

# HAAKE®

## Bloqueio de Válvulas



**CSA SOLUÇÕES**  
Control Safety Automation

<b>Introduction</b>	<b>2</b>
<b>Brief description</b>	<b>3</b>
<b>Process Interlocking</b>	<b>4</b>
<b>Functional description</b>	<b>5</b>
<b>Advantages Applications</b>	<b>6</b>
<b>Key HSV-K</b>	<b>7</b>
<b>Valve interlock HSV-S-Q HSV-M-Q</b>	<b>8-9</b>
<b>Valve interlock HSV-S-R HSV-M-R</b>	<b>10-11</b>
<b>Valve interlock HSV-M-AT</b>	<b>12-13</b>
<b>Pig-trap interlock HSV-CL</b>	<b>14</b>
<b>Exchange unit HSV-X Key cabinet HSV-KC</b>	<b>15</b>



## Haake Technik GmbH

has been involved in the industrial safety market for over 20 years. Our company specialises in design and development of machine and process safety systems.

We are:

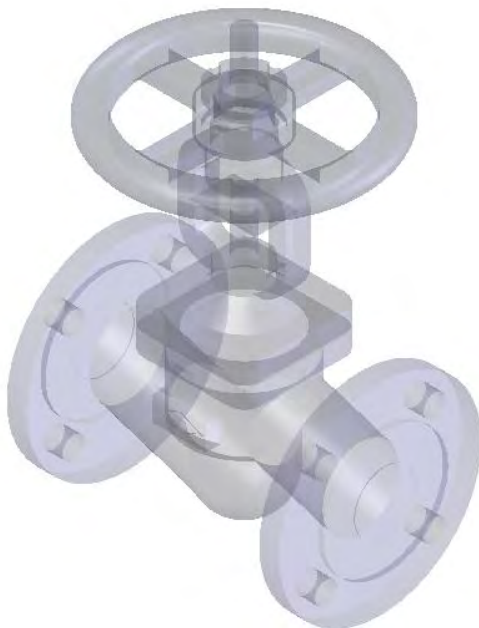
- Specialists in safety-controlled systems using interlocks
- Our R & D dept. is committed to long-term product development and innovation
- Mechanical as well as electrical safety systems
- All products are tested by a third party
- We have an international distribution network
- ISO 9001-2000 registered company
- Our products are made in Germany.



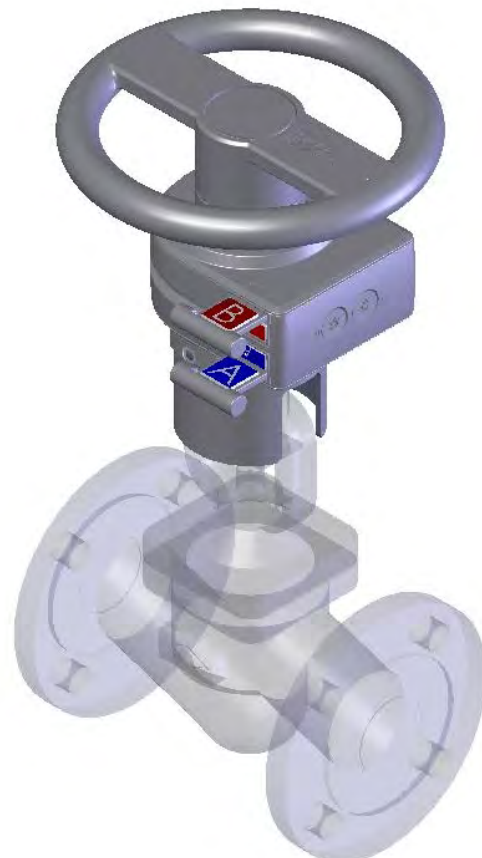
## Mechanical interlock system to avoid operator error when opening and closing safety and process critical valves

Valve interlocks could be used in many applications where the control of valves is necessary to protect personnel, plant and the environment.

Examples include oil and gas production, power generation, water treatment, pulp and paper etc.



Valve without safety interlock



Valve with safety interlock

# Process Interlocking

Valves have a prime safety function in many process industries. However, the opening and closing of valves in the wrong sequence can have disastrous consequences; causing serious or fatal injury to operating personnel, loss of product, damage to plant and equipment and pollution of the environment.

Ensuring the safe operation of valves is essential, in industries ranging from brewing and food production to chemical manufacture and oil refining.

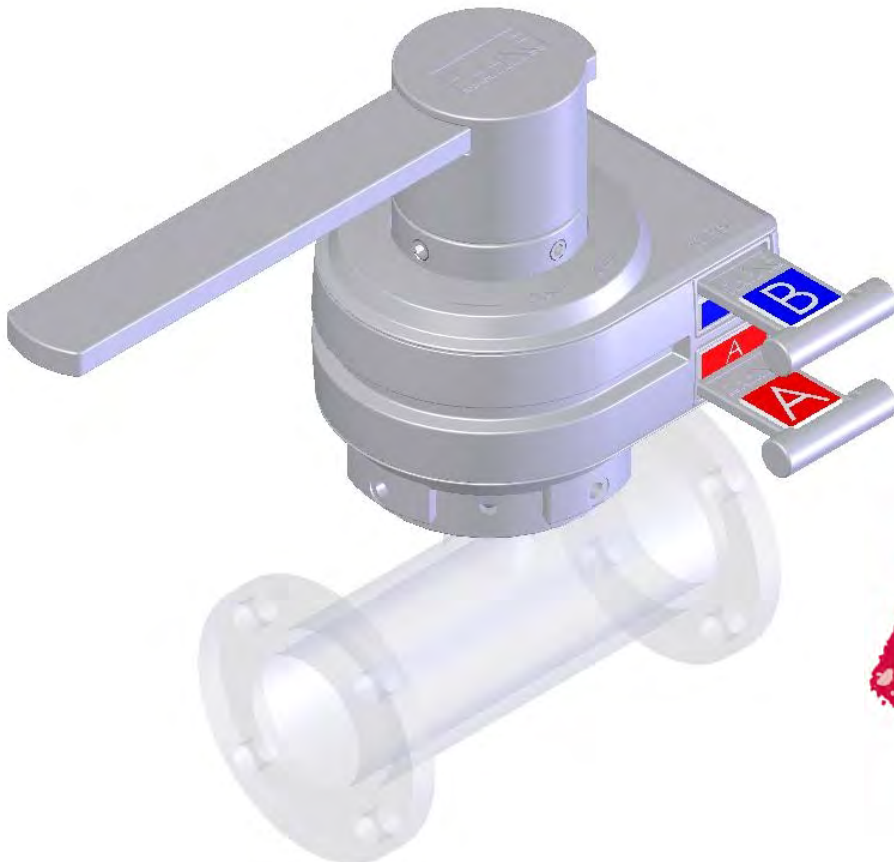
While padlocks and chains allow some degree of control, this method has one serious draw back; they do not eliminate the potential for human error.

Fitting an interlock system ensures that whenever valves are operated the correct sequence of events is followed. The Haake range can be fitted to every type of lever or hand wheel operated valve without breaking the pressure seal.

The interlocks are robust, easy to operate and show clearly the condition of the valve.

**ADVANTAGE:**  
Robust  
construction!

**ADVANTAGE:**  
High safety level !



**ADVANTAGE:**  
Easy to install !

# Functional Description

Haake Valve Interlocks HSV® are robust mechanical devices which can be customised to provide a safe sequence of operation in any process.

Fitting valve interlocks ensures a logical and safe sequence of operation by the exchange of coded keys between valves in the system.

When a valve is fitted with an interlock, the valve can only be operated when both individually coded keys (A and B) are inserted into the interlock.

Key A can only be removed when the valve is in the open position and key B can only be removed, when the valve is in the closed position.

To guarantee a high degree of safety, the keys are coded in a way that they only fit each designated valve interlock.



Valve closed, key A trapped, key B free



During the operation both keys are trapped



Valve open, key A free, key B trapped

# Advantages of mechanical valve interlocks

Resistant to aggressive environments

Manufactured in stainless steel AISI 316

High degree of safety through unique individual coding of keys

Two-sided orientation of coded keys - ensure key can be easily inserted into the interlock

Early indication of incorrect matching of key and lock

Linear coded keys, which cannot be copied readily

Condition of valve can be visually observed by position of the keys (tOpen)

Continuous closing feature: Enables a further rotation of the hand wheel to the closed position without the need to insert the close key. This feature is crucial if the valve is leaking and the close key is trapped in another valve

Existing hand wheel can be re-used in most applications

“Anti tamper“ fixings avoid unauthorized operation and tampering of valves

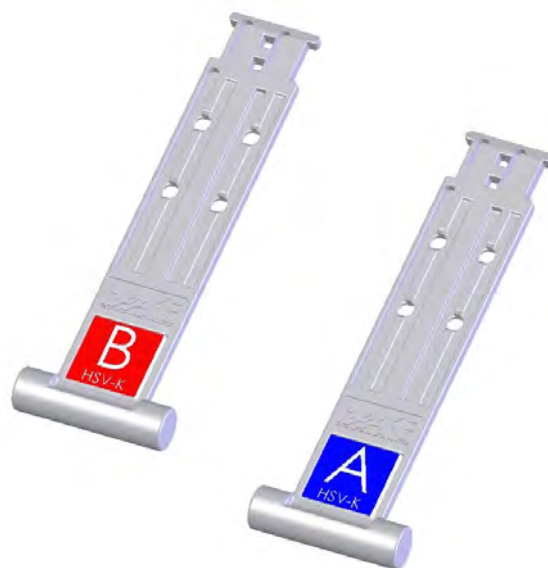
Weather strip fitted to key entry points

Easy to mount and maintenance free

No padlocks which could be removed easily

Padlock keys are easy to copy

Padlocks increase the possibility of human error



## Multiple areas of applications

Oil / gas industries

Refineries

Chemical industry

Pharmaceutical industry

Water distribution

Breweries

Environment protection

Food industry

Energy supply

Waste disposal

Pulp and paper industry

Nuclear power plants

etc.

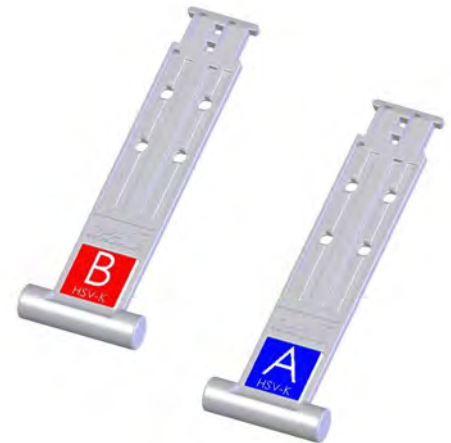
# KEY HSV-K



To guarantee a high degree of safety, the keys are coded in a way that they only fit each designated valve interlock.

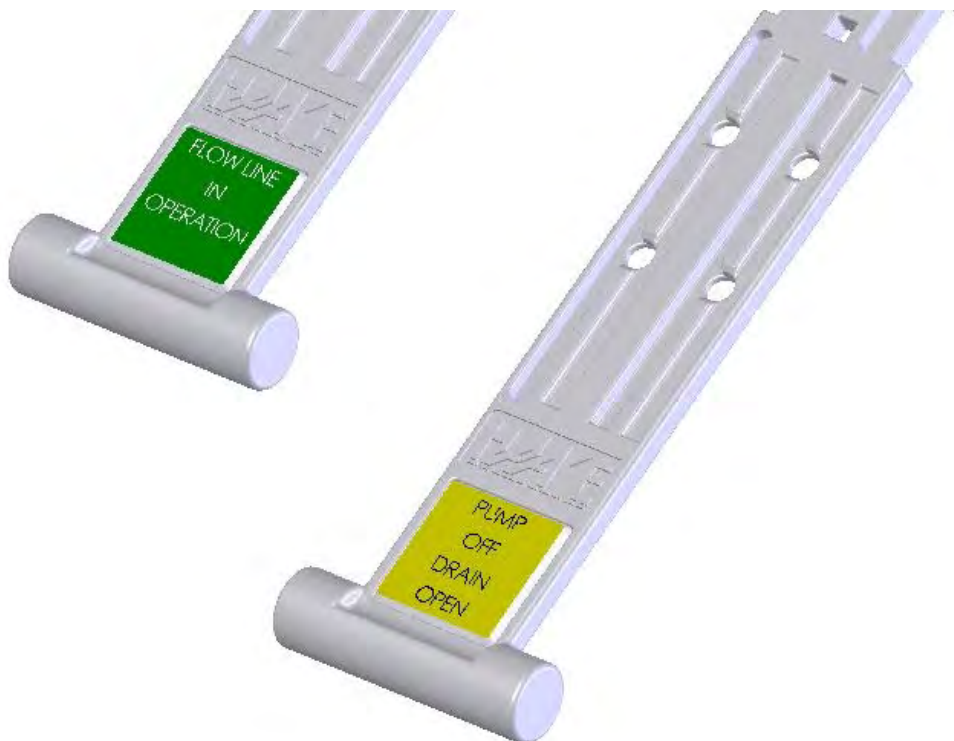
Multiple choice of engraving for each key which is shown on the tag plate. The plates have space for four lines and are available in blue, red, black, white, yellow and green. This colour system simplifies matching the key to each interlock and clearly shows the condition of the valve from a distance.

Two-sided orientation of coded keys - ensure key can be easily inserted into the interlock.



## Characteristics:

- Robust finish from stainless steel
- Ergonomic shaping
- Tag plate available with four text lines
- Various colour codes available for identification
- Multiple coding options
- Omni directional key insertion



The HSV- Q is part of an extensive range of valve interlocking products suitable for fitting to all types of valves used in processing plants. Other items include interlocks for hand wheel operated valves, actuated valves, needle valves, access interlocks, exchange boxes, pig trap enclosures locks and key cabinets.

## General Description

The HSV- Q valve interlock is an integral valve interlock designed to enable the locking of lever operated valves (ball butterfly and plug) in either the open, closed or open and closed positions.

## Features

- Stainless steel
- Wide operating temperature range
- Linear coded card key
- Omni directional key insertion
- Self sealing stainless steel weather strips
- Fitted with anti tamper fixings
- Maintenance free
- Can be retro fitted to existing site valves

## Operation

The HSV-Q is designed to operate as part of an integrated safety system - Controlling the operation of valves in safety and process critical applications. The operation of the valve is controlled by the insertion or retraction of coded card keys specific to that valve. Insertion of the change key will allow the rotation of the lever to open or close the valve. After operation the change key will remain trapped. The second key is now released and transferred to the next valve interlock in the sequence.

## Coding and Security

The HSV- Q is coded to ensure that only the correct key can operate its associated lock. Keys are engraved, colour coded and tagged to identify the function and status of the valve or valves to be operated by the key.

The HSV-Q interlock can be installed on any type of valve that operates with a 90° or 180° rotation, such as ball-, butterfly-, and plug valves. The stainless steel sliding lever, which is provided with the lock, gives the operator more flexibility. The static lock-body always ensures the most convenient operating position. Only the lever turns 90° or 180°.

## Installation

Fitting the HSV-Q enforces a logical, pre-determined and safe sequence of operation where the control of flow paths is critical.

The HSV-Q can be retrofitted on valves that are already in service with no requirement to break the valve pressure seal or modify the host valve. All fittings are stainless steel and tamper proof.



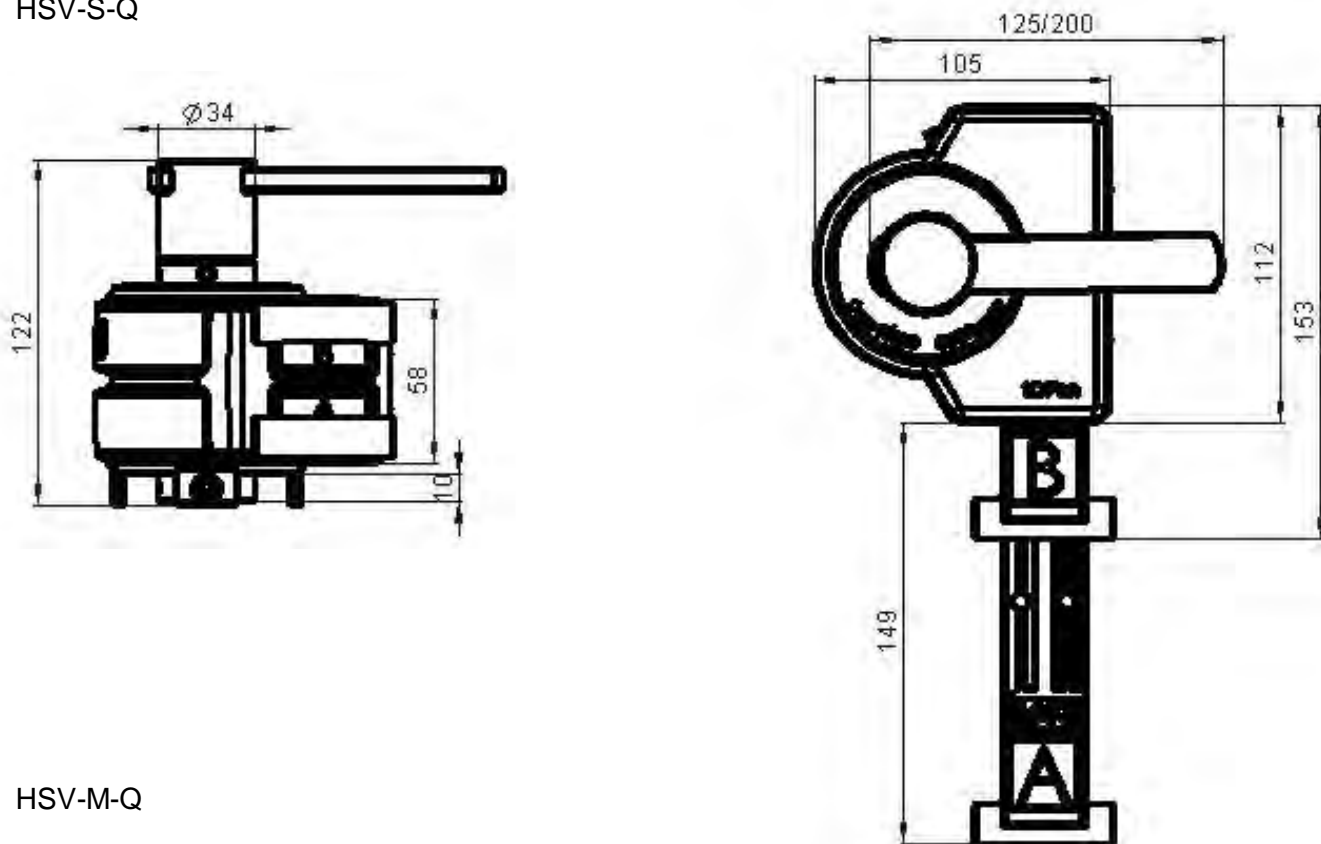
HSV-S-Q



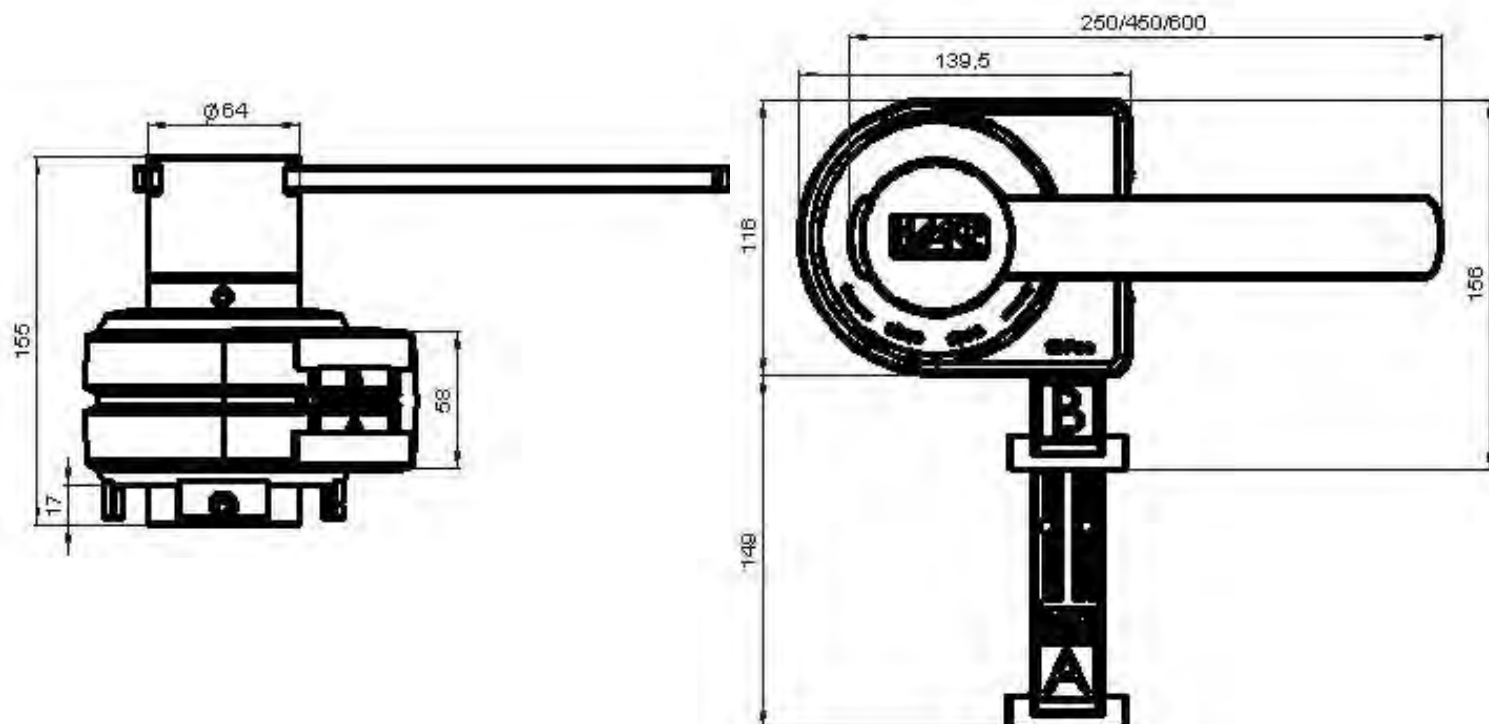
HSV-M-Q

## Measurements:

### HSV-S-Q



### HSV-M-Q



The HSV-R is part of an extensive range of valve interlocking devices suitable for fitting to all types valves used in processing plants. Other items include interlocks for lever operated valves, actuated valves, needle valves, access interlocks, exchange boxes, pig trap enclosures locks and key cabinets.

## General Description

The HSV-R valve interlock is an integral valve interlock designed to enable the locking of multi rotational valves (i.e. gate, globe and gear operated valves) in either the open, closed or open and closed positions.

## Features

- Stainless steel
- Wide operating temperature range
- Linear coded card key
- Omni directional key insertion
- Self sealing stainless steel weather strips
- Fitted with anti tamper fixings
- Maintenance free
- Can be retro fitted to existing site valves

## Operation

The HSV-R is designed to operate as part of an integrated safety system - Controlling the operation of valves in safety and process critical applications. The operation of the valve is controlled by the insertion or retraction of coded card keys specific to that valve. Insertion of the change key will allow the rotation of the hand wheel to open or close the valve. After operation the change key will remain trapped. The second key is now released and transferred to the next valve interlock in the sequence.

## Coding and Security

The HSV-R is coded to ensure that only the correct key can operate any given lock. Keys are engraved, colour coded and tagged to identify the function and status of the valve or valves to be operated by the key.

The number of rotations to open or close a valve is different for almost every valve. The HSV-M-R has a field adjustable, easy to set counting mechanism. Setting the counting mechanism is achieved by using a special tamperproof fitting-tool and the correct linear keys.

With both linear keys in the lock, the valve interlock counting mechanism can be adjusted to release the keys only when the valve is fully opened or closed.

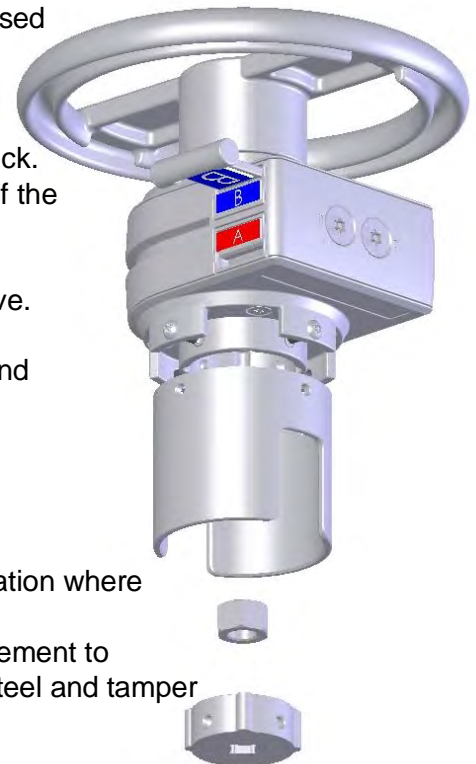
## Installation

Fitting the HSV-R enforces a logical, pre-determined and safe sequence of operation where the control of flow paths is critical.

The HSV-R can be retrofitted on valves that are already in service with no requirement to break the valve pressure seal or modify the host valve. All fittings are stainless steel and tamper proof.



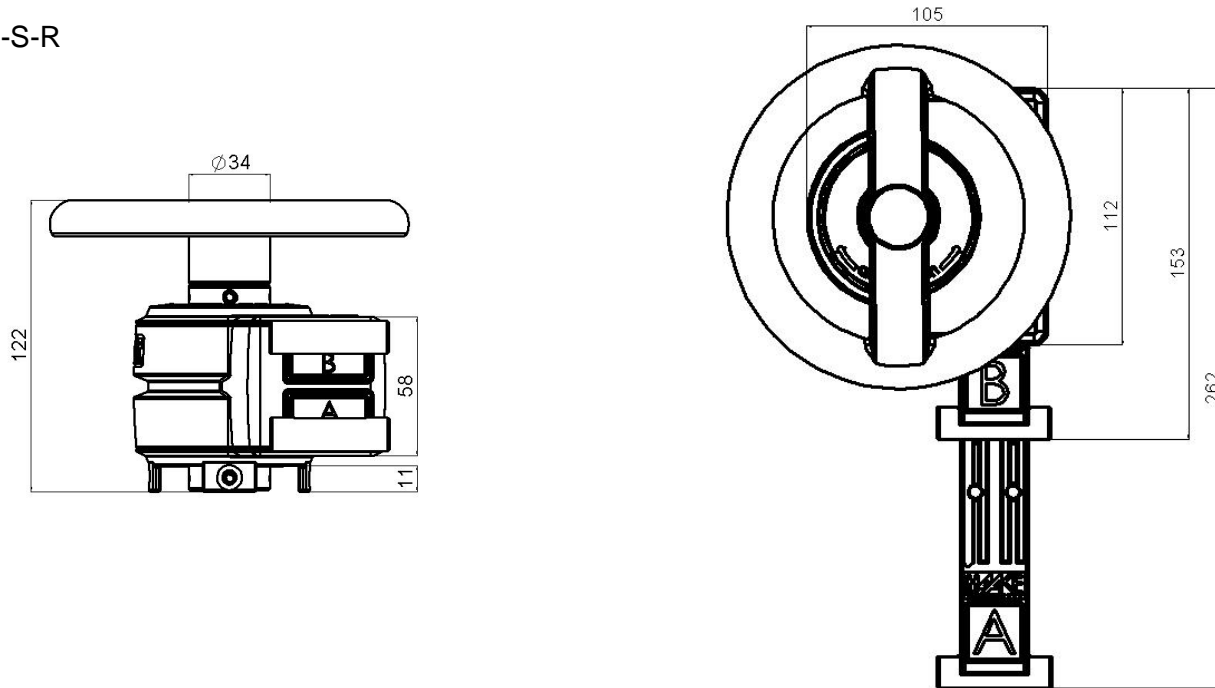
HSV-M-R-10



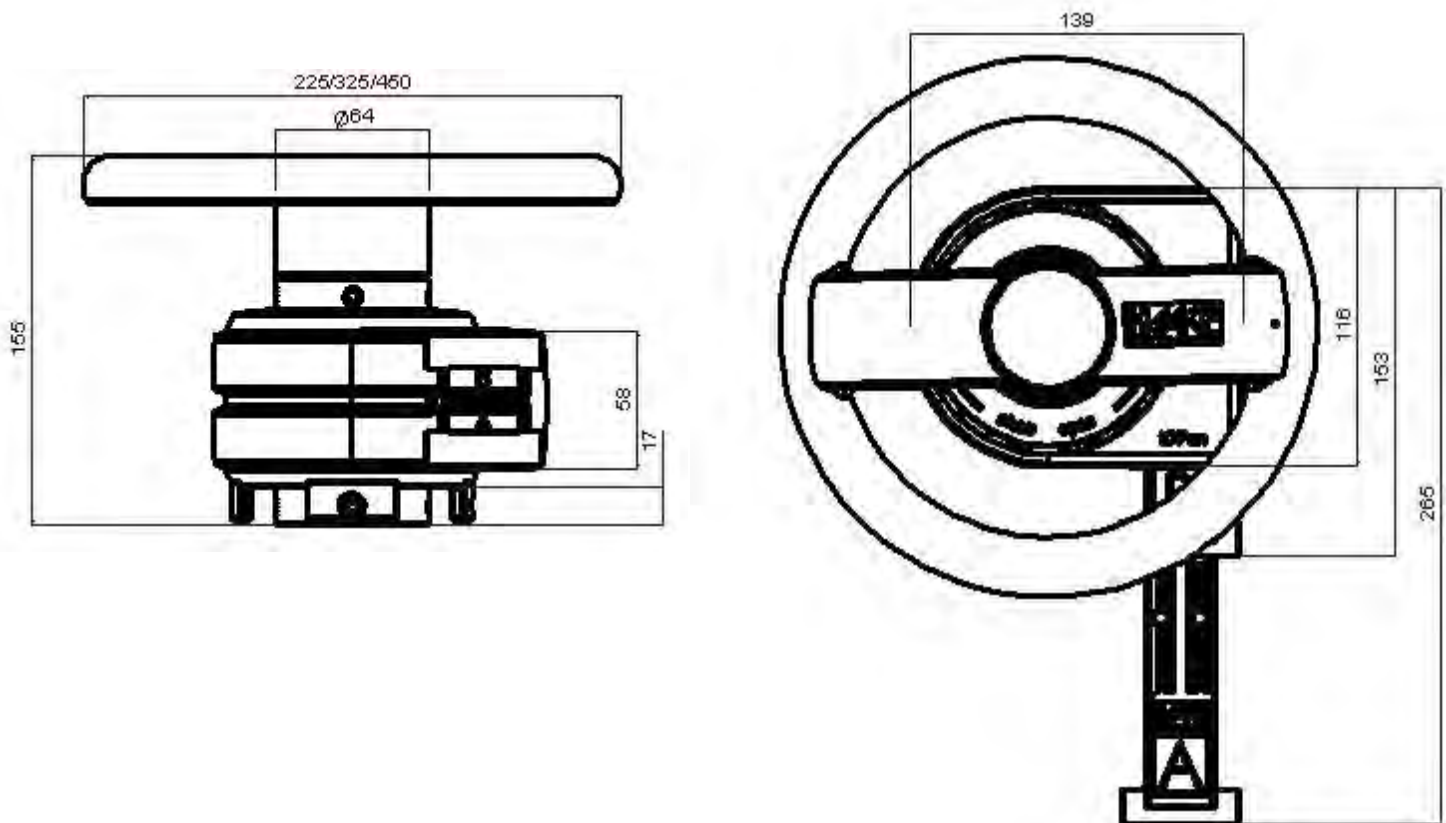
HSV-S-R

## Measurements:

### HSV-S-R



### HSV-M-R



# VALVE LOCK HSV-M-AT



The anti tamper lock (HSV-AT) has been specifically designed to prevent unauthorised operation, violation and sabotage of valves in any process.

The AT is a development of valve interlocking technology – a technology in use in petrochemical plants throughout the world to ensure safety critical valves are operated in the correct sequence and by authorised personnel only. The operation of the interlocks is through the exchange of coded keys between system valves.

While the technology behind the AT is very similar to safety interlocking the primary design function of the AT is valve security and not safety – However, by fitting the AT a high level of safety is also achieved by restricting the operation of production and safety critical valves to those personnel who have the right knowledge, skills, training and authority.

## Design Characteristics

The AT is a valve “lock-off” device that prevents the operation of a valve (open to closed or closed to open) unless the operator is in possession of a coded key.

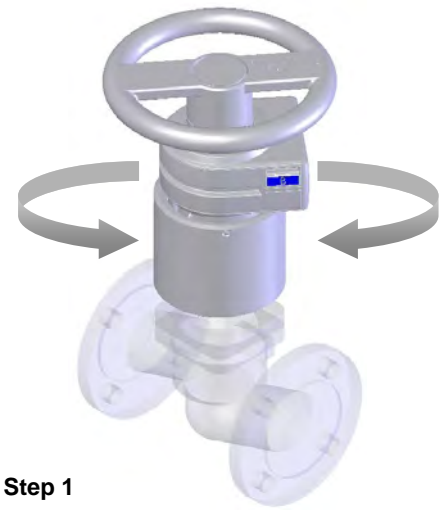
Unauthorised operation of the valve is avoided through a unique drive mechanism incorporated within the key module within the AT body. When the coded key is removed from the AT, the AT will spin freely around the drive shaft of the valve on bearings located within the lock body. In this state the AT does not engage the valve drive shaft and therefore the valve state can not be changed.

Inserting the coded key into the AT will mechanically latch the drive mechanism. The valve can now be moved to the desired position (normally either fully open or closed). Removing the key will disengage the drive mechanism and the AT will again spin freely around the valve.

The AT can be fitted to any size and type of valve (ball, butterfly, gate, globe, gear box) lever or hand wheel operated. In addition the AT design options included a case hardened skirt to protect the lower valve assembly from sabotage or tampering.

## Features

- Stainless steel
- Hardened steel skirts to protect lower body of lock
- Wide operating temperature range
- Linear coded card key
- Omni directional key insertion
- Self sealing stainless steel weather strips
- Fitted with anti tamper fixings
- Maintenance free
- Can be retro fitted to existing site valves
- Available in handweel- and lever-version



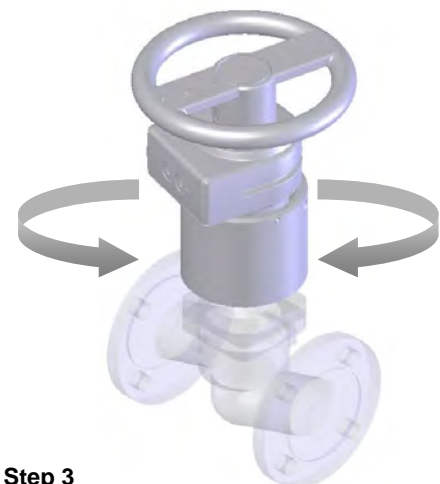
### Step 1

With the coded key removed the ATL lock free wheels (There is no drive through to the valve spindle)



### Step 2

Inserting the key engages the drive. The valve can now be opened or closed.

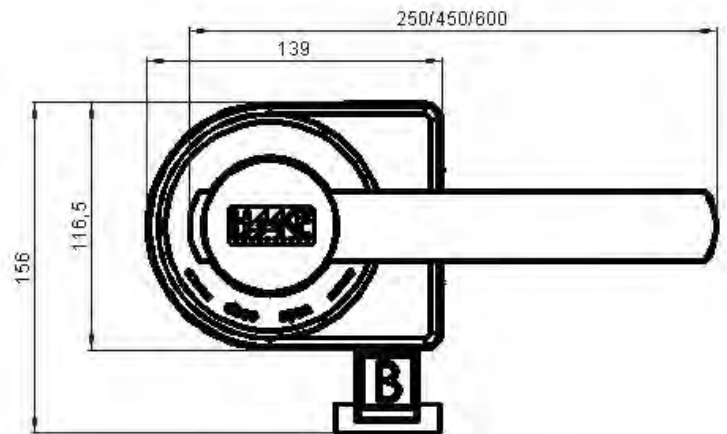
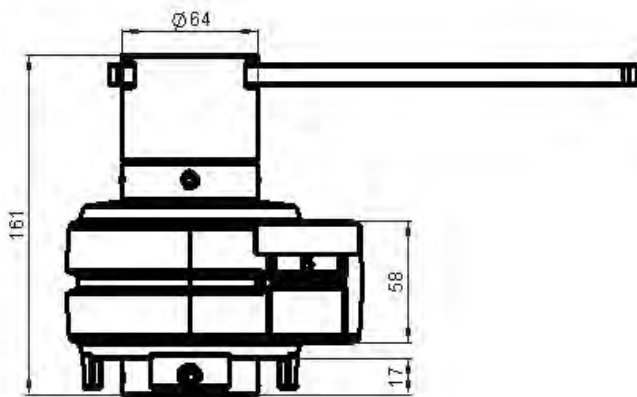
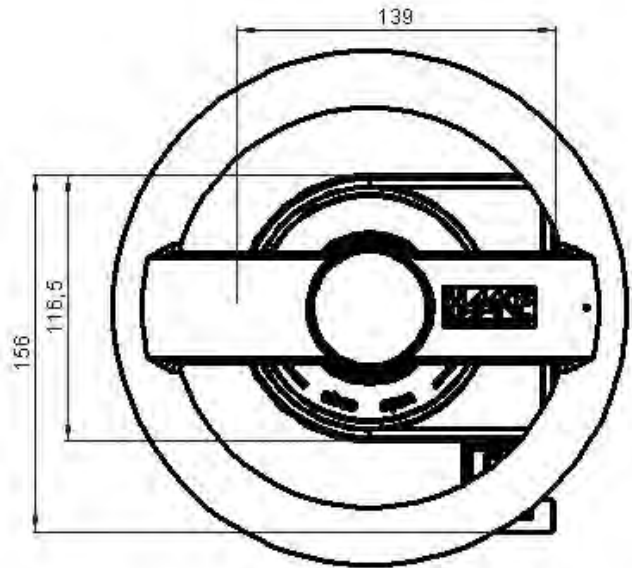
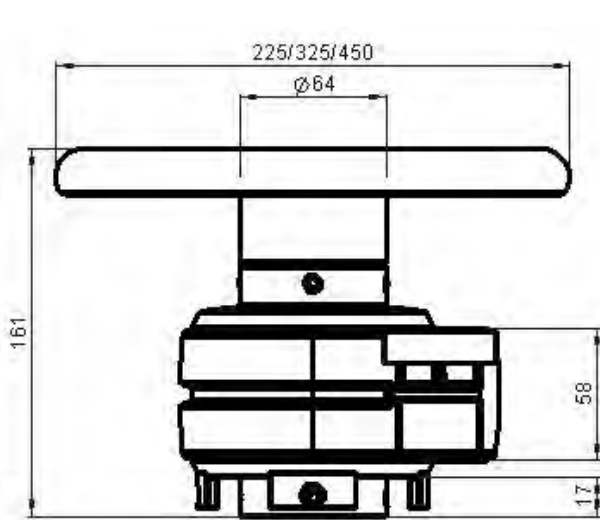


### Step 3

Removing the key will lock the valve in any position. The ATL will again free wheel preventing unauthorised operation of the valve.

## Measurements:

HSV-M-AT



# PIG-TRAP INTERLOCK HSV-CL



The HSV-CL is part of an extensive range of valve interlocking products suitable for controlling the safe opening and closing of pressure doors in a safety critical system. Typically a closure door on a pigging system.

## General Description

Opening the closure door during pig launching and receiving is potentially hazardous due to residual pressure, liquids and gases. The hazards associated with this process can be significantly reduced by fitting a key interlock system to control the opening and closing of the vessel closure door, main isolating valves, kicker, vent, drain and purge valves. Fitting a HSV-CL to the closure door will ensure access into the pig launcher or receiver can only be achieved under controlled and safe conditions.

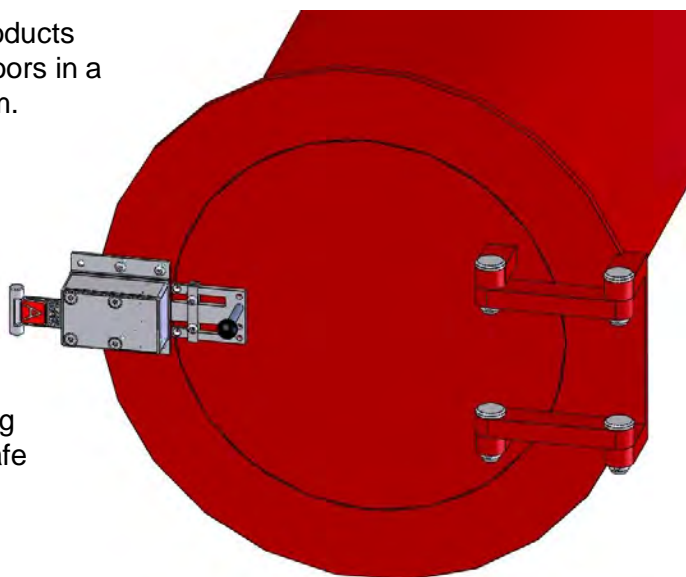
## Features

- Can be fitted to all types of closure
- Robust construction
- Stainless steel
- Wide operating temperature range
- Linear coded card key
- Omni directional key insertion
- Self sealing stainless steel weather strips
- Fitted with anti tamper fixings
- Maintenance free

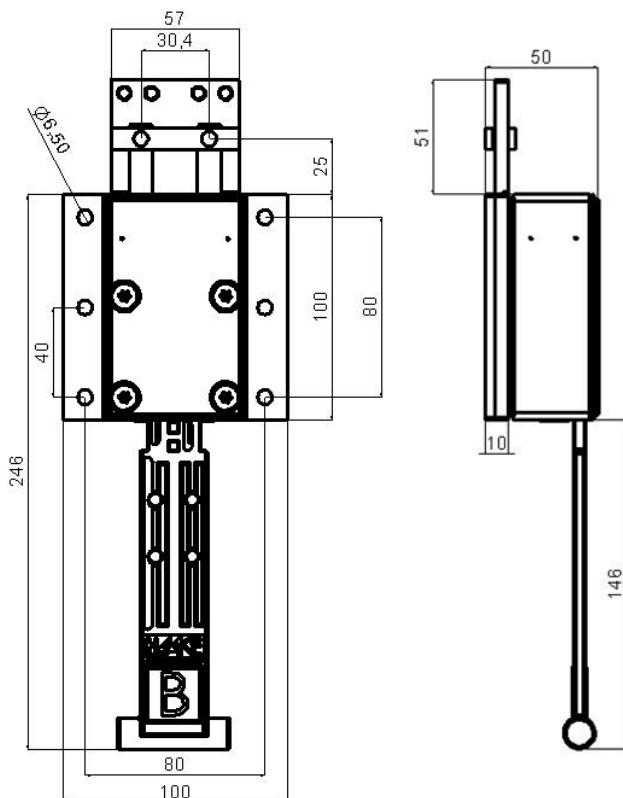
## Installation

As a minimum, vessel closures are usually interlocked with vessel venting and drain valves. However, the interlocking arrangement can be extended to incorporate all process items of equipment relating to the vessel's operation.

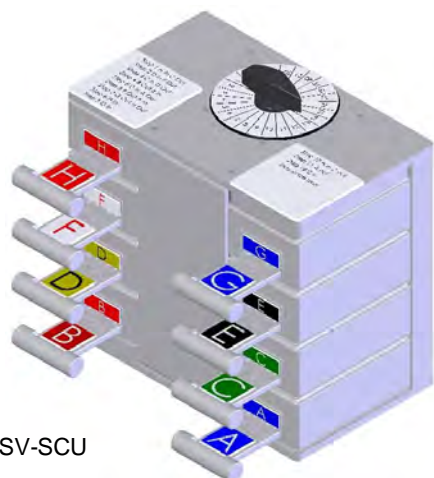
The HSV-CL interlock is adaptable to all types of vessel/access closures and is very simple to install in pig trap applications . All fittings are stainless steel and tamper proof.



## Measurements:



Not all pigging operations involve a linear key exchange procedure between control valves. The HSV-SCU key sequence unit can be used where a programmed sequence is required



HSV-SCU

## KEY EXCHANGE BOXES

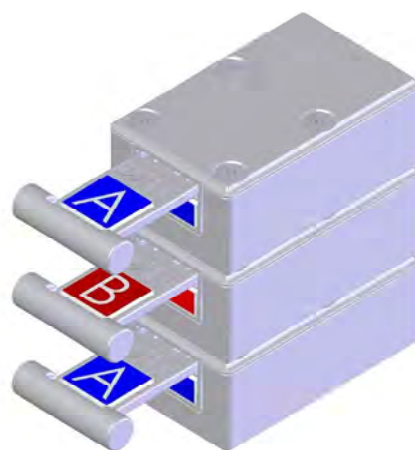
Many applications require the use of key transfer boxes as part of an integrated safety system linking applications of the sequence control process.

The key exchange is configured to trap and release keys in a predetermined sequence, depending on the operating requirements of the interlocking system.

The key exchange unit can be configured to provide bi-directional control of up-stream and down-stream operation. They can therefore be used in complex applications. Assembly is modular and easily extendable.

Another application is the exchange unit HSV-X-HST. Using this device, the HSV valve interlock range can be combined with the HST door interlock system.

The selection of exchange units depends on your requirements and your logic key plan.



HSV-X



HSV-X-HST

## KEY CABINET HSV-KC

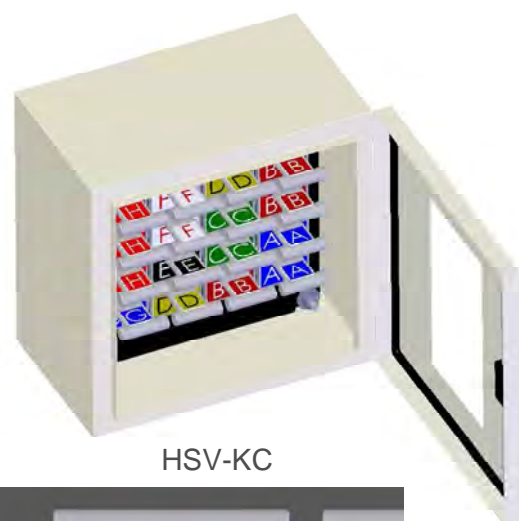
The Safety-Key Cabinet is designed to enhance the control and management of valve interlocking keys on site.

The cabinet is made of fire resistant material to IP55 ingress protection and suitable for storing up to 100 keys.

Each key slot is hard coded (a key cannot be physically inserted into the wrong slot), colour coded and engraved with the key tag number for easy identification and location.

### Features

- Visual indication of key status
- Robust construction
- Front lock
- Optional switches for electrical signalling
- Glassed door
- Custom built
- Higher IP ratings available
- Suitable for marine environments



HSV-KC

