

# OWNER'S MANUAL

RD-8457E

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Important : Read these instructions before installing, operating or servicing this product.

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## **POSITIONING SYSTEM AND ACCESSORIES** **MODEL : PT-103 / PT-203** **WELDING POSITIONERS** **(With CB-101/CB-102)**

**Serial number : 1808001 ~ and later**

**Date : Aug. 21, 2018**

**UNITED PROARC CORPORATION**

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## INTRODUCTION

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### **WARNING**

A procedure, which if not properly followed, may cause injury to the operator or others in the operating area.



### **WARNING**

Read and understand this entire manual regarding the rules for users' safety before installing, operating, or servicing the equipment.

Equipment identification

The identification number, model, and serial number of this unit usually appear on a nameplate attached to the control panel; record these numbers for future reference.

Receipt of equipment

When you receive the equipment, check it against the shipping documents. Make sure it is complete and inspect the equipment for possible damage during shipping. If there is any damage, notify the carrier immediately to file a claim.

Furnish complete information concerning damage claims or mistake(s) in shipment to United ProArc Corporation: No. 3 Gungye10<sup>th</sup> Road, Pingjen Industrial Park, Pingjen City, Taoyuan 324, Taiwan. Include the equipment identification number along with a description of the parts in question.

Move the equipment to the installation site before uncrating the unit. Use care to avoid damaging the equipment when using bars, hammers, etc. to uncrate the unit.

## SAFETY PRECAUTIONS



### WARNING

Operation and maintenance involves potential hazards. All operators and personnel should be alerted to possible hazards and precautions should be taken to prevent possible injury.

#### Electrical safety

##### Machine :

- \* The counter, safety device against excess current and electrical installation, are compatible with its maximum power and its main voltage.
- \* The connection, single-phase or three-phase, is possible on a stand compatible with the plug of its cable link.
- \* If the cable is connected with the electrical network, the earth must never be cut by the protection device against electrical shocks.

##### Work Place :

- \* Be very careful to avoid contact between metal part and phase conductor and the neutral of electric network.
- \* Electrical messes of different electrical machine and apparatus are connected between themselves and with the terminal of earth neutral wire.

##### Interventions :

- \* Before control and repair, see the apparatus is switched off and insulated.
- \* Connection with fixed installation cable is impossible.
- \* It's on "Stop" and connection is impossible.
- \* Some apparatus are provided with starting circuit HT HF (with a plate). Never enter into the corresponding switch cupboard.
- \* Only qualified persons are authorized for intervention concerning electrical installation.

#### Maintenance

- \* Often check the insulation and connection good state of apparatus and electrical accessories: taps, appliance cords, coatings, switch, extension cords, etc.
- \* Maintenance and repair of insulating coatings operations are very important.
- \* Do repair with a specialist or better replace defective accessories.
- \* Check regularly the right adjustment and the non-heating of electrical connections.

#### Individual safety

- \* The operator must be dressed and protected in relation with his work.
- \* Avoid contacting metal parts connected or accidentally connected.
- \* Wear leather gloves with gauntlet.
- \* Safety clothes : gloves, apron, safety shoes protect the operator and his assistants against burns of hot parts, projections and slag.

## SAFETY PRECAUTIONS

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Gases and fumes



- \* Gases and fumes produced during the plasma cutting or welding process can be dangerous and hazardous to your health.
- \* Ventilation must be adequate to remove gases and fumes during operation.
- \* Keep all fumes and gases from the breathing area.
- \* Use an air supplied respirator if ventilation is not adequate to remove all fumes and gases.
- \* Oil or grease in the presence of oxygen may ignite and burn violently. Keep cylinders, valves, couplings, regulators, hoses, and other apparatus clean and free from oil and grease. Oxygen cylinders and apparatus should not be handled with oily hands or gloves. Do not allow an oxygen stream to contact oily or greasy surfaces.
- \* Do not use oxygen as a substitute for compressed air.

Fire



- \* Fire can be caused by hot slag and sparks.
- \* Remove combustibles from working area or provide a fire watch.
- \* Do not cut containers that have held combustibles. Remove all flammable and combustible materials in the operating area that may be ignited by sparks.

Noise



- \* Noise can cause permanent hearing loss.
- \* Wear proper protective ear muffs or plugs.
- \* Make sure others in the operating are protected from noise.

Protection goggle



- \* Welding radiation may cause permanent sight damage
  - Eyes protection goggle recommended

## LIMITED WARRANTY

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**UNITED PROARC CORPORATION** warrants all new equipment to be free from defects in material and workmanship, provided that the equipment is installed and operated according to instructions stated in this manual.

**UNITED PROARC's** obligation under this warranty policy is expressly limited to the replace or repair, at its option, of the defected part only. ProArc's option to repair or replacement of a defected part under this warranty shall be based on FOB Taiwan basis.

**UNITED PROARC CORPORATION** shall not be liable for any loss or consequential damage or express accruing directly or indirectly from the use of equipment covered by this warranty.

This warranty supersedes all previous ProArc warranties and is exclusive with no other guarantees or warranties expressed or implied.

This warranty excludes the consumable parts that are used in normal operation.

## 1.1 GENERAL INFORMATION

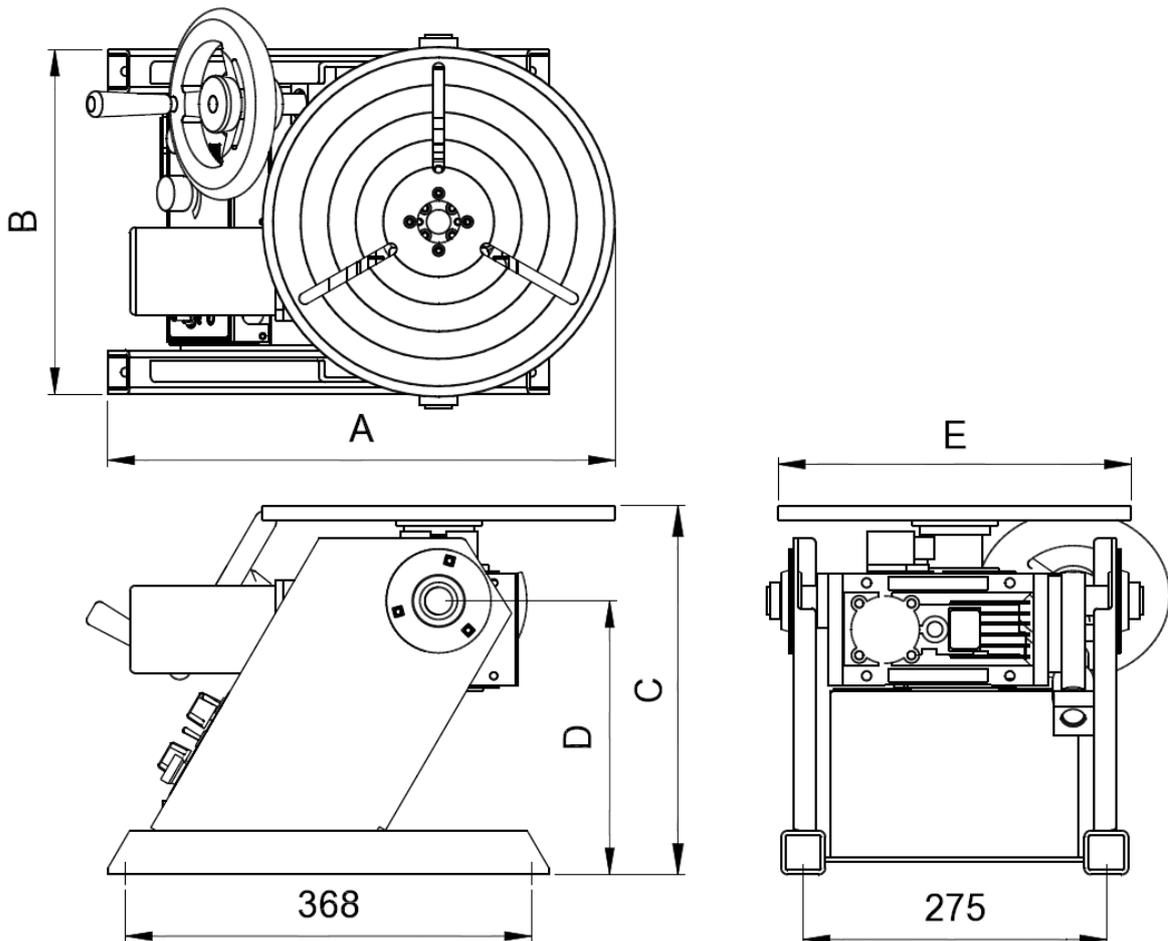
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### Features

- Multiple selection of gear reducer for TIG, MAG/MIG welding application.
- High frequency interference tested.
- Tilting angle ranges from 0° ~120°
- Faceplate through-hole Ø22mm for gas purge application.
- Faceplate with 3 straight slots for 3-jaws fixture (PG-150,450L,500) mounting.
- Control box selection :
  - CB-101 standard controller : Speed adjuster / Welding timer.
  - CB-102 advanced controller : Speed adjuster / start delay / overlap timer, and home sensor.
  - CB-107 Multi-function controller : PLC with HMI process control to support various E.Z.Arc system assembly.

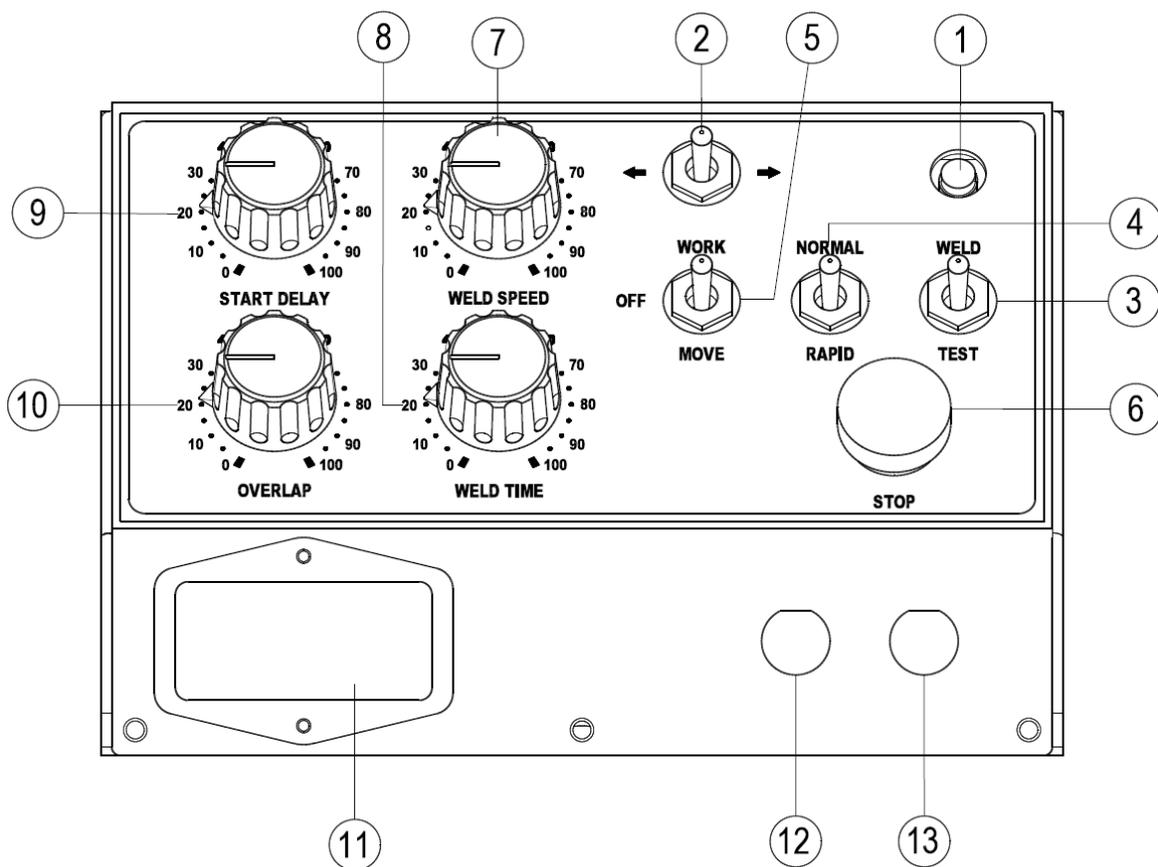
## 1.2 SPACIFICATION

Model	Unit	PT-103	PT-203
Power input	~	1 Phase 100 ~ 240V 50/60Hz	
Capacity(Horizontal/Vertical)	kg	100 / 60	200 / 130
Rated eccentricity	mm	A : 180, B : 90, C : 60, D : 45	A : 84, B : 42, C : 28, D : 10
Table dimension (E)	mm	$\phi$ 320	
Rotation speed	rpm	A : 0.3 ~ 4 B : 0.6 ~ 8 C : 0.8 ~ 12 D : 1 ~ 16	
Spindle thru hole	mm	$\phi$ 22	
Earthing	Amp	200 @ 100% ( 300 @ 40% )	
Tilt range	deg.	0 ~ 120	
Welding timer	sec.	0 ~ 60	
Overall length (A)	mm	460	
Overall width (B)	mm	315	
Overall height (C)	mm	340	
Center to floor (D)	mm	250	
Net weight	kg	38	42



## 2.1 CONTROL PANEL

1. Power On signal (LED)
2. CW/CCW selection switch. (SW1)
3. Weld / Test mode selection switch. (SW4)
4. Normal / Rapid speed selection switch. (SW3)
5. Work / Move mode selection switch. (SW2)
6. Stop button (STOP)
7. Welding speed adjustment. (VR1)
8. Welding timer adjustment. (VR2)
9. Welding start delay timer adjustment (VR3) (For CB-102)
10. Welding overlap timer adjustment. (VR4) (For CB-102)
11. Power switch. (PSW)
12. Foot switch connector. (P1)
13. Power source connector. (P2)



## 2.2 INSTALLATION

- Power cord. Connect the power cord to 1 phase 100V~240VAC

Note : The standard power connector is NEMA-5-15P, different region may select different power connector.

NEMA-5-15P(Standard)

European Adapter(Optional)

Australian Adapter(Optional)



- **Grounding Stud**

To avoid potential electrical damage, please connect the grounding stud to actual ground.

- **Tilt Lock / Release Handle**

Clockwise rotation to lock, counter clockwise rotation to release

**Danger! Do not release the tilt handle when part is loaded on the faceplate.**

- **(PSW) Power Switch**

I = On · O = Off

- **LED Indicator Color Identification.**

Green : Standby.

Red : Stop button activated.

White : Auto-procedure in progress.

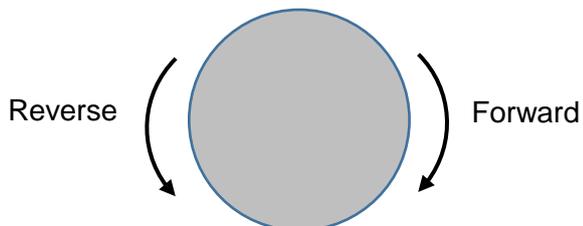
Flashing Green : Homing sequence in progress. (CB-102 only)

Flash Red : Overload.

- **Forward / Reverse Switch (SW1)**

Faceplate rotation direction.

CW ( → ) / CCW ( ← )



## 2.3 OPERATION

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- **WORK / OFF/MOVE Toggle Switch (SW2)**

WORK : Enable the system in “WORK procedure” standby. Press/release the footswitch to start “WORK procedure”. Faceplate rotates according to timer VR1-VR4.

OFF : Reset error and stop work procedure.

MOVE : Enable the system in “MOVE” procedure standby. Press the footswitch to start the rotation, and release footswitch to stop the rotation. Rotation speed varies according to VR1 or SW3 setting.

- **NORMAL / RAPID Toggle Switch (SW3)**

NORMAL : Faceplate rotation speed varies according to WELD SPEED Knob (VR1).

RAPID : Faceplate rotates with maximum speed.

- **WELD / TEST Toggle Switch (SW4)**

WELD : Welder output(P2) will be enabled when faceplate start rotating in either WORK or MOVE (SW2) procedure.

TEST : Welder output (P2) is disable in WORK/MOVE procedure.

Note : Welder output (P2) type : Relay dry contact.

- **Speed Adjustment Knob (VR1)**

Adjust rotation speed. CW to increase rotation speed. CCW to decrease rotation speed.

- **Weld Timer Knob (VR2)**

Active in WORK procedure. Weld Timer is the duration of rotation after footswitch is triggered. Adjustable between 1~60 second.

- **Start Delay Knob (VR3) (CB-102 only)**

Active in WORK procedure. Start delay is the time delay before faceplate rotation. Adjustable between 0-9.9 second.

- **Overlap Knob (VR4) (CB-102 only)**

Active in WORK procedure. Overlap is the time delay after faceplate has hit the home sensor before faceplate stops rotation. Adjustable between 0-9.9 second

- **STOP Button**

Press to stop the all control. Rotate CW/Pull to reset.

- **Homing Sequence (CB-102 only)**

Homing sequence activates automatically when below condition are met.

A. Right after placing WORK / MOVE toggle switch (SW2) in WORK position.

B. 2 seconds after end of “WORK procedure”.

C. Flipping Forward/Reverse (SW1) switch in “WORK procedure” standby.

D. Reset the STOP button in “WORK procedure” standby.

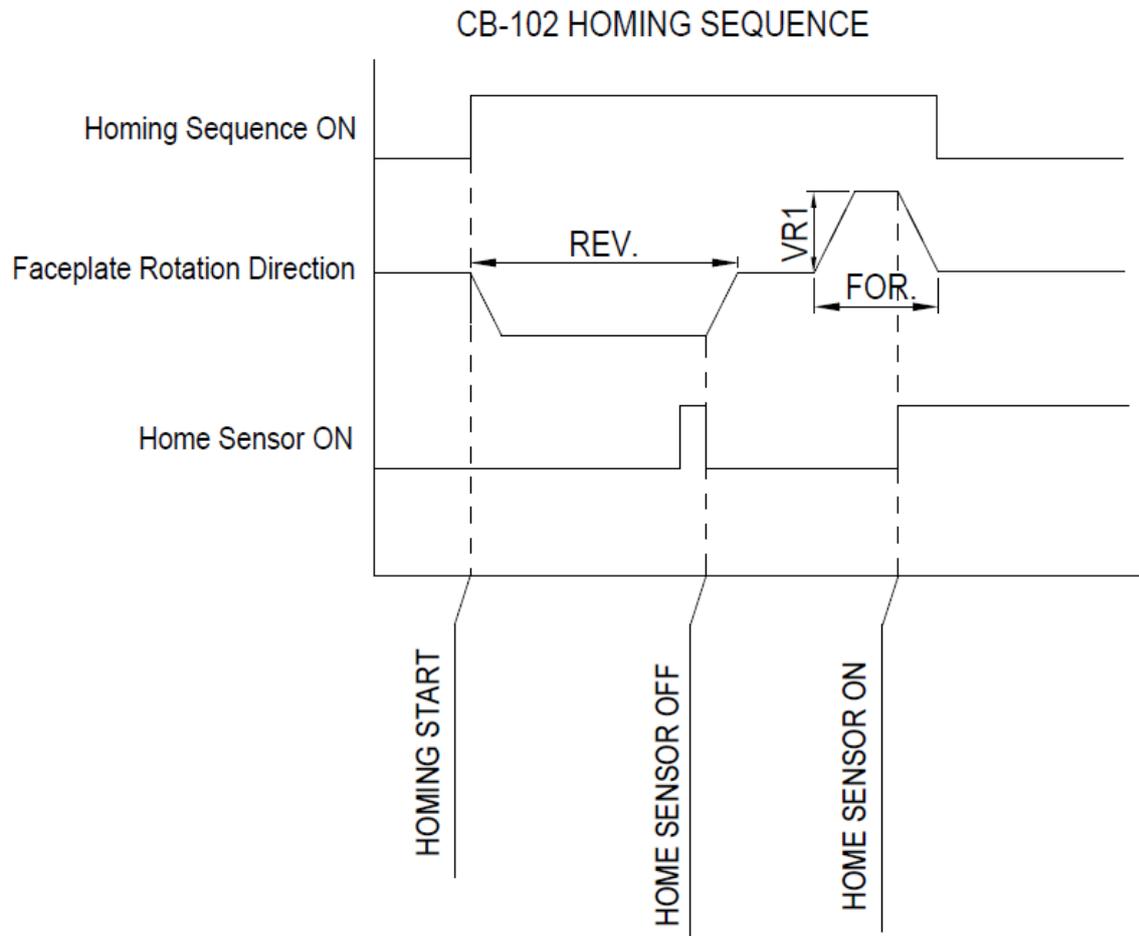
Note : Homing sequence is divided into 2 stages. Faceplate first rotates in half of maximum speed until home sensor is triggered and stops. Then faceplate rotates according to VR1 setting to trigger the home sensor again. Problem may rise in second stage when VR1 is adjusted too small.

**Warning : Homing sequence is a semi-automatic process that activates when above conditions are met. Operator caution is advised.**

- **Variable Speed Foot Switch (Option)**

Variable foot switch change welding speed as a percentage of VR1. Example1, Set weld speed knob 100% and external variable foot switch 50%, the resulting rotation speed is  $100\% \times 50\% = 50\%$ . Example2, Set weld speed knob 50% and external variable foot switch 50%, the resulting rotation speed is  $50\% \times 50\% = 25\%$ .

## 2.4 TIMING DIAGRAM (CB-102)



### 3.1 TROUBLESHOOTING GUIDE

SYMPTOMS	POSSIBLE CAUSES / REMEDIES
Power indicator LED does not illuminate.	A. Blown fuse: Check the fuse, replace fuse when necessary.
	B. Input power switch malfunction : Check and replace the power switch.
	C. Check for any loose cable connection between Control Board and Switch Board.
	D. LED malfunction, replace Switch Board.
	E. Power supply malfunction, use a voltmeter and check power supply's 24VDC output.
Motor has no motion.	A. Damaged motor : Use ohmmeter to measure CM1 female plug pin1 & Pin2 and It should read around 2ohm. Replace motor when reading is either 0 (short circuit between wires) or infinite (broken wires)
	B. Check motor power cable for loose or disconnect cable.
	C. Damaged foot switch : Step on the footswitch and use an ohmmeter to measure footswitch connector pin4 and pin5. The reading should be 0 (short circuit). Replace the footswitch when necessary.
	D. Inspect Control Board JP2 for loose connection
	E. Inspect Control Board fuse F1
Welder start output no response.	A. Damaged Weld / Test toggle switch (SW4), replace Switch Board.
	B. Inspect Control Board JP3 for loose connector.
Forward / Reverse rotation function no response.	A. Switch Board : Step on the footswitch and flip the CW/CCW toggle switch(SW1). Observe the TR and TL LED on the Control Board. If both LEDs have no response, replace the Switch Board.
Speed adjustment no response	A. Take the VR Board JP1 connector off. Rotate the weld speed knob and measure JP1 Pin1 & Pin2's resistance. The value should varies from 0-10kΩ. If there is no variation, check for any disconnection or replace VR1.
	B. Check for any loose cable connection between VR Board and Switch Board.
	C. Normal / Rapid toggle switch (SW3) is set to Rapid position causing the faceplate to rotate at max speed. Flip to "Normal" position.

### 3.2 TROUBLESHOOTING GUIDE (CB-102)

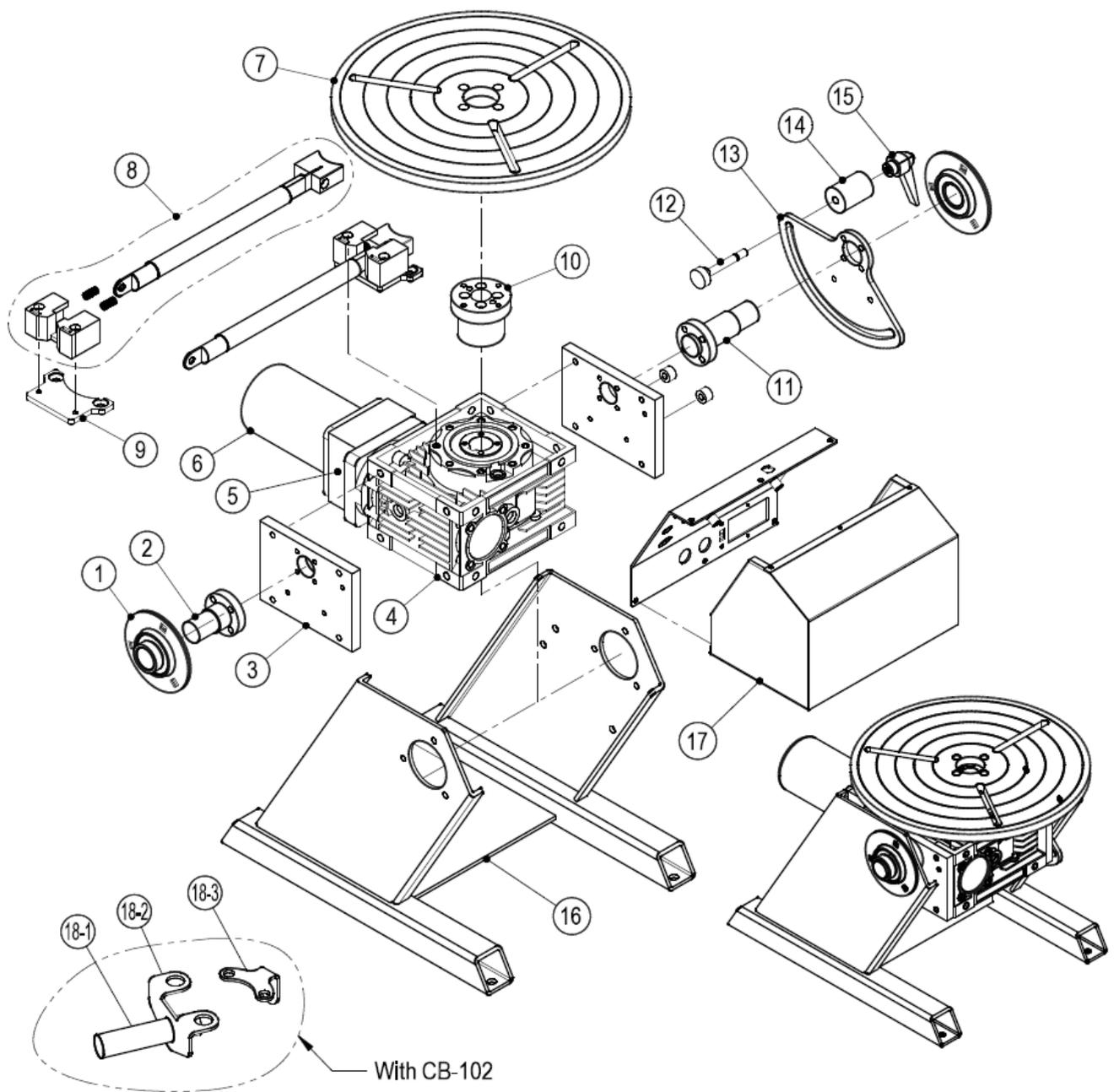
SYMPTOMS	POSSIBLE CAUSES / REMEDIES
Weld timer function no response.	A. Take VR Board JP2 connector off. Rotate the Start Delay knob and measure JP2 Pin 1 & 2's resistance. The value should vary from 0-10kΩ. If there is no variation, check for any disconnection or replace VR2.
	B. Check for any loose cable connection between VR Board and Switch Board.
Overload (Blinking Red LED)	Inspect the work and make sure it isn't over-spec (weight / eccentricity ...etc). Place the Work/Move switch (SW2) in "OFF" position to reset the system.
Home sequence problem	A. Work / Move switch (SW2) malfunction, replace Switch Board.
	B. If the green LED is flashing and there is no rotation, place the Work/Move switch (SW2) in "Move" position and adjust the welding speed knob (VR1) to desired speed. Restart the homing sequence.
	C. Proximity switch too far : Adjust the proximity switch so it can sense the homing block correctly.
	D. Proximity switch malfunction: use a screwdriver to test trigger the proximity switch. Replace when necessary.
Overlap delay function inaccurate or no response	A. Take VR Board JP4 connector off. Rotate the OVERLAP knob and measure JP4 Pin 1 & 2's resistance. The value should vary from 0-10kΩ. If there is no variation, check for any disconnection or replace VR4.
	B. Check for any loose cable connection between VR Board and Switch Board.
Welding start delay function no response	A. Take VR Board JP3 connector off. Rotate the START DELAY knob and measure JP3 Pin 1 & 2's resistance. The value should vary from 0-10kΩ. If there is no variation, check for any disconnection or replace VR3.
	B. Check for any loose cable connection between VR Board and Switch Board

#### 4.1 PART LIST — MECHANISM (PT-103)

Item.	Part No.	Description	Q'ty	Remark
1	0312-0501	Shaft	2	
2	5012-1150200-11	Reducer shaft	1	
3	5112-1130000-10	Reducer fixing plate	2	
4	0353-0332	Worm reducer	1	
5	0351-0109	Gear reducer (15K)	1	A : 0.3~4 rpm
	0351-0115	Gear reducer (7.5K)	1	B : 0.6~8 rpm
	0351-0122	Gear reducer (5K)	1	C : 0.8~12 rpm
	0351-0129	Gear reducer (3.6K)	1	D : 1.0~16 rpm
6	* 0361-1002-9	PMDC Motor w/ cable & terminals	1	
7	5010-1010100-10	Faceplate	1	
8	5010-2040010-20	Grounding brush w/ conducting seat	1	
9	5114-12305105000-10	Grounding brush mounting plate	1	
10	5114-12305104000-10	Reducer flange	1	
11	5012-1150100-20	Reducer Shaft	1	
12	5012-2320000-20	Tilt fixing axle	1	
13	5012-2300000-20	Tilt angle plate	1	
14	5012-2310000-20	Tilt fixing module	1	
15	0130-0125	Tilt fixing handle	1	
16	5012-1120000-20	Base column plate	1	
17	6511-0110	Control box	1	CB-101 (Option)
	6511-0120	Control box	1	CB-102 (Option)
18-1	* 3231-2007-9	Proximity sensor w/ connector	1	With CB-102
18-2	5010-4041000-30	Proximity sensor bracket	1	With CB-102
18-3	5010-4040000-30	Fixed sensing plate	1	With CB-102

\* Recommended spare parts

## 4.1 PART LIST — MECHANISM (PT-103)

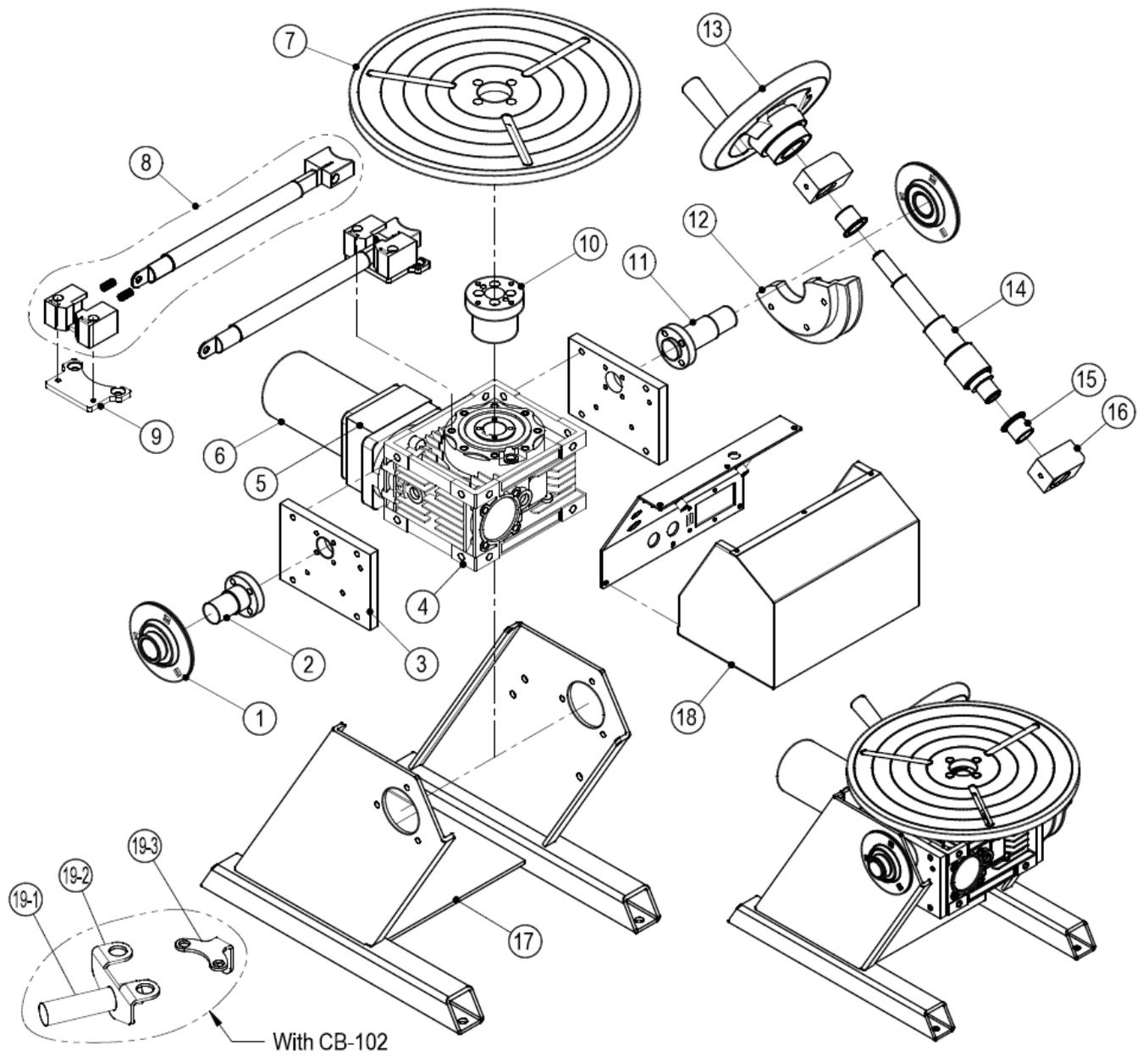


## 4.2 PART LIST — MECHANISM (PT-203)

Item.	Part No.	Description	Q'ty	Remark
1	0312-0501	Bearing	2	
2	5012-1150200-11	Reducer shaft	1	
3	5112-1130000-10	Reducer fixing plate	2	
4	0353-0332	Worm reducer	1	
5	0351-0109	Gear reducer (15K)	1	A : 0.3~4 rpm
	0351-0115	Gear reducer (7.5K)	1	B : 0.6~8 rpm
	0351-0122	Gear reducer (5K)	1	C : 0.8~12 rpm
	0351-0129	Gear reducer (3.6K)	1	D : 1.0~16 rpm
6	* 0361-1002-9	PMDC Motor w/ cable & terminals	1	
7	5010-1010100-10	Faceplate	1	
8	5010-2040010-20	Grounding brush w/ conducting seat	1	
9	5114-12305105000-10	Grounding brush mounting plate	1	
10	5114-12305104000-10	Reducer flange	1	
11	5012-1150100-20	Shaft	1	
12	5012-2360000-22	Tilting worm reducer	1	
13	3053-1002	Tilting hand wheel	1	
14	5012-2350000-20	Tilting worm shaft	1	
15	0331-2003	Self-lubricating bushing	2	
16	5012-2340000-20	Mounting bracket	2	
17	5012-1120000-20	Base column plate	1	
18	6511-0110	Control box	1	CB-101 (Option)
	6511-0120	Control box	1	CB-102 (Option)
19-1	* 3231-2007-9	Proximity sensor w/ connector	1	With CB-102
19-2	5010-4041000-30	Proximity sensor bracket	1	With CB-102
19-3	5010-4040000-30	Fixed sensing plate	1	With CB-102

\* Recommended spare parts

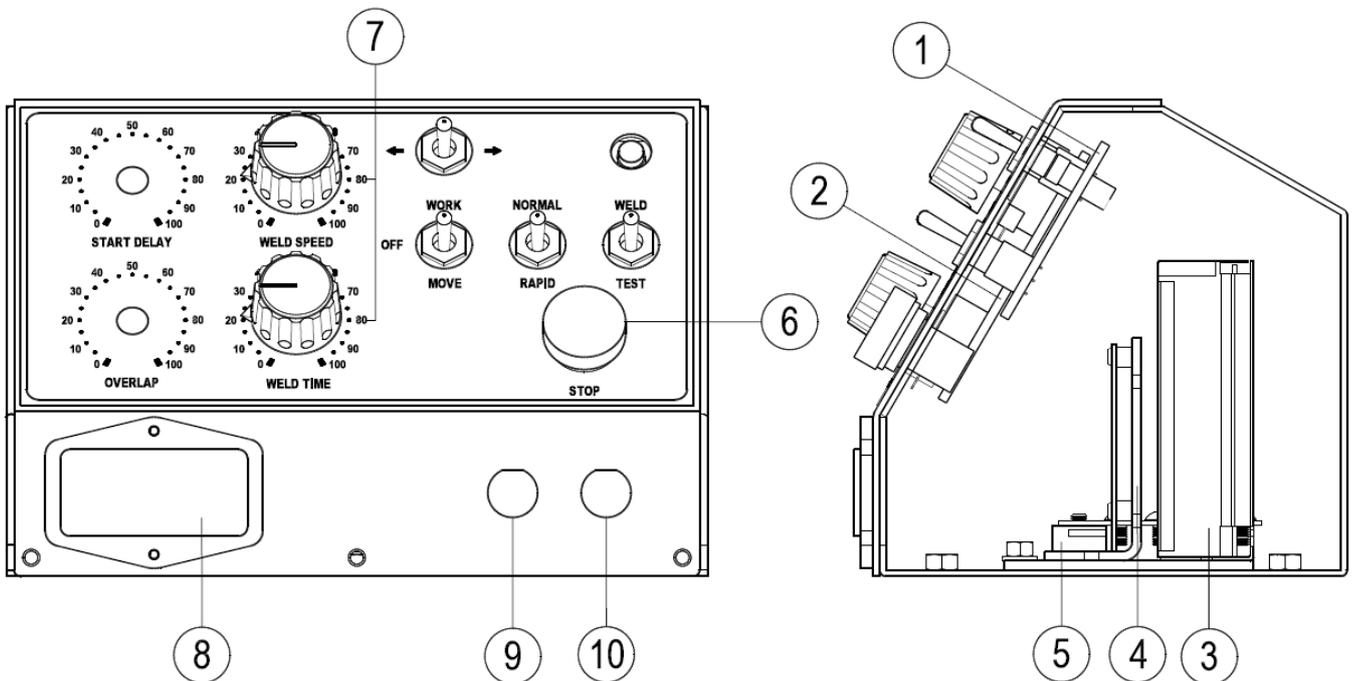
## 4.2 PART LIST — MECHANISM (PT-203)



### 4.3 PART LIST — CONTROL BOX (CB-101)

Item.	Part No.	Description	Qty	Remark
1	* 6622-1010	Printed circuit board	1	Switch board
2	* 3922-1210	Printed circuit board	1	VR Board
3	3326-0008	Power supply	1	
4	* 6651-1110	Printed circuit board	1	Motor speed control board
5	3545-5001	Grounding copper bar	1	
6	3214-2009	Push button	1	
7	3216-0006	Knob	2	VR1~VR2
	3747-1001-8	Potentiometer w/Connector	2	
8	3331-2001	IEC Inlet filter	1	PSW
9	3242-1116	Foot switch	1	
	3124-2006	Socket male 5Pin	1	P1
10	3123-2005	Plug female 4Pin	1	
	3124-2005	Socket male 4Pin	1	P2

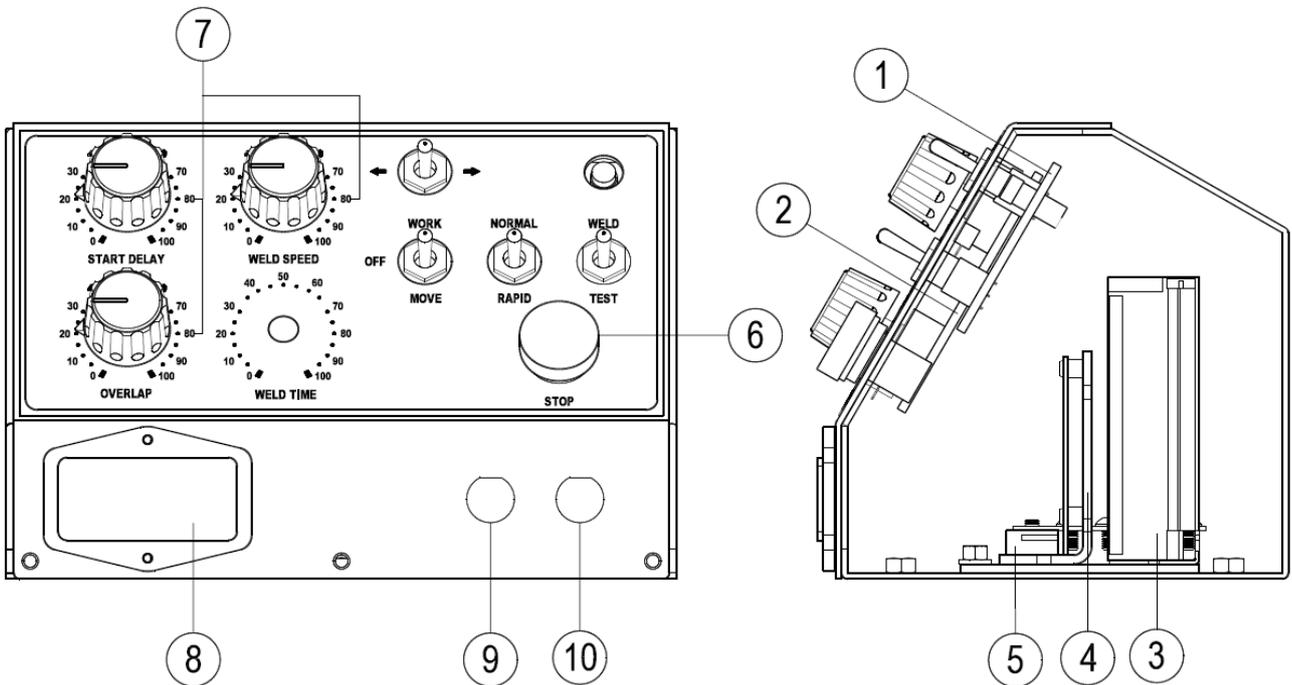
\* Recommended spare parts.



#### 4.4 PART LIST — CONTROL BOX (CB-102)

Item.	Part No.	Description	Qty.	Remark
1	* 6622-1010	Printed circuit board	1	Switch board
2	* 3922-1210	Printed circuit board	1	VR Board
3	3326-0008	Power supply	1	
4	* 6651-1110	Printed circuit board	1	Motor speed control board
5	3545-5001	Grounding copper bar	1	
6	3214-2009	Push button	1	
7	3216-0006	Knob	3	VR1,VR3,VR4
	3747-1001-8	Potentiometer w/Connector	3	VR1,VR3,VR4
8	3331-2001	IEC Inlet filter	1	PSW
9	3242-1116	Foot switch	1	
	3124-2006	Socket male 5Pin	1	P1
10	3123-2005	Plug female 4Pin	1	
	3124-2005	Socket male 4Pin	1	P2

\* Recommended spare parts



## 5.1 CIRCUIT DIGARM (CB-101/CB-102)

