

High Performance **Check Valves**

for liquid and gaseous media



© All rights reserved, WEH GmbH 2008.

Unauthorized copies are strictly forbidden as well as the publishing and using without the written consent of the WEH company.
By the transfer of an up to date brochure or document all precursory versions will run out of validity. As a matter of principle the latest up to date version of brochures and other documents are valid. These versions can be inquired by the WEH company.
Our general terms and conditions are valid for consignments and all other services, unless otherwise agreed. We do not accept general terms and conditions of the purchaser.

WEH® is a registered trademark of the WEH GmbH Precision Connectors.

Table of contents

HIGH PERFORMANCE CHECK VALVES

Overview. 4

TVR2 | Stainless steel check valves. 6

 with double ferrule fitting on both sides 8

 with internal thread on both sides 9

 with external thread on both sides 10

 with external thread and internal thread 11

 with double ferrule fitting and internal thread 11

 with double ferrule fitting and external thread 11

TVR60 | Steel check valves 12

TVR61 | Brass check valves 14

FURTHER INFORMATION

Special applications 16

Technical appendix. 17

Brochure data 18

Questionnaire 19

Overview

CHECK VALVES FOR YOUR APPLICATION

WEH can offer the right valve for your application. The TVR2 stainless steel check valves are suitable for demanding applications and the TVR60 in steel and TVR61 in brass are low-cost alternatives.

The check valves are manufactured to the quality assurance standard ISO 9001 and the pressure equipment directive (PED).

OVERVIEW TYPES

Type	Material	Connection	Nominal bore DN	Operating pressure PB	Leak tightness valve seat
TVR2	Stainless steel	Double ferrule fitting on both sides	5 up to 14 mm	Max. 350 bar	High
TVR2	Stainless steel	Internal thread on both sides	6 up to 50 mm	Max. 400 bar	High
TVR2	Stainless steel	External thread on both sides	6 up to 20 mm	Max. 400 bar	High
TVR2	Stainless steel	Internal thread / external thread	6 up to 20 mm	Max. 400 bar	High
TVR2	Stainless steel	Double ferrule fitting / internal thread	5 up to 14 mm	Max. 350 bar	High
TVR2	Stainless steel	Double ferrule fitting / external thread	5 up to 14 mm	Max. 350 bar	High
TVR60	Galvanised steel	Internal thread on both sides	4 up to 50 mm	Max. 300 bar	Reduced
TVR61	Brass	Internal thread on both sides	10 up to 50 mm	Max. 48 bar	Average

Our check valves type TVR2 in stainless steel are also available with these connection options. Please contact us if you need alternative connections.



Stainless steel check valves TVR2
with double ferrule fitting



Stainless steel check valves TVR2
with internal thread



Stainless steel check valves TVR2
with external thread



Steel check valves TVR60
with internal thread



Brass check valves TVR61
with internal thread

Overview

CONNECTION POSSIBILITIES

The check valves are available as standard or special solutions with different connection options.

- Internal and external threads from G1/8" up to max. G3"
- Tube fittings for pipe diameters 6 mm up to 50 mm
- NPT, UNF or metrical threads
- Flanges up to DN 125 mm
- Hose connections, pipe ends or cartridge styles

SPECIAL SOLUTIONS

WEH specializes in developing customer-tailored solutions. After a thorough analysis of your application our engineers can design a solution for you. With our know-how we can also solve many difficult connection problems. Contact us with your enquiry. You will find some examples in the section ‚special solutions‘.

General

DESCRIPTION



Features

- Stainless steel 1.4305 (AISI 303)
- Extremely leak tight
- Seals are protected from the media flow
- Wear and corrosion resistant
- Low-noise opening and closing
- Low cracking pressure – starting from 0.01 bar
- Max. operating pressure – up to 1000 bar

High performance check valves for use with liquid and gaseous media

The seals are protected from the media flow thus minimizing the effect of dirt particles on the sealing components within the unit. The WEH-Check valves are constructed from high-grade materials achieving a very durable unit. The check valves are silent in use even under high flow requirements and offer minimum opening pressures from 0.01 bar onwards with high sealing integrity. The high performance sealing system ensures that the TVR2 is suitable for applications with gaseous media. WEH not only offer check valves with threaded connections but also with ferrule fittings, flanges, hose nozzles, nipples or custom designed cartridge valves, even for small quantities.

Application

TVR2 check valves are for use with liquid and gaseous media.

The WEH Check Valves can be used for a large range of applications in mechanical engineering and construction, chemical / pharmaceutical and food industry, materials-handling and medical technology etc.

OVERVIEW TYPES

WEH offer various types of TVR2 check valves:



TVR2 | Stainless steel check valves with double ferrule fitting on both sides



TVR2 | Stainless steel check valves with internal thread and external thread



TVR2 | Stainless steel check valves with internal thread on both sides



TVR2 | Stainless steel check valves with double ferrule fitting and internal thread



TVR2 | Stainless steel check valves with external thread on both sides



TVR2 | Stainless steel check valves with double ferrule fitting and external thread

General

TECHNICAL DATA

Characteristic	Basic version	Options
Port A / B	Double ferrule fitting: tube Ø 6 - tube Ø 16 mm Internal thread: G1/8" - G2" External thread: G1/8" - G1"	Double ferrule fitting: up to max. tube Ø 50 mm on request Internal thread: up to max. G3" on request External thread: up to max. G3" on request
Nominal bore DN	Acc. to design	On request
Operating pressure PB	Double ferrule fitting: max. 350 bar Internal thread: max. 400 bar (up to G3/4") max. 250 bar (from G1" onwards) External thread: max. 400 bar	Higher pressures on request.
Cracking pressure PC	Approx. 0.1 bar / 0.5 bar / 1.0 bar, acc. to design.	Approx. 0.01 bar / 0.1 bar / 0.2 / 0.5 / 1.0 bar Other cracking pressures on request.
Temperature range	-20 °C up to max. +120 °C	Depending on version and application temperature from -45 °C up to max. +300 °C. Other temperature ranges on request.
Medium	Liquid or gaseous	On request
Material	Stainless steel 1.4305 (AISI 303). Up to DN 8 mm, some inner parts brass.	Stainless steel 1.4571 (AISI 316Ti) Other materials on request.
Spring material	Stainless steel 1.4310 (AISI 301)	Stainless steel 1.4571 (AISI 316Ti) Other materials on request.
Sealing material	FKM	FFKM, EPDM, Silicone, Urethane, PTFE, PEEK, NBR Other sealing materials on request.
Valve seat	Up to DN 6 mm ball sealing, larger dimensions cone sealing.	On request
Approval	PED 97/23/EC For automotive applications other approvals are available. Please contact us!	

Flow values

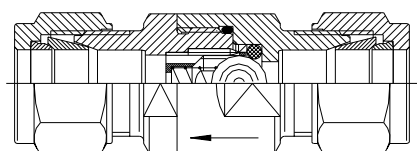
Please find in the table below flow rates for various nominal bores of the TVR2 stainless steel check valves.

Nominal bore DN	Cv-Value	Nominal bore DN	Cv-Value
5 mm	0.4	20 mm	10.6
6 mm	0.5	25 mm	14.7
10 mm	2.9	32 mm	27.7
14 mm	7.4	40 mm	38.1
16 mm	8.1	50 mm	57.4

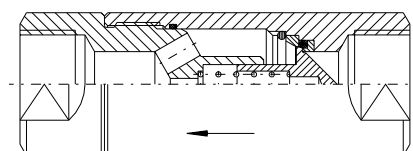
The flow curves were determined on the basis of the standards EN 60534 with water and refer to a cavitation free flow. The curves relate to unrestricted inlet and outlet.

Sealing types

Up to DN 6 mm ball sealing, larger dimensions cone sealing.



Ball seal construction

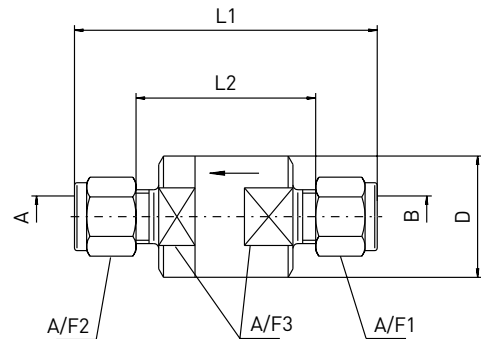


Cone seal construction

Ordering

ORDERING | TVR2 with double ferrule fitting on both sides

approx. dimensions (mm)



Type ball sealing

Part No.	DN	A / B	PB (bar)	PC (bar)	D	L1	L2	A/F1 A/F2	A/F3
C20010	5	Tube Ø 6	350	0.1	25	64	33.7	14	22
C20011	6	Tube Ø 8	350	0.1	25	64	33.7	16	22
C20012	6	Tube Ø 10	350	0.1	25	64	33.7	19	22
C20013	6	Tube Ø 12	350	0.1	25	70	33.7	22	22



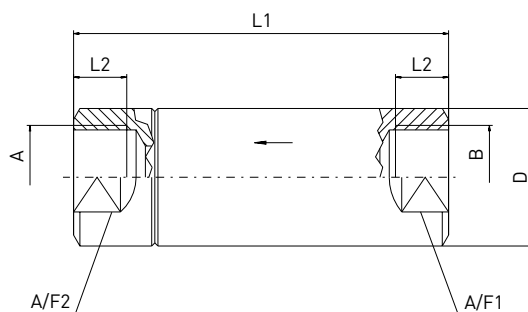
Type cone sealing

Part No.	DN	A / B	PB (bar)	PC (bar)	D	L1	L2	A/F1 A/F2	A/F3
C20014	10	Tube Ø 12	350	0.5	35	110	62.7	22	30
C20015	14	Tube Ø 16	350	0.5	35	112	62.7	25	30

Ordering

ORDERING | TVR2 with internal thread on both sides (DIN ISO 228-1)

approx. dimensions (mm)



Type ball sealing



Part No.	DN	A / B	PB (bar)	PC (bar)	D	L1	L2	A/F1 A/F2
C20000	6	G1/8" internal thread	400	0.1	25	52	10	22
C20001	6	G1/4" internal thread	400	0.1	25	52	10	22

Type cone sealing

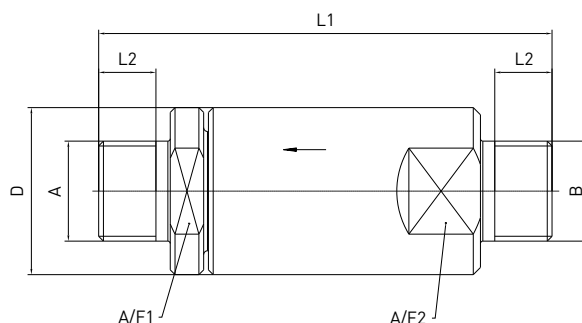


Part No.	DN	A / B	PB (bar)	PC (bar)	D	L1	L2	A/F1 A/F2
C20002	14	G3/8" internal thread	400	0.1	35	95	17	30
C20003	14	G1/2" internal thread	400	0.5	35	95	17	30
C20004	16	G3/4" internal thread	400	0.5	39	110	17	34
C20005	20	G1" internal thread	250	1.0	48	120	18	41
C20006	25	G1 1/4" internal thread	250	1.0	60	125	22	50
C20007	32	G1 1/2" internal thread	250	1.0	65	130	22	55
C20008	40	G1 1/2" internal thread	250	1.0	69	145	22	60
C20009	50	G2" internal thread	250	1.0	88	152	24	75

Ordering

ORDERING | TVR2 with external thread on both sides (DIN ISO 228-1)

approx. dimensions (mm)



Type ball sealing

Part No.	DN	A / B	PB (bar)	PC (bar)	D	L1	L2	A/F1 A/F2
C20201	3	G1/8" external thread	400	0.1	25	52	10	22
C20202	5	G1/4" external thread	400	0.1	25	52	10	22



Type cone sealing

Part No.	DN	A / B	PB (bar)	PC (bar)	D	L1	L2	A/F1 A/F2
C20203	8	G3/8" external thread	400	0.1	35	95	12	30
C20204	12	G1/2" external thread	400	0.5	35	95	12	30
C20205	16	G3/4" external thread	400	0.5	39	110	12	34
C20206	20	G1" external thread	250	1.0	48	120	18	41

Ordering

ORDERING | TVR2 with external thread and internal thread (DIN ISO 228-1)

approx. dimensions (mm)



Part No.	DN	A	B	PB (bar)	PC (bar)	D	L	A/F1 A/F2
C1-95696	14	G1/2" internal thread	G1/2" external thread	400	0.1	35	95	30

ORDERING | TVR2 with double ferrule fitting and internal thread

approx. dimensions (mm)



Part No.	DN	A	B	PB (bar)	PC (bar)	D	L	A/F1 A/F2
C1-91624	6	UNEF 9/16"-24 internal thread	Tube Ø 10	350	1.0	25	73.5	22

ORDERING | TVR2 with double ferrule fitting and external thread

approx. dimensions (mm)



Part No.	DN	A	B	PB (bar)	PC (bar)	D	L	A/F1 A/F2
C1-81108	6	G1/4" external thread	Tube Ø 8	350	0.05	25	58.6	22

Other connector sizes are available on request.

General

DESCRIPTION



Features

- Galvanised steel (EN10277-3)
- Prevent fluid return in the circuit
- Metal-to-metal sealing system, without o-ring
- For applications with reduced demands concerning leak tightness in the valve seat
- Highly resistant to stress during pressure peaks

The new series of steel check valves were developed specially for oil and hydraulic applications in industry and agriculture.

Application

Oil and hydraulic applications in industry, agriculture and construction machinery.

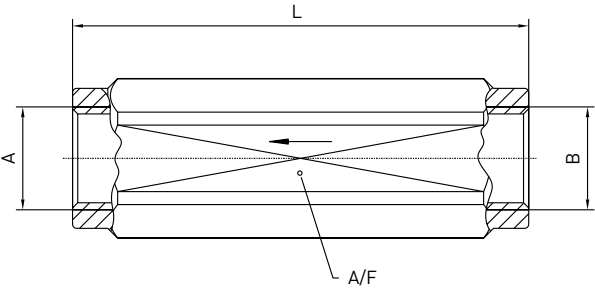
TECHNICAL DATA

Characteristic	Basic version	Options
Port A / B	Internal thread: G1/8" - G2"	Inlet: external thread on request.
Nominal bore DN	4 up to 50 mm	On request
Operating pressure PB	Max. 300 bar, acc. to body size	On request
Cracking pressure PC	Approx. 0.35 bar	Approx. 1 bar / 2.5 bar / 4.5 bar / 6 bar / 8 bar Other cracking pressures on request.
Temperature range	-20 °C up to max. +135 °C	On request
Medium	On request	On request
Material	Housing in galvanised steel (EN10277-3)	On request
Valve seat	Metallic sealing cone seat, without o-ring	On request
Approval	PED 97/23/EC	

Ordering

ORDERING | TVR60 with internal thread on both sides (DIN ISO 228-1)

approx. dimensions (mm)



Part No.	DN	A / B	PB (bar)	PC (bar)	L	A/F
C1-90389	4	G1/8" internal thread	300	0.35	44	14
C1-90390	6	G1/4" internal thread	300	0.35	56	19
C1-90391	10	G3/8" internal thread	300	0.35	70	22
C1-90392	12	G1/2" internal thread	300	0.35	77	30
C1-90393	20	G3/4" internal thread	300	0.35	90	36
C1-90394	25	G1" internal thread	300	0.35	106	46
C1-90395	31	G1 1/4" internal thread	300	0.35	125	55
C1-90396	40	G1 1/2" internal thread	300	0.35	140	60
C1-90397	50	G2" internal thread	200	0.35	160	75

Other connector sizes and versions are available on request.

General

DESCRIPTION



Features

- Brass MS58 (CuZn39Pb3 / CZ121)
- Full flow, high flow rate
- Minimum pressure loss
- Compact dimensions
- Average leak tightness
- Low-noise opening and closing

The check-valves of the series type TVR61 are featuring low-noise operation and have a high flow rate. The valves can be installed in any position. Only the flow direction must be considered.

Application

Hydraulic and pneumatic applications in plant engineering, also suitable in applications with submersible pumps, pressure vessels, air conditioning systems, heating systems etc.

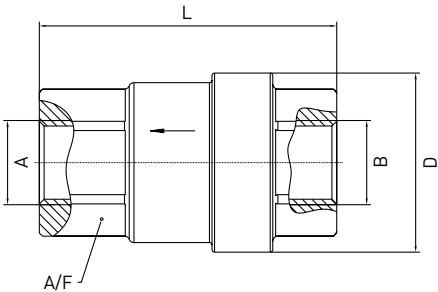
TECHNICAL DATA

Characteristic	Basic version	Options
Port A / B	Internal thread: G1/4" - G2"	Internal thread: up to max. G3" on request
Nominal bore DN	10 up to 50 mm	On request
Operating pressure PB	Min. 0.05 bar - max. 48 bar, acc. to body size	On request
Cracking pressure PC	Min. 0.03 bar	On request
Temperature range	-20 °C up to max. +135 °C	On request
Medium	Cold and hot water, compressed air, oils	On request
Material	Housing of brass MS58 (CuZn39Pb3 / CZ121), inner parts of POM	On request
Spring material	Stainless steel	On request
Sealing material	FKM	On request
Valve seat	Cone seal	On request

Ordering

ORDERING | TVR61 with internal thread on both sides (DIN ISO 228-1)

approx. dimensions (mm)



Part No.	DN	A / B	PB (bar)	PC (bar)	D	L	A/F
C1-89289	10	G1/4" internal thread	48	0.03	28	47	21
C1-89290	10	G3/8" internal thread	48	0.03	28	47	21
C1-89292	15	G1/2" internal thread	42	0.03	34	50	26
C1-89293	20	G3/4" internal thread	35	0.03	42	60	32
C1-89294	25	G1" internal thread	30	0.03	50	67	39
C1-89295	32	G 1 1/4" internal thread	25	0.03	60.5	76	49
C1-89296	40	G 1 1/2" internal thread	25	0.03	73.5	90	56
C1-89297	50	G2" internal thread	20	0.03	89	101	69

Other connector sizes and versions are available on request.

Special check valve examples

WEH specializes in developing customer-tailored solutions. Hereafter please find some examples showing a small selection of special valves. Over the years WEH have designed many special solutions together with our customers. We also have your solution. Please contact us!

MINI CHECK VALVE



- Internal thread on both sides G1/8" or G1/4"
- Material: all stainless steel 1.4305 or 1.4571 (AISI 303 or AISI 316Ti)
- Sealing material: EPDM or FKM
- Cracking pressure: 0.1 or 0.2 bar
- Extremely short, only 45 mm
- Small outer diameter (15 or 18 mm)
- Max. operating pressure: 100 bar
- Nominal bore: approx. 3 or 4 mm
- Other designs on request
- On request also available with adjustable cracking pressure

FLANGE VALVE



- Flange connection acc. to DIN 2633 on both sides
- Material: all stainless steel 1.4539 (AISI 904)
- Sealing material: FFKM
- Cracking pressure: approx. 0.1 - 0.5 bar
- Nominal bore: approx. 25 mm
- Other designs on request

FLANGE INSERT VALVE



- Customer specific flange connection
- Material: Alloy C4
- Sealing material: metallic sealing
- Cracking pressure: 0.025 bar $\pm$ 0.01 bar
- Nominal bore: approx. 25 mm
- Other designs on request

CARTRIDGE CHECK VALVE



- Inlet: UNF 1/4"-28 internal thread
- Outlet: bore $\varnothing$ 8 mm
- Material: all stainless steel 1.4305 (AISI 303), spring 1.4568 (AISI 631, 313)
- Sealing material: FFKM
- Cracking pressure: 0.14 bar - 0.35 bar
- Nominal bore: approx. 4 mm
- Other designs on request

Technical appendix

Definition

Abbreviation	Explanation
Pressure specifications	
PB	Max. allowable operating pressure at 15 °C: The nominal pressure ratings PN and the operating pressures PB represent the max. permissible operating pressures in bar including pressure peaks. When higher temperatures and mechanical vibrations are involved, the operating pressures should be reduced accordingly.
PC	Cracking pressure: The input pressure at which the first indication of flow occurs.
PT	Test Pressure is the pressure used to test a component during inspection on structural integrity (normally PB x 1.43 up to 1.5).
Dimensions	
L1, L2, L3 ...	Length specification
D1, D2, D3 ...	Diameter specification
Ports	
A / B	Medium outlet / inlet
Others	
DN	Nominal bore

Technical note

Term	Explanation
Temperature range	Standard range: +5 °C up to +80 °C Special range: -100 °C up to +200 °C; special applications on request. The temperatures stated as standard cover most common applications. The seal material used has higher or lower temperature limits dependant on material (e.g. NBR -30 °C up to +100 °C, FKM -20 °C up to +200 °C, EPDM -40 °C up to +150 °C). Under such extreme temperature conditions the suitability of WEH products to the application has to be checked specifically. If necessary, we can develop special solutions.
Material	Parts not in contact with the media may be made of any suitable materials, for example aluminium, brass or stainless steel. Seals, not in contact with the media, are normally NBR.
Pressure - temperature-compensation	For higher temperatures the max. operating pressure needs to be reduced dependant on the application. Possible values therefore are: 50 °C - 5 %, 100 °C - 10 %, 150 °C - 20 %. In case of doubt, please contact us! When using certain materials, for example plastics, the valves need to be further derated.

OVERVIEW SEALING MATERIAL

The WEH check valves can be adapted to your specific application. A large variety of sealing materials is available for this purpose. Together with the supplier of the sealing material we choose the right material suitable for your medium. If extremely high temperatures are prevailing we also use metallic seals.

Sealing material	Suited for
FKM	Mineral oils, greases, petrol, super petrol, diesel oils, air
FFKM	Very aggressive media, resistant against nearly all media. Special types are applicable up to +325 °C
EPDM	Hot water, steam, brake fluid, media containing glycol

Other sealing materials: Silicone, Urethane, PTFE, PEEK, NBR, etc.

Brochure data

Maximum care has been taken compiling this catalogue based on many years of experience.

However we must point out, that all catalogue data is only valid, if it was expressly confirmed in the individual order. We cannot guarantee the veracity of the data and the introductions in individual cases due to the large variety of applications for WEH products, and the unknown parameters and conditions of use. We have to refer to the individual order.

The limits of use for pressure, temperature etc. in this catalogue are theoretical data calculated on the basis of tests. Because of different operating conditions we cannot guarantee that the data do accord with the special use of the client. It has to be considered, that in the practical use interactive interferences of data parameters can cause the change of the maximum values. Especially if the operating conditions are extreme, the WEH Company must be consulted before the use of the products. Therefore the requested values should be stated in the individual order, especially for extreme operating conditions.

Furthermore we point out, that we cannot guarantee for misprints, uncompleted data or misinterpretation. The illustration of the products is for demonstration only. The exact form and design of the product is only defined by the individual order. The brochure is only an integral part of the contract, if it is agreed expressly. Dimensions and other technical data in this catalogue are without obligation.

By the transfer of an up to date brochure or document all precursory versions will run out of validity. As a matter of principle the latest up to date version of brochures and other documents are valid. These versions can be inquired by the WEH company.

Our general terms and conditions are valid for consignments and all other services, unless otherwise agreed. We do not accept general terms and conditions of the purchaser.

QUESTIONNAIRE

Please fill in the following form and fax it to: **+49 7303 9609-9999**

Company	_____	Name	_____
Address	_____	Position	_____
	_____	Department	_____
Postcode	_____	Phone	_____
City	_____	Fax	_____
Country	_____	eMail	_____

► Your check valve parameters:

Nominal bore	Required flow rate: _____		
Dimension / Inlet	Internal thread: _____	External thread: _____	Tube: _____
Dimension / Outlet	Internal thread: _____	External thread: _____	Tube: _____
Temperature	from: _____	up to: _____	
Pressure	Cracking pressure: _____	Max. operating pressure: _____	
Media	_____		
Material	☐ Stainless steel 1.4305 (AISI 303) ☐ Stainless steel 1.4571 (AISI 316Ti)	☐ Galvanised steel ☐ Brass	Others: _____
Sealing material	☐ FKM ☐ FFKM ☐ NBR	☐ EPDM ☐ PTFE / PEEK	Others: _____
Quantity	_____		
Regular demand	☐ Yes	☐ No	
Application	_____		
Remark	_____		

► Yes, I want to have more details

- ☐ Please contact us
 ☐ Offer
 (please describe application)
- ☐ Information about other products

