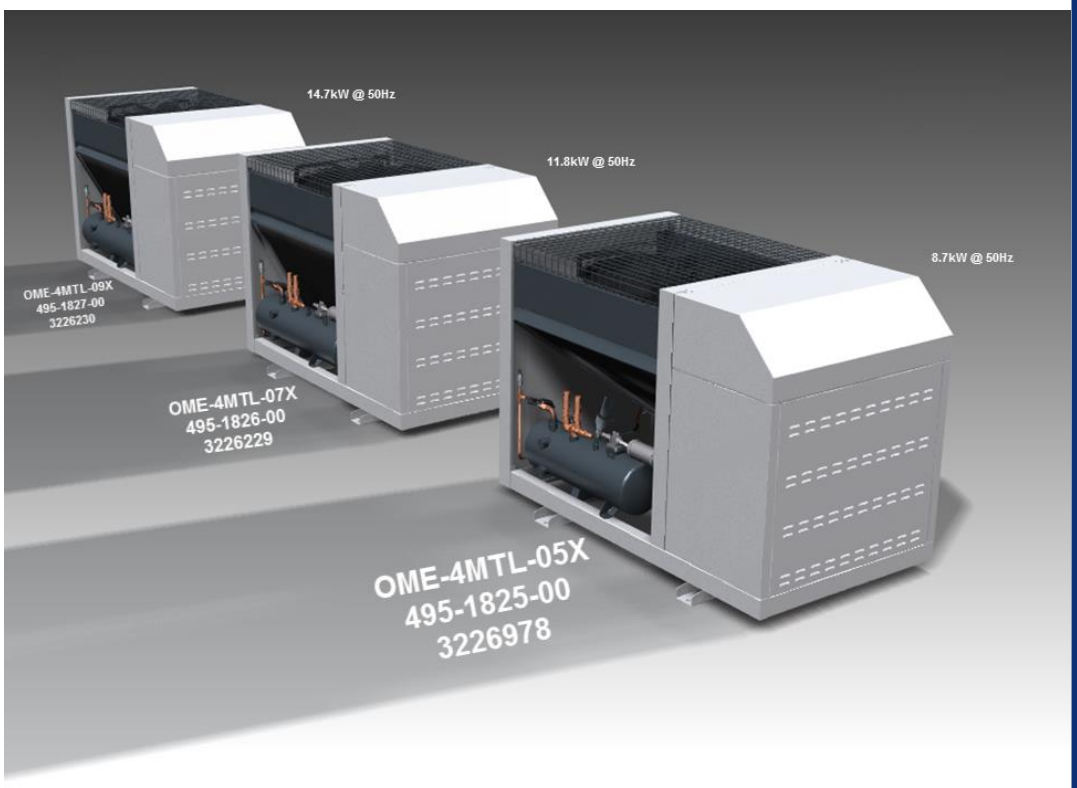
EMERSON™
Climate Technologies

Copeland
Outdoor refrigeration unit
OME-4MTL



Application Guideline

C6.1.6/0513-0615/E

About these guidelines

The purpose of these application guidelines is to provide guidance in the application of Copeland OME refrigeration units for natural refrigerant CO_2. They are intended to answer the questions raised while designing, assembling and operating a system with these products.

Besides the support they provide, the instructions listed herein are also critical for the proper and safe functioning of the refrigeration units. Emerson Climate Technologies will not guarantee the performance and reliability of the product if it is misused in regard of these guidelines.

These application guidelines cover stationary applications only. For mobile applications, contact Application Engineering as other considerations may apply.

Safety instructions

Copeland EazyCool™ OME outdoor refrigeration units are manufactured according to the latest European Safety Standards. Particular emphasis has been placed on the user's safety.

These refrigeration units are intended for installation in machines and systems according to the Machinery directive MD 2006/42/EC. They may be put to service only if they have been installed in these systems according to instructions and conform to the corresponding provisions of legislation. For relevant standards please refer to the Manufacturer's Declaration, available at www.emersonclimate.eu.

These instructions should be retained throughout the lifetime of the compressor as well as the refrigeration unit.

You are strongly advised to follow these safety instructions.

1.1 Icon explanation

	**WARNING** This icon indicates instructions to avoid personal injury and material damage.		**CAUTION** This icon indicates instructions to avoid property damage and possible personal injury.
	**High voltage** This icon indicates operations with a danger of electric shock.		**IMPORTANT** This icon indicates instructions to avoid malfunction of the compressor.
	**Danger of burning or frost burn** This icon indicates operations with a danger of burning or frost burn.	***NOTE***	This word indicates a recommendation for easier operation.
	**Explosion hazard** This icon indicates operations with a danger of explosion.		

1.2 Safety statements

- **Refrigeration compressors & units must be employed only for their intended use.**
- **Only qualified and authorized HVAC or refrigeration personnel are permitted to install, commission and maintain this equipment.**
- **Electrical connections must be made by qualified electrical personnel.**
- **All valid standards for connecting electrical and refrigeration equipment must be observed.**
- **The national legislation and regulations regarding personnel protection must be observed.**

Use personal safety equipment. Safety goggles, gloves, protective clothing, safety boots and hard hats should be worn where necessary.

1.3 General instructions

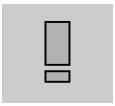
WARNING
System breakdown! Personal injuries! Never install a system in the field and leave it unattended when it has no charge, a holding charge, or with the service valves closed without electrically locking out the system.
System breakdown! Personal injuries! Only CO_2 and approved refrigeration oils must be used.

WARNING
CO_2 refrigerant! Danger of suffocation! Never release significant volumes of CO_2 or the entire contents of the system into closed rooms. In case of closed room, if possible, keep the room well ventilated and/or install a CO_2 detection device. CO_2 is odourless and colourless, so it cannot be perceived directly in case of emission.

WARNING
High shell temperature! Burning! Do not touch the compressor until it has cooled down. Ensure that other materials in the area of the compressor do not get in touch with it. Lock and mark accessible sections.

CAUTION
Overheating! Bearing damage! Do not operate compressors without refrigerant charge or without being connected to the system.

CAUTION
Contact with POE! Material damage! POE lubricant must be handled carefully and the proper protective equipment (gloves, eye protection, etc.) must be used at all times. POE must not come into contact with any surface or material that it might damage, including without limitation, certain polymers, eg, PVC/CPVC and polycarbonate.



IMPORTANT
Transit damage! Compressor / Unit malfunction! Use original packaging. Avoid collisions and tilting.

The contractor is responsible for the installation of the unit and should ensure the follow points:

- sufficient liquid sub-cooling in the line to the expansion valve(s) to avoid “flash-gas” in the liquid line;
- sufficient amount of oil in the compressor (in case of long piping additional oil must be added).

Product description

1.4 Common information about Copeland OME refrigeration units

Emerson Climate Technologies has developed the Copeland OME outdoor refrigeration unit to meet primarily the demands of the food retail and food service sectors. It is a refrigeration air-cooled unit that uses the latest Copeland™ brand products transcritical Stream compressors with Inverter. All electronic protection and diagnostics features are built in the chassis, as well as the controls for the refrigeration unit.

Figure 1: Front View OME

1.5 EU Ecodesign directive 2009/125/EC

The European Directive 2009/125/EC with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers requires manufacturers to decrease the energy consumption of their products by establishing minimum energy efficiency standards. Copeland™ brand products condensing units are prepared and optimized to meet the requirements of the Ecodesign Directive. The integrated variable speed fan and condenser reduce the noise level and energy consumption significantly. This, combined with Copeland CO_2 Stream compressor technology, allows for high-efficiency operation.
These guidelines meet the requirements of Regulation 2015/1095, Annex V.
The overview table according to Annex V for all OME CO2 units are attached in Appendix

1.6 Product range

Copeland OME outdoor refrigeration units are released for refrigerant CO_2. They have only one cabinet size and are always equipped with one fan. The units are designed for medium temp application only, the Inverter is calculated to drive the compressor in subcritical & transcritical applications.

	Displacement @ 50Hz [m3/h]	Cooling Capacity* [kW]	Abs. Maximum Pressures (high/low) Operating Pressure [bar]	Design Pressure PS [bar]	Net Weight [kg]	Power Supply
OME-4MTL-05X	4.6	8.72	115/87	120/90	440	3/N/PE~50Hz 400/230V TN-S
OME-4MTL-07X	6.2	11.81	115/87	120/90	440	3/N/PE~50Hz 400/230V TN-S
OME-4MTL-09X	7.4	14.65	115/87	120/90	460	3/N/PE~50Hz 400/230V TN-S

Table 1 : Product Range Overview

* **Cooling capacity declared at ambient temperature 32°C, evaporating temperature -10°C, suction temperature 0°C and compressor frequency 50Hz**

Product nameplate

The unit nameplate shows model designation and serial number, as well as nominal power and safety pressures.

The compressor has its own nameplate with all electrical characteristics.

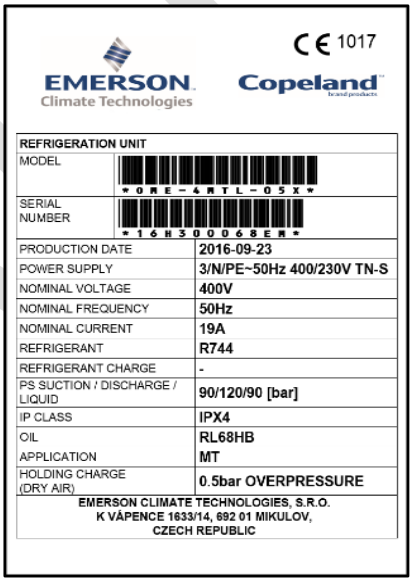


Figure 2 : Nameplate OME

1.7 Nomenclature

The model designation contains the following technical information about the refrigeration unit:

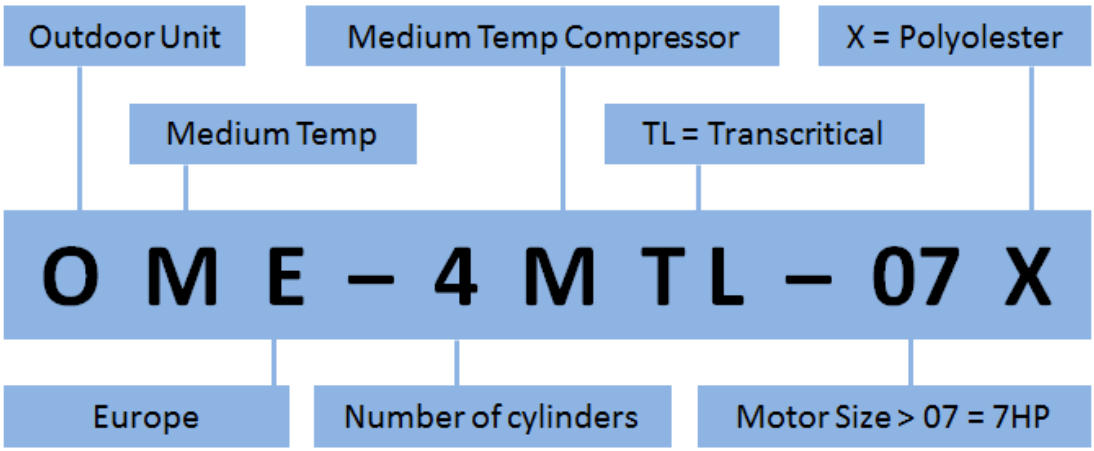


Figure 3: Nomenclature OME units

1.8 Application range

1.8.1 *Qualified refrigerants and oils*

Oil recharge values can be taken from Copeland® brand products Selection Software on www.emersonclimate.eu.

Qualified refrigerant	R744 (CO_2)		
Qualified servicing oils	Polyester Emkarate RL68 HB		
	OME-4MTL-05X	OME-4MTL-07X	OME-4MTL-09X
Oil Charge [liters]	1.5	1.5	1.5

Table 2: Qualified refrigerants and oils

NOTE: Use only lubricants which are qualified for the product. Usage of not approved lubricants can damage the products and results in loss of warranty!
NOTE: The Polyol ester oil is very hygroscopic. Never keep the system open to the ambient for longer time. If there is, for whatever reason, no refrigerant in the system it's recommended to charge the system with a protective gas (e.g. inert gas N_2)

Recommended quality for carbon dioxide purity class is 4.0 [(≥ 99.99%) H_2O ≤ 10 ppm, O_2 ≤ 10 ppm, N_2 ≤ 50 ppm] or higher.

The characterization of R744 according to EN378-1 is safety class A1, not flammable, ODP = 0 & GWP = 1. Higher concentrations of CO_2 are dangerous. This refrigerant is odorless and colorless. Therefore usage of CO_2 detectors is required.

CO_2 is heavier than air. Therefore local concentrations (especially on ground floor or in deeper slots = CO_2 pockets) can be higher than average values in the machine room. Ventilation system must consider this.

1.8.2 *Application limits*

For application envelope, please see Figure 2. Envelope is valid for 25-60Hz with 10K superheat.

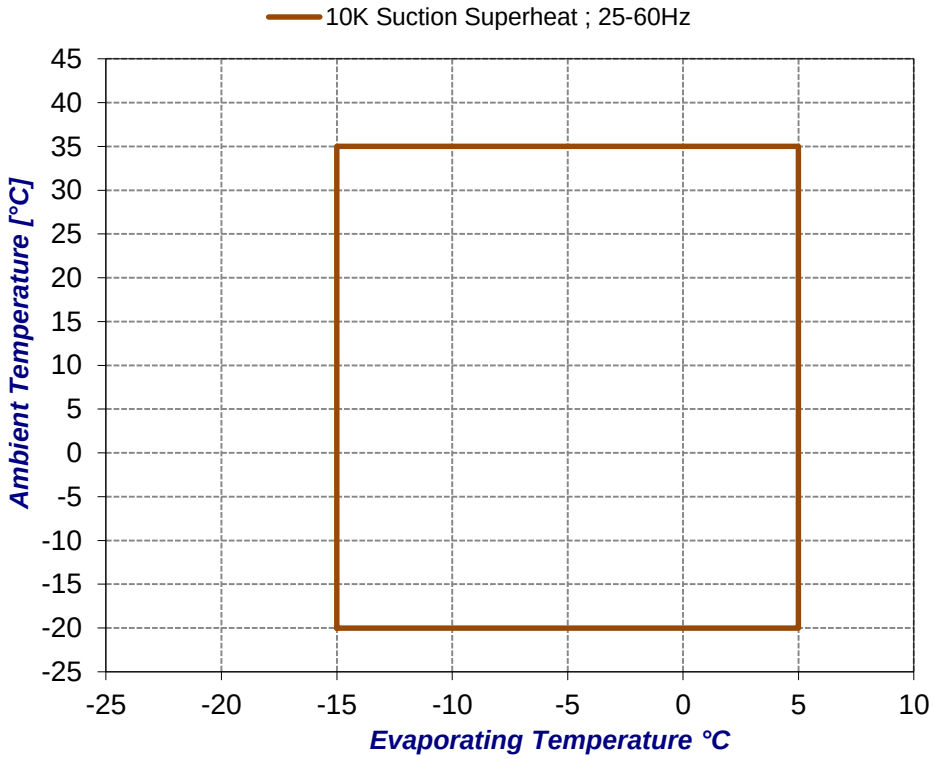


Figure 4: Envelope OME units

WARNING
Compressor breakdown! Oil dilution due to low superheat! Low suction superheat leads to oil dilution. Always operate the system with adequate superheat to avoid viscosity decrease of the oil. Additional measures in system design might help to avoid inacceptable lubrication conditions.

1.8.3 *Recommendations for minimum suction superheat – Lubrication conditions*

Operation of CO2 compressors / units at conditions where the viscosity of the oil is low, might become very harmful for compressor lifetime expectancy. Indicators like oil temperature & discharge temperature have to be observed to judge about the lubrication conditions. Depending on the application (low temp, medium temp, parallel compression, etc.…) different minimum suction superheat values have to be respected to secure maximum protection of the compressor. In general, higher superheat on the suction inlet of a compressor provides higher safety, but the limits for the maximum allowable discharge temperature have to be considered as well (superheat has direct impact on discharge temperature). For medium temperature application an absolute minimum of 10K is recommended.

Considerations:

- Measuring the suction superheat becomes more critical with larger diameters on the suction tube. Take care for proper positioning of sensor. Sensor sleeves to be used with large diameters.
- Oil temperature can be measured on bottom (lowest position) of the compressor shell directly between the two sight glasses. Usage of sensors for measurements on a plain surface preferable for best accuracy.
- Discharge temperature is observed by unit controller. The temperature on the discharge line should never exceed 135°C (measured directly after the compressor shut off valve). The temperature of the discharge gas on the outlet of the valve plate is 10-15K higher than the temperature on the discharge line.

1.8.4 *Design pressures*

The unit has 3 different pressure areas. The design on suction side is made for maximum allowable pressure of 90 bar (absolute) standstill. The area with discharge pipe, condenser / gas cooler and the high pressure regulation valve is approved for maximum allowable pressure of 120 bar (absolute). The section after the high pressure valve (liquid line, liquid receiver, filter drier, sight glass) to the liquid line outlet of the unit is approved for 90 bar (absolute) standstill too.

The design pressure is a safety related value. The restrictions for reliable operation of the unit are described by the envelope (see chapter 1.8.2 Application Limits).

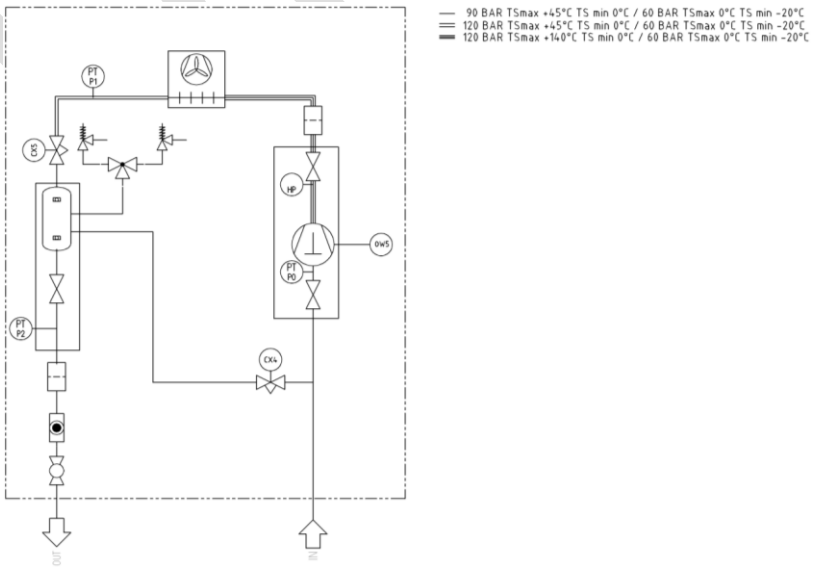


Figure 5 : PI-Diagram OME-Unit

1.9 Main component description

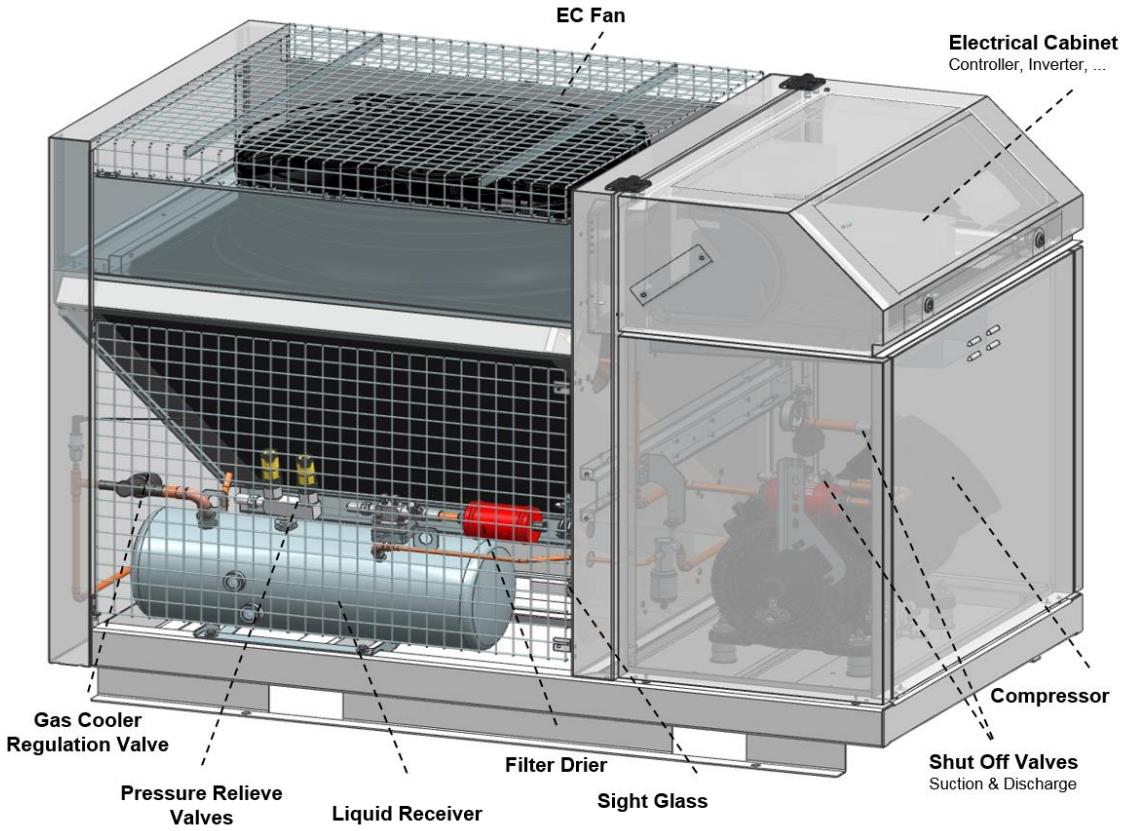


Figure 6 : Main components OME-Unit

Electrical cabinet: The electrical cabinet is on the edge above the compressor chamber beside the fan. All electrical components like main unit controller, inverter, contactors, transformers, wiring terminals and fuses are installed in this area. The electrical cabinet is covered by a hinged upper shell which can be fixed in two opening angles.

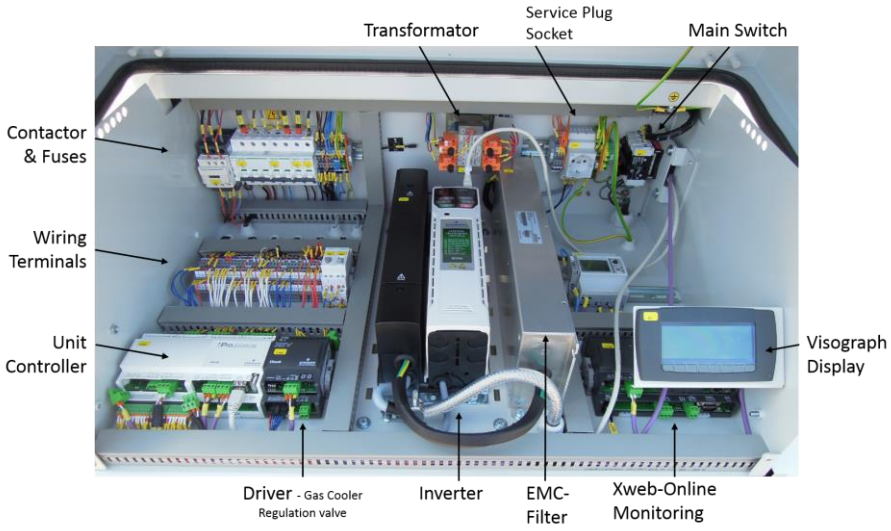


Figure 7 : Electrical cabinet - Overview

Compressor: The compressor is installed in the chamber below electrical cabinet. The standard delivery is with shut off valve on discharge, CoreSense Protection module, Oil watch system connected to one of the sight glass connections. One additional sight glass on opposite side of compressor allows visual check of oil level. A third sight glass is located in the crankcase cover which give indication if there is oil on the inlet of the oil splasher.
All electrical wiring is preassembled in the factory. There is a pressure relief valve (135bar) installed on the compressor directly. According to EN378 requirements there is a pressure cut out device installed on the discharge side of the compressor.

Liquid Receiver: The liquid receiver (20 litres for OME-4MTL-05X & OME-4MTL-07X ; 24.9 litres for OME-4MTL-09X) is installed beside the condenser / gas cooler. It's equipped with a shut off valve on the outlet and a safety group (2 pressure relief valves 90bar, connected to a switch over valve). In the shell of the liquid receiver are 2 sight glasses to check the refrigerant level inside the vessel.

Condenser / Gas Cooler Regulation valve: The High pressure regulation valve (Alco CX5) is installed between the condenser / gas cooler and the liquid receiver. It regulates the high pressure for optimum COP or maximum capacity in transcritical operation. The CX5 driver is a XEV20-D, which is installed in the electrical cabinet.

1.9.1 *Exploded view*

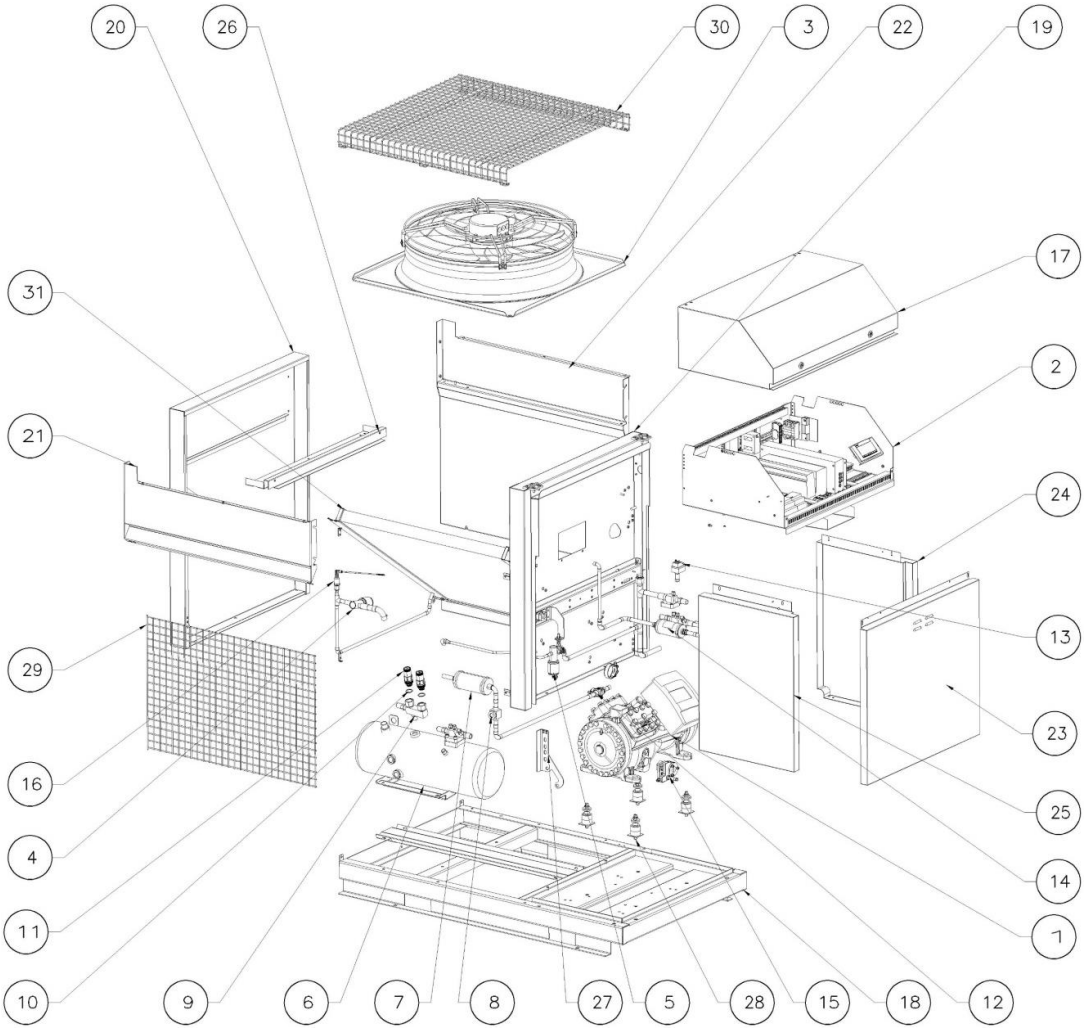


Figure 8 : Exploded View OME

No	PN	Description	UNIT SIZE
1	5017110 5017121 5017132	4MTL-05X-EWL 4MTL-07X-EWL 4MTL-09X-EWL	05 07 09
2	562-0273-00	E-BOX	05, 07, 09
3	550-0698-00 550-0699-00	FAN D710 EC 230V 50/60HZ D FAN D710 EC 230V 50/60HZ G	05 07, 09
4	510-0891-00	VALVE-EE CX5-CO2	05, 07, 09
5	510-0893-00	VALVE-EE CX4-CO2	05, 07, 09
6	577-0541-00 577-0066-00	LIQ.RECEIVER H 20L LIQ.RECEIVER H 25L	05, 07 09
7	013-0220-00	FILTERDRIER DCY-P14 16ID	05, 07, 09
8	570-0053-00	SIGHTGLASS REF606107016	05, 07, 09
9	510-0892-00	VALVE-CHANGEOVER 1/2NPT	05, 07, 09
10	020-1509-00	GASKET-SAFETY VALVE	05, 07, 09
11	510-0751-00	VALVE-SAFETY ASSM 90BAR	05, 07, 09
12	510-0890-00	VALVE-B REF1.1.S.B.016.K65	05, 07, 09
13	039-0039-00	PRESSOSTAT CS3-W8S 120 230V	05, 07, 09
14	019-0142-00	Muffler SCY-P14 50 S/MMS	05, 07, 09
15	570-0056-00	OIL WATCH-OW5-120	05, 07, 09
16	085-0263-00	SENSOR P 0-150 C	05, 07, 09
17	005-1710-00	COVER-EBOX	05, 07, 09
18	522-0074-00	BASEFRAME CO2	05, 07, 09
19	003-1575-00	PLATE-DIVIDER	05, 07, 09
20	005-1656-01 005-1656-00	COVER-BACK SIDE COVER-BACK SIDE	05 07, 09
21	005-1716-00 005-1698-00	COVER-SEAL PROFILE COVER-SEAL PROFILE	05 07, 09
22	005-1717-00 005-1698-01	COVER-SEAL PROFILE COVER-SEAL PROFILE	05 07, 09
23	005-1694-00	COVER-FRONT SIDE	05, 07, 09
24	005-1695-01	COVER-RIGHT SIDE	05, 07, 09
25	005-1695-00	COVER-LEFT SIDE	05, 07, 09
26	005-1718-00	COVER-SEAL PROFILE	05, 07, 09
27	C003-074-A057-03	BRACKET	05, 07, 09
28	C003-527-A001-00	MOUNTING PARTS	05, 07, 09
29	C003-005-A037-03	SIDE GRID	05, 07, 09
30	C003-005-A037-01	FAN COVER	05, 07, 09
31	066-0482-00 066-0470-02 066-0470-03 066-0470-00 066-0470-01	CONDENSER-TF CO2 V1 CONDENSER-TF CO2 V2 R CONDENSER-TF CO2 V1 L CONDENSER-TF CO2 V3 R CONDENSER-TF CO2 V3 L	05 07 07 09 09

Table 3: Main Component overview

1.10 Overall physical dimensions

The figures hereafter show the overall physical dimensions (in millimetres) of the OME refrigeration units:

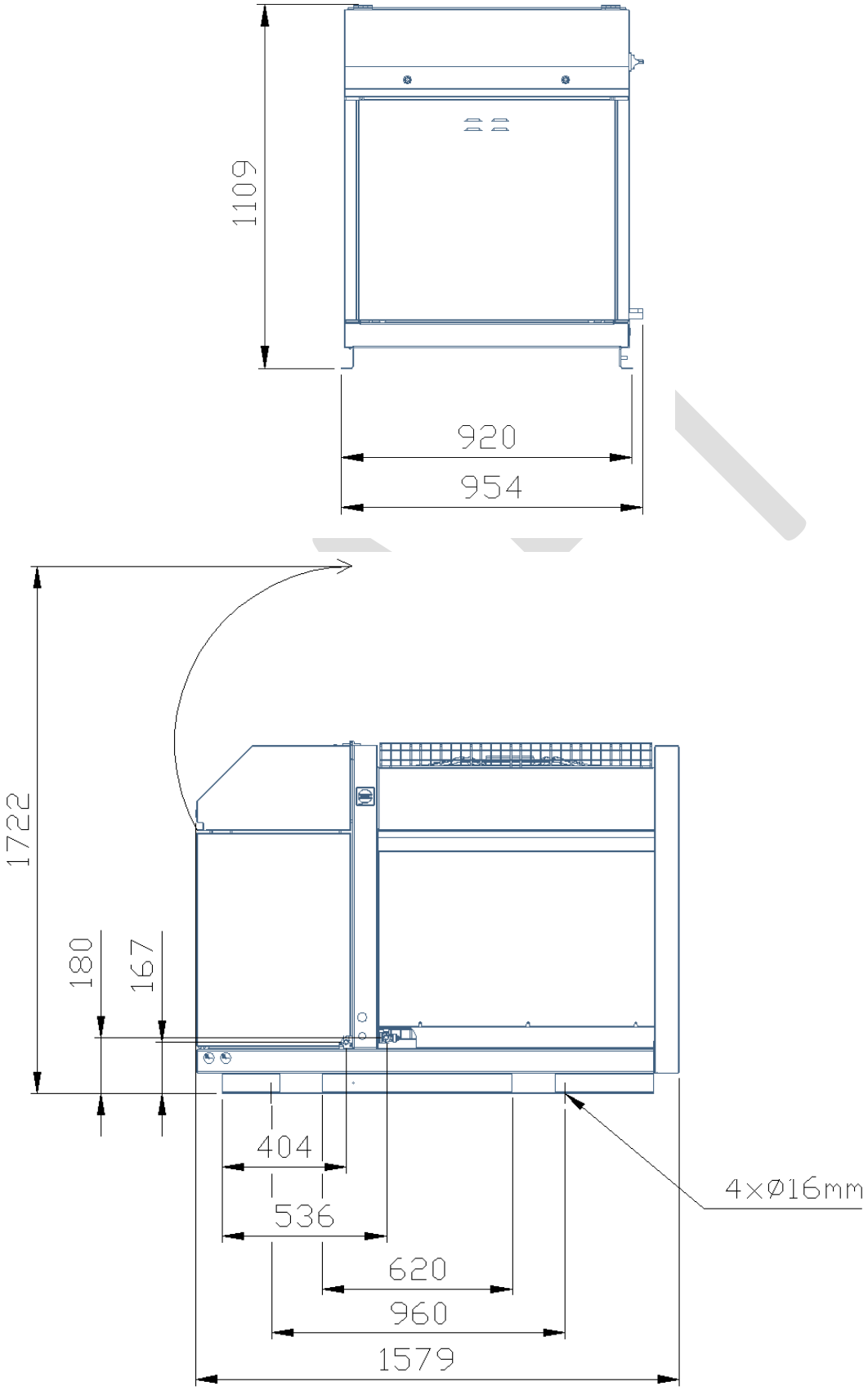


Figure 9: Dimensions of models OME-4MTL-09X, OME-4MTL-07X and OME-4MTL-05X

1.10.1 *Fan(s)*

The condensers of the OME refrigeration units are equipped with EC fans.

Unit	Fan		
	PN	Description	Copeland ID. Number
OME-4MTL-05X	550-0698-00	FN071-6IQ.BD.V7P3	TBD
OME-4MTL-07X	550-0699-00	FN071-ZIQ.DG.V7P3	TBD
OME-4MTL-09X	550-0699-00	FN071-ZIQ.DG.V7P3	TBD

Table 4: Used Fans

Fan			Power input	Maximal Current	Air Flow
PN	Description	ID. Number	[W]	[A]	[m3/h]
550-0698-00	FN071-6IQ.BD.V7P3	TBD	280	1.4-1.0	7100
550-0699-00	FN071-ZIQ.DG.V7P3	TBD	660	3.4-2.4	11950

Table 5: Fans specific technical data

Description	Unit	Value
Supply frequency	[Hz]	50/60Hz
Min to Max ambient temperature	[°C]	-35 to +60
ErP 2015	[-]	Yes
Supply Voltage	[V]	200-277
IP class	[-]	54
Fan motor type	[-]	EC
Fan blades	[-]	Plastic

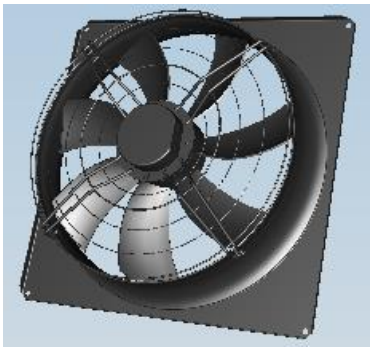


Figure 10 : Fan on OME

Table 6: Fans common technical data

1.10.2*Housing*

OME refrigeration units have new unique design. There is an electrical cabinet above the compressor chamber with a hinged cover for easy and service friendly access. Electrical cabinet and compressor area are accessible independent. The fan has vertical air flow and is protected by a safety grid. Gas cooler, liquid receiver and connected parts are free accessible for the service technician

Figure 11: Overview

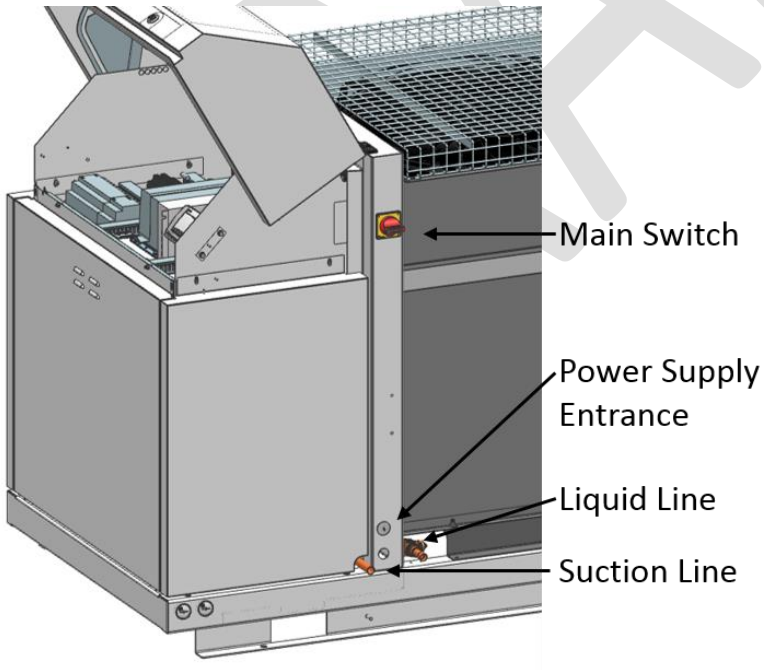


Figure 12 : Position of Connections

1.10.3 *To Open the housing*

For servicing & maintenance it's necessary to open the unit housing at some time:

Opening of electrical cabinet – release the lock located on both sides of electrical cabinet and open the cover up

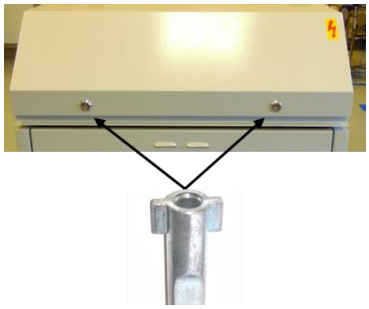


Figure 13 : Open electrical cabinet

Opening of compressor chamber – unscrew two screws located on the top of compressor chamber cover and unplug green/yelow grounding cable by pulling and remove the cover by lifting

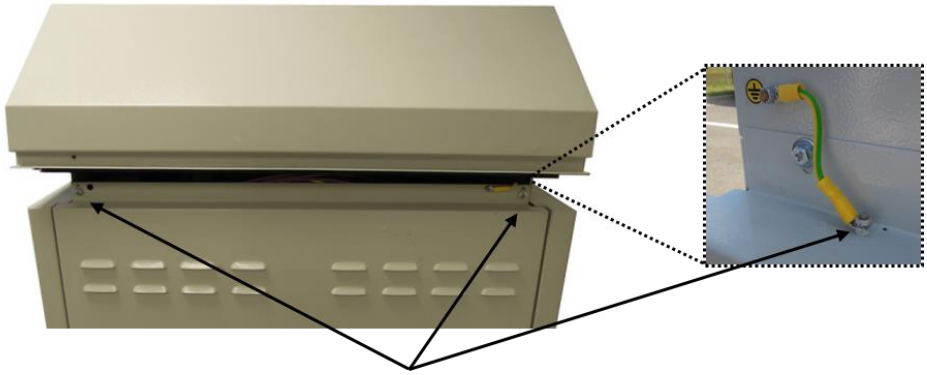


Figure 14 : Open compressor compartment

Removing safety Grid of fan – Grid can be remove only whe the unit is turn off. To remove the grid unsrew 6 srews located on the grid and remove the grid by lifting

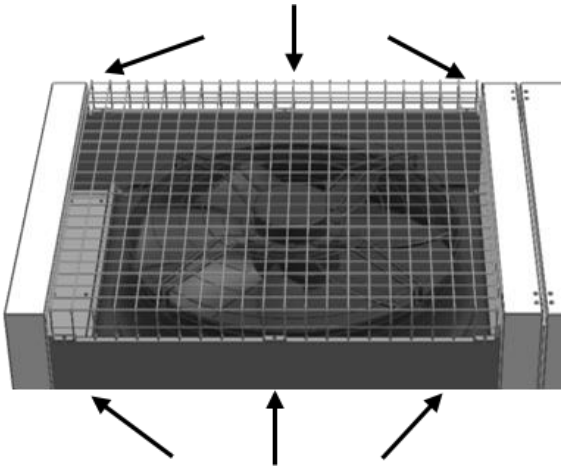


Figure 15 : Open fan safety grid

Access to the inner part of condenser / gas cooler – Side pannel can be reomoved only when the unist is turn off. To remove the side pannel unsrew 3 srews below condenser first continue to unscrew all remaining srews from outside then remove the cover by lifting

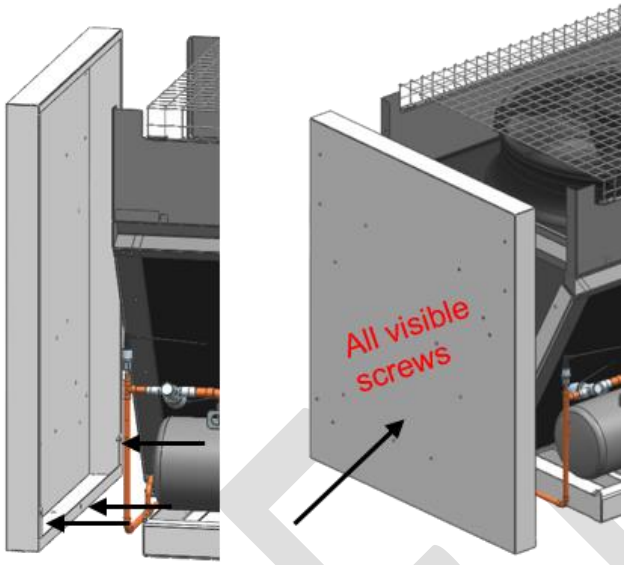


Figure 16 : Open gas cooler segment

1.11 P&I diagram for OME units

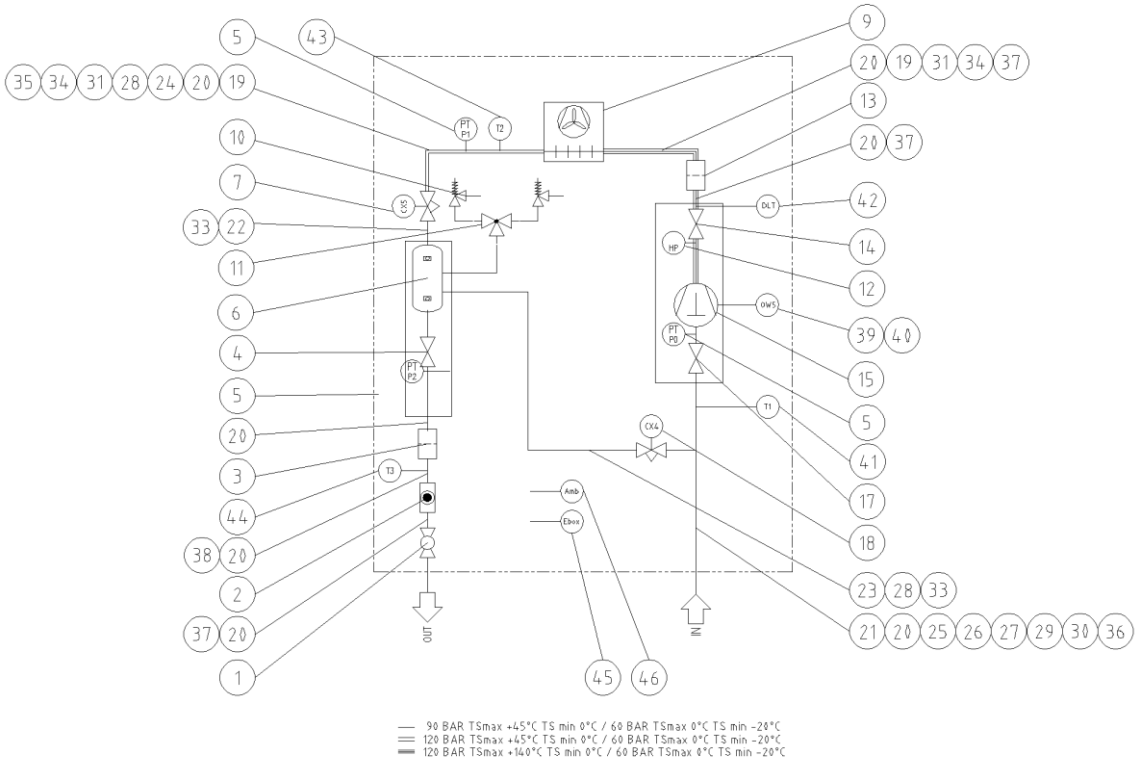


Figure 17: P&I diagram for OME units

Position	Description (OME-4MTL-05X)	Comments
1	(510-0890-00) - VALVE-B REF1.1.S.B.016.K65	Piping
2	(570-0053-00) - SIGHTGLASS REF606107016	Piping
3	(013-0220-00) - FILTERDRIER DCY-P14 165 S/MMS	Piping
4	(085-0263-00) - SENSOR PT5 0-150 C	Sensor
5	(510-0823-00) - Shut-off valve 5/8" ODS	Piping
6	(577-0541-00) - LIQ.RECEIVER H 20L	Liquid Receiver
7	(510-0891-00) - VALVE-EE CX5-CO2	Controls
8	(085-0263-00) - SENSOR PT5 0-150 C	Sensor
9	(066-0482-00) - CONDENSER-TF CO2 V1	Gas Cooler
10	(510-0751-00) - VALVE-SAFETY ASSM 90BAR	Controls
11	(510-0892-00) - VALVE-CHANGEOVER 1/2NPT	Safety
12	(039-0039-00) - PRESSOSTAT CS3-W8S 120 230V	System safety
13	(019-0142-00) - Muffler SCY-P14 50 S/MMS	Piping
14	(510-0823-00) - Shut-off valve 5/8" ODS	Piping
15	(497-1349-00) - 4MTL-05X-EWL	Compressor
16	(085-0263-00) - SENSOR PT5 0-150 C	Sensor
17	(510-0824-00) - Shut-off valve 3/4" ODS	Piping
18	(510-0893-00) - VALVE-EE CX4-CO2	Controls
19	(028-1962-25) - TUBE 1/2X0.85 R420	Piping
20	(028-1962-26) - TUBE 5/8X1.05 R300	Piping
21	(028-1962-27) - TUBE 3/4X1.3 R300	Piping

Position	Description (OME-4MTL-05X)	Comments
22	(028-1962-28) - TUBE 7/8X1.5 R300	Piping
23	(028-1962-02) - TUBE 3/8	Piping
24	(036-1488-00) - REDUCER 3/8ODX1/4NPTID	Piping
25	(036-1600-00) - REDUCER 3/4ODXM24X1.5	Piping
26	(036-1612-00) - FITTING-PLUG	Piping
27	(036-1484-00) - REDUCER 3/4ODX5/8ID P4	Piping
28	(036-1489-00) - REDUCER 5/8ODX3/8ID	Piping
29	(036-1498-00) - ELBOW 3/4IDX3/4ID	Piping
30	(036-1491-00) - UNION 3/4IDX3/4ID P4	Piping
31	(036-1481-00) - ELBOW 1/2IDX1/2ID	Piping
32	(036-1482-00) - ELBOW 1/2IDX1/2OD	Piping
33	(036-1483-00) - ELBOW 7/8IDX7/8OD	Piping
34	(036-1485-00) - REDUCER 5/8ODX1/2ID	Piping
35	(036-1499-00) - TEE 5/8IDX5/8IDX5/8ID	Piping
36	(036-1490-00) - TEE 3/4IDX3/4IDX3/4ID	Piping
37	(036-1497-00) – ELBOW 5/8IDX5/8ID	Piping
38	(036-1496-00) - ELBOW 5/8IDX5/8OD	Piping
39	(534-0058-00) - ADAPTOR-OIL WATCH	Piping
40	(570-0056-00) - OIL WATCH-OW5-120	Sensor
41	() – NT6-55 Suction Temperature	Sensor
42	() – S6.H DLT Temperature	Sensor
43	() – NT6-55 Gas Cooler Outlet Temperature	Sensor
44	() – NT6-55 Liquid Temperature	Sensor
45	() – NG6 Compartment/Ebox Temperature	Sensor
46	() – NG6 Ambient Temperature	Sensor

Table 7: Legend of the P&I diagram for OME units

1.12 Compressor safety

1.12.1 *Compressor motor protection*

The unit is equipped with a 4MTL Stream compressor including CoreSense Protection Technology. All relevant electrical protection features are covered by the frequency inverter M200-054 (Emerson Industrial Automation). For details see manual for Unidrive M200 on www.emersonindustrial.com/en-EN
In addition, Core Sense Protection module is protecting the motor from overheat.

Discharge line temperature is monitored and controlled by iPro controller.

The different areas of the system are limited by different design pressure PS. See chapter 1.8.3 Design pressures for details. There are different levels of protection & controls to keep the pressures always inside approved envelope.

1.12.2*High-pressure safety (type approved pressure limiter)*

A type approved pressure limiter (according to EN12263) with automatic reset is installed on the compressor. It's a normally closed switch from ALCO. Pressure cut out is set to 120 bar and cut in set to 90 bar.

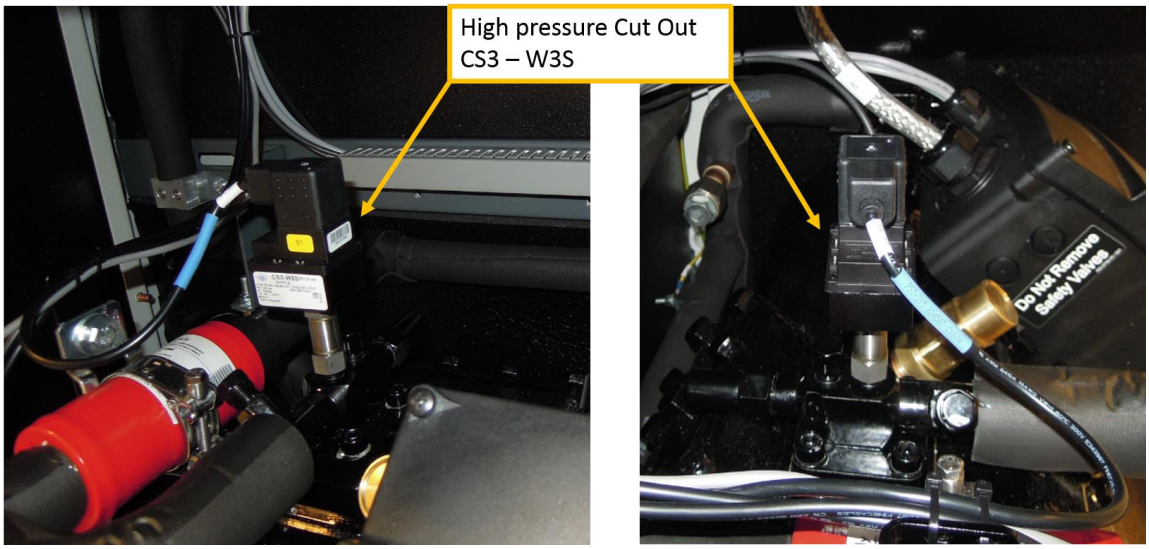
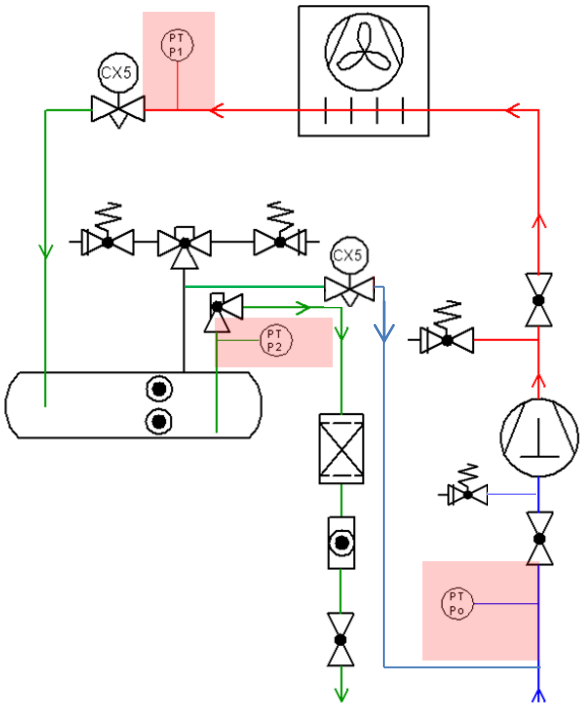


Figure 18: High pressure cut out device

1.12.3 *High pressure safety control*

There are 3 pressure transmitters assembled in the unit. Those transmitters are used for control purposes in the system as well as for safety control. They are located on the suction side (PT_{P0}), between gas cooler and high pressure regulation valve (PT_{P1}) and on liquid receiver outlet (PT_{P2}). The factory setting for the high pressure is slightly below the activation set point of the high pressure safety switch. The transmitter on the liquid receiver (PT_{P2}) is also used to limit the liquid receiver pressure during operation by help of the system controller.



1.12.4 *Pressure Relief valve – high side*

The compressor has a pressure relief device (135bar) on the discharge side. This device will reach 100% of blow off capacity when maximum allowable pressure PS of the compressor will be exceeded by 10% (opening at 1.0 x PS, max capacity at 1.1 x PS).

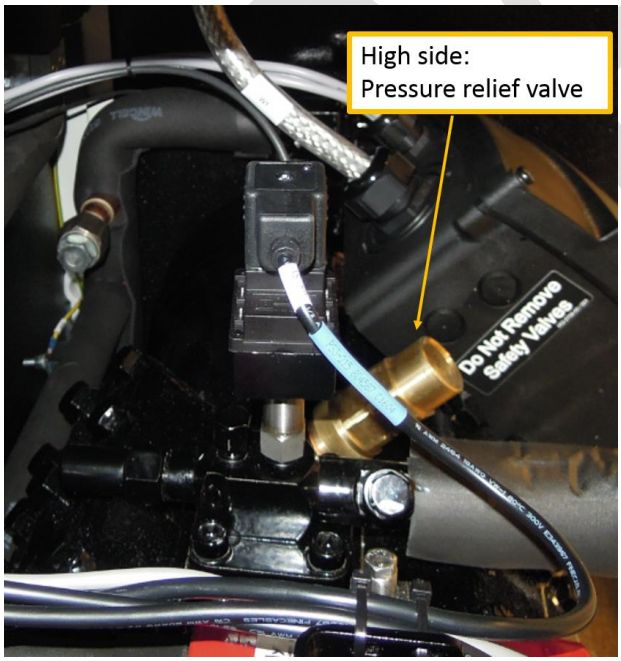


Figure 19: High side pressure relief valve

1.12.5 *Pressure Relief valve – Liquid Receiver*

There are two pressure relief valves (90bar) on the liquid receiver, connected on a changeover valve. In case of refrigerant blow off this allows easy replacement of the relief device without interruption of unit operation by using the second valve. Typically, after a blow off event the relief devices are never 100% tight again, therefore component exchange after activation is recommended. Thread connections on changeover valve and pressure relief valve are ½"-NPT.

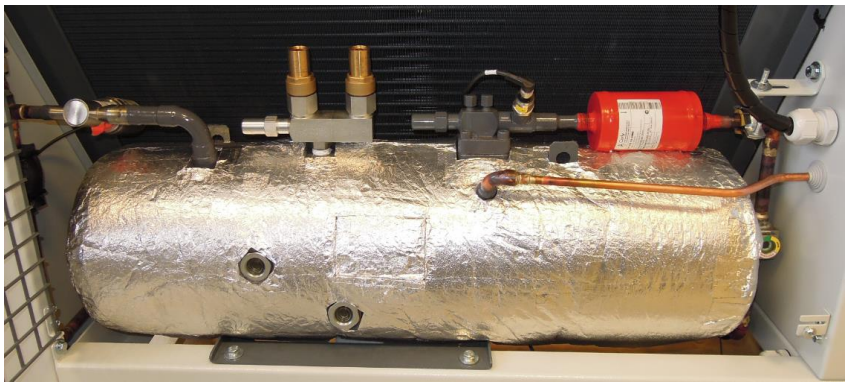


Figure 20: Liquid receiver with safety group

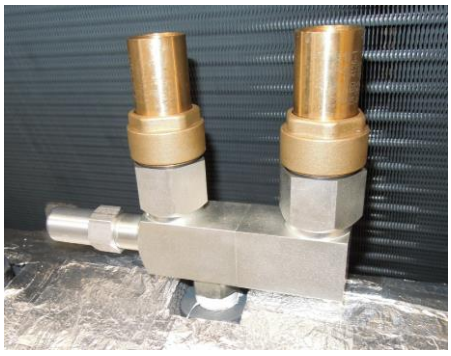


Figure 21: Pressure relief valves with change over valve

1.12.6 *Low-pressure safety control*

Like on discharge & liquid side a suction pressure transmitter (PT_{Po}) provides information about suction pressure to the system controller. This value is used to evaluate the load requirement and to protect the unit / system against too low pressure on suction side.

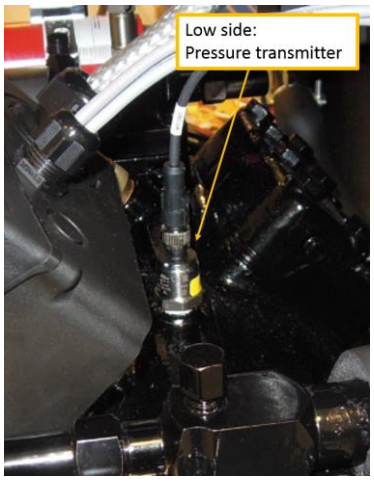


Figure 22: Low side pressure transmitter

1.12.7 *Pressure Relief valve – low side*

The compressor has a pressure relief device (90bar) on the suction side. This device will reach 100% of blow off capacity when maximum allowable pressure PS of the compressor will be exceeded by 10% (opening at 1.0 x PS, max capacity at 1.1 x PS).

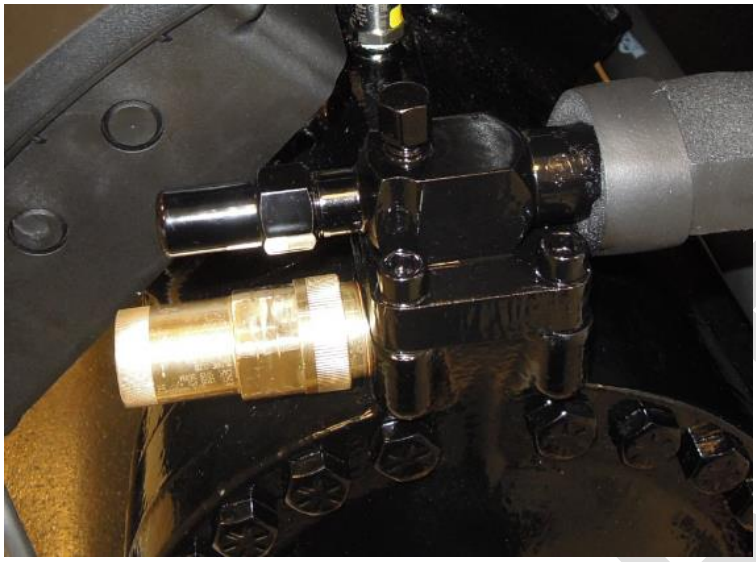


Figure 23: Low side pressure relief valve

1.12.8 *Maximum compressor cycle*

The factory setting of the system controller already takes into account the maximum permitted starts and stops of the compressor and also controls running time and minimal downtime. It is recommended to change these settings only in exceptional cases.

Installation

WARNING
High pressure! Injury to skin and eyes possible! Be careful when opening connections on a pressurized item.

Copeland OME refrigeration units are delivered with a holding charge of neutral gas.

The refrigeration unit should be located in such a place to prevent any dirt, dust, plastic bag, leaves or papers from covering the condenser / gas cooler and its fins.

The place of installation has to be plain and horizontal. The unit must be fixed to the underground to avoid any movement of the base frame. The ground needs to be designed for the weight of the unit. It might be required to install additional vibration absorber between the unit and the underground to avoid transmission of vibration to the rest of the building.

The unit must be installed without restricting the airflow. Avoid also harmful environmental condition like very low or high temperatures.

A clogged condenser / gas cooler will increase the refrigeration temperature / gas cooler outlet temperature and could lead to a high-pressure switch tripping. Clean the condenser fins on a regular basis.

The place of installation should be sufficient illuminated and the location should allow access for easy service and maintenance work.

In case of installation in a machine room consider EN378-3 and all additional national regulations.

A risk assessment for the place of installation has to be done in advance. This has to be documented for local authorities. It should contain safety related measures to avoid risks. The risk assessment for the unit itself was performed by manufacturer.

1.13 Refrigeration unit handling

1.13.1 *Transport and storage*

WARNING
Risk of collapse! Personal injuries! Move refrigeration unit only with appropriate mechanical or handling equipment according to weight.
Keep in the upright position.
Don't stack other pallets on top of the unit packaging.
Keep the packaging dry at all times.

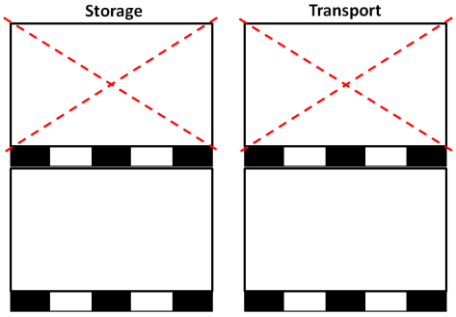


Figure 24: Transport and storage

1.13.2 *Lifting*

Always lift by point marked with red arrows on pictures below. For lifting with slings always used spreader bar mounted above unit to prevent unit squeezing.

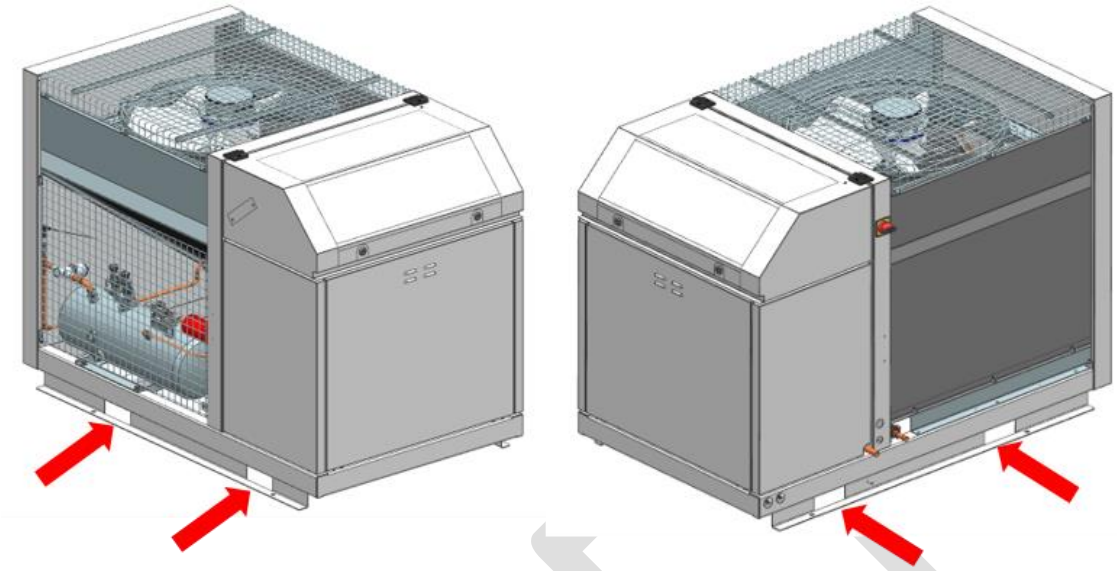


Figure 25 : Lifting OME 1

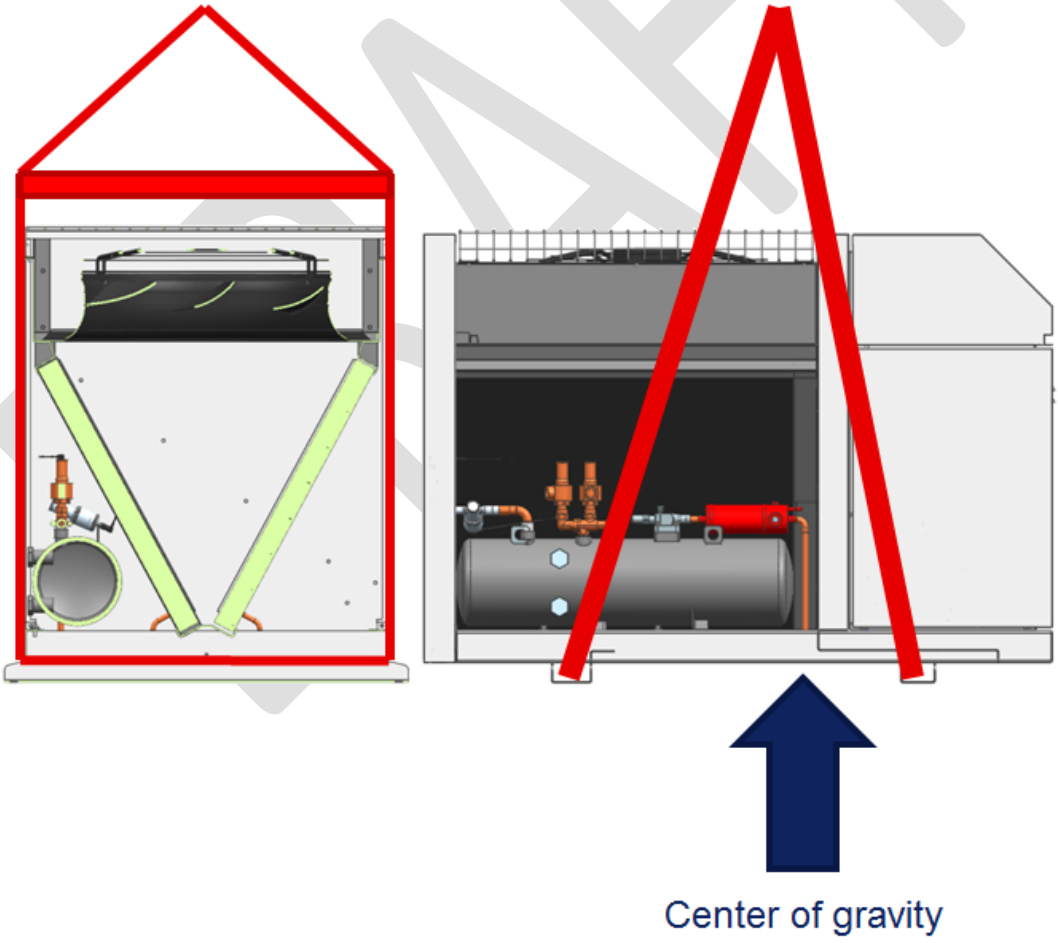


Figure 26 : Lifting OME 2

1.13.3 *Weights*

Unit	Net Weight
OME-4MTL-05X	440 kg
OME-4MTL-07X	440 kg
OME-4MTL-09X	460 kg

Table 8: Weights

1.14 Location & fixings

IMPORTANT
Dust and dirt contamination! Unit life reduction! The unit should always be installed in a location that ensures clean air flow. External fouling of the condenser fins also leads to high condensing temperatures or pressures, and will reduce the lifetime of the unit.

It is recommended to follow a clearance (red dimensions) on Figure 6. 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. However, in general terms, air by-pass around each condenser and between the units should be avoided at all times.

Ideally, the unit should be mounted level on a solid concrete slab with anti-vibration pads between unit feet and concrete. However, the OME refrigeration unit has also been designed for wall mounting on suitable brackets. In this case it is equally important that the dimensional guidelines given in Chapter 1.18 Required distances are followed and that additional consideration is given for possible air recycling if units are stacked above and below each other. 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 refrigeration temperatures and ultimately resulting in reducing the life of the unit. A baffle is a remedy for this situation.

1.14.1 *Required distances*

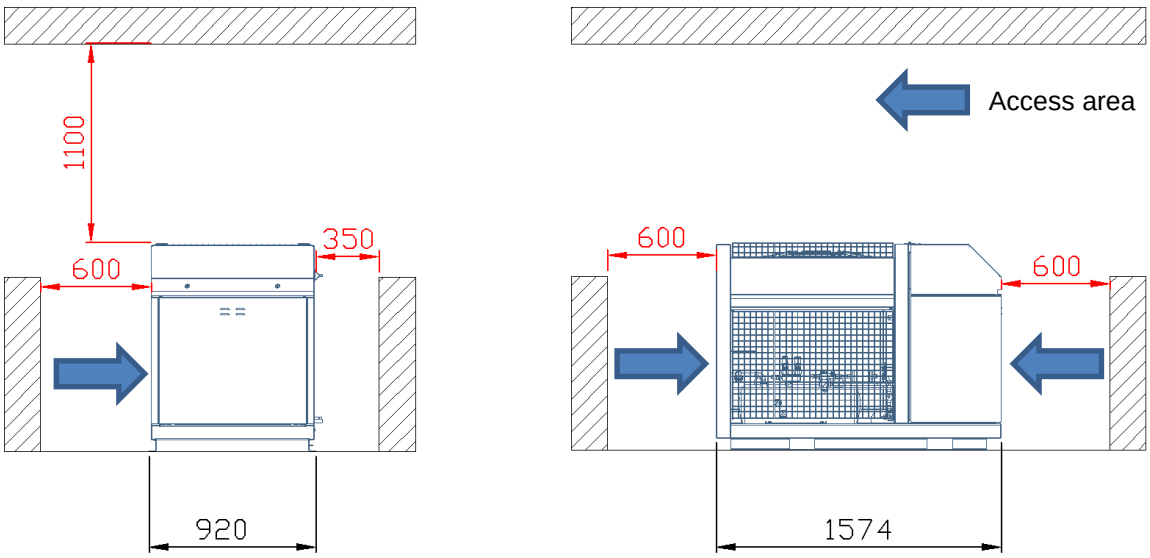


Figure 27: Fixing dimensions and distances are in mm

1.15 Refrigeration piping connections

1.15.1 *Refrigeration piping installation*

WARNING
High pressure! Risk of personal injury! The units are pressurized with dry air. Be careful when opening connections on a pressurized item.

IMPORTANT
Tubing quality! Installation contamination! All interconnecting piping 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 2 hours), pipes should be re-capped to prevent moisture and contaminant from entering the system.
Connection sizes! Unsuitable refrigerant flow rate! Do not assume that the service connection sizes on the unit (at the service valves) are in fact 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 piping should be sized to satisfy the duty required.

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.

The piping on the unit is made with K65, which is a high copper alloy tube for high operating pressures. This kind of tube is more rigid than standard copper tube which needs to be considered for the design & fixation of the piping system.

System liquid line piping must be design for PS of 90bar absolute pressure as pressures around 85bar can occur during normal operation.

System suction line piping is also expected to be design for PS of 90bar to withstand still pressures for high ambient temperatures. Any deviation from that should be consulted with Application Engineering.

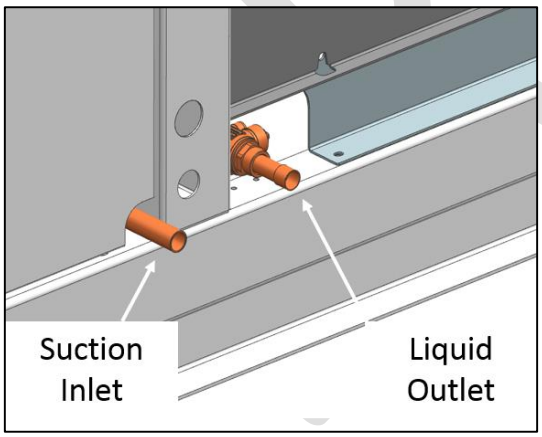


Figure 28 : Piping connections

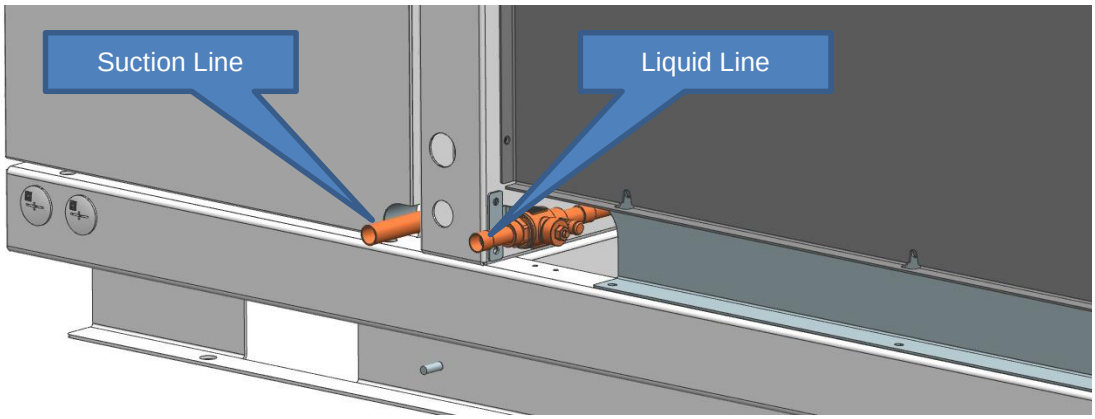
Unit	Inlet (ODS)	Outlet (IDS)
OME-4MTL-09X	22.23 mm	16.2 mm
OME-4MTL-07X	19.05 mm	16.2 mm
OME-4MTL-05X	19.15 mm	12.9 mm

Table 9: Connection size

1.15.2 *Brazing recommendations*

IMPORTANT
Blockage! Compressor breakdown! Maintain a flow of oxygen-free nitrogen through the system at very low pressure during brazing. Nitrogen displaces the air and prevents the formation of copper oxides in the system. If 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.
Contamination or moisture! Bearing failure! Do not remove plugs longer time before starting the brazing process. This minimizes any entry of contaminants and moisture.

- Remove the liquid connection cap.
- Remove the suction connection cap.
- Open liquid line valve mid-way. Care should be taken to avoid the holding charge releasing too quickly.
- Be sure tube fitting inner surface and tube outer surface are clean prior to assembly.
- Both tubes are extended from the refrigeration unit housing, therefore we recommend to isolate the housing by using a wet cloth on the copper tubing.



- Recommended brazing materials: See K65 recommendations:
  - http://www.wieland-thermalsolutions.com/commonmedia/content/media/en/prospekte_2/gbrohre/prospekte/untersuchungsergebnisse_wieland_k65_11.pdf

Following table is an extract of the recommendation for acceptable brazing alloys and flux:

BRAZING ALLOY	DIN EN ISO 17672	DVGW*-NUMBER	WORKING TEMPERATURE [°C]	COMPOSITION [% by weight]				
				Ag	Cu	Zn	Sn	P
BrazeTec 4576	Ag145	DV-0150CM0043	670	45	27	25.5	2.5	-
BrazeTec 3476	Ag134	DV-0150CM0045	710	34	36	27.5	2.5	-
BrazeTec 4404	Ag244	DV-0150CM0044	730	44	30	26	-	-
BrazeTec S 15	CuP284	-	700	15	80	-	-	5
BrazeTec S 5	CuP281	-	710	5	89	-	-	6
BrazeTec S 2	CuP279	DV-0105CL0475	740	2	91.7	-	-	6.3

FLUX	DIN EN 1045	DVGW*-NUMBER	ACTIVE TEMPERATURE [°C]	ANNOTATIONS
BrazeTec h	FH10	DV-0101AU2227	550-970	Flux residues are corrosive and must be removed

*DVWG = German Technical and Scientific Association for Gas and Water

- Use a double-tipped torch.

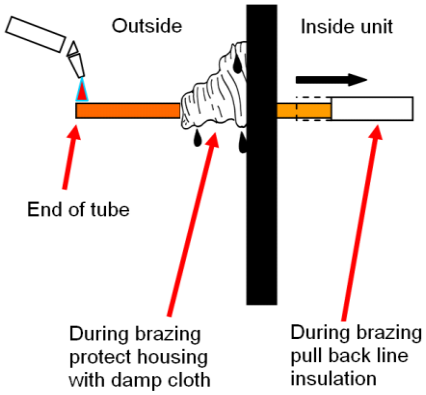


Figure 29: Brazing - Sectional view

1.16 Electrical connection

1.16.1 *Power supply connections*

The electrical connection of the refrigeration unit to the power supply must be made by qualified technicians according to the valid electrical directives, for instance DIN EN 60204-1. Also the voltage drop and temperatures on line must be considered for cable selection. Nominal power and current are showed in Table 10: Unit nominal power and current.

Copeland OME units are designed for a 380-420V / 3Ph / 50 Hz + N + PE power supply (TN-S-system). A voltage tolerance of ± 10% is acceptable.

The circuit breaker & main switch on backside of the unit must be switched off before opening the hinged front cover and connecting the power supply cable.

For comfortable main power supply connection unscrew two screws marked with red arrow on right picture of figure 23 and then pull out the main switch.

Power cable should be always provided with cable grommet at unit entrance (see Figure 11). Power cable should enter the E-box through rubber grommet marked with blue arrow on Figure 30

Figure 31 : Main switch position & power supply connection

Unit	Nominal Power [kW]	Nominal Current [A]
OME-4MTL-05X	11	19
OME-4MTL-07X	14	22
OME-4MTL-09X	16	27

Table 10: Unit nominal power and current

1.16.2 *Electrical wiring*

Before commissioning, ensure that the neutral "N" and ground protection “PE” wires are connected to the main switch.

1.16.3 *Electrical protection standard (protection class)*

- Unit IPX4
- Stream 4MTL compressors T-Box: IP54 according to IEC 34.
- Fan: IP54 according to IEC 34.

Starting up & operation

Before commissioning, ensure that all valves on the refrigeration unit are fully opened. Only qualified personal and certified company are allowed to do installation, commissioning, service & maintenance work.

1.17 Evacuation

IMPORTANT
The evacuation procedure is based upon achieving an actual system vacuum standard and is NOT TIME DEPENDENT! Before commissioning the system must be evacuated by the vacuum pump. Before the installation is put into commission, it has to be evacuated with a vacuum pump. Proper evacuation reduces residual moisture to 50 ppm. The installation of adequately sized access valves at the furthest point from the compressor in the suction and liquid lines is advisable. The system must be evacuated down less than 3 mbar and if required break the vacuum by the dry nitrogen repeated. Pressure must be measured using a vacuum pressure gauge on the access valves and not on the vacuum pump; this serves to avoid incorrect measurements resulting from the pressure gradient along the connecting lines to the pump.

IMPORTANT
Take care that all components (solenoids, expansion devices, regulators) in the refrigeration cycle, which separate a part of the installation when de-energized, are manually opened to guarantee successful evacuation in complete piping system

1.18 Charging procedure

1.18.1 *Refrigerant charging procedure*

The pre-charging (both sides, suction & discharge/liquid) must be done with gaseous refrigerant through the service valve on the liquid receiver and the suction shut off valve on the compressor. It is important to charge gaseous CO_2 to a pressure level above the triple point of the refrigerant (5,185 bar absolute) to avoid dry ice. A gaseous pre-charge of 10 bar in whole system is common practice.

After pre-charging gaseous CO_2 the main quantity of refrigerant can be charged liquid to the service connection port on liquid receiver. It is advisable to pre-fill the suction side with a partial filling to avoid the vacuum operation during initial start-up. Further charging can be effected by careful gaseous filling into the suction line during observation of the sight glass (sight glasses on liquid receiver and sight glass after filter drier in liquid line) when system is in operation.

Refrigerant charge might vary due to system size. Proper amount of refrigerant will be charged during unit commissioning by qualified technician based on real application needs. In order to prevent system overcharge for high ambient temperatures is advice to charge the liquid receiver only up 60% considering typical piping length of 30m.

In high ambient condition (above 30°C) charge until liquid refrigerant is visible in upper sight glass of the liquid receiver

In low ambient condition (below 10°C) charge until liquid refrigerant is visible in lower sight glass of liquid receiver.

Any temperature between means liquid between two sight glasses.

Never charge the system to a liquid level higher than upper sight glass of liquid receiver

WARNING
CO_2 refrigerant! Risk of dry ice! It is important to charge gaseous CO_2 to a pressure level above the triple point of the refrigerant (5,185 bar absolute) to avoid dry ice. A gaseous pre-charge of 10 bar in whole system is common practice.

IMPORTANT
Inadequate charge! Overheating! The compressor design requires system charging as quickly as possible with liquid refrigerant into the liquid line. This will avoid running the compressor under conditions whereby insufficient suction gas is available to cool not only the motor but limit the discharge line temperature.

1.18.2 *Oil charging procedure*

Copeland OME refrigeration units are supplied only with a compressor oil charge. After commissioning, the oil level should be checked and topped up if necessary.

NOTE: **The oil level should be approximately halfway up the sight glass.**

According to chapter 1.8.1 Emerson Climate Technologies recommends charging the oil with one of the following oil types:

- Polyolesteroil Emkarate RL68HB

Charging of additional oil is done through the Schrader valve located on the suction shut off valve.
Compressor is equipped with oil watch to prevent running without sufficient oil level in compressor. If insufficient oil level occurs compressor will be shutdown automatically when appropriate amount of oil is applied compressor will start again automatically.

1.19 Checks before starting & during operation

IMPORTANT
Liquid valves not fully opened! Liquid trap! Both valves should be fully opened on the liquid line, in order to prevent trapping liquid.

- Check that all valves are fully opened.
- Set the essential parameters of the electronic controller in the programing level 1 (Refrigerant type, Compressor cut-out/in settings, Fan setpoint….) according to the required application.
- We recommend to check the oil level in compressor after starting and operation conditions have stabilised, and to add oil if needed to ensure a sufficient oil level (halfway up the sight glass).

1.20 Electronic control

The unit is equipped with iPro controller (IPG215) and with Visograph display. iPro is managing compressor frequency inverter through 0-10V and through one digital signal. iPro is also responsible for pressures regulation which is done by CX valves driven by driver XEV20D which is controlled from iPro through CAN BUS. XEV20D can operate two valves simultaneously. Controller can handle gas cooler pressure and liquid receiver pressure by dedicated CX valves.

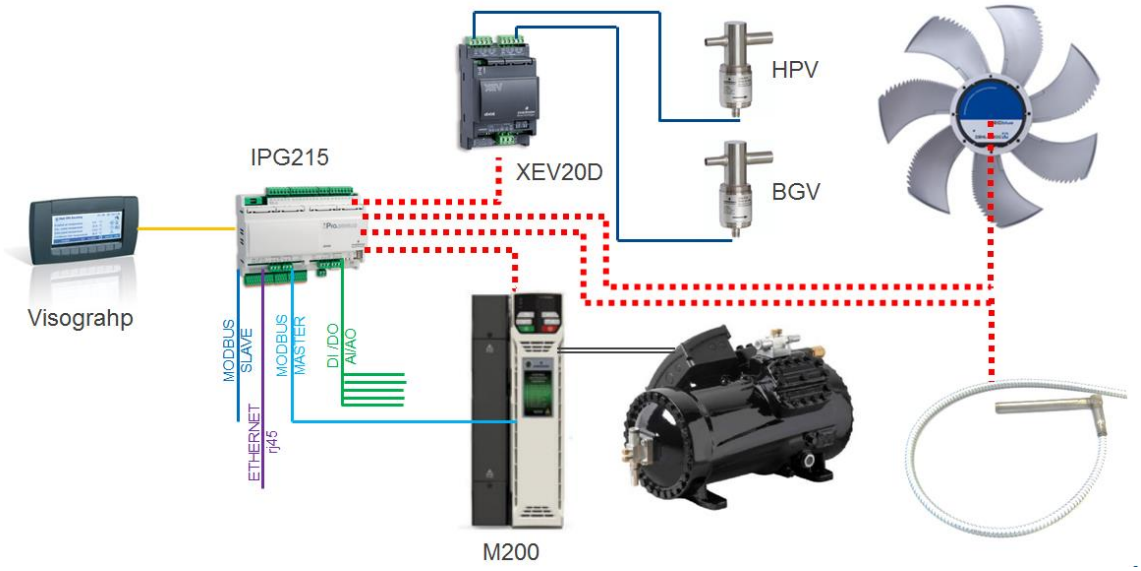


Figure 32 : Control scheme of OME

1.20.1 *iPro controller*

iPro is standard Dixell controller IPR215D. Detail manual can be found on www.emersonclimate.eu. The controller is pre-set from factory for -10°C evaporating temperature and factory settings can be found in Appendix 3.

It's recommended to change evaporating temperature only to achieve desired temperatures as rest of the parameters is already pre-set. If change of any other parameters than evaporating pressure is required please contact local Application Engineering representative.

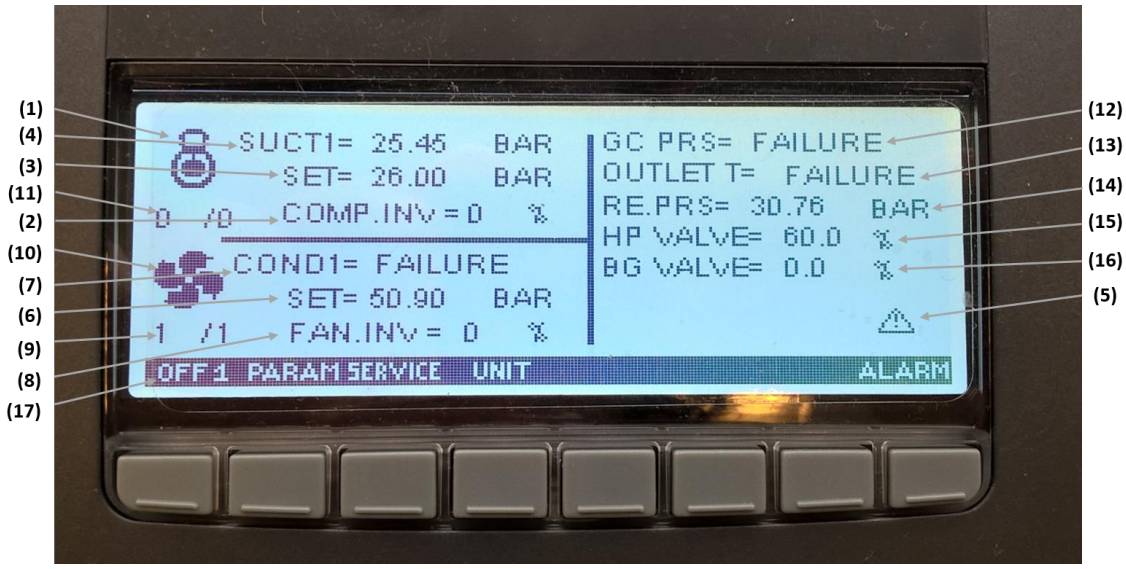


Figure 33: Button description controller

Symbol of compressor: it is present if a relay is configured as a compressor
Analogue output status for frequency compressor: it is present only if an inverter driven compressor is used
Suction pressure (temperature) set point: it is present if a relay is configured as a compressor
Current value of suction pressure (temperature): it is present if a relay is configured as a compressor
Alarm: it is displayed when an alarm happens in suction or delivery section
Delivery pressure (temperature) **set point**: it is present if a relay is configured as a fan
Current value of delivery pressure (temperature): it is present if a relay is configured as a fan
Analogue output status for inverter for fan: it is present only if an inverter driven fan is used. It displays the percentage of the analog output driving the inverter
Number of fans activated / Total number of fans: it is present if a relay is configured as a fan
Symbol of fan: it is present if a relay is configured as a fan
Number of compressors and steps activated / Total number of compressors and steps: it is present if a relay is configured as a compressor

***Note**: the total number of compressors is referred to the number of available compressors. Compressors that are in "maintenance" or that are stopped by their own digital Output are not included*

Gas Cooler pressure:HPV pressure, the same displayed in "Stage Gas Cooler Info"
Outlet temperature: the same displayed in "Stage Gas Cooler Info"
Receiver pressure: BGV pressure, the same displayed in "Stage Gas Cooler Info"
HPV valve % (if configured)
BGV valve % (if configured)
Operating mode

Descriptions of buttons:

ALARM	Alarm: To enter the alarm menu
PARAM	Param: To enter the parameter programming
SERVICE	Service: To enter the service menu
UNIT	Measurement unit: To switch the probe visualization and set point from pressure to temperature and vice versa
OFF1	To switch the controller OFF: hold pushed for 10s to switch the controller off (it is enabled only if parameter OT5 = yES)

1.20.2 *How to change parameters*

Push the **PARAM** key and the programming menu is entered.
Parameters are collected in two menu:
Pr1: menu of parameters without password.
Press the Pr1 key to enter.
Pr2: menu of parameters with password.
If the password is enabled, use the following procedure to put it.

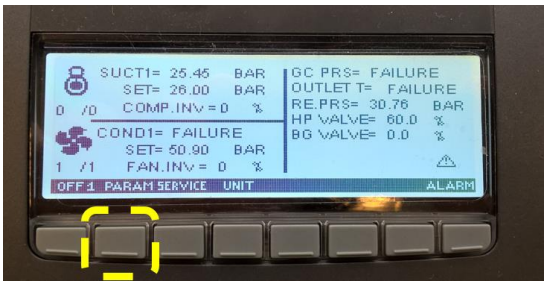


Figure 34: iPro Parameter button

1.20.3 *Controller setting*

To change evaporating pressure go to menu PARAM -» Pr1 -» Set Point (SETC1-SETC2) and then adjust the SETC1 to desired suction pressure.

IMPORTANT
Never adjust suction pressure out of envelope! Envelope is mentioned in chapter 1.8.2 Application limits.

There is no change required in iPro HPV setting before starting the unit.

1.20.4 *How to enter programming level 2 (Pr2)*

If the password is enabled, by pushing the Pr2 key the following interface is displayed:

Add a foto !!

1. 1. Push the SET key.
2. 2. Use the UP and DOWN keys to set the password
3. The factory setting for the password is 12 TBC
4. 3. Push the SET key to confirm it
5. 4. The following message is displayed
6. 5. Push the ENTER key to enter in Pr2 menu

Add a foto !!

1.20.5 *How to set time & date*

Procedure:

1. Enter the SERVICE menu
2. Select the sub-menu “REAL TIME CLOCK”
3. Push the ENTER key.
4. Set the day by means of the UP and DOWN keys.
5. Push the SET key, to confirm and pass to the setting of time.
6. Use the same procedure for the date.
7. Then confirm the selection by means of the SET key.

1.20.6 *How to enter the service menu & service sub-menu*

From the main display screen push the SERVICE button and the SERVICE menu is entered.

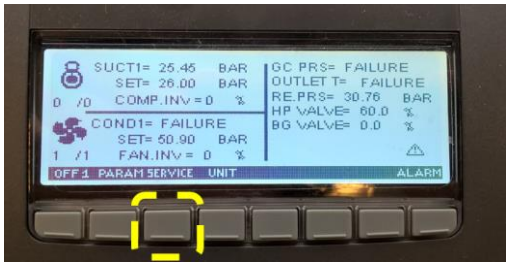


Figure 35: iPro Service button

The following sub-menus are available

- PROBES
- ANALOG OUTPUTS
- OUTPUT (OM)
- LOADS STATUS
- DIGITAL INPUTS
- SUPERHEAT (INACTIVE)
- PUMP DOWN

- COMPRESSOR SERVICE CIRCUIT 1
- CORESENSE SETUP
- CORESENSE INFORMATION
- LOG FILE MANAGEMENT
- UPDATE VISOGRAPH
- M400 STATUS
- ENERGY METER STATUS
- XEV02 STATUS
- DEVICE ONLINE/OFFLINE
- CONF FILE MANAGEMENT
- CONF IP/MDB ADDRESS
- REAL TIME CLOCK
- LANGUAGE
- PASSWORD
- GAS COOLER INFORMATION

1.20.7 *How to see values of inputs & outputs*

Procedure:

1. Enter the SERVICE menu
2. Select the sub-menu you want to check
3. Push the ENTER key.

Analog outputs can be used to drive an external inverter or to repeat a main probe, by means of a signal 4-20mA or 0-10V.
Digital outputs

1.20.8 *How to see status of relais / loads*

Procedure:

1. Enter the SERVICE menu
2. Select the sub-menu “LOAD STATUS”
3. Push the ENTER key.

1.20.9 *Compressor Service sub menu for maintenance*

The COMPRESSOR SERVICE menu could be protected by password.
By means of the COMPRESSOR SERVICE sub-menu is possible to perform a maintenance section, consisting on:

- disabled an output
- check and (eventually) erase the running hour of a load.

Procedure:

1. Enter the SERVICE menu
2. Select the sub-menu “Compressor Service”
3. Push the ENTER key.

To disabled an output during a maintenance session means to exclude the output from the Regulation.

To do it act as in the following:

1. Enter the COMPRESSOR SERVICE CIRCUIT 1 sub-menu, as described in the previous paragraph.
2. Select the load SUB-MENU by means of the UP and DOWN keys
3. Push the SET key, to enter the COMPRESSOR 1 SERVICE submenu
4. To enable a load for regulation or to disable it, push one of the following keys:
5. ENB: to enable the load for regulation
6. DISB: to disable the load for regulation

NOTE: If some outputs are disabled they don’t take part to the regulation, so the regulation goes on with the other outputs.

1.20.10 *Manual compressor run*

IMPORTANT
Manual compressor run is intended to be used for maintenance reasons only! Only qualified personal and certified company are allowed to. Using manual run can force to run the compressor outside of envelope therefore take extra caution when using it. Never run the compressor for too long (max 2 minutes).

During manual compressor run all safety features remain active. Using manual compressor run is in fact bypassing the controller run signal.

To manually run the compressor, check that SB2 switch is position “I” and then push the push button SB1. Compressor will start immediately at minimal speed.

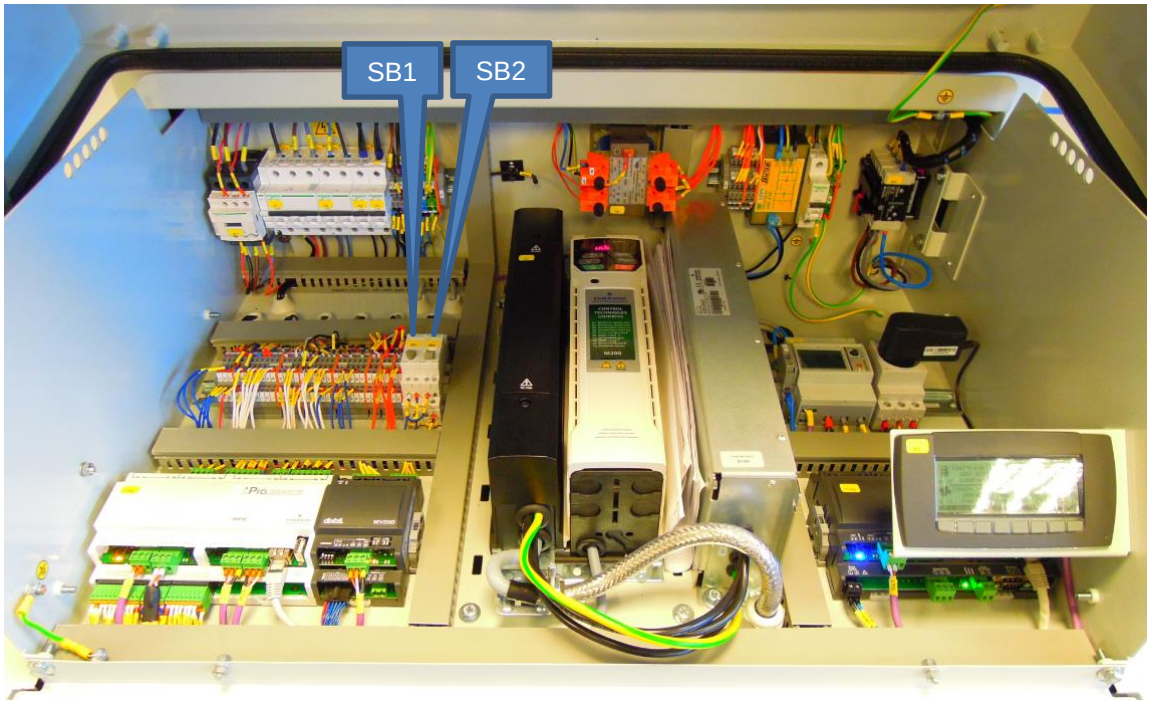


Figure 36: Manual compressor operation

1.20.11 *Factory settings – How to get them back*

Procedure:

1. Enter the SERVICE menu
2. Select the sub-menu “CONF FILE MANAGEMENT”
3. Push the Set key.

Pushing the SET key transfers the parameter map from Backup.conf file to Param_model.conf file. The Iprorack will reboot and the parameters are reloaded from the Param_model.conf file.

1.20.12 *Customer settings – How to save them*

To update the back up file with the current parameter map:

Procedure:

1. Enter the SERVICE menu
2. Select the sub-menu “CONF FILE MANAGEMENT”
3. Push the ENTER key.
4. Select the menu: “Send parameters to Backup.conf file”
5. Push “Set” key

ATTENTION: Saving of customer settings will overwrite the factory settings!

CONF IP/MDB ADDRESS
This sub-menu allows to modify the IP address and the modbus address. Every time there is a new value it requires a reboot of Ipro. Inside the code it is necessary to use the FB IPRO_config.

1.20.13 *How to check the inverter M400 settings*

Procedure:

1. Press the SERVICE key in the main display visualization.
2. Select M400 STATUS sub-menu.
3. Press the ENTER key to enter the sub-menu.

Maintenance & repair

1.21 Replacing a compressor

CAUTION
Inadequate lubrication! Bearing destruction! Exchange the accumulator (if present in system) after replacing a compressor with a burned out motor. The accumulator oil return orifice or screen may be plugged with debris or may become plugged. This will result in starvation of oil to the new compressor and a second failure.

In the case of a motor burnout, the majority of contaminated oil will be removed with the compressor. The rest of the oil is cleaned through the use liquid line filter drier. A 100% activated alumina suction line filter drier is recommended but must be removed after 72 hours. It is highly recommended to replace the suction accumulator, if the system contains one. This is because the accumulator oil return orifice or screen may be plugged with debris or may become plugged shortly after a compressor failure. This will result in starvation of oil to the replacement compressor and a second failure. When a compressor is exchanged in the field, it is possible that a major portion of the oil may still be in the system. While this may not affect the reliability of the replacement compressor, the extra oil will add to rotor drag and increase power usage.

- De-energize the refrigeration unit before any intervention.
- Close valves to isolate the unit from the system.
- Recover the refrigerant from the unit and make sure that the compressor is not under pressure.
- Release the compressor mounting parts then lift it to replace with a new compressor.

NOTE: **For more detailed instructions, please refer to the compressor application guidelines.**

1.22 Condenser fins

CAUTION
Acid cleaning! Corrosion of condenser fins! Do not use acidic solutions to clean the coil. After cleaning, the fins should be brushed lightly with a proper fin comb.

Condenser fins become dirty over time as ambient air is induced to the condenser. Dirty coil surfaces result in high condensing temperatures or pressures and poor unit performance. Regular cleaning is recommended, the frequency of doing so being dependent on the installation and the surrounding environment. As a general guide it is advisable to do this at least once every two months.

As a general rule and for a clean environment we recommend the fins be cleaned with liquid detergent diluted with clean water. The OME has a well-designed chassis with falling levels towards a large drainage hole and provided the unit is installed level, any cleaning solution should be able to drain away. A light brush downward (in the direction of the fins) should be done before washing to remove heavy deposits.

1.23 Electrical connections

WARNING
Isolating switch "On"! Danger of electric shock! Turn off the unit isolating switch before undertaking this task!

All refrigeration units will generate some degree of vibration. Copeland OME units are no exception.

Nevertheless, over time, due to these slight vibrations and to temperature fluctuations within the unit housing, electrical terminations might become loose. The components most likely to be affected are the main terminal strip and the compressor contactor. It is suggested to check the main electrical terminations for tightness and to carry out a visual inspection of the low voltage crimped terminals at least once every 6 months.

In all cases when any sheet metal covers (with grounding connection) are removed for maintenance when placed back all grounding connection has to be connected back before unit operation.

1.24 Routine leak testing

All joints within the system should be leak-tested as part of a regular maintenance schedule.

1.25 Condenser fan(s) & motor(s)

A yearly inspection of these items is recommended. Fastenings can become loose, bearings may wear and fans may require cleaning of solid deposits that can cause rotational imbalance. Motors come with lifelong lubrication bearings that do not require lubricating on a routine basis, but just need to be checked for wear.

Certification & approval

- Units are CE marked.
- The piping is in compliance with the Pressure Equipment Directive PED 97/23/EC (Art.3 §3 - Sound Engineering Practice).
  - The components of the refrigeration units carry a CE mark as far as required and thereby establish conformity with the relevant directives.
- Conformity Declarations for components are available as far as required.
- The units are in conformity with the low voltage directive. The applied harmonised standard is EN 60335-2-891 (Safety Household and Similar Electrical Appliance, Part 2: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant refrigeration unit or compressor).
-

Dismantling & disposal

Removing oil and refrigerant:

1. **Do not disperse in the environment.**
2. **Use the correct equipment and method of removal.**
3. **Dispose of oil and refrigerant properly.**
4. **Dispose of unit properly.**

DISCLAIMER

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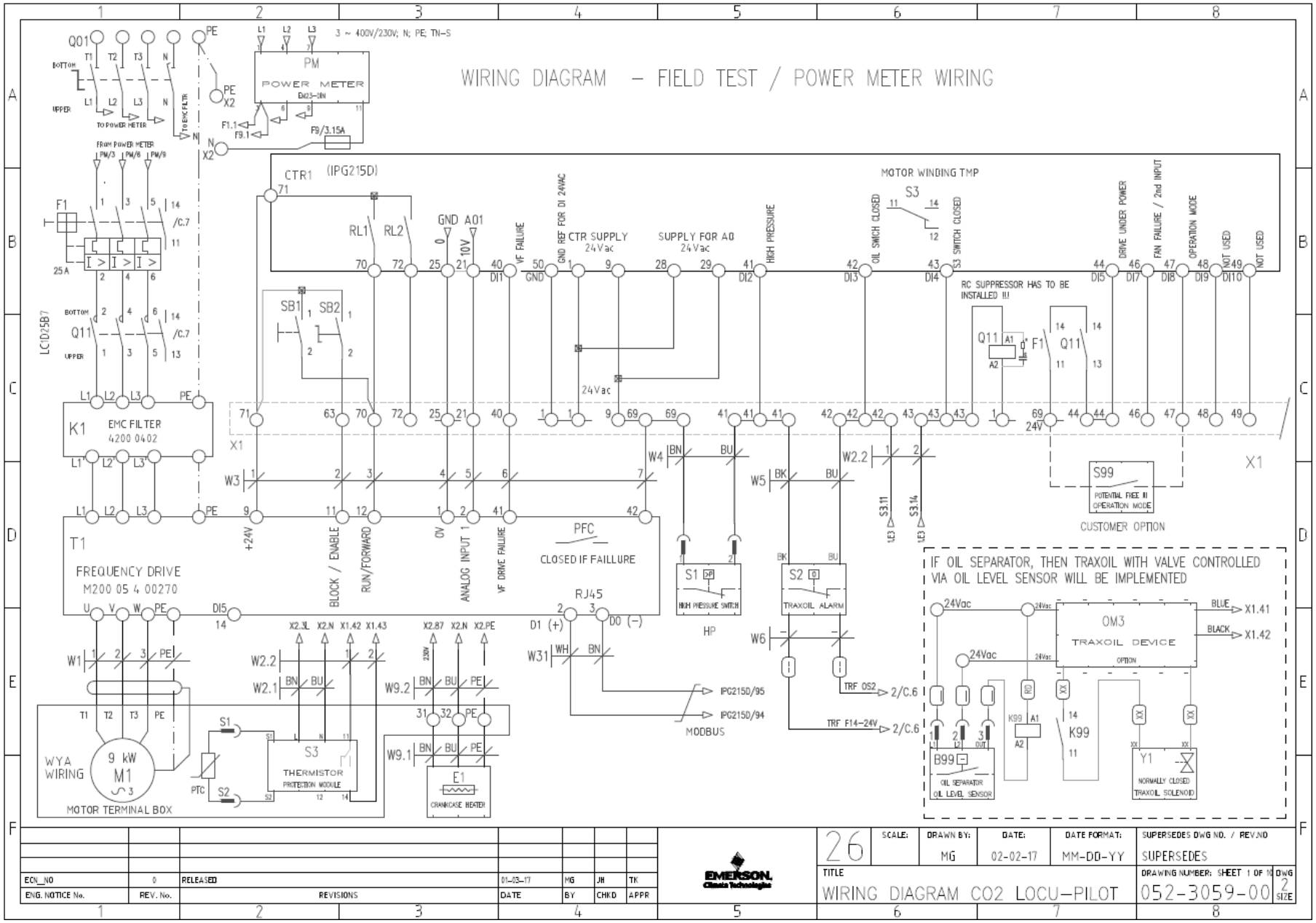
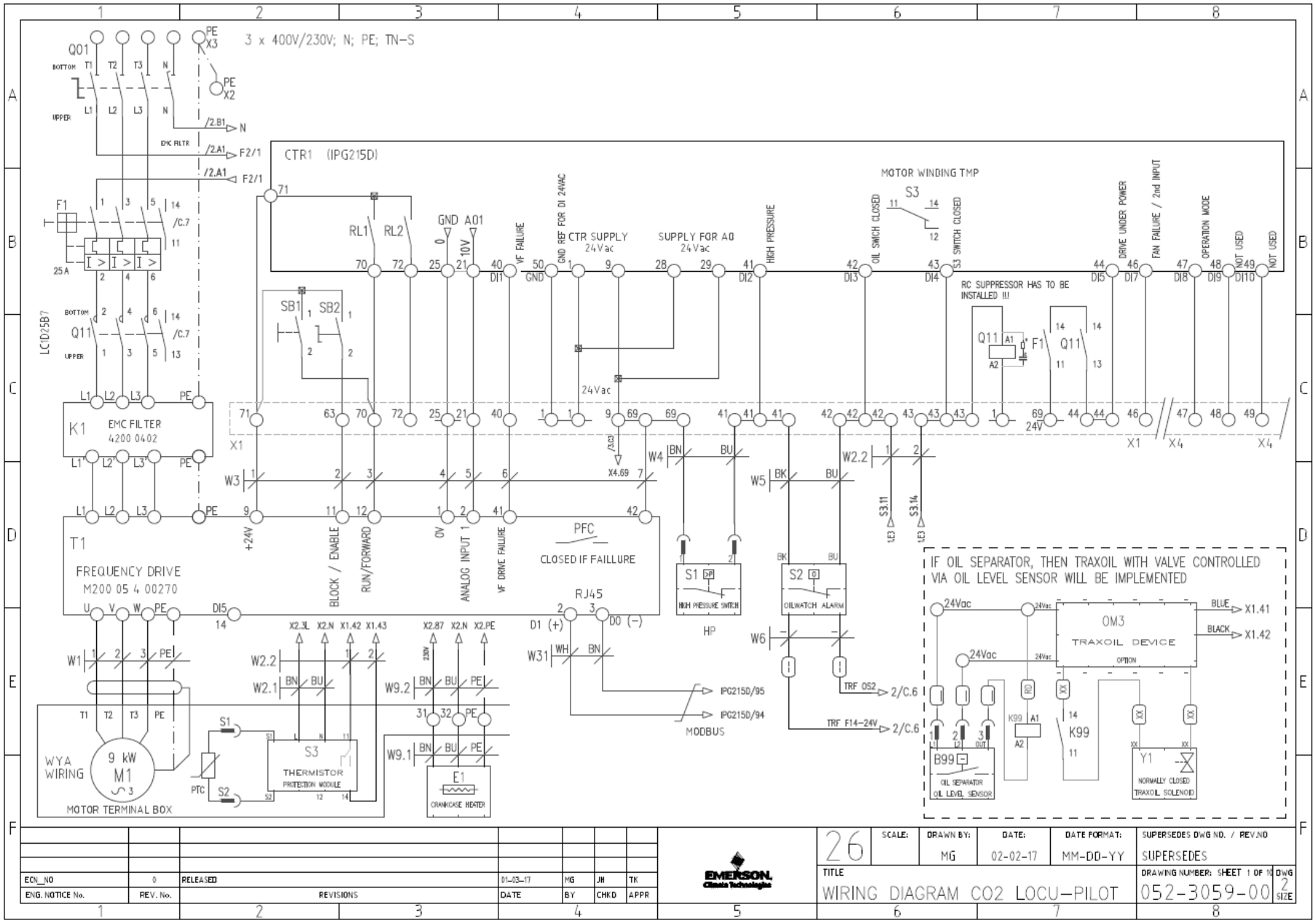
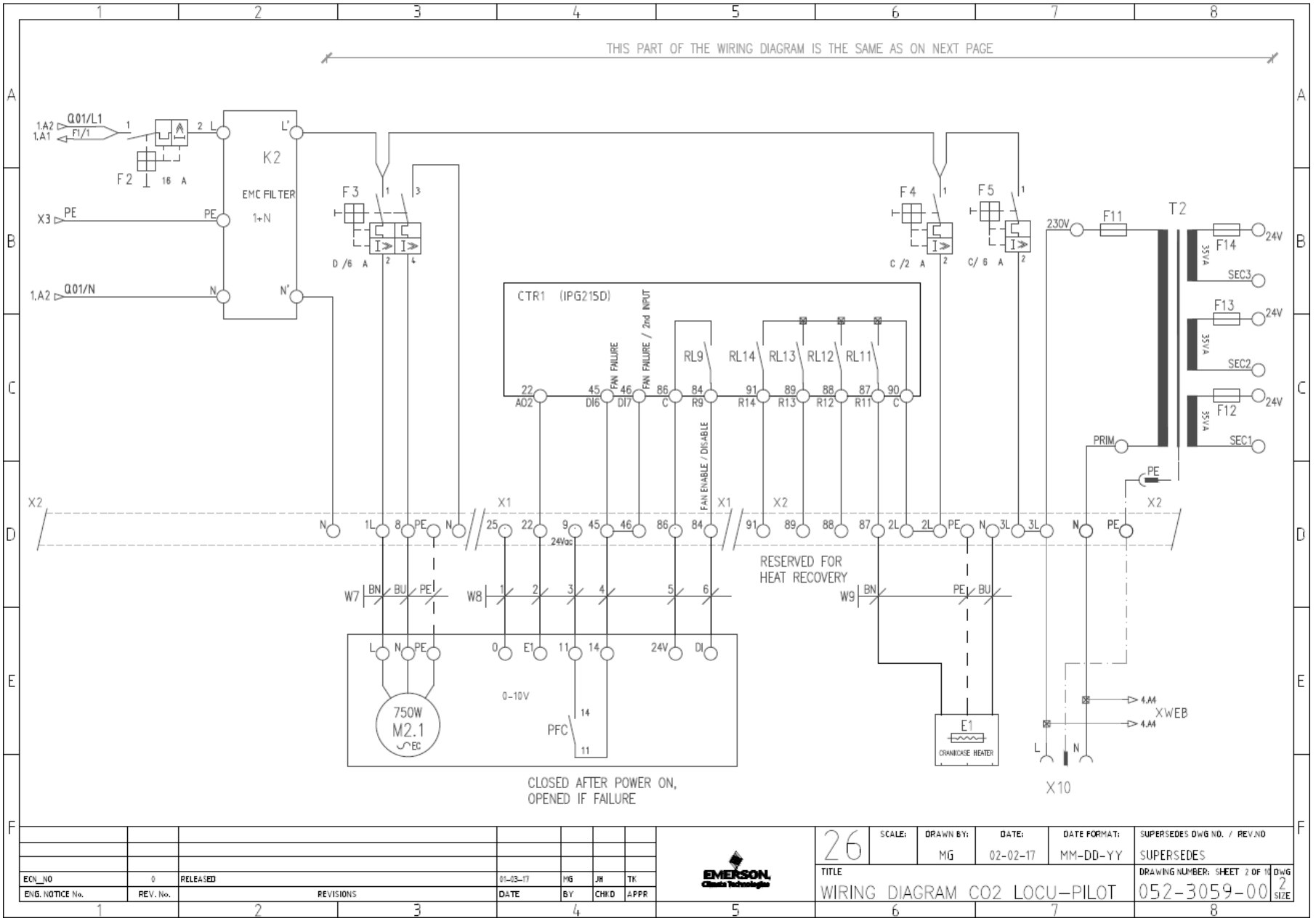
Appendix 1: Wiring diagram – OME-4MTL Refrigeration unit




3 x 400V/230V; N; PE; TN-S
CTR1 (IPG215D)
MOTOR WINDING TMP
RC SUPPRESSOR HAS TO BE INSTALLED !!!
EMC FILTER
4200 0402
FREQUENCY DRIVE
M200 05 4 00270
MOTOR TERMINAL BOX
WYE WIRING
9 kW
THERMISTOR PROTECTION MODULE
CRANKCASE HEATER
HIGH PRESSURE SWITCH
OILWATCH ALARM
CLOSED IF FAILLURE
IF OIL SEPARATOR, THEN TRAXOIL WITH VALVE CONTROLLED VIA OIL LEVEL SENSOR WILL BE IMPLEMENTED
TRAXOIL DEVICE
OIL SEPARATOR OIL LEVEL SENSOR
NORMALLY CLOSED TRAXOIL SOLENOID
MODBUS
WIRING DIAGRAM CO2 LOCU-PILOT
052-3059-00
SUPERSEDES



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ENG. NOTICE No.	REV. No.	REVISIONS	DATE	BY	CHKD	APPR	

EMERSON Climate Technologies

26	SCALE:	DRAWN BY:	DATE:	DATE FORMAT:	SUPERSEDES DWG NO. / REV.NO
		MG	02-02-17	MM-DD-YY	SUPERSEDES

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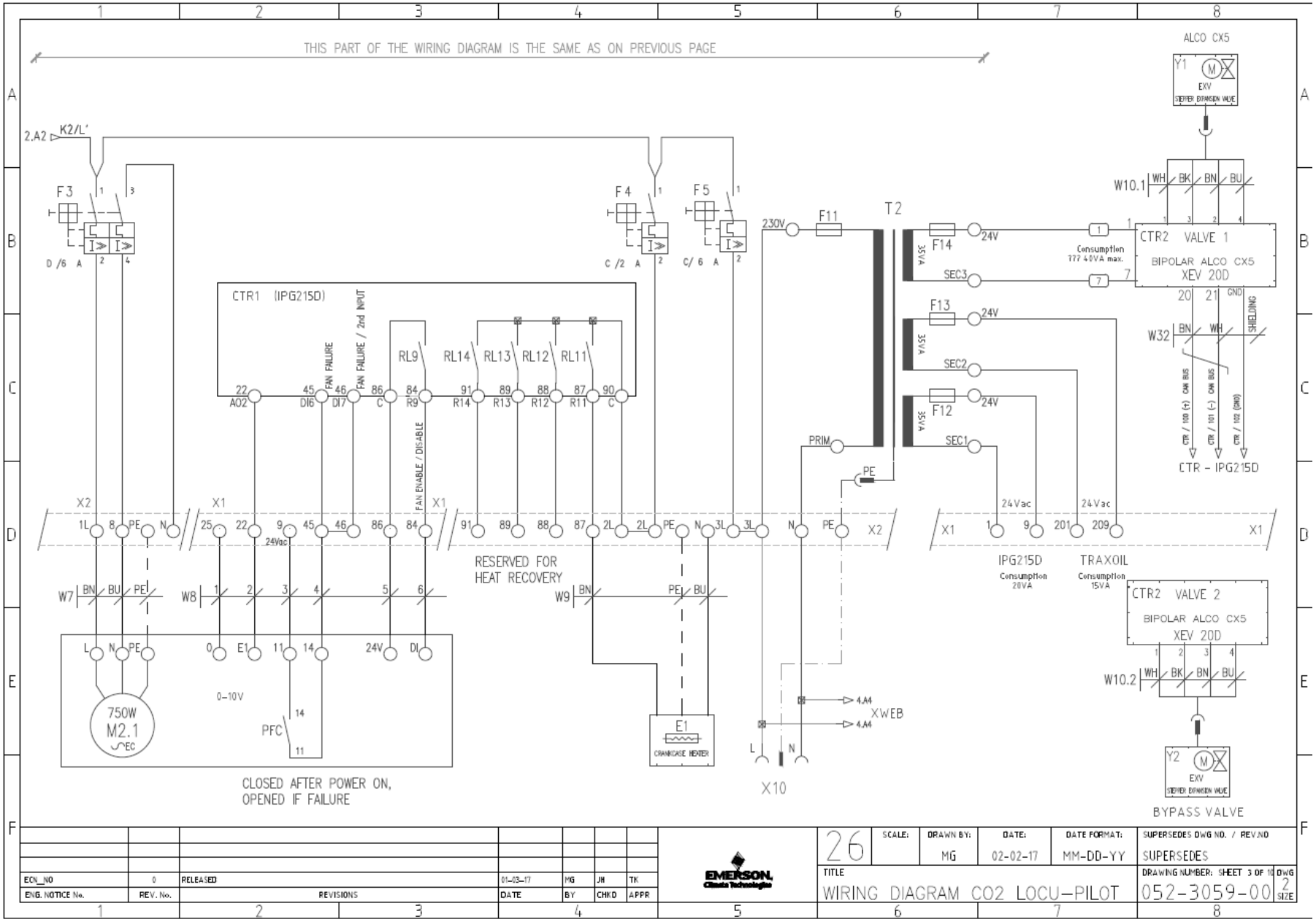
DRAWING NUMBER: 052-3059-00 SHEET 2 OF 10 DWG 2 SIZE


THIS PART OF THE WIRING DIAGRAM IS THE SAME AS ON PREVIOUS PAGE
ALCO CX5
Y1
EXV
STEPPER EXPANSION VALVE
2.A2 K2/L'
F3
D /6 A
F4
C /2 A
F5
C/ 6 A
230V
F11
T2
F14
F13
F12
24V
35VA
SEC3
SEC2
SEC1
Consumption
777 40VA max.
CTR2 VALVE 1
BIPOLAR ALCO CX5
XEV 20D
W10.1
WH
BK
BN
BU
20
21
GND
SHIELDING
W32
CTR - IPG215D
CTR1 (IPG215D)
FAN FAILURE
FAN FAILURE / 2nd INPUT
FAN ENABLE / DISABLE
RL9
RL14
RL13
RL12
RL11
AO2
DI6
DI7
C
R9
R14
R13
R12
R11
PRIM
PE
X2
X1
1L
8
N
25
22
9
45
46
86
84
91
89
88
87
2L
3L
24Vac
RESERVED FOR
HEAT RECOVERY
IPG215D
Consumption
20VA
TRAXOIL
Consumption
15VA
201
209
CTR2 VALVE 2
BIPOLAR ALCO CX5
XEV 20D
W10.2
W7
W8
W9
L
0
E1
11
14
DI
0-10V
PFC
750W
M2.1
EC
E1
CRANKCASE HEATER
4-A4
XWEB
X10
Y2
BYPASS VALVE
CLOSED AFTER POWER ON,
OPENED IF FAILURE
ECN_NO
ENG. NOTICE No.
REV. No.
RELEASED
REVISIONS
01-03-17
DATE
MG
BY
JH
CHKD
TK
APPR
EMERSON
Climate Technologies
26
SCALE:
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MG
DATE:
02-02-17
DATE FORMAT:
MM-DD-YY
SUPERSEDES DWG NO. / REV.NO
SUPERSEDES
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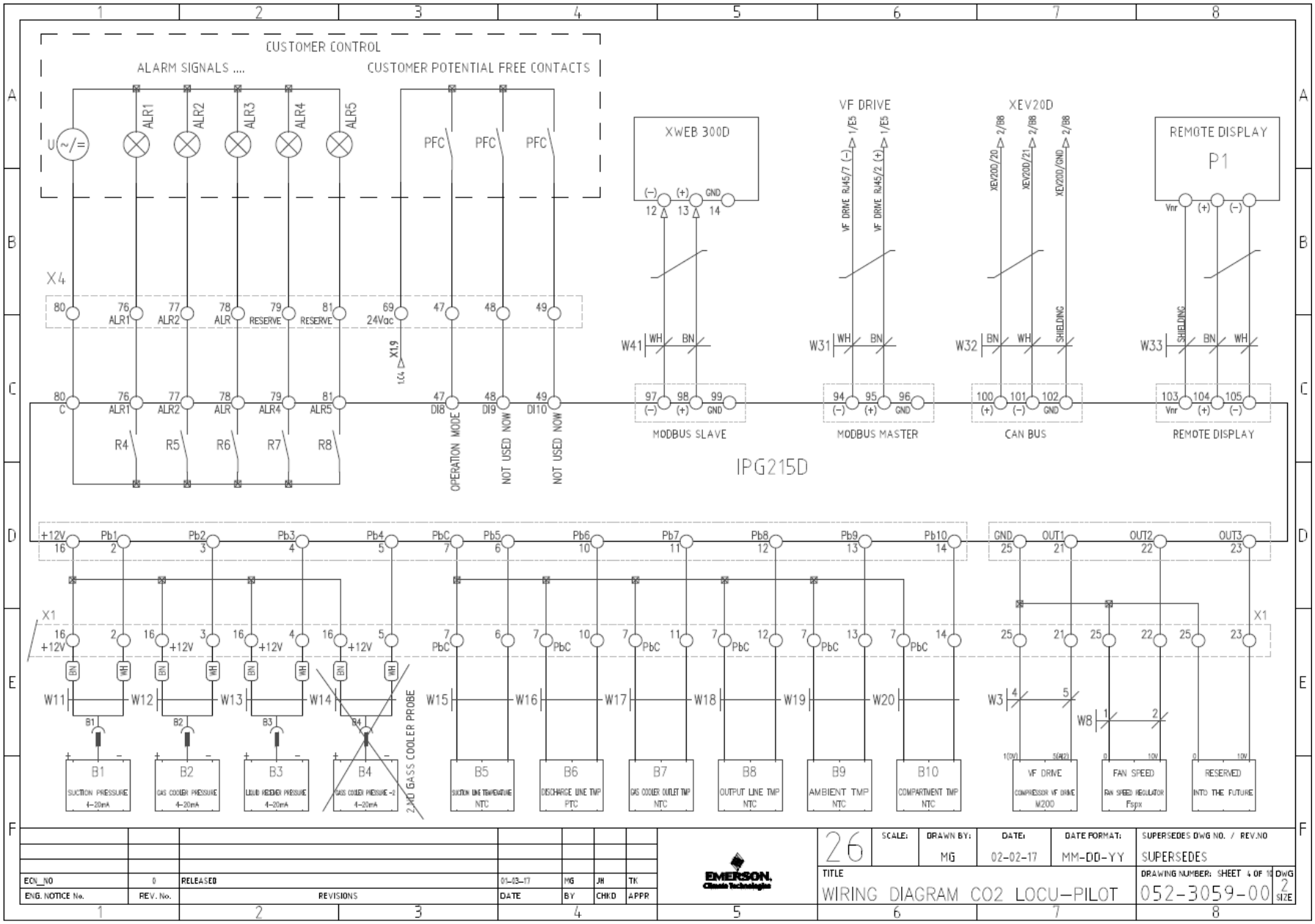
DRAWING NUMBER: SHEET 3 OF 10
052-3059-00
DWG
2
SIZE


CUSTOMER CONTROL
ALARM SIGNALS ....
CUSTOMER POTENTIAL FREE CONTACTS
ALR1
ALR2
ALR3
ALR4
ALR5
PFC
PFC
PFC
XWEB 300D
VF DRIVE
XEV20D
REMOTE DISPLAY
P1
IPG215D
MODBUS SLAVE
MODBUS MASTER
CAN BUS
REMOTE DISPLAY
OPERATION MODE
NOT USED NOW
NOT USED NOW
2-WIRE GLASS COOLER PROBE
B1
SUCTION PRESSURE
4–20mA
B2
GAS COOLER PRESSURE
4–20mA
B3
LIQUID HEATER PRESSURE
4–20mA
B4
GAS COOLER PRESSURE - 2
4–20mA
B5
SUCTION LINE TEMPERATURE
NTC
B6
DISCHARGE LINE TMP
PTC
B7
GAS COOLER OUTLET TMP
NTC
B8
OUTPUT LINE TMP
NTC
B9
AMBIENT TMP
NTC
B10
COMPARTMENT TMP
NTC
VF DRIVE
COMPRESSOR VF DRIVE
M200
FAN SPEED
FAN SPEED REGULATOR
Fspx
RESERVED
INTO THE FUTURE
ECN_NO
ENG. NOTICE No.
REV. No.
RELEASED
REVISIONS
01-03-17
DATE
MG
BY
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CHKD
TK
APPR
EMERSON.
Climate Technologies
26
SCALE:
DRAWN BY:
MG
DATE:
02-02-17
DATE FORMAT:
MM-DD-YY
SUPERSEDES DWG NO. / REV.NO
SUPERSEDES
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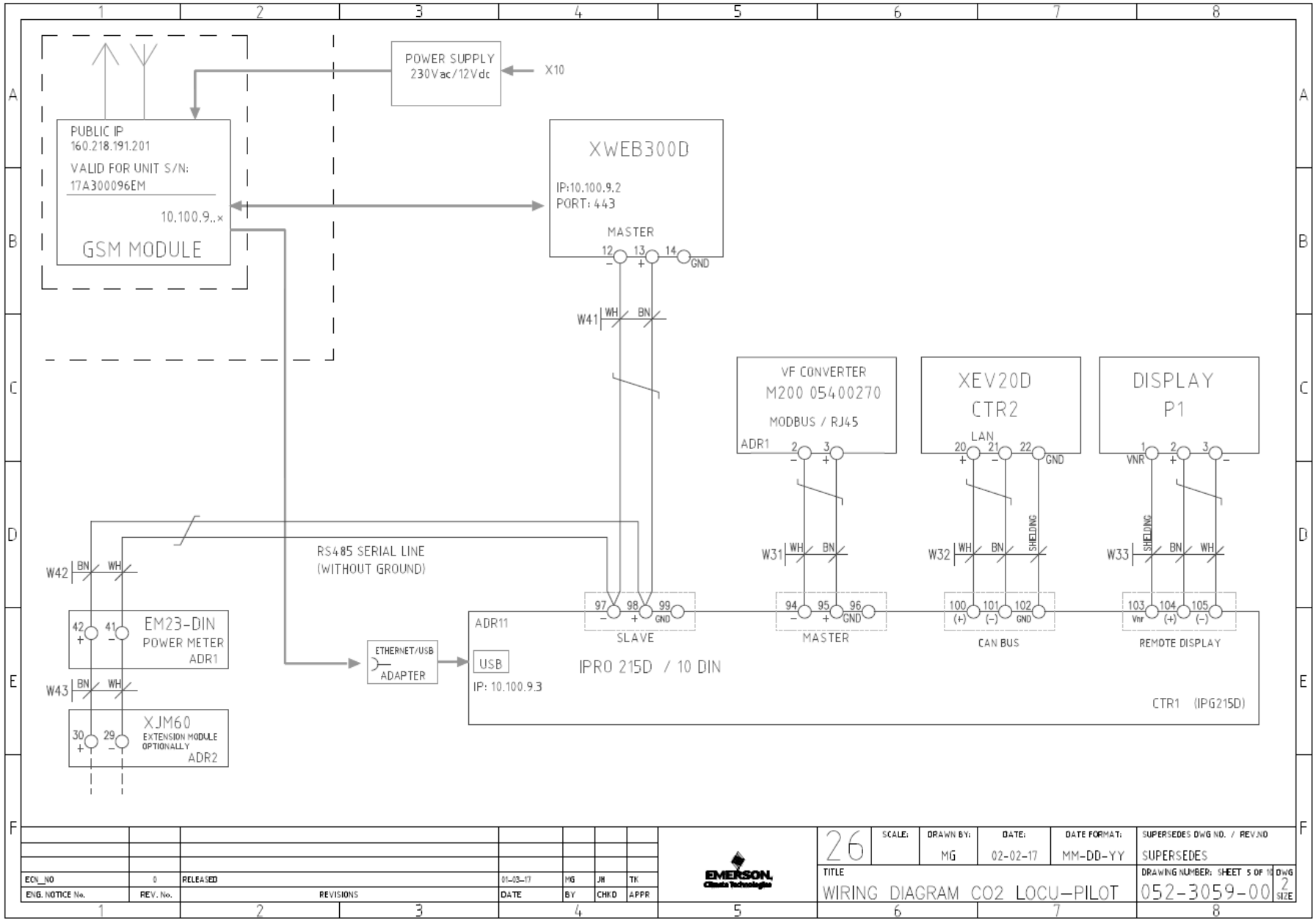
DRAWING NUMBER: SHEET 4 OF 12
052-3059-00
DWG
2
SIZE


POWER SUPPLY
230Vac/12Vdc
X10
PUBLIC IP
160.218.191.201
VALID FOR UNIT S/N:
17A300096EM
10.100.9..x
GSM MODULE
XWEB300D
IP:10.100.9.2
PORT: 443
MASTER
12 13 14 GND
W41 WH BN
VF CONVERTER
M200 05400270
MODBUS / RJ45
ADR1
2 3
W31 WH BN
XEV20D
CTR2
LAN
20 21 22 GND
W32 WH BN SHIELDING
DISPLAY
P1
1 2 3
VNR
SHIELDING
W33 SHIELDING BN WH
RS485 SERIAL LINE
(WITHOUT GROUND)
W42 BN WH
EM23-DIN
POWER METER
ADR1
42 41
W43 BN WH
XJM60
EXTENSION MODULE
OPTIONALLY
ADR2
30 29
ETHERNET/USB
ADAPTER
ADR11
USB
IP: 10.100.9.3
IPRO 215D / 10 DIN
97 98 99 GND
SLAVE
94 95 96 GND
MASTER
100 101 102 GND
(+) (-)
CAN BUS
103 104 105
Vnr (+) (-)
REMOTE DISPLAY
CTR1 (IPG215D)
ECN_NO 0 RELEASED 01-03-17 MG JH TK
ENG. NOTICE No. REV. No. REVISIONS DATE BY CHKD APPR
EMERSON Climate Technologies
26
SCALE:
DRAWN BY: MG
DATE: 02-02-17
DATE FORMAT: MM-DD-YY
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DRAWING NUMBER: SHEET 5 OF 10
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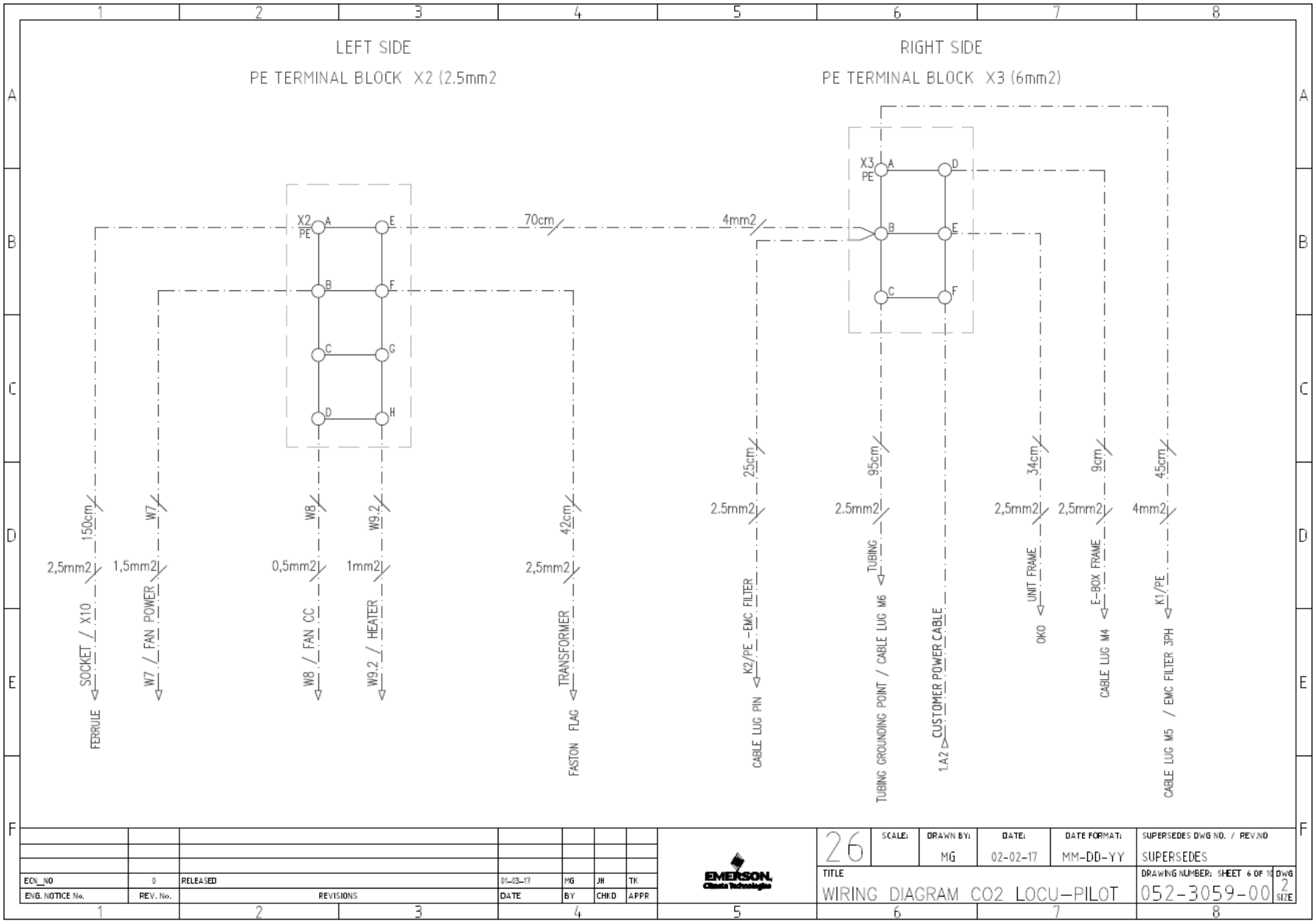
DWG SIZE 2


LEFT SIDE
PE TERMINAL BLOCK X2 (2.5mm2
RIGHT SIDE
PE TERMINAL BLOCK X3 (6mm2)
X2 PE A E B F C G D H
X3 PE A D B E C F
70cm
4mm2
150cm
W7
W8
W9.2
42cm
25cm
95cm
34cm
9cm
45cm
2,5mm2
1,5mm2
0,5mm2
1mm2
2,5mm2
2.5mm2
2.5mm2
2,5mm2
2,5mm2
4mm2
SOCKET / X10
FERRULE
W7 / FAN POWER
W8 / FAN CC
W9.2 / HEATER
TRANSFORMER
FASTON FLAG
K2/PE -EMC FILTER
CABLE LUG PIN
TUBING
TUBING GROUNDING POINT / CABLE LUG M6
1.A2
CUSTOMER POWER CABLE
UNIT FRAME
OKO
E-BOX FRAME
CABLE LUG M4
K1/PE
CABLE LUG M5 / EMC FILTER 3PH
ECN_NO 0 RELEASED 01-03-17 MG JH TK
ENG. NOTICE No. REV. No. REVISIONS DATE BY CHKD APPR
EMERSON Climate Technologies
26
SCALE:
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DWG SIZE 2

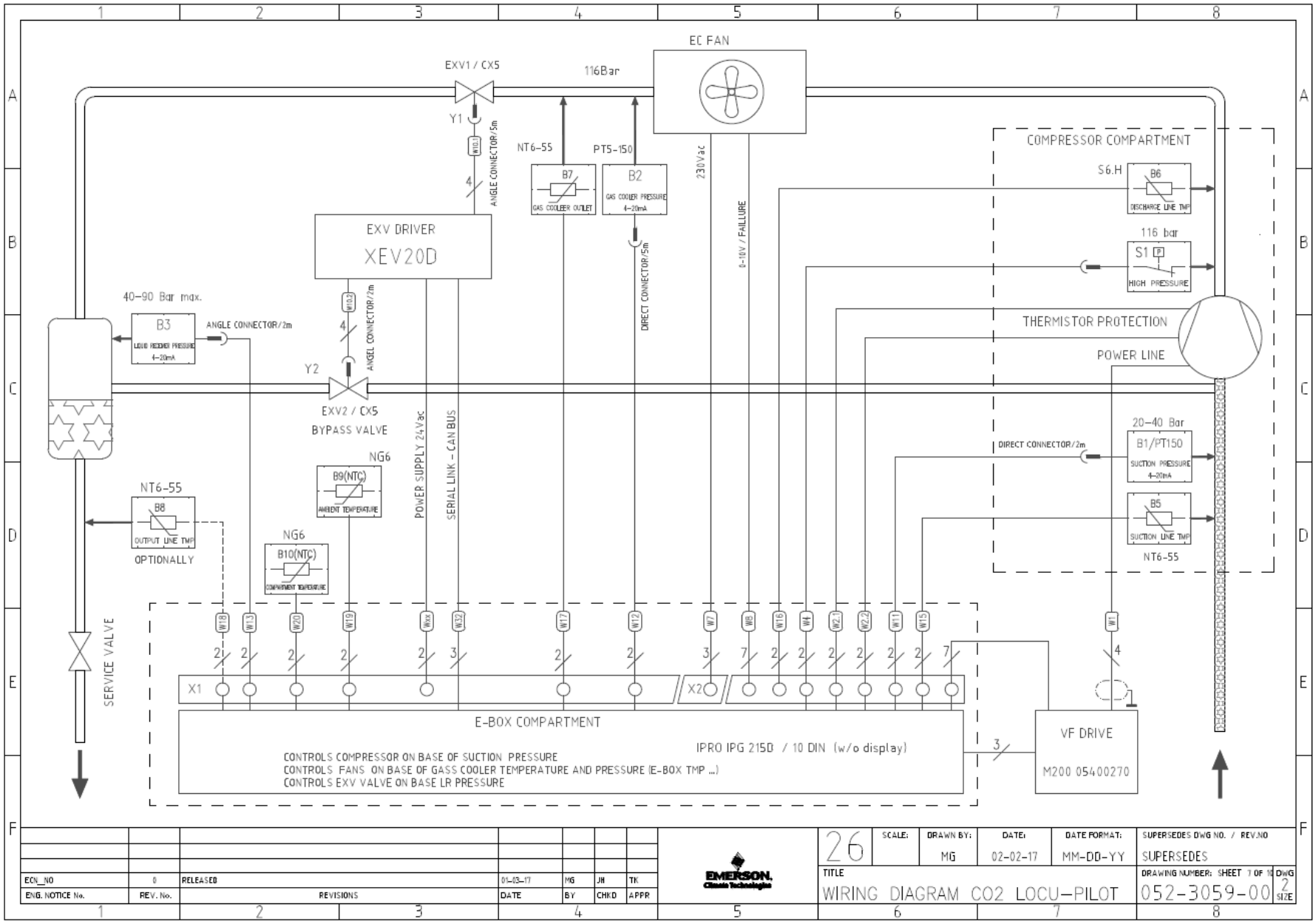

Figure 37: Wiring diagram

Appendix 2: Parameter list iPRO215D

Group	Label	Description	Factory
SET POINT	SETC1	Compressor set point circuit 1	26.50
SET POINT	SETF1	Fan set point circuit 1	40.00
RACK CONFIGURATION	CF1	Kind of compressors	Spo
RACK CONFIGURATION	CF16	Kind of gas circuit 1	r744
REGULATION	CF18	Regulation for compressor circuit 1	dB
REGULATION	CF20_1	Fan SET POINT management in Performance Mode (Mode 1)	Std
REGULATION	CF20_2	Fan SET POINT management in Efficiency Mode (Mode 2)	Std
REGULATION	CF20_3	Fan SET POINT management in Sound Mode (Mode 3)	Std
REGULATION	CF20_4	Fan SET POINT management in Manual Mode (Mode 4)	Std
REGULATION	CF20_5	Fan SET POINT management in Mode Pre-set 5	Std
REGULATION	CF20_6	Fan SET POINT management in Mode Pre-set 6	Std
REGULATION	CF20_7	Fan SET POINT management in Mode Pre-set 7	Std
REGULATION	CF20_8	Fan SET POINT management in Mode Pre-set 8	Std
REGULATION	CF21_1	Fan Regulation Band Optimization with frequency compressor in Performance Mode (Mode 1)	Std
REGULATION	CF21_2	Fan Regulation Band Optimization with frequency compressor in Efficiency Mode (Mode 2)	Std
REGULATION	CF21_3	Fan Regulation Band Optimization with frequency compressor in Sound Mode (Mode 3)	Std
REGULATION	CF21_4	Fan Regulation Band Optimization with frequency compressor in Manual Mode (Mode 4)	Std
REGULATION	CF21_5	Fan Regulation Band Optimization with frequency compressor in Mode Pre-set 5	Std
REGULATION	CF21_6	Fan Regulation Band Optimization with frequency compressor in Mode Pre-set 6	Std
REGULATION	CF21_7	Fan Regulation Band Optimization with frequency compressor in Mode Pre-set 7	Std
REGULATION	CF21_8	Fan Regulation Band Optimization with frequency compressor in Mode Pre-set 8	Std
REGULATION	CF22	Compressor rotation circuit 1	yES
REGULATION	CF24	Fan rotation circuit 1	no
VISUALIZATION	CF26	Displaying measurement unit	bar/°C
VISUALIZATION	CF27	Pressure display (rel/abs)	AbS
ANALOG INPUTS	AI1	Probe 1 adjustment	0.00
ANALOG INPUTS	AI2	Probe 2 adjustment	0.00
ANALOG INPUTS	AI3	Probe 3 adjustment	0.00
ANALOG INPUTS	AI4	Probe 4 adjustment	0.00
ANALOG INPUTS	AI5	Probe 5 adjustment	0.0
ANALOG INPUTS	AI6	Probe 6 adjustment	0.0
ANALOG INPUTS	AI7	Probe 7 adjustment	2.0
ANALOG INPUTS	AI8	Probe 8 adjustment	0.0
ANALOG INPUTS	AI9	Probe 9 adjustment	0.0
ANALOG INPUTS	AI10	Probe 10 adjustment	0.0
ANALOG INPUTS	AI11	Alarm relay for faulty probe	ALr
ANALOG INPUTS	AI12	Probe 1 value at 4mA/0V/1V	1.00
ANALOG INPUTS	AI13	Probe 1 value at 20mA/5V/5V	151.00
ANALOG INPUTS	AI14	Probe 2 value at 4mA/0V/1V	1.00
ANALOG INPUTS	AI15	Probe 2 value at 20mA/5V/5V	151.00
ANALOG INPUTS	AI16	Probe 3 value at 4mA/0V/1V	1.00
ANALOG INPUTS	AI17	Probe 3 value at 20mA/5V/5V	151.00
ANALOG INPUTS	AI18	Probe 4 value at 4mA/0V/1V	1.00
ANALOG INPUTS	AI19	Probe 4 value at 20mA/5V/5V	151.00
ANALOG INPUTS	AI20	Probe 5 value at 4mA/0V/1V	1.00
ANALOG INPUTS	AI21	Probe 5 value at 20mA/5V/5V	151.00
ANALOG INPUTS	AI22	Probe 6 value at 4mA/0V/1V	1.00
ANALOG INPUTS	AI23	Probe 6 value at 20mA/5V/5V	50.00
ANALOG INPUTS	AI24	Probe 7 value at 4mA/0V/1V	0.00
ANALOG INPUTS	AI25	Probe 7 value at 20mA/5V/5V	50.00
ANALOG INPUTS	AI26	Probe 8 value at 4mA/0V/1V	0.00
ANALOG INPUTS	AI27	Probe 8 value at 20mA/5V/5V	150.00
ANALOG INPUTS	AI28	Probe 9 value at 4mA/0V/1V	0.00
ANALOG INPUTS	AI29	Probe 9 value at 20mA/5V/5V	150.00
ANALOG INPUTS	AI30	Probe 10 value at 4mA/0V/1V	0.00
ANALOG INPUTS	AI31	Probe 10 value at 20mA/5V/5V	150.00
SAFETY DIGITAL INPUTS	SDI1	Manual restart for compressor alarms	no
SAFETY DIGITAL INPUTS	SDI2	Manual restart for fan alarms	no
SAFETY DIGITAL INPUTS	SDI3	Alarm relay for compressor or fan alarms	ALr
DIGITAL INPUTS	CDI1	Liquid level digital input 1 delay	20
DIGITAL INPUTS	CDI3	Liquid level digital input 1 alarm relay	ALr
COMPRESSORS REGULATION	RC1	Regulation band width compressors 1	6.00
COMPRESSORS REGULATION	RC2	Minimum set point compressors circuit 1	20.00
COMPRESSORS REGULATION	RC3	Maximum set point compressors circuit 1	40.00
COMPRESSORS REGULATION	RC4	Energy saving compressors circuit 1	0.00
FANS REGULATION	RC9	Regulation band width fans circuit 1	10.00
FANS REGULATION	RC10	Minimum set point fans circuit 1	40.00

Appendix 3: Parameter list iPro

Group	Label	Description	Factory
FANS REGULATION	RC11	Maximum set point fans circuit 1	100.00
FANS REGULATION	RC12	Energy saving fans circuit 1	0.00
FANS REGULATION	RC33	Fan heat reclaim value - Circuit 1	0.00
COMPRESSORS REGULATION	RC35	Band offset - Circuit 1	0.00
COMPRESSORS REGULATION	RC36	Integral sampling time - Circuit 1	0
COMPRESSORS REGULATION	RC37	Derivative sampling time - Circuit 1	0
COMPRESSORS REGULATION	RC38	Derivative time - Circuit 1	0
FANS REGULATION	RC43	Variable Speed Fan Driver Circuit 1	Analog output
COMPRESSORS REGULATION	RC45	Proportional band-Circuit 1	0.00
FAN SETTING FOR MAX COP	RC56	Suction temperature/pressure start scale for Max COP	20.00
FAN SETTING FOR MAX COP	RC57	Suction temperature/pressure end scale for Max COP	20.00
FAN SETTING FOR MAX COP	RC58	Fan set point value at RC56 suction temperature/pressure for Max COP algorithm	40.00
FAN SETTING FOR MAX COP	RC59	Fan set point value at RC57 suction temperature/pressure for Max COP algorithm	40.00
FAN SETTING FOR MAX COP	RC60	Fan set point update period	15
FAN SETTING FOR MAX COP	RC61	Max Fan set point variation every RC60 seconds	5.00
FAN REGULATION BAND OPTI. WITH FREQ. COMP	RC62	Start Value of the analog output or frequency compressor for band optimization	25
FAN REGULATION BAND OPTI. WITH FREQ. COMP	RC63	Second value of the analog output or frequency compressor for band optimization	50
FAN REGULATION BAND OPTI. WITH FREQ. COMP	RC64	Third value of the analog output or frequency compressor for band optimization	88
FAN REGULATION BAND OPTI. WITH FREQ. COMP	RC65	Width of fan regulation band at RC62	40.00
FAN REGULATION BAND OPTI. WITH FREQ. COMP	RC66	Width of fan regulation band at RC63	20.00
FAN REGULATION BAND OPTI. WITH FREQ. COMP	RC67	Width of fan regulation band at RC64	1.00
FAN REGULATION BAND OPTI. WITH FREQ. COMP	RC68	Band update period	15
FAN REGULATION BAND OPTI. WITH FREQ. COMP	RC69	Max band variation every RC68 seconds	5.00
OPERATING MODE SCHEDULING	OMS1	Alternative operating mode start on Monday	10:00
OPERATING MODE SCHEDULING	OMS2	Alternative operating mode duration on Monday	10:00
OPERATING MODE SCHEDULING	OMS3	Alternative operating mode of Monday	Mode1
OPERATING MODE SCHEDULING	OMS4	Alternative operating mode start on Tuesday	0:00
OPERATING MODE SCHEDULING	OMS5	Alternative operating mode duration on Tuesday	0:00
OPERATING MODE SCHEDULING	OMS6	Alternative operating mode of Tuesday	Mode1
OPERATING MODE SCHEDULING	OMS7	Alternative operating mode start on Wednesday	11:30
OPERATING MODE SCHEDULING	OMS8	Alternative operating mode duration on Wednesday	0:10
OPERATING MODE SCHEDULING	OMS9	Alternative operating mode of Wednesday	Mode3
OPERATING MODE SCHEDULING	OMS10	Alternative operating mode start on Thursday	0:00
OPERATING MODE SCHEDULING	OMS11	Alternative operating mode duration on Thursday	0:00
OPERATING MODE SCHEDULING	OMS12	Alternative operating mode of Thursday	Mode1
OPERATING MODE SCHEDULING	OMS13	Alternative operating mode start on Friday	0:00
OPERATING MODE SCHEDULING	OMS14	Alternative operating mode duration on Friday	0:00
OPERATING MODE SCHEDULING	OMS15	Alternative operating mode of Friday	Mode1
OPERATING MODE SCHEDULING	OMS16	Alternative operating mode start on Saturday	0:00
OPERATING MODE SCHEDULING	OMS17	Alternative operating mode duration on Saturday	0:00
OPERATING MODE SCHEDULING	OMS18	Alternative operating mode of Saturday	Mode1
OPERATING MODE SCHEDULING	OMS19	Alternative operating mode start on Sunday	0:00
OPERATING MODE SCHEDULING	OMS20	Alternative operating mode duration on Sunday	0:00
OPERATING MODE SCHEDULING	OMS21	Alternative operating mode of Sunday	Mode1

Group	Label	Description	Factory
COMPRESSORS SAFETY	SL1	2 start compressor delay	0
COMPRESSORS SAFETY	SL2	Minimum time load off	1
COMPRESSORS SAFETY	SL3	2 different load start delay	15
COMPRESSORS SAFETY	SL4	2 different load off delay	15
COMPRESSORS SAFETY	SL5	Minimum time load on	10
COMPRESSORS SAFETY	SL6	Maximum time load on (0=nu)	0
COMPRESSORS SAFETY	SL7	Min time Frq1-2 off after CP14	0
COMPRESSORS SAFETY	SL8	SL3 enabled also at first on exiting from neutral zone	no
COMPRESSORS SAFETY	SL9	SL4 enabled also at first off exiting from neutral zone	no
COMPRESSORS SAFETY	SL10	Output delay at power on	20
FANS SAFETY	SL12	2 different fan start delay	5
FANS SAFETY	SL13	2 different fan off delay	10
COMPRESSORS SAFETY	SL14	Compressor Cycle limit	1000
COMPRESSORS SAFETY	SL15	Compressor start delay after fan start	9
FANS SAFETY	SL16	Fan operating mode	Comp
ALARMS CONFIGURATION	AC1	Compressors alarms configuration	ABS
ALARMS CONFIGURATION	AC2	Fans alarms configuration	ABS
COMPRESSORS ALARMS	AL1	Suction Probe 1 alarm delay at power on	2
COMPRESSORS ALARMS	AL3	Minimum temp/press circuit 1 compressors alarms	10.00
COMPRESSORS ALARMS	AL4	Maximum temp/press circuit 1 compressors alarms	60.00
COMPRESSORS ALARMS	AL5	Temp/press alarm delay circuit 1 compressors alarms	0
COMPRESSORS ALARMS	AL9	Relay for temp/press compressors alarms	ALr
COMPRESSORS ALARMS	AL10	Running hours for compressor maintenance alarm (0= not used)	0
COMPRESSORS ALARMS	AL11	Relay for maintenance alarm	nu
COMPRESSORS ALARMS	AL12	LP switch 1 activation number	3
COMPRESSORS ALARMS	AL13	LP switch 1 activation time	60
COMPRESSORS ALARMS	AL14	Compressors on with faulty probe 1	0
COMPRESSORS ALARMS	AL15	Capacity engaged with faulty probe 1	0
COMPRESSORS ALARMS	AL20	Electronic pressure switch 1 enable	yES
COMPRESSORS ALARMS	AL21	Electronic pressure switch 1 threshold	22.00
FANS ALARMS	AL24	Minimum temp/press circuit 1 fans alarms	15.00
FANS ALARMS	AL25	Maximum temp/press circuit 1 fans alarms	111.00
FANS ALARMS	AL26	Temp/press alarm delay circuit 1 fans alarms	0
FANS ALARMS	AL27	Compressor off with fans circuit 1 maximum temp/pres alarm	yES
FANS ALARMS	AL28	Compressor off delay with fans circuit 1 maximum temp/pres alarm	5
FANS ALARMS	AL29	HP switch 1 activation number	3
FANS ALARMS	AL30	HP switch 1 activation time	20
FANS ALARMS	AL31	Fans circuit 1 ON with faulty probe	1
FANS ALARMS	AL40	Relay for fans temp/press alarm	ALr
SUCTION DYNAMIC SET POINT	DSP1	Dynamic set enabled compressors circuit 1	no
SUCTION DYNAMIC SET POINT	DSP2	Maximum set for compressors circuit 1	33.00
SUCTION DYNAMIC SET POINT	DSP3	Dynamic set start temperature compressors circuit 1	15.0
SUCTION DYNAMIC SET POINT	DSP4	Dynamic set stop temperature compressors circuit 1	15.0
CONDENSING DYNAMIC SET POINT	DSP9_1	Dynamic set enabled for condenser- Circuit 1 in Performance Mode (Mode 1)	no
CONDENSING DYNAMIC SET POINT	DSP9_2	Dynamic set enabled for condenser- Circuit 1 in Efficiency Mode (Mode 2)	no
CONDENSING DYNAMIC SET POINT	DSP9_3	Dynamic set enabled for condenser- Circuit 1 in Sound Mode (Mode 3)	no
CONDENSING DYNAMIC SET POINT	DSP9_4	Dynamic set enabled for condenser- Circuit 1 in Manual Mode(Mode 4)	no
CONDENSING DYNAMIC SET POINT	DSP9_5	Dynamic set enabled for condenser- Circuit 1 in Mode Pre-set 5	no
CONDENSING DYNAMIC SET POINT	DSP9_6	Dynamic set enabled for condenser- Circuit 1 in Mode Pre-set 6	no
CONDENSING DYNAMIC SET POINT	DSP9_7	Dynamic set enabled for condenser- Circuit 1 in Mode Pre-set 7	no
CONDENSING DYNAMIC SET POINT	DSP9_8	Dynamic set enabled for condenser- Circuit 1 in Mode Pre-set 8	no
CONDENSING DYNAMIC SET POINT	DSP10	Minimum set fans circuit 1	40.00
CONDENSING DYNAMIC SET POINT	DSP11	Differential dynamic set fans circuit 1	5.0
AUXILIARY OUTPUTS	AR1	Set point aux relay 1	20.0
AUXILIARY OUTPUTS	AR2	Differential for aux relay 1	3.0
AUXILIARY OUTPUTS	AR3	Kind of action for aux 1	Ht
AUXILIARY OUTPUTS	AR4	Set point aux relay 2	1.0
AUXILIARY OUTPUTS	AR5	Differential for aux relay 2	1.0
AUXILIARY OUTPUTS	AR6	Kind of action for aux 2	CL
AUXILIARY OUTPUTS	AR7	Set point aux relay 3	1.0
AUXILIARY OUTPUTS	AR8	Differential for aux relay 3	1.0
AUXILIARY OUTPUTS	AR9	Kind of action for aux 3	CL
AUXILIARY OUTPUTS	AR10	Set point aux relay 4	1.0
AUXILIARY OUTPUTS	AR11	Differential for aux relay 4	1.0

Appendix 3: Parameter list iPro

Group	Label	Description	Factory
AUXILIARY OUTPUTS	AR12	Kind of action for aux 4	CL
AUXILIARY OUTPUTS	AR13	Set point for auxiliary relay 5	0.0
AUXILIARY OUTPUTS	AR14	Differential for aux relay 5	0.1
AUXILIARY OUTPUTS	AR15	Kind of action for aux 5	CL
AUXILIARY OUTPUTS	AR16	Set point for auxiliary relay 6	0.0
AUXILIARY OUTPUTS	AR17	Differential for aux relay 6	0.1
AUXILIARY OUTPUTS	AR18	Kind of action for aux 6	CL
SUPERHEAT	ASH1	Superheat 1 pre-alarm differential	5.0
SUPERHEAT	ASH2	Superheat 1 alarm threshold	5.0
SUPERHEAT	ASH3	Superheat 1 pre-alarm delay	5
SUPERHEAT	ASH4	Compressors off with superheat 1 alarm	no
SUPERHEAT	ASH5	Regulation restart differential after superheat 1 alarm	5.0
SUPERHEAT	ASH6	Regulation restart delay after superheat 1 > ASH2+ASH5	0
SUPERHEAT	ASH7	Superheat value 1 at which to enable valve 1 for injecting hot gas (hot action)	15.0
SUPERHEAT	ASH8	Differential for ASH7	5.0
SUPERHEAT	ASH16	Alarm relay selection for superheat 1 alarm	ALr
OTHER	OT1	Alarm relay off by keyboard	no
OTHER	OT2	Alarm relay 1 off by keyboard	no
OTHER	OT3	Alarm relay 2 off by keyboard	no
OTHER	OT4	Serial address	11
OTHER	OT5	Off function enabling	yES
OTHER	OT6	Modulating compressors management	Managed by 0-10V
ANALOG OUTPUT 1	AO1_1	Probe for analog output 1	Pb1
ANALOG OUTPUT 1	AO1_2	Lower limit for analog output 1	0.00
ANALOG OUTPUT 1	AO1_3	Upper limit for analog output 1	10.00
ANALOG OUTPUT 1	AO1_4	Minimum value for analog output 1	0
ANALOG OUTPUT 1	AO1_5	Analog output 1 value after load start	100
ANALOG OUTPUT 1	AO1_6	Analog output 1 value after load off	0
ANALOG OUTPUT 1	AO1_7	Exclusion band start value 1	50
ANALOG OUTPUT 1	AO1_8	Exclusion band end value 1	50
ANALOG OUTPUT 1	AO1_9	Safety value for Analog output 1	55
ANALOG OUTPUT 1	AO1_10	Delay between the entrance in the regulation band and the regulation activation	5
ANALOG OUTPUT 1	AO1_11	Analog output 1 rise time from minimum value to maximum	60
ANALOG OUTPUT 1	AO1_12	Analog output 1 permanency before load activation	2
ANALOG OUTPUT 1	AO1_13	Max value for analogue Output 1	100
ANALOG OUTPUT 1	AO1_14	Analog output 1 decreasing time after load off	0
ANALOG OUTPUT 1	AO1_15	Analog output 1 permanency before load off	3
ANALOG OUTPUT 1	AO1_16	Analog output 1 decreasing time from maximum before load on	20
ANALOG OUTPUT 1	AO1_17	Regulation band width 1	3.00
ANALOG OUTPUT 1	AO1_18	Integral time 1	300
ANALOG OUTPUT 1	AO1_19	Band offset 1	0.00
ANALOG OUTPUT 1	AO1_20	Integral action limitation (Not used)	0.00
ANALOG OUTPUT 1	AO1_21	Maximum value of A.O.1 during silent mode	100
ANALOG OUTPUT 1	AO1_22	Minimum capacity of inverter 1	0
ANALOG OUTPUT 1	AO1_23	Maximum time at minimum capacity of inverter 1	120
ANALOG OUTPUT 1	AO1_24	Time of inverter functioning at maximum to restore the right lubrication	2
ANALOG OUTPUT 2	AO2_1	Probe for analog output 2	Pb2
ANALOG OUTPUT 2	AO2_2	Lower limit for analog output 2	30.00
ANALOG OUTPUT 2	AO2_3	Upper limit for analog output 2	70.00
SELECTION OF AO2_4	AO2_4	AO2_4_1~AO2_4_8, the final value used in mode selection	25
ANALOG OUTPUT 2	AO2_4_1	Minimum value for analogue Output 2 in Performance Mode (Mode 1)	25
ANALOG OUTPUT 2	AO2_4_2	Minimum value for analogue Output 2 in Efficiency Mode (Mode 2)	25
ANALOG OUTPUT 2	AO2_4_3	Minimum value for analogue Output 2 in Sound Mode (Mode 3)	25
ANALOG OUTPUT 2	AO2_4_4	Minimum value for analogue Output 2 in Manual Mode(Mode 4)	25
ANALOG OUTPUT 2	AO2_4_5	Minimum value for analogue Output 2 in Mode Pre-set 5	25
ANALOG OUTPUT 2	AO2_4_6	Minimum value for analogue Output 2 in Mode Pre-set 6	25
ANALOG OUTPUT 2	AO2_4_7	Minimum value for analogue Output 2 in Mode Pre-set 7	25
ANALOG OUTPUT 2	AO2_4_8	Minimum value for analogue Output 2 in Mode Pre-set 8	25
ANALOG OUTPUT 2	AO2_5	Analog output 2 value after load start	50
ANALOG OUTPUT 2	AO2_6	Analog output 2 value after load off	50
ANALOG OUTPUT 2	AO2_7	Exclusion band start value 2	50
ANALOG OUTPUT 2	AO2_8	Exclusion band end value 2	50
ANALOG OUTPUT 2	AO2_9	Safety value for Analog output 2	0
ANALOG OUTPUT 2	AO2_10	Delay between the entrance in the regulation band and the regulation activation	0

Group	Label	Description	Factory
ANALOG OUTPUT 2	AO2_11	Analog output 2 rise time from minimum value to maximum	40
ANALOG OUTPUT 2	AO2_12	Analog output 2 permanency before load activation	0
SELECTION OF AO2_13	AO2_13	AO2_13_1~AO2_13_8, the final value used in mode selection	50
ANALOG OUTPUT 2	AO2_13_1	Max value for analogue Output 2 in Performance Mode (Mode 1)	50
ANALOG OUTPUT 2	AO2_13_2	Max value for analogue Output 2 in Efficiency Mode (Mode 2)	50
ANALOG OUTPUT 2	AO2_13_3	Max value for analogue Output 2 in Sound Mode (Mode 3)	50
ANALOG OUTPUT 2	AO2_13_4	Max value for analogue Output 2 in Manual Mode(Mode 4)	50
ANALOG OUTPUT 2	AO2_13_5	Max value for analogue Output 2 in Mode Pre-set 5	50
ANALOG OUTPUT 2	AO2_13_6	Max value for analogue Output 2 in Mode Pre-set 6	50
ANALOG OUTPUT 2	AO2_13_7	Max value for analogue Output 2 in Mode Pre-set 7	50
ANALOG OUTPUT 2	AO2_13_8	Max value for analogue Output 2 in Mode Pre-set 8	50
ANALOG OUTPUT 2	AO2_14	Analog output 2 decreasing time after load off	10
ANALOG OUTPUT 2	AO2_15	Analog output 2 permanency before load off	30
ANALOG OUTPUT 2	AO2_16	Analog output 2 decreasing time from maximum before load on	0
ANALOG OUTPUT 2	AO2_17	Regulation band width 2	10.00
ANALOG OUTPUT 2	AO2_18	Integral time 2	120
ANALOG OUTPUT 2	AO2_19	Band offset 2	0.00
ANALOG OUTPUT 2	AO2_20	Integral action limitation (Not used)	0.60
ANALOG OUTPUT 2	AO2_21_1	Maximum value of A.O.2 during silent mode in Performance Mode (Mode 1)	50
ANALOG OUTPUT 2	AO2_21_2	Maximum value of A.O.2 during silent mode in Efficiency Mode (Mode 2)	50
ANALOG OUTPUT 2	AO2_21_3	Maximum value of A.O.2 during silent mode in Sound Mode (Mode 3)	50
ANALOG OUTPUT 2	AO2_21_4	Maximum value of A.O.2 during silent mode in Manual Mode(Mode 4)	50
ANALOG OUTPUT 2	AO2_21_5	Maximum value of A.O.2 during silent mode in Mode Pre-set 5	50
ANALOG OUTPUT 2	AO2_21_6	Maximum value of A.O.2 during silent mode in Mode Pre-set 6	50
ANALOG OUTPUT 2	AO2_21_7	Maximum value of A.O.2 during silent mode in Mode Pre-set 7	50
ANALOG OUTPUT 2	AO2_21_8	Maximum value of A.O.2 during silent mode in Mode Pre-set 8	50
ANALOG OUTPUT 2	AO2_22	Minimum capacity of inverter 2	0
ANALOG OUTPUT 2	AO2_23	Maximum time at minimum capacity of inverter 2	30
ANALOG OUTPUT 2	AO2_24	Time of inverter functioning at maximum to restore the right lubrication	2
ANALOG OUTPUT 3	AO3_1	Probe for analog output 3	Pb8
ANALOG OUTPUT 3	AO3_2	Lower limit for analog output 3	0.00
ANALOG OUTPUT 3	AO3_3	Upper limit for analog output 3	10.00
ANALOG OUTPUT 3	AO3_4	Minimum value for analog output 3	10
ANALOG OUTPUT 3	AO3_5	Analog output 3 value after load start	80
ANALOG OUTPUT 3	AO3_6	Analog output 3 value after load off	20
ANALOG OUTPUT 3	AO3_7	Exclusion band start value 3	50
ANALOG OUTPUT 3	AO3_8	Exclusion band end value 3	50
ANALOG OUTPUT 3	AO3_9	Safety value for Analog output 3	55
ANALOG OUTPUT 3	AO3_10	Delay between the entrance in the regulation band and the regulation activation	0
ANALOG OUTPUT 3	AO3_11	Analog output 3 rise time from minimum value to maximum	50
ANALOG OUTPUT 3	AO3_12	Analog output 3 permanency before load activation	0
ANALOG OUTPUT 3	AO3_13	Max value for analogue Output 3	80
ANALOG OUTPUT 3	AO3_14	Analog output 3 decreasing time after load off	0
ANALOG OUTPUT 3	AO3_15	Analog output 3 permanency before load off	0
ANALOG OUTPUT 3	AO3_16	Analog output 3 decreasing time from maximum before load on	0
ANALOG OUTPUT 3	AO3_17	Regulation band width 3	0.50
ANALOG OUTPUT 3	AO3_18	Integral time 3	300
ANALOG OUTPUT 3	AO3_19	Band offset 3	0.00
ANALOG OUTPUT 3	AO3_20	Integral action limitation (Not used)	0.60
ANALOG OUTPUT 3	AO3_21	Maximum value of A.O.3 during silent mode	80
ANALOG OUTPUT 3	AO3_22	Minimum capacity of inverter 3	10
ANALOG OUTPUT 3	AO3_23	Maximum time at minimum capacity of inverter 3	255
ANALOG OUTPUT 3	AO3_24	Time of inverter functioning at maximum to restore the right lubrication	2
ANALOG OUTPUT 4	AO4_1	Probe for analog output 4	Pb8
ANALOG OUTPUT 4	AO4_2	Lower limit for analog output 4	0.00
ANALOG OUTPUT 4	AO4_3	Upper limit for analog output 4	10.00
ANALOG OUTPUT 4	AO4_4	Minimum value for analog output 4	20
ANALOG OUTPUT 4	AO4_5	Analog output 4 value after load start	40
ANALOG OUTPUT 4	AO4_6	Analog output 4 value after load off	80
ANALOG OUTPUT 4	AO4_7	Exclusion band start value 4	20
ANALOG OUTPUT 4	AO4_8	Exclusion band end value 4	20
ANALOG OUTPUT 4	AO4_9	Safety value for Analog output 4	55

Appendix 3: Parameter list iPro

Group	Label	Description	Factory
ANALOG OUTPUT 4	AO4_10	Delay between the entrance in the regulation band and the regulation activation	30
ANALOG OUTPUT 4	AO4_11	Analog output 4 rise time from minimum value to maximum	15
ANALOG OUTPUT 4	AO4_12	Analog output 4 permanency before load activation	20
ANALOG OUTPUT 4	AO4_13	Max value for analogue Output 4	85
ANALOG OUTPUT 4	AO4_14	Analog output 4 decreasing time after load off	25
ANALOG OUTPUT 4	AO4_15	Analog output 4 permanency before load off	5
ANALOG OUTPUT 4	AO4_16	Analog output 4 decreasing time from maximum before load on	5
ANALOG OUTPUT 4	AO4_17	Regulation band width 4	0.80
ANALOG OUTPUT 4	AO4_18	Integral time 4	20
ANALOG OUTPUT 4	AO4_19	Band offset 4	0.00
ANALOG OUTPUT 4	AO4_20	Integral action limitation (Not used)	0.60
ANALOG OUTPUT 4	AO4_21	Maximum value of A.O.4 during silent mode	85
ANALOG OUTPUT 4	AO4_22	Minimum capacity of inverter 4	0
ANALOG OUTPUT 4	AO4_23	Maximum time at minimum capacity of inverter 4	255
ANALOG OUTPUT 4	AO4_24	Time of inverter functioning at maximum to restore the right lubrication	2
ANALOG OUTPUT 5	AO5_1	Probe for analog output 5	Pb10
ANALOG OUTPUT 5	AO5_2	Lower limit for analog output 5	0.00
ANALOG OUTPUT 5	AO5_3	Upper limit for analog output 5	10.00
ANALOG OUTPUT 5	AO5_4	Minimum value for analog output 5	0
ANALOG OUTPUT 5	AO5_5	Analog output 5 value after load start	100
ANALOG OUTPUT 5	AO5_6	Analog output 5 value after load off	0
ANALOG OUTPUT 5	AO5_7	Exclusion band start value 5	50
ANALOG OUTPUT 5	AO5_8	Exclusion band end value 5	50
ANALOG OUTPUT 5	AO5_9	Safety value for Analog output 5	55
ANALOG OUTPUT 5	AO5_10	Delay between the entrance in the regulation band and the regulation activation	30
ANALOG OUTPUT 5	AO5_11	Analog output 5 rise time from minimum value to maximum	120
ANALOG OUTPUT 5	AO5_12	Analog output 5 permanency before load activation	60
ANALOG OUTPUT 5	AO5_13	Max value for analogue Output 5	100
ANALOG OUTPUT 5	AO5_14	Analog output 5 decreasing time after load off	25
ANALOG OUTPUT 5	AO5_15	Analog output 5 permanency before load off	5
ANALOG OUTPUT 5	AO5_16	Analog output 5 decreasing time from maximum before load on	5
ANALOG OUTPUT 5	AO5_17	Regulation band width 5	0.60
ANALOG OUTPUT 5	AO5_18	Integral time 5	300
ANALOG OUTPUT 5	AO5_19	Band offset 5	0.00
ANALOG OUTPUT 5	AO5_20	Integral action limitation (Not used)	0.60
ANALOG OUTPUT 5	AO5_21	Maximum value of A.O.5 during silent mode	100
ANALOG OUTPUT 5	AO5_22	Minimum capacity of inverter 5	0
ANALOG OUTPUT 5	AO5_23	Maximum time at minimum capacity of inverter 5	255
ANALOG OUTPUT 5	AO5_24	Time of inverter functioning at maximum to restore the right lubrication	2
ANALOG OUTPUT 6	AO6_1	Probe for analog output 6	Pb6
ANALOG OUTPUT 6	AO6_2	Lower limit for analog output 6	0.00
ANALOG OUTPUT 6	AO6_3	Upper limit for analog output 6	10.00
ANALOG OUTPUT 6	AO6_4	Minimum value for analog output 6	0
ANALOG OUTPUT 6	AO6_5	Analog output 6 value after load start	100
ANALOG OUTPUT 6	AO6_6	Analog output 6 value after load off	0
ANALOG OUTPUT 6	AO6_7	Exclusion band start value 6	50
ANALOG OUTPUT 6	AO6_8	Exclusion band end value 6	50
ANALOG OUTPUT 6	AO6_9	Safety value for Analog output 6	55
ANALOG OUTPUT 6	AO6_10	Delay between the entrance in the regulation band and the regulation activation	30
ANALOG OUTPUT 6	AO6_11	Analog output 6 rise time from minimum value to maximum	120
ANALOG OUTPUT 6	AO6_12	Analog output 6 permanency before load activation	60
ANALOG OUTPUT 6	AO6_13	Max value for analogue Output 6	100
ANALOG OUTPUT 6	AO6_14	Analog output 6 decreasing time after load off	25
ANALOG OUTPUT 6	AO6_15	Analog output 6 permanency before load off	5
ANALOG OUTPUT 6	AO6_16	Analog output 6 decreasing time from maximum before load on	5
ANALOG OUTPUT 6	AO6_17	Regulation band width 6	0.60
ANALOG OUTPUT 6	AO6_18	Integral time 6	300
ANALOG OUTPUT 6	AO6_19	Band offset 6	0.00
ANALOG OUTPUT 6	AO6_20	Integral action limitation (Not used)	0.60
ANALOG OUTPUT 6	AO6_21	Maximum value of A.O.6 during silent mode	100
ANALOG OUTPUT 6	AO6_22	Minimum capacity of inverter 6	0
ANALOG OUTPUT 6	AO6_23	Maximum time at minimum capacity of inverter 6	255
ANALOG OUTPUT 6	AO6_24	Time of inverter functioning at maximum to restore the right lubrication	2
CORESENSE	CO1	Address core sense out 1	NU
CORESENSE	CO2	Address core sense out 2	NU

Group	Label	Description	Factory
CORESENSE	CO16	Coresense model 1	R112
CORESENSE	CO17	Coresense model 2	R112
Configuration Digital Input	DIC1	Configuration Digital Input 1	o63 - Inverter suction 1 safety
Configuration Digital Input	DIC2	Configuration Digital Input 2	o50 - High pressure Circuit 1
Configuration Digital Input	DIC3	Configuration Digital Input 3	0 - Not used
Configuration Digital Input	DIC4	Configuration Digital Input 4	0 - Not used
Configuration Digital Input	DIC5	Configuration Digital Input 5	0 - Not used
Configuration Digital Input	DIC6	Configuration Digital Input 6	0 - Not used
Configuration Digital Input	DIC7	Configuration Digital Input 7	0 - Not used
Configuration Digital Input	DIC8	Configuration Digital Input 8	0 - Not used
Configuration Digital Input	DIC9	Configuration Digital Input 9	0 - Not used
Configuration Digital Input	DIC10	Configuration Digital Input 10	0 - Not used
Configuration Digital Input	DIC11	Configuration Digital Input 11	0 - Not used
Configuration Digital Input	DIC12	Configuration Digital Input 12	o60 - Safety Inverter condenser Circuit 1
Configuration Digital Input	DIC13	Configuration Digital Input 13	0 - Not used
Configuration Digital Input	DIC14	Configuration Digital Input 14	0 - Not used
Configuration Digital Input	DIC15	Configuration Digital Input 15	o57 - Oil of frequency compressor suction Circuit 1
Configuration Digital Input	DIC16	Configuration Digital Input 16	0 - Not used
Configuration Digital Input	DIC17	Configuration Digital Input 17	o58 - Safety of frequency compressor Suction Circuit 1
Configuration Digital Input	DIC18	Configuration Digital Input 18	o59 - Thermal Safety of frequency compressor suction Circuit 1
Configuration Digital Input	DIC19	Configuration Digital Input 19	o74 - External alarm 1
Configuration Digital Input	DIC20	Configuration Digital Input 20	c95 - Operating mode 2
Configuration Digital Ouput	DOC1	Configuration Digital Output 1	c1 - Inverter 1 Suction Circuit 1
Configuration Digital Ouput	DOC2	Configuration Digital Output 2	0 - Not used
Configuration Digital Ouput	DOC3	Configuration Digital Output 3	0 - Not used
Configuration Digital Ouput	DOC4	Configuration Digital Output 4	c46 - Alarm
Configuration Digital Ouput	DOC5	Configuration Digital Output 5	0 - Not used
Configuration Digital Ouput	DOC6	Configuration Digital Output 6	0 - Not used
Configuration Digital Ouput	DOC7	Configuration Digital Output 7	0 - Not used
Configuration Digital Ouput	DOC8	Configuration Digital Output 8	0 - Not used
Configuration Digital Ouput	DOC9	Configuration Digital Output 9	c58 - Inverter free Circuit 1
Configuration Digital Ouput	DOC10	Configuration Digital Output 10	0 - Not used
Configuration Digital Ouput	DOC11	Configuration Digital Output 11	c49 - Auxiliary output 1
Configuration Digital Ouput	DOC12	Configuration Digital Output 12	0 - Not used
Configuration Digital Ouput	DOC13	Configuration Digital Output 13	0 - Not used
Configuration Digital Ouput	DOC14	Configuration Digital Output 14	0 - Not used
Configuration Digital Ouput	DOC15	Configuration Digital Output 15	0 - Not used
Configuration Analog Ouput	AOC1	Configuration Analog Output 1	2 - 0-10V output inverter 1 Suction Circuit 1
Configuration Analog Ouput	AOC2	Configuration Analog Output 2	5 - 0-10V output inverter condenser free Circuit 1
Configuration Analog Ouput	AOC3	Configuration Analog Output 3	0 - Not used
Configuration Analog Ouput	AOC4	Configuration Analog Output 4	0 - Not used
Configuration Analog Ouput	AOC5	Configuration Analog Output 5	0 - Not used
Configuration Analog Ouput	AOC6	Configuration Analog Output 6	0 - Not used

Appendix 3: Parameter list iPro

Group	Label	Description	Factory
Configuration Analog Input	AIC1	Configuration Analog Input 1	27 - 4-20mA Pressure Probe Suction Circuit1
Configuration Analog Input	AIC2	Configuration Analog Input 2	0 - Not used
Configuration Analog Input	AIC3	Configuration Analog Input 3	98 - 4-20mA Pressure Probe of CO2 receiver
Configuration Analog Input	AIC4	Configuration Analog Input 4	28 - 4-20mA Pressure Probe Condenser Circuit1
Configuration Analog Input	AIC5	Configuration Analog Input 5	13 - NTC AUX Temperature probe suction Circuit1
Configuration Analog Input	AIC6	Configuration Analog Input 6	103 - PTC Discharge line temperature circuit 1
Configuration Analog Input	AIC7	Configuration Analog Input 7	100 - NTC Gas cooler outlet temperature
Configuration Analog Input	AIC8	Configuration Analog Input 8	4 - NTC Temperature probe Thermostat Aux2
Configuration Analog Input	AIC9	Configuration Analog Input 9	11 - NTC Temperature probe Dynamic set condenser 1
Configuration Analog Input	AIC10	Configuration Analog Input 10	3 - NTC Temperature probe Thermostat Aux1
ECM	ECM1	Reset	no action
ECM	ECM4_1	Address ECM Fan 1	0
ECM	ECM4_2	Address ECM Fan 2	0
ECM	ECM4_3	Address ECM Fan 3	0
ECM	ECM4_4	Address ECM Fan 4	0
ECM	ECM4_5	Address ECM Fan 5	0
ECM	ECM4_6	Address ECM Fan 6	0
ECM	ECM4_7	Address ECM Fan 7	0
ECM	ECM4_8	Address ECM Fan 8	0
ECM	ECM5	Set value source	Analog input
ECM	ECM6	Preferred running direction	counter clockwise
ECM	ECM7	Motor stop enable (parameter set 1)	continuous run
ECM	ECM8	Override value for Default set value	0
ECM	ECM9	Enable Override	no
XEV02	XEV1	Circuit 1 Device address	0
XEV02	XEV3	TDG (Modulation Time Interval Circuit 1)	10
M400	VFD1	VFD Address	99
M400	VFD2	Sets Minimum Speed	0.00
M400	VFD3	Sets Maximum Speed	0.00
M400	VFD4	Accel Rate	5.0
M400	VFD5	Decel Rate	10.0
M400	VFD6	Motor Rated Current (FLA)	0.00
M400	VFD7	Motor Rated Speed (rpm)	0.0
M400	VFD8	Motor Voltage	208
M400	VFD9	Drive Configuration	0
M400	VFD10	Start/Stop Logic Select	0
M400	VFD11	Digital Input 03 Destination	0.000
M400	VFD12	Digital Input 04 Destination	0.000
M400	VFD13	Digital Input 05 Destination	0.000
M400	VFD14	Digital Input 06 Destination	0.000

Group	Label	Description	Factory
M400	VFD15	Onboard User Program	stop user program
M400	VFD16	Motor Power Factor	0.50
M400	VFD17	Drive Control Mode	0
M400	VFD18	Sets acc/dec in S/60Hz	0
M400	VFD19	Slip Compensation Level	0.0
M400	VFD20	Supply Loss Mode	0
M400	VFD21	Time Selector	0
M400	VFD22	Stop Mode	Coast to Stop
M400	VFD24	Ramp Mode Select	0
M400	VFD25	Parameter Access	0
M400	VFD26	Reset Energy Meter	no action
M400	VFD27	Speed Reference	0.00
M400	VFD28	Drive Software Enable	disable drive
M400	VFD29	Drive Run Forward	no action
M400	VFD30	Force External Trip	Simulates a trip
M400	VFD31	Reset Drive	no action
M400	VFD32	Reset Drive	no action
M400	VFD33	Enable Override	no
M200	INV1	INV Address	-1
M200	INV2	Sets Minimum Speed	25.00
M200	INV3	Sets Maximum Speed	65.00
M200	INV4	Accel Rate	5.0
M200	INV5	Decel Rate	10.0
M200	INV6	Motor Rated Current (FLA)	0.00
M200	INV7	Motor Rated Speed (rpm)	190.0
M200	INV8	Motor Voltage	400
M200	INV9	Drive Configuration	0
M200	INV10	Start/Stop Logic Select	0
M200	INV11	Digital Input 03 Destination	0.000
M200	INV12	Digital Input 04 Destination	0.000
M200	INV13	Digital Input 05 Destination	0.000
M200	INV16	Motor Power Factor	0.85
M200	INV17	Drive Control Mode	4
M200	INV18	Sets acc/dec in S/60Hz	0
M200	INV19	Slip Compensation Level	100.0
M200	INV20	Supply Loss Mode	0
M200	INV21	Time Selector	1
M200	INV22	Stop Mode	ramp
M200	INV24	Ramp Mode Select	1
M200	INV25	Parameter Access	1
M200	INV26	Reset Energy Meter	no action
M200	INV27	Speed Reference	30.00
M200	INV28	Drive Software Enable	enable drive
M200	INV29	Drive Run Forward	no action
M200	INV30	Force External Trip	Simulates a trip
M200	INV31	Reset Drive	no action
M200	INV32	Reset Drive	no action
M200	INV33	Enable Override	no
GAS LEAK DETECTOR	GLD1	Pre-alarm threshold for Gas Leak Detector 1	800
GAS LEAK DETECTOR	GLD2	Alarm threshold for Gas Leak Detector 1	1000
GAS LEAK DETECTOR	GLD3	Differential for Gas Leak pre-alarm and alarm recover Detector 1	800
GAS LEAK DETECTOR	GLD4	Relay activation in case of Gas Leak pre-alarm Detector 1	Aux. output 8
GAS LEAK DETECTOR	GLD5	Relay activation in case of Gas Leak alarm Detector 1	nu
GAS LEAK DETECTOR	GLD6	Pre-alarm threshold for Gas Leak Detector 2	0
GAS LEAK DETECTOR	GLD7	Alarm threshold for Gas Leak Detector 2	0
GAS LEAK DETECTOR	GLD8	Differential for Gas Leak pre-alarm and alarm recover Detector 2	1
GAS LEAK DETECTOR	GLD9	Relay activation in case of Gas Leak pre-alarm Detector 2	nu
GAS LEAK DETECTOR	GLD10	Relay activation in case of Gas Leak alarm Detector 2	nu
GAS LEAK DETECTOR	GLD11	Pre-alarm threshold for Gas Leak Detector 3	0
GAS LEAK DETECTOR	GLD12	Alarm threshold for Gas Leak Detector 3	0
GAS LEAK DETECTOR	GLD13	Differential for Gas Leak pre-alarm and alarm recover Detector 3	1
GAS LEAK DETECTOR	GLD14	Relay activation in case of Gas Leak pre-alarm Detector 3	nu
GAS LEAK DETECTOR	GLD15	Relay activation in case of Gas Leak alarm Detector 3	nu
GAS LEAK DETECTOR	GLD16	Pre-alarm threshold for Gas Leak Detector 4	1000
GAS LEAK DETECTOR	GLD17	Alarm threshold for Gas Leak Detector 4	2000
GAS LEAK DETECTOR	GLD18	Differential for Gas Leak pre-alarm and alarm recover Detector 4	1000
GAS LEAK DETECTOR	GLD19	Relay activation in case of Gas Leak pre-alarm Detector 4	Aux. output 1
GAS LEAK DETECTOR	GLD20	Relay activation in case of Gas Leak alarm Detector 4	Aux. output 1
ENERGY METER	EPM1	Device Address Power Meter 1	0

Appendix 3: Parameter list iPro

Group	Label	Description	Factory
ENERGY METER	EPM2	Display Units Power Meter 1	IEC
ENERGY METER	EPM3	Command Power Meter 1	no action
ENERGY METER	EPM4	System Type Power Meter 1	A+N
ENERGY METER	EPM5	CT primary Ratio Power Meter 1	1
ENERGY METER	EPM6	CT Secondary Ratio Power Meter 1	1V
ENERGY METER	EPM7	PT Ratio Power Meter 1	0.01
ENERGY METER	EPM8	System Voltage Power Meter 1	82
ENERGY METER	EPM9	Power up Counter Power Meter 1	0
ENERGY METER	EPM10	Device Address Power Meter 2	0
ENERGY METER	EPM11	Display Units Power Meter 2	IEC
ENERGY METER	EPM12	Command Power Meter 2	no action
ENERGY METER	EPM13	System Type Power Meter 2	A+N
ENERGY METER	EPM14	CT primary Ratio Power Meter 2	1
ENERGY METER	EPM15	CT Secondary Ratio Power Meter 2	1V
ENERGY METER	EPM16	PT Ratio Power Meter 2	0.01
ENERGY METER	EPM17	System Voltage Power Meter 2	82
ENERGY METER	EPM18	Power up Counter Power Meter 2	0
GAS COOLER HEAT RECLAIM	HTRC1	Start point for the HR regulation	2.000
GAS COOLER HEAT RECLAIM	HTRC2	End point for the HR regulation	8.000
GAS COOLER HEAT RECLAIM	HTRC3	Pressure set point to use when the HR input has the HTRC1 value	50.00
GAS COOLER HEAT RECLAIM	HTRC4	Pressure set point to use when the HR input has the HTRC2 value	80.00
GAS COOLER HEAT RECLAIM	HTRC5	Delta pressure step from H-R to Normal Regulation	4.00
GAS COOLER HEAT RECLAIM	HTRC6	Time for the HTRC5 pressure step from H-R to normal regulation	1
GAS COOLER HEAT RECLAIM	HTRC7	Low discharge temperature to stop H-R	50.0
GAS COOLER HEAT RECLAIM	HTRC8	Differential to restart H-R when is stopped by low discharge temperature	10.0
GAS COOLER HEAT RECLAIM	HTRC9	Heat reclaim stop delay with discharge temperature below HTRC7	1
GAS COOLER HEAT RECLAIM	HTRC10	Low post exchanger CO2 temperature to stop H-R	20.0
GAS COOLER HEAT RECLAIM	HTRC11	Differential to restart H-R when is stopped by low post exchanger temperature	2.0
GAS COOLER HEAT RECLAIM	HTRC12	Heat reclaim stop delay with post heat exchanger temperature below HTRC10	1
GAS COOLER HEAT RECLAIM	HTRC13	H-R restart time when is stopped by: no one compressor running, low discharge temperature, low post heat exchanger temperature	5
GAS COOLER	GC1	Setpoint for Subcritical and Transcritical mode switch	27.0
GAS COOLER	GC2	Hysteresis for Subcritical and Transcritical mode switch	1.0
GAS COOLER	GC3	Minimum pressure set point value in transcritical mode	72.00
GAS COOLER	GC4	Transcritical proportional band	6.00
GAS COOLER	GC5	Transcritical band offset	3.00
GAS COOLER	GC6	Integral sampling time	30
GAS COOLER	GC7	Derivative	0
GAS COOLER	GC8	PID step band	4.00
GAS COOLER	GC9	Minimum PID step	0
GAS COOLER	GC10	Maximum PID step	6
GAS COOLER	GC11	Maximum HPV% open	80
GAS COOLER	GC12	Minimum HPV% open	26
GAS COOLER	GC13	Maximal allowable pressure in gas cooler	100.00
GAS COOLER	GC14	HP safety set point	93.00
GAS COOLER	GC15	HP safety delay before standard regulation	0
GAS COOLER	GC16	Offset end temperature	32.0
GAS COOLER	GC17	Offset value	6.00
GAS COOLER	GC18	Open HPV% in Subcritical	100
GAS COOLER	GC19	Pressure value near HP cut out	115.00
GAS COOLER	GC20	Receiver pressure setpoint	82.00
GAS COOLER	GC21	BGV proportional band	7.00
GAS COOLER	GC22	BGV band offset	0.00
GAS COOLER	GC23	BGV integral sampling time	120
GAS COOLER	GC24	BGV derivative sampling time	0
GAS COOLER	GC25	BGV derivative time	0
GAS COOLER	GC26	Maximum BGV valve % open	100
GAS COOLER	GC27	Minimum BGV valve % open	0
GAS COOLER	GC28	High pressure setpoint	87.00
GAS COOLER	GC29	High pressure setpoint Pre-Alarm	85.00
GAS COOLER	GC30	High pressure hysteresis	3.00
GAS COOLER	GC31	Low pressure setpoint	33.00
GAS COOLER	GC32	Low pressure hysteresis	2.00
GAS COOLER	GC33	Rate at which the HPV will close in safe mode	3
GAS COOLER	GC34	HPV% open during Subcritical with sensor failure	60
GAS COOLER	GC35	HPV% open during Transcritical with sensor failure	25

Group	Label	Description	Factory
GAS COOLER	GC36	HPV% open during low pressure safety mode	90
GAS COOLER	GC37	BPV% open during high pressure safety mode	50
GAS COOLER	GC38	Valves types for value1 and 2	bipolar
GAS COOLER	GC39	Max steps for valve 1	75
GAS COOLER	GC40	Min steps for valve 1	10
GAS COOLER	GC41	Extra steps for Valve1 close	30
GAS COOLER	GC42	Step rate for valve 1	500
GAS COOLER	GC43	Peak current for valve 1	50
GAS COOLER	GC44	Hold current for valve 1	10
GAS COOLER	GC45	Max steps for valve 2	75
GAS COOLER	GC46	Min steps for valve 2	10
GAS COOLER	GC47	Extra steps for Valve2 close	30
GAS COOLER	GC48	Step rate for valve 2	500
GAS COOLER	GC49	Peak current for valve 2	50
GAS COOLER	GC50	Hold current for valve 2	10
GAS COOLER	GC51	Valve 1 of the XEV20D	HPV
GAS COOLER	GC52	Valve 2 of the XEV20D	BGV
GAS COOLER	GC53	Hour when the HPV calibration mode initiate	0
GAS COOLER	GC54	HPV Interval days when calibrating happens	0
GAS COOLER	GC55	Hour when the BGV calibration mode initiate	0
GAS COOLER	GC56	BGV Interval days when calibrating happens	0
GAS COOLER	GC57	HPV Calibration T Frame	0
GAS COOLER	GC58	HPV Calibration Min Valve%	0
GAS COOLER	GC59	HPV Calibration Direct	Close
GAS COOLER	GC60	BGV Calibration T Frame	0
GAS COOLER	GC61	BGV Calibration Min Valve%	0
GAS COOLER	GC62	BGV Calibration Direct	Close
GAS COOLER	GC63	OverrideCMD:if 1, override mode, 0, normal mode	no
GAS COOLER	GC64	Override time:1~30 minutes, when OverrideCMD is from 0 to 1, timer starts running, when timer is up, set 0 to OverrideCMD	30
GAS COOLER	GC65	HPV set point in subcritical mode with GC18 = -1	0.02
GAS COOLER	GC66	HPV proportional band in subcritical mode	5.50
GAS COOLER	GC67	HPV band offset in subcritical mode	4.00
GAS COOLER	GC68	HPV integral sampling time in subcrtical mode	120
GAS COOLER	GC69	HPV derivative time in subcrtical mode	500
GAS COOLER	GC70	HPV MAX variation percentage every second in subcritical mode	30
GAS COOLER	GC71	BGV MAX variation percentage every second	5
GAS COOLER	GC72	HPV% in transcritical mode when compressor start	33
UNIT PROTECTION	DLT1	Maximum allowable DLT temperature	145.0
UNIT PROTECTION	DLT2	DLT Band	5.0
UNIT PROTECTION	DLT3	Evaluation period for DLT protection	20
UNIT PROTECTION	DLT4	Compressor Speed reduction	3
UNIT PROTECTION	DLT5	Interval for compressor speed reduction	10
UNIT PROTECTION	DLT6	Pressure ratio in low pressure conditions	1.0
UNIT PROTECTION	DLT7	Time of pressure ratio below DLT6 before sending an alarm	1
UNIT PROTECTION	DLT8	Pressure ratio differential	0.1
UNIT PROTECTION	DLT9	Probe to monitor the temperature inside e-box	AIC10
UNIT PROTECTION	DLT10	E-box high temperature threshold to increase fan speed	48.0
UNIT PROTECTION	DLT11	Differential for high temperature threshold recover	3.0
UNIT PROTECTION	DLT12	Value to add to the Fan Set point if the high temperature threshold inside e-box is exceed	-5.00
UNIT PROTECTION	DLT13	Enable Low Ambient start function	no
UNIT PROTECTION	DLT14	Ambient probe for Low Ambient start function	AIC9
UNIT PROTECTION	DLT15	Compressor Start Low Ambient Frequency	30
UNIT PROTECTION	DLT16	Low Ambient Start Time in minutes	1
UNIT PROTECTION	DLT17	Low Ambient Start HPV valve opening	10
UNIT PROTECTION	DLT18	Temperature offset for Low Ambient start	5.0
UNIT PROTECTION	DLT19	Pressure/temperature offset for Low Ambient start	0.10
UNIT PROTECTION	DLT20	Enable Low Ambient start with Pump Down	no
UNIT PROTECTION	DLT21	Input used to monitor DLT	AI
UNIT PROTECTION	DLT22	Fan ON % if compressor OFF	0
MANUAL PUMP DOWN	SPF1	Compressor Set point during pump down	15.00
MANUAL PUMP DOWN	SPF2	Compressor frequency during pump down	44
MANUAL PUMP DOWN	SPF3	Manual pump down max time	0
DEVICE TYPE	DeviceType	Device type(0:10DIN 1:4DIN)	0
PROBE TYPE	ProbeType	Probe Type for Gas Cooler heat reclaim HTRC	0
AOX values	AOX_4_Comp	AOX_4_Comp used for RC62/DLT15	0
AOX values	AOX_13_Comp	AOX_13_Comp used for RC64/DLT15	100

Table 11: Parameters level 1

Appendix 3: Parameter list iPro

Appendix 3: Ecodesign overview tables according regulation 2015/1095

Compressor - Copeland Selection Software, 7.13 AX Int / 42710 (12/16), gascooler - lab measurement, suction superheat 10K			5-Dec-16
Model: OME-4MTL-05X	Refrigerant: R744 Dew Point		SI
Evaporating Temperature	t	-10	°C
Annual electricity consumption	Q	22254	kWh/y
Seasonal energy performance ratio	SEPR	2.93	
Parameters at full load and ambient temperature 32°C			
Capacity (rated)	P_A	10.61	kW
Power Input (rated)	D_A	7.21	kW
COP (rated)	COP_A	1.47	
Parameters at part load and ambient temperature 25°C			
Capacity (declared)	P_B	10.21	kW
Power Input (declared)	D_B	5.08	kW
COP (declared)	COP_B	2.01	
Parameters at part load and ambient temperature 15°C			
Capacity (declared)	P_C	8.59	kW
Power Input (declared)	D_C	3.06	kW
COP (declared)	COP_C	2.80	
Parameters at part load and ambient temperature 5°C			
Capacity (declared)	P_D	7.32	kW
Power Input (declared)	D_D	1.78	kW
COP (declared)	COP_D	4.10	
Parameters at full load and ambient temperature 43°C			
Capacity	P_3	-	kW
Power Input	D_3	-	kW
COP	COP_3	-	
Other items			
Capacity control		Invertor	
Degradation coefficient	Cds	0.25	
Contact details	Emerson Climate Technologies - European Headquarters - Pascalstrasse 65 - 52076 Aachen, Germany Phone: +49 (0) 2408 929 0 - Fax: +49 (0) 2408 929 570 - Internet: www.emersonclimate.eu		

Compressor - Copeland Selection Software, 7.13 AX Int / 42710 (12/16), gascooler - lab measurement, suction superheat 10K			5-Dec-16
Model: OME-4MTL-07X	Refrigerant: R744 Dew Point		SI
Evaporating Temperature	t	-10	°C
Annual electricity consumption	Q	29381	kWh/y
Seasonal energy performance ratio	SEPR	2.95	
Parameters at full load and ambient temperature 32°C			
Capacity (rated)	P_A	14.12	kW
Power Input (rated)	D_A	9.67	kW
COP (rated)	COP_A	1.46	
Parameters at part load and ambient temperature 25°C			
Capacity (declared)	P_B	12.47	kW
Power Input (declared)	D_B	6.18	kW
COP (declared)	COP_B	2.02	
Parameters at part load and ambient temperature 15°C			
Capacity (declared)	P_C	11.41	kW
Power Input (declared)	D_C	4.21	kW
COP (declared)	COP_C	2.71	
Parameters at part load and ambient temperature 5°C			
Capacity (declared)	P_D	10.22	kW
Power Input (declared)	D_D	2.34	kW
COP (declared)	COP_D	4.37	
Parameters at full load and ambient temperature 43°C			
Capacity	P_3	-	kW
Power Input	D_3	-	kW
COP	COP_3	-	
Other items			
Capacity control		Invertor	
Degradation coefficient	Cds	0.25	
Contact details	Emerson Climate Technologies - European Headquarters - Pascalstrasse 65 - 52076 Aachen, Germany Phone: +49 (0) 2408 929 0 - Fax: +49 (0) 2408 929 570 - Internet: www.emersonclimate.eu		

Compressor - Copeland Selection Software, 7.13 AX Int / 42710 (12/16), gascooler - lab measurement, suction superheat 10K — 5-Dec-16

Model: OME-4MTL-09X — Refrigerant: R744 Dew Point — SI

Evaporating Temperature	t	-10	°C
Annual electricity consumption	Q	34809	kWh/y
Seasonal energy performance ratio	SEPR	3.02	
Parameters at full load and ambient temperature 32°C			
Capacity (rated)	P_A	17.12	kW
Power Input (rated)	D_A	11.60	kW
COP (rated)	COP_A	1.48	
Parameters at part load and ambient temperature 25°C			
Capacity (declared)	P_B	15.05	kW
Power Input (declared)	D_B	7.33	kW
COP (declared)	COP_B	2.05	
Parameters at part load and ambient temperature 15°C			
Capacity (declared)	P_C	12.91	kW
Power Input (declared)	D_C	4.73	kW
COP (declared)	COP_C	2.73	
Parameters at part load and ambient temperature 5°C			
Capacity (declared)	P_D	12.29	kW
Power Input (declared)	D_D	2.75	kW
COP (declared)	COP_D	4.47	
Parameters at full load and ambient temperature 43°C			
Capacity	P_3	-	kW
Power Input	D_3	-	kW
COP	COP_3	-	
Other items			
Capacity control		Invertor	
Degradation coefficient	Cds	0.25	

Contact details: Emerson Climate Technologies - European Headquarters - Pascalstrasse 65 - 52076 Aachen, Germany
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Appendix 4: List of tables and figures

Tables

Figures

iPro controller manual

iPro controller manual can be found as separate document provided together with this application guideline.

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