





Some Value Points in purchasing machines

When you want to purchase a machine or machines for your factory, we recommend you to consider the following points:

- 1- Describe and explain raw material you are going to use and attach a **drawing or drawings relating to the parts and** explain all technical affairs in details, for example ST 37, thickness 2.5 mm, dimensions, critical dimensions, tolerances (Tolerance range) and other technical data such as Coaxial if needed.
- 2- Explain and describe your **factors' environment** including Room temperature, Permissible noise, Humidity.
- 3- Giving suppliers some information about **Performance Data** such as Working days per year, working shifts, Working hours per shift, Efficiency, Technical availability and Demand.
- 4- Determine which **Brands of electrical parts** you like to have in the machine. For example, do you like to have LG PLC, Siemens PLC, ABB PLC, Fanuc PLC or Omron plc.
- 5- Determine which **Brands of mechanical parts** you like to have in the machine. For example, do you like to have Bearings of FAG, SKF or INA and for Pneumatic parts of Festo, Kelmk, SMC, HUK, Morgren or SMC.
- 6- Request the supplier to provide you with a list of **technical documents** such as Electrical drawings, Pneumatic drawings, Cable connections drawing, spare parts list, maintenance manual and Lubricating plan.
- 7- **Wiring diagrams** should be requested from suppliers. It would be also helpful in maintenance.
- 8- Get a **List of recommended equipment** from the suppliers.
- 9- **Warranty** and **Guarantee** should be mentioned either in P/I or agreed performance specifications signed by two parties (purchaser and supplier).
- 10- **Packing**: One of the main points should be considered in purchasing machines is Packing. What kind of Packing the supplier wants dispatch the machines. If the machine is going to be shipped by vessel, you can request supplier to pack the machine in seaworthy case.
- 11- **Pre acceptance** and Final acceptance are affairs that requested by purchaser. Before shipping the machines to customers site, some purchasers want to be ensure the machines come to their factory without any problem. They go to suppliers 'factory and produce some parts with the machine.
- 12- **Final Acceptance**: Some customers want suppliers to set off experts to customer's factory to install and run the machines in factory.

We have prepared a form- as sample- which may help you in this regard

1. Introduction

Wheelchair Welding Machine to braze pipes of wheelchairs in mass production.

2. Quantity and Type of the Parts

- 2.1.** The type and quantity of Wheelchair body per year is in accordance with the attachment. No.1
The Wheel chair body mentioned in the attachment No.1 is just to be considered as examples.

3. Performance Data

- Working days per year : 270 days
- Working shifts : 2 shifts
- Working hours per shift : 7 hours
- Efficiency : 80%
- Technical availability : 95 %
- Demand : 45 Body/ h.

4. Work Environment

- Room temperature : Between 15-40°C
- Permissible noise : 75 dB
- Humidity : Between 40-80 %

5. Technical requirements

- 5.1.** The machine has four stations in vertical moving.
- 5.2.** Heating of the part will be accomplished with 7 torch heating at Station 2 using Propane/Oxygen mixture.
- 5.3.** The process of Brazing by Brazing machine & related equipment shall guarantee that the Brazing process is performed correctly so that the welded Wheel chair bodies are in conformity with the related standards .the standards is part of acceptance documents
- 5.4.** After brazing, all brazed joint are clear and have no over flow of filler. It is ready for coating and have no need for any operation before coating
- 5.5.** The machine has 4 ~ 8 burner tips per one torch, depending on an item.
Gas flux will be feed into the system to provide additional cleaning of steel parts
With gas flux unit, this is made of SUS 304.
- 5.6.** Each group of 3 ~ 4 torches will be controlled from a separate mixer valve.
The machine would have, each 2EA of auto pressure controllers for gas & air etc,
To make an easy to control gas & air amount.
- 5.7.** The machine could control brazing temperature and time. If the amount of the produced heat exceeds the preset tolerance range and cannot be compensated by the control unit, an error message should appear on the display and the incompletely –welded Wheel chair body should be rejected.
- 5.8.** The assembly to be brazed will be manually loaded into the machine, and unload.

5.9. Station 1: Load new assembly into the fixture & Can unload the brazed assembly prior to load
Supply rings or performs for each joints with flux brushing

Station 2, 3&4: Brazing.

5.10. The machine has Auto gas control system. it is a gas and oxygen controller for brazing & soldering M/C, in order to keep the same pressure of Gas and Oxygen constantly, Even if the pressure is changed on the primary supply. It consists of process control unit, pressure sensor and transmitter unit, continues, control V/V unit etc and gives easy control and constant pressure etc.

Process control unit

- . A customer can set the pressure value a customer wants in it.
- . Will send the value to pressure sensor and transmitter unit.
- . Shows a flow pressure value in the line with digital gauge.

Pressure sensor and transmitter

- . Senses the pressure value in the line.
- . Will send electrical signal to a continues control V/V unit by sensing a current Pressure in a line.

Continues control V/V unit

- . Will operate continuously depending on the electrical signal from the pressure Transmitter.
- . Will control a constant pressure, depending on the signal from process control Unit.

5.11. Brazing m/c shall be equipped with digital counter, which gets password for changes.

5.12. An automatic lubrication system shall be installed for lubrication of the moving parts of the machine, which also monitors the lubrication pressure and the lubrication intervals.

Oil circulation should be separated for lubricating and hydraulic. There should be a window over all of the oil reservoirs, through which the amount of the remaining oil could be controlled. Also there should be a cautionary device to indicate when oil drops lower than the minimum level.

It should operate in an automatic cycle of lubricating by switching "ON" the machine.

For providing oil for the guide ways and ball screws in closed area there should be several lubricating points and oil should be fed through separate inlets.

5.13. All machine processes should be controlled by a PLC. A swiveled panel serves as the operator interface. This should be equipped with multi – function switches and a soft key color screen.

5.14. Pneumatic system shall be equipped with service units manufactured by Festo or other reliable companies.

Operating pressure = 5 bar

Fineness of air filter = 10 µm

5.15. It shall take less than 30 minutes to set the machine for Brazing other types of Wheel chair body.

5.16. It is used very accurate positioning with accurate roller gear type index drive unit.

5.18. The Brazing table should be driven by a brushless servomotor through a precision gearbox and pulleys. An encoder giving 3600 pulses per revolution should be applied to allow an accuracy of 0.05 degrees at the lower electrodes.

5.19. Announcement of errors should be via warning lamp and Alarm.

The machine is simply designed system allows operator to be feel free from hard working. It is used anticorrosive materials for Jig/Fixture design. It is flexible designed to adapt other products as just changing jig.

5.21. Changing of Brazing parameters should be done just after entering the password.

5.22. Rules of machines protection, also instructions, regulations and the latest leaflets published from VDE, VDI, ZH, UW, DIN and CE standards or other equal standard and also legal regulations and technical principles of safety and environmental protection and entire valid rules in Iran or the country of order when dispatching goods should have been observed.

5.23. Design and manufacturing all Brazing sets for 1 types of Wheel chair body in accordance with attachment No.1 is on supplier's responsibility.

5.24. M/C shall be painted in a quality coat enamel and undercoat. Customer will announce details of color later.

5.24. The machine has emergency stop key

5.32. In this mode the machine should only rotate and not weld the parts.

5.34. Machine should have a smog extraction system

6. Electrical and control systems requirements

6.1. Wiring diagram

Format of wiring diagrams is DINA3 or DINA4. All of the internal wiring connections should be shown with dimensions.

Part list should include exact information about type, usage, and manufacturer data. It should maintain all groups of constructions.

6.2. Repair and maintenance:

All of tools such as adaptor cards, diagnostic cards, programming help and tools for fault diagnosis should be supplied.

6.3. Input current hasn't 3, 5, 7 harmonic currents.

6.4. Marking

If switching elements are passed over several clips or/and terminals, they should have a clip mark in a way that make it possible to track the route.

6.5. Control

PLC controls should be Siemens (S7) or LG.

For all of the automated systems with PLC, on-line communication with system should be considered.

For Data & program load-unload, one RS-232 or V-24 interface should be considered.

For all PLC control systems following facilities should be considered:

These operating modes should be considered: Automatic, Step –by- Step, Set-up.

The place of failure for which the system is stopped should be pointed out.

The program or subprogram and the network, which is related to the fault, should be announced.

The hard ware devices, switches or subsystems, which are related to the failure, should be displayed.

6.6. Operator display

There should be a “lamp-test” bottom with which lamps could be controlled.

6.7. Lighting

Lighting for the inner area of the machine should be installed. It should be connected before the main switch.

6.8. Disturbance

In the case of any fault for any reason there should be a fault lamp error flash (e.g. on the control cabinet) to show the situation.

6.9. Counters

One operating time counter should be considered. Maintenance counter should be installed inside the control cabinet.

One-part counter should be considered.

6.10. General electrical power 400±10%V, 50HZ ± 1HZ, 3PH, N, P, E.**6.11. Safety and security requirements according to DIN 31000****6.12. Safety requirements of electric and control system according to DIN EN 60204****6.13. Cabinet insulation and protection according to IP 54****6.14. All solenoids and valves according to IP 65****6.15. Electrical air conditioning system for control cabinet to maintain temperature in 20-25°C and the air inlet to be equipped with air filter****6.16. Control system voltage, 24 VDC****6.17. The maximum length of the electric doors is 60 cm and the minimum door-opening angle is 90° and also 20% free space is to be considered in the cabinet****6.18. All electrical components including motors, sensors and contactors should be marked with a durable system according to the specified No. in the drawings**

-All cables and wires should be numbered

-All the terminals and sockets should be numbered

- All the terminals and sockets should be numbered

7. List of recommended equipment:

7.1. Protective switches, Power & Control fuses	:	Siemens, Telemecanic
7.2. Main switch	:	Kloekner Moeller
7.3. Limit SW. for protective door	:	Schmersal
7.4. Inductive position or proximity SW	:	Balluff
7.5. Operating components (Bottoms, Lamps...)	:	Siemens
7.6. Optical protective elements	:	Sick
7.7. Air-conditioning system	:	Rittal, Seifert
7.8. Motors, Drives, and Drivers	:	Siemens, Fanuc, Indramat
7.9. Text display	:	Siemens, Woehrle
7.10. Measuring Devices or Instruments	:	
-Linear or rotary, direct or indirect measuring	:	Heidenhain,
-Temperature measuring	:	Stoerk
7.11. Plug-connector for signals	:	Balluff
7.12. Terminal	:	Weidmueller
7.13. PLC control	:	Siemens
7.14. Pneumatic	:	Festo
7.15. Rotary connector	:	Deublin
7.16. Bearings	:	FAG, SKF, INA
7.17. Guide way, ball screws	:	THK
7.18. Flexible cable channel	:	Igus
7.19. Conveyor	:	Knoll
7.20. Lubrication system	:	Vogel
7.21. Test bench valves	:	Siteck
7.22. Filter system	:	Mahle

8. The machine capability and accuracy

- 8.1. Machine capability indexes, C_m and C_{mk} , for critical dimensions marked with 7, 8,9,10, created by this machine, should be ≥ 1.67 .
- 8.2. Symmetry and perpendicularity of the Wheel chair body should be measured after Brazing process

9. General requirements

9.1. Training

Training shall involve 2 stages :

9.1.1. Training at supplier's plant

Training is considered as four (4) man/month. Training and transfer charges from airport to hotel shall be born by supplier. The cost of accommodation and food shall be born by customer. Language of training course shall be English.

9.1.2. Training at customer's plant

The supplier should organize the training so that the necessary technical knowledge is transferred and the trainees would be able to operate, service and maintain the machine. Training of the machine shall be carried out in such a way that the trainees would be able to produce the workpieces in the required quality and quantities. The customer is obliged to bear the costs of the accommodation, food and transfer of supplier's staff.

9.2. Repair Services

If required, the time of the reaction to dispatch repairmen should not last more than 4 weeks from the written declaration of the customer, and the specialists in the field of electric / electronic and mechanic should be specified by the supplier to set technical communications in the English language.

9.3. For adjustable parts such as clutches, brakes and over load safeguards, etc. the adjustable values should be mentioned in operation instructions.

9.4. Technical documents

The English version of the following documents, among others, should be offered to the customer by supplier:

Electrical drawing (Max DIN A3) attached with parts list	:	2	Series
Cable connections drawing/listing (for electro – control max DIN A3	:	2	Series
PLC program on CD-ROM & floppy diskette (Inc.: comments, text, I/O lists)	:	2	Series
Print out of the PLC program (Inc.: comments, text, lists...)	:	2	Series
Pneumatic drawing, set up instruction and parts list	:	2	Series
Functional diagrams and work cycle or signal flow drawing	:	2	Series
Drawings of sub-assemblies & their part list (Wearing parts to be marked)	:	2	Series
Drawings of wearing parts	:	2	Series
Complete spare parts list (Inc.: Part Id. No., Mann. Data (add, Tel, Fax, e-mail...))	:	2	Series
Instruction manual, drawings, maintenance manual and any other supplementary document for purchased parts (Elec., Mech., Hyd., Penu...)	:	2	Series
Jigs & Fixture documents (Dwg, Part list, Manu. Data....)	:	2	Series
Operating instruction	:	2	Series
Transport guide	:	2	Series
Foundation drawing and installation instruction	:	2	Series
Descriptions and guidance for start-up & commissioning	:	2	Series
List of alarms and their remedy procedure	:	2	Series

Lubricating plan	:	2 Series
Guide for fault finding and removing the fault	:	2 Series
Maintenance manual (Incl.: checking list and schedule and consumable material spec.	:	2 Series
Trouble shooting (among others, the most important of which are as noted in attachment II of this manual)	:	2 Series
The above-mentioned documents shall be certified and accepted by experts during acceptance process.		

10. Acceptance

Machine acceptance contains 3 stages:

- Pre-acceptance at manufacturer's site
- Secondary Acceptance (Installation and commissioning at customer's site (.....))
- Final acceptance at the customer's site (.....)

10.1. Pre-acceptance at manufacturer site:

After adjusting the machine for each part, 50 parts will be welded. The critical characteristics, especially characters 7 to 10, as shown in the attached drawings, should be measured and the calculated machine capability indices, Cm and Cmk, should be ≥ 1.67 . Then at least two working shifts will be implemented for each part and the produced parts are statistically controlled.

The machine stability and capability will be controlled. The part dimensions are compared at the beginning and end of each process. At the end of the pre-acceptance step, one protocol concerning the results of the pre-acceptance processes shall be provided and signed by the two parties if the results are confirmed by the customer, of course. This protocol shall be considered as an integral part of the shipping documents to be sent to the customer by the supplier.

10.1.1. Geometry test

One protocol on geometry dimensions should be issued and confirmed by the two parties if the results of this test proved to be acceptable.

10.2. Secondary Acceptance (Installation and commissioning at customer's site (.....))

To prepare the ground for the whole project, supplier is responsible for providing the time schedule including testing, pre-acceptance, shipping and final acceptance at customer's site. The machine is adjusted by manufacturer and the same characters as mentioned in pre-acceptance step shall be considered in the installation and commission stage. If there is no problem with the components and accessories of machine, the verification of the machine preparation will be confirmed. In case the same tests, as mentioned in Article 11.1 above, have successfully been carried out at Buyer's site, the two parties shall issue and confirm the related Secondary Acceptance Protocol.

10.3. Final acceptance

After machine commissioning by manufacturer in customer's site and meeting the conditions of pre-acceptance, the machine should work 4 weeks in two working shifts without any problems and

final acceptance protocol shall be signed accordingly. In case of any failure, the manufacturer shall do his best to remove the defect max in one month from written declaration of the customer. Then at least one working shift shall be implemented for parts and they shall be controlled statistically.

11. Delivery time

Delivery time Shall be regarded as 16 weeks after receipt of the order by irrevocable documentary letter of credit.

11.1. Payment and delivery conditions

The price is to be understood to be on CFR-BANDAR ABBAS basis, any customs duty fees as well as extra charges to be paid by the supplier in the country of origin. The balance of P/I by irrevocable letter of credit shall be payable in USD after deducting the banking charges.

The L/C shall permit transshipment. The charges outside I.R. of Iran such as legalization of document in Iranian Consulate shall, if required, be borne by the supplier.

12. Warranty

In accordance with regulations and conditions of for the delivery of the mechanical, electrical equipment and their associated electronic parts, Supplier Co. shall give a warranty of 12 months beginning from the date of signing the final take over protocol of machinery and installation in the customer's factory in Mashhad –Iran.

Supplier Co. submits its warranty to Mfg. Co. as follows:

- 1.** Under facilities, normal usage, normal electricity i.e. 400 VAC /50 Hz/3 phase water conditions, normal worker's operation, Supplier Co. gives one year warranty for the a.m machine in good conditions and operation .In other words, if this machine is broken or out of work under abnormal situation, supplier has to study and find out the problem and put forward the right solution and solve the problem in Max .4 weeks from the date of customer's written declaration.
- 2.** If everything on side of would be right, the supplier shall undertake the responsibility for any kind of quality problem of the machine within one year from start-up of the machine. All spare parts for this situation should be on supplier's account .In this case with no delay after the first fax transmission and announcement by, replacements will be delivered by supplier and Y.T. will return back the damaged pieces upon the supplier's request.
- 3.** Supplier will send its engineers to to do maintenance works in due course after receipt of the request. Hotel fees and food charges shall be borne by

Above-mentioned warranty is legislative and applicable from the date at which the machine reaches YT and installation takes place.

Certificate of warranty shall notify above details and shall be signed and sealed by the supplier and certified by its local Chamber of Commerce.