P602C

Stepping Servo Motor Double Axes Controller User's Manual

TROY Made by TROY Enterprise Co., Ltd

TÜV Rheinland/
Berlin-Brandenburg **TÜV**
Anlagentechnik GmbH
ISO14001
Certificate No.: 09 104 9351

TÜV CERT
DIN EN ISO 9001:2000
Certificate: 09 100 99275

Environment Responsibility
- TROY is always committed to environment protection. All packaging material is recyclable and reusable.
- If disposing of used product, please recycle by type as per waste disposal procedures.
----------------Protect the green earth with your care and commitment---------------

※The product is subject to design modification for performance improvement without prior notice. For more details please contact with your local seller.

Precautions

Precautions for using

1. Thank you for purchasing TROY products. Please read this user's manual thoroughly before installing and operating the driver, and always keep the manual where it is readily available.

2. The products described in this manual has been designed and manufactured for use in industrial machinery, and must not be used for any other purpose. We are not responsible for any damage caused through failure to observe this warning.

3. Check that the motor, driver and any accessories are all present. If an accessory is missing or damaged, contact the nearest our branches.

4. Never disassemble the motor and driver. Damage or performance impairment may result. Disassembly voids all warranties.

Precautions for maintenance

Check the ambient environments, clean the system equipment to remove dust and tighten the screws periodically. Also pay attention to the followings.

1. Contact us when repairs become necessary.
2. Since the temperature of the frame of the driver can rise high, be careful when conducting maintenance work or inspection work.

Precautions for warranty period

Within the period of one year after delivery of the system equipment, when failures occurring from design error or fabrication error attributable to the manufacture side occur, we will be repairing the failure free of charge within the reparable range or will replace with substitute. (We cannot hold ourselves responsible for breakage and accidents occurring from your use beyond the specified range described in this document.)
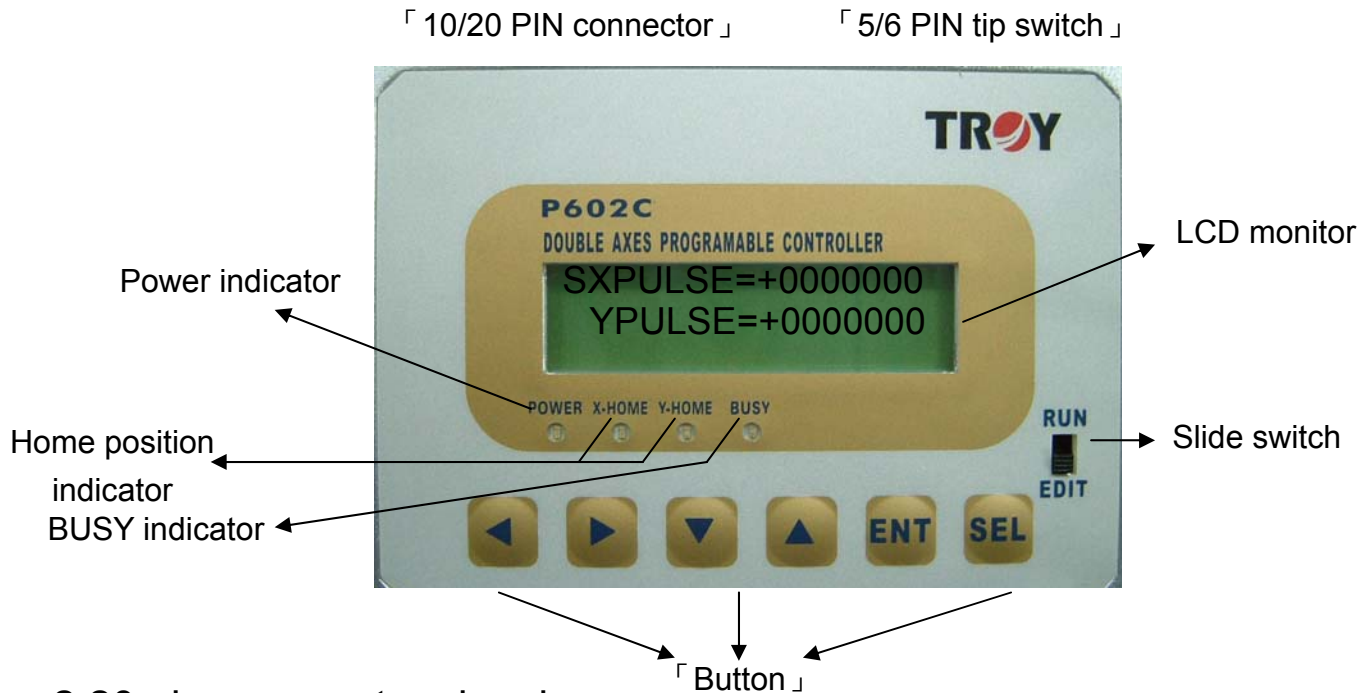
Precautions for disposal

When disposing of the driver and the motor, treat them as ordinary industrial waste.

Contents

※For any operational or technical question with the product, please contact us for professional service「**0800-450-168**」during our business hours.

1.Name of controller parts

「10/20 PIN connector」　　　「5/6 PIN tip switch」

Power indicator

LCD monitor

Home position
indicator

BUSY indicator

Slide switch

「Button」

2.20 pins connector signal

Pin No.	Input/Output	Name	Function
1	Input	0V	Power input (0V)
2	Input	+24V	Power input (+24V)
3	Input	START	Start signal
4	Input	R/S	L→SCAN (Continuous operation) H→RUN (Positioning operation)
5	Input	STOP	Emergency stop L→Operation stop　　　　　　　H→Operation permissible
6	Output	BUSY	Output signal during pulse generated (L output)
7	Output	READY	Output signal during pulse ended (H→L→H)
8	Input	SEL1	Positioning option/Continuous operation
9	Input	SEL2	Positioning option/Continuous operation
10	Input	SEL3	Positioning option
11	Input	S/L	H→S curve acceleration L→ Linear acceleration
12	Input	BL	Detection signal input:Counterclockwise rotation limitation
13	Input	BHL	Detection signal input:Counterclockwise rotation deceleration then stop
14	Input	ORG	Detection signal input:Mechanical home position
15	Input	FL	Detection signal input:Clockwise rotation limitation
16	Input	FHL	Detection signal input:Clockwise rotation deceleration then stop
17	Output	CW+	CW pulse output:Connect with driver CW+
18	Output	CW-	CW pulse output:Connect with driver CW-
19	Output	CCW+	CCW pulse output:Connect with driver CCW+
20	Output	CW-	CCW pulse output:Connect with driver CCW-
Please do not turn on the power when installed the 20 pins connector（Do not work under live！）		L:Terminal connected with 0V H:Terminal OPEN	

3.10 pins connector signal

1.	Input	S/L	H→S shape line acceleration L→Liner acceleration
2.	Input	YBL	Detection signal input:Y axis counterclockwise rotation limitation
3.	Input	YBHL	Detection signal input:Y axis counterclockwise rotation deceleration then stop
4.	Input	YORG	Detection signal input:Y axis mechanical home position
5.	Input	YFHL	Detection signal input:Y axis clockwise rotation deceleration then stop
6.	Input	YFL	Detection signal input:Y axis clockwise rotation limitation
7.	Output	YCW＋	Y axis CW pulse output：Connecting driver CW＋
8.	Output	YCW－	Y axis CW pulse output：Connecting driver CW－
9.	Output	YCCW＋	Y axis CCW pulse output：Connecting driver CCW＋
10.	Output	YCCW－	Y axis CCW pulse output：Connecting driver CCW－
Please do not turn on the power when installed the 20 pins connector（Do not work under live！）			L：Terminal connected with 0V H：Terminal OPEN

4.6 pins tip switch

| Pin No.	Name	Function	Description
1	TEST	TEST MODE	OFF：Operation mode ON：Test mode
2	XFHL	Detection mode:X axis clockwise rotation deceleration then stop	1.OFF:Normal close detection mode 2.ON:Normal open detection mode 3.If there is no need 2~6 functions Please switch the tip switch to the ON side.
3	XFL	Detection mode:X axis clockwise rotation limitation	
4	XORG	Detection mode:X axis mechanical home position	
5	XBHL	Detection mode:X axis counterclockwise rotation deceleration then stop	
6	XBL	Detection mode:X axis counterclockwise limitation	

5.5 pins tip switch

Pin No.	Name	Function	Description
1	YFL	Detection mode:Y axis clockwise rotation	OFF：Operation mode ON：Test mode
2	XFHL	Detection mode: Y axis clockwise rotation deceleration then stop	1.OFF:Normal close detection mode 2.ON:Normal open detection mode 3.If there is no need 2~6 functions Please switch the tip switch to the ON side.
3	YORG	Detection mode:Y axis mechanical home position	
4	YBHL	Detection mode:Y axis counterclockwise rotation deceleration then stop	
5	YBL	Y axis counterclockwise rotation limitation	

6.Specs

Positioning data	8 sets programs and saved by EEPROM Each function capacity as below: POSITIONING　29Bytes TIME　　　　　3Bytes INPUT　　　　　2Bytes OUTPUT　　　　2Bytes REPEAT　　　　3Bytes END REAPEAT　1Bytes CALL　　　　　2Bytes RETURN　　　　1Bytes
Positioning control	Per programs：9999999 PULSE Operation pulse speed：35~59995 PPS Start pulse speed：35~9995 PPS Acceleration/deceleration time：1~9999 ms
Control mode	External control mode (RUN MODE) Data input mode (EDIT MODE) Test mode (TEST MODE)
Operation mode	Positioning operation (INDEX) Mechanical zero return mode (HOME) Continuous operation (SCAN)
Input signal	DC 24 V photocoupler input, input impendence 4.7KΩ DC 24 V photocoupler ombined with transistor output,output current 25mA
Output signal	DC 24 V photocoupler combined with transistor output,output current 25mA
Power input	DC 24V/100 mA
Ambient temperature	0℃~+40℃

7.Internal output circuit
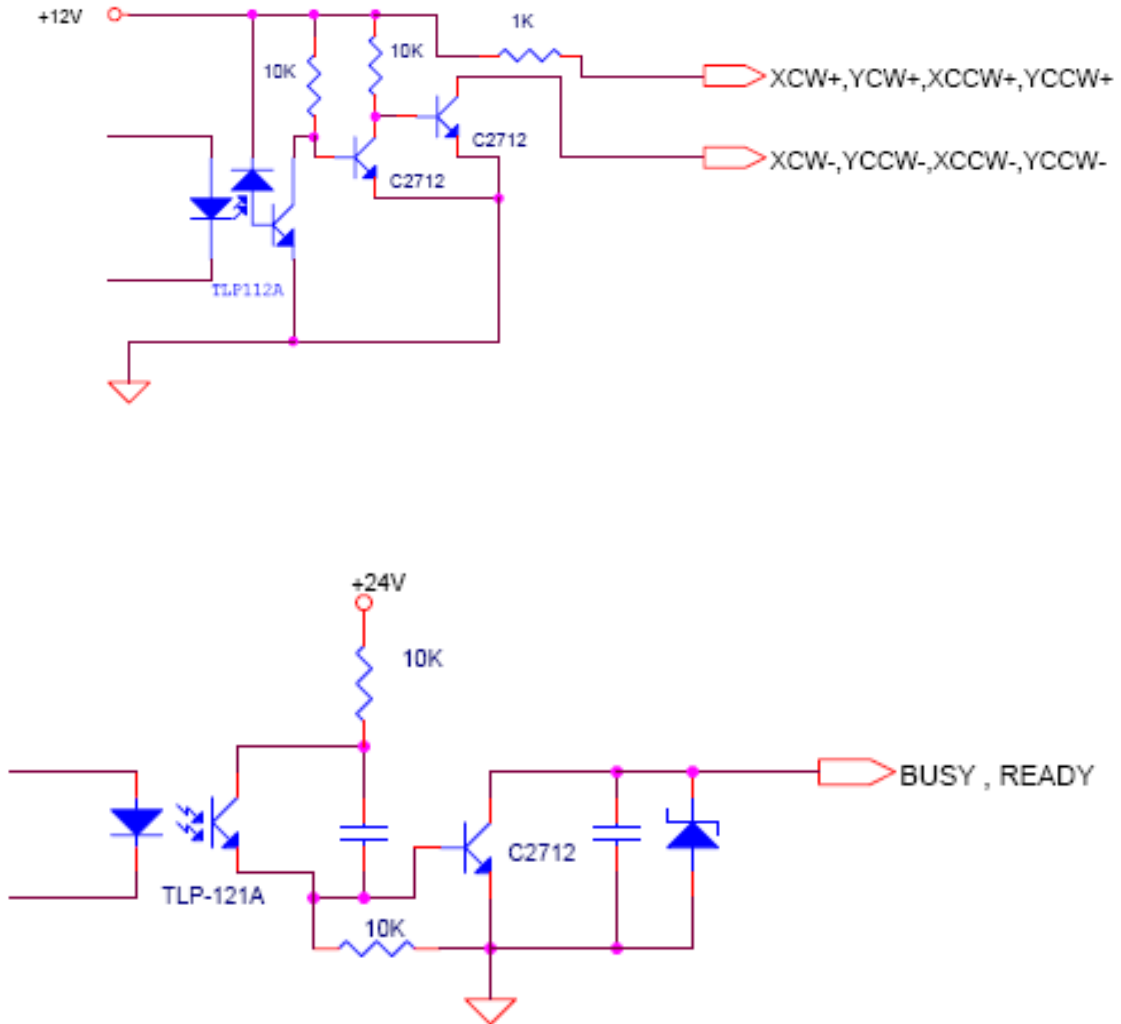
8.Internal input circuit
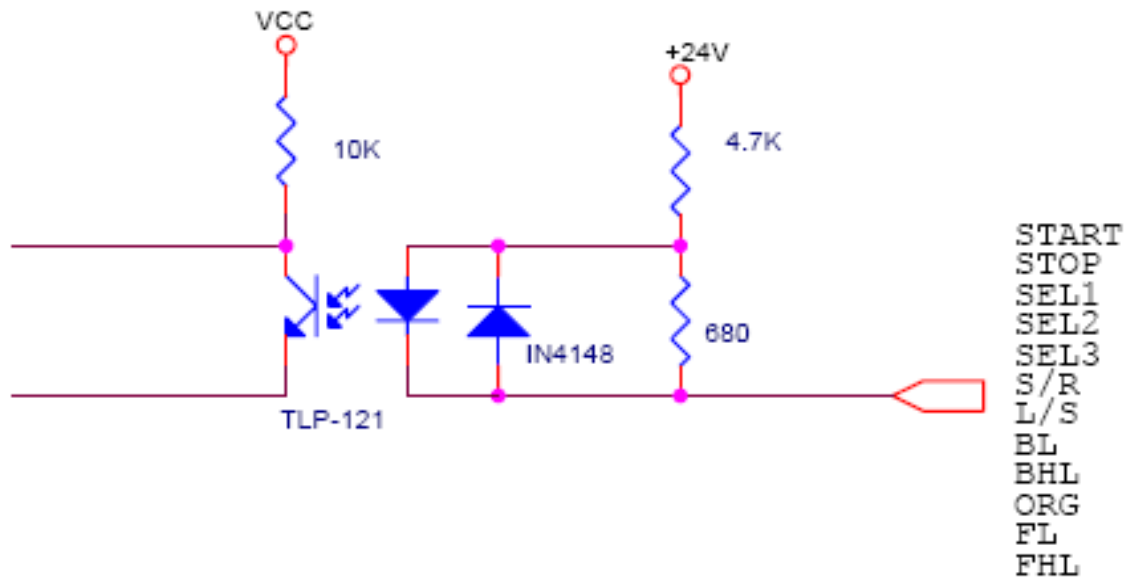
9.Operation data setting

   Before data setting,please switch the slide switch to the EDIT

a.Intialize(Default value)

The controller has defaulted before shipping

After power OFF,switch the slide switch to the EDIT then press the button「ENT」and turn the power ON.

The LED indicated "*DATA-initial*" Please wait......then let the button「EDIT」off, all data initialized and enter into the （EDIT）mode

Initialize data as below:

Common using data

Vs(Initial speed)=130 pps

Tacc/dec(Acceleration/deceleration time)＝30 ms

ORG VR(Zero point end speed)＝-1030 pps(＋Clockwise rotation to the zero point,

－Counterclockwise rotation to the zero point)

Searching the zero point   Setting(ORG motion set)

ORG motion

   ---YES---

*YES：Back to the zero point under SCAN mode

*NO：Position indicats "0000000"and without back to the zero point under SCAN mode

b. 「EDIT」 procedures

※Description of each button

► : 1.X axis clockwise rotation 「TEST-SCAN mode/TEACH mode」

2.Cursor move to the right 「EDIT mode」

◄ : 1.X axis counterclockwise 「TEST-SCAN mode」

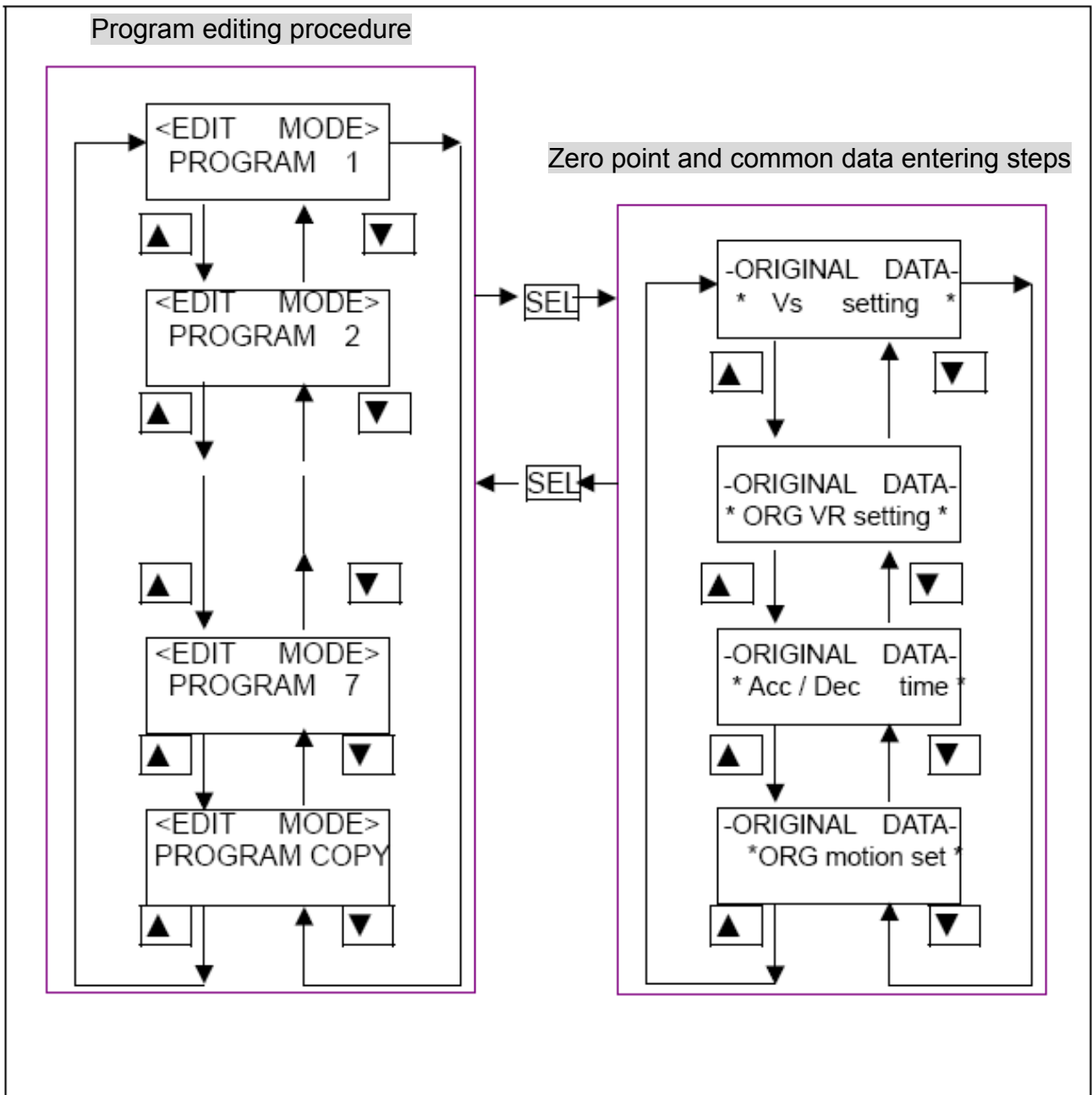2. Cursor move to the left 「EDIT mode」

SEL : 1.Cursor switch from X to Y axis or from Y to X axis 「Value editing」

2.Functions switching 「ORIGINAL DATA of EDIT mode ◄──► Program edit」

3.Data switching 「IN◄──► IN-OUT and OUT◄──► OUT-NOT of EDIT mode」

4.Finish edit

ENT : Entering/Executing/Confirming 「The functions indicated in the monitor」

▲ : 1.Y axis clockwise rotation 「TEST-SCAN mode」

2.Increasing the value indicated in the monitor or modified the content

3.Upward to 「TEST-SCAN mode」

▼ : 1.Y axis counterclockwise rotation 「TEST-SCAN mode」

2.Decreasing the value indicated in the monitor or modified the content

3.Downward 「TEST-SCAN mode or EDIT mode」

SEL + **◄** : Switching to modified the TEACH data 「EDIT mode」

Program editing procedure

```
<EDIT   MODE>
PROGRAM   1
```

Zero point and common data entering steps

▲   ▼

```
<EDIT   MODE>
PROGRAM   2
```

→ SEL →

```
-ORIGINAL   DATA-
*   Vs   setting   *
```

▲   ▼

▲   ▼

← SEL ←

```
-ORIGINAL   DATA-
* ORG VR setting *
```

▲   ▼

▲   ▼

```
<EDIT   MODE>
PROGRAM   7
```

```
-ORIGINAL   DATA-
* Acc / Dec   time *
```

▲   ▼

▲   ▼

```
<EDIT   MODE>
PROGRAM COPY
```

```
-ORIGINAL   DATA-
*ORG motion set *
```

▲   ▼

▲   ▼

※ORIGINAL DATA(Common data) setting

1.Pressing " **SEL** " to switch with the Program edit

2.Pressing " ▲ "or " ▼ " to select the Vs,ORG,VR,Acc/Dec time,ORG motion

3.Pressing" **ENT** " and entering the option then repeat the b.「EDIT procedure」to edit the data

※Program edit

1. Pressing " ▲ "or " ▼ " to select the 6 PROGRAM

2. Pressing" ENT " and entering the option then indicated the "Have data!Clear ?"

    1.KEEP 2.CLEAR（Pressing the ◄ or ► to select the keep/clear）

3. Pressing" ENT " entering the PROGRAM and the monitor indicated the step numbers
   (STEP：XX) for input

4. Pressing" ENT " entering the（STEP:XX）or pressing the " ▲ "or " ▼ " to select the step numbers
   which edited already and do the following functions

a.>Entering the new step numbers(STEP:XX)
   Indicates1.POSITIONING
          2.TIME
          3.INPUT
          4.OUTPUT
          5.REPEAT
          6.END REPEAT
          7.CALL
          8.RETURN
       *PROGRAM CONNECT
         ---< BACK >---

Pressing " ▲ "or " ▼ " to select the option and pressing " ENT " entering then edit the data as

b.「EDIT procedure」

b.>Entering the edited step numbers (STEP:XX)
   Indicates" STEP:XX"
   View indicates:Glance/Ins indicats:Insert a step/Del indicates:Delete a step

   c.>Function description

Name	Description
POSITIONING	Setting motor operation data:Vs,VR,Acc/Dec time PULSE
TIME	TIMER setting(Unit:10ms)
INPUT	Input START/START-NOT signal then execute the next step(STEP)
OUTPUT	Execute this step and output the READY/READT-NOT signal
REPEAT	Execute the times of the LOOP (END REPEAT/REPEAT is a set)
END REPEAT	It is the end of LOOP (END REPEAT/REPEAT is a set)
CALL	Jumping to the XX step and execute it (CALL/RETURN is a set)
RETURN	It is the end of CALL (Next step before back to the CALL)
PROGRAM CONNECT	The connection of edit the program:Finish this set then execute the

	other set
---< BACK >---	Back to the status (STEP:XX) before select the function

5.Pressing " SEL "when the monitor indicated STEP:XX

The monitor indicates：-PROGRAM END-

1.Yes!　2.Back!

Yes:Exit the PROGRAM edit

Back:Back to the PRORAM edit (STEP:XX)

6.Entering PROGRAM COPY and pressing ◄ or ► to select

PROGRAM→PROGRAM

FROM Xs　TO　Xd

Xs：Source of copy　　Xd：Destination of copy

7.Function description

PULSE of POSITIONING

The monitor indicated 3 kinds of input mode : 1.KE 2.TH 3.PS after input the Vs,VR,Acc/Dec time

a.>1.KE. 2.TH are absolute coordinate,3.PS is opposite coordinate

b.>Absolute coordinate type:Positioning point moved by "0" which in opposite coordinate

c.>Opposite coordinate type:Positioning point moved by pre-point which in opposite coordinate

d.>KE:Input the data as " ▲ "" ▼ "" ◄ "" ► "

e.>TH : As SCAN mode moved the position to the expected position then press " ENT " which can

input the position at present.

f.>PS：Input the data as " ▲ "" ▼ "" ◄ "" ► "

TIME

a.> Input the data as " ▲ "" ▼ "" ◄ "" ► "

b.>Executing this function has to wait the TIME countdown to the "0" then execute the next STEP

INPUT

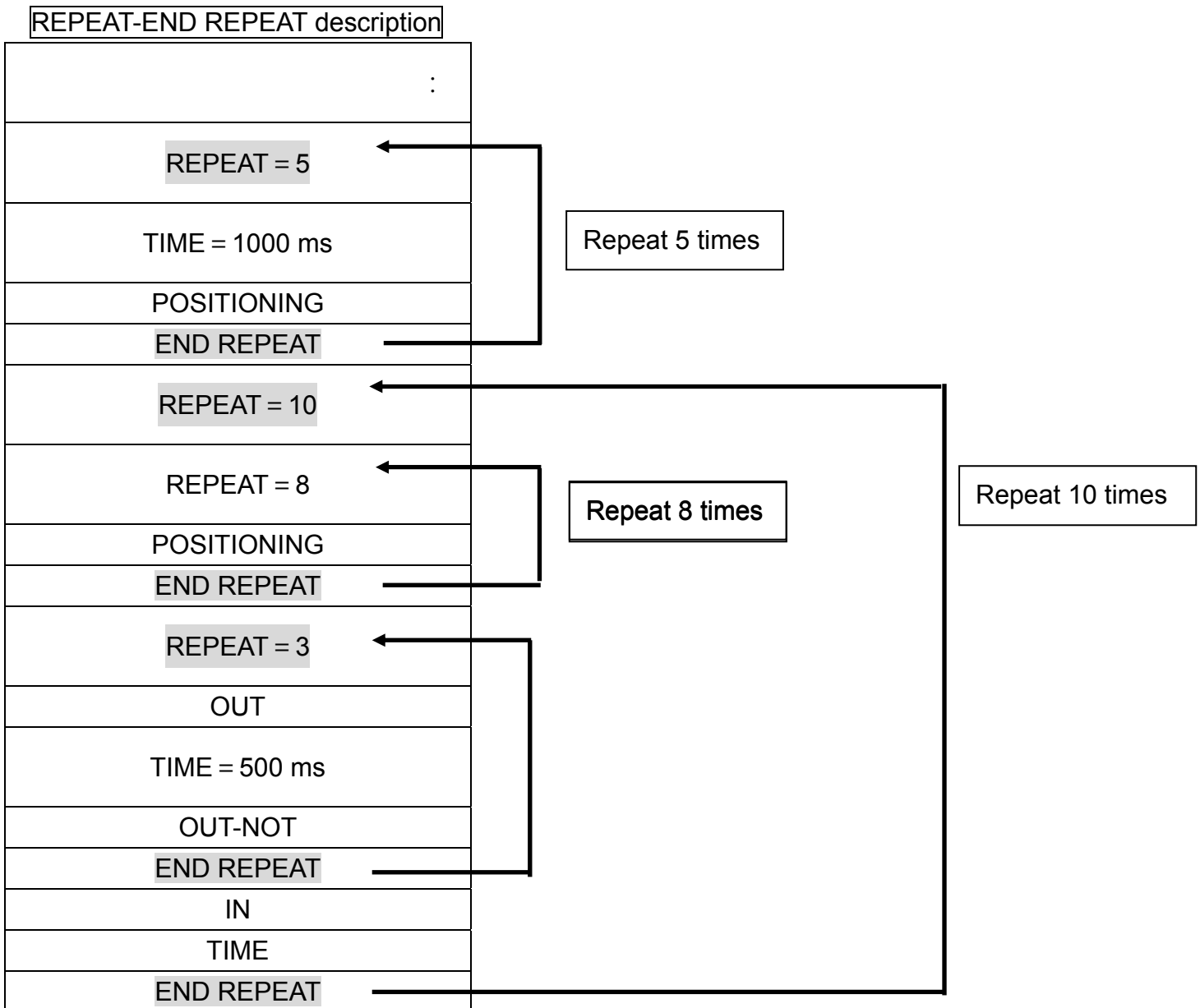a.>IN：Executing this function has to wait the START signal input then execute the next step

b.>IN-NOT：It is opposite to IN

OUTPUT

a.>OUT：Pin 7(READY) of 20 PIN will output L signal

b.>OUT-NOT：It is opposite to OUT

Executing this function Pin 7(READY) of 20PIN will back to H level

REPEAT-END REPEAT description

:	
REPEAT = 5	Repeat 5 times
TIME = 1000 ms	
POSITIONING	
END REPEAT	
REPEAT = 10	
REPEAT = 8	Repeat 8 times
POSITIONING	
END REPEAT	
REPEAT = 3	Repeat 10 times
OUT	
TIME = 500 ms	
OUT-NOT	
END REPEAT	
IN	
TIME	
END REPEAT	

※REPEAT-END REPEAT is a set and it can not insert the other REPEAT before this loop

finished

CALL-RETURN description

:	
STEP : 13 OUT	
STEP : 14 TIME = 1000ms	
STEP : 15 OUT-NOT	
STEP : 16 RETURN	
:	
STEP : 30 CALL STEP : 13	
STEP : 31 POSITIONING	
:	

:	
STEP : 10 CALL STEP : 20	
STEP : 11 OUT-NOT	
:	
STEP : 20 POSITIONING	
STEP : 21 TIME = 1000 ms	
STEP : 22 OUT	
STEP : 23 RETURN	
:	
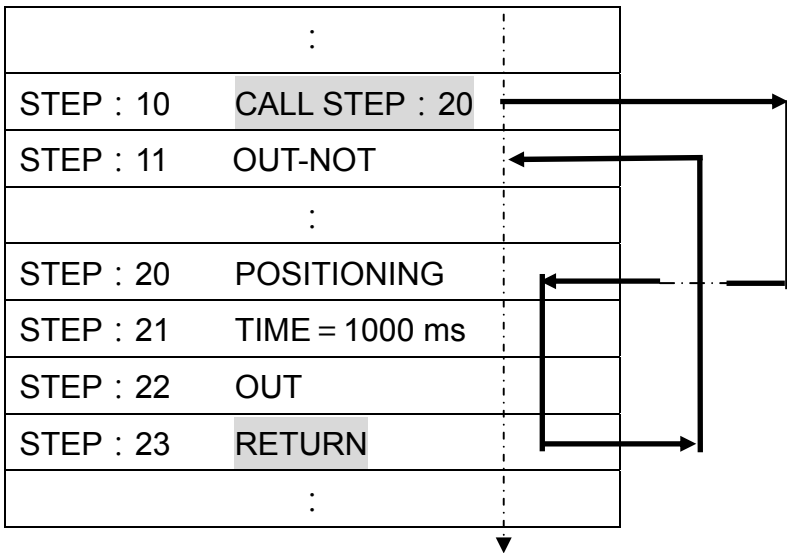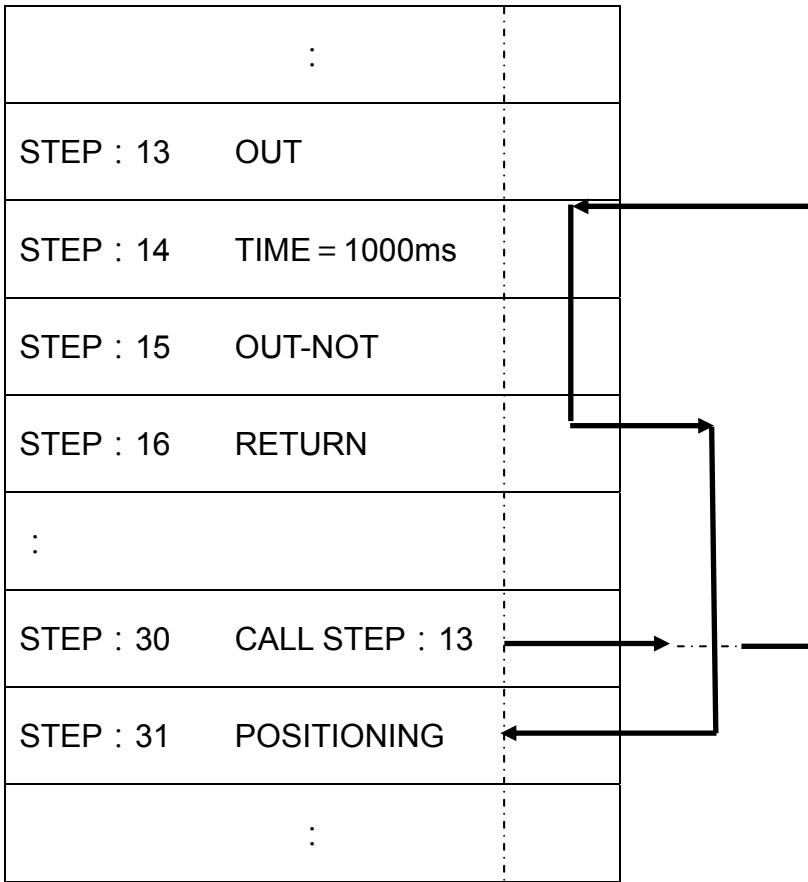
10.External operation control

a.Switching the slide switch to the RUN and control signal input via 20 pins/10 pins connector

b.Continuous operation

Step1.：Pin No.4(R/S) of 20 PINS connected o the 0V→SCAN MODE

Step2.：Selecting the liner acceleration or S curve line acceleration

　　　Pin No.1(L/S) of 10 PINS connected to the 0V：Liner acceleration

　　　　　　　　　　　　No connection：S curve line acceleration

Step3.：Pin No.8(SEL1) of 20 PINS connected to the 0V：X axis continuous clockwise rotation

　　　Pin No.9(SEL2) of 20 PINS connected to the 0V：X axis continuous counterclockwise

　　　rotation

　　　Pin No.10(SEL1) of 20 PINS connected to the 0V：Y axis continuous clockwise rotation

　　　Pin No.11(SEL2) connected to the 0V：Y axis continuous counterclockwise rotation

　　　　　　　　　　　No connection of each pin：Stop operation

c.Zero return

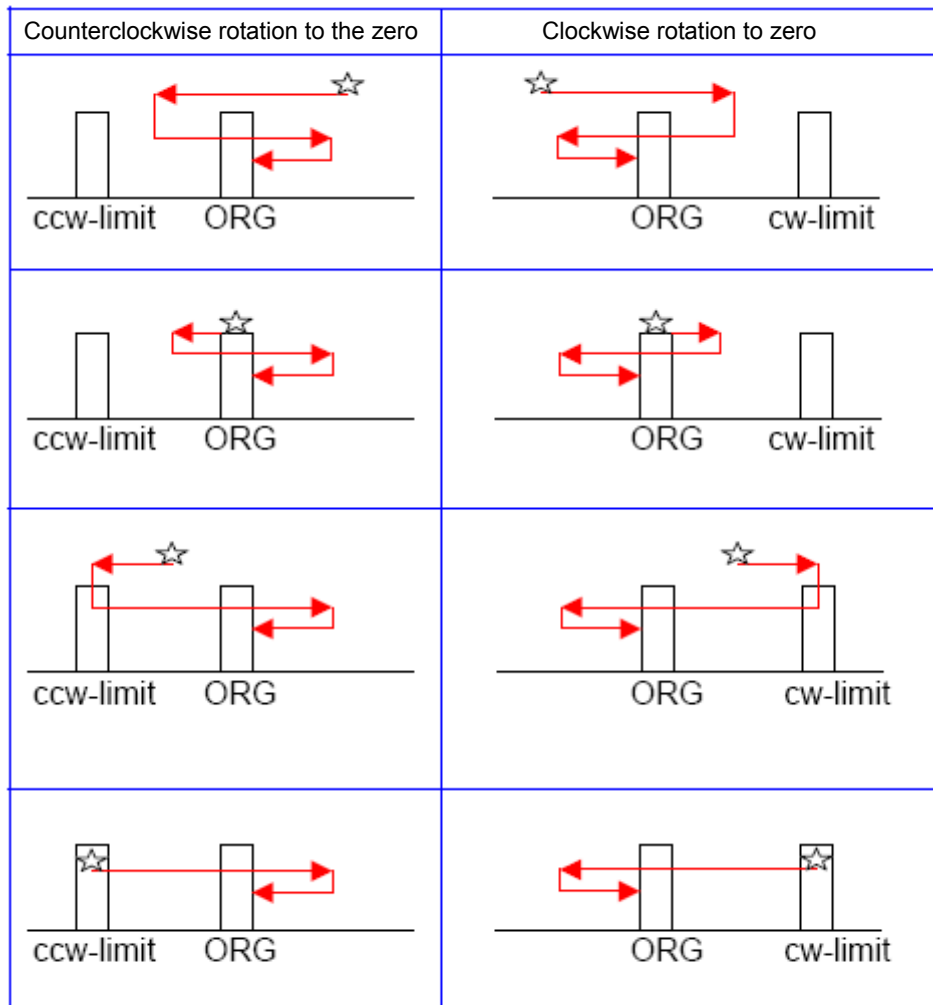Step1.：Pin No.4 (S/R)of 20 PINS connected to the 0V→SCAN MODE

Step2.：Selecting the liner acceleration or S curve line acceleration

　　　Pin No.1(L/S) of 10 PINS connected to the 0V：Liner acceleration

　　　　　　　　　　　　No connection：S curve line acceleration

Step3.：Pin No.3(START) of 20 PINS connected to the 0V：Execute the zero return

　　　Pin No.5(STOP) of 20 PINS connected to the 0V：Emergency stop

Counterclockwise rotation to the zero	Clockwise rotation to zero
ccw-limit ORG	ORG cw-limit
ccw-limit ORG	ORG cw-limit
ccw-limit ORG	ORG cw-limit
ccw-limit ORG	ORG cw-limit

Zero return procedure：

Input START command (X/Y axis start at the same time)→X or Y axis return to the zero and stop→Both of X/Y axis stop→X axis final zero return→Y axis final zero return→Zero return finished

d.Positioning operation

Step1.：Pin No.4(S/R) no connection→RUN MODE

Step2.：Selecting liner acceleration or S curve line acceleration

　　　　Pin No.11(L/S) connected to the 0V：Line acceleration

　　　　　　　　　　No connection：S curve line acceleration

Step3.：Selecting one of 1~8 set programs

	SEL1	SEL2	SEL3
PROGRAM 1	No connection	No connection	No connection
PROGRAM 2	L(0V)	No connection	No connection
PROGRAM 3	No connection	L(0V)	No connection
PROGRAM 4	L(0V)	L(0V)	No connection
PROGRAM 5	No connection	No connection	L(0V)
PROGRAM 6	L(0V)	No connection	L(0V)
PROGRAM 7	No connection	L(0V)	L(0V)
PROGRAM 8	L(0V)	L(0V)	L(0V)

Step4.：Pin No.3(START) connected to the 0V：Execute the selected program

Pin No.5(STOP) connected to the 0V：Emergency stop

◆P602C each set can edit max 80 STEPS

◆Executing mode is "Step by Step continuously"

STEP01→STEP02→STEP03→…………END

◆When meet the REPEAT ………..END REPEAT,it will repeat the STEP between the REPEAT

and END REPEAT

◆When meet the jumped STEP from CALL……RETURN during execution until meet the

RETURN and back to the next STEP before CALL

e.Emergency stop

Pin No.5 (STOP) of 20 PINS connected to the 0V and motor stops operation at Continuous

operation(SCAN MODE)、Zero return or Positioning operation(RUN MODE)

f.BUSY

When operation pulse outputs the Pins No.6(BUSY) of 20 PINS is Low outputs and the BUSY
    indicator(Red) will lit up until operation pulse stopped output,Pin No.6(BUSY) changed to
    Hi,the BUSY indicator(Red) goes off

g.READY

When executed the OUT order of OUTPUT function,the Pin No.7 (READY) of 20 PINS connector
    outputs L signal.If executed the OUT-NOT order function,the Pin No.7 (READY) of 20 PINS
    connector back to H level

11.TEST mode
a.Functions

Executing the Continuous operation、Zero return or Positioning operation function on the panel

b.Setting

Switching the slide switch to the RUN and switch the first PIN(6 PIN tip switch) to the ON

c.Execution

When the monitor indicated

```
< TEST    MODE >
Origin    Search ?
```

It indicated Zero return waiting for execute and pressed the following buttons

·Pressing ▲ : Forward to searching the other operation function as below：

Search HOME → SCAN → PROGRAM 1 → PROGRAM 2 →……→ PROGRAM 8 → SCAN → Search HOME

・Pressing ▼ : Backward to searching the other operation function as below：

Search HOME → SCAN → PROGRAM 8 → PROGRAM 7→......→PROGRAM 1 → Search
　HOME

・Pressing ENT : Executing the function which indicated in the monitor

Such as Search HOME → Executing the Zero ruturn

　　　　PROGRAM 1 → Executing the first set of operation pulse outputs
　　　　SCAN　　　→ Entering the continuous operation(SCAN MODE)

Pressing ▶ : X axis clockwise rotation(CW)

　　　　◄ : Y axis counterclockwise rotation(CCW)

　　　　▲ : Y axis clockwise rotation(CW)
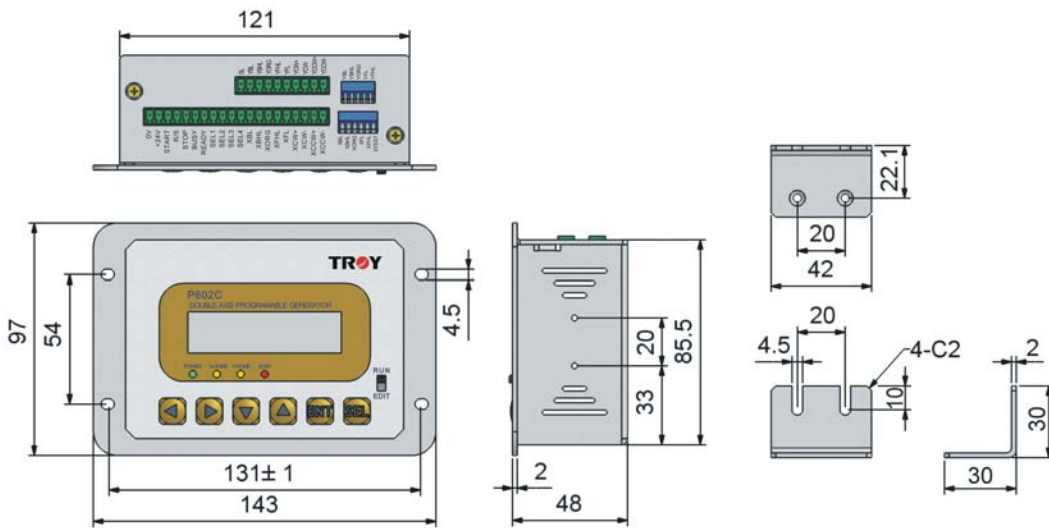
　　　　▼ : Y axis counterclockwise rotation(CCW)

　　　　▼ : Exit the SCAN mode

·Acceleration/Deceleration of pulse output in the TEST MODE which is S curve line
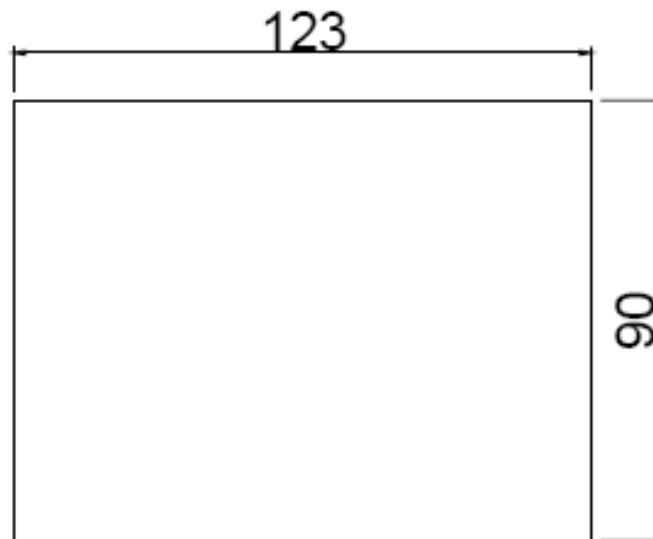　acceleration/deceleration and can not set via external
d.Exit the TEST MODE
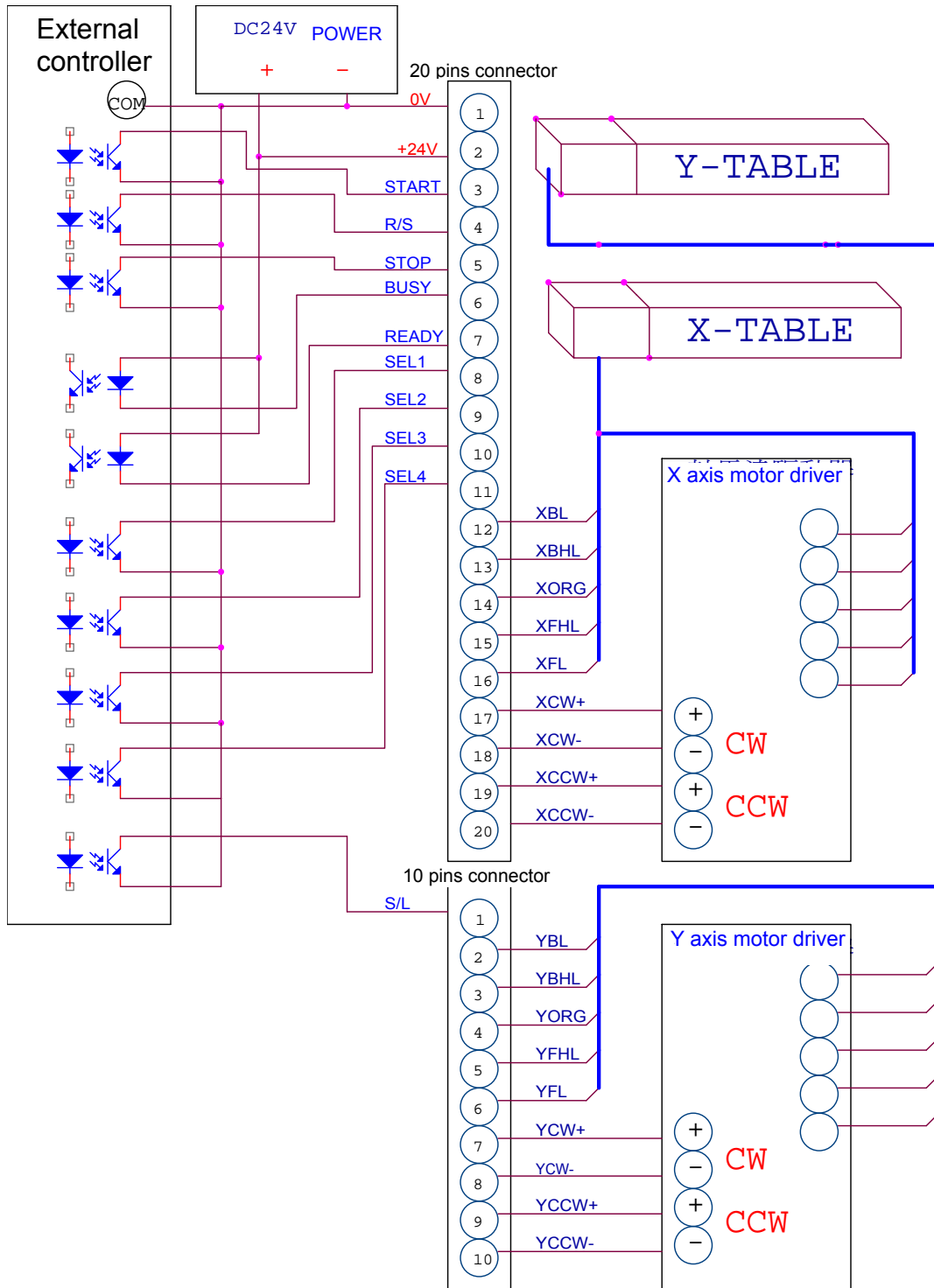Switching the first PIN(6 PIN tip switch) to OFF

12.Dimension

13.P602C mounting diagram

Unit:mm

14.Wiring

＊**For environment protection, paper saving and resources preservation, please download the user's manual directly from SUNHOLY website：http:// www.sunholy.com.tw**

Our constant aim：Demand for professionalism

Our belief： Commitment to every detail

Our innovation： Introduction of cutting-edge equipments

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Ready for request!.

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