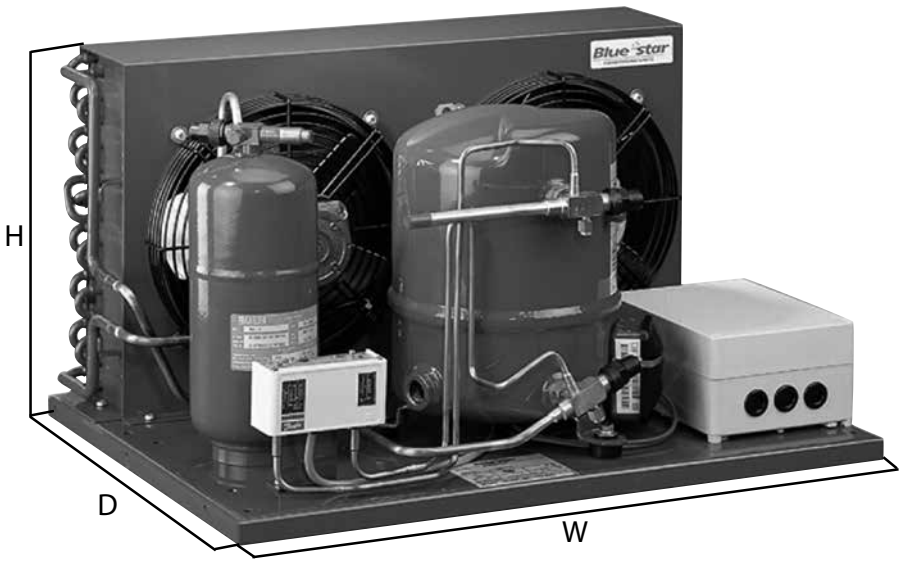
ENGINEERING
TOMORROW

Instructions

Optyma™ Blue
Condensing units



Code	Model Name	Refrigerant
114X8056	OP-LGHE068NTA07D	R404A/R507
114X8057	OP-LCHE096NTA07D	
114X8058	OP-LGHE108NTA07D	
114X8059	OP-LGHE136NTA07D	
114X8060	OP-LGHE215NTA07D	
114X8048	OP-LGHE271NTA07D	
114X8061	OP-MGZE038MTA07G	R404A/R507, R134a
114X8062	OP-MGZE048MTA07D	
114X8063	OP-MGZE060MTA07D	
114X8064	OP-MGZE086MTA07D	
114X8065	OP-MGZE108MTA07D	
114X8066	OP-MGZE136MTA07D	
114X8067	OP-MGZE171MTA07D	
114X8068	OP-MGZE215MTA07D	

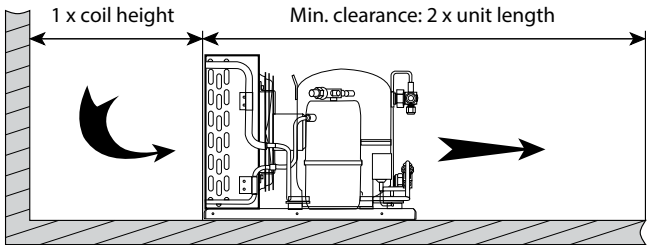


Fig.2

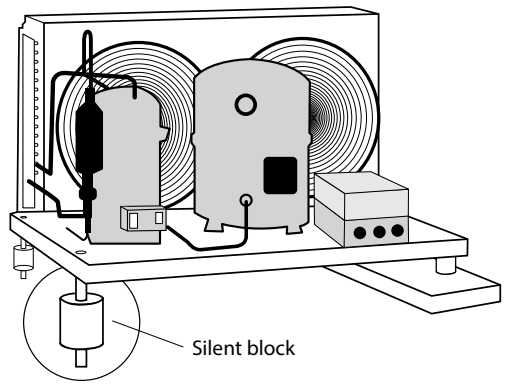


Fig.4

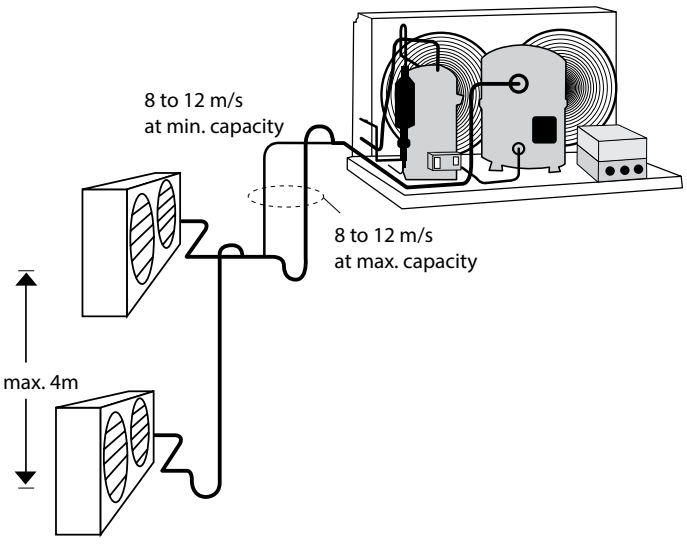
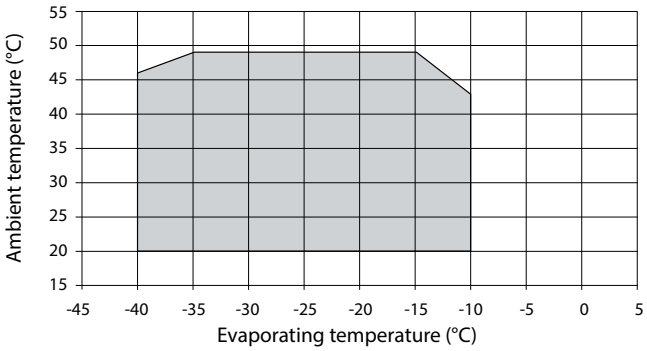


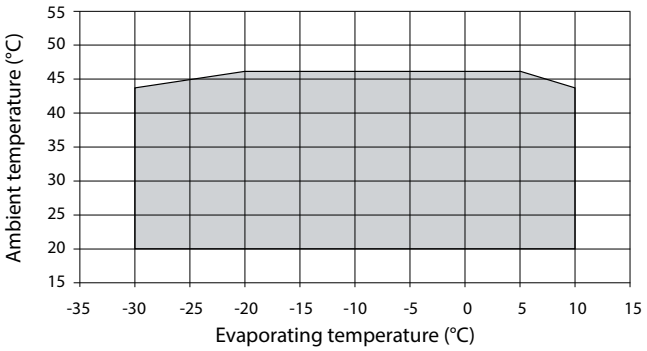
Fig.3

Operating Envelop (Super heat 10K, Subcooling 0K)

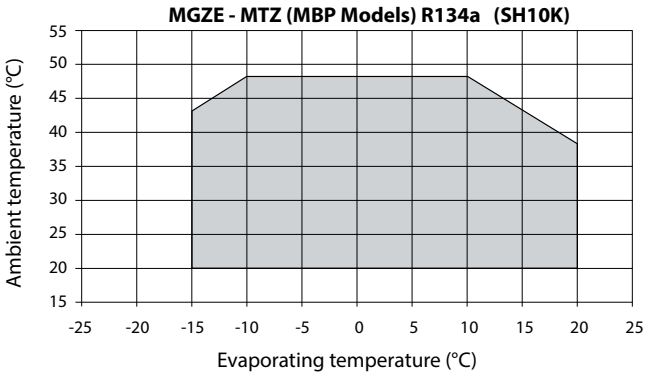
LGHE - NTZ (LBP Models) R404A/507 (SH10K)



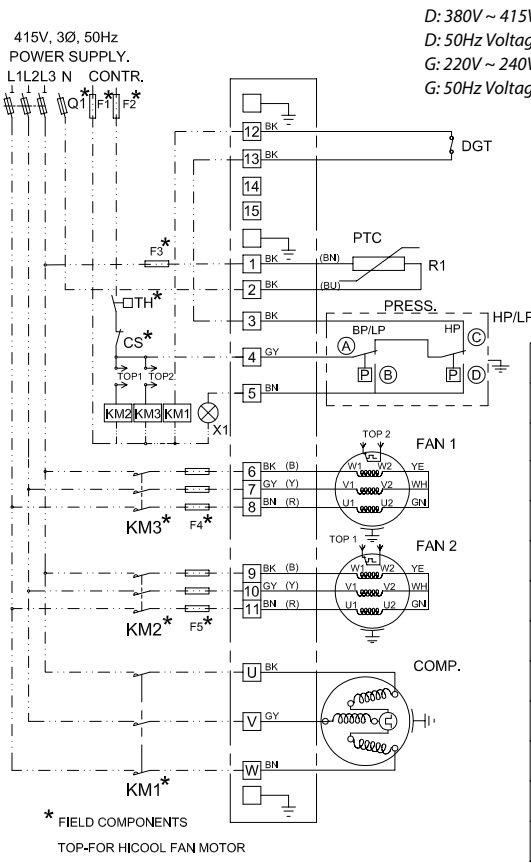
MGZE - MTZ (MBP Models) R404A/507 (SH10K)



MGZE - MTZ (MBP Models) R134a (SH10K)



Wiring Diagram



D: 380V ~ 415V/ 3P/50 HZ (Compressor 415V/3P/50Hz, Fan 415V/3P/50Hz)
D: 50Hz Voltage range 3 Phases :342V ~ 440V
G: 220V ~ 240V/ 1P/ 50 Hz (Compressor 230V/1P/50Hz, Fan 230V/1P/50Hz)
G: 50Hz Voltage range 1 Phase :200V ~ 264V

BK:BLACK	BU: BLUE
BN: BROWN	WH: WHITE
RD: RED	GY:GREY
YE: YELLOW	GN:GREEN

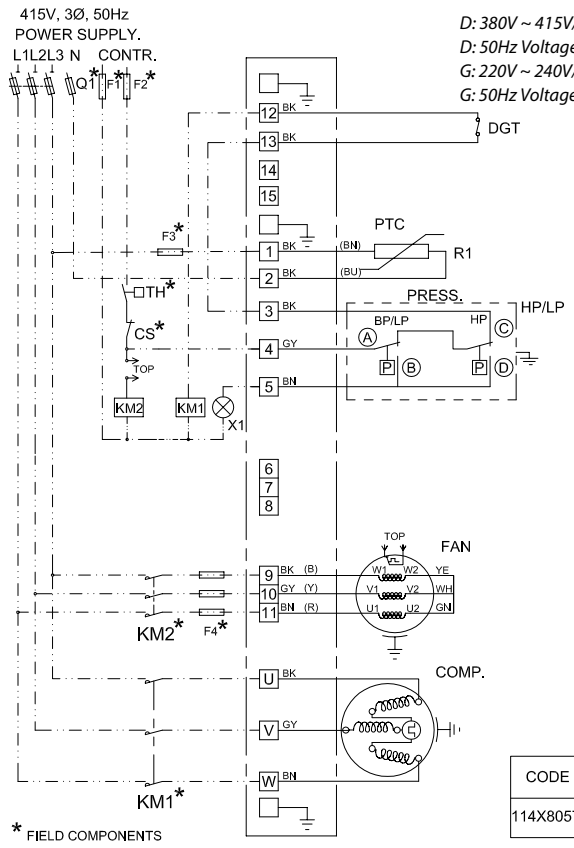
LEGEND	
CS	CONTROL SWITCH ON/OFF
F1,2	FUSE CONTROL CIRCUIT
F3,4,5	FUSE FOR CCH & CONDENSER FANS
FAN 1-2	CONDENSER FANS
HP/LP	DUAL PRESSURE SWITCH
KM1	COMPRESSOR CONTACTOR
KM2	FAN CONTACTOR
KM3	FAN CONTACTOR
Q1	MAIN SWITCH + CIRCUIT BREAKER
R1	CRANKCASE HEATER
X1	LP/HP ALARM
TH	THERMOSTAT
DGT	DISCHARGE GAS THERMOSTAT
TOP	THERMAL OVERLOAD PROTECTOR

DRW. NO.-118R9237 REV.00

CODE	DESCRIPTION	POWER SUPPLY	COMPRESSOR	Q1	F1,2,3,4,5	KM1	KM2	KM3
114X8048	OP-LGHE271NTA07D	415V, 3Ø, 50Hz	NTZ271	32A	3A	26A	6A	6A
114X8056	OP-LGHE068NTA07D	415V, 3Ø, 50Hz	NTZ068A4LR1A	10 A	3 A	9 A	6 A	6 A
114X8058	OP-LGHE108NTA07D	415V, 3Ø, 50Hz	NTZ108A4LR1A	16 A	3 A	18 A	6 A	6 A
114X8059	OP-LGHE136NTA07D	415V, 3Ø, 50Hz	NTZ136	20 A	3 A	18 A	6 A	6 A
114X8060	OP-LGHE215NTA07D	415V, 3Ø, 50Hz	NTZ215	32 A	3 A	25 A	6 A	6 A
114X8062	OP-MGZE048MTA07D	415V, 3Ø, 50Hz	MTZ28-4VM	10 A	3 A	9 A	6 A	6 A
114X8063	OP-MGZE060MTA07D	415V, 3Ø, 50Hz	MTZ36-4VM	16 A	3 A	12 A	6 A	6 A
114X8064	OP-MGZE086MTA07D	415V, 3Ø, 50Hz	MTZ50-4VM	16 A	3 A	18 A	6 A	6 A
114X8065	OP-MGZE108MTA07D	415V, 3Ø, 50Hz	MTZ64-4VM	20 A	3 A	18 A	6 A	6 A
114X8066	OP-MGZE136MTA07D	415V, 3Ø, 50Hz	MTZ80-4VM	25 A	3 A	25 A	6 A	6 A
114X8067	OP-MGZE171MTA07D	415V, 3Ø, 50Hz	MTZ100-4VM	32 A	3 A	25 A	6 A	6 A
114X8068	OP-MGZE215MTA07D	415V, 3Ø, 50Hz	MTZ125-4VM	32 A	3 A	32 A	6 A	6 A

WD1

Wiring Diagram



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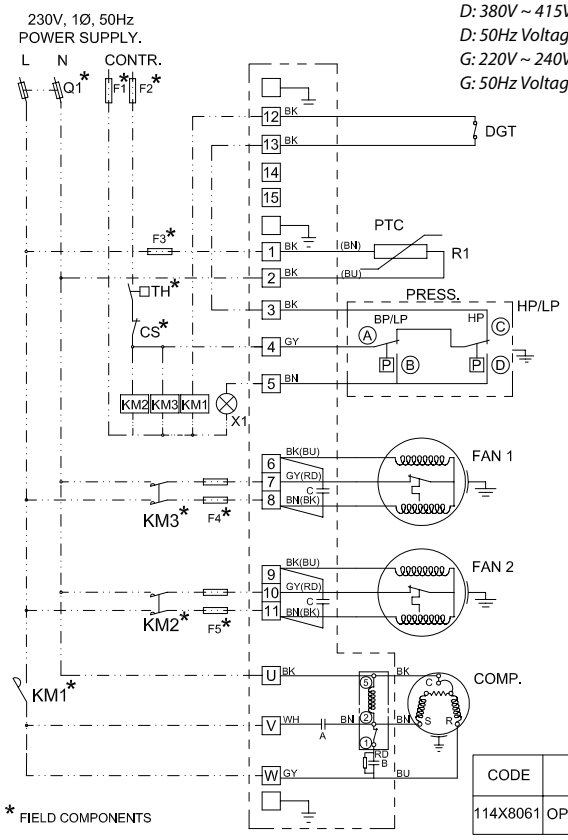
HP/LP	DUAL PRESSURE SWITCH
KM1	COMPRESSOR CONTACTOR
KM2	FAN CONTACTOR
Q1	MAIN SWITCH + CIRCUIT BREAKER
R1	CRANKCASE HEATER
X1	LP/HP ALARM
TH	THERMOSTAT
DGT	DISCHARGE GAS THERMOSTAT
TOP	THERMAL OVERLOAD PROTECTOR

CODE	DESCRIPTION	POWER SUPPLY	COMPRESSOR	Q1	F1,2,3,4	KM1	KM2
114X8057	OP-LGHE096NTA07D	415V, 3Ø, 50Hz	NTZ096A4LR1A	16 A	3 A	12 A	6 A

DRW. NO. -118R0238 REV. 00

WD2

Wiring Diagram



D: 380V ~ 415V/ 3P/50 HZ (Compressor 415V/3P/50Hz, Fan 415V/3P/50Hz)
D: 50Hz Voltage range 3 Phases :342V ~ 440V
G: 220V ~ 240V/ 1P/ 50 Hz (Compressor 230V/1P/50Hz, Fan 230V/1P/50Hz)
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F3,4,5	FUSE FOR CCH & CONDENSER FANS
FAN 1-2	CONDENSER FANS
HP/LP	DUAL PRESSURE SWITCH
KM1	COMPRESSOR CONTACTOR
KM2	FAN CONTACTOR
KM3	FAN CONTACTOR
Q1	MAIN SWITCH + CIRCUIT BREAKER
R1	CRANKCASE HEATER
X1	LP/HP ALARM
TH	THERMOSTAT
DGT	DISCHARGE GAS THERMOSTAT

CODE	DESCRIPTION	POWER SUPPLY	COMPRESSOR	Q1	F1,2,3,4,5	KM1	KM2	KM3
114X8061	OP-MGZE038MTA07G	230V, 1Ø, 50Hz	MTZ22-5VM	20 A	3 A	18 A	6 A	6 A

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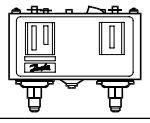
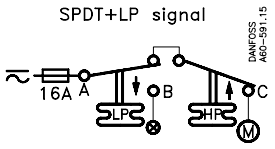
WD3

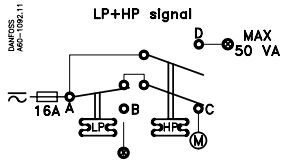
KP 15, 15A, 17W, 17B



SPDT+LP signal



LP+HP signal



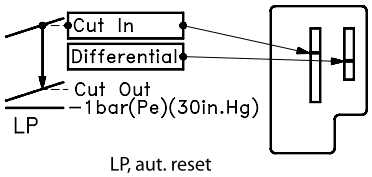
Listed refrigeration controller 61B5

Contacts	Voltage AC	Voltage DC	FL A	LR A	Resist. load	Pilot duty
A-B	240		8	48	8A	3A
A-C	120		16	96	16A	
		240				12W
A-D	240					50VA

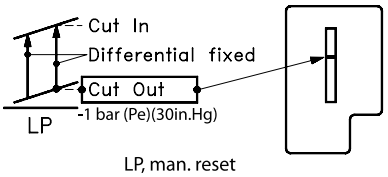
Use copper wire only
Tightening torque 20lb.in.

When used acc. to UL regulations

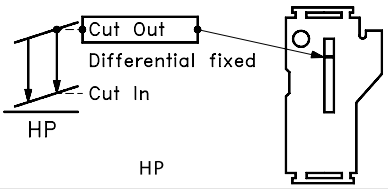
LR 112A	AC1 16 A AC3 16 A AC11 10 A	400 V	DC 11 12 W 220 V



LP, aut. reset

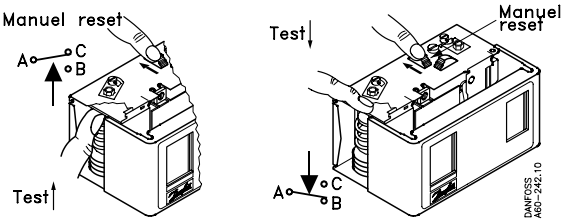


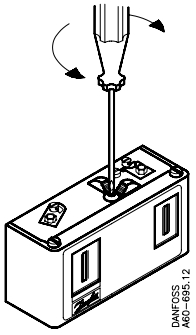
LP, man. reset



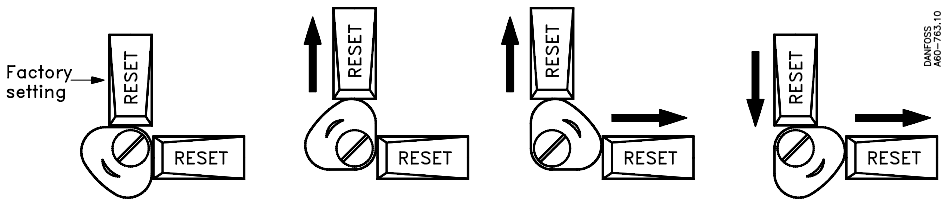
HP

Manual test





Convertible reset
KP 15 060-1154, 060-1220, 060-1261, 060-1263, 060-1283

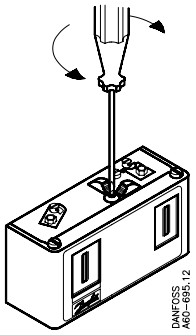


LP-man. HP-man.

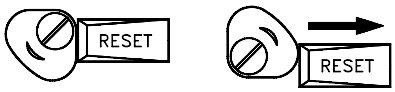
LP-auto. HP-man.

LP-auto. HP-auto.

LP-man. HP-auto.

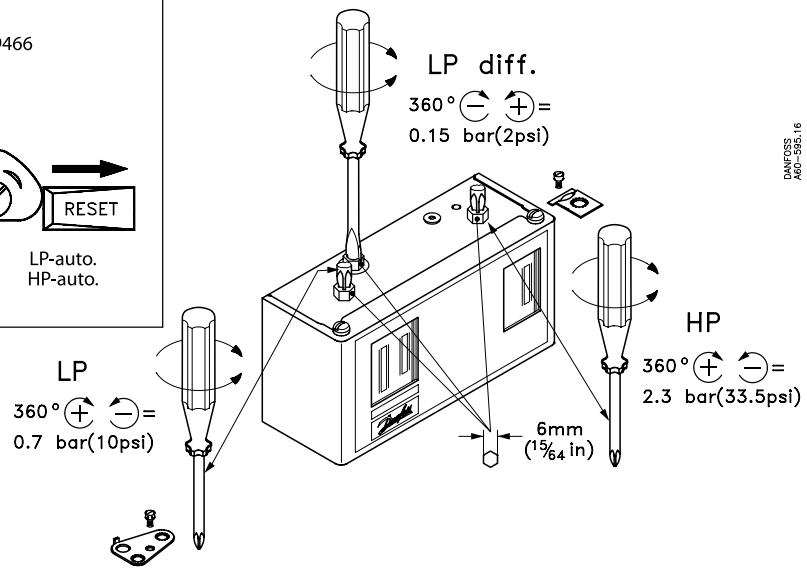


Convertible reset
KP 17B 060-539366, 060-539466



LP-auto. HP-man.

LP-auto. HP-auto.



Factory setting

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

Contents

1 - Introduction

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

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, a connecting box and service valves.

• Approved list of refrigerants:
- The LGHC and LCHC product line (fitted with Maneurop® NT compressors) can be used with R404A/R507.
- The MCZC and MGZC product line (fitted with Maneurop® MTZ compressors) can be used with R404A, R507 and R134a.

• 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. 1).

⚠ Condensing units are delivered under nitrogen gas pressure (between 1 and 2 bar) and hence cannot be connected as is; please refer to the **«Assembly»** section for further details.

⚠ Condensing units are not certified for mobile and explosion-proof applications. Any use 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) requirement must be fulfilled.

⚠ When pressure tests are required on the system, they are to be performed by qualified personnel, in paying close attention to potential pressure-related hazards and heeding the pressure limits displayed on the compressor nameplate or in the application 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 invalidate the user's authorization to operate the equipment.

2 - 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.

3 - Safety measures prior to assembly

• 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 equipment, 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 refrigerationgrade 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 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.

⚠ When installing a liquid receiver or any other pressure-containing component on the condensing unit, be sure that these components comply with the PED 2014/68/EU.

⚠ Make sure the installation is equipped with high-pressure safety components (e.g. pressure switch, pressure relief valve) to prevent against the bursting of pressure-containing components.

• 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.

4 - Assembly

⚠ The condensing unit's time of exposure to the atmosphere during installation shall be held to a minimum. The condensing unit is fitted with suction and liquid copper stubs equipped with shut-off valves to enable connection to the circuit without ingress of air or moisture in the unit.

Opening the shut-off valves before connection will cause moisture contamination of the compressor lubricant.

• Rubber grommets can 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.

⚠ Before opening the compressor connection fittings, it is mandatory to connect a 1/4" service hose to the Schrader fitting on the compressor shell in order to gradually release the nitrogen holding charge.

• 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.

5 - Leak detection

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

• 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.

⚠ Do not use a megohmeter or apply power to the compressor while it is under vacuum, as this may cause motor winding damage (motor burn-out).

⚠ Do not use colored leak detection fluids. Do not use chlorofluorocarbon in leak testing systems designed for HFC fluids.

6 - Vacuum dehydration procedure

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 shut-off 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 dryer 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.

⚠ Do not use a megohmeter or apply power to the compressor while it is under vacuum, as this may cause motor winding damage (motor burnout).

7 - Electrical connections

• Make sure the main power supply to the system 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 manual reset overload is recommended for protecting the circuit against over-current.

• The "must trip" value of this overload relay must be set in accordance with power line sizing and design and shall never exceed the "A max." value stamped on the nameplate.

• On units equipped with an 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, 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.

8 - 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 asclose 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.

• Remember that vapor-charging is only appropriate for pure refrigerants, such as R22.

• 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.

9 - 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 378-2:2012).

• 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.

10 - Start up

⚠ Never start the compressor in the absence of a refrigerant charge.

• 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 ata 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 (when mounted) 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.

⚠ Do not overcharge the system.

11 - 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, control the motor windings with an ohmmeter.
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.

• **Abnormal 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.

• **The high-pressure switch trips out:** check condenser operations (condenser cleanliness, fan operations, 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.

• **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 dryer, 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 pumpdown pressure has been reached or when safety devices will prohibit compressor further operation.

12 - 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.
- 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.
- Change the filter dryer 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.

13 - Replacement

⚠ Precaution must be taken when disconnecting any components, cutting or drilling holes in the tubing to ensure that no refrigerant under pressure is present in the system.

⚠ The refrigerant shall not be discharged directly into the atmosphere; rather, it must be removed using approved reclamation techniques and equipment and then safely stored, inaccordance with applicable legislation.

⚠ The presence of refrigerant vapor can displace air and lead to suffocation. Proper ventilation is mandatory 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 indiagnosis 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.

• 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 dryer 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 dryer cartridges and the suction filter previously installed. Repeat oil and*

filter dryer 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.

14 - 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 cause 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. abnormal operation, fire,…) leading to personnel injury if suddenly released; therefore, never drill, weld or cut 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.