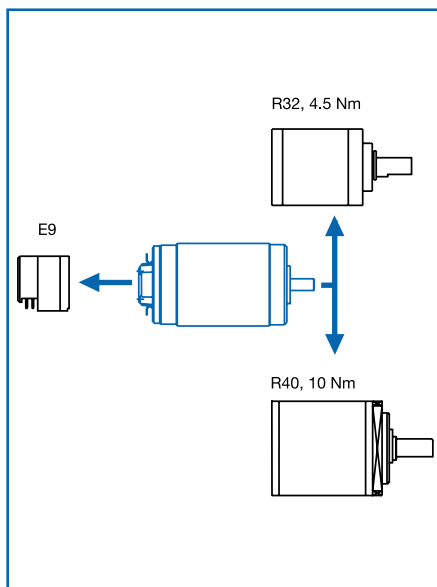


Winding types	•••	-228P	-228E	-416SP
Measured values				
1 Measuring voltage	V	9.0	15.0	24.0
2 No-load speed	rpm	4990	4320	4470
3 Stall torque	mNm (oz-in)	121 (17.12)	148 (20.89)	149 (21.11)
4 Average no-load current	mA	180	90.0	50.0
5 Typical starting voltage	V	--	--	--
Max. recommended values				
6 Max. continuous current	A	3.04	1.87	1.18
7 Max. continuous torque	mNm (oz-in)	48.1 (6.8)	57.9 (8.2)	58.3 (8.3)
8 Max. angular acceleration	10 ³ rad/s ²	40	48	45
Intrinsic parameters				
9 Back-EMF constant	V/1000 rpm	1.76	3.40	5.40
10 Torque constant	mNm/A (oz-in/A)	16.8 (2.38)	32.5 (4.60)	51.6 (7.30)
11 Terminal resistance	ohm	1.25	3.30	8.30
12 Motor regulation R/k ²	10 ³ /Nms	4.43	3.13	3.12
13 Rotor inductance	mH	0.13	0.52	1.30
14 Rotor inertia	kgm ² · 10 ⁻⁷	48.00	48.00	52.00
15 Mechanical time constant	ms	21	15	16

Availability: see enclosed document at the end of the catalogue



- Thermal resistance:
 - rotor-body 4°C/W
 - body-ambient 8°C/W
- Thermal time constant - rotor / stator: 50 s / 920 s
- Max. rated coil temperature: 155°C
- Recom. ambient temperature range: -10°C to +80°C (-14°F to +176°F)
- Max. axial static force for press-fit : 100 N
 - shaft supported: 1000 N
- End play: negligible
- Radial play: negligible
- Shaft runout: ≤ 10 μm
- Max. side load at 10 mm from mounting face:
 - ball bearings 35 N
- Motor fitted with ball bearings

