KVT
SOLUTIONEERING
A BOSSARD COMPANY

PEMSERTER®

High performance installation of self-clinching fasteners

The center of excellence for high-performance fastening technology

KVT-Fastening is an expert for high-quality fastening applications and offers engineering solutions based on the wide product portfolio of the leading manufacturers in the market.

Mechanical engineering | Automotive | Electrical engineering | Energy | Precision engineering | Fluid power | Transportation | Off-shore and Marine | Medical equipment Aviation and aerospace | Construction industry | Watch manufacturing industry

www.kvt-fastening.com

KVT
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High-performance solutions from KVT-Fastening are found wherever absolutely safe and secure connections are essential. These small but extremely resilient components play key roles where it matters most – whether in the electronics and energy sector, the automotive and transportation industries, aviation and aerospace, engineering and construction, precision engineering, or medical equipment.

KVT-Fastening does not just supply standard products and individual components, but also provides close and active customer support in the search for ideal solutions, particularly when specific requirements must be fulfilled. This portfolio is complemented by a range of innovative tools and machines as well as, if needed, the integration into automated serial production workflows.

Ever since 1927, KVT-Fastening has stood for experience, solution-driven know-how, unique expertise in development and consultancy as well as the ultimate in reliability. Since December 2012, KVT-Fastening is a member of the Bossard Group. Bossard is a leading provider of intelligent solutions for industrial fastening technology. The range includes global sales, technical consulting (engineering) and logistics of fastening technology components and bolts. Customers benefit from the extension of competencies in industrial fastening technology and from an optimally enhanced product or service portfolio.

Flexible, high-performance and safe – An installation you can rely on

PEM® self-clinching fasteners are always a good choice, but the right installation for each application is decisive for reliable results of the operation.

No matter what the demands of the application are, the PEMSERTER® machine range guarantees an optimum installation for all PEM® self-clinching fasteners.

From the manual entry-level model to the semi-automatic version with feeder option to the high-tech machine with quadruple feed and robot connection, PEM® offers a range of machinery designed to cover all your requirements. Feeding the fastener directly into the stamping press is also an option.

Advantages

- Time saving
- Quality
- Cost reduction
- System sell
- On-site service

Contents

Technical performances, installation recommendations as well as unspecified tolerances regarding the dimensions of the parts have to be requested individual for each application before starting the series production.

All dimensions are specified in mm.

KfW-Energy-efficiency
programme | www.kfw.de

PEMSERTER®3000

Summary of advantages

Safety and quality

Safety system
Patented, photo-optical, self-monitoring safety system.
Force monitoring
The PEMSERTER® measures actual force and compares it with reference force.
Accident prevention regulations
The press complies fully with accident prevention regulations.
Ram stroke distance control
Bottom dead centre position is set using the integrated ram stroke distance control and each stroke is thus monitored. The system works without the electrical conductivity of the material.
Workpiece protection
The preset safety window protects both workpiece and operator.
Non-conductive workpieces
The safety system permits the installation into painted, anodised panels as well as circuit boards.
CE-marking
Complies with CE-directives.

Flexibility

Feeding tools
With five different automatic feeding possibilities, the PEMSERTER® 3000 is extremely flexible and easy to use.
Accessibility
Fasteners can be inserted from both sides in various different geometries.
Saving settings
All data can be saved on the hard disk. These programs can be archived with name and article numbers.
Intranet
External data storage is possible.
Control
Programming is installed on an integrated industrial PC (standard) with touch screen.
Return stroke limit
The return stroke can be set steplessly on the screen.
Automation robots
As a standard feature, the PEMSERTER® 3000 can be incorporated in a robot or an automated system.

Economy

Speed
The working stroke takes about 1 second (110 mm stroke).
Drive
Servo electromechanical actuator.
Energy efficiency
Power consumption 0.3 kW per hour.
Installation technology OMP (optimised motion profiles)
This means no dwell time is needed for installation into stainless steel panels and the installation result is optimised.
Tool changeover time
The PEMSERTER® 3000 can be changed over to another feeding tool in about 3 minutes.
Workpiece picture
It is possible to store pictures of the workpieces, incorporating the pictures in the program sequence and showing the installation position of the fasteners.
Languages
Operator guidance is available in several languages.
Videos
Stored training videos simplify and speed up the training process.

Service and maintenance

Software Update
At each inspection the software will be updated to the latest version.
Fault diagnostics
An intelligent software shows hardware and handling faults in plain text.
Router
The software can be actualised using a router and a connection can be established to the company's own network.
Maintenance contract
We offer an annual inspection by our own customer service as an option.
Telephone hotline
We are there to help you. Our customer service guarantees swift assistance.

Feeding versions and equipment
see pages 16, 18 – 19.

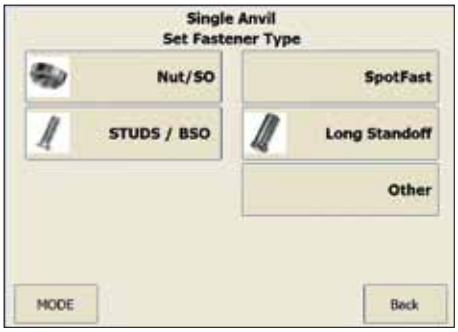
PEMSERTER®3000

Operator guidance

After starting up the Windows operating system the info screen appears, giving details of telephone and fax number of KVT-Fastening GmbH and the software version currently in use. By clicking on the country symbols different operating languages can be chosen.

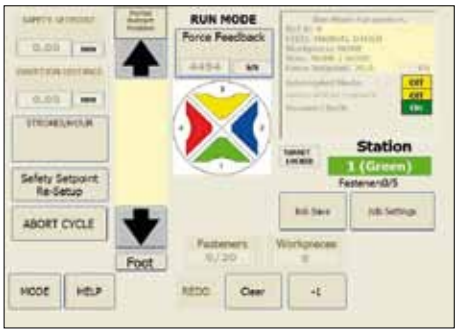
The access codes, selectable by the customer, enables operations only by authorised personnel (operator – setting-up technician – maintenance personnel).

You can select from five automatic feeding versions and a customer-specific programmable variant. This makes the PEMSERTER®3000 extremely flexible and versatile.



By selecting the size of thread and the corresponding workpiece material, the technology package will give you the specific installation force.

When in operation, the PEMSERTER®3000 displays all important parameters. You can restrict the return stroke or save your settings on this screen.



PEMSERTER®3000

Operator guidance

The operator of the PEMSERTER®3000 can control the behaviour of the screen navigation by disabling selection options not applicable for configuration of the press. Adjustment of the functions and their presentation is also possible.

The counter only records the number of fasteners correctly inserted in the workpiece and the number of panels per lot. An opto-acoustic signal is triggered to confirm when the set values have been reached.

The operator controls all output control signals of the PC with this screen. An output control signal can be switched on or off with each of the output buttons.

With this screen the operator can retrieve preset order details or store them.

KfW-Energy-efficiency
programme | www.kfw.de

PEMSERTER®3000MB™

Summary of advantages

Upgraded with expansion bowls

The multi bowl equipment comprises the PEMSERTER® 3000 automatic inserter, upgraded with the driven QX™ turret tool system and up to three further bowls. With this enhancement, the operator can process up to four different fasteners – nuts, studs or standoffs of different thread sizes – with automatic top feed tools. No further tool change is required.

The possibility of being able to match a standard PEMSERTER®3000 with existing levels of demand by additional bowls creates cost efficiency.

Summary of advantages

- Onetime handling of panels despite multiple fastener installation
- Universal tools – no tool changing during processing
- Automatic feeding of up to four different fasteners / sizes
- The PEMSERTER®3000 retains all its characteristics and advantages
- Large bowls for M2.5 – M8
- Can be retrofitted at any time – separately too

Universal jaw system

Using this system it is possible to combine feeds for different fasteners

Feeding versions

The QX™ turret tool system can be equipped with up to four anvils of your choice. The right position is determined by sensors. The table only „locks" in the correct position to prevent an operating fault.

Drive

The electric drive rotates the unit to the next programmed position, which simplifies the processing of large panels enormously.

1. Second bowl optional, from PEMSERTER® Series 2007

PEMSERTER®2000

Summary of advantages

Safety and quality

Safety system
The PEMSERTER®2000 has a patented, photo-optical, self-monitoring safety system.
Force monitoring
The PEMSERTER® measures actual force and compares it with reference force.
Accident prevention regulations
The press complies fully with accident prevention regulations.
Ram stroke distance control
Bottom dead centre position is set using the integrated ram stroke distance control and each stroke is thus monitored. The system works without the electrical conductivity of the material.
Workpiece protection
The preset safety window protects both workpiece and operator.
Compressed air monitoring
If pressure is too low, the PEMSERTER® shows a fault message and stops.
Painted panels or plastics
The PEMSERTER® safety system permits the installation into painted, anodised panels as well as circuit boards.
CE-marking
Complies with CE-directives.

Flexibility

Feeding tools
With five different automatic feed possibilities, the PEMSERTER®2000 is extremely flexible and easy to use.
Accessibility
Fasteners can be inserted from both sides in various different geometries.
Saving settings
Simply save your own settings. Order related data can also be recorded.
Control
The powerful PLC control can optionally be extended and programmed for further requirements.
Return stroke limit / dwell time
Due to the electronic return stroke limit and the variable dwell times (0.25 – 2 seconds) the PEMSERTER® produces a perfectes press result with optimum cycle rates.
Automation Robots
Optionally, the PEMSERTER®2000 can be incorporated in a robot system or an automated system.

Economy

Speed
The working stroke takes about 1.5 seconds (110 mm stroke).
Drive
The force is built up hydro-pneumatically. This form of energy
is only expended when the machine is working.
Changeover time
The PEMSERTER®2000 can be changed over to another feeding tool in about 3 minutes.
Operating costs
Energy and operating costs of the PEMSERTER®2000 are very low – e.g. only 4 litres of oil. Due to the high variable cost factor the PEMSERTER® is independent of all variation in quantities.

Service and maintenance

Software update
At each inspection the software will be updated to the latest version.
Fault diagnostics
Self-diagnosis and the plain text messages help to correct a standstill quickly.
Maintenance contract
We offer an annual inspection by our own customer service as an option.
Telephone hotline
We are there to help you. Our customer service guarantees swift assistance.

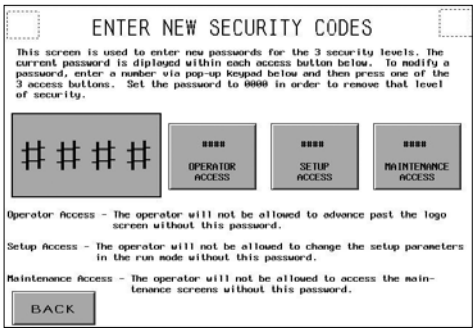
Feeding tools and equipment see pages 16 – 19.

PEMSERTER®2000

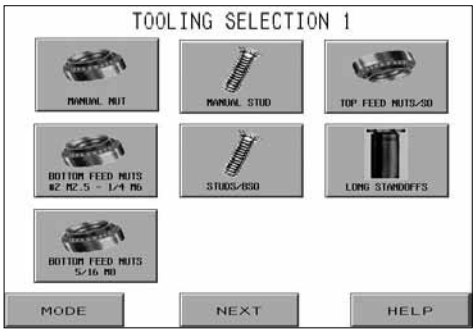
Operator guidance

After switching on the PEMSERTER®2000, the info screen appears, giving details of telephone and fax number of KVT-Fastening GmbH and the software version currently in use. Operator guidance is available in several languages.

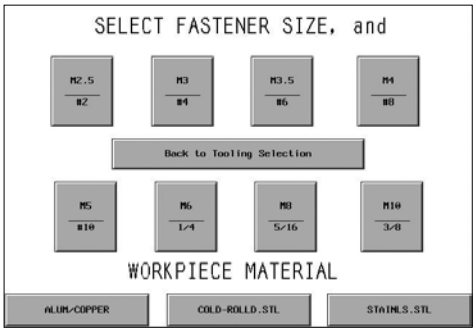
The access codes, selectable by the customer, enables operations only by authorised personnel (operator – setting-up technician – maintenance personnel).



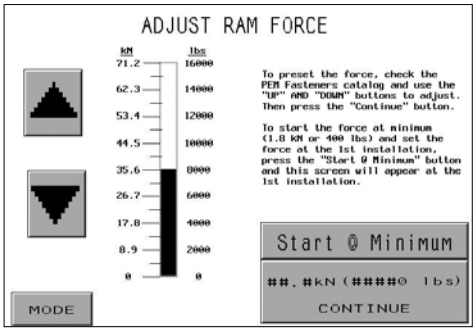
You can select from five automatic feeding versions and a customer-specific programmable variant. Thus the PEMSERTER®2000 is extremely flexible and versatile. The individual feeding versions are described again in the „Help" section.



By selecting the size of thread and the corresponding workpiece material, the technology package will give you the specific installation force.



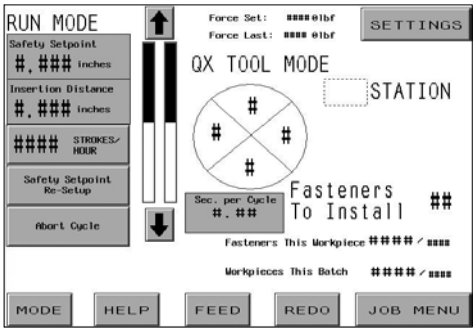
The installation force suggested can be altered to the customer's requirements for the actual hardness of the panels



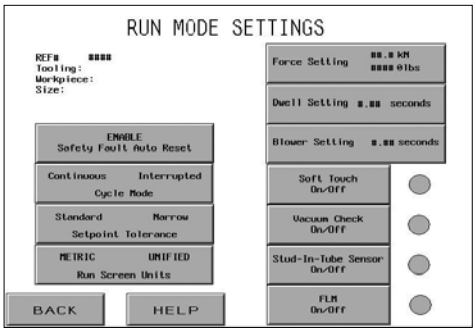
PEMSERTER®2000

Operator guidance

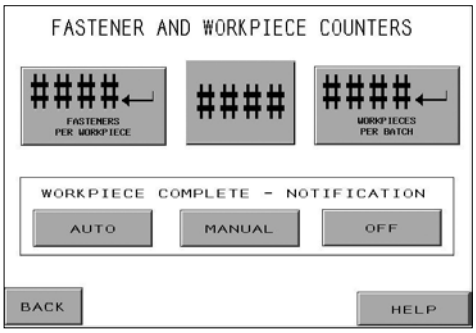
When in operation, the PEMSERTER®2000 displays all important parameters. Here you can restrict the return stroke or save your settings.



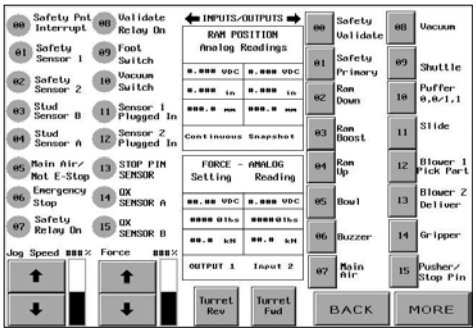
Various settings can be adjusted in the set parameters (e.g. dwell time, safety window, soft-touch etc.)



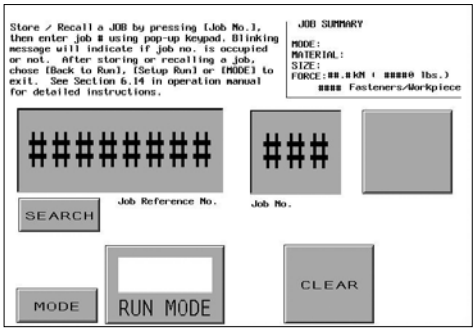
The counter only records the number of fasteners correctly installed in the workpiece and the number of panels per lot. An opto-acoustic signal is triggered to confirm when the set values have been reached.



All input signals, changeover valves and mechanical functions can be tested via the direct control of the input and output signals. Down-time is thus reduced to a minimum in case of a malfunction.



Your set values can be saved to several storage areas. If required, the order number can also be saved.



PEMSERTER®2000/3000

Equipment

Fastener length monitoring FLM

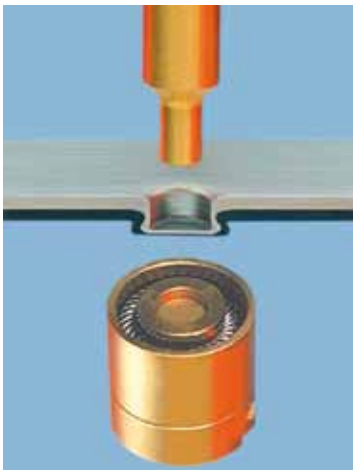
(on request)

The FLM system ensures that only studs and standoffs of the desired length are processed in the PEMSERTER® automatic inserter. This option protects from expensive malfunctions if parts of the wrong length find their way into the bowl by mistake. The sensor recognises this and rejects the part. The unit is self-monitoring and if it detects a malfunction, no further parts are allowed to pass the FLM.

Note

With the PEMSERTER®2000 pressure joining is possible.

For further information, please contact us.



PEMSERTER®2000

Equipment

Second bowl

The optional second bowl can be retrofitted to all PEMSERTER®2000, from PEMSERTER® Series 2007. In conjunction with the QX turret tool system can be fed two fasteners automatic and two manual. This increases flexibility and throughput to an optimum.

PEMSERTER®2000/3000

Feeding versions

Feeding versions of PEM® self-clinching fasteners and equipment

Top feed
Self-clinching nuts and standoffs are taken by the punch pilot pin from the jaws. During the working stroke the anvil pin lowers for the fastener.

Top feed
Studs and blind standoffs are held in place by a vacuum punch. During the working stroke the anvil pin lowers for the fastener.

Bottom feed
Only nuts can be blown directly into the bottom feed module (anvil) using a special feeding tube. The shank of the self-clinching nut points upwards and simplifies the exact location of the positioning hole in the panel.

PEMSERTER®2000/3000

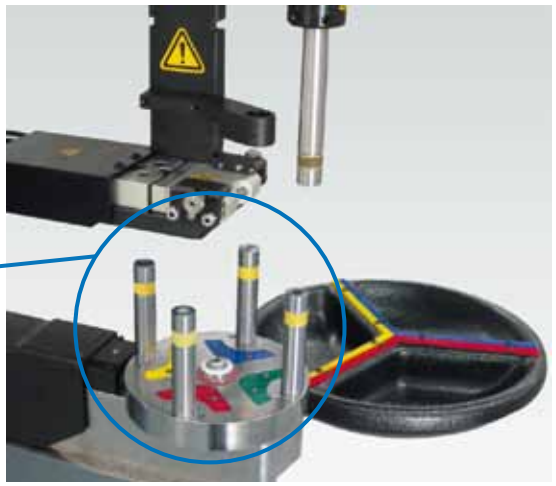
Feeding versions, equipment

Top feed double stroke
In the first part of the cycle the punch pilot pin takes only PEM® self-clinching nuts out of the jaw and places them on the anvil with the shank pointing upwards.

Pre-location and anchoring
Now the hole in the panel is placed on the shank of the nut. In the second part of the cycle, the punch moves down to install the nut permanently into the panel.

Equipment: QX™ turret tool system
The „QX" can be set up with four different anvils of your choice. In the manual version (only PEMSERTER®2000) each position is fed manually. The correct position is determined by sensors. The table only locks in the correct position and thus prevents any malfunction.

Drive:
The electric motor which can be retrofitted rotates the table into the next programmed position. This makes the processing of large panels more simply. When the PEMSERTER®3000 is retrofitted with the QX system, the drive is included automatically.




SERIES 4

PEMSERTER®4 AF

Summary of advantages

The PEMSERTER®4 AF is designed for the automatic feeding of studs, nuts and standoffs from M2.5 to M6.

The force-limited system processes all PEM® fasteners up to 53.4 kN. It is used for medium to larger quantities.
To operate the press it only requires an air supply of 6 – 7 bar as well as a 230V power connection.

Features

- Design with integrated bowl
- Integrated PLC control with touch screen (picture 1)
  - Fault diagnosis
  - Display of setup parameters
  - Integrated fastener and workpiece counter
  - Password protection
- Continuous variable power adjustment from 1.8 to 53.4 kN through a pressure regulator with quick exhaust feature and display in kN
- Increasing production efficiency by automatic feeding and easy handling of changing tools (picture 2)
- The stable and robust tool cabinet/frame ensures safe and ideal footing to the pneumatic press
- Compatible tools to other PEMSERTER® presses
- Ideal cost / performance ratio

Benefits

- Time saving through efficient operation and short convert/retrofit times
- High product quality
- Cost reduction through efficiency
- System sell in combination with our wide PEM® fastener product range
- On-site service

The basic machine structure is identical with the machine PEMSERTER®4 (see page 23).


1


2


1


2


3


4

PEMSERTER®4

Summary of advantages

Manual pneumatic press for installing all PEM® self-clinching fasteners with M2 – M8 threads in corresponding panel material.

The press with force restrictor installes all PEM® self-clinching fasteners in a range up to 53,4 kN. It is used for small to medium-sized lots. Only a compressed air connection of maximum 6 bar is needed to operate the press. A delay valve (timer) enables – especially for stainless steel panels – an optimum installation of self-clinching fasteners. When using turret anvils (revolving anvils), the changeover time from one thread size to another is reduced to a matter of seconds.

These turret anvils are available for studs, stand-offs and nuts. Naturally such a turret anvil can also be modified to make it suitable for various parts, exactly in accordance with the requirements of the customer's components.

1. On the PEMSERTER®4, working safety for the operator is guaranteed mechanically.
   The punch moves downwards by its own weight, damped by the air valve.
   During the setup, the thickness of the panel and the height of the self-clinching fasteners will be set. In continuous operation, the power stroke can only be actuated when the control nose on the upper punch shaft contacts the ball-valve while moving down.
   The power stroke, actuated by a lever, is a maximum of 4 mm.

2. Steplessly variable force setting from 1.8 – 53.4 kN via a pressure reducer with quick vent valve and a display in kN.
   Selector switch for setting and working operations.
   The mechanical counter registers the valid working strokes and thus the fasteners. This prevents defective deliveries and thus customer complaints.

3. Setting the dwell time (the time for which pressure is maintained while pressing) is possible by using the timer. The dwell time is most important in particular for hard panels such as those of stainless steel. Material must be able to flow into the undercut of the self-clinching fastener. A good connection is only guaranteed when adequate time is preselected to allow cold-forming to take place.

4. The laser spot helps to find the installation position. The laser spot is directed at the centre of the anvil. The laser spot shows exactly where the panel must be moved to find the anvil.
   This saves time and money!

PEMSERTER®4

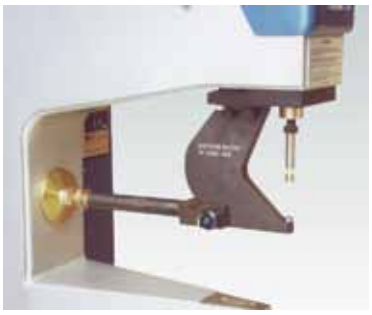
Equipment

Turret tools (revolving tools)

Used for installing self-clinching fasteners of different thread sizes.
By rotating the turret anvil, retooling is accomplished in a matter of seconds.

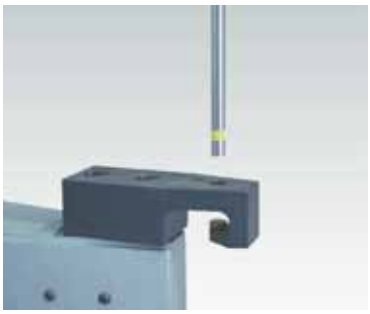
Top mount reverse flange anvil holder

When a workpiece flange and fastener location prohibits the use of standard tooling, the use of a top mount reverse flange anvil holder will often solve the installation problem.
Maximum force 40 kN.



Bottom mount reverse flange anvil holder

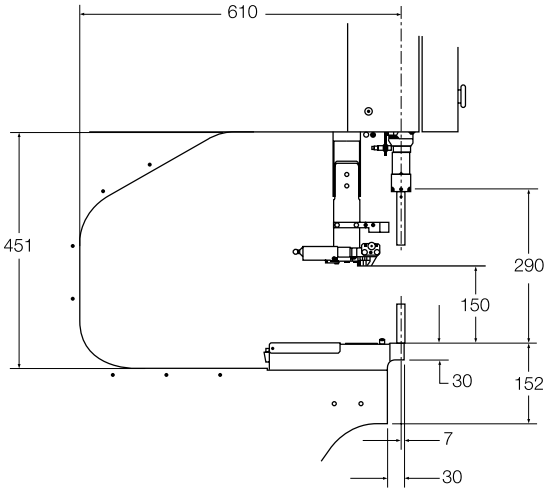
When a workpiece flange and fastener location prohibits the use of standard tooling, the use of a bottom mount reverse flange anvil holder will often solve the installation problem.
Maximum force 27 kN.



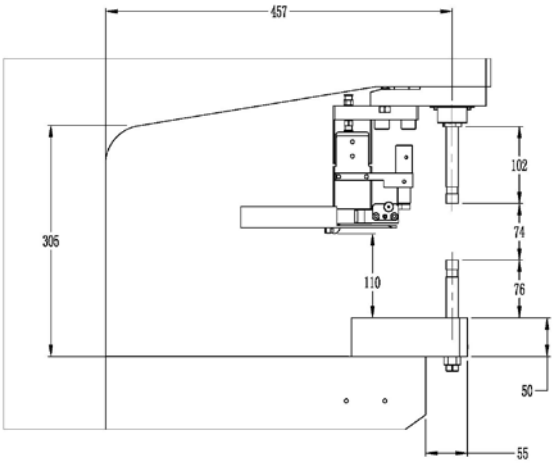
PEMSERTER®3000/2000/4 AF/4

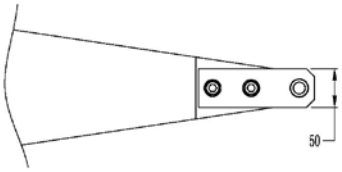
Technical drafts

PEMSERTER®3000/2000

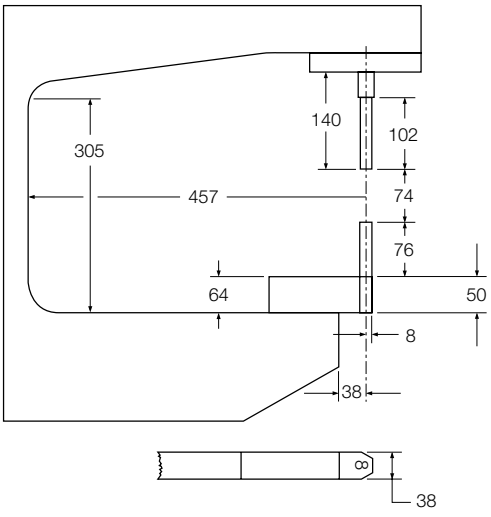


PEMSERTER®4 AF





PEMSERTER®4



PEMSERTER®3000/2000/4 AF/4

Technical drafts

	PEMSERTER®3000	PEMSERTER®2000	PEMSERTER®4 AF	PEMSERTER®4
Time per stroke (seconds)	1	1,5	3	3
Installation force	71,2 kN	71,2 kN	53,4 kN	53,4 kN
C-Frame depth	610 mm	610 mm	457 mm	457 mm
Stainless steel technology	•	–	–	–
Automatic installation force setup	•	–	–	–
Installation force monitoring	•	•	–	–
Photo-optical self-monitoring savety system	•	•	–	–
Tool changer - QX™ (4 tools)	o	o	–	–
QX™ Turret tool drive	o	o	–	–
Second bowl	o	o	–	–
Touchscreen control	incl. PC Windows XP	PLC	PLC	–
Fastener Length Monitoring - FLM	–	o	–	–
Vacuum monitoring	•	•	•	–
Operating software	•	•	•	–
Storage for pictures	•	–	–	–
Fault diagnostic software	•	•	•	–
Robot capability	•	o	–	–
Dwell time/timer	•	•	•	•
Workpiece protection	•	•	•	•
Fastener counter	•	•	•	•
Laserspot	•	•	•	•
Batch counter	•	•	•	–
Bowl size	up to M10	up to M10	up to M6	–
System of drive	Servo motor	hydropneumatic	pneumatic	pneumatic
Electric Inlet	400V/50Hz/32 Amp.	230V/50Hz/16 Amp.	230V/50Hz/16 Amp.	–
Air inlet	5 – 6 bar	6 – 7 bar	max. 6 bar	max. 6 bar
Height	2.080 mm	1.930 mm	1.676 mm	1.676 mm
Width	920 mm	920 mm	690 mm	690 mm
Depth	1.260 mm	1.260 mm	940 mm	940 mm
Weight	ca. 1.235 kg	ca. 1.135 kg	ca. 390 kg	ca. 308 kg
Training and first time operation	•	•	•	•
Warranty/years	1	1	1	1

• standard | o optional | – not available

Every feeding line, shuttle and blower pipe is independently monitored by sensors.

Maximum 5 lines (different self-clinching fasteners) can be simultaneously controlled with IN-DIE.

1. Bunker
2. Bowl
3. Feed line, shuttle and feeder sensors
4. Touch-screen control
5. Mobile cart

Technical data

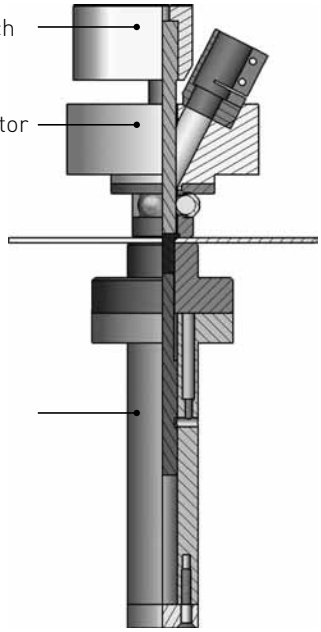
- Electric requirements: 230V/50Hz/16 Amp.
- Air requirements: 6 – 7 bar
- Height (incl. bunker): 1.580 mm
- Width: 790 mm
- Depth: 1.220 mm
- Weight: 770 kg

PEMSERTER® IN-DIE

Automated feeding of PEM® self-clinching fasteners for die-cut serial parts

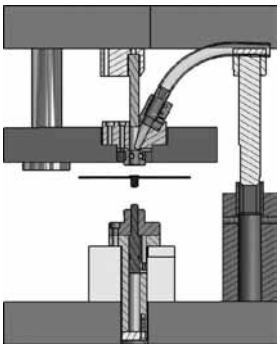
Standard design feeding system
Stud cart | universal* | 1 bowl | 4 lines

Stud installation tools

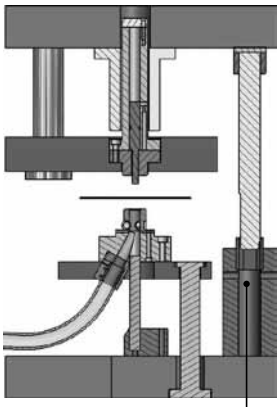


Tooling

Stud top feed



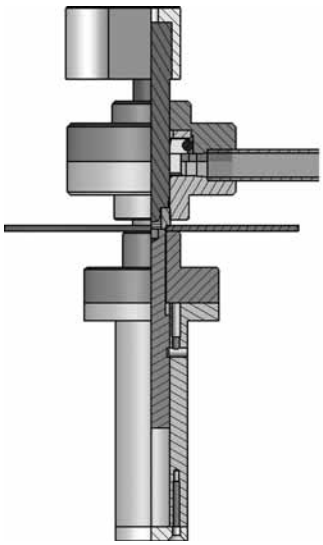
Stud bottom feed



Flag sensor and control box (one unit per customer's tool)

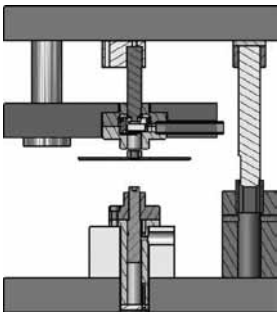
Standard design feeding system
Nut cart | universal* | 1 bowl | 4 lines

Installation tool for nuts

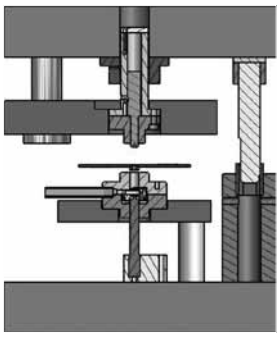


Tooling

Nuts top feed



Nuts bottom feed



* Universal means that the respective feeding system is supplied with conversion sets for thread sizes M5, M6 and M8. Other variants and sizes on request.

PEMSERTER® IN-DIE

Nut cart

With the universal nut cart*, up to four self-clinching nuts with thread sizes M5 / M6 / M8 can be fed. Special designs for a maximum of five nuts with two bowls are available on request.

* Universal means that the respective feeding system is supplied with conversion sets for thread sizes M5, M6 and M8. Other variants and sizes on request.

One nut at a time is blown from the sensor-monitored shuttle into the tool and is installed subsequently.

The nuts are pre-sorted in an escapement into the correct direction for installation.

Sensors monitor and regulate the feeding of the nuts into the feeding lines.

PEMSERTER® IN-DIE

Stud cart

With the universal stud cart* up to four threaded studs of types FH / HFH / HFE and coarse-threaded studs with M5 / M6 / M8 thread sizes can be fed.

* Universal means that the respective feeding system is supplied with conversion sets for thread sizes M5, M6 and M8. Other variants and sizes on request.

One stud at a time is blown from the sensor-monitored shuttle into the tool and is installed subsequently.

Sensors monitor and regulate the feeding of the studs into the feeding lines.

The bunker, also sensor-controlled, guarantees a constant filling level of the bowl.

KVT-Fastening – Fastening technology


Blind rivet nuts


Blind rivet technology


Thread inserts


Self-clinching fasteners


Stud welding systems [1]


Lock nuts


Bonding fasteners


Access solutions


Quick fastening elements and clips


Quick release pins and spring plungers


Adhesives and sealants [1]


Construction fasteners [2]


Special processes [2]


Plugs


Pressure intensifiers [3]


Installation technology


Quick connectors [4]

Fastening, sealing and flow control solutions for complex applications

The extensive KVT-Fastening portfolio offers optimal solutions for your most challenging applications. The products included in this catalog represent only a selection from our entire product portfolio. Upon request, we will be pleased to provide additional information or an individual consultation to you.

Intelligent logistic systems

Bossard SmartBin and SmartLabel are intelligent logistics systems which monitor stock with total reliability and ensure stock replenishment automatically.
An online system transmits the data to our server, and this – if necessary – triggers an order. These systems ensure quick and easy availability of C-parts while production is running.


Logistic systems

Competent analysis for efficient solutions

KVT-Fastening's highly qualified experts analyze the given task at hand.
Based on this sound understanding of the project, they then develop ideal solutions that are economical, efficient, and safe.


Solutioneering

For more information about our range of products and order at our E-shop, please visit www.kvt-fastening.com

[1] Not available in Germany. [2] Only available in Switzerland. [3] Not available in Switzerland. [4] Not available in Austria.

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