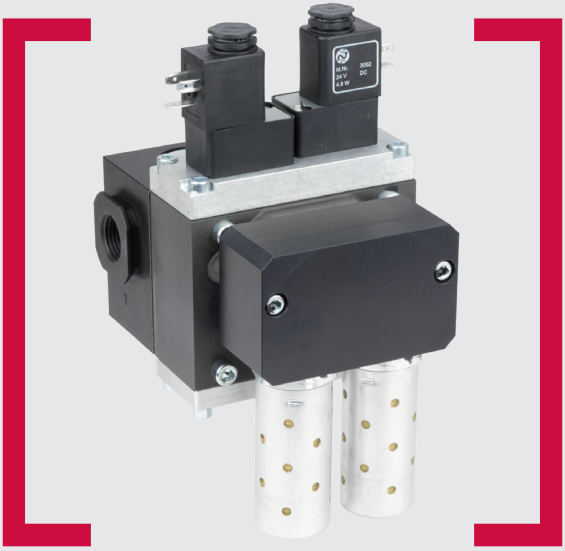
SCVA, 3/2-way safety valves

elektro-pneumatic actuated
G1/4, G1/2, G3/4, G1 / 1/4-NPT, 1/2-NPT, 3/4-NPT, 1-NPT



Before starting work read these instructions.

Content

1 Information about these instructions

These instructions will enable you to safety install, set up and operate the SCVA safety valves.
These instructions are an integral part of the product and must be accessible to personnel.
Personnel must carefully read through and understand these instructions before starting work of any kind on the valves.
Following all the safety and handling instructions contained in this manual is a fundamental requirement for safe working.

1.1 Validity of documentation

These instructions are valid for all 3/2- way valves of the range SCVA. It is adressed to all personnel with access to the area nearby the instalation and machines, especially: User, operators, expert staff, instructed persons, mechanics, maintenance-/service-personnel, cleaning staff and mechanics.

1.2 Explanation of symbols

SIGNAL WORD

Type of danger
Consequences of non-observance
→ Measurements to be taken to encounter the danger.

1.3 Risk categories (ANSI Z535.6)

⚠ DANGER

This warning indicates an immediate hazardous situation with high risk, the consequence of which could be fatal or (severe) injuries if it is not prevented.

⚠ WARNING

This warning indicates a possible hazardous situation with medium risk, the consequence of which could be fatal or (severe) injuries if it is not prevented.

⚠ CAUTION

This warning indicates a hazardous situation, the consequence of which could be slight or moderate injuries if it is not prevented.

ADVICE

This advice indicates a hazardous situation, the consequence of which could be material damages if it is not prevented.

1.4 Used symbols and signal words

In this documentation the following symbols and signal words are used:

•	numeration
→	instruction
1. 2.	specified order of instructions
info	additional information
DANGER	warning integrated in text
WARNING	
CAUTION	
ADVICE	
specific values respectively fixed attributes	

Example:

info A tight pressure system contributes energy savings, thus ressources and the environment.

1.5 Liability and warranty

Modifications to the safety valves may only be carried out by the manufacturer's personnel.

If the safety valve requires repairs or servicing beyond the scope of the activities described in these instructions, this work may only be carried out by the manufacturer of the safety valve or by persons who have been expressly authorised and trained by the manufacturer.

Failure to observe the above will void the warranty. The manufacturer accepts no liability for damages incurred.

1.6 Manufacturer's address

Norgren GmbH
Stuttgarter Str. 120
D-70736 Fellbach
Tel.: +49 (0)711 52 09-0
Fax: +49 (0)711 52 09-614
product.support@imi-precision.com
www.imi-precision.com/de

2 General safety instructions

This section provides an overview of all major safety aspects for the protection of people and for safe, fault-free operation. Further task-related safety notices appear in the sections on transportation, installation, checks before initial operation, and maintenance.

The safety instructions are related to the valve itself. In combination with other machine parts, additional potential risks might occure which must be evaluated in a risk assessment of the complete machine.

→ The limitations of temperature, pressure ranges, must not be exceeded.

2.1 Intended use

SCVA series safety valves are used to control hazardous movements in pneumatic safety systems with category 4 control requirements per ISO 13849-1 with performance level „e". The valves are only intended to use in large scale stationary industrial tools or plants.

The valve must not be used in explosive zones/areas.

It shall be ensured that clogging of the silencers can not result in a hazardous condition.

2.2 Not intended use

The use of the valve is in the following cases **not intended**:

- The valve is used outside the specified operational values. The permitted temperature- and pressure ranges are exceeded.
- Damages on the valve have been noticed, but the valve is still in operation.
- The valve has been structurally changed without permission of the manufacturer.
- The safety instructions in this documentation have not been observed.
- The valve is used in explosive zones/areas.
- A noise reduction measurement has not been applied.
- The safety valve has been disassembled or single parts separated/exchanged.
- The safety valve is used as a climbing assist.
- SCVA 3/2-way double valves are not suitable for the control of clutch and brake on mechanical presses.
- Pneumatically actuated 3/2-way double valves are not suitable for the control of clutch and brake on mechanical presses.

⚠ WARNING

Clogging of silencers

Dirt can cause malfunction of the safety silencer.

→ Check for adequate air quality.

2.3 General risks

The following section lists residual risks which may be present even if the safety valves are used correctly.

⚠ DANGER

Danger caused by hazardous movements

When the power is switched off or if there is a power cut the loads supported by the safety valves can drop and the system can lose pressure. This can cause serious injuries..

Provide additional mechanical safety devices that prevent hazardous movements after the power is switched off.

⚠ CAUTION

Danger of injury caused by hot surfaces

The safety valves can become very hot during operation. Skin contact with hot surfaces causes severe burns.

→ When working near hot surfaces, always wear heat-resistant protective clothes and protective gloves.

→ Before you start any work, make sure that all surfaces have cooled to ambient temperature.

⚠ WARNING

Danger of injury caused by noise
The noise level that occurs can seriously damage your hearing.

→ Always wear ear protection when working.
→ Fit noise reduction measures, e.g. silencers, during installation.

⚠ WARNING

Danger of injury caused by compressed air
Compressed air can cause injuries if not handled correctly.

→ Ensure systems are depressurised before work begins.
→ Have all work carried out by pneumatics specialists.

⚠ WARNING

Danger of injury caused by lack of training
People who lack proper training cannot assess the risks when handling the safety valves and they place others at risk of serious injury or death.

→ Have all work on the pneumatic system carried out by pneumatics specialists.
→ Train the personnel widely in safety related topics.
→ Have all electrical installation work carried out by qualified electricians.

Requirements

Pneumatics specialists are trained for the specialist area they work in, and they know the relevant standards and regulations.

Because of their special training and experience, pneumatics specialists can carry out work on pneumatic, electropneumatic and mechatronic systems and identify and avoid risks by themselves.

Qualified electrician, because of their specialist training, knowledge and experience, and their knowledge of the relevant standards and regulations, qualifi ed electricians are able to carry out work on electrical installations and identify and avoid possible risks by themselves.

Qualifi ed electricians are specially trained for the area they work in, and they know the relevant standards and regulations.

2.5 Personal protective equipment

While carrying out work of various kinds on and with the safety valves, personnel must wear personal protective equipment which is referred to in the individual sections in these instructions.

	**Protective clothing** Protective clothes are heat-resistant and closefitting clothes with low tear strength, close-fitting sleeves and without any parts sticking out..
	**Safety shoes** Safety shoes protect the feet from crushing, falling parts and slipping on slippery surfaces.
	**Safety goggles** Safety goggles protect the eyes from fl ying objects and splashing liquid.
	**Protective gloves** Protective gloves protect the hands and forearms against contact heat if they touch hot surfaces.
	**Ear protection** Ear protection protects your hearing from damage caused by exposure to noise.

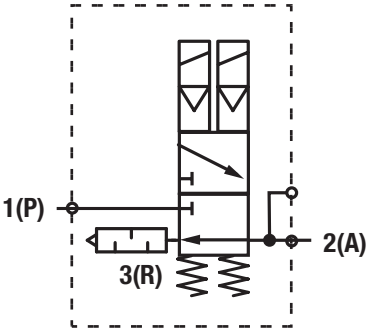
2.6 Log book

→ To comply with legal requirements, a log book must be kept of all activities involving the safety valves.

3 Technical specifications, design and function
3.1 SCVA08/SCVA10/SCVA20/SCVA32
3/2-way safety valve, electro-pneumatic actuated

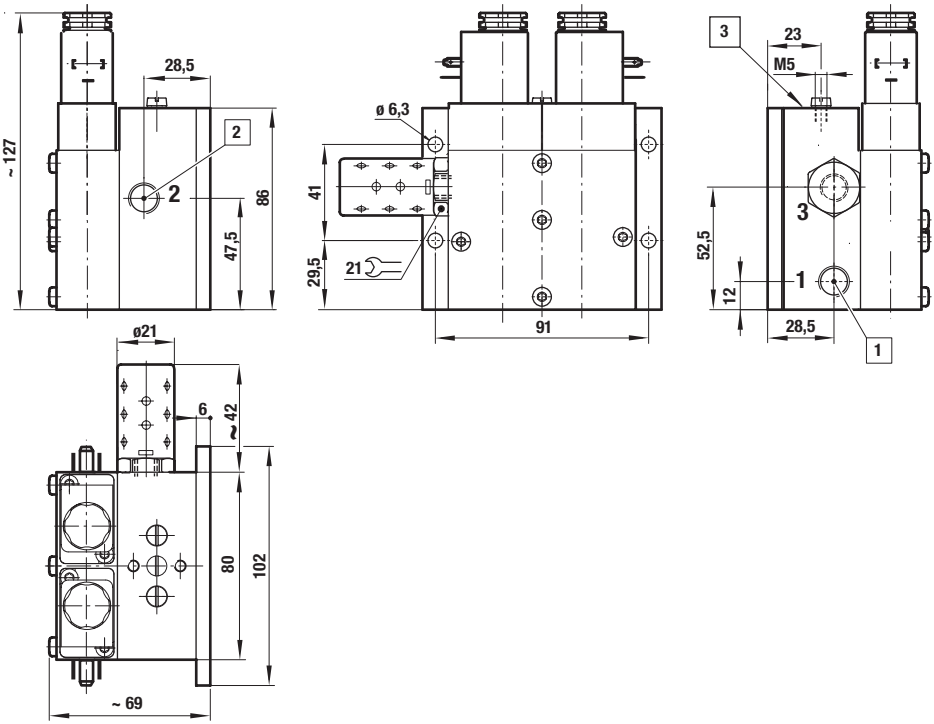
Specification	Value
Temperature range	-10 ... +60 °C
Installation position	Preferably vertical, with the solenoid at the top
Operation pressure	3 ... 10 bar (SCVA08)
Weight	1,1 kg (SCVA08) 2,4 kg (SCVA10) 3,6 kg (SCVA20) 10,3 kg (SCVA32)
Voltage solenoid type 3052, 0200, 0800	DC or AC voltage
Power consumption with 24 V DC & 230 V AC	4,8 W (Solenoid: 3052) 11 W (Solenoid: 0200) 16 W (Solenoid: 0800)
Solenoid protection class	IP 65
Electrical connection	Connector per DIN EN 175301-803 Form B (SCVA08, SCVA10) Form A (SCVA20, SCVA32)

Schematic



Dimensions

- SCVA08



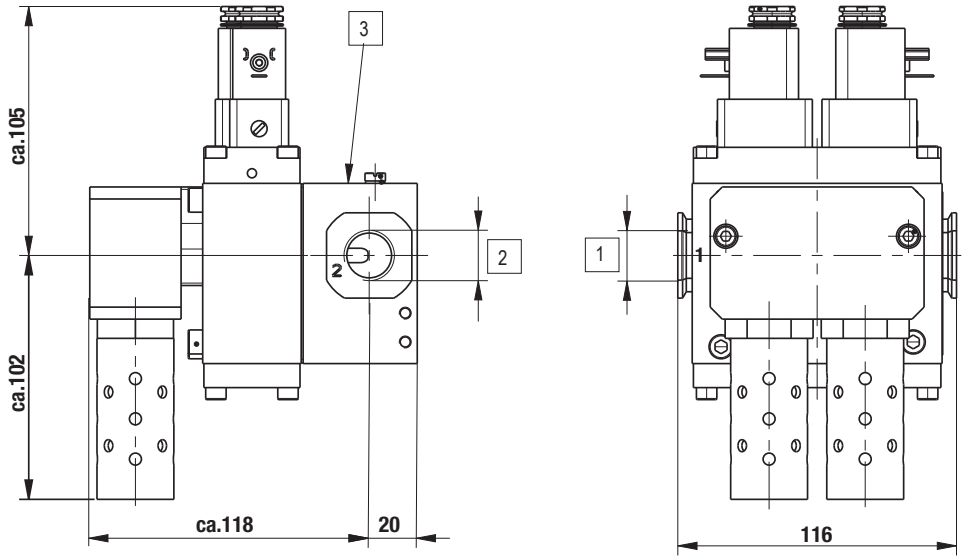
1 Line connection 1 (G1/4 or 1/4 NPT)

2 Line connection 2 (G1/4 or 1/4 NPT)

3 Flange surface for pressure switch

Dimensions

- SCVA10



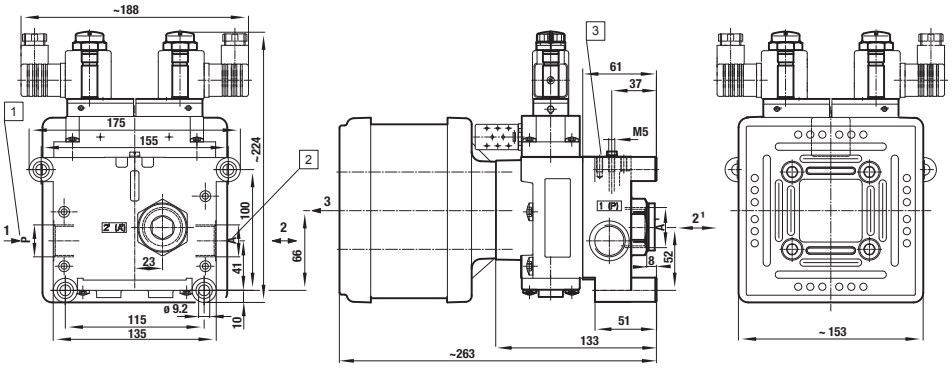
1 Line connection 1 (G1/2 or 1/2 NPT)

2 Line connection 2 (G1/2 or 1/2 NPT)

3 Flange surface for pressure switch

Dimensions

- SCVA20



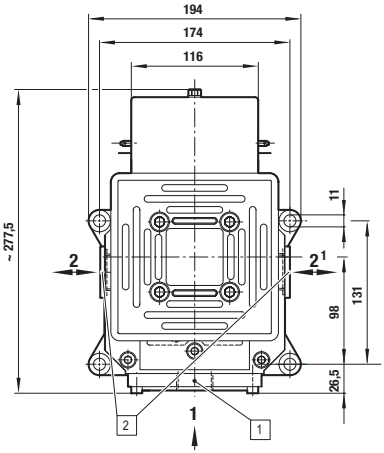
1 Line connection 1 (G1/2 or 1/2 NPT)

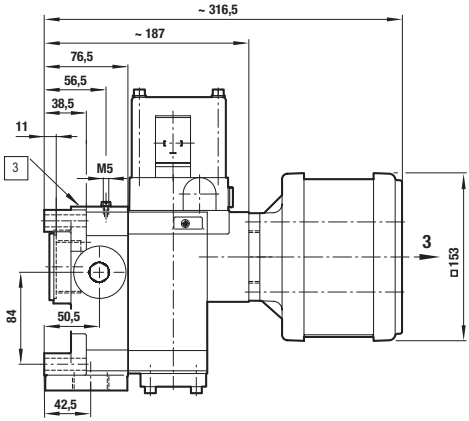
2 Line connection 2 (G1/2 or 1/2 NPT)

3 Flange surface for pressure switch

Dimensions

- SCVA32





1 Line connection 1 (G1/2 or 1/2 NPT)

2 Line connection 2 (G1/2 or 1/2 NPT)

3 Flange surface for pressure switch

3.2 Materials

- Housing: aluminium
- Seals: PUR, NBR

3.3 Requirements for operating media

Filter grade

- 5 - 40 µm

Requirements for lubricants

- DVI value <8 (DIN ISO 1817)
- ISO viscosity class 32 - 46 (DIN 51519)

Recommended lubricants

- Shell Tellus S2 MA 32
- ExxonMobil Febis K Series 32

Compressed air quality

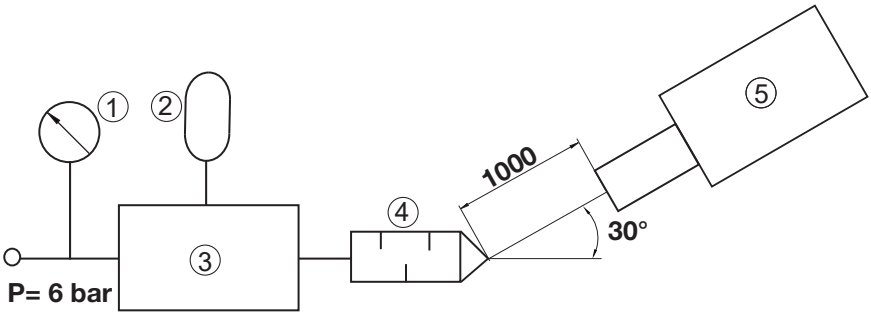
- Filtered, oiled or oil-free compressed air
- According to ISO 85731-1:2010 [7:3:4]

Class	7=	Particle size < 40 µm Particle concentration < 10 mg/m³
	3=	Dew point under pressure < -20 °C
	4=	Oil concentration < 5 mg/m³

3.4 Noise emissions

info Noise emissions depend on the installation site and the operating conditions. Contact the manufacturer for ways of reducing noise, see 1.6 Manufacturer's address.

Measurement method



Sound pressure level L_{AFmax} in dB(A)

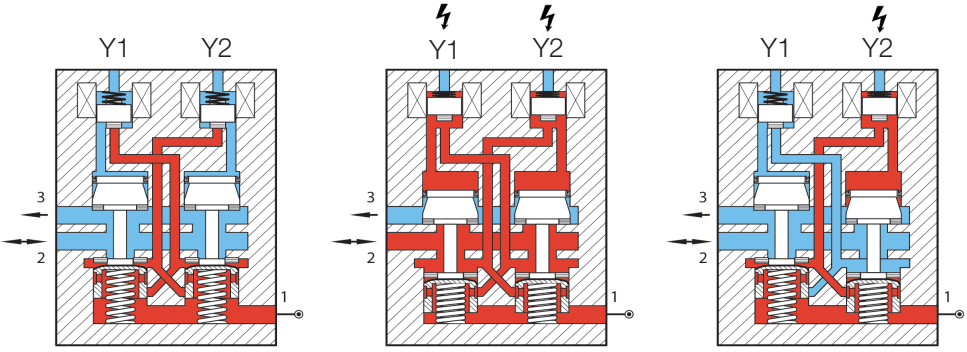
Valve	Pressure [bar]	Volume [l]	max. dB(A)
SCVA08	6	0.4	92
SCVA10	6	3	103
SCVA20	6	3	94
SCVA32	6	4	99

① Gauge
② Volume
③ Valve
④ Silencer
⑤ Noise level at measuring device

3.5 Design and function

The safety SCVA valve is designed as a dual valve with piston valve. It comprises two mechanically separated pilot control systems and main valve systems. The pilot control systems are electro-pneumatic actuated.

Electro-pneumatic actuation



Home position

The working connection 2 (A) is vented via connection 3 (R). Pressure connection 1 (P) is closed..

Switched position

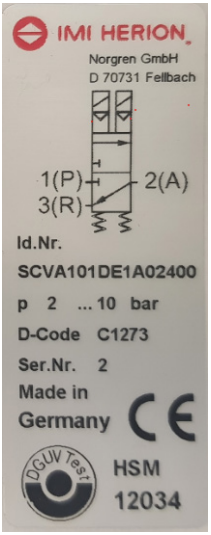
The solenoids in the safety valve are actuated simultaneously.
Working connection 2 (A) is connected to the pressure connection 1 (P).
The valve systems monitor themselves for correct operation with every switching procedure (dynamic monitoring).

Faulty switching

The solenoids are actuated with a time difference >0,5 s.
The dynamic monitoring system detects the delayed actuation and prevents pressure build-up at working connection 2 (A).

4 Labelling

The type plate is attached on the valve body.



The following information appears on the type plates

- Manufacturer
- Schematic
- Identification number
- Operating pressure range
- Norgren date code, 5 digits, year / week / day

Digit 1-2:	Year of manufacture 2001 = A1 2010 = B0 2011 = B1
Digit 3-4:	Week of manufacture (calendar week))
Digit 5:	Day of manufacture Sonday = 1 Monday = 2

Example: A1225 = 31. Mai 2001

5 Transport and storage

Individual packed items are packed according to the expected transportation conditions.

5.1 Transport

ADVICE

Damage of the valve

Packaging is intended to protect the individual components against transportation damage, corrosion and other damage until they are installed.

→ Transport the valve in the delivery packaging.
→ Do not throw packaged units.
→ Do not drop packaged units.
→ Only remove the packaging just before installation.

info Check package on delivery to make sure it is complete and has not been damaged in transit.

5.2 Storage

The safety valves are packed for immediate installation upon delivery.
If they are going to be stored for extended periods, please:

→ Leave the packed units in the box they were shipped in.
→ Do not store them outdoors.
→ Store them in a dry, dust-free place.
→ Don't expose them to aggressive media, such as salty air.
→ Protect them from direct sunlight.

Storage temperature: +15 °C bis +35 °C

Relative humidity: max. 90 %

6 Installation

Before installation of the valve, please note:

→ Create a safety zone around the hazardous area in accordance with the risk assessment for the machine or equipment.
→ For new systems, ensure that connections and lines are deburred.
→ Do not remove blanking covers from the safety valves until just before installation.

6.1 Pneumatic connection

⚠ DANGER

Danger of injury caused by improper connection!
Faulty pneumatic connections can impair the safe operation of the safety valves and may cause severe injuries during operation.

→ Use additional safety equipment if necessary.
→ Pipe cross-section corresponding to the required design flow rate.
→ Make sure that any noise reduction measures that are fitted do not impair the functioning of the safety valve.
→ Basically the EN ISO 4414 to be considered.

⚠ WARNING

Danger of injury caused by compressed air!
Compressed air can cause injuries if not handled correctly.

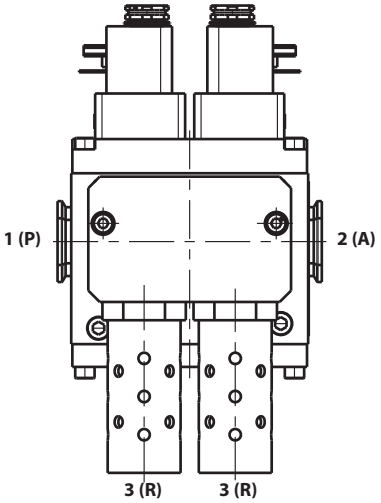
→ Make sure the machine is depressurised before work begins.
→ Have all work carried out by pneumatics specialists..

⚠ **ADVICE** Avoid damaging the thread when removing the blanking covers.

1. Carefully remove the blanking covers from the safety valve.
2. Fit any additional safety equipment such as failure indicator units in accordance with the separate instructions.
3. Connect air supply equipment for drying, filtering and lubricating air before pressure connection P. For requirements of operating media and consumables, see section **3.3 Requirements for operating media.**
4. Connect supply line to the pressure connection 1 (P) in accordance with section **3 Technical specifications, design and function**.
5. Connect safety valve to the load. The distance between the valve and load should be kept as small as possible.
6. Securely bolt the safety valves to the frame or machine base via the mounting holes.
7. Fit and seal pipes and hose connections to the valve and from the valve to the load, following national standards and regulations as applicable.

⚠ **ADVICE** Avoid damaging the thread when removing the blanking covers.

info Lubrication is not necessary if the connected load is suitable for oil-free operation.
info An airtight compressed air system helps to save energy, which protects the environment.



Valve connection

1 (P) Compressed air connection
2 (A) Working connection
3 (R) Venting connection via silencer

6.1 Electrical connection

⚠ DANGER

Danger of injury caused by improper connection!
Danger of death through contact with live components. When switched on, electrical components can perform uncontrolled movements and result in serious injury or death.

→ Isolate the electrical supply before starting work and make sure it cannot be switched back on.

1. Make sure that connectors for the electrical connection are available. If necessary, obtain them from the manufacturer - see section **1.6 Manufacturer's address**.
2. Connect the safety valves in accordance with the specifications on the type plate.

⚠ **ADVICE** If using a two-hand control, ensure that the actuating solenoids are actuated by an output signal from an electrical two-hand control of type III C per DIN EN 574.

7 Test

Check before initial operation:

1. Apply operating pressure in accordance with the type plate -> The cylinder piston assumes its initial position.
2. Carry out a functional test according to following table.

Non-load functional testing

Nr.	Test	Result
1	Actuate solenoid **Y1**	Piston must not move
2	Actuate solenoid **Y2**	Piston must not move
3	Actuate solenoid **Y1** and after t > 0,5 s solenoid **Y2**	Piston must not move
4	Actuate solenoid **Y2** and after t > 0,5 s solenoid **Y1**	Piston must not move
5	Actuate both solenoids simultaneously within t < 0,1 s. Deactuate solenoid **Y1** and after t > 0,5 s actuate it again.	Piston moves at first. After deactuation of solenoid **Y1** piston returns to initial position and remains there
6	Actuate both solenoids simultaneously within t < 0,1 s. Deactuate solenoid **Y2** and after t > 0,5 s actuate it again	Piston moves at first. After deactuation of solenoid **Y2** piston returns to initial position and remains there

8 Servicing

⚠ WARNING

Danger of injury caused by improper maintenance!
Improper maintenance can result in serious injury and extensive damage to property.

→ It is generally recommended maintenance and repair work must be carried out by the manufacturer.
→ Carry out the tests listed below at the specified maintenance intervals.
→ If any components fail the test, repair work must be carried out by the manufacturer.

Interval

After 1 million switching operations, at least once per year:

Activity	Description
Silencer Check the fastening screws for tightness	Tightening torque of the four mounting screws is: SCVA10 mit 4+1 Nm SCVA20 mit 10+2 Nm SCVA32 mit 10+2 Nm

Replacement valves

⚠ WARNING

Risk of injury from using incorrect replacement valves!
Using incorrect or faulty replacement valves may endanger personnel and cause damage, malfunctions, or total failure.

→ Only use the manufacturer's original replacement valves.
→ Contact the manufacturer for information about replacement valves, see **1.6 Manufacturer's address**.

9 Disposal

→ Dissemble the valve parts after shutting-down of the valve. Apply reusable materials to recycling.

ADVICE

Improper disposal may cause an environmental hazard!
Improper disposal may result in risks to the environment.

→ At the end of their life, have safety valves disposed of by a licensed waste disposal contractor.
→ If in doubt, ask the local municipal authority or special waste disposal.

10 Declaration of conformity

-ORIGINAL-

Norgren GmbH
Postfach 15 60
D-70705 Fellbach
Stuttgarter Str. 120
D-70736 Fellbach
Tel: + 49 711 5209-0
Fax: +49 711 5209-614

www.imi-precision.com

EC Declaration of conformity in accordance with the Machinery Directive 2006/42/EG

IMI Precision Engineering

Component	**3/2-way safety valves**
	electro-pneumatic actuated
Series	**SCVA08xxxxxxxxx / SCVA10xxxxxxxxx**
	SCVA20xxxxxxxxx / SCVA32xxxxxxxxx

The manufacturer hereby declares that the mentioned product conforms to all relevant provisions of the above-stated directive and with the additional applied standards (stated below) - including those amendments valid at the time this declaration was signed.

The following harmonised standards were applied:

EN ISO 12100:2010:	General principles for design - risk assessment and risk reduction
EN ISO 13849-1:2016:	Safety of machinery - Safety related parts of control system - Part 1: General principles for design
EN ISO 4414:2010:	Pneumatic fluid power - General rules and safety requirements for systems and their components

Notified body
Deutsche Gesetzliche Unfallversicherung [German Social Accident Insurance]
Kreuzstraße 45
40210 Düsseldorf / Certificate no. HSM 12034 dated 27.02.2015

Engineering GREAT Solutions

Fellbach, Germany, July 2017

Norgren GmbH
ppa.
Dr. Maik Fiedler
Engineering Director
Europe & IA

Norgren GmbH
i. A.
Viktor Knoll
Corporate representative
Machinery directive

IMI NORGREN
IMI BUSCHJOST
IMI FAS
IMI HERION
IMI MAXSEAL

The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of exercising judgement and verification. It must be remembered that our products are subject to a natural process of wear and ageing.

Printed in Germany.

These instructions were originally written in German.

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DE
Revision: 3

IMI HERION®

Norgren GmbH
Stuttgarter Str. 120
D-70736 Fellbach

Postfach 15 60
D-70705 Fellbach

Telefon +49 (0) 5209-0
Fax +49 (0) 5209-614

www.imi-precision.com
germany@imi-precision.com