

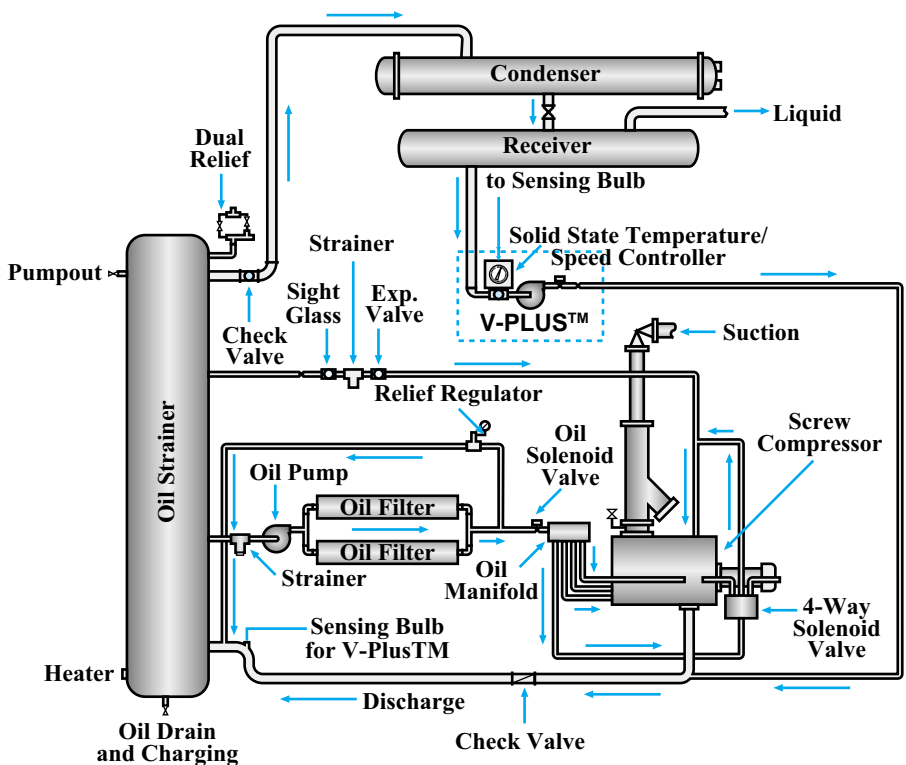
# V-PLUS™ Refrigerant Oil Cooling System



## Refrigerant Oil Cooling System Cuts Energy Use 2% to 5%

With assistance from the Department of Energy's Inventions and Innovation Program, Vilter Manufacturing Corporation proved that adding its refrigerant pump system, the Vilter-Pumped Liquid Unitary System (V-PLUS) System, to screw compressors for industrial refrigeration and cooling systems increases system capacity, extends system lifetime, and saves energy. Vilter's single-screw compressor is a rotary, oil-injected, positive-displacement machine that can operate with commonly used industrial refrigerants. It consists of a cylindrical main screw with six helical grooves and two planar gaterotors. The gaterotors engage with the main screw to form the compressor chamber. Vilter also offers dual-screw compressor system packages with this technology. Further, the V-PLUS system can be added to other types of compressor-driven refrigeration systems.

The invention saves energy and increases screw compressor life by injecting refrigerant liquid into the outlet stream of the compressor to cool the lubricant oil. In addition to cutting the horsepower needed for the compressor, the oil cooling increases compressor longevity because no capacity is sacrificed unlike compressor refrigerant injection systems, this system is cheaper to install than "after cooler" external water-cooling systems and is less costly to operate.



System with V-PLUS Oil Cooler

## Overview

- ◆ Invented and patented by Vilter Manufacturing Corporation
- ◆ 250 units operating in the United States in 2003

## Energy Savings (Trillion Btu)

Cumulative through 2003	2003
1.00	0.090

## Emissions Reductions (Thousand Tons, 2003)

Particulates	SO <sub>x</sub>	NO <sub>x</sub>	Carbon
0.0	0.019	0.014	1.77

## Applications

- ◆ Refrigeration systems for food processing and cold storage warehousing
- ◆ Climate control systems for industrial, commercial, and institutional buildings

## Capabilities

- ◆ Can be retrofit to any medium to large compressor-driven refrigeration or cooling system to raise compressor capacity, cut duty cycle, and increase system efficiency.
- ◆ Available on Vilter compressors with displacements from 100 cubic feet minute to 1800 cubic feet/minute.

## Benefits

### Energy Savings

V-PLUS™-equipped systems reduce the horsepower requirement by 2% to 5%, depending on configuration and operating characteristics, and reduces electricity use by 2% to 5% for refrigeration and cooling.

### Productivity

Improves compressor operation and life. Raises compressor capacity compared with systems that inject refrigerant into the compressor.