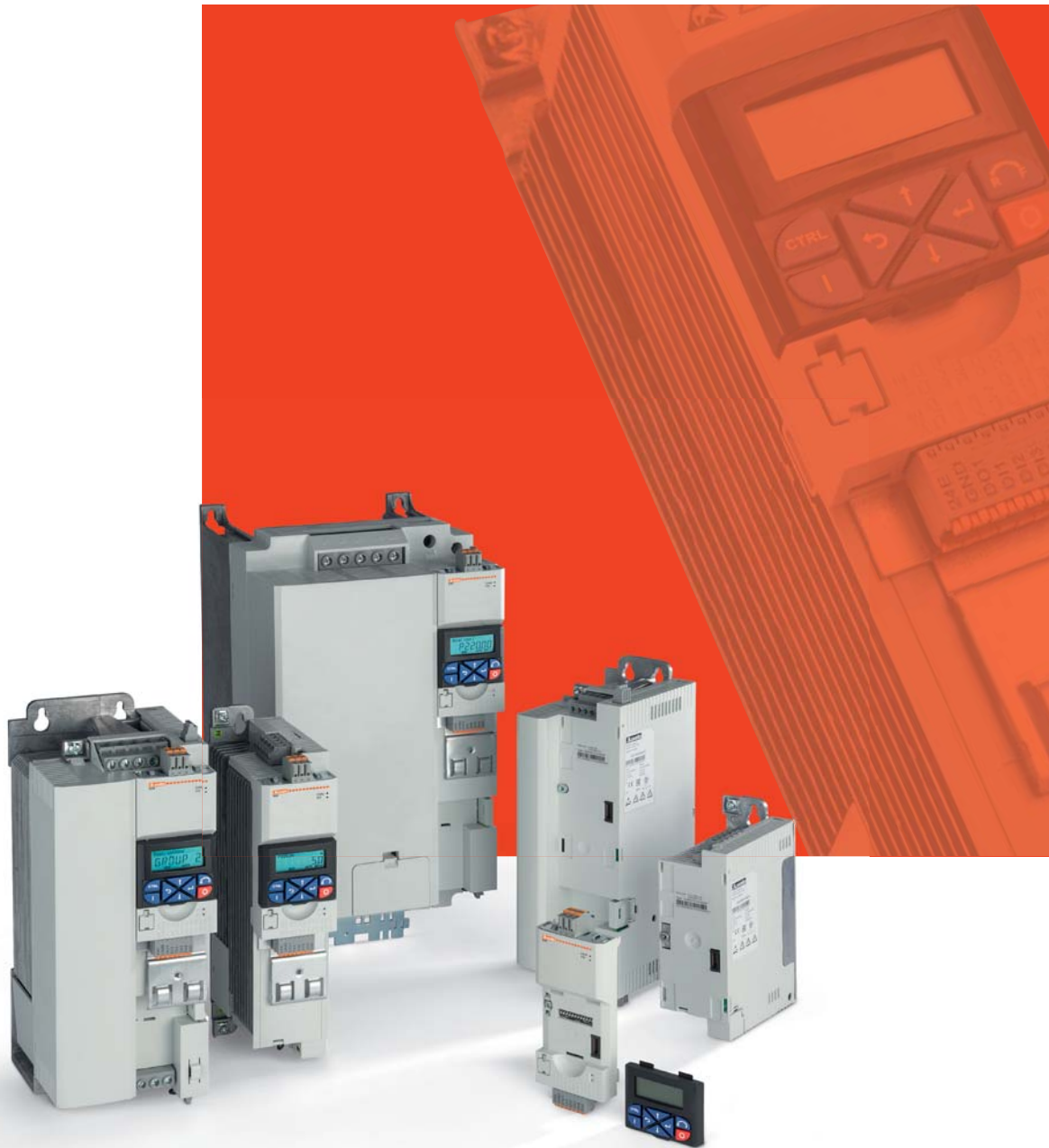


VARIABLE SPEED DRIVES



 **Lovato**
electric

ENERGY AND AUTOMATION

COMPACT, VERSATILE
HIGH PERFORMANCE



VARIABLE
SPEED DRIVES
0.4...110kW THREE-PHASE

APPLICATION AREAS

Automatic car washing equipment



Pumps

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



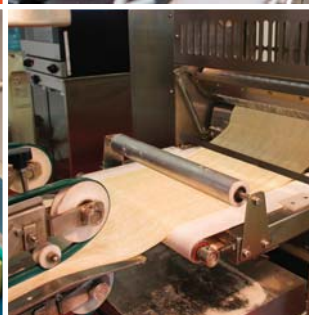
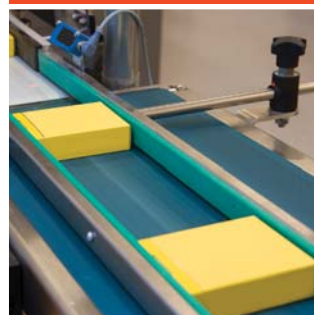
Fans

Fans for air conditioning, refrigeration systems, compressors.



Packaging

Automatic and semi-automatic packaging machines for cartons, plastic bags or cases or with cellophane, etc.



Conveyance machinery

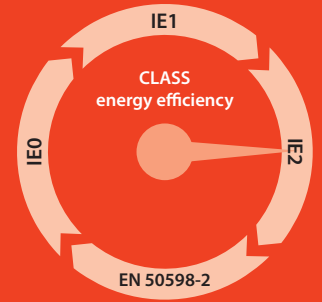
Product conveyor belts for warehouses, trade businesses, etc.

Food processing industry

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

VLB3 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



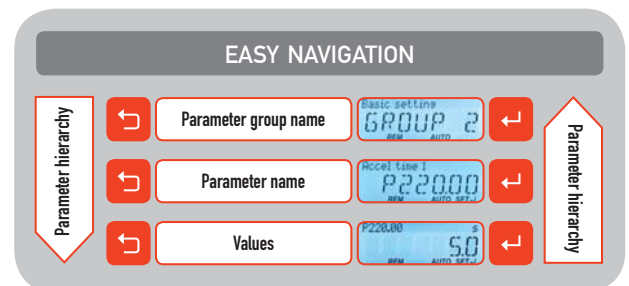
Wi-Fi module



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 VLBX SW. Parameter access also without powering the variable speed drive (for USB module).

- Parameters setting easy and repeatable.
- Diagnostic (load curves, PID parameter control, etc.).

Modbus-RTU

CANopen

PROFI BUS

PROFI NET

EtherCAT

■ EMC CHARACTERISTICS

Built-in EMC suppressor (EN61800-3), motor cable length:

- up to 3m for cat. C1 (for sizes 0.4kW and 0.75kW)
- up to 20m for cat. C2



■ STO SAFETY MODULE (Safe Torque Off)



Performance level
ISO 13849-1 (EN 954-1)
Safety class SIL 3
EN 62061 / EN 61800-5-2

■ MOTOR CONTROL METHODS

Speed

Control with linear, quadratic 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 VLB series variable speed drives simultaneously. The drives must be equipped with Modbus RTU logic unit (code VLXB L06).

The configuration is completely automatic: the EXC RDU1 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 temperature of the motor and of the heatsink through 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 USA market.



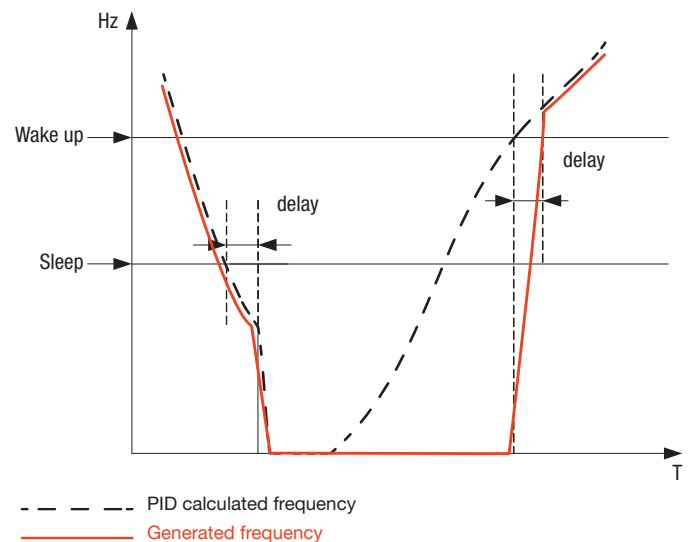
■ PID CONTROL

In some applications, for instance 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 control, the variable speed drive sets motor speed to obtain the target setpoint.

PID control also includes the following functions:

- **sleep:** when the PID output frequency is lower than the programmed limit, that is the speed drive is close to the allowable minimum when propulsion is not needed, the variable speed 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 variable speed drive picks up motor control again at a suitable speed to reach the target setpoint without a manual starting.

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



GENERAL CHARACTERISTICS

VLB3 is a compact variable speed drive with three-phase supply input.

It is ideal for general applications and, in particular, for lifts and the control of pumps and fans, thanks to several specific built-in functions (S Curve, PID, squared torque 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 keypad 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 by using a PC.

The RS485 communication port with built-in Modbus RTU and EMC filter complete the hardware supply for version up to 30kW. The logic unit can be replaced with one of the VLBX... codes, obtaining a different communication port.

Control and logic units can be purchased separately.

Speed reference signals

- external potentiometer 0...10k Ω
- analog voltage signal -10...10VDC (two-pole) or analog current signal 0/4...20mA
- buttons on front keypad
- remote control panel
- 15 preset speeds via digital inputs
- motopotentiometer
- settings via communication protocols.

Programmable inputs/outputs

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

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 loop 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
- suitable for asynchronous or synchronous motors up to 22kW
- different parameter configurations
- user menu (favorite parameters)
- Safe Torque Off (STO) accessory class SIL 3 (EN62061 / EN61800-5-2).

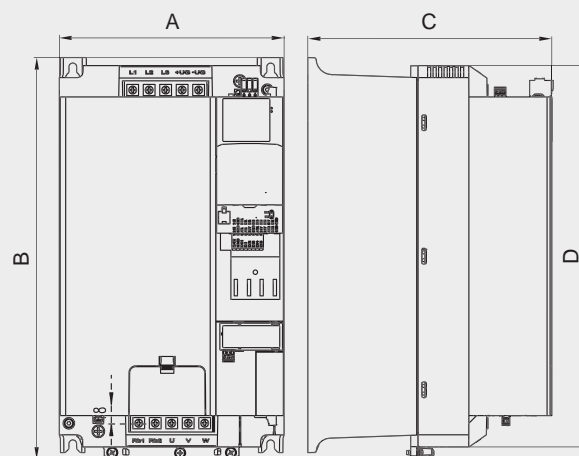
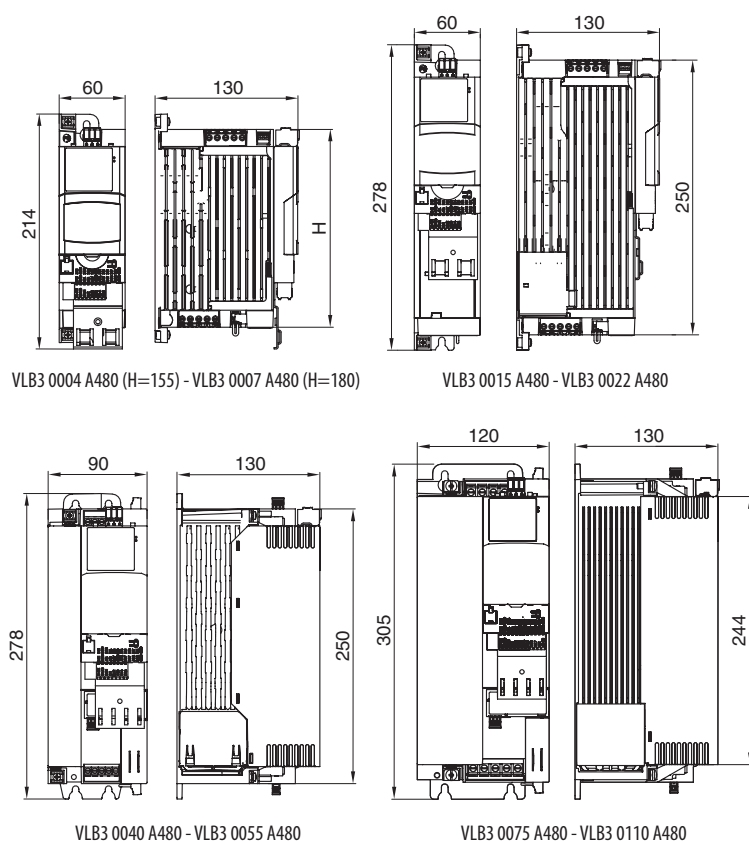
Operational characteristics

- input voltage: 400...480VAC three-phase
- rated operational current I_e: 1.3...212A
- 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
- operating temperature: -10...+55°C (45°C without derating)
- maximum altitude (with power derating)
- relative humidity: 5...95% (with no condensing)
- side-by-side installation
- built-in EMC suppressors (EN61800-3) motor cable length: up to 3m for cat. C1 (up to size 0.75kW) up to 20m for cat. C2
- IE2 efficiency class (EN50598-2).

Certifications and compliance

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

DIMENSIONS [mm]



	A	B	C	D
VLB3 0150 A480	204.5	366	222	347
VLB3 0185 A480	204.5	366	222	347
VLB3 0220 A480	204.5	366	222	347
VLB3 0300 A480	250	520	230	450
VLB3 0370 A480	250	520	230	450
VLB3 0450 A480	250	520	230	450
VLB3 0550 A480	250	623	265	536
VLB3 0750 A480	250	623	265	536
VLB3 0900 A480	258	775	304	685
VLB3 0110 A480	258	775	304	685

HOW TO ORDER

COMPLETE DRIVES AND POWER UNITS



Order code	Complete drives ①	Power units ②	HEAVY-DUTY LOAD ③			STANDARD LOAD ④			Qty per pkg n°	Weight	
			3-phase motor power at 400VAC			3-phase motor power at 400VAC				Complete drives	Power units
			le (A)	[kW]	[HP]	le (A)	[kW]	[HP]			
VLB3 0004 A480	VLB3 0004 A480XX	VLB3 0004 A480XX	1.3	0.37	0.5	⑤	⑤	⑤	1	0.850	0.800
VLB3 0007 A480	VLB3 0007 A480XX	VLB3 0007 A480XX	2.4	0.75	1	⑤	⑤	⑤	1	1.100	1.000
VLB3 0015 A480	VLB3 0015 A480XX	VLB3 0015 A480XX	3.9	1.5	2	⑤	⑤	⑤	1	1.380	1.350
VLB3 0022 A480	VLB3 0022 A480XX	VLB3 0022 A480XX	5.6	2.2	3	⑤	⑤	⑤	1	1.380	1.350
VLB3 0040 A480	VLB3 0040 A480XX	VLB3 0040 A480XX	9.5	4	5	11.9	5.5	7.5	1	2.450	2.300
VLB3 0055 A480	VLB3 0055 A480XX	VLB3 0055 A480XX	13	5.5	7.5	15.6	7.5	10	1	2.450	2.300
VLB3 0075 A480	VLB3 0075 A480XX	VLB3 0075 A480XX	16.5	7.5	10	23	11	15	1	3.950	3.700
VLB3 0110 A480	VLB3 0110 A480XX	VLB3 0110 A480XX	23.5	11	15	28.2	15	20	1	3.950	3.700
VLB3 0150 A480	VLB3 0150 A480XX	VLB3 0150 A480XX	32	15	20	38.4	18.5	25	1	10.650	10.300
VLB3 0185 A480	VLB3 0185 A480XX	VLB3 0185 A480XX	40	18.5	25	48	22	30	1	10.650	10.300
VLB3 0220 A480	VLB3 0220 A480XX	VLB3 0220 A480XX	47	22	30	56.4	30	40	1	10.650	10.300
VLB3 0300 A480	VLB3 0300 A480XX	VLB3 0300 A480XX	61	30	40	73.2	37	50	1	17.500	17.200
-	VLB3 0370 A480XX	VLB3 0370 A480XX	76	37	50	91.2	45	60	1	-	17.200
-	VLB3 0450 A480XX	VLB3 0450 A480XX	89	45	60	107	55	75	1	-	17.200
-	VLB3 0550 A480XX	VLB3 0550 A480XX	110	55	75	132	75	100	1	-	24.000
-	VLB3 0750 A480XX	VLB3 0750 A480XX	150	75	100	180	90	125	1	-	24.000
-	VLB3 0900 A480XX	VLB3 0900 A480XX	180	90	125	216	110	150	1	-	35.600
-	VLB3 1100 A480XX	VLB3 1100 A480XX	212	110	150	254	132	175	1	-	35.600

① Complete drive (power unit, logic unit with Modbus RTU and control unit with display and keypad). ② To be completed with logic unit and control unit. ③ Heavy-duty load: 150% overload for 60s. ④ Standard load: 120% overload for 60s. ⑤ Standard duty load not available for this size.

LOGIC UNITS



Order code	Description	Qty per pkg n°	Weight [kg]
VLBX L01	Logic unit with CANopen	1	0.209
VLBX L02	Logic unit with Profibus	1	0.209
VLBX L03	Logic unit with Profinet	1	0.209
VLBX L04	Logic unit with Ethercat	1	0.209
VLBX L06	Logic unit with Modbus RTU	1	0.209

CONTROL UNITS



Order code	Description	Qty per pkg n°	Weight [kg]
VLBX C00	Blanking cover	4	0.128
VLBX C01	Display and keypad	1	0.080
VLBX C02	USB communication module	1	0.080
VLBX C03	Wi-Fi communication module	1	0.080

ACCESSORIES



Order code	Description	Qty per pkg n°	Weight [kg]
VLBX P01	Door-mount installation kit for display and keypad VLBX C01, IP65, cable included	1	0.340
EXC RDU1	Remote display unit, LCD graphic touchscreen display, built-in RS485 port, for monitoring and remote control of max 32 drives, IP65 and 4X protection rating, 3m cable long	1	0.360
VLBX SM	Safe Torque Off (STO) module	1	0.080

BRAKING RESISTORS

Order code	Power [W]	Resistance [Ω]	Drive output power [kW]	Qty per pkg n°	Weight [kg]
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...75	1	9.500

THREE-PHASE INDUCTANCES

Order code	Current [A]	Inductance [mH]	Drive output power [kW]	Qty per pkg n°	Weight [kg]
VLBX L590	50	0.59	22...30	1	8.350
VLBX L370	80	0.37	37	1	12.500
VLBX L330	90	0.33	45	1	16.000
VLBX L300	100	0.30	55	1	19.000
VLBX L190	160	0.19	75	1	26.000
VLBX L140	200	0.14	90...110	1	32.000

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