

# SmartD Clean Power VFD

## FEATURES

- Pure sine wave 3-phase power output
- Scalar V/f control for 3-phase AC induction motors
- Multifunctional, digital and analog IOs
- Built-in safe torque off (STO) inputs
- SIL 3 capacity level to IEC61800-5-2
- 24 VDC power supply input
- Dual Ethernet port
- Fire emergency mode
- Configurable Linear and S-curve ramps
- Starting torque boost
- Integrated EMC filters
- Set, monitor, control it with an app
- Pluggable display
- Natural language user interface



The SmartD Clean Power Variable Frequency Drive is a compact AC drive utilizing SmartD's patented own algorithms combined with WBG transistor technology. Producing a clean and pure sine wave to power and control 3-phase AC induction motors has never been easier. The SmartD VFD has essential features built-in for space, wiring and time savings, it eliminates the need for filters on the output, and guarantees longer motor lifetime.



**CLEAN  
SIGNAL**



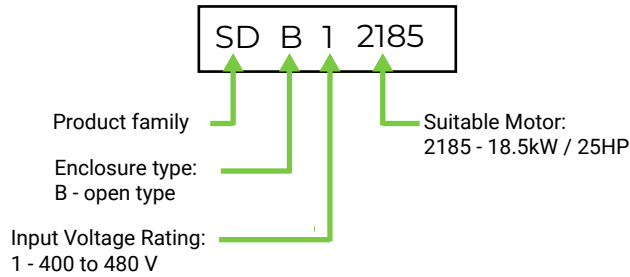
**50%  
SMALLER**



**ENERGY  
SAVINGS**



**TYPE DESIGNATION**



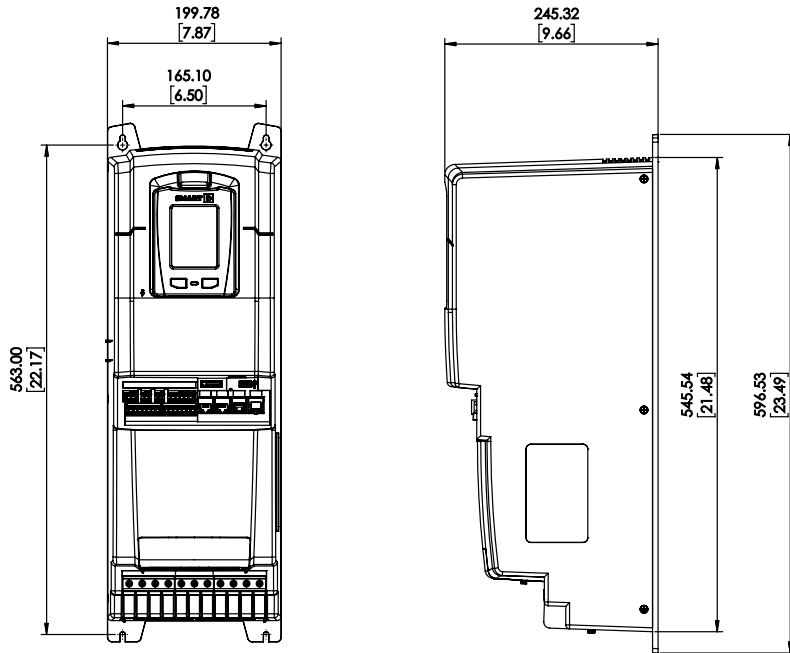
ITEM	SPECIFICATION	
<b>POWER INPUT</b>		
Voltage Rating $U_{in}$		3 x 400VAC -15% / +10%
		3 x 480VAC -15% / +10%
Frequency $F_n$		50 and 60Hz +/- 5%
Current Rating $I_{in}$	With input choke 1mH	27A
	Without input choke	36A
Apparent power @480V	With input choke 1mH	22 kVA
	Without input choke	30 kVA
Prospective Line Isc		5 kA
<b>POWER OUTPUT</b>		
Rated Current $I_{out}$ @40 °C (104 °F)	Normal operation	33A
	Heavy duty operation	24A
Maximum Transient Output current	Normal operation	110% during 60s every 10 min at 40 °C (104 °F)
	Heavy duty operation	150% during 60s every 10 min at 40 °C (104 °F)
Motor Power kW normal duty (1)	3x400VAC 50/60Hz	max 15kW
	3x460VAC 50/60Hz	max 18.5kW
Motor Power kW heavy duty (1)	3x400VAC 50/60Hz	max 11kW
	3x460VAC 50/60Hz	max 15kW
Speed drive output Frequency		0.1 to 120 Hz
Nominal switching frequency		105 kHz
Effective switching frequency		210 kHz
Efficiency		97%

- (1) Motor power values are indicative. They vary with the motor type, technology and manufacturer. The variable frequency drive must not be selected from motor power rating. The variable frequency drive must be selected by skilled and experienced personnel. The variable frequency drive must be selecting according to motor FLA, the load's driving force and the movement cycle, and the operating environment.
- (2) Continuously available without overload.

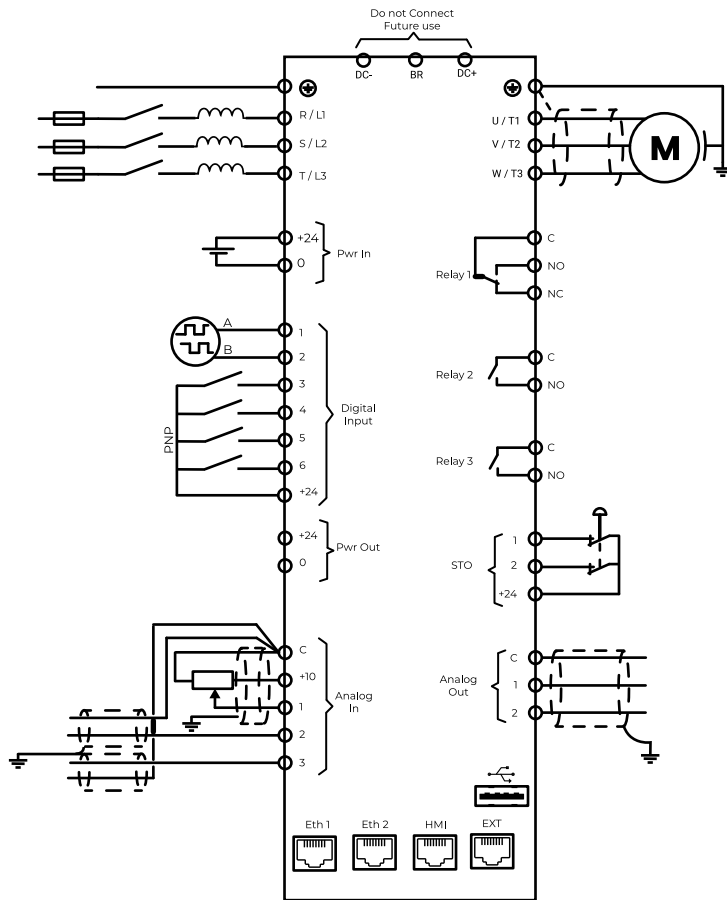
\* Specifications are subject to change without notice.

**DIMENSIONS**

Width 199.78mm / 7.87 in  
 Height 596.53mm / 23.49 in  
 Depth 245.32mm / 9.66 in  
 Net weight 15 kg



**WIRING**



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ITEM	SPECIFICATION		
<b>DIGITAL I/O's</b>			
Digital input numbers			6
Digital inputs common terminal			1
Inputs 1 and 2	User settable Adapted for encoder		0...50 kHz, 24 VDC, A/B phase for speed and direction
Inputs 3 to 6	Settable by user		default setting as DI3 = Run forward, DI4 =Run Reverse, DI5=Stop , DI6=preset speed/speed from Analog input 1
Input logic	Wire-able as sink/source, configured by software		default : source
Output power for digital inputs			+24VDC (20% .. +20%) / 200 mA
STO (safe torque off) inputs	2 inputs		SIL 3 capacity level - conformed to IEC61800-5-2
	stop category		category 0
Digital output numbers			3
relay 1	Relay output SPDT (form C)	NO contact	Resistive load, AC: 5 A @ 250 V / DC 5 A @ 30 V
		NC contact	Resistive load, AC: 3 A @ 250 V / DC 3 A @ 30 V
relay 2 and 3	Relay output NO (form A)		Resistive load, AC: 3 A @ 250 V / DC 3 A @ 30 V
<b>ANALOG I/O's</b>			
Analog input numbers			3
Analog input types	Settable by user		0..10VDC 0..20mA / 4..20mA 0..24VDC Impedance to read PTC temperature sensor
Resolution			12 bits
Sampling time			2ms
Accuracy			± 1% at 25 °C (77 °F) / ± 2% for a temperature variation of 60 °C (108 °F)
Reference power supply for potentiometer			+10 VDC / tolerance ± 2% for the temperature range of 20 °C to 30 °C / Current: maximum 10 mA, short circuit protected
Analog output numbers			2
Analog output types	Settable by user		0..10VDC (15 mA max) 0..20mA / 4..20mA
Resolution			12 bits
Sampling time			2ms
Accuracy			± 1% at 25 °C (77 °F) / ± 2% for a temperature variation of 60 °C (108 °F)

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ITEM	SPECIFICATION	
COMMUNICATIONS		2 Ethernet Ports
ENVIRONMENT		
Insulation resistance		> 1 MOhm 500 V DC for 1 min to earth
Noise Level		63.5 dB conforming to 86/188/EEC
Heat dissipation	At rated current output:	387 W at 430 V, switching frequency 105 kHz
Cooling	Forced air flow (power):	0.36 m <sup>3</sup> / min - 12.7 CFM
Surrounding environment pollution degree		2 conforming to EN/IEC 61800-5-1
Vibration resistance		1.5 mm peak to peak (f= 2...13 Hz) conforming to IEC 60068-2-6 1 gn (f= 13...200 Hz) conforming to IEC 60068-2-6
Relative humidity		5...95 % without condensation conforming to IEC 60068-2-3
Ambient air temperature for operation		-15...40 °C without derating
for storage		-40...70 °C
Cooling		Integrated, replaceable fans
Operating altitude		1) <= 2000 m (6600 ft) without de-rating
Environmental characteristic		Chemical pollution resistance class 3C3 conforming to EN/IEC 60721-3-3 Dust pollution resistance class 3S3 conforming to EN/IEC 60721-3-3
Ingress Protection IP	IP20	According to the IEC standard 60529
Protection Degree		UL type 1

APPLICABLE STANDARDS		
Functional Safety		UL /IEC 61800-5-1 :2007+AMD:2016CSV C22.2 No. 274
EMC	IEC 61800-3: 2017 emissions IEC 61000-4 immunity	
Harmonics	IEC 61000-3-12 IEEE 519	
Generic	IEC 61800-2 : 2021	
EcoDesign / Energy Efficiency	IEC 61800-9	
Safety Standard (STO)	IEC 61508 part 1 and part2 IEC 62061 :2021	
Cybersecurity	IEC62443	
Environmental	IEC 60068-2 WEEE directive RoHS	
Certifications	UL Listed	

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