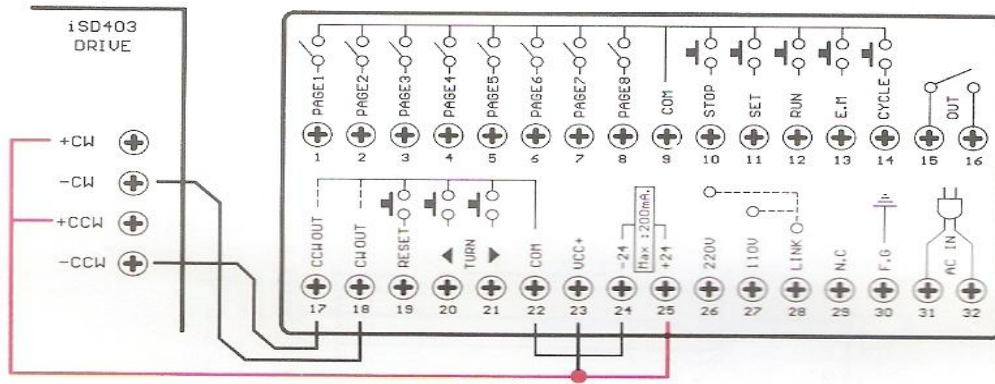


# Wire connection of RoboFec

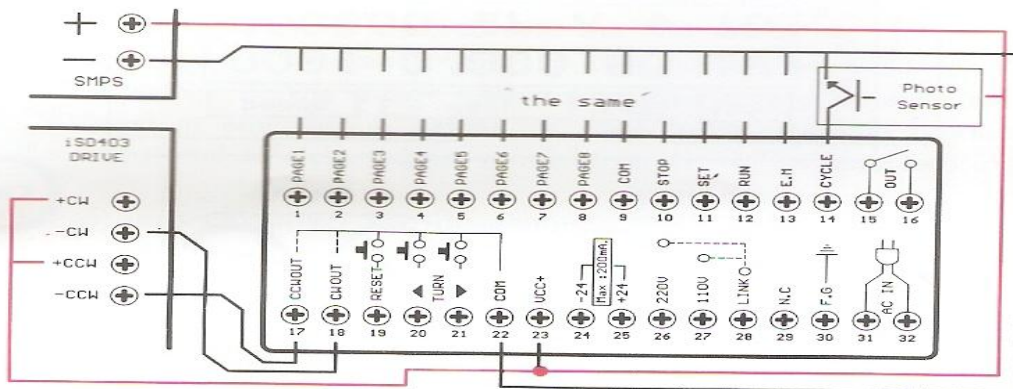
When switches (a micro switch, a button switch etc.) are used for input, please connect electric wires using the inner power source as follow. Thick wires should be connected shortly and common impedance should not be formed. Any wires (high voltages) which might produce noise should be apart more than 10cm from the present wires.

**NOTICE** Please connect Link terminals with wires only after confirming the input power source 110V/220V.

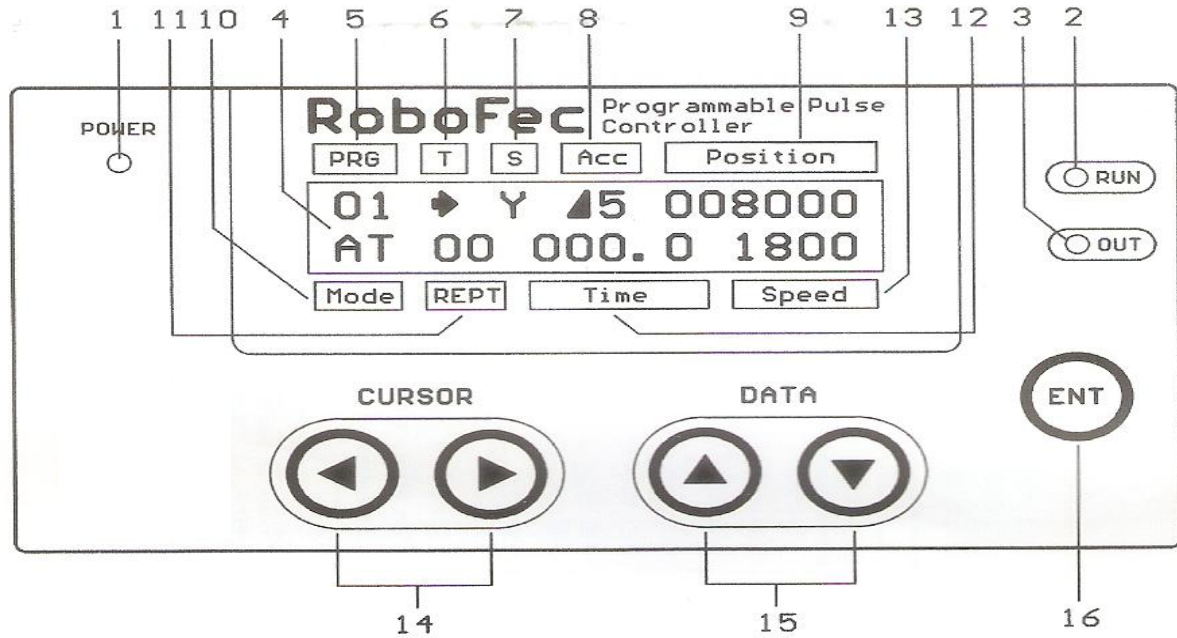


Twist wire connections are desirable.

When sensors (photo-switches etc.) are used for input, please use an extra outer power source of 24V (SMPS) essentially in order to supply electric power to the sensors. The present inner power source is prepared for an inner circuit. Therefore if the inner power source produces at the inner power supplying device. (Selection method of the SMPS) : Consumption Current of Sensor X Number of Sensors = Total Consumption Current X 24V = Power (W)



## Description of an picture of the LCD



(1) **POWER LAMP** : Lamp for Confirming Power Input.

(2) **RUN LAMP** : Lamp to be lighted whenever CW and CCW pulses are output.

(3) **OUT LAMP** : Lamp for confirming output of END signal.

(4) **LCD Display** : Lamp for Displaying Program Data.

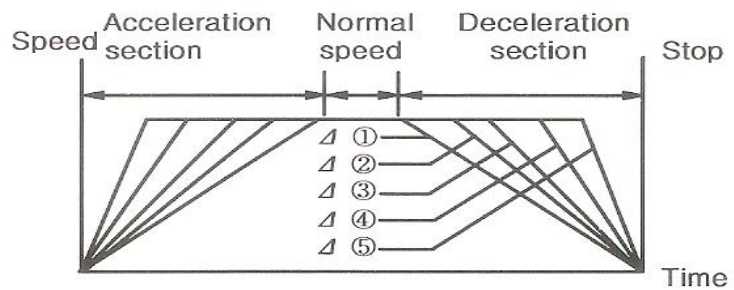
(5) **PRG** : This displays the number of the operation order of programs at edit of programs. Programs is running in order from the number of 01 at run. (But, the address of 00 is used specially for control of a reference point. Running speed at the reference point and the rotation direction of the motor can be controlled at the address of 00.

(6) **TURN** : This select right - reverse rotation of the motor. The motor rotates to reverse direction by selection of " ← ". The motor rotates to right direction by selection of " → ".

(7) **SIGNAL** : If "Y"(Yes) is selected, a signal for END confirmation is produced during 0.3 second (Relay Contact Point) to outer signal terminal. If "N"(No) is selected, the signal is not produced.

(8) **ACC** : Speed level of acceleration and deceleration is selected. The level can be selected according to the characteristic of the motor. Step motors has the characteristic that they runs by pulses. If high speed pulses input to a step motor suddenly, the motor cannot rotate and an trouble is produced in the motor. (Not related to low speed). There for the speed level (Speed, acceleration and deceleration) should be selected according to the characteristic of the motor. The characteristic of acceleration is described according to a graph as follow.

Δ1 to Δ5 can be selected. An section of acceleration and deceleration at Δ1 is longest. An section of acceleration and deceleration is shortest.

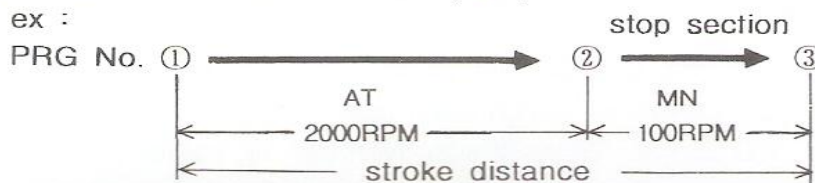


**(9) POSITION** : The rotation value(Pulse)of the motor can be input. The maximum value which is input is 999,999. For example, when user wants to rotate a step motor with 2 phase 50 turns at 2 phase mode, the rotation value is calculated as follow and inputted.  $50$  (rotation turns)  $\times$   $400$  (the number of pulses which is needed for 1 rotation) =  $20000$ . The numeral of  $20000$  is displayed in position mode by data buttons of "▲,▼".

**(10)MODE** : Two modes of AT and MN are supported. If AT(Auto)mode is selected, the motor rotates times corresponding to the number of said position setting pulses and stops. Then a program of next number is proceeded automatically. If MN(manual) mode is selected, the motor rotates continuously not related to the number of position pulses. Then the rotation of the motor is stopped when an outer stop signal is inputted. Then a program of next number

is proceeded.

NOTICE) When the high speed is used in MN mode, if stop signal is in putted, a position error of stop might be occurred due to sudden stopping. Thus the stop operation should be performed gradually. Therefore the program may be divided to 2 step as follow and then the error cannot be occurred. (Not related to low speed)



**(11)REPT** : An program number can be selected repeatedly. Selected programs of 00 ~ 99 times can be repeated. An program of repeated times is finished and then an program with next number is proceeded.

**(12)TIME** : A function that start delays selected time is performed. Proceeding program is delayed the predetermined time when run signal input or program input is inputted. The delayed time can be predetermined among 0.1 ~ 999.9 second.

**(13)SPEED** : RPM of rotation number per a minute is displayed. The rotation numbers corresponding to respective program can be selected between 30 steps from 10 to 2,000 rpm. (The rotation number of the motor can be used up to 1200 rpm in application of motor with level of more than 3.5 Ampere.)

## Description of keys

(14) **CURSOR** : This keys are used when cursor is moved among positions of respective modes by buttons of "◀, ▶".

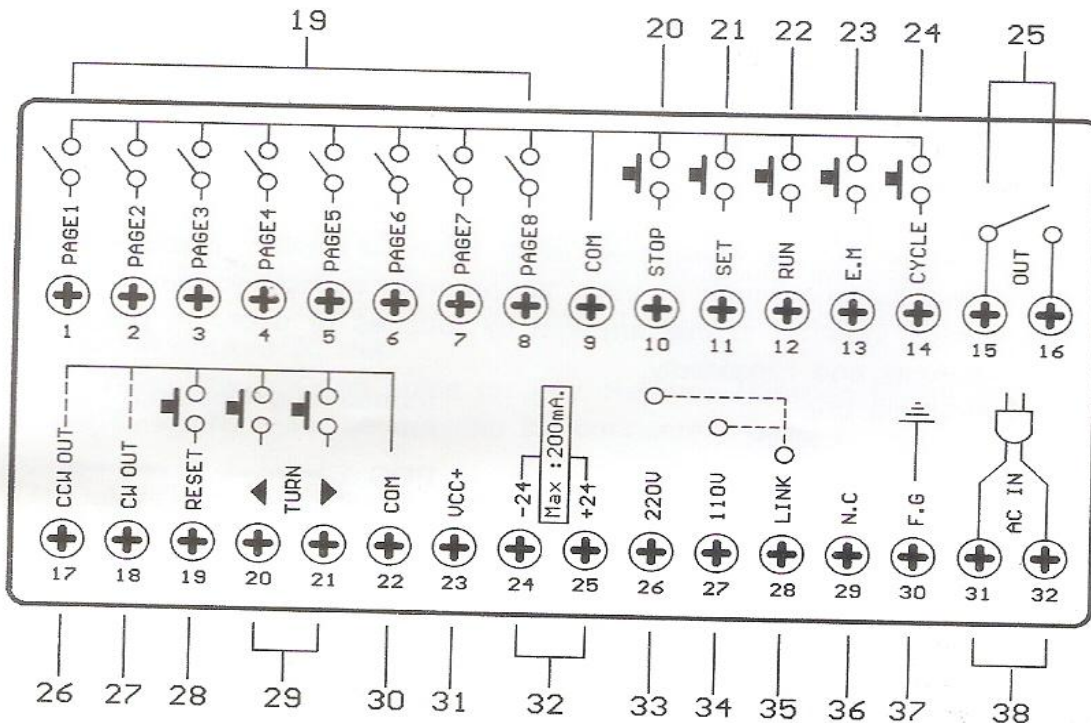
(15) **DATA** : This keys are used when data are inputted by buttons of "▲, ▼".

(16) **ENT** : Input button for selecting a program page and for saving an edited program.

(17) **Method for Editing Program** : Program mode begins when a power is applied (or outernal Resetting is performed) with the buttons of "▲, ▼" pressed simultaneously. The Pages 1-8 are respective packages of programs which user can edit and use. A capacity for program per respective page is 100 steps. When Page Number is selected using buttons "▲, ▼" and the key "ENT" is pressed, user can edit a program for the page. Then, when the key "ENT" is pressed after finishing editing the program, the edited program is saved in a memory.

(18) **Method for Deleting Data for Program** : When a Power is applied (or Outernal Resetting is applied) with four buttons ("◀, ▶, ▲, ▼") pressed simultaneously, Clear Page twinkles. Then, when the button 'ENT' is pressed after selecting a Page to be deleted with the buttons "▲, ▼", the data for the page is deleted. (All numbers 1-8 of pages can be deleted in the display "A".)

## Description of outer input terminals



(19)PAGE 1-8 : These are terminals for selecting Program Page. When one of them is connected with "COM", a program page which was selected runs. Even when it runs, any other page among No. 1-8 can be called and used at any time.

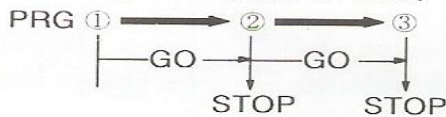
(20)STOP Terminal : STOP signal input terminal at running of motor in MN mode

(21)SET Terminal : This terminal is used for control of an initial position when the power switch become ON/OFF. If the input switch corresponding to this terminal is ON, the motor stops at the initial position.(The initial position can be changed whenever an power switch is ON)

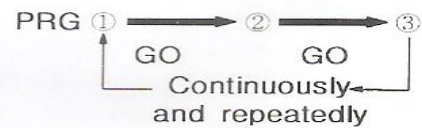
(22)RUN Terminal : RUN can be performed by 2 kinds of mode. Whenever one pulse is inputted in this terminal by one touch of user, an program edited by user is running 1 step. If pulses is continuously inputted in this terminal by touches of user, an program is running automatically, continuously and repeatedly.

ex: (In case of inputting one

pulse by one touch of user)



(continuous inputting)



(23)EMERGENCY Terminal : All operations are stopped when an emergency signal is inputted to this terminal by an emergency switch.(If the emergency switch is ON, the right and reverse rotation of the motor can be performed manually by keys of "◀" "▶".)

(24)Cycle terminal :All edited programs stop after proceeding of 1 cycle if one pulse is inputted in this terminal by one touch of user.

(In case of inputting one pulse by one touch of user)



(25)OUT : This is a terminal for outputting signal to confirm that the program ends. It can be used with other devices as an outernal controller. Otherwise, it can be used as an interface for inputting a signal to a Program Logic Controller.

(26)CCW OUT : This outputs CCW pulse for 24V-Reverse Rotation to the driver for the motor. Please connect it, referring to the drawing for connecting wires.

(Notice : Admission current 50 mA)

(27)CW OUT : This outputs CW pulse for 24V-Reverse Rotation to the driver for the motor. Please connect it, referring to the drawing for connecting wires.(Notice : Admission current 50 mA)

(28)RESET : Outernal Terminal for Initializing

(29)"◀,▶"TURN : This key is used when motor is rotated forcibly to a right or reverse direction according to outer emergency input signal.

(30)COM : It should be used with minus(-) power source. It is common for all input terminals.

(31)VCC : Terminal for connecting a plus power source.

- (32)Output : Terminal of 24V Internal Power Source : The maximum output is 200 mA.
- (33)220V : Terminal for connecting LINK TERMINAL in case of 220V
- (34)110V : Terminal for connecting LINK TERMINAL in case of 110V
- (35)LINK : Terminal for selecting 110V/220V
- (36)N.C : Terminal that is not used.
- (37)F.G : Terminal for Grounding
- (38)Terminal for Power Source : Please supply a power after confirming "LINK" before using this system.

## Example for editing Program

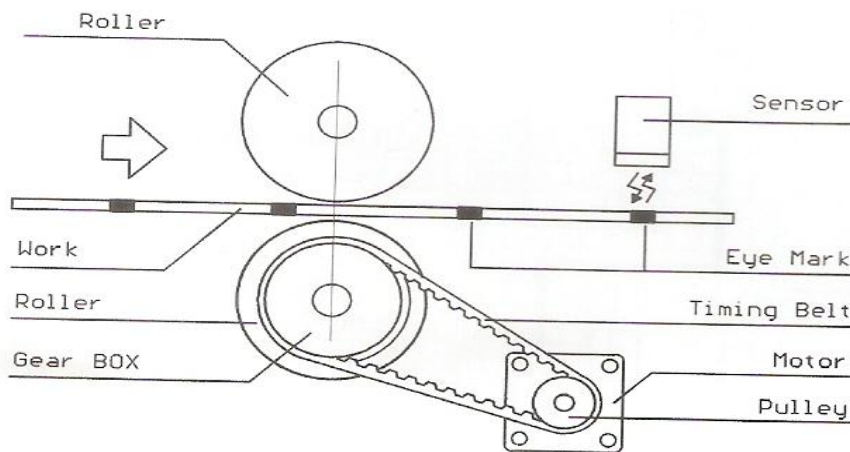
### (Example1 : ROLLER FEEDING CONTROL )

#### 1. Eye Mark Control

Two buttons of "▲,▼"(DATA) are pressed simultaneously and the power switch ON. → "Select Page1" → "ENT" → Example1 for editing program → "ENT" → POWER OFF → PAGE1 program is SAVED in a memory.

#### 2. Auto position Control

Two buttons of "▲,▼"(DATA) are pressed simultaneously and the power switch ON. → "Select Page1" → "▲" → "Select Page2" → "ENT" → Example2 for editing program → "ENT" → POWER OFF → PAGE2 program is SAVED in a memory.



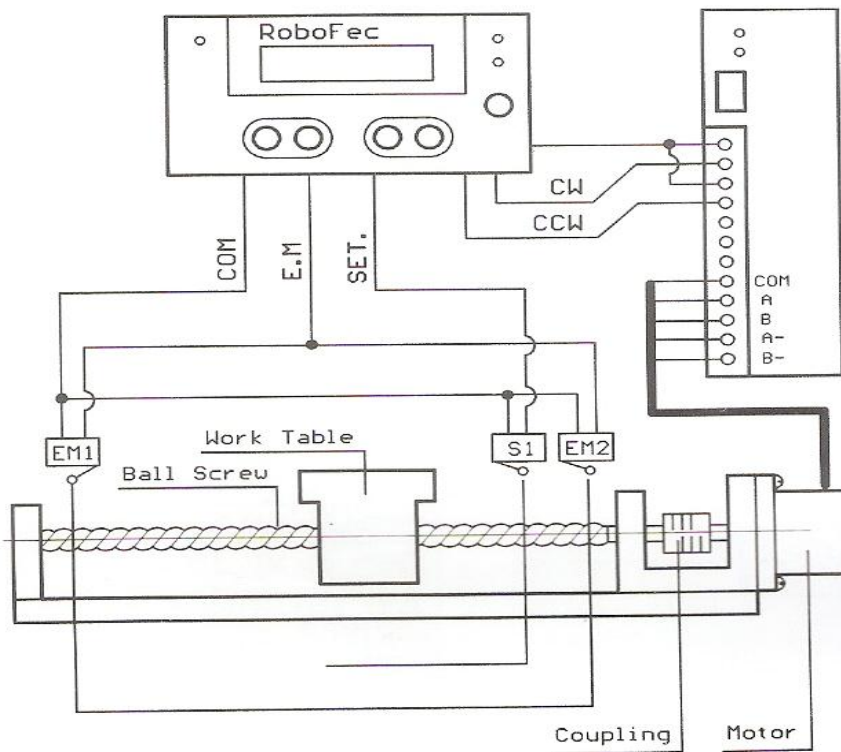
(Program 1)

PRG	T	S	Acc	Position
01	→	Y	▲5	000000
MN	00	000.0	0500	
Mode	REPT	Time	Speed	

(Program2)

PRG	T	S	Acc	Position
01	→	Y	▲5	000400
AT	00	000.0	0500	
Mode	REPT	Time	Speed	

(Example2 : BALL SCREW CONTROL )



( Example2 : One Axis Control)

1. POWER ON → Auto Run Starting Point.(RPM:200)
2. Run Terminal Touch → 1.2Sec Delay → Motor is Left 1Turns(RPM:100) → 10 Repeat Run → Stop.
3. Run Terminal Touch → 2.5Sec Delay → Motor is Left 10Turns(RPM:300) → Stop.
4. Run Terminal Touch → Motor is Right 20Turns (RPM:1500) → Stop.

(Example2 : Editing Program)

1. Two buttons of "▲, ▼" (DATA) are pressed → POWER ON → "Select Page 1" → "▲" pressed → "Select Page 3" setting → "ENT" → Example2 for editing program → "ENT" → POWER OFF → PAGE3 program is SAVED in a memory.

PRG	T	S	Acc	Position
00	→	Y	▲5	000000
MN	00	000.0	0200	
Mode	REPT	Time	Speed	



PRG	T	S	Acc	Position
01	←	Y	▲5	000400
AT	09	001.2	0100	
Mode	REPT	Time	Speed	

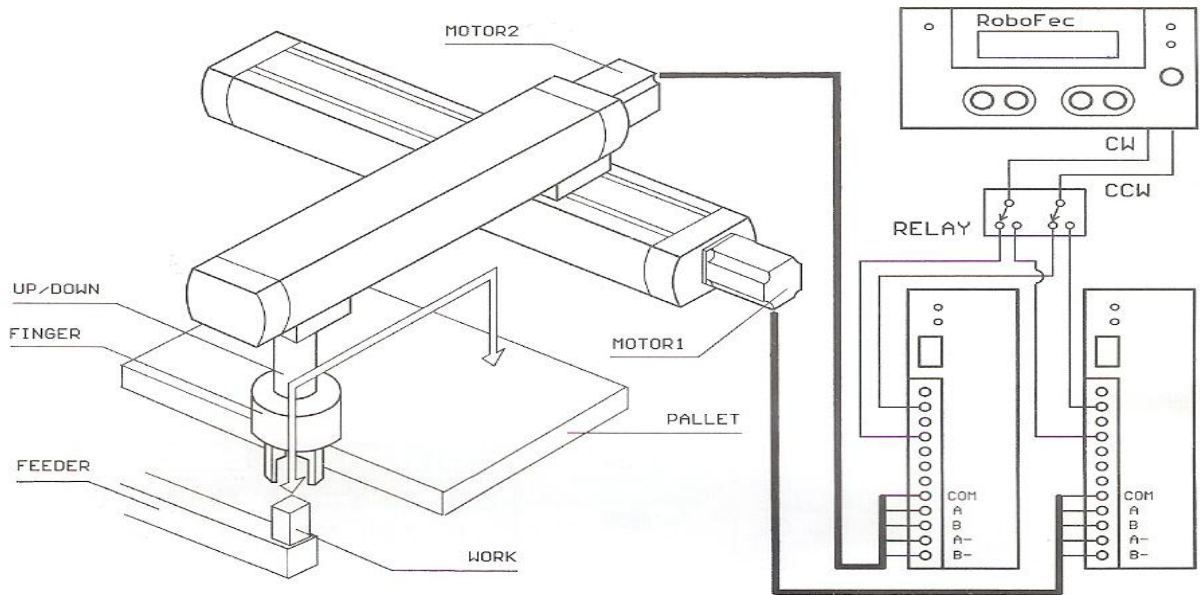


PRG	T	S	Acc	Position
03	→	Y	▲5	008000
AT	00	000.0	1500	
Mode	REPT	Time	Speed	



PRG	T	S	Acc	Position
02	←	Y	▲5	004000
AT	00	002.5	0300	
Mode	REPT	Time	Speed	

(Example3 : X-Y STAGE CONTROL)

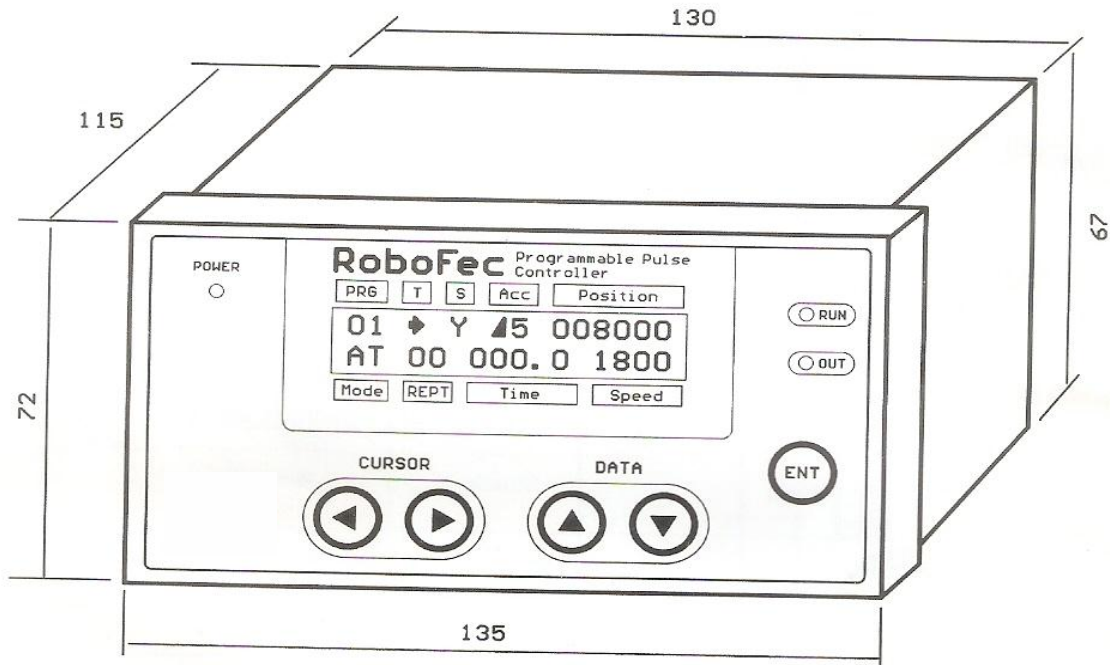


## Specific

Power source	110V / 220V (10 %) 50 , 60Hz Fuse 250V 1A	The number of Programs	0 ~ 99 (100 Step) × 8Page
Input control	⊖ input	The repeated number of Step program	0 ~ 99 (100 Step)
Control input power source	12V ~ 24V .	Designation range of speed	10 ~ 100 (10Steps) , 100 ~ 2000 (20Steps) (Total 30Steps)
Insulation method	Photo-coupler DC	Allowable temperature	0 ~ 60℃
DATA BANK	100Step × 8Page Group	Storage temperature	-10℃ ~ +70℃
START delay Timer	0.1 ~ 999.9 sec (To support 99 Timers)	Notice of humidity of use	5 ~ 95% RHC (Relative Humidity) Dewdrops should not be formed.
Maximum number of designated pulses	999.999 (6 digits)	Structure	ABS Resin Case
Output for confirming "END"	Relay Contact Point	Used EEPROM	28C64 (Non-volatile ROM)
Acceleration/deceleration range	Δ1 ~ Δ5 (5Steps)	Weight	700g



## Dimension of outer casing



## Notice of use

- (1)The casing should not be arranged in a place where vibration dew and water leakage is strong or a place where dew and water leakage are occurred. The casing should be arranged in a place where air is fluently passed.
  - (2)A cooling fan is arranged within the casing. Therefore the casing should not be arranged in a place where dust on the cooling fan is removed after using of several months.
  - (3)A special noise filter may not be used since a noise filter are arranged within the casing.
  - (4)Rated fuse (250V 1(A)) should be used for safety of the product.
  - (5)Outer casing should be connected to earth for earth in order to protect from electric shock accident by current leakage.
- \*A/S will be performed free when you called the main office due to trouble of the product.  
(However, an internally remodeled product or an product serviced by other man is excepted.)

## Application examples

Various automatic process systems such as Indexes, X-Y tables, Robot Systems, Roll Feeding machines, Painting machines, Automatic drilling machines, Precise assembling machines, Packing machines, Semiconductor equipments, Cutters, Pick up systems, Various kinds of test equipments, Printing machines, Screw jointing machines, Part inserting machines and Mold part loading machines etc.