VARIABLE SPEED DRIVES VLB SERIES

Lovato electric

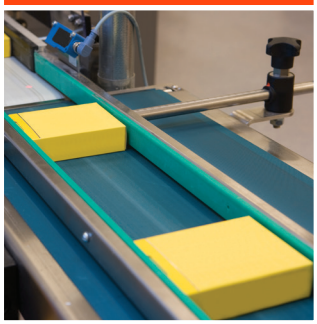
ENERGY AND AUTOMATION

APPLICATION AREAS

Automatic car washing equipment

Packaging
Automatic and semi-automatic packaging machines for carton boxes, plastic bags or cases, etc.

Pumps
Fans, dryers, water purification systems, waterworks, etc.



Conveyor belts
Product transport lines for warehouses, trade businesses, etc.

Food processing industry
Machinery for bakery and fresh pasta, confectionery equipment, mixers and blenders, flour and liquid dispensing equipment, etc.

Fans
Fans for air conditioning, refrigeration systems, compressors

Lovato electric
ENERGY AND AUTOMATION

COMPACT, VERSATILE
WITH HIGH PERFORMANCE

VARIABLE SPEED DRIVES

SINGLE-PHASE from 0,4kW to 2,2kW (240VAC)

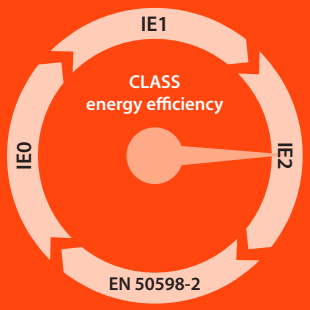
THREE-PHASE from 0,4kW to 110kW (400VAC)

Lovato electric

ENERGY AND AUTOMATION

VLB series

MODULARITY AND **DIAGNOSTIC**



IE2 efficiency class (EN50598-2)

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

POWER UNITS

LOGIC UNITS

CONTROL UNITS

Display and keypad

USB module

Wi-Fi module

Modbus TCP/IP

Modbus RTU

CANopen

PROFIBUS

PROFINET

EtherCAT

IO-Link

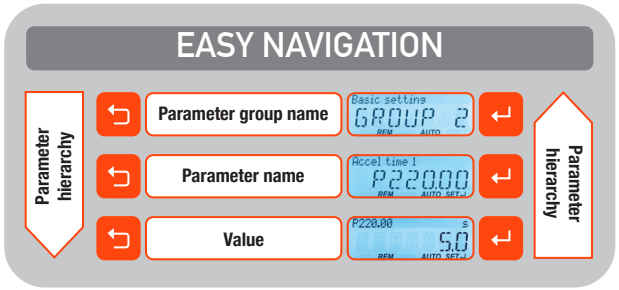
CONTROL UNITS

- Interchangeable.
- Removable without interrupting the power supply.

Advantages

- Re-usable on all variable speed drives.
- Protection of settings with the ability to operate the drive even without control unit modules.

DISPLAY AND KEYPAD



Example "acceleration time"

- Group 2 (basic setup).
- Parameter 20.

USB AND WI-FI COMMUNICATION MODULES

Connection with software VLBXSW. Parameter access also without powering the variable speed drive (for USB module).

- Parameters setting easy and repeatable with software VLBXSW, freely downloadable from the website **www.LovatoElectric.com**.
- Diagnostic (measure trends, PID parameter control, etc.).

EMC CHARACTERISTICS

Built-in EMC suppressor (EN61800-3), motor cable length:
- up to 3m for cat. C1 (for sizes up to 2.2kW)
- up to 20m for cat. C2

Built-in EMC suppressor deactivable in case of IT networks

Shield plate for control cables

STO SAFETY MODULE (Safe Torque Off)

Safety Integrity Level SIL 3 (IEC/EN 61508, IEC/EN 62061)

Performance Level PL e (EN ISO 13849-1)

MOTOR CONTROL MODES

Speed

V/f linear or quadratic control or ECO curve (for energy saving)

Torque

Open or closed loop vector control

"SIDE-BY-SIDE" INSTALLATION

Multiple variable speed drives can be installed without side clearance for space saving.

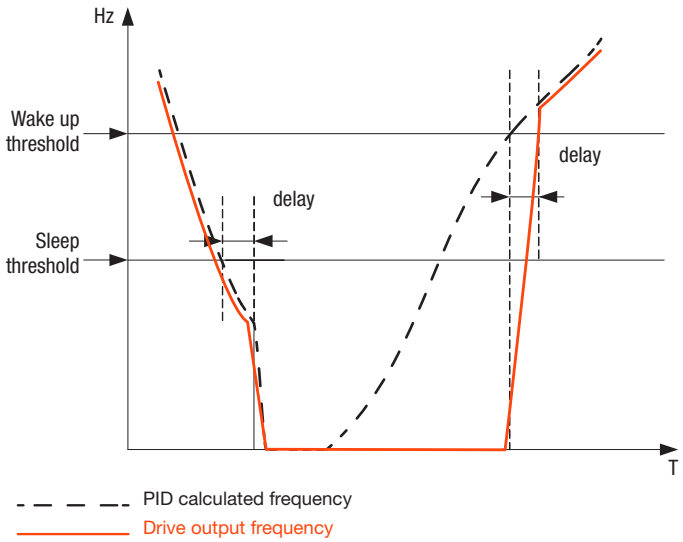
REMOTE DISPLAY UNIT

EXCRDU1 is a remote display for variable speed drives, providing complete monitoring, control and command through the touch screen.
The built-in isolated RS485 interface allows the connection up to 32 variable speed drives VLB series simultaneously. The drives must be equipped with Modbus-RTU logic unit (code VLBXL06).
The configuration is completely automatic: the EXCRDU1 remote display recognizes automatically the type of drive connected
- Command the start and stop of the motor
- Possibility to reverse the sense of rotation of the motor
- Regulation of the frequency
- Signaling of active alarms
- It reproduces on the display the LEDs present on the variable speed drive
- Monitoring of the motor and heatsink temperature with graphical bars
- PID control
- Monitoring of the main electrical measures
- Possibility to reach long distances thanks to the isolated RS485 interface (up to 600 meters between EXCRDU1 and the more distant unit)
- Compatibility with DIN 96x96mm and ANSI 4" for US market.

PID CONTROL

In some applications, such as the control of pumps and fans, the integrated PID control is used for the automatic adjustment of the motor speed, with the purpose of maintain constant a physical variable, such as pressure, temperature, or flow. The value of the controlled variable (feedback) is monitored through a transducer connected to an analog input of the drive, while the PID controller modulates the output frequency to reach the desired target value (setpoint). The PID control also includes the following functions:
- **sleep:** upon reaching the setpoint value of the controlled variable, the drive stops the motor and enters an energy-saving mode;
- **wake-up:** during the sleep phase, if the drive detects that the controlled variable deviates from the setpoint value, it automatically restarts the motor and adjusts its speed to chase the target value.

Both functions are configurable with independent thresholds and tripping delays.



GENERAL CHARACTERISTICS

VLB is a variable speed drive with compact dimensions, available in version with single-phase or three-phase power supply. 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 the configuration and monitoring software VLBXSW via connection with optional USB or Wi-Fi modules. The integrated EMC suppressor and the RS485 communication port with Modbus-RTU protocol (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

Speed reference signals
- external potentiometer 0...10kΩ
- analog voltage signal type 0/2...10VDC, -10...+10VDC, 0...5VDC or current signal type 0/4...20mA
- buttons on front keypad
- remote control panel
- 15 preset speeds via digital inputs
- motopotentiometer
- settings via communication protocols.

Programmable inputs/outputs
- selectable pNp or nPn connections
- 5 digital inputs
- 1 digital output, 1 changeover relay output
- 2 analog inputs configurable as type 0/2...10VDC, -10...+10VDC, 0...5VDC or type 0/4...20mA
- 1 analog output configurable as type 0...10VDC or 0/4...20mA.

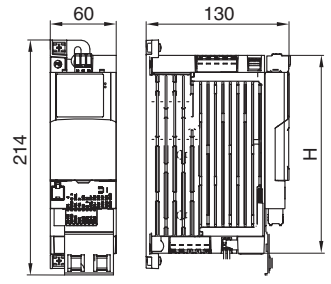
Protections
- overcurrent
- output short circuit and earth/ground leakage
- overvoltage
- undervoltage
- phase loss
- motor heat overload (I^2t)
- motor PTC heat protection
- drive motor and braking resistor overload
- overspeed
- speed reverse.

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 (for VLB3...)
- DC braking and DC injection at start
- built-in PID with sleep and wake-up thresholds
- sequencer (programmable frequency/time cycles)
- suitable for AC three-phase asynchronous or synchronous motors (up to 22kW)
- different parameter configurations
- user menu (favorite parameters)
- Safe Torque Off (STO) optional module Safety Integrity Level SIL3 (IEC/EN 61508, IEC/EN 62061) and Performance Level e (EN/ISO 13849-1).

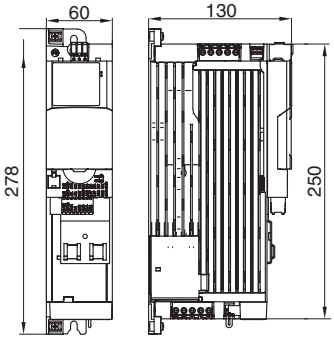
Operational characteristics
- input voltage:
  - VLB1: single-phase 200...240VAC
  - VLB3: three-phase 400...480VAC
- mains frequency: 50/60Hz
- output frequency: 0...599Hz
- current overload: 150% for 60s; 200% for 3s
- IEC degree of protection: IP20
- operating temperature: -10...+60°C (45°C without derating)
- maximum altitude: 4000m (with derating above 1000m)
- relative humidity: 5...95% (with no condensing)
- side-by-syde installation
- built-in EMC suppressor (EN61800-3)
- IE2 efficiency class (EN50598-2).

Certifications and compliance
Certifications obtained: cULus, RCM.
Compliant with standards: EN 61800-5-1, UL 61800-5-1, CSA 22.2 N°. 274.

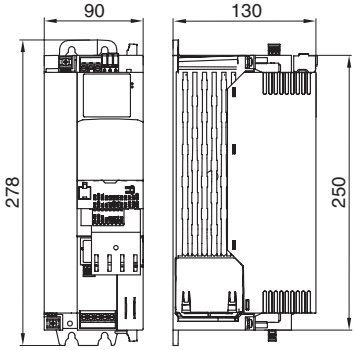
DIMENSIONS [mm]



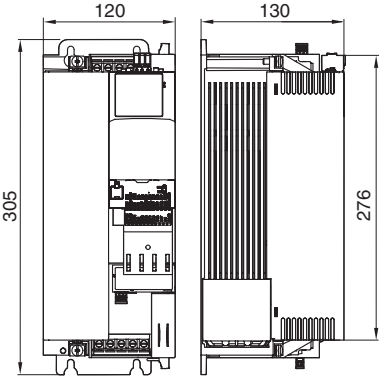
VLB104A240 (H=155) - VLB30004A480 (H=155)
VLB107A240 (H=180) - VLB30007A480 (H=180)



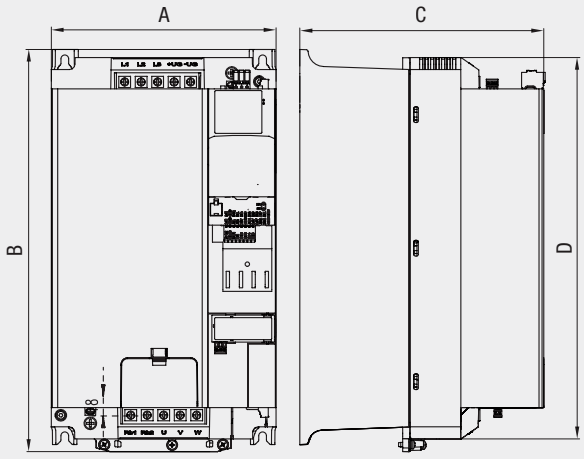
VLB115A240 - VLB122A240
VLB30015A480 - VLB30022A480 - VLB30040A480



VLB30055A480



VLB30075A480 - VLB30110A480



	A	B	C	D
VLB30150A480 ❶	180	384	165	342
VLB30185A480 ❶	180	384	165	342
VLB30220A480 ❶	180	384	165	342
VLB30300A480 ❶	180	384	165	342
VLB30370A480	250	520	230	450
VLB30450A480	250	520	230	450
VLB30550A480	250	623	265	536
VLB30750A480	250	623	265	536
VLB30900A480	258	775	304	685
VLB31100A480	258	775	304	685

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

The dimensions refer to complete drives, consisting of power unit type VLB...XX, logic unit type VLBXL... and control unit type VLBXC...

HOW TO ORDER

COMPLETE DRIVES AND POWER UNITS

VLB3...

VLB...XX

Order code		HEAVY-DUTY LOAD ❸			STANDARD LOAD ❹			Qty per pkg	Weight	
Complete drives ❶	Power units ❷	Ie	three-phase motor power		Ie	three-phase motor power			Complete drives	Power units
		[A]	[kW]	[HP]	[A]	[kW]	[HP]	n°	[kg]	[kg]
single-phase supply 200...240VAC 50/60Hz										
–	VLB104A240XX	24	0,4	0,5	❺	❺	❺	1	-	0,850
–	VLB107A240XX	4,2	0,75	1	❺	❺	❺	1	-	1,050
–	VLB115A240XX	7	1,5	2	❺	❺	❺	1	-	1,400
–	VLB124A240XX	9,6	2,2	3	❺	❺	❺	1	-	1,400
three-phase supply 380...480VAC 50/60Hz										
VLB30004A480	VLB30004A480XX	1,3	0,4	0,5	❺	❺	❺	1	1,000	0,850
VLB30007A480	VLB30007A480XX	2,4	0,75	1	❺	❺	❺	1	1,200	1,050
VLB30015A480	VLB30015A480XX	3,9	1,5	2	❺	❺	❺	1	1,550	1,400
VLB30022A480	VLB30022A480XX	5,6	2,2	3	❺	❺	❺	1	1,550	1,400
VLB30040A480	VLB30040A480XX	9,5	4	5	11,9	5,5	7,5	1	1,550	1,400
VLB30055A480	VLB30055A480XX	13	5,5	7,5	15,6	7,5	10	1	2,500	2,350
VLB30075A480	VLB30075A480XX	16,5	7,5	10	23	11	15	1	3,950	3,750
VLB30110A480	VLB30110A480XX	23,5	11	15	28,2	15	20	1	3,950	3,750
VLB30150A480	VLB30150A480XX	32	15	20	38,4	18,5	25	1	10,650	10,350
VLB30185A480	VLB30185A480XX	40	18,5	25	48	22	30	1	10,650	10,350
VLB30220A480	VLB30220A480XX	47	22	30	56,4	30	40	1	10,650	10,350
VLB30300A480	VLB30300A480XX	61	30	40	73,2	37	50	1	10,650	10,350
-	VLB30370A480XX	76	37	50	91,2	45	60	1	-	17,250
-	VLB30450A480XX	89	45	60	107	55	75	1	-	17,250
-	VLB30550A480XX	110	55	75	132	75	100	1	-	24,050
-	VLB30750A480XX	150	75	100	180	90	125	1	-	24,050
-	VLB30900A480XX	180	90	125	216	110	150	1	-	35,650
-	VLB31100A480XX	212	110	150	254	132	175	1	-	35,650

❶ Complete drive (power unit, logic unit with Modbus-RTU and control unit with display and keypad). ❷ To be completed with VLBXL... logic unit and VLBXC.. control unit..
❸ Heavy load: 150% overload for 60s. ❹ Normal load: overload 120% for 60s. ❺ Operation for standard load not available for this code.

LOGIC UNITS

VLBXL...

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	1	0,209
VLBXL07	Logic unit without communication port	1	0,209
VLBXL08	Logic unit with Modbus-TCP	1	0,209
VLBXL09	Logic unit with IO-Link	1	0,209

CONTROL UNITS

VLBXC00

VLBXC01

VLBXC02

VLBXC03

Order code	Description	Qty per pkg	Weight
		n°	[kg]
VLBXC00	Blanking cover	4	0,128
VLBXC01	Display and keypad	1	0,095
VLBXC02	USB communication module	1	0,095
VLBXC03	Wi-Fi communication module	1	0,095

ACCESSORIES

EXCRDU1

VLBXP01

VLBXSM

LPCPA001

Order code	Description	Qty per pkg	Weight
		n°	[kg]
VLBXP01	Door-mount installation kit for the keypad VLBXC01, IP65, type 4x, 3m long cable included	1	0,340
EXCRDU1	Remote display unit, LCD graphic touchscreen display, built-in RS485 port, for the monitoring and remote control of max 32 drives, IP65 and type 4X, 3m long cable included	1	0,360
VLBXSM	STO (Safe Torque Off) module	1	0,080
LPCPA001	Potentiometer 1kOhm, 1 turn, with knob, IP66, IP67 and IP69K on front.	1	0,040

Braking resistors, three-phase mains chokes and three-phase motor chokes are also available. For details consult the www.LovatoElectric.com.

PD113 GB 04 24

VARIABLE SPEED DRIVES
VLB SERIES

Lovato electric
ENERGY AND AUTOMATION

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