



# The Turbocor Family of Compressors

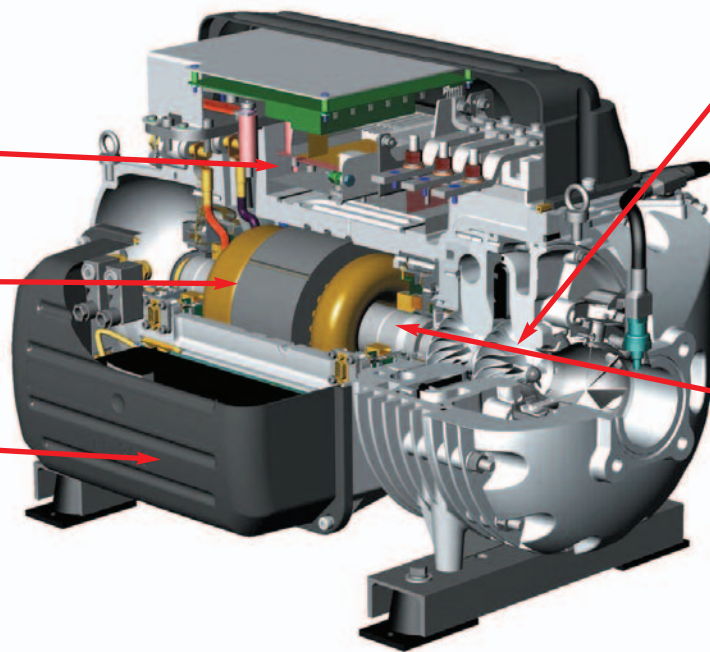
## Model TT-300

– the “Next Generation” of HVAC Mid-Range compressors

A VFD (Variable Frequency Drive) built in as a standard providing unmatched part-load efficiency.

A permanent magnet motor which cuts size and weight while increasing efficiency.

A fully functional computer to provide control plus an unheard of level of monitoring and diagnostics.



Two Stage, Direct Drive, Hermetic Centrifugal compressor with unshrouded impellers resulting in high efficiency at full load and extraordinarily high efficiency at part load conditions.

Oil-free magnetic bearings provide quiet and reliable operation. No need for oil, reduces maintenance by up to 50% and eliminates the complexity, cost and reliability issues of oil based designs.

### A 60 to 90 ton compressor that is:

**33%+ More Efficient:** A compressor 33%+ more efficient than other compressors in its size range. And this exceptional performance can be monitored, either on site or remotely, via a state-of-the-art monitoring and diagnostics system.

**Totally Oil-Free:** Oil-free operation is something the industry has worked decades to achieve. This *oil-free* design eliminates not only the potential for efficiency robbing oil contamination, but also all of the oil management accessories: oil heaters, oil pumps, oil separators, oil filters, etc., plus oil disposal.

**Extremely Lightweight:** A 60 to 90 ton TURBOCOR, TT-300 compressor weighs only 265 pounds, approximately 1/5 the weight of conventional compressors. Further, this compressor only requires about half the space of a traditional compressor.

**Extraordinarily Quiet:** At an operating sound level of 70 dBA at 5'; a compressor is so quiet that, given typical equipment background noise, one literally cannot hear it run.

**Redefines Soft-Start:** The TT-300 compressor redefines soft-start, drawing less than 2 amps, compared to 500-600 amps required by conventional compressors using across-the-line starters.

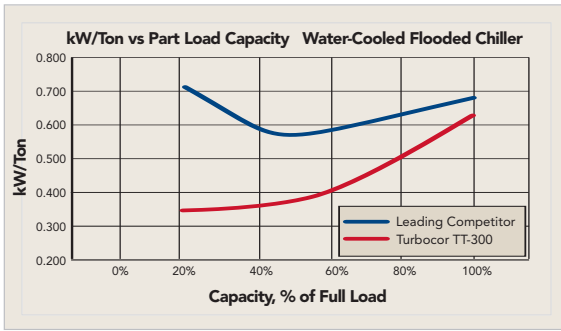
## That's leading edge technology!

Visit our website at [www.turbocor.com](http://www.turbocor.com)  
to learn more about this and other Danfoss Turbocor products.

# Unprecedented energy efficiency for mid-sized commercial air conditioning applications

Outstanding energy savings from digitally controlled, frictionless two-stage centrifugal compression means significant reductions in operating cost and environmental emissions associated with energy production.

Chart 1 shows the full and part load performance curve of the Turbocor compressor compared with a typical oil-flooded screw compressor on a 75-ton water-cooled chiller. The integrated part load values (IPLV) yield a 33%+ improvement in many applications.



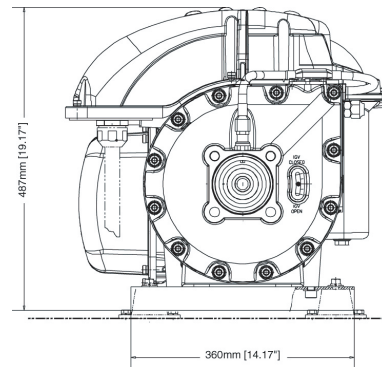
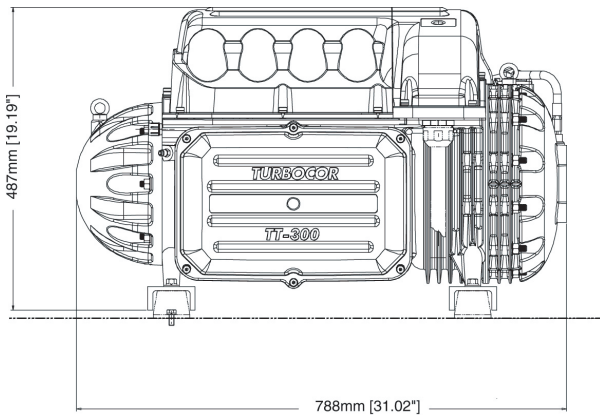
## Typical water-cooled chiller operating cost savings calculation

	Turbocor	Screw Compressor	Savings
IPLV kW/TR	0.38	0.63	0.25
Tons capacity	90	90	—
kW*	34	57	23
Annual operating days	240	240	—
Operating hours per day	12	12	—
Total annual kWh	59,098	87,878	38,880
Power cost (\$/kWh)	\$0.10	\$0.10	—
Annual operating cost	\$5,410.00	\$9,785.00	<b>\$3,888.00</b>
2-year savings			<b>\$7,776.00</b>
3-year savings			<b>\$11,664.00</b>

\* Calculations based on average load of 60%

### Environmental Impact:

Extending this example, the 38,880 kWh energy savings through the use of a Turbocor compressor yields an annual CO<sub>2</sub> emissions reduction of over 58,320 lbs (U.S. EPA average emissions).



Length	31.02" (788 mm)
Width	20.40" (518 mm)
Height	19.19" (487 mm)
Shipping weight	265 lbs. (120 kg)
Refrigerant	R-134a (R-22 for retrofit applications)
Sound	70 dBA @5'

## Danfoss Turbocor TT-300 Specifications

Construction shall utilize a two-stage, variable-speed centrifugal compressor design requiring no oil for lubrication. Compressor shall be constructed with cast aluminum casing and high-strength thermoplastic electronics enclosures. The two-stage centrifugal impellers shall consist of cast and machined aluminum. The motor rotor and impeller assembly shall be the only major moving part. The compressor shall be designed for use with HFC-134a. (HCFC-22 is also approved for retrofit applications).

The compressor should be provided with radial and axial magnetic bearings to levitate the shaft thereby eliminating metal to metal contact, and thus eliminating friction and the need for oil. The compressor shall have a variable frequency drive (VFD) for linear capacity modulation, high part-load efficiency and low in-rush starting current of less than 2 amps. In case of power failure, the compressor shall be capable of allowing for a normal de-levitation and shutdown. Capacity modulates infinitely as motor speed is

varied across the range. inlet guide vanes (IGV) shall be built-in to further trim the compressor capacity in conjunction with the variable-speed control, to optimize compressor performance at low loads.

The compressor shall be provided with a direct drive, high efficiency permanent-magnet synchronous motor, powered by pulse width modulating (PWM) voltage supply. The motor shall be compatible with high-speed variable frequency operation that affords high speed efficiency, compactness and soft start capability. Motor cooling shall be by liquid refrigerant injection.

The compressor shall include a microprocessor controller capable of controlling magnetic bearings and speed control. Controller shall be capable of providing monitoring including commissioning assistance, energy outputs, operation trends, and fault codes via a Modbus interface.



Danfoss Turbocor Compressors Inc.  
1850 Trans-Canada Highway, Dorval, Québec H9P 2N4  
Phone: 888-440-0523 • Fax: 514-421-4277 • [www.turbocor.com](http://www.turbocor.com)