



ASSUN AM-BD2453AN Series TOTAL SOLUTION for Precision DC Drive System 2020 User Manual

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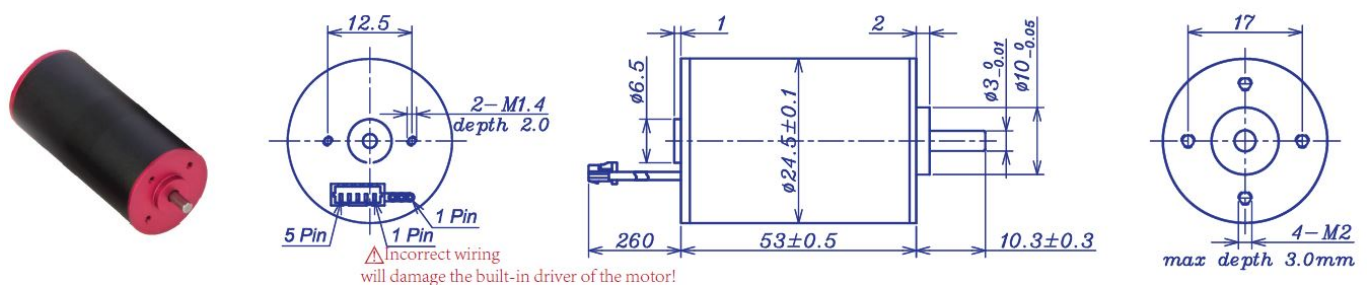


ASSUN AM-BD2453AN Series TOTAL SOLUTION for Precision DC Drive System 2020



SPEED DRIVER INTEGRATED SERIES

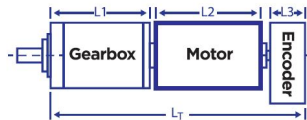
AM-BD2453AN Series



Brushless Motor		Ball Bearings					
Motor Model			1213	1210	1813	2414	2410
Nominal voltage		V	12	12	18	24	24
No load speed $\pm 12\%$		rpm	13010	10460	12920	13625	9770
No load current Max 150%		mA	180	140	115	100	75
Recom mend limit for	Max cont. torque	mN.m	17.6	18.7	18.3	18.4	21.5
	Rated Speed	rpm	11818	9188	11495	12429	8514

Cable 2: Blue GND	27.4	33.1			
Plug defi nition (A WG 28#)	32.6	40.3			
Molex: 5 1021-05 00					
Plug 1: Red					
GND					
Plug 2: Black FG P ulse					
Plug 3 : Yellow CW/CC W	Remarks: Client can choose gearbox and encoder to match with this				
Plug 4: Red P WM	motor. Some combinations are listed here for reference.				
Plug 5: Blue B rake					

AM-BD2453AN Combination Scheme

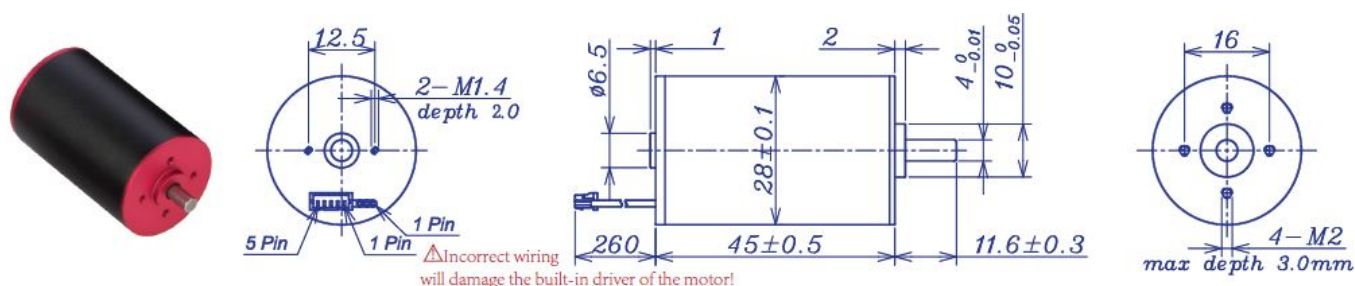


Recommended Gearbox:
Planetary Gearbox:
AM-24GP
AM-28GP

Recommended Encoder:
Encoder S: AM-EN1611S***
2~3 Channels
Encoder T: AM-EN1612T***
2~3 Channels

For more combination specs, visit Assun Motor website.

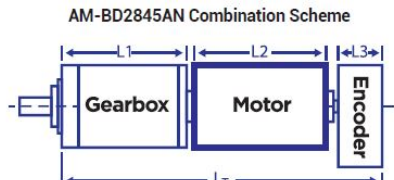
Motor data tested at 25°C. Motor operation exceeding continuous limits will reduce life or result in damage. At elevated ambient temperatures, load current must be reduced.

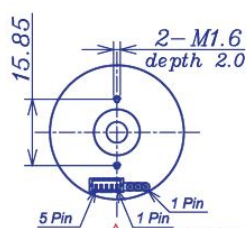


Brushless Motor			Ball Bearings						
Motor Model		1203	1 2 1 5	1210	1813	1810	2412	2409	
Nominal voltage	V	12	1 2	12	18	18	24	24	

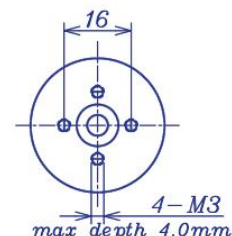
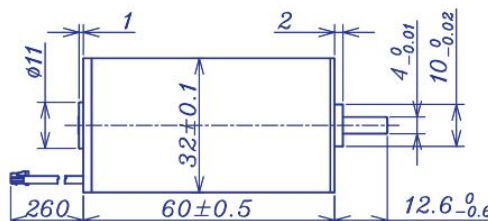
No load speed ±12%		rpm	3300	14800	10000	12520	9680	11680	9080	
No load current Max 150%		mA	55	300	190	170	120	120	85	
Recom mend	Max cont. torque	mN.m	25.2	20.7	26.2	23.8	26.0	24.1	27.9	
limit for	Rated Speed	rpm	2122	13760	8814	11502	8580	10608	7909	
continu ous	Rated Current	mA	800	3000	2500	1920	1600	1360	1200	
operatin g	Rated Power	W	5.6	29.9	24.2	28.7	23.4	26.8	23.1	
Starting current		mA	2143	38710	19672	21687	13139	13636	8727	
Stall torque		mN.m	71	21	221	293	229	263	216	
Maximum power output		W	6.1	114.3	57.9	96.1	58.0	80.4	51.3	
Maximum Efficiency		%	71	83	81	83	82	82	81	
Operating Range		V	10~28	10~28	10~28	10~28	10~28	10~28	10~28	
Type of Current			Cont rolle d	C o n t r o l l e d	Controlled	Contr olled	Contr olled	Contr olled	Contr olled	

Mechanical time constant	ms	3.0	3.3	2.9	2.8	2.7	2.9	2.7		
Moment of inertia	gcm ²	6.19	6.19	6.19	6.19	6.19	6.19	6.19		
Torque constant	mN.m/A	33.8	7.7	11.3	13.6	17.6	19.4	25.0		
Speed constant	rpm/V	282	1243	841	701	543	491	382		
Speed/torque gradient	rpm/mN.m				42.7	42.3	44.4	42.0		
Weight	g				139.1	140.1	138.4	139.2		
ADDITIONAL INFORMATION										
Motor thermal resistance:		10.2 K/W		Motor thermal time constant:		822 S				
Axial (dynamic):		4.0 N		Radial (5mm from mounting face):		16.0 N				
Press-fit force (static):		50 N		Max allowable screw depth into flange:		3.0 mm				
Maximum radial play (5mm from mounting face):		≤0.02 mm		Axial play:		0 (4.0N)				
Maximum winding temperature:		85°C		Ambient temperature range:		-30 to 65°C				
Standard rear shaft diameter:		4 mm		Standard rear shaft length “L”:		0/3.7/5.5 mm				
Connecti on (AWG 22#)	Total Length: L _T =L1+L2+L3									
	L1:28GP	L1: 32GP	L2: BD28	L3: EN16S	L3:EN16T					
	25.9	25.9	45.0	10.7	12.0					
	33.1	35.9								
	40.3	44.4								

Molex: 5 1021-05 00						AM-BD2845AN Combination Scheme  Recommended Gearbox: Planetary Gearbox: AM-20GP AM-32GP Recommended Encoder: Encoder S: AM-EN1611S*** 2~3 Channels Encoder T: AM-EN1612T*** 2~3 Channels For more combination specs, visit Assun Motor website.
Plug 1: Red						
GND						
Plug 2: B lack FG Pul se						
Plug 3 : Yellow CW/CC W	Remarks: Client can choose gearbox and encoder to m atch with this					
Plug 4: Red P WM	motor. Some combinations are listed here for reference.					
Plug 5: B lue Bra ke						
Motor data tested at 25°C. Motor operation exceeding continuous limits will reduce life or result in damage. At elevated ambient temperatures, load current must be reduced.						



Incorrect wiring
will damage the built-in driver of the motor!



Brushless Motor		Ball Bearings						
Motor Model			1212	1208	2413	2409	2408	2407
Nominal voltage		V	12	12	24	24	24	24
No load speed ±12%		rpm	12191	8127	12832	9752	8448	7008
No load current Max 150%		mA	355	192	190	127	110	86
Recom mend li mit for c ontinuo	Max cont. torque	mN.m	23.8	36.5	21.5	29.7	32.0	36.1
	Rated Speed	rpm	11671	7362	12390	9133	7769	6237
	Rated Current	mA	2900	2800	1400	1400	1300	1200

us operating	Rated Power	W	29.1	28.2	27.9	28.4	26.1	23.6
Starting current		mA	60000	27907	35294	20168	14907	10213
Stall torque		mN.m	557	388	624	468	398	328
Maximum power output		W	177.9	82.6	209.5	119.5	88.1	60.2
Maximum Efficiency		%	85	84	86	85	84	82
Operating Range		V	10~28	10~28	10~28	10~28	10~28	10~28
Type of Current			Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Mechanical time constant		ms	3.0	2.9	2.9	2.9	3.0	3.0
Moment of inertia		gcm ²	13.3	13.3	13.3	13.3	13.3	13.3
Torque constant		mN.m/A	9.3	14.0	17.8	23.4	26.9	32.4
Speed constant		rpm/V	1022	682	538	409	355	294
Speed/torque gradient		rpm/mN.m				20.8	21.2	21.3
Weight		g				240	240	240

ADDITIONAL INFORMATION

Motor thermal resistance:	7.8 K/W	Motor thermal time constant:	1089 S
Axial (dynamic):	4.0 N	Radial (5mm from mounting face):	16.0 N
Press-fit force (static):	50 N	Max allowable screw depth into flange:	3.0 mm
Maximum radial play (5mm from mounting face):	≤0.02 mm	Axial play:	0 (4.0N)
Maximum radial play:	85°C	Ambient temperature range:	-30 to 65°C
Standard Rear Shaft Diameter:	4 mm	Standard rear shaft length "L":	0/3.7/5.5 mm

Connecti on (AW G 20#)	Total Length: LT=L1+L2+L3					
	L1:32GP	L1: 36G P	L2:B D32	L3:EN22S	L3:EN24T	
	Cable 1: Red +Vcc	27.4	39.6	60.0	10.7	12.0
	Cable 2: Blue GND	35.9	48.9			
	Plug defi	44.4	57.6			

nition (A WG 28#) Molex: 5 1021-05 00						
Plug 1: Red GND						
Plug 2: Black FG Pulse	Remarks: Client can choose gearbox and encoder to match with t his motor. Some combinations are listed here for reference.					
Plug 3 : Yellow CW/CC W						
Plug 4: Red PWM						
Plug 5: Blue Br ake						

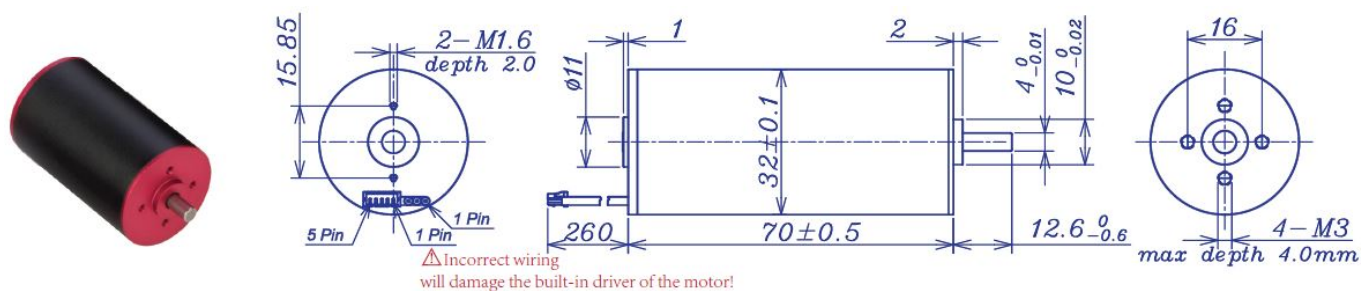
AM-BD3260AN Combination Scheme

Recommended Gearbox:
Planetary Gearbox:
AM-32GP
AM-36GP

Recommended Encoder:
Encoder S: AM-EN2211S***
2~3 Channels
Encoder T: AM-EN2412T***
2~3 Channels

For more combination specs, visit Assun Motor website.

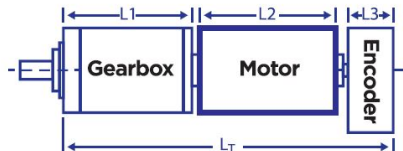
Motor data tested at 25°C. Motor operation exceeding continuous limits will reduce life or result in damage.
At elevated ambient temperatures, load current must be reduced.

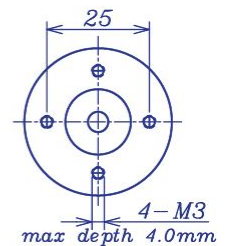
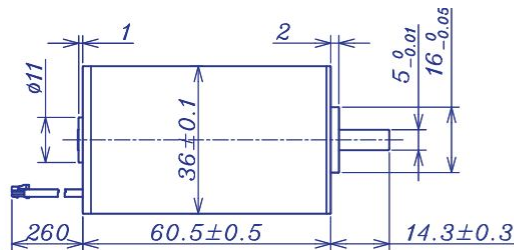
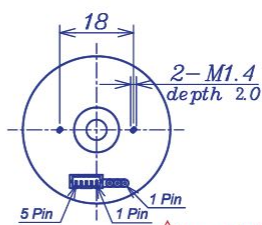


Brushless Motor		Ball Bearings							
Motor Model		1210	1 2 0 7	2412	2409	2407	2406		
Nominal voltage	V	12	1 2	24	24	24	24		
No load speed ±12%	rpm	9794	6 5 2 9	11523	8904	7255	6121		

No load current Max 150%		mA	355	1 9 2	190	127	88	75		
Recom mend	Max cont. torque	mN.m	30.7	4 5. 4	33.8	46.7	47.5	51.1		
	Rated Speed	rpm	9294	5 8 2 8	11011	8204	6547	5373		
limit for	Rated Current	mA	3000	2 8 0 0	1900	1950	1600	1450		
continu ous										
running	Rated Power	W	29.9	2 7. 7	39.0	40.1	32.6	28.8		
Starting current		mA	5217 4	2 4 4 9 0	38710	2330 1	1558 4	1132 1		
Stall torque		mN.m	602	4 2 3	762	593	487	418		
Maximum power output		W	154. 4	7 2. 3	230.0	138.3	92.5	67.0		
Maximum Efficiency		%	84	8 3	86	86	86	84		
Operating Range		V	10~2 8	1 0 ~ 2 8	10~28	10~2 8	10~2 8	10~2 8		
Type of Current			Cont rolle d	C o n t r o l le d	Controlled	Contr olled	Contr olled	Contr olled		
Mechanical time constant		ms	2.6	2. 5	2.4	2.4	2.4	2.3		
Moment of inertia		gcm ²	15.3	1 5. 3	15.3	15.3	15.3	15.3		

Torque constant	mN.m/A	11.6	1 7. 4	19.8	25.6	31.4	37.2		
Speed constant	rpm/V	822	5 4 8	482	373	304	257		
Speed/torque gradient	rpm/mN.m				15.0	14.9	14.6		
Weight	g				290	290	290		
ADDITIONAL INFORMATION									
Motor thermal resistance:		8.2 K/W		Motor thermal time constant:		822 S			
Axial (dynamic):		4.0 N		Radial (5mm from mounting face):		16.0 N			
Press-fit force (static):		50 N		Max allowable screw depth into flange:		3.0 mm			
Maximum radial play (5mm from mounting face):		≤0.0 2 m m		Axial play:		0 (4.0N)			
Maximum winding temperature:		85°C		Ambient temperature range:		-30 to 65°C			
Standard rear shaft diameter:		4 m m		Standard rear shaft length "L":		0/3.7/5.5 mm			
Connecti on (AWG 20#)	Total Length: LT=L1+L2+L3								
	L1:32GP	L1: 36G P	L2: BD3 2	L 3 : E N 2 2 S	L3:EN24T				
	Cable 1: Red +Vcc	27.4	39.6	70.0	1 0 . 7	12.0			
	Cable 2: Blue GND	35.9	48.6						
	Plug defi nition (A WG 28#)	44.4	57.6						
	Molex: 5 1021-05 00								

Plug 1: Red						AM-BD3660AN Combination Scheme  Recommended Gearbox: Planetary Gearbox: AM-36GP AM-40GP c Encoder S: AM-EN2211S*** 2~3 Channels Encoder T: AM-EN3612T*** 2~3 Channels For more combination specs, visit Assun Motor website.
GND						
Plug 2: Black FG Pulse						
Plug 3 : Yellow CW/CCW	Remarks: Client can choose gearbox and encoder to match with this					
Plug 4: Red P WM	motor. Some combinations are listed here for reference.					
Plug 5: Blue Brake						
Motor data tested at 25°C. Motor operation exceeding continuous limits will reduce life or result in damage. At elevated ambient temperatures, load current must be reduced.						



Brushless Motor			Ball Bearings					
Motor Model			1211	1209	2413	2410	2408	2407
Nominal voltage	V		12	12	24	24	24	24
No load speed ±12 %	rpm		11200	8840	12500	10200	8200	6966
No load current Max 15 0%	mA		320	230	220	165	100	85
Recom mend	Max cont. torque	mN.m	39.5	43.4	32.5	41.0	50.0	56.1
limit for	Rated Speed	rpm	10472	8066	11997	9525	7409	6116

continuos	Rated Current	mA	4200	3600	2000	2000	1900	1800		
operating		Rated Power	W	43.3	36.7	40.8	40.9	38.8	35.9	
Starting current		mA	60000	38710	44444	27907	18750	14118		
Stall torque		mN.m	607	496	807	620	518	459		
Maximum power output		W	178.1	114.8	264.0	165.5	111.3	83.7		
Maximum Efficiency		%	86	85	86	85	86	85		
Operating Range		V	10~28	10~28	10~28	10~28	10~28	10~28		
Type of Current			Controlled	Controlled	Controlled	Controlled	Controlled	Controlled		
Mechanical time constant		ms	3.2	3.1	2.7	2.9	2.8	2.7		
Moment of inertia		gcm ²	16.75	16.75	16.75	16.75	16.75	16.75		
Torque constant		mN.m/A	10.2	12.9	18.2	22.3	27.8	32.7		
Speed constant		rpm/V	938	741	523	428	343	292		
Speed/torque gradient		rpm/mN.m				16.5	15.8	15.2		
Weight		g				327.2	328.1	328.4		
ADDITIONAL INFORMATION										
Motor thermal resistance:			6.9 K/W	Motor thermal time constant:			1188 S			
Axial (dynamic):			6.0 N	Radial (5mm from mounting face):			28.0 N			
Press-fit force (static):			110 N	Max allowable screw depth into flange:			4.0 mm			
Maximum radial play (5mm from mounting face):			≤0.02 mm	Axial play:			0 (6.0N)			
Maximum winding temperature:			85°C	Ambient temperature range:			-30 to 65°C			
Standard rear shaft diameter:			5 mm	Standard rear shaft length “L”:			0/3.7/5.5 mm			
Connection (AWG 20#)	Total Length: L _T =L1+L2+L3									
	L1:36GP	L1:40GP	L2:B D36	L3:EN22S	L3:EN36T					

Cable 1: Red +Vcc	25.9	25.9	60.5	10.7	12.0
Cable 2: Blue GND	33.1	35.9			
Plug defi nition (A WG 28#)	40.3	44.4			
Molex: 5 1021-05 00					
Plug 1: Red GND					
Plug 2: Black FG P ulse					
Plug 3 : Yellow CW/CC W	Remarks: Client can choose gearbox and encoder to match with this				
Plug 4: Red PWM	motor. Some combinations are listed here for reference.				
Plug 5: Blue B rake					

AM-BD3270AN Combination Scheme

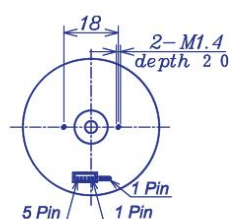
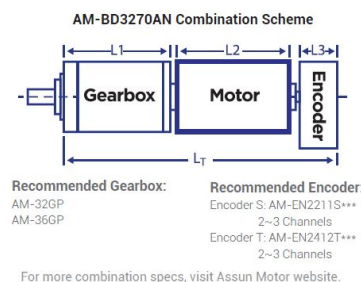
Recommended Gearbox:
AM-32GP
AM-36GP

Recommended Encoder:
Encoder S: AM-EN2211S***
2~3 Channels
Encoder T: AM-EN2412T***
2~3 Channels

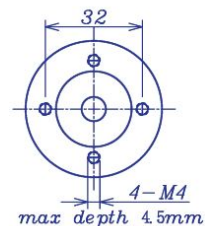
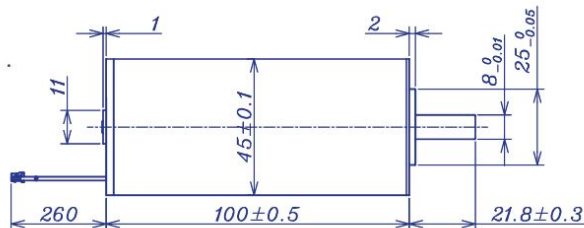
For more combination specs, visit Assun Motor website.

Motor data tested at 25°C. Motor operation exceeding continuous limits will reduce life or result in damage.

At elevated ambient temperatures, load current must be reduced.



Incorrect wiring
will damage the built-in driver of the motor!

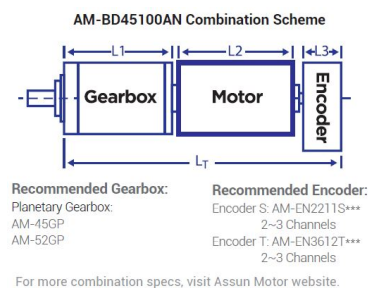


Brushless Motor

Ball Bearings

Motor Model			2411	2406	2407	2404	2405	2403	
Nominal voltage		V	24	24	24	24	24	24	
No load speed ±12%		rpm	11240	5900	6912	4272	5208	3240	
No load current Max 15 0%		mA	600	320	320	180	220	160	
Recom mend	Max cont. tor que	mN.m	48.7	134.4	121.4	171.6	156.7	170.9	
	Rated Speed	rpm	11059	5539	6539	3782	4747	2748	
limit for									
continu ous	Rated Curren t	mA	3000	3800	4000	3400	3800	2600	
operatin g	Rated Power	W	56.4	78.0	83.2	68.0	77.9	49.2	
Starting current		mA	150000	57143	68571	28235	40678	16216	
Stall torque		mN.m	3034	2195	2252	1496	1771	1125	
Maximum power output		W	892.8	339.0	407.6	167.3	241.4	95.4	
Maximum Efficiency		%	88	86	87	85	86	81	
Operating Range		V	10~28	10~28	10~28	10~28	10~28	10~28	
Type of Current			Controlled	Controlled	Controlled	Contr olled	Contr olled	Contr olled	
Mechanical time consta nt		ms	4.3	3.1	3.5	3.3	3.4	3.3	
Moment of inertia		gcm2	109.8	109.8	109.8	109.8	109.8	109.8	
Torque constant		mN.m/A	20.3	38.6	33.0	53.3	43.8	70.0	
Speed constant		rpm/V	470	247	289	179	218	136	
Speed/torque gradient		rpm/mN.m				2.9	2.9	2.9	
Weight		g				841.5	847.5	840.3	
ADDITIONAL INFORMATION									
Motor thermal resistance:			3.6 K/W	Motor thermal time constant:			1286S		
Axial (dynamic):			6.0 N	Radial (5mm from mounting face):			28.0 N		
Press-fit force (static):			110 N	Max allowable screw depth into fla nge:			4.5 mm		
Maximum radial play (5mm from mo unting face):			≤0.02 m m	Axial play:			0 (6.0N)		
Maximum winding temperature:			85°C	Ambient temperature range:			-30 to 65°C		
Standard rear shaft diameter:			8 mm	Standard rear shaft length “L”:			0/3.7/5.5 mm		
		Total Length: L T=L1+L2+L3							

Connection (AWG 18#)	L1:45GP	L1:52GP	L2:BD45	L3:EN22S	L3:EN36T
Cable 1: Red + Vcc	62.8	81.0	100.0	10.7	12.0
Cable 2: Blue GND	74.8				
Plug definition (AWG 28#)					
Molex: 51021-0500					
Plug 1: Red GND					
Plug 2: Black F G Pulse					
Plug 3: Yellow CW/CCW	Remarks: Client can choose gearbox and encoder to match with this				
Plug 4: Red PWM	motor. Some combinations are listed here for reference.				
Plug 5: Blue Brake					



Motor data tested at 25°C. Motor operation exceeding continuous limits will reduce life or result in damage.
At elevated ambient temperatures, load current must be reduced.

Download datasheet: <https://assunmotor.com/documents-download>.
Visit Our Website and Online Shop at: <https://assunmotor.com>.
Contact: info@assunmotor.com.

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Documents / Resources



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References

- [^ Assun Motor: Driving The Future](#)
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