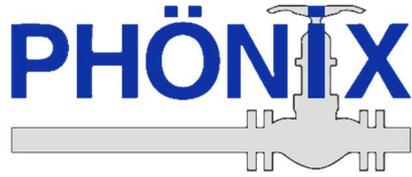


PHOENIX Armaturenwerke GmbH



Manual for Check valves
BA 120-RV

Edition 2023-08-00



Type 420



Type S27

Edition		00							
Date	Name	08/23	Wo						
Edition									
Date	Name								

Operation Instruction –Check Valves

Declaration of conformity acc. to Directive 2014/68/EU

The manufacturer	PHOENIX Armaturenwerke GmbH 34471 Volkmarsen
declares that the valves	Check Valves Manufacturer and Brand PHOENIX: Type 420 Brand STRACK: Type S27
<ol style="list-style-type: none">are pressure bearing equipments within the meaning of the Pressure Equipment Directive 2014/68/EU and in conformity with the requirements of this directive, Note: check valves <DN 32 are not concerned by this directivecan only be used and operated under observance of the attached operation manual N° BA120-RV.	

Related standards:

DIN EN 16668	Requirements and testing for metallic valves as pressure accessories. Direction for pressure bearing body components Body- and Bonnet Material acc. AD 2000 AD-A4 with Inspection Certificate 3.1 to DIN EN 10204
DIN EN 19	Marking of metallic valves

Description of type and technical features:

PHOENIX-type datasheets <420>

STRACK-type datasheets, <S27>

NOTE: This manufacturer declaration is valid for all variants of types mentioned in the PHOENIX catalogue

Applied procedure for the rating of the conformity:

to Annex II of the Pressure Equipment Directive 2014/68/EU Module „H“

Name of the notified body:

Identification N° of the notified body:

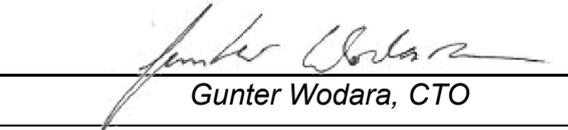
LRQA Deutschland GmbH

0525

Modifications on check valves and/or components with consequences for the technical features of the valve, of the <defined use> acc. to section 1 of the operation instruction and which will modify the valve essentially cancel these declarations.

According to the guidelines for the application of the Council's general direction 2014/34/EU of 26.02.2014 for adapting legal regulations valid in the single member countries and dealing with apparatuses and safety systems and their application in areas endangered by explosion, check valve do not have an integrated potential source of sparks as revealed by the danger of releasing sparks analysis. Due to this, check valves are not subject to the guideline mentioned above.

Volkmarsen, 30.08.2023


Gunter Wodara, CTO

Operation Instruction –Check Valves

0 Introduction

This instruction shall support the user for installation, operation, and maintenance of Check valve types **420, S27**.

	The non observance of the following attention and warning notes might cause dangers with the consequence that the manufacturer's guarantee becomes void.
Attention	For questions in this regard contact the manufacturer, addresses see section 8.

1 Defined use

After their installation in a piping system (either between flanges or by welding) the use of the check valve **types 420, S27** is exclusively defined as to stop or convey the flow of media within the admitted pressure and temperature limits by manual operation. The safety instructions of section 2 <safety instructions> shall be observed. The use of these valves for media with solid matters, especially with wearing particles is not re-commended.

The design document <Pressure-Temperature-Tables TDB3/1 to 3/5> (see section 8.1 <Information>) shows the admitted pressure-temperature-range for these check valves.

It is assumed that the safety instructions of section 2 <safety instructions> shall be observed.

2. Safety instructions

2.1 General safety instructions

Valves are subject to the same safety impositions which are valid for the piping system where the valves shall be installed. The present instruction mentions only such kind of safety notes which must additionally be considered for valves.

2.2 Safety instructions for the user

It is not within the responsibility of the manufacturer and must be safeguarded by the user of the check valve that

⇒ the valve is only used as required by the "defined use" as described in section 1

 Danger to life	Valves whose admitted pressure-temperature range (= "Rating") is not sufficient for the operating conditions shall not be used. For materials or pressures or temperatures not indicated in the a.m. <Pressure-Temperature-Tables TDB 3/1 to 3/5> a release note from the manufacturer is mandatory. The disregard of this ordinance can provoke danger to life and cause damages in the piping system.
 Danger	Protection against wrong use of the check valve: It must be absolutely assured that the selected materials of the wetted parts of the check valve are suitable for the handled media. The manufacturer is not responsible for damages of the check valve caused by corrosive agents. The disregard of this ordinance can provoke danger for the user and cause damages in the piping system.

Operation Instruction –Check Valves

- ⇒ The check valve and the control system will be installed workmanlike in the piping system, especially such types of valves which are fitted into the piping system by welding. The wall thickness of the valve body shall be calculated in such a way that an additional load F_z within the usual order of magnitude ($F_z = \pi/4 \cdot DN^2 \cdot PS$ or PN) is taken into account for such a workmanlike mounted piping system.
(*PS = max. admitted design pressure at ambient temperature*),
- ⇒ the valve shall be fitted workmanlike with these systems,
- ⇒ inside this piping system the usual flow rates in continuous operation shall not be exceeded and exceptional operating conditions such as vibrations, water hammers, cavitation, and higher percentages of solid matters in the media – especially wearing ones – had been cleared with the manufacturer,
- ⇒ check valves used at operating temperatures $>+50^\circ\text{C}$ or $<-20^\circ\text{C}$, are protected against contact as it is intended for the pertinent piping system,
- ⇒ Only qualified staff is used for the operation and maintenance of equipment for pressure bearing piping systems.

2.3 Special risks

 Danger to life	Before the disassembling of the valve out of the piping system and/or before the loosening of the bolts and nuts of the bonnet the system shall be completely depressurised to avoid an uncontrollable fugitive emission of the media.
 Danger	<i>check valves which are not slowly operated in the starting up phase at service temperatures of $>250^\circ\text{C}$:</i> Leakages might occur. See also section 6.1. <Starting-up phase>
 Danger	Whenever a check valve which is used as final valve shall be opened under pressure load this must be performed with extraordinary care and in such a manner to assure that the outspurring media cannot provoke damages.
 Danger	When a valve shall be disassembled from the piping system there exists the risk that the media can flow out off the piping or the valve. In case of liquids which are harmful for the health or dangerous the piping system shall be completely drained before the valve can be removed from the system. Caution of residues coming out off or remaining in dead holes of the valve or the piping system itself.

Operation Instruction –Check Valves

2.4 Marking of the check valve

Each check valve is normally marked as follows:

For	Marking	Note
CE-Mark	CE	Corresponding to PED 2014/68/EU valves shall be marked with the CE-mark only for sizes DN 32 and more
CE-Ident N°	0525	Nominated body to EU Directive = LRQA Deutschland GmbH Register
Manufacturer	PHOENIX (PAG)	is the Logo for <Fa. PHOENIX Armaturenwerke>
Brand	STRACK (SAG)	is the Logo für <Fa. STRACK Armaturenwerke>
Date of manufacture	e.g.: 05/02	The first figures before the strike indicate the month of manufacture (05 = May), the figures after the strike = year of manufacture, e.g. (02 = 2002)
Valve type	Type (und Zahlenwert)	e.g. Type 420, see Datasheet PHOENIX
Body material	e.g.: 1.0619.01	N° of material standard to EN 10027, Part 2
Size	DN or NPS (and numerical value)	Numerical value in mm, e.g. DN 200 or NPS 8
Design pressure	PS or PN (and numerical value)	Numerical value in [bar] at 20°C, e.g. PS 40
	ANSI and Class (numerical value)	e.g. ANSI 300
max. pressure for the closing disc	Dp and numerical value	Numerical value in [bar] at operating pressure e.g. dp = 12 (please see also valve info tag plate)
Heat-/ Melt N°	e.g.: 25652 or GHW	Heat-/Melt N° of the foundry

3 Transport and Storage

Check valve shall be carefully treated, transported, and stored:

- ⇒ The valve shall be stored with its protecting packing and/or with its protecting caps on the inlet and outlet. Valves with a weight of more than 10 kos shall be stored on pallets (or similar) and be transported in such a state (even on the transport to the installation point).

 Attention	<p><i>To protect the valve against damages:</i> Ropes and belts shall only be fixed on the body/bonnet!</p>
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- ⇒ Before its installation the valve shall be normally stored in closed area and be protected against detrimental influences such as dirt and humidity.
- ⇒ In particular the end orifices of the check valve for the connection with the piping system shall not be damaged neither by mechanical nor other influences.
- ⇒ Check valve will be supplied shall be stored in this state.

Operation Instruction –Check Valves

4 Installation into the piping system

4.1. General

For the installation of valves into a system the same instructions are valid as for the connection of pipes among themselves and similar piping components. When in a plant the piping and other equipment are isolated, this must also be applied to the built-in check valves. In addition, the following instructions are valid for check valve. For the transport to the installation place please mind the information given in section 3 of this manual.

 Danger to life	If check valves are installed in insulated piping systems, or in the area of other isolated equipment, so they must also be isolate. In absence of insulation, check valves can be damaged. In serious cases, the pressurized parts could be damaged.
 Note	Acc. To their design check valve shall be installed as follows: -Flow direction in conformity with the arrow, -Valve bonnet always directed upwards , - Never in downstream pipings
 Attention	<i>To avoid damages of check valves with weld ends:</i> During the welding of the valves into the piping system the weld procedure shall be performed in such a way that the applied heat energy is limited and distortions of the valve body are avoided. Therefore, larger sizes shall be welded in alternating procedures once from one side and then from the other to avoid restraints in the valve's body. During the weld procedure the check valve shall be brought and kept in the open position until the weld conjunction is cooled down to <100°C.

4.2 Working steps

- ⇒ Transport the check valve in its protecting packing to the installation site and unpack the valve just before its immediate fitting into the system to ensure that the valve is protected against each kind of contamination.
- ⇒ Inspect the valve on possible transport damages. Damaged valves shall not be installed.
- ⇒ Make sure that only check valves will be installed whose pressure rating, type and dimensions of connections correspond to the operating conditions. In this regard also see related marking of the check valve.

 Danger to life	Check valve whose admitted pressure-/temperature rating is not sufficient for the operating conditions shall not be installed. This admitted range results in the marking and/or in the design document <Pressure-Temperature-Tables TDB3/1 to 3/5> see also section 1 <Defined use>. Disregard of this precautionary measure can provoke danger to life for the user and damages in the piping system.
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- ⇒ The connections of the piping system shall be in strict alignment with the end connections of the check valve and shall have plane-parallel ends.
- ⇒ Before the installation the valve and the corresponding pipe shall be carefully cleaned from dirt and contaminations, especially hard foreign particles shall be removed.
- ⇒ The flow direction of check valve is marked by an arrow.

	Check valve shall not be installed against the marked flow direction.
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Operation Instruction –Check Valves

Danger to life	Disregard of this precautionary measure can provoke danger to life for the user and damages in the piping system.
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For check valve with weld ends only:

- ⇒ The weld ends of the valve shall be in true alignment and shall have parallel faces and must be of identical type and materials as the pipes – see type plate of the valve. Opposite weld ends must fit to each other as far as diameters and weld joints are concerned.
- ⇒ Make sure by workmanlike welding that neither worth mentioning tensions will be produced in this piping section or on the valve nor that the check valve body might get distorted due to unilateral heat introduction during the weld procedure. Only temperatures of <300°C, measured on the body wall, are admitted.
- ⇒ The weldings must be performed workmanlike
- ⇒ Weld cables shall not be fixed on the valve itself but exclusively on the pipings.

 Attention	Disregard of these impositions can provoke distortion of the valve body. A permanent distortion in the seat area of the valve can signify that the valve becomes un-serviceable.
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5 Pressure test of the piping section.

For the pressure test of check valve the same instructions are valid as imposed for the piping system. In addition the following shall be considered:

- ⇒ Newly installed pipe system shall be carefully cleansed to flush off all foreign particles.
- ⇒ The test pressure “PT” of an **opened valve** shall **not exceed the value 1,5x PN/PS** by virtue of the marking of the valve.
- ⇒ The test pressure “PT” of a **closed valve** shall **not exceed the value 1,1x max. admitted.**

6 Starting up/commissioning, normal operation and maintenance.

6.1 Starting up/Commissioning

During the “starting up phase” of a piping section it must be assured at temperatures of >100°C – especially when check valves of >DN 300 are involved - that the handled medium will be slowly fed-in. Otherwise the valve’s body gets distorted and the valve will leak.

6.2 Maintenance

Regular maintenance work is not required for check valves, however, during the inspection of the piping section no leakage shall appear neither on the flanged and/or screwed connections nor on the stuffing box. In case of leakages and repairs please see section 2 – <Safety instructions> and section 7 <Failures>

7 Trouble shooting

During the remedy of failures section 2 <Safety instructions> shall be absolutely considered.

 Danger	<i>When a check valve is removed from systems conveying dangerous media and shall be carried away from the plant:</i> Then the check valve must be professionally decontaminated.
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Operation Instruction –Check Valves

Kind of failures	Procedures for remedy	Note
Leakage on the flanges to the system or between body and bonnet	Tighten bolts and nuts. <i>When the valve is still leaking:</i> Remove the valve, considering always the notes in section 2.3 <Special risks> and ask for spare gaskets for the bonnet and correlated instructions at PHOENIX:	Note 1: <i>Spare parts shall be ordered with all indications of the marking of the valve. Only the original PHOENIX spare parts shall be used for repairs and replacements</i>
Leakage in the closed position	Remove the valve (Mind and consider notes of section 2.3 <Special risks) and check the valve. <i>In case of damaged seats:</i> Repair necessary: Remove the valve, mind the notes of section 2.3 <Special risks>. Ask PHOENIX for corresponding instructions or send the valve back to PHOENIX for repair.	<i>the original PHOENIX spare parts shall be used for repairs and replacements</i>

8 Information

The mentioned <Datasheets>, <Design documents> Repair instructions and other information – also in other languages - you can ask for under

Info@phoenix-valvegroup.com oder <http://www.phoenix-valvegroup.com>

or at the following address:

PHOENIX Armaturenwerke GmbH

Am Stadtbruch 6
34471 Volkmarsen

Tel.: 05693-988-0
Fax.: 05693-988-140

8.1 Pressure – Temperature-Rating, Excerpt TDB 3/1 to 3/5

The requirements of DIN EN 12516 – 1 are principally fulfilled. For pressure temperature rating > PN 160 please ask the manufacturer PHOENIX.

- Low alloyed and not alloyed steels

PN	DN-range	Admitted oper. pressure (bar) at oper.temperatures (°C)						
		-60*	-10	120	200	300	400	450
10	15-500	7,5	10	10	8	6	6	5
16	15-500	12	16	16	15	12	9	6
25	15-500	18,75	25	25	23	18	14	12
40	15-300	30	40	40	38	30	24	20
63	15-150	47,25	63	63	55	41	35	32
100	15-150	75	100	100	85	62	53	51
160	15-150	120	160	160	130	96	84	81

* AD-W10, Load case II

Operation Instruction –Check Valves

- Stainless steels

PN	DN-range	Admitted oper. pressure (bar) at oper.temperatures (°C)					
		-196*	-10	120	200	300	400
10	15-500	10	10	10	8	6	6
16	15-500	16	16	16	15	12	11
25	15-500	25	25	25	23	18	16
40	15-300	40	40	40	36	30	25
63	15-150	63	63	63	50	44	40
100	15-150	100	100	100	80	70	64
160	15-150	160	160	160	130	112	103

* Not valid for SS 1.4581

- Low temperature steels

PN	DN-range	Admitted oper. pressure (bar) at oper.temperatures (°C)					
		-60*	-50	-10	120	200	300
10	15-500	10	10	10	10	8	6
16	15-500	16	16	16	16	15	12
25	15-500	25	25	25	25	23	18
40	15-300	40	40	40	40	36	30
63	15-150	63	63	63	63	55	41
100	15-150	100	100	100	100	85	62
160	15-150	160	160	160	160	130	96

* 1.0488

For steels not mentioned in these tables the user shall contact the manufacturer/supplier of the valve.

