



22V28 **** .201

| Electrical Data | **** | 213P | 216E | 213E | 210E | 208E | |
|---|---------------------------------|--------------------------------|----------------|-------------|-------------|-------------|-------------------------|
| 1 Nominal Voltage | V | 6 | 9 | 12 | 15 | 24 | Volt |
| 2 No-Load Speed | n_0 | 7,100 | 6,725 | 7,630 | 7,550 | 6,340 | rpm |
| 3 No-Load Current | I_0 | 15.0 | 9.0 | 7.6 | 6.0 | 3.2 | mA |
| 4 Terminal Resistance | R | 3.0 | 6.7 | 11.9 | 24.5 | 75.0 | Ω |
| 5 Output Power | $P_{2max.}$ | 4.1 | 4.4 | 3.8 | 3.3 | 3.6 | W |
| 6 Stall Torque | mNm | 16 (2.27) | 17.1 (2.43) | 15 (2.13) | 11.5 (1.63) | 11.5 (1.63) | mNm (oz-in) |
| 7 Efficiency | $\eta_{max.}$ | 83 | 84 | 83 | 81 | 81 | % |
| 8 Max continuous speed | $n_{e max.}$ | 12,000 | 12,000 | 12,000 | 12,000 | 12,000 | rpm |
| 9 Max continuous torque | $M_{e max.}$ | 9.1 (1.38) | 9.7 (1.38) | 8.5 (1.21) | 7.4 (1.05) | 8.1 (1.15) | mNm (oz-in) |
| 10 Max continuous current | $I_{e max.}$ | 1.15 | 0.77 | 0.58 | 0.40 | 0.23 | A |
| 11 Back-EMF Constant | k_E | 0.84 | 1.33 | 1.56 | 1.97 | 3.75 | mV/rpm |
| 12 Torque Constant | k_M | 8.00 | 12.70 | 14.90 | 18.80 | 35.80 | mNm/A |
| 13 Motor Regulation | R/k^2 | 47.0 | 42.0 | 54.0 | 69.00 | 58.00 | $10^3/Nms$ |
| 14 Friction Torque | T_F | 0.12 (0.02) | 0.12 (0.02) | 0.11 (0.02) | 0.11 (0.02) | 0.11 (0.02) | mNm (oz-in) |
| 15 Rotor Inductance | L | 0.15 | 0.50 | 0.55 | 0.80 | 3.30 | mH |
| 16 Mechanical Time Constant | τ_m | 15.0 | 16.4 | 17.3 | 20.0 | 13.9 | ms |
| 17 Rotor Inertia | J | 3.20 | 3.90 | 3.20 | 2.90 | 2.40 | g.cm ² |
| 18 Thermal Resistance (rotor/body) | R_{th1} / R_{th2} | 7/16 | 7/16 | 7/16 | 7/16 | 7/16 | $^{\circ}C/W$ |
| 19 Thermal Time Constant (rotor/stator) | τ_{w1}/τ_{w2} | 8/460 | 8/460 | 8/460 | 8/460 | 8/460 | $^{\circ}C/W$ |
| 20 Operating Temperature Range: | motor | -30°C to 85°C (-22°F to 185°F) | | | | | $^{\circ}C (^{\circ}F)$ |
| | rotor | 100°C (212°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 | 68 (2.4) | | | g (oz) | |

| Execution | | | | | |
|-----------|--------------|-------|-------|------------|------------|
| Gearbox | Single Shaft | F16 | E9 | HEDS | MR2 |
| | 22V28 | 22V28 | 22V48 | 22V48 | 22V48 |
| R22 | 202 | 202 | 225 | Contact Us | Contact Us |
| M22 | 201 | 201 | 204 | Contact Us | Contact Us |
| K24 | 202 | 202 | 225 | Contact Us | Contact Us |
| K27 | 202 | 202 | 225 | Contact Us | Contact Us |

