

## 1. Especially to be observed:

- 1.1 The nameplate on the actuator contains the data concerning actuator and valve.
- 1.2 When ordering spare parts, always state App. No. and K-No. shown on the nameplate.
- 1.3 On reversing the actuator or changing the operating conditions, check data on the nameplate; if necessary order corrected nameplate.
- 1.4 On operating trouble or after exchange of spare parts it has to be observed,  
that the diaphragm cover (28) at the diaphragm and  
the O-ring (26) are tight  
that lift and initial spring tension are correctly adjusted.
- 1.5 Diaphragm and gasket can be exposed to temperatures from -30°C to +100°C. With regard to the durability in case of high temperatures we recommend to provide for a heat protection and in case of temperatures below -10°C to provide for dry air.
- 1.6 The mounting position is vertical on top of the valve. For other mounting positions, please consult with us.

## 2. Construction and Reversibility of the Actuator

The pneumatic diaphragm actuator is constructed in such a way that it can be reversed at any time without additional parts and with only a few manipulations, e.g. the valve can always be changed from an opening into a closing valve and vice versa. The diaphragm case (28) with spring case (46) will be simply mounted in a reversed sense between the support (55) remaining below and the bonnet (22) remaining on top.

If the pressure chamber is on top, the increasing signal pressure effects a downward thrust of the motor spindle.

If the pressure chamber is below, the increasing signal pressure effects an upward pull of the motor spindle.

The hand adjustments are especially designed for only one action respectively. For reversing a hand adjustment "pressure chamber on top" into a hand adjustment "pressure chamber below", the parts 7, 8, 9, 10, 15, 16 and 17 are needed. For the reversing into a hand adjustment "Pressure chamber on top" the parts 4, 5, 11, 13, 14 and 18 are necessary.

## 3. Mounting

### 3.1 Control-signal connection

The diaphragm cover (28) has a connection for 1/4" NPT for motor sizes U0 and UI as well as a connection 1/2" NPT for motor sizes UIII and UV. The supply line should be a pipe of at least 6 mm inner diameter (8x 1 mm).

### 3.2 Mounting of accessories

The servomotor offers easy mounting of instruments as there are positioner, remote transmitter, limit switch, limit relay or field controller. At the spring case (46) there is one bolting area each in front and at the back with fastening threads M8 and a distance of 57 mm. The support is constructed according to NAMUR principles and provides there too the possibility of mounting with fastening thread M8.

### 3.3 The hand adjustment

The hand adjustment is a separate element which can be mounted at any time, not only to this servomotor.

On air failure in case of emergency remove the hand-wheel safety lock (6) from the lower bore of the hand wheel spindle (11/17) and put it into the bore hole at the upper end of the hand wheel spindle (11/17).

**Pushing hand adjustment:**

(Valve opened on air failure)

To close the valve turn hand wheel (3) clockwise.

**Pulling hand adjustment:**

(Valve closed on air failure)

To close the valve turn hand wheel (3) clockwise.

**Attention:** Before changing to automatic service turn hand wheel (3) to upper position and replace hand-wheel safety lock (6) into lower bore.

- 3.4 If the servomotor works by lever and rods, it has to be mounted firmly. The rods have to be very stiff, their joints and rotation points should be central to the servomotor. On medium lift the rods should build a right angle to servomotor and valve to effect the most favourable power transmission.

### 4. Lift adjustment

If there is no valve connected to the actuator and the actuator is without pressure, the lift indicator (53) is screwed onto the threaded pin of the spindle (37) so far that it points for about 1 mm over the end of the lift marking of the lift plate (54). The lift indicator can be turned when the clamping screws (52) are loosened.

For lift adjustment with valve connected, see mounting and operating instructions for control valves.

For special lift limitation, please request for accessories.

### 5. Adjustment of initial tension in the spring

The initial tension in the spring is adjustable so that the different operating conditions in the valve can be adapted to the available control signal ranges.

The control pressure given to the servomotor must be sufficient to lift the spindle from its end position. If the required pressure for starting the lift movement is above or below the desired starting signal (e.g. 0,2 bar), it is corrected at the spring-tightening screw (42) until starting signal and start of lift correspond. Turning clockwise means increasing, counterclockwise decreasing the spring tension.

## 6. Recommended spare parts

The servomotor is largely service-free and the diaphragm has a long service life. We recommend to keep the following spare parts in store:

Part Nr.	Naming
32	Diaphragm
25, 47	Slide bushing
26	O-ring
38	Spring
41	Quadring

## 7. Exchange of spare parts

The following mounting plan shows the mounting proceedings for the two servomotor versions “ö” and “s” and for the different spare parts. Proceed with the mounting step by step according to the numerical order 1, 2, 3 etc. of the mounting plan. The actuator is provided with enormous forces. This applies also to the spring, especially the reinforced spring. Not in every case is it possible to release the spring totally by the tightening screw (42).

Therefore: **Attention! Use the mounting aid!**

## 8. Instructions for the use of the mounting aids

Please use these mounting aids with:

- actuators with reinforced spring
- all the actuators where the spring is not released by the tightening screw (42).

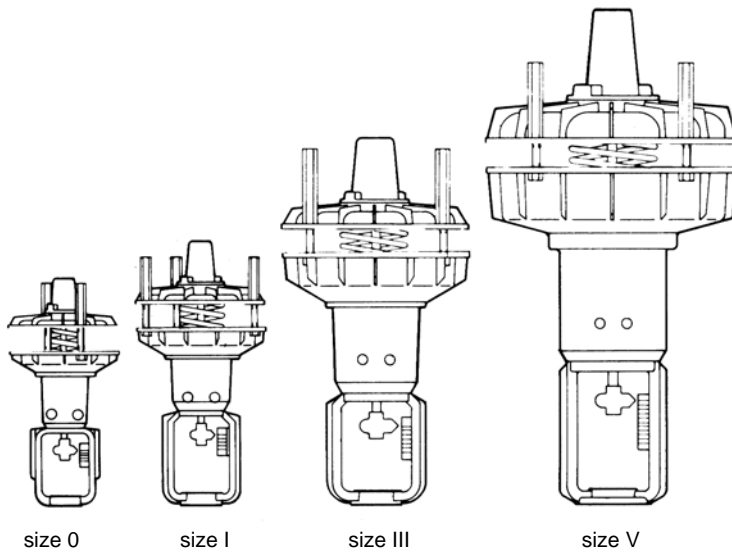
The mounting aids consist of over-long hex. screws of the quality 8.8 and long hex.-nut sleeves.

Mounting succession:

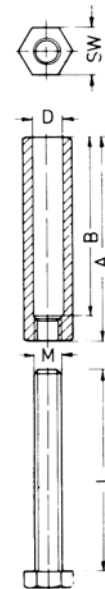
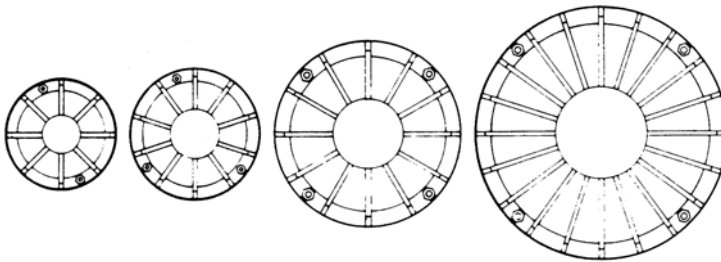
- At first unscrew only 2 to 4 screws (34), symmetrically distributed on the circuit. See drawing on page 4.
- Insert the over-long hex. screws into the 2 to 4 passage holes that are free now and screw the hex.-nut sleeves on these screws.
- Loosen and remove all the other screws (34) so that the connection is only held by the mounting aids.
- Loosen hex.-nut sleeves slowly and evenly on all 2 to 4 mounting aids so that the two body parts (46 and 28) separate and the spring tension reduces.
- Now the actuator can be further disassembled and the spare parts can be replaced. The re-assembling now follows in reverse succession.

**Important:** Only in a few cases you can dispense with the mounting aids, if the spring is not to be exchanged, and the pressure chamber lies at the top. A flinging out of the spindle (37) with the diaphragm plate (33) is avoided by

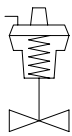
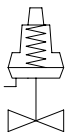
- firmly clamping the lift indicator (53) on the spindle (37) so that the lift indicator can lean on the tightening screw (42).
- keeping the spindle (37) and the valve spindle coupled by means of the lift indicator (53) so that the valve plug comes to the upper stop.



Number and distribution of the mounting aids.



	U0 and UI	UIII and UV
	mm	mm
A	75	145
B	65	133
D	9	11
SW	13	17
M	M8	M10
L	75	150
Screw designation	M8 x 75 DIN 933-8.8	M10 x 150 DIN 933-8.8

<b>Mounting Plan</b>	Reversing	Spare parts exchange with					
		Pressure chamber on top „S“ 			Pressure chamber below „Ö“ 		
		Diaphragm (32)	Bearings and O-ring (25,26)	Spring (38)	Diaphragm (32)	Bearings and O-ring (25,26)	Spring (38)
Loosen cyl. screws (23) and remove cap (22) resp. hand adjustment.	1		1				
Release spring (38) by turning tightening screw (42) counterclockwise until screw turns easily and spring plate (43) rests on spring casing (46).	2	1	2	1	1	1	1
Loosen clamp screws (52) at lift indicator (53) and remove divided lift indicator from spindle (37).	3			2	2	2	
Remove hex. nuts (21) in upper part of support.	4				3		
Remove screws (34, 36) at diaphragm cover. If diaphragm sticks, separate by screw-driver at peripheral slit. If spring tension is still high, at first fasten the mounting aids. See paragraph 7 and instructions for using the mounting aids on the back side.		2 *	3 *	3	4	3	2
Remove spacer (27) from spindle (37) and unscrew central nut (29).		3			5		
Exchange diaphragm (32) with a new one. Cloth-reinforced side towards diaphragm plate.		4			6		
Remove diaphragm cover (28) with support (55) from spindle.						4	
Exchange O-ring and/or slide bushing (25, 26).			4			5	
Take diaphragm plate (33) complete with spindle (37) and diaphragm (32) out of casing (46).				4			
Take off spring case (46) and spring plate (43).							3
Exchange spring (38) with a new one.				5			4
Turn servomotor round and place it on support.	5						
Further mounting analogous to succession: Furthermore: Adjustment of initial tension of spring, see para. 5 Lift adjustment see para. 4	4 to 1	3 to 1	3 to 1	4 to 1	5 to 1	4 to 1	3 to 1

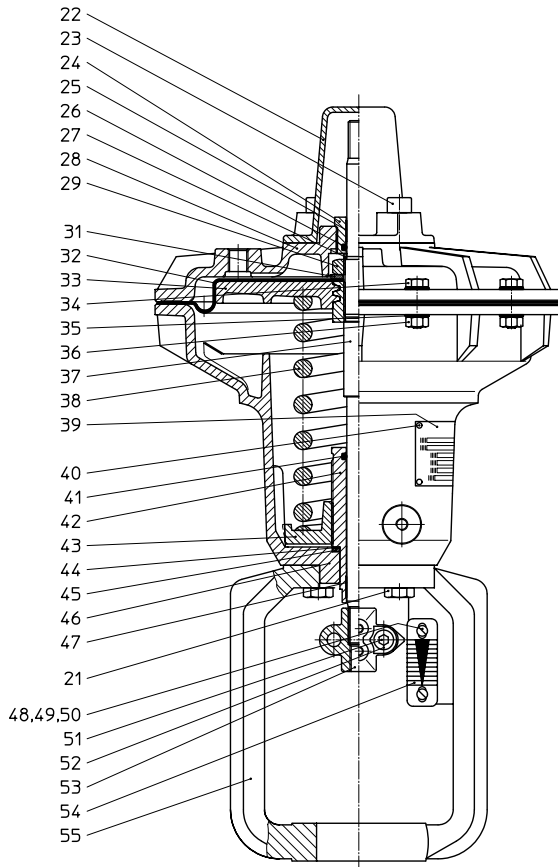
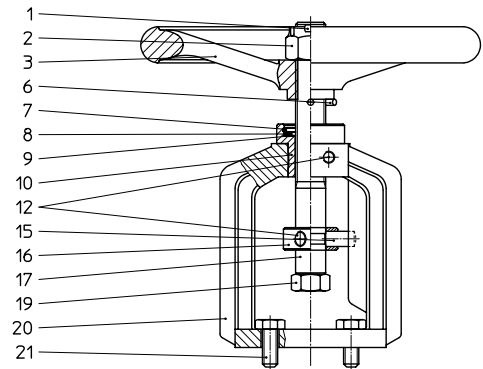
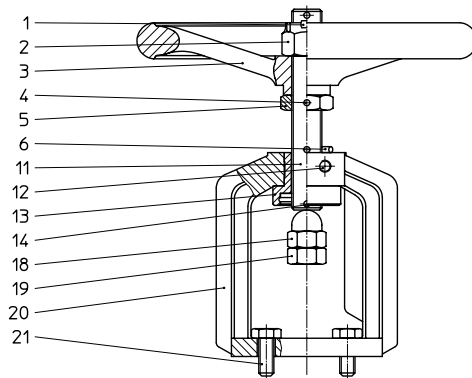
\*See notes under point 8!

**Attention:**

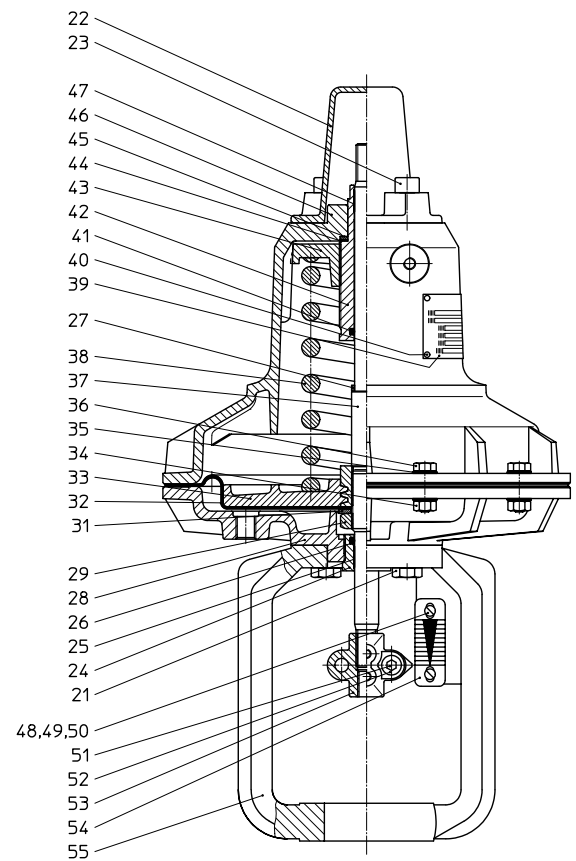
On mounting the diaphragm actuator please pay special attention!

1. Before tightening the screws (34) adjust diaphragm cover (28) and spring casing in such a way that both parts are mounted concentric.
2. The code numbers on both of the stroke indicator halves (53) have to be consistent.  
(Danger of mixing up in case of mounting several stroke indicators at one time).

## 9. Drawing



„S“  
to close



„Ö“  
to open

### 10. Parts List

Position	Naming
1	Splint
2	Nut
3	Hand wheel
4	Adapter sleeve
5	Hex. nut
6	Hand-wheel lock
7	Bearing lock
8	Bearing disc
9	Bearing
10	Guide bushing
11	Hand-wheel spindle
12	Screwed pin
13	Threaded bushing
14	Adapter sleeve
15	Plug notched-pin
16	Clamp ring
17	Hand-wheel spindle
18	Cap nut
19	Hex. nut
20	Support for hand wheel
21	Hex. screw
22	Cap
23	Cyl. screw
24	Guide bushing
25	Slide bushing
26	O-ring
27	Spacer

28	Diaphragm cover
29	Hex. nut
31	Disc
32	Diaphragm
33	Diaphragm plate
34	Hex. screw
35	Disc
36	Hex. nut
37	Spindle
38	Spring
39	Name-plate
40	Notch rivet
41	Quadrang
42	Tightening screw
43	Spring plate
44	Supporting disc
45	Teflon disc
46	Spring case
47	Slide bushing
48	Cyl. screw
49	Toothed disc
50	Hex. nut
51	Hex. nut
52	Cyl. screw
53	Lift-indicator
54	Lift-plate
55	Support