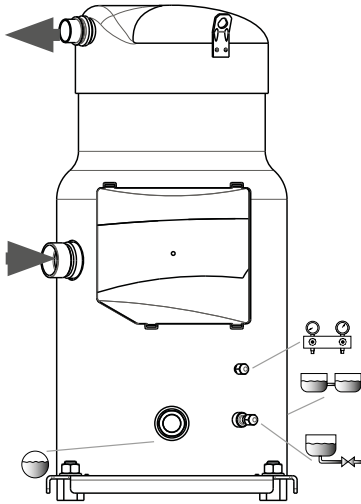


Instructions

Danfoss scroll compressors MLZ/MLM116



A: Model number
B: Serial number
C: Refrigerant

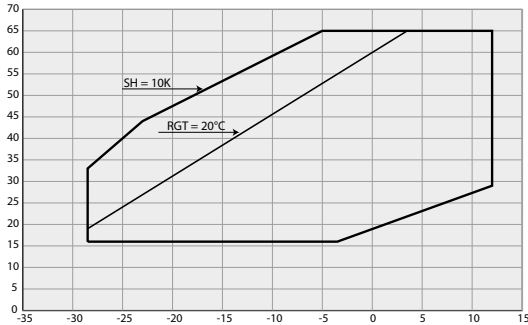
D: Supply voltage, Starting current & Maximum operating current
E: Housing service pressure
F: Factory charged lubricant



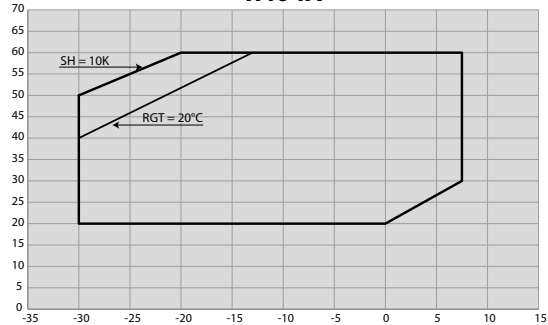
Installation and servicing of the compressor by qualified personnel only. Follow these instructions and sound refrigeration engineering practice relating to installation, commissioning, maintenance and service.

<p>! The compressor must only be used for its designed purpose(s) and within its scope of application (refer to «operating limits»). Consult Application guidelines and datasheet available from cc.danfoss.com</p>	<p>Under all circumstances, the EN378 (or other applicable local safety regulation) requirements must be fulfilled.</p>	<p>The compressor is delivered under nitrogen gas pressure (between 0.3 and 0.7 bar) and hence cannot be connected as is; refer to the «assembly» section for further details.</p>	<p>The compressor must be handled with caution in the vertical position (maximum offset from the vertical : 15°)</p>
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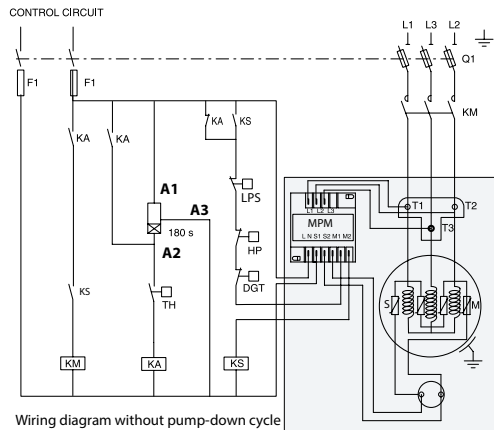
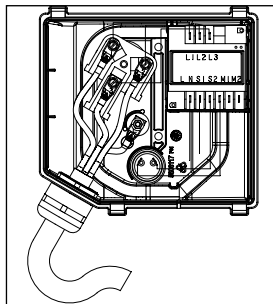
R22



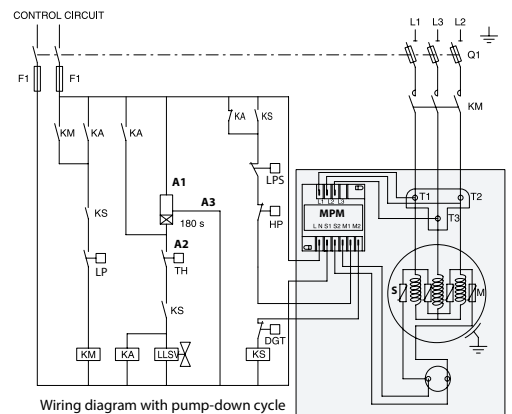
R404A



Danfoss MLZ/MLM116 scroll compressors' motors are protected by an external module protecting against phase loss/reversal, overheating and high current draw.



Wiring diagram without pump-down cycle



Wiring diagram with pump-down cycle

FusesF1
Compressor contactor..... KM
Control relay KA
Safety lock out relay..... KS
Optional short cycle timer (3 min) 180 s
External overload protection..... F2

Pump-down pressure switch LP
High pressure safety switch..... HP
Control device..... TH
Liquid Line Solenoid valve..... LLSV
Discharge gas thermostat..... DGT
Fused disconnect..... Q1

Motor safety thermostat..... thM
Compressor motor M
Motor Protection Module MPM
Thermistor chain..... S
Safety pressure switch..... LPS



1 – Introduction

These instructions pertain to the Danfoss scroll compressors MLZ/MLM116 scroll compressors used for refrigeration systems. They provide necessary information regarding safety and proper use of this product.

2 – Handling and storage

- Handle the compressor with care. Use the dedicated handles in the packaging. Use the compressor lifting lug and use appropriate and safe lifting equipment.
- Store and transport the compressor in an upright position.
- Store the compressor between -35°C and 50°C.
- Don't expose the compressor and the packaging to rain or corrosive atmosphere.

3 – Safety measures before assembly

- ⚠ Never use the compressor in a flammable atmosphere.
- The compressor ambient temperature may not exceed 50°C during off-cycle.
- Mount the compressor on a horizontal flat surface with less than 3° slope.
- Verify that the power supply corresponds to the compressor motor characteristics (see nameplate).
- When installing MLZ/MLM116, use equipment specifically reserved for HFC refrigerants which was never used for CFC or HCFC refrigerants.
- Use clean and dehydrated refrigeration-grade copper tubes and silver alloy brazing material.
- Use clean and dehydrated system components.
- The piping connected to the compressor must be flexible in 3 dimensions to dampen vibrations.

4 – Assembly

- In parallel assemblies of MLZ/MLM116 the compressor requires a rigid mounting on the rails. Use the rigid spacers from mounting kit 777045 to connect compressor to rails. For rail and frame connection, use rubber grommet from manufacturing kit (777041 for tandem and quadro / 777049 for trio). Never use rigid connection between rail and frame.
- Slowly release the nitrogen holding charge through the schrader port.
- Remove the gaskets when brazing rotolock connectors.
- Always use new gaskets for assembly.
- Connect the compressor to the system as soon as possible to avoid oil contamination from ambient moisture.
- Avoid material entering into the system while cutting tubes. Never drill holes where burrs cannot be removed.
- Braze with great care using state-of-the-art technique and vent piping with nitrogen gas flow.
- Connect the required safety and control devices. When the schrader port is used for this, remove the internal valve.
- Do not exceed the maximum tightening torque for rotolock connections:

Rotolock connections	Tightening torque
1 3/4" rotolock	110 Nm
2 1/4" rotolock	130 Nm.

5 – Leak detection

- ⚠ Never pressurize the circuit with oxygen or dry air. This could cause fire or explosion.
- Pressurize the system on HP side first and then on LP side. Never let the pressure on LP side exceed the pressure on HP side with more than 5 bar. Such pressure difference could cause internal compressor damage.
- Do not use dye for leak detection.
- Perform a leak detection test on the complete system.
- The test pressure must not exceed :

Models	LP side	HP side
MLZ/MLM116	25 bar	32 bar

- When a leak is discovered, repair the leak and repeat the leak detection.

6 – Vacuum dehydration

- Never use the compressor to evacuate the system.
- Connect a vacuum pump to both the LP & HP sides.
- Pull down the system under a vacuum of 500µm Hg (0.67 mbar) absolute.

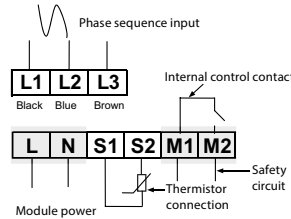
Danfoss A/S, 6430 Nordborg, Denmark

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- Do not use a megohmmeter nor apply power to the compressor while it is under vacuum as this may cause internal damage.

7 – Electrical connections

- Switch off and isolate the main power supply. See overleaf for wiring details.
- All electrical components must be selected as per local standards and compressor requirements.
- Refer to page 2 for electrical connections details.
- The Danfoss scroll compressors scroll compressor only works correctly in one rotation direction. Line phases L1, L2, L3 must absolutely be connected to compressor terminals T1, T2, T3 to avoid reverse rotation.
- Please make sure M1/M2 is connected to OEM controller and L/N is connected to outside power supply, otherwise, there will be no motor protection.



Motor protection module inside the terminal box must be connected properly according to wiring diagrams. Miss connection is never allowed!

接线盒内的电动机保护模块必须按照布线图正确连接。模块严禁漏接！

- Use ø 4.8 mm (3/16") screws and ¼" ring terminals for the power connection. Fasten with 3 Nm torque.
- The thermostat connection (if present) is a ¼" AMP-AWE spade connector.
- The compressor must be connected to earth with the 5 mm earth terminal screw.

8 – Filling the system

- Keep the compressor switched off.
- Fill the refrigerant in liquid phase into the condenser or liquid receiver. The charge must be as close as possible to the nominal system charge to avoid low pressure operation and excessive superheat. Never let the pressure on LP side exceed the pressure on HP side with more than 5 bar. Such pressure difference could cause internal compressor damage.
- Keep the refrigerant charge below the indicated charge limits if possible. Above this limit; protect the compressor against liquid flood-back with a pump-down cycle or suction line accumulator.
- Never leave the filling cylinder connected to the circuit.

Compressor models	Refrigerant charge limit (kg)
MLZ/MLM116	13.5

9 – Verification before commissioning

- ⚠ Use safety devices such as safety pressure switch and mechanical relief valve in compliance with both generally and locally applicable regulations and safety standards. Ensure that they are operational and properly set.
- ⚠ Check that the settings of high-pressure switches and relief valves don't exceed the maximum service pressure of any system component.
- A low-pressure switch is recommended to avoid vacuum operation. Minimum setting for MLM116: 0.5 bar g. Minimum setting for MLZ116: 0.7 bar g.
- Verify that all electrical connections are properly fastened and in compliance with local regulations.
- When a crankcase heater is required, it must be energized at least 12 hours before initial start-up and start-up after prolonged shutdown for belt type crankcase heaters (6 hours for surface sump heaters).

10 – Start-up

- Never start the compressor when no refrigerant is charged.
- All service valves must be in the open position.
- Balance the HP/LP pressure.
- Energize the compressor. It must start promptly. If the compressor does not start, check wiring conformity and voltage on terminals.
- Eventual reverse rotation can be detected by following phenomena; the compressor doesn't build up pressure, it has abnormally high sound level and abnormally low power consumption. In such case, shut down the compressor immediately and connect the phases to their proper terminals. MLZ/MLM116 scroll compressors scroll compressors are protected against reverse rotation by the external electronic protection module. They will shut off automatically.

11 – Check with running compressor

- Check current draw and voltage.
- Check suction superheat to reduce risk of slugging.
- Observe the oil level in the sight glass for about 60 minutes to ensure proper oil return to the compressor.
- Respect the operating limits.
- Check all tubes for abnormal vibration. Movements in excess of 1.5 mm require corrective measures such as tube brackets.
- When needed, additional refrigerant in liquid phase may be added in the low-pressure side as far as possible from the compressor. The compressor must be operating during this process.
- Do not overcharge the system.
- Never release refrigerant to atmosphere.
- Before leaving the installation site, carry out a general installation inspection regarding cleanliness, noise and leak detection.
- Record type and amount of refrigerant charge as well as operating conditions as a reference for future inspections.

12 – Maintenance

- ⚠ Internal pressure and surface temperature are dangerous and may cause permanent injury. Maintenance operators and installers require appropriate skills and tools. Tubing temperature may exceed 100°C and can cause severe burns.
- ⚠ Ensure that periodic service inspections to ensure system reliability and as required by local regulations are performed.
- To prevent system related compressor problems, following periodic maintenance is recommended:
- Verify that safety devices are operational and properly set.
- Ensure that the system is leak tight.
- Check the compressor current draw.
- Confirm that the system is operating in a way consistent with previous maintenance records and ambient conditions.
- Check that all electrical connections are still adequately fastened.
- Keep the compressor clean and verify the absence of rust and oxidation on the compressor shell, tubes and electrical connections.

13 – Warranty

- Always transmit the model number and serial number with any claim filed regarding this product. The product warranty may be void in following cases:
- Absence of nameplate.
- External modifications; in particular, drilling, welding, broken feet and shock marks.
- Compressor opened or returned unsealed.
- Rust, water or leak detection dye inside the compressor.
- Use of a refrigerant or lubricant not approved by Danfoss.
- Any deviation from recommended instructions pertaining to installation, application or maintenance.
- Use in mobile applications.
- Use in explosive atmospheric environment.
- No model number or serial number transmitted with the warranty claim.

14 – Disposal

- ⚠ Danfoss recommends that compressors and compressor oil should be recycled by a suitable company at its site.