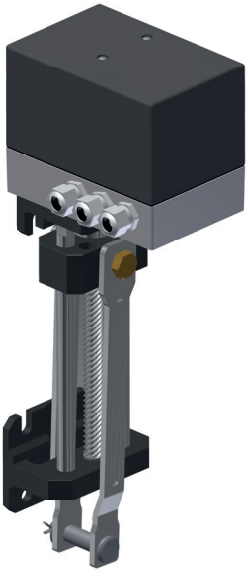
ARIS
Stellantriebe

Operating instructions for

ARIS Damper Actuator LINEARIS



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Inhaltsverzeichnis

ARIS Stellantriebe GmbH
Rotter Viehtrift 9
53842 Troisdorf

Tel.: 02241 25186-0
Fax: 02241 25186-99

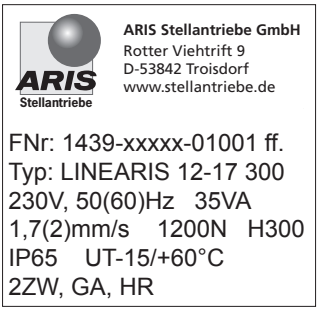
aris@stellantriebe.de
www.stellantriebe.de

1. Identification

This manual is valid for:

Description:	Electric actuator
Type:	LINEARIS
Serial no.:	1439-xxxxx-01001 ff

1.1 Nameplate



← *Serial number*
← *Actuator type*
← *Voltage/Frequency/Power consumption*
← *Actuating time/Torque*
← *Ambient temperature/Protection class*
← *Additional built-in parts*

1.2 Guidelines and standards

ARIS actuators are partly completed machinery according to directive 2006/42/EC. This is certified by a declaration of incorporation (see page 14).

Further applicable EC directives:	EMC Directive 2004/108/EC	
Applied harmonized standards:	LVD (electrical safety)	DIN EN 61010-1:2011-07
	MachDir	DIN EN 12100:2011-03

2. Safety information

2.1 Warnings

Observe the significance of the following symbol and note explanations. They are subdevided in security levels and classified according to ISO 3864-2.

DANGER	DANGER indicates a hazard with a high risk degree, which, if not avoided, causes death or heavy injuries.
WARNING	WARNING indicates a hazard with a medium risk degree, which, if not avoided, can cause death or heavy injuries.
CAUTION	CAUTION indicates a hazard with a low risk degree, which, if not avoided, can cause slight or moderate injuries.
ADVICE	Indicates general advices, useful hints and work recommendations, which don´t have influence on the safety and health of the staff.

2.2 General safety advices

The actuator components are conform to the state of the art and apply as generally safe at the time they are shipped.

This manual serves as basis to install and operate ARIS actuators safety conform. All persons working with or on ARIS actuators must observe this manual and especially its safety advices.

ADVICE	• This manual has to be kept at the operating place at any time. • Read the manual carefully prior to installation and initial operation.
WARNING	Certain parts of active electric appliances are obligatory under voltage.

- Working on electric appliances or equipment is only allowed for electrically qualified persons or other instructed persons under guidance and custody of an electrically qualified person according to the electro-technical regulations.
- Observe all safety and accident prevention regulations while installing, operating and testing any electrical appliances or machinery.
- Prior to all installation or regular work on the actuator make sure to switch off all connected machinery/appliances.

3. Technical specification

3.1 Function and application areas (Intended use)

ARIS actuators are exclusively designed for industrial use. ARIS actuators are utilized for operating regulating and shut-off appliances (valves, ball valves, slide valves, dosing pumps, etc.).

ARIS actuators may not be used for:

- Potentially explosive atmospheres
- Temperatures below -15 °C or over 60 °C (optional +80 °C)
- Underground environments
- Near open fires
- Under water
- Operating elevators

3.2 Safe and accurate use

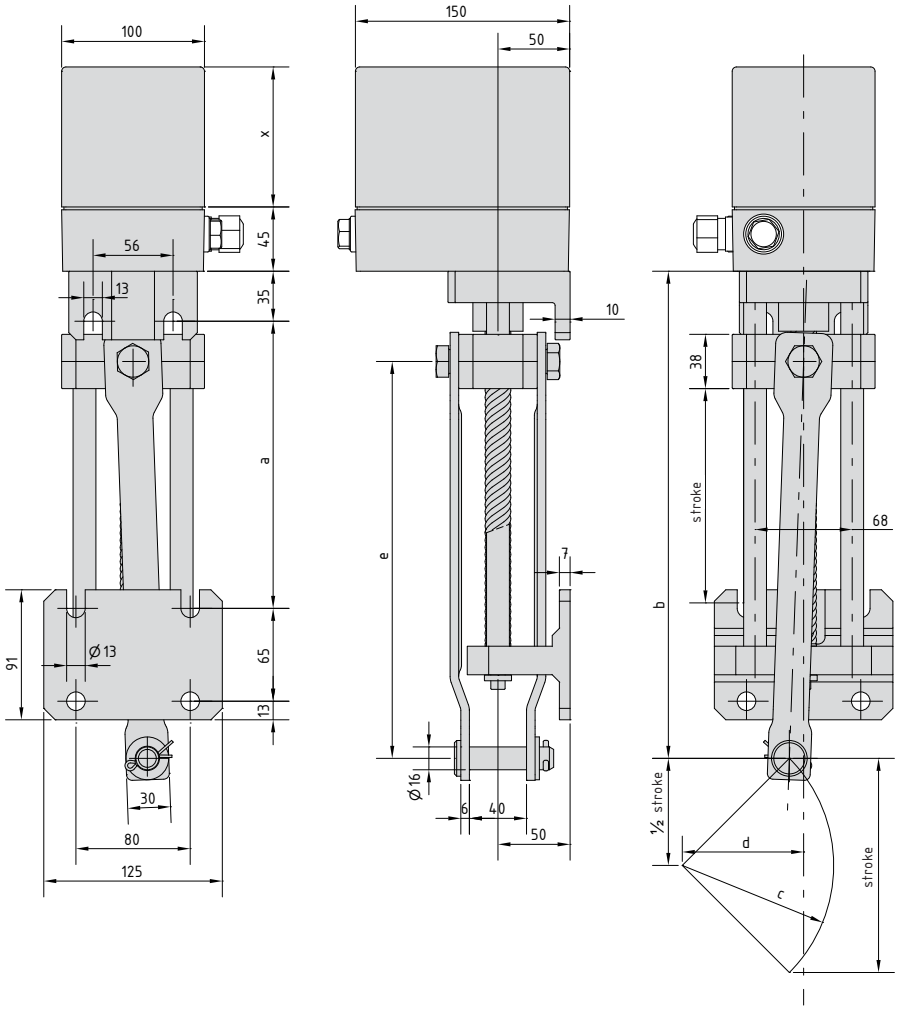
ARIS actuators are factory checked prior to delivery. The final functional testing must be performed within the total system by qualified technical personnel.

The ARIS company assumes no liability for possible manufacturing errors and resulting damages or subsequent damages after the actuator has been tested, installed and declared functional correct. The ARIS company especially assumes no liability for possible manufacturing errors and resulting damages or subsequent damages when the actuator was operated inappropriate, has not sufficiently been tested within the total system, or has not been put out of operation after a failure has determined during testing.

⚠CAUTION	Installation and initial operation only by qualified experts.

- Valves, levers and connecting rods are moving during actuator operation;
- Check for proper function of all emergency equipment on your machinery;
- Check for proper function of the actuator and operated valves after completion of all installation work;
- Never work with or operate a faulty actuator.

3.3 Dimensions



Stroke	a	b	c	d	e
150	201	341	106	85	278
300	351	491	212	170	428

X (Cover height) depending on options: 98–178 mm

3.4 Performance data

- ***Protection class: According DIN EN 60529, IP65, IP66 (option)***
- ***Motor: 230V ±10%, 50/60Hz ±5%, 100% ED (standard)***
  » Special voltage /-frequency see nameplate (option)
  » Insulation class B acc. VDE 0530 (standard motor)
- ***Connection: 3 cable glands M20x1.5 (customer provided)***
- ***Path cut-off: Changeover switch (Opener/Closer)***
  » Switching capacity max. 10(3)A, 250V AC;
  » Closer, plug connections 6.3 x 0.8 mm; Option: Switch with gold contacts, Switching capacity 0.1 (0.05) A, 250 V AC
- ***Ambient temperature***
  » -15 °C bis +60 °C (upto -40 °C with heating (option), upto +80 °C (option))
- ***Installation position: Arbitrary***
- ***Potentiometer (option)***
  » Recommended wiper current: <0.02 mA (RP 19)/<2 µA (MP21)
  » Capacity at +70 °C: 0.5 W (RP19)/1W (MP21)
- ***Stroke: 150 mm or 300 mm***

3.5 Expected lifespan and intended disposal

ARIS actuators have an expected lifespan of several years, depending on their utilization and application. No longer usable actuators must not be dismantled as a whole, but seperately recycled in parts divided by their materials. Non-recyclable components must be disposed according to national disposal regulations.

4. Actuator setup for use

4.1 Transport and (temporary) storage

Use the factory packaging for transport to the installation point.
Replace a damaged original packaging by a new solid packaging.

⚠ WARNING Suspended load

Unsachgemäßer Einsatz von Transportmitteln (Flurförderzeuge, Hallenkran, Hilfsmittel, Anschlagmittel etc.) kann zu Quetschungen und anderen Verletzungen führen. Gefordertes Verhalten:

- Transportmittel sachgemäß einsetzen;
- NICHT unter schwebender Last aufhalten;
- Stellantriebe mit angebauter Armatur: Hebezeug nur an der Armatur befestigen und NICHT am Stellantrieb;
- ARIS Antriebe dürfen nicht als Steig- oder Abstützhilfe benutzt werden;

ⓘ ADVICE Damage by wrong storage

- Store in well-ventilated rooms;
- Protection against possible ground humidity (shelf storage).

4.2 Packaging

ARIS actuators are protected by special cardboard packaging at delivery.

4.3 Safe disposal of packaging

Additionally necessary packaging is made by easily separable packaging materials and can be recycled individually:

- Wood
- Cardboard
- Paper
- Plastics

4.4 Installation and mounting

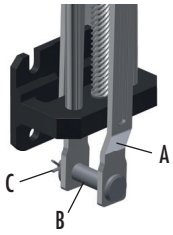
- Inspect the actuator for damages prior to installation;
- check leak tightness of cable glands and blank plugs prior to initial operation;
- tighten the cover screws evenly (max. 1.2 Nm);
- do not operate before limit switches have been adjusted;
- protect the actuator against climatic influences (e.g. by a protective cover);
- do not expose the actuator to hard shocks (e.g. by dropping);
- do not attach ropes, hooks or the like to the actuator;
- permanent overload and blocking leads to actuator damages;
- spark suppressor capacitor can effect the rotation stability of the actuators and may cause damages;
- use only ARIS original spare parts.

Consider prior to attachment of couplings:

- Do not turn the lead screw by force;
- the connection to an actuator or solid underground is made by pre-assembled mounting brackets.

Driver connection

1. The con rods (A) are connected to the valve by a bolt (B).
2. Lubricate moving parts (OKS 416 or similar).
3. Insert the bolt (B) into the bores of the con rods attach the cotter pin (C).
4. Finally bend the cotter pin ends apart.



Installation position: The actuators can be installed position independendly.

ADVICE Protection class IP65 (standard), IP66 (option)

For all actuators observe the following advices:
The initial operation of the actuator is only permitted with orderly closed cover and closed cable entries. Use only cable glands which are appropriate for the respective protection class.

- Cable entries
  Ensure that all cable entries are closed properly during storage, installation and initial operation.

Use only cables which are suitable for the diameter of the cable entries.
Cover assembly
During the cover assembly make sure that the cover fits correctly.
The cover must not show any damages on the joint surface.
Tighten cover screws evenly (max. 1.2 Nm).

- Housing/Cover

⚠ CAUTION	No additional bores are allowed in the housing and the cover.

4.5 Initial operation

4.5.1 Electrical connection

⚠ WARNING	Hazardous voltage: Possible stroke! • The initial operation must be carried out only by experts! • De-energize the actuator before opening. • Observe the appropriate regulations during electrical installation and initial operation.

Connect the actuator as follows:

- Connect the ground wire of the electric supply to the appropriate protective earth terminal.
- Connect the neutral N to terminal 1.
- Follow the steps under „Set up rotation direction“ (S. 10) during connection of the actuator.
- Always refer to the wiring diagram located inside the actuator.

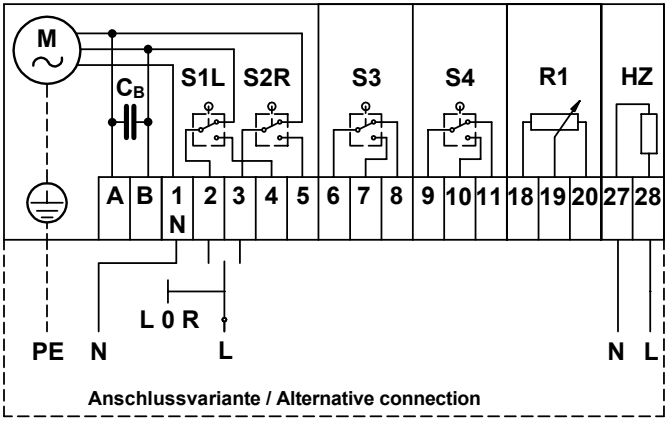
Check before you close the circuit for the first time:

- Is the actuator undamaged on the outside?
- Is the mechanical connection correct?
- Has the electrical connection been made regularly?
- Check if current type, voltage and frequency match with the motor data (see nameplate on cover and inside the actuator).
- Insert suitable cable glands for the connection line.
- Observe the wiring diagram inside the cover.
- Use separate (shielded) wires for low voltages (e.g. potentiometer).
- Set up limit switches prior to initial operation (see page 11).

ⓘ ADVICE	All elements, such as switches, potentiomer etc., are factory-wired. Never change the internal wiring.

4.5.2 Wiring diagram

S1L	Limit switch, CCW
S2R	Limit switch, CW
S3	Auxiliary switch 1 (Option)
S4	Auxiliary switch 2 (Option)
S5	Auxiliary switch 3 (Option)
S6	Auxiliary switch 4 (Option)
R1	Potentiometer 1
R2	Potentiometer 2 (Option)
HZ	Heating
M	Current output (Option)
K1	Relais for parallel operation (Option)



ADVICE	All auxiliary switches must be operated within the same voltage range. Do not mix line voltage with low voltage.
	For options follow the wiring diagrams inside the actuator.

5. Operation of the actuators

5.1 Set up rotation direction

Due to the internal wiring, the rotation direction (viewing direction is through the actuator towards the shaft) and the limit switches assign as follows:

1. With line voltage on terminal 1 and 2, the actuator shaft rotates ***counter-clockwise*** and results in a pushing stroke. Limitation of this stroke with lower switch S1L. When the switch is activated, line voltage is on terminal 4.

2. With line voltage on terminal 1 and 3, the actuator shaft rotates ***clockwise*** and results in a pulling stroke. Limitation of this stroke with lower switch S2L. When the switch is activated, line voltage is on terminal 5.

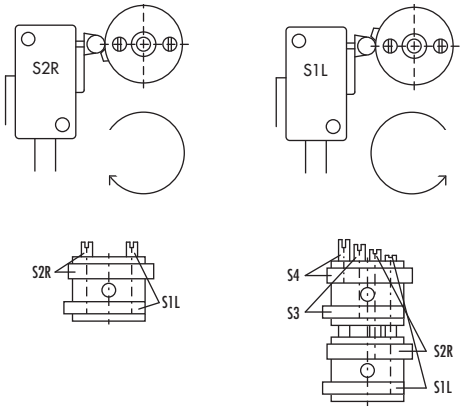
3. If the actuator runs counterrotating to the commands, change the external connection of terminal 2 and 3 .

ADVICE	Depending on the model, limit switches may be arranged different than drawn in the wiring diagram (see wiring diagram inside the actuator).

5.2 Set up limit switches

Depending on the model, the cams may be factory pre-adjusted to a switching position.

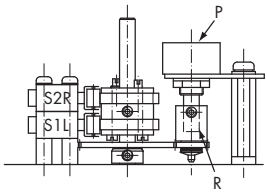
1. Apply voltage for CCW run (pushing stroke). The actuator moves towards the preset direction.
2. Depending on the model, the shaft rotates with or against the rotation direction of the lead screw. Switch off voltage when the desired end position has reached (avoid blocking of the gear!).
3. Turn the switch cam „S1L“ via the adjustment screw „J“ in rotating direction of the shaft until the appropriate switch „S1L“ clicks.
4. Check setup by moving the actuator again electrically and adjust if necessary.
5. Adjust all other switches accordingly.



5.3 Optional modules and extra features

5.3.1 Potentiometer

Electrical connection
Connect terminals 18, 19 and 20 according to the desired requirements (voltage ≤ 50V); (see page 10). Use only separate (shielded) wires.

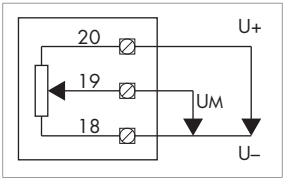


Adjustment
Set up limit switch before adjusting the potentiometer P. Approach both end positions electrically (see chapter 5.2). Observe travel and potentiometer solution.

Do not overrun the ordered travel to avoid damage to the friction clutch R by permanent override. Potentiometer P adjusts roughly automatically.

The travel of the valve is transferred to the rotating angle of the potentiometer by the friction clutch R. Approach both end positions again electrically and adjust potentiometer P with the friction clutch R.

ADVICE All potis must generally run under a potential divider circuit.



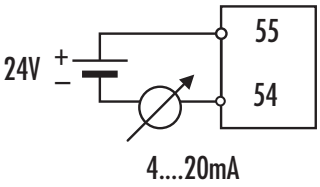
5.3.2 2-wire-current output 4-20 mA

Electrical connection
Connect terminal 54 and 55 according to the wiring diagram (see page 10). Use separate (shielded) wire with minimum diameter of 0.5 mm² and a max. length of 1000 m.

Setup
Operate the current output via buttons „4“ and „20“. Assigning arbitrary positions for 4 mA and 20 mA is possible at any time. The lower and upper current limit (4/20 mA) is programmed steady.

a) Assignment of end position 4 mA:
- Approach end position;
- press button „4“ more than 2 sec.;
- release button „4“;
- the end position is programmed and active at once.

b) Assignment of end position 20 mA:
- Approach end position;
- press button „20“ more than 2 sec.;
- release button „20“;
- the end position is programmed and active at once.



5.3.3 Gear disengagement

⚠ CAUTION Vor Betätigen der Getriebeausrastung muss die Gewindespindel gegen selbstständiges Verdrehen gesichert werden.

1. Switch off operating voltage of actuator.
2. Move lever (Auto/Manual) to position »Manual«. Flow of power between motor and output shaft is interrupted.
3. This position serves for quick adjustments of the output shaft during adjustment work.
4. Turn the fitting to the desired position (no need to disengage output and fittingshafts). (Control cams of the position limit/auxiliary position switches and potentiometer turn with it. Set positions are retained.)
5. Move lever (Auto/Manual) back to position »Auto«. Power flow between motor and fitting is restored.
6. Switch-on operating voltage of actuator.

AUTO **HAND**

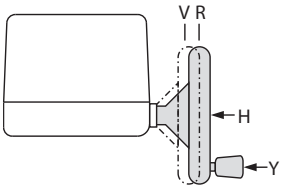
ⓘ ADVICE To avoid the risk of overrunning the limit stop switches during manual operation, set the limit positions of the fitting mechanically. The actuator must not be electrically activated when disengaged!

5.3.4 Hand wheel (option)

In the event of a power failure the actuator can be operated with the help of a hand wheel.

ADVICE	The hand wheel may be operated only in power-off condition.

1. Switch off operating voltage of the actuator and if equipped with gear disengagement, move this to „Manual" position.
2. Push hand wheel H into position V and turn in the desired direction. (Control cams of position switches and potentiometers are also turned with it. Set positions are retained).
3. After reaching the desired position let the hand wheel H go (it returns automatically to its initial position R).



ADVICE	To avoid overrunning position switches and the potentiometer during manual operation, set the limit positions of the actuator mechanically.

6. Required customer information

6.1 Extraordinary situations

Run frequent testings during operation. Observe especially:

- Intended use of the actuator (chapter 3.1);
- unusual noise, heavy vibration or high temperatures;
- check screws for tight seat;
- check cable entries, cable glands and blank plugs for tight seat and possible leakness;
- condition of electric wires.

If failure appear, set the actuator out of order and correct the error.

ADVICE	If you can not correct the error, contact an ARIS service person. More information under: www.stellantriebe.de

6.2 Troubleshooting and repair

WARNING	Hazardous voltage: Possible stroke! • Troubleshooting and repair only by experts! • Cut off voltage before opening the actuator.
CAUTION	Moving parts at built-on valves: Possible bruise! • Troubleshooting and repair only by experts!
ADVICE	We recommend a repair at the ARIS factory. More information under: www.stellantriebe.de

7. Maintenance

7.1 Service

Actuator

ARIS actuators of type Nano have a lifetime lubrication and are generally maintenance-free.
The drive head ist exchangeable separately.

⚠ CAUTION	Dismount all additional parts (valve or rods) before exchanging the drive head! Dismount the drive head only under a load-free condition.

Linear unit

Maintenance-free by dry-run, no lubrication necessary.

ADVICE	We recommend a visible and functional actuator check during plant service work, but at least once a year. (s. Kapitel 4.5.1)

7.2 Accessories

No special tools are required for installation.

7.3 Spare parts

ADVICE	Order spare parts at aris@stellantriebe.de any time. Please always state the serial number of the actuator.

Declaration of Incorporation of partly completed machinery

according
EU directive 2006/42/EC Annex II B „Machinery Directive“

Herewith we declare, that the below mentioned incomplete machinery

Product description:	Elektrische Schwenk-, Dreh- und Linearantriebe
Product Types:	CL-S, CL-M, CL-L, CL H and identical

Fulfills the basic requirements of the annex I of the directice 2006/42/EC, if it applies to the appropriate order:
1.1.2; 1.1.3; 1.1.5; 1.3.4; 1.4.1; 1.4.2.1; 1.5.1; 1.5.2; 1.5.4; 1.5.6; 1.5.8; 1.5.9; 1.5.11; 1.6.4; 1.7.3; 1.7.4

The following harmonized standards were applied: DIN EN ISO 12100:2011-03 („Safety of machinery“)

The product is a partly completed machinery in accordance with Article 2 letter g of the Directive 2006/42/EG. The special technical documents according to annex VII part B have been created. For reasonable requests these documents can be sent electronically to the responsible authorities.

Regarding the outgoing electrical hazards of the partly completed machinery, the safety objectives of directive 2006/95/EC ("Low Voltage Directive") are complied in accordance with Annex I No. 1.5.1 of Directive 2006/42/EC. Applied harmonized standard:

DIN EN 61010-1:2011-07 (“Safety requirements for electrical equipment for measurement, control, Control and laboratory use ")

The initial operation of this incomplete machinery is only permitted, if it is approved that the facility or machinery in which it will be installed corresponds to the EC directive 2006/42/EC, if it applies.

Authorized representative for collection of relevant technical documents:

Claudio Usai
Quality and product safety
ARIS Antriebe und Steuerungen GmbH
Rotter Viehtrift 9
D-53842 Troisdorf

This declaration is invalid if the machinery is changed or rebuilt in a manner it was not designed for.

Troisdorf, 02. January 2014

i.V. C. Usai

C. Usai (Quality and product safety)

ARIS Antriebe und Steuerungen GmbH
www.stellantriebe.de
Rotter Viehtrift 9
D-53842 Troisdorf
Telefon +49(0)2241-25186-0
Telefax +49(0)2241-25186-99

Subject to technical changes.

ARIS Stellantriebe GmbH
Rotter Viehtrift 9
53842 Troisdorf / Germany

Tel.: +49 2241 25186-0
Fax: +49 2241 25186-99
aris@stellantriebe.de

www.stellantriebe.de

ARIS
Stellantriebe