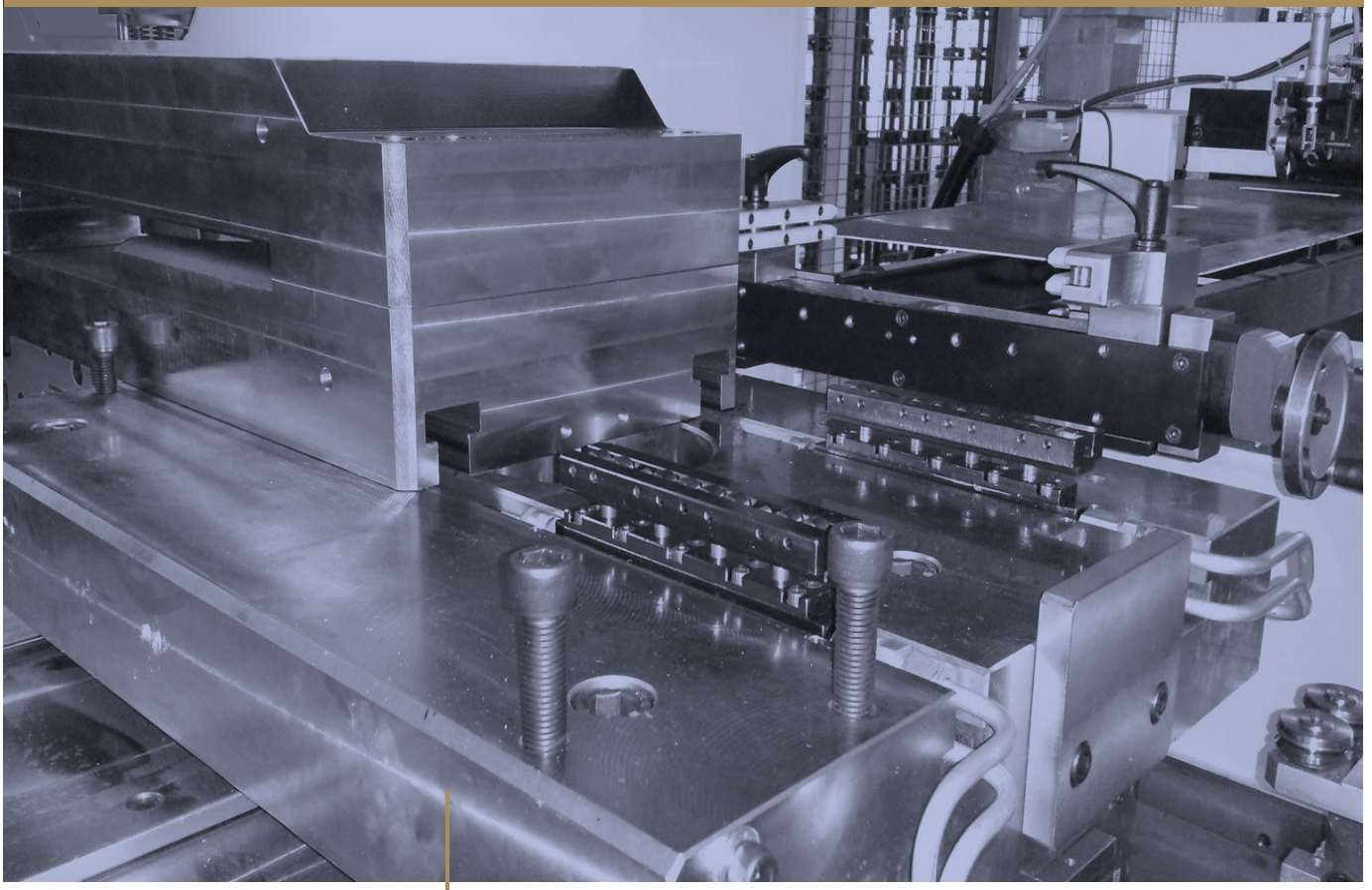
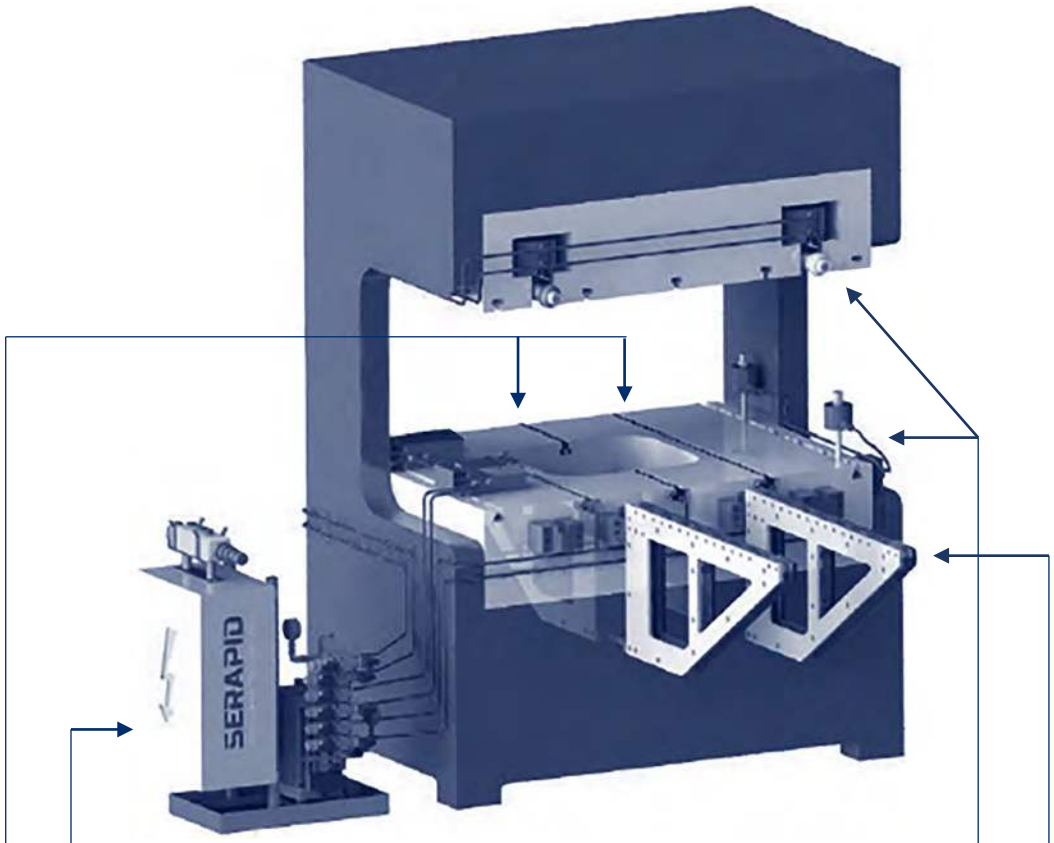
QUICK DIE EXCHANGE
SOLUTIONS FOR PRESSES

CLAMPING · POSITIONING · TRANSPORT · SAFETY · PRECISION · EFFICIENCY



SERAPID

QUICK DIE CHANGE
SYSTEM COMPONENTS



HYDRAULIC POWER

Depending on the size and the degree of automation of your QDX system, you may choose between manual pump or a variety of automated hydraulic power units, operated by a control panel.

CLAMPS

We offer clamps for standard or custom applications. Clamping and unclamping options span from manual to fully automated and can be customized for any press setup.

ROLLER BARS

Our die rollers and lifters let dies glide smoothly into position, & our motion systems drive them safely and accurately. SERAPID understands the environment of scrap chutes, lubricants, shakers, and sludge-laden slugs. Our rollers will not jam or mar the bottom of your dies.

BOLSTER EXTENTIONS

SERAPID bolster extensions are available in removable and swing-away options ranging from standard 20" extensions to custom applications approaching 10ft of rolling path and capable of supporting 50,000 lbs.

QUICK DIE CHANGE
CLAMPING AND POSITIONING

SERAPID QDX

Efficient, Reliable and Low Maintenance

Die change safety & efficiency are critical factors for profitable operations. Each die change means exposure to downtime, possible operator injury, or damage to equipment. SERAPID QDX reduces and eliminates these exposures with purposefully designed equipment for these production environments.

Maintenance

SERAPID QDX systems generally require little or no maintenance. As with any hydraulic/mechanical equipment, seals, valves and bushings eventually wear out. SERAPID has this covered with a responsive parts department.

Clamping

We offer a variety of clamps for both standard and custom applications. Clamping of dies can be automated or manually adjusted.

Positioning

Our die rollers, lifters and extensions allow dies and tools to glide smoothly into position. Our motion systems drive them safely and accurately .

Transporting

Our transporters range from rail-bound die shuttles to remote-controlled die carts that will take your dies to the press and back to storage, reducing transit and handling time. A typical fully automated rail-mounted cart will complete a changeover in minutes as compared to hours or days.

QUICK DIE CHANGE
PUSH-PULL SYSTEM (PPS)

SERAPID PPS: Push / Pull System

SERAPID's signature rigid chain systems (or Push/Pull as we like to call them) are heavy load linear actuators, which vary in size and can provide thrust approaching 36,000 pounds. Mechanical action avoids high pressure hydraulic, which can be detrimental to sensitive environments. The innovative design stores the retracted portion of chain out of the way, as opposed to a cylinder which requires equal room behind the point of origin to store the rod.

High Reliability

The PPS can withstand heavy loads and frequent use with little to no maintenance. In a typical pressroom environment, a rigid chain system will maintain itself.

Fast And Efficient Movement

The SERAPID push-pull system is capable of moving loads quickly and efficiently, which is crucial in applications where time is of the essence.

Customizable

The SERAPID PPS is highly customizable and can be tailored to specific applications and requirements. Whether you need a custom rolling bolster for your straight-side or a side loader for your C-Frame, from controls to color coordination: SERAPID has you covered.

Safe Operation

The SERAPID PPS is designed with safety in mind. Every installation – and they number in the thousands – is developed with industry safety standards in mind.

QUICK DIE CHANGE
CLAMP SELECTION & OPTIONS

Fixed Clamps vs. Removable Clamps

A fully automated QDX system requires fixed clamps that function with no operator intervention. Such an application requires a certain level of standardization.

Removable clamps require an operator to place them by hand, but they also offer more adjustability and greater economy. This adjustability accommodates the facility that handles a wide variety of tools that are not standardized.

Clamping Position

All clamps can be used on the bolster or ram. They can also lock down a rolling bolster. Clamps that retract fully out of the way have additional utility specific to the ram: When unclamped, the ram can be raised without removing the clamps.

Pictured:
Removable PSH clamp detail (above)
Fixed TB90 clamp detail (below)

Sensor Control

A selection of clamps can be equipped with inductive sensors to communicate clamp condition to the controls. Parking brackets are also available with sensors for applications in which the clamps are not always used.

Embedded Clamps

We have single and dual function clamps that reside inside vertically opposing T-Slots. These can also function as rolling elements, wherein unclamping the tool and lifting it onto rollers is now simultaneous.

Dimensional information

All inquiries will be guided through applicable dimensional data requirements. Whether it be clamping height, T-Slot dimensions, or temperature (high temp. clamps are available for applications exceeding 320 degrees).

Hydraulic Supply

SERAPID clamps and lifters require hydraulic pressures ranging from 1500 psi (100 bar) up to 5800 psi (400 bar). Details on pressure and volume are readily available for every hydraulic component.

For further information including data-sheets and technical drawings on each of our clamp types, visit our website: www.serapid.com.

QUICK DIE CHANGE
CLAMP SELECTION & OPTIONS

Double-Acting Clamps

Our double-acting clamps generally move themselves out of the way for tool removal. Tool change is faster when the operator doesn't have to manually remove each clamp. Roller bar clamps are also double acting, and while they clamp in one direction, they lift and roll in the other direction. Double acting clamps are best suited to standardized tooling.

Single-Acting Clamps

Single-acting clamps secure the tool when energized and release by spring action. The exception is the BCM Series lever clamp, which tightens by heavy spring and releases with hydraulic pressure. Single acting clamps are ideal for non-standardized tooling, the clamps cannot be permanently mounted because the tool size is not consistent. The operator must manually place the clamps before tightening.

Clamping Force

Clamping force calculations are based on the press tonnage. Generally, clamping force is equal to press tonnage plus 10%. Calculation for the ram is not the same as the bolster, as considerations for tool weight and additional security must be considered. On the ram, maximum upper die weight is added, and hydraulic supply is broken up into two separate circuits for safety purposes. Each circuit must meet the clamping requirement should one circuit fail.

Standardization of tools

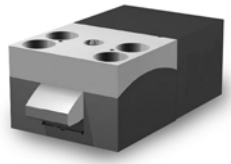
When the die shoes are all the same dimensions, clamps can be permanently mounted. In this case automation is possible and tool change time is reduced to an absolute minimum.

Information Needed for Clamp Selection

- Press Tonnage and stripping forces.
- Max. die weight, both upper die and total die weight.
- Bolster and Ram dimensions (Front to back, and left to right)
- Die shoe dimensions (Front to back, and left to right)
- Die shoe thickness (Both upper and lower)
- T-Slot size, number of T-Slots, and distance between.

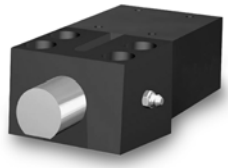
FIXED CLAMPS

Fixed Clamps are mounted permanently on the bolster and/or ram. When released, they move out of the way so the tool can be lifted and rolled out of the press. These clamps can be automated, and when implemented in combination with lifters and our Rigid Chain systems, can be automated according to your application specific needs.



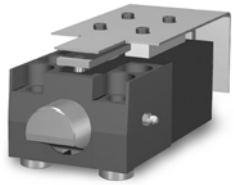
TBHS - Escaping Arc Clamp 20-630 kN | 8 models

- Escaping arc shape, clamping wedge moving on a curved path
- Horizontal clamping surface
- Vertical clamping force, without a radial load (force component)
- Mechanical safety lock holds the die if the pressure drops
- Hydraulic clamping and release



TBH - Wedge Clamp 25-100 kN | 3 models

- Clamps on the edge of the die
- Clamping surface sloped at 20°
- Horizontal action clamp
- Hydraulic clamping and release



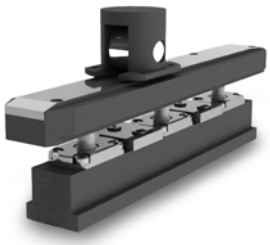
TBHI - Wedge Clamp 15-100 kN | 4 models

- Clamping on tool edge with wedge movement
- Horizontal clamping surface
- Roller bar clamp LSHP with outside rollers (GP)
- Hydraulic clamping and release

PHL - Ledge Clamp 85-250 kN | 3 models

- Static side clamp with easy installation
- Several clamps can be combined in a row
- Clamping height is determined by mounting block (not shown).
- Location for standard dies on the bolster
- Location on the ram possible when electronically controlled
- Hydraulic clamping and release

FIXED CLAMPS



LSHP - Roller Bar Clamp w/ Outside Rollers (GP) 60-100 kN | 2 models

- Double T-slot with rolling track For GP45 load bearing rollers
- Fixed in the bolster T-slot, the bar clamps the die using its T slots
- Hydraulic clamping and lifting
- Clamps large tools that completely cover the press table
- Several bars can be combined to cover the entire bolster length
- Movement of the die on the bar clamps using GP45 load bearing rollers
- Different models available using GP30 load bearing rollers

LSGH - Roller Bar Clamp T-slot w/ Embedded Rollers 25-140 kN | 4 models

- Double T slot with rolling track
- Fixed in the bolster T-slot, the bar clamps the die using its T-slots
- Rolling track on the upper part
- Hydraulic clamping and lifting
- Several bars can be combined to cover the entire bolster length

TB90 - Tilting Rod Clamp 60-100 kN | 2 models

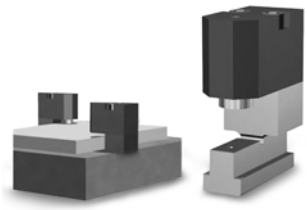
- Fixed clamp with 90° tilting rod
- Fully built into the bolster or ram
- The rod tilts 90° after opening and is then in a horizontal position
- 2 inductive sensors for position control
- Working temperature of up to 70 °C

ROTO-ESCAM - Swing Sink Clamp 50-200 kN | 4 models

- Clamping and rotation are done separately to avoid any collisions
- Fully automated with descending and rotating pulling
- Rotating clamping element for DIN 650 T-slots or specific slots
- Fully enters and exits the ram T-slot
- Position check using inductive sensors
- All movements are controlled by a PLC module
- Stroke on request
- Working temperature of up to 70 °C

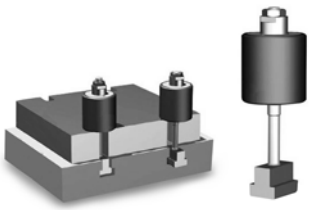
SYSTEM COMPONENTS
REMOVABLE CLAMPS

Removable Clamps must be removed and re-inserted manually. This solution is cost-saving and flexible, but more labor-intensive. Removable clamps are lower cost and more adaptable, but they prevent the automation of the QDX process.



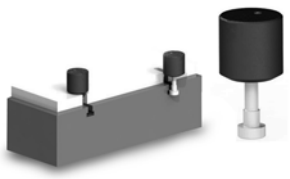
PSH - C-Clamp 20 -100 kN | 4 models

- Straight edge clamping
- Manually inserted into the T slot or static
- Hydraulic clamping, mechanical spring washers "Belleville" release
- Adapted to press bolsters and rams
- Easily adaptable clamping height



BTSA / BTSB / BTSC - Rod Clamp 60-150 kN | 13 models

- Replaces traditional nut and bolt clamping
- Manually inserted into the T-slot or static
- Rod adjustable by ± 10 mm depending on the die height (BTSA)
- Fixed clamping height using a fixed height rod, on request (BTSB)
- Clamping height is adjustable, with intervals of 5 to 130 mm (BTSC)
- Compact and particularly cost-effective shape



BTM – Rod Clamp 20-60 kN | 3 models

- Hydraulically released mechanical clamp
  Manually inserted into the T slot or static
- Mechanical clamping, using spring washers and hydraulic release
- Clamping height set by the length of the clamp rod size

SYSTEM COMPONENTS
REMOVABLE CLAMPS

BCM - Lever Clamp 20-60 kN | 3 models

- Mechanical clamping using spring washers
- Belleville" force, hydraulic release
- Manually installed in the T slot
- Clamping height can reach a maximum of 80 mm

BLH – Lever Clamp 40-60 kN | 2 models

- Hydraulic lever clamp
- Mechanical release using 2 springs
- Manually inserted into the T slot or static
- Particularly narrow clamp

LSH - Bar Clamp 30-156 kN | 6 models

- Double T-slot
- Manually inserted into the T-slot of the ram and of the tool
- Can be combined with LSGH / LSHP type clamps on bolster only
- Hydraulic clamping, mechanical opening using the spring force
- Clamping of dies covering the entire bolster

Pictured: Manual insertion of BTM Rod Clamps (left) and BCM lever clamps (right)

ROLLING ELEMENTS

- **SERAPID Rolling Elements** are available as separate individual cartridges, or in bars that fit into slots in the press bolster. Either option can be installed in any desired configuration.

- **Rolling on Balls** allows flexible and highly accurate positioning. The die can be moved in any direction at any angle. This is useful for smaller dies that are positioned manually.

- **Rolling on Cylindrical Rollers** allows for higher capacity loads than balls. They are ideal when a straight-line rolling path is required and are often paired with SERAPID Rigid Chain Systems.

- **Rolling on Roller Bearings** offer even lower rolling resistance. These needle bearings can be fitted with waterproof and dustproof seals and paired with SERAPID Rigid Chain Systems.

When Are Rolling Elements Required?

Whenever rollers are possible, they should be used. There are some situations when rollers are not possible, on these occasions a robust rigid chain system can easily move most tools metal-on-metal into and out of the press. Properly sized rollers generate less wear to the die shoe, bolster, and other press equipment.

Mechanical or Hydraulic?

The work of lifting a heavy die can be done either mechanically or hydraulically. In mechanical systems, the rolling element is spring loaded and is always exerting a lifting force the die, even when clamped. In a hydraulic system, the lifting action only occurs when hydraulic pressure is applied. Tool/die weight and clamping power must be considered when selecting your press equipment.

LBR / LBH - Ball Bars

- Can be combined in lines
- Especially suitable for manual die positioning
- When the die is clamped, the balls retract (LBR)
- Mechanical lifting w/ spring washers "Belleville" (LBR) & hydraulic (LBH)
- When die is clamped, bar exerts no force on the sole; gravity return (LBH)
- Available for your slots according to DIN 650 T 18, 22, 24, 28 and 36 (LBH)

LGRL / LGH / LGHL - Roller Bars

- Can be combined in lines
- Hydraulic lifting (LGH/LGHL)
- Mechanical lifting with spring washers "Belleville" (LGRL)
- High dynamic capacity (LGH)
- When the die is clamped, the rollers retract (LGRL)
- When die is clamped, bar exerts no force on the sole (LGH/LGHL)
- Available for your slots according to DIN 650
- Sizes 22 - 36 for LGRL & LGHL and 18 - 36 for the roller LGH

LG / LGG / LGGR – Standard / Heavy Duty Static Roller Bars

- Bars with static rollers (no lifting mechanism)
- Use as a track for heavy dies (LG) and very heavy dies (LGG/LGGR)
- Recommended for dies weighing → 10 tons (LGG/LGGR)
- Adding of a lateral guidance version (LGGL)
- Heavy load hydraulic bar (LGGH)

LGGH – Heavy Duty Hydraulic Lifting

- Can be mounted with rollers facing down on the outgoing bolster
- Recommended for dies weighing → 10 tons
- LPGH version for 50 x 50 mm slot (020-05*)
- G1/4" (BSPP) or UNF 9/16

ROLLER CARTRIDGES

LC - Retractable Ball Cartridges

- Used to create rolling surfaces of different sizes and shapes
- Built into the bolster, can be used when there is no available slot
- Adapted housing machined into the bolster or the sole of the die
- With spring washers "Belleville"

CG / CGX / CGH - Retractable Roller Cartridges

- Used to create rolling surfaces of different sizes and shapes
- Built into the bolster, can be used when there is no available slot
- Adapted housing machined into the bolster or the sole of the die
- With spring washers "Belleville" (CG / CGX)
- Hydraulic piston lifting (CGH)
- Various dimensions and capacities

Lifting Force

The total force required to lift the die is spread over rolling elements. Consider the distance between rolling elements as well as any gaps in the bolster. For instructions on calculating the load, see our datasheet 010-00*.

Dynamic Load

Check the relevant graphs provided in the datasheet 010-00* to make sure the dynamic capacity of the rolling elements will not be exceeded. Dynamic overload will damage the contacting surface. If necessary, reinforce the rolling path with hardened steel strips.

Rolling Friction

Using balls, the rolling friction depends chiefly on the hardness of the surface. Friction coefficient between 0,15 and 0,2. With small rollers (Ø ← 30 mm), the friction coefficient typically lies 0,07.

In general, for an entered load, the bigger the rollers are, the lower the friction is.

SYSTEM COMPONENTS
BOLSTER EXTENTIONS

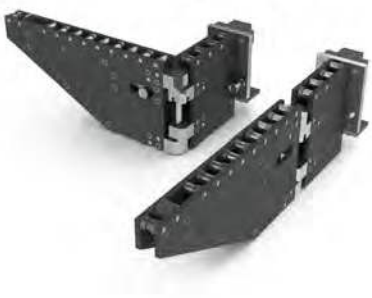
Bolster Extensions offer a safe and economical way to move dies to an accessible location outside of the press for transportation by crane or forklift. The extensions feature a stop to prevent tool roll-off and potential injury. They can also function as bridges to other equipment such as carts, stackers, and tables. Our bolster extensions are equipped with large rollers for smoother rolling and lower resistance and are compatible with lifters as they provide a path for hydraulic lines. Available options include lightweight lift-off, swing-aside, and bifold units, with or without legs.

CSL - Removable Bolster Extension

- Manually lift and place
- Capacity up to 6600 pounds.
- Length up to 39"

CSM - Removable Swing-Aside Bolster Extension

- Locks in open and closed position
- Capacity up to 6600 pounds.
- Length up to 39 "



CSN - Swing-aside Double-Pivot Bolster Extension

- Locks in open and closed positions
- Double pivot can fold into tighter places.
- Capacity up to 6600 pounds.
- Length up to 47 "

BOLSTER EXTENTIONS

CSP - Removable Bolster Extension With Leg

- Extension positioned manually
- Optional cross pieces and legs to create loading table
- Optional wheeled leg for roll-away unit

CSQ - Removable Swing Aside Bolster Extension With Leg

- Open / closed position locked
- Optional wheeled leg

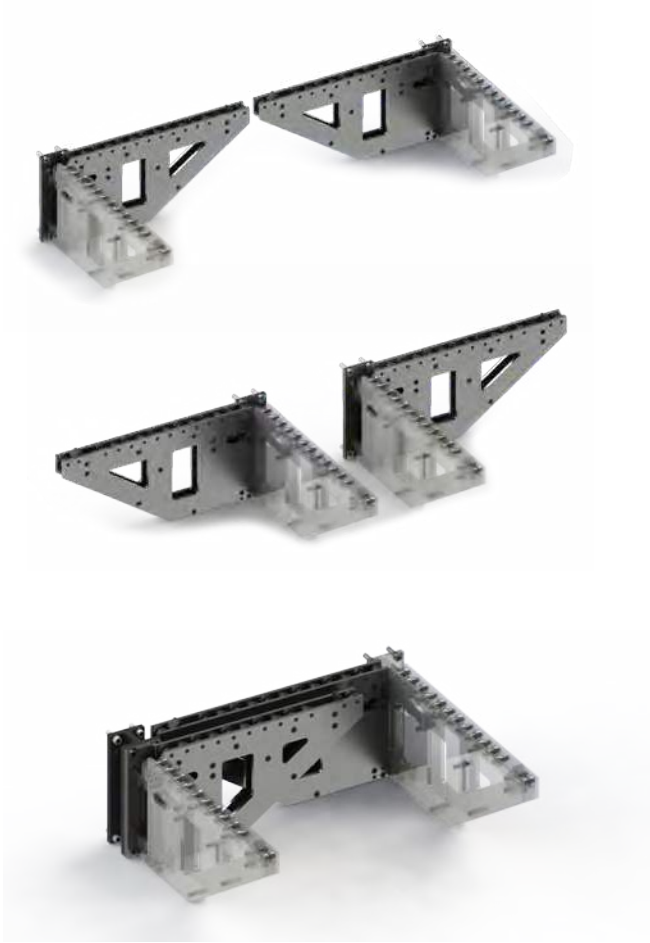
CSR - Swing Aside, Double Pivot Extension With Leg

- Double pivot, specially designed for small swing aside space
- Open / closed position locked
- Optional wheeled leg

SYSTEM COMPONENTS
BOLSTER EXTENTIONS

Customizable Solutions

Bolster extensions can be moved side-to-side or made-to-order to meet the dimensions of your die. Optional legs, wheels, and cross-braces can be combined with our bolster extensions to create a solution customized to your specific application. Our bolster extensions are designed for easy loading via crane or forklift and feature precision-cut aluminum plate design, hardened steel rollers and retractable stops



Pictured: Leg and wheel options, multi-directional folding options, typical side-to-side configuration.

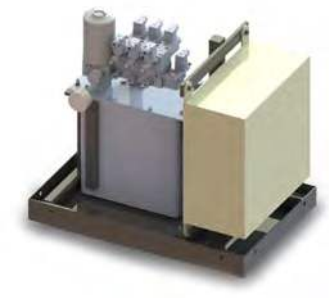
HYDRAULIC POWER

Hydraulic Power Units for the QDX System:

A successful QDX system requires consistent hydraulic pressure. SERAPID offers top-of-the-line hydraulic power systems in both air power or electric options. In combination with our clamps and lifters, hydraulic pumps are buildable into anything from a simple clamp/release system to a full-blown rolling bolster system with retractable stops, lifters, and automated clamping. For powered models, a customizable valve bank offers ultimate versatility. We also offer a hand pump for smaller scale systems.

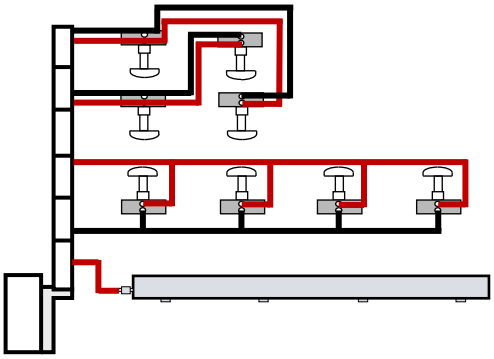
KA (HK) - Electric Hydraulic Power Unit (HPU)

- Compact unit, consisting of a hydraulic pump and a motor
- Effective volume: 1,8 to 5,4 l
- Engine power: 1 kW in 230 or 400 V (2,2 kW)
- Tri-phased 50 Hz IP 54
- Factory pre-set operating pressure until 400 bars
- Aluminum casing allows cooling for continuous operation
- Large range of pressure adjustments until 400 bars
- Includes terminal box for remote control / electrical control unit



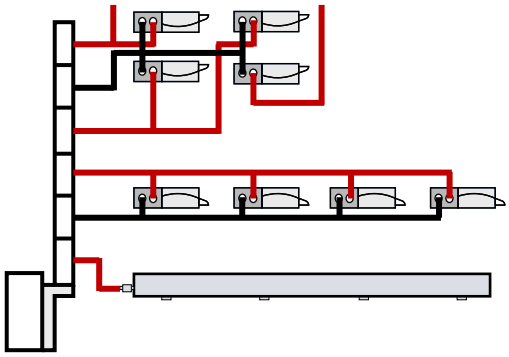
LP - Air-driven Hydraulic Power Unit (HPU)

- Effective volume: 4 l
- Factory pre-set operating pressure until 400 bars
- Flow rate when not under load: 2 l/mn
- Under load: 1 l/mn at 400 bars
- Air supply: 6 bars
- Controlled by air-to-oil pressure ratio
- Pressure monitoring with compensation for pressure drops



Hydraulic Configuration Example 1

Four diagonal circuits on the ram, and two circuits on the bolster. Both are used for tightening and releasing clamps. One circuit per 100 roller bars.



Hydraulic Configuration Example 2

Two diagonal circuits for tightening and one circuit for releasing clamps on the ram, and two circuits for tightening and releasing clamps on the bolster.

Requirements for External Hydraulic Sources:

- HLP 32 or 46 CST Oil
- Pressure limiter to regulate and protect output
- Flow rates = 0.8 to 4 l/min available
- Ball-type valve bank
- Must have non-return valve at bottom of the column

QUICK DIE CHANGE
DIE CARTS & TRANSPORT

SERAPID GPO Die Cart Truck is a specialized vehicle designed to transport heavy loads in industrial settings. The term "GPO" comes from a French acronym that translates to Tool Carrier &Stacker. Our die carts can be controlled manually or via remote control. The standard capacities are 1, 5, 10, and 15 tons, but we can also create custom units to move up to 60 tons!

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