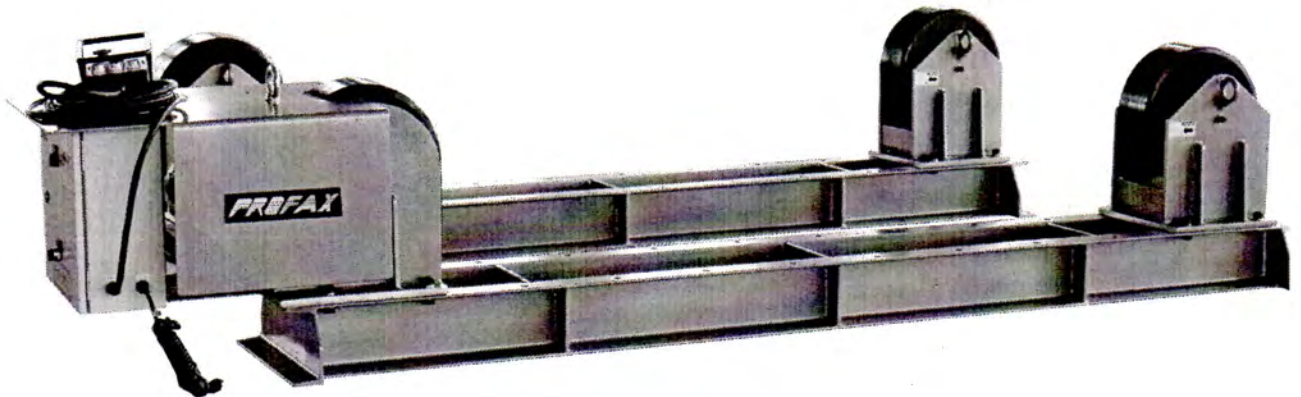


**TR-20000 ROTATOR
OPERATION & MAINTENANCE
MANUAL**

TR-20000



INSTRUCTION MANUAL

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IDENTIFICATION DATA

Purchaser : PROFAX
PO No. : 66480
Seril No. : TR20-1005
Equipment Type : ROTATOR
Model : TR-20000
Loading Capacity : 10 Metric Ton
Rotating Capacity : 15 Metric Ton
Vessel Size (Min.) : Φ 519 at 60° included Angle
Vessel Size (Max.) : Φ 4041 at 60° included Angle
Roller Speed : 0 to 1959mm/min at 0-900V
Power Supply : 110V-1P-60Hz
Weight : 602KG
Color : Silver Gray
Quantity : 6

Please quote the above serial no. and details when ordering spares or in any other communications regarding this equipment.

SAFETY PRECAUTIONS

1. General Safety Instruction

- 1.1 This manual must be thoroughly understood prior to actual installation and operation of the machine. In addition to the manual, please refer to O & M Manual of Welding Equipment.
- 1.2 Please observe applicable legal and other mandatory regulations relevant to accident prevention and environment protection. These compulsory regulations may also deal with handling of hazardous substances, issuing and/or warning of personal protective equipment, or traffic regulations.
- 1.3 Installation instruction contained herein must be supplemented by instructions covering all duties involved in supervising and notifying other parties working within the area of operation.
- 1.4 Observe all basic safety rules like using the correct tools, wearing of safety harness, etc. Always use the lifting lugs provided on the equipment.

DO NOT COMPROMISE ON SAFETY.

2. Installation Preparation

- 2.1 During design and installation it is vital to take into account relevant standards and regulations, the load bearing capacity of building or floor or other attachment devices.
- 2.2 Before starting installation, prepare a sketch or drawing showing the extent of the PROFAX Rotator System and its required area of operation with respect to building.
- 2.3 Use only original PROFAX components. When using supplementary bolt or other fasteners, use only those according to the specified grade.
- 2.4 PROFAX Rotator is designed for ready-to-use and there is no further mechanical installation requirement except to provide connection to the electrical supply. However, we recommend that a thorough Visual inspection to be carried out to ascertain that no visual damage has occurred during the course of shipment and transit.
- 2.5 We recommend, after the completion of installation but before taking the unit into service, it is commissioned by recognized experts in the field. We remain naturally at your service with hints and advice should you require them. It is better to ask once too much and nothing must be unclear. We trust that with proper installation procedure, PROFAX Rotator will provide you years of trouble-free service.

OPERATION AND MAINTENANCE

1. General Description

- 1.1 PROFAX Turning Rolls or Rotators are robustly built and uses the $\Phi 300\text{mm} \times 100\text{mm}$ Polyurethane tires for durability and superior traction. It is designed to withstand the rugged and harsh environment expected of such application. Detail attentions such as grit blasting to SA2.5 for all structural steel work and polyurethane paintwork will ensure that PROFAX equipment provides you with many years of uninterrupted use.
- 1.2 PROFAX Rotators are supplied as either Powered Rolls or Idler Rolls (unpowered)

2. Main Specification

1	Model	TR-20000
2	Capacity (Loading)	10 Metric Ton
3	Capacity (Turning)	15 Metric Ton
4	Vessel Size (Min.)	$\Phi 519$ at 60° included Angle
5	Vessel Size (Max.)	$\Phi 4041$ at 60° included Angle
6	Tyre Type and Size	Polyurethane, $\Phi 345\text{mm} \times 130\text{mm}$
7	Electrical Panel	Yes
8	Control Means	Via Push Button pendant Control C/W 5m cable
9	Incoming Supply	110V-1P-60Hz
10	Control Voltage	24VAC
11	Roller Drive Motor	750W DC Motor
12	Roller Speed	0 to 1959mm/min at 0~900V
13	Surface Preparation	Gritblast to SA2.5
14	Painting	Powder Coating
15	Color	Silver Gray
16	Weight	602KG

3. BASIC CONSTRUCTION

3.1 Skid

The skid is constructed from I-Beams welded together and drilled precisely to accommodate the different center to center (C-C) distances of Roller Frames. The center-to-center distance between two rolls is measured from the center of the wheel shaft of one roll to the other as shown in below.

The minimum C-C for any type of skid is 432mm while the maximum C-C varies from 2192mm onwards depending on the type of skid. Basically, the skid for powered rolls is the same as that for the idler rolls, only that a pipe conduit is added to the former for the cables to run through. The skid must be used on a designated place where the floor is level and able to sustain the loading from the work piece.

3.2 Primary Gearbox

The Primary Gearbox is of worm design and is coupled to an DC Squirrel Cage motor via flange. It is supplied fully aligned hence no further adjustment is required.

3.3 Secondary Gearbox

The Secondary Gearbox is coupled to the Primary Gearbox via flange. The output shaft is fitted with a high quality heat-treated pinion and meshed with the spur gear of the steel drum. This provides the basis of rotation for the roller.

Each powered roller is equipped with its own Primary/Secondary Gearbox together with a motor. Both powered rollers are symmetrical and seat on the same skid

3.4 Drive Motor

This Drive Motor is DC Motor

3.5 Electrical Panel

Also known as the Control Panel, the Electrical Panel is mounted on the Left module or dubbed as the Primary Module (when looking at the gearbox).

4. Installation

4.1 PROFAX Rotators are designed for immediate put-to-use and therefore no mechanical connection is required. However, here is a list of some guidelines that should be taken into consideration during installation.

- Check all quantity against the Detailed Packing List.
- Check for damages from handling or leaking gearboxes.
- Check for correct voltages.

4.2 Procedures

- Select the area for installation. Preferably, this should be level and able to take the load of work piece without subsequent soil settlement. Study the area of operation to ensure that it will be large enough for the work piece where extension will be required.
- Do not mix the Powered and Idler Rolls of different makers and/or types.
- Place both the Powered and Idler Rolls in the best alignment possible. It is recommended to invest in this initial setup process.
- Do not anchor the skids to the floor if the ratio of the work piece's Diameter to LENGTH IS LESS THAN 1. This floating arrangement tends to "correct" itself if there is misalignment from the setup or from the work piece itself.
- The number of idler rolls should be increased if possible especially in larger diameters or thinner wall thickness.
- Test run the rolls in rotating motions for both directions and observe if there is any unusual noise or smell. Tests run the rolls in traveling motions for both directions and observe if there is any unusual noise or smell.
- Test the Stop Button on the Pendant Controller to ensure its functionality.
- Test run again the rolls in rotation motions for both directions and observe if there is any unusual noise or smell.

5. Start-Up Operation

5.1 General

- To operate the Rotators properly, it is strongly recommended that the person-in charged be knowledgeable enough of the theories behind the operation of such equipment.
- Read this manual thoroughly before operation.
- Check the work piece is free from encumbrances.

5.2 Included Angle

Under normal circumstances for general application, the rotators' center distance of wheels apart should be of 30° to 60° included angle for concentric balanced loads. This is also the widely acceptable standard industry practice.

A pair of rotators with the center set apart at angle of 30° will require less torque or tractive pull when compared with a similar pair set at angle of 45° or 60°. Increasing the included angle toward the upper limit of the recommended range will increase the torque required to pull the work piece. Concentric loads are usually set on small center distance apart whereas eccentric loads are usually set on wider center distance apart.

5.3 Work Piece Analysis

Generally, the factors to be taken into consideration before setting up a job are as follows:

- Rigidity
- Roundness
- Weight
- Diameter
- Center of Gravity

Aside from the above-mentioned factors, other prevailing conditions that will affect the rotation must also be considered, such as protrusions or sagging due to thin material and/or bigger diameters.

5.4 Roller Alignment

Roller alignment setting is very important because it will greatly affect the job longitudinally, that is, from rolling and falling over the rotators. Hence, the user needs to ensure that

- the centerline of the powered and idler units are parallel, and
- the floor has to be flat and even.

5.5 Height over Width “Toppling”

It is always a good practice to ensure that the outside diameter of the job should not exceed its length when performing all the normal settings. Furthermore, should the length be greater than its diameter, extra care must be taken when anchoring the rotators on the floor. The user can also employ additional idler units to increase the stability of the job when in operation.

5.6 Power ON Procedure

- Follow this Power ON Procedure whenever the equipment will be used:

No	Task	Results
1	Turn on the wall isolator.	Voltage is supplied to the main panel.
2	Turn on isolator main switch on main electrical panel.	Power is turned on.
3	Turn the Potentiometer to “Low” and test the function of all buttons, especially the E-Stop.	All buttons should function according to its purpose specified in Appendix B

- Note that Function Test is only possible if there is no work piece mounted on the rotators. In case there is a work piece, common sense must prevail.
- All controls of the pendant must be tested to ensure that they operate as it is intended.

6. During Operation

Observe the following guidelines whenever operating the equipment:

- Before rotating any work piece, bring the speed down to minimum by turning the potentiometer to 5.
- Start rotating the work piece in desired direction and increasing the speed gradually.
- Always ensure that the work piece is in good contact with the Power and Idler units used.
- When a Power unit is used with more than one idler unit, the Power unit should always be located at one end of the vessel so as to ensure contact with the load and prevent slipping.

- In case roller slippage occurs, it can usually be overcome by:
 - increasing the units center distance to increase traction;
 - removing dirt and greases from the rolls surface and work piece surface;
 - redistributing the load on the Power and Idler units in order to make greater proportion of the load lie on the Power units and hence, increase traction;
 - ensuring that rotators have the same height and diameter in order to prevent cylindrical work piece from moving along the longitudinal axis; and
 - checking the squareness of the rotators. This is done by aligning the Power Roll and Idler Roll with each other and making their diagonals equal.

In case of doubts of the machine functionalities, always report to the supervisor and discontinue the use of the equipment until it has been rectified and certified by an authorized maintenance personnel.

IGNORANCE IS NOT AN EXCUSE!

7. Shutdown Operation

7.1 Power OFF Procedure

- Follow this Power OFF Procedure after operating the equipment:

No.	Task	Results
1	Depress STOP button	Equipment stops operation.
2	Depress Emergency STOP button on electrical panel	No power to Main Contactor
3	Turn off main switch on the electrical panel	Power is turned off the Breaker.
4	Turn off wall isolator	Power OFF to the main panel.

7.2 Clear the operation area and keep all tools in their proper location.

PRACTICE GOOD HOUSEKEEPIN!!

8. Maintenance & Troubleshoot of Mechanical Parts

8.1 Maintenance Routine For The Equipment

■ Recommended Maintenance Routine for the Equipment

No.	Component	Inspection / Action	Interval
1	Electrical Panel	Clean with light Compressed Air	3 months
2	Filter at Panel	Replace	6 months
3	Pendant	Open and clean by applying WD 40 at moving parts	3 months
4	Bolt & Fastener	Visual on corrosion, missing	Weekly
5	Warning Labels	Visual, replace where torn	weekly

8.2 Troubleshooting of Mechanical Parts

■ Troubleshooting of Mechanical Parts

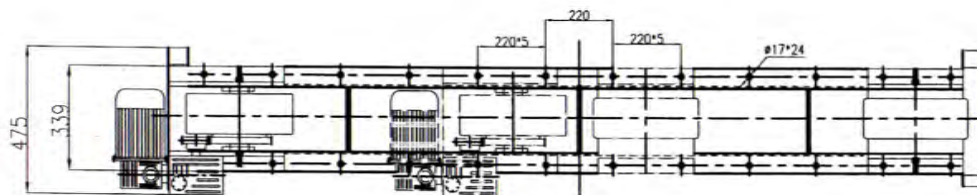
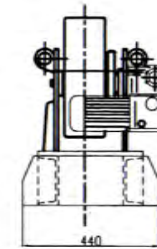
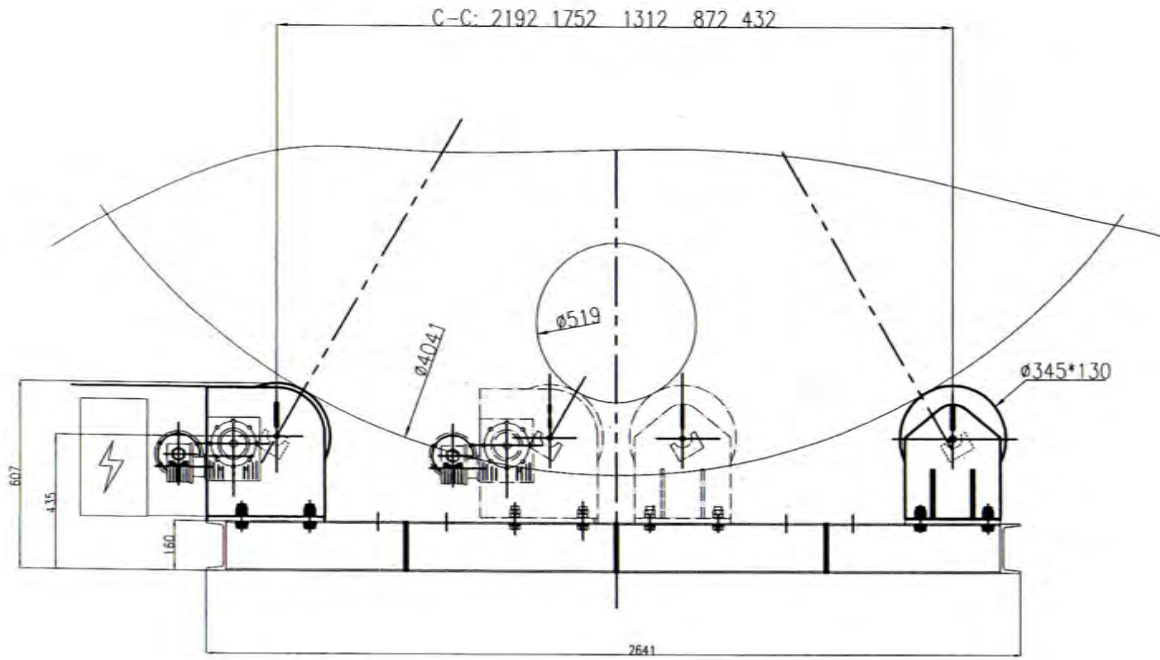
Problem	Possible Cause	Solution
Indicator Light Fails to light	<ol style="list-style-type: none"> 1. No power 2. Fuse blown 3. Faulty indicator light 4. Faulty power switch 	<ol style="list-style-type: none"> 1. Check power supply 2. Check and replace fuse 3. Check and replace indicator 4. Check and replace power switch
Fuse blown	<ol style="list-style-type: none"> 1. Faulty PC board 2. Faulty motor 3. Faulty or bad transformer 	<ol style="list-style-type: none"> 1. Check and replace control box 2. Check and replace motor 3. Check and replace control box
Power roll fails to turn	<ol style="list-style-type: none"> 1. Faulty PC board or control box 2. Faulty motor 3. Faulty forward/off/reverse switch 	<ol style="list-style-type: none"> 1. Voltage to motor should vary from 0 to 90VDC in relation to the speed control. If output is erratic or non-existing replace control box. 2. Check and replace motor 3. Check to see if switch is in correct position. Must be in either forward or reverse position to run. Test switch continuity
Work piece motion is intermittent	<ol style="list-style-type: none"> 1. Drive roll tension adjustment 	<ol style="list-style-type: none"> 1. Adjust drive roll tension

**APPENDIX A
GENERAL ARRANGEMENT**

The General Arrangement is a CAD module illustrating the general set-up of the equipment. The main specifications of the equipment are also listed in the GA. The General Arrangement for the TR-20000 ROTATOR is presented in the succeeding pages.

Specification for Rotator-Power Unit

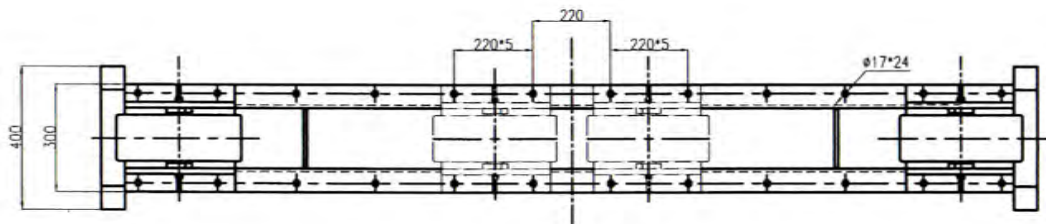
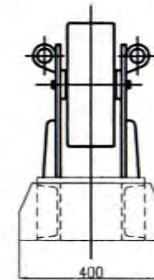
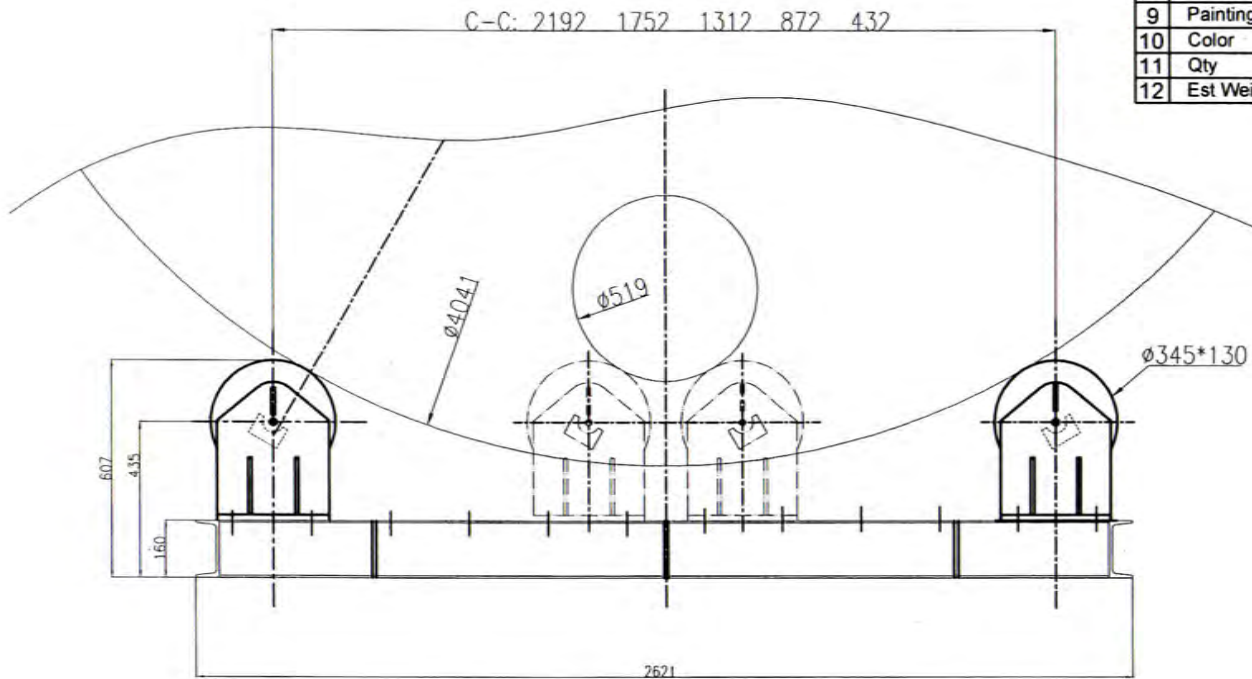
1	Model	PR-10000
2	Capacity(loading)	5 Metric Ton
3	Capacity(Turning)	15 Metric Ton
4	Vessel Size (Min)	Ø519 at 60° included Angle
5	Vessel Size (Max)	Ø4041 at 60° included Angle
6	Tyre Type and Size	polyurethane, Ø345mmX130mm
7	Electrical Panel	YES
8	Roller Speed	0 to 1959 mm /min at 0-90V
9	Incoming Supply	110V-1P-60HZ
10	Control Voltage	24VAC
11	Control Means	Via Push Button Pendant c/w 5m Cable
12	Roller Drive Motor	750W DC Motor
13	Surface Preparation	Gritblast to SA2.5
14	Painting	Powder coating
15	Color	Silver Gray
16	Qty	6 Unit
17	Est Weight	354KG



			PROJECT/MODEL :		TR-20000
			CLIENT :		GA
DIVER : ZHANG NAME : DATE : 2012/07/25			DWC. NAME :		Rotator - Power unit
APPROVED : <i>Jin</i> 8.1			DWC. NO. :		PR-10000
			SCALE :		1:1
			REVISION :		01
			SHEET NO :		1 OF 1

Specification for Rotator-Power Unit

1	Model	IR-10000
2	Capacity(loading)	5 Metric Ton
3	Capacity(Turning)	N.A
4	Vessel Size (Min)	Ø519 at 60° included Angle
5	Vessel Size (Max)	Ø4041 at 60° included Angle
6	Tyre Type and Size	polyurethane, Ø345mmX130mm
7	Electrical Panel	NO
8	Surface Preparation	Gritblast to SA2.5
9	Painting	Powder coating
10	Color	Silver Gray
11	Qty	9 Unit
12	Est Weight	248KG



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			TR-20000	
DRAWN	NAME	DATE	CLIENT :	
	ZHANG	2012/07/26	GA	
APPROVED			DWG. NAME :	
	Juz 8.10		Rotator - Idle unit	
			DWG. NO. :	
			IR-10000	
				SCALE: 1:1
				REVISION: 01
				SHEET NO: 1 OF 1

APPENDIX B
Electrical Drawings

Electrical Drawings are compiled in this section to give the user a detailed graphical illustration of the electrical components and circuit diagrams associated with the equipment.



CONTROL PANEL EQUIPMENT LIST

Sales Order No.:	66480	Customer/Project :	PROFAX
Item No.:		Model No :	TR-20000
No. of Units :	6	Reference No.:	TR-20000-EIC1-110V
Revision :	01		

Prepared By:	Approved By:	Issued To :
<i>MAY 2012.08.09</i>	<i>WU 2012.08.09</i>	<i>Jazz 2012 8.10</i>

No.	Symbol No.	Description	Type	Qty/Unit	Brand	Remarks
1	CP1	CONTROL PANEL	H380 x W380 x D175	1		
2	PL1	PILOT LIGHTS WITH INTEGRAL LED	AD16-22D/S ACDC24V (Red)	1	APT	
3	SW1	2-SATY PUT SELECTOR SWITCHES	LAY37	1	SANLI	
4	PT1	TRANSFORMER	IP:110V OP:220V/110V/24V/0V (100W)	1	JUCHE	
5	PCB	DC MOTOR CONTROLLER	XJB110-90H-O (750W/AC110/DC90V)	1	XAJONG	
6	MCB	THERMAL MAGNETIC CIRCUIT BREAKER	DZ47-63 2P C6	1		
7	MCF/MCR	3-POLE CONTACTORS	GMC-12 ACDC24V 50/60HZ	2	LG	
8	CR1	RELAY	MY2NJ AC24V	1	OMRON	
9	--	RELAY SOCKET FOR MY2N	PYF08A-E	1	OMRON	
10	--	RELAY HOLD-DOWN CLIPS	PYC-A1	2	OMRON	
11	F1	DOMESTIC CARTRIDGE FUSE	RT14-20(10 x 38) 2A	1	MIRO	
12	F2	DOMESTIC CARTRIDGE FUSE	RT14-20 (10 x 38) 10A	1	MIRO	
13	F1-F2	MODULAR FUSE CARRIERS	RT18-32(10 x 38) 32A	2	MIRO	
14	SPW	NOISE FILTER	FC2213-6-01	1	QITONG	
15	TB1	TERMINAL BLOCKS	TBR-10	14	TEND	
16	TB1	LEAD RAIL	DIN	1		
17		GROUDN COPPER BARS		1		
18	TB1	WIRE GROOVE	25*30*1000	1		
19	D1	POWER CABLE	RVV3*1.31*3M	1	QIAOPU	
20	D1	CABLE GLANDS	KB-1	1		
21	TB1	WIRE GROOVE	25*30*1000	1		

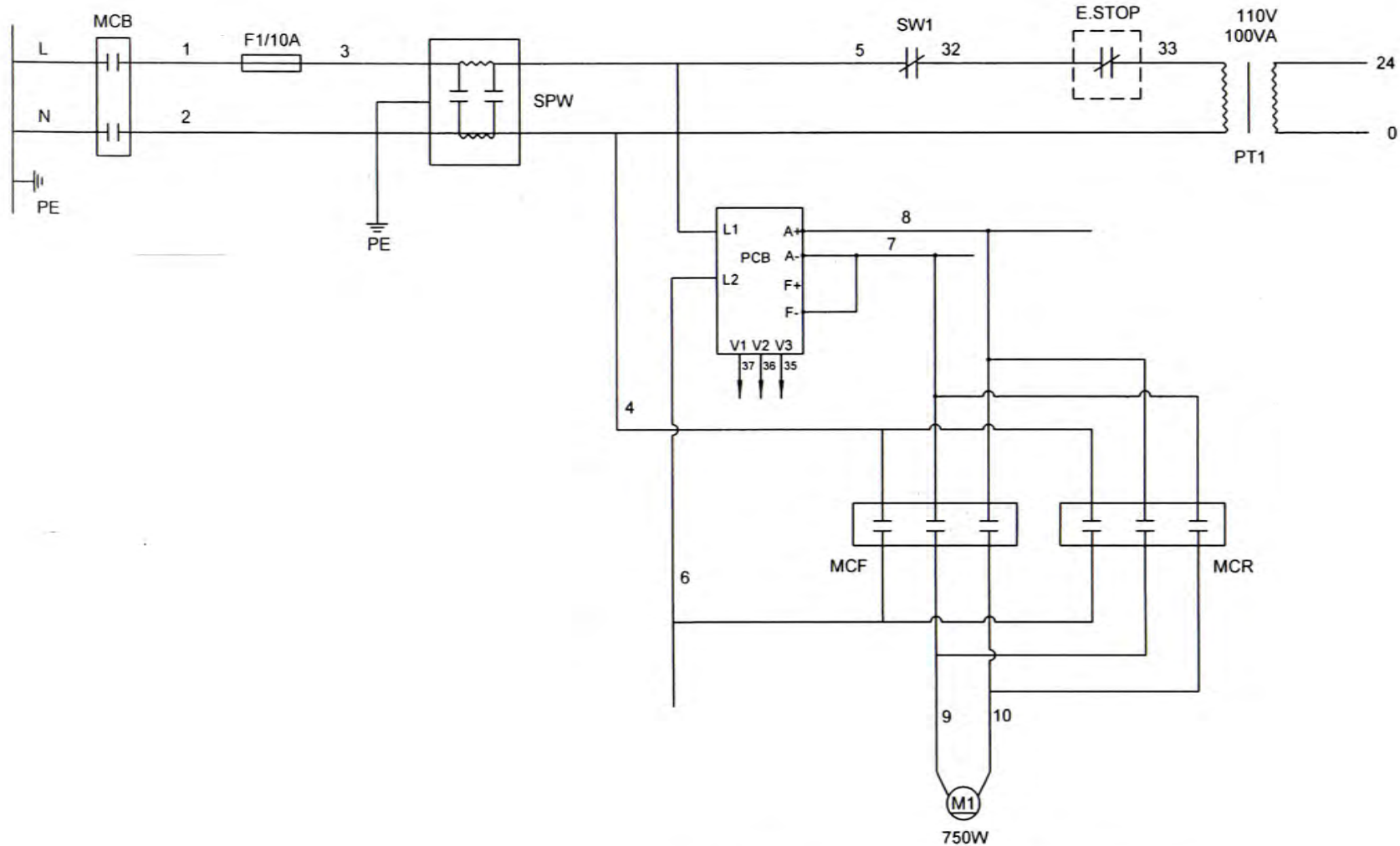



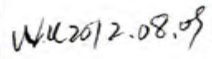
CONTROL PANEL EQUIPMENT LIST

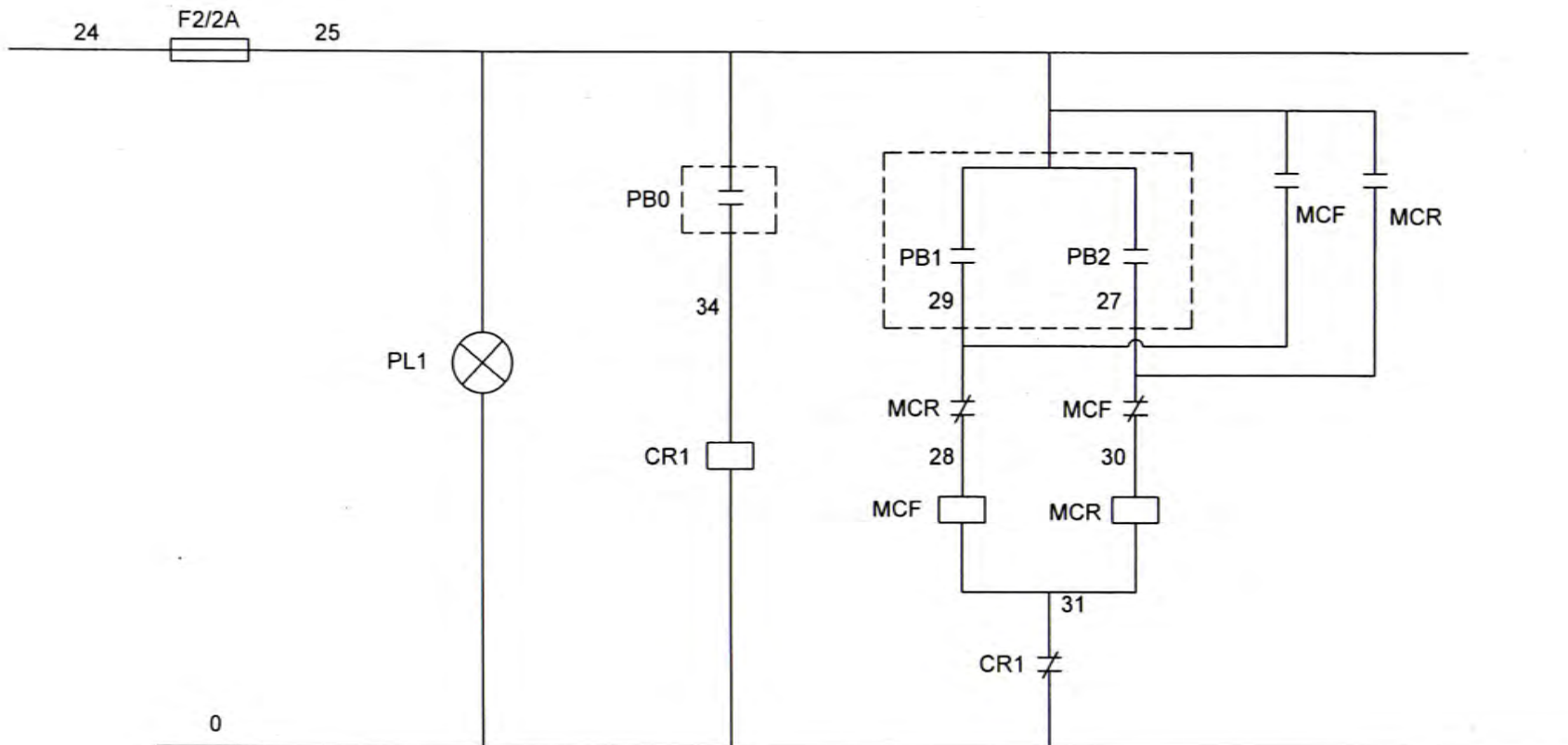
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Item No.:		Model No :	TR-20000
No. of Units :	6	Reference No.:	TR-20000-EIC1-110V
Revision :	01		

Prepared By:	Approved By:	Issued To :
<i>MAS 2012.08.09</i>	<i>WU 2012.08.09</i>	<i>Ju 22 ²⁰¹² 8.10</i>



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23	VR1	POTENTIONMETER	RV24YN 20S B502	1	COSMOS	
24	--	POTENTIONMETER KNOB	RW100C	1	COSMOS	
25	E.STOP	MUSHROOM HEAD PUSH-BUTTONS	LAY37 (Red)	1	SAN LI	
26	PB0	PUSH-BUTTONS	LAY37 (Red)	1	SANLI	
27	PB1	PUSH-BUTTONS	LAY37 (Green)	1	SANLI	
28	PB2	PUSH-BUTTONS	LAY37 (Yellow)	1	SANLI	
29	D2	CABLE GLANDS	M22	1		
30		CABLE GLANDS	M25	1		
31		REDUCER	UCX50/80-10*40-200/19-A	1	CHENTA	
32		MOTOR	750W/DC90V/1800RPM Φ19 Force Cooling	1	CHANGYIH	



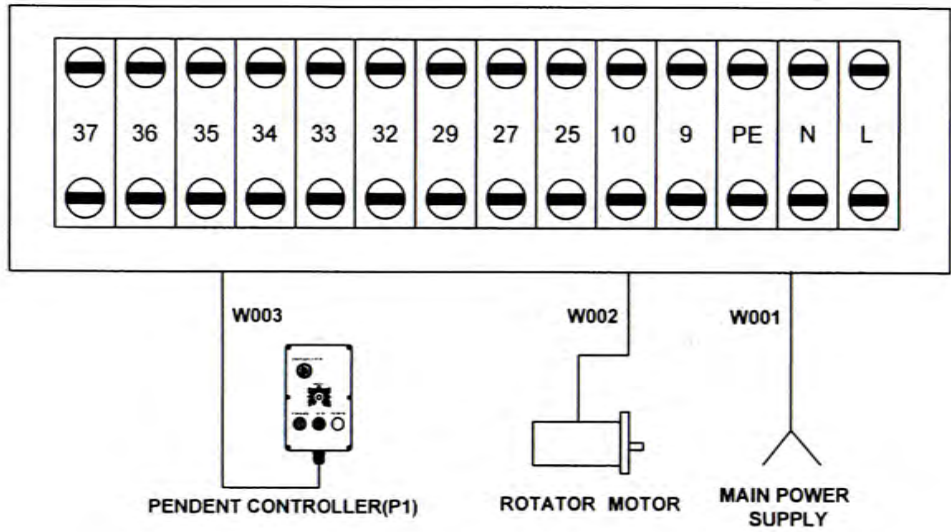
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
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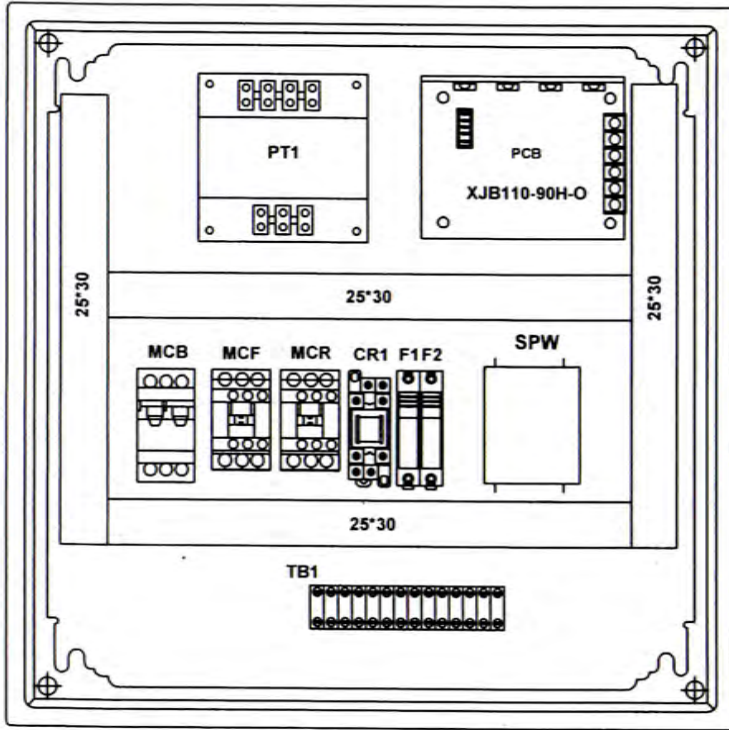
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APPROVED		<i>WU 2012.08.08</i>		SCALE: N/A REVISION: 01 SHEET NO: 1 OF 1

TB1

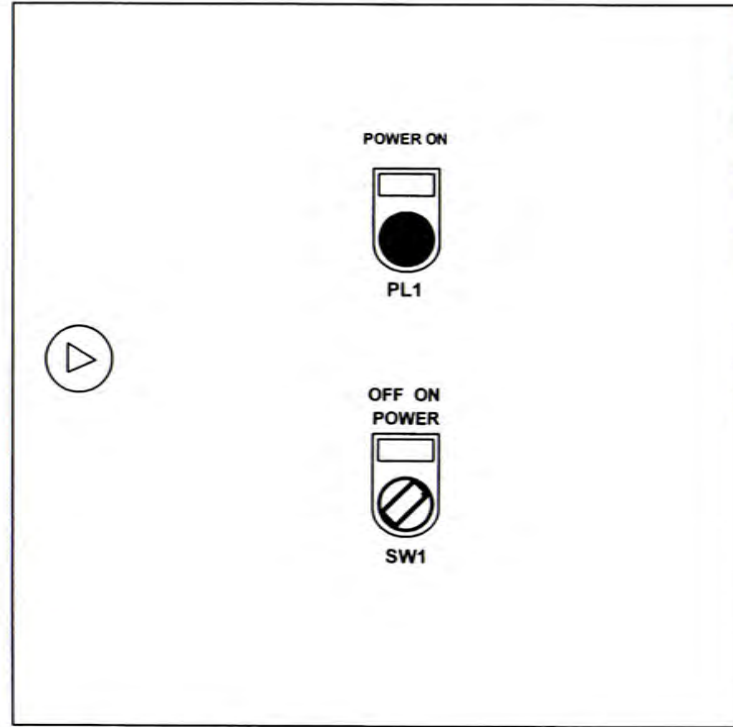


NOTE: Refer to drawing No. TR-20000-EIW1-110V for cable size and cable code.

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APPROVED			<i>WU 2012.08.08</i>		SCALE:
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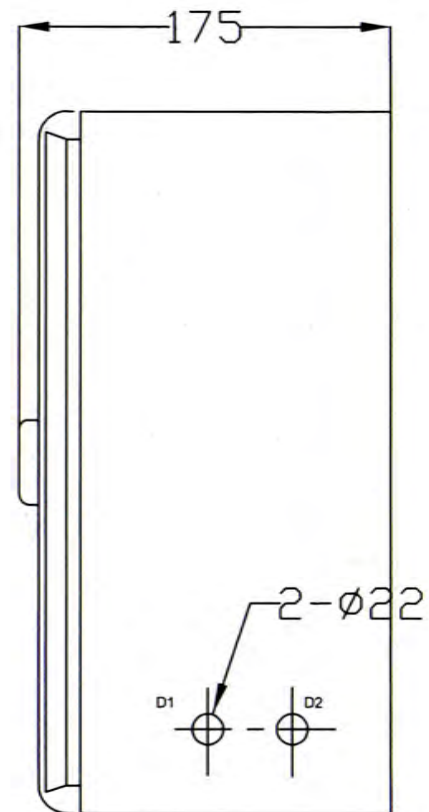
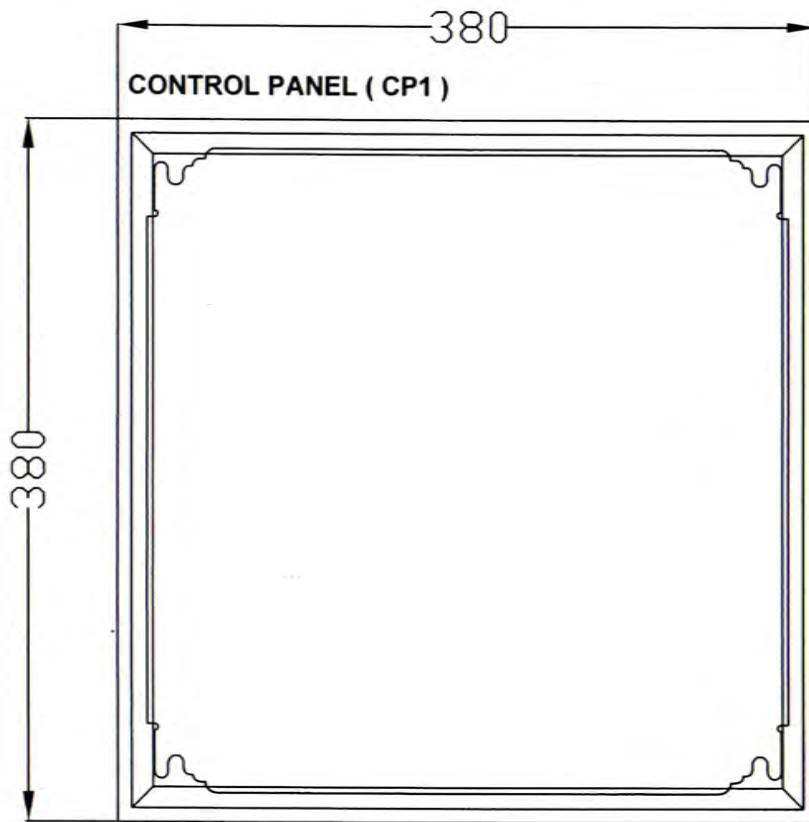


CONTROL PANEL CP1





CONTROL PANEL CP1

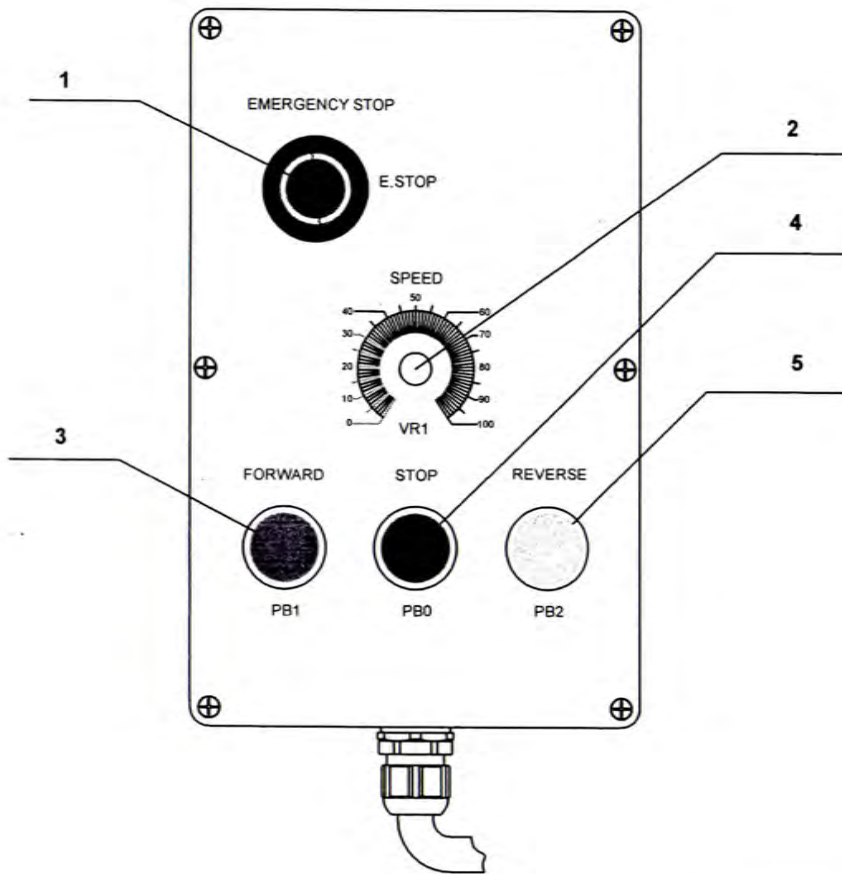
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
D1 : CABLE TO CONTROL PENDANT (M22)

D2 : CABLE FROM MAIN POWER SUPPLY (KB-1)

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			TR-20000		
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			DWG. NO. : TR-20000-EIP2-110V		SHEET NO: 1 OF 1





NO	Symbols	Destription
1	E.STOP	Emergency Stop
2	VR1	Rotation Drive Speed setting
3	PB1	Roller Forward
4	PB0	Stop
5	PB2	Roller Reverse

		PROJECT/MODEL :		
		TR-20000		
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		WU	2012/08/08	
APPROVED		<i>WU 2012.08.08</i>		SCALE: N/A REVISION: 01 SHEET NO: 1 OF 1

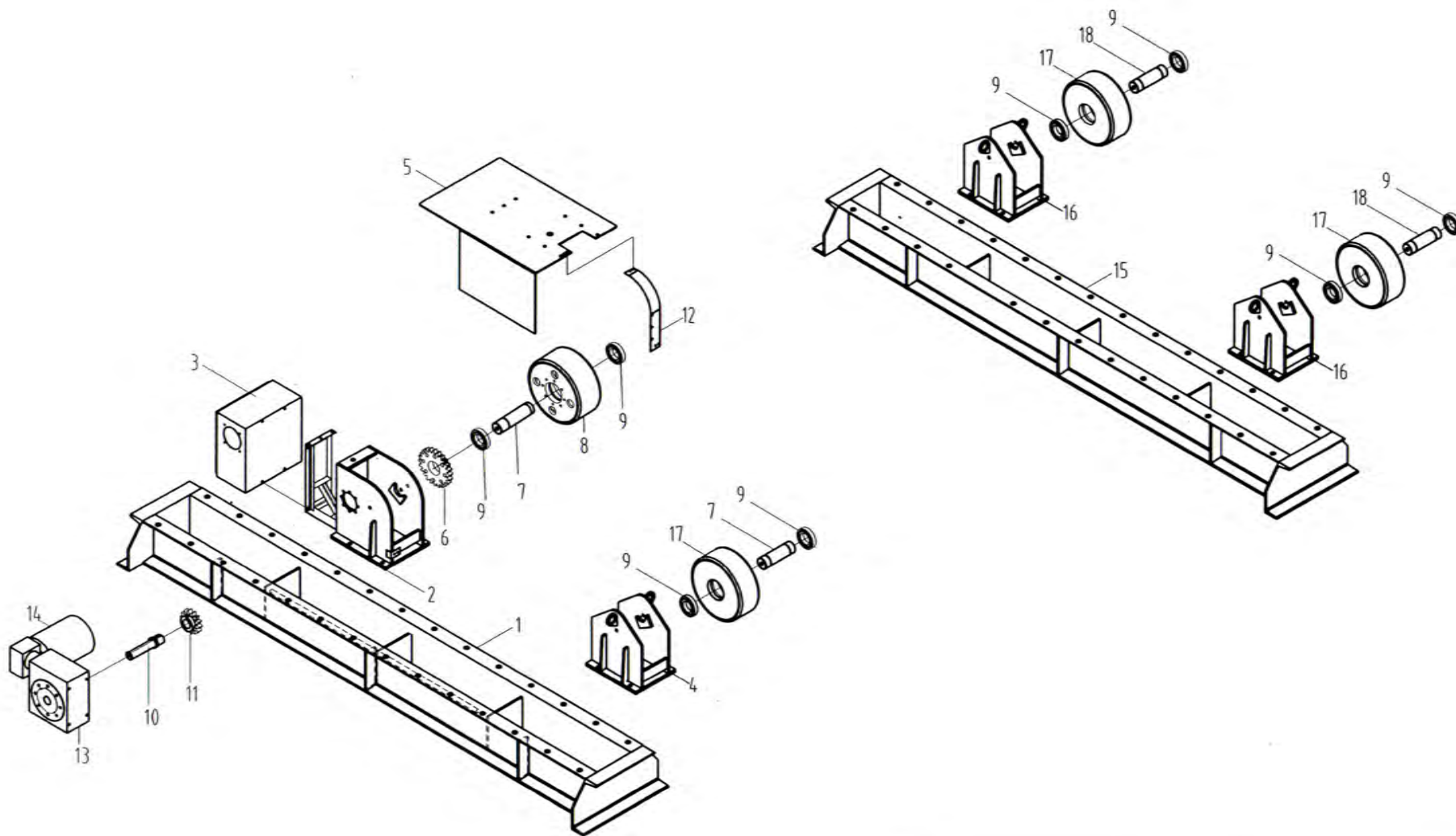
CABLE NO.	CABLE SIZE	ESTIMATE	FROM	TO	CABLE CODE	1	2	3										
W001	1.31 mm²x 3C		Power Incomming	Panel (P1)	WIRING NO.	L	N	PE										
W002	0.75 mm²x 4C		Panel (CP1)	Motor M	WIRING NO.	1	2											
W003	0.75 mm²x 10C		Panel (CP1)	Pendent(P1)	WIRING NO.	9	10											
					CABLE CODE	1	2	3	4	5	6	7	8	9				
					WIRING NO.	25	27	29	32	33	34	35	36	37				
					CABLE CODE													
					WIRING NO.													
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NOTE :This table is used for Drawing No. TR-20000-EI03-110V.

		PROJECT/MODEL :		TR-20000	
		CLIENT :			
DRAWN	NAME	DATE	DWG. NAME :		
APPROVED	WU	2012/08/08	DWG. NO. :		
		WU2012.08.05		TR-20000-EIW1-110V	



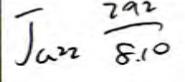
**APPENDIX C
ASSEMBLY DRAWINGS**

Detailed Parts List Drawings are not included in this manual. However, you may contact our sales department through the contact numbers listed at the back page of this manual to request for the detailed parts list drawings to assist you when ordering spare parts.



		PROJECT/MODEL:		TR-20000	
		CLIENT:			
DRAWN	NAME	DATE		SCALE:	
		2012/08/08		N/A	
APPROVED	WU 2012.08.05		DWG NAME:	Assembly Drawing	REVISION:
			DWG NO.:	TR-20000	01
				SHEET NO:	1 OF 1

NO	PROFAX	Name	QTY	TYPE	Remark
1		Base (Power)	1	Q235	
2	WPP21018	Wheel Base (Power) (Left)	1	Q235	
3	WPP21005	Control Box	1		H380*W380*D175
4	WPP21019	Wheel Base (Power)(Right)	1		
5	WPP21020	Cover (Left)	1	Q235	
6	WPP21021	Gear (Big)	1	45#	M5*40T
7	WPP21022	Wheel Shaft (Power)	2	45#	
8	WPP21023	Wheel (Power)	1		φ345*130
9	WPP21024	Bearing	8		6212ZZ
10	WPP21025	Shaft (Gearbox)	1	45#	
11	WPP21026	Gear (Small)	1	45#	M5*17T
12	WPP21027	Metal Band	1		
13	WPP21028	GearBox	1		UCX50/80-10*40-200/19-A
14	WPP21029	Motor	1		750W/DC90V/1800RPM φ19 Force Cooling
15		Base (Idle)	1	Q235	
16	WPP21030	Wheel Base (Idle)	2	Q235	
17	WPP21031	Wheel (Idle)	3		φ345*130
18	WPP21019-1	Wheel Shaft (Idle)	2		

		PROJECT/MODEL:	TR-20000
		CLIENT:	
DRAWN	NAME	DATE	
		2012/08/08	
APPROVED			DWG NAME: Assembly List DWG NO.: TR-20000
			SCALE: N/A REVISION: 01 SHEET NO: 1 OF 1