



**SAFETY SOLUTIONS**  
**Interlocking systems**

Trapped-key interlocking systems HST® |  
Valve interlocking systems HSV® |

[www.haake-technik.com](http://www.haake-technik.com)





# Making the world a safer place

With the aim of making the interaction between humans and machines as safe as possible, we have been developing, producing, and distributing innovative safety products since 1987.

In the field of safety technology, where the highest level of reliability is essential, we do not compromise on the quality of our products. By utilising premium materials, we not only contribute to accident prevention but also safeguard and conserve the environment.

**We embrace this responsibility day by day.**



## Offering individual and solution-oriented approaches

Close collaboration with you is of utmost importance to us, serving as the foundation for developing new ideas and tailored solutions that meet your requirements for maximum machine safety.

- ✓ **Our solutions are custom-fit to protect people, machinery, and the environment.**



## Certified safety solutions

We don't leave anything to chance. All HAAKE product lines leave our factory after thorough inspection.

- ✓ **Quality management system - UQS**
- ✓ **Quality management according to ISO 9001**
- ✓ **Environment management according to ISO 14001**
- ✓ **Health & safety according to ISO 45001**



Here you can find the certificates







**Contents**

About HAAKE®	<b>2-4</b>
Contents	<b>5</b>
<b>Trapped-key interlocking systems HST®</b>	
Product presentation	<b>6-9</b>
Systems with accessible rear area	<b>10-11</b>
Systems with delay time	<b>12-13</b>
Best Practice – HST®	<b>14-15</b>
System components HST®	<b>16-17</b>
<b>Valve interlocking systems HSV®</b>	
Product presentation	<b>18-21</b>
Safeguarding of pressure safety valves (PSV)	<b>22-23</b>
Safeguarding of a pigging station	<b>24-25</b>
Best Practice – HSV®	<b>26</b>
System components HSV®	<b>26-27</b>
HAAKE® Portfolio	<b>28-29</b>
HAAKE® Sales channels	<b>30-31</b>

More **information** is available **online** at:

[www.haake-technik.com](http://www.haake-technik.com)

## Haake Technik GmbH – Innovator for your machine safety

When humans and machines come together, the highest safety precautions and standards are required. From the automotive industry to robotics, specialised safety solutions are in demand.

For decades, we have been impressing renowned machine manufacturers, system integrators, end consumers, and public institutions with our innovative HAAKE® safety products.

As problem solvers, we support you with specific safety questions and are experts in safeguarding hazardous areas or danger zones using tactile sensors or mechanical key transfer systems, taking into account individual safety requirements and needs.



Jonas and André Haake



# Trapped-key interlocking systems HST®



## Safely controlling machines and processes

To protect operators from dangerous machinery and equipment, they are often safeguarded with safety fences and guard doors. Additional safety is provided by the use of a trapped-key interlocking system. It ensures that a guard door remains closed and locked until the hazardous machinery or equipment is shut down. Conversely, such a system prevents the restart of a machine or hazardous machine function if the guard door is not closed and locked.

### Application areas (excerpt):

- Wind turbines
- Electrostatic precipitators
- Mixers
- Grinding mills
- Granulators
- Stone crushers
- Asphalt mixing plants
- Spray dryers
- Robotic cells
- Bakery lines
- Animal enclosures

Key exchange device HST® W 10 for multiplying the keys of a trapped-key interlocking system

### What are trapped-key interlocking systems?

A trapped-key interlocking system consists of at least two components and is intended to prevent the execution of dangerous machine functions under predefined conditions.

The heart of the system is an individually coded key, which exists uniquely for each system and is inevitably transferred between the components of a trapped-key interlocking system. This key can only be removed from the lock in a safe state, for example, when the machine is switched off via the switch or when the guard door is closed and locked.



Individually coded key



Key exchange device HST® W 5

Depending on the application - such as a mixing plant with a time delay or for safeguarding an animal enclosure, for example - Haake Technik provides appropriately configured systems. Together with you, we determine the predetermined sequence of process steps during the conception of the system. It is not possible to deviate from this predetermined sequence. This ensures a high level of safety, and practically any type of hazard can be safeguarded.







**Bolt lock HST®-B**

### Functionality & Structure

Typically, a trapped-key interlocking system consists of an energy control device (such as a bolt lock HST®-B, an interlocking device HST®-LS, or a key-operated switch HST®-S) and an access lock on a guard (e. g. access lock HST®-TS2). The energy control device and the access lock are different components. The individually coded key represents the connection between these components. Through it, the desired process sequence is ensured and a defeat in a reasonably foreseeable manner is prevented.



**Access lock HST®-TZ2**



**Interlocking device HST® LS**



Here is the link to the data sheets



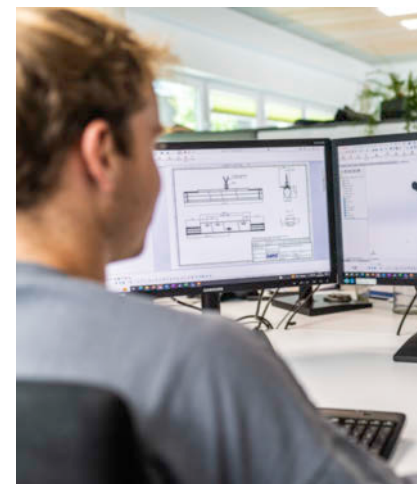
### Solutions for every need

If the hazardous area can be accessed through multiple doors, then the use of a so-called key exchange device is required. By inserting the main key from the energy control device, the key exchange device releases a number of differently coded access keys according to the number of guard doors. These coded access keys can then be used for operating different variants of access locks according to the defined process sequence. For example, if there is a risk that the operator in the hazardous area may be overlooked, then the use of an access lock with a personnel key, such as the access lock HST®-TZ2, is mandatory. As long as the operator is in the hazardous area with the personnel key, the machine or equipment cannot be started.



### Your benefits at glance

- ✓ **Ease of use:** Your employees can quickly and easily learn how to operate the system regardless of their qualifications. This increases acceptance and reduces motivation for manipulation.
- ✓ **Individually coded keys and locks with a high number of codes:** The operating sequence is forcibly predetermined by the individual coded keys and locks. The risk of accidents due to bypassing or incorrect operation is reduced to an absolute minimum.
- ✓ **Individual and difficult-to-copy key design and controlled key issuance by HAAKE Technik:** Within your facility or application, we prevent the existence of uncontrolled spare keys that would allow bypassing of the safety function.
- ✓ **Purely mechanical, without wiring:** Our system can be easily and cost-effectively installed, and the safety function is permanent, i. e. guaranteed even in the event of a power outage.
- ✓ **Maintenance-free**
- ✓ **Simple retrofitting is possible:** Already delivered systems can be easily expanded or supplemented afterwards.
- ✓ **High mechanical robustness and resistance to harsh environmental conditions:** You can confidently use our trapped-key interlocking system in environments where other protective devices quickly fail. Due to its very high robustness and durability, you also save costs for spare parts procurement.



### Customisation – Personal support

If you have specific requirements that our standardised shapes, sizes, colours, or materials do not cover, we'll be happy to develop custom solutions for you.



**Find your regional contact person here**

# Safeguarding of hazardous areas with whole body access

In automated production lines of industrial manufacturing, where, as in the following case study, robots are used for processing packages, high safety standards are required. Impact and crushing injuries to operators caused by the robot or unexpected restarts of the robot while operators are in close proximity to the robot are potential hazards that need to be prevented. How these hazards are minimised or reduced to a minimum through the use of a **HAAKE® trapped-key interlocking system HST®** is explained in the following presentation.

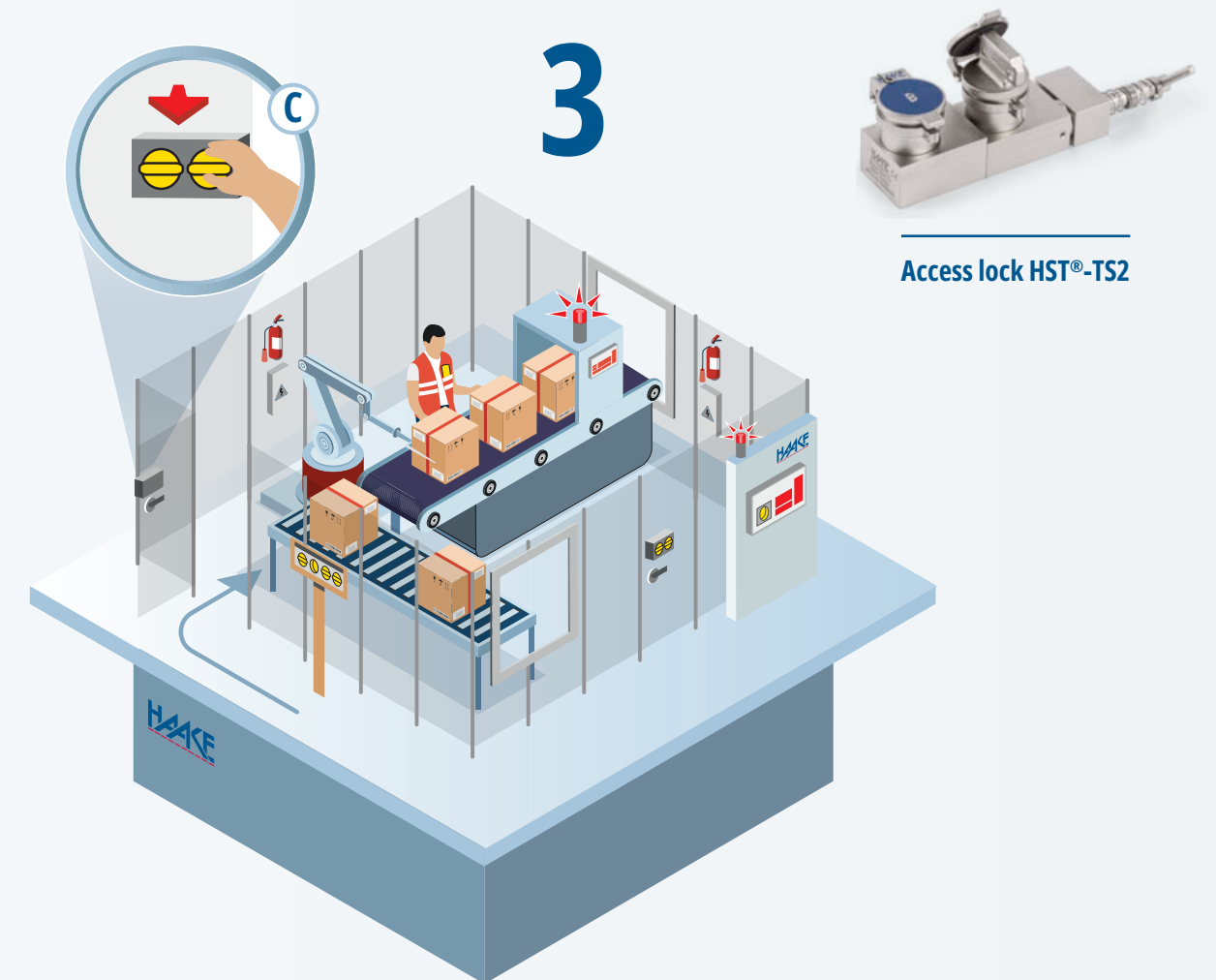


## 1. Robot shutdown

To perform maintenance work, the robot must be shut down. At the control panel outside the fenced danger zone, the robot can be shut down by rotating and removing **key A** from the **HAAKE® key operated switch HST®-S**.

## 2. Access to the maintenance area

Since the danger zone can be accessed through two guard doors, the use of a **HAAKE® key exchange device HST®-W** is required. By inserting **key A**, the differently coded keys B are released. After removing **key B**, **key A** is trapped.



## 3. Opening the guard doors and working in the maintenance area

By inserting **key B** into the **HAAKE® access lock HST®-TS2**, the guard door is unlocked, and the personnel **key C** is released. The employee now carries the personnel **key C** and enters the hazardous area to perform maintenance, for example. While the employee carries this personnel **key C**, the previous keys are trapped, and the system cannot be started. Through this forced key transfer, the employee can perform maintenance exclusively in a safe state. After completing the maintenance, the keys must be returned in reverse order to release the respective previous key. The robot can now be restarted once all keys have been returned. This inevitably ensures that no employee is in the danger zone when the robot starts.

# Safeguarding a machine with stopping time

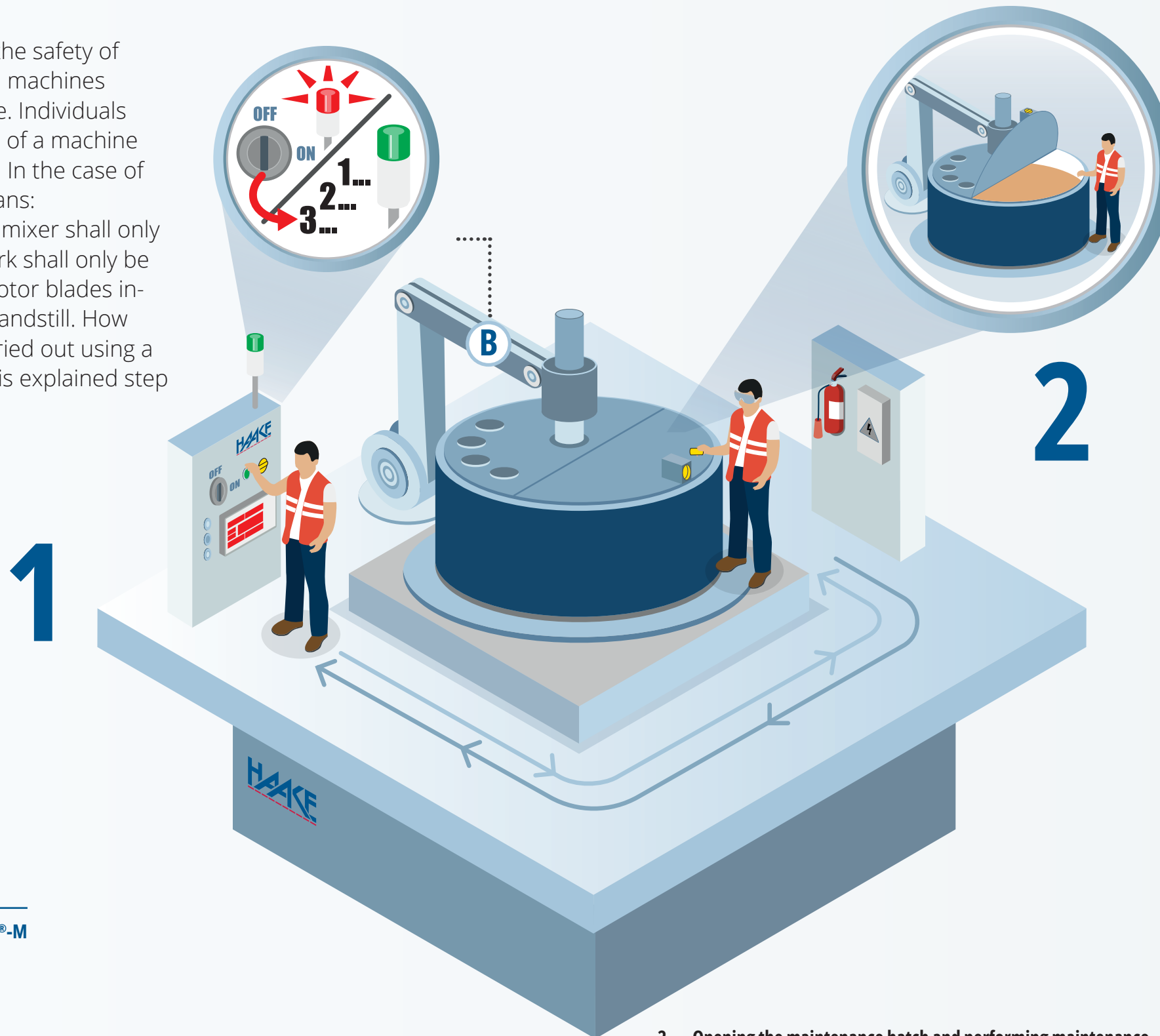
Special requirements regarding the safety of the operating personnel apply to machines and systems with a stopping time. Individuals must not reach the moving parts of a machine or system while it is in operation. In the case of maintenance of a mixer, this means: The maintenance hatches of the mixer shall only be opened and maintenance work shall only be started when the moving parts/rotor blades inside the mixer have come to a standstill. How such a process can be safely carried out using a trapped-key interlocking system is explained step by step in the example provided.

## Application areas (excerpt):

- Mixers
- Grinding mills
- Crushers



Key-operated solenoid controlled switch HST®-M



Access lock HST®-TZ1

or



Access lock HST®-TS1

### 1. Mixer shutdown

To perform maintenance work, the mixer must first be shut down at the control panel using the **HAAKE® key-operated solenoid-controlled switch HST®-M**. Since the mixer does not come to a complete standstill immediately after shutdown, the signal from a standstill monitor or time relay must be waited for. Only when this signal arrives at the switch element with locking device and the green indicator light of the indicator key-operated solenoid-controlled switch is illuminated can the switch be pressed, and key A can be removed.

### 2. Opening the maintenance hatch and performing maintenance

The operator takes key A and operates the **HAAKE® access lock HST®-TZ1** with this key. The actuator of the access lock is released, and the maintenance hatch can be opened. The key is now trapped and can only be removed after the hatch is closed and the actuator is inserted into the access lock again. To restart the mixer, the key must be returned to the switch element at the control panel.



# Trapped-key interlocking systems HST® Best Practice



## Safeguarding of impact crushers for secondary and hard rock crushing

To open the maintenance flap of the Hazemag impact crusher, the operator must first switch off the machine. Only after the impact crusher has come to a complete standstill, the uniquely coded operating key is released and can be retracted from the key-operated solenoid-controlled switch HST®-M. This key can now be used to open the maintenance flap by operating the access lock HST®-TS1. Once the flap is opened the key is trapped in the access lock.

As long as the service flap is open, the key cannot be removed. This is only possible when the flap is closed. This ensures that the machine cannot be started as long as a person is doing maintenance work.



For more **information** and **case studies**, please go to:

<https://www.haake-technik.com/en/case-studies/>

## Development of an individual trapped key interlocking system for **HAZEMAG**:

In some industrial sectors, machines are used whose hazardous movements come to a standstill with a certain stopping time when they are switched off. In other words, even if they are switched off, it takes time for them to come to a complete standstill. A grinder, for example, has such a stopping time. As long as this grinder has not come to a complete standstill, there is a risk of a person being drawn in.

In order to rule out such hazards and thus accidents, HAZEMAG & EPR GmbH has opted for the longstanding, robust and proven sequential protection provided by a HAAKE® trapped-key interlocking system HST®.

### Application areas (excerpt):

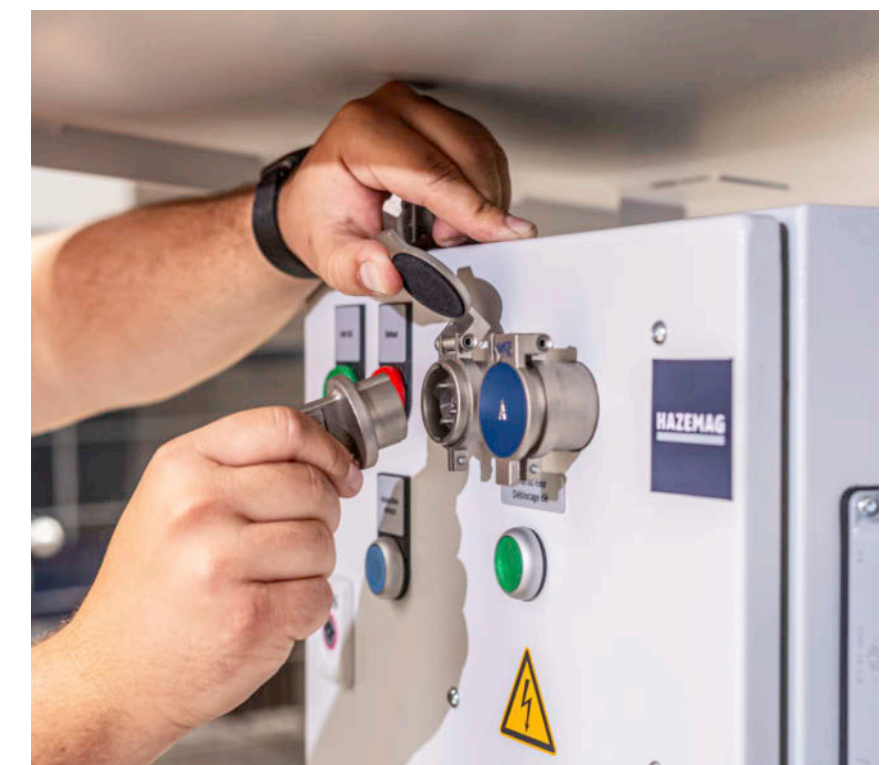
- Impact crushers
- Machines with stopping time



Key-operated solenoid-controlled HST-M in a customised enclosure



Access lock HST®-TS1 with chained actuator







Here is the link to the data sheets



## Typical components of Trapped-key interlocking systems HST®.



### Key-operated switch HST®-S

The key-operated switch HST®-S is used to switch off a machine / danger point. A switch is actuated by turning a key. The key is released and can be removed. The switching element HST®-S is supplied as a panel version (as shown) or in metal case.



### Key-operated solenoid-controlled switch HST®-M

The key-operated solenoid-controlled switch HST®-M is used on machines with run-down time. The key can be removed only if a signal from the machine control is present that the dangerous movement has stopped. An illuminated pushbutton indicates the standstill. You have to press this button to remove the key.

Turning the key activates a rotary switch with selectable contact configuration. The solenoid-controlled switch HST®-M is supplied as a panel version (as shown) or in metal case. Versions with one and two locks are available.



### Bolt lock HST®-B

The bolt lock HST®-B is used for locking switching devices (circuit breakers, disconnectors, earthing switches etc.). By turning the key, the bolt moves into a corresponding recess on the handle or the control unit of the switching device and locks. The key can be removed only in this position.

The bolt lock HST®-B is not suitable for locking guard doors, flaps or similar.



### Key exchange device HST®-W5

The key exchange device HST®-W5 is used to increase the number of keys of a trapped-key interlocking system. One or more primary keys are inserted to release the desired number of secondary keys.

Typically, a key exchange device is installed as interlink between the switch and guard doors.



### Key exchange device HST®-W10

The key exchange device HST®-W10 is used to increase the number of keys of a trapped-key interlocking system. One or more primary keys are inserted to release the desired number of secondary keys.

Typically, a key exchange device is installed as interlink between switch and guard doors.



### Access lock HST®-TS1

The access lock HST®-TS1 consists of a lock and a locking bolt part and can be used on swing and sliding doors or flaps. Versions with different locking bolt positions are available.

Insert the key to open the guard door or flap. The locking bolt can then be rotated by 90 ° and removed. The key is trapped.



### Access lock HST®-TS2

The access lock HST®-TS2 features 2 locks and is used in applications with accessible area. The operator takes the second, personnel key into the danger zone. This personnel key can also be used for other functions (e.g. teach mode), or the operator can carry the personnel key along as described previously.

Before the personnel key visible in the picture can be removed, a matching key must first be inserted and turned in the empty lock part. The personnel key can now be removed, and the previously inserted key is trapped.



### Access lock HST®-TZ1

The access lock HST®-TZ1 features a flexible slam-type locking actuator mechanism and can be used without any problems on misaligned or sagging doors and flaps.

Different versions with numerous actuator orientations are available. Insert and turn the key to open the guard door or flap. The actuator is pushed out of the lock part. The key is trapped.



### Access lock HST®-TZ2

The access lock HST®-TZ2 features 2 locks and is used in applications with accessible area.

The operator takes the second, personnel key into the danger zone. This personnel key can also be used for other functions (e.g. teach mode), or the operator can carry the personnel key along as described previously.

Before the personnel key visible in the picture can be removed, a matching key must first be inserted and turned in the empty lock part. The personnel key can now be removed, and the previously inserted key is trapped.



# Valve interlocking systems HSV®



## What are the valve interlocking systems?

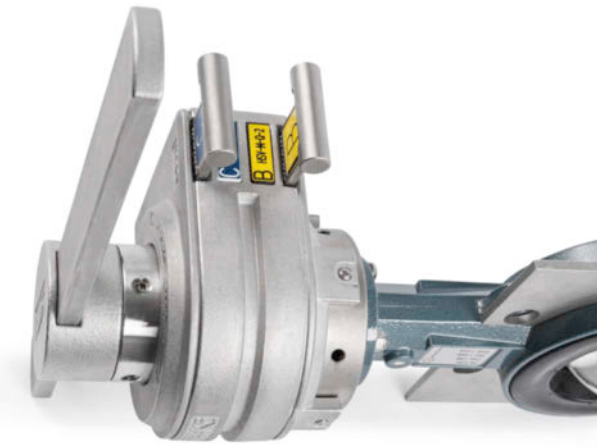
Valve interlocking systems consist of at least two components and control the controlled opening and closing of valves. They are used wherever a specific sequence for opening and closing multiple valves is required to prevent accidents, protect materials, or ensure process safety.

An easy-to-use and safe valve interlocking system provides the best possible protection against personal, property, and environmental damage. A valve interlocking system from Haake Technik enforces adherence to a specific sequence when opening and closing multiple valves. The key coding tailored to the intended process ensures maximum protection of the system.

The modular system allows for a variety of variants. Useful accessories such as key exchange devices or key cabinets complete the system. Combinations with the the HAAKE® Trapped-key interlocking system HST® are also possible. Anti-tamper locks protect against vandalism and theft.



Click here for the product video



Valve Interlock HSV®-M-Q-2

## The key to plant and process safety

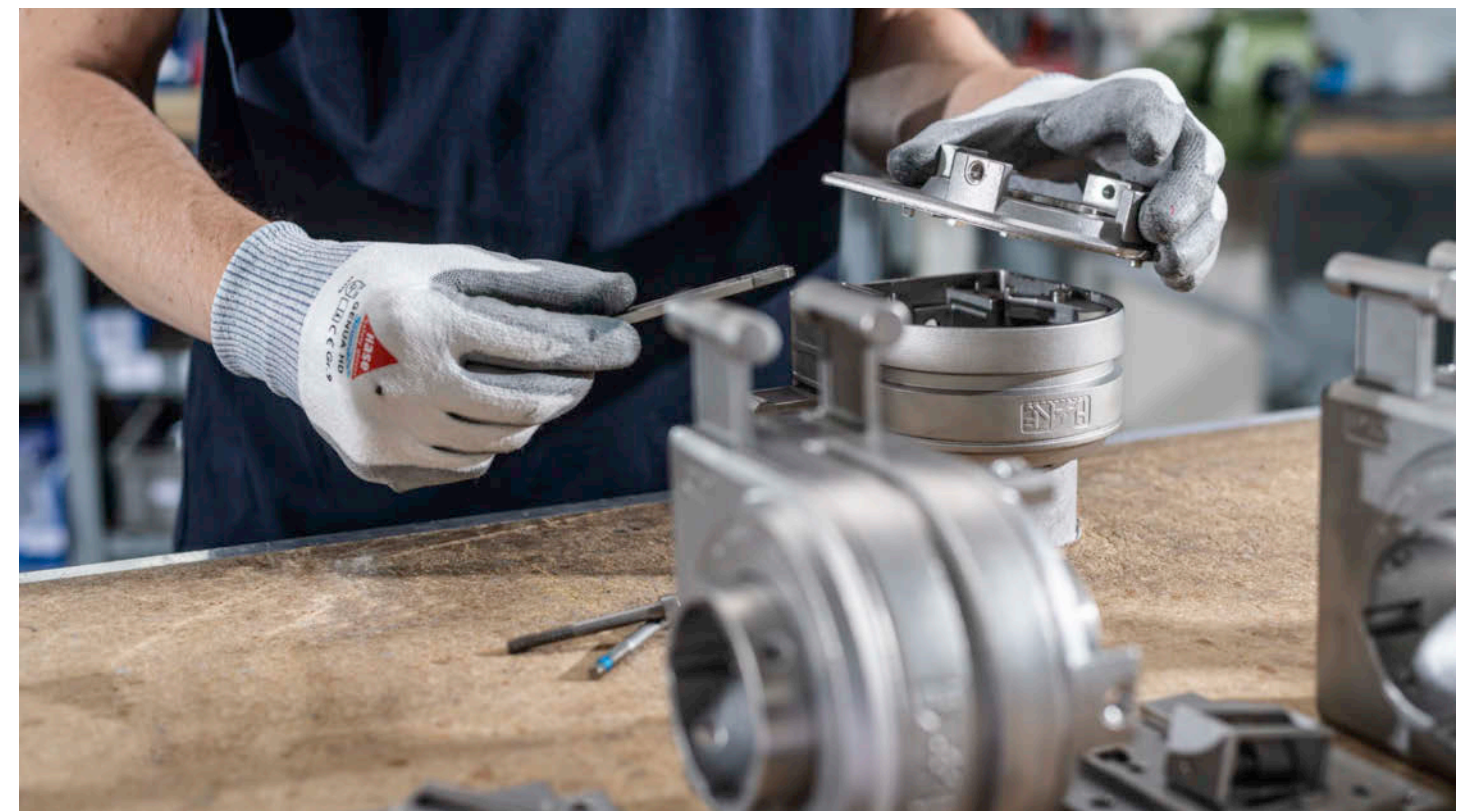
In many industrial production lines, as well as in chemical parks and in the oil and gas industry, valves play a central role in safety and process control. Incorrect operation of valves must be ruled out from the outset. Chains, padlocks, or organisational measures such as Lockout-Tagout procedures (LOTO) are not sufficient for this purpose. The key to your plant and process safety lies in the use of valve interlocking systems.

### Application areas (excerpt):

- Oil and gas networks
- Pipelines
- Tank farms
- Chemical production facilities
- Power plants
- Water supply systems
- Filling systems
- Paper factories



Valve Interlock HSV®-M-R-2





## Functionality & Structure

Haake Technik's valve interlocks are made of AISI 316L stainless steel, offering the highest level of safety, robustness, and user-friendliness. They can be used with all types of valves: lever valves, gate valves, slide valves, cone valves, and ball valves. Adjustments to all sizes and dimensions are possible with the help of standard and customised adapters.

The functionality of the different types of valve interlocks is based on the same principle: A valve – whether with a lever or a handwheel – cannot be operated without inserting a coded key. For example, if mixing of media is to be prevented, a second valve can only be opened when a first valve is closed. This is ensured by locking the first valve to release a key required to unlock the second valve – and vice versa.



Valve Interlock HSV®-M-R-2  
on a gate valve



Handwheel of a valve interlock



Differently coded and engraved operating keys

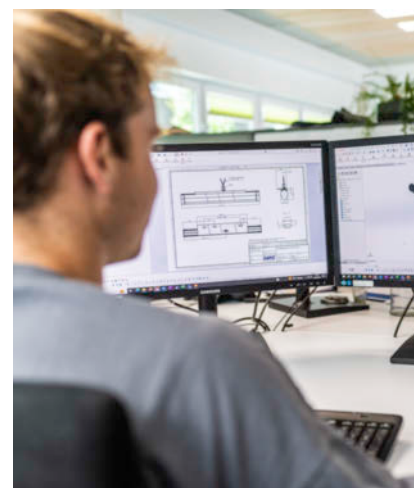
## Highest safety for your plants and processes

Both HAAKE® keys and HAAKE® valve interlocks are made of stainless steel. Thanks to the individual coding, the highest level of safety is always guaranteed – copying keys like with simple padlock keys is not possible. Moreover, the ergonomic and intelligent design ensures maximum ease of use even with heavy safety gloves. The keys can be inserted on both sides into the shaft, and it is immediately apparent after a few millimetres whether the key fits. In addition, a colour code and a custom engraving of up to four lines facilitate identification and assignment. All of this ensures a smooth workflow.



## Your benefits at glance

- ✓ **Ease to use:** Your employees can learn how to operate the system quickly and easily, regardless of their qualifications. This increases acceptance and reduces the motivation for manipulation.
- ✓ **Individually coded keys and locks with a high coding number:** The operating sequence is predefined by the individual keys and locks. The risk of accidents due to bypassing or incorrect operation is reduced to an absolute minimum.
- ✓ **Individual and difficult-to-copy key design and a controlled key providing by Haake Technik:** We prevent the existence of uncontrolled spare keys within your system or application, which would allow the safety function to be bypassed.
- ✓ **Ergonomic key that can be inserted from both sides with early detection:** The simple and transparent operation ensures a fast and trouble-free work process, thus increasing operator acceptance. In addition, early key recognition prevents potential damage to the lock and consequently reduces repair and maintenance costs.
- ✓ **Mechanical, without wiring:** Our system is easy and inexpensive to install and the safety function is permanently guaranteed, i.e. even in the event of a power failure
- ✓ **Maintenance-free**
- ✓ **Simple retrofitting is possible:** Systems that have already been supplied can easily be expanded or supplemented.
- ✓ **Continuous closing:** In case of a leakage, it may be necessary to operate the valve in the locked and closed condition. With the help of our valve interlocks with continuous closing feature, a valve that is locked in the closed condition can be closed further without a key, in order to close a leakage without going through the entire operating sequence.



## Customisation – Personal support

If you have specific requirements that our standardised shapes, sizes, colours, or materials do not cover, we'll be happy to develop custom solutions for you.



Find your  
regional contact  
person here



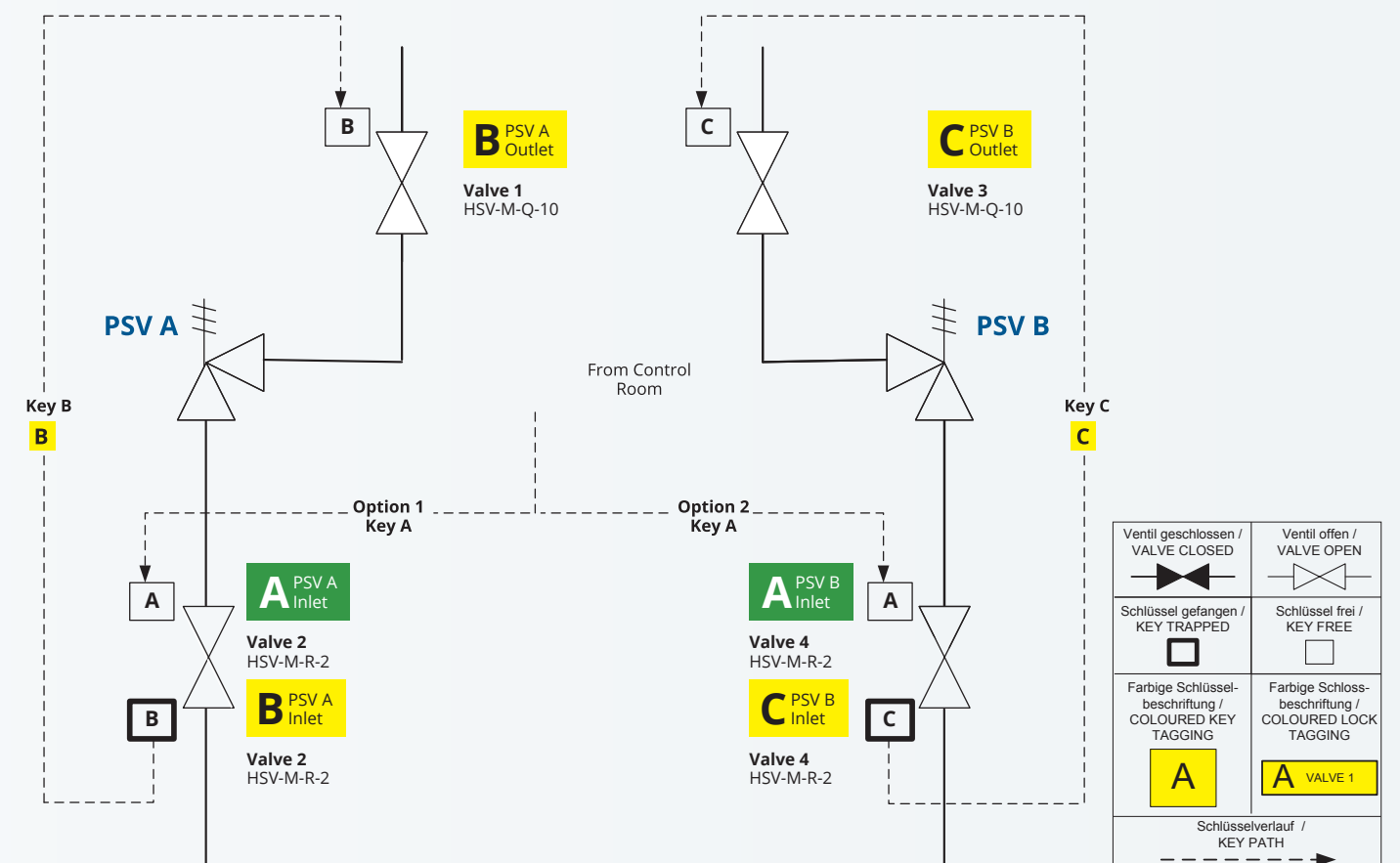
## Safeguarding of pressure safety valves (PSV)

Wherever piping is used for production processes, pressure safety valves (PSV) can be found. To prevent over pressurisation within the system during maintenance work, it must be ensured that a minimum number of PSV lines is always opened. The use of our valve interlocking systems HSV® ensures that a predefined, safe sequence of opening and closing of the corresponding valves is maintained. In the below example of a chemical production site both PSV lines are open during normal operation. The operator must close a line before maintenance work can be carried out. Our **valve interlocking systems HSV®** guarantee that the operator can only close one of the two lines at any time.



This realisation of the safety requirement is illustrated in our key logic diagram. With the start key A, which is safely stored in the control room, the authorised operator can decide which of the two lines should be closed. This key is designed in such a way that it can unlock both inlet valves of the two PSV lines.

As the key is trapped after closing the selected valve, it ensures that the second line cannot be closed if the first line has already been closed. Only after the line to be serviced has been fully re-opened, key A is released and can be used to close the other line.



### Sequence of operation to put PSV A OFFLINE

1. Take **key A** from Control Room.
2. Insert **key A** into interlock of **Valve 2 PSV A Inlet** to unlock and close valve.
3. Lock **Valve 2 PSV A Inlet** in closed position by removing **key B**. **Valve 2** is now locked closed with **key A** trapped.
4. Insert **key B** into interlock of **Valve 1 PSV A Outlet** to unlock and close valve. **key B** is trapped as long as valve is closed.

### Sequence of operation to put PSV B OFFLINE

1. Take **key A** from Control Room.
2. Insert **key A** into interlock of **Valve 4 PSV B Inlet** to unlock and close valve.
3. Lock **Valve 4 PSV B Inlet** in closed position by removing **key C**. **Valve 4** is now locked closed with **key A** trapped.
4. Insert **key C** into interlock of **Valve 3 PSV B Outlet** to unlock and close valve. **key C** is trapped as long as valve is closed.

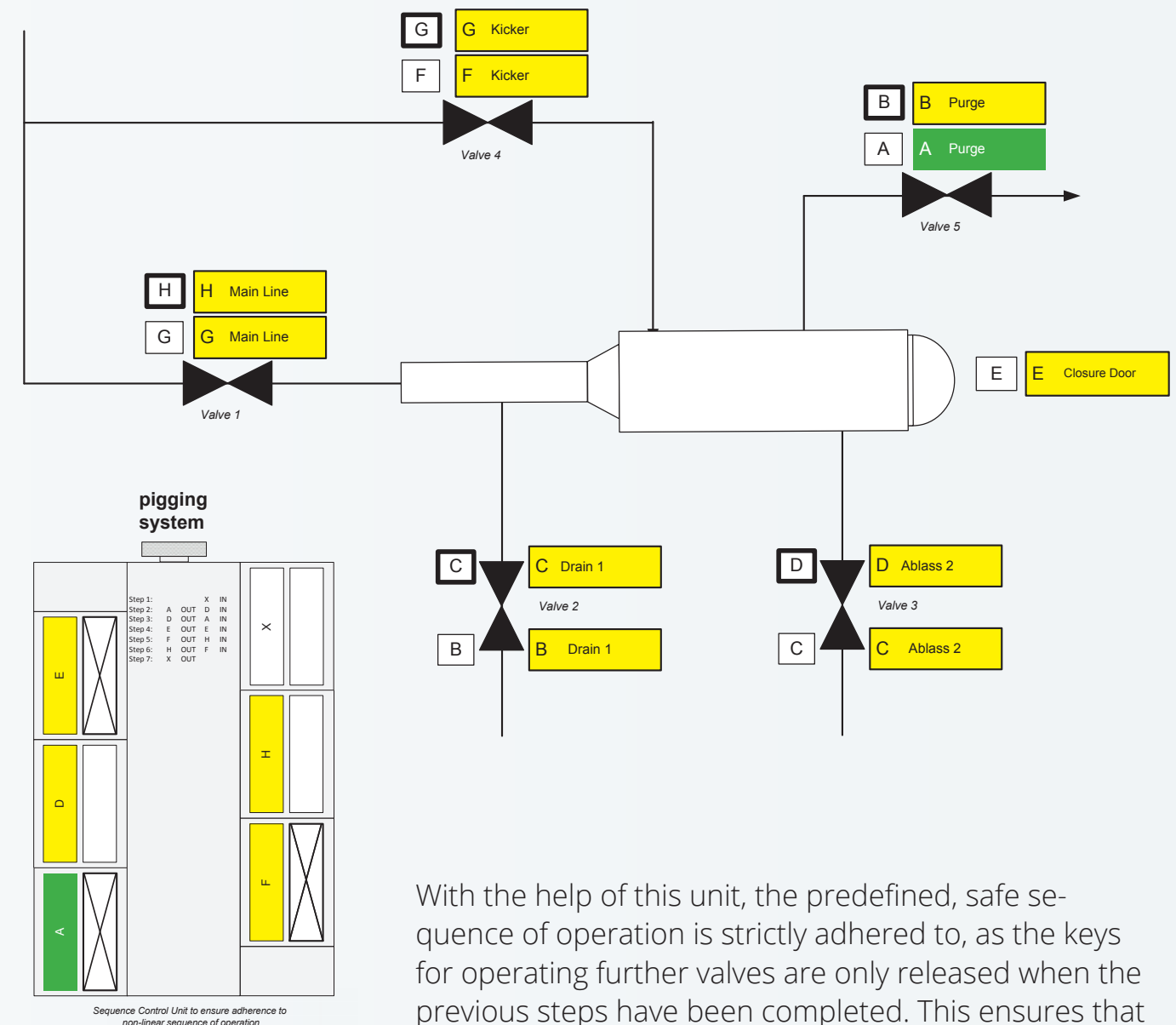
Repeat above sequence in reverse order to restore the normal operating condition.



# Safeguarding of a pigging station

Normally, cleaning pigs are used to clean pipelines. Equipped with brushes or other scraping devices, these pigs remove dirt and other debris as they move through the pipelines. These are brought into the pipeline through a pig trap and transported through the pipes using pressure. Our **Valve interlocking systems HSV®** are used to ensure that this pig trap can only be opened when it is in safe condition.

Such pigging systems are often more complex to operate and contain a number of valves and operating steps. To be able to cover non-linear sequences, so-called Sequence Control Units are used in pigging systems.



With the help of this unit, the predefined, safe sequence of operation is strictly adhered to, as the keys for operating further valves are only released when the previous steps have been completed. This ensures that the operator can only open the pig trap closure door when it is depressurised. A special, customised design of our HSV-CL component is used to safeguard the closure door. Even motor-operated valves, that are often used in the main lines of such pigging systems, can be integrated into the key interlocking sequence using a specialised set of interlocks. Therefore, the **Valve Interlocking System HSV®** provide a complete solution for securing the pigging process at site.



# Valve interlocking systems HSV® Best Practice



„The use of Valve interlocking systems ensures safe and smooth operation during plant operation when switching between various work processes. Together with Haake Technik GmbH, we successfully handed over this work package of our largest engineering project to the customer.“

**Thomas Hornbogen**  
Head of Process Engineering Department  
CAC ENGINEERING GMBH



With the help of the valve lock system from Haake Technik GmbH, the complex requirements of process safety for Europe's largest cumene production plant could be met.



## System components valve interlocking systems HSV®



### Valve interlocks HSV®-Q

Valve interlocks HSV®-Q are utilised for lever-actuated valves such as ball valves, shut-off valves and plug valves. All types of valves that operate with a 90° or 180° rotation can be fitted with HSV®-Q valve interlocks. Standard delivery includes a stainless-steel lever that is available in different lengths. The interlock can be perfectly aligned at different positions on the valve to guarantee optimal access to the key slots. Valves that are already in operation can also be fitted retrospectively with HSV®-Q valve interlocks without damaging or changing the valve fittings or seals. During installation of the HSV-Q, the valve body remains unchanged; the existing lever is replaced as part of the valve interlock assembly includes a replacement lever which corresponds to the size of the original lever. The valve interlock can be supplied with either one or two operating keys depending on the type of system control required.



### Valve interlocks HSV®-R

Valve interlocks HSV®-R are utilised for valves actuated by hand wheels such as slide valves, gate valves or gear box operated valves. The number of rotations required for opening or closing varies depending on the type of valve. For this reason, the valve interlocks HSV®-R are equipped with a count-release mechanism that adapts the locking action to the number of rotations required for corresponding final position. In this way, any valve position can be set as the locked open or closed position. The valve interlock assembly includes a replacement hand wheel which corresponds to the size of the original hand wheel. The valve interlock can be supplied with either one or two operating keys depending on the type of system control required.



### Anti-tamper locks HSV®-M-AT

Anti-tamper locks HSV®-M-AT protect against unauthorised actuation of valves, vandalism, or theft. This type of technology is currently used in petrochemical, gas and water treatment plants around the world. A mechanism in the body of the lock ensures that the lock rotates freely around the internal drive spindle of the body. No force is transferred to the spindle in this state and the valve cannot be operated. The coded key must be inserted to engage the drive spindle and hence to open or close the valve.

HSV®-AT anti-tamper locks are suitable for any type of valve (ball, butterfly, gate, globe, gear box driven, slide valves etc.) and come equipped with either a lever or a hand wheel.



### Locking device HSV®-CL (Pig trap door locks)

The locking device HSV®-CL is an integral part of a valve interlocking system that controls access to pig trap launchers and receivers. The valve interlock control system will ensure that all pressure and residual material is removed from the pig trap before the door can be opened.



### Key exchange device HSV®-X

The purpose of the HSV®-X key exchange device is to release or trap keys according to a pre-determined sequence and in accordance to the valve interlock system requirements.

The special HSV®-X-HST model combines the keys of the HSV® valve interlocks with those of the HST door interlocks by Haake Technik.



### Key cabinet HSV®-KC

The purpose of the HSV®-KC key cabinet is to facilitate the local supervision and monitoring of valve interlock keys. Different cabinet sizes are available.

Every key slot on the cabinet is individually coded and assigned one matching key only. Colour codes and numbers make it easy to match the corresponding keys.



## Other HAAKE® Safety Solutions



Find more information in our Downloads section



**Safety edges HSC®** – no more unsafe pinch points, shearing and crushing edges



### What are Safety edges?

Safety switch strips contain touch-sensitive sensors that detect contact with a person or parts of their body. If a switch strips senses contact or an obstacle, it immediately shuts down the automatic drive of the machine. For instance, safety switch strips are used in lifting tables with pinch edges or in large carousel revolving doors in buildings. The highly effective and reliable HAAKE safety switching strip operates on the opening method.

**Safety bumpers HSB®** – protection for machines with high moment of inertia and long stopping distance



### What are Safety bumpers?

Safety bumpers contain touch-sensitive sensors that detect contact with a person or parts of their body. As soon as a HAAKE bumper detects contact with an obstacle, the safety-effective and reliable opening principle ensures the immediate shut-down of the automatic drive. This means the machine, the hangar door, the theatre stage, or the unmanned transport vehicle is at a standstill.

**Safety mats HSM®** – safeguarding hazard areas across the entire floor



### What are Safety mats?

Safety mats are sensitive protective devices that react immediately when they are stepped on by a person. When stepped on, the machine is shut down and placed in a safe operating state. As long as a person is on the safety mat, it is not possible to start the machine. HAAKE safety mats are used to safeguard large danger zones in facilities such as machining centres, gantry milling machines, presses, and robots.



## Foot protection switch HFS-FS – Accident reduction when handling pallet trucks



1 Vehicle equipped with foot protection switch. Collision with foot detected. Vehicle stops.



2 Vehicle equipped with foot protection switch. After collision and stop, the vehicle reverses.

### What is the Foot protection switch HFS-FS?

In the event of contact the HAAKE® Foot protection switch provides a stop command to the control system of the pallet truck leading to the immediate stop and reverse of the machine. Thereby we significantly reduce the risk of accidents when handling industrial trucks and avoid long term accident-related absences and costs.

### The Features

- ✓ Highly sensitive pressure sensor
- ✓ High robustness against mechanical influences
- ✓ Adaptability to almost any vehicle shape



Find more information about the Haake Foot protection switch in our Downloads section







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- ✓ Safety edges HSC®
- ✓ Safety mats HSM®
- ✓ Safety bumpers HSB®
- ✓ Trapped-key interlocking systems HST®
- ✓ Valve interlocking systems HSV®
- ✓ Foot protection switch HFS-FS®



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