

OWNER'S MANUAL

RD-8428E

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

MODEL : TR-3500B / TR-6000B

Digital Turning Rollers

Serial number : 1401013 ~ later

Date : Feb. 27, 2014

UNITED PROARC CORPORATION

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PRIMARY POWER CONNECTION



WARNING

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

Please read this owner's manual carefully before connection of the wires to AC power. Wrong connection may damage the equipment.

Before connecting primary power, check the data plate to verify the voltage required by the TR-XX. Check the power supply line that corresponds to the machine's specification.

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INSTRUCTION



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 specification or part 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 Gungye 10th Road, Pingjen Ind. 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.



WARNING

Falling machine due to lifting device failure may cause death or injury.

- * Lifting device may fail when overloaded.
- * Avoid sudden jerks, drops or swinging.
- * Check lifting device components visually for looseness and signs of metal fatigue.
- * Before changing any hardware, check grade and size of bolts, and replace with bolts of equal or higher size and grade.
- * Falling object may potentially cause serious bodily harm, please keep a safe distance away from any hanging objects
- * Long working duration may cause lumbar back strain and sprain. Please take caution and rest accordingly from time to time, or work in shifts to prevent long working hours.

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

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 area are protected from noise.

protection goggle



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

LIMITED WARRANTY

UNITED PROARC CORPORATION warrants all new equipment to be free from defects in material and workmanship for a period of one (1) year, 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.

The warranty period begins on the date of sale to the original-purchase user of the equipment.

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.

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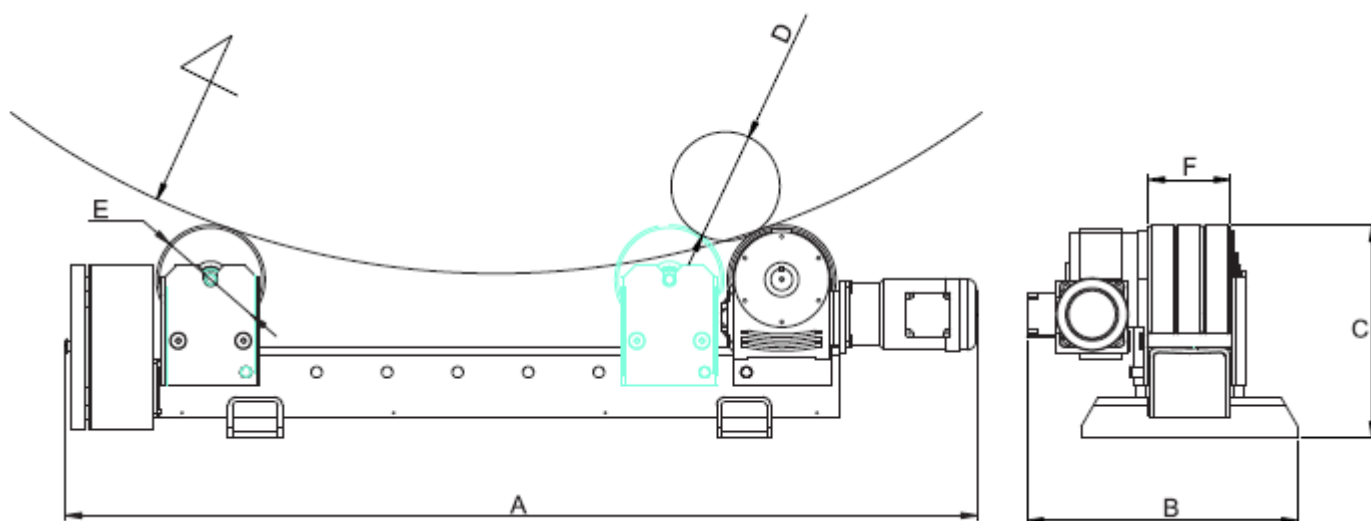
1.1 INTRODUCTION

Instruction	<ul style="list-style-type: none">* The turning rollers can be applied on round shaped work pieces, such as tanks, drums, pressure and cylindrical vessels and pipe to do the sequential circumferential rotation.* The turning roller can be associated with manual welding or the automatic welding. For example : manipulator.* Suitable for various kinds of welding process : SMAW, MIG, TIG, Plasma welding.
Features	<ul style="list-style-type: none">* The machine is so designed that uses low-axial single-sided power rolls. The motor drive uses a shaft mounted worm reducer coupled on axis producing high torque and low clearances operation.* The rolls are wrapped with heat resistant, anti-spalling rubber. It has good friction and will minimize work piece slippage.* Roll move method is done manually by hand with positioning-bar to lock.* The option is adjusted roll manually by the L/R screw. The operator must refer to 3.1 Installation & Adjustment (<i>page 4 of this manual</i>) for instruction to match the diameters of work piece.

1.2 SPECIFICATION

MODEL	UNIT	TR-3500B	TR-6000B
Power Input	~	1 Phase 220V ~ 240V 50 / 60Hz 3 Phase 460V 50 / 60Hz	
Rated capacity	KVA	0.5	0.5
NFB capacity	A	6 / 2	6 / 2
Turning capacity	kg	3500	6000
Diameter range (D)	mm	ϕ 50 ~ 3000	
Speed range	mm/min	60 ~ 1200	
Motor	Hp	1/2	
Wheel Dia. (E)	mm	ϕ 200	
Wheel width (F)	mm	100	150
Roller type	-	PU	
Overall length (A) (Drive / Idler)	mm	1520 / 1260	1670 / 1260
Overall width (B) (Drive / Idler)	mm	500 / 400	500 / 400
Overall height (C) (Drive / Idler)	mm	391	
Weight(Drive / Idler)	kg	171 (102 / 69)	242 (150 / 92)

Installation location	Altitude 1000M or below , Free from corrosive gas and liquid.
Ambient temperature	0~+40°C (non-condensing and not frozen)
Ambient humidity	Below 90%RH(non-condensing)
Storage temperature	-20~+60°C (non-condensing and not frozen)
Storage humidity	Below 90%RH(non-condensing)
International projection	IP 22

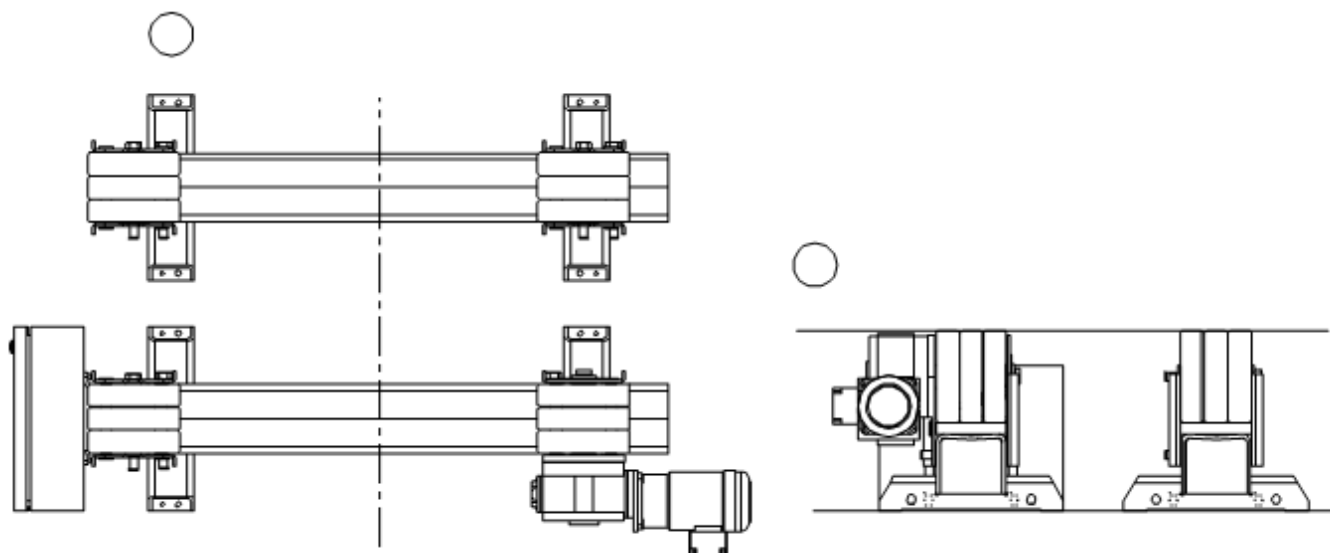


2.1 INSTALLATION & ADJUSTMENT

Instruction

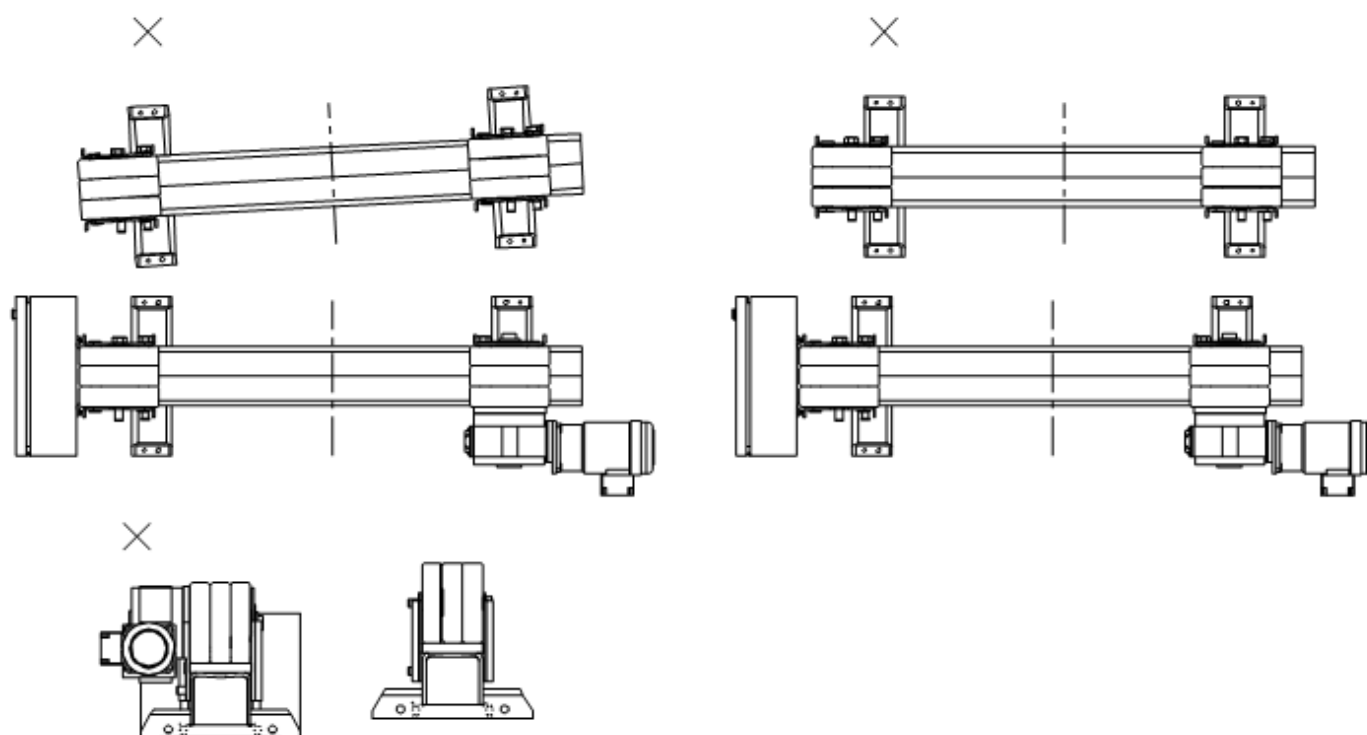
During installation, please pay attention to the parallelism and horizontal height of the bed of drive / idler.

- * When the ground is rugged, please adjust the screw of the base to make the height of bed horizontal and to prevent vibrations. Bed needs to be fixed on the ground to prevent any movement caused by vibration during operation.
- * The correct installation method is as the following figure :



Faulty installation method :

The following 3 installation methods should be avoided to prevent the work piece from falling down or prevent the turning roller from being damaged by the outside unusual force.



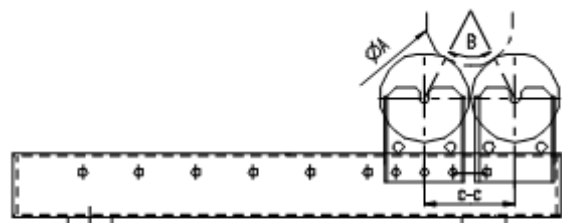
3.1 OPERATION INSTRUCTION

Instruction	<p>* Correct loading angle --- 40°~ 60°. When the loading angle is incorrect, the following situations would occur:</p> <p>A. When the contact angle between work piece and turning roller is more than 60°, the roller would suffer from the improper squeeze or the work piece would be stuck between the rollers, which would cause the damage of the roller and shaft. The drive motor would burn down as well.</p> <p>B. When the contact angle between work piece and turning roller is less than 40°, the work piece would slip or fall off. Before putting the work piece, the correct loading angle should be identified in advance to make the machine run normally.</p> <p>* The calculation method of the loading angle and turning roller C-C :</p> $C-C = [(\sin \theta / 2) \times (r + D)] \times 2$ <p>Ex : Diameter of work piece (D) = ϕ 500mm Radius of roller (r) = 202.5mm Loading angle = θ Hence, roller C-C = 702.5</p>
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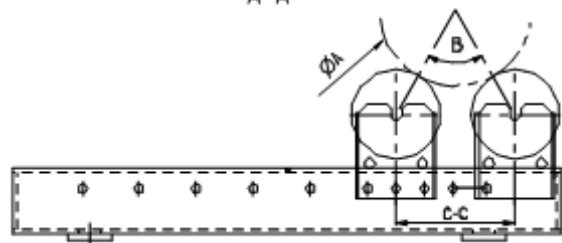
Please check this table before loading work pieces :

Roll-Roll	A-A	B-B	C-C	D-D	E-E	F-F	G-G	H-H	I-I
C-C	207	272	337	402	532	662	792	922	1052
Angle (A) \	Work-pieces Dimension (B)								
38.36~40.22	400	600	\	1000	1400	1800	2200	2600	3000
41.04~44.06	350	550	750	900	1300	1600	2000	2400	2800
44.10~47.32	\	500	650	800	1200	\	1800	2200	2600
47.70~49.32	300	450	600	\	1100	1400	\	2000	2400
51.96~54.52	250	400	550	700	1000	\	1600	1800	2200
57.08~60.18	\	350	500	600	900	1100	1400	\	2000
61.68~61.98	200	\	\	\	\	\	\	1600	1850

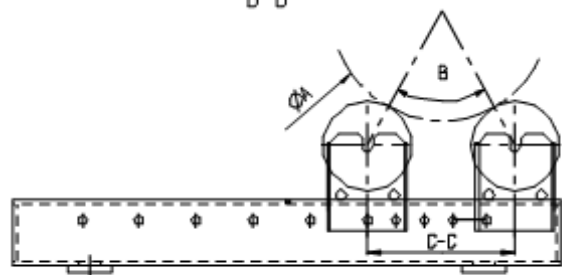
3.1 OPERATION INSTRUCTION



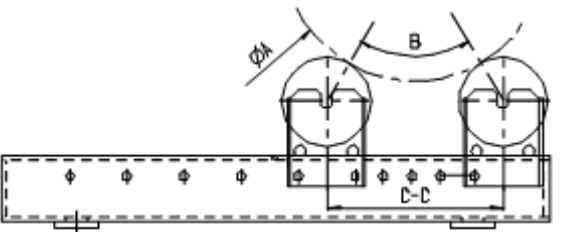
A-A



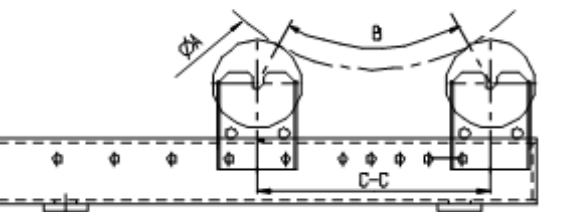
B-B



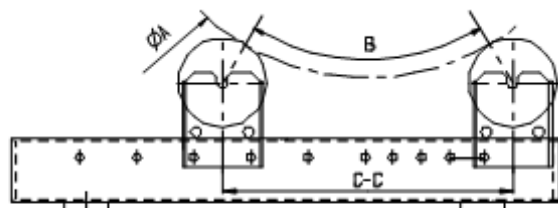
C-C



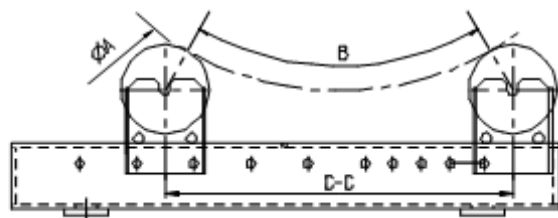
D-D



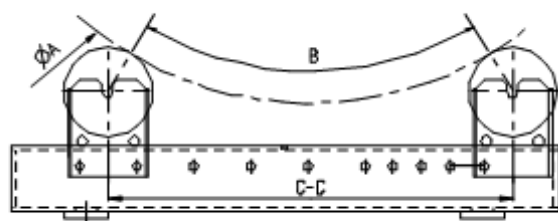
E-E



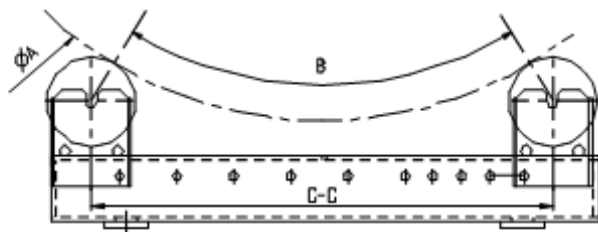
F-F



G-G



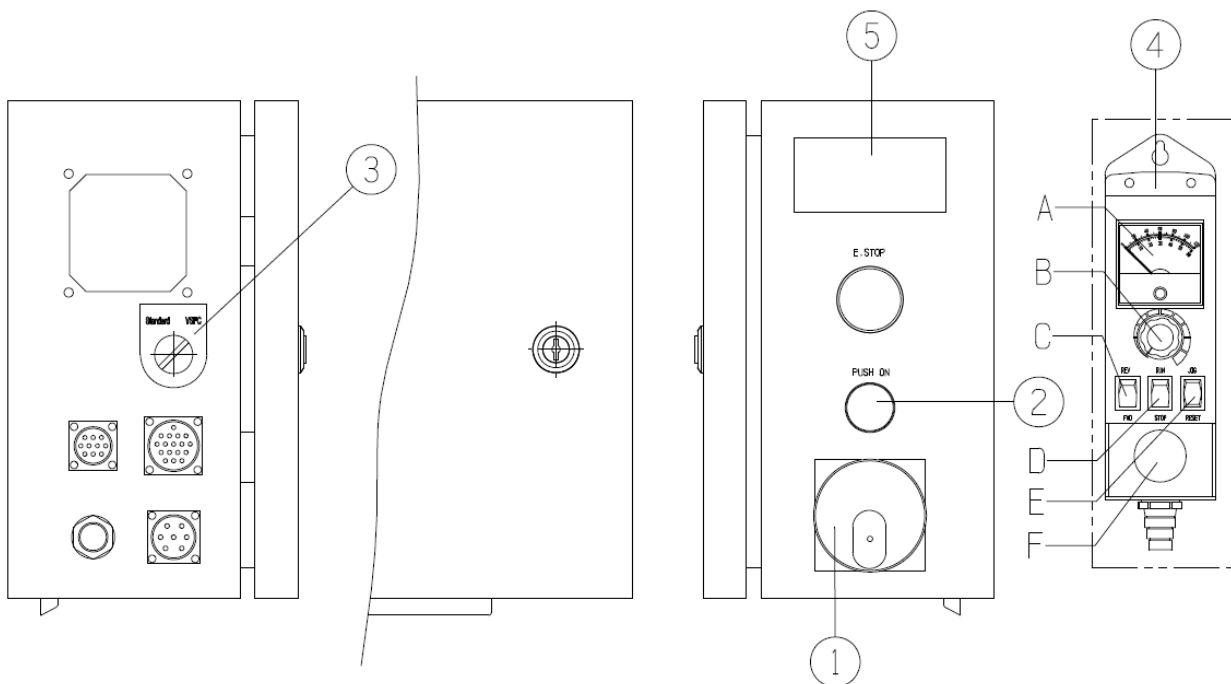
H-H



I-I

3.2 REMOTE CONTROL INSTRUCTION

1. System power switch : System's main power - NFB switch (circuit breaker).
2. "Start" switch : Press to start the system – green light.
3. While HP mode, the wheel speed is controlled by the adjustment knob on the remote pendent. The foot switch is only used to start / stop the rotation.
While RP mode, the maximum wheel speed is set by the remote pendent adjustment knob. The foot switch controls speed between 0 and the maximum speed.
4. Remote control device :
 - A. Speed meter
Shows the speed data (Hz.)
 - B. Speed knob
To increase speed, turn clockwise.
To decrease speed, turn counter clockwise.
 - C. Forward / Reverse
Indicates forward and reverse direction of the turning rollers.
CAUTION: [WHILE TURNING, PLEASE AVOID CHANGING DIRECTION.]
 - D. Run / Stop
Set the "**Forward / Reverse**" direction followed by pressing the "**Run**" button to turn the rollers continuously. Press "**Stop**" button to stop the turning.
 - E. Jog / Reset
While the machine is not in motion, you can adjust to desired position slowly by pressing "**Jog**" function. When the inverter driver displays an error message, press "**Reset**" to clear the error and reset the system.
 - F. E-stop button
Press the emergency stop button to terminate the driver circuit.
5. Line speed meter :
Display 0 when the wheel is completely stopped. The line speed is displayed to facilitate the wheel speed adjustment.
*** Please remove the external cover in order to set the RPM meter.**



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4. 1 TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSE / REMEDY
(1.) After switch on, the power light doesn't lit	A. NFB jumps off. To check the main circuit-disconnect or short.
	B. No power input. To inspect the AC power input voltage and phase.
	C. DC24V no output 1. To inspect and make sure the switching power supply input voltage is correct or not ? 2. To Check the Fuse was burn down or not? If yes, please replace new one.
	D. Control PC board. Please refer the item (2.)
	E. The indicator light breaks down. 1. To make sure the voltage of indicator-DC24V. 2. To inspect the indicator.
(2.) Control PC board indicator (LED lamp) wasn't illuminated or damaged.	A. AC or DC power input disconnected. To inspect power input voltage and phase.
	B. Fuse burn down. To inspect the F1 & F2 fuse working or not, If damaged, please replace a new one.
(3.) Inverter – no display.	A. Inverter has no power input. Check if magnetic contactor is defective (replace).
	B. Inverter has power input. Check if inverter's digital remote panel is defective (replace).
(4.) Inverter – displays ALM.	A. Inverter driver display" ALM "data. To make sure the display status, and refer the inverter driver Trouble shooting.
(5.) The turntable has no movement.	A. Remote control breaks down. Please refer the item (6.)
	B. Control PC board. Please refer the item (2.)
	C. Inverter breaks down, no output. Please refer the item 3 & 4.
	D. Failed motor Check / change a new motor.
	E. The reducer is damaged. Replace a new reducer.

4.1 TROUBLE SHOOTING GUIDE

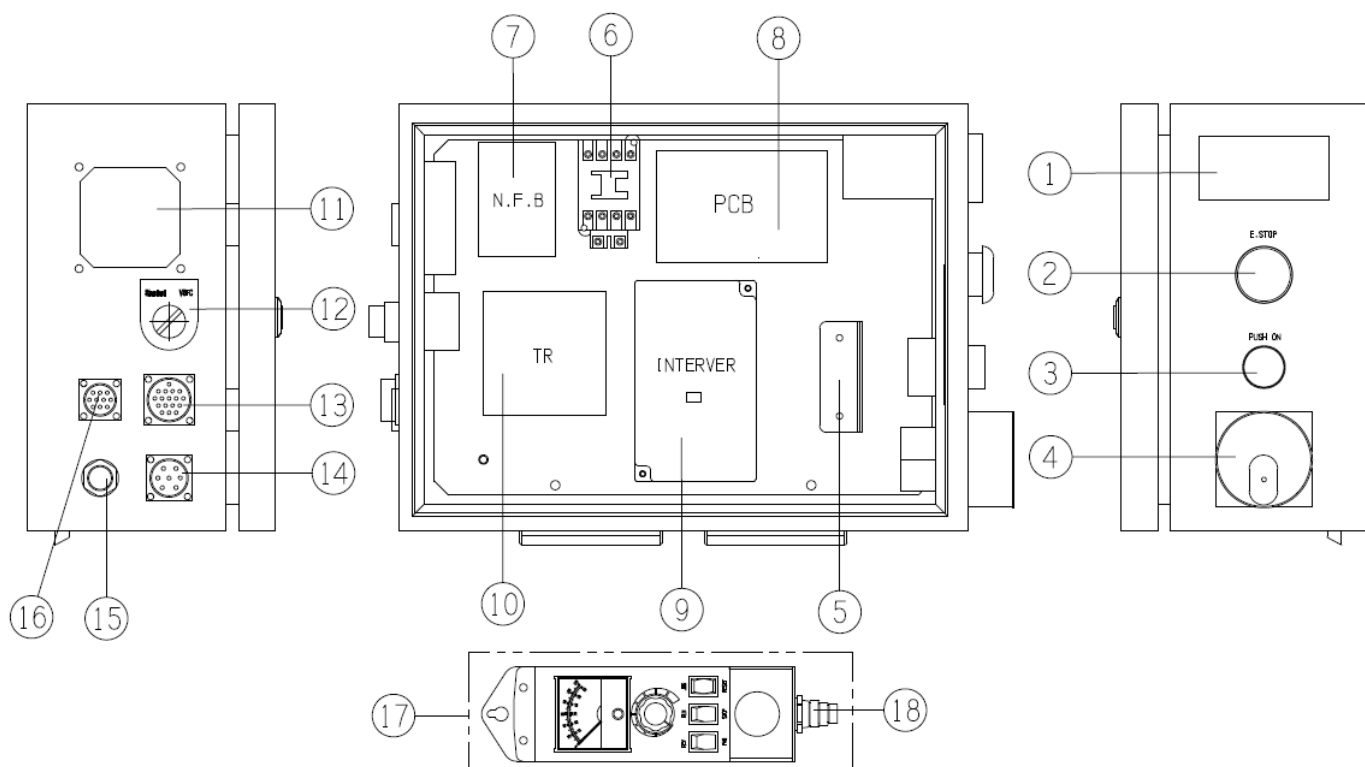
SYMPTOM	POSSIBLE CAUSE / REMEDY
(6.) Remote switch has no action or speed control knob disable.	A. Snap switch damaged. To check the snap switch connector is normal or not? And replace it.
	B. Potentiometer damaged. To measuring the potentiometer resistance (5K Ω) is normal or not? If yes, please change a new one.
	C. Indicator was no work. To change the indicator.
(7.) Remote foot control has no response, or cannot control speed.	A. Remote foot control limited switch failed 1. Check the limited switch and its connector. Replace when required. 2. To make sure the activating position in the dog is correct. Adjust its position if required.
	B. Potentiometer damaged. Measure the resistance of the potentiometer – should be about 5K Ω . Replace when necessary.

5.1 PARTS LIST – CONTROL BOX

Fig No.	Part No.	Description	Q'ty.	Remark
1	3061-1006	Line speed meter	1	
2	3214-2002	ES Push Button	1	
	3214-1005	Contact	1	
3	3214-4006	Push button (w/ light)	1	PB1
4	3216-1003	Rotaryes switch	1	
5	* 3323-0005	Power supply	1	PS
	* 5015-5090000-30	Power supply clamping plate	1	PS
6	* 3224-1005	Magnetic contactor	1	MC
7	3221-2001	No Fuse Breaker	1	220VAC
	3221-3008	No Fuse Breaker	1	460VAC
8	* 6652-1221	PC Board	1	PCB
9	** 3021-2001	Inverter	1	INV
	** 3021-4003	Inverter	1	INV
10	** 3311-0018	Transformer	1	AC460V
11	3071-2201	Fan	1	
12	3211-4105	Select switch	1	SW1
13	3122-7002	Socket female 17 Pin	1	JN4
14	3122-4003	Female male connector 7 Pin	1	JN2
15	3534-3005	Cable clamp	1	P1
16	3122-4004	Metal connector socket 10Pin	1	JN5
17	3023-0003	Remote control 7.5M	1	
18	3534-3003	Nylon cable gland	1	

* Recommended spare parts

** Options

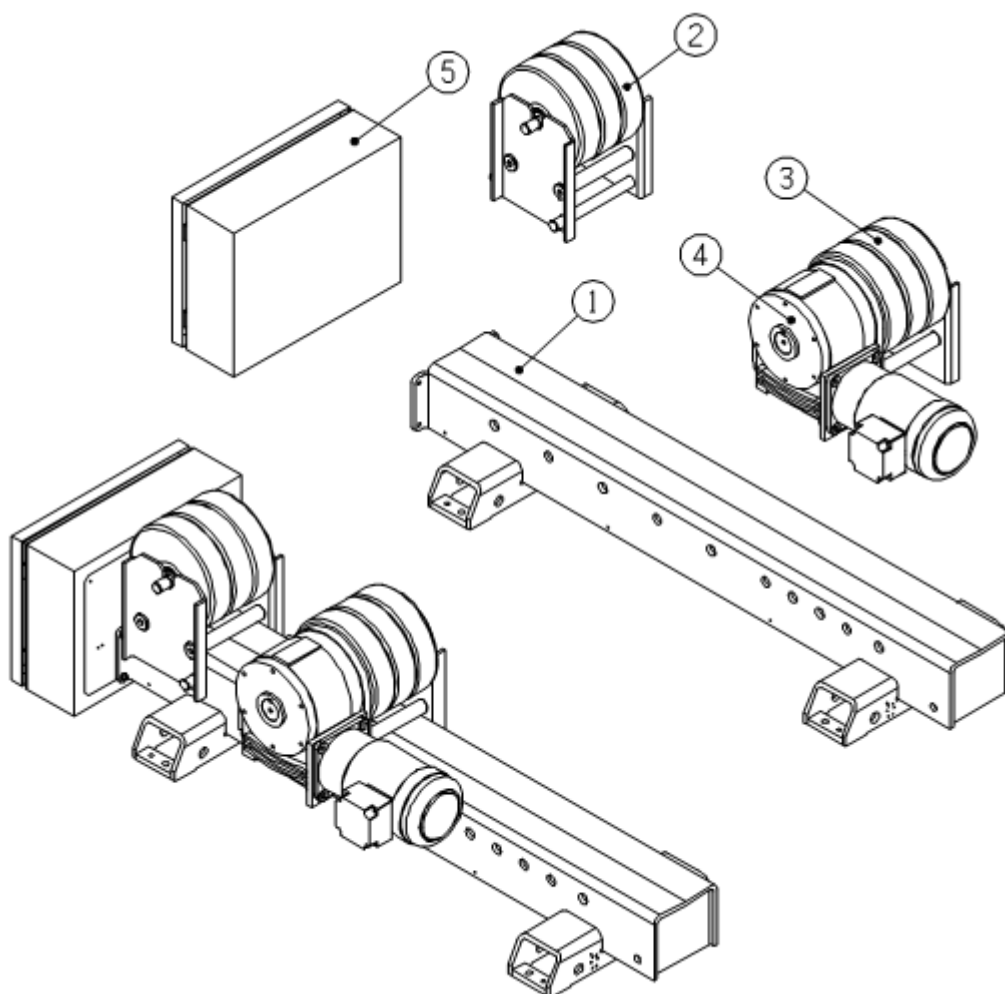


5.2 PARTS LIST – TR-3500BP / TR-6000BP

Fig No.	Part No.	Description	Q'ty.		Remark
			TR-3500BP	TR-6000BP	
1	5041-4010000-24	Machine bed	1	1	
2	** 5041-3700010-20	Idler wheel	1		
	** 5041-4030010-20	Idler wheel		1	
3	** 5041-3600010-22	Main wheel	1		
	** 5041-4060010-22	Main wheel		1	
4	** 0353-0111	Worm reducer	1		
	** 0353-0114	Worm reducer		1	
	* 0350-0019	Gear Motor	1	1	
5	** 6501-0520	Control box	1	1	AC 220V
	** 6501-0550	Control box	1	1	AC 460V

* Recommended spare parts

** Options

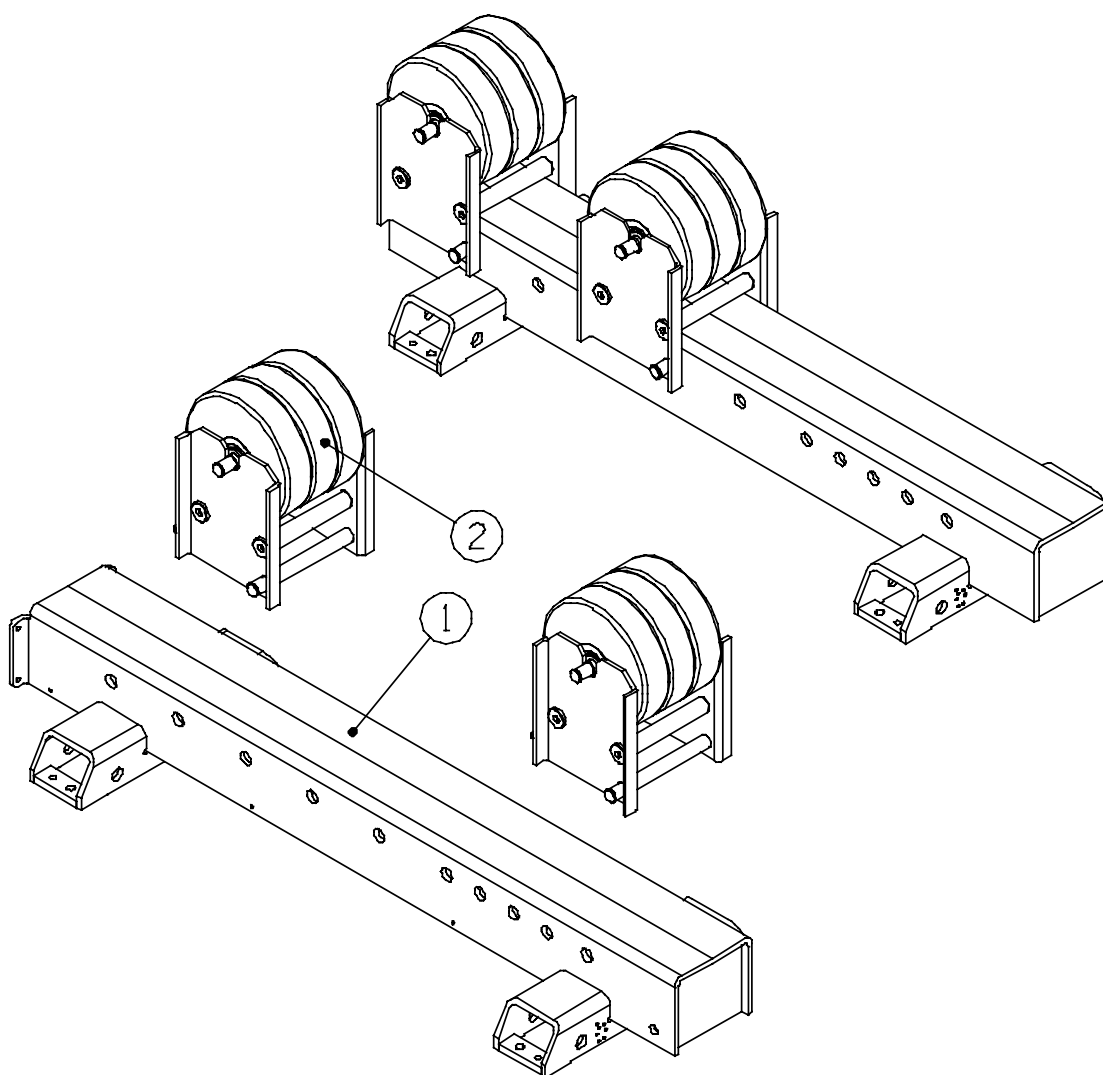


5.3 PARTS LIST – TR-3500BI / TR-6000BI

Fig No.	Part No.	Description	Q'ty.		Remark
			TR-3500BI	TR-6000BI	
1	5041-4190000-10	Machine bed	1	1	
2	** 5041-3700010-21	Idler wheel	2		
	** 5041-4030010-21	Idler wheel		2	

* Recommended spare parts

** Options

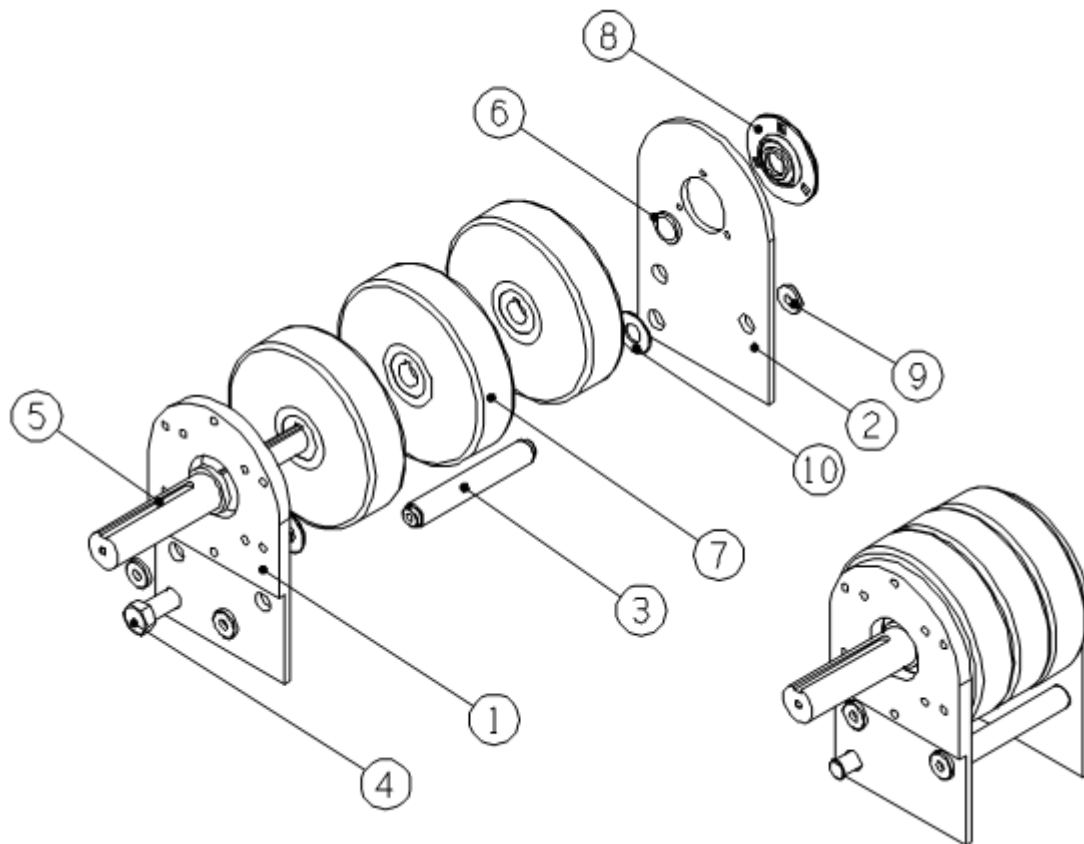


5.4 PARTS LIST – TR-3500BP / TR-6000BP (MAIN WHEEL)

Fig No.	Part No.	Description	Q'ty.		Remark
			TR-3500BP	TR-6000BP	
1	5041-4060000-13	Support plate (left)	1	1	
2	5041-4070000-13	Support plate (right)	1	1	
3	* 5041-4110000-20	Joint-Bar	2	2	
4	5041-4110100-20	Positioning bar	1	1	
5	** 5041-3640000-21	Drive shaft	1		
	** 5041-4120100-21	Drive shaft		1	
6	** 5041-3650000-21	Spacer	1		
	** 5041-4120200-11	Spacer		1	
7	5041-4120000-20	PU rolls	2	3	
8	0312-0501	Pillow block BPF5	1	1	
9	5034-5820500-20	Washer	5	5	
10	5041-4110200-20	Spacer	2	2	

* Recommended spare parts

** Options

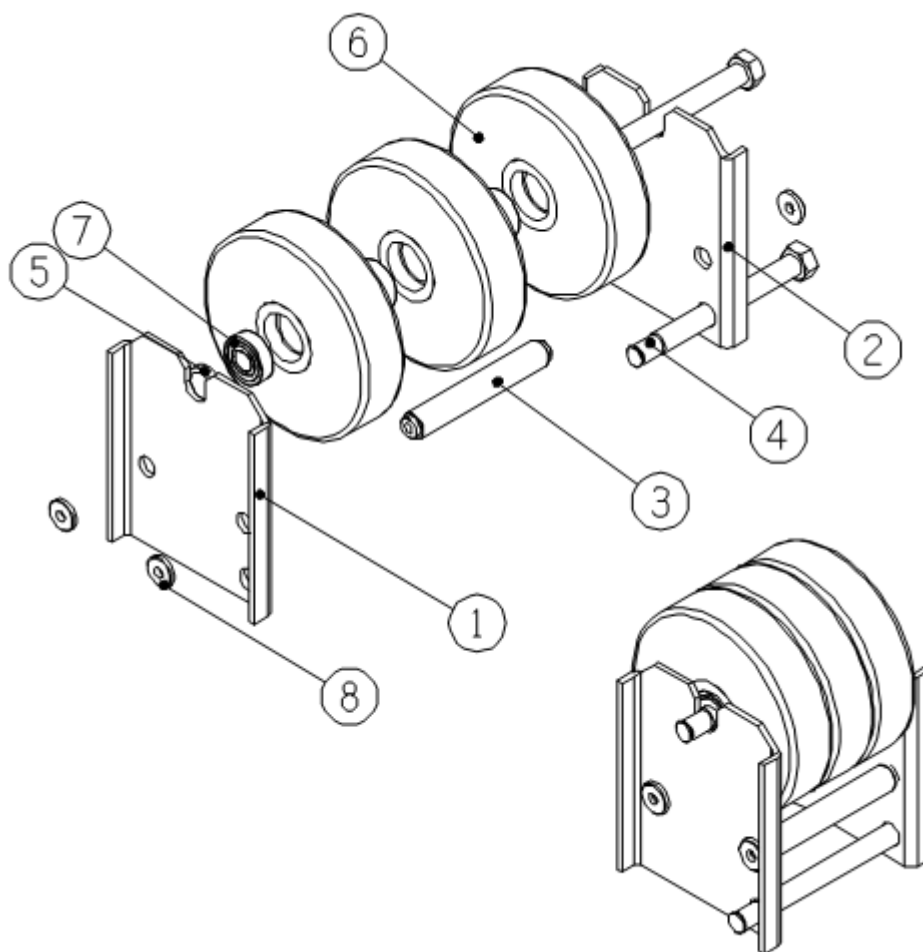


5.5 PARTS LIST – TR-3500BI / TR-6000BI (IDLER WHEEL)

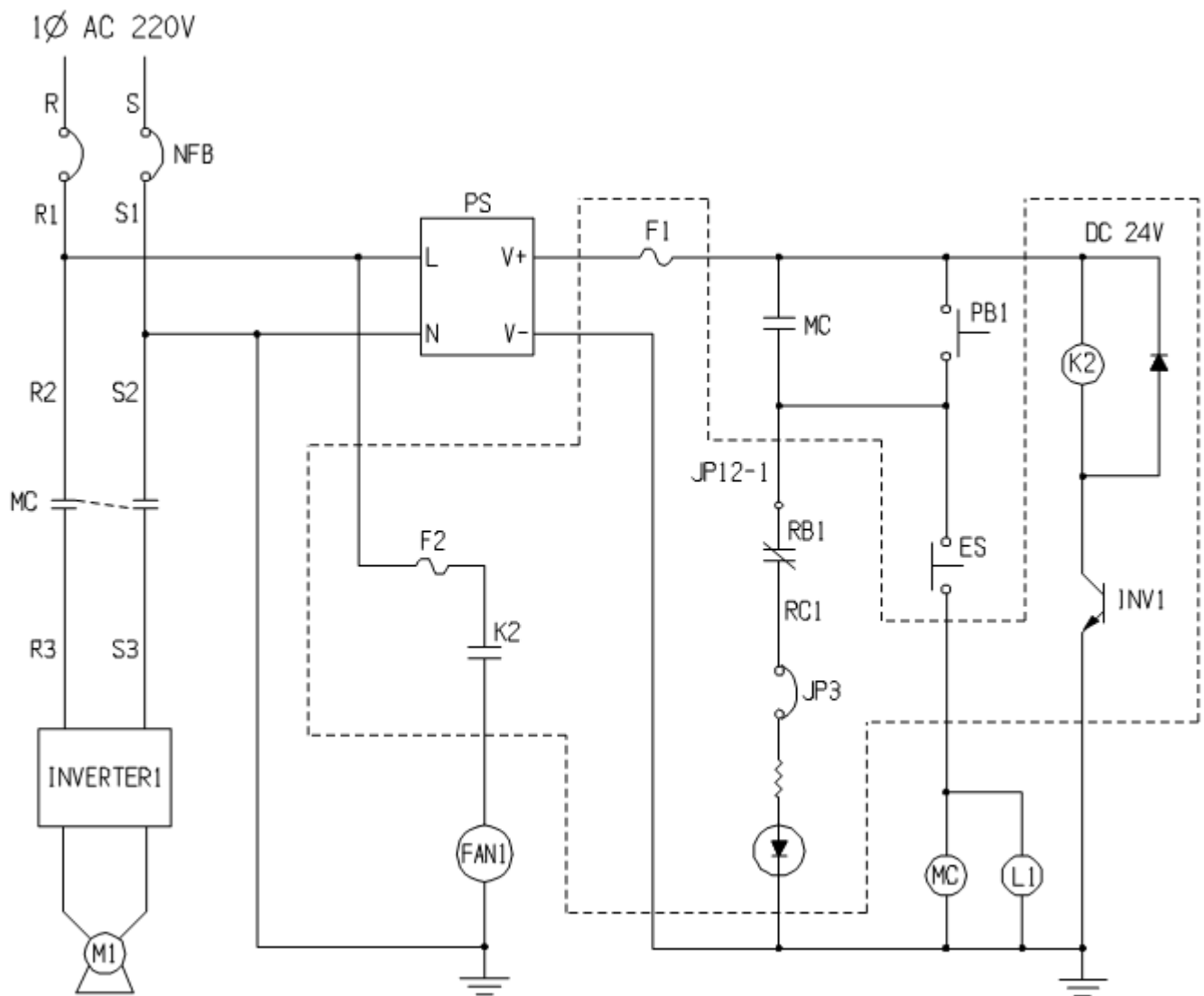
Fig No.	Part No.	Description	Q'ty.		Remark
			TR-3500B	TR-6000B	
1	5041-4030000-21	Support plate (left)	1	1	
2	5041-4040000-21	Support plate (right)	1	1	
3	* 5041-4110000-20	Joint-Bar	2	2	
4	* 5041-4110100-20	Positioning bar	1	1	
5	** 5041-3230000-20	Spacer	2		
	** 5041-4110200-10	Spacer		2	
6	5041-1030100-10	PU Rolls	2	3	
7	* 0301-0403	Bearing	4	6	
8	5034-5820500-20	Washer	4	4	

* Recommended spare parts

** Options

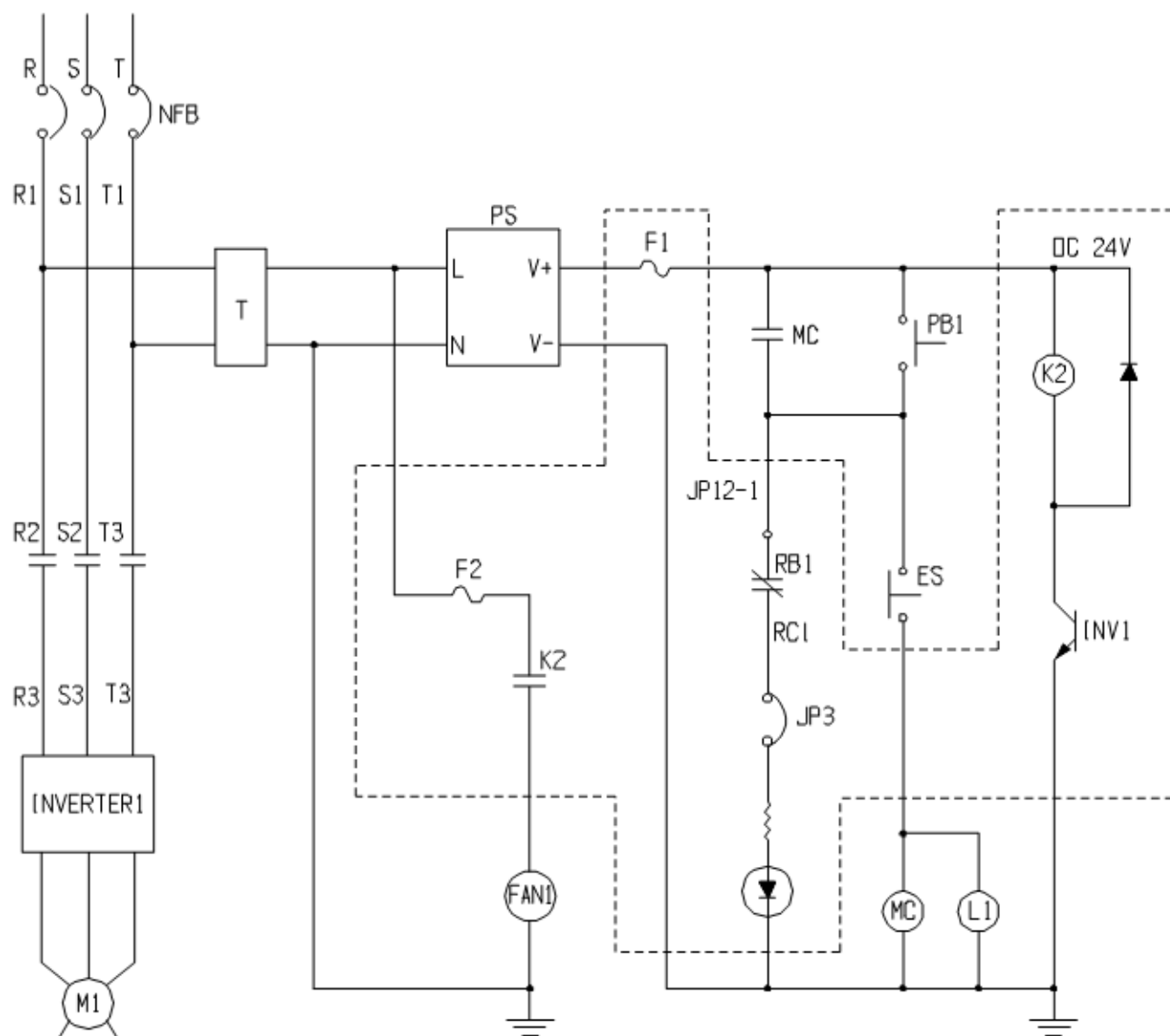


6.1 CONTROL BOX CIRCUIT (1 ϕ 220V)

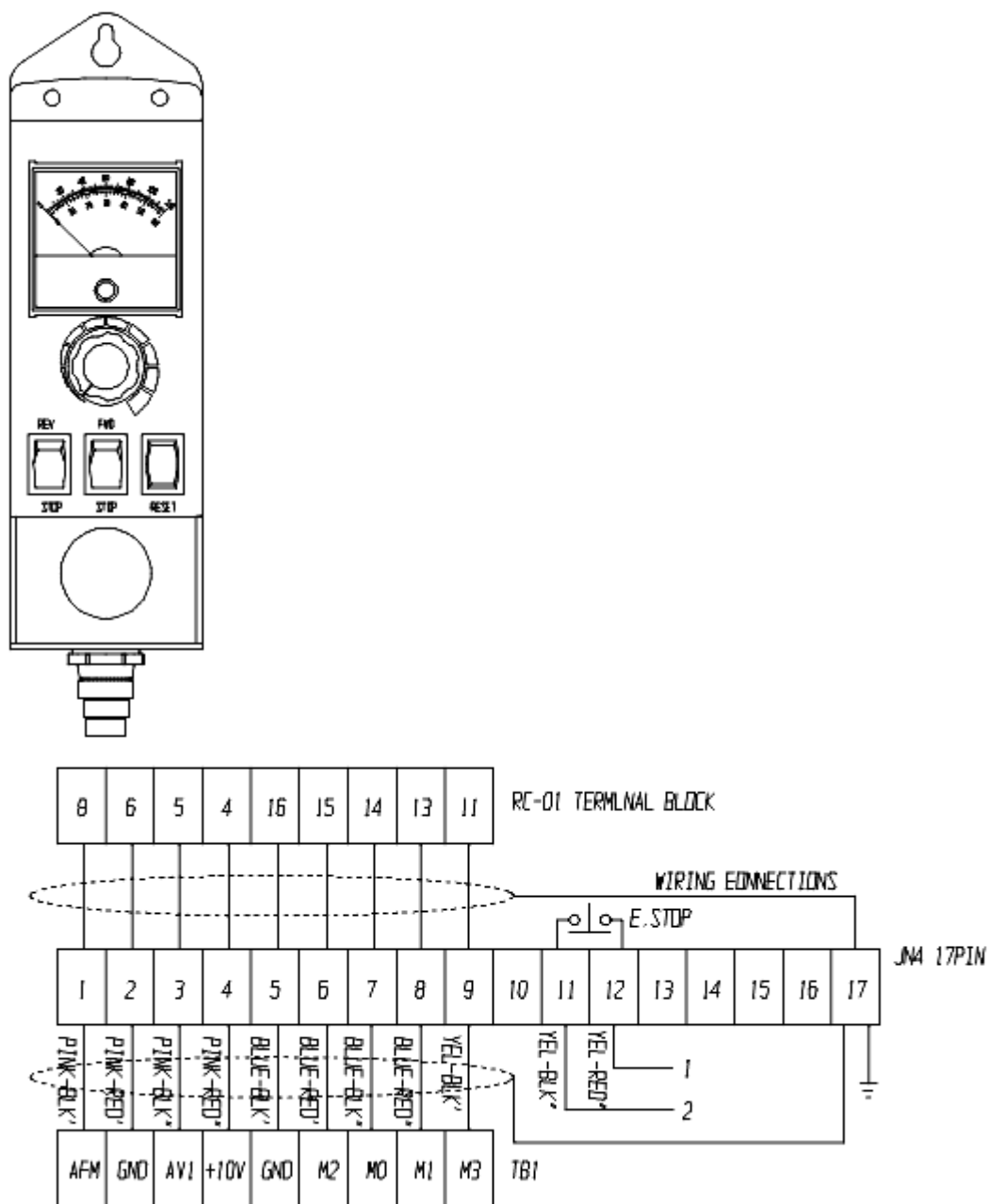


6.1 CONTROL BOX CIRCUIT (3 ϕ 380V / 415V / 460V)

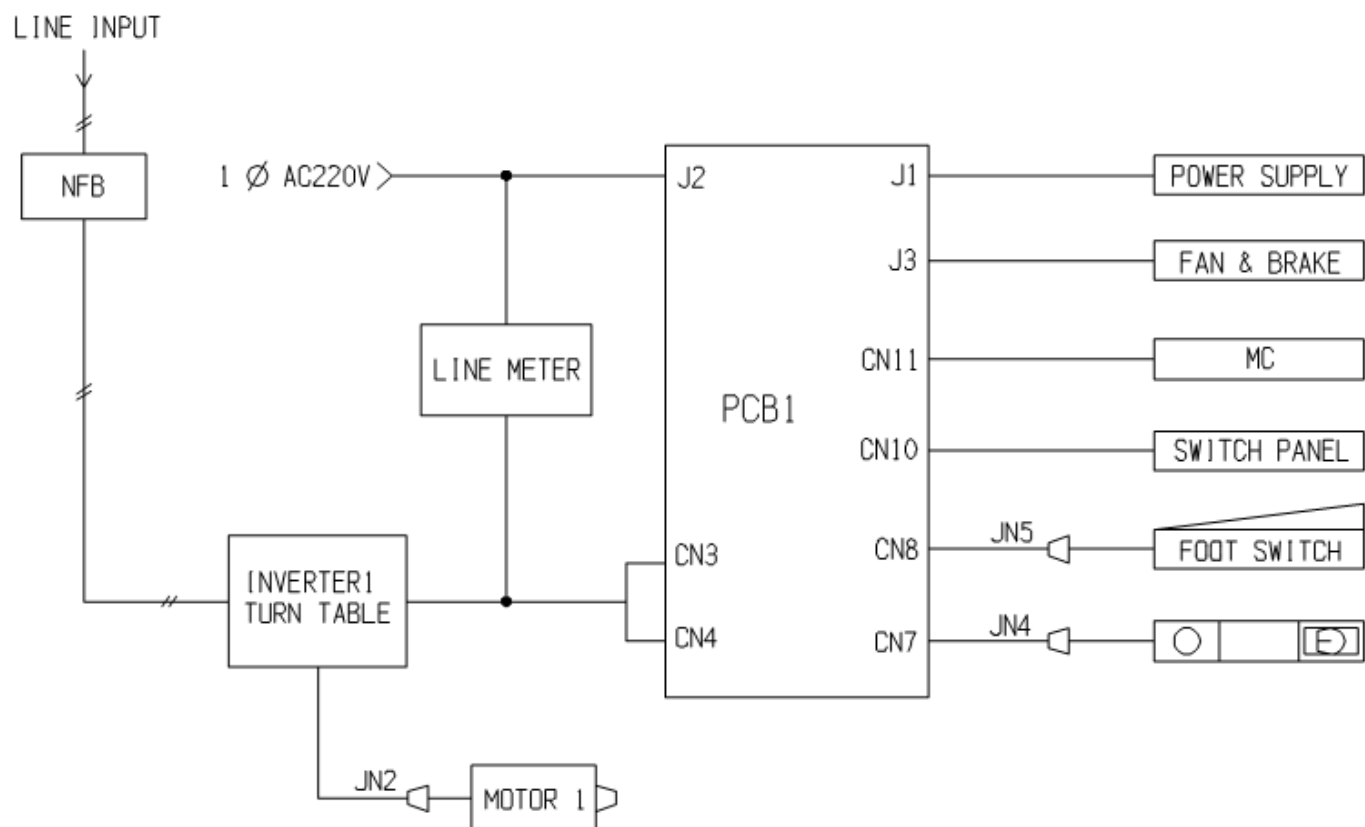
3 ϕ AC380V/415V/460V



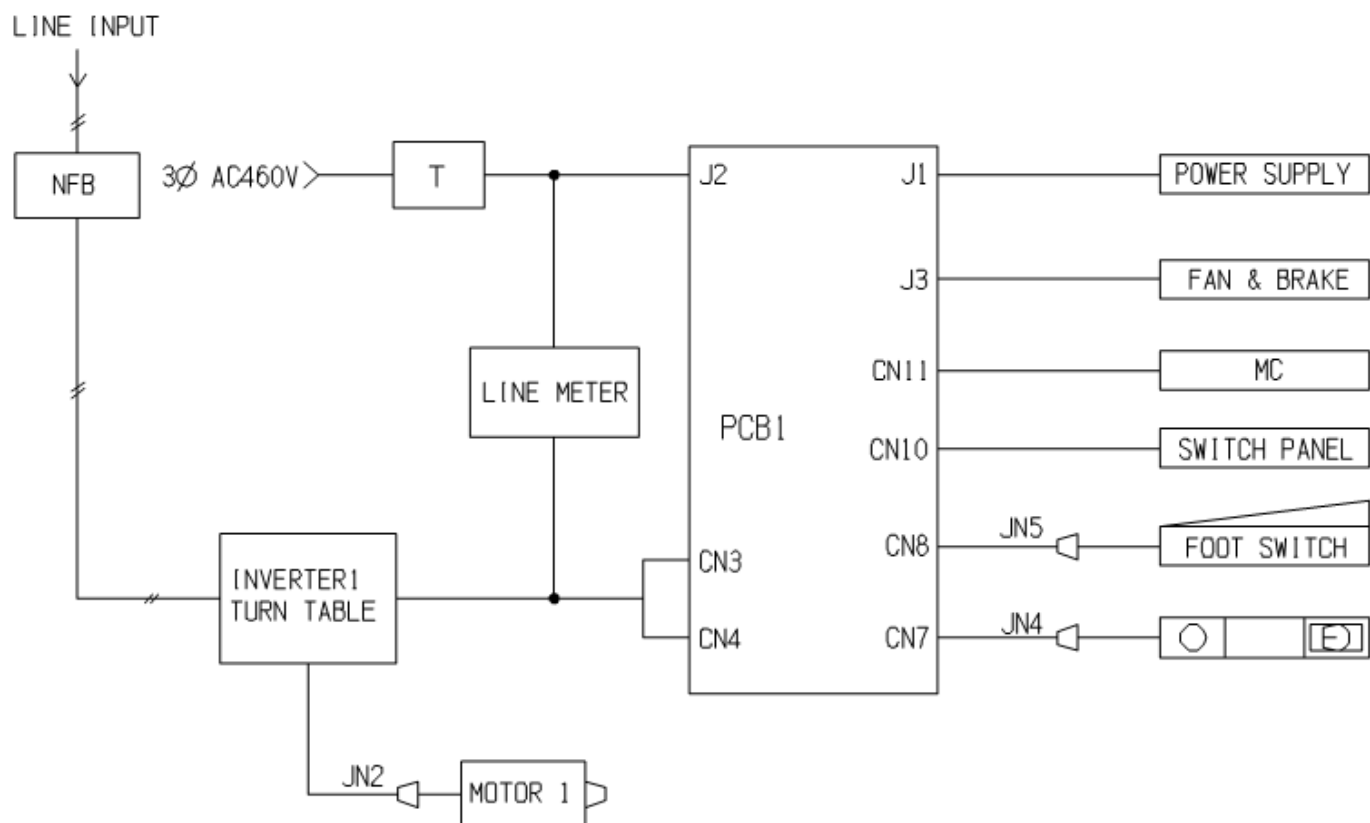
6.1 CONTROL BOX CIRCUIT



6.2 CONTROL SYSTEM BOX (1 ϕ 220V)



6.2 CONTROL SYSTEM BOX (3 ϕ 460V)



6.3 INSIDE INPUT/OUTPUT CONNECT INTERFACE : PCB1

J1 CONNECTOR		
J1	POWER SUPPLY	DESCRIPTION
1	L	L10
2	N	L20
3	+V	P+
4	-V	P

J2 CONNECTOR		
J2	CS	DESCRIPTION
1	1	L1
2	3	L2

LINE METER		
TB	PCB-CN12	DESCRIPTION
9	2	IN (HI)
6	1	IN(LO)
	J3	
3	5	POWER
1	6	POWER

J3 CONNECTOR		
J3	INVERTER CTL	DESCRIPTION
1	JN2-5	INV1-F1
2	JN2-6	INV1-F2

CN3 CONNECTOR		
CN3	INVERTER 1	DESCRIPTION
1	RA	RA
2	RB	RB
3	RC	RC

6.3 INSIDE INPUT/OUTPUT CONNECT INTERFACE : PCB1

CN4 CONNECTOR		
CN4	INVERTER 1	DESCRIPTION
1	M0	M0
2	M1	M1
3	M2	M2
4	M3	M3
5	M4	M4
6	M5	M5
7	GND	GND
8	AFM	AFM
9	AVI	AVI
10	+10V	+10V
11	MCM	MCM
12	M01	M01

CN7 CONNECTOR		
CN7	HAND PENDANT	DESCRIPTION
1	1	AFM1
2	2	GND1
3	3	AVI1-HP
4	4	10V1
5	5	GND1
6	6	M12
7	7	M10-HP
8	8	M11
9	9	M13
10	10	NC
11	11	ES-1
12	12	ES-2

CN8 CONNECTOR		
CN8	REMOTE FOOT SWITCH	DESCRIPTION
1	JN5-3	RMV
3	JN5-2	RMI
4	JN5-1	GND1
5	JN5-4	M10-RF
6	JN5-5	GND1

6.3 INSIDE INPUT/OUTPUT CONNECT INTERFACE : PCB1

CN10 CONNECTOR		
CN10	FRONT SW	DESCRIPTION
1	PB1-1	PB1-1
2	PB1-2	PB1-2
3	L1-1	L1-1
4	L1-2	L1-2
11 (Option)	SW2-1	SW2-1
12 (Option)	SW2-2	SW2-2

CN11 CONNECTOR		
CN11	MC	DESCRIPTION
1	A1	A1
2	A2	A2
3	13	C1
4	14	C2

6.4 INPUT/OUTPUT CONNECT INTERFACE

JN2 CONNECTOR		
JN2	PCB-J3	DESCRIPTION
1		U1
2		V1
3		W1
4		G
5	1	INV1-F1
6	2	INF1-F2
7		

JN4 CONNECTOR		
JN4	PCB-CN7	DESCRIPTION
1	1	AFM1
2	2	GND1
3	3	AVI1-HP
4	4	10V1
5	5	GND1
6	6	M12
7	7	M10-HP
8	8	M11
9	9	M13
10	10	NC
11	11	ES-1
12	12	ES-2
17		G

JN5 CONNECTOR		
JN5	PCB-CN8	DESCRIPTION
1	4	GND1
2	1	RMI
3	3	RMV
4	5	M10-RF
5	6	GND1
6	2	GND1
10		G

APPENDIX A: INVERTER SETTINGS

Item	No.	Name	Setting Value	Remark
1	Pr00	Source of frequency command	01	
2	Pr01	Source of operation command	01	
3	Pr03	Maximum output frequency	60	
4	Pr04	Maximum voltage frequency	60	
5	Pr05	Maximum output voltage	220	
6	Pr06	Mid-Point frequency	3.0	
7	Pr07	Mid-Point voltage	23	
8	Pr08	Minimum output frequency	1.5	
9	Pr09	Minimum output voltage	18	
10	Pr10	Acceleration time 1	1	
11	Pr11	Deceleration time 1	1	
12	Pr12	Acceleration time 2	1	
13	Pr13	Deceleration time 2	1	
14	Pr14	Acceleration / Deceleration S-Curve	3	
15	Pr16	Jog frequency	60	
16	Pr38	Multi-function Input terminal (M0,M1)	01	
17	Pr40	Multi-function Input terminal (M3)	09	
18	Pr45	Multi-function output terminal 1	00	
19	Pr46	Multi-function output terminal 2	07	
20	Pr54	Torque compensation	0	
21	Pr58	Electronic thermal overload relay selection	1	
22	Pr59	Electronic thermal motor overload	60	
23	Pr60	Over-Torque detection mode	03	
24	Pr61	Over-Torque detection level	150	
25	Pr62	Over-Torque detection time	01	
26	Pr76	Parameter lock and configuration	01	
27	Pr114	Cooling fan control	02	

WRING DIAGRAM

PD-6166

REVISIONS

Manual number	Print data	Changed page	Revisions
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RD-8428E	2017, 01.04	5.2 (P11)	Revised No.2 and No.3 part no.