YASKAWA

LA700

The Lift Drive

www.yaskawa.eu.com

Best value for lift

LA700 lift drives are the solution to technical requirements of today's elevators. This lift drive controls induction and permanent magnet motors. It 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.

Drawing upon more than 100 years of experience in driving motors, Yaskawa develops products which perfectly combine technical superiority with easy operation.

Our number one priority is to always keep the customer's perspective in mind. We offer the highest market benchmark in quality and product reliability.

We can now deliver ideal solutions for various tasks related to the operation of elevators and escalators, including brake sequences that have evolved from the technologies we have developed to date.

Key features

- Super-smooth ride comfort
- Quieter operation thanks to new frequency adjustment function
- Advanced light load search for evacuation (smaller UPS)
- SIL3 STO (Zero contactor solution)
- BiSS support
- Integrated Class C2 EMC filter
- Coated PCBs according to 3C2, 3S2 by default
- Embedded braking chopper (up to 75 kW)
- Fast installation and easy setup thanks to our intuitive start-up wizard
- Smart MRL replacement
- Motor tuning in stand-still condition without removing ropes
- For gearless and geared lifts
- Up to 4 m/s
- Certified Brake Monitor Function for UCM:EN 81-1:1998+A3:2009 9.11.3 and EN 81-20:2014 5.6.7.3

Advanced functions

- Direct to floor
- Monitors for motor temperature, peak current and lifetime
- Advanced short floor management
- Elevator setup wizard
- Support for 13 languages
- Torque compensation (load cell optional)
- DCP3, DCP4* and CAN Lift*

LA700 – flexibility, ease of use, and a sustainable design offer the best value proposition for your lift application.

*currently in development

Key features and benefits

Designed to drive both induction and permanent magnet motors, LA700 drives are becoming the preferred choice for various applications, including new installations, machine-room-less lifts and modernisation projects. By choosing an LA700 drive, you can experience our proven reliability with a higher standard of ride comfort, ensuring a modern and efficient solution for today's lift systems.

Super-smooth ride comfort

Ride profiles with individual jerk setting for each speed change and different selectable acceleration/deceleration ramps allow fine tuning for a smooth and shockless ride.

- Five individual jerk settings for each speed change.
- Up 4 to different selectable acceleration/deceleration ramps.
- Dedicated and easy to adjust lift brake sequence.
- Three independent Speed Loop settings for fine tuning. (ASR) (Start/Constant/Stop)
- Allows fine tuning for a smooth and comfortable ride.

Rescue & evacuation function

When the power fails and people need to be rescued, we have the new Advanced Light Load function. The LA700 will automatically evacuate in the direction of regeneration. This function allows the use of smaller UPS. UPS or DC battery backup can be used.

Anti-rollback feature + torque compensation as an option

For improved ride comfort, the starting torque when releasing the brake is set during commissioning.

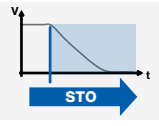
- Improved Anti-Back function for smooth starting
- Torque compensation function also available with load cell.

Short floor function

The Short Floor function controls that the movement distance when decelerating from the highest frequency or nominal speed to the leveling speed. In all cases (positioning accuracy) is the same. This means, that the elevator covers different distances, if the leveling speed command is set at different speeds.

- Short floor operation is used when the fast speed is not reached between floors.
- It optimizes the leveling speed/ distance of the lift and reduces the travelling time.

Safety Input (SIL 3)



With its built-in dual-channel STO (Safe Torque Off) circuit and EDM (Electronic Device Monitor) signal, the LA700 provides the right tools for easy integration of emergency stop functions into the lift, even when higher levels of safety are required. This allows lift motors to be operated without motor contactors in accordance with EN81-20.

- Silent operation
- Saves panel space
- Less parts, less probability of failure means less call outs for maintenance

Designed for **10 YEARS** of maintenance free operation

Lifetime monitoring & predictive maintenance

Monitor the life of your drive and minimize unplanned downtime.

- Number of run commands
- Drive and fan running time
- Capacitor, IGBT SoftCharger relay,
- Cooling fan life
- Drive temperature
- Drive, motor overload
- Peak current

Direct approach

In addition to leveling speed, the LA700 allows direct floor entry without leveling speed. No lift shaft encoder required, just motor feedback via PG card.

UCM brake monitoring

The LA700 is available with brake monitoring as part of it's protection against unintentional car movement for UCM:EN 81-1:1998+A3:2009 9.11.3 and EN 81-20:2014 5.6.7.3.
This replaces external devices, reducing installation time and cost.

Low stand-by power consumption

Save energy and reduce costs.
The LA700 has a stand-by power consumption of less than 5 to 10 W, depending on the specific drive rating. This helps to achieve a Class 1 efficiency rating for your lift (according to ISO 25745-2; max 50 W).
In addition, the LA700 has its own standby function which allows it to be set to sleep mode.

Travel counter

The travel counter function helps to monitor the life of plastic-coated ropes. The drive warns when critical levels are reached (advising maintenance) and stops the lift when maximum levels are reached.

13 languages support

The LA700 supports 13 languages, so you can choose the language you're most comfortable with and understand all the options.

Elevator units in lift terminology

Use the units and terms you are familiar with, like Hz, %, rpm, m/s, ft/s, etc. simplifying the setup procedure.

Brake torque check function

This function checks the holding torque of the motor brake.

- If the lift moves during the check, the drive judges that the brake has deteriorated.
- No additional load is required for testing and the motor brakes are always closed.

Feedback options

- Biss-C (with and without incremental signals)
- Heidenhain EnDat (with and without incremental signals
- HIPERFACE (SICK STEGMANN)
- SinCos encoder
- Incremental TTL encoder
- Incremental HTL encoder

Makes your life easier

The LA700 drive comes with value-adding functions and smart features which offer benefits throughout the entire life cycle of an installation. No matter whether in drive selection, through design, during installation, start up or troubleshooting, the LA700 makes life easy.

Temperature controlled fans

Cooling fans run only when needed. Audible noise and contamination is minimized while service intervals can be prolonged.

Tactile keypad

The bright LED display and tactile buttons make menu navigation easy and intuitive. The removable keypad can serve as a parameter backup or copy unit.

Robust design

The LA700 can be operated at altitudes of up to 4000 m and in high-temperature environments of up to 60°C. Coated PCBs protect the drive against dust and mist.

Embedded braking chopper

Direct connection of a braking resistor reduces the number of parts, required space and simplifies the installation.

24 VDC power input for controller

Simplify your wiring and keep the drive's command interface operational, even during standby or power outages.

Built-in EMC filter

Built in class C2 filters allow for compliance with EN12015 without the need for external EMC filters.

Common menus

Menus and parameters are arranged and named as with any other Yaskawa drive, thus reducing training expenses.

USB port

Easily connect to your PC or mobile device for programming, monitoring or troubleshooting the LA700.

Minimal service requirements

Designed for over 2 million full-load starts and 10 years of maintenance-free operation.

Screwless control terminals

Easily create long-lasting, reliable connections without the need for periodical re-tightening.

Easily accessible main circuit terminals

Connect main circuit and motor cables in shortest time without removing any covers.

24 VDC power for sensors

Internal power supply delivers an extra 150 mA for use with external sensors, thus eliminating the need for a separate power supply.

Usability first

Copy function
Multiple sets of parameters can be stored and easily transferred (copied) to additional drives

Hi-resolution display
Contrast control offers clear and readable full-text descriptions

Automatic backup function
Saves the current parameter settings after a period of user inactivity. After an incident, settings can be retrieved from the keypad in a couple of seconds.

Advanced keypad navigation
Faster scrolling and function keys provide more responsive navigation and shortcuts that reduce programming time.

Micro SD storage
Micro SD for data logging storage

Real-time clock
Real-time clock for time stamp of fault information (battery compartment in back)

Optional LCD keypad with Bluetooth®
Wireless communication capability between the mobile device and drive

Keypad benefits and features:

Reduce set-up time
- Start-up wizard
- Favorite parameter/monitor function
- Copy function integrated into the keypad
- Parameter set is backward compatible with previous generation drive products
- Fast navigation
- Parameter description

Drive parameter management
- Storage of up to 4 drive parameter sets
- Data logging with real time stamp e.g. for fault analysis, load profile analysis etc. (up to 32 GB on a Micro SD card)
- Fault logging with real time stamp for better analysis
- Multiple parameter storage
- Automatic parameter back-up

Easy to use
- LCD keypad with Bluetooth® option
- Display contrast control
- Real-time clock with time stamp
- Tactile feel buttons
- Remote mounting of keypad using standard RJ45 extension cable

Elevator Start-up wizard
The start-up wizard reduces setup time to just a few minutes. It guides you through basic setup using simple questions that do not require any knowledge of drive parameters, saving valuable time.

Relaxing in daily use and installation

Enjoy a smooth and comfortable ride of your lift. The excellent motor control of the the LA700 and the integrated brake control sequence guarantee for soft changes in speed and accurate landing.

Highest comfort

Ride profiles with individual jerk setting for each speed change and different selectable acceleration/de-celeration ramps allow fine tuning for a smooth and shockless ride.

The accurate leveling control of LA700 makes floor and cabin ground even under any load condition, thus avoiding dangerous traps.

The flexible brake control sequence optimizes the start and stop for soft movement and accurate landing.

- Adjustable speed profiles with individual jerk settings
- Accurate leveling independent of load
- Short floor management
- Easy to tune brake sequence for smooth ride and best landing
- Evacuation in light direction for smallest possible UPS/battery

Easy Start-up

The integrated EMC filter and braking chopper make installation faster, reduce wiring, save space and time.

Intuitive menus with lift terminology (terms and units on LC display) simplify the setup procedure.

Operate the lift without motor contactors - just make use of the Safe Torque Off function (STO, SIL3) of the LA700. Avoiding additional contactors also reduce the space required, wiring effort and eliminates switching noise.

- Integrated EMC filter with class C2 for EN12015 and EN12016 compliance
- Integrated braking chopper
- Integrated SIL3 STO function for operation without motor contactors
- Flexible control sequence to work with almost any controller
- Setup in lift terminology and units
- Automatic motor data tuning in stand still condition without removing ropes

Sustainable

With it's innovative design the LA700 paves the way to sustainable lift system. The LA700 is designed with durability in mind. It can stand more than 2 million full load starts while components are selected to provide up to 10 years operation free of maintenance.

The drive's cooling fans are temperature controlled and only run when really required. This avoids pollution by twirling dust inside the panel, improves reliability, and minimizes the need for regular maintenance.

LA700 is not only reliable, it also helps to make your lift green. The very low stand-by power consumption of only approx. 10 W saves energy and helps to achieve Class 1 rating in terms of efficiency for your elevator (according to ISO 25745-2; max 50 W).

- Long lasting design
- Maintenance free
- Energy saving by super low stand-by consumption

Integrated Functional Safety

With the built-in dual channel STO (safe torque off) circuit and EDM signal (electronic device monitor) the LA700 provides the right tools for an easy integration of emergency stop functions into machines, even when higher levels of safety are required.

Functional safety benefits and features:

Risk reduction made easy

- STO with SIL3/PLe according to IEC 61800-5-2/IEC 61508/ISO 13849
- EDM monitor
- Lower number of parts reduces installation effort while increasing reliability
- TÜV Süd certified

Embedded functional safety

The built-in STO replaces mechanical emergency relays. The electronic sequencing improves reliability and cost compared to mechanical components.

DriveWizard Mobile

DriveWizard mobile is the ultimate setup tool for LA700 drives. From simple parameter editing to the Setup Wizard with an 8 channel fully featured oscilloscope, it provides all the tools needed for setup, monitoring, and process optimization.

- Intuitive parameter editing with help and search functions
- Create favorite parameter lists
- 8-channel oscilloscope with comprehensive trigger functions and data analysis
- Parameter backup/verify
- Setup Wizard for quick setup without knowledge of menus and parameters
- Troubleshooting support with fault analysis and countermeasures
- Export to DriveWizard PC tool
- Worry-free data recovery: Parameter back-up/retrieval anytime via Yaskawa cloud service for registered drives
- Usable offline in areas without mobile reception
- Programming without power

Mobile Device Connectivity

Mobile device connectivity is achieved through using the built-in USB port or wireless communication with the Bluetooth® LCD keypad option.

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on
GET IT ON Google Play
Download on the App Store

Quick & easy setup

Self-guiding navigation menus and start-up wizards make the programming and set-up faster and easier than ever. With DriveWizard Mobile the LA700 can easily be managed and controlled from your smartphone or tablet.

1. Bluetooth keypad optional
2. Supports Android and iOS

Energy-saving solutions

We offer customer-friendly solutions with the D1000 regenerative converter unit and the R1000 regenerative unit, which can make a significant contribution to reducing power consumption by feeding braking energy back into the power grid. This reduces costs and ensures efficient operation.

Merit \ Model	Braking resistor	D1000	R1000
Use for regenerative applications	○	●	●
Energy saving by power regeneration	–	●	●
Improve power factor	–	●	–
Suppress input current harmonics	–	●	–
DC voltage boost	–	●	–
Multiple drives	–	●	–

Best performance

Minimum operation cost

Small carbon footprint

R1000 regenerative unit

The R1000 regenerative unit with block circuit is an environmentally friendly, sustainable alternative for braking resistors.
Compared to conventional solutions, the R1000 regenerative unit saves space and reduces maintenance work. The energy fed back into the grid also contributes to cost savings and at the same time protects the environment!

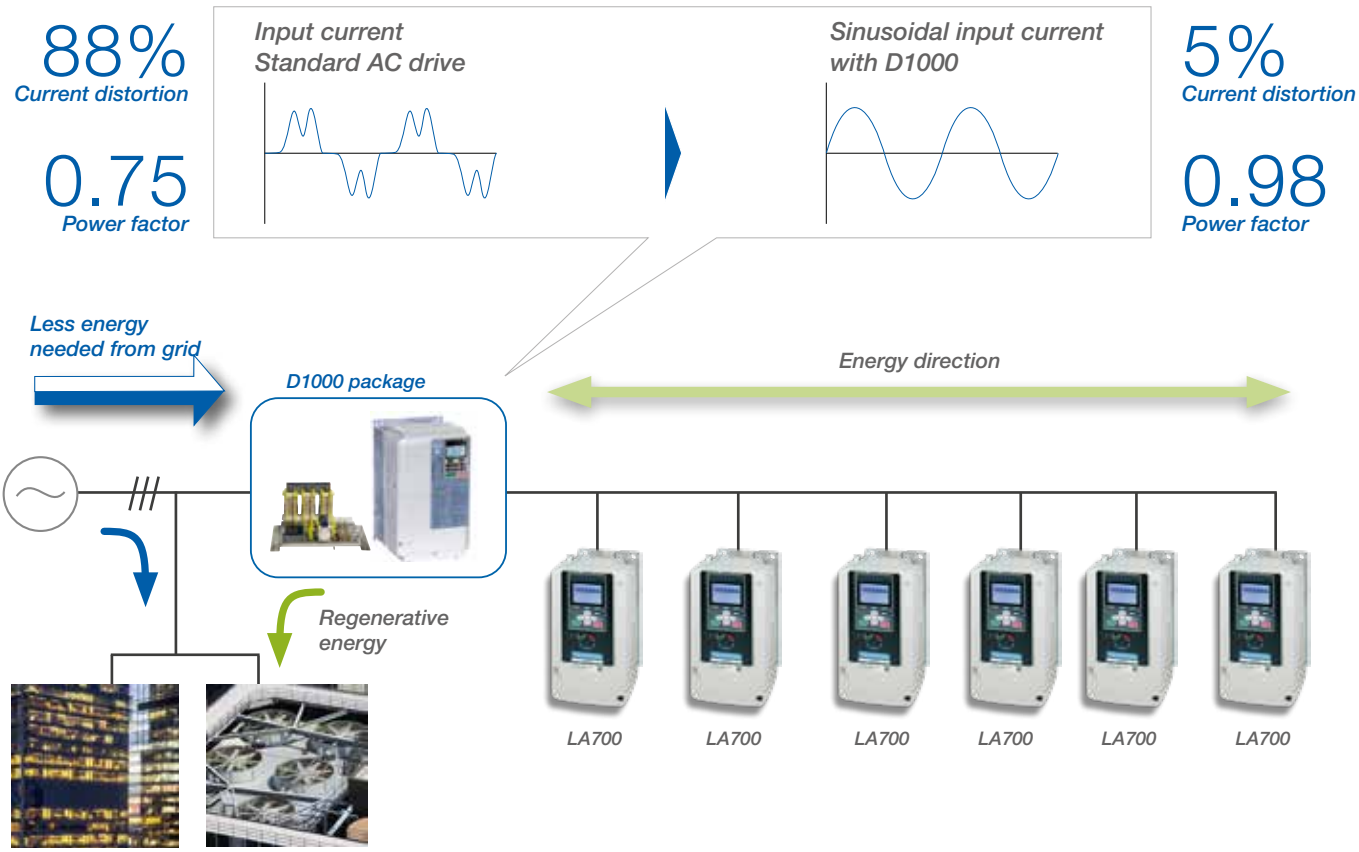
- Suitable for 4-quadrant operation without braking resistors
- Eliminating braking resistors saves space and simplifies installation
- Less cooling required for the control cabinet because no heat is generated by resistors
- Recovered energy can be made available to other consumers in the plant, thus reducing the total energy consumption of buildings or factories
- Quick amortization of initial costs
- Proven Yaskawa quality

D1000 regenerative converter unit

The D1000 regenerative unit saves both power and space. It is suitable for individual regenerative AC drives as well as for systems of AC drives, servo axes or robots.
It feeds excess braking energy back into the power grid instead of converting it to heat. The DC voltage amplification function increases the reliability of the system even when variable or fluctuating input voltages are present.

- Constant sinusoidal input and feedback
- No distortion of the input voltage
- Stable intermediate circuit voltage
- DC gain
- Very low harmonics
- Common DC bus for several AC drives

Clean grid with D1000



Specification overview

Motor control	
Motor types	Induction Motor (IM), Permanent magnet motor (PM)
Control methods	V/f Control, Open Loop Vector, Closed Loop Vector, PM Closed Loop Vector
Motor parameter tuning	Automatic, rotating/static

Main control functions
Anti-Rollback Function, Overtorque/Undertorque Detection, Torque Limit, 5 Zone Jerk Settings, Auto-Tuning (Rotational and Stationary Motor/Encoder Offset Tuning), Cooling Fan ON/OFF Switch, Energy Saving Control, MEMOBUS/Modbus Communication (RS-485 max, 115.2 kbps), Automatic Fault Reset, Online Tuning, High Frequency Injection, Short Floor, Rescue Operation (Light Load Direction Search Function), Inspection Operation, Brake Sequence, Brake Torque Check Function, etc.

Protective functions
Motor protection, Momentary overcurrent protection, Overload protection, Overvoltage protection, Undervoltage protection, Heatsink overheat protection, Braking resistor overheat protection, Stall prevention, Ground fault protection, etc.

Self-monitoring
Monitoring of main components (fans, IGBTs, capacitors, charging circuit) with maintenance alarm notification

Communication options	Model code
CANopen	SI-S3

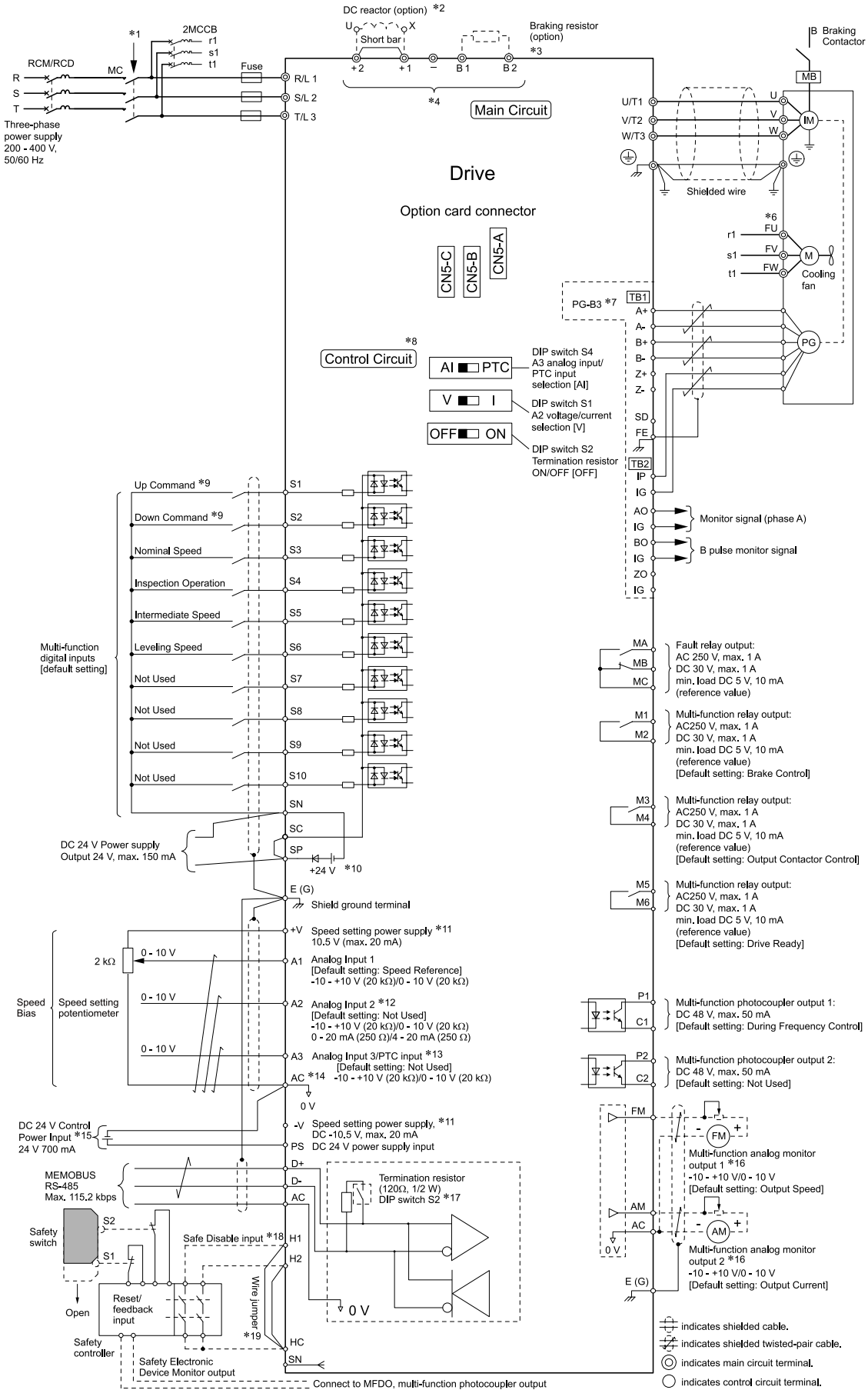
Operating environment	
Ambient temperature	IP20: -10 to +50 °C
Storage temperature	-20 to +70 °C
Humidity	95 % RH or less (non-condensing)
Altitude	Up to 1000 m without derating, up to 4000 m with derating
Vibration/Shock	10 to 20 Hz: 9.8 m/s^2 20 to 55 Hz: 5.9 m/s^2
Protection design	IP20 standard
Environmental conditions	IEC 60721-3-3, Class 3C2 (chemical gases), Class 3S2 (solid particles)

Conformity / Standards	
Standards	CE, UKCA
Functional safety	EN 61800-5-1, EN 61800-3, EN ISO 13849-1:2015 (PL e (Cat.3)), EN 62061 (SILCL3), EN 61800-5-2 (SIL3), EN IEC 63000, IEC 61800-9-2, IEC/CE 60664, UL 61800-5-1, IEC/EN 61000-6-7, IEC/EN 61508

Power ratings	
Overload capacity	210% of continuous rated output current for 3 sec
Rated voltage	380 to 480 VAC, -15 to +10 %
Capacity range (ND)	400 V Class: 4.0 to 15 kW
Output frequency	0 to 200 Hz
Carrier frequency	8 kHz/10 kHz; max. 15 kHz with derating
Braking transistor	Integrated up to 75 kW

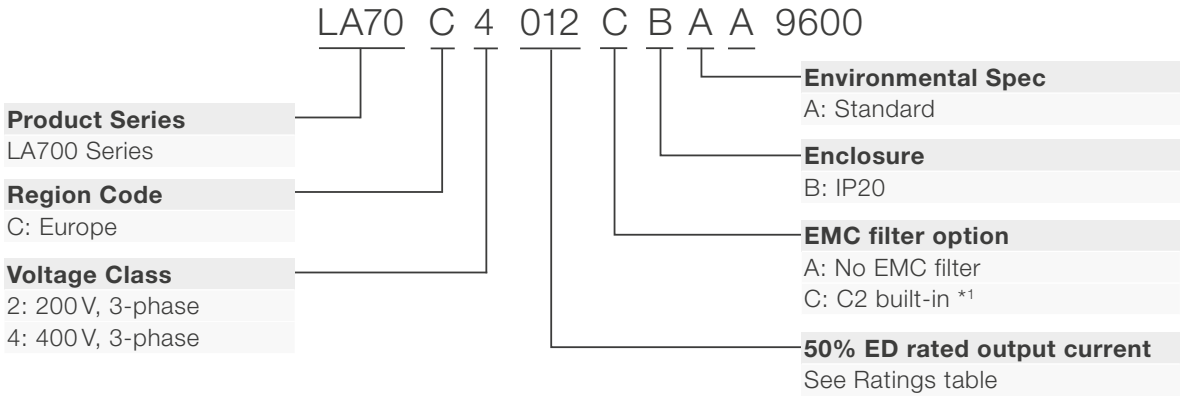
Control / Programming	
Control inputs	10 digital, 3 analog (1×V/I, 2×V)
Control outputs	4 relay, 2 photo coupler, 2 analog
Programming interface	Mini-USB on the front cover; digital operator with Bluetooth® (optional)
Keypad	High-resolution LCD operator included (bluetooth keypad optional), tactile soft buttons, copy function (removable), storage for up to 4 parameter sets
Serial communication	Memobus/Modbus, RS-485, up to 115 kbit/s

Connection diagram



Technical data

Model code



*1 Only available for 400 V models from 4012 to 4056.

Note: Yaskawa recommends sizing the drive capacity so that the load factor during operation (load factor at constant speed) does not exceed 80% of the 50% ED rated output current.

Ratings - 200 V models

Catalog Code LA70C	Max Appl. Motor Power (HD) [kW]	Continuous Output Current [A]	50% ED Rated Output Current [A]	Dimensions [mm] W	H	D	Weight [kg]
2022	3.7	17.5	21.9	140	260	211	3.8
2031	5.5	25	31.3				4.2
2041	7.5	33	41.3				
2059	11	47	58.8	180	300	202	6
2075	15	60	75	220	350	227	8.5
2094	18.5	75	93.8				9.5
2110	22	88	110	240	400	280	18
2144	30	115	143.8	255	450	280	22
2181	37	145	181.3	264	543	335	34
2225	45	180	225				35
2269	55	215	268.8	312	700	420	59
2354	75	283	353.8				62
2432	90	346	432	440	800	472	101
2519	110	415	518.8				107

Ratings - 400 V models

Catalog Code LA70C	Max Appl. Motor Power (HD) [kW]	Continuous Output Current [A]	50% ED Rated Output Current [A]	Dimensions [mm]			Weight [kg]
				W	H	D	
4012	4.0	8.1	11.5	140	260	211	3.9
4019	5.5	13	18.5				4.1
4023	7.5	15.8	22.5				
4030	11	21	30	180	300	202	5.5
4039	15	27.1	38.8				6.0
4049	18.5	34.1	48.8	220	350	227	8.5
4056	22	39.4	56.3				13
4075	30	52.5	75	240	400	280	15
4094	37	65.6	93.8	255	450	280	20
4114	45	79.6	113.8				25
4140	55	98	140	264	543	335	37
4188	75	131.3	187.5				38
4225	90	157.5	225	312	700	420	61
4270	110	189	270				63
4325	132	227.5	325				66
4380	160	266	380	440	800	472	107

Lifting everyone to a sustainable tomorrow

Achieving the European climate goals

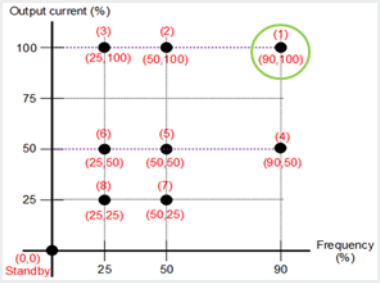
To achieve European "Green Deal" climate targets, the ErP (Energy-related Products) Directive was created, which is often referred to as the Ecodesign Directive. It provides a framework but does not contain product-specific requirements, as these are so diverse that they cannot possibly be covered by just one directive. Consequently, implementation regulations have been defined, based on the ErP Directive, which regulate the requirements for the energy efficiency of products.

Similar regulations and labels exist for industrial applications such as compressors, fans, pumps, etc., and electric motors, which are estimated to consume half of the electrical energy produced in the EU, have not been spared. However, it was recognized that much more energy could be saved by controlling the speed of electric motors and so Regulation (EU) 2019/1781 was published, which now regulates the efficiency of the variable speed drive that work alongside the motors.

Efficiency at a glance

Watt loss according to IEC 61800-9-2 and efficiency class according to (EU) 2019/1781

CDM data (complete drive module)



IE classes

IE2	Loss < Ref* 75%
IE1	Reference Loss
IE0	Loss > Ref* 125%

How is efficiency determined?

To determine the efficiency of an inverter, the loss values are measured at eight defined load points and in standby according to the IEC 61800-9-2 standard. The loss value at the load point (90, 100) (90% speed, 100% load) is compared with a defined reference value. If it is below 75 % of the reference value, the device corresponds to the highest efficiency class IE2.

You can follow this QR code or visit yaskawa.eu.com/ecodesign for more information on this subject.

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