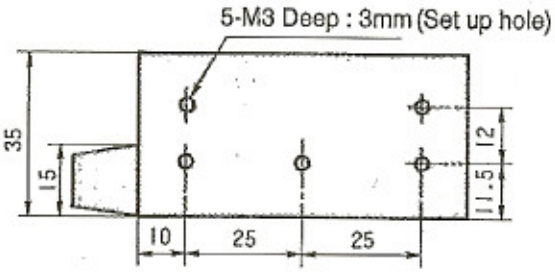
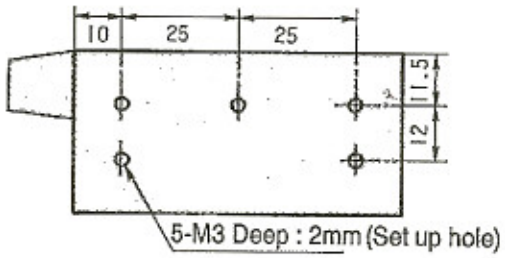
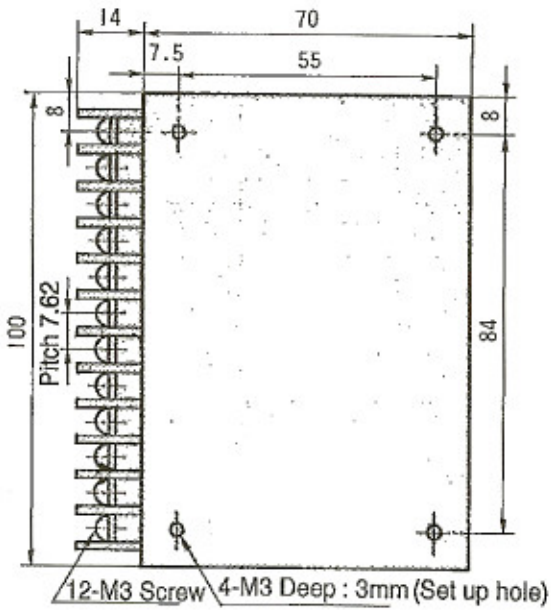
Specifications

FEATURE	D2060	D2045	D2030	COMMENT
INPUT VOLTAGE	DC12±0.5V			
INPUTCURRENT	2.5A max	1.5A max	1.0A max	
MOTOR DRIVE VOLTAGE	100~130Vrms (Sin.Cos)			
OSCILLATING FREQUENCY	40Khz	43Khz	42Khz	
OSCILLATING WAVE FORM	SINE WAVE			
NON-LOAD VARIABLE SPEED SCOPE	50~100rpm	80~120rmp	130~250rpm	
SPEED CONTROL	B10KΩ 0.1W			
SPEED CONTROL INPUT VOLTAGE	DC0~1.6V			
VARIABLE SPEED METHOD	FREQUENCY CHANGE METHOD			
WAVE FREQUENCY CONTROL		AMPLITUDE AND PHASE CONTROL		
STARTING/STOPPING MECHANISM	CAN USE EITHER CONTACT OR CONTACTLESS POINT			
STARTING RESPONSE TIME	20mSec	40mSec	50mSec	under no inertial load
STOPPING RESPONSE TIME	WITHIN 1mSec			under no inertial load
OVER CURRENT PROTECTION FUSE	3A FUSE	2A FUSE	1.5A FUSE	φ5.2midget type glass tube fuse
INSULATION RESISTANCE	MINIMUM 10MΩ			housing unit and terminals, motor disconnected
INSULATION VOLTAGE RESISTANCE	1KV AC			housing unit and terminals, motor disconnected
STORAGE TEMPERATURE	-20C~+80C			
OPERATING TEMPERATURE	-10C~+50C			
WEIGHT	240g			

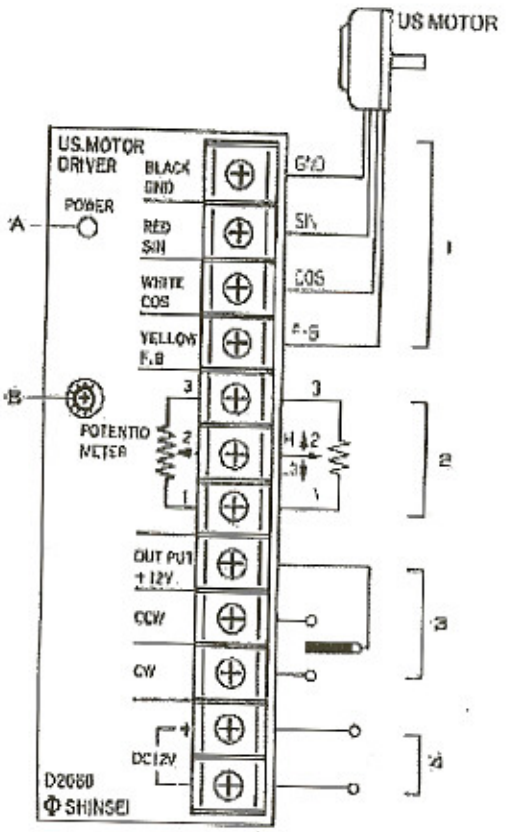
Exterior


5-M3 Deep : 3mm (Set up hole)
35
15
12
11.5
10
25
25


10
25
25
11.5
12
5-M3 Deep : 2mm (Set up hole)


14
70
7.5
55
8
8
100
Pitch 7.62
84
12-M3 Screw
4-M3 Deep : 3mm (Set up hole)

Terminal Functions and Connecting Method



2. Speed Control Terminals

The speed can be set by connecting a B10KΩ(0.1W) variable resistor.

3. Start, Stop, & Reverse Switch Terminals

- For the contact point, please use a single-pole double-throw equipped Snap Switch.
- When using several relays, please be sure to not have the CW and CCW on at the same time.

4. Power Supply Terminals

Connect to a 12V direct current power supply. Make certain your electric supply source is of sufficient capacity.

Note: Do no turn the power supply on and off to start or stop the motor.

A) LED Display Light

The light will turn on when the power supply has reached approximately 10V or higher. If the internal fuse is burnt out, the LED will not light up.

1. Motor Connection Terminals

Connect according to the motor lead line color. The maximum functional length for a motor lead line is 10m.

B) Marginal Rotational Speed Setting Variable Resistor

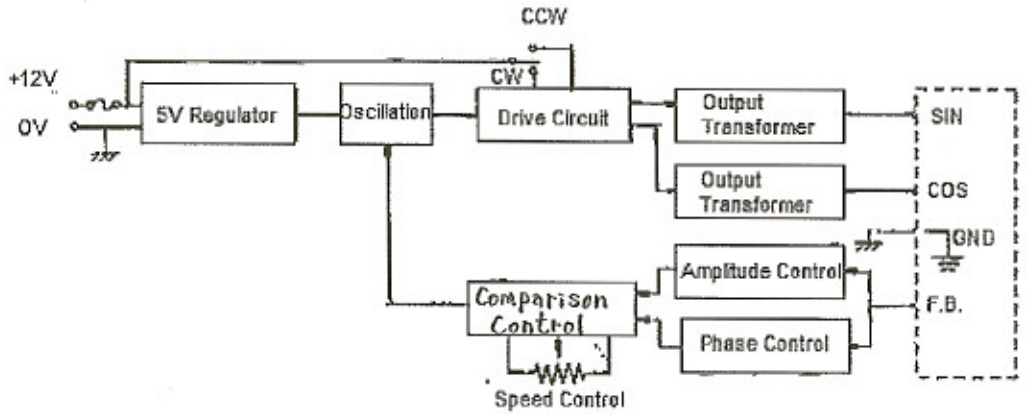
The speed has been pre-adjusted in the factory, please do not change this. If changes to the length of the motor lead are necessary, please contact Fukoku for further information.

USR60...100rpm

USR45...120rpm

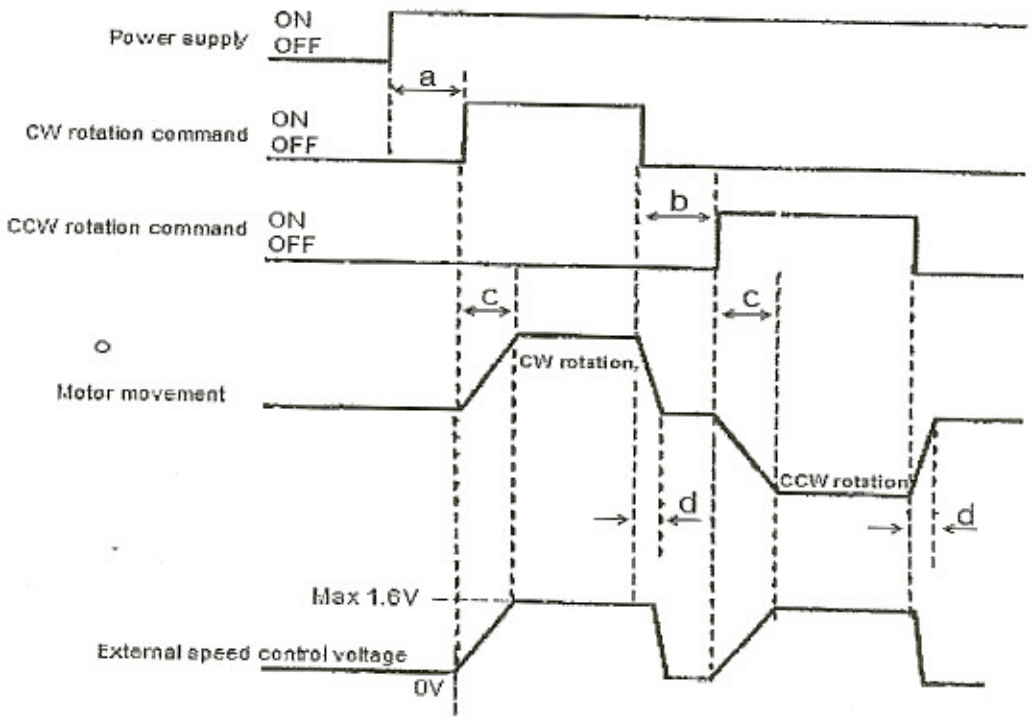
USR30...250rpm

Circuit Configuration



- Drive case does not degrade due to GND potential.
- Motor case is connected by the black ground lead line and can degrade due to a12V minus GND power supply.

Timing Chart



a: From turning on the driver's power source to processing the launch command (either CW or CCW) requires at least 100 milliseconds.

b: Switching of rotational direction requires an interval time of at least 10 milliseconds. If speed is controlled by external voltage, please turn down the voltage on the speed control down to 0V.

c: Launch response properties (under no inertial load): USR60 at 20 milliseconds, USR45 at 40 milliseconds, USR30 at 50 milliseconds

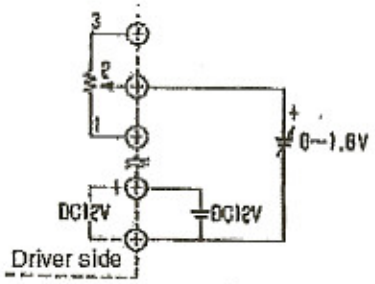
If speed is controlled by external voltage, raise the voltage from 0V. At that time, please ensure that the voltage is no less than the launch response time of the --------.

Caution: If speed control voltage is left applied, there is the possibility of malfunction.

d: Suspension response properties (under no inertial load): USR60, USR45, and USR30 all respond within 1 millisecond.

External Controls

Speed control process----------

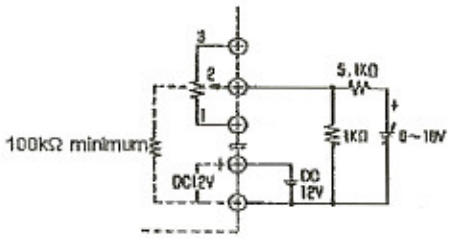


- If powered by external voltage source, instead of the speed control, connect to the DC variable power source as shown above. Instead of changing the voltage from 0~1.6V, by changing the volume from 0~max, similar speed control is possible.

Caution: In this case, CW and CCW rotation variance may be generated easily.

※ External power sources electric current expenditure must be below 1mA.

※ As the speed directive voltage increases, there are restrictions on the changing speed. Please reference the timing chart.

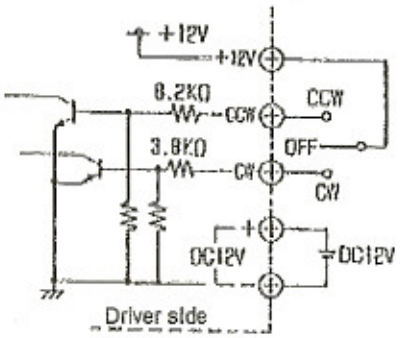


- If you wish to expand the variable scope of external voltage, there is an electrical resistance partial pressure method. Because the driver's internal impedance is at least 100KΩ, speed can be changed between 0~10V as shown in the above drawing.

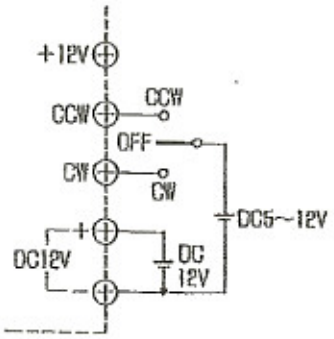
Caution: Under these circumstances, noise and similar effects are more easily produced.

Starting, stopping, and rotational switching processes----------

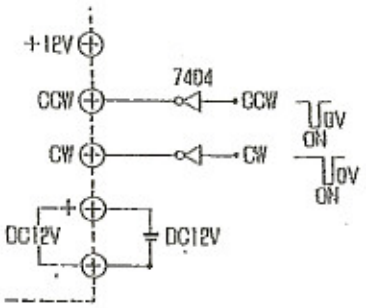
- Input via the driver power source utilizing contact point switch



- Input via external power source utilizing contact point switch



- Input via external TTL



Caution: Please do not have CW and CCW on at the same time.

※ CW↔CCW switching intervals should be referenced on the timing chart.

Cautions for Usage

Please take notice of the following:

1. Please avoid operation under excessive loads, excessive inertial loads, and use in vacuo. This will cause considerable wear to the slider and will extremely shorten the life span of the motor.

2. The motor output shaft has a dimensional tolerance of g6. When placing into the coordinating hole's indentation or placement, please take care to avoid locking it in place.

   * g6 ... Shaft diameter

3~6	-0.004 ~ -0.012
6~10	-0.005 ~ -0.014
10~18	-0.006 ~ -0.017

3. Please avoid thrust loads to the shaft.

4. Please allow for heat diffusion that maintains the temperature of the motor case at below 55C at all times.

5. When turning the motor off, do not force rotation other than maintenance torque.

6. As the motor and driver are adjusted as a pair, please make sure to only connect and use parts of the same serial number.

7. Please be sure to use only a specified lead line for the motor lead line. If you wish to change the length of the lead line, please be sure to use the trimmer located on the front of the driver to make adjustments.

8. Please be sure to use the external 12V DC power source for the driver only when there is room for expansion of electrical current capacity.
   D2060...3.5A minimum
   D2045...2.5A minimum
   D2030...2A minimum