

Welding Column & Booms



PEMA Welding Column & Booms

PEMA Column & Booms are developed to improve productivity and meet the standards of high quality fabrication. Completed with required standard welding modules and accessories, PEMA Column & Booms complement even the most demanding hard automation solutions.

Designed and Built for Professionals

PEMA Column & Booms are designed in close co-operation with the best professionals. PEMA's extensive experience in designing and manufacturing welding automation solutions has been a key factor in the development of PEMA column & booms. Designed to the same high quality standards as PEMA roller beds and positioners, PEMA Column & Booms fulfil the requirements of the European EN-safety norm. All PEMA Column & Booms come with CE-markings.

Modularity Provides Flexibility

PEMA Column & Booms have a modular construction. Depending on the welding process in question, used material and the geometry of manufactured products, every column & boom can be modularly tailored to best suit the task at hand. In addition to column and boom dimensions, e.g. the welding equipment, cross slide, welding head mounting, flux handling in case of SAW, wire reel size and position, seam tracking method, etc. are selected to optimise the device for maximum productivity.



Welding with PEMA Column & Boom with PEMA WeldControl 100 system

High Quality, Comprehensive Support

All components used in PEMA Column & Boom are provided by well-established, widely recognised suppliers. Only the best components are accepted. This guarantees full performance even under toughest fabrication conditions. PEMA's comprehensive customer support further ensures a continuous, uninterrupted production and optimal utilisation of the equipment.

Wide Variety of Applications

Focusing on the actual welding processes, all PEMA Column & Booms, as well as related accessories, have been developed to compliment the welding process. Combined with e.g. PEMA roller beds, the result is a complete welding solution providing the required performance that meets or exceeds your productivity demands. By choosing PEMA you are investing in a partner with the right experience and the right solutions to help you to boost your productivity.



PEMA WeldControl 500 system integrates all the movements and controls to a clear-cut, easy-to-use system.

Application Illustration, Standard Solutions



Welding of longitudinal seams of shells or beams. Both internal and external welding is possible.



Welding of a circumferential seam. Also welding of flanges is possible in this application.

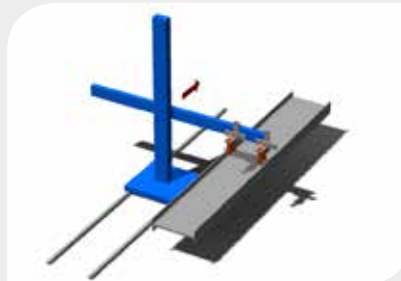


Outside welding of a circumferential seam. The work piece is rotated by PEMA roller beds.

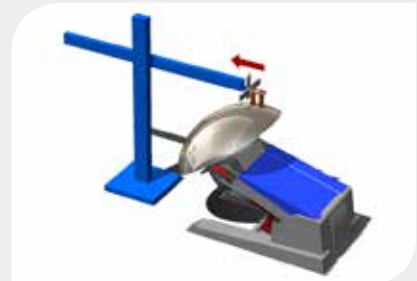
Application Illustrations, Engineering Solutions



External and internal welding of two or more circumferential seams simultaneously by using several welding torches.



Simultaneous welding of several longitudinal seams in beams. In this case, the Column & Boom is driven on rails. Automatic seam tracking is recommended.



Tilting and turning movement of a PEMA positioner can be interfaced to a Column & Boom, e.g. in case of automatic welding of demanding dish ends or similar work pieces.

Medium Duty Series

PEMA MD is a medium-duty Column & Boom series for hard welding automation purposes. With a stable construction for rack-bar drive and linear rail movements, PEMA MD provides smooth operation resulting in an excellent welding quality. It is a versatile and cost-effective solution especially for a single wire and twin SAW welding, but suits well also for MIG/MAG and TIG welding processes.

- A cost-effective way to improve productivity, welding quality and safety
- Several dimensions, welding processes, and wide range of accessories
- Technologically advanced



PEMA MD Column & Boom with set of PEMA roller beds.



Internal longitudinal welding with PEMA Column & Boom and a set of roller beds.



MAG welding with PEMA MD Column & Boom

Ideal Hard Automation Solution

PEMA MD series Column & Booms weld both longitudinal and circumferential seams. The MD series sizes range from 3 x 3 meters up to 5 x 5 meters (column movement x boom movement). MD can easily be combined with PEMA roller beds and positioners to improve productivity, welding quality and safety at work. Safety is ensured for instance with a falling prevention device. The series is also available with integrated control system which combines welding parameter control, welding data storage, remote control and other advanced welding functions into the column & boom control interface. The Column & Boom can be equipped with motorised rail cars and a multitude of other accessories: see page 12 for modulation and accessory list.

Versatile Mounting of Welding Equipment

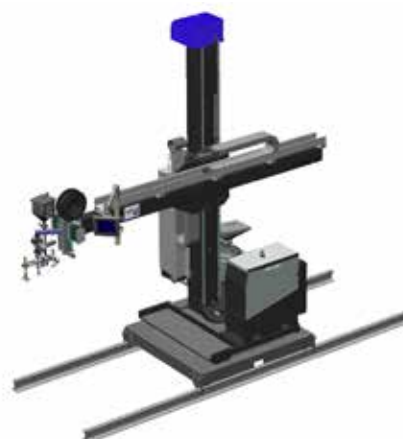
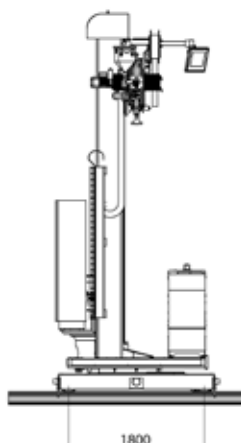
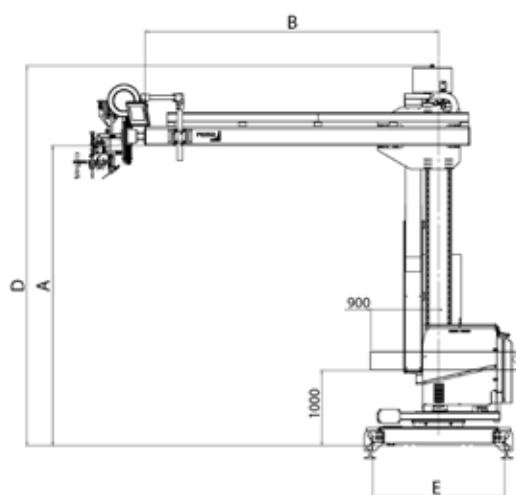
The standard PEMA MD & HD series Column & Booms can be used for welding longitudinal and circumferential seams. This makes it possible to use PEMA Column & Boom and PEMA roller beds on the same rails.



Outside or inside welding of a longitudinal seam



Outside or inside welding of a circumferential seam



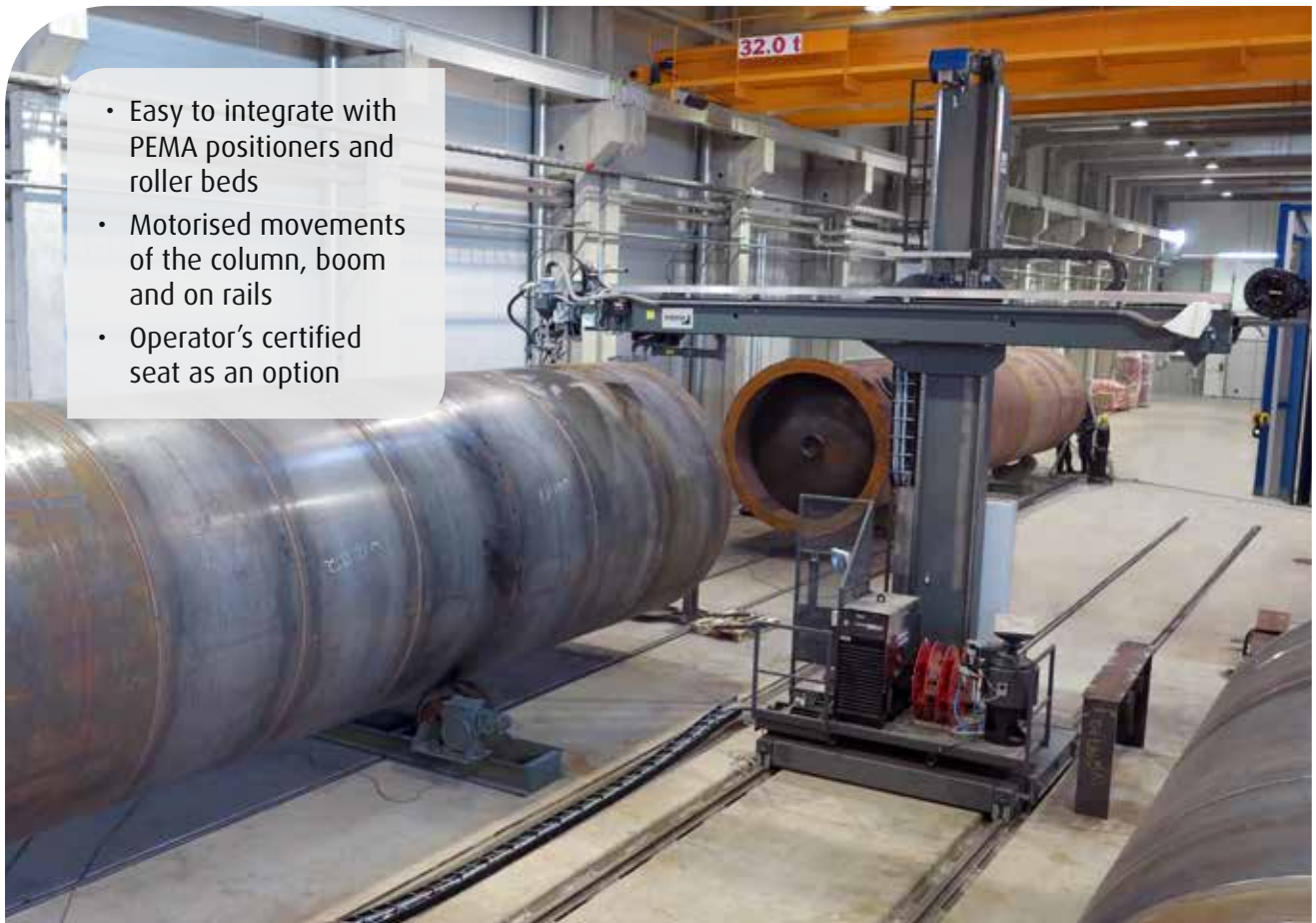
Medium Duty Column & Booms

MD SERIES:	MD 3 x 3	MD 4 x 4	MD 5 x 5
Vertical reach [A] (mm)	1 000 – 4 000	1 000 – 5 000	1 000 – 6 000
Boom reach from c-c [B] (mm)	900 – 3 900	900 – 4 900	900 – 5 900
Column rotation	manual / motorized	manual / motorized	manual / motorized
Rail car speed (mm/min)	2 500	2 500	2 500
Rail track span; inside-inside (mm)	1 750	1 750	1 750
Total height [D] (mm)	5 050	6 050	7 050

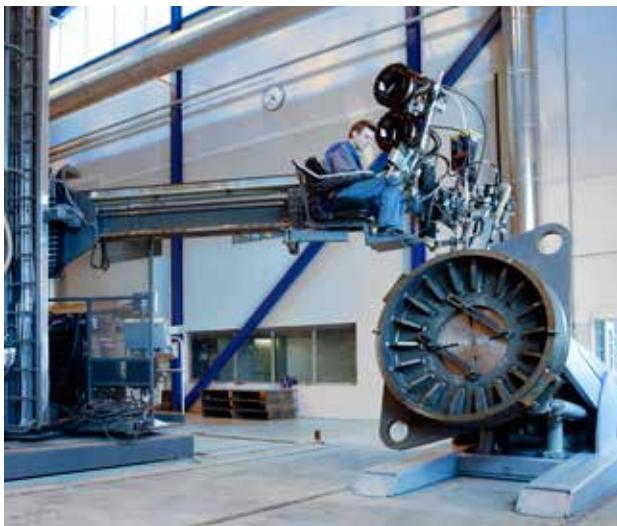
Download complete
product data sheets from
www.pemamek.com

Heavy Duty Series

PEMA HD is a heavy-duty Column & Boom series for demanding welding automation purposes. With a roller bed and positioner interface as a standard feature, it is the right solution especially for tandem SAW welding in complete welding hard automation cells, but goes well also for single wire and twin SAW as well as TIG and MIG/MAG welding processes.



PEMA HD Column & Boom with roller beds



PEMA HD 6x6 integrated to a PEMA positioner. An operator's seat is available as an option.

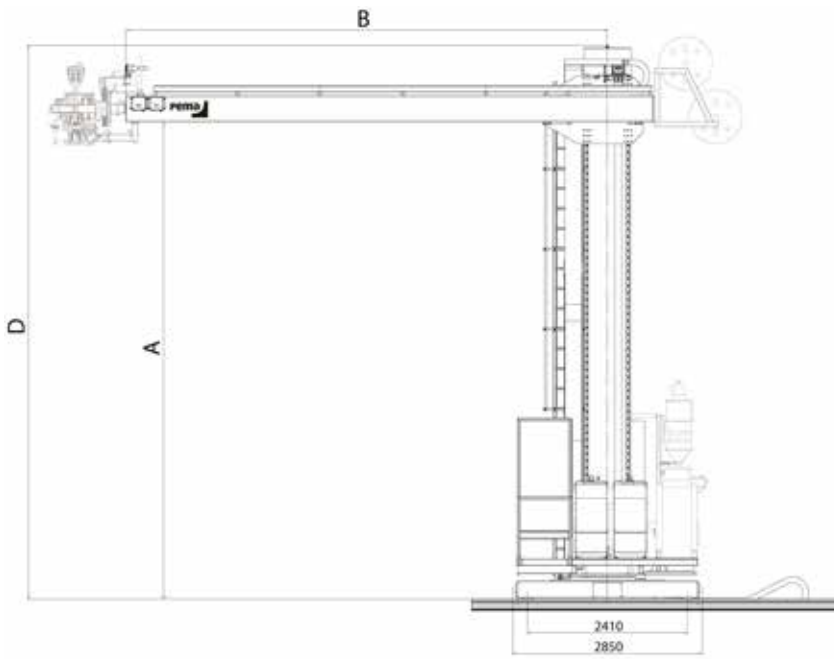
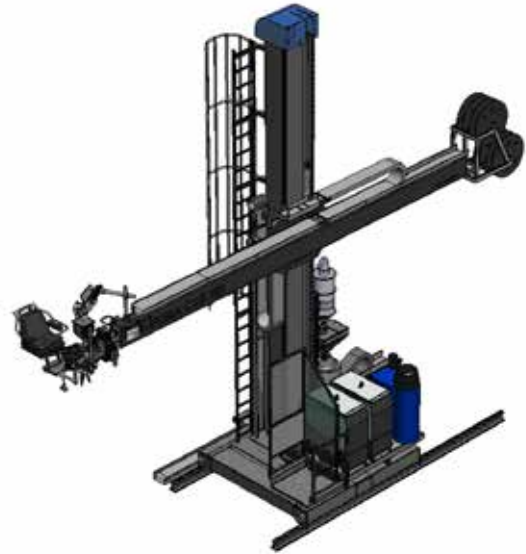


Longitudinal PEMA welding station with HD series Column & Boom.

Extreme Hard Automation Capacity

PEMA HD series sizes range from 3 x 3 meters up to 8 x 7 meters (column movement x boom movement). PEMA roller beds and positioners are easy to integrate to PEMA HD Column & Booms. With this kind of combination, automated welding of work pieces can be carried out reliably and to highest standards of productivity and welding quality. The HD series of Column & Booms weld both longitudinal and circumferential seams: the column, boom and rail movements are all motorised. In addition to column and boom movements, welding is also possible with boom movement and, as an option, with movement on rails. See page 12 for modulation and accessory list.

Every PEMA HD series Column & Boom is built on the same principles as PEMA's high-end engineering solutions. Designed and manufactured in PEMA's modern factory in Finland, each machine is carefully tested before delivery. This stands for an easy and quick installation as well as efficient commissioning.

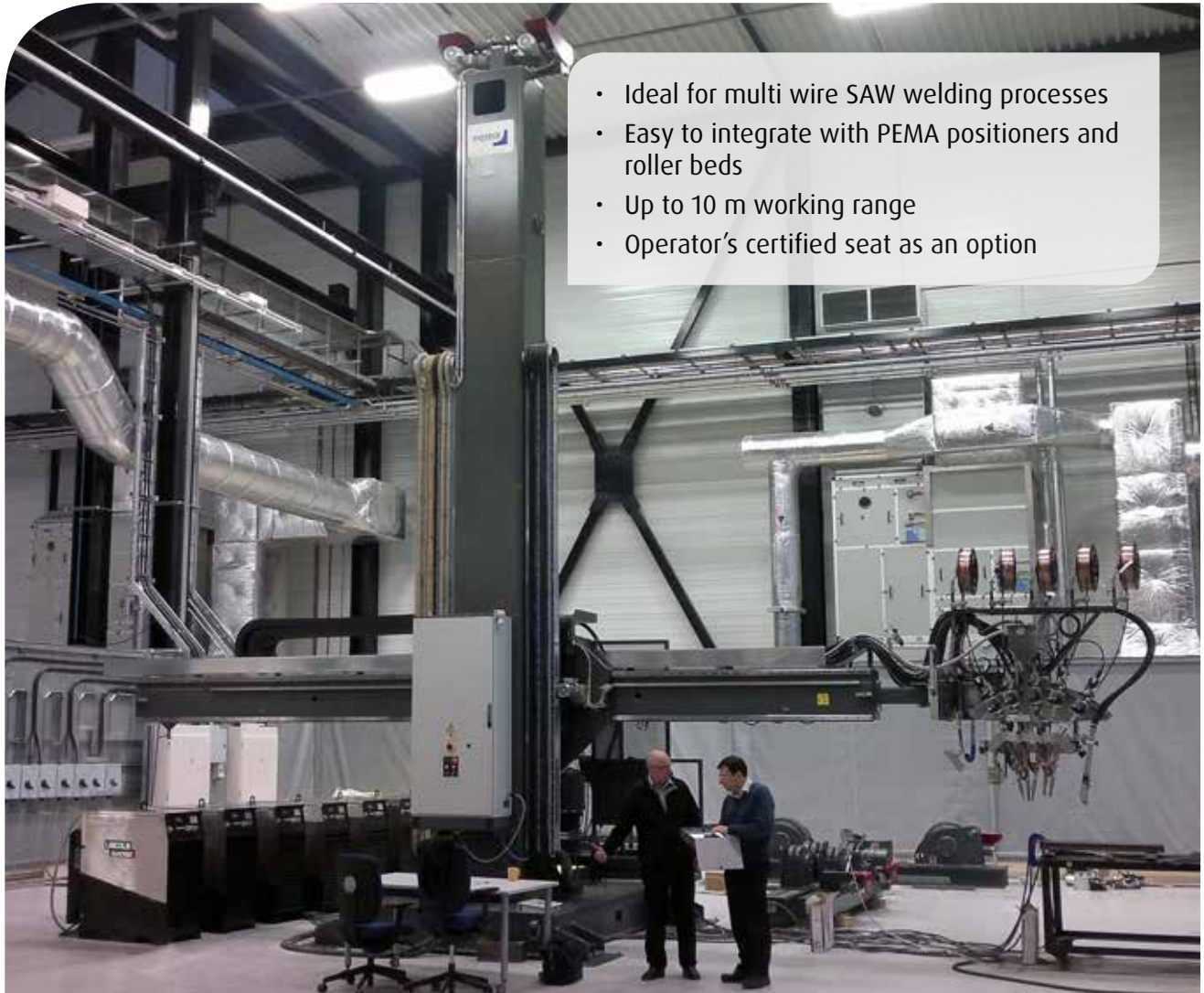


Heavy Duty Column & Booms

HD SERIES:	HD 3 x 3	HD 4 x 4	HD 5 x 5	HD 6 x 6	HD 7 x 7	HD 8 x 6
Vertical reach [A] (mm)	1 150 – 4 150	1 150 – 5 150	1 150 – 6 150	1 150 – 7 150	1 150 – 8 150	1 150 – 9 150
Boom reach from c-c [B] (mm)	1 250 – 4 250	1 250 – 5 250	1 250 – 6 250	1 250 – 7 250	1 250 – 8 250	1 250 – 7 250
Column rotation speed (degrees / min)	360 / 2	360 / 2	360 / 2	360 / 2	360 / 2	360 / 2
Rail car speed (mm/min)	2 500	2 500	2 500	2 500	2 500	2 500
Rail track span; inside-inside (mm)	2 350	2 350	2 350	2 350	2 350	2 350
Total height [D] (mm)	5 300	6 300	7 300	8 300	9 300	10 300

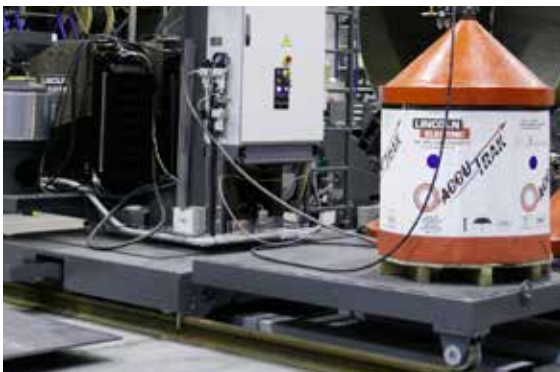
Extra Heavy Duty Series

PEMA EHD is an extra heavy-duty Column & Boom series for very demanding welding automation purposes. Always built to fulfil specific fabrication requirements, PEMA EHD Column & Booms are a perfect solution especially for heavy SAW welding in tailored welding hard automation cells.



- Ideal for multi wire SAW welding processes
- Easy to integrate with PEMA positioners and roller beds
- Up to 10 m working range
- Operator's certified seat as an option

Internal welding with PEMA EHD Column & Boom and PEMA roller beds



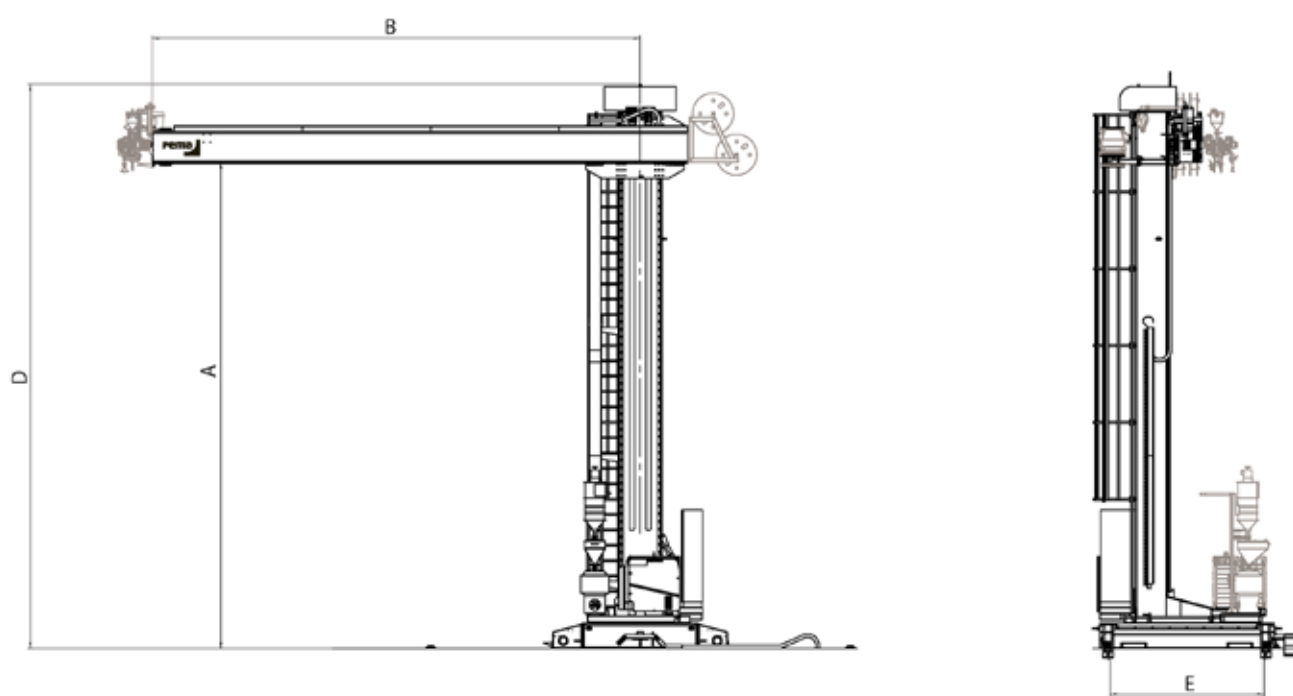
Platform for welding wire reels is available as an option



PEMA EHD is often used for very demanding welding applications

Extra Heavy Capacity, Ultimate Quality

PEMA EHD series sizes range from 5 x 5 meters up to 10 x 10 meters (column movement x boom movement). PEMA roller beds and positioners are readily integrated to PEMA EHD Column & Boom to form customer-specific, modulated hard automation cells for an extra heavy steel fabrication. With this kind of combination, automated welding of work pieces can be carried out reliably and to highest standards of productivity and welding quality. The EHD series Column & Booms weld both longitudinal and circumferential seams: the column, boom and rail movements are all motorised. In addition to column and boom movements, welding is also possible with boom movement and, as an option, with movement on rails. In addition to all SAW processes, strip cladding and different narrow gap applications can be integrated. See page 12 for modulation and accessory list.



Extra Heavy Duty Column & Booms

EHD SERIES:	EHD 5x5	EHD 6x6	EHD 7 x 7	EHD 8 x 8	EHD 9x9	EHD 10 x 10
Vertical reach [A] (mm)	1 500 - 6 500	1 500 - 7 500	1 500 - 8 500	1 500 - 9 500	2 100 - 11 100 (TBC)	2 100 - 12 100 (TBC)
Boom reach from c-c [B] (mm)	1 250 - 6 250	1 250 - 7 250	1 250 - 8 250	1 500 - 9 500	2 000 - 11 000 (TBC)	2 000 - 12 000 (TBC)
Column rotation speed (degrees / min)	360 / 2	360 / 2	360 / 2	360 / 2	360 / 2	360 / 2
Rail car speed (mm/min)	2 500	2 500	2 500	2 500	2 500	2 500
Rail track span; inside-inside [E] (mm)	2 500	2 500	2 500	3 000	TBC	TBC
Total height [D] (mm)	7 900	8 900	9 900	11 000	13 600 (TBC)	14 600 (TBC)

PEMA WS Welding Platform

Besides to standard PEMA Column & Boom series, roller beds and positioners, PEMA designs and manufactures also WS welding platforms. Typically a part of a larger engineering solution, the platforms are often delivered together with heavy-duty roller beds or large welding positioners. The movement range can be up to 12 x 10 meters.



- Extreme heavy welding applications
- Huge production capacity
- Typically delivered as a key part of a larger engineering solution
- Turn-key deliveries

PEMA is able to supply complete project deliveries



An operator controls welding process on a safe working platform



WS welding platforms are especially designed for special customer requirements

Extreme Welding Capacity

In case of welding platforms, welding processes used are usually SAW with several wires, strip cladding, or narrow gap type solutions with a single or double wire. Also a tandem MIG/MAG is available. In special cases, even 8 sets of double tandem SAW may be mounted to a special double-sided platform: this arrangement enables simultaneous use of 32 wires.

Heavy Welding Applications

Typical welding platform work pieces are heavy and thick-walled pressure vessels, components for nuclear power plants, offshore constructions, or e.g. wind energy plant towers and foundations. PEMA WS welding platforms are especially designed for this type of production and facilitate the special requirements of the corresponding tasks.

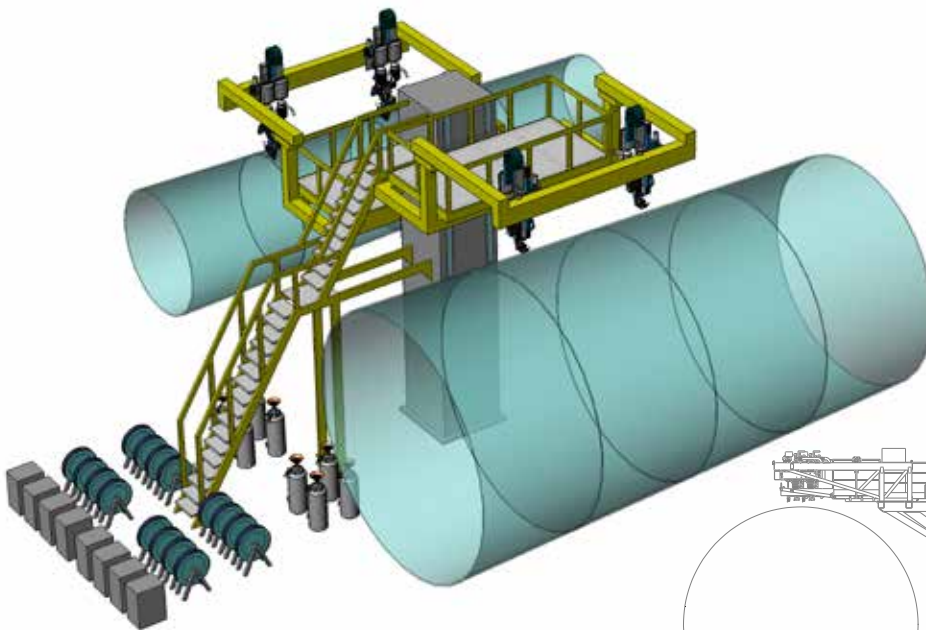
Fixed Boom with a Moving Carriage

Standard PEMA WS welding platforms are of Column & Boom type. The construction is very heavy because of the solid stability of the boom. The boom is equipped with a moving welding carriage and a safe working platform for the operator to control the welding process. Standard PEMA welding platforms are equipped with a motorised travelling carriage.

Flawless Quality

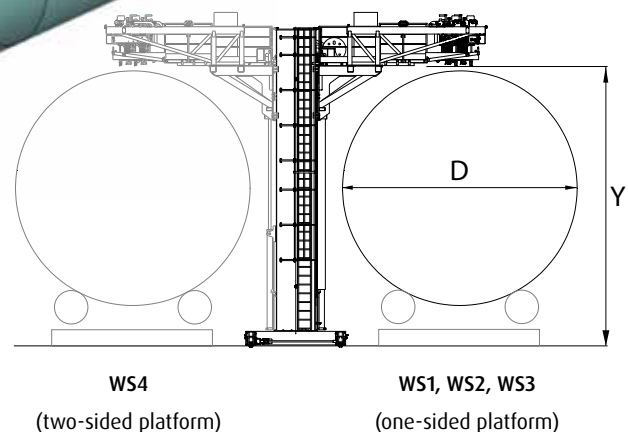
The work pieces have to meet tight welding quality requirements. Therefore a fully automated welding process is a must. PEMA WMP welding platforms are usually equipped with optional fully automatic controls for both the welding process and the movements. PEMA roller beds or PEMA positioners can be completely integrated to the same control interface.

As world's leading welding automation supplier, PEMA has the resources to supply complete turnkey projects from basic planning to final commissioning, and further to the customer support for all PEMA solutions.



Welding Platforms

	WS1	WS2	WS3	WS4
Vertical reach [Y] (mm)	5200, 6200, 7250, 7580, 8580, 9600			
Max. workpiece diameter [D] (mm)	8000			
Number of welding heads	1	2	3	2 + 2



Modulation and Accessories

		MD series	HD series	EHD series
Column - vertical stroke	3 m	●	●	
	4 m	●	●	
	5 m	●	●	●
	6 m		●	●
	7 m		●	●
	8 m		●	●
	9 m			●
	10 m			●
Boom - horizontal stroke	3 m	●	●	
	4 m	●	●	
	5 m	●	●	●
	6 m		●	●
	7 m		● 1)	●
	8 m			●
	9 m			●
	10 m			●
Base	Floor mounted with rotation	○ 2)	●	●
	Rail carriage with rotation	○ 2)	●	●
Welding equipment	TIG	●	●	
	MIG/MAG	●	●	
	Single SAW	●	●	●
	Tandem MAG	●	●	●
	Twin SAW	●	●	●
	Tandem SAW		●	●
	Tandem Twin SAW		●	●
	Compact Single SAW (d400, L2000)	●	●	●
	Compact Single SAW (d600)	●		
	Compact Tandem SAW		●	●
	Cladding	●	●	●
Cross slide (vertical x horizontal)	Motorised 200x200, 300x300, 600x300	●	●	●
Flux handling for SAW	Pressured air operated	●	●	●
	Vacuum operated	●	●	●
Wire reels	Front 30 kg	○	○	○
	Back 30 kg	○	○	○
	Back 100kg	○	○	○
	Platform or additional carriage: 250 kg		○	○
	Carriage for wire drums, up to 4x1000 kg		○	○
Control systems and interfaces	PEMA WeldControl 100	●	●	●
	PEMA WeldControl 500	●	●	●
Camera		○	○	○
Seam tracking	Optical height control	○	○	○
	Electro-mechanical seam tracking	○	○	○
	Laser seam tracking	○	○	○
Operator seat	Seat including ladders		○	○ 3)
Rails	Standard rail types 60E1, A55	○	○	○
Energy chain	Rail movement 4 - 30 m	○	○	○
Guide hooks	For different rail types	●	●	●
End stoppers	For different rail types	●	●	●
Roller guides	For welding with rail movement	○	○	○
Air drying unit	When air quality not complying DIN Class 3	○	○	○

● = Standard feature
○ = Optional accessory

1) No operator seat available
2) Motorized rotation is optional for MD-series
3) Also operator platform available on request

Due to continuous R&D Pemamek Oy reserves the right to change the specification without notice.

PEMA Column & Booms have a modular construction and can be equipped with various accessories. Depending on the welding process in question, material to be used and the geometry of work pieces, every column & boom can be modularly tailored to best suit the task at hand.

Welding Processes

PEMA Column & Booms can be equipped with common welding processes.



TIG

TIG (GTAW) is most commonly used to weld thin sections of stainless steel and non-ferrous metals such as aluminum.



MIG/MAG

MIG (GMAW) is the most common industrial welding process, preferred for its versatility, speed and relative ease of adapting the process to automation.



Single SAW

A versatile process that can be used for a wide range of single-pass and multi-pass applications. In submerged-arc processes, the arc is struck beneath a covering layer of flux.



Twin SAW

A high-penetration / high-deposition process especially suited for making high-speed fillet welds and overlap joints.



Tandem SAW

A high deposition rate process for filling a joint quicker with fewer passes. Can also be used to obtain faster weld speeds for single-pass applications.



Tandem Twin SAW

Extremely high deposition rates are obtainable by using two twin arcs. The ultimate choice in welding thicker materials.

Welding Equipment

PEMA welding heads are equipped with all necessary accessories for efficient and high-quality welding. Depending on the welding process, these may include e.g. vertical, horizontal and tilting slides for torches, spot light, laser line, flux supply and suction and high-quality torches.



Single SAW welding head

Minimum diameter for inside welding is 800 mm.



Tandem/Tandem Twin SAW welding head

For heavy-duty applications.



MIG/MAG welding head

Designed for the latest MIG/MAG processes. Also weaving unit is available as an option.



All PEMA Single and Tandem welding heads are fully compatible with Lincoln Electric Power Wave® or Idealarc® technology.



Compact Single SAW, min diameter 600 mm

Special welding head for small diameter work pieces. Suitable for circular or long seam welding. Seam tracking is available as an option.



Compact Tandem SAW

Special Tandem head for small diameter work pieces. Suitable for circular or long seam welding. Seam tracking is available as an option.



Compact Single SAW, min diameter 400 mm

Extension-type welding head for extremely small diameter work pieces. Suitable for circular or long seam welding.



Cladding ESW or SAW

Cladding heads for electro slag and sub-arc strip cladding. Fixing brackets for quick change with a welding head. Strip widths 20 - 120 mm.

Modulation and Accessories

Cross Slide



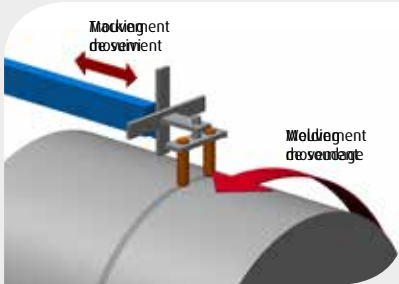
Standard motorised cross slide

Standard Heavy duty cross slides can be used in all welding processes. These can be chosen from 100 mm up to 600 mm stroke both in vertical and in horizontal direction.

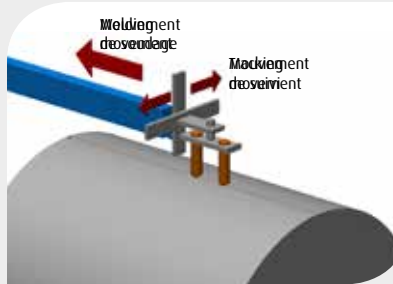
The slides are equipped with powerful and reliable DC motor that can be operated with seam tracking as a servo system. Also manual slides are available. All slides are equipped with covers with a good resistance to welding splatter and hot material.

Special slides can be made to customer needs for an extra heavy use, long travels or special movements.

Welding Head Fixing



Circular welding

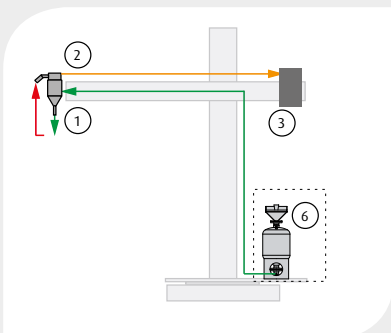


Longitudinal welding

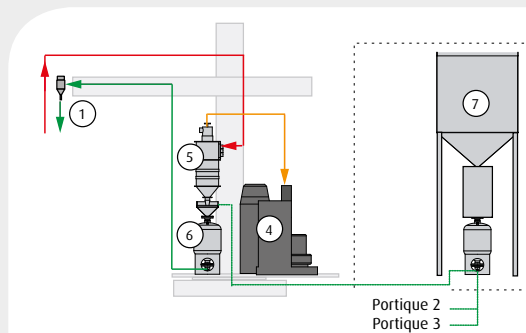
All standard PEMA welding heads can be rotated 90° for a longitudinal and circular welding in the same application.

Seam tracking control movement can be shifted from PEMA WeldControl panel to handle both directions.

Flux Handling for SAW



Pressured air operated flux handling

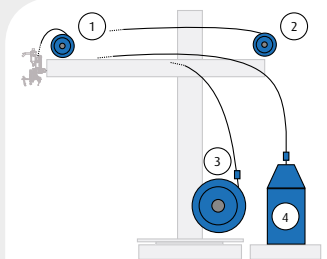


Vacuum operated flux handling

Flux handling equipment

1. Flux hopper
2. Ejector, pressure air operated
3. Filter unit
4. Heavy duty vacuum and filter unit
5. Cyclone
6. Pressure tank, heated/ not heated (optional in pressured air operated)
7. Flux silo (optional)

Wire Reels



Wire reel locations

1. Boom front: 30 kg reel
2. Boom back: 30 or 100 kg reel
3. Platform or additional carriage: 250 kg reels and additional wire feeders
4. Platform or additional carriage: 250 to 500 kg or up to 4x1000 kg AccuTrack® drum packages and additional wire feeders

Camera



A camera option is recommended for platform-operated column & booms.

Control Systems and Interfaces

PEMA offers two interface models for controlling column & booms. The location of a touch-panel user interface can be selected to fulfil the requirements of each application.

Both control systems integrate the controls of a column & boom, welding power sources, work piece handling equipment, and welding parameters to a clear-cut, easy-to-use system. The user interfaces are full-color industrial-quality touch screens. Welding process parameters are visualized by means of graphical trend lines. The system can also be connected to a factory data network.



PEMA WeldControl 100

- 12" industrial-quality touch screen
- Independent remote controller for controlling e.g. the movements of column & boom
- Management of all welding parameters and storage into memory slots
- Seam-tracking control
- Storing of production data
- Language support
- Remote support

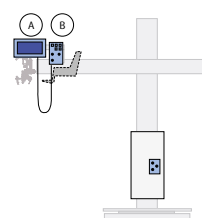


PEMA WeldControl 500

In addition to WeldControl 100 features:

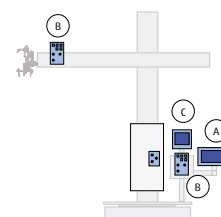
- PC technology 19" touch screen
- Multipass welding functionality
- Adaptive welding
- Groove measurement, camera and auxiliary software can be integrated
- Work-cycle manager
- Versatile graphical monitoring and storing of welding conditions
- Remote support

Boom end / Seat operated



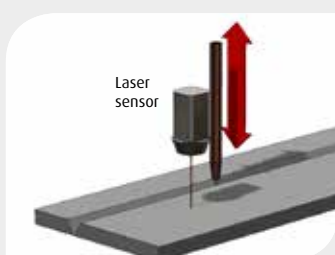
A: Touch-panel user interface
B: Remote controller
(Seat is available for HD/EHD models.)

Platform operated

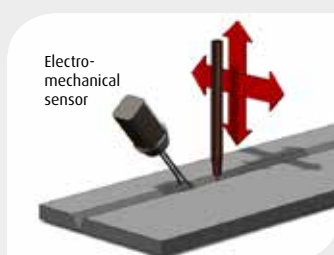


A: Touch-panel user interface
B: Remote controller
C: Camera display (recommended)

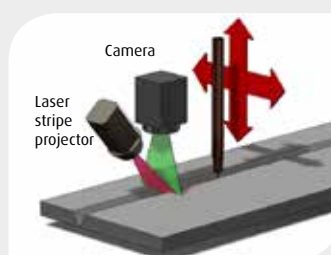
Seam Tracking



Optical height control



Electro-mechanical



Laser tracking with camera

Different types of seam tracking solutions are selected according to the customer needs.

Operator Seat



EU type certified operator seat with ladders.

Energy Chain



Energy chain for rail movement.

Rails, Stoppers and Safety Hooks



Rails, rail end stoppers and safety hooks for different rail types.



Make More with PEMA Production and Welding Automation

Pemamek Oy Ltd is a world-leading specialist in designing and manufacturing welding automation systems and equipment for various industry sectors.

PEMA products utilize modern robotized and automatic welding technology, and are uncompromisingly designed to increase customer value, competitiveness and production productivity. With over 45 years of activity, Pemamek has delivered welding automation systems to over 50 countries, more than 60% of which are outside of Europe.

PEMA systems and comprehensive customer support services are specifically engineered for the following industries:

- Heavy fabrication
- Mobile machinery
- Steel Structure manufacturing
- Shipbuilding
- Industrial boilers
- Wind energy
- Oil&Gas and Process

The time to start welding automation is now!

Make More.



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