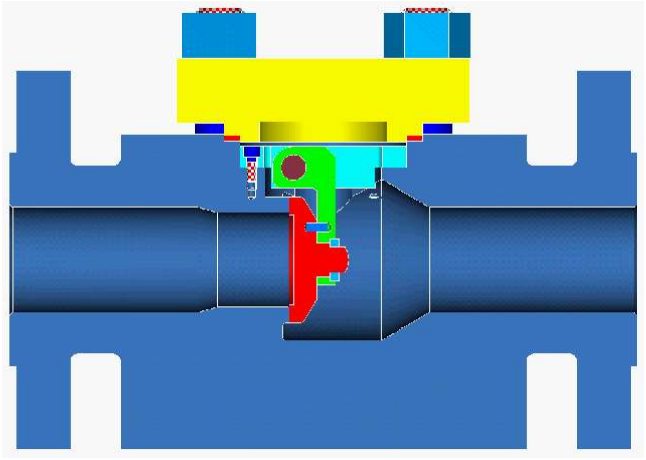
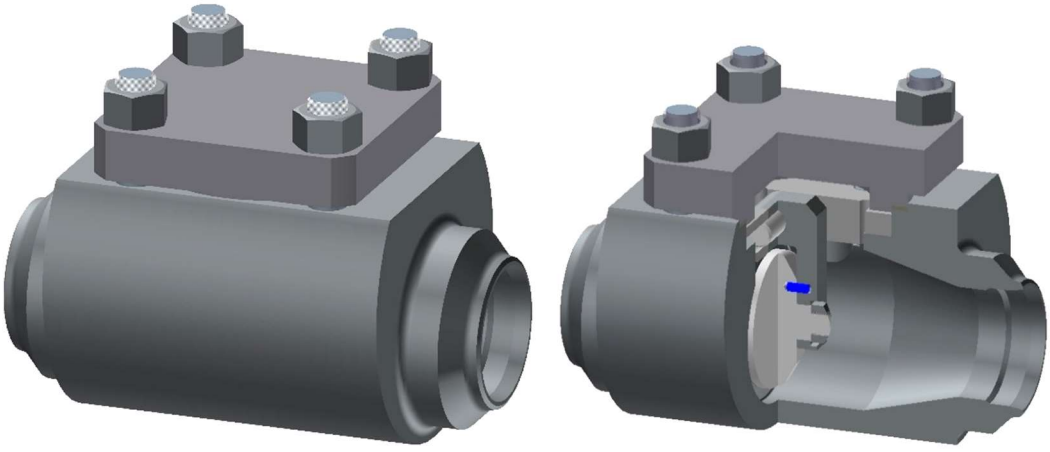
PHOENIX Armaturenwerke GmbH

Manual for Swing Check Valves BA 121-RK

Edition 2023-08-00





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

The manufacturer	**PHOENIX Armaturenwerke GmbH 34471 Volkmarsen**
declares that the valves	**Swing Check Valves** **Manufacturer and Brand PHOENIX:** **Typ 418,** **Brand STRACK:** **S70, S72, S73**

1. 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: Swing sheck valves < DN 32 are not concerned by this directive

2. can only be used and operated under observance of the attached operation manual N° BA121-RK.

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 data sheet <418>, STRACK-type data sheets <S70, S72, S73>

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 swing sheck valve 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 modifiy 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 appar-tuses and safety systems and their application in areas endangered by explosion, swing check valves do not have an integrated potential source of sparks as revealed by the danger of releasing sparks analysis. Due to this, swing sheck valves are not subject to the guidline mentioned above.

Volkmarsen, 30.08.2023

Gunter Wodara, CTO

0 Introduction

This instruction shall support the user for installation, operation, and maintenance of swing sheck valve **types 418, S70, S72 und S73**.

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

1 Defined use

After their installation in a piping system (either between flanges or by welding) the use of the ckeck valve **types 418, S70, S72 und S73**.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 valves.

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

2. Saftey 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.

Additional safety notes are given in the instructions of the actuator components.

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.**

⇒ The check valve 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 ambien 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,

⇒ valves used at operating temperatures >+50°C or <–20°C, are protected against contact as it is intended for the pertinent piping system,

⇒ Only qualifed 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. It must be assured that **the valve is completely open** to enable that the pressure can escape on both sides of the valve.
 **Danger**	*Check valves which are not slowly operated in the starting up phase at service temperatures of >250°C:* Leakages might occure. See also section 6.1. <Starting-up phase>
 **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 harmfull 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.**

2.4 Marking of the Swing Check valve

Each swing sheck 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)**	Logo for <PHOENIX Armaturenwerke GmbH>
Brand	**STRACK (SAG)**	Logo for <STRACK Armaturenwerke GmbH>
Manufacturer-N°	**e.g.:98898/02**	The first figures before the strike are the factory number, the last figures after the strike = item n° g.g. /02 = item 2 of the order
Date of manu-facture	**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** (and numerical value)	e.g. Type 418, 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 sea also valve info tag plate)
Heat-/ Melt N°	**e.g.: 25652 or GHW**	Heat-/Melt N° of the foundry

In addition, the actuated valves are marked with a valve information plate.

3 Transport and Storage

Swing sheck valve shall be carefully treated, transported, and stored:

⇒ The valve shall be stored with its protectecting 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**	*To protect the valve against damages:* Ropes and belts shall only be fixed on the body/bonnet!

⇒ 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 handwheel and the end orifices of the swing sheck valve for the connection with the piping system shall not be damaged neither by mechanical nor other influences.

⇒ Swing sheck valve will be supplied with disc in closed position and shall be stored in this state.

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 swing sheck 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 swing sheck valve shall be installed as follows: - Flow direction in conformity with the arrow, - Valve **bonnet** always directed **upwards**, - **Never in downstream pipings** - Installation in horizontal pipe systems and vertikal riser pipes possible.
Attention	*To avoid damages of swing check valves with weld ends:* 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 distorsions of the valve body are avoided. Therefore, larger sizes shall be welded in alternating pro-cedures 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 and the actuator 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	Swing sheck 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.**

⇒ 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. For special applications and information see section 8 < Information>

Danger to life	Swing sheck valve shall not be installed against the marked flow direction. **Disregard of this precautionary measure can provoke danger to life for the user and damages in the piping system.**

⇒ Introducing the valve (and the flange gasket) into an existing piping system e.g. in case of replacement, the distance between the pipe ends must be dimensioned in such a way that the sealing surfaces of the flanges and the gaskets, too, will not be damaged.

However, the gap shall not be larger than necessary to avoid additional loads onto the piping system during the installation.

For Swing sheck 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 identic 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 swing sheck 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 distorsion of the valve body.** A permanent distorsion in the seat area of the valve can signify that the valve becomes unserviceable.

5 Pressure test of the piping section.

For the pressure test of swing sheck 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 Dp** by virtue of the marking on the valve info plate *(see section 2.4 < Marking of the swing sheck valve with actuator).*

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**	*When a check valve is removed from systems conveying dangerous media and shall be carried away fromt he plant:* Then the check valve must be professionally decontaminated.

Kind of failures	Procedures for remedy	Note
Leakage on the flanges to the system or bet- ween body and bonnet	Tighten bolts and nuts. *When the valve is still leaking:* 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:*** *Spare parts shall be ordered with all indications of the marking of the valve. Only the ori- ginal PHOENIX spare parts shall be used for repairs and replacements*
Leakage in the closed position	Remove the valve (Mind and consider notes of section 2.3 <Special risks) and check the valve. *In case of damaged seats:* 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.	***Note 2:*** *When it is noted after the disassembling of the valve that the body and/or trim is not sufficiently resistant against attacks of the media opt for more suitable materials of design*

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 fullfilled.

- **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

- **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.