

## Main

Range of product	Lexium 32
Product or component type	Motion servo drive
Component name	LXM32A
Type of polarization	No polarization impedances Modbus

## Complementary

Network number of phases	3 phases
[Us] rated supply voltage	380...480 V - 15...10 %
Supply frequency	50/60 Hz - 5...5 %
Network frequency limits	47.5...63 Hz
Continuous output current	6 A 8 kHz
Output current 3s peak	18 A 8 kHz 1 s
Nominal power	1.8 kW 8 kHz
Line current	5.5 A 380...480 V
Prospective line I <sub>sc</sub>	5 kA
Switching frequency	8 kHz
Overvoltage category	III
Inrush current	< 60 A
Leakage current	< 30 mA
Output voltage	<= power supply voltage
Insulation	Electrical between power and control
Type of cable	Single-strand IEC cable 50 °C copper 90 °C XLPE/EPR
Electrical connection	Terminal 3 mm <sup>2</sup> AWG 12 CN8 Terminal 5 mm <sup>2</sup> AWG 10 CN1 Terminal 5 mm <sup>2</sup> AWG 10 CN10
Tightening torque	0.5 N.m CN8 0.7 N.m CN1 0.7 N.m CN10
Discrete input number	1 capture 2 safety 3 logic
Discrete input type	Capture CAP Logic DI Safety compliment of STO_A, compliment of STO_B
Sampling duration	0.25 ms DI discrete
Discrete input voltage	24 V DC capture 24 V DC logic 24 V DC safety
Discrete input logic	Positive compliment of STO_A, compliment of STO_B < 5 V > 15 V EN/IEC 61131-2 type 1 Positive DI > 19 V < 9 V EN/IEC 61131-2 type 1 Positive or negative DI < 5 V > 15 V EN/IEC 61131-2 type 1
Response time	<= 5 ms compliment of STO_A, compliment of STO_B
Discrete output number	2
Discrete output type	Logic DI 24 V DC

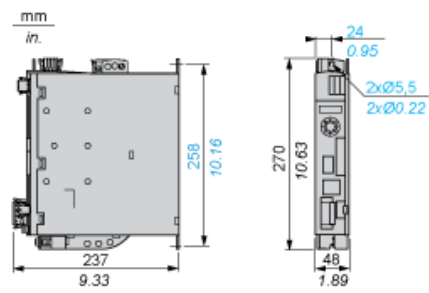
Discrete output voltage	<= 30 V DC
Discrete output logic	Positive or negative DI EN/IEC 61131-2
Contact bounce time	<= 1 ms compliment of STO_A, compliment of STO_B 2 µs CAP 0.25 µs...1.5 ms DI
Braking current	50 mA
Response time on output	250 µs DI discrete
Control signal type	Servo motor encoder feedback
Safety function	Safe torque off safety function stop and/or prevent unintended operation of the servo motor IEC/EN 61800-5-2 Safe torque off safety function stop and/or prevent unintended operation of the servo motor ISO 13849-1 level e
Communication port protocol	CANmotion CANopen Modbus
Type of connector	RJ45 (labelled CN4 or CN5) CANmotion RJ45 (labelled CN4 or CN5) CANopen RJ45 (labelled CN7) Modbus
Method of access	Slave
Physical interface	2-wire RS485 multidrop Modbus
Transmission rate	1 Mbps <= 4 m CANopen, CANmotion 125 kbps <= 500 m CANopen, CANmotion 250 kbps <= 250 m CANopen, CANmotion 50 kbps <= 1000 m CANopen, CANmotion 500 kbps <= 100 m CANopen, CANmotion 9600, 19200, 38400 bps <= 40 m Modbus
Number of addresses	1...127 CANopen, CANmotion 1...247 Modbus
Communication service	1 receive SDO CANmotion 1 transmit SDO CANmotion 2 PDOs conforming to DSP 402 CANmotion 2 SDOs receive CANopen 2 SDOs send CANopen 4 configurable mapping PDOs CANopen CANopen dvc pfl drv + mtn ctrl CANopen, CANmotion Disp of flts on intd disp term Modbus Emergency CANopen, CANmotion Evt,Time-trgd, rmt, rmt, sync CANopen Node guarding, heartbeat CANopen Position control mode CANmotion Pos ctrl, spd, tq pfl+homing md CANopen Sync CANmotion
Status LED	1 LED error 1 LED red servo drive voltage 1 LED RUN
Signalling function	Display of faults 7 segments
Installed device	31 Modbus
Marking	CE
Type of cooling	Integrated fan
Operating position	Vertical +/- 10 degree
Product weight	2 kg

## Environment

EMC filter	Integrated
Electromagnetic compatibility	Conducted EMC EN 55011 class A group 1 Conducted EMC EN 55011 class A group 2 Conducted EMC EN/IEC 61800-3 environment 2 category C3 Conducted EMC IEC/EN 61800-3 category C2 EMC immunity IEC/EN 61800-3 environments 1 and 2 EMC immunity level 3 EN/IEC 61000-4-2 EMC immunity level 3 EN/IEC 61000-4-3 EMC immunity level 3 EN/IEC 61000-4-5 EMC immunity level 4 EN/IEC 61000-4-4 Radiated EMC EN 55011 class A group 2 Radiated EMC IEC/EN 61800-3 category C3
Standards	EN/IEC 61800-3 EN/IEC 61800-5-1
Product certifications	CSA RoHS TÜV UL
IP degree of protection	IP20 EN/IEC 60529 IP20 EN/IEC 61800-5-1
Vibration resistance	1 gn 13...150 Hz EN/IEC 60068-2-6 1.5 mm peak to peak 3...13 Hz EN/IEC 60068-2-6
Shock resistance	15 gn 11 ms EN/IEC 60028-2-27
Pollution degree	2 EN/IEC 61800-5-1
Environmental characteristic	Classes 3C1 IEC 60721-3-3
Relative humidity	Class 3K3 (5 to 85 %) without condensation IEC 60721-3-3
Ambient air temperature for operation	0...50 °C
Ambient air temperature for storage	-25...70 °C
Operating altitude	≤ 1000 m without derating > 1000...3000 m with conditions

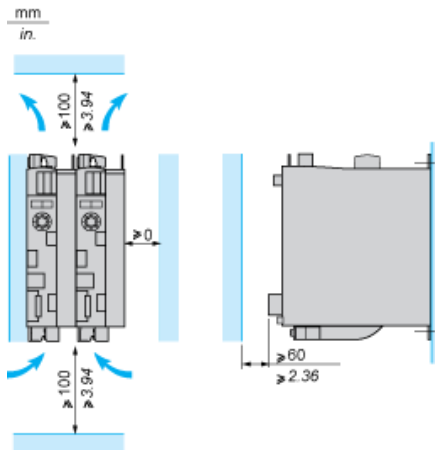
Lexium 32 Servo Drive

Dimensions



Lexium 32 Motion Control Servo Drives

Mounting Recommendations



LXM32•U45M2, •U90M2 and LXM32•U60N4 servo drives are cooled by natural convection. LXM32•D18M2, •D30M2, LXM32 •D12N4, •D18N4, •D30N4 and •D72N4 servo drives have an integrated fan.

When installing the servo drive in the enclosure, follow the instructions below with regard to the temperature and protection index:

- Provide sufficient cooling of the servo drive
- Do not mount the servo drive near heat sources
- Do not mount the servo drive on flammable materials
- Do not heat the servo drive cooling air by currents of hot air from other equipment and components, for example from an external braking resistor
- Mount the servo drive vertically ( $\pm 10\%$ )
- If the servo drive is used above its thermal limits, control stops due to overtemperature

For cables that are connected via the underside of the servo drive, a free space  $\geq 200$  mm/7.87 in. is required under the unit to comply with the bending radius of the connection cables.

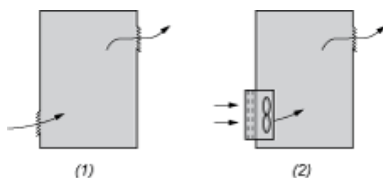
Ambient temperature	Mounting distances	Instructions to be followed
0°C...+ 50°C	$d \geq 0$ mm	–
+ 50°C...+ 60°C	$d \geq 0$ mm	Reduce the output current by 2.2% per °C above 50°C

Do not use insulated enclosures, as they have a poor level of conductivity.

Recommendations for Mounting in an Enclosure

To ensure good air circulation in the servo drive:

- Fit ventilation grilles on the enclosure.
- Ensure that ventilation is adequate, otherwise install a forced ventilation unit with a filter.



- (1) Natural convection
- (2) Forced ventilation

- Any apertures and/or fans must provide a flow rate at least equal to that of the servo drive fans (see below).
- Use special filters with IP 54 protection.

Dissipated power and fan flow rate compatible with the servo drive rating

Servo drive	Dissipated power W	Ventilation	Flow rate
LXM32-U45M2	10	Natural convection	–
LXM32-U90M2	18		–
LXM32-U60N4	20		–
LXM32-D18M2	34	Integrated fan	0.26 m <sup>3</sup> /min (69 gal/min)
LXM32-D30M2	38		0.26 m <sup>3</sup> /min (69 gal/min)
LXM32-D12N4	42		0.26 m <sup>3</sup> /min (69 gal/min)
LXM32-D18N4	76		0.26 m <sup>3</sup> /min (69 gal/min)
LXM32-D30N4	129		0.75 m <sup>3</sup> /min (198 gal/min)
LXM32-D72N4	315		1.45 m <sup>3</sup> /min (383 gal/min)

### Mounting in Metal Enclosure (IP 54 Degree of Protection)

The servo drive must be mounted in a dust and damp proof enclosure in certain environmental conditions, such as dust, corrosive gases, high humidity with risk of condensation and dripping water, splashing liquid, etc. In these cases, Lexium 32 servo drives can be installed in an enclosure where the internal temperature must not exceed 60°C.

General Overview of Lexium 32 Functions

The Lexium 32 servo drive integrates different operating modes, enabling it to be used in a wide range of industrial applications. There are two main function families:

- Conventional adjustment modes, such as:
  - Homing
  - Manual mode (JOG) for position or speed
  - Auto-tuning of the servo drive/servo motor combination
- Operating modes, such as:
  - Position control:
    - Point-to-point mode
    - Motion sequence mode
    - Electronic gearing mode (pulse position and speed control)
  - Speed control:
    - Motion sequence mode
    - Electronic gearing mode
    - Speed control with acceleration/deceleration ramp
    - Instantaneous speed control
  - Current control:
    - Current control

Two types of operation are possible, in local mode or via communication buses and networks.

In local mode:

The servo drive parameters are defined via:

- The user interface
- The remote graphic display terminal
- The SoMove setup software

Movements are then determined by:

- Analog signals ( $\pm 10$  V)
- PTI signals (pulse/direction (P/D), A/B or CW/CCW signals) In this mode, limit switches and homing switches are not managed by the servo drive. It is, however, possible to limit movement by assigning a logic input.

Via communication buses and networks:

All the servo drive parameters and those associated with the operating modes can be accessed via:

- The communication buses and networks, in addition to access via the user interface
- The remote display terminal
- The SoMove setup software

The following table indicates the control type and the sources of setpoint values available for each of the operating modes.

Operating modes	Control	Setpoint value via	
Via communication buses and networks	Local		
Adjustment modes			
Homing (for Lexium 32A and M)	Function available	Function not available	Buses and networks or SoMove setup software
Manual mode (JOG)	Function available	Function available	Buses and networks, SoMove setup software, user interface or remote display terminal
Auto-tuning	Function available	Function available	Buses and networks or SoMove setup software
Operating modes			
Point-to-point mode (for Lexium 32A and M)	Function available	Function not available	Buses and networks or SoMove setup software
Motion sequence mode (for Lexium 32M)	Function available	Function available	Buses and networks or SoMove setup software
Electronic gearing mode (for Lexium 32C and M)	Function available	Function available	Pulse/direction (P/D), A/B or CW/CCW signals

Operating modes	Control	Setpoint value via	
Via communication buses and networks	Local		
Speed control with ramp	Function available	Function not available	Buses and networks or SoMove setup software
Current control	Function available	Function available	Analog input, buses and networks or SoMove setup software

## Homing

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Before performing an absolute movement in point-to-point mode, a homing operation must be carried out.

Homing consists of associating an axis position with a known mechanical position. This position then becomes the reference position for any subsequent movement of the axis.

Homing is carried out by:

- Immediately writing the actual position register
- Movements up to a reference sensor

## Manual Mode (JOG)

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This mode enables an axis to be moved manually. The movement can be carried out over one movement step (position JOG) or continuously, at constant speed (speed JOG). Two speeds of movement are available (slow or fast).

Various parameters are used to configure the manual movement. They are transmitted via the fieldbus, the SoMove setup software, the servo drive user interface or the remote display terminal.

## Auto-Tuning of the Servo Drive/Servo Motor Combination

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The auto-tuning function integrated in the servo drive enables tuning of the servo control parameters to be performed after the initial configuration. This function is activated via:

- The user interface
- The remote display terminal
- The SoMove setup software

The user has a choice of three auto-tuning modes:

- Automatic mode: This enables automatic tuning of the servo control parameters, without user intervention. This mode is designed for simple applications.
- Semi-automatic mode: This enables automatic tuning of the standard parameters used in the majority of motion applications. It does, however, offer the user the opportunity to modify certain parameters to ensure optimum use of the servo motor/ servo drive combination.
- Expert mode: This allows the user to modify the standard configuration by altering each adjustment parameter. This mode is designed for complex applications.

The SoMove setup software also provides access to screens for making servo control adjustments in each of the three modes.

## Point-to-Point Mode

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### Presentation

This mode, also referred to as PTP, is used to move the axis from a position A to a position B. The movement can be absolute: this consists of expressing position B in relation to a home position (the axis must have previously been referenced), or relative position: in this case the movement is performed in relation to the current axis position (A). The movement is performed according to acceleration, deceleration and speed parameters.

### Possible Applications

A motion controller for coordinated axes or a PLC can manage several axes controlled via communication buses and networks.

This mode is often used in:

- Material handling
- Automated inspection

For multi-axis applications requiring fast and precise sequences, we recommend using the motion sequence operating mode.

## Speed Control with Acceleration/Deceleration Ramp

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## Presentation

In this operating mode, the speed setpoint is applied according to an acceleration/deceleration ramp that can be adjusted using parameters. The speed setpoint can be modified during the movement. Current limiting is also possible.

The position control that is present in the background allows flexible synchronisation of two axes which are in speed control mode, and enables position control mode to be entered on the fly.

## Possible Applications

This mode is mainly used with infinite axes.

Examples include turntable management, printing, labelling applications, etc.

## Instantaneous Speed Control

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### Presentation

In this mode the Lexium 32 servo drive can be used with an analog output motion controller. It is suitable for all other high-performance speed control requirements.

### Possible Applications

Handling

Packing

Cutting to length

Winding and unwinding applications

## Current Control

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### Presentation

Current control is necessary for servo motor torque control. This mode, which can be added onto the other modes, is used in machine phases where torque control is crucial.

### Possible Applications

Car assembly applications (tool fixing machine)

Special machines

## Other Functions

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Control functions:

- Status monitoring in movement mode
- Monitoring of the axis signals
- Monitoring of the internal signals specific to the servo drive
- Monitoring switching
- Monitoring communication on the communication buses and networks

Entering the various scaling factors

Adjusting the movement generator

Activating the STOP signal

Triggering the fast stop function (Quick-Stop)

Activating the motor brake via the HBC (Holding Brake Controller)

Reversing the direction of rotation of the motor

Reading the analog input values

Determining the signal logic

Possible replacement of the servo motor encoder with an external encoder to close the position loop

Rotary axes (rollover)

Position register for controlling logic outputs

Controlling third-party motors

These functions can be activated and configured via:

- Logic I/O, some of which are reassignable
- Communication buses and networks
- The SoMove setup software
- The servo drive user interface
- The remote graphic display terminal