

# PRODUCT OVERVIEW



## V-CLASS WATER-COOLED CHILLERS



**SMARTD**  
GLOBAL #1 IN OIL-FREE CHILLERS

## V-Class Water-Cooled Chillers

Smardt's V-Class Water-Cooled Chillers are large-capacity chillers that utilize Smardt's oil-free chiller technology with Turbocor's VTT or VTX compressors using R134a refrigerant. V-Class Water-Cooled Chillers are available from 300 to 3600 TR (1055 to 12660 kW) and can be supplied in multiple configurations, which Smardt can customize per the requirements of your application.



**A Smardt V-Class Water-Cooled Chiller in a Pony Express configuration**

### V-Class Water-Cooled

Smardt has brought its extensive experience in oil-free chiller development, sales and service into designing the V-Class — a range of large-capacity water-cooled chillers\* that deliver the highest level of reliability, outstanding efficiency and the lowest total cost of ownership.

V-Class chillers offer valuable benefits to owners and operators, such as ease of installation, simple streamlined operation and maintenance, and lower lifetime operating and maintenance costs. These advantages are the hallmark of Smardt chillers.

Your requirements for capacity, configuration, and turndown performance will help your Smardt representative assist with determining the best product fit for your project.

### Oil-Free Operation

Smardt oil-free centrifugal chillers use magnetic bearings and a variable-speed drive to deliver IPLV efficiencies that far surpass those of conventional oil-lubricated centrifugal, reciprocating, scroll and screw chillers.

Smardt utilizes totally oil-free Turbocor compressor technology, achieving the highest part-load efficiencies for our chillers and chilled water systems (including water-, air- and evaporatively-cooled applications).

Proprietary magnetic bearings replace

conventional oil-lubricated bearings. This eliminates the high friction losses, mechanical wear, and the higher-maintenance oil management systems that are inherent with conventional compressor designs.

Turbocor's primary moving part (the rotor shaft and impellers) is levitated during rotation by a digitally controlled magnetic bearing system. Position sensors at each magnetic bearing provide real-time feedback to the bearing control system, 120 times each revolution, ensuring constantly centered rotation.

The result is oil-free operation that delivers significant chiller energy savings compared with standard chillers, and provides an extended service life without the efficiency decrease seen in oil-based systems.

### Global Number One

Smardt is the industry leader in oil-free centrifugal chillers. Smardt pioneered oil-free centrifugal compressor technology to provide plant owners and operators a line of chillers that broke through industry norms of lifetime performance, energy conservation (reducing operating expenses), streamlined maintenance, and ease of operation.

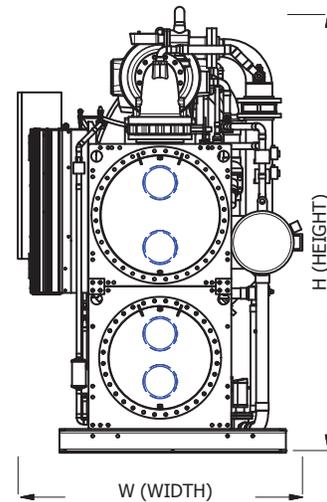
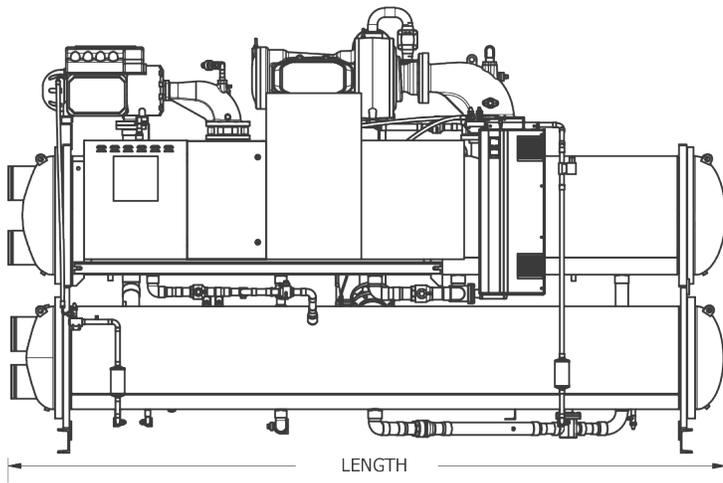
Since our first oil-free centrifugal chiller in 2002, more than 10,000 Smardt chillers, ranging from 60 TR up to 3200 TR, are now saving money, energy and CO<sub>2</sub> emissions across the globe.

\*For applications 45-1600 TR (160-5625 kW) capacity, see Smardt's T-Class Water-Cooled Chillers.

# V-Class Water-Cooled Chillers



# V-Class Water-Cooled Chillers



Side and front views of a Smartd V-Class Water-Cooled Chiller customized in a stacked configuration to fit a smaller footprint within a plant room. This example also illustrates a Pony Express configuration.

## Largest Capacity Chiller

Smartd V-Class chillers are designed for projects with ambitious kW/TR requirements. The world's largest installed oil-free chiller is a Smartd V-Class chiller, which serves a district cooling application.

## Turbocor VTT/VTX Compressor

The V-Class series of chillers can be equipped with 1–8 Turbobor VTT or VTX oil-free compressors. Turbobor VTT and VTX compressors boast outstanding full-load and part-load efficiencies. These oil-free compressors have low-sound output and use R134a refrigerant.\*



VTT Compressor

VTX Compressor

\*The Danfoss Turbobor VTX compressor can use R134a, R513A, R515B, and R1234ze refrigerants. A Smartd V-Class Water-Cooled Chiller using R513A, R515B, and R1234ze effectively becomes a G-Class Water-Cooled Chiller V-Series.

## V-Class Variations

The Smartd V-Class chiller is also available in two versions that are tailored for projects with special requirements. These are the Modular V-Class and the Pony Express V-Class (see illustration on page 5).

## Modular V-Class

Smartd's modular V-Class chillers are specially designed to enable safe and efficient transport in sections that fit within a typical freight elevator. This can avoid costly and time-consuming wall demolition and rebuilding that might otherwise be necessary for access.

## Pony Express V-Class

The Smartd Pony Express V-Class eliminates the need to have an additional low-load "pony chiller" for reduced-load situations such as nighttime or weekends. It is configured to extend the chiller's capabilities at full or part

load. This is achieved by utilizing a combination of multiple Turbobor VTT or VTX compressors running parallel with a single, smaller TTS compressor. This Pony Express compressor mix efficiently handles all types of loads. In a Pony Express configuration, the V-Class chiller uses R134a refrigerant.

## Turbocor TTS Compressor

The Turbobor TTS oil-free compressor, VFDs are built-in, and drives are internal to the machine. These oil-free compressors have low-sound output and with a V-Class chiller use R134a refrigerant.\*



TTS Compressor

\*The Danfoss Turbobor TTS compressor can use R134a or R513A refrigerants. A Smartd V-Class chiller using R513A effectively becomes a G<sup>v</sup>-class chiller.

# V-Class Water-Cooled Chillers

## Smardt Chiller Barrel Configuration Options

Standard Configuration	Configuration Options for Dimensional Considerations	Additional Options for Special Requirements
<p><b>Narrow</b></p>  <p><b>1-4 compressors</b></p> <ul style="list-style-type: none"> <li>Stacked orientation</li> <li>Slim design</li> </ul>	<p><b>Side-by-Side</b></p>  <p><b>3-5 compressors</b></p> <ul style="list-style-type: none"> <li>Barrels beside each other</li> <li>For short and wide layouts</li> <li>Panels mounted above condenser barrel</li> </ul> <p><b>6-8 compressors</b></p> <ul style="list-style-type: none"> <li>Barrels beside each other</li> <li>For short and wide layouts</li> <li>Panels mounted above condenser barrel</li> </ul>	<p><b>Compact - Modular</b></p>  <p><b>1-8 compressors</b></p> <ul style="list-style-type: none"> <li>For tight fits</li> <li>Can be modular</li> <li>Dimensioned to fit through elevators and doors</li> </ul>

## Plant Room Access Options

Configuration Options for Plant Room Access Considerations	
Knocked-Down Kit	Split Barrel
 <p><b>1-8 compressors</b></p> <ul style="list-style-type: none"> <li>Fully-built chiller tested at factory</li> <li>Disassembly of components: compressors, control panel, and even complete disassembly if needed</li> </ul>	 <p><b>1-8 compressors</b></p> <ul style="list-style-type: none"> <li>Ideal for applications with limited plant room area</li> </ul>

**Smardt V-Class water-cooled chillers offer barrel configuration flexibility for applications with restricted footprints or access challenges.**

### Multiple Configurations

Smardt can configure your V-Class chiller to fit any footprint or height restriction, with multiple barrel configurations available.

### Extended Service Life

The V-Class chiller is designed for a service life of 25 years.

### Chiller Options

Options for Smardt's V-Class chillers include our integrated pump packages, economizer, and Smardt Restart.

Smardt Restart ensures that in the event of a power failure, your Smardt chiller is back on line as quickly as 45 seconds. Chilled water supply for critical applications is not impacted by intermittent power loss, eliminating the need for additional thermal storage. The start-up mode includes additional motor and surge protection.

### Applications

Energy conscious plant owners and operators want optimized performance with savings over the life of the chiller. Smardt's V-Class Water-Cooled Chillers support critical-load applications in a variety of markets, including commercial, data center, pharmaceutical, hospital, higher education, district cooling, hotels, malls, and manufacturing.

### Highlights

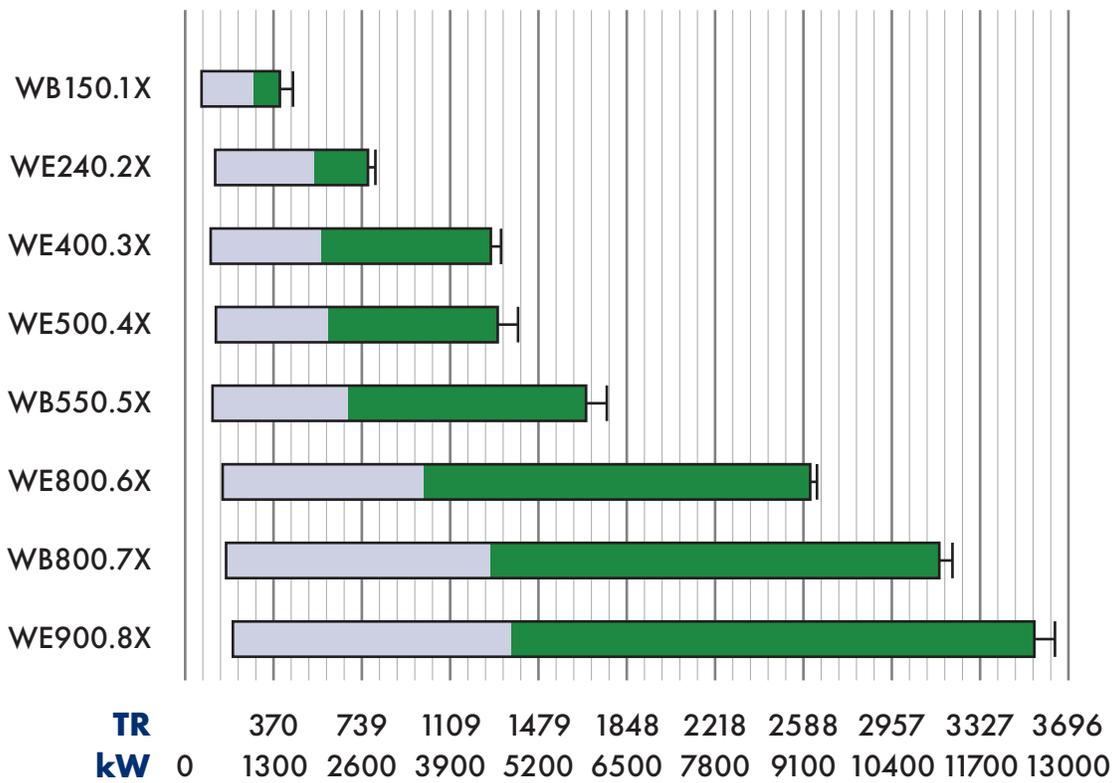
- Largest capacity range in oil-free water-cooled chillers.
- Class leading part-load efficiencies, achieving optimum IPLV in total capacity range.
- Typically smaller footprint than chillers of comparable capacity.
- Responsive chilled water control under all conditions.
- Inbuilt redundancy with multiple compressors.
- Designed for ease of maintenance and serviceability, featuring field-serviceable compressors.
- Smardt quality, acceptance tested and pre-commissioned prior to delivery ensuring trouble-free commissioning and start-up on every project.

# V-Class Water-Cooled Chillers

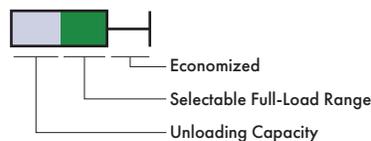
Smardt's V-Class Water-Cooled Chillers with full-load capacities of units with R134a refrigerant, ranges from 300 to 3600 TR (1055 to 12660 kW)

## Representative Models

Smardt can customize your V-Class Water-Cooled Chiller to meet your project's needs and specifications. The models included in this capacity chart are considered representative of the V-Class Water-Cooled Chiller, but selection is not limited to these specific models. Your Smardt representative can provide capacity data for your project.



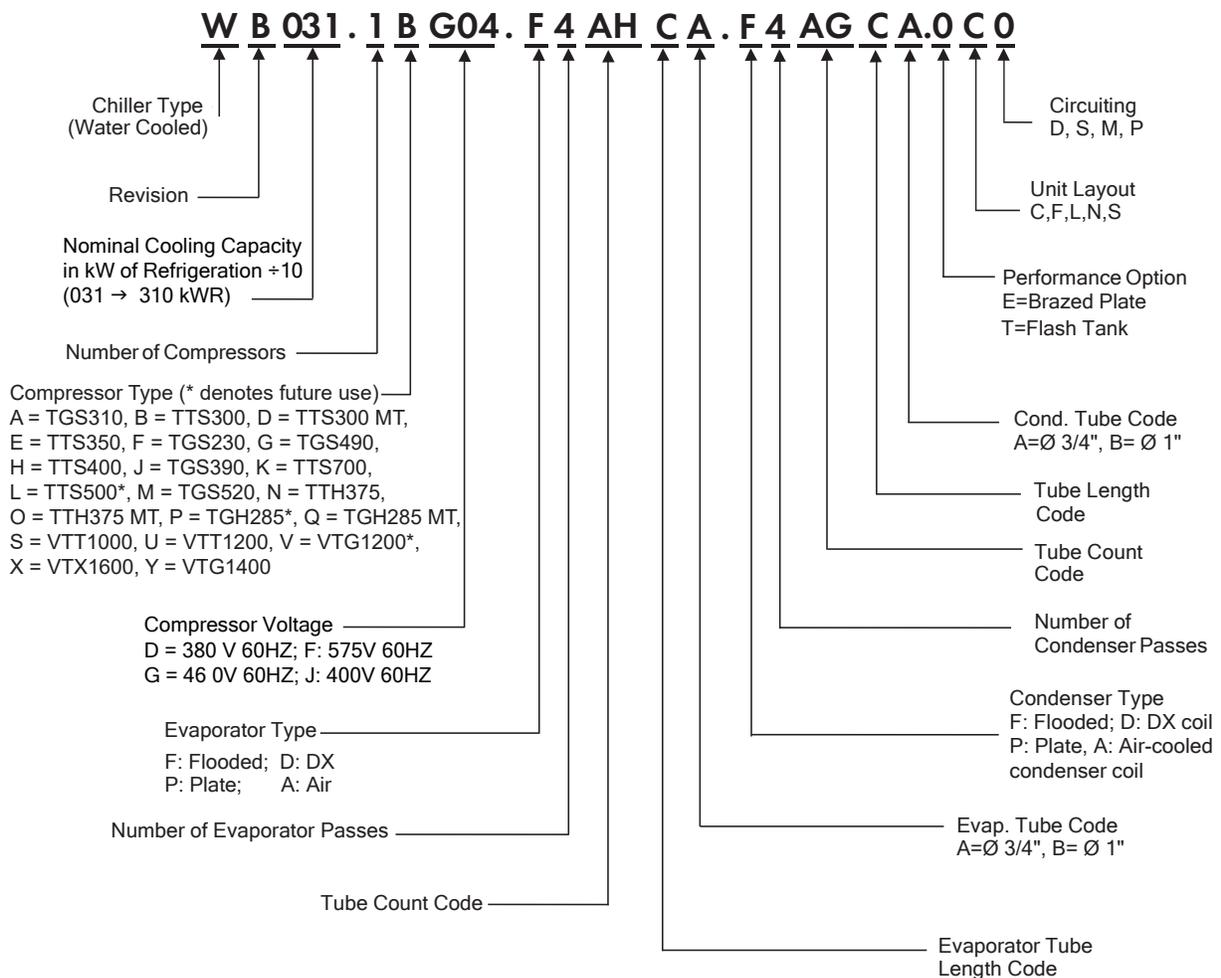
### Cooling Capacity TR (kW)



Note: Available cooling capacity will vary with operating conditions and chiller configuration. Capacities shown are based on standard AHRI conditions.

# V-Class Water-Cooled Chillers

## Model Number Nomenclature



## Global reach, single focus

Smardt is both the pioneer and world-leader in oil-free centrifugal chillers, with production facilities in Canada (Montreal area), Australia (Melbourne area), United States (Plattsburgh, New York), Germany (Stuttgart area), and China (Guangzhou and Nanjing).

Smardt service networks extend across the globe to monitor and support the world's largest installed base of oil-free high-efficiency chillers, with more than 10000 chillers installed globally.



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