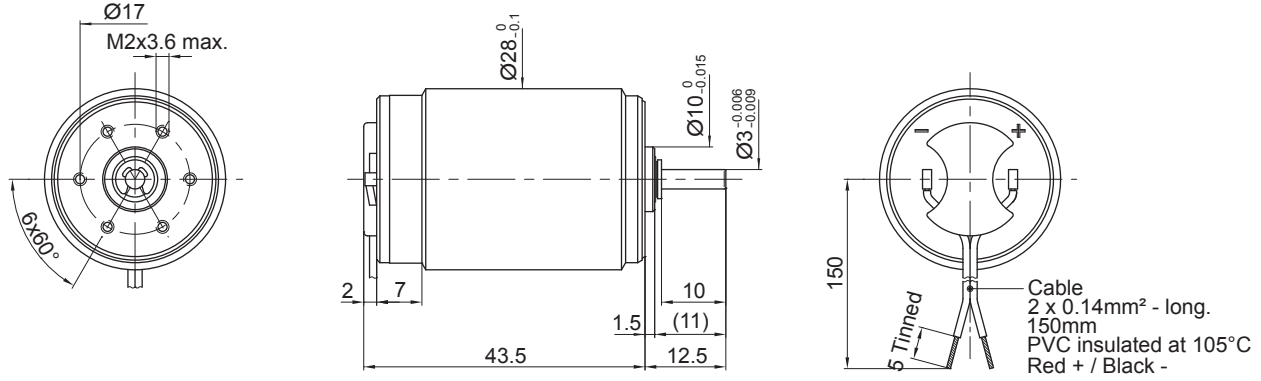


**28L28**

Ø 28 mm • Precious metal commutation • 21 mNm



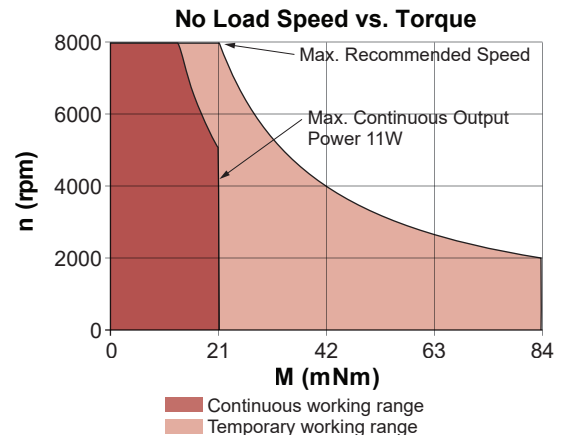
Dimensions in inches [mm]

Electrical Data	Symbol	28L28 .... 49				Unit
		219	416E	413E	410E	
1 Nominal Voltage	V	12	24	28	36	Volt
2 No-Load Speed	$n_0$	5,300	5,590	5,325	5,000	rpm
3 No-Load Current	$I_0$	22.0	11.0	9.0	6.6	mA
4 Terminal Resistance	R	6.0	19.5	33.0	71.0	Ω
5 Output Power	$P_{2max}$	9.6	10.0	9.3	9.0	W
6 Stall Torque	mNm	43 (6.09)	50 (7.09)	32 (4.54)	34 (4.82)	mNm (oz-in)
7 Efficiency	$\eta_{max}$	80	82	80	78	%
8 Max Continuous Speed	$n_{e max}$	8,000	8,000	8,000	8,000	rpm
9 Max Continuous Torque	$M_{e max}$	19.9 (2.98)	21 (2.98)	19.4 (2.75)	18.5 (2.62)	mNm (oz-in)
10 Max Continuous Current	$I_{e max}$	0.95	0.53	0.40	0.28	A
11 Back-EMF Constant	$k_E$	2.24	4.26	5.20	7.10	mV/rpm
12 Torque Constant	$k_M$	21.40	40.70	49.70	67.80	mNm/A
13 Motor Regulation	$R/k^2$	13.0	12.0	13.2	15.20	10 <sup>3</sup> /Nms
14 Friction Torque	$T_F$	0.47 (0.07)	0.45 (0.07)	0.45 (0.07)	0.45 (0.07)	mNm (oz-in)
15 Rotor Inductance	L	0.50	2.40	3.20	5.20	mH
16 Mechanical Time Constant	$\tau_m$	13.5	21.0	17.8	16.7	ms
17 Rotor Inertia	J	10.40	17.50	13.50	11.00	g-cm <sup>2</sup>

General Data				
18 Thermal Resistance (rotor/body)	$R_{th1}/R_{th2}$	5/12		°C/W
19 Thermal Time Constant (rotor/stator)	$t_{W1}/t_{W2}$	13/760		S
20 Operating Temperature Range:	motor	-30°C to 85°C (-22°F to 185°F)		°C (°F)
	rotor			100°C (212°F)
21 Shaft Load Max.: (5 mm from bearing)		With sleeve bearings		
	-radial	6.0 (21.6)		N (oz)
	-axial	250 (899.2)		N (oz)
22 Shaft Play:	-radial	<0.18 (0.0007)		mm (inch)
	-axial	0.15 (0.0059)		mm (inch)
23 Weight	g	125 (4.41)		g (oz)
24 Commutation Segment	-	9		segment

**Execution Table**

Gearbox	Single Shaft	Double Shaft for E9
R22	164	317
R32	49	315



► Motor shaft rotates CW when seen from motor front face when +ve and -ve supply is given to respective terminals.