

MANIPULATOR WHM-2020 OPERATION & MAINTENANCE MANUAL

WHM-2020



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IDENTIFICATION DATA

Purchaser : MG WELDING
PO No. : MG7695
Seril No. : MG7695-01
Equipment Type : Manipulator
Model : WHM-2020
Vertical Speed : Max.925mm/min 0.37kw at 60Hz with brake
Brake Supply : 220V
Boom Speed : 290to2940mm/min 0.37kw at 6-60Hz with Farce Cooling
Power Supply : 400V-3P-50HZ
Control Voltage : 24V AC
Slewing Feature : Yes
Max. Under Boom Height : 2000mm
Effective Boom Travel : 2000mm
Color : RAL 3003Red
Quantity : 1

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.
- 1.2 In addition to the manual, please refer to O & M Manual of Welding Equipment.
- 1.3 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.
- 1.4 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.
- 1.5 Observe all basic safety rules using the correct tools and lifting slings, wearing of safety harness, etc.
- 1.6 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 MG WELDING Manipulator System and its required area of operation with respect to building.
- 2.3 Use only original MG WELDING components. When using supplementary bolt or other fasteners, use only those according to the specified grade.
- 2.4 MG WELDING Manipulator is designed for ready-to-use and there is no further mechanical installation requirement except to provide connection to the electrical supply. However, we recommended 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 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 advise should you require them. It better to ask once too much and nothing must be unclear. We trust that with proper installation procedure, MG WELDING Manipulator will provide you years of trouble-free service.

OPERATION AND MAINTENANCE

1. General Description

- 1.1 MG WELDING Welding Manipulators (Column & Boom) are categorised by the horizontal outreach and the under boom height as measured from the underside of boom to the floor.
- 1.2 MG WELDING Manipulators are modular in construction and robustly built to withstand the rugged and harsh environment expected of such application. Detail attentions such as grit blasting to SA 2.5 for all structural steel work and polyurethane paintwork will ensure that our equipment provides you with many years of uninterrupted use.
- 1.3 Various options are available such as Travel Car, Step over Control, Motorised X-Y slide and many others. MG WELDING can customise the Manipulator to meet the demand of the workpiece.
- 1.4 Main Component.
- 1.4.1 Table (1)

Item Number	Description	Remarks
1	Hoisting Assembly	
2	Mast Plate	
3	Column or Mast	
4	Boom	
5	TravelCar	

2. Main Specification

1	Model	WHM-2020
2	Capacity	100Kg at 300mm from Boom End
3	Vertical Speed	Max.925mm/min 0.37kw at 60Hz with brake
4	Vertical Drive Motor	0.37KW with Brake
5	Boom Speed	390 to 3920mm/min
6	Boom Drive Motor	0.37KW with Farce Cooling
7	Travel Speed	N.A.
8	Max. Under Boom Height	2000mm
9	Effective Boom Travel	2000mm
10	Electrical Panel	Yes
11	Base Type	Fixed
12	Column Rotation	Manual
13	Power Supply	400V-3P-50HZ
14	Control Voltage	24V AC
15	Control Means	Via push button pendant on 10m cable
16	Surface Preparation	Gritblast to SA2.5
17	Color	RAL 3003Red
18	Qty	1 unit
19	Weight	1210KG

3. Basic Construction

3.1 Hoisting Assembly

- This is a lifting system, which moves the entire Mast Plate Assembly, the Boom, Welding Head and all ancillary fixtures that is mounted therein, up and down the column.
- The lifting force is effected via a geared motor c/w brake on a chain.

3.2 Mast Plate

- The Mast Plate or commonly refer as the Saddle, is fitted with guide rollers for the boom and guides the column.
- The front face guide rollers engaged onto the Boom, thus allowing the Boom to traverse left or right.
- The rear face guides engaged onto the guide Rail of the Mast, thus allowing the Mast Plate to move up or down.

3.3 Column or Mast

- The Column is constructed in a box-up design and the rails are machined in a single pass to ensure a tight tolerance.
- The column is bolted down onto a Slew Ring, the latter being mounted on a Fixed Base or a Travel Car.
- The Column can slew effectively 360° and be locked at any position via a locking screws.

3.4 Boom

- ◆ This is tabular in construction and offer both rigidity and torsion, thereby minimizing deflection during operation.
- ◆ The guide rails are precision-machined in a single stroke.

- A gear rack is bolted along the length of the Boom, where it is engaged by a pinion, driven by a geared motor mounted on the rear face of the Mast Plate. This effects the traversing of the Boom in left or right direction.
- The traversing is limited via limit switches activated by striker block mounted on Mast Plate and Boom respectively.

3.5 Travelcar

- This is of manual push type, on V wheels.

3.6 Electrical Panel

- This is mounted on the rear of column and houses all the electrical contacts, termination and pc board, among others.

3.7 Pendant Controller

- This is connected out of the Electrical Panel via a 6m long control cable.
- The Pendant houses all movement controls of the Manipulator In addition to the Emergency Stop.

4. Installation

4.1 MG WELDING Manipulators 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.

- Remove all Packing Material.
- 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.
- It is preferable to read this section together with Appendix A and B,C
- For a Travel Car, simply place it on the rails. Check that the both wheels sit snugly on the rails.
- Lift up the Mast via the Lifting holes.
- Place it over the Travel Car, lower the Mast slowly and insert and tighten all screws.
- Disengage the Boom drive motor. Lift the Boom and insert Boom into the Roller's opening.
- Engage the Drive Pinion with the Boom's gear rack,.
- Terminate the Incoming Cable to the Electrical Panel.

- Connect the 3-phase supply once the set up is completed.
- Test up/down function to ensure the phases coincide with the equipment and observe if there is any unusual noise or smell.
- If the "up" function operate the down movement of Mast plate, change any 2 phases of the supply.

(Note: Do not continue to operate the machine as the limit switch will not operate when phases are incorrect.)

- Test the Stop Button on the Pendant Controller to ensure its functionality
- Test the Emergency Stop Button on the Electrical Panel to ensure its functionality.
- Fine-tune the adjustment until the Boom is level to the ground.
- Adjust all the Side Rollers so that the Boom is level in the Horizontal Plane.
- Re-check that all Rollers are tightened.

5. Pre-Operation Inspection

5.1 General

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

5.2 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. Operation

Observe the following guidelines whenever operating the equipment:

- Only authorized and trained personnel are allowed.
- Before welding any work piece, bring the speed down to minimum by turning the potentiometer to 5.
- Always ensure that the work piece is in good contact.
- The operation of the manipulator is limited to the functions of the pendant.
- General safety requirement needs to be observed as with all moving equipment.
- Always warn fellow workers before movement.
- Always shut down when unattended.

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

8.1 Only authorized and trained personnel are allowed.

8.2 Preventive maintenance consists of inspecting, adjusting and cleaning of the static and dynamic parts of the whole mechanical unit. Regular inspection at intervals dependent upon the service conditions are the best insurance against costly breakdown.

Component	Inspection/Action	Interval
Electrical Panel	Clean with light Compressed Air	3 months
Filter at Panel	Replace	6 months
Pedant	Open and clean	3 months
Bolt & Fastener	Visual on corrosion, missing	Weekly
Warning Labels	Visual, replace where torn	Weekly

8.3 All moving parts, for example, bearings and couplings, are to be lubricated at regular interval. Nipples are to be greased by means of a grease-gun, so that all the internal moving parts can be lubricated, hence, prolong the life-span of the whole mechanical unit.

Component	Inspection & Action	Lubricant & Detergent Code	Interval of Hours
Travel Car :	Grease	B	1000 Hours
Slewing Ring			
Mast – Plate :	Clean Clean	F F	As Necessary As Necessary
Mast Way Boom Way			
Hoisting Assembly :	Clean & Lubricate	F	As Necessary after cleaning
Leadscrew	Oil Top-Up	A	As Necessary 2000Hours or 18Months
Gearbox			

- Before running the machine for any length of time, the user must ensure that all the reducers and the transmission have oil up to the proper level in their respective cases.
- Oil of proper grade for local use must be regularly checks and top-up to commensurate with either time or usage, whichever is earlier.
- Attempt must be made to eliminate all sources of contamination, moisture and for maximum insulation life for electrical motor.

8.4 Daily Check

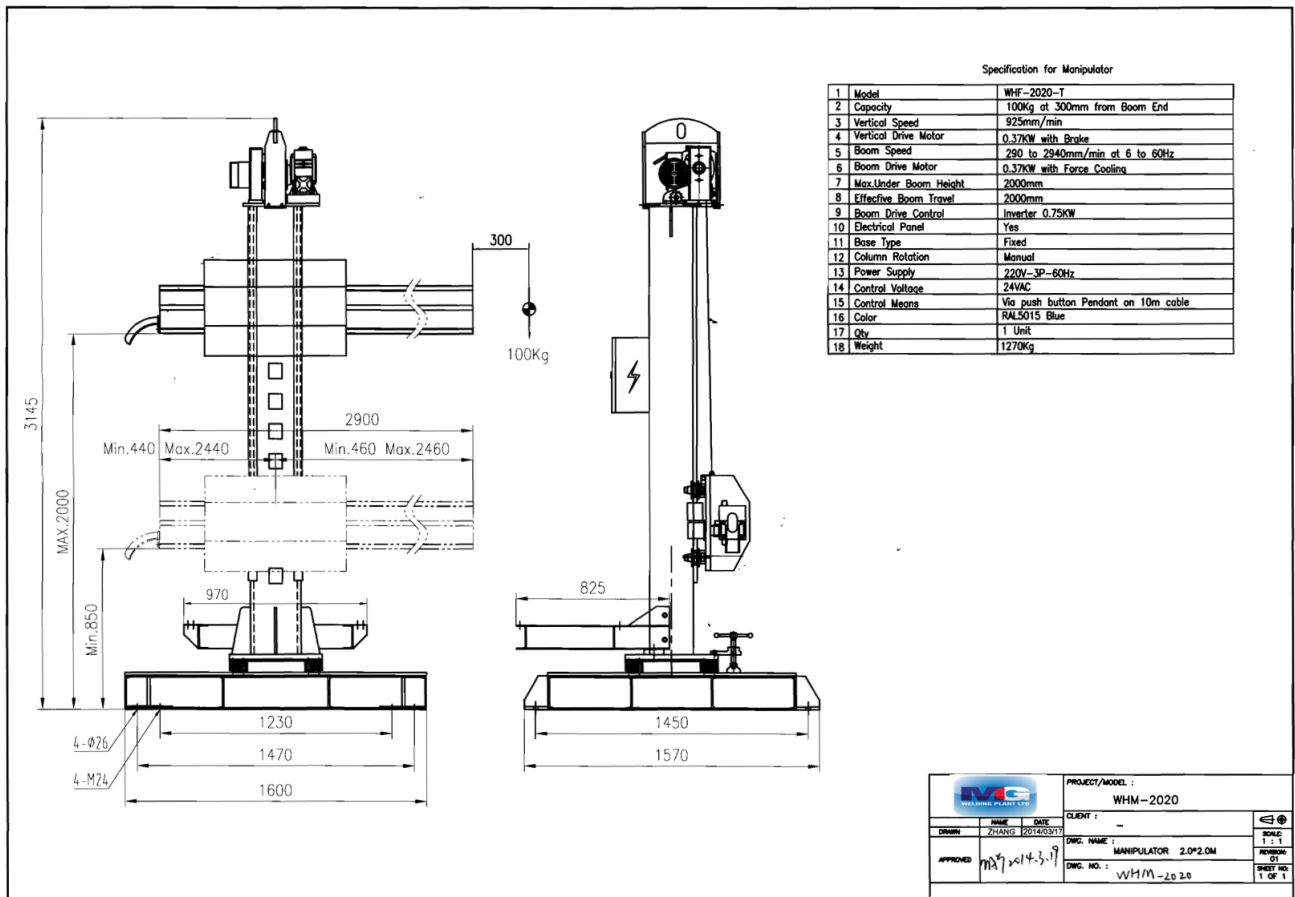
- Rails are clear from obstruction.
- Familiarize with the obstruction along the path of the Boom.
- Unusual noise or smell during operations.

8.5 Troubleshooting of Mechanical Parts

No	Malfunction		
1	No move or lights	No Incoming Power Faulty Motor Starter Faulty Panel Isolator	Turn on Wall Isolator Turn on Panel Isolator Release Panel E-Stop Release Pendant E-Stop Replace Replace
2	Incorrect Direction	Incorrect Phases	Change any 2 phase at Wall Isolator
3	Alarm Light Up	Inverter Problem Overload relay trip Motor burnt	Replace inverter Reset inverter Reset relay Replace motor
4	Speed cannot be regulated	Parameter setting Faulty Potentiometer Wire loose or broken	Reset inverter Replace potentiometer Tighten or replace

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 WHT-3 ROTATOR is presented in the succeeding pages.



SIZE: A3

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. For more information regarding the electrical and electronic system of this Manipulator model, please visit the respective manufacturer's website.

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.

