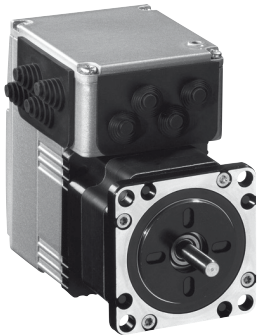


Lexium™ Integrated Drives Motion control

ILS1 with pulse/direction (P/D) interface



ILS1 with pulse/direction (P/D) interface

Introduction

ILS1 Integrated Drives consist of a 3-phase stepper motor and control electronics with pulse/direction (P/D) interface. The pulse/direction (P/D) signals from a master controller – for example, a Lexium Controller, or the A/B signals from an encoder – are converted directly into a movement.

ILS1 Integrated Drives with 3-phase stepper motor provide high torques at low speeds of rotation. They are mainly used in rotation speed mode and have excellent speed stability characteristics for high resolution positioning.

The control section consists of control electronics and a power stage that have a common power supply and are thermally insulated from the motor. These control electronics are not electrically isolated.

ILS1 Integrated Drives can operate on a 24 V to 36 V V supply.

ILS1 Integrated Drives control the stepper motor according to a reference value. This reference value is sent to the multifunction interface by a master controller or an external master encoder.

The number of steps per turn is set via the parameter switch.

ILS1 Integrated Drives with pulse/direction (P/D) interface have numerous interfaces:

- Multifunction interface
 - Interface for four 24 V signals
 - RS 485 serial link interface
 - Interface for the integrated Safe Torque Off function
- They are wired via a printed circuit board connector.

The commissioning of ILS1 drives with stepper motor is simplified, as they do not require any configuration of the control loop.

Interfaces

Multifunction interface

The multifunction interface takes one of the following signals, depending on the integrated drive model:

- 24 V signals separated by optical coupler (ILS1U)
- 5 V signals separated by optical coupler (ILS1V)
- 5 V differential signals without electrical isolation (ILS1W)

The reference values are sent via two signals, either as pulse/direction (P/D) signals, or as type A/B encoder signals.

The other signals have the following functions:

- Activation or locking of the power stage, and activation or locking of the indexing pulse
- Setting the number of steps or setting the motor phase current

RS 485 serial link interface

The RS 485 signal interface is used to connect an RS 485 serial link during configuration, commissioning or maintenance.

This signal interface is used to connect the Lexium CT PC software with a direct link, via an RS 485/

RS 232 or RS 485/USB converter, to access the fault log, temperature control and various other functions.

Interface for 24 V signals

Two input signals and two output signals are available.

The input signals have the following functions:

- Setting the number of steps
- Activation or locking of the power stage, and activation or locking of the indexing pulse

The output signals have the following functions:

- Drive ready
- Display a fault or indexing pulse

The 24 V power for the outputs is provided internally via the integrated drive's power supply.

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Interfaces (continued)

Interface for Safe Torque Off (Power Removal) safety function

The Safe Torque Off (Power Removal) safety function enables a category 0 or 1 stop to be performed in accordance with standard IEC/EN 60204-1 and/or prevents unintended motor operation in accordance with standard IEC/EN 61508 level SIL2, ISO 13849-1 performance level “d” (PL d) and IEC/EN 61800-5-2 (STO).

No additional power protection option is necessary. The Lexium ILS1 Integrated Drive can remain powered up, which reduces the system costs and the restart time.

The Safe Torque Off function is activated via two redundant 24 V input signals (active in OFF state).

Special technical features

- High continuous stall torque
- Good speed stability characteristics
- High encoder accuracy (0.018°)
- Integrated holding brake available as an option for the ILS1●85 Integrated Drive
- Planetary gearbox available as an option

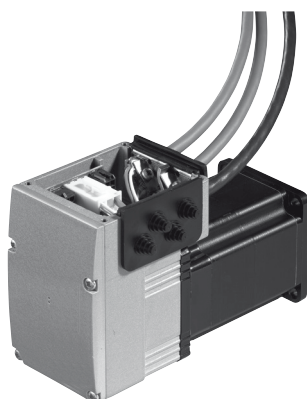
Connections

Lexium ILS Integrated Drives are connected via printed circuit board connectors.

Printed circuit board connectors

Printed circuit board connectors are used to connect the multifunction interface, the RS 485 serial link, the interface for 24 V signals and the Safe Torque Off function, as well as the power supply.

The ILS1 integrated drive is connected via two plates for cable entry plates, to be ordered separately (see accessories page 38).



Integrated drive with printed circuit board connectors

Main functions

Configuration by parameter switch

The following functions can be set on ILS1 Integrated Drives via the parameter switch:

- Number of steps
- Motor phase current
- Reduction of motor phase current
- Input signal functions:
 - ☐ Transmission of the reference value via pulse/direction (PULSE/DIR) or encoder (A/B) signals
 - ☐ Activation/locking of the power stage (ENABLE/GATE input signal)
 - ☐ Activation/locking of the indexing pulse (ENABLE/GATE input signal)
 - ☐ Modulation of the motor phase current via a PWM signal (PWM/STEP2_INV input signal)
 - ☐ Increase/decrease the number of steps by a factor of 10 (PWM/STEP2_INV input signal)
- Output signal functions:
 - ☐ Display a detected fault (FAULT/INDEXPULSE output signal)
 - ☐ Indexing pulse signal (FAULT/INDEXPULSE output signal)
 - ☐ “Drive ready” signal (ACTIVE output signal)
- Blocking detection
- Activation of the RS 485 line terminator
- Activation/deactivation of the Safe Torque Off function

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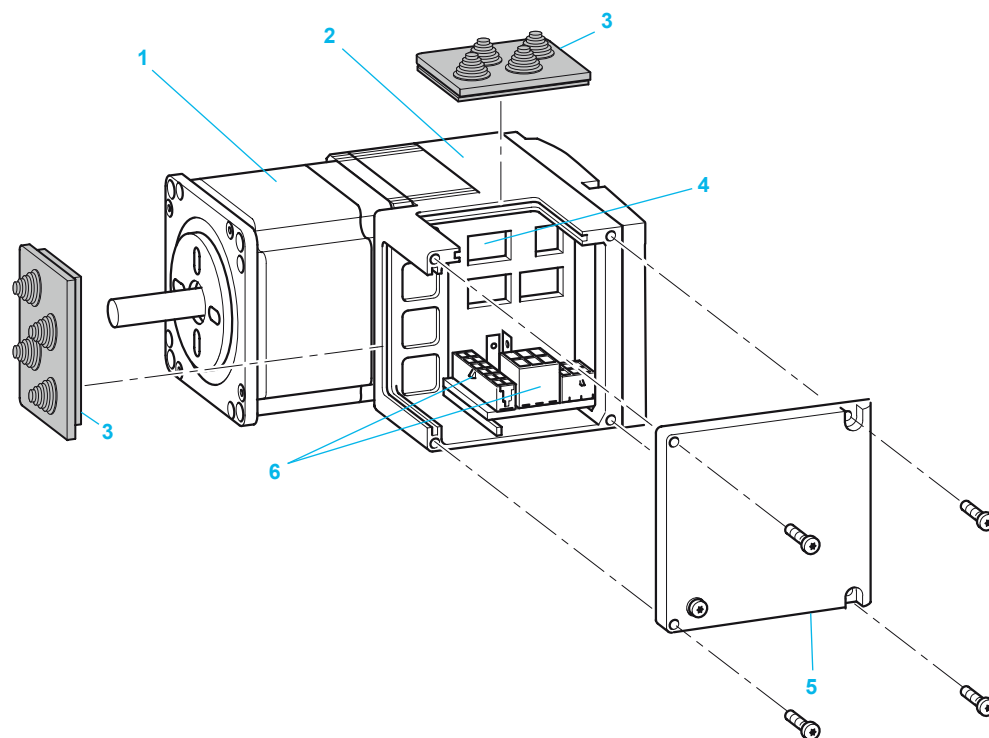
ILS1 with pulse/direction (P/D) interface
ILS1 with 3-phase stepper motor

Description

ILS1 Integrated Drives consist of control electronics with pulse/direction (P/D) interface and a 3-phase stepper motor.

They are available with printed circuit board connectors.

For ILS1M85 Integrated Drives, an integrated holding brake is available as an option.

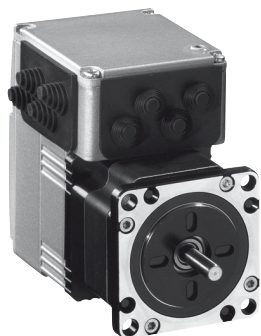


- 1 3-phase stepper motor
- 2 Electronic unit
- 3 Cable entry plate (see accessories page 38)
- 4 Parameter switch
- 5 Cover
- 6 Connection terminals

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ILS1 with pulse/direction (P/D) interface
ILS1 with 3-phase stepper motor



ILS1 Integrated Drive with pulse/direction interface

References											
Example:	I	L	S	1	U	5	7	1	P	B	A 0
Motor type S = 3-phase stepper motor	I	L	S	1	U	5	7	1	P	B	A 0
Supply voltage 1 = 24...36 V	I	L	S	1	U	5	7	1	P	B	A 0
Interface U = 24 V pulse/direction signals, separated by optical coupler V = 5 V pulse/direction signals, separated by optical coupler W = 5 V pulse/direction signals, RS 422	I	L	S	1	U	5	7	1	P	B	A 0
Flange size 57 = 57 mm 85 = 85 mm	I	L	S	1	U	5	7	1	P	B	A 0
Drive type (1) 1 = ILS1●●●1 2 = ILS1●●●2 3 = ILS1●●●3	I	L	S	1	U	5	7	1	P	B	A 0
Winding type P = medium rotation speed T = high rotation speed (2)	I	L	S	1	U	5	7	1	P	B	A 0
Connection B = printed circuit board connector	I	L	S	1	U	5	7	1	P	B	A 0
Sensor type 1 = reference pulse sensor (Zero marker)	I	L	S	1	U	5	7	1	P	B	A 0
Holding brake A = without holding brake F = with holding brake (3)	I	L	S	1	U	5	7	1	P	B	A 0
Gearbox 0 = without gearbox	I	L	S	1	U	5	7	1	P	B	A 0

(1) See the main specifications and dimensions according to the type of drive in the table below:

Drive		ILS1●571	ILS1●572	ILS1●573	
Winding type		P	P	P	
Nominal speed of rotation	rpm	1000	600	450	
Maximum torque	Nm	0.45	0.9	1.5	
Holding torque	Nm	0.51	1.02	1.7	
Dimensions (overall in mm)	W x H x D	57.2 x 92.2 x 101.9	57.2 x 92.2 x 115.9	57.2 x 92.2 x 138.9	
Drive		ILS1●851	ILS1●852	ILS1●853	
Winding type		P	P	P	T
Nominal speed of rotation	rpm	450	200	120	300
Maximum torque	Nm	2	4	6	4.5
Holding torque	Nm	2	4	6	4.5
Dimensions (overall in mm)	Without holding brake	W x H x D	85 x 119.6 x 140.6	85 x 119.6 x 170.6	85 x 119.6 x 200.6
	With holding brake	W x H x D	85 x 119.6 x 187.3	85 x 119.6 x 217.3	85 x 119.6 x 247.3

(2) Twinding only available for integrated drive with 85 mm flange (ILS1●853).

(3) Holding brake only available for integrated drive with 85 mm flange (ILS1●85).

Note: See all the data (specifications, dimensions) on our website www.schneider-electric.com.