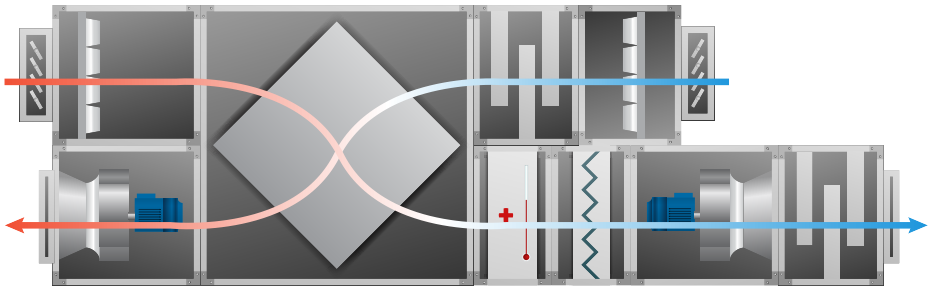
DATASHEET

# Air Handling Units Application Data Sheet

Turntide Smart Motor System™

Air handling units (AHUs) work behind the scenes in buildings to maintain optimal indoor conditions - from maintaining a stockroom of perishable goods, to ensuring critical data center infrastructure is cooled and maintained at a proper temperature.



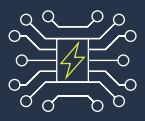
Unfortunately, HVAC systems, including AHUs, run on old, inefficient technologies. Due to their importance to everyday business operations, HVAC can contribute up to 35% of energy costs within a building – reducing profits and increasing utility bills.

Designed with a Optimal Efficiency Motor™, the Turntide Smart Motor System™ drastically reduces the energy consumption of AHUs with zero compromises to HVAC run conditions: saving energy, money, and the environment.



## Immediate Energy Savings

Turntide motors save energy through patented switched reluctance design, which utilizes optimal device physics and control algorithms to run more efficiently.



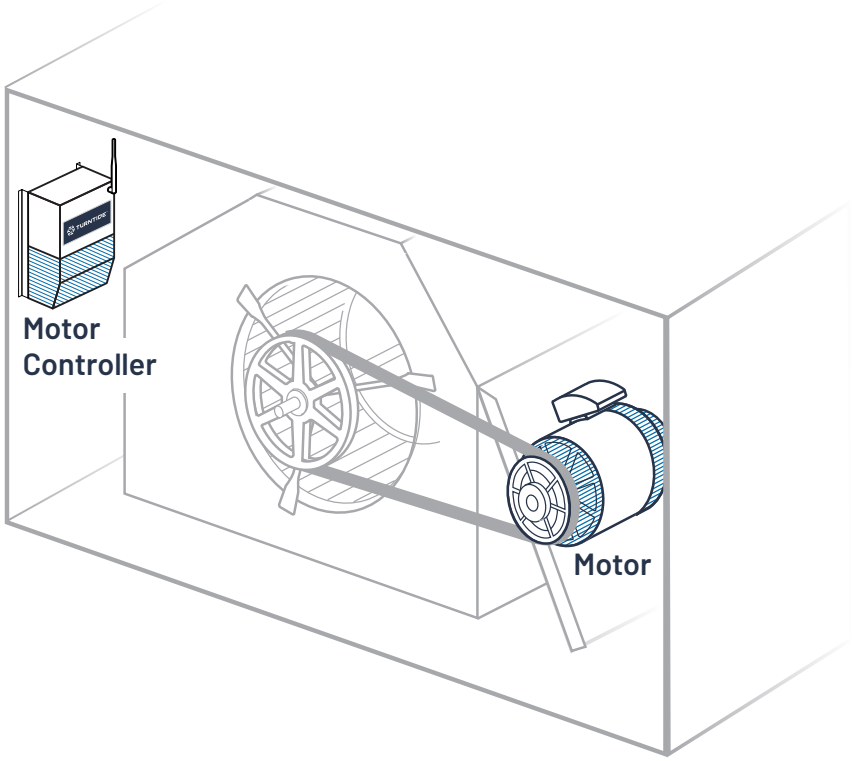
## Gets Better and Smarter Over Time

Turntide motors utilize operating conditions and runtime data to generate improved control algorithms that further optimize system efficiency.

## The Turntide Smart Motor System™ for Air Handling Units

The Turntide Smart Motor System is a high-impact energy conservation measure that delivers immediate and long-term savings. By swapping out legacy AC induction motors and replacing them, Turntide reduces HVAC energy use by an average of 64%.

# What's in the Turntide Smart Motor System?





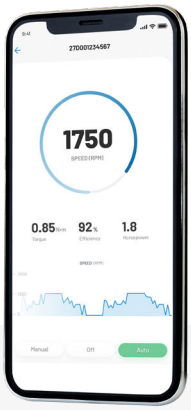

## Smart Motor

Our patented high rotor pole switched reluctance motor with advanced device physics runs more efficiently and reliably.



## Motor Controller

The controller helps the variable-speed motor work at optimized efficiency across a broad range of speeds, enables customized sequences of operation or application-specific functionality, and protect the system from damage or failure.




## Turntide Technician

Turntide Technician mobile app makes evaluating, commissioning, and installing Turntide energy conservation projects easy.

## Outperforms Existing HVAC Efficiency Measures

### The ultimate energy conservation measure

The Smart Motor System makes HVAC equipment more efficient, more intelligent, ultra reliable, and simple.

# 13%

Better performance than VFD retrofit

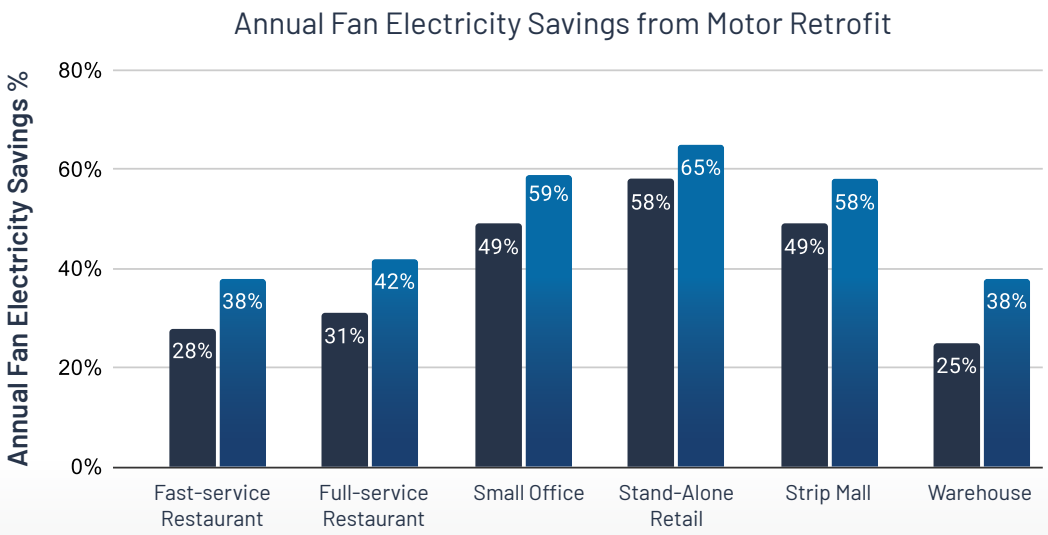
Source: NREL Study

NEMA Premium Induction Motor with VFD

Turntide Smart Motor

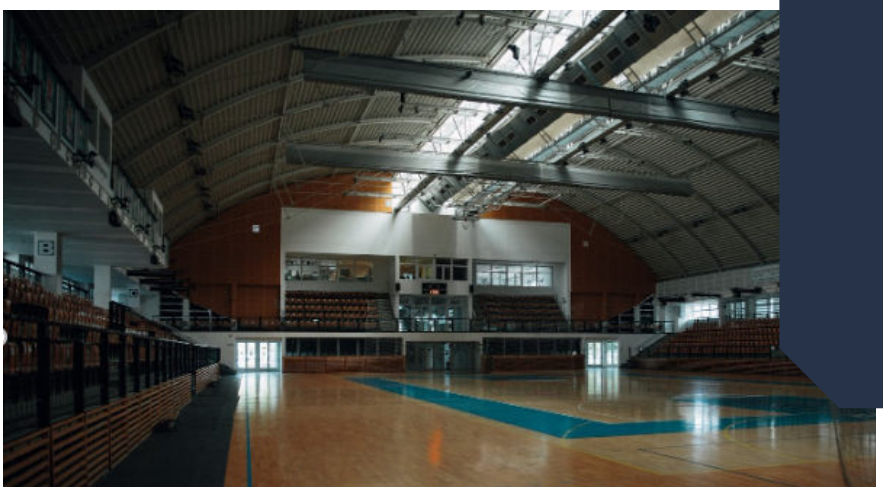
View NREL study

Source: NREL Study




## Proven to Improve HVAC Performace in AHUs*

Forward-thinking prestigious university upgrades air handing units at multipurpose gymnasium



### THE RESULTS:

**87%** energy reduction compared to baseline ^

**34%** more energy reduction compared to VFD retrofit

**71,400 kWh** annual energy savings

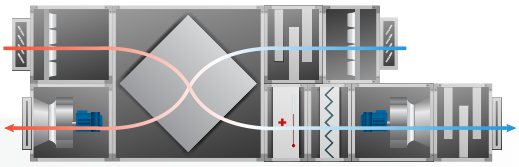
**3.1 year** simple payback

*Note: Actual energy savings results may vary depending on multiple factors, including the configuration and control scheme of the AHU.

^Includes control scheme optimizations to further reduce energy use

# Turntide Smart Motor System Specifications





## Motor Compatibility

Turntide smart motors are designed with industry-standard specifications, matching nameplate specs found on AC induction motors

**Horsepower**

- 1-15 HP

**Voltage**

- 208-230V
- 460V
- 575V

**RPM Range**

- 100-3600 RPM

**NEMA Frame Sizes**

- 56Y
- 56/56H
- 56Z/56HZ/143T/145T
- 182T/184T
- 213T/215T

**NEMA Motor Enclosure**

- TEFC

## AHU Compatibility

The Turntide Smart Motor System is compatible with most air handler unit systems both indoors and outdoors, for most building types.

**Indoor and Outdoor Air Handling Units**

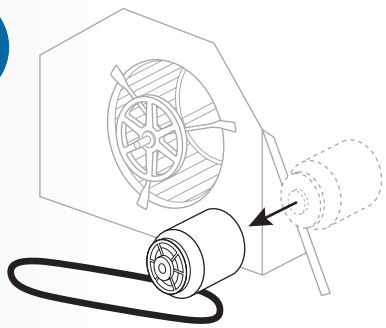
- Rooftop
- Mechanical Spaces

**Building Types**

- Shopping Malls
- Retail
- School
- Office
- Hotel
- Supermarkets
- Industrial/Warehouses
- And Many More

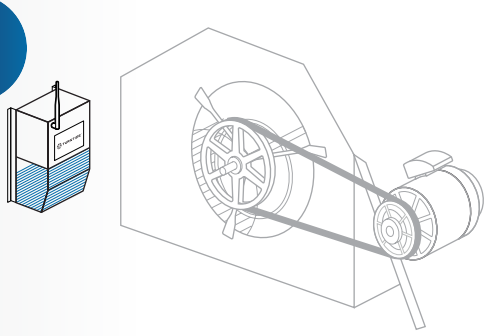
# AHU Retrofit: 5 Easy Steps

1



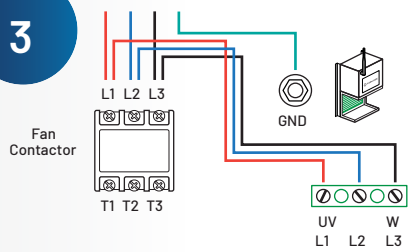
The original motor in the air handling unit is removed, and replaced with a Turntide smart motor

2



The Turntide motor controller is installed to connect with the motor

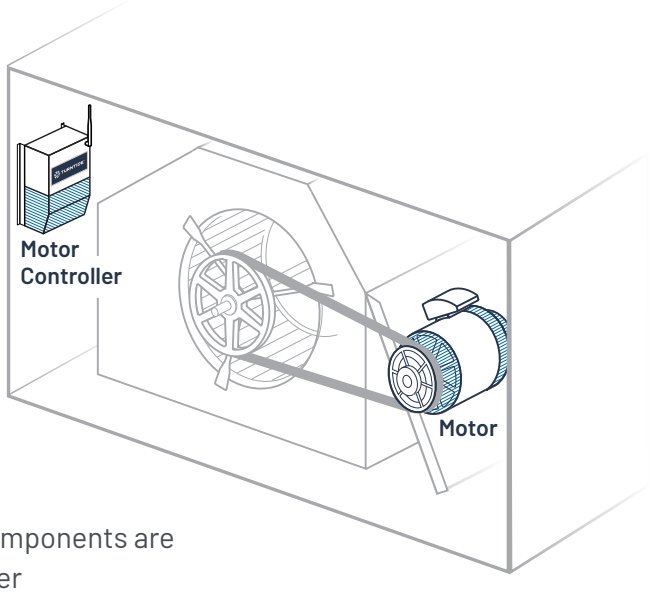
3




Controller jumper pins/switches are verified to ensure proper configuration before wiring the system together

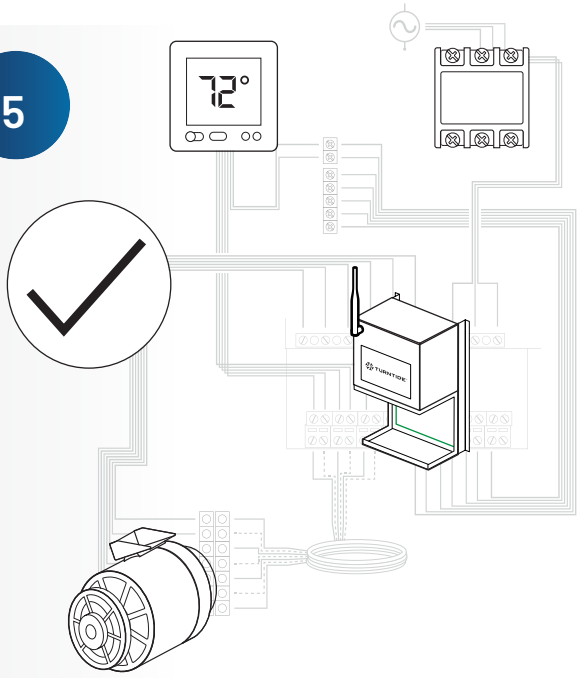
- P06 and SL120/SL121 motor controllers are labeled L1, L3, and L3
- P04/P05 motor controllers are labeled U, V, and W

4




All system components are wired together

5




System is started up to test and ensure all components work properly for 24/7 safe, reliable operation

For full install information, see support.turntide.com

**TURNTIDE TECHNOLOGIES**

Turntide Technologies | 11720 Amber Park Drive, Suite 160, Alpharetta, GA 30009 | turntide.com |
support@turntide.com