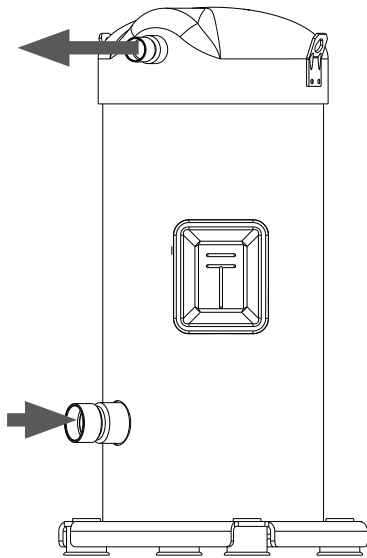


Instructions

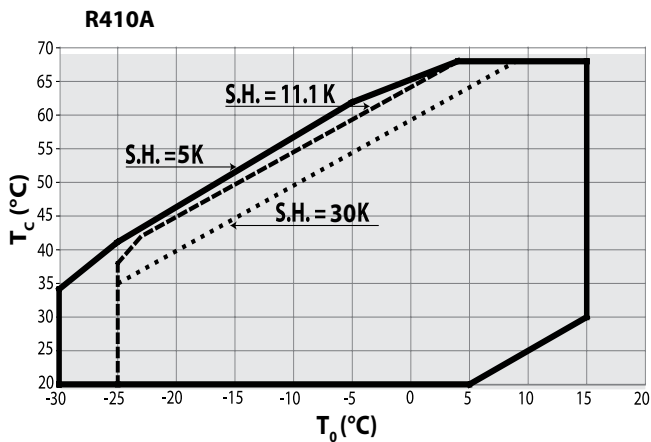
# Danfoss scroll compressors CXH



- A: Model number
- B: Serial number
- C: Refrigerant
- D: Supply voltage, Starting current & Maximum operating current
- E: Housing service pressure
- F: Factory charged lubricant



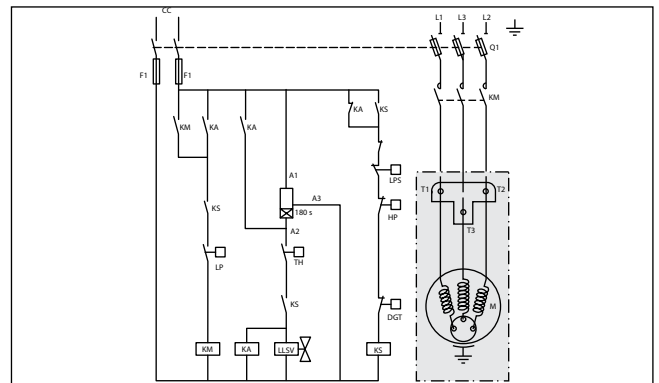
**Installation and servicing of the compressor by qualified personnel only. Follow these instructions and sound refrigeration engineering practice relating to installation, commissioning, maintenance and service.**



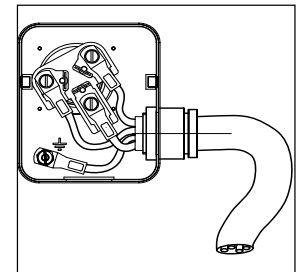
<p>⚠ The compressor must only be used for its designed purpose(s) and within its scope of application (refer to «operating limits»). Consult Application guidelines and datasheet available from cc.danfoss.com</p>	<p>⚠ Under all circumstances, the EN378 (or other applicable local safety regulation) requirements 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>

### CXH140

These Danfoss scroll compressors are protected against overheating and overloading by an internal safety motor protector. However, an external manual reset overload protector is recommended for protecting the circuit against over-current.



- Fuses ..... F1
  - Compressor contactor ..... KM
  - Control relay ..... KA
  - Safety lock out relay ..... KS
  - 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
  - Compressor motor ..... M
  - Safety pressure switch ..... LPS
  - Control circuit ..... CC
- All Wiring diagrams are with pump-down cycle**



### 1 - Introduction

These instructions pertain to the Danfoss scroll compressors CXH used for air-conditioning systems. They provide necessary information regarding safety and proper usage 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 CXH, 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 CXH the compressor requires a rigid mounting on the rails. Use the rigid spacers from the tandem mounting kit or the rigid spacers delivered with dedicated tandem compressors.
- 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.

#### 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
CXH140	33.3 bar	45.5 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 500 µm Hg (0.67 mbar) absolute.
- 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 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.
- Use  $\varnothing$  4.8 mm (3/16") screws and 1/4" ring terminals for the power connection. Fasten with 3 Nm torque.

- The thermostat connection (if present) is a 1/4" 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)
CXH140	7.9

#### 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 CXH: 1.5 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 6 hours before initial start-up and start-up after prolonged shutdown for 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. CXH140 has no internal reverse rotation protection. Prolonged reverse rotation will damage the compressors.
- If the internal overload protector trips out it must cool down to 60°C to reset. Depending on ambient temperature, this may take up to several hours.

#### 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 (if provided) 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

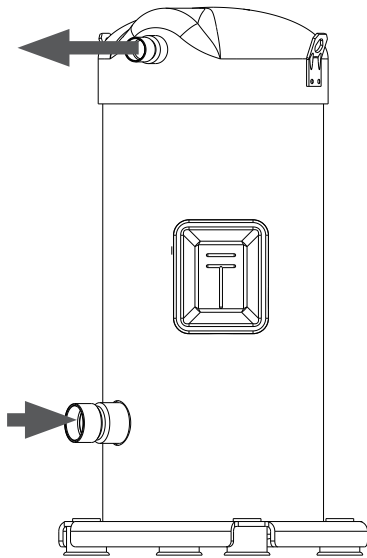
⚠ Danfoss recommends that compressors and compressor oil should be recycled by a suitable company at its site.



说明

# Danfoss 涡旋 压缩机

## CXH

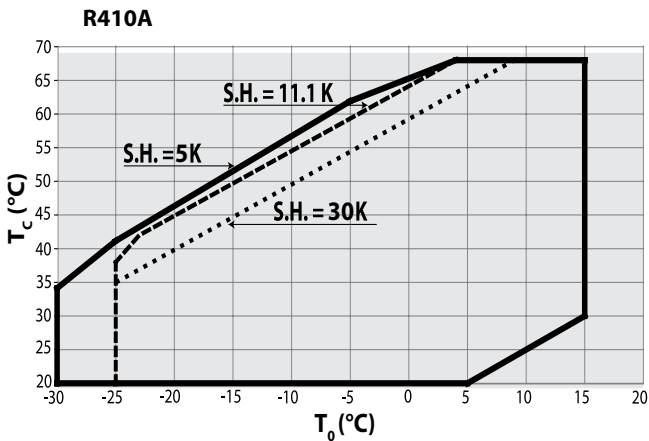


A: 型号  
B: 序列号  
C: 制冷剂

D: 电源电压、启动电流、最大工作电流  
E: 外壳工作压力  
F: 工厂注入的润滑油



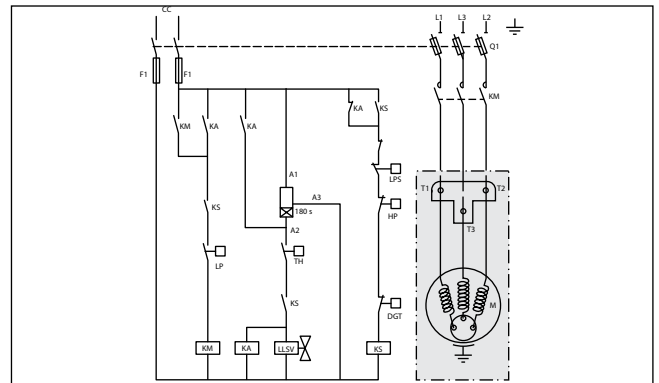
本压缩机须由经过培训的人员安装和维护。并按照以下说明以及与安装、运行和维护相关的制冷工程知识。



<p><b>!</b> 该压缩机只能用于指定用途及其应用范围之内（请参考“应用限制”）。 请查阅 <a href="http://cc.danfoss.com">cc.danfoss.com</a> 提供的应用指南和数据表</p>	<p><b>!</b> 在任何情况下，都必须达到 EN378（或其他适用的当地安全规定）要求。</p>
<p>压缩机出厂时，充注氮气压力（0.3 到 0.7 bar 之间），因此在这种情况下无法直接连接，有关进一步信息，请参考“组装”一节</p>	<p>处理压缩机时必须小心，并使其处于垂直位置（至多可偏离垂直位置：15°）</p>

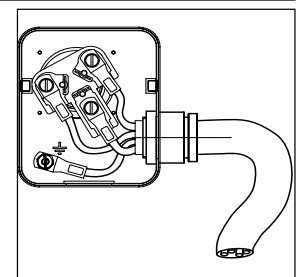
### CXH140

这些压缩机可通过内部电机保护器，防止电机过热和超载。不过，建议使用外部手动过载保护器对电路进行过电流保护。



保险丝.....	F1
压缩机接触器.....	KM
控制中继器.....	KA
安全闭锁继电器.....	KS
抽气压力开关.....	LP
高压安全开关.....	HP
控制设备.....	TH
液体管路电磁阀.....	LLSV
排气温控器.....	DGT
压缩机电动机.....	M
电动机保护模块.....	MPM
热敏电阻测温链.....	S
安全压力开关.....	LPS
控制管路.....	CC

所有的接线图都带有抽液周期



### 1 - 概述

这些概述面向用于空调系统的 CXH 涡旋压缩机。它们提供了有关该产品的安全和正确使用信息的必要信息。

### 2 - 处理和存储

- 处理压缩机时请小心。请使用包装箱内的专用把手。请使用压缩机的吊耳，并采用恰当且安全的起重设备。
- 请将压缩机竖直存储和运输。

- 请在 -35° C 到 50° C 温度间存储压缩机。请勿让压缩机和包装箱淋雨或是放在腐蚀性环境中。

### 3 - 组装前的安全措施

- !** 切勿在易燃环境中使用压缩机。
- 存储时，压缩机所处的环境温度不得超过 50° C。
- 在坡度小于 3° 的水平面上安装压缩机。
- 确保电源与压缩机的电动机特性对应（请

参见铭牌）。

- 安装SZ或 CXH 压缩机时，使用专门为HFC制冷剂的设备，该设备不得用于CFC或HCFC制冷剂。
- 请使用干净且已脱水的制冷级铜管和银钎焊合金。
- 请使用干净且已脱水的系统组件。
- 与压缩机相连的管道在空间上必须有弹性，以降低振动。



#### 4 - 组装

- 在 CXH 的并联组装中，压缩机需要刚性安装在导轨上。使用并联安装附件中提供的刚性底座或为专用并联压缩机提供的刚性底座。
- 通过注液阀口慢慢释放氮气。
- 对螺纹口接头进行铜焊时，先取出垫圈。
- 组装时始终使用新的垫圈。
- 尽快将压缩机连接至系统，以避免周围环境中的水分污染润滑油。
- 切割管道时，避免材料进入系统。若无法去除毛刺，切勿钻孔。
- 采用最新技术、利用通风管中的氮气流进行铜焊，并且要格外小心。
- 连接所需的保护装置和控制器。使用注液阀口进行连接时，请拆掉内阀。

#### 5 - 泄漏检测

⚠ 切勿用氧气或干燥空气给回路增压。这会酿成火灾或爆炸。

- 先在高压端密封该系统，然后再在低压端密封该系统。切勿让低压端上的压力超过高压端 5 bar。否则，这样的压差会导致压缩机内部损伤。
- 请勿使用染料来进行泄漏检测。
- 对整个系统进行泄漏检测。
- 测试压力不得超过：

型号	LP 侧	HP 侧
CXH140	33.3 bar	45.5 bar

- 如果发现泄漏，则检修泄漏并再次进行泄漏检测。

#### 6 - 真空脱水

- 切勿使用压缩机将系统排空。
- 将真空泵连接至低压和高压端。
- 将系统降至真空绝对值 500  $\mu\text{m Hg}$  (0.67 mbar) 以下。
- 在压缩机处于真空状态时，请勿使用兆欧表测试压缩机，因为这样会造成内部损伤。

#### 7 - 电气连接

- 关闭主电源并将其绝缘。请参阅背面的布线详细资料。
- 所有电气组件的选择必须依据当地标准和压缩机要求进行。
- 请参阅第 2 页，以了解电气连接详细信息。
- 涡旋压缩机只能在一个旋转方向正确运行。线相 L1、L2、L3 必须绝对连接到压缩机端子 T1、T2、T3，以避免反转。
- 使用  $\varnothing 4.8$  毫米 (3/16") 螺栓和 1/4" R 型端子连接电源。以 3 Nm 的扭矩拧紧。
- 温控器连接 (如果有) 为 1/4" AMP-AWE 扁形接头。
- 必须使用 5 毫米接地端子螺钉将压缩机与地面连接。

#### 8 - 系统充注

- 切断压缩机电源。
- 将制冷剂液体装入冷凝器或液体接收器。充注量必须尽可能接近标称系统充注量，以免操作压力过低或过热。切勿让低压端上的压力超过高压端 5巴。否则，这样的压差会导致压缩机内部损伤。
- 如果可能的话，让制冷剂充注量保持在指定的充注限制以下。如果超出该限制；请防止压缩机的吸气周期或吸入管累加器出现液体回液。
- 切勿将充注罐一直与回路连接。

压缩机型号	制冷剂充注量 (kg)
CXH140	7.9

#### 9 - 运行前的核查工作

⚠ 请依照通用和当地适当的规定和安全标准，使用安全压力开关和机械卸压阀等保护装置。确保它们运行且状态良好。

⚠ 检查高压开关的设置，并确保卸压阀未超出任何系统组件的最大维修压力。

- 建议采用低压开关，以免真空操作。CXH 最低设置：1.5 bar g。
- 确保所有电气连接均已正确固定，且符合当地规定。
- 如果需要曲轴箱加热器，必须在初次启动或长期停机后再次启动之前预热6小时以上 (使用油槽表面加热片)

#### 10 - 启动

- 切勿在未充注制冷剂的情况下启动压缩机。
- 所有检修阀必须处于打开位置。
- 平衡高低压力。
- 给压缩机通电，它应会立即启动。如果压缩机没有启动，请检查端子电压以及布线是否一致。
- 根据以下现象可以检测出反向旋转；压缩机没有形成压力，出现不正常噪声和不正常低功耗。在此情况下，请立即关闭压缩机并将相位连接到正确的端子。大多数涡旋压缩机都可通过内部反向保护或外部电子保护模块来防止反向。它们会自动关闭。CXH140没有反向保护。长时间持续反向运转会损伤压缩机。
- 如果内部过载保护器断开，则必须待其冷却至 60° C 后才能复位。这可能几个小时，具体取决于环境温度。

#### 11 - 检查压缩机的运行情况

- 检查最大电流和电压。
- 检查抽吸过热情况，降低液击风险。
- 观察视液镜中的油位约60分钟 (如果有视液镜)，以确保返回到压缩机的油量适当。
- 请遵守运行限制。
- 检查所有管道是否存在异常振动。如果移

动幅度超过 1.5 毫米，则须采用管道托架等纠正措施。

- 如有需要，请向低压端添加更多的液相制冷剂，并尽可能远离压缩机。必须在压缩机运行过程中执行该操作。
- 请勿对系统进行过量充注。
- 切勿将制冷剂洒到周围环境中。
- 离开安装场地之前，执行常规安全检查，包括清洁度、噪音和泄漏检测。
- 记录制冷剂的类型和充注量以及工作条件，以供将来检查参考。

#### 12 - 维护

⚠ 内部压力和表面温度均具有危险性，并可能造成持久伤害。维护操作员和安装人员需要具备适当的技能和工具。管道温度可能超过 100° C，并会造成严重烧伤。

⚠ 务必根据当地规定定期进行维修检查，以确保系统的可靠性。

为防止与压缩机相关的系统问题，建议定期进行下列维护操作：

- 检查保护装置是否正确安装和运行。
- 确保系统无漏损。
- 检查压缩机的最大电流。
- 确保系统按照先前的维护记录和周围环境持续运行。
- 检查所有电气连接是否依然紧固。
- 保持压缩机的清洁，确保压缩机壳体、管道和电气连接没有生锈或氧化。


#### 13 - 保修

对该产品进行索赔时，必须提供其型号和序列号。

产品保修在下列情况下无效：

- 无铭牌。
- 外部改装，尤其是钻孔、焊接、脚垫破损以及撞击痕迹。
- 压缩机已打开或返还时未密封。
- 压缩机内生锈，存在水渍或泄漏检测染料。
- 使用未经 Danfoss 批准的制冷剂或润滑剂。
- 任何违背有关安装、应用或维护的建议指示的行为。
- 用于移动应用。
- 在爆炸性环境中使用。
- 进行保修索赔时未提供型号或序列号。

#### 14 - 处理

 Danfoss 建议由适当的公司在其站点回收压缩机和压缩机油。