

SISTO-SK-i LED **SISTO-SK-i LED AS-i**

Intelligent Actual-position Feedback Unit

for Linear Valves
Stroke: 5 - 45 mm



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Glossary

Type Series Booklet

The Type Series Booklet can be downloaded at:
<http://sisto-aseptic.com/downloads/>
or
<https://products.ksb.com/>

SISTO-C LAP

SISTO-C diaphragm valve with pneumatic piston actuator, stainless steel

SISTO-C LAP.520

SISTO-C diaphragm valve with pneumatic piston actuator, stainless steel

SISTO-C LAP.530

SISTO-C diaphragm valve with pneumatic piston actuator, aluminium, hard anodised

SISTO-SK-i LED

SISTO intelligent actual-position feedback unit

SISTO-SK-i LED AS-i

SISTO intelligent actual-position feedback unit with AS Interface

1 General

1.1 Principles

This operating manual describes the proper and safe use of the SISTO-SK-i LED intelligent actual-position feedback unit, or for the SISTO-SK-i LED AS-i intelligent actual-position feedback unit in all phases of operation.

The actual-position feedback unit SISTO-SK-i LED/SISTO-SK-i LED AS-i is used to measure the stroke of pneumatic valve actuators and to control them (optional).

In the event of damage, discrepancies and questions, immediately contact SISTO Armaturen sales organisation responsible in order to maintain the right to claim under warranty.

Only correct installation, maintenance or repair will ensure smooth operation of the actual-position feedback unit.

The manufacturer shall not accept any liability for the actual-position feedback unit if the manual set forth in this manual are not complied with.

In the case of any deviations or questions contact SISTO Armaturen.

1.2 Contact data

SISTO Armaturen S.A.
After-Sales-Services
18, rue Martin Maas
L-6468 Echternach Luxembourg

Tel.: +352 32 50 85-1
Fax: +352 32 89 56

Email: info@sisto-aseptic.com
www.sisto-aseptic.com

1.3 Target group

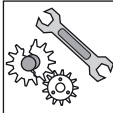
This operating manual is aimed at the target group of trained and qualified specialist technical personnel.

1.4 Other applicable documents

Document	Description
Type series booklet 8676.5 SISTO-SK-i LED	Description of the SISTO-SK-i LED/ SISTO-SK-i LED AS-i actual-position feedback unit
Operating manual 0570.822	Installation/operating manual of the SISTO-C/SISTO-B diaphragm valves

1.5 Key to safety symbols/markings

Symbol	Description
	DANGER In conjunction with the signal word DANGER this symbol indicates a high-risk hazard, which if not avoided, will result in death or serious injury.
	WARNING In conjunction with the signal word WARNING this symbol indicates a medium-risk hazard, which if not avoided, could result in death or serious injury.
	CAUTION In conjunction with the signal word CAUTION this symbol indicates a low-risk hazard, which if not avoided, could result in minor injury.
	Electrical hazard In conjunction with one of the signal words this symbol indicates a hazard involving electrical voltage and identifies information about protection against electrical voltage.

Symbol	Description
	CAUTION In conjunction with the signal word CAUTION this symbol indicates a hazard for the machine and its functions.
	NOTE This symbol indicates recommendations and important information on how to handle the product.

2 Safety information



All the information contained in this section refers to hazardous situations.

In addition to the present general safety information the action-related safety information given in the other sections must be observed.

2.1 General

This operating manual contains general installation, operating and maintenance instructions that must be observed to ensure safe product operation and prevent personal injury and damage to property.

Comply with all the safety instructions given in the individual sections of this operating manual.

The operating manual must be read and understood by the responsible specialist personnel/operators prior to installation and commissioning.

The contents of this operating manual must be available to the specialist personnel at the site at all times.

Information attached to the actual-position feedback unit, the valve or accessories must always be complied with and kept in a perfectly legible condition at all times.

This operating manual does not take into account:

- Any eventualities or incidents which may occur during installation, operation and maintenance performed by the customer.
- Local regulations; the operator must ensure that such regulations are observed by all, including the personnel called in for installation.

The operating manual must be kept for the entire life cycle of the equipment.

For any queries you may have or in the case of damage, please contact SISTO Armaturen.

2.2 Intended use

- The actual-position feedback unit SISTO-SK-i LED/SISTO-SK-i LED AS-i is used to measure the stroke of pneumatic valve actuators and to control them (optional).
- The actual-position feedback unit must only be operated in perfect technical condition.
- Only operate the actual-position feedback unit within the operating limits described in the other applicable documents.
- Other modes of operation, if not mentioned in the documentation, must be coordinated with SISTO Armaturen.

2.2.1 Prevention of foreseeable misuse

- It is not allowed to enter following fluids in the air supply ports of the actual-position feedback unit:
 - no liquids fluids
 - no fluids containing solids
 - no aggressive fluids
 - no combustible fluids.
- The actual-position feedback unit must not be operated in potentially explosive atmospheres.

- If the actual-position feedback unit is to be used in a damp environment, steps must be taken to ensure that any liquid that collects drains away from and does not penetrate the housing.
- The unit must never be cleaned with a water jet and/or aggressive cleaning agents (observe the requirements of the type of enclosure Section 7.2, Page 8/Section 7.4, Page 10).
- The housing of the actual-position feedback unit must not be subjected to mechanical loads. Connection and pneumatic lines must be routed in such a way that no forces act on the actual-position feedback unit.
- Protect actual-position feedback unit against source of radiation (e.g. the sun).
- Protect actual-position feedback unit against vibrations.
- Regularly check that the electrical and pneumatic connections are correctly seated and that the connection to the pneumatic valve actuator is correct.
- Never exceed the permissible application and operating limits specified in the product literature regarding pressure, temperature, etc.

2.3 Consequences and risks caused by non-compliance with this manual

Non-compliance with this operating manual will result in loss of warranty and forfeiture of any and all rights to claims for damages.

Non-compliance can have the following consequences for example:

- Failure of important functions of the product,
- Failure of prescribed maintenance and servicing practices,
- Hazard to persons by electrical and mechanical effects.

2.4 Safety awareness

In addition to the safety information contained in this operating manual and the intended use, the following safety regulations shall be complied with:

- Accident prevention, health regulations and safety regulations,
- Explosion protection regulations,
- Safety regulations for handling hazardous substances,
- Applicable standards, directives and laws.

2.5 Safety information for the operator/user

The actual-position feedback unit with valve is intended for use in areas which cannot be accessed by unauthorised persons. Operation of these valves in areas, which can be accessed by unauthorised persons, is only permitted if appropriate protective devices are fitted at the site. This must be ensured by the operator.

- Fit protective equipment (e.g. contact guards) supplied by the operator for hot, cold or moving parts, and check that the equipment functions properly.
- Do not remove any protective equipment (e.g. contact guards) during operation.
- Bring the plant and plant section into a safe state that allows safe switching on the actual-position feedback unit and the valve.
- Electrical hazards must be eliminated. (For details, refer to VDE regulations and the safety regulations laid down by the local energy supply companies, for instance).
- The operator has to ensure that the guards for live components are regularly checked for any damage. The valve must never be operated without appropriate protection.

2.6 Safety information for maintenance, inspection and installation

- The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual
- Always use suitable tools to ensure proper functioning of the actual-position feedback unit.

- Carry out work on the SISTO-SK-i LED/SISTO-SK-i LED AS-i actual-position feedback unit and the valve during standstill only.
- Generally recognised safety and technical rules must be adhered to when planning deployment and during operation.
- Prior to commissioning/start-up of the actual-position feedback unit observe the Section 9.1-9.4, Page 16.
- For shutdown of the actual-position feedback unit observe the Section 9.6, Page 17.

2.7 Unauthorised modification and manufacture of spare parts

Modifications or alterations of the actual-position feedback unit and the valve are only permitted with the manufacturer's prior consent.

Use only original spare parts and accessories authorised by the manufacturer. The use of other parts can invalidate any liability of the manufacturer for resulting damage.

2.8 Unauthorised modes of operation

The warranty relating to the operating reliability and safety of the SISTO-SK-i LED/SISTO-SK-i LED AS-i actual-position feedback unit supplied is only valid if the equipment is used in accordance with its intended use as described in Section 2.2. The limits stated in the technical literature must not be exceeded under any circumstances.

3 Product information (REACH)

Product information as per Regulation No. 1907/2006 (REACH):

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see <http://www.ksb.com/reach>.

4 Delivery/Storage/Disposal

4.1 Checking the condition upon delivery

Upon receipt of the goods, check immediately that the goods are complete and undamaged.

If the actual-position feedback unit was ordered together with a pneumatic valve actuator, the combined unit will come fully assembled.

In the case of any deviations contact the manufacturer.

4.2 Storage

Storage/temporary storage must ensure that even after a prolonged period of storage the function of the actual-position feedback unit will not be impaired. The following requirements must be met:

- Store in original packaging,
- Dry,
- Dark,
- Dust-free environment,
- Storage temperature must be between +10 °C and +30 °C.

4.3 Disposal

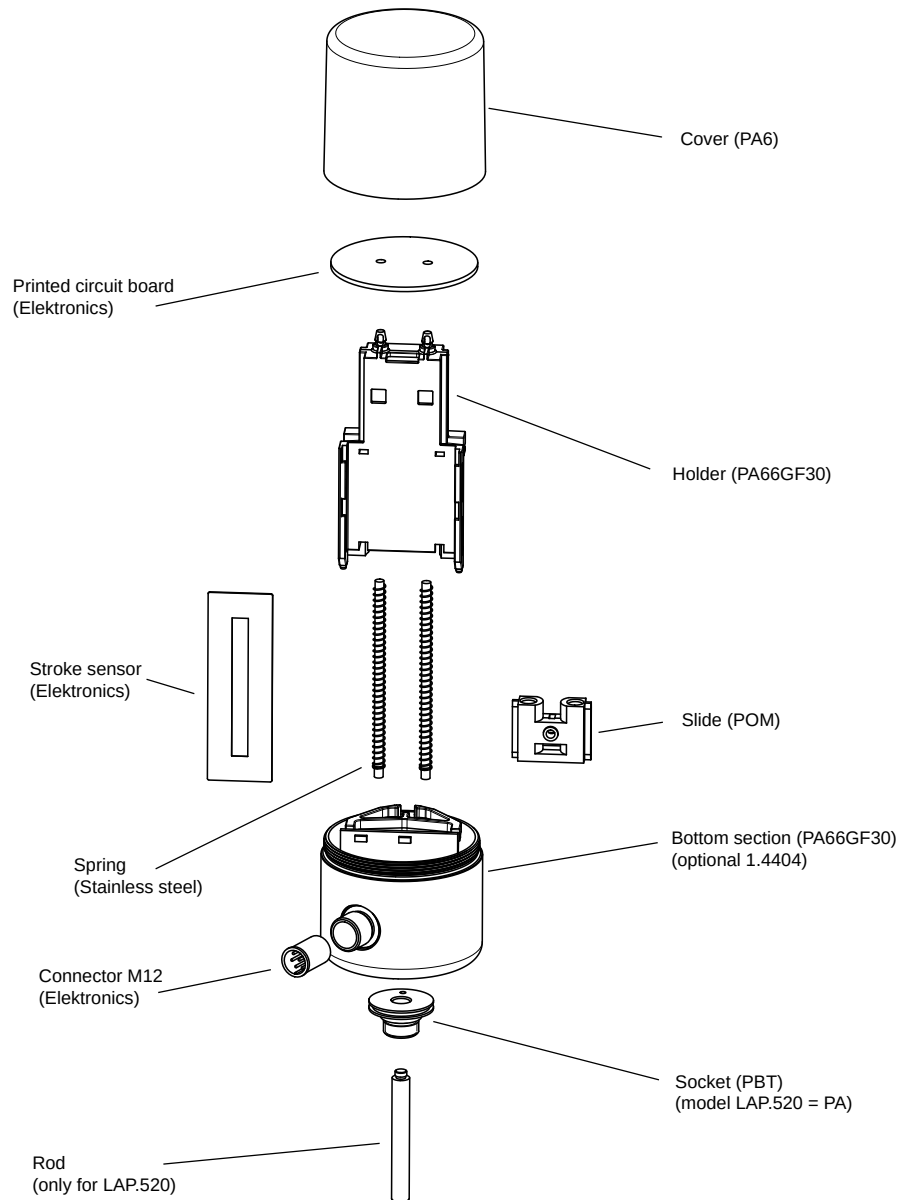
Comply with applicable legal requirements and regulations.

5 Marking

The actual-position feedback unit is marked with:

- Manufacturer
- Serial number
- Type

6 Exploded view



Not listed:
 Metal inserts 1.4404
 NBR sealing elements

7 Technical data

7.1 Technical data of SISTO-SK-i LED 24 V

Permissible operating temperature: -30 °C to +60 °C

Electrical data

Characteristic	Value
Electrical connection	8-pin M12 round plug connector
Supply voltage [V]	24 +/- 10 %
Current input [mA]	Approx. 45
Duty ratio	100 %
Digital outputs	24 V, max. 100 mA; short-circuit-proof Open Closed Fault
Digital inputs	24 V, Low: 0-3 V; High: 18-24 V Remote initialisation

Indicator and operating elements of SISTO-SK-i LED

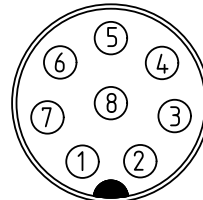


1)	Magnetic sensor
2)	High-visibility LED

Colour code of high-visibility LED

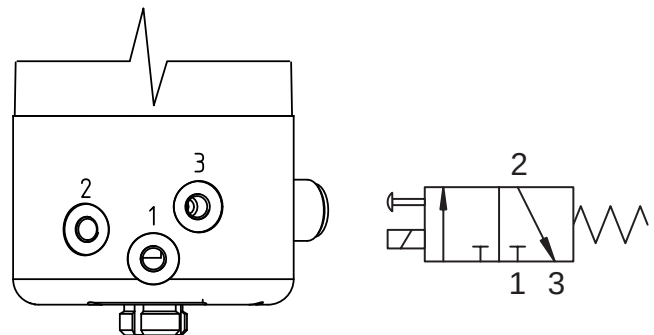
Colour code of high-visibility LED	Operating status
Orange	Valve in open position
Green	Valve in closed position
Red	Fault
Yellow	Initialising
Blue	Not initialised

Connector pin assignment of SISTO-SK-i LED



Pin	Assignment
1	+24 V
2	DO Open ¹⁾
3	0 V
4	DO Closed ¹⁾
5	DI Teach in ²⁾
6	DI Solenoid valve ^{2) 3)}
7	DO Fault ¹⁾
8	Not used

Pneumatic connection of SISTO-SK-i LED



Threaded port	Assignment
1	Air supply
2	Actuator
3	Air outlet

¹⁾ Binary output

²⁾ Binary input

³⁾ With integrated solenoid valve only

7.2 Additional technical data of SISTO-SK-i LED with solenoid valve

Electrical data

Characteristic	Value
Current input [mA]	Approx. 90
Additional digital input	Solenoid valve

Pneumatic data

Characteristic	Value
Threaded port	Internal thread M5
Flow rate [l_N /min]	15
P max. [bar]	10
Compressed air quality	ISO 8573-1 3/3/3

Materials

Description	Material	Material number
Pneumatic connection	X2CrNiMo17-12-2	1.4404

Standards	
Enclosure to EN 60529	IP65
Safety class to EN 61140	Safety class III
Directives	
Electromagnetic Compatibility Directive (EMC)	2014/30/EU
RoHS Directive	2011/65/EU
Machinery Directive	2006/42/EG

7.3 Technical data of SISTO-SK-i LED AS-i

Permissible operating temperature: -30°C to +60°C

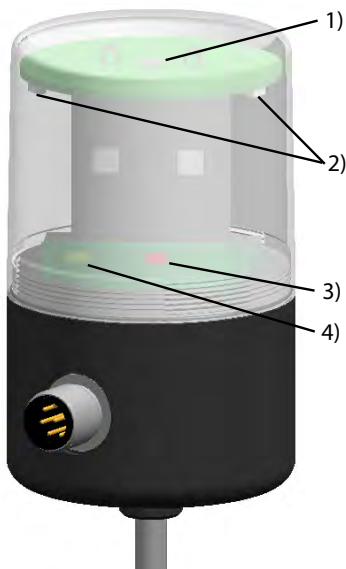
Electrical data

Characteristic	Value
Electrical connection	5-pin M12 round plug connector
Supply voltage [V]	26,5 - 31,6
Current input [mA]	Approx. 85
Duty ratio	100 %
AS-i specification	V3.0

AS Interface profile

Feature	Value
I/O configuration	7
ID-Code	A
ID1-Code	*
ID2-Code	E

Indicator and operating elements of SISTO-SK-i LED AS-i



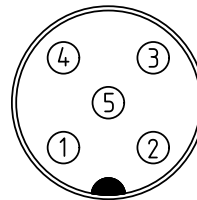
1)	Magnetic sensor	2)	High-visibility LED
3)	AS-i Fault	4)	AS-i Power

Colour code of high-visibility LED

Colour code of high-visibility LED	Operating status
Orange	Valve in open position
Green	Valve in closed position
Red	Fault
Yellow	Initialising
Blue	Not initialised

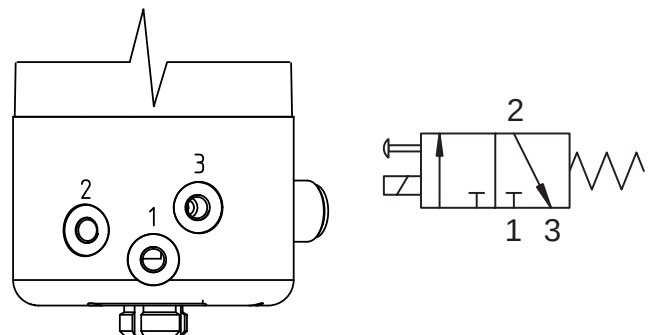
Colour code of LED	Operating status
Green	AS-i-Power
Red	AS-i-Fault

Connector pin assignment of SISTO-SK-i LED AS-i



Pin	Assignment
1	AS-i +
2	Not used
3	AS-i -
4	Not used
5	Not used

Pneumatic connection of SISTO-SK-i LED AS-i



Threaded port	Assignment
1	Air supply
2	Actuator
3	Air outlet

7.4 Additional technical data for SISTO-SK-i LED AS-i with solenoid valve

Electrical data

Characteristic	Value
Current input [mA]	Approx. 135

Pneumatic data

Characteristic	Value
Threaded port	Internal thread M5
Flow rate [l_N/min]	15
P max. [bar]	10
Compressed air quality	ISO 8573-1 3/3/3

Materials

Description	Material	Material number
Pneumatic connection	X2CrNiMo17-12-2	1.4404

Standards	
Enclosure to EN 60529	IP65
Safety class to EN 61140	Safety class III
Directives	
Electromagnetic Compatibility Directive (EMC)	2014/30/EU
RoHS Directive	2011/65/EU
Machinery Directive	2006/42/EG

7.5 Inputs and Outputs of SISTO-SK-i LED AS-i

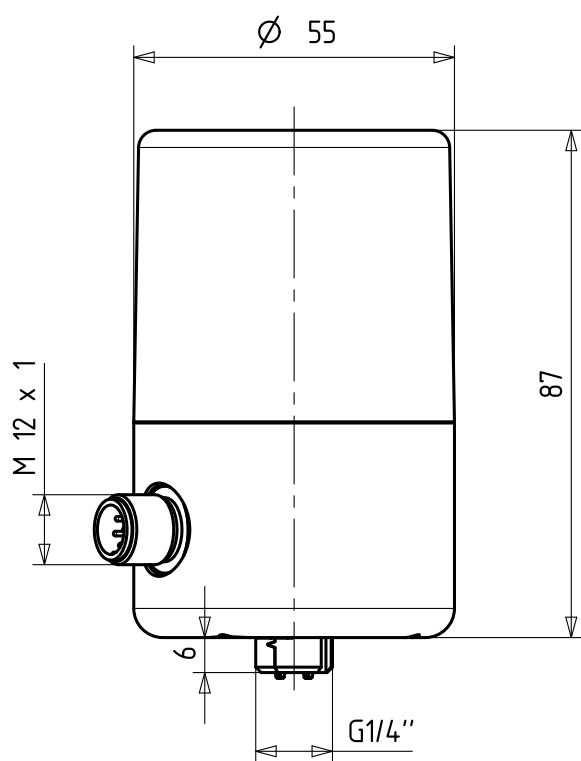
Inputs of SISTO-SK-i LED AS-i (AS-i master perspective)

Bit	Function	Logic
DI0	OPEN position	0 = „Not open“ position 1 = „Open“ position
DI1	CLOSED position	0 = „Not closed“ position 1 = „Closed“ position
DI2	Ready	0 = Normal operation 1 = Initialisation mode
DI3	Fault	0 = Normal operation 1 = Fault Alternating at 1 Hz = valve not initialised

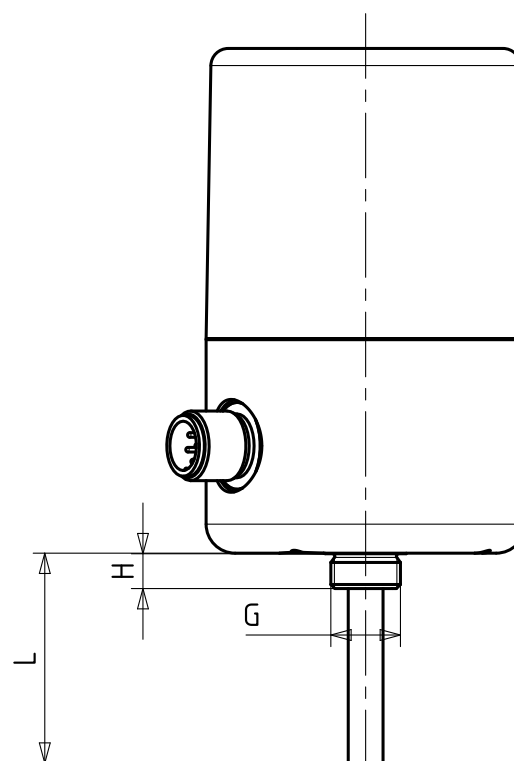
Outputs of SISTO-SK-i LED AS-i (AS-i master perspective)

Bit	Function	Logic
DO0	Operate valve	0 = Pilot valve not operated (if fitted) 1 = Pilot valve operated
DO1	Not connected	-
DO2	Activate teach-In	0 = Normal operation 1 = Initialisation mode
DO3	Not connected	-

7.6 Dimensions and weights



SISTO-C LAP



SISTO-C LAP.520

Mechanical data

Dimensions table of SISTO-SK-i LED/SISTO-SK-i LED AS-i

Dimensions	[mm]
Diameter	55
Height	87
Stroke	5-45

Weights

Material	Material number	Weight [kg]
Plastic, black	PA66-GF30	0,170
X2CrNiMo17-12-2	1.4404	0,380

Linear valves, variants ⁴⁾

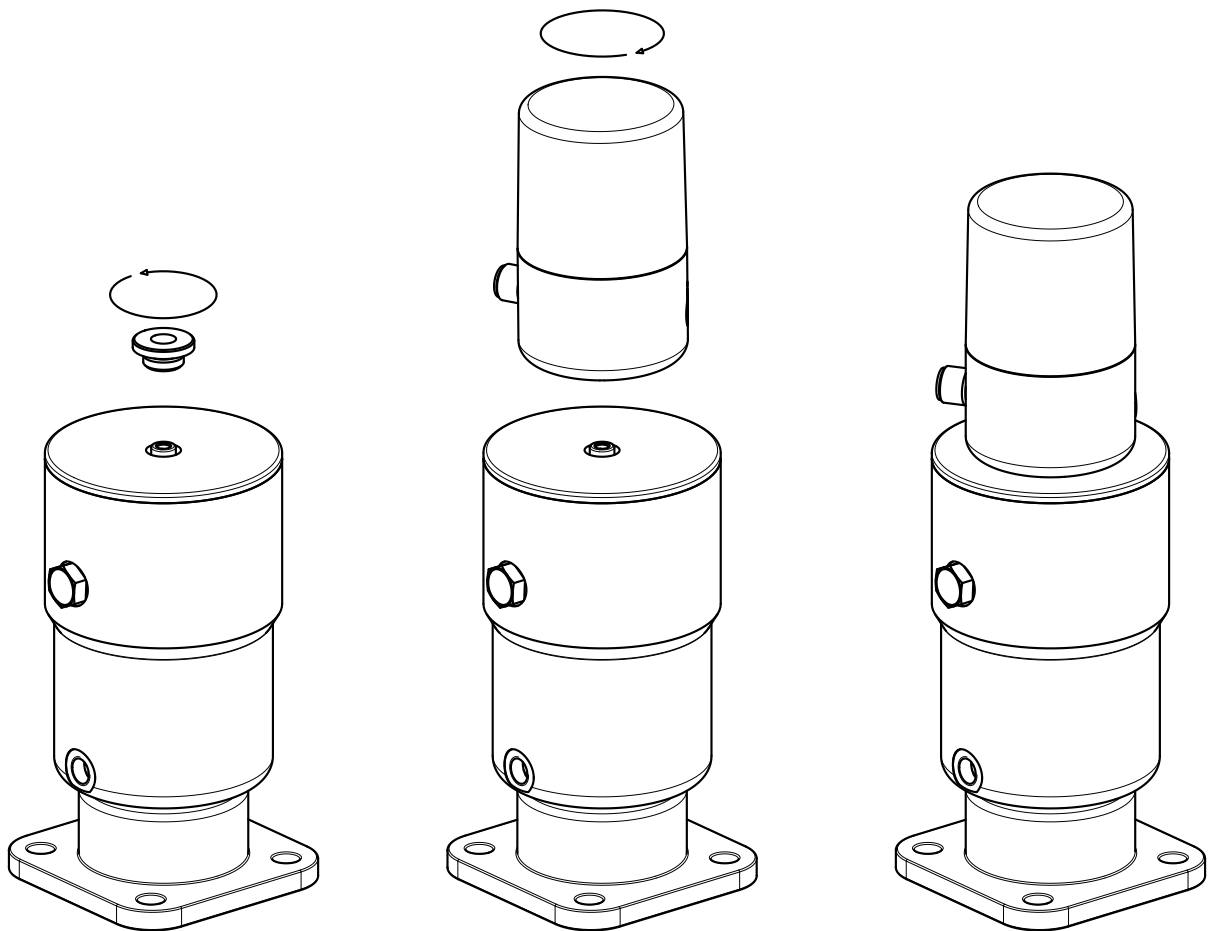
Actuator	SISTO-C LAP	SISTO-C LAP.520/530		
Ordering code for mounting options	00	01	02	03
L [mm]	-	38	38	59
G	G ¹ / ₄ in.	M12 x 1	M18 x 1	M18 x 1
H [mm]	6	6	6	6
Diaphragm diameter [MD]	30 - 168	30 - 65	92 - 115	168

⁴⁾ Further mounting variants available on request.

8 Mounting/Installation

	DANGER Risk of serious injury or death due to explosion! The actual-position feedback unit must not be operated in potentially explosive atmospheres.
	ATTENTION It is not allowed to enter following fluids in the air supply ports of the actual-position feedback unit: - no liquids fluids - no fluids containing solids - no aggressive fluids - no combustible fluids.
	ATTENTION ▪ Protect actual-position feedback unit against source of radiation (e.g. the sun). ▪ Protect actual-position feedback unit against vibrations.
	NOTE ▪ If the actual-position feedback unit is to be used in a damp environment, steps must be taken to ensure that any liquid that collects drains away from and does not penetrate the housing. ▪ The housing of the actual-position feedback unit must not be subjected to mechanical loads. Connection and pneumatic lines must be routed in such a way that no forces act on the actual-position feedback unit
	NOTE Regularly check that the electrical and pneumatic connections are correctly seated and that the connection to the pneumatic valve actuator is correct.

8.1 Mounting of the actual-position feedback unit on the valve actuators of the SISTO-C LAP type series:

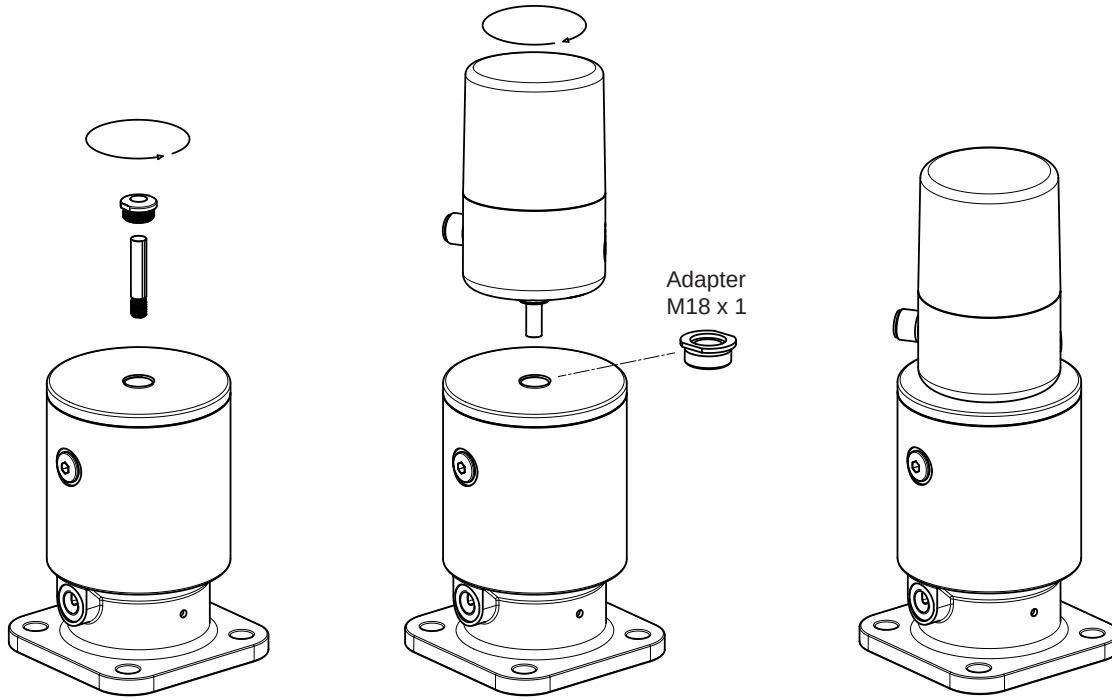


1. Remove the guide bush on the pneumatic valve actuator.

2. Screw the actual-position feedback unit into the tread and hand-tight.

3. To adjust the connections exactly, the actual-position feedback unit can be rotated further in clockwise direction.
After adjusting the actual-position feedback unit can be tightened with the help of a wire pin (Section 8.3, Page 13).

8.2 Mounting of the actual-position feedback unit on the valve actuators of the SISTO-C LAP.520/530 type series:



1. Remove the guide bush and the actual-position feedback unit on the pneumatic valve actuator.

2. Screw the actual-position feedback unit into the thread and hand-tight. With connection thread M18 x 1 in the actuator screw in thread adapter first.

3. To adjust the connections exactly, the actual-position feedback unit can be rotated further in clockwise direction. After adjusting the actual-position feedback unit can be tightened with the help of a wire pin (Section 8.3, Page 13).



WARNING

Risk of injuries, damage to equipment or damage to the environment due to incorrect assembly!

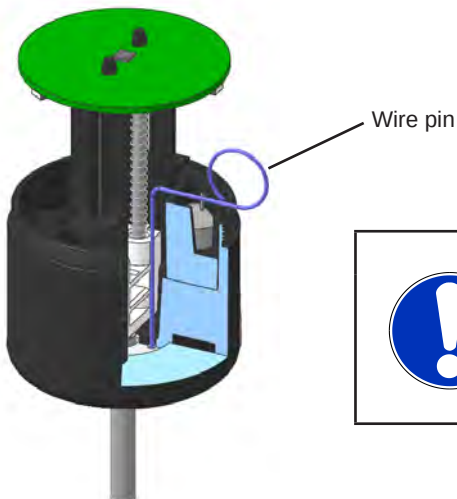
The assembling must be performed by qualified specialist personnel with suitable tools. Carry out work on the SISTO-SK-i LED/SISTO-SK-i LED AS-i actual-position feedback unit during standstill only. Prior to commissioning/start-up of the actual-position feedback unit observe the Section 9.1-9.4, Page 16.



NOTE

When assembling the actual-position feedback unit, a sufficient distance to electromagnetic sources of interference must be maintained.

8.3 Accessories



NOTE

The bottom housing section and the adapter can be interlocked. To do this, insert a wire pin (diameter ≈ 1 mm) through the opening in the housing into the hole in the adapter.

This wire pin is an accessory available as a set with programming magnet and lanyard with the article no. 42493506.

8.4 Mounting on valves from other manufactures

	NOTE On demand SISTO-SK-i LED actual-position feedback unit can also be mounted on valves from other manufactures. It is advisable to clarify the technical details in advance by consulting SISTO Armaturen.
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8.5 Electrical installation

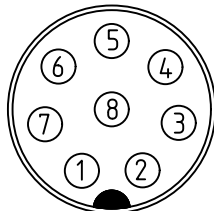
	DANGER Danger from electrical voltage! The system must be de-energised and safeguarded against restarting and it must be verified that it is de-energised before it is accessed. All applicable accident prevention, health and safety regulations must be observed when working on electrical equipment.
---	---

	WARNING Danger to life resulting, damage to equipment or damage to the environment from incorrect assembly! The mounting is performed by qualified specialist personnel with suitable tools, only. Carry out work on the SISTO-SK-i LED/SISTO-SK-i LED AS-i actual-position feedback unit during standstill only. Prior to commissioning/start-up of the actual-position feedback unit observe the Section 9.1-9.4, Page 16.
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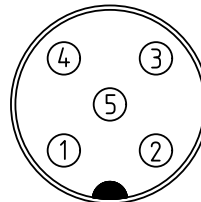
	DANGER Danger from electrostatic discharge! Take special care when the housing is open due to possible electrostatic discharge.
---	---

	NOTE A shielded connection cable must be used for the installation.
---	---

1. Check the supply voltage and voltage of the digital inputs.
2. Gently connect the M12 socket to the M12 plug on the actual-position feedback unit and screw them firmly.
Ensure that the anti-rotation device is positioned correctly.



SISTO-SK-i LED	
Pin	Assignment
1	+24 V
2	DO Open ⁵⁾
3	0 V
4	DO Closed ⁵⁾
5	DI Teach in ⁶⁾
6	DI Solenoid valve ^{6) 7)}
7	DO Fault ⁵⁾
8	Not used



SISTO-SK-i LED AS-i	
Pin	Assignment
1	AS-i +
2	Not used
3	AS-i -
4	Not used
5	Not used

⁵⁾ Binary output

⁶⁾ Binary input

⁷⁾ With integrated solenoid valve only.

8.6 Pneumatic installation (only for actual-position feedback unit with solenoid valve)



WARNING

Danger from pressure!

The feed line must be depressurised, bled and secured against being re-pressurised before the air supply connections are released.

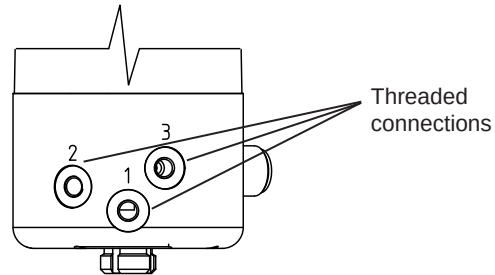


WARNING

Danger to life resulting, damage to equipment or damage to the environment from incorrect assembly!

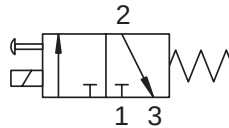
The mounting is performed by qualified specialist personnel with suitable tools, only.
Carry out work on the SISTO-SK-i LED/SISTO-SK-i LED AS-i actual-position feedback unit during standstill only.
Prior to commissioning/start-up of the actual-position feedback unit observe the Section 9.1-9.4, Page 16.

1. Remove the screw plug.
2. Screw the hose connectors into the respective threaded connections on the actual-position feedback unit.
(Hose connections are only included in the scope of delivery when an actual-position feedback unit with pneumatic valve actuator is ordered as a unit.)
3. Ensure that the threaded connections are established properly and are leak-free.



Optional:

Replace the silencer at threaded connection point 3 with a hose connector if the exhaust air is to be discharged via a connection line.



Threaded connection	Assignment
1	Air supply
2	Actuator
3	Air outlet

9 Commissioning/Start-up/Shutdown/Removing

9.1 Commissioning the actual-position feedback unit SISTO-SK-i LED/SISTO-SK-i LED AS-i without an integrated solenoid valve - *on site*

1. Verify that the electrical connections were established properly.
2. Check the supply voltage.
3. The valve actuator must be in its fail-safe position.
4. Check that the actual-position feedback unit is properly mounted on the valve actuator.

Start initialisation:

1. Keep the programming magnet in the middle of the top of the cover for at least 2 seconds. If the colour code start flashing yellow, remove the magnet.
2. Activate the external solenoid valve to trigger the valve actuator.
3. The actual-position feedback unit automatically detects whether the actuator is opening or closing the valve when the valve is activated.
4. The valve actuator reaches the limit position.
5. Detection of the end position is indicated by the yellow colour code of LED.
6. Deactivate the external solenoid valve to move the actuator back to its fail-safe position.
7. Limit position will be saved and signalled via colour code of LED.

Actual-position feed back unit is ready to be operated.

9.2 Commissioning the actual-position feedback unit SISTO-SK-i LED/SISTO-SK-i LED AS-i without an integrated solenoid valve - *remote initialisation*

1. Verify that the electrical connections were established properly.
2. Check the supply voltage.
3. The valve actuator must be in its fail-safe position.
4. Check that the actual-position feedback unit is properly mounted on the valve actuator.

SISTO-SK-i LED procedure:

1. Start remote initialisation: Apply 24 volts to the teach-in input (pin 5) for at least 0.5 seconds.
2. Activate the external solenoid valve to trigger the valve actuator.
3. The actual-position feedback unit automatically detects whether the actuator is opening or closing the valve when the valve is activated.
4. The valve actuator reaches the limit position.
5. The actual-position feedback unit sends after three seconds a signal to pin 2 (DO Open) or pin 4 (DO Closed).
6. Deactivate the external solenoid valve to move the actuator back to its fail-safe position.
7. After three seconds a signal is sent to pin 2 (DO Open) or pin 4 (DO Closed).
8. The alternating voltage at the fault output (pin 7) is switched off.

(Table „Pin assignment“, Section 7.1, Page 7)

Actual-position feedback unit is ready to be operated.

SISTO-SK-i LED AS-i procedure:

1. Start remote initialisation: Activate DO2 via AS-i master for at least 0.5 seconds.
2. The positioner is in the initialisation mode.
3. Activate the external solenoid valve to trigger the valve actuator.
4. The actual-position feedback unit automatically detects whether the actuator is opening or closing the valve when the valve is activated.
5. The valve actuator reaches the limit position.
6. The actual-position feedback unit sends after three seconds a signal to DI0 (Open) or DI1 (Closed).
7. Deactivate the external solenoid valve to move the actuator back to its fail-safe position.
8. After three seconds a signal is sent to DI0 (Open) or DI1 (Closed).
9. The alternating voltage at the fault output (DI3) is switched off.

(Table „Inputs and Outputs“, Section 7.5, Page 10)

Actual-position feedback unit is ready to be operated.

9.3 Commissioning the actual-position feedback unit SISTO-SK-i LED/SISTO-SK-i LED AS-i with an integrated solenoid valve - *on site*

1. Verify that the electrical and pneumatic connections were established properly.
2. Check the supply voltage and the control pressure present.
3. Check that the actual-position feedback unit is properly mounted on the valve actuator.

Start initialisation:

1. Keep the programming magnet in the middle of the top of the cover for at least 2 seconds. If the colour code start flashing yellow, remove the magnet again.
2. The Actual-position feedback unit switches the internal solenoid valve, reaches the both limit positions and saves them internally.
3. Limit position will be saved and signalled via colour code of LED. (Table "Colour code of high-visibility LED", Section 7.1, Page 7)

Actual-position feedback unit is ready to be operated.

9.4 Commissioning the actual-position feedback unit SISTO-SK-i LED/SISTO-SK-i LED AS-i with an integrated solenoid valve - *remote initialisation*

1. Verify that the electrical and pneumatic connections were established properly.
2. Check the supply voltage and the control pressure present.
3. Check that the actual-position feedback unit is properly mounted on the valve actuator.

SISTO-SK-i LED procedure:

1. Start remote initialisation: Apply 24 volts to the teach-in input (pin 5) for at least 0.5 seconds.
2. The actual-position feedback unit actuates the internal solenoid valve, reaches the both limit positions and saves them internally.
3. A signal is present at pin 2 (DO Open) or pin 4 (DO Closed).
4. No voltage is present at pin 7 (DO Fault).

(Table „Pin assignment“, Section 7.1, Page 7)

Actual-position feedback unit is ready to be operated.

SISTO-SK-i LED AS-i procedure:

1. Start remote initialisation: Activate DO2 via AS-i master for at least 0.5 seconds.
2. The actual-position feedback unit actuates the internal solenoid valve, reaches the both limit positions and saves them internally.
3. A signal is present at DI0 (Open) or DI1 (Closed).
4. No voltage is present at fault output (DI3).

(Table „Inputs and Outputs“, Section 7.5, Page 10)

Actual-position feedback unit is ready to be operated.

9.5 Reset of the actual-position feedback unit to factory setting

- Keep the programming magnet in the middle of the top of the cover for 30 seconds.
- Not initialized operating status is indicated by the blue colour code of LED.

9.6 Shutdown

	WARNING Risk of injury! Carry out work on the SISTO-SK-i LED/SISTO-SK-i LED AS-i actual-position feedback unit during standstill only.
	ATTENTION The installation be performed by skilled and trained personnel. Always use suitable tools to ensure proper functioning of the actual-position feedback unit.
	NOTE All applicable accident prevention, health and safety regulations must be observed when working on electrical equipment.

Measures for shutdown:

- **Before intervention in the system:**
 1. The system must be de-energised.
 2. Secure against restart.
 3. Check that no voltages are present.
- **Before the air supply connections are released:**
 1. Feed line must be depressurised.
 2. Feed line bleed.
 3. Feed line secure against being re-pressurised.

9.7 Removing the actual-position feedback unit

The actual-position feedback unit is dismantled in reverse order.

10 Trouble shooting

10.1 Error messages/operating status SISTO-SK-i LED/SISTO-SK-i LED AS-i

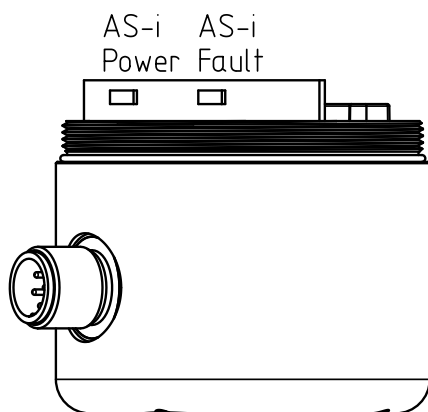
Symbol	Description
○	Off
●	On
✱	Flashing
☒	Undefined

High visibility-LED					Output signal			Fault/ Operating status	Trouble shooting/ Note
Blue	Yellow	Red	Orange	Green	DO Open	DO Closed	DO Fault		
○	○	○	○	○	○	○	○	No power supply.	• Check power supply.
✱	○	○	○	○	○	○	✱	-	• Reinitialise
○	✱	○	○	○	○	○	✱	Ready for initialisation.	-
○	✱	○	✱	○	○	○	✱	Initialisation (Movement in the opening direction)	-
○	●	○	○	○	●	○	✱	Initialisation (Reached open position)	-
○	✱	○	○	✱	○	○	✱	Initialisation (Movement in the closing direction)	-
○	●	○	○	○	○	●	✱	Initialisation (Reached closed position)	-
○	○	○	✱	○	○	○	○	Operation (Movement in the opening direction)	-
○	○	○	●	○	●	○	○	Operation (Reached open position)	-
○	○	○	○	✱	○	○	○	Operation (Movement in the closing direction)	-
○	○	○	○	●	○	●	○	Operation (Reached closed position)	-
○	○	✱	☒	☒	☒	☒	●	Fault (all positions)	• Limit position not reached • Check stroke • Reinitialise
○	○	✱	✱	○	☒	○	●	Fault limit position open (limit position does not match the status of the integrated solenoid valve).	• Check compressed-air supply • Check valve for mechanical blockage
○	○	✱	○	✱	○	☒	●	Fault limit position closed (limit position does not match the status of the integrated solenoid valve).	• Check compressed-air supply • Check valve for mechanical blockage
○	○	✱	✱	✱	☒	☒	●	Fault (all positions)	• Fault in system • Send in actual-position feedback unit to manufacturer.

10.2 Additional error messages/operating status SISTO-SK-i LED AS-i

Symbol	Description
○	Off
●	On
✱	Flashing

LED		Fault/ Operating status	Trouble shooting/ Note
AS-i Power	AS-i Fault		
○	○	No operating voltage	• No operating voltage is available.
●	○	Normal operation	• Data communication is established.
●	●	No data exchange	• The data-exchange-disable-flag is set. • Data port communication is not allowed. • IC is waiting for a write-parameter-request. • The communication monitor has detected „No data exchange status“ or the IC was reset by watchdog reset.
✱	●	No data exchange (address=0)	• Slave is waiting for address assignment. • Data port communication is not possible.
✱	✱	Peripheral fault	• Signal of peripheral fault generated at FID input.
●	✱	Worse Peripheral fault with reset.	• „Data Strobe“ driven LOW for more than 44µs.



Operating status	Colour code of LED
AS-i Power	Green
AS-i Fault	Red

11 Maintenance/Cleaning

The SISTO-SK-i LED/SISTO-SK-i LED AS-i actual-position feedback unit was designed to be maintenance-free. However, check all electrical and pneumatic connections at regular intervals.

ATTENTION	
	The unit must never be cleaned with a water jet and/or aggressive cleaning agents (observe the requirements of the type of enclosure Section 7.2, Page 8/Section 7.4, Page 10).
	Please contact SISTO Armaturen beforehand should any doubt arise as to the compatibility of the cleaning agent with the housing material.

**Maschinenrichtlinie 2006/42/EG
Einbauerklärung entsprechend Anhang IIB**

Hersteller, Adresse: **SISTO Armaturen S.A.
18, rue Martin Maas
L-6468 Echternach/Luxembourg**

Beschreibung der unvollständigen Maschine:

Stellungsrückmelder Typ SK-i LED oder Stellungsrückmelder SK-i LED AS-i, vorgesehen zum Aufbau auf lineare pneumatische Ventilantriebe.

Im Einklang mit folgenden angewendeten grundlegenden Anforderungen:

1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.2.1, 1.2.2, 1.2.3, 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.8, 1.3.8.1, 1.4.1 1.4.2.1, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.7, 1.5.8, 1.6.1, 1.6.3, 1.6.4, 1.7.1.1, 1.7.1.2, 1.7.2, 1.7.4, 1.7.4.1, 1.7.4.2

Die technische Dokumentation wurde erstellt in Übereinstimmung mit Anhang VII, Teil B.

Andere anwendbare Richtlinien:

- **EMC Directive 2014/30/EU / EMV-Richtlinie 2014/30/EU**
- **RoHS Directive 2011/65/EU / RoHS-Richtlinie 2011/65/EU**

Hinweis: Die unvollständige Maschine, die Gegenstand der vorliegenden Einbauerklärung ist, darf erst dann in Betrieb genommen werden, wenn die Maschine, in die sie eingebaut wird, die Anforderungen der Richtlinie 2006/42/EG erfüllt.

**Machinery Directive 2006/42/EC
Declaration of incorporation according to annexe IIB**

Manufacturer, address: **SISTO Armaturen S.A.
18, rue Martin Maas
L-6468 Echternach/Luxembourg**

Description of the partly completed machinery:

Actual-position feedback unit type SK-i LED or actual-position feedback unit type SK-i LED AS-i, intended for mounting on linear pneumatic valve actuators.

In accordance with the following essential requirements applied:

1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.2.1, 1.2.2, 1.2.3, 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.8, 1.3.8.1, 1.4.1 1.4.2.1, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.7, 1.5.8, 1.6.1, 1.6.3, 1.6.4, 1.7.1.1, 1.7.1.2, 1.7.2, 1.7.4, 1.7.4.1, 1.7.4.2

The technical documentation has been prepared in accordance with appendix VII, section B.

Other applicable directives /

- **EMC Directive 2014/30/EU / EMV-Richtlinie 2014/30/EU**
- **RoHS Directive 2011/65/EU / RoHS-Richtlinie 2011/65/EU**

Note: This partly completed machinery covered by this declaration may not be put into service until the machine into which it is installed complies with the requirements of Machinery Directive 2006/42/EC.



Bernd Hackenberger
Head of Design and Development

Echternach, 26.11.2020

EU-Konformitätserklärung
EU Declaration of Conformity

Hiermit erklären wir,

SISTO Armaturen S.A.
18, rue Martin Maas
L-6468 Echternach/Luxembourg

dass, die nachstehenden Produkte

Stellungsrückmelder Typ SISTO-SK-i LED
Stellungsrückmelder Typ SISTO-SK-i LED AS-i
vorgesehen zum Aufbau auf lineare pneumatische Ventilantriebe

mit den Vorschriften folgender der Richtlinien in ihrer gültigen Fassung entspricht:

- 2011/65/EU** **Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektrogeräten und Elektronikgeräten (RoHS)**
- 2014/30/EU** **Elektromagnetische Verträglichkeit**

Herewith we,

SISTO Armaturen S.A.
18, rue Martin Maas
L-6468 Echternach/Luxembourg

declare that the listed products

Actual-position feedback unit type SISTO-SK-I LED
Actual-position feedback unit type SISTO-SK-i LED AS-i
intended to be used with linear pneumatic valve actuators

meet the provisions of the below Directive in the valid version:

- 2011/65/EU** ***Restrictions of the use of certain hazardous substances in electrical and electronic equipment (RoHS)***
- 2014/30/EU** ***Electromagnetic Compatibility***



Echternach, 26.11.2020

Bernd Hackenberger
Head of Design and Development



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