

## **Operating instructions**

# Safety valve for industrial applications





IMPORTANT Read carefully before use. Keep for future reference.

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Elly-Heuss-Knapp-Straße 12 23843 Bad Oldesloe Germany

Phone: +49 4531 509 – 0 Fax: +49 4531 509 – 120

E-mail: info@herose.com Web: www.herose.com

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## 1 About these instructions

## 1.1 Principles

The operating instructions are part of the safety valve.

### 1.2 Applicable documents

Document	Contents				
Catalogue page	Description of the safety valve				
For accessories, refer to the respective manufacturer's documentation.					

#### 1.3 Hazard levels

The warning notes are marked and classified according to the following hazard levels:

Symbol	Explanation
	Identifies a hazard with a high risk level that will result in death or serious injury.
	Identifies a hazard with a moderate risk level that will result in death or serious injury.
	Identifies a hazard with a low risk level that will result in a minor or moderate injury.
NOTICE	Identifies a risk to property. Damage to property may occur if this notice is ignored.

## 2 Safety

#### 2.1 Intended use

The safety valve protects the vessel and pipework systems against impermissible excessive pressure. The permissible operating conditions are specified in these operating instructions.

The safety valve is suitable for the media listed in these operating instructions, see section 4.5 "Media". Operating conditions and applications deviating from these require the approval of the manufacturer. Only media may be employed to which the materials used for the valve body and seals are resistant. Contaminated media or usage outside of the pressure and temperature specifications can lead to damage to the valve body and seals.

#### Avoidance of foreseeable incorrect use

- Never exceed the permissible usage limits specified in the data sheet or in the documentation with regard to pressure, temperature, etc.
- ▶ Follow all safety instructions and operating procedures in these operating instructions.
- Warranty claims against HEROSE GMBH will be rejected if the HEROSE seal is broken by unauthorised companies.

## 2.2 Meaning of the operating instructions

The operating instructions are to be read and followed by the responsible technical personnel before mounting and start-up. As part of the safety valve the operating instructions must be available in their vicinity. People could be seriously injured or killed if the operating instructions are not followed.

- Read and observe the operating instructions before using the safety valve.
- Retain the operating instructions and make sure they are available.
- Pass on the operating instructions to subsequent users.



### 2.3 Requirements for persons who work with the safety valve

Persons could be seriously injured or killed if the safety valve is used improperly. In order to avoid accidents, all persons who work on the valve must meet the following minimum requirements:

- They must be physically able to control the safety valve.
- They are able to safely carry out the work with the safety valve within the scope of these operating instructions.
- They understand the operating principles of the safety valve works within the scope of their work and can recognise and avoid the hazards associated with the work.
- They have understood the operating instructions and are able to implement the information of the operating instructions accordingly.

#### 2.4 Personal protective equipment

Missing or unsuitable personal protective equipment increases the risk of damage to health and injuries to people.

- The following protective equipment is to be provided and worn during work:
  - □ Protective clothing,
  - □ Safety shoes.
- Define and use additional protective equipment depending on the application and the media:
  - Safety gloves,
  - □ Eye protection,
  - □ Ear protection.
- Wear the specified personal protective equipment for all work on the safety valve.

#### 2.5 Additional equipment and spare parts

Additional equipment and spare parts not conforming to the manufacturer's requirements can negatively affect the operational safety of the safety valve and cause accidents.

In order to ensure operational safety, use original parts or parts that conform to the manufacturer's requirements. If in doubt, have these confirmed by the dealer or manufacturer.

## 2.6 Adhere to the technical thresholds

If the technical thresholds for the safety valve are not adhered to, the safety valve may sustain damage, accidents may be caused and people may be seriously injured or killed.

Adhere to the thresholds. See chapter "4 Description of the safety valve".

#### 2.7 Safety instructions

#### 

#### Hazardous medium.

Escaping operating medium can lead to poisoning, burns and caustic burns!

- Wear the prescribed protective equipment.
- Provide suitable collecting containers.
- Stand to the side of or behind the valve during lifting.

#### The outlet must be free.

#### Flammable media and dusts.

Risk of sustaining burns!

- Avoid potential sources of ignition in the immediate vicinity of the safety valve.
- Attach warning signs.

#### Risk of injury due to pressure.

Injury due to the valve being flung away!

- Depressurise and empty all supply lines before dismounting the valve.
- Make sure that the system is depressurised.
- Secure against being pressurised again.
- ▶ Do not bend over the valve when dismounting.



## 

#### Harmful and/or hot/cold conveyed media, lubricants and fuels.

Hazardous for persons and the environment!

- Collect and dispose of rinsing medium and any residual media.
- Wear protective clothing and a protective mask.
- Observe legal regulations regarding the disposal of harmful media.

Risk of injury if maintenance work is done incorrectly.

Incorrect maintenance can lead to serious injury and considerable material damage!

- ► Before the start of work, ensure there is sufficient room for doing the work.
- Ensure the space around the work is tidy and clean! Parts and tools in loose piles or lying around are hazard sources.
- ▶ If parts have been removed, take care to assemble correctly and re-install all attachment items.
- Before putting back into service, ensure:
  - □ All maintenance work has been carried out and completed.
  - □ There are no persons in the hazard area.
  - □ All covers and safety devices are installed and operating correctly.

## 

#### Cold/hot pipelines and/or safety valves.

Risk of injury due to thermal influences!

- Insulate the safety valve.
- Attach warning signs.

#### Medium escaping at high speed and high/low temperature.

Risk of injury!

- Wear the prescribed protective equipment.
- Secure the discharge area.

#### NOTICE

#### Impermissible stresses arising from operating conditions and extensions / added structures.

Safety valve body leaking or broken!

- Provide suitable support.
- Additional loads, for example as a consequence of traffic, wind or earthquakes are not explicitly taken into account by default and require separate dimensioning.

#### Condensation in air conditioning, cooling and refrigeration plants.

Icing!

Blocking of the actuation mechanism!

Damage due to corrosion!

► Insulate the safety valve diffusion-tight.

#### Improper mounting.

Damage to the safety valve!

- Remove cover caps before mounting.
- Clean the sealing surfaces.
- Protect the body against hammering.

#### Painting of safety valves and pipelines.

Impairment of the function of the safety valves / loss of information!

Protect stem, synthetic material parts and type plate against the application of paint.

#### Exceeding the maximum permissible operating conditions.

Damage to the safety valve!

The maximum permissible operating pressure must not be exceeded, and the minimum and maximum allowable working temperatures must be observed.

## 3 Transport and storage

## 3.1 Inspection of condition on delivery

Inspect the safety valve for damage upon receipt. In case of transport damage, determine and document the precise extent of the damage, and report it immediately to the supplying dealer/carrier and the insurer.



## 3.2 Transportation

- Transport the safety valve in the packaging supplied.
  - The safety valve is delivered in a ready-to-operate state with the connections protected by caps.
- ▶ Protect the safety valve against shocks, hammering, vibrations and dirt.
- ► Adhere to a transport temperature range of -20 °C to +65 °C.

#### 3.3 Storage

- Store the safety valve in a clean and dry place.
- Make use of a desiccant or heating in damp storerooms to prevent the formation of condensation.
- ► Adhere to a storage temperature range of -20 °C to +65 °C.

## 4 Description of the safety valve

Refer to the respective catalogue page for further detailed information.

#### 4.1 Structure

#### Design

Directly acting angle type safety valve, spring-loaded, and directly acting, free-exhausting safety valve, spring-loaded.

#### 4.2 Valving marking

The safety valves are provided with an individual marking for identification.

Symbol	Explanation
e.g. G1/2	Connection size
PN	Rated working pressure (max. permissible operating pressure)
	Manufacturer's mark "HEROSE"
e.g. 1.4301	Material no.
e.g. <b>CE</b> 0045	CE-mark, ID of notified body
e.g. 06205	Туре
e.g. 01.18	Year of construction MM/YY
e.g. TÜV SV XX – XXX	Type test approval
e.g. EN ISO 4126-1:xxxx	Applied standard; issue date
°C +°C	min / max temperature
	UV stamp holder, National Board Registered
S/G/L F/K/S	Intended for steams, gases, liquids Intended for liquid, grainy, dusty goods
AD2000 / ASME	Rules for performance data
Axx.x	Narrowest flow area A in mm <sup>2</sup>
e.g. x.xxbar xxPSI	Test pressure
0.xx	Certified coefficient of discharge K <sub>dr</sub>
x.xxx	Coefficient of discharge Rated Slope
xxx Nm³/h xxxSCFM	Volumetric flow rate
10% / 5%	Normal lift / full lift
e.g. 1.8 mm	Rated travel
e.g. SN: 01234567	Serial no.
CRN XXXXXX.XX	Canada approval no.
TSF700D36-2021	Manufacturing permit for special devices – People's Republic of China
LR-TA92 / 20011	Classification company (Lloyd's Register), Type approval (operating permit) Certificate number



### 4.3 Intended use

Safety valves protect vessels and pipework systems against impermissible excess pressure. Safety valves represent the last line of safety for a vessel or pipework system. They should be capable of preventing impermissible excess pressure when all other upstream regulating, control and monitoring devices have failed. In order to ensure this operability, safety valves require special attention during their mounting and maintenance.

A safety valve is a piece of equipment with a safety function for protecting pressure equipment when the permissible limits are exceeded and is thus subject to Directive 2014/68/EU (Pressure equipment directive) of the European Parliament and of the Council, article 2, section 4 or the rules and standards of the American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code Section VIII, Division I.

## 4.4 **Operational data**

Туре	d₀ [mm]	Pressure range [bar]	Max. back pressure [%]	Temperatu [°C]	ire	Medium	
	7.0	0.4 to 43					
	12.0	0.2 to 22					
06205	15.0	0.2 to 16		-20 °C to +1	-20 °C to +160 °C		
	18.0	0.2 to 18					
	20.0	0.2 to 16					
	12.0	0.2 to 25					
	15.0	0.2 to 20	-				
06216/	20.0	0.2 10 30		40 °C to ±2	000 °C		
06217	25.0	0.2 to 22		-40 C t0 +2	200 C	-	
	32.0	0.2 to 16					
	40.0	0.2 to 12					
06218/	12.5	3.0 to 16		-60 °C to +1	50 °C		
06219	12.5	3.5 to 17		-60 °C to +150 °C			
	12.0				See section "4.5		
	15.0	1.0 to 16		-10 °C to +110 °C			
06370/	18.0						
00370	20.0						
	24.0						
06372	20.0	0.8 to 1.0		-10 °C to +120 °C		Media"	
00072	12.0	0.0 10 1.0			20 0	1	
	15.0		0.01				
00000	18.0	0.2 to 20	3%	10 °C to 11			
06380	20.0			-10 °C to +1	85 0		
	24.0	0.2 to 16					
	28.0	0.2 10 10				-	
	15.0			Metallic	PTFE- EPDM		
06395	18.0	0.5 to 25		-50 °C	-50 °C -40 °C		
	23.0	0.5 to 12.0		+225°C	to +150°C		
06500	20.0	0.5 to 2.5			+185 C		
00300	20.0	0.5 to 6.0					
	28.0	0.5 to 4.5					
06505	31.0	0.5 to 6.0		-40 °C to +200 °C			
	48.0	0.5 to 3.5	-				
06506	24.0	0.5 to 6.0					
00000	31.0	0.5 10 0.0					



Туре	d₀ [mm]	Pressure range [bar]	Max. back pressure [%]	Temperature [°C]	Medium
06602	10 5	1.2 to 1.3		-10 °C to +130 °C	See
06603	12.5	0.2 to 5.0	20/	-10 °C to +180 °C	section
50051.0004	7.0	6.0 to 15.0	3%	-10 °C to +160 °C	"4.5
50051.0011	7.0	1.5 to 5.0		-10 °C to +160 °C	Media"

#### 4.5 Media

Туре	Medium
06205 06216/06217 06218/06219	Non-toxic steams and gases
06370	Non-adhesive liquids
06372	Steams and gases
06376	Non-toxic, incombustible liquids
06380	Non-toxic steams and gases
06395	Steams and gases
06500 06505/06506	Liquid, grainy, dusty media
06602/06603	Steams and gases
50051.0004	Steams, gases and liquids that are specially intended for heavy oil and lubricants in the shipping, offshore and industrial environments
50051.0011	Steams and gases

#### 4.6 Materials

► See catalogue page.

#### 4.7 Scope of delivery

- Safety valve.
- Operating instructions.

#### 4.8 Dimensions and weights

See catalogue page.

#### 4.9 Lifetime

The user is obligated to use Herose products for their intended purpose.

In this case, a technical service life may be assumed in accordance with the underlying product standards (e.g. EN1626 for shut-off valves and EN ISO 4126-1 for safety valves).

The technical service life can be restarted several times through the exchange of wearing parts within the context of the maintenance intervals, and lifetimes of more than 10 years can be achieved.

If products are stored for a period exceeding 3 years, then the synthetic material components and elastomer sealing elements fitted to the product should be replaced as a precautionary measure before mounting and use.



## 5 Assembly

Other assembly steps may be necessary depending on the plant and type of safety valve. In the following instructions only the major assembly steps are summarised. The instructions are intended only for coarse orientation. The gasket manufacturer's data must be observed. Safety valves that are subject to special cleaning regulations may only be unpacked shortly before assembly. When unpacking, it must be ensured that the packaging is intact up to this point and that the safety valve is not contaminated. In addition, it must be ensured that the cleanliness requirements are also met during the assembly and that the safety valve is not contaminated.

#### 5.1 Installation position

Туре	Installation position
06205	Vertical With the narrowest flow diameter of 7.0 mm the valve may also be installed in a horizontal position.
06216/06217 06218/06219	The safety valves can be installed vertically or in a horizontal installation position.
06370/06372/06376	The safety valves can be installed vertically or in a horizontal installation position with the outlet facing downwards.
06380	Vertical
06395	Vertical
06500	Vertical
06505/06506	Vertical With the narrowest flow diameter of 24 mm, 28 mm and 31 mm the valve may also be installed in a horizontal position.
06602/06603	The safety valves can be installed vertically or in a horizontal installation position with the outlet facing downwards.
50051.0004	Vertical
50051.0011	The safety valve can be installed vertically or in a horizontal installation position with the outlet facing downwards.

## 5.2 Notices regarding the mounting

- Use suitable tools.
  - □ Open-ended spanners,
  - □ Torque wrench.
- Clean tools before the mounting.
- Open the packaging only directly before the mounting.
- Install the safety valve only if the maximum operating pressure and operating conditions correspond to the marking on the safety valve.
- Remove protective caps or covers before mounting.
- Check the safety valve for dirt and damage.
   DO NOT install damaged or dirty safety valves.
- Avoid damaging the connections. The sealing surfaces must remain clean and intact.
- Seal the safety valve using suitable seals.
- No sealant (sealing tape, liquid sealing tape) may enter the safety valve.
- Connect pipelines in a force-free and torque-free manner. Stress-free mounting.
- In order to ensure trouble-free operation, no impermissible static, thermal or dynamic stresses may be transmitted to the safety valve. Observe reaction forces.
- Temperature-dependent changes in length in the pipework system must be compensated with expansion joints.
- The safety valve is supported by the pipework system.
- ► The safety valve must be protected against dirt and damage during construction work.
- Check the leak-tightness.



## Tightening torques

	max. tightening torque [Nm]							
			Male thread			Female thread		
Туре	Material	Thread	G	NPT	R; Rc	G	NPT	R; Rc
		1/4"	20	20	20			
		3/8"	20	20	20			
		1/2"	45	45	45			
	CW614N	3/4"	55	55	55			
06205		1"	90	90	90			
		11/4"	180	180	180			
		11/2"	200	200	200			
	1 4571	1/4"	33	33	33			
	1.4071	3/8"	33	33	33			
		1/2"	60	100	90			
		3/4"	130	180	160			
06216/06217		1"	210	340	290			
06218/06219	CWOT/N	11/4"	470	560	550			
		11/2"	480	730	710			
		2"	940	1100	1300			
		1/2"				35	80	70
		3/4"				50	110	110
	0040414	1"				110	250	220
	CC491K	11/4"				170	390	390
06370		11/2"				220	550	530
06372		2"				360	890	980
06380		1/2"				35	80	70
	004001/	3/4"				50	110	110
	UU400K	1"				110	250	220
		11/4"				170	390	390
	1.4308	1"				230	490	440
	014/01/41	1/2"	43	70	80	49	110	90
		3/4"	120	180	160	70	180	160
	CW014N	1"	220	340	300	150	340	300
		11/4"	550	570	560	240	570	560
		1/2"	70	70	130	70	180	150
	1 4571	3/4"	200	200	280	120	290	270
06305	1.4371	1"	370	380	500	250	550	470
00395		11/4"	920	930	940	390	910	890
	1 4201	1"	350	380	470			
	1.4301	11/4"	880	910	890			
		1"				110	250	220
	CC40414	11/4"				170	390	390
	00491K	11/2"				220	550	530
		2"				340	880	980
	014/04 411	11/4"	560					
06500	CVV614N	11/2"	1100					
	CC491K	2"				370		



			max. tightening torque [Nm]					
			Male thread			Female thread		
Туре	Material	Thread	G	NPT	R; Rc	G	NPT	R; Rc
		1"	200					
	CINICA AN	11/4"	410					
	CVV614N	11/2"	910					
		2"	950					
06505		1"	310					
00300	1.4408	11/4"	650					
		11/2"	1400					
		2"	1400					
	1.4571	1"	350					
	CW614N	1/2"	70	100	90	48	110	90
06602	1.4301	1/2"				70	180	150
00000	CC491K	1"				110	250	220
E00E4 0004	1.4301	1/2"	110					
50051.0004	CC491K	1/2"				33		
E00E1 0011		1/4"	18					
50051.0011	CW614N	3/8"	50			12		

## 6 Operation

►

- ► The maximum permissible pressure drop in the inlet lines to the safety valves may not exceed the 3% pressure difference between the response pressure and superimposed back pressure on the safety valve.
- Vibrations are to be avoided.
  - Check the following points prior to start-up:
    - □ All mounting and installation work are completed.
    - □ Compare the material, pressure, temperature and installation position with the layout plan for the pipework system.
    - □ Dirt and residues have been removed from the pipeline and safety valve in order to prevent leaks.

## 6.1 Liftability (manual actuation for testing)

- Liftable safety valves are equipped with an appropriate device above the spring cap.
- ► Liftable safety valves can be made to open at ≥85 % of the set pressure without aids.
- Typical lifting cases are initial commissioning, after breaks in operation and functional testing; the procedure is as follows:



Step 1: Pull the lifting knob / ring upwards until blow-off of the operating medium is clearly audible.

Step 2: Release the lifting knob / ring.



Step 1: Pull the lifting lever away from the spring cap until blow-off of the operating medium is clearly audible.

Step 2: Release the lifting lever again.



## 7 Maintenance and service

## 7.1 Safety during cleaning

Take note of the specifications in the safety data sheet and the general occupational health and safety rules if degreasers are used for process-related reasons for the cleaning of bearing parts, unions and other precision parts.

## 7.2 Maintenance

The maintenance intervals must be defined by the user according to the operating conditions. The recommendations for the functional checking of the safety valves are to be taken from section 7.2.1 "Inspection and maintenance intervals" in these operating instructions.

#### 7.2.1 Inspection and maintenance intervals

Recommended intervals							
Inspection	Interval	Scope					
Inspection	During start-up	<ul> <li>Visual inspection         <ul> <li>of the angle valve for damage;</li> <li>of the valving marking for legibility;</li> <li>for absence of damage to the sealing.</li> </ul> </li> <li>Leak-tightness         <ul> <li>Union of the valve seat;</li> <li>If existent, actuation of the lifting device.</li> </ul> </li> </ul>					
Functional testing	► Annually	If present, test of lifting device including visual inspection.					
External inspection	<ul> <li>Every 2 years</li> </ul>	Function and tightness test including visual check.					
Internal inspection	► Every 5 years	Replacement of all sealing elements by the manufacturer including functional, tightness test and visual check.					
Hydraulic test	► Every 10 years	Replacement of all sealing elements by the manufacturer including functional, leak- tightness, pressure test and inspection.					



## 7.3 Fault table

Fault	Cause	Remedial action			
Safety valve does not respond	Covers have not been removed;	Remove covers.			
	Test pressure too high;	<ul> <li>Replace the safety valve.</li> </ul>			
	Back pressure not taken into account;	<ul> <li>Replace the safety valve.</li> </ul>			
Not liftable	Pressure below 85% of the set pressure;	► Lifting in the range ≥85 % of the set pressure without aids.			
Leak in the seating	Foreign bodies between cone and seating, contaminated medium;	<ul> <li>Remove foreign bodies by briefly lifting / flush the system or replace the safety valve.</li> </ul>			
	Seating damaged;	<ul> <li>Replace the safety valve.</li> </ul>			
	Cone seal damaged;	<ul> <li>Replace the safety valve.</li> </ul>			
	Safety valve has chattered;	► See "Chattering".			
Damage to the	Transport damage;	<ul> <li>Replace the safety valve.</li> </ul>			
inlet/outlet	Wrong connecting thread / tightening torque too high;	<ul> <li>Replace the safety valve.</li> </ul>			
	Impermissible forces such as bending or torsional forces are being transmitted;	<ul> <li>Install stress-free.</li> </ul>			
Shock waves	Safety valve not mounted at the highest point;	<ul> <li>Install the safety valve at the highest point.</li> </ul>			
	water not drained correctly or at all;	<ul> <li>Attach water drain according to regulations.</li> </ul>			
<ul> <li>Constantly blowing off</li> </ul>	Spring corroded by impermissible medium and broken;	<ul> <li>Replace the safety valve.</li> </ul>			
	System pressure too high	<ul> <li>Replace the safety valve.</li> </ul>			
	Seal damaged;	<ul> <li>Replace the safety valve.</li> </ul>			
Chattering	Pressure drop in the inlet line >3%;	<ul> <li>Reduce resistance through chamfer or radius in the connecting socket; choose a larger one if necessary.</li> <li>Shorter inlet line.</li> <li>Incorrect safety valve; exchange it.</li> </ul>			
	Seals for inlet and outlet connector too small or not installed centrally;	Change conditions.			
	Safety valves are too powerful;	<ul> <li>choose smaller safety valves.</li> </ul>			
	Outlet line too long or diameter too small;	Use a larger nominal diameter or a back-pressure-compensating stainless steel bellows. The max. height is to be specified by the manufacturer.			
	Inlet or outlet connector too small;	<ul> <li>Dimensions must be larger than the nominal inlet or outlet diameter.</li> </ul>			
	Back pressure higher than 3%;	<ul> <li>Use back-pressure-compensating stainless steel bellows. The max. height is to be specified by the manufacturer.</li> </ul>			
Inadequate capacity	Safety valves dimensioned incorrectly for the plant conditions;	<ul> <li>Re-dimension and replace the safety valve.</li> </ul>			
	Safety valves not being used in accordance with the applicable regulations;	Change conditions.			



## 7.4 Repairs

Repairs to the safety valves may be carried out only by HEROSE or by specialist workshops authorised by HEROSE and monitored by the regulatory authorities, using only original spare parts.

## 7.5 Returns / complaints

Use the Service form in case of returns/complaints.



Contact in case of service: Herose.com > Service > Product service > Complaints E-mail: service@herose.com Fax: +49 4531 509 – 9285

## 8 Disassembly and disposal

## 8.1 Notices regarding the disassembly

- Take note of all national and local safety requirements.
- The pipework system must be depressurised.
- ► The medium and the safety valve must be at ambient temperature.
- Aerate / flush the pipework system in the case of corrosive and aggressive media.

## 8.2 Disposal

- 1. Dismantle the safety valves.
  - Collect greases and lubricating fluids during dismantling.
- 2. Separate the materials:
  - □ Metal,
  - □ Synthetic material,
  - □ Electronic scrap,
  - $\hfill\square$  Greases and lubricating fluids.
- 3. Carry out a sorted disposal of the materials.