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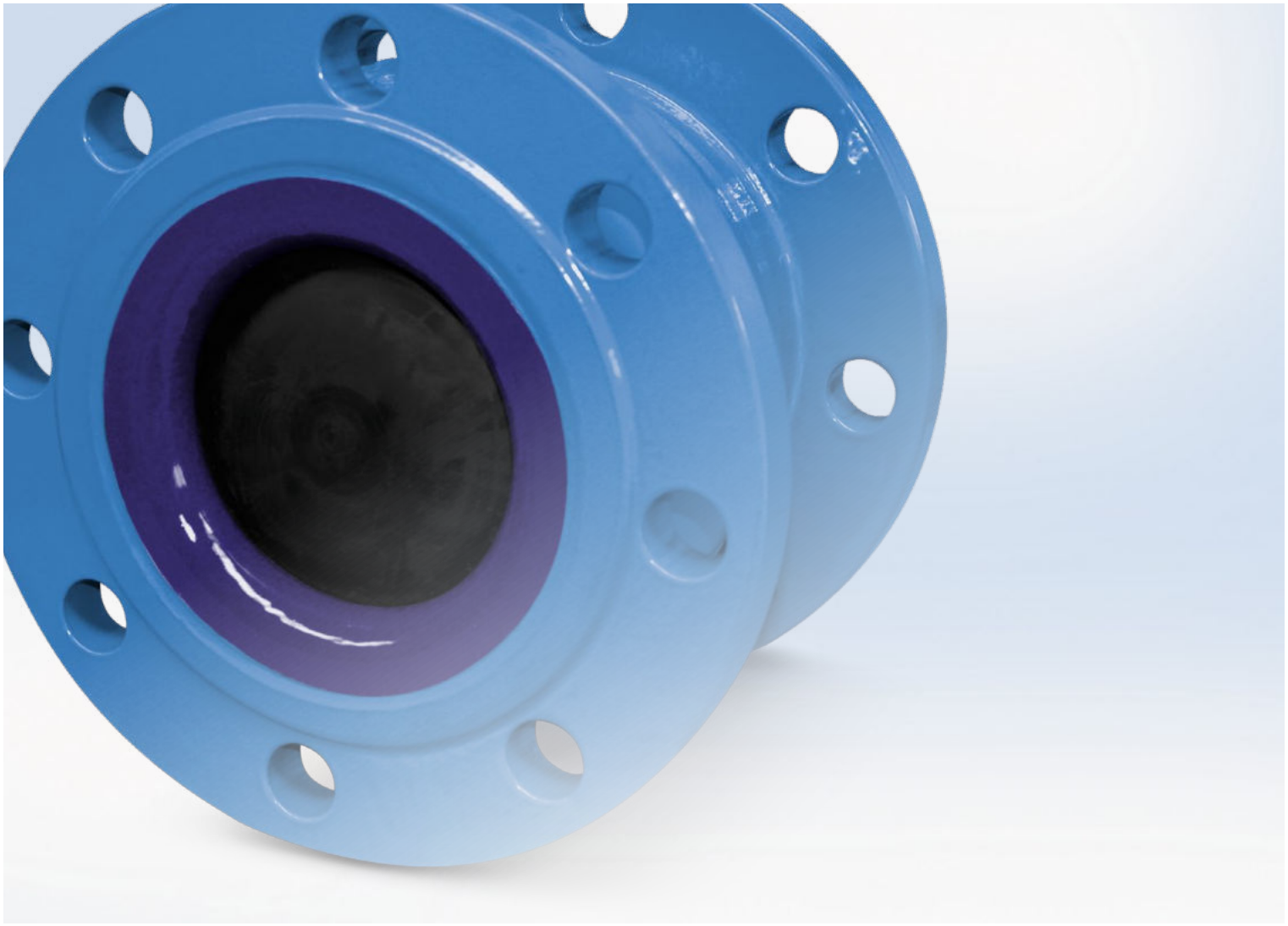
ERHARD

ERHARD
non slam nozzle check valve



The benchmark of non-return valves

The ERHARD non slam nozzle check valve is one of the most economical non-return valves. It is used to prevent reflux of the flow medium in a pipeline. The innovative ERHARD non slam nozzle check valve offers ERHARD quality with an optimum price-output ratio and excellent hydraulic performance. Thanks to some special design features, the ERHARD non slam nozzle check valve is the ideal non-return valve for any application.

Fields of application

Water supply, pump stations, water distribution, industry & process engineering

Flow media

Untreated water and drinking water as well as cleaned sewage water

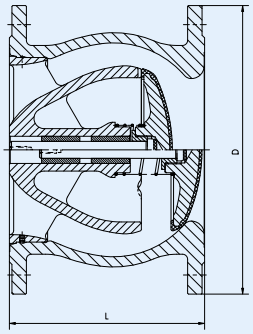
Typical examples of application

Non-return valve in pumping stations (with single or parallel pump operation), non-return valve in cooling-water circuits, foot valve in pumping stations, non-return valve for energy storage or network systems (e.g. delivery reservoirs, pipe networks, elevated tanks, headwater basins)

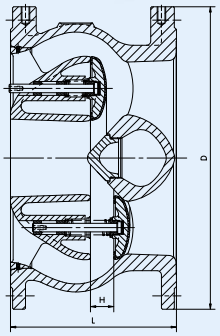
Scope of supply

- Nominal sizes: DN 80-300 and DN 350-600
- Pressure ratings: PN 10-40 and PN 10-16
- Temperatures: up to 60 °C (water)
- Face-to-face dimensions: adaptation to all the common face-to-face dimensions possible
- Special designs upon request

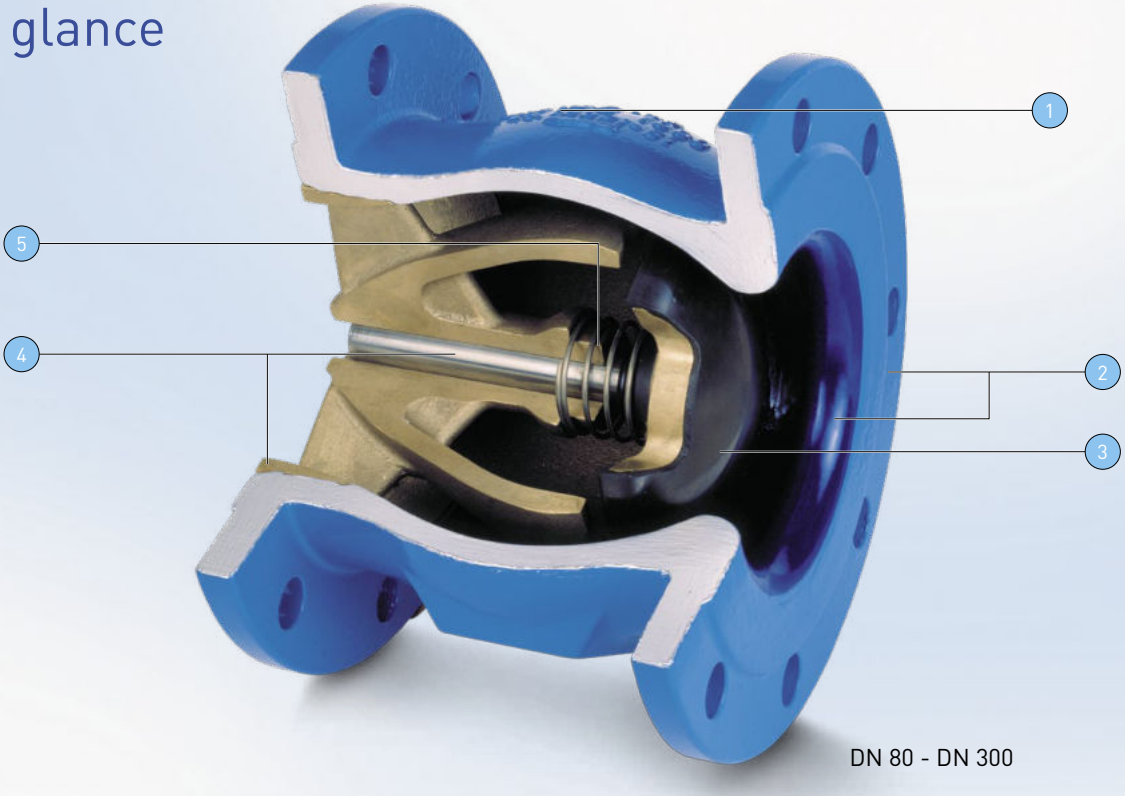
DN 80-300:
rubber-coated valve disc with KTW and W270 approvals



DN 350-600:
rubber-coated valve ring with KTW and W270 approvals for drinking water



Properties and advantages at a glance



DN 80 - DN 300

No.	Advantage	Property
	Very economical by continuous energy saving, low operating costs	Very low head loss thanks to optimised streamlined design: head loss coefficient ζ = 0.5 -0.7[1] in fully open position[2] [3]
1	Light weight, very little space requirement with standardised length	Compact shape and short face-to-face dimension. Standard face-to-face to EN 558 series 14
2	Permanent protection, safe operation ensured	High-grade surface protection: outside EKB-epoxy coating, inside vitreous enamel
3	Resilient-seated and permanent tightness (rate A), suitable for drinking water	Streamlined valve disc an valve ring, corrosion resistant material with rubber coating (zinc-free bronze, elastomer), elastomer with KTW and W270 approvals
	Reliable and safe operation, smooth and quick closing	Optimum hydraulic characteristics: quick response, short closing stroke and thus minimized pressure surges
4	Safe function for life, internal components easily exchangeable	Internal body secured, made of corrosion resistant material (zinc-free bronze), all interfaces protected against corrosion, maintenance-free guiding bushes
5	Universal application: any position of installation possible	Any position of installation possible (horizontal/vertical/inclined), adaptable to any plant conditions, spring force adapted to the various cases of application, high flow velocities and pressure ratings

1) corresponds to a head loss < 16 mbar
2) fully open position attained at a flow velocity of 2 m/s
3) value for DN 80-DN 300

Materials, measures and characteristics

We need the following data for preparing a quotation:
- *Nominal size DN*
- *Temperature range*
- *Position of installation*
- *Pressure rating PN*
- *Flow velocities (min./max.)*
- *Case of application*
- *Type of flow medium/analysis*
- *Characteristic curve of the plant*

Please contact us. We will be glad to advise you.

Brief specifications – materials and finishes

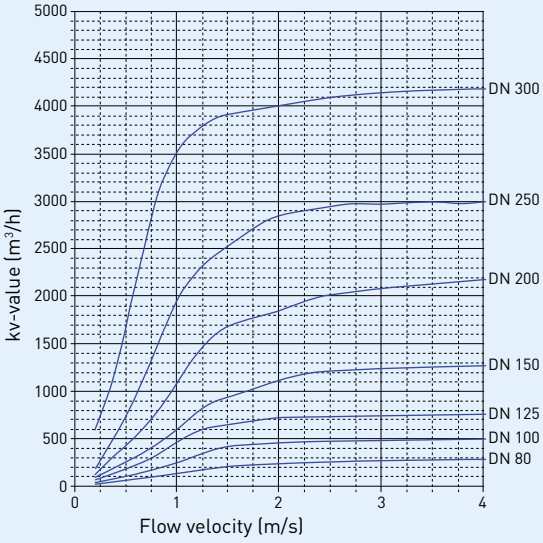
- **Valve disc/valve ring:** zinc-free bronze / 1.4404 / elastomer KTW/W270
- **Internal body:** zinc-free bronze
- **Guiding stem:** stainless steel
- **Guiding bush:** high-performance polymer
- **Body:** ductile cast iron
- **Spring:** stainless steel
- **Protection outside:** ERHARD EKB fusion bonded epoxy
- **Protection inside:** ERHARD vitreous enamel

Dimensions and weights:

Nominal size DN	Face-to-face L (EN558-series 14) mm	Weight approx. kg	Flange outside diameter D mm			
		PN10/16	PN 10	PN 16	PN 25	PN 40
DN 80	180	14	–	200	200	200
DN 100	190	19	–	220	235	235
DN 125	200	27	–	250	270	270
DN 150	210	32	–	285	300	300
DN 200	230	50	340	340	360	375
DN 250	250	70	400	400	425	450
DN 300	270	97	455	455	485	515
DN 350	290	135	505	520	–	–
DN 400	310	165	565	580	–	–
DN 500	350	275	670	715	–	–
DN 600	390	480	780	840	–	–

Hydraulic characteristic curves

$$\zeta = \left(\frac{\pi \cdot DN^2}{78{,}57 \cdot k_v}\right)^2 \quad DN \ldots mm$$



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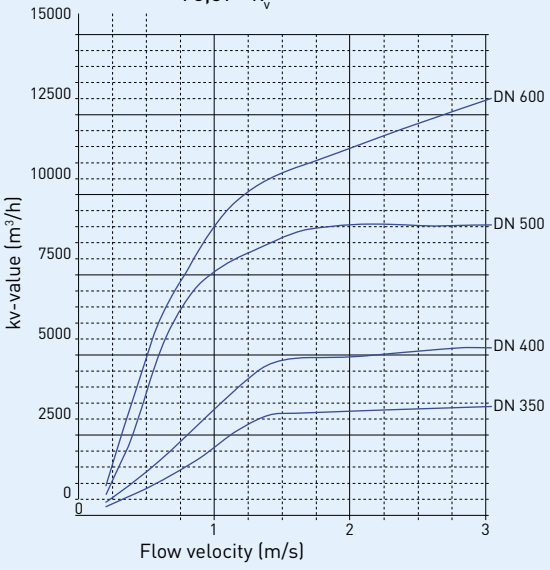


Optimum closing characteristics, optional position indicator

The valve disc, the spring and the closing travel have been designed in such a way that, compared to other types of non-return valves, the ERHARD non slam nozzle check valve acts so quickly that reflux velocities will be minimized, even in case of extremely high flow deceleration (e.g. vertical pipeline). This will lead to a smooth decrease of the flow and the water hammer phenomena will be minimum. The value of the deceleration depends on the plant.

This shows reflux velocity in an example of a plant with 8 m/s²:

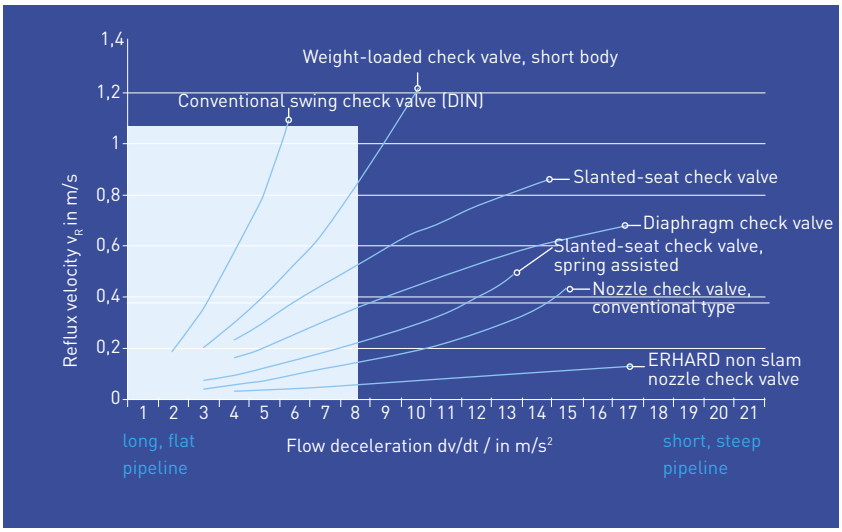
Weight-loaded check valve: V_R = 0,85 m/s

ERHARD non slam nozzle check valve: V_R = 0,1 m/s

According to Joukowsky, the theoretical max. water hammer effects are as follows:

Weight-loaded check valve: ΔH_D = 85 mWs

ERHARD non slam nozzle check valve: only ΔH_D = 10 mWs



Water hammer (Joukowsky)

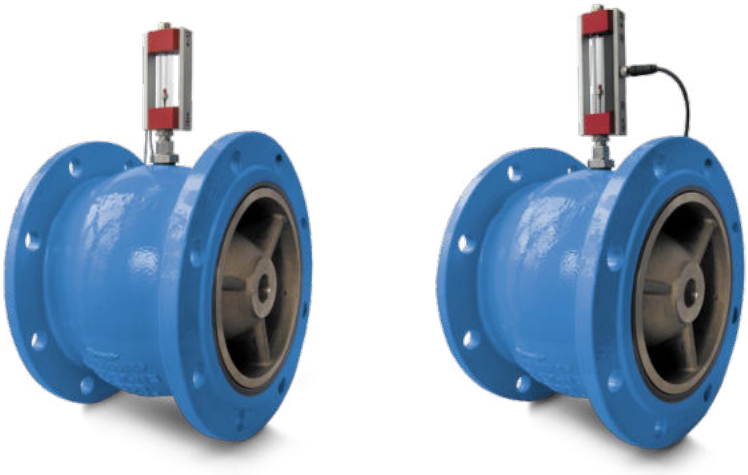
$$\Delta HD = \frac{a \cdot \Delta v_{Rmax}}{g}$$

ΔH_D	Water hammer [mWs]
a	Pressure wave velocity (1000 m/s)
ΔV_{Rmax}	Modification of the reflux velocity at the check valve in case of pump failure [m/s]
g	Acceleration due to gravity (9,81 m/s²)

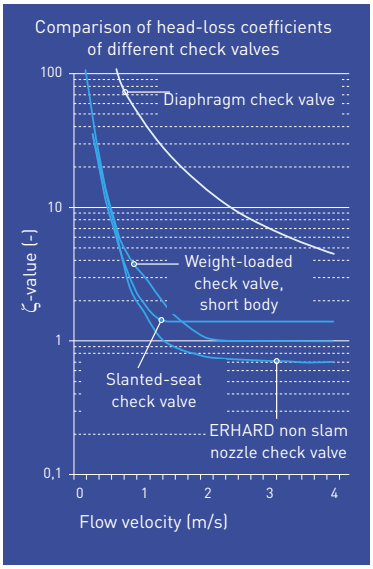
The water flowing back will be damped to v = 0 m/s within the reflexion time (Joukowsky).

Optional is the ERHARD Non slam nozzle check valve also in two variants with position indicator available:

- Visual indicator and Open-Closed limit switches (left)
- Visual indicator with position sensor (right)



Very economical



Hydraulic behavior in the comparison

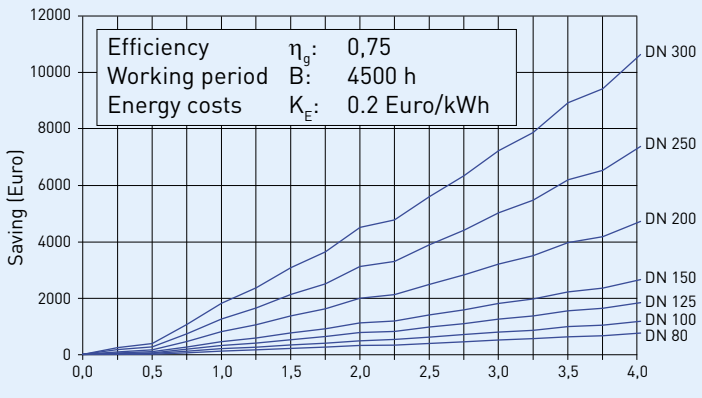
The optimized curve of cross sections and the well designed streamlined contour of the ERHARD non slam nozzle check valve result in minimum head-loss coefficient during operation. Compared to other check valves the ZETA-value of the ERHARD non slam nozzle check valve is record-suspiciously well. For example there will be an ZETA-value of 0.5 for nominal size DN 150 in fully open position (at a flow velocity of approx. 2 m/s).

To use energy saving potential

The ERHARD non slam nozzle check valve allows enormous energy savings – thanks to its low head-loss coefficients. The diagram shows that for large sizes and high flow velocities, the annual saving might even exceed the purchase price of the valve. The diagram shows sizes DN 80 - DN 300; for sizes DN 350 - 600 similar savings can be expected.

With DN 300 and an assumed flow velocity of 2.5 m/s, the possible annual saving when using an ERHARD non slam nozzle check valve (ζ-value = 0,7) instead of a diaphragm check valve will be about 5,600.– Euro per year. In any case, it pays to compare the costs!

Annual energy saving potential of the ERHARD non slam nozzle check Valve compared to a diaphragm check valve



Equation for energy cost saving:

$$\Delta K = \frac{\pi \cdot DN^2 \cdot v^3 \cdot (\zeta 2 - \zeta 1) \cdot \rho}{8000 \cdot \eta_g} \cdot B \cdot K_E$$

Symbols and units

ΔK	cost saving per time unit	EUR/a
DN	nominal diameter of pipe/valve	m
v	flow velocity	m/s
$\zeta 1$	head-loss coefficient of valve 1	-
$\zeta 2$	head-loss coefficient of valve 2	-
η_g	overall efficiency of pumping plant	-
B	running time of pumping plant	h/a
K_E	energy costs	EUR/kWh
ρ	density of the flow medium	kg/m³

ERHARD valves – for every application

Isolation valves

ERHARD Multamed Premium gate valve

ERHARD ERU K1 knife gate valve

ERHARD ROCO Premium butterfly valve

ERHARD ball valve

ERHARD ECLI butterfly valve

Security and control

ERHARD RKV needle valve

ERHARD REV control valve

ERHARD DVP4 pressure reducing valve

ERHARD TWIN-AIR air valve

ERHARD SWING check valve

Hydrants

ERHARD Industrial Hydrant 150

ERHARD CITY hydrant

ERHARD post fire hydrant

ERHARD under-ground fire hydrant

House connection

ERHARD ABS Premium service valve

Connection and repair

ERHARD dismantling joint

Your Choice in Waterflow Control

TALIS is the undisputed Number One for water transport and water flow control. TALIS has the best solutions available in the fields of water and energy management as well as for industrial and communal applications. We have numerous products for comprehensive solutions for the whole water cycle – from hydrants, butterfly valves and knife gate valves through to needle valves. Our experience, innovative technology, global expertise and individual consultation processes form the basis for developing long-term solutions for the efficient treatment of the vitally important resource "water".

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