LARSEN & TOUBRO

High on efficiency
big on reliability

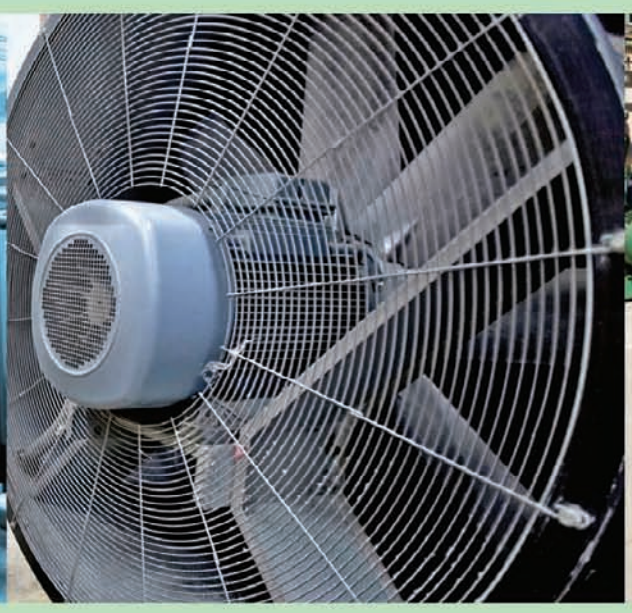
Ex2000 | AC Drive for Fans & Pumps

Three Phase 415V (5.5 ~ 450kW)

L&T SWITCHGEAR
SAFE & SURE

Two decades of application knowledge

For over two decades, various industry sectors have been reaping the benefits of L&T's cost-effective, performance-oriented AC Drive solutions. L&T's grasp of the specific needs of each industry enables it to offer application-specific solutions for various industries – such as processing, textile, plastic, ceramic, pharmaceutical, elevator, oil & gas, power, cement and material-handling.

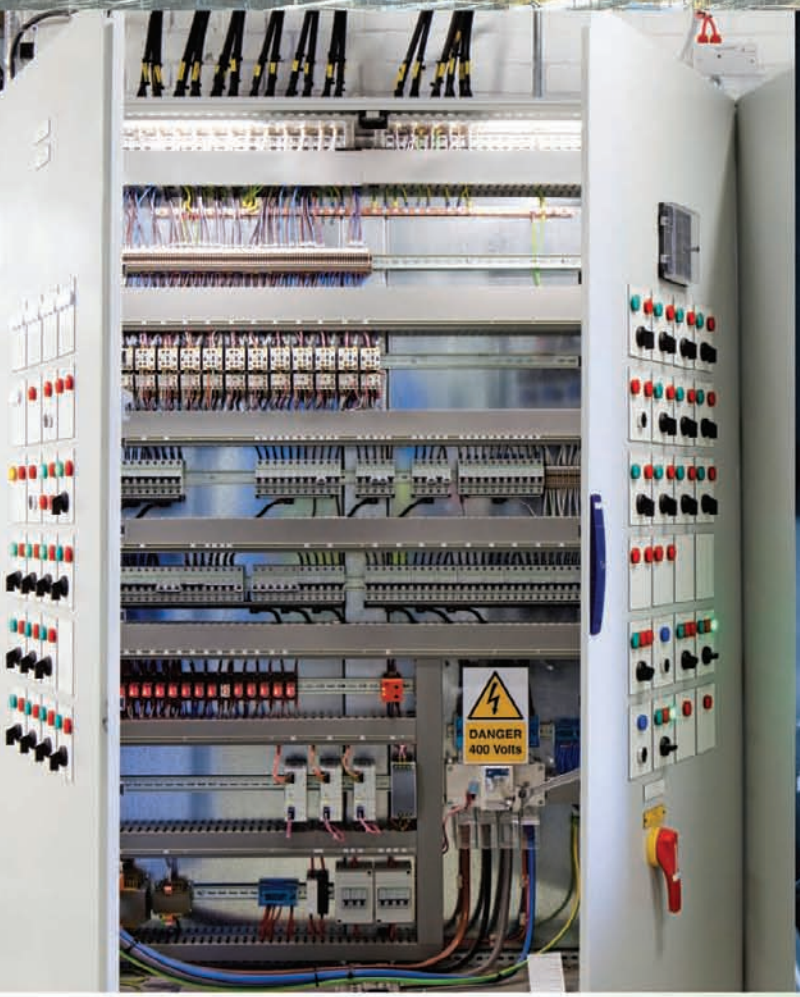




Ex2000 AC Drive

› The new reliability edge

The Ex2000 adds a new dimension to L&T's AC drive solutions. Built to L&T's stringent quality standards, the Ex2000 is tested and certified to meet global benchmarks, thus giving you the assurance of total reliability.

Specially designed for industrial applications, the Ex2000 is perfectly suited for fan and pump applications. It can handle loads up to 450 kW, and is engineered to keep your machine operating at optimum efficiency – even in the hot, humid and dusty conditions that characterize India's industrial environment. It has features that save energy and cost, and is easy to operate.



Backed by engineering knowledge across seven decades

A knowledge-based company, L&T brings you the benefits of over 75 years of engineering experience and expertise, and the richness of its collaborations with technology leaders across the globe.

For 50 years, L&T's low-tension switchgear – India's widest range – has been the preferred option of top industrial houses countrywide.

Meeting your needs, solving your problems

We believe in addressing your needs and not just selling a product. That's why a dedicated Solutions Team first focuses on understanding your application. Then helps you select the drive that best meets your needs. Our advice on installation, maintenance and replacement will ensure that your elevators function at peak productivity. From engineer to repair technician, our people have the knowledge and skill-sets to deliver total peace of mind.

Tested. Certified. Reliable.

L&T is one of the few switchgear manufacturers in India with a dedicated, NABL-certified testing facility. Our products are tested for conformity to standards that exceed minimum requirements, giving you the assurance of high-quality performance. Our focus on continuous improvement ensures that our standards are on par with the best in the world. Repeat orders endorse the value that we deliver.

The reliability of the Ex2000 is ensured by international test certification – UL, CE and RoHS.

After-sales service aimed at maximum uptime

A malfunction of the drive can bring an entire assembly line or process to a halt. To ensure maximum uptime for you, our Rapid Response service team is available to analyze the situation and help you set the problem right. We have set up strategic service centres across the country to provide temporary replacement drives or ready spares to ensure that your business keeps running smoothly.

Training your people to enhance your operations

At our countrywide Switchgear Training Centres, we can train your operators, electricians and supervisors to increase their effectiveness in the operation and maintenance and trouble-shooting of your drives. We can also conduct in-plant training and workshops at your premises to improve both power management and equipment maintenance skills. This gives you total operational excellence, minimising downtime.

L&T's engineers and channel partners also upgrade their skills through seminars, workshops, training sessions and white papers on electrical practices.

Features that ensure performance

- Specialized functions for fan & pump
- Energy-saving, high-efficiency
- Built-in Booster pump control
- Cascade PID
- Component Life Monitor
- Built-in DC Reactor from 22 to 280 kW
- VFD Bypass
- Removable control terminal
- Conformal Coating as per IEC 60721-3-3 class 3C2
- Built-in RS485 MODBUS (ASCII) Communication

Ex2000

The **energy-saving** cost-effective solution

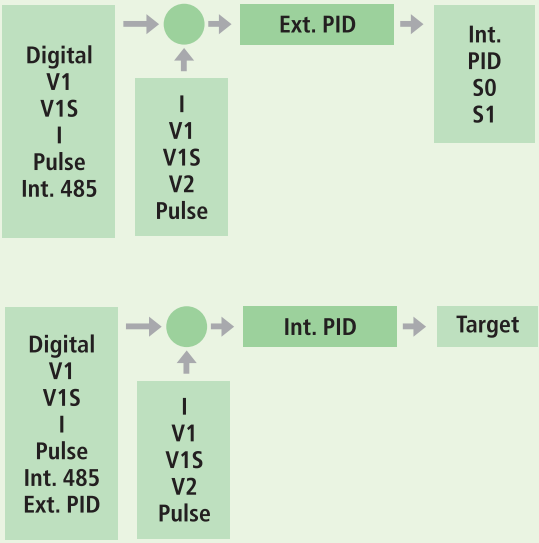
Engineered for optimum efficiency of your machine

PID Control

In the centrifugal fan and pump, PID control is provided as a standard function in order to maintain a constant pressure, flow or level. This block includes pre-PID, sleep, wake-up and output inverse sub-functions.

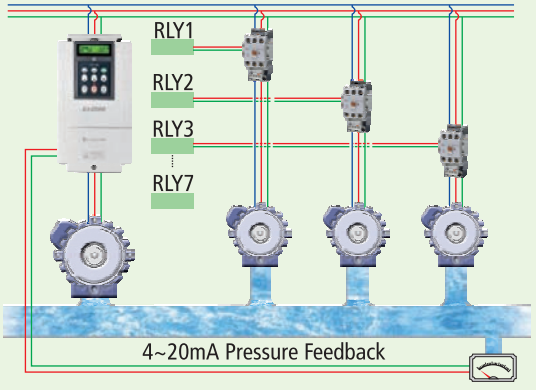
Dual PID

Where external or cascaded PID control is required, the built-in dual PID algorithm of the Ex2000 can be utilised to satisfy various system requirements.



Booster Pump Control (5.5~450kW)

The Ex2000 MMC function provides cost-effective, simultaneous control of multiple motors.

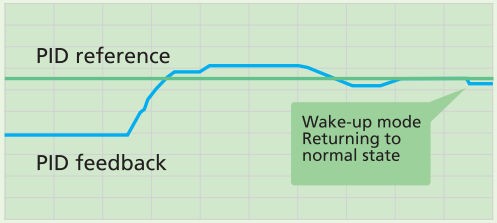


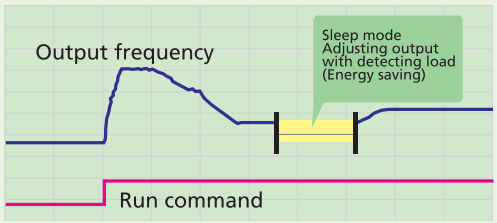
Convenience

Simple operation and easy maintenance features enhance your convenience.

Sleep and Wake-up Function

Energy savings are obtained through the sleep and wake-up functions, which enable the drive to automatically switch off during user-programmed low-load conditions and then to start up again when process demand increases.





Pre Heating Function

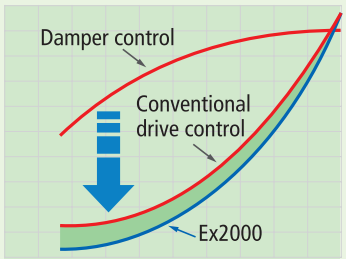
When using the drive in damp conditions, this function protects both the motor and the drive's output

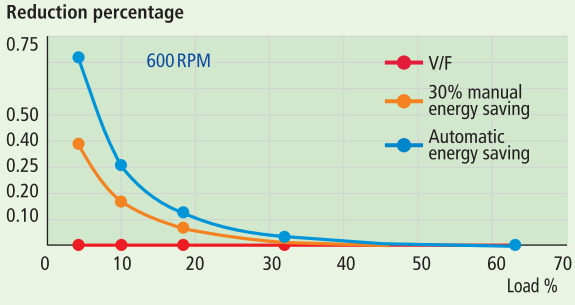
Flying Start Function

The Ex2000 detects the motor speed after a momentary power failure, enabling the motors to be smoothly re-accelerated without mechanical and electrical shock-loading to the system.

Automatic Energy Saving

Load change may incur energy losses. But the optimised flux control of the Ex2000 results in more outstanding energy-saving compared to previous models.



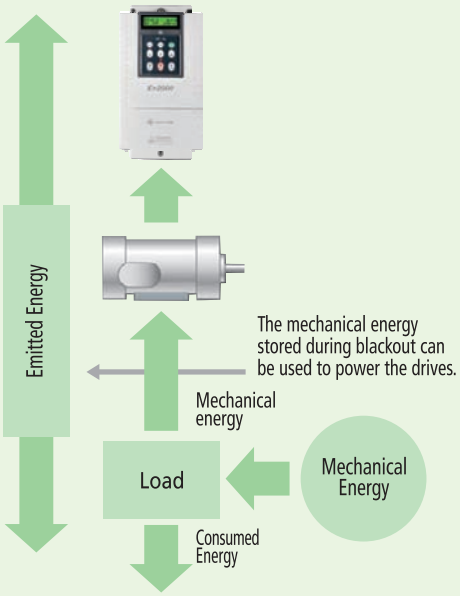


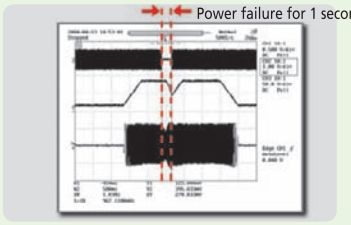
Constant and Stable Performance

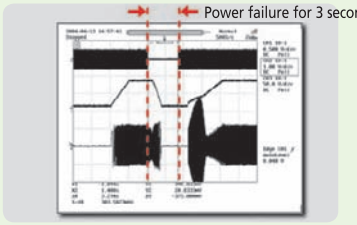
Despite external voltage fluctuations, the Ex2000 optimises motor performance.

Improved System Management during Power Dips and Momentary Power Outages

During power dips or momentary power outage, the drive's output can be maintained by utilising the residual mechanical energy in the load as a regenerative source. The duration of the power-dip ride-through depends on the load characteristics.





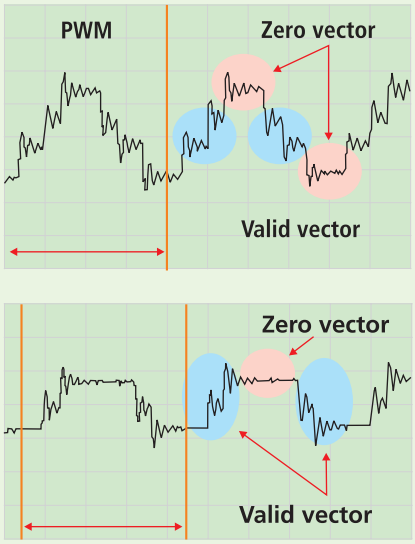


Safety Stop

During an unexpected power failure, the Ex2000 can bring the load to a controlled stop by utilising the inertial energy. This can prevent further process problems or accidents.

Current Leakage Reduction Algorithm

Under damp conditions, leakage currents can occur when using drives. These currents can cause a system failure. The Ex2000's low-leakage PWM algorithm reduces these leakage currents to ensure reliability of operation.



Flux Braking Algorithm

This algorithm reduces deceleration time, thus improving system efficiency.

Automatic Carrier Frequency Change

By taking ambient temperature into account, the Ex2000 can automatically adjust the carrier (modulation) frequency.

Protection

The Ex2000 has optimised protective functions, such as safety stop and pre-excitation of the motor.

Easy Start

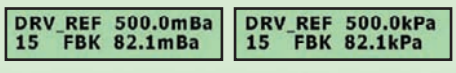
To turn the drive into 'Easy Start Mode' with FWD, REV and STOP commands, just press the STOP key for 2~3 seconds. SHIFT/ESC can return it to the previous mode.
Control method: V/F
Control frequency: Jog

1 NPN/PNP Input
The Ex2000 has both NPN and PNP input, and you can easily select either.

2 Abundant I/O Suggestion
The Ex2000 serves abundant I/O.

Digital Input	8 (Programmable NPN/PNP)
Digital Output	4 (R) (Programmable NO/NC) + 1 (TR)
Analog Input	1 (4 to 20mA) & 1 (0 to 10Vdc)
Analog Output	2 (0 to 10Vdc)
Pulse Input	1 Input (0 to 30kHz)
Pulse Output	1 Output (0 to 30kHz)
NTC/PTC Input	1

3 Various Units of I/O Display
The Ex2000 display can be calibrated in many different types of process units.



4 Built-in RS485 MODBUS (ASCII) and Optional Communication Cards
The built-in RS485 allows for communication without external option. However, the optional communication boards enable the Ex2000 to talk to BMS and most industrial systems.

5 Long-life Capacitor and Simple Framework
The Ex2000 adopts a long-life capacitor and enables easy maintenance in a simple framework.

6 Consumption Time Display
The Ex2000 displays consumption time of components so that users can replace them in time.

7 Others
- Removable terminal board
- External fan available
- Cooling fan on/off control

Standard Specification

Max Input Voltage	Three-Phase 380 ~ 480 VAC (-15% ~ +10%)
Rated Frequency	50/60Hz (-5/+5%)
Max Output Voltage	Proportional to Input Voltage
Max Output Frequency	0 to 120Hz
Keypad	Detachable LCD
DC Reactor	Built-in 22 to 280kW (ND)
Features	DC Braking, Reverse Rotation Prevention, Auto Restart, Inverter By-Pass, Auto-Tuning, PID Control, Flying Start, Safety Stop, Flux Braking, Low leakage, Pre-PID, Dual-PID, MMC, Easy Start, Pre-heater

Control

Control Methad	V/F, Sensorless Vector, Slip Compensation, Easy Start Selectable
Frequency Precision Setting	Digital Reference: 0.01 Hz (Below 100 Hz), 0.1 Hz (Over 100 Hz) Analog Reference: 0.01 Hz / 60 Hz
Frequency Control Range	0.01 to 120Hz
Output Frequency Resolution	0.01Hz below 100Hz, 0.1Hz over 100Hz
V/F Pattern	Linear, squared, user V/F
Overload Capacity	HD : 150% for 1min; ND: 110% for 1min
Starting Torque	200% at 0.5Hz for Sensorless Control
Accel/Decel Time	0.0 to 6000 Sec

Protective Function

Faults	Over Voltage, Low Voltage, Over Current, Ground Fault, Inverter Overheat, Motor Overheat, Output Phase Open, Overload Protection, External Fault 1, 2, Communication Error, Loss of Speed Command, Hardware Fault
Alarm	Stall Prevention, Overload Alarm, Thermal Sensor Fault
Trip Information	Max. 5 Faults are saved

Structure & Environment

Protection Degree	IP20 till 11kW & IP00 till 450kW
Ambient Temperature	HD operation: - 10 ~ 50°C (no freezing) ND operation: - 10 ~ 40°C (no freezing) (However, recommended to use load at 80% when using at 50°C in case of Normal Duty).
Storage Temperature	-20°C ~ 65°C
PCB Protection	Conformal Coating Complying to IEC 60721-3-3 class 3C2
Relative Humidity	Below relative humidity 90% RH (no condensation)
Altitude/Vibration	Below 1000m, 5.9m/sec^2 (0.6G)
Atmospheric Pressure	70~106 kPa
Installation Environment	Pollution degree 2, No Corrosive Gas, Combustible Gas, Oil Mist, or Dust
Global Compliance	CE, UL, RoHS

Motor Rating (Normal Duty)	Three-Phase 415V	Motor Rating (Normal Duty)	Three-Phase 415V
5.5kW (7.5HP)	LTVF-E40012BAA	75kW (100HP)	LTVF-E40152AAA
7.5kW (10HP)	LTVF-E40016BAA	90kW (125HP)	LTVF-E40183AAA
11kW (15HP)	LTVF-E40024BAA	110kW (150HP)	LTVF-E40223AAA
15kW (20HP)	LTVF-E40030AAA	132kW (200HP)	LTVF-E40264AAA
18.5kW (25HP)	LTVF-E40039AAA	160kW (250HP)	LTVF-E40325AAA
22kW (30HP)	LTVF-E40045AAA	220kW (300HP)	LTVF-E40432AAA
30kW (40HP)	LTVF-E40061AAA	280kW (350HP)	LTVF-E40547AAA
37kW (50HP)	LTVF-E40075AAA	315kW (400HP)	LTVF-E40613AAA
45kW (60HP)	LTVF-E40091AAA	375kW (500HP)	LTVF-E40731AAA
55kW (75HP)	LTVF-E40110AAA	450kW (600HP)	LTVF-E40877AAA

LTVF	—	E	4	0010	B	A	A
L&T Variable Frequency Drive		Series: Ex2000	Input Voltage: 4 = Three Phase 415[V]	Drive Current Rating: Normal Duty Amp	Enclosure: B = IP20; A = IP00	Reserved	Reserved

Input and Output: Input Voltage 415V (5.5~90kW)

LTVF-E4□□□□ □AA				0012	0016	0024	0030	0039	0045	0061	0075	0091	0110	0152	0183
Capacity [kVA][1]				9.6	12.7	19.1	23.9	31.1	35.9	48.6	59.8	72.5	87.6	121.1	145.8
Output ratings	Fan or pump load	Motor rating[2]	(HP)	7.5	10	15	20	25	30	40	50	60	75	100	125
			(kW)	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
		Current [A]		12	16	24	30	39	45	61	75	91	110	152	183
		(110% over current)		110% for 1 Minute (Normal Duty)											
	General load	Motor rating	(HP)	5.0	7.5	10	15	20	25	30	40	50	60	75	100
			(kW)	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75
		Current [A]		8.8	12	16	24	30	39	45	61	75	91	110	152
		(150% over current)		150% for 1 Minute (Heavy Duty)											
	Frequency			0.01~120 Hz											
	Voltage			380~480V[3]											
Input ratings	Voltage			3Phase 380~480V (-15%~+10%)											
	Frequency			50/60 Hz (± 5%)											
Protection degree				IP20			IP00								
DC Line Choke (DCL)				External Option					Built-in						

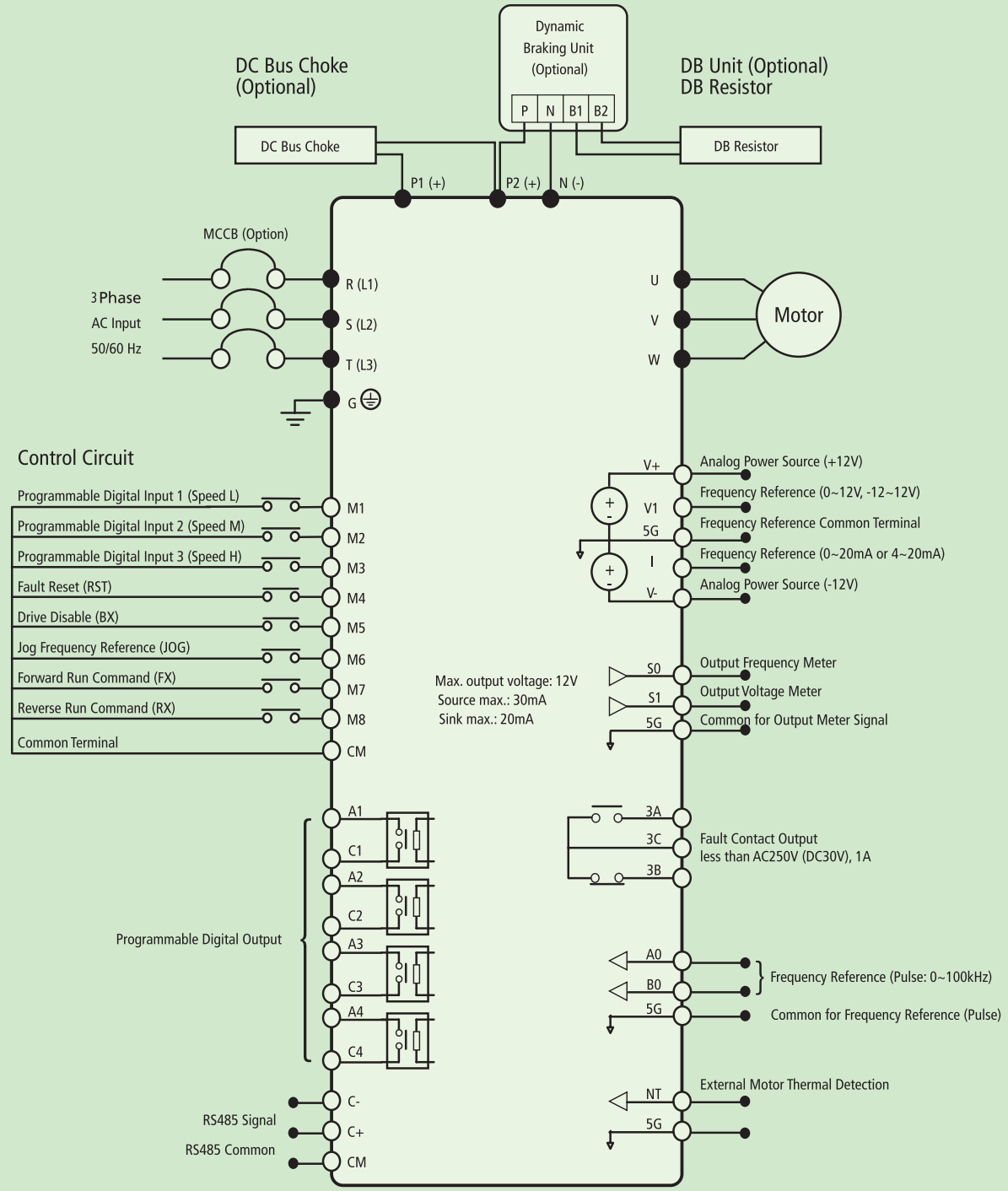
Input and Output: Input Voltage 415V (110~450kW)

LTVF-E4□□□□ □AA				0223	0264	0325	0432	0547	0613	0731	0877
Capacity [kVA][1]				178	210	259	344	436	488	582	699
Output ratings	Fan or pump load	Motor rating[2]	(HP)	150	200	250	300	350	400	500	600
			(kW)	110	132	160	220	280	315	375	450
		Current [A]		223	264	325	432	547	613	731	877
		(110% over current)		110% for 1 Minute (Normal Duty)							
	General load	Motor rating	(HP)	125	150	200	250	300	350	400	500
			(kW)	90	110	132	160	220	280	315	375
		Current [A]		183	223	264	325	432	547	613	731
		(150% over current)		150% for 1 Minute (Heavy Duty)							
	Frequency			0.01~120 Hz							
	Voltage			380~480V[3]							
Input ratings	Voltage			3Phase 380~480V (-15%~+10%)							
	Frequency			50/60 Hz (± 5%)							
Protection degree				IP00							
DC Line Choke (DCL)				Built-in					External Option		

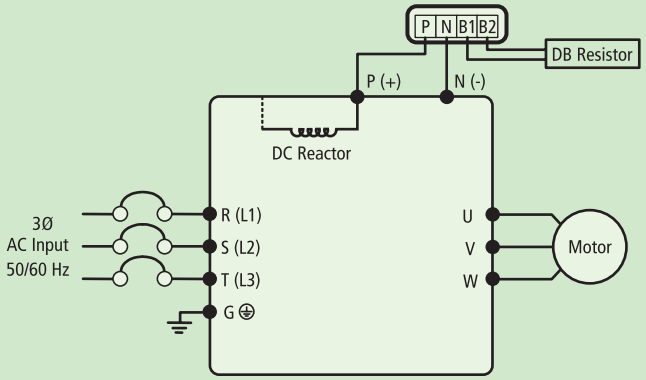
1) Rated capacity (1.732 x V x I) is based on 460V.
2) Indicates the maximum applicable capacity when using a 4-Pole motor.
3) Maximum output voltage will not exceed the input voltage. An output voltage less than the input voltage may be programmed if necessary.

For 5.5 ~ 18.5kW (12 ~ 39Amp) & 315~450kW (617~ 877Amp)

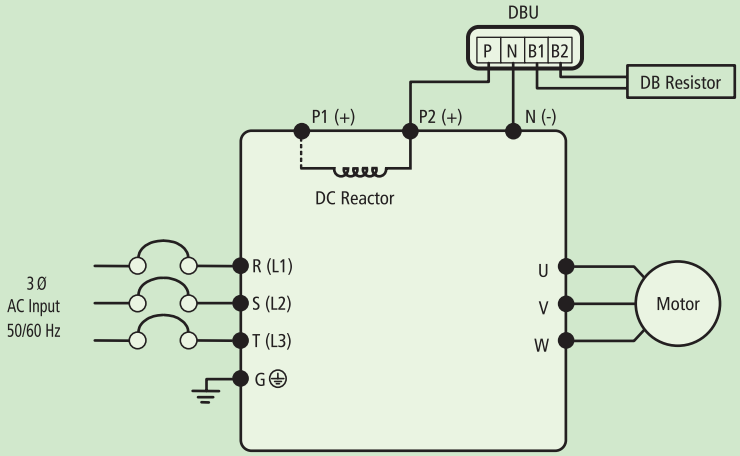
Main Power Circuit



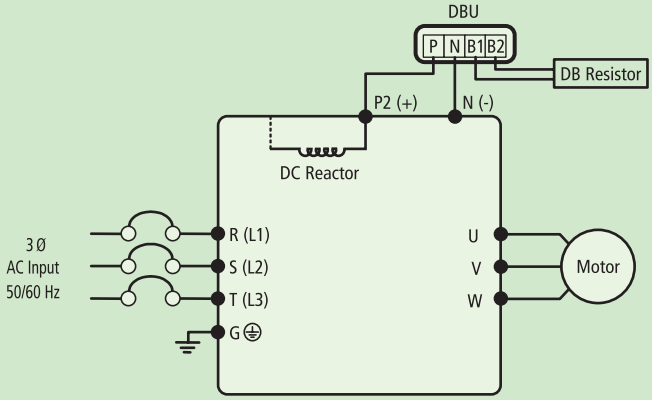
For 22 & 30kW - (45 ~ 61Amp) Built-in DCL



For 37 ~ 90kW - (75 ~ 183Amp) Built-in DCL

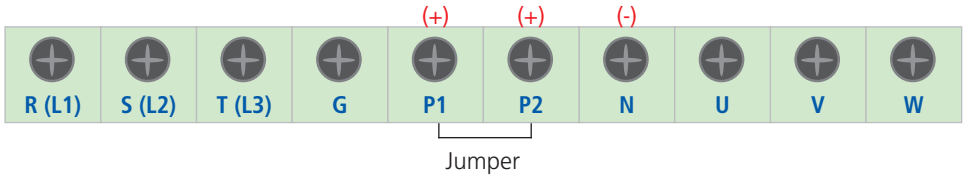


For 110 ~ 280kW - (223 ~ 547Amp) Built-in DCL

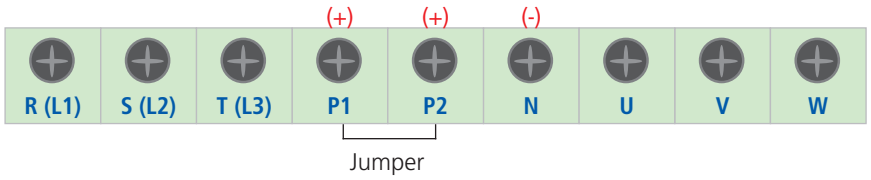


Note: Control Circuit Diagram remain the same

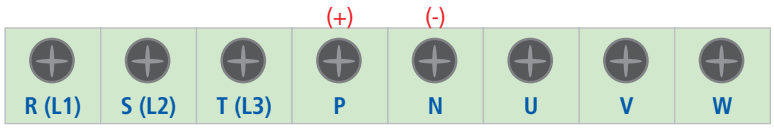
5.5~18.5kW - (12 ~ 39Amp)



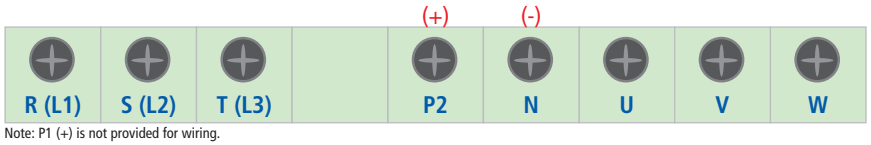
315~450kW - (613 ~ 877Amp)



22 & 30kW - (45 ~ 61Amp)



37 ~ 90kW - (75 ~ 183Amp) and 110 ~ 280kW - (223 ~ 547Amp)



Note: P1 (+) is not provided for wiring.

Symbol	Description
R, S, T (L1, L2, L3)	AC Line Voltage Input
G	Earth Ground
P1 (+), P2 (+)	External DC Reactor [P1 (+)-P2 (+)] Connection Terminals (Jumper must be removed).
P2 (+), N (-) or P (+), N (-)	DB Unit [P2 (+)-N (-)] Connection Terminals
U, V, W	3-Phase Power Output Terminals to Motor

Grounding

Drive Capacity		Grounding wire Sizes, kcmil (mm²)
kW	HP	415V
5.5 ~ 7.5	7.5 ~ 10	12 (3.5)
11 ~ 15	15 ~ 20	8 (8)
18.5 ~ 30	25 ~ 40	6 (14)
37 ~ 55	50 ~ 75	4 (22)
75 ~ 90	100 ~ 125	2 (38)
110 ~ 132	150 ~ 200	1/0 (60)
160 ~ 280	250 ~ 350	4/0 (100)
315 ~ 375	400 ~ 600	300 (150)
450	700	400 (200)

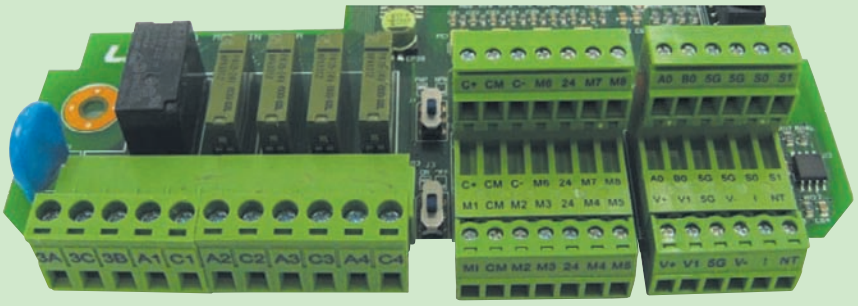
Wires & Terminal lugs

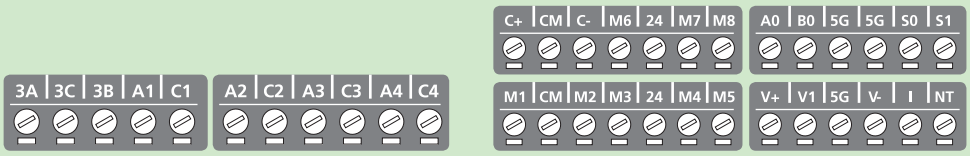
Refer to the table below for wires, terminal lugs, and screws used to connect the drive power input and output.

	Drive Cat. No.	Terminal screw size	Screw torque		W ire size			
					R(L1), S(L2), T(L3)		U, V, W	
			Kgf - cm	lb - in	mm²	AWG	mm²	AWG
415V Class	LTVF-E40012BAA	M4	7.1~12.2	6.2~10.6	3.5	12	3.5	12
	LTVF-E40016BAA	M4	7.1~12.3	6.2~10.7	3.5	12	3.5	12
	LTVF-E40024BAA	M4	7.1~12.4	6.2~10.8	5.5	10	5.5	10
	LTVF-E40030AAA	M6	30.6~38.2	26.6~33.2	8	8	8	8
	LTVF-E40039AAA	M6	30.6~38.3	26.6~33.3	14	6	14	6
	LTVF-E40045AAA	M8	61.2~91.8	53.1~79.7	22	4	22	4
	LTVF-E40061AAA	M8	61.2~91.8	53.1~79.7	22	4	22	4
	LTVF-E40075AAA	M8	61.2~91.8	53.1~79.7	38	2	38	2
	LTVF-E40091AAA	M8	61.2~91.9	53.1~79.8	38	2	38	2
	LTVF-E40110AAA	M8	61.2~91.9	53.1~79.8	38	2	38	2
	LTVF-E40152AAA	M10	89.7~122.0	77.9~105.9	60	1/0	60	1/0
	LTVF-E40183AAA	M10	89.7~122.0	77.9~105.9	60	1/0	60	1/0
	LTVF-E40223AAA	M12	182.4~122.0	158.3~186.6	100	4/0	100	4/0
	LTVF-E40264AAA	M12	182.4~122.0	158.3~186.6	100	4/0	100	4/0
	LTVF-E40325AAA	M12	182.4~122.1	158.3~186.7	150	300	150	300
	LTVF-E40432AAA	M12	182.4~122.2	158.3~186.8	200	12	3.5	12
	LTVF-E40547AAA	M12	182.4~122.3	158.3~186.9	250	12	3.5	12
	LTVF-E40613AAA	M12	182.4~122.4	158.3~186.1	325	12	3.5	12
	LTVF-E40731AAA	M12	182.4~122.5	158.3~186.1	2x20	2x400	2x200	2x400
	LTVF-E40877AAA	M12	182.4~122.6	158.3~186.2	2x20	2x500	2x250	2x500

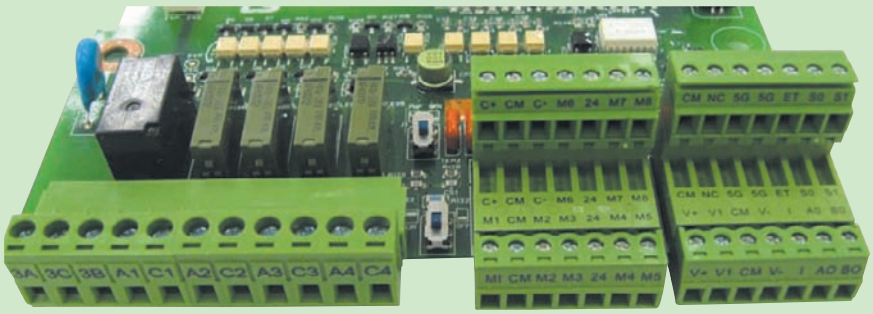
- Apply the rated torque to terminal screws.
- Loose screws can cause of short circuit or malfunction. Tightening the screw too much can damage the terminals and cause a short circuit or malfunction.
- Use copper wires only with 600V, 75°C ratings. For 7.5~11kW 240V type drives, R(L1), S(L2), T(L3) and U, V, W terminals are only for use with insulated ring type connector.

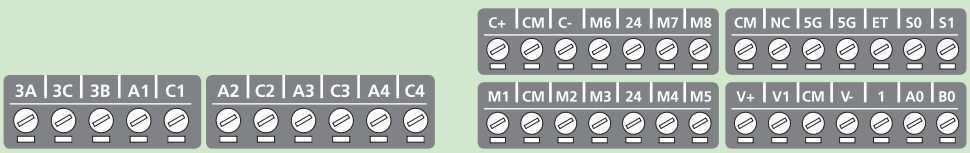
5.5~30kW / 7.5~40HP





37~450 kW/50~600HP





Terminal Configurations (Power Circuit Terminal)

Type		Symbol	Name	Description
Input Signal	Starting Contact Function Select	M1, M2, M3	Programmable Digital Input 1, 2, 3	Defines programmable digital inputs (Factory setting : Multi-step frequency 1,2,3)
		FX [M7] Command	Forward Run	Forward run when closed and stopped when open
		RX [M8] Command	Reverse Run	Reverse run when closed and stopped when open
		JOG [M6]	Jog Frequency Reference	Runs at jog frequency when the jog signal is on. The direction is set by the FX (or RX) signal
		BX [M5]	Emergency Stop	When the BX signal is ON, the output of the drive is turned off. When motor uses an electrical brake to stop, BX is used to turn off the output signal. Take caution when BX signal is off (Not turned off by latching) and FX signal (or RX signal) is on. Under these conditions, the motor will run!
		RST [M4]	Fault Reset	Used for fault reset.
		CM (NPN)	Sequence Common	Common terminal for NPN contact
		24 (PNP)	Sequence Common	Common 24V terminal for PNP contact input. Maximum output : +24V, 100mA
	Analog Frequency Setting	V +, V- (+12V,-12V)	Analog Power Source	Power supply for analog frequency setting. Maximum output : +12V, 100mA, -12V, 100mA
		V1 (Voltage)	Frequency Reference	Used by a DC 0~12V or -12~12V input to set the frequency reference. (Input impedance is 20k Ω)
		I	Frequency Reference (Current)	Used by a 0-20mA input to set the frequency reference. (Input impedance is 249 Ω)
		A0, B0 (Pulse)	Frequency Reference	Used by a pulse input to set the frequency reference.
		5G (~30kW) CM (37kW~)	Frequency Reference Common Terminal	Common terminal for analog frequency reference signal
	External Motor Thermal Detection	NT (~30kW) ET (37kW~)	External Motor Thermal Detection	Motor thermal sensor input. Used to prevent motor from overheating by using a NTC or PTC thermal sensor.
		5G	Common for NT (or ET)	Common terminal for external motor thermal detection
Built-in RS485 Terminal		C +, C-	Rs485 signal High, Low	RS485 signal (See RS485 communication in manual for more details.)
		CM	RS485 common	Common ground. Terminal for RS485 interface.
Output Signal	Analog Output	S0, S1	Programmable Voltage Output	Voltage output for one of the following : Output frequency, output current, output voltage, DC link voltage. Default is set to output frequency. (Maximum output voltage and output current are 0-12V and 1mA)
		5G	Analog Common Terminal	Common terminal for analog output (S0, S1)
	Contact	3A, 3C, 3B	Fault Contact Output	Energizes when a fault is present. (AC250V, 1A; DC30V, 1A) Fault : 3A-3C closed (3B-3C open) Normal : 3B-3C closed (3A-3C open)
		A1~4, C1~4 Digital	Programmable Output	Defined by programmable digital output terminal settings (AC250V, 1A or less; DC30V, 1A or less)

LCD Operator

32-character, background light, LCD display.
Adjustable background tone.

- Data set-up start

- Shift between function groups
- Shifting from group code to the upper code

- Data set-up completion

- Shift to function code
- Shift to next function code
- Data is increased in set-up mode

- Decimal point shift
- Only available in case of data set-up

- Reverse run command key
- Only available with loader operation
- LED is turned ON with reverse run
- Blinks during Acc/Deceleration of reverse run

- Forward run command key
- Only available with loader operation
- LED is turned ON with forward run
- Blinks during Acc/Deceleration of forward run

- Shift to function code
- Shift to previous code
- Data is decreased in set-up mode

- Stop command
- Available with the loader operation
- LED is turned on when drive stops its operation
- Blinks when fault occurs
- Reset
- Fault reset

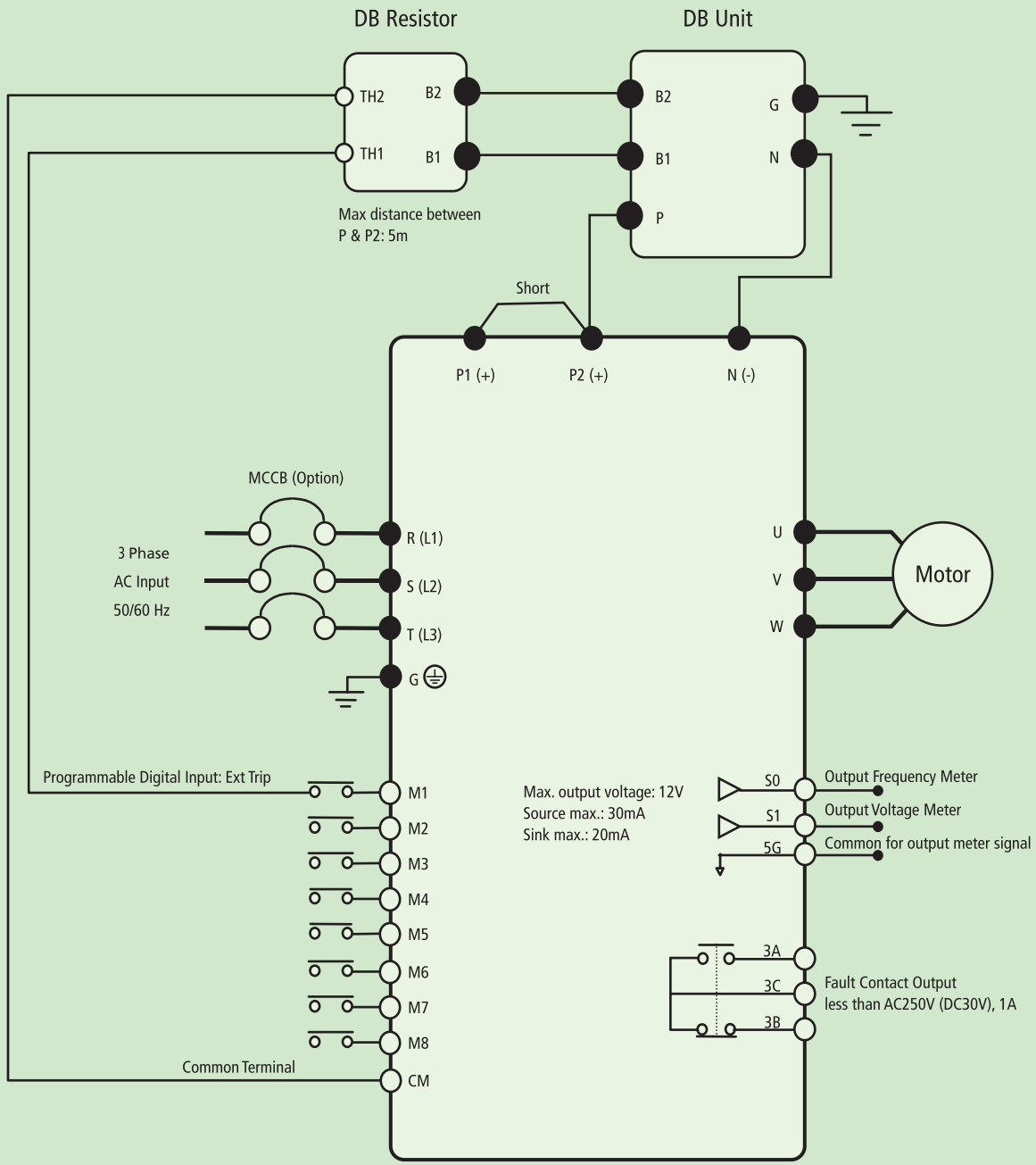
MCCB (Molded Case Circuit Breaker) and MC (Magnetic Contactor)

Voltage	Motor [kW]	Drive Cat. No.	MCCB (L&T)		MC (L&T)
			HD(Amp)	ND(Amp)	
Three Phase 415V	5.5	LTVF-E40012BAA	DM16/16	DM100/25	MO 25
	7.5	LTVF-E40016BAA	DM100/25	DM100/30	MO 25
	11	LTVF-E40024BAA	DM100/30	DM100/50	MO 32
	15	LTVF-E40030AAA	DM100/50	DM100/50	MO 50
	18.5	LTVF-E40039AAA	DM100/50	DM100/70	MO 70
	22	LTVF-E40045AAA	DM100/70	DM100/80	MO 80
	30	LTVF-E40061AAA	DM100/80	DN2-250M/100	MO 95
	37	LTVF-E40075AAA	DN2-250M/100	DN2-250M/125	MNX 140
	45	LTVF-E40091AAA	DN2-250M/125	DN2-250M/160	MNX 185
	55	LTVF-E40110AAA	DN2-250M/160	DN2-250M/200	MNX 225
	75	LTVF-E40152AAA	DN2-250M/200	DN3-400M/320	MNX 325
	90	LTVF-E40183AAA	DN2-250M/250	DN3-400M/320	MNX 400
	110	LTVF-E40223AAA	DN3-400M/320	DN3-400M/400	MNX 550
	132	LTVF-E40264AAA	DN3-400M/400	DN3-630M/500	MNX 650
	160	LTVF-E40325AAA	DN3-630M/500	DN3-630M/630	MNX 650
	220	LTVF-E40432AAA	DTH800/800	C-Power ACB/1000	800
	280	LTVF-E40547AAA	C-Power ACB/1000	C-Power ACB/1250	1000
	315	LTVF-E40613AAA	C-Power ACB/1250	C-Power ACB/1250	1200
	375	LTVF-E40731AAA	C-Power ACB/1250	C-Power ACB/1600	1400
	450	LTVF-E40877AAA	C-Power ACB/1600	C-Power ACB/2000	1600

AC Input Fuse

Voltage	Motor [kW]	Drive Cat. No.	AC Input Fuse [A]	AC Reactor		DC Reactor	
				[mH]	[A]	[mH]	[A]
Three Phase 415V	5.5	LTVF-E40012BAA	20	1.22	15	5.34	14
	7.5	LTVF-E40016BAA	30	1.14	20	4.04	19
	11	LTVF-E40024BAA	40	0.81	30	2.76	29
	15	LTVF-E40030AAA	60	0.61	38	2.18	36
	18.5	LTVF-E40039AAA	70	0.45	50	1.79	48
	22	LTVF-E40045AAA	80	0.39	58	Built-in	
	30	LTVF-E40061AAA	100	0.287	80	Built-in	
	37	LTVF-E40075AAA	125	0.232	98	Built-in	
	45	LTVF-E40091AAA	150	0.195	118	Built-in	
	55	LTVF-E40110AAA	175	0.157	142	Built-in	
	75	LTVF-E40152AAA	250	0.122	196	Built-in	
	90	LTVF-E40183AAA	300	0.096	237	Built-in	
	110	LTVF-E40223AAA	350	0.081	289	Built-in	
	132	LTVF-E40264AAA	400	0.069	341	Built-in	
	160	LTVF-E40325AAA	450	0.057	420	Built-in	
	220	LTVF-E40432AAA	700	0.042	558	Built-in	
	280	LTVF-E40547AAA	800	0.029	799	Built-in	
	315	LTVF-E40613AAA	900	0.029	799	0.09	836
	375	LTVF-E40731AAA	1000	0.024	952	0.076	996
	450	LTVF-E40877AAA	1200	0.024	952	0.064	1195

Wiring for DB unit and DB resistor (for 5.5~90kW/7.5~125HP drives)



DB resistor terminal	Description
B1, B2	Wire terminal properly based on wiring block diagram. Connect a DB resistor to the DB Unit's B1, B2 terminals.
TH1, TH2	Thermal sensor terminal of DB resistor. Normal temperature (Ambient): Contact ON (TH1-TH2 closed) DB resistor overheated: Contact OFF (TH1-TH2 open). Wire it to the drive terminal defined as 'External Trip'.

DBU and External DB resistor specification

The Ex2000 does not have built-in DB resistor on power stack as factory installation. External DB Unit (from 11kW) and Resistor (Optional) should be installed. Refer to the following table for more details (ED: 5%, Continuous Braking Time: 15 sec).
If Enable duty (%ED) is increased to 10%, use an external DB resistor with double the wattage rating.

Applied motor capacity (kW/HP)		Operating rate (ED/Continuous Braking Time)	100 % Braking Torque		150% Braking Torque		DB Unit
			[Ω]	[W]	[Ω]	[W]	
Three Phase 415V	5.5/7.5	5%/15 sec	120	700	85	1000	Built-in
	7.5/10	5%/15 sec	90	1000	60	1200	Built-in
	11/15	5%/15 sec	60	1400	40	2000	LTDBU-0150
	15/20	5%/15 sec	45	2000	30	2400	
	18.5/25	5%/15 sec	35	2400	20	3600	LTDBU-0220
	22/30	5%/15 sec	30	2800	20	3600	
	30/40	10%/6 sec	16.9	6400	-	-	LTDBU-0550
	37/50	10%/6 sec	16.9	6400	-	-	
	45/60	10%/6 sec	11.4	9600	-	-	LTDBU-0370
	55/75	10%/6 sec	11.4	9600	-	-	
	75/100	10%/6 sec	8.4	12800	-	-	LTDBU-0750
	90/125	10%/6 sec	8.4 (2 nos.)	12800	-	-	LTDBU-0750 (2 nos.)

Note: Please contact your nearest L&T branch office for ratings from 110~450 kW

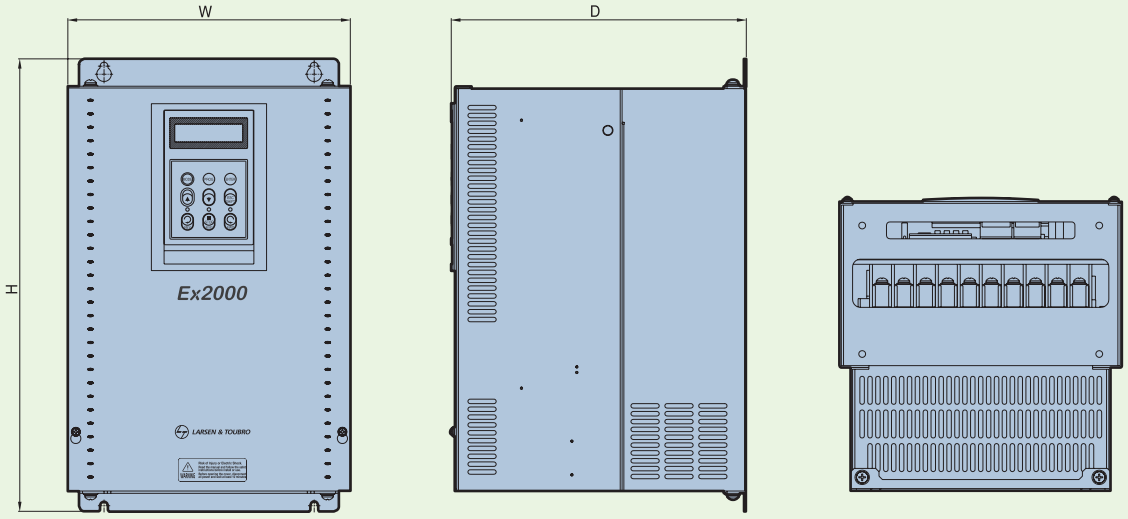
DBU Terminal Configuration

Terminals	Description	Terminals	Description
G	Ground terminal	CM	OH common
B2	Connect to DB Resistor's B2	OH*	Overheat trip output terminal (Open collector output: 20mA, 27V DC)
B1	Connect to DB Resistor's B1		
N	Connect to drive terminal N		
P	Connect to drive terminal P1		

Optional Devices

Keypad	LCD	32 character display keypad Download and Upload available	All units
Remote	Remote cable	2m, 3m and 5m long keypad cable enables users to control the drive from a distant area	Optional
Dynamic braking	DB resistor	To enhance the regenerative braking performance, it makes the drive to accelerate/decelerate rapidly	According to drive capacity
	DB unit	If it need a regenerative braking, it is used with DB resistor	
Communication option card	DEVICENET (LTCI-DEN-E)	DEVICENET optional communication card	All series (Above S/W V10)
	PROFIBUS (LTCI-PDP-E)	PROFIBUS optional communication card	All series (Above S/W V10)
	MODBUS_TCP (LTCI-TCP-E)	MODBUS_TCP optional communication card	All series (Above S/W V10)

5.5~450 kW, 415V



Note: This image is only for reference, please refer technical manual for more details.

Drive Cat. No.	W (mm)	H (mm)	D (mm)	Weight (kg)
LTVF-E40012BAA	150	284	156.5	5
LTVF-E40016BAA	200	284	182	6.1
LTVF-E40024BAA	200	284	182	6.1
LTVF-E40030AAA	250	385	201	12.6
LTVF-E40039AAA	250	385	201	13.1
LTVF-E40045AAA	260	480	268.6	26.6
LTVF-E40061AAA	260	480	268.6	26.6
LTVF-E40075AAA	300	684	265.6	39
LTVF-E40091AAA	300	684	265.6	39.8
LTVF-E40110AAA	300	684	292.6	41.5
LTVF-E40152AAA	370	760	337.6	67
LTVF-E40183AAA	370	760	337.6	68
LTVF-E40223AAA	510	784	422.6	101
LTVF-E40264AAA	510	784	422.6	101
LTVF-E40325AAA	510	861	422.6	114
LTVF-E40432AAA	690	1,078	449.6	200
LTVF-E40547AAA	690	1,078	449.6	200
LTVF-E40613AAA	772	1,140	422	243
LTVF-E40731AAA	922	1,302.50	495	380
LTVF-E40877AAA	922	1,302.50	495	380

Electrical Standard Products (ESP) Branch Offices:

REGISTERED OFFICE AND HEAD OFFICE
L&T House, Ballard Estate
P. O. Box 278
Mumbai 400 001
Tel: 022-67525656
Fax: 022-67525858
Website: www.Larsentoubro.com

ELECTRICAL STANDARD PRODUCTS (ESP)
501, Sakar Complex I
Opp. Gandhigram Rly. Station
Ashram Road
Ahmedabad 380 009
Tel: 079-66304006-11
Fax: 079-66304025
e-mail: esp-ahm@LNTEBG.com

38, Cubbon Road, P. O. Box 5098
Bangalore 560 001
Tel: 080-25020100 / 25020324
Fax: 080-25580525
e-mail: esp-blr@LNTEBG.com

131/1, Zone II
Maharana Pratap Nagar
Bhopal 462 011
Tel: 0755-3080511 / 05 / 08 / 13 / 17 / 19
Fax: 0755-3080502
e-mail: esp-bho@LNTEBG.com

Plot No. 559, Annapurna Complex
Lewis Road
Bhubaneswar 751 014
Tel: 0674-6451342, 2436690, 2436696
Fax: 0674-2537309
e-mail: nayakd@LNTEBG.com

Aspire Towers, 4th Floor
Plot No. 55, Phase-I
Industrial & Business Park
Chandigarh-160 002
Tel: 0172-4646840 / 41 / 42 / 46 / 53
Fax: 0172-4646802
Email: esp-chd@Lntebg.com

L&T Construction Campus
TC-1 Building, II Floor
Mount-Poonamallee Road
Manapakkam
Chennai 600 089
Tel: 044-2270 6800
Fax: 044-22706940
e-mail: esp-maa1@LNTEBG.com

67, Appuswamy Road
Post Bag 7156
Opp. Nirmala College
Coimbatore 641 045
Tel: 0422-2588120 / 1 / 5
Fax: 0422-2588148
e-mail: esp-cbe@LNTEBG.com

Khairasol, Degaul Avenue
Durgapur 713 212
Tel: 2559848, 2559849, 2559844
Fax: 0343-2553614
e-mail: esp-dgp@LNTEBG.com

5, Milanpur Road, Bamuni Maidan
Guwahati 781 021
Tel: +91 8876554410 / 8876554417
Fax: 361-2551308
e-mail: hazrasudipto@LNTEBG.com

II Floor, Vasantha Chambers
5-10-173, Fateh Maidan Road
Hyderabad 500 004
Tel: 040-67015052
Fax: 040-23296468
e-mail: esp-hyd@LNTEBG.com

Monarch Building, 1st Floor
D-236 & 237, Amrapali Marg
Vaishali Nagar
Jaipur 302 021
Tel: 0141-4385914 to 18
Fax: 0141-4385925
e-mail: esp-jai@LNTEBG.com

Akashdeep Plaza, 2nd Floor
P. O. Golmuri
Jamshedpur 831 003
Jharkhand
Tel: 0657-2312205 / 38
Fax: 0657-2341250
e-mail: esp-jam@LNTEBG.com

Skybright Bldg; M. G. Road
Ravipuram Junction, Ernakulam
Kochi 682 016
Tel: 0484-4409420 / 4 / 5 / 7
Fax: 0484-4409426
e-mail: esp-cok@LNTEBG.com

3-B, Shakespeare Sarani
Kolkata 700 071
Tel: 033-44002572 / 3 / 4
Fax: 033-22821025 / 7587
e-mail: esp-ccu@LNTEBG.com

A28, Indira Nagar, Faizabad Road
Lucknow 226 016
Tel: 0522-4929905 / 04
Fax: 0522-2311671
e-mail: esp-Lko@LNTEBG.com

No: 73, Karpaga Nagar, 8th Street
K. Pudur
Madurai 625 007
Tel: 0452-2537404, 2521068
Fax: 0452-2537552
e-mail: esp-mdu@LNTEBG.com

L&T Business Park,
Tower 'B' / 5th Floor
Saki Vihar Road, Powai
Mumbai 400 072
Tel: 022-67052874 / 2737 / 1156
Fax: 022-67051112
e-mail: esp-bom@LNTEBG.com

12, Shivaji Nagar
North Ambajhari Road
Nagpur 440 010
Tel: 0712-2260012 / 6606421
Fax: 2260030 / 6606434
e-mail: esp-nag@LNTEBG.com

32, Shivaji Marg
P. O. Box 6223
New Delhi 110 015
Tel: 011-41419514 / 5 / 6
Fax: 011-41419600
e-mail: esp-del@LNTEBG.com

L&T House
P. O. Box 119
191/1, Dhole Patil Road
Pune 411 001
Tel: 020-66033395 / 66033279
Fax: 020-26164048 / 26164910
e-mail: esp-pnq@LNTEBG.com

Crystal Tower,
4th Floor, G. E. Road
Telibandha
Raipur - 492 006
Tel: 0771-4283214
e-mail: esp-raipur@LNTEBG.com

3rd Floor
Vishwakarma Chambers
Majura Gate, Ring Road
Surat 395 002
Tel: 0261-2473726
Fax: 0261-2477078
e-mail: esp-sur@LNTEBG.com

Radhadaya Complex
Old Padra Road
Near Charotar Society
Vadodara 390 007
Tel: 0265-6613610 / 1 / 2
Fax: 0265-2336184
e-mail: esp-bar@LNTEBG.com

Door No. 49-38-14/3/2, 1st floor,
NGGO's Colony, Akkayyapalem,
Visakhapatnam - 530 016
Tel: 0891 2791126, 2711125
Fax.: 0891 2791100
Email: esp-viz@LNTEBG.com

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Web: www.Lntebg.com