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VE1 AND VFNC3 TYPES

- Single-phase 200...240VAC supply
- Three-phase motor power, 0.2...2.2kW / 0.25...3HP ratings at 230VAC
- Compliant with standard IEC/EN 61800-3, cat. C1 or cat. C2 without external filters
- Optional three-phase motor inductances for VFNC3.



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VLB3 TYPE

- Three-phase 400...480VAC supply
- Three-phase motor power, 0.4...30kW / 0.54...40HP ratings at 400VAC
- Compliant with standard IEC/EN 61800-3, cat. C1 or cat. C2 without external filters
- Integrated dynamic braking circuit
- Optional three-phase motor inductances
- Optional braking resistors
- Parameter programming also via USB and Wi-Fi modules.



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VFS15 TYPE

- Three-phase 380...500VAC supply
- Three-phase motor power, 0.4...15kW / 0.5...20HP ratings at 400VAC
- Compliant with standard IEC/EN 61800-3, cat. C1 or cat. C2 without external filters
- Integrated dynamic braking circuit
- Optional three-phase motor inductances
- Optional braking resistors.



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VFPS1 TYPE

- Three-phase 380...480VAC supply
- Three-phase motor power 18.5...630kW / 25...1000HP ratings at 400VAC
- Compliant with standard IEC/EN 61800-3, cat. C1 or cat. C2 without external filters
- Integrated dynamic braking circuit up to 220kW
- Optional three-phase motor inductances
- Optional braking resistors.



- Versions for single-phase up to 2.2kW / 3HP and three-phase up to 630kW / 1000HP
- Special function for pump and fan control using PID algorithm
- Active earth leakage protection
- EMC suppressor built-in all versions
- Selectable motor control mode: V/f, vector, energy saving
- Selectable digital and analog input and output functions.

Variable speed drives

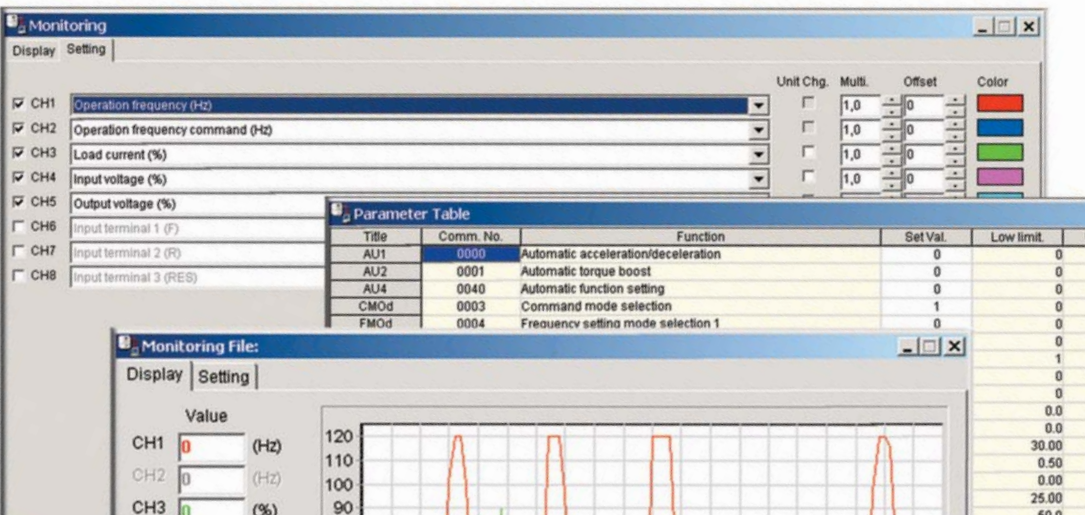
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Description		 VE1 1-phase	 VFNC3 1-phase	 VLB3 3-phase	 VFS15 3-phase	 VFPS1 3-phase
Three-phase motor power (kW)	normal load	—	—	0.75...37 (400V)	0.75...18 (400V)	—
	heavy load	0.2...2.2 (240V)	0.2...2.2 (240V)	0.4...30 (400V)	0.4...15 (400V)	18.5...630 (400V)
Method of control						
	Constant torque V/f	●	●	●	●	●
	Sensorless vector	—	●	●	●	●
	Automatic torque boost	●	●	●	●	●
	Variable torque (for pump and fan)	●	●	●	●	●
	Energy saving	●	●	●	●	●
	Vector with encoder feedback	—	—	●	—	●
Maximum output frequency		650Hz	400Hz	599Hz	500Hz	500Hz
Overload		150% for 60s	150% for 60s	150% for 60s	150% for 60s	120% for 60s
Serial communications RS485		n° 1	n° 1	n° 1	n° 1	n° 2
Protocols		Modbus-RTU, Modbus-ASCII	Modbus-RTU	Modbus-RTU, ProfiNET, canOPEN, Ethercat, ProfiBUS, EthernetIP	Modbus-RTU, PROFIBUS	Modbus-RTU, PROFIBUS
Digital inputs (inputs marked with ① can be configured as analog or digital)		5	4+1①	5	6+2①	6+1①
Digital outputs		1	1	2	2	3
Analog inputs (inputs marked with ① can be configured as analog or digital)		1	1①	2	1+2①	2+1①
Analog outputs		1	1	1	1	2
Sequencer (frequency/time cycles)		●	—	●	—	—
Onboard potentiometer		●	●	—	●	—
Auto-tuning		—	●	—	●	●
PID adjustment		●	●	●	●	●
PID SLEEP function		●	●	●	●	●
PID WAKE-UP function		●	—	●	—	—
FIRE function		—	—	—	—	●
Frequency potentiometer		—	●	●	●	●
3-wire motor running		●	●	●	●	●
DC braking		—	●	●	●	●
Preset speed frequency		8	15	15	15	15
Pump and fan functions		●	●	●	●	●
Auto-speed adjustment		—	●	●	●	●
Motor PTC thermistor input		—	—	●	●	●
S.T.O. (Safe Torque Off) per EN ISO 13849-1 cat. 3		—	—	Optional	—	●

VE1 type

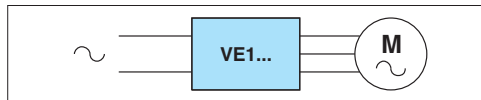


VE1...

Order code	Output current	3-phase motor power at 240V		Qty per pkg	Weight
	[A]	[kW]	[HP]	n°	[kg]

Single-phase supply 200...240VAC 50/60Hz.
 Three-phase motor output 240VAC max.
 Built-in EMC suppressor, cat. C2.
 12VDC pNp digital inlets; version with 24VDC pNp inlets available upon request.

VE1 02 A240	1.8	0.2	0.25	1	1.200
VE1 04 A240	2.6	0.4	0.5	1	1.200
VE1 07 A240	4.3	0.75	1	1	1.200
VE1 15 A240	7.5	1.5	2	1	1.800
VE1 22 A240	10.5	2.2	3	1	1.800

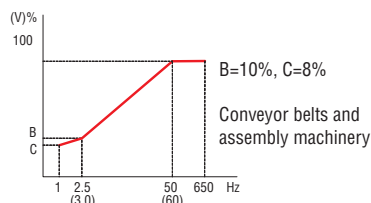


V/f CURVE PROGRAMMING

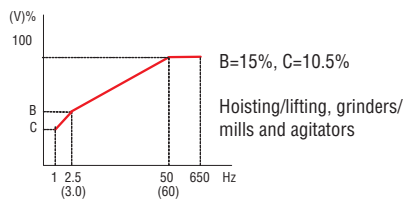
VE1 can handle 3 V/f preset curves and one programmed by the user.

3 V/f preset curves

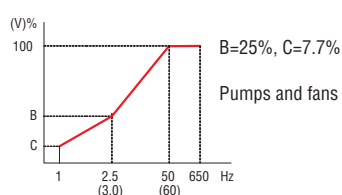
I – General use



II – High initial torque



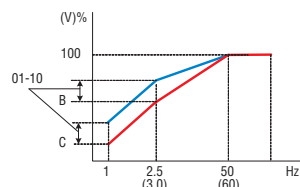
III – Variable curve



BOOST

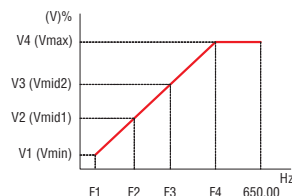
Torque boost can be applied on all preset curves with up to 10%.

Voltage to overcome very high inertia load conditions.



1 Programmable V/f curve

The user can customise a curve by defining 4 voltage / frequency points.



SPECIAL FUNCTIONS

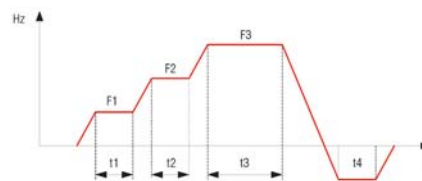
Sequencer

The user can program frequency-time cycles made up of a maximum of 8 steps, each characterised by motor speed, rotation direction and step duration.

The sequence cycle can be carried out in diverse modes:

- One single cycle with final motor stopping
- One single cycle with final motor running at last speed set
- Repeat cycles with no pause.

The sequence cycle can be stopped at any moment.



PID control

In some applications, such as pumps or fans, the output frequency of the drive is defined by the target to keep pressure or flow constant. Typically, by using the analog input, feedback is monitored and, with the PID offset control, the motor drive sets motor speed to obtain the target set-point.

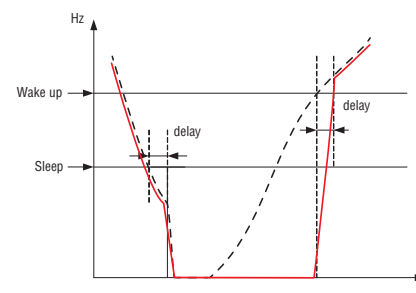
VE1 PID control also includes the following functions:

- **Sleep:** When the PID output frequency is lower than a programmed limit, that is the motor speed is close to the allowable minimum when propulsion is not needed, the motor drive completely stops the motor for energy saving.
- **Wake-up:** During sleep phase, when the PID output frequency is higher than the programmed limit, the motor drive picks up motor control again at a suitable speed to reach the target set-point without a manual starting.

----- PID calculated frequency

————— Generated frequency

Each function also has a programmable delay time to avoid inopportune and repetitive start-stop motor cycles.



General characteristics

VE1 is a high-performance compact drive, with V/f torque control and boost, featuring advanced functions such as the built-in PID control and sequences. It is versatile, easy to install and program and can be used in numerous applications. It has a digital display to simplify parameterising which can also be done remotely using the RS485 port. Motor speed can be adjusted with the front potentiometer or by using one of the preset V/f curves, each provided with dedicated acceleration and deceleration ramps.

It can be used in general applications such as automatic door controls, on conveyor belts, assembly, packaging and packing machinery, or for pump and fan control.

SPEED REFERENCE SIGNALS

Reference signals for speed adjustment are obtained by:

- Front potentiometer
- Voltage signals: 0...10V
- Current signals: 4...20mA
- 8 preset speeds
- RS485 serial signals.

PROGRAMMABLE INPUTS

- 5 digital multifunction inputs
- PNP 12VDC connection; 24VDC on request.

PROGRAMMABLE OUTPUTS

- 1 programmable relay
- 1 analog 0...10V.

PROTECTION

- Overload
- Overvoltage
- Minimum voltage
- Output short circuit
- Earth/ground leakage dispersion
- Over-temperature
- Restart after momentary power loss, with programmable number of attempts.

SPECIAL FUNCTIONS

- PID adjustment with sleep and wake-up functions
- Sequencer (work cycles)
- Motor control: V/f constant torque, variable torque, programmable motor start and stop curves (1 programmable by user)
- Hour counter: Motor running hours and power supply on hours.

Operational characteristics

- Input voltage: 200...240VAC single phase
- Output voltage: 0...240VAC three phase
- Rated operational current: 1.8...10.5A
- Mains frequency: 50/60Hz
- Output frequency: 0...650Hz
- Current voltage: 150% for 60s
- IEC degree of protection: IP20
- Ambient conditions
 - Operating temperature: -10...+40°C (up to 50°C with forced ventilation or 20% output current derating)
 - Maximum altitude: 1000m
 - Relative humidity: 95%.

Certifications and compliance

Certifications obtained: UL Listed for USA and Canada (cULus – File E360929) as Power Conversion Equipment. Compliant with standards: IEC/EN 61800-5-1, IEC/EN 61800-3 cat. C2, IEC/EN 60721-3-3, UL 508 C, CSA C22.2 n° 14

VFNC3 type



VFNC3...

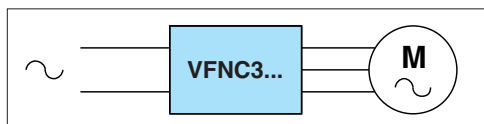
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Order code	Output current	3-phase motor power at 240V		Qty per pkg	Weight
	[A]	[kW]	[HP]	n°	[kg]

Single-phase supply 200...240VAC 50/60Hz.
Three-phase motor output 240VAC max.
Built-in EMC suppressor, cat. C1.

VFNC3S 2002 PLW	1.4	0.2	0.25	1	1.100
VFNC3S 2004 PLW	2.4	0.4	0.5	1	1.260
VFNC3S 2007 PLW	4.2	0.75	1	1	1.348
VFNC3S 2015 PLW	7.5	1.5	2	1	1.960
VFNC3S 2022 PLW	10	2.2	3	1	1.985

① Operation up to 50°C without derating.



“Side by Side” installation
Multiple units can be installed without side clearance for space saving.

Standard installation with gaps between one drive and the next one.

General characteristics

VFNC3 is an ultra-compact drive with high performance and extremely reliable (printed circuit surface protection per IEC/EN 60721-3-3).

Easily installed, VFNC3 is equipped with a front display and innovative jog dial control, which simplifies the programming and control processes of the drive and motor. The on-board RS485 interface permits an overall remote control (supervision and communication protocols). VFNC3 can be used in simple applications such as extractor fans, ventilators, conveyor belts, machine tools, car washes, fitness equipment, but also in applications of intermediate complexity, such as pumps, waterworks.

The vector control and the possibility to enable the motor auto-tuning warrants efficiency and high torques even with very low operating frequencies.

SPEED REFERENCE SIGNALS

Reference signals for speed adjustment are obtained by:

- Front jog dial control (potentiometer)
- External potentiometer: 1...10kΩ
- Voltage signal: 0...10V
- Current signal: 4...20mA
- Remote keypad option
- 15 preset speeds via digital inputs
- RS485 serial signals.

PROGRAMMABLE INPUTS

- Selectable pNp or nPn I/O logic
- 4 digital multifunction inputs
- 1 digital configurable as analog input.

PROGRAMMABLE OUTPUTS

- 1 relay with changeover contact
- 1 static configurable as analog 0...10V/4...20mA.

PROTECTION

- Overcurrent and overvoltage
- Input phase loss
- Output phase loss
- Motor drive overload
- Motor overload
- Output short circuit
- Motor stall.

SPECIAL FUNCTIONS

- PID function for pump and fan application
- Dual set of independent parameters and ramps for two different motor controls
- Automatic restarting and instantaneous speed tuning
- 15 viewable frequency values
- Start-up DC injection
- DC injection braking
- Motor control: constant torque V/f, sensorless vector, variable torque.

Operational characteristics

- Input voltage: 200...240VAC single-phase
- Output voltage: ≤ input voltage
- Rated operational current: 1.4...10A
- Mains frequency: 50/60Hz
- Output frequency: 0.1...400Hz
- Frequency modulation: 2...16kHz
- Current overload: 150% for 60s; 200% for 0.5s
- IEC degree of protection: IP20
- Ambient conditions
 - Operating temperature: -10...+60°C (50°C with non derating)
 - Maximum altitude: 3000m (with derating)
 - Relative humidity: 5...95% (with no condensing).

Certifications and compliance

Certifications obtained: UL Listed for USA and Canada (File E204788) as Power Conversion Equipment; CSA certified for Canada (File 231252) as Motor Controllers - Miscellaneous.
Compliant with standards: IEC/EN 61800-5-1, IEC/EN 61800-3 - first environment cat. C1, IEC/EN 60721-3-3, UL508 C, CSA C22.2 n° 14.

VLB3 type



VLB3...



The drive efficiency is 25% higher than the reference value for the IE1 class.

Order code	Output current	3-phase motor power at 400VAC with heavy load			Qty per pkg.	Weight
		[A]	[kW]	[HP]		
				n°	[kg]	

Three-phase supply 400...480VAC 50/60Hz.
 Three-phase motor output max. 480VAC.
 Built-in EMC suppressor, cat. C1.
 Built-in display and RS485 communication port.

VLB3 0004 A480	1.3	0.4	0.5	1	0.850
VLB3 0007 A480	2.4	0.75	1	1	1.100
VLB3 0015 A480	3.9	1.5	2	1	1.380
VLB3 0022 A480	5.6	2.2	3	1	1.380
VLB3 0040 A480	9.5	4	5	1	2.450
VLB3 0055 A480	13	5.5	7.5	1	2.450
VLB3 0075 A480	17	7.5	10	1	3.950
VLB3 0110 A480	23.3	11	15	1	3.950
VLB3 0150 A480	32	15	20	1	10.650
VLB3 0185 A480	40	18.5	25	1	10.650
VLB3 0220 A480	47	22	30	1	10.650
VLB3 0300 A480	66	30	40	1	10.650

Operational characteristics for standard load

Type	Output current	3-phase motor power at 400VAC with standard load	
VLB3 0004 A480	1.5A	0.75kW	1HP
VLB3 0007 A480	2.7A	1.5kW	2HP
VLB3 0015 A480	4.5A	2.2kW	3HP
VLB3 0022 A480	6.4A	4kW	5HP
VLB3 0040 A480	10.9A	5.5kW	7.5HP
VLB3 0055 A480	15A	7.5kW	10HP
VLB3 0075 A480	19.6A	11kW	15HP
VLB3 0110 A480	27.1A	15kW	20HP
VLB3 0150 A480	36.9A	18.5kW	25HP
VLB3 0185 A480	46.1A	22kW	30HP
VLB3 0220 A480	54.2A	30kW	40HP
VLB3 0300 A480	76.1A	37kW	50HP

① Operation up to 45°C without power derating.

② Heavy-duty load: 150% overload for 60s.
 Standard load: 120% overload for 60s.

General characteristics

VLB3 is a compact drive with three-phase supply input. It is ideal for general applications and, in particular, to lift and manage pumps and fans, thanks to several specific built-in functions (S Curve, PID, torque squared control). It does not require any space for side ventilation, allowing to install several side-by-side drives. The user interface, which comprises built-in keyboard and display, allows to access the setting parameters easily, thanks to the use of extended texts describing the functions and codes. Using the USB or Wi-Fi connection accessories, the programming, monitoring and diagnostics can be performed using a PC. The RS485 communication port with built-in RTU modbus and EMC filter complete the hardware supply. The logic unit can be replaced with one of the VLB... codes, obtaining a different communication port.

SPEED REFERENCE SIGNALS

- External potentiometer: 0...10kΩ
- Voltage signals: -10...10VDC (two-pole)
- Current signals: 0/4...20mA
- Buttons on front keyboard
- Remote control panel
- 15 preset speeds via digital inputs
- Motopotentiometer
- Setting via modbus protocol (RS485).

PROGRAMMABLE INPUTS/OUTPUTS

- pNp or nPn connections
- 5 digital inputs
- 1 digital output, 1 changeover relay output
- 2 voltage analog inputs -10...10VDC (two-pole) or current analog inputs 0/4...20mA
- 1 voltage analog output 0...10VDC (two-pole) or current analog output 0/4...20mA.

PROTECTIONS

- Overcurrent
- Output short circuit and earth/ground leakage
- Overvoltage
- Undervoltage
- Phase loss
- Motor heat overload (I²t)
- Motor PTC heat protection
- Drive, motor and braking resistor overload
- Overspeed
- Speed reverse.

FUNCTIONS

- Speed or torque control
- V/f linear or squared curves
- Open or closed ring vector control
- Energy-saving ECO control
- S curves
- Quick speed search
- Access to DC bus
- DC braking and DC injection at start
- Built-in PID with sleep and wake-up thresholds
- Programmable frequency/time cycles
- Ideal for asynchronous or permanent magnet motors
- Different parameter configurations
- User menu (favorite parameters)
- Safe Torque Off (STO) input accessory class SIL 3 (EN62061 / EN61800-5-2).

Operational characteristics

- Input voltage: 400...480VAC three-phase
- Rated operational current: 1.3...66A
- Mains frequency: 45...65Hz
- Output frequency: 0...599Hz
- Frequency modulation: 2...16kHz
- Current overload: 150% for 60s; 200% for 0.5s
- IEC degree of protection: IP20
- Ambient conditions
 - Operating temperature: -10...+60°C (45°C without derating)
 - Maximum altitude: 3000m (with power derating)
 - Relative humidity: 5...95% (with no condensing)
- Side-by-side installation
- Built-in EMC suppressor (EN61800-3) motor cable length: up to 3m for cat. C1; up to 20m for cat. C2
- IE2 efficiency level (EN50598-2).

Certifications and compliance

Certifications obtained: cULus, CSA, EAC.
 Compliant with standards: EN61800-5-1, UL61800-5-1, CSA 22.2 No. 274.

Accessories for VLB3



VLBX C01



VLBX C02



VLBX L...

Order code	Description	Qty per pkg.	Wt
		n°	[kg]
VLBX C01	Display and keyboard	1	0.032
VLBX P01	Door-mount installation kit	1	0.032
VLBX C02	USB communication module	1	0.032
VLBX C03	Wi-Fi communication module	1	0.032
VLBX SM	S.T.O. (Safe Torque Off) module	1	0.032
VLBX L01	Logic unit with can OPEN	1	0.209
VLBX L02	Logic unit with ProfiBUS	1	0.209
VLBX L03	Logic Unit with ProfiNET (available upon request)	1	0.209
VLBX L04	Logic Unit with Ethercat (available upon request)	1	0.209
VLBX L05	Logic Unit with EthernetIP (available upon request)	1	0.209

VFS15 type



VFS15...

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Order code	Output current	3-phase motor power at 400V heavy load ②		Qty per pkg	Weight
	[A]	[kW]	[HP]		

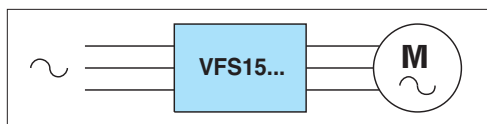
Three-phase supply 380...500VAC 50/60Hz ③.
 Three-phase motor output 500VAC max.
 Built-in EMC suppressor, cat. C3.

VFS15 4004 PLW	1.5	0.4	0.5	1	1.800
VFS15 4007 PLW	2.3	0.75	1	1	1.800
VFS15 4015 PLW	4.1	1.5	2	1	1.800
VFS15 4022 PLW	5.5	2.2	3	1	3.200
VFS15 4037 PLW	9.5	4	5	1	3.200
VFS15 4055 PLW	14.3	5.5	7.5	1	5.500
VFS15 4075 PLW	17	7.5	10	1	5.500
VFS15 4110 PLW	27.7	11	15	1	8.400
VFS15 4150 PLW	33	15	20	1	8.400

Operational characteristics for normal load conditions

Type	Current ①	3-phase motor power at 400VAC with standard load ②	
VFS15 4004 PLW	2.1A	0.75kW	1HP
VFS15 4007 PLW	3A	1.1kW	1.5HP
VFS15 4015 PLW	5.4A	2.2kW	3HP
VFS15 4022 PLW	6.9A	3kW	4HP
VFS15 4037 PLW	11.1A	5.5kW	7.5HP
VFS15 4055 PLW	17A	7.5kW	10HP
VFS15 4075 PLW	23A	11kW	15HP
VFS15 4110 PLW	31A	15kW	20HP
VFS15 4150 PLW	38A	18.5kW	25HP

- ① Operation up to 50°C without derating.
- ② Heavy-duty load: 150% overload for 60s. Standard load: 120% overload for 60s.
- ③ 200-240VAC three-phase version available on request; consult Customer Service for details; see contact details on inside front cover.



"Side by Side" installation
 Multiple units can be installed without side clearance for space saving.

Standard installation with gaps between one drive and the next one.

General characteristics

The high quantity of functions available and the construction characteristics allow to use the VFS15... speed drive in many fields: waterworks and methane piping ducts, cement, paper, chemical and petrochemical industries. The EASY function key allows direct switching to a customised menu with typical programming parameters for a dedicated application in order to quickly reach them for eventual consultation or changes.

SPEED REFERENCE SIGNALS

Reference signals for speed adjustment are obtained by:

- Front potentiometer
- External potentiometer: 1...10kΩ
- Voltage signal: 0...10V
- Current signal: 4...20mA
- Keypad on front
- Remote keypad option
- 15 preset speeds via digital inputs
- RS485 serial signals.

PROGRAMMABLE INPUTS

- Selectable pNp or nPn I/O logic
- 6 digital multifunction inputs
- 2 digital configurable as analog input.

PROGRAMMABLE OUTPUTS

- 1 relay with changeover contact and 1 relay with NO contact; 1 transistor and 1 analog configurable as 0...10VDC or 4...20mA.

PROTECTION

- Overcurrent and overvoltage
- Input and output phase loss
- Drive, motor and braking resistor overload
- Drive overtemperature and excessive torque
- Earth/ground fault.

SPECIAL FUNCTIONS

- PID function for pump and fan application
- Dual set of independent parameters and ramps for two different motor controls
- Automatic restarting and instantaneous speed tuning
- 15 viewable frequency values
- DC-Bus access for DC power supply
- Capacitor pre-charge circuit
- Integrated dynamic braking circuit; optional external braking resistor
- Motor control: constant torque V/f, variable torque, sensorless vector
- Automatic motor torque boost control
- Logic "Myfunction" mode permits to combine among each other inputs, outputs and drive states including ON/OFF delay timing, to elaborate more complex functions and comparators
- DC injection braking
- Auto-tuning
- Frequency potentiometer (speed adjustment via 2 external pushbuttons)
- Quick parameter search and programming
- Sequential starting control for sets of motors
- SLEEP function: automatic motor stopping after continuous running at minimum frequency
- Start-up DC injection
- OVERRIDE function for summing analog VIA-VIB inputs.

Operational characteristics

- Input voltage: 380...500VAC three-phase
- Output voltage: ≤ input voltage
- Rated operational current: 1.5...38A three-phase
- Mains frequency: 50/60Hz
- Output frequency: 0...500Hz
- Frequency modulation: 2...16kHz
- Current overload for 60s: 120% for normal load; 150% for heavy load
- Low speed torque: 200% 0.3Hz
- IEC degree of protection: IP20;
- Ambient conditions
 - Operating temperature: -10...+60°C (50°C without derating)
 - Maximum altitude: 1000m
 - Relative humidity: 20-93% (with no condensing).

Certifications and compliance

Certifications obtained: UL Listed for USA and Canada (File E204788) as Power Conversion Equipment; CSA certified for Canada (File 231252) as Motor Controllers - Miscellaneous; AS C-tick.
 Compliant with standards: EN 50178, IEC/EN 61800-3 - first environment cat. C2 or second environment cat. C3, UL508 C, CSA C22.2 n° 14.

VFPS1 type



VFPS1...

Order code	Output cur. ①	3-phase motor power at 400VAC		Qty per pkg.	Weight
	[A]	[kW]	[HP]	n°	[kg]

Three-phase supply 380...480VAC 50/60Hz ②.
 Three-phase motor output 480VAC max.
 Built-in EMC suppressor, cat. C3.

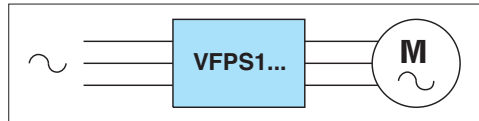
VFPS1 4185 PLWP	41	18.5	25	1	22.200
VFPS1 4220 PLWP	48	22	30	1	23.700
VFPS1 4300 PLWP	66	30	40	1	32.500
VFPS1 4370 PLWP	79	37	50	1	32.800
VFPS1 4450 PLWP	94	45	60	1	54.000
VFPS1 4550 PLWP	116	55	75	1	54.000
VFPS1 4750 PLWP	160	75	100	1	54.000
VFPS1 4900 PCWP	179	90	125	1	100.000
VFPS1 4110K PCWP	215	110	150	1	100.000

Three-phase supply 380...440VAC 50Hz/380...480VAC 60Hz.
 Three-phase motor output 440/480VAC max.
 Built-in EMC suppressor, cat. C3.

VFPS1 4132K PCWP	259	132	200	1	127.000
VFPS1 4160K PCWP	314	160	250	1	138.000
VFPS1 4220K PCWP	427	220	350	1	161.000
VFPS1 4250K PCWP	481	250	400	1	194.000
VFPS1 4280K PCWP	550	280	450	1	204.000
VFPS1 4315K PCWP	616	315	500	1	204.000
VFPS1 4400K PCWP	759	400	600	1	302.000
VFPS1 4500K PCWP	941	500	700	1	320.000
VFPS1 4630K PCWP	1181	630	1000	1	462.000

① Operation up to 50°C without derating.
 Consult Customer Service for details; see contact details on inside front cover.

② 240VAC three-phase available on request except for VPS1 4110 KPCWP type.



General characteristics

VFPS1 is a motor drive combining the most advanced and optimised mode for energy saving with a compact and complete line as well as a function software dedicated to pump and fan applications. The built-in EMC filters and the DC reactors supplied with the drive allow to significantly reduce the generated harmonic distortions and to limit the input current to a maximum value of 1.1 times the output current. QUICK mode provides for a customised menu of 32 specific parameters for a single application, inhibiting access to all the other parameters.

SPEED REFERENCE SIGNALS

Reference signals for speed adjustment are obtained by:

- External potentiometer: 1...10kΩ
- Voltage signal: 0 to 10V or -10 to +10V
- Current signal: 4...20mA or 0...20mA
- Keypad on front
- Remote keypad option
- 15 preset speeds via digital inputs
- RS485 serial signals.

PROGRAMMABLE INPUTS

- Selectable pNp or nPn I/O logic
- 6 digital multifunction inputs
- 1 digital configurable as analog input.

PROGRAMMABLE OUTPUTS

- 1 with relay (changeover contact)
- 2 static of which 1 programmable with pulse train
- 2 analog 0...10VDC or 0...20mA or 4...20mA

PROTECTION

- Overcurrent and overvoltage
- Output short circuit and earth/ground leakage
- Drive, motor and braking resistor overload
- Drive overtemperature
- Motor stall
- Too low torque.

SPECIAL FUNCTIONS

- PID function for pump and fan application
- Dual set of independent parameters and ramps for two different motor controls
- Automatic restarting and instantaneous speed tuning
- 15 viewable frequency values
- DC-Bus access for DC power supply
- Built-in DC reactor for reduced harmonic content at input
- DC braking board standard-supplied up to 220kW/350HP rating; optional external braking resistors
- DC injection at starting
- Motor control: constant torque V/f, variable torque, torque boost with automatic starting, sensorless vector, vector control in closed-loop conditions
- Auto-tuning
- Frequency potentiometer; speed adjustment via 2 external push buttons
- SLEEP function: automatic motor stopping after continuous running at minimum frequency
- FIRE control function: specified speed maintained even in alarm conditions
- Built-in PTC thermistor input.

Operational characteristics

- Output voltage: ≤ input voltage
- Rated operational current: 41...1181A
- Mains frequency: 50/60Hz ±5%
- Output frequency: 0.5...500Hz
- Frequency modulation: 1...16kHz
- Current overload: 120% for 60s, 135% for 2s
- IEC degree of protection: IP00 for all except VFPS1 4185 PLWP with IP20; IP55 on request
- Ambient conditions:
 - Operating temperature: -10...+60°C (50°C without derating)
 - Maximum altitude: 1000m without derating; up to 3000m with derating
 - Relative humidity: 20...93% (with no condensing).

Certifications and compliance

Certifications obtained: UL Listed for USA and Canada (File E204788) as Power Conversion Equipment; CSA certified for Canada (File 231252) as Motor Controllers - Miscellaneous; AS C-tick. Compliant with standards: IEC/EN 61800-5-1, IEC/EN 61800-3 - first environment cat. C2 or second environment cat. C3, UL508 C, CSA C22.2 n° 14.

Three-phase inductances



new

6
IND...

Order code	I _e	Induc- tance	Output ①	Qty per pkg.	Weight
	[A]	[mH]	[kW]	n°	[kg]
Inductances for VLB3... drives.					
VLBX L590	50	0.59	22...30	1	8.350
Inductances for VF... drives.					
IND2020	12	1	0.75...4	1	1.850
IND2030	25	0.6	5.5...11	1	2.670
IND3040	50	0.2	15...22	1	7.220
IND4040	100	0.15	30...45	1	14.410
IND4075	150	0.08	55...75	1	21.680
IND4090	300	0.04	90...110	1	27.000
IND5060	400	0.03	132...160	1	37.600
IND5080	600	0.02	220...250	1	45.000
IND7070	800	0.016	280...315	1	62.000

① For more information on the size of the inductances for currents higher than 800A, consult our Customer Service; see contact details on inside front cover.

General characteristics

VLBX L590 three-phase inductance applies to VLB3... drives, from 22kW or 30 kW.

The three-phase inductances, IND type, can be connected to the drives type VFNC3..., VFS11... and VFPS1... in the following ways:

- Drive input, to reduce the harmonic content upstream, with consequent reduction of the input current absorbed by the drives;
- Drive output, to reduce the voltage peaks generated by the drive towards the motor, or when several parallel motors are simultaneously controlled by the drives.

Inductances can be applied also on the input of drives with single-phase power supplies.

For the correct choice, select the inductance with I_e current rating equal to or greater than the rated current of the drive they will be used with.

Operational characteristics IND... type

- Class: H
- Current: 12-800A
- Ambient conditions:
 - Operating temperature: -25...+100°C.

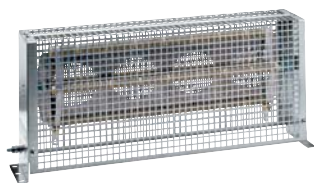
Operational characteristics VLBX L... type

- Ambient conditions:
 - Operating temperature: -25...+55°C
- IEC degree of protection: IP00.

Reference standards

Compliant with standards: IEC/EN 61558-1.

Braking resistors



ROF...
ROPPE...

new

Order code	Output	Resis- tance	Output②	Qty per pkg.	Wt
	[W]	[Ω]	[kW]	n°	[kg]
Resistors for VLB3... drives.					
VLBX R390	100	390	0.4...0.75	1	0.260
VLBX R180	200	180	1.5...2.2	1	0.630
VLBX R047	200	47	4...5.5	1	0.500
VLBX R027	200	27	7.5...11	1	0.500
VLBX R018	800	18	15	1	4.200
VLBX R015	800	15	18.5...22	1	4.200
VLBX R007	1900	7.5	30	1	9.500
Resistors for VF... drives.					
ROF20150	200	150	0.4...0.75	1	0.220
ROF20100	200	100	1.5...2.2	1	0.210
ROF35060	350	60	3.7...5.5	1	0.610
ROF50035	500	35	7.5	1	0.773
ROF80030	800	30	11...15	1	1.570
ROPPE11430	1300	30	18.5	1	3.856
ROPPE12515	2200	15	22...30	1	5.200
ROPPE14008	4000	8	37...75	1	6.780
ROPPE24003	8000	3	90...220	1	11.000

② For inverters with output higher than 220kW, consult our Customer Service; see contact details on inside front cover.

General characteristics

Braking resistors can be connected to drives in order to absorb the power generated during the motor stop phase.

Operational characteristics

- Maximum applicable voltage: 1000V
- Connection: With 250mm cable for ROF; directly on the resistor terminal for ROPPE
- IEC degree of protection: IP54 for ROF; IP20 for ROPPE.

Reference standards

Compliant with standards: IEC/EN 60204-1, IEC/EN 60664-1.

Others



VEX C00



MITOS



LPC PA...



Order code	Description	Qty per pkg.	Wt
		n°	[kg]
For VE1... drives.			
VEX C00	Connecting cable for VE1 RS485 port with PC USB port, 1.8m long ❶	1	0.080
For VFNC3...-VFS15...-VFPS1... drives.			
MITOSVT6	Remote control panel with functions: motor running, inverse rotation, speed adjustment and quantities control. IP65. 16 character-2 line display. Cable excluded ❷	1	0.200
MITOSVT6ECO	Remote control panel for quantities retention and control of a system (PID: pressure, temperature, etc). IP65. 16 character-2 line display. Cable excluded ❷	1	0.200
RJ45SH05000	RJ45 wire for MITOS... connection RKP002Z and USB001Z on the drive. 5m long	1	0.140
RKP002Z	Remote control panel with functions: motor running, speed adjustment, quantities control and parameter setting. IP20. 4 character-7 segment display. Cable excluded ❷	1	0.280
USB001Z	Drive programming module ❸❹	1	0.260
For VFNC3...-VFS15...-VFPS1...-VLB3... drives.			
LPC PA001	1kOhm potentiometer 1 turn, complete with operating knob. IP66, IP67 and IP69K.	10	0.040
51 PT25H101K	1kOhm potentiometer 10 turns, complete with operating knob	1	0.100

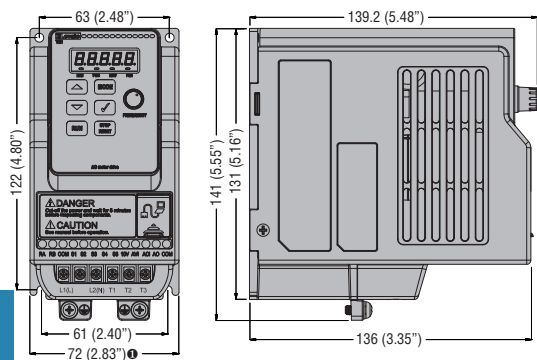
- ❶ The VE1 programming software is standard supplied with the cable.
- ❷ RJ45 cable to be purchased separately; order code RJ45SH05000.
- ❸ For USB001Z module → PC USB port connection, use a normal USB cable, USB1.1/2.0 compatible, type A-B connection, maximum recommendable length 1m only.
- ❹ Consult our Customer Service to request the drive remote control software; see contact details on inside front cover.

Compliance

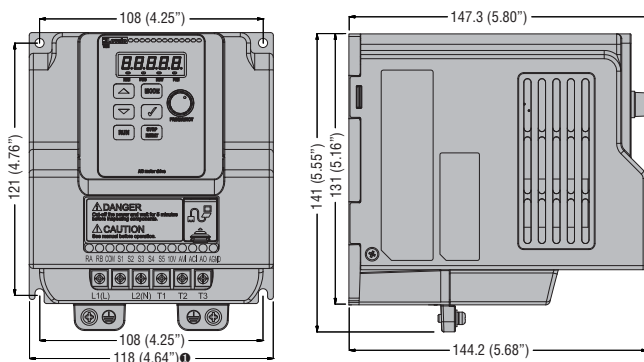
Compliant with standards: EN 50178, IEC/EN 61000-6-2, IEC/EN 61000-6-3 for MITOS... and RKP...

SINGLE-PHASE DRIVES

VE1 02 A240 - VE1 04 A240 - VE1 07 A240

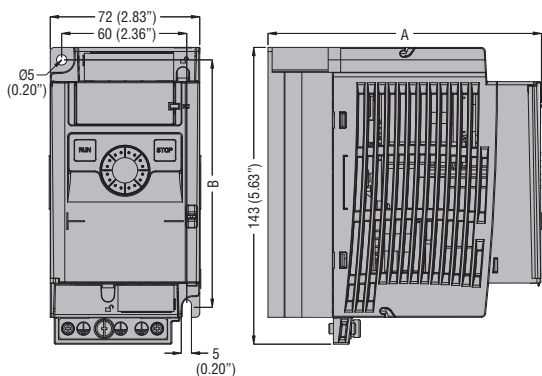


VE1 15 A240 - VE1 22 A240

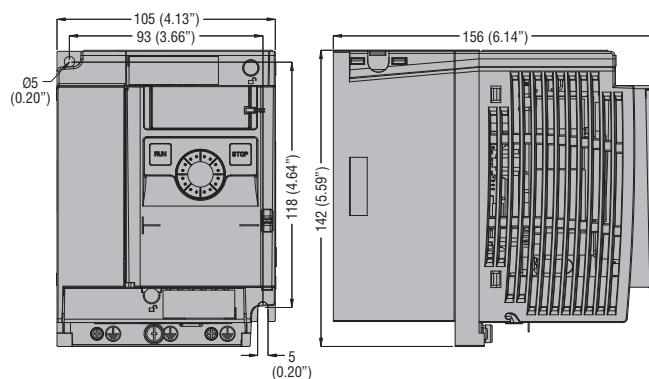


ⓘ In a control panel when more than one VE1 is installed side by side, provide sufficient air circulation space, of at least 5cm between each, in order to ensure proper cooling effect.

VFNC3S 2002 PLW...VFNC3S 2007 PLW



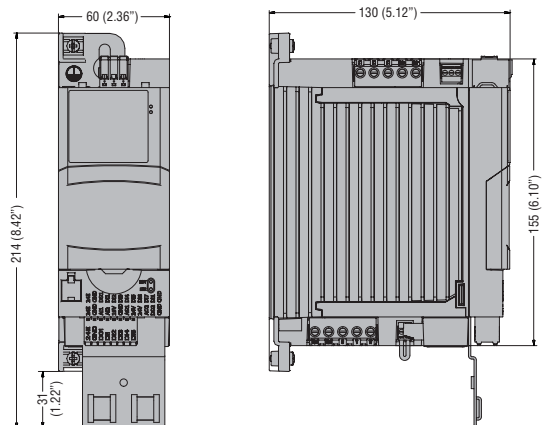
VFNC3S 2015 PLW - VFNC3S 2022 PLW



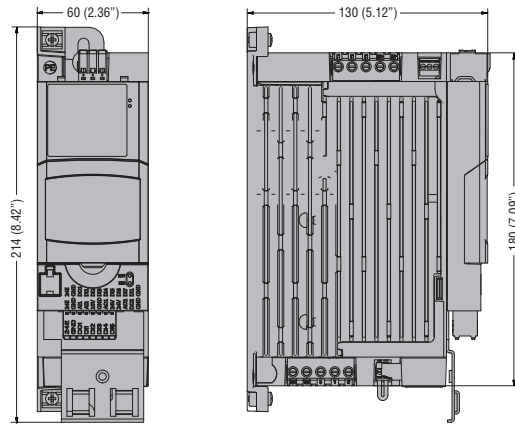
TYPE	A	B
VFNC3S 2002PL W	102 (4.01")	131 (5.16")
VFNC3S 2004PL W	121 (4.76")	118 (4.64")
VFNC3S 2007PL W	131 (5.16")	118 (4.64")

THREE-PHASE DRIVES

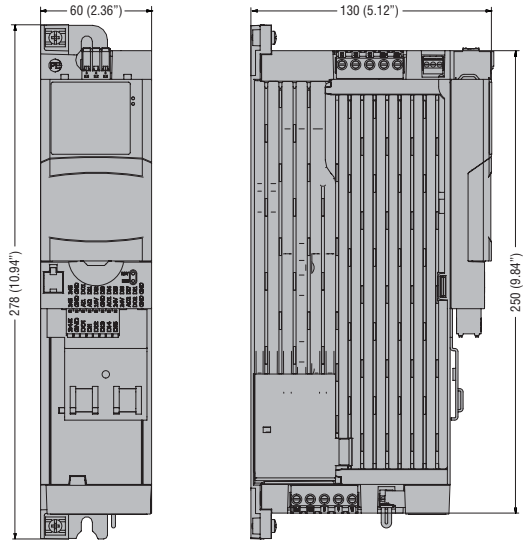
VLB3 0004 A480



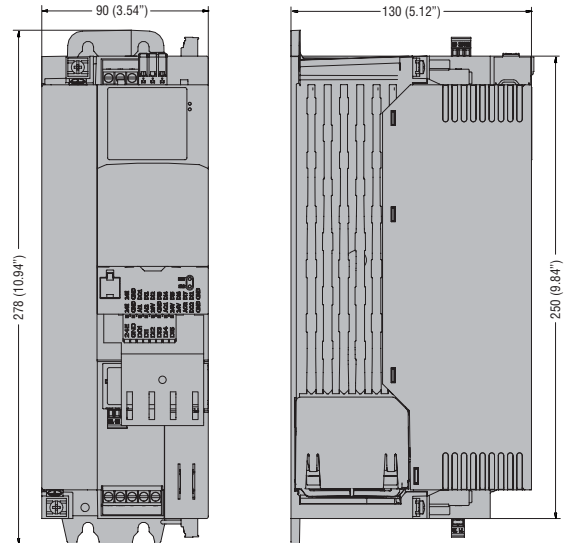
VLB3 0007 A480



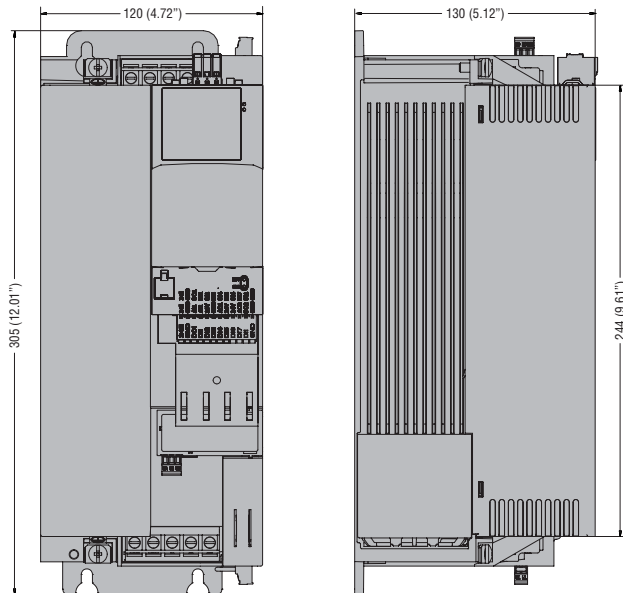
VLB3 0015 A480 - VLB3 0022 A480



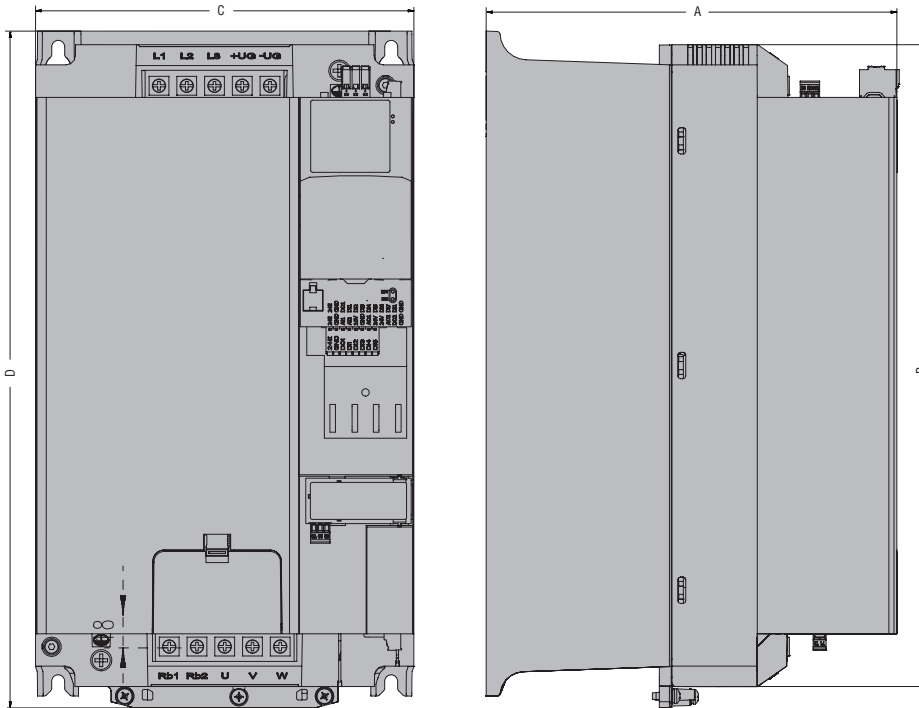
VLB3 0040 A480 - VLB3 0055 A480



VLB3 0075 A480 - VLB3 0110 A480



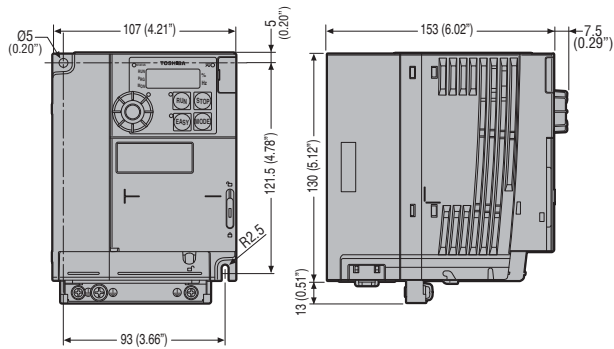
VLB3 0150 A480 - VLB3 0185 A480 - VLB3 0220 A480 - VLB3 0300 A480



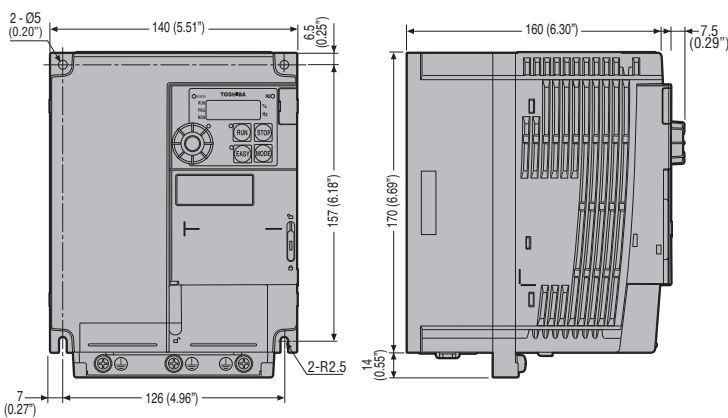
TYPE	A	B	C	D
VLB3 0150 A480	222 (8.74")	347 (13.66")	204.5 (8.05")	366 (14.41")
VLB3 0185 A480	222 (8.74")	347 (13.66")	204.5 (8.05")	366 (14.41")
VLB3 0220 A480	222 (8.74")	347 (13.66")	204.5 (8.05")	366 (14.41")
VLB3 0300 A480	230 (9.05")	450 (17.72")	250 (9.84")	520 (20.47")

THREE-PHASE DRIVES

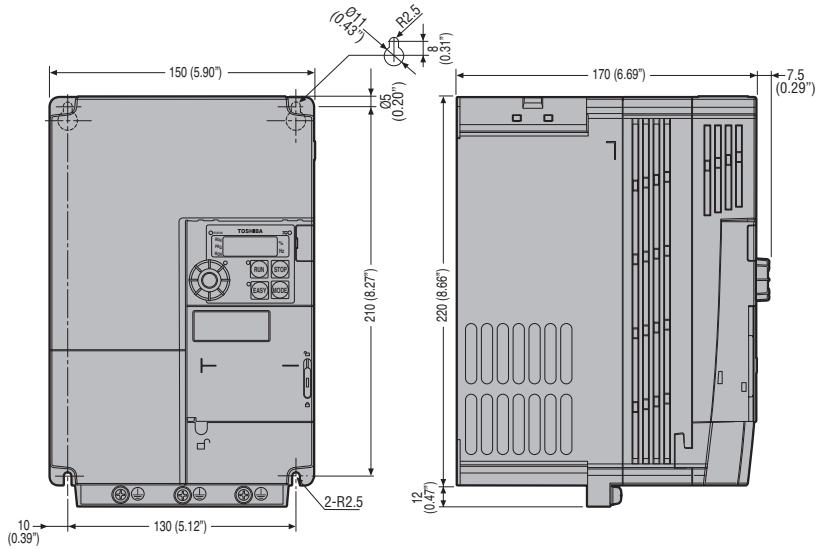
VFS15 4004 PLW - VFS15 4007 PLW - VFS15 4015 PLW



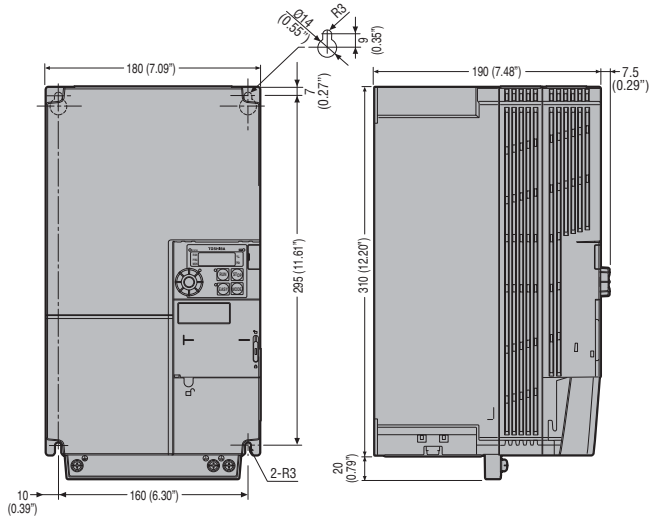
VFS15 4022 PLW...VFS15 4037 PLW



VFS15 4055 PLW - VFS15 4075 PLW



VFS15 4110 PLW - VFS15 4150 PLW



THREE-PHASE DRIVES

VFPS1 4185 PLWP

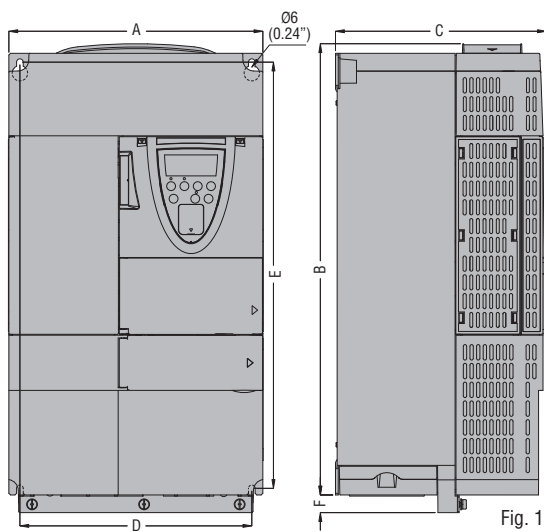


Fig. 1

VFPS1 4220 PLWP...VFPS1 4370 PLWP

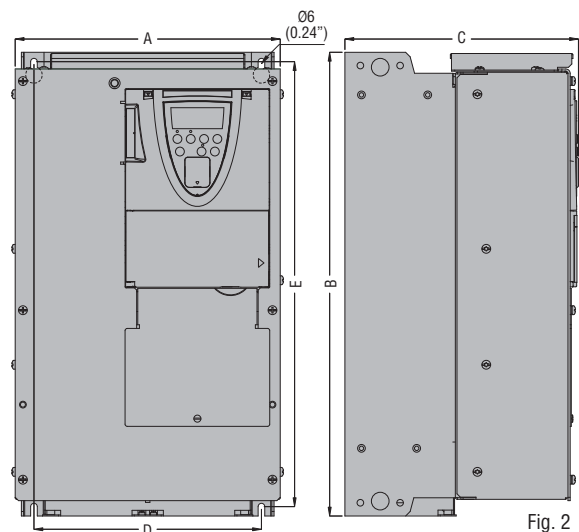


Fig. 2

TYPE	Fig.	A	B	C	D	E	F
VFPS1 4185 PLWP	1	230 (9.05")	409 (16.10")	191 (7.52")	210 (8.27")	386 (15.20")	16 (0.63")
VFPS1 4220 PLWP	2	240 (9.45")	420 (16.53")	212 (8.35")	206 (8.11")	403 (15.87")	—
VFPS1 4300 PLWP	2	240 (9.45")	550 (21.65")	242 (9.53")	206 (8.11")	529 (20.83")	—
VFPS1 4370 PLWP	2	240 (9.45")	550 (21.65")	242 (9.53")	206 (8.11")	529 (20.83")	—

VFPS1 4450 PLWP...VFPS1 4750 PLWP

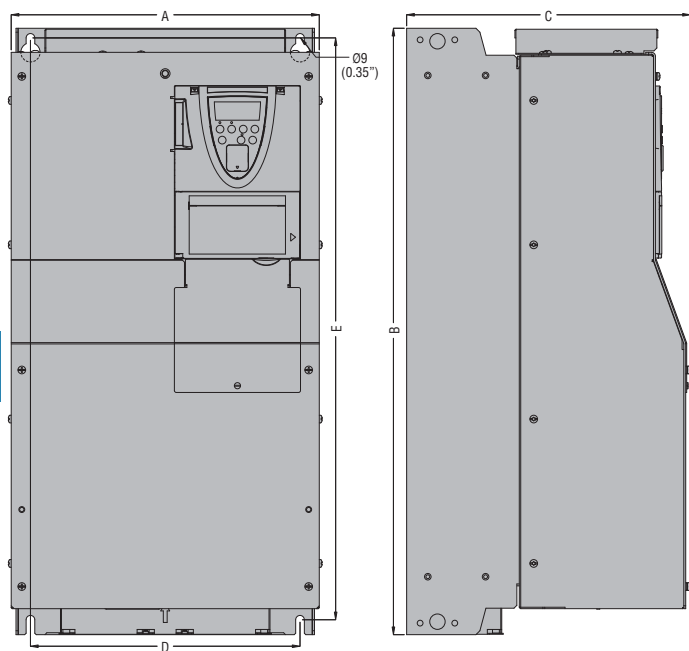


Fig. 3

VFPS1 4900 PCWP
VFPS1 4110K PCWP...VFPS1 4630K PCWP

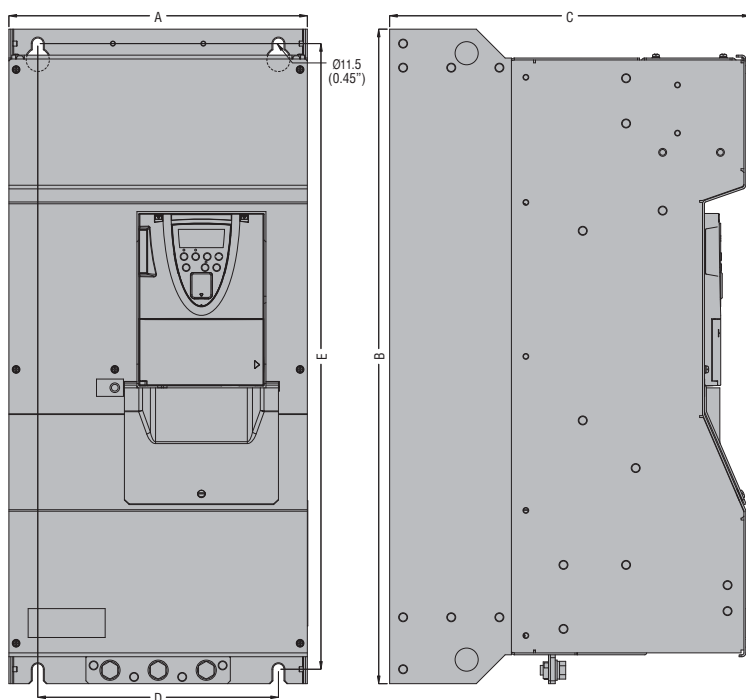


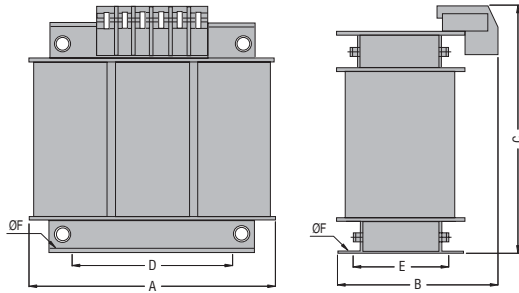
Fig. 4

TYPE	Fig.	A	B	C	D	E
VFPS1 4450 PLWP	3	320 (12.60")	630 (24.80")	290 (11.42")	280 (11.02")	605 (23.82")
VFPS1 4550 PLWP	3	320 (12.60")	630 (24.80")	290 (11.42")	280 (11.02")	605 (23.82")
VFPS1 4750 PLWP	3	320 (12.60")	630 (24.80")	290 (11.42")	280 (11.02")	605 (23.82")
VFPS1 4900 PCWP	4	310 (12.20")	680 (26.77")	375 (14.76")	250 (9.84")	650 (25.59")
VFPS1 4110 KPCWP	4	310 (12.20")	680 (26.77")	375 (14.76")	250 (9.84")	650 (25.59")
VFPS1 4132 KPCWP	4	350 (13.78")	782 (30.79")	375 (14.76")	298 (11.73")	758 (29.84")
VFPS1 4160 KPCWP	4	330 (12.99")	950 (37.40")	377 (14.84")	285 (11.22")	920 (36.22")
VFPS1 4220 KPCWP	4	430 (16.93")	950 (37.40")	377 (14.84")	350 (13.78")	920 (36.22")
VFPS1 4250 KPCWP	4	585 (23.03")	950 (37.40")	377 (14.84")	540 (21.26")	920 (36.22")
VFPS1 4280 KPCWP	4	585 (23.03")	950 (37.40")	377 (14.84")	540 (21.26")	920 (36.22")
VFPS1 4315 KPCWP	4	585 (23.03")	950 (37.40")	377 (14.84")	540 (21.26")	920 (36.22")
VFPS1 4400 KPCWP	4	880 (34.64")	1150 (45.27")	377 (14.84")	831 (32.71")	1120 (44.09")
VFPS1 4500 KPCWP	4	880 (34.64")	1150 (45.27")	377 (14.84")	831 (32.71")	1120 (44.09")
VFPS1 4630 KPCWP	4	1108 (43.62")	1150 (45.27")	377 (14.84")	1065 (41.93")	1120 (44.09")

ACCESSORIES

Three-phase inductances

IND...



Type	A	B	C	D	E	ØF
IND2020	115 (4.53")	80 (3.15")	125 (4.92")	78 (3.07")	55 (2.16")	5.5 (0.22")
IND2030	115 (4.53")	90 (3.54")	125 (4.92")	78 (3.07")	65(2.56")	5.5 (0.22")
IND3040	170 (6.69")	115 (4.53")	190 (7.48")	115 (4.53")	85 (3.35")	6.5 (0.25")
IND4040	240 (9.45")	135 (5.31")	230 (9.05")	146 (5.75")	80 (3.15")	8.5 (0.33")
IND4075	240 (9.45")	170 (6.69")	220 (8.66")	146 (5.75")	105 (4.13")	8.5 (0.33")
IND4090	240 (9.45")	195 (7.68")	220 (8.66")	146 (5.75")	120 (4.72")	8.5 (0.33")
IND5060	350 (13.78")	170 (6.69")	325 (12.79")	240 (9.45")	105 (4.13")	12.5 (0.49")
IND5080	350 (13.78")	190 (7.48")	325 (12.79")	240 (9.45")	125 (4.92")	12.5 (0.49")
IND7070	440 (17.32")	200 (7.87")	420 (16.53")	245 (9.64")	120 (4.72")	12.5 (0.49")

Braking resistors

ROF...

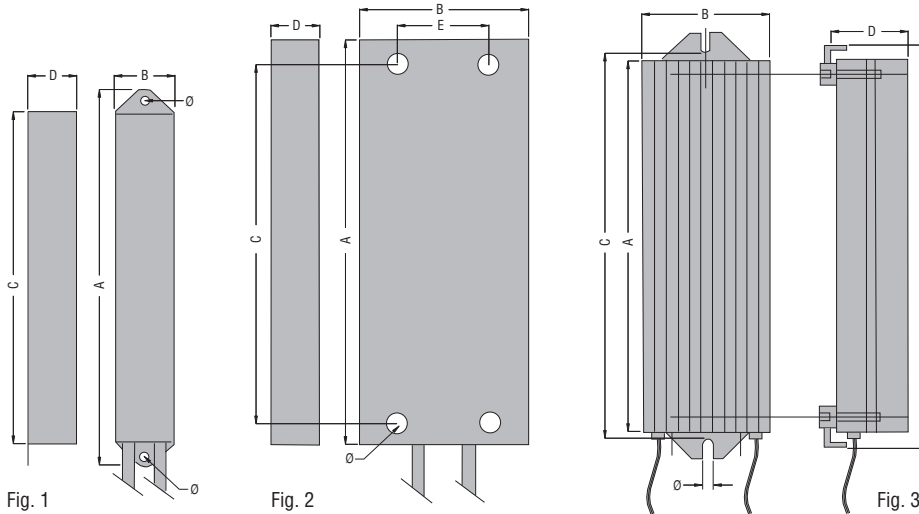


Fig. 1

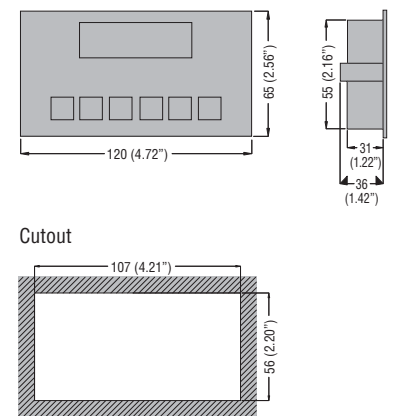
Fig. 2

Fig. 3

Type	ROF 20	ROF 35	ROF 50	ROF 80
Fig.	1	2	2	3
A	192 (7.56")	169 (6.65")	299 (11.77")	240 (9.45")
B	30 (1.18")	80 (3.15")	80 (3.15")	80 (3.15")
C	180 (7.09")	140 (5.51")	180 (7.09")	254 (10")
D	25 (0.98")	20 (0.79")	20 (0.79")	52 (2.05")
E	—	45 (1.77")	45 (1.77")	—
L	—	—	—	275 (10.83")
Ø	5 (0.20")	5 (0.20")	5 (0.20")	6 (0.24")

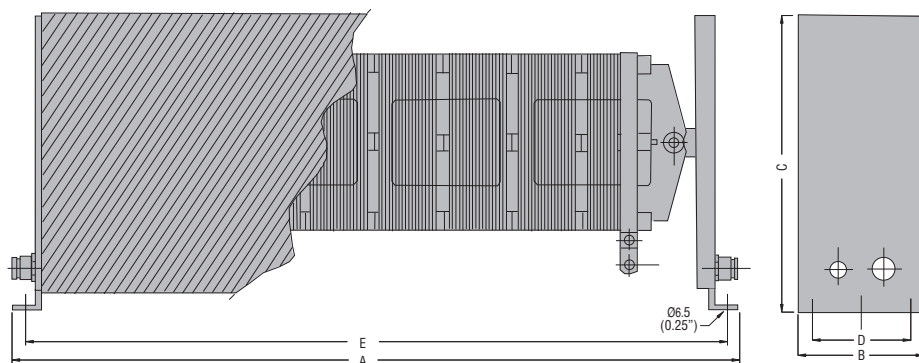
Remote control panel

MITOS...



Braking resistors

ROPPE...



Type	ROPPE 114	ROPPE 125	ROPPE 140	ROPPE 240
A	386 (15.20")	506 (19.92")	626 (24.64")	626 (24.64")
B	107 (4.21")	107 (4.21")	107 (4.21")	197 (7.75")
C	260 (10.24")	260 (10.24")	260 (10.24")	260 (10.24")
D	80 (3.15")	80 (3.15")	80 (3.15")	160 (6.30")
E	366 (14.41")	486 (19.13")	606 (23.86")	606 (23.86")

Remote control panel

RKP0022

