

# Welding column & booms



# PEMA welding column & booms

PEMA column & booms are developed to improve productivity and meet the standards of high quality production. 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 employed welding process, 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 and rollerbeds*

### High quality, comprehensive support

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

### Wide variety of applications

Focusing first and foremost on the welding processes themselves, all PEMA column & booms as well as their accessories have been developed in order to compliment the welding process. Combined with e.g. PEMA roller beds, the result is a complete welding solution providing the required performance which 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.



*Extra heavy duty PEMA welding station*

### Application examples, standard solutions



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



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

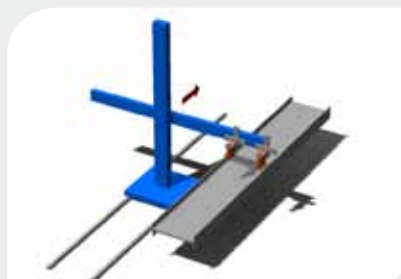


Outside welding of circumferential seam. The work piece is rotated by PEMA roller beds.

### Application examples, engineering solutions



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



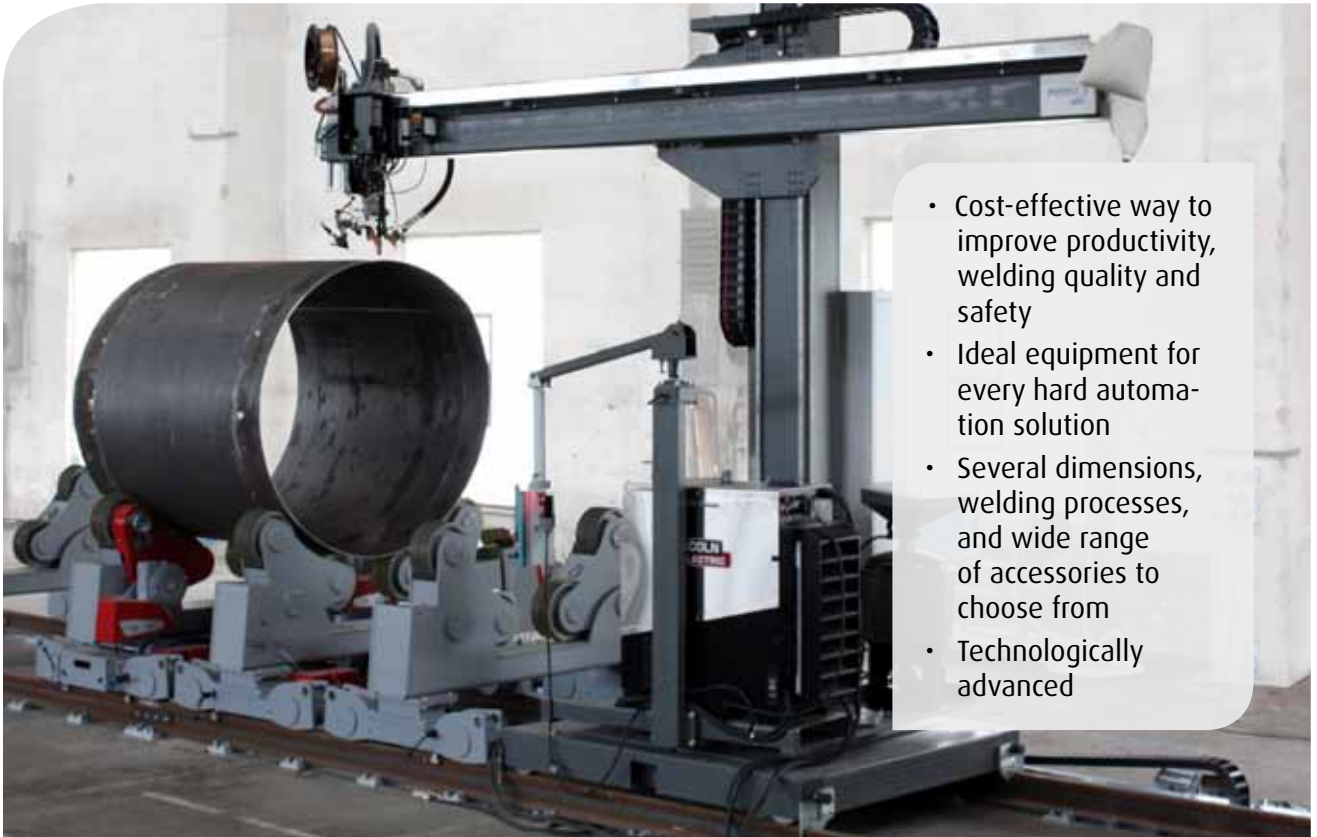
Simultaneous welding of several longitudinal seams in beams. In this case, the column & boom is driven on rails. Automatic seam tracking is recommended.



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



- Cost-effective way to improve productivity, welding quality and safety
- Ideal equipment for every hard automation solution
- Several dimensions, welding processes, and wide range of accessories to choose from
- Technologically advanced

*PEMA MD 4x4 column & boom with set of PEMA roller beds.*



*Internal longitudinal welding with PEMA column & boom and a set of roller beds*



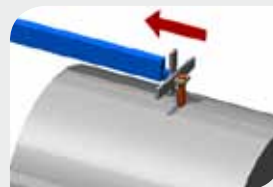
*MAG welding with PEMA MD column & boom*

## 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). The MD can easily be combined with PEMA roller beds and positioners to improve productivity, welding quality and safety at work. Safety is ensured with e.g. a falling prevention device. 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. 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

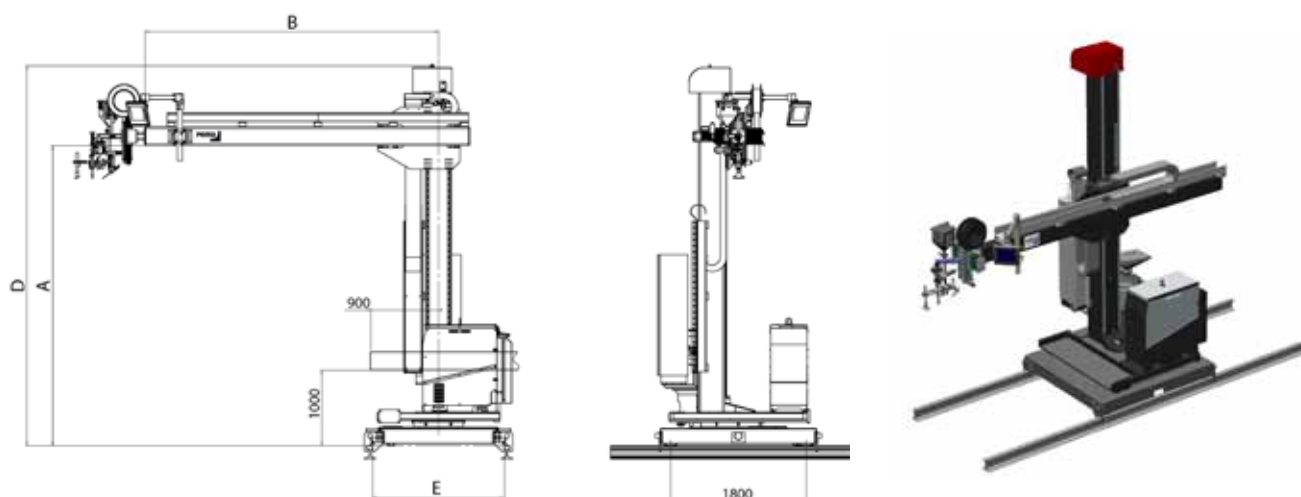
The standard PEMA MD series column & boom can be used for welding longitudinal and circumferential seams. This makes the use of a PEMA column & boom and PEMA roller beds on the same rails possible.



Outside or inside welding of a longitudinal seam



Outside or inside welding of a circumferential seam



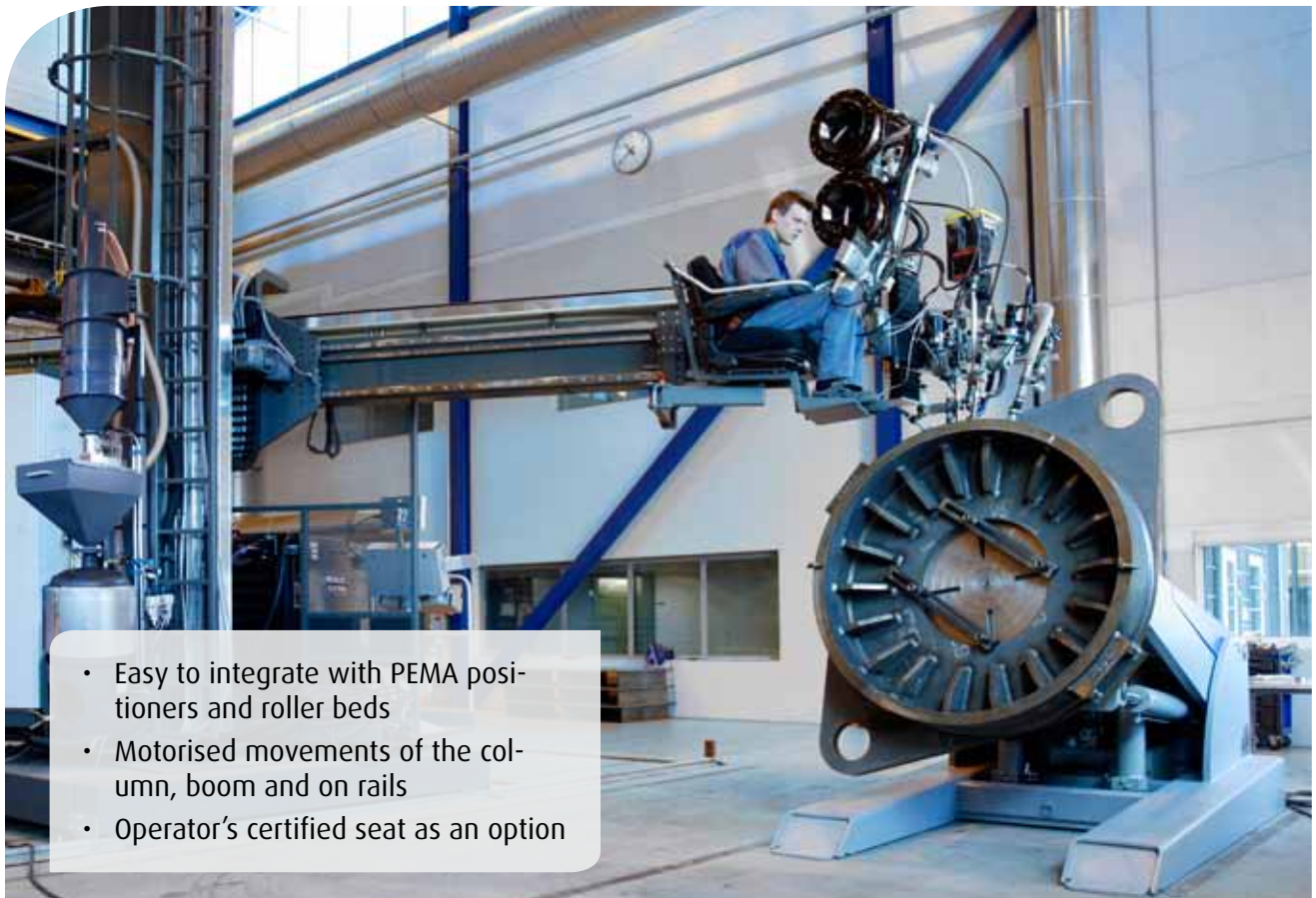
## Medium Duty Column & Booms

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](http://www.pemamek.com)

## Heavy Duty series

PEMA HD is a heavy-duty column & boom series for demanding welding automation purposes. With 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 suits well also for single wire and twin SAW as well as TIG and MIG/MAG welding processes.



*PEMA 6x6 HD column & boom integrated to a PEMA positioner*



*PEMA HD column & boom with PEMA rollerbeds*

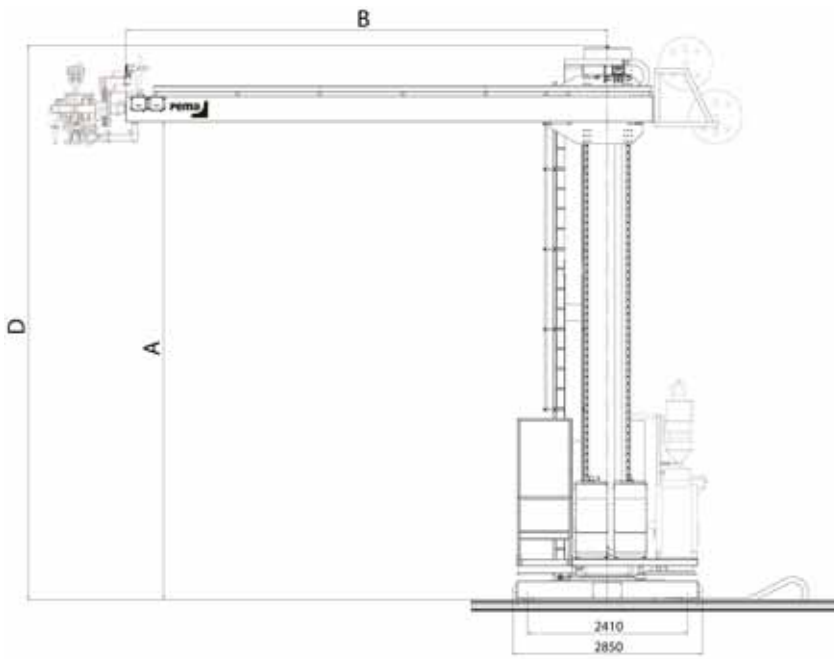
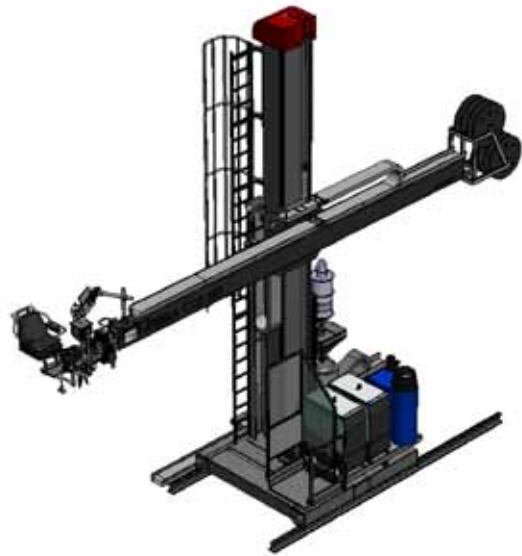


*EU type certified operator seat is available as an option*

## Heavy hard automation capacity

PEMA HD series sizes range from 4 x 4 meters up to 7 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 combinations, automated welding of work pieces can be carried out reliably and to highest standards of productivity and welding quality. The HD 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. 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 own factory in Finland, each machine is carefully tested before delivery. This stands for easy and quick installation as well as efficient commissioning.

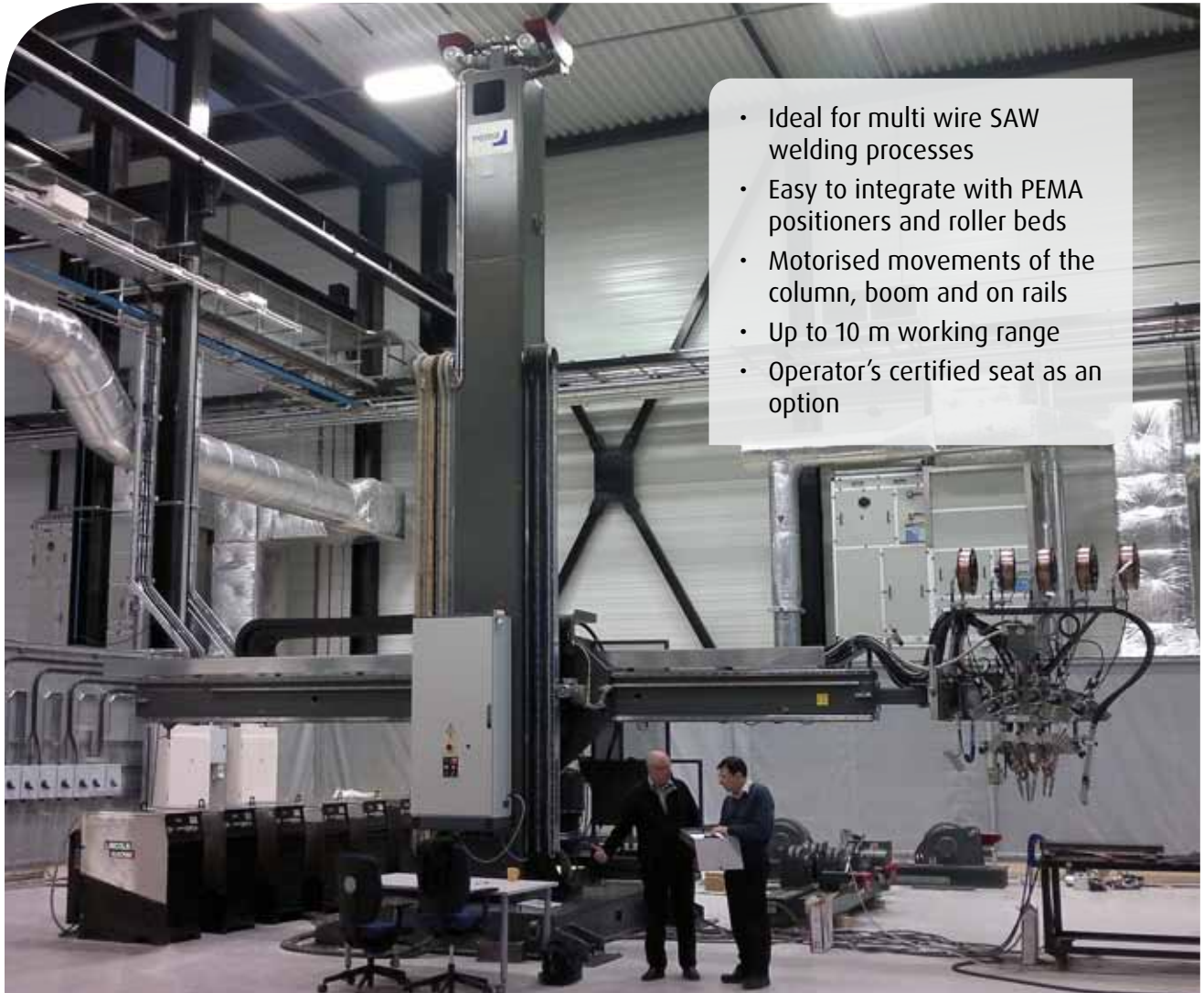


## Heavy Duty Column & Booms

HD SERIES:	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 – 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 – 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
Rail car speed (mm/min)	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
Total height [D] (mm)	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 customer production requirements, PEMA EHD column & booms are perfect solutions 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
- Motorised movements of the column, boom and on rails
- Up to 10 m working range
- Operator's certified seat as an option

*PEMA EHD 6x6 for engineered welding applications*



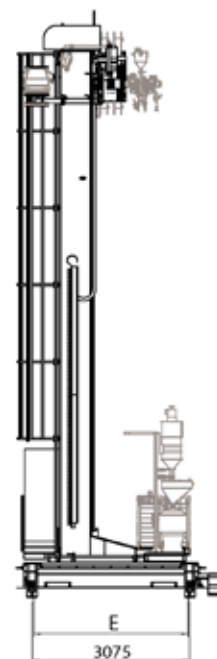
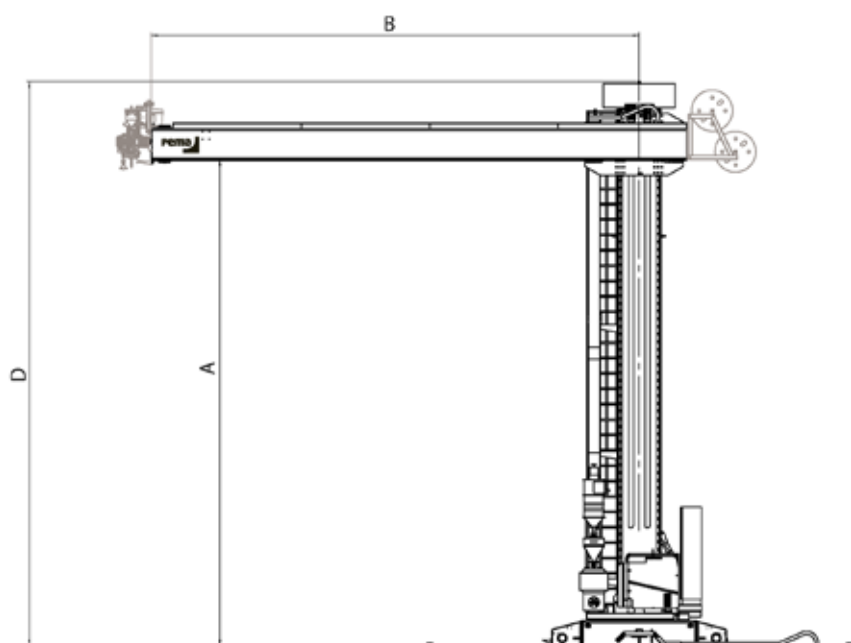
*PEMA EHD column & booms are always built to fulfil specific customer production requirements*



*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 & booms to form customer-specific, modulated hard automation cells for very heavy steel production. With this kind of combinations, 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 - 11 000 (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 Welding platform

Besides to standard PEMA column & boom series, roller beds and positioners, PEMA designs and manufactures also 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.



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

*PEMA is able to supply complete project deliveries*



*Operator controls welding process on a safe working platform*



*WMP welding platforms are especially designed for the special customer requirements*

### Huge welding capacity

In case of welding platforms, the welding processes are usually SAW with several wires, strip cladding, or narrow gap type solutions with single or double wire. Also 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 WMP welding platforms are especially designed for this type of production and facilitate the special requirements of the corresponding tasks.

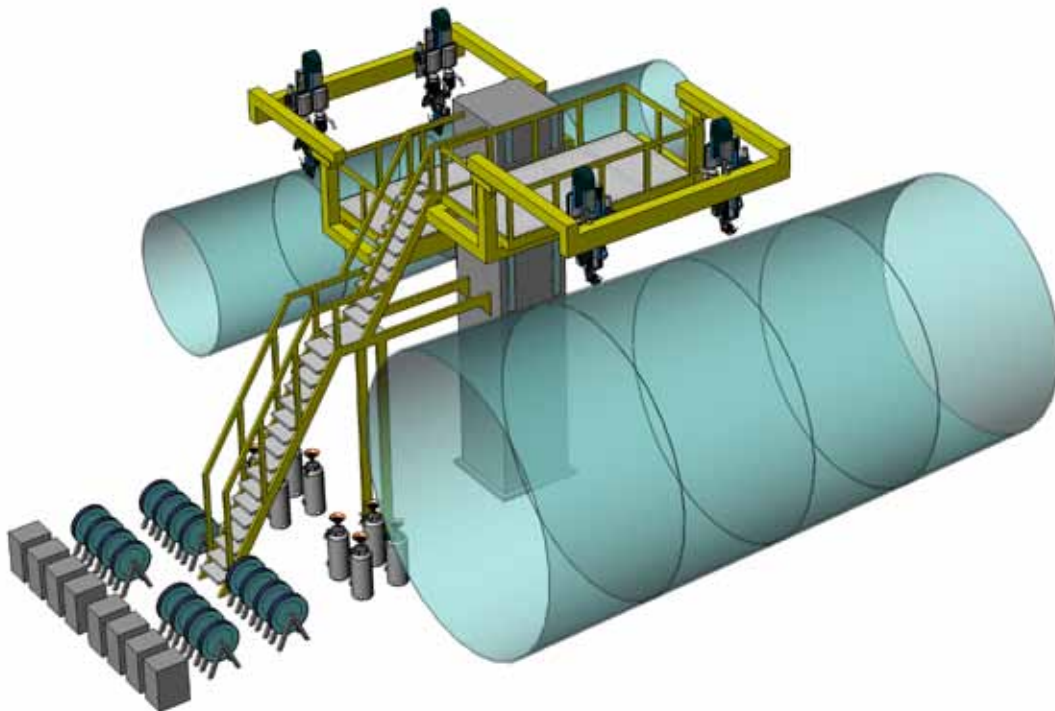
### Fixed boom with a moving carriage

Standard PEMA WMP welding platforms are of column & boom type. The construction is very heavy because the stability of the boom is a key issue. 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 motorised travelling carriage.

### Flawless quality

The work pieces have to meet tight welding quality requirements. That's why a fully automated welding process is a must. Therefore, 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 this same control interface.

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



## Welding platforms

	WMP 8 x 8 R	WMP 10 x 8 R	WMP 12 x 8 R	WMP 12 x 10 R
Vertical reach (mm)	1 000 – 9 000	1 000 – 11 000	1 000 – 13 000	1 000 – 13 000
Carriage reach from c-c (mm)	1 600 – 9 600	1 600 – 9 600	1 600 – 9 600	1 600 – 11 600
Operator platform	Included	Included	Included	Included

# Modulation and accessories

		MD series	HD series	EHD series
<b>Column</b> - vertical stroke	3 m	●	●	
	4 m	●	●	
	5 m	●	●	●
	6 m		●	●
	7 m		●	●
	8 m		●	●
	9 m			●
	10 m			●
<b>Boom</b> - horizontal stroke	3 m	●	●	
	4 m	●	●	
	5 m	●	●	●
	6 m		●	●
	7 m		● 1)	●
	8 m			●
	9 m			●
	10 m			●
<b>Base</b>	Floor mounted with rotation	○ 2)	●	●
	Rail carriage with rotation	○ 2)	●	●
<b>Welding equipment</b>	TIG	●	●	
	MIG/MAG	●	●	
	Single SAW	●	●	●
	Twin SAW	●	●	●
	Tandem SAW		●	●
	Tandem Twin SAW		●	●
	Compact Single SAW	●	●	●
	Compact Tandem SAW		●	●
	Cladding	●	●	●
<b>Cross slide</b> (vertical x horizontal)	Motorised 200x200, 300x300, 600x300	●	●	●
<b>Welding head mounting</b>	Longitudinal		●	●
	Circumferential		●	●
	Turnable 90°	●	●	●
<b>Flux handling for SAW</b>	Pressured air operated	●	●	●
	Vacuum operated	●	●	●
<b>Wire reels</b>	Front 30 kg	○	○	○
	Back 30 kg	○	○	○
	Back 100kg	○	○	○
	Platform or additional carriage: 250 kg		○	○
	Carriage for wire drums, up to 4x1000 kg		○	○
<b>Control systems and interfaces</b>	PEMA WeldControl 100	●	●	●
	PEMA WeldControl 500 Premium	●	●	●
<b>Camera</b>		○	○	○
<b>Seam tracking</b>	Optical height control	○	○	○
	Electro-mechanical seam tracking	○	○	○
	Laser seam tracking	○	○	○
<b>Operator seat</b>	Seat including ladders		○	○ 3)
<b>Rails</b>	Standard rail types 60E1, A55	○	○	○
<b>Energy chain</b>	Rail movement 4 - 30 m	○	○	○
<b>Guide hooks</b>	For different rail types	●	●	●
<b>End stoppers</b>	For different rail types	●	●	●
<b>Roller guides</b>	For welding with rail movement	○	○	○

● = 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 employed welding process, used material and the geometry of manufactured products, every column & boom can be modularly tailored to best suit the task at hand.

## Welding processes

Pema column & booms can be equipped with the 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.

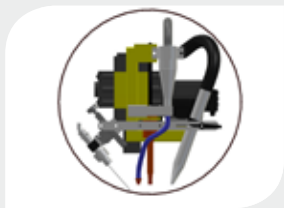


### MIG/MAG welding head

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

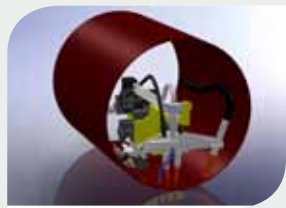


All PEMA Single and Tandem welding heads are fully compatible with Lincoln Electric Power Wave® or Idealarc® technology.



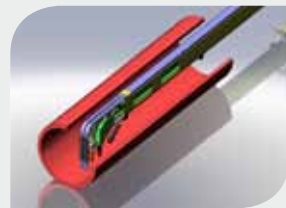
### Compact Single SAW, min diameter 600 mm

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



### Compact Tandem SAW

Special Tandem head for small diameter workpieces. 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 workpieces. Suitable for circular or long seam welding.

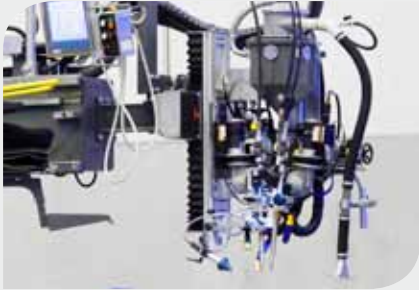


### Cladding

Cladding heads for electro slag and subarc strip cladding. Fixing brackets for quick change with a welding head.

# Modulation and accessories

## Cross slide

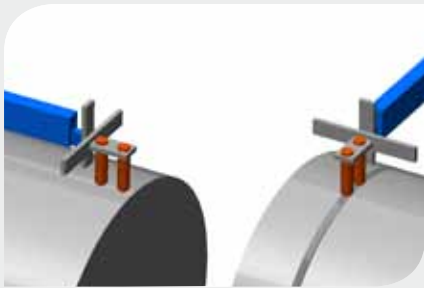


Standard motorised cross slide

Standard Heavy duty cross slides can be used in all welding processes. These can be chosen from 100mm up to 600mm stroke both in vertical and in horizontal direction. The slides are equipped with powerful and reliable DC motor that can operated with seam tracking as a servo system. Also manual slides are available. All slides are equipped with covers with good resistance to welding splatter and hot material.

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

## Welding head fixing



Longitudinal



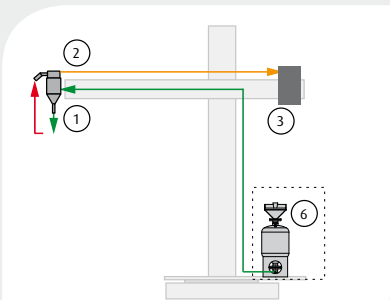
Circumferential



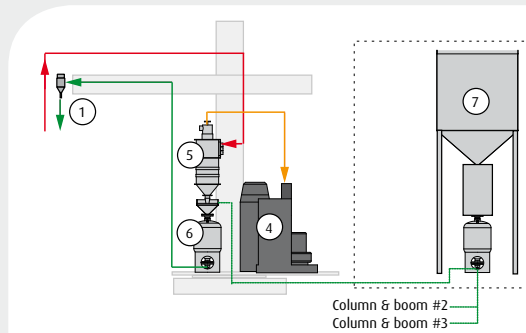
Turnable 90°

Welding head fixing is selected according to the needed solution. For Tandem process, PEMA can offer special head fixing for longitudinal or circumferential welding. With turnable welding head, both arrangements are possible. All standard Pema single SAW and Twin SAW heads are equipped with turnable heads.

## Flux handling for SAW



Pressured air operated flux handling

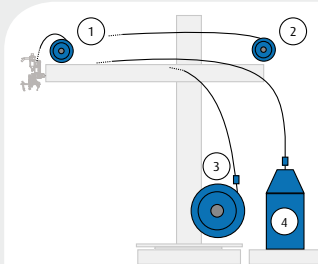


Vacuum operated flux handling

### 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



### 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



Camera option is recommended for platform-operated column & booms.

## Control systems and interfaces

PEMA offers two interface models for controlling column & booms. The touch-panel user interface location 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

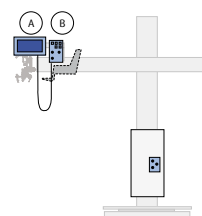


### PEMA WeldControl 500 Premium

In addition to WeldControl 100 features:

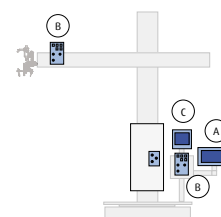
- PC technology 19" touch screen
- Multipass welding functionality
- Adaptive welding
- Groove measurement, camera and auxiliary software can be integrated
- Work-cycle manager
- Versatile graphical monitoring and storing of welding conditions

### Boom end / Seat operated



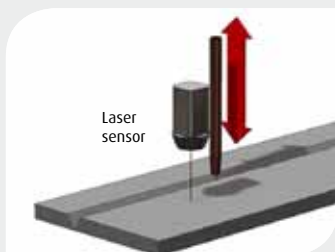
A: Touch-panel user interface  
B: Remote controller  
(Seat is available for HD/EHD models.)

### Platform operated

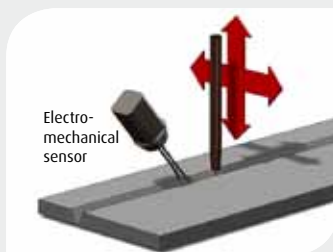


A: Touch-panel user interface  
B: Remote controller  
C: Camera display (recommended)

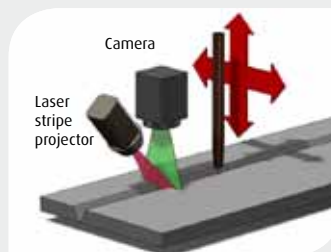
## Seam tracking



Optical height control



Electro-mechanical



Laser tracking with camera

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

## Operator seat



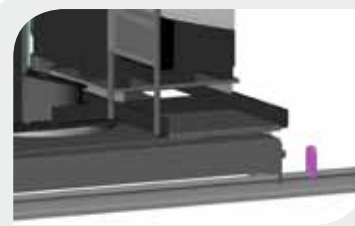
EU type certified operator seat with ladders.

## Energy chain



Energy chain for rail movement.

## Rails, stoppers and safety hooks



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



### THE WELDING EXPERTS

Lincoln Electric is the largest welding company in the world. The manufacturer employs more than 8,500 professionals globally, providing it with significant resources on which to call. With 42 manufacturing locations, including operations and joint ventures in 21 countries and worldwide network of distributors and sales offices covering more than 160 countries, Lincoln Electric is strategically positioned to provide the right products, service and support to enable its customers around the globe to prosper in today's challenging business environment. Lincoln prides itself on partnering with PEMA to offer customers the best Hard Automation solutions for any industry and application that utilizes arc welding.



### SPARKING YOUR BUSINESS

PEMA welding automation comes from Pemamek Oy Ltd, the world's leading specialist in designing and manufacturing welding mechanisation and automation systems, and workpiece handling equipment. Pemamek uses and produces high technology. Utilising the best available robot and automation technology, every PEMA product and system is uncompromisingly designed to improve customer competitiveness and productivity. Established in 1970, Pemamek has constantly strived to supply the best welding automation solutions in the world. In Europe, PEMA Hard Automation products and services are distributed by Lincoln Electric. For more information, visit [www.pemamek.com](http://www.pemamek.com).

***Contact Your Local Lincoln Electric Sales Office for More Information***

