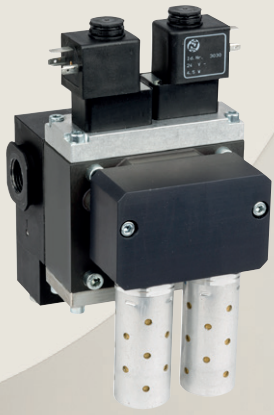
Industrial Automation

IMI Herion

SCSQ10
3/2 way safety valves
with start up function electropneumatic actuated
G1/2, 1/2 NPT



Breakthrough engineering for a better world

Operation Manual

Before starting work read these instructions.

1 General

1.1 Information about these instructions

These instructions will enable you to safety install, set up and operate the SCSQ10 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.

1.2 Explanation of symbols Safety notice

DANGER!

This combination of signal word and danger indicates an immediately dangerous situation that may result in death or serious injury if not avoided

WARNING!

This combination of signal word and danger indicates a potentially dangerous situation that may result in death or serious injury if not avoided.

CAUTION!

This combination of symbol and signal word indicates a possibly hazardous situation that may result in damage to property or environmental damage if it is not avoided.

Indicates tips and other useful information.

Safety notices in instruction manuals

Safety notices may relate to particular, individual instructions. Safety notices like these are embedded in the instructions so that they don't interrupt the flow of reading when performing the action. The signal words listed above are used.
Example:

1. Remove screw.

WARNING!
Danger of pinching body parts in the cover.

2. Close cover carefully.

Other symbols

The following symbols are used to emphasise instructions, outcomes, lists, references and other elements in these instructions.

Symbols	Meaning
1., 2., 3. ...	Step-by-step instructions
⇨	Results of instructions
●	Lists with no specific order

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.

1.4 Manufacturer's address

IMI International s.r.o
Evropská 852
664 42 Modřice
Czech Republic
Tel.:+420 532 278 111
product.support@imi-precision.com
www.norgren.com

2 Safety

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.

2.1 Intended use

SCSQ10 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 safety valves are free of residual pressure and are dynamically self-monitored.
Silencers shall not impair the operation of the soft start / quick exhaust valve.

Misuse

WARNING!
Dangerous if misused!

- Incorrect use of safety values can create dangerous situations.
- Do not use in explosive areas.
- Provide noise reduction measures.
- Never dismantle safety valves, or remove or replace individual parts.

2.2 General dangers

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

Hazardous movements

DANGER!

Danger of death 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.

Hot surfaces

WARNING!

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.

Noise

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

Compressed air

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.

2.3 Personnel requirements

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.
- Have all electrical installation work carried out by qualified electricians.

Pneumatics specialist

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, qualified electricians are able to carry out work on electrical installations and identify and avoid possible risks by themselves.
Qualified electricians are specially trained for the area they work in, and they know the relevant standards and regulations.

2.4 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.

For all work, always wear:

Protective clothing
Protective clothes are heat-resistant and close-fitting 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.

For special activities, wear:

Protective gloves
Protective gloves protect the hands and forearms against contact heat if they touch hot surfaces.

Safety goggles
Safety goggles protect the eyes from flying objects and splashing liquids.

Ear protection
Ear protection protects your hearing from damage caused by exposure to noise.

2.5 Log book

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

3 Specifications

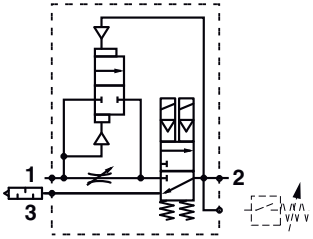
The specifications for the safety valve also appear on the type plates.

3.1 SCSQ10

3/2 way valve, electropneumatic actuated

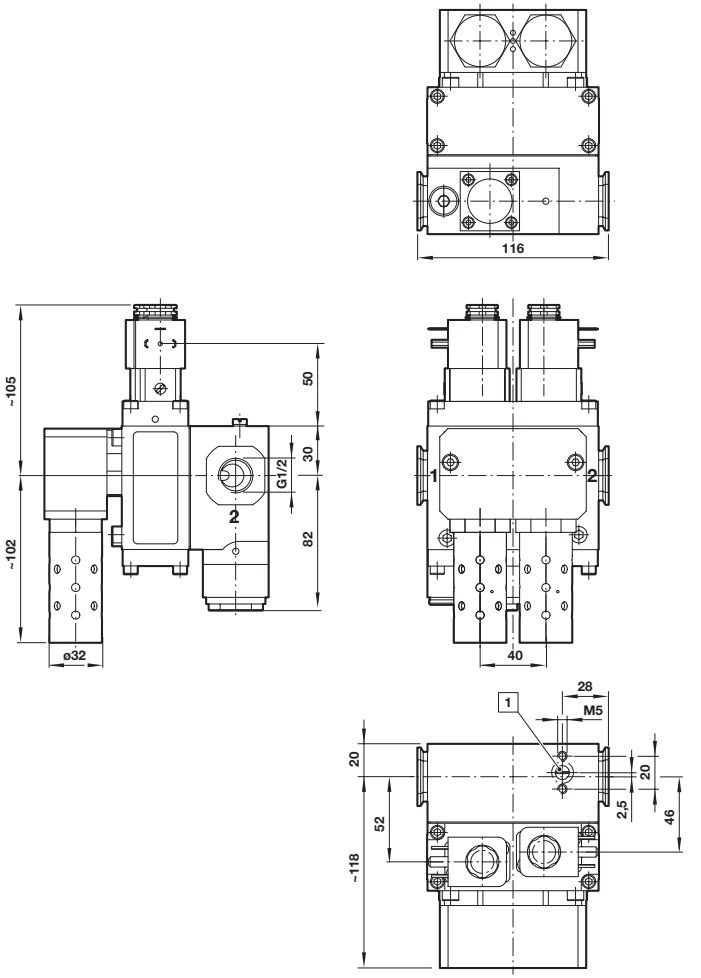
Specification	Value
Temperature range	-10 ... +50 °C
Installation position	Perferably vertical, with the solenoid at the top
Operating pressure	3,5 ... 10 bar
Weight	2,7 kg
Voltage Solenoid type 3030	DC voltage
Power consumption with DC voltage	4,5 W
Solenoid protection class	IP 65
Electrical connection	Connector per DIN EN 175301-803 Form A

Schematic



Dimensions

SCSQ101D01xxxxxx (1/2), SCSQ101T01xxxxxx (1/2 NPT) with silencer



1 Flange surface for pressure switch

3.5 Materials

Body: Aluminium
Seals: Polyurethan

3.6 Type plate

The following information appears on the type plates:

- Manufacturer
- Schematic
- Type
- Identification number
- Operating pressure range
- Norgren date code, 5 digits, year/week/day
  - Digits 1-2: Year of manufacture, 2001 = A1, 2010 = B0, 2011 = B1
  - Digits 3-4: Week of manufacture (calendar week)
  - Digit 5: Day of manufacture, Sunday = 1, Monday = 2

3.7 Requirements for operating media and consumables

Compressed air quality

- Filtered, lubricated or non-lubricated compressed air
- Compressed air per ISO 8573-1:2010 [7:3:4]

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

Filter grade:

25 – 50 µm

Requirements for lubricants

- DVI-Wert < 8 (DIN ISO 1817)
- ISO viscosity grade 32 – 46 (DIN 51519)

Recommended lubricants

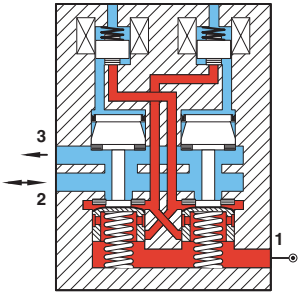
- Shell Tellus S2 MA 32
- ExxonMobil Febis K Series 32

4 Design and function

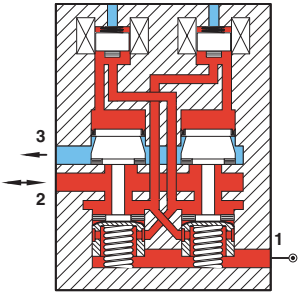
The safety valve with starting function is characterised by a pressure build-up of the outlet pressure in two phases.
In phase 1, there is initially a slower pressure build-up, which increases steadily depending on the throttle valve position and the volume to be filled.
In phase 2, upon reaching a certain pressure, the sequence valve first opens and then interconnects the full operating pressure at the valve outlet of the safety valve. The so-called gating pressure in this valve design depends on the operating pressure and is determined by the sequence valve with the piston area ratio of about 2:1

4.1 Electropneumatic actuated

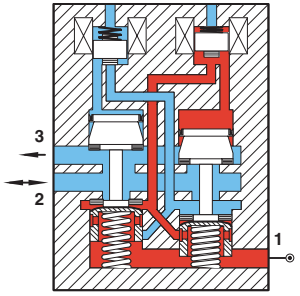
(Darstellung ohne Anfahrfunktion)



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



Schaltstellung
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 the working connection 2 (A).

5 Transport and storage

Transport

Individual packed items are packed according to the expected transportation conditions.
Packaging is intended to protect the individual components against transportation damage, corrosion and other damage until they are installed. So don't destroy the packaging and only remove it just before installation.

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

Packaging and storage

During transportation:

- Do not drop packaged units.
- Do not throw packaged units.

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 wereshipped 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 to 35 °C.
- Relative humidity: 90% max.

6 Installation

Before installation, 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

Improper 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 thr 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.

Compressed air

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.

Personnel:

- Pneumatics specialist

Protective equipment:

- Safety goggles
- Protective gloves

CAUTION!

Avoid damaging the thread when removing the blanking covers.

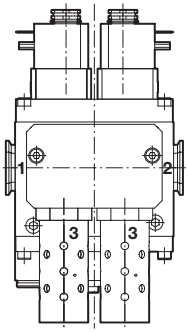
Installing safety equipment

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.

Connections

3. Connect air supply equipment for drying, filtering and lubricating air before pressure connection P.
   For requirements for operating media and consumables, see section 3.7.

Lubrication is not necessary if the connected load is suitable for oil-free operation.



Valve connections

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

4. Use only the original silencer (3). Only with the safety-silencer a residual pressure-free ventilation is ensured.

5. Connect supply line to the pressure connection 1 (P) in accordance with section 3 Specifications.

6. Connect safety valve to the load. The distance between the valve and load should be kept as small as possible.

Securing

7. Securely bolt the safety valves to the frame or machine base via the mounting holes.

Sealing

8. Fit and seal pipes and hose connections to the valve and from the valve to the load, following national standards and regulations as applicable.

An airtight compressed air system helps to save energy, which protects the environment.

6.2 Electrical connection

Improper 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.

Personnel:

- Qualified electrician

Protective equipment:

- Safety goggles
- Protective gloves

Electrical installation

1. Make sure that connectors for the electrical connection are available. If necessary, obtain them from the manufacturer, see section 1.4 Manufacturer's address.

2. Connect the safety valves in accordance with the specifications on the type plate.

Two-hand control

3. 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 Checks before initial operation

Personnel:

- Pneumatics specialist

Protective equipment:

- Safety goggles
- Protective gloves
- Ear protection

Tests

1. Apply operating pressure in accordance with the type plate.
   ⇨ The cylinder piston assumes its initial position.
2. Carry out a functional test (see section 7.1 No-load functional testing).
3. Carry out a pressure loss test for XSz10V valves (see section 7.2 Pressure loss testing).
4. If required, have official inspection and approval testing carried out (see section 7.3 Inspection and approval).

7.1 No-load functional testing

1. Carry out tests in accordance with the table below.

No	Test	Outcome
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 actuate 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 < 0.5 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 < 0.5 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 Maintenance

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.

Personnel:

- Pneumatics specialist

Protective equipment:

- Safety goggles
- Protective gloves
- Ear protection

Interval	Activity	Description
After 1 million switching operations, at least once per year	Carry out functional testing	See section 7.1 No-load functional testing See section 1.3 Liability and warranty

Troubleshooting

Special test equipment made by the manufacturer is required to ensure that the safety valves perform their safety function.

WARNING!

Danger of injury caused by improper troubleshooting!

Improper troubleshooting can result in serious injury and extensive damage to property.

- Troubleshooting work on the valve must only be carried out by the manufacturer's personnel, see section 1.4 Manufacturer's address.
- If necessary, contact the manufacturer for a replacement valve while troubleshooting is in progress.

Personnel:

- Pneumatics specialist
-

Protective equipment:

- Safety goggles
- Protective gloves
- Ear protection

What to do if there is a fault

1. Determine the cause of the fault.
2. If the cause of the fault is traced back to the safety valves, contact the manufacturer.

Restarting after a fault

1. If applicable, restore operating pressure at pressure connection 1 (P).

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 1.4 Manufacturer's address.

9 Disposal

CAUTION!

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 contractors for more information.

10 Declaration of conformity

IČO: 25692089 DIČ: CZ25692089

We IMI International s.r.o.
Norgren
CTPark, Evropska 852, Modrice 664 42, The Czech Republic

declare under our sole responsibility that the product(s)

Product **3/2-way safety valve with soft start function, electro-pneumatic actuated**

Ranges **SCSQ10xxxxxxxxxx**

to which this declaration relates is/are in conformity with the requirements of all relevant provisions of following directive and the additional applied standards – including those amendments valid at the time this declaration was signed.

2006/42/EG **Machinery Directive**

The conformity was checked in accordance with the following standard(s):

Standard(s)	
EN ISO 12100:2010	General principles for design – Risk assessment and risk reduction
EN ISO 13849-1:2023	Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
EN ISO 13849-2:2012	Safety of machinery – Safety-related parts of control systems – Part 2: Validation
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. HM 240019 dated 10/Apr/2024.

In Modrice 02/May/2024

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Jiri TOSOVSKY

Technical Manager, IA

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 given information does not release the user from the obligation of own judgement and verification. It must be remembered that our products are subject to a natural process of wear and aging.

Subject to modifications.
These instructions were originally generated in German.

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EN
Revision:A

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