

LIFT INVERTER SERIES L1000V



EN

DE

ES

FR

IT

L1000V
L1000V
L1000V
L1000V

L1000V

YASKAWA INVERTER DRIVE TECHNOLOGY

Contents

- ▶ **Page 2**
Introduction
- ▶ **Page 3**
YASKAWA L1000V –
Main Features
- ▶ **Page 4**
Specifications
- ▶ **Page 5**
Connection Diagram
- ▶ **Page 6**
Dimensions
Options
- ▶ **Page 7**
Ratings & Type Descriptions

Experience & Innovation

For more than 90 years YASKAWA has been manufacturing and supplying mechatronic products for machine building and industrial automation. Its standard products as well as tailor-made solutions are famous and have a high reputation for outstanding quality and durability.

More than 60,000 installed YASKAWA lift inverters per year clearly indicate a high level of market acceptance. Based on many years of practical experience in the market, the innovative L1000V solution offers optimum reliability, high operation efficiency and low energy consumption.

YASKAWA speaks Lift

The compact lift inverter drive L1000V was designed for low speed operation (up to 1 m/sec) of geared motors.

Its motor capacity range of 4 kW to 15 kW allows a wide scope of lift applications.

Optimised standard functions simplify set-up, operation and maintenance, while ensuring smooth and comfortable rides.

Its reliability and operational safety upgrade the lift system – particularly in terms of cost reduction and comfort.



L1000V main features

- ✓ Easy setup and operation
- ✓ Designed for long service performance and low life-cycle cost
- ✓ Smooth and comfortable rides
- ✓ Standard Safety Features
- ✓ Global Standards

YASKAWA L1000V – MAIN FEATURES

THE LIFT INVERTER DRIVE FOR OPEN-LOOP APPLICATIONS

Easy setup and operation

- ▶ New motor Auto-Tuning features
 - Stationary Auto-Tuning for modernisation applications
 - Rotational Auto-Tuning for high accuracy motor tuning
- ▶ Inverter software designed to support all common lift controllers in the market
- ▶ The L1000V speaks the language of the lift experts (monitoring in Hz, m/s, rpm, levelling speed, service speed, nominal speed)
- ▶ Quick and easy drive replacement due to multifunctional terminal block with parameter backup feature
- ▶ DriveWizardPlus: Software tool to support the user in storing and organising parameters
- ▶ Optional LCD operator for simple operation including copy function for saving drive settings.
- ▶ Also available: a USB Copy Unit offering a fast and convenient way to carry out instant programming of a large number of inverter drives with identical parameter settings

Standard Safety Features

- ▶ IEC 60204-1 Safe Torque Off (STO) functional safety
- ▶ ISO1384 9 1:2009 Performance Level C
- ▶ IEC/EN61508 SIL2

Designed for long service performance and low life-cycle cost

- ▶ Advanced IGBT protection ensures three million starts at 165% output current.
- ▶ Cooling fan and capacitors designed for more than 70,000 hrs of maintenance-free operation
- ▶ Performance Life Monitors for IGBT, cooling fan and capacitors.
- ▶ Only one motor contactor needed due to integrated functional safety feature (in compliance with EN81-1)
- ▶ Two relay outputs for fault and brake control reduce installation effort and costs.
- ▶ The size of the UPS (Uninterrupted Power Supply) is reduced by a light load function - in case of power loss emergency, the L1000V detects the light load direction of the lift.

Smooth and comfortable rides

- ▶ Specialized lift software based on many years of modernisation experience ensures smooth and quiet operation in passenger elevators.
- ▶ Simple and efficient brake sequence for smooth operation.
- ▶ High levelling accuracy even in open-loop, thanks to load detection during run
- ▶ Five independent settings of S-Curves to prevent jerks
- ▶ Built-in optional feature: pulse input feedback with PG to increase levelling accuracy

Global Standards

- ▶ CE Directive 2006/95/EC: EN61800-5-1:2003, EN50178:1997
- ▶ EMC Directive 2004/108/EC: EN61800-3:2004
- ▶ Lift: EN12015:2004 (with option), EN12016:2004





Specifications

Voltage class		200 V				400 V				
Inverter model		CIMR-LC2V				CIMR-LC4V				
		0025	0033	0047	0060	0009	0015	0018	0024	0031
Inverter output	Motor output [kW]*	5.5	7.5	11.0	15.0	4.0	5.5	7.5	11.0	15.0
	Rated output current [A]	25.0* ¹	33.0* ¹	47.0* ¹	60.0* ¹	9.2* ¹	14.8* ¹	18.0* ¹	24.0* ¹	31.0* ¹
	Overload	165% for 30 sec from inverter rated output current								
	Rated output power [kVA]	9.5* ²	12.6* ²	17.9* ²	22.9* ²	7.0* ³	11.3* ³	13.7* ³	18.3* ³	23.6* ³
	Max. output voltage	Three-phase 200 to 240 V (proportional to input voltage)				Three-phase 380 to 480 V (proportional to input voltage)				
	Max. output frequency						120 Hz			
Inverter input	Rated input voltage	Three-phase 200 to 240 V, -15% to +10%				Three-phase 380 to 480 V, -15% to +10%				
	Rated input frequency	50/60 Hz, ±5%								

*The motor capacity (kW) refers to a YASKAWA 4-pole, 60 Hz, 200 V motor. The rated output current of the drive output amps should be equal to or greater than the motor rated current.

*¹ at 8 kHz carrier frequency without derating

*² based on input voltage 220 V

*³ based on input voltage 400 V

Rotational Auto-Tuning must be performed to achieve the performance described with Open Loop Vector Control.

Specifications		
Control Functions	Control methods	Open Loop Vector Control (Current Vector), Open-Loop Vector Control with PG, V/f Control, V/f Control with PG
	Frequency Control Range	0.01 to 120 Hz
	Frequency Accuracy (Temperature Fluctuation)	Digital input: within $\pm 0.01\%$ of the max. output frequency (-10 to +40°C)
	Frequency Setting Resolution	Digital input: 0.01 Hz
	Output Frequency Resolution	20 bit of maximum output frequency (parameter E1-04 setting)
	Speed Control Range	1:100 (Open Loop Vector Control), 1:20 to 40 (V/f Control)
	Speed Control Accuracy	$\pm 0.2\%$ in Open Loop Vector Control (25°C $\pm 10^\circ\text{C}$) * ⁴
	Speed Response	5 Hz in Open Loop Vector (25°C $\pm 10^\circ\text{C}$) (excludes temperature fluctuation when performing Rotational Auto-Tuning)
	Accel/Decel Time	0.0 to 600.0 s
	V/f Characteristics	User-selected programs, V/f preset patterns possible
Protection Function	Main Control Functions	Brake sequence, Battery operation, Light load search function, Overtorque detection, Torque limit, 5 independent s-curve settings, Auto-tuning (rotational, stationary tuning for resistance between lines), Slip compensation, Upper/lower limits for frequency reference, DC injection braking at start and stop, Fault restart, Removable terminal block with parameter backup function ...
	Motor Protection	Motor overheat protection based on output current
	Momentary Overcurrent Protection	Drive stops when output current exceeds 200%
	Overload Protection	Drive stops after 30 s at 165% of rated output current* ⁵
	Overvoltage Protection	200 V class: Stops when DC bus exceeds approx. 410 V. 400 V class: Stops when DC bus exceeds approx. 820 V
	Undervoltage Protection	Stops when DC bus voltage falls below the following levels: Three-phase 200 V class: approx. 190 V, three-phase 400 V class: approx. 380 V
	Momentary Power Loss Ride-Thru	Battery operation with single phase 230 VAC UPS (Uninterrupted Power Supply)
	Braking Resistance Overheat Protection	Overheat sensor for braking resistor (optional ERF-type, 3% ED)
	Stall Prevention	Separate settings allowed during acceleration, and during run. Enable/disable only during deceleration.
	Ground Fault Protection	Protection by electronic circuit * ⁶
Operating Environment	Charge LED	Charge LED remains lit until DC bus has fallen below approx. 50 V
	Area of Use	Indoors
	Ambient Temperature	-10 to +50°C (IP20), -10 to +40°C (NEMA Type 1)
	Humidity	95 RH% or less (no condensation)
	Storage Temperature	-20 to +60°C (short-term temperature during transportation)
	Altitude	Max. 1000 m (output derating of 1% per 100 m above 1000 m, max. 3000 m)
	Shock	10 to less than 20 Hz (9.8 m/s ²) max., 20 to 55 Hz (5.9 m/s ²) max.
Safety Standard		UL508C, EN954-1 Cat. 3, IEC/EN61508 SIL2
Protection Design		IP20, NEMA Type 1 enclosure

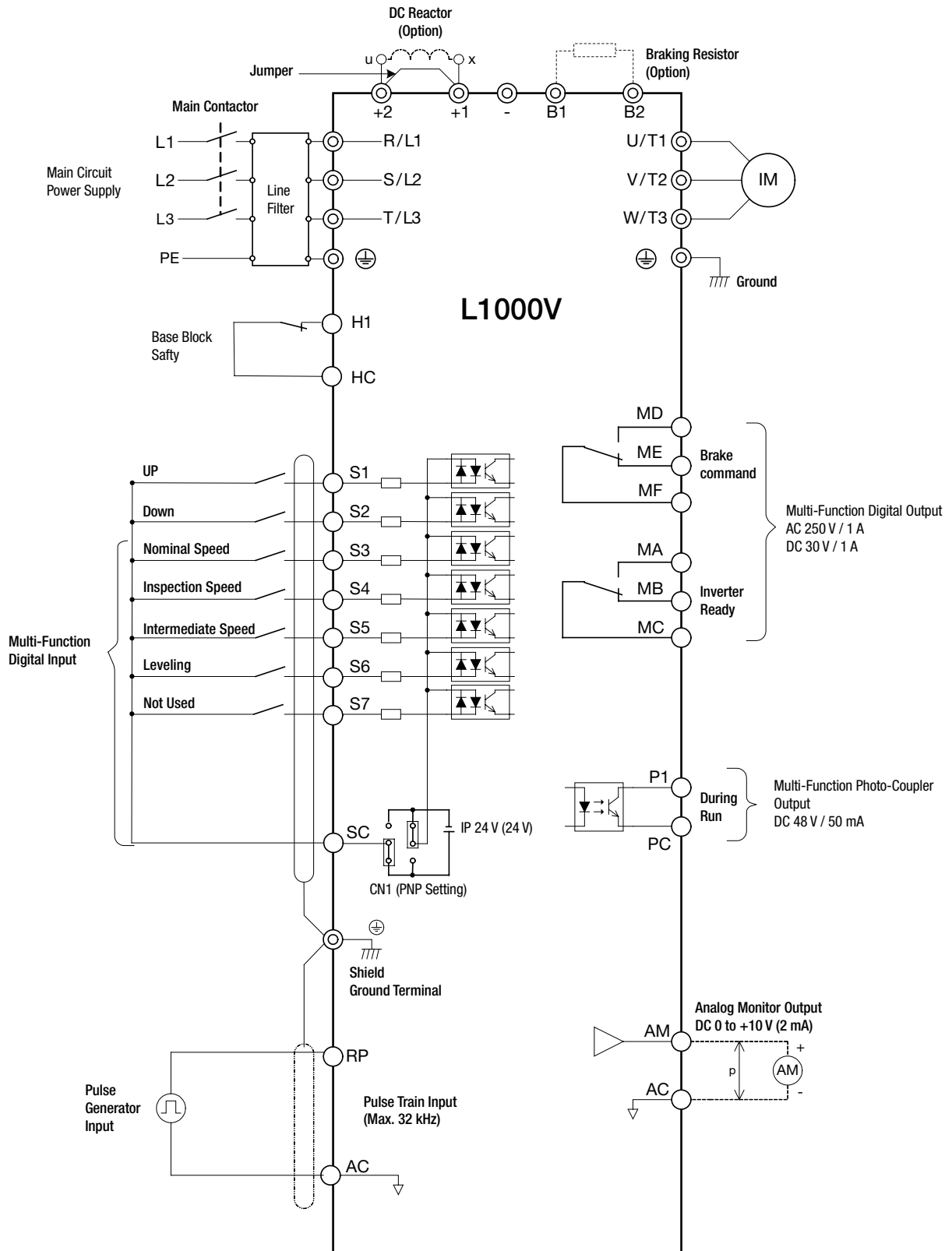
*⁴ Speed control accuracy may vary slightly depending on installation conditions or motor used.

*⁵ Overload protection may be triggered at lower levels if output frequency is below 6 Hz.

*⁶ Protection may not be provided under the following conditions as the motor windings are grounded internally during run:

- Low resistance to ground from the motor cable or terminal block.
- Drive already has a short-circuit when the power is turned on.

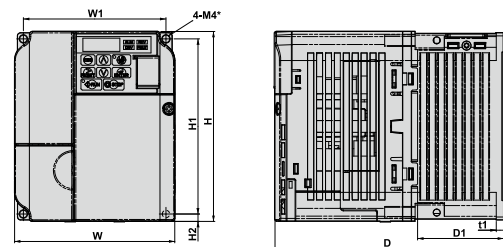
Connection Diagram



Dimensions

IP20 (without EMC filter)

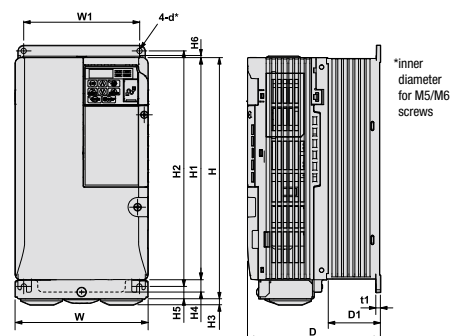
Voltage Class	Drive Model CIMR-LC□	Dimensions in mm								Weight (kg)
		W1	H1	W	H	D	t1	H2	D1	
400 V Class	4V0009B	128	118	140	128	143	5	5	65	2.4



*inner diameter for M4 screws

IP20/NEMA Type 1 (without EMC filter)

Voltage Class	Drive Model CIMR-LC□	Dimensions in mm													
		W1	H2	W	H1	D	t1	H5	D1	H	H4	H3	H6	d	Weight (kg)
200 V Class	2V0025F	122	248	140	234	140	5	13	55	254	13	6	1.5	M5	3.8
	2V0033F	122	248	140	234	140	5	13	55	254	13	6	1.5	M5	3.8
	2V0047F	160	284	180	270	163	5	13	75	290	15	6	1.5	M5	5.5
	2V0060F	192	336	220	320	187	5	22	78	350	15	7	1.5	M6	9.2
400 V Class	4V0015F	122	248	140	234	140	5	13	55	254	13	6	1.5	M5	3.8
	4V0018F	122	248	140	234	140	5	13	55	254	13	6	1.5	M5	3.8
	4V0024F	160	284	180	270	143	5	13	55	290	15	6	1.5	M5	5.2
	4V0031F	160	284	180	270	163	5	13	75	290	13	6	1.5	M5	5.5

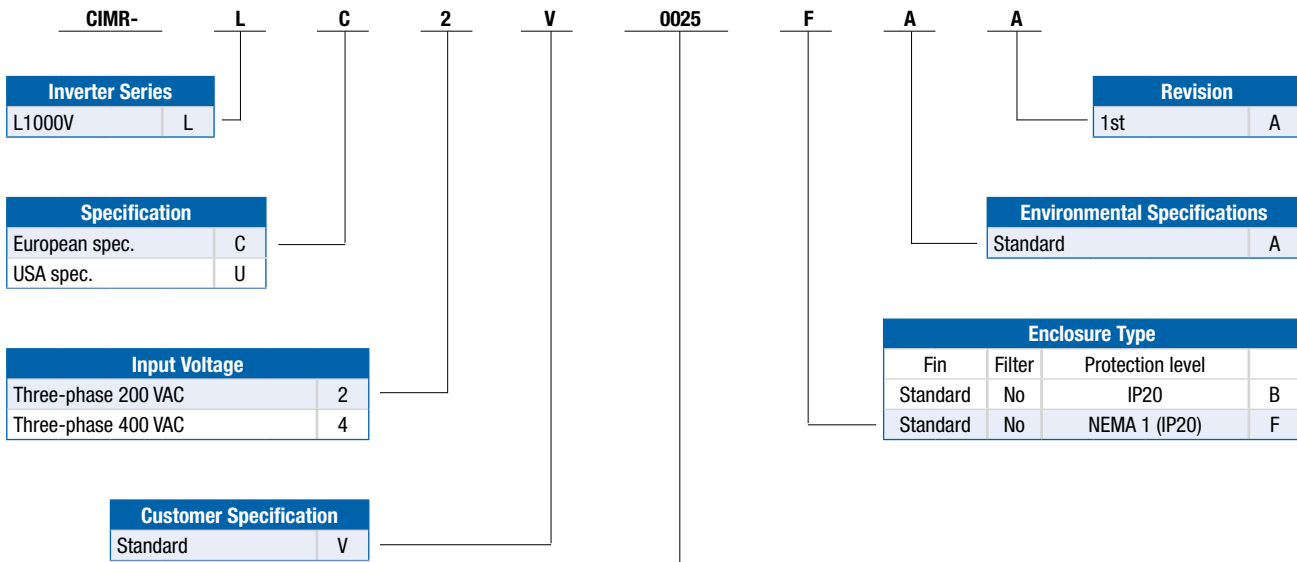


Options

Name	Purpose	Model		
Input noise filter	Reduces noise from the line that enters into the drive input power system. Should be installed as close as possible to the drive.	Three-phase 200 V CIMR-LC2V0025FAA CIMR-LC2V0033FAA CIMR-LC2V0047FAA CIMR-LC2V0060FAA Three-phase 400 V CIMR-LC4V0009BAA CIMR-LC4V0015FAA CIMR-LC4V0018FAA CIMR-LC4V0024FAA CIMR-LC4V0031FAA	Filter: FS23637-52-07 FS23637-52-07 FS23637-68-07 FS23637-80-07 Filter: FS23639-15-07 FS23639-30-07 FS23639-30-07 FS23639-50-07 FS23639-50-07	
AC Reactors	Used for harmonic current suppression and total improving power factor. Should be used if the power supply capacity is larger than 600 kVA. - Suppresses harmonic current - Improves the power factor of the input power supply	400V CIMR-LC4V0009BA CIMR-LC4V0015FA CIMR-LC4V0018FA CIMR-LC4V0024FA CIMR-LC4V0031FA	AC Reactor IP00 B 0903084 B 0903085 B 0903085 B 0903086 B 0903087	AC Reactor IP20 B 0903088 B 0903089 B 0903089 B 0903090 B 0903091
Braking resistor	Used to shorten the deceleration time by dissipating regenerative energy through a resistor.	R-EBR- □□□W □□□R Series		
USB copy unit (RS232/USB compatible plug)	Adapter for connecting the drive to the USB port of a PC. (e. g. for Support Tool Drive Wizard Plus). Can copy parameter settings to be later transferred to another drive.	JVOP-181		
Support tools (DriveWizard Plus) cable	Connects the drive to a PC for use with DriveWizard.	WV103		
LCD operator	For easier operation when using the optional LCD operator. Allows for remote operation. Includes a Copy function for saving drive settings.	JVOP-180		
Operator extension cable	Cable for connecting the LCD operator.	WV001: 1 m WV003: 3 m		

Note: contact the manufacturer in question for availability and specifications of non-YASKAWA products.

Ratings & Type Descriptions



200 V		
	Rated output current	Max. applicable motor
0025	25.0 A	5.5 kW
0033	33.0 A	7.5 kW
0047	47.0 A	11.0 kW
0060	60.0 A	15.0 kW
400 V		
	Rated output current	Max. applicable motor
0009	9.2 A	4.0 kW
0015	14.8 A	5.5 kW
0018	18.0 A	7.5 kW
0024	24.0 A	11.0 kW
0031	31.0 A	15.0 kW



YASKAWA Electric Europe GmbH

Hauptstr. 185
65760 Eschborn
Deutschland / Germany

+49 6196 569-300
info@yaskawa.de
www.yaskawa.eu.com