

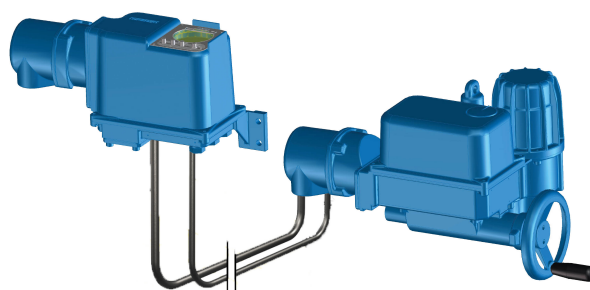
# **DREHMO**

## **VALVE ACTUATORS**

**A member of the AUMA Group**

## **Additional operating manual**

### **Of type SIMC with limit switching unit**



Operation and servicing instructions

Part. no: 384771

Revision: 1.0

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Keep this manual for future reference.

These operating manual is only valid in connection with the operating manual for i-matic.

# Table of Contents

<b>1</b>	<b>Commissioning</b>	<b>3</b>
1.1	Setting the torque values . . . . .	4
1.2	Setting the limit positions . . . . .	5
1.3	Setting the reduction gearing for multi-turn actuators . . . . .	6
1.4	Setting the reduction gearing for part-turn actuators . . . . .	9

# 1 Commissioning

The following chapter describes the commissioning step for DREHMO i matic actuators (for high temperatures) .

### NOTICE

**All explanations below relating to commissioning apply to actuators with clockwise closing valves.**



- Clockwise output drive rotation corresponds to direction CLOSE
- Counterclockwise output drive rotation corresponds to direction OPEN
- DR and WR switches are designated for torque and limit position in direction CLOSE
- DL and WL switches are designated for torque and limit position in direction OPEN
- The yellow transit screw must be unscrewed, after the setting of the limit positions

### CAUTION

**All working steps are performed while cover is open. Danger of pinching and contact with live parts**

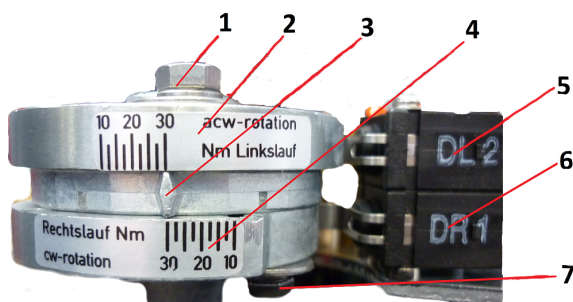


- The actuator may only be opened by suitable trained and qualified staff

## 1.1 Setting the torque values

The torques are set by manufacturer as instructed according to the order. The torques are only indicated on the name plate if this is specifically requested. If no torques are specified on the order, the smallest possible torque is set by the manufacturer. The torque can be infinitely varied within the range given on the name plate by means of the torque scales affixed to the unit.

Use the setting screws for torque setting if torque signals are to be used (refer to figure 1.1). Loosen screw on top of the cams if torque setting is to be performed in direction OPEN. The screw on the bottom of the cams is used for torque setting in direction CLOSE. After unfastening the respective screw, the cams can be readjusted by turning. Turn the cam until the desired value on the scale is aligned with the mark. Finally, fasten the appropriate screw.



1. Locking screw for torque adjustment OPEN
2. Scale with setting range for torque in direction OPEN
3. Setting mark (in this instance 30 Nm for both directions)
4. Scale with setting range for torque in direction CLOSE
5. Torque switch for direction OPEN in standard version
6. Torque switch for direction CLOSE in standard version
7. Locking screw for torque adjustment CLOSE

Figure 1.1: Torque setting



### **DANGER**

#### **Exceeding the maximum permitted torque**

- A setting above the maximum permitted torque is not permitted.



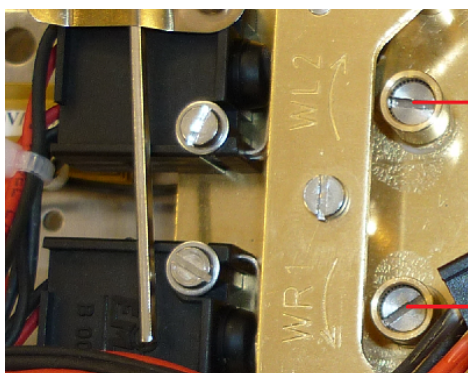
### **DANGER**

#### **Regard the permitted torque range for additional gears, if used**

- For actuators that are delivered with an additional gear or thrust unit by the manufacturer, the permitted torque range is written outside the housing cover.

## 1.2 Setting the limit positions

For setting the limit positions for OPEN and CLOSE, use the setting screws as shown in figure 1.2.



1. Setting screw for limit position OPEN
2. Setting screw for limit position CLOSED

Figure 1.2: Limit switches in standard version

For setting a limit position, operate the actuators into the desired position. Press the screw downward by means of the screwdriver and turn in direction of the arrow. The limit position is set when the cam operates the appropriate limit switch. After the setting procedure, release the screw.

Setting screws for limit positions engage in short intervals while being turned. Once cam

lines up with switch and it operates, stop turning. If the cam is turned too far by mistake, repeat the entire setting process from the beginning.

**NOTICE**

**The signal of the potentiometer is converted into a 4–20 mA**

- Adjust the reduction gearing to the stroke to make it run correctly

### **1.3 Setting the reduction gearing for multi-turn actuators**

To reset the reduction gearing according to table 1.1, loosen the fixing screw item 4 in figure 1.3. After unfastening the screw, the sliding wheel can be moved up (smaller angle for the mechanical position indicator) and down (larger angle for the mechanical position indicator). As soon as the new position of the sliding wheel has been reached, fasten the fixing screw.

**NOTICE**

**Observe correct position of the sliding wheel!**

- The splines of the sliding wheel must fully engage into the counterwheel.

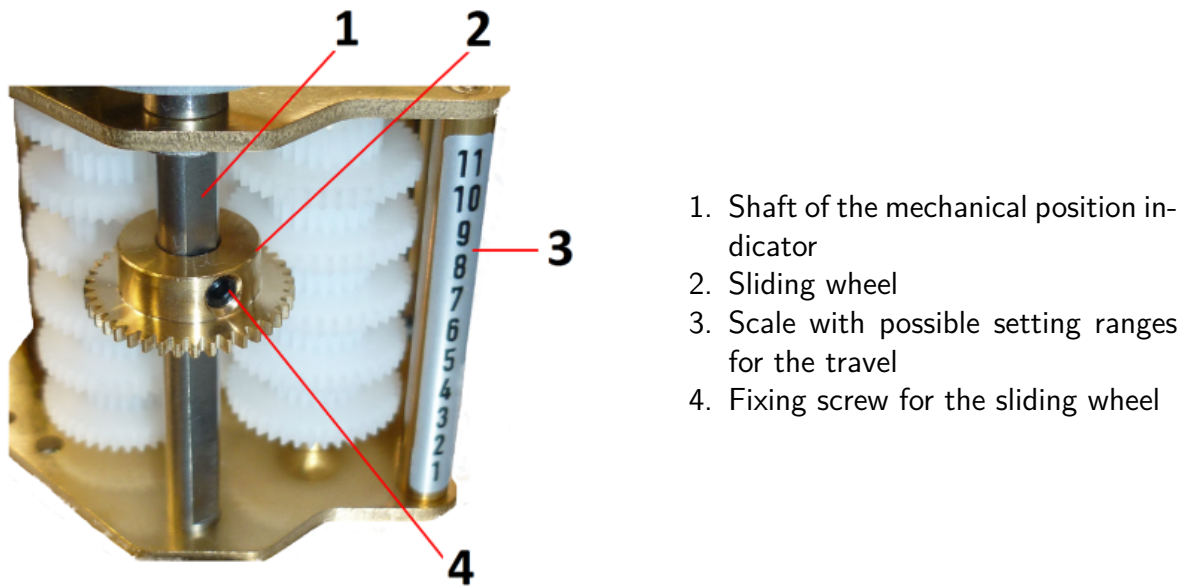


Figure 1.3: Reduction gearing

There is a gear wheel at the bottom of the base plate. The figure 1.4 shows the version for section III. For section II there would be a big instead of a little gear wheel. The opposite gear wheel is mounted on an output drive of the actuator.

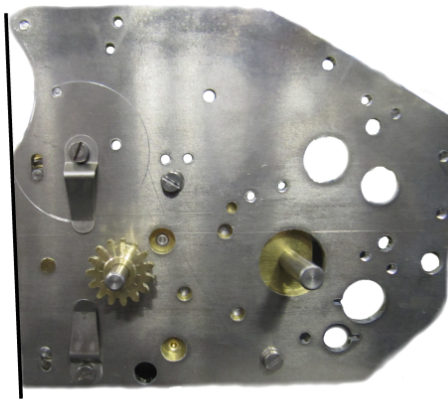


Figure 1.4: limit switching unit input drive gear wheel

The reduction gearing is available for a range between 1.38 – 1,450 turns/stroke. The range is divided into two sections: III (1.38 – 135 turns/stroke, large gear wheel to small gear wheel) and II (12.4 – 1450 turns/stroke; small gear wheel to large gear wheel). Changing between these ranges requires exchanging the gear wheels on the bottom of the limit switch base plate. By moving the sliding wheel in one of the positions 4 – 11, the required travel range can be selected.

Transmission ratio of limit switch wheels	Turns per travel (min. and max.)	Position of sliding wheel
1:3 (SectionIII)		1
1:3 (SectionIII)		2
1:3 (SectionIII)		3
<b>1:3 (SectionIII)</b>	<b>1.38 – 2.49</b>	<b>4</b>
<b>1:3 (SectionIII)</b>	<b>2.5 – 4.5</b>	<b>5</b>
<b>1:3 (SectionIII)</b>	<b>4.6 – 8.2</b>	<b>6</b>
<b>1:3 (SectionIII)</b>	<b>8.3 – 15</b>	<b>7</b>
<b>1:3 (SectionIII)</b>	<b>15.1 – 27.2</b>	<b>8</b>
<b>1:3 (SectionIII)</b>	<b>27.3 – 49.6</b>	<b>9</b>
<b>1:3 (SectionIII)</b>	<b>49.7 – 90.1</b>	<b>10</b>
<b>1:3 (SectionIII)</b>	<b>90.2 – 135</b>	<b>11</b>
3:1 (SectionII)		1
3:1 (SectionII)		2
3:1 (SectionII)		3
3:1 (SectionII)	12.4 – 22.4	4
3:1 (SectionII)	22.5 – 40.8	5
3:1 (SectionII)	40.9 – 74.2	6
3:1 (SectionII)	74.3 – 135	7
<b>3:1 (SectionII)</b>	<b>135 – 245</b>	<b>8</b>
<b>3:1 (SectionII)</b>	<b>246 – 446</b>	<b>9</b>
<b>3:1 (SectionII)</b>	<b>447 – 811</b>	<b>10</b>
<b>3:1 (SectionII)</b>	<b>812 – 1450</b>	<b>11</b>

Table 1.1: Setting the reduction gearing of the limit switching unit for multi-turn actuators

The values of the sliding wheel positions 1 – 3 are available on request.  
 Selection of the highlighted options is recommended and preferred.

#### NOTICE

If no stroke range is specified on the order, the reduction gear will be preset at factory



- For output speed of 5–50 turns/minute the factory setting is section III
- For output speed of 80–160 turns/minute the factory setting is section II



Setting:

1. If the required rev/stroke ratio of the actuator is communicated to the manufacturer upon ordering, the actuator is correctly set in the factory.
2. Determine actuator revolutions per stroke (e.g. actuator speed per minute x acting time in minutes).
3. Determine factory-preset range II or III. Determine actuator speed (via type designation on the actuator rating plate, e.g. D60 A-40 = 40 rpm)  
Range III preset: actuators with output speed 5-50 rev/stroke.  
Range II preset: actuators with output speed 25 -160 rev/stroke.

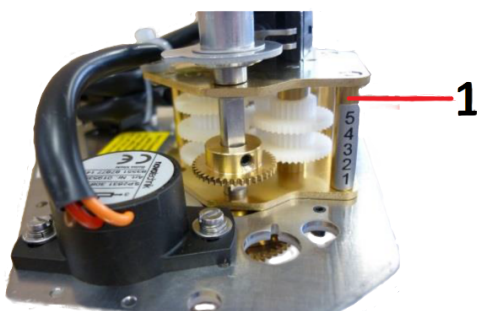
Alternative determination:

Turn sliding wheel into position 1. Perform approx. 13 handwheel turns while observing the mechanical position indication (if existing) or the operating cams of the intermediate position switches. If the angle of rotation is  $> 150^\circ$ , range III has been preset otherwise range II.

4. Set the reduction gearing according to the calculated value by shifting the sliding wheel with regard to table 1.1.

### 1.4 Setting the reduction gearing for part-turn actuators

This limit switching unit is of similar design, however equipped with a reduction gearing including mere 5 stages (refer to figure 1.5).



1. Reduction gearing with five stages

Figure 1.5: Setting the reduction gearing of the limit switching unit for part-turn actuators

The reduction gearing has a variable setting range, resulting from the plug-in sequence of the gear wheels at the bottom of the mounting plate. The sections II (small on large gear wheel) + III (large on small gear wheel) can be respectively preselected by exchanging the gear wheels on the bottom of the limit switching base plate. For section I, use two gear wheels of identical size. The setting options of this reduction gearing are specified in the following table 1.2.

Additional gearing	Without		SQ	SQ	SQ
Size	DPIM30...DPIM119		DPIM75... DPIM450	DPIM600... DPIM900	DPIM1200... DPIM1800
Swing angle	90°	180°	90°	90°	90°
Reduction ratio	none	none	5,5	11	25,3
Number of teeth LS	III/15:45	III/15:45	I/30:30	II/45:15	II/45:15
tr/stroke min.	0.25	0.5	1.375	2.75	6.325
Sliding wheel position	1	2	2	1	2
Turning angle $\alpha$ Cam shaft	175.4	193	177.5	214.5	271.3
Settling time %	58.5	64.3	59.1	71.5	90.4

Table 1.2: Setting the reduction gearing of the limit switching unit for part-turn actuators

### NOTICE

#### Different layout for DP319, DP799, DP1599



- The actuators DP319, DP799 und DP1599 are equipped with a limit switching unit with 11 stages (refer to section 1.3)



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