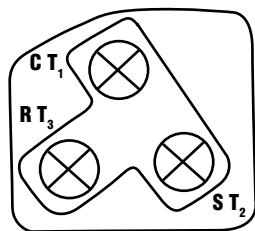
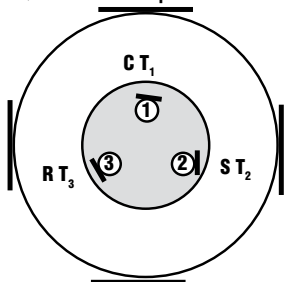


## Terminal Pin Orientation

Ring Connect Screw Terminal

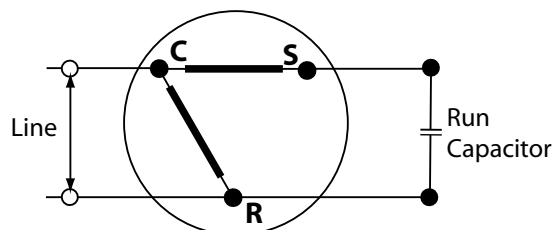


Quick Connect Spade Terminal

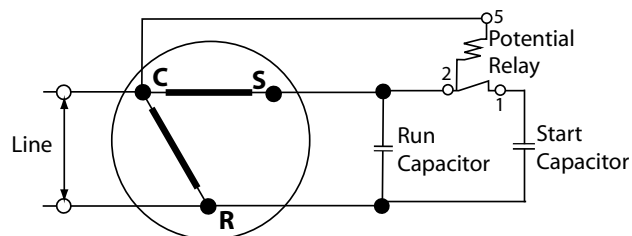


## WIRING DIAGRAMS

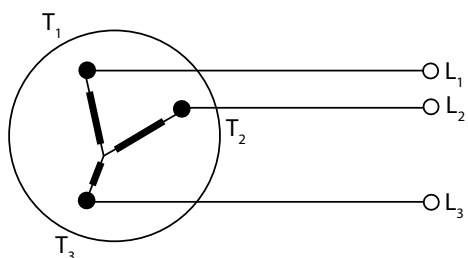
### PSC



### CSR



### 3 PHASE

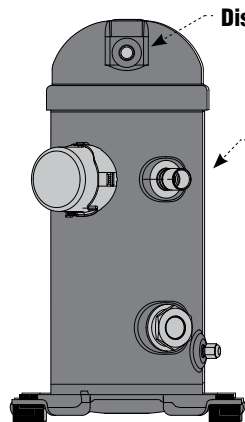


### ELECTRICAL COMPONENTS

Use only new electrical components specific for this compressor model.

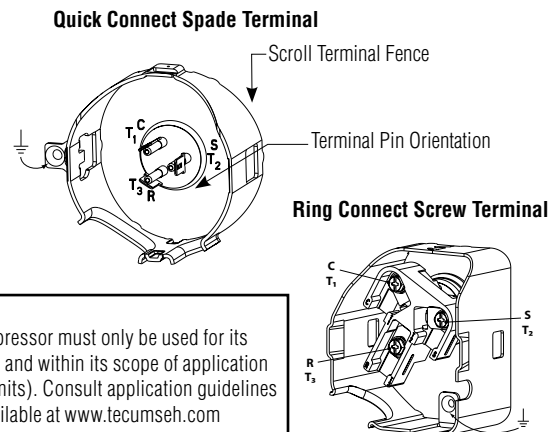


# VSC Series Scroll Compressor for Commercial (CBP) Refrigeration Installation Instructions



Discharge Rotolock

Suction Rotolock



Quick Connect Spade Terminal

Scroll Terminal Fence

Terminal Pin Orientation

Ring Connect Screw Terminal

### Important!

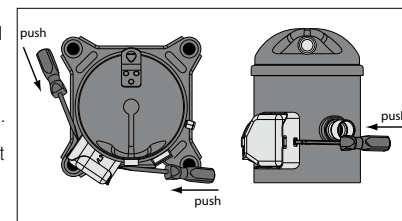
The VSC Scroll compressor must only be used for its designed purpose(s) and within its scope of application (refer to operating limits). Consult application guidelines and datasheet(s) available at [www.tecumseh.com](http://www.tecumseh.com)

NOTE: The compressor is delivered with a pressurized nitrogen charge (between 4 and 6 psig). Do not disassemble bolts, plugs, fittings, etc...unless all pressure has been relieved from the compressor. Wear protective goggles and work gloves.

Under all circumstances, applicable local safety regulation requirements must be used.

The compressor must be handled with caution in the vertical position (maximum offset from the vertical: 15°).

Never operate compressor without electrical terminal box cover in place and secured.



## General Installation Instructions

These instructions pertain to the Tecumseh VSC Series Commercial (CBP) scroll compressors used for refrigeration systems. They provide necessary information regarding safety and proper usage of this product.

### Handling

- 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 -30°F and 158°F (-35°C and 70°C).
- Don't expose the compressor and the packaging to rain or corrosive atmosphere.

### Safety First

- Never use the compressor in a flammable atmosphere.
- Mount the compressor on a horizontal flat surface with less than 7° slope.
- Verify that the power supply corresponds to the compressor motor characteristics.
- 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.
- The compressor must always be mounted with the rubber grommets supplied with the compressor.

### Assembly

- Slowly release the nitrogen holding charge through the discharge and suction ports.
- 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.
- Do not exceed the maximum torque for rotolock connections (see below).
- Tightening torque of rotolock connections: **1"** = 59 ft-lb ± 15 **1 1/4"** = 66 ft-lb ± 15 **1 3/4"** = 81 ft-lb ± 15
- Connect the required safety and control devices. When the schrader port, if any, is used, remove the internal valve.

**⚠ WARNING**

Never service, repair, or troubleshoot unless you are qualified to perform these functions. Improper servicing can lead to serious injury or death from fire, electrical shock, or explosion.



## Leak detection

- Never pressurize the refrigeration system with oxygen or dry air. This could cause fire or explosion.
- Do not use leak detection dye.
- Perform a leak detection test on the complete system.
- The low side test pressure must not exceed 450 psig.
- When a leak is discovered, repair the leak and repeat the leak detection.

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

## Electrical connections

- Switch off and isolate the main power supply.
- All electrical components must be selected as per local standards and compressor requirements.
- Refer to page 4 for electrical connections details. For three-phase applications, the terminals are labeled T1, T2, and T3. For single-phase applications the terminals are labeled C (common), S (start), and R (run).
- Tecumseh scroll compressors will only compress gas while rotating counter-clockwise (when viewed from the compressor top). Since single-phase motors will start and run in only one direction, reverse rotation is not a major consideration. Three-phase motors, however, will start and run in either direction, depending on the phase angles of the supplied power. Care must be taken during installation to ensure that the compressor operates in the correct direction.
- Use #10 - 32 screws and ¼" ring terminals for the power connection with ring connect screw terminal (C type). Fasten with 26.6 in. lb torque.
- Use ¼" tabs for quick connect spade terminals (P type).
- Use a self tapping screw to connect the compressor to ground.

## Charging the system

- Keep the compressor switched off.
- Keep the refrigerant charge below the indicated charge limits if possible. Above this limit; protect the compressor against liquid flood-back by using a pump-down cycle or suction line accumulator.
- Never leave the refrigerant filling cylinder connected to the circuit.

HP	Refrigerant charge limit (lb)
2 - 3.5	8
4 - 7	12
7.5 - 10	16

## 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 don't exceed the maximum service pressure of any system component.
- A low-pressure switch is recommended to avoid low pressure operation. (Please refer to the Minimum Setting table to the right).
- 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 24 hours before initial start-up and start-up after prolonged shutdown.
- Tighten rotolock nut to 66 ± 15 ft-lb.

Minimum Settings	
R22	7 psig
R134a	6 psig
R404A	20 psig

## Startup

- Never start the compressor without the proper refrigerant charge.
- Do not provide electrical power to the compressor unless suction and discharge service valves are open, if installed.
- Energize the compressor. It must start promptly. If the compressor does not start, check wiring conformity and voltage at the compressor terminals.
- Reverse rotation can be detected by following phenomena; excessive noise, no pressure differential between suction and discharge, and line warming rather than immediate cooling. A service technician should be present at initial start-up to verify that supply power is properly phased and that the compressor is rotating in the correct direction. VSC-series Scroll compressors are designed to operate for a maximum of 150 hours in reverse, but as a reverse rotation situation can go unnoticed for longer periods, phase monitors are recommended. For compressor models VSC9548Z and larger, phase monitors are required for all applications. Tecumseh recommends

phase protection for residential compressors.

- If the internal overload protector trips out, it must cool down to 140°F (60°C) to reset. Depending on ambient temperature, this may take up to several hours.

## Check with running compressor

- Check current draw and voltage. Measurement of amps and volts during running conditions must be taken at other points in the power supply, not in the compressor electrical box.
- 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 1/16 in (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 the 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.

## 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 212°F (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.
- Respect the operating limits.
- 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.
- Acid / moisture content in system and oil should be checked regularly.

## Warranty

Always provide the model number and serial number with any product warranty claim.

The product warranty may be void in the following cases:

- Absence of compressor nameplate/label.
- 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. Do not overcharge the system.
- Use of a refrigerant or lubricant not approved by Tecumseh.
- 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.

## Disposal

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

## QUESTIONS AND SUPPORT

**Tecumseh Tech Support: 800.211.3427 or Email: [technical.service@tecumseh.com](mailto:technical.service@tecumseh.com)**

Tecumseh reserves the right to change any information in this publication at any time.

This document is not intended to replace the training required for professional service personnel, or replace other information available from refrigeration and air conditioning equipment manufacturers. The information in this document is intended to assist service personnel in safely installing and servicing Tecumseh VSC Series Scroll compressors. Careful review of current application requirements is essential. IT IS THE RESPONSIBILITY OF THE SERVICE PERSON TO ASSURE THEY HAVE PURCHASED A REPLACEMENT PRODUCT WHICH MEETS THE NEEDS OF THE APPLICATION. Failure to do so may result in misapplication, requiring immediate or subsequent additional compressor replacement(s).

