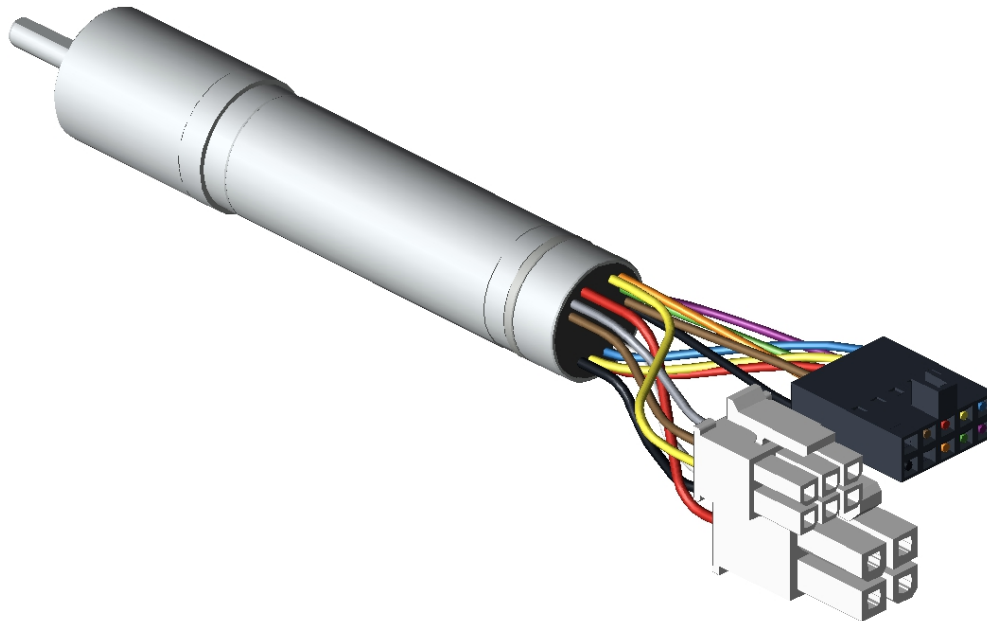


Configured drive

Motor - ECXSP13L BL KL A HP 24V
Gearhead - GPX14 C 5.3:1
Sensor - ENX13 EASY INT COMM 10IMP

Part number: B7E8F7F05F3E Revision number 1

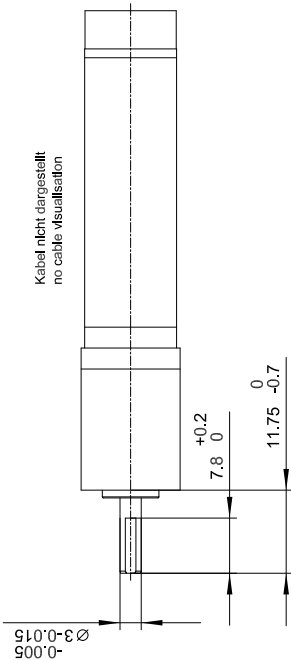
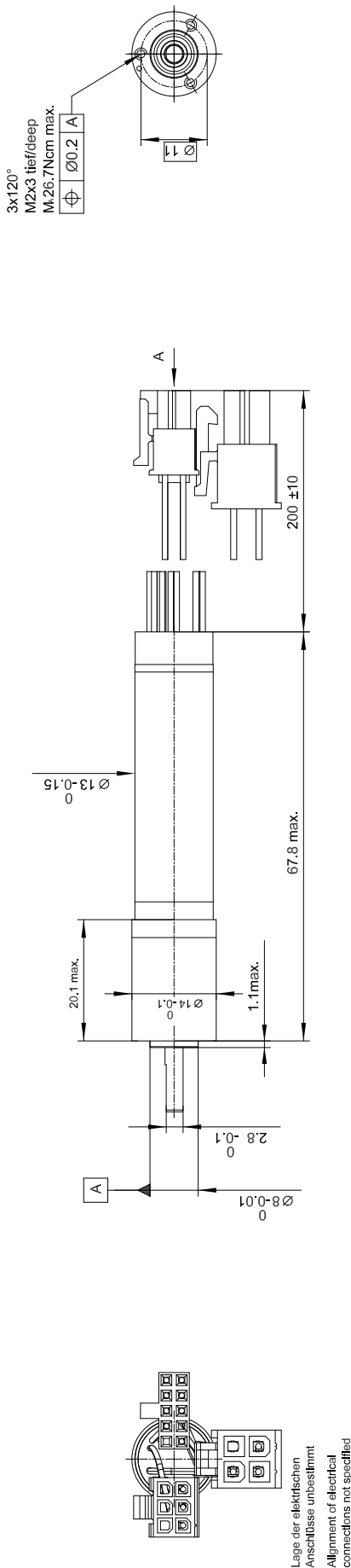
General Terms and Conditions https://www.maxongroup.ch/maxon/view/content/terms_and_conditions_page

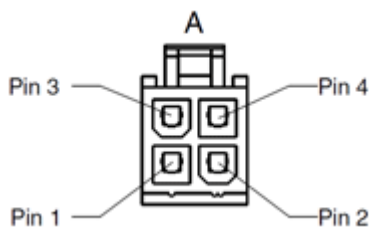


To open the integrated CAD file, please save this document and open it in Acrobat Reader. The STEP file is available after a double-click on the pin icon.

B7E8F7F05F3E.stp (STP AP 214)

Open configuration: <https://www.maxongroup.us/maxon/view/configurator/?ConfigID=B7E8F7F05F3E>



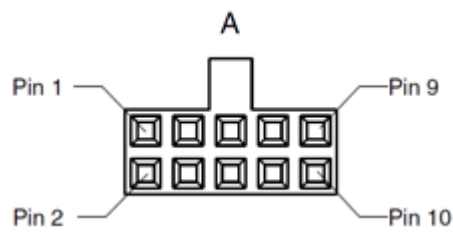


Connector type, motor

Molex 39-01-2040

Pin 1	Motor 1	Red
Pin 2	Motor 2	Black
Pin 3	Motor 3	White
Pin 4	NC	

Cable type: AWG26

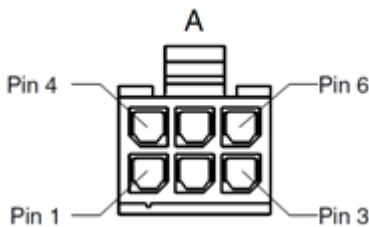


Connector type, encoder

Molex 22-55-2102

Pin 1	NC	
Pin 2	VCC	Black
Pin 3	GND	Brown
Pin 4	NC	
Pin 5	A \	Red
Pin 6	A	Orange
Pin 7	B \	Yellow
Pin 8	B	Green
Pin 9	Channel I\ (Index)	Blue
Pin 10	Channel I (Index)	Purple

Cable type: AWG28

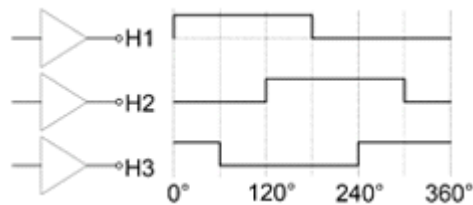


Hall sensor connector type

Molex 43025-0600

Pin 1	Hall-Sensor 1	Yellow
Pin 2	Hall-Sensor 2	Brown
Pin 3	Hall-Sensor 3	Gray

Cable type: AWG28



Output signals: CMOS compatible
push-pull stage
No pull-up resistor required
Hall signals are generated
by EASY INT sensor

Summary of your selected configuration

Total weight of the drive: 53.1 g

ECXSP13L BL KL A HP 24V

Product detail

Commutation	With Hall sensors
Nominal voltage	24 V
Motor bearings	Preloaded ball bearing
Version	High Power

Elec. connection, motor

Elec. connection, motor	Cable with connector
Connector type, motor	Molex 39-01-2040
Hall sensor connector type	Molex 43025-0600

Labeling

Labeling	Your own text
Your text	AMBER Lab

GPX14 C 5.3:1

Product detail

Gearhead type	Ceramic version
Reduction	5.3:1
Number of stages	1

ENX13 EASY INT COMM 10IMP

Product detail

Counts per turn	10
Connector type, encoder	Molex 22-55-2102

Legend for part designation

EC-Motor:

A	Hall sensor version
B	Sensorless version
BL	Brushless
C	Integrated electronics
ECX	EC-motor (brushless)
FL	FLAT (type series name)
HP	High Power
HTQ	High Torque
HTQF	High Torque, fan-ventilated
KL	Ball bearings
M/L/X	Medium / Long / Extra long
PR	PRIME (type series name)
SP	SPEED (type series name)
SQ	SQUARE (type series name)
STD	Standard
STE	Sterilizable
STEC	Sterilizable, ceramic bearing
TQ	TORQUE (type series name)

DC-Motor:

CLL	Capacitor long life (spark suppression)
DC-max	DC motors (brushed)
DCX	DC motors (brushed)
EB	Precious metal brushes
GB	Graphite brushes
KL	Ball bearings
S/M/L	Short / Medium / Long
SL	Sintered sleeve bearings

IDX Drive/Motor:

AB	Integrated brake
CO	CANopen interface
ENC	Encoder
ET	EtherCAT interface
IDX	Drive System
IO	I/O interface
P	Positioning-control
S	Speed-control
S/M/L	Short / Medium / Long

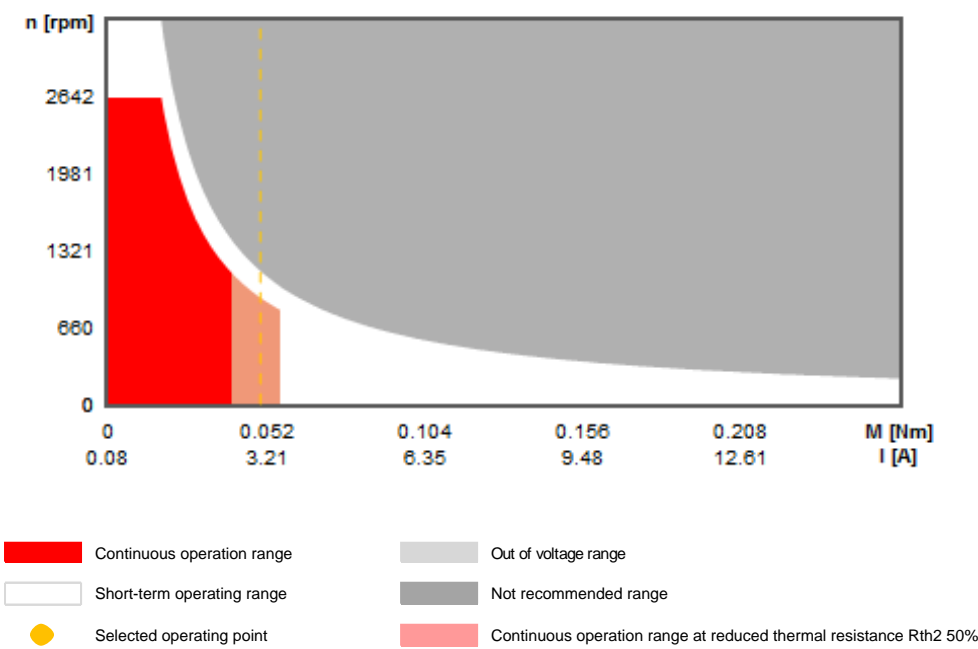
Gearhead

A	Standard version
C	Ceramic version
GPX	Planetary gearhead
HP	High Power
LN	Reduced noise level
LZ	Reduced backlash
SP	SPEED (type series name)
ST	Number of stages
STE	Sterilizable
STES	Sterilizable, with sealing
UP	Ultra Performance

Encoder/Sensor:

ABS	Absolute
BISSC	Bidirectional serial synchronous (protocol)
COMM	Commutation signals
EASY	(type series name)
EMT	(type series name)
ENX	Encoder
FFC	Flexible flat cable
GAMA	(type series name)
IMP	Pulses
INT	integrated
MAG	(type series name)
QUAD	(type series name)
RIO	(type series name)
SSI	Synchronous serial Interface (protocol)
XT	Extended version

Drive disposition



Combination details

Your entries

Available voltage	18 V
Speed	3302 min ¹
Torque	0.05 Nm

Values of the drive at available voltage

Available voltage	18 V
Max. speed at given load	917 min ¹
Max. continuous torque	0.04 Nm
Max. continuous current	2.52 A

Required electrical data for your operating point

Speed	3302 min ¹
Torque	0.05 Nm
Required voltage	8.24 V
Required current	3.06 A

ECXSP13L BL KL A HP 24V

Product specification

Values at nominal voltage

Nominal voltage	24 V
No load speed	65800 min ⁻¹
No load current	82.2 mA
Nominal speed	61700 min ⁻¹
Nominal torque (max. continuous torque)	8.57 mNm
Nominal current (max. continuous current)	2.52 A
Stall torque	163 mNm
Stall current	46.8 A
Max. efficiency	91.856 %

Characteristics

(typical, at	50 W
Terminal resistance phase-to-phase	0.512 Ω
Terminal inductance phase-to-phase	0.0309 mH
Torque constant	3.48 mNm A ⁻¹
Speed constant	2750 min ⁻¹ V ⁻¹
Speed/torque gradient	405 min ⁻¹ mNm ⁻¹
Mechanical time constant	1.48 ms
Rotor inertia	0.349 gcm ²

Thermal data

Thermal resistance housing-ambient	19.5 KW ⁻¹
Thermal resistance winding-housing	1.6 KW ⁻¹
Thermal time constant of the winding	1.76 s
Thermal time constant of the motor	329 s
Ambient temperature	-20...100 °C
Max. winding temperature	155 °C

Mechanical data

Max. permissible speed	70000 min ⁻¹
Axial play	0...0.28 mm
Preload	1.5 N
Direction of force	Pull
Radial backlash	0 mm
Max. axial load (dynamic)	1.5 N
Max. force for press fits (static)	50 N
Static, supported shaft	1500 N
Max. radial load 5 mm from flange	6 N
Measurement from the flange	5 mm

Further specifications

Number of pole pairs	1
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Number of phases	3
Typical noise level	dBA (50000 min ⁻¹)
Typical noise level at reference speed	50000 min ⁻¹
Number of autoclave cycles	0

More information on the motor: <https://www.maxongroup.com/maxon/view/product/ECXZ13L1KN50N1IL1D450A?download=show>

GPX14 C 5.3:1

Product specification

Gearhead data

Reduction	5.3:1
Absolute reduction	69/13
Number of stages	1
Max. continuous torque	0.21 Nm
Max. intermittent torque	0.26 Nm
Direction of rotation, drive to output	=
Max. efficiency	90 %
Average backlash no-load	1.1 °
Mass inertia	0.067 gcm ²
Max. transmittable power (continuous)	4.8 W
Max. short-time transferable output	6 W

Technical data

Output shaft bearing	
Max. radial play, 5 mm from flange	max. 0.1 mm
Axial play	0...0.1 mm
Max. permissible radial load, 5 mm from flange	30 N
Max. permissible axial load	20 N
Max. permissible force for press fits	50 N
Max. continuous input speed	14000 min ⁻¹
Max. intermittent input speed	14000 min ⁻¹
Recommended temperature range	-40..100 °C

More information on the gearhead: <https://www.maxongroup.com/maxon/view/product/GPX14CAKLSL05D3CPLW?download=show>

ENX13 EASY INT COMM 10IMP

Product specification		
Sensor data		
	Counts per turn	10
	Number of channels	3
	Line Driver	RS422
	Max. electrical speed	200000 min ¹
	Max. mechanical speed	200000 min ¹
Technical data		
	Supply voltage Vcc	5 V ±10 %
	Output signal	INC + COMM
	Output signal driver	Differential / EIA RS 422
	Output current per channel	-20...20 mA
	State length	45...135 °el
	Signal rise time/Signal fall time	60/60 ns
	Min. state duration	62.5 ns
	Direction of rotation	A vor B CW
	Index position	A low & B low
	Index synchronously to AB	Yes
	Index pulse width	90 °el
	Typical current draw at standstill	22 mA
	Max. moment of inertia of code wheel	0.005 gcm ²
	Operating temperature range	-40...125 C°
	Number of autoclave cycles	1000

More information on the encoder: <https://www.maxongroup.com/maxon/view/product/ENX13EASYINT01?download=show>