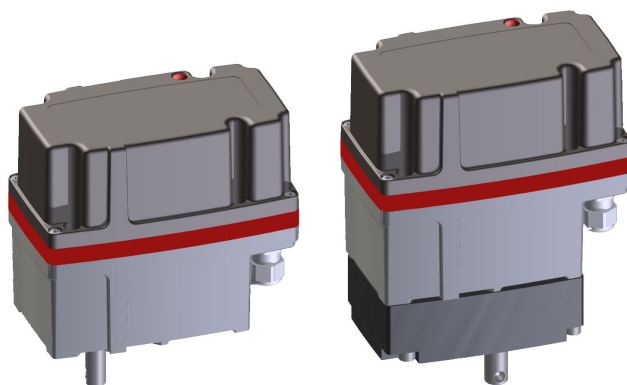


Original declaration of
incorporation with manual for

ARIS actuator Nano



incl. operating manual for

ARIS Microprocessor-Controller PMR-Nano

115 V AC / 230 V AC only

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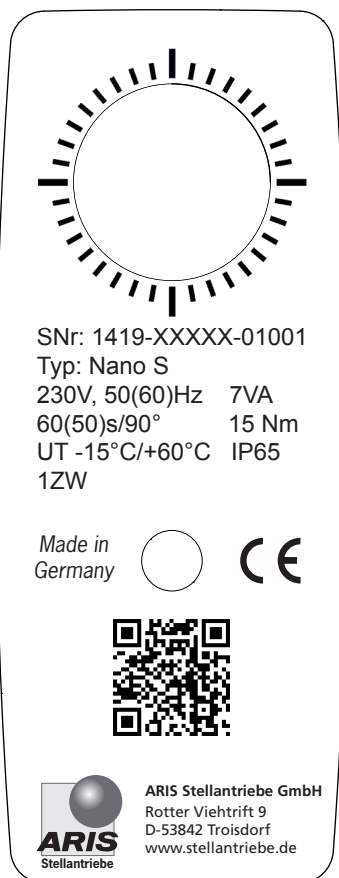
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1. Identification

This manual is valid for:

Description: Electric actuator
Type: Nano S / Nano M
Serial no.: 1419-xxxxx-01001 ff.

1.1 Nameplate



← Mechanical position indicator

← 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) MachDir EMC Directive 2004/108/EC	DIN EN 61010-1:2011-07 DIN EN 12100:2011-03 DIN EN 61000-3-2 DIN EN 61000-3-3 DIN EN 61000-6-2 DIN EN 61000-6-3 DIN EN 55011:2001-04 DIN EN 61000-6-4:2011-09
Protection classes by housing (IP-Codes):	Protection class test	DIN EN 60529:1991



ADVICE

EMC consideration of the complete plant and system perturbations and their combating have to be carried out by the plant builder or operator. The wiring of the actuator should comply with DIN EN 60204-1.

2. Safety information

2.1 Warnings

Symbols: Installation and initial operation only by certified experts according to the manual.

Observe the significance of the following symbol and note explanations. They are subdivided 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

3.2 Safe and accurate use

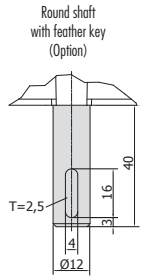
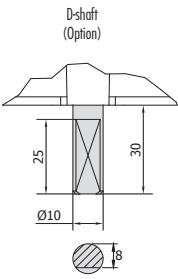
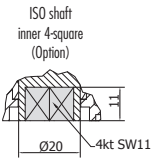
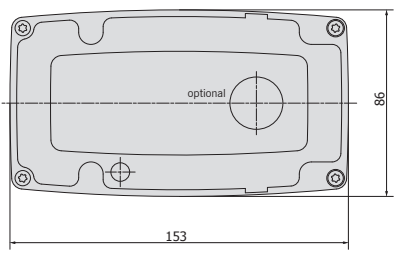
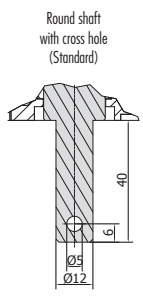
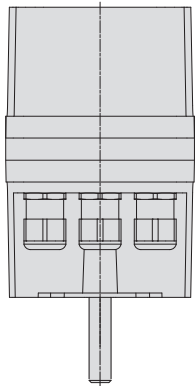
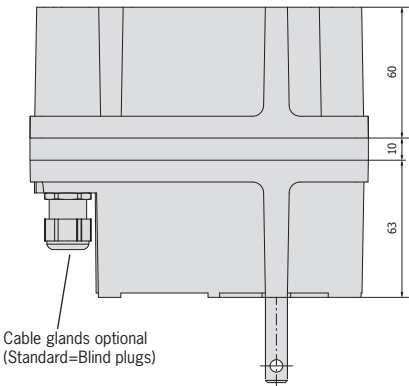
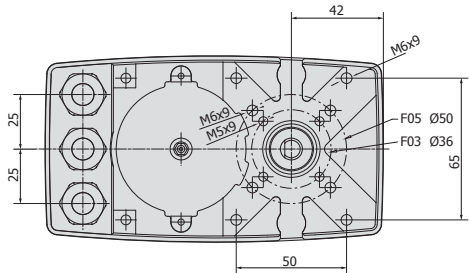
ARIS actuators are factory checked prior to delivery. The final functional testing must be performed within the total system by qualified technical personnel.

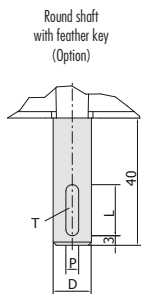
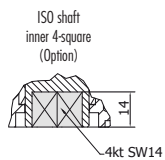
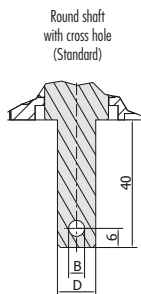
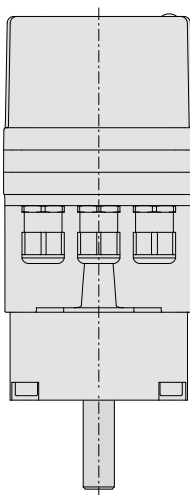
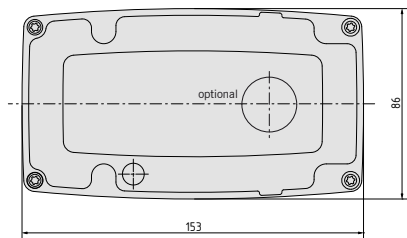
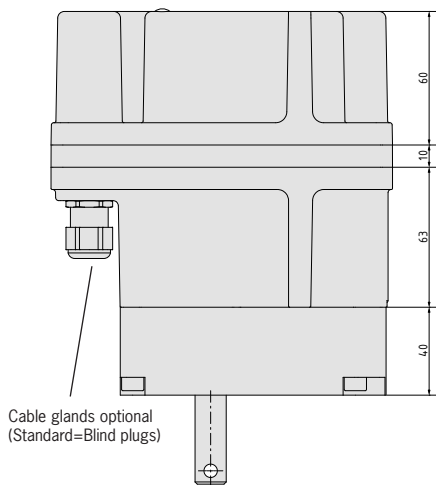
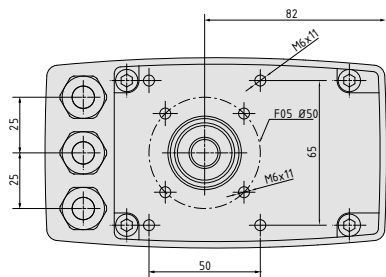
The ARIS company assumes no liability for possible manufacturing errors and resulting damages or subsequent damages after the actuator has been tested, installed and declared functional correct. The ARIS company especially assumes no liability for possible manufacturing errors and resulting damages or 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.

VORSICHT

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.





Type	D	B	L	P	T
30 bis 40 Nm	12	5	16	4	2.5
50 bis 60 Nm	14	6	22	5	3

3.4 Performance data

- **Protection class:** IP65 (optional IP66, IP67)
- **Motor:** 230V $\pm 10\%$, 50/60Hz $\pm 5\%$, 100% ED (standard)
 - » Special voltage/-frequency see nameplate (Option)
 - » Insulation class E acc. DIN EN 60034-1
- **Motor:** 24 V DC (Option) $\pm 20\%$, ED S3 50%
 - » Insulation class B acc. DIN EN 60034-1
- **Connection:** 3 cable glands M16x1.5 (customer provided), M20x1.5 (option)
- **Path cut-off:** Changeover switch (opener/closer)
 - » Switching capacity max. 10(3)A, 250V AC
- **Ambient temperature**
 - » -15 °C up to +60 °C (optional +80 °C)
- **Installation position:** Arbitrary
- **Potentiometer (Option)**
 - » Recommended wiper current: 0,2 μ A
 - » Capacity at +70 °C: 0,5 W
- **Travel:** 10°...330°

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 separately 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

Improper use of transportation (ground conveyer, overhead crane, tools, lifting means etc.) can cause crushes and other injuries.
Required behaviour:

- Use transportation properly;
- DO NOT step or stand under suspended loads;
- Actuators with attached valves: Attach lifting gear only on the valve and NEVER on the actuator;
- Do not use ARIS actuators as a climbing or support aid;



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;
- the screw-in depth of connecting thread holes must not exceed 9 mm;
- 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 actuator shafts by force;
- actuator and valve shafts must run central (possible adjustment by flexible coupling);
- the attachment to the valve is made by actuator-attached brackets.

Installation position: The actuators can be installed position independently.



ADVICE

Protection classes IP65 (optional IP66, IP67)

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:

ADVICE

The wire diameter must be designed according to the respective power consumption of the actuator and the required cable length. The nominal wire sizes for actuators of the Nano series are min. 0.5 mm² and max. 2,5 mm².

Too small wire diameter can often be the cause of malfunctions!

- Connect the ground wire of the electric supply to the appropriate protective earth terminal.
- Connect the neutral N to terminal N.
- 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).

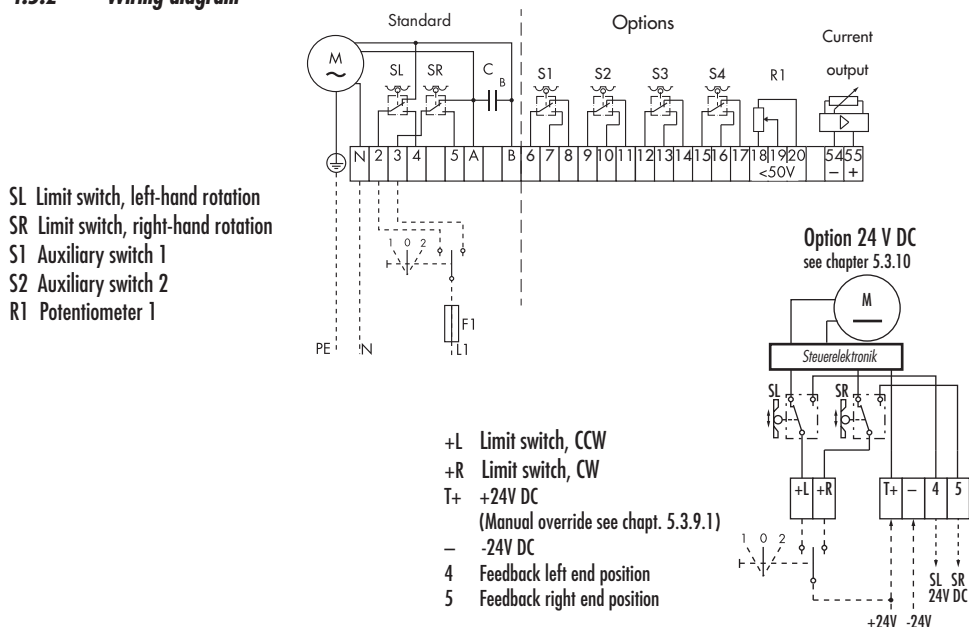
ADVICE

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

! ADVICE

In ARIS actuators no protection against defects in power circuit is available. Required fuses and disconnector switches must be planned and used. The current values for respective sizing is derived from the power consumption of the motor (s. Nameplate).

4.5.2 Wiring diagram



! ADVICE

All auxiliary switches must be operated within the same voltage range. Do not mix line voltage with low voltage.

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**. Limitation of this rotation direction with upper switch SL. 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**. Limitation of this rotation direction with lower switch SR. 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.

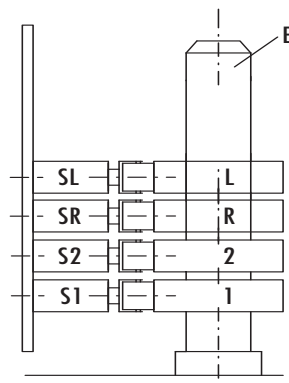
! ADVICE

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 (Self-adjusting switch cam)

The switch cams are turnable by hand and do not have to be fastened.

1. Apply voltage (see page 10): Actuator rotates in given direction.
2. Switch off voltage when the desired end position has reached (no blocking of gear).
3. Turn switch cam L in rotating direction of the cam shaft E until limit path switch SL clicks.
4. Set up switch cam R for contrary rotating direction as described under step 1–3.
5. Check setup by moving the actuator again electrically and adjust if necessary.



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 $\leq 50V$); (see page 10). Use only separate (shielded) wires.

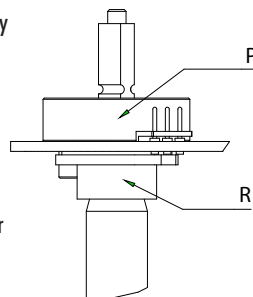
Adjustment

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 by permanent override. Potentiometer P adjust roughly automatically.

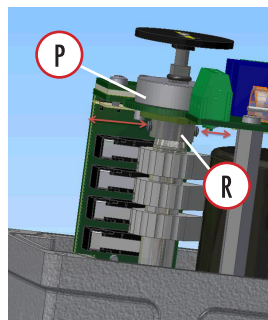
The travel of the valve is transferred to the rotating angle of the potentiometer by the friction clutch R. Approach both end positions again electrically (see page 15) and adjust potentiometer P with the friction clutch R.



5.3.2 Potentiometer with fixed shaft coupling

Adjustment

Setting the path limit switch before adjusting the potentiometer P. Approach both limit positions electrically (see Section 5.2). Note the travel and potentiometer resolution. To fix the position tighten the two thread pins after setting the potentiometer by using the supplied Allen key. The ordered travel range must not be exceeded, otherwise a damage to the clutch R and the potentiometer can not be excluded.

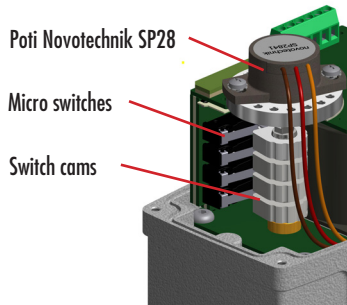


5.3.3 Potentiometer with approval acc. to DIN EN 12067-2 (TÜV-Poti)

Fail-safe potentiometer return for regulation of fuel, air and exhaust streams in combination with electronic compound control systems.

 ADVICE	At the installation of a regulation valve a consistently positive mechanical connection between the output shaft of the actuator with the valve shaft must be ensured.
	At delivery the wiper is in the electrical center.

Overview TÜV-Poti



 ADVICE	The in the actuators optional built in additional auxiliary limit switches must not be used for safety-related position feedback.
--	---

Electrical connection

Connect terminals 18, 19 and 20 according to the desired needs (voltage $\leq 50V$); (see page 11). Use only separate, shielded wires.

Adjustment

Set the limit switch prior to adjustment of the potentiometers SP28. Electrically drive towards both end positions (see chapter 5.2). Match both travel and potentiometer resolution.

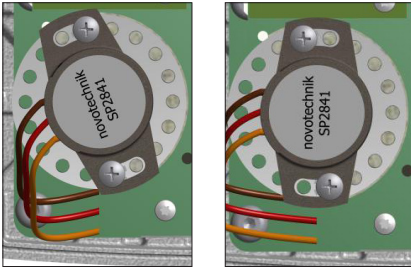


Fig. 1:
Poti adjustment up to 20°: Adjustment within the long holes. No move of screws necessary.

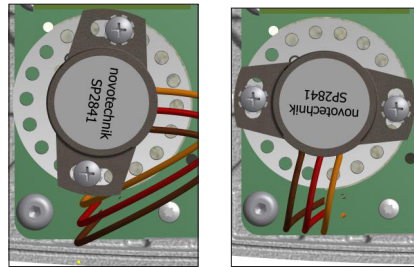


Fig. 2:
Poti adjustment 20° to 360°: Screws must be moved.

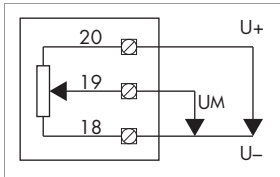
Within the long holes, the poti can be rotated up to 20° per hole (Fig. 1). If a rotation of more than 20° is necessary, the poti fastening screws are moved to the next hole. Then poti kann be moved in 20° steps up to 360° (Fig. 2). Fasten the screws with a torque of 1.8 Nm.

! ADVICE

It is mandatory that the factory-set TufLok screws must be used after loosening.
Recommendation: Secure the poti fastening screws with thread-lock fluid.

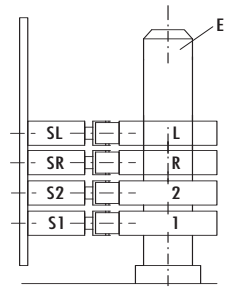
! ADVICE

All potis must generally run under a potential divider circuit.



5.3.4 Additional limit switches (Self-adjusting switch cam)

1. Approach desired position. Switching position must be approached from the desired rotating direction.
2. Turn switch cams „1“ resp. „2“ in rotating direction of the cam shaft E until limit switch „S1“ resp. „S2“ clicks.
3. Check setup by moving the actuator again electrically and adjust if necessary.



5.3.5 2-wire-current output 4-20 mA

Electrical connection

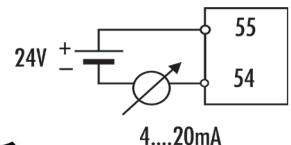
Connect terminal 54 and 55 according to the wiring diagram (see page 10). Use separate (shielded) wire with minimum diameter of 0.5 mm^2 and a max. length of 1000 m.

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.

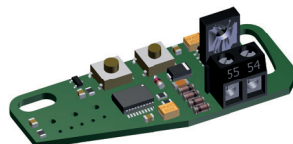
a) Assignment of end position 4 mA:

- 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.



5.3.6 Mechanical position indicator

The mechanical position indicator serves as a reference for the shaft position on the sight-glass and it is adjustable.

Adjustment: Adjust the mechanical position indicator by turning the angle pointer (marked with an arrow) and the enclosed arrow labels.



Ratio position indicator to valve position on Nano M: The ratio at Nano S is always 1 : 1

Type	Pos.ind. at 90°	Type	Pos.ind. at 90°	Type	Pos.ind. at 90°	Type	Pos.ind. at 90°
M 30-06	193.5°	M 40-09	288°	M 50-20	288°	M 60-20	288°
M 30-12		M 40-12	193.5°	M 50-50		M 60-50	
M 30-30		M 40-30	193.5°	M 50-90		M 60-90	
M 30-60		M 40-60	193.5°	M 50-180		M 60-180	
M 30-120		M 40-120	193.5°				

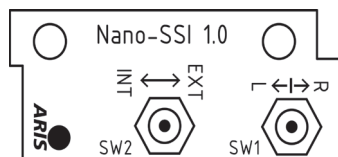
5.3.7 Service switch (230 V AC only)

Adjusting and service work can be done by using the service switch.

Operation:

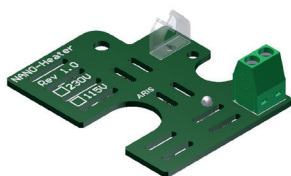
Set the switch „SW2“ to „INT“ „Manual operation“. The actuator can now be moved via the switch „SW1“ left (position „L“) or right (position „R“).

For operation by an external controller, set the switch „SW2“ to „EXT“. Switch „SW1“ is without function now.



5.3.8 Heating resistant (230 V AC only)

Heating element for use of actuators in cold-humid environments. To avoid condensation water inside the actuator at fluctuating temperatures.

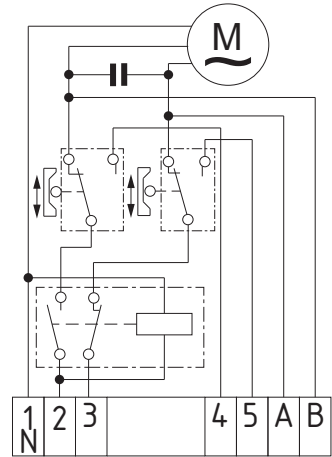
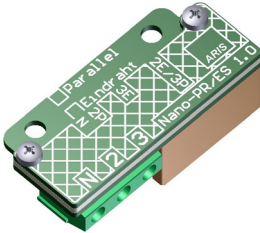


! ADVICE

The heater resistant is wired at factory. Never change the internal wiring. Observe the wiring diagram inside the actuator cover.

5.3.9 Single wire control (230 V AC only)

For use as open/close regulation by external controller or switching appliances with normally open or break contact. The rotation direction reverse is made by a built-in switching relay.

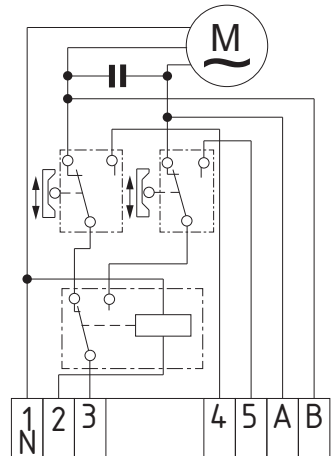
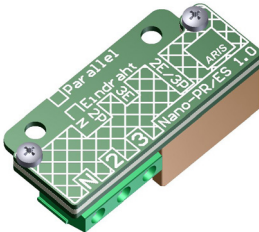


ADVICE

The add-on board with the single wire control is wired at factory. Never change the internal wiring. Observe the wiring diagram inside the actuator cover.

5.3.10 Parallel relay (230 V AC only)

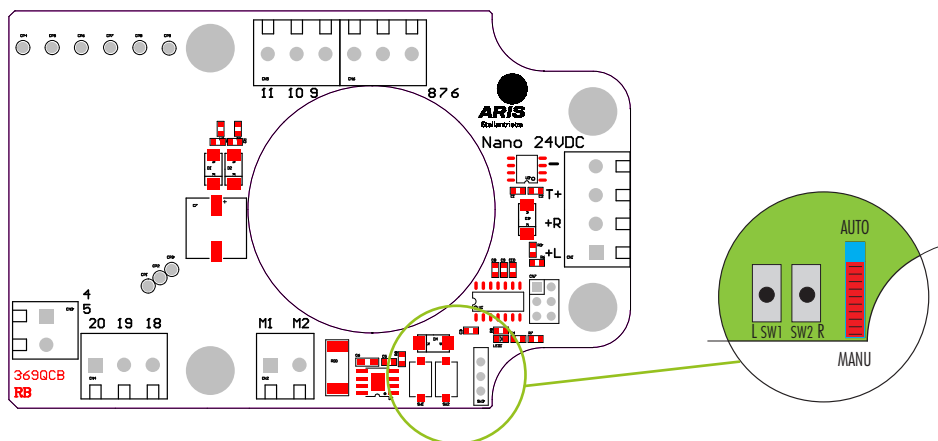
The integrated relay makes it possible to run several actuators in parallel mode over one switching contact.



ADVICE

The add-on board with the parallel relay is wired at factory. Never change the internal wiring. Observe the wiring diagram inside the actuator cover.

5.3.11 Power supply 24 V DC (Special edition)



5.3.11.1 Service switch

Use the service switch to perform adjustment and service works on the actuator. For this, terminal T+ must hold a direct current of 24 V DC.

Operation:

Set the sliding switch to „MANU“ (manual operation). The actuator can now be moved left with the button „L SW1“ (position „L“) or right with the button „R SW2“ (position „R“). For operation via an external controller set the sliding switch to „AUTO“. The buttons „L SW1“ and „R SW2“ are without function now.

! ADVICE

The actuating time of an actuator with direct current motor changes load dependant. The indicated actuating time refers to an actuator load with the indicated torque (see name plate).

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 leakiness;
- 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



Hazardous voltage: Possible stroke!

- Troubleshooting and repair only by experts!
- Cut off voltage before opening the actuator.



Moving parts at built-on valves: Possible bruise!

- Troubleshooting and repair only by experts!



We recommend a repair at the ARIS factory.

More information under: www.stellantriebe.de

7. Maintenance

7.1 Service

ARIS actuators of type Nano have a lifetime lubrication and are generally maintenance-free.

7.2 Accessories

No special tools are required for installation.

7.3 Spare parts



Order spare parts at aris@stellantriebe.de any time.

Please always state the serial number of the actuator.

ARIS Stellantriebe GmbH
Rotter Viehtrift 9
53842 Troisdorf / Germany

www.stellantriebe.de

Tel.: +49 2241 25186-0
Fax: +49 2241 25186-99
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Manual for

ARIS Microprocessor- Controller PMR-Nano

115 V AC / 230 V AC only

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Intended use

ARIS microprocessor controllers, series PMR-Nano, are used for activating ARIS actuators. They are integrated in the actuator housing. PMR-Nano series microprocessor controllers position the actuator based on a reference input (set point). The PMR controller compares the preset set point with the current position of the actuator (actual value). In case the values differ from each other, the actuator is moved to the position specified by the set point. The actual value is determined by a potentiometer, integrated in the actuator.

Electrical connection

Protective measures shall be implemented in accordance with VDE (Association of German Electrotechnical Engineers) and EVU (Electricity Board) regulations. In particular, VDE Regulation 0105 "Working on Live Components" shall be followed.

For electrical installation, make sure to follow the enclosed wiring diagram.

Supply lines to microprocessor controller and actuator must meet the conductor cross-section as specified in the VDE regulations.

For low voltages (set point/actual value signalling cable) use **shielded** conductors of minimum cross-section 0.5 sq.mm. and maximum length of 1000 m.

Make sure to connect one end of the shielding to the housing mass (earthing terminal).

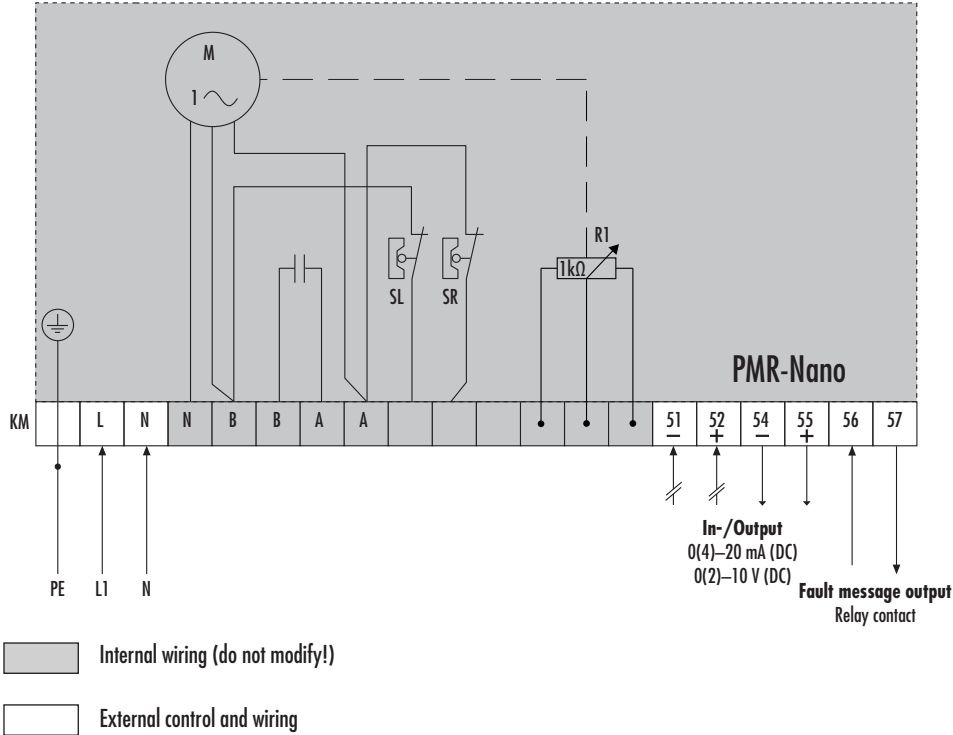


ADVICE

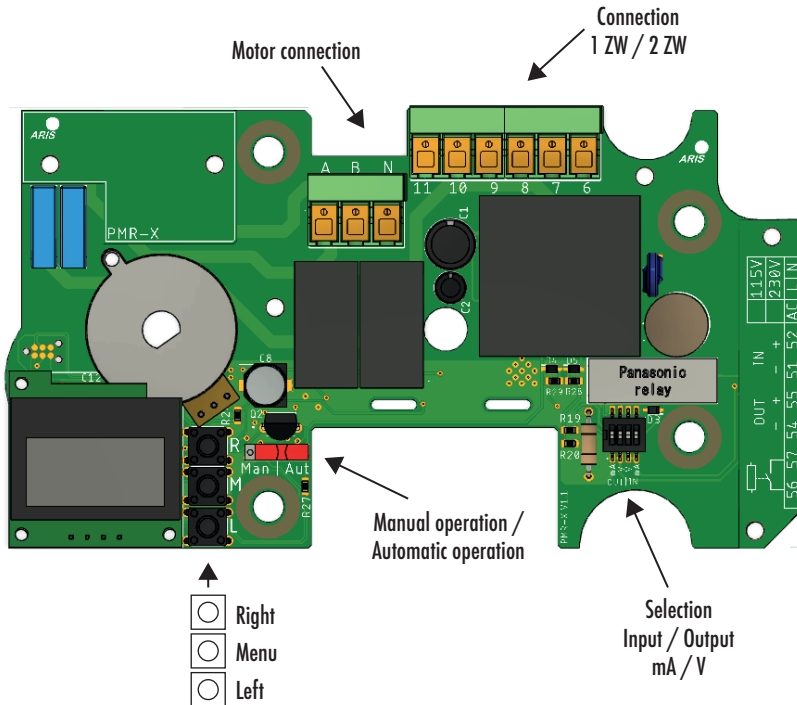
Never attempt to modify the internal wiring of the actuator.

Wiring diagram (Built-in version)

- KM Terminal strip for microprocessor controller
- M Actuator motor
- SL Limit switch, CCW rotation
- SR Limit switch, CW rotation
- R1 Potentiometer for actual value



Circuit board



General information

This product is a controller for activation with standard signals. The PMR-Nano control board converts the standard signal in CW or CCW motor activation.

! ADVICE

Position limit switches and potentiometer are not preset upon delivery from factory.

According to the actuated fitting it is necessary to set position limit switches and potentiometer to the regulating distance (max. 90° at the output shaft of the actuator).

! ADVICE

Controller is delivered un-programmed from factory.

Through programming, set points must be assigned to the controller for the stop positions within the range of 0° and 90° (min. difference 18°). Once programming is completed, the positions within the range of the stop positions are approached as activated.

DIP switches

The DIP switches must be set according to the desired configuration.

For current input and current output → **1 & 4 at ON** and **2 & 3 at OFF**.

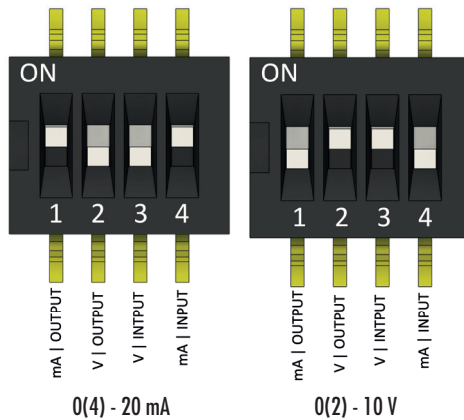
For voltage input and output → **2 & 3 at ON** and **1 & 4 at OFF**.

1 & 2 or **3 & 4** must never be ON at the same time, otherwise it can lead to malfunctions and defects.

However, a combination of current input and voltage output as well as voltage input and current output is possible.

Example: current input and voltage output 2 & 4 or voltage input and current output 1 & 3.

Set DIP switches when the power is off to avoid damage.



Programming

If the drive is not programmed, there is no function in automatic mode. As in manual mode, it is displayed that no configuration has been made.

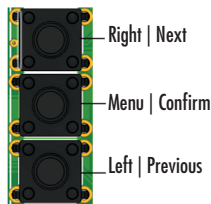
Manual	M
NO CONFIG	

Automatik	A
NO CONFIG	

You can switch between the modes using the slide switch. Switching to automatic moves the drive directly to the specified setpoint. If there is no setpoint, it moves to the set 0% position, unless wirebreak detection is activated.



To start the configuration, press the „Menu“ button for approx. 1s. The screen then changes to the menu view and the various menu items can be selected.



Via the upper button „Right | Next“ the menu is advanced to the end. Via the lower button „Left | Back“ back accordingly. Via the middle button „Menu | Confirm“ a submenu item is selected. The menu is exited by switching to automatic mode or via the corresponding menu item.

---Menu---	M
PRESS M FOR	
END CONFIG	

Press and hold the middle menu button to return to manual mode (= drive can be operated manually).

Menu

The menu items are structured in such a way that the complete configuration is run through once and the drive is then fully operational. Parameters that have already been configured are indicated by a tick symbol next to the value. This makes it possible to understand the settings that have already been made.

ARIS Intern

This setting is made internally by Aris and must not be changed. Depending on the gear, the actual value input must be adjusted. If the setting is incorrect, the right end position can no longer be set or the drive moves incorrectly. Possible source of error!

---Menu---	M
Invert	
No	

---Menu---	M
Invert	
Yes	

---Menu---	M
Invert	
Back	

End positions

The first menu item is the setting of the end positions. It must be started with the left end position. If there is a change later, you can start with both end positions. Confirming the „End Position“ menu item directly displays the „Left End“ item. After confirmation, the end position can be approached. Confirm this again and the menu item for the right end position is displayed. If both end positions are set, the submenu item „Back“ is displayed, which leads back to the main menu.

---Menu---	M
End position	

---Menu---	M
End position	
Left End	

---Menu---	M
End position	
Right End	

---Menu---	M
End position	
Back	

Important: The left end position must be on the left in the direction of rotation of the axis. An assignment whether left or right is 0% is possible in the following step. If the right end position is physically to the left of the left end position, an error is displayed. The menu can be exited despite an error message by switching to automatic mode and then back to manual.

Cams

The cams reflect the end positions. The end positions are set with the cams and approached when setting the end positions via the menu. The end position is stored using the cam.

It is also possible to store end positions in front of and between the cams. The cams switch off the motor safely, independently of the electronics in the event of a fault.

If the cam is in front of the end position and switches off the motor too early, the controller cannot reach the end position and remains in this mode until another command is received. This can result in 0(4) mA not being displayed, for example, but a higher value that does not correspond to 0%.

0% assignment

In the next menu item, the assignment is made as to whether 0% should be left or right.

---Menu---	M
0% Set	
Left = 0%	

---Menu---	M
0% Set	
Right = 0%	

---Menu---	M
0% Set	
Back	

Analog input/output

The analog input and output is selected in the following two menu items. Each submenu item from the input can be combined with each of the four from the output. The correct setting of the DIP switches must be observed.

---Menu---	M
Analog Input	
0-20 mA	

---Menu---	M
Analog Input	
4-20 mA	

---Menu---	M
Analog Input	
0-10 V	

---Menu---	M
Analog Input	
2-10 V	

---Menu---	M
Analog Input	
Back	

---Menu---	M
Analog Output	
0-20 mA	

---Menu---	M
Analog Output	
4-20 mA	

---Menu---	M
Analog Output	
0-10 V	

---Menu---	M
Analog Output	
2-10 V	

---Menu---	M
Analog Output	
Back	

Stop/start hysteresis

Since this is a two-point controller, the hysteresis setting is crucial for accuracy. The stop hysteresis indicates how much earlier the motor switches off before reaching the target value in order to approach it precisely.

The setting ranges from 1-10, experience has shown that a setting of 2-4 is sufficient. The following applies: the higher the value, the sooner the motor stops.

In addition, the start hysteresis can be set, which determines the deviation from the setpoint from which the PMR should readjust. The setting here ranges from 1-4, with 1 representing the minimum deviation. If the motor adjusts too much, it is advisable to select the next higher level.

---Menu---	M
Stop Hysteresis	
1-10	

---Menu---	M
Stop Hysteresis	
Back	

---Menu---	M
Start Hysteresis	
1-4	

---Menu---	M
Start Hysteresis	
Back	

Attention: If both hystereses are selected too low, it can happen, depending on the motor/gear combination, that the controller does not exactly reach the target value, but switches back and forth around it.

Note: The highest accuracy is achieved when the entire path is traversed. The PMR has a 10-bit input, which refers to the ordered travel, e.g. 90°. However, a setting of at least 18° is recommended if a smaller angle is to be used.

Wirebreak detection

When selecting 4-20 mA and 2-10 V there is a possibility of detecting a broken wire. If „Broken Wire“ is activated, the PMR issues an error message as soon as the signal falls below 4 mA or 2 V, and the error message output is also switched.

---Menu---	M
Broken Wire	
Deactivate	

---Menu---	M
Broken Wire	
to 0%	

---Menu---	M
Broken Wire	
Stop	

---Menu---	M
Broken Wire	
to 100%	

---Menu---	M
Broken Wire	
Back	

1. Deactivate: The actuator moves to 0%, the fault message output is not activated.
2. to 0%: The actuator moves to 0% end position.
3. Stop: The actuator remains on the actual position.
4. to 100%: The actuator moves to 100% end position.

For 0-20 mA and 0-10 V the setting has no effect. If the signal is lost, the drive always moves to the 0% position without switching the signaling output.

Hardware/firmware state

Both states are displayed here, this is important for support.

---Menu---	M
FW X.X	
HW X.X	

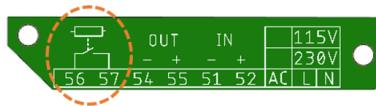
Menu end

Back to manual mode at the end of the menu: press the menu button >1s.

---Menu---	M
PRESS M FOR	
END CONFIG	

Fault message contact

The PMR has a fault message contact (potential-free). This is switched by default in manual mode. In addition, it switches when a wire break occurs.



Error Code

The PMR can output an „Error 11“ during the setting up of the end positions. This means that the right end position is physically to the left of the right end position. During setup, the drive must first be moved to the left end position using the left button, then to the right end position using the right button. During setup, the arrows on the display must rotate like the axis of the potentiometer.

Possible mistakes:

- At the right end position, the drive is moved to the left from the left end position. The assignment of 0% (0/4 mA) is done in another step.
- The first menu item has been changed. There are drives where the axis of the potentiometer rotates in the opposite direction to the drive axis due to a substructure gear. With these drives, the first menu item must be set to „Yes“. For all other drives, the selection where the potentiometer axis and drive axis rotate at the same time must be set to „No“. This menu item inverts the potentiometer and affects the display.

There are no other error codes, except for the alarm contact related to a broken wire.

Technical data

Power supply	115 V & 230 V, 50/60 Hz (motor dependent) Special voltage/frequency see nameplate	
Set value input	0(4)-20 mA (DC)	<i>Burden 250 Ohm / 500 mW</i> <i>Reverse polarity protection</i>
	0(2)-10 V (DC)	<i>Reverse polarity protection</i> <i>Overload protection</i>
Actual value output	0(4)-20 mA 0(2)-10 V Resolution 10 bit	
Fault message output	Relay contact (potential-free) max. 500 mA!	



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:	Electrical actuator
Product Types:	nano and identical

Fulfills the basic requirements of the annex I of the directive 2006/42/EC, if it applies to the appropriate order:

1.1.2c,e; 1.1.3; 1.1.5; 1.3.4; 1.5.1; 1.5.2; 1.5.4; 1.5.5; 1.5.6; 1.5.8; 1.5.9; 1.5.11; 1.6.1; 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 accordance with Article 2 letter g of the Directive 2006/42/EC. 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 with 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 Stellantriebe 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, 01. June 2014

C. Usai (Quality and product safety)

Subject to technical changes.

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