some time and the liquid line sight glass is clear.

## Refrigerant charging

### Reminder

- The scroll compressor design requires system charging with liquid refrigerant into the liquid line.
- Do not vapor charge the ZX scroll unit.

After ensuring all valves are opened and system is vacuumed properly, only then start the refrigerant charging process.

### Step-by-step:

1. Ensure that there is no power supply to the ZX unit. The Liquid Line solenoid needs to be kept open for the charging process and this may require a temporary power feed to it.
2. Connect the refrigerant cylinder to main service hose and purge line at the manifold end.
3. Ensure correct orientation of the refrigerant cylinder. Follow cylinder labeling/instructions so that liquid refrigerant can be charged into the system. This will be charged through the high-pressure side of the manifold and ZX unit liquid service valve.
4. The refrigerant cylinder should be weighed at this point to be able to record the final refrigerant charge. Note that the standard receiver capacity is 4.4 kg of refrigerant for single-fan units and 6.3 kg of refrigerant for dual-fan units at 80% capacity and 32°C ambient temperature (R404A).
5. Now open the liquid service valve (off the back seat). With a good vacuum in the system, the refrigerant cylinder correct orientation and at ambient, you should not need to run the compressor at all.

## Electrical (power) connections

**KEEP IN MIND:** ZX condensing units' uses 3-phase scroll compressors and can rotate in the wrong direction when starting. If this happens reverse any two phases (L1 & L3) and start again. Built-in electrical contactors - requires 3-phase power supply line ONLY (as shown) NO ADDITIONAL CONNECTIONS at the ON-BOARD CONTACTORS




## Maximum compressor cycle

Maximum permitted starts per hour is 10.

## ZX CDU field wiring connections: L1, L2, L3 and neutral line (N)



## Controller initialization message








Step	Action	Phenomenon and description
1	Power on controller	All LEDs will light up for 3 seconds.
2		Firmware version will be displayed for 3 seconds.
3		Parameter setting file (bin file) identifier will be displayed for 3 seconds.
4		Normal display (actual suction temperature will be displayed on ZXD unit, condensing temperature will be displayed on ZX/ZXL unit)

## Bin files number range









Bin number range	Family
1 to 200	ZX
301 to 500	ZXL
501 to 600	ZXD
800 to 806	Service Part

After installation and initial power on, it is critical to double check the parameters below.

## RTC (Real Time Clock) setting

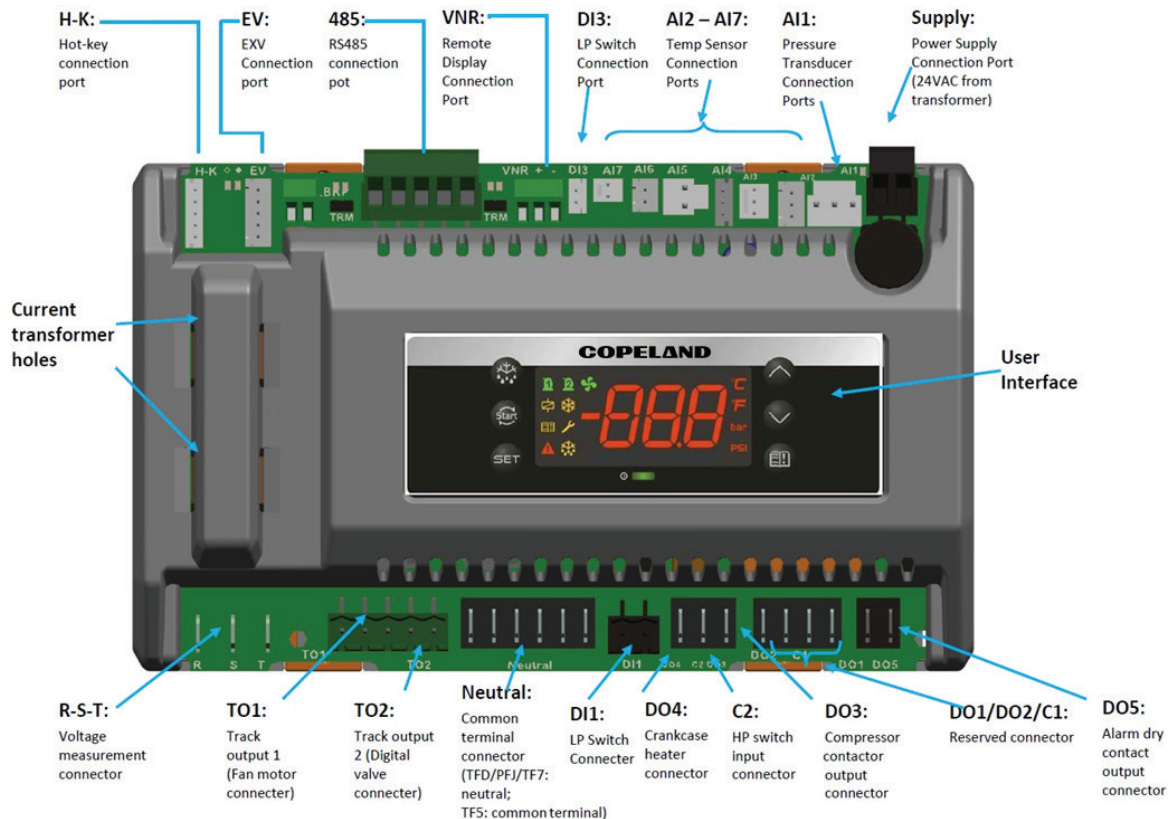
Step	Action	Phenomenon and description
1	Press "SET" + 	Enter menu to select "PAR" (parameter) or "rtC"
2	Press "  or " 	Select "rtC"
3	Press "SET"	"n01", minute "n02", hour "n03", day "n04", month "n05", year (last two digits)
4	Press "SET"	Display actual value
5	Press "  or " 	Modify the value
6	Press "SET"	Press "SET": the value will flash for 3 second, then move to the next value
7	Press "SET" + 	Exit to "rtC"
8	Press "SET" + 	Exit to main menu (or wait for 120 seconds and exit atomically)

# Refrigerants

Step	Action	Phenomenon and description
1	Press "SET" + 	Enter menu to select "PAr" (parameter) or "rtC"
2	Press "  " or "  "	Select "PAr (parameter)"
3	Press "SET"	Confirm selection
4	Press "  " or "  "	Browse to parameter C07
5	Press "SET"	Confirm selection
6	Press "  " or "  "	Select refrigerant to be used
7	Press "SET"	The number will flash for 3 seconds and confirm the refrigerant selection
8	Press "SET" + 	Exit (or exit automatically after waiting for 120 seconds)

## Procedure for converting the unit to R134a in case if it is not specified during ordering

Please insert the jumper at point DI3 after removing the existing LP cutout connection. The spare jumper is available in the controller as shown in the below pictures. Please note that the ZX condensing units are also provided with adjustable type LP cutout which work as pump down control as well as LP protection.





Jumper received with the unit



Jumper to be installed



Jumper after installation



Change the condensing temperature setpoint (E39) from 20°C to 35°C for R134a operation as below

Step	Action	Phenomenon and description
1	Press "SET" +	Enter menu to select "PAR" (parameter) or "rtC"
2	Press  or	Select "PAR (parameter)"
3	Press "SET"	Confirm selection
4	Press  or	Browse to parameter E39
5	Press "SET"	Confirm selection
6	Press  or	Change the set point from existing 20°C to 35°C
7	Press "SET"	The number will flash for 3 seconds and confirm the change in set point
8	Press "SET" +	Exit (or exit automatically after waiting for 120 seconds)

Now the unit is ready for operation with R134a refrigerant.

### Evaporating temperature (ZXD only)

Step	Action	Phenomenon and description
1	Press "SET" > 3 seconds	Press "SET" button for more than 3 seconds, the measurement units (°C) will flash together.
2	Press  or	Modify the number for target evaporating temperature
3	Press "SET"	Press "SET" to confirm, the number will flash for 2 seconds (or wait for about 10 seconds to confirm)

## Alarm codes

Level	Descriptions
Warning	Unit (including compressor) is running but some data reach unsafe area; alarm dry-contact will not close; reset automatically
Alarm	Unit (including compressor) may run not with full functions; alarm dry-contact will not close; reset automatically
Lock	Unit (including compressor) stops working; alarm dry-contact will close; manual reset is needed

## Diagnostics

Alarm code	Descriptions	Possible reason	Action	Reset
<b>Hardware error</b>				
E01	Suction pressure probe failure alarm	Probe failure or out of range	No (ZXD Unit Only)	Automatic Reset when the probe restarts working
E02	Condensing temperature probe failure alarm	Probe failure or out of range (-40 ~ 110°C)	Function: fan speed control is disabled	Automatic Reset when the probe restarts working
E03	Discharge temperature probe failure alarm	Probe failure or out of range (-40 ~ 180°C)	Function: discharge temperature protection is disabled	Automatic Reset when the probe restarts working
E04	PHE vapor inlet temperature probe failure alarm	Probe failure or out of range (-40 ~ 110°C)	Function: PHE Superheat Control is disabled(ZXL unit only)	Automatic Reset when the probe restarts working
E05	PHE vapor outlet temperature probe failure alarm	Probe failure or out of range (-40 ~ 110°C)	Function: PHE Superheat Control is disabled(ZXL unit only)	Automatic Reset when the probe restarts working
E06	Ambient temperature probe failure alarm	Probe failure or out of range (-40 ~ 110°C)	Related functions are disabled	Automatic Reset when the probe restarts working
E09	Current sensor 1 error alarm	Out of range	Related functions are disabled	Automatic Reset when the probe restarts working
E10	Current sensor 2 error alarm	Out of range	Related functions are disabled	Automatic Reset when the probe restarts working
E11	Voltage sensor 1 error alarm	Out of range	Related functions are disabled	Automatic Reset when the probe restarts working
E12	Voltage sensor 2 error alarm	Out of range	Related functions are disabled	Automatic Reset when the probe restarts working
E13	Voltage sensor 3 error alarm	Out of range	Related functions are disabled	Automatic Reset when the probe restarts working

Alarm code	Descriptions	Possible reason	Action	Reset
<b>Electrical error</b>				
E20	Missing phase alarm	One or two phases of compressor power supply lost or Voltage sensors do not work (3-ph unit only)	The compressor will be tripped	Automatically with time delay
L20	Missing phase lock	Missing phase alarm happened frequently	The compressor will be tripped and the unit will be locked	Press "Start" >5 sec or manually power-off and power-on
L21	Wrong phase sequence lock	Compressor power supply has wrong sequence (3-phase unit only)	The compressor will be tripped and the unit will be locked	Press "Start" >5 sec or manually power-off and power-on
E22	Imbalanced 3-phase warning	3-Ph currents are not balanced (3-Ph unit only)	No	Automatically with time delay
E23	Over current alarm	Compressor current is larger than settings	Function: PHE Superheat Control is disabled(ZXL unit only)	Automatic Reset when the probe restarts working
L23	Over current lock	Over current alarm happens frequently	The compressor will be tripped and the unit will be locked	Press "Start" >5 sec or manually power-off and power-on
E24	Compressor running circuit open alarm	Compressor running circuit open (1-ph unit only)	The compressor will be tripped	Automatically with time delay
L24	Compressor running circuit open lock	Running circuit open alarm happens frequently	The compressor will be tripped and the unit will be locked	Press "Start" >5 sec or manually power-off and power-on
E25	Compressor starting circuit open alarm	Compressor starting circuit open (1-ph unit only)	The compressor will be tripped	Automatically with time delay
L25	Compressor starting circuit open lock	Compressor starting circuit open alarm happens frequently	The compressor will be tripped and the unit will be locked	Press "Start" >5 sec or manually power-off and power-on
E26	Low voltage alarm	Voltage is lower than settings; or voltage sensors do not work	The compressor will be tripped	Automatically with time delay
L26	Low voltage lock	Low voltage alarm happens frequently	The compressor will be tripped and the unit will be locked	Press "Start" >5 sec or manually power-off and power-on
E27	Over voltage alarm	Voltage is higher than settings	The compressor will be tripped	Automatically with time delay
L27	Over voltage lock	Over voltage alarm happens frequently	The compressor will be tripped and the unit will be locked	Press "Start" >5 sec or manually power-off and power-on
E28	Compressor internal protector open warning	Compress internal protector is open; or current sensors do not work	No	The compressor will be tripped
E30	No controller power supply alarm	Controller lost power supply		

Alarm code	Descriptions	Possible reason	Action	Reset
<b>Refrigeration system error</b>				
E40	High pressure switch alarm	High pressure switch is open	The compressor will be tripped	Automatically when HP switch closes
L40	High pressure switch lock	High pressure switch alarm happens frequently	The compressor will be tripped and the unit will be locked	Press "Start" >5 sec or manually power-off and power-on
E41	Low pressure switch alarm	Low pressure switch is open	The compressor will be tripped	Automatically when LP switch closes and time delay
E44	High discharge temperature alarm	Discharge temperature is higher than settings	The compressor will be tripped	Automatically when discharge temperature is lower than settings and time delay
L44	Higher discharge temperature lock	High discharge temperature alarm happens frequently	The compressor will be tripped and the unit will be locked	Press "Start" >5 sec or manually power-off and power-on
E46	High condensing temperature alarm	Condensing temperature is higher than settings	No	Automatically when condensing temperature is lower than settings
E47	EXV Full-open warning	Less refrigerant charge or leakage	No	Automatically when EXV is not at full-open
E48	Less injection warning	Less refrigerant charge or leakage	No	Automatically when PHE super heat is smaller than settings
E50	High side liquid back warning	Suction liquid back or injection too much	No	Automatically when the difference of discharge temperature and condensing temperature is higher than settings and time delay

<b>Misc. error</b>				
E80	RTC warning	The time is configured for the new controller	No	Automatically when finish time configuration
E81	RTF warning	Communication error between MCU and unit clock	No	Automatically when the communication recovers
E82	Probe configuration error alarm	The same probes are configured	No	Automatically when the probes are configured correctly
E83	Digital inputs configuration error alarm	The same digital inputs are configured	The related functions will be disabled	Automatically when the digital inputs are configured correctly
E84	Compressor configuration error alarm	Digital compressor and solenoid valve configuration does not match	The compressor will not work	Manually power off and power on after the compressor configuration is right
E85	Injection probe configuration error alarm	EXV and injection configuration do not match	EXV will not work	Automatically when injection probe is configured correctly
L86	EEPROM R/W error lock	Write/read error into EEPROM	The compressor will tripped and the unit will be locked	Hold "start" button for 5s or manual power off and on, alarm will disappear when the communication between MCU and EEPROM is success.

# Wiring diagrams

## ZXD-TFD/TF7 Condensing Unit Wiring Diagram

TFD - 380/420V, 50Hz, 3Ph  
 TF7 - 380V, 60Hz, 3Ph

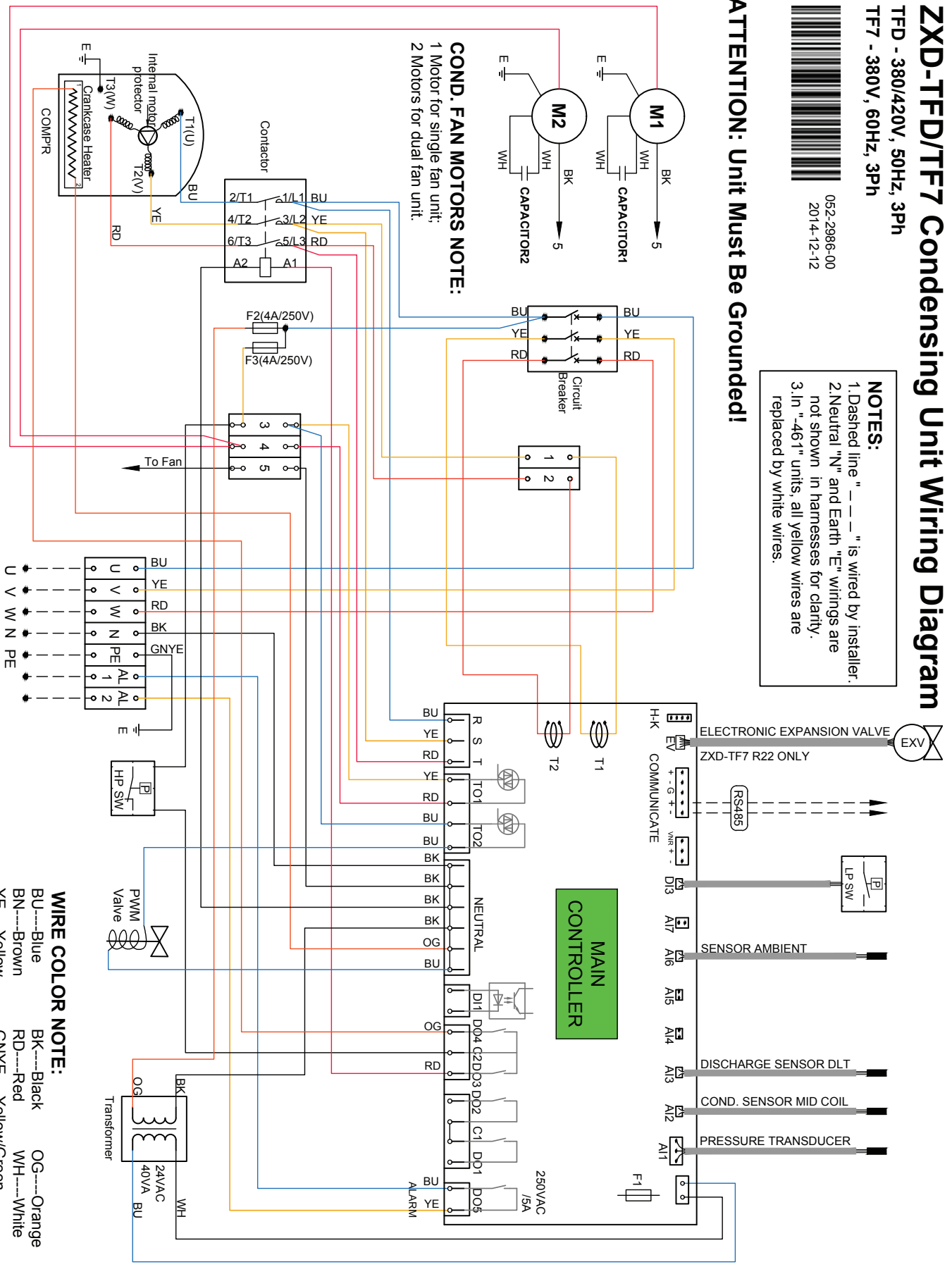


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 2014-12-12

**NOTES:**  
 1. Dashed line "----" is wired by installer.  
 2. Neutral "N" and Earth "E" wirtings are not shown in harnesses for clarity.  
 3. In "461" units, all yellow wires are replaced by white wires.

**ATTENTION: Unit Must Be Grounded!**

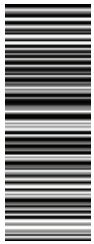
**COND. FAN MOTORS NOTE:**  
 1 Motor for single fan unit;  
 2 Motors for dual fan unit.



**WIRE COLOR NOTE:**  
 BU----Blue  
 BN----Brown  
 YE----Yellow  
 BK----Black  
 RD----Red  
 GNYE----Yellow/Green  
 OG----Orange  
 WH----White

# ZX/ZXL Condensing Unit Wiring Diagram

PFJ - 220/240V, 50Hz, 1Ph

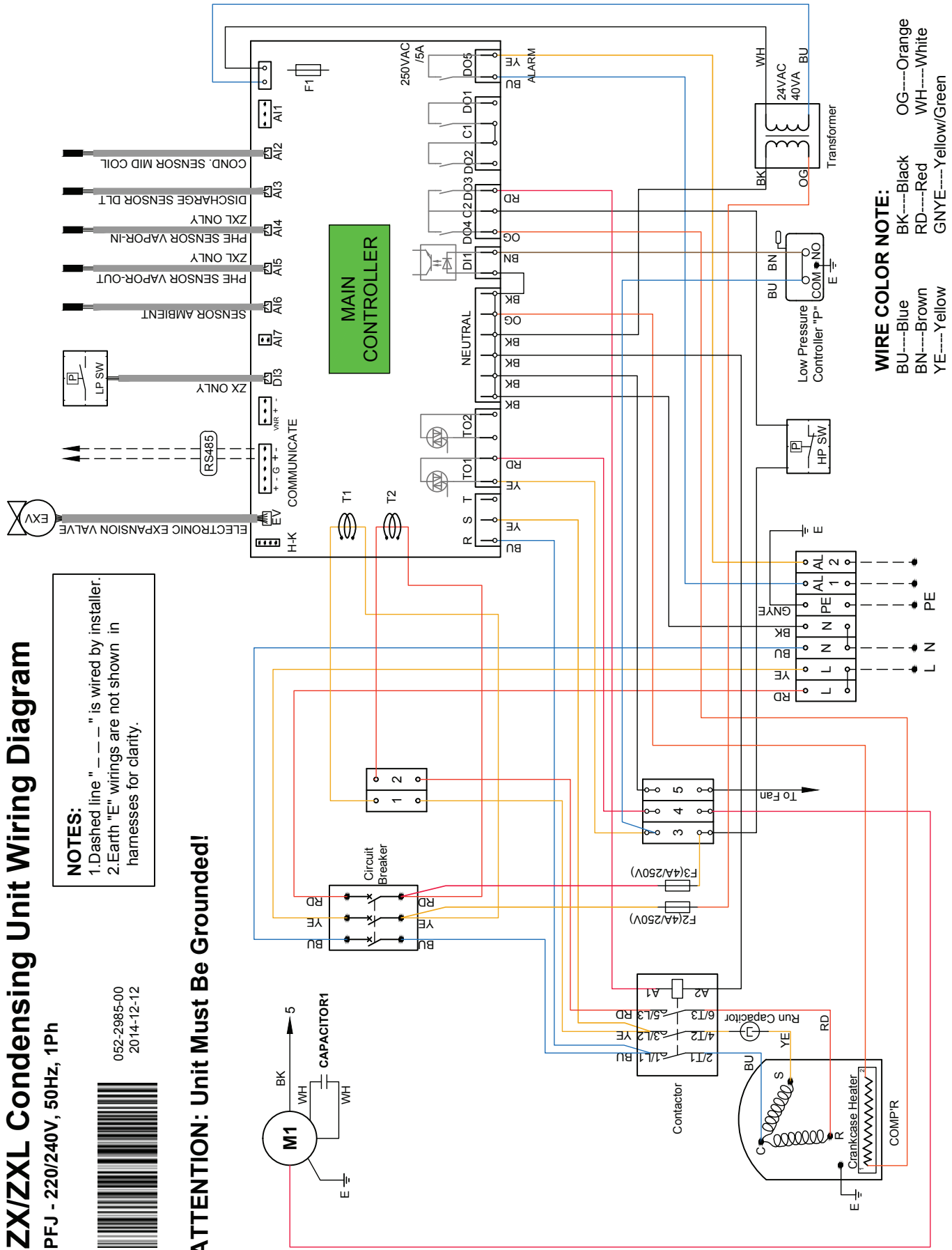


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2014-12-12

### NOTES:

1. Dashed line "----" is wired by installer.
2. Earth "E" wirings are not shown in harnesses for clarity.

**ATTENTION: Unit Must Be Grounded!**



# ZX/ZXL-TF5 Condensing Unit Wiring Diagram

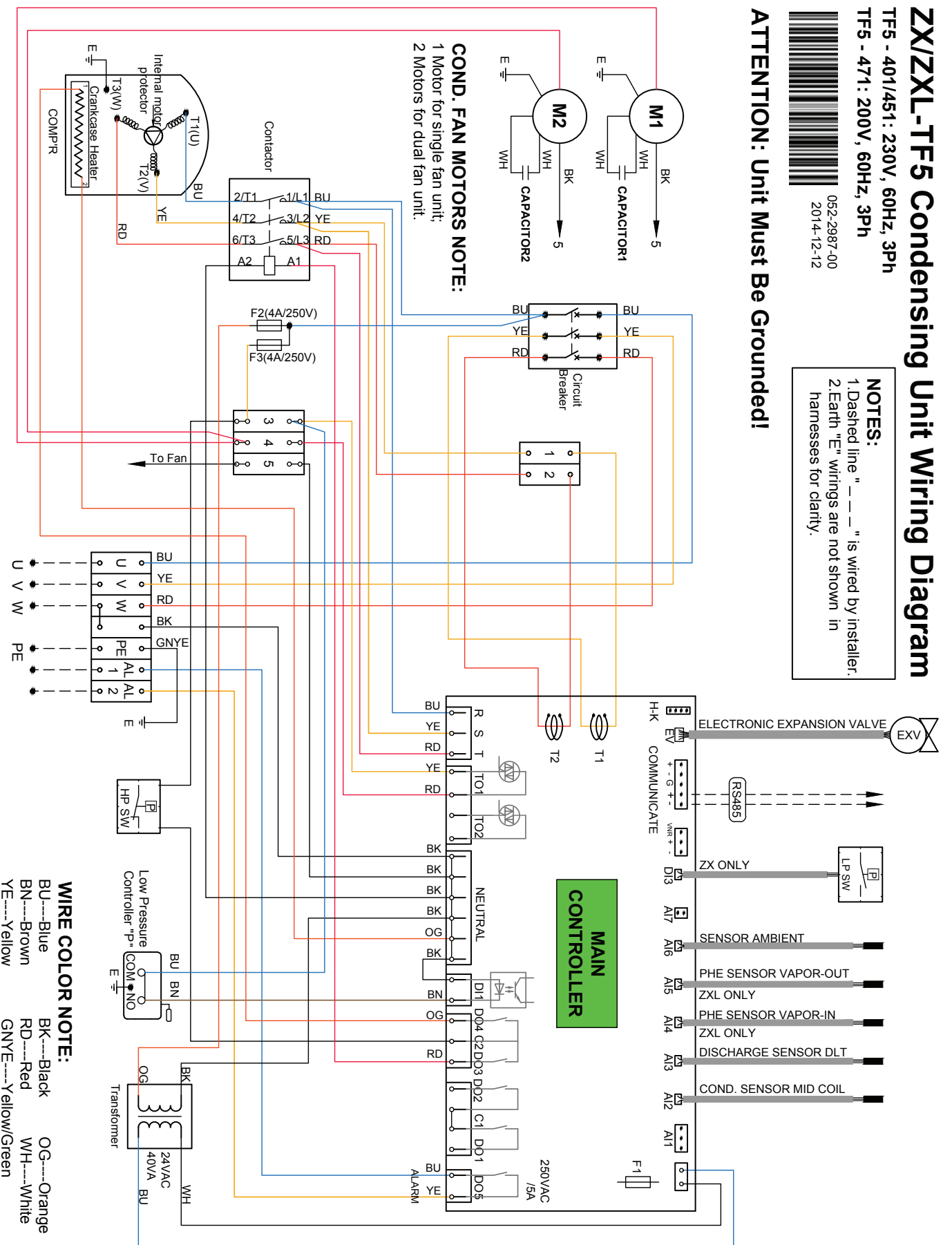
TF5 - 401/451: 230V, 60Hz, 3Ph  
 TF5 - 471: 200V, 60Hz, 3Ph



052-2987-00  
 2014-12-12

**ATTENTION: Unit Must Be Grounded!**

**NOTES:**  
 1. Dashed line "----" is wired by installer.  
 2. Earth "E" wirings are not shown in harnesses for clarity.



**COND. FAN MOTORS NOTE:**  
 1 Motor for single fan unit;  
 2 Motors for dual fan unit.

**WIRE COLOR NOTE:**

- BU----Blue
- BK----Black
- BN----Brown
- RD----Red
- GNYE----Yellow/Green
- OG----Orange
- WH----White

# ZX/ZXL-TFD/TF7 Condensing Unit Wiring Diagram

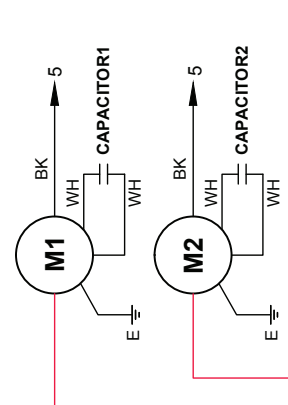
TFD - 380/420V, 50Hz, 3Ph  
 TF7 - 380V, 60Hz, 3Ph



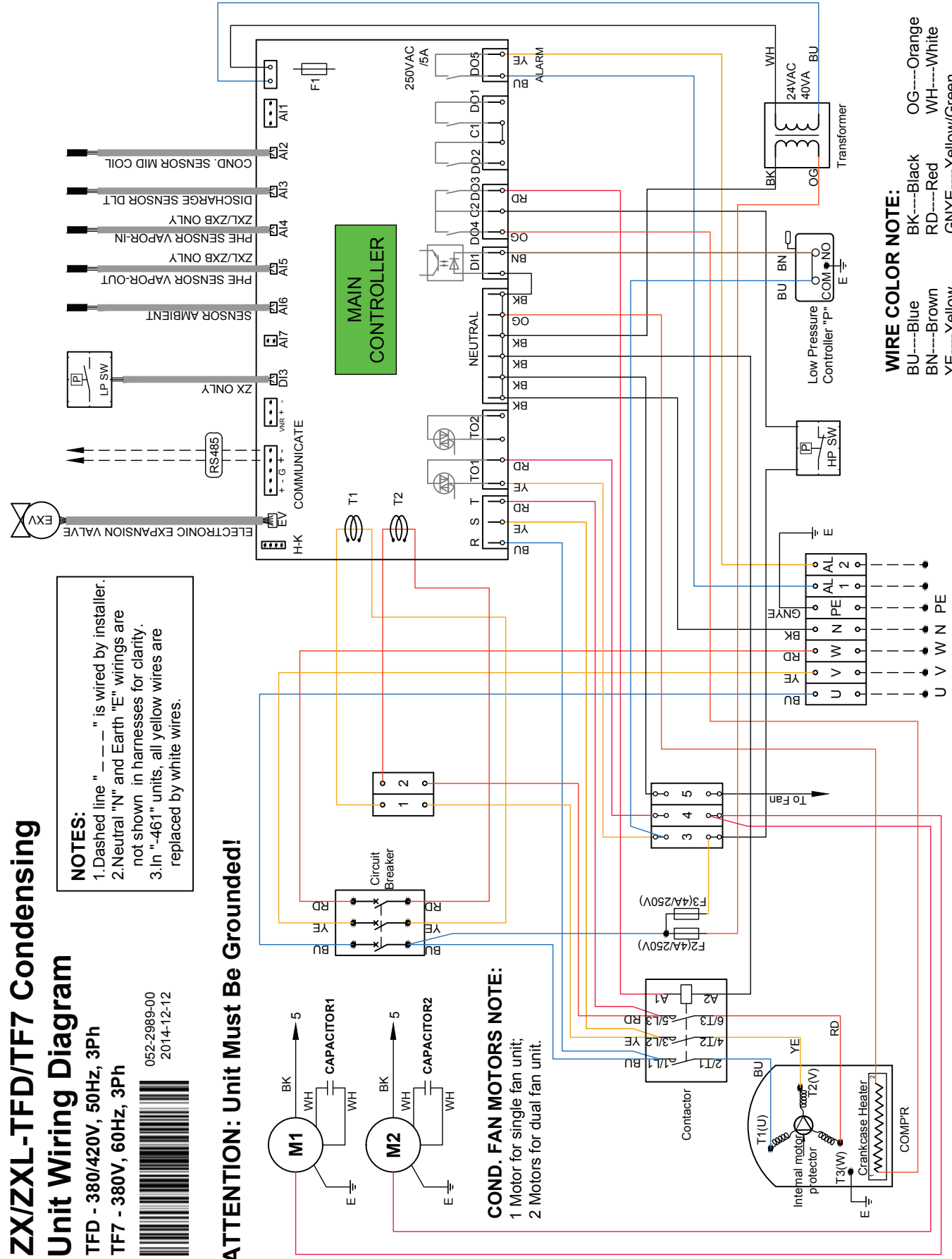
052-2989-00  
 2014-12-12

**NOTES:**  
 1. Dashed line "----" is wired by installer.  
 2. Neutral "N" and Earth "E" wirings are not shown in harnesses for clarity.  
 3. In ".461" units, all yellow wires are replaced by white wires.

**ATTENTION: Unit Must Be Grounded!**



**COND. FAN MOTORS NOTE:**  
 1 Motor for single fan unit;  
 2 Motors for dual fan unit.



**WIRE COLOR NOTE:**  
 BU----Blue  
 BN----Brown  
 YE----Yellow  
 BK----Black  
 RD----Red  
 GNYE----Yellow/Green  
 OG----Orange  
 WH----White  
 BU----Yellow/Green



# ZX/ZXL-TFD/TF7 Condensing BOM 481

## Unit Wiring Diagram

TFD - 380/420V, 50Hz, 3Ph  
 TF7 - 380V, 60Hz, 3Ph

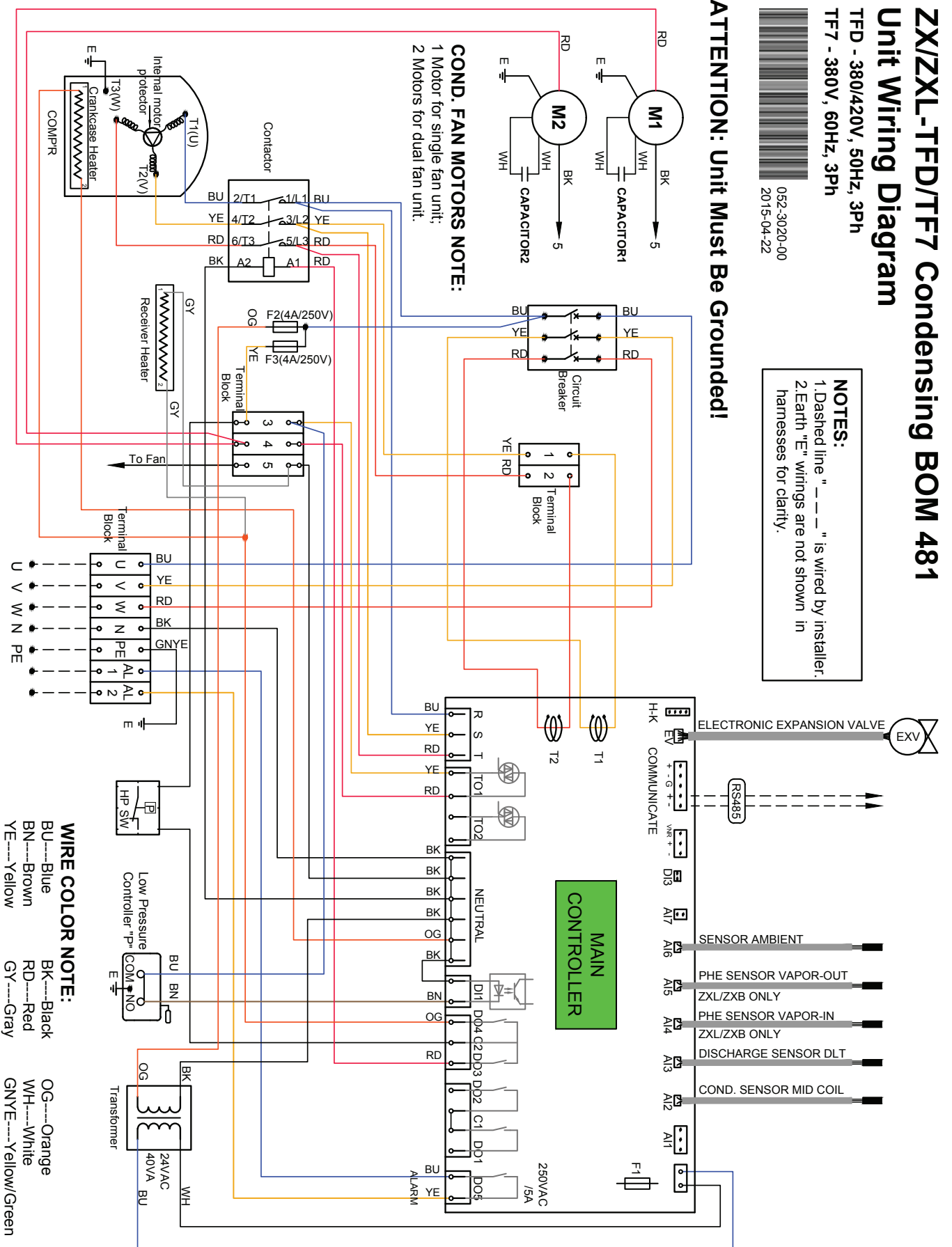


052-3020-00  
 2015-04-22

**NOTES:**  
 1. Dashed line " - - - " is wired by installer.  
 2. Earth "E" wirings are not shown in harnesses for clarity.

**ATTENTION: Unit Must Be Grounded!**

**COND. FAN MOTORS NOTE:**  
 1 Motor for single fan unit;  
 2 Motors for dual fan unit.



**WIRE COLOR NOTE:**

BU --- Blue	BK --- Black
BN --- Brown	RD --- Red
YE --- Yellow	GY --- Gray
	OG --- Orange
	WH --- White
	GYE --- Yellow/Green

# System start-up and operational check sheet

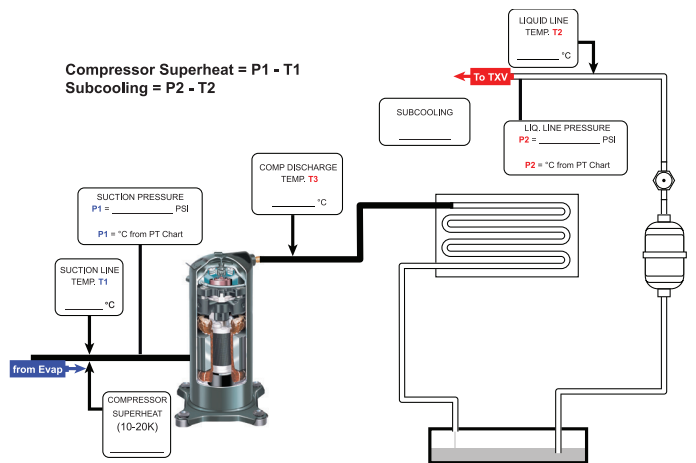
Client details	
Facility/customer name:	
Address:	
Contact details:	
Installer:	
Installation date:	

ZX condensing unit info	
CDU model:	
Serial number:	
CDU location:	
Indoor unit make/model:	

System details	
Room/case ID:	
Pipe length (approx.):	
OAT @ Start-up/check:	
PSI leak test:	<b>PSIG</b>
Duration:	<b>Hours</b>
System is leak tight:	<b>Y / N</b>
Triple evacuation:	<b>Y / N</b>
Micron gauge reading:	<b>microns</b>
Total evacuation:	<b>PSIG @ # of Hrs</b>
Refrigerant:	
Total charge:	<b>Kg.</b>
Sight glass clear:	<b>Y / N</b>
Evap fans running:	<b>Y / N</b>
Liquid line insulation:	<b>Y / N</b>
Sound and vibration:	

System operation	
COMP voltage:	<b>V</b>
COMP current:	<b>A</b>
Suction pressure:	<b>PSIG/Bar</b>
Liquid line pressure:	<b>PSIG/Bar</b>
COMP suction temp:	<b>°C</b>
COMP disch temp:	<b>°C</b>
Liquid line temp:	<b>°C</b>
Compressor SH:	<b>K</b>
Subcooling:	<b>K</b>
Adjustable LP setpoint:	<b>PSIG</b>
Design/operating temp:	<b>°C</b>
Actual room/case temp:	<b>°C</b>
Condenser fins:	

Comments



Prepared by: \_\_\_\_\_

Date: \_\_\_\_\_

## **General information**

Technical data are correct at the time of printing. Updates may occur, and should you need confirmation of a specific value, please contact Copeland stating clearly the information required.

Copeland cannot be held responsible for errors in capacities, dimensions, etc., stated herein. Products, specifications, and data in this literature are subject to change without notice.

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The suitability for this has to be assured from the plant manufacturer, which may include making appropriate tests.

### **Note:**

The components listed in this catalogue are not released for use with caustic, poisonous or flammable substances. Copeland cannot be held responsible for any damage caused by using these substances.



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2020/MEA/66 ZX condensing unit  
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