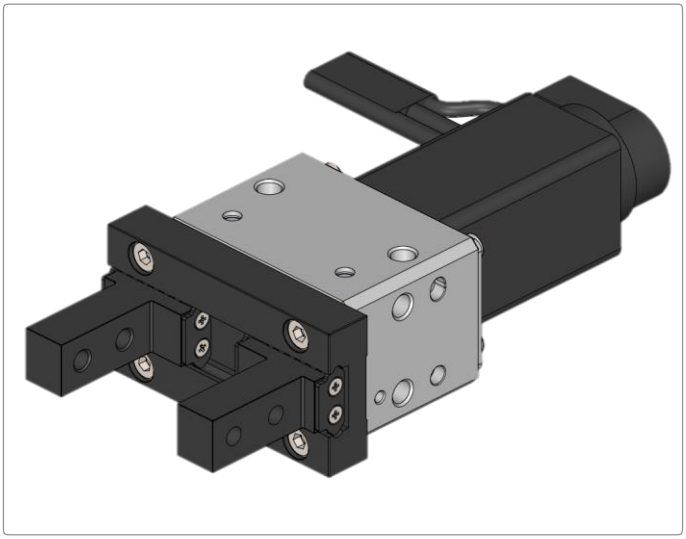
WGPE-025 Electrical Parallel Gripper

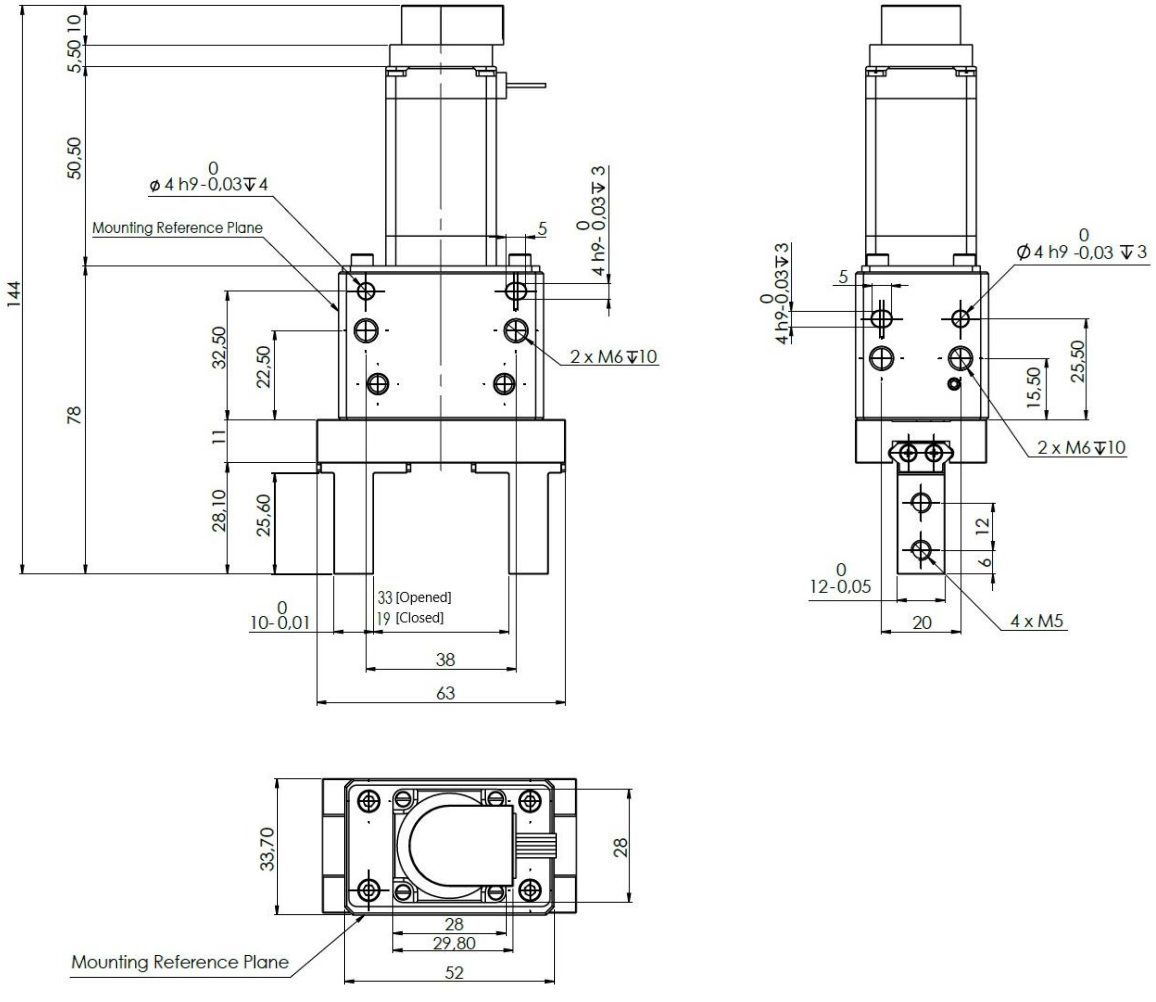


Specification

Size	025*
Stroke Per Jaw [mm]	7
Gripping Force [N]	16~40
Opening-Closing Speed [mm/s]	5~100
Temperature[°C]	5~40
Weight [g]	660
Motor Type	Step Motor
Motor Size	□ 28
Encoder	Incremental
Nominal Voltage [V]	VDC 24 ±%10

Note: The gripping force should be chosen 10 to 20 times the weight of the work piece.
*Get information for other sizes.

Technical Drawing

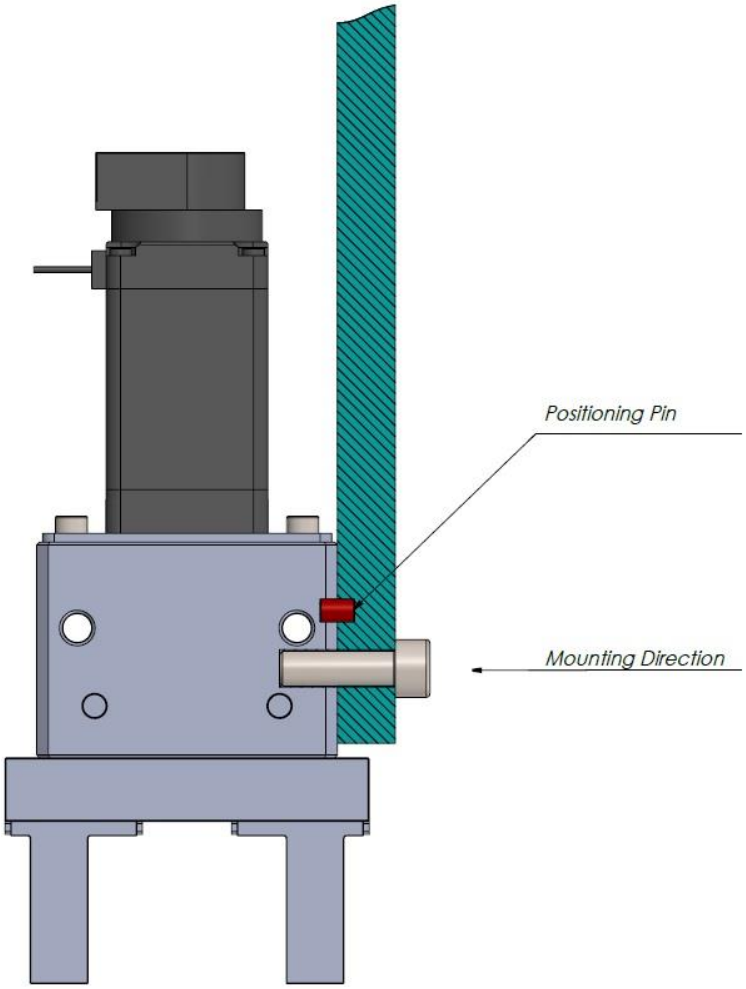


Ordering Code

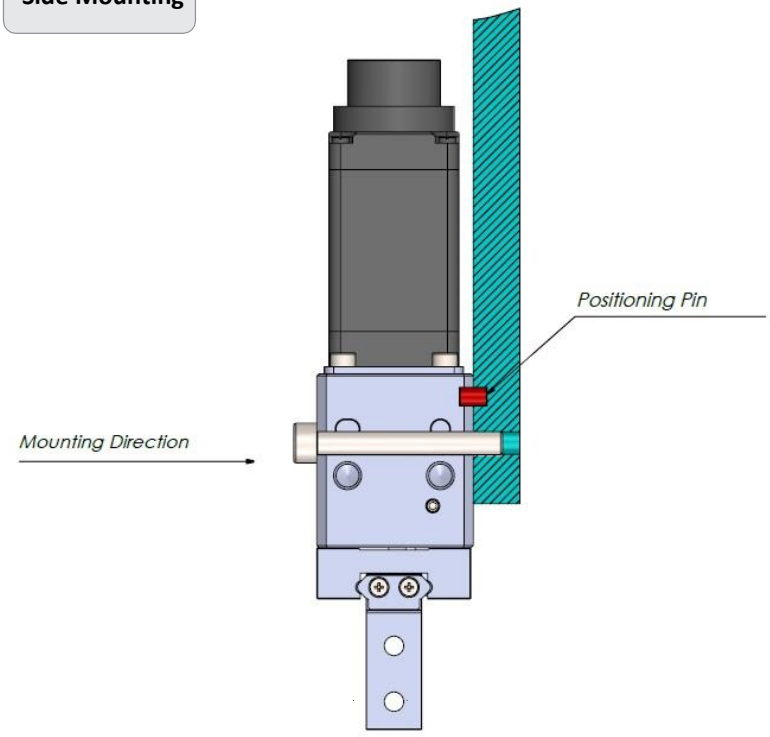
MODEL	SIZE
WGPE	**025**
Paralel Grippers	Serial

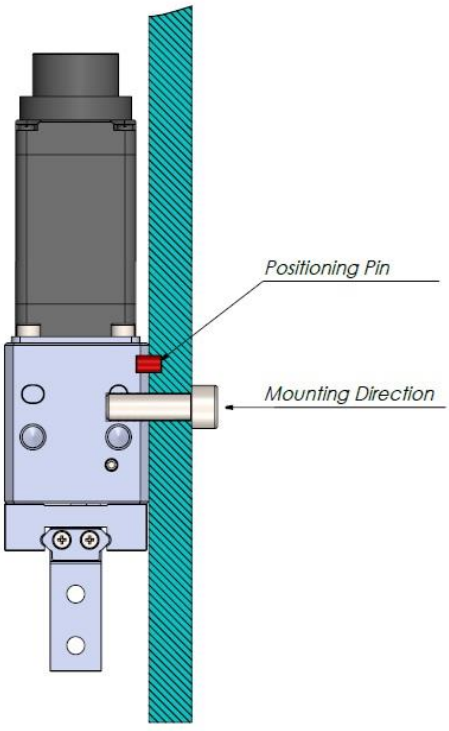
Gripper Mounting Style

Front Mounting

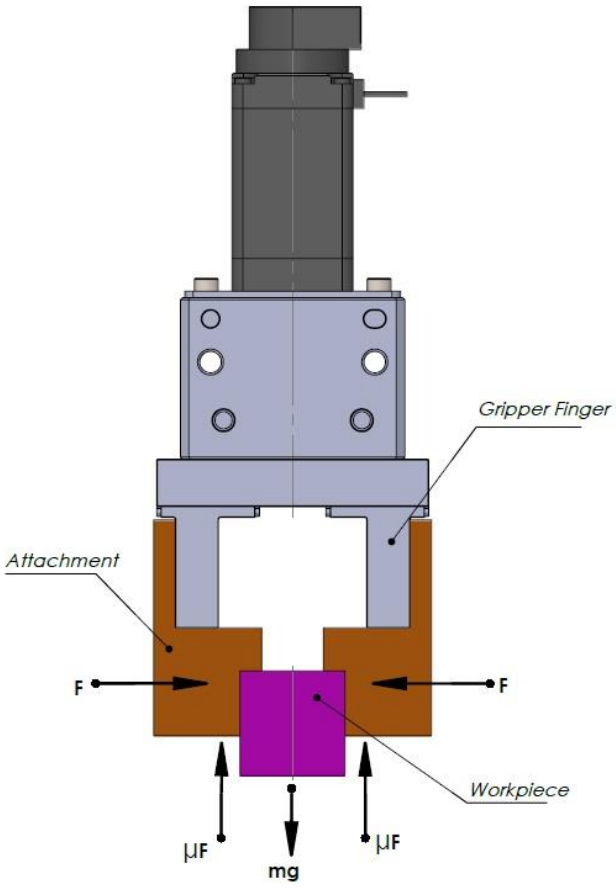


Side Mounting





Calculation of Required Gripping Force



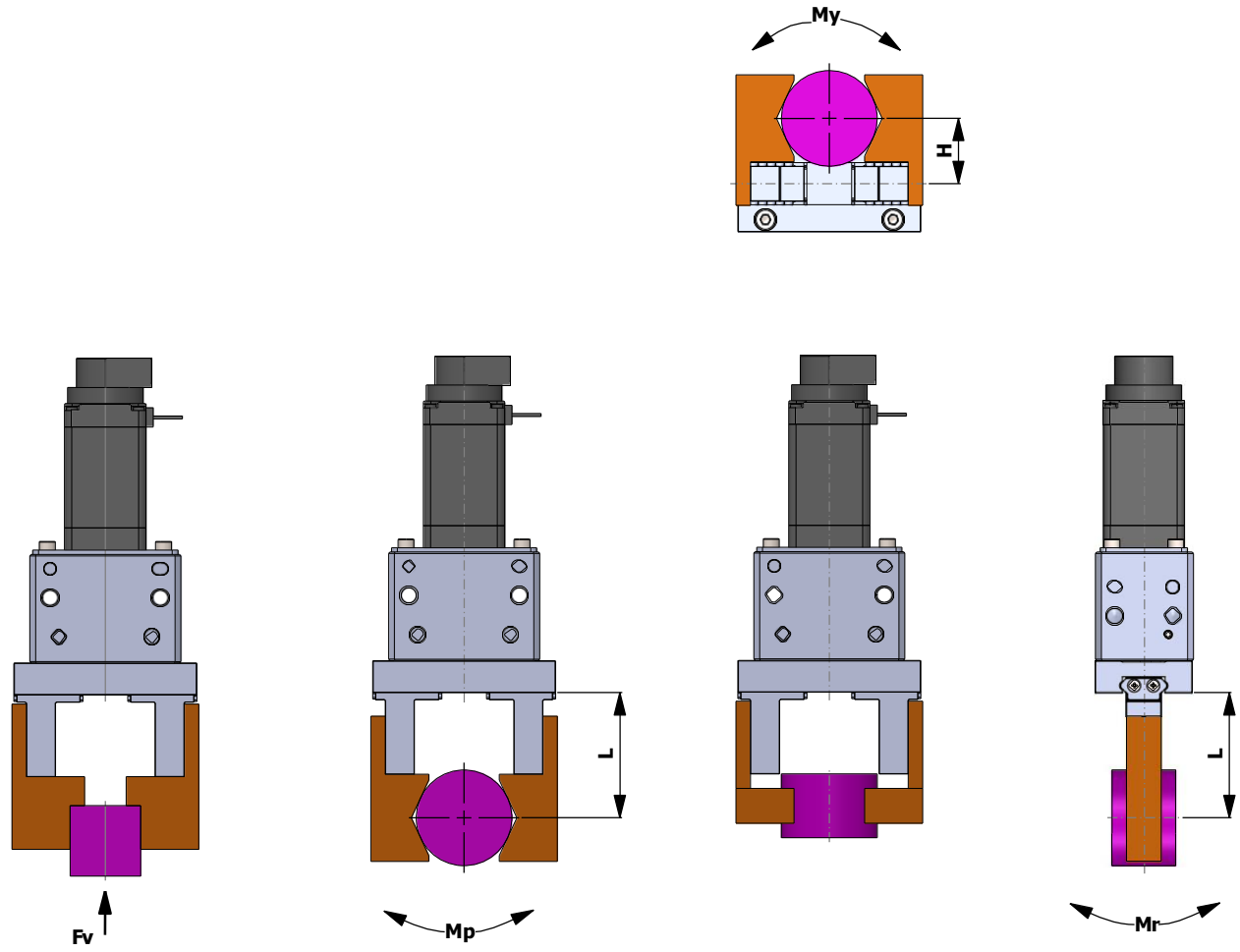
$$F > \frac{mg}{(2\times\mu)} \times a$$

*We recommend you to calculate safety factor as four(4).
*The F value calculated with the above formula should be between the "Gripping Force" values specified in the properties section.

F	**Gripping Force [N]**	*when μ = 0.1*	*when μ = 0.2*
μ	**Coefficient of Friction Between the Attachments and the Workpiece**		
m	**Workpiece Mass [kg]**		
g	**Gravitational Acceleration (=9,8m/s²)**	$F = \frac{mg}{2x0.1} \times 4 = 20 \times mg$	$F = \frac{mg}{2x0.2} \times 4 = 10 \times mg$
mg	**Workpiece Weight [N]**		
a	**Safety Coefficient**		

	"μ" Values Are Depend on Attachment Shape and Operating Environment.
μ	Coefficient of Friction Between the Attachments and the Workpiece
m	Attachment- Material of Workpiece
0.1	Metal Surface roughness < 3.2
0.2	Metal
>0.2	Rubber, Resin, etc.

Calculation of Allowable External Force



Fv : Allowable vertical load

Mp : Pitch Moment

My : Yaw Moment

Mr : Roll Moment

Size	Allowable Vertical Load Fv [N]	Static Allowable Moment		
		Pitch Moment [Nm]	Yaw Moment [Nm]	Roll Moment [Nm]
25	255	1.94	1.94	3.88

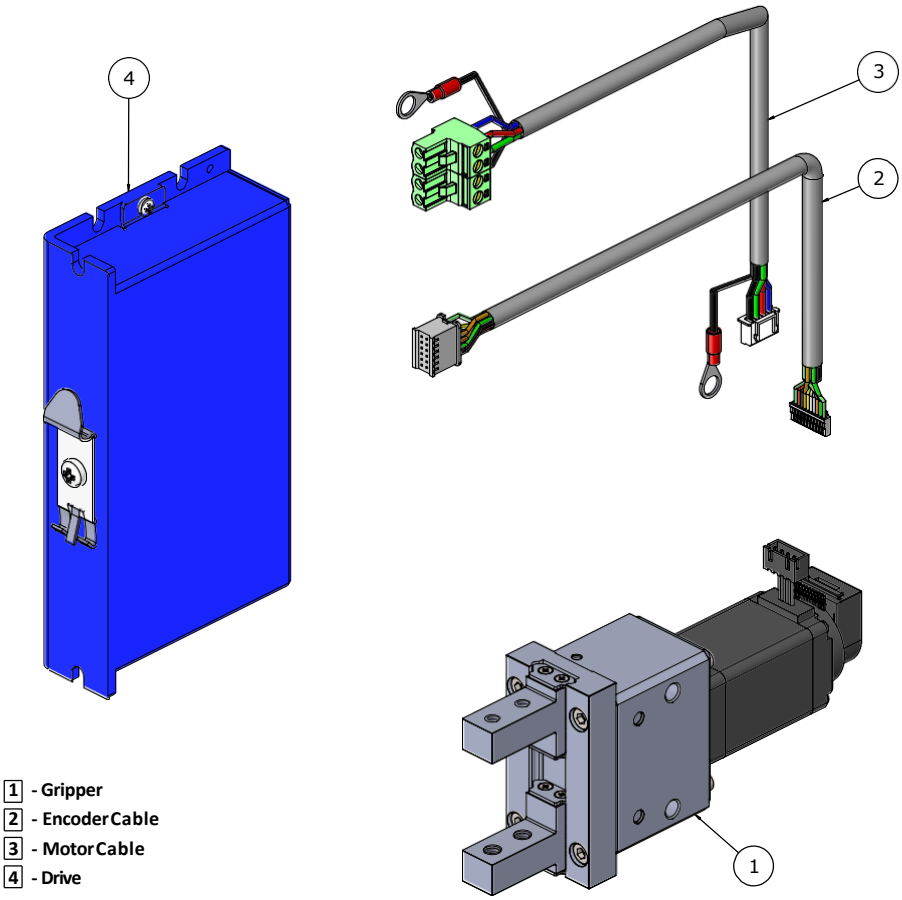
F = Allowable Load [N]

M = Static Allowable Moment [Nm]

L,H = Distance to the Point at Which the Load is Applied [N]

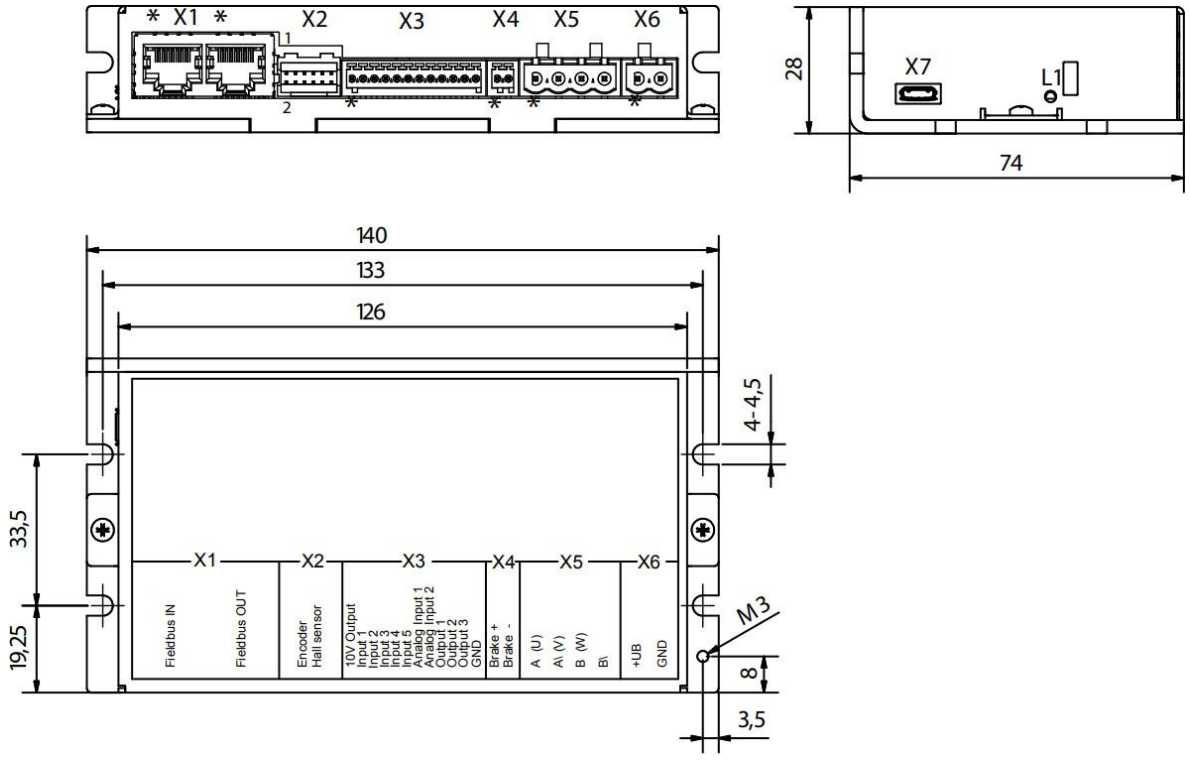
$$F = \frac{M}{L \times 10^{-3}} \times 4 = 10 \times mg$$

Connection Scheme

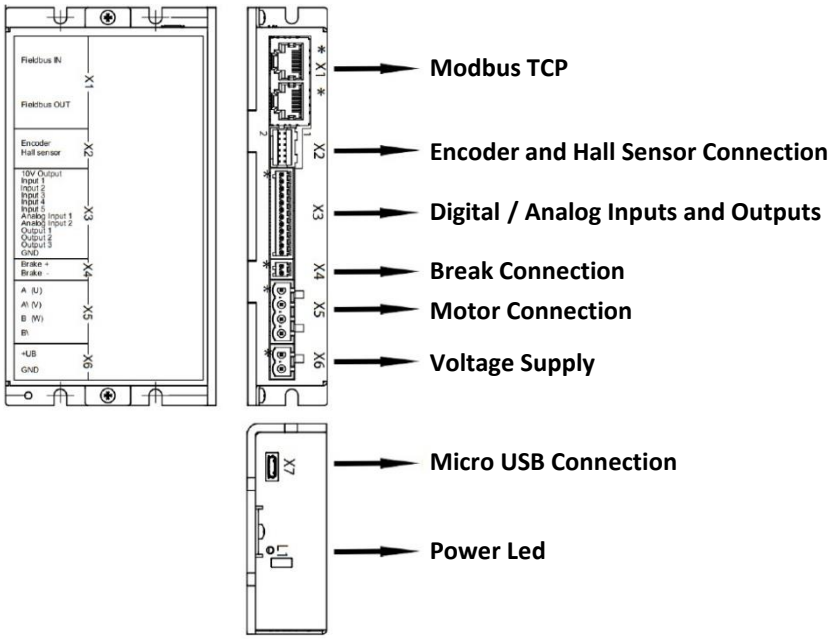


1 - Gripper
2 - Encoder Cable
3 - Motor Cable
4 - Drive

Dimensions



System Configuration



Connector	Function		Pin Assignment
X1	ModbusTCP	1	Tx+
		2	Tx-
		3	Rx+
		4	n.c.
		5	n.c.
		6	Rx-
		7	n.c.
		8	n.c.
X2	Encoder and Hall Sensor Max. 5VDC,1MHz Switching thresholds • On: >3.8 V • Off: <0.26 V	1	GND
		2	Vcc: +5 VDC output, max 200mA
		3	A
		4	B
		5	A\
		6	B\
		7	ı
		8	ı\
		9	Hall 1
		10	Hall 2
		11	Hall 3
		12	Shielding
X3	Digital and Analog Inputs and Outputs Switching Thresholds For Digital Inputs 1-5: • 5V (Factory Setting): On: >3.8 V; Off: <0,26 V • 24V: On: >14.42 V: Off: <4.16 V	1	10V Output: +10 V DC, max 200 mA
		2	Digital input 1: 5V / 24 V, switchable with object 3240h.
		3	Digital input 2: 5V / 24 V, switchable with object 3240h.
		4	Digital input 3: 5V / 24 V, switchable with object 3240h.
		5	Digital input 4: 5V / 24 V, switchable with object 3240h
		6	Digital input 5: 5V / 24 V, switchable with object 3240h.
		7	Analog input 1: 10 Bit, 0-10 V or 0-20 mA, switchable with object 3221h.
		8	Analog input 2: 10 Bit, 0-10 V, not switchable by means of software.
		9	Digital output 1: Open-Drain, max 24V/100 mA
		10	Digital output 2: Open-Drain, max 24V/100 mA
		11	Digital output 3: Open-Drain, max 24V/100 mA
		12	GND
X4	Brake	1	Brake+: internally connected to +UB
		2	Brake-: PWM-controlled open-drain output, max 1.5 A
X5	Motor	1	A (Stepper) U (BLDC)
		2	A\ (Stepper) V (BLDC)
		3	B (Stepper) W (BLDC)
		4	B\ (Stepper)
X6	Voltage supply	1	+UB
		2	GND
X7	USB		Micro USB
L1	Led		Power Led

Control Method

Pulse-Direction Mode

Connector	Function	Pin Assigment	
X3	Digital Inputs	2	Digital input 1: 5V / 24 V, switchable with object 3240h, max. 1 MHz: Pulse input in pulse-direction mode
		3	Digital input 2: 5V / 24 V, switchable with object 3240h, max. 1 MHz: Direction input in pulse-direction mode
		5	Digital input 4: 5V / 24 V, switchable with object 3240h, Motor enable
		6	Digital input 5: 5V / 24 V, switchable with object 3240h, Runs Auto-Setup mode
	Digital Outputs	9	Digital output 1: Open-Drain, max 24V/100 mA, Operation Enabled State
		10	Digital output 2: Open-Drain, max 24V/100 mA, Error Occurs State
	Voltage Supply	12	GND

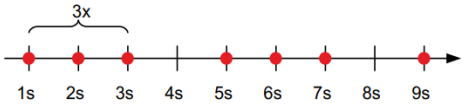
Technicals Details

Normal Operation

In normal operation, the green power LED L1 flashes briefly once per second.

Case of an error

If an error has occured, the LED turns red and signals an error number. In the following figure the error number 3 is signaled.



The following table shows the meaning of the error number.

Flash Rate	Error	Descriptions
1	General	Disconnect the power from the device. Wait 10 seconds, then connect it again. (*)
2	Voltage	Make sure your power supply is between 12 VDC and 48 VDC.
3	Temperature	Make sure that the operating temperature of the device is below approximately 75°C.
4	Overcurrent	Disconnect the power from the device. Wait 10 seconds, then connect it again. (*)
5	Controller	Disconnect the power from the device. Wait 10 seconds, then connect it again. (*)
6	Watchdog-Reset	Check the communication-wires. / Check if the PLC is running correctly.

* If the error continues, contact the authorized service.