

› High on **compactness**
big on reliability



Cx2000 | AC Drive

Single Phase 230V (0.1 ~ 2.2kW)

Three Phase 230V (0.2 ~ 11kW)

Three Phase 415V (0.75 ~ 11kW)

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.



Cx2000 | AC Drive

› The new **reliability** edge

The Cx2000 adds a new dimension to L&T's AC drive solutions. Built to L&T's stringent quality standards, the Cx2000 is tested and certified to meet global benchmarks, thus giving you the assurance of total reliability.



Cx2000

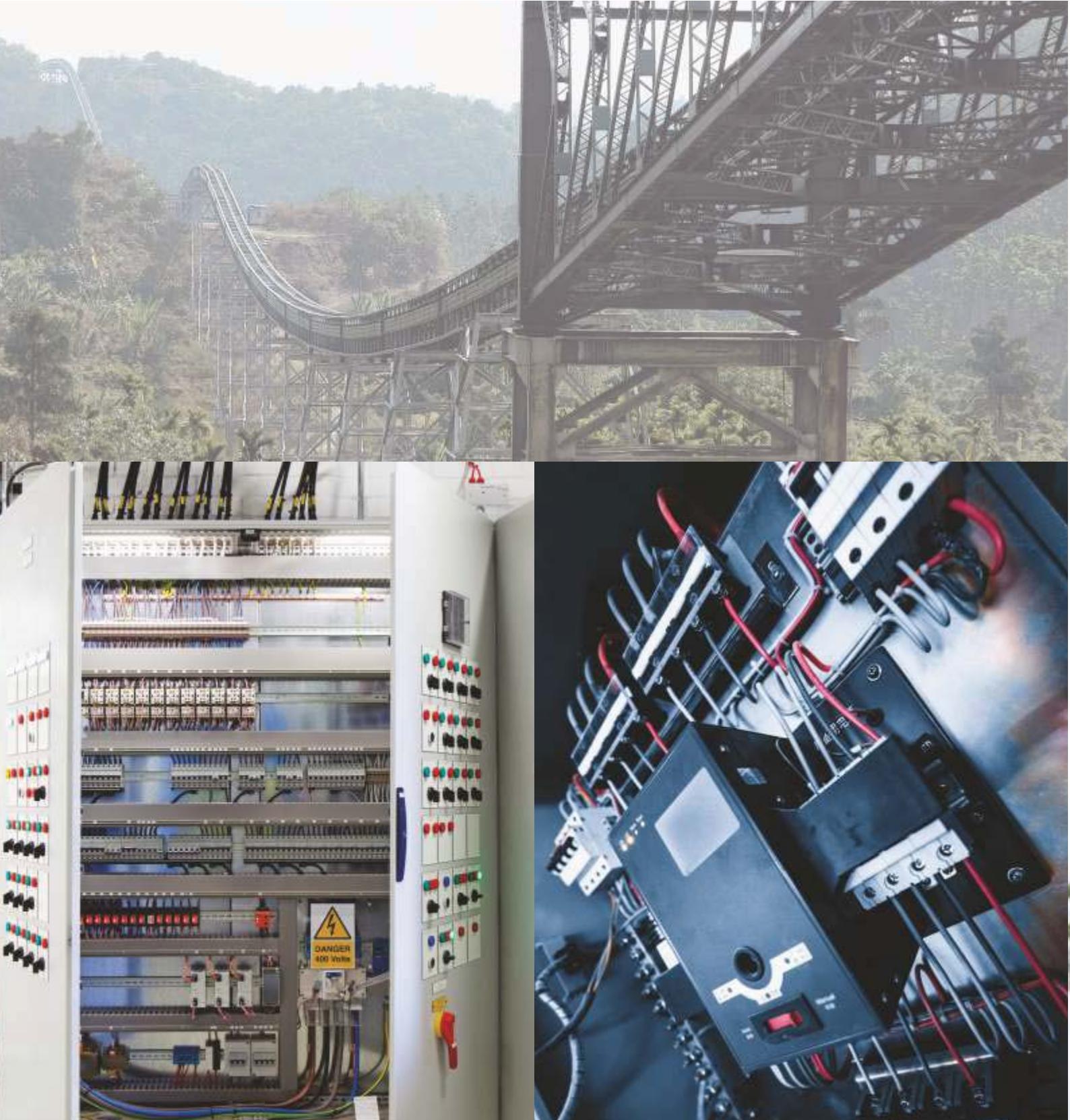


LARSEN & TOUBRO



Risk of Injury or Electric Shock.
Read the manual and follow the safety
instructions before install or use.
Before opening the cover, disconnect
all power and wait at least 10 minutes.

Compact, lightweight, easy to install, operate and service – the CX2000 is perfectly suited for conveyors, pumps, fans and textile machinery. It handles loads up to 11 kW, and is engineered to keep your machine operating at optimum efficiency, even in the hot, humid and dusty conditions that characterise India's industrial environment.



➤ **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 machines 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 Cx2000 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.

Rapid Response Service Team





➤ **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, 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, minimizing 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



- Sensorless Vector Control
- Integrated Potentiometer
- Inbuilt PID
- Torque Boost for Forward and Reverse direction
- Draw Mode
- Hardware Base Block
- Inbuilt 24V power source
- Component Life Monitor
- RS485 Modbus Communication

Cx2000

Provides Optimized Solutions to Global Customers

the cost effective and easy-to-install, compact drive will enhance your machine's performance



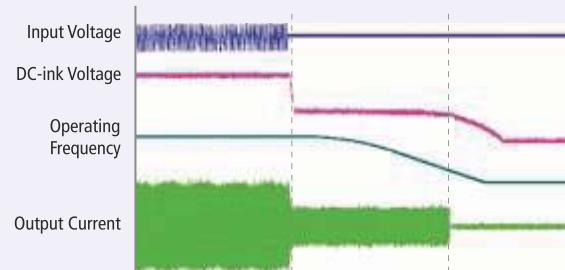
Side-by-Side Installation

The panel size can be significantly reduced thanks to the Cx2000's side-by-side installation.



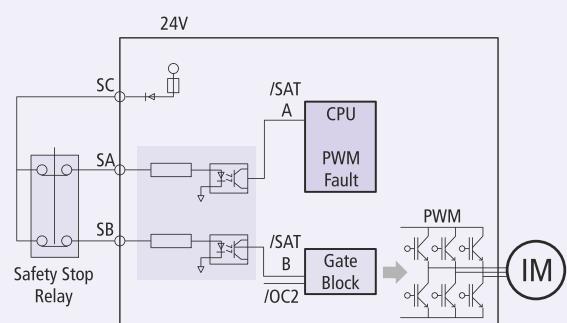
KEB for Safe Operating Stop in the Event of Power Failure

By using the regenerated power from the decelerating load, the KEB function automatically protects the machine by providing safe (controlled) braking in case of a power outage.



Compliance with Safety Requirements

- If a machine needs safe standstill functionality in case of emergency, the connection of SA, SB, and SC terminals that is shorted normally will be opened to block the drive output.
- Easy to comply with safety requirements at the system level by adding safe input functions complying with EN ISO 13849-1 Pld and EN61508SIL2 [EN60204-1, stop category 0]





Cx2000

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Risk of Injury or Electric Shock.
Read the manual and follow the safety
instructions before install or use.
Before opening the cover, disconnect
all power and wait at least 10 minutes.



WARNING

› Convenient

Simple operation and
easy maintenance features
enhance your
convenience.





➤ User Convenience through Simple Operation

Integrated Potentiometer

- Possible to add reference from keypad and external signal
- Provides external potentiometer for easier frequency control
- Additional 0~5V analog input for frequency control

➤ Easy Fan Maintenance

You can easily replace a fan without opening the drive cover



➤ Dual Rating

Designed to select between heavy and light load

Overload	Heavy load operation: 150% of rated current, 60 sec.
Withstand	Light load operation: 110% of rated current, 60 sec.

➤ PC-based Software for Easy Maintenance of Drive and Motor Parameters

DriveConnect software allows drive/system monitoring on a PC and easy maintenance of drive and motor parameters

- Windows-based graphic user interface (GUI)
- Modbus-RTU
- Connecting up to 31 drives
- Integrated control console
- Offline editing function
- Data upload/download
- 4-channel oscilloscope
- Trigger function



Motor Rating	Single-Phase 230V Heavy Duty	Three-Phase 230V Normal Duty	Three-Phase 415V Normal Duty
0.1 kW	LTVF-C10001BAA		
0.2 kW	LTVF-C10002BAA	LTVF-C20001BAA	
0.4 kW	LTVF-C10003BAA	LTVF-C20002BAA	
0.75 kW	LTVF-C10005BAA	LTVF-C20003BAA	LTVF-C40002BAA
1.1kW		LTVF-C20006BAA	LTVF-C40003BAA
1.5 kW	LTVF-C10008BAA		
2.2 kW	LTVF-C10011BAA	LTVF-C20010BAA	LTVF-C40005BAA
3 kW		LTVF-C20012BAA	LTVF-C40007BAA
4 kW		LTVF-C20018BAA	LTVF-C40010BAA
7.5 kW		LTVF-C20030BAA	LTVF-C40016BAA
11 kW	LTVF-C20040BAA		LTVF-C40023BAA

LTVF	-	C	4	0010	B	A	A
L&T Variable Frequency Drive		Series	Input Voltage	Drive Current Rating	Enclosure	Reserved	Reserved
	Cx2000	1	Single-Phase 200~240[V]	Normal Duty Amp	B	IP20	
		2	Three-Phase 200~240[V]				
		4	Three-Phase 380~480[V]				

➤ Input and Output Specifications: **Input Voltage Single-phase (230V)**

LTVF-C1 □□□□ BAA		0001	0002	0003	0005	0008	0011
Applicable Motor ²⁾	HP	1/8	1/4	1/2	1	2	3
	kW (HD)	0.1	0.2	0.4	0.75	1.5	2.2
Output Ratings	Rated Capacity [kVA] (HD)	0.3	0.5	1.0	1.9	3.0	4.2
	Rated Current [A] ²⁾ (HD)	0.8	1.4	2.5	5.0	8.0	11
	Max. Output Frequency	400 [Hz] ³⁾					
	Max. Output Voltage [V]	Three-Phase 200 ~ 240V ⁴⁾					
Input Ratings	Rated Voltage [V]	Single-Phase 200 ~ 240 VAC (-15% ~ +10%)					
	Rated Current [A]	1.4	2.8	5.5	11	14.1	24
	Rated Frequency	50 ~ 60 [Hz] ($\pm 5\%$)					
Cooling Type		Natural Cooling			Forced Cooling		

Input and Output Specifications: Input Voltage Three-phase (230V)

LTVF-C2 □□□□ BAA			0001	0002	0003	0006	0010	0012	0018	0030	0040	
Applicable Motor ¹⁾	HD	[HP]	0.12	0.25	0.5	1	2	3	5	7.5	10	
		[kW]	0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	
	ND	[HP]	0.25	0.5	1	1.5	3	4	5.4	10	15	
		[kW]	0.2	0.4	0.75	1.1	2.2	3.0	4.0	7.5	11.0	
Output Ratings	Rated Capacity [kVA]	HD	0.3	0.5	1.1	1.9	3.0	4.	6.1	9.1	12.2	
		ND	0.4	0.7	1.3	2.4	3.8	5.2	7.6	12.1	16.3	
	Rated Current [A] ²⁾	HD	0.8	1.4	2.5	5.0	8.0	11.0	16.0	24.0	32.0	
		ND	1.1	1.8	3.1	6.3	10.0	12.0	18.0	30.0	40.0	
Max. Output Frequency			400 [Hz] ³⁾									
Max. Output Voltage [V]			Three-Phase 200 ~ 240V ⁴⁾									
Input Ratings	Rated Voltage [V]		Three Phase 200 ~ 240 VAC (-15% ~ +10%)									
	Rated Current [A] ²⁾	HD	0.7	1.5	2.0	5.8	7.5	11.0	8.9	22.1	28.6	
		ND	1.1	1.9	3.9	7.3	10.8	13.9	24	28.6	41.2	
Rated Frequency			50 ~ 60 [Hz] ($\pm 5\%$)									
Cooling Type			Natural Cooling			Forced Cooling						

Input and Output Specifications: Input Voltage Three-phase (415V)

LTVF-C4 □□□□ BAA			0002	0003	0005	0007	0010	0016	0023	
Applicable Motor ¹⁾	HD	[HP]	0.5	1.0	2.0	3.0	5.0	7.5	10.0	
		[kW]	0.4	0.75	1.5	2.2	3.7	5.5	7.5	
	ND	[HP]	1	1.5	3	4	5.4	10	15	
		[kW]	0.75	1.1	2.2	3.0	4.0	7.5	11.0	
Output Ratings	Rated Capacity [kVA]	HD	1.0	1.9	3.0	4.2	6.1	9.1	12.2	
		ND	1.2	2.4	3.8	5.2	7.6	12.1	16.3	
	Rated Current [A] ²⁾	HD	1.25	2.5	4.0	5.5	8.0	12.0	16.0	
		ND	2.0	3.1	5.1	6.9	10.0	16.0	23.0	
Max. Output Frequency			400 [Hz] ³⁾							
Max. Output Voltage [V]			Three-Phase 380 ~ 480V ⁴⁾							
Input Ratings	Rated Voltage [V]		Three-Phase 380 ~ 480 VAC (-15% ~ +10%)							
	Rated Current [A] ²⁾	HD	1.8	3.2	4.4	6	10.4	11.0	14.4	
		ND	2.1	4.3	5.9	8.1	14	14.7	21.9	
Rated Frequency			50 ~ 60 [Hz] ($\pm 5\%$)							
Cooling Type			Natural Cooling			Forced Cooling				

Note 1) - Indicates the maximum applicable motor capacity when using a 4-pole standard motor.

Note 2) - When Carrier frequency setting (H39) is 6kHz or less.

Note 3) - The max. frequency setting range can be 120Hz when H40 is set to 3 (Sensorless vector control)

Note 4) - The maximum output voltage cannot be higher than the input voltage and it can be programmable below input voltage.

› Control

Control Type		V/F control, sensorless vector control, slip compensation
Frequency Precision Setting		Digital command: 0.01Hz Analog command: 0.05Hz (Max. frequency: 50Hz)
Frequency Precision		Operation by digital command: 0.01% of max. output frequency. Analog command operation: 0.1% of max. output frequency.
V/F Pattern		Linear, squared, user V/F
Overload Capacity		HD : 150%/ 1min; ND: 110%/ 1min
Torque Compensation		Manual/Auto torque compensation
Dynamic Torque 20%	Max. Brake Torque	20% ¹⁾
Braking	Time/%ED	150% ²⁾ when using optional DB resistor

Note - 1) Average braking torque during Decel to stop a motor. Note - 2) Refer to technical manual for DB resistor specification.

› Operation

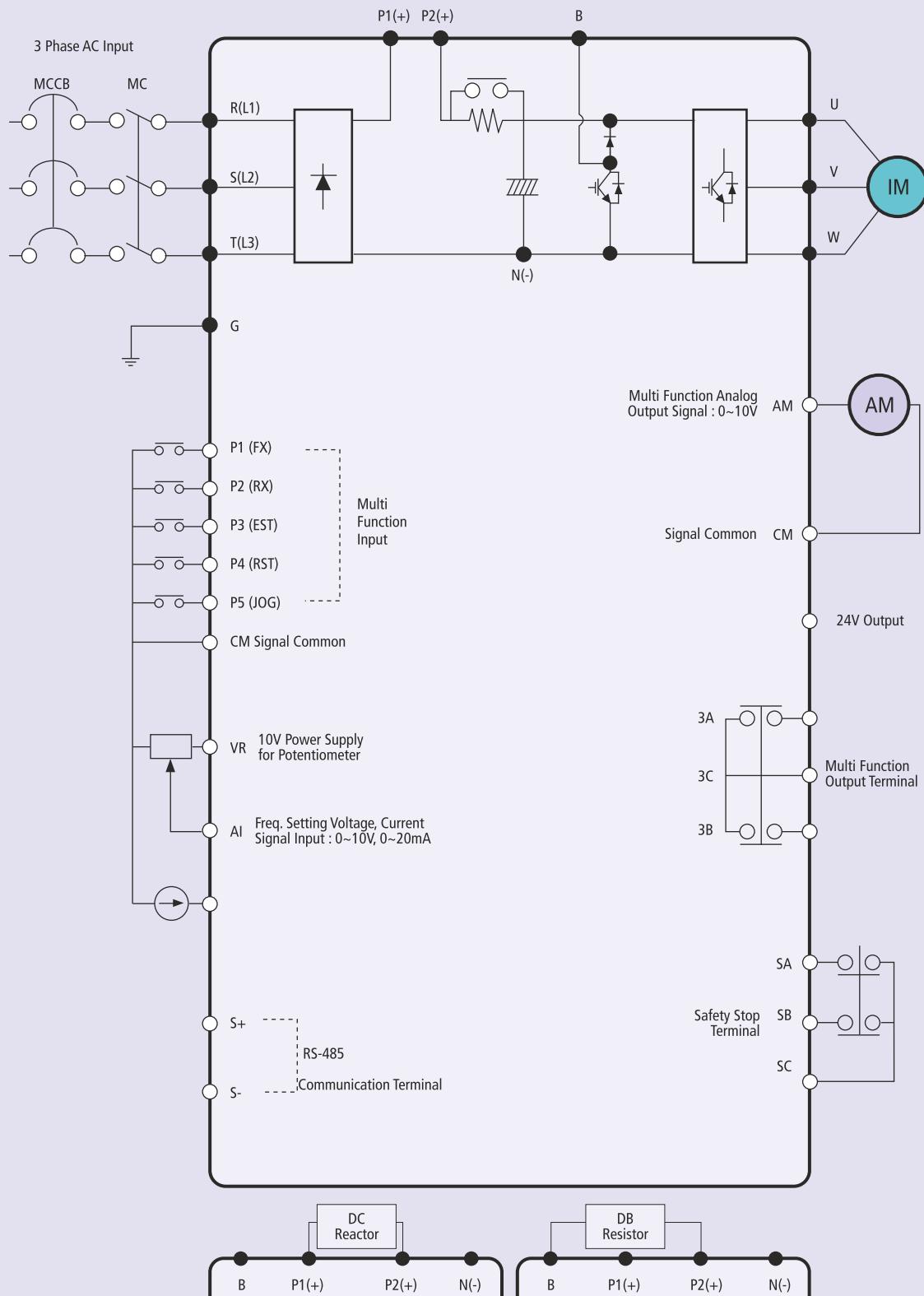
Operation Mode		Keypad / Terminal / Communication operation	
Frequency Setting		Analog type: 0 ~ 10[V], 0 ~ 20[mA] Digital type: Keypad Panel potentiometer	
Operational Functions		PID control, Up-Down operation, 3-wiring operation, Draw Mode	
Input	P1 ~ P5 Multi-function Terminals (5 points) P1 ~ P5	PNP / NPN Selectable Functions: Forward/Reverse operation, emergency stop, fault reset, jog operation, multi-step frequency – high, mid and low, multi-step accel/ decel- high, mid, low, DC braking at stop, 2 nd motor select, up/down operation function (increase/decrease of frequency), 3-wire operation, external fault signal input (contact A/B), general operation switched during PID operation, 2 nd source, analog hold, accel/decel stop, up/down save freq, jog forwards/reverse operation.	
	Analog Input	Signal Input: 0-10V, 0-20mA (programmable)	
Output	Multi-function Relay	Fault output and drive status output	< (N.O., N.C.) AC250V 1A, < DC 30V 1A
	Analog Output	0 ~ 10Vdc (less than 10mA): Choose among output freq, output current, output voltage, DC link selectable.	

› Protective Function

Faults	Over voltage, low voltage, over current, short circuit, ground current detection, drive overheat, motor overheat, input and output phase loss, overload protection, communication error, loss of frequency command, hardware fault, cool fan trip, brake error.
Alarm	Stall prevention, overload
Momentary Power Loss	Below 16 msec: Continuous operation Above 16 msec: Auto restarting.

› Structure and Application Environment

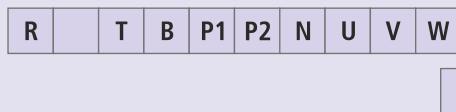
Protection Degree	Opening (IP 20)
Ambient Temperature	HD operation: - 10 ~ 50°C (no freezing) ND operation: - 10 ~ 40°C (no freezing) (For operation at 50°C, if the drive adopts ND load, it is recommended to use the load at 80%).
Storage Temperature	-20°C ~ 65°C
Relative Humidity	Below relative humidity 90% RH (no condensation)
Altitude/Vibration	Below 1000m, 5.9/sec ² (0.6G)
Atmospheric Pressure	70~106 kPa
Installation Environment	No corrosive air, combustible gas, oil mist, etc.



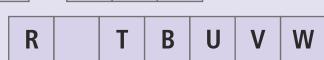
HD 0.1kW~0.4kW (Single-Phase 230V)



HD 0.75kW~1.5kW (Single-Phase 230V)



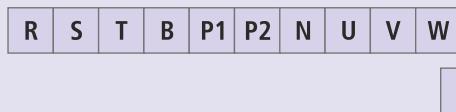
HD 2.2kW (Single-Phase 230V)



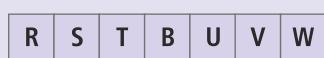
HD 0.1kW~0.75kW (Three-Phase 230V / 415V)



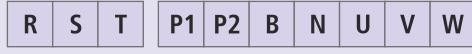
HD 1.5kW~2.2kW (Three-Phase 230V / 415V)



HD 3.7kW (Three-Phase 230V / 415V)

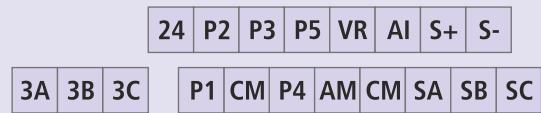


HD 5.5kW~7.5kW (Three-Phase 230V / 415V)



Cat. Nos.	HD kW	R,S,T Size		U,V,W Size		Ground Size		Terminal Screw Size	Screw Torque (kgf.cm)
		mm ²	AWG	mm ²	AWG	mm ²	AWG		
LTVF-C10001BAA	0.1	2	14	2	14	3.5	12	M3.5	10
LTVF-C10002BAA	0.2	2	14	2	14	3.5	12	M3.5	10
LTVF-C10003BAA	0.4	2	14	2	14	3.5	12	M3.5	10
LTVF-C10005BAA	0.75	2	14	2	14	3.5	12	M3.5	10
LTVF-C10008BAA	1.5	2	14	2	14	3.5	12	M3.5	10
LTVF-C10011BAA	2.2	3.5	12	3.5	12	3.5	12	M4	12.2
LTVF-C20001BAA	0.1	2	14	2	14	3.5	12	M3.5	10
LTVF-C20002BAA	0.2	2	14	2	14	3.5	12	M3.5	10
LTVF-C20003BAA	0.4	2	14	2	14	3.5	12	M3.5	10
LTVF-C20006BAA	0.75	2	14	2	14	3.5	12	M3.5	10
LTVF-C20010BAA	1.5	2	14	2	14	3.5	12	M3.5	10
LTVF-C20012BAA	2.2	2	14	2	14	3.5	12	M3.5	10
LTVF-C20018BAA	3.7	3.5	12	3.5	12	3.5	12	M4	12.2
LTVF-C20030BAA	5.5	6	10	6	10	5.5	10	M4	15
LTVF-C20040BAA	7.5	6	10	6	10	5.5	10	M4	15
LTVF-C40002BAA	0.4	2	14	2	14	2	14	M3.5	10
LTVF-C40003BAA	0.75	2	14	2	14	2	14	M3.5	10
LTVF-C40005BAA	1.5	2	14	2	14	2	14	M3.5	10
LTVF-C40007BAA	2.2	2	14	2	14	2	14	M3.5	10
LTVF-C40010BAA	3.7	3.5	12	3.5	12	2	14	M4	12.2
LTVF-C40016BAA	5.5	3.5	12	3.5	12	3.5	12	M4	13.8
LTVF-C40023BAA	7.5	3.5	12	3.5	12	3.5	12	M4	13.8

Control Terminal Specification



T/M	Terminal Description	Wire Size (mm ²)		Screw Size	Torque [Nm]	Specification
		Single Wire	Stranded			
P1~P5	Multi-function input terminal P1-P5	1.0	1.5	M2.6	0.4	
CM	Common terminal	1.0	1.5	M2.6	0.4	
VR	Power supply for analog	1.0	1.5	M2.6	0.4	Output voltage: 12V, Max output current: 10mA Potentiometer: 1 ~ 5kohm
AI	Analog (voltage and current) input terminal	1.0	1.5	M2.6	0.4	Input voltage: 0~10V
						Input current: 0 ~ 20mA, Internal resistance: 250 Ω
AM	Multi-function analog output terminal	1.0	1.5	M2.6	0.4	Max output voltage: 11[V], Max output current: 10mA
S+	RS485 communication terminal	1.0	1.5	M2.6	0.4	
S-	RS485 communication terminal	1.0	1.5	M2.6	0.4	
24	External 24V power supply	1.0	1.5	M2.6	0.4	Max output current: 100mA
3A	Multi-function relay output A	1.0	1.5	M2.6	0.4	AC 250V, less than 1A DC 30V, less than 1A
3B	Multi-function relay output B	1.0	1.5	M2.6	0.4	
3C	Multi-function relay common terminal	1.0	1.5	M2.6	0.4	
SA	Safe stop connection terminal A	1.0	1.5	M2.6	0.4	
SB	Safe stop connection terminal B	1.0	1.5	M2.6	0.4	
SC	Safety power supply (24V)	1.0	1.5	M2.6	0.4	

Note 1) - Tie the control wires more than 15cm away from the control terminals. Otherwise, it interferes front cover reinstallation.

Note 2) - Use copper wires rated 600V, 75 °C and higher.

Note 3) - Use the recommended tightening torque when securing terminal screws.



Display	Key	Description	
	RUN	Run command	
	STOP/RESET	STOP: Stop command during operation RESET: Reset command when fault occurs	
	Up	Used to move parameter codes or increase parameter values	
	Down	Used to move parameter codes or decrease parameter values	
	Left	Used to switch parameter groups or move the cursor to the left when the parameters are written	
	Right	Used to switch parameter groups or move the cursor to the right when the parameters are written	
	ENT	Used to read, write and keep the parameter values	
	Potentiometer	The keypad potentiometer V2 is used for frequency setting	
FWD	Forward	Lit during forward run	
REV	Reverse	Lit during reverse run	Blinks when a fault occurs
RUN	Running	Lit during operation	
SET	Setting	Lit during parameter setting	
7-segment	Current Values		

Braking Resistors

Input Voltage	Motor [kW]	100% Braking		150% Braking	
		Resistance [W]	P [W]	Resistance [W]	P [W]
230V	0.1	1200	20	1000	20
	0.2	700	25	500	35
	0.4	400	50	300	100
	0.75	200	100	150	150
	1.5	100	200	60	300
	2.2	60	300	50	400
	3.7	40	500	33	600
	5.5	30	700	20	800
	7.5	20	1000	15	1200
415V	0.4	1800	50	1200	100
	0.75	900	100	600	150
	1.5	450	200	300	300
	2.2	300	300	200	400
	3.7	200	500	130	600
	5.5	120	700	85	1000
	7.5	90	1000	60	1200

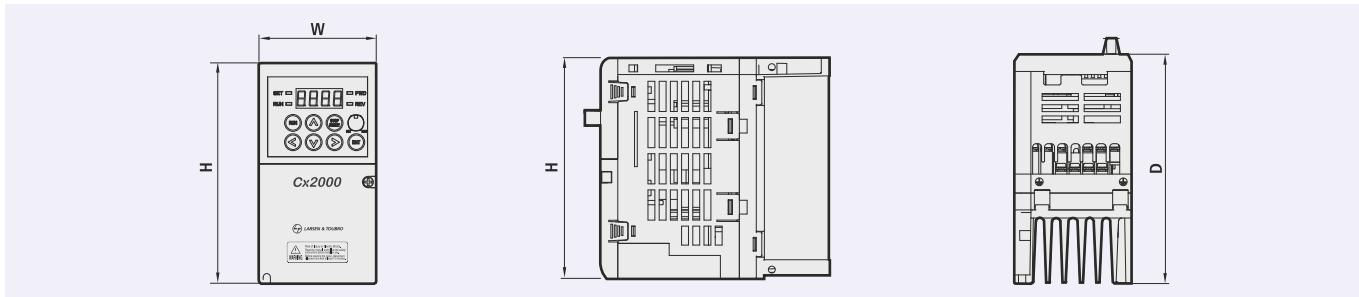
Peripheral Devices

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

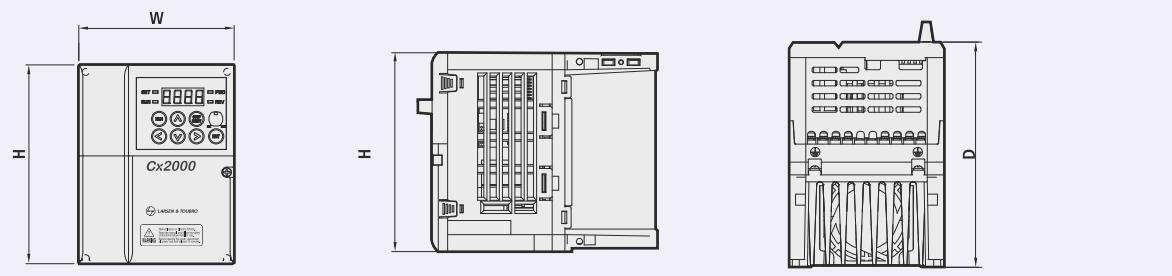
Input Voltage	Drive Model	MCCB (L&T)	MC (L&T)
Single-Phase 230V	LTVF-C10001BAA	DM16/2.5	MNX 9-2P
	LTVF-C10002BAA	DM16/6.3	MNX 9-2P
	LTVF-C10003BAA	DM16/12	MNX 9-2P
	LTVF-C10005BAA	DM100/25	MNX 9-2P
	LTVF-C10008BAA	DM100/30	MNX 12-2P
	LTVF-C10011BAA	DM100/50	MNX 18-2P
Three-Phase 230V	LTVF-C20001BAA	DM16/2.5	M09
	LTVF-C20002BAA	DM16/4	M09
	LTVF-C20003BAA	DM16/7.5	M09
	LTVF-C20006BAA	DM16/16	M09
	LTVF-C20010BAA	DM100/25	M0-12
	LTVF-C20012BAA	DM100/25	M0-18
	LTVF-C20018BAA	DM100/50	M0-32
	LTVF-C20030BAA	DM100/60	M0-40
	LTVF-C20040BAA	DM100/80	M0-50
	LTVF-C40002BAA	DM16/5	M09
Three-Phase 415V	LTVF-C40003BAA	DM16/10	M09
	LTVF-C40005BAA	DM16/12	M09
	LTVF-C40007BAA	DM16/16	M0-12
	LTVF-C40010BAA	DM100/30	M0-18
	LTVF-C40016BAA	DM100/30	M0-32
	LTVF-C40023BAA	DM100/50	M0-32

Warning: 1) MC(Magnetic Contactor) current is 1.5~2.0 times of the drive's rated current

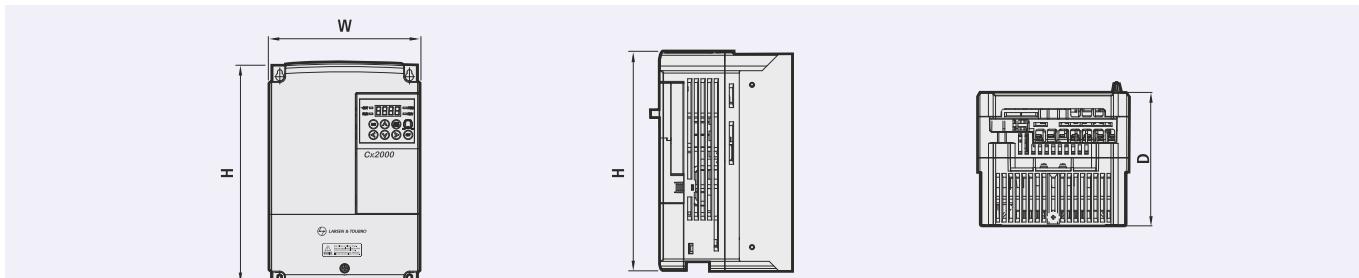
2) MCCB should be used to protect against overload and to avoid damage of installation of drive from the fault current (the Cx2000 has the overload capacity of 150% for 1 min)



Input Voltage	Drive Cat. No.	W (mm)	H (mm)	D (mm)	Weight (kg)
Single-Phase 230 V	LTVF-C10001BAA	68	128	93	0.55
	LTVF-C10002BAA	68	128	93	0.55
	LTVF-C10003BAA	68	128	128	0.8
Three-Phase 230 V	LTVF-C20002BAA	68	128	93	0.55
	LTVF-C20001BAA	68	128	93	0.55
	LTVF-C20003BAA	68	128	128	0.8
	LTVF-C20006BAA	68	128	128	0.8
Three-Phase 415 V	LTVF-C40002BAA	68	128	128	0.8
	LTVF-C40003BAA	68	128	128	0.8



Input Voltage	Drive Cat. No.	W (mm)	H (mm)	D (mm)	Weight (kg)
Single-Phase 230 V	LTVF-C10005BAA	100	128	130	1.22
	LTVF-C10008BAA	100	128	130	1.22
	LTVF-C10011BAA	140	128	145	1.97
Three-Phase 230 V	LTVF-C20010BAA	100	128	130	1.22
	LTVF-C20012BAA	100	128	145	1.42
	LTVF-C20018BAA	140	128	145	1.97
Three-Phase 415 V	LTVF-C40005BAA	100	128	130	1.22
	LTVF-C40007BAA	100	128	145	1.42
	LTVF-C40010BAA	140	128	145	1.97



Input Voltage	Drive Cat. No.	W (mm)	H (mm)	D (mm)	Weight (kg)
Three-Phase 230 V	LTVF-C20030BAA	160	232	141	3.3
	LTVF-C20040BAA	160	232	141	3.3
Three-Phase 415 V	LTVF-C40016BAA	160	232	141	3.3
	LTVF-C40023BAA	160	232	141	3.3

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Product improvement is a continuous process. For the latest information and special applications, please contact any of our offices listed here.



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