

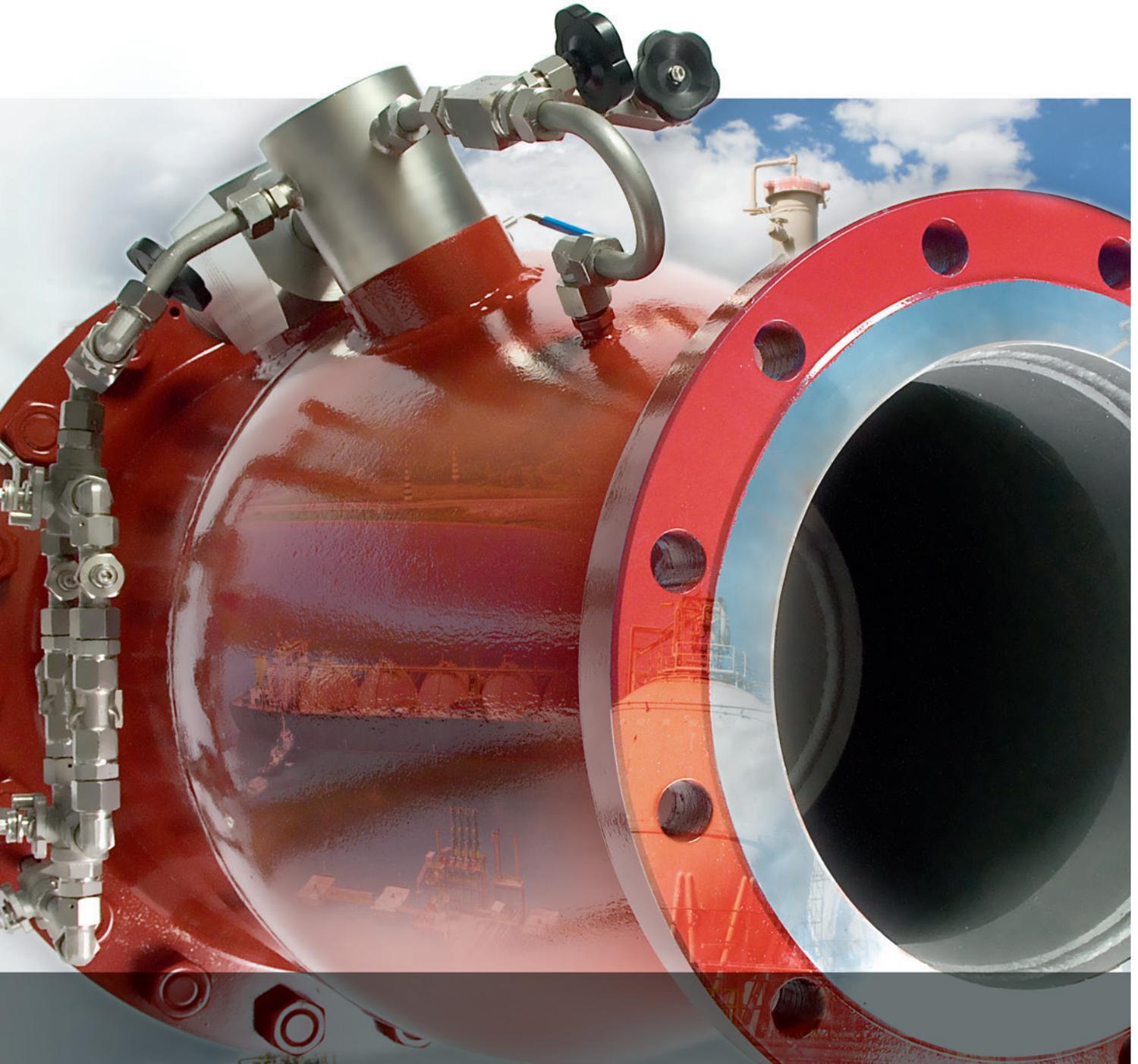


*flow & process solutions*



**MANKENBERG**

Industriearmaturen  
Industrial Valves



Your Specialist and Partner in the Domain  
of Pipeline and Storage Tank Applications

# Surge Relief Valve

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## SR 6.2P

flow optimised design (CFD)

least possible flow losses,  
 $\alpha_f$  max. 0,6

1

valve in welded construction

by comparison it features a low weight, an adapted building length, special materials and individual flange standards are possible, short delivery times

2

1

2

4

inner parts, pilot valve, piping and operating elements of CrNiMo-steel, painting as per DIN ISO 12944 part 5 C5-M

high corrosion protection

3

exchangeable filter in the pilot system

filter may be changed during operation, trouble-free function

4

MOD

Manual Opening Device

function control, bleeding, flushing, filling of the valve

5

pilot operation, closing time and response pressure can be adjusted

optimal response behaviour  
low-stress closure

6

balanced cone customer  $K_{vs}$ -value

high seat tightness until the response pressure is reached, smaller slop tanks possible, independent from counter-pressure

7

earthquake-proof

can be used world-wide

8

resistant to vacuum

also suitable for dry running systems

9

Options

second pilot valve

switchable response pressure



flow indicator and/or stroke sensor

function monitoring, recording

## Surge Relief Valve (peak loads)

## SR 6.2

self-actuated for extreme flow rates | straightway valve with optimised design with least possible flow loss | directly acting or pilot-operated | shortest possible response times | suitable for nearly all liquids | valve of welded steel, CrNiMo steel or special stainless steel | can be designed for any application, any problem with regards to pressure relief can be solved | versions for vertical or horizontal installation

DN	150 - 400	PN	16 - 160
$p_2$	max 160 bar	T	-30 - 130 °C / - 22 bis + 266 °F
$C_{vs}$	465 - 2,791 US gal/min.	$K_{vs}$	400 - 2,400 m <sup>3</sup> /h



## Extract from the Variety of our Valves for Pipeline Applications

### Pilot-operated Pressure Reducing Valve

RP 810

single-seat straight-way or angled design valve for large flow rates at high pressure | suitable for liquids and steam | body made of GGG-40, GS-C 25, C-steel, CrNiMo steel, special materials such as Duplex, Superduplex oder Hastelloy® available | maintenance work can be done from above at the installed valve, special versions available

DN	40 - 400	PN	16 - 160
		T	130 °C
p <sub>2</sub>	1 - 40 bar	K <sub>V5</sub>	20 - 900 m <sup>3</sup> /h



### Pilot-operated Pressure Reducing Valve

RP 814, 815

single seat inline valve in welded construction, pilot-operated inline valve for large flow rates | RP 815 with extended casing for maximum K<sub>V5</sub>-values, high pressure at large flow rates | body made of welded steel, CrNiMo steel | special versions available

DN	100 - 800	PN	16 - 100
		T	130 °C
p <sub>1</sub>	1 - 20 bar	K <sub>V5</sub>	60 - 2,100 m <sup>3</sup> /h



### Weight-loaded Pressure Reducing Valve

DM 3, 4

balanced straight-way valve for medium and high flow rates | suitable for liquids, gases, steam | high precision thanks to integral regulation behaviour | time response can be adjusted by damping | body made of GGG-40 or GS-C 25

DN	50 - 400	PN	16 - 40
		T	280 °C
p <sub>2</sub>	0.5 - 10 bar	K <sub>V5</sub>	32 - 1,200 m <sup>3</sup> /h



### Pressure Reducing Valve for Tank Inertisation

DM 762

single-seat straight-way valve for medium flow rates, especially for the control of millibar ranges | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | corrosion-resistant, very lightweight and compact | very precise owing to large control surfaces and a large number of different control ranges, available in many different versions

DN	15 - 50	PN	16
G	1/2 - 2	T	130 °C
p <sub>1</sub>	0.002 - 0.52 bar	K <sub>V5</sub>	0.2 - 3.6 m <sup>3</sup> /h



### Pilot-operated Pressure Reducing Valve for Tank Inertisation

RP 840

millibar control valve for medium flow rates, very precise, available in various versions | suitable for liquids and gases | completely made of deep-drawn CrNiMo steel | optimal surface characteristics, highest regulating accuracy, lowest control ranges up to a limit of 2 millibar

DN	50 - 150	PN	16/1
		T	130 °C
p <sub>2</sub>	0.002 - 0.52 bar	K <sub>V5</sub>	3.6 - 150 m <sup>3</sup> /h



### Pilot-operated Backpressure Regulator

RP 820

single-seat straight-way or angled design valve for large flow rates at high pressure | suitable for liquids and gases | body made of GGG-40, GS-C 25, C-steel, CrNiMo steel, special materials such as Duplex, Superduplex oder Hastelloy® available | maintenance work can be done from above at the installed valve, special versions available

DN	40 - 400	PN	10 - 63
		T	130 °C
p <sub>1</sub>	2 - 40 bar	K <sub>V5</sub>	20 - 900 Nm <sup>3</sup> /h



fig. similar

### Pilot-operated Backpressure Regulator

RP 824, 825

single seat inline valve in welded construction, pilot-operated inline valve for large flow rates | RP 825 with extended casing for maximum K<sub>V5</sub>-values, high pressure at large flow rates | body made of welded steel, CrNiMo steel | special versions available

DN	100 - 800	PN	10 - 25
		T	130 °C
p <sub>1</sub>	2 - 20 bar	K <sub>V5</sub>	60 - 2,100 Nm <sup>3</sup> /h



### Weight-loaded Backpressure Regulator

UV 1.6, 2.6

balanced straight-way valve for medium and high flow rates | suitable for liquids, gases, steam | high precision thanks to integral regulation behaviour | time response can be adjusted by damping | body made of GGG-40 or GS-C 25

DN	50 - 400	PN	16 - 40
		T	280 °C
p <sub>1</sub>	0.5 - 10 bar	K <sub>V5</sub>	32 - 1,200 Nm <sup>3</sup> /h



### Backpressure Regulator for Tank Inertisation

UV 3.9

single-seat valve in the straightway, angle-type or U-shaped version for very small inlet pressures | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra ≤ 1.6 µm | highest regulating accuracy, lowest control ranges, good surface characteristics, various K<sub>V5</sub>-values and versions possible

DN	15 - 50	PN	1 - 2,5
G	1/2 - 2	T	130 °C
p <sub>1</sub>	0,1 - 1,1 bar	K <sub>V5</sub>	0,2 - 28 m <sup>3</sup> /h



### Vacuum Breaker with Setting Scale

VV 34, 35, 36

VV 34 with flange connection, with spring cap (CrNiMo steel) and setting scale, VV 35 screw-in version | VV 36 without spring cap and setting scale | suitable for liquids and gases | body made of CrNiMo steel, flange of steel, CrNiMo steel | available in special materials, e.g. seawater resistant material, NACE compatible | nearly universally usable

DN	20 - 250	PN	6 - 40
G	1/2 A - 2 1/2 A	T	300 °C
p <sub>2</sub>	0.05 - 0.95 bar	K <sub>V5</sub>	1.2 - 388 m <sup>3</sup> /h



## Bleeding and Venting Valve with integrated Vacuum Breaker EB 1.57

for pipelines or plants subject to severe vacuum hazards and systems particularly requiring ventilation | float and lever ensure the discharge of large gas quantities for constant ventilation at maximum operating pressure | the adjustable vacuum breaker with large nominal diameter ensures maximum ventilation performance during draining of systems and means optimal dual functionality | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $R_a \leq 1.6 \mu\text{m}$  | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact

DN	100	PN	10
		T	130 °C
p	0 - 10 bar	Q	190 m <sup>3</sup> /h



## Combined Valve especially for Clean Water EB 1.74

for large air volumes at startup, continuous bleeding or venting under pressure, opens with large ventilation capacity if a vacuum is present | suitable for nearly all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $R_a \leq 1.6 \mu\text{m}$  | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, easy-to-maintain owing to the clamp system – highest effectiveness with compact design

DN	50 - 150	PN	16
		T	130 °C
p	0 - 8 bar	Q	1,783 m <sup>3</sup> /h



## Bleeding and Venting Valve for highest Flow Rates EB 6.54

suitable for high operational pressures | for large air volumes during startup, large air volumes during bleeding | bleeding under pressure owing to adapted continuous venting valve | avoids cavitation peaks | suitable for all liquid media, also for petrol, oil and chemicals | body made of steel, CrNiMo-steel, massive welded construction, extremely sturdy, also available in seawater-resistant materials | optimal triple functionality

DN	25 - 300	PN	6 - 40
		T	130 °C
p	0.3 - 40 bar	Q	18,550 m <sup>3</sup> /h



## Pot Strainer for large Nominal Diameters SF 2.00

low pressure drop, different sieve finenesses, clear mesh width 0.25–2.5 mm | usable for liquids, gases and steam | body made of steel, CrNiMo-steel | very sturdy welded construction of steel or CrNiMo-steel, specific customised versions available

DN	25 - 1,000	PN	6 - 160
		T	200 °C



## Customised Solutions Your operating data determine the solution.

Customer-specific solutions are individually designed valves for our customers' special requirements. Mankenberg checks with every enquiry the customer-specific technical operating data and subsequently quotes the technical solution. If the operating data require solutions which cannot be realised with Mankenberg standard valves, our engineers will be happy to develop special solutions in accordance with our customer's enquiry. This may lead to either slightly modified valve type series or to a complex system. Discover our strength also in this case and send us your enquiry.



example

# Mankenberg Valves for Pipeline Applications in Action

## Pipeline Protection at Russian Seaports

At various Russian Black Sea and Baltic ports loading facilities called seaports are operated where large oil tankers are loaded up. Movable marine loading arms establish a connection between the pipeline systems on land and the vessel. Should the vessel unexpectedly drift away from the pier, the pipeline connection could be torn apart. In that case an emergency disconnection will be carried out: the connection will be separated with a quick-release coupling and the loading system will be shut down.

This emergency disconnection can cause a serious pressure peak due to the kinetic energy within the liquid column. Mankenberg's SR 6.2P, a quick opening pilot-operated pressure relief valve, disposes the liquid which caused the pressure peak in a slop-tank. As soon as the closing pressure has been reached, the pressure relief valve shuts down automatically and in a damped way. Notwithstanding the extreme temperature fluctuations, the pressure relief valve SR 6.2P effectively regulates the medium to temperatures ranging from  $-20\text{ }^{\circ}\text{C}$  to  $+30\text{ }^{\circ}\text{C}$ .



## Pump Protection for Heavy Crude Oil Loading Facilities in a German Refinery

The refinery – one of the most modern in Europe - has an annual capacity of over 10 million tonnes of crude oil. This oil is brought to the plant via large pipeline systems from i.e. Rotterdam.

Due to the high viscosity of the oil at the heavy crude oil loading facilities (up to 650 cSt at a temperature of  $85\text{ }^{\circ}\text{C}$ ), two eccentric spiral pumps are in use. Pump performance is enhanced by backpressure regulators which guard against overpressure hazards caused by fluctuations in system operations.

Mankenberg's weight loaded UV 2.6 backpressure regulators are suitable for highly viscous media applications. These twin seat valves are designed for a flow capacity of 125 or  $250\text{ m}^3/\text{h}$  and temperatures up to  $200\text{ }^{\circ}\text{C}$ .

Some design modifications were carried out for this specific application: sense lines are not provided and unused space has been minimised as far as possible. In addition to that the customer carried out a trace heating of the valve.



## Pipeline Ventilation of an Oil Tank Depot in the Sultanate of Oman

The pipeline at this oil depot with docking and loading facilities is only used for liquids when a tanker has to be filled up. Due to this fact the pipeline is regularly put into operation afresh. At the plant, liquid fossil fuels are transported and processed. That is why protection against excess pressure and vacuum damage is essential. For security reasons, gases found in the pipe are collected and then disposed of.

During the start-up / filling process with liquid fossil fuels four venting and bleeding valves, type Mankenberg EB 6.54 DN 80 (3") and DN 100 (4"), dispose the escaping gases according to the fluid level and avoid a vacuum during the draining of the system thanks to a systematic ventilation.



# Mankenberg Valves for Pipeline Applications in Action

## Protection of Tank Systems and of Products by Tank Blanketing with Nitrogen

Since the entry into force of the Kyoto protocol the demand for tank blanketing systems has continuously increased. This is due to the rising demand for fuel with bioethanol. Although such fuels featuring a bioethanol percentage of up to 10 % are a good contribution to climate protection, they introduce new challenges to the tank system operators.

When reacting with water (atmospheric humidity) bioethanol can be converted to methyl esters. These are very aggressive and can severely damage the tank foundations made of concrete. In addition, of course, the fuel loses quality during storage. To solve this problem technically, Manenberg has developed the pressure reducing valve RP840 in close cooperation with its customers. A millibar reducing valve proven for decades controls a main valve customised to the tank system. Thus the high regulating accuracy at very low pressures (~5 mbar(g)) combines with the high volume flow necessary for big tanks and pumps. The customer thereby obtains a very economic solution for his plant.



Please send us your enquiry and allow us to advise you.

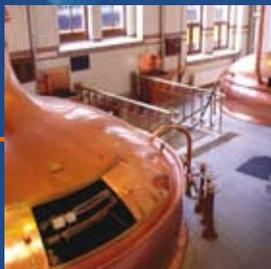
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