

AC MOTOR

CONTENTS

- Synchronous PM

1. Φ 28 系列 page1-2
2. Φ 35 系列 page3-6
3. Φ 37 系列 page7-8
4. Φ 42 系列 page9-11
5. Φ 45 系列 page12-13
6. Φ 49 系列 page14-15
7. Φ 50 系列 page16-38
8. Φ 60 系列 page39-42
9. Φ 64 系列 page43-44
10. Φ 212 系列 page45-46

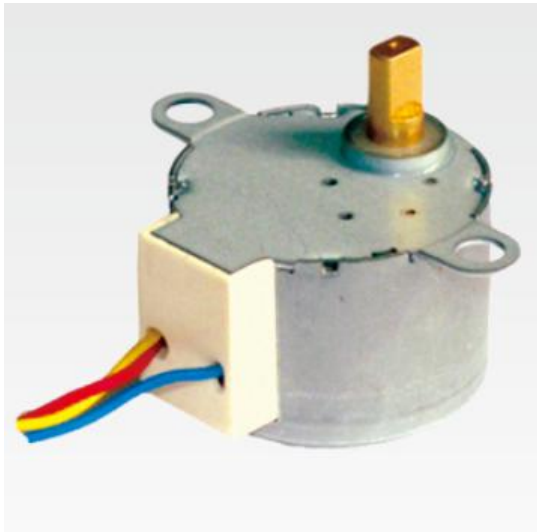
- Shaded pole motor

1. Φ 61 系列 page47-48

- Three-phase AC motor

1. Φ 220 系列 page49

002028 Synchronous PM

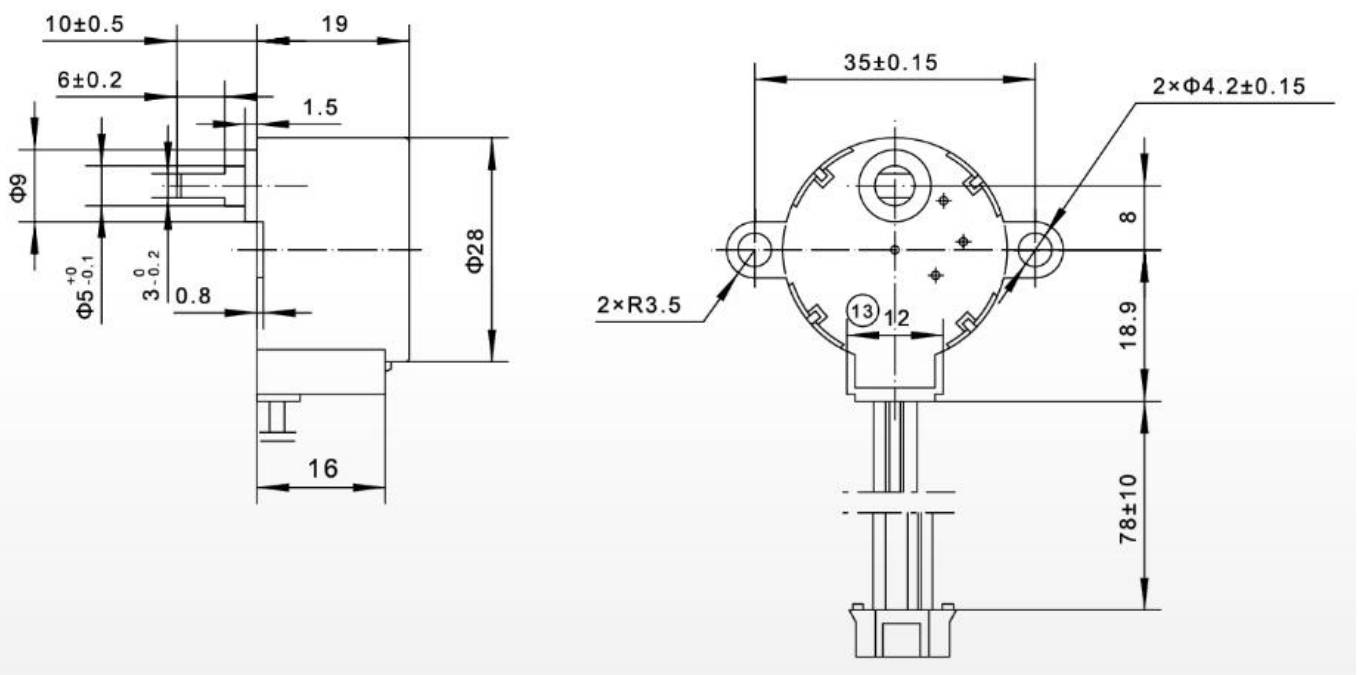


Typical Applications

Home Appliances

- Air-conditioning
- Refrigerator
- Intelligent Sanitary
- Automatic Door Lock
- CCTV Monitor
- Electronic Instruments

Mechanical dimensions: mm



002028 Synchronous PM

Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Pull-out Torque [kgf.cm]	Temperature Rise[K]	Noise dB [A]	Insulation Class	Weight [g]
M024 AI004 9-28- 19	24	50	5.8	≤80	≤2	≥0.5	≤60	≤40	E	45

002035 Synchronous PM



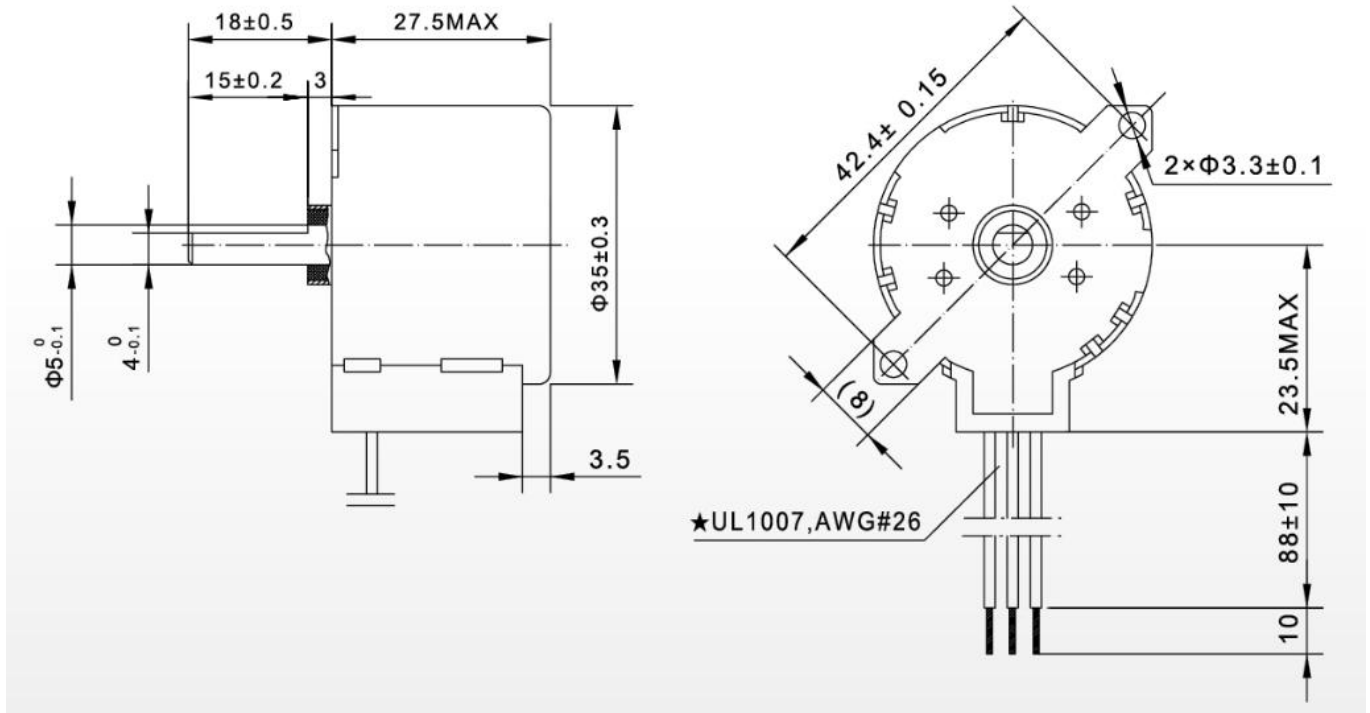
Typical Applications

Home Appliances

- Air-conditioning
- Refrigerator
- Intelligent Sanitary
- Automatic Door Lock
- CCTV Monitor
- Electronic Instruments

Mechanical dimensions: mm

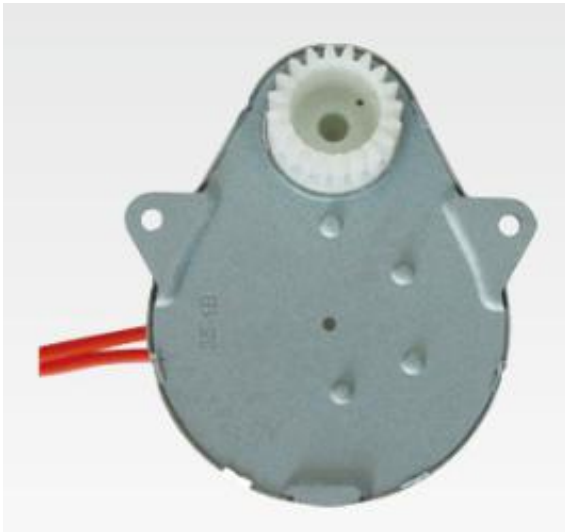
002035 Synchronous PM



Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Temperature Rise [K]	Noise dB [A]	Insulation Class	Weight [g]
M024 AI004 9-35- 27	24	50	5.8	≤ 80	≤ 2	≥ 0.5	≤ 65	≤ 40	A	50

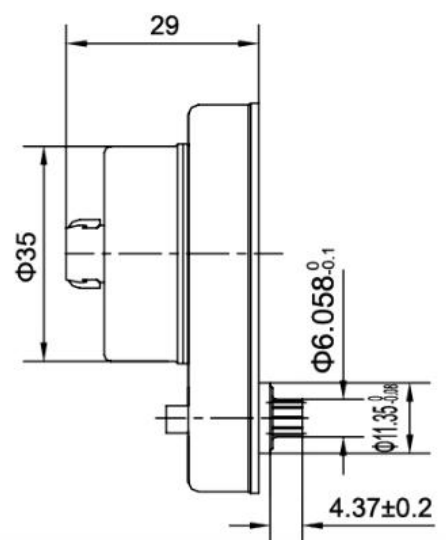
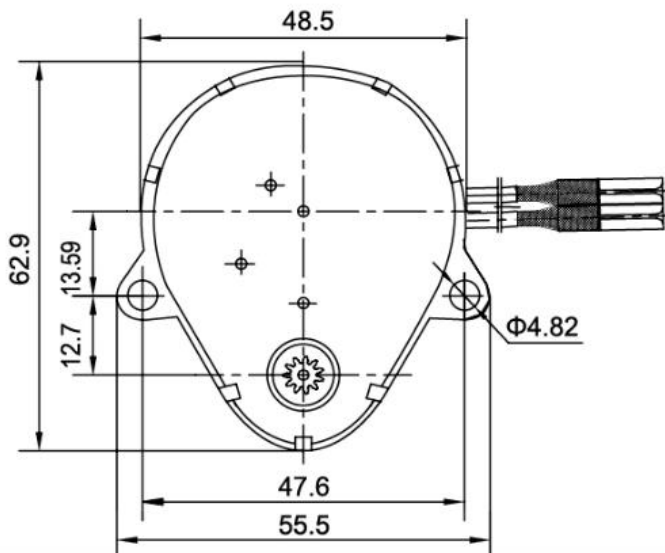
003035 Synchronous PM



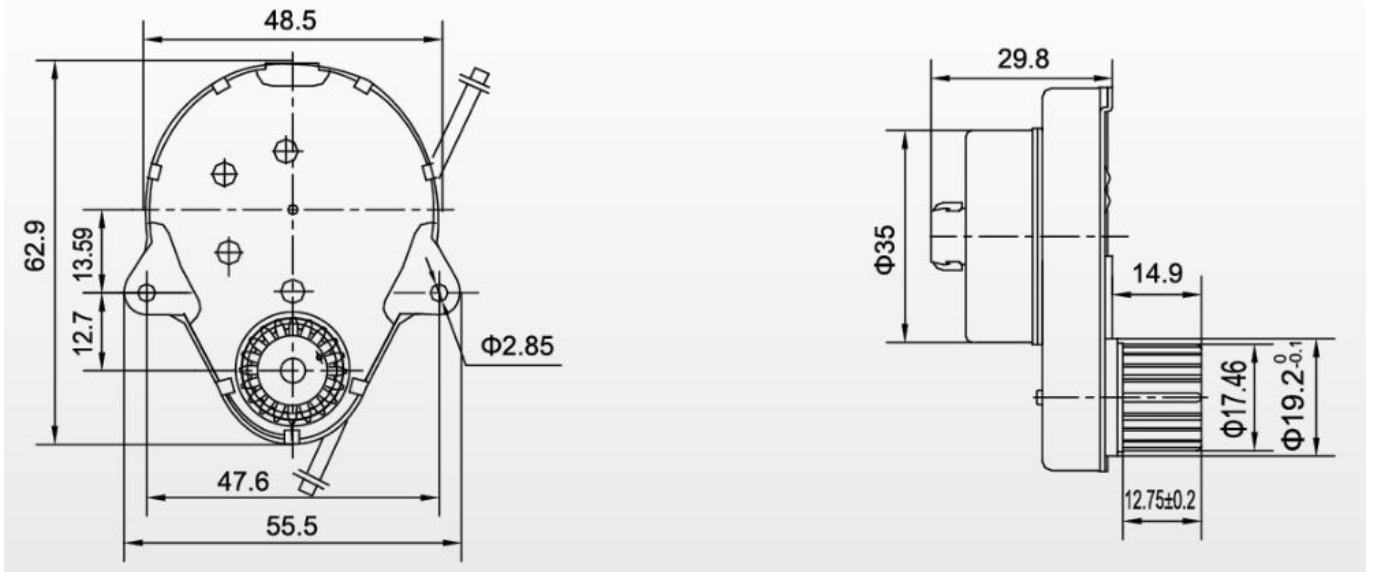
Typical Applications

- Valve Control
- Home Appliances
- Timer

Mechanical dimensions: mm



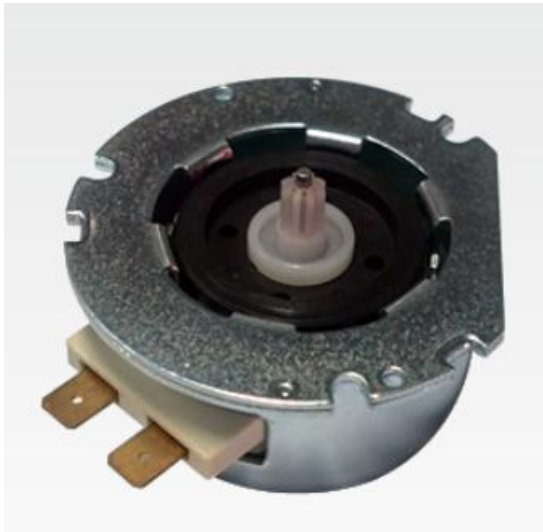
003035 Synchronous PM



Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Starting Voltage [V]	Temperature Rise [K]	Noise dB [A]	Insulation Class	Weight [g]
M120 AI00 93-35-23	120	60	2	≤10	≤3	≥0.95	≤90	≤60	≤40	A	80
M230 AI01 77-35-23	230	50	0.868	≤10	≤3	≥1.81	≤190	≤60	≤40	A	80
M120 AI01 69-35-23	120	60	1	≤10	≤3	≥1.73	≤90	≤60	≤40	A	80

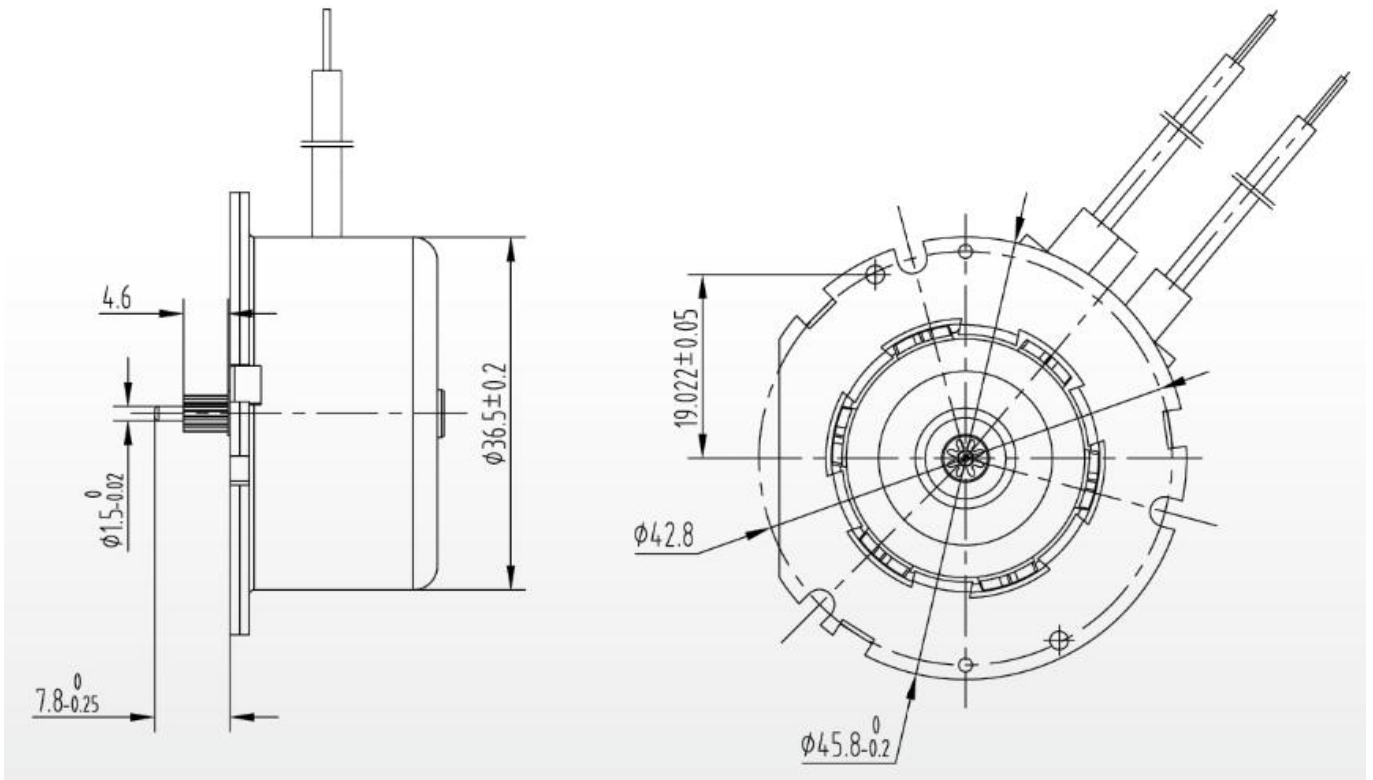
003037 Synchronous PM



Typical Applications

- Valve Control
- Home Appliances
- Timer

Mechanical dimensions: mm



003037 Synchronous PM

Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [mN.m]	Starting Voltage [V]	Temperature Rise[K]	Noise dB [A]	Insulation Class	Weight [g]
M220 AI00 02- 37- 21	220	50/60	500/600	≤20	≤3	≥2	≤160	≤65	≤60	A	64
M120 AI00 02- 37- 21	100-120	60	600	≤30	≤3	≥2	≤70	≤65	≤60	A	64

004042 Synchronous PM



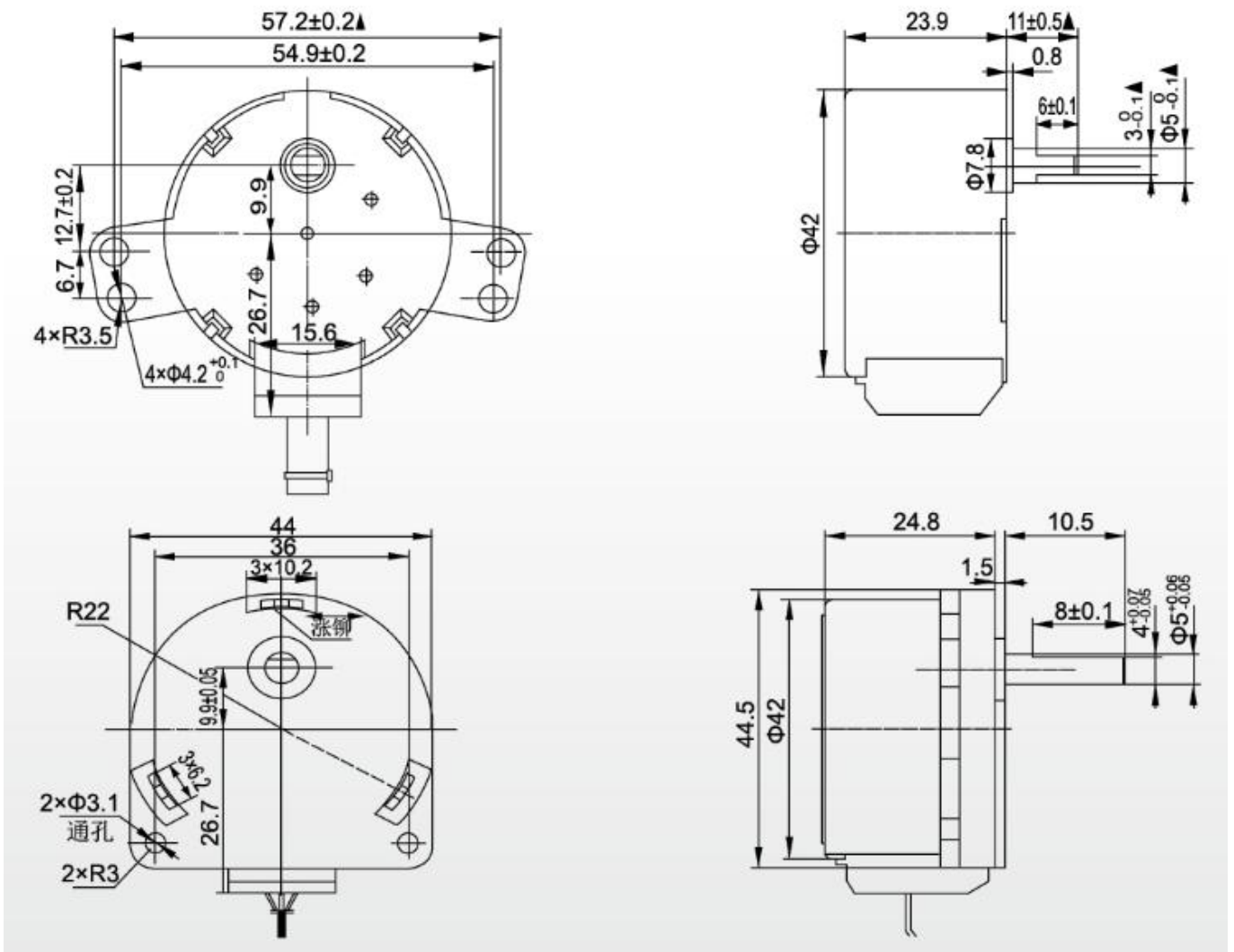
Typical Applications

Home Appliances

- Air-conditioning
- Roaster
- Electrical andiron
- Actomatic Door Lock
- Microwave Oven

Mechanical dimensions: mm

004042 Synchronous PM



Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Starting Voltage [V]	Temperature Rise [K]	Noise dB [A]	Insulation Class	Weight [g]
M024 AI01 47- 42- 24	24	50/60	15/18	≤200	≤4	≥1.5	≤20	≤65	≤40	E	130
M110 AI02 94- 42- 24	110/120	50/60	5/6	≤45	≤5	≥3	≤96	≤65	≤40	E	130
M110 AI01 96- 42-	110/120	50/60	15/18	≤45	≤5	≥2	≤96	≤65	≤40	E	130

004042 Synchronous PM

24												
M110 AI01 47- 42- 24	110/120	50/60	22/26	≤ 45	≤ 5	≥ 1.5	≤ 96	≤ 65	≤ 40	E	130	
M220 AI02 94- 42- 24	220/240	50/60	5/6	≤ 20	≤ 4	≥ 3	≤ 176	≤ 65	≤ 40	E	130	
M220 AI01 96- 42- 24	220/240	50/60	15/18	≤ 20	≤ 4	≥ 2	≤ 176	≤ 65	≤ 40	E	130	
M220 AI01 47- 42- 24	220/240	50/60	22/26	≤ 20	≤ 4	≥ 1.5	≤ 176	≤ 65	≤ 40	E	130	
M220 AI02 45- 42- 24	220/240	50/60	12.5/15	≤ 20	≤ 4	≥ 2.5	≤ 176	≤ 65	≤ 40	E	130	

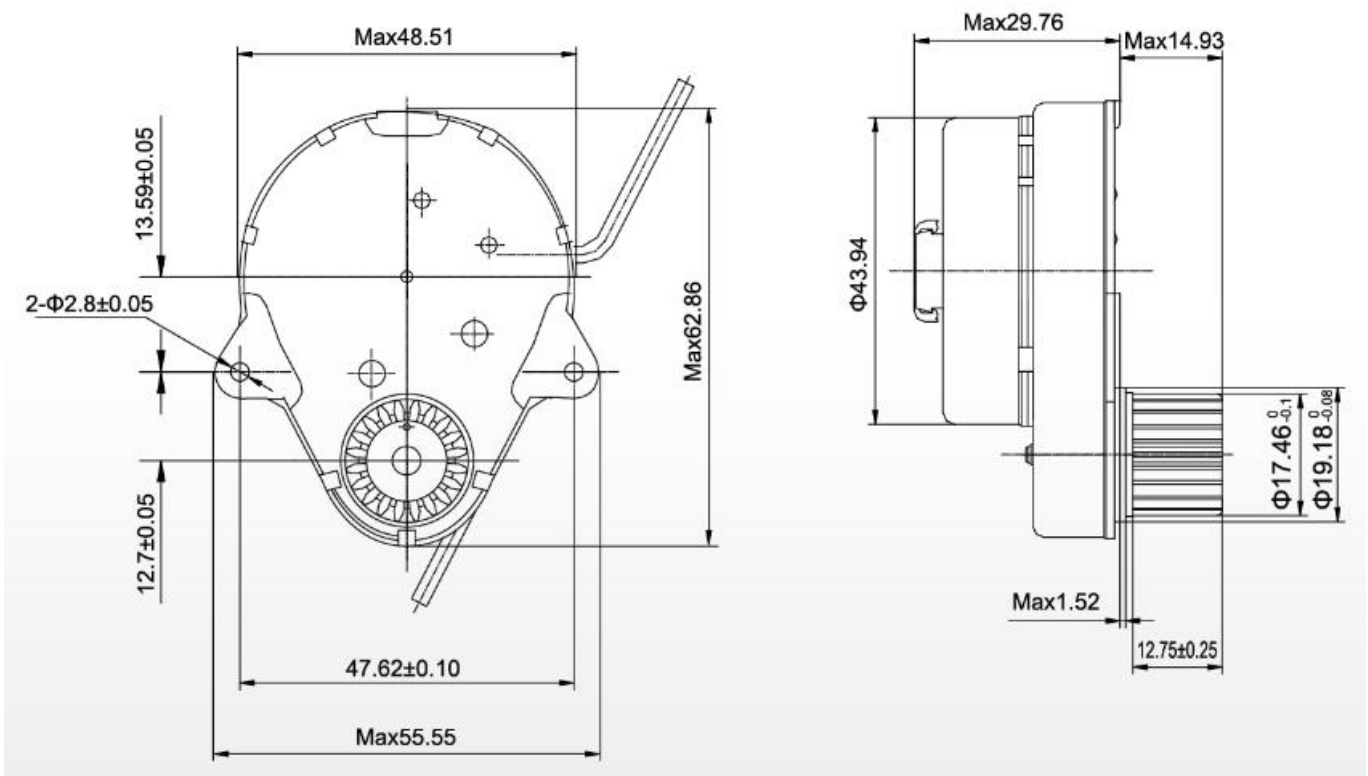
005045 Synchronous PM



Typical Applications

- Valve Control
- Home Appliances
- Timer

Mechanical dimensions: mm



005045 Synchronous PM

Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Starting Voltage [V]	Temperature Rise[K]	Noise dB [A]	Insulation Class	Weight [g]
M120 AI00 44- 45- 25	120	60	1	≤25	≤5	≥0.45	≤90	≤60	≤40	A	105

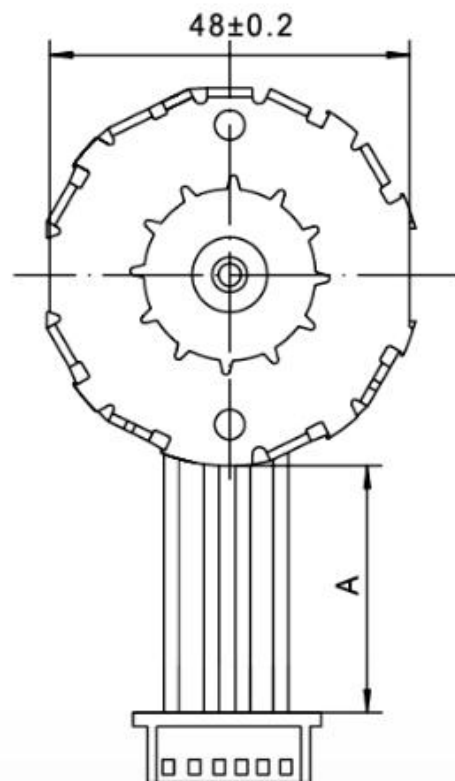
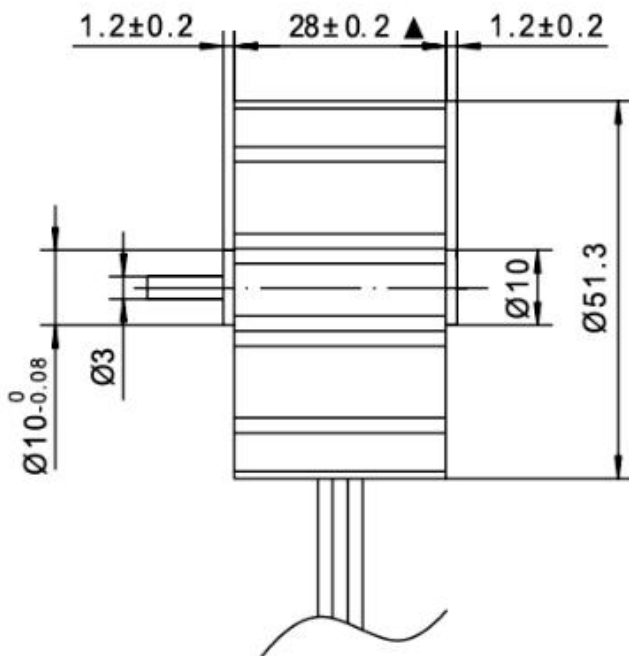
007049 Synchronous PM



Typical Applications

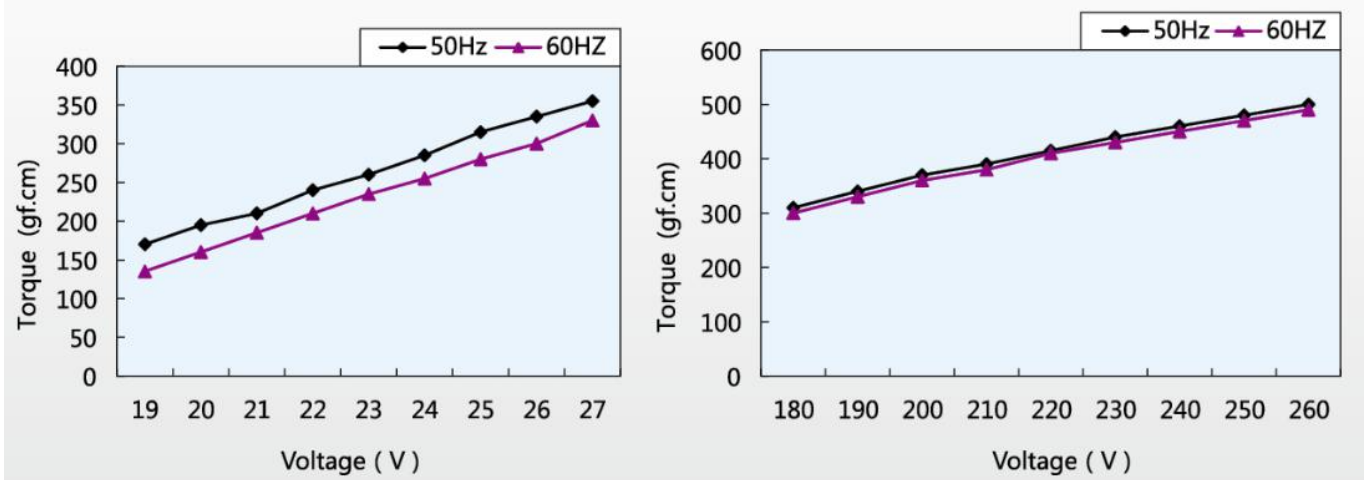
Valve Control

Mechanical dimensions: mm



007049 Synchronous PM

Torque Characteristics



Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [gf.cm]	Starting Voltage [V]	Insulation Resistance	Dielectric Strength [V/S]	Class Of Insulation
M024 AI002 5-49-28	24	50	500	<190	<4.6	>260	15	100M Ω min	600	E
M024 AI002 2-49-28	24	60	600	<240	<4.6	>230	15	100M Ω min	600	E
M230 AI002 9-49-28	230	50	500	<25	<7	>300	180	100M Ω min	600	E
M230 AI002 4-49-28	230	60	600	<30	<7	>250	180	100M Ω min	600	E

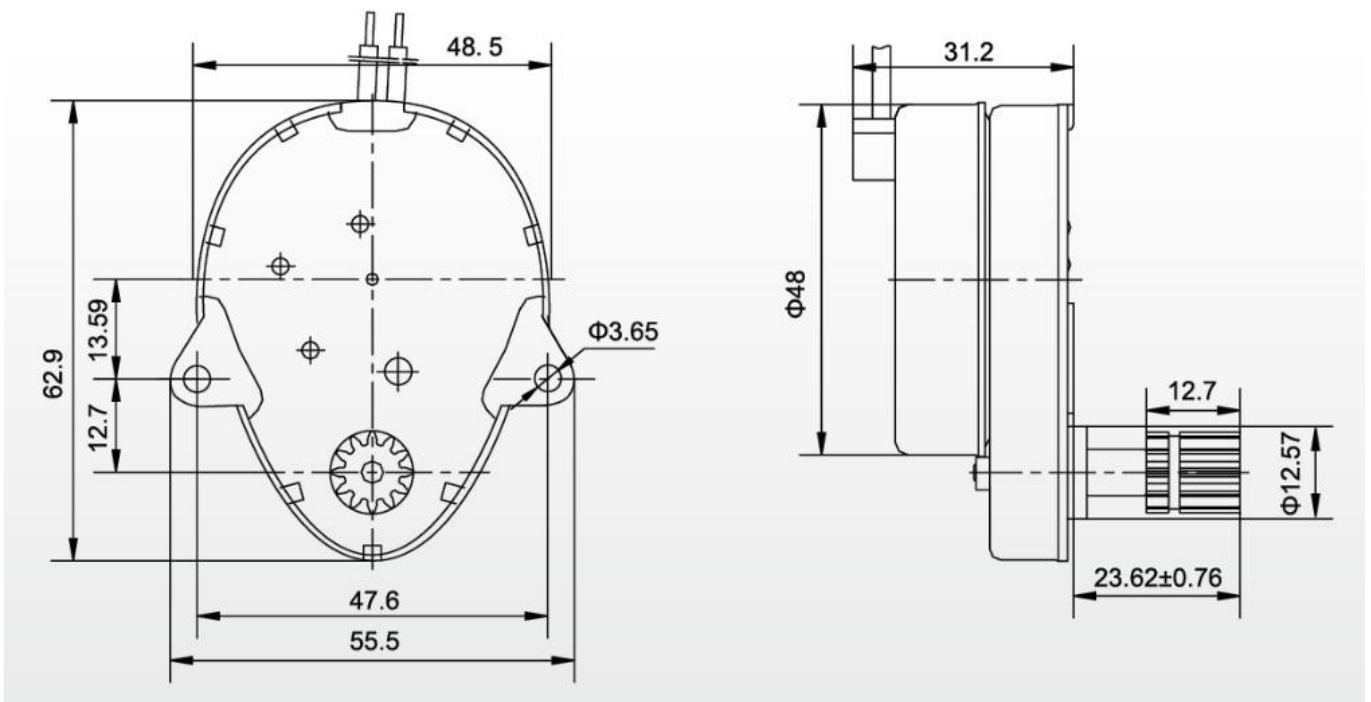
003050 Synchronous PM



Typical Applications

- Valve Control
- Timer
- Home Appliances
 - Air-conditioning

Mechanical dimensions: mm



003050 Synchronous PM

Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [N.m]	Starting Voltage [V]	Temperature Rise[K]	Noise dB [A]	Insulation Class	Weight [g]
M012 AI09 00- 50- 24	12	50/60	2	≤280	≤3	≥0.90	≤9	≤60	≤40	A	140
M024 AI09 00- 50- 24	24	50/60	2	≤150	≤3	≥0.90	≤18	≤60	≤40	A	140
M115 AI09 00- 50- 24	115	50/60	2	≤35	≤3	≥0.90	≤90	≤60	≤40	A	140
M240 AI09 00- 50- 24	220-240	50/60	2	≤20	≤3	≥0.90	≤180	≤60	≤40	A	140
M012 AI14 00- 50- 24	12	50/60	4/3	≤280	≤3	≥1.40	≤9	≤60	≤40	A	140
M024 AI14 00- 50- 24	24	50/60	4/3	≤150	≤3	≥1.40	≤18	≤60	≤40	A	140
M115 AI14 00- 50- 24	115	50/60	4/3	≤35	≤3	≥1.40	≤90	≤60	≤40	A	140
M240 AI14 00- 50- 24	220-240	50/60	4/3	≤20	≤3	≥1.40	≤180	≤60	≤40	A	140
M012 AI01 50- 50- 24	12	50/60	12	≤280	≤3	≥0.15	≤9	≤60	≤40	A	140
M024 AI01 50- 50- 24	24	50/60	12	≤150	≤3	≥0.15	≤18	≤60	≤40	A	140

003050 Synchronous PM

M115 AI01 50- 50- 24	115	50/60	12	≤ 35	≤ 3	≥ 0.15	≤ 90	≤ 60	≤ 40	A	140
M240 AI01 50- 50- 24	220-240	50/60	12	≤ 20	≤ 3	≥ 0.15	≤ 180	≤ 60	≤ 40	A	140

003050-1 Synchronous PM

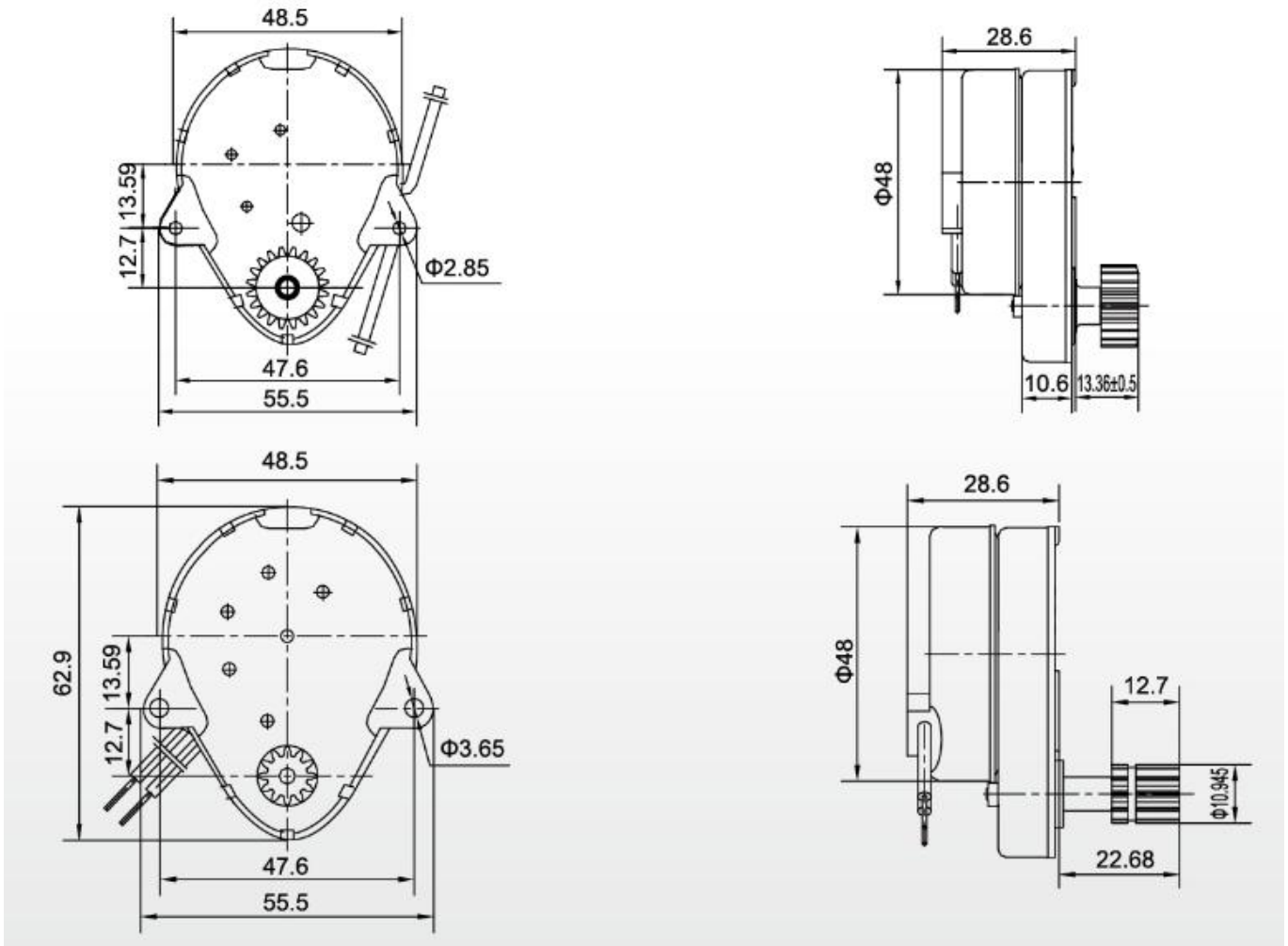


Typical Applications

- Valve Control
- Timer
- Home Appliances
 - Air-conditioning

Mechanical dimensions: mm

003050-1 Synchronous PM



Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [N.m]	Starting Voltage [V]	Temperature Rise [K]	Noise dB [A]	Insulation Class	Weight [g]
M120 AI14 10- 50- 24	120	60	1/30	≤30	≤3	≥1.41	≤90	≤60	≤40	A	140
M220 AI05 00- 50- 24	220/240	50/60	1	≤20	≤3	≥0.5	≤180	≤60	≤40	A	140
M120 AI05 00- 50- 24	120	60	1	≤30	≤3	≥0.5	≤90	≤60	≤40	A	140

003050-1 Synchronous PM

M220 AI14 10- 50- 24	220/240	50/60	1/30	≤ 20	≤ 3	≥ 1.41	≤ 180	≤ 60	≤ 40	A	140
M024 AI14 10- 50- 24	24	50/60	1/30	≤ 130	≤ 3	≥ 1.41	≤ 18	≤ 60	≤ 40	A	140
M024 AI07 00- 50- 24	24	60	1	≤ 130	≤ 3	≥ 0.7	≤ 18	≤ 60	≤ 40	A	140
M220 AI05 00- 50- 24	220/240	50/60	0.9375	≤ 20	≤ 3	≥ 0.5	≤ 180	≤ 60	≤ 40	A	140

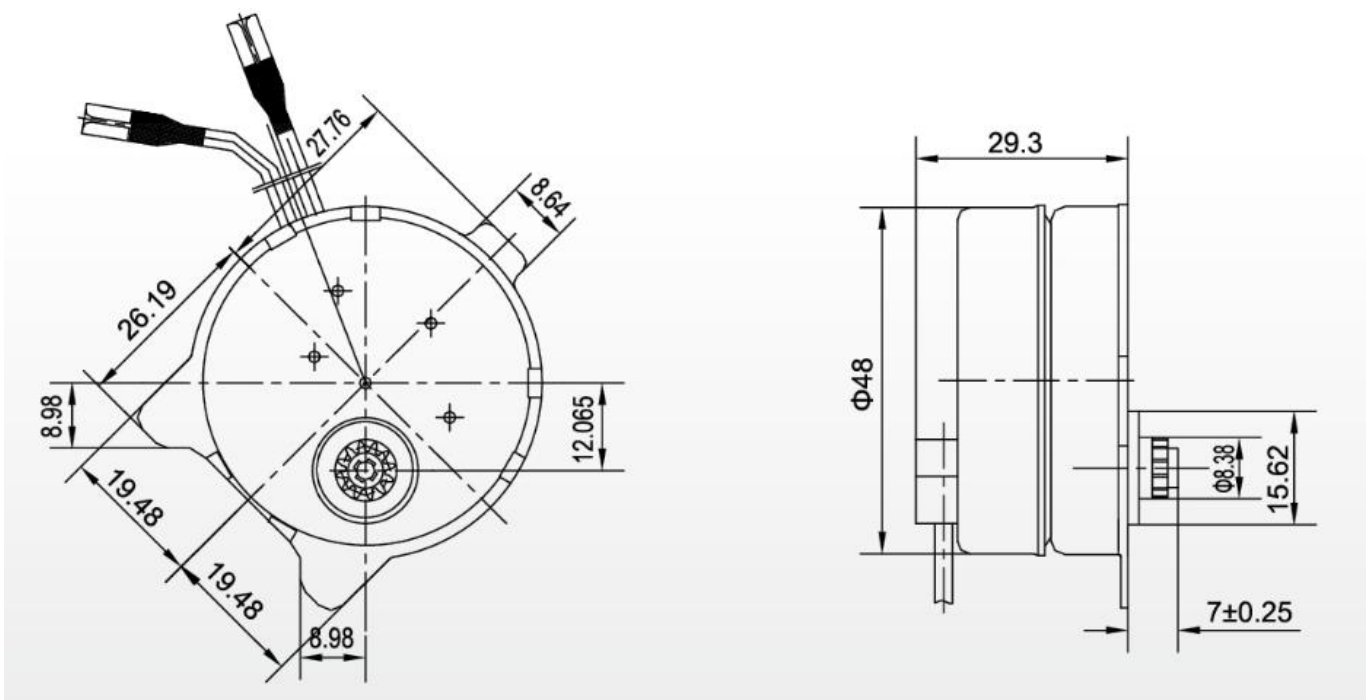
003050-2 Synchronous PM



Typical Applications

- Valve Control
- Timer
- Home Appliances
 - Air-conditioning

Mechanical dimensions: mm

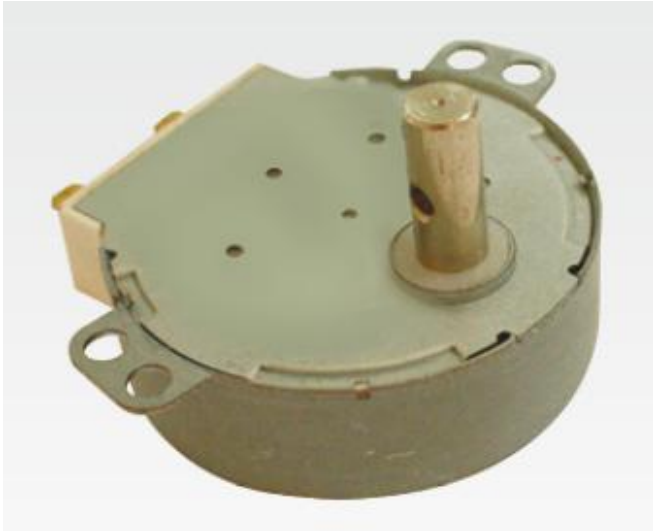


003050-2 Synchronous PM

Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [N.m]	Starting Voltage [V]	Temperature Rise[K]	Noise dB [A]	Insulation Class	Weight [g]
M115 AI03 00-50-23	115	60	9	≤35	≤3	≥0.30	≤90	≤60	≤40	A	105
M115 AI03 00-50-23	115	60	2.25	≤35	≤3	≥0.30	≤90	≤60	≤40	A	105
M115 AI03 00-50-23	115	60	2.656	≤35	≤3	≥0.30	≤90	≤60	≤40	A	105
M115 AI03 00-50-23	115	60	3	≤35	≤3	≥0.30	≤90	≤60	≤40	A	105
M115 AI03 00-50-23	115	60	1/36	≤35	≤3	≥0.30	≤90	≤60	≤40	A	105
M115 AI03 00-50-23	115	60	2/135	≤35	≤3	≥0.30	≤90	≤60	≤40	A	105
M220 AI03 00-50-23	220/240	50/60	4.5	≤35	≤3	≥0.30	≤180	≤60	≤40	A	105
M115 AI03 00-50-23	115	60	6	≤35	≤3	≥0.30	≤90	≤60	≤40	A	105
M115 AI03 00-50-23	115	60	28/297	≤35	≤3	≥0.30	≤90	≤60	≤40	A	105

003050-3 Synchronous PM



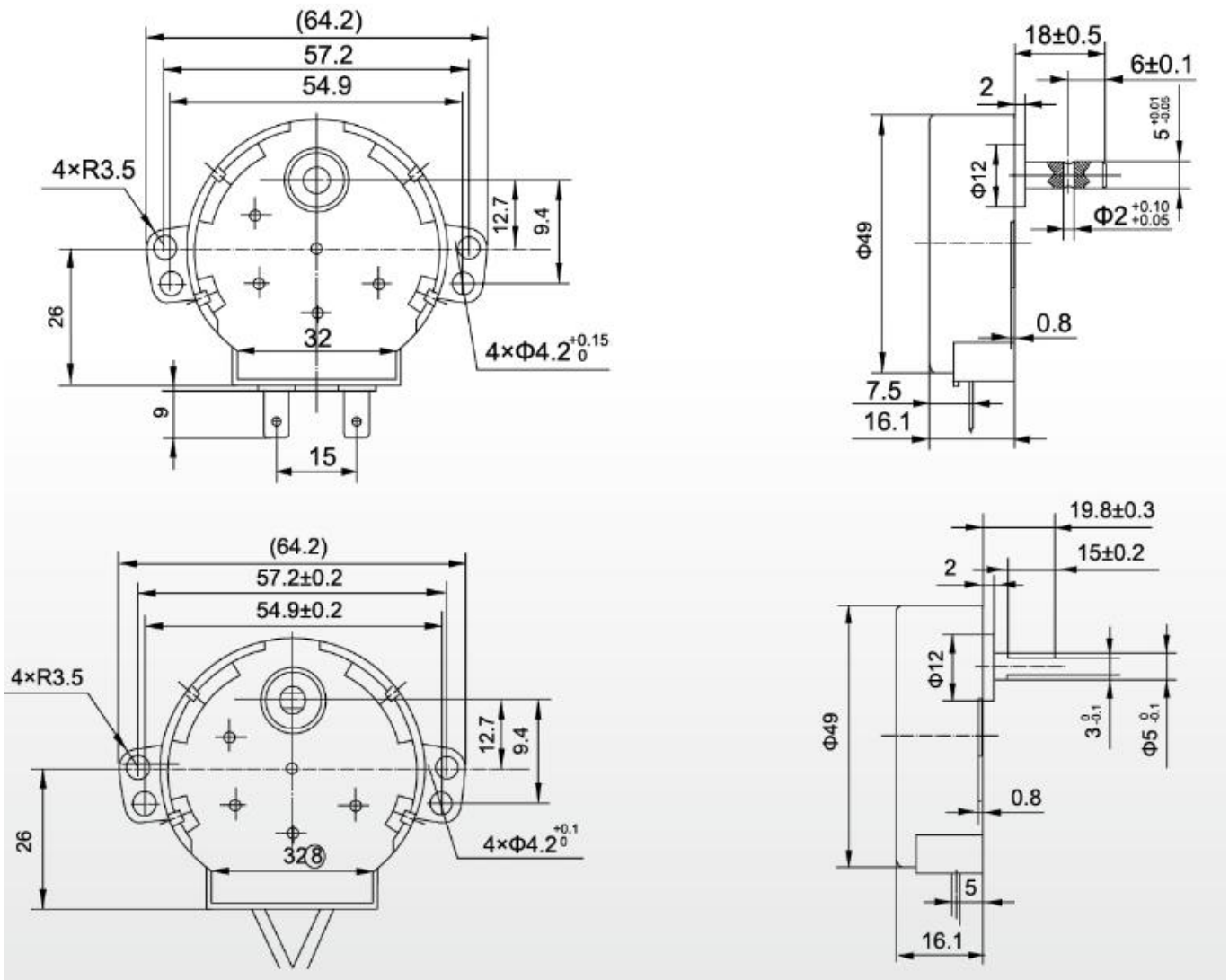
Typical Applications

Home Appliances

- Air-conditioning
- Roaster
- Electrical andiron
- Actomatic Door Lock
- Microwave Oven

Mechanical dimensions: mm

003050-3 Synchronous PM



Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Starting Voltage [V]	Temperature Rise [K]	Noise dB [A]	Insulation Class	Weight [g]
M110 AI02 11-50-16	110/220	50/60	5/6	≤40	≤3.5	≥2.16	≤96	≤60	≤40	A	80
M110 AI02 45-50-16	110/220	50/60	4/5	≤40	≤3.5	≥2.5	≤96	≤60	≤40	E	80

003050-3 Synchronous PM

M110 AI03 92- 50- 16	110/220	50/60	2.5/3	≤ 40	≤ 3.5	≥ 4	≤ 96	≤ 60	≤ 40	E	80
M220 AI02 11- 50- 16	220/240	50/60	5/6	≤ 20	≤ 3.5	≥ 2.16	≤ 176	≤ 60	≤ 40	E	80
M220 AI02 45- 50- 16	220/240	50/60	4/5	≤ 20	≤ 3.5	≥ 2.5	≤ 176	≤ 60	≤ 40	E	80
M220 AI03 92- 50- 16	220/240	50/60	2.5/3	≤ 20	≤ 3.5	≥ 4	≤ 176	≤ 60	≤ 40	E	80
M220 AI00 78- 50- 16	220/240	50/60	20/24	≤ 20	≤ 3.5	≥ 0.8	≤ 176	≤ 60	≤ 40	E	80

004050 Synchronous PM



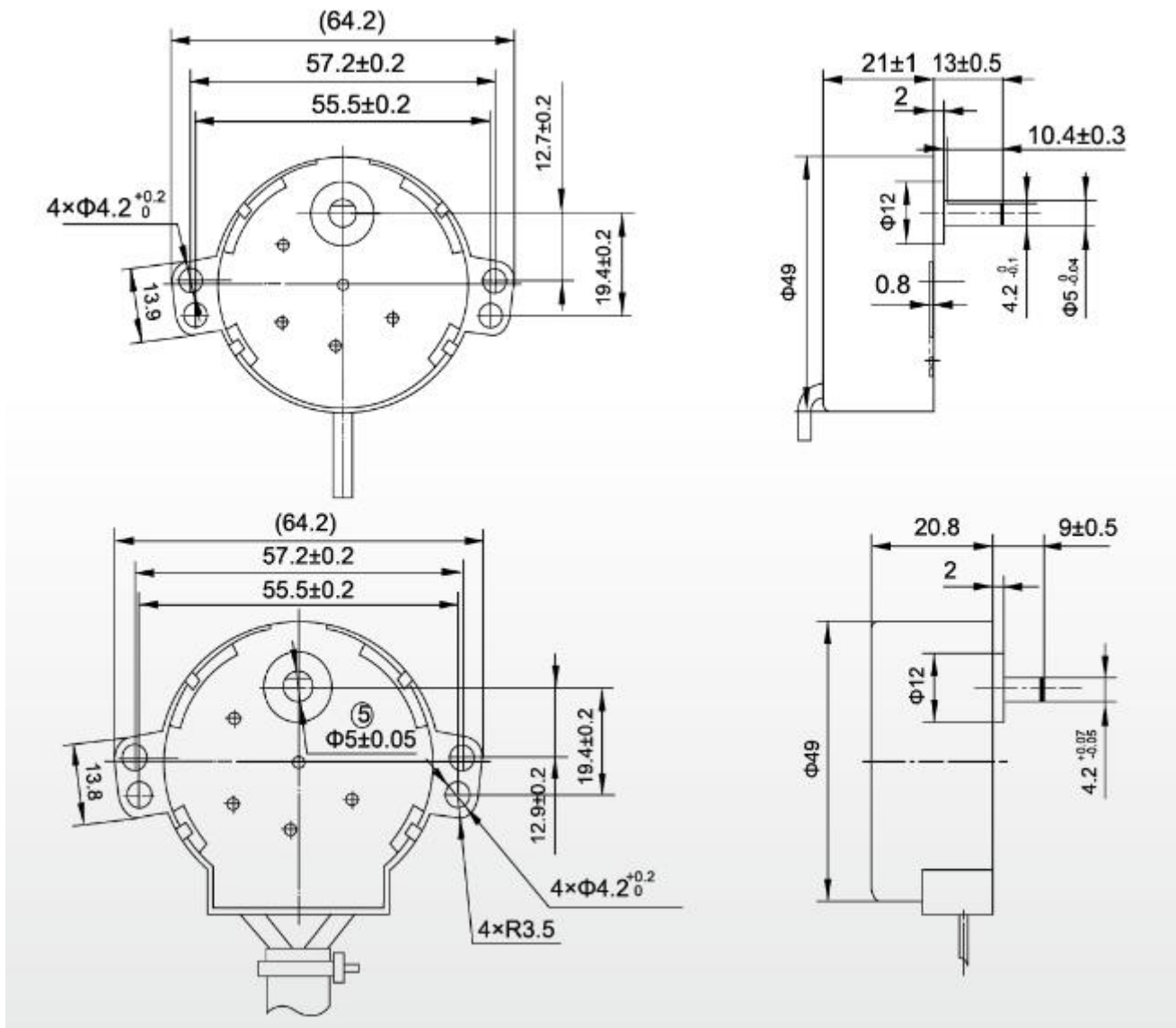
Typical Applications

Home Appliances

- Air-conditioning
- Roaster
- Electrical andiron
- Actomatic Door Lock
- Microwave Oven

Mechanical dimensions: mm

004050 Synchronous PM



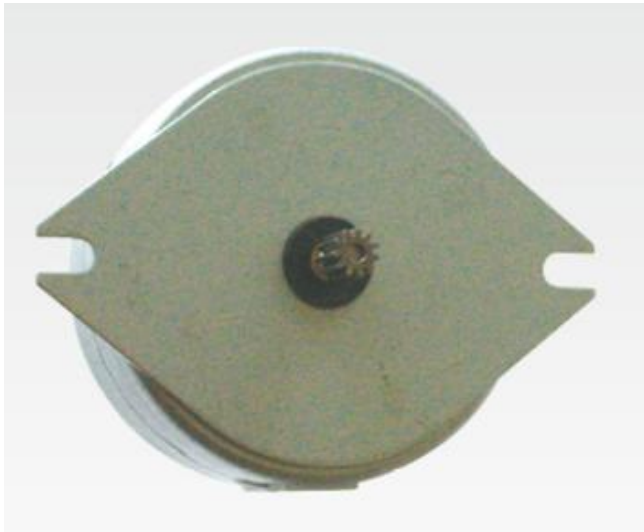
Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Starting Voltage [V]	Temperature Rise [K]	Noise dB [A]	Insulation Class	Weight [g]
M110 AI03 92-50-21	110/220	50/60	5/6	≤40	≤4	≥4	≤96	≤60	≤40	E	90
M110 AI04 90-50-21	110/220	50/60	4/5	≤40	≤4	≥5	≤96	≤60	≤40	E	90

004050 Synchronous PM

M220 AI03 92- 50- 21	220/240	50/60	5/6	≤ 20	≤ 4	≥ 4	≤ 176	≤ 60	≤ 40	E	90
M220 AI04 90- 50- 21	220/240	50/60	4/5	≤ 20	≤ 4	≥ 5	≤ 176	≤ 60	≤ 40	E	90
M220 AI05 88- 50- 21	220/240	50/60	2.5/3	≤ 20	≤ 4	≥ 6	≤ 176	≤ 60	≤ 40	E	90
M220 AI00 98- 50- 21	220/240	50/60	15/18	≤ 20	≤ 4	≥ 1	≤ 176	≤ 60	≤ 40	E	90

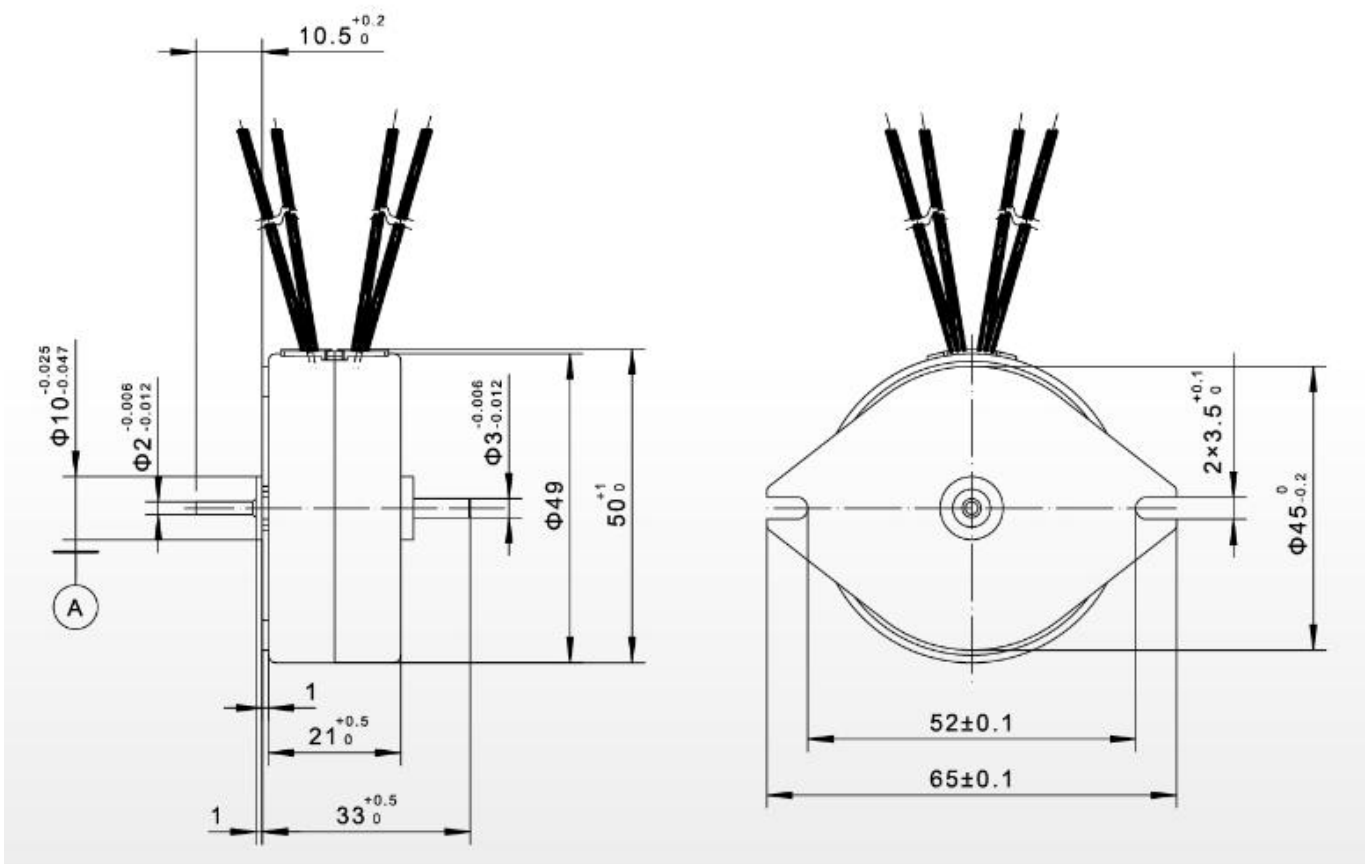
004050-1 Synchronous PM



Typical Applications

Building Automatic System(BAS)

Mechanical dimensions: mm



004050-1 Synchronous PM

Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Starting Voltage [V]	Temperature Rise [K]	Noise dB [A]	Insulation Class	Weight [g]
M024 A100 24- 50- 21	24	50/60	250/300	≤160/182	≤ 3.86/4.37	≥0.25	-	≤55/60	≤25	B	180

004050-2 Synchronous PM

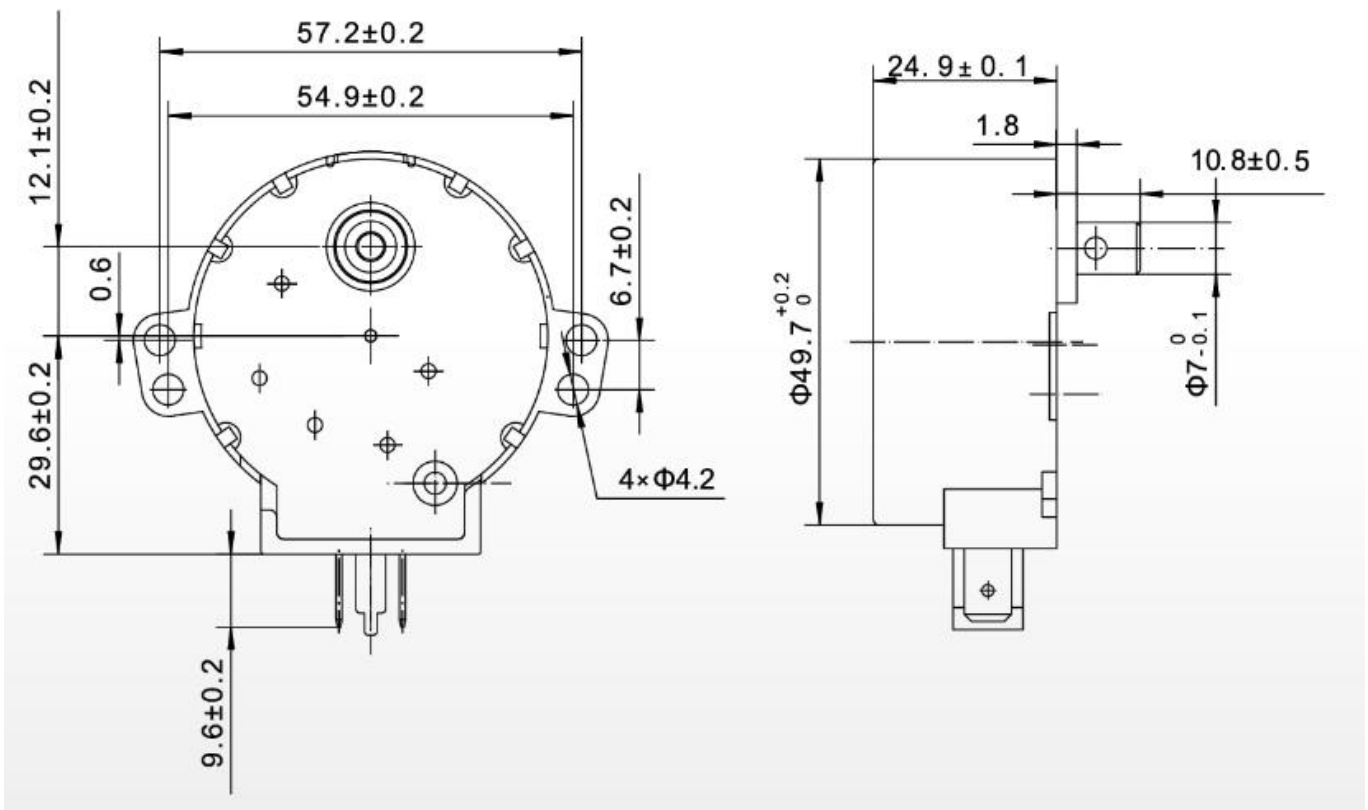


Typical Applications

Home Appliances

- Roaster

Mechanical dimensions: mm



004050-2 Synchronous PM

Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Starting Voltage [V]	Temperature Rise[K]	Noise dB [A]	Insulation Class	Weight [g]
M120 AI09 80- 50- 25	120	50/60	1.66/2	≤40	≤4	≥10	≤95	≤55	≤40	B	128

005050 Synchronous PM

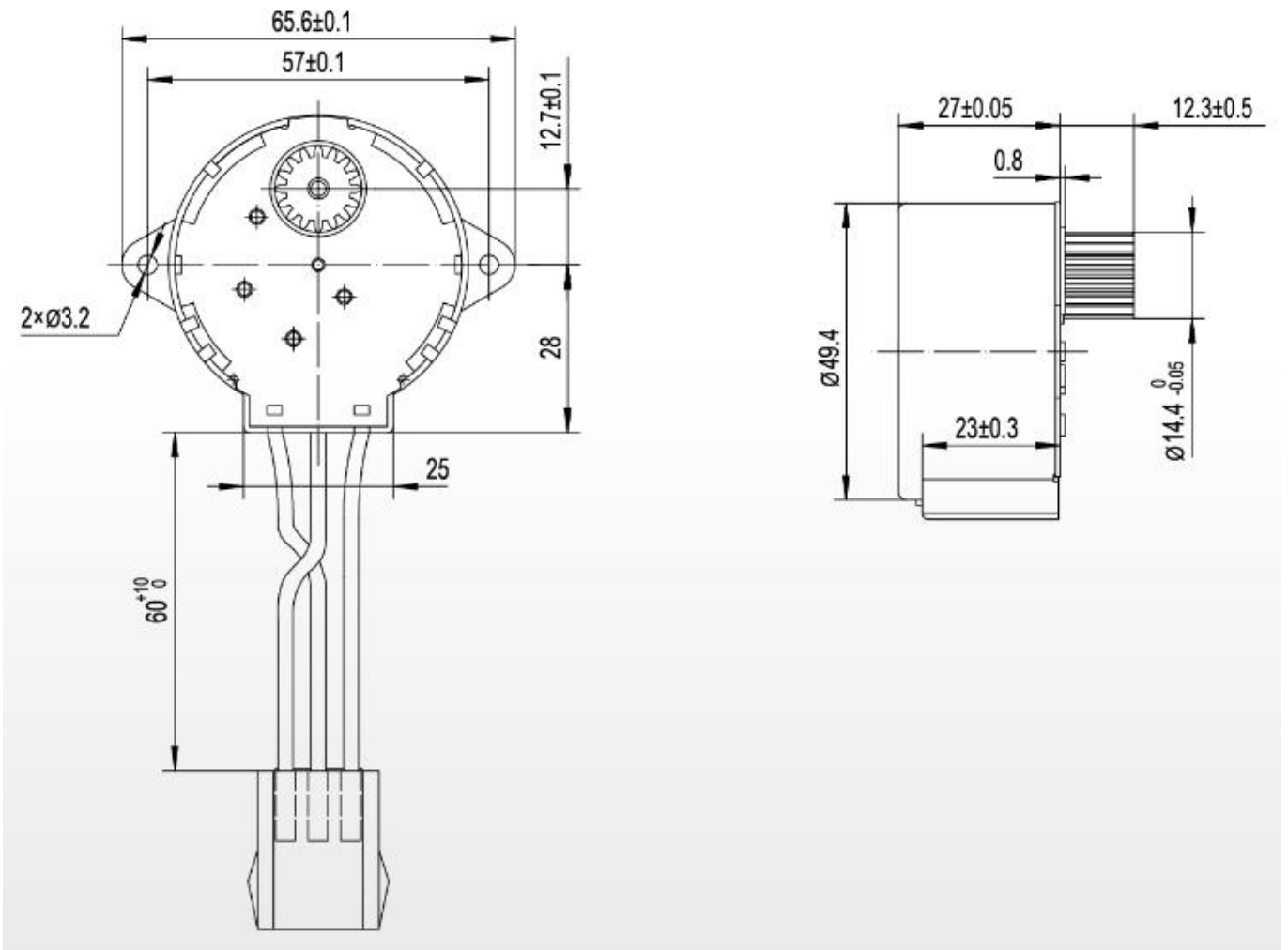


Typical Applications

- Home Appliances
- Refrigerator

Mechanical dimensions: mm

005050 Synchronous PM



Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Starting Voltage [V]	Temperature Rise [K]	Noise dB [A]	Insulation Class	Weight [g]
M120 AI04 41-50-27	120	60	1.5	≤40	≤5	≥4.5	≤96	≤65	≤40	E	90
M220 AI05 39-50-27	220/240	50	1.25	≤20	≤5	≥5.5	≤176	≤65	≤40	E	90
M220 AI05 88-50-27	220	60	1.5	≤30	≤6	≥6	≤176	≤65	≤40	E	90

007050 Synchronous PM



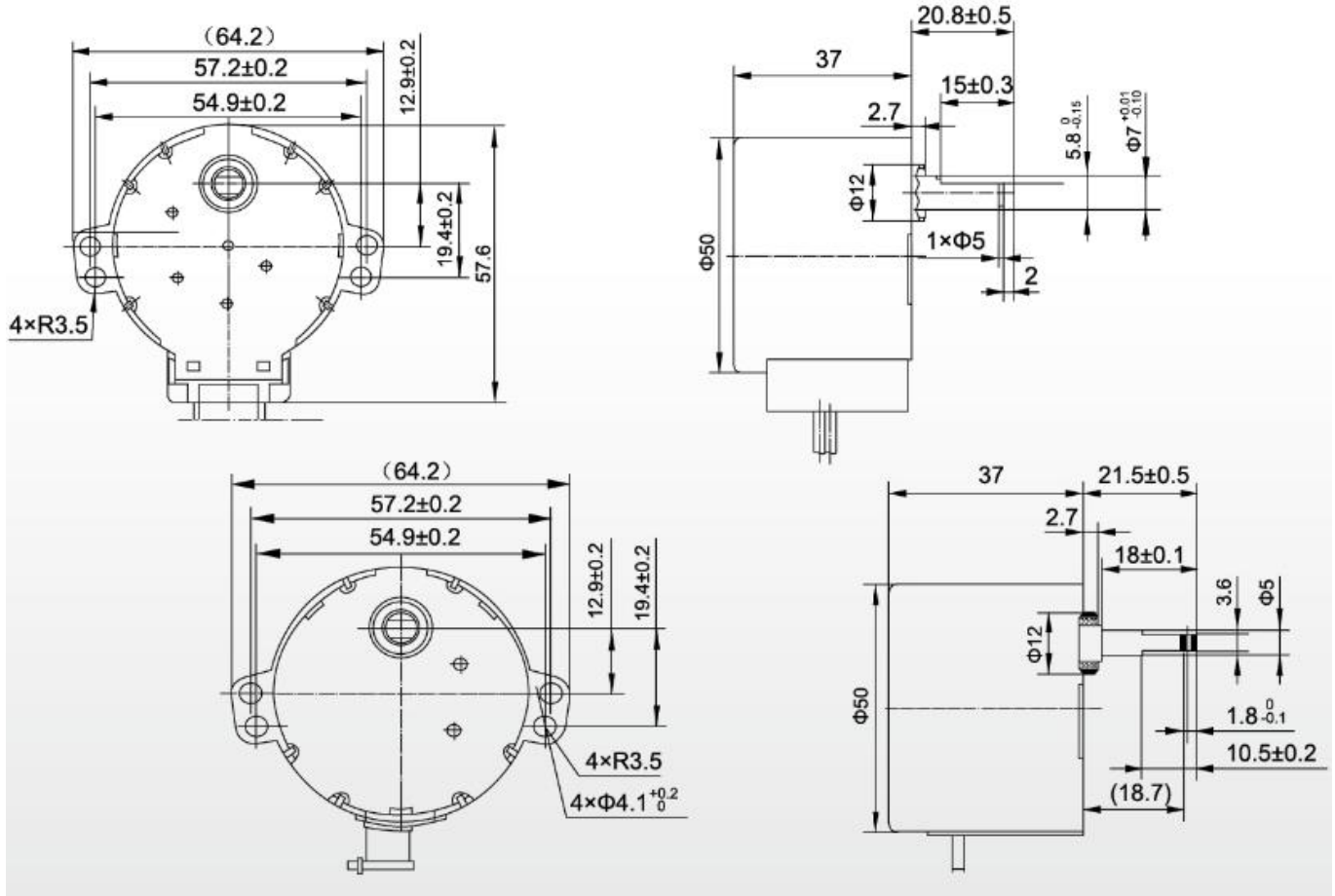
Typical Applications

Home Appliances

- Air-conditioning
- Roaster
- Electrical andiron
- Automatic Door Lock
- Microwave Oven

Mechanical dimensions: mm

007050 Synchronous PM



Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Power [W]	Stall Torque [kgf.cm]	Temperature Rise [K]	Noise dB [A]	Insulation Class	Weight [g]
M024A I2940- 50-37	24 110/120 200/240	50/60	1.1/1.3	≤7	30	≤75	≤40	E	250
M024A I2940- 50-37		50/60	1.6/2	≤7	30	≤75	≤40	E	250
M024A I0980- 50-37		50/60	5/6	≤7	10	≤75	≤40	E	250

007050 Synchronous PM

M024A I0980- 50-37		50/60	8.3/10	≤7	10	≤75	≤40	E	250
M024A I0686- 50-37		50/60	11.5/13.8	≤7	7	≤75	≤40	E	250
M024A 0588- 50-37		50/60	11.7/14	≤7	6	≤75	≤40	E	250
M024A I0392- 50-37		50/60	15/18	≤7	4	≤75	≤40	E	250
M024A I0343- 50-37		50/60	16.5/19.8	≤7	3.5	≤75	≤40	E	250
M024A I0294- 50-37		50/60	20/24	≤7	3	≤75	≤40	E	250
M024A 0245- 50-37		50/60	33.3/40	≤7	2.5	≤75	≤40	E	250
M024A I0196- 50-37		50/60	40/48	≤7	2	≤75	≤40	E	250

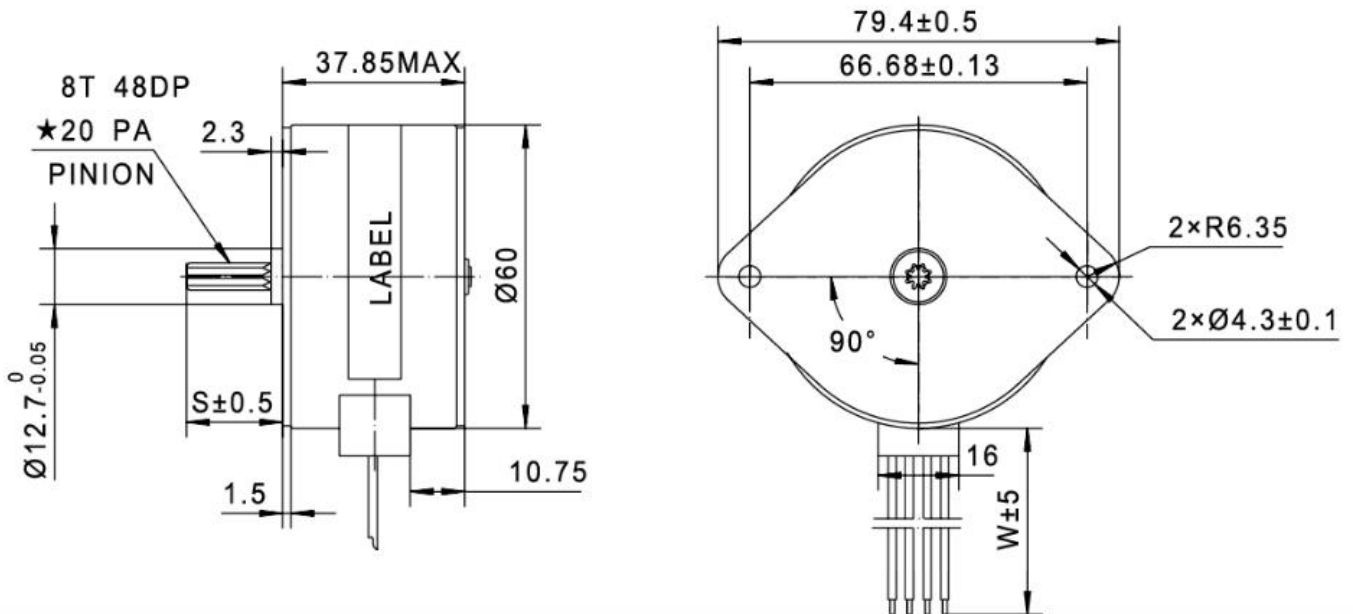
005060 Synchronous PM



Typical Applications

- Printer
- Copycat
- Value Control
- Special-Purpose

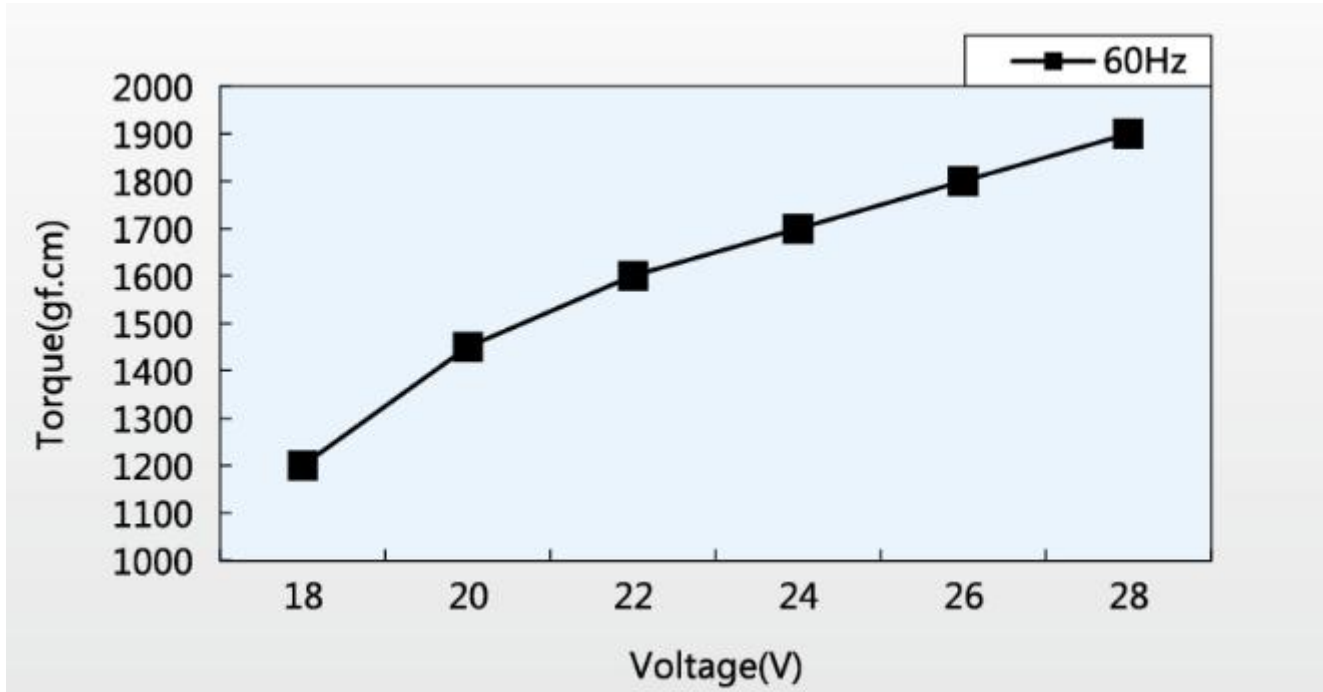
Mechanical dimensions: mm



005060 Synchronous PM

Torque Characteristics

CONST.VOLT(at 24V,33uF,60Hz)



Specification

Type	Drive Voltage [V]	Capacitance [uF]	Frequency [Hz]	Output Speed [rpm]	Coil Resistance/Phase [Ω]	Insulation Resistance	Dielectnic Strength	Class Of Insulation
M024AI 0171- 60-37	AC24	33	50/60	250/300	13.5	100M Ω min	500VAC1min	E
M230AI 0206- 60-37	AC230	0.33	50/60	250/300	1350	100M Ω min	500VAC1min	E

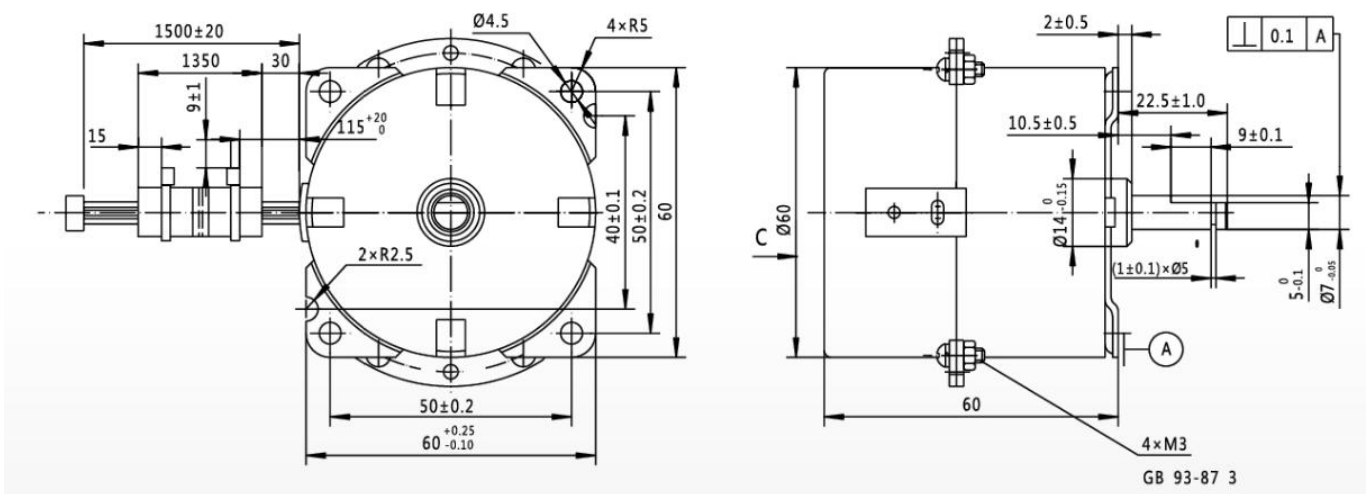
010060 Synchronous PM



Typical Applications

- Home Appliances
- Air-conditioning
- Roaster
- Electrical andiron
- Actomatic Door Lock
- Microwave Oven

Mechanical dimensions: mm



010060 Synchronous PM

Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [mA]	Input Power [W]	Stall Torque [kgf.cm]	Starting Voltage [V]	Temperature Rise[K]	Noise dB [A]	Insulation Class	Weight [g]
M220 A106 86- 60- 60	200/240	50/60	20/24	≤45	≤10	≥7.0	≤176	≤75	40	E	570

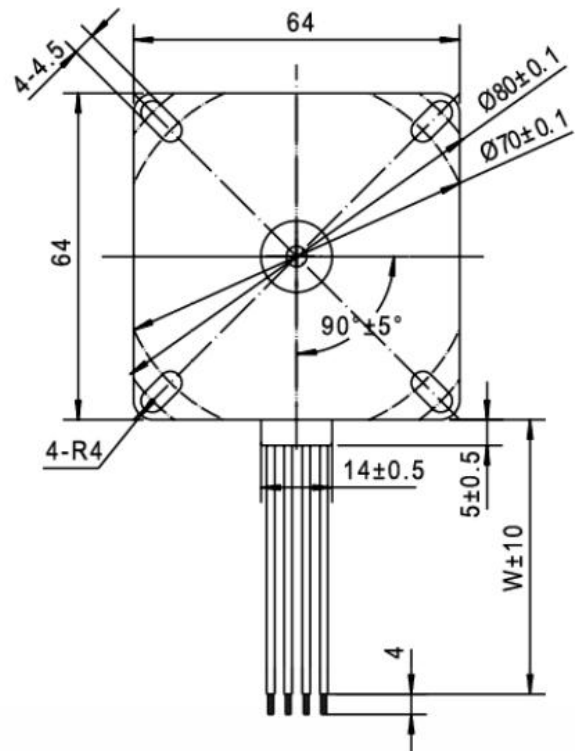
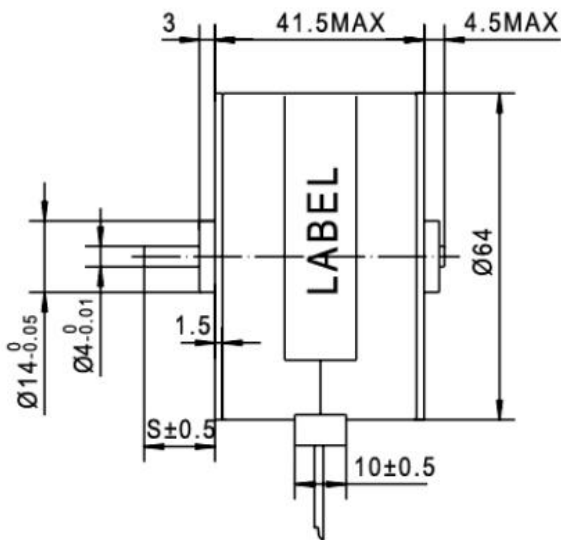
005064 Synchronous PM



Typical Applications

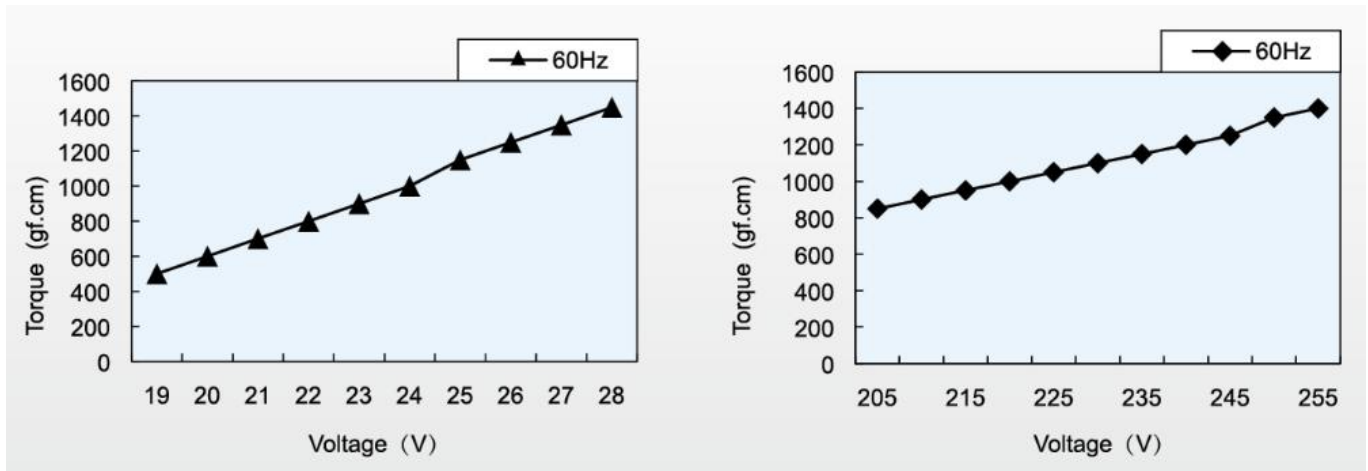
Value Control

Mechanical dimensions: mm



005064 Synchronous PM

Torque Characteristics



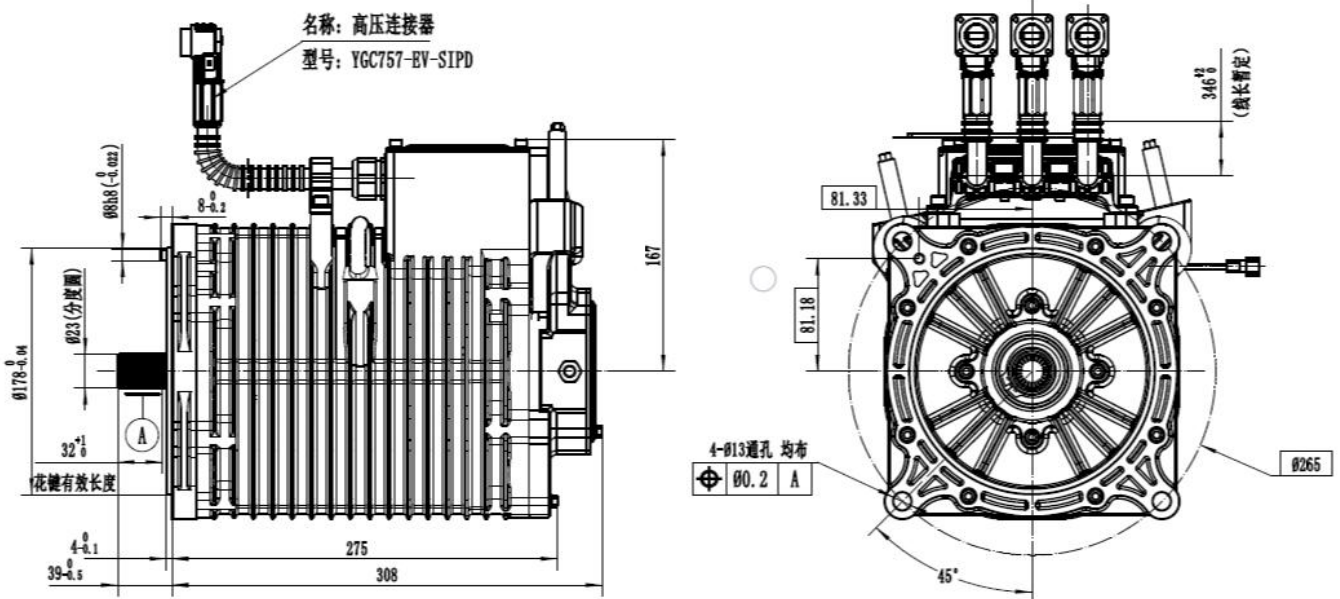
Specification

Type	Drive Voltage [V]	Capacitance [uF]	Frequency [Hz]	Output Speed [rpm]	Coil Resistance/Phase [Ω]	Insulation Resistance	Dielectric Strength	Class Of Insulation
M230AI 0112- 64-41	AC230	0.33	50/60	375/450	2450	100MΩ min	500VAC1min	E
M024AI 0130- 64-41	AC24	33	50/60	375/450	24	100MΩ min	500VAC1min	E

015212 Synchronous PM



Mechanical dimensions: mm



Specification

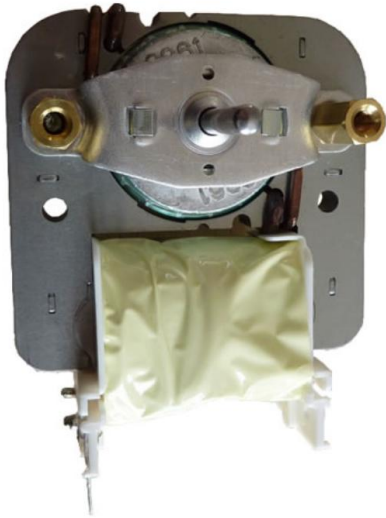
Type	Voltage	Torque	Peak Torque	Power	Peak Power	Speed	Duty	IP Grade	Insulation Class
M144AI04 70-212-308	144 VDC	47 N.m	150 N.m	15 kW	35 kW	6000 rpm	S9	IP67	H

015212 Synchronous PM

Configuration

- Shaft Modification and double shaft
- Other winding voltage possible
- Other Types available with special length

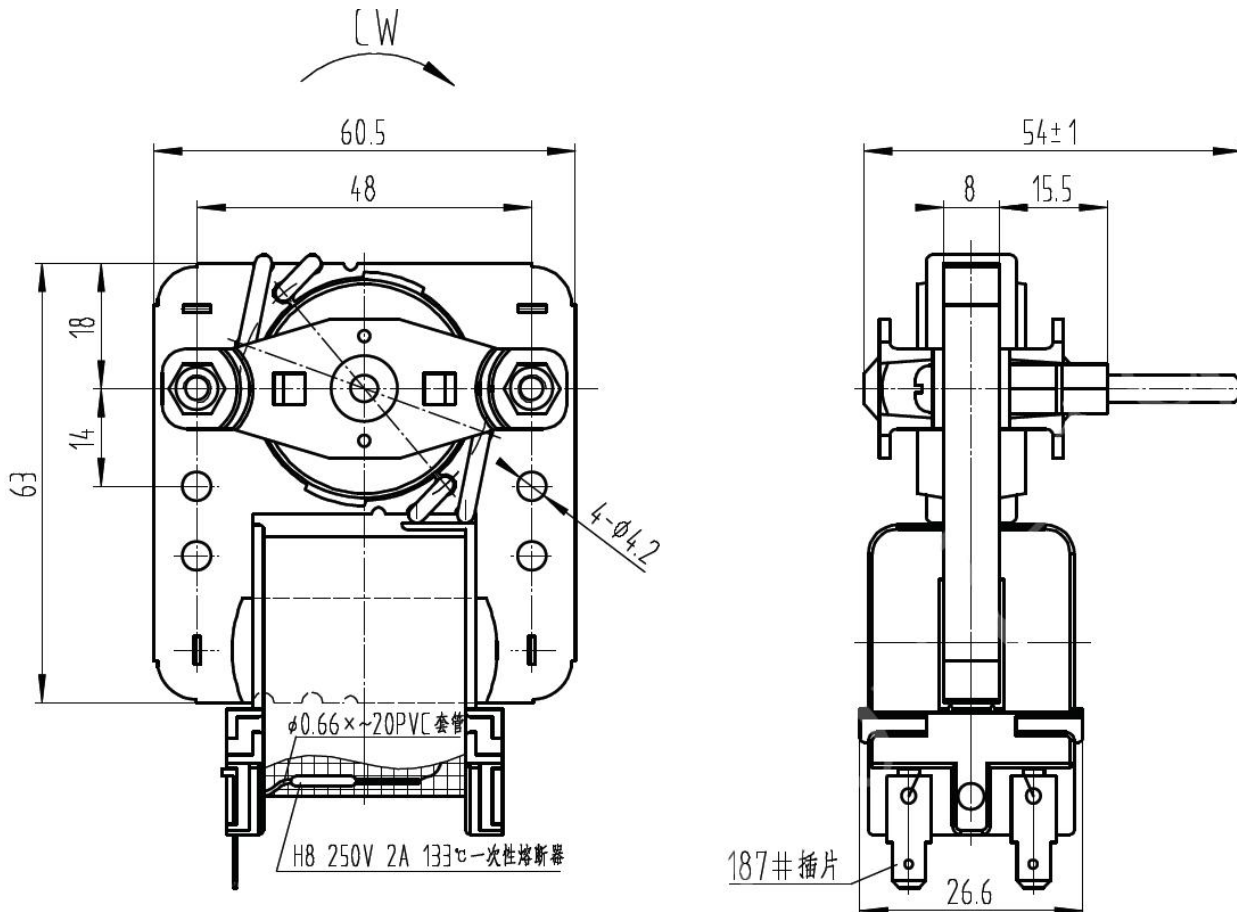
100061 Shaded pole motor



Typical Applications

- Home Appliances
 - Dishwasher

Mechanical dimensions: mm

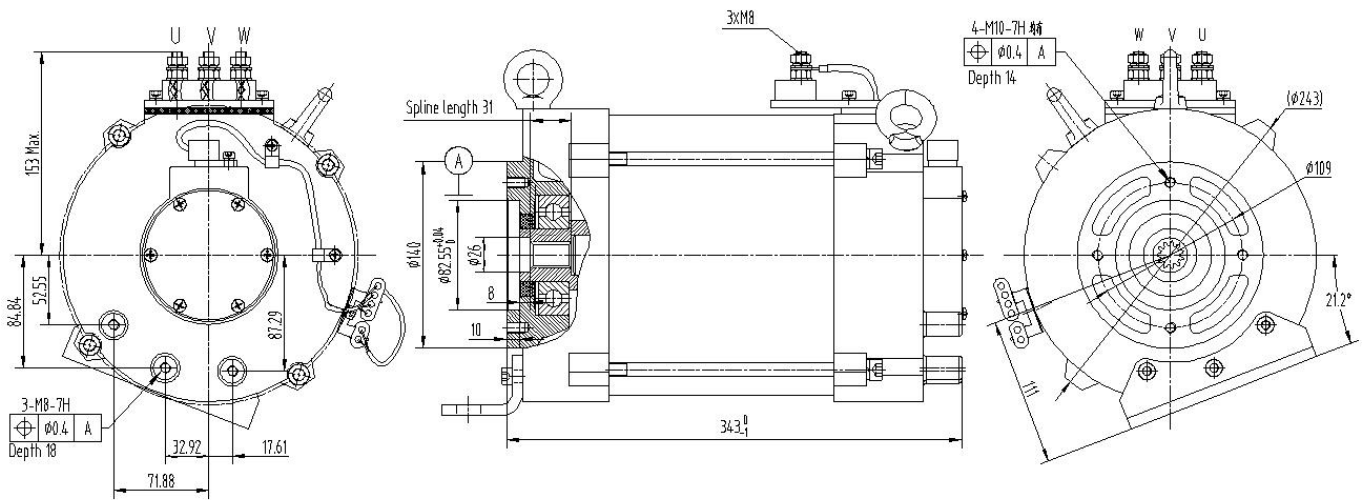


100061 Shaded pole motor

Specification

Type	Rated Voltage [V]	Operation Frequency [Hz]	Rated Speed [rpm]	Input Current [A]	Input Power [W]	No-load Start-Up Voltage [V]	Temperature Rise[K]	Noise dB [A]	Insulation Class
M100 AI004 7-61-8	100AC	50/60	2330/2100	\leq 0.254/0.19 8	\leq 10.5/9. 2	\leq 55	\leq 90	\leq 33	E

015220 Three-phase AC motor



Specification

Type	Voltage	Current	Power	Speed	Duty	IP Grade	Insulation Class
M033XI0527-220-343	25/33 VAC	433/328 A	15 kW	2030/2715 rpm	S3-15%	IP54	H

Configuration

- Shaft Modification and double shaft
- Other winding voltage possible
- Other Types available with special length