

## Series RV Plug Check Valves Vertical installation



### Keep for future use!

This operating manual must be strictly observed before transport, installation, operation and maintenance

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9550-070-en Revision 01 Edition 02/2007

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## Relevant documents

- ◆ Declaration of conformity acc. to the EC Pressure Equipment Directive 97/23/EC
- ◆ Form for General Safety Certificate QM 0912-16-2001\_en

## 1 Technical data

### Manufacturer:

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 D-47906 Kempen  
 Telephone : +49 (0) 2152 146-0  
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### Designation :

Plug check valve, series RV  
 Certified to Clean Air Act (TA Luft)  
 Strength and tightness (P10, P11) of the pressure-bearing body tested to DIN EN 12266-1.  
 Gas-tight (P12) in the seat to DIN EN 12266-1, leak rate A  
Face to face: not acc. to DIN  
Flange connecting dimensions:  
 DIN EN 1092-2, type B (ISO 7005-2 Type B) PN 10

### Materials

Body material: Ductile cast iron EN-JS 1049 to DIN EN 1563 (0.7043 DIN 1693)

Lining material: PTFE

### Temperature range :

See pressure-temperature diagram in Section 1.3.

**Operating pressure :** PN 10

**Size in mm :** DN 150, 200

**Installation position :** vertical installation  
 See Section 6.2

### Dimensions and individual parts:

See sectional drawings in Section 10

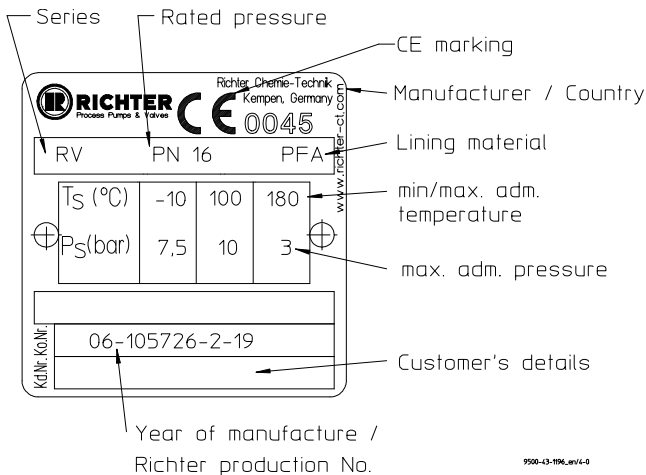
**Wear parts :** Shut-off cap, plug stem

### 1.1 Name plate, CE and body markings

The stainless steel name plate is firmly riveted to the body.

If the operator attaches his identification, it must be ensured that the valve matches the application in question.

**Example of name plate with CE marking:**



**Body identification :**

The following are visible on the body according to DIN EN 19 and AD 2000 A4:

- ◆ Flange nom. size [mm] [inch]
- ◆ Rated pressure
- ◆ Body material
- ◆ Manufacturer's identification
- ◆ Melt number/Foundry identification
- ◆ Cast date
- ◆ Arrow for direction of flow

### 1.2 Tightening torques

All screws greased, tighten in diametrically opposite sequence!

The tightening torques for pipe screws and body screws mentioned must not be exceeded. For an exception, see **Section 8**, flange connection valve / pipe is leaking.

### Pipe screws

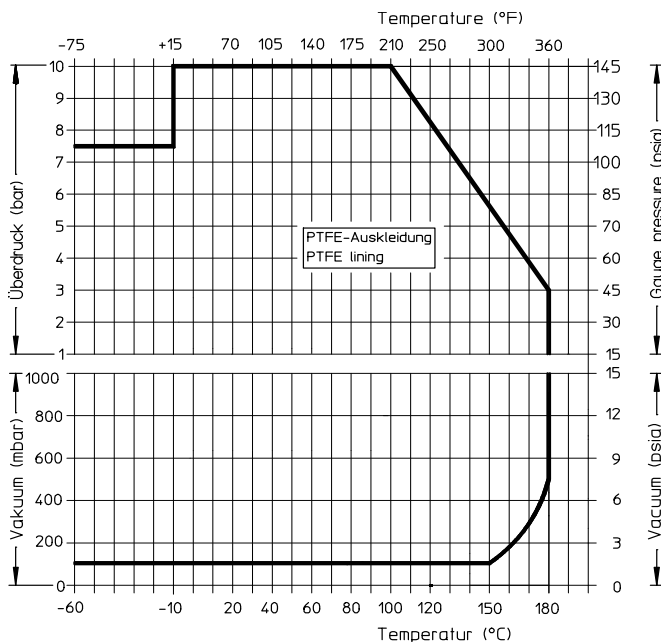
The following tightening torques are recommended.

Flange nom. size	Screws	Tightening torque
[mm]	[ISO/DIN]	[Nm]
150	8 x M20	55
200	8 x M24	75

### Body screws

Flange nom.	Screws	Tightening torque
[mm]	[ISO/DIN]	[Nm]
150	8 x M20	70
200	8 x M20	70

### 1.3 Pressure/temperature diagram



When used in the minus temperature range, the regulations applicable in the country in question must be observed.

## 2 Notes on safety

This operating manual contains fundamental information which is to be observed during installation, operation and maintenance. It must therefore be read before installation and commissioning.

For valves which are used in potentially explosive areas, see **Section 3**.

Installation and operation are to be performed by qualified staff.

The area of responsibility, authority and supervision of the staff must be regulated by the customer.



### General hazard symbol!

People may be put at risk.



**Safety symbol!** The ball valve and its function may be put at risk if this safety symbol is not observed.

It is imperative to observe warnings and signs attached directly to the ball valve and they are to be kept fully legible.

**Non-observance of the notes on safety may result in the loss of any and all claims for damages.**

For example, non-observance may involve the following hazards:

- ◆ Failure of important functions of the valve/plant.
- ◆ Risk to people from electric, mechanical and chemical effects.
- ◆ Risk to the environment through leaks of hazardous substances.

### 2.1 Intended use

Richter check valves of the series RV are pressure relief components in accordance with the Pressure Equipment Directive (PED) for the passage of fluids in the direction of the flow arrow on the body and for the shut-off of fluids in the opposite direction.

However, shut-off of the passage of fluids in the opposite direction may be cancelled out, depending on the installation position, ball design, differential pressure and fluid.

The valves are suitable for vapours, gases and liquids of group 1 in accordance with the PED and have a corrosion-resistant plastic lining.

Solids can lead to increased wear, leaks, damage to sealing surfaces or to a reduction in the service life of the valve.

In case of the valve is intended for operating data other than those intended, the customer must carefully examine whether the design of the valve, accessories and materials are suitable for the new application (consult the manufacturer).

### 2.2 For the customer / operator

If a safety valve is used, the operator must ensure that

- ◆ actuators which are retrofitted are adapted to suit the valve
- ◆ hot or cold valve parts are protected by the customer against being touched
- ◆ the valve has been properly installed in the pipe system
- ◆ the operating conditions stipulated in the data sheet are not exceeded in continuous operating mode.

This is not the manufacturer's responsibility.

Loads caused by earthquakes were not allowed for in the design.

Fire protection to DIN EN ISO 10497 is not possible (plastic lining and plastic components).

### 2.3 Improper operation

The operational reliability of the valve supplied is only guaranteed if it is used properly in accordance with **Section 2.1** of this operating manual.



The operation limits specified on the identification plate and in the pressure-temperature diagram must under no circumstances be exceeded.

### 3 Safety notes for applications in potentially explosive areas based on the Directive 94/9/ EC (ATEX 95)

The valves are intended for use in a potentially explosive area and are therefore subject to the conformity assessment procedure of the directive 94/9/EC (ATEX).

As part of this conformity assessment, an ignition hazard analysis to EN 13463-1 to satisfy the fundamental safety and health requirements was conducted with the following result:

- ◆ **The valves do not have any ignition source of their own.**
- ◆ **The valves are not covered by the scope of application of the ATEX directive and therefore do not need to be identified accordingly.**
- ◆ **The valves may be used in a potentially explosive area.**

It is imperative to observe the individual points of intended use for application in a potentially explosive area.

#### 3.1 Intended use

**Inadmissible modes of operation, even for brief periods, may result in serious damage to the valve.**

**In connection with explosion protection, potential sources of ignition (overheating, electrostatic and induced charges, mechanical and electric sparks) may result from these inadmissible modes of operation; their occurrence can only be prevented by adhering to the intended use.**

Furthermore, reference is made in this connection to the Directive 95/C332/06 (ATEX 118a) which contains the minimum regulations for improving the occupational health and safety of the workers who may be at risk from an explosive atmosphere.

A difference is made between two cases for the use of chargeable liquids (conductivity  $< 10^{-8}$  S/m):

##### 1. Chargeable liquid and non-conductive lining

Charges can occur on the lining surface. As a result, this can produce discharges inside the valve. However, these discharges cannot cause ignitions if the valve is completely filled with medium.

If the valve is not completely filled with medium, e.g. during evacuation and filling, the formation of an explosive atmosphere must be prevented, e.g. by superimposing a layer of nitrogen. It is recommended to wait 1 hour before removing the valve from the plant in order to permit the elimination of static peak charges.

This means that, to safely prevent ignitions, the valve must be completely filled with medium at all times or else a potentially explosive atmosphere must be excluded by superimposing a layer of inert gas.

##### 2. Chargeable liquid and conductive lining

No hazardous charges can occur as charges are discharged direct via the lining and shell (surface resistance  $< 10^9$  Ohm, leakage resistance  $< 10^6$  Ohm)

**Static discharges of non-conductive linings are only produced through the interaction with a non-conductive medium and are therefore the responsibility of the plant operator.**

**Static discharges are not sources of ignition which stem from the valves themselves!**

- The temperature of the medium must not exceed the temperature of the corresponding temperature class or the maximum admissible medium temperature as per the operating manual.
- If the valve is heated (e.g. heating jacket), it must be ensured that the temperature classes prescribed in the Annex are observed.
- To achieve safe and reliable operation, it must be ensured in inspections at regular intervals that the valve is properly serviced and kept in technically perfect order.
- Increased wear to the valve can be expected with the conveyance of liquids containing abrasive constituents. The inspection intervals are to be reduced compared with the usual times.
- Actuators and electric peripherals, such as temperature, pressure and flow sensors etc., must comply with the valid safety requirements and explosion protection provisions.
- The valve must be grounded.  
This can be achieved in the simplest way via the pipe screws using tooth lock washers. Otherwise grounding must be ensured by other action, e.g. cable bridges.
- Plastic-lined valves must not be operated with carbon disulphide.

## 4 Safety note for valves, certified to German Clean Air Act (TA Luft)

On request, this valve can be supplied compliant with the German Clean Air Code.

Certificate / Manufacturer Declaration Validity is dependent on the operating instructions being read and observed.

In particular, servicing must be conducted at regular intervals, and the bolted connections relevant for tightness must be inspected and retightened if necessary.

## 5 Transport and storage



It is imperative, for all transport work, to observe generally accepted engineering practice and the accident prevention regulations.



The valve is supplied with flange caps. Do not remove them until just before installation. They protect the plastic surfaces against dirt and mechanical damage.

Handle the goods being transported with care. During transport the valve must be protected against impacts and collisions.

Directly after receipt of the goods, the consignment must be checked for completeness and any in-transit damage.

Do not damage paint protection.

### 5.1 Storage

If the valve is not installed immediately after delivery, it must be put into proper storage.

It should be stored in a dry, vibration-free and well-ventilated room at as constant a temperature as possible.

### 5.2 Return consignments

Valves which have conveyed aggressive or toxic media must be well rinsed and cleaned before being returned to the manufacturer's works.

It is **imperative** to enclose a **safety information sheet / general safety certificate** on the field of application with the return consignment.

Pre-printed forms are enclosed with the installation and operating manual.

Safety precautions and decontamination measures are to be mentioned.

## 6 Installation

- ◆ Examine valve for in-transit damage, damaged valves must not be installed.
- ◆ Before installation the valve and the connecting pipe must be carefully cleaned to remove any dirt, especially hard foreign matter.
- ◆ During installation, pay attention to the correct tightening torque, aligned pipes and tension-free assembly.

### 6.1 Flange caps and gaskets

Leave protective caps on the flanges until just prior to installation.

Where there is a particularly high risk of damage to the plastic sealing surfaces, e.g. if the mating flanges are made of metal or enamel, PTFE-lined gaskets with a metal inlay should be used. These gaskets are available as special accessories in the Richter range.

### 6.2 Direction of flow and installation position

The installation position of the check valve RV is only possible in a vertical pipe.

The direction of flow is marked on the valve, the shut-off operation is already initiated by the weight of the shut-off element when delivery decreases.

### 6.3 Grounding

The valve must be grounded. The simplest solution is to use tooth lock washers which are placed under one pipe bolt of each flange.

### 6.4 Test pressure

The test pressure PT of a valve must not exceed the value of 1.5 x PS(PN) as per the identification of the valve.

## 7 Operation

### 7.1 Initial commissioning

Normally, the valves have been tested for leaks with air or water. Prior to initial operation check cover screws. For torques see **Section 1.2**.



Unless otherwise agreed, there could be residual amounts of water in the flow section of the ball valve; this could result in a possible reaction with the medium.

To prevent leaks, all connection screws should be retightened after the initial loading of the valve with operating pressure and operating temperature. For torques, see **Section 1.2**.

### 7.2 Improper operation and their consequences

- ◆ Crystallisation must be prevented, e.g. by heating. In the extreme case a blockage may occur.
- ◆ Increased wear occurs in operation with solids contents.
- ◆ Increased wear occurs in operation under cavitation.
- ◆ Non-observance of the pressure-temperature diagram can lead to damage.

### 7.3 Shutdown

The local regulations are to be observed when dismantling the valve.

Prior to starting any repair work, the valve is to be thoroughly cleaned. Even if the valve has been properly emptied and rinsed, residual medium may still found in the valve.

## 8 Malfunctions

- ◆ Flange connection valve/pipe is leaking  
Retighten the flange screws to a tightening torque according to **Section 1.2**. If this does not remedy the leak, the recommended torques may be exceeded by 10%.  
If this also fails to stop the leak, dismantle and inspect the valve.
- ◆ Flange connection main body/body end piece is leaking  
Retighten body screws. See paragraph "Flange connection ball valve/pipe is leaking".
- ◆ Valve does not close  
Are there solids between the sealing surface and the plug?  
Is the sealing surface of the seat damaged?  
Is the shut off cap damaged?

## 9 Maintenance

- ◆ All repair work is to be performed by qualified personnel using the appropriate tools. Generally recognised practice in mechanical engineering is to be observed.
- ◆ For the arrangement, designation and item numbers of all parts of the valve, see **Section 10**.
- ◆ Spare parts are to be ordered with all the details in acc. with the valve identification.
- ◆ Only original spare parts may be installed.
- ◆ To prevent leaks, a regular check of the connection screws should be made in line with the operating requirements.  
For torques see **Section 1.2**.

### 9.1 Dismantling

#### 9.1.1 Replacing wear parts

- Screw upper **125** and lower body **126** sections apart.
- Remove the perforated plate **242**.
- Remove the plug stem **310** with shut-off cap **421** from the guide bush **307**.
- The plug stem **310** and shut-off cap **421** can be dismantled by pulling out the PTFE round cord **522**.
- Replace or rework the shut-off cap **421**.
- Assembly is performed in reverse sequence.

## 9.2 Assembly

- Prior to assembly all parts are to be cleaned and the plastic-lined parts checked for damage.

- Screw the upper and lower body sections together. Tighten the hex. screws and nuts to a tightening torque according to **Section 1.2**.

## 10 Drawing

### 10.1 Legend

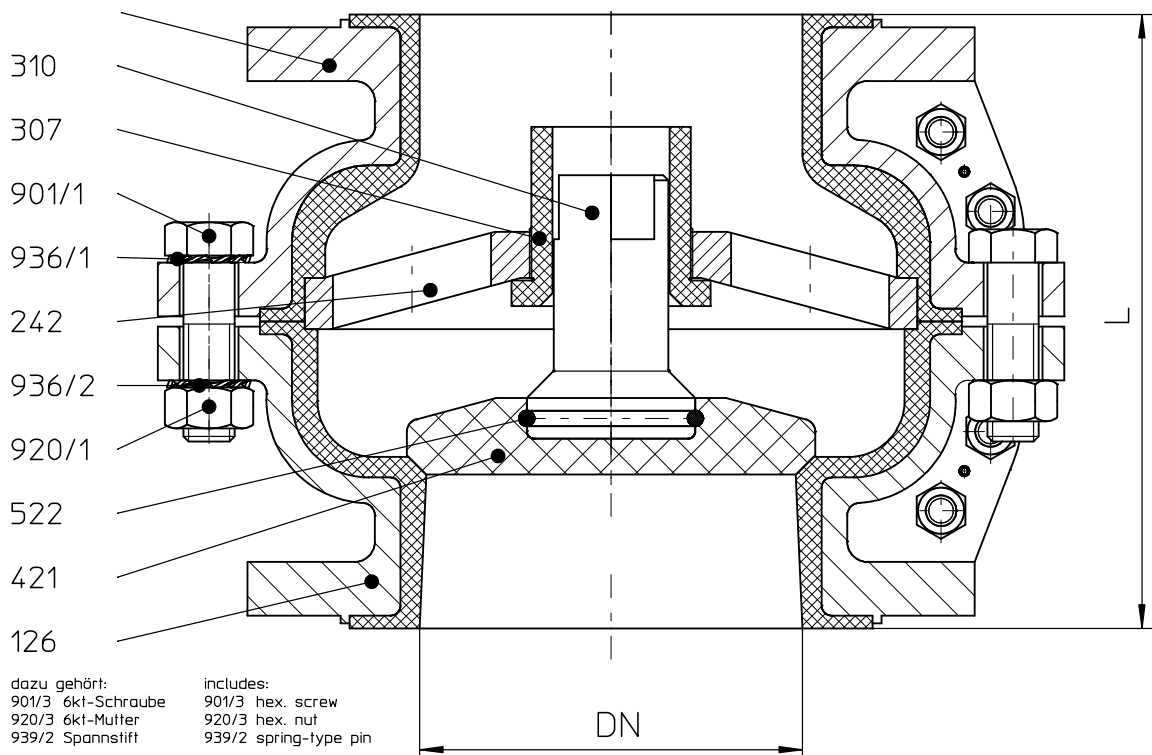
<b>125</b>	body upper part	<b>522</b>	round cord
<b>126</b>	body lower part	<b>901/1</b>	hex. screw
<b>242</b>	perforated plate	<b>920/1</b>	hex. nut
<b>307</b>	guide bush	<b>936/x</b>	toothed lock washer
<b>310</b>	plug stem		
<b>421</b>	shut-off cap		

### 10.2 Sectional drawing

125

dazu gehört: 901/2 6kt-Schraube  
920/2 6kt-Mutter  
939/1 Spannstift

includes: 901/2 hex. screw  
920/2 hex. nut  
939/1 spring-type pin



dazu gehört: 901/3 6kt-Schraube  
920/3 6kt-Mutter  
939/2 Spannstift

includes: 901/3 hex. screw  
920/3 hex. nut  
939/2 spring-type pin

DN	150	200
L	240	280

**CE Konformitätserklärung** nach EN ISO//IEC 17050  
**Declaration of Conformity** according to EN ISO//IEC 17050

Produkt <i>Product</i>	Kunststoffausgekleidete Rückschlagventile <i>Plastic lined check valves</i>
Bauart <i>Design</i>	Kugelrückschlagventil, Kegelrückschlagventil, Rückschlagventil mit integriertem Schauglas <i>Ball check valve, plug check valve, check valve with integrated sight glass</i>
Baureihe <i>Series</i>	BC, BCV, CV, CVV, GR, RV, SR, SR-B, SRV, SRV-B, SRZ-V
Nennweite <i>Size</i>	DN 15 bis DN 200, ½" bis 6" <i>DN 15 to DN 200, ½" to 6"</i>
Seriennummer <i>Series number</i>	ab/from 29.12.2009
EU-Richtlinie <i>EU-Directive</i>	97/23/EG Druckgeräterichtlinie <i>97/23/EC Pressure Equipment Directive</i>
Angewandte Technische Spezifikation <i>Applied Technical Specification</i>	DIN EN ISO 12100-2 AD 2000
Überwachungsverfahren <i>Surveillance Procedure</i>	97/23/EG Zertifizierungsstelle für Druckgeräte der TÜV Nord Systems GmbH & Co. KG Notified Body 0045
Konformitätsbewertungs- verfahren 97/23/EG <i>Conformity assessment procedure 97/23/EC</i>	Modul H
Kennzeichnung <i>Marking</i>	97/23/EG <sup>1)</sup> ≥ DN 32, ≥ 1" 97/23/EC <sup>1)</sup> ≥ DN 32, ≥ 1" <span style="float: right;"><b>CE</b>0045</span>


Das Unternehmen Richter Chemie-Technik GmbH bescheinigt hiermit, dass die o.a. Baureihen die grundsätzlichen Anforderungen der aufgeführten Richtlinien und Normen erfüllt.  
*Richter Chemie-Technik GmbH confirms that the basic requirements of the above specified directives and standards have been fulfilled.*

<sup>1)</sup> Für nicht aufgeführte Nennweiten ist eine Kennzeichnung nicht zulässig.  
*For sizes not listed a marking is not permissible.*

Kempen, 14.01.2011

  
\_\_\_\_\_

G. Kleining  
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Manager Research & Development

  
\_\_\_\_\_

A. Linges  
Leiter Qualitätsmanagement  
Quality Manager

## Safety Information / **Declaration of No Objection** Concerning the Contamination of Richter-Pumps, -Valves and Components

### 1 SCOPE AND PURPOSE

Each entrepreneur (operator) carries the responsibility for the health and safety of his employees. This extends also to the personnel, who implements repairs with the operator or with the contractor.

Enclosed declaration is for the information of the contractor concerning the possible contamination of the pumps, valves and component sent in for repair. On the basis of this information for the contractor is it possible to meet the necessary preventive action during the execution of the repair.

Note: The same regulations apply to repairs **on-site**.

### 2 PREPARATION OF DISPATCH

Before the dispatch of the aggregates the operator must fill in the following declaration completely and attach it to the shipping documents. The shipping instructions indicated in the respective manual are to be considered, for example:

- Discharge of operational liquids
- remove filter inserts
- lock all openings hermetically
- proper packing
- Dispatch in suitable transport container
- Declaration of the contamination fixed **outside!!** on the packing



## FAX

**Fax No. ()**

**Pages (incl. cover sheet) ()**

**To:**

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()

Reference:  
()

Extension:  
- ()

E-Mail Address:  
()

Date:  
()

**Your order No.:** ()

**Our Kom. No.:** ()

**Serial No.:** ()

Dear Sirs,

The compliance with laws for the industrial safety obligates all commercial enterprises to protect their employees and/or humans and environment against harmful effects while handling dangerous materials.

The laws are such as: the Health and Safety at Work Act (ArbStättV), the Ordinance on Harzadous Substances (GefStoffV, BIOSTOFFV), the procedures for the prevention of accidents as well as regulations to environmental protection, e.g. the Waste Management Law (AbfG) and the Water Resources Act (WHG)

An inspection/repair of Richter products and parts will only take place, if the attached explanation is filled out correctly and completely by authorized and qualified technical personnel and is available.

In principle, radioactively loaded devices sent in, are not accepted.

Despite careful draining and cleaning of the devices, safety precautions should be necessary however, the essential information must be given.

The enclosed declaration of no objection is part of the inspection/repair order. Even if this certificate is available, we reserve the right to reject the acceptance of this order for other reasons.

Best regards  
RICHTER CHEMIE-TECHNIK GMBH

Enclosures

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