

*Machines for  
solid metal forming*

# Hydraulic presses

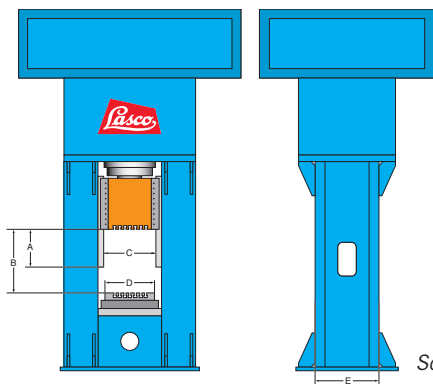


**LASCO UMFORMTECHNIK  
WERKZEUGMASCHINENFABRIK**





# VP series



Schematic of VP press

A = Ram stroke  
 B = Installation height max.  
 C = Daylight between guides  
 D = Table width  
 E = Table depth

VPA	Press force [kN]	Ram stroke [mm]	Installation height max. [mm]	Daylight between guides [mm]	Table (ram) area width x depth [mm] x [mm]	Ram speed Return [mm/sec]	Pressing speed [mm/sec]	Main motor [kW]
250	2500	450	900	800	780 x 700	550	100	160
400	4000	650	1150	1000	980 x 1000	550	85	2 x 132
630	6300	650	1250	1000	980 x 1000	550	110	3 x 160
800	8000	650	1250	1250	1230 x 1200	550	85	3 x 160
1000	10000	700	1400	1250	1230 x 1200	550	100	3 x 200
1250	12500	800	1500	1400	1380 x 1300	550	110	4 x 200
1600	16000	800	1500	1500	1480 x 1400	550	85	4 x 200
2000	20000	1000	1600	1600	1580 x 1500	550	85	5 x 200

VPE	Press force [kN]	Ram stroke [mm]	Installation height max. [mm]	Daylight between guides [mm]	Table (ram) area width x depth [mm] x [mm]	Ram speed Return [mm/sec]	Pressing speed [mm/sec]	Main motor [kW]
400	4000	450	1000	1000	980 x 1000	550	45	120
500	5000	450	1000	1000	980 x 1000	550	70	2 x 120
630	6300	650	1100	1000	980 x 1000	550	60	2 x 132
800	8000	650	1100	1250	1230 x 1000	550	55	2 x 200
1000	10000	800	1350	1300	1280 x 1200	550	68	3 x 200
1250	12500	800	1350	1300	1280 x 1200	550	55	3 x 200
1600	16000	800	1350	1500	1480 x 1400	550	55	3 x 200
2000	20000	800	1350	1600	1580 x 1500	550	50	4 x 200

- Additional press series (e.g. VPZ) and sizes on request
- Hydraulic ejectors in the table and/or in the ram on customer's demand
- Ejector force, -stroke, -speed according to customer's specifications



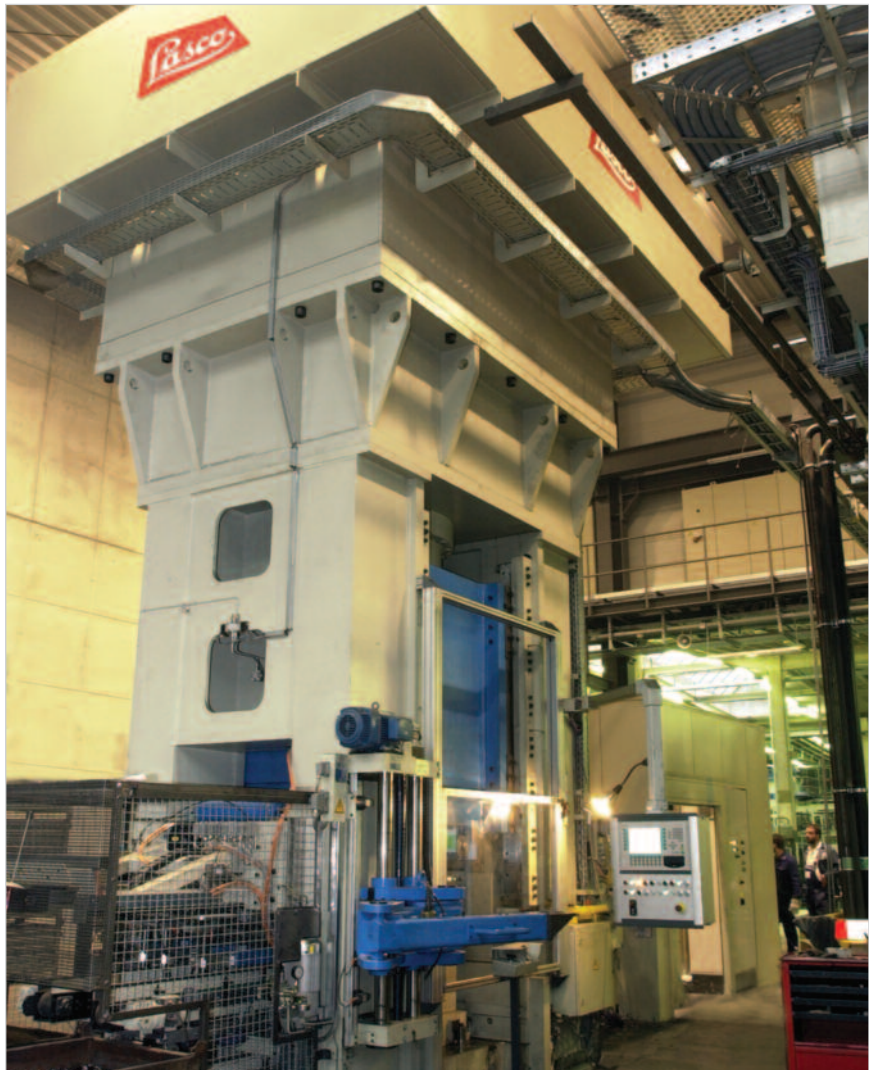
## Economic production machines

Since its foundation in 1863, LASCO has been engaged in harnessing fluid power for forming applications. At an early stage we became aware of the advantages of oil-hydraulic systems and applied them to the construction of efficient forming machines. With more than 100 years of experience, LASCO offers forming systems world wide that are designed to withstand the demanding working environments which exist in the forming industry and are capable of performing their tasks with efficiency and reliability.

LASCO presses, with oil-hydraulic drive, combine "state of the art" hydraulic, mechanical, and electronic control technology in a functional entity, ensuring optimum productivity in a cost effective manner, for the long term.

The requirements of our customers are the benchmark for our actions, resulting in the production of machines designed specifically for each application.

Whilst the basic concepts of LASCO hydraulic presses are outlined in this brochure, we would be delighted to discuss with you, the exact performance you would expect from "your" hydraulic press.



*Illustrated is a LASCO KFP cold extrusion press of 1000 tonnes capacity for extrusion of automotive parts. More than 1000 LASCO hydraulic presses, engaged in a wide range of applications, are installed world-wide.*



*The 300 experts at LASCO have one common goal: the delivery of machines that will ensure the client's long term success.*

## Hydraulic presses for solid metal forming



*Pistons are forged on a VPE 160 and a VP 800.*



*A billet is pre-formed for a ring, on a VPE 800.*



*Calibrating in a KP 500.*

Hydraulic presses are the first choice for a diverse range of solid metal forming tasks, due to the wide range of energy at their disposal, which in combination with other inherent characteristics provides high versatility. Efficiency is maximised by the careful design of the drive unit and by the selection of modern control technologies.

Characteristics which LASCO incorporate in all their presses are rigidity, ergonomic design, operator safety, ease of operation and maintenance, and never sacrificing long term viability for reasons of cost.

Consideration of high rigidity of the press frame, optimum forming speeds, rapid pressure attainment, quick reversal of stroke, and exceptionally short contact times is afforded high priority at the design stage.

The **VP**, **KFP** and **KP** ranges are available with a large number of options of automation, quick tool change systems and process technology for a wide range of hot, warm, and cold forming applications, which may include combinations of descaling, upsetting, edge breaking, pre-forming, stretching, bending, extrusion, trimming, piercing, and calibrating.

Demands of the actual process will influence selection of stroke length, ram speed, function and tool area dimensions, as well as frame construction, press drives, ram depth and guidance, and possibility of ejection systems.

Customer preferences will influence the design of the control system and tooling application.

LASCO is able to offer not just the construction, fabrication and assembly of a press, but an

integrated production and quality system, incorporating all the features requested by the customer, with development done in house, ensuring a smooth installation and start up in the customer's plant.

## Ensuring profitable production



*A billet is pre-formed for a ring, on a VPE 800.*

## Comprehensively proven...



Layout of a press cylinder on a "LASCO" hydraulic press.

#### Press frame design

The choice of press frame design, either single piece or multiple element construction is determined by table area, installation height, ram stroke and application.

- Single piece weld fabrication, stress-relieving heat treated.
- Multiple element press frames, consisting of press table, uprights and cross head, pre-stressed with four tie rods.

#### Multiple element press frame

The press frame offers certain advantages, compared with single piece frames. Different materials of special suitability may be considered for the individual parts.

Potential notch stress concentrations at the connection between the table and the uprights and between the cross-head and the uprights on single piece frames are eliminated.

Transport of multi piece presses may be easier and at lower cost, as press is able to be disassembled into smaller units.

Above all, the press frame consisting of several parts is considerably more rigid as a result of the pre-stressing. For the same tensile stress, the elongation is only 20% of the value induced in a single piece frame.

As well as ensuring longevity of the frame, and forming of more accurate parts, overall size and weight of press may be reduced.

#### Bolster plate on the table

LASCO presses are equipped with a protective bolster plate on the table to minimise wear. They are supplied as standard with T-slots for holding the tools, with option of custom designed hydraulic clamping systems.

#### Press cylinder

The press cylinder is forged steel with the bore honed. A pre-fill valve between the top of the cylinder and the oil tank ensures rapid filling and return of the oil. Split chevron packings with wiper rings provide a seal between cylinder and piston.

#### Press piston

The press piston is also forged. The contact surfaces are hardened, ground, and polished. A bronze bush ensures optimum sliding characteristics in the upper sealing and guiding area.

#### Ram

The ram may be either a steel casting or weld fabricated, fully stress-relieved. It is accurately mated with the bore in the piston and clamped securely.

#### Guiding system

The guiding system is designed according to the specific application. For hot forming processes, a system maintaining constant clearance in spite of heat expansion has become standard. For cold forming, a guiding system with eight slideways is preferred. The sliding surfaces are bronze running on nitrited steel. Tight clearances may be maintained and are adjustable by shims.

Combined with the long ram guiding system and the high press rigidity, production of high accuracy parts with excellent tool life is assured.



...in demanding environments

### Ram support device

A pneumatically operated, electrically safe-guarded ram support device provides operational safety and prevents unintentional movements of the ram. The ram may be locked in its top position, when work is being carried out in the tool area. This safety feature is integrated into the press control system.



Sections of frames of LASCO presses - single piece (right top side) and pre-stressed multi piece (left).

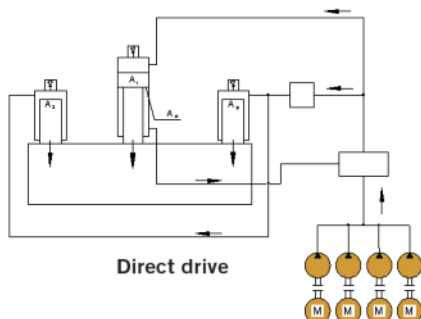
## The "heart" of the press



LASCO employees are installing the hydraulic drive of a VPE.

### Press drive

The press drive determines the efficiency of a press by its performance and quality. LASCO designs the system in house, and manufactures the manifold block. The pumps and valves are sourced from major hydraulic companies with highest standards of technology and after sales and spare parts service.



*In the case of a direct drive, the movements of the hydraulic press are dependent on the delivery of pressurised oil provided by the pumps. This solution is preferred, when a particular performance is required over a relatively long stroke, with a high stroking rate.*

### Direct drive, accumulator drive, combination

Depending on the size and the characteristics of the press, LASCO considers three basic concepts of hydraulic drives: the direct drive, the accumulator drive, and a combination of the two. Press forces from 1000 kN to 50000 kN may be achieved with these systems.

LASCO prefers to install the drive system on the head of the press, with the advantages of good

accessibility to all hydraulic elements and short pipe connections between the pumps, accumulator, and cylinder, as well as a clear floor area. However, option of floor mounting of the drive system is available in situations where the overall height is restricted.

The constant temperature of the hydraulic oil is maintained by a heating system installed in the oil tank. A separate cooling/filtering system driven by a pump prevents the maximum temperature from being exceeded and continuously cleans the oil. Status of the filters is indicated on the screen of the control system.

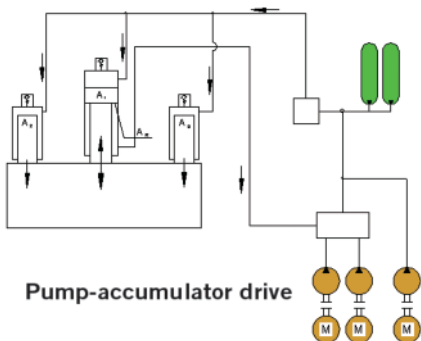
### Lubrication

The lubrication of the slideways is by oil. Adjustment of the amount and frequency is through the electronic control which also prevents the oil level from dropping below the minimum.

## Competent design



Hydraulic drive on the head plate.



The pump-accumulator drive stores part of the energy in the accumulator. This solution is preferred when high pressing speeds are necessary, but production output is not high, allowing time for recharging the accumulator, between press strokes, and reducing the size of the motors installed.

## Controlled production without compromise

### Decentralised process control

If the hydraulic system is the "heart", then the "brain" of a modern hydraulic press is the decentralised process control. As LASCO is totally customer focused, all configuration and programming is performed in house.

LASCO's competence in software programming and in the design and installation of electronic, electrical, and mechatronic components allows the consideration of all customer requests that are technically feasible, including the provision of interfaces for integration of existing processes and inter-linked operations.

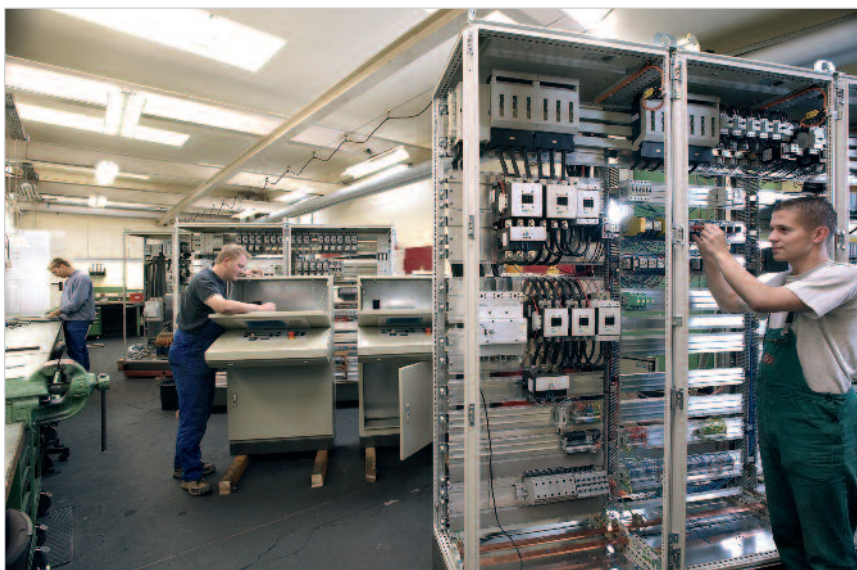
LASCO press and process controls offer all the performance characteristics of a modern product organisation, such as:

- Centralised, product-related setting and evaluation of all machine parameters.
- Product data administration with connection to a database.
- Operating data registration.
- Product follow-up.
- Integration in MRP.
- Integrated maintenance programme.
- Integrated data logger.

The requests of the customer are also considered, when designing man-to-machine interfaces, as well as specific screen menus and charts (available in several languages).

The operator is guided by a graphic colour display, which is in the same language as the messages displayed at the terminal. The registration, evaluation, and listing of data can be input during operation and the data can be transferred into the company network via interfaces.

Software modules specific to the customer can be linked. Options of integrated phone- or internet-aided on-line maintenance systems are offered.



*The design, installation, and programming of electronic, electrical, and mechatronic components are core competences of LASCO.*

## Operator guidance on customer's demand



LASCO designs the operator menus and screen forms of a control system individually according to the customer's demand, in this case, located in China.

Efficient interfaces ensure the real time communication with automation systems and industrial robots. In principle, a data logger is integrated and offers the possibility of archiving internal and external analogous and binary signals.

LASCO control concepts are decentralised on the basis of bus systems. Only hardware of international industrial standards is selected. This permits customers

the possibility of making adjustments and performing maintenance work on their own as well as reprogramming and enhancing at a reasonable price. Not least this means a high security of investment.

## Multipurpose presses

The VP range of LASCO presses covers a large spectrum for hot metal forming of solid parts. The press forces and characteristics are chosen for each application. This versatility makes the LASCO VPs ideal presses for pre-forming tasks, such as edge breaking, upsetting, bending or material distribution.

In addition, the sturdy VP series are well-suited for tasks demanding one step finishing, or for intricate forming processes with several stages, as well as for extrusion.

By doing the pre-forming of components which are finished subsequently in die forging hammers or presses - it increases productivity and efficiency of the forging process, while at the same time optimising material utilisation.

Salient features of the LASCO-VP range are their high capacities and their rigidity which permits the application of eccentric loads, long ram guidance, infinitely adjustable pressing speeds and press stroke, and precise pressure control.

The VP series provide customers with a versatile press, capable of a wide range of applications, at an economical cost. The precise control depending on force, speed and/or distance is the key to precision of the single forming operation and its repeatability.



*Typical components pre-formed and finish-formed on LASCO VP series presses.*

## Versatile press with a wide range of applications



Layout of the basic design of a LASCO press from the VP range.



Lubrication of the dies of a VPE 500 (top).  
LASCO VPA 1250

## Optimum specification



*A LASCO VPZ 500 in production.*

It is often a requirement on some pressing applications that the nominal press force is available for the entire stroke at maximum speed. Thus, the VPA range has been designed especially for massive forming with a high press force, such as is encountered in the manufacture of extruded parts, for example, automobile axle tubes. A favourable ratio between the width and the height of the ram and accurately adjustable slideways permit the precise forming of long components with a high eccentric load.

The VP series from LASCO have proven their capabilities world-wide in combined forming operations. Thus, the piercing and



## For multiple operations

drawing press VPZ performs on a single setup the type of work that would normally have to be applied to two presses, a hot extrusion press and a subsequent ironing press. Long, axially symmetrical hollow parts up to an outer diameter of approx. 350 mm and a length of approx. 2000 mm, such as axle tubes, tool joints and gas bottles, are produced on a VPZ - including ironing and indenting - with consistent precision and high output.

The hot ironing following the hot extrusion process can either be effected with a movable drawing punch, or with a drawing slide. The part manipulation and the combined inner and outer cooling of the tools is automated.



*Combined piercing and drawing press VPZ for the production of axially symmetrical parts (schematic).*

## Cold extrusion presses



*KFP 1000 forming aluminium parts for the automotive industry.*

LASCO KFP hydraulic cold forming presses are capable of producing parts with a tolerance of one-hundredth of a millimetre.

Cold extrusion is among the most important processes for the economic forming of near net-shape parts in large volumes. The KFP characteristics of stroke, force, and speed are particularly suited to the rigorous demands imposed by cold extrusion.

World-wide a multitude of different parts, including drive pinions, starter shafts, hollow shafts, and similar automotive parts, are cold forged on LASCO KFP presses. In a combined process of forward, backward, and cross extrusion, intricate parts, such as spiders, can be produced in an efficient way and with consistent quality.

A LASCO KFP is capable of incorporating several subsequent



*Typical parts produced by LASCO hydraulic KFP cold extrusion presses.*

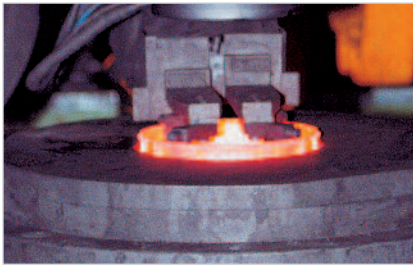
## Superior for producing large volumes

forming stages in the tool area. A guiding system with eight slideways ensures the utmost precision at each stage. Options, such as shifting slides, rotary punches and tables (top or bottom), as well as feeding and handling devices for billets or for pre-formed parts, allow the KFP to be considered for fully automatic production. Ejector systems integrated in the press table and the ram are standard features.



*Layout of the basic design of a LASCO KFP press.*

## Calibrating presses



*Hot calibration of powder-forged synchronous rings.*

Calibrating of parts after the actual forming operation is often required to meet dimensional tolerances, improve surface finish and straightness.

LASCO KP calibrating presses are intended for the cold, warm, and hot calibration of parts, but may also be considered for trimming, piercing, and bending operations.

The tool area has been designed for a wide range of applications

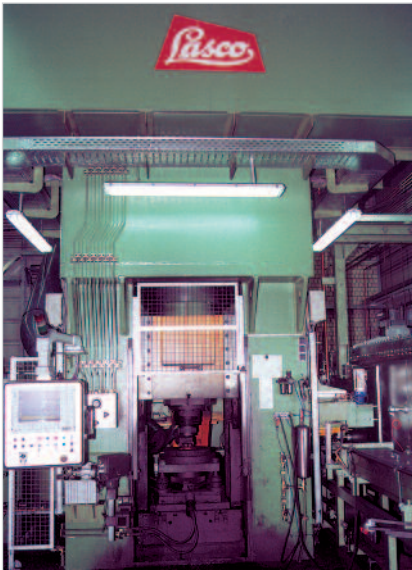
and is able to accept eccentric loads. The pressing speed and press force is infinitely adjustable, up to maximum values, and combined with accurate ram positioning by servo drive, ensures a high calibrating accuracy.

Basic presses are able to be retro-fitted with upgrades to hydraulic and electronic control circuits, to meet unforeseen future production demands.



*Examples of powder-forged and standard sintered parts that are calibrated on LASCO calibrating presses.*

An economic way to achieve final geometry

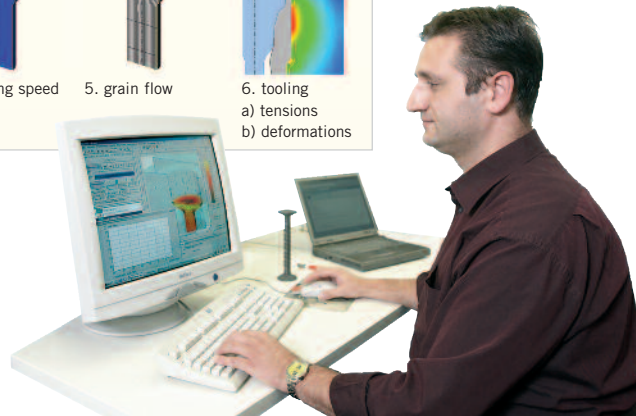
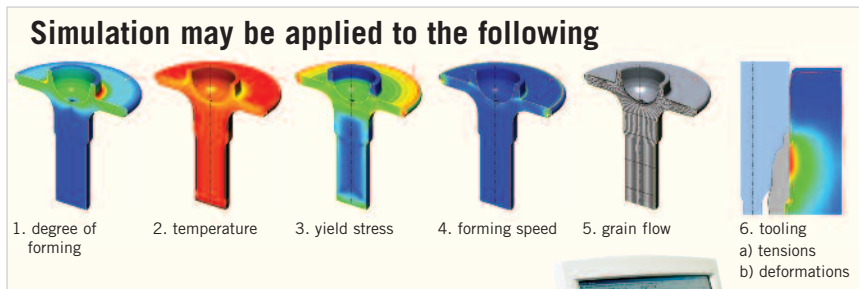


LASCO KP 630.



Basic design of a LASCO KP calibrating press (schematic).

# Adaptable to special demands



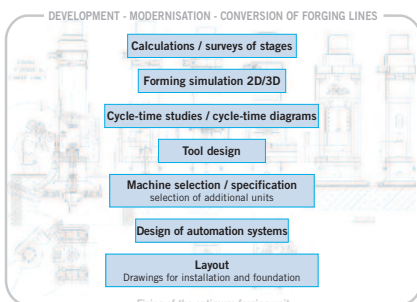
Specialists in process technology develop optimum forming processes to satisfy the demands of the individual customer.

LASCO hydraulic presses for hot, warm, and cold solid metal forming embody leading technology in all their elements and reflect "state of the art" process technology. Their inherent characteristics are rigid design and power in reserve. Highest levels of efficiency are achieved by individual adaptation of the press to the specific demands of the customer.

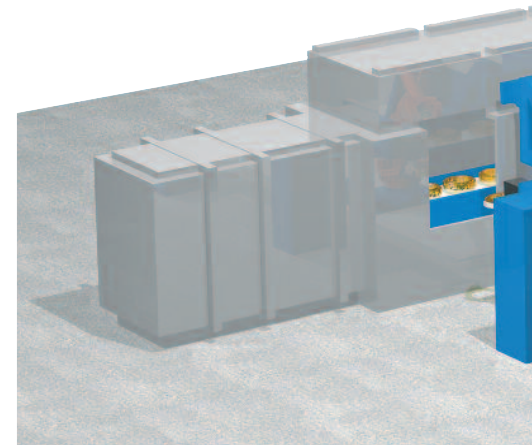
LASCO defines its role as a highly flexible press manufacturer in

providing tailor made solutions to complicated and changing demands. Our process specialists develop efficient line concepts starting with the range of the parts to be formed, and the particular demands of the client.

Their goal is to harmonise all major parameters of the forming unit and the tooling, resulting in the most economic forming process. The result is usually a truly unique solution for each project.



Fixing of the optimum forging unit  
The computer-aided simulation of forming processes plays a major role in the development of all LASCO machines and forming solutions (top).



## Automation, integration, control

Of course LASCO offers also a wide range of peripheral equipment to augment the production process of the main unit.

This option permits consideration of almost any automation for our presses, but also their successful integration into inter-linked processes.

### Optional components

- Automatic loading and unloading devices
- Tools and tool holders (with temperature control as an option)
- Quick-changing systems for tools, tool holders or cassettes
- Tool conditioning units
- Hydraulic ejectors in the table and in the ram (multiple operations)
- Sound isolation and enclosures
- Manipulators (in the press and outside)
- Robots
- Protective devices
- Hydraulic descalers
- Electronic on-line maintenance



Schematic of two inter-linked LASCO units VPE 500 and MPP 400 with automation devices.

## The LASCO benefit



*Experts in the sales, design, manufacturing, installation, and service departments enable LASCO to take care of its customers' requests in a flexible and comprehensive way.*

## Your single source for engineered solutions

All components of a forming system that are essential for it to perform consistently are sourced from leading international suppliers or made in house by LASCO's highly experienced and motivated experts. This fact, combined with the flexibility and the concise management of a medium-sized company, enable

LASCO to react in a comprehensive manner to requests and to offer perfect solutions from one source.

Complemented by personal service all around the globe, LASCO guarantees its customers a level of performance that has set the industry standard for decades.

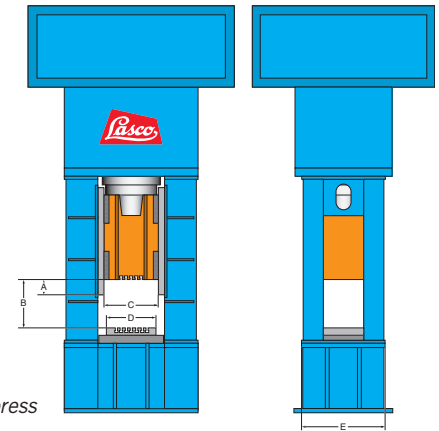


*LASCO employees co-operate in interdisciplinary project teams to find the optimum solution for your forming requirements.*





# KFP and KP series



Schematic of KFP press

A = Ram stroke  
 B = Installation height max.  
 C = Daylight between guides  
 D = Table width  
 E = Table depth

KFP	Press force	Ram stroke	Installation height max.	Daylight between guides	Table (ram) area	Ram speed	Pressing speed	Main motor
	[kN]	[mm]	[mm]	[mm]	width x depth [mm] x [mm]	Return [mm/sec]	[mm/sec]	[kW]
250	2500	500	1000	800	600 x 600	480	65	100
400	4000	650	1450	1000	800 x 900	550	60	150
500	5000	650	1450	1000	800 x 900	550	67	220
630	6300	800	1800	1150	950 x 1000	500	50	220
800	8000	800	1800	1150	950 x 1000	400	40	220
1000	10000	1000	2000	1250	1050 x 1200	550	65	2 x 220
1200	12000	1000	2000	1400	1200 x 1300	500	55	2 x 220
1500	15000	1200	2200	1600	1400 x 1500	450	45	2 x 220



Schematic of KP press

KP	Press force	Ram stroke	Installation height max.	Daylight between guides	Table (ram) area	Ram speed	Pressing speed	Main motor
	[kN]	[mm]	[mm]	[mm]	width x depth [mm] x [mm]	Return [mm/sec]	[mm/sec]	[kW]
400	4000	350	750	800	750 x 800	240	14	30
500	5000	350	750	800	750 x 800	220	12	30
630	6300	350	750	850	800 x 800	260	10	30
800	8000	350	750	1000	900 x 800	260	13	55
1000	10000	350	750	1100	1000 x 800	300	12	55
1250	12500	350	750	1200	1100 x 800	200	10	75
1600	16000	450	1100	1350	1250 x 1100	260	12	90
2000	20000	500	1000	1450	1350 x 1100	250	13	2 x 75

- Additional press series and sizes on request
- Hydraulic ejectors in the table and/or in the ram on customer's demand
- Ejector force, -stroke, -speed according to customer's specifications



**www.lasco.com**

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