

➤ 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.



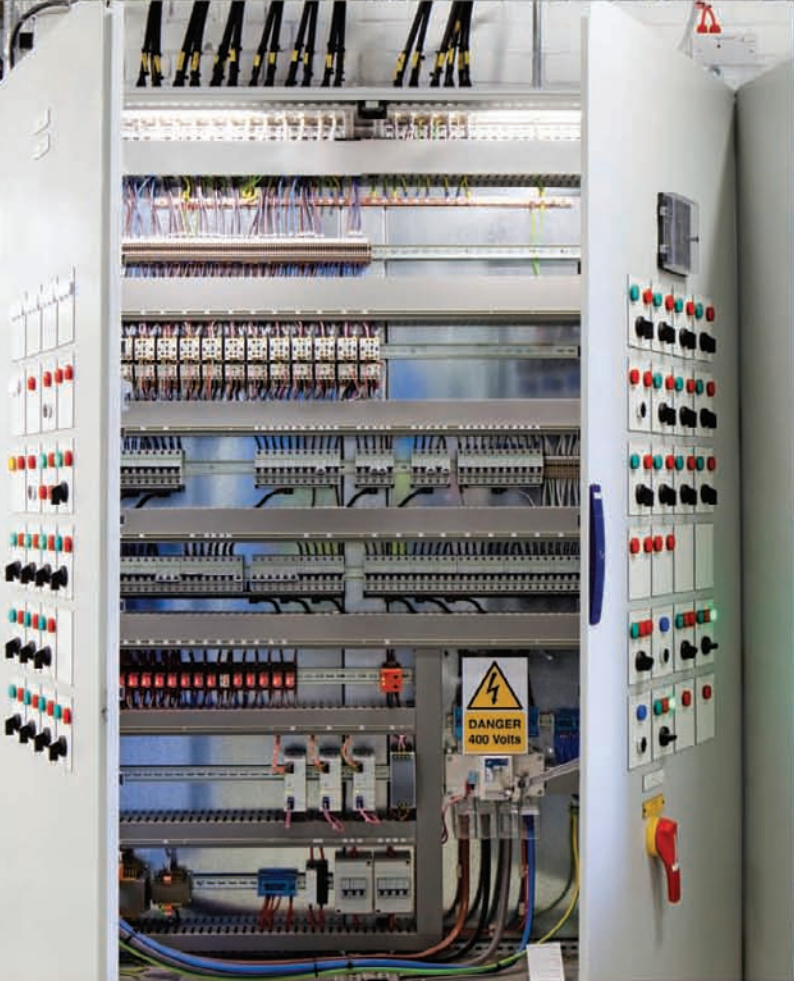
Cx2000 | AC Drive

› 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.



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 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 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 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.

Cx2000

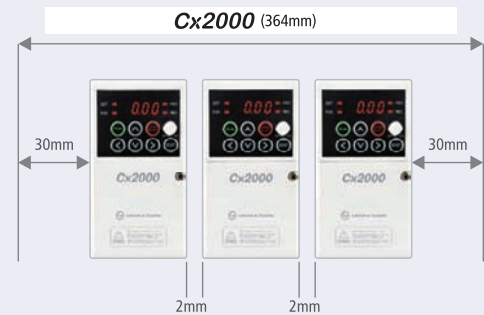
Provides Optimized Solutions to Global Systems

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



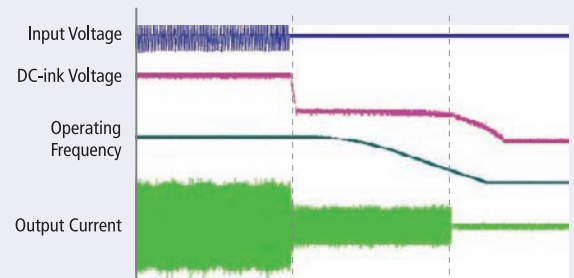
Side-by-Side Installation

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



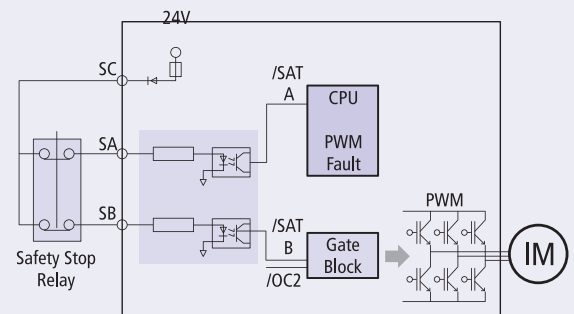
KEB for Safe Operating Stop in the Event of Power Failure

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]



Note: Safety relay not included



➤ 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

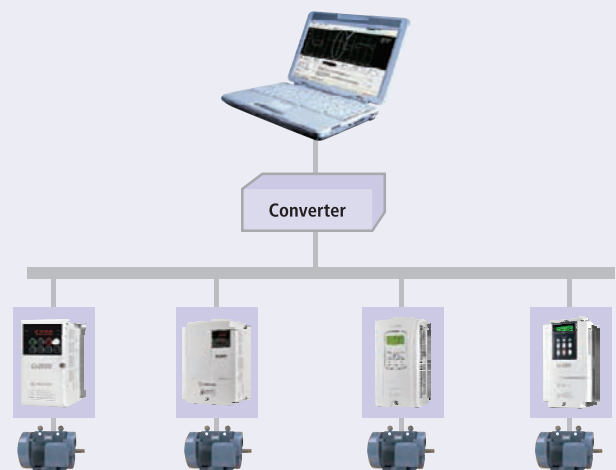
Designed to select between heavy and light load

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

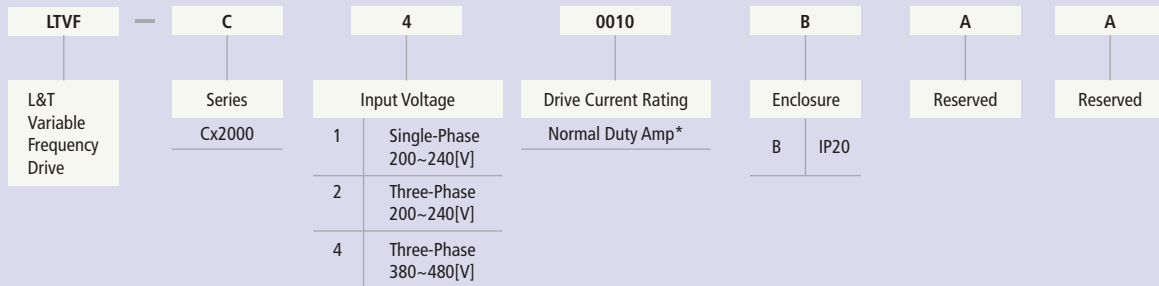
➤ PC-based Software for Easy Maintenance of Drive and Motor Parameters

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
1.1 kW		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



* For 230V single phase mentioned current is for HD rating.

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

LTVF-C1 □□□□ BAA		0001	0002	0003	0005	0008	0011
Applicable Motor ¹⁾	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 ²⁾ [A]	1.4	2.8	5.5	11	14.1	24
	Rated Frequency	50 ~ 60 [Hz] (±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	
Output Ratings	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	
	Rated Capacity [kVA]	HD	0.3	0.5	1.1	1.9	3.0	4.2	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] (±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		
Output Ratings	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		
	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] (±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.

Standard Specification

Max Input Voltage	Single-Phase 200 ~ 240 VAC (-15% ~ +10%) 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 400Hz (Sensorless: 0 to 120Hz)
Keypad	LED (Non detachable)
Braking Chopper	Built-in
Features	Built PID, RPM Display, 2nd Motor Operation, Easy Maintenance of Fan ,Built-in Safety Circuit, Draw Mode, Inbuilt 24V power source, Brake Control, Auto Tuning, KEB

Control

Control Method	V/F control, sensorless vector control, slip compensation	
Frequency Precision Setting	Digital command: 0.01Hz Analog command: 0.03Hz (Max. frequency: 50Hz)	
Frequency Precision	Operation by digital command: 0.01% of max. output frequency. Analog command operation: 0.1% of max. output frequency.	
Frequency Control Range	0.01 to 400Hz for V/F , 0 to 120Hz for Sensorless Vector Control	
Output Frequency Resolution	0.01Hz	
V/F Pattern	Linear, squared, user V/F	
Overload Capacity	HD : 150% for 1min; ND: 110% for 1min	
Starting Torque	150% at 3 Hz in V/F	
Accel/Decel Time	0.0 to 6000 Sec	
Torque Compensation	Manual/Auto torque compensation	
Dynamic Torque 20% Braking	Max. Brake Torque	20% ¹⁾
	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	
		5 (Programmable NPN / PNP) Functions: Forward/Reverse operation, emergency stop, fault reset, jog operation, multi-step frequency- high, mid and low, multi-step accel/ decel- high, mid, low, and DC braking at stop, 2 nd motor select, up/down operation function (increase/decrease of frequency), 3-wire operation, external fault signal input and (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.	
Safety I/P	2		
Communication	RS485 Modbus RTU		
Potentiometer	Built-in		

Protective Function

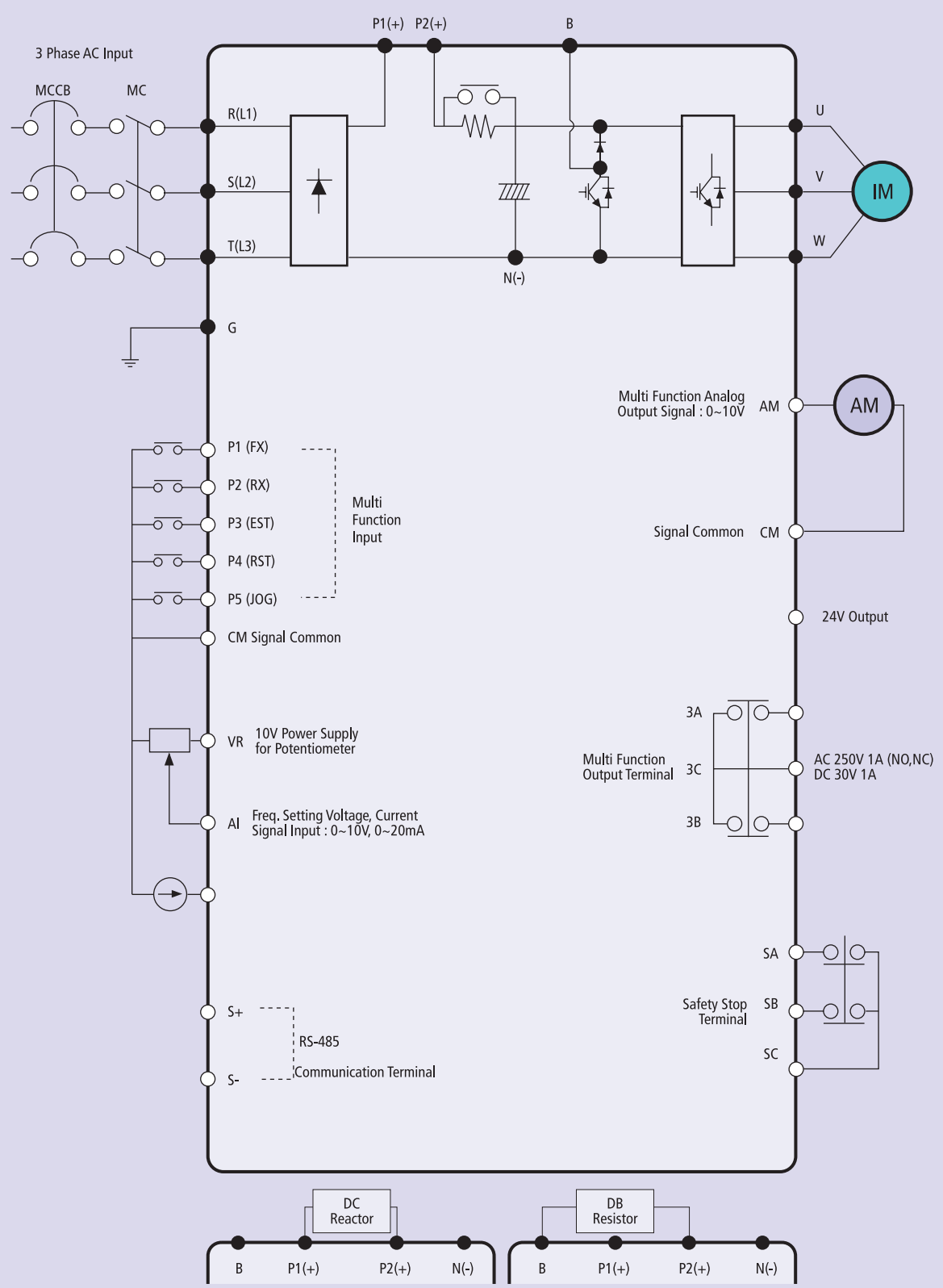
Faults	Over voltage, low voltage, over current, short circuit, ground current detection, drive overheat, motor overheat, input and output phase loss, overload protection, communication error, loss of frequency command, hardware fault, cool fan trip, brake error.
Alarm	Stall prevention, overload
Momentary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

Structure & Environment

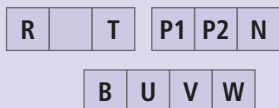
Protection Degree	Opening (IP20)
Ambient Temperature	HD operation: - 10 ~ 50°C (no freezing) ND operation: - 10 ~ 40°C (no freezing) (However, recommended to use load at 80% when using at 50°C in case of Normal Duty).
Storage Temperature	-20°C ~ 65°C
PCB Protection	Conformal Coating Complying to IEC 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	No corrosive air, combustible gas, oil mist, etc.
Global Compliance	CE, UL, RoHS



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	Blinks when a fault occurs
REV	Reverse	Lit during reverse run	
RUN	Running	Lit during operation	
SET	Setting	Lit during parameter setting	
7-segment	Current Values		



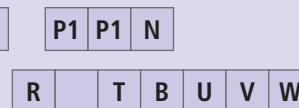
HD 0.1kW~0.4kW (Single-Phase 230V)



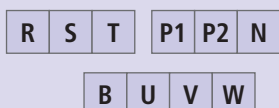
HD 0.75kW~1.5kW (Single-Phase 230V)



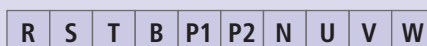
HD 2.2kW (Single-Phase 230V)



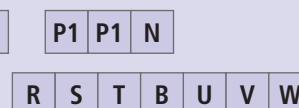
HD 0.1kW~0.75kW (Three-Phase 230V / 415V)



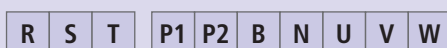
HD 1.5kW~2.2kW (Three-Phase 230V / 415V)



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

24 P2 P3 P5 VR AI S+ S-

3A 3B 3C P1 CM P4 AM CM SA SB SC

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.

Braking Resistors

Input Voltage	Motor [kW]	100% Braking		150% Braking	
		Resistance [Ω]	P [W]	Resistance [Ω]	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
415V	7.5	20	1000	15	1200
	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

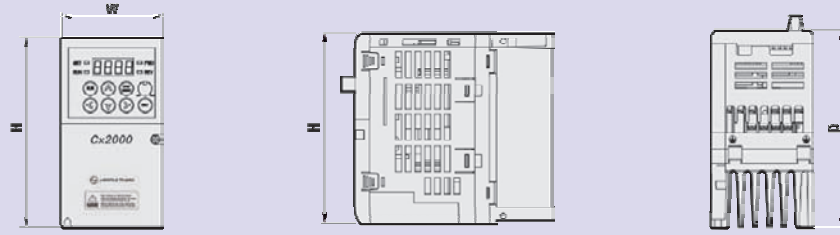
Braking Resistors

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

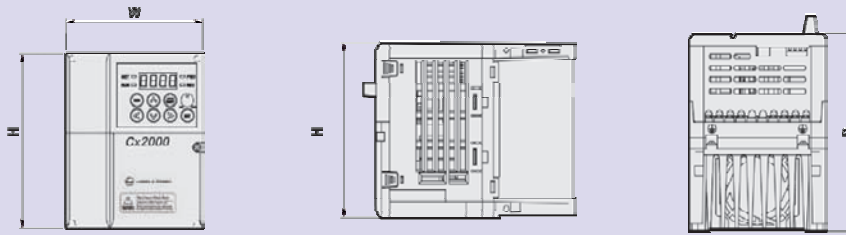
Input Voltage	Drive Model	MCCB (L&T)	MC (L&T)
Single-Phase 230V	LTVF-C10001BAA	DM16/2.5	MNX 9-2P
	LTVF-C10002BAA	DM16/6.3	MNX 9-2P
	LTVF-C10003BAA	DM16/12	MNX 9-2P
	LTVF-C10005BAA	DM100/25	MNX 9-2P
	LTVF-C10008BAA	DM100/30	MNX 12-2P
	LTVF-C10011BAA	DM100/50	MNX 18-2P
Three-Phase 230V	LTVF-C20001BAA	DM16/2.5	MO9
	LTVF-C20002BAA	DM16/4	MO9
	LTVF-C20003BAA	DM16/7.5	MO9
	LTVF-C20006BAA	DM16/16	MO9
	LTVF-C20010BAA	DM100/25	MO-12
	LTVF-C20012BAA	DM100/25	MO-18
	LTVF-C20018BAA	DM100/50	MO-32
	LTVF-C20030BAA	DM100/60	MO-40
	LTVF-C20040BAA	DM100/80	MO-50
Three-Phase 415V	LTVF-C40002BAA	DM16/5	MO9
	LTVF-C40003BAA	DM16/10	MO9
	LTVF-C40005BAA	DM16/12	MO9
	LTVF-C40007BAA	DM16/16	MO-12
	LTVF-C40010BAA	DM100/30	MO-18
	LTVF-C40016BAA	DM100/30	MO-32
	LTVF-C40023BAA	DM100/50	MO-32

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

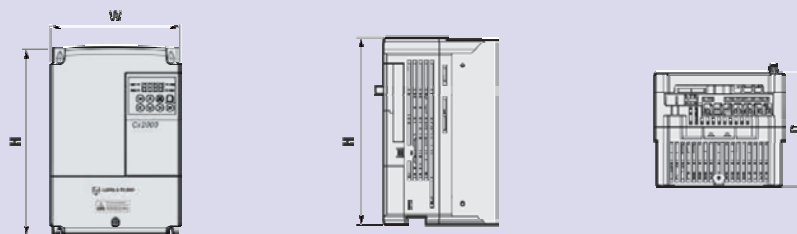
2) MCCB should be used to protect against overload and to avoid damage of installation of drive from the fault current (the Cx2000 has the overload capacity of 150% for 1 min)



Input Voltage	Drive Model	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 Model	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 Model	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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