

GESTRA

Tank-Car and Tank-Container Valves

Product Range, Group A3

formerly





Tank-Car and Tank-Container Valves

General

Handling of hazardous gases and liquids imposes stringent safety requirements on all the equipment used.

GESTRA equipment for road, rail and storage tanks is manufactured to the highest standards of quality and reliability and, insuring an optimum safety for people, plant and the environment.

Our systems and safety valves have been used for decades throughout the world for the transfer, transport and storage of hazardous liquids and gases by many road and rail operators and forwarding agents. GESTRA's criteria for the design, function and material selection of the tank-car and tank-container valves are national and international standards. In addition, due to close co-operation with all parties concerned, customer-specific requirements are also considered.

than 70 years of know-how, forms a solid basis for an advanced technology with a high safety standard.

GESTRA tank-car and tank-container valves meet the national and international regulations and requirements laid down by the following:

RID
Règlement concernant le transport ferroviaire des marchandises dangereuses (European Agreement concerning the Carriage of Dangerous Goods by Rail)

ADR.....
Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the Carriage of Dangerous Goods by Road)

IMDG Code
International Maritime Dangerous Goods Code

GGVE
Gefahrgutverordnung Eisenbahn (German Regulations concerning the Carriage of Dangerous Goods by Rail)

GGVS
Gefahrgutverordnung Straße (German Regulations concerning the Carriage of Dangerous Goods by Road)

GGVSee
Gefahrgutverordnung See (German Regulations concerning the Carriage

of Dangerous Goods by Sea)

TRT
Technische Richtlinien Tank (Technical Directives for Tanks)

UN Sheets
Recommendations of "CEFIC", Union of European Chemical Associations

UIC 573
UIC 573 Union internationale des chemins de fer (Bulletin of International Union of Railways)

GEST 75/46
Recommendation of the Chlorine Transport Work Group, formerly BITC. (BITC = Bureau International de Transport de Chlore)

DIN
German standard specification (CEN)

EN
European standard (CEN)

Type Approvals

GESTRA tank car/container valves are made in Germany and designed to meet the requirements of international regulations, specifications and standards. Type-test approval marks have been granted by the umbrella organization of the German Technical Supervisory Association (VdTÜV) and many European railway authorities in order to certify the high quality and safety standard of our valves. The respective type-test certificates and documents can be presented on request.



GESTRA offers the right concept for every safety level – national and international.

GESTRA – The standard bearer for quality

For GESTRA the concept of “Quality” not only refers to the product, but applies equally to planning, handling, and support services. It is our aim to recognize and eliminate the sources of potential errors during all phases of order processing by implementing comprehensive internal strategies. The ideal basis is a quality assurance system in accordance with EN ISO 9000. Of the three possible levels, our quality assurance system achieved certification in accordance with EN ISO 9001. The high quality standard of GESTRA products has been confirmed time and again by a large number of recognized type-approvals by the TÜV (German Technical Supervisory Association), Germanischer Lloyd, Lloyd’s Register of Shipping, and many other inspection authorities. Hence it follows that our equipment also complies with the relevant regulations for pressure vessels.

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Tank Cars and Tank Containers for Pressure Liquefied Gases

GESTRA Rapid-Action Safety Bottom Valves HWV 46/4, HWV 55 and Loading System HV 215

GESTRA rapid-action safety bottom valves are used for loading and unloading mobile tanks, e. g. rail-tank cars, tank containers and road tankers, that carry gases liquefied under pressure.

Mobile tanks are equipped with two valves mounted at the bottom of the tank. One valve, DN 80 mm (3"), is used for loading and unloading pressure liquefied gas (liquid phase) and the other valve, DN 50 mm (2") is used for gas (gas phase). In future only nominal size DN 80 mm will be used for the gas phase. The two valves are coupled such that they open and close simultaneously when the operating mechanism is actuated.

The spring-loaded main valves are protected inside the tank, ensuring safety in transit and tight shut-off even if, in the case of an accident, the exterior mechanisms are torn off. The bottom valves can be operated mechanically or hydraulically.

HWV 46/4 Bottom valve, DN 50 mm, for gas phase.

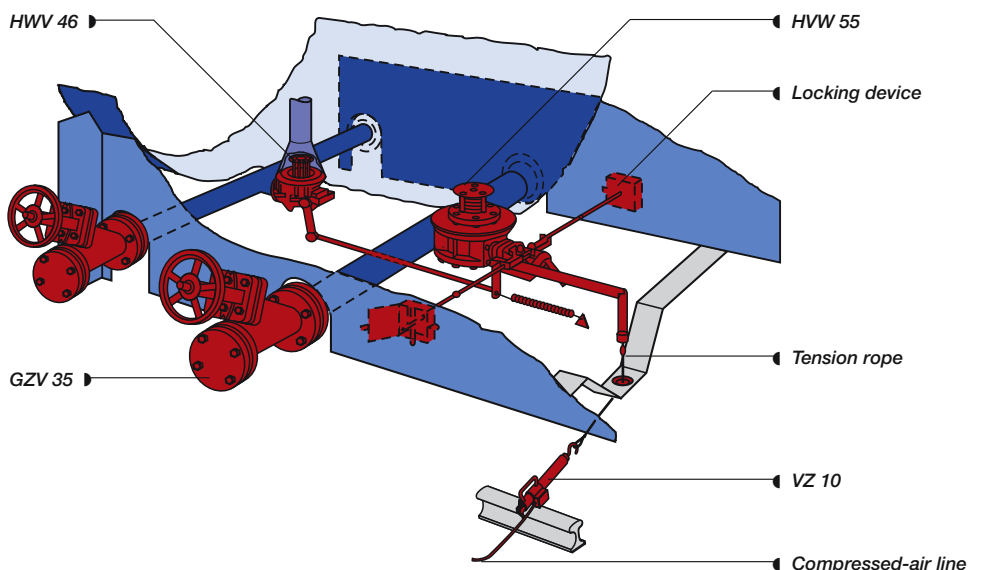
HW 55 Bottom valve, DN 80 mm, for liquid phase

HWV 55/1 Bottom valve, DN 80 mm, for gas phase. The closing device of the valve is externally mounted inside the tank. When the bottom valve is equipped with a locking and an emergency device, it can also be used for the liquid phase.

HWV 205/1 and HWV 215/1 Bottom valve, DN 80 mm, for gas and liquid phase used for the hydraulically operated loading

system HV 215. The operating mechanisms are separated by a locking device (mechanical operation) or a dedicated control unit (hydraulic operation) in order to prevent unintentional opening. The locking devices can be released independently of each other from either side of the mobile tank. The rail hook keeps the valve in the open position for loading and unloading processes. An additional spring incorporated in the rail hook compensates for the differences in height between an empty and a full tank car. The two valve types differ through the control unit, which is bolted on for the HWV 215.

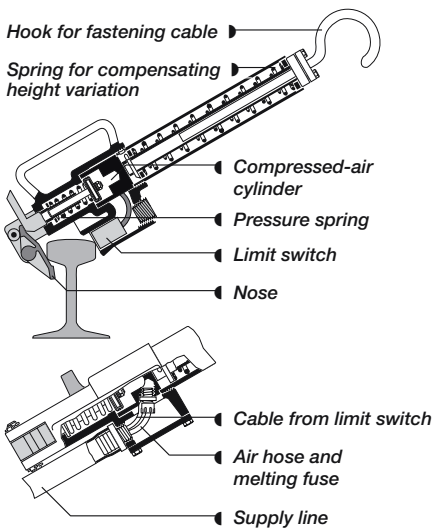
Rapid-action safety bottom valves HWV 46 and HWV 55



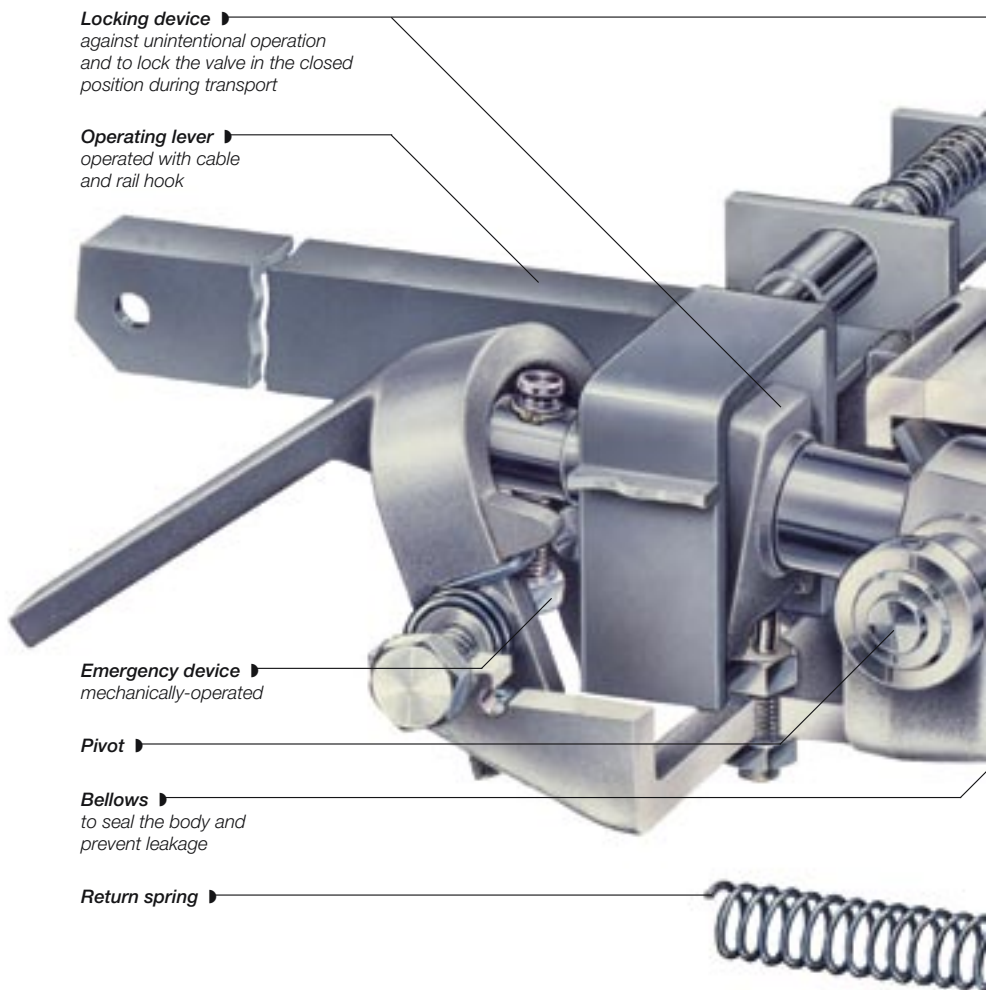


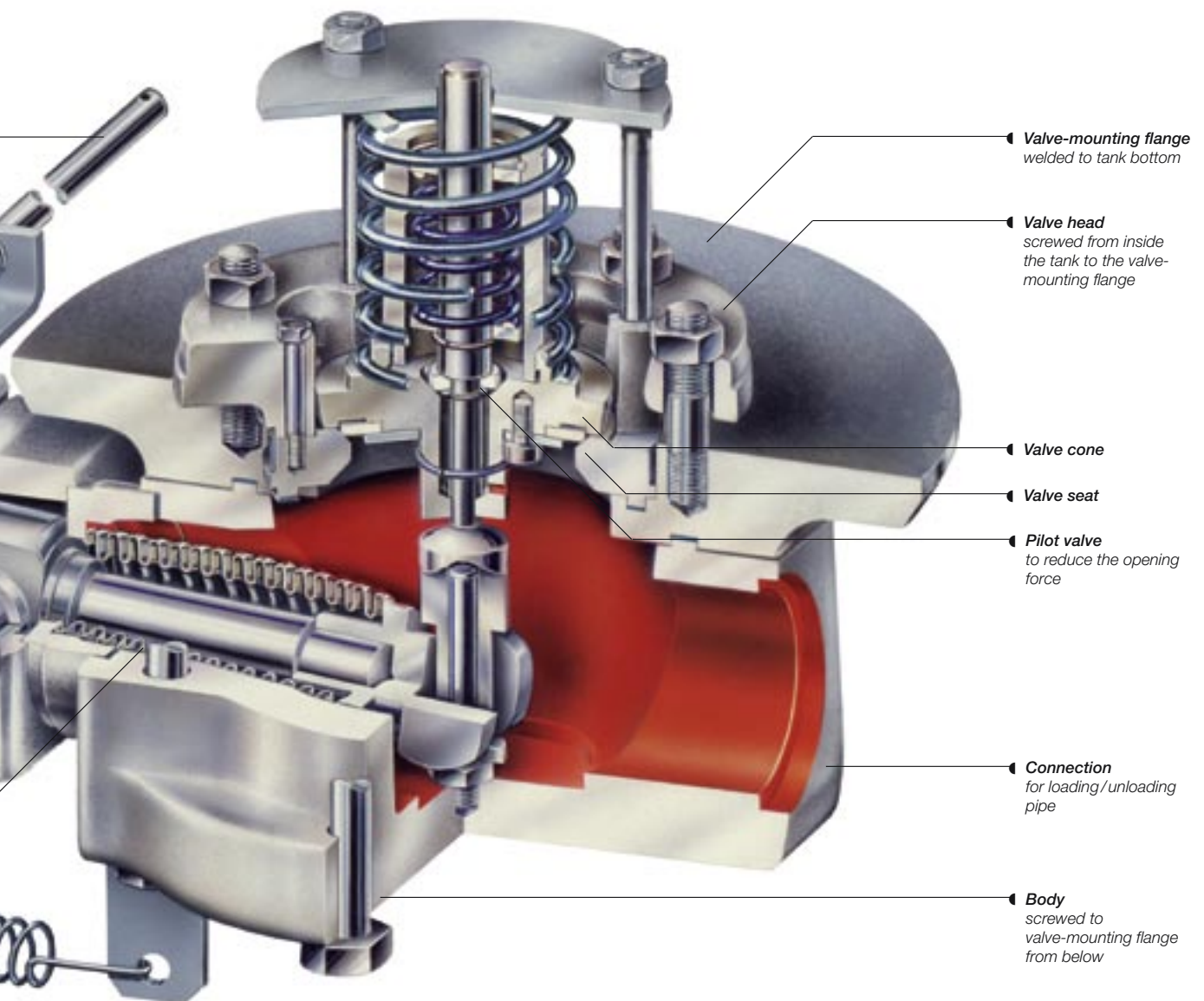
Rail Hook VZ 10

To ensure safety during loading and unloading of tank cars, the pneumatic rail hook type VZ 10 should be used. The rail hook is made of spark-proof material, and designed for rail sections S 49 to DIN 5902. The necessary force for keeping the valves open is provided by a compressed-air cylinder and a pressure spring. When shutting off the air supply and venting the cylinder of the rail hook, quick-closing of the valves is initiated. A limit switch in the rail hook signals whether the hook is correctly engaged in the rail. If the tank car is unintentionally shifted, the hook is disengaged, closing the valves immediately. In the event of a fire, the fuse provided in the rail hook melts at 150 °C. A mechanical rail hook is available on request.



GESTRA Rapid-Action Safety Bottom Valve HWV 55





Type Approvals

HWV 55: TÜ · AGG · 048-90
 HWV 46/4: TÜ · AGG · 095-90
 HWV 205/1 TÜ · AGG · 315-99

These type approvals are recognized by the German Federal Railway Office (EBA) for use on rail tank cars and by the German Federal Institute for Materials Testing (BAM) for use on tank containers.

Safety Features

► **Locking device to prevent unintentional opening of the valve:**
 Visual monitoring.

► **Installation inside the tank:** Safeguard against the escape of gases in the event of an accident.

► **Automatic quick-closing in case of fire:** Cable operation: for tank cars, by rail hook with melting fuse; for tank containers, by lever, melting fuse fitted to cable.

► **Quick-closing from a safe distance in case of danger:** Shutting-off of air supply for rail hook; release cord fitted to lever for tank containers.

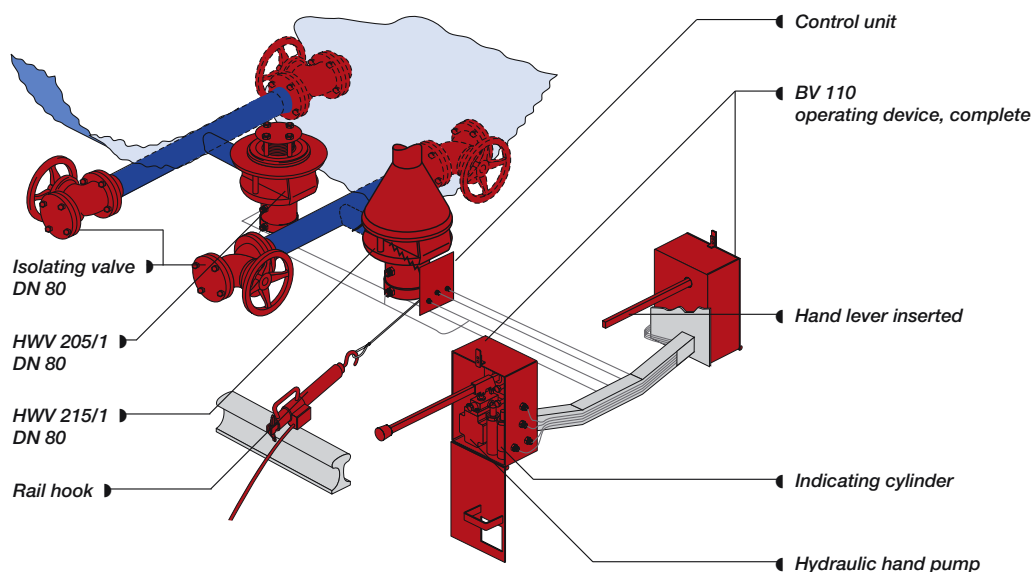
► **Automatic quick-closing:** Automatic disconnection of rail hook if the tank car is moved.

► **Easy opening of frozen valves:** Emergency operating device integrated in valve.

Some media with which the HWV valves may be used:

Designation	UN No.
Ammonia	1005
Propane	1978
Butane	1011
Mixture A	1965
Mixture B	1965
Mixture C	1965
Methylamine	1061
Gas R12	1028
Iso-butane	1969
Further media see data sheet	

Loading system HV 215 (arrangement at the tank car)



Tank Cars and Tank Containers for Pressure Liquefied Gases

GESTRA Rapid-Action Dome Bonnet Valves PV 65

For loading and unloading rail tank cars, tank containers, and other mobile tanks. The valves are suited for highly toxic gases liquefied under pressure (e.g. chlorine) requiring loading from the top.

The valve body is made of low-temperature carbon steel; the bellows of Hastelloy C, welded to the spindle. The seating surfaces consist of PTFE. The valve is provided with replaceable austenitic stainless-steel seat rings. The hydrostatic test pressure is 40 barg (580 psig), the temperature range -50°C to 100°C . The required air pressure for valve operation ranges between 3.5 barg (50 psig) and 7.5 barg (108 psig).

A mobile tank requires three valves mounted in the tank dome, forming a unit. Two valves are used for the liquid phase and therefore provided with dip pipes, one is for the gas phase and without dip pipe. Depending on the position of the tank car or container, one of the liquid phase valves is used together with the gas phase valve.

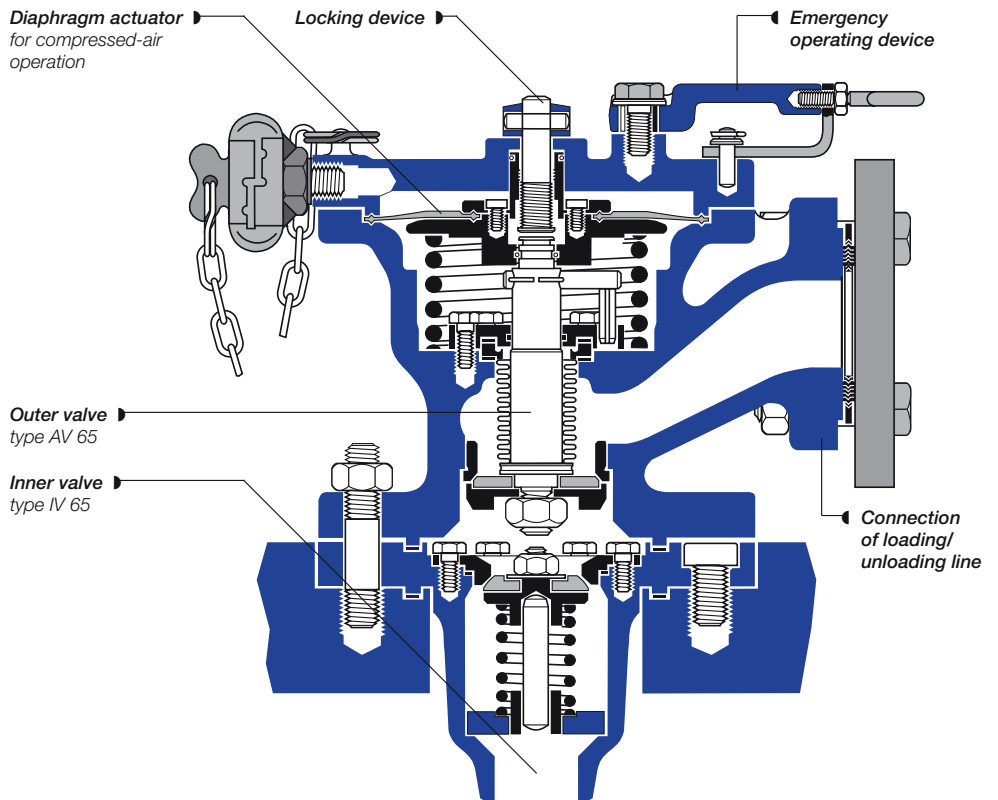
The PV 65 consists of two main components: the inner valve type IV 65, and the outer angle valve type AV 65 with diaphragm actuator (secondary shut-off).

The three PV 65s are normally mounted in a DN 500 dome bonnet.

Type Approvals

- IV 65: TÜV AGG -228-94
- AV 65: TÜV AGG -229-94

These type approvals are recognized by the German Federal Railway Office (EBA) for use on rail tank cars, and by the German Federal Institute for Materials Testing for use on tank containers.



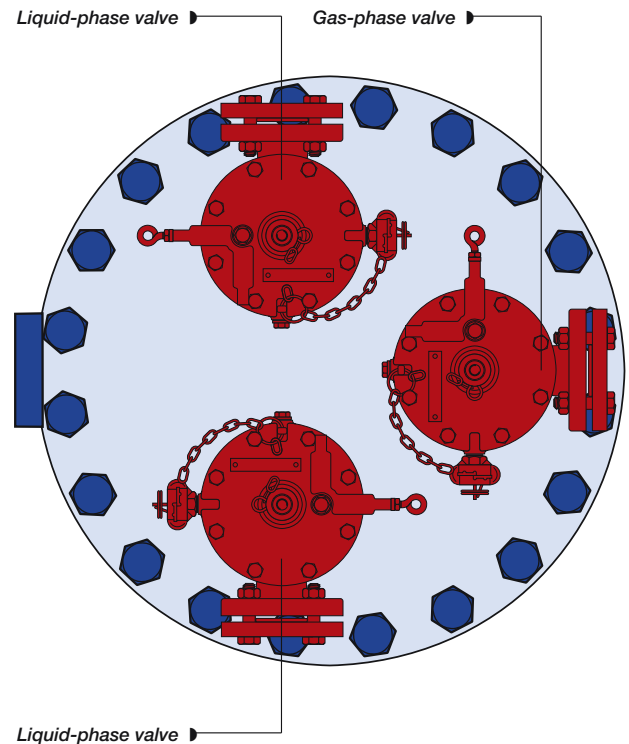
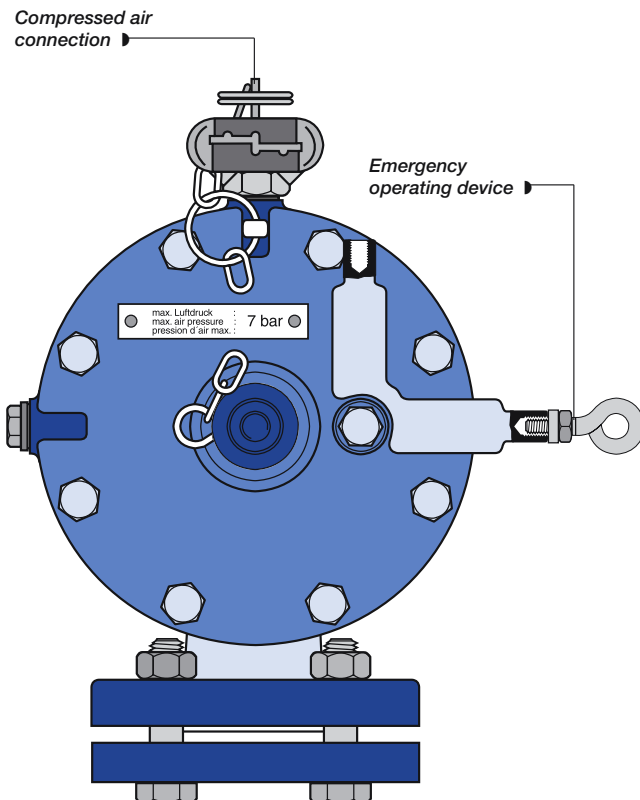
**GESTRA offers
highest reliability with
longest lifetime
and maximum safety.**

Safety Features

- ▶ **Inner and outer quick-closing valves:** Two independent shut-off devices.
- ▶ **Shear studs provided on outer valve:** Effective safeguard against escape of product in the event of an accident.
- ▶ **Quick closing in emergency:** Valves open against spring force.

Some media with which the PV valves may be used

Designation	UN No.
Dry chlorine	1017
Sulphur dioxide	1979
Ethyl chloride	1037
Methyl chloride	1063
Methyl mercaptane	1064
Further media on request.	



Tank Cars and Tank Containers for Pressure Liquefied Gases

Rapid-Action Loading System HV 215

The hydraulically-operated rapid action bottom valve is used for loading and unloading mobile tanks carrying pressure liquefied gases. The HV 215 is the first shut-off as defined by the regulations for mobile tanks and meets the requirements of the new European standard specifying nominal size DN 80 mm for the gas phase.

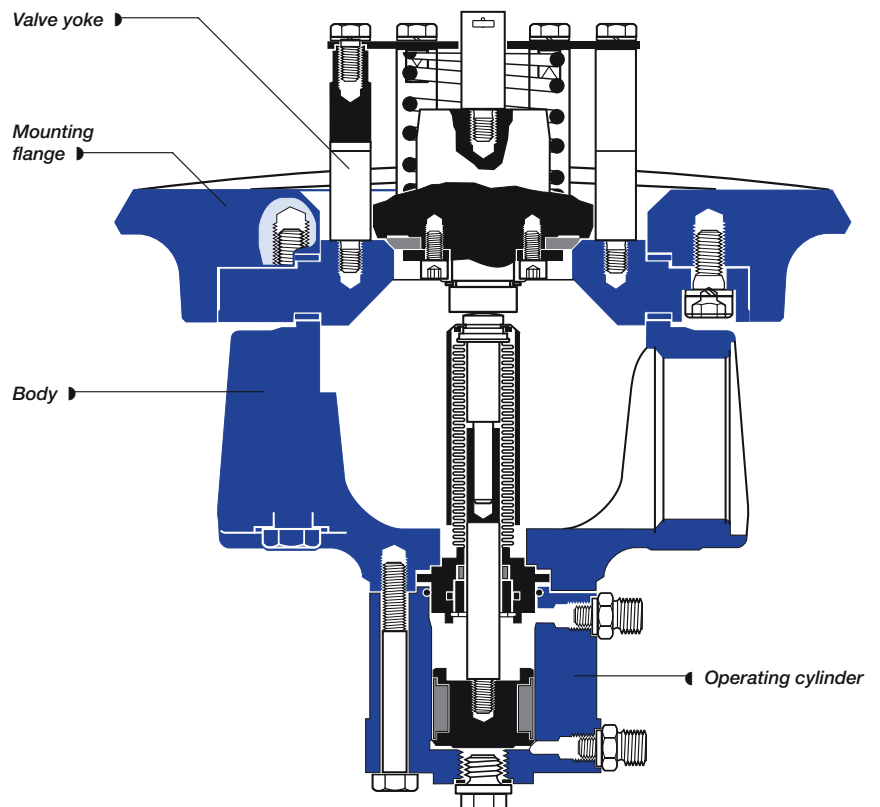
The two bottom valves HWV 205/1 and HWV 215/1, DN 80 mm, are both equipped with hydraulic cylinders for opening. Unlike the mechanically-operated bottom valve, the HWV 205/1 and HWV 215/1 are not provided with a pilot valve. The closing elements (valve yoke) are attached from outside to the mounting flange, which protects them against damage in case of an accident. The sealing between media and hydraulics is provided by a bellows made of stainless steel.

To open the bottom valves, it is necessary to tighten the tension rope and increase the pressure using the hand pump of the BV 110. A safety valve incorporated in the hand pump protects the hydraulic system against excessive pressure. Two position indicators are fitted next to the hand pump, indicating the actual positions (open/closed) of the bottom valves.

The tension rope prescribed by UIC 573 und DIN EN 12561-3 is fastened to the control unit located on the housing of the HWV 215/1.

Pressure/Temperature Ratings:

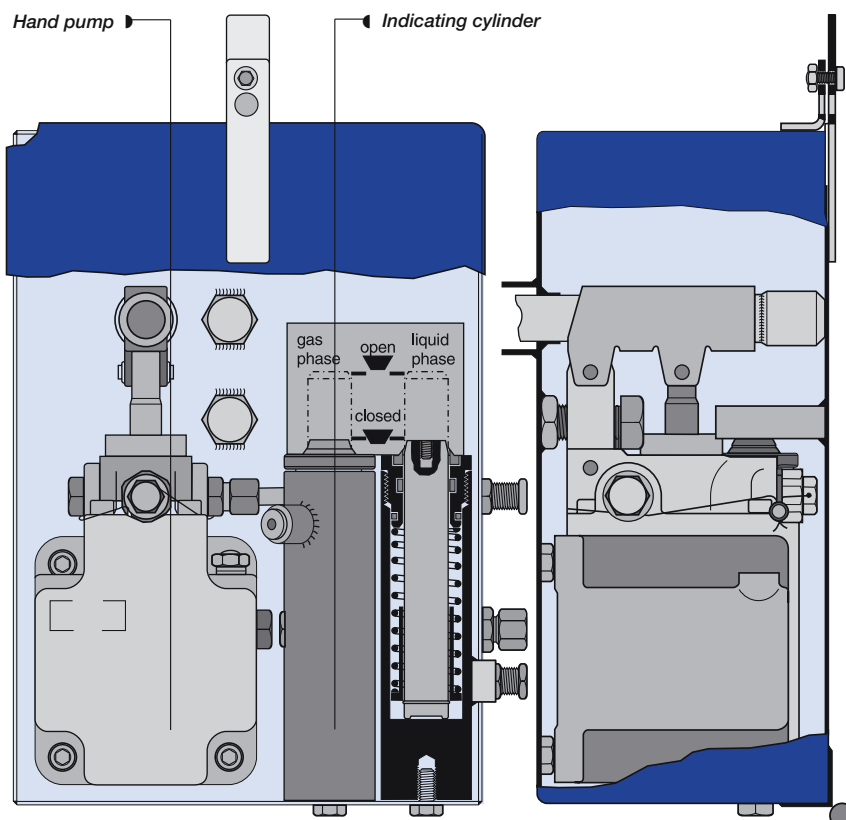
Test pressure = 37.5 barg
Service temperature = -50 °C to +50 °C



GESTRA offers the highest possible accident protection, even under extreme conditions.

Safety Features

- ▶ **Valve fits snugly into the tank contour**, thus preventing leakage of gas in the case of an accident.
- ▶ **Quick-closing** from a safe distance in case of danger, by disengaging of the rail hook.
- ▶ **Valve position (open/closed)** indicated at both sides of the tank, even when the flap of the BV 110 is closed.
- ▶ **Automatic quick-closing in case of fire** by virtue of a melting fuse integrated in the rail hook or tension rope.



Type Approval

TÜ · AGG · 315-99

Some media with which the HV 205 may be used

Designation	UN No.
Ammonia	1005
Propane	1978
Butane	1011
Mixture A	1965
Mixture B	1965
Mixture C	1965
Methyl amine	1061
Gas R12	1028
Isobutane	1969
For further media see data sheet	

Mineral-Oil and Chemical Tank Cars

Loading and Unloading System EV 30 with Gas Balance Line

The EV 30 is used for loading and unloading tank cars. The system is suitable for liquid loads such as petrol, diesel oil, aviation fuel, fuel oil EL and other low-viscosity chemical products. The EV 30 is a manually-operated bottom loading system consisting of two main component parts:

Inner bottom valve UV 70.....
 DN 125 mm, with manual operating mechanism BV 50, DN 160 (butt weld 139.7 x 4). The UV 70 is used for loading and unloading tank cars and serves as first shut-off, the secondary shut-off is ensured by the isolating valves mounted in connecting tubes (see page 13).

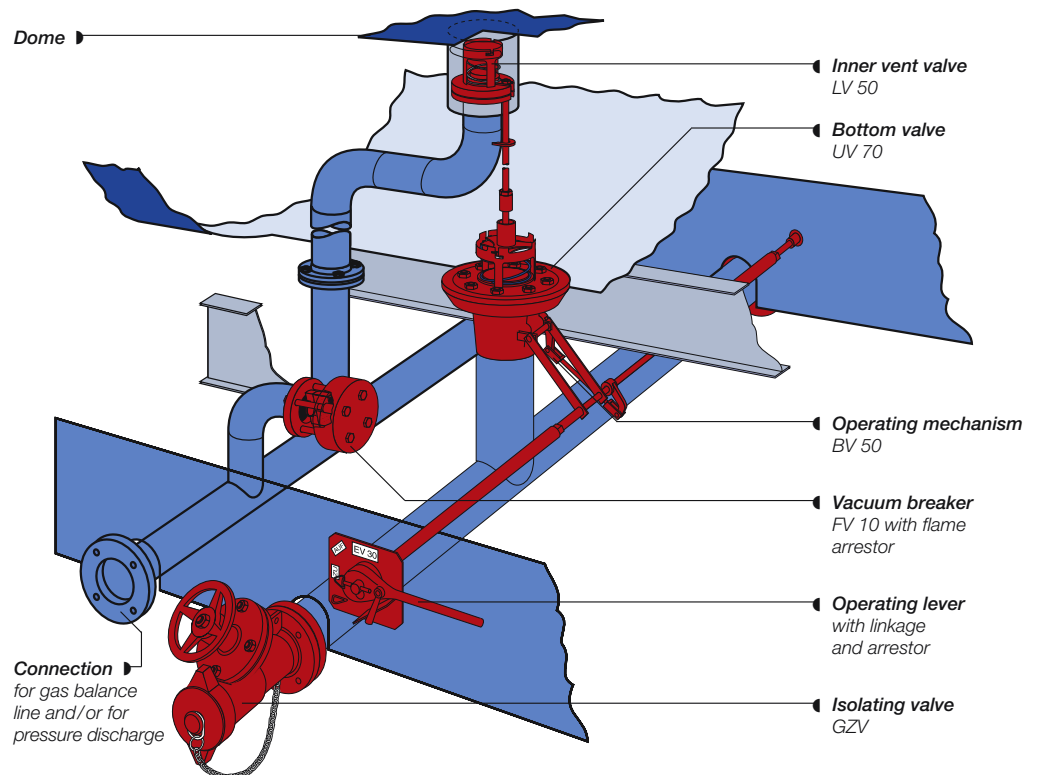
Inner vent valve LV 50
 DN 80, used for air/gas supply during loading and unloading. The LV 50 is provided with a connection for a gas balance line or pressure discharge. The valve FV 10, DN 80, serves as vacuum breaker when the gas balance pipe is not connected. This valve arrangement complies with the relevant German regulations and European standards.

Safety Features

- ▶ **Locking device to prevent unintentional or careless operation:**
 Visual monitoring
- ▶ **Valve fitted inside the tank:**
 Safeguard against accidents
- ▶ **Flame arrestor:**
 Can be monitored from the ground
- ▶ **Vacuum breaker:**
 Safeguard against tank damage

Type Approvals

EV 30 F: TÜ AGG. 276-97
 LV 50: TÜ AGG. 277-97



Tank Cars and Tank Containers for Pressure Liquefied Gases

GESTRA Isolating Valves GZV

The isolating valve type GZV 25, DN 80 and DN 50 is used as secondary shut-off for the HWV 55, HWV 46/4 and HV 205. For the loading and unloading system EV 30 the isolating valve type GZV 10, DN 100 with screwed connection is applied. The GZV valves are suited e.g. for inflammable and toxic gases liquefied under pressure, for oils, fuels, bitumen, sulphur, and liquid chemical products of low viscosity.

Two versions are available for tank cars:

Valves with stuffing box and PTFE cone seal and hand-wheel.

Bellows-sealed valve with PTFE cone seal, and additional safety stuffing box.

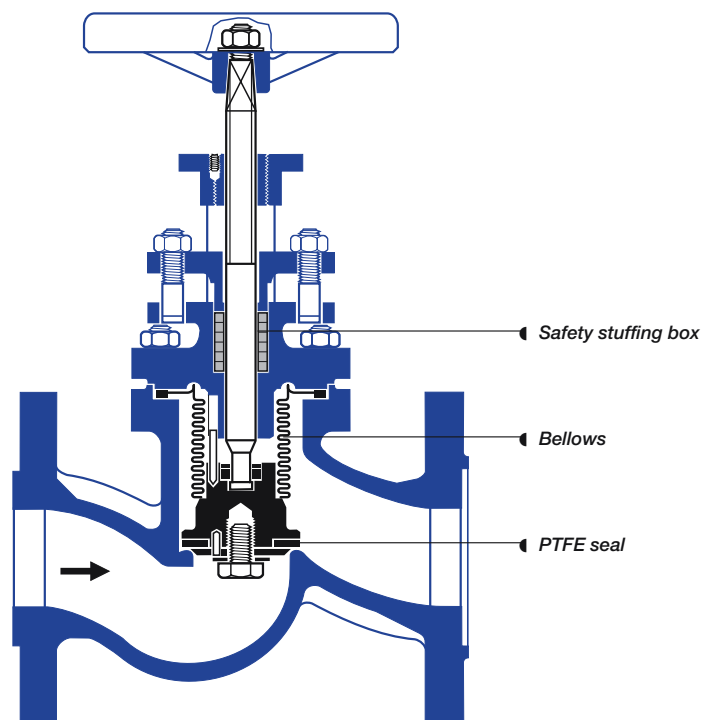
GZV 20 is also available as an angle valve.

Type Approvals

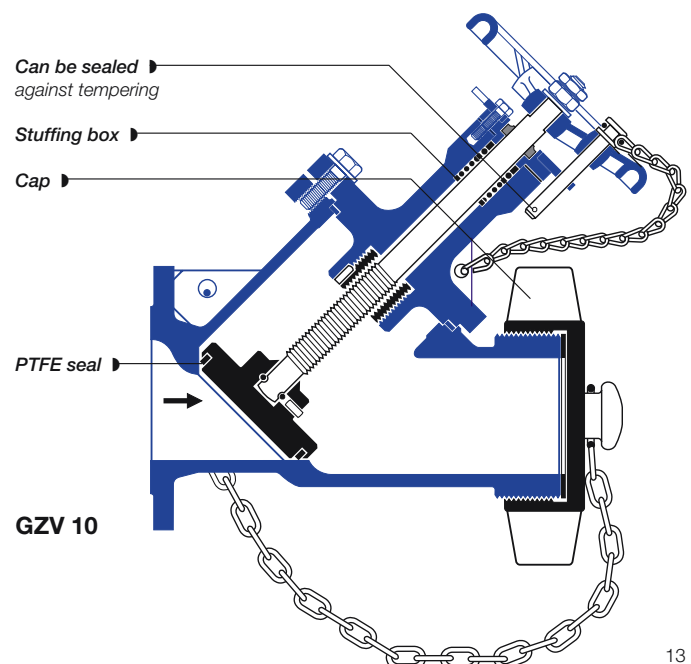
GZV 25, DN 50, DN 80:
TÜV AGG-185-93 (without bellows)

GZV 25, DN 50, DN 80:
TÜV AGG-184-93 (with bellows)

GZV 10, DN 100:
TÜV AGG-183-93 (for mineral-oil and chemical tank cars)



GZV 25



GZV 10



FLOWSERVE Flow Control
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