Technical Information TI-A10

Safety Catchers

- High holding force by self-intensifying clamping
- Hydraulic respectively pneumatic actuation
- Approved for use in presses and lifting gear (DIN EN 693)

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A detailed description of the control, assembly and operational test of the SITEMA Safety Catchers can be found in the “Operating Manuals BA-A11 to BA-A14”.

1 Purpose

Safety Catchers are used where protection of personnel and accident prevention must be achieved in connection with raised loads or tools in case of failure of load-bearing machine parts. This may be a leakage or breakdown, for example, of a hydraulic or pneumatic pressure system. Safety Catchers catch falling masses infinitely variable at any position of the stroke, in a mechanically secure and absolutely reliable manner. The design principle of the self-reinforcing clamping ensures an extremely high safety level.

2 Function

The piston shaft (1) is surrounded by the housing (2) in which several wedged clamping jaws (3), each with one slide lining (4) and one brake lining (5), are assembled. When pressure (p) is applied to the plungers (8), the clamping jaws are held in a raised position so that the shaft can move freely. The springs (6) are compressed in this position.

The Safety Catcher becomes effective as soon as pressure is released from the plungers (8). The action of the springs causes the clamping jaws (3) to then clamp the shaft (1) firmly, thus securing the load.

The clamping force, however, is not built up until the shaft has been moved by the load. Due to the self-intensifying static friction at the shaft, the clamping jaws (3) are drawn into the clamping position at their stops (7) after having moved the distance "e" (approx. 5 to 15 mm, depending on the design). This movement is illustrated as phase A in the force-path diagram.

If the load is increased further (phase B), the shaft remains in its position, independent of the load, until the static holding force F* is reached. As soon as this limit is exceeded, the clamping device (phase C) generates a mean dynamic braking force F -- the holding force -- and thus dissipates the kinetic energy of the falling mass.

The clamping is released by an upward movement of the shaft through path "e", by applying pressure corresponding to the load being lifted. Thus the release operation is only possible if the pressure system is intact. Excess pressure (e.g. for breaking loose) is normally not required.

Fig. 1: Design principle

released

clamped

F*

F

structure

force-path diagram
3 Design types
Depending on size there are different types of SITEMA Safety Catchers. K-, KR- and KRP-type Safety Catchers are identical as far as function and application are concerned.

Type K
This type has a number of small plungers to lift the clamping jaws. They are pressurised simultaneously by a common, annular groove.

Type KR
In this case the lifting function is ensured by an annular piston instead of the individual plungers used in type K. For reasons of design and cost, this solution is preferred to type K if used on shaft diameters of less than approximately 80 mm.

Type KRP
The KRP-type is the pneumatic option within the family of Safety Catchers. Although the forces of pneumatic actuators are a lot less than of comparable hydraulic ones, the KRP-types and KR-types of same rod size have same outer dimensions and same holding capacity. This is why - thanks to the self-intensifying friction - the holding force does not depend on the actuating spring force or actuator force.

4 Control

Pneumatic actuation:
The compressed air must be dried and filtered.

Actuation with a 3/2-way valve
In most applications the actuation suggested in fig.2 is used. During every operational cycle, the 3/2-way valve is actuated electrically and releases the clamping device.
In all other operational conditions, as well as in cases of power failure, emergency stop, etc. the clamping device becomes effective, secures the shaft and/or stops the load. In case the pressure line should fail, the load is secured in the same way.
If required e.g. in hydraulic lifts, the valve can also be controlled by a speed governor. In this case the safety catcher acts as a safety gear (braking mechanism).

Monitoring by proximity switches
The proximity switch 1 „Load secured“ signals the secure state and is used to authorise entrance to the danger area. Switch 2 „released“ is used to activate the downward movement of the drive.
For automatic detection of failures both signals are compared. In case both switches indicate the same state - apart from minor overlapping periods - there is a defect present.

5 Choosing the right size
The admissible load M is stated for all types in the „Technical Data Sheets TI-A11 to TI-A14“. During usual conditions (vertical movement), the criteria as below is to be maintained..

\[
M \geq \frac{\text{Moving weight}}{\text{Number of safety catchers}}
\]

The holding (braking) force for dry running or mineral-oil wetted shafts is not less than 2 x M, but will not exceed 3,5 x M. The fixing elements which accept the load (e.g. linking the rod to the travelling tool etc.) must therefore be dimensioned for a 3.5 x M force. This maximum force can occur with emergency braking and also if, in case of control errors, the full driving force is exerted against the Safety Catcher. However, circumstances of this kind should remain accidental exceptions, as otherwise possible damage could occur to the Safety Catcher.

6 Rod requirements
The Safety Catcher will operate correctly only if the rod has the correct surface:
- ISO tolerance field f7 or h6
- Surface roughness: Rz = 1 to 4 µm
- Hardchrome plated surface recommended
- Lead-in chamfer 3x20°, rounded.

As the maximum load can be as high as 3.5 times the nominal force M (for M see data sheets or dimensional drawing), care must be taken to ensure that the strength of the rod material is adequate. In the case of compression-loaded rods, sufficient buckling resistance must be assured.
In practice, suitable and commercially available rods are:

- Piston rods with,
  - Rod diameter toleranz: ISO f7
  - Basic material: 42CrMo4V
  - Hard chrome plating: 800-1100 HV min. 13 µm deep
  - Surface finish: RA 0,15 - 0,25

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Surface finish: RA 0,15 - 0,25
7 Service life
When discussing the service life of SITEMA Safety Catchers, a distinction must be made between two different types of use. In the normal case of securing a stationary load (e.g. the slide, etc.), the clamping jaws will only cover a very small distance, until the radial play is eliminated and an equilibrium between the spring forces and the forces generated on the slide and brake linings is achieved. The stress caused by this operations is extremely low and can certainly be cycled millions of times. For this reason, securing of a stationary slide, for example at each stroke of the press, will certainly not cause any wear or fatigue of safety-relevant parts, even after years of service. The radial forces and material stresses for which the unit is initially designed will occur only if unoperational lowering of the shaft occurs in clamped "load secured" condition, due to leakage, pipe break etc. In this case the clamping jaws are drawn into the clamping position after moving the full distance "e". Lowering through such a distance as a result of leakage is very rare, however, and only occurs when the machine is stopped for an extended period of time. Pipe breaks are even less frequent. Such events will certainly not occur more than several times a day or a few hundred times per year.

Based on the results of fatigue tests it can be guaranteed that for several years in normal use, the holding force will not drop below the nominal value, and that even after lots of clamping cycles, no relevant changes in the diameter or surface quality will be observed on the clamping shaft. The service life of SITEMA Safety Catchers will therefore not be less than the usual service life of production machinery.

There will be no relevant reduction of service life even in the occasional case of slippage when catching the load or due to overloads resulting from incorrect operation of the press cylinder with the clamp engaged, or the lifting of load without applying pressure simultaneously. However, abnormal situations like this should be avoided.

On the other hand it should be mentioned, that from our experience certain undesired operational conditions could diminish the service life considerably.

Most of all following operating conditions must be avoided:
- Radial forces or side loads due to misalignment
- Finish of the rod too rough
- Penetration of corrosive substances into the housing (including humid compressed air)
- Lowering of the load in "load secured" position with every stroke due to control.

8 Acceptance by Safety Authorities
SITEMA Safety Catchers have been tested and approved as safety devices for a number of different applications by:
- TÜV Technischer Überwachungsverein
- Berufsgenossenschaften (Workers Insurance)
- Lloyd's Register of Shipping

Particularly SITEMA Safety Catchers are certified with respect to the European Standard DIN EN 693 (Machine tools - Safety - Hydraulic presses) and DIN EN 692 (- Mechanical presses) as mechanical restraint device to prevent gravity fall.

A copy of respective certification and additional information can be found in “Technical Information TI-A40”.

9 Required risk assessment
It must be ensured that the dimensions and arrangement of SITEMA - Safety Brakes in safety-relevant applications meet the requirements of the risk evaluation DIN EN ISO 14121-1 and also comply with any further standards and regulations applying to the intended use. This is the duty of the system manufacturer and the user.

10 Operating conditions
The Safety Catcher is designed to operate in usual clean and dry shop atmosphere. In case of other environments at least the port T for breathing purposes is to be connected to a clean and dry volume (tank).

Should heavy soiling conditions (grinding dust, chips, other liquids, etc.) exist, please contact SITEMA. Grease on the rod may reduce the holding force.

The permissible surface temperature is 0 - 60°C.

11 Overall documentation and CE label
The Safety Catcher is designed as a component to be integrated into a machine or system and as such can never be CE-certified itself. The seller of the machine or system must provide information on the Safety Catcher with the overall documentation and if applicable ensure that the machine or system is CE-certified.

12 Regular functional checks
The Safety Catcher must be functionally checked at regular intervals. Regular checking is the only way to ensure that the unit will operate safely in the long run.

Please see the respective operating manual for further details. For standard versions "Operating Manuals BA-A11 to BA-A14" are valid.

13 Maintenance
The maintenance of the SITEMA Safety Catchers is limited to the prescribed regular functional check.

Should the Safety Catchers cease to comply with the required characteristics, the aforementioned safety of working with the machine or system is no longer given. In this case the Safety Catchers must be removed immediately and professionally repaired by SITEMA.

Any repair or refurbishing must be carried out by SITEMA. SITEMA cannot take any responsibility for repairs by another party.
**14 How to attach**

There are various ways to attach the Safety Catchers type K and KR/KRP. In any case it must be ensured, that no side load can be induced due to tolerances in dimensions or angular alignment relative to other guiding means.

If the Safety Catcher is directly mounted to a cylinder end cap, it usually is properly centered to the rod. In all other setups either the rod or the body of the catcher must not be rigidly fixed but mounted floating with enough radial clearance.

The 4 basic options are illustrated below, using hydraulic presses as an example of application. They can be applied in other cases as well if the expression slide is replaced by the more general term load carrying device.

Suitable attachment flanges are offered in „Technical Data Sheet TI-A30“.

**1. Safety Catcher fixed to machine frame -**

If the clamping device is firmly bolted to the machine frame, the retaining rod must have sufficient clearance at its attachment, so that the transverse or tilting movements of the slide will not create transverse forces to the rod.

**2. Safety Catcher floating on machine frame -**

The collar flange as shown above is one of the common solutions for a mounting with radial play. Alternatively a spring-base can be recommended, which on top is providing other advantages as described in "Technical Information TI-A20".

Both mounting versions make sure that the safety catcher can move freely in order to compensate for transverse movements of the travelling rod.

**3. Safety Catcher fixed to slide - rod floating on machine frame**

If the moving Safety Catcher is firmly mounted on the slide, the stationary rod must be loosely attached, similar to the option 1.

This is another application using a coupling flange. In addition an axial clearance of \( h = \) approx. 5 to 10 mm is used, so that this design will perform the function of the spring-base as well.

**4. Safety Catcher floating on slide - rod fixed to machine frame**
**Technical Data Sheet TI-A11**

**Safety Catcher KR**  Load direction compressive (to mounting surface)

General information, particularly regarding purpose, function, choosing right type and control is provided in "Technical Information TI-A10". Furthermore important practical advices are given in the "Operating Manual BA-A11".

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**Table: KR types with technical data**

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**Notes:**

1. M is the admissible force the mass to be secured exerts on the clamping device. The holding (braking) force for dry running or mineral-oil wetted shafts is not less than 2 x M, but will not exceed 3.5 x M.

2. Minimum operating pressure is 40 bar. In case a spring base is installed, for releasing without lifting the required pressure is 60 bar, conf. "Technical Information TI-A20". Admissible working pressure is 250 bar.

3. As supplied port LL is plugged by a plug screw. It may be used alternatively to port L and is useful for air-bleeding. It is generally recommended to install the Auto-Bleeder as described in the "Technical Information TI-Z10" at port LL (or L respectively).

4. Hydraulic operating volume.

5. Proximity switch holders are provided for standard proximity switches M12x1 shielded and with a nominal switching distance of 2 mm, except KR 25 and KR 28: M8x1 with nominal distance 1.5 mm. For easier service, the proximity switch holders have a positive stop and are presetted when delivered from the factory.

6. Port T is used for pressure compensation (breathing). It is plugged with an air filter element.

If, however, moisture or aggressive media are present, a hose instead of the filter must be installed to connect the device with a clean atmosphere (e.g. hydraulic tank).

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**Fig. 1:** Dimensions Safety Catcher KR (CAD-Files download at www.sitema.com)
Technical Data Sheet

Safety Catcher K

Load direction compressive (to mounting surface)

General information, particularly regarding purpose, function, choosing right type and control is provided in "Technical Information TI-A10". Furthermore important practical advices are given in the "Operating Manual BA-A11".

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Proximity switch port:1 Signal „Load secured“ see 5

Proximity switch port:2 Signal „unclamped“ see 5

Line from the automatic bleeder, see 7

Subject to modification without prior notice

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</table>

bold types = recommended standard, on stock

Fig. 2: Dimensions Safety Catcher K (CAD-Files download at www.sitema.com)
## Technical Data Sheet TI-A12

### Safety Catcher KRP

Load direction compressive (to mounting surface)

General information, particularly regarding purpose, function, choosing right type and control is provided in "Technical Information TI-A10". Furthermore important practical advices are given in the "Operating Manual BA-A12".

### Fig. 1: Dimensions Safety Catcher KRP (CAD-Files download at www.sitema.com)

<table>
<thead>
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<th>Typ</th>
<th>Ident.-Nr.</th>
<th>d</th>
<th>M</th>
<th>D</th>
<th>H</th>
<th>Y</th>
<th>Z</th>
<th>X</th>
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<th>G1</th>
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</table>

**bold types = recommended standard, on stock**

Subject to modification without prior notice

1. **M** is the admissible force the mass to be secured exerts on the clamping device. The holding (braking) force for dry running or mineral-oil wetted shafts is not less than 2 x M, but will not exceed 3.5 x M.

2. Minimum operating pressure is 4 bar. In case a spring base is installed, for releasing without lifting the required pressure is 6 bar, conf. "Technical Information TI-A20". Admissible working pressure is 10 bar.

3. Pneumatic operating volume.

4. Proximity switch holders are provided for standard proximity switches M12x1shielded and with a nominal switching distance of 2 mm, except KRP 25 and KRP 28: M8x1 with nominal distance 1.5 mm. For easier service, the proximity switch holders have a positive stop and are presetted when delivered from the factory.

5. Port T is used for pressure compensation (breathing). It is plugged with an air filter element. If, however, moisture or aggressive media are present, a hose instead of the filter must be installed to connect the device with a clean atmosphere (e.g. hydraulic tank).
To hold the tensile forces these KR/T types have a strong shoulder near the upper end, which is designed to transmit the force to a collar flange.

Therefore it is possible to attach the safety catcher to the machine frame in a fixed or floating manner according to the explanation given in „Technical Information TI-A10“, §14 „How to attach“.

Standard versions of those flanges are listed „Technical Information TI-A30“. Such flange is not part of the Safety Catcher KR/T and K/TA, but available as an option.

M is the admissible force the mass to be secured exerts on the clamping device. The holding (braking) force for dry running or mineral-oil wetted shafts is not less than 2 x M, but will not exceed 3,5 x M.

Minimum operating pressure is 40 bar. Admissible working pressure is 250 bar.

As supplied port LL is plugged by a plug screw. It may be used alternatively to port L and is useful for air-bleeding. It is generally recommended to install the Auto-Bleeder as described in the „Technical Information TI-Z10“ at port LL (or L respectively.

Hydraulic operating volume.

Proximity switch holders are provided for standard proximity switches M12x1 shielded and with a nominal switching distance of 2 mm, except KR/T 25: M8x1 with nominal distance 1,5 mm.

For easier service, the proximity switch holders have a positive stop and are presetted when delivered from the factory.

Port T is used for pressure compensation (breathing). It is plugged with an air filter element.

If, however, moisture or aggressive media are present, a hose instead of the filter must be installed to connect the device with a clean atmosphere (e.g. hydraulic tank).

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<th>Ident.-No.</th>
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<th>M</th>
<th>H</th>
<th>D1</th>
<th>D2</th>
<th>D</th>
<th>X</th>
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<tr>
<th>Port: release pressure</th>
<th>Alternativ port: release pressure</th>
<th>Port: pressure compensation</th>
<th>Proximity switch port:1 Signal „Load secured“</th>
<th>Proximity switch port:2 Signal „unclamped“</th>
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<td>3</td>
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</tbody>
</table>

Due to tolerances the ports 1 and 2 may be misaligned up to +/-4° relative to port L.

Subject to modification without prior notice
The attachment flange of type K/TA is supplied with boreholes to fix the device with bolts firmly to the frame.

As explained in „Technical Information TI-A10“, it must be ensured that the retaining rod has sufficient clearance at its attachment so that no transverse forces can be induced to the clamping device due to tolerances in dimensions or angular alignment.

Fig. 2: Dimensions Safety Catcher K/TA (CAD-Files download at www.sitema.com)

**Type** | **Ident.-No.** | **d** | **M** | **HG** | **H** | **D1** | **D2** | **D** | **X** | **Z** | **n** | **B** | **L1** | **V** | **w** | **HL** | **H1** | **H2** | **H3** | **Weight** |
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<td>0°</td>
<td>61,5</td>
<td>263</td>
<td>213</td>
<td>129</td>
</tr>
</tbody>
</table>

bold types = preferential sizes, available from stock

Subject to modification without prior notice

1. **M** is the admissible force the mass to be secured exerts on the clamping device. The holding (braking) force for dry running or mineral-oil wetted shafts is not less than 2 x M, but will not exceed 3,5 x M.
2. Minimum operating pressure is 40 bar. Admissible working pressure is 250 bar.
3. As supplied port LL is plugged by a plug screw. It may be used alternatively to port L and is useful for air-bleeding.
4. Hydraulic operating volume.
5. Proximity switch holders are provided for standard proximity switches M12x1 shielded and with a nominal switching distance of 2 mm.
6. Port T is used for pressure compensation (breathing). It is plugged with an air filter element.

If, however, moisture or aggressive media are present, a hose instead of the filter must be installed to connect the device with a clean atmosphere (e.g. hydraulic tank).

7. An automatic bleeder is integrated in the unit. Due to the permanent bleeding, small quantities of an air-oil-mixture will escape from the port. Therefore, a connection line to the tank is indispensable.

(For further information see „Technical Information TI-Z10“)

8. Optionally, the unit can be equipped with an oil sensor. This sensor indicates at an early stage beginning leakage due to worn or damaged seals.

SITEMA GmbH & Co.KG . Im Mittelfeld 10 . D-76135 Karlsruhe . Phone: +49(0)721/98661-0 . Fax: -11 . www.sitema.com
To hold the tensile forces these KRP/T types have a strong shoulder near the upper end, which is designed to transmit the force to a collar flange.

Therefore it is possible to attach the safety catcher to the machine frame in a fixed or floating manner according to the explanation given in „Technical Information TI-A10“, § 14 „How to attach“.

Standard versions of those flanges are listed „Technical Information TI-A30“. Such flange is not part of the Safety Catcher KRP/T, but available as an option.

---

**Type** | **Ident.-No.** | **d** | **M** | **H** | **D1** | **D2** | **D** | **X** | **Y** | **V** | **AG** | **HL** | **H1** | **H2** | **w** | **Weight** |
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
KRP/T 25 | KR 025 36 | 25 | 10 | 155 | 70 | 88 | 71 | 3 | 13 | 20 | G1/8 | 39 | 87 | 105 | 23.5° | 4 |
KRP/T 40 | KR 040 36 | 40 | 33 | 214 | 106 | 125 | 106 | 4 | 20 | 50 | G1/4 | 51 | 109 | 128 | 35° | 9.5 |
KRP/T 56 | KR 056 36 | 56 | 67 | 265 | 140 | 164 | 140 | 5 | 25 | 80 | G1/4 | 55 | 125 | 168 | 0° | 26 |
KRP/T 80 | KR 080 36 | 80 | 133 | 325 | 200 | 225 | 194 | 6 | 34 | 150 | G1/4 | 57 | 131 | 179 | 0° | 60.5 |

**Subject to modification without prior notice**

1. M is the admissible force the mass to be secured exerts on the clamping device. The holding (braking) force for dry running or mineral-oil wetted shafts is not less than 2 x M, but will not exceed 3.5 x M.
2. Minimum operating pressure is 4 bar. In case a spring base is installed, for releasing without lifting the required pressure is 6 bar, conf. „Technical Information TI-A20“. Admissible working pressure is 10 bar.
3. Proximity switch holders are provided for standard proximity switches M12x1 shielded and with a nominal switching distance of 2 mm, except KRP/T 25: M8x1 with nominal distance 1.5 mm.
   For easier service, the proximity switch holders have a positive stop and are presetted when delivered from the factory.
4. Proximity switch holders are provided for standard proximity switches M12x1 shielded and with a nominal switching distance of 2 mm, except KRP/T 25: M8x1 with nominal distance 1.5 mm.
   For easier service, the proximity switch holders have a positive stop and are presetted when delivered from the factory.
5. Port T is used for pressure compensation (breathing). It is plugged with an air filter element. If, however, moisture or aggressive media are present, a hose instead of the filter must be installed to connect the device with a clean atmosphere (e.g. hydraulic tank).
General Information

Purpose
SITEMA Safety Catchers can only be unlocked if their clamping system is not under load. This is a matter of principle and complies with the relevant safety regulations. If, however, the slide or any other load carrying device overshoots after reaching its top cut-off position, or moves slightly downward for any particular reason, the Absturzsicherung K und KR is subjected to a partial load. In practice this means that the slide must first be raised before a closing movement of the press is possible. This effect oft can be avoided by not bolting the safety catcher directly to the machine frame, but rather on a spring-base.

Solution
The housing (1) is securely fixed to the machine frame. Inside this housing the flange plate (2) which bears the safety catcher, is free to move vertically (stroke "h") as well as transversely (by the permitted eccentricity of "x"), and is allowed to tilt. The safety catcher when released (i.e. not under load) is pressed upward by the spring (3), against the stop. If the slide should settle slightly (due to leakage, for example) while the safety catcher is engaged, only the spring force — which is very low in comparison to the holding force — is exerted on the safety catcher. In this case, the safety catcher can be released without an upward movement. Only when the lowering movement exceeds stroke length "h", the full weight of the slide will be borne by the safety catcher. Now it is possible to release the safety catcher after only a short upward movement.

Note:
The overall lowering path, after which the slide will be secured mechanically, is increased by the distance h (for h see picture at page 2). This amount is to be taken into consideration when making safety analyses for engineering purposes. Special note must be made of this in the operating instructions for the press.

Advantages
Raising the slide before the lowering movement is no longer required, even if a leakage should occur at the cylinder seals.

The crucial safety criteria, “safety catcher can only be released when the weight of the slide is supported entirely by the hydraulic pressure”, is satisfied without restriction. Enlarging the maximum lowering distance by the stroke "h" is not relevant to safety in this case.

The spring-base also compensates for certain misalignment between the slide guide and the clamping rod. Other methods („Technical Information TI-A10“ § 14 „How to attach“) are not necessary in this case.

There are two alternatives for attaching the Safety Catcher to the machine frame. Either using threaded holes arranged identical to the ones on the clamping device or the externally attached shoulder which engages with the coupling flange FL/FS („Technical Data Sheet TI-A30“)

Mounting
As usually ordered the the spring-base is factory-mounted under the Absturzsicherung K und KR, ready for use. Special mounting instructions are supplied for retrofitting.

The electric control of the Safety Catcher unit is described in „Technical Information TI-A10“. The required release pressure is 60 bar for standard hydraulic versions and 6 bar for pneumatic ones. Pressure must be supplied via a flexible line.
Dimensions

For KR 25/FS 25 to KR 80/FS 80
In these sizes a centrally located spring carries the weight of the clamping device. The housing has no protection against torsion and is therefore self-aligning to the forces applied by the connecting hose.

For KRP 25/FS 25 to KRP 80/FS 80
For these pneumatic version the connecting hoses often rather small and flexible. In order to prevent kinking or squeezing, the suiting spring bases are equipped with a twist protection.

For KRP 100/FS 100, K 100/FS 100 to K 140/FS 140
By contrast, these sizes are fitted with a set of borehole guided compression spring, which by the way prevents the body from being rotated.

![Figure 1: Spring base for KR 25 to KR 80 and KRP 25 to KRP 80](image1)

![Figure 2: Spring Base for KRP 100 and K 100 to K 140](image2)

<table>
<thead>
<tr>
<th>Safety Catcher</th>
<th>Spring-base</th>
<th>H</th>
<th>H1</th>
<th>D</th>
<th>D1</th>
<th>D2</th>
<th>Y</th>
<th>L</th>
<th>G</th>
<th>T</th>
<th>h</th>
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<td>4xM16</td>
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Subject to modification without prior notice
Technical Data Sheet TI-A30
Mounting Flanges for Safety Catchers K and KR

General Information
The standard SITEMA Safety Catcher K and KR are supplied with a set of threaded boreholes to bolt the unit to the machine frame. But often a mounting flange is required, because bolting from below is impossible or a floating attachment is necessary (see also „Technical Information TI-A10“, §14 „How to attach“).

Different mounting flanges for typical applications are listed below. Additionally page 3 shows coupling flanges for Spring Bases. Page 4 shows mounting flanges for tensile versions of Safety Catchers.

Flange FL/SL (standing / floating)
For attachment of Safety Catchers K, KR and KRP on the machine frame
To avoid possible transverse forces it is often helpful to attach the safety catcher FL/SL floating on the machine frame. Floating coupling flanges for Safety Catcher K and KR are listed below.

Pressure must be supplied via a flexible line, in order to allow the desired three-dimensional motions of the housing. Please note, that there is no stop in torsional direction, so that the housing will be self-aligning to the forces applied by the connecting hose.

For type KR

<table>
<thead>
<tr>
<th>Type</th>
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<th>D</th>
<th>C</th>
<th>A</th>
<th>G</th>
<th>E</th>
<th>n</th>
<th>T</th>
<th>S</th>
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<tbody>
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<td>32</td>
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<td>KR 40 or KRP 40</td>
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<td>144</td>
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<td>20</td>
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<td>FL/SL 56</td>
<td>KR 56 or KRP 56</td>
<td>198</td>
<td>180</td>
<td>147</td>
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<td>11</td>
<td>6x60°</td>
<td>63</td>
<td>77</td>
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<td>KR 80 or KRP 80</td>
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For type K (2 parts)

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<th>C</th>
<th>A</th>
<th>G</th>
<th>E</th>
<th>n</th>
<th>T</th>
</tr>
</thead>
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<td>FL/SL 125</td>
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<tr>
<td>FL/SL 140</td>
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<td>4x90°</td>
<td>147</td>
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Subject to modification without prior notice
Flange FL/SF (standing / fixed)

For attachment of Safety Catchers KR and KRP on the machine frame or travelling overhead with the slide

Alternatively to the fixation by bolting from below, the mounting flange FL/FS can be used to fix the safety catcher to the machine frame.

In this case it has to be ensured, that the retaining rod has sufficient clearance at its attachment so that no transverse forces can be induced to the clamping device.

This standard flange is only available for KR and KRP-type safety catchers. Nevertheless, fixed flange attachments for K-type units are available on request. Please ask for details.

Flange FL/HL (hanging / floating)

For attachment of Safety Catchers KR and KRP travelling with the slide

The floating flange FL/HL should be used, if the safety catcher is arranged attached to the slide from below and travelling with it, while the rod is fixed stationary to the machine frame (normally hanging).

Due to the axial play of 8 mm this flange additionally fulfils the function of the Spring-base „Technical Information TI-A10“, §13 „Attachment“.

Pressure must be supplied via a flexible line, in order to allow the desired three-dimensional motions of the housing. Please note, that there is no stop in torsional direction, so that the housing will be self-aligning to the forces applied by the connecting hose.

Due to the design, this flange is only available for KR and KRP-type safety catchers.

### Tables

#### Flange FL/SF for type KR and KRP

<table>
<thead>
<tr>
<th>Type</th>
<th>for Safety Catcher</th>
<th>D</th>
<th>C</th>
<th>A</th>
<th>G</th>
<th>E</th>
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#### Flange FL/HL for type KR and KRP

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<td>FL/HL 40</td>
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<td>6x60°</td>
<td>59</td>
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<td>FL/HL 56</td>
<td>KR 56 or KRP 56</td>
<td>198</td>
<td>180</td>
<td>148</td>
<td>27</td>
<td>11</td>
<td>6x60°</td>
<td>77</td>
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<tr>
<td>FL/HL 70</td>
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<td>FL/HL 80</td>
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<td>202</td>
<td>32</td>
<td>11</td>
<td>6x60°</td>
<td>107</td>
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</tbody>
</table>

Subject to modification without prior notice
Flange FL/FS (spring-base)
For attachment of spring-bases FS on the machine frame
Alternatively to the bolting of the spring-base from below, this flange can be used.

For type KR and KRP

<table>
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<tr>
<th>Type</th>
<th>for Spring-base</th>
<th>D</th>
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<th>A</th>
<th>G</th>
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<td>160</td>
<td>141</td>
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<td>6x60°</td>
</tr>
<tr>
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<td>FS 56</td>
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<td>210</td>
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<td>11</td>
<td>6x60°</td>
</tr>
<tr>
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<td>4x90°</td>
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</tbody>
</table>

Mounting Flanges for type KR/T or KRP/T

Mounting flange fix - type FL/TF
If the retaining rod has sufficient clearance on the slide or load carrying device to move freely, the safety catcher can be centered and bolted on the machine frame.
The flange FL/TF offers the possibility to turn the ports in a desired direction before the housing is fixed by fastening the bolts.

For type KR/T and KRP/T

<table>
<thead>
<tr>
<th>Type</th>
<th>for safety Catcher</th>
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<th>C</th>
<th>D</th>
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<td>70</td>
<td>22</td>
<td>12x30°</td>
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</table>

Subject to modification without prior notice.
Mounting flange floating - type FL/TL

To avoid possible transverse forces it is often helpful to attach the safety catcher floating on the machine frame, using flange FL/TL. It allows the housing to move radial (3mm) and axial (1mm) as well as to tilt (approx. 0.25°).

Pressure must be supplied via a flexible line, in order to allow the desired three-dimensional motions of the housing. Please note, that there is no stop in torsional direction, so that the housing will be self-aligning to the forces applied by the connecting hose.

For type KR/T and KRP/T

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<tr>
<th>Type</th>
<th>for Safety Catcher</th>
<th>AL</th>
<th>C</th>
<th>D</th>
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<td></td>
<td>or</td>
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<td>KR/T 40</td>
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</tr>
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<td></td>
<td>or</td>
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Subject to modification without prior notice.