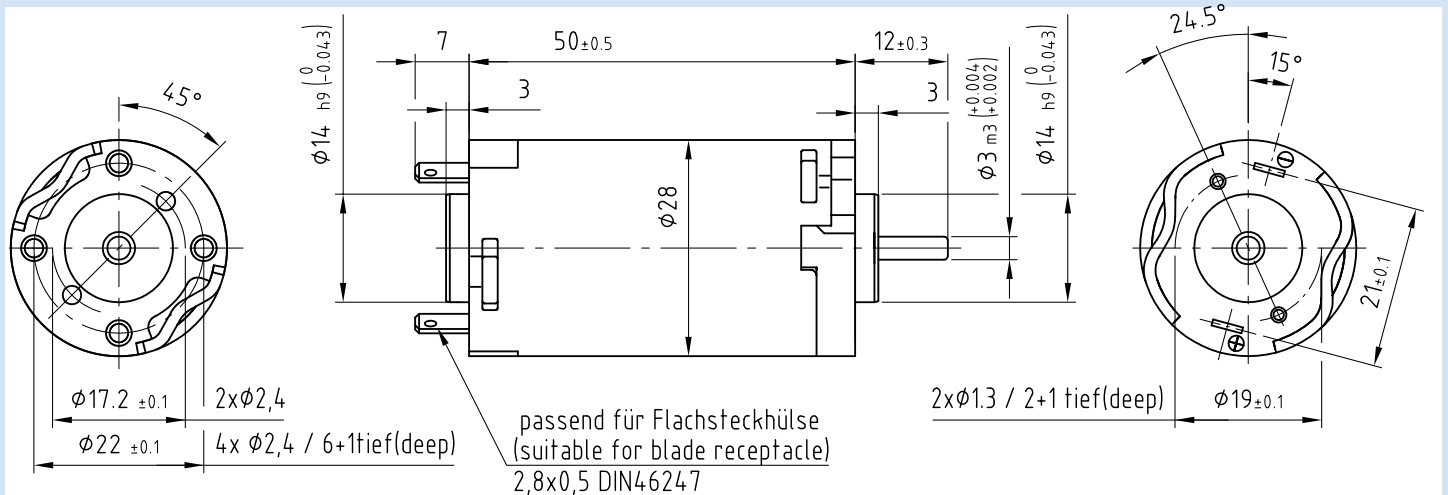


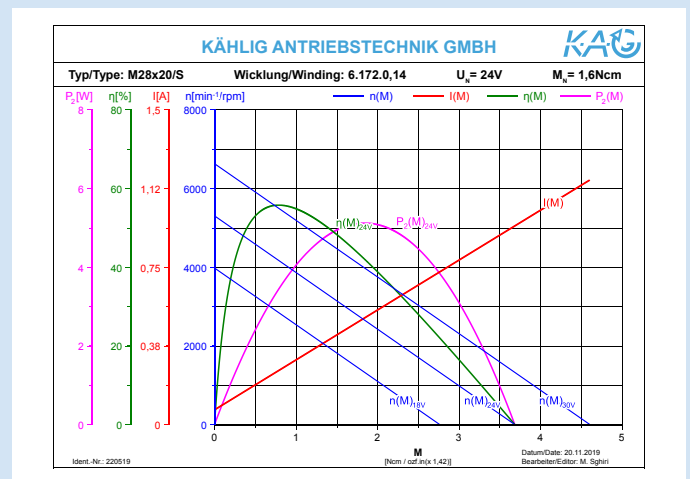
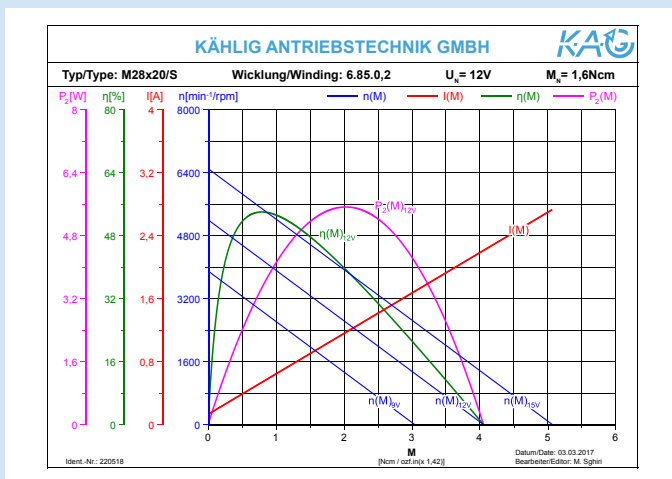
# DC-Motor M28x20/S

## Id.-Nr. 220518 (12V) 220531 (24V)

- Brushed DC motor with permanent magnets
- Sintered bearings
- Clip connection
- Closed zinc-plated housing with plastic bearing flanges
- Direction of rotation CW / CCW



Application on request



Stand: 23. Juli 2020 – changes reserved

# DC-Motor M28x20/S

## Id.-Nr. 220518 (12V) 220519 (24V)

### Performance

	Sign	Unit	Value 12V	Value 24V	Tolerances
Rated Voltage	$U_N$	V	12	24	
Rated torque <sup>1)</sup>	$M_N$	Ncm	1.6	1.6	
Rated speed <sup>1)</sup>	$n_N$	min <sup>-1</sup>	3150	3000	±10%
Rated current <sup>1)</sup>	$I_N$	A	0.95	0.45	±20%
No load speed <sup>1)</sup>	$n_0$	min <sup>-1</sup>	5200	5300	±15%
No load current <sup>1)</sup>	$I_0$	A	0.13	0.07	±50%
Rated power output <sup>1)</sup>	$P_{2N}$	W	5.3	5	
Rated power input <sup>1)</sup>	$P_{IN}$	W	11.4	10.8	
Rated efficiency <sup>1)</sup>	$\eta_N$	%	46.3	46.5	
Maximum power output <sup>2)3)</sup>	$P_{2max}$	W	5.5	5.1	
Maximum continuous torque <sup>2)3)</sup>	$M_{max}$	Ncm	1.6	1.6	
Maximum continuous current <sup>2)3)</sup>	$I_{max}$	A	0.95	0.45	
Maximum speed <sup>1)3)</sup>	$n_{max}$	min <sup>-1</sup>	12000	12000	
Anhaltmoment <sup>1)</sup>	$M_H$	Ncm	4.1	3.7	
Stall torque <sup>1)</sup>	$I_H$	A	2.2	0.9	
Demagnetization current	$I_E$	A	4.33	1.9	
Connecting resistance	R	Ω	5.43	25.38	
Armature resistance <sup>1)</sup>	$R_A$	Ω	5.3	22.25	±5%
Armature inductance [1 kHz] <sup>1)</sup>	$L_A$	mH	3.31	23	
Rise of speed-characteristic <sup>1)</sup>	$k_D$	Ncm/min	-1281.3	-1437.5	
Torque constant <sup>1)</sup>	$k_M$	Ncm/A	1.95	4.2	
Voltage constant <sup>1)</sup>	$k_E$	V/10 <sup>3</sup> min <sup>-1</sup>	2.17	4.2	
Friction torque <sup>1)</sup>	$M_R$	Ncm	-0.25	-0.3	
Mechanical time constant <sup>1)</sup>	$T_M$	ms	15.28	16.7	
Electrical time constant <sup>1)</sup>	$T_e$	ms	0.61	0.9	
Rotor inertia	$J_R$	gcm <sup>2</sup>	14	14	
Maximum case temperature <sup>2)</sup>	$\vartheta_G$	°C	80	80	
Starting voltage <sup>1)</sup>	$U_A$	V	2	2	
Permissible axial shaft loads <sup>3)</sup>	$F_{axial}$	N	5	5	
Permissible radial shaft loads <sup>3)</sup>	$F_{radial}$	N	20	20	
Protection class DIN VDE 0530			IP30		
Duty cycle DIN VDE 0530			S1		
Insulation class DIN VDE 0530			E		
Lifetime at rated torque <sub>N</sub>			≥ 1500 h		
Ambient temperature			-15°C to +40°C		
Bearing			2 sintered bearings		
Interference suppression			feasible		

1)  $\vartheta_w$  Winding temperature ≈ 20°C    2)  $\Delta\vartheta_w$  allowable = 100K  
 3) The operating at maximum levels reduces the lifespan

Stand: 23. Juli 2020 – changes reserved