RICHTER CHEMIE-TECHNIK

The Answer to Corrosion **Series BC/BCV**

Operating Manual for Ball Check Valves

Contents

Total No. of pages: 5

Note:
Before transport, installation operation, etc. read these instructions carefully!.

TM 2135 en Edition 3/95
Version 1.1

RICHTER
Process Pumps & Valves

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1 General

RICHTER valves correspond to the general delivery conditions for valves as per DIN 3230.

1.1 Use

The universal corrosion-resistant fluoroplastic lining of the valve makes it ideally suited for aggressive media.

When the valve is to be employed using alternative operational data, the operating company has to carefully consider whether the valve, accessories and materials are suitable for the new application.

1.2 Product data

Type code		
BC	:	Ball check valve with a solid ball
BCV	:	Ball check valve with a hollow ball
nominal diameters	:	½", ¾", 1", 1½", 2", 3", 4", 6"

2 Safety

The safety precautions in these operating instructions are specially marked with the standard symbol for danger when non-observance could endanger lives.

2.1 Qualifications and training of personnel

The personnel responsible for operation, maintenance, inspection and assembly must be appropriately qualified.
The operating company must precisely define the responsibilities, competence and supervision of the personnel. If the personnel lack the necessary knowledge, they are to be trained and instructed. If required, this can be carried out by the manufacturer/supplier of the valve by order of the operating company. Furthermore, the operating company is to ensure that the contents of the operating instructions have been fully understood by the personnel.

2.2 Dangers through non-observance of the safety precautions

The non-observance of the safety precautions can lead to the loss of all claims for damages.

Non-observance can result in the following:

- failure of important functions of the valve/plant
- endangering of lives by chemical influences
- endangering the environment through leakage of dangerous materials

2.3 Safety awareness at work

Attention must be paid to the safety precautions in these operating instructions, the current national regulations concerning the prevention of accidents as well as any labour-, company- and safety-regulations of the operating company.

2.4 Safety precautions for the operating company/individual operator

If hot or cold components of the valve are a source of danger, these components must be secured against contact by the operating company.

2.5 Safety precautions for maintenance, inspection and assembly

Valves which have been exposed to harmful media must be decontaminated.

2.6 Unauthorized reconstruction and manufacture of spare parts

Reconstruction or modification of the valve is only admissible after consultation with the manufacturer. Genuine spare parts and accessories authorized by the manufacturer serve to maintain safety. The use of other parts can annul all liability for the consequences.

2.7 Inadmissible modes of operation

The operational reliability of the valve supplied is only guaranteed when used as designated, as laid down in section 1.0 - **General** - of the operating instructions. The operating limits given on the identification plate and in the data sheet may not be exceeded under any circumstances.

3 Transport and storage

The universally recognized technical standards and the regulations regarding prevention of accidents have to be observed at all times when handling.

3.1 Transport

The goods have to be carefully handled in order to prevent damage.

The yellow flange caps provide protection during transport and may not be removed.

3.2 Unpacking

Having been unpacked the shipment is to be checked in respect of entirety and possible damage.

3.3 Storage

If the valve is not to be installed immediately following delivery, it must be properly stored.

Storage should be in a dry room at a temperature as constant as possible.

Storage over a longer period may necessitate individual moisture-proof packaging. This is dependent on the local conditions. Consult manufacturer for recommendations.

3.4 Return shipment

The operator of valves used for aggressive or toxic media has to ensure that these are well flushed and cleaned before being handed to the maintenance personnel.

This is particularly important when returning to the manufacturer. MSDS are required for authorization to return valves to the manufacturer.

4 Product description

Installation: horizontal or vertical

When installing horizontally, a minimum differential pressure is required in order to permit a closing of the valve.

The check valve BCV can also be employed as a ventilation valve due to the hollow ball. For this purpose, it is installed in a vertical position with the seat upwards.

For sectional drawing and operating data see section **9.0**.

In accordance with DIN EN 19 and MSS SP-25, the **body** displays the following data:

- nominal diameter
- nominal pressure
- material for armouring
- material for lining
- manufacturer's sign
- foundry sign
- cast charge number
- arrow for direction of flow

The identification plate contains the following information:

- series, nominal pressure, lining material
- admissible operating pressures at admissible temperatures
- ITT Richter consigment no. (= works number)
- ITT EV serial-no.
- customer details

Example of serial-no.: 95-0000/
In case of queries at the manufacturer/agency please state the serial-no. of the valve.

5 Installation

Contamination or damage of the sealing surfaces can best be avoided by leaving the yellow caps on the flanges until just before installation.

To prevent the sealing surfaces being damaged by the mating flanges, we recommend the installation of gaskets. In cases where there is a considerable danger of damage to the plastic sealing surfaces, e.g. with mating flanges of metal or enamel, PTFE-lined seals with a metal inlay should be used.

The **direction of flow** is marked by a cast arrow on the body.

6 Operation

The valves have been tested for tightness with water and air. Unless other arrangements have been agreed to, there may still be a residual quantity of water in the bore of the valve. Beware of a possible reaction with the process liquid.

Following the initial loading of the valve with operating pressure and operating temperature, the torques of all connecting bolts must be checked.

7 Maintenance

- Sporadic check for tightness.
- Dismantling and assembling can be managed as drawing in section 8 shows.

The safety regulations concerning the handling of media are to be observed at all times.
Even with proper cleaning and flushing of the valve, a residual quantity of medium may remain in the valve, e.g. between the sealing surfaces.
The plastic components may have also absorbed medium which gradually seeps out of the material following flushing.
For this reason, regulation safety clothing is to be worn.

Following reassembly, the valves are to be checked for tightness. Tightness is verified according to DIN 3230, part 3, BO, leak rate 3 x 2.

8 Tables, diagrams, drawings

8.1 Connecting dimensions

- Face to face : See order
- Flange : See order

8.2 Torques

Housing bolting, greased

DN	lbs in	Nm	
½"	222	25	
¾"	222	25	
1"	89	10	
1½"	222	25	Tighten
2"	222	25	crosswise
3"	443	50	
4"	443	50	
6"	443	50	

Flange bolting, greased

DN	lbs in	Nm	
½“	106	12	
¾“	115	13	
1“	124	14	
1½“	178	20	Tighten
2“	310	35	crosswise
3“	354	40	
4“	310	35	
6“	487	55	

8.3 Weights

DN	lbs	kg
½“	7,1	3,2
¾“	8,2	3,7
1“	8,2	3,7
1½“	13,9	6,3
2“	18,5	8,4
3“	47,6	21,6
4“	76,0	34,5
6“	102,6	46,6

8.4 Flow rates

DN	C_V US gpm	C_V Brit gpm	K_{VS} m³/h
½"	8,2	6,8	7,0
¾"	12,8	10,7	11,0
1"	25,6	21,3	22,0
1½"	73,4	61,2	63,0
2"	107	89	91,9
3"	233	194	200,0
4"	420	350	360,5
6"	420	350	360,5

8.5 Minimum differential pressures

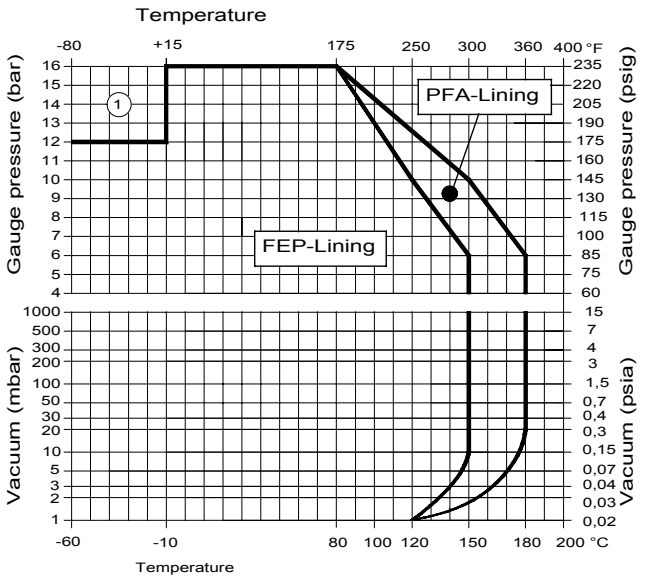
	Installation position horizontal	vertical
BC	15 psi	0,30 psi
BCV	7 psi	0,12 psi

For ventilation valves the installation position is vertically with seat upwards

BCV: Closes at a density of 62,5 lb/cu ft

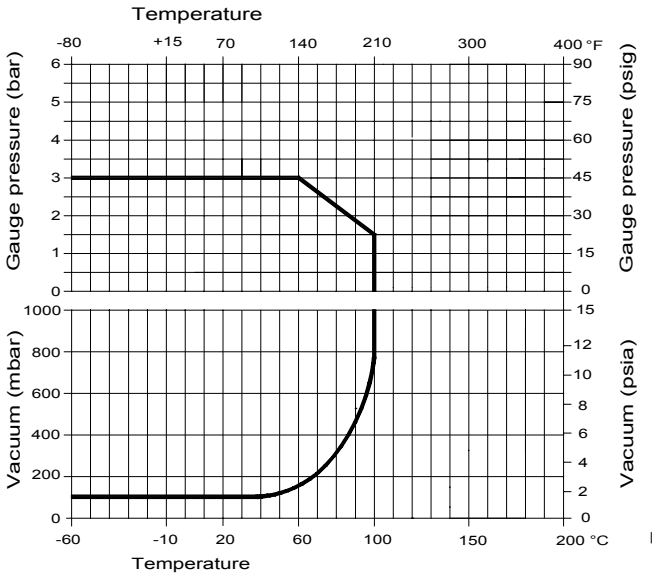
8.6 Pressure-temperature-diagram

Type BC



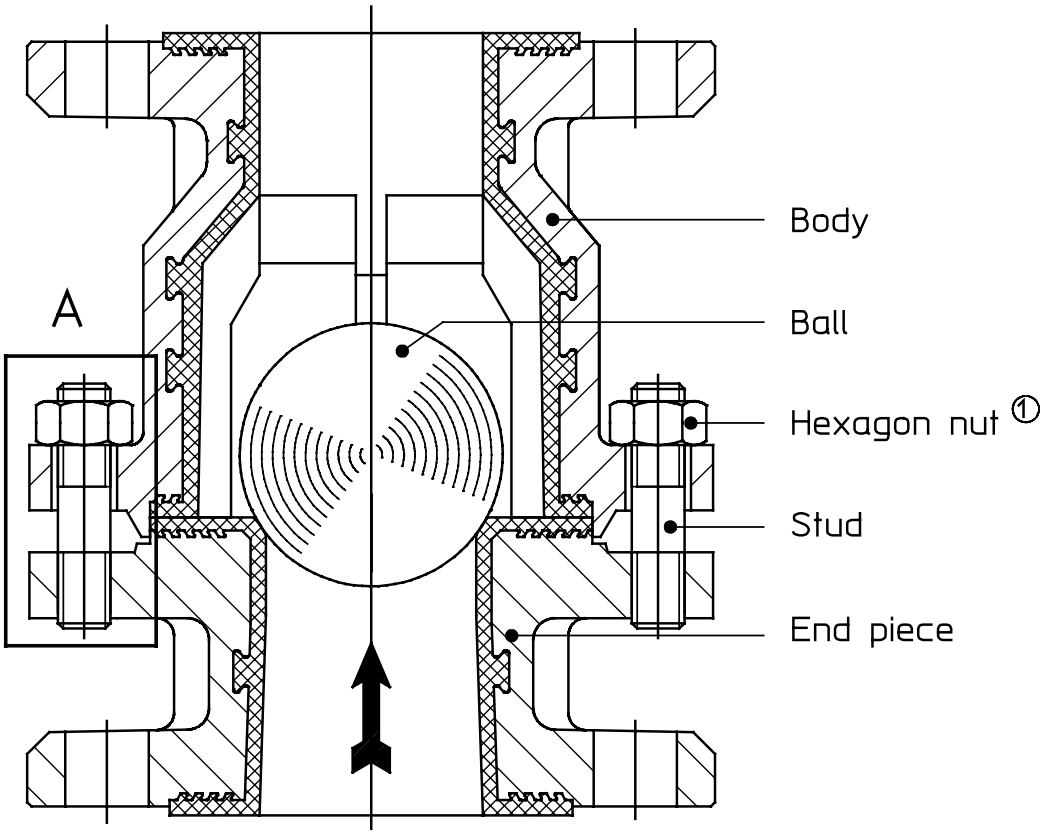
(1) With armouring-material of 0.7043
p permissible is diminished for 25%.
The local regulations are to observe, too.

Type BCV



9500-43-1014.4-00.1

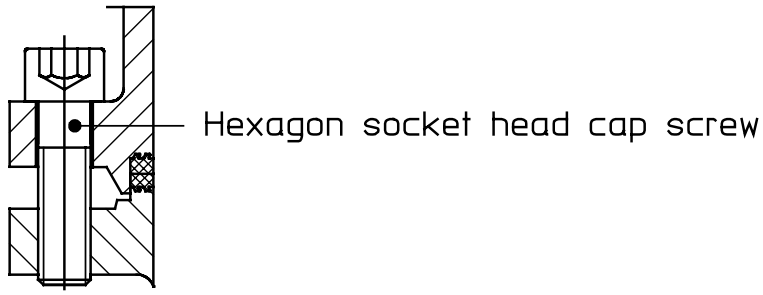
8.7 Sectional drawing



① With DN 1" special hexagon nut
(Height 0,315 inch instead of 0,256 inch)

A

Only with DN 1/2" and 3/4"



ITT Industries / Richter	Ball Check Valve Type BC / BCV	Datum / Name	Maßstab
		Bearb. 26.01.1995 Herezniak	1:1
		TM 2135 26.01.1995 Herezniak	
		Zeichn.-Nr. 9550-29-2403/4-0	
		Komm.-Nr.	
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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 and can be operated both manually as well as mechanically/electrically.**

- **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.**

Supplementary notes:

- **Electric/mechanical actuators must be subjected to their own conformity assessment to ATEX.**

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

1. Intended use:

Inadmissible modes of operation, even for brief periods, may result in serious damage to the unit.
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 long as the valve is completely filled with medium, no hazardous discharges can result from these charges.
     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)
     The following special feature applies to the series with bellows (HV, RSS, BAV, KSE, GU, GUT, PA):
     The bellows are not offered with a conductive lining, i.e. the restrictions under point 1 apply.

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

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 unit 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.

- Attachments such as actuators, position controllers, limit switches etc. must satisfy the relevant safety regulations as regards explosion protection and, if required, be designed in compliance with Atex.
  Special attention must be paid to the appropriate safety and explosion protection notes in the respective operating manuals.

- Plastic-lined valves must not be operated with carbon disulphide.

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

Declaration about the Contamination of Richter Pumps, -Valves and Components

The repair and/or maintenance of pumps, valves and components can only be implemented if a completely filled out declaration is available. If this is not the case, delay of the work will occur. If this declaration is not attached to the devices, which have to be repaired, the transmission can be rejected.
Every aggregate has to have it's own declaration.
This declaration may be filled out and signed only by authorized technical personnel of the operator.

Contractor/dep./institute :	Reason for transmitting ☒ Please mark the applicable
	Repair: ☐ subject to fee ☐ Warranty
Street :	**Exchange:** ☐ subject to fee ☐ Warranty
Postcode, city:	☐ Exchange/ Replacement already initiated/received
Contact person:	**Return**: ☐ Leasing ☐ Loan ☐ for credit note
Phone : Fax :	
End user :	

A. Details of Richter-product:

Classification:	**Failure description:**
Article number:	
Serial number:	**Equipment:**
	Application tool:
	Application process:

B. Condition of the Richter-product:	**no**[1]	**yes**	**no**
Was it in operation ?	☐	☐ →	
Drained (product/operating supply item) ?		☐	☐
All openings hermetically locked!		☐	
Cleaned ?		☐	☐
If yes, with which cleaning agent:			
and with which cleaning method:			

[1] if "no", then forward to **D**.

Contamination :	**no**[1]	**yes**
toxic	☐	☐
caustic	☐	☐
inflammable	☐	☐
explosive[2]	☐	☐
mikrobiological[2]	☐	☐
radioactive [3]		
other pollutant	☐	☐

[2] Aggregates, which are contaminated with microbiological or explosive substances, are only accepted with documented evidence of an approved cleaning.
[3] Aggregates, which are contaminated with radioactive substances, are not accepted in principle.

C. Details of the discharged materials (must be filled out imperatively)

1. **With which materials did the aggregate come into contact ?** Trade name and/or chemical designation of operational funds and discharged materials, material properties, e.g. as per safety data sheet (e.g. toxic, inflammable, caustic)

X Trade name:	Chemical designation:
a)	
b)	
c)	
d)	

	no	**yes**
2. **Are the materials specified above harmful to health ?**	☐	☐
3. **Dangerous decomposition products during thermal load ?**	☐	☐
If yes, which ones ?		

D. Mandatory declaration: We assure that the data in this explanation are truthful and complete and as a signatory I am able to form an opinion about this. We are aware that we are responsible towards the contractor for damages, which results from incomplete and incorrect data. We commit ourselves to exempt the contractor from claims for damages of thirds resulting from incomplete or incorrect data. We are aware that we are directly responsible towards thirds, irrespective of this declaration, which belongs in particularly to the employees of the contractor consigned with the handling repair of the product.

Name of the authorized person (in block letters): _____

Date _____ Signature _____

Company stamp

FAX

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Fax No. ()

Pages (incl. cover sheet) ()

To:

()

Contact person:	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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