



HB SERIES

WELDING POSITIONER

OPERATING MANUAL

PACIFIC INDUSTRIAL SUPPLIES PTY LTD

Prologue

Firstly thanks for choosing our products.

Please carefully review the manual before operation so as to properly manipulate our HB series of welding manipulators.

Please carefully check whether the machine is in good condition and in accordance with packing list after its arrival. If it is damaged during transportation and loading, or if parts are missed, please contact us soon, so that we can deal with it in time in case of any lose or inconvenience for you.

The “operating manual” is for installing and debugging, correctly operating, checking and eliminating anomaly, and daily maintenance for user. Please carefully read it before operation and maintenance, and proceed strictly in accordance with the operating regulations.

The machine should be operated and maintained by the man who has been well trained. If you have any technical problem, please contact our after-sale department.

If there is any omission in the manual, please understand. You are welcome to give valuable opinions and suggestions to us. We'll try to supply you with the best and efficient service.

If technical parameters would be improved and the manual would be changed, please forgive our not notifying.

The ownership and interpretation right belong to PACIFIC INDUSTRIAL SUPPLIES PTY LTD. It is forbidden to copy the manual to a third party. Otherwise, it will be regarded as a tort.

PACIFIC INDUSTRIAL SUPPLIES PTY LTD

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Safety notes

★ **The people on operating and in the vicinity, should have a full understanding of safety measures.**



Please install, debug, operate and maintain strictly in accordance with the operating regulations.



Please wear the necessary protective guards: mask, gloves, hats and so on!



Rotating components may hurt you, please prevent fingers, clothing, hair, etc. involved!

★ Safety matters

- Keep a distance to the welding positioner to prevent persons or other machines from damage, while it is running.
- The whole equipment should be reliable grounding. Electric cables should be firmly and reliably connected. Cables and rubber should be prevented from mechanical, heat, oil and other injuries, to keep well reliability of insulation and avoid from electric shocking and impacting equipments.
- Welding arc will harm eyes and skin, it is necessary to pay attention to wear protective guards.
- Welding fume and dust is harmful to human body. Try to eliminate them, and prevent or reduce human inhalation.
- Welding splash may cause scald or fire. Pay attention to your safety and avoid firetrap.
- Rescue measures should be prepared for sudden injury from machine, electric shock and scald.
- The machine should be set far away from flammable or explosive materials. And required fire-extinguisher must be equipped at a visible place.

★ Operating regulations

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- Perform strictly in accordance with the "operating manual"
 - Operating and maintaining the equipment should be done by professionals or specially trained personnel.
 - The operator is needed to master the machine's control, operation, and security regulations etc.
 - Wrong operation may cause accidents, injure operator or damage the machine.
 - The machine should be carefully checked before running every time, if there is any anomaly, you must find it out and obviate the malfunction, and then operate the machine.

Summary

HB series of welding positioner are electric-mechanical efficient equipment for automatic welding. It is always used in automatic welding of revolving work-pieces such as axes, disks, cylinders etc. It is especially fit for circle automatic positioning and welding in types of cylinder-plate fillet weld. It is also fit for position of other manual working to get perfect processing position.

The product is made up of work table, machine body, rotation drive part, reversal drive part, control system etc. The whole machine adopts seat-type structure that has an integral reliability. Generally, it doesn't need to be fixed on the foundation, convenient to move. The work table is made of finished casting, not easy to be hurt by welding splash. Some position lines are marked on the surface of the work table. Some T-shaped grooves are available, which is easy for installation and position of work piece. LG transducer, with a wide range of speed regulation and high work stability, is adopted for rotating work table, which can rotate the work table with a firm speed. The parameters can be preset and digitally displayed. Reversal of work table adopts drive gear wheel and pole reducer to keep constant-speed reversal, with large turning torque, self-locking function and reliable positioning. All actions are through remote control box to manipulate, convenient and flexible in operation. Linkage interfaces are reserved in the electric box, which can realize the connection and linkage operation with other operating machines and welding machines, to make up automatic welding center.

Working Conditions

ambient temperature:	-25°C ~ +55°C
air humidity:	≤ 50% (at 40°C) / ≤ 90% (at 20°C)
control power source:	50Hz、240V、1Phase
input power source:	50Hz、415V、3 Phase
power voltage fluctuation:	≤ ± 10%
power frequency fluctuation:	≤ ± 1%

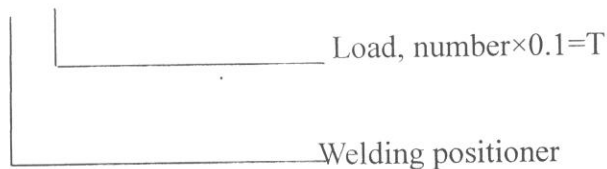
Circumstance requirements:

The welding positioner should be fixed in the location where sunlight cannot radiate directly, and be not in the damp environment. It should be in a dry, well-ventilated and non-dirty environment without steam, chemical deposit, fungus or other explosive and corrosive mediator. It should be also far from severe shock and vibration possibly.

Specifications and Parameters

Model definition

HB-[]-[] _____ “0”- normal type, “1”- special type

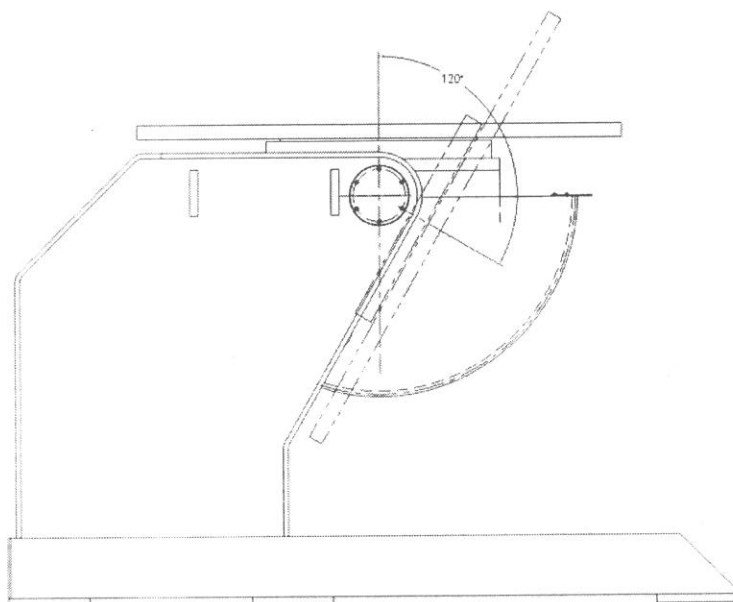


Model of the machine: HB-5, welding positioner with capacity of 500kg

Main specifications and parameters

Model	HB-5	HB-10	HB-20	HB-30	HB-40	HB-50	HB-80	HB-100
Load capacity /t	0.5	1.0	2.0	3.0	4.0	5.0	8.0	10.0
Diameter of table (mm)	800	1200		1400		1600		1800
Rotating speed (r/min)	0.065-1	0.045-0.65				0.035-0.5		

Tilting speed (r/min)	0.75	0.37				0.25			
Tilting angle	120°								
Max centrobaric distance (mm)	200	250				300			
Max eccentric distance (mm)	150	200				200			
Dimension mm	H	800	955	1180	1215	1510		1790	2000
	L	1000	1500	1800	1900	2200		3000	3900
	w	820	1200	1370	1400	1600		1930	2400
	D	148	156	176	181	226		205	
Deadweight /t	0.6	1.3	1.7	2.0	3.8	4.0	7.5		
Power supply	Three phase-415V								



Machine's Structure

The product is made up of work table, machine body, rotation drive part, reversal drive part, electric system etc.

Machine body:

The body is made of steel board by welding. There are two hooks for lifting itself up on the flank of the body.

At the back of the body, there are connectors for power anode & cathode, and there is a device for checking current signals (It is used in automatic welding.).

On one side of the body, there are two limited switches which can prevent the work table from hitting the machine body. The limited switches have been turned into the

proper position at our factory. If adjustment is needed, please turn the cam angle.

Rotation part:

Rotation part uses AC motor for frequency control. It drives main axle turning after slowdown. For the first step, speed is reduced by planet gear with big reduction rate and high drive efficiency. For the second step, speed is reduced by worm and worm wheel with big reduction rate and good self-locking performance. For the third step, it is reduced by straight cylinder gear, which can greatly increase drive torque with impact structure, stable drive and little noise.

Rotation part uses frequency control. It adjusts speed through transducer frequency and it has normal-reverse control.

Reversal part:

It uses two-step helical gear-worm & worm wheel reducer. It drives reversal through one-step straight cylinder gear (sector gear) reducer. For the first two steps it uses helical gear-worm & worm wheel reducer with impact structure, big reduction rate and good self-locking performance. For the third step, it uses straight cylinder gear reducer, which can greatly increase drive torque with impact structure, stable drive and little noise.

Angle reversal is in way of manual point-control.

Notes: Please timely pour lubrication in the reducer through the hole and lay on lubrication to the surface of the rotation part to reduce wearing when you operate the machine. When the machine is matched with welding power source, please firmly connect welding earthing cable with connector before welding. Meanwhile, please check if the nut on connectors is loose or not. If it is loose, it should be fixed at once. Otherwise, stop working.

Operation

Firstly place the work table in a horizontal level (if necessary, it needs to adjust the slant angle)→place work piece and tighten it (some holding device needed)→set the frequency of transducer to get the rotation speed and other welding parameters according to weld length and other welding conditions (welding speed, it needs transition: rotation speed is 0.65rpm when the frequency is 50HZ, the displayed frequency divides 50 and multiples 0.65 to get the actual rotation speed, finally it multiples radius at welding point to get linear speed.)→use hand torch, weld with tightened torch or match with manipulator.

When it is equipped with manipulator, firstly calculate and set the rotation speed of welding positioner. After turning the work piece to needed angle, adjust the torch

position on the manipulator (generally first move boom height and expansion, and then adjust cross or three-dimensional slide of machine head to exactly position the torch), then turn the Start button to Auto on the manual control box (at the time starting of positioner is controlled by manual control box on the manipulator), at last manipulator does linked control.

Note: Operator may monitor and adjust the position of machine head in case of welding at the wrong direction.

Control System

- 1) Reversal of work table is controlled by relay with easy principles and convenient maintenance. It uses AC frequency control and starts, stops and does normal-reverse operation through relay.
- 2) It uses separate DC PWM circuit and rotation speed in digital display.
- 3) It uses manual adjustment and automatic welding, not only for manual welding and working, but also for matching with manipulator to make up auto welding center.

Note: Control principle and connection are attached.

Installation and debugging

Before installation, please check all units and accessories of the machine proper as packing list, then wipe the dirt & dust off, and lay on lubrication to the surface of the rotation part and pour lubrication in the reducer through the hole.

- 1) Before installation, please confirm the following conditions.

controller power voltage 1Ph- AC 240V \pm 10%

controller input cable \geq 0.75mm²

- 2) Power frequency

Controlled is design with reference to 50HZ; please also confirm the required power frequency and input voltage of equipped welding power source.

- 4) Machine installation

The machine is in seat type with good stability so that it needn't to be fixed on the special ground base. Please avoid strong light, shock, dust, inflammable and

explosive places. Make sure the feet of welding positioner grounds well in case of shake of machine during welding process.

5) Debugging

After the cables and control cables are well connected, do electric inspection for the whole machine. Turning the switched on the manual control box, it starts, stops and does normal-reverse, tilting and reversal so as to check if connection is correct, if the electric components are complete and if the limit switch is properly placed with normal performance. Meanwhile, note if there is abnormal noise and odor during rotation and reversal to check if drive parts are well engaged and if the connection is poor connected or overheated.

Maintenance

To safely operate the machine, please maintain and repair it regularly.

When checking the inner and outer terminals of machine, please turn off the gas switch of electrical tank firstly.

Daily notes:

- 1) Check if there is abnormal shock, noise and odor.
- 2) Check if the connectors are abnormally heated and if the input cable is loose.
- 3) Check if the connection of each control cable is loose or broken.

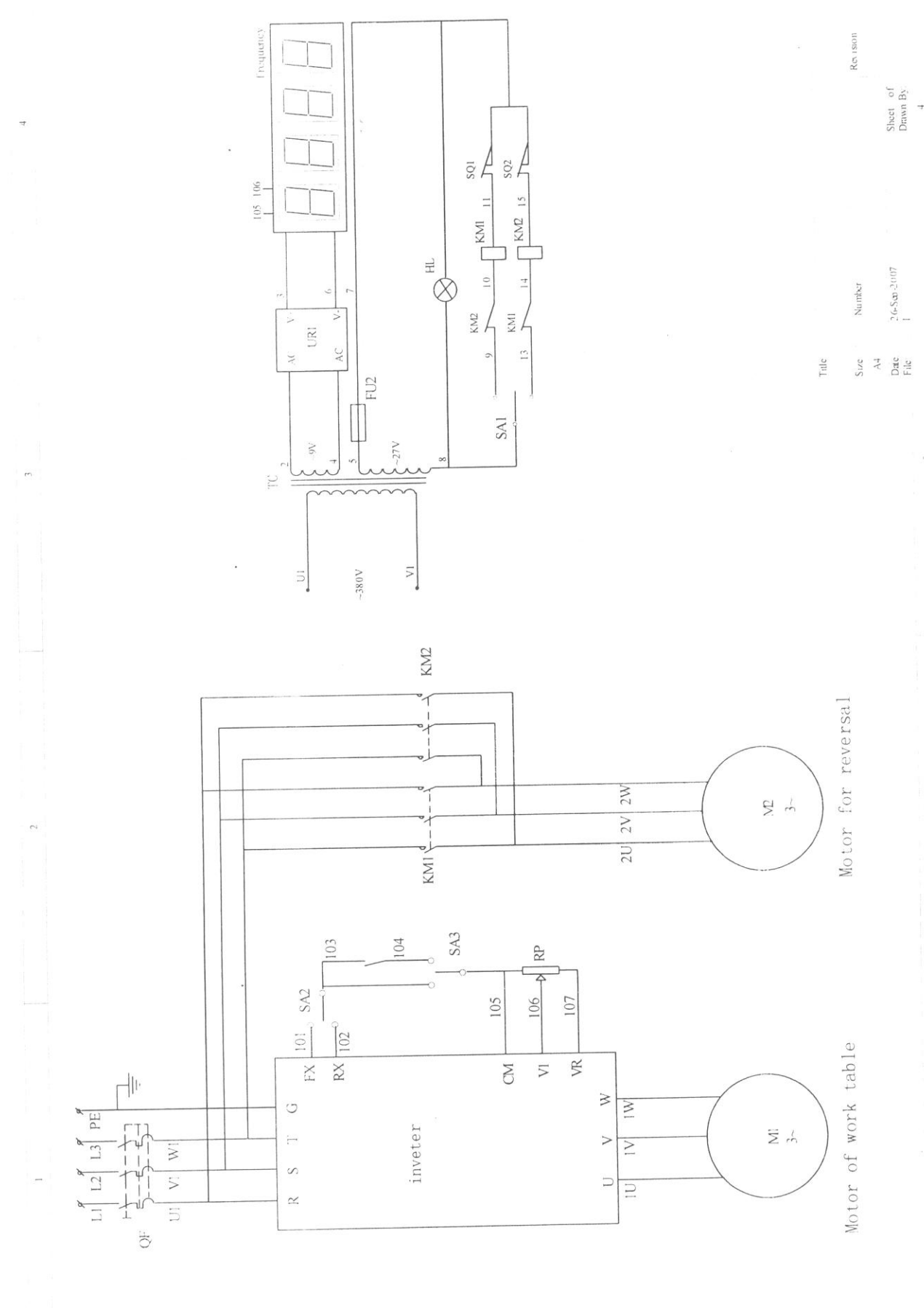
Checking items every three to six months:

- 1) Please poor lubrication in reducer before application. Due to handling and transportation, the reducer is with little lubrication ex factory. Before worm and worm wheel reducer move, open guard cover of reducer and pour ISO VG-320 (or VG-220) up to oil scale center. Before cycloidal gear reducer move, use 40# or 90# mechanical oil to extend the life span of reducer. EP gear oil 70# or 90# is recommended. For grease, special grease -2#, molybdenum disulphide grease -2# and lithium base grease 2L-2# are recommended. For the first time, after one month (about 200-300hrs), clean the inner part and pour fresh oil. Change it about every 2000hrs. It should be less than six months.
- 2) For gear and bearing, pour lubrication regularly into the parts which need to be lubricated.
- 3) Maintain and repair the welding power source according to the operating manual.

If the trouble can not be solved, please contact our company in time.

APPENDIX FILES

- Operating manual
- Qualification
- Maintenance card
- Manual of inverter
- The electrical schematic diagram of turning roll
- The wiring diagram of turning roll



Motor of work table

Motor for reversal

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