YASKAWA

LA700

AC Drive for High Performance Elevator Applications

Technical Data Sheet

Type: **CIPR-LA70Cxxxxxxxx-9600**

400 V Class, Three-Phase Input: 4.0 to 160 kW



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Contents

Introduction 1
Drive Selection 1
How to Read Model Numbers 2
List of Models 3
General specification 4
Power Ratings 6
Three-phase 400 V Units 6
Drive Watt Loss 7
Three-phase 400 V Units 7
Deratings 8
Carrier Frequency Derating 8
Ambient Temperature Derating 9
Altitude Derating 9
Built-in EMC Filters / Leakage Current 10
Electrical Connections 11
Connection Diagram 11
Dimensions and Weight 12
400V class: 4kW to 30kW 12
400V class: 37kW to 160kW 13
Accessories & Power Options 14
Network Communications Option Cards 14
Motor Speed Feedback Option Card 14
Speed Reference Card 14
LED/LCD Keypads 15
PC Connection Cable (USB) 16
Keypad Door Mounting Kits 16
Cable Shield Clamp Kit 17
AC Line Reactors / Power Coordinating Reactor 18
D1000: Regenerative Converter (AFE) 19
R1000: The intelligent regenerative braking unit 21
Dynamic braking with Braking Resistors 23
LA700 online info 26
Certification/Declaration 26
LA700 Info Page 26
Software Tools 27
Software Tools 27

Introduction



The LA700 offers best in class and most reliable drive performance on the market.

The LA700 is the first choice for new installation, machine room less lifts, but also for modernization. Experience the proven YASKAWA reliability combined with a new level of ride comfort.

The LA700 comes with a sophisticated vector control algorithm and lift dedicated control functions which assure a bump-free start also without load sensor, smooth speed transition and precise landing.

The performance features are well-suited for both Induction and Permanent Magnet motors with the latest control functions.

Yaskawa Europe is happy to serve innovative technology paired with hardware designed for 10 years of maintenance free operation.

Drive Selection

LA700 drives must be selected according to power supply voltage, motor rated current, load profile of the application, and ambient condition of the environment they are operated in.

Yaskawa Europe GmbH recommends sizing the drive capacity to match the load factor during operation (load factor at constant speed) does not exceed 80% of the 50% ED current.

LA700 drives are designed to be wall mounted upright and in clean environmental condition. In case of special mounting methods, high ambient temperature (>50 °C), high altitude (> 1000 m), use of high carrier frequency, an output current derating must be considered when selecting the drive.

Examine the drive for damage. Immediately contact the shipping company if the drive is damaged. The Yaskawa warranty does not cover damage from shipping.

Verify the drive model number to make sure that you received the correct model. Verify the model number in the “MODEL” section of the drive nameplate to make sure that you received the correct model.

If you received a product different than you ordered or a product with a defect, contact Yaskawa or your nearest sales representative.



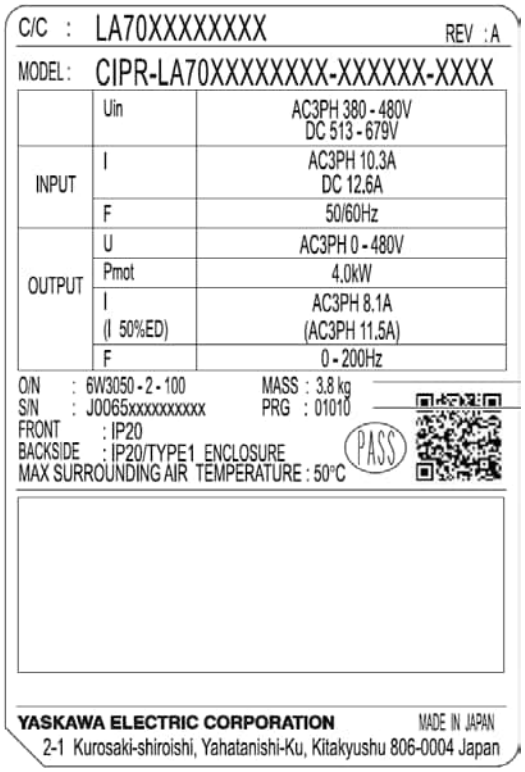
How to Read Model Numbers

The following diagram and table describe how to read model number of the crane drive.

CIPR – LA70 C 4 005 C B A A – HAAAAA - 9600

1 2 3 4 5 6 7 8 9 10

No.	Description
1	Drive Series
2	Product Series • LA70: LA700
3	Region code • C: Europe
4	Voltage class • 4: 400V 3-phase
5	Rated output current (50% ED) ***Note:*** *Refer to the list of models*
6	EMC filter • A: no built-in EMC filter • C: Built-in EMC filter category C2
7	Enclosure design • B: IP20
8	Environmental specification • A: Standard
9	Design revision order
10	VAG Number • 9600: Local European Product



List of Models

Model CIPR-LA70C...	Power	50% ED Current	Continuos Rated Current	Model Code	SAP #
4012	4 kW	11,5 A	8,1 A	CIPR-LA70C4012CBAA-HAAAAA-9600	10115850
4019	5,5 kW	18,5 A	13 A	CIPR-LA70C4019CBAA-HAAAAA-9600	10115852
4023	7,5 kW	22,5 A	15,8 A	CIPR-LA70C4023CBAA-HAAAAA-9600	10115854
4030	11 kW	30 A	21 A	CIPR-LA70C4030CBAA-HAAAAA-9600	10115856
4039	15 kW	38,8 A	27,1 A	CIPR-LA70C4039CBAA-HAAAAA-9600	10115858
4049	18,5 kW	48,8 A	34,1 A	CIPR-LA70C4049CBAA-HAAAAA-9600	10116078
4056	22 kW	56,3 A	39,4 A	CIPR-LA70C4056CBAA-HAAAAA-9600	10116080
4075	30 kW	75 A	52,5 A	CIPR-LA70C4075ABAA-HAAAAA-9600	10116081
4094	37 kW	93,8 A	65,6 A	CIPR-LA70C4094ABAA-HAAAAA-9600	10116082
4114	45 kW	113,8 A	79,6 A	CIPR-LA70C4114ABAA-HAAAAA-9600	10116083
4140	55 kW	140 A	98 A	CIPR-LA70C4140ABAA-HAAAAA-9600	10116084
4188	75 kW	187,5 A	131,3 A	CIPR-LA70C4188ABAA-HAAAAA-9600	10116085
4225	90 kW	225 A	157,5 A	CIPR-LA70C4225ABAA-HAAAAA-9600	10116086
4270	110 kW	270 A	189 A	CIPR-LA70C4270ABAA-HAAAAA-9600	10116087
4325	132 kW	325 A	227,5 A	CIPR-LA70C4325ABAA-HAAAAA-9600	10116088
4380	160 kW	380 A	266 A	CIPR-LA70C4380ABAA-HAAAAA-9600	10116089

General specification

Item	Specification
Control Method	• V/f Control • Open Loop Vector • Closed Loop Vector • PM Closed Loop Vector
Frequency Control Range	0.01 Hz to 200 Hz
Frequency Accuracy (Temperature Fluctuation)	Digital inputs: ±0.01% of the maximum output speed (-10 °C to +40 °C (14 °F to 104 °F)) Analog inputs: ±0.1% of the maximum output speed (25 °C ±10 °C (77 °F ±18 °F))
Frequency Setting Resolution	Digital inputs: 0.01 Hz Analog inputs: 1/2048 of the maximum output speed (11-bit signed)
Output Frequency Resolution	0.001 Hz
Frequency Setting Signal	Main speed reference: -10 Vdc to +10 Vdc (20 kΩ), 0 Vdc to 10 Vdc (20 kΩ), 4 mA to 20 mA (250 Ω), 0 mA to 20 mA (250 Ω)
Starting Torque	• V/f: 150%/3 Hz • OLV: 200%/0.3 Hz • CLV: 200%/0 min^{-1} (rpm) • CLV/PM: 200%/0 min^{-1} (rpm)
Speed Control Range	• V/f Control (V/f): 1:40 • Open Loop Vector Control (OLV): 1:200 • Closed Loop Vector Control (CLV): 1:1500 • Closed Loop Vector Control for PM (CLV/PM): 1:1500
Zero Speed Control	Possible in these control methods: • CLV • CLV/PM
Torque Limits	Parameter settings allow separate limits in four quadrants in Open Loop Vector Control (OLV), Closed Loop Vector Control (CLV), and Closed Loop Vector Control for PM (CLV/PM).
Accel & Decel Time	0.0 sec to 6000.0 sec
Braking Torque	Approximately 20% Approximately 125% with a dynamic braking option • Short-time average deceleration torque Motor output 0.4/0.75 kW: over 100% Motor output 1.5 kW: over 50% Motor output 2.2 kW and larger: over 20% • Continuous regenerative torque: Approximately 20%. Dynamic braking option allows for approximately 125%, 10% ED, 10 s Note: • Models 2022 to 2144 and 4012 to 4188 have a braking transistor. • Motor characteristics change the continuous regenerative torque and short-time average deceleration torque for motors 2.2 kW and larger.
V/f Characteristics	User-set V/f pattern.
Main Control Functions	Droop Control, Feed Forward Control, Position Lock at Start and Stop/Anti-Rollback Function, Overtorque/Undertorque Detection, Torque Limit, 8 Step Speed (max.), Accel/Decel Switch, 5 Zone Jerk Settings, Auto-Tuning (Rotational and Stationary Motor/Encoder Offset Tuning), Dwell Function, Cooling Fan ON/OFF Switch, Slip Compensation, Torque Compensation, DC Injection Braking at Start and Stop, Energy Saving Control, MEMOBUS/Modbus Communication (RS-485 max, 115.2 kbps), Automatic Fault Reset, Removable Terminal Block with Parameter Backup Function, Online Tuning, High Frequency Injection, Short Floor, Rescue Operation (Light Load Direction Search Function), Inspection Operation, Brake Sequence, Brake Torque Check Function, Speed related parameters with elevator units display, etc.
Motor Protection	Electronic thermal overload protection
Overload Protection	Drive stops when the output current is more than 171% of the continuous rated output current for 10 seconds. The permitted frequency of overload is one time each 10 minutes. Note: If output speed < 6 Hz, the drive can trigger the overload protection function when the output current is in the overload tolerance range.
Overvoltage Protection	200 V class: Stops when the DC bus voltage is more than approximately 410 V 400 V class: Stops when the DC bus voltage is more than approximately 820 V
Undervoltage Protection	200 V class: Stops when the DC bus voltage decreases to less than approximately 190 V 400 V class: Stops when the DC bus voltage decreases to less than approximately 380 V

Item	Specification
Heatsink Overheat Protection	The drive stops when the thermistor detects an IGBT temperature more than approximately 100°C (212°F). The trip temperature level is different for different drive models.
Braking Resistor Overheat Protection	Overheat detection for braking resistor (optional ERF-type, 3% ED)
Stall Prevention	Stall prevention is available during acceleration, deceleration, and during run.
Ground Fault Protection	Electronic circuit protection **Note:** This protection detects any ground faults during run. The drive will not provide protection when: • There is a low-resistance ground fault for the motor cable or terminal block • Energizing the drive when there is a ground fault present.
DC Bus Charge LED	Charge LED illuminates when DC bus voltage is above 50 V.
Area of Use	Indoors
Power Supply	Overvoltage Category III
Ambient Temperature	IP20/UL Open Type: -10°C to +50 °C (14 °F to 122 °F) • When you install the drive in an enclosure, use a cooling fan or air conditioner to keep the internal air temperature in the permitted range. • Do not let the drive freeze.
Humidity	95% RH or less Do not let condensation form on the drive.
Storage Temperature	-20 °C to +70 °C (-4 °F to +158 °F) (short-term temperature during transportation)
Surrounding Area	Pollution degree 2 or less Install the drive in an area without: • Oil mist, corrosive or flammable gas, or dust • Metal powder, oil, water, or other unwanted materials • Radioactive materials or flammable materials, including wood • Harmful gas or fluids • Salt • Direct sunlight Keep wood or other flammable materials away from the drive.
Altitude	1000 m (3281 ft.) maximum **Note:** Derate the output current by 1% for each 100 m (328 ft.) to install the drive in altitudes between 1000 m to 4000 m (3281 ft. to 13123 ft.). It is not necessary to derate the rated voltage in these conditions: • Installing the drive at 2000 m (6562 ft.) or lower • Installing the drive between 2000 m to 4000 m (6562 ft. to 13123 ft.) and grounding the neutral point on the power supply. Contact Yaskawa or your nearest sales representative when not grounding the neutral point.
Vibration	• 10 Hz to 20 Hz: 1 G (9.8 m/s^2, 32.15 ft/s^2) • 20 Hz to 55 Hz: 2022 to 2225, 4012 to 4188: 0.6 G (5.9 m/s^2, 19.36 ft/s^2) 2269 to 2519, 4225 to 4380: 0.2 G (2.0 m/s^2, 6.56 ft/s^2)
Installation Orientation	Install the drive vertically for sufficient cooling airflow.
Harmonized Standard	• UL61800-5-1 • EN61800-3 • IEC/EN61800-5-1 • Two Safe Disable inputs and one EDM output according to ISO/EN13849-1 Cat.III PLe, IEC/EN61508 SIL3
Protection Design	IP20/UL Open Type

Power Ratings

Three-phase 400 V Units

Model CIPR-LA70C…		4012	4019	4023	4030	4039	4049	4056	4075
Maximum Applicable Motor Capacity	kW	4	5,5	7,5	11	15	18,5	22	30
Rated Output Current	Cont.	8,1	13	15,8	21	27,1	34,1	39,4	52,5
	50% ED	11,5	18,5	22,5	30	38,8	48,8	56,3	75
	3 sec	16.7	27	37	49	62.6	78.8	97.4	120.6
Default Carrier Frequency	kHz	8	10	10	10	8	8	8	8
DC Reactor		External Option							Built-in
Braking Transistor		Built-in							
Maximum Output Voltage		Three phase 380V to 480V Note: The maximum output voltage is proportional to the input voltage							
EMC Filter		Category C2 EMC filter built-in IEC61800-3							External
Power Supply		AC Power: Three phase 380V to 480V at 50/60Hz , DC Power: 513V to 679V Allowable Voltage Fluctation: -15% to +10%, Allowable Frequency Fluctation: ±5%							
Input Power	kVA	9,3	13	17	24	33	40	34	46

Model CIPR-LA70C…		4094	4114	4140	4188	4225	4270	4325	4380
Maximum Applicable Motor Capacity	kW	37	45	55	75	90	110	132	160
Rated Output Current	Cont.	65,6	79,6	98	131,3	157,5	189	227,5	266
	50% ED	93,8	113,8	140	187,5	225	270	325	380
	3 sec								
Default Carrier Frequency	kHz	5	5	5	5	5	5	5	5
DC Reactor		Built-in							
Braking Transistor		Built-in				External			
Maximum Output Voltage		Three phase 380V to 480V Note: The maximum output voltage is proportional to the input voltage							
EMC Filter		External							
Power Supply		AC Power: Three phase 380V to 480V at 50/60Hz , DC Power: 513V to 679V Allowable Voltage Fluctation: -15% to +10%, Allowable Frequency Fluctation: ±5%							
Input Power	kVA	57	69	84	113	135	165	198	239

Drive Watt Loss

Three-phase 400 V Units

Model CIPR-LA70C…	Power	Current	LA700 Drive Heat Losses			
			Carrier Frequency (kHz)	Inside (W)	Outside (W)	Total Loss (W)
4012	4 kW	11,5 A	8	36	70	106
4019	5,5 kW	18,5 A	10	48	99	147
4023	7,5 kW	22,5 A	10	58	126	184
4030	11 kW	30 A	10	79	169	248
4039	15 kW	38,8 A	8	95	231	326
4049	18,5 kW	48,8 A	8	124	298	422
4056	22 kW	56,3 A	8	145	358	503
4075	30 kW	75 A	5	202	548	750
4094	37 kW	93,8 A	5	209	565	774
4114	45 kW	113,8 A	5	251	683	934
4140	55 kW	140 A	5	291	851	1142
4188	75 kW	187,5 A	5	408	1079	1487
4225	90 kW	225 A	5	388	1225	1613
4270	110 kW	270 A	5	483	1300	1783
4325	132 kW	325 A	5	586	1760	2346
4380	160 kW	380 A	5	696	2010	2706

Deratings

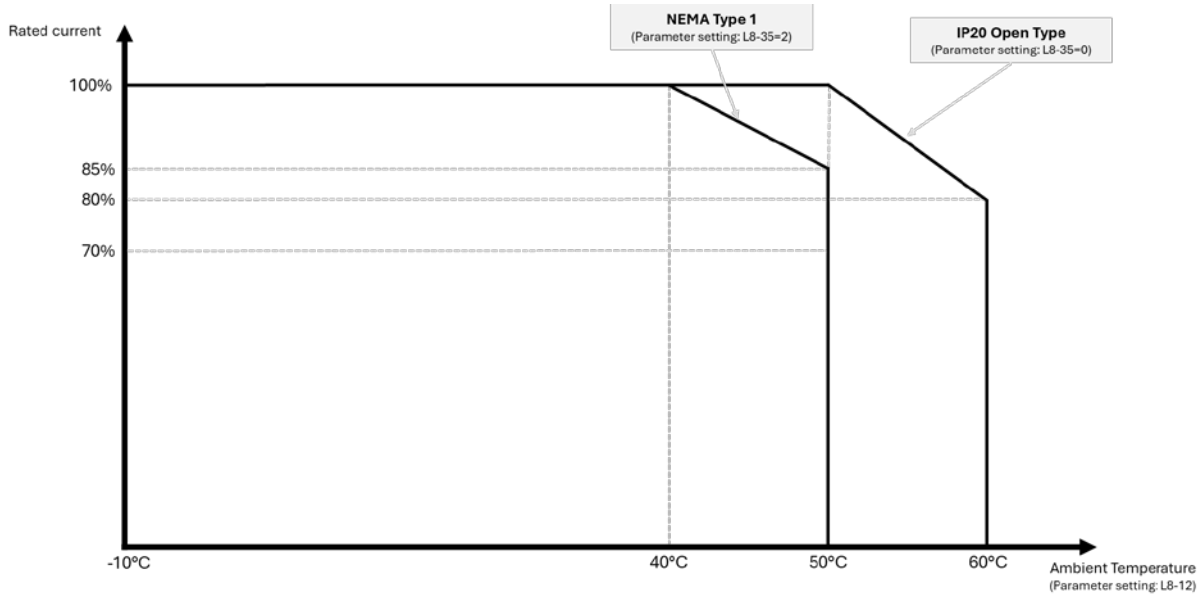
Carrier Frequency Derating

The rated current of LA700 drives might need to be reduced depending on the selected carrier frequency.

Model CIPR-LA70C…			LA700 Continuose Rated Output Current in Ampere					
	Power	Current	2 kHz	5 kHz	8 kHz	10 kHz	12.5 kHz	15 kHz
4012	4 kW	8,1 A	8,1	8,1	8,1	7,1	5,9	4,7
4019	5,5 kW	13 A	13	13	13	13	11,2	9,5
4023	7,5 kW	15,8 A	15,8	15,8	15,8	15,8	14,1	12,4
4030	11 kW	21 A	21	21	21	21	18,6	16,2
4039	15 kW	27,1 A	27,1	27,1	27,1	24	20,1	16,3
4049	18,5 kW	34,1 A	34,1	34,1	34,1	30,8	27,1	23,4
4056	22 kW	39,4 A	39,4	39,4	39,4	35,5	31,2	26,8
4075	30 kW	52,5 A	52,5	52,5	52,5	46,5	39	31,5
4094	37 kW	65,6 A	65,6	65,6	54,3	46,8	37,5	28,1
4114	45 kW	79,6 A	79,6	79,6	69,1	62,1	53,3	44,6
4140	55 kW	98 A	98	98	80,4	68,6		
4188	75 kW	131,3 A	131,3	131,3	107,6	91,9		
4225	90 kW	157,5 A	157,5	157,5	129,2	110,3		
4270	110 kW	189 A	189	189	155	132,3		
4325	132 kW	227,5 A	227,5	227,5	186,6	159,3		
4380	160 kW	266 A	266	266	218,1	186,2		

Ambient Temperature Derating

Depending on the mounting condition, enclosure type and ambient temperature derating factors need to be applied on the rated output current of LA700 drives. The derating curves shown below are valid for all frames of LA700.



Altitude Derating

LA700 drives can be operated at altitudes up to 1000 m without derating. Between 1000 and 4000 m altitude above sea level a derating of 1 % per 100 m must be applied to the rated output current.

Additionally, a derating must be applied to the rated voltage if the drive is installed over 2000 m above sea level with the neutral point of the power supply ungrounded.

Built-in EMC Filters / Leakage Current

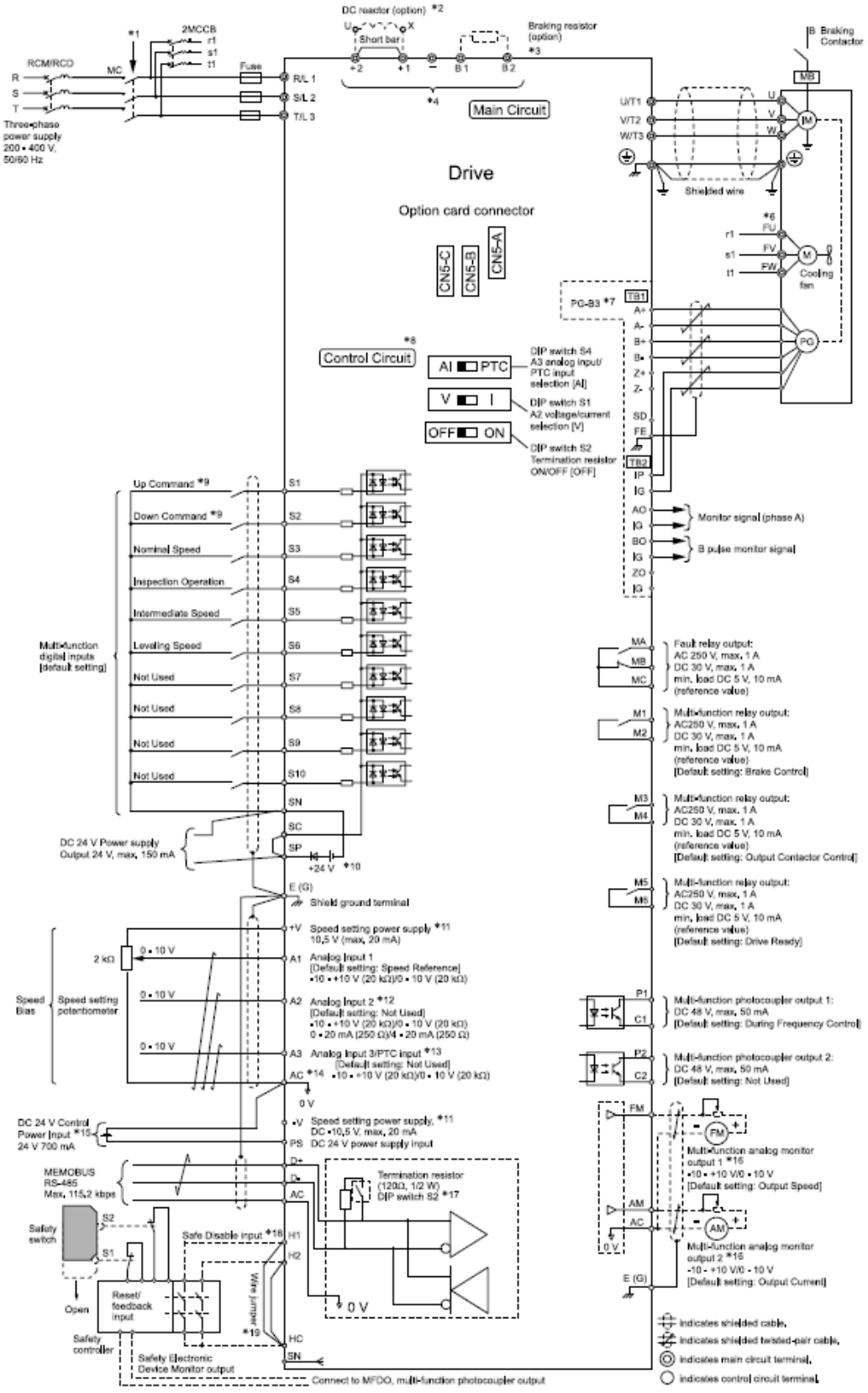
LA700 Drives are without an embedded EMC filter. Internal EMC filters are designed to be used in TN grids. The filters shall be disabled when using the drive in an ungrounded system or a system that is not grounded symmetrically.

CIPR-LA70C4□□□	Power	Current (50% ED)	IEC61800-3 Category	Cable Length *1
4012	4 kW	11,5 A	C2	10 m
4019	5,5 kW	18,5 A	C2	10 m
4023	7,5 kW	22,5 A	C2	10 m
4030	11 kW	30,0 A	C2	10 m
4039	15 kW	38,8 A	C2	10 m
4049	18,5 kW	48,8 A	C2	10 m
4056	22 kW	56,3 A	C2	10 m

Note:
*1 Shielded Motor Cable

Electrical Connections

Connection Diagram



*For more details check LA700 Technical Manual chapter 3.5 Control Circuit Wiring

Dimensions and Weight

400V class: 4kW to 30kW

Model CIPR-LA70C□□□□	Power	Exterior and Mounting Dimensions	W	H	D	D1	D2	W1	W2	W5	H1	H2	H4	t1	t2	d	Weight (kg)
4012	4 kW	Figure 1	140	260	211	138	73	102	102		248	6		2	5	M5	3,9
4019	5,5 kW		140	260	211	138	73	102	102		248	6		2	5	M5	4,1
4023	7,5 kW		140	260	211	138	73	102	102		248	6		2	5	M5	4,1
4030	11 kW	Figure 2	180	300	202	134	68	140	140		284	8		2	2	M5	5,5
4039	15 kW		180	300	202	134	68	140	140		284	8		2	2	M5	5,5
4049	18,5 kW	Figure 3	220	350	227	140	87	192	192		335	8		2	2	M6	8,5
4056	22 kW		220	350	227	140	87	192	192		335	8		2	2	M6	13
4075	30 kW	Figure 4	240	400	280	166	114	195	186	12	375	18	18	2	2	M6	15

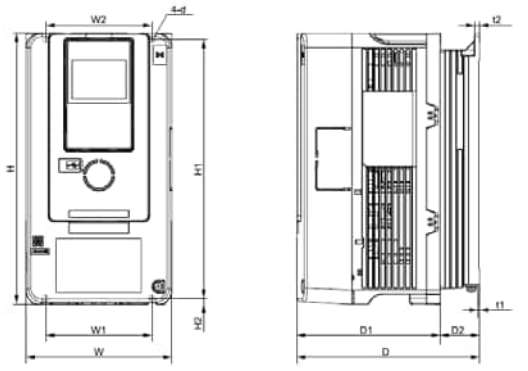


Figure 1

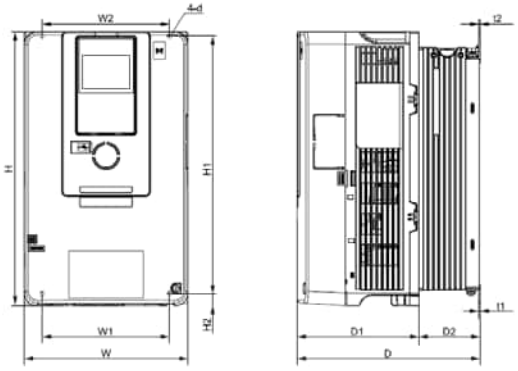


Figure 2

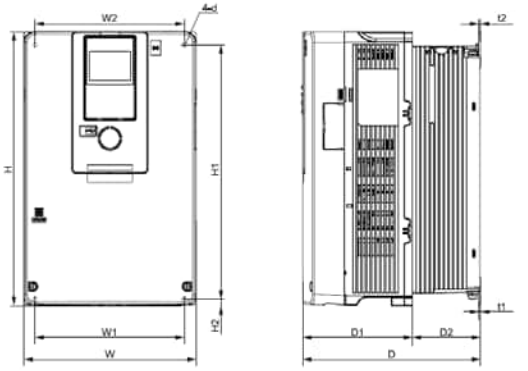


Figure 3

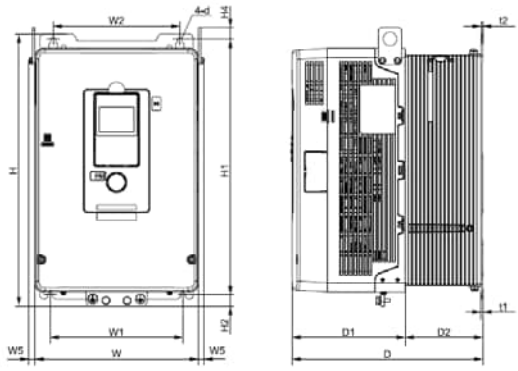


Figure 4

400V class: 37kW to 160kW

Model CIPR-LA70C□□□□	Power	Exterior and Mounting Dimensions	W	H	D	D1	D2	W1	W2	W5	H1	H2	H3	H4	t1	t2	d	Weight (kg)
4094	37 kW	Figure 5	225	450	280	166	114	170	165	12	424	16	29	21	2	2	M6	20
4114	45 kW		225	450	280	166	114	170	165	12	424	16	29	21	2	2	M6	25
4140	55 kW	Figure 6	264	543	335	186	149	190	182	12	516	18	29	21	2	2	M8	37
4188	75 kW		264	543	335	186	149	190	182	12	516	18	29	21	2	2	M8	38
4225	90 kW	Figure 7	312	700	420	260	160	218	218	18	659	28	44	29	5	5	M10	61
4270	110 kW		312	700	420	260	160	218	218	18	659	28	44	29	5	5	M10	63
4325	132 kW		312	700	420	260	160	218	218	18	659	28	44	29	5	5	M10	66
4380	160 kW	Figure 8	440	800	472	254	218	370	370	20	757	28	44	30	5	5	M12	107

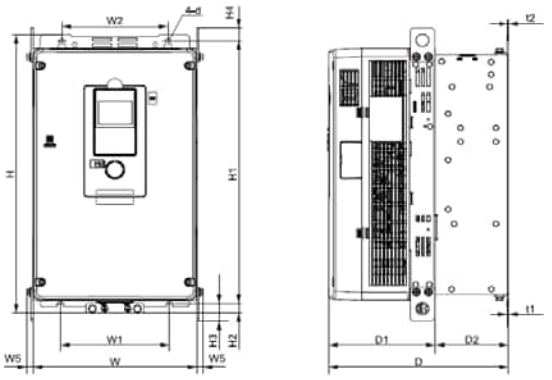


Figure 5

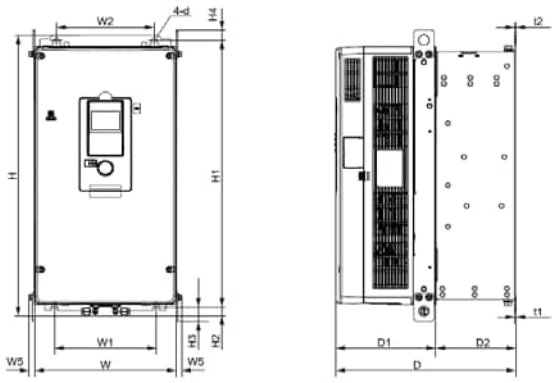


Figure 6

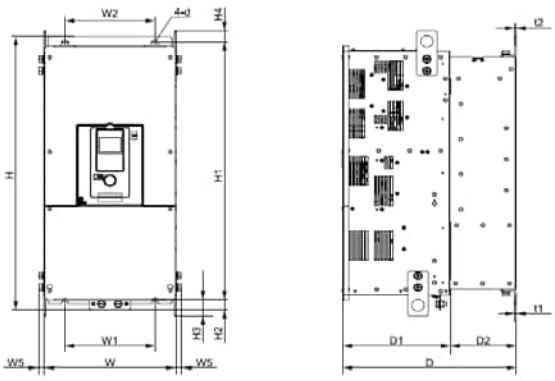


Figure 7

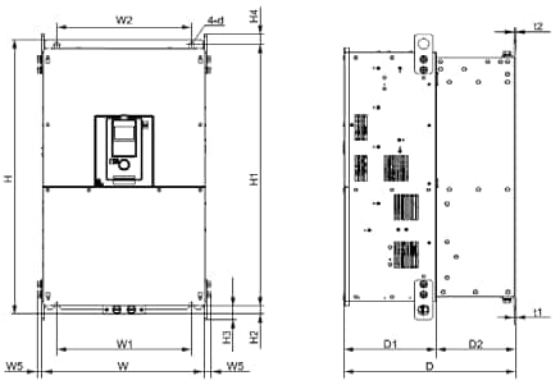


Figure 8

Accessories & Power Options

Network Communications Option Cards

The communication option cards listed below can be mounted on CR700 drive. They are shipped lose together with the required installation material.

Network Type	Model Codes	SAP #
CANopen	SI-S3	100-046-870
CANlift*	SI-L3	*will be available in 2H'2025

Motor Speed Feedback Option Card

The Motor Speed Feedback Option Card allows the user to connect a driver encoder (PG) for motor speed feedback to the drive to increase the control accuracy and performance in V/f w/PG, CLV, AOLV, and CLV/PM control methods.

This PG encoder signal allows the drive to compensate for subtle variations in the load while providing the drive with the necessary data to control the output frequency and maintain an accurate constant speed.

For motor speed feedback option card details and compatible encoder types check the technical manual.

Encoder Type	Model Codes	SAP #
Open Collector (HTL)	PG-B3	10062639
Line Driver (TTL/RS422)	PG-X3	100-046-872
ERN1387	PG-E3	500-033-406
EnDat, HIPERFACE	PG-F3	100-067-860
BiSS	PG-F3-B	10114797

Speed Reference Card

Enables high-precision and high-resolution analog/digital speed reference setting.

Input Signal	Model Codes	SAP #
Analog Input (3 inputs) (-10 to +10Vdc or 4 to 20mA)	AI-A3	100-046-873
Digital Input (BCD Code)	DI-A3	100-046-875

LED/LCD Keypads



LCD Keypad (standard)

Model Code: JVOP-KPLCA04AEA
SAP # 10105769

This optional LCD keypad greatly improves the operability of the drive. The high-res screen can display graphics and multi-language full text. Additional functions are: Start-up Wizard, copy function (4 sets of parameters), backup, data logging, real-time clock.

LCD Bluetooth Keypad

Model Code: JVOP-KPLCC04ABA
SAP # 10099085

This optional LCD keypad provides the ability to connect to the drive using Bluetooth. It is designed to be able to operate like the LCD keypad if keypad navigation is required.

This keypad is used in conjunction with DriveWizard Mobile to connect to the drive via Bluetooth. You can download DriveWizard Mobile to your mobile device through the Apple AppStore or Google Play.

LED Full Size Keypad

Model Code: JVOP-KPLEA04AAA
SAP # 10010185

This optional LED keypad provides a larger LED display (5 digit, 7 segments) and larger navigation buttons for more comfort during drive operation.

Note: The LED keypad does not support the Remote Display functionality of CANopen Lift and DCP. Further, it has some restrictions regarding the Travel Direction Change Counter functionality and the Setup Wizard.

Extension Cables

Extension cables for keypads are offered in two lengths.

Model Number	Description	SAP #	
WV001-YEG	Keypad Remote Mount Cable - 1 Meter	10007058	
WV003-YEG	Keypad Remote Mount Cable - 3 Meter	10012366	

PC Connection Cable (USB)

Model Number	Description	SAP #
JZSP-CVS06-02-E	USB-mini connection cable for PC 2.5m	300-100-888

Keypad Door Mounting Kits

Door Mounting Kits for LCD Keypads (with or without Bluetooth)

The LCD keypads can be mounted to a panel front door using one of the mounting kits below.

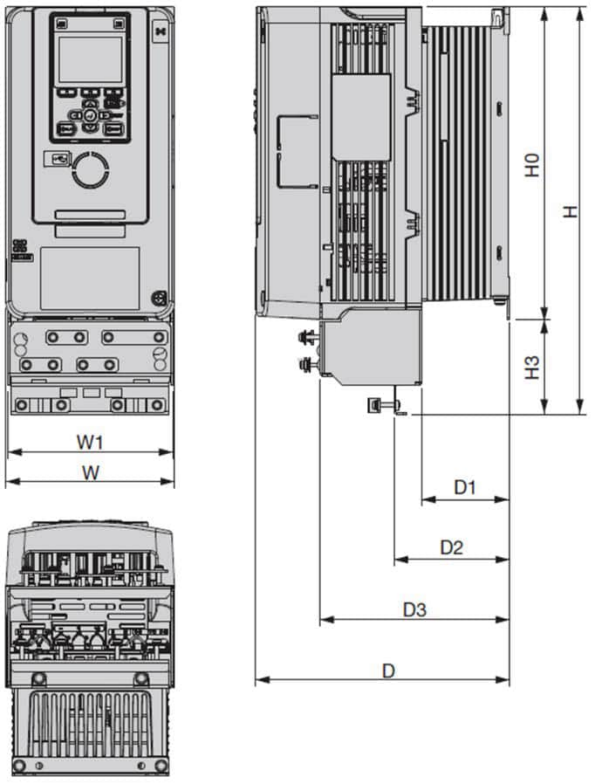
Type of Mounting	Brackets have tapped holes for use with screws	brackets have untapped holes for use with panel studs
Model Number	900-192-933-001	900-192-933-002
SAP #	10090514	10090515
Appearance		

Cable Shield Clamp Kit

A cable shield kit can be mounted at the bottom of the drive, in order to easy cable shield connection and provide a strain relief at the same time

Important:
- Cable shield and UL Type 1 kits cannot be installed simultaneously.

Model CIPR-LA70C 4□□□	Power	W	H	D	D1	D2	D3	W1	H0	H3	Shield Clamp Kit (Model No.)
012	4 kW	140	339	211	73	96	158	137	260	79	100-206-983
019	5,5 kW	140	339	211	73	96	158	137	260	79	100-206-983
023	7,5 kW	140	339	211	73	96	158	137	260	79	100-206-983
030	11 kW	180	439	202	68	93	148	175	298	141	100-206-984
039	15 kW	180	439	202	68	93	148	175	298	141	100-206-984



AC Line Reactors / Power Coordinating Reactor

Input reactors can be applied to reduce harmonic distortion on the AC input line. Reactors are offered with 4% uk. IP20 covers are separately available.

Model CIPR-LA70C…	Power	Current	IP00	IP20 cover	SAP # (IP00)	SAP# (IP20 cover)
4012	4 kW	11,5 A	B 1103136	IP20-BOX32	10008858	10062614
4019	5,5 kW	18,5 A	B 1103138	IP20-BOX35	10000040	10062617
4023	7,5 kW	22,5 A	B 1103139	IP20-BOX36	10000041	10062618
4030	11 kW	30 A	B 1103140	IP20-BOX37	10000042	10062619
4039	15 kW	38,8 A	B 1103140	IP20-BOX37	10000042	10062619
4049	18,5 kW	48,8 A	B 1103141	IP20-BOX39	10008862	10062621
4056	22 kW	56,3 A	B 1103142	IP20-BOX39	10008863	10062621
4075	30 kW	75 A	B 1103142	IP20-BOX39	10008863	10062621
4094	37 kW	93,8 A	B 0910013	IP20-BOX42	10008857	10062624
4114	45 kW	113,8 A	B 0910013	IP20-BOX42	10008857	10062624
4140	55 kW	140 A	B 1411053	IP20-BOX46	10008876	10062628

D1000: Regenerative Converter (AFE)

The D1000 regenerative converter unit complements the Yaskawa product range with a low harmonics Active Frontend Solution. Suitable for standard and regenerative applications with individual drives or systems of inverter drives, the D1000 feeds excess braking energy back into the power grid instead of dissipating it as heat and keep the harmonic migration below 5% under full load.

The D1000 KIT is a pre-configured package that include D1000 regenerative converter unit, EMC filter, input reactor(s) and harmonic filter module.

D1000 KIT (with THD filter module in IP00 protection)

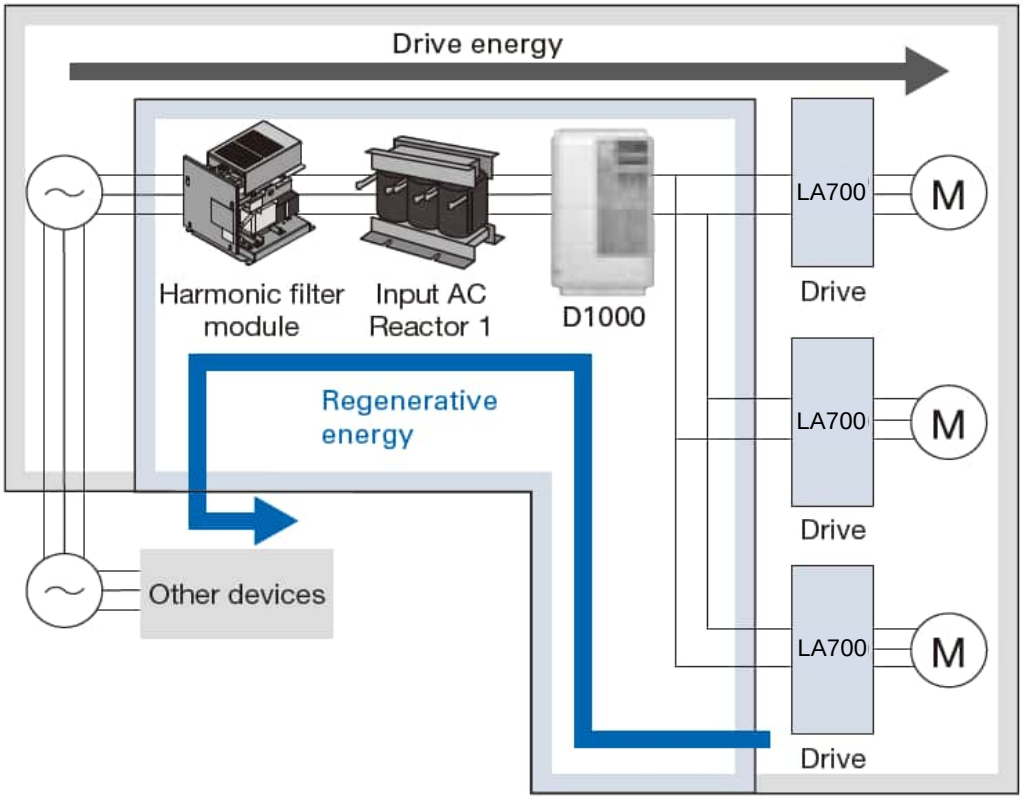
Power	D1000 KIT Model Code	SAP #
5 kW	D1KIT40005AAAAB	10009715
10 kW	D1KIT40010AAAAB	10009718
20 kW	D1KIT40020AAAAB	10009722
30 kW	D1KIT40030AAAAB	10009726
40 kW	D1KIT40040AAAAB	10009730
60 kW	D1KIT40060AAAAB	10009734
100 kW	D1KIT40100AAAAB	10009736
130 kW	D1KIT40130AAAAB	10009738
185 kW	D1KIT40185AAAAB	10009740

D1000 KIT (with THD filter module in IP20 protection)

Power	D1000 KIT Model Code	SAP #
5 kW	D1KIT40005AABAB	10009716
10 kW	D1KIT40010AABAB	10009719
20 kW	D1KIT40020AABAB	10009723
30 kW	D1KIT40030AABAB	10009727
40 kW	D1KIT40040AABAB	10009731

For more detail such as dimensions or weight check the D1000 catalog or visit the D1000 (D1000 Regenerative Converter) or LA700 (LA700 Premium Lift Drive) web information.

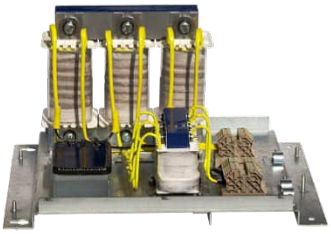
Schematic diagram



D1000 KIT components (example with IP20 THD filter cover)



D1000 Regenerative Converter Unit



THD filter



EMC filter



THD filter cover (IP20)

R1000: The intelligent regenerative braking unit

The R1000 regenerative braking unit is a smart and efficient alternative to dynamic braking for single or multi-axis drive installations with a high amount of regenerative motor operation. Instead of wasting the braking energy as heat, the R1000 feeds excessive braking energy back to the grid.

The R1000 KIT is a pre-configured package that include R1000 regenerative converter unit and current suppression reactor.

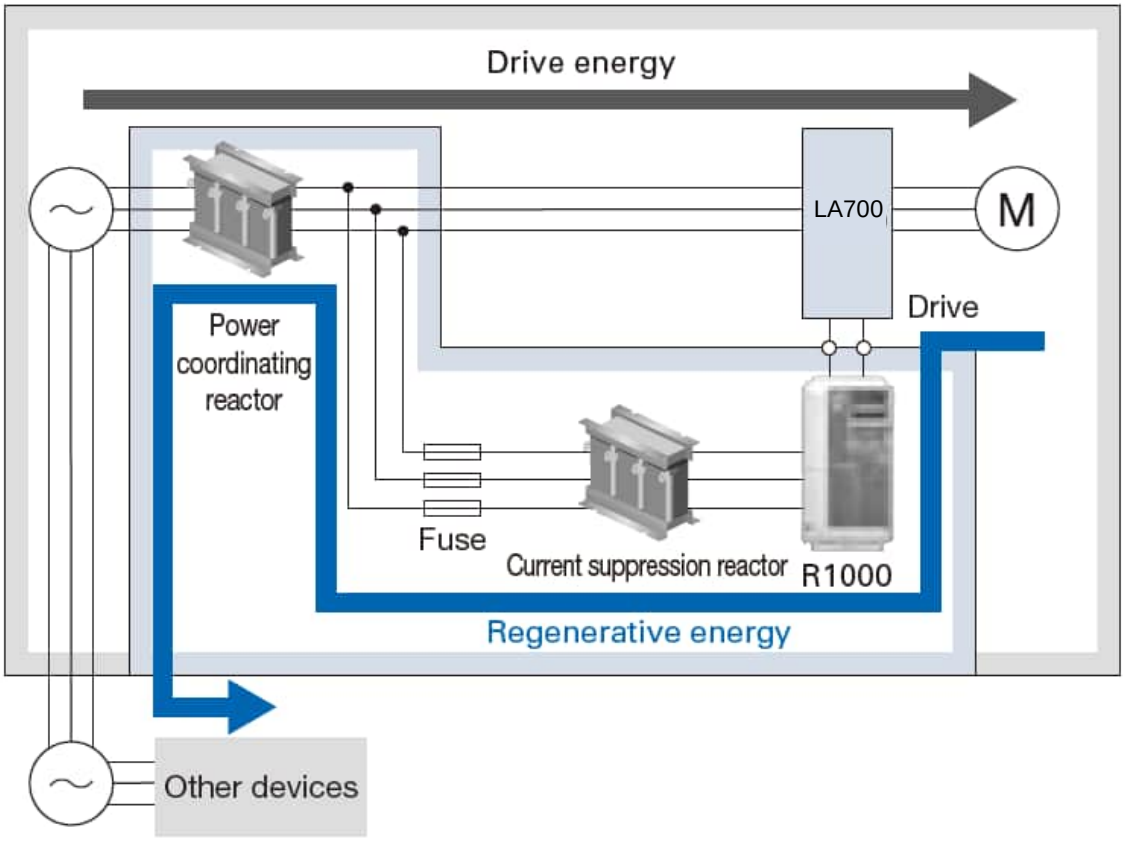
To comply with EN12015 customer must add the Power Coordinating Reactor (see page 18). For details refer also to R1000 catalog.

Power	Model Code (R1000 KIT with IP20 reactor)	SAP #	Model Code (R1000 KIT with IP00 reactor)	SAP #
3,5 kW	R1KIT40003AABAA	10011484	R1KIT40003AAAAA	10011483
5 kW	R1KIT40005AABAA	10011486	R1KIT40005AAAAA	10011485
7 kW	R1KIT40007AABAA	10011488	R1KIT40007AAAAA	10011487
10 kW	R1KIT40010AABAA	10011490	R1KIT40010AAAAA	10011489
14 kW	R1KIT40014AABAA	10011492	R1KIT40014AAAAA	10011491
17 kW	R1KIT40017AABAA	10011494	R1KIT40017AAAAA	10011493
20 kW	R1KIT40020AABAA	10011496	R1KIT40020AAAAA	10011495
28 kW	R1KIT40028AABAA	10011498	R1KIT40028AAAAA	10011497
35 kW	R1KIT40035AABAA	10011500	R1KIT40035AAAAA	10011499
43 kW	R1KIT40043AABAA	10011502	R1KIT40043AAAAA	10011501
53 kW	R1KIT40053AABAA	10011504	R1KIT40053AAAAA	10011503
73 kW	R1KIT40073AABAA	10011506	R1KIT40073AAAAA	10011505
105 kW	R1KIT40105AABAA	10011508	R1KIT40105AAAAA	10011507
150 kW	R1KIT40150AABAA	10011510	R1KIT40150AAAAA	10011509

Note:
Each system that incorporates an R1000 unit must include the Power Coordinating Reactor, Current Suppression Reactor and EMC Filter. The Current Suppression Reactor must only withstand the regenerative current and is therefore included in the R1000 kit. However, the Power Coordinating Reactor (AC Input Reactor) and EMC Filter must also withstand the motoring current going into de system. Since the input current can be higher than the regenerative current depending on the application, these components must be ordered separately. Fuses in the R1000 branch must be installed by the customer according to Yaskawa recommendations.

For more detail such as dimensions or weight check the R1000 catalog or visit the R1000 (R1000 Regenerative Unit) or LA700 (LA700 Premium Lift Drive) web information.

Schematic diagram



R1000 KIT components (example with IP20 reactor cover)



R1000 Regenerative Converter Unit



Current suppression reactor



Power Coordinating Reactor



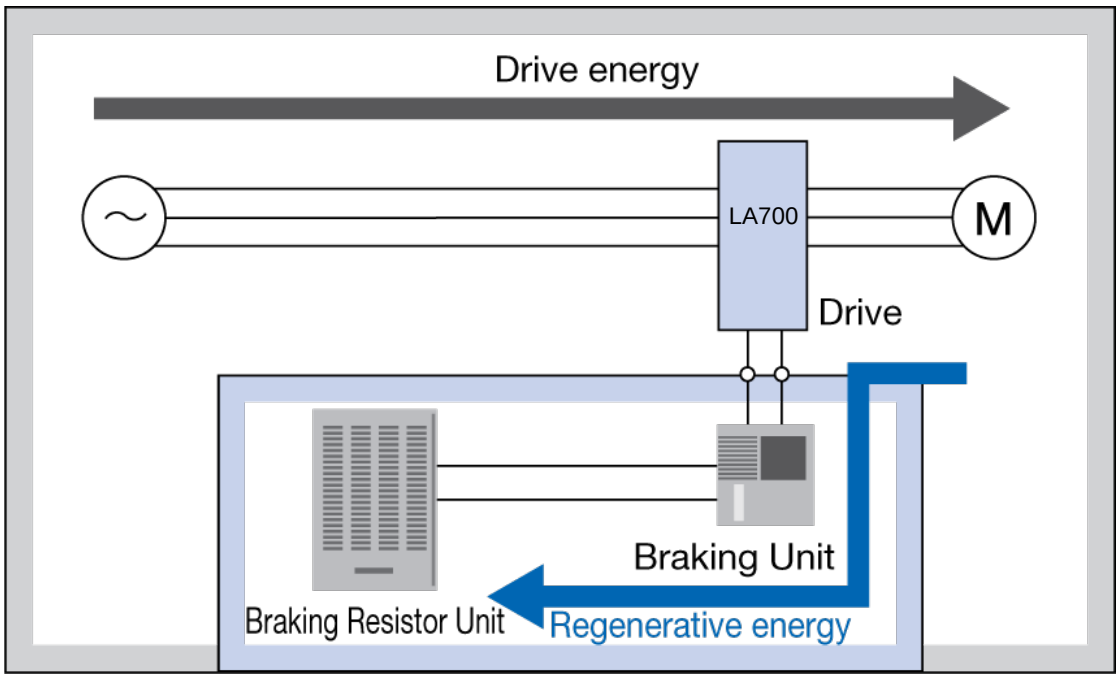
Reactor cover (IP20)

Dynamic braking with Braking Resistors

When lowering a load with a crane the motor works in regenerative mode for the whole lowering process. Reason for this is an additional energy feedback (kinetic energy of the machine) to the inverter while deceleration. The motor must produce a braking torque which causes voltage increase on the DC bus. This causes a rise of the DC bus voltage. If the feedback energy is too high, the inverter may trip with an overvoltage fault (OV). In this case a braking resistor or a combination of a braking unit and a braking resistor must be used to dissipate the energy as heat.

CR700 drives have embedded braking transistors up to drive capacity of 75kW. Resistors selected from the table below can be directly connected to terminals B1 and B2. When connecting other resistors, the resistance must be higher than the minimum value listed below. See more details on next page

Schematic diagram



Dynamic braking item examples



CDBR-4045D



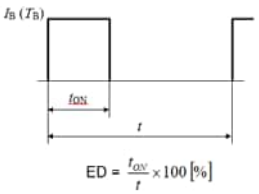


Braking Resistor Series RH

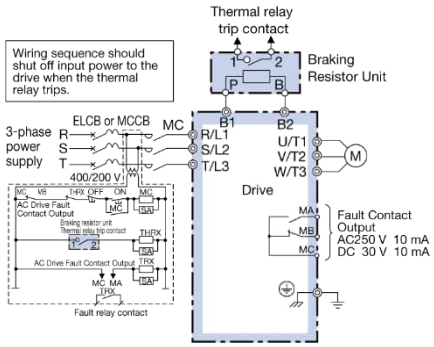
Braking resistor (40% ED) without Thermosensor

Model CIPR-LA70C□□□	Braking Unit			Braking Resistor*1				
	Braking Chopper	Qty.	Material No.	Resistor 40% ED	Qty.	Min. Resistor*2 [Ω]	Connection Diagram	SAP #
4012	Built-in Braking Transistor			RH-1000W120	1	55	A	10004349
4019				RH-1560W040	1	32	A	10004350
4023				RH-2700W025	1	32	A	10004351
4030				RH-3700W040	1	20	A	10004352
4039				RH-4800W022	1	20	A	10004353
4049				RH-6000W022	1	19,2	A	10004356
4056				RH-7500W023	1	19,2	A	10004357
4075				On request, contact your sales representative				
4094								
40114								
4140								
4188								
4225	CDBR		On request, contact your sales representative					
4270	CDBR							
4325	CDBR							
4380	CDBR							

Note: 40% ED: 120 s cycle time (t) and 48 s switch on time (t_{on})



Connection Diagram A



Connection Diagram A

*1: Refers to a motor coasting to stop with a constant torque load. Constant output and regenerative braking will reduce the duty factor. Applications with a relatively large amount of regenerative power may require more braking power than is possible with the standard braking unit and braking resistor unit only. If the braking torque exceeds the value shown in the table, the capacity of the braking resistor unit must be increased.

*2: This value is the min. resistor value which can be connected to the drive. Lower value will result in damage of the LA700 and/or braking unit. The braking unit should have a resistance higher than the minimum connectable resistance value and be able to generate enough braking torque to stop the motor. For more information on the braking resistor check the technical data sheet of the resistor or contact your nearest Yaskawa sales representative.

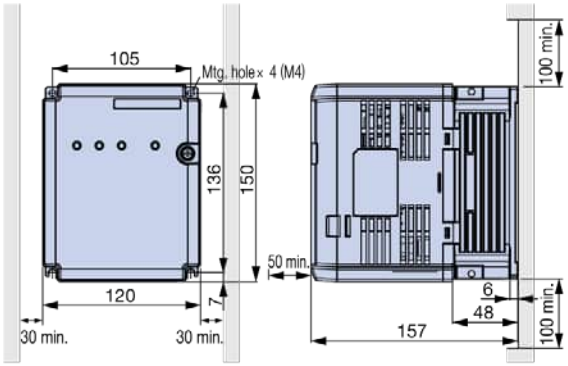
*3: When using multiple braking resistor units, connect them in parallel.

General Note:

- Be sure to protect braking resistors by thermal overload relay

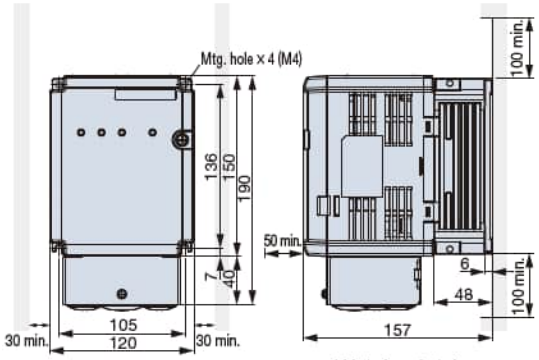
Dimensions: CDBR braking unit

Braking Unit	Max. discharge current (A) 10% ED (10 sec. max)	Rated discharge current (A) continuous	Watt Loss (W)	SAP #
4045D	60	18	36	100-091-723
4090D	100	30	51	100-091-525
4220D	250	80	152	100-091-526



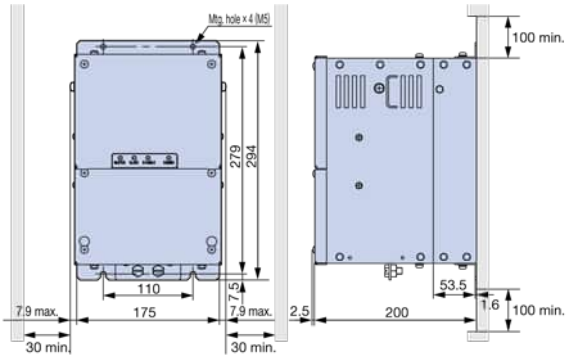
CDBR-4045D

Weight: 2 kg



CDBR-4090D

Weight: 2.3 kg



CDBR-4220D

Weight: 7.5 kg

General Note:

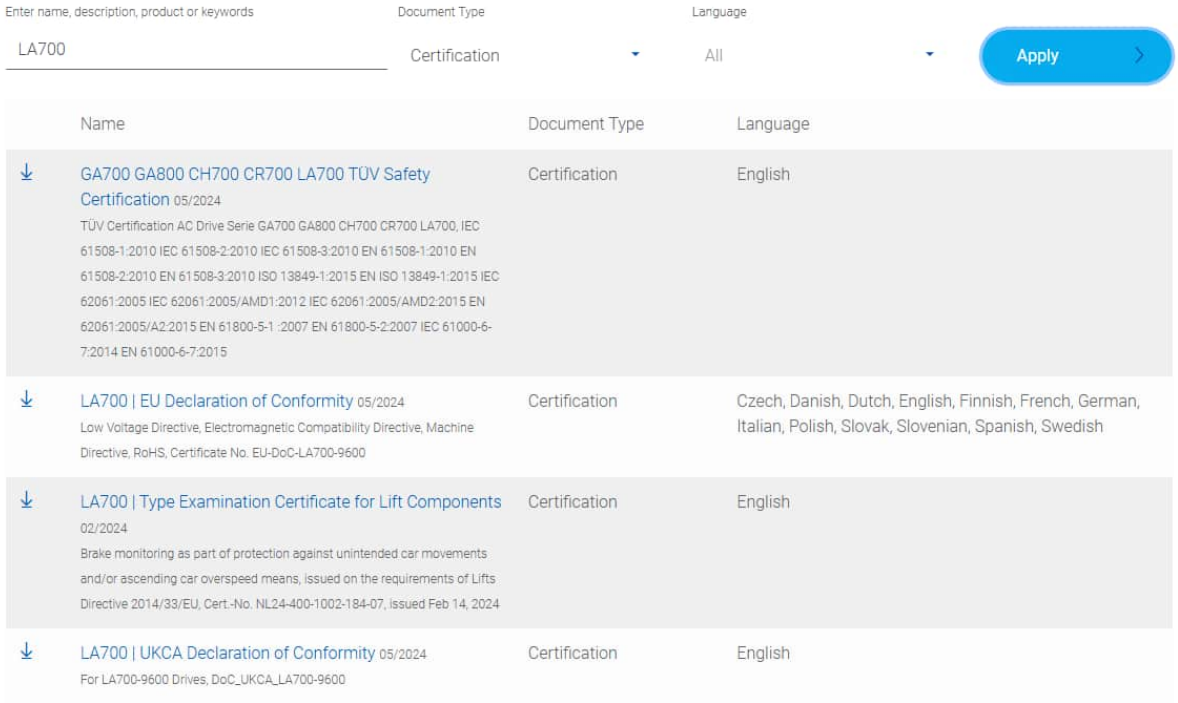
- Be sure to protect braking resistors by thermal overload relay
- When using more than one braking unit connected in parallel, set one of the braking units as the master, and set the others as slaves
- Connect CDBR fault relay output to multi-function digital input S (External Fault). Connect the CDBR transistor short-circuit detection output to disconnect main input power to the drive

LA700 online info

Certification/Declaration

The latest version of LA700 product certification/declaration can be downloaded from Yaskawa website.

Use the link Download Center to access Yaskawa document download. Enter the *search name* **LA700** and change the *Document Type* to **Certification** for declaration and certification files.



LA700 Info Page

LA700 Online Info

Software Tools

Software Tools

Tool	Description	System	Connection
DriveWizard 10	PC Tool for parameter management/backup/diagnostics	Windows	USB-mini
DriveWizard Mobile	Mobile app for parameter management/backup/diagnostics	Android	• Bluetooth • USB-mini with USB on-the-go adapter
		iPhone	• Bluetooth

LA700

ELEVATE YOUR LIFESTYLE



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