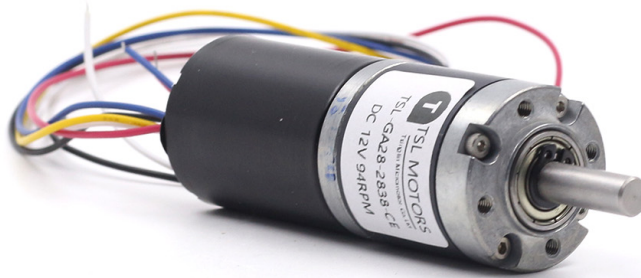


TSL-GA28-2838-CE

Brushless DC Motor with Planetary Gearbox



Product Overview

Product Type	Brushless DC Motor with Planetary Gearbox
Rated Voltage / Power	12 VDC / 2 W; 24 VDC / 8 W
Gearbox Diameter	28 mm
Output Shaft	Ø6 mm × 18 mm
Lead Length	280 ± 10 mm
Available Reduction Ratios	4:1, 16:1, 25:1, 64:1, 88:1, 110:1, 125:1, 138:1, 151:1, 256:1, 320:1, 400:1, 500:1, 625:1, 756:1, 832:1
Control Functions	Direction control, FG speed feedback, and PWM speed control
Lead Wires	Red: VCC; Black: GND; White: Direction; Yellow: FG; Blue: PWM

This series is suitable for compact drive applications requiring speed control, reversible rotation, and high reduction ratios.

Performance Parameters

12 VDC, 2 W

Ratio	No Load		Rated Load			Stall	
	Speed	Current	Speed	Current	Torque	Torque	Current
i:1	RPM ±10%	A	RPM ±10%	A	kg.cm	kg.cm	A
4	1500	0.13	1063	0.6	0.2	0.6	1.7
16	375	0.13	266	0.6	0.75	2.25	1.7
25	240	0.13	170	0.6	1	3	1.7
64	94	0.13	66	0.6	2.25	6.75	1.7
88	68	0.13	48	0.6	3.25	9.75	1.7
110	54	0.13	39	0.6	4.5	13.5	1.7
125	48	0.13	34	0.6	5	15	1.7
138	43	0.13	31	0.6	5.5	16.5	1.7
151	39	0.13	28	0.6	5.75	17.2	1.7
256	23	0.13	17	0.6	9.5	28.5	1.7
320	18	0.13	13	0.6	12	36	1.7
400	15	0.13	11	0.6	15	45	1.7
500	12	0.13	9	0.6	19	45	1.7
625	9	0.13	7	0.6	20	45	1.7
756	8	0.13	6	0.6	20	45	1.7
832	7	0.13	5	0.6	20	45	1.7

Note: Performance parameters are for reference only and can be customized according to customer requirements.

Performance Parameters

24 VDC, 8 W

Ratio	No Load		Rated Load			Stall	
	Speed	Current	Speed	Current	Torque	Torque	Current
i:1	RPM ±10%	A	RPM ±10%	A	kg.cm	kg.cm	A
4	3000	0.25	2125	1.1	0.4	1.2	1.7
16	750	0.25	531	1.1	1.5	4.5	1.7
25	480	0.25	340	1.1	2	6	1.7
64	187	0.25	132	1.1	4.5	13.5	1.7
88	136	0.25	96	1.1	6.5	19.5	1.7
110	109	0.25	77	1.1	9	27	1.7
125	96	0.25	68	1.1	10	30	1.7
138	86	0.25	61	1.1	11	33	1.7
151	79	0.25	56	1.1	11.5	34.5	1.7
256	46	0.25	33	1.1	19	57	1.7
320	37	0.25	26	1.1	24	72	1.7
400	30	0.25	21	1.1	30	90	1.7
500	24	0.25	17	1.1	38	90	1.7
625	19	0.25	13	1.1	40	90	1.7
756	15	0.25	11	1.1	40	90	1.7
832	14	0.25	10	1.1	40	90	1.7

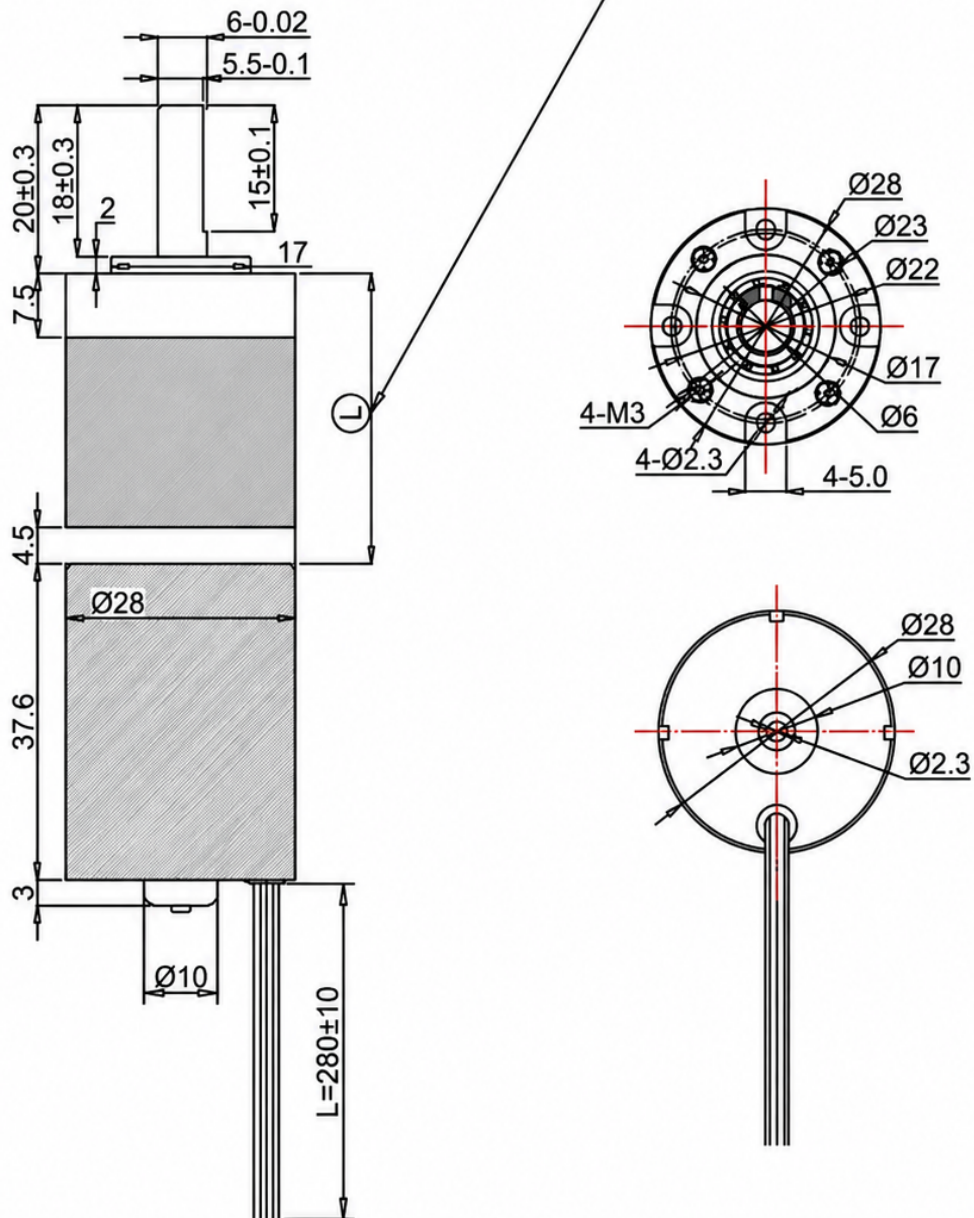
Note: Performance parameters are for reference only and can be customized according to customer requirements.

Mechanical Dimensions

GA28Y-2838, output shaft $\varnothing 6 \times 18$ mm. All dimensions are in millimetres.

GA28Y-2838 $\varnothing 6$ 18MM

L Value Corresponding to Different Reduction Ratios																	
Reduction Ratio (Variation)	4	16	25	64	88	110	125	138	151	256	320	400	500	625	756	832	
L Dimension (mm)	23	28.5	34.4					40									



The gearbox length L varies according to the selected reduction ratio. Please refer to the ratio table shown in the drawing.

Wiring and Control Interface

Five-wire control interface for power input, direction control, speed feedback, and PWM control.

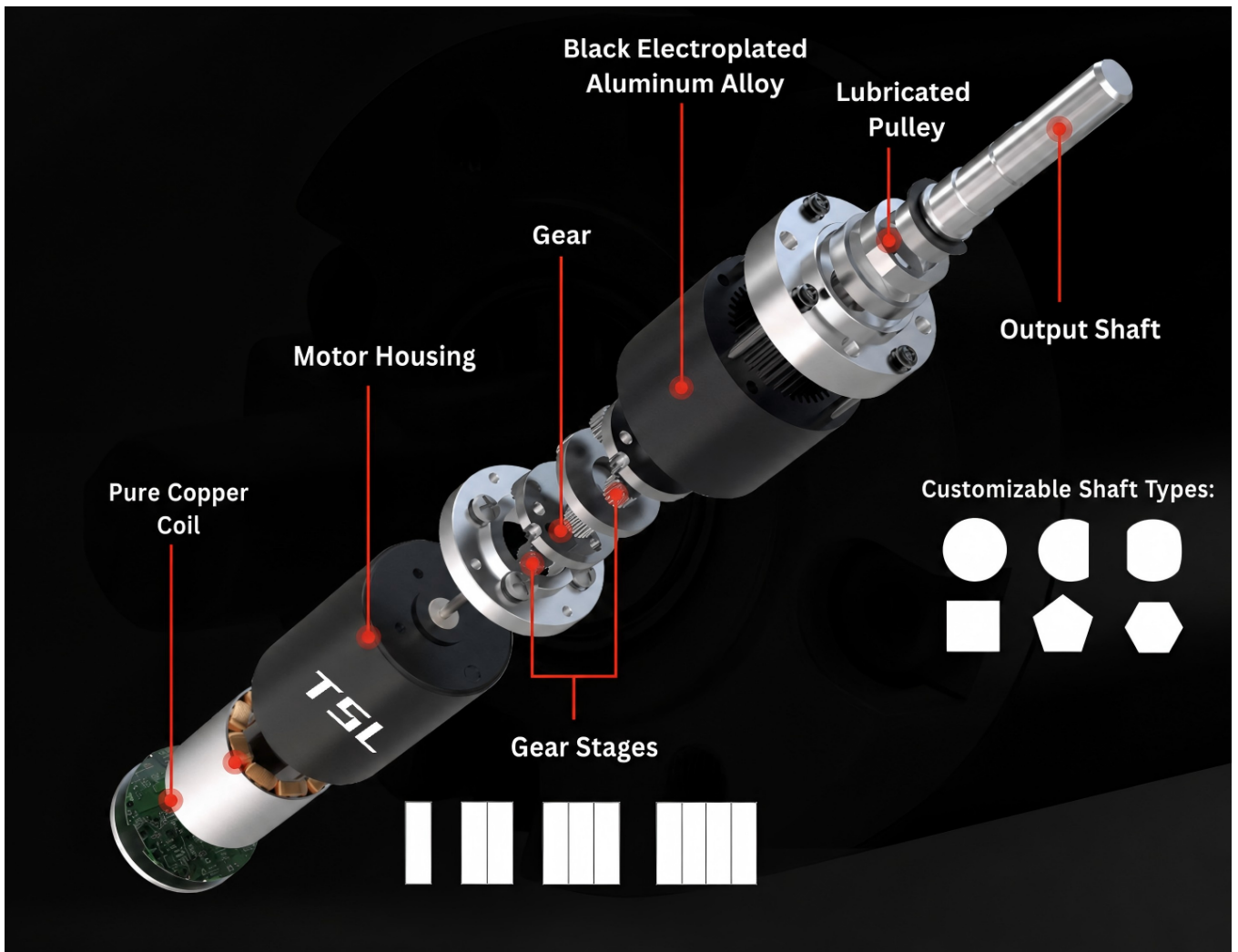
Wire	Signal	Description
Red	VCC	Motor power supply input.
Black	GND	Ground.
White	DIR	Direction control input. High level = CCW; low level = CW.
Yellow	FG	Open-collector (NPN) speed feedback output for rotational speed detection.
Blue	PWM	PWM speed control input. Recommended PWM frequency: 15 kHz-35 kHz.

Control Item	Electrical Specification	Operating Logic
Direction input	0-5.0 V; $V_{IH} \geq 5$ V; $V_{IL} \leq 0.3$ V	High = CCW; Low = CW
FG output	V_{OH} 1.5-5.0 V at 5 V; $V_{OL} \leq 0.6$ V; output current ≤ 3 mA	Connect to the controller FG input to detect rotational speed.
PWM input	0-5.0 V; $V_{IH} \geq 5$ V; $V_{IL} \leq 0.23$ V; recommended frequency 15-35 kHz	High = stop; Low = run. PWM duty or input level controls speed.

1. Do not reverse or interchange the positive and negative power leads.
2. Stop the motor before switching direction to avoid possible damage.
3. The factory-default output direction may vary with the reduction ratio.
4. Reducing speed also reduces available output torque; choose the working speed accordingly.

Internal Structure

Exploded structural illustration of the motor and planetary gearbox assembly.



Pure Copper Coil	Efficient brushless motor winding for compact drive performance.
Planetary Gear Stages	Multiple reduction stages are available according to the selected ratio.
Metal Gear Components	Compact planetary arrangement designed for stable transmission.
Aluminum Alloy Housing	Compact 28 mm housing with a robust structure.
Customizable Output Shaft	Different shaft types can be customized according to application requirements.

Structure illustration is for reference only. Internal configuration and shaft form can be customized.