Copeland multi-compressor pack

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With our strong investments in research and development combined with technically superior products from our industry leading brand we have turned experience and expertise to design a wide-range of multiple compressor rack solutions. The Copeland Multi-Compressor Pack (CMP) series is designed with the proven Copeland Stream semi-hermetic compressors. The range is available from 50-200HP with a combination of 2, 3 or 4 compressors in a rack.

These racks are qualified to work with R404A, R407F, R407A/C, R134a, R22, R448A and R449A refrigerants.

This catalogue presents information for medium temperature (MT) and low temperature (LT) applications using R404A. For applications using other refrigerants, please contact your Copeland representative.

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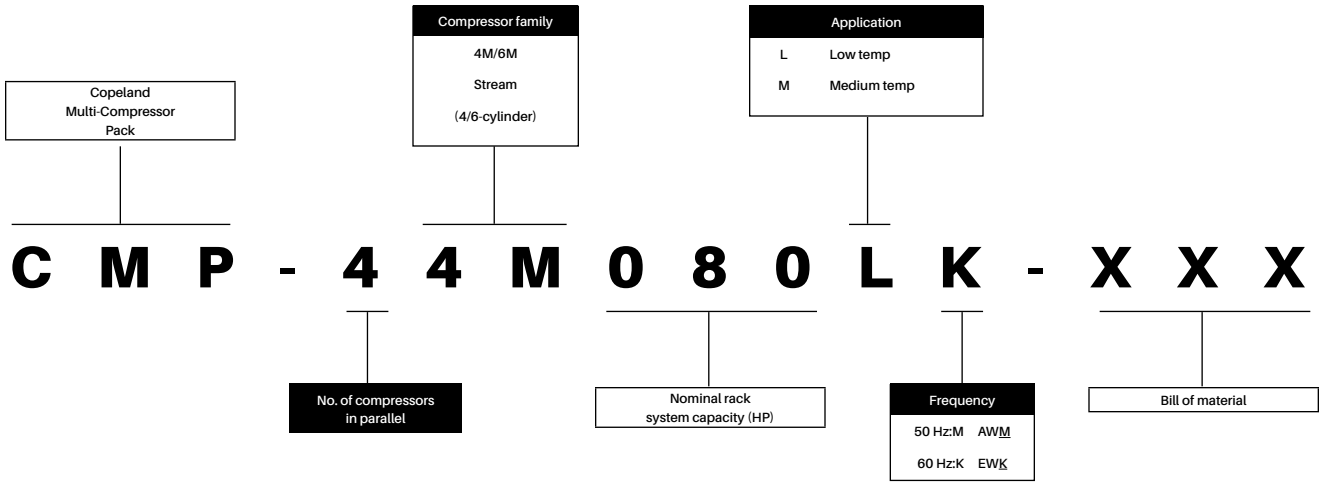
Features and benefits

Features	Benefits
Stream semi-hermetic compressor with CoreSense Diagnostics	• Stream's unique valve technology makes it 10% more efficient than any other compressor and therefore helps reduce the carbon footprint and running cost of any installation • Stream is a multi refrigerant compressor. One model suits all applications without any compromise on performance. • Digital technology or operation with inverter makes Stream the most flexible choice for continuous capacity modulation. • Sound shell technology makes Stream the quietest compressor in the market for sound critical applications. • CoreSense Diagnostics offers advanced protection and diagnostics benefits for excellent system reliability, reduced service costs and increased equipment uptime.
iProRack controller	• Optimized algorithms for efficient compressor rack control. • Flexible and easy to configure. • Large and easy to read display.
Electrical panel	• Circuit breakers, thermal overload protection for each individual compressor, phase failure, and voltage protection for reliable operation.
Copeland electronic oil management system	• Active oil management with Copeland branded oil separator, oil receiver, oil filter, oil pressure switch, and electronic oil level regulator ensures oil is effectively circulated in the system and returned to each compressor.
Copeland line components	• Copeland branded line components for efficiency, reliability and serviceability.
Spring mounted frame	• Robust & sturdy spring mounted frame reduces nois and vibration. • Rack layout facilitates serviceability.
Mobile liquid station	• Allows flexibility when installing liquid receiver either side by side to the rack or close to the condenser or evaporators.

Nomenclature



Bill of material

EMP bill of material								
3		0		0			A	
3	Rack with electrical panel	0	Standard	0	Part winding start	50 Hz	(Blank)	Digital fan control & R404A Ref.
2	Rack w/o electrical pane	2	Digital		Direct online start	60 Hz	A	Analogue fan control & R404A Ref.
		4	VFD	1	Part winding start	50 Hz	B	Digital fan control & R134a Ref.
					Start unloader		C	Analogue fan control & R134a Ref.
				2	Part winding start	50 Hz	D	Digital fan control & R407F/C Ref.
					Direct online start	60 Hz	E	Analogue fan control & R407F/C Ref.
					Capacity unloader	50 & 60 Hz		
				3	Part winding start	50 Hz		
					Start unloader			
					Capacity unloader			

Rack with panel	50 Hz 60 Hz	50 Hz	50 Hz 60 Hz	50 Hz
	300	301	302	303
Standard	✓	✓	✓	✓
Start unloader		✓		✓
Capacity unloader			✓	✓

Digital	320	321	322	323
VFD	340	341	342	343

Rack with panel	50 Hz 60 Hz	50 Hz	50 Hz 60 Hz	50 Hz
	200	201	202	203
Standard	✓	✓	✓	✓
Start unloader		✓		✓
Capacity unloader			✓	✓

Digital	220	221	222	223
VFD	240	241	242	243

Item	Standard features
1	Copeland stream compressor
2	Adequately sized stainless steel/copper suction header
3	Suction and discharge service valves
4	Multiple suction stubs fitted with ball valves
5	Suction filters (with replaceable core and ball valve for isolation)
6	Crankcase heater
7	Discharge header
8	Vibration eliminators
9	Oil management system: • Oil level regulator with sight glasses • Oil receiver and oil separator • Oil level sight glasses and filters • Oil pressure switch
10	High pressure/low pressure adjustable switches

Item	Standard features
11	Adequately sized and ventilated electrical panel
12	Circuit breakers and thermal overload protection (for Individual compressors)
13	Circuit breaker and thermal overload protection (for condenser fan - max 4 stages)
14	Electronic controller (Copeland iProRack controller) - with display alarms, I/O relays for safety and communication
15	Complete wiring for compressor rack control and management
16	50 Hz: AWM (380 - 420V/3ph) - part wind start
17	60 Hz: EWK (380 - 420V/3ph) - direct online start
18	Step capacity control kit for MT racks (R404A) (optional)
19	Mobile liquid station • Inlet and outlet isolating valve • Replaceable core filter • Moisture indicator • Pressure relief valve • Low liquid level alarm switch

Best in class features

Stream semi-hermetic compressor

Stream technology and its 5 key benefits

Diagnostics
CoreSense Diagnostics technology helps your refrigeration equipment last longer. This technology offers advanced compressor protection, diagnostics, communication and power consumption measurement.

Efficiency
Its unique valve technology makes Stream more efficient than any other compressor and therefore helps you reduce the carbon footprint and running cost of your installation.

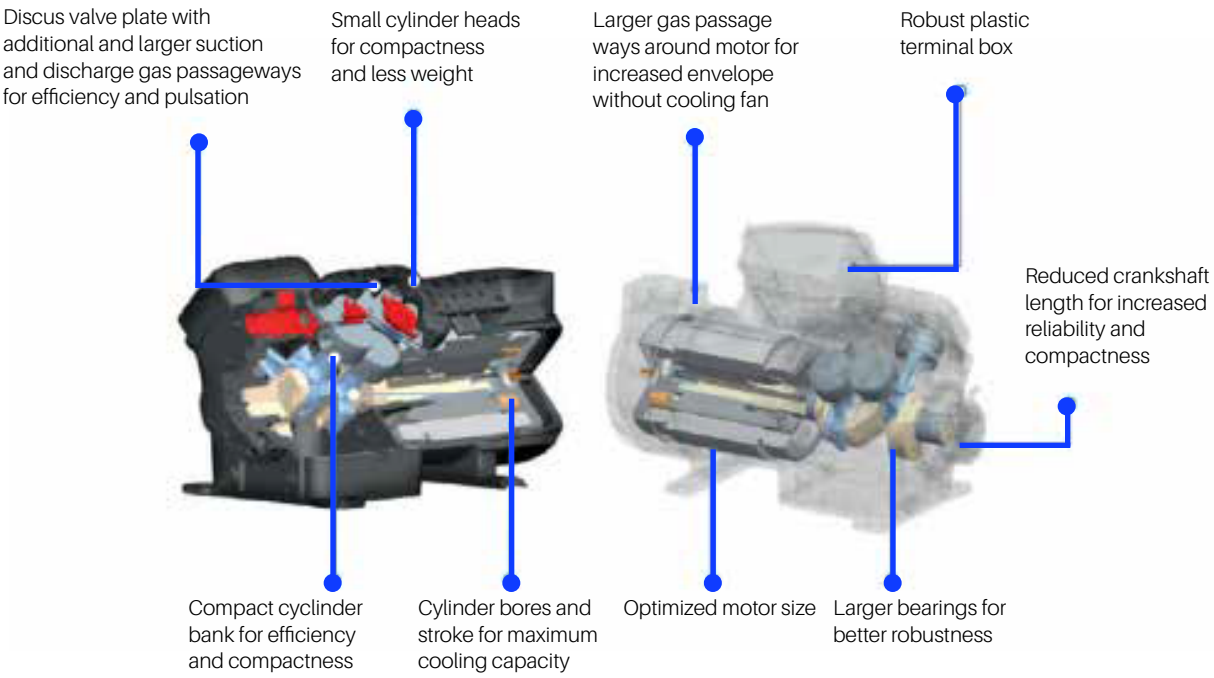
Multi refrigerant
Its unique valve technology makes Stream a multi refrigerant compressor. One model suits all applications without any compromise on performance.

Modulation
Digital technology or operation with inverter makes Stream the most flexible choice for continuous capacity modulation.

Low sound
Sound shell technology makes Stream the quietest compressor in the market for sound critical applications

Our Stream range provides best in class performance for today's commonly used HFCs and uprising low GWP refrigerants. This results in significantly smaller cost of operation and reduced environmental impact compared to competing products.

Inside view of Stream compressor



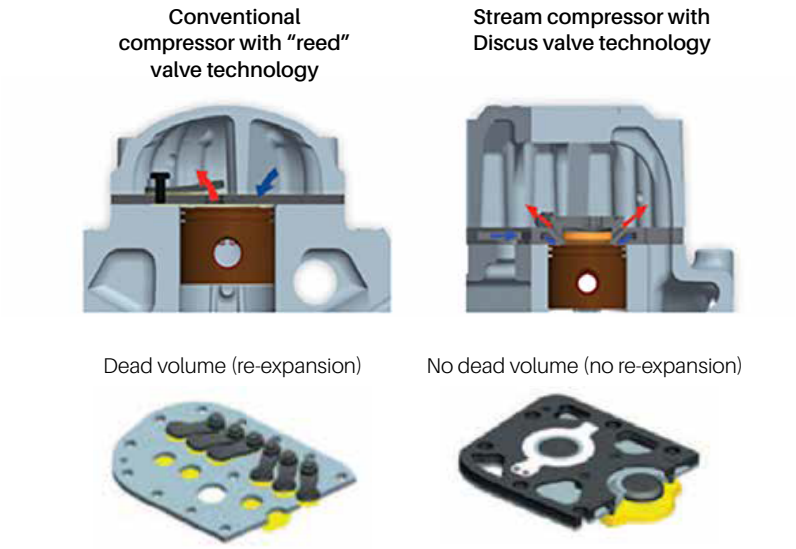
Discus valve technology

Thanks to the unique Discus valve technology, significant savings can be made using Stream compressors. It is the key difference between Stream and conventional reciprocating technologies available on the market. The valve technology is at the heart of the efficiency advantage of Stream.

The unique valve technology allows gas to flow into the cylinders with minimum heat gain while suction cavities are designed to smoothly route the gas to minimize losses. This leads to a superior capacity and efficiency of the compressor compared to conventional reed type compressors, giving customers much more efficiency and significant savings.

The Discus technology takes its name from the conical discharge valve. When closed, the valve remains flush with the valve plate reducing the clearance volume to an absolute minimum when the piston is at the top of the cylinder as shown in Figure 1. With a conventional machine, the reed suction valve prevents the piston coming close to the top of the cylinder causing additional "dead volume" in the discharge ports of the valve plate.

Figure 1. Key difference between conventional reed and Discus valve technology



CoreSense Diagnostics

All Stream models feature CoreSense Diagnostics offering advanced protection and diagnostics benefits for excellent system reliability, reduced service costs and increased equipment uptime. With CoreSense technology, service engineers can now diagnose system-related problems faster or even before they occur to keep the refrigeration system in optimum condition over its entire lifetime.

CoreSense Diagnostic module

Intelligent CoreSense Diagnostics add value to your system

Advanced motor protection

Using proprietary algorithms, CoreSense goes beyond conventional basic motor protection. It protects the compressor from severe damage-causing failures like locked rotor, single phasing and voltage imbalances. Furthermore, CoreSense provides discharge temperature protection.

CoreSense not only protects the compressor from these critical failures but also displays, stores and communicates this information to the customer and to responsible service technicians, so that the problem can be quickly diagnosed to avoid system downtime and food loss.

Diagnostics

The diagnostics feature of CoreSense provides the compressor alarm history and running status information. EEPROM memory in the CoreSense module stores the complete failure history including asset information of the compressor (serial number and model number of the compressor). The customer can access the information directly on site using the rack controller display or CoreSense PC interface software. This software is either installed on the service laptop or on a remote computer with access via Modbus communication.

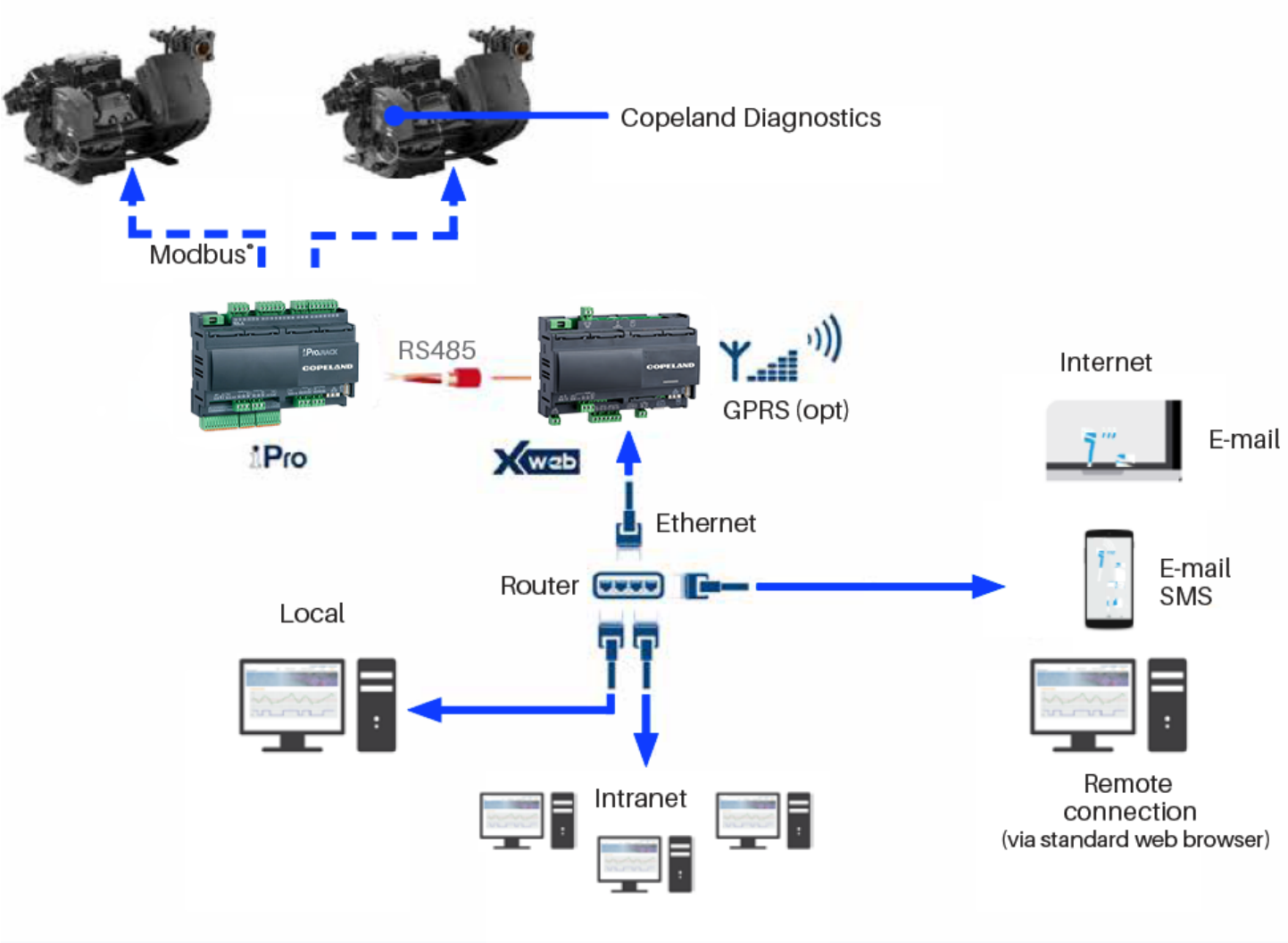
Communication

Figure 2 shows an example of CoreSense communication with Copeland iProRack. The communication feature of the CoreSense module provides access to information such as alarm history, operating parameters and the running status for a rack controller with open Modbus protocol.

It enables remote reset capability and remote monitoring of the compressor information with no requirement of actually visiting the site. An easy-to-access and user-friendly Copeland web server interface for rack controller, Copeland iProRack, allows customers to read the CoreSense information remotely with a graphical interface.

In addition, we offer a PC interface software for a direct service laptop connection to the CoreSense module. This enables access to CoreSense module information directly on site such as compressor operating information and alarm history.

Figure 2



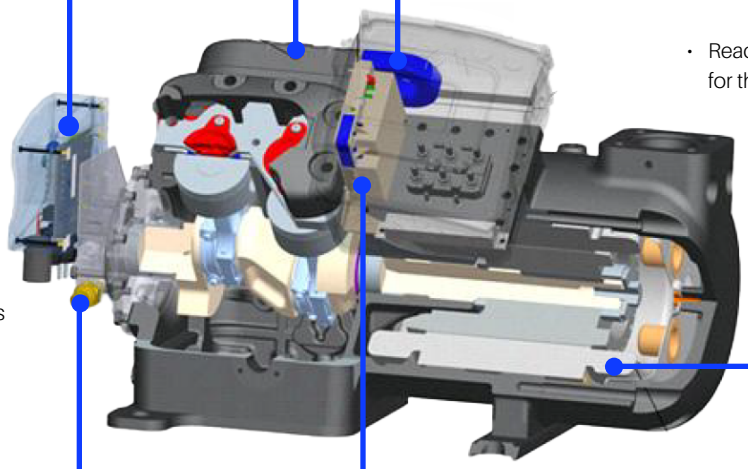
The alarm history is stored in different ways:

- 8-day history of alarms showing the number of occurences per day
- The most recent 10 alarms
- Accumulated number of failures since the compressor was first put into operation
  - Compressor running status information
  - Number of compressor running hours, alignment starts, resets and type of resets
  - Number of compressor running hours without sufficient oil pressure

CoreSense architecture

CoreSense control module

- Motor overheat protection
- Oil protection High discharge temperature protection
- Communication to rack controller via Modbus
- Sensor module communications
- Compressor proofing
- EEPROM memory
- Alarm history, operating capability
- Multi-color LEDs to indicate alarms



Discharge temperature sensor

Current sensor inside terminal box

- Reads current values as an input for the sensor modules

Motor temperature sensor

Oil pressure sensor

Sensor module inside

- Reads and processes phase voltages by using voltage sensing leads and current sensor module
- Supplies information to CoreSense control module
- Acts as a slave to CoreSense control module

- Sensor module offers the following features:
  - Locked rotor
  - Low voltage
  - Single phasing
  - Voltage imbalance
  - Crankcase heater control
  - Power consumption monitoring protection

CoreSense Diagnostics features

- Basic protection - Against motor overheat and insufficient oil protection
- Advanced motor protection - Against single phasing, locked rotor, voltage imbalance and protection of discharge temperature and low voltage
- Diagnostics - Alarm history, compressor operating history, compressor running status information
- Communication - From the CoreSense to a rack controller using open Modbus® protocol
- Advanced features - Power consumption measurement (voltage, current; power factor measurement), remote reset capability, crankcase heater control

What it means to you

- Improved compressor reliability and performance
- Easy preventive maintenance using the diagnostics features
- Avoidance of refrigeration system downtime and food loss
- Reduced applied system costs
  - Factory installed devices: Oil protection sensor and the discharge temperature sensor are installed and connections are already made in the factory
  - Crankcase heater control is integrated in CoreSense
- Remote access to the compressor data, running status and possibility to reset alarms without visiting the installation site
- Multi-color LEDs on the module help to find any compressor issue quickly
- Power consumption monitoring of the compressor to analyze the energy costs of the compressor

iProRack controller

Copeland Multi-Compressor Packs are designed with Copeland iProRack controller. The iProRack is built on a highly sophisticated and stable platform with LINUX operating system on a CPU ARM9 (200MHz/32bit). The software is created on a well-structured and documented development system. This provides guaranteed controller support throughout the equipment life time. In addition, the platform can be expanded. It can control up to two circuits with a maximum of six compressors per circuit. It can drive one lead compressor per circuit with either inverter or Copeland digital modulation. iProRack provides benefits to end users and contractors that are simply unmatched by any multiple controller platform in the market today.

The iProRack controller is also designed with multiple proprietary algorithms which provides best running cost. It is featured with dynamic set point control, which allows the user to schedule target suction and discharge pressures based on time, external analog or digital set points. The controller is also capable of doing iterative optimization of target suction pressures when connected to Copeland cold room or case temperature controllers. This is a very powerful feature that helps in reducing running cost. One-degree centigrade change in set point can save between 2-5% of annual electricity cost.

The iProRack controller is interfaced with a Visograph, featuring a large LCD graphic display. This provides excellent interface on the machine room to view Stream compressor operation status, modulation, CoreSense Diagnostics messages, and other operating information.

Electrical panel

Copeland Multi-Compressor Packs are fitted with a fully featured electrical panel for ease of installation and reduced field cost. The panel uses high quality electrical switch gears and cable. It is designed for high reliability and safe operation.

Features of the electrical panel include:

- Flexible and easy to configure circuit breakers and thermal overload protectors for each individual compressor
- Phase failure & voltage protection
- Complete wiring for compressor rack control & management

See Figure 3.A and Figure 3.B for electrical panel layout.

Figure 3.A

Figure 3.B

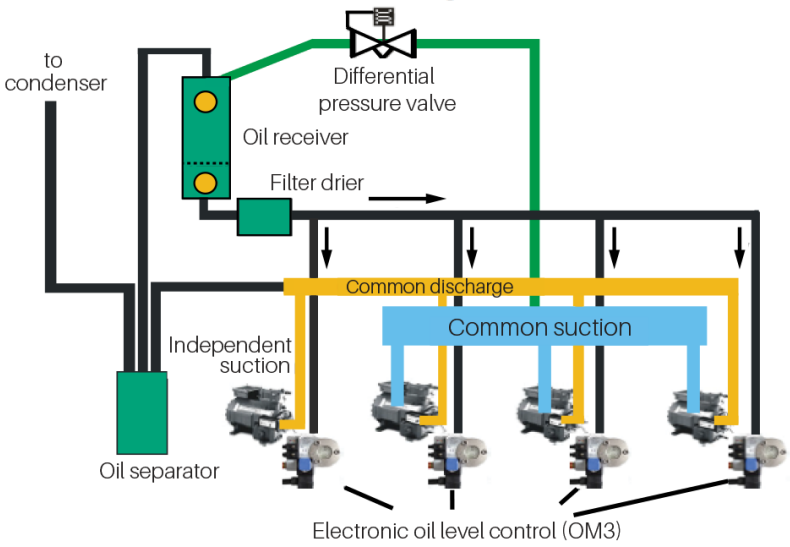
Connectivity with Stream CoreSense Diagnostics and Copeland X-Web

Refer to Figure 2 (page 9). iProRack controller communicates with the CoreSense Diagnostics module for maximum compressor protection against low oil pressure, excessive discharge temperature and motor over heat. iProRack has an integrated web site which can be easily accessed through a standard web browser. RS485 communication allows connectivity to the Copeland X-Web supervisory controller, providing an intelligent architecture to the refrigeration system.

Copeland electronic oil management system

The layout in Figure 4 shows a typical active electronic oil management system.

Figure 4



Oil management is an important parameter for any rack. As two or more compressors are operated in parallel, it is of primary importance that oil is circulated into the system, returned back to the compressors, and is equalized properly. If oil does not return properly to each compressor, and is not equalized well, compressors will start to fail.

Table 1 shows the Copeland electronic oil management system components used on the Copeland Multi- Compressor Pack.

Copeland line components

Table 2 shows the list of line components used in the Copeland Multi-Compressor Pack.

Optimized and insulated suction header

The suction headers are designed for the lowest pressure loss at the same time sufficiently return oil back to the compressor. The headers are designed with maximum of 4 return lines stubs coming from evaporator. The suction header is designed with high quality refrigerant grade copper piping.

Table 1

Copeland electronic oil management system
Electronic oil level control (OM3)
Oil filter
Oil receiver
Oil separator
Oil sight glass

Table 2

Copeland line components
Ball valves
Check valves (discharge line and oil separator)
High pressure/low pressure adjustable switches
HP transducer (Copeland PP/PPR series)
Liquid line ball valve
Liquid line filter drier (replaceable core type)
Liquid line sight glass
LP transducer (Copeland PP/PPR series)
Pressure relief valve (on receiver)
Suction line filter drier (replaceable core type)

High quality discharge header

The discharge headers are designed for field reliability to handle the start stop stresses and discharge pulsation. The discharge header is designed with high quality refrigerant grade copper piping.

Spring mounted frame

The frames are built with mild steel and painted for strength and rust prevention. The frame is supported by springs to absorb transmitted vibration to the mounting floor.

Optional liquid station

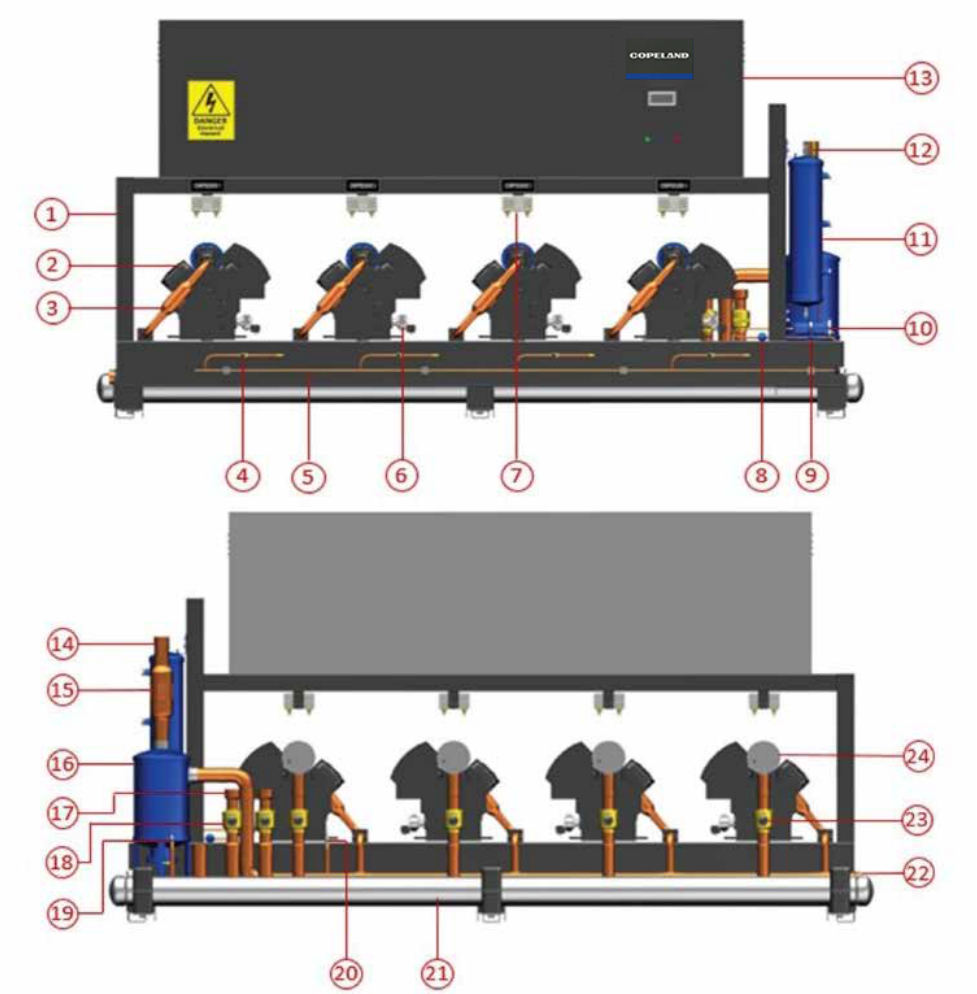
The optional liquid station consists of:

- Liquid receiver with inlet and Rotalock valve outlet and built-in sight glass (2 or 3)
- Filter drier with replaceable core
- Moisture indicator
- Ball valve for isolation
- Low liquid level alarm switch
- Pressure relief valve

The separate liquid station allows for flexible installation of liquid receiver either side by side to the rack or close to the condenser or evaporators.

Layout

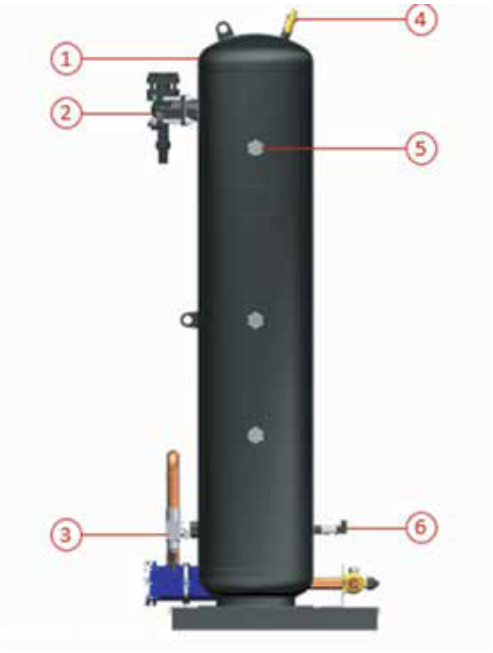
4 compressor rack

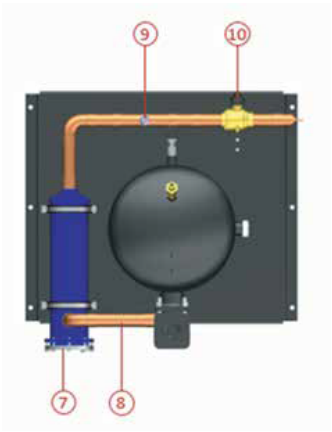


Item	Description	Item	Description
1	Base-frame	13	Control panel*
2	Stream compressor	14	Condenser inlet
3	Discharge lines with check valve	15	Check valve
4	Oil return line ball valve	16	Centrifugal oil separator
5	Oil return header	17	Suction inlet
6	Electronic oil level control (OM3)	18	Ball valve
7	Pressure control switch	19	LP transducer
8	Oil sight glass	20	HP transducer
9	Oil return line ball valve	21	Suction header
10	Oil filter	22	Discharge header
11	Oil receiver	23	Ball valve
12	Differential pressure valve	24	Suction filter

*Note: Units are also available without the control panel.

Mobile liquid station





Item	Description
1	Receiver
2	Inlet valve
3	Outlet valve
4	Pressure relief valve
5	Receiver sight glasses
6	Liquid level switch
7	Filter drier
8	Liquid line
9	Liquid line sight glass
10	Ball valve

Depending on application requirement and rack capacity, liquid stations are available in different capacities as follows:

Liquid station Copeland part no.	Liquid receiver volume (liters)	Inlet rotalock valve (ODS, in)	Outlet rotalock valve (ODS, in)	Filter drier
577-0552-00	90	1-3/8	1-1/8	Two core - 48 cu in.
577-0552-01	130	1-5/8	1-3/8	Two core - 48 cu in.
577-0552-02	160	2-1/8	1-5/8	Three core - 48 cu in.
577-0552-03	225	2-1/8	1-5/8	Three core - 48 cu in.
577-0552-04	350	2-5/8	2-1/8	Three core - 48 cu in.
577-0552-05	350	2-5/8	2-1/8	Three core - 100 cu in.

Mechanical specification

Medium temperature (MT)

Model name	Compressor model	No. of compressors	Capacity (kW)	Total displacement (m3/h)	Nominal unit weight (kg)	Liquid receiver volume (liters)	Receiver station part numbers
EMP-24M044MM-XXX	4MA-22X	2	64	123	1200	90	577-0546-00
EMP-34M066MM-XXX	4MA-22X	3	96	185	1400	130	577-0546-01
EMP-44M088MM-XXX	4MA-22X	4	128	247	1800	160	577-0546-02
EMP-24M050MM-XXX	4MH-25X	2	75	143	1200	130	577-0546-01
EMP-34M075MM-XXX	4MH-25X	3	113	214	1400	130	577-0546-01
EMP-44M100MM-XXX	4MH-25X	4	150	286	1800	160	577-0546-02
EMP-24M060MM-XXX	4MI-30X	2	84	156	1200	130	577-0546-01
EMP-34M090MM-XXX	4MI-30X	3	125	234	1400	160	577-0546-02
EMP-44M120MM-XXX	4MI-30X	4	167	312	1800	225	577-0546-03
EMP-24M066MM-XXX	4MJ-33X	2	93	175	1200	130	577-0546-01
EMP-34M099MM-XXX	4MJ-33X	3	140	263	1400	160	577-0546-02
EMP-44M132MM-XXX	4MJ-33X	4	186	350	1800	225	577-0546-03
EMP-24M070MM-XXX	4MK-35X	2	105	199	1200	130	577-0546-01
EMP-34M105MM-XXX	4MK-35X	3	157	299	1400	160	577-0546-02
EMP-44M140MM-XXX	4MK-35X	4	209	398	1800	350	577-0546-04
EMP-26M080MM-XXX	6MI-40X	2	126	241	1200	160	577-0546-02
EMP-36M120MM-XXX	6MI-40X	3	190	362	1400	225	577-0546-03
EMP-46M160MM-XXX	6MI-40X	4	253	482	1800	350	577-0546-04
EMP-26M090MM-XXX	6MJ-45X	2	142	270	1200	160	577-0546-02
EMP-36M135MM-XXX	6MJ-45X	3	212	405	1400	350	577-0546-04
EMP-46M180MM-XXX	6MJ-45X	4	283	540	1800	350	577-0546-05
EMP-26M100MM-XXX	6MK-50X	2	158	306	1200	160	577-0546-02
EMP-36M150MM-XXX	6MK-50X	3	237	459	1400	350	577-0546-04
EMP-46M200MM-XXX	6MK-50X	4	316	612	1800	350	577-0546-05

Low temperature (LT)

Model name	Compressor model	No. of compressors	Capacity (kW)	Total displacement (m3/h)	Nominal unit weight (kg)	Liquid receiver volume (liters)	Receiver station part numbers
EMP-24M030LM-XXX	4ML-15X	2	37	143	1200	90	577-0546-00
EMP-34M045LM-XXX	4ML-15X	3	55	214	1400	90	577-0546-00
EMP-44M060LM-XXX	4ML-15X	4	73	286	1800	130	577-0546-01
EMP-24M040LM-XXX	4MM-20X	2	41	156	1200	90	577-0546-00
EMP-34M060LM-XXX	4MM-20X	3	61	234	1400	90	577-0546-00
EMP-44M080LM-XXX	4MM-20X	4	82	312	1800	130	577-0546-01
EMP-24M044LM-XXX	4MT-22X	2	46	175	1200	90	577-0546-00
EMP-34M066LM-XXX	4MT-22X	3	69	263	1400	90	577-0546-00
EMP-44M088LM-XXX	4MT-22X	4	92	350	1800	130	577-0546-01
EMP-24M050LM-XXX	4MU-25X	2	50	199	1200	90	577-0546-00
EMP-34M075LM-XXX	4MU-25X	3	76	299	1400	130	577-0546-01
EMP-44M100LM-XXX	4MU-25X	4	101	398	1800	130	577-0546-01
EMP-26M060LM-XXX	6MM-30X	2	61	241	1200	90	577-0546-00
EMP-36M090LM-XXX	6MM-30X	3	92	362	1400	130	577-0546-01
EMP-46M120LM-XXX	6MM-30X	4	123	482	1800	160	577-0546-02
EMP-26M070LM-XXX	6MT-35X	2	69	270	1200	90	577-0546-00
EMP-36M105LM-XXX	6MT-35X	3	104	405	1400	130	577-0546-01
EMP-46M140LM-XXX	6MT-35X	4	138	540	1800	160	577-0546-02
EMP-26M080LM-XXX	6MU-40X	2	77	306	1200	130	577-0546-01
EMP-36M120LM-XXX	6MU-40X	3	116	459	1400	130	577-0546-01
EMP-46M160LM-XXX	6MU-40X	4	154	612	1800	160	577-0546-02

Note:

1. Capacity calculated for R404A at

   Medium temperature: Evaporating temperature: -10°C / Condensing temperature: 45°C / Superheat: 20K

   Low temperature: Evaporating temperature: -25°C / Condensing temperature: 45°C / Superheat: 20K

2. Liquid receiver volume (liters) is given with respect to rack capacities.

3. For rack capacities of 50kW or lower, depending on customer demand, 60 liter size liquid receiver stations can be made available.

Electrical specification

Medium temperature (MT)

Model name	Compressor	Compressor quantity	MOC (Amps)	Total MOC (Amps)	PW1 O/L	PW2 O/L	Time delay block
EMP-24M044MM-XXX	4MA-22X	2	36.3	72.6	Y	Y	Y
EMP-34M066MM-XXX	4MA-22X	3	36.3	108.9	Y	Y	Y
EMP-44M088MM-XXX	4MA-22X	4	36.3	145.2	Y	Y	Y
EMP-24M050MM-XXX	4MH-25X	2	41.6	83.2	Y	Y	Y
EMP-34M075MM-XXX	4MH-25X	3	41.6	124.8	Y	Y	Y
EMP-44M100MM-XXX	4MH-25X	4	41.6	166.4	Y	Y	Y
EMP-24M060MM-XXX	4MI-30X	2	46.6	93.2	Y	Y	Y
EMP-34M090MM-XXX	4MI-30X	3	46.6	139.8	Y	Y	Y
EMP-44M120MM-XXX	4MI-30X	4	46.6	186.4	Y	Y	Y
EMP-24M066MM-XXX	4MJ-33X	2	52.9	105.8	Y	Y	Y
EMP-34M099MM-XXX	4MJ-33X	3	52.9	158.7	Y	Y	Y
EMP-44M132MM-XXX	4MJ-33X	4	52.9	211.6	Y	Y	Y
EMP-24M070MM-XXX	4MK-35X	2	61.1	122.2	Y	Y	Y
EMP-34M105MM-XXX	4MK-35X	3	61.1	183.3	Y	Y	Y
EMP-44M140MM-XXX	4MK-35X	4	61.1	244.4	Y	Y	Y
EMP-26M080MM-XXX	6MI-40X	2	71.4	142.8	Y	Y	Y
EMP-36M120MM-XXX	6MI-40X	3	71.4	214.2	Y	Y	Y
EMP-46M160MM-XXX	6MI-40X	4	71.4	285.6	Y	Y	Y
EMP-26M090MM-XXX	6MJ-45X	2	81.5	163.0	Y	Y	Y
EMP-36M135MM-XXX	6MJ-45X	3	81.5	244.5	Y	Y	Y
EMP-46M180MM-XXX	6MJ-45X	4	81.5	326.0	Y	Y	Y
EMP-26M100MM-XXX	6MK-50X	2	92.9	185.8	Y	Y	Y
EMP-36M150MM-XXX	6MK-50X	3	92.9	278.7	Y	Y	Y
EMP-46M200MM-XXX	6MK-50X	4	92.9	371.6	Y	Y	Y

Low temperature (LT)

Model name	Compressor	Compressor quantity	MOC (Amps)	Total MOC (Amps)	PW1 O/L	PW2 O/L	Time delay block
EMP-24M030LM-XXX	4ML-15X	2	35.4	70.8	Y	Y	Y
EMP-34M045LM-XXX	4ML-15X	3	35.4	106.2	Y	Y	Y
EMP-44M060LM-XXX	4ML-15X	4	35.4	141.6	Y	Y	Y
EMP-24M040LM-XXX	4MM-20X	2	39.0	78.0	Y	Y	Y
EMP-34M060LM-XXX	4MM-20X	3	39.0	117.0	Y	Y	Y
EMP-44M080LM-XXX	4MM-20X	4	39.0	156.0	Y	Y	Y
EMP-24M044LM-XXX	4MT-22X	2	44.5	89.0	Y	Y	Y
EMP-34M066LM-XXX	4MT-22X	3	44.5	133.5	Y	Y	Y
EMP-44M088LM-XXX	4MT-22X	4	44.5	178.0	Y	Y	Y
EMP-24M050LM-XXX	4MU-25X	2	51.9	103.8	Y	Y	Y
EMP-34M075LM-XXX	4MU-25X	3	51.9	155.7	Y	Y	Y
EMP-44M100LM-XXX	4MU-25X	4	51.9	207.6	Y	Y	Y
EMP-26M060LM-XXX	6MM-30X	2	59.7	119.4	Y	Y	Y
EMP-36M090LM-XXX	6MM-30X	3	59.7	179.1	Y	Y	Y
EMP-46M120LM-XXX	6MM-30X	4	59.7	238.8	Y	Y	Y
EMP-26M070LM-XXX	6MT-35X	2	67.3	134.6	Y	Y	Y
EMP-36M105LM-XXX	6MT-35X	3	67.3	201.9	Y	Y	Y
EMP-46M140LM-XXX	6MT-35X	4	67.3	269.2	Y	Y	Y
EMP-26M080LM-XXX	6MU-40X	2	75.8	151.6	Y	Y	Y
EMP-36M120LM-XXX	6MU-40X	3	75.8	227.4	Y	Y	Y
EMP-46M160LM-XXX	6MU-40X	4	75.8	303.2	Y	Y	Y

Note:

Maximum operating current (MOC) calculated for R404A at

MT: Evaporating temp: -10°C / Condensing temp: 45°C / Superheat: 20K

LT: Evaporating temp: -25°C / Condensing temp: 45°C / Superheat: 20K

Mechanical specification

Medium temperature (MT)

Model name	Compressor model	No. of compressors	Capacity (kW)	Total displacement (m3/h)	Nominal unit weight (kg)	Liquid receiver volume (liters)	Receiver station part numbers
EMP-24M044MK-XXX	4MA-22X	2	75	149	1200	130	577-0546-01
EMP-34M066MK-XXX	4MA-22X	3	113	224	1400	130	577-0546-01
EMP-44M088MK-XXX	4MA-22X	4	151	298	1800	160	577-0546-02
EMP-24M050MK-XXX	4MH-25X	2	89	172	1200	130	577-0546-01
EMP-34M075MK-XXX	4MH-25X	3	133	258	1400	160	577-0546-02
EMP-44M100MK-XXX	4MH-25X	4	178	344	1800	225	577-0546-03
EMP-24M060MK-XXX	4MI-30X	2	99	189	1200	130	577-0546-01
EMP-34M090MK-XXX	4MI-30X	3	148	284	1400	160	577-0546-02
EMP-44M120MK-XXX	4MI-30X	4	198	378	1800	225	577-0546-03
EMP-24M066MK-XXX	4MJ-33X	2	110	212	1200	130	577-0546-01
EMP-34M099MK-XXX	4MJ-33X	3	165	318	1400	160	577-0546-02
EMP-44M132MK-XXX	4MJ-33X	4	220	424	1800	350	577-0546-04
EMP-24M070MK-XXX	4MK-35X	2	124	240	1200	160	577-0546-02
EMP-34M105MK-XXX	4MK-35X	3	185	360	1400	225	577-0546-03
EMP-44M140MK-XXX	4MK-35X	4	247	480	1800	350	577-0546-04
EMP-26M080MK-XXX	6MI-40X	2	149	291	1200	160	577-0546-02
EMP-36M120MK-XXX	6MI-40X	3	224	437	1400	350	577-0546-04
EMP-46M160MK-XXX	6MI-40X	4	298	582	1800	350	577-0546-05
EMP-26M090MK-XXX	6MJ-45X	2	167	326	1200	225	577-0546-03
EMP-36M135MK-XXX	6MJ-45X	3	251	489	1400	350	577-0546-04
EMP-46M180MK-XXX	6MJ-45X	4	334	652	1800	350	577-0546-05
EMP-26M100MK-XXX	6MK-50X	2	187	370	1200	225	577-0546-03
EMP-36M150MK-XXX	6MK-50X	3	280	555	1400	350	577-0546-05
EMP-46M200MK-XXX	6MK-50X	4	373	740	1800	350	577-0546-05

Low temperature (LT)

Model name	Compressor model	No. of compressors	Capacity (kW)	Total displacement (m3/h)	Nominal unit weight (kg)	Liquid receiver volume (liters)	Receiver station part numbers
EMP-24M030LK-XXX	4ML-15X	2	43	172	1200	90	577-0546-00
EMP-34M045LK-XXX	4ML-15X	3	65	258	1400	90	577-0546-00
EMP-44M060LK-XXX	4ML-15X	4	86	344	1800	130	577-0546-01
EMP-24M040LK-XXX	4MM-20X	2	48	189	1200	90	577-0546-00
EMP-34M060LK-XXX	4MM-20X	3	72	284	1400	130	577-0546-01
EMP-44M080LK-XXX	4MM-20X	4	96	378	1800	130	577-0546-01
EMP-24M044LK-XXX	4MT-22X	2	54	212	1200	90	577-0546-00
EMP-34M066LK-XXX	4MT-22X	3	81	318	1400	130	577-0546-01
EMP-44M088LK-XXX	4MT-22X	4	108	424	1800	130	577-0546-01
EMP-24M050LK-XXX	4MU-25X	2	60	240	1200	90	577-0546-00
EMP-34M075LK-XXX	4MU-25X	3	89	360	1400	130	577-0546-01
EMP-44M100LK-XXX	4MU-25X	4	119	480	1800	130	577-0546-01
EMP-26M060LK-XXX	6MM-30X	2	72	291	1200	130	577-0546-01
EMP-36M090LK-XXX	6MM-30X	3	109	437	1400	130	577-0546-01
EMP-46M120LK-XXX	6MM-30X	4	145	582	1800	160	577-0546-02
EMP-26M070LK-XXX	6MT-35X	2	81	326	1200	130	577-0546-01
EMP-36M105LK-XXX	6MT-35X	3	122	489	1400	160	577-0546-02
EMP-46M140LK-XXX	6MT-35X	4	163	652	1800	225	577-0546-03
EMP-26M080LK-XXX	6MU-40X	2	91	370	1200	130	577-0546-01
EMP-36M120LK-XXX	6MU-40X	3	137	555	1400	160	577-0546-02
EMP-46M160LK-XXX	6MU-40X	4	182	740	1800	225	577-0546-03

Note:

1. Capacity calculated for R404A at

   Medium temperature: Evaporating temperature: -10°C / Condensing temperature: 45°C / Superheat: 20K

   Low temperature: Evaporating temperature: -25°C / Condensing Temperature: 45°C / Superheat: 20K

2. Liquid receiver volume (liters) is given with respect to rack capacities.

3. For rack capacities of 50kW or lower, depending on customer demand, 60 liter size liquid receiver stations can be made available.

Electrical specification

Medium temperature (MT)

Model name	Compressor	No. Of compressors	MOC 400V (Amps)	MOC 400V total (Amps)	O/L
EMP-24M044MK-XXX	4MA-22X	2	45.7	91.4	Y
EMP-34M066MK-XXX	4MA-22X	3	45.7	137.1	Y
EMP-44M088MK-XXX	4MA-22X	4	45.7	182.8	Y
EMP-24M050MK-XXX	4MH-25X	2	52.4	104.8	Y
EMP-34M075MK-XXX	4MH-25X	3	52.4	157.2	Y
EMP-44M100MK-XXX	4MH-25X	4	52.4	209.6	Y
EMP-24M060MK-XXX	4MI-30X	2	58.7	117.4	Y
EMP-34M090MK-XXX	4MI-30X	3	58.7	176.1	Y
EMP-44M120MK-XXX	4MI-30X	4	58.7	234.8	Y
EMP-24M066MK-XXX	4MJ-33X	2	66.7	133.4	Y
EMP-34M099MK-XXX	4MJ-33X	3	66.7	200.1	Y
EMP-44M132MK-XXX	4MJ-33X	4	66.7	266.8	Y
EMP-24M070MK-XXX	4MK-35X	2	77.0	154.0	Y
EMP-34M105MK-XXX	4MK-35X	3	77.0	231.0	Y
EMP-44M140MK-XXX	4MK-35X	4	77.0	308.0	Y
EMP-26M080MK-XXX	6MI-40X	2	90.0	180.0	Y
EMP-36M120MK-XXX	6MI-40X	3	90.0	270.0	Y
EMP-46M160MK-XXX	6MI-40X	4	90.0	360.0	Y
EMP-26M090MK-XXX	6MJ-45X	2	103.0	206.0	Y
EMP-36M135MK-XXX	6MJ-45X	3	103.0	309.0	Y
EMP-46M180MK-XXX	6MJ-45X	4	103.0	412.0	Y
EMP-26M100MK-XXX	6MK-50X	2	117.0	234.0	Y
EMP-36M150MK-XXX	6MK-50X	3	117.0	351.0	Y
EMP-46M200MK-XXX	6MK-50X	4	117.0	468.0	Y

Low temperature (LT)

Model name	Compressor	No. of compressors	MOC 400V (Amps)	MOC 400V total (Amps)	O/L
EMP-24M030LK-XXX	4ML-15X	2	44.6	89.2	Y
EMP-34M045LK-XXX	4ML-15X	3	44.6	133.8	Y
EMP-44M060LK-XXX	4ML-15X	4	44.6	178.4	Y
EMP-24M040LK-XXX	4MM-20X	2	49.1	98.2	Y
EMP-34M060LK-XXX	4MM-20X	3	49.1	147.3	Y
EMP-44M080LK-XXX	4MM-20X	4	49.1	196.4	Y
EMP-24M044LK-XXX	4MT-22X	2	56.1	112.2	Y
EMP-34M066LK-XXX	4MT-22X	3	56.1	168.3	Y
EMP-44M088LK-XXX	4MT-22X	4	56.1	224.4	Y
EMP-24M050LK-XXX	4MU-25X	2	65.4	130.8	Y
EMP-34M075LK-XXX	4MU-25X	3	65.4	196.2	Y
EMP-44M100LK-XXX	4MU-25X	4	65.4	261.6	Y
EMP-26M060LK-XXX	6MM-30X	2	75.2	150.4	Y
EMP-36M090LK-XXX	6MM-30X	3	75.2	225.6	Y
EMP-46M120LK-XXX	6MM-30X	4	75.2	300.8	Y
EMP-26M070LK-XXX	6MT-35X	2	84.8	169.6	Y
EMP-36M105LK-XXX	6MT-35X	3	84.8	254.4	Y
EMP-46M140LK-XXX	6MT-35X	4	84.8	339.2	Y
EMP-26M080LK-XXX	6MU-40X	2	95.5	191.0	Y
EMP-36M120LK-XXX	6MU-40X	3	95.5	286.5	Y
EMP-46M160LK-XXX	6MU-40X	4	95.5	382.0	Y

Note:

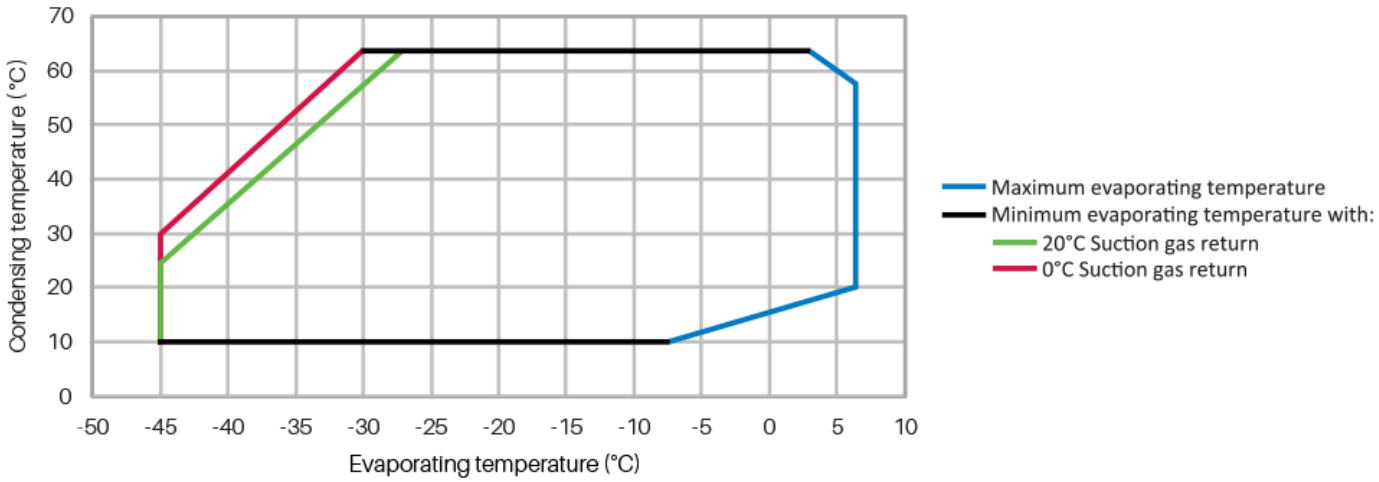
Maximum operating current (MOC) calculated for R404A at

MT: Evaporating temp: -10°C / Condensing temp: 45°C / Superheat: 20K

LT: Evaporating temp: -25°C / Condensing temp: 45°C / Superheat: 20K

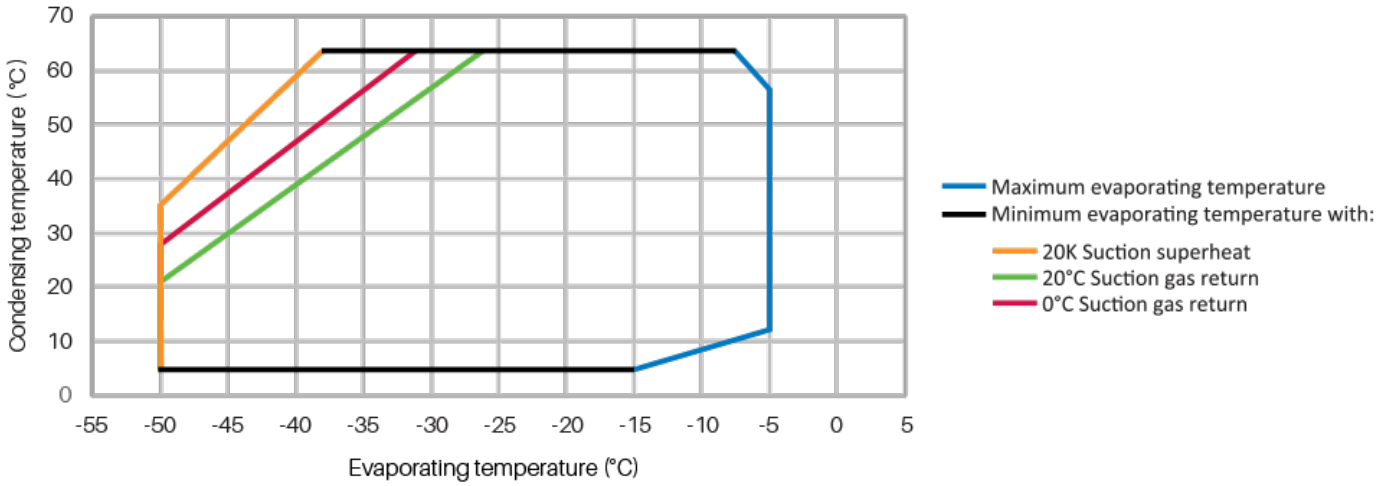
Medium temperature application

Rack with compressor models: 4MA-22X, 4MH-25X, 4MI-30X, 4MJ-33X, 4MK-35X, 6MI-40X, 6MJ-45X, 6MK-50X

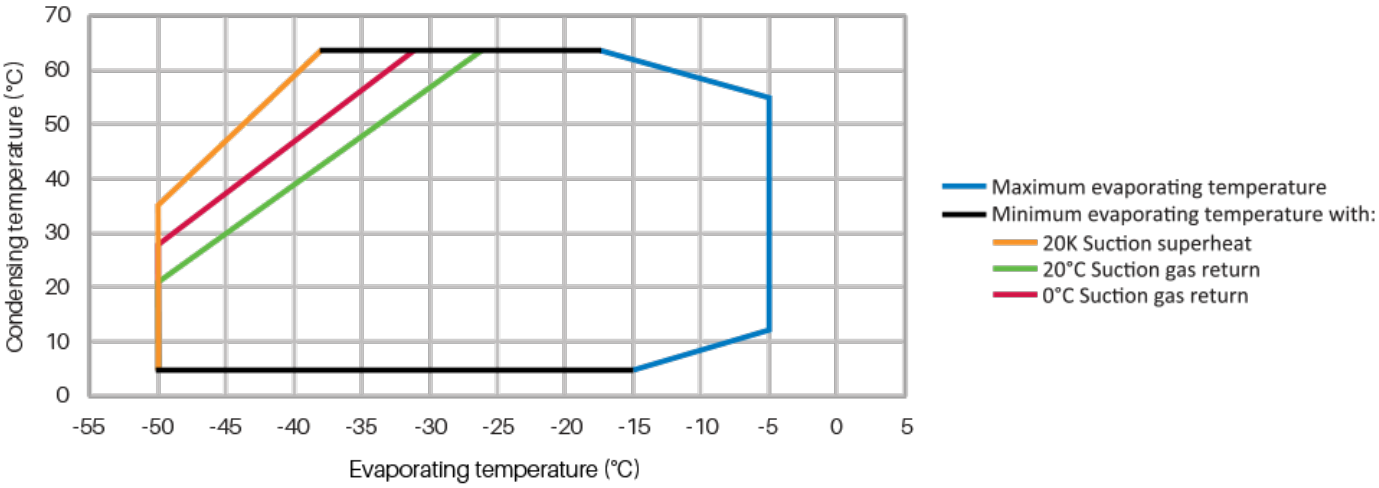


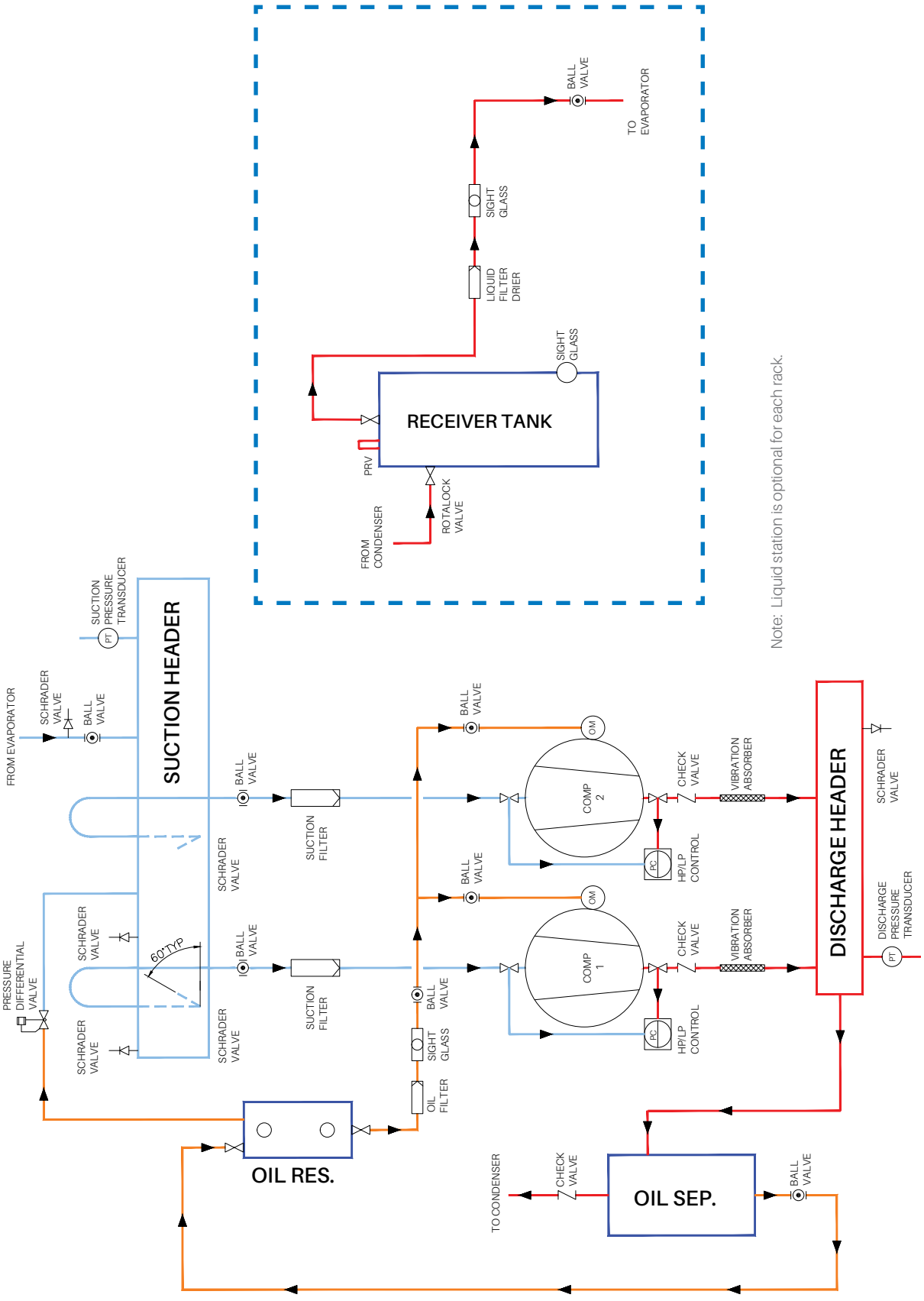
Low temperature application

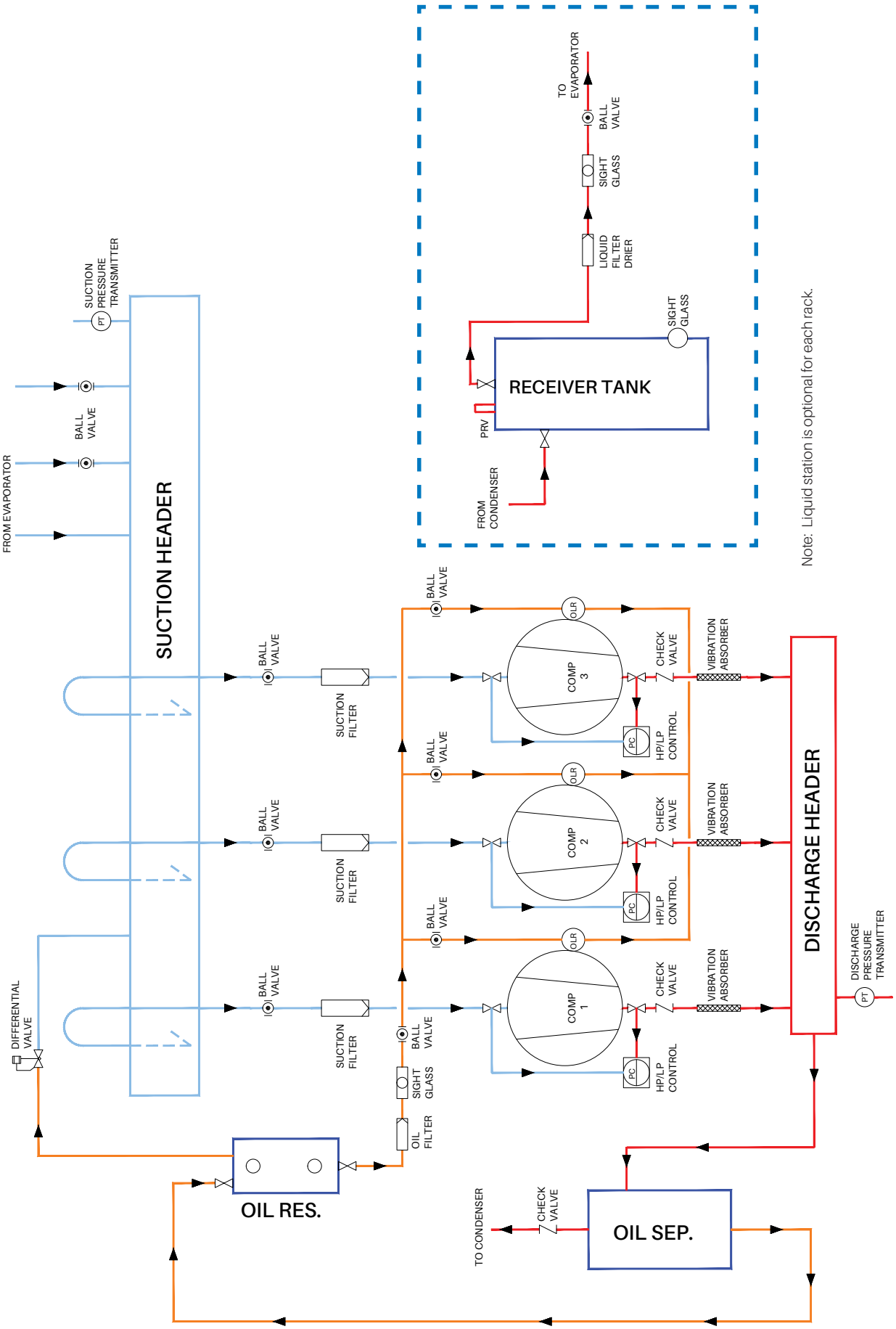
Rack with compressor models: 4MF-13X ,4ML-15X ,4MM-20X , 4MT-22X, 6MM-30X ,6MT-35X, 6MU-40X

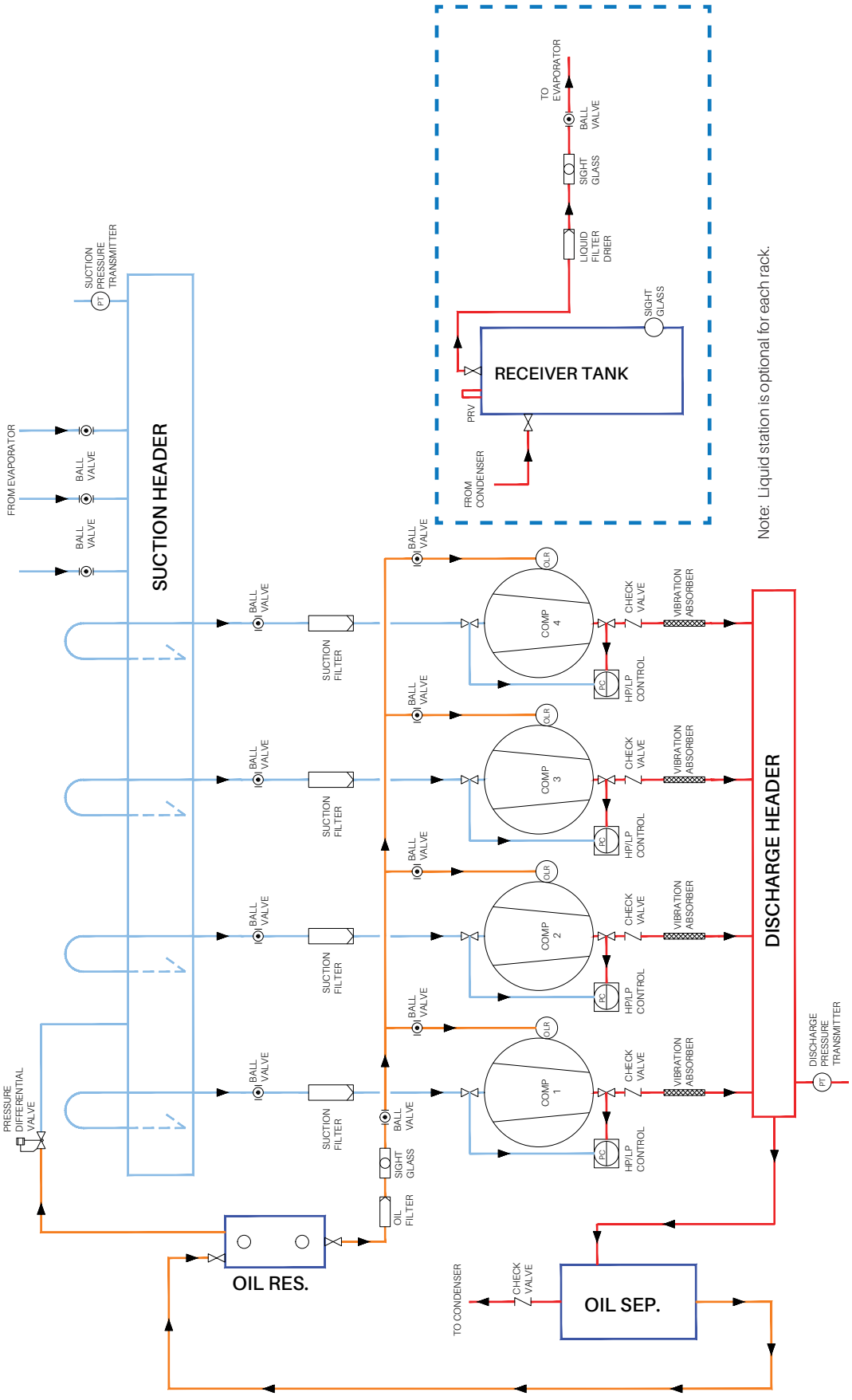


Rack with compressor model: 4MU-25X

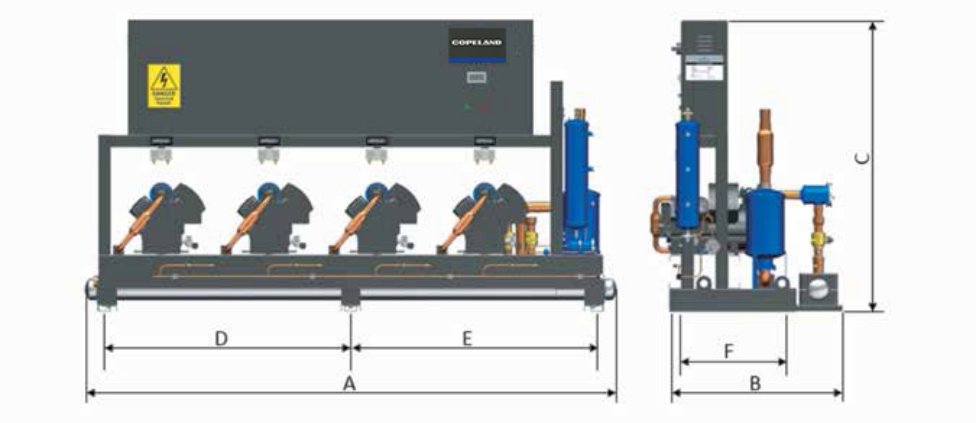



RECEIVER TANK
SIGHT GLASS
LIQUID FILTER DRIER
SIGHT GLASS
BALL VALVE
TO EVAPORATOR
PRV
ROTALOCK VALVE
FROM CONDENSER
Note: Liquid station is optional for each rack.
SUCTION HEADER
SUCTION PRESSURE TRANSDUCER
FROM EVAPORATOR
SCHRADER VALVE
BALL VALVE
PRESSURE DIFFERENTIAL VALVE
60° TYP
SUCTION FILTER
OIL FILTER
OIL RES.
COMP 2
COMP 1
OM
CHECK VALVE
VIBRATION ABSORBER
HP/LP CONTROL
DISCHARGE HEADER
DISCHARGE PRESSURE TRANSDUCER
OIL SEP.
TO CONDENSER

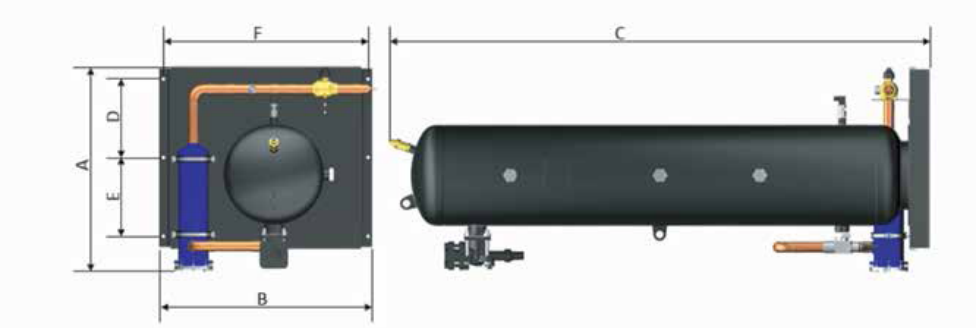

TO EVAPORATOR
BALL VALVE
SIGHT GLASS
LIQUID FILTER DRIER
SIGHT GLASS
RECEIVER TANK
PRV
FROM CONDENSER
Note: Liquid station is optional for each rack.
SUCTION PRESSURE TRANSMITTER
PT
BALL VALVE
FROM EVAPORATOR
SUCTION HEADER
BALL VALVE
SUCTION FILTER
BALL VALVE
OLR
COMP 3
CHECK VALVE
VIBRATION ABSORBER
PC
HP/LP CONTROL
BALL VALVE
OLR
COMP 2
CHECK VALVE
VIBRATION ABSORBER
PC
HP/LP CONTROL
BALL VALVE
OLR
COMP 1
CHECK VALVE
VIBRATION ABSORBER
PC
HP/LP CONTROL
DISCHARGE HEADER
DISCHARGE PRESSURE TRANSMITTER
PT
DIFFERENTIAL VALVE
SUCTION FILTER
BALL VALVE
SIGHT GLASS
OIL FILTER
OIL RES.
TO CONDENSER
CHECK VALVE
OIL SEP.


TO EVAPORATOR
BALL VALVE
SIGHT GLASS
LIQUID FILTER DRIER
SIGHT GLASS
RECEIVER TANK
PRV
FROM CONDENSER
Note: Liquid station is optional for each rack.
SUCTION PRESSURE TRANSMITTER
PT
FROM EVAPORATOR
BALL VALVE
BALL VALVE
SUCTION HEADER
BALL VALVE
SUCTION FILTER
BALL VALVE
OLR
COMP 4
CHECK VALVE
VIBRATION ABSORBER
HP/LP CONTROL
HPC
COMP 3
COMP 2
COMP 1
DISCHARGE HEADER
DISCHARGE PRESSURE TRANSMITTER
PRESSURE DIFFERENTIAL VALVE
SIGHT GLASS
OIL FILTER
OIL RES.
TO CONDENSER
CHECK VALVE
OIL SEP.

Dimensional drawings



No. of compressors	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
2 compressor	2040 (nominal)	1129	1115	895	915	705
3 compressor	2800 (nominal)	1129	1900	1257.5	1257.5	705
4 compressor	3504 (nominal)	1129	1900	1610	1610	705



Part number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
577-0546-00	672	772	1462	250	250	740
577-0546-01	677	772	2012	250	250	740
577-0546-02	812	847	1611	312	313	815
577-0546-03	812	847	2150	312	313	815
577-0546-04	933	922	2164	350	350	890
577-0546-05	956	922	2164	350	350	890

Note: Please contact your Copeland representative for line sizes.

Other supplementary references

1. IProRack controller user manual
2. Stream user manual
3. Select 7 software

General Information

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

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

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

Note:

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

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Copeland is a global leader in sustainable heating, cooling, refrigeration and industrial solutions. We help commercial, industrial, refrigeration and residential customers reduce their carbon emissions and improve energy efficiency. We address issues like climate change, growing populations, electricity demands and complex global supply chains with innovations that advance the energy transition, accelerate the adoption of climate friendly low GWP (Global Warming Potential) and natural refrigerants, and safeguard the world's most critical goods through an efficient and sustainable cold chain. We have over 18,000 employees, with feet on the ground in 50 countries - a global presence that makes it possible to serve customers wherever they are in the world and meet challenges with scale and speed. Our industry-leading brands and diversified portfolio deliver innovation and technology proven in over 200 million installations worldwide. Together, we create sustainable solutions that improve lives and protect the planet today and for future generations.

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