

Technical Data Manual

TDM

Group: Chiller
Part Number: TDM CLIC
Date: 4 August 2023

CLIC Series **Air-Cooled Scroll Compressor Chiller** **Water Generator Unit**

Model

25 to 250 TR

HFC-410A Refrigerant

50/60 Hz



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Manufactured in an ISO 9001 certified facility



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SAFETY WARNING

This manual provides information on the technical data of the Clima Flex CLIC series.

NOTES: Installation and maintenance must be performed only by qualified personnel who are familiar with local codes and regulations and who have experience with this type of equipment.

⚠ DANGER ⚠

LOCK OUT/LABEL all power sources before starting, pressurizing, depressurizing or shutting down the chiller.

Disconnect electrical power before servicing equipment. More than one disconnection may be required to de-energize the unit. Failure to follow this warning to the letter can result in serious injury or death. Be sure to read and understand the installation, operating and service instructions in this manual.

⚠ WARNING ⚠

Electric shock danger. Improper handling of this equipment can cause personal injury or equipment damage. This equipment must be properly grounded. Control panel connections and maintenance should be performed only by personnel knowledgeable in the operation of the equipment being controlled. Disconnect electrical power before servicing equipment. Be sure to install a earth leakage breaker. Failure to install a earth leakage breaker may result in electric shock or fire.

⚠ CAUTION ⚠

Static sensitive components. Static discharge during handling of the electronic circuit board can cause damage to components. Use a static strap before performing any service work. Never unplug any cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

⚠ CAUTION ⚠

When moving refrigerant to/from the cooler using an auxiliary tank, a grounding strap should be used. An electrical charge builds up when halo-carbon refrigerant travels in a rubber hose. A grounding strap should be used between the auxiliary refrigerant tank and the cooler end sheet (ground to ground), which will safely carry the charge to ground. Failure to follow this procedure may result in damage to sensitive electronic components.

⚠ WARNING ⚠

If refrigerant leaks from the unit, there is a potential choking danger as the refrigerant will displace air in the immediate area. Be sure to follow all applicable published industry-related standards and local, state, and federal statutes, regulations, and codes if refrigerant is produced. Avoid exposing refrigerant to an open flame or other ignition source.

⚠ WARNING ⚠

Polyolester oil, commonly referred to as POE oil, is a synthetic oil used in many refrigeration systems and may be present in this Clima Flex product. POE oil, if it ever comes in contact with PCV/CPVC, will coat the inside wall of the PVC/CPVC pipe and cause environmental stress fractures. Although there is no PCV/CPCV pipe in this product, keep this in mind when selecting piping materials for your application, as system failure and property damage could occur. Consult the pipe manufacturer's recommendations to determine appropriate pipe applications.

DANGER IDENTIFICATION INFORMATION

⚠ DANGER ⚠

Danger indicates a dangerous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING ⚠

Warning indicates a potentially dangerous situation which may result in property damage, personal injury or death if not avoided

⚠ CAUTION ⚠

Caution indicates a potentially dangerous situation which may result in minor injury or equipment damage if not avoided.

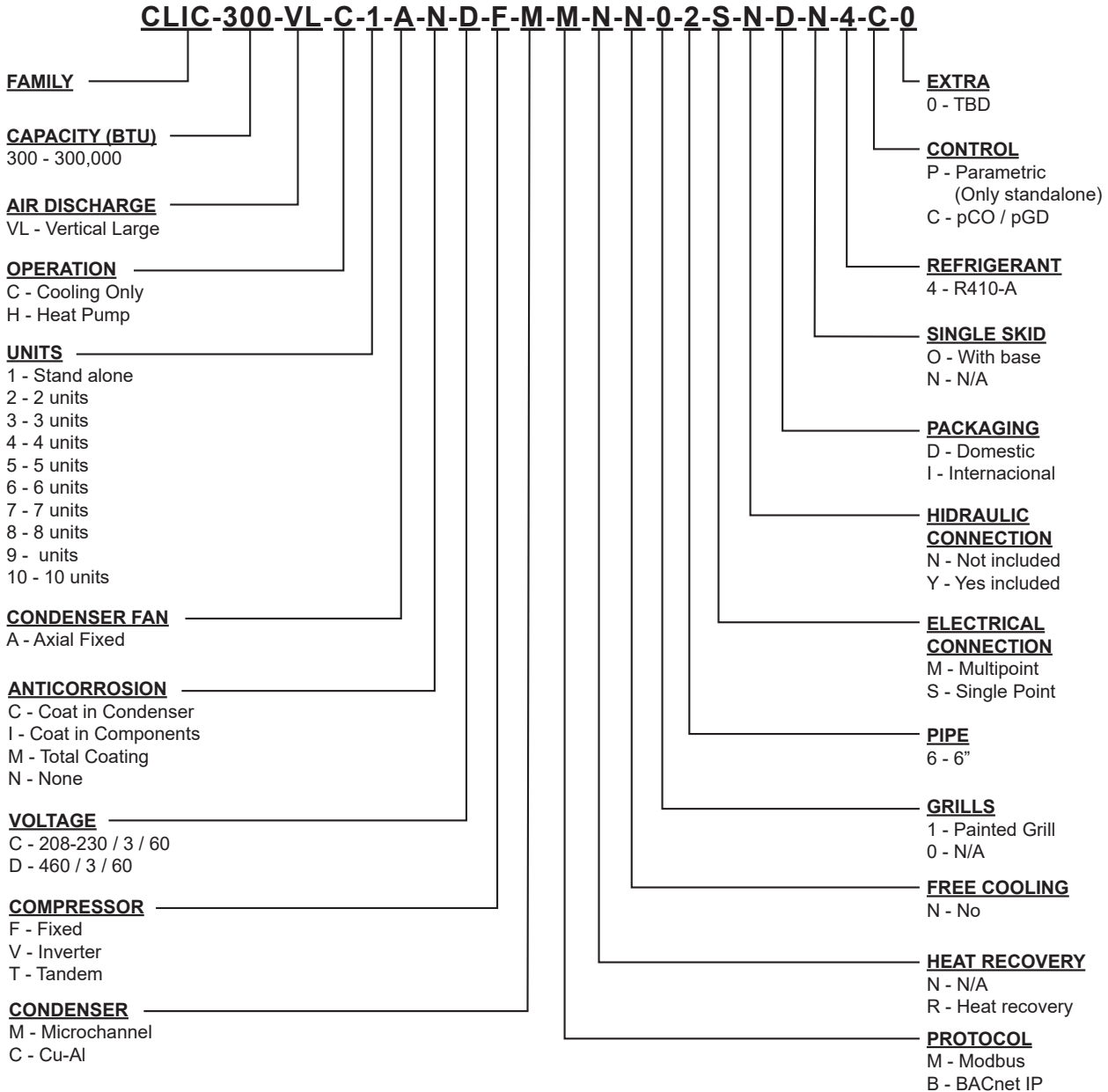
Notes: Indicate important details or clarifying statements for the information presented.

Our units are built with design and control in mind, so we use specialized technical control software. Some of our special features are our own piping and wiring, Scroll compressors, new generation evaporators, air cooled condensers, optional hydraulic

components, and various safety protections.

Our units are environmentally friendly and operate with R410A refrigerant.

NOMENCLATURE



FEATURES / BENEFITS

EFFICIENCY

Our units are designed to meet the needs of any project. Our intelligent process controllers and smart temperature sensors provide maximum performance and energy savings.

The system automatically modifies the operating mode to maintain optimum system conditions, making it very easy to operate.

All temperature sensors are calibrated and adjusted at the factory prior to shipment. Start-up should be performed by a qualified technician, during initial start-up the unit will be adjusted to local conditions and all operating points will be checked.

Once the unit has been placed in place, operation is a matter of pressing the start/stop button until it is certain that the unit is operating properly, after which the unit will operate automatically, turning itself on according to the demand of the refrigeration system and local conditions.

FLEXIBILITY

The units feature intelligent processors and sensors that automatically control the temperature at optimum operating conditions.

The units were designed to be coupled with each other and combined to meet different load variations (Tandem Installation). Up to 10 modules can be combined; these combinations can be made with Water Chiller Units of different capacities ranging from 25 to 250 tons. Capacities vary depending on the number and type of units.

SAFETY

All frames are manufactured from galvanized sheet steel, coated with electrostatic baked-on paint to ensure long durability and freedom from corrosion under all weather conditions, such as direct sunlight, rain and wind.

All units are designed to fit into a small installation space, thus eliminating large installation areas. We use only high quality components to ensure durability and safety even in harsh environmental conditions.

NOTE: For applications in tropical climates, our units are coated inside and out with corrosion protection (over-ordering).

Our products have AHRI efficiency certifications and ETL safety certifications, in addition to meeting all industry safety standards. We are members of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). To show our commitment to our customers and stakeholders; our equipment comes with a 1 year major warranty after start-up.

Our units use R410A refrigerant, which is harmless to the ozone layer and is non-toxic and non-flammable, even in case of leakage.

Finally, the efficiency of the heat exchanger and its modular design allow for quick and easy installation.

DESIGN

Research conducted by the Engineering Department has resulted in units with high design efficiency and optimum performance. The selection of the main components, our quality and control system guarantee high performance and safety.

All major components are rigorously tested and qualified before installation. Each designed unit has undergone long hours of rigorous testing to ensure the safety, durability and quality of the entire system.

COMMUNICATION

The units can be controlled in tandem mode and/or can be connected to a central control unit. Operation and user access will be through a 7" color touch screen.

Our units can be managed through different communication protocols; such as Modbus and BACnet, the most commonly used protocols in the Air Conditioning industry.

Our units keep track of all programmable variables in real time, such as performance monitoring, refrigeration cycle specific alarms and electrical system.

The control and monitoring system ensures the correct operation of the unit by monitoring in real time the condition of the major components (high or low refrigerant pressure, compressor and fan motor conditions, etc.).

In case of failure, the event will be recorded for later analysis, facilitating the localization of a possible failure and its solution.

INSTALLATION

The units have been designed for easy installation. Screw connections provide easy installation of the water piping, which are located on both sides of the unit, so that the piping can be connected to either side of the unit.

The individual assembly of the units reduces installation cost, the units have a rigid base that balances the weight of the unit and allows for easy installation.

MAINTENANCE

The simplicity in the design of each unit allows for maximum ease of maintenance. All major components are available to maintenance personnel by simply opening the service panel.

If an emergency shutdown occurs, the control section will indicate in detail the cause of the failure, helping to facilitate and accelerate troubleshooting.

TESTING

Each unit is pressure and vacuum tested and then charged with the refrigerant required for proper operation based on the customer's installation conditions.

The units are evaluated at full load operation with water flow, heat load and line voltage placed at actual operating conditions.

NOTE: The warranty policy requires that commissioning be performed by qualified personnel authorized by the company.

INSITUM® CORROSION PROTECTION

Spray for coating hvac/r products

Coating is a flexible, water-based, water-reducible, synthetic polymer corrosion coating designed specifically for the protection of HVAC/R coils and components. Insitu® Spray Applied Coating contains ES2 (embedded stainless steel pigment) technology, an anti-corrosion coating specifically designed for the protection of coils mounted in corrosive areas.

HVAC/R coils, components and enclosures will have a permanent water-based synthetic coating with ES2 pigment applied to all areas of the coating surface with no bridging of material between fins. Therefore, ES2 pigments are suitable for even the most corrosive environments and will maintain their appearance after many years of exposure. UV degradation ES2 pigments form a multilayer structure throughout the paint film.

This creates a barrier layer that reflects sunlight away from the paint film preventing UV rays from penetrating. As a result, UV degradation of individual polymer molecules is eliminated, film integrity is maintained and the pigment particles remain well anchored to the substrate.

The resulting smooth, hard finish prevents dirt build-up. The multilayer structure of ES2 pigments delays the passage of water molecules into the film and acts as an effective moisture barrier

Ideal applications for Insitu® spray-applied coatings.

- Mini-splits
- Packaged enclosures
- Condensing units
- Modular air handlers
- Air-cooled chillers
- Indoor and outdoor HVAC cabinets and copper tubing
- Heat exchange coils (water, condenser, evaporator, DX)



TECHNICAL INFORMATION

Figure 1. CLIC 25 RT water-cooled unit



Selection Conditions	
Head (ft)	0
Condenser water inlet temperature (°F)	95°
Water injection temperature (°F)	44°

Cooling mode	
Rated capacity (BTU/hr)	300,000
Actual capacity (BTU/hr)	285,861
EER (BTU/W*hr)	10.77
IPLV (EER)	9.845

Electrical	
Power supply (V,Hz)	208-230/3/60
a	280.35
MCA (A)	155.8
Total amperage (A)	87.04
Total consumption (kW)	26.55

Standard features

- Limited Warranty Clima Flex units
- 1 year warranty on functional parts of the equipment

Unit Data	
Refrigerant Type	R-410A (Charged)
Refrigerant charge (lbs)	21
Noise Level (Db)	74
Net Weight (lbs)	1,521
Operating Weight (lbs)	1,671
Controller	Digital (pCO)
Evaporator total pressure drop (ft WG)	16.7 (49.9)
Condenser total pressure drop (ft WG)	0.0330 (0.0986)

Dimensions	
Length (in)	87.25
Depth (in)	32.63
Height (in)	82.75
Water inlet and outlet diameter (in)	4

Compressor	
Type	Fixed
Quantity	1
Consumption (kW)	23.67
Amperage (A)	77.44

Evaporator	
Type	Stainless steel plates
Water flow (GPM)	57.17/35.73
Water inlet temperature (°F)	54°
Water outlet temperature (°F)	44°

Condenser	
Type	Microchannel
Airflow (CFM)	20,000
Area (ft²)	35.84

Fan	
Type	Axial
Pressure drop (in, H2O)	0.400
Air operating range (°F)	55.01/120.0
Consumption (kW)	2.880
Amperage (A)	9.600

Note: The document is subject to change without notice.

Note: For more technical information go to the "Software Selection" page. <http://www.clima-flex.com/chillers/index.php>

TECHNIQUE DATA

Oventrop Balancing Valve

Performance	
Maximum operating temperature:	248 °F (120 °C)
Minimum operating temperature:	14 °F (-10 °C)
Max. operating pressure:	232 psi (1600 kPa)
Max. Differential pressure:	58 psi (400 kPa)
Fluid:	Water or mixture of water and ethylene/propylene glycol (max. 50%) ph: 6.5-10

⚠ WARNING ⚠

HOT AND COLD SURFACES! RISK OF INJURY!

Do not touch the valve without safety gloves. The valve can become very hot during operation.

SHARP EDGES! RISK OF INJURY!

Only touch with safety gloves. The threads, recesses and edges of the valve are sharp.

General description

The “Cocon QTR” regulation and control valve is designed to be installed in air conditioning and heating systems with closed water circuits (e.g. central heating systems and radiant floor heating, coils, chilled ceilings, convection fans, etc.).

It operates as an automatic pressure differential flow regulator (hydraulically balanced), being able to control another variable (e.g. coming from a room thermostat) by modifying the flow rate with the help of an actuator.

Function

The Oventrop pressure independent control valve “Cocon QTR” is a valve combination consisting of an automatic flow controller and a regulating valve that can be equipped with an actuator (children only).



Notes: For more information, see “Hydraulic Balance Data Sheets” at <https://www.ventrop.com/es-ES/productos/hojast%C3%A9cnicasinstruccionesdefuncionamiento>

Table 1. Refrigerant charge.

COMPRESSOR	MODEL	R410A (LBS)	R410A (GR)
VZH117	Microchannel	19,07	8650,0
SH295	Microchannel	19,07	8650,0
DSH295	Microchannel	18,00	8164,7
VZH117	Cu/Al	30,00	13607,8
SH295	Cu/Al	30,00	13607,8

TECHNICAL INFORMATION

Figure 2. Diagrama to obtain the vacuum and refrigerant charge.

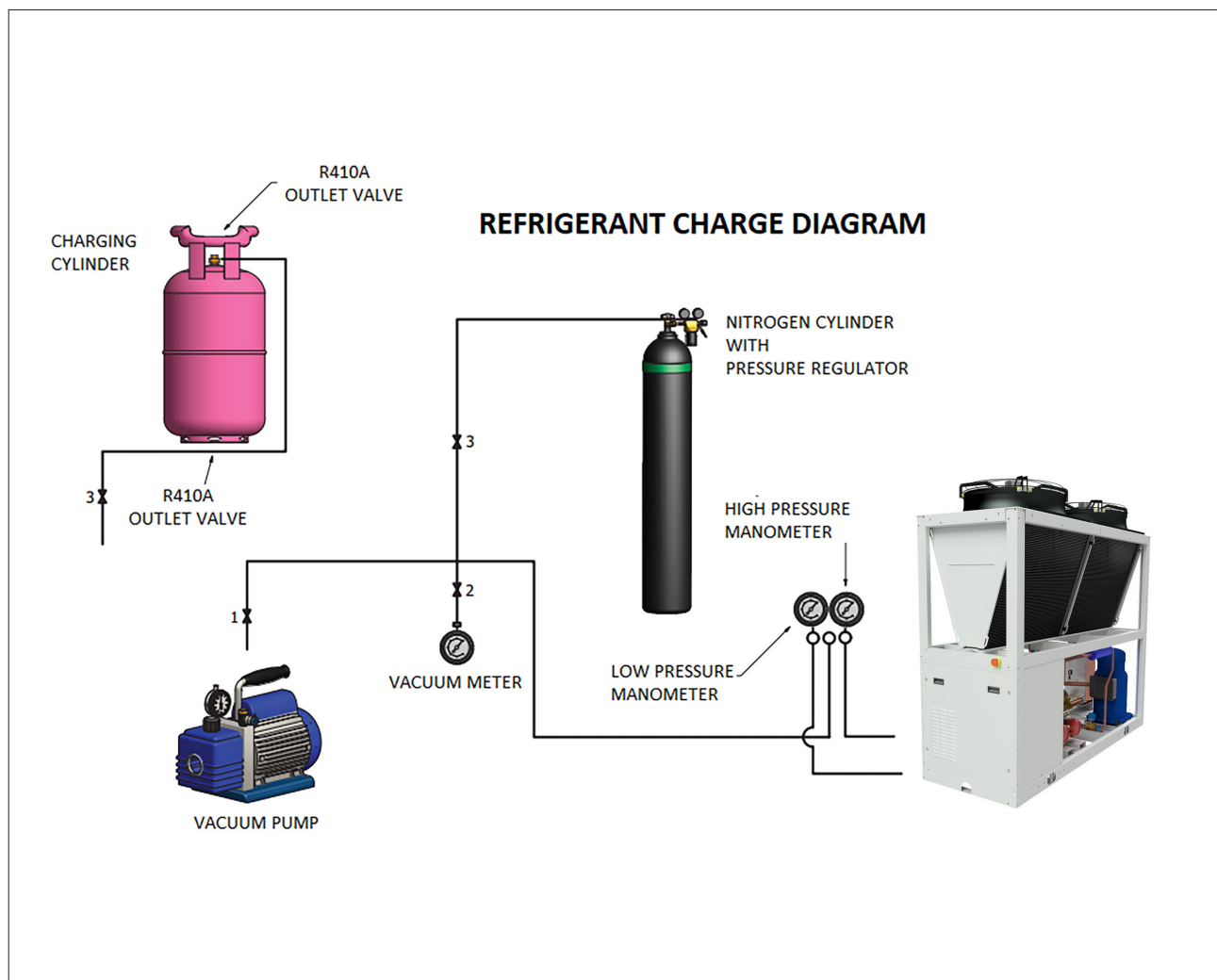
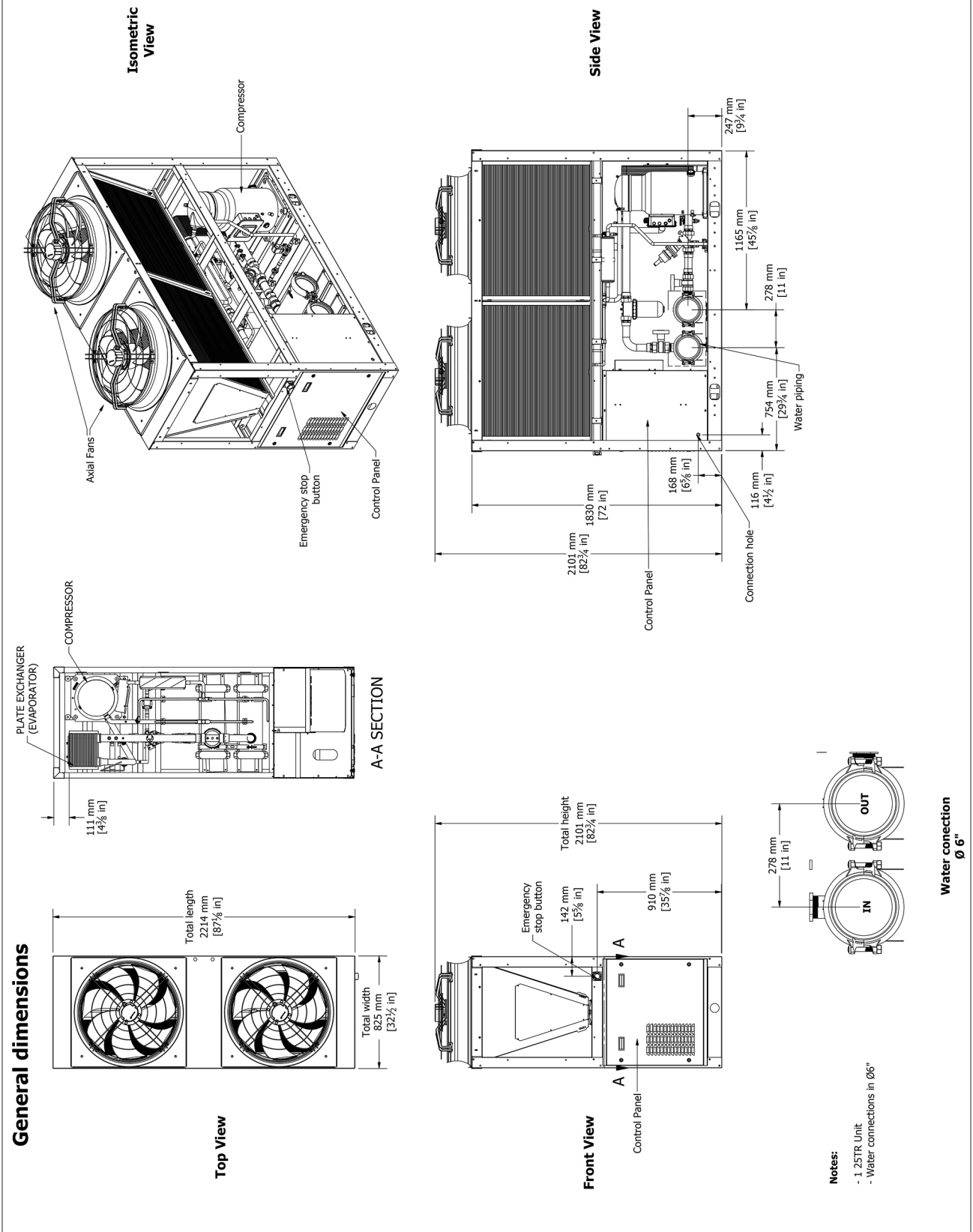


Figure 3. Dimensional configuration of a unit 25 RT.



DESIGN PARAMETERS

Figure 4. Dimensional configuration of a unit 50 RT.

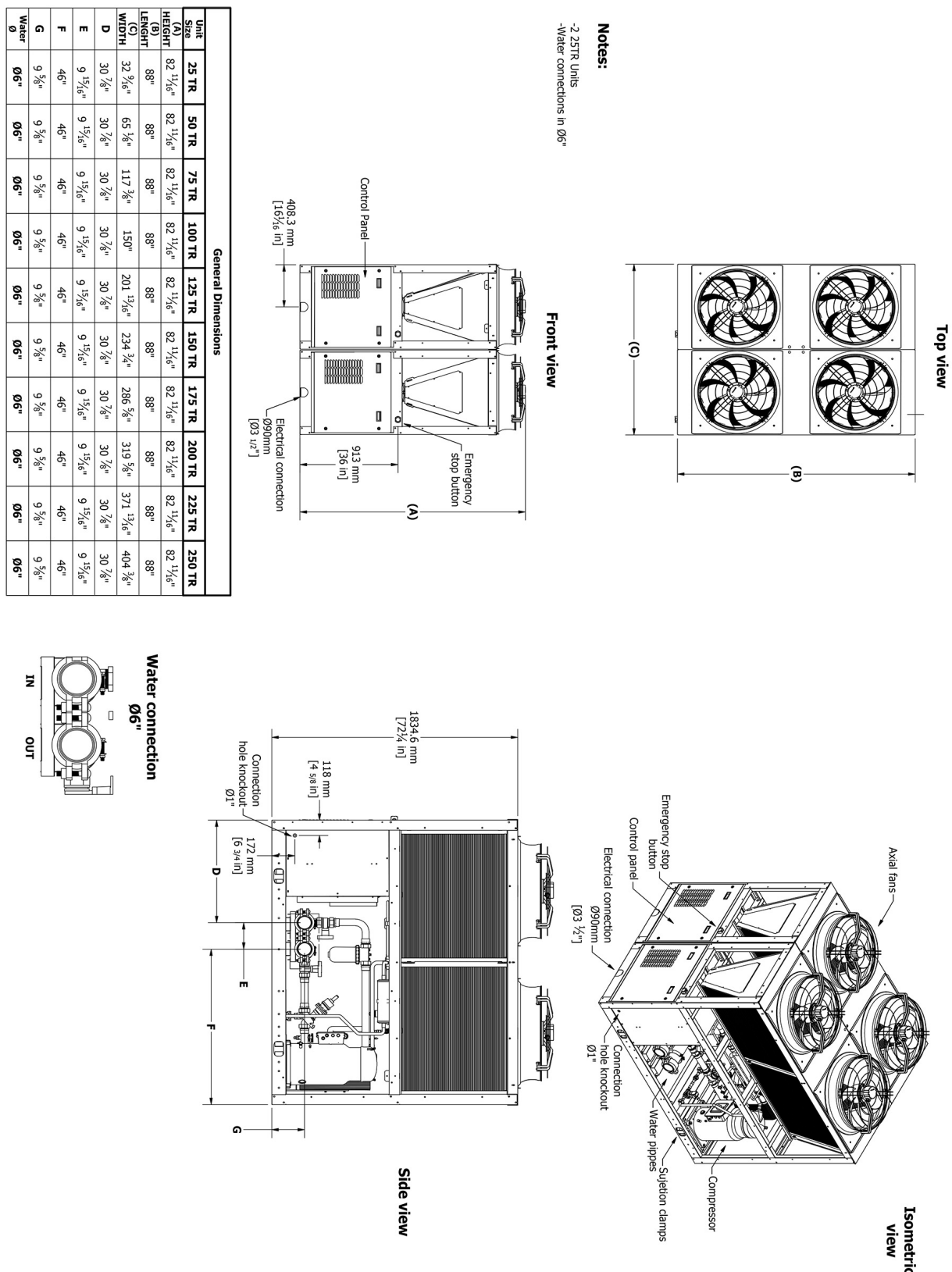
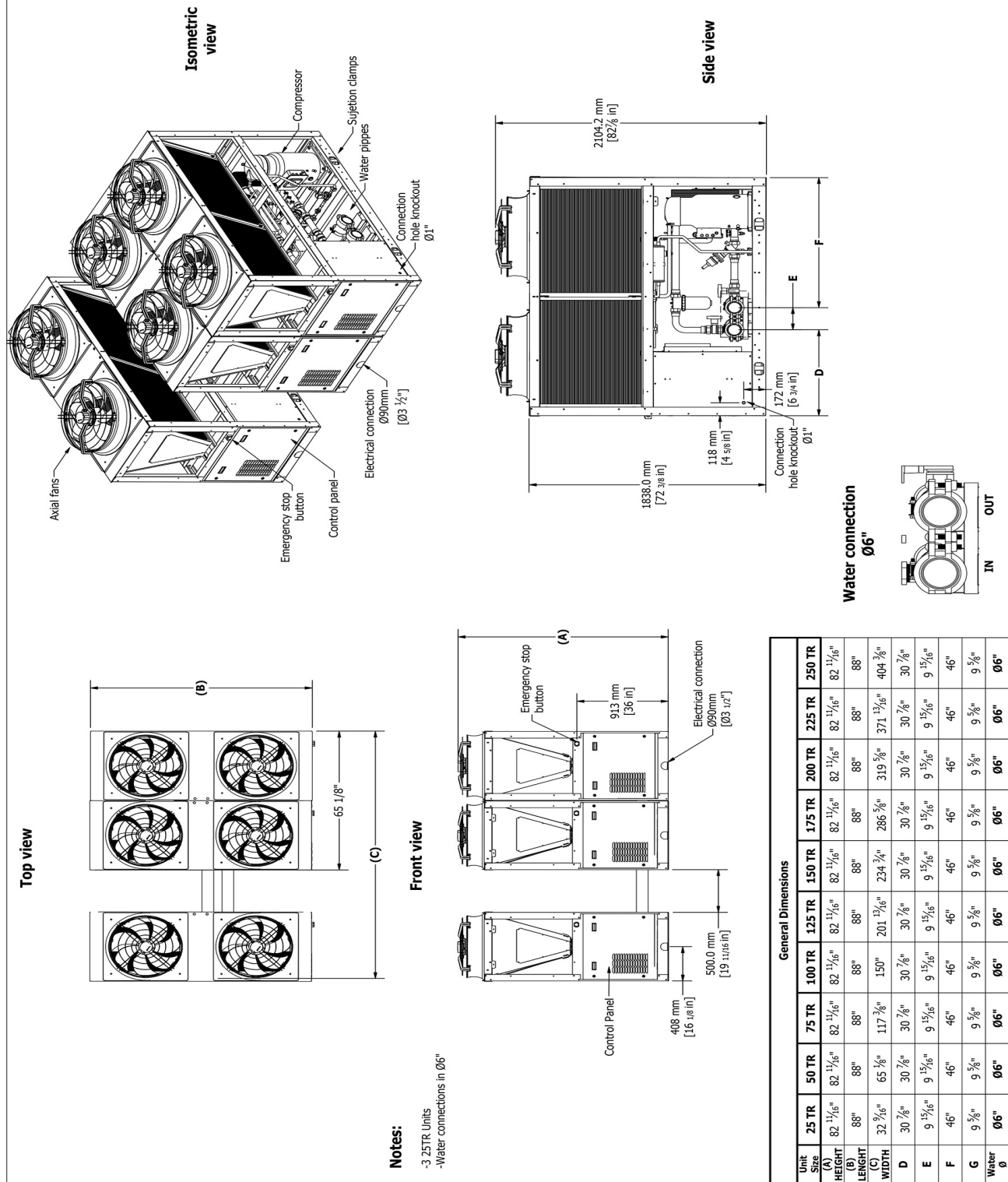


Figure 5. Dimensional configuration of a unit 75 RT.



DESIGN PARAMETERS

Figure 6. Dimensional configuration of a unit 100 RT.

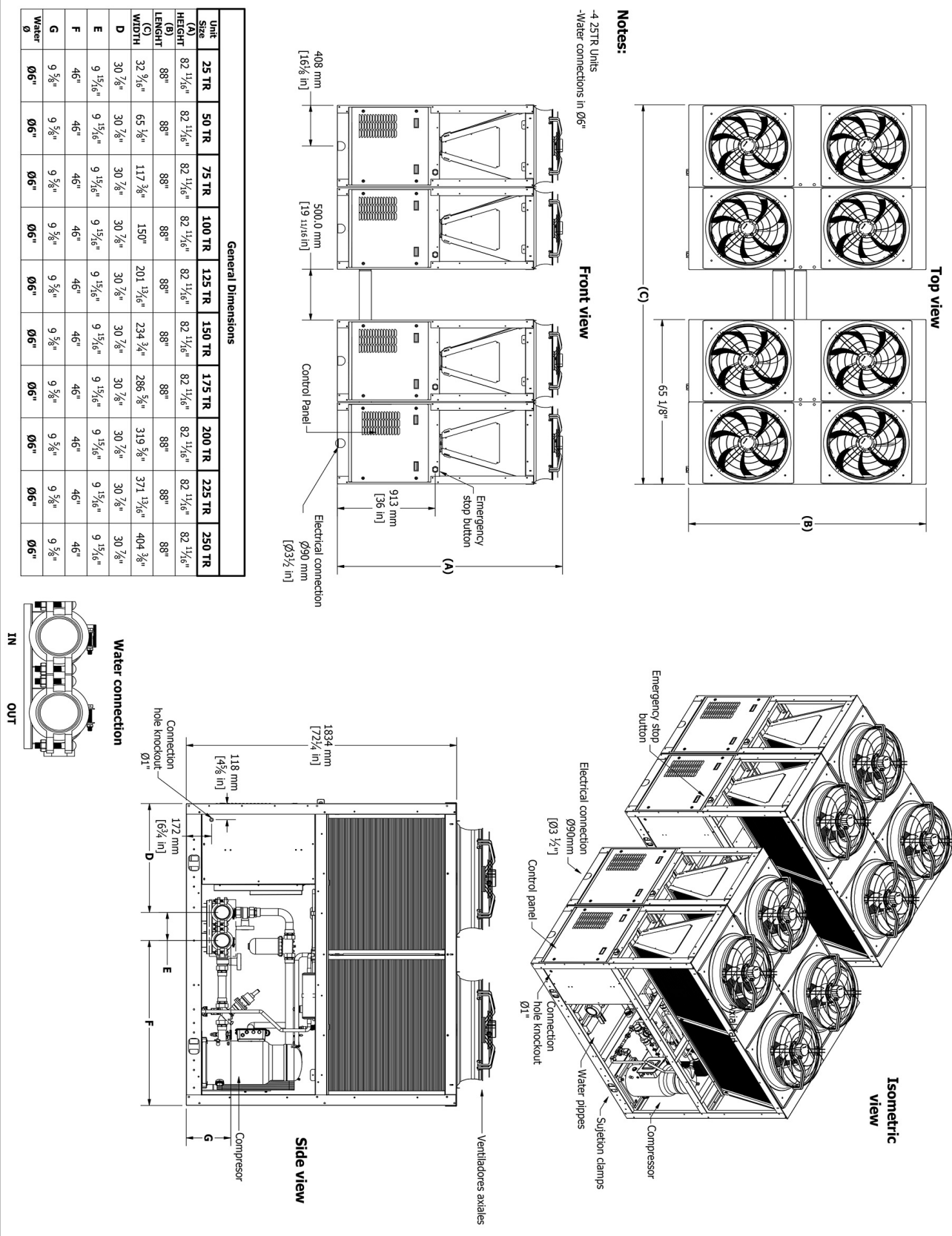
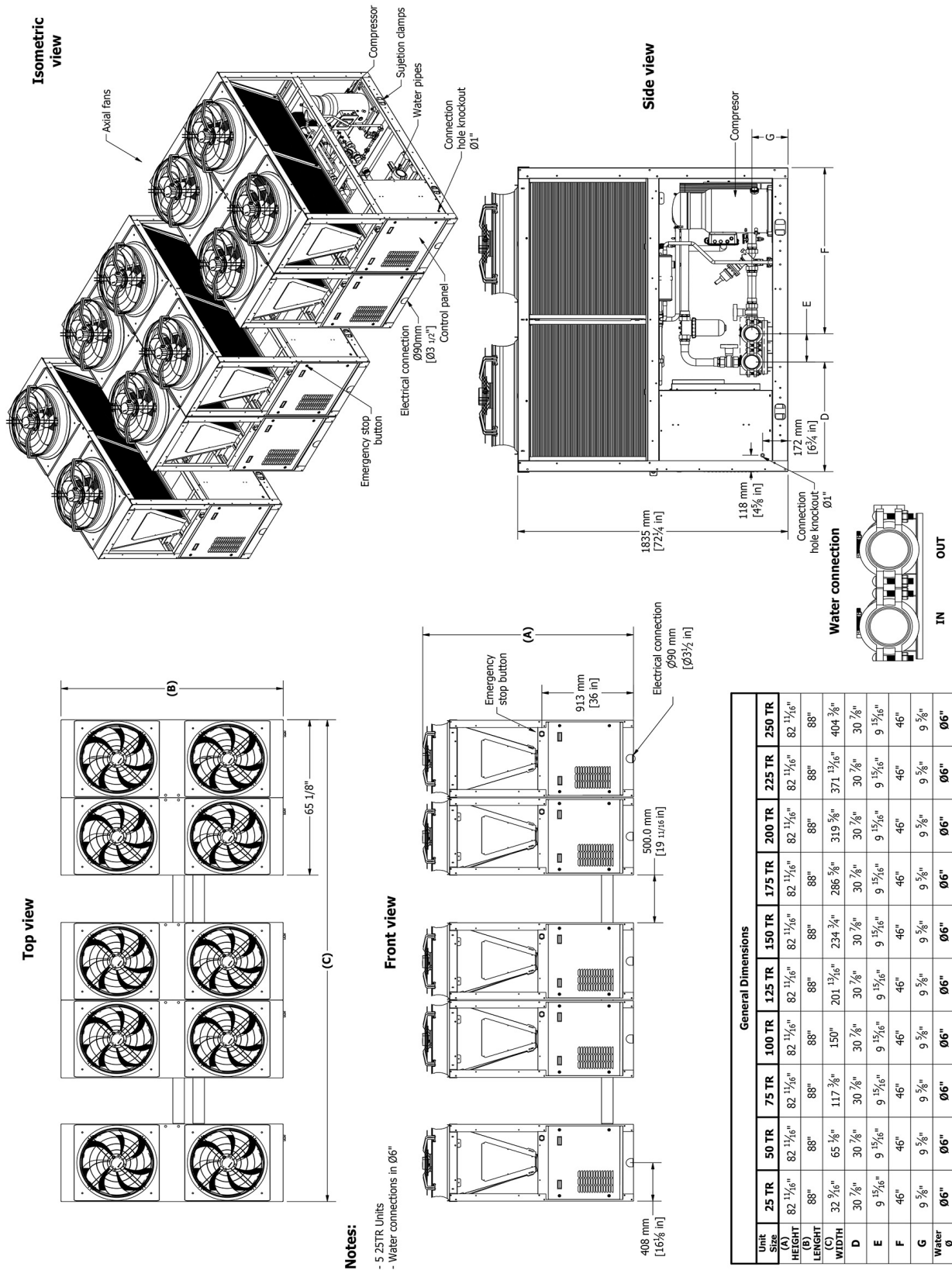


Figure 7. Dimensional configuration of a unit 125 RT.



DESIGN PARAMETERS

Figure 8. Dimensional configuration of a unit 150 RT.

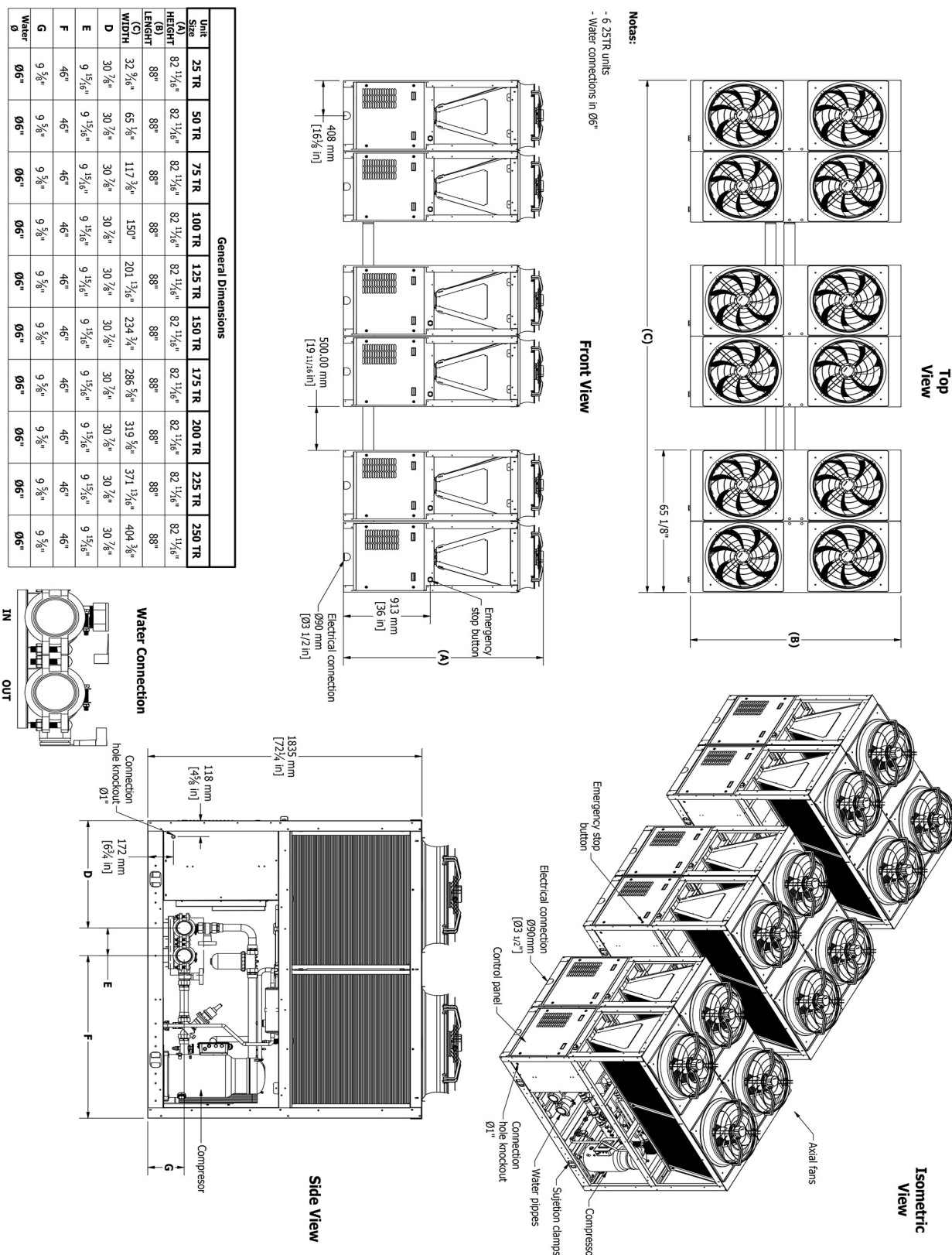
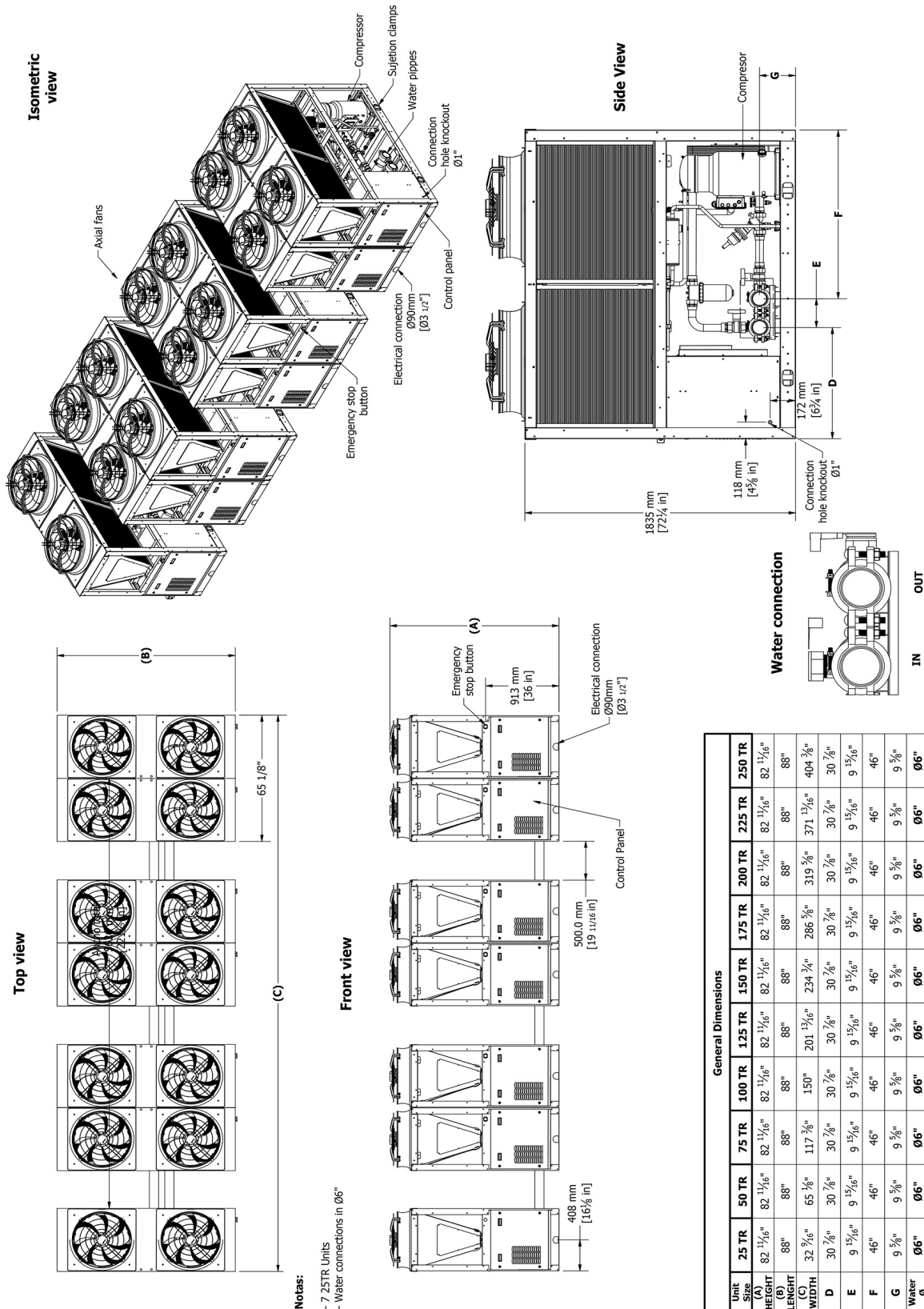


Figure 9. Dimensional configuration of a unit 175 RT.



DESIGN PARAMETERS

Figure 10. Dimensional configuration of a unit 200 RT.

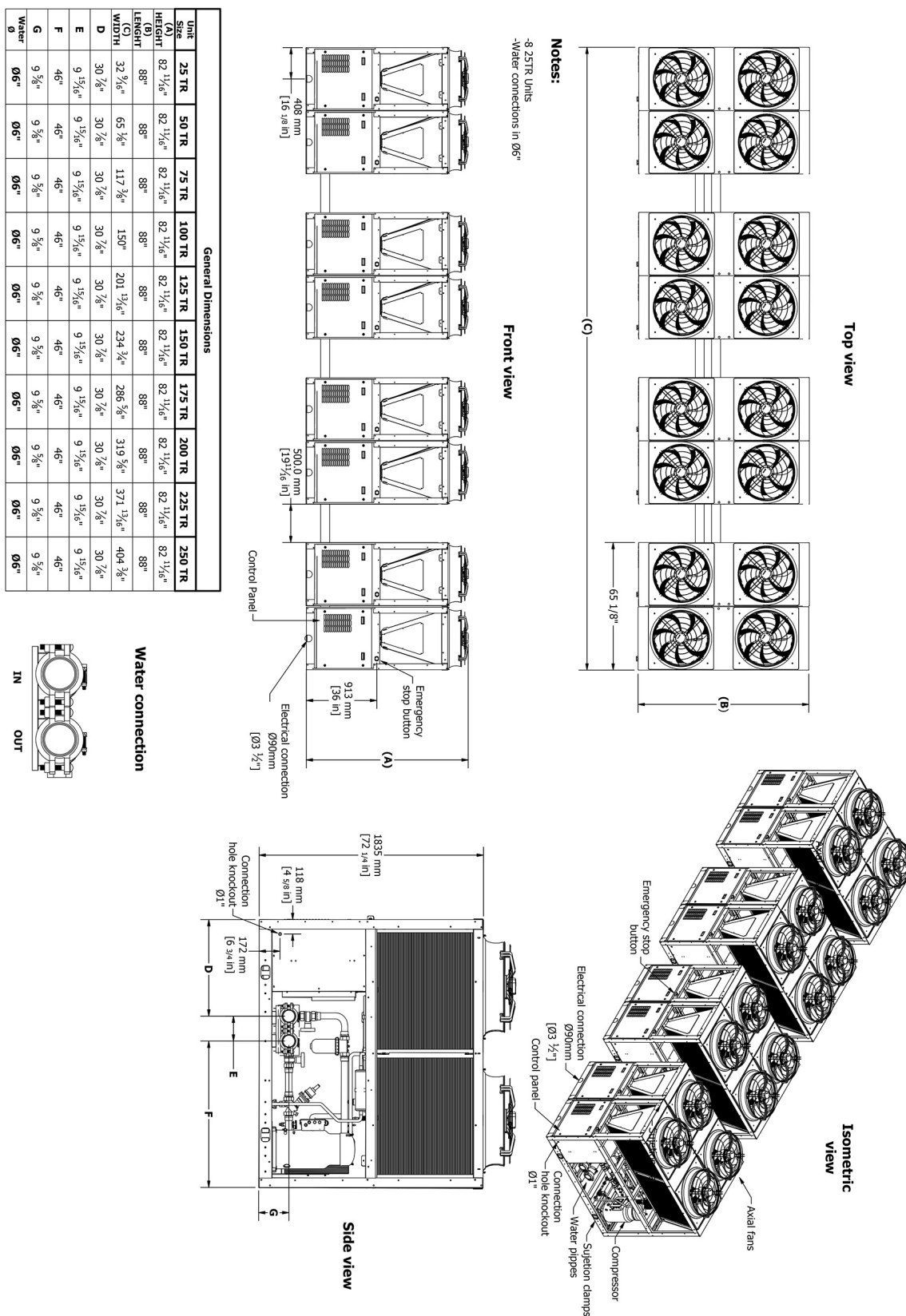
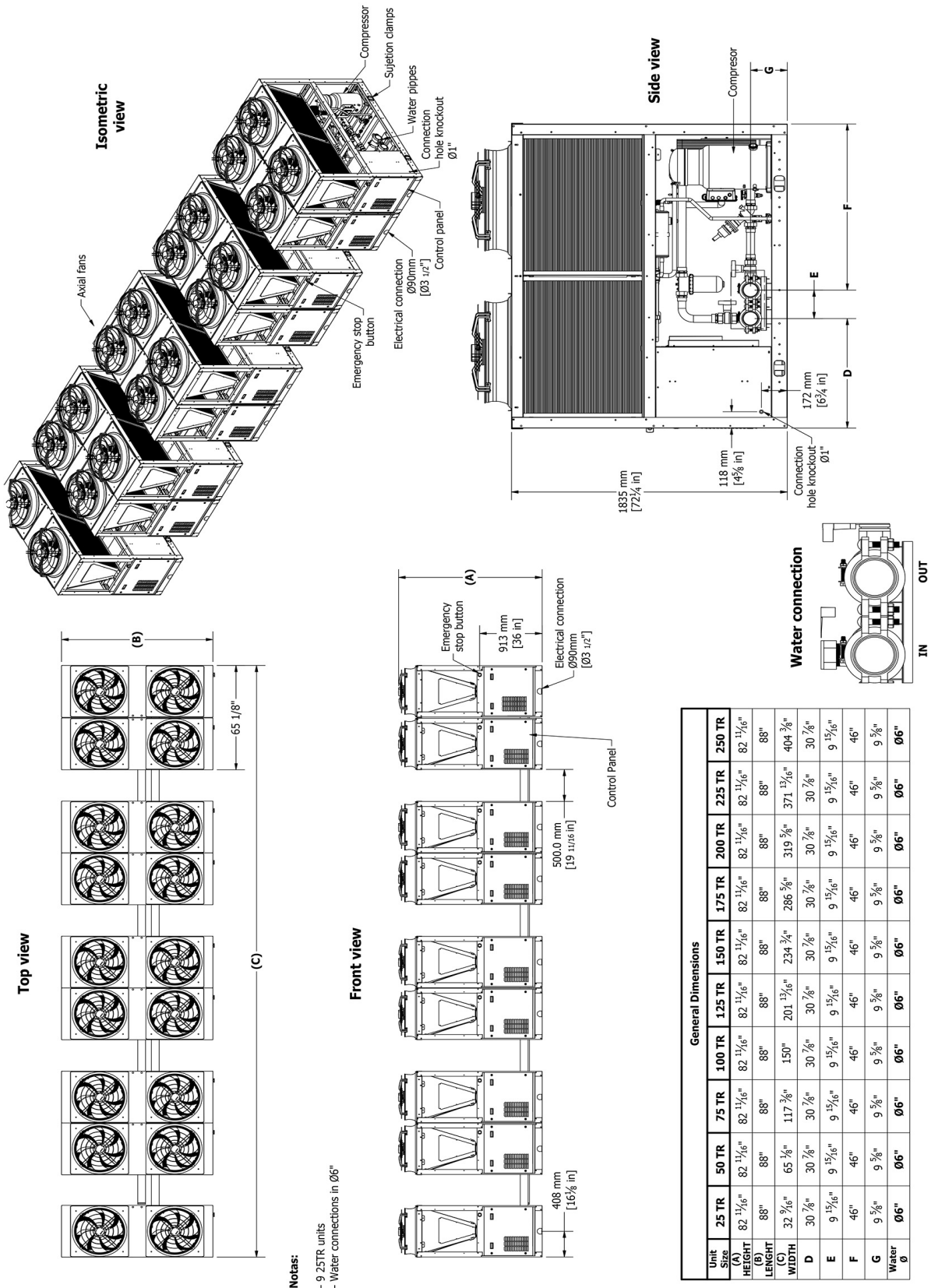


Figure 11. Dimensional configuration of a unit 225 RT.



DESIGN PARAMETERS

Figure 12. Dimensional configuration of a unit 250 RT.

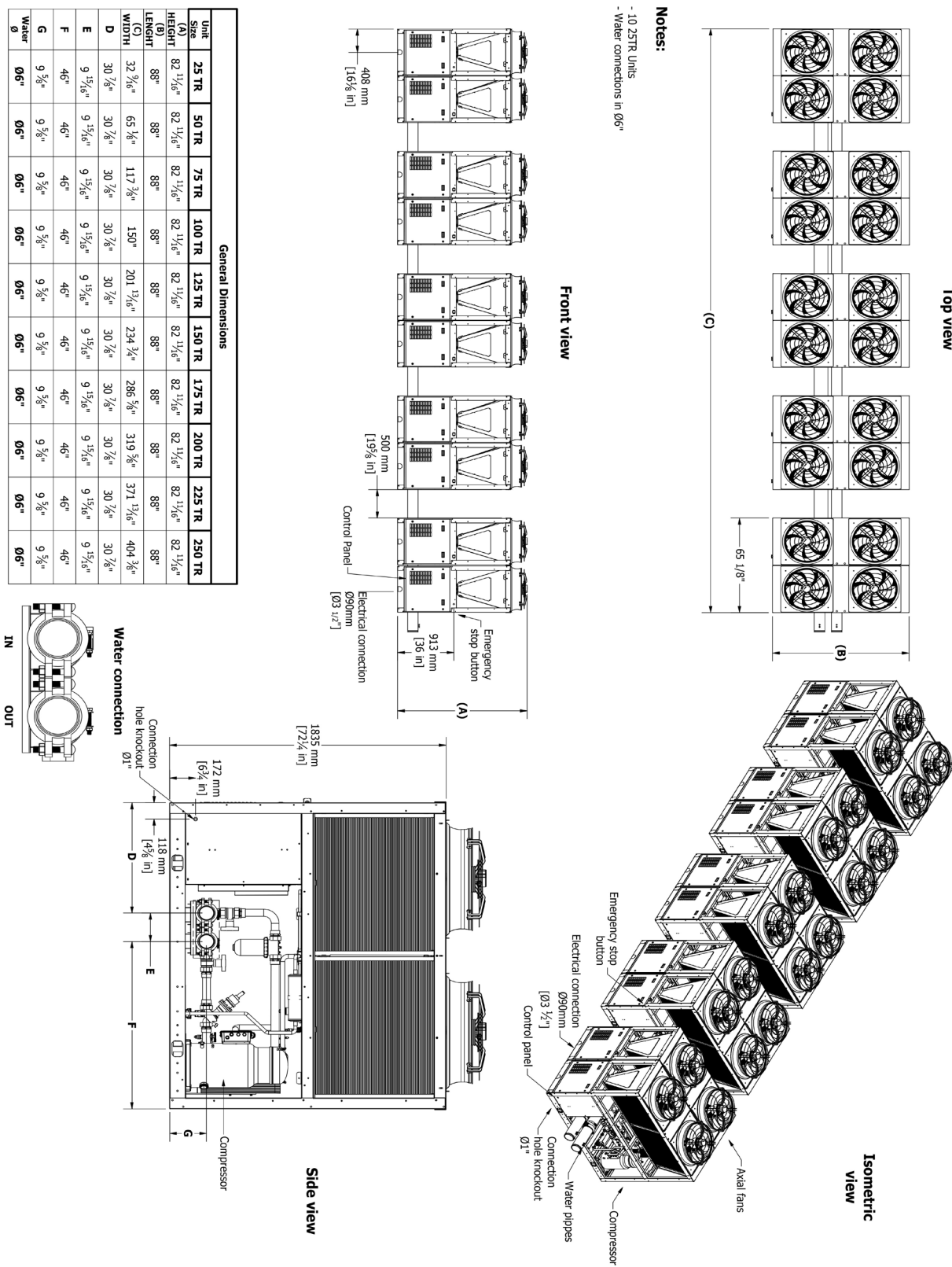
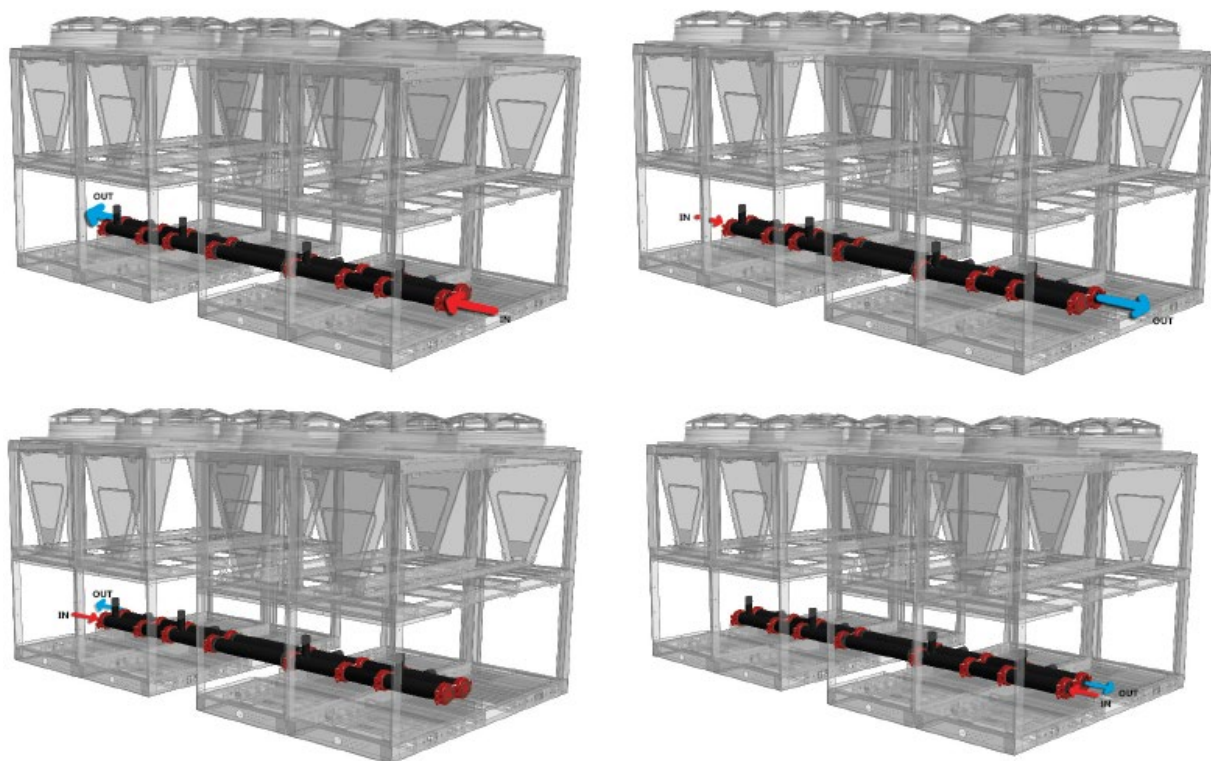
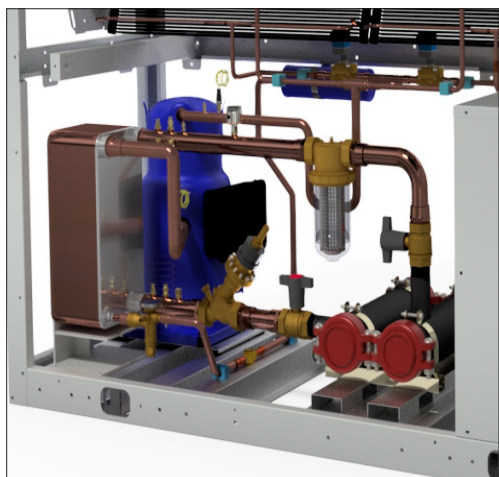


Figure 13. Hydraulic configuration options for a 25- 250 RT unit (representative image)



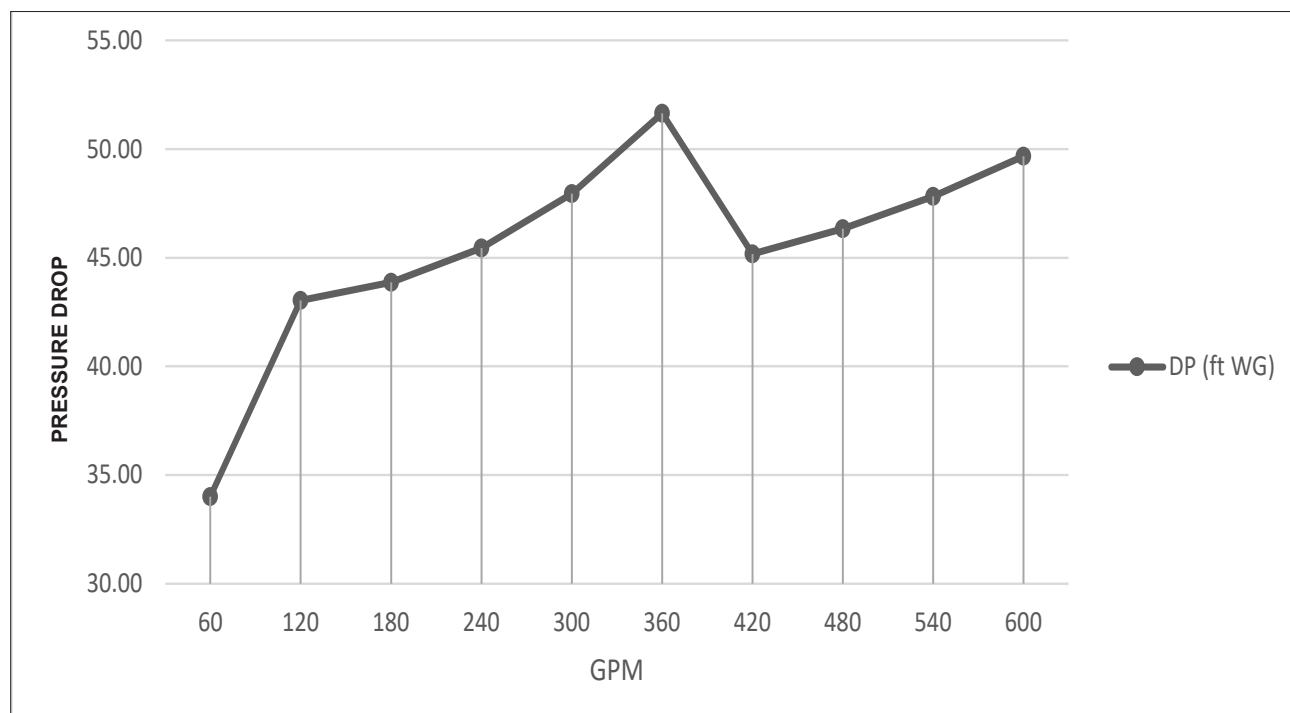
DESIGN PARAMETERS

Table 2. Ratio RT-Drop pipe 2 " module 25-250 RT



UNITS FROM 25 TO 250 RT					
UNIT	CAPACITY	# MODULE	GPM	Φ PIPE SIZE	DP (FT WG)
M	25	1	60	4	34.01
M+E	50	2	120	4	43.04
M+(E*2)	75	3	180	4	43.88
M+(E*3)	100	4	240	4	45.44
M+(E*4)	125	5	300	4	47.96
M+(E*5)	150	6	360	4	51.65
M+(E*6)	175	7	420	6	45.17
M+(E*7)	200	8	480	6	46.33
M+(E*8)	225	9	540	6	47.83
M+(E*9)	250	10	600	6	49.68

Figure 14. Graph RT-CDP Ratio

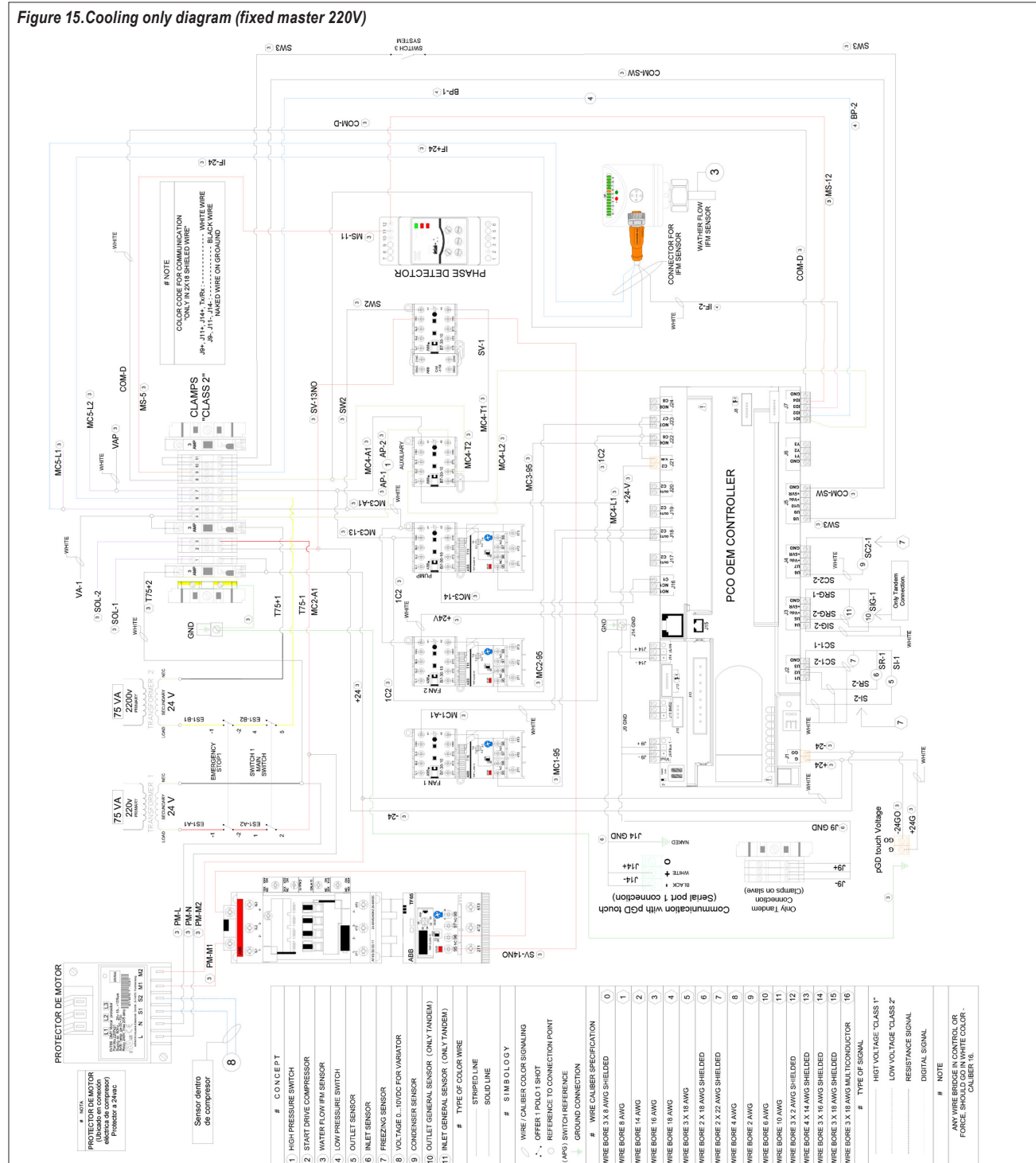


⚠ WARNING ⚠

Electric shock danger. Improper handling of this equipment can cause personal injury or equipment damage. This equipment must be properly grounded. Control panel connections and maintenance should be performed only by personnel knowledgeable in the operation of the equipment being controlled. Disconnect electrical power before servicing equipment. Be sure to install a earth leakage breaker. Failure to install a earth leakage breaker may result in electric shock or fire.

NOTE: The electrical installer must provide a 12-gauge neutral wire to the master units.

Figure 15. Cooling only diagram (fixed master 220V)



ELECTRICAL INFORMATION

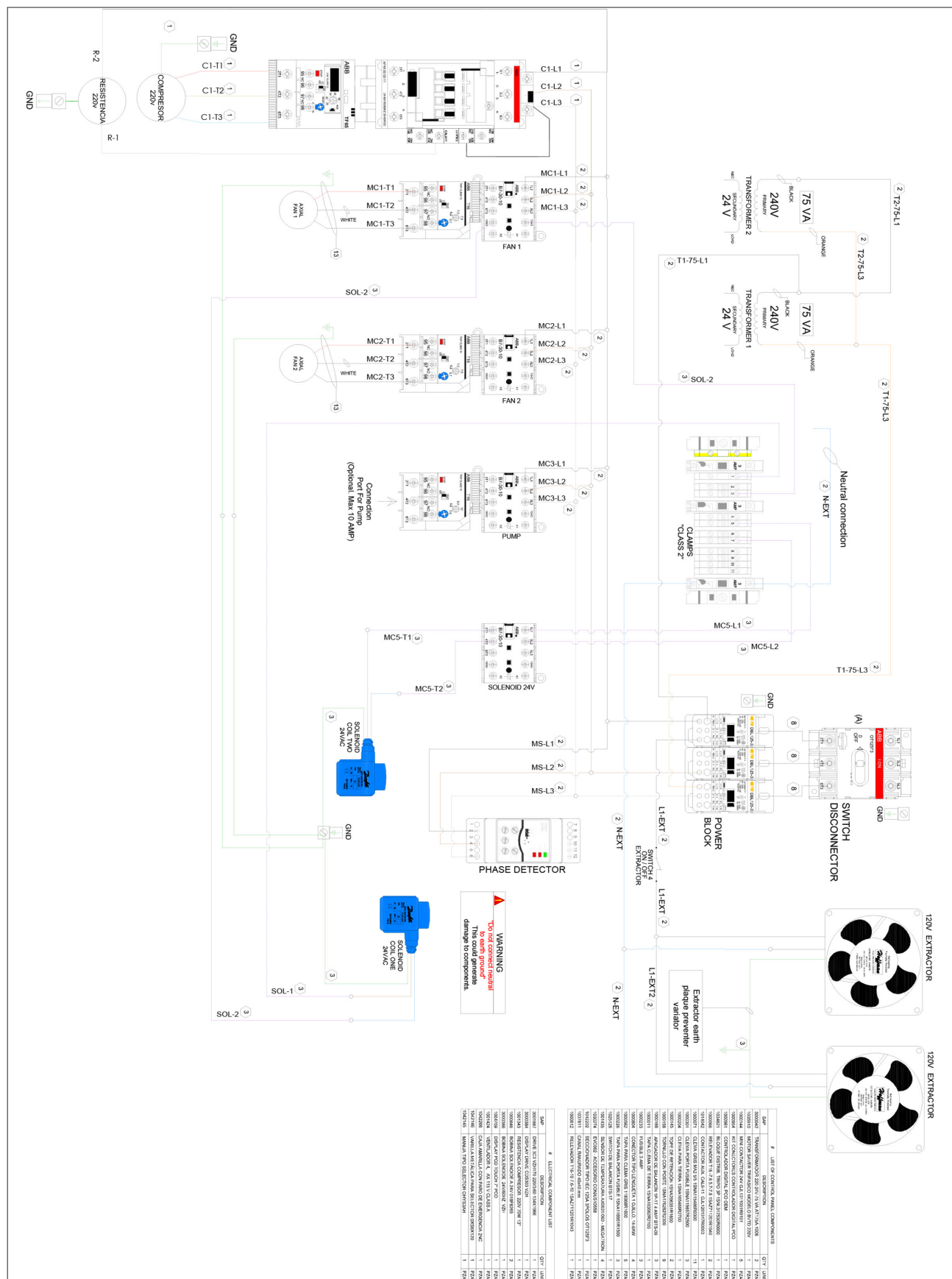
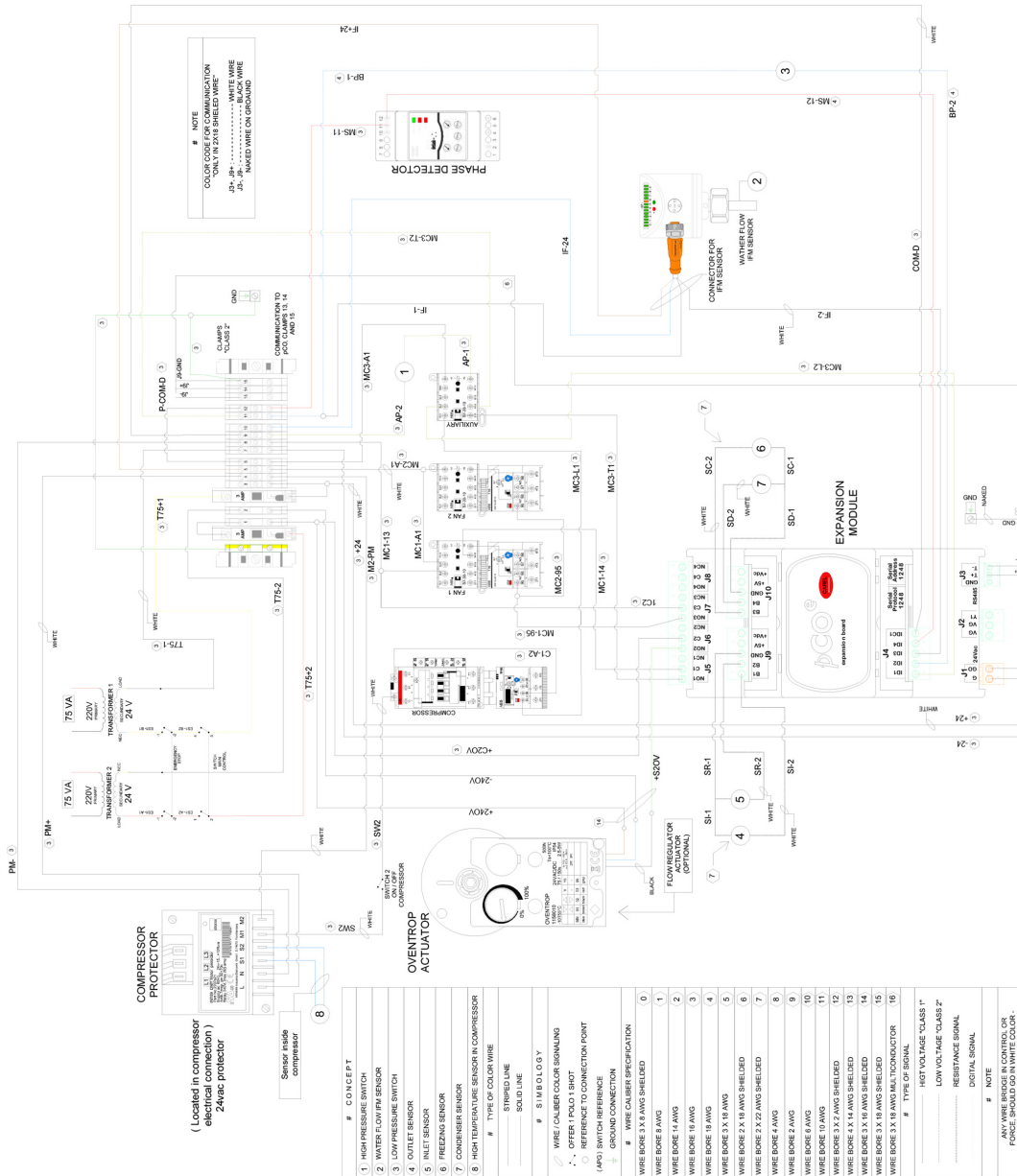


Figure 16. Cooling only diagram (220V Slave)



ELECTRICAL INFORMATION

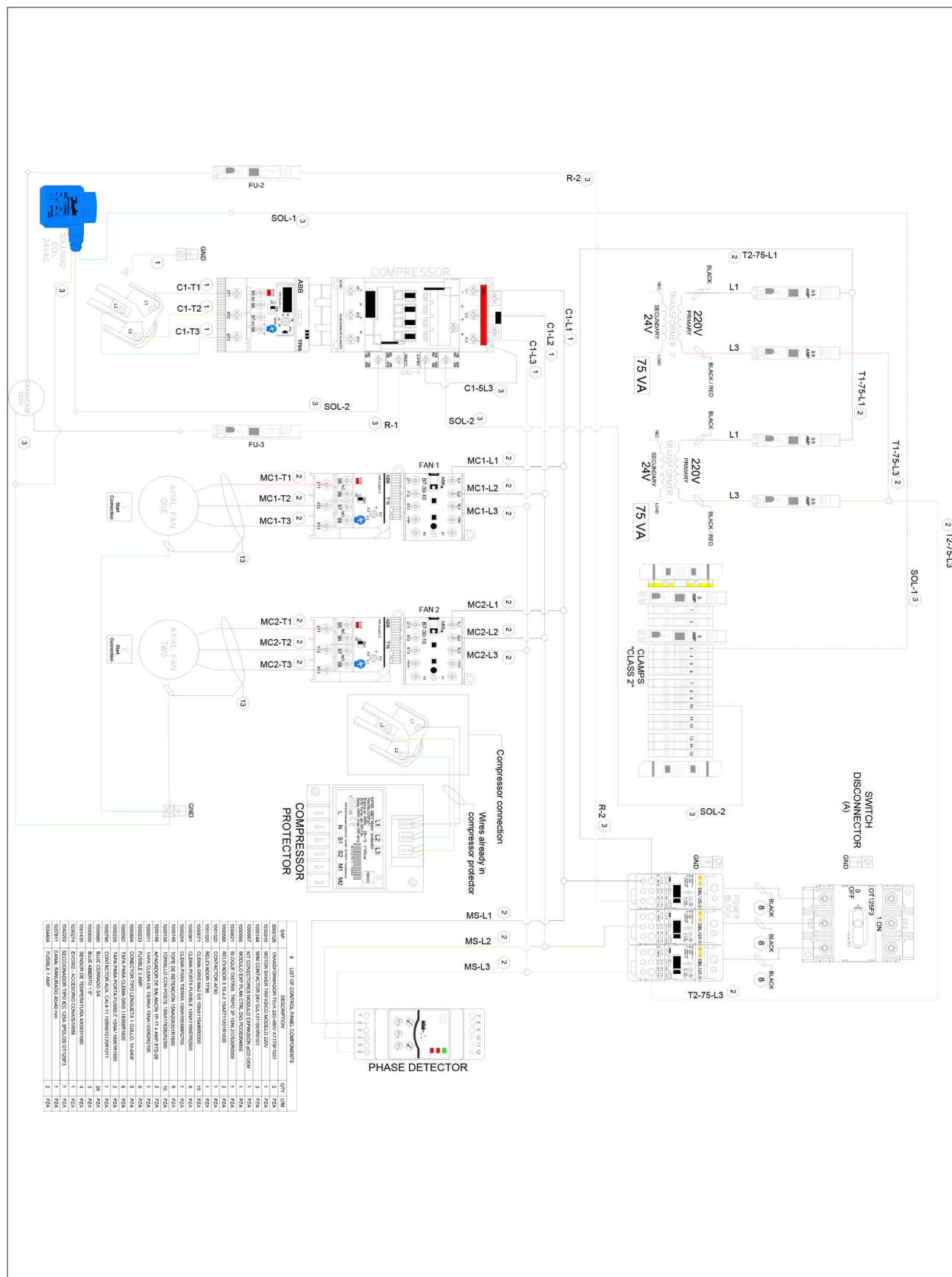
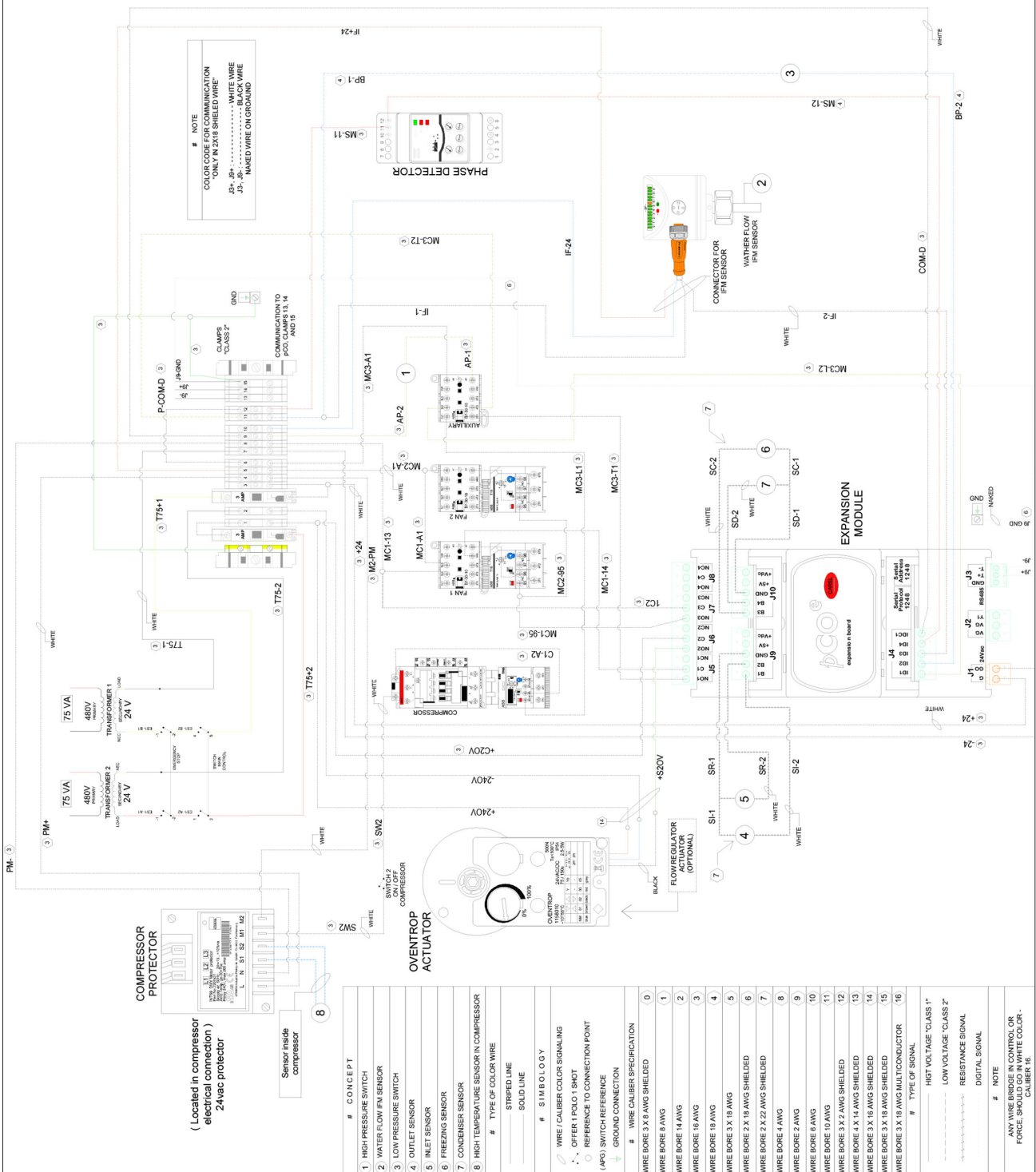


Figure 17. Cooling only diagram (440V slave)



ELECTRICAL INFORMATION

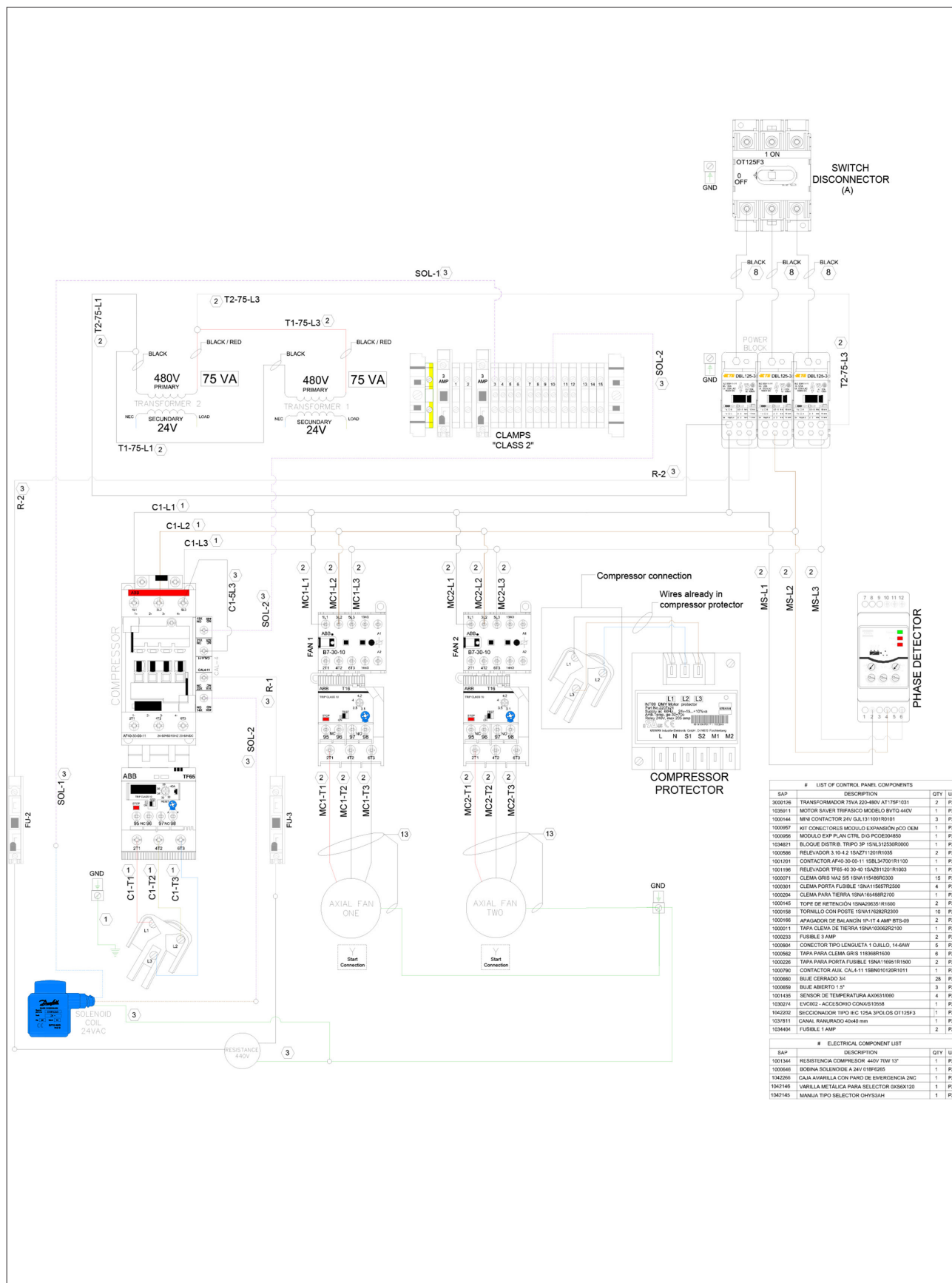
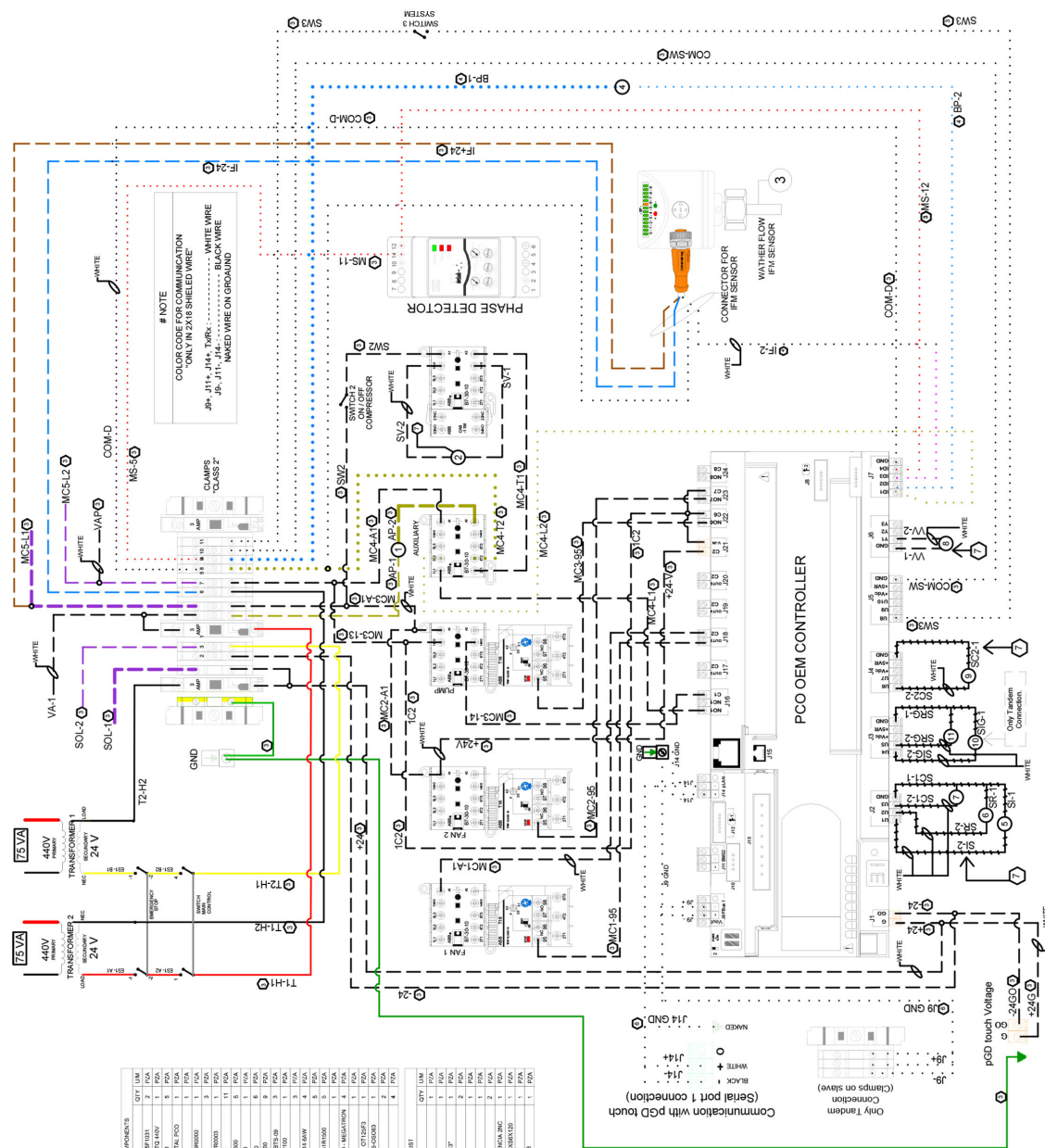


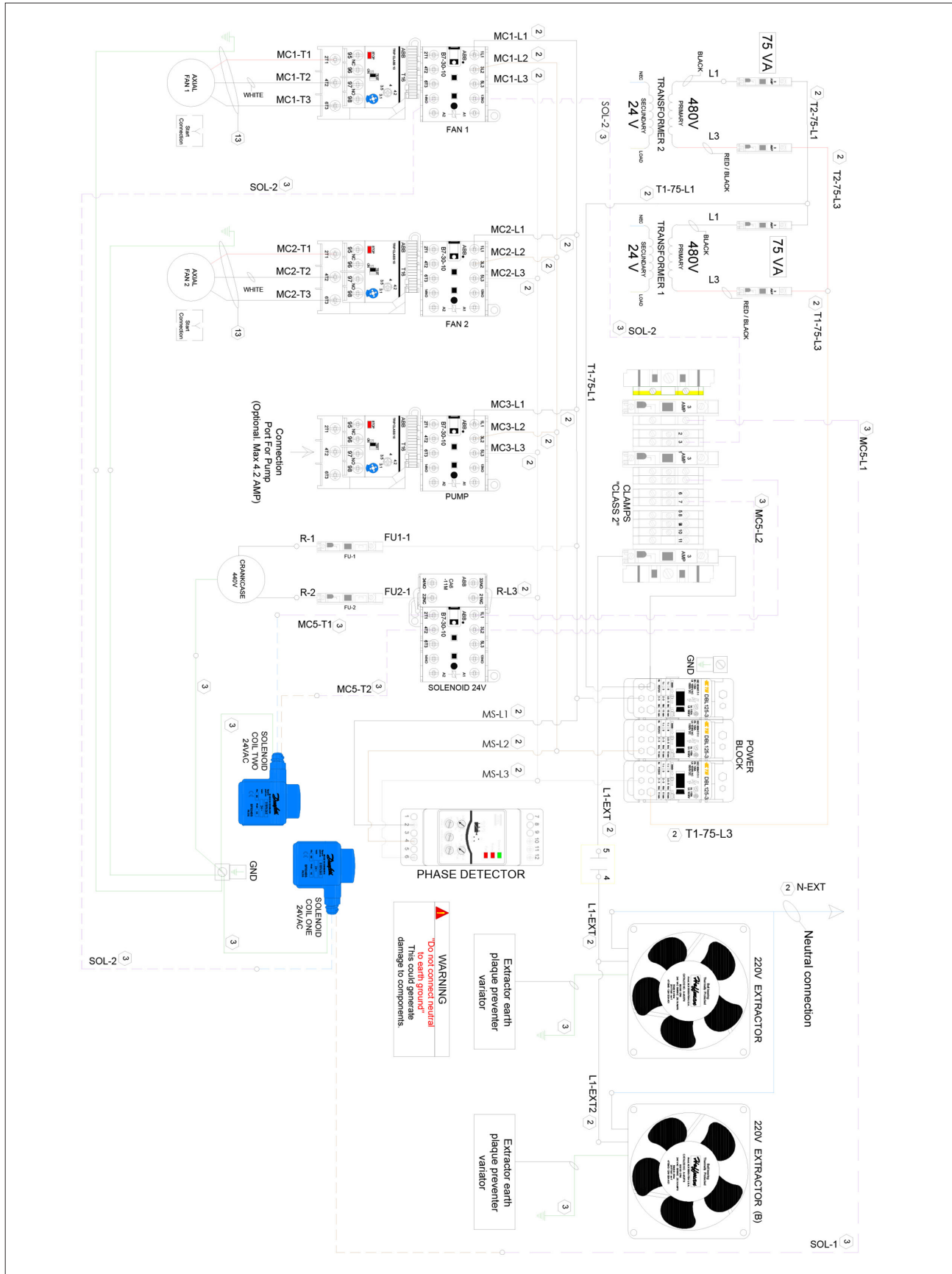
Figure 18. Cooling only diagram (440V master)



LIST OF COMPONENTS		LIST OF COMPONENTS	
SAP	DESCRIPTION	SAP	DESCRIPTION
000001	CONCRETE	000001	CONCRETE
000002	STEEL	000002	STEEL
000003	GLASS	000003	GLASS
000004	PAINT	000004	PAINT
000005	CEILING	000005	CEILING
000006	FLOOR	000006	FLOOR
000007	WALL	000007	WALL
000008	DOOR	000008	DOOR
000009	WINDOW	000009	WINDOW
000010	ROOF	000010	ROOF
000011	FOUNDATION	000011	FOUNDATION
000012	BASEMENT	000012	BASEMENT
000013	ATTIC	000013	ATTIC
000014	CHIMNEY	000014	CHIMNEY
000015	STAIR	000015	STAIR
000016	ELEVATOR	000016	ELEVATOR
000017	MECHANICAL	000017	MECHANICAL
000018	ELECTRICAL	000018	ELECTRICAL
000019	PLUMBING	000019	PLUMBING
000020	LANDSCAPE	000020	LANDSCAPE
000021	INTERIOR	000021	INTERIOR
000022	EXTERIOR	000022	EXTERIOR
000023	MECHANICAL	000023	MECHANICAL
000024	ELECTRICAL	000024	ELECTRICAL
000025	PLUMBING	000025	PLUMBING
000026	LANDSCAPE	000026	LANDSCAPE
000027	INTERIOR	000027	INTERIOR
000028	EXTERIOR	000028	EXTERIOR
000029	MECHANICAL	000029	MECHANICAL
000030	ELECTRICAL	000030	ELECTRICAL
000031	PLUMBING	000031	PLUMBING
000032	LANDSCAPE	000032	LANDSCAPE
000033	INTERIOR	000033	INTERIOR
000034	EXTERIOR	000034	EXTERIOR
000035	MECHANICAL	000035	MECHANICAL
000036	ELECTRICAL	000036	ELECTRICAL
000037	PLUMBING	000037	PLUMBING
000038	LANDSCAPE	000038	LANDSCAPE
000039	INTERIOR	000039	INTERIOR
000040	EXTERIOR	000040	EXTERIOR
000041	MECHANICAL	000041	MECHANICAL
000042	ELECTRICAL	000042	ELECTRICAL
000043	PLUMBING	000043	PLUMBING
000044	LANDSCAPE	000044	LANDSCAPE
000045	INTERIOR	000045	INTERIOR
000046	EXTERIOR	000046	EXTERIOR
000047	MECHANICAL	000047	MECHANICAL
000048	ELECTRICAL	000048	ELECTRICAL
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000050	LANDSCAPE	000050	LANDSCAPE
000051	INTERIOR	000051	INTERIOR
000052	EXTERIOR	000052	EXTERIOR
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000054	ELECTRICAL	000054	ELECTRICAL
000055	PLUMBING	000055	PLUMBING
000056	LANDSCAPE	000056	LANDSCAPE
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000058	EXTERIOR	000058	EXTERIOR
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000060	ELECTRICAL	000060	ELECTRICAL
000061	PLUMBING	000061	PLUMBING
000062	LANDSCAPE	000062	LANDSCAPE
000063	INTERIOR	000063	INTERIOR
000064	EXTERIOR	000064	EXTERIOR
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000077	MECHANICAL	000077	MECHANICAL
000078	ELECTRICAL	000078	ELECTRICAL
000079	PLUMBING	000079	PLUMBING
000080	LANDSCAPE	000080	LANDSCAPE
000081	INTERIOR	000081	INTERIOR
000082	EXTERIOR	000082	EXTERIOR
000083	MECHANICAL	000083	MECHANICAL
000084	ELECTRICAL	000084	ELECTRICAL
000085	PLUMBING	000085	PLUMBING
000086	LANDSCAPE	000086	LANDSCAPE
000087	INTERIOR	000087	INTERIOR
000088	EXTERIOR	000088	EXTERIOR
000089	MECHANICAL	000089	MECHANICAL
000090	ELECTRICAL	000090	ELECTRICAL
000091	PLUMBING	000091	PLUMBING
000092	LANDSCAPE	000092	LANDSCAPE

#	CONCEPT
1	HIGH PRESSURE SWITCH
2	START DRIVE COMPRESSOR
3	WATER FLOW/PM SENSOR
4	LOW PRESSURE SWITCH
5	OUTLET SENSOR
6	INLET SENSOR
7	FREIZING SENSOR
8	VOLTAGE 0...10VDC FOR VARIATOR
9	CONDENSER SENSOR
10	OUTLET GENERAL SENSOR (ONLY TANDEM)
11	INLET GENERAL SENSOR (ONLY TANDEM)
#	TYPE OF COLOR WIRE
	STRIPED LINE
	SOLID LINE
	# SYMBOL
	WIRE / CALBER COLOR SIGNALING
	OFFER 1 POLO 1 SHOT
	REFERENCE TO CONNECTION POINT
	SWITCH REFERENCE
	GROUND CONNECTION
	# WIRE CALBER SPECIFICATION
0	WIRE BORE 3 X 8 AWG SHIELDED
1	WIRE BORE 8 AWG
2	WIRE BORE 14 AWG
3	WIRE BORE 16 AWG
4	WIRE BORE 18 AWG
5	WIRE BORE 3 X 18 AWG
6	WIRE BORE 2 X 18 AWG SHIELDED
7	WIRE BORE 2 X 22 AWG SHIELDED
8	WIRE BORE 4 AWG
9	WIRE BORE 2 AWG
10	WIRE BORE 6 AWG
11	WIRE BORE 10 AWG
12	WIRE BORE 3 X 2 AWG SHIELDED
13	WIRE BORE 4 X 14 AWG SHIELDED
14	WIRE BORE 3 X 16 AWG SHIELDED
15	WIRE BORE 3 X 18 AWG SHIELDED
16	WIRE BORE 3 X 18 AWG MULTICONDUCTOR
#	TYPE OF SIGNAL
	HIGH VOLTAGE "CLASS 1"
	LOW VOLTAGE "CLASS 2"
	RESISTANCE SIGNAL
	DIGITAL SIGNAL
	# NOTE
	ANY WIRE BRIDGE IN CONTROL OR FORCE SHOULD GO IN WHITE COLOR.

ELECTRICAL INFORMATION



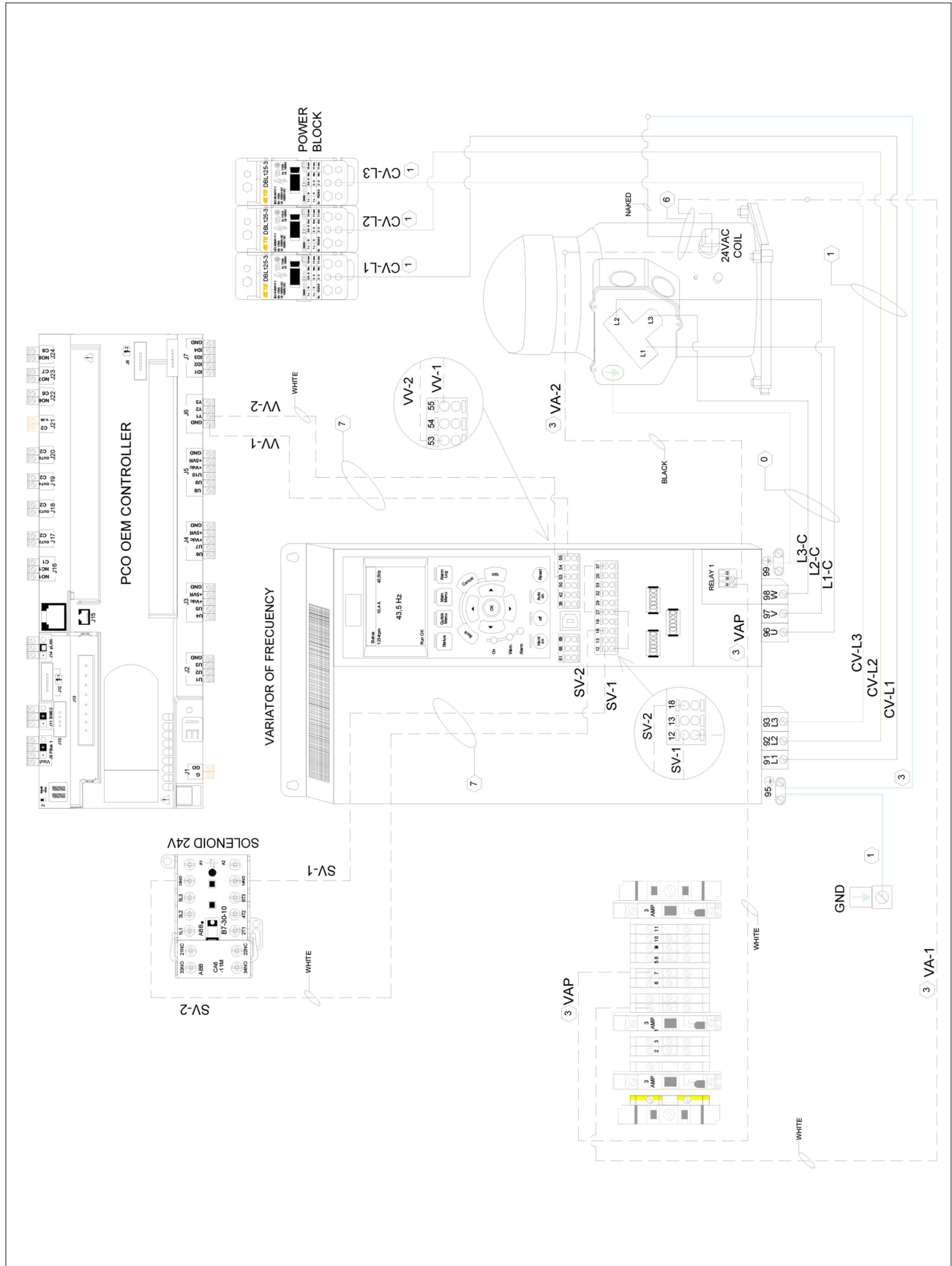
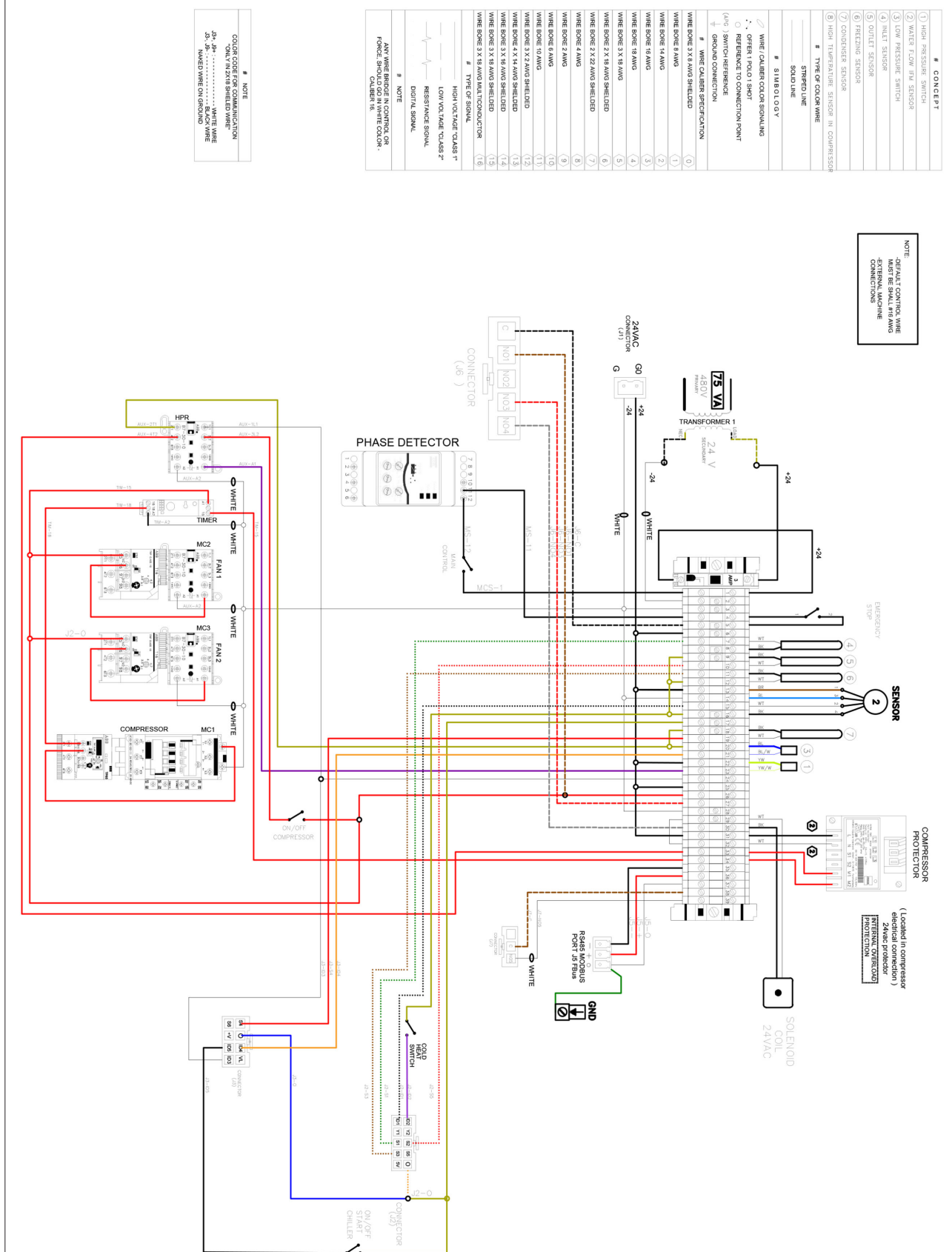
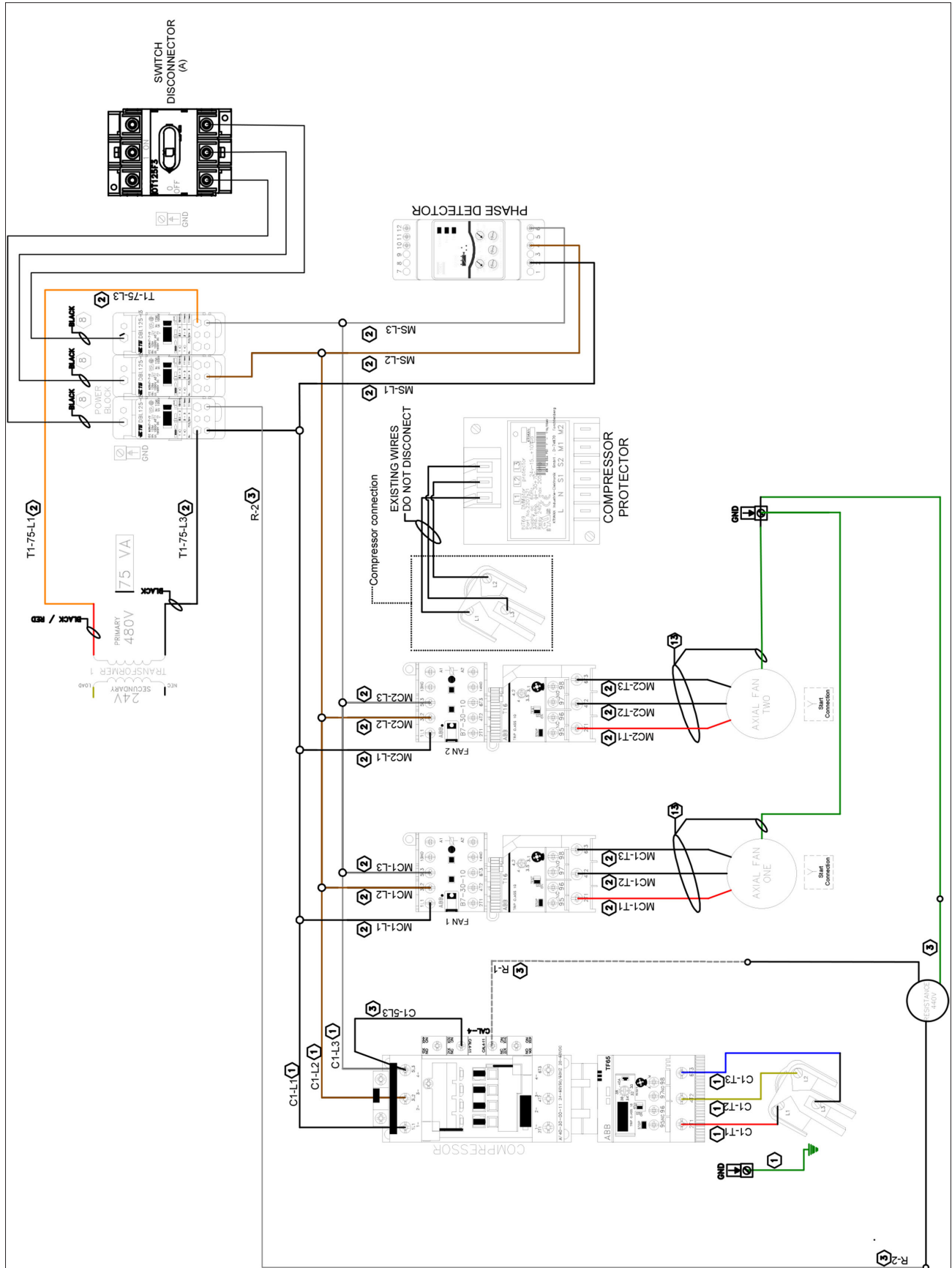


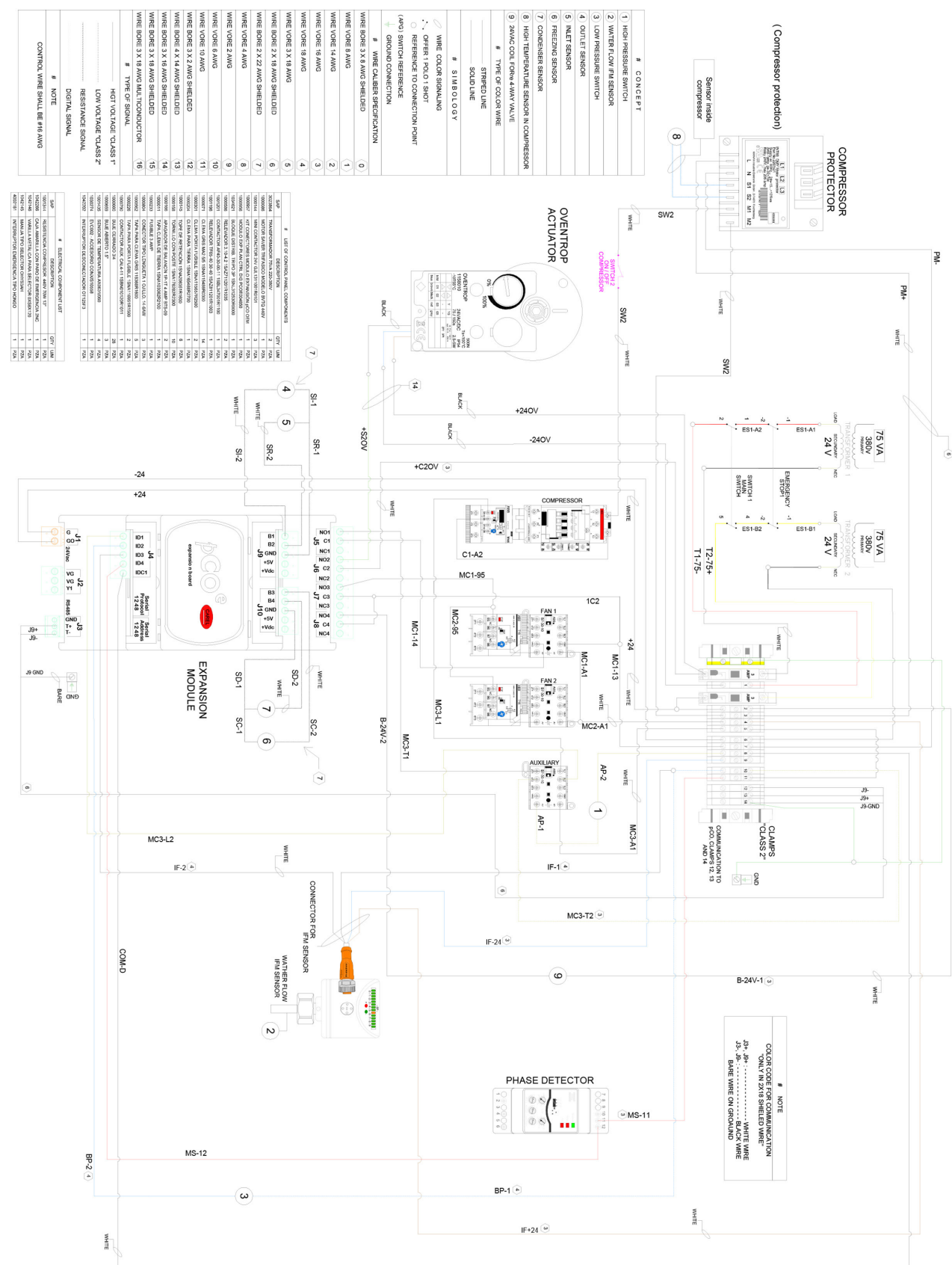
Figure 19. Heat pump diagram (440V slave)

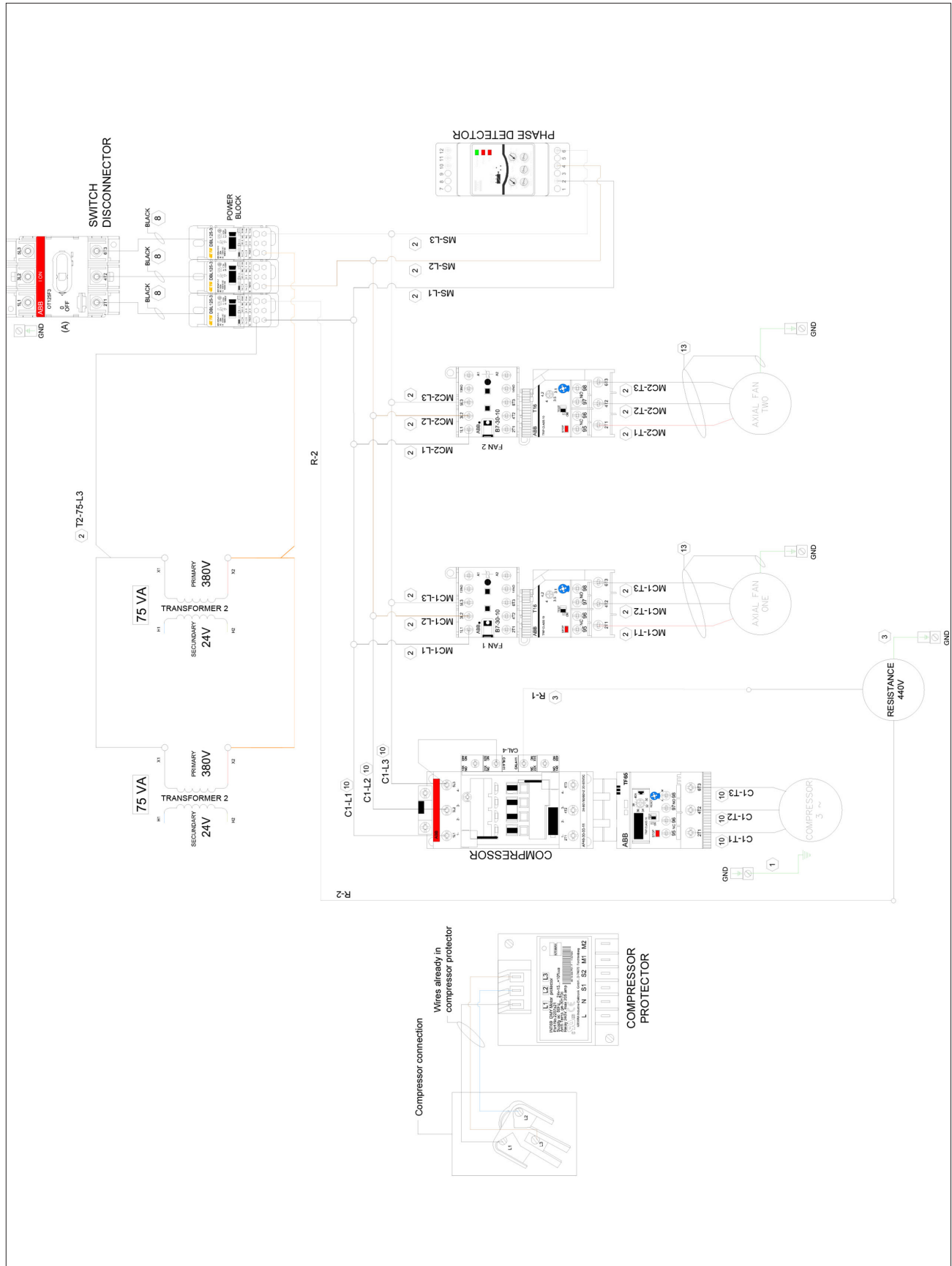




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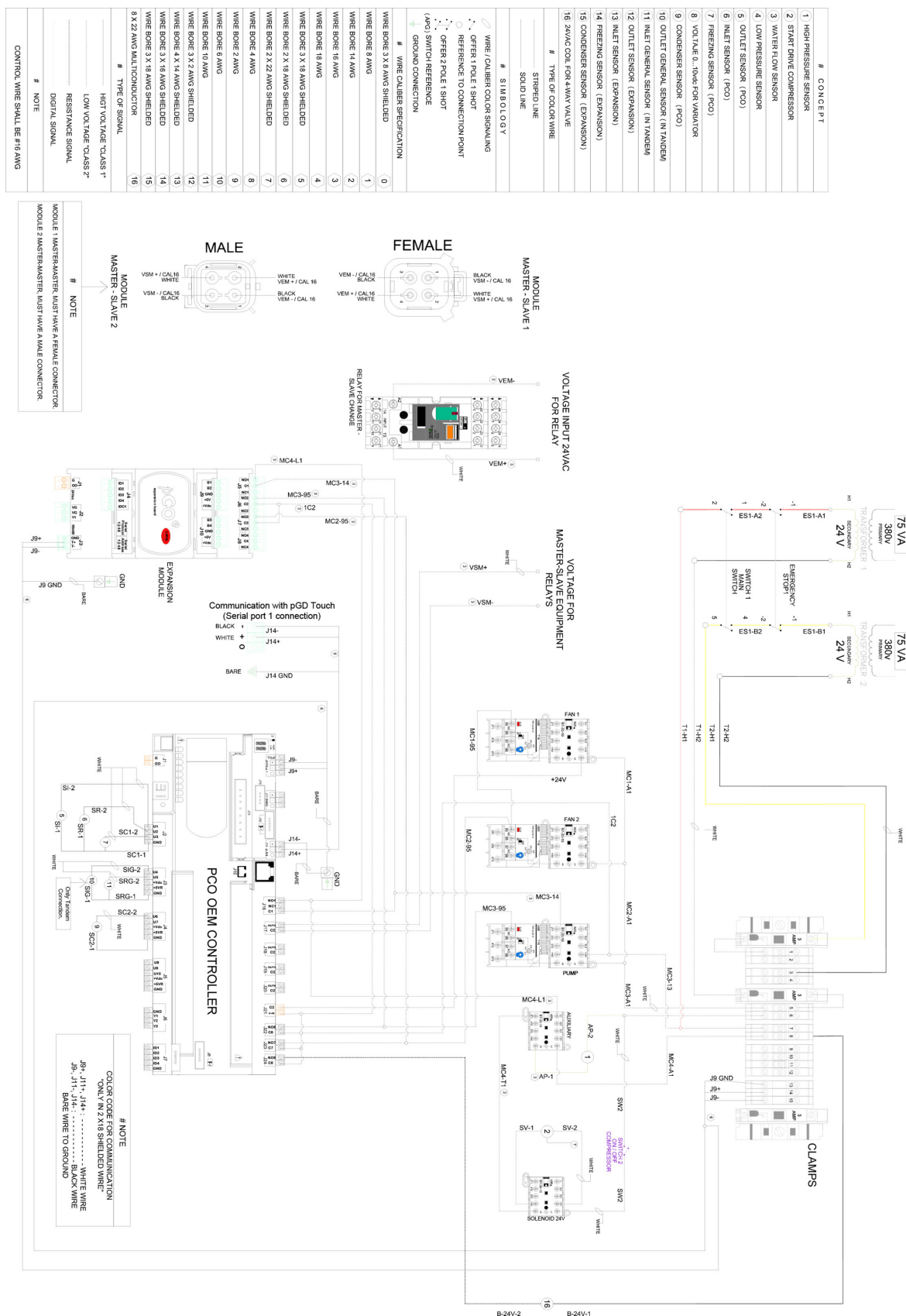
Figure 20. Heat pump diagram (380V slave)

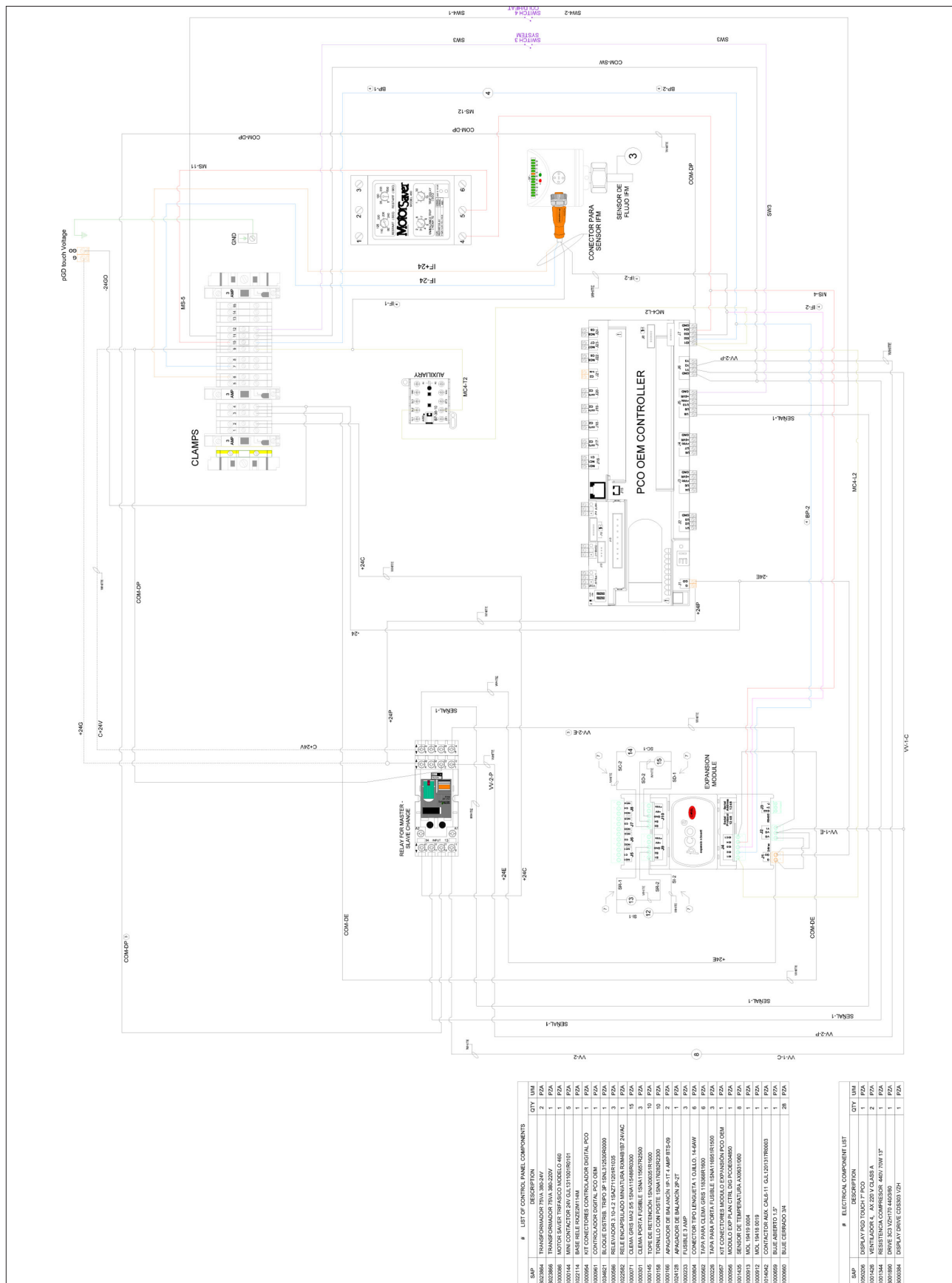




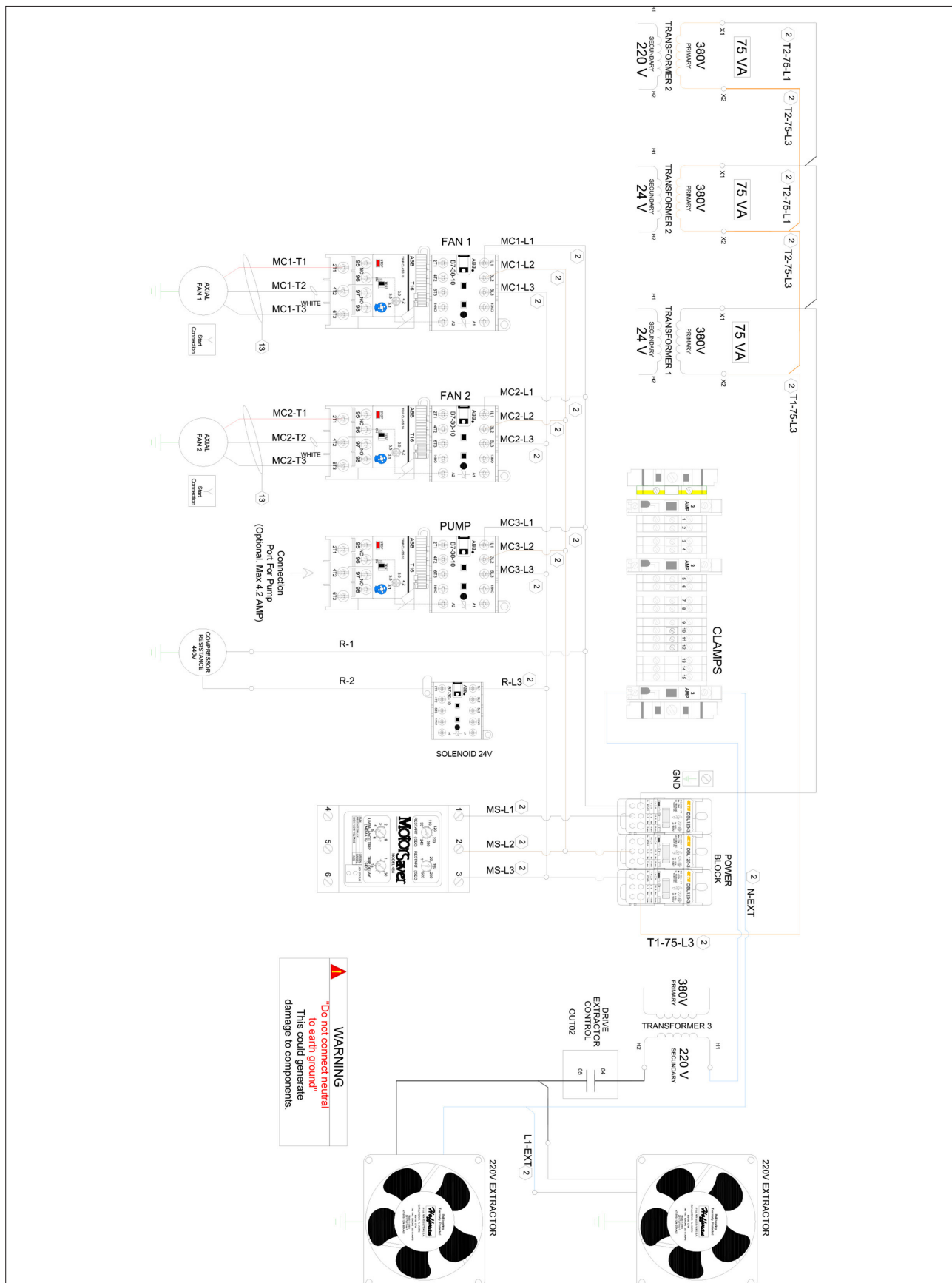
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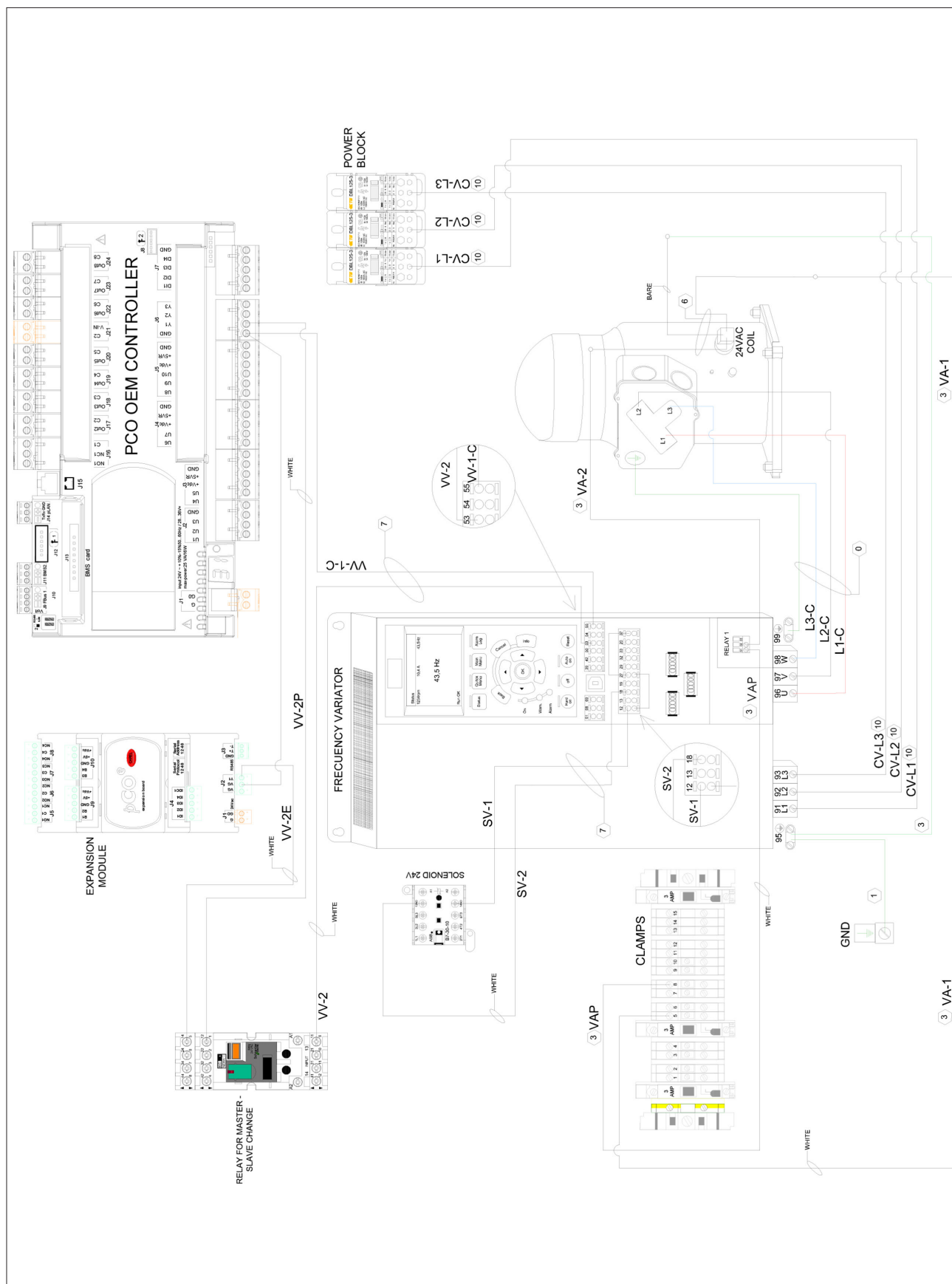
Figure 21. Master - Master diagram 380V





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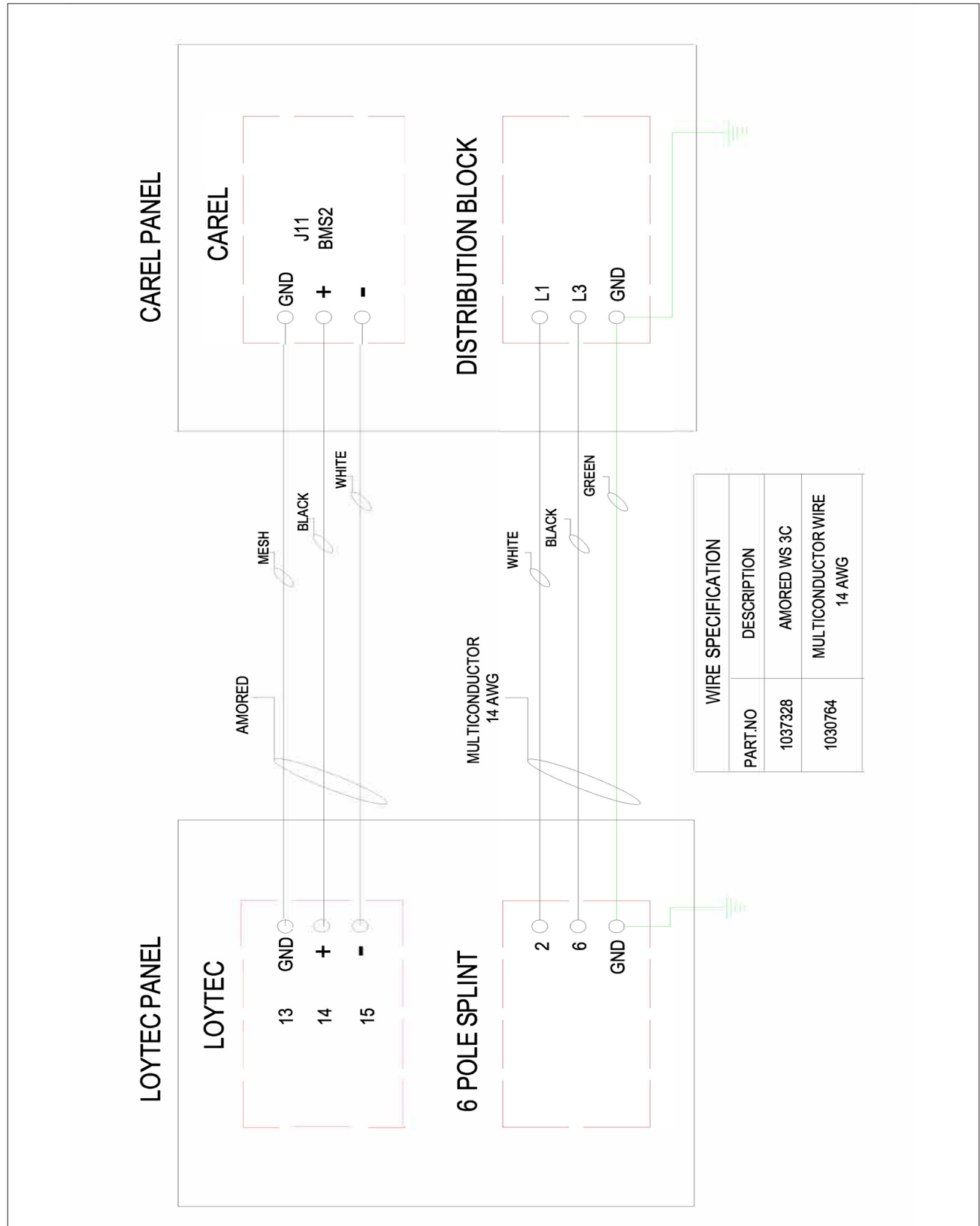
Table 3. Maximum overcurrent protection and minimum circuit amperage (220V)

# EQ	TR/UN	TR Total	iTotal	MCA	MOP
1	25	25	124.6	155.8	280.35
1	25	25	101	126.3	227.25
2	25	50	225.6	256.8	381.35
3	25	75	326.6	357.8	482.35
4	25	100	427.6	458.8	583.35
5	25	125	528.6	559.8	684.35
6	25	150	629.6	660.8	785.35
7	25	175	730.6	761.8	886.35
8	25	200	831.6	862.8	987.35
9	25	225	932.6	963.8	1088.35
10	25	250	1033.6	1064.8	1189.35

Table 4. Maximum overcurrent protection and minimum circuit amperage (440V)

# EQ	TR/UN	TR Total	MCA	MOP
1	25	25	83.3	149.85
1	25	-	62.4	112.28
2	25	50	133.2	199.75
3	25	75	183.1	249.65
4	25	100	233.0	299.55
5	25	125	282.9	349.45
6	25	150	332.8	399.35
7	25	175	382.7	449.25
8	25	200	432.6	499.15
9	25	225	482.5	549.05
10	25	250	532.4	598.95

NOTE: The BACnet control panel must be installed in the first slave equipment.



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