Danfoss LCQN 048 MT Optyma Integral Range Instructions

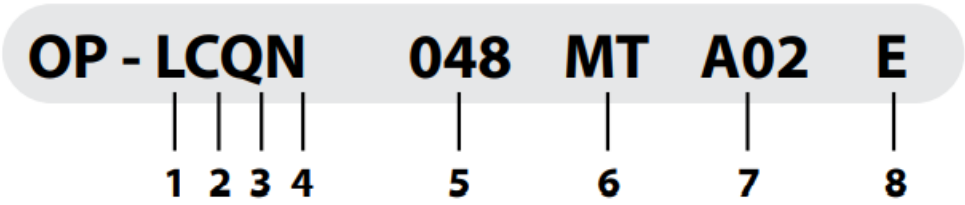
LCQN 048 MT Optyma Integral Range Instructions

Instructions
Condensing Units
Optyma™ **Integral** range

Contents

LCQN 048 MT Optyma Integral Range

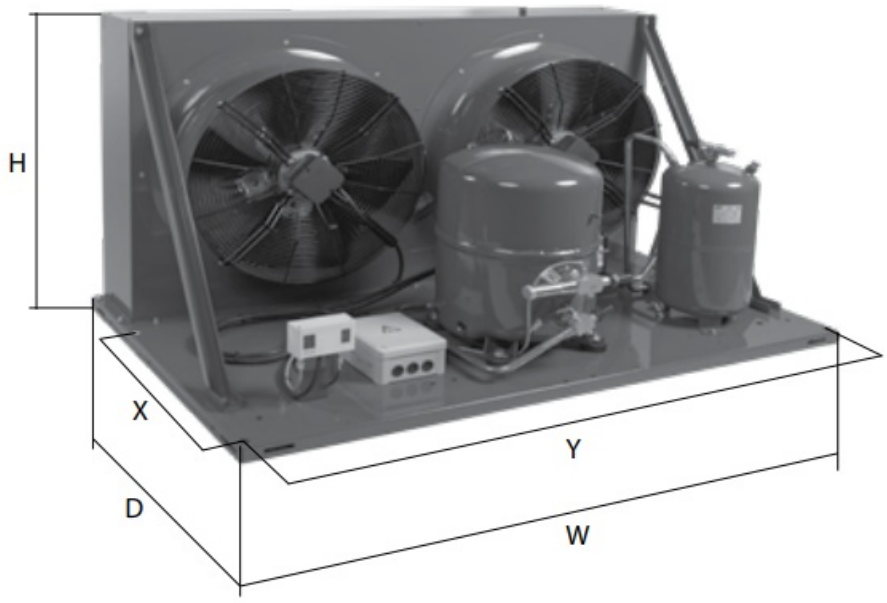
Designation system for the Optyma™ Integral range



1	**Application**: **M** = Medium Back Pressure ; **L** = Low Back Pressure
2	**Platform**: **C**: Air cooled condensing unit with single fan **G**: Air cooled condensing unit with dual fan
3	**Refrigerant:** **R**: R134a, R404A/R507, R407C, R407A, R407F, R448A, R449A, R452A; **Q**: R452A, R404A/R507
4	**Condenser design**: **N**: Microchannel condenser, ambient temperature up to 46°C
5	Compressor displacement: Example 068 = 68 cm3
6	Reciprocating compressor platform: **NT** = NTZ, **MT** = MTZ
7	**Version**: A14 (See version table below)
8	**Electrical code**: **G**: Compressor 230V/1P/50Hz, fan 230V/1P/50Hz **E**: Compressor 400V/3P/50Hz, fan 230V/1P/50Hz

Version Information

Specifications Version	**Optyma™**
	A14
Compressor technology	Reciprocating (MTZ & NTZ)
Microchannel condenser	Yes (Up to 46°C Ambient)
Filter drier (Solder connections)	Yes
Sight glass (Solder connections)	Yes
Crankcase heater	Yes
HP/LP adjustable Pressure switch	Yes
	LP – Auto reset,
	HP – Manual reset (convertible)
Electrical Box design	IP54
Liquid Receiver	Yes (with Roto lock connection)
Contactor	Yes
Overload Relay	Yes
Fuses (fan motor, control circuit)	Yes



MBP application

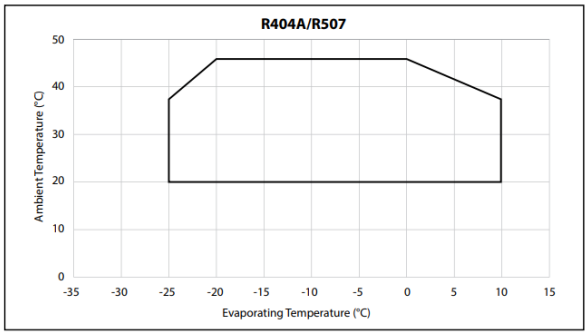
50 Hz	Compressor	H (mm)	W (mm)	D (mm)	X (mm)	Y (mm)
OP-MCRN038	MTZ022	545	900	900	600	865
OP-MCRN048 OP-MC RN060	MTZ028 MTZ036	705	900	900	600	865
OP-MCRN086	MTZ050					
OP-MCRN096	MTZ056	836.5	1200	800	500	1165
OP-MCRN108	MTZ064					

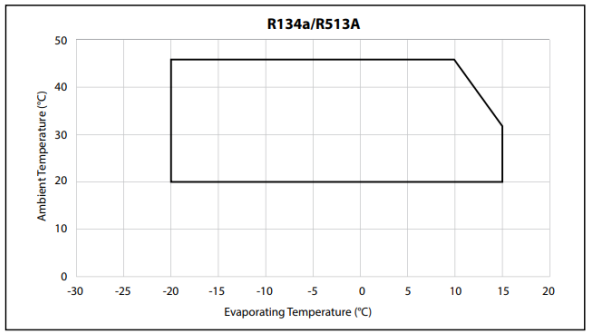
LBP application

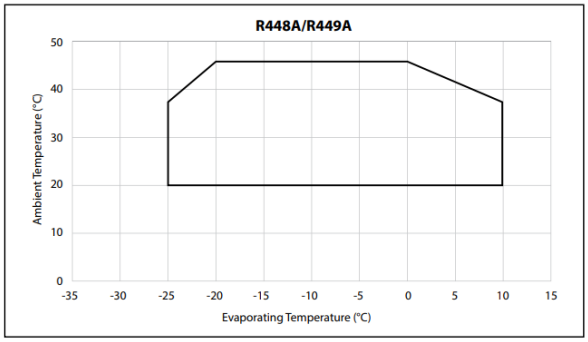
50 Hz	Compressor	H (mm)	W (mm)	D (mm)	X (mm)	Y (mm)
OP-LCQN068	NTZ068	705	900	900	600	865
OP-LCQN108 OP-LCQ N136	NTZ108 NTZ136	836.5	1200	800	500	1165
OP-LGQN096	NTZ096	693.5	1500	870	580	1465
OP-LGQN215	NTZ215	836.5	1500	870	580	1465

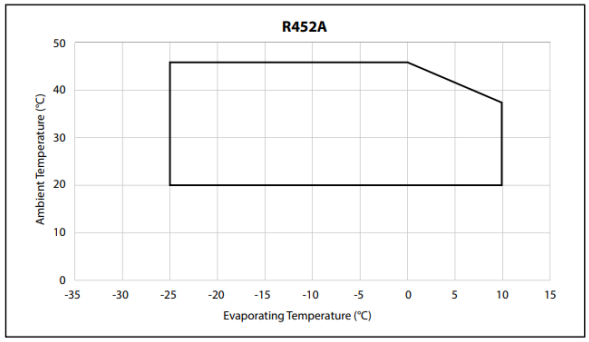
Instructions

Application envelope
MBP (Fig.1a)
SH = 10 K , SC = 0 K

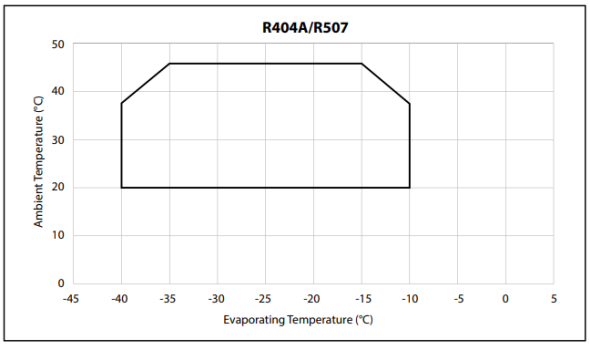








LBP (Fig.1b)
SH = 10 K , SC = 0 K


R404A/R507
Ambient Temperature (°C)
50
40
30
20
10
0
-45
-40
-35
-30
-25
-20
-15
-10
-5
0
5
Evaporating Temperature (°C)

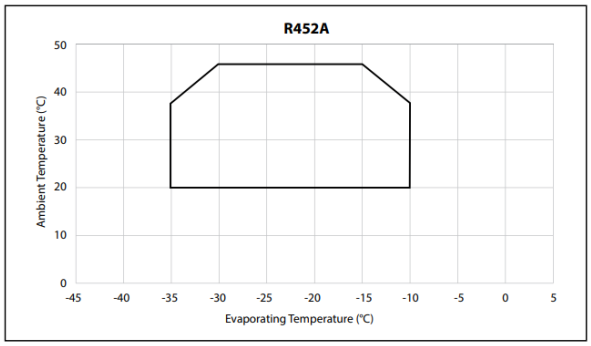

R452A
Ambient Temperature (°C)
50
40
30
20
10
0
-45
-40
-35
-30
-25
-20
-15
-10
-5
0
5
Evaporating Temperature (°C)

Fig.2

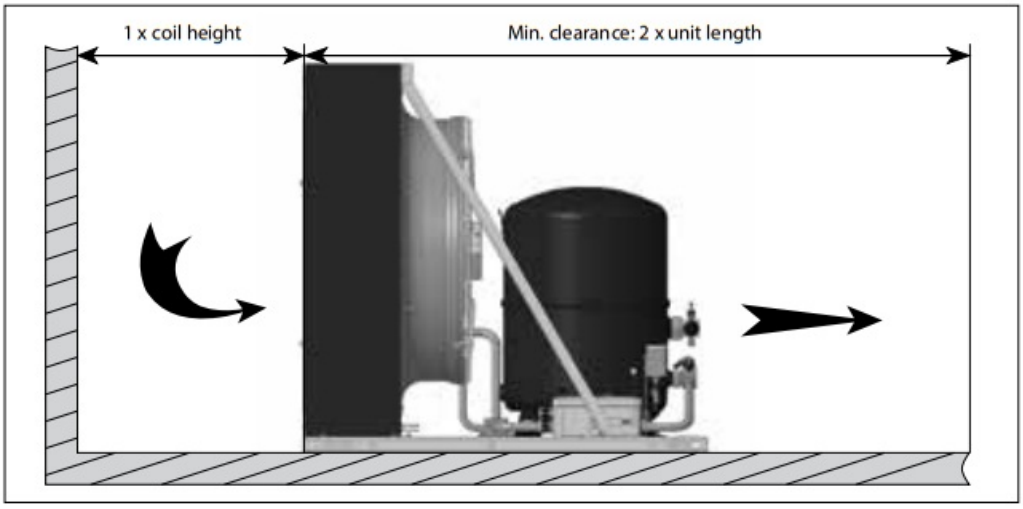


Fig.3

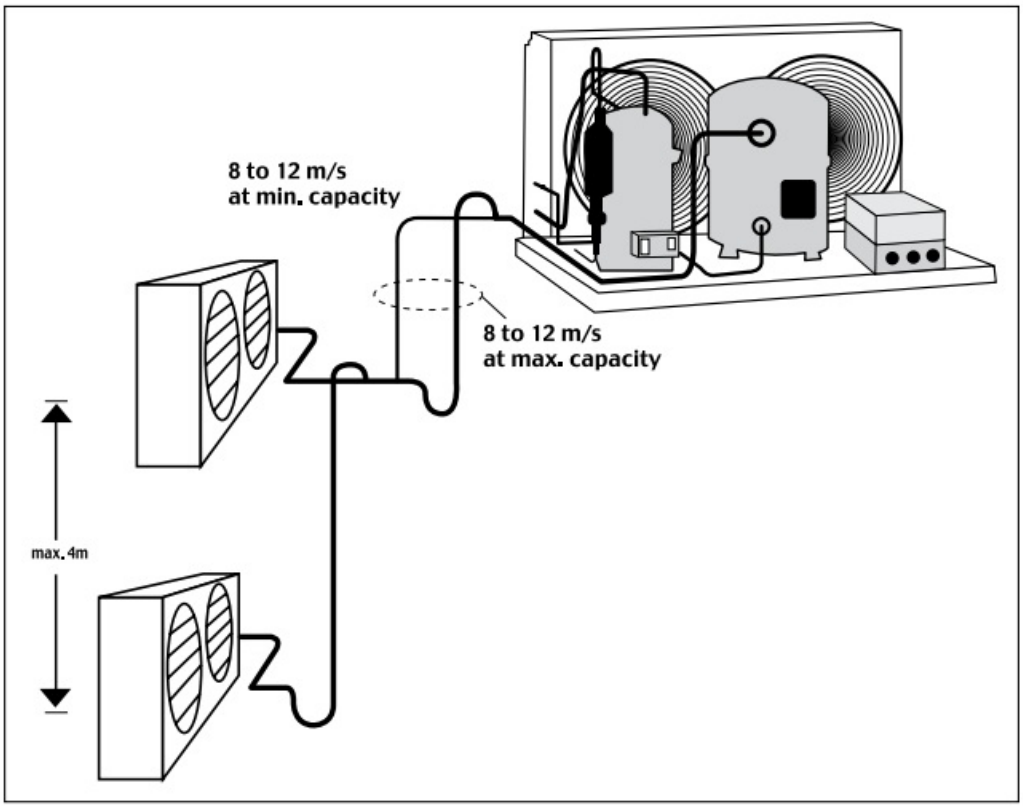
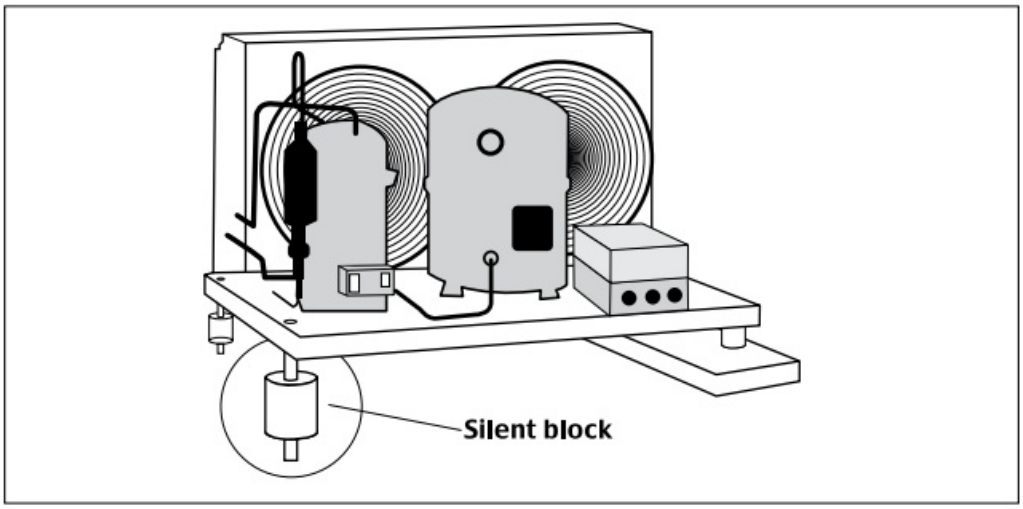
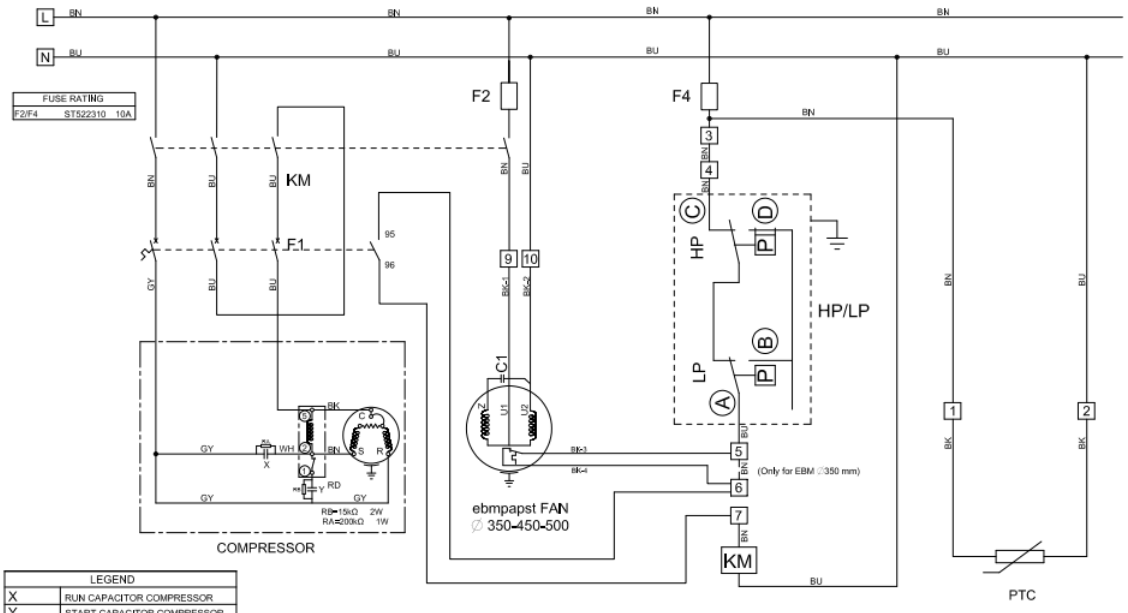


Fig.4



Single phase models



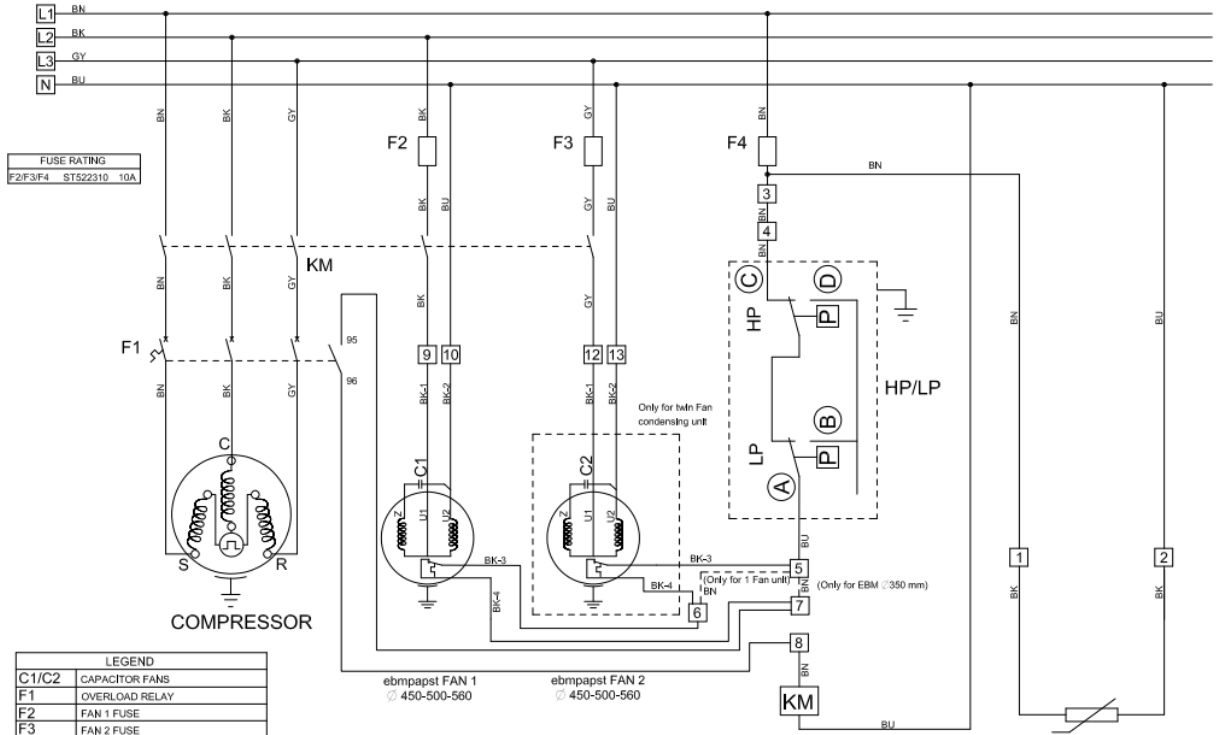
LEGEND	
X	RUN CAPACITOR COMPRESSOR
Y	START CAPACITOR COMPRESSOR
C1	CAPACITOR FAN
F1	OVERLOAD RELAY
F2	FAN 1 FUSE
F4	CONTROLCIRCUIT FUSE
FAN	CONDENSER FAN
HP/LP	DUAL PRESSURE SWITCH
KM	COMPRESSOR CONTACTOR
PTC	CRANKCASE HEATER
RA	BLEEDER RESISTOR
RB	BLEEDER RESISTOR

Unit code	Overload relay	Contactor	Compressor	MRA/MCC Compressor	Condenser Fan Capacity
114X5783	3RU2126-4BB0 13-20A	3RT2026-1AL20 25A	NTZ068	17 A	5 µF / 400V
114X5789	3RU2126-4BB0 13-20A	3RT2026-1AL20 25A	MTZ022	15 A	2 µF / 400V
114X5791	3RU2126-4CB0 17-22A	3RT2026-1AL20 25A	MTZ028	20 A	5 µF / 400V
114X5793	3RU2126-4DB0 20-25A	3RT2026-1AL20 25A	MTZ036	22 A	5 µF / 400V
114X5798	3RU2126-1KB0 9-12,5A	3RT2025-1AL20 16A	NTZ048-5B	11 A	5 µF / 400V

BK:BLACK
BN: BROWN
BU:BLUE
GY: GREY
RD: RED
WH: WHITE

230/1/50

Three phase models

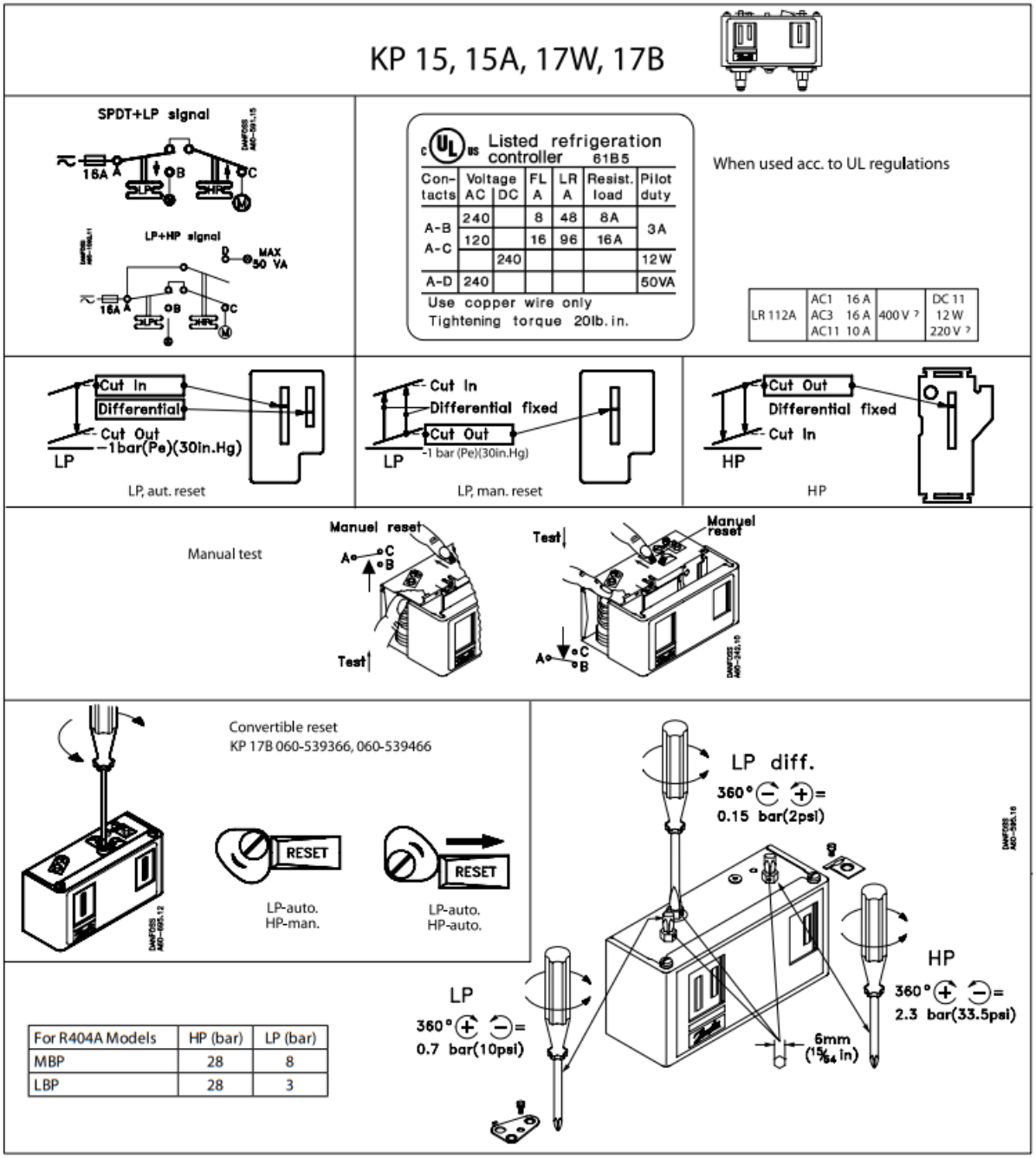


LEGEND	
C1/C2	CAPACITOR FANS
F1	OVERLOAD RELAY
F2	FAN 1 FUSE
F3	FAN 2 FUSE
F4	CONTROL CIRCUIT FUSE
FAN 1-2	CONDENSER FAN
HP/LP	DUAL PRESSURE SWITCH
KM	COMPRESSOR CONTACTOR
PTC	CRANKCASE HEATER

Unit Code	Overload Relay	Contactor	Compressor	MRA/MCC Compressor	Condenser fan capacitor
114X5784	3RU2126-1JB0 7-10A	3RT2024-1AL20 12A	NTZ068	8,4 A	5 µF / 400V
114X5785	3RU2126-1KB0 9-12,5A	3RT2025-1AL20 16A	NTZ096	10,1 A	2 µF / 400V
114X5786	3RU2126-4AB0 11-16A	3RT2025-1AL20 16A	NTZ108	12,1 A	5 µF / 400V
114X5787	3RU2126-4AB0 11-16A	3RT2025-1AL20 16A	NTZ136	14,3 A	5 µF / 400V
114X5788	3RU2126-4DB0 20-25A	3RT2026-1AL20 25A	NTZ215	22,3 A	10 µF / 400V
114X5790	3RU2116-1HB0 5,5-8A	3RT2016-1AP01 9A	MTZ022	6 A	2 µF / 400V
114X5792	3RU2116-1HB0 5,5-8A	3RT2016-1AP01 9A	MTZ028	7,5 A	5 µF / 400V
114X5794	3RU2126-1JB0 7-10A	3RT2024-1AL20 12A	MTZ036	9 A	5 µF / 400V
114X5795	3RU2126-4AB0 11-16A	3RT2025-1AL20 16A	MTZ050	12 A	5 µF / 400V
114X5796	3RU2126-4AB0 11-16A	3RT2025-1AL20 16A	MTZ056	12,5 A	5 µF / 400V
114X5797	3RU2126-4AB0 11-16A	3RT2025-1AL20 16A	MTZ064	13,5 A	5 µF / 400V
114X5799	3RU2116-1GB0 4,5-6,3A	3RT2016-1AP01 9 A	NTZ048-4B	4,8 A	5 µF / 400V

BK:BLACK
BN: BROWN
BU:BLUE
GY: GREY
RD: RED
WH: WHITE

400/3/50



For R404A Models	HP (bar)	LP (bar)
MBP	28	8
LBP	28	3

Dual Pressure switch – Refrigerant setting

Refrigerants	High pressure settings (bar (g))		Low pressure settings (bar (g))	
	ON	OFF	ON	OFF
R134a, R513A	14	17	2	1
R404A/R507, R452A	24	27	2	1
R448A/R449A	22	26	2	1

Introduction

These instructions pertain to Optyma™ Blue condensing units used for refrigeration purposes.
They are intended to provide necessary information regarding safety features and proper handling of this product.

⚠	Condensing units are delivered un- der nitrogen gas pressure (between 1 and 2 bar) a nd hence cannot be connected as it is; please refer to the «Assembly» section for furth er details.
	Condensing units are not certified for mobile and explosion-proof ap- plications. Any us e of flammable refrigerant (e.g. hydrocarbons) or air is also strictly forbidden Under all circumstances, the EN 378- 2:2016 (or other applicable local regulation) requ irement must be fulfilled.
	When pressure tests are required on the system, they are to be per- formed by qualifie d personnel, in paying close attention to potential pressure-related hazards and heeding the pressure limits displayed on the compressor nameplate or in the applicatio n guidelines.
	Modifications or alterations to the compressor or receiver (such as brazing on the shell) not expressly approved by the party responsible for ensuring compliance could in- val idate the user's authorization to operate the equipment.

Note that this is a general document for the entire range of condensing units; certain details therefore may not be applicable to the particular model you purchased. Please keep your manual and all relevant information handy for future
reference.

- Equipment description: condensing units are available under different configurations. They incorporate a compressor and a fan-cooled condenser mounted on a base frame. In addition, they may include a liquid receiver, a pressure switch, Filter drier, Sight Glass, Contactor, Overload Relay a connecting box and service valves.
- Approved list of refrigerants: – The MCRN and MGRN product line (fitted with Maneiro® MTZ compressors) can be used with R404A, R507, R134a/R513A, R407C, R407A, R452A, R448A, R449A.
  – The LCQN and LGQN product line (fitted with Maneurop® NTZ compressors) can be used with R404A, R452A and R507A.
- Note that Maneurop® compressors are filled with lubricant before leaving the factory:
  – The MTZ series with polyolester oil (ref. 175PZ),
  – The NTZ series with polyolester oil (ref. 175Z).
  These lubricants must not be mixed with one another.
- Condensing units must only be used for their designed purpose(s) and within their scope of application (refer to Fig. 1a,1b).

Transportation, storage

- The condensing unit must be handled in the vertical position (maximum offset from the vertical: 15°). Should the unit be handled in an upside-down position, its performance may no longer be insured.
- Beware that all condensing unit handling must be carried out with extreme caution to avoid any shocks. Appropriate and safe lifting equipment is to be used during handling and unpacking. Be careful with the condenser's front surface (note that the condenser side is indicated on the packaging).
- Any damage noticed on either the packaging or the product itself upon reception should be indicated on a Customer Claim addressed to the shipping company. The same recommendation applies to all instances when transport instructions have not been fully respected.
- Please review the safety instructions printed on the cardboard packaging before storage.

- Verify that the condensing unit is never stored in an ambient temperature of below -35°C (-31°F) or above 50°C (122°F).
- Ensure that the condensing unit and its packaging are not exposed to rain and/or a corrosive, flammable atmosphere.

Safety measures prior to assembly

⚠	When installing a liquid receiver or any other pressure-containing com- ponent on the c ondensing unit, be sure that these components comply with the PED 2014/68/EU.
	Make sure this new installation is equipped with high-pressure safety components (e.g . pressure switch, pressure relief valve) to prevent against the bursting of pressure-con taining components.

- All installation and servicing is to be performed by qualified personnel in compliance with all pertinent practices and safety procedures.
- The condensing unit must be located in a well-ventilated area; air flow through unit shall not be restricted in any way (refer to Fig.2). Make sure that the ambient temperature never exceeds 50°C (122°F) during the off-cycle.
- For outdoor installations, provide a shelter or use a Danfoss condensing unit housing.
- Make certain that the condensing unit can be mounted onto a horizontal plane with a maximum slope of 3°.
- Check that the condensing unit model corresponds to system specifications (capacity, use of refrigerant, etc.).
- Verify that the power supply corresponds to compressor and fan motor characteristics (refer to the condensing unit nameplate for precision).
- Ensure that the refrigerant charging equip-ment, vacuum pumps, etc. for HFC refrigerant systems have been specifically reserved for these refrigerants and never used with other CFC, HCFC refrigerants.
- Use only clean and dehydrated refrigeration grade copper tubes as well as silver alloy brazing material.
- Verify that all system components are appropriate (use of refrigerant, etc.), clean and dehydrated before being connected to the completed assembly. Perform a check on the suction lines: horizontal sections are to be sloped downwards towards the compressor. Suction gas velocity must be high enough to provide for an adequate oil return. This velocity must be within 8 to 12 m/s in vertical risers. In horizontal pipes, this velocity can decrease to 4 m/s. The use of U-trap and double-suction risers may be required on vertical sections, but not in excess of 4 m unless a second U-trap system has been fitted (refer to Fig. 3). Suction line piping must be insulated in order to minimize the effects of high superheating.
- The piping connected to the compressor must be configured on the basis of a flexible 3-axis design to dampen vibrations and designed in such a way as to prevent free liquid refrigerant migration and drainage back to the compressor sump.
- Note that all local and regional regulations and safety standards, such as EN 378-2:2016, must be taken into account when designing, connecting and running the system.

Assembly

⚠	The condensing unit's time of expo- sure to the atmosphere during ins- tallation shall b e held to a minimum. The condensing unit is fitted with suction and liquid copper stubs equipped with Roto lock Valves to enable connection to the circuit without ingress of ai r or moisture in the unit. Opening the Roto lock Valves be- fore connection will cause moisture contamination of the compressor lubricant.
	Before opening the compressor connection fittings, it is mandatory to connect a 1/4" s ervice hose to the Schrader fitting on the compressor shell in order to gradually release the nitrogen holding charge.

- Silent block must be installed under the condensing unit base frame, as shown in Fig 4, to prevent vibration interference from other operating equipment or machinery and to reduce vibration transmission to the supporting structure.
- Ensure that no material enters into the system while cutting the tubing. Moreover, never drill holes in the pipe work after installation.
- Avoid flare-type connections and exercise great care while brazing (use only state-of the-art practices); apply a nitrogen gas flow to prevent oxidation inside the tubing, especially when HFC refrigerants are being used. All brazing material is to contain a minimum of 5% silver.
- When brazing, protect the valves and all other unit components from torch heat damage (painted surfaces, gaskets, connecting box).
- Note that it is not necessary to remove compressor shut-off valves for connection to the system, hence no need to replace associated gaskets.
- Be sure to connect the required safety and control devices onto compressor shut-off valves or fittings.
- In case of oil return through the Schrader fitting on the compressor shell, make sure the internal valve is removed.

Leak detection

Never use oxygen or dry air in order to avoid the risk of fire or explosion.

⚠	Do not use a megohmmeter or apply power to the compressor while it is under vacuum, as this may cause motor winding damage (motor burnout).
	Do not use colored leak detection fluids. Do not use chloroform- carbon in leak testing systems designed for HFC fluids.

- Perform a leak detection test on the complete system by means of: a dry nitrogen pressure test, a mixture of nitrogen and the refrigerant to be used in the system, a helium leak test and/or a deep vacuum test.
- The test should be long enough in duration to ensure the absence of any slow leaks in the system.
- Use tools specifically designed for detecting leaks.
- The low side test pressure must not exceed 1.1 x Ps pressure indicated on the compressor nameplate.
- For high side test pressure, do not exceed the pressure indicated on the condensing unit nameplate.
- Whenever the condensing unit is equipped with suction and liquid shut-off valves, these valves are to remain in the closed position while performing the leak test (condensing unit leak test already performed in the factory).
- Should a leak be discovered, proceed with repair steps and repeat the leak detection.

- When a deep vacuum leak detection test is selected, observe the following:

1. The level to reach is 500 µm Hg.
2. Wait 30 min.
3. If pressure increases rapidly, the system is not airtight. Locate and repair leaks. Restart the vacuum procedure, followed by steps 1, 2, etc.
4. If pressure increases slowly, the system contains moisture inside. Break the vacuum with nitrogen gas and restart the vacuum procedure, followed by steps 1, 2, etc.
5. Connect the compressor to the system by opening the valves.
6. Repeat the vacuum procedure, followed by steps 1, 2, etc.
7. Break the vacuum with nitrogen gas.
8. Repeat the vacuum procedure, steps 1, 2; a vacuum of 500 µm Hg (0.67 mbar) should be reached and maintained for 4 hours. This pressure is to be measured in the refrigeration system, and not at the vacuum pump gauge.

Vacuum dehydration procedure

⚠ Do not use a megohmmeter or apply power to the compressor while it is under vacuum, as this may cause motor winding damage (motor burnout).
Whenever possible (if shut-off valves are present), the condensing unit must be isolated from the circuit. It is essential to connect the vacuum pump to both the LP & HP sides, in order to avoid dead-ending system parts.

Recommended procedure:

1. Once leak detection has been completed,
2. Pull down the system under a vacuum of 500 µm Hg (0.67 mbar).
3. When the vacuum level of 500 µm Hg has been reached, the system must be isolated from the pump.
4. A vacuum of 500 µm Hg (0.67 mbar) has to be reached and maintained for 4 hours. This pressure is to be measured in the refrigeration system, and not at the vacuum pump gauge.

If pressure increases, restart the leak-detection procedure (refer to the «Leak detection» section of this manual if necessary).
Vacuum pump:
A two-stage vacuum pump with gas ballast valve (0,04-mbar standing vacuum) shall be used; its capacity is to be consistent with system volume.
Never use the compressor as a vacuum pump. It is recommended to use large-diameter connection lines and to connect these lines to the shutoff valves, rather than to the Schrader connection. This recommendation allows avoiding excessive pressure losses.
Moisture level:
At the time of commissioning, system moisture content may be as high as 100 ppm. During operation, the liquid line filter drier must reduce this level to < 20 ppm.

Additional notes:

- To improve moisture removal, the temperature of the system should not be lower than 10°C.
- A proper vacuum procedure is even more important with HFC and polyolester lubricant than it has “traditionally” been with HCFC (R22) or CFC and mineral oil.
- For further details, please refer to TI 3-026.

Electrical connections

- Make sure the main power supply to the sys- tem has been switched off and isolated, in accordance with applicable regulations, before performing any electrical connection.
- Please refer to Figs 5 and 6 for typical wiring connections and examine the specific wiring diagram located in the electrical box cover.
- For further details, refer to the condensing unit guidelines.
- Note that Maneurop® compressors fitted on condensing units are protected against overheating and overloading by an internal safety motor protector. However an External Overload Protector (Manual/Auto Reset) is installed for protecting circuit and components against over-current.
- The “must trip” value of this overload relay will be Factory set in accordance with power line sizing and design and shall never exceed the “A max.” value stamped on the nameplate. Refer Fig.5 and 6 for Overload relay Current setting.
- On units equipped with an IP54 electrical box, all electrical connections (condenser fan motor, compressor motor, pressure control switch, crankcase heater, etc.) have already been wired at the factory. For single-phase compressors, start-and-run capacitors are included in the connecting box.
- The connecting box is equipped with screw type terminal blocks with Ferrule numberings, for both power and control lines as well as earth terminals for grounding connections.
- All electrical components must be selected as per local standards and condensing unit component requirements.

Filling the system

- Before charging the refrigerant, verify that the oil level is between 1/4 and 3/4 on the compressor oil sight glass and/or ensure that the oil charge of the original compressor is sufficient as regards system dimension and piping design: – An additional quantity of oil might be necessary for line lengths (back and forth) in excess of 20 m. – In the event additional oil is required, use only an approved lubricant (refer to the «Introduction» section of this manual).
- Make sure the refrigerant used to fill the system is compatible with compressor design. Refer to the «Introduction» section of this manual for an approved list of refrigerants.
- Compressor switched off: the liquid refrigerant is charged into the condenser and/or liquid receiver in the liquid phase (compulsory for refrigerant blends).The charge must be close to the nominal system charge as possible in order to avoid both low pressure operations and excessive superheating at start-up. Throughout this operation, both compressor service valves must remain closed.
- To the extent possible, maintain the refrigerant charge below 2.5 kg per cylinder. Above this limit, install a system, such as a pump-down cycle or suction line accumulator, to prevent against liquid flood-back into the compressor.
- Be sure that the refrigerant charge is suitable for both winter and summer operations.

Verification before commissioning

⚠ Ensure that all service valves are in the open position before start-up. A closed discharge or suction service valve may cause serious damage to the compressor and/or compromise safety device operation, thereby resulting

in potential injury to personnel.

- Check that all safety devices are operational and properly set (safety pressure switch set point, mechanical relief valve if necessary, etc.). Make sure that these devices comply with both generally – and locally – applicable regulations and standards (e.g. EN 378-2:2016).
- When using high-pressure switches or relief valves, the setting must not exceed maximum service pressure of any system component. Refer to the Application Guidelines for relevant condensing unit pressure safety limits.
- A low-pressure switch is recommended to prevent operation under vacuum. Use a minimum setting of 1.2 bar (absolute).
- Verify that all electrical connections are properly fastened and in compliance with local safety regulations.
- A compressor crankcase heater is factory installed, ensure that it has been energized for a minimum of 12 hours before initial start-up and/or during prolonged shutdown periods.

Start up

	Never start the compressor in the absence of a refrigerant charge.
	Do not overcharge the system.

- Do not bypass the LP or any other safety switches during start-up
- Check current draw and voltage levels.
- Monitor the oil sight glass to ensure proper oil return to the compressor. After 2 to 4 hours of operations under established conditions, check the oil level and add oil if necessary (refer to TI bulletin 3-025).
- If oil return continues to perform poorly, further investigation of the piping design is required.
- In all cases, the application limits of the compressor must be respected; moreover, high superheat values lead to high discharge temperatures and decrease compressor capacity. The maximum discharge temperature is 130°C: operating at a higher temperature may result in refrigerant decomposition.
- Under steady-state operating conditions, check refrigerant piping or capillary tubes for abnormal vibrations (refrigeration line movement in excess of 1.5 mm necessitates corrective actions, pipe brackets, etc.).
- Ensure that refrigerant flow through the liquid line sight glass is adequate and that operating temperatures correspond with system specifications.
- When needed, refrigerant may be added in the liquid phase, carefully throttling the refrigerant on the low-pressure side and as far as possible from the compressor. The compressor must be operating during this process.

Troubleshooting

- **Compressor failure to start:** verify that the compressor is hooked up to the power supply; check the power lead connections and all suitable capacitors on single-phase models. If these verifications reveal no abnormality, Check the Motor winding resistance with ohmmeter. Also the check the accurate functioning wiring of Contactor.

  Note: when the internal motor protector has tripped out, it may take up to several hours to reset and restart the compressor.
- Compressor failure to build up pressure:

check to make sure that all bypass valves in the system have not been opened. Also check that all solenoid valves are in their proper position. If the internal pressure relief valve is open, the compressor sump will be warm and the compressor will trip out on the motor protector. If this happens, it may take up to 2 or 3 hours to reset and automatically restart the compressor.

- A**bnormal running noise on the system:** – Ensure the absence of any liquid flood-back to the compressor by means of measuring the return gas superheat and compressor sump temperature. The sump should be at least 10K above the saturated suction temperature under steady-state operating conditions.
  – Check that the fans are running free and without vibration. Also, no tubing's are touching the sheet-metal parts causing it to generate noise because of Vibration
- **The high-pressure switch trips out:** check condenser operations (condenser cleanliness, fan operations, High Ambient Temperatures than operating limit, etc.). If above check out OK, the problem may be due to either refrigerant overcharging or the presence of a non-condensable (e.g. air, moisture) in the circuit. In this case replacement of Drier will be necessary.
- The low-pressure switch trips out: check evaporator operations (coil cleanliness, fan operations, water flow, water filter, etc.), liquid refrigerant flow and pressure drops (solenoid valve, filter drier, expansion valve, etc.), refrigerant charge.
- **Low refrigerant charge:** the correct refrigerant charge is given by the liquid sight glass indication, the condenser delta T in relation to the refrigerant pressure tables (pressure-temperature), the superheat and the sub-cooling, etc. (if additional charge is deemed necessary, refer to the «Filling the system» section).
- **Compressor maximum short cycling:** there must be a minimum delay of five minutes between two compressor starts. DCC recommends the compressor should run at least two minutes after each start, and between each stop and start must be three minutes standstill. Only during pump down cycle, the compressor may run much shorter until the pump down pressure has been reached or when safety devices will prohibit compressor further operation.

Maintenance

- Proper operations and maintenance of the condensing units serve to prevent against system-related problems. The following preventive maintenance checks, to be performed at regular intervals, are highly recommended:
  – Control operating conditions (evaporating temperature, condensing temperature, compressor discharge temperature, temperature difference on heat exchangers, superheat, sub-cooling). These conditions must always remain within compressor operation limits.
  – Verify that safety devices are operational and properly set.
  – Check the compressor oil level and quality; this step may include an acid test, humidity check, spectrometer analysis, etc. whenever the oil becomes discolored.
  – Ensure that the circuit is leak tight.
  – Frequently monitor the Refrigerant flow across the Liquid Sight glass
  -Verify the proper operation of heat exchangers and, if necessary, clean them.
  – Check that the fans are running free (without vibration) and current draw on the compressor motor as well as proper voltage balance between phases.
  – **Note** 1: The condenser must be checked at least once a year for clogging and be cleaned if deemed necessary. Access to the internal side of the condenser takes place through the fan panel. Microchannel coils tend to accumulate dirt on the surface rather than inside, which makes them easier to clean than fin-&-tube coils. – Change the filter drier when necessary.

– Check that all electrical connections are still adequately fastened.

– Make sure the condensing unit is clean and in good working order; verify the absence of rust or corrosion on components under pressure and electrical connections. – Make sure the refrigerant charge is suitable for both winter and summer operation.

- Ensure that periodic in-service inspections required by local regulations are performed.

  – Note 2: Remove surface dirt, leaves, fibers, etc. with a vacuum cleaner, equipped with a brush or other soft attachment. Alternatively, blow compressed air through the coil from the inside out, and brush with a soft bristle. Do not use a wire brush. Do not impact or scrape the coil with the vacuum tube or air nozzle.
  cleaned if deemed necessary. Access to the internal side of the condenser takes place through the fan panel. Microchannel coils tend to accumulate dirt on the surface rather than inside, which makes them easier to clean than fin-&-tube coils. – Change the filter drier when necessary.

  – Check that all electrical connections are still adequately fastened.

  – Make sure the condensing unit is clean and in good working order; verify the absence of rust or corrosion on components under pressure and electrical connections.

  – Make sure the refrigerant charge is suitable for both winter and summer operation.
- Ensure that periodic in-service inspections required by local regulations are performed.

  – **Note** 2: Remove surface dirt, leaves, fibers, etc. with a vacuum cleaner, equipped with a brush or other soft attachment. Alternatively, blow compressed air through the coil from the inside out, and brush with a soft bristle. Do not use a wire brush. Do not impact or scrape the coil with the vacuum tube or air nozzle.

Replacement

⚠	Precaution must be taken when disconnecting any components, de- brazing in the tubing to ensure th at no refrigerant under pressure is pre- sent in the system.
	The refrigerant shall not be discharged directly into the atmosphere; rather, it must be removed using a pproved reclamation techniques and equipment and then safely stored, in accordance with applicable legislation.
	The presence of refrigerant vapor can displace air and lead to suffocation. Proper ventilation is manda tory at all times when servicing the equipment.
	A condensing unit component change must be carried out in compliance with local regulations.

- Make sure that the main power supply has been switched off.
- Before replacement, it is necessary to determine the cause of failure and implement remedial action. If such analysis and repair are not performed, repetitive failure may occur. Note that an oil acidity test always proves helpful in diagnosis when undertaking compressor replacement.
- Check that the replacement component has the same electrical and refrigeration performance characteristics as the original one.
- Whenever piping needs to be modified, please refer to the «Safety measures prior to assembly» section.
- In the event of Wiring loosened or removed, care must be taken to connect it back at the right Terminal block looking at the Ferrule numbers.
- For further details on replacement steps, refer to the previous sections of this manual.

Note: In the event of compressor motor failure, flush and clean the entire circuit before replacing the compressor in order to remove acids and contaminants. Systematically install a new filter drier on the liquid line. Prior to this

step (if necessary),run the system for at least 2 hours with anti-acid cartridges (in such instances, the installation of a suction filter might also be required). After an operating period of approximately 2 weeks, check the level of oil acidity. If the oil acid test proves positive, drain and replace the oil, replace the anti-acid liquid line filter drier cartridges and the suction filter previously installed. Repeat oil and filter drier replacements until the system is clean and acid-free. When there is no longer any sign of acidity, replace the anti-acid cartridges by the standard model and remove the suction strainer cartridge as required.

User advisory

Insist that all service operations only be performed by qualified personnel.

⚠	The condensing unit tubing and compressor surface temperatures may exceed 100°C (212°F) and ca use severe bodily burns. Special precaution must be taken when working around the compressor and refrigerant tubing. Moreover, a compressor in operation can generate very cold surface temperatures (as low as -45°C/ -49°F), there by exposing personnel to the risk of freezing burns.
	Pressure inside the compressor and refrigerant circuit can reach dangerously high levels (e.g. abnor mal operation, fire,…) leading to personnel injury if suddenly released; therefore, never drill, weld or c ut the compressor shell and adjacent tubing (release of liquid refrigerant can cause flash freezing on exposed skin).
	Even though fans are fitted with safety guard it is recommended not to work on condenser while fans are running.

Be aware that the product warranty may be deemed null and void in the following cases:

- Modifications to the unit, unless approved by Danfoss Commercial Compressors, absence of nameplate, broken or dented components, shock marks, etc…
- Compressor opened by the customer or returned unsealed (i.e. open discharge or suction ports),
- Presence of rust or water inside the condensing unit circuit,
- Addition of leak-detection fluid in the compressor lubricant,
- Use of a refrigerant or lubricant not approved by Danfoss Commercial Compressors.,
- Any deviation from recommended instructions pertaining to installation, application or maintenance,
- Use in mobile applications (boats, trains, trucks, etc.) or under explosive atmospheric conditions. The date of production of the condensing unit is indicated on the nameplate. Ensure that the model and serial number information is always transmitted with any claim filed regarding this product.

Declaration of incorporation

- Pressure Equipment Directive 2014/6 8/EU EN 378-2:2016 – Refrigerating systems and Heat Pumps – Safety and environmental requirements-Parts 2: Design, construction, testing, marking and documentation.
  Low Voltage Directive 2014/35/EU EN 60335-1:2012 + A11:2014- Household and similar electrical appliances-Safety-Part 1: General requirements-for all above mentioned condensing units Eco-design DIRECTIVE 2009/125/ EC, establishing a framework for the setting of Eco-design requirements for energy related products. REGULATION (EU) 2015/1095, implementing Eco-design Directive 2009/125/EC with regard to Eco-design requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process Chiller.
- Condensing unit measurements are made according to standard “EN 13771-2:2017” – Compressor and condensing units for refrigeration-performance testing and test methods- part 2: Condensing units. Eco design

declaration; refer Danfoss Coolselector®2 with code number (114X….) to find the declaration.

Disposal

Danfoss recommends that condensing units and oil should be recycled by a suitable company at its site.

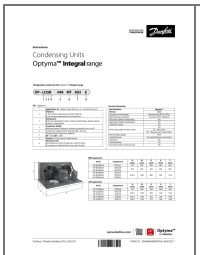
Danfoss A/S Climate Solutions • danfoss.com • +45 7488 2222

101AN368656896297en-AU0102 – 118U5272 Danfoss1Climate Solutions (CU) 2022.07

http://scn.by/krzp87a5z2ak2c
www.danfoss.com

Optyma™
by Danfoss
118U5272 – AN368656896297en-AU0102

Documents / Resources



[Danfoss LCQN 048 MT Optyma Integral Range] [pdf] Instructions
LCQN 048 MT Optyma Integral Range, LCQN 048 MT, Optyma Integral Range, Integral Range, Range

References

- Engineering Tomorrow | Danfoss
- User Manual