BRUDERER Precision punching on high-speed presses

11st April 2024

Werner Bähler (Regional Sales Manager)

Slobodan Stevanovic (Sales Engineer Central Eastern Countries)

5th WORKSHOP Forming and Punching

The unique BRUDERER principle

Eccentric presses with full mass counterbalancing

BRUDERER company worldwide

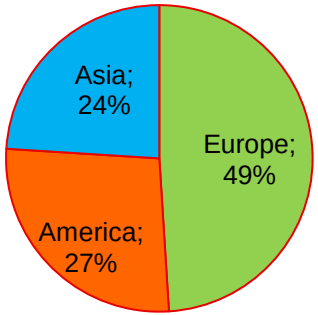
Employees worldwide:

500

Machines sold:

SALE

14,600



Machines in operation:

over 90%

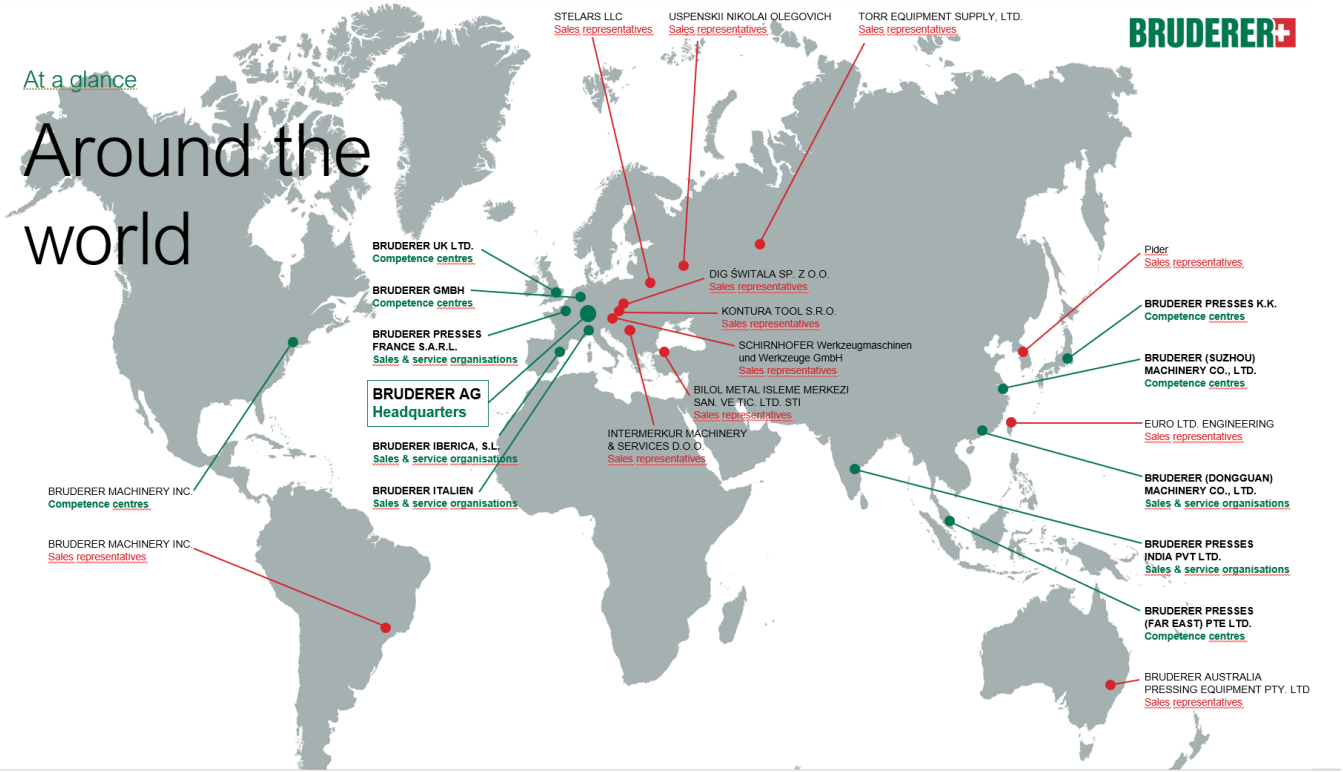
13,140

The unique BRUDERER principle

Eccentric presses with full mass counterbalancing

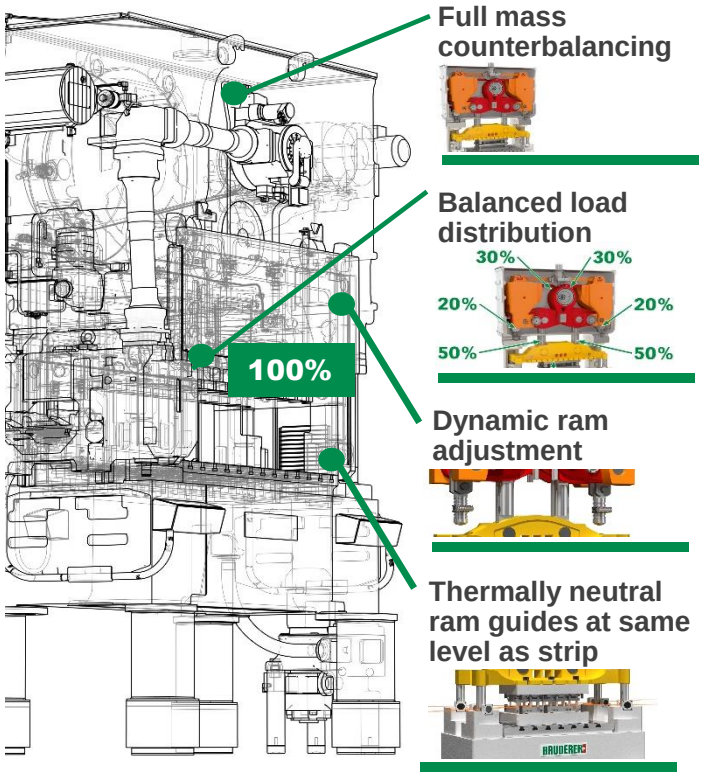
At a glance

Around the world



The unique BRUDERER principle

Eccentric presses with full mass counterbalancing



The technology behind the precision

Lever system to distribute the stamping force

Multi-row cylindrical roller bearings with minimum clearance

Mass counterbalancing with automatic adaptation to stroke adjustment

Short, torsional rigid main shaft in transverse layout

High-volume lubricating circle

Short stop and acceleration time

BRUDERER spring dampers

Dynamic ram adjustment

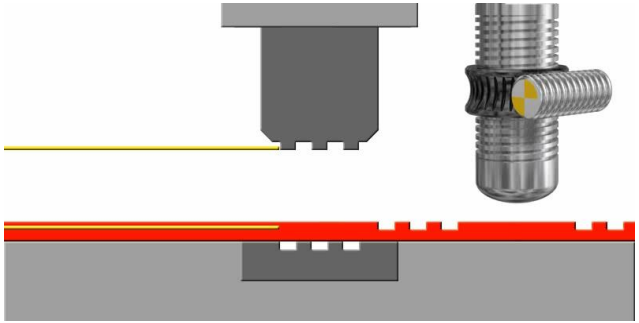
BDC position at the closest of tolerances.

Thanks to the unique lever system, the spindles in the ram adjustment each receive just 20% of the overall load.

This BRUDERER in-house innovation makes it possible to adjust the ram height during the stamping process and to maintain the BDC position to the closest of tolerances at all times.

Dynamic ram adjustment

Micro-level insertion depth correction



Correction of ram height during stamping.

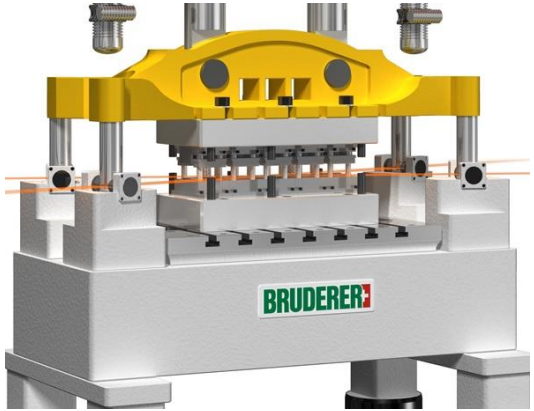
Thanks to the hardened and ground spindles, it is possible to adjust the ram height by +/- 5 µm during the stamping process and to maintain the BDC position within the closest of tolerances at any time.

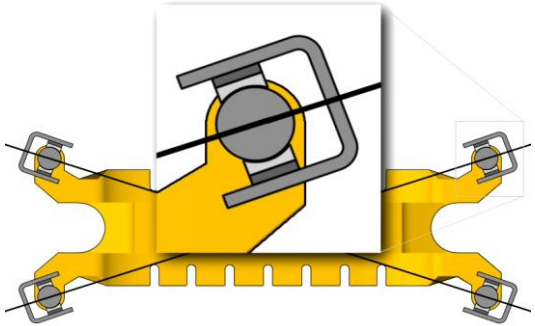
Typical ram adjustment: 10 µm,
up to 2000 min-1 and 2500 kN stamping force

Minimum ram adjustment: 2 µm,
as a control option on BSTA 200, 280, 510

Thermally neutral ram guiding

Compensation of the horizontal extensions



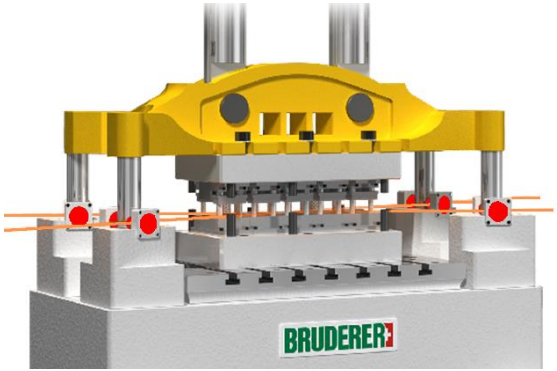


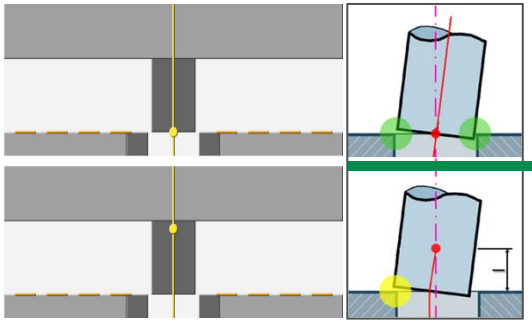
Extending tool life.

The unique construction means that the thermal influence on the ram guiding is compensated.

Ram guiding at strip level

Backlash-free guiding thanks to four guiding elements





Stamping with eccentric loads.

The ram tipping point on BRUDERER high-performance stamping presses is at strip level for eccentric ram loads. The advantages of this are:

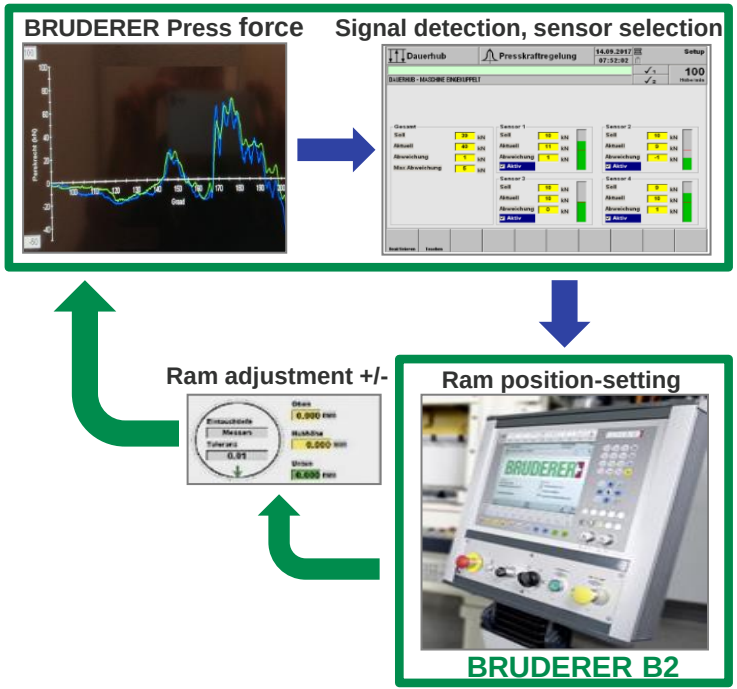
constant interface distribution

minimal punching wear

long tool life

Ram position adjustment

Press force signal, signal detection and sensor selection



Press force measurement of the machine:

Stabilisation of press force by influencing the ram position during operation.

Ram position adjustment via the press force measurement of the machine.

BDC adjustment due to constant press force signal (limit: cutting force of higher stop force)

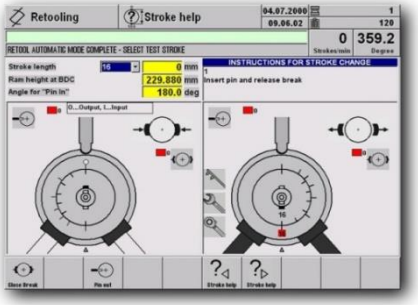
Stabilisation of machine press force during production.

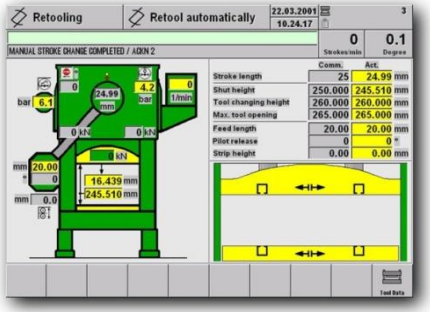
BRUDERER B2 control

Well-arranged control screens

Retooling

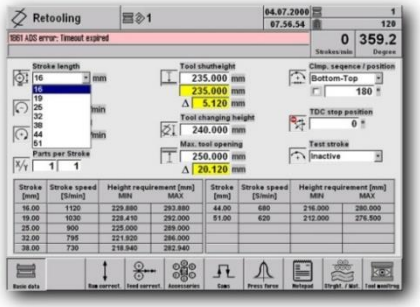
Set-up

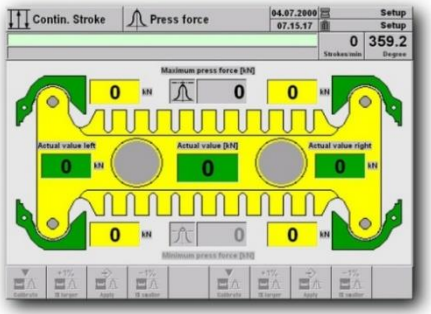




Machine data

Tool data settings





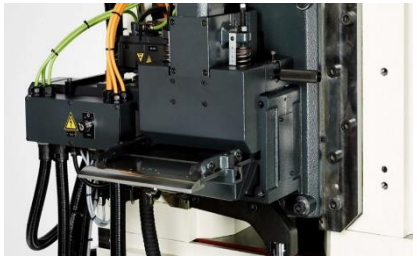
Press force monitoring

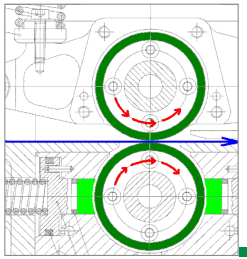
Tool monitoring

Position monitoring

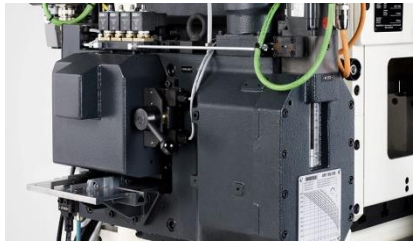
Feed units

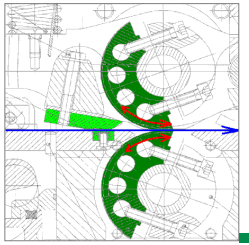
Feed technologies



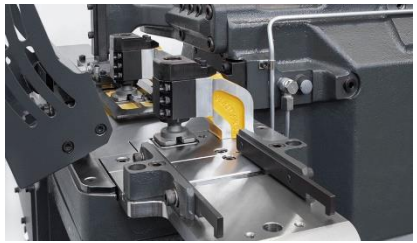


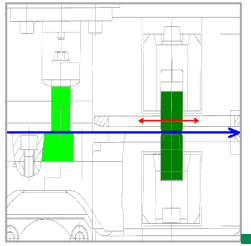
BSV
servo feed





BBV
roller feed





BZV
gripper feed

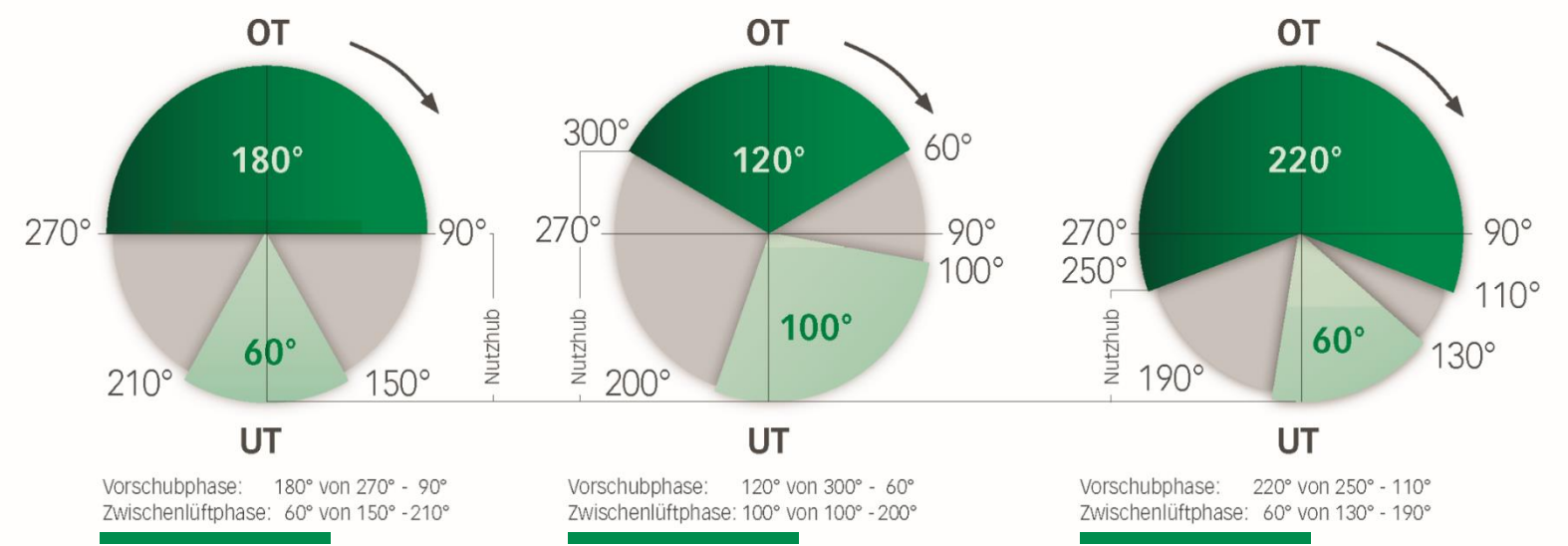
These electrically driven feed units boast the utmost in flexibility and precision, and thanks to the freely programmable axes, they can be implemented almost anywhere.

For decades now, these entirely mechanical feeds have the reference point for precision and reliability. The drive goes from the main shaft of the stamping press via a drive shaft to the strip feed.

With its strip clamping using grippers, this feed is the ideal solution for thinner, more sensitive and refined raw materials. The linear grip movement means that the feed rollers do not deviate from the strip.

Feed technology

Feed optimisation with feed phase and intermediate lifting.

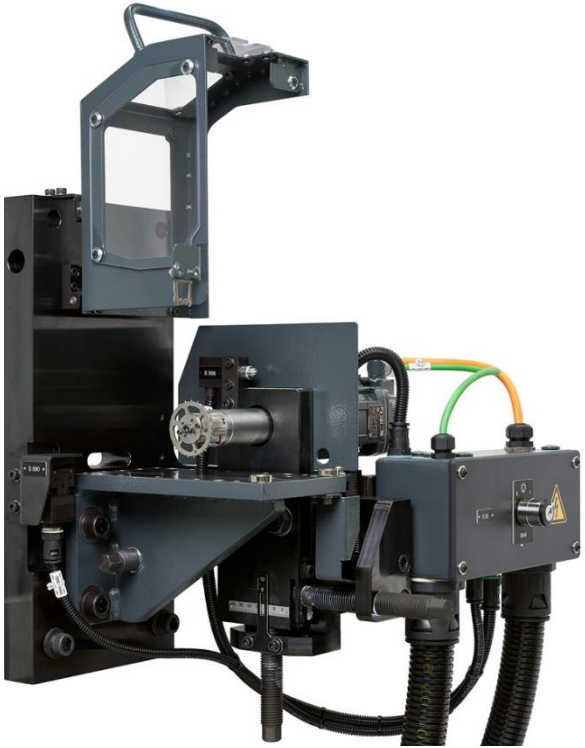


Effective stroke optimisation via short feed-phase, large intermediate lifting angle for formed part
Set-up for forming and deep-drawing work

Large feed angle for smooth running of the strip at high speeds
Intermediate lifting asymmetric to lower half

BSA servo axes

Different operating moduls



Class 1: Processing module
(speed-controlled)

Control of tools such as milling spindles, thread cutters, drills etc.

Class 2: Positioning module
(position-controlled)

Simple adjusting axes with or without dynamic correction.

Class 3: Synchronised module
(synchronisation-controlled with the machine or feed speed)

Transport and conveyor units (feeder, de-stacking units)

Tool functions and movements (assembly or cross-slider, ejector, pawl feeder etc.)

Strip and feed tightening (additional feed or sprocket wheel – solo or in combination with BRUDERER BSV servo feed)

BPG 22 planetary gear

Mounting options

BPG 22 planetary gear can be used **with the following stamping presses:** BSTA 280, BSTA 510 and BSTA 810.

maximum stamping force and work capacity from 1 spm to 80 spm.

Test and production machine combined in one stamping press.

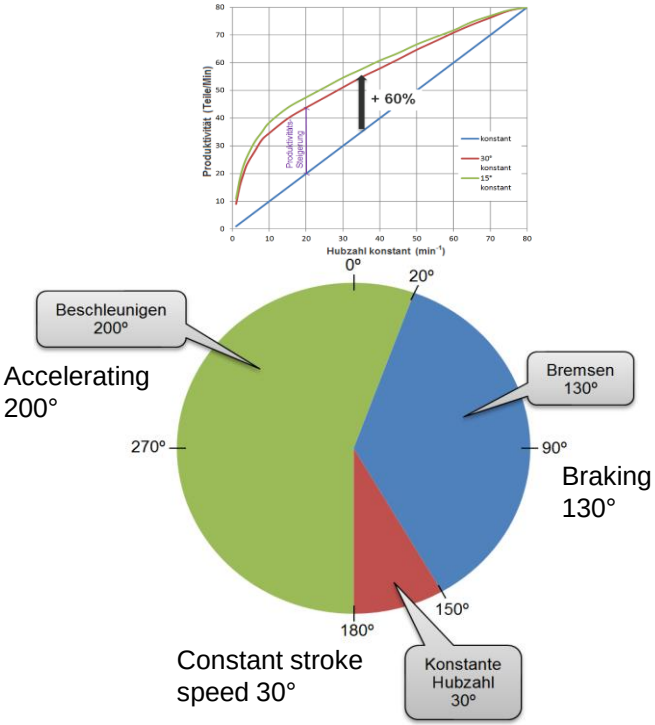
High productivity at low stroke speeds thanks to stroke speed modulation.

Can be implemented in various settings.

.

BPG 22 planetary gear

Stroke speed modulation – high productivity at low speeds.



Stroke speed modulation – an additional BPG function

Greater production of parts than stroke speed in stamping.

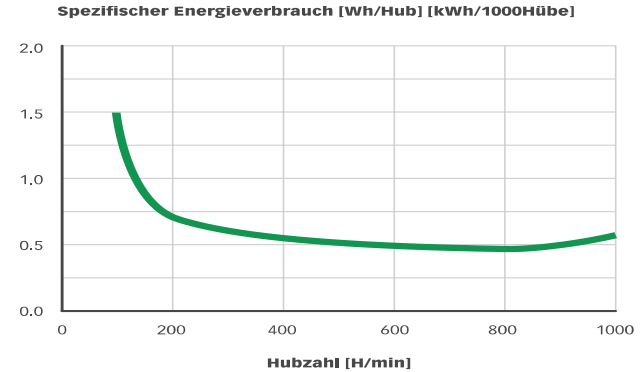
Slow forming and stamping with full force.

Simple tool-dependent programming.

Test, “servo” function and high-speed press all in one.

Energy efficiency

Loads and energy consumption.



The energy usage of BRUDERER stamping presses can be expressed in the following simplified way:

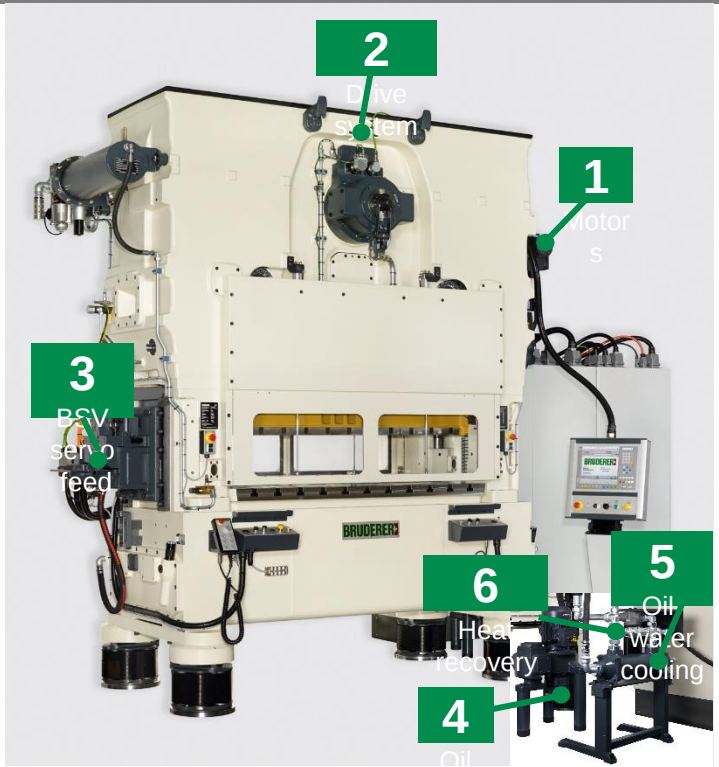
Basic machine usage:
- Pumps, fans, control, drives and motors

Operational machine usage:
- Energy to overcome friction and moved masses (drag power)

Process usage:
- Energy for the stamping process and peripherals

Energy efficiency

Measures to increase machine efficiency.



1. Energy-efficient class IE3/4 motors for fans and pumps.
2. Drive system with energy recovery fed back into the power supply system. The brake energy from the flywheel is recovered.
3. Servo feed with energy recycling from start-stop operation via capacitors.
4. Operation of oil pump via frequency convertor for needs-based cooling and lubrication of the machine.
5. Temperature-controlled oil cooler (oil-air and oil-water).
6. Water cooling of the machine and the control cabinet for central heat recovery.

Thank you very much

Please come to our booth where we can

have further discussions and exchanges