

3D-WELDING WORK TABLE-MODULAR SYSTEM SPECIAL DEVICES WELDING AUTOMATION



In our capacity

as a manufacturer of 3D welding tables, custom-built jigs/fixtures and positioning systems as a system vendor for various welding technology techniques and their special applications as a system vendor of FANUC Robotics and as a specialist of traverse and motion units as an engineering company for both special-purpose machines and plants

it is our concern to conceptualise and create the entirety of an individual welding task - adjusted and optimised together with the customer – at our premises.

Even from the technological project planning stage we see the project as an undivided whole: from practical welding trials and evaluations up to system completion, continuing service and support.

As a result, a wide range of new, interesting, patented and prize-winning solutions have been developed during the past years.

Rainer Förster (SFI), Grad. Welding Engineer

System vendor "Fanuc-Robotics"

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Welding tables Welding jigs and fixtures Special-purpose machines welding robots

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Special-purpose machines

Förster

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CNC machining technology

power & competence networking





2011



BAYERISCHER STAATSPREIS 2002



STAATSPREIS 1997



Perfect

to the last Detail





Property rights

European Patent Application: 912 299 German Patent: 196 190 66 German Patent Application: 198 152 34 German Patent Application: 199 104 83 German Patent Application: 198 111 57 German Patent Application: 10 2010 015 357.5

Utility model: 296 085 56 Utility model: 20 2010 005 029.4

Awards

State price 2011 in Gold 2002 Bavarian State Prize in Gold 1997 Bavarian State Prize in Gold Saxony-Thuringia Innovation Prize

Welding Tables

Why welding tables?

The most significant cost factor in the manufacturing of a welded construction is not the welding seam; the average seam takes up only about 15% of the actual work time. 85% of the time needed is nonproductive time spent on the precise dimension and angle assignment of the individual parts, in addition to measuring, correcting, aligning, and mechanically reworking of the components.

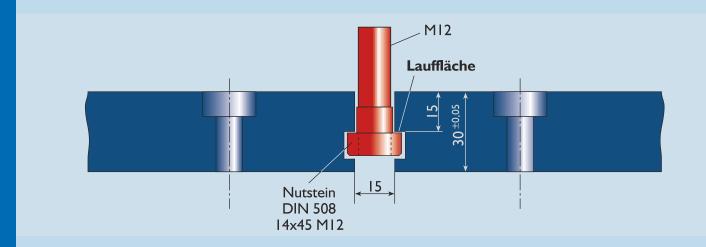


A precise method for creating an assembly, in conjunction with suitable clamping elements and stops, can result in a variety of significant benefits, even in single part production.

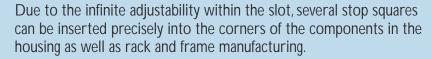
What is the advantage of the slot system?

The T-slot represents the ideal way to solve the widest variety of tasks flexibly on one working surface.

No spatter-sensitive H7 holes are required for receiving special clamping elements, and the functional surface (bearing surface) of the slot is located in a fully protected position.







Our patented version of the T-slot between two rails prevents the T-slot from becoming dirty. Rhombic slot blocks can even be inserted from above into T-slots which are already in use.



Certain areas of the table surface can be opened to insert any protruding parts. This has proven to be particularly useful in practice. The rails can also be replaced, protecting the user during particularly coarse welding work.

Heat input to the table surface allows our t-slot rails to expand freely and does not cause warpage.

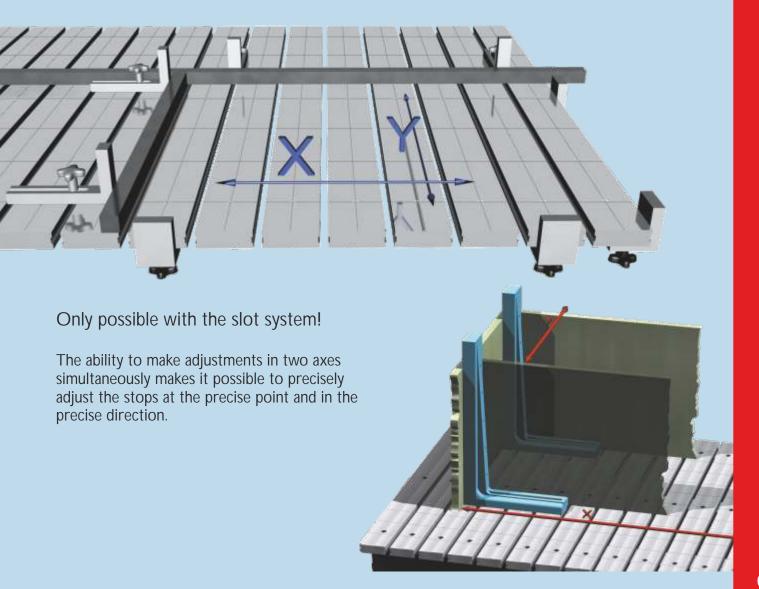
made in "one casting"

Precision

The table and the steel square are made to extremely precise standards. In fact, the flatness and the angularity comply with the "H" section, or "Fine" requirements of ISO 2768 T2. The individual rails of the table surface exhibit a tolerance of \pm 0.05 mm and are therefore interchangeable.

Measuring and positioning

The table surface has a 100 x 100 etched grid for orienting straight lines and angles. Parts are normally created by first placing them at a right angle to the stops on the side and front edges of the table. The length and the width of the part, which normally does not match a fine grid, can be easily defined by infinitely adjusting the steel square.



Grey Cast

Better than any additional surface treatment!

What are the advantages of grey cast iron?

Certainly the most important argument for grey cast iron is, that most welding processes result in spatter that can stick to the table surface.

NEW • NEW • NEW • NEW

Secure protection from spatter!

Our special open-pored grey cast iron with high graphite content enables a secure and long-term ingression of protection and maintenance agents and provides permanent protection from spatter.

Striking liquid metal particles provoke an immediate activation of the embedded protection and maintenance agents in the relevant area and do not allow the metal drop to adhere.

Grey cast iron ages in favour of the structure, with graphite deposits diffusing to the surface, which is an additional protection from splatter adherence.



Grey cast iron

the most successful basis for rough welding processes.

Additional advantages of grey cast iron are:

- the low expansion coefficient in exposure to heat
- improved sound dissipation when positioning parts/components

Aluminium-copper

Why using an aluminium-copper alloy as table surface?

The professional handling of stainless steels (austenites) requires a strict separation of ferritic materials since even finest adhesive contaminants and scratches may cause continuative corrosions (e.g. pitting corrosion) on the surface.

As a general rule, weak spots in surface finishing can be corrected only by complete "immersion pickling". Therefore, for companies working with stainless steels it is of great interest safe covering of the welding and work table, having permanent contact with the component subject to further procedures, as early as during preparation.

For this particular purpose, a table surface made of an aluminium-copper alloy has proven to be especially advantageous due to a relatively high tensile strength (=F37, similar to structural steel) at low surface hardness not causing damages to polished stainless steel surfaces.

The high thermal conductivity also almost entirely prevents the sticking of potential welding spatters.



3D-Clamping and welding tables

predominantly for MAG welding	Grey cast iron table surface, no spatter-sensitive H7 holes
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predominantly for use with stainless steel

Al-Cu alloy table surface

The table surface is completely covered with grey cast iron rails or non-ferritic rails with a spacing of 100 mm. The grey cast iron rails have an engraving of 100 x 100 mm.

The maximum permissible concentrated load per rail is 1.5 tons for grey cast iron and 1.0 tons for Al-Cu alloy. If required, the overall maximum permissible component load can be increased up to 5 tons.

Standard table, stationary

for steel processing in grey cast iron

3000 x 1500 x 810 mm GG 25 Order No.: 1108 3000 x 1200 x 810 mm GG 25 Order No.: 1109 2400 x 1200 x 810 mm GG 25 Order No.: 1110 2000 x 1000 x 810 mm GG 25 Order No.: 1115 1800 x 1200 x 810 mm GG 25 Order No.: 1120

1000 x 1200 x 810 mm GG 25 Order No.: 1130

for stainless steel processing in Al/Cu alloy

3000 x 1500 x 810 mm	Al/Cu	Order No.: 1308
3000 x 1200 x 810 mm	Al/Cu	Order No.: 1309
2400 x 1200 x 810 mm	Al/Cu	Order No.: 1310
2000 x 1000 x 810 mm	Al/Cu	Order No.: 1315
1800 x 1200 x 810 mm	Al/Cu	Order No.: 1320
1000 x 1200 x 810 mm	Al/Cu	Order No.: 1330

Standard table, moveable

for steel processing in grey cast iron

 for stainless steel processing in Al/Cu alloy

3000 x 1500 x 810 mm Al/Cu Order No.: 1208 3000 x 1200 x 810 mm Al/Cu Order No.: 1209 2400 x 1200 x 810 mm Al/Cu Order No.: 1210 2000 x 1000 x 810 mm Al/Cu Order No.: 1215 1800 x 1200 x 810 mm Al/Cu Order No.: 1220 1000 x 1200 x 810 mm Al/Cu Order No.: 1230

Other sizes and designs on request.

On request, single rails are also available in the following lengths: 800 / 1000 / 1200 / 1500 mm.

mobile, stationary, variable



The four legs have adjustable feet which allow the table to be adjusted to a working height of 800 – 900 mm.



Design with 4 braked steering wheels, which are adjustable in height.



Our modular system makes it possible to design and customise the widest variety of table surfaces with only a few components. The entire table surface can be moved in varying ways ensuring the tailored manufacture of lift tables, horizontal rotary tables and vertical turntables.

Stops and clamping elements

multi-purpose and effective

Clamping arm (Ø 50 mm)

Material: steel, with adjustable and pivoting clamping element. Thrust piece Ø 60 mm with V-block made of steel or bronze

Ø 50	Order No.: 2050
Ø 50	Order No.: 2050 Br

Support arm Ø 50 mm

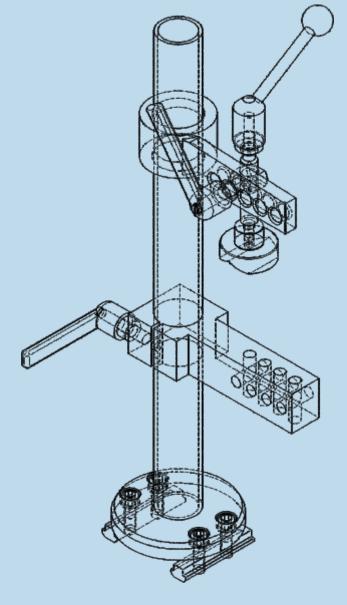
Material: steel, for 3D clamping, infinitely adjustable, for free spatial positioning

Ø 50 Order No.: 2051

Clamping tower Ø 50 mm

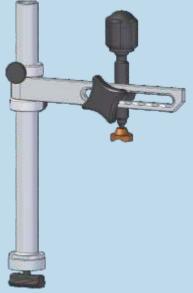
Precision steel tube, for 3D clamping, infinitely adjustable, for free spatial positioning

Ø 50 x	300 mm	Order No.: 2052
Ø 50 x	600 mm	Order No.: 2053
Ø 50 x	900 mm	Order No.: 2054
Ø 50 x	1200 mm	Order No.: 2055









Clamping arm Ø 30 mm

Material: steel, chromated, with adjustable and pivoting clamping element. Thrust piece \varnothing 30 mm with V-block made of steel or bronze

Ø 30	Order No.: 2010
Ø 30	Order No.: 2010 Br

Clamping column Ø 30 mm

Precision steel tube, chromated, with sliding block and setting collar in various lengths

Ø 30 x 150 mm	Order No.: 2020
Ø 30 x 350 mm	Order No.: 2021
Ø 30 x 550 mm	Order No.: 2022

Stops and clamping elements

precise and handy

Try-square

100 x 170 mm, grey cast iron GG 25 or aluminium, chromated, outer surface machined, with retainer

100 x 170 mm	GG 25	Order No.: 3013
100 x 170 mm	Al	Order No.: 3013Al

170 x 170 mm, grey cast iron 25 or aluminium, chromated, incl. lever retainer, outer and side surfaces machined

170 x 170 mm	GG 25	Order No.: 3014
170 x 170 mm	Al	Order No.: 3014Al

600 x 350 mm, grey cast iron 25 or aluminium, chromated, with 6 threaded bore holes, incl. lever retainer, outer and side surfaces machined

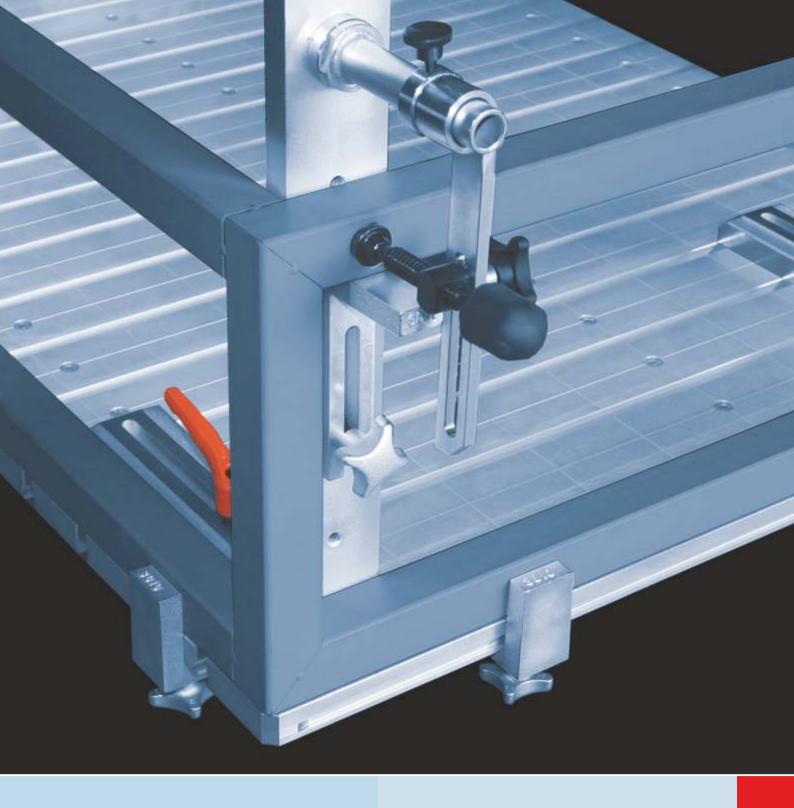
600 x 350 mm	GG 25	Order No.: 3015
600 x 350 mm	Al	Order No.: 3015Al

1000 x 350 mm, grey cast iron 25 or aluminium, chromated, with 6 threaded bore holes, incl. lever retainer, outer and side surfaces machined

1.000 x 350 mm	GG 25	Order No.: 3016
1.000 x 350 mm	Al	Order No.: 3016Al









Edge stop

Material: grey cast iron 25 or aluminium, chromated, for stopping the workpiece at straight and right angles along the outer table edges; foot with slant for secure positioning, complete with retainer in two different heights

70 mm	GG 25	Order No.: 3010
70 mm	Al	Order No.: 3010Al
200 mm	GG 25	Order No.: 3011
200 mm	Al	Order No.: 3011Al

Stops and clamping elements

precise and accurate

Flat stop

170 x 40 x 20 mm, steel or aluminium, chromated for positioning sheet metal and profiles, with retainer

steel	Order No.: 3012
Alu	Order No.: 3012Al

Quick-release clamp with flat stop

for clamping sheet metal and small parts. The quick-release clamp can be infinitely positioned in the x and y axes using it in combination with the flat stop.

Order No.: 2042

Four-sided angle

grey cast iron 25 or aluminium, chromated, machined on six sides, with two positioning studs each, height 100 mm, with retainer

100 mm	GG 25	Order No.: 3017
100 mm	Al	Order No.: 3017 Al
as hefore height 200 mm		

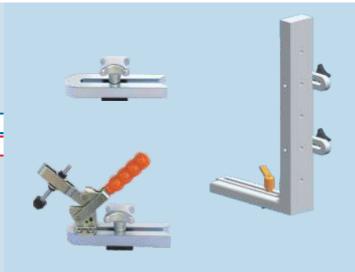
as before, height 300 mm

300 mm	GG 25	Order No.: 3018
300 mm	Al	Order No.: 3018 Al

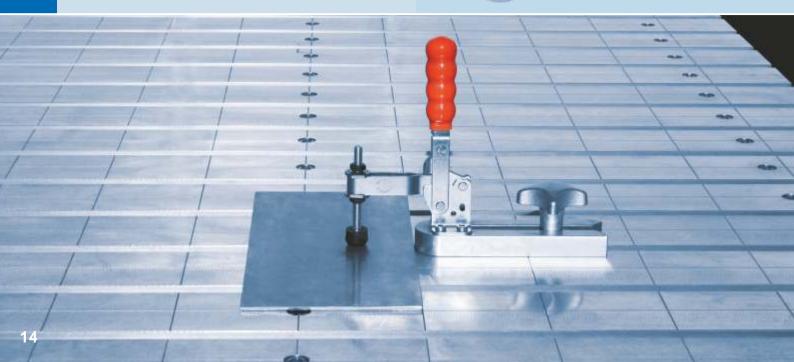
Infinitely adjustable angle

350 x 350 mm, grey cast iron 25 or aluminium, chromated, with key and retainer

350 x 350 mm	GG 25	Order No.: 3019
350 x 350 mm	Al	Order No.: 3019Al













Flat clamp

for clamping flat parts, projection 200 mm, maximum clamping height 110 mm (adjustable)

Order No.: 2040

Clamping jaws

for clamping flat parts to the try-square, projection 70 mm, maximum clamping range 60 mm (adjustable)

Order No.: 2041

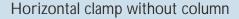
Stops and clamping elements

simple and user-friendly

Flange clamp with clamping tower

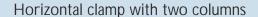
for free positioning of various flanges, mountable on clamping tower 50 mm; a max. clamping height of 1100 mm can be reached

Ø 50 x 600 with tower Order No.: 3030



for generating horizontal clamping forces, thrust piece made of steel or bronze; delivered without column

Ø 30	without column	Order No.: 2043
Ø 30	without column	Order No.: 2043Br

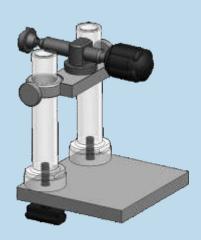


for generating horizontal clamping forces at various heights, infinitely adjustable, delivered with two columns Ø 30x350 mm

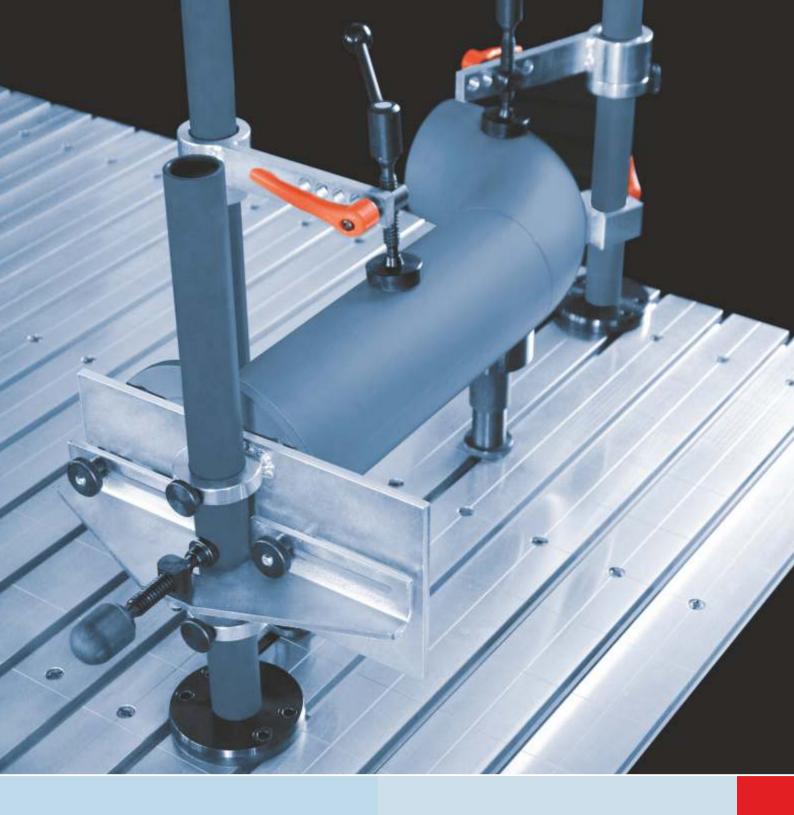
Ø 30	with 2 columns	Order No.: 2044
Ø 30	with 2 columns	Order No.: 2044Br













V-block support

Ø 60 mm, Ø 100 mm, V-block 120°, steel or bronze with threaded piece with adjusting screw with sliding block

Ø 60	Order No.: 3020
Ø 60	Order No.: 3020Br
Ø 100	Order No.: 3021
Ø 100	Order No.: 3021Br

Accessories

tried and tested

Accessories rack cart

1000 x 800 x 1650 mm, moveable, for carrying a wide range of accessories

Order No.: 2090

Protection and maintenance agents

silicone-free, for deep ingression into the porous cast structure ensures secure protection from splatter adherence

5 I tank with spray pump bottle
12 aerosol cans, each 400 ml
Order No.: 2091
Order No.: 2092

Double slot profile 50 x 55

The profiles consist of a high-strength F37 aluminium alloy. The standard 14 mm T-slot allows the affixing of all Förster stops and clamping elements. These profiles can be used as a slot addon for steel squares or for the erection of limit stop walls for 3D sheet metal framework structures. The profiles can be shifted and locked simultaneously in two axes by means of special connecting elements. As accessories, both simple connectors and connectors for biaxial movement are available.

Product sold by the meter on request





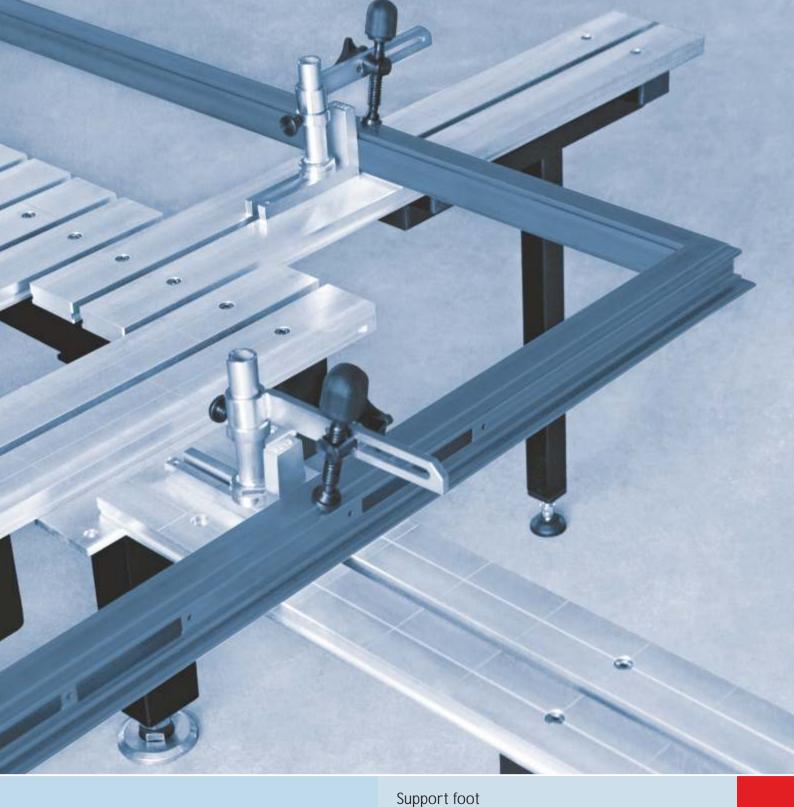




Table extension plate

300 x 120 x 10 mm, used for connecting several tables (2 pieces per connection) or to extent a table with two cast rails and support foot (attachment to both the front and the long sides is possible).

for fitting two cast rails to extend the table

Order No.: 1602

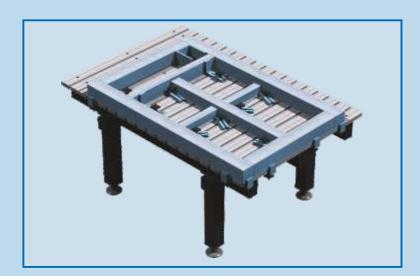
Order No.: 1604

Cover plate

made of hardwood 200 x 100 x 30 mm, for covering uncovered frame spaces

Order No.: 1601

Welding tables



for manufacturing frames for smaller profile frames 1500 x 1000 mm; components are subject only to inserting – tacking - welding



The edge of the table is used as a straight / right angle for frame constructions by using edge guides.

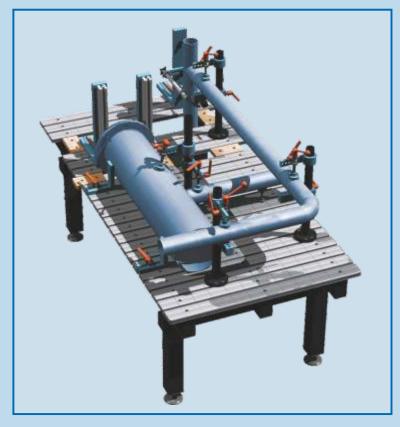
Flat edge guides / small stop angles can be precisely positioned in the T-slot and form a complex unit with the fitted clamping element.

For large and projecting frame constructions, the table surface can be adjusted to the relevant working tasks by laterally shifting the rails.

Application examples

for rack manufacturing frame rack 1500 x 1000 x 400 mm (both front and rear sides of rack are pre-fabricated as frames)





for tube manufacturing various possibilities of tube clamping

Welding tables

Large structural steelwork constructions can be manufactured on movable table bridges.

The example on hand: 30000 x 4000 mm



Single tables / table bridges can be moved and fixed on level rails in row or parallel across the entire area of the hall.

The rails with corresponding control members are

- installed into the floor or
- flat mounted on the floor.



movable on rails

For the manufacture of long structural steelwork constructions it is recommended to position our 3D welding tables within levelled guide rails in accordance with the job to be implemented.



Welding tables

Welding table with adjustable height

with hydraulic lift platform substructure and underride frames

lifting





adjustable in height

simple design with telescopic legs



for rotating, tilting, lifting and swivelling

Welding table with lift-tilting function

Electrohydraulic-operated independently of each other lifting within 500 – 1000 mm and tilting by $2x\ 45^{\circ\circ}$



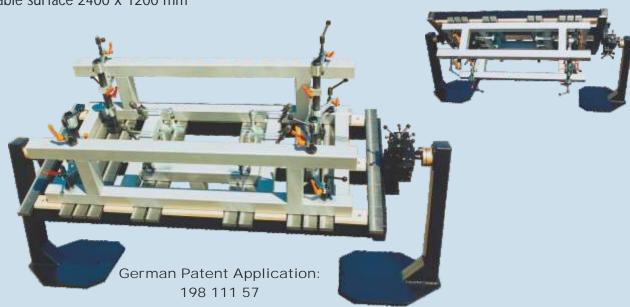




Welding tables

Rotating welding table with balance point axis adjustment (illustration with building parts)

Table surface 2400 x 1200 mm



This table allows the positioning of individual parts of a component, to tack-weld them in place, and then weld them in the appropriate ideal working position. Thanks to the patented centre-of-gravity adjustment-of-axis feature, torque due to the gravitational force can always be set to 0, even when working with parts up to 1 ton, making it easy to move the part by hand. The secure stand of the table in the respective position is achieved by a fixing brake with additional locking device.

The variable table surface facilitates to expose certain sections of the table to ensure the welding of the component from beneath in one single chucking.

The result is significantly easier work, optimum welds, and a virtually warp-free workpiece.

This kind of quality can also mean that subsequent machining is not necessary.



for rotating, tilting, lifting and swivelling

electro motor-operated or electrohydraulic lift and swivel table

swivel table for components >1500 mm, swivel range 360°,

for both circumferential welding of components and avoiding positional welding (table surface is often operated in a partially covered state).

Where appropriate, it can be dispensed with the lift function by shifting the swivel axis eccentrically and thus reducing the swivel range to approx. 240°.





Manipulator

with lifting function and two pivot axles in order to reach all weld seams in tub position and ergonomic working height.

for manual welding and robot welding

Welding tables

with fume capture capability



fume capture capability





The welding fume is sucked through the open slots of welding table affected by an additional air stream coming from above.



Fig. above:

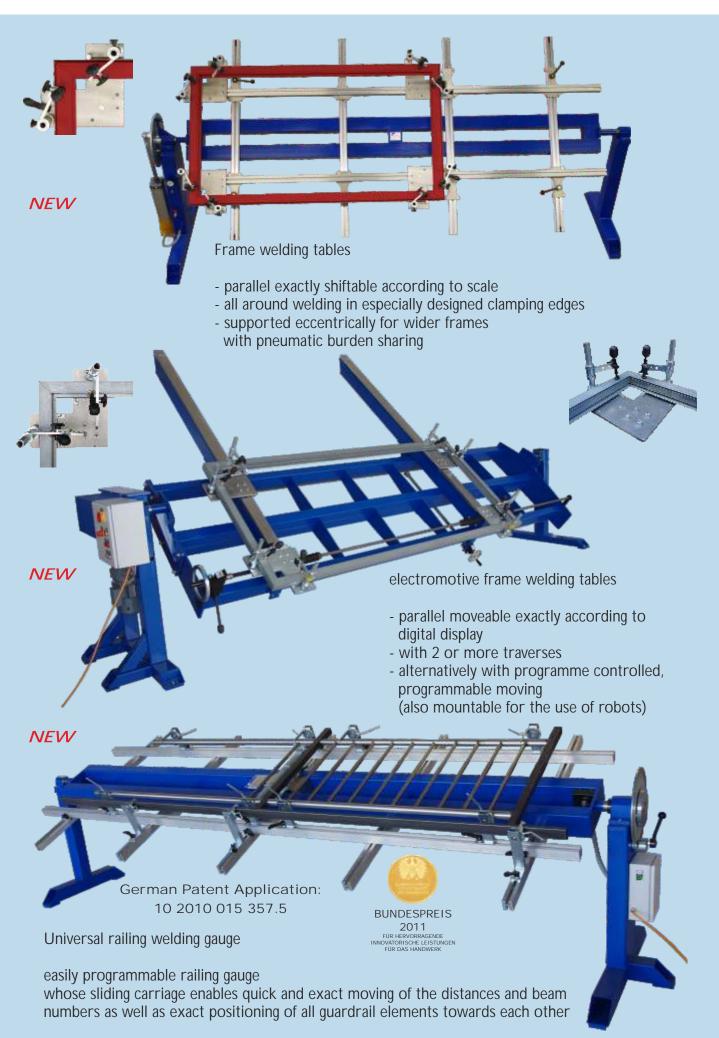
Basic version: the additional air stream is fed via a nozzle bar on the helmet with a simultaneous fresh air supply into the breathing area (inwards).



Fig. below:

The additional air flow is fed regulated by a stationary air supply duct far above the welding table. A combination with circular welder curtains intensifies the developing circulation effect.

Frame & railing welding gauges



Special Devices







Longitudinal & circumferential seam welding

Plasma welding of corner joints. The component is closely-to-the-joint clamped onto a backing with copper rail using a toggle lever adjuster. The travel length is variable; torch returns automatically in rapid traverse.





Plasma welding of corner joints. The component is sucked onto a vacuum beam with copper rail. The travel length is variable; torch returns automatically in rapid traverse.

Circumferential seam welding plant

with automatic building element holding fixture and torch guiding system



Welding automation

As system house for complete welding solutions,

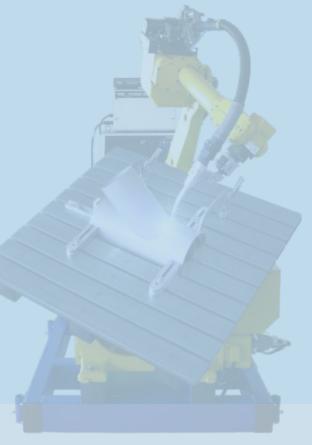
we create your special robot welding system and combine

- our long-time experience in all areas of welding technology
- our extensive options in the field of plant and jig construction
- the in-house building element programming with comprehensive support and training for your staff, as well as sample welding and welding optimisation
- the integration of safety equipment like safety covers, fume exhaustion and other components



with welding robot





Standard welding tables for the use of robots are useful for small to medium quantities, where the use of fixed devices is not practicable. With the help of our slot system, elementary devices can be created quickly by yourself and bolted for repetitiveness.







Robotics

Manipulators & special plants

Rotary tables - positioner

with parallel lifting, rotating and tilting function with face plate or slotted table surface from 250 kg to 250 t







Manipulators from 750 kg to 40 t



Large scale plants

Rollerbeds from 5 t to 150 t





fron

Pole and portal welding plants from 3 x 3 m to 10 x 10 m



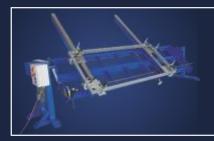
Rotation device for heavy loads



3D-WELDING TABLE SYSTEM



WELDING, ASSEMBLING AND SPECIAL DEVICES



FRAMES AND RAILINGS



MECHANIZATION -AUTOMATION -ROBOTICS



MANIPULATORS AND LARGE SCALE PLANTS



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