Презентация

Решения SITEMA для гидравлических прессов

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Securing Presses with SITEMA

Product Group: Safety Catcher

Series K, KR, K/TA, KR/T,KRP, KRP/T

- Absolute functional safety
- Approved and certified
- 100% tested
- More than 40 years of experience

SITEMA for Hydraulic Presses

Official requirement

Requirement by standard ISO 16092

The standard ISO 16092 (Machine tools – Safety – Hydraulic presses) requires certain safety measures to prevent injuries caused by unintentional lowering of the slide due to its own weight (force exceeding 150 N).

There is a distinction between the two cases

- *During production*
- *During maintenance or repair*

In both cases, mechanical restraint devices are a permissible solution.

Official requirement

For maintenance or repair, only a mechanical restraint device is permitted:

"Where there is a risk of injury (force higher than 150 N) from a gravity fall of the slide/ram, during repair works or any necessary intervention between the tools (which is not the normal manual feeding), a mechanical restraint device […] shall be installed in the press."

(translation of German DIN EN ISO 16092-1, paragraph 5.3.6)

Official requirement

For larger presses is furthermore required:

"On presses with an opening stroke length of more than 500 mm and a depth of table of more than 800 mm, a mechanical restraint device shall be permanently fixed and integrated with the press."

(translation of German DIN EN ISO 16092-3, paragraph 5.3.6.1)

Official requirement

Official approval by the DGUV (German Social Accident Insurance)

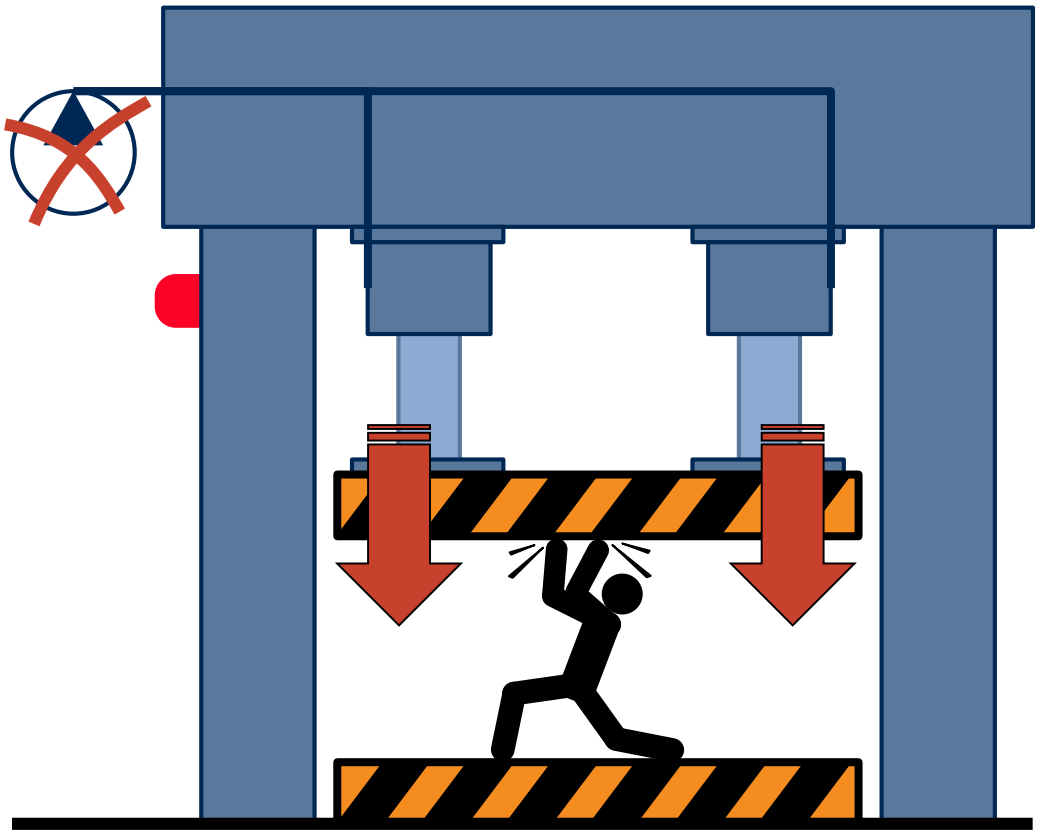
The DGUV certifies that SITEMA Safety Catchers (as well as our Safety Brakes KSP and Locking Units KFHS) are mechanical restraint devices that are permanently fixed and integrated with a press.

SITEMA Safety Catchers are officially certified by the DGUV as a mechanical restraint device in this sense.

SITEMA for Hydraulic Presses

Your requirement: safe access to the press at standstill

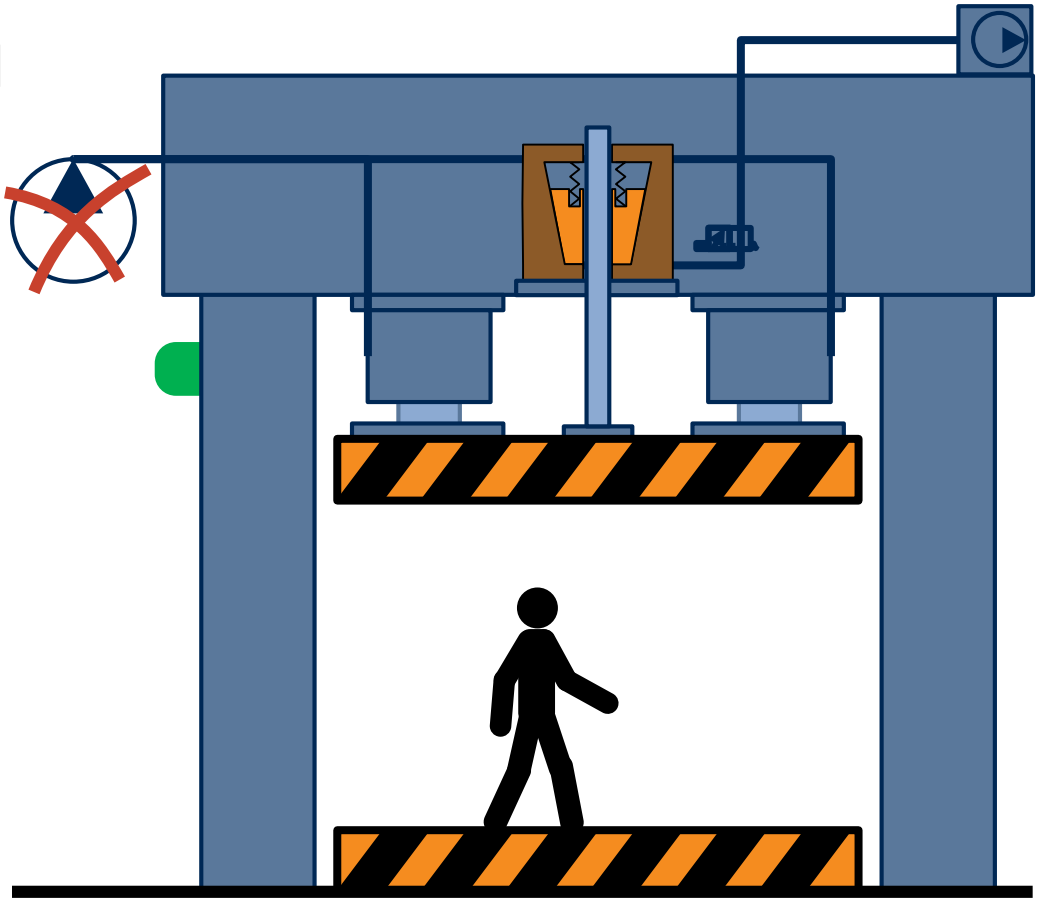
- High risk in case of failure
- High risk in case of operating errors



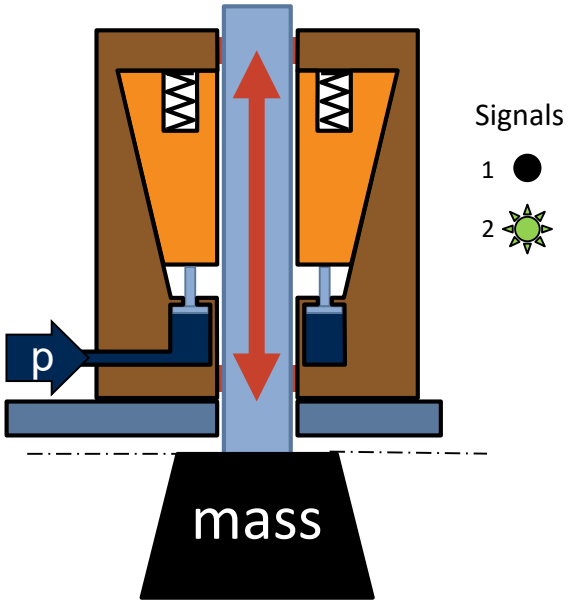
SITEMA for Hydraulic Presses

Our solution: SITEMA Safety Catcher

- Safe against unintended release
- Officially certified
- Easy integration
- Stepless clamping
- High flexibility during maintenance / try-out



Function during press cycle



- Slide moving, driven by press drive -

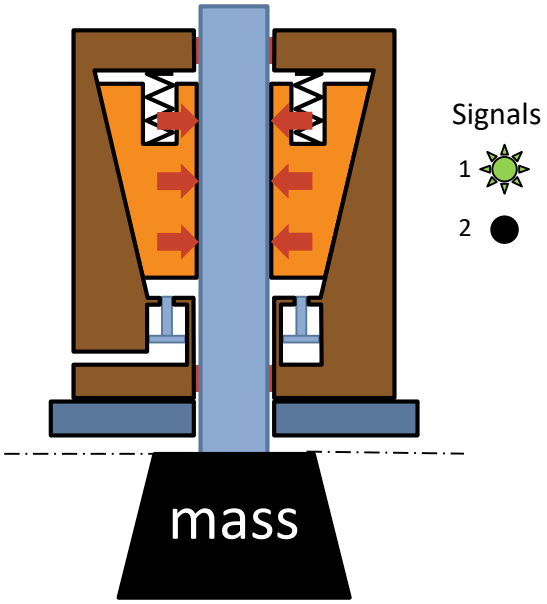
Safety Catcher pressurized

- Clamping released
- Free rod movement

= Safety Catcher open during press cycle

- During downward movement of the slide
- During pressing
- During lifting of the slide

Function during press cycle



- Slide stopped, held by press drive -

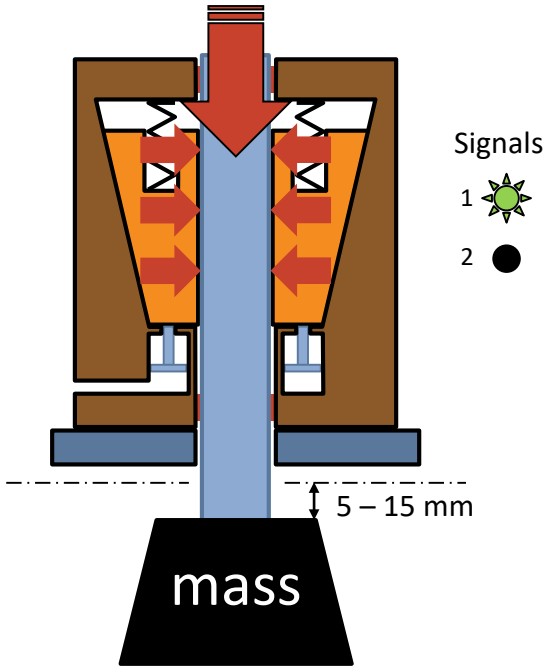
Safety Catcher without pressure

- Load secured
- Load not yet taken over
- Immediate release if pressure is applied

= Safety Catcher in secured position

- Slide in top position for work piece change
- Slide in any position for tool change
- During maintenance

Function in emergency situation



- Press drive fails! -

Safety Catcher without pressure

- Load secured
- Load taken over and held by Safety Catcher

= Total safety

- Protection against accidental release
- Upward movement necessary for release, thus making sure the load will be safely taken by the press drive

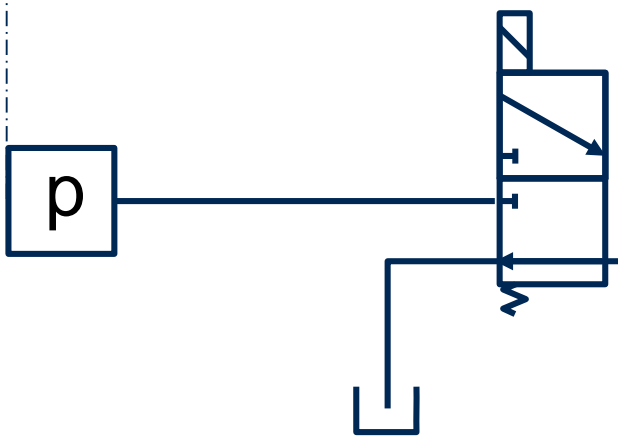
Connections

Actuation

- hydraulic[1] or
- Pneumatic[2]

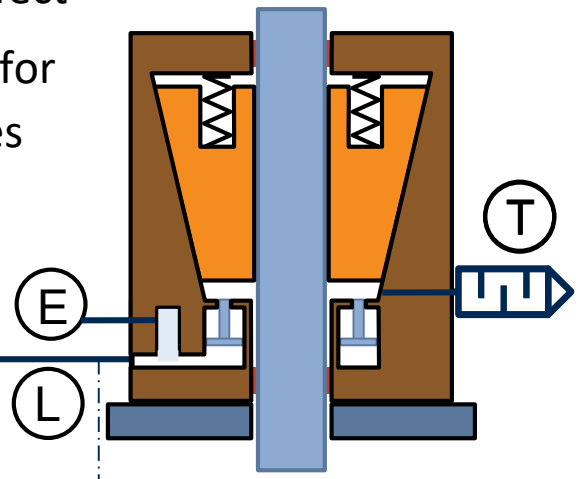
Control

- 3/2-way valve



Integrated automatic air bleeder “E” (series K & K/TA)

- reduces Dieseling effect
- available separately for other hydraulic series
- connection to tank (free of pressure)



Connecting port “L”

- short distance to valve
- minimal flow restriction

Breather port “T”

- filter or
- connection to tank (free of pressure)

[1]) KR, K, KR/T, K/TA
[2]) KRP, KRP/T

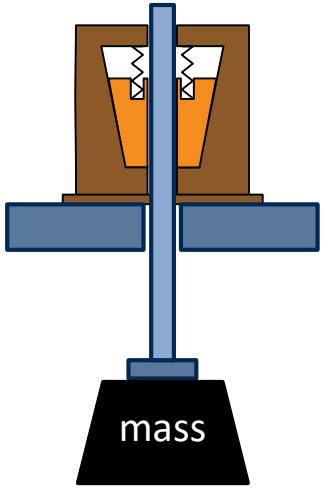
Versions

Compressive load version

Data sheets:

Series KR, K
(hydraulic)

Series KRP
(pneumatic)

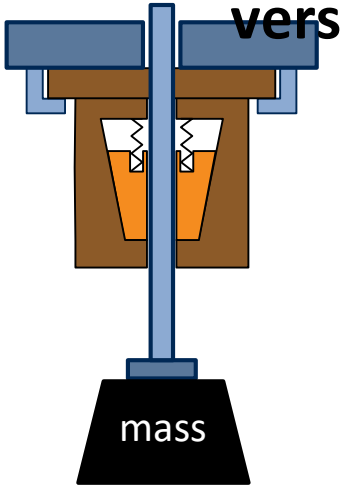


Tensile load version

Data sheets:

Series KR/T, K/T
(hydraulic)

Series KRP/T
(pneumatic)



Both compressive and tensile load version can be mounted in a fix position or move with the load. You can find more details on this in chapter 13 of Technical Information TI-A10.

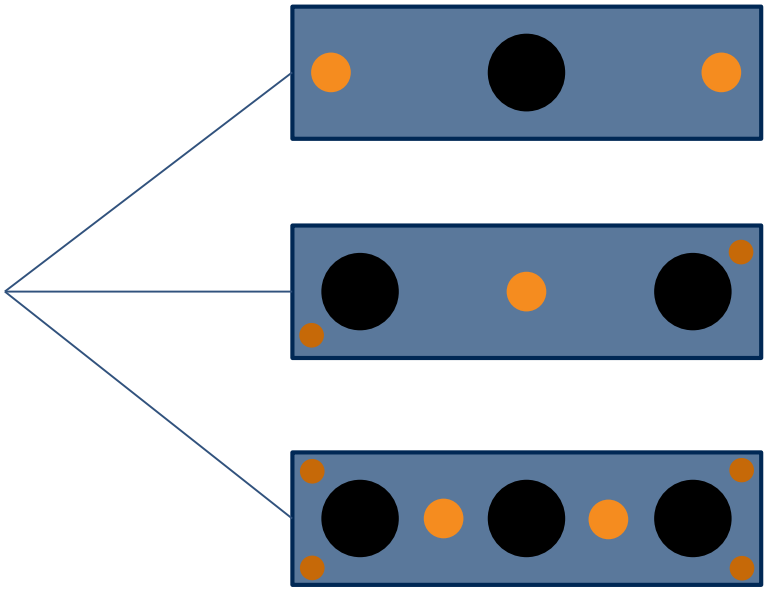
Arrangement

The arrangement of the Safety Catcher(s) should be as symmetrical as possible.

Examples:

Slide

(seen from above)



One press cylinder in the center:
- 2 Safety Catchers, one on either side

Two press cylinders near the edges:
- 1 Safety Catcher in the center or
- 2 Safety Catchers, diagonally opposing

Three press cylinders:
- 2 Safety Catchers in between or
- 4 Safety Catchers in the corners

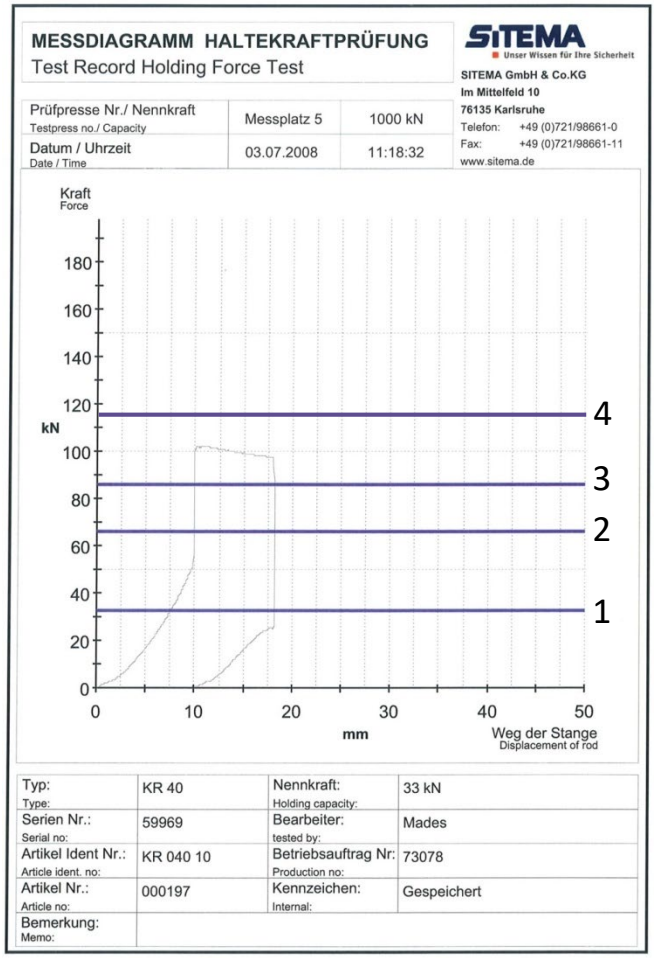
= Press cylinder

= Safety Catchers in exemplary positions

How to choose the right Safety Catcher size

- Define the **maximum weight to be secured** (all moving parts: slide, cylinder rods, heaviest possible tool, etc.) – only the static load needs to be considered
- Define the **number of Safety Catchers** to be used (take care to have a symmetric arrangement)
- Choose a Safety Catcher from the data sheets of which the **admissible load M** fulfills the condition

Safety factor already included!



MESSDIAGRAMM HALTEKRAFTPRÜFUNG
Test Record Holding Force Test

SITEMA
Unser Wissen für Ihre Sicherheit

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76135 Karlsruhe
Telefon: +49 (0)721/98661-0
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www.sitema.de

Prüfpresse Nr./ Nennkraft Testpress no./ Capacity	Messplatz 5	1000 kN
Datum / Uhrzeit Date / Time	03.07.2008	11:18:32

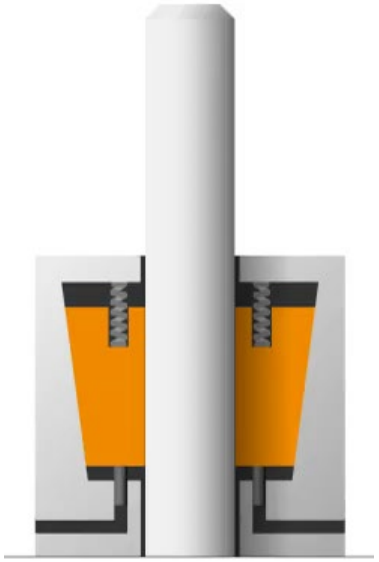
Typ: Type:	KR 40	Nennkraft: Holding capacity:	33 kN
Serien Nr.: Serial no:	59969	Bearbeiter: tested by:	Mades
Artikel Ident Nr.: Article ident. no:	KR 040 10	Betriebsauftrag Nr: Production no:	73078
Artikel Nr.: Article no:	000197	Kennzeichen: Internal:	Gespeichert
Bemerkung: Memo:			

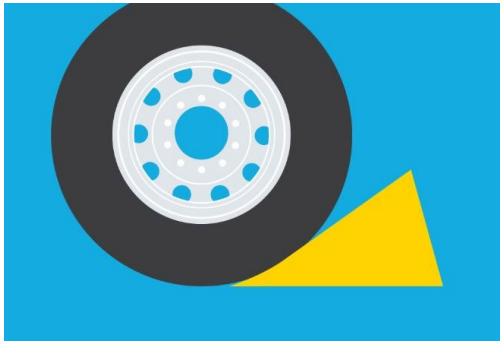
- For each Safety Catcher, an **admissible load M** is given (line 1)
- Due to the **official certification** by European Authorities, the **holding force is guaranteed to be at least 2 x M** (line 2)
- SITEMA internally has **even higher** standard (line 3)
- Guaranteed **overload protection** latest at **3.5 x M** (4)

Example → A Safety Catcher with an *admissible load of 3.3 tons* will have a **holding force** of up to **over 10 tons**!

SiForce Technology

- SITEMA Safety Catchers create the holding force with a **self-intensifying technology**: under the effects of an acting load, wedge-shaped parts contract inside the clamping head.
- The more the load pulls on the rod, the higher the holding force will be.
- This technology is SITEMA's unique feature - **SiForce Technology** is not just about safety, but also relates to the principle of self-intensifying force.





SiForce Technology

The advantages at a glance

- Release under load is impossible, thereby ensuring safety against unintentional release.
- As long as the closed clamping system is unloaded (secured state), simply pressurizing it is enough to release it (no need to raise the load).
- The loaded clamping head can be released (e.g., after an emergency stop) only after the clamping head has been relieved. Safe load transfer to another system (such as the drive) is therefore automatically ensured. Simply lifting the load is enough to relieve it; no additional force (no “reversing/ retracting”) is necessary.
- Consequently, release is also gentle when used on cylinders.

SiForce

Technology

- Moving upwards is always possible, e.g., to free a trapped person, even when the clamp is closed.
- The clamping system is loaded only when this is really necessary – when the Safety Catcher accepts the load.
- This ensures a long service life (B_{10D} values up to 6 million).
- Safety factor > 2 built in.
- Loads up to 220 kN can be secured pneumatically as well (with SITEMA Safety Catchers; up to 30 kN with SITEMA Safety Brakes).

Accessories: Spring Base and Flanges

Advantages of the Spring Base:

- Even if the load slowly sinks down during normal operation, e.g. due to a small leakage at the lifting actuators, it is not necessary to lift the load before any downward movement.
- Compensates for lateral misalignment between the load guide elements and the clamping rod
- For details see Technical Information TI-A20 (compressive load versions) and TI-A21 (tensile load versions)
- You can find an animation with spring base here (Internet link)

Flanges:

- Different flanges for fixation are available, see

Accessories hydraulic: Automatic Air Bleeder

The Automatic Air Bleeder makes sense for all hydraulic units

Why use the Automatic Air Bleeder?

- Air inside the oil can cause damages to seals due to the so-called “Dieseling”.
- clamping heads can be particularly affected by Dieseling, as they are often installed on top of a machine.
- Air can collect there and is not transported away because there is no oil circulation through the clamping head.
- The Automatic Air Bleeder removes air from the oil at every activation of the clamping head.
- In bigger Safety Catchers (standard series K and K/TA), an automatic air bleeder is already included.

Accessories: Rod Attachment STB

Advantages of the rod attachment STB:

- Ready-to-use solution
  (rod not included)
- Designed for the maximum force that can occur at the Safety Catcher (3.5 x M)
- Slight radial and axial play
- For details see Technical Information TI-STB10
- You can find further information here on our website (Internet link)

Quality & Certification

SITEMA quality management

- 100% quality control
- 100% performance testing

Certified safety

- SITEMA is certified according to DIN ISO 9001 and DIN ISO 14001
- SITEMA Safety Catchers are approved by European Authorities

TÜV SÜD ISO 9001

TÜV SÜD ISO 14001

DGUV Test
HSM 19010
Sicherheit geprüft
tested safety
dguv.de/pruefzeichen

Summary

- **Maximum safety**
  - Automatic activation
  - Safe against operating errors
  - Protection against accidental release
- **Easy to integrate**
  - Safety factor already included
  - Stepless clamping at any point
  - Easy to retrofit
- **Reliable**
  - Certified by EU authorities
  - Proven components for more than 30 years
  - Long lifetime

SIFORCE TECHNOLOGY

Comparison Ratchet – Safety Catcher

Advantages Safety Catcher:

- Emergency braking possible
- Overload protection
- Stepless clamping
- Safety factor included
- Easy integration in all machines
- Automatic clamping at energy failure, safe against operating errors and accidental release
- Officially certified by European Authorities
- Easy remote control and surveillance
- Standard solution with absolute functional safety, reliable and proven since more than 35 years

Disadvantages Ratchet:

- Useable only at standstill
- No overload protection
- Blocking only at given positions
- Safety factor to be considered
- Complicated integration into the machine
- Does not block automatically in case of energy failure, not fail safe
- Own certification necessary
- Difficult control depending on the type
- Own special design necessary for each press type, i.e. additional cost

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