

## APV CU4\*plus\* AS-interface Control Unit

SAFETY AGAINST EXPLOSION - FOR IECEx ZONE 2 GAS APPLICATIONS



FORM NO.: H354318 REVISION: GB-1

READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.







**CE Declaration of Conformity**  
**UKCA Declaration of Conformity**

We,

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declare under our sole responsibility that the

**CU4 Direct Connect, AS-interface Control Units for IECEx ATEX Zone 2**  
**CU4plus Direct Connect, AS-interface, IO-Link Control Units for IECEx ATEX Zone 2**  
**Explosion subcategory / Equipment marking:**  
**II 3 G Ex ec IIB T4 Gc**  
**IECEX TUN 22.0020X**  
**TÜV 23 ATEX 349764 X**  
**0°C ≤ Tamb. ≤ +55°C**

**meet the requirements of the**  
**IECEX ATEX Standards**

IEC 60079-0:2017, Edition 7.0 and IEC 60079-7:2017, Edition 5.1 as well as  
EN IEC 60079-0:2018 and EN IEC 60079-7:2015/ A1:2018  
TÜV NORD CERT GmbH, Hanover-Office, Am TÜV 1, 30519 Hanover, Germany,  
Notified Body number: 0032

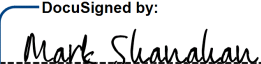
**Electromagnetic Compatibility Directive 2014/30/EU**  
& protection class IP 64 EN 60529, EN 61000-6-2, EN 61000-6-4, EN 60068-2-6  
**RoHS Directive 2011/65/EU**

Holzwickede, Nov. 2023

  
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Dr.-Ing. Behdad Ariatabar, Design Center Lead - Valves

**meet the requirements of the**  
**Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres**  
**Regulations 2016 No. 1107 & BS harmonized standards**  
**Electromagnetic Compatibility Regulations 2016 No. 1091 & BS harmonized standards**  
**Restriction of Use of Certain Hazardous Substances in Electrical and Electronic Equipment**  
**Regulation 2012 No. 3032**

Manchester, Nov. 2023

DocuSigned by:  
  
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Mark Shanahan, VP Finance N&H Solutions



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## 0. IECEx Specific Instructions

### 0.1. General Information

These **IECEX** Specific Safety Instructions apply for **CU4\*\* resp. CU4\*plus\* Control Units** used in Potentially Explosive Atmospheres **Zone 2, Gas** applications. The equipment was assessed according to IEC 60079-0:2017, Edition 7.0 and IEC 60079-7:2017, Edition 5.1.

Notified body: TÜV NORD CERT GmbH, Hanover-Office  
Am TÜV 1, 30519 Hanover, Germany  
Notified Body number: 0044

These instructions shall be read carefully by the competent operating and maintenance personnel.

We point out that we will not accept any liability for damage or malfunctions resulting from the non-compliance with these instructions.

### 0.2. IECEx Specific Symbol



#### **DANGER! WARNING! CAUTION!**

This symbol draws your attention to important directions which have to be observed for the operation in explosive areas.

Failure to observe the warning may result in fatal or serious injury as well as damage to property!

### 0.3. Authorized Use

The Control unit type CU4\*\* resp. CU4\*plus\* is designed to be mounted to pneumatic actuators of process valves for the control of media as used in the food and beverage industries as well as in pharmaceutical and chemical applications.

The control unit is installed on a pneumatic actuator of a process valve. The process valve and the actuator must have at least the IECEx ATEX approval of the control unit.

SPX FLOW will be held responsible only for the control units supplied and selected according to the operating conditions indicated by the customer or end user and as stated in the order confirmation. If in doubt, contact your local supplier.

Observe the admissible data, operating conditions and conditions of use as specified in the contract documents, instruction manuals and on the type label.

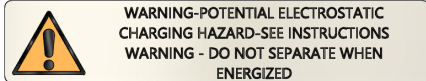
The control unit must only be used with SPX FLOW valves and components recommended and authorized by SPX FLOW.

Adequate transport, storage and installation, careful handling and maintenance are essential for a faultless and reliable function of the control unit.

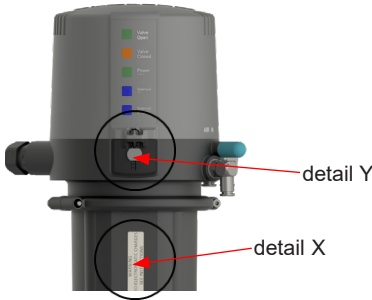
Observe the intended use of the control unit.

## 0. IECEx Specific Instructions

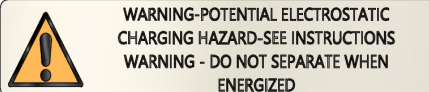
### 0.4. Specific Safety Instructions



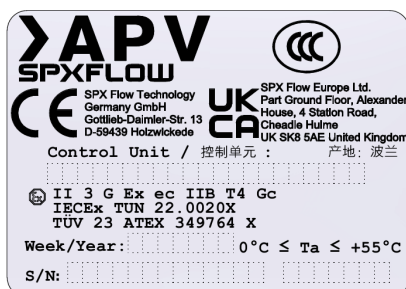
lead seal



**detail X:** electrostatic risk label  
CU4 D4 IECEx Z2



**detail Y:** type label  
control unit



- Connecting/Disconnecting pluggable electric circuits**
- The connecting and disconnecting of the pluggable electrical circuits including field wirings is only permitted in the absence of explosive atmosphere.

- Opening the device**
- Do not open the control unit in the presence of explosive atmosphere.
  - Do not install and set the proximity switches in the presence of explosive atmosphere.
  - Before startup, secure the cover with the enclosed lead seal. Opening the cover without tools must be prevented.

- Electrostatic discharge**
- The control unit has to be installed and used in such a way, that electrostatic charging from operation, maintenance and cleaning is excluded.
  - Connect the earthing screw in order to integrate the control unit in the local potential equalization system.
  - In case of sudden discharge from electrostatically charged devices or individuals, risk of explosion in the explosive area exists.
  - Prevent the occurrence of electrostatic discharges by suitable measures.
  - Clean the control unit surface by gently wiping it with a damp or antistatic cloth, only.

- In order to prevent the emergence of explosion risks observe the safety instructions of the instruction manual and adhere to the following:**
- Observe information on temperature classes, ambient temperatures, degree of protection and voltage on the approval ID label.
  - Do not use control units in areas subject to gas with lower ignition temperatures than indicated on the approval ID label.
  - Installation, operation and maintenance may only be performed by qualified personnel.
  - Observe the applicable international and national safety regulations as well as the general rules of technology for construction and operation.
  - Do not repair the control unit yourself. Replace it by an equivalent device.
  - Repairs may only be performed by the manufacturer.
  - Do not expose the control unit to mechanical and/or thermal loads which may exceed the limits described in the instruction manual.
  - Only use cable and/or line entry points approved for the respective application area and which are screwed in place according to the respective installation instructions.
  - The cable glands may be used for fixed installations, only.
  - Close all unnecessary cable glands with locking screws approved for the explosive area.

## 0. IECEx Specific Instructions

### 0.4. Specific Safety Instructions



**In order to prevent the emergence of explosion risks observe the safety instructions of the instruction manual and adhere to the following:**

- The required degree of protection (IP64) is guaranteed only in connection with suitable adaption sets. All pneumatic and electrical connections must be equipped with suitable connectors.
- Install the control unit in such a way that it is protected from UV-radiation.
- The control unit has to be installed in such a way that a pollution degree 2 or better, according to IEC 60664-1, is achieved.
- Externally to the control unit, measures have to be taken to provide a transient protection which ensures that the rated voltage, connected to the power supply terminals, is not exceeded by more than 40 %.
- Ambient temperature range:  $0\text{ }^{\circ}\text{C} \leq T_{amb} \leq +55\text{ }^{\circ}\text{C}$



- 安全使用条件:
- 使用环境温度:  $0\text{ }^{\circ}\text{C} \sim +55\text{ }^{\circ}\text{C}$
- 控制单元CU4\*\*和CU4\*plus\*在安装和使用时, 避免在操作, 维护和清洁时产生静电
- 控制单元CU4\*\*和CU4\*plus\*在安装时必须防止紫外线照射
- 在爆炸性危险场所严禁连接和断开电路
- 根据GB/T 16935.1, 该设备只应在污染程度不低于2级的区域使用
- 控制单元CU4\*\*和CU4\*plus\*的瞬态保护应提供不超过设备的供电端子额定峰值电压值140%的保护

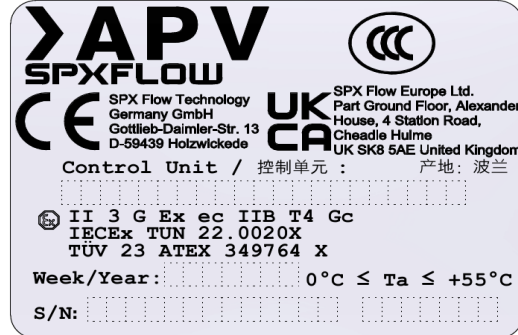


## 0. IECEX Specific Instructions

### 0.5. Identification of CU4\*\* resp. CU4\*plus\* Control Units for use in IECEX ATEX environment



IECEX / ATEX - identification:



Equipment group II

Explosion subcategory / Equipment marking  
Ex ec IIB T4 Gc



Ambient temperature  
 $0\text{ °C} \leq T_{amb} \leq +55\text{ °C}$

### 0.6. Responsibilities

It is within the operator's responsibility to ensure that the specified product temperatures are not exceeded and that regular inspections and maintenance are carried out to provide for proper function of the control unit and valve.

**The following pages show the operating instructions for the standard control unit for non - IECEX ATEX applications.**

## 1. Abbreviations and Definitions

<b>A</b>	<b>Exhaust air</b>
<b>AWG</b>	<b>American Wire Gauge</b>
<b>CE</b>	<b>Communauté Européenne</b>
<b>CU</b>	<b>Control Unit</b>
<b>DI</b>	<b>Digital Input</b>
<b>DO</b>	<b>Digital Output</b>
<b>EMV</b>	<b>Electromagnetic Compatibility</b>
<b>EU</b>	<b>European Union</b>
<b>GND</b>	<b>Ground/mass potential</b>
<b>IP</b>	<b>International Protection</b>
<b>LED</b>	<b>Luminous diode</b>
<b>N</b>	<b>Pneumatic Air Connection NOT element</b>
<b>NEMA</b>	<b>National Electrical Manufacturers Association</b>
<b>P</b>	<b>Supply Air Connection</b>
<b>PELV</b>	<b>Protected Extra-Low Voltage</b>
<b>PWM</b>	<b>Pulse-width modulation</b>
<b>Y</b>	<b>Pneumatic Air Connection</b>
<b>SLD</b>	<b>Seat Lift Detection / Seat Lift Gathering</b>

## 2. Safety Instructions

### 2.1. Sentinels

**Meaning:**



**Danger!**

Direct danger which can lead to severe bodily harm or to death!



**Caution!**

Dangerous situation which can lead to bodily harm and/or material damage.



**Attention!**

Risk as a result of electric current.



**Note!**

Important technical information or recommendation.

**These special safety instructions point directly to the respective handling instructions. They are accentuated by the corresponding symbol. Carefully read the instructions to which the sentinels refer. Continue handling the control unit only after having read these instructions.**

## 2. Safety Instructions

### 2.2. Intended use

The CU4plus AS-i control unit is only intended for use as described in chapter 3.1. Use beyond that described in chapter 3.1. do not comply with the regulations and SPX FLOW shall not be responsible for any damage resulting from this non-observance. The operator bears the full risk. Prerequisites for proper and safe operation of the control unit are the appropriate transport and storing as well as the professional assembly. Intended use also means the observance of operating, service and maintenance conditions.

### 2.3. General regulations for careful handling

To ensure a faultless function of the unit and a long service life, the information given in this instruction manual as well as the operating conditions and permissible data specified in the data sheets of the control unit for process valves should be strictly adhered to.

- The operator is committed to operating the control unit in faultless condition, only.
- Observe the general technical rules while using and operating the unit.
- Observe the relevant accident prevention regulations, the national rules of the user country as well as your company-internal operating and safety regulations during operation and maintenance of the unit.
- Switch off the electrical power supply before carrying out any work on the system!
- Note that piping or valves that are under pressure must not be removed from a system!
- Take suitable measures to prevent unintentional operation or impermissible impairment.
- Following an interruption of the electrical or pneumatic supply, ensure a defined and controlled re-start of the process!
- If these instructions are not observed, we will not accept any liability. Warranties on units, devices and accessories will expire!

## 2. Safety Instructions

### 2.4. Welding instructions



It is generally recommended to avoid welding work in process installation in which control units are installed and connected. If welding is nonetheless required, earthing of the electrical devices in the welding area is a necessity.

### 2.5. Persons



- Installation and maintenance work may only be carried out by qualified personnel and by means of appropriate tools.
- Qualified personnel must get a special training with regard to possible risks and must know and observe the safety instructions indicated in the instruction manual.
- Work at the electrical installation may only be carried out by personnel specialized in electrics!

### 2.6. Warranty

This document does not contain any warranty acceptance. We refer to our general terms of sale and delivery. Prerequisite for a guarantee is the correct use of the unit in compliance with the specified conditions of application.



#### Note!

This warranty only applies to the Control Unit. No liability will be accepted for consequential damage of any kind arising from failure or malfunction of the device.

## 2. Safety Instructions

### 2.7. Important safety instructions for AS-interface networks

Aside from complying with the Installation Guidelines according to AS-i Specification, observe the following instructions!

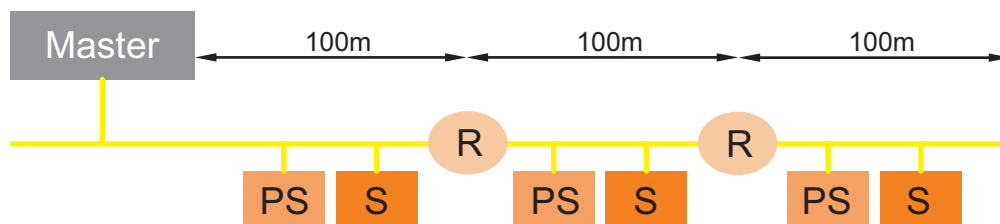
#### 2.7.1 Earthing

- The PE connection of the AS-i power supply (protective earth) must (if existent) be grounded.
- The symmetry point of the AS-i network (GND, ground, shield) must be connected with the plant ground).
- Neither AS-i – nor AS-i + must be grounded.
- Use of earth-leakage relay, insulation monitoring modules is recommended.
- Use of surge protection modules is recommended.

#### 2.7.2. Network design and voltage supply

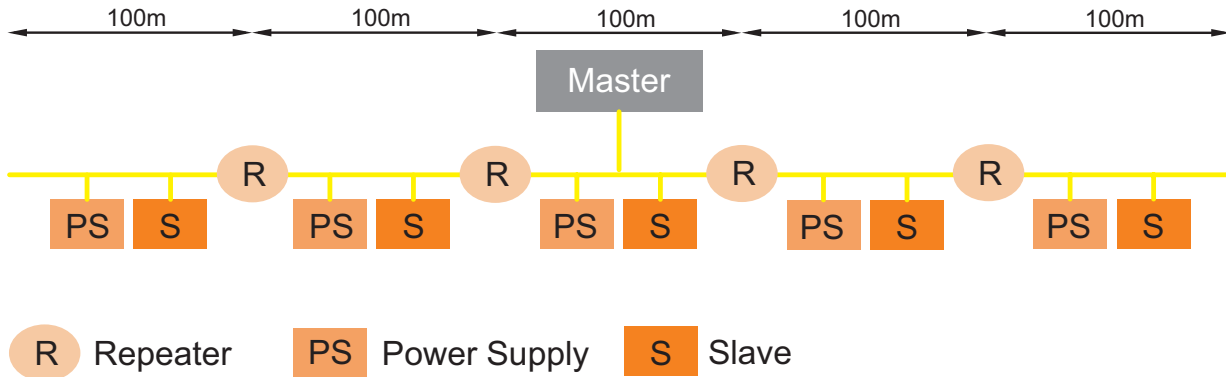
- Use only AS-i certified power supplies.
- Output voltage 26.5 to 31.6 VDC
- AS-i power supplies deliver up to 8A.
- The voltage drop between power supply and bus device must not exceed 3V. If required, the power supply must be set closer to the slaves. Alternatively power supplies with repeaters can be extended to such an extent that up to 3 power supplies can be distributed over the whole bus, see fig.
- An AS-i segment including all stubs must not be longer than 100 m.
- Additional 100 m AS-i cable may be connected to each repeater, whereas not more than 2 repeaters (max. 2 connected in series) may be set between a slave and the master.
- A galvanically isolated AS-i power supply must be connected in every segment.

#### Extension with repeater



## 2. Safety Instructions

### Extension with repeater to max. 500 m (central positioning)



- AS-i power cables must be separated from the energy cables and must be as short as possible.
- External proximity switches must be connected to the slave as close as possible.
- Floating sensors/actuators: Grounding of galvanic peripheral devices connected with AS-i potential is not permitted. It must be avoided in terms of immunity to interference.

#### 2.7.3. Selection of the appropriate power supply:

The max. electricity demand in the AS-i net (sum of all consumers) per segment must be smaller than the admissible current carrying capacity of the AS-i network (max. 90 %).

- The electricity demand of the individual slave results from the instruction manual. For the design of the networks a simultaneity factor can be integrated if necessary. A max. assignment of e.g. 62 slaves should be taken as a basis.
- At the end of each segment under full load, the AS-i voltage must be within the specification 26.5 to 31.6 V.

#### 2.7.4. What has to be observed if a 8A AS-i power supply is used?

If more than the standard current of 2 A is transferred via the AS-i cables, the following boundary conditions must be considered when planning the net:

- The voltage drop along the AS-i line increases. For orientation purposes: If 2 A are transferred via one 100 m-long-cable with wire cross-section of 1.5 mm, the voltage drop amounts to 5 V.
- The contacts of the penetration technology are designed only for certain maximum permanent current which are partially below 8 A. Refer to the manufacturer datasheet!

## 2. Safety Instructions

### 2.7.5. Increase in interference resistance

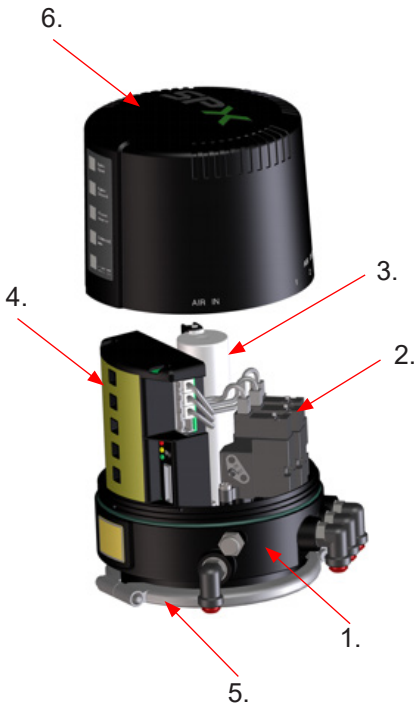
- The connection „Schirm“ (shield) at the AS-i power supply unit must be connected directly and with good RF characteristics with the potential equalization of the machine or plant. This is not a grounding measure for safety reasons, but a functional grounding so that the AS-i line can be operated symmetrically against the earth. If a shielded cable is used, the cable shield must be connected there - and there only, as well.
- A good symmetrie must also be observed towards other electrical sources of interference (speed-controlled actuators, welding units etc.). The length of the connecting cables between the active slaves (CU4, CU4plus etc.) and the proximity switches connected to them must be limited to max. 2 m.
- When high electrostatic charge is expected (e.g. polishing machines, injection moulding machines, wrapping foils for plastic materials etc.) it may be required to take additional protective measures, such as the installation of arresters for static loads.

### 2.7.6. May the AS-i cable be laid in parallel to power cables?

- Although the communication via AS-i cable is not sensitive to EMC, it should be laid separately from line cables - also in control cabinets.
- Maximum distance to potential sources of interference (e.g. frequency converter) must be observed.
- Every AS-i wiring harness should have its own cable, i.e. AS-i cables should not be laid together with other cables in the same common cable.
- If it is required to lay single conductors (e.g. in control cabinets), parallel conductors must be laid. In case of standard stranded wires, lay and twist single conductors together.

## 3. General Terms

fig. 3.2.



### 3.1. Purpose of use

The control unit CU4plus AS-i has been developed for the control of process valves in food processing industry as well as related industries.

The CU4plus AS-i control unit operates as interface between process control and process valve and controls the electric and pneumatic signals.

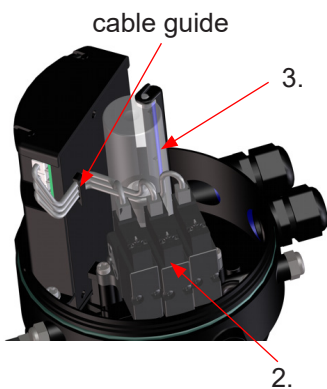
The pneumatic control of valves is undertaken via the solenoid valves. The control unit controls the valve positions, **open** and **closed**, via sensors. The electronic module undertakes the task to process the switching signal from the control and to control the corresponding solenoid valves. The electronic module also provides for potential-free contacts. The corresponding light signals in the control unit provide for an external indication of the valve positions.

### 3.2. Design of CU4plus AS-interface (fig. 3.2.)

The CU4plus AS-interface control unit consist of the following components:

1. The Control Unit base with integrated air channels and electric and pneumatic connections as well as window with type label.
2. 1 or 3 solenoid valves for the control of the valve actuators and for the seat lifting of double seat valves.
3. Sensor module with integrated position measuring system for the detection of the valve position.
4. Electronic module for the electric supply, for the AS-i communication with the control, evaluation of feedback signals and control of solenoid valves as well as valve position indication through LED.
5. Clamp ring to fasten the CU4 on the adapter.
6. Cover with optical window.

fig. 3.2.1



The cable/s by means of which the solenoid valves are connected with the electronic module must be guided through the cable guide at the rear side of the electronic module. (fig. 3.2.1).



## 3. General Terms

### 3.3. Function of the individual components

The installation of the control unit is undertaken by special adapters which are available for the different valves types, see **chapter 5**. Adapter. The snap connectors for supply air and pneumatic air to the individual cylinders at the valves are located at the outside of the control unit. At the control units for valves with turning actuator, the pneumatic air is transferred internally to the actuator. The air supply of the control unit is equipped with an exchangeable air filter. Observance of the required compressed air quality is imperative. Please also see **chapter 4.5** Technical Data.

The number of the solenoid valves installed in the CU4 depends on the valve actuators to be controlled. Double seat valves without seat lift function require 1 solenoid valve.

Control units for double seat valves equipped with 3 solenoid valves. For the manual actuation, the solenoid valves are provided with a safe handle which is easy to operate.

The electronic module installed in the control unit fulfils the task to process the electric signals from the control, to activate the solenoid valves and to evaluate the feedback signals from the feedback unit. Moreover, the signalling and indication of the valve positions as well as additional diagnostic functions are undertaken via the electronic module.

The electronic module is the interface between actuators, sensors and the superior control system. Communication is undertaken via the standard AS-interface bus protocol according to specification V3.0.

Valve position detection is realized via a linear sensor which is integrated in the sensor module.

The switching cam mounted on the actuator rod triggers the signals on the linear sensor. The measuring range of the linear sensor detects the complete valve stroke. By means of the teach-in function, the corresponding position for closed and open valve position are detected and seat lift positions are permanently saved in the electronic module if required. (see **chapter 7.3** Teach-in function)

For the D4 valve generation, additionally to the linear sensor integrated in the control unit, 1 or 2 internal hall sensors are installed at the CU4 feedback tower.

## 3. General Terms

### 3.3. Function of the individual components

The luminous diodes are located on the front side of the electronic module. Their signals are visibly indicated to the outside by an optical window in the cover the control unit. Beside the open and closed valve position, the existence of the operating voltage as well as different diagnostic information are indicated. **Chapter 6.6.** LED indicators provides more details.

The complete control unit has been designed on the building block principle. By exchange of the electronic module, the control type can be changed, e.g. from direct control (Direct Connect) or IO-Link to communication with AS-interface.

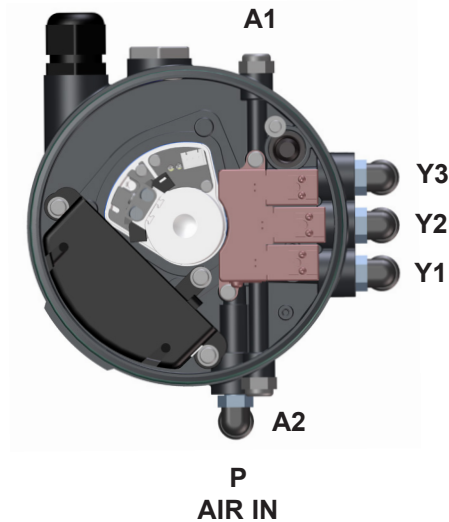


**Note!** Wiring must be changed!

## 4. Mechanics and Pneumatics

### 4.1. Air connections for double seat mix proof valves

#### 4.1.1. Function



#### CU41plus-D4

**design for D4 double seat mix proof valves  
without seat lift function**

- P air supply with integrated particle filter
- Y1 control air connection for main actuator
- A1 exhaust air with silencer

#### CU43plus-D4

**design for D4 SL double seat mix proof valves  
with seat lift function**

- P air supply with integrated particle filter
- Y1 control air connection for main actuator
- Y2 pneumatic air connection for seat lift actuator of upper seat lifting
- Y3 pneumatic air connection for seat lift actuator of lower seat lifting
- A1/A2 exhaust air with silencer

### 4.2. Pressure relief valve

The base of the control unit is equipped with a pressure relief valve which prevents an inadmissible pressure build-up in the inner control unit.

If required, the pressure relief valve vents into the clearance between the base and the adapter of the control unit.



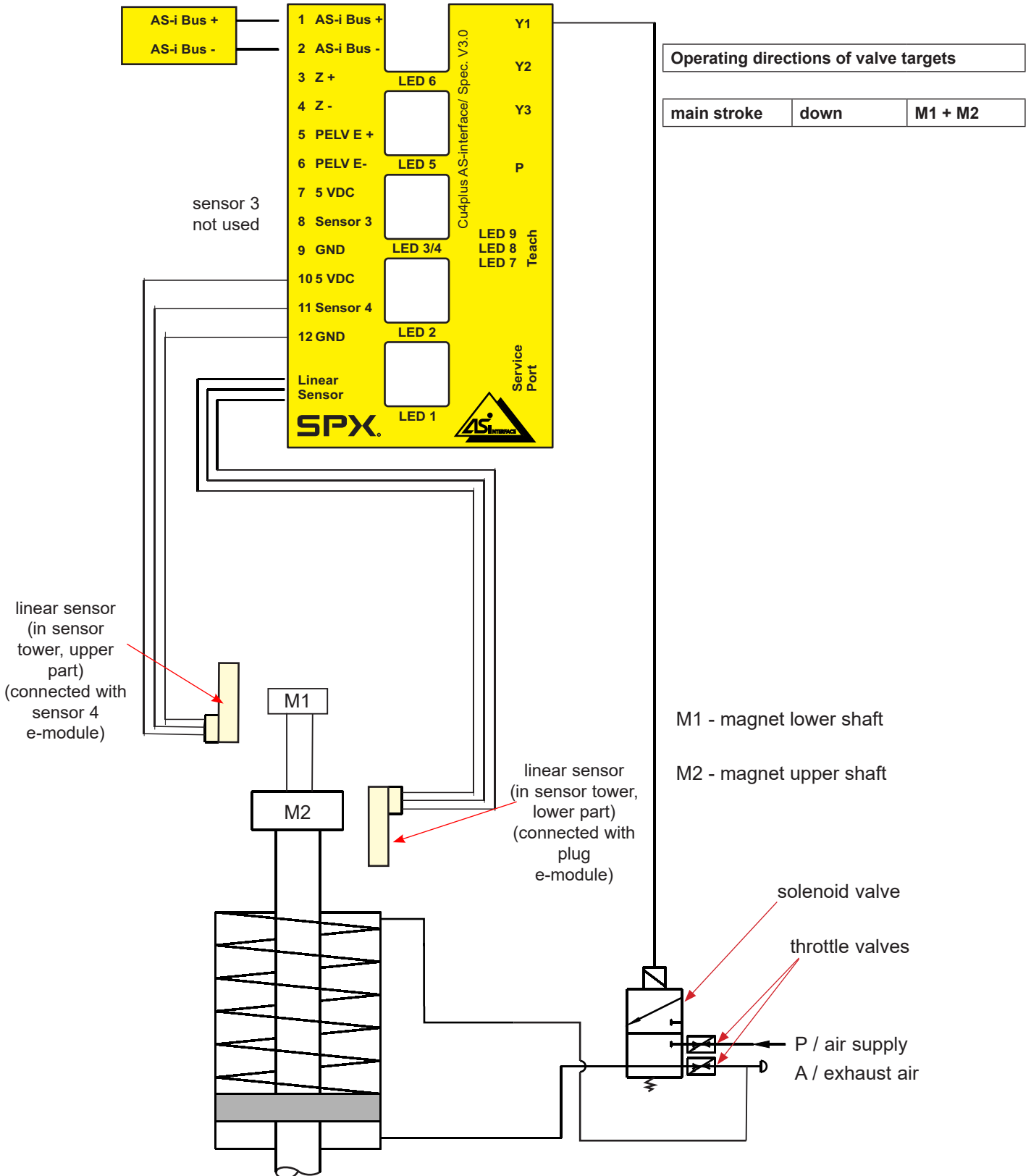
**The pressure relief valve must not be mechanically blocked under any circumstances.**

## 4. Mechanics and Pneumatics

### 4.3. Functional description - block diagrams



#### 4.3.1. CU41plus-D4 for D4 double seat mix proof valves without seat lift function

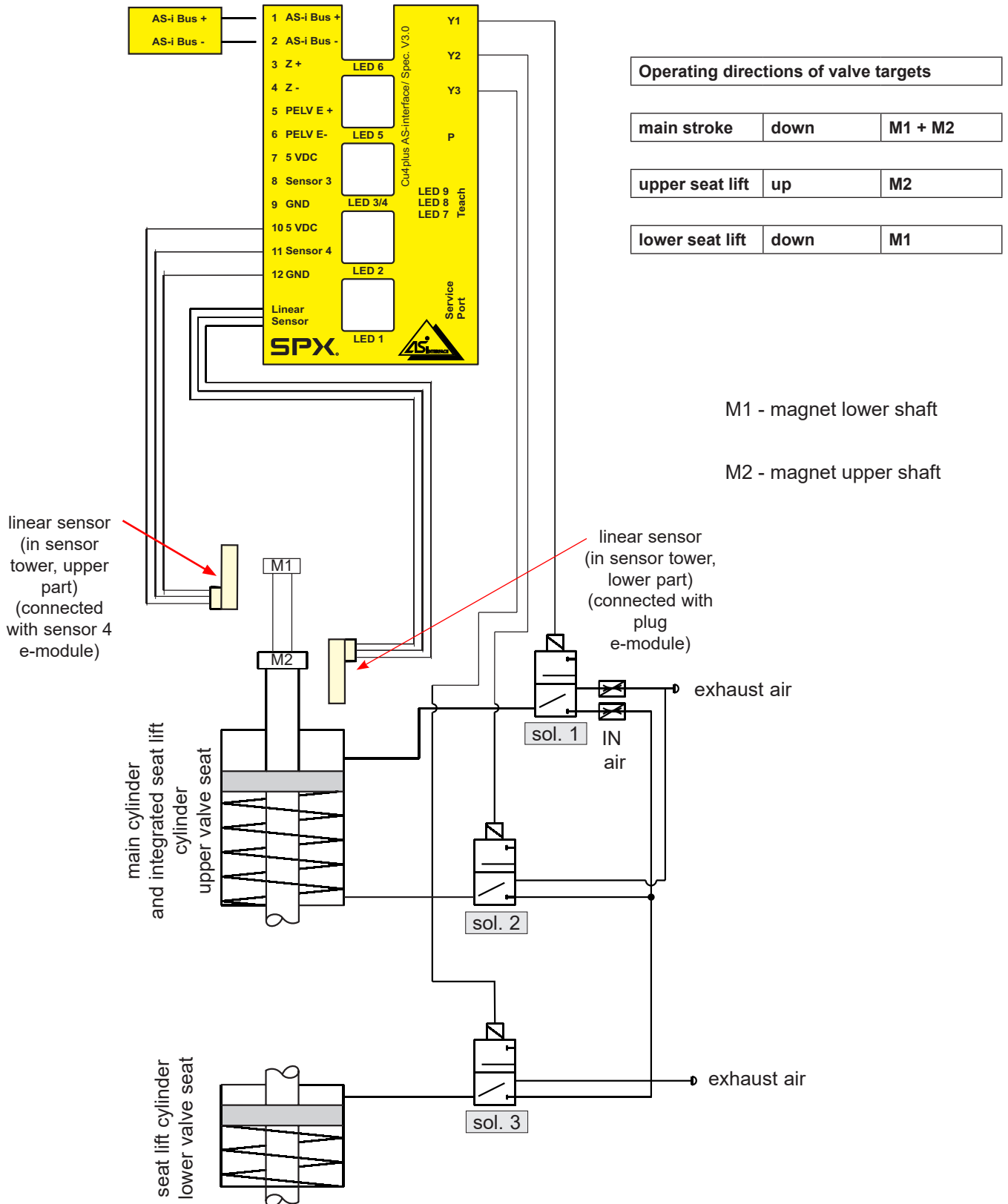


## 4. Mechanics and Pneumatics

### 4.3. Functional description - block diagrams



#### 4.3.2. CU43plus-D4 for D4 SL double seat mix proof valves with seat lift function



## 4. Mechanics and Pneumatics

### 4.4. Technical data / Standards

<b>Material:</b>	PA6.6/PA12
<b>Ambient temperature:</b>	0°C to +55°C (limitation due to ATEX application)
<b>EU:</b>	EMC 2014/30/EU (89/336/EEC)

**Standards and environmental audits:**

protective class IP 64 EN 60529  
 EMC interference resistance  
 EN 61000-6-2  
 EMC emitted interference  
 EN 61000-6-4  
 AS-interface certification according to specification V3.0

vibration/oscillation EN60068-2-6

safety of machinery DIN EN ISO 13849-1

**Air hose:** 6 mm / ¼" OD

**Pressure range:** 6–8 bar

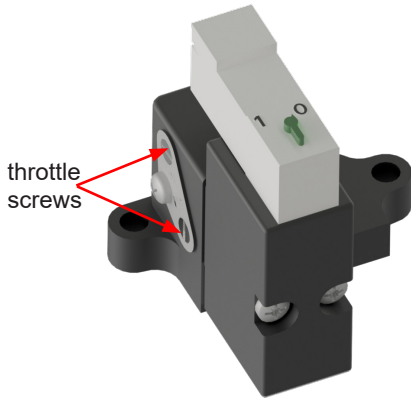
**Compressed air quality:** quality class acc. to DIN ISO 8573-1

- **content of solid particles:** quality class 3,  
 max. size of solid particles per m<sup>3</sup>  
 10000 of 0,5 µm < d < 1,0 µm  
 500 of 1,0 µm < d < 5,0 µm
- **content of water:** quality class 3,  
 max. dew point temperature -20 °C  
 For installations at lower temperatures or at higher altitudes, additional measures must be considered to reduce the pressure dew point accordingly.
- **content of oil:** quality class 1,  
 max. 0,01 mg/m<sup>3</sup>

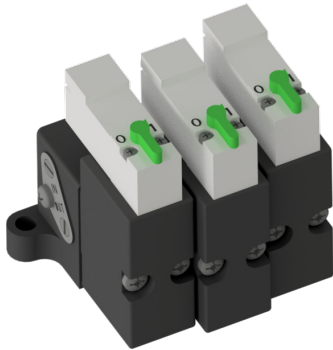
**The oil applied must be compatible with Polyurethane elastomer materials.**

## 4. Mechanics and Pneumatics

**solenoid valve  
block 1**



**solenoid valve  
block 3**



### 4.5. Solenoid valves

In the base of the control unit max. 3 solenoid valves are installed. The 3/2-way solenoid valves are connected with the electronic module by moulded cables and plug connector.

**control:** PWM signal  
**handle:** rotary switch at valve

### 4.6. Throttling function

The operating speed of the valve actuator can be varied or reduced. This may be necessary to slacken the actuation of the valve in order to prevent pressure hammers in the piping installation. For this purpose, the supply and exhaust air of the **first solenoid valve** can be adjusted via the throttling screws respectively allocated in the interface of the solenoid valve. By turning the screws in anticlockwise direction, the inlet or outlet air is throttled.

## 5. Adapter

Adapter for Double seat mix proof valves D4, D4 SL





## 6. Electronic Module

### 6.1. Function/block diagram

The CU4plus AS-i control unit is a slave for the fieldbus system AS-Interface according to specification V3.0. The profile is S-7.A.\*.E (3 outputs and 2/4 inputs).

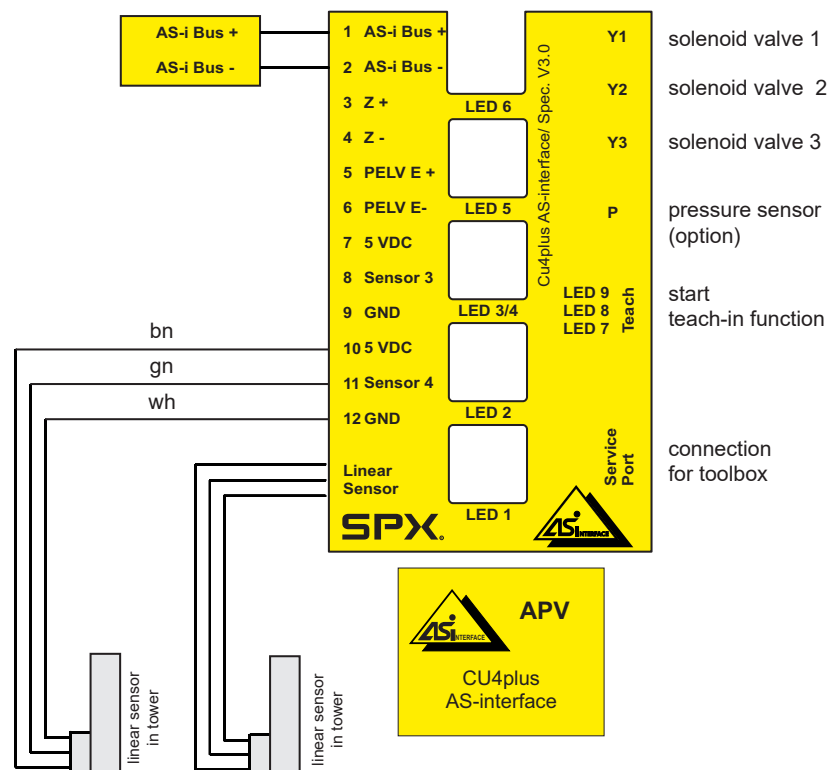
The CU4plus AS-i is designed for the extended address range. With these devices in the extended address range up to 62 slaves (formerly known as 2.1) can be connected with one AS-Interface cable.

**Attention:** Consider cumulative power input and simultaneity factor!

With the CU4plus AS-i energy supply of the control valves can be effected via the AS-i bus or via separate auxiliary energy lines. Thus, it is possible to realize an EMERGENCY STOP function: If the auxiliary voltage is safely shut off by conventional means, the control valves are deprived of electric energy and they fall into a safe position. The function of the inputs is preserved even if auxiliary energy is shut off.

The control of the solenoid valves is undertaken in energy-saving mode via the pwm signals.

#### 6.1.1. CU41plus-D4 CU43plus-D4



## 6. Electronic Module

### 6.2. Functional description of connections

Terminal	Designation	Functional Description
1	AS-i +	connection AS-i network
2	AS-i -	connection AS-i network
3	Z +	bridge Z+ / PELV E+ (in case of energy supply for solenoid valves via AS-i bus)
4	Z -	bridge Z- / PELV E- (in case of energy supply for solenoid valves via AS-i bus)
5	PELV E+	separate auxiliary energy PELV 24VDC + (for EMERGENCY STOP function, only)
6	PELV E-	separate auxiliary energy PELV 24VDC - (for EMERGENCY STOP function, only)
7	5 VDC	voltage supply for proximity switches
8	no sensor	
9	GND	mass potential for sensor voltage supply
10	5 VDC	voltage supply for proximity switches
11	sensor 4	linear sensor for valve position detection (for suitable SPX FLOW sensor, only!)
12	GND	mass potential for sensor voltage supply
linear sensor		linear sensor for valve position detection (for suitable SPX FLOW sensor, only!)
Y1		solenoid valve 1 (main valve)
Y2		solenoid valve 2 (upper seat lift)
Y3		solenoid valve 3 (lower seat lift)
P		optional connection - pressure sensor
service port		connection serial/USB converter for CU4plus toolbox software

## 6. Electronic Module

### 6.3. Technical data / AS-interface

<b>AS-interface-profile:</b>	S-7.A.*.E
<b>Extended address mode:</b>	is supported
<b>Serial communication mode:</b>	no
<b>Inverse-polarity protection:</b>	exists
<b>Indication "Power":</b>	LED 3 (green)
<b>Indication "Fault":</b>	LED 4 (red)
<b>AS-interface voltage range:</b>	26.5...31.6 V
<b>External voltage supply</b>	
<b>PELV</b>	24 VDC
<b>max. current consumption:</b>	100 mA
(in case of supply of actuators from auxiliary energy)	150 mA
(in case of supply of actuators from AS-interface)	
<b>Input delay time:</b>	< 1 s
<b>AS-interface specification:</b>	V3.0
<b>Supply of solenoid valves:</b>	pwm signal from electronic module
<b>Short-circuit protection:</b>	yes
<b>Excess voltage protection:</b>	100 mA
<b>Induction protection:</b>	yes
<b>Status indication of outputs:</b>	LED on board
<b>Response time of watchdog:</b>	--- (watchdog not activated)

**Short-circuit or excess voltage of actuator supply or cable break at valves is signalled to the master via the peripheral failure bit (profile S-7.A.\*.E only). Simultaneously, LED 3/4 flashes according to AS-interface specification alternately red/green.**

<b>Supply of sensors:</b>	5 VDC, 4,75...5,25V (sum of all currents < 40mA)
---------------------------	--



**Caution!** The sensor inputs and the peripheral supply must not be connected with installation-GND.

<b>Connecting terminals:</b>	conductor cross section 0.5 – 1,5 mm <sup>2</sup> (with conductor sleeve) complying with AWG 20-16
------------------------------	--



**Note!** Observe that only one cable should be installed. If more than one cable is required, follow the max. cross section limitations!

<b>Torque for screw terminal:</b>	0,8 Nm +/- 0,1
-----------------------------------	----------------

**AS-interface communication / data: see 6.7.**

## 6. Electronic Module

### 6.4. Connections

#### Sensors for valve position detection:

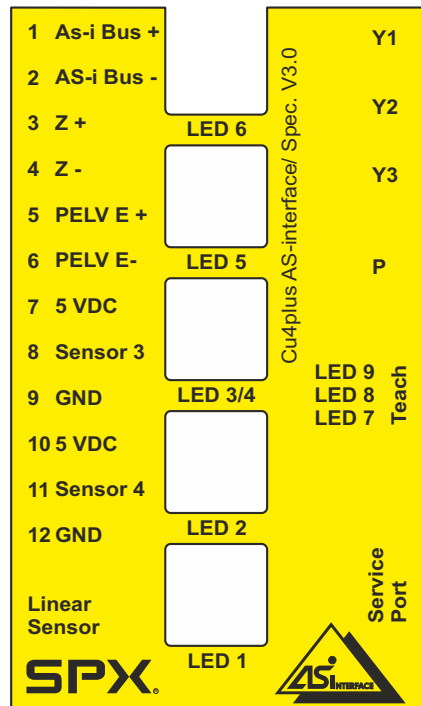
**Internal sensors:** internal linear sensor SPX FLOW type switching distance acc. to SPX FLOW specification

**Internal hall sensors:** "magnetic hall sensor"  
SPX FLOW UB 4.75 - 5.25 VDC  
switching distance acc. to SPX FLOW specification

**External sensors:** inductive proximity switch  
SPX FLOW UB 4.75-5.25 VDC  
switching distance acc. to SPX FLOW specification














### 6.5. LED indications

The meanings of the different colors of the LED indication are described in table 6.5.1. LED indications / Indicator lights.



## 6. Electronic Module

### 6.5.1. LED indication / Indicator lights

LED 1	solenoid valve 2 / upper seat lift	blue, 1 blink		solenoid valve 2 controlled upper seat * <b>lifted</b>
	solenoid valve 3 / lower seat lift	blue, 2 blinks		solenoid valve 3 controlled lower seat * <b>lifted</b>
LED 2	sol. valve 1 /main valve	blue, 2 blinks		main valve controlled
LED 3/4	power and diagnosis	green, permanent light		operating voltage ok, no failure - AS-i status indication
		red, green blink		peripheral failure (short circuit, excess voltage, cable break) - teach-in requested, flash data failure, valve failure, wrong number of valves, overload of sensor voltage supply
		red, permanent light		AS-i communication failure - no data interchange with master - master in stop mode - slave cannot read master commands - master in protect mode and slave not i protect mode
		green, blink		AUX voltag missing (connect either PELV or bridge Z/PELV)
		green, permanent light red, blink = red-yellow blink		slave address = 0
		red, blink		duplicate addresses recognized
LED 5	valve closed	orange, permanent light		valve closed
LED 6	valve open	green, permanent light		valve open
LED 7	pressure signal (option)			
LED 8	service request	yellow, permanent light		imminent service request
LED 9	teach-in	red, permanent light blink		teach-in is running teach-in required
LED Y1	solenoid valve 1	permanent light		controlled
LED Y2	solenoid valve 1	permanent light		controlled
LED Y3	solenoid valve 1	permanent light		controlled

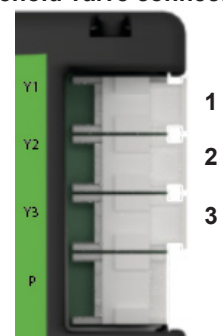


**Valve Open**  
**Valve Closed**  
**Power Diagnose**  
**Solenoid Main Solenoid**  
 ○ upper seat  
 ○○ lower seat

#### Function LEDs



#### Solenoid valve connections



## 6. Electronic Module

### 6.6. Adjustment of valve profiles

The adjustment of valve profiles is carried out with the Service Software CU4plus Toolbox (see CU4plus Toolbox manual). For the different process valves different logic profiles exist. These differ in view of the detection of the feedback and the logic profile of the valve.

#### Valve profile:

Type	Valve profile	Valve position measuring system	Tolerance band	Valve basic position NO/NC	Invert - valve position indication	Number of solenoids
1	Mix proof valve D4	2 internal linear sensors	fixed +/- 1 mm	NC only	possible	always 1
2	Mix proof valve D4 SL	2 internal linear sensors	fixed +/- 1 mm	NC only	possible	always 3

Valve basic position: Depending on the valve type, the basic position can be adjusted.

Tolerance band: Selection according to valve type.  
**(see chapter 7.2)**

Valve position indication: LED can be inverted, e.g. for adaption of valve type

Delivery status: Mix proof valve DA4 profile is adjusted.

Adjusted valve characteristics: logic profile 1, for DA3+ with SLD

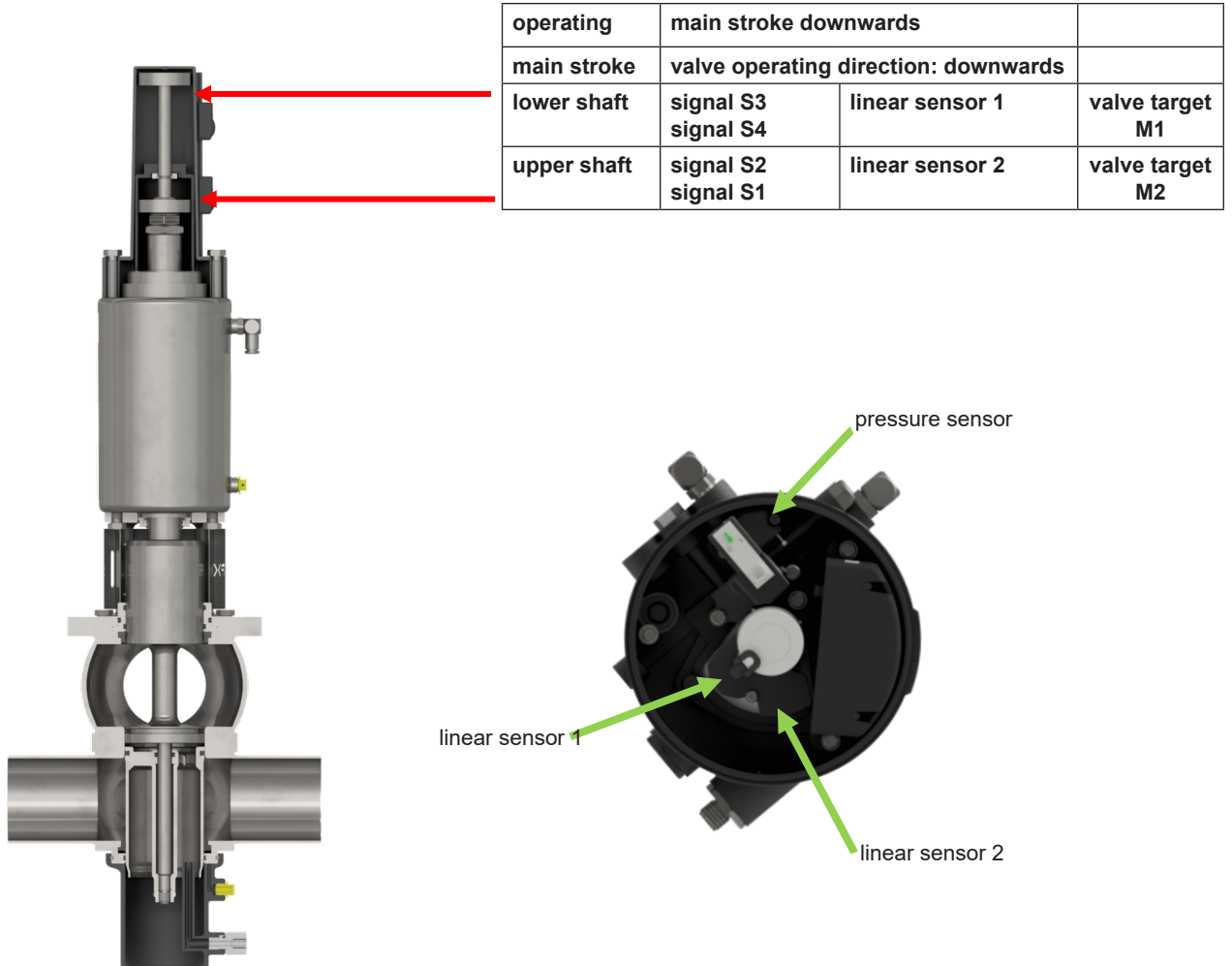
Teach-in: CU waits for Teach-in with valve, LED 3-6 blink

Adjustment / change of valve profile is realized via ToolBox software (see Toolbox manual).

## 6. Electronic Module

### 6.7. Data signals

#### 6.7.1. Mix proof valve D4



Output signals	valve status	linear sensor 2 / (Teach data)		linear sensor 1 / (Teach date)		tolerance band
		sensor signal S1	sensor signal S2	sensor signal S3	sensor signal S4	
O0	closed	1	0	not used	0	+1 mm, -1 mm
O1	open	0	0	not used	1	+1 mm, -1 mm
DI2						
DI3						

Input signal	solenoid 1 Main	solenoid 1 upper seat lift	solenoid 1 lower seat lift
I0	1	0	0
I1			
I2			

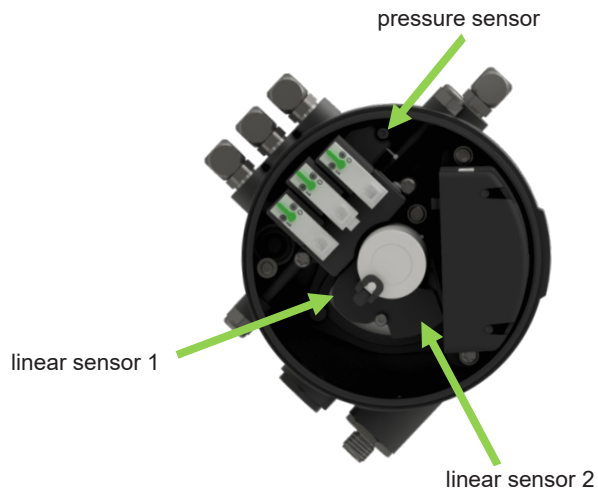
## 6. Electronic Module

### 6.7. Data signals

#### 6.7.2. Mix proof valve D4 SL



operating	main stroke downwards upper seat lift upwards lower seat lift downwards		
main stroke	valve operating direction: downwards		
lower shaft	signal S3 signal S4	linear sensor 1	valve target M1
upper shaft	signal S2 signal S1	linear sensor 2	valve target M2



Output signals	valve status	linear sensor 2 / (Teach data)		linear sensor 1 / (Teach data)		tolerance band
		sensor signal S1	sensor signal S2	sensor signal S3	sensor signal S4	
O0	closed	1	0	1	0	+1 mm, -1 mm
O1	open	0	0	0	1	+1 mm, -1 mm
O2	upper seat lift	0	1	1	0	+1 mm, -1 mm
O3	lower seat lift	1	0	0	0	+1 mm, -1 mm

Input signal	solenoid 1 Main	solenoid 2 upper seat lift	solenoid 3 lower seat lift
I0	1	0	0
I1	0	1	0
I2	0	0	1



## 6. Electronic Module

### 6.7. Data signals

#### 6.7.3. AS-i communication / AS-i parameter data / status / diagnosis



AS-i parameter data (inverted)			
inputs		outputs	
PI3	not occupied	PO3	not occupied
PI2	Teach mode	PO2	not occupied
PI1	Aux. Voltage	PO1	not occupied
PI0	Service requ.	PO0	not occupied

AS-i status	
inputs	
S3	EEPROM error
S2	Automatic "unique" duplicate address detection
S1	Periphery fault
S0	Address not permanently stored

AS-i diagnosis	
inputs	
0	Air pressure availed
1	Teach-in-successfully completed



### 6.8. Service and Maintenance Software CU4plus Toolbox

For the parameterization of the CU4plus AS-i the CU4plus Toolbox Software is available.

The Toolbox kit with appropriate USB/serial cable can be purchased from SPX Flow using the article number H333470.

The latest version of the Toolbox Software is always available from the SPX Flow F&B Sharepoint. Please contact your SPX Flow Sales representative.

This software is designed for PC system software Windows 7, Windows 8.1, Windows 10.

After installation of the CU4plus Toolbox the corresponding control unit is connected with the PC by means of an adapter cable.

The individual functions are described in the CU4plus Toolbox manual.



## 6. Electronic Module

### 6.9. Seat Pulsation - Efficiency in Cleaning

For increasing seat cleaning efficiency there is a function called "Pulsation". With this function, the seat lifts can be operated in pulsation mode if the PLC signal activates the seat lift.

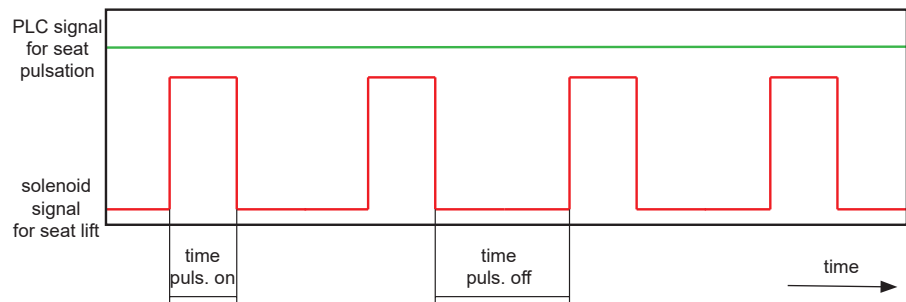
For the pulsation the ON and OFF time can be adjusted with the CU4plus Toolbox.

Parameters, see table in chapter 6.8.17.

The selection of the pulsation times must be done in accordance with the process situation and the appropriate valve size. The selected times must ensure complete opening and closing of the seats.

We recommend adjusting the time for "pulse off" to be larger than 30 seconds.

When the seat pulsation is activated, with the 1st seat lifting (pulse on), the feedback signal for the appropriate seat lift will be active.



## 7. Valve Position Indication

### 7.1. Continuously measuring valve position measuring system

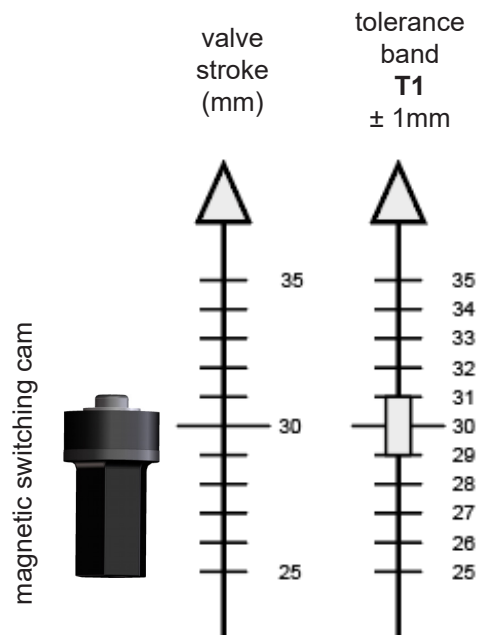
For the internal detection of the valve position indication, a contact-free operating linear sensor is used which is actuated via the magnetic switching cam installed at the valve rod. The nominal measuring range of the measuring system amounts to 0 - 72 mm, relative repetitive accuracy < 0.1 mm.

Within this measuring range, the corresponding positions for closed and open valve position as well as seat lift positions are generated via the teach-in function and permanently saved in the electronic.

### 7.2. Tolerance band of the valve position measuring system

The tolerance band of the valve position measuring system describes the active measuring range in which the corresponding feedback information, closed or open valve position, is registered. For different process valves also different tolerance bands exist. The adjustment is realized via the ToolBox software.

Tolerance band	Output of feedback signals in range	Recommendation for valve type
T1	+/- 1 mm	e.g. D4, D4 SL



## 7. Valve Position Indication

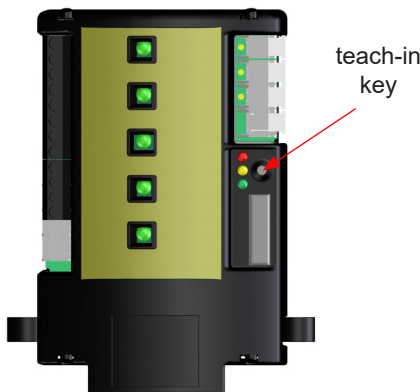
### 7.3. Adjustment of valve position indication / Teach-in

The continuously measuring valve position measuring system is taught via a reference valve movement.

The respective positions for the closed and open valve position as well as for further valve positions, e.g. seat lifting, are travelled to and the corresponding position of the sensor system is permanently stored in the memory of the electronic module. This process is called Teach-In.

The Teach-In is started by pressing the Teach-In key at the electronic module. The key must be pressed permanently for 3 seconds.

After the start of the Teach-In the LED 9 lights up and the valve travels into the corresponding final positions and back into the basic position. The positions of the corresponding valve positions are stored.



Indication	Status	Action
LED 3-6,9 blink	Delivery status Waiting for teach-in	Start teach-in press teach-in for at least 3 seconds
LED 9 OFF LED 3/4 blink	Teach-in active	Wait Do not control valve via PLC.
LED 9 OFF	Successful teach-in	Valve can be controlled by PLC.
LED 9 ON	Valve service carried out	Start teach-in / press teach-in key for 3 sec.
LED 9 blink	Teach-in not successful, repetition required.  Possible reasons for teach-in failure:  Compressed air is missing. Supply voltage missing. Switching logic does not fit to valve.	Start teach-in / press teach-in key for 3 sec.

### 7.4. Teach closed position

If required, the closed position of a valve can be calibrated separately. The Toolbox starts this function.

The assumption of this function is that the valve is closed. This means that all solenoid valves are off for a N.C. (normally closed) valve or the main solenoid valve is activated for a valve with N.O. (normally open) functionality.

## 7. Valve Position Indication

### 7.5. To be observed before teach-in:

- Corresponding switching cam is mounted to the valve guide rod.



#### **Note! Caution!**

The switching cam is not identical with the standard CU switching cam!

- CU4plus AS-i control unit is not duly installed on the valve. Valve is duly installed in the process.
- **Valve is not manually controlled or controlled by PLC.**
- Control air is connected (requirements, see Technical Data, chapter 4.5.).
- Nominal valve stroke is not restricted, e.g. through chunky products in the valve.
- Selected switching logic complies with the installed process valve (adjustment is realized via CU4plus Toolbox software, delivery status is switching logic profile 1).

During the Teach-In function, the valve is controlled and moves independently into all operating positions.

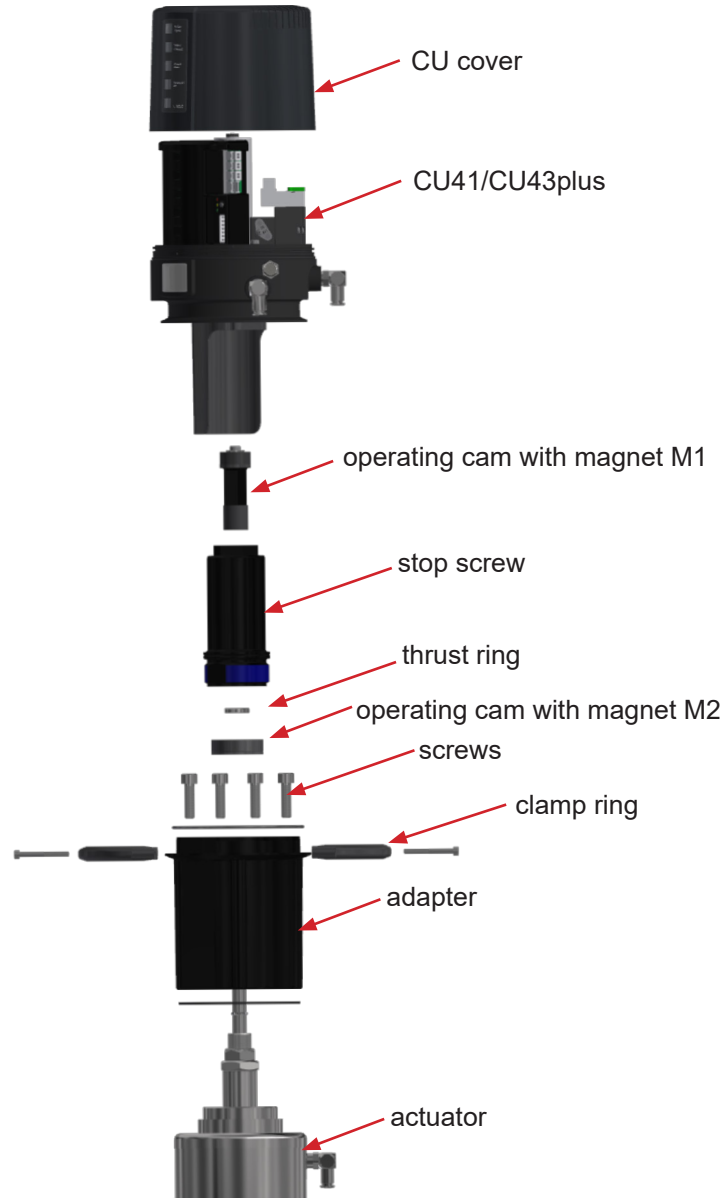
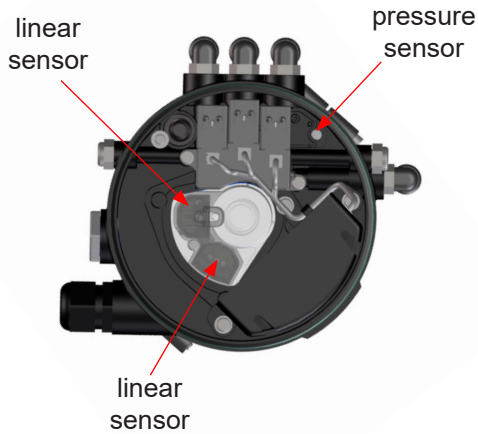
**As a precaution, the Teach-In function is to be repeated after any valve service or maintenance!**



**If these instructions are not observed, process failures, product loss or personal injury may occur!**

## 8. CU Assembly and Startup

### 8.1. Double seat mix proof valves D4, D4 SL



#### Assembly of the control unit on the valve

1. Take off the stop screw and thrust ring.
2. Assemble the magnet M2 on the upper shaft.
3. Reassemble the thrust ring and stop screw.
4. Assemble the adapter with the 4 screws on the double seat valve.
5. Assemble the operating cam M1 with guide rod extension on the guide rod.
6. Place the control unit onto the adapter. Observe alignment!
7. Attach the clamp rings and fasten them with the 2 screws.
8. Attach air connections of the control unit to the valve actuator.

## 8. CU Assembly and Startup

### 8.1.1 Pneumatic connection

#### Supply air:



#### Caution!

Shut off the compressed air supply before connecting the air hose!

Make sure that the air hose is professionally cut to length. Use a hose cutter for this purpose.

#### Pneumatic air to valve actuator:

Connect pneumatic air connection **Y1** with the valve actuator, air connection 1 - main stroke

Connect pneumatic air connection **Y2** with the valve actuator, air connection 2 - upper seat lifting

Connect pneumatic air connection **Y3** with the valve actuator, air connection 3, lower seat lifting

#### Exhaust air:

As a standard, the exhaust air connections **A1** and **A2** are equipped with a silencer. If required, the silencer can be removed and the exhaust air can be hosed separately when it must be led off to the exterior, for example.

### 8.1.2 Electric connection



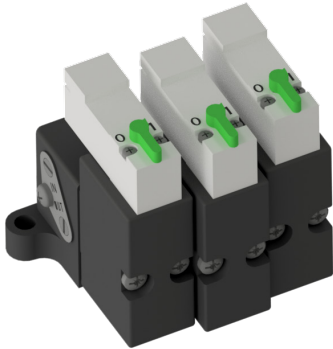
#### Attention!

Electric connections shall only be carried out by qualified personnel.

Observe the Safety Instructions specified in chapter 2.

## 8. CU Assembly and Startup

**solenoid valve  
block 3**



### 8.4.3 Connection of external proximity switches

The electric connection of the proximity switches specified by SPX FLOW is undertaken according to the terminal layout described in chapter 6.

The mechanic assembly of the proximity switches is carried out at the actuator of the corresponding double seat valves.

Observance of the instruction manual for double seat valves is essential!

### 8.4.4 Startup

After proper assembly and installation of the control unit, startup can be undertaken as described below

1. Switch on the air supply
2. Switch on the voltage supply.
3. Check the solenoid valves by turning the lever on the upper side by 90°.
4. Select Valve Type:  
Type 1 D4  
Type 2 D4 SL
5. For final adjustments of the feedback position switches please use the Teach function.



## 9. Accessories and Tools

### Assembly/disassembly - adapter on valve actuator:

- hexagon socket wrench 6 mm
- screwdriver 4 mm

### Assembly/disassembly – CU on adapter:

- hexagon socket wrench 3 mm

### Assembly/disassembly – electronic module:

- Torx wrench TX20
- screwdriver 3.5 mm

### Assembly/disassembly – feedback unit:

- Torx wrench TX15

### Assembly/disassembly – electronic modules:

- Torx wrench TX20

### Assembly/disassembly – air connections:

- jaw wrench SW13

### Assembly/disassembly – pressure relief valve:

- Torx wrench TX10

### Loctite semi-solid

jaw wrench



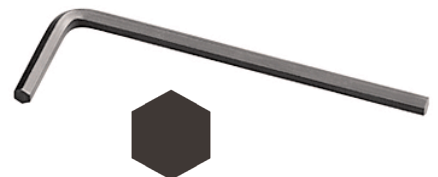
torx wrench



screwdriver



hexagon socket wrench



## 10. Service

### 10.1. Dismantling

Before disassembly, verify the following items:

- The valve must be in safety position and must not be controlled!
- Shut off air supply!
- Cut off current to control unit, i.e. interrupt the supply voltage!

#### **Solenoid valve (4, 5, 6)**

- + Open the CU cover by turning in anticlockwise direction.
- + Release the plug connection at the electronic module for the corresponding solenoid valve.
- + Release and remove the 2 screws (20) TX20.
- + Replace the solenoid valve.
- + Assembly in reverse order. See to a proper fit of the flat seal!

#### **Electronic module (2)**

Before releasing the cable connections make sure that all lines are de-energised!

- + Open the CU cover by turning in anticlockwise direction.
- + Release the plug connection of the solenoid valves.
- + Release the cable from the terminal strip, all terminals 1-8.
- + Release and remove the 3 screws (20) TX20.
- + Replace the electronic module.
- + Assembly in reverse order.

#### **Feedback unit**

Before releasing the cable connections make sure that all lines are de-energised!

- + Open the cover.
- + Release the cable for the linear sensors from the terminal strip, terminals 3-8.
- + Release the clamp ring and lift the CU4 from the adapter.
- + Remove the 4 screws (9) TX15 at the lower side of the CU base (1).
- + Take out the feedback unit to the bottom.

#### **Linear sensor**

The linear sensor can only be replaced at the dismantled feedback unit.

- + Remove the 2 screws (14) TX10.
  - + Release the plug connection at the electronic module.
- Dismantle the linear sensor.
- + Assembly in reverse order.
  - + Carry out Teach-In.

## 11. Trouble Shooting

Failure	Remedy
Valve position is not indicated.	Carry out teach-in.
	Check fastening of magnetic switching cam.
	Check adjusted logic profile and process valve.
Feedback via proximity switches is missing.	Check positioning of proximity switches.
	Check AS-i bus communication.
	Check cabling to the electronic module.
LED indication is missing.	Check AS-i bus communication.
	Check cabling to the electronic module.

Failure	Remedy
<b>Control Unit CU41 installed on D4 Double seat valves without seat lifting</b>	
Valve position movement is missing with actuated solenoid valve.	Check if right control unit is installed. Check label in type window of control unit: CU41plus-D4 AS-i
	Check valve movement with manual at solenoid valve.
	Check cabling between electronic module and solenoid valve.
	Check compressed air (min. 5 bar).
	Check control air connection between the CU41 and the valve actuator.
<b>Control Unit CU43 installed on D4 SL Double seat valves with seat lift detection (SLD)</b>	
Valve position movement is missing with actuated solenoid valve.	Check if right control unit is installed. Check label in type window of control unit: CU43plus-D4 AS-i
	Check valve movement with manual at solenoid valve.
	Check cabling between electronic module and solenoid valve.
	Check compressed air (min. 5 bar).
	Check control air connection between the CU43 and the D4 SL actuator.

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## 12. IECEX / CCC Certificate of Conformity

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Please see attachment.

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## 13. Spare Parts Lists

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The reference numbers of spare parts for the different control unit designs and adapters are included in the attached spare parts drawings with corresponding lists.

When you place an order for spare parts, please indicate the following data:

- number of parts required
- reference number
- parts designation

Data are subject to change.





# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.:	<b>IECEX TUN 22.0020X</b>	Page 1 of 3	<a href="#">Certificate history:</a>
Status:	<b>Current</b>	Issue No: 0	
Date of Issue:	2023-09-11		
Applicant:	<b>SPX Flow Technology Germany GmbH</b> Gottlieb-Daimler-Str. 13 59439 Holzwickede Germany		
Equipment:	<b>Control unit resp. Double seat valve resp. Assembly</b>		
Optional accessory:	Control unit type CU4** resp. CU4*plus* resp. Double seat valve type D4* resp. Assembly type D4*-CU4**/CU4*plus*3G		
Type of Protection:	<b>Equipment protection by increased safety "ec"; Non-electrical equipment for explosive atmospheres</b>		
Marking:	Control unit type CU4** resp. CU4*plus*: <b>Ex ec IIB T4 Gc</b> Double seat valve type D4*: <b>Ex h IIB T6...T4 Gb</b> Assembly type D4*-CU4** / D4*-CU4*plus*3G: <b>Ex ec h IIB T4 Gc</b>		

Approved for issue on behalf of the IECEx  
Certification Body:

**Thomas Heinen**

Position:

**Deputy Head of the IECEx Certification Body**

Signature:  
(for printed version)

**TUVNORD**

Digital unterschrieben  
von Heinen Thomas  
Datum: 2023.09.11  
12:48:33 +02'00'

Date:  
(for printed version)

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Hanover Office  
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Germany





# IECEX Certificate of Conformity

Certificate No.: **IECEX TUN 22.0020X**

Page 2 of 3

Date of issue: 2023-09-11

Issue No: 0

Manufacturer: **SPX Flow Technology Germany GmbH**  
Gottlieb-Daimler-Str. 13  
59439 Holzwickede  
**Germany**

Manufacturing locations: **SPX Flow Technology Germany GmbH**  
Gottlieb-Daimler-Str. 13  
59439 Holzwickede  
**Germany**

**SPX Flow Technology Poland Sp. z o.o.**  
Rolbieskiego 2  
Bydgoszcz 85-862  
**Poland**

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

#### STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements  
Edition:7.0

[IEC 60079-7:2017](#) Explosive atmospheres - Part 7: Equipment protection by increased safety "e"  
Edition:5.1

[ISO 80079-36:2016](#) Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic methods and requirements  
Edition:1.0

[ISO 80079-37:2016](#) Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres - Non electrical type of protection constructional safety "c", control of ignition source "b", liquid immersion "k"  
Edition:1.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

#### TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[DE/TUN/ExTR22.0018/00](#)

Quality Assessment Report:

[DE/TUN/QAR18.0002/02](#)



# IECEX Certificate of Conformity

Certificate No.: **IECEX TUN 22.0020X**

Page 3 of 3

Date of issue: 2023-09-11

Issue No: 0

## EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

### Description:

The control unit type CU4\*\* resp. CU4\*plus\* is provided for controlling process valves in hazardous areas, it used as an interface between the process control and the process valve and operates the electrical and pneumatic signals.

The double seat valve type D4\* used to process two different fluids efficiently through the valve simultaneously.

The assembly type D4\*-CU4\*\*/CU4\*plus\*3G is consisted of the electrical control unit CU4\*\* resp. CU4\*plus\* and the non-electrical double seat valve type D4\*.

### Type code, electrical and thermal data:

See attachment to IECEx TUN 22.0020X issue No.0

### SPECIFIC CONDITIONS OF USE: YES as shown below:

1. For the control unit type CU4\*\* resp. CU4\*plus\* the permissible ambient temperature range during operation is  $0\text{ }^{\circ}\text{C} \leq T_a \leq +55\text{ }^{\circ}\text{C}$

For the double seat valve type D4\* the permissible ambient temperature range depending on the temperature class is the medium or cleaning solution's temperature and is to be taken from the operating instructions.

For the assembly type D4\*-CU4\*\* / D4\*-CU4\*plus\* 3G the permissible ambient temperature range during operation at the control unit type CU4\*\* resp. CU4\*plus\* is  $0\text{ }^{\circ}\text{C} \leq T_a \leq 55\text{ }^{\circ}\text{C}$  and on the double seat valve type D4\* is  $0\text{ }^{\circ}\text{C} \leq T_a \leq +130\text{ }^{\circ}\text{C}$

2. Metallic process connection parts of the double seat valve type D4\* have to be included in the local potential equalization.
3. The control unit CU4\*\* resp. CU4\*plus\* and the plastic base of the double seat valve type D4\* have to be installed and used in such a way, that electrostatic charging from operation, maintenance and cleaning is excluded.
4. The base of the control unit CU4\*\* resp. CU4\*plus\* has to be installed in such a way that it is protected from UV-radiation.
5. The connecting and disconnecting of the pluggable electrical circuits inclusive the field wirings is only permitted if no explosive atmosphere exists
6. The control unit type CU4\*\* resp. CU4\*plus\* has to be erected in such a way that a pollution degree 2 or better, according to IEC 60664-1, is achieved.
7. Measures have to be taken, external to the control unit type CU4\*\* resp. CU4\*plus\*, to provide a transient protection that ensures that the rated voltage, connected to the power supply terminals, is not exceeded by more than 40%
8. To prevent the breaking of the springs, the actuator has to be replaced after 250,000 cycles.

### Annex:

[Attachment to IECEx TUN 22.0020X issue No.0.pdf](#)



**Page 1 of 5**  
**Attachment to IECEx TUN 22.0020X issue No.: 0**

**General product information:**

**Description:**

The control unit type CU4\*\* resp. CU4\*plus\* is provided for controlling process valves in hazardous areas, it used as an interface between the process control and the process valve and operates the electrical and pneumatic signals.

The double seat valve type D4\* used to process two different fluids efficiently through the valve simultaneously.

The assembly type D4\*-CU4\*\*/CU4\*plus\*3G is consisted of the electrical control unit CU4\*\* resp. CU4\*plus\* and the non-electrical double seat valve type D4\*.

**Type code:**

Control unit type CU4* *		
		AS-interface 24V Direct Connect
		1: 1 solenoid 1N: 1 solenoid, 1NOT element 3: 3 solenoids

Control unit type CU4* plus*		
		AS-interface 24V Direct Connect 24V IO-Link
		1: 1 solenoid 1N: 1 solenoid, 1NOT element 3: 3 solenoids

Double seat valve type D4*		
		NSL: Non Seat Lift SL: Seat Lift

**Marking:**

Control unit type CU4** resp. CU4*plus*	<b>Ex ec IIB T4 Gc</b>
Double seat valve type D4*	<b>Ex h IIB T6...T4 Gb</b>
Assembly type D4*-CU4** / D4*-CU4*plus*3G	<b>Ex ec h IIB T4 Gc</b>

**Page 2 of 5**  
**Attachment to IECEx TUN 22.0020X issue No.: 0**

**Electrical data:**

For the control unit type CU4\* plus AS-interface

Internal / External	Terminal	Designation	Functional description
External	1	AS-i +	Connection AS-i network (26.5 V...31.6 V d.c.)
External	2	AS-i -	Connection AS-i network (GND)
Internal	3	Z +	Bridge Z+ / PELV E+ (in case of energy supply for solenoid valves via AS-i bus)
Internal	4	Z -	Bridge Z- / PELV E - (in case of energy supply for solenoid valves via AS-i bus)
Internal	5	PELV E+	Separate auxiliary energy PELV 24VDC + (for EMERGENCY STOP function, only)
Internal	6	PELV E-	Separate auxiliary energy PELV 24VDC - (for EMERGENCY STOP function, only)
Internal	7	5 VDC	Voltage supply for proximity switches
Internal	8	Sensor 3	Signal sensor 3 (evaluation of logic table for appropriate valve type) for the control unit type CU4* AS-interface V1 resp. CU4* AS-interface V1 plus
		No sensor	For the control unit type CU4* AS-interface V2 resp. CU4* plus AS-interface V2
Internal	9	GND	Mass potential for sensor voltage supply
Internal	10	5 VDC	Voltage supply for proximity switches
Internal	11	Sensor 4	Signal sensor 4 (evaluation of logic table for appropriate valve type)
Internal	12	GND	Mass potential for sensor voltage supply
Internal	Linear sensor		Linear sensor for valve position detection (for suitable SPX FLOW sensor, only!)
Internal	Y1	--	Solenoid valve 1 (main valve)
Internal	Y2	--	Solenoid valve 2 (upper seat lift)
Internal	Y3	--	Solenoid valve 3 (lower seat lift)
Internal	P	--	Optional connection - pressure sensor
External	Service port	--	Connection serial/USB converter for CU4plus toolbox software

**Page 3 of 5**  
**Attachment to IECEx TUN 22.0020X issue No.: 0**

For the control unit type CU4\* plus 24V Direct Connect:

Internal / External	Terminal	Designation	Functional description
External	1	Power+	Power supply 24V d.c. ± 20%
External	2	Power-	Power supply 24V d.c. (GND)
Internal	3	O0 Digital Output	PLC input valve status / closed
Internal	4	O1 Digital Output	PLC input valve status / open
Internal	5	O2 Digital Output	PLC input valve status / upper seat lift
Internal	6	O3 Digital Output	PLC input valve status / lower seat lift
Internal	7	SV Digital Output	PLC input service request
Internal	8	I0 Digital Input	PLC output to activate solenoid 1 / main valve
Internal	9	I1 Digital Input	PLC output to activate solenoid 2 / upper seat lift
Internal	10	I2 Digital Input	PLC output to activate solenoid 3 / lower seat lift
Internal	11	+5VDC	Supply voltage for SPX prox. sensor / linear sensor
Internal	12	S	Signal SPX prox. sensor
Internal	13	0V	Potential for SPX prox. sensor / linear sensor
Internal	Linear sensor	Linear sensor	--
Internal	Y1	PWM Output	Solenoid valve 1 (main valve)
Internal	Y2	PWM Output	Solenoid valve 2 (upper seat lift)
Internal	Y3	PWM Output	Solenoid valve 3 (lower seat lift)
External	Service port	--	Connection serial/USB converter for CU4plus toolbox software

For the control unit type CU4\*plus 24V IO-Link:

Internal / External	Terminal	Designation	Functional description
External	1	Power+	Operating voltage + (18 V...30 V d.c.)
External	2	Power-	Operating voltage – or Ground
Internal	3	C / Q	IO-Link Signal
Internal	4...10	--	Not in use
Internal	11	5 VDC	Voltage supply for valve sensor or extension module
Internal	12	Sensor 2	Sensor 2 connection or extension module
Internal	13	GND	Mass potential for sensor supply or extension module
Internal	JST	Sensor 1	Linear Sensor 1
Internal	14	Sensor 2	Sensor Signal 2
Internal	15	GND	Mass potential for sensor supply
Internal	Y1	PWM Output	Solenoid valve 1 (main valve)
Internal	Y2	PWM Output	Solenoid valve 2 (upper seat lift)
Internal	Y3	PWM Output	Solenoid valve 3 (lower seat lift)
External	Service port	--	Connection serial/USB converter for CU4plus toolbox software
Internal	P	Pressure sensor	Pressure measurement of main actuator

**Page 4 of 5**  
**Attachment to IECEx TUN 22.0020X issue No.: 0**

For the control unit type CU4\*24V Direct Connect:

Internal / External	Terminal	Designation	Functional description
External	1	Power+	Power supply 24V d.c. ± 20%
External	2	Power-	Power supply 24V d.c. (GND)
External	3	O0 Digital Output	PLC input valve status / closed
External	4	O1 Digital Output	PLC input valve status / open
External	5	SV Digital Output	Common
External	6	DI0 Digital Input	PLC output to activate solenoid 1 / main valve
External	7	DI1 Digital Input	PLC output to activate solenoid 2 / upper seat lift
External	8	DI2 Digital Input	PLC output to activate solenoid 3 / lower seat lift
External	9	DI common	Common signal
Internal	10	+5VDC	Supply voltage for SPX prox. sensor / linear sensor
Internal	11	Signal	Signal SPX prox. sensor
Internal	12	GND	Potential for SPX prox. sensor / linear sensor
Internal	13	+5VDC	Supply voltage for SPX prox. sensor / linear sensor
Internal	14	Signal	Signal SPX prox. sensor
Internal	15	GND	Potential for SPX prox. sensor / linear sensor

For the control unit type CU4\*AS-interface:

Internal / External	Terminal	Designation	Functional description
External	1	AS-i +	Connection AS-i network (26.5 V...31.6 V d.c.)
External	2	AS-i -	Connection AS-i network (GND)
Internal	3	5 VDC	Voltage supply for proximity switches
Internal	4	Sensor 1	Signal sensor 1 (closed valve position)
Internal	5	GND	Common potential
Internal	6	5 VDC	Voltage supply for proximity switches
Internal	7	Sensor 2	Signal sensor 2 (open valve position)
Internal	8	GND	Common potential
Internal	10	Normal	Bridge for feedback signal
Internal	11	Feedback	Bridge for feedback signal
Internal	12	Reverse	Bridge for feedback signal

Page 5 of 5  
Attachment to IECEx TUN 22.0020X issue No.: 0

**Thermal data:**

Control unit type CU4\*\* resp. CU4\*plus\*:

Permissible ambient temperature range during operation:  $0\text{ °C} \leq T_a \leq +55\text{ °C}$

Double seat valve type D4\*:

The permissible ambient temperature range as process temperature (medium or cleaning solutions temperature) depending on the temperature class is shown in the following table:

Temperature of the medium or cleaning solution	Temperature class
0°C...80°C	T6
0°C...95°C	T5
0°C...130°C	T4

Assembly type D4\*-CU4\*\* / D4\*-CU4\*plus\* 3G consisted of the control unit CU4\*\* resp. CU4\*plus\* and the valve type D4\*:

Control unit type CU4\*\* resp. CU4\*plus\*:

Permissible ambient temperature range during operation:  $0\text{ °C} \leq T_a \leq +55\text{ °C}$

Double seat valve type D4\*:

The permissible ambient temperature range as process temperature (medium or cleaning solutions temperature) is  $0\text{ °C} \leq T_a \leq +130\text{ °C}$

The reverse heat flow from the process beyond the permissible ambient temperature of the control unit CU4\*\* resp. CU4\*plus\* is not possible by construction.

**Specific Conditions of Use**

- For the control unit type CU4\*\* resp. CU4\*plus\* the permissible ambient temperature range during operation is  $0\text{ °C} \leq T_a \leq +55\text{ °C}$   
For the double seat valve type D4\* the permissible ambient temperature range depending on the temperature class is the medium or cleaning solution's temperature and is to be taken from the operating instructions.  
For the assembly type D4\*-CU4\*\* / D4\*-CU4\*plus\* 3G the permissible ambient temperature range during operation at the control unit type CU4\*\* resp. CU4\*plus\* is  $0\text{ °C} \leq T_a \leq 55\text{ °C}$  and on the double seat valve type D4\* is  $0\text{ °C} \leq T_a \leq +130\text{ °C}$
- Metallic process connection parts of the double seat valve type D4\* have to be included in the local potential equalization.
- The control unit CU4\*\* resp. CU4\*plus\* and the plastic base of the double seat valve type D4\* have to be installed and used in such a way, that electrostatic charging from operation, maintenance and cleaning is excluded.
- The base of the control unit CU4\*\* resp. CU4\*plus\* has to be installed in such a way that it is protected from UV-radiation.
- The connecting and disconnecting of the pluggable electrical circuits inclusive the field wirings is only permitted if no explosive atmosphere exists.
- The control unit type CU4\*\* resp. CU4\*plus\* has to be erected in such a way that a pollution degree 2 or better, according to IEC 60664-1, is achieved.
- Measures have to be taken, external to the control unit type CU4\*\* resp. CU4\*plus\*, to provide a transient protection that ensures that the rated voltage, connected to the power supply terminals, is not exceeded by more than 40 %.
- To prevent the breaking of the springs, the actuator has to be replaced after 250,000 cycles.





# CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

No.: 2023312304001783

**Applicant** SPX(Shanghai) Flow Technology Company Limited  
**Address** No.666, Fengjin Road, Xidu Industry park, Fengxian District, Shanghai China  
**Manufacturer** SPX Flow Technology Poland Sp. z o.o.  
**Address** Stanisława Rolbieskiego 2, Bydgoszcz 85-862, Poland  
**Production Factory** SPX Flow Technology Poland Sp. z o.o.  
**Production Address** Stanisława Rolbieskiego 2, Bydgoszcz 85-862, Poland  
**Product** Control unit  
**Model/Type** CU4\*\* , CU4\*plus\*  
**Ex marking** Ex ec IIB T4 Gc  
**Reference Standards** GB/T 3836.1-2021, GB/T 3836.3-2021

**Certification mode** Type Test + Initial Factory Inspection + Post-Certification Surveillance

The product(s) is verified and certified according to CNCA-C23-01: 2019 *China Compulsory Certification Implementation Rule on Explosion Protected Electrical Product* and CNEC-C2301-2019 *Guideline of China Compulsory Certification Implementation Rule on Explosion Protected Electrical Product*.

See Annex for the detailed product information (8 pages)

Initial issue date: 2023-10-27

Issued date: 2023-10-27

Valid to: 2028-10-26

The validity of this certificate is maintained through the regular supervision of the issuing authority during the validity period.

Where any discrepancy arises between the English translation and the original Chinese version, the Chinese version shall prevail.

Director:



Nanyang Explosion Protected Electrical Apparatus Research Institute Co.,Ltd.



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[ccc.china-ex.com](http://ccc.china-ex.com)

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Tel: 0377-63239734 Email: [ccc@cn-ex.com](mailto:ccc@cn-ex.com)

CN0000078DZ



# CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION (Annex)

No.: 2023312304001783

Page 1 of 8

**Product information:**

1. This certificate covers the following models:

- CU4\*\* , CU4\*plus\*

Nomenclature:

1) CU4\*\*

CU4	*	*
	a	b

a:

- 1: 1 solenoid
- 2: 1 solenoid, 1NOT element
- 3: 3 solenoids

b:

- AS-interface
- 24V Direct Connect

2) CU4\*plus\*

CU4	*	plus	*
	a		b

a:

- 1: 1 solenoid
- 2: 1 solenoid, 1NOT element
- 3: 3 solenoids

b:

- AS-interface
- 24V Direct Connect
- 24V IO-Link

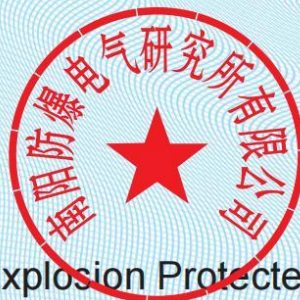
Electrical data:

Issued date: 2023-10-27

Director:



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Apparatus Research Institute Co.,Ltd.







# CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION (Annex)

No.: 2023312304001783

Page 2 of 8

### Control unit type CU4\*AS-interface

Internal / External	Terminal	Designation	Functional description
External	1	AS-i +	Connection AS-i network (26.5 V...31.6 V d.c.)
External	2	AS-i -	Connection AS-i network (GND)
Internal	3	5 VDC	Voltage supply for proximity switches
Internal	4	Sensor 1	Signal sensor 1 (closed valve position)
Internal	5	GND	Common potential
Internal	6	5 VDC	Voltage supply for proximity switches
Internal	7	Sensor 2	Signal sensor 2 (open valve position)
Internal	8	GND	Common potential
Internal	10	Normal	Bridge for feedback signal
Internal	11	Feedback	Bridge for feedback signal
Internal	12	Reverse	Bridge for feedback signal

### Control unit type CU4\*24V Direct Connect:

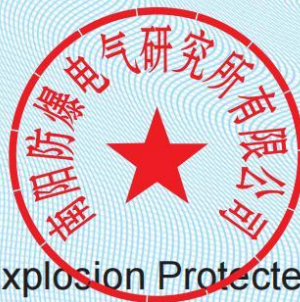
Internal / External	Terminal	Designation	Functional description
External	1	Power+	Power supply 24V d.c. ± 20%
External	2	Power-	Power supply 24V d.c. (GND)
External	3	O0 Digital Output	PLC input valve status / closed
External	4	O1 Digital Output	PLC input valve status / open

Issued date: 2023-10-27

Director:



**Nanyang Explosion Protected Electrical  
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# CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION (Annex)

No.: 2023312304001783

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External	5	SV Digital Output	Common
External	6	DI0 Digital Input	PLC output to activate solenoid 1 / main valve
External	7	DI1 Digital Input	PLC output to activate solenoid 2 / upper seat lift
External	8	DI2 Digital Input	PLC output to activate solenoid 3 / lower seat lift
External	9	DI common	Common signal
Internal	10	+5VDC	Supply voltage for SPX prox. sensor / linear sensor
Internal	11	Signal	Signal SPX prox. sensor
Internal	12	GND	Potential for SPX prox. sensor / linear sensor
Internal	13	+5VDC	Supply voltage for SPX prox. sensor / linear sensor
Internal	14	Signal	Signal SPX prox. sensor
Internal	15	GND	Potential for SPX prox. sensor / linear sensor

### Control unit type CU4\* plus AS-interface

Internal / External	Terminal	Designation	Functional description
External	1	AS-i +	Connection AS-i network (26.5 V...31.6 V d.c.)
External	2	AS-i -	Connection AS-i network (GND)

Issued date: 2023-10-27

Director:



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# CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

## (Annex)

No.: 2023312304001783

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Internal	3	Z +	Bridge Z+ / PELV E+ (in case of energy supply for solenoid valves via AS-i bus)
Internal	4	Z -	Bridge Z- / PELV E - (in case of energy supply for solenoid valves via AS-i bus)
Internal	5	PELV E+	Separate auxiliary energy PELV 24VDC + (for EMERGENCY STOP function, only)
Internal	6	PELV E-	Separate auxiliary energy PELV 24VDC - (for EMERGENCY STOP function, only)
Internal	7	5 VDC	Voltage supply for proximity switches
Internal	8	Sensor 3	Signal sensor 3 (evaluation of logic table for appropriate valve type) for the control unit type CU4* AS-interface V1 resp. CU4* AS-interface V1 plus
		No sensor	For the control unit type CU4* AS-interface V2 resp. CU4* plus AS-interface V2
Internal	9	GND	Mass potential for sensor voltage supply
Internal	10	5 VDC	Voltage supply for proximity switches
Internal	11	Sensor 4	Signal sensor 4 (evaluation of logic table for appropriate valve type)
Internal	12	GND	Mass potential for sensor voltage supply
Internal	Linear sensor	Linear sensor	Linear sensor for valve position detection (for suitable SPX FLOW sensor, only!)
Internal	Y1	--	Solenoid valve 1 (main valve)
Internal	Y2	--	Solenoid valve 2 (upper seat lift)

Issued date: 2023-10-27

Director:



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# CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION (Annex)

No.: 2023312304001783

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Internal	Y3	--	Solenoid valve 3 (lower seat lift)
Internal	P	--	Optional connection - pressure sensor
External	Service port	--	Connection serial/USB converter for CU4plus toolbox software

### Control unit type CU4\* plus 24V Direct Connect

Internal / External	Terminal	Designation	Functional description
External	1	Power+	Power supply 24V d.c. ± 20%
External	2	Power-	Power supply 24V d.c. (GND)
Internal	3	O0 Digital Output	PLC input valve status / closed
Internal	4	O1 Digital Output	PLC input valve status / open
Internal	5	O2 Digital Output	PLC input valve status / upper seat lift
Internal	6	O3 Digital Output	PLC input valve status / lower seat lift
Internal	7	SV Digital Output	PLC input service request
Internal	8	I0 Digital Input	PLC output to activate solenoid 1 / main valve
Internal	9	I1 Digital Input	PLC output to activate solenoid 2 / upper seat lift
Internal	10	I2 Digital Input	PLC output to activate solenoid I2 / lower seat lift
Internal	11	+5VDC	Supply voltage for SPX prox. sensor / linear sensor

Issued date: 2023-10-27

Director:



**Nanyang Explosion Protected Electrical Apparatus Research Institute Co.,Ltd.**



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# CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION (Annex)

No.: 2023312304001783

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Internal	12	S	Signal SPX prox. sensor
Internal	13	0V	Potential for SPX prox. sensor / linear sensor
Internal	Linear sensor	--	--
Internal	Y1	PWM Output	Solenoid valve 1 (main valve)
Internal	Y2	PWM Output	Solenoid valve 2 (upper seat lift)
Internal	Y3	PWM Output	Solenoid valve 3 (lower seat lift)
External	Service port	--	Connection serial/USB converter for CU4plus toolbox software

### Control unit type CU4\*plus 24V IO-Link

Internal / External	Terminal	Designation	Functional description
External	1	Power+	Operating voltage + (18 V...30 V d.c.)
External	2	Power-	Operating voltage – or Ground
Internal	3	C /Q	IO-Link Signal
Internal	4...10	--	Not in use
Internal	11	5 VDC	Voltage supply for valve sensor or extension module
Internal	12	Sensor 2	Sensor 2 connection or extension module
Internal	13	GND	Mass potential for sensor supply or extension module

Issued date: 2023-10-27

Director:



**Nanyang Explosion Protected Electrical  
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# CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION (Annex)

No.: 2023312304001783

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Internal	JST	Sensor 1	Linear Sensor 1
Internal	14	Sensor 2	Sensor Signal 2
Internal	15	GND	Mass potential for sensor supply
Internal	Y1	PWM Output	Solenoid valve 1 (main valve)
Internal	Y2	PWM Output	Solenoid valve 2 (upper seat lift)
Internal	Y3	PWM Output	Solenoid valve 3 (lower seat lift)
External	Service port	--	Connection serial/USB converter for CU4plus toolbox software
Internal	P	Pressure sensor	Pressure measurement of main actuator

Ex marking: Ex ec IIB T4 Gc

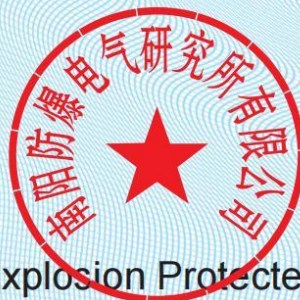
- Producers should organize production in accordance with the technical documents approved by the certification body.

2. Specific conditions of safety use:

- Ambient temperature range: 0°C~+55°C.
- The control unit CU4\*\* resp. CU4\*plus\* have to be installed and used in such a way, that electrostatic charging from operation, maintenance and cleaning is excluded.
- The base of the control unit CU4\*\* resp. CU4\*plus\* has to be installed in such a way that it is protected from UV-radiation.
- The connecting and disconnecting of the pluggable electrical circuits inclusive the field wirings is only permitted if no explosive atmosphere exists.
- The control unit type CU4\*\* resp. CU4\*plus\* has to be erected in such a way that a pollution degree 2 or better, according to GB/T 16935.1, is achieved.

Issued date: 2023-10-27

Director:



**Nanyang Explosion Protected Electrical  
Apparatus Research Institute Co.,Ltd.**



<http://www.ccc-cnex.com>  
ccc.china-ex.com

Add: No. 20, North Zhongjing Road, Nanyang, Henan, P. R. China P.C.: 473008  
Tel: 0377-63239734 Email: ccc@cn-ex.com



# CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION (Annex)

No.: 2023312304001783

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- Measures have to be taken, external to the control unit type CU4\*\* resp. CU4\*plus\*, to provide a transient protection that ensures that the rated voltage, connected to the power supply terminals, is not exceeded by more than 40%.

- See instruction for other information.

3. Certificate related report(s):

- Type test report: CQST2309C003

- Factory inspection report: CN2023Q010528

4. Certificate change information: None

Issued date: 2023-10-27

Director:



Nanyang Explosion Protected Electrical  
Apparatus Research Institute Co.,Ltd.



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**Spare Parts list**

**CU4plus D4 AS-i  
II 3 G Ex ec IIB T4 Gc  
IECEX - Zone 2**



Date: 21.06.23

Name: C.Keil

Reviewed: N.Spl

Date:

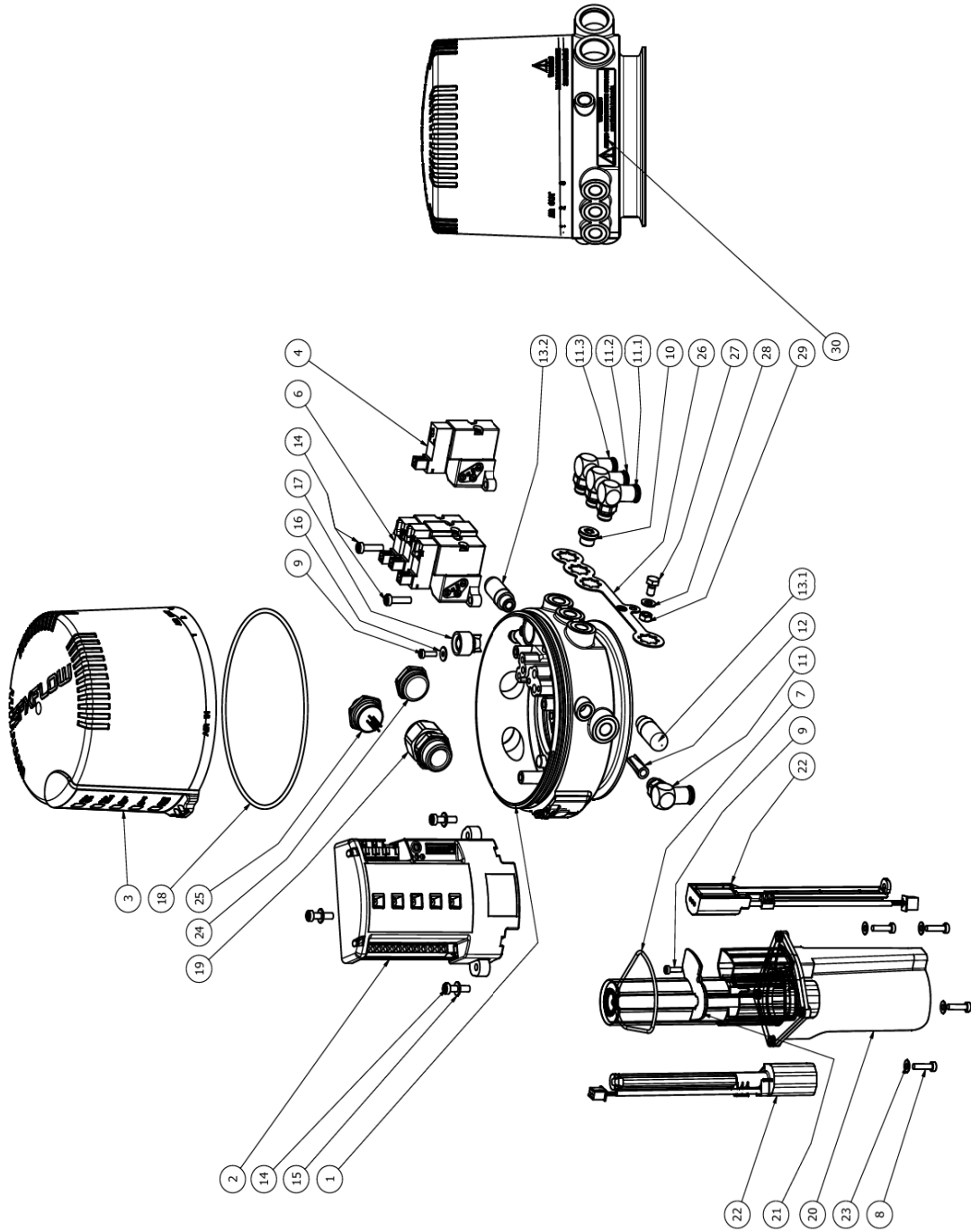
Name:

Reviewed:

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Page 1 of 2

**RN ATEX 01.044-6**



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**Spare parts list**

**CU4plus D4 AS-i ext.  
II 3 G Ex ec IIB T4 Gc  
IECEX - Zone 2**



Date:	21.06.23
Name:	C.Keil
Reviewed:	N.Spl
Date:	
Name:	
Reviewed:	

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Page 2 of 2  
**RN ATEX 01.044-6**

pos. item	Quantity	Description	required in version	Material	Part no.
		CU41plus D4 AS-i ext. IECEX Z2		PA6.6 GF30	H345096
		CU41plus D4 AS-i ext. IECEX Z2 M12		PA6.6 GF30	H345097
		CU43plus D4 AS-i ext. IECEX Z2		PA6.6 GF30	H345092
		CU43plus D4 AS-i ext. IECEX Z2 M12		PA6.6 GF30	H345093
1	1	CU41 Ex Base M cpl.	CU41	PA6.6 GF30 +PA12	H344231
1	1	CU43 Ex Base M cpl.	CU43	PA6.6 GF30 +PA12	H344232
2	1	CU4plus AS-i SLD E-Modul	CU41+43	Zyfel 70G33L black	H333117
3	1	CU4 cover translucent	CU41+43	Lexan 945AU	H337948
4	1	Solenoid valve 1 sol.	CU41	PPS	H319950
6	1	Solenoid valve 3 sol.	CU43	PPS	H319952
7	1	O-ring 45,6 x 2,4	CU41+43	NBR	H320401
8	4	Ejot Delta PT screw WN5452 35x14	CU41+43	A2	H320364
9	2	Ejot Delta PT screw WN5452 30x10	CU41+43	A2	H320363
10	1	IECEX blind plug CU4	CU41	Ms / nickel-plated	H347957
11	1	Elbow connector G1/8" 6x1	CU41+43	1.4301 / PA	H208825
11.1	1	Elbow connector G1/8" 6x1	CU41+43	1.4301 / PA	H208825
11.2	1	Elbow connector G1/8" 6x1	CU43	1.4301 / PA	H208825
11.3	1	Elbow connector G1/8" 6x1	CU43	1.4301 / PA	H208825
12	1	CU4 air filter	CU41+43	PE-porous	H320223
13.1	1	Sound reducer	CU41+43	PE-porous	H347802
13.2	1	Sound reducer	CU43	PE-porous	H347802
14	5	Ejot Delta PT screw WN5452 40x16	CU41+43	A2	H320365
15	3	Washer ø4,3 DIN125	CU41+43	A2	H79576
16	1	Washer A 3,2 DIN9021	CU41+43	A2	H320404
17	1	CU4 pressure relief valve	CU41+43	PPS	H320352
18	1	O-ring 120,32 x 2,62	CU41+43	NBR	H320402
19	1	Screwed cable gl. M20x1,5 cable ø5-9mm	CU41+43	PA black	H344598
20	1	CU4plus sensortower D4 V2	CU41+43	PET	H339461
21	1	Cap CU4plus sensor tower	CU41+43	Noryl 731 S	H339432
22	2	CU4plus Sensor V2	CU41+43	Noryl 731 S	H339463

pos. item	Quantity	Description	required in version	Material	Part no.
23	4	Washer A=3,7	CU41+43	A2	H323771
24	1	Blind cap V-Ex M20 x 1,5	CU41+43	PA	H347803
25	1	Female Flange M12x1,5 - 4pin	CU41/43-M12	Ms / nickel-plated	H338108
26	1	CU4 equipotential bonding rail	CU41+43	1.4310	H347605
27	1	Hex. screw M5x8	CU41+43	A2	H339700
28	1	Washer l=5,3	CU41+43	A2	H79587
29	1	Hex. Nut M5	CU41+43	A2	H79276
30	1	ATEX CU label - Electrostatic risk	all versions	Tevus	H345151

**CU4plus Adapter**

1	CU4plus D4 V2 adapter cpl.	all versions	H341891
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Adapter spareparts information to be found in document: RN 01.044.3-1

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Ersatzteilliste: spare parts list

# CU4plus Adapter

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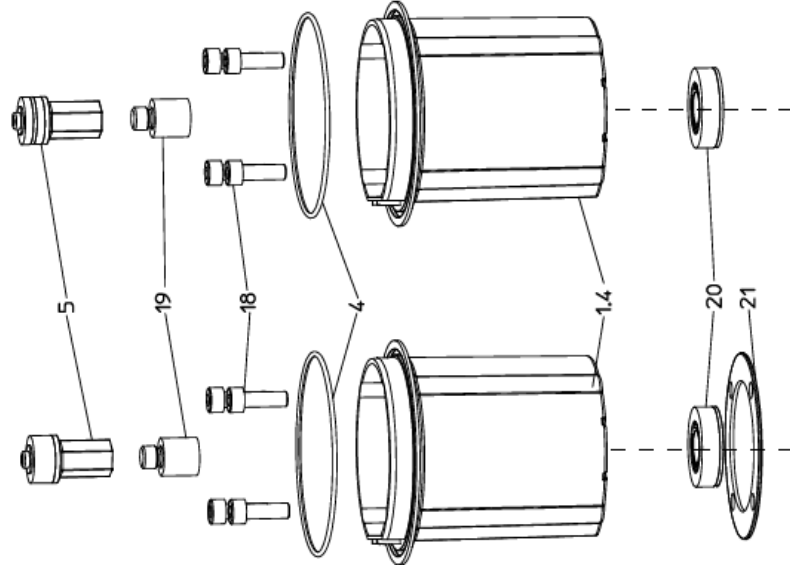
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Name:	Trytko	Trytko	C.Keil	C.Keil
Geprüft:	Schulz	Schulz	C.Keil	C.Keil

Blatt 1 von 6

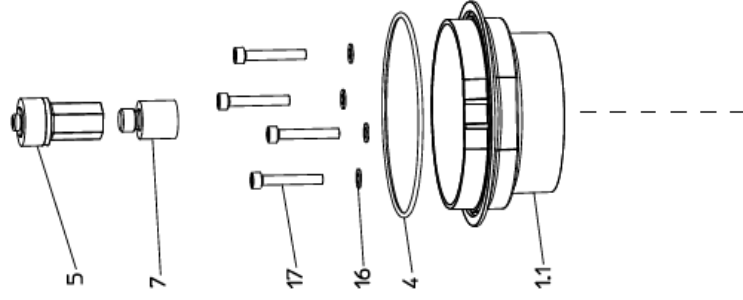
**RN01.044.3-1**

CU4Plus D4 Adapter

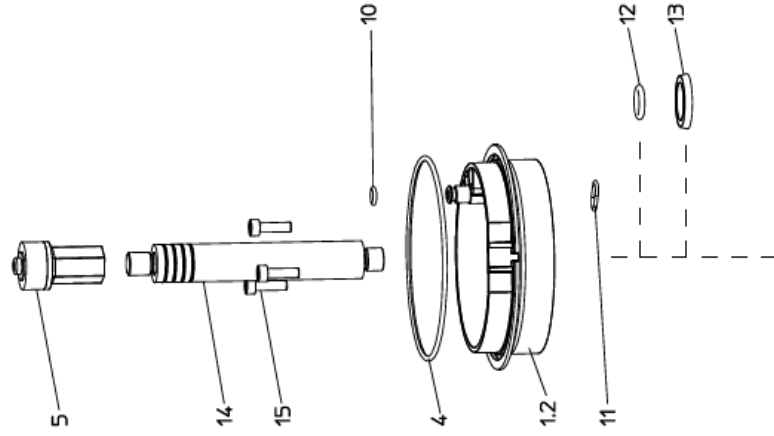
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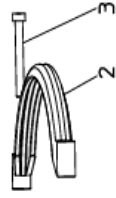
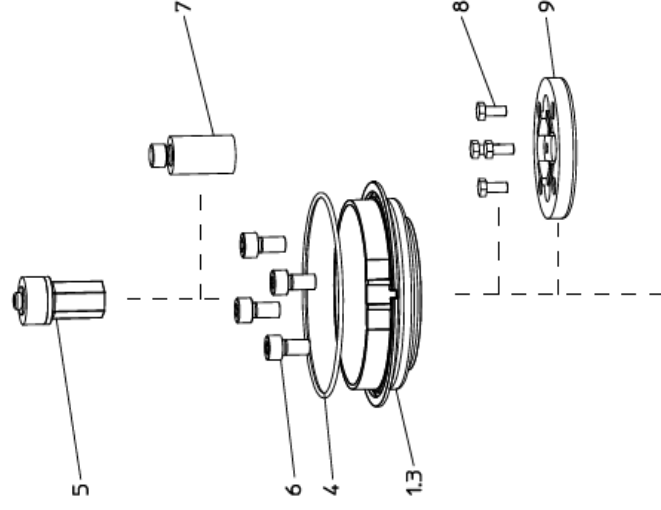
CU4Plus M - Adapter



CU4Plus T - Adapter



CU4Plus S - Adapter



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**Ersatzteilliste: spare parts list**

## CU4plus Adapter

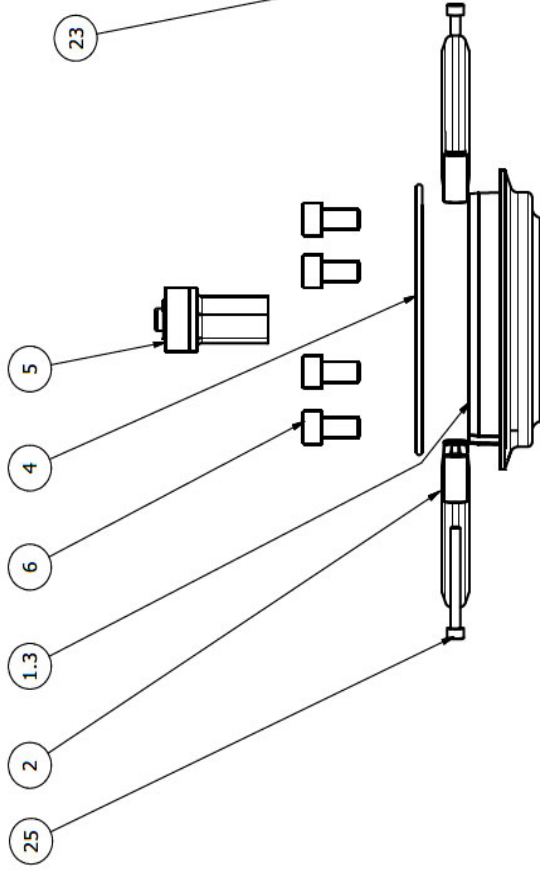
Datum:	26.01.16	04.04.16	20.05.19	09.11.19
Name:	Trytko	Trytko	C.Keil	C.Keil
Geprüft:	Schulz	Schulz	C.Keil	C.Keil
Datum:	26.01.21			
Name:	C.Keil			
Geprüft:	C.Keil			

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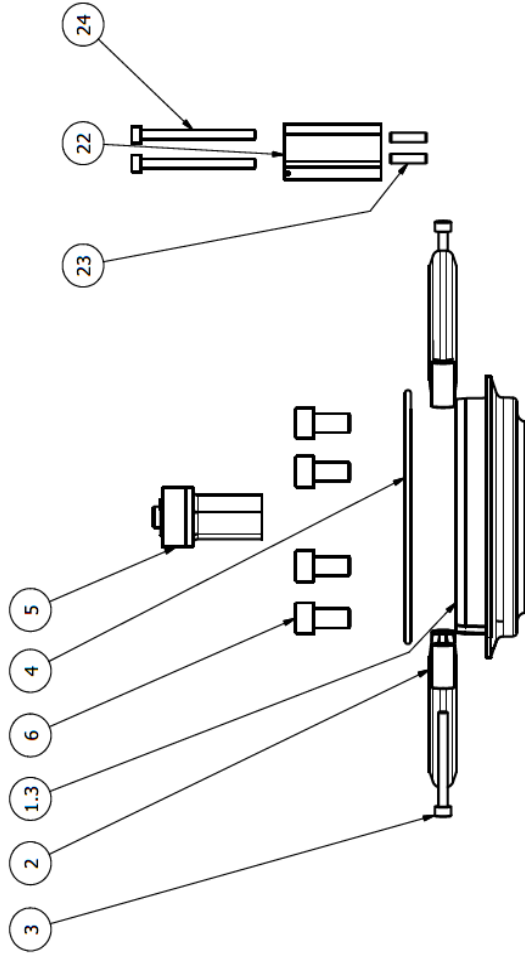
Blatt 2 von 5

**RN01.044.3-1**

CU4plus DT4 -62 Adapter



CU4plus DT4 -92 Adapter



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Ersatzteilliste: spare parts list

## CU4plus Adapter

pos. item		Beschreibung description	Material	CU4plus - S		CU4plus - Smini		CU4plus - Smax		CU4plus - T		CU4plus - Tmax	
				WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.		
		CU4 Adapter kpl. CU4 adapter cpl.		08-48-690/93 H333143	08-48-696/93 H335312	08-48-691/93 H333144	08-48-692/93 H333145	08-48-693/93 H333146					
1.1	1	CU4 Adapter M CU4 adapter M	Zytel 70G33L schwarz										
1.2	1	CU4 Adapter T CU4 adapter T	Zytel 70G33L schwarz						08-46-571/93 H319875				
1.3	1	CU4 Adapter S CU4 adapter S	Zytel 70G33L schwarz		08-46-570/93 H319874								
2	2	CU4 Clamphalbschale kpl. CU4 clamp cpl.	Grivory GH-5H1		08-46-569/93 H319873								
3	2	Zylinderschraube Cyl. Screw	A2-70		65-05-040/13 H320360								
4	1	O-Ring O-ring	NBR		58-06-493/83 H148389								
5	1	CU4 Magnetschaltnocke kpl. CU4 magnet switch cam cpl.	Zytel HTN		08-46-767/93 H333099								
6	4	Zylinderschraube Cyl. Screw	A2-70	65-05-120/13 M8x16 H79012	65-05-122/13 M8x25 H79014	65-05-120/13 M8x16 H79012	65-05-129/13 M8x60 H315760						
7	1	Zugstangenverlängerung Guide rod extension	PA6		15-26-070/93 H208096	15-26-070/93 H208096	15-26-058/93 H327149						
8	4	Skt. Schraube Hex. screw	A2-70		65-01-033/15 H78737	65-01-033/15 H78737							
9	1	CU Adapter SW4 CU adapter SW4	PA6		08-48-359/93 H330879	08-48-355/93 H207570	08-48-361/93 H327150						
10	1	O-Ring O-ring	NBR							58-06-059/83 H320505			
11	1	O-Ring O-ring	NBR							58-06-034/83 H321897			
12	1	O-Ring O-ring	NBR									58-06-039/83 H208632	

Datum: 26.01.16 04.04.16 20.05.19

Name: Trytko Trytko C. Keil

Geprüft: Schulz Schulz C. Keil

Datum: Blatt 3 von 6

Name: RN01.044.3-1

Geprüft:

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Ersatzteilliste: spare parts list

## CU4plus Adapter

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Blatt 5 von 6

**RN01.044.3-1**

pos. item	Menge quantity	Beschreibung description	Material	CU41plus - M CU4-M is used	CU43plus - M	CU4plus - D4 V1	CU4plus - D4 V2	CU4plus DT4-62	CU4plus DT4-92
				WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.	WS-Nr. ref.-no.
		CU4 Adapter kpl. CU4 adapter cpl.		08-48-602/93 H320476	08-48-695/93 H333148	08-48-666/93 H336441	08-48-668/93 H341891	08-48-699/93 H343619	08-48-700/93 H343620
1.1	1	CU4 Adapter M CU4 adapter M	Zytel 70G33L schwarz	08-46-572/93 H319876					
1.2	1	CU4 Adapter T CU4 adapter T	Zytel 70G33L schwarz						
1.3	1	CU4 Adapter S CU4 adapter S	Zytel 70G33L schwarz					08-46-570/93 H319874	
1.4	1	CU4 Adapter D4 CU4 Adapter D4	PA6.6 GF30			08-46-940/93 H336038			
2	2	CU4 Clamphalbschale kpl. CU4 clamp cpl.	Grivory GH-5H1			08-46-569/93 H319873			
3	2	Zylinderschraube Cyl. Screw	A2-70			65-05-040/13 H320360			
4	1	O-Ring O-ring	NBR			58-06-493/83 H148389			
5	1	CU4 Magnetschaltnocke kpl. CU4 magnet switch cam cpl.	Zytel HTN		08-46-767/93 H333099	08-60-900/93 H320479		08-46-767/93 H333099	
6	4	Zylinderschraube Cyl. Screw	A2-70						65-05-120/13 M8x16 H79012
7	1	Zugstangenverlängerung Guide rod extension	PA6		08-46-920/93 H333136				
8	4	Skt. Schraube Hex. screw	A2-70						
9	1	CU Adapter SW4 CU adapter SW4	PA6						
10	1	O-Ring O-ring	NBR						
11	1	O-Ring O-ring	NBR						







# APV CU4\*plus\*

## AS-interface Control Unit

FOR IECEx ZONE 2 GAS APPLICATIONS

# SPXFLOW®

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ISSUED 06/2023 - Original Manual

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