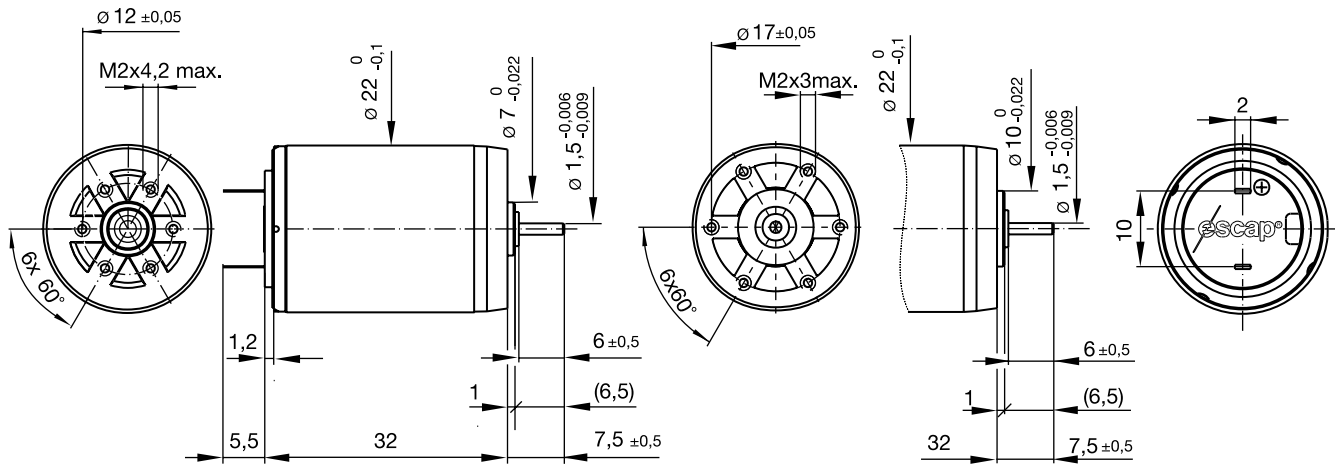




scale: 1:1
dimensions in mm
mass: 53 g

22N28...•201

22N28...•286

Winding types

...

-216P

-216E

-213E

-210E

-208E

-105

Measured values

1 Measuring voltage	V	3.0	6.0	9.0	12.0	18.0	36.0
2 No-load speed	rpm	5200	5600	7000	5900	6300	7200
3 Stall torque	mNm (oz-in)	10.9 (1.54)	10.6 (1.50)	10.7 (1.51)	8.6 (1.21)	8.2 (1.17)	8.5 (1.20)
4 Average no-load current	mA	12.6	7.0	6.0	3.5	2.5	1.4
5 Typical starting voltage	V	0.03	0.05	0.06	0.08	0.12	0.24

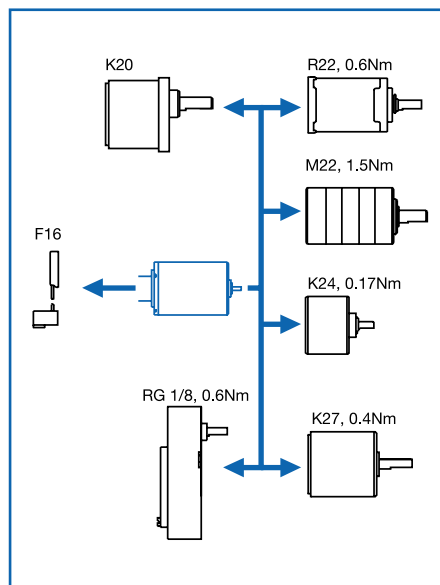
Max. recommended values

6 Max. continuous current	A	1.50	0.83	0.62	0.38	0.26	0.14
7 Max. continuous torque	mNm (oz-in)	8.1 (1.15)	8.4 (1.19)	7.7 (1.06)	7.3 (1.04)	7.0 (0.98)	6.6 (0.93)
8 Max. angular acceleration	10 ³ rad/s ²	63	60	67	61	60	82

Intrinsic parameters

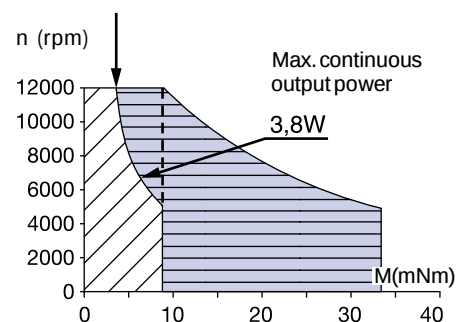
9 Back-EMF constant	V/1000 rpm	0.57	1.07	1.28	2.02	2.83	4.95
10 Torque constant	mNm/A (oz-in/A)	5.44 (0.77)	10.2 (1.45)	12.2 (1.73)	19.3 (2.73)	27.0 (3.83)	47.3 (6.69)
11 Terminal resistance	ohm	1.50	5.80	10.3	27.0	59.0	200
12 Motor regulation R/k ²	10 ³ /Nms	51	56	69	73	81	90
13 Rotor inductance	mH	0.10	0.35	0.50	1.20	2.30	7.00
14 Rotor inertia	kgm ² · 10 ⁻⁷	3.50	3.50	2.80	3.00	2.90	2.00
15 Mechanical time constant	ms	18	19	19	22	23	18

Availability: see enclosed document at the end of the catalogue



- Thermal resistance:
rotor-body 6°C/W
body-ambient 22°C/W
- Thermal time constant - rotor / stator:
9 s / 550 s
- Max. rated coil temperature: 100°C (210°F)
- Recom. ambient temperature range:
-30°C to +65°C (-22°F to +150°F)
- Viscous damping constant:
0.1 x 10⁻⁶ Nms
- Max. axial static force for press-fit: 150 N
- End play: ≤ 150 μm
Radial play: ≤ 30 μm
Shaft runout: ≤ 10 μm
- Max. side load at 2 mm from mounting face:
- sleeve bearings 1.5 N
- ball bearings 3 N
- Motor fitted with sleeve bearings
(ball bearings optional)

Max. recommended speed



Continuous working range

Temporary working range

Specifications subject to change without prior notice