# Commercial Refrigeration Scroll Compressors

Reference Guide-Wholesale Distribution


Tecumseh

VSC Series Scroll Compressors
for Commercial Refrigeration

# Scroll Compressors for Commercial Refrigeration

## CBP and LBP Commercial Refrigeration Applications

Tecumseh's new VSC Series Scroll Compressor has been designed to replace Original Equipment compressors used today on 2 to 10 ton R404A/R507 commercial refrigeration applications. The VSC scroll complements our current offering of 1-1/2 to 5 ton refrigeration reciprocating compressors, giving Tecumseh Authorized Wholesalers a single source for commercial refrigeration replacement compressors.

VSC Series Scroll refrigeration compressors are considered "Universal" replacements since they have the standard mounting footprint, overall height, rotolock connections, orientation and performance characteristics of competitive models.

## FEATURES AND BENEFITS

### UNIVERSAL REPLACEMENT FOR ORIGINAL EQUIPMENT COMPRESSORS

Standard mounting footprint, overall height and rotolock connection size/orientation. Meets or exceeds performance characteristics of competitive models.

**Note:**

VSC compressors are supplied with rotolock connections only. (All images show sweat connections.)


### HIGH RELIABILITY

Built-in reliability due to scroll design and engineered bearings. Thermal fault protection contributes to excellent reliablity.

### QUIETEST SCROLL ON THE MARKET

Low sound is a result of smooth and continuous compression combined with the absence of suction/discharge valves.

### ENERGY SAVINGS

High efficiency motor and optimized scroll design combine to reduce energy consumption and deliver high capacity for commercial refrigeration applications. Vapor injection (LBP models) boosts cooling capacity.

# Table of Contents



## TECH TIPS

Tecumseh has developed a number of tools to help you sell, while also helping your customer sell.

### Website: www.tecumseh.com

Tecumseh's portal to the world, the website offers product information, compressor data sheets, wholesaler location lookup, basic cross-referencing and a library filled with marketing brochures/catalogs, application bulletins and more.

### Tecumseh Web Applications

A suite of online web application tools that eliminates the guess work. Site includes product and component look up, cross reference tools, drawings, along with performance data. Analytical tools are also available for use including, refrigerant line sizing and calculating box (heat) load requirements. Go to the website at, http://boxload.tecumseh.com/

### Online Literature

Tecumseh's online literature portal, located under the "Library" tab of www.tecumseh.com, provides downloadable and searchable PDF versions of all catalogs, brochures and reference booklets produced.

### Mobile Tech to Go

These apps are the electronic version of Tecumseh's Electrical Service Parts & Cross Reference tools. For iPhone®/iPad® and Android® devices.

Available on the App Store

iPhone/

https://itunes.apple.com/us/app/tecumseh/id502258181?mt=8

Available on the Android Market

Android Device

https://play.google.com/store/apps/details?id=com.logic.tecumseh

### Tecumseh Web Applications

Box Load Program Capillary Tube Sizing Program

Condensing Unit Data Sheets Evaporator Coil Data Sheets

Electrical Service Parts Guidebook Competitive Cross Reference

Condensing Unit Fast Reference Compressor Fast Reference

Part Number Fast Reference Refrigerant TP - PT Chart

Compressor Performance Data Condensing Unit Performance Data

System Analyzer Refrigerant Line Sizing

3-Phase Voltage Imbalance Calculator Compressor Housing Drawings

Units of Measurement Converter

# MODELS RELEASED

| Model | BOM | Voltage | HP | Capacity (Btu/h)* | Motor Type | RLA | LRA | Oil Type |
|---|---|---|---|---|---|---|---|---|
| **R404A COMMERCIAL TEMPERATURE** | | | | | | | | |
| VSC9515ZNA | VS220ET-103-J7 | 208-230/60/1 | 2.0 | 14,622 | PSC | 12.2 | 69 | PVE |
| VSC9515ZXG | VS220TT-103-J7 | 460/60/3, 380-420/50/3 | 2.0 | 14,499 | 3PH | 4.5 | 30 | PVE |
| VSC9515ZXH | VS220VT-103-J7 | 575/60/3, 480-520/50/3 | 2.0 | 14,499 | 3PH | 3.5 | 26 | PVE |
| VSC9515ZXT | VS220RT-103-J7 | 200-230/60/3, 200-220/50/3 | 2.0 | 14,499 | 3PH | 9.3 | 60 | PVE |
| VSC9519ZNA | VS221ET-103-J7 | 208-230/60/1 | 2.5 | 19,501 | PSC | 16.0 | 97 | PVE |
| VSC9519ZXG | VS221TT-103-J7 | 460/60/3, 380-420/50/3 | 2.5 | 19,461 | 3PH | 6.1 | 45 | PVE |
| VSC9519ZXH | VS221VT-103-J7 | 575/60/3, 480-520/50/3 | 2.5 | 19,461 | 3PH | 5.0 | 38 | PVE |
| VSC9519ZXT | VS221RT-103-J7 | 200-230/60/3, 200-220/50/3 | 2.5 | 19,461 | 3PH | 11.2 | 95 | PVE |
| VSC9521ZNA | VS222ET-103-J7 | 208-230/60/1 | 3.0 | 20,690 | PSC | 16.7 | 97 | PVE |
| VSC9521ZXG | VS222TT-103-J7 | 460/60/3, 380-420/50/3 | 3.0 | 20,843 | 3PH | 6.1 | 45 | PVE |
| VSC9521ZXH | VS222VT-103-J7 | 575/60/3, 480-520/50/3 | 3.0 | 20,843 | 3PH | 4.5 | 38 | PVE |
| VSC9521ZXT | VS222RT-103-J7 | 200-230/60/3, 200-220/50/3 | 3.0 | 20,843 | 3PH | 11.2 | 95 | PVE |
| VSC9526ZNA | VS223ET-103-J7 | 208-230/60/1 | 3.5 | 26,033 | PSC | 21.0 | 115 | PVE |
| VSC9526ZXG | VS223TT-103-J7 | 460/60/3, 380-420/50/3 | 3.5 | 25,808 | 3PH | 6.4 | 45 | PVE |
| VSC9526ZXH | VS223VT-103-J7 | 575/60/3, 480-520/50/3 | 3.5 | 25,808 | 3PH | 5.1 | 38 | PVE |
| VSC9526ZXT | VS223RT-103-J7 | 200-230/60/3, 200-220/50/3 | 3.5 | 25,808 | 3PH | 14.1 | 95 | PVE |
| VSC9530ZNA | VS224ET-104-J7 | 208-230/60/1 | 4.0 | 30,328 | PSC | 24.4 | 150 | PVE |
| VSC9530ZXG | VS224TT-104-J7 | 460/60/3, 380-420/50/3 | 4.0 | 30,324 | 3PH | 8.3 | 60 | PVE |
| VSC9530ZXH | VS224VT-104-J7 | 575/60/3, 480-520/50/3 | 4.0 | 30,324 | 3PH | 5.1 | 42 | PVE |
| VSC9530ZXT | VS224RT-104-J7 | 200-230/60/3, 200-220/50/3 | 4.0 | 30,324 | 3PH | 16.7 | 120 | PVE |
| VSC9538ZNA | VS225ET-104-J7 | 208-230/60/1 | 5.0 | 35,870 | PSC | 28.9 | 160 | PVE |
| VSC9538ZXG | VS225TT-104-J7 | 460/60/3, 380-420/50/3 | 5.0 | 36,497 | 3PH | 9.6 | 70 | PVE |
| VSC9538ZXH | VS225VT-104-J7 | 575/60/3, 480-520/50/3 | 5.0 | 36,497 | 3PH | 4.7 | 53 | PVE |
| VSC9538ZXT | VS225RT-104-J7 | 200-230/60/3, 200-220/50/3 | 5.0 | 36,497 | 3PH | 16.7 | 123 | PVE |
| VSC9545ZXG | VS226TT-104-J7 | 460/60/3, 380-420/50/3 | 6.0 | 44,144 | 3PH | 9.6 | 82 | PVE |
| VSC9545ZXH | VS226VT-104-J7 | 575/60/3, 480-520/50/3 | 6.0 | 44,144 | 3PH | 7.7 | 64 | PVE |
| VSC9545ZXT | VS226RT-104-J7 | 200-230/60/3, 200-220/50/3 | 6.0 | 44,144 | 3PH | 19.2 | 170 | PVE |
| VSC9548ZXG | VS227TT-104-J7 | 460/60/3, 380-420/50/3 | 7.0 | 48,249 | 3PH | 10.3 | 87 | PVE |
| VSC9548ZXH | VS227VT-104-J7 | 575/60/3, 480-520/50/3 | 7.0 | 48,249 | 3PH | 8.3 | 67 | PVE |
| VSC9548ZXT | VS227RT-104-J7 | 200-230/60/3200-220/50/3 | 7.0 | 48,249 | 3PH | 23.7 | 190 | PVE |
| VSC9558ZXG | VS228TT-105-J7 | 460/60/3, 380-420/50/3 | 7.5 | 55,551 | 3PH | 12.8 | 95 | PVE |
| VSC9558ZXH | VS228VT-105-J7 | 575/60/3, 480-520/50/3 | 7.5 | 55,551 | 3PH | 9.4 | 75 | PVE |
| VSC9558ZXT | VS228RT-105-J7 | 200-230/60/3, 200-220/50/3 | 7.5 | 55,551 | 3PH | 25.6 | 190 | PVE |

| Model | BOM | Voltage | HP | Capacity (Btu/h)* | Motor Type | RLA | LRA | Oil Type |
|---|---|---|---|---|---|---|---|---|
| **R404A COMMERCIAL TEMPERATURE (continued)** | | | | | | | | |
| VSC9566ZXG | VS229TT-105-J7 | 460/60/3, 380-420/50/3 | 9.0 | 65,491 | 3PH | 16.0 | 110 | PVE |
| VSC9566ZXH | VS229VT-105-J7 | 575/60/3, 480-520/50/3 | 9.0 | 65,491 | 3PH | 11.5 | 95 | PVE |
| VSC9566ZXT | VS229RT-105-J7 | 200-230/60/3, 200-220/50/3 | 9.0 | 65,491 | 3PH | 29.5 | 235 | PVE |
| VSC9576ZXG | VS230TT-105-J7 | 460/60/3, 380-420/50/3 | 10.0 | 73,940 | 3PH | 19.2 | 140 | PVE |
| VSC9576ZXH | VS230VT-105-J7 | 575/60/3, 480-520/50/3 | 10.0 | 73,940 | 3PH | 14.2 | 100 | PVE |
| VSC9576ZXT | VS230RT-105-J7 | 200-230/60/3, 200-220/50/3 | 10.0 | 73,940 | 3PH | 32.0 | 235 | PVE |
| **R404A LOW TEMPERATURE** | | | | | | | | |
| VSCF513ZXG | VS231TT-106-J7 | 460/60/3, 380-420/50/3 | 4.0 | 13,162 | 3PH | 8.0 | 62 | PVE |
| VSCF513ZXT | VS231RT-106-J7 | 200-230/60/3, 200-220/50/3 | 4.0 | 13,162 | 3PH | 17.9 | 123 | PVE |
| VSCF515ZXG | VS232TT-106-J7 | 460/60/3, 380-420/50/3 | 5.0 | 16,099 | 3PH | 9.6 | 88.5 | PVE |
| VSCF515ZXT | VS232RT-106-J7 | 200-230/60/3, 200-220/50/3 | 5.0 | 16,099 | 3PH | 18.5 | 180 | PVE |
| VSCF518ZXG | VS233TT-106-J7 | 460/60/3, 380-420/50/3 | 6.0 | 19,163 | 3PH | 10.0 | 90 | PVE |
| VSCF518ZXT | VS233RT-106-J7 | 200-230/60/3, 200-220/50/3 | 6.0 | 19,163 | 3PH | 20.0 | 184 | PVE |
| VSCF524ZXG | VS234TT-107-J7 | 460/60/3, 380-420/50/3 | 8.0 | 23,923 | 3PH | 13.5 | 95 | PVE |
| VSCF524ZXT | VS234RT-107-J7 | 200-230/60/3, 200-220/50/3 | 8.0 | 23,923 | 3PH | 25.6 | 190 | PVE |
| VSCF534ZXG | VS235TT-108-J7 | 460/60/3, 380-420/50/3 | 10.0 | 32,600 | 3PH | 16.0 | 120 | PVE |
| VSCF534ZXT | VS235RT-108-J7 | 200-230/60/3, 200-220/50/3 | 10.0 | 32,600 | 3PH | 32.0 | 240 | PVE |

*ARI Conditions;
CBP (Commercial Back Pressure) Evaporating Temp 20°F (-6.7°C), Condensing Temp 120°F (48.9°C), Return Gas 40°F (4.4°C), Liquid Temp 120°F (48.9°C), Ambient Temp 95°F (35°C).
LBP (Low Back Pressure) Evaporating Temp -25°F (-31.7°C), Condensing Temp 105°F (40.6°C), Return Gas 65°F (18.3°C), Liquid Temp 105°F (40.6°C), Ambient Temp 95°F (35°C).

## VSA / VSC FEATURE COMPARISON

| Feature | VSA | VSC |
|---|---|---|
| Mounting Footprint | 7.5" x 7.5" | 7.5" x 7.5" |
| Sight Glass | X | X |
| Schrader Valve | X | X |
| Suction/Discharge Connections | Braze/Rotolock | Rotolock |
| LBP Liquid Injection | X | |
| LBP Vapor Injection | | X |
| Capacity Range (CBP) | 1 HP to 6 HP | 2 HP to 10 HP |
| Capacity Range (LBP) | 2 HP to 6 HP | 4 HP to 10 HP |
| Refrigerants (CBP) | R404A/R507 | R404A/R507, R22, R134a |
| Refrigerants (LBP) | R404A/R507 | R404A/R507 |
| Oil | POE | PVE |

# COMPETITIVE CROSS REFERENCE

Tecumseh commercial refrigeration scrolls are considered “Drop-In” or “Universal” replacements since they have the standard mounting footprint, overall height, rotolock connections and orientation and performance characteristics as competitive models.

As with any cross reference, please review fit, form and function with your customer and their application.

## Tecumseh to Competitive Cross

| R404A COMMERCIAL TEMPERATURE | | | | | |
|---|---|---|---|---|---|
| **VSA Model** | **VSC Model** | **HP** | **Btu/h** | **Voltage** | **Copeland Model** |
| VSA9514ZNA | VSC9515ZNA | 2 | 14,622 | 208-230/60/1 | ZS15KAE-PFV |
| VSA9514ZXG | VSC9515ZXG | 2 | 14,499 | 460/60/3 | ZS15KAE-TFD |
| N/A | VSC9515ZXH | 2 | 14,499 | 575/60/3 | ZS15KAE-TFE |
| VSA9514ZXT | VSC9515ZXT | 2 | 14,499 | 200-230/60/3 | ZS15KAE-TF5 |
| N/A | VSC9519ZNA | 2.5 | 19,501 | 208-230/60/1 | ZS19KAE-PFV |
| VSA9517ZXG | VSC9519ZXG | 2.5 | 19,461 | 460/60/3 | ZS19KAE-TFD |
| N/A | VSC9519ZXH | 2.5 | 19,461 | 575/60/3 | ZS19KAE-TFE |
| VSA9517ZXT | VSC9519ZXT | 2.5 | 19,461 | 200-230/60/3 | ZS19KAE-TF5 |
| N/A | VSC9521ZNA | 3 | 20,690 | 208-230/60/1 | ZS21KAE-PFV |
| VSA9521ZXG | VSC9521ZXG | 3 | 20,843 | 460/60/3 | ZS21KAE-TFD |
| N/A | VSC9521ZXH | 3 | 20,843 | 575/60/3 | ZS21KAE-TFE |
| VSA9521ZXT | VSC9521ZXT | 3 | 20,843 | 200-230/60/3 | ZS21KAE-TF5 |
| VSA9524ZNA | VSC9526ZNA | 3.5 | 26,033 | 208-230/60/1 | ZS26KAE-PFV |
| VSA9524ZXG | VSC9526ZXG | 3.5 | 25,808 | 460/60/3 | ZS26KAE-TFD |
| N/A | VSC9526ZXH | 3.5 | 25,808 | 575/60/3 | ZS26KAE-TFE |
| VSA9524ZXT | VSC9526ZXT | 3.5 | 25,808 | 200-230/60/3 | ZS26KAE-TF5 |
| N/A | VSC9530ZNA | 4 | 30,328 | 208-230/60/1 | ZS30K4E-PFV |
| VSA9528ZXG | VSC9530ZXG | 4 | 30,324 | 460/60/3 | ZS30K4E-TFD |
| N/A | VSC9530ZXH | 4 | 30,324 | 575/60/3 | ZS30K4E-TFE |
| VSA9528ZXT | VSC9530ZXT | 4 | 30,324 | 200-230/60/3 | ZS30K4E-TF5 |
| N/A | VSC9538ZNA | 5 | 35,870 | 208-230/60/1 | ZS38K4E-PFV |
| VSA9536ZXG | VSC9538ZXG | 5 | 36,497 | 460/60/3 | ZS38K4E-TFD |
| N/A | VSC9538ZXH | 5 | 36,497 | 575/60/3 | ZS38K4E-TFE |
| VSA9536ZXT | VSC9538ZXT | 5 | 36,497 | 200-230/60/3 | ZS38K4E-TF5 |
| VSA9544ZXG | VSC9545ZXG | 6 | 44,144 | 460/60/3 | ZS45K4E-TFD |
| N/A | VSC9545ZXH | 6 | 44,144 | 575/60/3 | ZS45K4E-TFE |
| VSA9544ZXT | VSC9545ZXT | 6 | 44,144 | 200-230/60/3 | ZS45K4E-TF5 |

| R404A COMMERCIAL TEMPERATURE | | | | | |
|---|---|---|---|---|---|
| **VSA Model** | **VSC Model** | **HP** | **Btu/h** | **Voltage** | **Copeland Model** |
| N/A | VSC9548ZXG | 7 | 48,249 | 460/60/3 | - |
| N/A | VSC9548ZXH | 7 | 48,249 | 575/60/3 | - |
| N/A | VSC9548ZXT | 7 | 48,249 | 200-230/60/3 | - |
| N/A | VSC9558ZXG | 7.5 | 55,551 | 460/60/3 | ZS56K4E-TWD |
| N/A | VSC9558ZXH | 7.5 | 55,551 | 575/60/3 | ZS56K4E-TWE |
| N/A | VSC9558ZXT | 7.5 | 55,551 | 200-230/60/3 | ZS56K4E-TWC |
| N/A | VSC9566ZXG | 9 | 65,491 | 460/60/3 | - |
| N/A | VSC9566ZXH | 9 | 65,491 | 575/60/3 | - |
| N/A | VSC9566ZXT | 9 | 65,491 | 200-230/60/3 | - |
| N/A | VSC9576ZXG | 10 | 73,940 | 460/60/3 | ZS75K4E-TWD |
| N/A | VSC9576ZXH | 10 | 73,940 | 575/60/3 | ZS75K4E-TWE |
| N/A | VSC9576ZXT | 10 | 73,940 | 200-230/60/3 | ZS75K4E-TWC |

| R404A LOW TEMPERATURE | | | | | |
|---|---|---|---|---|---|
| **VSA Model** | **VSC Model** | **HP** | **Btu/h** | **Voltage** | **Copeland Model** |
| VSAG513ZXG | VSCF513ZXG | 4 | 13,162 | 460/60/3 | ZF13K4E-TFD |
| VSAG513ZXT | VSCF513ZXT | 4 | 13,162 | 200-230/60/3 | ZF13K4E-TF5 |
| VSAG514ZXG | VSCF515ZXG | 5 | 16,099 | 460/60/3 | ZF15K4E-TFD |
| VSAG514ZXT | VSCF515ZXT | 5 | 16,099 | 200-230/60/3 | ZF15K4E-TF5 |
| VSAG518ZXG | VSCF518ZXG | 6 | 19,163 | 460/60/3 | ZF18K4E-TFD |
| VSAG518ZXT | VSCF518ZXT | 6 | 19,163 | 200-230/60/3 | ZF18K4E-TF5 |
| VSAG523ZXG | VSCF524ZXG | 8 | 23,923 | 460/60/3 | ZF24K4E-TWD |
| VSAG523ZXT | VSCF524ZXT | 8 | 23,923 | 200-230/60/3 | ZF24K4E-TWC |
| N/A | VSCF534ZXG | 10 | 32,600 | 460/60/3 | ZF33K4E-TWD |
| N/A | VSCF534ZXT | 10 | 32,600 | 200-230/60/3 | ZF33K4E-TWC |

# COMPETITIVE CROSS REFERENCE

Tecumseh commercial refrigeration scrolls are considered “Drop-In” or “Universal” replacements since they have the standard mounting footprint, overall height, rotolock connections and orientation and performance characteristics as competitive models.

As with any cross reference, please review fit, form and function with your customer and their application.

## Competitive Cross to Tecumseh

| R404A COMMERCIAL TEMPERATURE | | | | | |
|---|---|---|---|---|---|
| **Copeland Model** | **VSC Model** | **VSA Model** | **HP** | **Btu/h** | **Voltage** |
| ZS15KAE-PFV | VSC9515ZNA | VSA9514ZNA | 2 | 14,622 | 208-230/60/1 |
| ZS15KAE-TFD | VSC9515ZXG | VSA9514ZXG | 2 | 14,499 | 460/60/3 |
| ZS15KAE-TFE | VSC9515ZXH | N/A | 2 | 14,499 | 575/60/3 |
| ZS15KAE-TF5 | VSC9515ZXT | VSA9514ZXT | 2 | 14,499 | 200-230/60/3 |
| ZS19KAE-PFV | VSC9519ZNA | N/A | 2.5 | 19,501 | 208-230/60/1 |
| ZS19KAE-TFD | VSC9519ZXG | VSA9517ZXG | 2.5 | 19,461 | 460/60/3 |
| ZS19KAE-TFE | VSC9519ZXH | N/A | 2.5 | 19,461 | 575/60/3 |
| ZS19KAE-TF5 | VSC9519ZXT | VSA9517ZXT | 2.5 | 19,461 | 200-230/60/3 |
| ZS21KAE-PFV | VSC9521ZNA | N/A | 3 | 20,690 | 208-230/60/1 |
| ZS21KAE-TFD | VSC9521ZXG | VSA9521ZXG | 3 | 20,843 | 460/60/3 |
| ZS21KAE-TFE | VSC9521ZXH | N/A | 3 | 20,843 | 575/60/3 |
| ZS21KAE-TF5 | VSC9521ZXT | VSA9521ZXT | 3 | 20,843 | 200-230/60/3 |
| ZS26KAE-PFV | VSC9526ZNA | VSA9524ZNA | 3.5 | 26,033 | 208-230/60/1 |
| ZS26KAE-TFD | VSC9526ZXG | VSA9524ZXG | 3.5 | 25,808 | 460/60/3 |
| ZS26KAE-TFE | VSC9526ZXH | N/A | 3.5 | 25,808 | 575/60/3 |
| ZS26KAE-TF5 | VSC9526ZXT | VSA9524ZXT | 3.5 | 25,808 | 200-230/60/3 |
| ZS30K4E-PFV | VSC9530ZNA | N/A | 4 | 30,328 | 208-230/60/1 |
| ZS30K4E-TFD | VSC9530ZXG | VSA9528ZXG | 4 | 30,324 | 460/60/3 |
| ZS30K4E-TFE | VSC9530ZXH | N/A | 4 | 30,324 | 575/60/3 |
| ZS30K4E-TF5 | VSC9530ZXT | VSA9528ZXT | 4 | 30,324 | 200-230/60/3 |
| ZS38K4E-PFV | VSC9538ZNA | N/A | 5 | 35,870 | 208-230/60/1 |
| ZS38K4E-TFD | VSC9538ZXG | VSA9536ZXG | 5 | 36,497 | 460/60/3 |
| ZS38K4E-TFE | VSC9538ZXH | N/A | 5 | 36,497 | 575/60/3 |
| ZS38K4E-TF5 | VSC9538ZXT | VSA9536ZXT | 5 | 36,497 | 200-230/60/3 |
| ZS45K4E-TFD | VSC9545ZXG | VSA9544ZXG | 6 | 44,144 | 460/60/3 |
| ZS45K4E-TFE | VSC9545ZXH | N/A | 6 | 44,144 | 575/60/3 |
| ZS45K4E-TF5 | VSC9545ZXT | VSA9544ZXT | 6 | 44,144 | 200-230/60/3 |

| R404A COMMERCIAL TEMPERATURE | | | | | |
|---|---|---|---|---|---|
| **Copeland Model** | **VSC Model** | **VSA Model** | **HP** | **Btu/h** | **Voltage** |
| - | VSC9548ZXG | N/A | 7 | 48,249 | 460/60/3 |
| - | VSC9548ZXH | N/A | 7 | 48,249 | 575/60/3 |
| - | VSC9548ZXT | N/A | 7 | 48,249 | 200-230/60/3 |
| ZS56K4E-TWD | VSC9558ZXG | N/A | 7.5 | 55,551 | 460/60/3 |
| ZS56K4E-TWE | VSC9558ZXH | N/A | 7.5 | 55,551 | 575/60/3 |
| ZS56K4E-TWC | VSC9558ZXT | N/A | 7.5 | 55,551 | 200-230/60/3 |
| - | VSC9566ZXG | N/A | 9 | 65,491 | 460/60/3 |
| - | VSC9566ZXH | N/A | 9 | 65,491 | 575/60/3 |
| - | VSC9566ZXT | N/A | 9 | 65,491 | 200-230/60/3 |
| ZS75K4E-TWD | VSC9576ZXG | N/A | 10 | 73,940 | 460/60/3 |
| ZS75K4E-TWE | VSC9576ZXH | N/A | 10 | 73,940 | 575/60/3 |
| ZS75K4E-TWC | VSC9576ZXT | N/A | 10 | 73,940 | 200-230/60/3 |

| R404A LOW TEMPERATURE | | | | | |
|---|---|---|---|---|---|
| **Copeland Model** | **VSC Model** | **VSA Model** | **HP** | **Btu/h** | **Voltage** |
| ZF13K4E-TFD | VSCF513ZXG | VSAG513ZXG | 4 | 13,162 | 460/60/3 |
| ZF13K4E-TF5 | VSCF513ZXT | VSAG513ZXT | 4 | 13,162 | 200-230/60/3 |
| ZF15K4E-TFD | VSCF515ZXG | VSAG514ZXG | 5 | 16,099 | 460/60/3 |
| ZF15K4E-TF5 | VSCF515ZXT | VSAG514ZXT | 5 | 16,099 | 200-230/60/3 |
| ZF18K4E-TFD | VSCF518ZXG | VSAG518ZXG | 6 | 19,163 | 460/60/3 |
| ZF18K4E-TF5 | VSCF518ZXT | VSAG518ZXT | 6 | 19,163 | 200-230/60/3 |
| ZF24K4E-TWD | VSCF524ZXG | VSAG523ZXG | 8 | 23,923 | 460/60/3 |
| ZF24K4E-TWC | VSCF524ZXT | VSAG523ZXT | 8 | 23,923 | 200-230/60/3 |
| ZF33K4E-TWD | VSCF534ZXG | N/A | 10 | 32,600 | 460/60/3 |
| ZF33K4E-TWC | VSCF534ZXT | N/A | 10 | 32,600 | 200-230/60/3 |

# PRODUCT MARKETING

## COMPRESSOR MODEL NOMENCLATURE

**VS C 9 5 15 Z XT**

**Family**
VS Series

**Release Generation**

**Application**
"9" Commercial Temperature
"F" Low Temperature, Vapor-Injection

**Capacity**
Number of digits in Rated Btu/h Capacity

**Capacity**
Next two digits are the first two digits in Rated Btu/h Capacity.

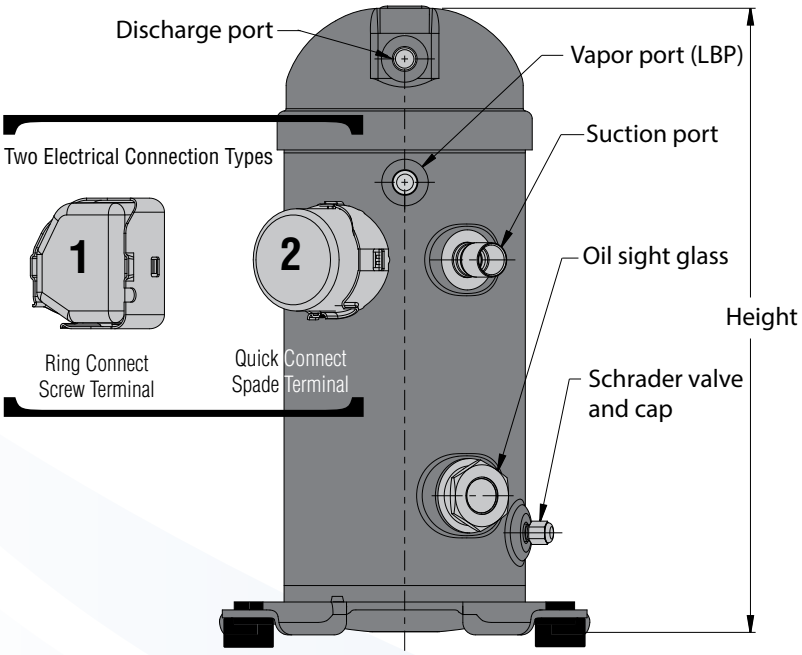
**Refrigerant***
Z = R404A, R507

**Approved Voltage**
NA 208-230/60/1
XT 200-230/60/3, 200-220/50/3
XG 460/60/3, 380-420/50/3
XH 575/60/3, 480-520/50/3

* CBP also designed for common refrigerants R22 and R134a

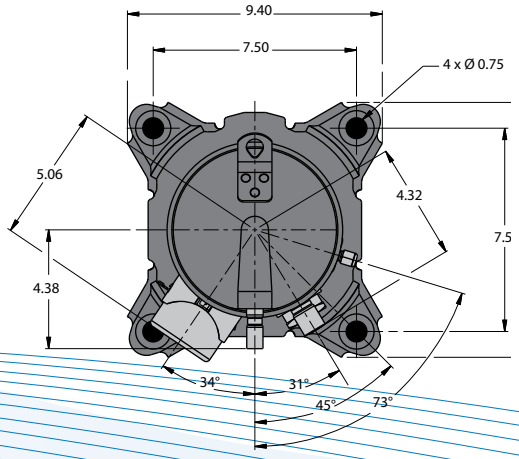
## DIMENSIONS

All dimensions are in inches.




| Dim. Drawing | Suction Rotolock | Discharge Rotolock | Height (in.) | Conn. Types |
|---|---|---|---|---|
| A1 | 1 1/4 | 1 | 16.2 | 2 |
| A2 | 1 1/4 | 1 | 17.9 | 1 |
| A3 | 1 3/4 | 1 1/4 | 21.1 | 1 |
| B1 | 1 1/4 | 1 | 19.1 | 1 |
| B2 | 1 3/4 | 1 1/4 | 21.3 | 1 |
| B3 | 1 3/4 | 1 1/4 | 22.2 | 1 |

All measurements are in inches.



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# PRODUCT SPECIFICATIONS

## Commercial Scroll (R404A/R507, R134a, R22)

| | | |
|---|---|---|
| **Evaporating Ranges:** | **CBP** -20°F to +50°F (-30°C to +10°C) | **LBP** -40°F to +14°F (-40°C to -10°C) |
| **Refrigerants:** | **CBP** R404A/R507, R134a, R22 | **LBP** R404A/R507 |
| **Oil:** | Polyvinyl Ether | **Viscosity** 32 cSt |
| **Size:** | **Commercial (CBP)** 2 to 10 HP | **Low (LBP)** 4 to 10 HP |
| **Connections (in):** | **Suction Rotolock** 1 1/4 and 1 3/4 | **Discharge Rotolock** 1 and 1 1/4 |
| **Footprint (in):** | Industry Standard 7.5 x 7.5 | |
| **Motor Type:** | PSC, 3 Phase | |

# SERIAL LABEL

### Commercial Back Pressure (CBP) Models

S 03 09 K 12345

- S — Manufacturing Location
- 03 — Production Week
- 09 — Production Year
- K — Month Code
- 12345 — 5 Digit Serial Number

### Low Back Pressure (LBP) Models

A B 25 12345678

- A — Year Code
- B — Month Code
- 25 — Plant Assemby Line Code
- 12345678 — 8 Digit Serial Number

| Serial Label Year/Month Identifiers | | | |
|---|---|---|---|
| A – 2010/January | D – 2013/April | G – 2016/July | K – 2019/October |
| B – 2011/February | E – 2014/May | H – 2017/August | L – 2020/November |
| C – 2012/March | F – 2015/June | J – 2018/September | M – 2021/December |


**Note:**

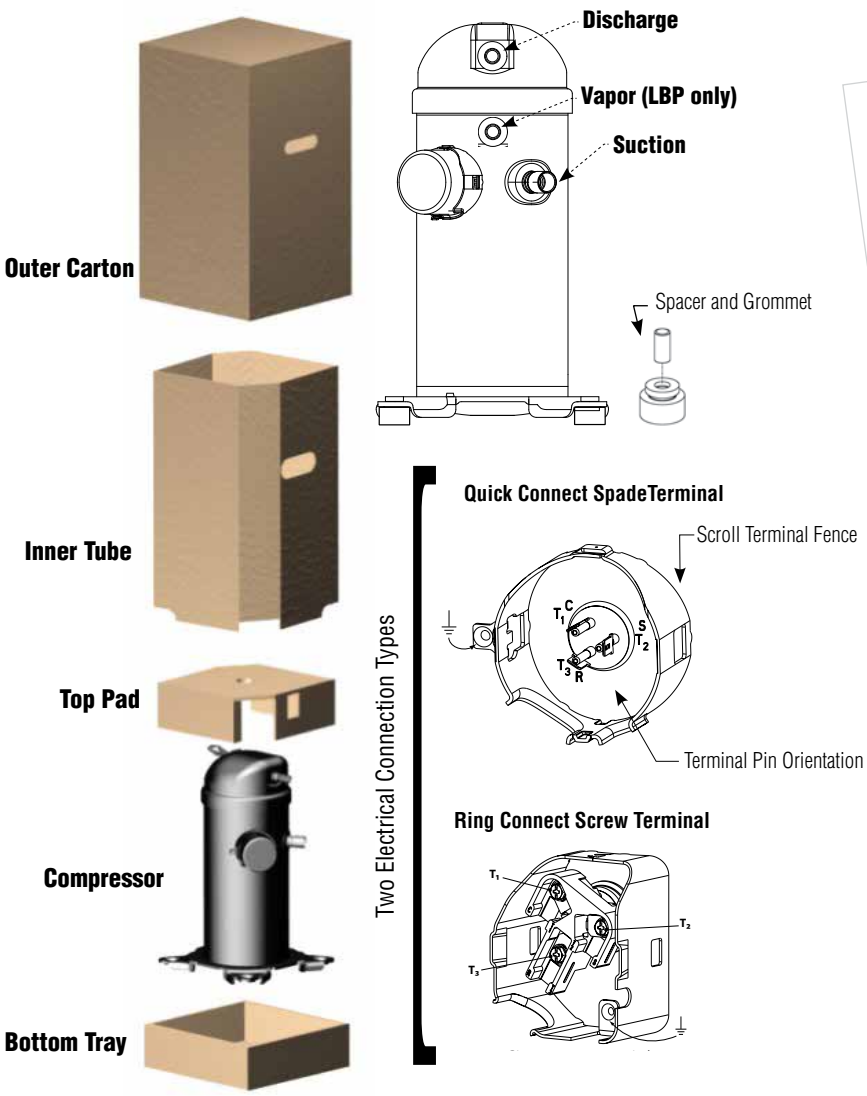
Serial label is marked A4,

and the

Carton label is marked J7.

# WHAT'S IN A SINGLE PACK?

To facilitate ease of change-out, Tecumseh provides the following packaging, labeling, components and support documentation with scroll compressor purchase:

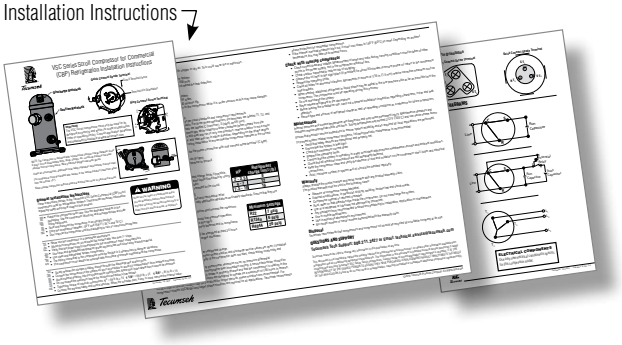



## CHECKLIST

- ☑ Compressor
- ☑ Protective Cover
- ☑ CBP: Compressor Mounting Kit (Spacers and Grommets: LP-10070)
- ☑ LBP: Compressor Mounting Kit (Spacers, Grommets and Rotolock Braze Adaptor Kit. See next page for Kit Numbers)
- ☑ Installation Instructions (CBP: Pub #TR-305 / TPC#132-10010, LBP: Pub #TR-306 / TPC#132-10011)*

*See page 20-23 for full details.

Installation Instructions



**ELECTRICAL COMPONENTS**

⚠ Use only new electrical components specific for that compressor model.

Wholesale Carton Label

**TECUMSEH COMPRESSOR COMPANY**

PART NO. **VS224ET-104-J7**

MODEL **VSC9530ZNA**

VOLTAGE
208-230V ~ 60
PH 1

SERIAL NO. **04B101411987456**

(S)

**MADE IN USA**

Carton Label SP1.lwl

Second Wholesale Carton Label - Cross Reference

**Model: VSC9530ZNA Item: VSC224ET-104-J7**
**Scroll Compressor**

**Replaces:**

**COPELAND**
ZS30K4E-PFV

**DANFOSS**
MLZ030T1

Carton Label 89X1.lwl

Note: The Cross Reference information listed on this diagram is for example purposes only. For the most current information refer to the competitive cross reference available at http://boxload.tecumseh.com/ on Tecumseh's Web Application site.



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# CREATING VALUE AND EASE OF CHANGE-OUT

Tecumseh provides the following:

## 1. Second Wholesale Carton Label - Cross Reference

This label with cross reference (Tecumseh and competitive) has been added to assist wholesalers and their customers.

Second Wholesale Carton Label - Cross Reference

**Model: VSC9530ZNA** **Item: VSC224ET-104-J7**
**Scroll Compressor**

**Replaces:**
**COPELAND**
ZS30K4E-PFV

**DANFOSS**
MLZ030T1

Carton Label 89X1.lwl

Note: The Cross Reference information listed on this diagram is for example purposes only. For the most current information refer to the competitive cross reference available at http://boxload.tecumseh.com/ on Tecumseh's Web Application site.

## 2. Compressor Mounting Kit

These have been supplied with each compressor to make the change out quick and easy. Braze rotolock adaptor kits are included with LBP models only.

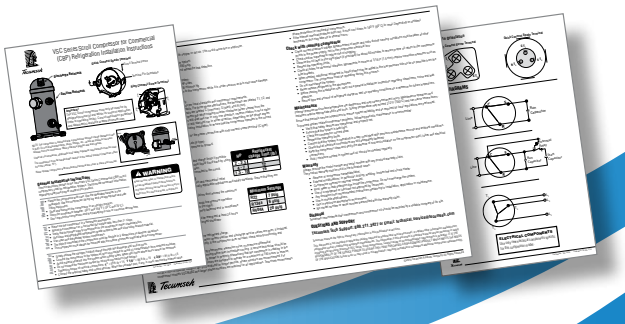
CBP
Kit Number: LP-10070

LBP

| Models | Kit Numbers |
|---|---|
| VSCF513Z* | LP-10094 |
| VSCF515Z* | LP-10094 |
| VSCF518Z* | LP-10094 |
| VSCF524Z* | LP-10095 |
| VSCF534Z* | LP-10095 |

## 3. Installation Instructions

Installation Instructions with wiring diagrams and safety precautions.
See pages 16-19.



# ADDITIONAL INFORMATION

## Product Dimensions and Weights

| Model Number | Item Number (BOM) | Wt. (lb) | Footprint (in) | Height (in) | *Dim. Drawing |
|---|---|---|---|---|---|
| **R404A Commercial Temperature** | | | | | |
| VSC9515ZNA | VS220ET-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9515ZXG | VS220TT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9515ZXH | VS220VT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9515ZXT | VS220RT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9519ZNA | VS221ET-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9519ZXG | VS221TT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9519ZXH | VS221VT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9519ZXT | VS221RT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9521ZNA | VS222ET-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9521ZXG | VS222TT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9521ZXH | VS222VT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9521ZXT | VS222RT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9526ZNA | VS223ET-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9526ZXG | VS223TT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9526ZXH | VS223VT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9526ZXT | VS223RT-103-J7 | 68 | 7.5 x 7.5 | 16.2 | A1 |
| VSC9530ZNA | VS224ET-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9530ZXG | VS224TT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9530ZXH | VS224VT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9530ZXT | VS224RT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9538ZNA | VS225ET-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9538ZXG | VS225TT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9538ZXH | VS225VT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9538ZXT | VS225RT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9545ZXG | VS226TT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9545ZXH | VS226VT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9545ZXT | VS226RT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9548ZXG | VS227TT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9548ZXH | VS227VT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9548ZXT | VS227RT-104-J7 | 82 | 7.5 x 7.5 | 17.9 | A2 |
| VSC9558ZXG | VS228TT-105-J7 | 97 | 7.5 x 7.5 | 21.1 | A3 |
| VSC9558ZXH | VS228VT-105-J7 | 97 | 7.5 x 7.5 | 21.1 | A3 |
| VSC9558ZXT | VS228RT-105-J7 | 97 | 7.5 x 7.5 | 21.1 | A3 |
| VSC9566ZXG | VS229TT-105-J7 | 100 | 7.5 x 7.5 | 21.5 | A3 |
| VSC9566ZXH | VS229VT-105-J7 | 100 | 7.5 x 7.5 | 21.5 | A3 |
| VSC9566ZXT | VS229RT-105-J7 | 100 | 7.5 x 7.5 | 21.5 | A3 |
| VSC9576ZXG | VS230TT-105-J7 | 100 | 7.5 x 7.5 | 21.5 | A3 |
| VSC9576ZXH | VS230VT-105-J7 | 100 | 7.5 x 7.5 | 21.5 | A3 |
| VSC9576ZXT | VS230RT-105-J7 | 100 | 7.5 x 7.5 | 21.5 | A3 |
| **R404A Low Temperature** | | | | | |
| VSCF513ZXG | VS231TT-106-J7 | 93 | 7.5 x 7.5 | 19.1 | B1 |
| VSCF513ZXT | VS231RT-106-J7 | 93 | 7.5 x 7.5 | 19.1 | B1 |
| VSCF515ZXG | VS232TT-106-J7 | 93 | 7.5 x 7.5 | 19.1 | B1 |
| VSCF515ZXT | VS232RT-106-J7 | 93 | 7.5 x 7.5 | 19.1 | B1 |
| VSCF518ZXG | VS233TT-106-J7 | 95 | 7.5 x 7.5 | 19.1 | B1 |
| VSCF518ZXT | VS233RT-106-J7 | 95 | 7.5 x 7.5 | 19.1 | B1 |
| VSCF524ZXG | VS234TT-107-J7 | 102 | 7.5 x 7.5 | 21.3 | B2 |
| VSCF524ZXT | VS234RT-107-J7 | 102 | 7.5 x 7.5 | 21.3 | B2 |
| VSCF534ZXG | VS235TT-108-J7 | 105 | 7.5 x 7.5 | 22.2 | B3 |
| VSCF534ZXT | VS235RT-108-J7 | 105 | 7.5 x 7.5 | 22.2 | B3 |

*Compressor dimension drawings on page 10.

| Dim. Drawing | Box Height (in) |
|---|---|
| A1 | 19 |
| A2 | 19 |
| A3 | 22.5 |
| B1 | 22.5 |
| B2 | 22.5 |
| B3 | 23.5 |

# FAQs

**Q** Is the existing VSA Scroll product line available?
**A** **No, the current VSA product line is no longer available. No VSA replacement compressors or VSA condensing units are available.**

**Q** Is there any change to the warranty return process?
**A** **No, the Wholesale Warranty and Return Process remains unchanged.**

**Q** I already stock electrical service parts for the VSA compressor, can I use those service parts on the VSC?
**A** **No, VSC component and electrical parts are not interchangeable with VSA compressors.**

**Q** Can I get service components and electrical parts for the VSC?
**A** **Yes, Tecumseh has established new "K" replacement relay, start capacitor kits and run capacitors.**

**Q** Will the VSC be used in Tecumseh Condensing Units?
**A** **Yes, VSC compressors will be integrated into Tecumseh's line of indoor air-cooled condensing units and outdoor air-cooled condensing units.**

**Q** Will I receive a new price list?
**A** **Yes. An updated price list will be sent to all authorized wholesalers' designated contact(s).**

**Q** What are the advantages of the VSC compressor?
**A** **See pages 2 and 5.**

**Q** Will the VSC be available in a pallet pack option?
**A** **Yes. Models will be available in a pallet pack option. Contact your Tecumseh Sales Rep for details.**

**Q** When will VSC (LBP) Liquid Injection models be available?
**A** **Liquid injection LBP models are planned to launch in 2015, more details to follow.**

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

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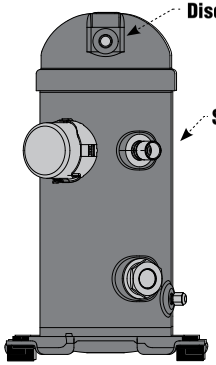
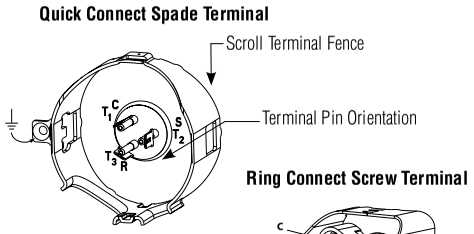
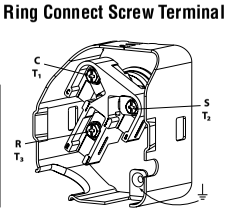


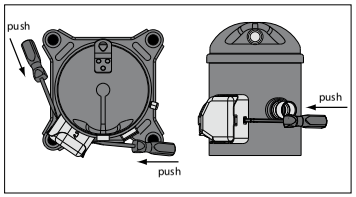

**Important!**
The VSC Scroll compressor must only be used for its designed purpose(s) and within its scope of application (refer to operating limits). Consult application guidelines and datasheet(s) available at www.tecumseh.com

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.

**⚠ 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.

### 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.

Part Number: 132-10010 Publication: TR-305 7/14

### 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 compresor 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

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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**

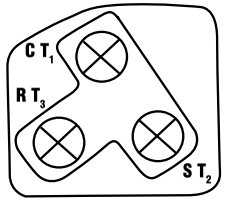
Tecumseh reserves the right to change any information in this publication at any time.

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).

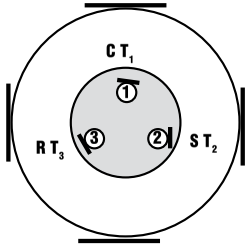


### Terminal Pin Orientation

Ring Connect Screw Terminal

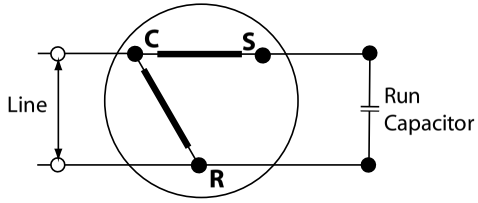



Quick Connect Spade Terminal

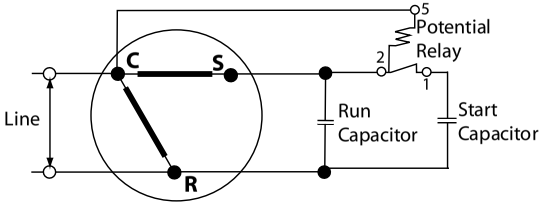



## WIRING DIAGRAMS

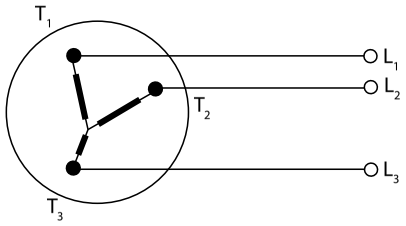
### PSC




### CSR




### 3 PHASE



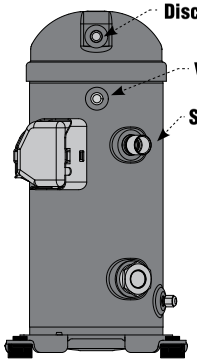

**ELECTRICAL COMPONENTS**
Use only new electrical components specific for this compressor model.

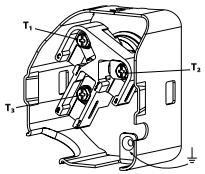
Tecumseh

Part Number: 132-10010 Publication: TR-305 7/14

# LBP Installation Instructions

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



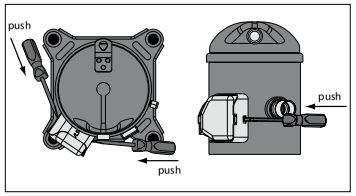

**Important!**
The VSC Scroll compressor must only be used for its designed purpose(s) and within its scope of application (refer to operating limits). Consult application guidelines and datasheet(s) available at www.tecumseh.com

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 (LBP) scroll compressors used for refrigeration systems. They provide necessary information regarding safety and proper usage of this product.

**⚠ 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.

**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.

Part Number: 132-10011 Publication: TR-306 7/14

### 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. Three-phase applications, the terminals are labeled T1, T2, and T3.
- Tecumseh scroll compressors will only compress gas while rotating counter-clockwise (when viewed from the compressor top). Three-phase motors 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 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 filling refrigerant cylinder connected to the circuit.

| HP | Refrigerant charge limit (lb) |
|---|---|
| 4 - 6 | 10 |
| 8 - 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.

| 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 compresor 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. Phase monitors are required for all applilcations.
- 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**

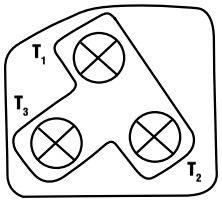
Tecumseh reserves the right to change any information in this publication at any time.

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).



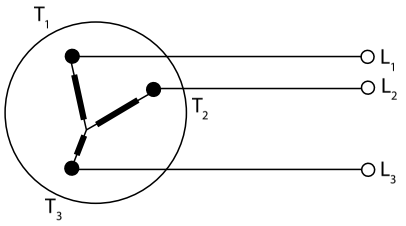
### Terminal Pin Orientation

**Ring Connect Screw Terminal**




## WIRING DIAGRAMS

### 3 PHASE




**ELECTRICAL COMPONENTS**
Use only new electrical components specific for this compressor model.

Part Number: 132-10011 Publication: TR-306 7/14

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