

## Standard AC Motor Type

# MSS·W Series



This is unit products which is combined a compact speed control pack and 6W-90W speed control motor.



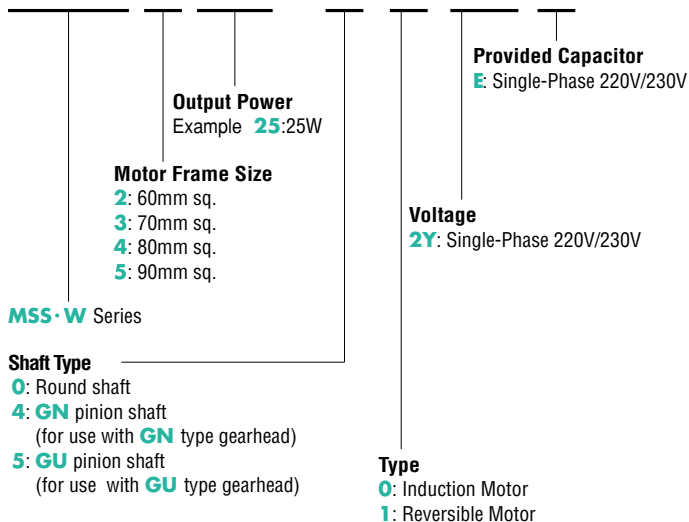
The gearhead shown in the photograph is sold separately.

## Features

- **Speed control range**  
90~1400r/min (50Hz), 90~1600r/min (60Hz)
- **Speed control motor unit**  
Directly connected to the programming controller, the speed control pack is used for managing the motor speed. It is not necessary for controlling through the power relay, realizing less wiring and reduced maintenance.
- **Multi-functions**  
In addition to the speed controlling function, a variety of controlling functions are featured in the attempt to responding to different driving conditions. Those functions include slow start/slow down function, immediate stopping function, changing driving direction function.
- **Easy wiring**  
The motor and the control pack can be connected easily through the connector.
- **Built-in overheat protection device**  
Motors contain a built-in overheat protection device.  
6W: Impedance protected  
15W~90W: Built-in thermal protector.
- **Wide range of variation**  
From the frame size of 60mm sq. 6W type to 90mm sq. 90W type, a variety of products are lined up in the series.

## Product Number Code

# MSS 4 25 - 4 0 2Y E



**Note:** The "E" at the end of the model number indicate that the unit includes a capacitor. This letter is not listed on the motor nameplate.

- Refer to page A-32 for the Product Number Code of the Gearheads.

## Safety Standards and CE Marking

Products	Standards	Certification Body	Standards File No.	CE Marking
Motor	UL1004 UL519(6W type) UL547(15W-90W type)	UL	E64199(6W type) E64197(15W~90W type)	Low Voltage Directive
	CSA C22.2 No.100 CSA C22.2 No.77			
	EN60950	VDE	114919ÜG (6W type) 6751ÜG (15W~90W type)	
	EN60034-1 EN60034-5 IEC60034-11 *	Conform to EN/IEC Standards (EN/IEC certifications are scheduled.)		
	Control Pack	UL508 CSA C22.2 No.14	UL	
EN60950 EN50178		Conform to EN Standards		

**Note:** Recognized name and certified name are motor name and speed control pack name.

- For installation conditions for EN/IEC standards, refer to page D-2.
- \* 15W ~ 90W type.

### Installation Conditions

- Overvoltage category II
- Pollution degree 2
- Class I equipment

## Product Lines

### Induction Motors

Output Power (W)	Pinion shaft type	Round shaft type
6	<b>MSS206-402YE</b>	<b>MSS206-002YE</b>
15	<b>MSS315-402YE</b>	<b>MSS315-002YE</b>
25	<b>MSS425-402YE</b>	<b>MSS425-002YE</b>
40	<b>MSS540-402YE</b>	<b>MSS540-002YE</b>
60	<b>MSS560-502YE</b>	<b>MSS560-002YE</b>
90	<b>MSS590-502YE</b>	<b>MSS590-002YE</b>

### Reversible Motors

Output Power (W)	Pinion shaft type	Round shaft type
6	<b>MSS206-412YE</b>	<b>MSS206-012YE</b>
15	<b>MSS315-412YE</b>	<b>MSS315-012YE</b>
25	<b>MSS425-412YE</b>	<b>MSS425-012YE</b>
40	<b>MSS540-412YE</b>	<b>MSS540-012YE</b>
60	<b>MSS560-512YE</b>	<b>MSS560-012YE</b>
90	<b>MSS590-512YE</b>	<b>MSS590-012YE</b>

## Specifications

### Induction Motors – Continuous Rating

Model	Pinion Shaft Type		Maximum Output Power W	Voltage V	Frequency Hz	Variable Speed Range *1 r/min	Permissible Torque		Starting Torque mN·m	Current A	Power Consumption W	Capacitor $\mu$ F
	Pinion Shaft Type	Round Shaft Type					1200r/min mN·m	90r/min mN·m				
Ⓟ <b>MSS206-402YE</b>	<b>MSS206-002YE</b>		6	220	60	90 ~ 1600	50	32	44	0.14	27	0.6
				230	50	90 ~ 1400	47	32	44	0.13	26	0.6
				230	60	90 ~ 1600	50	32	50	0.14	28	0.6
Ⓟ <b>MSS315-402YE</b>	<b>MSS315-002YE</b>		15	220	60	90 ~ 1600	125	40	67	0.23	46	1
				230	50	90 ~ 1400	125	40	72	0.23	43	1
				230	60	90 ~ 1600	125	40	81	0.23	46	1
Ⓟ <b>MSS425-402YE</b>	<b>MSS425-002YE</b>		25	220	60	90 ~ 1600	200	47	120	0.34	67	1.5
				230	50	90 ~ 1400	205	50	125	0.33	62	1.5
				230	60	90 ~ 1600	185	45	135	0.35	68	1.5
Ⓟ <b>MSS540-402YE</b>	<b>MSS540-002YE</b>		40	220	60	90 ~ 1600	260	70	190	0.56	106	2.3
				230	50	90 ~ 1400	320	65	190	0.53	95	2.3
				230	60	90 ~ 1600	240	70	190	0.55	104	2.3
Ⓟ <b>MSS560-502YE</b>	<b>MSS560-002YE</b>		60	220	60	90 ~ 1600	490	230	350	0.95	180	4
				230	50	90 ~ 1400	490	200	350	0.92	170	4
				230	60	90 ~ 1600	490	230	350	0.96	185	4
Ⓟ <b>MSS590-502YE</b>	<b>MSS590-002YE</b>		90	220	60	90 ~ 1600	730	280	460	1.3	236	6
				230	50	90 ~ 1400	730	260	460	1.2	217	6
				230	60	90 ~ 1600	730	290	460	1.3	239	6

Ⓟ :These motors are impedance protected.

Ⓟ :These motors contain a built-in thermal protector.When a motor overheats for any reason,the thermal protector is opened and the motor stops.When the motor temperature drops,the thermal protector closes and the motor restarts.Be sure to turn the motor off before inspecting.

\*1:The speed ranges shown are under no load condition.

● The "E" at the end of the model number indicate that the unit includes a capacitor. This letter is not listed on the motor nameplate.

### Reversible Motors – 30-Minutes Rating

Model	Pinion Shaft Type		Maximum Output Power W	Voltage V	Frequency Hz	Variable Speed Range *1 r/min	Permissible Torque		Starting Torque mN·m	Current A	Power Consumption W	Capacitor $\mu$ F
	Pinion Shaft Type	Round Shaft Type					1200r/min mN·m	90r/min mN·m				
Ⓟ <b>MSS206-412YE</b>	<b>MSS206-012YE</b>		6	220	60	90 ~ 1600	50	50	50	0.16	32	0.8
				230	50	90 ~ 1400	50	50	50	0.15	30	0.8
				230	60	90 ~ 1600	50	50	50	0.16	32	0.8
Ⓟ <b>MSS315-412YE</b>	<b>MSS315-012YE</b>		15	220	60	90 ~ 1600	125	90	104	0.29	58	1.5
				230	50	90 ~ 1400	125	90	120	0.28	55	1.5
				230	60	90 ~ 1600	125	89	120	0.29	58	1.5
Ⓟ <b>MSS425-412YE</b>	<b>MSS425-012YE</b>		25	220	60	90 ~ 1600	205	100	145	0.43	88	2
				230	50	90 ~ 1400	205	100	150	0.43	84	2
				230	60	90 ~ 1600	205	100	150	0.43	88	2
Ⓟ <b>MSS540-412YE</b>	<b>MSS540-012YE</b>		40	220	60	90 ~ 1600	320	145	260	0.71	130	3.5
				230	50	90 ~ 1400	320	145	260	0.72	127	3.5
				230	60	90 ~ 1600	320	145	260	0.71	129	3.5
Ⓟ <b>MSS560-512YE</b>	<b>MSS560-012YE</b>		60	220	60	90 ~ 1600	490	250	440	1.0	199	5
				230	50	90 ~ 1400	490	250	440	1.0	194	5
				230	60	90 ~ 1600	490	250	440	1.0	199	5
Ⓟ <b>MSS590-512YE</b>	<b>MSS590-012YE</b>		90	220	60	90 ~ 1600	730	260	540	1.4	253	7
				230	50	90 ~ 1400	730	260	540	1.3	236	7
				230	60	90 ~ 1600	730	260	540	1.4	258	7

Ⓟ :These motors are impedance protected.

Ⓟ :These motors contain a built-in thermal protector.When a motor overheats for any reason,the thermal protector is opened and the motor stops.When the motor temperature drops,the thermal protector closes and the motor restarts.Be sure to turn the motor off before inspecting.

\*1:The speed ranges shown are under no load condition.

● The permissible torque and the starting torque of the reversible motors are shown in terms without the brake applied. Please keep in mind that you should select a suitable motor with enough torque, when designing the equipment.

● The "E" at the end of the model number indicate that the unit includes a capacitor. This letter is not listed on the motor nameplate.

## General Specifications of Motors

● After rated motor operation under normal ambient temperature and humidity.

Item	Specifications
Insulation Resistance	100M $\Omega$ or more when 500V DC is applied between the windings and the frame.
Dielectric Strength	Sufficient to withstand 1.5kV at 50Hz and 60Hz applied between the windings and the frame.
Temperature Rise	80°C or less measured by the resistance change method after rated motor operation with connecting a gearhead or equivalent heat radiation plate.*
Insulation Class	Class B (130°C)
Overheat Protection	<b>MSS206</b> Type have impedance protection. All others have built-in thermal protector (Automatic return type) Operating temperature, open:130°C $\pm$ 5°C close:82°C $\pm$ 15°C
Ambient Temperature Range	-10°C~+40°C
Ambient Humidity	85% maximum (noncondensing)
Degree of protection	<b>MSS206,MSS315,MSS425,MSS540</b> Type:IP20 <b>MSS560,MSS590</b> Type:IP40

\* Equivalent head radiation plate sizes  
(material : aluminum)

Unit=mm

Model	Output power	W $\times$ D $\times$ t
<b>MSS206</b> Type	6W	115 $\times$ 115 $\times$ 5
<b>MSS315</b> Type	15W	125 $\times$ 125 $\times$ 5
<b>MSS425</b> Type	25W	135 $\times$ 135 $\times$ 5
<b>MSS540</b> Type	40W	165 $\times$ 165 $\times$ 5
<b>MSS560</b> Type	60W	200 $\times$ 200 $\times$ 5
<b>MSS590</b> Type	90W	200 $\times$ 200 $\times$ 5

## General Specifications of Speed Control Packs

Item	Specifications
Voltage	Single-Phase 220V $\pm$ 10% 60Hz, Single-Phase 230V $\pm$ 10% 50/60Hz
Function	Speed Control, CW/CCW Instantaneous Direction Change, Instantaneous Stop, Slow Start/Slow down
Control Input	Voltage : DC24V $\pm$ 10% 0.1Amin. Signal Input : CW/CCW/FREE/SPEED SET Photocoupler Input Contact capacity : DC24V 10mA Speed controller input signal, External speed potentiometer (0~20k $\Omega$ ) or DC power supply (0~5V DC)
Speed Range	50Hz : 90~1400r/min 60Hz : 90~1600r/min
Insulation Resistance	100M $\Omega$ or more when 500V DC is applied between the PE terminal and the power supply input terminals, the signal input terminals and the power supply input terminals.
Dielectric Strength	Sufficient to withstand 1.5kV(3kV)AC at 50Hz and 60Hz applied between the PE terminal and the power supply input terminals (the signal input terminals and the power input terminals) for 1 minute.
Ambient Temperature Range	0~+40°C
Degree of protection	IP10
Ambient Humidity	85% maximum (noncondensing)

## List of Motor and Speed Control Pack Combinations

Model numbers for motor speed control pack combinations are shown below.

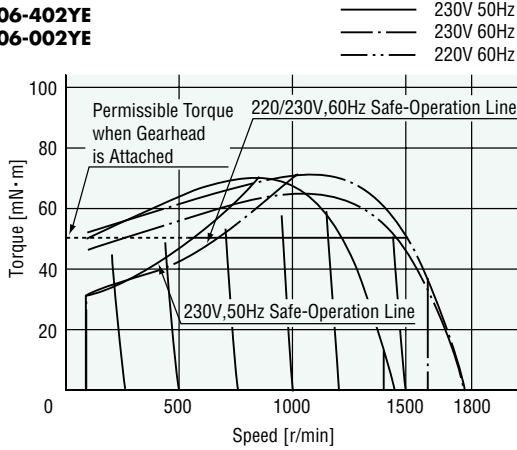
Output Power (W)	Unit Model	Motor Model	Speed Control Pack Model	Junction Cable Model	
6	<b>MSS206-402YE</b>	USM206-402W	MSP-2Y	CC005SS052B	
	<b>MSS206-002YE</b>	USM206-002W			
15	<b>MSS315-402YE</b>	USM315-402W			
	<b>MSS315-002YE</b>	USM315-002W			
25	<b>MSS425-402YE</b>	USM425-402W			
	<b>MSS425-002YE</b>	USM425-002W			
40	<b>MSS540-402YE</b>	USM540-402W			
	<b>MSS540-002YE</b>	USM540-002W			
60	<b>MSS560-502YE</b>	USM560-502W			CC005SS072
	<b>MSS560-002YE</b>	USM560-002W			
90	<b>MSS590-502YE</b>	USM590-502W			
	<b>MSS590-002YE</b>	USM590-002W			

Output Power (W)	Unit Model	Motor Model	Speed Control Pack Model	Junction Cable Model	
6	<b>MSS206-412YE</b>	USM206-412W	MSP-2Y	CC005SS052B	
	<b>MSS206-012YE</b>	USM206-012W			
15	<b>MSS315-412YE</b>	USM315-412W			
	<b>MSS315-012YE</b>	USM315-012W			
25	<b>MSS425-412YE</b>	USM425-412W			
	<b>MSS425-012YE</b>	USM425-012W			
40	<b>MSS540-412YE</b>	USM540-412W			
	<b>MSS540-012YE</b>	USM540-012W			
60	<b>MSS560-512YE</b>	USM560-512W			CC005SS072
	<b>MSS560-012YE</b>	USM560-012W			
90	<b>MSS590-512YE</b>	USM590-512W			
	<b>MSS590-012YE</b>	USM590-012W			

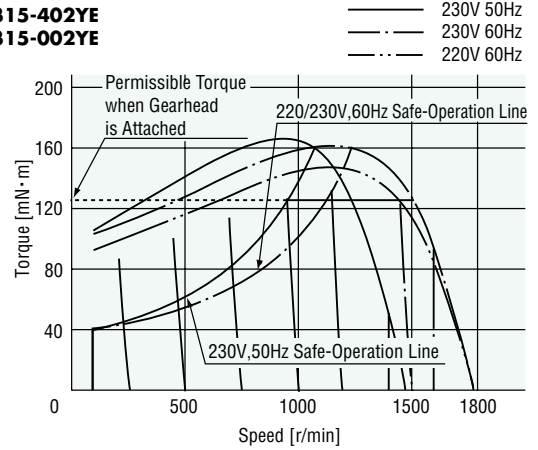
# Torque-Speed Characteristics

## Induction Motors

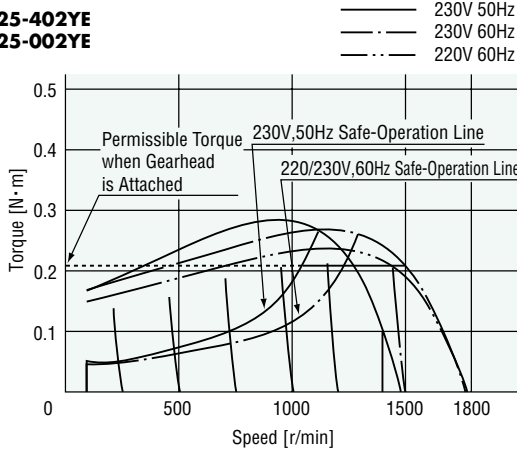
**MSS206-402YE**  
**MSS206-002YE**



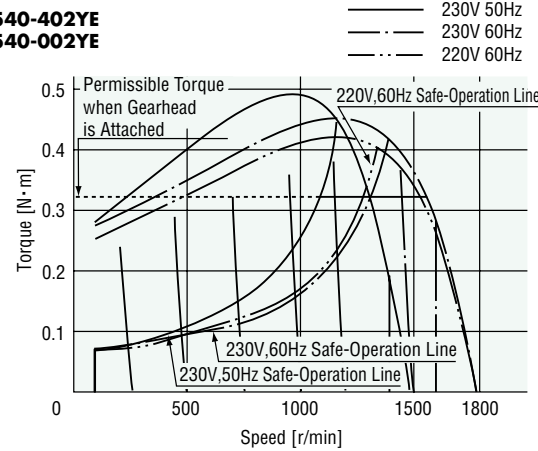
**MSS315-402YE**  
**MSS315-002YE**



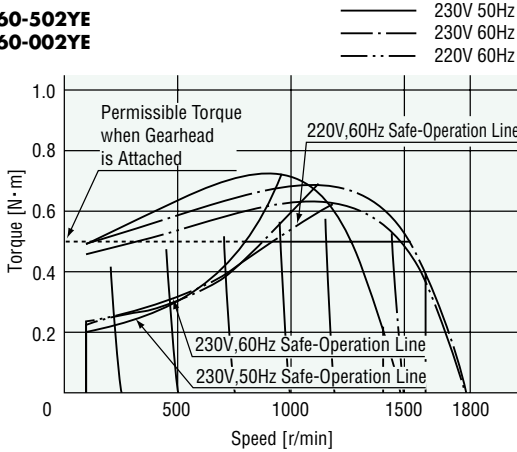
**MSS425-402YE**  
**MSS425-002YE**



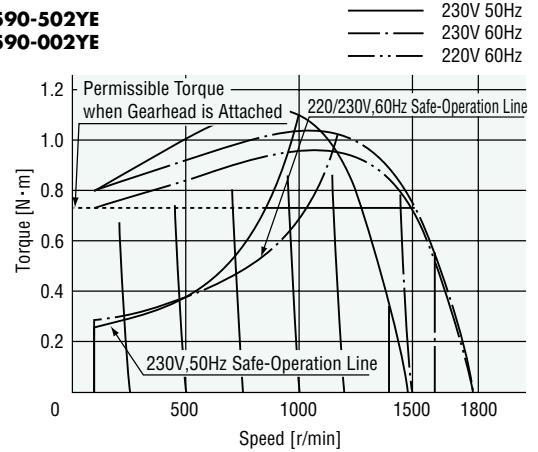
**MSS540-402YE**  
**MSS540-002YE**



**MSS560-502YE**  
**MSS560-002YE**



**MSS590-502YE**  
**MSS590-002YE**



Induction Motors

Reversible Motors

Electromagnetic Brake Motors

FBL II

AXU

AXH

HBL

MSS - W

ES

US

Gearheads

Linear Heads

Water Tight Motors FPW

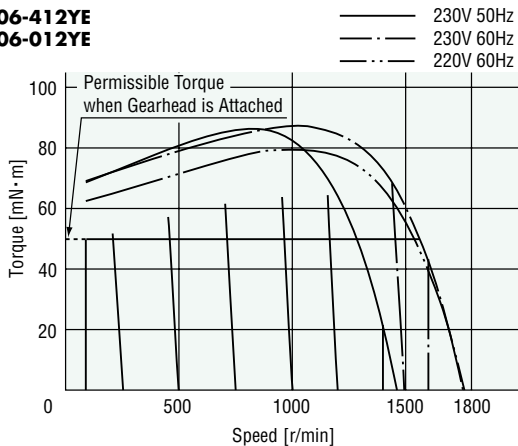
Accessories

Brushless Motor and Driver

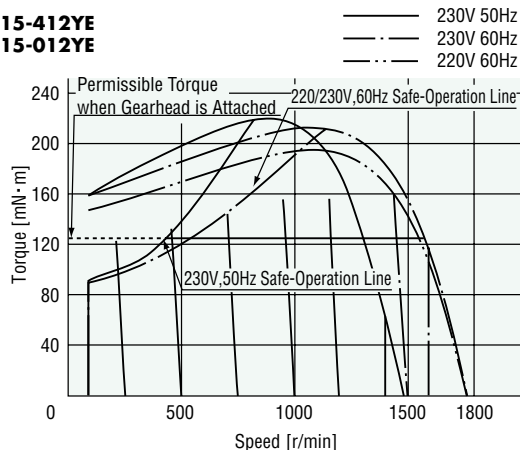
AC Speed Control Motors

● Reversible Motors

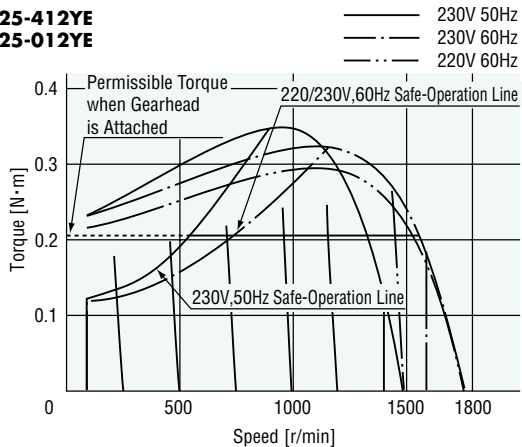
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**MSS206-012YE**



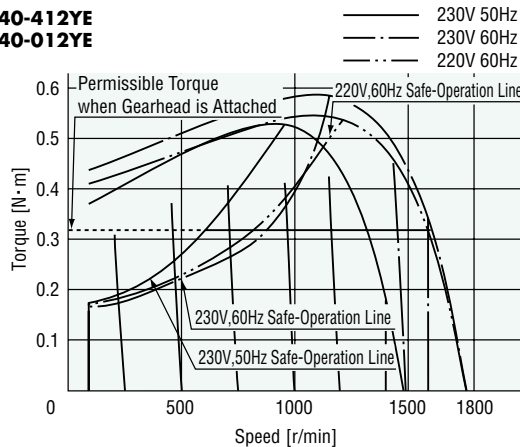
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**MSS315-012YE**



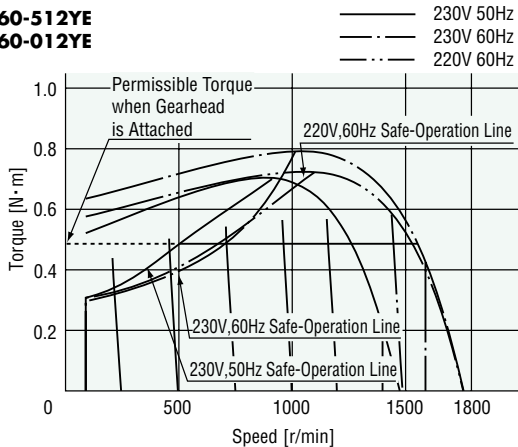
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**MSS425-012YE**



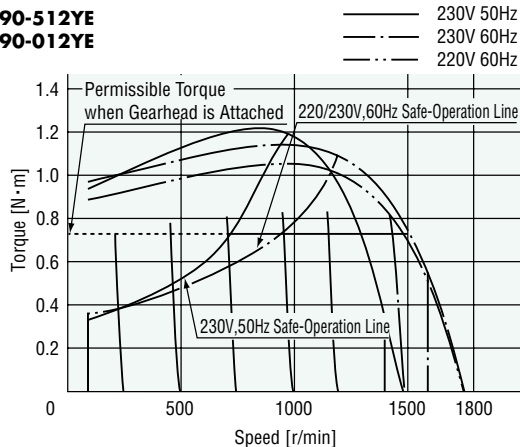
**MSS540-412YE**  
**MSS540-012YE**



**MSS560-512YE**  
**MSS560-012YE**



**MSS590-512YE**  
**MSS590-012YE**



## Speed Range when Gearheads is Attached

Unit = r/min

Gear Ratio		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
High Speed	50Hz	466	388	280	233	186	155	112	93	77	56	46	38	28	23	18	15	14	11	9	7
	60Hz	533	444	320	266	213	177	128	106	88	64	53	44	32	26	21	17	16	13	10	8.8
Low Speed		30	25	18	15	12	10	7.2	6	5	3.6	3	2.5	1.8	1.5	1.2	1	0.9	0.75	0.6	0.5

## Permissible Torque When Gearhead is Attached

The permissible torque with decimal gearhead with a gear ratio of 10 is;

**2GN□K** : 3N·m **3GN□K** : 6N·m **4GN□K** : 8N·m (for 1/25 ~ 1/36 : 6N·m) **5GN□K** : 10N·m **5GU□KB** : 20N·mRight-Angle gearheads may be connected to **MSS425**, **MSS540**, **MSS560** and **MSS590** types. Refer to page A-180 for further detail.

### Induction Motors

#### Single-Phase 230V 50Hz

Unit = N·m

Model	Gear Ratio	3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
<b>MSS206-402YE</b> <b>/2GN□K</b>	1200r/min	0.11	0.14	0.19	0.23	0.29	0.34	0.48	0.57	0.69	0.86	1	1.2	1.6	1.9	2.3	2.8	3	3	3	3
	90r/min	0.078	0.093	0.13	0.16	0.19	0.23	0.32	0.39	0.47	0.58	0.7	0.84	1.1	1.3	1.6	1.9	2.1	2.5	3	3
<b>MSS315-402YE</b> <b>/3GN□K</b>	1200r/min	0.3	0.36	0.51	0.61	0.76	0.91	1.3	1.5	1.8	2.3	2.7	3.3	4.1	5	5	5	5	5	5	5
	90r/min	0.097	0.12	0.16	0.19	0.24	0.29	0.41	0.49	0.58	0.73	0.88	1.1	1.3	1.6	2	2.4	2.6	3.2	4	4.8
<b>MSS425-402YE</b> <b>/4GN□K</b>	1200r/min	0.5	0.6	0.83	1	1.2	1.5	2.1	2.5	3	3.7	4.5	5.4	6.8	8	8	8	8	8	8	8
	90r/min	0.12	0.15	0.2	0.24	0.3	0.36	0.51	0.61	0.73	0.91	1.1	1.3	1.7	2	2.5	3	3.3	4	5	5.9
<b>MSS540-402YE</b> <b>/5GN□K</b>	1200r/min	0.78	0.93	1.3	1.6	1.9	2.3	3.2	3.9	4.7	5.8	7	8.4	10	10	10	10	10	10	10	10
	90r/min	0.16	0.19	0.26	0.32	0.39	0.47	0.66	0.79	0.95	1.2	1.4	1.7	2.1	2.6	3.2	3.9	4.3	5.1	6.4	7.7
<b>MSS560-502YE</b> <b>/5GU□KB</b>	1200r/min	1.2	1.4	2	2.4	3	3.6	4.5	5.4	6.4	8.1	9.7	12	16	19	20	20	20	20	20	20
	90r/min	0.49	0.58	0.81	0.97	1.2	1.5	1.8	2.2	2.6	3.3	4	4.8	6.6	7.9	8.9	11	12	14	18	20
<b>MSS590-502YE</b> <b>/5GU□KB</b>	1200r/min	1.8	2.1	3	3.5	4.4	5.3	6.7	8	9.6	12	14	17	20	20	20	20	20	20	20	20
	90r/min	0.63	0.76	1.1	1.3	1.6	1.9	2.4	2.8	3.4	4.3	5.1	6.2	8.6	10	12	14	15	18	20	20

### Reversible Motors

#### Single-Phase 230V 50Hz

Unit = N·m

Model	Gear Ratio	3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
<b>MSS206-412YE</b> <b>/2GN□K</b>	1200r/min	0.12	0.15	0.2	0.24	0.3	0.36	0.51	0.61	0.73	0.91	1.1	1.3	1.7	2	2.5	3	3	3	3	3
	90r/min	0.12	0.15	0.2	0.24	0.3	0.36	0.51	0.61	0.73	0.91	1.1	1.3	1.7	2	2.5	3	3	3	3	3
<b>MSS315-412YE</b> <b>/3GN□K</b>	1200r/min	0.3	0.36	0.51	0.61	0.76	0.91	1.3	1.5	1.8	2.3	2.7	3.3	4.1	5	5	5	5	5	5	5
	90r/min	0.22	0.26	0.36	0.44	0.55	0.66	0.91	1.1	1.3	1.6	2	2.4	3.0	3.6	4.5	5	5	5	5	5
<b>MSS425-412YE</b> <b>/4GN□K</b>	1200r/min	0.5	0.6	0.83	1	1.2	1.5	2.1	2.5	3	3.7	4.5	5.4	6.8	8	8	8	8	8	8	8
	90r/min	0.24	0.29	0.41	0.49	0.61	0.73	1	1.2	1.5	1.8	2.2	2.6	3.3	4	5	5.9	6.6	7.9	8	8
<b>MSS540-412YE</b> <b>/5GN□K</b>	1200r/min	0.78	0.93	1.3	1.6	1.9	2.3	3.2	3.9	4.7	5.8	7	8.4	10	10	10	10	10	10	10	10
	90r/min	0.35	0.42	0.59	0.7	0.88	1.1	1.5	1.8	2.1	2.6	3.2	3.8	4.8	5.7	7.2	8.6	9.6	10	10	10
<b>MSS560-512YE</b> <b>/5GU□KB</b>	1200r/min	1.2	1.4	2	2.4	3	3.6	4.5	5.4	6.4	8.1	9.7	12	16	19	20	20	20	20	20	20
	90r/min	0.61	0.73	1	1.2	1.5	1.8	2.3	2.7	3.3	4.1	5	5.9	8.3	9.9	11	13	15	18	20	20
<b>MSS590-512YE</b> <b>/5GU□KB</b>	1200r/min	1.8	2.1	3	3.5	4.4	5.3	6.7	8	9.6	12	14	17	20	20	20	20	20	20	20	20
	90r/min	0.63	0.76	1.1	1.3	1.6	1.9	2.4	2.8	3.4	4.3	5.1	6.2	8.6	10	12	14	15	18	20	20

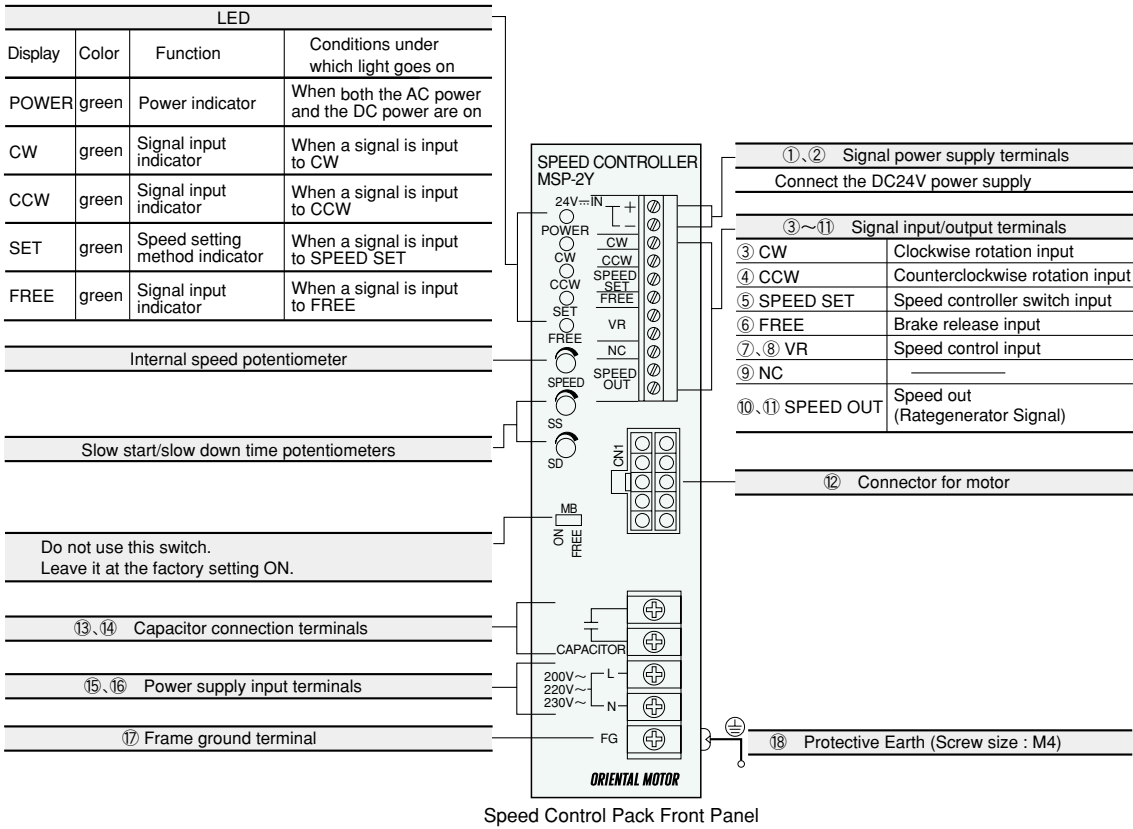
- Gearheads and decimal gearheads are sold separately.

- Enter the gear ratio in the box (□) within the model number. A colored indicates gear shaft rotation in the same direction as the motor shaft; a white background indicates rotation in the opposite direction.

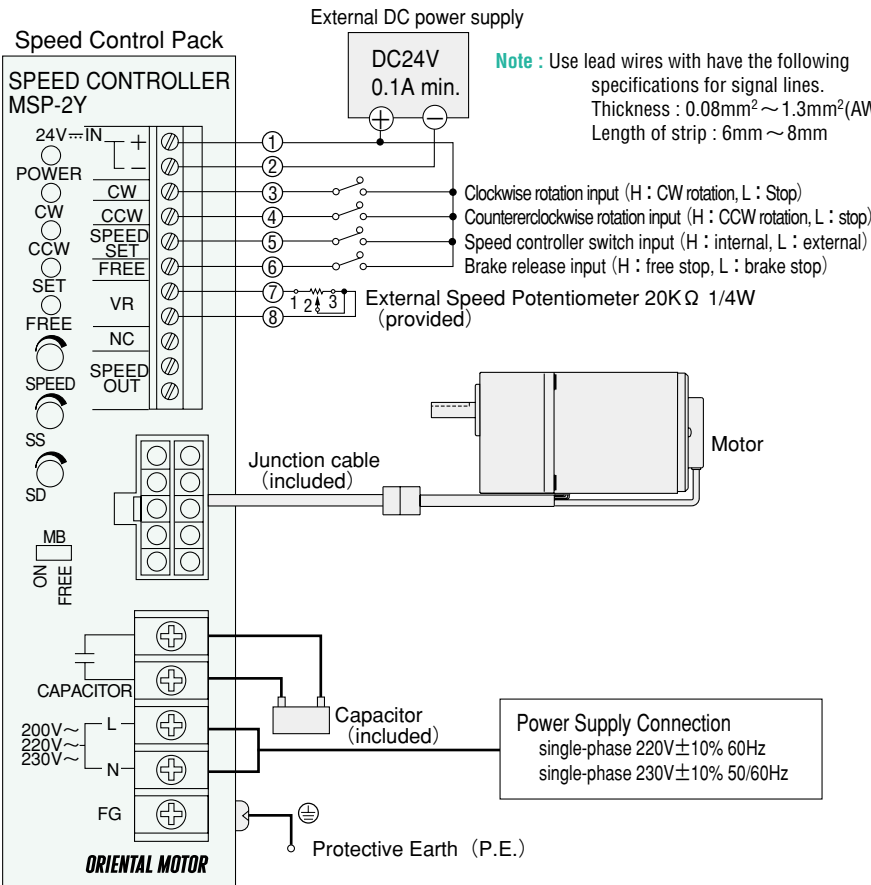
- Values for permissible torque are calculated by taking permissible torque at high speed (1200r/min) and low speed (90r/min) and multiplying by gear ratio and gearhead efficiency.

## Operation of MSS-W Series

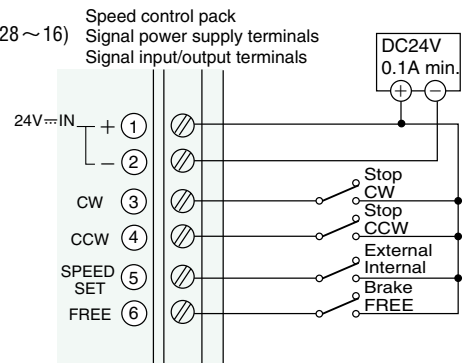
### Names and Functions of Speed Control Pack



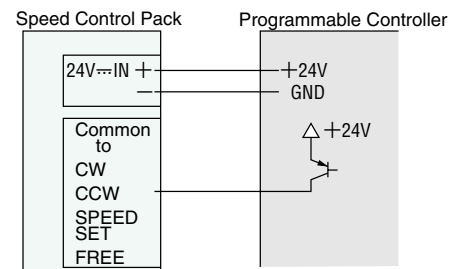
### Examples of Connections



#### Control by Small Capacity Relays or Switches Switch capacity : DC24V 10mA



#### Control by Programmable Controller (Transistor output type)



- Note :**
- In the connection diagram, the bold lines indicate the power lines, and the other lines indicate signal lines.
  - Large current run through the bold lines indicated in the connecting diagrams.
  - Use wires with cross sectional area of AWG18(0.75mm<sup>2</sup>) or larger for these lines.
  - Use one speed control pack per motor.
  - Replace the plastic cover over the power cord terminal block.
  - When motors are running, a voltage of the motor power supply voltage is applied across the terminals of the capacitor.
  - The terminals must therefore be insulated to ensure safety.

### ● Signal Input Timing Chart

● Control of operation, stopping, switching direction of rotation and instantaneous stopping can all be performed with clockwise rotation input, brake release input, and counterclockwise rotation input signals.

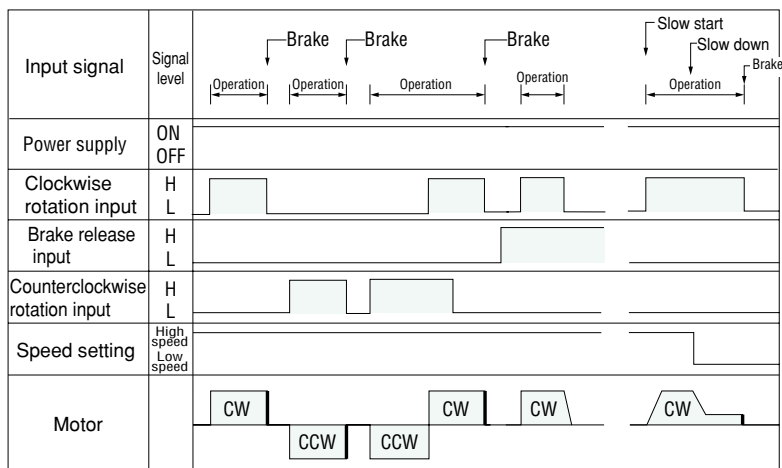
● When CW or CCW input is turned on (switch to high), the motor accelerates to the selected speed for the length of time set on the acceleration time potentiometer. If CW and CCW are input simultaneously, CW has priority. Thus, if CCW input is left on, direction can be changed instantaneously by turning the CW input on and off (only reversible motor).

However, under certain power supply voltages or load conditions, change of direction may be delayed.

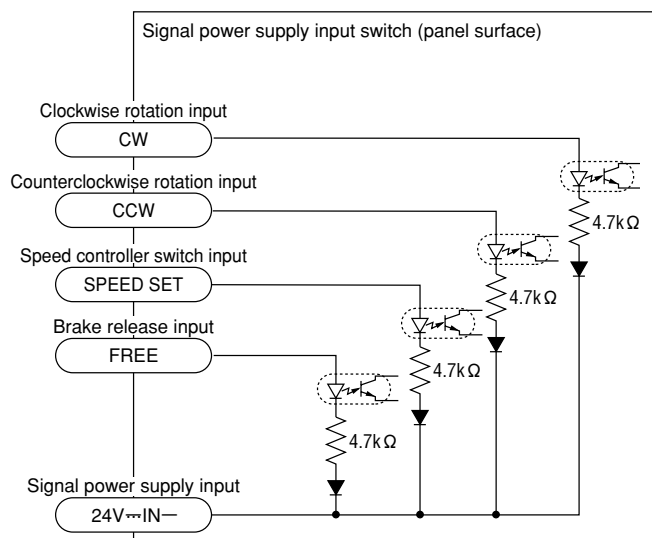
● Switching brake release input OFF and then switching both clockwise rotation input and counterclockwise rotation input OFF makes the dynamic brake go into operation automatically and stops the motor instantaneously.

During an instantaneous stop, the dynamic brake sends a braking current for 0.2-0.4 seconds.

● Switching brake release input ON and then switching both clockwise rotation input and counterclockwise rotation input OFF makes the motor come to a free stop.



### ● Internal Equivalent Circuit Diagram



Clockwise rotation input, counterclockwise rotation input, speed controller switch input, and brake release input are performed by photocoupler input.

The internal equivalent circuits are as shown in this diagram.

### ● Braking Current

There is a 0.2-0.4 second flow of maximum halfwave rectified current when the motor is instantaneously stopped. When attaching a circuit protector or other safeguard to a line carrying this type of braking current, refer to the table to select a device with the appropriate capacity.

Type	Braking Current (Peak Value) [A]
<b>MSS206</b> Type	0.8
<b>MSS315</b> Type	2.1
<b>MSS425</b> Type	3.3
<b>MSS540</b> Type	6.7
<b>MSS560</b> Type	9.0
<b>MSS590</b> Type	13.6

Repeated motor operation and braking causes the motor's temperature to rise and limits the continuous usage time of both the motor and control pack.

Maximum motor output	Operation and braking cycle
6W~25W	2 seconds or longer (1 second of operation and 1 second stopped)
40W~90W	4 seconds or longer (2 second of operation and 2 second stopped)

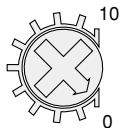


### ● Methods of Speed Setting and Their Connection

The following three methods of setting speed can be used with **MSS · W** units.

#### ● Internal speed potentiometer

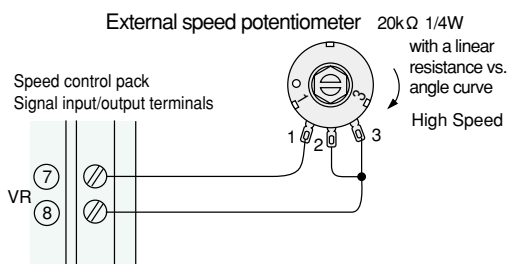
The internal speed potentiometer can be selected by turning on (switch to high) input to the SPEED SET terminal ⑤. The speed is set to 0r/min when the product is shipped. Rotate clockwise to start the motor rotating.



Internal speed potentiometer

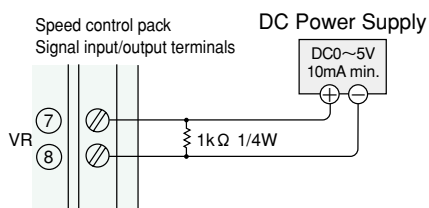
#### ● External speed potentiometer(provided)

The external potentiometer can be selected by turning off (switch to low) input to the SPEED SET terminal ⑤. The external speed potentiometer is connected as shown in the following diagram below using the lead wire. When connecting, turn the external speed potentiometer's knob counterclockwise and set the speed to 0r/min. In this case, high-speed operation can be set when turning the external potentiometer's knob clockwise.



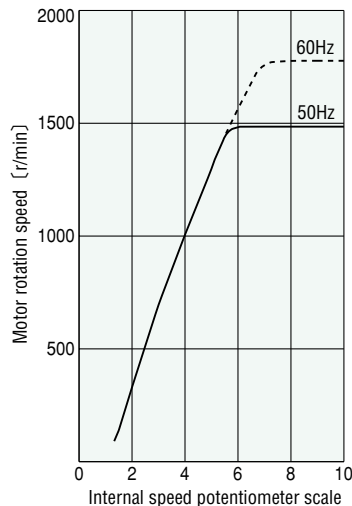
#### ● External DC voltage

The external DC voltage can be selected by turning off (switch to low) input to the SPEED SET terminal ⑤. To connect an external DC voltage, connect the plus wire to the terminal ⑦, the minus wire to the terminal ⑧. High speed operation can be set when DC voltage of the external DC supply is elevated.

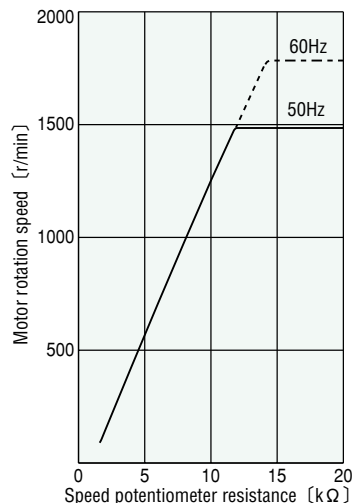


**Note :** Ensure that there are no errors in positive and negative polarity. This could result in faulty operation and damage the speed control pack.

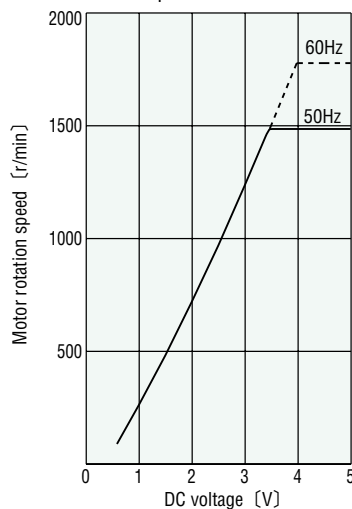
Internal speed potentiometer scale-rotation speed characteristics (Representative Values)



External speed potentiometer resistance-rotation speed characteristics (Representative values)



DC voltage - rotation speed characteristics (Representative Values)



## ■ Slow start / Slow down

Equipment and work pieces are subject to large acceleration/deceleration force at start, stop, and when changing speeds.

When you want to accelerate/decelerate without any accompanying shock, the acceleration/deceleration time can be extended using the slow start/slow down function. The slow start/slow down time can be set using the slow start/slow down time potentiometers built into the control pack. However, when the load inertia is large, the slow down time may be longer than the slow down time set.

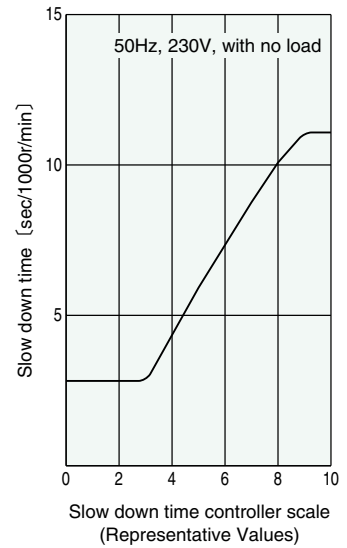
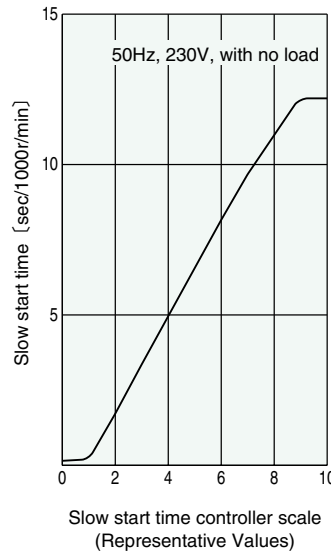
### ● Slow start

The slow start function is activated at start up and after switching to high speed. To not use slow start, set the slow start time potentiometer to 0.

### ● Slow down

The slow down function is activated after switching from high speed to low speed. To not use slow down, set the slow down time potentiometer to 0.

The illustration below shows for induction motor type.

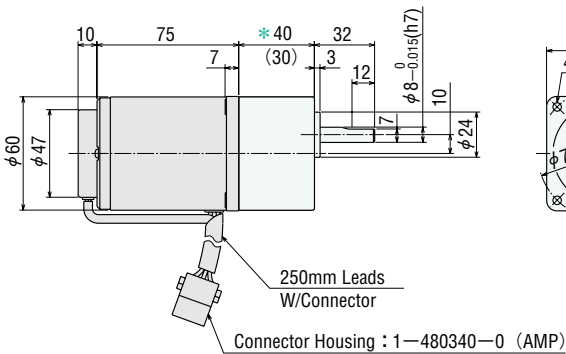


## ■ Dimensions (Scale 1/4, Unit=mm)

### ● MSS206-402YE (Pinion Shaft) MSS206-412YE

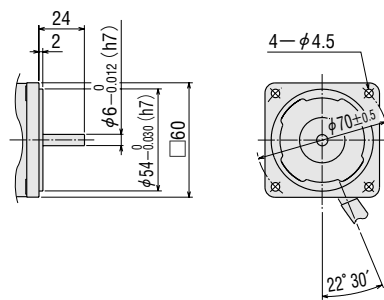
Motor USM206-402W  
USM206-412W  
Mass 0.8kg

Gearhead **2GN** □ **K** (Sold separately)  
Mass 0.4kg



### ● MSS206-002YE (Round Shaft) MSS206-012YE

Motor USM206-002W USM206-012W  
Mass 0.8kg

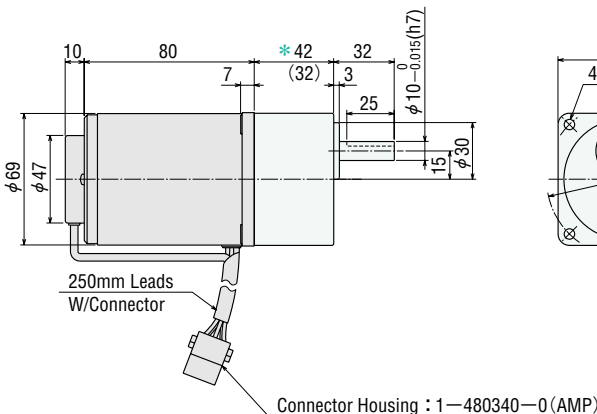


Asterisk (\*) indicates dimensions of **2GN25K~180K**, the figure in parenthesis indicates dimensions of **2GN3K~18K**.

### ● MSS315-402YE (Pinion Shaft) MSS315-412YE

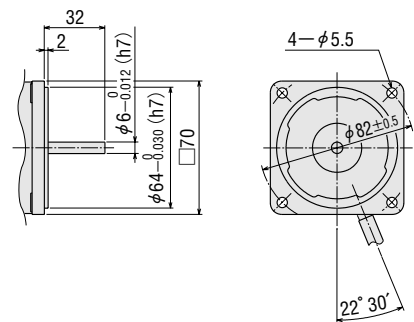
Motor USM315-402W  
USM315-412W  
Mass 1.2kg

Gearhead **3GN** □ **K** (Sold separately)  
Mass 0.55kg



### ● MSS315-002YE (Round Shaft) MSS315-012YE

Motor USM315-002W USM315-012W  
Mass 1.2kg



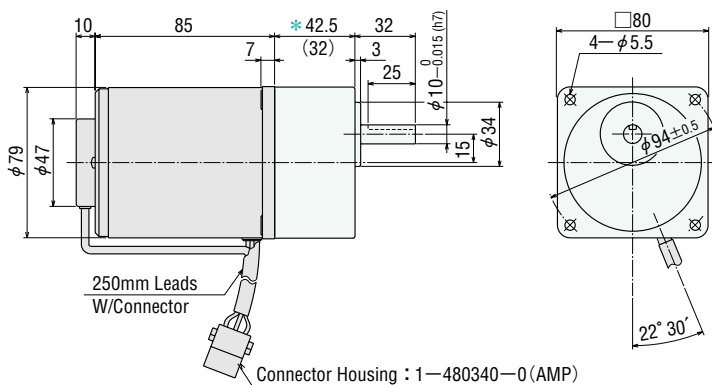
Asterisk (\*) indicates dimensions of **3GN25K~180K**, the figure in parenthesis indicates dimensions of **3GN3K~18K**.

● **MSS425-402YE** (Pinion Shaft)

**MSS425-412YE**

Motor USM425-402W  
USM425-412W  
Mass 1.6kg

Gearhead  
**4GN □ K** (Sold separately)  
Mass 0.65kg

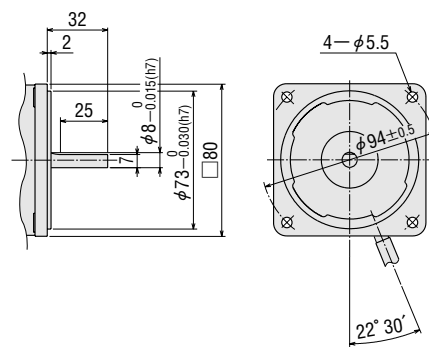


● **MSS425-002YE** (Round Shaft)

**MSS425-012YE**

Motor USM425-002W  
USM425-012W

Mass 1.6kg



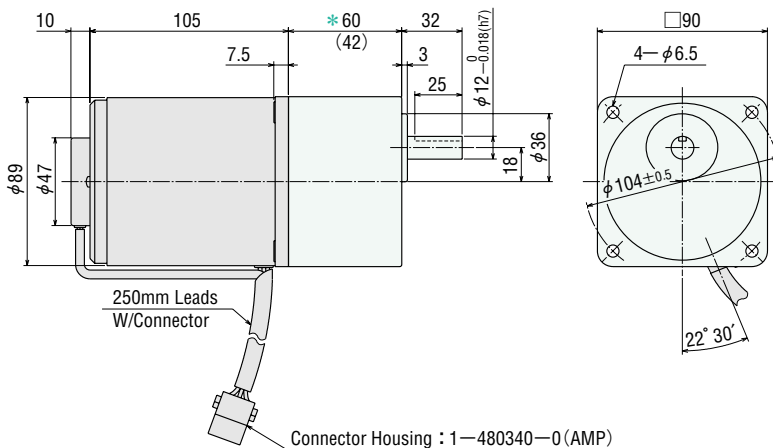
Asterisk (\*) indicates dimensions of **4GN25K~180K**,  
the figure in parenthesis indicates dimensions of **4GN3K~18K**.

● **MSS540-402YE** (Pinion Shaft)

**MSS540-412YE**

Motor USM540-402W  
USM540-412W  
Mass 2.6kg

Gearhead  
**5GN □ K** (Sold separately)  
Mass 1.5kg

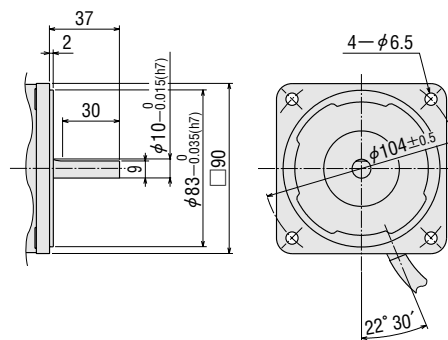


● **MSS540-002YE** (Round Shaft)

**MSS540-012YE**

Motor USM540-002W  
USM540-012W

Mass 2.6kg

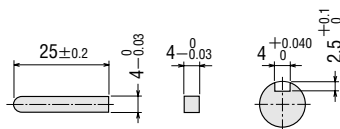


Asterisk (\*) indicates dimensions of **5GN25K~180K**,  
the figure in parenthesis indicates dimensions of **5GN3K~18K**.

● **Key and Key Slot** (Scale 1/2)

(Included with the gearheads)

**3GN □ K, 4GN □ K, 5GN □ K**

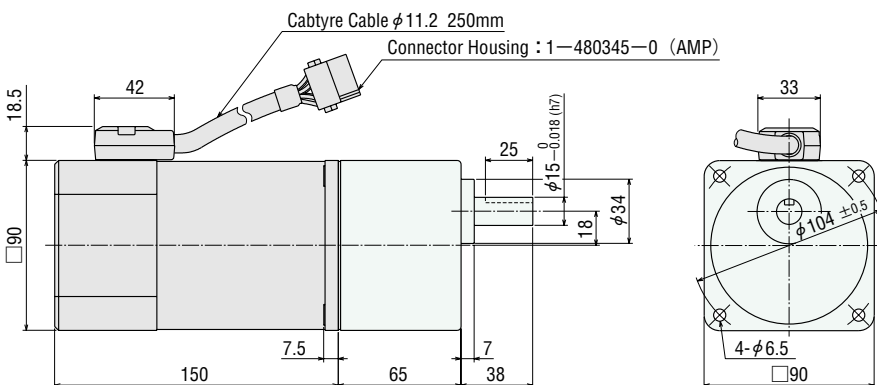


● **MSS560-502YE** (Pinion Shaft)

**MSS560-512YE**

Motor USM560-502W  
USM560-512W  
Mass 2.8kg

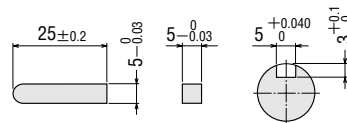
Gearhead  
**5GU □ KB** (Sold separately)  
Mass 1.5kg



● **Key and Key Slot** (Scale 1/2)

(Included with the gearheads)

**5GU □ KB**

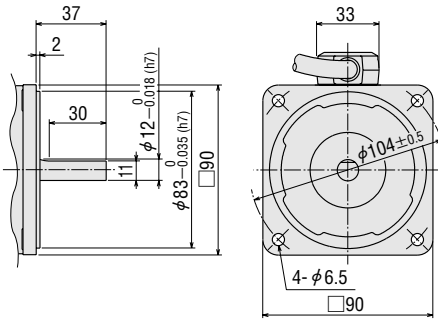


● **MSS560-002YE** (Round Shaft)

**MSS560-012YE**

Motor USM560-002W  
USM560-012W

Mass 2.8kg



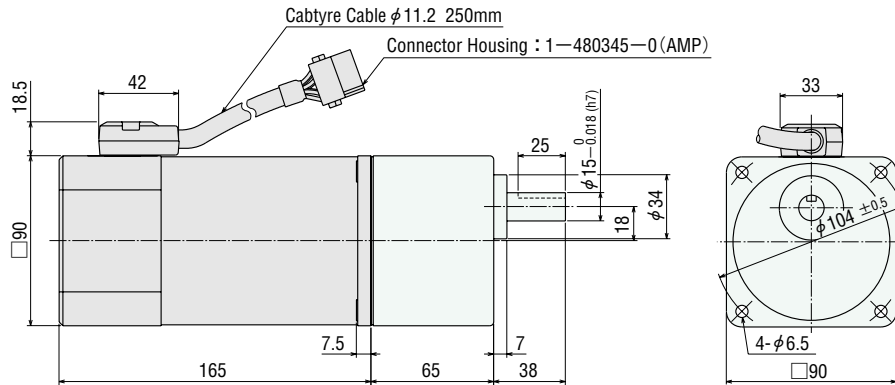
● **MSS590-502YE** (Pinion Shaft)

**MSS590-512YE**

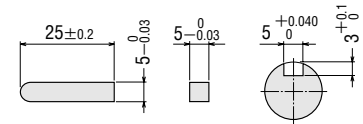
Motor USM590-502W  
USM590-512W

Mass 3.6kg

Gearhead  
**5GU □ KB** (Sold separately)  
Mass 1.5kg



● **Key and Key Slot** (Scale 1/2)  
(Included with the gearheads)  
**5GU □ KB**

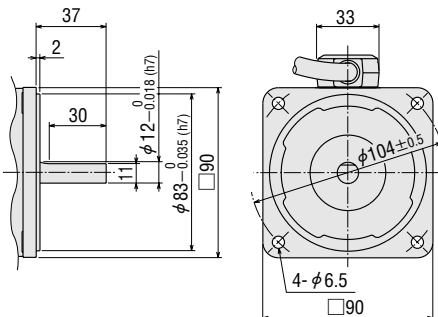


● **MSS590-002YE** (Round Shaft)

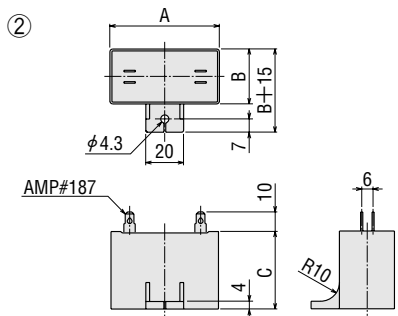
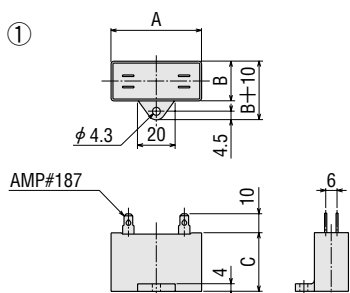
**MSS590-012YE**

Motor USM590-002W  
USM590-012W

Mass 3.6kg



● **Capacitor** (Included with the motor ; Unit=mm)



● **Induction Motor**

Model	Capacitor Model	A	B	C	Mass (g)	No.	
<b>MSS206-402YE</b>	<b>MSS206-002YE</b>	CH06BFAUL	31	14.5	23.5	15	①
<b>MSS315-402YE</b>	<b>MSS315-002YE</b>	CH10BFAUL	37	18	27	25	①
<b>MSS425-402YE</b>	<b>MSS425-002YE</b>	CH15BFAUL	38	21	31	35	①
<b>MSS540-402YE</b>	<b>MSS540-002YE</b>	CH23BFAUL	48	21	31	40	①
<b>MSS560-502YE</b>	<b>MSS560-002YE</b>	CH40BFAUL	58	23.5	37	65	②
<b>MSS590-502YE</b>	<b>MSS590-002YE</b>	CH60BFAUL	58	29	41	85	②

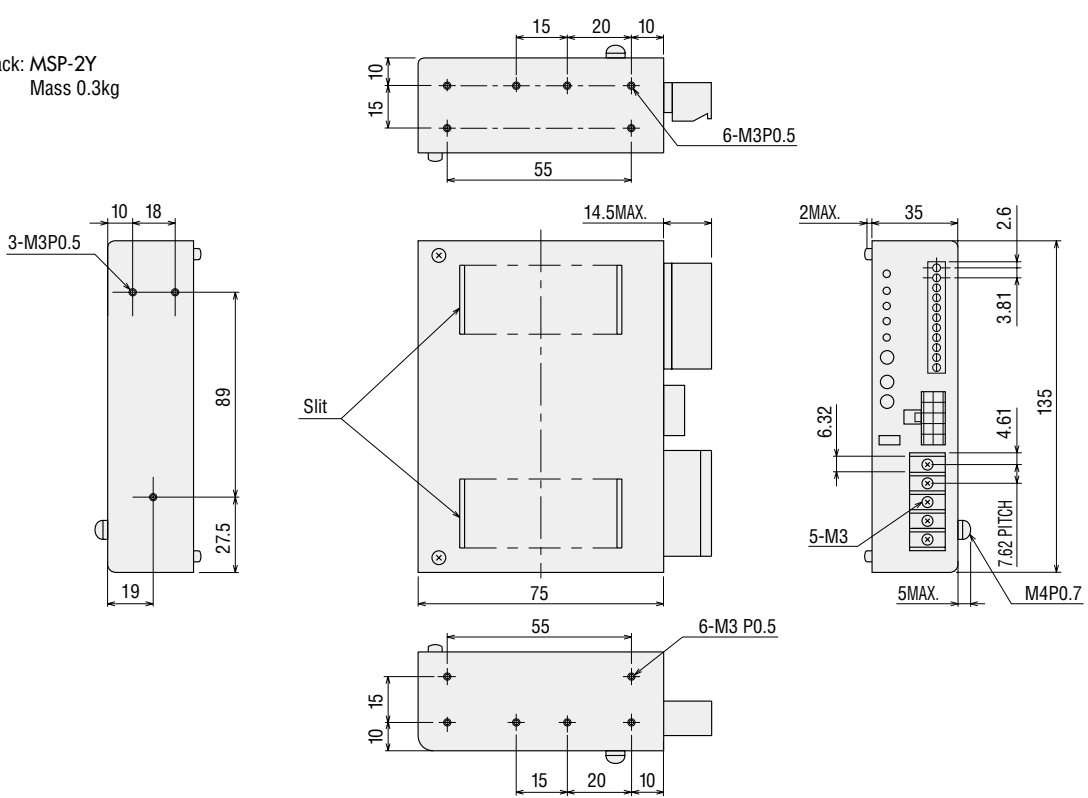
● **Reversible Motor**

Model	Capacitor Model	A	B	C	Mass (g)	No.	
<b>MSS206-412YE</b>	<b>MSS206-012YE</b>	CH08BFAUL	31	17	27	20	①
<b>MSS315-412YE</b>	<b>MSS315-012YE</b>	CH15BFAUL	38	21	31	35	①
<b>MSS425-412YE</b>	<b>MSS425-012YE</b>	CH20BFAUL	48	19	29	35	①
<b>MSS540-412YE</b>	<b>MSS540-012YE</b>	CH35BFAUL	58	22	35	55	①
<b>MSS560-512YE</b>	<b>MSS560-012YE</b>	CH50BFAUL	58	29	41	85	②
<b>MSS590-512YE</b>	<b>MSS590-012YE</b>	CH70BFAUL	58	35	50	125	②

● If you need to order a capacitor without a motor, add "-C" to the capacitor model number shown. A capacitor cap is always included with a capacitor.

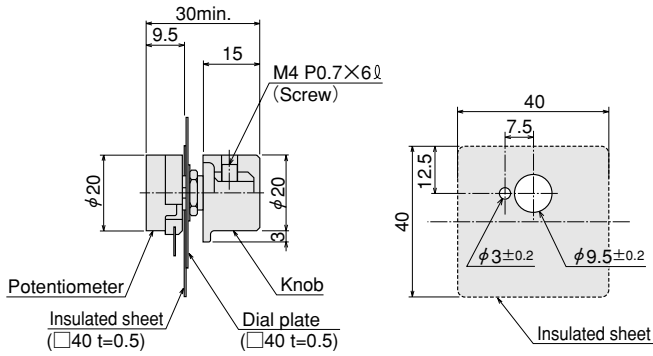
● **Control Pack** (Scale 1/4, Unit=mm)

Control Pack: MSP-2Y  
Mass 0.3kg



● External speed potentiometer

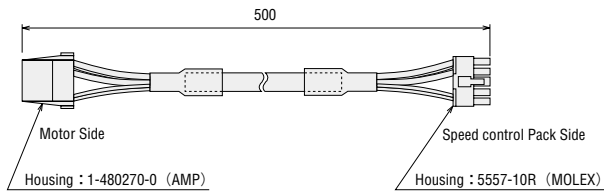
(Included, scale 1/2, Unit=mm)



● Junction cable

(Included, Unit=mm)

● For 6W, 15W, 25W, 40W types

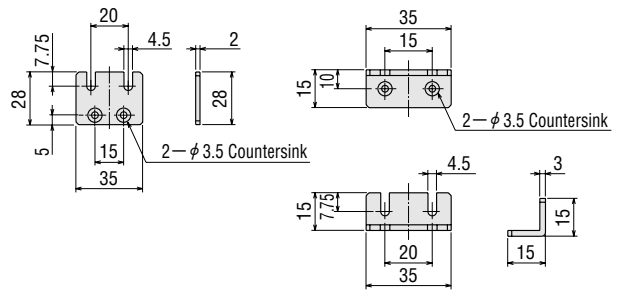


● Speed control pack Mounting Tab

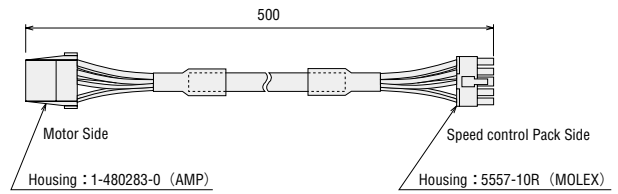
(Mounting Screws (M3) included)

● Mounting Tab A...1 set of 2 pieces included

● Mounting Tab B...1 set of 2 pieces included



● For 60W, 90W types



■ Right-Angle Gearhead (Sold separately)

The right-angle gearhead provides an output shaft at a right angle to the motor's output shaft. Refer to page A-180 for further detail.



■ Accessories (Sold separately)

● Motor Mounting Brackets

Optional die-cast aluminum mounting brackets are available. They can be used to install motors without gearheads. Refer to page A-220 for further detail.



● DIN Rail Mounting Plate

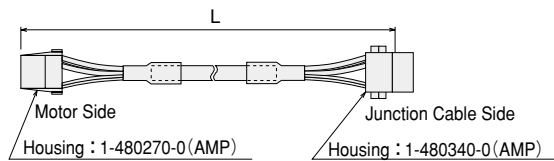
This mounting plate is convenient for installing the speed control pack and DIN rails with ease. Refer to page A-227 for further detail. Model: **PADP01**



● Extension Cable

- For **MSS206** Type
- MSS315** Type
- MSS425** Type
- MSS540** Type

Model	L (m)
<b>CC01SS052</b>	1
<b>CC02SS052</b>	2
<b>CC03SS052</b>	3
<b>CC04SS052</b>	4



- For **MSS560** Type
- MSS590** Type

Model	L (m)
<b>CC01SS2</b>	1
<b>CC02SS2</b>	2
<b>CC03SS2</b>	3
<b>CC04SS2</b>	4

