



22N28 **** .286

Electrical Data	****	216P	216E	213E	210E	208E	105	
1 Nominal Voltage	V	3	6	9	12	18	18	Volt
2 No-Load Speed	n_0	5,275	5,580	7,000	5,880	6,300	3,580	rpm
3 No-Load Current	I_0	12.6	7.0	6.0	4.5	3.5	1.4	mA
4 Terminal Resistance	R	1.5	5.8	10.3	27.0	59.0	200.0	Ω
5 Output Power	$P_{2max.}$	4.3	4.2	3.8	3.7	3.5	3.3	W
6 Stall Torque	mNm	10.9 (1.55)	10.5 (1.49)	10.7 (1.52)	8.6 (1.22)	8.2 (1.17)	4.3 (0.61)	mNm (oz-in)
7 Efficiency	$\eta_{max.}$	85	84	84	81	80	77	%
8 Max continuous speed	$n_{e max.}$	12,000	12,000	12,000	12,000	12,000	12,000	rpm
9 Max continuous torque	$M_{e max.}$	8.8 (1.19)	8.4 (1.19)	7.5 (1.07)	7.3 (1.04)	6.9 (0.98)	6.5 (0.93)	mNm (oz-in)
10 Max continuous current	$I_{e max.}$	1.63	0.83	0.62	0.38	0.26	0.14	A
11 Back-EMF Constant	k_E	0.57	1.07	1.28	2.02	2.83	4.95	mV/rpm
12 Torque Constant	k_M	5.40	10.20	12.20	19.30	27.00	47.30	mNm/A
13 Motor Regulation	R/k^2	51.4	55.7	69.2	72.49	80.93	89.39	$10^3/Nms$
14 Friction Torque	T_F	0.07 (0.01)	0.07 (0.01)	0.07 (0.01)	0.07 (0.01)	0.07 (0.01)	0.07 (0.01)	mNm (oz-in)
15 Rotor Inductance	L	0.10	0.35	0.50	1.20	2.30	7.00	mH
16 Mechanical Time Constant	τ_m	18.0	19.5	19.4	21.7	23.5	17.9	ms
17 Rotor Inertia	J	3.50	3.50	2.80	3.00	2.90	2.00	$g.cm^2$
18 Thermal Resistance (rotor/body)	R_{th1} / R_{th2}	5/20	5/20	5/20	5/20	5/20	5/20	$^\circ C/W$
19 Thermal Time Constant (rotor/stator)	τ_{w1}/τ_{w2}	5/550	5/550	5/550	5/550	5/550	5/550	$^\circ C/W$
20 Operating Temperature Range:	motor	-30 $^\circ C$ to 85 $^\circ C$ (-22 $^\circ F$ to 185 $^\circ F$)						$^\circ C$ ($^\circ F$)
	rotor	100 $^\circ C$ (212 $^\circ F$)						$^\circ C$ ($^\circ F$)
21 Shaft Load max.:		With sleeve bearings						
	at 3,000 rpm (5mm from bearing)	-radial	3.0 (10.8)				N (oz)	
	at 3,000 rpm	-axial	150 (539.5)				N (oz)	
22 Shaft play:	-radial	<0.03 (0.0012)				mm (inch)		
	-axial	0.15 (0.0059)				mm (inch)		
23 Weight	g	53 (1.87)				g (oz)		

		Execution			
Gearbox	Single Shaft	F16	E9	MR2	
	22N28	22N28	22N48	22N48	
R22	286	286	309	Contact Us	
M22	286	286	308	483	
K24	286	286	308	Contact Us	
K27	286	286	308	Contact Us	

