

# **Turntide V-Series Motors**

## **Turntide V-Series Motor Product Family**

Designed for HVAC Motor Upgrade / Retrofit







V02 (5 hp)



V03 (15 hp)

Turntide's V-Series motors set the new standard for high efficiency in HVAC systems, exceeding IE5 efficiency levels across most operating points, proving to be an excellent option for retrofitting your existing HVAC systems. Built with Turntide's patented high rotor pole-switched reluctance motor (HR-SRM) topology, V-Series motors are engineered to replace inefficient motors found in legacy rooftop units (RTUs) and air handling units (AHUs), helping businesses run HVAC systems on significantly reduced energy, saving money while reducing carbon footprint.

# Turntide V-Series Motors: Key Benefits



#### Other Benefits of Turntide V-Series Motors

- Contains no rare earth magnets typically designed into other high-efficiency motor technologies
- Streamlined installation, commissioning, and performance monitoring through the Turntide Technician mobile app



# **General Information** (Same Across All Models)

Suitable HVAC Equipment for Motor Retrofit	Rooftop Units (RTUs), Air Handling Units (AHUs)
Product Name	V01 (up to 3 hp), V02 (up to 5 hp), V03 (up to 15hp)
Horsepower	1 – 15 hp
Voltage	208-230V, 400V, 460V, 575V
RPM Range	100 - 3600 RPM
Available Frame Sizes	56Y, 56/56H, 56Z / 56HZ/ 143T / 145T, 182T/184T, 213T/215T
Motor Enclosure	TEFC
Supply Phase	3 - Phase
Ambient Temperature Range	-10°C to 40°C
Relative Humidity	95%, noncondensing
Insulation Class	F
Motor Ingress Protection	IP20

## **Detailed Technical Information**

The charts below show technical specifications for our different specific motor models. For more information about proper motor selection, please refer to our <u>Quick Reference Guide</u>.

# USA/Canada

Motor Model	Motor SKU	Rated HP / Power	Rated RPM	Operating RPM	Rated Service Factor	Peak Motor Efficiency	Peak System Efficiency	Rotor Inertia	Motor Frame Size	Motor Weight	Supply Voltage	Supply Frequency	Recommended Motor Controller SKU	Motor Controller Ingress Protection	Motor Controller Weight	Motor to Controller Power Wire
V01	V01-0300-2-D00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.2%	88.6%	0.1 lb-ft2 (0.0042 kg-m2)	56Z/56HZ***/ 143T/145T	54 lb (24.5 kg)	208/230V~	60 Hz	SL121-2030A-RT^	IP20^	6.7 lb (3 kg)	14 AWG
V01	V01-0300-2-A00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.2%	88.6%	0.1 lb-ft2 (0.0042 kg-m2)	56Y*	54 lb (24.5 kg)	208/230V~	60 Hz	SL121-2030A-RT^	IP20^	6.7 lb (3 kg)	14 AWG
V01	V01-0300-2-C00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.2%	88.6%	0.1 lb-ft2 (0.0042 kg-m2)	56/56H**	54 lb (24.5 kg)	208/230V~	60 Hz	SL121-2030A-RT^	IP20^	6.7 lb (3 kg)	14 AWG
V01	V01-0300-2-F00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.2%	88.6%	0.1 lb-ft2 (0.0042 kg-m2)	182T/184T	54 lb (24.5 kg)	208/230V~	60 Hz	SL121-2030A-RT^	IP20^	6.7 lb (3 kg)	14 AWG
V01	V01-0300-4-D00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.1%	90.2%	0.1 lb-ft2 (0.0042 kg-m2)	56Z/56HZ***/ 143T/145T	54 lb (24.5 kg)	460V~	60 Hz	SL121-4030A-RT^	IP20^	6.7 lb (3 kg)	14 AWG
V01	V01-0300-4-A00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.1%	90.2%	0.1 lb-ft2 (0.0042 kg-m2)	56Y*	54 lb (24.5 kg)	460V~	60 Hz	SL121-4030A-RT^	IP20^	6.7 lb (3 kg)	14 AWG
V01	V01-0300-4-C00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.1%	90.2%	0.1 lb-ft2 (0.0042 kg-m2)	56/56H**	54 lb (24.5 kg)	460V~	60 Hz	SL121-4030A-RT^	IP20^	6.7 lb (3 kg)	14 AWG
V01	V01-0300-4-F00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.1%	90.2%	0.1 lb-ft2 (0.0042 kg-m2)	182T/184T	54 lb (24.5 kg)	460V~	60 Hz	SL121-4030A-RT^	IP20^	6.7 lb (3 kg)	14 AWG
V01	V01-0300-6-D00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.2%	90.6%	0.1 lb-ft2 (0.0042 kg-m2)	56Z/56HZ***/ 143T/145T	54 lb (24.5 kg)	575V~	60 Hz	P06C-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V01	V01-0300-6-A00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.2%	90.6%	0.1 lb-ft2 (0.0042 kg-m2)	56Y*	54 lb (24.5 kg)	575V~	60 Hz	P06C-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V01	V01-0300-6-C00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.2%	90.6%	0.1 lb-ft2 (0.0042 kg-m2)	56/56H**	54 lb (24.5 kg)	575V~	60 Hz	P06C-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V01	V01-0300-6-F00	3 HP / 2.23 kW	1800 RPM	100-3600 RPM	1.15	92.2%	90.6%	0.1 lb-ft2 (0.0042 kg-m2)	182T/184T	54 lb (24.5 kg)	575V~	60 Hz	P06C-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V02	V02-0500-2-D00	5 HP / 3.72 kW	1800 RPM	100-3600 RPM	1.15	92.2%	88.9%	0.164 lb-ft2 (0.0068 kg-m2)	56Z/56HZ***/ 143T/145T	72 lb (32.7 kg)	208/230V~	60 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V02	V02-0500-2-F00	5 HP / 3.72 kW	1800 RPM	100-3600 RPM	1.15	92.2%	88.9%	0.164 lb-ft2 (0.0068 kg-m2)	182T/184T	72 lb (32.7 kg)	208/230V~	60 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V02	V02-0500-4-D00	5 HP / 3.72 kW	1800 RPM	100-3600 RPM	1.15	92.0%	90.0%	0.164 lb-ft2 (0.0068 kg-m2)	56Z/56HZ***/ 143T/145T	72 lb (32.7 kg)	460V~	60 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V02	V02-0500-4-F00	5 HP / 3.72 kW	1800 RPM	100-3600 RPM	1.15	92.0%	90.0%	0.164 lb-ft2 (0.0068 kg-m2)	182T/184T	72 lb (32.7 kg)	460V~	60 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V02	V02-0500-6-D00	5 HP / 3.72 kW	1800 RPM	100-3600 RPM	1.15	91.8%	89.4%	0.164 lb-ft2 (0.0068 kg-m2)	56Z/56HZ***/ 143T/145T	72 lb (32.7 kg)	575V~	60 Hz	P06C-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V02	V02-0500-6-F00	5 HP / 3.72 kW	1800 RPM	100-3600 RPM	1.15	91.8%	89.4%	0.164 lb-ft2 (0.0068 kg-m2)	182T/184T	72 lb (32.7 kg)	575V~	60 Hz	P06C-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V03	V03-1000-4-H00	10 HP / 7.46 kW	1800 RPM	100-3600 RPM	1.15	94.7%	93.2%	0.1 lb-ft2 (0.0042 kg-m2)	213T/215T	151 lb (68.5 kg)	460V~	60 Hz	P06-1500-RT	IP65	11 lb (5 kg)	10-14 AWG
V03	V03-1000-6-H00	10 HP / 7.46 kW	1800 RPM	100-3600 RPM	1.15	94.7%	93.2%	0.1 lb-ft2 (0.0042 kg-m2)	213T/215T	151 lb (68.5 kg)	575V~	60 Hz	P06C-1500-RT	IP65	11 lb (5 kg)	10-14 AWG
V03	V03-1500-4-H00	15 HP / 11.19 kW	1800 RPM	100-3600 RPM	1.15	94.7%	93.2%	0.1 lb-ft2 (0.0042 kg-m2)	213T/215T	151 lb (68.5 kg)	460V~	60 Hz	P06-1500-RT	IP65	11 lb (5 kg)	10-14 AWG
V03	V03-1500-6-H00	15 HP / 11.19 kW	1800 RPM	100-3600 RPM	1.15	94.7%	93.2%	0.1 lb-ft2 (0.0042 kg-m2)	213T/215T	151 lb (68.5 kg)	575V~	60 Hz	P06C-1500-RT	IP65	11 lb (5 kg)	10-14 AWG

## IEC (Europe)

Motor Model	Motor SKU	Rated HP / Power	Rated RPM	Operating RPM	Rated Service Factor	Peak Motor Efficiency	Peak System Efficiency	Rotor Inertia	Motor Frame Size	Motor Weight	Supply Voltage	Supply Frequency	Recommended Motor Controller SKU	Motor Controller Ingress Protection	Motor Controller Weight	Motor to Controller Power Wire
V01	V01-0300-2-ID00	2.2 kW	1500 RPM	300-3000 RPM	1.15	90.9%	87.6%	0.1 lb-ft2 (0.0042 kg-m2)	90S/90L	54 lb. (24.5 kg)	200V~	50 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V01	V01-0300-2-IE00	2.2 kW	1500 RPM	300-3000 RPM	1.15	90.9%	87.6%	0.1 lb-ft2 (0.0042 kg-m2)	100L	54 lb. (24.5 kg)	200V~	50 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V01	V01-0300-2-IF00	2.2 kW	1500 RPM	300-3000 RPM	1.15	90.9%	87.6%	0.1 lb-ft2 (0.0042 kg-m2)	1128	54 lb. (24.5 kg)	200V~	50 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V01	V01-0300-4-ID00	2.2 kW	1500 RPM	300-3000 RPM	1.00	90.9%	88.9%	0.1 lb-ft2 (0.0042 kg-m2)	90S/90L	54 lb. (24.5 kg)	400V~	50 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V01	V01-0300-4-IE00	2.2 kW	1500 RPM	300-3000 RPM	1.00	90.9%	88.9%	0.1 lb-ft2 (0.0042 kg-m2)	100L	54 lb. (24.5 kg)	400V~	50 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V01	V01-0300-4-IF00	2.2 kW	1500 RPM	300-3000 RPM	1.00	90.9%	88.9%	0.1 lb-ft2 (0.0042 kg-m2)	1128	54 lb. (24.5 kg)	400V~	50 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V02	V02-0500-2-IG00	4 kW	1500 RPM	300 - 3000 RPM	1.00	91.8%	88.2%	0.164 lb-ft2 (0.0068 kg-m2)	112M	72 lb. (32.7 kg)	200V~	50 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V02	V02-0500-4-IG00	4 kW	1500 RPM	300- 3000 RPM	1.00	93.4%	91.6%	0.164 lb-ft2 (0.0068 kg-m2)	112M	72 lb. (32.7 kg)	400V~	50 Hz	P06-0500-RT	IP65	11 lb (5 kg)	10-14 AWG
V03	V03-0750-4-IH00	5.5 kW	1500 RPM	300 - 3000 RPM	1.15	94.5%	92.6%	0.1 lb-ft2 (0.0042 kg-m2)	1328	151 lb (68.5 kg)	400V~	50 Hz	P06-1500-RT	IP65	11 lb (5 kg)	10-14 AWG
V03	V03-1000-4-IJ00	7.46 kW	1500 RPM	300 - 3000 RPM	1.15	94.5%	92.6%	0.1 lb-ft2 (0.0042 kg-m2)	132M	151 lb (68.5 kg)	400V~	50 Hz	P06-1500-RT	IP65	11 lb (5 kg)	10-14 AWG

#### Notes:

For other technical specifications not covered in the document, please reach out directly to Turntide at <a href="https://example.com">hvacmotorsales@turntide.com</a> for further information.

<sup>\*56</sup>Y frame motors are not all the same dimensions. If the existing motor is 56Y, make sure to check that it matches with the Turntide motor.

<sup>\*\*</sup>A shaft diameter of 5/8" = NC, if 7/8" = ND. 56/56H motors typically have a 5/8" shaft diameter, but are not all the same dimensions. Make sure to check that shaft diameter, shaft height, shaft length, and bolt hole positioning match the Turntide motor.

<sup>\*\*\*</sup>A shaft diameter of 5/8" = NC, if 7/8" = ND. 56Z/56HZ motors typically have a 7/8" shaft diameter, but are not all the same dimensions. Make sure to check that shaft diameter, shaft height, shaft length, and bolt hole positioning match the Turntide motor.

Alf the motor controller requires protection above IP20, use P06-0500-RT motor controller SKU instead. The motor controller will have IP65 ingress protection.

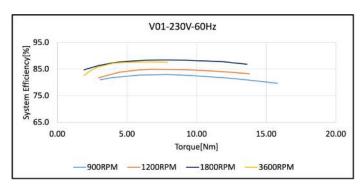


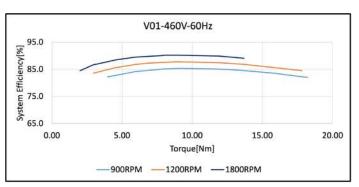
# **Motor System Efficiency Curves**

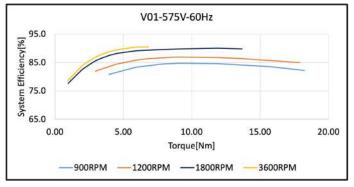
#### Notes:

- 1. These efficiency curves depict motor system efficiency vs. torque, meaning it covers the Turntide smart motor paired with its compatible Turntide motor controller.
- 2. Not all possible motor performance options are shown in these curves.

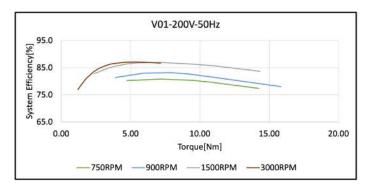
#### V01USA / Canada

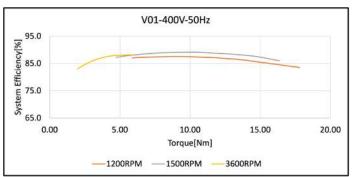






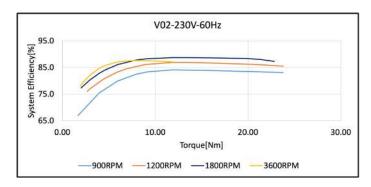
## V01 Europe (IEC)

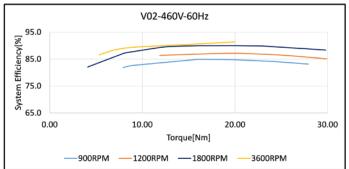


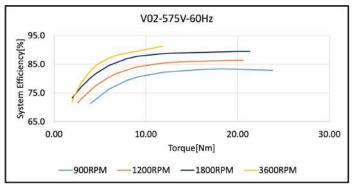




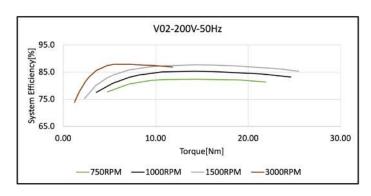
#### V02 USA / Canada

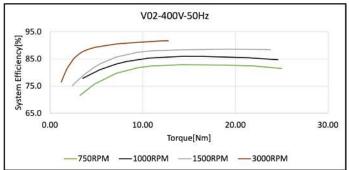




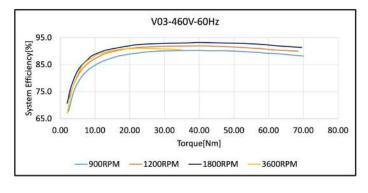


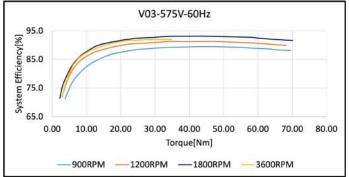
## V02 Europe (IEC)





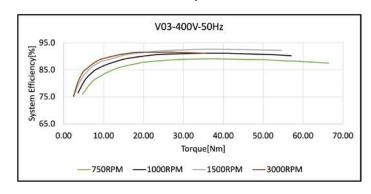
#### V03 USA / Canada



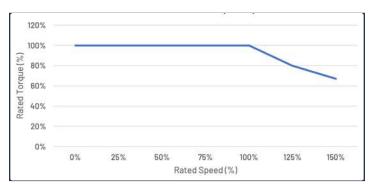




## V03 Europe (IEC)



## V-Series Motor Torque-Speed Curve



## Certifications













UL: 1004-7

CSA: C22.2#77

IEC: 60034-1, 60204-1

## Table I. NEMA Motors

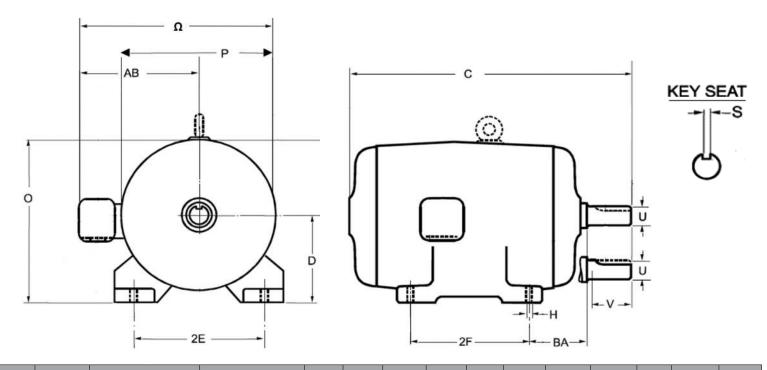
Agency	Code	Description
CSA	C22.2 No.77	Motors with inherent overheating protection
CSA	C22.2 No. 100	Motors and generators
UL	1004-7	Electronically protected motors
UL	1004-8	Inverter Duty Motors
ETL-Intertek		Marking
RoHS		Restriction of Hazardous Substances Directive

## Table II. IEC Motors

Agency	Code	Description
IEC	60204-1	Safety of machinery – Electrical equipment of machines – Part 1: General Requirement
IEC	60034-1	Rotating electrical machines - Part 1: Rating and performance
CE		Marking
RoHS		Restriction of Hazardous Substances Directive



## Motor Dimensions (Fractions) all dimensions are in inches



	Frame	D	**	0**												
Motor	Size	Standard Foot	N.I. Foot	Standard Foot	N.I. Foot	2E	2F	Н	BA	U	V	С	Р	S	AB	Ω***
	56	3-1/2	4	7-5/16	7-13/16	4-7/8	3	11/32	2-3/4	5/8	1-7/8	12-1/4	7-11/16	3/16	6-1/2	10-3/8
	56Y*	3-1/2	4	7-5/16	7-13/16	4-7/8	3	11/32	2-3/4	5/8	4-1/2	14-5/6	7-11/16	3/16	6-1/2	10-3/8
	56H*	3-1/2	4	7-5/16	7-13/16	4-7/8	5	11/32	2-3/4	5/8	1-7/8	12-1/4	7-11/16	3/16	6-1/2	10-3/8
V01	56HZ	3-1/2	4	7-5/16	7-13/16	4-7/8	5	11/32	2-3/4	7/8	2-1/4	12-5/8	7-11/16	3/16	6-1/2	10-3/8
V01	143T	3-1/2	4	7-5/16	7-13/16	5-1/2	4	11/32	2-3/4	7/8	2-1/4	12-5/8	7-11/16	3/16	6-1/2	10-3/8
	145T	3-1/2	4	7-5/16	7-13/16	5-1/2	5	11/32	2-3/4	7/8	2-1/4	12-5/8	7-11/16	3/16	6-1/2	10-3/8
	182T	4-1/2	5	7-5/16	7-13/16	7-1/2	4-1/2	11/32	2-3/4	11/8	2-3/4	12-7/8	7-11/16	3/16	6-1/2	10-3/8
	184T	4-1/2	5	7-5/16	7-13/16	7-1/2	5-1/2	11/32	2-3/4	11/8	2-3/4	12-7/8	7-11/16	3/16	6-1/2	10-3/8
	143T	3-1/2	3-5/7	8-5/16	8-51/100	5-1/2	4	11/32	2-1/4	7/8	2-1/4	15-1/2	7-11/16	1/4	6-1/2	10-3/8
V00	145T	3-1/2	3-5/7	8-5/16	8-51/100	5-1/2	5	11/32	2-1/4	7/8	2-1/4	15-1/2	7-11/16	1/4	6-1/2	10-3/8
V02	182T	4-1/2	4-5/7	8-5/16	8-51/100	7-1/2	4-1/2	11/32	2-3/4	1-1/8	2-3/4	15-3/4	7-11/16	1/4	6-1/2	10-3/8
	184T	4-1/2	4-5/7	8-5/16	8-51/100	7-1/2	5-1/2	11/32	2-3/4	1-1/8	2-3/4	15-3/4	7-11/16	1/4	6-1/2	10-3/8
V03	213T	5-1/4	5-85/100	11-1/2	12-1/10	8-1/2	5-1/2	13/32	3-1/2	1-3/8	3-1/2	17-7/16	11-11/16	5/16	8-3/16	14-3/8
	215T	5-1/4	5-85/100	11-1/2	12-1/10	8-1/2	7	13/32	3-1/2	1-3/8	3-1/2	17-7/16	11-11/16	5/16	8-3/16	14-3/8

Note: N.I. Foot stands for noise isolation feet

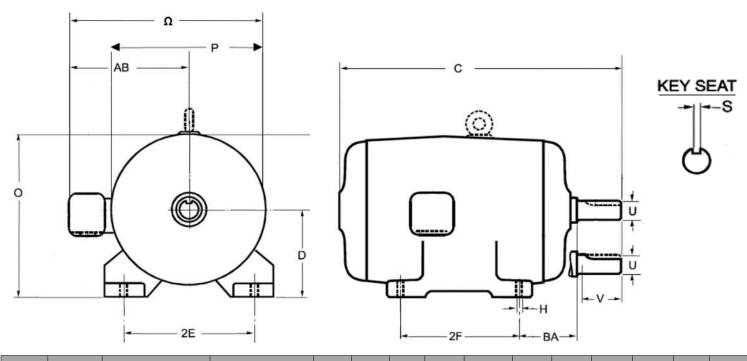
<sup>\*56</sup>Y and 56H frame motors are not all the same. If the existing motor is 56Y or 56H, make sure to check it matches with the Turntide motor.

<sup>\*\*</sup>Motors with noise isolation feet attached will have different "D" and "O" dimensions

<sup>\*\*\*</sup>Not a NEMA reference



# Motor Dimensions (Decimals) all dimensions are in inches



	Fromo	D*	**	0**				ш								
Motor	Frame Size	Standard Foot	N.I. Foot	Standard Foot	N.I. Foot	2E	2F	Н	BA	U	V	С	Р	S	AB	Ω***
	56	3.50	4.00	7.31	7.81	4.88	3.00	0.34	2.75	0.6250	1.88	12.25	7.69	0.188	6.50	10.38
	56Y*	3.50	4.00	7.31	7.81	4.88	3.00	0.34	2.75	0.6250	4.50	14.83	7.69	0.188	6.50	10.38
	56H*	3.50	4.00	7.31	7.81	4.88	5.00	0.34	2.75	0.6250	1.88	12.25	7.69	0.188	6.50	10.38
V/01	56HZ	3.50	4.00	7.31	7.81	4.88	5.00	0.34	2.75	0.8750	2.25	12.63	7.69	0.188	6.50	10.38
V01	143T	3.50	4.00	7.31	7.81	5.50	4.00	0.34	2.75	0.8750	2.25	12.63	7.69	0.188	6.50	10.38
	145T	3.50	4.00	7.31	7.81	5.50	5.00	0.34	2.75	0.8750	2.25	12.63	7.69	0.188	6.50	10.38
	182T	4.50	5.00	7.31	7.81	7.50	4.50	0.34	2.75	1.1250	2.75	12.88	7.69	0.188	6.50	10.38
	184T	4.50	5.00	7.31	7.81	7.50	5.50	0.34	2.75	1.1250	2.75	12.88	7.69	0.188	6.50	10.38
	143T	3.50	3.70	8.31	8.51	5.50	4.00	3.67	2.25	0.8750	2.25	15.50	7.69	0.250	6.50	10.38
VOO	145T	3.50	3.70	8.31	8.51	5.50	5.00	3.67	2.25	0.8750	2.25	15.50	7.69	0.250	6.50	10.38
V02	182T	4.50	4.70	8.31	8.51	7.50	4.50	3.67	2.75	1.1250	2.75	15.75	7.69	0.250	6.50	10.38
	184T	4.50	4.70	8.31	8.51	7.50	5.50	3.67	2.75	1.1250	2.75	15.75	7.69	0.250	6.50	10.38
V07	213T	5.25	8.85	1.50	12.10	8.50	5.50	0.41	3.50	1.3750	3.50	17.44	11.69	0.313	8.19	14.38
V03	215T	5.25	8.85	1.50	12.10	8.50	7.00	0.41	3.50	1.3750	3.50	17.44	11.69	0.313	8.19	14.38

Note: N.I. Foot stands for noise isolation feet

<sup>\*56</sup>Y and 56H frame motors are not all the same. If the existing motor is 56Y or 56H, make sure to check it matches with the Turntide motor.

<sup>\*\*</sup>Motors with noise isolation feet attached will have different "D" and "O" dimensions

<sup>\*\*\*</sup>Not a NEMA reference

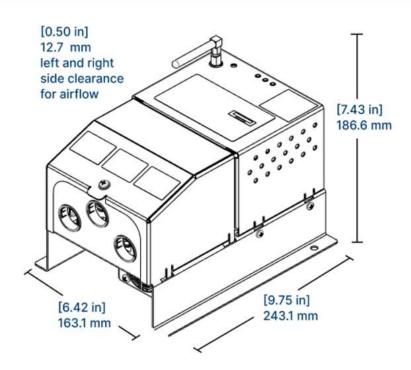


## **Motor Controller Dimensions**

#### **P06 Motor Controller**

# [16.10 in] 408.9 mm [6.08 in] 154.6 mm

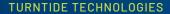
#### **SL121 Motor Controller**





## **Questions?**

If you have any specific questions about Turntide motors not answered in this document, please contact hvacmotorsales@turntide.com for more information.



Our breakthrough technologies accelerate electrification and sustainable operations for energy-intensive industries

