

Panasonic

Speed controller [EX48 type] for (G Series) Motor

Operation Manual

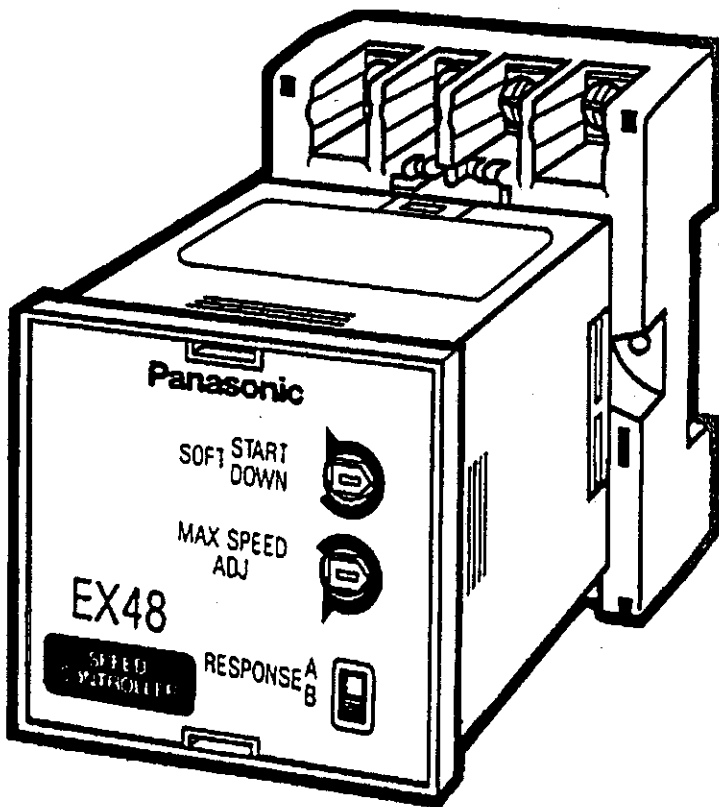


Table Of Contents		page
Caution On Handling		
Pre Installation		2
Model/Applicable Motor		
Construction		
Actual Wiring		3
Caution On Wiring/Operation		
Wiring for motor with fan(F)		4
motor with thermal protector (TP)		
Basic Wiring Diagram(variable)		5
Basic Wiring Diagram		
..(One way + Electrical Brake)		6
Basic Wiring Diagram		
(Fwd/Rvrs + Electrical Brake)		7
Extra Wiring Diagram		
Multi-speed		8
Max. speed adjustment		
Variable with analog signal		
Parallel run with external		9
potentiometer		
Parallel run with analog signal		
Wiring Diagram for Electromagnetic		
Brake Motor		10
Soft start/down		
Noise suppression		11
Maintenance/Troubleshooting		12
Specifications/Dimensions		13

Important User Information

Because of the variety of uses for this equipment and because of the differences between this solid state equipment and electromechanical equipment, the user of and those responsible for applying this equipment must satisfy themselves that as to the acceptability of each application and use of the equipment.

IN NO EVENT will Panasinic be responsible or liable for indirect or consequential damages resulting from the use or the application of this equipment.

No patent liability is assumed by Panasonic with respect to use of information, circuits or equipment described in this text.

○ Caution On Handling

■ Installation Location

Please install the controller in the environment with $-10 \sim +50^{\circ}\text{C}$, 85% RH or lower.

Please do not subject the controller to the following :

- Direct sunshine, severe vibration and shock
- Dusty or humid environment
- Errosive gas or flammable gas
- High static electricity
- High magnetic field

■ Power Source

- Please use the proper power source.
- Please turn off the power if the controller is not in use for a long time.
- Please pay extra attention if small capacity transformer.

■ Chemical/Oil/Water

- Please do not subject the controller to any organic solvent nor, oil nor strong alkaline material.
- The controller is not Water-proof.

○ Pre Installation

Please confirm the following before installation;

- Right model/voltage/output ?
- The motor and gearhead and the controller is packed seperately.
- Is mounting screw packed together ?

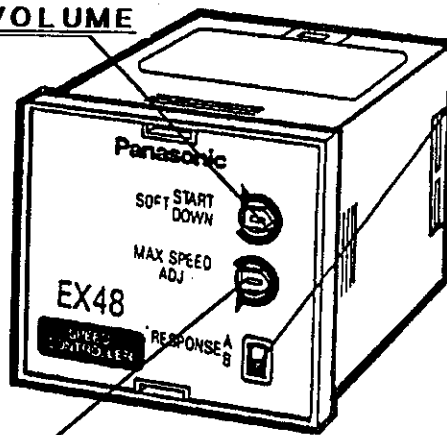
○ Model and Applicable Motor Output

Power source Motor output	1 ϕ AC100 ~120V	1 ϕ AC200 ~240V
3 ~ 20W	DVEX48AL	DVEX48AY
25 ~ 40W	DVEX48BL	DVEX48BY
50 ~ 90W	DVEX48CL	DVEX48CY

○ Construction/identification

SOFT START/DOWN VOLUME

You can set the soft start/down time at the same time, when you want to soften the shock of the load caused by the sudden change of the speed.
If you do not need this function, turn this volume to the full right.



SWITCH FOR RESPONSE SELECTION

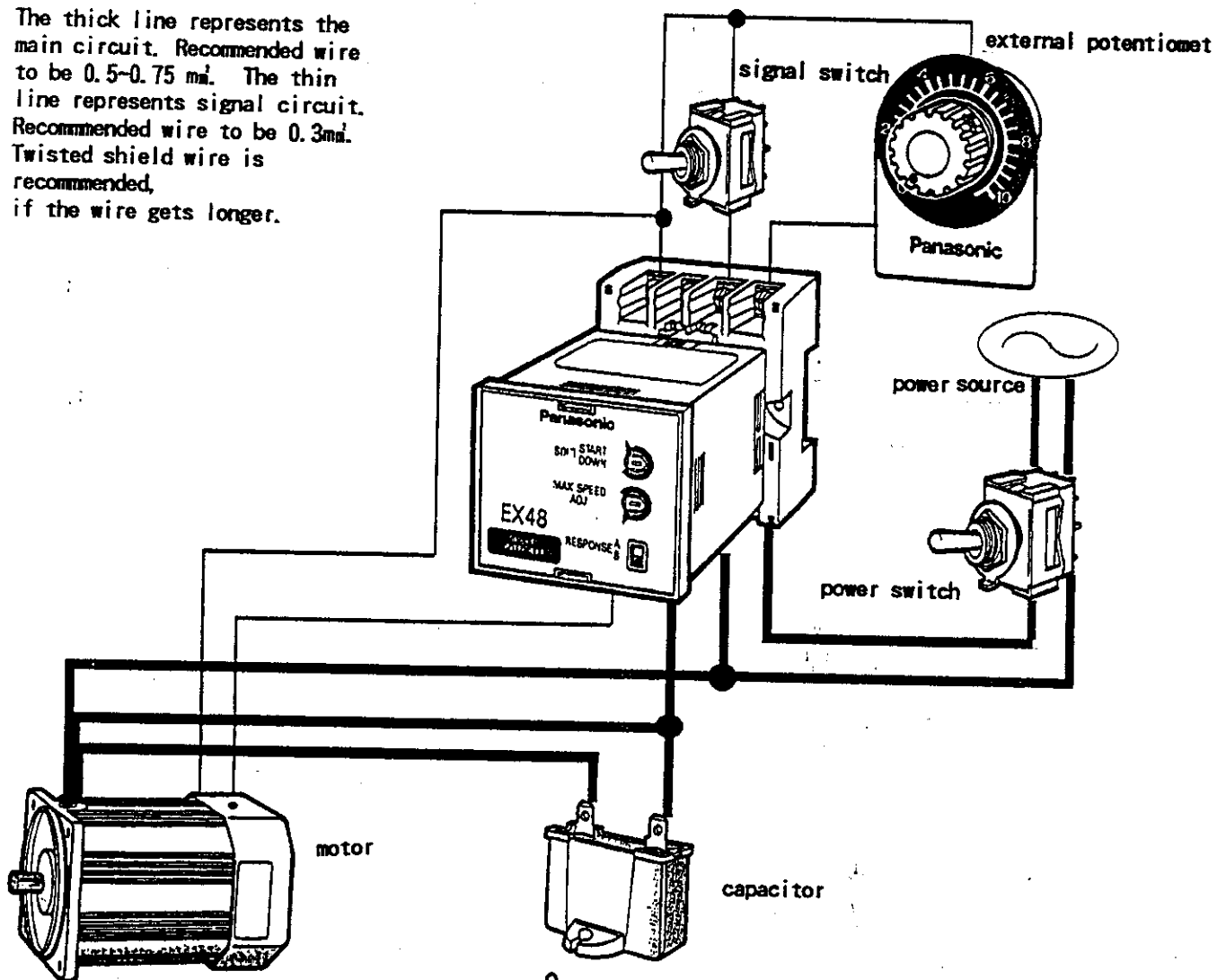
- A : High stability mode
 - You can expect minimum speed fluctuation due to the load change. (less than 3%) (Hunting may occur due to the sudden change of the speed)
 - You can expect wider speed range for control.
- B : High response mode
 - You can expect high response and less hunting
 - Suitable for positioning.

MAX. SPEED ADJUST VOLUME

You can adjust the speed when you set the external potentiometer to the max. Please set to 1700r/min at 50Hz, or 1400r/min at 60Hz or lower.

○ Actual Wiring (Ex. One way run)

The thick line represents the main circuit. Recommended wire to be 0.5~0.75 mm². The thin line represents signal circuit. Recommended wire to be 0.3mm². Twisted shield wire is recommended, if the wire gets longer.



○ Caution

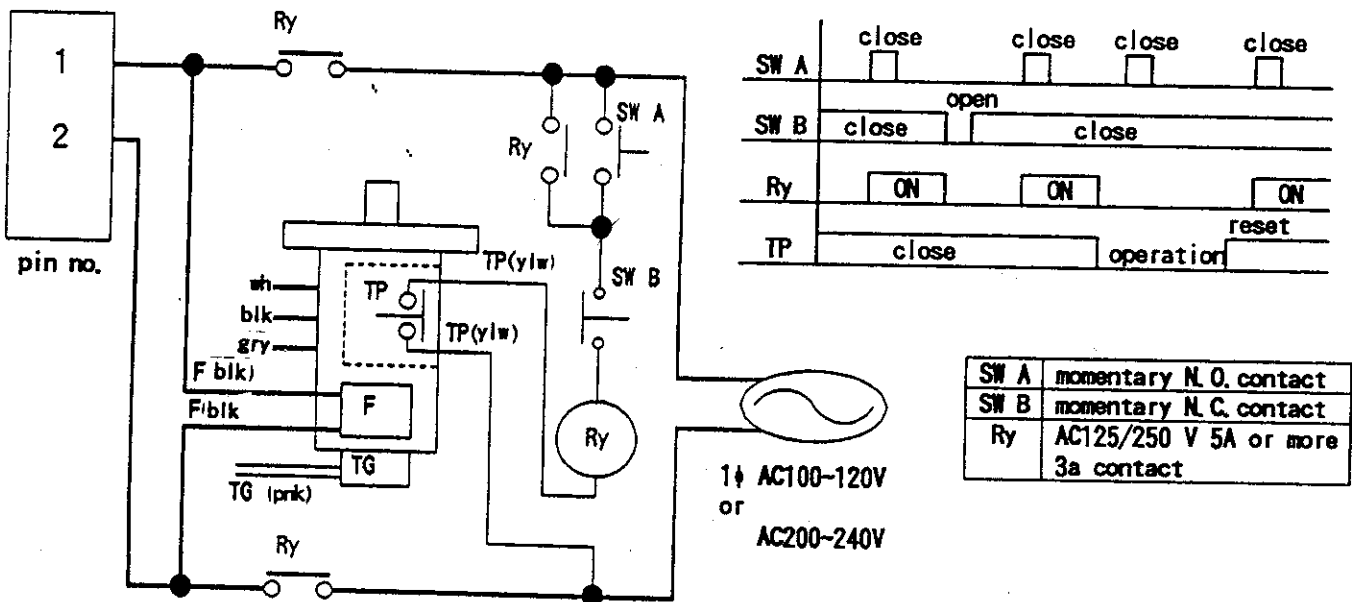
■ Caution on Wiring

- Please do not solder directly to the pins of the controller.
- Please avoid the parallel wiring with high capacity/high frequency equipment which is controlled with thyristors. (Please do not use the same wiring either.)
- This controller is not protected against a large surge current caused by thunderbolt.
- Please prepare a proper noise suppression if necessary.

■ Caution on Operation

- Please make sure that the temperature at the motor case does not exceed 90 °C.
- If the temperature exceeds this, please use the larger output motor.

○ Wiring Diagram (motor with fan (F), with thermal protector (TP))



1. Thermal protector is an automatic reset type. Please follow the wiring as above.
2. Please allow cooling time for the thermal protector to reset.
3. Please install the cooling fan between the power terminals of ① and ②.
4. Please refer other section for other wiring for the motor and tachogenerator.

○ Basic Wiring Diagram (variable only)

• One-Way Run

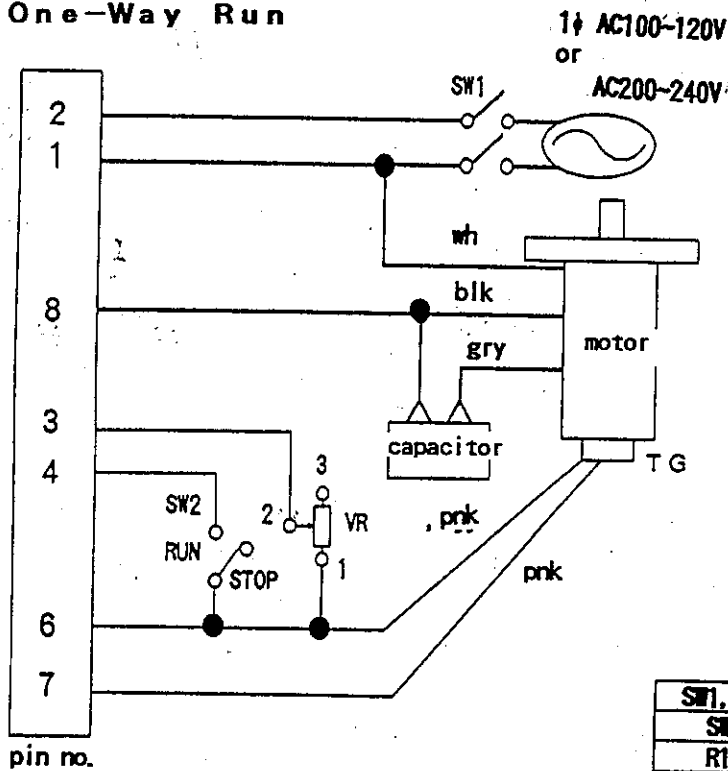
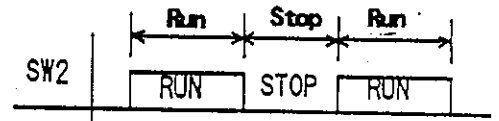
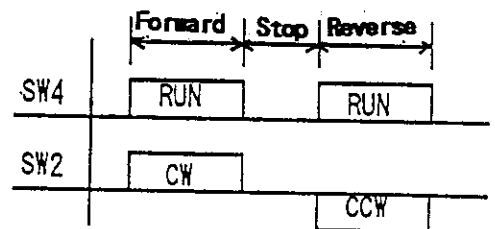
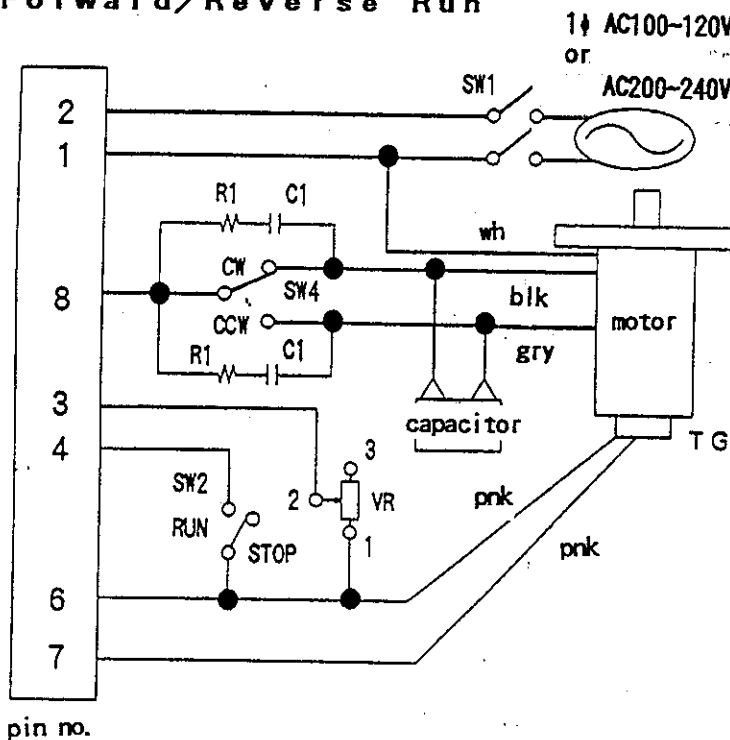


Diagram of the left represents CW rotation. (viewed from the motor shaft) For CCW rotation, switch the black and the gray wire.



SW1, SW4	AC125V/250V, 5A or more.
SW2	DC10V, 10mA
R1	10 ~ 200 Ω (1/4 W or more)
C1	0.1 ~ 0.33 μF (AC125V or 250V)
VR	20 kΩ 1/4 W

• Forward/Reverse Run



[Note]

1. You can run the motor at the preset speed by turning SW2 to RUN and stop by turning SW2 to STOP.
2. In case of the induction motor, please allow the motor to stop before you select SW4 for Forward/Reverse Run.
3. In case of the reversible motor, you can select the rotational direction with SW4 while keeping SW2 at RUN and the direction reverses immediately.
4. Please refer the previous page if you use fan motor or motor with thermal protector.

○ Basic Wiring Diagram (One-Way + Electrical Brake)

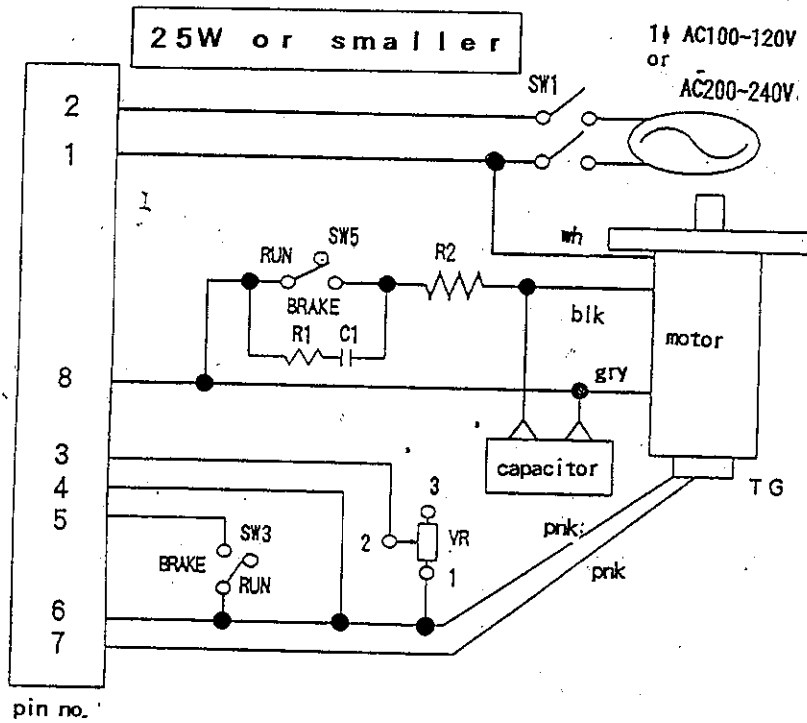
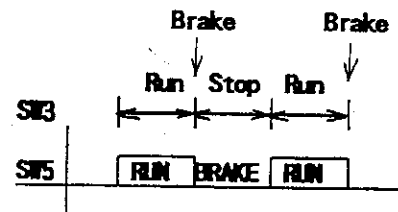
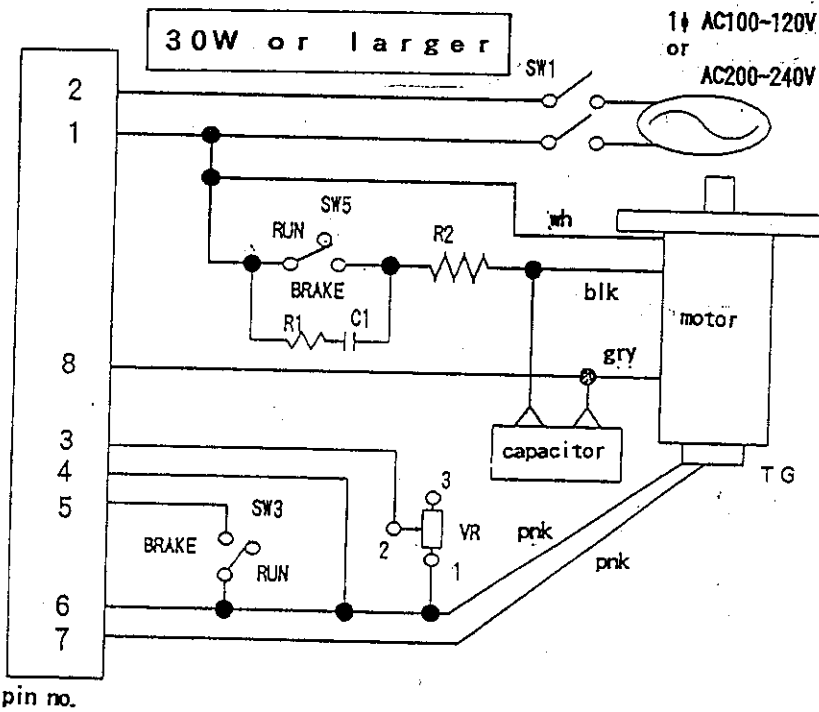


Diagram of the left represents CW rotation (viewed from the motor shaft). For CCW rotation, switch the black and the gray wire.

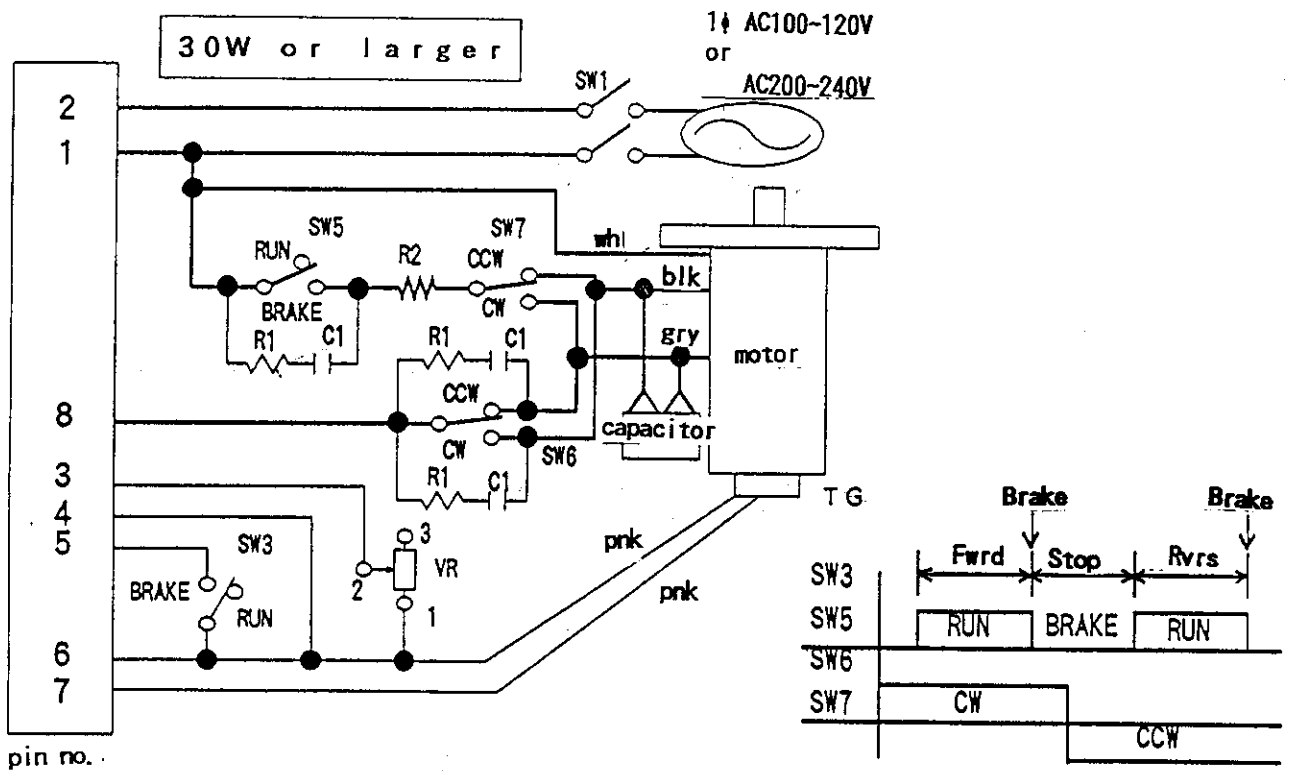
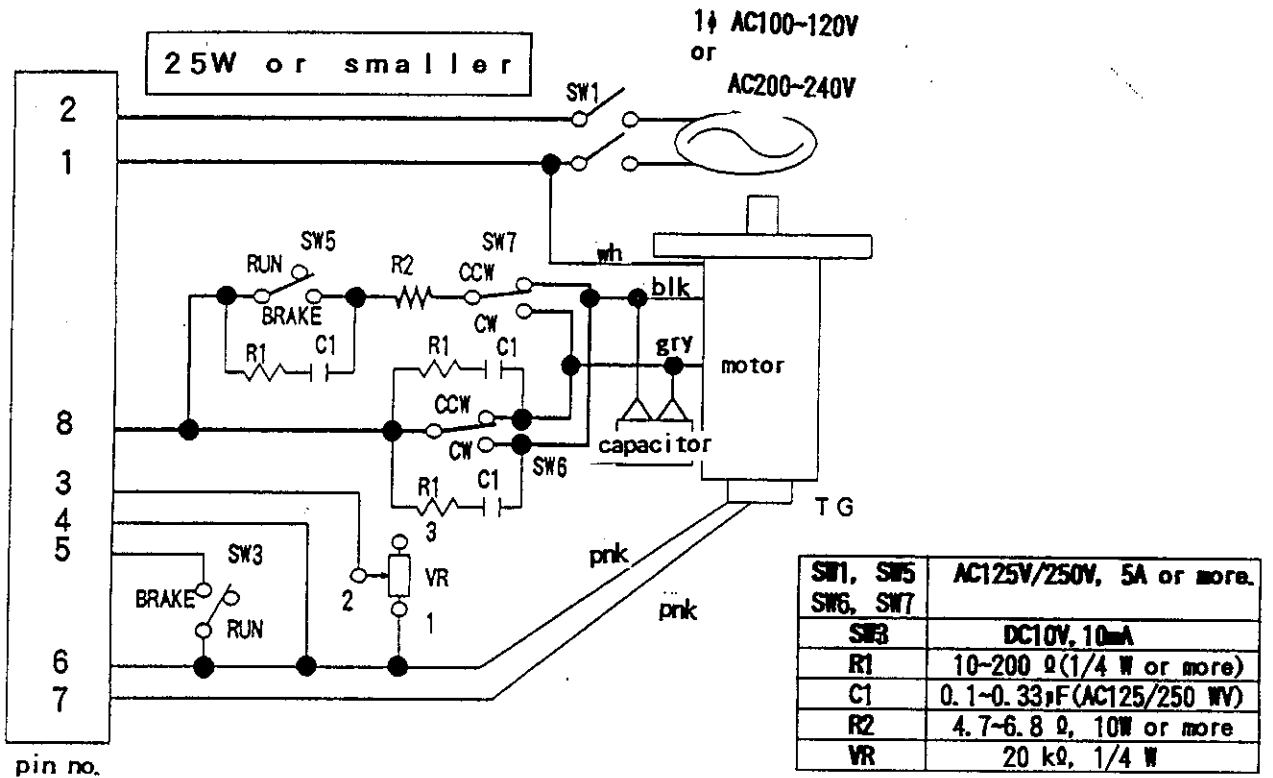
SW2, SW5	AC125V/250V, 5A or more.
SW3	DC10V, 10mA
R1	10-200 Ω (1/4 W or more)
C1	0.1-0.33μF (AC125WV/ 250WV)
R2	4.7-6.8Ω, 10W or more
VR	20 kΩ, 1/4 W



[Note]

1. You can run the motor at the preset speed by turning SW3 and SW5 to RUN from BRAKE, and stop the motor with brake (electrical) by turning SW3 and SW5 to BRAKE from RUN.
2. Please refer the page 4 if you use fan motor or motor with thermal protector.

○ Basic Wiring Diagram (Frwd/Rvrs+Electrical Brake)



[Note]

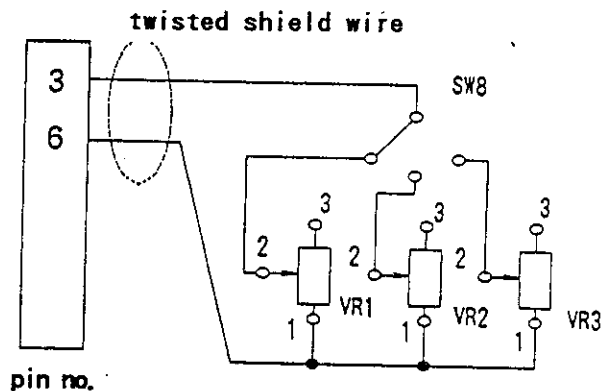
1. You can run the motor at the preset speed by turning SW3 and SW5 to RUN from BRAKE, and stop the motor with brake (electrical) by turning SW3 and SW5 to BRAKE from RUN.
2. Please operate SW6 and SW7 only after the motor stops.
3. Please select SW6 and SW7 before you select SW3 and SW5.
4. Please refer the page 4 if you use fan motor or motor with thermal protector.

○ Extra Wiring Diagram

■ Multi-speed Operation

Please set the speed with external potentiometers, VR1, VR2 and VR3. And select with SW8.

SW8	DC10 V, 10mA
VR1	20 kΩ, 1/4 W
VR2	
VR3	

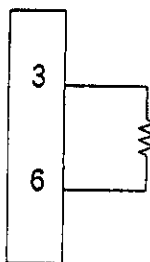


■ Max. Speed Adjustment

You can adjust the max. speed with Max. speed Adjust Volume when you do not need to change the speed frequently and do not require external potentiometer.

● Connect R3 instead of external potentiometer

● Open ③ and ⑥



pin no.

You can control the speed at full range of the Max. Speed Adjust Volume.

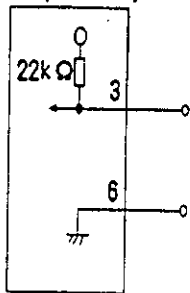


pin no.

You can control the speed at half the range of the Max. Speed Adjust Volume.

■ Variable speed with analog signal

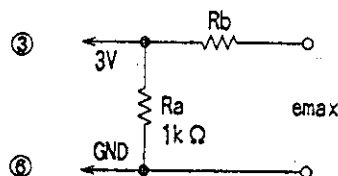
input impedance 22kΩ



pin no.

[Note]

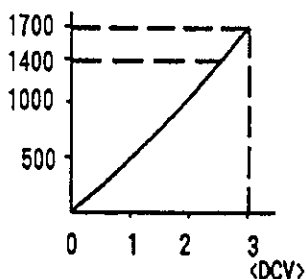
1. Adjust the necessary max. speed with the Max. Speed Adjust Volume corresponding to the max. value(ex. 3VDC) of analog signal.
2. You can run with soft start/down by adjusting Soft Start/Down volume.
3. Please note that the max. applicable voltage of the analog signal is 5V. Recommended standard is 3VDC. If you use higher than 3V, please use the following diagram;



$$R_b \geq \frac{e_{max}}{3} - 1 \text{ (k}\Omega\text{)}$$

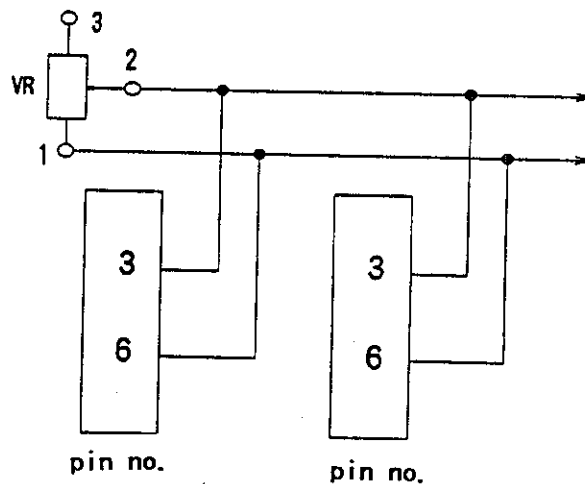
e_{max} ; max. analog signal voltage

<r/min>



4. Please adjust a signal for [0]-speed as DC0.1V or smaller.
5. Please refer other sections for other operation.
6. Please adjust a voltage ripple of analog signal as 2% or less.

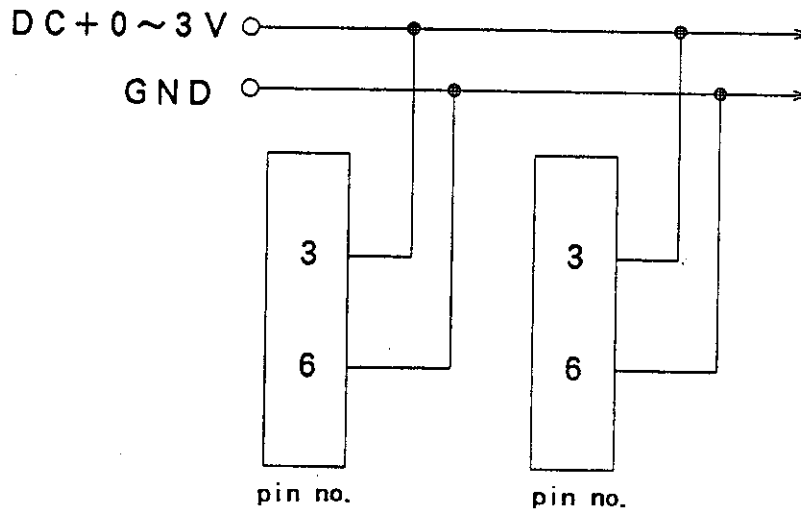
■ Parallel Run with external potentiometer



[Note]

1. Resistance(R_s) of the external potentiometer to be as $R_s = 20/N(k\Omega)$
(where: N = number of the motors to be controlled)
2. Please adjust individually the necessary speed with Max. Speed Adjust Volume when you make synchronous or proportional operation. Also set the same position of each volume for Soft Start/Down, Response Selection SW.
3. Use the same pin number for wiring each potentiometer to the controller. (3 - 6)
4. Noise suppression filter may be required to each wiring if the numbers of the motor is increased.
5. Please refer the other section for other operation.

■ Parallel run with analog signal

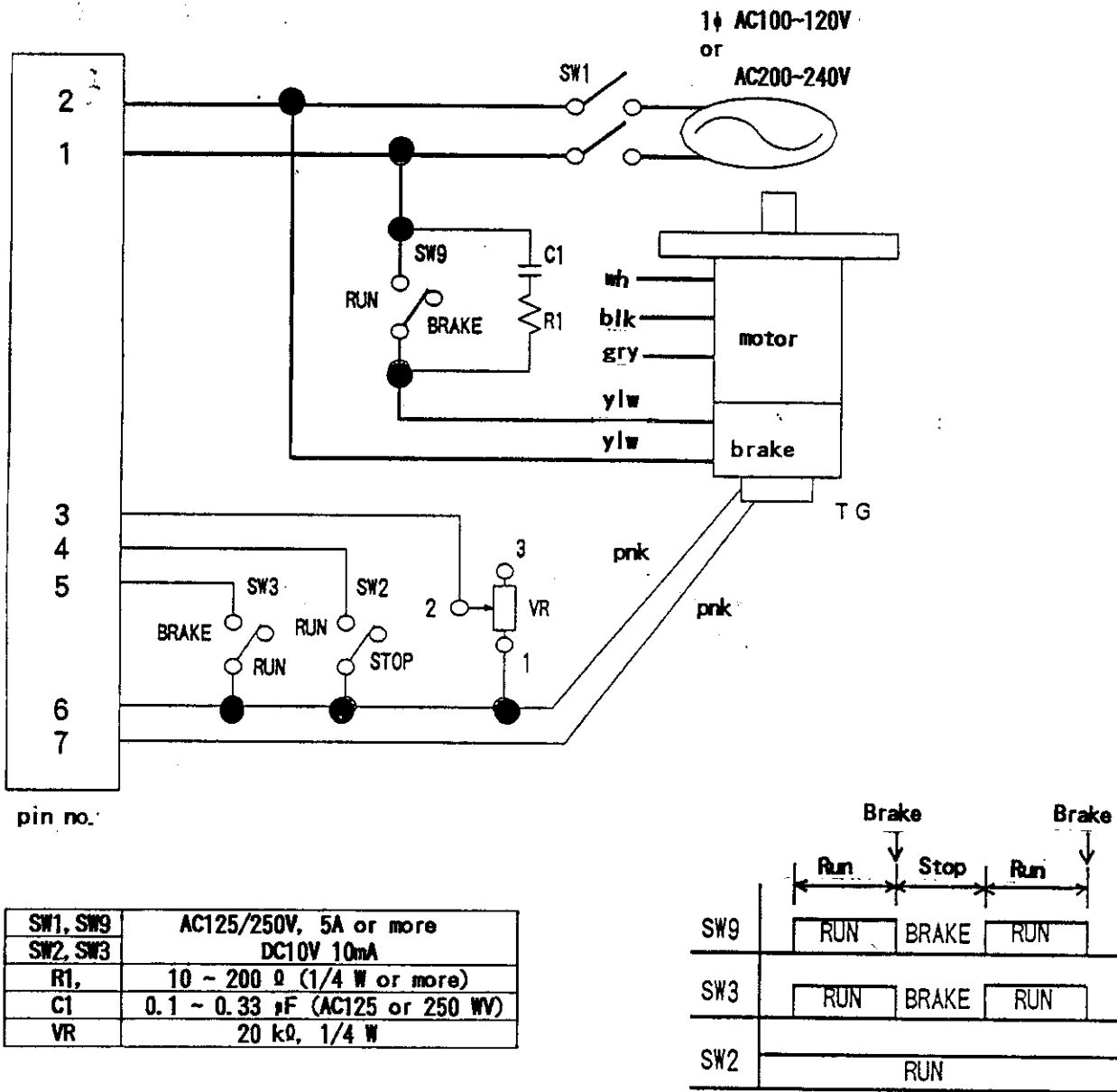


[Note]

1. Input impedance of the controller is 22 k Ω .
2. Please refer other section for other operation.

○ Wiring Diagram (with Electromagnetic Brake Motor)

■ Variable + E/M Brake + Electric Brake

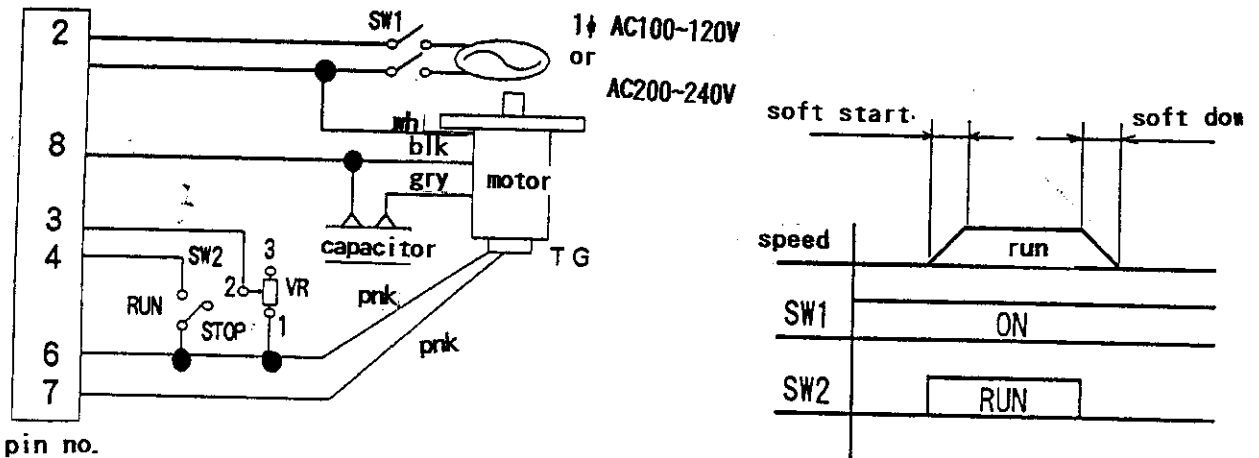


[Note]

1. Please turn on the SW1 about 0.5 secs before the run signal through SW3 and SW9.
2. You can run the motor at the preset speed by turning SW3 and SW9 to RUN from BRAKE, and stop the motor with both electrical and electromagnetic brake by turning SW3 and SW9 to BRAKE from RUN.
3. Please refer other section for other operation.

○ Soft Operation

■ Soft Start/Down



[Note]

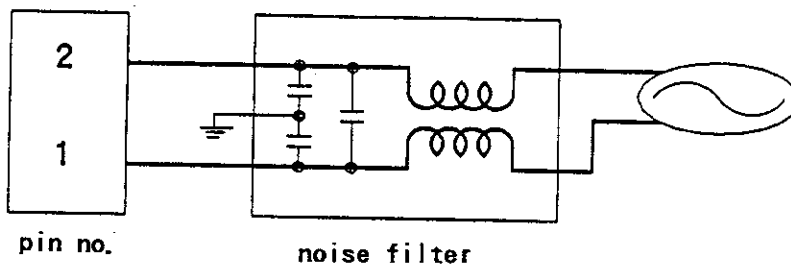
1. Please turn on SW1 about 0.5 secs before the run signal through SW2.
2. Please turn on and off with SW2 keeping SW1 as [ON] if you repeat start/stop frequently. (thus you can control with small signal.) Please turn off SW1 if the controller is not in use for a long time.
3. When you turn the Soft Start/Down volume to the full right and turn on SW2, the motor starts running immediately, and when the stop signal comes, the controller shuts off the current to the motor but motor stops gradually due to the inertia of the load and the motor.
4. You can set the Soft Start/Down time at up to max. 5 secs. (please note that actual time may differ due to the load inertia)
5. Above diagram represents [One-Way + Variable]. please refer other section for other operation.

■ Soft Start/Down + Electrical Brake

Please refer page 6 for the wiring.

○ Noise Suppression

It is recommended to use proper noise suppression when you use the controller(see the below)

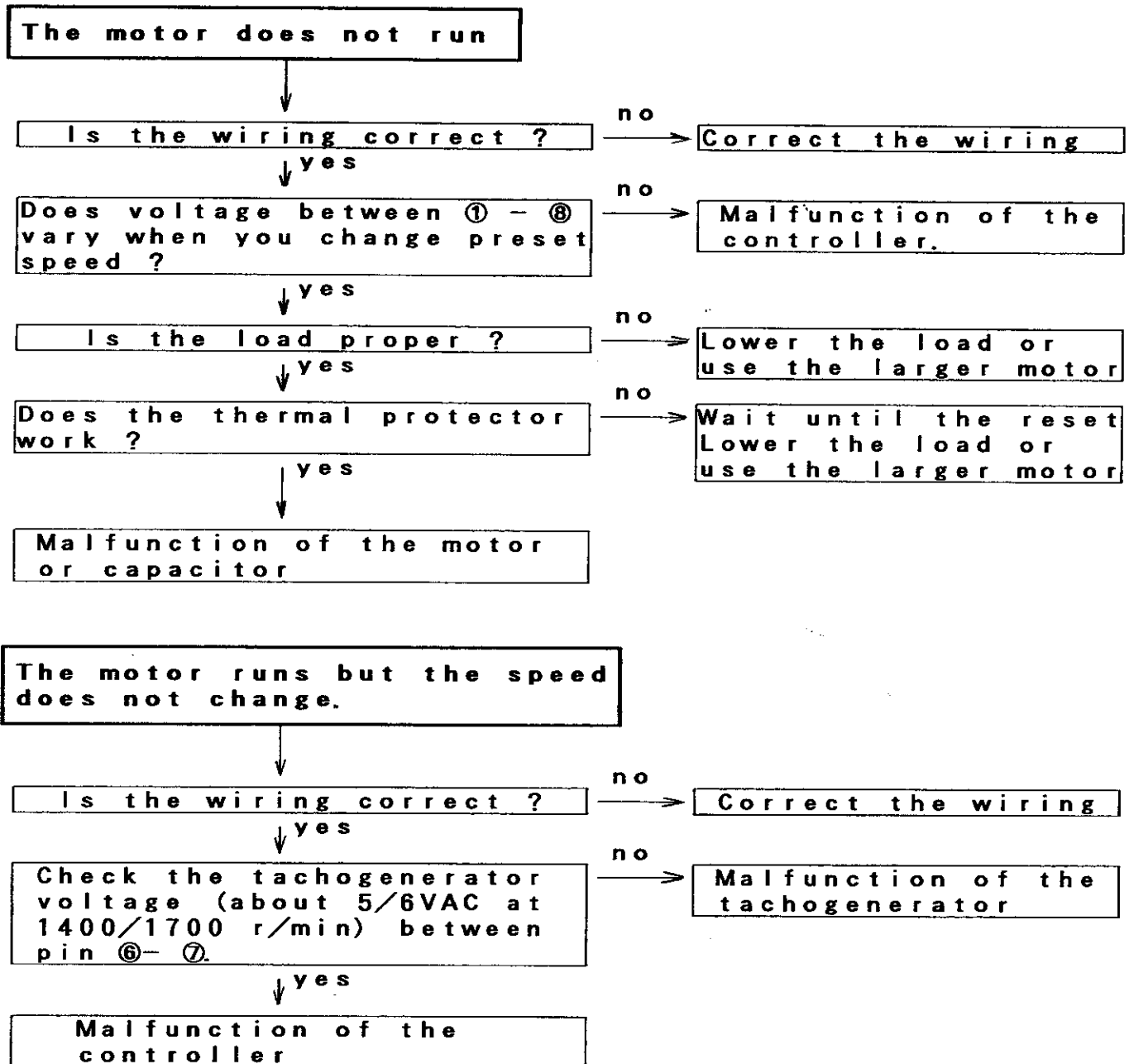


0 Maintenance

Please pay extra attention to the following:

1. Does the motor run smoothly ?
2. Any abnormal noise ?
3. Overheating ?

0 Troubleshooting



0 Specifications

Item	Model	DVEX	DVEX	DVEX	DVEX	DVEX	DVEX
		48AL	48BL	48CL	48AY	48BY	48CY
Input voltage		Single phase AC100 ~ 120V			Single phase AC200 ~ 240V		
Working voltage		± 10%					
Input frequency		50/60 Hz					
Rated current		0.5A	1.0A	2.0A	0.3A	0.5A	1.0A
Applicable motor output (W)	#1	3~20	25~40	50~90	3~20	25~40	50~90
Controllable speed range	A#2	50~1400 r/min /			50 ~ 1700 r/min		
	B#2	90~1400 r/min /			90 ~ 1700 r/min		
Speed variation	A#2	3 % or less					
	B#2	5 % or more					
Speed setting		External potentiometer Analog voltage Max. Speed Adjust Volume					
Brake #3		Electrical					
Brake time		5 secs (shuts off the current for the brake when the motor stops within 5 secs.)					
Parallel operation		Applicable					
Soft start/down		Applicable			Up to 5 secs (0~1000 r/min)		
Temperature	(working)	- 10 ~ 50 °C					
	(storage)	- 20 ~ 60 °C					

#1 Apply to Panasonic G-Series motors.

#2 A : High stability mode, B : High response mode

#3 Electrical brake does not hold.

0 Dimensions

