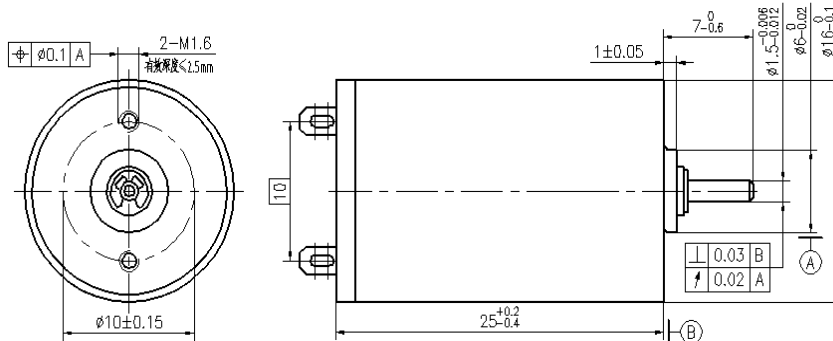


Precious metal brushes, Sleeve bearings (ball bearings available on request)

Serie 1625		Model	2112.A	2212.A	2209.A	2207.A	2120.A	2214.A	2211.A	2208.A
<b>Motor data (at 25°C)</b>										
1 Assigned power rating	W		0.8	0.8	0.8	0.7	1.0	1.3	1.3	1.0
2 Nominal voltage	Volt		4.5	6	9	12	3	6	9	12
3 Terminal resistance	±10% Ohm		4.26	8.00	17.2	39.4	1.03	5.05	10.3	26.0
4 No load speed	±10% rpm		8,800	8,590	8,480	8,280	10,900	10,100	10,600	10,400
5 No load current	≤125% mA		21.6	12.8	8.40	5.70	60.0	13.0	13.5	8.70
6 Speed constant	rpm/V		1,956	1,432	942	690	3,633	1,683	1,178	867
7 Torque constant	mNm/A		4.79	6.56	9.98	13.59	2.58	5.61	7.99	10.82
8 Starting current	mA		1,056	750	523	304	2,913	1,188	874	462
9 Stall torque	mNm		5.06	4.92	5.22	4.13	7.50	6.67	6.98	4.99
10 Max. efficiency	%		73	76	76	74	73	80	77	74
<b>Limits for continuous operating</b>										
11 Max. continuous current	mA		240	187	120	76	394	297	190	115
12 Max. continuous torque	mNm		1.15	1.23	1.20	1.03	1.01	1.67	1.52	1.24
13 Max. continuous speed	rpm		6,801	6,448	6,535	6,212	9,426	7,575	8,295	7,809
14 Max. continuous power output	W		0.818	0.828	0.819	0.671	1.00	1.32	1.32	1.02
<b>Dimensions</b>										

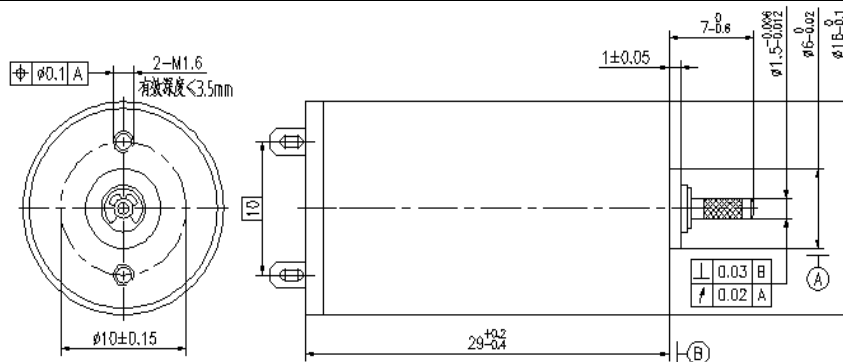


## Additional Information

- Axial play (measured at 4N axial force.) 0.05~0.15 mm
- Max. sleeve bearing loads
  - Axial ( dynamic ) 0.8N
  - Radial ( 4 mm from jamming ring ) 1.4N
  - Force for press-fits ( static ) 15N
- Max. radial play sleeve bearing 0.02 mm
- Ambient temperature range -20~+65°C
- Max. rotor temperature +85°C
- Number of commutator segments 5
- Weight of motor 19g
- Motor service life depends on operating conditions. Under normal operating conditions, motor's service life of 1000 to 3000 hours is achievable.
- Electrical connections: two terminals

Precious metal brushes, Sleeve bearings (ball bearings available on request)

Serie 1630		Model	5123.A	5113.A	5213.A	5210.A				
<b>Motor data (at 25°C)</b>										
1	Assigned power rating	W	1.4	1.4	1.7	1.4				
2	Nominal voltage	Volt	3	6	9	12				
3	Terminal resistance	±10% Ohm	0.932	4.44	8.73	18.4				
4	No load speed	±10% rpm	10,200	10,300	10,600	10,200				
5	No load current	≤125% mA	45.0	20.2	15.2	8.10				
6	Speed constant	rpm/V	3,400	1,717	1,178	850				
7	Torque constant	mNm/A	2.77	5.48	7.99	11.10				
8	Starting current	mA	3,219	1,351	1,031	652				
9	Stall torque	mNm	8.92	7.41	8.24	7.24				
10	Max. efficiency	%	78	77	77	79				
<b>Limits for continuous operating</b>										
11	Max. continuous current	mA	580	310	257	163				
12	Max. continuous torque	mNm	1.61	1.70	2.05	1.81				
13	Max. continuous speed	rpm	8,362	7,937	7,958	7,651				
14	Max. continuous power output	W	1.41	1.41	1.71	1.45				
<b>Dimensions</b>										



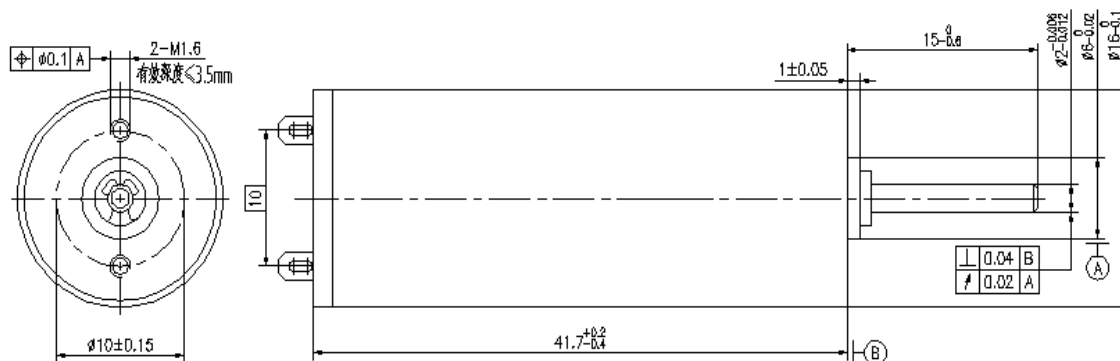
## Additional Information

- Axial play (measured at 4N axial force.) 0.05~0.15 mm
- Max. sleeve bearing loads
  - Axial ( dynamic ) 0.8N
  - Radial ( 4 mm from jamming ring ) 1.4N
  - Force for press-fits ( static ) 15N
- Max. radial play sleeve bearing 0.02 mm
- Ambient temperature range -20~+65°C
- Max. rotor temperature +85°C
- Number of commutator segments 5
- Weight of motor 22g
- Motor service life depends on operating conditions. Under normal operating conditions, motor's service life of 1000 to 3000 hours is achievable.
- Electrical connections: two terminals

Precious metal brushes, Sleeve bearings (ball bearings available on request)

Serie 1643		Model	8128.A	8123.A	8118.A	8113.A	8110.A	8211.A	8208.A
<b>Motor data (at 25°C)</b>									
1	Assigned power rating	W	1.5	1.8	1.9	1.9	1.5	2.5	1.8
2	Nominal voltage	Volt	3	4.5	6	9	12	18	24
3	Terminal resistance ±10%	Ohm	0.658	1.21	2.45	6.10	13.4	20.2	50.5
4	No load speed ±10%	rpm	8,400	8,450	8,700	8,580	8,570	8,530	8,640
5	No load current ≤125%	mA	70.0	28.0	36.7	22.8	13.4	12.1	8.90
6	Speed constant	rpm/V	2,800	1,878	1,450	953	714	474	360
7	Torque constant	mNm/A	3.36	5.05	6.49	9.87	13.18	19.89	26.04
8	Starting current	mA	4,559	3,719	2,449	1,475	896	891	475
9	Stall torque	mNm	15.32	18.78	15.89	14.56	11.80	17.72	12.38
10	Max. efficiency	%	77	83	77	77	77	78	75
<b>Limits for continuous operating</b>									
11	Max. continuous current	mA	582	460	381	260	155	178	95
12	Max. continuous torque	mNm	1.96	2.32	2.47	2.57	2.04	3.54	2.47
13	Max. continuous speed	rpm	7,328	7,405	7,346	7,068	7,087	6,826	6,913
14	Max. continuous power output	W	1.50	1.80	1.90	1.90	1.52	2.53	1.79

## Dimensions



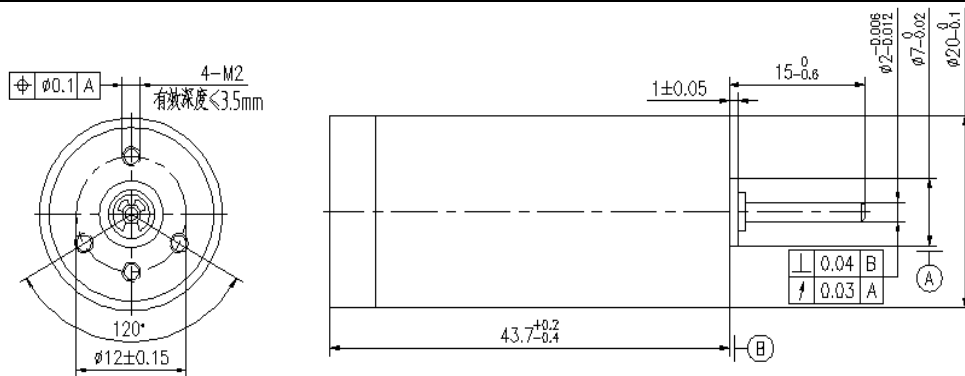
## Additional Information

- Axial play (measured at 4N axial force.) 0.05~0.15 mm
- Max. sleeve bearing loads
  - Axial ( dynamic ) 0.8N
  - Radial ( 4 mm from jamming ring ) 1.4N
  - Force for press-fits ( static ) 15N
- Max. radial play sleeve bearing 0.02 mm
- Ambient temperature range -20~+65°C
- Max. rotor temperature +85°C
- Number of commutator segments 5
- Weight of motor 35g
- Motor service life depends on operating conditions. Under normal operating conditions, motor's service life of 1000 to 3000 hours is achievable.
- Electrical connections: two terminals



Precious metal brushes, Sleeve bearings (ball bearings available on request)

Serie 2043		Model	5120.A						
<b>Motor data (at 25°C)</b>									
1	Assigned power rating	W	3.2						
2	Nominal voltage	Volt	9						
3	Terminal resistance	±10% Ohm	2.20						
4	No load speed	±10% rpm	8,130						
5	No load current	≤125% mA	23.2						
6	Speed constant	rpm/V	903						
7	Torque constant	mNm/A	10.52						
8	Starting current	mA	4,091						
9	Stall torque	mNm	43.02						
10	Max. efficiency	%	86						
<b>Limits for continuous operating</b>									
11	Max. continuous current	mA	396						
12	Max. continuous torque	mNm	4.16						
13	Max. continuous speed	rpm	7,343						
14	Max. continuous power output	W	3.20						
<b>Dimensions</b>									



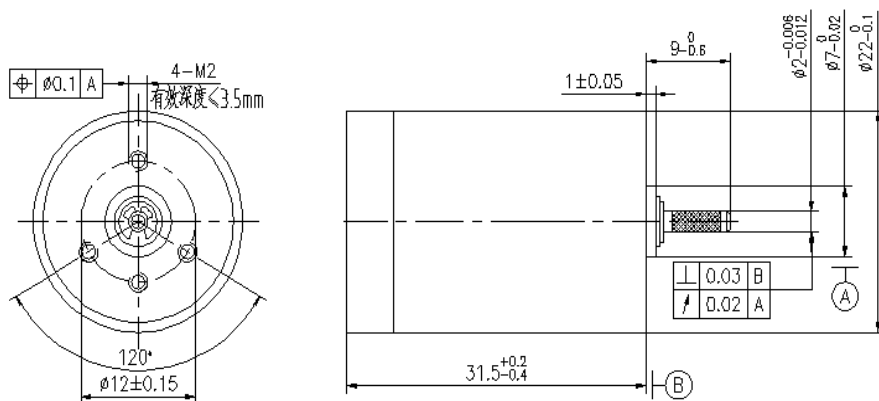
### Additional Information

- Axial play (measured at 4N axial force.) 0.05~0.15 mm
- Max. sleeve bearing loads
  - Axial ( dynamic ) 1.0N
  - Radial ( 4 mm from jamming ring ) 2.7N
  - Force for press-fits ( static ) 80N
- Max. radial play sleeve bearing 0.02 mm
- Ambient temperature range -20~+65°C
- Max. rotor temperature +85°C
- Number of commutator segments 5
- Weight of motor 61g
- Motor service life depends on operating conditions. Under normal operating conditions, motor's service life of 1000 to 3000 hours is achievable.
- Electrical connection: 2 wire pigtails approx. 150 mm long.

Precious metal brushes, Sleeve bearings (ball bearings available on request)

Serie 2230		Model	2135.A	2120.A	2218.A	2216.A	2214.A	2211.A		
<b>Motor data (at 25°C)</b>										
1	Assigned power rating	W	2.0	2.0	2.8	3.4	3.6	2.6		
2	Nominal voltage	Volt	3	6	9	12	15	18		
3	Terminal resistance	±10% Ohm	0.381	1.87	4.60	6.78	9.84	19.9		
4	No load speed	±10% rpm	8,500	8,330	8,200	8,160	8,400	8,170		
5	No load current	≤125% mA	75.0	24.0	15.3	14.1	12.1	9.10		
6	Speed constant	rpm/V	2,833	1,388	911	680	560	454		
7	Torque constant	mNm/A	3.34	6.83	10.40	13.94	16.93	20.84		
8	Starting current	mA	7,874	3,209	1,957	1,770	1,524	905		
9	Stall torque	mNm	26.30	21.92	20.36	24.67	25.80	18.85		
10	Max. efficiency	%	81	83	83	83	83	81		
<b>Limits for continuous operating</b>										
11	Max. continuous current	mA	742	381	391	354	305	181		
12	Max. continuous torque	mNm	2.48	2.60	4.07	4.93	5.16	3.77		
13	Max. continuous speed	rpm	7,699	7,341	6,561	6,528	6,719	6,535		
14	Max. continuous power output	W	2.00	2.00	2.79	3.37	3.63	2.58		

## Dimensions



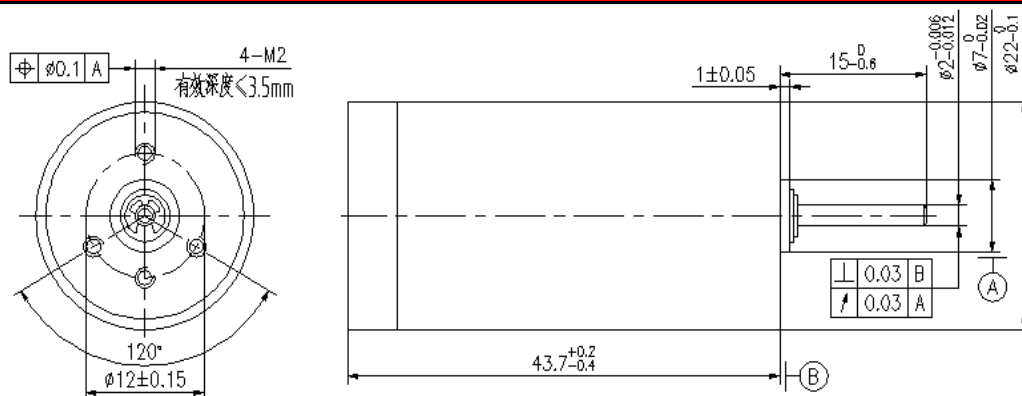
## Additional Information

- Axial play (measured at 4N axial force.) 0.05~0.15 mm
- Max. sleeve bearing loads
  - Axial ( dynamic ) 1.0N
  - Radial ( 4 mm from jamming ring ) 2.7N
  - Force for press-fits ( static ) 80N
- Max. radial play sleeve bearing 0.02 mm
- Ambient temperature range -20~+65°C
- Max. rotor temperature +85°C
- Number of commutator segments 5
- Weight of motor 48g
- Motor service life depends on operating conditions. Under normal operating conditions, motor's service life of 1000 to 3000 hours is achievable.
- Electrical connection: 2 wire pigtails approx. 150 mm long.

Precious metal brushes, Sleeve bearings (ball bearings available on request)

Serie 2243		Model	5125.A	5225.A	5218.A	5216.A				
<b>Motor data (at 25°C)</b>										
1	Assigned power rating	W	4.0	4.0	6.0	8.0				
2	Nominal voltage	Volt	9	12	18	24				
3	Terminal resistance ±10%	Ohm	1.33	2.20	6.25	9.05				
4	No load speed ±10%	rpm	8,240	8,240	8,120	8,180				
5	No load current ≤125%	mA	38.2	22.7	12.5	13.3				
6	Speed constant	rpm/V	916	687	451	341				
7	Torque constant	mNm/A	10.38	13.86	21.09	27.89				
8	Starting current	mA	6,767	5,455	2,880	2,652				
9	Stall torque	mNm	70.22	75.58	60.73	73.97				
10	Max. efficiency	%	86	88	87	86				
<b>Limits for continuous operating</b>										
11	Max. continuous current	mA	481	358	387	394				
12	Max. continuous torque	mNm	4.99	4.96	8.16	10.99				
13	Max. continuous speed	rpm	7,654	7,699	7,029	6,965				
14	Max. continuous power output	W	4.00	4.00	6.00	8.01				

## Dimensions



## Additional Information

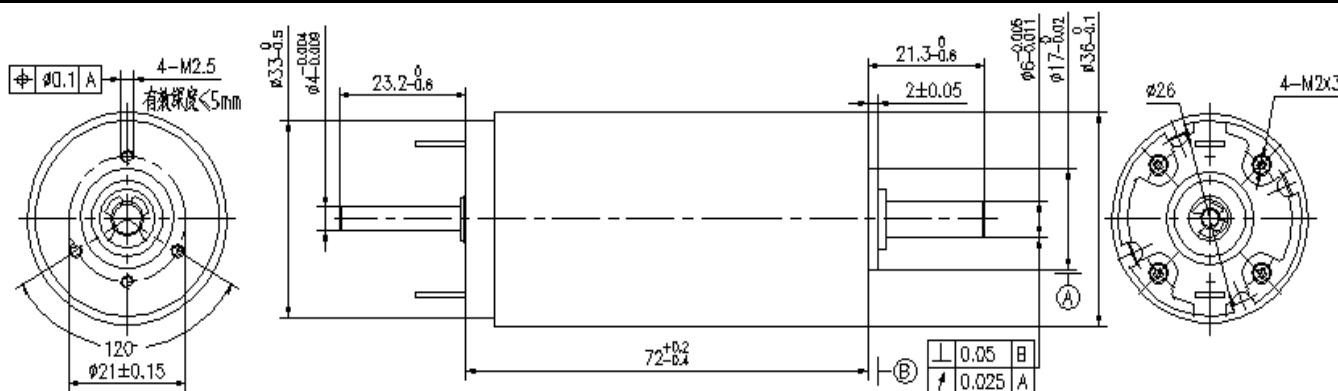
- Axial play (measured at 4N axial force.) 0.05~0.15 mm
- Max. sleeve bearing loads
  - Axial ( dynamic ) 1.0N
  - Radial ( 4 mm from jamming ring ) 2.7N
  - Force for press-fits ( static ) 80N
- Max. radial play sleeve bearing 0.02 mm
- Ambient temperature range -20~+65°C
- Max. rotor temperature +85°C
- Number of commutator segments 5
- Weight of motor 70g
- Motor service life depends on operating conditions. Under normal operating conditions, motor's service life of 1000 to 3000 hours is achievable.
- Electrical connection: 2 wire pigtailed approx. 150 mm long.



Graphite brushes, ball bearings

Serie 3672		Model	2340.B	2335.B	2240.B	2235.B	2231.B		
<b>Motor data (at 25°C)</b>									
1 Assigned power rating	W		41	42	45	45	42		
2 Nominal voltage	Volt		12	15	24	30	36		
3 Terminal resistance	±10% Ohm		0.561	0.692	1.40	2.00	2.90		
4 No load speed	±10% rpm		6,010	6,260	6,130	6,090	6,220		
5 No load current	≤125% mA		248	190	56.5	53.9	49.6		
6 Speed constant	rpm/V		501	417	255	203	173		
7 Torque constant	mNm/A		18.86	22.69	37.28	46.90	55.08		
8 Starting current	mA		21,390	21,676	17,143	15,000	12,414		
9 Stall torque	mNm		403.32	491.89	639.13	703.43	683.71		
10 Max. efficiency	%		80	82	89	88	88		
<b>Limits for continuous operating</b>									
11 Max. continuous current	mA		4,270	3,364	2,135	1,682	1,324		
12 Max. continuous torque	mNm		80.51	76.34	79.60	78.88	72.92		
13 Max. continuous speed	rpm		4,810	5,288	5,367	5,407	5,557		
14 Max. continuous power output	W		40.536	42.255	44.711	44.641	42.410		

## Dimensions



## Additional Information

- Axial play (measured at 4N axial force.) 0.05~0.15 mm
- Max. ball bearing loads
  - Axial (dynamic) 2.4N
  - Radial (4 mm from jamming ring) 28N
  - Force for press-fits (static) 110N
- Max. radial play ball bearing 0.025 mm
- Ambient temperature range -20~+65°C
- Max. rotor temperature +85°C
- Number of commutator segments 13
- Weight of motor 340g
- Motor service life depends on operating conditions. Under normal operating conditions, motor's service life of 1000 to 3000 hours is achievable.
- Electrical connections: two terminals

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