

Pressure Control Valves: Pressure Reducing Valves: DM 3, DM 4, DM 152, DM 401, DM 462, DM 502, DM 505, DM 505Z, DM 505P, DM 506, DM 510, DM 511, DM 512, DM 513, DM 514, DM 515, DM 516, DM 517, DM 518, DM 603, DM 604, DM 613, DM 620, DM 621, DM 644, DM 622, DM 623, DM 624, DM 625, DM 626, DM 627, DM 628, DM 652, DM 662, DM 664, DM 701, DM 762, DM 765, Backpressure Regulators: UV 1.2, UV 1.8, UV 1.9, UV 3.0, UV 3.1, UV 3.2, UV 3.5, UV 3.5Z, UV 3.8M, UV 3.8K, UV 3.9, UV 4.1, UV 4.4, UV 4.7, UV 4.8, UV 5.1, UV 6.2, UV 8.2, UV 1.3, Sliding Gate Valves: DM 307, DM 308, UV 6.7, UV 6.8, Burst Pipe Isolating Valves: RS 219, RS 659, Flow Control and Differential Pressure Valves: DV 652, Vacuum Breakers and Vacuum Control Valves: VV 5, VV 34, VV 35, VV 36, VV 59, VV 652, Safety Valves: SV 4, SV 6, SV 29, SV 29V, SV 40, SV 60, Pilot-operated Control Valves: P 814, RP 815, RP 818, RP 820, RP 824, RP 825, RP 840, Bleeding and Venting Valves: EB 1.10, EB 1.11, EB 1.12, EB 1.20, EB 1.32, EB 1.32SO, EB 1.48, EB 1.57, EB 1.60, EB 1.65, EB 1.70, EB 1.75, EB 1.80, EB 1.85, EB 3.50, EB 3.52, Combined Bleeding and Venting Valves: EB 1.74, Controlled Steam Traps: Axomat, Niagara, KA 2, KA 2K, KA 2X, KA 3, Float Valves: NV 36SF, NV 94, NV 98, Float Valves for external installation on tanks: NV 16, NV 16E, NV 26, NV 66E, NV 82, Pipeline Fittings: SF 1.00, SF 1.22, SF 2.00, SF 3.00, SF 6.00, Liquid Separators: AS 2, Sight Glass: DA 4.10, DA 4.40, DA 6.00, DA 6.10, DA 6.12, DA 6.30, DA 7.00, Condensate Pumps: SW 1.40, SW 6.14, Backflow Preventers: Valves: Electrical Control Valves: Pumps: Series:





"None of our company's products are designed for mass production but rather they require a high degree of expertise and understanding from each of our employees. In many cases special designs have to be conceived. Tasks of considerable difficulty have hitherto been mastered to the satisfaction of the buyers. Therefore, I should like to make this request of my friends and customers in Germany and abroad: Please give me every opportunity to think and work for you."

Gustav Mankenberg (1858–1945)

*Dear Sir or Madam,*

This statement from my great-grandfather has accompanied our family firm for some generations now and is valid still today. The large variety of our production techniques and products, the know-how of our longtime employees and not least our enthusiasm for technology create ideas and solutions. We often manufacture an industrial valve only once for a single difficult application, but in many cases modular serial products may be the

optimal solution for your requirement. See for yourself and enjoy reading our short catalogue.

*A. Weidner*

AXEL WEIDNER  
Managing Director and Co-proprietor

По всем вопросам обращайтесь в наш офис ООО "ТИ-Системс":  
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**MANKENBERG**



## Table of Contents

Foreword .....	2
Mankenberg .....	6
Variety of Products .....	9
Pressure Regulating Valves can be so Various! .....	10
High Grade .....	14
One Pot and Many Applications .....	18
High Grade Pure .....	22
Large Diameter Valves .....	25
Customised Solutions .....	26
Quality, Approvals & Certificates .....	28
After Sales .....	64
Customer Seminars .....	66
Job Order Production .....	68

## Products

Index of Product Groups .....	30
 Pressure Regulating Valves .....	32
 Bleeding and Venting Valves .....	49
 Steam Traps .....	54
 Float Valves .....	56
 Pipeline Ancillaries .....	58
 Pumps .....	62
 Accessories and Spare Parts .....	63
 Customised Solutions .....	26

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**MANKENBERG**





## Mankenberg – Your Specialist in Valves and Flow Technology Design

Flexible standard valves or project-related, custom-made special valves since 1885: Mankenberg's creative brains combine experience, technological know-how and a well-trained eye for your special requirements. They develop your optimum solution in the domain of self-energised regulating valves that do not require any external energy.

More than 6,000 active customers appreciate the affidability, functional reliability and long operational lifespan of the Mankenberg valves. It is not unheard of for our valves to have a usage period of 25 years or longer. The long life expectancy of our products is the result of our individual advice, appropriate product selection and project-specific solution for your applications. The very high degree of vertical integration at our location in Lübeck subsequently ensures quality, flexibility and high on-time delivery performance for your order.

### Mankenberg – Made in Germany

Mankenberg industrial valves rightly bear this title. For decades we have applied the appropriate modern production methods

at our location and exclusively produced at our plant in Lübeck. Deep drawing of stainless steel and special materials is as much an important core competency as toolmaking, turning and milling, welding, surface treatment, assembly and testing methods.

### Our Secret to Quality – Our Staff

Our staff are our greatest asset. We have been true to this principle every day and, of course, the same applies to our young-generation employees. In our region, Mankenberg ranks among the companies with a very high percentage of trainees. Our commitment has been rewarded: more than half of our current employees have been trained in our company. Periods of employment of several decades are not uncommon.

When designing and selecting our valves, our engineers, technicians and sales people will find the optimal solution for your application together with you. Mankenberg has a reputation for giving technical expertise and comprehensive advice – just take us at our word!

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**MANKENBERG**





On the inside pages:  
Pressure Regulating  
Valves can be so  
Various!





## A Wide Variety of Products for an Optimum Solution – Deep-drawn Stainless Steel Valves, Valves Made of Cast Steel and Machined from Solid Material as well as Welded Constructions

Thanks to more than 30 years of experience we have become experts in the deep-drawing of stainless steel. The vast array and flexibility of deep-drawn stainless steel valves (High Grade) from Mankenberg are unique in the world.

Our high degree of vertical integration enables us to act flexibly in accordance with your specific needs. With our know-how and experience we also manufacture valves

from deep-drawn titanium or seawater-resistant material.

Our product range is completed by valves from cast steel, from solid material or welded constructions. For this purpose special materials such as Duplex steel or Hastelloy® are also used. This wide range allows for full flexibility and tailor-made solutions for your needs and the use of our valves in your special plant or machine.

## Pressure Regulating Valves can be so Various!

Pilot-operated Pressure Reducing Valve	RP 814	1
Valve for Small Flow Rates	DM 505	2
Millibar Control Valve	DM 762	3
Standard Cast Valve	DM 613	4
Valve for High Pressures and High Temperature	DM 401	5
Universal Valve	DM 652	6
Pilot-operated Pressure Reducing Valve	DM 810	7
Valve for High Pressures for Control Ranges up to 160 bar	DM 510	8
Valve for Hygiene Applications / Ultrapure Media	DM 152	9
Pilot-operated Millibar Control Valve	RP 840	10



1 Page 46



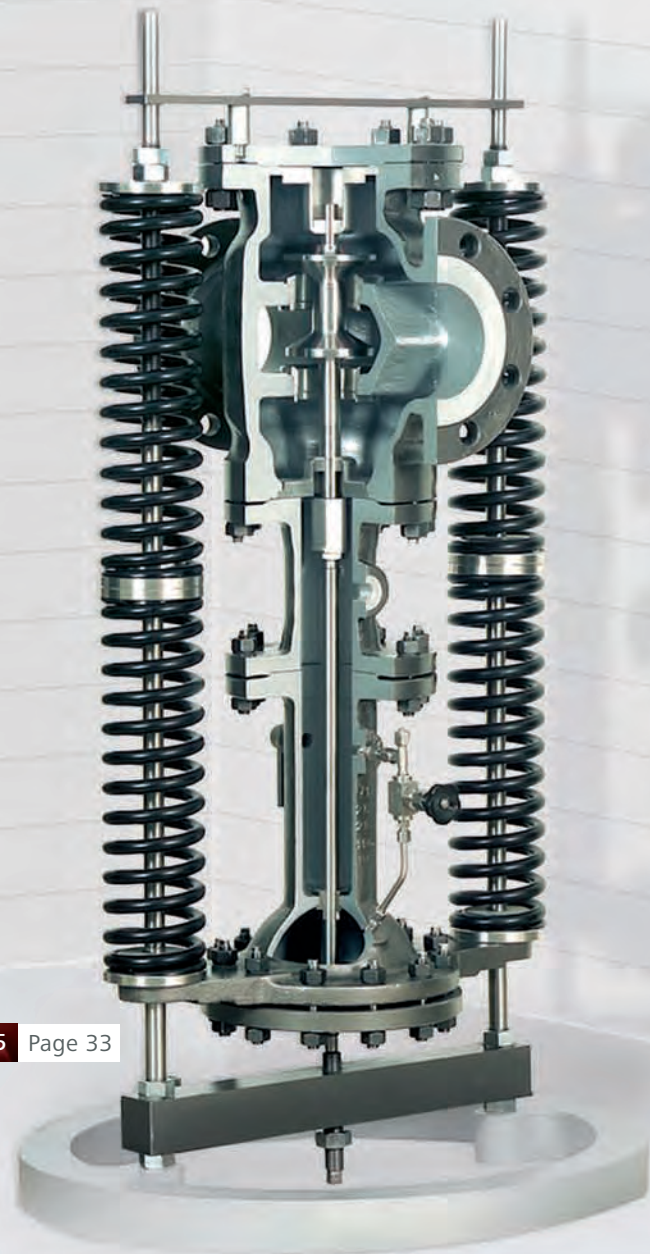
2 Page 34



3 Page 38



4 Page 36



5 Page 33



8 Page 34



6 Page 36



7 Page 46



9 Page 32



10 Page 46

1.400 mm  
1.300 mm  
1.200 mm  
1.100 mm  
1.000 mm  
900 mm  
800 mm  
700 mm  
600 mm  
500 mm  
400 mm  
300 mm  
200 mm  
100 mm

## High Grade – A World Full of Advantages

Products from our comprehensive range of deep-drawn stainless steel regulating valves carry the Mankenberg High Grade label. A flexible and worldwide unique modular system of deep-drawn stainless steel components forms the basis of this range of products. The diversity of combination possibilities creates our variety of standard products as well as special solutions. The modular system is simple:

A mass production method combined with individual connections provides the greatest possible flexibility and a delivery time of not more than three days for standard valves. In addition, special solutions can be offered at an optimal price / performance ratio.



Mankenberg's  
High Grade label

## On the Safe Side

The proven properties of our High Grade valves enhance the operational availability of the plant and reduce the costs to the operators on a long-term basis. All this thanks to the smooth surface, ease of assembly and long lifespan as well as corrosion resistance of the high-quality stainless steel used. If an overpressure situation occurs, the Mankenberg clamp system of our deep-drawn stainless steel valves raises the operational safety by yielding slightly. Unlike with cast valves, possible bursting is excluded.

CrNiMo-steel (316L), deep-drawn, corrosion-resistant, lightweight and compact

long lifespan, manageable installation, requiring minimum space, low delta-ferrite content possible

inlet pressure up to 250 bar

Mankenberg clamp system  
easy-to-maintain

adjusting screw as a function of display, non-varying installation height  
function externally visible

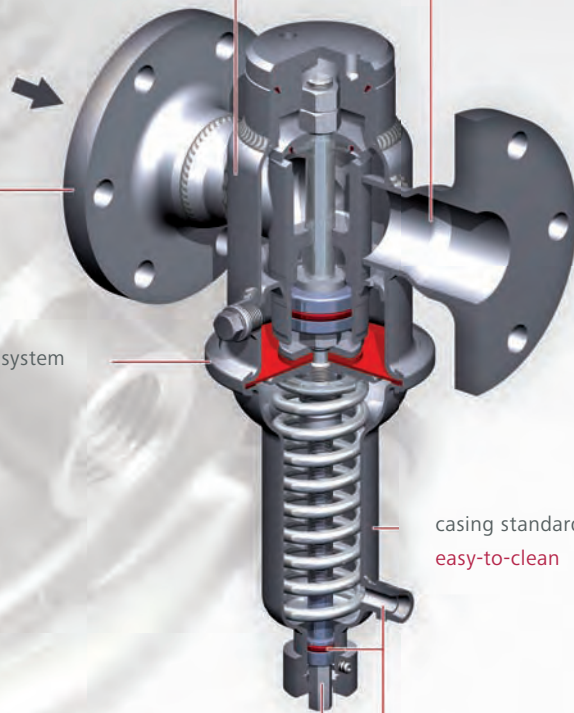
a wide variety of connection types: DIN-, ANSI-, JIS- or aseptic flanges, weld-on ends and many others ...

no adapters or fitting pieces required

casing standard surface < Ra 1.6 µm  
easy-to-clean

leak socket and sealed setting screw (option)

can be used for combustible and dangerous media in compliance with UVV rules





## Modular Design is Our Main Principle

The basic components for our High Grade valves are the pots that we manufacture from deep-drawn stainless steel. The special feature of deep-drawing at Mankenberg is that a mass production procedure is used even for special designs with very small order quantities. The first step is always the manufacture (or the selection) of the suitable tool for the deep-drawing process.

The required form of the pot is shaped from high-quality stainless steel sheets through a multi-step manufacturing process. The multiple use of one pot type will

yield a wide range of combinations. The same component can be used for various final products. Similar final products can be employed for a wide variety of applications by replacing single components such as the cone, diaphragm or spring cap and using welded-on standard parts and precision castings.

This is exactly what the High Grade modular design provides: a combination of flexibility, quality and performance.



On the inside pages:  
One Pot and Many Applications

## One Pot and Many Applications

One simple pot is the best example to demonstrate our High Grade modular system. It is the basic body for a float valve NV 66 as well as for a pressure reducing valve DM 664, a strainer SF 6 and also for a bleeding and venting valve EB 1.74 or EB 1.12 or EB 3.52.

One and the same component can be used for various final products. It is the multiple use of a deep-drawn pot for various valves that allows applying a cost-effective mass production technique such as deep-drawing. At the same time the modular system provides a large number of possible combinations and flexibility for customer-specific solutions as well as fast delivery times.



Level Regulating Valve	NV 66E	1
Combined Bleeding Valve	EB 1.84	2
Pressure Regulator Valve	UV 1.850	3
Level Regulating Valve	NV 67E	4
Continuous Bleeding Valve	EB 1.12	5
Startup Bleeding Valve	EB 3.52	6
Combined Bleeding Valve	EB 1.74	7
Pot Strainer Made of Stainless Steel	SF 6	8
Pressure Regulating Valve	UV 4.8	9



## Keeping Pace

This also means maintaining the overview. One and the same valve type, the same body part and a vast number of different connection types, such as sockets, flanges or clamps. They result in a large number of similar valves that are so different at the same time. One standard valve provides a tailor-made solution for the customer.





## High Grade Pure

The High Grade Pure product range has been specifically developed for use in hygiene applications. Except for the mentioned advantages compared to High Grade valves, the High Grade Pure valves distinguish themselves in their once-again improved surface quality and their special construction form. The polished valves have been especially designed for use in hygiene applications, for example in the pharmaceutical industry, foodstuffs industry or for semiconductor production. The construction form, i.e. in particular the minimised dead pockets, as well as the low surface roughness, ensure that safety and purity requirements for the processes are fulfilled. Simultaneously, less energy is needed for CIP/SIP cleaning procedures thanks to comparatively thin wall thicknesses. Thus costs and downtime are reduced.



Mankenberg's  
High Grade Pure label

adjusting screw as a function of display

non-varying installation height, function externally visible

leak socket and sealed setting screw (option)

can be used for combustible and dangerous media in compliance with UVV rules

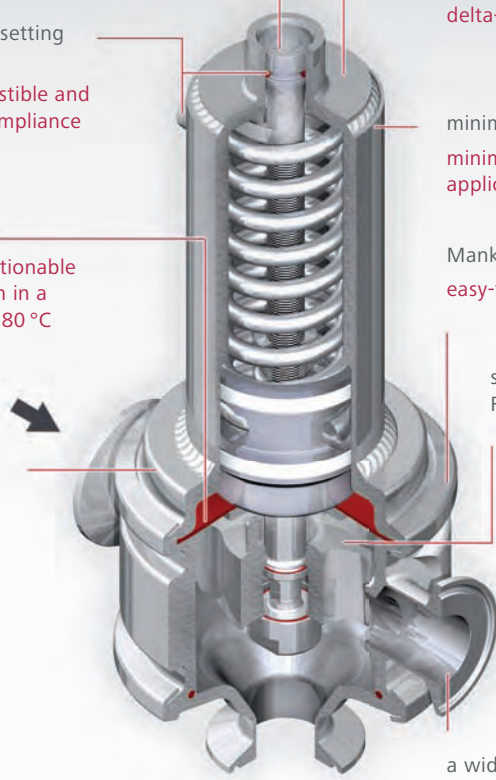
protective PTFE foil

physiologically unobjectionable when exposed to steam in a temperature range of 180 °C

as angle valve virtually pocket-free

also suitable for highly viscous media

Illustration: three-connection version



CrNiMo-steel (316L), deep-drawn, corrosion-resistant, lightweight and compact

long lifespan, manageable installation, requiring minimum space, low delta-ferrite content possible

minimum weight  
minimal heat losses for CIP/SIP applications

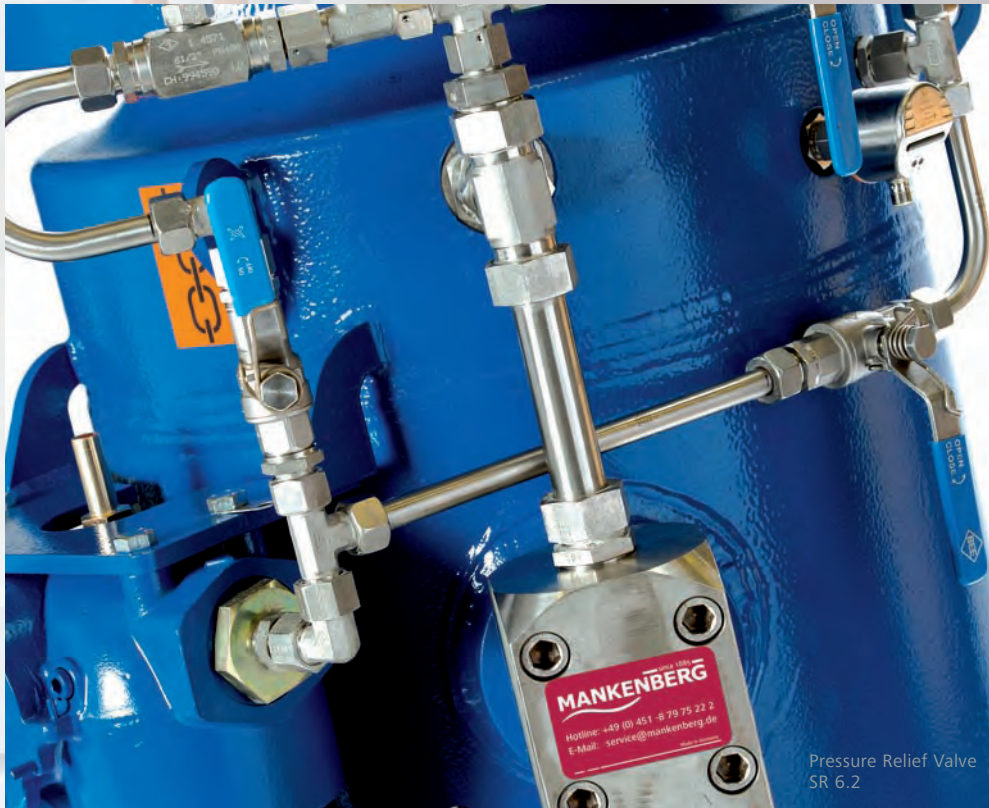
Mankenberg clamp system  
easy-to-maintain

surface finish (internal) up to  $Ra = 0.25 \mu m$

a wide variety of connection types: clamp connections, milk pipe unions, DIN-, ANSI-, JIS- or aseptic flanges, weld-on ends and many others ...

no adapters or fitting pieces required





## Welded Construction – A Flexible Solution for Large Nominal Diameters

Welded constructions are a flexible solution for valves with large nominal diameters. In addition, a combination of various materials and production techniques is possible. In so doing, steel elements can be reasonably completed with parts made of stainless steel and solid material. This process is very cost-effective for limited-lot or single-item productions and simultaneously offers a lot of flexibility with regard to your requirements.

## Customised Solutions

Customer-specific solutions are individually designed valves for your special requirements. Mankenberg checks with every enquiry the individual technical operating data and subsequently quotes the technical solution. If the operating data require valves which cannot be

realised with Mankenberg standard valve type series, our engineers will be happy to develop special solutions for you. This may lead to either slightly modified valve type series or to a complex system.

1. Individual design specifically adapted to special needs

2. From standard valves made of cast steel, steel and stainless steel through to special materials such as Hastelloy®, titanium, Duplex steel

3. Various possibilities for approvals, e.g. in accordance with NACE, NORSOK etc

4. A wide variety of connection types: DIN-, ANSI-, JIS- or aseptic flanges, weld-on ends and many others ...

Your Customised Industrial Valve

5. From single-item production through to serial production



## Valves Made Out of Solid Material – For Very Specific Requirements

In many cases valves that are turned, milled or drilled from solid material are used for special requirements. A particular advantage is that in addition to the individual design, a variety of possible special materials may be chosen. Valves made of Hastelloy®, titanium or of seawater-resistant material, approved by NACE or NORSOK, form part of our standard. Individual connections, as an example JIS (Japanese Industrial Standard), ANSI or DIN, complete the range of possible individual solutions.

## Quality, Approvals & Certificates



Quality Assurance  
Team

Marcus Köster,  
Control

Daniel Tesmer,  
Control

Thorsten Vollstedt,  
Head of Quality Dept.

Falk Jaquart,  
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Christiane Broszinsky,  
Quality Dept.

Oliver Studier,  
Test Bench

Jasmina Gruhl,  
Quality Dept.

Michael Bandholz,  
Test Bench

Holmer Bastian,  
Test Bench



## Quality has Many Faces

Industrial valves play a key role in plants and pipelines, and for this reason they can be of significant influence to the customer's process: regulating accuracy, reliability and safety are of top priority. This is why quality assurance is a central topic at Mankenberg during each production step. As a staff office it reports directly to the managing director. Any item leaving our production hall has to go through the expert hands of our quality department.



## Acceptance & Material Certificates

- » EN 10204/2.1
- » EN 10204/2.2
- » EN 10204/3.1
- » EN 10204/3.2

## Acceptance

- » TÜV
- » Det Norske Veritas (DNV)
- » Germanischer Lloyd
- » Registro Italiano Navale
- » Lloyd's Register of Shipping
- » American Bureau of Shipping (ABS)
- » Bureau Veritas (BV)

## Supply on Request

- » Norsok (Norsk Søkkel Konkuranseposisjon)
- » ASME (American Society of Mechanical Engineers)
- » NACE (National Association of Corrosion Engineers)
- » API (American Petroleum Institute)
- » ANSI (American National Standards Institute)
- » JIS (Japanese Industrial Standard)
- » FDA (Food and Drug Administration)
- » USP Class VI (United States Pharmacopeia)

## Approvals & Certificates

- » ISO 9001 since 1994
- » AD-2000 Leaflet HPO
- » Areva Standard IAEA 50-C-Q
- » Pressure Equipment Directive 97/23/EG
- » VGB Certificates as per KTA 1401
- » Ghost-R and Rostechnadzor
- » Environmental Management System EN 14001
- » Penetration Testing Level 2 (PT) as per DIN 473
- » Occupational Health and Safety Management BS OHSAS 18001

## Certified Welding Processes

- » AD2000-HP5/2
- » DIN EN ISO 15614-5
- » DIN EN ISO 15614-1
- » Others on request

## Qualified Welders

- » AD2000-HP3
- » DIN EN ISO 3834-2
- » DIN EN 1418
- » EN 9606-5
- » EN 287-1
- » ASME

## Index of Product Groups

Pressure Reducing Valves ... 32 | Backpressure Regulators ... 38 | Burst Pipe Isolating Valves ... 42 |  
Flow Control and Differential Pressure Valves ... 43 | Vacuum Breakers and Vacuum Control Valves ... 43 |  
Safety Valves ... 44 | Pilot-operated Control Valves ... 45 | Pressure Relief Valves ... 47

Continuous Bleeding and Venting Valves ... 49 | Startup Bleeding and Venting Valves ... 51 |  
Combined Bleeding and Venting Valves ... 52

Float-controlled Steam Traps ... 54

Float Valves for Installation in Tanks ... 56 | Float Valves for External Installation on Tanks ... 57 |  
Float Valves for Pipelines ... 57

Strainers and Filters ... 58 | Liquid Separators ... 60 | Sight Glasses / Flow Indicators ... 60

Condensate Pumps ... 62

Accessories ... 63 | Spare Parts ... 63

Customer-specific Special Solutions ... 26

**Druckregelventile**  
Pressure Control Valves



32

**Be- und Entlüftungsventile**  
Bleeding and Venting Valves



49

**Kondensatableiter**  
Steam Traps



54

**Schwimmerventile**  
Float Valves



56

**Rohrleitungsarmaturen**  
Pipeline Ancillaries



58

**Pumpen**  
Pumps



62

**Zubehör und Ersatzteile**  
Accessories and Spare Parts



63

**Sonderlösungen**  
Customised Solutions



26

## Pressure Control Valves



Pressure control valves comprise all spring-actuated valves which safely realise the required specific procedural parameters such as inlet or outlet pressure or differential pressure, flow rates or other setpoints.

Mankenberg pressure control valves are available with a wide spectrum of nominal pressure and setting ranges and are resistant to various media and temperatures. Mankenberg pressure control valves feature highest quality and regulation performance. Their independence from auxiliary energy combined with individual design and production of the valves is the basis for maximum operation safety.

## Pressure Reducing Valves

### Your Benefits

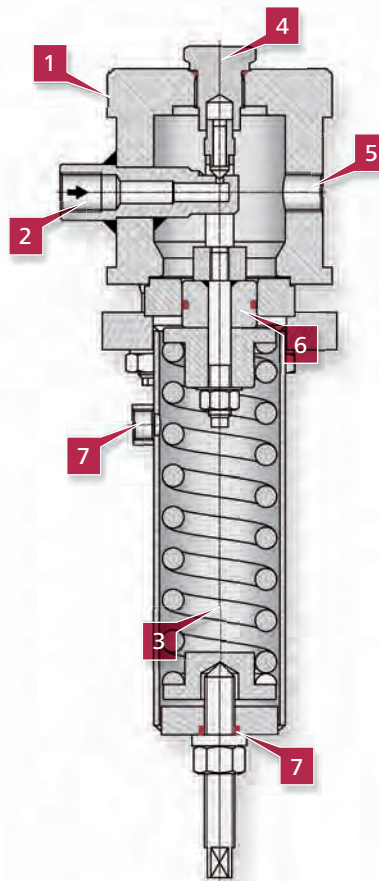
DM 510



body made of C-steel, CrNiMo-steel (316L), also available in special materials

long operational lifespan, minimum space required

inlet pressure up to 315 bar



manometer connection (option)

various connection alternatives: DIN-, ANSI- or JIS- flanges, welded ends ...

no adapters or fitting pieces required

diaphragm-, piston- or bellows-controlled

applicable up to 400 °C

many control modules available  
 most accurate regulation, also in millibar ranges

leakage line connection and sealed adjusting screw (option)

suitable for inflammable and dangerous media in compliance with UVV rules

### Valve for Hygiene Applications / Ultrapure Media

DM 152

single-seat, angled design suitable for small and medium flow rates | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish possible up to Ra < 0.25 µm | virtually pocket-free, is corrosion-resistant, lightweight and compact | elastomers as per FDA and USP Class VI, hygienic class HE5 | reduced preheating time for CIP/SIP procedures, less energy needed | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | Tri-Clamp® connections or DIN/ISO clamp connections | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 50	PN	2.5 - 10
		T	130 °C / 180 °C
p <sub>2</sub>	0.3 - 5 bar	K <sub>vs</sub>	2 - 7 m <sup>3</sup> /h



## Pressure Reducing Valves

### Valve for Large Flow Rates

DM 212

single-seat straight-way valve with balanced cone | usable for liquids and gases | body made of GS-C 25, CrNiMo-steel | seat-controlled, controlled by diaphragm, piston or bellow | spring cap available with leakage line connection and adjusting screw seal

DN	32 - 150	PN	16 - 100
		T	200 °C
p <sub>2</sub>	4 - 35 bar	K <sub>VS</sub>	8 - 160 m <sup>3</sup> /h



fig. similar

### Valve for Large Flow Rates for Hygiene Applications

DM 212P

single-seat straight-way valve with balanced cone | usable for liquids and gases | body made of C-steel, CrNiMo-steel, special material such as Duplex, Superduplex, Hastelloy® or titanium | seat-controlled, controlled by diaphragm or piston | spring cap available with leakage line connection and adjusting screw seal

DN	25 - 100	PN	16 - 40
		T	130 °C
p <sub>2</sub>	1 - 16 bar	K <sub>VS</sub>	6 - 50 m <sup>3</sup> /h



### Weight-loaded Pressure Reducing Valve

DM 3, 4

balanced straight-way valve for medium and very high flow rates | usable for liquids, gases and steam | body made of GG-20 or GS-C 25 | high precision thanks to integral control behaviour | response time can be adjusted by damping

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



### Valve for High Pressures and High Temperature

DM 401

double-seat straight-way valve for high pressure and high temperature, high flow rates | usable for steam | body made of GS-C 25, GS 17 CrMo 55 | usable as soot blower with damping | especially sturdy, offers long maintenance intervals, a long operational lifespan

DN	25 - 250	PN	16 - 250
		T	500 °C
p <sub>2</sub>	1.5 - 32 bar	K <sub>VS</sub>	6 - 360 m <sup>3</sup> /h



### Valve for Hygiene Applications / Ultrapure Media

DM 462

double-seat angled valve for large flow rate | usable for liquids, gases, steam | completely made of deep-drawn CrNiMo steel (316L), surface finish possible up to Ra < 0.25 µm | virtually pocket-free, corrosion-resistant, lightweight and compact | elastomers as per FDA and USP Class VI, hygienic class HE4 | reduced preheating time for CIP/SIP procedures, less energy needed | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | Tri-Clamp® connections or DIN/ISO clamp connections, any other available on request | spring cap available with leakage line connection and adjusting screw seal

DN	25 - 100	PN	2.5 - 10
		T	130 °C / 180 °C
p <sub>2</sub>	0.3 - 5 bar	K <sub>VS</sub>	4 - 80 m <sup>3</sup> /h



## Pressure Reducing Valves

### Valve for Hygiene Applications / Ultrapure Media

DM 462V

double-seat straight-way or angled valve for medium flow rate | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L), surface finish possible up to  $Ra < 0.25 \mu m$  | virtually pocket-free, corrosion-resistant, lightweight and compact | elastomers as per FDA and USP Class VI, hygienic class HE5 | reduced preheating time for CIP/SIP procedures, less energy needed | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | Tri-Clamp® connections or DIN/ISO clamp connections, PTFE protective foil for diaphragms | can be actuated pneumatically | spring cap available with leakage line connection and adjusting screw seal

DN	25	PN	2.5 - 16
		T	180 °C
$p_2$	0.8 - 5 bar	$K_{VS}$	4 m <sup>3</sup> /h



### Standard Valve

DM 502

single-seat straight-way valve for medium flow rate | usable for liquids and gases, in particular CO<sub>2</sub> | body made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$ , inner parts of brass | corrosion-resistant, very lightweight and compact | adjusting screw as a function of display, easy-to-maintain owing to the clamp system, many control ranges available | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

		PN	40 - 100
G	1/2 - 2	T	130 °C / 180 °C
$p_2$	0.02 - 16 bar	$K_{VS}$	0.6 - 4.2 m <sup>3</sup> /h



### Valve for Small Flow Rates

DM 505

single-seat straight-way valve, inlet pressure up to 250 bar, also controls millibar ranges | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, various designs and connection types | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 25	PN	40 - 250
G / NPT	1/2	T	130 °C / 180 °C
$p_2$	0.005 - 20 bar	$K_{VS}$	0.2 - 1.4 m <sup>3</sup> /h



### Valve for Small Flow Rates

DM 505Z

single-seat straight-way valve | inlet pressure up to 250 bar, also controls millibar ranges | usable for steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, various designs and connection types | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 25	PN	40 - 250
G / NPT	1/2	T	200 °C / 250 °C
$p_2$	0.005 - 12 bar	$K_{VS}$	0.2 - 1.4 m <sup>3</sup> /h



### Valve for High Pressures for Control Ranges up to 160 bar DM 510 - 518

single-seat straight-way valve for small to medium flow rates | highest pressures, up to 315 bar inlet pressure, high temperatures, also controls millibar ranges | usable for liquids, gases and steam | body made of C-steel, CrNiMo-steel, special materials such as Duplex, Superduplex, Hastelloy® or titanium available | NACE-compatible | spring cap available with leakage line connection and adjusting screw seal | hard-faced valve cone and seat available for high pressure drops

DN	15 - 50	PN	16 - 315
G / NPT	3/8 - 2	T	130 °C / 180 °C / 400 °C
$p_2$	0.005 - 160 bar	$K_{VS}$	0.2 - 5.5 m <sup>3</sup> /h



## Your Benefits



### Adjusting Screw as a Function of Display

#### Function Control after Installation

With the adjusting screw being flush with the cone spindle, the stroke of the valve is visible on the adjusting screw. Thus the function of the installed valve can be controlled under operational conditions.

#### Compact Design

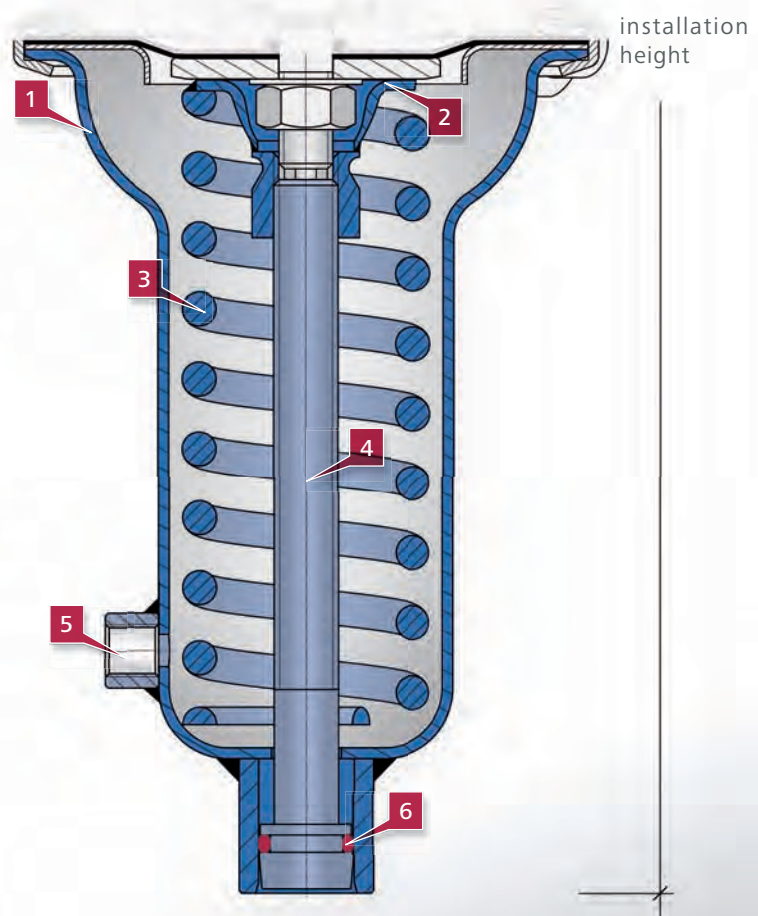
The valve installation height remains constant after the pressure range has been set or changed. Thus the valve can be easily incorporated into the pipe system.

#### Safety during Maintenance

Using a spring pack that rests at the spring cap will prevent tension when the spring cap is separated from the valve body. During disassembly the valve parts will not become dislodged in an uncontrolled way, even if the spring has not been released by mistake. Thus the valve ensures a particularly safe disassembly.

#### Additional Safety

Thanks to the O-ring seal of the adjusting screw and the connection of a so-called leakage line the valve is always hermetically sealed also in case of damage to the control element (diaphragm, piston or bellows). Thus the German rules for prevention of accidents (UVV) and the rules of the trade association BG for the handling of hazardous media are complied with. In addition, the connection of a manometer enables an easy function control.



Spring pack	
Spring cap	1
Spring plate	2
Spring	3
Adjusting screw	4
Leakage line connection	5
Adjusting screw seal	6

## Pressure Reducing Valves

### Standard Cast Valve

DM 603, 604

single-seat straight-way valve for high flow rates with balanced cone | highest temperatures up to 350 °C, DM 604 up to 250 °C | usable for steam | body made of GGG-40, GS-C25, CrNiMo-steel | steel/stainless steel, stainless-steel-diaphragm body, very precise thanks to a large number of different control ranges

DN	15 - 150	PN	16 - 40
		T	up to 350 °C
p <sub>2</sub>	0.02 - 10 bar	K <sub>VS</sub>	4 - 160 m <sup>3</sup> /h



fig. similar

### Standard Cast Valve

DM 613

single-seat straight-way valve for high flow rates with balanced cone | for temperatures up to 130 °C | usable for liquids and gases | body made of GGG-40, GS-C25, CrNiMo-steel | steel/stainless steel, stainless-steel-diaphragm body, very precise thanks to a large number of different control ranges

DN	15 - 150	PN	16 - 40
		T	130 °C
p <sub>2</sub>	0.02 - 10 bar	K <sub>VS</sub>	4 - 160 m <sup>3</sup> /h



### Valve for High Pressures for Control Ranges up to 160 bar DM 620 - 628

single-seat straight-way valve for medium and high flow rates with balanced cone | highest pressures, up to 315 bar inlet pressure | usable for liquids and gases | body made of C-steel, CrNiMo-steel, special materials such as Duplex, Superduplex, Hastelloy® or titanium are available | NACE-compatible | spring cap available with leakage line connection and adjusting screw seal | hard-faced valve cone and seat available for high pressure drops | allows for the solution of most difficult procedural requirements with only one device

DN	15 - 50	PN	16 - 315
G	1/2 - 2	T	200 °C
p <sub>2</sub>	2 - 160 bar	K <sub>VS</sub>	0.4 - 10 m <sup>3</sup> /h



### Epoxy-coated Cast Valve for Medium Flow Rates

DM 644

piston-controlled, single-seat straight-way valve with balanced cone | usable for water, especially suitable for potable water | body made of GGG-50 with KTW-compliant epoxy coating | closed spring cap

DN	50 - 150	PN	16 - 40
		T	70 °C
p <sub>2</sub>	1.5 - 12 bar	K <sub>VS</sub>	17 - 155 m <sup>3</sup> /h



### Universal Valve

DM 652

single-seat straight-way valve with balanced cone for high flow rates | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 μm | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very light-weight and compact | highest regulating accuracy thanks to a multitude of control ranges | various variants of convincing quality for your individual application | various connections and special versions available | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 50	PN	16 - 40
G	1/2 - 2	T	130 °C / 190 °C / 220 °C
p <sub>2</sub>	0.02 - 12 bar	K <sub>VS</sub>	5 - 22 m <sup>3</sup> /h





## Pressure Reducing Valves

### Pressure Reducing Valve in Action

DM 652



#### The Allrounder

How does carbon dioxide (CO<sub>2</sub>) get into the drink? Since CO<sub>2</sub> is not normally dissolved in drinks, it has to be brought in under pressure. In a pressure cylinder battery the process gas is generated from liquefied CO<sub>2</sub> process gas and is then fed to the drink production process. Different identical valves work in parallel downstream of several evaporators so that a continuous process is ensured in case one production line fails. The pressure reducing valves reduce the process pressure from 15–17 bar to 11–12 bar. Since particular hygiene requirements have to be observed in the foodstuffs sector, the stainless steel valve DM 652 is used in this case. This deep-drawn valve is highly corrosion-resistant and features a high surface finish. The compact design and the clamp system facilitate installation and maintenance.



#### Universal Valve for Medium Flow Rate

DM 662

single-seat straight-way valve with balanced cone | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | highest regulating accuracy thanks to a multitude of control ranges | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 25	PN	100
G	1/2 - 1	T	130 °C / 180 °C
p <sub>2</sub>	0.02 - 12 bar	K <sub>Vs</sub>	3.2 - 3.6 m <sup>3</sup> /h



#### Valve for Large Flow Rates

DM 664

single-seat straight-way valve with balanced cone | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, lightweight compared to its size, compact design | especially well-suited for use with deionised water

DN	50 - 100	PN	16
		T	130 °C / 150 °C
p <sub>2</sub>	0.02 - 8 bar	K <sub>Vs</sub>	32 - 100 m <sup>3</sup> /h



S

## Pressure Reducing Valves

### Valve for High Pressures and High Temperatures

DM 701

double-seat straight-way valve for high pressures and temperatures, small flow rates | usable for steam | body made of GS-C 25, C 22 N, 10 CrMo 9-10 | especially sturdy with long service intervals, long operational lifespan | optionally: integrated extension on the outlet side

DN	15 - 50	PN	16 - 315
		T	500 °C
p <sub>2</sub>	0.5 - 40 bar	K <sub>Vs</sub>	0.2 - 5.5 m <sup>3</sup> /h



### Millibar Control Valve

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>2</sub>	0.002 - 0.52 bar	K <sub>Vs</sub>	0.2 - 3.6 m <sup>3</sup> /h



## Backpressure Regulators

### Your Benefits

UV 3.8F



CrNiMo-steel (316L), deep-drawn, corrosion-resistant, lightweight and compact

long lifespan, manageable installation, requiring minimum space, low delta-ferrite content possible

1

leakage line connection and sealed adjusting screw (option)

suitable for inflammable and dangerous media in compliance with UVV rules

2

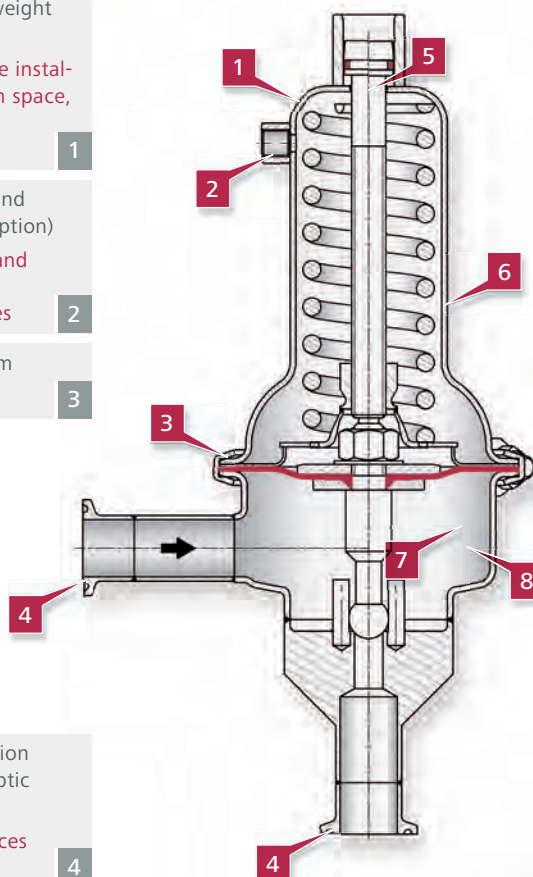
Mankenberg clamp system easy-to-maintain

3

a wide variety of connection types: DIN-, ANSI- or aseptic flanges, weld-on ends ...

no adapters or fitting pieces required

4



adjusting screw as a function of display (option)

non-varying installation height, function externally visible

5

minimum weight

minimal heat losses for CIP/SIP applications

6

Surface finish (internal) up to Ra 0.25 µm

easy-to-clean

7

as angle valve virtually pocket-free

also suitable for highly viscous media

8

## Backpressure Regulators

### Valve for Large Flow Rates

UV 1.2

single-seat straight-way valve with balanced cone for temperatures up to 300 °C | usable for liquids and gases | body made of GG-25, GGG-40, GS-C 25 or CrNiMo-steel | diaphragm-, piston- or bellows-controlled | suitable for higher pressures

DN	25 - 200	PN	16 - 40
		T	130 °C / 300 °C
p <sub>2</sub>	2 - 40 bar	K <sub>VS</sub>	6 - 125 m <sup>3</sup> /h



fig. similar

### Weight-loaded Backpressure Regulator

UV 1.6, 2.6

balanced straight-way valve for medium up to very large flow rates | usable for liquids, gases and steam | body made of GG-20 or GS-C 25 | high precision thanks to integral control behaviour | response time can be adjusted by damping

DN	50 - 400	PN	16 - 40
		T	280 °C
p <sub>1</sub>	0.5 - 10 bar	K <sub>VS</sub>	21 - 1,200 m <sup>3</sup> /h



### Valve for Medium and Large Flow Rates

UV 1.8

seat-controlled, single-seat angle valve with balanced cone for temperatures up to 300 °C | usable for liquids and gases, also suitable for viscous media | body made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | virtually pocket-free, corrosion-resistant, lightweight and compact | diaphragm-, piston- or bellows-relieved | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	25 - 100	PN	16
G	1 - 2	T	130 °C / 300 °C
p <sub>1</sub>	2 - 16 bar	K <sub>VS</sub>	6 - 50 m <sup>3</sup> /h



fig. similar

### Pump Protection Valve

UV 1.9

seat-controlled, single-seat angle valve with balanced cone for medium flow rates | usable for all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | corrosion-resistant, frost-proof, free-draining | long operational lifespan, manageable installation, easy-to-maintain owing to the clamp system – highest effectiveness with compact design

DN	50	PN	40 / 16
G	2	T	130 °C / 180 °C
p <sub>1</sub>	2 - 16 bar	K <sub>VS</sub>	12 m <sup>3</sup> /h



### Millibar Control Valve

UV 3.0

single-seat straight-way valve for medium flow rates | 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 / 1
G	1/2 - 2	T	130 °C
p <sub>1</sub>	0.002 - 0.52 bar	K <sub>VS</sub>	0.2 - 3.6 m <sup>3</sup> /h



## Backpressure Regulators

### Backpressure Regulator in Action

UV 2.6



## 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 Rotterdam, for instance. Due to the high viscosity of the oil at the heavy crude oil loading facilities (up to 650 cSt at a temperature of 85°C), two eccentric spiral pumps are in use. They have to be protected against excessive pressure, caused by fluctuations in system operations, by means of self-energised backpressure regulators. Mankenberg's 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 m<sup>3</sup>/h and temperatures up to 200°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.



### Backpressure Regulator for Small and Medium Flow Rates UV 3.2

single-seat straight-way valve for temperatures up to 300°C | usable for liquids and gases | body made of GG-25, GGG-40, GS-C 25 or CrNiMo-steel | diaphragm-, piston- or bellows-controlled

DN	15 - 50	PN	16 - 40
		T	300 °C
p <sub>1</sub>	2 - 40 bar	K <sub>Vs</sub>	0.2 - 5.5 m <sup>3</sup> /h



### Compact Valve for Small Flow Rates UV 3.5

single-seat straight-way valve, also controls millibar ranges | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, various designs and connection types | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 25	PN	25
G	1/2	T	130 °C / 180 °C
p <sub>1</sub>	0.005 - 20 bar	K <sub>Vs</sub>	0.2 - 1.4 m <sup>3</sup> /h



## Backpressure Regulators

### Valve for Small Flow Rates and High Temperatures

UV 3.5Z

single-seat straight-way valve, also controls millibar ranges | usable for steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, various designs and connection types | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 25	PN	25
G	1/2	T	200 °C / 250 °C
p <sub>1</sub>	0.005 - 12 bar	K <sub>VS</sub>	0.2 - 1.4 m <sup>3</sup> /h



### Valve for Hygiene Applications / Ultrapure Media

UV 3.8M

single-seat, angled design, straight-way valve for medium flow rates | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish possible up to  $Ra < 0.25 \mu m$  | virtually pocket-free, corrosion-resistant, lightweight and compact | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | elastomers as per FDA and USP Class VI, hygienic class HE5 | reduced preheating time for CIP/SIP procedures, less energy needed | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 50	PN	10 - 16
G	1/2 - 2	T	130 °C / 180 °C
p <sub>1</sub>	2 - 16 bar	K <sub>VS</sub>	3.5 - 5.5 m <sup>3</sup> /h



fig. similar

### Valve for Viscous Media

UV 3.8K

single-seat angle valve for medium flow rates | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | corrosion-resistant, lightweight and compact | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 50	PN	10 - 16
G	1/2 - 2	T	130 °C / 180 °C
p <sub>1</sub>	2 - 16 bar	K <sub>VS</sub>	3.5 - 5.5 m <sup>3</sup> /h



### Standard Cast Valve

UV 4.1

single-seat straight-way valve with balanced cone for high flow rates | usable for liquids, gases and steam | body made of GG-25, GGG-40, GS-C 25 or CrNiMo-steel | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 150	PN	16 - 40
		T	130 °C / 200 °C
p <sub>1</sub>	0.02 - 10 bar	K <sub>VS</sub>	4 - 160 m <sup>3</sup> /h



### Epoxy-coated Cast Valve for Medium Flow Rates

UV 4.4

piston-controlled, single-seat straight-way valve with balanced cone | usable for water, especially suitable for potable water | body made of GGG-50 with KTW-compliant epoxy coating | closed spring cap

DN	50 - 150	PN	16 - 40
		T	70 °C
p <sub>1</sub>	1.5 - 12 bar	K <sub>VS</sub>	17 - 155 m <sup>3</sup> /h



## Backpressure Regulators

### Valve for Aggressive Media and Large Flow Rates UV 4.7, 4.8

single-seat straight-way valve with balanced cone | UV 4.7 with open spring cap, UV 4.8 with closed spring cap | usable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | easy-to-maintain owing to the clamp system | corrosion-resistant, lightweight compared to its size, compact design | suitable for challenging environmental conditions and aggressive media

DN	50 - 100	PN	16
		T	130 °C / 150 °C
$p_1$	0.02 - 10 bar	$K_{VS}$	32 - 100 m <sup>3</sup> /h



### Universal Valve UV 5.1

single-seat straight-way valve with balanced cone for high flow rates | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | corrosion-resistant, very lightweight and compact | adjusting screw as a function of display, easy-to-maintain owing to the clamp system | highest regulating accuracy thanks to a multitude of control ranges | various variants of convincing quality for your individual application | various connections and special versions available | can be actuated pneumatically, spring cap available with leakage line connection and adjusting screw seal

DN	15 - 50	PN	16
G	1/2 - 2	T	130 °C / 180 °C
$p_1$	0.02 - 12 bar	$K_{VS}$	3.5 - 22 m <sup>3</sup> /h



### Valve for High Pressures for Control Ranges up to 100 bar UV 8.2

single-seat straight-way or angle valve for small and medium flow rates | highest pressures, high temperatures | usable for liquids, gases and steam | body made of C-steel, CrNiMo-steel, special material such as Duplex, Superduplex, Hastelloy® or titanium | NACE-compatible | spring cap available with leakage line connection and adjusting screw seal | hard-faced valve cone and seat available for high pressure drops | unique worldwide: valve for high pressures combined with medium flow rates

DN	15 - 50	PN	250
G	3/8 - 2	T	130 °C / 400 °C
$p_1$	2 - 100 bar	$K_{VS}$	0.2 - 5.5 m <sup>3</sup> /h



fig. similar

## Burst Pipe Isolating Valves

### Burst Pipe Isolating Valve for Hazardous Media RS 659

Shuts off pipelines in case of a leakage, automatic locking triggered after differential pressure evaluation, RS 219 available for high pressures and high volume flows | usable for liquids, gases and steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | universal, saves costs

DN	15 - 50	PN	16 - 40
G	1/2 - 2	T	130 °C
$K_{VS}$	4 - 18 m <sup>3</sup> /h	$K_{VS}$	65 m <sup>3</sup> /h (RS 219)



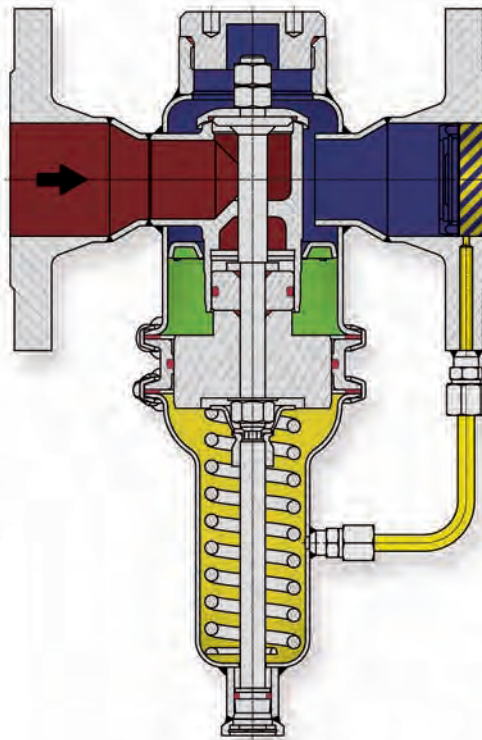
## Flow Control and Differential Pressure Valves

### Your Benefits

DV 652F



In principle, any balanced pressure regulating valve may serve as differential pressure, vacuum or flow control valve. The special advantages of these valves are obvious: to a large extent, they can be adapted to any procedural requirement and process. Flow control and differential pressure valves are suitable for all media, all pressures and any required volume flow. In addition, the valves are self-energised. They require no external energy sources and are thus particularly safe in function.



- » Can be specifically adapted to all special needs
- » Can be used for all media
- » Suitable for any kind of pressure (normal compressor pressure, millibar and high pressure ranges)
- » Any requested flow rate can be designed

inlet pressure $p_1$	
outlet pressure $p_2$	
control pressure $p_{st+}$	
control pressure $p_{st-}$	

### Valves Fabricated to Meet Your Needs

DV 652

Please let us have your operating data (medium, volume flow, pressure range, temperature, requested function and any further requirements) and a description of the application.

DN	according to your specification	PN	according to your specification
G	according to your specification	T	according to your specification
$p_2$	according to your specification	$K_{vs}$	according to your specification



fig. similar

## Vacuum Breakers and Vacuum Control Valves

### Vacuum Breaker with Setting Scale

VV 34, 35

with spring cap (CrNiMo-steel (316L)) and setting scale, VV 35 screw-in version | suitable for liquids and gases | body made of CrNiMo-steel (316L), 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
$p_2$	0.05 - 0.95 bar	$K_{vs}$	1.2 - 388 m <sup>3</sup> /h



## Vacuum Breakers and Vacuum Control Valves

### Vacuum Control Valve

VV 652

please let us have your operating data (medium, volume flow, pressure range, temperature, requested function and any further requirements) and a description of the application | suitable for liquids and gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation – highest effectiveness with High Grade design

DN	according to your specification	PN	according to your specification
G	according to your specification	T	according to your specification
$p_2$	according to your specification	$K_{Vs}$	according to your specification



fig. similar

## Safety Valves

### Normal and Proportional Valve

SV 4

spring-loaded, SV 4 with closed spring cap, SV 40 with open spring cap for steam | body made of GG-25, GS-C 25, CrNiMo-steel

DN	15 - 150	PN	16 - 40
$p_1$	0.5 - 40 bar	T	200 °C / 400 °C



### Full Lift Safety Valve

SV 6

spring-loaded, SV 6 with closed spring cap, SV 60 with open spring cap for steam | body made of GG-25, GS-C 25, CrNiMo-steel, welded steel

DN	25/40 - 250/400	PN	16 - 40
$p_1$	0.5 - 40 bar	T	200 °C / 400 °C



### Normal or Full Lift Threaded Valve

SV 29

spring-loaded, SV 29 normal safety valve, SV 29V full lift safety valve | body made of 1.4104, 1.4404

		PN	40 - 400
G	$1/2 - 1$	T	200 °C / 300 °C





## Pilot-operated Control Valves

### Pilot-operated Pressure Reducing Valve for Water

RP 115

pilot-operated pressure reducing valve for large flow rates | especially designed for potable water | body made of GGG-40 with epoxy coating according to KTW recommendation | adjustable closing, opening and reaction speed

DN	50 - 400	PN	16
		T	70 °C
p <sub>2</sub>	1.5 - 15 bar	K <sub>vs</sub>	40 - 1,400 m <sup>3</sup> /h



### Pilot-operated Backpressure Regulator for Water

RP 116

pilot-operated backpressure regulator for large flow rates | especially designed for potable water | body made of GGG-40 with epoxy coating according to KTW recommendation | adjustable closing, opening and reaction speed

DN	50 - 400	PN	16
		T	70 °C
p <sub>1</sub>	1.5 - 15 bar	K <sub>vs</sub>	40 - 1,400 m <sup>3</sup> /h



### Pilot-operated Regulating Valve in Action RP 810



## Cleaning under High Pressure

To clean the inner walls of carbon-fired boilers so-called soot blowers are used. Sootblowing can be done by means of high pressure steam, with the plants being exposed to very high temperatures, as well as by means of water. Both procedures serve the purpose of maintaining the optimal effectiveness for the heat transfer from the boiler to the boiler feed water and to avoid sedimentation of agglomerates.

In the water-blowing systems water with an inlet pressure of 35 to 45 bar is fed to the lances that are arranged around the boiler at various heights. However, lances work at a very restricted pressure range of abt. 18.6 bar. The pilot-operated Mankenberg pressure reducing valve of the RP 810 type with a nominal width of DN 100 reduces the inlet pressure correspondingly so that the inner boiler wall is continuously cleaned and a malfunction of the entire plant is avoided. Steam sootblowing can be regulated using pressure reducing valves of the DM 401 / DM 701 type.



## Pilot-operated Control Valves

### Pilot-operated Pressure Reducing Valve

RP 810

pilot-operated pressure reducing valve made of cast steel for large flow rates at high pressure | usable for liquids and gas | body made of GGG-40, GS-C 25, CrNiMo-steel | 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 - 80 bar	K <sub>VS</sub>	20 - 900 m <sup>3</sup> /h



### Pilot-operated Pressure Reducing Valve

RP 814

pressure reducing valve of the inline design in welded construction for large flow rates | RP 815 with extended casing for maximum K<sub>VS</sub>-values, high pressure at large flow rates | body made of steel, CrNiMo-steel, welded, internal parts made of CrNiMo-steel | special versions available

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



### Pilot-operated Backpressure Regulator

RP 820

pilot-operated backpressure regulator made of cast steel for large flow rates at high pressure | usable for liquids and gases | body made of GGG-40, GS-C 25, CrNiMo-steel | 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>1</sub>	2 - 80 bar	K <sub>VS</sub>	20 - 900 m <sup>3</sup> /h



### Pilot-operated Backpressure Regulator

RP 824

backpressure regulator of the inline design in welded construction for large flow rates | RP 825 with extended casing for maximum K<sub>VS</sub>-values, high pressure at large flow rates | body made of steel, CrNiMo-steel, welded, internal parts made of CrNiMo-steel | special versions available

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



### Pilot-operated Millibar Control Valve

RP 840

pilot-operated pressure reducing valve consisting of a differential pressure regulator for large flow rates combined with a High Grade millibar valve serving as a pilot valve, available as prefabricated unit in a rack

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



## Pilot-operated Control Valves

### Pilot-operated Control Valve in Action RP 840



## Protection of Tank Systems and 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, the tanks are blanketed with inert gas ( $N_2$ ). For this purpose large quantities of nitrogen at small excess pressures in the lower millibar range are needed. Mankenberg has developed the pressure reducing valve RP 840 in close cooperation with its customers. A millibar reducing valve proven for decades controls a main valve adapted to the plant, which has to cope with large gas quantities. Thus the high regulating accuracy at very low pressures ( $\sim 5$  mbar(g)) combines with the high volume flow of nitrogen necessary for big tanks and pumps. The customer thereby obtains a very economic solution for his plant.



## Pressure Relief Valves

### Pressure Relief Valve (Peak Load)

SR 6.2

self-energised for extremely high flow rates | straight-way valve with optimised design and minimum flow losses | directly acting or pilot-operated | short response times | usable for any liquid | valve made of welded steel, CrNiMo-steel or special stainless steels | can be designed for any application, any problem regarding pressure relief can be solved | for vertical or horizontal installation

DN	150 - 400	PN	16 - 160
		T	130 °C
$p_1$	max. 160 bar	$K_{vs}$	400 - 2,400 m <sup>3</sup> /h



## Pressure Relief Valves

### Your Benefits

SR 6.2



straight-way valve with CFD-  
 optimised design

minimum flow losses

1

MOD (manual opening device)

function control, bleeding,  
 rinsing, filling of the valve

2

pilot system, pipework, operating  
 elements made of CrNiMo-steel

corrosion-resistant

3

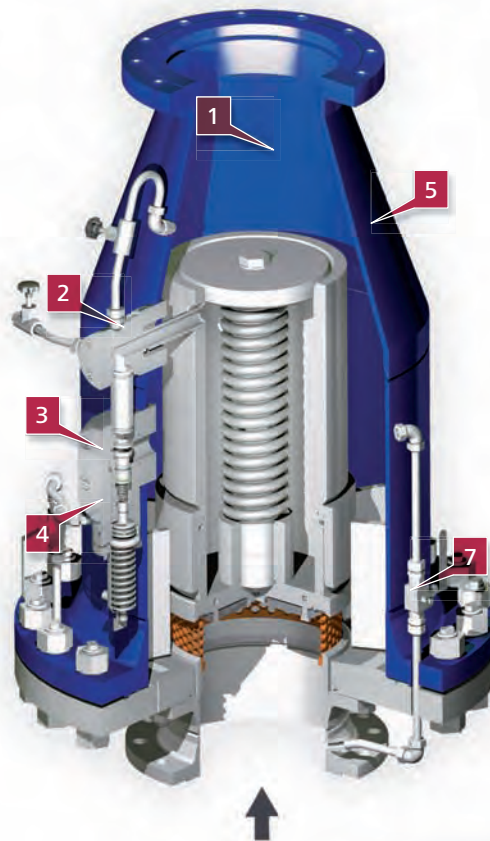
pilot control, adjustable set pres-  
 sure possible

optimal response behaviour,  
 adjustable closing time and  
 response pressure

4

fine adjustment of the set pressure  
 SR 6.2K

very precise setting possible



valve in welded construction

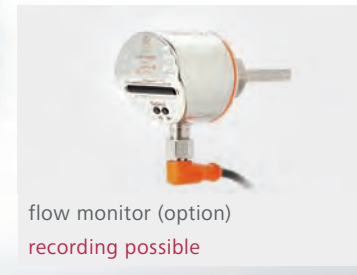
low weight, adapted overall  
 length, special materials and  
 individual flange standards  
 possible

5

spin-on filter in the pilot system

filter replacement is possible  
 during ongoing operation

6



flow monitor (option)

recording possible

### Pressure Relief Valve in Action

SR 6.2



#### Pipeline Protection at Port Loading Facilities in Russia

At various Russian Black Sea and Baltic ports loading facilities called seaports are operated where large oil tankers are loaded. 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 into a slop tank. As soon as the pressure has dropped below the set pressure, the pressure relief valve shuts down automatically and without external energy. Despite the extreme ambient temperature fluctuations, the pressure relief valve SR 6.2P effectively regulates the medium within a temperature range from -30°C to +80°C.



## Bleeding and Venting Valves



Bleeding and venting valves separate air or other gases from a liquid depending on the level of such liquid. Thus bleeding and venting valves contribute to the efficiency and enhance the safety of the plant. This emphasises the importance and necessity of a professional design for such valves to enhance the safety of your plant. Mankenberg bleeding and venting valves for continuous operation or startup as well as combined devices are available in various materials (cast steel, deep-drawn stainless steel (High Grade), special materials such as titanium or Hastelloy®).

## Continuous Bleeding and Venting Valves

### Your Benefits

EB 1.12



deep-drawn CrNiMo-steel (316L), corrosion-resistant, lightweight and compact

long operational lifespan, manageable installation, requiring minimum space

1

standard surface <math>< Ra 1.6 \mu m</math> easy-to-clean

2

Mankenberg clamp system easy-to-maintain

3

internal parts and float resistant to corrosion and pressure, made of CrNiMo-stainless steel (316L)

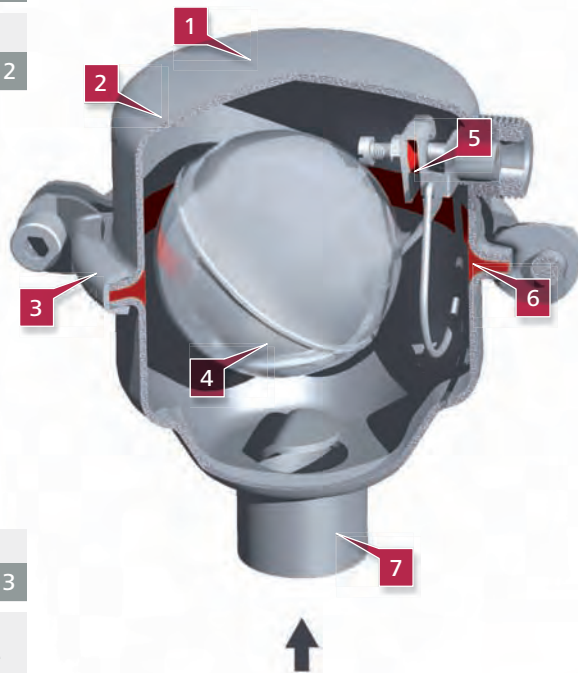
long operational lifespan

4

sturdy valve mechanism

low maintenance

5



optional elastomers

suitable for ozone, FDA-compatible

6

a wide variety of connection types: DIN-, ANSI- or aseptic flanges, weld-on ends ...

no adapters or fitting pieces required

7

### Valves of Cast Steel

EB 1.10, 1.11

float-controlled operational bleeding valve with lever control for larger air volumes, e.g. on sand filters | EB 1.11 with external float for contaminated and foaming media, EB 1.20 for maximum air volumes | valve cone with soft or metallic seal for temperatures up to 200 °C | body made of GGG-40 or GS-C25, internal parts made of CrNiMo-steel | rubber coating or synthetic material coating available for aggressive media, also available with non-return valve as pure bleeding valve

DN	32 / 15 - 100 / 50	PN	16 - 40
		T	200 °C
$p_1$	0 - 40 bar	Q	2,440 Nm <sup>3</sup> /h



## Continuous Bleeding and Venting Valves

### Compact Standard Bleeding Valve (small-sized design) EB 1.12

float-controlled operational bleeding valve for all types of pipelines, tanks etc., thanks to soft seal especially tight-closing | EB 1.12 outlet at the side, EB 1.32 outlet to the top | usable for nearly all liquids (petrol, oil ...), available in the ozone-resistant version | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $R_a < 1.6 \mu\text{m}$  | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | available in special materials, such as seawater-resistant stainless steel, titanium, Hastelloy® etc. | EB 1.32 also available with non-return valve as pure bleeding valve

		PN	16
G	$\frac{3}{4} \times G \frac{1}{2} A$	T	190 °C
p	0 - 16 bar	Q	12 Nm <sup>3</sup> /h



### Compact Standard Bleeding Valve (medium-sized design) EB 1.12

float-controlled operational bleeding valve for all types of pipelines, tanks etc., thanks to soft seal especially tight-closing, outlet at the side | usable for nearly all liquids (petrol, oil ...), available in the ozone-resistant version | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $R_a < 1.6 \mu\text{m}$  | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | available in special materials, such as seawater-resistant stainless steel, titanium, Hastelloy® etc.

DN	25 - 50 x G $\frac{3}{4} A$	PN	16
G	1 - 2 x G $\frac{3}{4} A$	T	190 °C
p	0 - 16 bar	Q	73 Nm <sup>3</sup> /h



### Compact Standard Bleeding Valve (large-sized design) EB 1.12

float-controlled operational bleeding valve for all types of pipelines, tanks etc., thanks to soft seal especially tight-closing, outlet at the side | usable for nearly all liquids (petrol, oil ...), available in the ozone-resistant version | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $R_a < 1.6 \mu\text{m}$  | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | available in special materials, such as seawater-resistant stainless steel, titanium, Hastelloy® etc.

DN	65 - 100 x G $\frac{3}{4} A$	PN	16
		T	190 °C
p	0 - 16 bar	Q	248 Nm <sup>3</sup> /h



### Valve for High Pressures EB 1.32SO

float-controlled operational bleeding valve, float and lever made of stainless steel, flanged body halves, also available as pure bleeding valve | usable for nearly all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $R_a < 1.6 \mu\text{m}$  | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, easy-to-maintain – highest effectiveness with compact design

DN	15 - 50	PN	25 - 63
G	$\frac{1}{2} - 1$	T	200 °C
p	0 - 63 bar	Q	30 Nm <sup>3</sup> /h



### Bleeding and Venting Valve with Sight Glass for Visual Checking EB 1.48

float-controlled operational bleeding valve for all types of pipelines, tanks etc., thanks to soft seal especially tight-closing | usable for nearly all liquids (petrol, oil ...), available in the ozone-resistant version | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $R_a < 1.6 \mu\text{m}$  | corrosion-resistant, very lightweight and compact

		PN	16
G	$\frac{1}{2}$	T	130 °C
p	0 - 16 bar	Q	28 Nm <sup>3</sup> /h



## Startup Bleeding and Venting Valves

### Valve for Very Large Air Volumes

EB 3.50

float-controlled startup bleeding valve for high operating pressures, special designs available with adapted continuous bleeding and venting valve (EB 6.54) | usable for nearly all liquids | body made of steel, CrNiMo-steel | high-pressure-resistant welded construction | long operational lifespan, extremely sturdy, available in special materials

DN	100 - 300	PN	6 - 40
		T	200 °C
p	0.3 - 40 bar	Q <sub>max</sub>	18,550 Nm <sup>3</sup> /h



### Bleeding and Venting Valve in Action

EB 1.10



## Reliable Bleeding and Venting for Our Elixir of Life

Each of us will know his local waterworks that reliably supplies potable water to our homes. The waterworks have the task of purifying various types of untreated water and converting them to pure potable water. In many cases wells are used, in which submerged pumps convey the raw water to the surface. Being a natural product, this water would be drinkable, however a high content of iron and manganese compounds spoil the enjoyment of drinking. These compounds are removed in the oxidising tank. The filters (in most cases gravel filters) remove suspended matter and other foreign bodies from the untreated water. Compressed air floods the filter in order to supply large amounts of oxygen, which is able to bind manganese and iron, to the gravel filter. However, the air has to be transferred out of the system under pressure and without any loss of water. For decades Mankenberg bleeding and venting valves of the EB 1.10 type have been employed on the top of the tanks. The angle design of the valve is very advantageous considering the simple pipe layout. The valves of coated cast iron have been used without any change in design in many waterworks since the middle of the 1960s. When used for oxidising tanks, polyamide-coated bleeding valves are preferred in order to protect the metallic surface.



### Universal Valve

EB 3.52

float-controlled startup bleeding valve | usable for all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, available in special materials – such as seawater resistant stainless steels – highest effectiveness with compact design

DN	25 - 100	PN	16
		T	190 °C
p	up to 13 bar	Q	1,935 Nm <sup>3</sup> /h



## Combined Bleeding and Venting Valves

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

for 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  $Ra < 1.6 \mu m$  | 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 <sub>max</sub>	190 Nm <sup>3</sup> /h



### Bleeding and Venting Valve with Integrated Vacuum Breaker EB 1.59

for plants subject to vacuum hazards, float and lever control the valve shut-off to discharge gas with the additional vacuum breaker function by means of a spring-controlled rubber ball in the large valve seat | usable for water and fuel | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | corrosion-resistant, very lightweight and compact owing to the clamp system

DN	100	PN	10
		T	60 °C
p	0 - 10 bar	Q	62 Nm <sup>3</sup> /h



### Combined Valve Especially Designed for 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  $Ra < 1.6 \mu m$  | 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 Nm <sup>3</sup> /h



### Epoxy-coated Cast Valve for Water EB 1.75

large bleeding or ventilation quantities owing to ventilation cross sections and connection flange dimensions of the same size | body made of GGG-50 with KTW-compliant epoxy coating | bleeding under operating pressure, max. bleeding performance in the start-up mode and max. ventilation performance during draining of systems means optimal triple functionality | optionally with anti-shock device for suppression of water hammers

DN	50 - 200	PN	16 - 25
G	1 + 2	T	70 °C
p	0.3 - 25 bar	Q <sub>max</sub>	7,600 Nm <sup>3</sup> /h



### Combined Valve Especially Designed for Dirty or Waste Water EB 1.84

for large air volumes at startup, continuous bleeding or venting under pressure, opens immediately if a vacuum is present | usable for nearly all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation, extremely reliable – highest effectiveness with compact design | optimal triple functionality

DN	50 - 150	PN	16
		T	130 °C
p	0 - 6 bar	Q	970 Nm <sup>3</sup> /h





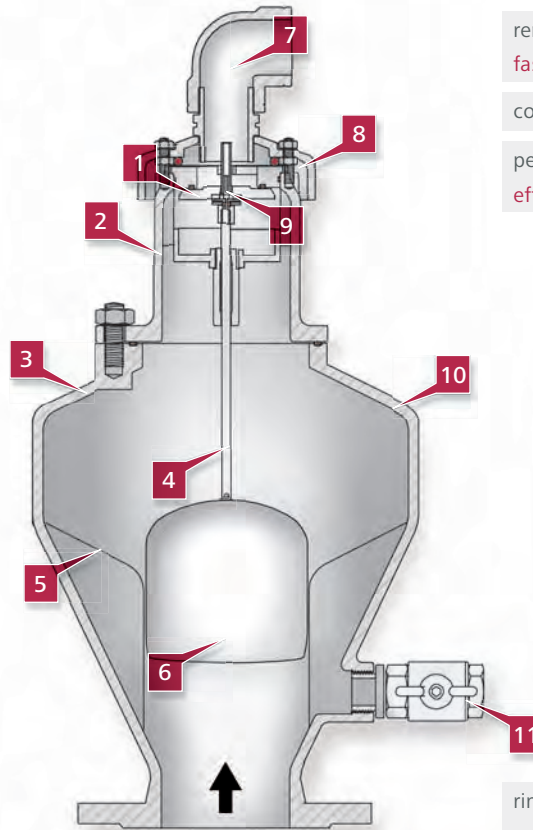
## Combined Bleeding and Venting Valves

### Your Benefits

EB 1.85



- main valve seat  
maximum volume flow **1**
- removable top part  
fast and easy maintenance **2**
- body made of GGG 40  
high corrosion protection  
min. 250 µm **3**



- degassing bend **7**
- removable cap  
fast and easy maintenance **8**
- continuous bleeding seat **9**
- pear-shaped valve body  
effective against deposits **10**

- long float rod  
safe function for bleeding  
and venting **4**
- float guide **5**
- float made of CrNiMo-steel  
long operational lifespan **6**

- rinsing and draining tap  
pressure relief prior to main-  
tenance work **11**

### Epoxy-coated Cast Valve Especially Designed for Waste Water EB 1.85

optimised body design with guided float to ensure maximal protection of the bleeding and venting device | large bleeding or ventilation quantities owing to ventilation cross sections and connection flange dimensions of the same size | body made of GGG-50 with KTW-compliant epoxy coating | bleeding at operating pressure, max. bleeding performance in the startup mode and max. ventilation performance during draining of systems | optionally with anti-shock device for suppression of water hammers

DN	50 - 200	PN	10 - 16
G	2	T	70 °C
p	0.2 - 16 bar	Q <sub>max</sub>	4,200 Nm <sup>3</sup> /h



### Bleeding and Venting Valves 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
G	1 - 2	T	130 °C
p	0.3 - 40 bar	Q <sub>max</sub>	18,550 Nm <sup>3</sup> /h



## Steam Traps



Steam traps are valves that separate liquids from steam, air or other gases. Mankenberg steam traps are available in various materials and designs. There are small-sized and compact valves of deep-drawn stainless steel (High Grade), but also other versions of cast steel which have been invariably used for more than 100 years without changing material and design.

## Float-controlled Steam Traps

### Your Benefits

KA 2K



deep-drawn CrNiMo-steel (316L),  
corrosion-resistant, lightweight  
and compact

long operational lifespan, man-  
ageable installation, minimum  
space required, low delta-  
ferrite content possible

1

standard surface <math><math>Ra 1.6 \mu m</math></math>  
easy-to-clean

2

Mankenberg clamp system  
easy-to-maintain

3

internal parts and float made of  
CrNiMo-steel (316L) resistant to  
pressure and corrosion

long operational lifespan

4

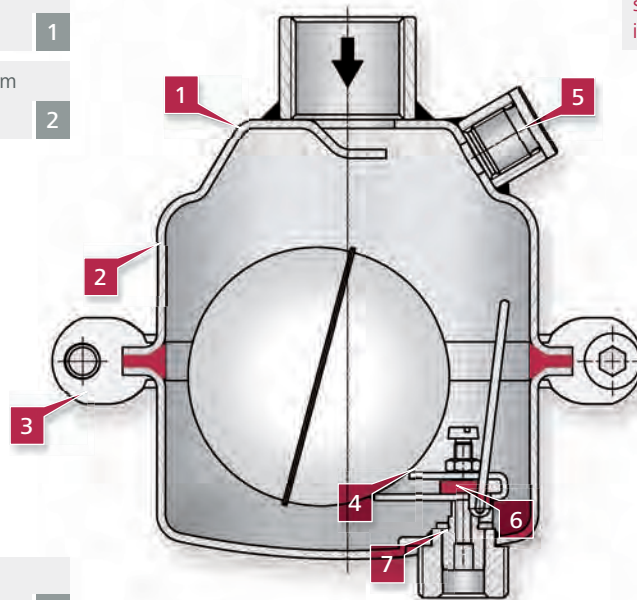
compensation line connection  
optimal pressure  
compensation

5

soft seal

sealed valve closure already  
in depressurised condition

6



sturdy valve mechanism  
low maintenance

7

ATEX certificate of conformity  
(option)

## High-performance and Sturdy Steam Trap

Niagara

with manual or thermal bleeding or fixed continuous bleeding | usable for steam | body made of GGG-40, GS-C 25, internal parts of CrNiMo-steel | solid, well-proven, sturdy, for very high temperatures | extended service intervals, extremely long operational lifespan, reliable | well-known as a high-performance valve

DN	15 - 150	PN	16 - 40
		T	200 °C / 400 °C
p	0 - 40 bar	Q	193 m <sup>3</sup> /h



## Float-controlled Steam Traps

### Universal Valve for Small Flow Rates

KA 2

float-controlled, soft seal valve closure, fully developed lever mechanism, with manual bleeding for steam | usable for steam, compressed air, aerosols | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | very lightweight and compact, corrosion-resistant to aggressive media, especially gastight | easy installation, long operational lifespan

		PN	16
G	$\frac{3}{4}$ x G $\frac{1}{2}$ A	T	190 °C
p	0 - 12 bar	Q	350 l/h



### Universal Valve for Larger Flow Rates

KA 2X

metallic seal, for steam with manual bleeding | usable for steam, compressed air, aerosols | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | very lightweight, corrosion-resistant to aggressive media | easy installation, long operational lifespan

DN	25 x G $\frac{3}{4}$ A	PN	16
G	1 x G $\frac{3}{4}$ A	T	190 °C
p	0 - 13 bar	Q	1,200 l/h



## Steam Trap in Action

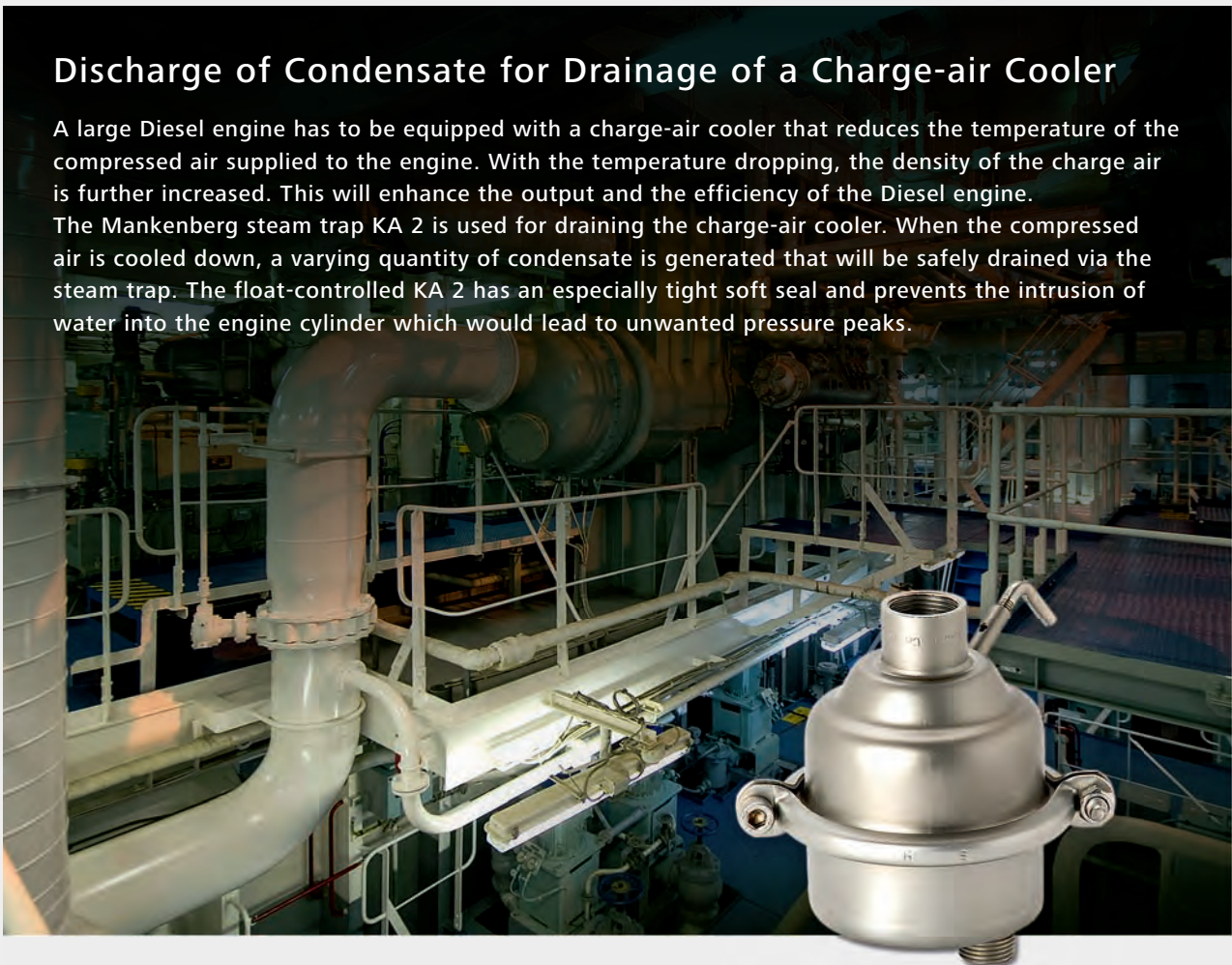
KA 2



### Discharge of Condensate for Drainage of a Charge-air Cooler

A large Diesel engine has to be equipped with a charge-air cooler that reduces the temperature of the compressed air supplied to the engine. With the temperature dropping, the density of the charge air is further increased. This will enhance the output and the efficiency of the Diesel engine.

The Mankenberg steam trap KA 2 is used for draining the charge-air cooler. When the compressed air is cooled down, a varying quantity of condensate is generated that will be safely drained via the steam trap. The float-controlled KA 2 has an especially tight soft seal and prevents the intrusion of water into the engine cylinder which would lead to unwanted pressure peaks.



## Float-controlled Steam Traps

### Steam Trap Especially Designed for Cold Condensates

KA 2K

particularly gastight also without fluid content owing to the soft seal valve closure and the fully developed lever mechanism | certified in accordance with ATEX | operating pressures down to millibar range | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | easy-to-maintain owing to clamp system | very lightweight and compact, corrosion-resistant to aggressive media, especially gastight | manageable installation, long operational lifespan

		PN	16
G	$1/2 - 1$	T	80 °C
p	0 - 12 bar	Q	1,570 l/h



## Float Valves

Depending on the design and the liquid level in a tank, float valves control the inflow and outflow of liquid media. Float valves are available in various versions and materials or material combinations (cast steel, steel and stainless steel) according to requirements.

### Float Valves for Installation in Tanks

#### Standard Valve of Cast Steel

NV 12

single-seat feed valve of angle design | body made of GG-25, GGG-40 | incl. lever and float made of CrNiMo-steel, proven technology that requires no external energy | parallel guidance available

DN	20 - 150	PN	16
p	0 - 8 bar	T	110 °C
$K_{VS}$	2.8 - 195 m <sup>3</sup> /h		



#### Compact Stainless Steel Valve

NV 94

single-seat feed or drain valve | suitable for nearly all liquids, also aggressive ones | completely made of CrNiMo-steel (316L) | incl. lever and ball float made of CrNiMo-steel | sturdy technology, smooth surfaces

		PN	16
G	$3/8 A - 1 1/2 A$	T	300 °C
p	0 - 8 bar	$K_{VS}$	0.5 - 21 m <sup>3</sup> /h



#### Universal Valve

NV 98

single-seat feed valve of angle design | usable for nearly all liquids, also aggressive ones / completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | incl. lever and ball float made of CrNiMo-steel | parallel guidance available

DN	40 - 80	PN	16
G	$3/8 A - 1 1/2 A$	T	180 °C
p	0 - 8 bar	$K_{VS}$	0.5 - 82 m <sup>3</sup> /h



## Float Valves for External Installation on Tanks

### Level Regulating Valve

NV 55 - 56

NV 55 single seat, NV 55E balanced single seat, NV 56 double seat, straight-way valve for feeding or draining, for large flow rates and nominal diameters | body made of GG-25, GGG-40, GS-C25, CrNiMo-steel | incl. float rod and shell-type float made of CrNiMo-steel | rubber coating or synthetic material coating available for aggressive media

DN	15 - 400	PN	16 - 40
		T	130 °C
p	0 - 16 bar	K <sub>VS</sub>	2.6 - 1,800 m <sup>3</sup> /h

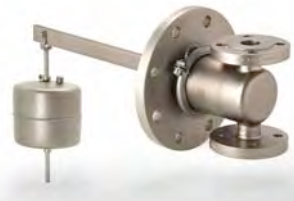


### Level Regulating Valve

NV 67E

single-seat, balanced straight-way valve for feeding or draining, for large flow rates | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to clamp system | incl. float rod and shell-type float made of CrNiMo-steel

DN	15 - 100	PN	16
		T	130 °C
p	0 - 16 bar	K <sub>VS</sub>	4 - 100 m <sup>3</sup> /h



### Direct Feed or Drain Valve

NV 71

single-seat angle valve for feeding or draining, the tank is filled and drained via the mounting flange on the tank | usable for nearly all liquids | body made of steel, optionally CrNiMo-steel | incl. level and ball float made of CrNiMo steel | rubber coating or synthetic material coating for aggressive media

DN	25 - 150	PN	16
		T	300 °C
p	0 - 8 bar	K <sub>VS</sub>	1.6 - 81 m <sup>3</sup> /h



## Float Valves for Pipelines

### Cast Steel Valve for High Flow Rates

NV 16

single-seat straight-way valve for feeding or draining | body made of GG-25, GGG-40, GS-C25, CrNiMo-steel | incl. float rod and shell-type float made of CrNiMo-steel | rubber coating or synthetic material coating available for aggressive media

DN	15 - 400	PN	16 - 40
		T	130 °C
p	0 - 4 bar / 0 - 16 bar	K <sub>VS</sub>	2.6 - 1,800 m <sup>3</sup> /h



### Level Regulating Valve

NV 66E

single-seat, balanced straight-way valve for feeding or draining, large flow rates | usable for nearly all liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | incl. float rod and shell-type float made of CrNiMo-steel

DN	15 - 100	PN	16
		T	130 °C
p	0 - 16 bar	K <sub>VS</sub>	4 - 100 m <sup>3</sup> /h



## Pipeline Ancillaries



Pipeline ancillaries comprise active or passive components for pipeline construction as well as for measuring and control technology.

Various devices and components are available in the proven quality that Mankenberg offers, from filters and liquid separators through to sight glasses for high pressures for high temperature applications.

## Strainers and Filters

### Filter in Action

FI 6.06



## Cleaning of Control Air in Compressed Air Systems

Owing to their size, Diesel engines used on ships or in power plants can only be started by means of compressed air. Given this size, the nominal pressure may amount to up to 30 bar. The compressed air systems of the engine unit take in air that is often heavily contaminated with particles. The control air is needed to push open the injection valves during the start of the engines and must be filtered prior to entering the system. Without air filtering the injection valves may be damaged and cause the engine to become blocked. The compressed air filter FI 6.06 is installed upstream of the compressed air system cleaning the control air. The very lightweight and compact FI 6.06 is made of deep-drawn stainless steel and has a high dirt-holding capacity at low pressure loss.



## Pot Strainers for High Pressures

SF 1.00

pot strainer for high pressure | mesh width 0.25–2.5 mm | as gas filter FI 1.01 with polyester foam mat, pore size 0.15–0.58 mm | low pressure drop | body made of GG-25, GGG-40, GS-C 25 | different sieve or filter finenesses | optionally with manometer

DN	15 - 150	PN	16 - 160
G	$\frac{3}{8}$ - 2	T	80 °C / 400 °C



## Strainers and Filters

### 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



### Strainer for Very High Pressures

SF 3.00

strainer made of forged steel in block design, low pressure drop, different sieve finenesses, clear mesh width 0.25–2.5 mm | usable for liquids, gases and steam | body made of C-steel, CrNiMo-steel, special material such as Duplex, Superduplex, Hastelloy® or titanium available | optionally with manometer connection

DN	15 - 100	PN	160 - 500
G	1/2 - 4	T	550 °C



### Stainless Steel Pot Strainer

SF 6.00

flat sieve with low pressure drop, different sieve finenesses, clear mesh width 0.25–2.5 mm | usable for liquids, gases and steam | completely made of CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation – highest effectiveness with compact design

DN	15 - 100	PN	16
G	1/2 - 2	T	200 °C



### Stainless Steel Gas Filter

FI 6.01

low pressure drop, filter medium made of polyester foam, pore size 0.15–0.58 mm | usable for gases | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation – highest effectiveness with compact design

DN	15 - 100	PN	16
G	1/2 - 2	T	80 °C



### Stainless Steel Filter

FI 6.06

especially suitable for sterile steam, filter insert of sintered steel or pleated stainless steel mesh, filter fineness 5, 20 or 25 µm | usable for gases, steam, compressed air | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation – highest effectiveness with compact design

DN	15 - 50	PN	16
G	1/2 - 2	T	190 °C



## Liquid Separators

### Your Benefits

AS 2



deep-drawn CrNiMo-steel (316L), corrosion-resistant, lightweight and compact

long operational lifespan, manageable installation, minimum space required, low delta-ferrite content possible

1

optimised flow geometry

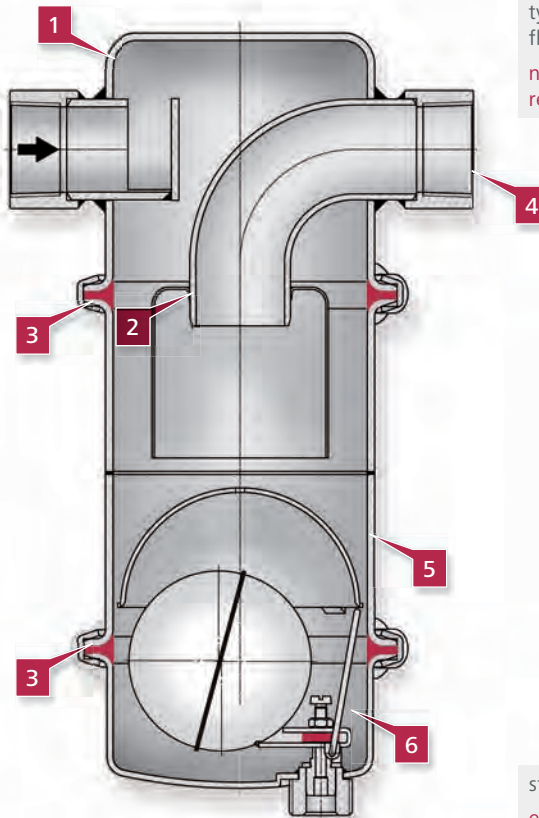
up to 99% separating performance

2

Mankenberg clamp system

easy-to-maintain

3



a wide variety of connection types: DIN-, ANSI- or aseptic flanges, weld-on ends ...

no adapters or fitting pieces required

4

standard surface < Ra 1.6 µm

easy-to-clean

5

integrated steam trap

6

### Combined Valve with Integrated Liquid Separator

AS 2

spin separator of straight design | usable for liquids, gases, steam | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | long operational lifespan, manageable installation – highest effectiveness with compact design

DN	25 + 40	PN	16
G	1 + 1 1/2	T	190 °C
p	0 - 13 bar	Q	1,900 Nm <sup>3</sup> /h



## Sight Glasses / Flow Indicators

### Small-sized Flow Indicator with Single Glass

DA 1.10

small-sized version with single glass, DA 1.10 with flag, DA 1.30 with vane, DA 1.40 with ball. DA 2.00 with turbulence block | usable for liquids, gases, steam | body made of GG-25, CrNiMo-steel, steel | available in various variants, also in special materials (e.g. Hastelloy®) | individually customised to your requirements

		PN	16 - 40
G	3/8 - 3/4	T	280 °C





## Sight Glasses / Flow Indicators

### Flow Indicator with Two Glasses

DA 4.00 - 4.40

DA 4.00 without internal parts | DA 4.10 with flag, DA 4.30 with vane, DA 4.40 with ball | usable for liquids, gases, steam | body made of GG-25, GS-C 25, CrNiMo-steel, steel | available in various variants, also in special materials (e.g. Hastelloy®) | individually customised to your requirements

DN	15 - 250	PN	16 - 40
G	$\frac{3}{8}$ - 2	T	280 °C



### Flow Monitor with Single Glass

DA 6.00 - 6.30

DA 6.00 without internal parts, DA 6.10 with flag, DA 6.12 with external display for opaque liquids, DA 6.30 with vane | usable for liquids, gases, steam | body made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | long operational lifespan, manageable installation – well-priced stainless steel sight glasses

DN	15 - 50	PN	16
G	G $\frac{1}{2}$ - 2	T	130 °C



### Flow Indicator with Two Glasses

DA 7.00, 7.10

DA 7.00 without internal parts, DA 7.10 with flag | usable for liquids, gases, steam | body made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | easy-to-maintain owing to the clamp system | long operational lifespan, manageable installation – well-priced stainless steel sight glasses

DN	15 - 50	PN	16
G	$\frac{1}{2}$ - 2	T	130 °C



## Pumps



Pumps are central fluid conveying elements of the process engineering sector. The pumps produced by Mankenberg are predominantly fluid-actuated pumps made of deep-drawn stainless steel (High Grade). They convince through their compact and lightweight design, which gives enormous advantages with regards to installation and assembly, as compared to cast steel construction. In comparison with an electrically actuated pump and its necessary wiring the investment costs for the condensate pump, which requires no external energy, are considerably better-priced. Pump designs for explosion protection zones can be easily realised because no external energy is required.

## Condensate Pumps

### Your Benefits

KH 1

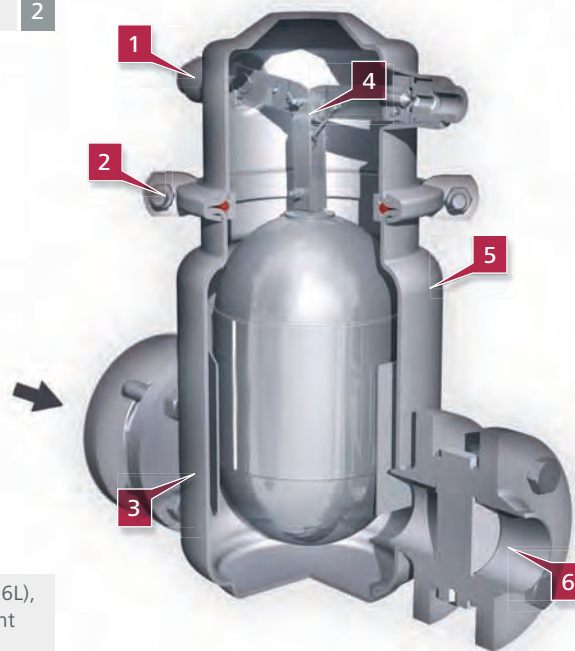


compressed air, steam or inert gases up to max. 8 bar serving as propellant **1**

Mankenberg clamp system **2**  
 easy-to-maintain

sturdy valve mechanism **4**  
 low maintenance

standard surface <math>Ra < 1.6 \mu m</math> **5**  
 easy-to-clean



deep-drawn CrNiMo-steel (316L), corrosion-resistant, lightweight and compact, only 21 kg of weight for a nominal diameter of DN 50 **3**  
 sturdy valve mechanism, low maintenance

inlet and outlet bottom-mounted **6**

### Very Lightweight Condensate Pump Made of CrNiMo-Steel KH 1

pump requires no external energy, soft seal for gas tightness in explosive environments | usable for condensates and liquids | completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body  $Ra < 1.6 \mu m$  | easy-to-maintain owing to the clamp system | corrosion-resistant, very lightweight and compact | manageable installation, long operational lifespan – highest effectiveness with compact design

DN	25 + 50	PN	16
		T	200 °C
p	0 - 8 bar	Q <sub>max</sub>	3,430 l/h



## Accessories and Spare Parts



Our accessories, such as manometers or float balls, complete the need for components for the construction of process plants.

### Accessories

#### Diaphragm Compensation Vessel

AKM 200

completely made of deep-drawn CrNiMo-steel (316L) – surface finish of the body Ra < 1.6 µm | diaphragm optionally made of EPDM or FPM | easy-to-maintain owing to the clamp system

		PN	10
G	1/2	T	130 °C
p	1 - 10 bar		



#### Float Made of CrNiMo-steel (316L)

SC

float designed in various forms, sizes and wall thicknesses | attached to the lever by means of a fork or rod passing through it | SC 3 and SC 4 for pressure vessels, SC 7 and SC 8 for pressureless vessels




### Spare Parts

We guarantee 25 years of availability of spare parts for Mankenberg stainless steel valves. Together with your valve serial number we save all the relevant data which is important to you. If you require spare parts or maintenance kits, we are able to make the necessary single parts or maintenance kits available to you as soon as possible up to 25 years after purchase of the valve.

#### Service Subscription

Do you remember the regular maintenance dates for your valves?  
 Should you wish to be reminded of the next due inspection date, we would be happy to oblige. Feel free to contact us!

#### Service Department is at Your Disposal!

Our experienced service team is available to give advice on our service hotline. You will receive direct and prompt replies to your enquiries about repairs, spare parts or maintenance kits.

Service Hotline: +49 (0) 451-8 79 75 222  
 email: [service@mankenberg.de](mailto:service@mankenberg.de)

Any further information you require can be found on our website: [www.mankenberg.de](http://www.mankenberg.de)

## After Sales



### Telephone Support

Competent and Fast

We offer comprehensive telephone support and quick troubleshooting by our qualified and friendly staff. Your direct phone connection to our know-how:

**Service Phone: +49 (0) 451- 8 79 75 222**

Monday through Thursday 7.30 a.m. – 5.00 p.m.

Friday 7.30 a.m. – 4.00 p.m.

- » Quick troubleshooting
- » Practical experience
- » Instructions for troubleshooting on the phone



### On-the-spot Service

Always and Everywhere

Experienced Mankenberg specialists are available for your needs. You carry out the commissioning or setting of the valves in your plant. Benefit from our know-how and get an optimal cost / benefit ratio.

Our team leader and his service team are available on phone: +49 (0) 451-8 79 75 222 or email: [service@mankenberg.de](mailto:service@mankenberg.de)



### Spare Parts Service

Rapidly Ensure Safety in the Long Term

Additionally to individual combined spare parts packages, our comprehensive depot ensures permanent availability of spare parts. Our express delivery service will despatch your required spare parts on the same day with express delivery, if the order is placed by 3.00 p.m, so that the valves will be back in operation as quickly as possible and maximum productivity of your plant is guaranteed.

- » Availability of parts for at least 25 years in the long term
- » Vast assortment
- » Permanent availability of relevant spare parts
- » Express delivery

For direct placement of your spare parts order in the Internet:  
[www.mankenberg.com](http://www.mankenberg.com) or email: [service@mankenberg.de](mailto:service@mankenberg.de)



### Maintenance

Smartly Avoid Failures

Continuous maintenance of the valves by experts prevents long downtimes and expensive failures. In case of need our repair service will be immediately on the spot and will ensure that your processes are up and running again as quickly as possible.

- » Service contracts (minimise downtimes)
- » Monitoring the maintenance schedules

Any further information on maintenance can be found in the Internet:  
[www.mankenberg.com](http://www.mankenberg.com) or email: [service@mankenberg.de](mailto:service@mankenberg.de)



## Service and Maintenance Training Courses

Know-how to its Very Essence

Comprehensive service and maintenance training courses as well as individual seminars regarding any technical and process-optimising subject with regards to our valves will continuously increase the existing potential of your staff and machines. Experts from the field will transmit the necessary knowledge on selection and application of our valves. Thus you and your staff will always be updated.

Further information and current schedules can be found in the Internet:  
[www.mankenberg.com](http://www.mankenberg.com) or let us have your enquiry by email: [service@mankenberg.de](mailto:service@mankenberg.de)



After Sales Team

Henning Tietz,  
Service

Christian Peine,  
Service Team Leader

Janina Pflaum,  
Service

## Customer Seminars



### Seminars

Control Valves are Our World

With competence and experience we regularly hold training courses and seminars on various subjects. Experts from the field will teach the fundamentals of in-depth knowledge regarding selection and application of our comprehensive product range of control valves during a one-day seminar, which can be held at Mankenberg in Lübeck, at various venues in Germany or on-site in your company.

### Subjects

Example from our Mankenberg Basic Seminar

- » Mankenberg – Valves made of deep-drawn stainless steel
- » Our delivery programme – an overview
  - » Pressure regulating valves
  - » Float-controlled valves
  - » Other valves
- » Application technology (practical examples)
  - » Valves in different processes
  - » Valves in various industries
  - » Specially designed valves
- » Guided tour of the factory (only for seminars held in Lübeck!)
- » Test bench (only for seminars held in Lübeck!)
  - » Pressure regulating valve with large nominal diameters
  - » High-performance bleeding and venting valves
- » Technical terms – what does ... mean?
  - » Definition of the technical terms used
  - » Components of control valves
  - » Selection criteria
- » Design of pressure regulating valves
  - » Calculation basis, operating data
  - »  $K_{vs}$ -value, flow velocity, nominal diameter
- » Special valves for special applications
- » Events of damage – how and why

Further information and current schedules can be found in the Internet: [www.mankenberg.com](http://www.mankenberg.com)  
or let us have your enquiry by email: [kundenschulung@mankenberg.de](mailto:kundenschulung@mankenberg.de)



...or simply scan the QR Code  
with your smartphone!













## Job Order Production



## Job Order Production – Our Variety for your Benefit

Mankenberg has long been known as quality manufacturer for industrial valves. Now get to know us as a subcontractor, too. At our production site in Lübeck Mankenberg manufactures valves in various techniques at nearly 100% degree of vertical integration. Apart from our unique know-how in the deep-drawing of stainless steel and the processing of special materials, Mankenberg has gained long-standing experience in the manufacture of pressure-carrying parts in accordance with the Pressure Equipment Directive and AD 2000 rules. Within the framework of our production, we can offer a wide variety of solutions from single-item through to series fabrication. Our engineers will be happy to assist you, feel free to ask for advice.

### Overview of our Performance – Our Skills at our Facility in Lübeck

 Turning	 Punching
 Milling	 Thermoforming
 Deep-drawing	 Surface Treatment
 Welding	 Modular Assembly

- » Engineering
- » Tool Manufacture
- » Know-How

- » Quality Assurance
- » With or without Procurement of Material





### One Product by Comparison – Pressfit Seat with Cone Guide

Competitor: Investment Casting Part  
 Mankenberg: Turning / Deep-drawing / Welding

#### Your Benefit:

- » Higher-quality material
- » More lightweight
- » Later postprocessing possible
- » Small batch and series production
- » More dimensional accuracy
- » Better surface quality
- » Better price/performance ratio