CS10

CONTROL HEAD

Instruction Manual

20202512-IM001

CONTENTS

1 General Description

This manual should be read carefully by all personnel involved in operation and maintenance.

Liability for any damages or issues resulting from non-compliance with these instructions will not be accepted.

It should also be noted that descriptions and specifications in this manual may be subject to technical changes.

1.1 Intended Use

The CS10 control head is designed for the purposes outlined in chapter 2.1. Any use beyond what is described in that chapter does not adhere to regulations, and MST (Minox) will not be held responsible for any resulting damages. The operator assumes full responsibility for risks.

Proper and safe operation of the control unit requires appropriate transportation, storage, and professional assembly. Intended use also includes adherence to operating, service, and maintenance guidelines.

2 MINOX® CS10 Control Head

2.1 Purpose of use

MINOX® CS10 control head offers a comprehensive sensing and control solution tailored for process valves within the food and beverage, dairy, brewery, and pharmaceutical industries.

The CS10 control head can integrate with any PLC system, enabling automated control and offering real-time monitoring of valves.

The signal from the PLC system is processed within the CS10 control head. The electronic module sends a command to activate the solenoid valve by controlling the pneumatic flow into the valve actuator, moving the valve into the desired position. The sensor detects and evaluates the valve position and provides feedback back to the PLC system. The LED lights in the electronic module provide visual indication of the valve position and operational status.

2.2 Design of CS10

The design of CS10 control head is illustrated in *Figure 2.2.1*.

1. **Control head base** consists of air passages, electric and pneumatic connections.
2. **Electronic module** provides electrical supply, communicates with the control system, controls the solenoid valve, evaluates and provides feedback signals, consists of LED lights for the valve position indication.
3. **Solenoid valve** controls the valve actuator.
4. **Sensor** consists of two adjustable Hall effect sensors to detect the valve position.
5. **Safety valve** opens when air leaks into the control head to prevent overpressure and protect the integrity of the control head.
6. **Cover**

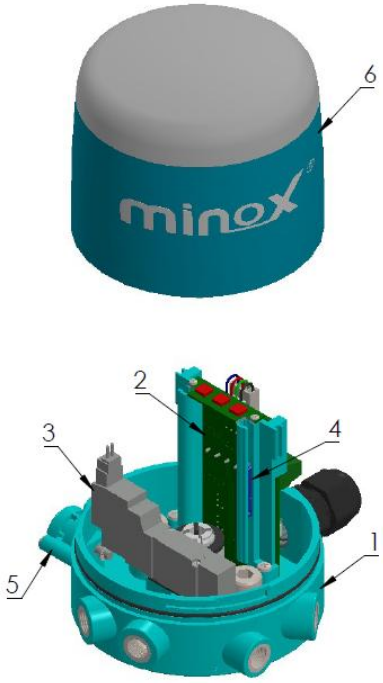


Figure 2.2.1

2 MINOX® CS10 Control Head

2.3 Features

The MINOX® CS10 control head is used with pneumatically operated MINOX® sanitary butterfly valve and seat valve. CS10 control head provides direct interface between the PLC system and the sanitary process valve, enabling seamless communication and integration into automated systems.

Key features include:

- Digital interface with 24 V DC or AS-Interface communication for connection to a PLC system
- Capable of controlling single-acting and double-acting process valves
- Automatic air supply via solenoid valve
- High precision position sensors with easy adjustment
- Valve status display via LED, visible from any direction
- In-line air filter provided to protect solenoid valve

3 Technical Data

Material	
Cover	PC
Body	PC
Basic housing	Nylon
Seal	NBR

Installation Environment	
Working temperature	-10 to +50°C
Protection class (IP)	IP 65 acc. to EN 60529

Performance data	
Communication	Digital interface AS-Interface v3.0
Position sensor	Contactless magnetic sensor (PNP) (NPN on request)
Stroke range valve spindle	8 - 60mm

Solenoid Valve	
Supply voltage	24V DC ± 10%
Nominal power	0.35 W
Air supply	150 kPa – 700 kPa
Type of solenoids	3/2-way or 5/2-way
Number of solenoids	1
Manual hold override	Yes

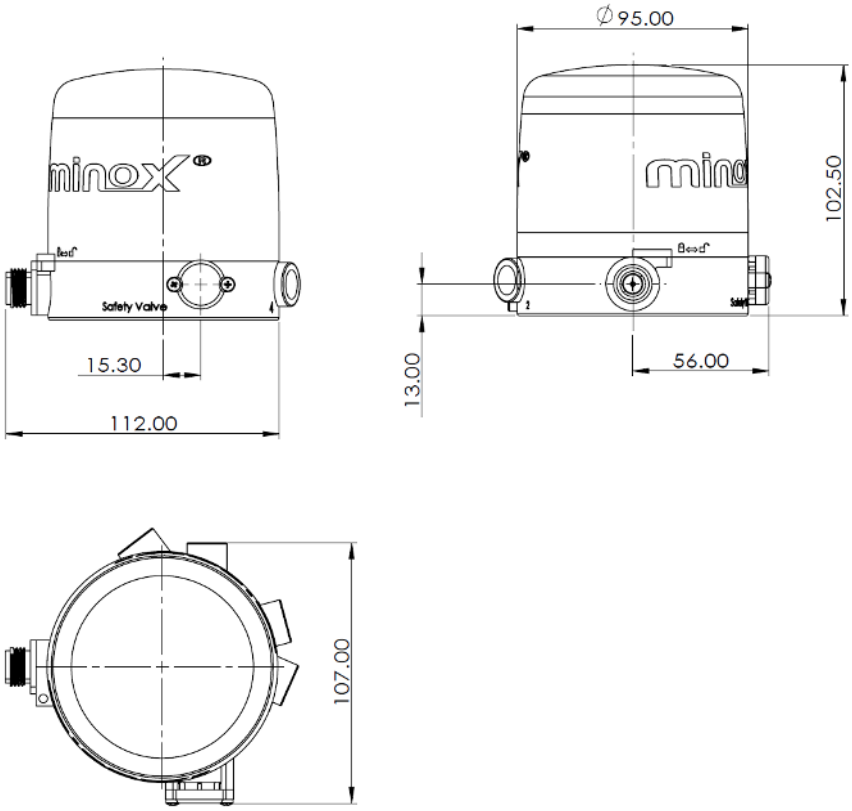
Electrical Connection	
Multipole (Digital & AS-I)	M12, 5-pins
Cable gland (Digital)	M16 × 1.5 (Terminal range 4 - 8mm); With screw terminals for cable cross-sections 1.0 - 2.5mm²

Pneumatic Data	
Air quality	Class 3,3,3 acc. to DIN ISO 8573-1
Supply pressure to actuator	6 - 8bar
In-line air filter	Exchangeable
Filtration	10µm
Pilot air ports	Threaded ports G 1/8, stainless steel

3 Technical Data

LED Indication	
Valve ENERGISED	Green color
Valve DE-ENERGISED	Blue color

Dimension



4 Installation

4.1 Mechanical installation

The installation of CS10 control head on the valve actuator is illustrated in *Figure 4.1.1*.

1. Install the permanent magnet adaptor onto the actuator stem and tighten it carefully by hand.

Caution!
Proctect the magnet adaptor from mechanical stress to avoid the risk of fracture.

2. Mount the CS10 control head on top of the actuator and fasten it with two screws using a 6 mm hex socket wrench.

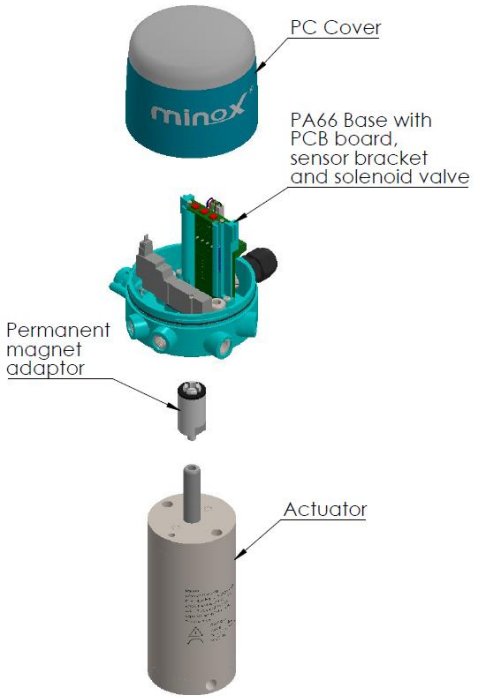


Figure 4.1.1.

Note:
Delivery of MINOX® valve with CS10 control head will be assembled in one complete set.

4 Installation

4.2 Pneumatic installation

The pneumatic connections for **turning actuators (spring return)** – normally closed (NC) or normally open (NO) as shown in *Figure 4.2.1*.

1 Supply air port

4A Bore; transfer pneumatic air to actuator

3/5 Exhaust air port

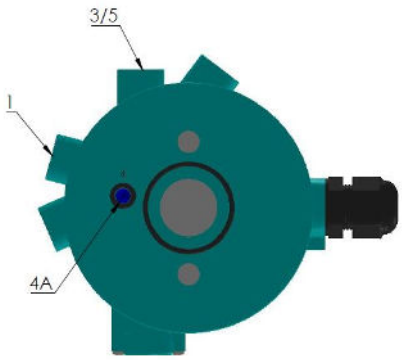


Figure 4.2.1.

Note:

NC				NO			
DE-EN	4A	→	3/5	DE-EN	1	→	4A
EN	1	→	4A	EN	4A	→	3/5

Supply air

1. Shut off the compressed air supply before connecting the air hose to the control head.
2. Cut the air hose to the appropriate length by using a hose cutter.

Pneumatic air for valve actuator

3. The assembly of the control head on the turning actuator (NC or NO) with integrated air transfer (4A) does not require an external air hose between the control head and the actuator.
4. Connect the supply air hose to the supply air port (1) on the control head.
5. Turn on the supply air.

Exhaust air

6. The exhaust air port (3/5) is equipped with a silencer.

4 Installation

4.2 Pneumatic installation

The pneumatic connections for **turning actuators** – double-acting (DA**)** as shown in *Figure 4.2.2*.

1 Supply air port

2 Air outlet port

4A Bore; transfer pneumatic air to actuator

3/5 Exhaust air port

Note:

DA						
DE-EN	1	→	2	4A	→	3/5
EN	1	→	4A	2	→	3/5

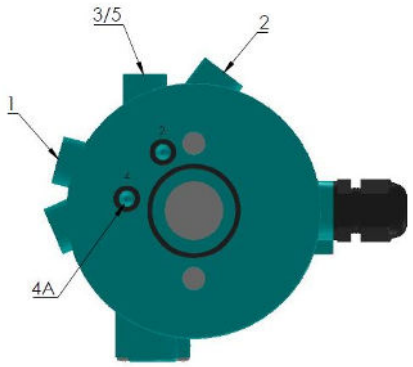


Figure 4.2.2.

Supply air

1. Shut off the compressed air supply before connecting the air hose to the control head.
2. Cut the air hose to the appropriate length by using a hose cutter.

Pneumatic air for valve actuator

3. The assembly of the control head on the turning actuator (DA) with integrated air transfer (4A) does not require an external air hose between the control head and the actuator.
4. Connect the air hose between the air outlet port (2) on the control head and the air port on the valve actuator.
5. Connect the supply air hose to the supply air port (1) on the control head.
6. Turn on the supply air.

Exhaust air

7. The exhaust air port (3/5) is equipped with a silencer.

4 Installation

4.2 Pneumatic installation

The pneumatic connections for **seat valve actuators (spring return)** - normally open (NO) as shown in *Figure 4.2.3*.

1 Supply air port

4A Bore; transfer pneumatic air to actuator

3/5 Exhaust air port

Note:

NO			
DE-EN	4A	→	3/5
EN	1	→	4A

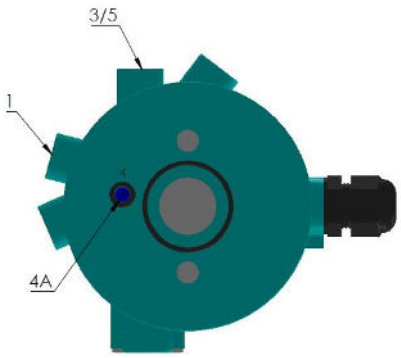


Figure 4.2.3.

Supply air

1. Shut off the compressed air supply before connecting the air hose to the control head.
2. Cut the air hose to the appropriate length by using a hose cutter.

Pneumatic air for valve actuator

3. The assembly of the control head on the seat valve actuator (NO) with integrated air transfer (4A) does not require an external air hose between the control head and the actuator.
4. Connect the supply air hose to the supply air port (1) on the control head.
5. Turn on the supply air.

Exhaust air

6. The exhaust air port (3/5) is equipped with a silencer.

4 Installation

4.2 Pneumatic installation

The pneumatic connections for **seat valve actuators** – normally close (NC) and double-acting (DA**)** as shown in *Figure 4.2.4*.

1 Supply air port

2A Bore; transfer pneumatic air to actuator

4 Air outlet port

3/5 Exhaust air port

Note:

NC/DA						
DE-EN	1	→	2A	4	→	3/5
EN	1	→	4	2A	→	3/5

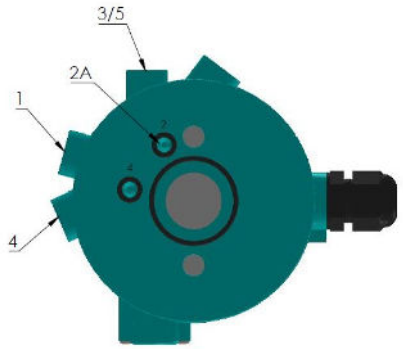


Figure 4.2.4.

Supply air

1. Shut off the compressed air supply before connecting the air hose to the control head.
2. Cut the air hose to the appropriate length by using a hose cutter.

Pneumatic air for valve actuator

3. The assembly of the control head on the seat valve actuator (DA) with integrated air transfer (2A) does not require an external air hose between the control head and the actuator.
4. Connect the air hose between the air outlet port (4) on the control head and the air port on the valve actuator.
5. Connect the supply air hose to the supply air port (1) on the control head.
6. Turn on the supply air.

Exhaust air

7. The exhaust air port (3/5) is equipped with a silencer.

4 Installation

4.3 Electrical installation

1. Remove the cover by turning it counter-clockwise and then lifting it up.
2. Connect the wires to the terminals as shown in the electrical connection.
3. Tighten the cable gland using a 16mm wrench; tighten the M12 connector using a 17mm wrench.
4. Place the top cover back onto the unit.
5. Turn on the power supply. The LED light will illuminate if the installation is correct.

Attention!
Ensure that the operating voltage is correct.
Electric connections must only be performed by qualified personnel.

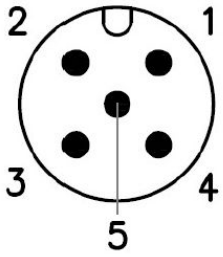
4 Installation

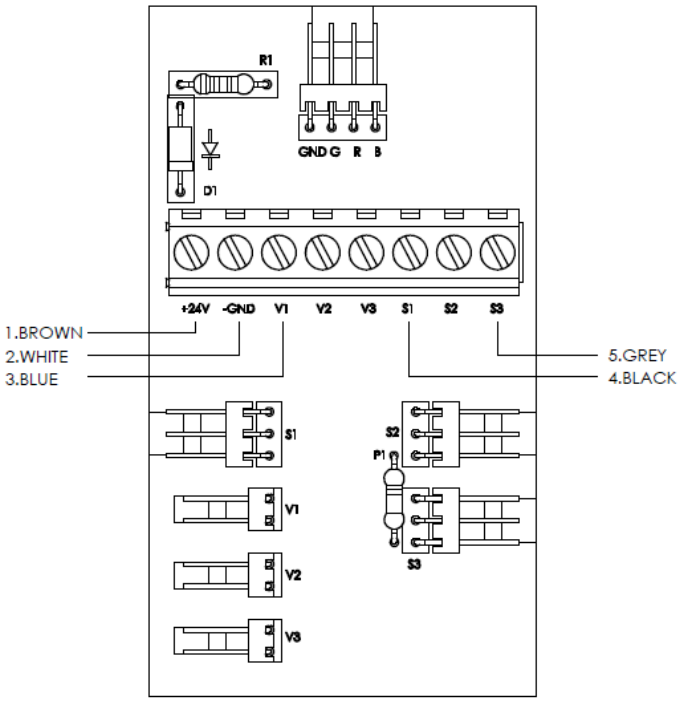
4.4 Digital interface, 24V DC

Voltage supply	24 V DC ± 10%
Current consumption	Max. 100 mA (solenoid valve, sensor and LED light active)
Terminal type	Screw terminal for cable cross-sections 1.0 - 2.5 mm²

Electrical Connection

Multipole M12, 5-pins	Cable Gland Circular





Pin	Control board		Colour Code Wires	LED Indication
1	Power supply	+24V	Brown	-
2	Power supply	-GND	White	-
3	in	V1: Main valve	Blue	-
4	Out	S1: Valve EN	Black	Green
5	Out	S3: Valve DE-EN	Grey	Blue

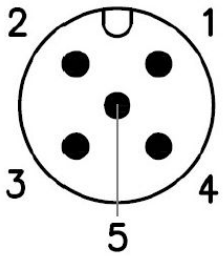
4 Installation

4.5 AS-Interface

Voltage supply	AS-Interface 26.5 – 31.6 V DC
Protection class	III
Surge protection	U_e: overvoltage category II, safe isolated power supplies (PELV)
Current consumption	Max. 100 mA (solenoid valve, sensor and LED light active)
AS-I specification v3.0	• Supports extended A/B addressing and allows up to 62 nodes on an AS-I network • Slave profile = 7A77
AS-I addressing	• Default slave address (node) is 0 • Address (node) changes with a standard handheld AS-I addressing device or via AS-I Master Gateway

Electrical Connection

Multipole M12, 5-pins



Pin	Control board	Colour Code Wires
1	AS-I +	Brown
2	nc	-
3	AS-I -	Blue
4	nc	-
5	nc	-

5 Operation

After properly assembly and installation of the CS10, the operation procedures as follows:

1. Turn on the air supply.
2. Turn on the voltage supply.
3. Check the solenoid valves by turning the button on the upper side of the valve.
4. Check the valve position indicator and adjust the feedbacks for the open and closed positions by turning the screw on the Hall sensors until the required position is reached, as illustrated in *Figure. 5.1.1*.
5. The LED for valve closed and open will light up.

Figure 5.1.1

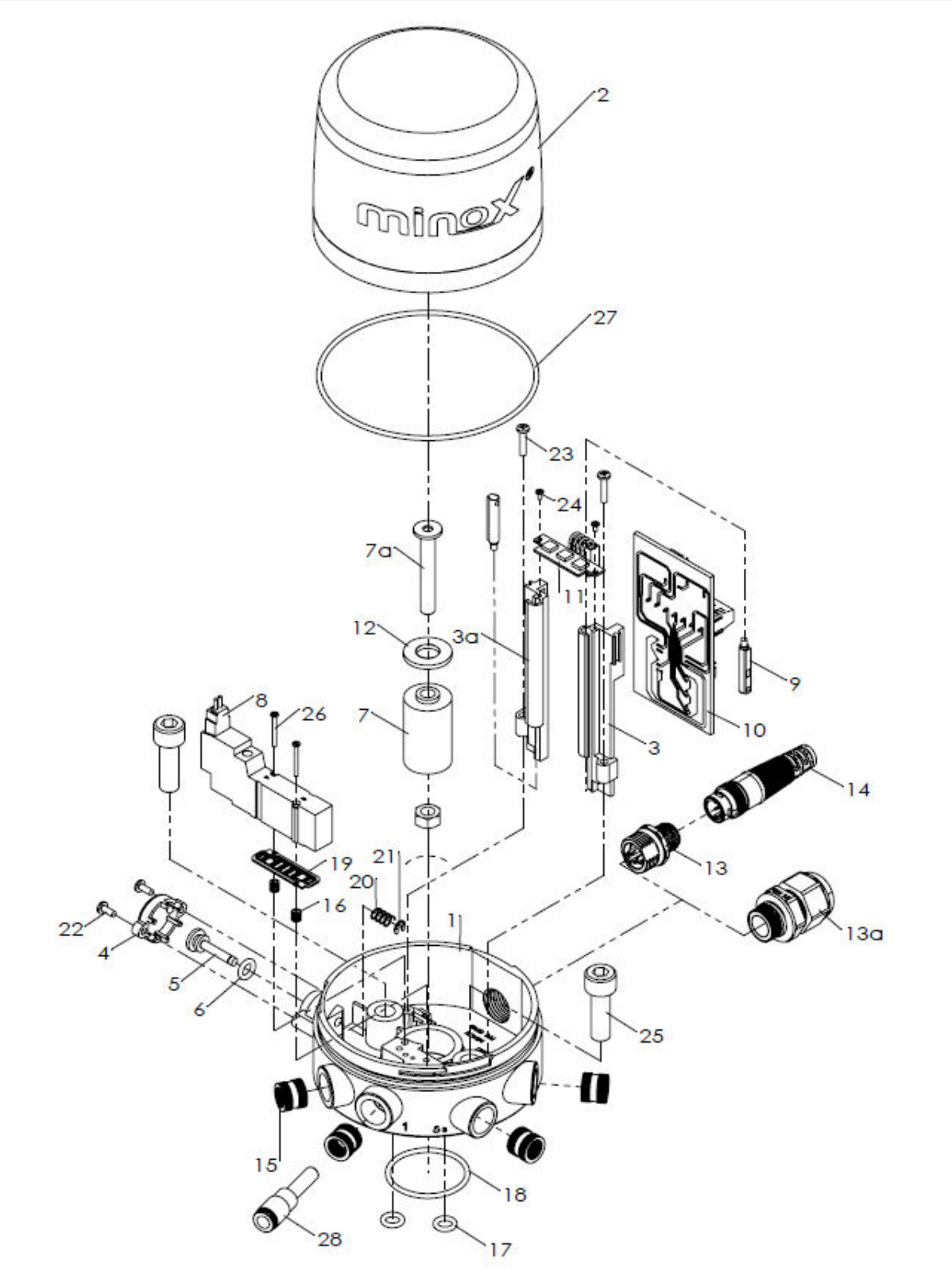
Caution!
Before operation, confirm whether the valve should be configured as normally open (NO) or normally Closed (NC).
Selecting the incorrect mode may cause the solenoid valve to remain continuously energized, which can lead to increased coil temperature. Excessive temperature rise may shorten the coil's service life!

6 Troubleshooting

Failures	Remedy
Valve position or feedback is not indicated in PLC	- Adjust the Hall sensors. - Check the wiring of the Hall sensors to the electronic module. - Check the attachment of the magnetic adaptor.
LED indication is not illuminated	- Check the operating voltage. - Check the wiring of LED to the electronic module.
Valve is not moving with actuated solenoid valve.	- Check valve movement by overriding the solenoid valve. - Check the wiring of solenoid valve to the electronic module. - Check the compressed air supply is between 5 to 7bar. - Bore for transfer of control air to turning actuator must be open. - Check the control air connection between the CS10 and the valve actuator.
Air leakage from the bottom side of the adaptor.	- Check the O-rings of the adaptor.

Note:
Contact MINOX sales personnel if technical assistance is required.

7 Spare Part List



7 Spare Part List

Pos. Item	Quantity	Description	Material
1	1	Control Head Base	Nylon
2	1	Cover	PC
3	1	Hall Sensor Bracket	Nylon
3a	1	Hall Sensor Bracket	Nylon
4	1	Safety Valve Cover	Nylon
5	1	Axle	Nylon
6	1	O-Ring	NBR
7	1	Adaptor	Nylon
7a	1	Flat Head Cap Screw	Stainless Steel
8	1	Solenoid Valve	Zinc
9	2	Hall Sensor	
10	1	Electronic Module	RF4
11	1	RGB LED Light	RF4
12	1	Permanent Magnet	NdFeB
13	1	Multipole Male Connector, M12	Stainless Steel
13a	1	Cable Gland, M16	Nylon
14	1	Multipole Female Connector, M12	Stainless Steel
15	4	Threaded Port	Stainless Steel
16	2	Insert Nut	Copper
17	2	O-Ring	NBR
18	1	O-Ring	NBR
19	1	Gasket	NBR
20	1	Spring	Steel
21	1	E-Clip	Steel
22	2	Self-Tapping Screw	Stainless Steel
23	2	Self-Tapping Screw	Stainless Steel
24	2	Self-Tapping Screw	Stainless Steel
25	2	Cap Screw	Stainless Steel
26	2	Screw	Stainless Steel
27	1	O-Ring	NBR
28	1	In-Line Air Filter	PC

The information provided in this manual is intended for general guidance and should be used in accordance with the instructions provided.

MST Stainless Steel Sdn Bhd (Minox) reserves the right to make changes to the design and materials of this product at any time without prior notification.

For customer support or additional information, please contact our sales representative in your region or visit our website at www.minox.biz.

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