Suministros Industriales Arbaiza, S.L.

# Needle Valve

# RKV



Polígono Ind. Igeltzera Nº6 2J · 48610 Urduliz - Bizkaia - Spain · Telf.: 94 676 62 10 · sumival@sumival.com · www.sumival.com

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# NEEDLE VALVE

## RKV NEEDLE VALVE

The RKV Needle valve is the right valve to use whenever pressure heads or flow rates need to be safely and reliably reduced and controlled. They are used for two main tasks:

- By restricting the cross-section, a change in flow rate, flow velocity and pressure is forced, which results in higher stress in the valve. The valve must therefore be designed so that potential cavitation cannot cause any damage whatsoever.
- To be able to control the pressure and flow precisely and finely, the control valve's control characteristics must be as linear as possible over the whole operating range. Thanks to their well thought out and tested design, The RKV Needle valves fulfil these requirements to the greatest possible degree and are therefore the ideal valves for numerous control tasks.



### ADVANTAGES

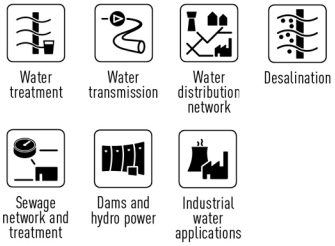
**Efficiency:**
Optimised flow performance and flow guiding with best hydraulic performance when fully open for optimum energy efficiency and savings.

**Precise flow control:**
With a control range up to 96% the RKV guarantee an optimal flow control thanks to the mechanism of the SKG slider crank. More than the optimisation of the regulation range SKG slider crank allow a slow closing speed to avoid hammer shock risk.

**Prevent cavitation damage:**
Thanks to a large control insert range from standard to customised specially design to localised cavitation in a non-risky area for the engine. In addition to the 70+ years experience and proven site operation, Erhard continuously conducts hydraulic tests and numerical fluid simulations to further optimize cavitation control. ERHARD confirm is expert position in the control of extreme application.

**Durability:**
The different design choice such as at least 4 guiding, main gasket in cavitation free area or shaft protected from water stagnation, permit to guarantee long life of the valve. Long-lasting, high-quality components and superior 250µm epoxy coating without any interruption ensure also a long duration.

### APPLICATIONS




### USES

**Water transmission and distribution:**
Linked to the large control insert available in standard the RKV could be used in different type of control circuits for distribution (pressure control, flow control, reservoir control).

**Dams and hydropower:**
For small, medium and large installations. In the bottom outlet of a dam with special air-admission option.

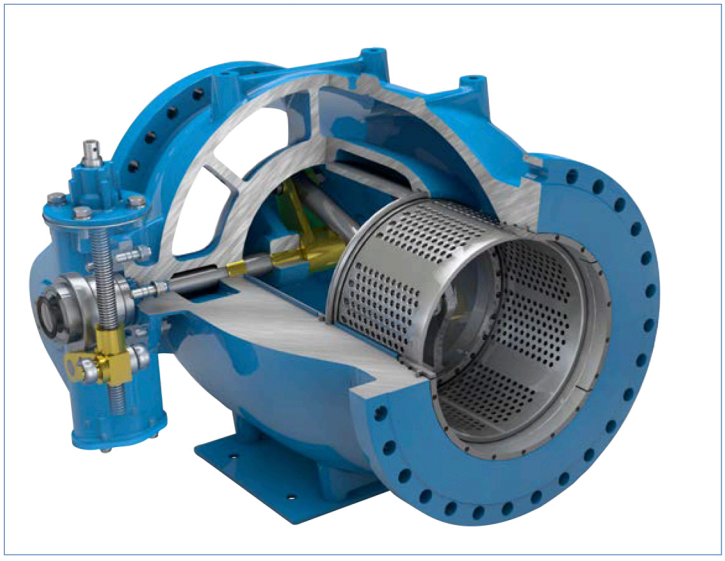
**Industrial water applications:**
Often installed in different industries where the pressure control and flow of water are required. The different control mode and the technical support team permit to advice the most adapted solution for the application.

**Sewage network and treatment:**
Air-flow control valve for activated sludge basins in sewage treatment plants.
By providing a full control range, The Needle Valve is very often used to control air admission in sludge basins. Energy cost savings are therefore much more important than the quality treatment.

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## CHARACTERISTICS

- Optimised flow performance and flow guiding for practical Zeta values, minimum pressure losses when fully opened.
- Control inserts for safe and reliable pressure reduction to prevent cavitation damage in every application: seat ring, vaned ring, slotted cylinder, perforated cylinder and other special inserts.
- Wide range of pressure ratings, nominal sizes and designs. Adapted solutions for numerous special applications.
- Perfect adaptation to all installation situations with a standardised connection for all types of actuators.
- SKG gearbox or Auma gears with unique slider crank mechanism optimise the linear control range and protects against water hammer by gradually slowed closing.
- Proven design, reliability and experience: more than 100 years of experience with needle valve.
- 100% tested according to DIN EN 12266 and DIN EN 1074.
- Made in Germany



## TECHNICAL DATA

- **Size**
  DN 100 - DN 2000 PN 10-40 Higher pressure rate available on request as CLASS 900 (PN160)
- **Flange Drilling**
  PN10 to PN40 acc.
  to EN 1092-2 ANSI available on request
- **Medium Temperature**
  0°C to 70°C
- **Coating:**
  Epoxy 250 µm

## APPROVALS

- NSF, ACS, DVGW for material and coating

## OPTIONS/VARIANTS

- **Coating:**
  250µm EKB fusion bonded epoxy colour blue
- **Materials**
  **Body:** Ductile cast iron EN-JS1050
  **Piston guide:** DN100-150 Stainless steel
  DN200-300 Bronze
  DN350-2000 Brass
  **Cylinder:** Stainless steel
  **Seals:** EPDM, KTW and W270 – or NBR, others on request
  **Shaft, Piston:** stainless steel
  **Gearbox body:** grey cast iron EN-JL1040
  **Gearbox crank:** ductile cast iron EN-JS1050
  **Gearbox stem:** ferritic Cr-Ni steel
  **Stem nut:** special brass
- **Cylinder options:**

**Standard:** Seat ring, Vaned ring, Slotted cylinder, Perforated cylinder
**Customised:** Special cylinder (slotted or perforated), Throttle ring especially for energy recovery systems, Control attachments for pump test rig, Control inserts for bottom outlets

- **Different type of actuators** from float control through hydraulic and pneumatic actuator to electric actuator

# PROVEN ENGINEERING FOR DIVERSE TASKS

Needle valves have been part of ERHARD's extensive product range for more than 100 years. This experience is reflected in thousands of installed valves which have proven their worth in daily use. Product innovations developed by ERHARD have therefore often been copied and today form the standard in the needle valve market. But only the combination of well thought through details and decades development, production, installation and maintenance experience results in the perfect original, the ERHARD RKV needle valve.

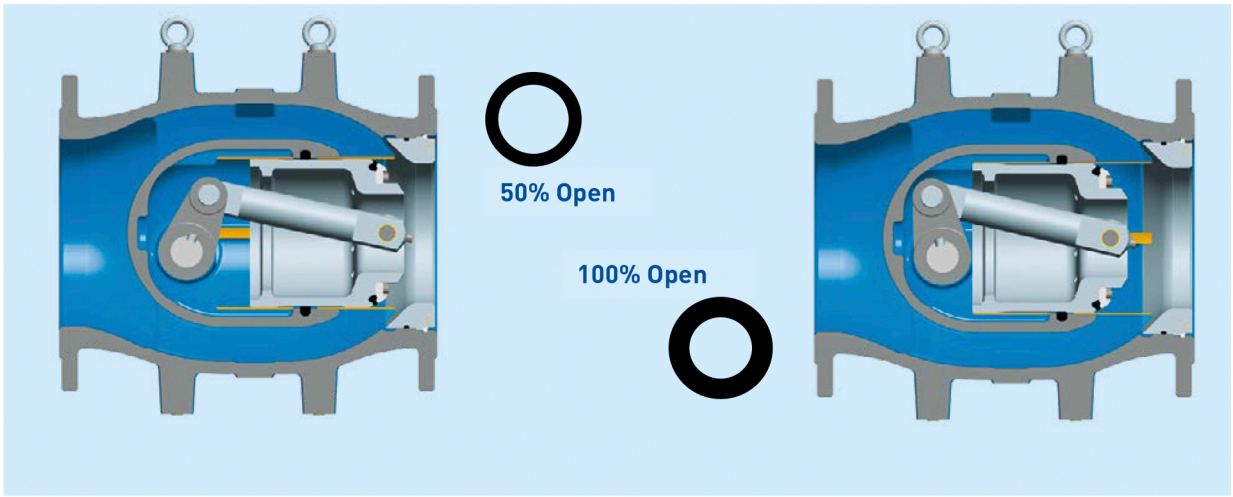


Improper continuous use of butterfly valves as a control valve can result in dramatic material damage, as in this valve opened by 5° after a year in seawater.

## The principle of the needle valve

The cross-section in the valve is reduced to control pressure ratings and flow rates. But while asymmetrical cross-sections result in gate valves or valves (e. g. if the gate valve is closed from above), in the needle valve a ring-shaped cross-section always exists in every position, which therefore, depending of the cylinder type, enables a linear control curve over a wide range.

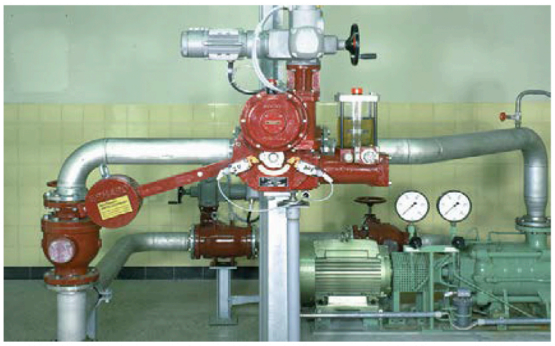
Initially the cross-section is steadily reduced from the inlet up to the restrictor cross-section and the flow is guided along in a geometrically optimised shape on the teardrop shaped internal body. A sliding piston is axially guided inside the internal body for flexible and precise change in cross-section. This movement results from conversion of the rotary movement of the actuator shaft by the internal slider crank mechanism and ensures a defined ring-shaped crosssection in every position. Depending on the intended use, various control inserts are mounted on the piston, which split the flow into individual flow filaments for conversion of the energy. Water is guided though slots or perforations in a specific way intended to dissipate the energy in the safest possible way for the valve and the equipment installed downstream of the valve.




The design of the ERHARD RKV needle valve ensures a ring-shaped cross-section in every piston position and therefore safe, reliable energy conversion in the middle of the valve, which significantly minimises the effects of cavitation.

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ERHARD needle valves can be used for numerous tasks –
from the bottom outlet valve of dams through to complex control tasks.

## Designs for every purpose

ERHARD RKV needle valves, depending on their nominal size, are available as a one-piece type or a multipart type. Depending on the tasks to be fulfilled, a suitable control insert can be used: from a seat ring and a vaned ring to slotted cylinder and perforated cylinder through to other special types of control inserts.

ERHARD RKV needle valves can be used in numerous control applications, e. g.

- Downstream pressure control
- Upstream pressure control
- Reservoir control
- Flow control

Attention must also be paid to venting, depending on the positioning of the needle valve. For example, if it is positioned directly at the end of a pipe in a bottom outlet or a turbine bypass and is equipped with a vaned ring or a seat ring, the energy conversion takes place by splitting up the water jet and intensive mixing with the ambient air, so that separate venting is not necessary. Your ERHARD team will provide you with competent and comprehensive design advice.





Depending on the nominal size and design, ERHARD RKV needle valves are available as single or multipart types.

## Exemple of specific case:

- 100 bar to 1 bar in one valve with suitable cavitation protection technology.
- Very high precision flow control going as low as 0,1 liter / sec at 50 bar pressure difference and more
- Very fast actuation going below 0.5sec open to close
- customized inserts for liner and nonlinear Kv performance
- Complex multistage inserts tailormade to fit the toughest operating conditions in the water industry.
- Continues R&D in Erhard laboratories to further optimize current designs and to develop new solutions.
- Class 900 (PN160)
- Erhard is involved in many cases with consultants during the hydraulic study to provide valve characteristics and other useful data that will assist the designers.

Sumival

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# NEEDLE VALVE RKV

**FOR MORE THAN 70 YEARS, ERHARD HAS BEEN THE EXPERT IN NEEDLE VALVES WITH HIGH-QUALITY COMPONENTS AND FEATURES ADAPTED TO YOUR NEEDS EVEN FOR EXTREME CONDITIONS - TRUST THE EXPERT.**

Designed to meet highest demands in terms of performance and versatility for a wide variety of applications – Quality Made in Germany.

**EXPERTISE**
For customized solutions, trust the expertise of ERHARD for preventing cavitation damage. We provide adapted solutions for every application.

**PERFORMANCE**
The exactly adapted regulating range based on adaptable cylinder with a reliable operation linked to a securely guided piston.

**DURABILITY**
Uninterrupted corrosion protection at least 250 µm epoxy coating acc. GSK optimised guiding element ensure long service life and clean water.

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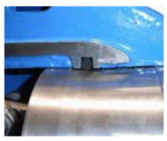
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# NEEDLE VALVE RKV

## Low-wear sealing

HIGH DURABILITY

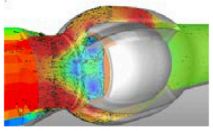
- Wide main seal in hydraulically non-critical and cavitation-free zone
- Main seal in stainless steel chamber safely enclosed
- All sealing systems are designed to minimize wear



## Proven Engineering

CUSTOMIZED SOLUTIONS

- A large number of actuator options are available, electric, pneumatic, hydraulic, weight loaded
- Innovative and customer-focused product development
- In-house research institute for product testing



## 3D simulations

ENGINEERING KNOW-HOW

- Simulations of the flow performance with state-of-the-art 3D CAD systems confirm the optimized flow pattern

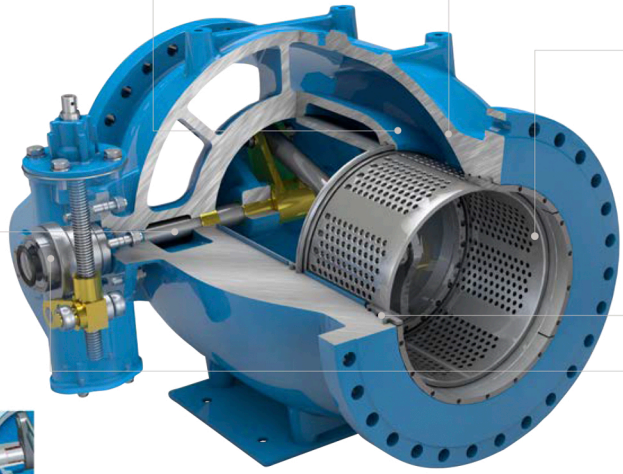


## Expert in cavitation control

PRESSURE CONTROL EXPERT

- Wide range of cylinders
- Technical expert able to advice the design that fits best to your application

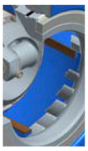




## Piston Guiding

HIGH DURABILITY AND STABILITY

- Piston is precisely guided by at least 4 guides
- Allows any installation position
- Designed for stability and long service life





## Bearing system

SAFE AND TIGHT

- Maintenance-free self-lubricating bushes
- Additional shaft seal to protect corrosion and stagnant water

## Uninterrupted corrosion protection

HIGH DURABILITY

- Internal and External Coating Epoxy at least 250 µm acc. GSK

## SKG slider crank gearbox

PERFORMANCE AND RELIABILITY

- A large stroke for an optimal control
- Precise regulation even at the smallest flow



### ISOLATION VALVES



INFINITY RESILIENT SEATED GATE VALVE

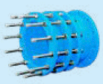


BALL VALVE



ROCO WAVE DOUBLE ECCENTRIC BUTTERFLY VALVE

### COMPLEMENTARY PRODUCTS



DISMANTLING JOINT

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## THE PERFECT SOLUTION EVEN FOR SPECIAL REQUIREMENTS

ERHARD RKV needle valves are suitable for classic uses such as the bottom outlet control and safety devices in turbines and pipes and could be customized to cover a wide range of application:

- Shut-off device in pipes with high operating pressure and high flow velocities
- Pump start-up valve
- Return flow prevention for pumps with drop weight
- Safety overflow valve for removing impermissible pressure increases in the pipe system (free of auxiliary power)
- Turbine bypass
- Pump recirculation bypass
- Filling valve for high pressures and pipe discharging in the open air or for large pipelines
- Flushing/purging valve
- Pump test rig
- Air flow rate control in aeration tanks
- Industrial applications



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An ERHARD needle valve with ingenious control engineering was installed in the secondary turbine outlet during the modernisation of a River Danube power station. The valve operates autonomously via its own medium control and if the turbines are shut down, pressure surges and therefore risk to the plant are reliably avoided.

In storage operation of large drinking water supply plants, geodetic energy is often available virtually free of charge. Reliable valves suitable for use with drinking water are necessary in the parts of the plant in which energy recovery is possible. An example of the use of ERHARD valves for these application cases is a needle valve DN 600 PN 16 with weight-loaded hydraulic actuator and magnetic clutch. Up to 1,200 l/s have to be safely controlled upstream of the turbine and must be stopped reliably and without surges if the turbine is shut down. In this application case, ERHARD proves to be a competent partner for the project planning and design of valves.



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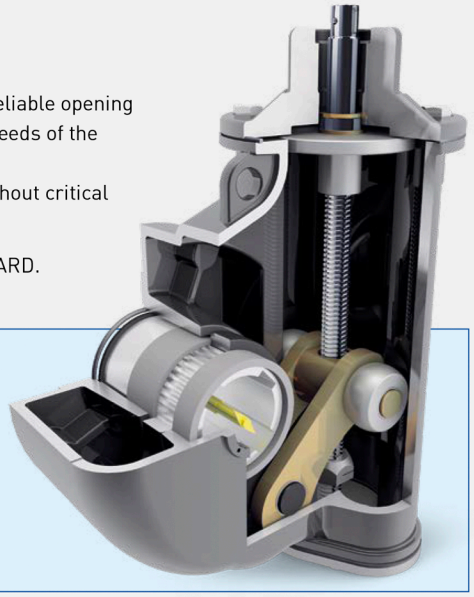
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# SKG SLIDER CRANK GEARBOX

## PERFECTLY ADAPTED TO THE VALVE DYNAMICS

RKV with a unique slider crank gearbox (SKG), is the ideal solution for reliable opening and closing, as its movement kinematics are optimally adjusted to the needs of the needle valve.
It therefore enables optimum control of even the smallest quantities without critical annular clearance and a large control range of up to 96 %.

The high precision SKG gearbox is developed and manufactured at ERHARD.



- SYSTEM SAFETY
- IP68 SYSTEM



### Standardized ISO Connections

The SKG gearbox input and output flange connections are standardized accoding to DIN ISO 5210/5211 allowing full flexbility for all actuation methods



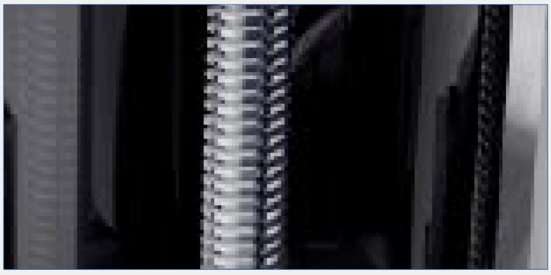
### Adustable end stop on the spindle

The robust, adjustable end stop on the spindle ensures that no forces are being exerted on the housing parts during operation. The inner parts are made of bronze and stainless steel, ensuring a long life time.



### Mechanical position indicator with sight glass

The mechanical position indicator with a pointer directly connected to the valve shaft is visible through a sight glass in the gear box. The sight glass is made of impact resistant polycarbonate (PC) and thus suitable for chamber or underground installations.



### Self-locking mechanism

The SKG gearbox is characterized by a self-locking effect in any position thanks to a trapezoidal thread. It therefore has the advantage that it does not have to be secured separately in a resting position.

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# COATING

## PERFECT PROTECTION FOR EVERY FIELD OF APPLICATION

Corrosion protection for long lasting valves and clean water is a key technology of ERHARD needle valves.

EKB fusion bonded epoxy coating represents the classic coating solution, being a proven technology suitable for the most common requirements. EKB is physiologically non-hazardous and has confirmed test certificates for drinking water, among others, from the DVGW Research Centre TZW Karlsruhe, from the Hygiene Institute of Gelsenkirchen and the WRAS (WRC) in Great Britain.

Additionally, customized solutions like EPC and other coatings adapted to the application are available upon request.

## EKB FUSION BONDED EPOXY COATING

ERHARD works using the latest technologies and complies with the test conditions of the Quality Association for "Heavy Duty Corrosion Protection of Powder Coated Valves and Fittings" (GSK). The standard thickness is at least 250 µm, layer thicknesses up to 500 µm are possible.

ERHARD covers two coating processes for fusion bonded epoxy coating:

- Electrostatic powder coating in accordance with the GSK Quality Association (RAL-GZ 662).

  The epoxy resin coating provided in the powder coating process is one of the most often used corrosion protection processes. During this process, the coating is applied in a precisely defined thickness and melted on at exactly 210 °C.

- Wet electrostatic coating applying the liquid epoxy resin material directly on to the valve.

  With large valves, EKB is applied in a wet process in a two-layer structure:

  A cathodic basic protection is followed by an electrostatic wet coating using a low-solvent two component epoxy resin. In the heat channel, the final bonding takes place to the heavy corrosion protection according to DIN 30677-2.





EPOXY COATING AT THE ERHARD PLANT IN HEIDENHEIM/ GERMANY

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# CHOICE OF MODEL AND DIMENSIONING

The RKV needle valve contribute to an overall optimized system for a lowest energy consumption when the valve is fully open to an adapted pressure and flow in regulation mode. The energy consumption and flow is also submit to the cylinder which must be choosen in fonction of the application. The choice of size and cylinder are decisive for an optimal behaviour of the global system and take place with 2 main elements, the hydraulic performances and the cavitation risk. Special calculations are necessary for special uses (e. g. as bottom outlet, pump bypass, turbine inlet or bypass valve); our engineers would be pleased to perform these calculations for you.

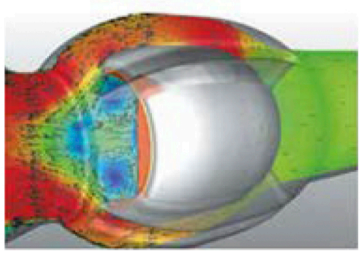
## DESIGNED FOR BEST HYDRAULIC PERFORMANCE:

Key figures are Kv and ζ (zeta) values

- The Kv-factor of a valve indicates the water flow in m³/h at a pressure drop across the valve of 1 kg /cm2 at 5-30°C when the valve is 100% open.
- The head loss coefficient ζ (zeta), also referred to as pressure loss coefficient or resistance coefficient is a dimensionless measure in fluid mechanics reflecting the resistance in a certain hydraulic element. This resistance depends on the geometry of the system.
- The zeta value can be derived from the Kv value and vice versa.
  High Kv factors and low zeta values mean reduced pressure losses and thus, smaller pump capacities.

| DN | Seat ring | | Vaned ring | | Slotted cylinder | |
|---|---|---|---|---|---|---|
| | ζ (zeta) | Kv m³/h | ζ (zeta) | Kv m³/h | ζ (zeta) | Kv m³/h |
| 100 | 1 | 400 | 1,2 | 365 | 3,1 | 230 |
| 125 | 2,7 | 380 | 2,9 | 366 | 8,3 | 220 |
| 150 | 1,6 | 711 | 2,4 | 580 | 7,3 | 330 |
| 200 | 1,3 | 1402 | 1,6 | 1.260 | 7,6 | 580 |
| 250 | 1,9 | 1812 | 2,5 | 1.580 | 8,5 | 860 |
| 300 | 1,4 | 3039 | 1,9 | 2.610 | 7,6 | 1.310 |
| 350 | * | * | 1,5 | 4.000 | 6,5 | 1.900 |
| 400 | * | * | 1,5 | 5.220 | 6,5 | 2.510 |
| 450 | * | * | 1,5 | 6.610 | 6,5 | 3.180 |
| 500 | * | * | 1,5 | 8.160 | 6,5 | 3.920 |
| 600 | * | * | 1,5 | 11.700 | 6,5 | 5.650 |
| 700 | * | * | 1,5 | 16.000 | 6,5 | 7.680 |
| 800 | * | * | 1,4 | 21.600 | 6,5 | 10.040 |
| 900 | * | * | 1,4 | 27.300 | 6,5 | 12.700 |
| 1000 | * | * | 1,3 | 35.000 | * | * |
| 1200 | * | * | 1,1 | 54.900 | * | * |
| 1400 | * | * | 1,1 | 74.700 | * | * |
| 1600 | * | * | 1 | 102.300 | * | * |
| 1800 | * | * | 1 | 129.500 | * | * |

Note: Special calculations incorporating the precise installation situation are necessary for the designs marked with an asterisk (*); we would be pleased to perform these calculations for you based on your application data. All values have been determined under practical conditions in ERHARD's in-house test centre.



$$K_v = \frac{Q}{\sqrt{\Delta p}} \qquad \zeta(zeta) = \frac{d^4}{626{,}3 \cdot {K_v}^2}$$

Kv-factor is defined in VDI/VDE Richtlinien No. 2173

Q = Water flowrate
Δp = Differential pressure
d = Nominal diameter
v = Flow speed

## FLOW SPEEDS:

Following needed application RKV valve could be adapted with different accessories like air admission so as to extend the admissible flow velocity to the application need. To ensure perfect operation, for velocities above 1.5m/s we recommend a straight pipe section of at least 3-5 x DN upstream and 5-10 x DN downstream of the valve, within which there must be no fittings or valves.

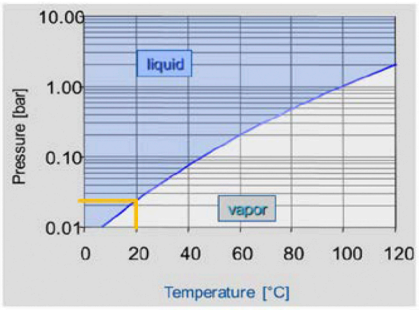
## REGULATION RANGE:

RKV Valve are designed for an optimal regulation range between 10 to 85% of opening. Some extension of this regulation range is possible but need to be controlled during the design phase with the technical support team.

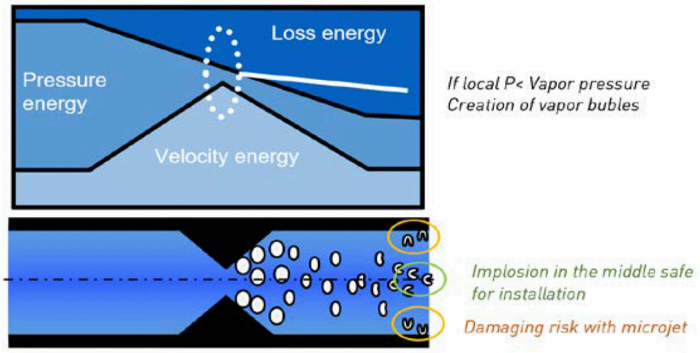
## CAVITATION UNDER CONTROL:

Depending on the pressure and velocity conditions, turbulence and cavitation zones can occur in pipes and fittings which can cause vibrations, oscillations and, under certain operating conditions, can even cause material damage.

Cavitation occurs if vapour bubbles form and implode in the pipe. According to Bernoulli's law, the total energy of a flowing medium is always the same; and therefore, the sum of the potential, pressure, velocity (kinetic) and lost (dissipated) energy is constant. If the flow velocity now increases at a constriction, e. g. a needle valve, the pressure energy simultaneously falls. If the pressure falls below the medium's saturation vapour pressure, vapour bubbles form which further deform after the constriction. Downstream of the constriction the velocity reduces again, and the pressure increases, so that the bubbles finally implode. The microjet produced as a result can hit components with high velocities and remove component material where they impact. Therefore, a decisive factor for use of the needle valve is for the energy conversion to take place in the middle of the valve, which is ensured by the design of the flow profile and special control inserts.

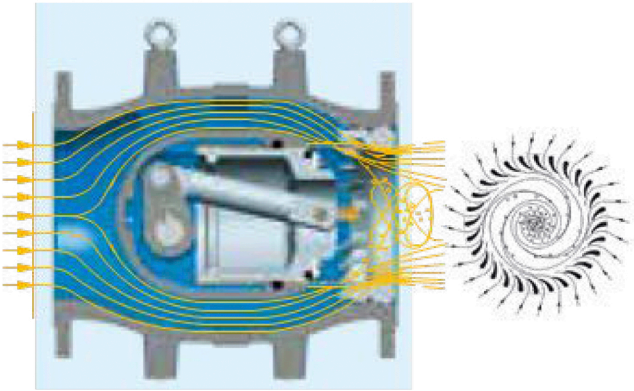



Water vaporpressure curve
At 20°C Vaporisation pressure 0.025bar

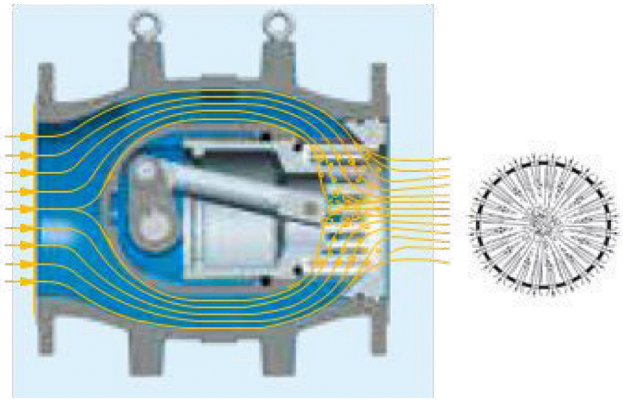



Creation of cavitation with flow restriction area

## CYLINDER SPECIALLY DESIGNED TO CENTRALIZE THE CAVITATION IN THE MIDDLE OF THE PIPELINE



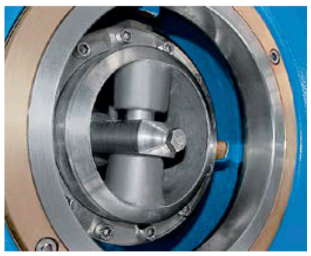
Vaned ring
For average pressure differences and in back pressure



Slotted and perforated cylinder
For high pressure differences

# THE CYLINDER TO CONTROL CAVITATION

RKV Valve are designed for an optimal regulation range between 10 to 85% of opening. Some extension of this regulation range is possible but need to be controlled during the design phase with the technical support team.

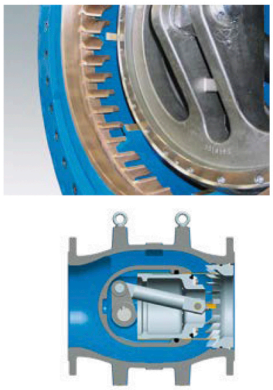


## Safe and reliable pressure reduction and cavitation under control

ERHARD control valves are fitted with a seat ring as a basic standard: this is the suitable solution for low pressure loss coefficients (K-values) or for the medium air. For most of all other applications, it makes sense to use special control inserts matched to the respective operating conditions; the design of these inserts is only one example of ERHARD's extensive know-how for control tasks. They ensure that the velocity increase which occurs when the cross-section is changed do not result in cavitation damage. Choice of the correct control insert depends on the operating conditions, the differential pressure and the resulting cavitation behaviour. We would be pleased to advise you.

## Vaned ring

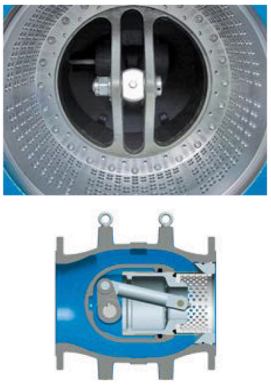
The vaned ring is a ring with uniformly arranged blades, which split the flow into individual flow filaments just before the discharge and due to their shape set them in a spiral movement. The outer flow is pressed against the wall of the outlet part or the downstream pipe so that the cavitation bubbles which occur do not come anywhere near the wall, but instead are bundled together to form a "pigtail" in the middle of the pipe. There they are dissipated without causing any damage. Vaned ring are used for a dynamic head ratio of 0.6 or higher.



Vaned ring



Slotted cylinder



Perforated cylinder

## Slotted cylinder

Slotted cylinders, on the other hand, are the suitable design for high pressure differences. This attachment extends the end piston in a similar way to a pipe and is especially designed to the specific operating conditions. The water jets flowing from the outside to the inside through the slots are split up at the slots and reach a high velocity. Then, in the material free centre of the cylinder, they collide with the jets emerging from the slots on the opposite side. On collision part of the kinetic energy is converted into pressure energy. The cavitation bubbles occurring at the slots and dragged along with the jets are dissipated by this increase in pressure in the centre of the flow without causing any damage.

## Perforated cylinder

The perforated cylinder, which functions in the same way as the slotted cylinder.

## Other control inserts available

- Special slotted cylinder
- Special perforated cylinder
- Throttle ring
- Control inserts for bottom outlets

Suministros Industriales Arbaiza, S.L.

## CALCULATION AND SERVICE:

Our team support you from the planning and design to the commissioning and maintenance:

**Planning and design:**

- Individual advice
- Calculation and advice on optimal solutions



Calculation report sample

**The following data is required:**

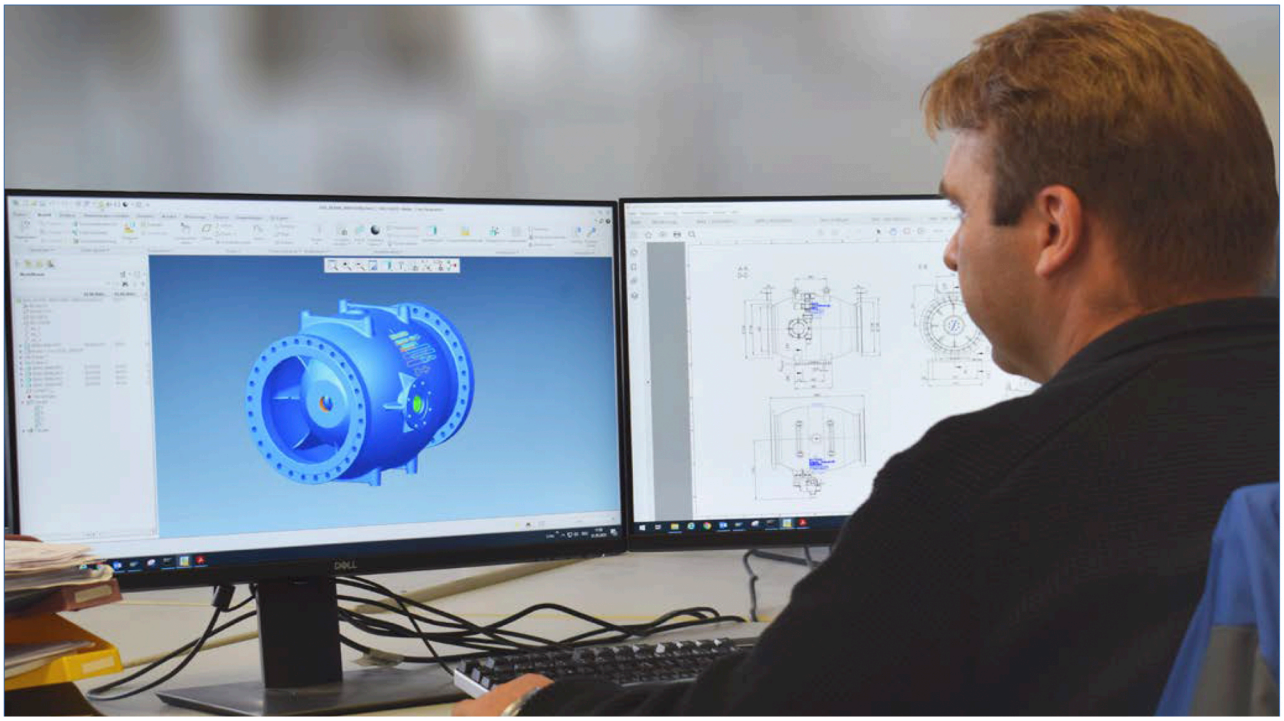
- Flow rates Qmax. and Qmin.
- Upstream pressure of the valve (for Qmax/Qmin)
- Dynamic heads on any available point of the range
- Downstream pressure of the valve (for Qmax/Qmin)
- Area of use (control device, bottom outlet, etc.)
- Required actuator type
- Operating mode (continuous or short-term operation, etc.)
- In-house laboratory for product tests and trials

**Installation and commissioning**

- On-site assembly and installation
- Training and instruction

**Maintenance and repair**

- Inspections and services
- Fast spare part supply
- Repairs on site or in our Heidenheim factory



# ACTUATION

## OVERVIEW OF ACTUATION METHODS

The actuation design is always adapted to the application and specific need.



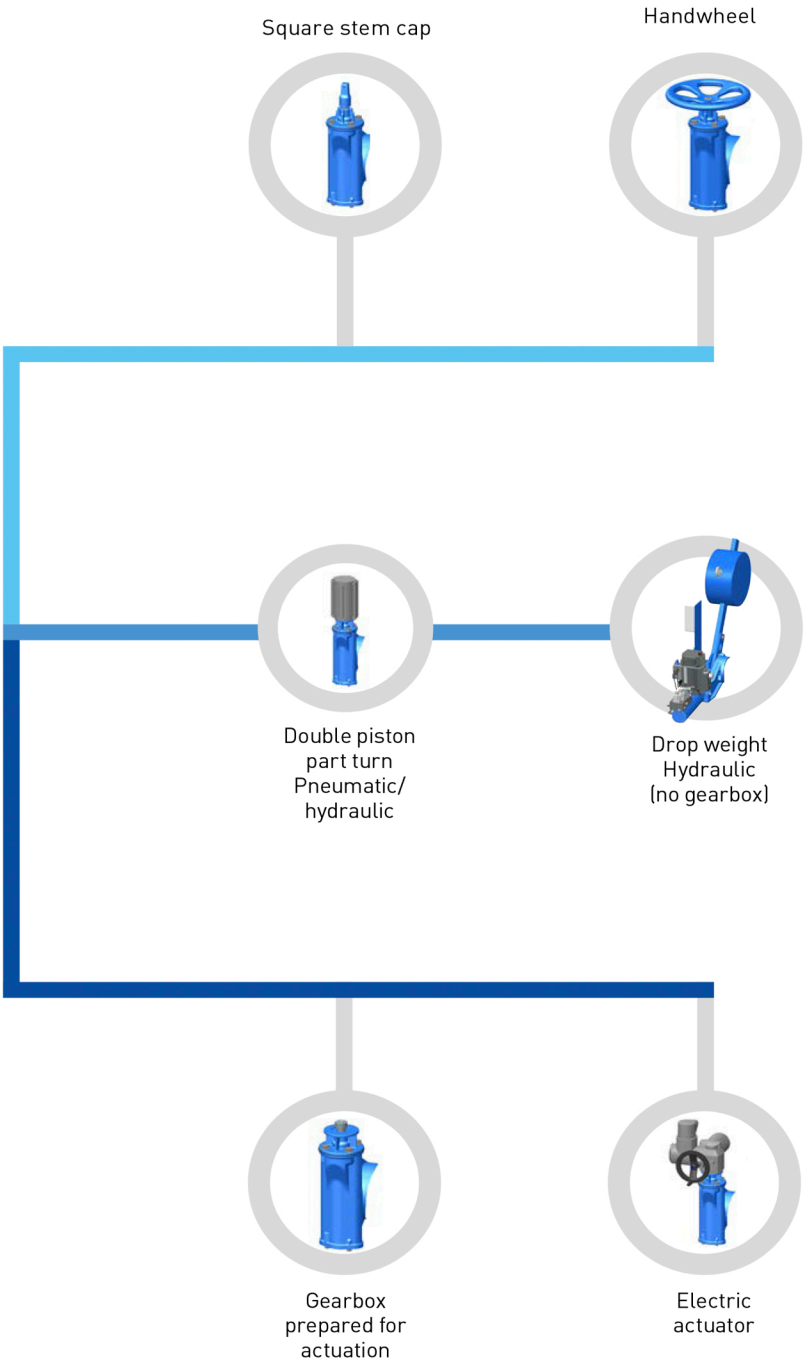
WITHOUT FLANGES - FOR ACTUATION WITH CAPTOP, HANDWHEEL OR EXTENSIONS



**VALVE WITH BARE SHAFT**



FLANGED CONNECTION ACC. TO DIN ISO 5210 - PREPARED FOR ACTUATOR



Suministros Industriales Arbaiza, S.L.



Polígono Ind. Igeltzera Nº6 2J · 48610 Urduliz - Bizkaia - Spain · Telf.: 94 676 62 10 · sumival@sumival.com · www.sumival.com

INSCRITA EN EL REG. MER. DE BIZKAIA, TOMO 728, LIBRO 0, FOLIO 52, HOJA Nº BI-9922, INSCIPCION 2º CIF: B-48580377

Suministros Industriales Arbaiza, S.L.

# QUALITY AND TESTING

- Without exception, 100% of ERHARD valves are tested according to DIN EN 12266, or as per customer requirements. Additionally, ERHARD conducts tests above industry standards.
- Type tests are conducted according to DIN EN 1074 (2500 cycles endurance resistance).

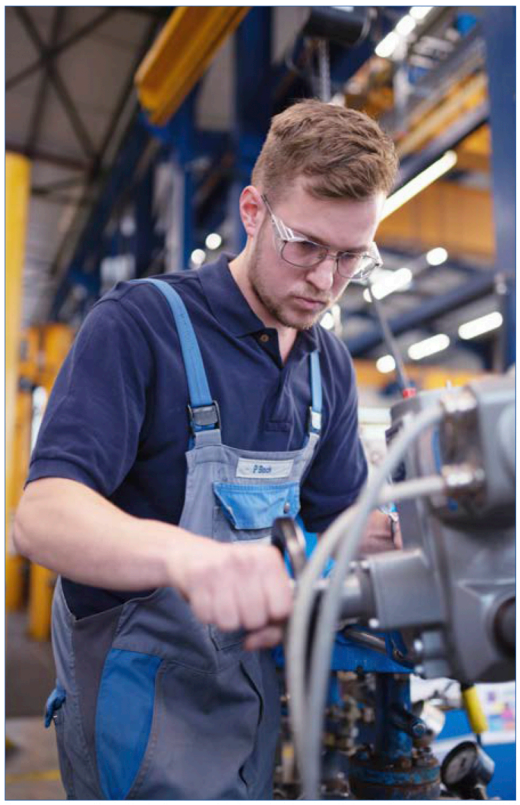


**Testing pressures**

| Pressure values of testing / body test | | | |
|---|---|---|---|
| | PN 10 | PN 16 | PN 25 |
| acc. EN 12266 | 15 | 24 | 37,5 |
| acc. EN 1074 | 17 | 25 | 42,5 |

**Testing durations**

| Duration values of testing / body test | | |
|---|---|---|
| DN of valves | EN 12266 | ERHARD |
| ≤ DN 150 | 60 s | 300 s |
| DN 150 - DN 300 | 120 s | 300 s |
| DN 350 - DN 500 | 300 s | 300 s |
| > DN 500 | 300 s | 600 s |



## APPROVALS

A cutting-edge traceability system applied from the reception of raw material to product supply, together with an exhaustive control of proces-ses, guarantees the top quality of our products.

ERHARD valves are suitable for potable water and they are approved by the most prestigious organisations all over the world.

WRAS APPROVED PRODUCT

DVGW Only for components

NSF

QUALITY AND TESTING

## CERTIFIED PROCESSES

In addition, the TÜV certification according to DIN EN ISO 9001 and industry-specific certifications guarantee the highest quality and efficiency of all ERHARD processes and thus also of our valves.
(DIN ISO 9001:2015; DGRL 2014/68/EU Modul H; KTA 1401; AD-WO/2014/68/EU)

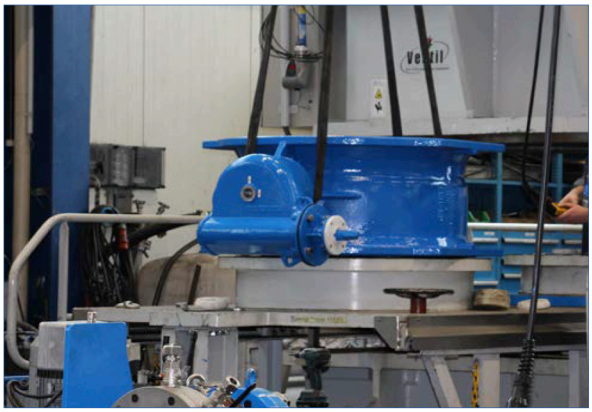
## PREQUALIFICATIONS AND AUDITS

- ERHARD is prequalified at renowned utility companies such as Thüga, innogy, Berliner Wasserbetriebe and Bodensee-Wasserversorgung.
- Country registration procedures such as SPAN (Malaysia) and yearly audits such as for IGH (Croatia) and BULGARKONTROLA (Bulgaria) are part of our Quality Management routine.
- Regular audits according to customer specifications demonstrate suitability in terms of quality, know-how and performance.



## OWN RESEARCH INSTITUTE

ERHARD has the infrastructure to test the quality of its products and validate the results directly. Testing grounds, laboratories and immediate testing results for our product engineering processes on site, enable us to provide the highest quality of our products. In our own research institute at ERHARD, we can test valves up to DN 1200. E.g. we can measure and carry out flow characteristics, endurance tests, corrosion tests, torque detection and much more.



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Suministros Industriales Arbaiza, S.L.

# AFTER-SALES AND SERVICES

## ABSTRACT OF OUR SERVICE-RANGE:

- Original spare parts
- Spare parts
- Repairs in our factory
- Technical on-site maintanance
- Product trainings
- Inspections
- Maintanance
- Revisions
- Commissioning
- Trainings of maintanance instructions

## PERSONAL AND TELEPHONE SERVICE ADVISE

The ERHARD specialists will be happy to inform you in a personal meeting about the comprehensive portfolio of technical services. Experienced service technicians will also be happy to answer your questions by phone and thus ensure shorter downtimes. You can reach the right contact person under the following phone / fax numbers:

**Complaint acceptance**
Tel.: +49 7321 320-398

**On-site maintanance**
Tel.: +49 7321 320-398

**Repairs in our factory in Heidenheim**
Tel.: +49 7321 320-325

**Technical questions to delivered products**
Tel.: +49 7321 320-313

**Spare parts**
Tel.: +49 7321 320-530

**Requests of service performance**
Fax: +49 7321 320-550

## REVISION ADN REPAIR IN OUR FACTORY



before



after

## SERVICE CONTRACTS AND WARRANTY

You have the statutory warranty claim for ERHARD products. With a maintenance contract tailored to your needs, you can extend the warranty individually.

Talk to us, we will be happy to advise you.

## REFERENCE PRJOECT: WENDEFURTHER DAM

The heavyweight (needle valve)) with a nominal width of two meters and a weight of 40 tons was sent by heavy goods vehicle on the two-day journey from the Harz to Heidenheim. In addition to the repair, the overall construction was also optimized by specialists from ERHARD





The needel valve DN 2000 has been revised at ERHARD in August 2009 after the valve had been working continuously since the dam was commissioned in 1967.

# A LARGE RANGE OF PRODUCT ADAPTED TO YOUR NEEDS OF CONTROL

Needle valves are only one product variant of control valves from ERHARD Range. There are two more types for basic applications:

- Valves controlled by their own medium, which obtain their actuation energy from the flowing medium, e. g. pressure reducing, pressure retention and floating valves, the Hydrobloc PREMIUM range.
- Valves controlled by external energy, which are actuated electrically, pneumatically, hydraulically, manually or by potential energy as, apart from the needle valve, the REV control valve.

All fulfil the requirements in an optimum way:

- Control characteristics to control large flow ranges
- Removal of pressure differences without generation of cavitation damage
- Low vibrations and quiet energy conversion

## HYDROBLOC PREMIUM

The hydrobloc PREMIUM is a range of control valve with different function of control:

- pressure,
- level,
- flow.

The design of this range was done to optimize the robustness and ease the maintenance. The Hydrobloc Premium is the optimal solution for water network control with a hydraulically controlled valve.



## ERHARD REV CONTROL VALVE

The REV control valve is suitable for all throttling and regulation tasks in nominal sizes DN 50 to DN 150. The main component is the fixed slotted cylinder in which the control piston is moved and covers or releases the slot areas depending on the control position.

The REV control valve is used particularly where flexible control is necessary, in conjunction with electronic controllers, pressure gauges, flow meters or float switches, or simpler with a handwheel.



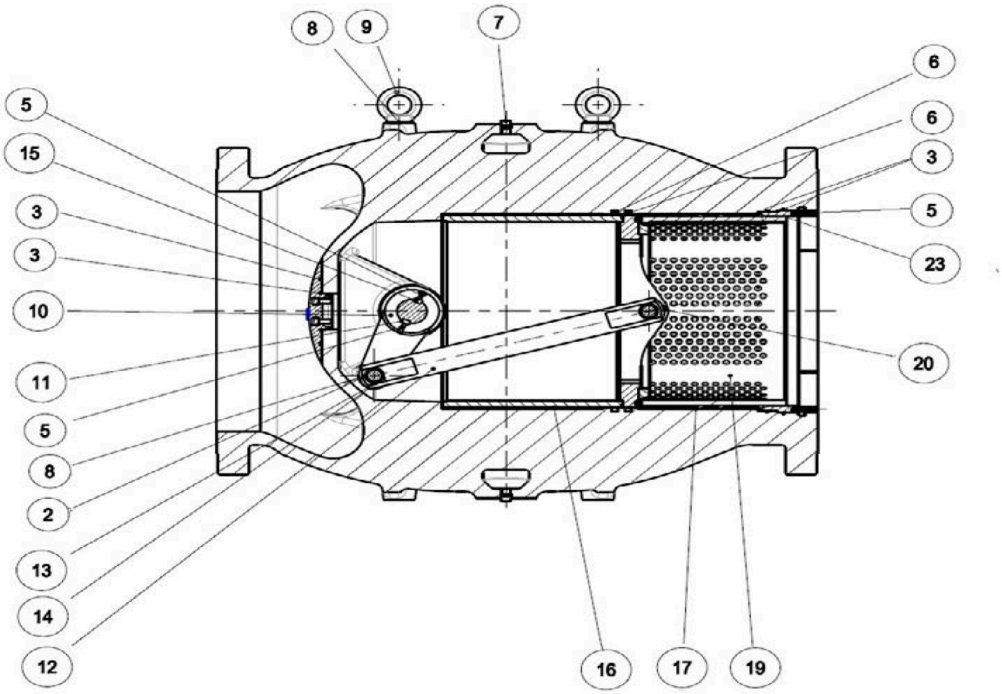
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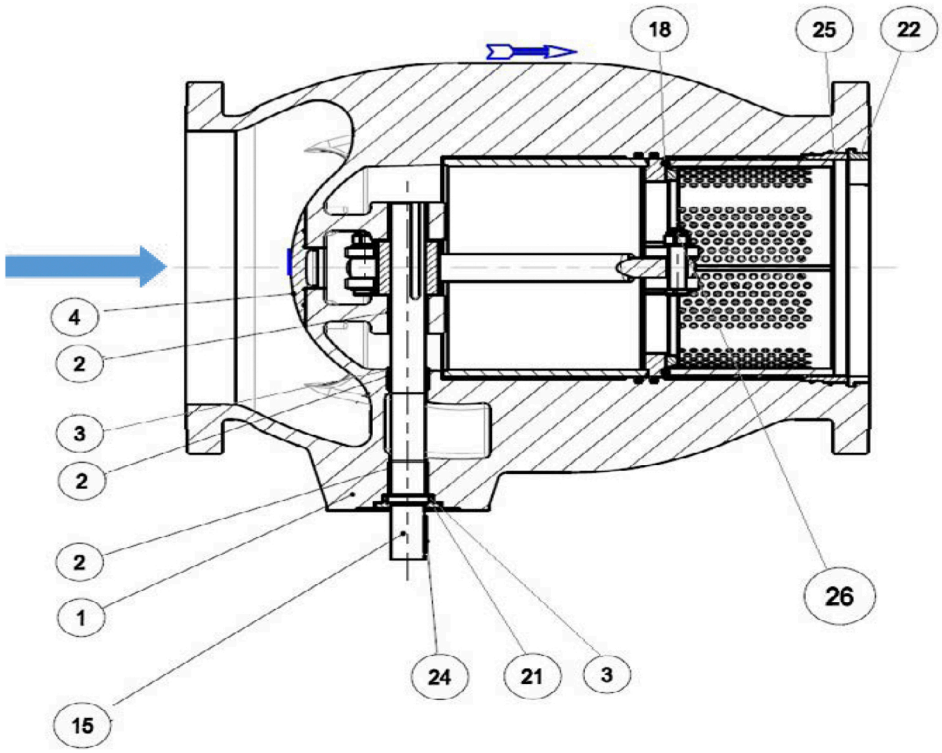
# ERHARD CONE OUTLET VALVE

The cone outlet valve is a special variant of control valve and the ideal fitting for using under extreme conditions. Thanks to its excellent hydraulic features, the cone outlet valve can be used to control a large amount of water with the smallest possible diameter. The head loss coefficient of a cone outlet valve is even lower than a control valve for free discharge applications. The typical applications for this control valve are dam water level control, emergency and environmental applications. Diameters range up to DN2000 and more upon request.



# MAIN COMPONENTS MATERIAL



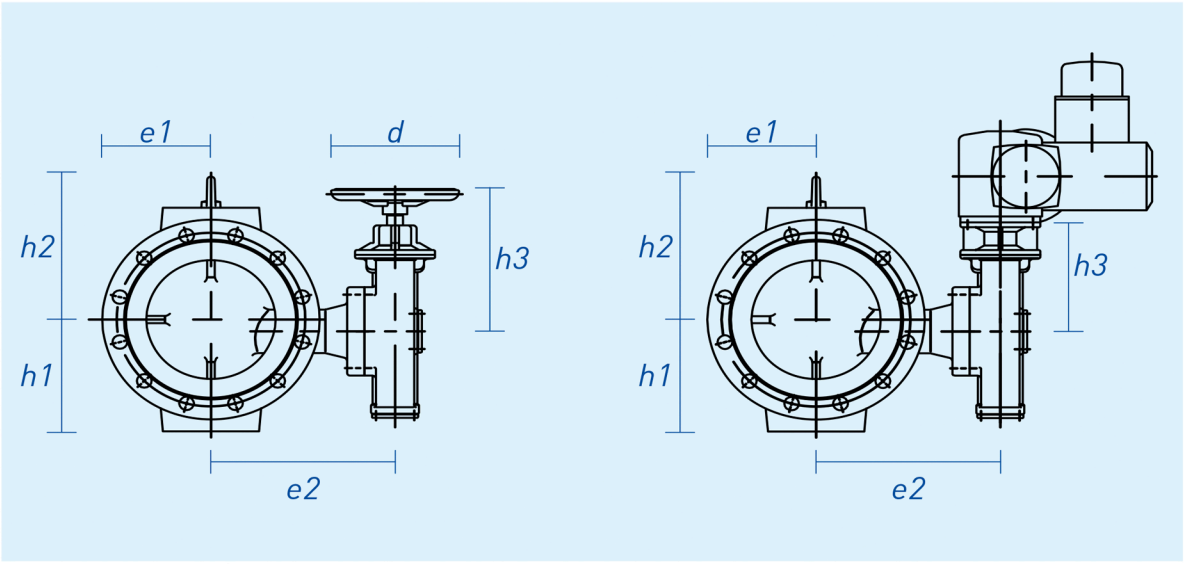



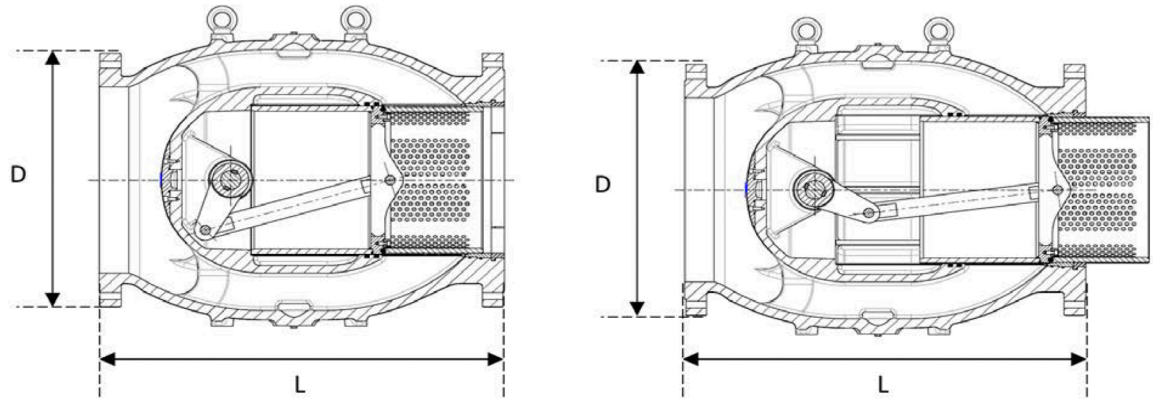
## MAIN COMPONENTS

| Pos. | Description | Material - Standard | Optional | Spare Part | Water contact |
|---|---|---|---|---|---|
| 1 | BODY | EN-GJS-500-7 | | | |
| | COATING | Epoxy coating 250µm | EPC Multilayer fusion and wet epoxy up to 500µ | | x |
| 2 | BUSH | CC483K | | | x |
| 3 | O-RING | EPDM | | | x |
| 4 | COVER | EN-GJS-500-7 | | | |
| | COATING | Epoxy coating 250µm | EPC Multilayer fusion and wet epoxy up to 500µ | | x |
| 5 | HEXAGON SOCKET HEAD CAP SCREW | DN100-300 A4<br>DN350-1400 A2 | | | x |
| 6 | SEALING RING | | | | x |
| 7 | SCREW PLUG | | | | x |
| 8 | WASHER | 1.4301 | | | x |
| 9 | EYEBOLT | 1.1141 | | | |
| 10 | GEARBOX CRANK | DN100-300 1.4469<br>DN350-1400 A351<br>Gr.CF8M | | | |
| 11 | PARALLEL KEY | DN100-300 1.4401<br>DN350-1400 1.4301 | | | |
| 12 | PISTON ROD | DN100-300 1.4401<br>DN350-1400 1.4301 | | | |
| 13 | BOLT | DN100-300 A4<br>DN350-1400 A2 | | | |
| 14 | CASTLE NUT | DN100-300 A4<br>DN350-1400 A2 | | | |
| 15 | DRIVE SHAFT | DN100-300 1.4462<br>DN350-1400 1.4057 | | | |
| 16 | PISTON WELDED | | | | x |
| 17 | GUIDE | DN100-150 Stainless steel<br>DN200-300 Bronze<br>DN350-2000 Brass | | | x |
| 18 | PROFILE RING | EPDM | | x | x |
| 19 | PERFORATED CYLINDER | | | | x |
| 20 | HEXAGON SCREW | DN100-300 A4<br>DN350-1400 A2 | | | x |
| 21 | RETAINING CAGE | CC483K | | | x |
| 22 | RETAINING RING | 1.4301 | | | x |
| 23 | SEAT RING | 1.4404 | | | x |
| 24 | PARALLEL KEY | 1.0503 | | | |
| 25 | BRACKET | 1.4401 | | | x |
| 26 | SPLIT PIN | 1.0038 | | | x |

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## DIMENSIONS AND WEIGHTS




PN 10

| DN | L | D | h1 | h2 | h3 Handwheel | h3 Electric actuator | e1 | e2 | Handwheel turn number (Open/closed) | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|
| 200 | 400 | 340 | 195 | 248 | 244 | 165 | 152 | 288 | 20 | 120 |
| 250 | 450 | 400 | 234 | 296 | 314 | 233 | 188 | 365 | 25 | 190 |
| 300 | 500 | 455 | 266 | 322 | 314 | 233 | 224 | 402 | 25 | 260 |
| 350 | 700 | 505 | 280 | 342 | 360 | 292 | 280 | 420 | 43 | 425 |
| 400 | 800 | 565 | 310 | 372 | 365 | 297 | 310 | 460 | 42 | 570 |
| 450 | 900 | 615 | 340 | 411 | 404 | 331 | 335 | 510 | 36 | 780 |
| 500 | 1000 | 670 | 415 | 462 | 409 | 336 | 370 | 558 | 43 | 875 |
| 600 | 1200 | 780 | 500 | 548 | 517 | 416 | 440 | 645 | 43 | 1660 |
| 700 | 1400 | 895 | 535 | 644 | 566 | 465 | 510 | 720 | 57 | 2125 |
| 800 | 1600 | 1015 | 640 | 729 | 571 | 470 | 588 | 875 | 52 | 4450 |
| 900 | 1800 | 1115 | 700 | 828 | 531 | 430 | 655 | 860 | 58 | 4250 |
| 1000 | 2000 | 1230 | 830 | 937 | 531 | 430 | 513 | 996 | 60 | 7650 |
| 1200 | 2400 | 1455 | 950 | 1118 | 570 | 465 | 870 | 1110 | 78 | 8200 |

## PN 16

| DN | L | D | h1 | h2 | h3 Handwheel | h3 Electric actuator | e1 | e2 | Handwheel turn number (Open/closed) | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 325 | 220 | 142 | 187 | 222 | 154 | 99 | 214 | 15 | 60 |
| 125 | 325 | 250 | 142 | 187 | 222 | 154 | 99 | 214 | 15 | 60 |
| 150 | 350 | 285 | 158 | 203 | 222 | 144 | 116 | 231 | 15 | 75 |
| 200 | 400 | 340 | 195 | 248 | 244 | 165 | 152 | 288 | 20 | 120 |
| 250 | 450 | 400 | 234 | 296 | 314 | 233 | 188 | 365 | 25 | 190 |
| 300 | 500 | 455 | 266 | 322 | 314 | 233 | 224 | 402 | 25 | 260 |
| 350 | 700 | 520 | 280 | 342 | 360 | 292 | 280 | 420 | 43 | 450 |
| 400 | 800 | 580 | 310 | 372 | 365 | 297 | 310 | 460 | 42 | 595 |
| 450 | 900 | 640 | 340 | 411 | 404 | 331 | 335 | 510 | 36 | 826 |
| 500 | 1000 | 715 | 415 | 462 | 409 | 336 | 370 | 558 | 43 | 945 |
| 600 | 1200 | 840 | 500 | 548 | 517 | 416 | 440 | 645 | 43 | 1780 |
| 700 | 1400 | 910 | 535 | 644 | 566 | 465 | 510 | 720 | 57 | 2175 |
| 800 | 1600 | 1025 | 640 | 729 | 571 | 470 | 588 | 875 | 52 | 4475 |
| 900 | 1800 | 1125 | 700 | 828 | 531 | 430 | 655 | 860 | 58 | 4310 |
| 1000 | 2000 | 1255 | 830 | 937 | 531 | 430 | 513 | 996 | 60 | 7750 |
| 1200 | 2400 | 1485 | 950 | 1118 | 570 | 465 | 870 | 1110 | 78 | 8350 |

## PN 25

| DN | L | D | h1 | h2 | h3 Handwheel | h3 Electric actuator | e1 | e2 | Handwheel turn number (Open/closed) | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 325 | 235 | 142 | 187 | 222 | 154 | 99 | 214 | 15 | 60 |
| 125 | 325 | 270 | 142 | 187 | 222 | 154 | 99 | 214 | 15 | 60 |
| 150 | 350 | 300 | 158 | 203 | 222 | 144 | 116 | 231 | 15 | 75 |
| 200 | 400 | 360 | 195 | 248 | 244 | 165 | 152 | 288 | 20 | 120 |
| 250 | 450 | 425 | 234 | 296 | 314 | 233 | 188 | 365 | 25 | 190 |
| 300 | 500 | 485 | 266 | 322 | 314 | 233 | 224 | 402 | 25 | 260 |
| 350 | 700 | 555 | 280 | 342 | 360 | 292 | 280 | 420 | 43 | 450 |
| 400 | 800 | 620 | 310 | 372 | 365 | 297 | 310 | 460 | 42 | 595 |
| 450 | 900 | 670 | 340 | 411 | 404 | 331 | 335 | 510 | 36 | 826 |
| 500 | 1000 | 730 | 415 | 462 | 409 | 336 | 370 | 558 | 43 | 1000 |
| 600 | 1200 | 845 | 500 | 548 | 517 | 416 | 440 | 645 | 43 | 1800 |
| 700 | 1400 | 960 | 535 | 644 | 566 | 465 | 510 | 720 | 57 | 2265 |
| 800 | 1600 | 1085 | 640 | 729 | 571 | 470 | 588 | 875 | 52 | 4500 |
| 900 | 1800 | 1185 | 700 | 828 | 531 | 430 | 655 | 860 | 58 | 4500 |
| 1000 | 2000 | 1320 | 830 | 937 | 531 | 430 | 513 | 996 | 60 | 8000 |
| 1200 | 2400 | 1530 | 950 | 1118 | 570 | 465 | 870 | 1110 | 78 | 8500 |