ARIS
Stellantriebe

Original declaration of incorporation with manual for

ARIS
Damper actuator
LINEARIS TE

ADVICE After first start (RE blinks in the display), the end positions must be adjusted.

CE

LITE1537EN01

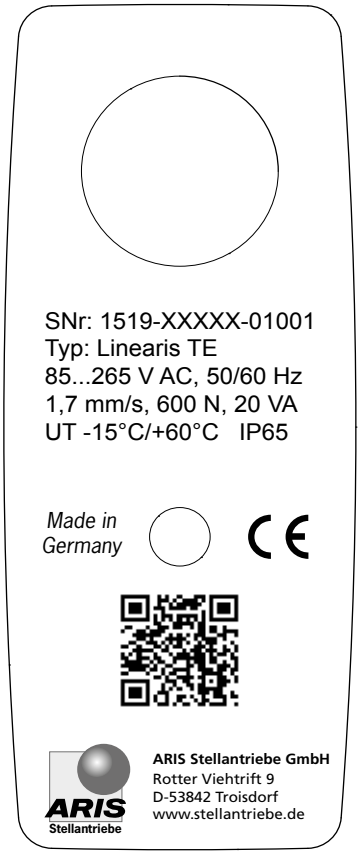
Inhaltsverzeichnis

1. Identification

This manual is valid for:

Description:	Electric actuator
Type:	Linearis TE
Serial no.:	1519-xxxxx-01001 ff.

1.1 Nameplate



← *Serial number*
← *Actuator type*
← *Voltage/Frequency*
← *Actuating time/Force/Power consumption*
← *Ambient temperature/Protection class*

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 30).

Further applicable EC directives:	EMC Directive 2004/108/EC	DIN EN 61000-3-2 DIN EN 61000-3-3 DIN EN 61000-6-2 DIN EN 61000-6-3 DIN EN 61000-6-4 DIN EN 55011
Applied harmonized standards:	LVD (electrical safety) 2006/95/EG	DIN EN 61010-1:2011-07
	MachDir 2006/42/EG	DIN EN 12100:2011-03
Protection class by housing (IP-Code)	Protection class testing	DIN EN 60529:1991

ADVICE	EMC considerations of the overall system and system perturbations and their fight to be treated by the system manufacturer or system operator. The wiring of the actuator should be carried out in accordance 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 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

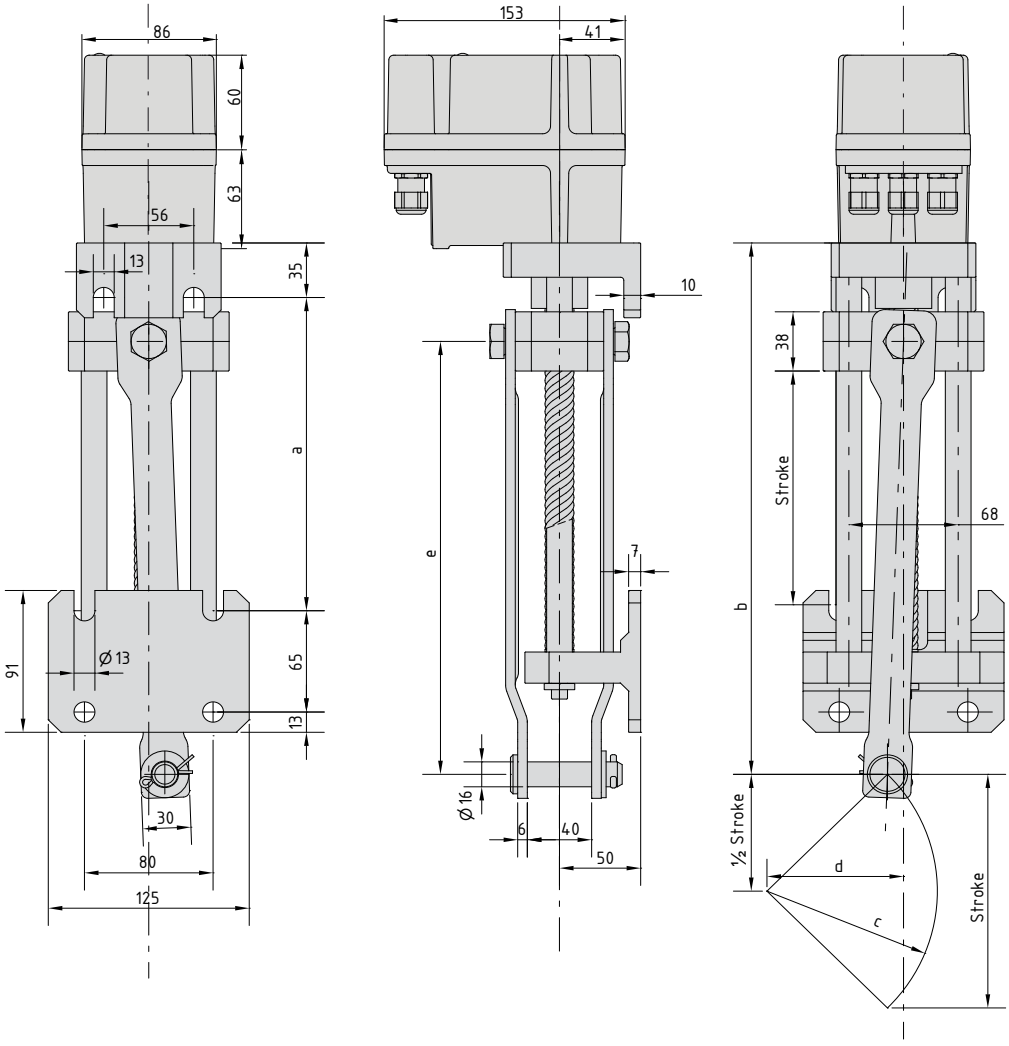
ARIS actuators are factory checked prior to delivery. The final functional testing must be performed within the total system by qualified technical personnel.

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.

All persons who do the installation, commissioning and setting, must
- be specially trained and qualified;
- be mentally and physically capable;
- observe the operating instructions.

- 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.



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

3.4 Performance data

3.4.1 Actuator specifications

Protection class	IP65 (IP 66/IP 67 Option)
Motor	• Supply: 85...265 V AC, 50/60 Hz • Protection: Primary 2A Tr • Control: BLDC • 50/60Hz ±5%, 100% ED • Isolation class E acc. to DIN EN 60034-1
Connection	3 cable entries M16x1.5 (customer provided)
Path cutoff	Digital via magnet sensor
Ambient temperature	-15 °C up to +60 °C
Installation position	Arbitrary
Potentiometer (Option)	Electronic
Travel	150 mm; 300 mm

3.4.2 Specifications I-ACT (PMR)

Function group flash controller, DSP functions	
System resolution	12 bit
Set value input	Current input max. 0...20 mA, burden 250 W Voltage input adjustable 0...5 V or 0...10 V Limited protection against overload and reverse polarity
Actual value transducer	Magnetic position sensor upon basic board
Actual value output	4...20 mA, 0...20 mA, galvanically isolated Burden max. 500 Ω, Output stroke max. 10 V Burden 250 Ω, Output stroke 0...5 V
Operation	3 buttons: Left / MENU / Right 1 switch: AUTO / MANU Status display via two 7 segment displays
Configurable parameters	End position left and right
	Set value input: 0/4/20/free values [mA] or 0/5/10/free values [V]
	Actual value output: 0/4/20/free values [mA] or 0/5/10/free values [V]
	Switch-on and switch-off hysteresis
	Speed reduction
	Fault message output on/off

3.4.3 Zusätzliche Weghilfsschalter (Relaisbaugruppe)

2 or 4 bistable relays holding the switch status in currentless condition.

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 utilization

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

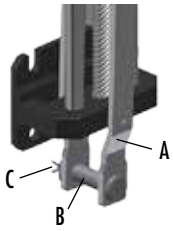
- Inspect the actuator for damages prior to installation;
- the screw-in depth of connecting thread holes must not exceed 9 mm;
- check leak tightness of cable glands and blank plugs prior to initial operation;
- tighten the cover screws evenly (max. 1.2 Nm);
- do not operate before limit switches have 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 centrical (possible adjustment by flexible coupling);
- the attachment to the valve is made by actuator-attached 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 (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.

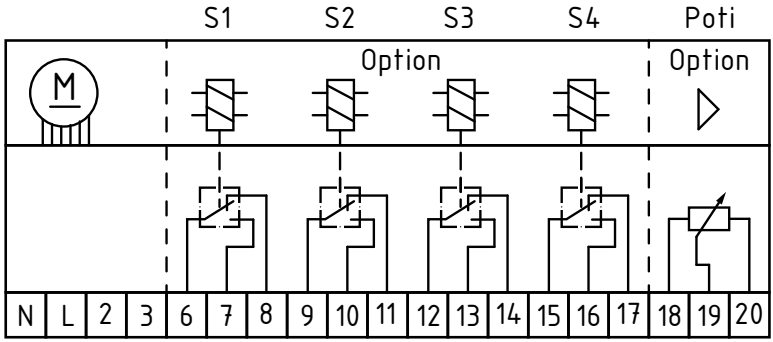
Connect the actuator as follows (wiring diagram see chapter 4.5.2):

- Connect the ground wire of the electric supply to the appropriate protective earth terminal.
- Connect the neutral N to terminal N. Connect the phase L to terminal L.
- 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.
- Set up limit switches prior to initial operation (see chapter 7.2.4.3).

4.5.2 Wiring diagram

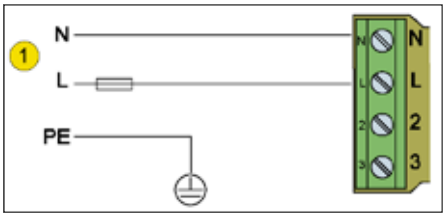


85...265 V (AC)

Supply connection

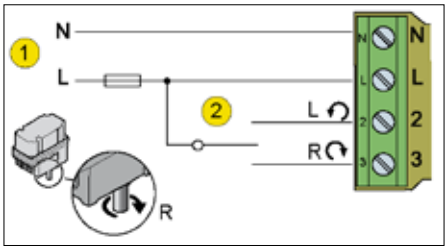
N Neutral
L Phase / Supply 85 ... 265 V AC

Connect the ground wire to the housing.



Conctrol connection

2 Control connection > left-turning
3 Control connection > right-turning



ADVICE	The control terminals have a function only if the tensor electronics is operated without the controller module I-ACT (PMR).
CAUTION	The drive must be permanently energized, otherwise the holding torque is not available!

5. Actuator operation without controller and display module (Standard)

ADVICE	Set up the end positions prior to initial use.

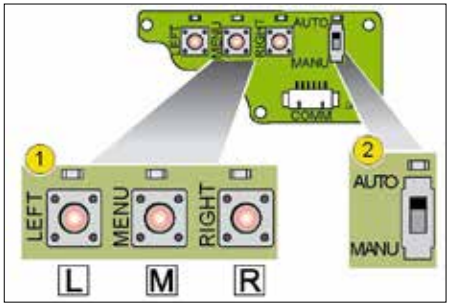
5.1 Operation

5.1.1 Buttons and switches

The buttons (1) are marked with

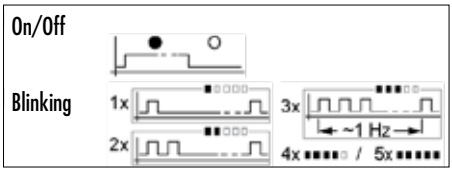
LEFT [L]
MENU [M]
RIGHT [R]

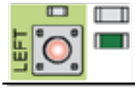
Switch (2) changes between automatic and manual mode. In MANU position the setup operation can be turned on from manual mode.



5.1.2 LED displays

The LEDs on the operation module show information by flashing or blinking.



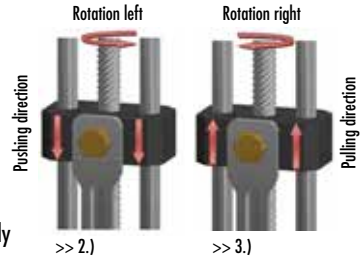
LED		Status	Description
	LEFT	On 2x flashing	Spindle rotates left (Pushing direction) End position reached or overrun
	MENU	On 2x flashing	Power supply on Set-up mode active
	RIGHT	On 2x flashing	Spindle rotates right (Pulling direction) End position reached or overrun
	AUTO	On/Off	On: Automatic active Off: Manual active
	ERROR	On OFF 1x flashing 4x flashing 5x flashing	Current limit active with actuator LI/RE no error Holding current active with motor STOP Sensor error Motor error
	SERVICE	On/Off	Status changing secondwise: Micro controller in function and OK

ADVICE

In case of loss of the mains voltage the MENU LED goes out. After saving the sensor position all LED lioght until the final loss of the operating voltage. The motor is immediately switched from the holding current in to the STOP mode.

5.2 Programming the end positions (Setup mode)

1. In manual mode, press the MENU button for >5s → the menu LED flashes 2x. Now the setup mode is active, the drive can now be moved even over the pre-programmed limits.
2. Move the actuator to the left end position using the LEFT button. Hold buttons MENU and LEFT at once. → Left LED is blinking. Hold buttons until the LED flashes permanently → the left end position is now saved.
3. Move the actuator to the right end position using the RIGHT button. Hold buttons MENU and RIGHT at once. → Right LED is blinking. Hold buttons until the LED flashes permanently → the right end position is now saved.

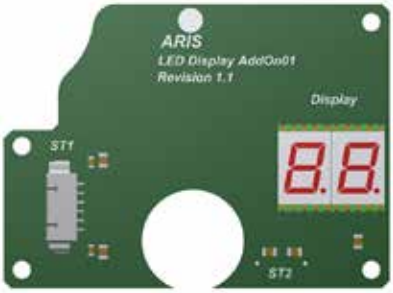


- Quit the programming mode by switching to AUTO mode or by cutting the supply voltage.
- Now the actuator moves only between the programmed end positions.

5.3 Optional modules and extras

5.3.1 LED display module (additional board)

The LED display module simplifies the setup of the actuator via a clear presentation of the menu items in the double-digit 7-segment display.

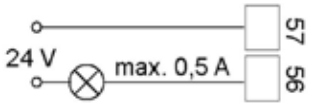


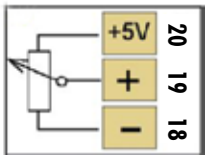
Menu pattern

Nr.	Menu	Description	Chapter
1	EL	End position left	7.2.2.1
2	Er	End position right	
3	rE*	Relay board	5.3.3
4	Hb	Switch-off hysteresis	7.2.2.5
5	Hd	Switch-on hysteresis	
6	rP	Speed reduction	7.2.2.6
7	rr	Firmware Revision	
8	E	Exit	

* only visible, if module is plugged in

5.3.2 Potentiometer (electronic via additional board)





Connection configuration
Use only shielded wires

18	GND Poti
19	Output Poti 0...100% (Wiper, output impedance 1 kΩ)
20	+Ub Poti 5...24 V DC
56, 57	Fault message output (potential free closer max. 200 V/0.5 A)

Menu pattern

Nr.	Menu	Description	Chapter
1	EL	End position left	7.2.2.1
2	Er	End position right	
3	rE*	Relay board	5.3.3
4	PL	Poti left	5.3.2
5	Pr	Poti right	
6	AO	Message output	7.2.2.4
7	Hb	Switch-off hysteresis	7.2.2.5
8	Hd	Switch-on hysteresis	
9	rP	Speed reduction	7.2.2.6
10	Fr	Firmware Revision	
11	E	Exit	

* only visible, if module is plugged in

Actual value output of the potentiometer end positions
The actual value output must be set for both end positions.

- Choose menu item „PL“ for programming of the left end position or „PR“ for the right end position and confirm with button [M]. The display shows a confirmation dialog.

PL
Pr

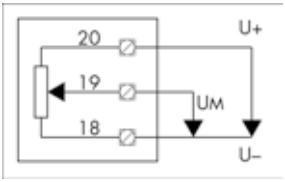
- Set the desired value via button [R] or [L]. The display shows a confirmation dialog.

L_. → 0% L9. → 90%

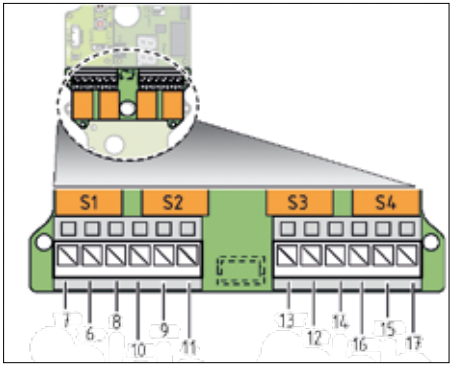
L0. → 10% L^. → 100% L≡. → free values

- Finally save the new value with button [M], hereby the next menu item is activated automatically.

ADVICE The potentiometer module must generally run under a potential divider circuit.



5.3.3 Additional auxiliary switches S1-S4 (add-on board)

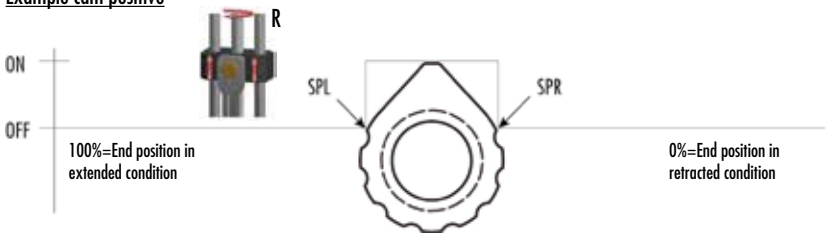


The additional board ZW provides outputs for up to four additional limit switches ready to be freely programmed.

Switching points
It can be defined for each relay a left and right switching point.

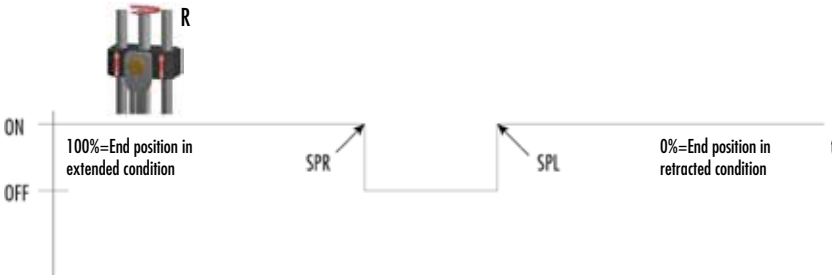
While moving from left to right (direction CLOSE) applies to the transitions:
- **SPL** left switching point changes from OFF to ON
- **SPR** right switching point changes from ON to OFF

Example cam positive



By defining and position of these two switching points different shift pattern (cam profiles) can be freely defined.

Example cam negative (by changing the switching points from the same direction)



ADVICE	If no switching point defined, the corresponding relay is not switching. When turning on the power supply all switching points are checked and the relays are preset or possibly switched according to the current sensor position.

Minimum width of the cam

Both switching points must be different and must have a minimum distance. If they are programmed too close to each other, the switching points are placed with a minimum width around the current position.

Sequential output

The relays are switched sequentially to the current reduction, i.e. if several relays are programmed on one and the same switching position, they are switched on or off in succession of REL1 to REL4 , the delay here is max. two program cycles (about 100ms).

Forced circuit

In order to detect even short cams with fast angle changes each position crossing is stored and then processed and switched sequentially. Here is the minimum switch-on or -off time one cycle (about 50ms). This may lead to a short "tracking" of the cam.

Programming of the left end position

The switch positions of the relays are independent from the programmed end positions, however, the left end position is an internal reference. If relay switching points are defined and the left end position is changed, the relay board must be plugged in, otherwise all switching points are deleted as a precaution!

Programming of the switching points **without** 7-segment display:

1) Choose programming mode

- In hand mode push [MENU]-button > 2s → The menu LED is blinking 2x (see chapter 5.1.2)
- Push [MENU]-button again >4s → The menu LED is blinking 4x

2) Choose relay

The actual selected relais is now indicated via the appropriate fast blinking LED. Select the desired relays with buttons [R] / [L]. Confirm with [MENU].

3) Define/delete switching points

Now the switching points can be defined.

- Set the desired position via buttons [L] / [R], then save/delete::
  [MENU] + [L]: Save left switching position
  [MENU] + [R]: Save right switching position
  [L] + [R]: Delete both switching positions.
  Hold both buttons at once, until the appropriate LED (L and/or R) blinks fast and then permanently flashes.

Display of LEDs on the relay board:

Selected relays: - slowly blinking ca. 1x/s: no switching position defined
- 1x flash: 1 switching position defined
- 2x flash: 2 switching positions defined

Not selected relays: - all showing the actual status of the selected relays (ON / OFF)

ADVICE	To ensure reliable switching even when traveling over an end position, it can be run over by approximately 10 ° by pressing the L / R button.

4) Select other relays
- Button [M] > push 2 seconds → further see item 2) or 5)

5) Exit programming menu
- Switch to AUTO mode.

ADVICE	During programming, all relays switch to the programmed set points, so that they can be checked directly.

Programming of the switching points **with** 7-segment display:

1) Select programming mode
- In hand mode push MENU button > 2s → the display shows „EL"
- Select menu item RE via button [R] and confirm with [M].

2) Select relays
The selected relays is shown in the display.
Select the desired relays with buttons [R] / [L]. The additional fifth menu item E (EXIT) can be selected.
Confirm with [M].

3) Define/delete switching points
Now the switching points can be defined.
- Set the desired position via buttons L / R, then save/delete:
  The actual position is shown (0..100%).

By activating the buttons, the appropriate commands are issued:
- [MENU] + [L] → SL (Save Left)
- [MENU] + [R] → SR (Save Right)
- [L] + [R] → dE (Delete)
- [MENU] → E (EXIT)

4) Select other relays
- Push button [M] > 2 seconds → further see item 2) or 5)

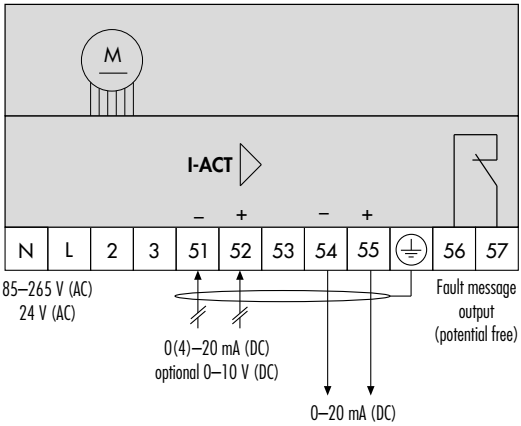
5) Exit programming menu
- Select menu item E (EXIT) and confirm with [MENU].

6. Operation of actuators with microprocessor controller I-ACT (PMR)

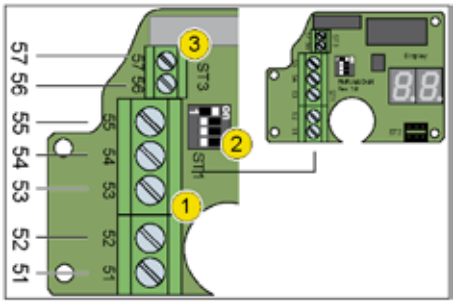
6.1 Wiring diagram and pin configuration

Basic board

L	Phase / Supply 85..265 VAC
N	Neutral
2	without function at plugged in PMR board
3	without function at plugged in PMR board



57/56	Message output, potential free opener, max. 200 V or 0.5 A und max. 10 W
55	Actual value output, +
54	Actual value, ground
53	+ 5 V supply
52	Set value input
51	Set value input, ground



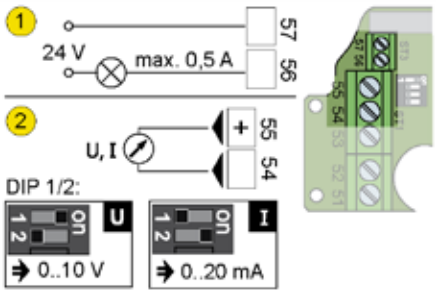
ADVICE

All drives are preset at the factory. When you change the DIP switch, the instructions given here are to be observed!

The function of the inputs and outputs at pin 51 to 55 (1) is set by DIP switches (2), see section 6.2. The message output (3) is used for operational monitoring.

Message output

The message output (1) Pin 56/57 works as potential free activated opener. The capacity of the contact is
max. 200 V supply
max. 0.5 A
max 10 W



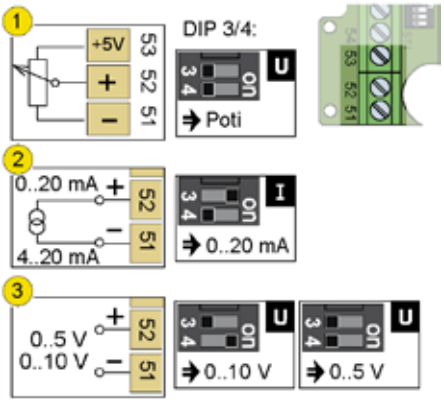
Actual value output

The output (2) at pin 54/55 is supplying a voltage or current depending on the DIP switch setting. The output is galvanically isolated from the other ports.

Set value input

Via pin 51/52 the controller receives a set value. When connecting a potentiometer (1) pin 53 supplies the encoder with the supply voltage. Via the DIP switches 3 and 4, the controller receives the information for use of input:

– Set value via poti (1)
– Set value as current (2)
– Set value as voltage (3)



6.2 Configure controller connection

To operate a drive control, the DIP switches must be configured and the ports on the controller I-ACT (PMR) connected.

Setting up DIP switches

⚠ CAUTION

Component damage by short-circuit.
The DIP switches 1-2 and 3-4 switch to the same outputs. Are the DIP switches 1 and 2 or the DIP switches 3 and 4 ON during operation, a short circuit can destroy components.
– Do not set DIP 1 and 2 to ON at once
– Do not set DIP 3 and 4 to ON at once

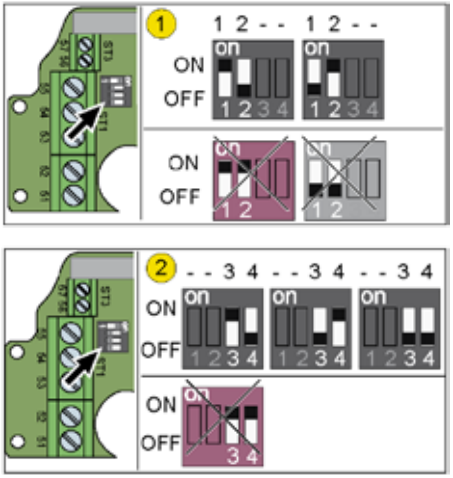
Via DIP 1-2 (1) the actual value output is configured. With DIP 3-4 (2) configure the setpoint input.

Cut off supply voltage, set up DIP switches:

DIP	*Actual value*
1 ON / 2 OFF	0...10 V
1 OFF / 2 ON	0...20 mA

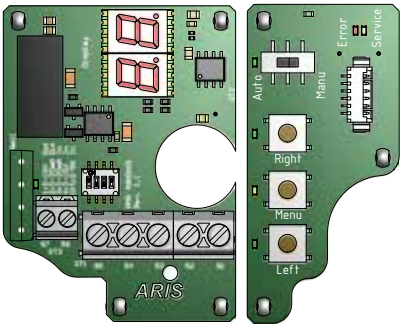
DIP 1 and DIP 2 to OFF creates an undefined condition.

DIP	*Set value input*
3 ON / 4 OFF	0...20 mA
3 OFF / 4 ON	0...10 V
3 OFF / 4 OFF	0...5 V / Poti operation

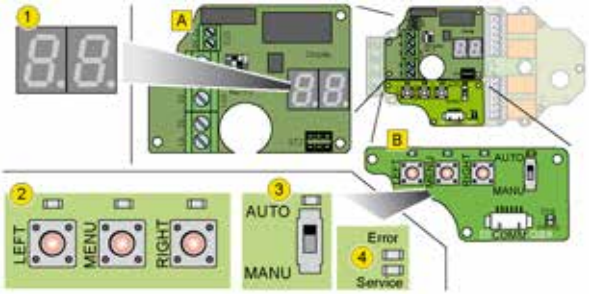


6.3 Operation

6.3.1 Layout I-ACT (PMR)



6.3.2 Operation and display elements



Two 7-segment displays (1) provide information on the controller status and the operating steps. The controller is configured and operated with the three keys (2) and the switch (3).

The small LEDs above the switches and the switch and the two LEDs (4) below the switch indicate various operating states and messages.

6.3.3 Displays on the I-ACT (PMR)

Menus

There are menus only in setup mode to set parameters and values. The function of a menu item results from a two-letter abbreviation, for example:. End position left:

E.L Set end position left

Parameter values

The segment display can show values from 0 to 100. The value 100 is indicated by a ring sorrounding both segments.

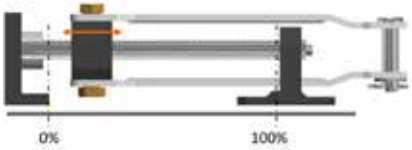
0.0. ... 9.9. C.

Fault message

Errors in operation, the controller indicates by permanently flashing an error code. Details about the error codes see section 8.2.

Actuator movements

The controller displays actuator position and direction. The actuator position is displayed as a %-value from 0 to 100%. The regulator calculates the current %-value from the distance between the two end positions. The extracted end position is corresponding to the value of 100%, the retracted of 0%.



If the actuator moves, a circulating dash running around both segments indicates the direction of rotation. Direction of the dash movement shows the direction of rotation of the spindle as if you look through the drive. Indication of position and direction of rotation are displayed with the drive running and changing every second.

Sleep mode

If the regulator is not activated for 10 seconds, it goes into sleep mode and displays the %-value of the motor position every two seconds. The controller leaves the sleep mode as soon as a button is pressed or the motor is driven.

ADVICE Before starting up the controller, the end positions must be programmed.

7. Operation of the I-ACT (PMR)

ADVICE The electronics of the I-ACT (PMR) works like a PID controller

7.1 Automatic and hand mode

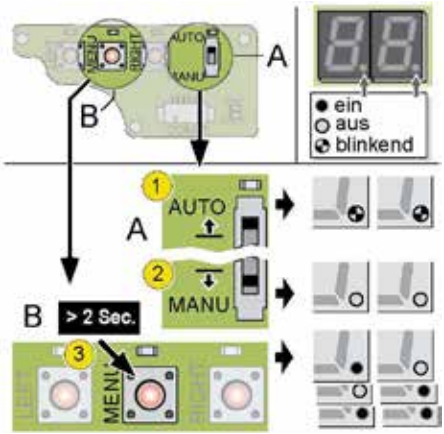
7.1.1 Operation modes

The controller works in three operation modes:

- Automatic: Control mode with surveillance
- Hand mode: Manual left- and right-run of the motor
- Setup mode: Parameterization of the controller.

7.1.2 Change operation mode

Change the operating modes by using switch (A) and button (B). The two 7 segment fields show the current operating mode with the decimal points.



7.1.3 Automatic mode

Slide switch to AUTO (1).

Both points will flash alternately at 1 Hz; additionally the LED above the switch lights. The control is active.

The actuator is driven via signals from the set value input. The control monitors the approach of end positions and changes of input signals. The three buttons have no function.

7.1.4 Hand mode

Slide switch to MANU (2).

Both points and the LED above the switch are off. The control is active and waiting for input via push button. The actuator is operated via the two buttons [R] and [L]. The motor controller is active and switches off the motor upon reaching an end position.

- Hold button [R] to rotate the motor right. The two segments show a circumferential clockwise dash order as long as the motor rotates.
- Hold button [L] to rotate the motor left. The LED above the pressed button lights. Both segments show a circumferential counterclockwise dash order as long as the motor rotates. Upon reaching an end position, the LED on the operated key will blink twice.
- Press and hold button [M]. After 2 seconds, the controller switches to the set-up mode. The LED above the button will flash 2x.

7.2 Setup mode I-ACT (PMR)

1. Slide switch to MANU (2).
2. Hold down button MENU (3) at least 2 seconds.

The left point flashes. The controller stands in the 1. menu level and waiting for further commands.

Survey

The microprocessor controller I-ACT (PMR) can perform the following tasks:

- Set left and right end position
- Set handling shortly before reaching an end position and switching on and off of the motor
- Enter voltage and current values for the end positions
- Activate message output

Buttons and switches

In the setup mode the buttons have different functions in the three menu levels. The two points display the menu level, in which the controller is currently working.

ADVICE	By changing the switch from manual to automatic the setup mode is left without saving a currently revised parameter value.

Start setup mode

1. Slide switch to „MANU“.
2. Hold down button [M] at least 2 sec.

The setup for parameter setting is turned on, the display shows the first menu item.

E.1 Setup mode active, 1. menu level in display.

To exit the programming mode, slide switch back to "AUTO".

7.2.1 Survey of menu items

	Display	Function	⇩Parameter⇧	Remarks
	E.L	Set end position left 100% Tensor S, 0% Tensor M	no / yes	0...100%
	E.r	Set end position left 0% Tensor S, 100% Tensor M	no / yes	0...100%
	S.L	Set value for left end position	0/4/20/0...99 0...5 0...10	0...99 mA 0...5 V 0...10 V
	S.r	Set value for right end position	0/4/20/0...99 0...5 0...10	0...99 mA 0...5 V 0...10 V
	C.L	Actual value for left end position	0/4/20/0...99 0...5 0...10	0...99 mA 0...5 V 0...10 V
	C.r	Actual value for right end position	0/4/20/0...99 0...5 0...10	0...99 mA 0...5 V 0...10 V
	r.E*	Relay board	see chapter 5.3.3	
	A.0	Alarm via fault message output	0/1	0: inactive 1: active
	H.b	Switch-off hysteresis (b: brake)	0...8, hysteresis for switch-off	0...80%
	H.d	Switch-on hysteresis (d: difference)	0...9, hysteresis for switch-on	0...90%
	r.P	RPM speed reduction prior to shut-off point	0...9	0...90%
	F.r	Firmware	--	Shows actual firmware re-vision
	E.	Exit, change to manual	--	

* only visible, if module is plugged in

ADVICE In menu mode, [L] scrolls down, [R] upward, [M] confirms the entry or leaving the (sub) menu.

7.2.2 Menu items in detail

7.2.2.1 Programming end positions

- Select the menu item "EL" for programming the left end position or "ER" for the right end position and confirm with button [M]. The screen displays a confirmation dialog.

- Press button [R] (yes) to move to the new end position and confirm with button [M]. With button [L] (no), the process can be aborted.

⚠ CAUTION	Motor or components may be damaged when driving on an obstacle. As long as the end position is reprogrammed, the engine no longer stops at the predetermined end position. For entering new end positions move the drive slowly and with caution

- Move motor to the desired end position by pressing [L] or [R] .
- Accept with button [M] the current position as end position. If programming is aborted by changing to AUTO mode, the previously programmed end position applies.

ⓘ ADVICE	For technical reasons the two end positions must be at least a 1/2 sensor turn apart. If the difference range is too little, the controller gives out the error "RE" - "RangeError".

7.2.2.2 Set value input for the end positions

The left and right limit switch position is assigned to a new set value. Voltage or current values at the input terminals 51, 52 provide the controller with the default for the positioning of the motor. The actual position signals the controller via the terminals 54, 55.

The input is suitably connected and configured via DIP switches 3 and 4, see page 20.

- Select the menu item "SL" or "SR" and confirm with button [M]. Depending on DIP switch setting one of the following three values will be displayed:
  - DIP3/DIP4 – ON/OFF: 0 mA / 4 mA / 20 mA / 0…20 mA
  - DIP3/DIP4 – OFF/ON: 0... 10 V
  - DIP3/DIP4 – OFF/OFF: 0... 5 V

- At preset of a
  - current value (mA) select one of the displayed values
  - voltage value (V) set a value between 0…5 or 0…10

0 mA
(0 V optional)

4 mA
(2 V optional)

20 mA
(5 or 10 V optional)

free values [mA]
([V] optional)

- Finally save new value with button [M], thereby the next menu item is active automatically.

ADVICE	Defaults for the set values of the end positions must cover at least 20% of full scale, otherwise the error "PE" - "Parameter Error" is reported. Example: Range 1..5 V => Covering (5-1) V x 20% = 0.8 V Lower end position 0.5 V => Upper end position min. 0.5 V+0.8 V =1.3 V

7.2.2.3 Actual value output for the end positions

The actual feedback must be set analogous to the set values for both end positions.

CL

CR

- Set with DIP switches 1 and 2 how the actual value is used, see page 20th.
- Select menu item „CL“ or „CR“ and confirm with button [M].
- Set the value depending on the DIP position:
  - DIP1/DIP2 – ON/OFF: 0…10 V
  - DIP1/DIP2 – OFF/ON: 0... 20 mA
- Finally save the new value with button [M], thereby the next menu item is active automatically.

ADVICE	Defaults for the actual limits of the end positions must cover at least 20% of full scale, otherwise the error "PE" - "Parameter Error" is reported. Example: Set range 4 mA => Covering 4 mV x 20% = 0.8 mA Lower end position 0.1 mA => Upper end position min. 0.9 mA (=0.1+0.8)

7.2.2.4 Fault message output

The contact to the terminals 56 and 57 is closed when the controller is in operation.
The following events will trigger the opening of the signal contact:

- I-ACT is in hand mode
- >> bE: Motor Error
- >> SE: Sensor Error
- >> rE: Range Error
- >> CE: Calibration Error
- >> PE: Parameter Error

Detailed description of errors see chapter 8.2.

A.0

For activating the message function:

- Select menu item „Ao“ and confirm with button [M].
- Activate output with button [R] (1), set inactive with button [L] (0).
- Finally save new settings with buttonutton [M].

7.2.2.5 Hysteresis run (motor start and stop)

Start and stop run of the engine can be influenced by a hysteresis function. e.g. to protect the mechanism and to increase the reliability in operation.

H.b
Switch-off hysteresis

H.d
Switch-on hysteresis

With "Hb" (H-brake) the switch-off hysteresis of 0 - 80% is set. "Hd" (H-difference) defines a hysteresis between 0 - 90% for the switch-on run. A value of 0% disables the hysteresis functions.

- Select menu item „Hb“ or „Hd“ and open submenu with button [M].
- Set a value between 0 and 8 or 9 for 80 % or 90 %. The difference of nominal value and actual value is then compared with the hysteresis. If this difference is a) less than the switch-off hysteresis -> the drive stops, larger than the switch-on hysteresis -> the drive regulates and moves.

7.2.2.6 Speed reduction

RPM speed reduction prior to switch-off point

r.P

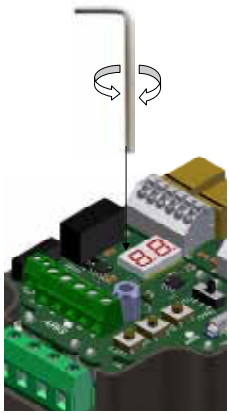
- Select menu item „rP“ and confirm with button [M].
- In the submenu set the value between 0 (low speed reduction) and 9 (high speed reduction) for 90 %.

8. Additional option

8.1 Internal manual override (mechanical)

⚠ CAUTION	Actuation of manual adjustment with a cordless screwdriver is not permitted because the gearbox can be destroyed due to the high speed!

Rotate the output shaft by use of an Allen key SW4 on the manual adjustment until the desired position is reached. 32 turns on the manual adjustment correspond to a complete revolution (360°) of the spindle.



9. Required customer information

9.1 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

9.2 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

Error messages

Errors the controller indicates with a flashing error message on both display segments. Automatic and manual operation can not be used as long as a fault is present. The set-up can be started.

Display	Function	Meaning	Remarks
bE	Motor Error	No valid values for motor control from Hall sensor	
SE	Sensor Error	No valid values from position sensor. No existing magnet or out of valid range	
rE	Range Error	Programmed end positions too close	End positions must be > 0.5 sensor turns apart
CE	Calibration Error	Actual output value too low Set input value too low	
PE	Parameter Error	Too low difference between free set and actual values	At free values, the difference must cover at least 20% of the complete range

10. Maintenance

10.1 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.

10.2 Accessories

No special tools are required for installation.

10.3 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:	Electrical actuator
Product Types:	tensor and identical

Fulfills the basic requirements of the annex I of the directice 2006/42/EC, if it applies to the appropriate order:
1.1.2c,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/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 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, 02. March 2015

i.V. C. Usai

C. Usai (Quality and product safety)

Subject to technical changes.

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