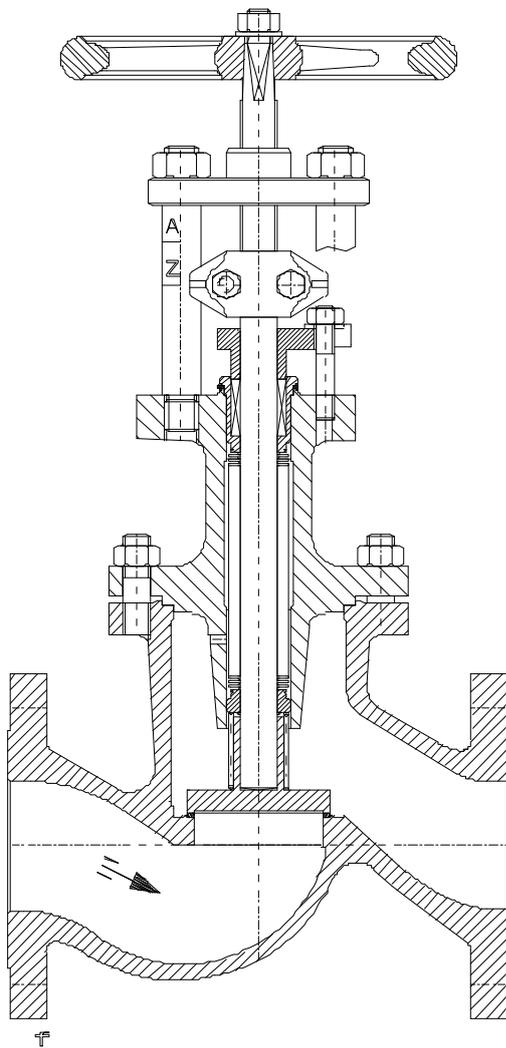




PHOENIX – Armaturenwerke GmbH

Operating Instruction Stop Check Valve
BA 126-ARV

Edition 2023-08-00



Revision		00						
Date	Name	08/23	Wo					
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Date	Name							

Operating Instruction Stop Check Valve

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

The manufacturer	PHOENIX Armaturenwerke GmbH, D 34471 Volkmarsen
declares that the valves	Stop Check Valves Type 346
1. are pressure bearing equipment within the definition of the EC Pressure Equipment Directive 2014/68/EU and in conformity with the requirements of this directive, Note: Stop Check Valves < DN 32 are not covered by this directive	
2. can only be used and operated under observance of the attached operation manual N° BA 126-ARV.	

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-Datasheet <346>

NOTE: This manufacturer declaration is valid for all variants of type 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 Stop Check Valves and/or components with consequences for the technical features of the valve, of the “defined use” per section 1 of these operating instructions, 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, Stop Check valves do not have an integrated potential source of sparks as revealed by the danger of releasing sparks analysis. Due to this, Stop Check Valves are not subject to the guideline mentioned above.

Volkmarsen, 31.08.2023



Gunter Wodara, CTO

Operating Instruction Stop Check Valve

0 Introduction

This instruction shall support the user for installation, operation, and maintenance of **Stop Check Valves Type 346**.

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

1 Defined Use

Stop check valves **Type 346** are exclusively to be used for installation into a piping system (either between flanges or by welding) to prevent the flow reversal of a fluid inside this piping system within allowable pressure and temperature rating of the valve. This valve can additionally be shut off, this means that the check function of the valve can be eliminated. See safety instruction in Section 2 <Safety Instructions>.

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

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. Therefore, the present instruction mentions only such kind of safety notes that 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 stop 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 for the stop check valve: It must be absolutely assured that the selected materials of the wetted parts of the stop check valve are suitable for the handled media. The manufacturer is not responsible for damages of the stop 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 stop check will be installed workmanlike in the piping system, especially such types of stop check 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 ($F_z = \pi/4 \cdot DN^2 \cdot PS$) is taken into account for such a workmanlike mounted piping system.

($PS = \text{max. admitted design pressure at ambient temperature}$),

⇒ the valve shall be fitted workmanlike with these systems,

⇒ inside this piping system the usual flow rates (e.g. 4 m/s for liquids) in continuous operation shall not be exceeded and exceptional operating conditions such as vibrations, water hammers, cavitations and higher percentages of solid matters in the media – especially wearing ones – had been cleared with the manufacturer,

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- ⇒ stop check valves used at operating temperatures $>+50^{\circ}\text{C}$ or $<-10^{\circ}\text{C}$, are protected against contact as it is intended for the pertinent piping system,
- ⇒ Only qualified staff is used for the operation and maintenance of 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 depressurized to avoid an uncontrollable fugitive emission of the media.
 Danger	<i>Stop check valves need to be operated slowly 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	When a valve shall be disassembled from the piping system 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.

2.4 Marking of the stop check valve.

Each stop check valve is normally marked as follows:

Table 1 Marking of the stop check valve

For	Marking	Note
CE-Mark	CE	Corresponding to PED 2014/68/EU valves shall be marked with the CE-mark only for sizes DN32 and more
Marking	0525	Named place according to EU Guidelines = LRQA Deutschland GmbH Register
Manufacturer	PHOENIX (PAG)	Logo for <PHOENIX Armaturenwerke GmbH>
Manufacturer-N°	e.g.: 98898/02	The first figures before the slash are the factory number, the last figures after the slash = year of production, e.g. /02 = 2002
Manufacturing Date	e.g. 05/02	The two first number are the month (05=May), the two last numbers after the slash are the year (02= 2002).
Valve type	Type (and number)	e.g. Type 346, see Datasheet PHOENIX
Body material	e.g.: 1.0619.01	N° of material standard to DIN EN 10027 Part 2
Size	DN or NPS (and numerical value)	Numerical value in mm, e.g. DN 200 or NPS 8
Max. 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
Lot N°	e.g. 25503; GWN	Lot number of the foundry

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3 Transport and Storage

Stop check valves shall be carefully treated, transported, and stored:

- ⇒ The valve shall be stored on pallets (or similar) with its protecting packing and/or with its protecting caps on the inlet and outlet and shall also be transported in such a state (even on the transport to the installation point). Stop check valves weighting over about 10kg, shall be stored, and transported on a palette (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 bonnet but never on the handwheel!</p>
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- ⇒ Before its installation the valve shall be normally stored in closed area shall be protected against detrimental influences such as dirt and humidity.
- ⇒ In particular the handwheel and the end orifices of the stop check valves for the connection with the piping system shall not be damaged neither by mechanical nor other influences.
- ⇒ Stop check valves shall be stored in the conditions as they were supplied by the manufacturer.

4 Installation into the piping system

4.1 General

For the installation of valves into a piping 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 stop check valves. In addition, the following instructions are valid for stop check valves. For the transport to the installation place please see the information given in section 3 of this manual.

 Danger to life	<p>If stop 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, stop check valves can be damaged. In serious cases, the pressurized parts could be damaged.</p>
 Note	<p>Stop check valves – depending on their design – must be installed according to the following:</p> <ul style="list-style-type: none"> - Flow direction per indication (marking) on valve body, - Bonnet always in vertical position, - Not for installation into vertical piping.
 Attention	
 Attention	<p><i>To avoid damages of stop 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 deviations 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.</p>

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4.2 Working steps.

- ⇒ For transportation to the installation site the stop check valve has to in its protecting packing; 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 stop check valves shall be installed whose pressure rating, type and dimensions of connections correspond to the operating conditions. In this regard also see related marking of the stop check valve.
- ⇒ The connections of the piping system shall be in strict alignment with the end connections of the stop check valve and 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 required flow direction of the valve is marked on the valve body and shall be respected.

 Danger to life	No stop check valve should be installed against the required flow direction. Disregard of this imposition can provoke danger for the operator and damages in the piping system.
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For stop check valves 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 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 stop 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.
- ⇒ All welding must be performed workmanlike.
- ⇒ Weld cables shall not be fixed on the valve but exclusively on the piping.

 Attention	Disregard of these impositions can provoke distortion of the valve body. Even 1/10 mm of permanent distortion in the seat area of the valve can signify that the valve becomes unserviceable.
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5 Pressure test of the piping section.

For the pressure test of stop check valves the same instructions are valid as 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 PS (at 20°C) by virtue of the marking of the valve and tables TDB3/1 to 3/5.**
In case that the valve is only marked with PN then $PT = 1,5 \times PN$ [bar] is valid.
- ⇒ The test pressure “PT” of a **closed valve** shall **not exceed the value 1,1x PS (at 20°C).**

6 Starting up, and maintenance.

6.1 Starting up.

During the “starting up phase” of a piping section it must be assured at temperatures of >100°C – especially when the stop check valves of >DN 300 are involved - that the fluid enters the pipe section slowly. Otherwise, the valve bodies get distorted, and the stop check valve will leak.

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6.2 Maintenance

Regular maintenance work is not required for stop check valves, however, during the inspection of the pi-ping 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 correction of failures, section 2 <Safety instructions> shall be absolutely considered.

 Danger	<p><i>When a stop check valve is removed from systems conveying dangerous media and shall be carried away from the plant:</i></p> <p>The stop check valve must be professionally decontaminated.</p>
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Kind of failures	Procedures for correction	Note
Leakage on the flanges to the pipe or between body and bonnet	<p>Tighten bolts and nuts.</p> <p><i>When the valve is still leaking:</i></p> <p>Remove the valve, considering always the notes in section 2.3 <Special dangers> and ask for spare gaskets for the bonnet and correlated instructions at PHOENIX.</p>	Note 1:
Leakage of the stuffing box seal	<p><u>Stop check valves without bellows seal:</u></p> <p>Tighten the nuts of the gland follower alternating and clockwise in little steps of max. ¼ turn until the leakage stops.</p> <p>In the document <A119R> (<u>see section 8</u>), the max. admitted torque for the tightening is specified.</p> <p><i>In case the leakage cannot be eliminated by this procedure:</i></p> <p>Repair will be necessary. Ask PHOENIX for new packing and corresponding instructions.</p> <p><i>In case the nuts of the gland follower shall be loosened or re-moved (anticlockwise turning):</i></p> <div style="text-align: center;">  <u>Danger of life</u> </div> <p>To protect the staff against possible risks the complete system shall be absolutely depressurised. Consider section 2.3 <Special risks>.</p> <p><u>Stop check valves with bellows seal:</u></p> <p>The bellows is damaged and shall be replaced as soon as possible, especially when used with corrosive/hazardous media: Repair necessary. Remove stop check valve from the line, consider section 2.3 <Special risks>. Ask PHOENIX for required spares and corresponding instructions.</p> <p><i>As long as replacement is not possible:</i></p> <p>Retighten stuffing box as described above.</p>	<p><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></p> <p><u>Note 2:</u></p> <p><i>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</i></p>

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Kind of failures	Procedures for correction	Note
Leakage in the closed position	<p>Remove the valve (Mind and consider notes of section 2.3 <Special risks) and check the valve.</p> <p><i>In case of damaged seats:</i></p> <p>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.</p>	
Functional failures	<p>Check stem and stem nut.</p> <p><i>When these functional components are ok but not sufficiently lubricated:</i></p> <p>Clean stem from dirt and contaminations and lubricate with grease compatible with the operating temperatures. For normal operating temperatures lithium saponified greases are sufficient.</p> <p><i>When this procedure will not correct the failure:</i></p> <p>Repair necessary: Remove the valve and inspect, mind the notes of section 2.3 <Special risks>. Ask PHOENIX for corresponding spares and required instructions.</p>	

8 Additional Information

The mentioned <Datasheets>, <Design documents> Repair instructions and other information – also in other languages - are available under

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

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

The requirements of DIN EN 12516 – 1 are principally fulfilled.

- Low alloyed and not alloyed steels

PN	DN-range	Max. working pressure (bar) at operating 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	Max. working pressure (bar) at operating 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 for material 1.4581

- Low temperature steels

PN	DN-range	Max. working pressure (bar) at operating 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 material not mentioned in these tables the user shall contact the manufacturer/supplier of the valve.