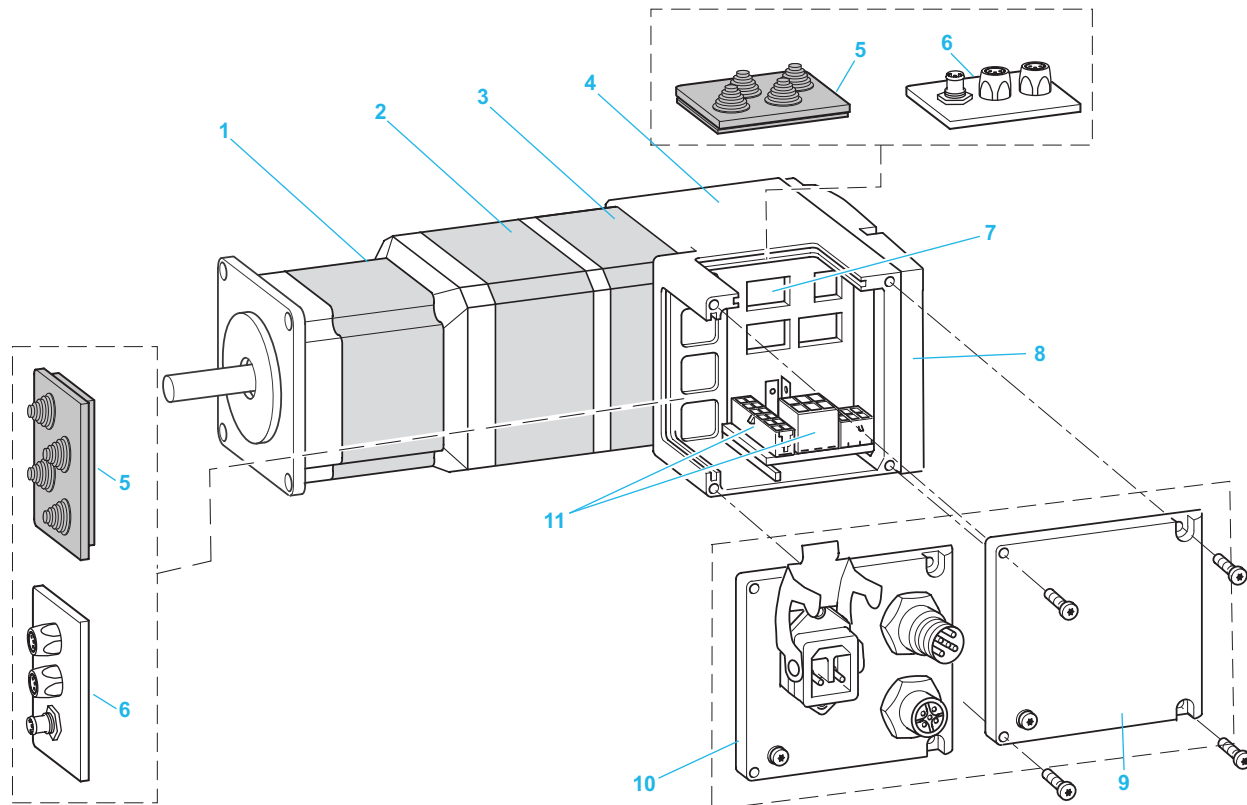


Lexium integrated drives IL●1 for CANopen, PROFIBUS DP, RS 485 ILA1 with AC synchronous servo motor

Description

ILA1 comprise control electronics with a fieldbus interface for CANopen DS301, PROFIBUS DP or RS 485 and an AC synchronous servo motor. ILA1 is optionally available with printed circuit board connectors or industrial connectors. A multiturn encoder is optionally available for ILA1. A holding brake is optionally available for the ILA1 with a singleturn encoder.



- 1 Synchronous AC servo motor
- 2 Holding brake (optional)
- 3 Singleturn or multiturn encoder (optional)
- 4 Electronics housing
- 5 Insert cable entry (accessory)
- 6 I/O insert with industrial connectors (accessory)
- 7 Settings via parameter switches
- 8 Cover for electronics housing
- 9 Cover for Lexium integrated drives with option "PCB connector"
- 10 Cover for supply voltage \sim V and fieldbus connection for Lexium integrated drives with option "industrial connector"
- 11 Electrical interfaces

Certifications		
Conformity to standards		Lexium integrated drives have been developed to comply with the stringent international standards and with the recommendations for adjustable speed power drive systems, specifically: IEC/EN 61800-3 (noise immunity to conducted and radiated high-frequency signals) and IEC/EN 50178 (resistance of devices to vibration).
EMC immunity		EN 61800-3:2001, second environment
Conducted and radiated EMC emissions		EN 61800-3:2001-02; IEC 61800-3, Ed.2 <ul style="list-style-type: none"> ■ Power supplies without external mains filter: <ul style="list-style-type: none"> □ C3 up to 10 m supply cable length ■ Power supplies with external mains filter: <ul style="list-style-type: none"> □ C2 up to 20 m supply cable length □ C3 up to 50 m supply cable length
CE marking		The Lexium integrated drives are CE marked in accordance with the European Machinery Directive (98/37/EEC) and the European EMC Directive (2004/108/EEC).
Product certifications		UL (USA), cUL (Canada) TÜV certification: Lexium integrated drives are TÜV-certified for device safety and medical devices. The certification includes: <ul style="list-style-type: none"> ■ Functional safety of electrical/electronic/programmable safety-related electronic systems (IEC 61508:2000; SIL 2) ■ Safety of machinery – functional safety of safety-related electrical and electronic and programmable electronic control systems (IEC 62061:2005; SILcl2) ■ Safety of machinery – safety-related parts of control systems – Part 1: General principles for design (ISO 13849-1:2006; PL d (Category 3))
Ambient conditions		
Ambient temperature (1)		°C 0 ... 65; power reduction by 2%/°C at 50 ... 65
Max. permissible temperature of the power amplifier		°C 105
Max. permissible temperature of the motor (2)		°C 110
Transport and storage temperature		°C -25 ... +70
Installation height without power reduction		m < 1000 m above mean sea level
Relative humidity		% 15 ... 85 (not condensing)
Vibration load during operation as per IEC/EN 60068-2-6	Number of cycles	10
	Acceleration amplitude:	m/s ² 20
	Frequency range	Hz 10 ... 500
Continuous shocks as per IEC/EN 60068-2-29	Number of shocks	1000
	Peak acceleration	m/s ² 150
Shaft wobble and perpendicularity		According to EN 50347 (IEC 60072-1)
Degree of protection as per DIN EN 60034-5		Total except shaft bushing IP54, shaft bushing IP41
Electrical data		
Supply voltage (CN1)		Corresponds to PELV according to DIN 19240, not protected against reverse polarity
Supply voltage range (absolute limit values)		V 18 ... 40
Nominal supply voltage		V 24 ... 36
Ripple at nominal voltage		V _{PP} ≤ 3.6
Max. continuous current consumption	■ Winding type T	A ILA1●571 7.5 ILA1●572 7.5
	■ Winding type P	A 5 7
Peak current consumption	■ Winding type T	A 11 9
	■ Winding type P	A 7 8.5
Inrush current		Inrush current time-dependent by current incline function and depending on device capacitance C = 1500 µF and resistance of connectivity
External fuse		A 10
Fieldbus interfaces (CN2 and CN3)		
CANopen	Signal inputs/outputs	According to ISO 11898 standard, no galvanic isolation
	Transmission rate	kBaud 50 / 100 / 125 / 250 / 500 / 800 / 1000
	Transmission protocol	CANopen as per DS301
PROFIBUS DP	Signal inputs/outputs	According to RS 485, galvanic isolation, 2-wire
	Transmission rate	kBaud 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 / 1500 / 3000 / 6000 / 12000
	Transmission protocol	PROFIBUS DP-V0 (data format as per Profdrive V2.0 PPO Type 2)
RS 485	Signal inputs/outputs	According to RS 485, no galvanic isolation, 2-wire
	Transmission rate	kBaud 9.6 / 19.2 / 38.4
	Transmission protocol	Manufacturer-specific

(1) Limit values with flanged motor mounted on a steel plate 300 x 300 x 10 mm
 (2) Measured at the surface

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Electrical data			
24 V signal interface (CN4)		4 signals, can each be used as input or output	
24 V signal inputs		Galvanically connected to 0VDC, protected against reverse polarity	
Logic 0 (U_{low})	V	-3 ... +4.5	
Logic 1 (U_{high})	V	+15 ... +30	
Input current (typical at 24 V)	mA	2	
Debounce time	IO0 and IO1	ms	0.1
	IO2 and IO3	ms	0.01
24 V signal outputs		Switching to plus, short-circuit protected, suitable for inductive load (1000 mH / 100 mA)	
Supply voltage range	--- V	23 ... 25	
Max. switching current (total)	mA	200	
Max. switching current per output	mA	100	
		The internal power supply unit is protected against: ■ Short circuit of the output voltage ■ Overload of output voltage (limited to 6 W output power)	
Interface for safety function "Safe Torque Off" ("Power Removal") (CN5)		No galvanic isolation; corresponds to RS 485 standard	
Logic 0 (U_{low})	V	-3 ... +4.5	
Logic 1 (U_{high})	V	+15 ... +30	
Input current (typical at 24 V)	$\overline{STO_A}$	mA	≤ 10
	$\overline{STO_B}$	mA	≤ 3
Debounce time	ms	1	
Response time (until shutdown of power amplifier)	ms	< 50	
Max. time offset until detection of signal differences between $\overline{STO_A}$ and $\overline{STO_B}$	S	< 1	
Safety function "Safe Torque Off" ("Power Removal")			
Protection	Of machine	"Safe Torque Off" safety function which forces stopping and/or prevents unintended restarting of the motor, conforming to standard ISO 13849-1, performance level "d" (PL d), and standard IEC/EN 61800-5-2	
	Of the system process	"Safe Torque Off" safety function which forces stopping and/or prevents unintended restarting of the motor, conforming to standard IEC/EN 61508 level SIL2 and standard IEC/EN 61800-5-2	

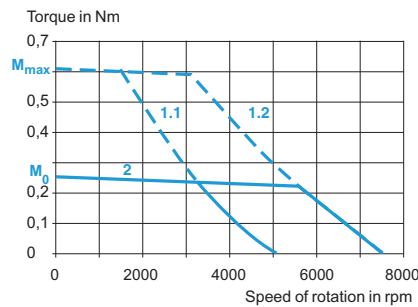
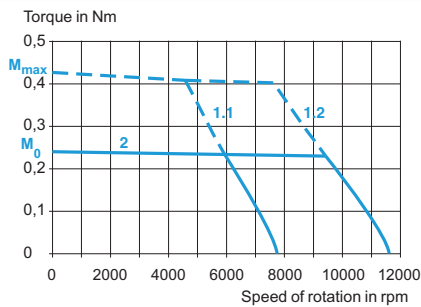
Mechanical data

Type of integrated drive		ILA1●571				ILA1●572			
		T		P		T		P	
Winding type		T		P		T		P	
Nominal supply voltage		24		36		24		36	
Nominal speed of rotation		rpm		rpm		rpm		rpm	
Max. torque (1)		Nm		Nm		Nm		Nm	
Continuous torque (2)		Nm		Nm		Nm		Nm	
Positioning resolution per revolution		Inc.		Inc.		Inc.		Inc.	
Accuracy of positioning sensor		°		°		°		°	
Rotor inertia		kg·cm ²		kg·cm ²		kg·cm ²		kg·cm ²	
Mass		kg		kg		kg		kg	
Shaft load		Max. radial force (3)		N		N		N	
		Max. axial tensile force		N		N		N	
		Max. axial force pressure		N		N		N	
		Nominal bearing service life (4)		h		h		h	
Holding brake (optional) (5)									
Holding torque		Nm		Nm		Nm		Nm	
Electrical pull-in power		W		W		W		W	
Brake release time		ms		ms		ms		ms	
Brake application time		ms		ms		ms		ms	
Moment of inertia		kg·cm ²		kg·cm ²		kg·cm ²		kg·cm ²	
Multiturn encoder (optional) (5)									
Measuring range absolute		rpm		rpm		rpm		rpm	
Positioning resolution per revolution		Inc.		Inc.		Inc.		Inc.	
Accuracy of positioning sensor		°		°		°		°	

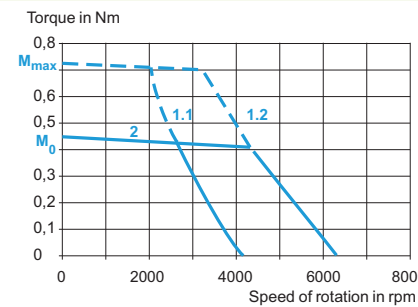
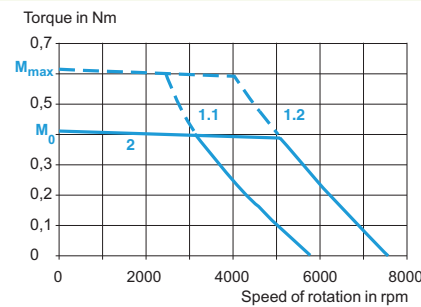
- (1) Max. 2.5 s
- (2) At 20 rpm; at 0 rpm the continuous torque is reduced to 89% of the specified value
- (3) Point of application of radial force: 10 mm distance to flange
- (4) Operating hours at a probability of failure of 10%; conditions for shaft load: speed 4000 rpm, 100% duty cycle at continuous torque, ambient temperature 40 °C
- (5) Holding brake and multiturn encoder cannot be used in combination.

Torque characteristics

ILA1●571T (winding type T) ILA1●571P (winding type P)



ILA1●572T (winding type T) ILA1●572P (winding type P)



- 1.1 Max. torque at 24 V
- 1.2 Max. torque at 36 V
- 2 Continuous torque

Lexium integrated drives

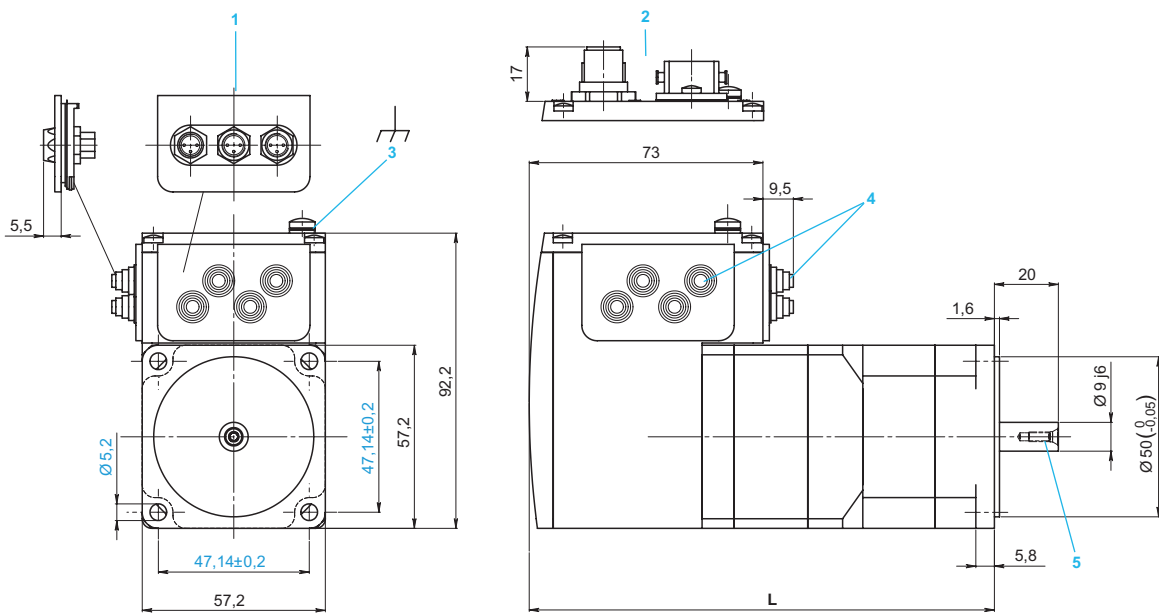
IL●1 for CANopen, PROFIBUS DP, RS 485

ILA1 with AC synchronous servo motor

References												
Example:	I	L	A	1	B	5	7	1	P	B	1	A
Motor type A = AC synchronous servo motor	I	L	A	1	B	5	7	1	P	B	1	A
Supply voltage 1 = 24 ... 36 V	I	L	A	1	B	5	7	1	P	B	1	A
Communication interface B = PROFIBUS DP F = CANopen DS301 R = RS 485	I	L	A	1	B	5	7	1	P	B	1	A
Flange size 57 = 57 mm	I	L	A	1	B	5	7	1	P	B	1	A
Motor length ("L") (1) 1 = motor length ("L") 2 = motor length ("L")	I	L	A	1	B	5	7	1	P	B	1	A
Winding type P = medium speed of rotation, medium torque T = high speed of rotation, medium torque	I	L	A	1	B	5	7	1	P	B	1	A
Connection technology B = printed circuit board connector C = industrial connector	I	L	A	1	B	5	7	1	P	B	1	A
Measurement system 1 = singleturn encoder 2 = multiturn encoder (2)	I	L	A	1	B	5	7	1	P	B	1	A
Holding brake A = no holding brake F = with holding brake (2)	I	L	A	1	B	5	7	1	P	B	1	A

(1) The motor length "L" depends on the mechanical characteristics, see pages 4/19 and 4/21.
 (2) Holding brake and multiturn encoder cannot be used in combination.

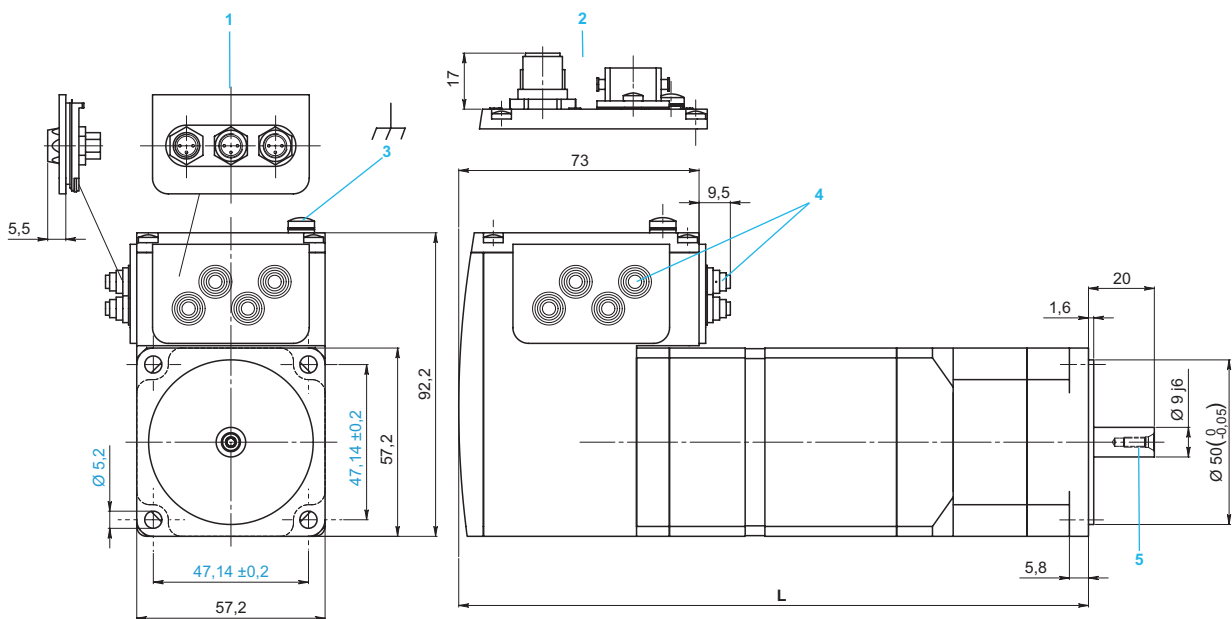
ILA1 integrated drives without holding brake



	L (without multiturn encoder)	L (with multiturn encoder)
ILA1●571	145.3	189.3
ILA1●572	163.8	207.8

- 1 Accessories: I/O signal insert with industrial connectors
- 2 Option: industrial connectors
- 3 Earth (ground) terminal
- 4 Accessories: cable entries $\varnothing = 3 \dots 9$ mm
- 5 Centring hole DIN 332 - DS M3

ILA1 integrated drives with holding brake



	L
ILA1●571	190.8
ILA1●572	209.3

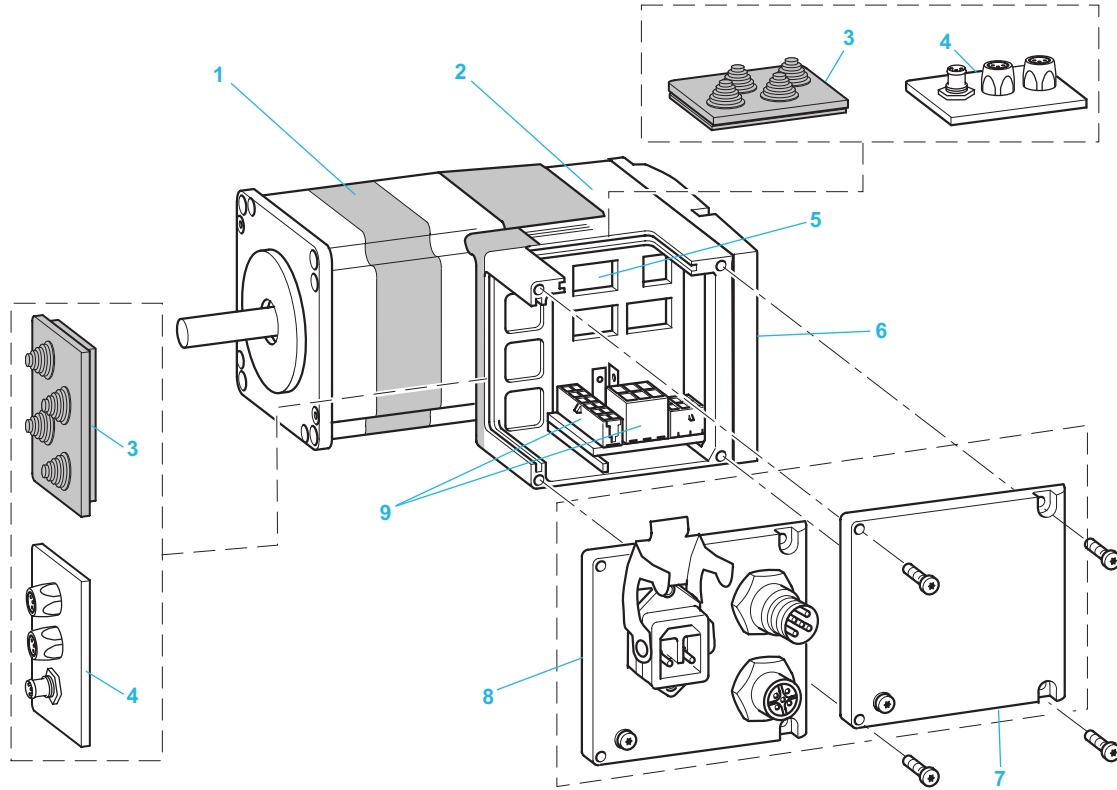
- 1 Accessories: I/O signal insert with industrial connectors
- 2 Option: industrial connectors
- 3 Earth (ground) terminal
- 4 Accessories: cable entries $\varnothing = 3 \dots 9$ mm
- 5 Centring hole DIN 332 - DS M3

Lexium integrated drives

IL●1 for CANopen, PROFIBUS DP, RS 485
 ILE1 with brushless DC motor

Description

ILE1 comprise control electronics with a fieldbus interface for CANopen DS301, PROFIBUS DP or RS 485 and a brushless DC motor. ILE1 is optionally available with straight teeth gear or worm gear and printed circuit board connectors or industrial connectors.



- 1 Brushless DC motor
- 2 Electronics housing
- 3 Insert cable entry (accessory)
- 4 I/O insert with industrial connectors (accessory)
- 5 Settings via parameter switches
- 6 Cover for electronics housing
- 7 Cover for Lexium integrated drives with option "PCB connector"
- 8 Cover for supply voltage --- V and fieldbus connection for Lexium integrated drives with option "industrial connector"
- 9 Electrical interfaces

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