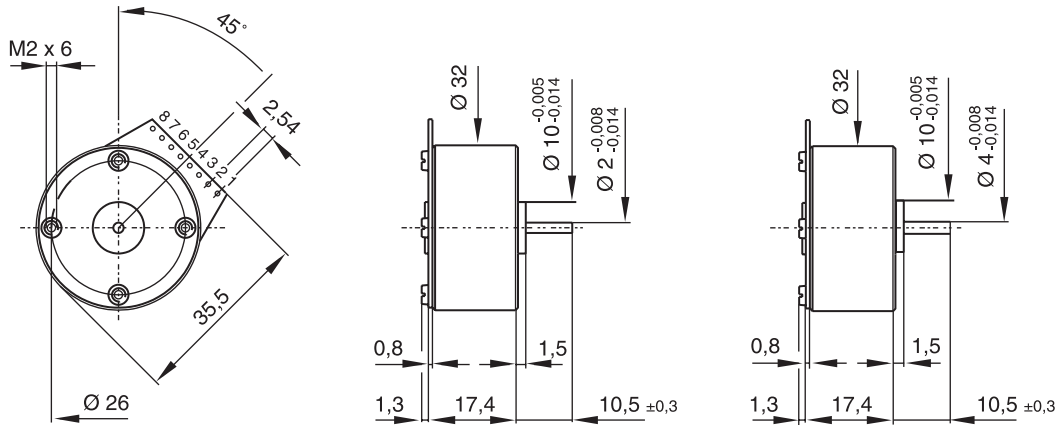
Turbo Disc™ P310

Stepper motor

Suitable for microstep operation

60 steps/revolution
6° step angle



scale 2:3
dimensions in mm
mass : 40g

P310-158 - ▪▪▪▪ • 09 **P310-158 - ▪▪▪▪ • 10**

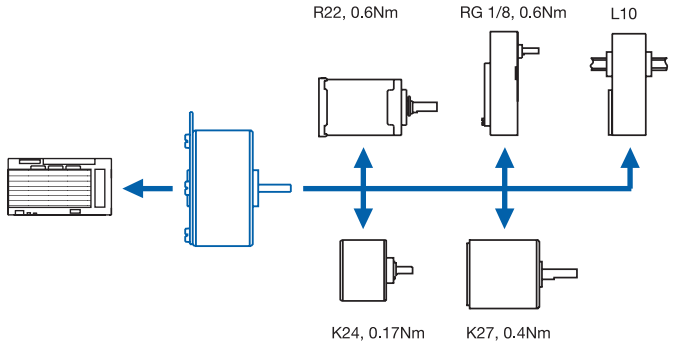
Windings available	▪▪▪▪	170	170	005	005
		coils in series	coils in parallel	coils in series	coils in parallel
Coil dependent parameters		typ	typ	typ	typ
1 Phase resistance	ohm	332	83	10.5	2.6
2 Phase inductance (1 kHz)	mH	184	46	6.4	1.6
3 Nominal phase current (2 ph. on)	A	0.06	0.12	0.36	0.72
4 Nominal phase current (1 ph. on)	A	0.09	0.17	0.51	1
5 Back-EMF amplitude	V/kst/s	18	9	3.2	1.6

Coil independent parameters [1]		min	typ	max
Torque parameters				
6 Holding torque (nominal current)	mNm (oz-in)	11.5 (1.6)	14 (2)	16.5 (2.4)
7 Holding torque (1.5 x nominal current) [2]	mNm (oz-in)	23 (3.8)	28 (4)	33 (4.8)
8 Detent torque amplitude and friction	mNm (oz-in)	1.4 (0.2)	2.5 (0.3)	3 (0.4)
Thermal parameters				
9 Thermal resistance coil-ambient [3]	°C/W		25	
Angular accuracy				
10 Absolute accuracy (2 ph. on full-step mode)	% full-steps		±3.5	±5
Mechanical parameters				
11 Rotor inertia	$kgm^2.10^{-7}$		0.86	
Other parameters				
12 Natural resonance frequency (nominal current)	Hz		230	
13 Electrical time constant	ms		0.6	
14 Angular acceleration (nominal current)	rad/s^2		140 000	

- Max. rated coil temperature : 130°C
- Recom. ambient temperature range : -20 °C to +50 °C

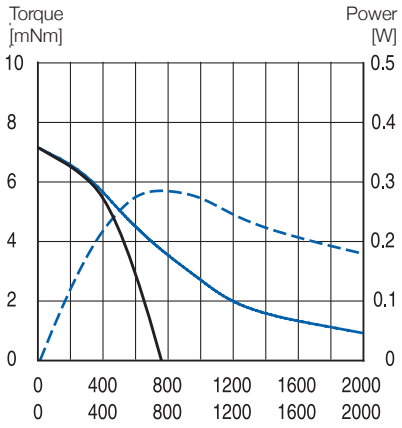
- Radial shaft play (3N)[4] : 35 µm
  Axial shaft play (3N)[4] : 100 µm
- Max. radial load[5] in N : 1 (10)*
  Max. axial load[6] in N : 0.5 (20)*

- Test voltage (1 min) 500 V_{RMS}
- "Power rate" (nominal current) 1.7 kW/s

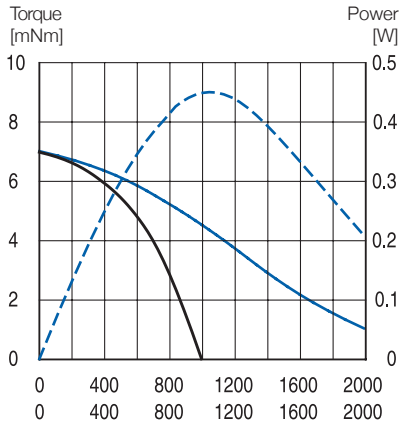


[1] Bipolar driver.
[2] The maximum coil temperature must be respected.
[3] Motor unmounted.
[4] Sleeve bearing version.
[5] Sleeve bearing version. Load applied at 8 mm from mounting face.
[6] Sleeve bearing version. Shaft must be supported for press-fitting a pulley or pinion.
* Fitted with ball bearings.

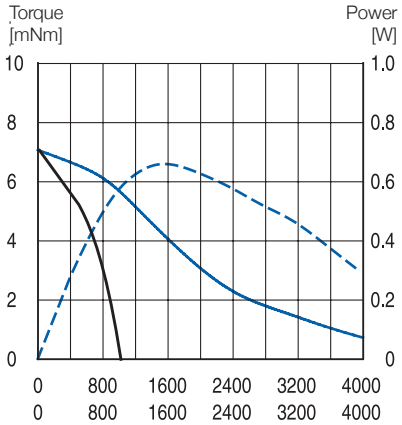
P310-158-005
Coils in serie
Voltage driver type L/R
0Ω series resistor, 7V



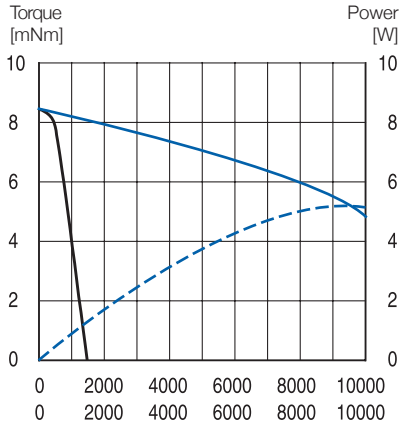
P310-158-170
Coils in serie
Voltage driver type L/R
56Ω series resistor, 24V



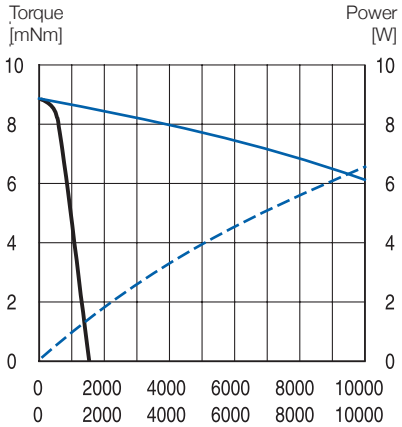
P310-158-170
Coils in parallel
Voltage driver type L/R
120 ohm series resistor, 24V



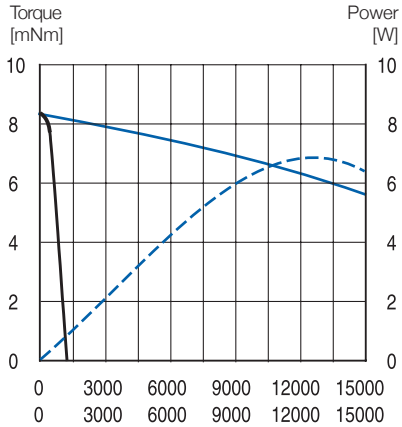
P310-158-170
Coils in parallel
escap® EDM-453,
I = 1A, U = 24V



P310-158-005
Coils in parallel
escap® ESD-1200,
I = 1A, U = 24V

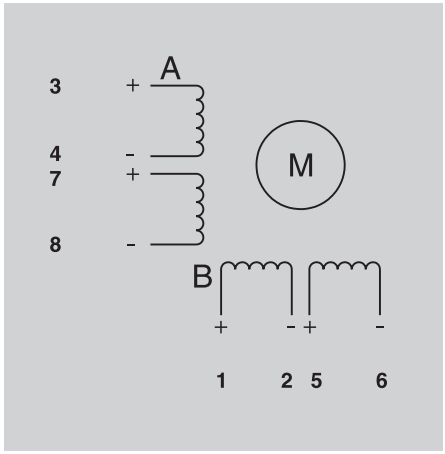


P310-158-005
Coils in serie
escap® ESD-1200,
I =0.5A, U = 45V



Pull-in range
Pull-out range
Power output

Pull-in is measured with a load inertia equal to the rotor inertia.



Motor connections

Executions available from stock :

- **09** sleeve bearings, diameter 2
- **10** bearings, diameter 4
- **09 & L10, K24, K27, R22, RG 1/8**

Particular versions include options such as series or parallel connections prewired on the PC board, special shafts (hollow shaft), windings, and so forth.

Notes

The high power/size ratio and high peak speed dedicate this motor to the most demanding fields of applications.

Its extended pull-in range and excellent efficiency are benefits for straight forward battery driven operation.

The motor is energised with nominal current unless otherwise specified.

The following escap® drive circuits are recommended with the P310 motor, depending on the drive mode and the dynamic performance required: EDM-453 (p.96), ESD-1200 (p.97).

Availability: see enclosed document at the end of the catalogue