# LA500 Data Sheet

## AC Compact Drive for Lift Applications

## Data Sheet

Type: **CIPR-LA50Cxxxxxxxx**

**400 V Class, Three-Phase Input: 4 to 22 kW**

# Contents

# Introduction

LA500 is a dedicated drive for lift applications. The key attributes are ease of use, flexibility and sustainability. Loaded with valuable features and functions the LA500 drives greatly simplifies system designs and maximize system and machine performance while reducing the effort for installation and setup to a minimum.


LA500 Online Info

# Drive Selection

LA500 drives must be selected according to power supply voltage, motor rated current, load profile of the application, and ambient condition of the area they are operated in.

LA500 standard drives are rated for Heavy Duty applications. In Heavy Duty the LA500 can run applications with constant torque and heavy overload of up to 165% for 30 seconds.

LA500 drives are designed to be wall mounted upright and in clean environmental condition. In case of special mounting methods (heatsink external, horizontal, etc.), high ambient temperature (>50 °C), high altitude (> 1000 m), use of high carrier frequency, and so forth, an output current derating must be considered when selecting the drive.

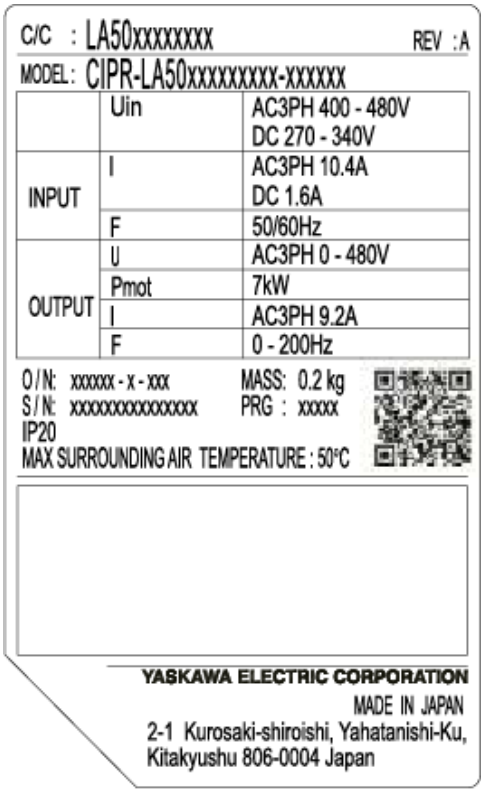
# Model Designation

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

CIPR – LA50 C 4 005 B B A B

1 2 3 4 5 6 7 8 9

| No. | Description |
|---|---|
| 1 | Drive Series |
| 2 | Product Series<br>• LA50: LA500 |
| 3 | Region code<br>• C: Europe |
| 4 | Voltage class<br>• 4: 400V 3-phase |
| 5 | Rated output current<br>***Note:*** *Refer to the list of models* |
| 6 | EMC filter<br>• A: no built-in EMC filter<br>• B: Built-in EMC filter<br>(400V: C2, 20m; 200V: C3,20m) |
| 7 | Enclosure design<br>• B: IP20 |
| 8 | Environmental specification<br>• A: Standard |
| 9 | Design revision order<br>• A: Without SIL3 STO function<br>• B: With SIL3 STO function |



# List of Models

| Type | Model CIPR-LA50C... | Power | Current | Model Code |
|---|---|---|---|---|
| LA500 | 4009 | 4 kW | 9,2 A | CIPR-LA50C4009EBAB |
| LA500 | 4015 | 5,5 kW | 14,8 A | CIPR-LA50C4015EBAB |
| LA500 | 4018 | 7,5 kW | 18 A | CIPR-LA50C4018EBAB |
| LA500 | 4024 | 11 kW | 24 A | CIPR-LA50C4024EBAB |
| LA500 | 4021 | 15 kW | 31 A | CIPR-LA50C4021EBAB |
| LA500 | 4039 | 18,5 kW | 39 A | CIPR-LA50C4039EBAB |
| LA500 | 4045 | 22 kW | 45 A | CIPR-LA50C4045EBAB |

# General specification

| Item | Description |
|---|---|
| **Product Name** | LA500 |
| **Power Range** | 3-phase 380~400 V: 4 to 22 kW |
| **Rated Input Frequency** | 50 Hz |
| **Allowable Voltage Fluctuation** | -15 to +10% |
| **Allowable Frequency Fluctuation** | ±5% |
| **DC Supply** | 400 V class: 513 to 679 Vdc |
| **Overload Tolerance** | 165% of rated output current for 30 sec |
| **DC Reactor** | External |
| **Braking Transistor** | Built in |
| **Applicable Motor Types** | Induction |
| **Maximum Output Frequency** | Induction Motor: 120 Hz |
| **Output frequency resolution** | 0.001 Hz |
| **Starting Torque** | V/f control (IM): 150% @ 3 Hz<br>Vector Control (IM): 150% @ 1 Hz<br>CLV control (IM): 150% @ 0 rpm |
| **Speed Control Range** | V/f control (IM): 1:40<br>OLV control (IM): 1:100<br>CLV control (IM): 1:1500 |
| **Torque Limit Control** | Possible in Vector Control (IM), sensorless, 4 quadrants individually adjustable |
| **Acceleration/Deceleration Ramps** | 4 individual, 0 to 600 s linear, 4 separately adjustable S-curves |
| **Braking Torque** | Approx. 20% without braking resistor, approx. 125% with dynamic braking option |
| **V/f Pattern** | Freely adjustable |
| **Protection** | • Motor electronic thermistor function<br>• Motor PTC input<br>• Instantaneous over current at 200% of rated current<br>• Drive over load 150% (HD) for 1 min, once per 10 min<br>• DC over voltage at 820 Vdc (400 V units)<br>• Output ground fault<br>• Motor stall prevention |
| **Software Functions** | • Power outage ride through control<br>• Brake Sequence<br>• Light Load Search and Rescue Operation<br>• Short Floor Function<br>• Over-/under torque detection<br>• 17-step multi-speed operation<br>• Motor data auto-tuning rotating/in stop condition<br>• Dwell function<br>• Cooling fan control by heatsink temperature<br>• Leveling Speed<br>• Phase loss detection<br>• Parameter copy function |
| **Ambient Conditions** | Place of Installation:<br>• Indoors, no direct sunlight<br>• free from oil, mist, flammable gases, metal powder, oil, water, salt, harmful gases and liquids, solvents<br>Operation temperature:<br>• IP20: -10 to +50°C (up to 60°C with derating)<br>• UL type 1: -10 to +40°C<br>• Side-by-Side mounting: -10 to +40°C (up to 50°C with derating)<br>Storage temperature: -20 to +70°C<br>Humidity: 95% RH, no condensation<br>Overvoltage category: III<br>Pollution degree: 2 or less<br>Altitude: up to 1000m, up to 4000m with 1% current derating per 100 m |
| **Vibration Resistance** | 10 to 20 Hz – 1 g (9.81 m/s²); 20 to 55 Hz – 0.6 g (5.9 m/s²) |

| | |
|---|---|
| **Standards** | • UL61800-5-1<br>• EN61800-2<br>• IEC/EN61800-5-1<br>• ISO/EN13849-1 Cat. III PLe, IEC/EN61508 SIL3 (2 Safety inputs, 1 EDM output) |
| **Enclosure** | • IP20 |
| **Communication** | • Modbus/Memobus embedded via built in RS485 interface, 115.2 kBps |
| **Programming Interface** | • Built in removable LED keypad with soft buttons<br>• Built in USB mini port for connection a PC or Android Smart Device<br>• Serial through keypad port (needs adapter) |
| **Programming Tools** | • DriveWizard 10 (Windows 10)<br>• DriveWizard mobile (Android and iOS) |

# Power Ratings

| Model CIPR-LA50C… | | 4009 | 4015 | 4018 | 4024 | 4031 | 4039 | 4045 |
|---|---|---|---|---|---|---|---|---|
| Maximum Applicable Motor Capacity | **kW** | 4 | 5,5 | 7,5 | 11 | 15 | 18,5 | 22 |
| Rated Output Current | **Amp** | 9,2 | 14,8 | 18 | 24 | 31 | 39 | 45 |
| Rated Output Capacity | **kVA** | 7 | 11,3 | 13,7 | 18,3 | 23,6 | 29,7 | 34,3 |
| Rated Input Current (A) | **AC** | 10,4 | 15 | 20 | 29 | 39 | 50,5 | 59,7 |
| Default Carrier Frequency | **kHz** | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| DC Reactor | | External Option | | | | | | |
| Braking Transistor | | Built-lin | | | | | | |
| Maximum Output Voltage | | Three phase 380V to 480V<br>Note: The maximum output voltage is proportional to the input voltage | | | | | | |
| EMC Filter | | Built-in, category: C2 | | | | | | |
| Power Supply | | AC Power: Three phase 380V to 480V (-15% to +10%) at 50/60Hz<br>Allowable Frequency Fluctuation: ±5%<br>DC Power: 513V to 679V | | | | | | |
| Input Power | **kVA** | 9,5 | 14 | 18 | 27 | 36 | 47 | 55 |

# Integrated EMC Filters

LA500 Drives are offered with or 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.

| Voltage Class | Model | IEC61800-3 Category | Cable Length *1 | Leakage Current *2 |
|---|---|---|---|---|
| Three-phase 400 V | LA50C4009Exx | C2 | 20 m | 3.1 |
| | LA50C4015Exx / LA50C4018Exx | C2 | 20 m | 7.8 |
| | LA50C4024Exx / LA50C4031Exx | C2 | 20 m | 1.9 |
| | LA50C4039Exx / LA50C4045Exx | C2 | 20 m | 7.8 |

*1 Shielded Motor Cable
*2 Leakage currents shown here are calculated and for the EMC filter only. Values in real applications can vary depending on factors like phase voltage imbalance, grounding etc.

# Watt Loss

| Model CIPR-LA50C… | Power | Current | LA500 Drive Heat Losses | | | |
|---|---|---|---|---|---|---|
| | | | Carrier Frequency (kHz) | Inside (W) | Outside (W) | Total Loss (W) |
| 4009 | 4 kW | 9,2 A | 8 | 55 | 116 | 171 |
| 4015 | 5,5 kW | 14,8 A | 8 | 63 | 141 | 204 |
| 4018 | 7,5 kW | 18 A | 8 | 93 | 206 | 299 |
| 4024 | 11 kW | 24 A | 8 | 121 | 286 | 407 |
| 4031 | 15 kW | 31 A | 8 | 132 | 331 | 463 |
| 4039 | 18,5 kW | 39 A | 8 | 141 | 365 | 506 |
| 4045 | 22 kW | 45 A | 8 | 188 | 497 | 685 |

# Deratings

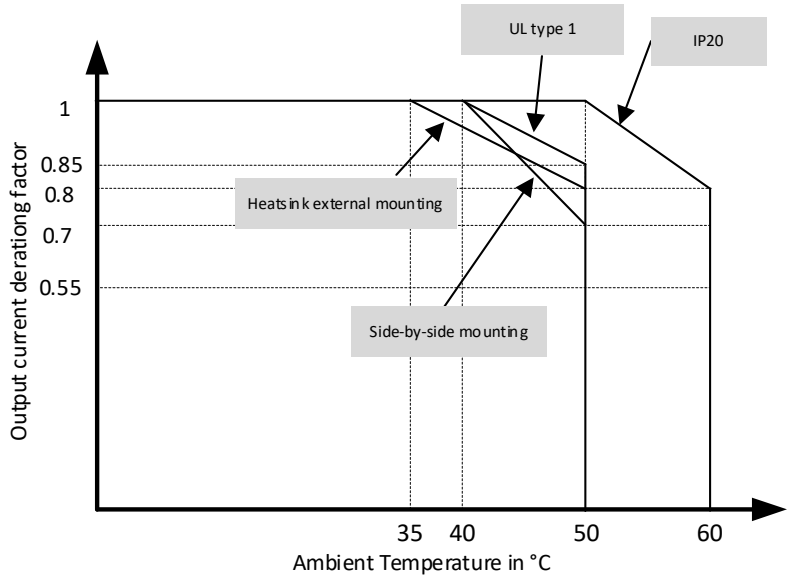
## Carrier Frequency Derating

The rated current of LA500 drives might need to be reduced depending on the selected carrier frequency.

| Model CIPR-LA50C… | Power | Current | LA500 Rated Output Current in Ampere | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 2 kHz | 5 kHz | 8 kHz | 10 kHz | 12.5 kHz | 15 kHz |
| 4009 | 4 kW | 9,2 A | 9,2 | 9,2 | 9,2 | 8,1 | 6,8 | 5,5 |
| 4015 | 5,5 kW | 14,8 A | 14,8 | 14,8 | 14,8 | 13,1 | 11 | 8,9 |
| 4018 | 7,5 kW | 18 A | 18 | 18 | 18 | 13,1 | 11 | 11 |
| 4024 | 11 kW | 24 A | 24 | 24 | 24 | 21,3 | 17,8 | 14 |
| 4031 | 15 kW | 31 A | 31 | 31 | 31 | 27,5 | 23 | 19 |
| 4039 | 18,5 kW | 39 A | 39 | 39 | 39 | 34,5 | 29 | 23 |
| 4045 | 22 kW | 45 A | 45 | 45 | 45 | 39,9 | 33,4 | 27 |

# 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 LA500 drives. The derating curves shown below are valid for all frames of LA500.



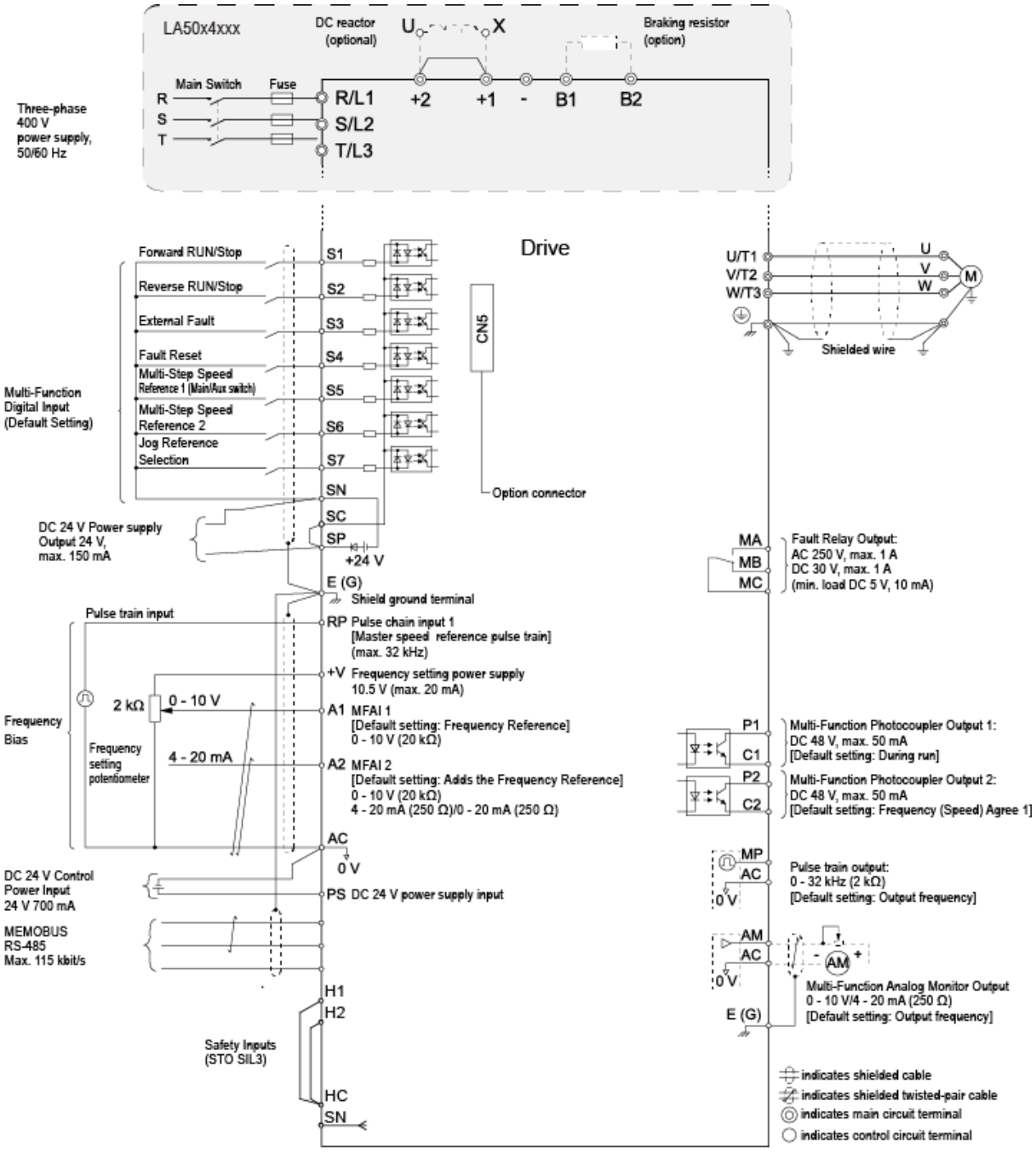

# Altitude Derating

LA500 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.

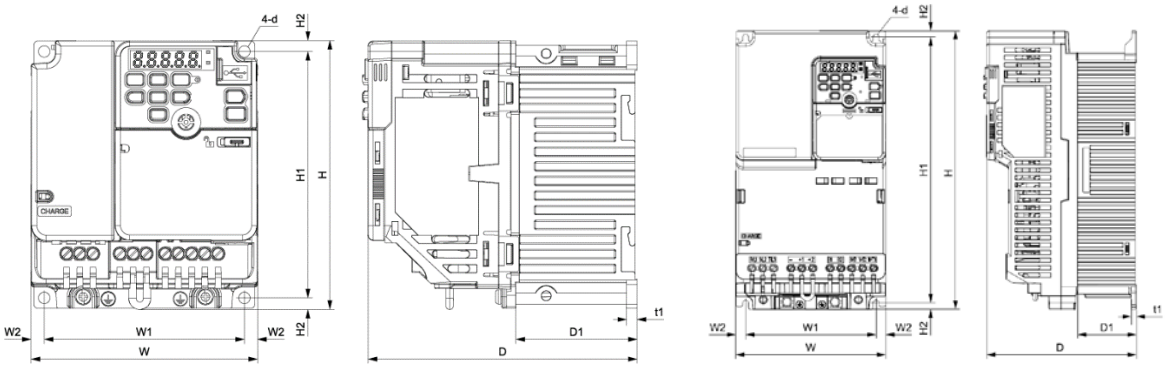
Additionally, a derating must be applied to the rated voltage if the drive is installed over 2000 m above sea level with the neutral point of the power supply ungrounded.

# Electrical Connections

## Connection Diagram



# Dimensions




| Voltage Class | Power [kW] | Model | Dimensions [mm] / Weight [kg] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | W | H | D | D1 | W1 | W2 | H1 | H2 | t1 | d | Weight |
| **3x400V** | **4** | **LA50x4009** | 140 | 128 | 193 | 65 | 128 | 6 | 118 | 5 | 5 | For M5 | 2.6 |
| **3x400V** | **5.5** | **LA50x4015** | 140 | 260 | 196 | 55 | 122 | 9 | 248 | 6 | 5 | For M5 | 3.9 |
| **3x400V** | **7.5** | **LA50x4018** | 140 | 260 | 196 | 55 | 122 | 9 | 248 | 6 | 5 | For M5 | 3.9 |
| **3x400V** | **11** | **LA50x4024** | 180 | 300 | 196 | 55 | 160 | 10 | 284 | 8 | 5 | For M5 | 5.5 |
| **3x400V** | **15** | **LA50x4031** | 180 | 300 | 196 | 55 | 160 | 10 | 284 | 8 | 5 | For M5 | 5.5 |
| **3x400V** | **18.5** | **LA50x4039** | 190 | 350 | 251 | 94 | 160 | 15 | 336 | 7 | 5 | For M6 | 8 |
| **3x400V** | **22** | **LA50x4044** | 190 | 350 | 251 | 94 | 160 | 15 | 336 | 7 | 5 | For M6 | 8.5 |


# Accessories

## Motor Speed Feedback option

The LA500 is capable to control the motor in CLV mode. The required motor feedback option (encoder) should be of TTL type.

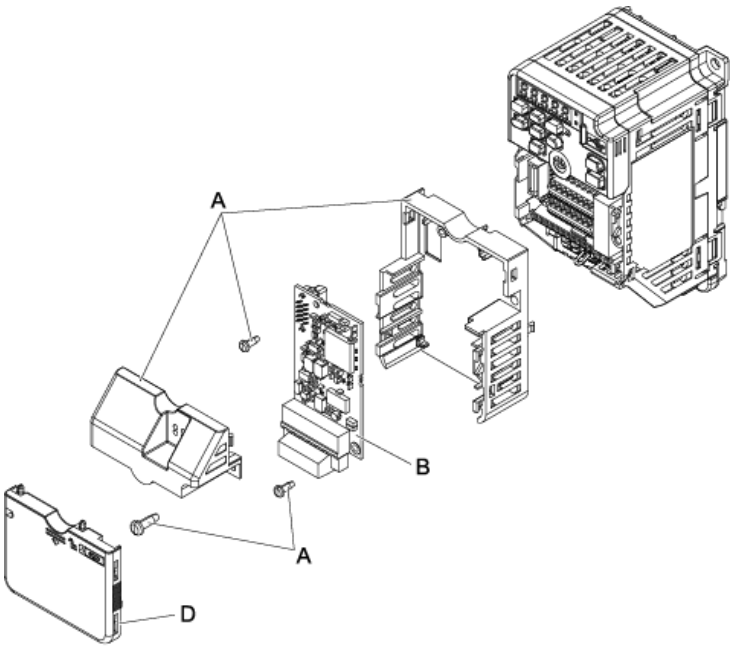
To make brake control easier the LA500 motor speed feedback option series JOHB-PGX3-AE also includes two relays on the feedback card to connect the motor brake directly.

| Network Type | Option Card Model Codes |
|---|---|
| **Motor Feedback Option** | JOHB-PGX3-AE |
| **Option Card Enclosure** | JOHB-GA50 |

**Important:**

- The motor feedback option enclosure must be **ordered separately**
- With an option card enclosure installed the depth of the drive increases for 27 mm
- The JOHB-PGX3-AE option card will be released early 2024
- For LA500 units manufactured before year 2024 a firmware upgrade will be required to support JOHB-PGX3-AE option card

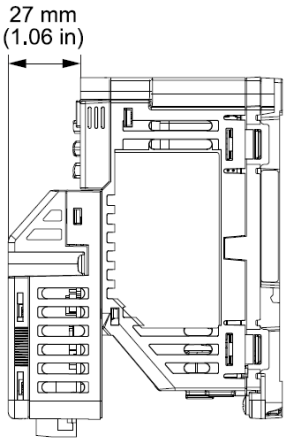
Option enclosure (Model code: JOHB-GA50, parts A) and option card installation:




**A - Option card mounting kit components**

**B - Motor speed feedback option (JOHB-PGX3-AE)**

**C - Front cover**



# LED/LCD Keypads

### LED Full Size Keypad (Model Code: JVOP-KPLEA04AAA)

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


### LCD Keypad (Model Code: JVOP-KPLCA04AEA)

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)

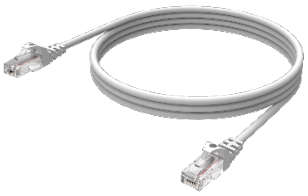
This optional LCD keypad provides the ability to connect to the drive using Bluetooth. It is designed to be able to operate like the LCD keypad if keypad navigation is required.

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.

### Extension Cables

Extension cables for keypads are offered in two lengths.

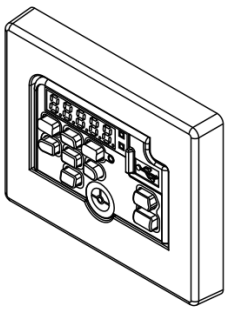
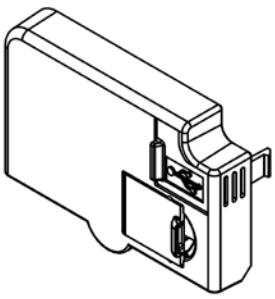
| Model Number | Description |
|---|---|
| WV001-YEG | Keypad Remote Mount Cable - 1 Meter |
| WV003-YEG | Keypad Remote Mount Cable - 3 Meter |



# Keypad Door Mounting Kits

## Door Mounting Kit for LA500 Internal Keypad

The removable keypad on LA500 can be mounted on a panel door using the parts below. When mounting the keypad externally a blind cover should be applied to the drive. Cables WV001-YEG or WV003-YEG are recommended as extension cable.

| **Part** | Door mounting kit for LA500 integrated keypad | Blind cover for LA500 |
|---|---|---|
| **Model Number** | ZPBA-GA500 | JVOP-KPBCH04AAA |
| **Appearance** |  (Door mounting kit does not contain a keypad, blind cover or cable!) |  |

## 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 |
| **Appearance** |  |  |

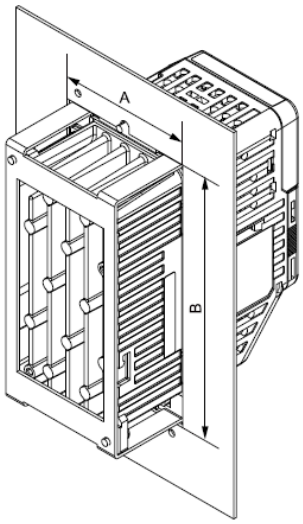
# Heatsink External Mounting Kit

LA500 drives with IP20 can be mounted with the heatsink out the back of the panel or enclosure in order to have the main source of heat loss outside and so reduce panel volume or panel cooling. A rectangular cut out is required in the panel. Drives are fixed using an heatsink external mounting kit. Details on assembly and installation can be found the Installation Manual for these kits (TOEPC72060009_).

**Important:**

- With this method of mounting the rated output current might require a derating. See section “Deratings“ in this document.
- The backside of the drive remains IP20. The externally mounted heatsink should not be exposed to dusty or wet environment that would normally require a higher degree of ingress protection.

## Appearance




## Heatsink External Mounting Kit Model Numbers

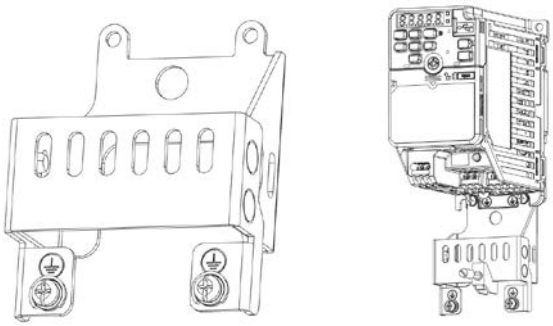
| Voltage Class | Power kW | LA500 Model | Heatsink External Mounting Kit |
|---|---|---|---|
| **3x400V** | **4** | **LA50x4009xxx** | ZPSA-GA50V3-1 |
| **3x400V** | **5.5** | **LA50x4015xxx** | ZPSA-GA50V5-1 |
| **3x400V** | **7.5** | **LA50x4018xxx** | ZPSA-GA50V5-1 |
| **3x400V** | **11** | **LA50x4024xxx** | ZPSA-GA50V6-1 |
| **3x400V** | **15** | **LA50x4031xxx** | ZPSA-GA50V6-1 |
| **3x400V** | **18.5** | **LA50x4039xxx** | ZPSA-GA50V8-1 |
| **3x400V** | **22** | **LA50x4044xxx** | ZPSA-GA50V8-1 |

## 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.

### Appearance



### Cable Shield Kit Model Numbers

| Voltage Class | Power kW (HD) | LA500 Model | Shield Clamp Kit |
|---|---|---|---|
| 3x400V | 4 | LA50x4009xBx | ZHZ-GA50V3 |
| 3x400V | 5.5 | LA50x4015xBx | ZHZ-GA50V5 |
| 3x400V | 7.5 | LA50x4018xBx | ZHZ-GA50V5 |
| 3x400V | 11 | LA50x4024xBx | ZHZ-GA50V6 |
| 3x400V | 15 | LA50x4031xBx | ZHZ-GA50V6 |
| 3x400V | 18.5 | LA50x4039xBx | ZHZ-GA50V8 |
| 3x400V | 22 | LA50x4044xBx | ZHZ-GA50V8 |

# Tools and 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<br>• USB-mini with USB on-the-go adapter |
| | | iPhone | • Bluetooth |

## Connection Cables

| Model Number | Description |
|---|---|
| JZSP-CVS06-02-E | USB-mini connection cable for PC 2.5m |

# Power Options

## AC Input Reactors

Input reactors can be applied in order to reduce harmonic distortion on the AC input line. Reactors are offered with 2% or 4% uk. IP20 covers are separately available.

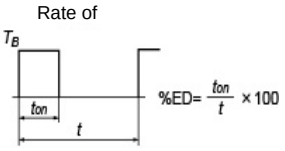
| LA500 Model | 4 % uk | | 2 % uk | |
|---|---|---|---|---|
| | IP00 | IP20 cover | IP00 | IP20 cover |
| **LA50C4009xxx** | LR3 40-4/16 | | ALR3 40-2/16 | IP20-Box35 |
| **LA50C4015xxx** | LR3 40-4/25 | IP20-Box33 | ALR3 40-2/25 | |
| **LA50C4018xxx** | | | | |
| **LA50C4024xxx** | LR3 40-4/45 | IP20-Box35 | ALR3 40-2/45 | |
| **LA50C4031xxx** | | | | |
| **LA50C4039xxx** | LR3 40-4/63 | IP20-Box36 | ALR3 40-2/63 | IP20-Box35 |
| **LA50C4044xxx** | LR3 40-4/90 | IP20-Box39 | n.a | |

## Braking Resistors

LA500 drives have embedded braking transistors. 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.

| LA500 Model | Resistor 40% ED | Minimum Resistor (Ohm) |
|---|---|---|
| **LA50C4009xxx** | RH-0520W120 | 100 |
| **LA50C4015xxx** | RH-0780W040 | 32 |
| **LA50C4018xxx** | RH-1560W040 | 32 |
| **LA50C4024xxx** | | 20 |
| **LA50C4031xxx** | RH-4800W022 | 20 |
| **LA50C4039xxx** | RH-6000W022 | 19.2 |
| **LA50C4044xxx** | | 19.2 |

- 40% ED : 120 s cycle time (t) and 48 s switch on time (ton)



# LA500 Lift Inverter

## THE NEW REFERENCE IN COMPACT LIFT DRIVE

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