

- Versions with single-phase input up to 2.2kW / 3HP and three-phase input up to 110kW / 150HP
- Special function for pump and fan control using PID algorithm
- EMC suppressor integrated in all versions
- Selectable motor control modes: V/f, vector control, energy saving
- Selectable digital and analog input and output functions
- Integrated functions for motor protection
- STO (Safe Torque Off) module.

Variable speed drives

VT1 series (single-phase ultra-compact with RS485)	6 - 3
VLA1 series (single-phase)	6 - 4
VLB1 series (single-phase advanced type)	6 - 5
VLB3 series (three-phase advanced type)	6 - 6
VLG3 series (three-phase)	6 - 8

Accessories

Three-phase chokes	6 - 9
Braking resistors	6 - 9
Other accessories	6 - 9

Dimensions	6 - 10
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SEC. - PAGE



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VT1... SERIES

- Single-phase 200...240VAC supply
- Three-phase motor power 0.2...2.2kW / 0.25...3HP, ratings at 240VAC
- Built-in EMC suppressor cat. C2 (IEC/EN/BS 61800-3)
- Built-in RS485 port, Modbus-RTU and BACnet protocol
- Ultra-compact.



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VLA1... SERIES

- Single-phase 200...240VAC supply
- Three-phase motor power 0.25...2.2kW / 0.33...3HP, ratings at 240VAC
- Built-in EMC suppressor cat. C2 (IEC/EN/BS 61800-3)
- Optional USB module for parameter programming with software
- "Book style" housing.



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VLB1... SERIES

- Single-phase 200...240VAC supply
- Three-phase motor power 0.4...2.2kW / 0.5...3HP, ratings at 240VAC
- Built-in EMC suppressor cat. C1 and C2 (IEC/EN/BS 61800-3)
- Modular structure
- Built-in braking chopper
- Optional communication protocols: Modbus-RTU, Modbus-TCP, CANopen, ProfiBUS, ProfiNET, Ethercat and IO-Link
- Optional STO (Safe Torque Off) module
- Optional USB and Wi-Fi modules for programming with software
- "Book style" housing.



Page 6-6

VLB3... SERIES

- Three-phase 400...480VAC supply
- Three-phase motor power 0.4...110kW / 0.5...150HP for heavy load, up to 132kW / 175HP for standard load, ratings at 400VAC
- Built-in EMC suppressor cat. C1 (up to 2.2kW) and C2 (IEC/EN/BS 61800-3)
- Modular structure
- Built-in braking chopper
- Optional communication protocols: Modbus-RTU, Modbus-TCP, CANopen, ProfiBUS, ProfiNET, Ethercat and IO-Link
- Optional STO (Safe Torque Off) module
- Optional USB and Wi-Fi modules for programming with software
- "Book style" housing.



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VLG3... SERIES

- Three-phase 380...480VAC supply
- Three-phase motor power 0.4...22kW / 0.5...30HP for heavy load, 0.75...30kW / 1...40HP for standard load, ratings at 400VAC
- Built-in EMC suppressor cat. C3 (IEC/EN/BS 61800-3)
- Built-in braking chopper
- Built-in RS485 port, Modbus-RTU protocol
- Optional Ethernet communication module, Modbus-TCP protocol.

Description		 VT1 single-phase ultra-compact with RS485	 VLA1 single-phase	 VLB1 single-phase advanced	 VLB3 three-phase advanced	 VLG3 three-phase
Three-phase motor power (kW)	heavy load ^❶	0.2...2.2kW (240V)	0.25...2.2kW (240V)	0.4...2.2kW (240V)	0.4...110kW (400V)	0.4...22kW (400V)
	standard load ^❷	—	—	—	5.5...132kW (400V)	0.75...30kW (400V)
Motor control modes						
	V/f linear	●	●	●	●	●
	V/f quadratic (for pumps and fans)	●	●	●	●	●
	Sensorless vector control	●	●	●	●	●
	Servo control with encoder feedback	—	—	●	●	—
	Energy saving mode (ECO)	—	—	●	●	—
	V/f closed loop with encoder feedback	●	—	●	●	●
	Multipoint V/f curve	—	—	●	●	—
	Torque setpoint	—	●	●	●	—
	Sensorless control for synchronous motors	—	—	●	● (up to 22kW)	—
Maximum output frequency		599Hz	599Hz	599Hz	599Hz	400Hz
Current overload		150% for 60s	150% for 60s	150% for 60s	Heavy load: 150% for 60s standard load: 120% for 60s	Heavy load: 150% for 60s standard load: 120% for 60s
Communication port		RS485 (Modbus-RTU and BACnet protocols)	—	Optional, a choice between: Modbus-RTU, Modbus-TCP, Profibus, ProfiNET, Ethercat, IO-Link or without communication	RS485 (Modbus-RTU) on complete drives, other optional available protocols: Modbus-TCP, Profibus, ProfiNET, Ethercat, IO-Link or without communication	RS485 (Modbus-RTU), optional module with Modbus-TCP protocol
Digital inputs		5	5	5	5	5
Digital outputs		1	2	2	2	2
Analog inputs		2	2	2	2	2
Analog outputs		1	1	1	1	1
Sequencer (frequency/time cycles)		●	●	●	●	—
Onboard potentiometer		●	—	—	—	●
PID control with sleep and wake-up thresholds		●	●	●	●	●
Jog		●	●	●	●	●
3-wire motor control		●	●	●	●	●
DC braking		●	●	●	●	●
Braking with resistor		—	—	●	●	●
Preset frequencies		●	●	●	●	●
Multi-pump PID control		●	●	●	●	—
Flying restart		—	●	●	●	●
Motor PTC thermistor input		●	—	●	●	●
Fire mode		—	—	—	—	●
STO (Safe Torque Off) module		—	—	Optional	Optional	—

❶ Current overload 150% for 60s.

❷ Higher operational current, reduced current overload 120% for 60s.

VT1 series (single-phase ultra-compact with RS485)

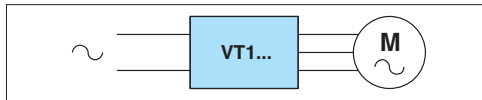


VT1...

Order code	Output current [A]	3-phase motor power at 240V [kW]	3-phase motor power at 240V [HP]	Qty per pkg n°	Weight [kg]
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Single-phase supply 200...240VAC 50/60Hz.
Three-phase motor output 240VAC max.
Built-in RS485 communication port.
Built-in EMC suppressor.

VT102A240	1.8	0.2	0.25	1	1.0
VT104A240	2.6	0.4	0.5	1	1.0
VT107A240	4.3	0.75	1	1	1.0
VT115A240	7.5	1.5	2	1	2.0
VT122A240	10.5	2.2	3	1	2.0



Accessories for VT1



VT1XC01



VT1XC02

Order code	Description	Qty per pkg n°	Weight [kg]
VT1XC01	Cable RS485/USB for the connection VT1-PC ①, 1.8m length	1	0.080
VT1XC02	Remote keypad (Ethernet connection cable ② not included), IP20	1	0.122

① Software for programming and monitoring VT1XSW freely downloadable from the website www.LovatoElectric.com, download section.

② Use a standard Ethernet cable (CAT.5 or higher) max. 5m length.

General characteristics

VT1 is an ultra-compact variable speed drive with single phase input and built-in RS485 communication port. Simple and versatile, it can be used in several applications such as control of pumps and fans, conditioning systems, packaging machines, conveyor belts, control of automatic doors, etc. The extremely compact dimensions make it suitable for the installation in panels or machinery with limited space. The integrated RS485 communication port allows the remote control and monitoring of the drive from a supervision system or a controller such as a PLC or HMI. It supports the communication protocols Modbus-RTU, Modbus-ASCII and BACnet.

VT1 is extremely simple to install and configure from the frontal keypad with 7 segment LED display. Alternatively, it is possible to program the parameters from a PC with software VT1XSW and dedicated USB connection cable VT1XC01. The different integrated motor control modes, like the linear or quadratic V/f control, multipoint curve and sensorless vector control, make it perfectly suitable for several types of loads and applications.

SPEED REFERENCE SIGNALS

- Front jog dial control (potentiometer)
- External potentiometer 1...10kΩ
- Voltage or current analog signals
- 8 preset speeds via digital inputs
- Optional remote keypad
- RS485 serial signals.

PROGRAMMABLE INPUTS AND OUTPUTS

- 5 digital inputs
- 1 voltage analog input 0...10VDC
- 1 current analog input 0/4...20mA
- 1 relay output with NO contact
- 1 voltage analog output 0...10VDC.

PROTECTIONS

- Motor and drive overload
- Overvoltage and undervoltage
- Phase loss
- Overtemperature
- Overspeed.

FUNCTIONS

- Speed control
- V/f linear or quadratic curves
- V/f customizable multipoint curve
- Sensorless (open loop) vector control
- Preset speeds
- DC braking and DC injection at start
- PID control with sleep and wake up thresholds
- Sequencer (programmable frequency/time cycles)
- Multi-pump PID for the control of up to 4 VT1... drives in master-slave configuration
- Software for programming and monitoring VT1XSW, freely downloadable from the website www.LovatoElectric.com.

Operational characteristics

- Input voltage: 200...240VAC single-phase
- Output voltage: 0...240VAC three-phase
- Mains frequency: 50/60Hz
- Output frequency: 0...599Hz
- Current overload: 150% for 60s
- Operating temperature:
 - -10...+40°C (50°C with derating of 40% of the output current) for sizes 0.2...0.75kW
 - -10...+50°C for sizes 1.5 and 2.2kW
- Maximum altitude: 1000m, (3000m with derating)
- Relative humidity <95% (with no condensing)
- Built-in EMC suppressor, cat. C2 (EN/BS 61800-3)
- IEC degree of protection: IP20.

Certifications and compliance

Certifications:

- VT1...A240: cULus, EAC, RCM
- VT1XC...: EAC.

Compliant with standards: EN/BS 61800-5-1, UL 508C, CSA C22.2 No. 274.

VLA1 series (single-phase)

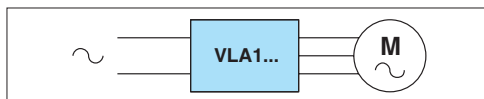


VLA1...

Order code	Output current	3-phase motor power at 240VAC		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.

VLA102A240	1.7	0.25	0.33	1	0.750
VLA104A240	2.4	0.4	0.5	1	0.750
VLA107A240	4.2	0.75	1	1	0.950
VLA115A240	7	1.5	2	1	1.350
VLA122A240	9.6	2.2	3	1	1.350



Accessories for VLA1



VLAXC01



VLAXC02



VLAXP01

Order code	Description	Qty per pkg	Weight
		n°	[kg]
VLAXC01	Display and keypad	1	0.050
VLAXC02	USB communication module	1	0.050
VLAXP01	Door-mount installation kit for the keypad VLAXC01. IP65, Type 4X. Connecting cable included, 3m long	1	0.340

Software for programming and monitoring VLBXSW freely downloadable from the website www.LovatoElectric.com

General characteristics

VLA1 is an ultra-compact drive (book style housing) with high performance. It integrates different motor control modes, like V/f linear and quadratic and sensorless vector control. VLA1... is extremely versatile and can be used in several applications such as conveyor belts, machine tools, control of automatic doors, packaging machines and in particular to manage pumps and fans thanks to specific integrated functions like the PID control and flying restart. Simple to install and configure.

The user interface, which comprises of a built-in keypad and display, allows to access the setting parameters easily, thanks to the use of extended texts describing the functions and codes. Using the optional USB communication module, the programming, monitoring and diagnostics can be performed using a PC with software VLBXSW, freely downloadable from the website www.LovatoElectric.com.

SPEED REFERENCE SIGNALS

- External potentiometer 1...10kΩ
- Voltage or current analog signals
- Buttons on front keypad
- Door-mount installation kit
- 15 preset speeds via digital inputs
- Motor potentiometer.

PROGRAMMABLE INPUTS AND OUTPUTS

- 5 digital inputs
- 1 digital output
- 1 changeover relay output
- 2 analog inputs: 1 configurable as voltage input 0/2...10VDC, 0...5VDC or current input 0/4...20mA, 1 voltage input 0/2...10VDC, 0...5VDC
- 1 analog output configurable as voltage output 0/2...10VDC, 0...5VDC or current output 0/4...20mA.

PROTECTIONS

- Overcurrent
- Output short circuit and earth/ground leakage
- Overvoltage and undervoltage
- Phase loss
- Motor heat overload (I²t)
- Overspeed
- Speed reverse.

FUNCTIONS

- Speed or torque control
- V/f linear or quadratic curves
- Sensorless vector control
- Flying restart
- DC braking and DC injection at start
- Preset speeds
- PID control with sleep and wake up thresholds
- Multi-pump PID control (1 main pump frequency regulated + 2 auxiliary pumps activated in on-off mode in case of necessity)
- Sequencer (programmable frequency/time cycles)
- Different parameter configurations
- Programming and monitoring software VLBXSW, freely downloadable from the website www.LovatoElectric.com.

Operational characteristics

- Input voltage: 200...240VAC single-phase
- Output voltage: 0...240VAC three-phase
- Mains frequency: 50/60Hz
- Output frequency: 0...599Hz
- Current overload: 150% for 60s; 200% for 3s
- Operating temperature: -10...+45°C (up to 55°C with derating)
- Maximum altitude: 1000m (4000m with derating)
- Relative humidity: 5...95% (with no condensing)
- Side-by-side installation
- Built-in EMC suppressor, cat. C2 (EN/BS 61800-3)
- IE2 efficiency level (EN/BS 50598-2)
- IEC degree of protection: IP20.

Certifications and compliance

Certifications: cULus, EAC, RCM (excluded VLAXP01).
Compliant with standards: EN/BS 61800-5-1, UL 61800-5-1, CSA C22.2 No. 274.



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

VLB1 series (single-phase advanced)



VLB1...A240XX



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

Modularity of the VLB1... variable speed drive

Every VLB1... variable speed drive must be composed of:

- a power unit type VLB1...A240XX, to be chosen according to the motor size
- a logic unit type VLBXL..., to be chosen according to the desired communication protocol
- a control unit type VLBXC..., at choice between keypad with display, USB module and Wi-Fi module
- any optional accessories.

POWER UNIT



VLB1...A240XX
available sizes:
0.4...2.2kW

+

LOGIC UNIT



VLBXL...

+

CONTROL UNIT



VLBXC01
Keypad and display

or



VLBXC02
USB module

or



VLBXC03
Wi-Fi module

Order code	Output current [A]	3-phase motor power at 240VAC [kW] [HP]			Qty per pkg n°	Weight [kg]
VLB104A240XX	2.4	0.4	0.5	1	0.850	
VLB107A240XX	4.2	0.75	1	1	1.050	
VLB115A240XX	7	1.5	2	1	1.400	
VLB122A240XX	9.6	2.2	3	1	1.400	

new

POWER UNITS

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

LOGIC UNITS

See page 6-7

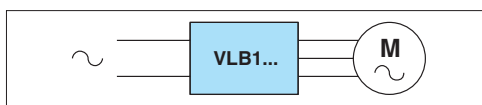
CONTROL UNITS

See page 6-7

ACCESSORIES

See page 6-7

- ① To be completed with logic unit VLBXL... and control unit VLBXC... See page 6-7.



General characteristics

VLB1 is a variable speed drive with single phase input 200...240VAC and advanced functionalities. The "book" shape and the modular structure, composed by power unit, logic unit and control unit, allows to create a compact drive with the desired features to meet the requirements of any facility. Available in sizes from 0.4 to 2.2kW, it is suitable for the command of pumps, fans, conveyor belts, compressors, packaging machines, elevators, automatic doors and many other applications. The optional keypad VLBXC01 allows for simple and intuitive programming, alternatively to the optional USB and Wi-Fi modules for configuration from a PC with VLBXSW software.

It integrates the EMC suppressor and it supports a logic unit type VLBXL... that completes the drive with the I/Os and a communication port, with a choice of Modbus-RTU, Modbus-TCP, CANopen, Profibus, Profinet, Ethercat, IO-Link or version without communication.

VLB1... offers advanced features, the same of the three-phase series VLB3..., with which it also shares the optional accessories, including the STO (Safe Torque Off) safety module and the fieldbus, realizing a single-phase drive with high performance.

SPEED REFERENCE SIGNALS

- External potentiometer 1...10kΩ
- Voltage or current analog signals
- Buttons on front keypad
- Remote control panel
- 15 preset speeds via digital inputs
- Motor potentiometer
- Setting via communication protocol.

PROGRAMMABLE INPUTS AND OUTPUTS

- 5 digital inputs
- 1 digital output, 1 changeover relay output
- 2 analog inputs configurable as voltage inputs (0/2...10VDC, -10...+10VDC, 0...5VDC) or current inputs 0/4...20mA
- 1 analog output configurable as voltage output 0...10VDC or current output 0/4...20mA.

PROTECTIONS

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

FUNCTIONS

- Speed or torque control
- V/f linear or quadratic curves
- Open or closed loop vector control
- Energy-saving ECO control
- S-shape curves
- Flying restart
- DC braking and DC injection at start
- PID control with sleep and wake up thresholds
- Multi-pump PID control (1 main pump frequency regulated + 2 auxiliary pumps activated in on-off mode in case of necessity)
- Sequencer (programmable frequency/time cycles)
- Suitable for AC three-phase asynchronous or synchronous motors
- Different parameter configurations
- Safe Torque Off (STO) function with optional module
- Programming and monitoring software VLBXSW, freely downloadable from the website www.LovatoElectric.com.

Operational characteristics

- Input voltage: 200...240VAC single-phase
- Output voltage: 0...240VAC three-phase
- Mains frequency: 50/60Hz
- Output frequency: 0...599Hz
- Current overload: 150% for 60s; 200% for 3s
- Operating temperature: -10...+45°C (up to 60°C with derating)
- Maximum altitude: 1000m (4000m with derating)
- Relative humidity: 5...95% (with no condensing)
- Side-by-side installation
- Built-in EMC suppressor, cat. C1 and C2 (EN/BS 61800-3)
- IE2 efficiency level (EN/BS 50598-2)
- IEC degree of protection: IP20.

Certifications and compliance

Certifications obtained: cULus, RCM.
Compliant with standards: EN/BS 61800-5-1, UL 61800-5-1, CSA C22.2 n° 274.

VLB3 series (three-phase advanced)



VLB3...A480



VLB3...A480XX

Order code	Output current I _e ③	3-phase motor power at 400VAC with heavy load④			Qty per pkg.	Weight [kg]
		[A]	[kW]	[HP]		

COMPLETE DRIVES①

Three-phase supply 400...480VAC 50/60Hz.
Three-phase motor output max 480VAC. Built-in EMC suppressor.

VLB30004A480	1.3	0.4	0.5	1	1.000
VLB30007A480	2.4	0.75	1	1	1.200
VLB30015A480	3.9	1.5	2	1	1.550
VLB30022A480	5.6	2.2	3	1	1.550
VLB30040A480	9.5	4	5	1	1.550
VLB30055A480	13	5.5	7.5	1	2.500
VLB30075A480	16.5	7.5	10	1	3.950
VLB30110A480	23.5	11	15	1	3.950
VLB30150A480	32	15	20	1	10.650
VLB30185A480	40	18.5	25	1	10.650
VLB30220A480	47	22	30	1	10.650
VLB30300A480	61	30	40	1	10.650

POWER UNITS②

Three-phase supply 400...480VAC 50/60Hz.
Three-phase motor output max 480VAC. Built-in EMC suppressor.

VLB30004A480XX	1.3	0.4	0.5	1	0.850
VLB30007A480XX	2.4	0.75	1	1	1.050
VLB30015A480XX	3.9	1.5	2	1	1.400
VLB30022A480XX	5.6	2.2	3	1	1.400
VLB30040A480XX	9.5	4	5	1	1.400
VLB30055A480XX	13	5.5	7.5	1	2.350
VLB30075A480XX	16.5	7.5	10	1	3.750
VLB30110A480XX	23.5	11	15	1	3.750
VLB30150A480XX	32	15	20	1	10.350
VLB30185A480XX	40	18.5	25	1	10.350
VLB30220A480XX	47	22	30	1	10.350
VLB30300A480XX	61	30	40	1	10.350
VLB30370A480XX	76	37	50	1	17.250
VLB30450A480XX	89	45	60	1	17.250
VLB30550A480XX	110	55	75	1	24.050
VLB30750A480XX	150	75	100	1	24.050
VLB30900A480XX	180	90	120	1	35.650
VLB31100A480XX	212	110	150	1	35.650

LOGIC UNITS

See page 6-7

CONTROL UNITS

See page 6-7

ACCESSORIES

See page 6-7

Operational characteristics for standard load⑤

(available only for variable speed drives from 4kW upwards)

Order code	I _e ③	3-phase motor power at 400VAC with standard load		
		[A]	[kW]	[HP]
Complete drives①	Power units②			
VLB30040A480	VLB30040A480XX	11.9	5.5	7.5
VLB30055A480	VLB30055A480XX	15.6	7.5	10
VLB30075A480	VLB30075A480XX	23	11	15
VLB30110A480	VLB30110A480XX	28.2	15	20
VLB30150A480	VLB30150A480XX	38.4	18.5	25
VLB30185A480	VLB30185A480XX	48	22	30
VLB30220A480	VLB30220A480XX	56.4	30	40
VLB30300A480	VLB30300A480XX	73.2	37	50
-	VLB30370A480XX	91.2	45	60
-	VLB30450A480XX	107	55	75
-	VLB30550A480XX	132	75	100
-	VLB30750A480XX	180	90	120
-	VLB30900A480XX	216	110	150
-	VLB31100A480XX	254	132	175

General characteristics

VLB3 is a variable speed drive with compact dimensions and three-phase supply 400...480VAC. Its versatility and the numerous integrated functions make it suitable for the control of applications like pumps, fans, compressors, textile machines, conveyor belts, packaging machines, elevators. The modular structure, composed of power unit, logic unit and control unit, makes it extremely flexible to satisfy any plant requirement. Moreover, the compact "book" shape housing allows the side-by-side installation without the need of space for side ventilation. The user interface, consisting of a keypad with display, allows for quick and intuitive parameter configuration. Alternatively, it can be programmed from a PC with software VLBXSW via connection with optional USB or Wi-Fi modules. The integrated EMC suppressor and the RS485 communication port with Modbus-RTU (integrated on complete drives type VLB3...A480) complete the hardware equipment. Alternatively, several optional logic units with the most common fieldbuses are available, as well as a wide range of accessories for expanding functionalities, including the Safe Torque Off (STO) module for safety purposes.

SPEED REFERENCE SIGNALS

- External potentiometer: 1...10kΩ
- Voltage or current analog signals
- Buttons on front keypad
- Remote control panel
- 15 preset speeds via digital inputs
- Motor potentiometer
- Setting via communication protocol.

PROGRAMMABLE INPUTS AND OUTPUTS

- 5 digital inputs
- 1 digital output, 1 changeover relay output
- 2 analog inputs configurable as voltage inputs (0/2...10VDC, -10...+10VDC, 0...5VDC) or current inputs 0/4...20mA
- 1 analog output configurable as voltage output 0/2...10VDC, 0...5VDC or current output 0/4...20mA.

PROTECTIONS

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

FUNCTIONS

- Speed or torque control
- V/f linear or quadratic curves
- Open or closed loop vector control
- Energy-saving ECO control
- S-shape curves
- Flying restart
- Direct access to DC bus
- DC braking and DC injection at start
- PID control with sleep and wake up thresholds
- Multi-pump PID control (1 main pump frequency regulated + 2 auxiliary pumps activated in on-off mode in case of necessity)
- Sequencer (programmable frequency/time cycles)
- Suitable for AC three-phase asynchronous or synchronous motors (up to 22kW)
- Different parameter configurations
- Safe Torque Off (STO) function with optional module
- Programming and monitoring software VLBXSW freely, downloadable from the website www.LovatoElectric.com.

Operational characteristics

- Input voltage: 400...480VAC three-phase
- Output voltage: 0...480VAC three-phase
- Mains frequency: 50/60Hz
- Output frequency: 0...599Hz
- Current overload: 150% for 60s (heavy load), 120% for 60s (standard load)
- Operating temperature: -10...+45°C (up to 60°C with derating)
- Maximum altitude: 1000m (4000m with derating)
- Relative humidity: 5...95% (with no condensing)
- Side-by-side installation
- Built-in EMC suppressor cat. C1 (up to 2.2kW) and C2 (EN/BS 61800-3)
- IE2 efficiency level (EN/BS 50598-2)
- IEC degree of protection: IP20.

Certifications and compliance

Certifications obtained: cULus, EAC, RCM.
Compliant with standards: EN/BS 61800-5-1, UL 61800-5-1, CSA C22.2 No. 274.



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

① Complete drive: power unit + logic unit with Modbus-RTU + control unit with keypad and display

② To be completed with logic unit VLBXL... and control unit VLBXC... See page 6-7

③ Operation up to 45°C without power derating

④ Heavy load: 150% overload for 60s

⑤ Standard load: 120% overload for 60s

Logic units for VLB1 and VLB3



VLBXL...

new

Order code	Description	Qty per pkg.	Weight
		n°	[kg]
VLBXL01	Logic unit with CANopen	1	0.209
VLBXL02	Logic unit with ProfiBUS	1	0.209
VLBXL03	Logic unit with ProfiNET	1	0.209
VLBXL04	Logic unit with Ethercat	1	0.209
VLBXL06	Logic unit with Modbus-RTU (RS485)	1	0.209
VLBXL07	Logic unit without communication port	1	0.209
VLBXL08	Logic unit with Modbus-TCP (Ethernet)	1	0.209
VLBXL09	Logic unit with IO-Link	1	0.209

Control units for VLB1 and VLB3



VLBXC00



VLBXC01



VLBXC02



VLBXC03

Order code	Description	Qty per pkg.	Weight
		n°	[kg]
VLBXC00	Blanking cover	4	0.128
VLBXC01	Keypad and display	1	0.095
VLBXC02	USB communication module	1	0.095
VLBXC03	Wi-Fi communication module	1	0.095

Accessories for VLB1 and VLB3



VLBXSM



EXCRDU2

new

Order code	Description	Qty per pkg.	Weight
		n°	[kg]
VLBXSM	STO (Safe Torque Off) module	1	0.080
VLBXP01	Door-mount installation kit for the keypad VLBXC01, IP65, Type 4X, connecting cable included 3m long	1	0.340
EXCRDU2	Remote display unit, widescreen colour LCD graphic display, built-in RS485 port, for the monitoring and control of max 32 starters, IP65, 3m cable included	1	0.420



VLBXP01

Modularity of the VLB... series variable speed drives

Every VLB... variable speed drive must be composed of:

- a power unit, to be chosen according to the type of supply voltage (single-phase or three-phase) and the motor size
- a logic unit, to be chosen according to the desired communication protocol
- a control unit, at choice between keypad with display, USB module and Wi-Fi module
- any optional accessories.

POWER UNIT



VLB1...A240XX
(single-phase 200...240VAC)
VLB3...A480XX
(three-phase 400...480VAC)

LOGIC UNIT



VLBXL...

CONTROL UNIT



Keypad and display
VLBXC01

or



USB module
VLBXC02

or



Wi-Fi module
VLBXC03

General characteristics

LOGIC UNITS VLBXL...

The variable speed drives VLB... series must be equipped with a logic unit type VLBXL..., which integrates the terminal blocks with I/Os, the program memory and a communication port. Several models are available, which differ in the type of fieldbus integrated. The complete drives type VLB3...A480 come standard with the Modbus-RTU logic unit, which can be replaced with any of the other logic units if needed.

CONTROL UNITS VLBXC...

The variable speed drives VLB... series can be programmed with the control unit VLBXC01 (keypad and display) or alternatively from a PC with the software VLBXSW (freely downloadable from the website www.LovatoElectric.com) by using the communication modules type VLBXC02 (USB) and VLBXC03 (Wi-Fi).

SAFE TORQUE OFF (STO) MODULE VLBXSM

The VLBXSM module allows to increase and optimize the safety functions of the drive providing two inputs dedicated to the function Safe Torque Off (STO) with safety class SIL 3 (IEC/EN 62061 and IEC/EN 61508) and Performance Level e (ISO 13849-1).

DOOR-MOUNT INSTALLATION KIT VLBXP01

With the kit VLBXP01 it is possible to mount on the panel door the keypad and display type VLBXC01 (provided as standard on the complete drives VLB3...A480 or purchased as an optional accessory for the power units VLB...XX) The kit has an IP65 and Type 4X degree of protection and it is provided with an Ethernet connection cable 3 meters long.

REMOTE DISPLAY UNIT EXCRDU2

The EXCRDU2 remote display allows to command and monitor up to 32 starters via RS485 communication, at choice between variable speed drives VLB... series or soft starters ADXL... or ADXNP... series. EXCRDU2 allows to command the motor start and stop, reverse the sense of rotation, adjust the motor frequency and monitor the status and the main measures of the starters connected with graphical pages on the display.

- Auxiliary power supply: 100...240VAC 50/60Hz, 110...250VDC
- Widescreen colour LCD graphic display 118x96mm
- Isolated RS485 communication port, Modbus-RTU protocol
- Configurable communication parameters
- Integrated optical port for firmware update
- Flush mount, standard 92x92mm cut-out
- Compatible with VLB... variables speed drives equipped with RS485 logic unit type VLBXL06 (already integrated as standard on the complete drives type VLB3...A480)
- RS485 cable included, 3m length
- IEC degree of protection: IP65 frontal with gasket (provided as standard), IP20 housing and terminals.

Certifications and compliance

Certifications obtained:

- VLBXC..., VLBXSM and VLBXP01: cULus, EAC, RCM
- VLBXL...: cULus, EAC (excluded VLBXL07, VLBXL08, VLBXL09), RCM
- EXCRDU2: cETLus.

Compliant with standard:

- VLBXC..., VLBXL..., VLBXP01 and VLBXSM: EN/BS 61800-5-1, UL61800-5-1, CSA C22.2 n°274
- EXCRDU2: IEC/EN/BS 61010-1, IEC/EN/BS 61010-2-030, IEC/EN/BS 61000-6-2, IEC61000-6-4.

VLG3 series (three-phase)



VLG3...

new

Order code	Output current I _e	3-phase motor power at 400VAC with heavy load ^①		Qty per pkg. n°	Weight [kg]
		[A]	[kW]		

Three-phase supply 380...480VAC 50/60Hz.
Three-phase motor output max 480VAC
Built-in RS485 communication port.
Built-in EMC suppressor.

VLG30004A480	1.3	0.4	0.5	1	1.040
VLG30007A480	2.5	0.75	1	1	1.080
VLG30015A480	4	1.5	2	1	1.440
VLG30022A480	5.5	2.2	3	1	1.460
VLG30040A480	9	4	5	1	1.980
VLG30055A480	12	5.5	7.5	1	3.240
VLG30075A480	16	7.5	10	1	3.280
VLG30110A480	24	11	15	1	5.040
VLG30150A480	31	15	20	1	5.060
VLG30185A480	39	18.5	25	1	7.960
VLG30220A480	45	22	30	1	7.980

Operational characteristics for standard load^②

Order code	3-phase motor power at 400VAC with standard load		
	[A]	[kW]	[HP]
VLG30004A480	2	0.75	1
VLG30007A480	3.1	1.5	2
VLG30015A480	5.1	2.2	3
VLG30022A480	6.9	4	5
VLG30040A480	10	5.5	7.5
VLG30055A480	16	7.5	10
VLG30075A480	23	11	15
VLG30110A480	31	15	20
VLG30150A480	38	18.5	25
VLG30185A480	45	22	30
VLG30220A480	61	30	40

Accessories for VLG3



VLGXC01



VLGXC02



VLGXL01

new

Order code	Description	Qty per pkg. n°	Weight [kg]
VLGXC02	Remote keypad, IP20. Connection cable included, 3m length	1	0.229
VLGXL01	Ethernet communication module, Modbus-TCP protocol	1	0.210

- ① Heavy load: 150% overload for 60s.
- ② Standard load: 120% overload for 60s.
- ③ Programming and monitoring software VLGXSW freely downloadable from the website www.LovatoElectric.com.

General characteristics

VLG3 is a simple and versatile three-phase general purpose variable speed drive. It finds use in numerous industrial sectors for controlling applications such as conveyor belts, textile machines, escalators, lifts, pumps, fans, compressors, washing machines, mixers. The range consists of sizes from 0.4 to 22 kW and it integrates as standard the EMC suppressor and the braking chopper. The compact enclosure allows side-by-side installation, with the possibility of mounting on DIN rail or screw. On the front of the drive, there is a keypad with a 7-segment LED display for the configuration, a potentiometer for frequency adjustment, and an RJ45 connector for connecting peripheral devices such as the optional remote keypad and the PC connection cable for programming via VLGXSW software (downloadable from the website www.LovatoElectric.com). The built-in RS485 serial port with Modbus-RTU completes the hardware equipment for the interfacing with a supervision and control network or the communication with a master like PLC or HMI. It is also possible to add on to the drive an Ethernet communication port via the optional module installed on the front.

SPEED REFERENCE SIGNALS

- Front jog dial control (potentiometer)
- External potentiometer 1...5kΩ
- Voltage or current analog signals
- Buttons on front keyboard
- Remote control panel
- 8 preset speeds via digital inputs
- Motor potentiometer
- Setting via communication protocol.

PROGRAMMABLE INPUTS AND OUTPUTS

- 5 digital inputs
- 2 relay outputs: 1 with changeover contact and 1 with NO contact
- 2 analog inputs: 1 voltage input (type 0...10VDC or -10...+10VDC) and 1 current input 0/4...20mA
- 1 analog output 0...10VDC.

PROTECTIONS

- Overcurrent
- Output short circuit and earth/ground leakage
- Overvoltage and undervoltage
- Phase loss
- Motor heat overload (I2t)
- Drive and motor overtemperature
- Speed reverse.

FUNCTIONS

- Speed control
- V/f linear or quadratic curves
- Open or closed loop vector control
- S-shape curves
- Flying restart
- DC braking and DC injection at start
- PID control with sleep and wake up thresholds
- Torque boost
- Fire mode
- Programming and monitoring software VLGXSW, freely downloadable from the website www.LovatoElectric.com.

Operational characteristics

- Input voltage: 380...480VAC three-phase
- Output voltage: 0...480VAC three-phase
- Mains frequency: 50/60Hz
- Output frequency: 0...400Hz
- Current overload: 150% for 60s (heavy load), 120% for 60s (standard load)
- Operating temperature: -10...+40°C (up to 50°C with derating)
- Maximum altitude: 1000m (4000m with derating)
- Relative humidity: ≤95% (with no condensing)
- Side-by-side installation
- Built-in EMC suppressor, cat. C3 (EN/BS 61800-3)
- IEC degree of protection: IP20.

Certifications and compliance

Certifications: cULus (excluded accessories).
Compliant with standards: EN/BS 61800-5-1, EN/BS 61800-3, UL 61800-5-1, CSA C22.2 No 274.

Three-phase mains chokes



VLBXL...

Order code	I _e	Inductance	Drive power	Qty per pkg.	Wt
	[A]	[mH]	[kW]	n°	[kg]
Three phase mains chokes for VLB3... variable speed drives.					
VLBXL590	50	0.59	22...30	1	8.350
VLBXL370	80	0.37	37	1	12.500
VLBXL330	90	0.33	45	1	16.000
VLBXL300	100	0.30	55	1	19.000
VLBXL190	160	0.19	75	1	26.000
VLBXL140	200	0.14	90...110	1	32.000

General characteristics

VLBXL... three-phase mains chokes are applied to the input of VLB3... drives from 22kW to 110kW to reduce the harmonic content upstream, with consequent reduction of the input current absorbed by the drives.

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

Operational characteristics

- Current: 50...200A.
- Operating temperature: -10...+40°C (up to 55°C with derating)

Compliance

Compliant with standards: IEC/EN/BS 61558-1.

Three-phase motor chokes



VLXM...

Order code	I _e	Inductance	Drive power	Qty per pkg.	Wt
	[A]	[mH]	[kW]	n°	[kg]
Three phase motor chokes for VLA1... - VT1... - VLB1... - VLB3... - VLG3... variable speed drives.					
VLXM012	12.5	1	0.2...4	1	3.000
VLXM025	25	0.6	5.5...11	1	6.000
VLXM050	50	0.2	15...22	1	8.000
VLXM100	100	0.15	30...45	1	16.000
VLXM150	150	0.08	55...75	1	18.000
VLXM300	300	0.04	90...110	1	29.000

General characteristics

Three phase motor chokes VLXM... can be installed to the 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.

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.

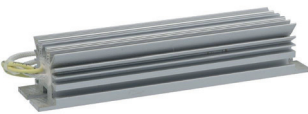
Operational characteristics

- Rated mains voltage: 400VAC
- Operating range: 170...530VAC
- Rated frequency: 50/60Hz
- Winding material: Aluminium
- Rated current I_e: 12.5...300A type code according
- Rated power: 150...3390VA type code according
- Saturation current: 1.5 * I_e
- THD: about 40%
- Ambient temperature max: 40°C
- Maximum altitude: 1000m
- Insulation class: F
- Working class: F
- Test voltage: 3kV/1 sec
- Protection degree: IP00.

Compliance

Compliant with standards: IEC/EN/BS 61558.

Braking resistors



VLBXR...

Order code	Output	Resistance	Qty per pkg.	Wt
	[W]	[Ω]	n°	[kg]
Resistors for VLB1... - VLB3... - VLG3... variable speed drives ^① .				
VLBXR390	100	390	1	0.260
VLBXR180	200	180	1	0.630
VLBXR047	200	47	1	0.500
VLBXR027	200	27	1	0.500
VLBXR018	800	18	1	4.200
VLBXR015	800	15	1	4.200
VLBXR007	1900	7.5	1	9.500

^① For the correct selection of the resistor see the installation manual of the variable speed drives, available on the website www.LovatoElectric.com.

General characteristics

Braking resistors can be connected to VLB1... - VLB3... - VLG3... drives in order to absorb the power generated during the motor stop phase.

Certifications and compliance

Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60204-1, IEC/EN/BS 60664-1.

Other accessories



LPCPA001

Order code	Description	Qty per pkg.	Wt
		n°	[kg]
Potentiometer.			
LPCPA001	1kΩ potentiometer 1 turn, complete with operating knob IP66, IP67 and IP69K on front ^②	10	0.040

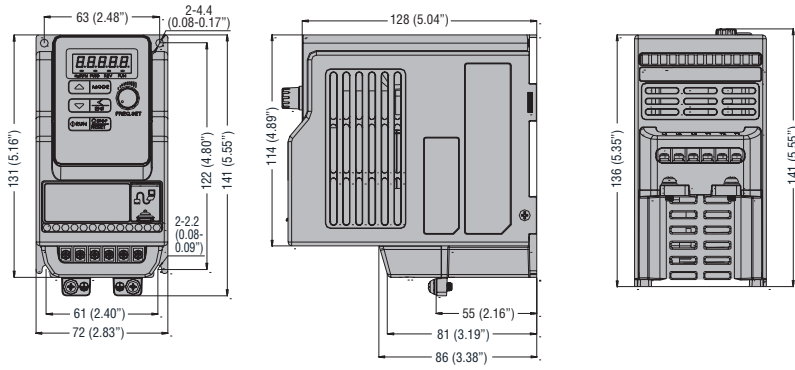
^② For more information consult page 8-35.

6 Variable speed drives

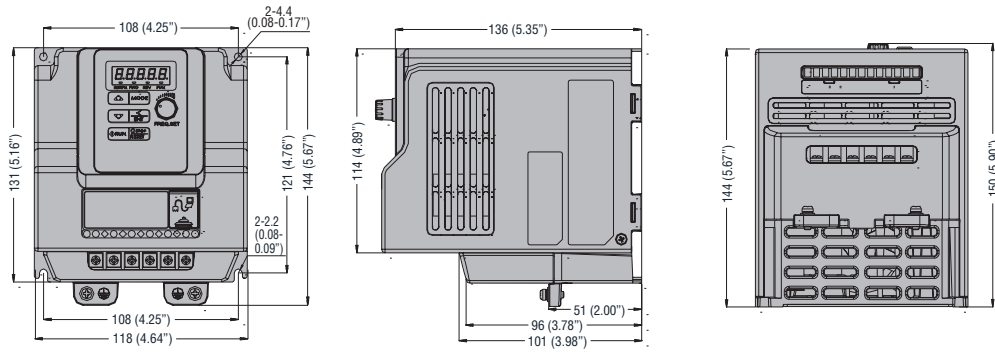
Dimensions [mm (in)]

SINGLE-PHASE ULTRA-COMPACT VARIABLE SPEED DRIVES WITH RS485 VT1 SERIES

VT102A240 - VT104A240 - VT107A240

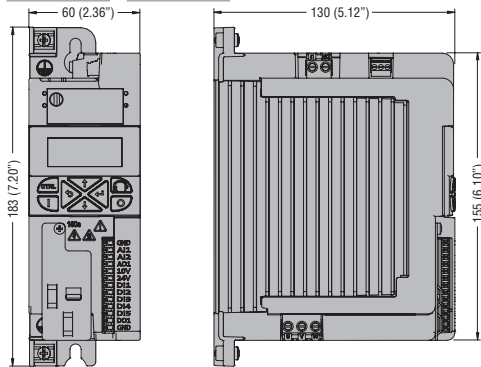


VT115A240 - VT122A240

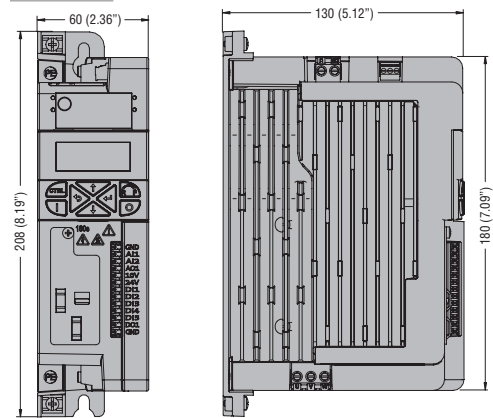


SINGLE-PHASE VARIABLE SPEED DRIVES VLA1 SERIES

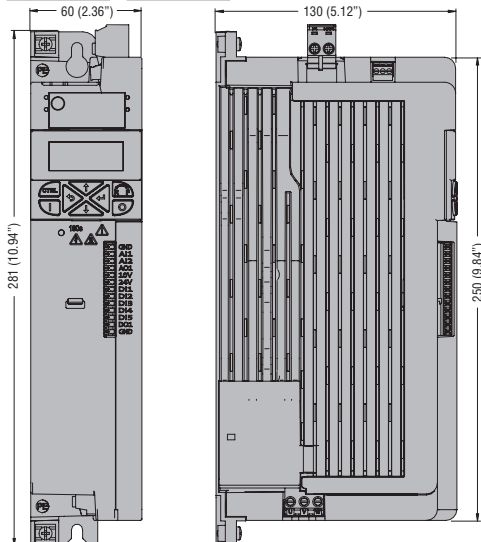
VLA102A240 - VLA104A240



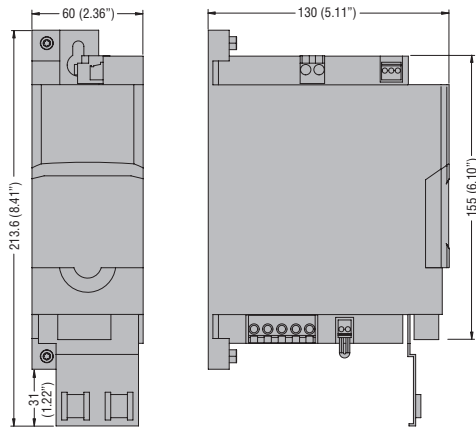
VLA107A240



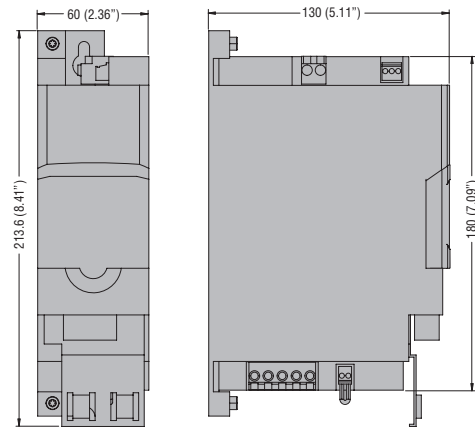
VLA115A240 - VLA122A240



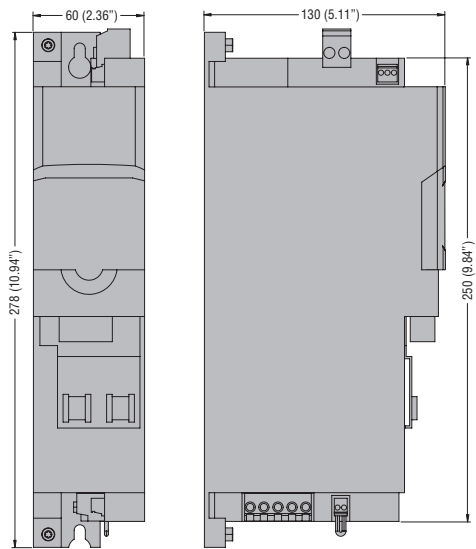
SINGLE-PHASE ADVANCED VARIABLE SPEED DRIVES VLB1 SERIES❶
VLB104A240



VLB107A240



VLB115A240 - VLB122A240



❶ The dimensions refer to complete drives, composed of power unit type VLB1...A240XX, logic unit type VLBXL... and control unit type VLBC...

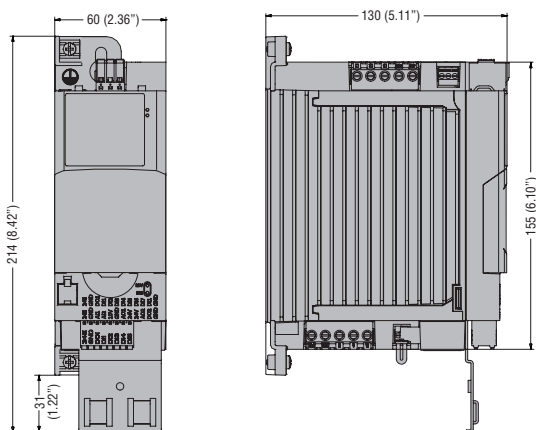
6 Variable speed drives

Dimensions [mm (in)]

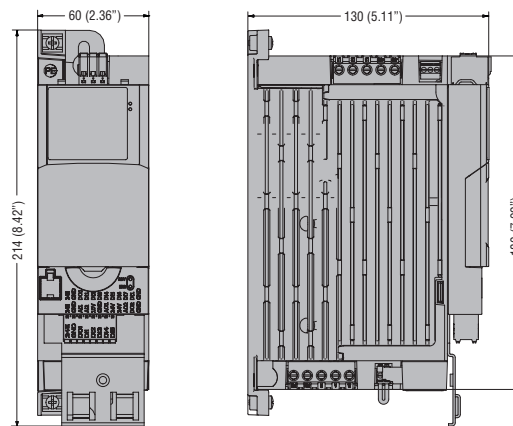
INDEX

THREE-PHASE ADVANCED VARIABLE SPEED DRIVES VLB3 SERIES

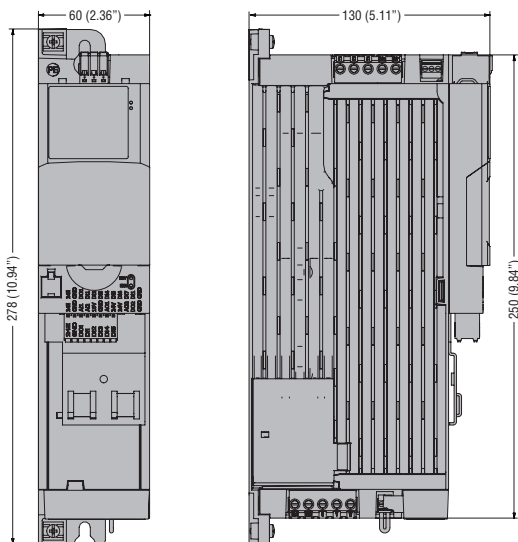
VLB30004A480



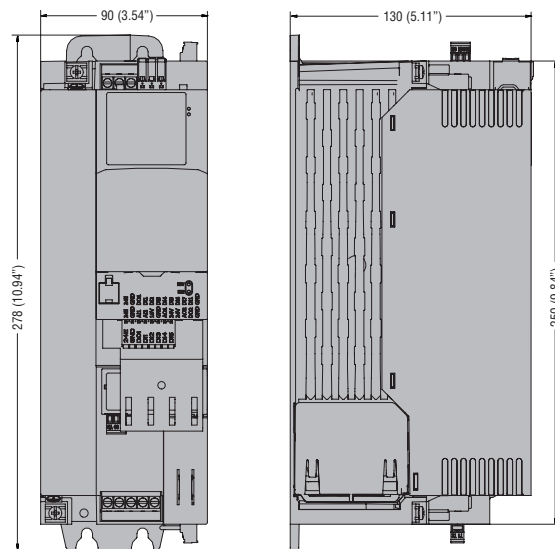
VLB30007A480



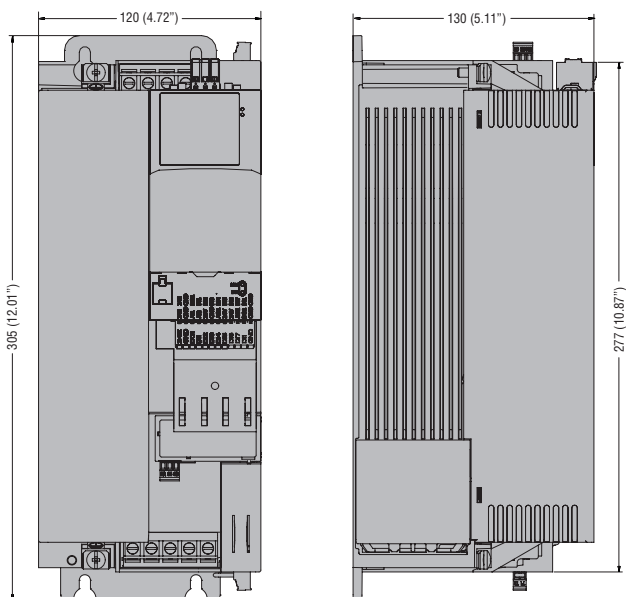
VLB30015A480 - VLB30022A480 - VLB30040A480



VLB30055A480



VLB30075A480 - VLB30110A480

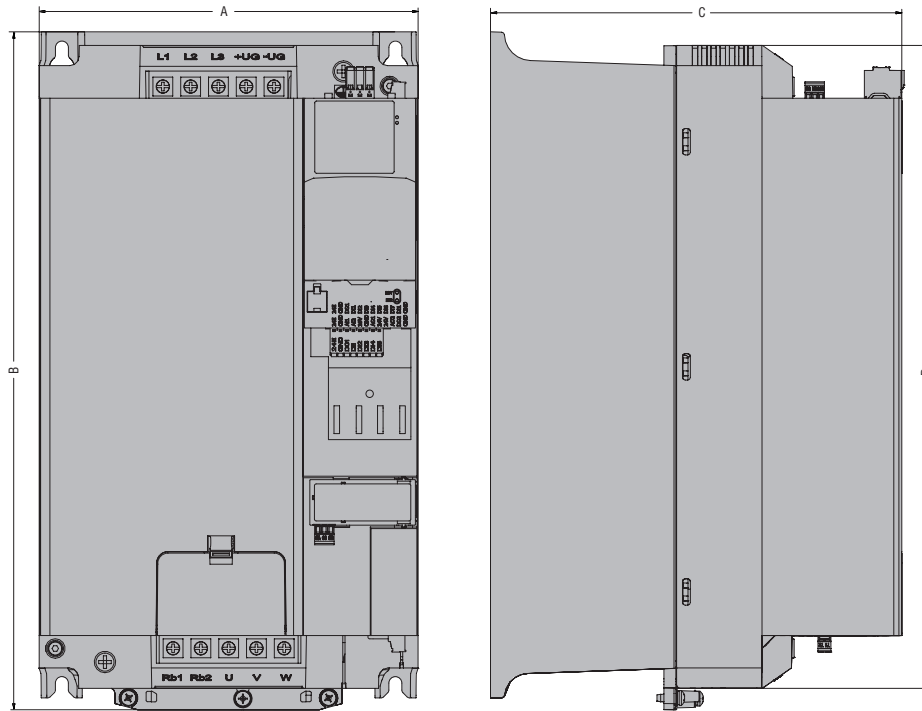


1 The dimensions refer to complete drives, composed of power unit type VLB3...A480XX, logic unit type VLBL... and control unit type VLBXC...

6 Variable speed drives

Dimensions [mm (in)]

VLB30150A480...VLB31100A480

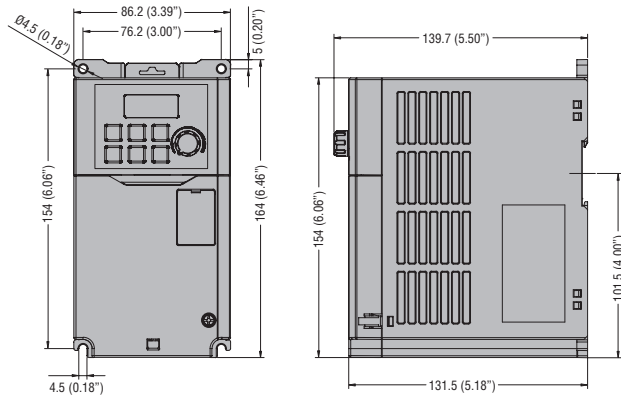


TYPE	A	B	C	D
VLB30150A480	180 (7.09")	384 (15.12")	165 (6.50")	342 (13.46")
VLB30185A480	180 (7.09")	384 (15.12")	165 (6.50")	342 (13.46")
VLB30220A480	180 (7.09")	384 (15.12")	165 (6.50")	342 (13.46")
VLB30300A480	180 (7.09")	384 (15.12")	165 (6.50")	342 (13.46")
VLB30370A480	250 (9.84")	520 (20.47")	230 (9.05")	450 (17.72")
VLB30450A480	250 (9.84")	520 (20.47")	230 (9.05")	450 (17.72")
VLB30550A480	250 (9.84")	623 (24.53")	265 (10.43")	536 (21.10")
VLB30750A480	250 (9.84")	623 (24.53")	265 (10.43")	536 (21.10")
VLB30900A480	258 (10.16")	775 (30.51")	304 (11.97")	685 (26.97")
VLB31100A480	258 (10.16")	775 (30.51")	304 (11.97")	685 (26.97")

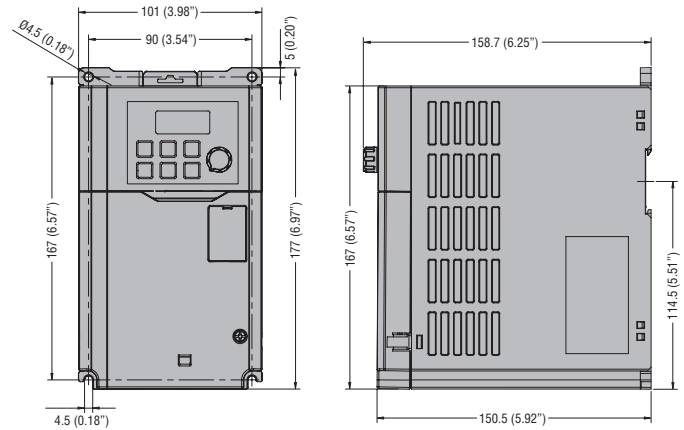
① Dimensions valid for variable speed drives with batch number starting with letter E or higher.

THREE-PHASE VARIABLE SPEED DRIVES VLG3 SERIES

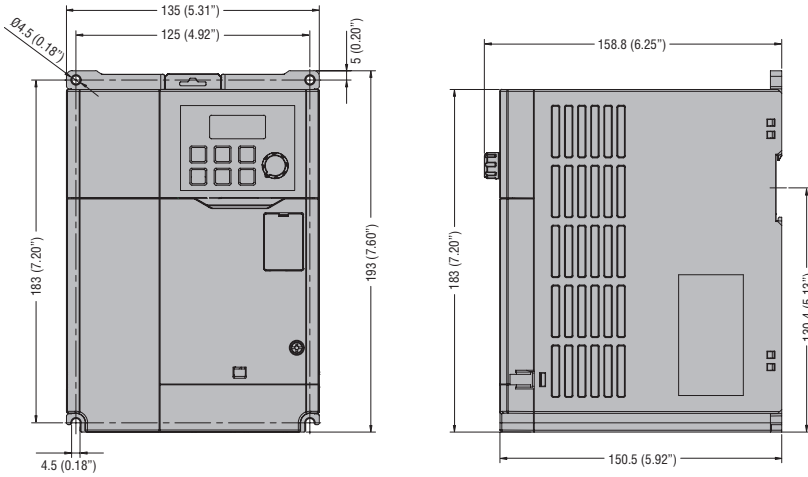
VLG30004A480 - VLG30007A480



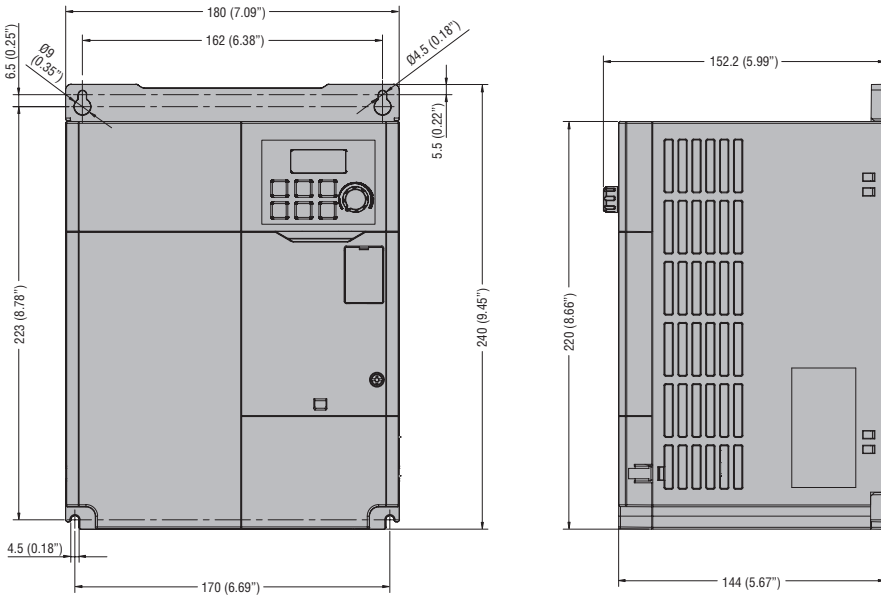
VLG30015A480 - VLG30022A480



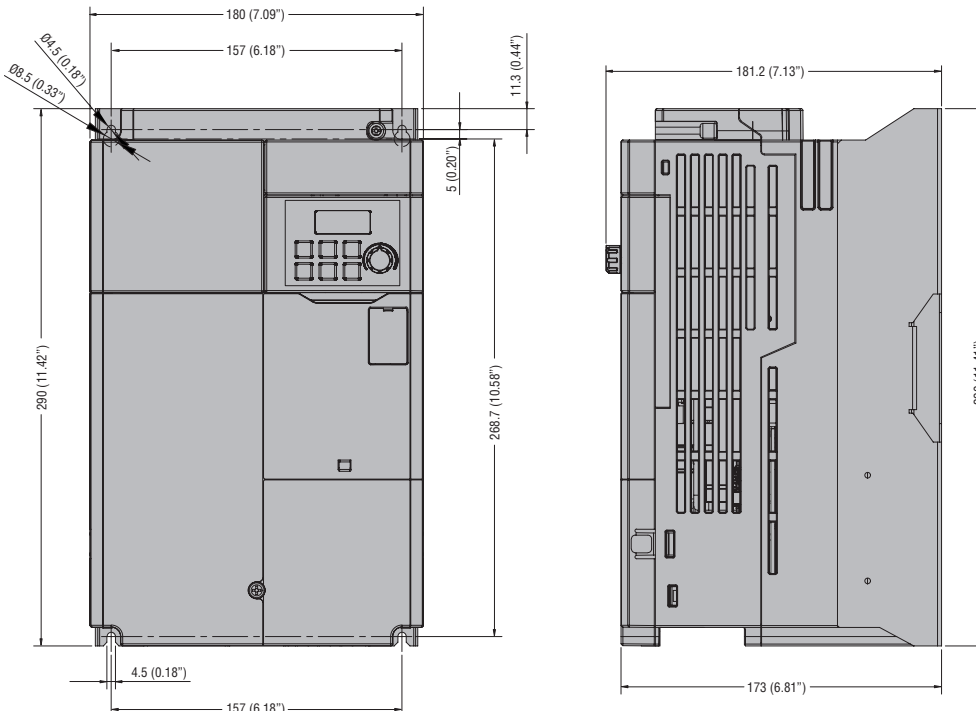
VLG30040A480



VLG30055A480 - VLG30075A480



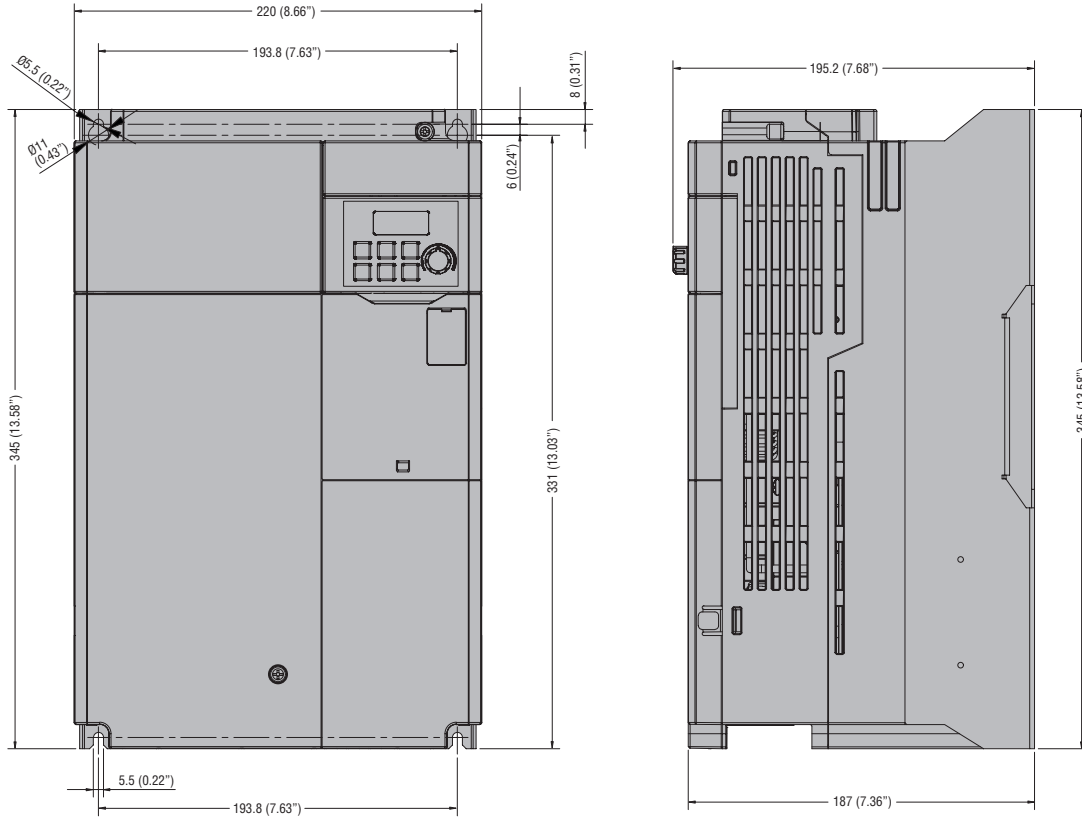
VLG30110A480 - VLG30150A480



6 Variable speed drives

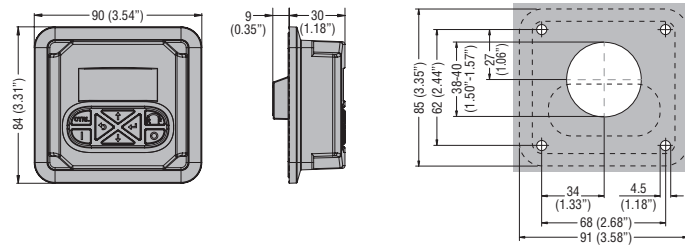
Dimensions [mm (in)]

VLG30185A480 - VLG30220A480

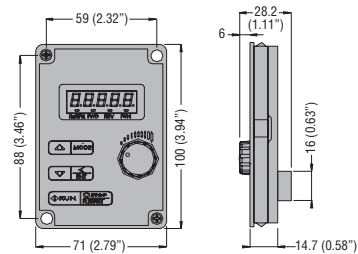


Remote keypads

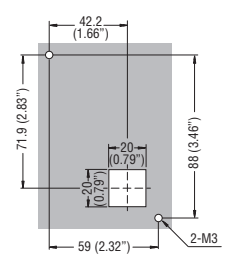
VLAXP01 - VLBXP01



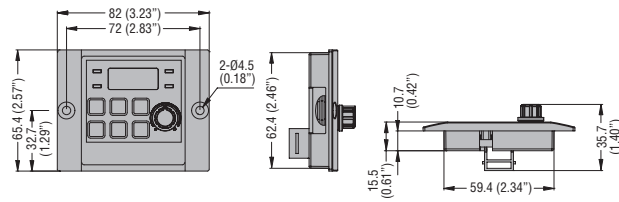
VT1XC02



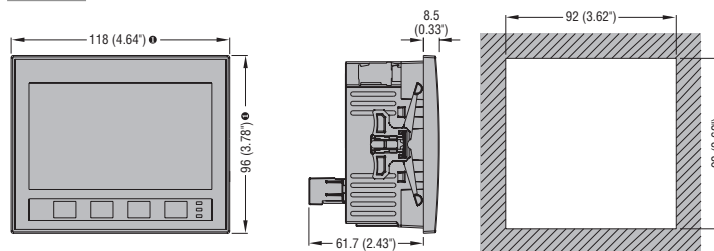
Cut-out



VLGXC02



EXCRDU2



① Dimensions with gasket: 122x100mm/4.80x3.94\".

Note. For the dimensions of the mains chokes, motor chokes and braking resistor, see the website www.LovatoElectric.com.