

Operating Manual

DELTA CU3 AS-interface 2.1

Control Unit



Read and understand this manual prior to operating or servicing this product.

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1. Information

Symbols

The following symbols are used in the operating manual.



Attention: Indicates information which, if not followed, could result in danger to your health or to the functionality of the machine.



Note : Indicates important additional information, tips and recommendations.

2. Safety instructions

Important Information



**Always read the manual BEFORE
using the Control Unit.**

2.1 General

To ensure that the device functions correctly and will have a long service life, please comply with the information given in this operating manual as well as with the operating conditions and permissible data specified in the data sheets of the control unit for process valves.

- When planning the application of the device, and during its operation, observe the general technical rules!
- Installation and maintenance work may only be carried out by specialist staff using the correct tools!
- Observe the relevant accident prevention and safety regulations applicable for electrical equipment while operating and maintaining the device!
- Always switch off the electrical power supply before carrying out any works on the system!
- Note that piping or valves must not be removed from a system that is under pressure!
- 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 ignored, liability will not be accepted from our side, and the guarantee on the device and its accessories will expire!

2. Safety instructions

2.2 Safety instructions for AS-Interface

Overvoltage protection

Always use overvoltage protection modules in your AS-i installation.

2.3 Safety instructions for AS-Interface

Earthing

A potential-free operation must be provided for the AS-interface network. See to the general use of insulation monitoring devices to ensure proper earthing conditions.

(If bus wires or connected devices are earthed or provided with external voltage, this will lead to failure of the bus system.)

2.4 Welding

In general, it is recommended to avoid welding work in process plants if the control units are already installed and electrically connected.

If welding is absolutely necessary, switch off power in the complete network and always earth the devices in the welding area.

2.5 Connecting terminals

To connect cables with the terminals at the electronic module only use short wire end ferrules without plastic collar!

2.6 Guarantee

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



Attention !

This guarantee only applies to the Control Unit. No liability will be accepted, however, for consequential damage of any kind that could arise from the failure or malfunction of the device.

3. General description

The control unit consists of an electronic part which scans the position of the valve and provides the information as signals which are compatible with most AS-i bus control systems.

The solenoid valve is located in the control unit. The solenoid valve which is electrically activated, controls the compressed air. The solenoid valve is equipped with a throttling system for supply and exhaust air, which ensures to decrease the opening and closing speed of the valve.

The control unit for DELTA DE3 / DA3+ valves is available with 1 solenoid valve and with 3 solenoid valves.

The control unit has LEDs which ensure quick visual indication of the valve position, solenoid status and operating voltage.

Connections for air and power supply are installed at the control unit together with a valve which cuts off the air supply for removal of the control unit. The control unit can be removed by release of a quick-acting coupling. This permits fast servicing of the valve.

The whole control unit is encapsulated, and all the cable passages and air supplies are sealed so that the control unit complies with the requirements of IP 67.

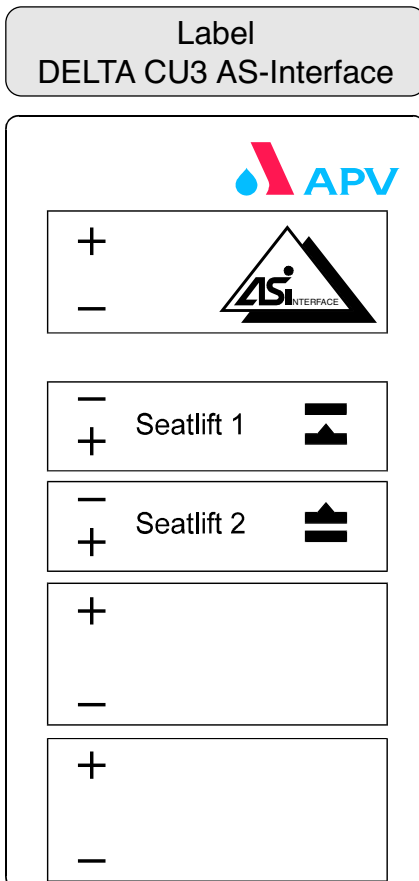
3.1 Description of the electronic module AS-interface

The solenoid valve and feedback signals are controlled by an electronic module.

The sensors for the upper and lower valve position consist of two Hall sensors or of two external proximity switches for DA3+ and DE3 valves.

The certified AS-interface control complies with the AS-interface specification 2.1 and the profile S-7.A.E. Alternatively, for the replacement in older readily installed plants with AS-i master according to specification 2.0, an electronic module with the profile S-7.F.F. is available.

The corresponding certificate from AS-international will be presented by APV if requested.



3. General description

The Control Unit DELTA CU3 AS-interface is designed for the extended address range. With these devices in the extended address area up to 62 slaves (CUs) can be connected with one AS-interface branch.

Attention: Consider cumulative power consumption and simultaneity factor.

3.1.1 Start-up

In shipping state, the DELTA CU valve head has the address 0. In the AS-interface network every slave must have an address within the range from **1A** to **31B**.

Addresses must only appear once.

Moreover, it is not permitted to operate one standard slave and one slave with extended address mode on the same address (e.g. slave **17** and slave **17A** or **17B**) in the same network.

3.1.2 Addressing with the address device

Before installation in the AS-interface network, the required address is adjusted with the address device which is connected with the connections ASI + and ASI - of the control unit (compare with description of address device).

3.1.3 Addressing in the network

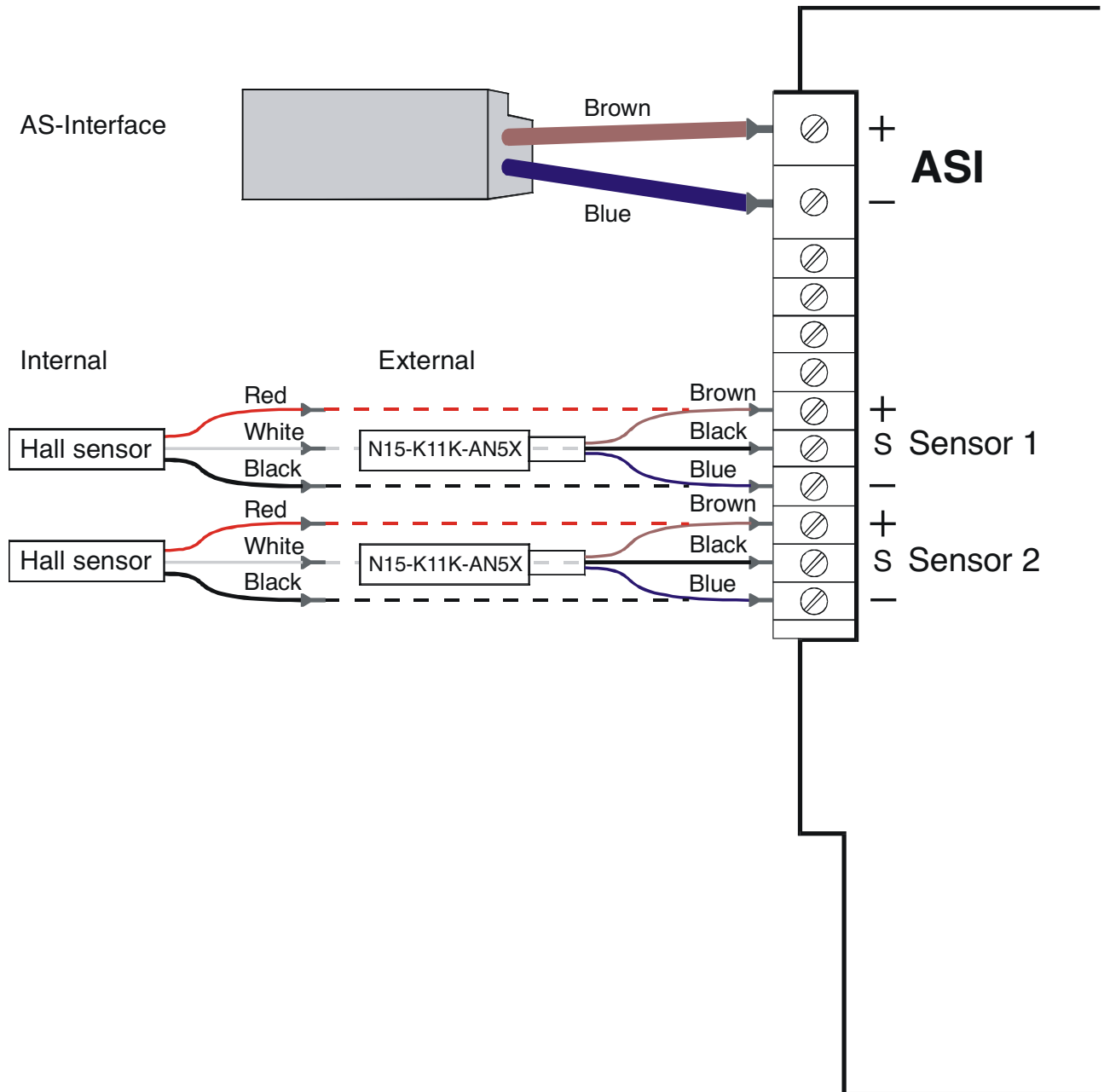
Alternatively, the AS-interface DELTA CU valve head can be connected with the AS-interface network and be provided with its set address via the AS-interface Master (in the project mode). In this case, however, observe that only one slave with the address 0 may exist in the network.

3. General description

3.2 Electronic module, 1 solenoid valve

For control units with 1 solenoid valve and internal or external sensors the below wiring diagram is used.

Wiring diagram:

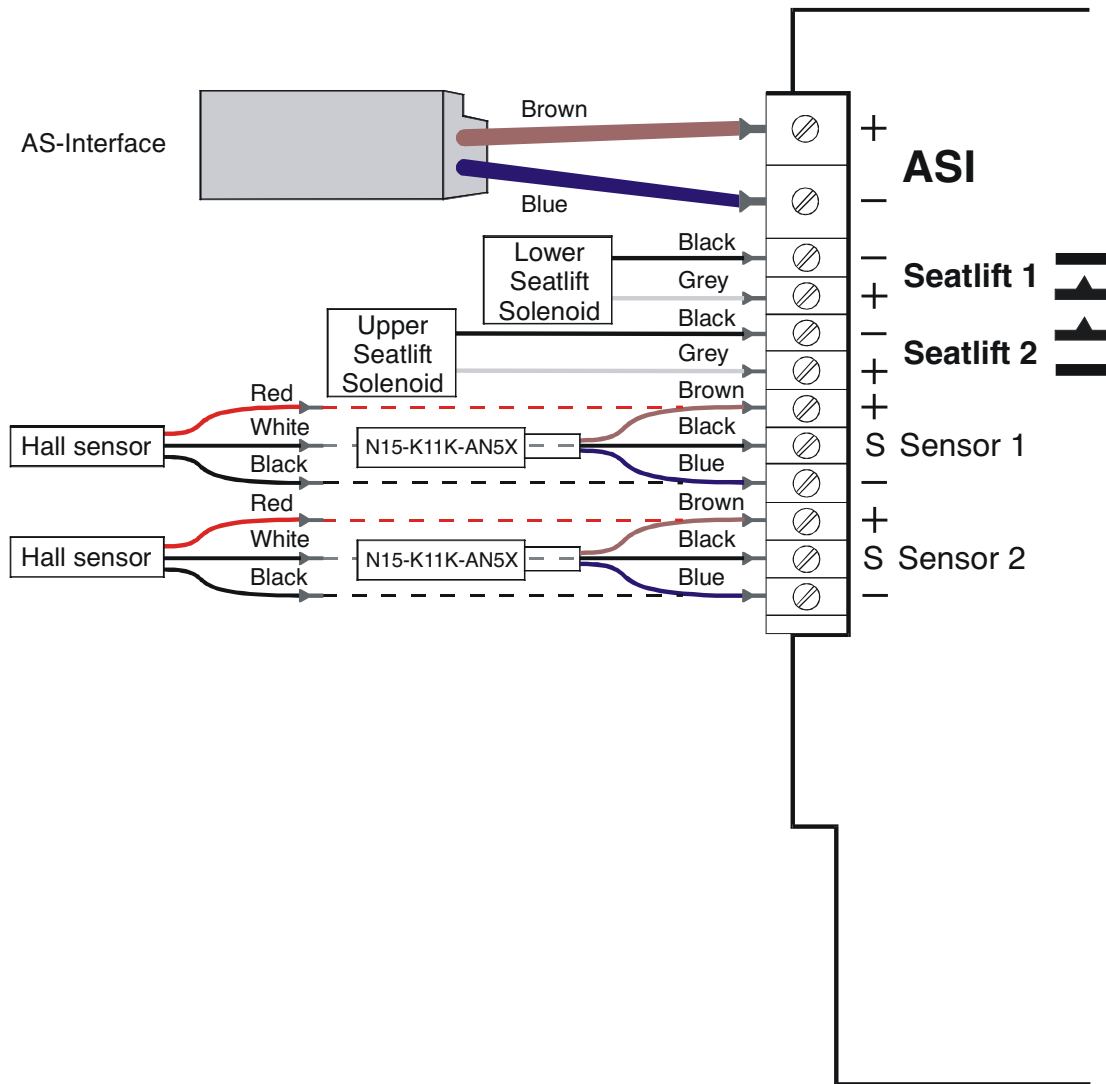


3. General description

3.2.1 Electronic module, 3 solenoid valves

For control units for DELTA DA3+ valves with 3 solenoid valves and external sensors the following wiring diagram is used.

Wiring diagram:



3.2.2 Programming

The control unit must be programmed to the required AS-i slave address. This can be done via the AS-i master module or via an AS-i hand held terminal.

Connection

The control unit is supplied with a PG 9 gland for insertion of the AS-i cable.

3. General description

3.3 Solenoid valve

The solenoid valve is equipped with a manual override. The override handle cannot be locked. Two throttling seat valves provide for the change of the opening and closing speed. Please note that the seat valve controlling the air supply must never be completely closed. An inner air filter protects the solenoid valve against dust. For further details, see section 4.2, 4.3 and 4.8.



Air supply for solenoid valves.
Air pressure: 6 - 8 bar
Important see chapter technical data

3.4 NOT element

The spring force of the air actuator can be increased with additional compressed air by installing a logical NOT element which directs the compressed air to the spring side of the actuator. For correct positioning, see section 8.5

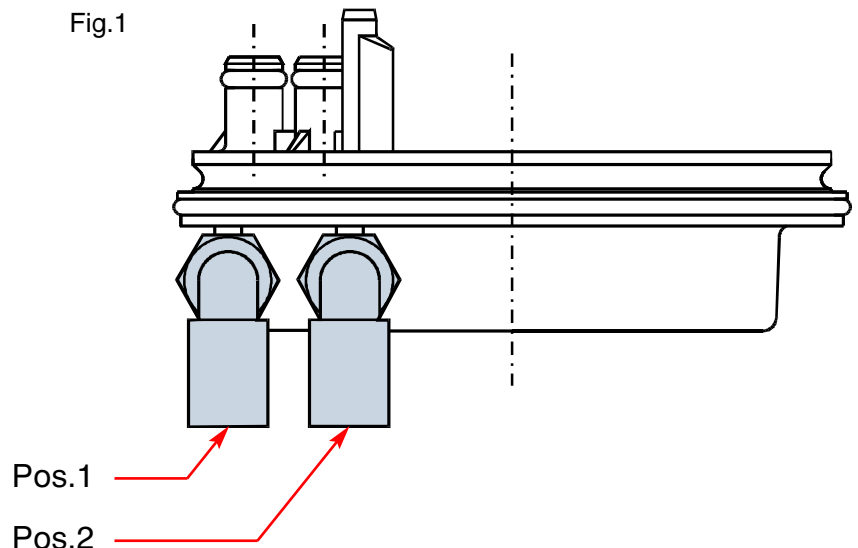
3.5 Adapter

The complete control unit is composed of a control unit top and an adapter unit. The adapter unit consists of an adapter and an actuator screw which are different from valve to valve. Since the control unit can be installed to different types of valve, different adapter units are necessary. It depends on the valve type which respective adapter type is combined with the control unit top.

Section 5.3 spare parts lists shows which adapter is used with the respective valve type.

The adapter for DELTA SV/SVS and DELTA DKR valves has an internal air connection. Pos. 1 and pos. 2 contain two blind plugs.

Fig.1

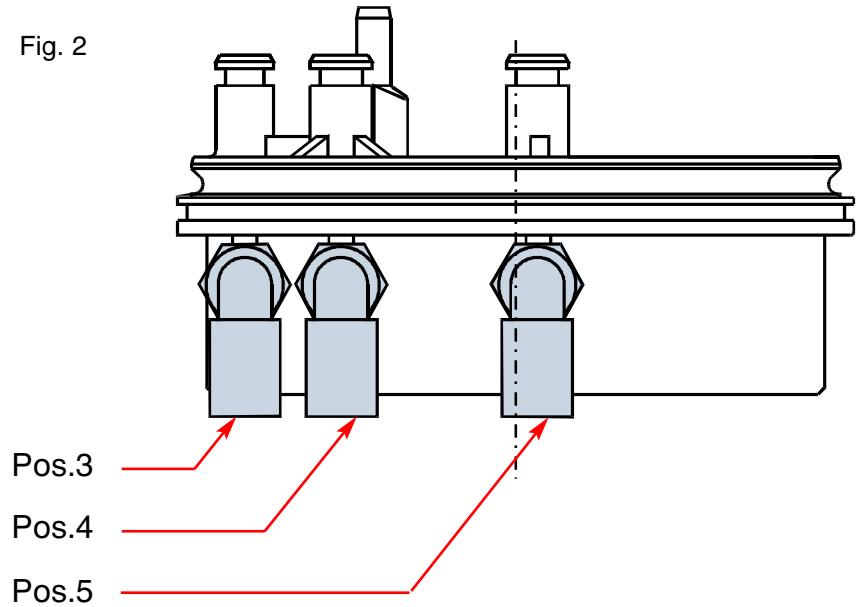


3. General description

The adapter shown in figure 2 is for the double seat valves DELTA DA3+ and DE3. It is either equipped with one (for DELTA DE3 with one solenoid valve) or three air connections (for DELTA DA3+ with three solenoids).
If fitted with one air connector pos. 4 and 5 are closed with a blind plug.

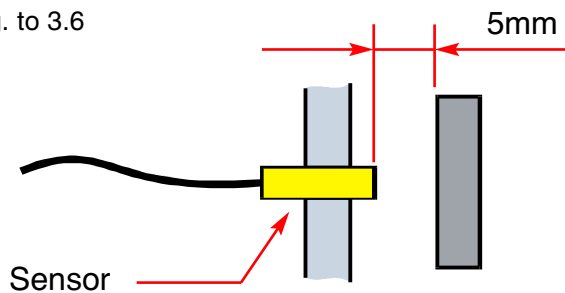
- Pos. 3 air supply to open valve
- Pos. 4 air supply to lift lower seat
- Pos. 5 air supply to lift upper seat

Fig. 2



- 3.6 External sensor**
A 5V DC NPN sensor must be used.
Operating distance: 5 mm.

Fig. to 3.6



- 3.7 Air connections / elbow unions**
The elbow unions for the control unit and adapter have a cylindrical thread. For their replacement against other unions, take care that the new union has a cylindrical thread.

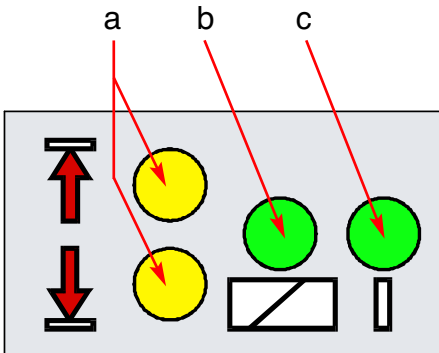
4. Functional description

4.1 LED indication (Pos. 2)

There are four LEDs which have the following functions:

- a) Valve position indication. The LED lights up and indicates the valve position. This is used to provide information during operation and to adjust the position sensors.
Please see section 8.2.5

Fig. to 4.1



b) Control of the solenoid valves / green

- | | |
|---------------------------------------------|-----------------|
| 1) solenoid valve
(main control) | permanent green |
| 2) solenoid valve
for lower seat lifting | 1 flash / 2sec. |
| 3) solenoid valve
for upper seat lifting | 2 flash / 2sec. |

(priority has 1 before 2 and 2 before 3)

Attention:

Max. 2 solenoid valves may be activated simultaneously.
Which 2 valves are activated can, however, be selected freely.

- | | |
|-------------------------------|----------------|
| c) Power supply AS-interface | - green |
| Indication peripheral failure | - red flashing |

Peripheral failures can be released in the following cases:

- short circuit or overload at the sensor entries
- short circuit or cable parting in the solenoid valve control
- overload as a result of simultaneous control of all 3 solenoid valves
(Permitted is the simultaneous control of max. 2 solenoid valves!)

As-interface Diagnosis Indication

Under all other conditions the LED output operates as a status indicator. The LED will display the following status information:

LED Off:

- **RESET:** Either DSR pin is static low or the IC is executing its reset/initialisation procedure. This procedure takes approximately 2 ms. The initialisation procedure will be performed after an power-on reset, a software reset (call RES), or an external reset.
- **Communication ON:** The slave can respond to DEXG master calls if its data exchange disable flag (*DATAEXCHG_DIS*) has been cleared.
The *DATAEXCHG_DIS* is set during initialisation of the A²SI. It will be cleared by the first write parameter request (WPAR) addressing the considered slave.

4. Functional description

LED Constant On:

- **Communication OFF:** After an IC reset, the *data exchange disable flag (DATAEXCHG_DIS)* is set and causes the LED to become constant on. Following scenarios may cause an IC reset:
 - o power-on reset, external reset, execution of a software reset (call RES, BR01)
 - o reset caused by the integrated watchdog
 - o an access to a non-implemented EEPROM register
 - o The LED is also constant on if the IR-addressing channel was selected and no communication takes place.**A** turned on LED represents the logical high level of the MAN2-coded output signal.

LED Flashing (2Hz):

- **Periphery Fault:** In case of a periphery fault the LED flashes with a frequency of 2Hz. Since the FID signal has higher priority than the *Communication OFF* state, the LED will remain flashing even if the Communication is off (*data exchange disable flag* is set).

4.2 Throttling function (Pos. 3a and 3b)

The inlet and outlet air can be adjusted at the solenoid valve by the two throttling valves (pos. 3a / IN and pos. 3b. / OUT). By turning the screws in anticlockwise direction, the inlet or outlet air is throttled. The required adjustment must be determined by the operator himself. Please note that the throttling valve controlling the inlet and outlet air must never be completely closed.

4.3 Manual activation of the solenoid valve (Pos. 4)

The solenoid valve can be activated manually by turning the handle placed on the top of the solenoid valve. This function is used to adjust the Hall sensor or to by-pass the control system to activate the valve.

4.4 Removal of control unit from valve (Pos. 5)

The control unit is released by turning the ribbed ring from the "lock" to the "un-lock" symbol. Then the control unit can easily be lifted off. The removal of the control unit shuts off air supply.

4.5 Adjustment of feed-back position (Pos. 6)

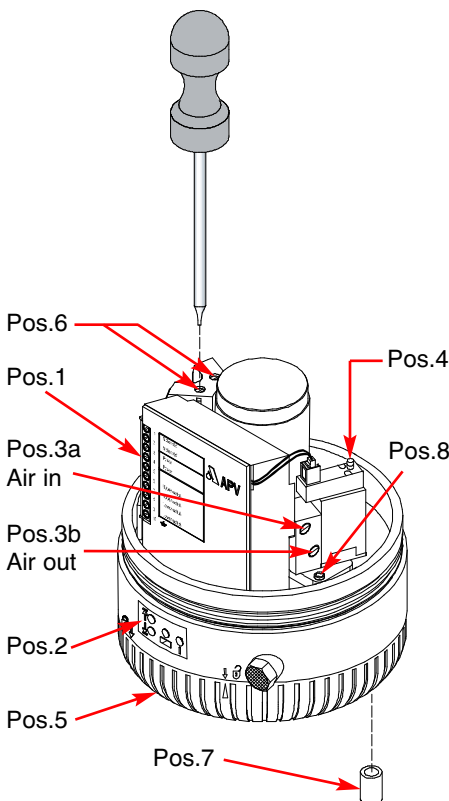
After dismantling of the CU, check that the position of the Hall sensors are properly adjusted.

The procedure is as follows:

The Hall sensors must be adjusted to transmit a signal respectively for activated valve position and not-activated valve position. In this case it is an advantage to use manual activation (**Pos. 4**).


Turn the adjusting screws (**Pos. 6**) up/down until the correct LED just lights up. Check if it is in fact the correct LED that lights up. To allow for small fluctuations, turn the adjusting screws two revolutions in the direction in which the LED remains lit.


Control units for DELTA DA3+ and DE3 valves are fitted with external proximity switches.





4. Functional description

Valves in normally closed (NC) design


The Hall sensor for activated valve position is fitted on a screw marked 


The Hall sensor for not-activated valve position is fitted on a screw marked 


The LED for “activated” valve sensor is marked 


The LED for “not-activated” valve sensor is marked 

Valves in normally open (NO) design and DELTA DA3+ and DELTA DE3 double-seat valves, DELTA SV/SVS butterfly valves and DELTA DKR double-seat ball valves - independent of normally closed or normally open design

The Hall sensor for activated valve position is fitted on a screw marked 

The Hall sensor for not-activated valve position is fitted on a screw marked 

The LED for “activated” valve sensor is marked 

The LED for “not-activated” valve sensor is marked 

4.6 Pressure relief valve (Pos. 7)

The pressure relief valve ensures that no pressure builds up in the cap.

4.7 Removal of the electronic box (pos. 1)

The electronic box can be removed by loosening two screws. One screw is placed between the two guides for the Hall sensors, and the other is placed on the right side of the electronic box. Remove the cable (plug) from the solenoid valve. During assembly ensure that the wires for the hall sensors are not tangled, preventing them from sliding up and down unobstructedly in the wire tracks.

4.8 Removal of the solenoid valve (pos. 8)

Remove the cable (plug) from the solenoid valve. Loosen the two screws which are fixing the solenoid valve, distributor and gasket. During assembly make sure that the gasket is positioned very precisely between the edges at the distributor. The torque for the two screws of the solenoid valve is **1,3 Nm, max. 1,6 Nm.**

5. Technical Data

5.1 General technical data

Ambient temperature:	-20°C to + 70°C
Enclosure rating:	IP 67
CE:	EMC 89/336/EEC
Control air :	quality acc. to DIN/ISO 8573-1
- solid partice content :	quality class 3, maximum number of particeles per m ³ 10 000 of size 0,5µm < d < 1,0µm 500 of size 1,0µm < d < 5,0µm
- water content :	quality class 4, max. pressure dew point +3°C (for installations at lower temperatures or higher altitudes additional measures must be considered to reduce the pressure dew point accordingly)
- oil content :	quality class 1, max. 0,01mg/m ³ (the used oil must be compatible with Polyurethan elastomer materials)

5.2 Electrical data

AS-Interface profile:	S-7.A.E. (S-7.F.F possible as option)
extended addressing mode:	is supported
serial communication mode:	-----
reverse battery protection:	exists
peripheral failure bit:	activated
watchdog:	not activated
display "power":	LED C (green)
display "fault"	LED C (red)
AS-Interface voltage range:	26,5....31,6V
max. current consumption:	≤ 160 mA
Power consumption of electronic module	
controlled without solenoid valve:	40 mA
controlled with 1 solenoid valve:	70 mA
controlled with 2 solenoid valves: (respectively 1 sensor controlled)	100 mA

5. Technical data

5.3 Standards

AS-Interface specification:	2.1
AS-Interface certificate:	No. of the certification document 54301
Standards:	EN 50295 IEC 62026-2:2000 EN 55022 (A/B) EN 61000-4-4 EN 61000-4-6 EN 61000-4-3 EN 61000-4-2

5.4 Communication data

The use of data bits is shown in the following table:

Data bit	Info	Port	Level
DO0 (output)	0 1	Main control valve	Low (no current) High (current)
DO1 (output)	0 1	Lower seat lifting (option)	Low (no current) High (current)
DO2 (output)	0 1	Upper seat lifting (option)	Low (no current) High (current)
DO3 (output)		Free	
DI0 (input)	0 1	Position sensor activated valve position	Low (no current) High (current)
DI1 (input)	0 1	Position sensor not-activated valve position	Low (no current) High (current)
DI2 (input)	1	Permanent "1"	-----
DI3 (input)	1	Permanent "1"	-----

Data bits DI2 / DI3 are permanently switched to High (1).
 - Communication can be checked with these bits!

BA CUASI02102
ID-No.: H 3 1 6 7 2 2
Translation of original manual



rev. 3



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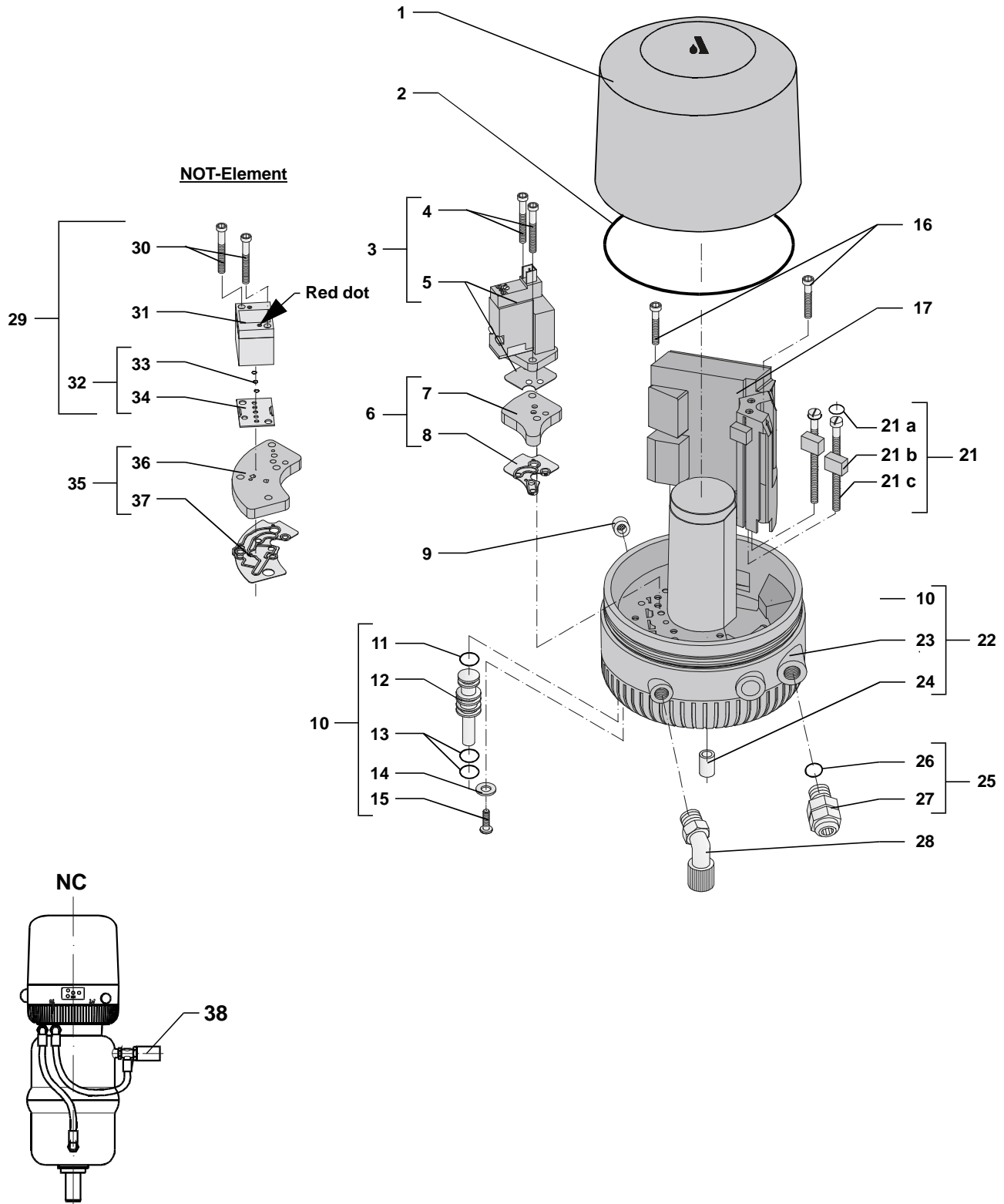
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6.1 Steuereinheit / Control unit

DELTA CU3 AS-interface 2.1



6.1 Steuereinheit / Control unit

DELTA CU3 AS-interface 2.1

Pos	Stk/Qty	Maße / Dim.	Benennung	Description	Ws.-Nr./Part No.
-	-		CU31 - AS-Interface - Standard	CU31-AS-Interface - Standard	08-45-020/93
-	-		CU31N - AS-Interface mit NOT - Element	CU31N - AS-Interface with NOTelement	08-45-021/93
1	1		CU Haube	CU Cap	08-60-713/93
2	1	Ø105x2,5 /NBR	O-Ring	O-ring	-
3	1		Magnetventil CU3 komplett	Solenoid Valve CU3 complete	97-00-160/93
- 4	2		TORX - Schraube	TORX-screw	-
- 5	1		Magnetventil mit Dichtung	Solenoid Valve with seal	-
6	1		Luftverteilerplatte CU31 komplett	Air Distributing Plate CU31 cpl.	08-60-319/93
- 7	1		Luftverteilerplatte	Air Distributing Plate	-
- 8	1		Dichtung für Luftverteilerplatte	Gasket for Air Distributing Plate	-
9	1		Schalldämpfer	Sound Reducer	08-60-751/93
10	1		Druckluftabsperkolben CU3 kpl.	Shut-off Piston Comp. Air CU3 cpl.	15-28-860/93
- 11	1	Ø7,65x1,78 /NBR	O-Ring	O-ring	-
- 12	1		Kolben	Piston	-
- 13	2	Ø9,25x1,78 /NBR	O-Ring	O-ring	-
- 14	1	Ø4,3 A2 /DIN 9021	Scheibe	Washer	-
- 15	1	40x12 /WN 1451	Schraube	Screw	-
16	2	40x45 /WN 1451	TORX - Schraube	TORX-screw	08-60-752/15
17	1		CU31 Elektronikbox ASi-Hall. kpl.	CU31 Electronic Box ASi-hall cpl.	16-31-195/93
21	1		Hall Sensor komplett	Hall sensor complete	08-60-850/93
- 21a	1	Ø3x2 / NBR	O-Ring	O-ring	-
- 21b	1		Hall Sensor	Hall Sensor	-
- 21c	1	M4x80 /DIN 84A A2	Justierschraube	Adjusting screw	-
22	1		CU31 Sockel komplett	CU31 Base complete	08-51-016/93
- 23	1		Sockel	Base	-
- 24	1		Überströmventil	Pressure relief Valve	-
25	1		Kabelverschraubung 4-8mm kpl.	Screwed Cable Gland cpl. 4-8mm	08-29-310/93
- 26	1	Ø12,42x1,78 /NBR	O-ring	O-Ring	-
- 27	1		Kabelverschraubung	Cable Inlet	-
28	1		Winkelverschraubung	Elbow Connector	08-60-750/93
29	1		NOT - Element CU3 komplett	NOTelement CU3 complete	08-60-290/93
- 30	2	40x50 /WN 1452	Schraube	TORX-screw	08-60-759/15
- 31	1		NOT - Element	NOTelement	-
- 32	1		Dichtungssatz NOT - Element	Seal kit NOT - element	58-34-300/13
- 33??	3	Ø3,68x1,78 /NBR	O-ring	O-Ring	-
- 34	1		Dichtung	Seal	-
35	1		Luftverteilerplatte CU31N kpl.	Air Distributing Plate CU31N cpl.	08-60-320/93
- 36	1		Luftverteilerplatte	Air Distributing Plate	-
- 37	1		Dichtung für Luftverteilerplatte	Seal for Air Distributing Plate	-
38???	1		Druckreduzierventil	Pressure reducer valve	08-60-766/93

? Ersatzteile für Elektronikbox / Spare part for Electronic Box

?? Ersatzteile für NOT - Element / Spare part for NOT - element

??? Das Druckreduzierventil wird nur bei der Control Unit mit NOT - Element eingesetzt.

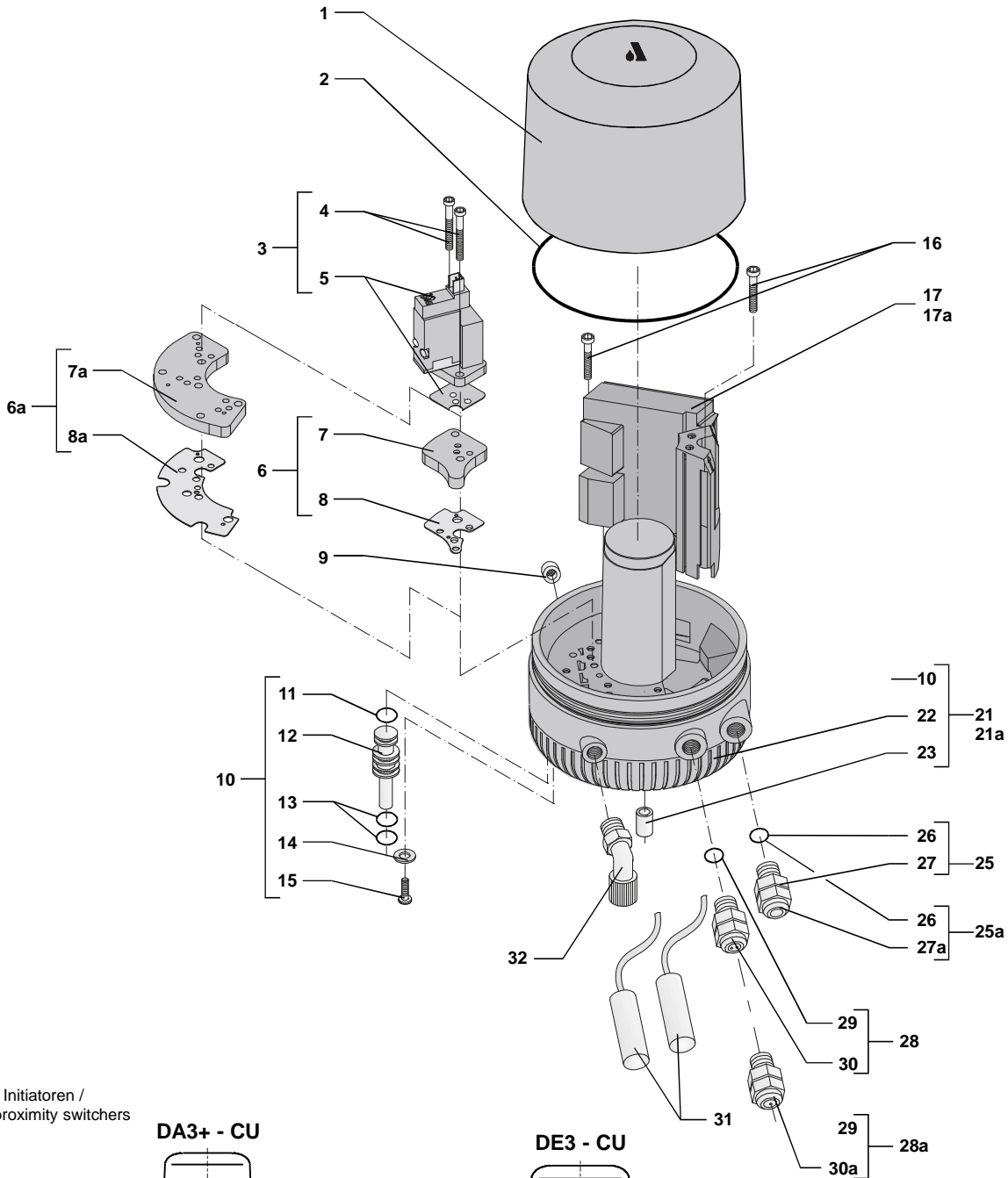
Für die Montage in den Antrieb ist das Druckreduzierventil beigelegt.

The pressure reducing valves is used only for the Control Unit with NOT - element.

For assembly in the actuator the pressure reducing valve forms part of the scope of supply.

6.2 Steuereinheit / Control unit

DELTA CU3 AS-interface 2.1 for DA3+ / DE3



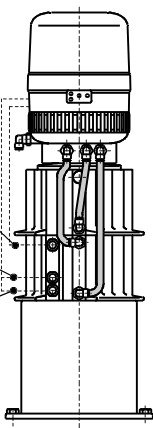
Position der Initiatoren /
Position of proximity switchers

DA3+ - CU

geschlossene Position /
closed position

geöffnete Position
nur für DN 40, 1,5" /
open position
only for DN 40, 1,5"

geöffnete Position
nur für DN 50-100, 2"-4" /
open position
only for DN 50-100, 2"-4"

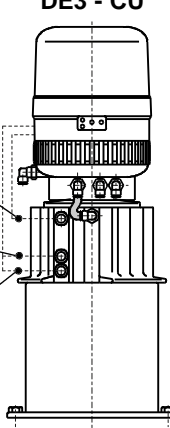


DE3 - CU

geschlossene Position /
closed position

geöffnete Position
nur für DN 40-50, 1,5"-2" /
open position
only for DN 40-50, 1,5"-2"

geöffnete Position
nur für DN 65-100, 2,5"-4" /
open position
only for DN 65-100, 2,5"-4"

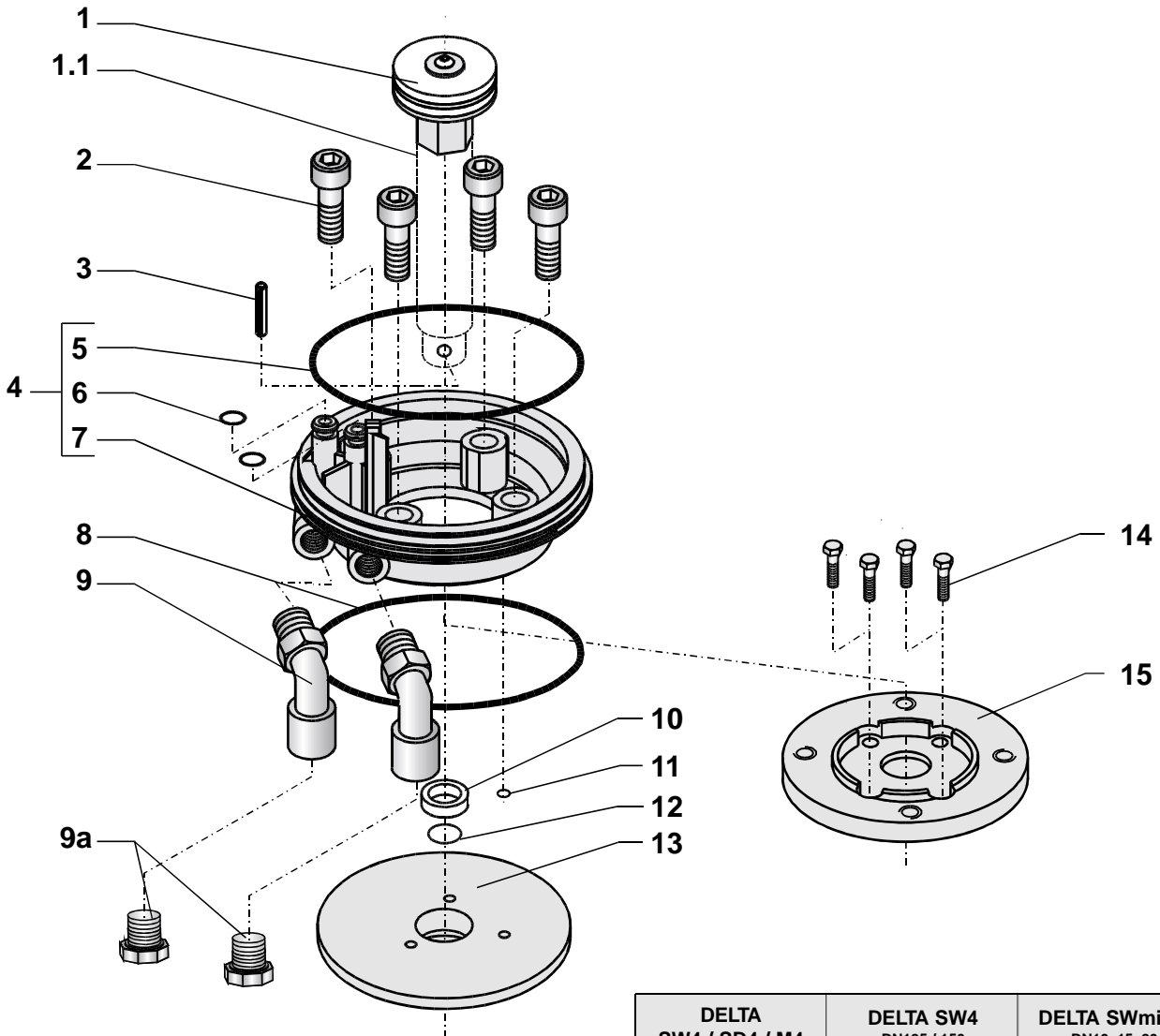


6.2 Steuereinheit / Control unit DELTA CU3 AS-interface 2.1 for DA3+ / DE3

Pos.	Stk/Qty	Maße / Dim.	Benennung	Description	Ws.-Nr. / Part No.
-	-		CU31 DE3 AS-Interface 1EMV	Control unit - 1 Solenoid Valve	08-45-022/93
-	-		CU33 DA3+ AS-Interface 3EMV	Control unit - 3 Solenoid Valves	08-45-023/93
1	1		CU Haube	Cap	08-60-713/93
2	1	Ø105x2,5 /NBR	O-Ring	O-Ring	-
3	1		Magnetventil CU3 komplett	Solenoid Valve CU3 complete	97-00-160/93
- 4	2	40x25 /WN 1451	TORX - Schraube	TORX-screw	-
- 5	1		Magnetventil	Solenoid Valve	-
6	1		Luftverteilerplatte CU31 komplett	Air Distributing Plate CU31 cpl.	08-60-319/93
- 7	1		Luftverteilerplatte	Air Distributing Plate	-
- 8	1		Dichtung für Luftverteilerplatte	Seal for Air Distributing Plate	-
6a	1		Luftverteilerplatte CU33 komplett	Air Distributing Plate CU33 cpl.	08-60-321/93
- 7a	1		Luftverteilerplatte	Air Distributing Plate	-
- 8a	1		Dichtung für Luftverteilerplatte	Seal for Air Distributing Plate	-
9	1		Schalldämpfer	Sound Reducer	08-60-751/93
10	1		Druckluftabsperrkolben CU3 kpl.	Shut-off Piston Comp. Air CU3 cpl.	15-28-860/93
- 11	1	Ø7,65x1,78 /NBR	O-Ring	O-ring	-
- 12	1		Kolben	Piston	-
- 13	2	Ø9,25x1,78 /NBR	O-Ring	O-ring	-
- 14	1	Ø4,3 A2 /DIN 9021	Scheibe	Washer	-
- 15	1	40x12 /WN 1451	Schraube	Screw	-
16	2	40x45 /WN 1451	TORX - Schraube	TORX-screw	08-60-752/15
17	1		CU31 Elektronikbox AS-Interface kpl.	CU31 Electronicbox AS-Interface cpl.	08-60-815/93
17a	1		CU33 Elektronikbox AS-Interface kpl.	CU33 Electronicbox AS-Interface cpl.	16-31-196/93
21	1		CU31 - DE3 Sockel kpl. 1EMV	CU31 - DE3 Base cpl. - 1 SV	08-51-017/93
21a	1		CU33 - DA3+ Sockel kpl. 3EMV	CU33 - DA3+ Base cpl. - 3 SV	08-51-018/93
- 22	1		Sockel	Base	-
- 23	1		Übertrömventil	Pressure relief Valve	-
25	1		Kabelverschraubung 4-8mm kpl.	Screwed Cable Gland cpl. 4-8mm	08-29-310/93
- 26	1	Ø12,42x1,78 /NBR	O-Ring	O-ring	-
- 27	1		Kabelverschraubung	Cable Inlet	-
25a	1		Kabelverschraubung 5-10mm kpl.	Screwed Cable Gland cpl. 5-10mm	08-29-311/93
- 26	1	Ø12,42x1,78 /NBR	O-Ring	O-ring	-
- 27a	1		Kabelverschraubung	Cable Inlet	-
28	1		Kabelverschraubung f. 2xInitiatoren kpl.	Screw. Cable Gland f. 2 Prox. switch	08-29-320/93
- 29	1	13,00 x 2,00/NBR 70	O-Ring	O-ring	-
- 30	1		Kabelverschraubung	Cable Inlet	-
28a	1		Kabelverschraubung f. 1xInitiator kpl.	Screw. Cable Gland f. 1 Prox. switch	08-29-321/93
- 29	1	Ø18,77x1,78 NBR 70	O-Ring	O-ring	-
- 30a	1		Kabelverschraubung	Cable Inlet	-
31	2		Initiator für DA3+, DE3, D3	Proximity Switch for DA3+, DE3, D3	08-60-769/93
32	1		Winkelverschraubung	Elbow Connector	08-60-750/93

6.3 Adapter / Adaptor

DELTA CU3



Pos.	Stk./Qty.	Benennung	Description	DELTA	DELTA SW4	DELTA SWmini4
				SW4 / SD4 / M4	DN125 / 150	DN10, 15, 20
				Ws.-Nr. / Part No.		
-	-	CU Adapter kpl.	CU adaptor complete	08-48-415/93	08-48-362/93	08-48-414/93
1	1	Schaltnocke	Actuator screw	08-60-700/93	08-60-700/93	08-60-700/93
1.1	1	Zugstangenverläng.	Extension rod	-	15-26-057/93	15-26-070/93
2	4	Schraube	Screw	M8x25/DIN 912	M8x25/DIN 912	M8x25/DIN 912
3	1	Spannstift	Split pin	-	-	-
4	1	CU Adapter Set	Adaptor kit	08-60-331/93	08-60-331/93	08-60-331/93
- 5	1	O-Ring	O-ring	Ø88,62x1,78 /NBR	Ø88,62x1,78 /NBR	Ø88,62x1,78 /NBR
- 6	2	O-Ring	O-ring	Ø5,28x1,78 /NBR	Ø5,28x1,78 /NBR	Ø5,28x1,78 /NBR
- 7	1	Adapter	Adaptor	-	-	-
8	1	O-Ring	O-ring	-	-	-
9	2	Winkelverschraub.	Elbow connector	08-60-750/93	08-60-750/93	08-60-750/93
9a	1	Stopfen	Plug	-	-	08-74-021/93
10	1	Dichtung	Gasket	-	-	-
11	1	O-Ring	O-ring	-	-	-
12	1	O-Ring	O-ring	-	-	-
13	1	Adapter	Adaptor	-	-	-
14	4	Schraube	Screw	-	-	M5 x 12/DIN 933
15	1	Adapter CU3 SW4-20	Adaptor CU3 SW4-20	-	-	08-48-355/93

6.3 Adapter / Adaptor

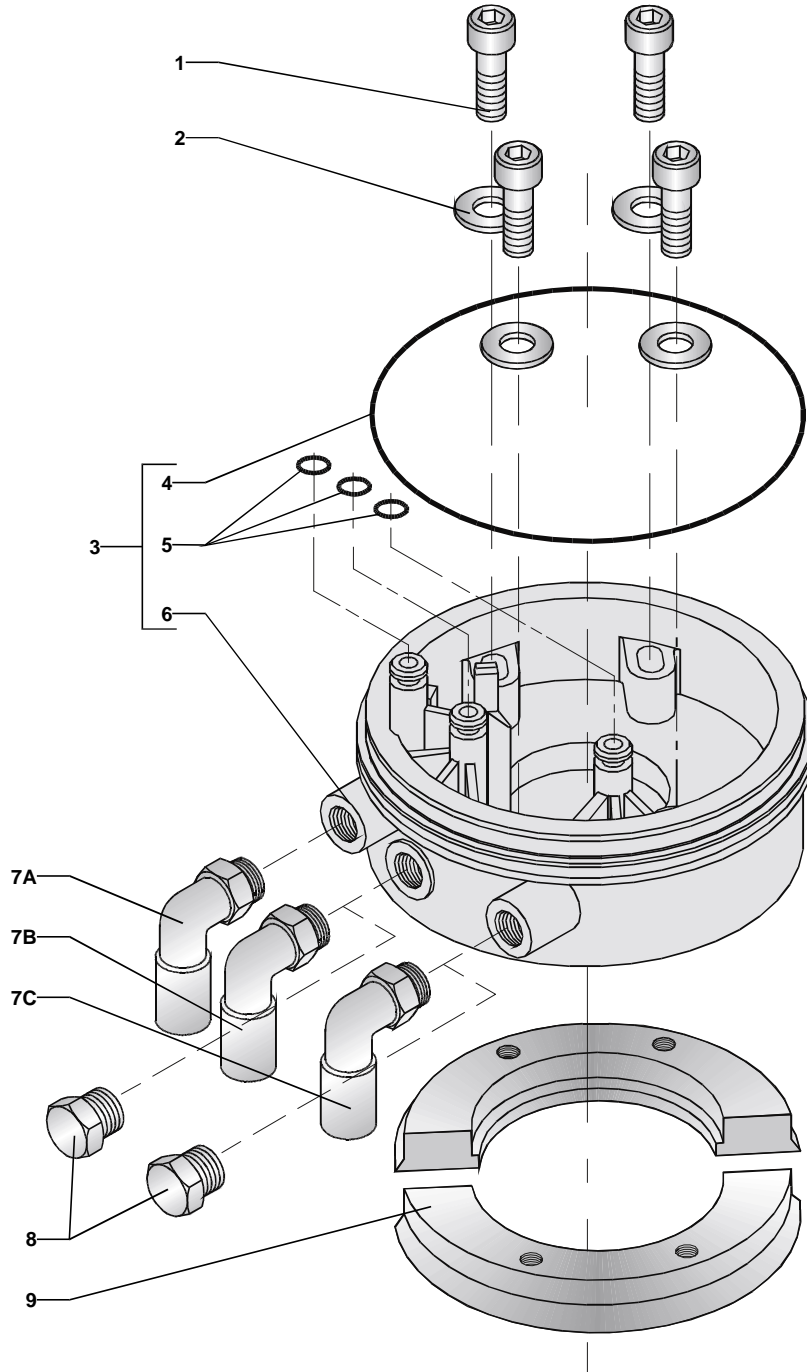
DELTA CU3

Pos.	Stk./Qty.	Benennung	Description	SV/SVS1F DN 25 - 100 and 1" - 4"	SVS1F DN 125 - 250	S2 / D2	S3
				DKR 2 DN25 - 65 and 1" - 2,5"	DKR2 DN 80 - 125 and 3" - 4"		
				Ws.-Nr. / Part No.			
-	-	CU Adapter kompl.	CU adaptor cpl.	08-48-416/93	08-48-417/93	08-48-418/93	08-48-419/93
1	1	Schaltnocke	Actuator screw	08-60-779/93	08-60-780/93	08-60-781/93	08-60-782/93
2	4	Schraube	Screw	-	-	-	M8x25/DIN 912
	4	Schraube	Screw	M5x18/ISO 1207	M5x18/ISO 1207	-	-
	4	Schraube	Screw	-	-	M8x22/DIN 912	-
3	1	Spannstift	Split pin	-	-	-	-
4	1	Adapter Set	Adaptor kit	08-60-333/93	08-60-333/93	08-60-334/93	08-60-334/93
- 5	1	O-Ring	O-ring	Ø 88,62x1,78 /NBR	Ø 88,62x1,78 /NBR	Ø 88,62x1,78 /NBR	Ø 88,62x1,78 /NBR
- 6	2	O-Ring	O-ring	Ø 5,28x1,78 /NBR	Ø 5,28x1,78 /NBR	Ø 5,28x1,78 /NBR	Ø 5,28x1,78 /NBR
- 7	1	Adapter	Adaptor	-	-	-	-
8	1	O-Ring	O-ring	Ø 90x2/ NBR	Ø 90x2/ NBR	-	-
9	2	Winkelverschraubung	Elbow connector	-	-	08-60-750/93	08-60-750/93
9a	2	Blindstopfen	Plug	08-60-740/93	08-60-740/93	-	-
10	1	Nutring	Gasket	-	08-60-738/93	-	-
11	1	O-Ring	O-ring	Ø 13 x 2 / NBR 70	Ø 13 x 2 / NBR 70	-	-
12	1	O-Ring	O-ring	-	Ø 11 x 3 / NBR	-	-
13	1	Adapter	Adaptor	-	-	-	-

Pos.	Stk./Qty.	Benennung	Description	VPS / VPL / VPB	VPS - 3A	VPS-3A Longstroke	VPM
				Ws.-Nr. / Part No.			
-	-	CU Adapter kompl.	CU adaptor cpl.	08-48-420/93	08-48-421/93	08-48-422/93	08-48-423/93
1	1	Schaltnocke	Actuator screw	08-60-778/93	08-60-783/93	08-60-784/93	08-60-785/93
1.1	1	Zugstangenverläng.	Extension rod	-	-	-	-
2	4	Schraube	Screw	-	-	-	-
	4	Schraube	Screw	M5x18/ISO 1207	M5x18/ISO 1207	M5x18/ISO 1207	M5x18/ISO 1207
3	1	Spannhülse	Split pin	-	08-60-762/15	08-60-762/15	-
4	1	CU Adapter Set	Adaptor kit	08-60-332/93	08-60-332/93	08-60-332/93	08-60-332/93
- 5	1	O-ring	O-Ring	Ø 88,62x1,78 /NBR	Ø 88,62x1,78 /NBR	Ø 88,62x1,78 /NBR	Ø 88,62x1,78 /NBR
- 6	2	O-ring	O-Ring	Ø 5,28x1,78 /NBR	Ø 5,28x1,78 /NBR	Ø 5,28x1,78 /NBR	Ø 5,28x1,78 /NBR
- 7	1	Adapter	Adaptor	-	-	-	-
8	1	O-ring	O-Ring	Ø 88x1,5/ NBR	Ø 88x1,5/ NBR	Ø 88x1,5/ NBR	Ø 88x1,5/ NBR
9	2	Winkelverschraub.	Elbow connector	08-60-750/93	08-60-750/93	08-60-750/93	08-60-750/93
9a	2	Stopfen	Plug	-	-	-	-
10	1	Dichtung	Gasket	-	-	-	-
11	1	O-ring	O-Ring	-	-	-	-
12	1	O-ring	O-Ring	-	-	-	-
13	1	Adapter VPM	Adaptor VPM	-	-	-	08-20-125/12

6.4 Adapter / Adaptor

DELTA CU3 for DA3+ / DE3



Pos.	Benennung	Description
7A	Luftanschluss : Ventil öffnen	Air connection : Valve opening
7B	Luftanschluss : untere Sitzanlüftung	Air connection : lower seat lift
7C	Luftanschluss : obere Sitzanlüftung	Air connection : upper seat lift

6.4 Adapter / Adaptor

DELTA CU3 for DA3+ / DE3

Adapter für DE3 / DA3+ - 1 Magnetventil (EMV) / Adaptor for DE3 / DA3+ - 1 Solenoid valve (SV)

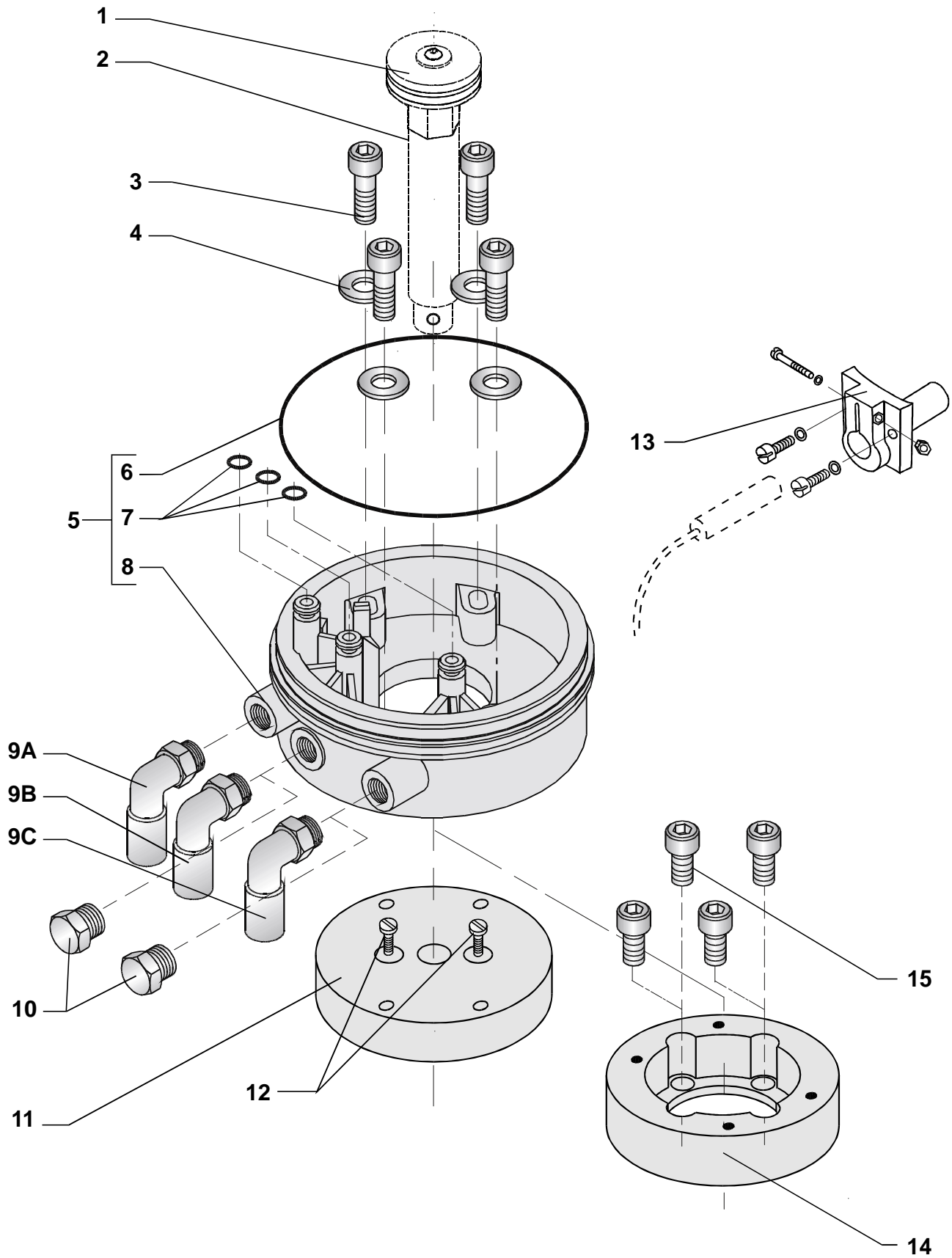
Pos	Stk/Qty	Benennung	Description	Ws.-Nr. / Part No.
-	-	CU21 Adapter DA3+, DE3 komplett -1 Elektromagnetventil	CU21 Adaptor DA3+, DE3 complete -1 solenoid Valve	08-48-424/93
1	4	Schraube	Screw	M5x25/ ISO4762
2	4	Scheibe	Washer	08-60-767/15
3	1	CU2 Adapter Set DA3+, DE3	CU2 Adaptor kit DA3+, DE3	08-60-330/93
- 4	1	O-ring	O-Ring	Ø88,62x1,78 /NBR
- 5	3	O-ring	O-Ring	Ø5,28x1,78 /NBR
- 6	1	Adapter	Adaptor	-
7A	1	Winkelverschraubung	Elbow connector	08-60-750/93
8	2	Blindstopfen	Plug	08-60-740/93
9	2	Montagehälfte CU Adapter DA3+ / DE3	Assembly half CU adaptor DA3+ / DE3	08-60-717/93

Adapter für DA3+ - 3 Magnetventile (EMV) / Adaptor for DA3+ - 3 Solenoid valves (SV)

Pos	Stk/Qty	Benennung	Description	Ws.-Nr. / Part No.
-	-	CU23 Adapter DA3+ komplett - 3 Elektromagnetventile	CU23 Adaptor DA3+ complete - 3 solenoid valves	08-48-425/93
1	4	Schraube	Screw	M5x25 ISO4762
2	4	Scheibe	Washer	08-60-767/15
3	1	CU2 Adapter Set DA3+, DE3	CU2 Adaptor kit DA3+, DE3	08-60-330/93
- 4	1	O-ring	O-Ring	Ø88,62x1,78 /NBR
- 5	3	O-ring	O-Ring	Ø5,28x1,78 /NBR
- 6	1	Adapter	Adaptor	-
7A-B-C	3	Winkelverschraubung	Elbow connector	08-60-750/93
8	-	Blindstopfen	Plug	-
9	2	Montagehälfte CU Adapter DA3+ / DE3	Assembly half CU adaptor DA3+ / DE3	08-60-717/93

6.5 Adapter / Adaptor

DELTA CU3 for PHB/ PSL, S2 - DN 10, 15, 20



6.5 Adapter / Adaptor

DELTA CU3 for PHB/ PSL, S2 - DN 10, 15, 20

Adapter für Pneumatische Hubbegrenzung (PHB) SW4 / M4 / Adaptor for Pneumatic Stroke Limitation (PSL) SW4 / M4

Pos	Stk/Qty	Benennung	Description	Ws.-Nr. / Part No.
-	-	CU32 Adapter SW4 / M4 - PHB kpl.	CU32 Adaptor SW4 / M4 - PSL cpl.	08-48-370/93
1	1	Schaltnocke	Actuator screw	08-60-700/93
2	1	Zugstangenverlängerung	Extension rod	15-26-057/93
3	4	Zyl. Schraube	Cyl. Screw	M5x25 ISO4762
4	4	Scheibe	Washer	08-60-767/15
5	1	CU2 Adapter Set DA3+, DE3	CU2 Adaptor kit DA3+, DE3	08-60-330/93
- 6	1	O-ring	O-Ring	Ø88,62x1,78 /NBR
- 7	3	O-ring	O-Ring	Ø5,28x1,78 /NBR
- 8	1	Adapter	Adaptor	-
9A-B	2	Winkelverschraubung	Elbow connector	08-60-750/93
10	1	Blindstopfen	Plug	08-60-740/93
11	-			
12	-			
13	-			
14	1	CU3 Adapter SW4, M4, PHB	CU3 Adaptor SW4, M4, PSL	08-48-371/93
15	4	Schraube	Screw	M8x12 DIN912

Adapter für S2-DN 10, 15, 20 / Adaptor for S2-DN 10, 15, 20

Pos	Stk/Qty	Benennung	Description	Ws.-Nr. / Part No.
-	-	CU31 Adapter S2 - DN10,15,20 kpl	CU31 Adaptor S2 - DN10,15,20 cpl.	16-00-174/93
1	-			
2	-			
3	4	Zyl. Schraube	Cyl. Screw	M5x25 ISO4762
4	4	Scheibe	Washer	08-60-767/15
5	1	CU2 Adapter Set DA3+, DE3	CU2 Adaptor kit DA3+, DE3	08-60-330/93
- 6	1	O-ring	O-Ring	Ø88,62x1,78 /NBR
- 7	3	O-ring	O-Ring	Ø5,28x1,78 /NBR
- 8	1	Adapter	Adaptor	-
9A	1	Winkelverschraubung	Elbow connector	08-60-750/93
10	2	Blindstopfen	Plug	08-60-740/93
11	1	Deckel Adapter CU31	Cover Adapter CU31	16-00-174/93
12	2	Zyl. Schraube	Cyl. Screw	M5x10/ DIN912
13	2	Initiatorenhalter kpl.	Proximity switch support cpl.	15-33-921/83
14	-			