JOCH ANTRIEBE GMBH

BA-JAG-DE
Installation Declaration, Original Operating and Assembly Instructions in Accordance with the EU Machinery Directive 2006/42/EC

PNEUMATIC ROTARY ACTUATORS
JAG SERIES

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

Contents

Oskar-von-Miller Street 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

1.0 Introduction

In this Operation and Installation Manual, important notes are indicated by the following symbols:

⚠	Danger – Warning … signals an immediate hazard that, if not avoided, could result in death or serious injury. Note
❗	… points out a mandatory instruction that must be followed.
ℹ	Information … offers helpful tips and recommendations

This Operation and Installation Manual provides essential information for the safe and proper assembly, maintenance, and operation of the actuators. Following these guidelines helps prevent accidents, reduces repair costs and downtime, and improves both reliability and lifespan of the actuators.
Anyone assigned to work on the actuators must read and follow this Operation and Installation Manual. The manual should always be accessible to both operating and maintenance personnel. Keep a copy of this manual at the actuator installation site at all times. Before starting any assembly or maintenance work, make sure to thoroughly read the entire manual. If you have any questions, always contact JAG – JOCH ANTRIEBE GMBH. We reserve the right to make technical modifications or update the description/instructions.

⚠	Before installing, starting up, or servicing the actuators, it is essential to read this operation and installation manual thoroughly and follow all included safety instructions.

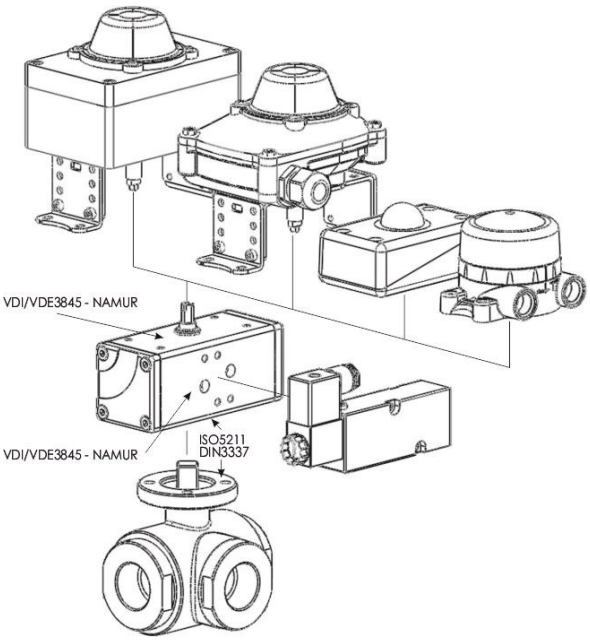
1.1 Scope of Application

This operation and installation manual applies to double-piston rotary actuators in sizes 10-30-60-120-360-720-1440 and other model and intermediate sizes within the DA (double-acting) and SR (single-acting with spring return) series, featuring end position adjustment.

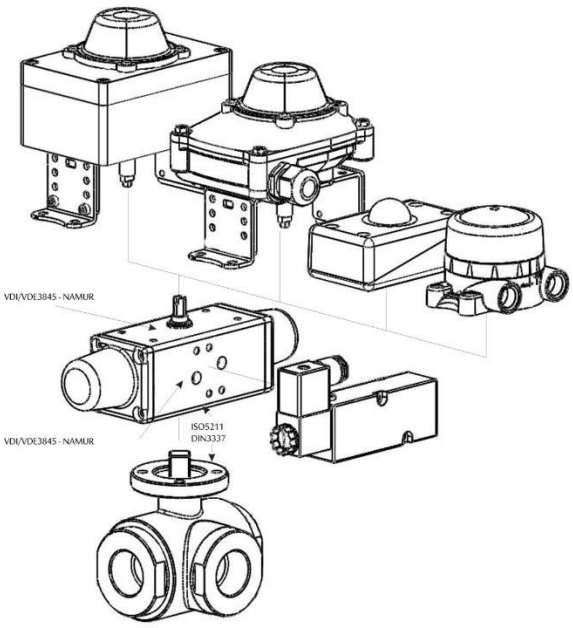
1.2 Peripheral Overview – Interfaces

Our rotary actuators include three basic interfaces due to their design and application:

- ISO5211-DIN3337 actuator connections for valves – located on the bottom of the actuator (towards the valve)
- VDI/VDE3845-NAMUR connection points between actuator and accessories – found on the top of the actuator
- VDI/VDE3845-NAMUR mounting for solenoid valves on rotary actuators – positioned on the side of the actuator



Double-acting rotary actuators DA



Single-acting rotary actuators SR

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany
Phone: ++49 7542 938226
Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

1.3 Proper and Improper Use

The JAG pneumatic quarter-turn actuators, available as double-acting and spring-return models, are designed for the following applications

- after installing or connecting a control valve to the actuator's NAMUR interface and
- connecting it to a control system provided by the plant
- using compressed air as the control medium, within the operating range specified on the nameplate
- by mounting directly (via the ISO5211 interface) or indirectly (with brackets and adapters) onto industrial valves (such as ball valves, plug valves, or butterfly valves) to operate them through a 0-90° rotation as instructed by the electrical signals from the above-mentioned control system
- The JAG..SR spring-return series actuators have an additional safety function ("fail-safe"). If the air supply is shut off or fails, an integrated spring will mechanically move the valve to either the open or closed position, as required.
- A properly mounted actuator will display the valve position with its visual indicator.
- An optional position indicator assembly installed on the actuator can signal the valve position to the system's control unit.

The following operating conditions must also be met for safe and proper use:

- Use dry compressed air as the control medium. The dew point must be at least 10°C below the lowest operating temperature (see nameplate). To protect the control valve and actuator, the air should be filtered to 40µm mesh size (ISO8573-1, Class 5). For switching cycles ≥ 4 per minute: lubricate.
- The minimum and maximum allowable control pressure (typically 6 bar) and the temperature range (typically -20°C to +80°C) are specified on the actuator's nameplate. Special versions may differ from these conditions.
- It must be ensured that no moisture or water can enter the spring chamber of single-acting actuators through the air supply port.
- Actuators are not designed to absorb continuous rotary oscillations when in end positions.
- Select the actuator so its torque and torque curve—see diagram in the technical appendix—match the specifications of the valve. Maximum allowable torque for connection flanges and mounting according to ISO5211 must be observed. Always follow the valve manufacturer's guidelines and operating instructions.

!	Double-acting actuators remain in their current position if control pressure fails. If control pressure is present but the solenoid valve loses power or fails, the actuator's position will depend on the design and control of that solenoid valve. Unless otherwise specified by the purchaser, the actuator should close the valve. Single-acting or spring return Actuators with closing springs move to the safety position - air supply to the safe position CLOSED. Single-acting or spring-return actuators equipped with an opening spring will move to the OPEN safe position if air supply fails or is switched off. The selected valve and control should ensure these spring-return functions are reliably maintained.

!	Manual override options available in the event of a control pressure failure: Double-acting actuators are equipped with a square extension on the drive shaft for manual operation using an appropriately sized open-end wrench. Manual override at the shaft extension must never be performed while control pressure is present. Single-acting spring-return actuators can only be operated manually using an optional handwheel gearbox installed between the actuator and valve. This option is also recommended for double-acting actuators. For actuators with spring return, manual override with a wrench or similar tools is strictly prohibited.

⚠	The actuator is not intended for any use other than those listed here. Please note the following are not permitted: • Operating actuators with electrical components in environments where their protection class according to EN60529 is insufficient, especially in hazardous areas. Installing or using actuators with electrical accessories such as solenoid valves, position indicators, or controllers without approved explosion protection as per EN 50014, 50018, 50019, or 50020 is prohibited. • Using control media or pressures higher than 8 bar other than those specified in this manual without manufacturer approval. • Operating the actuator at ambient temperatures above +80°C or below -20°C without consulting the manufacturer. • Single-acting rotary actuators must not be operated with air assistance for safety reasons (i.e., do not apply air pressure to the outer spring chambers to support the safety function of the springs). • Actuators are not to be used as ladders or steps in any installation. Proper use as specified must be strictly observed. Any deviations from the stated operating conditions must be discussed with the manufacturer in advance. The manufacturer accepts no warranty or liability for improper use.

Oskar-von-Miller Strasse 8
D-88069 Tettnang
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info@jochantriebe.com
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- Manufacturer Declarations
  1 Installation declaration for incomplete machines according to Machinery Directive 2006/42/EC Annex II 1B

We hereby declare that for the series-manufactured pneumatic rotary actuators

Type: Pneumatic rotary actuators with yoke kinematics, JAG Series

Model range: JAG…DA double-acting and JAG…SR single-acting with spring return

Actuator sizes: JAG 10-30-60-120-360-720-1440 (and all subsequent sizes or intermediate sizes)

Manufacturer: JAG – JOCH ANTRIEBE GMBH
Oskar-von-Miller St. 8
DE-88069 Tettnang-Bechlingen

1. The following basic requirements from Annex I of the aforementioned directive have been applied and observed:
   a. General Principles No. 1
   b. The table on the reverse specifies whether and how the directive's requirements are met
2. Operation is permitted only in compliance with the operating and installation instructions
3. This product is not considered a pressure device within the meaning of the EU Pressure Equipment Directive 2014/68/EU, as per Chapter 1, Article 1, Paragraph 2.j.ii.

This incomplete machine may only be commissioned after it has been confirmed that the machine into which it is installed complies with the requirements of the Machinery Directive 2006/42/EC, whenever applicable.

The special documentation was prepared according to Annex VII, Part B of the directive.
The aforementioned special technical documentation may be sent to the relevant authority by mail if required.

Technical specifications applied:
EU-Directives: Machinery Directive EN 2006/42/EC
Harmonized Standards: EN ISO 12100, EN ISO 5211, VDI / VDE 3844 / 3845

Mr. Gunnar Berge is authorized to compile the technical documentation.

Address: JAG – JOCH ANTRIEBE GMBH
Oskar-von-Miller St. 8
DE-88069 Tettnang-Bechlingen

Location, Date: Tettnang, May 17, 2016

Manufacturer's Signature: _____

Details of the signatory: Gunnar Berge, Managing Director

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

Installation declaration for incomplete machines according to Machinery Directive 2006/42/EC Annex II 1B Page 2 of 2

The Manufacturer	JAG – JOCH ANTRIEBE GMBH, DE-88069 Tettnang
confirms that the JAG rotary actuators of the JAG-DA and JAG-SR Series meet the following requirements:	
Requirements according to Annex I of Machinery Directive 2006/42/EC	
1.1.1. h) Intended Use	Refer to Operations and Assembly Manual
1.1.1. i) Foreseeable Misuse	Refer to Operations and Assembly Manual
1.1.2. c) Warnings About Misuse	Refer to Operations and Assembly Manual
1.1.2. e) Special Equipment and Accessories	No special tools required for replacing wear parts
1.1.3. Parts in Contact with Media	The materials of all media-contacting parts are coordinated prior to delivery and specified in both the datasheet and JAG order confirmation. The user is expected to conduct a suitable risk assessment regarding compatibility with the operating medium and environment.
1.1.5. Handling	Fulfilled by the instructions in the Operating and Installation Manual
1.2. Controls	The user is responsible, in accordance with the installation instructions for the actuator and, if applicable, the valve
1.3.2. Prevention of Breakage Risk	For functional components: Assured when used as intended
1.3.4. Sharp Edges and Corners	Requirement met
1.3.7./8. Injury from Moving Parts	All requirements are met when used as intended. Maintenance and repair may only be performed when the actuator is shut off and power has been disconnected.
1.5.1.-1.5.3. Power Supply	User responsibility – See Operating and Installation Manual
1.5.4. Installation Errors	User responsibility – Refer to the Operating and Installation Manual
1.5.5. Operating Temperature	Warning notices regarding exceeding permissible limits – See Operating and Installation Manual – Intended Use.
1.5.7. Explosion	Ex - Protection is required. Must be explicitly stated in the purchase contract. In this case: Use only as specified on the actuator
1.5.13 Emission of Hazardous	Not applicable
Substances 1.6.1. Maintenance	Refer to the operation and installation manual. Coordinate spare parts storage with JAG – JOCH ANTRIEBE GMBH.
1.7.3. Identification	Refer to Operations and Assembly Manual
1.7.4. Operating instructions	This operation and installation manual also contains guidelines for using the rotary actuator. Any additions required for the operating manual of the “complete machine” are the responsibility of the planner or user.
Appendix III	The rotary actuator is not a “complete machine.” Therefore, no CE marking is provided for compliance with machinery regulations.
Appendices IV, VIII-XI	Not applicable
in accordance with EN12100	
1. Scope of application	Our decades of experience with the actuator types listed on page 1 form the foundation. Note: Users are expected to carry out a risk analysis tailored to the specific operating scenario for the pipeline section and any installed valves, as outlined in sections 4 to 6 of EN 12100.
3.20, 6.1 inherently safe design	Actuators are built on the principle of “inherently safe design.”
Analysis according to sections 4, 5, and 6	Documented experiences of failures and improper use recorded by the manufacturer, including damages (as per ISO 9001 documentation), have been taken into account.
5.3 Machine limitations	The classification of the “incomplete machine” is based on the intended use of the rotary actuator. Matters beyond this are not the responsibility of JAG–JOCH ANTRIEBE GMBH.
5.4 Decommissioning, disposal	
6.2.2 Geometric factors	Because the valve and actuator enclose all functional parts during proper use, this section is not applicable.
6.3 Technical safety devices	If applicable, only required with accessories – see order confirmation. Since
6.4.5 Operating instructions	actuated valves operate “automatically” as directed by the control system, the operating manual covers aspects specific to the actuator, which must be provided to the manufacturer of the (pipeline) system.

Oskar-von-Miller Street 8
D-88069 Tettnang,
Germany
Phone: ++49 7542 938226
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Risk Assessment	The risk assessment was carried out by JAG – JOCH ANTRIEBE GMBH in accordance with MRL, Annex VII B, and is documented per MRL Annex VII B.

1.4.2 EU Declaration of Conformity according to ATEX Directive 2014/34/EU

Pursuant to the EC Directive 2014/34/EU dated February 26, 2014 and its implementing legal provisions, the manufacturer declares:

JAG – JOCH ANTRIEBE GMBH
Oskar-von-Miller Str. 8
DE-88069 Tettnang – Germany

that the products described in the operating and installation manual, JAG Series:

Type: Pneumatic rotary actuators with yoke mechanism

Series: JAG…DA double-acting and JAG…SR single-acting with spring return; actuator sizes: JAG

10-30-60-120-360-720-1440 (including all subsequent sizes or intermediate sizes) Oskar-von-Miller Str. 8

Manufacturer: JAG – JOCH ANTRIEBE GMBH

DE-88069 Tettnang-Bechlingen

is not considered a device as defined in Chapter 1, Article 2, (1+3) of Directive 2014/34/EU and does not have its own potential ignition source, but complies with the essential safety and health requirements according to Annex II of Directive 2014/34/EU and the following harmonized standards:

EN 1127-1:2011-10	Explosive atmospheres – Explosion protection – Part 1: Basics and methodology
EN 13463-1:2009-07	Non-electrical equipment intended for use in potentially explosive atmospheres – Part 1: Basic requirements and principles
EN 13463-5:2011-10	Non-electrical equipment for use in potentially explosive atmospheres – Part 5: Protection by constructional safety ‘c’

The specified rotary actuator meets the requirements for constructional safety type “c” explosion protection and is marked as follows depending on the O-ring material used:

NBR	-20°C +80°C	Marking:		II 2G Ex h IIC T6…T5 Gb II 2D Ex h IIIC T85°C…T95°C Db
FKM	-4°F to +320°F	Marking:		II 2G Ex h IIC T6…T3 Gb II 2D Ex h IIIC T185°F…T203°F Db
Silicone	-58°F to +320°F	Marking:		II 2G Ex h IIC T6…T3 Gb II 2D Ex h IIIC T185°F…T329°F Db

With appropriate labeling (to be specified during ordering), our pneumatic rotary actuators may be used in Group II hazardous areas, Zones 1 & 2 and 21 & 22.

Furthermore, we confirm that our pneumatic rotary actuators do not qualify as pressure equipment under the EU Pressure Equipment Directive 2014/68/EU (see Chapter 1, Article 1, Section 2.j.ii.). These incomplete machines may only be put into operation once it has been established that the machine into which they are integrated complies with the requirements of the Machinery Directive 2006/42/EC, where applicable.

Place, Date: Tettnang, 05/17/2016

Manufacturer’s Signature: _____

Information about the signatory: Gunnar Berge, Managing Director

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

1.4.3 EU Declaration of Conformity according to Pressure Equipment Directive 2014/68/EU

In accordance with EU Directive 2014/68/EU dated May 15, 2015 and the relevant implementing regulations, the manufacturer declares:

JAG – JOCH ANTRIEBE GMBH
Oskar-von-Miller Str. 8
DE-88069 Tettnang – Germany

that the products described in the operating and installation manual, JAG Series:

Type: Pneumatic rotary actuators with yoke mechanism

Model series: JAG...DA double-acting and JAG...SR single-acting with spring return

Actuator sizes: JAG 10-30-60-120-360-720-1440 (and all subsequent sizes or intermediate sizes)

Manufacturer: JAG – JOCH ANTRIEBE GMBH
Oskar-von-Miller Str. 8
DE-88069 Tettnang-Bechlingen

have been designed and sized according to Chapter 1, Article 1, Section 2.j.ii. and, as defined by the EU Pressure Equipment Directive 2014/68 /EU, are considered control devices, not pressure equipment, and are therefore excluded from the aforementioned directive.

Place, Date: Tettnang, 05/17/2016

Manufacturer's Signature: _____

Details of the signer: Gunnar Berge, Managing Director

Oskar-von-Miller Strasse 8
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1.5 Safety Instructions for Operators

The actuators described here have been designed and manufactured in accordance with the above-mentioned standards and guidelines. They represent the current state of the art and fulfill the requirements of these standards. However, safety in day-to-day operation is only assured when all necessary precautions are taken. It is the responsibility of system planners and operators of piping systems with installed actuators to plan appropriate measures and oversee their implementation. In particular, the operator must ensure that

- the actuator is used only as specified under Section 1.3 Intended and Alternative Use,
- the control medium is compatible with the actuator's material (anodized aluminum),
- the actuator is operated only in proper working condition and that safety devices in the system for generating and distributing control pressure, as well as the system's electric controls, are regularly checked for proper function,
- all protective devices for electrical and mechanically moving parts of the actuator and its accessory modules remain in their delivered condition, and that covers on connection boxes are correctly closed after wiring,
- only sufficiently qualified and authorized personnel plan, connect, operate the control, and are regularly instructed in all relevant local safety regulations—including those for electrical equipment,
- this personnel has the necessary equipment to carry out the operating steps described here,
- this personnel is familiar with this manual and the instructions for the corresponding valve, and follows all guidance provided,
- repair and modification work on actuators with spring return is performed only under the supervision of a safety specialist.

Additional Essential Safety Instructions:

For actuators, the same safety requirements apply as for the system that generates and distributes the control pressure and for the system-side electrical controls to which they are connected. Compliance with these regulations is also required when working with the actuator.

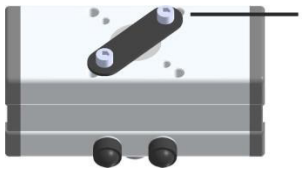
Additional precautions for pneumatic rotary actuators:

- If these actuators are installed on-site and not supplied by the manufacturer together with the valve, it's essential to follow the guidelines outlined in the section 'Assembly of an Actuator...'.
- Operation may cause the actuator to heat up, but this self-heating is limited to a maximum of 10°C.
- All electrical connections must be handled exclusively by trained professionals responsible for overseeing the control of the entire system.

⚠	ATTENTION: Applying pressure to the actuator without the valve installed poses a risk that if the retaining ring (on the shaft or top of the housing) is missing, damaged, or not properly engaged, the drive shaft can be forced out from the bottom of the actuator .

To eliminate any risk to people or nearby property, it is strongly recommended to perform actuator function tests while installed on a valve. If testing without a valve, the following procedure must be strictly followed:

- Disconnect the control air line from the actuator
- If necessary, remove the actuator from the valve
- Secure the drive shaft using the appropriate tool as shown in the diagram



Attach the tool to the bottom of the actuator, aligning with the mounting pattern according to DIN EN ISO 5211

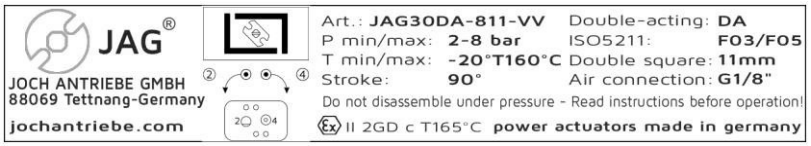
- Place the actuator with its underside on a stable surface
- Reconnect the control air line to the actuator
- Check actuator operation by supplying compressed air

Oskar-von-Miller Street 8,
D-88069 Tettnang,
Germany Phone: ++49
7542 938226 Fax: ++49
7542 938227
info@jochantriebe.com
www.jochantriebe.com

If the instructions in this manual are not followed, JAG – JOCH ANTRIEBE GMBH cannot be held liable.

1.6 Actuator Identification

Each actuator is marked with a sample nameplate as shown below:



Charge no.:	30-999999
Order no.:	AB 999999
Production date:	2016-23 (year/week)

Nameplate Details

	Example Designation	Comment
Model	JAG30DA-811-VV-VIP1	See article number system
Double-acting Spring return	DA S6	AIR-AIR actuator AIR-SPRING actuator (spring pack 6 for 6 bar control pressure)
P min/max.	2-8 bar	Permitted minimum and maximum control pressure
ISO5211	F03/F05	Available flange images per ISO5211
T min/max.	-20°T160°C	Permitted minimum and maximum temperature range
Double square	11mm	Available internal octagon (double square)
Stroke	90°	Standard rotation angle of the actuator
Air connection	G1/8"	Pneumatic control ports for supply and exhaust air according to VDI/VDE-NAMUR standards
Do not open when under pressure	Do not open when under pressure	Never open the actuator while pressurized – risk of injury!
Please read the instructions before operating	Read instructions before use	Read the original operating and installation manual before using the actuator – Manufacturer's warranty is void if instructions are not followed!
jochantriebe.com	jochantriebe.com	Manufacturer's website – Find more documentation, certifications, and contact information
Ex	II 2G Ex h IIC T6…T3 Gb II 2D Ex h IIIC T85°C…T165°C Db	Marking compliant with ATEX Directive 2014/34/EU Only JAG___-ADA or JAG___AS (ATEX)
Batch no.	10-999999	Continuous serial number for full actuator traceability
Order no.	AB 999999	Order number for complete actuator traceability
Production date	2016-20 (year/week)	Production year and calendar week

Article number system

Series	Model function	Design	Shaft interface Type	Size		O-rings Shaft, housing + piston		Opt. indicator	Size
JAG	30	(A)DA -	8	11	- V		V	-	VIP1
JAG	30	(A)S6 -	4	11	-	V	S	-	VIP1
	10	DA	0 - Round/groove	9		V - Viton		V - Viton	1 = JAG10/30/60/120
	30	S3 - 3 bar	2 - Double flat	11		N - NBR		N - NBR	2 = JAG240/360/480
	60	S6 - 6 bar	4 - Square	14		E - EPDM		E - EPDM	720/960
	120		8 - Octagonal	17		S - Silicone		S - Silicone	
	240			22					
	360			27					
	480			36					
	720			46					

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

1.7 Certification according to ATEX Directive 2014/34/EU (see also 1.4.2 EU Declaration of Conformity)

These actuators are suitable for use in installations that fall under Equipment Group II, Category 2 in accordance with Directive 2014/34/EG. The maximum surface temperature largely depends on the surrounding environment (marked as Tx). The maximum allowable ambient temperature is indicated on the nameplate.

II 2G Ex h IIC T6…T3 Gb
II 2D Ex h IIIC T85°C…T165°C Db

A maximum self-heating temperature increase of 10°C must be considered. The supplied compressed air temperature must not exceed 45°C.

All electrical and pneumatic devices attached must also meet the explosion protection requirements of the system.

Corrosive media must not enter the actuator. Repair or modification work is not permitted in explosive atmospheres.

⚠	Any deviation from these operating conditions invalidates the actuator's certification under Directive 2014/34/EG as valid. Failure to comply with these regulations poses a significant risk to both users and equipment. for the system.

1.8 Shipping and (Interim) Storage - Unit Weights

An actuator or assembly is a precision product and must be handled, transported, and stored with care to prevent damage to the unit or any auxiliary components. Only personnel with proper expertise and experience in transportation should perform these tasks. Always use transport equipment and tools that are suitable for the required load and are in good condition.

The weights of the individual actuators, excluding attachments, are listed in the following table:

Model	Unit Weight (kg)	
	DA double acting / AIR-AIR	SR single acting / AIR-SPRING
JAG 10	0.312	-
JAG 30	0.750	0.850
JAG 60	1.325	1.650
JAG 120	2.250	3.000
JAG 240	4.136	5.208
JAG 360	4.979	6.817
JAG 720	9.190	12.63
JAG 1440	17.92	25.28

⚠	If you use lifting gear (such as ropes or similar) with the mounting points provided on the actuator if applicable, designed for this purpose, lifting™ (drilled - holes), these should only be used for mounting the actuator to the fitting, never for lifting the entire assembly (fitting + actuator).

- If the actuator or actuator/valve assembly must be stored before installation, keep it protected from harmful elements like dust, dirt, and moisture—ideally in an indoor location.
- If the packaging shows no signs of shipping damage, only unpack the actuators or control units right before installation.
- Store the actuator or actuator/valve assembly in its original packaging (on a pallet or similar).
- Unpacked components must be protected from any contamination, moisture, and corrosion.
- The actuator/valve assembly—even if packed—should not be exposed to direct sunlight for extended periods.
- Do not operate the actuator or actuator/valve assembly during storage.
- Do not stack unpacked actuators!
- Any actuator that has been damaged during transport or storage must not be used.

⚠	Make sure the air ports are sealed with plugs to keep out dust and debris.

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Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

2.0 Installation and Commissioning

JAG actuators can be supplied with the necessary accessories such as pilot valves and feedback boxes. If these are not included, please observe the following instructions when attaching accessories and fittings.

2.1 Air Connections

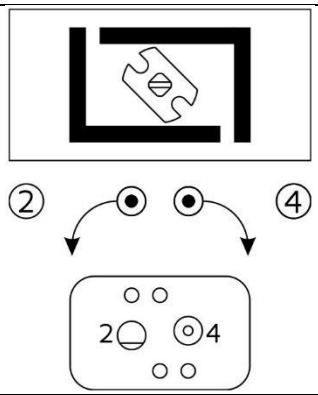
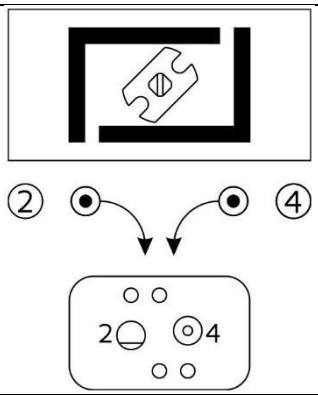
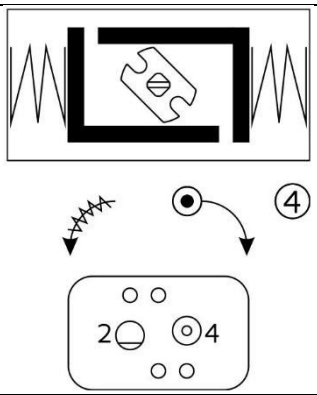
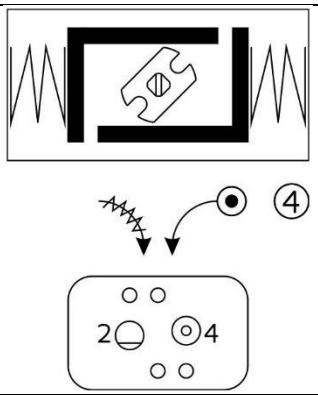
JAG rotary actuators are equipped as standard with a NAMUR interface, allowing direct mounting of pilot valves according to VDI/VDE 3845 for efficient supply and exhaust of the internal and external air chambers.

2.2 Installing Pilot Valves on JAG Actuators

The following components are required for standard control:

- For JAG-DA (double acting): a 5/2-way valve, either in monostable (1 coil with spring return) or bistable design (2 coils – impulse type)
- For JAG-SR (single acting): a 3/2-way valve in monostable design (1 coil with spring return)

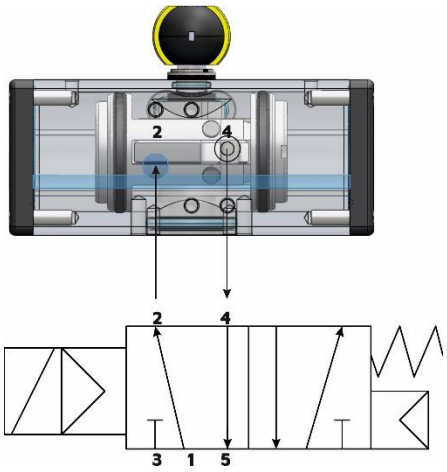
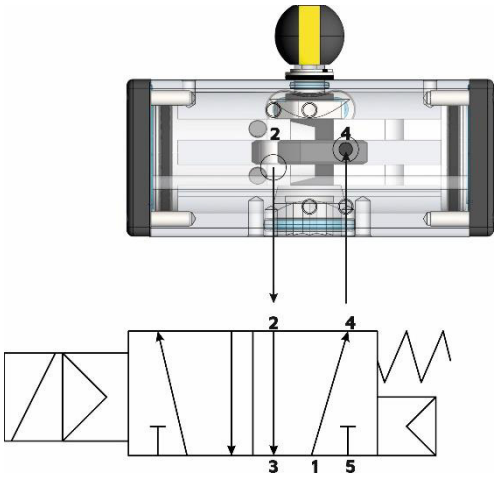
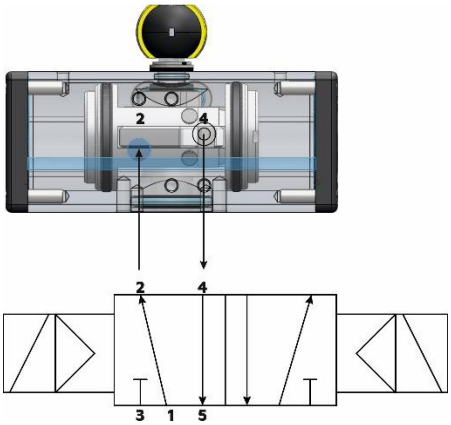
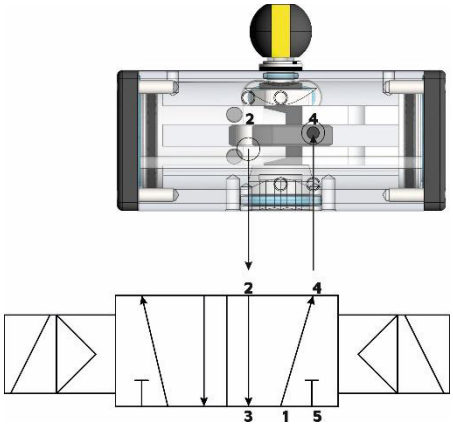
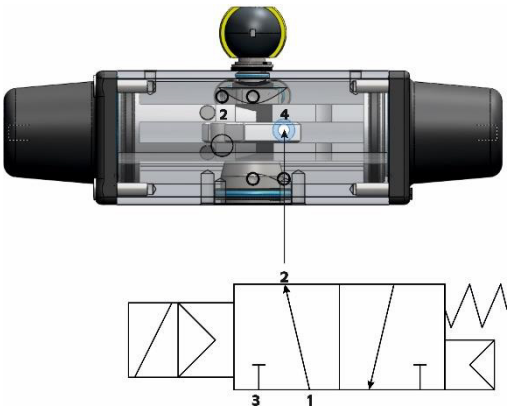
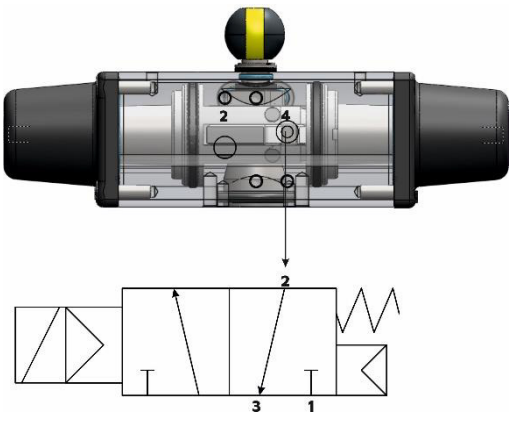
2.3 Standard Control Diagrams – Rotation Direction in Standard Version

			
DA - double acting	DA - double acting	SR - single acting	SR- single-acting
JAG Standard	JAG Special	JAG Special	JAG Standard

The actuators shown have their pistons in the safety position, meaning the piston is retracted—depending on the shaft end (with the slot on top), it can be either open or closed.

⚠	Check the function you require and make sure the direction of rotation and the actuator's operation match the direction and function of the valve or any attached components such as position controllers or limit switch boxes.

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

	5/2 single solenoid with spring return D (optionally, de-energized A open or closed)		
		Actuator opens counterclockwise when the coil is energized and vents the inner air chamber	The actuator closes with a right-hand (clockwise) rotation when the coil is not energized, venting the outer air chambers.
	5/2 bistable, pulse operation D (energizing A for both opening and closing)		
		The actuator opens with a left-hand (counterclockwise) rotation when the left coil is energized, venting the inner air chamber.	The actuator closes with a right-hand (clockwise) rotation when the right coil is energized, venting the outer air chambers.
	3/2 single solenoid S with spring return R (closed when de-energized)		
		Actuator opens with a left rotation (counterclockwise) when the coil is energized and vents the outer air chambers	Actuator closes with a right rotation (clockwise) when the coil is de-energized and vents the inner air chamber

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!	In the standard version of the double-acting actuator, supplying control air to the left port opens the actuator with a counterclockwise rotation. Supplying air to the right port closes the actuator with a clockwise rotation. In the standard configuration of the single- acting actuator, supplying control air to the right port triggers an opening action counter rotating counterclockwise wise. For safety reasons, the left side connection must reasons, never be supplied with control air.

We recommend using control valves with NAMUR connections. Using the NAMUR coding pin ensures the valve can only be mounted in the specified position (ensuring the actuator functions in the required direction).

If single-acting actuators (TYPE JAG-SR) are not operated with a NAMUR valve, it is essential to ensure that both supply and exhaust air for the outer spring chambers are clean and dry.
Make sure that no contaminants such as dust, liquids, vapors, or corrosive gases are able to enter the actuator.

⚠	CAUTION: When operating single-acting actuators of the JAG SR type, make sure that no corrosive substances can enter through the vent port. Otherwise, there is a risk that the spring could break.

2.4 Installing Positioners or Feedback Units on JAG Actuators

JAG rotary actuators come standard with an interface in accordance with VDI/VDE 3845 – Mounting Level 1, designed for attaching feedback units and positioners.

If not already done, connect the feedback unit or positioner according to the manufacturer's regulations and installation instructions.

⚠	CAUTION: Work on electrical systems or equipment should only be carried out by a qualified electrician or by trained personnel under the supervision and direction of a qualified electrician, and in compliance with electrical and national safety standards.

2.5 Mounting JAG Actuators on Valves

JAG rotary actuators are equipped as standard for mounting to valves per DIN EN ISO 5211. Valve connection is typically done directly or using a bracket and adapter (coupling) in line with DIN EN 15081. Always ensure that the actuator and valve are aligned for the correct rotation and proper function. Non-standard assemblies may negatively affect the actuator’s performance and service life.

Align the actuator so that, at the end positions, the valve is either fully open or securely closed.

The key factors influencing the required operating torque are valve size, operating pressure, and the type of medium. Taking these into account, the necessary operating and running torque for the valve must be specified by the valve manufacturer. It’s recommended to add a safety margin to this value when selecting the actuator (see also the manufacturer's guidelines). Be sure to consider the typical torque curve for JAG actuators. For 3-way valves, ensure there is always enough actuator torque available while moving from 0° to 90° and back. ISO5211 sets out the maximum permissible torques for connection flanges and drive squares, which must always be observed. This prevents twisting of the valve shaft and loosening of the friction-fit connection.

⚠	CAUTION: During a test run of the control device, it is essential to observe all operational safety regulations, the component manufacturers’ operating instructions, and accident prevention regulations!

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Tel: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

2.6 Commissioning

Please make sure all fittings are properly tightened and that the control pressure lines, feedback units, and positioners are correctly connected before starting up the system.

Check that the piping system is properly grounded to prevent static buildup and potential differences.

	CAUTION: Ensure that activating the actuators does not trigger any hazardous movements. Protect areas where pinching or crushing could occur by installing appropriate safety guards.

Before starting any movement, make sure the attached fitting is properly installed in the pipeline. If the fitting is removed, ensure that its passage is securely covered with protective caps.

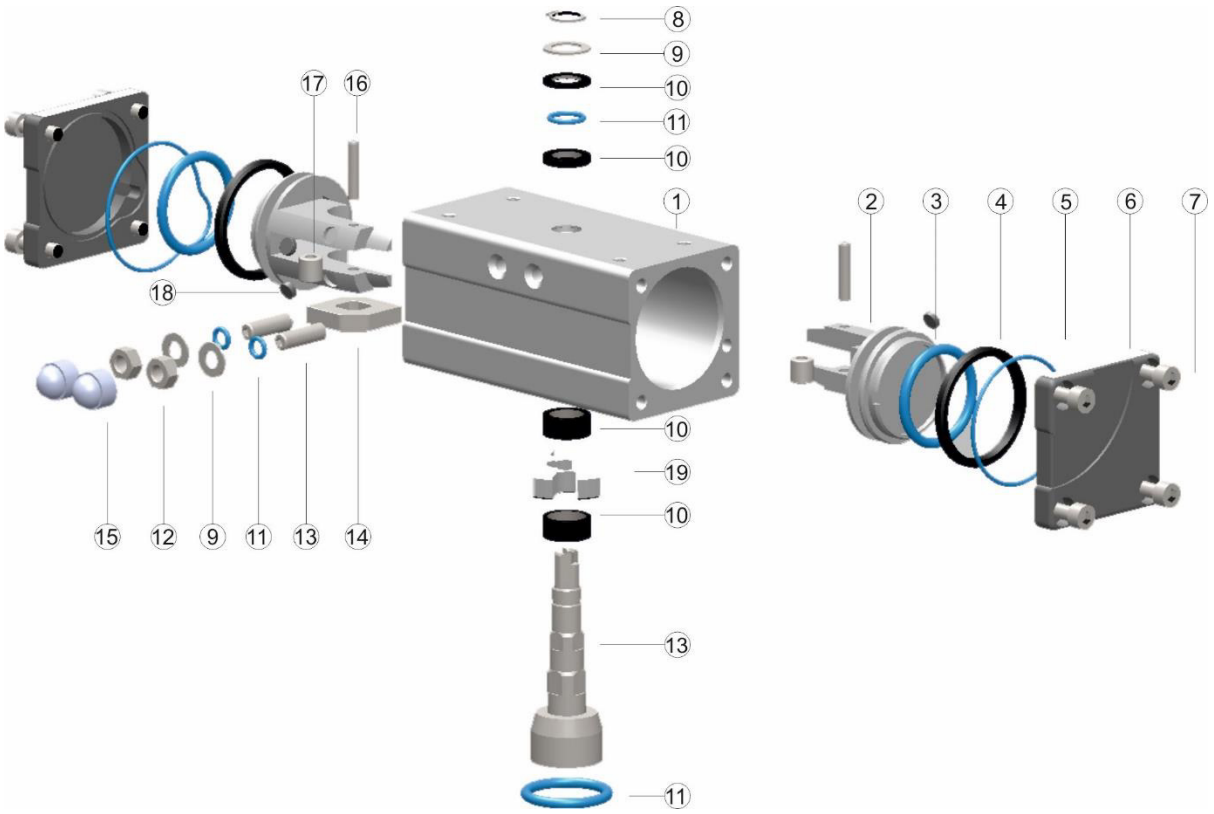
	CAUTION: Only operate the actuator once all required safety features are in place and there is no risk from any attached components.

3.0 Design and Operation

The conversion from linear to rotary motion is achieved using two opposing pistons with yoke mechanics. Compressed air enters one of the chambers, setting the pistons in motion. These pistons act on the yoke disc, which is connected to the drive shaft, and initiate the rotary movement.

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

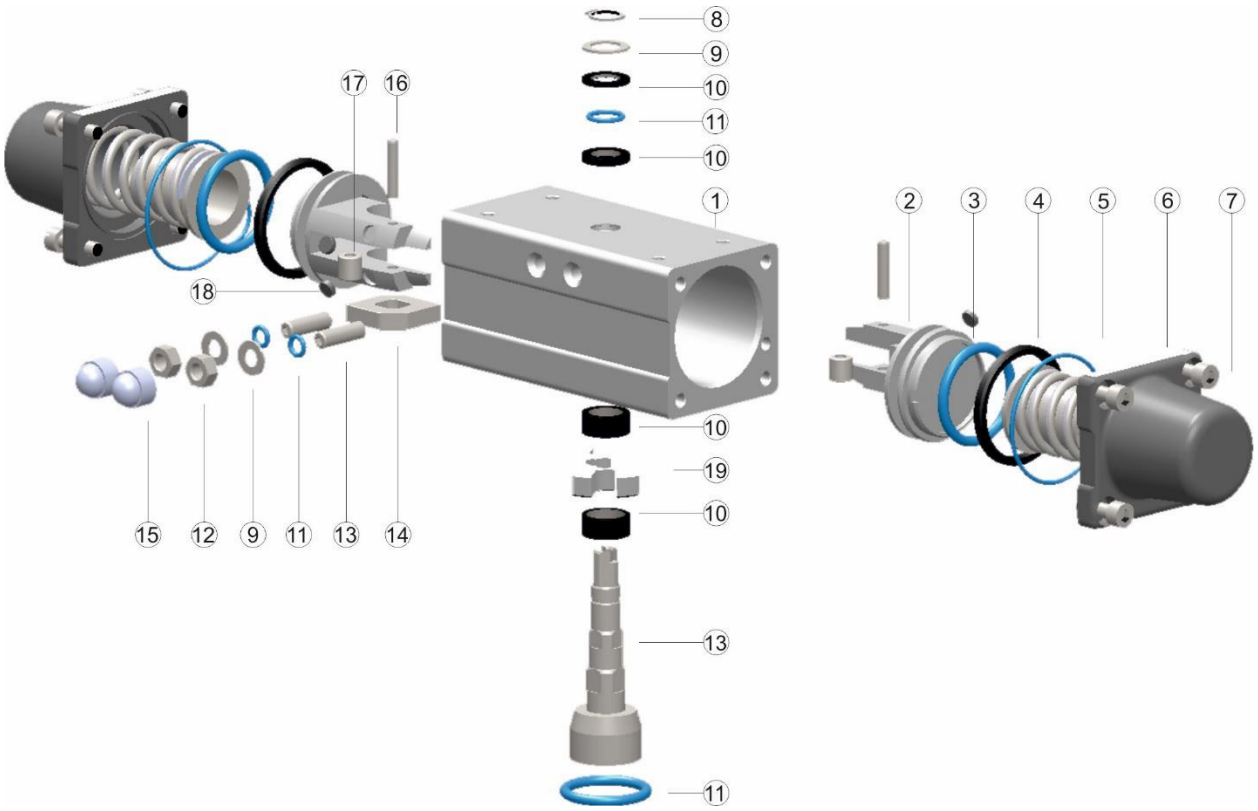
3.1 Parts List and Materials for Double-Acting JAG DA Rotary Actuators



Pos.	Beschreibung	Description	Descrizione	Stk. Pcs. Pzi.	Werkstoff Material Materiale
1	Gehäuse	Cylinder body	Corpo attuatore	1	Aluminium EN AW 6060 T66
2	Kolben	Piston	Pistone	2	Aluminium EN AC46100
3	O-Ring Kolben	O-ring piston	O-ring pistone	2	Silikone-Silicone 70Sh/Viton/NBR
4	Gleitband Kolben	Glide band piston	Anello guida pistone	2	PTFE-Kohle-Carbon-Carbone
5	Dichtung Endkappe	Sealing end caps	Guarnizione testate	2	Silikone-Silicone 70Sh/Viton/NBR
6	Endkappe epoxy anthrazit	End caps epoxy anthracite	Testate epossidico antracite	2	Aluminium EN AC46100
7	Schrauben Endkappe	Screws end caps	Viti testate	8	DIN912 1.4301 - AISI304 - A2
8	Sicherungsring	Retaining ring	Anello elastico	1	DIN471 1.4301 - AISI304 - A2
9	Passscheibe	Shim ring	Anello di supporto	1	DIN988 1.4301 - AISI304 - A2
10	Gleit- und Distanzbuchsen	Glide and distance rings	Anello di guida e distanza	4	PTFE-Kohle-Carbon-Carbone
11	O-Ringe	O-rings	O-ring	2	Silikone-Silicone 70Sh/Viton/NBR
12	Sechskantmuttern	Hexagon nuts	Dadi esagonali	2	DIN934 1.4301 - AISI304 - A2
13	Gewindestift	Hexagon socket set screws	Grani cava esagonale	2	ISO4026 1.4301 - AISI304 - A2
14	Anschlagscheibe	Travel stop disc	Disco regolazione corsa	1	C10
15	Schutzkappe Mutter	Protective cap for nut	Tappo protettivo dado	2	LLD-PE schwarz-black-nero
16	Zylinderstift gehärtet	Parallel pin hardened	Spina cilindrica temprato	2	DIN6325 Stahl - Steel - Acciaio
17	Zylindrische Bohrbuchse	Press fit jig bushes hardened	Bussola di guida temprato	2	DIN179 Stahl - Steel - Acciaio
18	Gleitnoppen Kolben	Glide support piston	Supporto guida pistone	2	PTFE-Kohle-Carbon-Carbone
19	Schwinge	Crank	Forcella	1	C10

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

3.2 Parts List and Materials for JAG SR Single-Acting Rotary Actuators



Pos.	Beschreibung	Description	Descrizione	Stk. Pcs. Pzi.	Werkstoff Material Materiale
1	Gehäuse	Cylinder body	Corpo attuatore	1	Aluminium EN AW 6060 T66
2	Kolben	Piston	Pistone	2	Aluminium EN AC46100
3	O-Ring Kolben	O-ring piston	O-ring pistone	2	Silikone-Silicone 70Sh/Viton/NBR
4	Gleitband Kolben	Glide band piston	Anello guida pistone	2	PTFE-Kohle-Carbon-Carbone
5	Dichtung Endkappe	Sealing end caps	Guarnizione testate	2	Silikone-Silicone 70Sh/Viton/NBR
6	Endkappe epoxy anthrazit	End caps epoxy anthracite	Testate epossidico antracite	2	Aluminium EN AC46100
7	Schrauben Endkappe	Screws end caps	Viti testate	8	DIN912 1.4301 - AISI304 - A2
8	Sicherungsring	Retaining ring	Anello elastico	1	DIN471 1.4301 - AISI304 - A2
9	Passscheibe	Shim ring	Anello di supporto	1	DIN988 1.4301 - AISI304 - A2
10	Gleit- und Distanzbuchsen	Glide and distance rings	Anello di guida e distanza	4	PTFE-Kohle-Carbon-Carbone
11	O-Ringe	O-rings	O-ring	2	Silikone-Silicone 70Sh/Viton/NBR
12	Sechskantmuttern	Hexagon nuts	Dadi esagonali	2	DIN934 1.4301 - AISI304 - A2
13	Gewindestift	Hexagon socket set screws	Grani cava esagonale	2	ISO4026 1.4301 - AISI304 - A2
14	Anschlagscheibe	Travel stop disc	Disco regolazione corsa	1	C10
15	Schutzkappe Mutter	Protective cap for nut	Tappo protettivo dado	2	LLD-PE schwarz-black-nero
16	Zylinderstift gehärtet	Parallel pin hardened	Spina cilindrica temprato	2	DIN6325 Stahl - Steel - Acciaio
17	Zylindrische Bohrbuchse	Press fit jig bushes hardened	Bussola di guida temprato	2	DIN179 Stahl - Steel - Acciaio
18	Gleitnoppen Kolben	Glide support piston	Supporto guida pistone	2	PTFE-Kohle-Carbon-Carbone
19	Schwinge	Crank	Forcella	1	C10

Oskar-von-Miller Street 8,
D-88069 Tettnang,
Germany Phone: ++49
7542 938226 Fax: ++49
7542 938227
info@jochantriebe.com
www.jochantriebe.com

4.0 Disassembly and Assembly of Rotary Actuators

	Attention! Any work or manipulation on actuators under auxiliary power is strictly prohibited! Only work on actuators that are depressurized!
	Attention! Maintenance and repair work must be carried out exclusively by trained professionals. Make sure to follow all current safety regulations as well as these installation, operating, and assembly instructions.

Before disassembling the actuator, make sure to remove all attached components (such as fittings, control valves, etc.).
Prior to reassembling the actuator, clean all parts thoroughly, inspect for damage, replace components if necessary, and renew all seals.

Before reinstalling, apply grease to the bearing surfaces, housing tracks, all installed parts, sealing elements, spring assemblies, and the shaft (see section 4.1 for recommended lubricants and quantities).

Always use a new retaining ring (8) when installing the drive shaft (for details on risks associated with incorrect installation, refer to section 1.5 Safety Instructions for Operators).

	Attention! After assembly, double-check that all cover screws (7) are tightened as specified in the instructions and that the retaining ring (8) is securely installed.

4.1 Lubricants

For optimal protection and performance, we strongly recommend using only original JAG lubricants:

FUCHS RENOLIT CX-TOM15	Calcium sulfonate complex grease with partially synthetic base oil, -40°C to +160°C, available from JAG – JOCH ANTRIEBE GMBH in a 400g cartridge

4.2 Double-acting rotary actuators JAG DA

4.2.1 Disassembly of double-acting rotary actuators JAG DA (starting from the open position of the actuator with the slot in the drive shaft parallel to the housing):

1. Remove the cover screws (7) and take off both flat covers (6) with the gaskets.
2. Take off the protective cap (15) from the adjustment screws (13), then loosen and remove the socket head screws (13) by turning them counterclockwise until they can be taken out. Leave the hex nuts (12) on the socket head screws in their preset position—this will help you match the original screw-in depth and preset swing angle during reassembly.
3. By turning the drive shaft (13) at the external square in a clockwise direction, push both pistons (2) out of the housing (1). Mark the position of the slot in the drive shaft; you'll need this for proper piston installation during reassembly.
4. Mark the installed position of the pistons for reassembly.
5. Remove the retaining ring (8), shim washer (9), and bearing washer (10). Be sure to note the position of the stop washer (14) and the swing arm (19) relative to the drive shaft (13) before pressing the shaft downward out of the housing (1).

4.2.2 Assembly of double-acting rotary actuators JAG DA

1. Carefully insert the drive shaft (13) from below into the housing (1). Guide the upper part of the shaft through the inner cylinder bore, passing in sequence through the lower bushing (10), the swing arm (19), the next bushing (10), the stop washer (14), another bushing (10), and finally up through the housing (1) until it stops. Be sure that the O-rings (11) inside the housing are not damaged. Outside the housing (1), fit the bushing (10) onto the drive shaft (13), then the shim washer (9), and finally place a new retaining ring (8) into the groove provided on the drive shaft (13). Make certain that the swing arm (19) and stop washer (14) are correctly aligned with the drive shaft (13)—see notes in 4.2.1 point 5.

	CAUTION: If the actuator is pressurized without the fitting installed later on, there is a risk that if the retaining ring (on the shaft or top) is missing, damaged, or not properly engaged,

Oskar-von-Miller Street 8,
D-88069 Tettnang,
Germany
Phone: ++49 7542 938226
Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

	the drive shaft may be pushed out from the bottom of the housing—see also 1.5 Safety Instructions for Operators

2. Insert the pistons (2) into the housing (1) from both sides. Guide the cylinder sleeve (17) of each piston (2) into the designated opening of the lever (19), and as you continue inserting the pistons into the housing, rotate the shaft counterclockwise. Make sure to install in the correct position—refer to notes 4.2.1 point 5.!

3. Push both pistons (2) together until the piston bottoms are flush with the housing (1).
4. If both pistons (2) are evenly flush with the housing (1), continue turning the drive shaft (13) counterclockwise until they press inward against each other. Position "OPEN".
5. Screw the adjustment screw assembly (13) back into the designated threads on the housing (1) until the hex nuts (12) rest against the housing. Secure the hex nuts (12) by turning them slightly clockwise against the housing wall (1). This restores the same swivel angle as before disassembly.
6. Lightly grease the cover seal (O-ring) (5) and place it into the groove of the flat cover (6).
7. Make sure that, when installing the cover, the longitudinal bore in the housing is positioned inside the cover seal (O-ring) (5).
8. Attach both flat covers (6) using the cover screws (7). Tighten the screws in a crisscross pattern with the specified torque. (Refer to the following table)
9. Check the position of the drive shaft in the “CLOSED” setting. The corners of the internal drive shaft octagon should line up with the axis cross of the actuator, and the slot in the external square should be across the actuator. If not, press the drive shaft (13) down out of the housing (1) and reinstall it in the correct position.
10. Slide the bearing washer (10) and shim washer (9) over the free end of the drive shaft and secure with the retaining ring (8).

⚠	CAUTION: If the actuator is pressurized without the fitting installed, there is a risk that if the retaining ring is missing, damaged, or not properly snapped in place (on the shaft or top side of the housing), the drive shaft may be pushed out from the bottom of the actuator – see also 1.5 5 Safety Instructions for Operators

4.3 Single-Acting Rotary Actuators JAG SR

⚠	WARNING! Only remove the spring covers when the actuator is in the safe position, meaning the springs are not under tension. Risk of injury!

⚠	WARNING! The spring covers are under preload when being loosened! The springs store energy and can cause injury if not handled correctly!

4.3.1 Disassembling Single-Acting Rotary Actuators JAG SR (starting from the closed position of the actuator, with the shaft slot perpendicular to the housing = safety position):

These actuators come equipped with preloaded spring assemblies.

1. Evenly loosen all cover screws (7). After a few turns, the spring tension in the spring assembly will be absorbed.

2. If the spring tension does not release after unscrewing the cover screws by 4-5 mm, stop the process. The spring assembly sleeve may be damaged. In this case, completely remove two opposite screws and replace them with two longer screws, screwing them in deeply. Then, continue loosening the remaining screws evenly until all the shorter screws are removed. Replace them as well with longer screws and repeat the process until the springs are fully relaxed and the spring cover can be safely removed. Remove both spring covers (6) along with the gaskets.

3. Remove the protective cap (15) from the adjustment screws (13), then loosen and remove the hex socket screws (13) by turning them counterclockwise until you can take them out. Leave the hex nuts (12) in their preset position on the hex socket screw. This makes it easier to set the same screw depth and preadjusted swivel angle during reassembly.

4. By turning the drive shaft (13) with an external square in a clockwise direction, push both pistons (2) out of the housing (1). Mark the slot position on the drive shaft, so you can reinsert the pistons into the rocker (19) at the same spot during reassembly.
5. Mark the installation position of the pistons for reassembly.

Oskar-von-Miller Street 8,
D-88069 Tettnang,
Germany Tel: ++49 7542 938226
Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

6. Remove retaining ring (8), shim washer (9), and bearing washer (10). Before pressing the drive shaft down and out of the housing (1), note the positions of the stop washer (14) and the lever arm (19) in relation to the drive shaft (13) for reassembly.

4.3.2 Assembly of Single-Acting Rotary Actuators JAG SR, Spring-Return Closed Position

1. Start assembly as you would for the double-acting actuator. The spring covers (6) are installed in the reverse order of removal.
2. Carefully insert the drive shaft (13) upwards from below into the housing (1), guiding the upper part of the shaft inside the cylinder bore first through the lower bushing (10), then the lever arm (19), the next bushing (10), the stop washer (14), another bushing (10), and finally through the top of the housing (1) until fully seated. Take care not to damage the O-rings (11) inside the housing. Outside the housing (1), install the bushing (10) on the drive shaft (13), followed by the shim washer (9), and finally a new retaining ring (8) into the designated groove on the drive shaft (13). Ensure the lever arm (19) and stop washer (14) are correctly positioned in relation to the drive shaft (13)—see notes 4.2.1, item 5.

	ATTENTION: If the actuator is pressurized without the fitting installed, there is a risk that if the retaining ring is missing, damaged, or not properly engaged (on the shaft or top of the housing), the drive shaft could be pushed out from the underside of the actuator – see also 1.5 Safety Instructions for Operators

3. Insert the pistons (2) into the housing (1) from both the left and right sides. Guide the cylinder sleeve (17) of each piston (2) into the designated opening on the lever (19). As you continue to push the pistons into the housing, rotate the shaft counterclockwise. Be sure to observe the correct installation position—refer to section 4.2.1, point 5!

4. Push the pistons (2) together until their bottoms are flush with the housing (1).
5. If both pistons (2) are evenly aligned with the housing (1), turn the control shaft (13) counterclockwise until the pistons (2) press inward against each other. This sets the position to "CLOSED".
6. Screw the adjustment bolts (13) back into their threads on the housing (1) until the hex nuts (12) rest against the housing. Secure the hex nuts (12) by gently turning them clockwise against the housing wall (1). This restores the same swing angle as before disassembly.
7. Lightly lubricate the cover seal (O-ring) (5) and fit it into the groove of the flat cover (6).
8. When installing the cover, make sure the longitudinal bore in the housing sits within the cover seal (O-ring) (5).

9. Place the spring pack of a spring cover into its designated pocket in the piston (2).
10. Fasten the first spring cover (6) using the cover bolts (7). Tighten the cover bolts (7) in a crisscross pattern to the specified torque (see following table). Always complete the work fully on one cover side before switching to the other.

11. Repeat steps 9 and 10 for the second spring cover.
12. Check the control shaft position in the "CLOSED" state. The corners of the inner shaft octagon should be aligned with the actuator's axis cross, and the slot on the outer square shaft should run perpendicular to the actuator. If this is not the case, press the control shaft (13) down out of the housing (1) and reinstall it in the correct position.

13. Slide the bearing washer (10) and spacer washer (9) onto the open end of the control shaft, then lock them in place with the retaining ring (8).

	ATTENTION: If the actuator is pressurized without the fitting installed, there is a risk that if the retaining ring is missing, damaged, or not properly engaged (on the shaft or top of the housing), the drive shaft could be pushed out from the underside of the actuator – see also 1.5 Safety Instructions for Operators

Thread size	Tightening torque (Nm)
M5	4
M6	7
M8	17
M10	35
M12	60
M16	145
M20	290

4.4 Reversing the direction of rotation

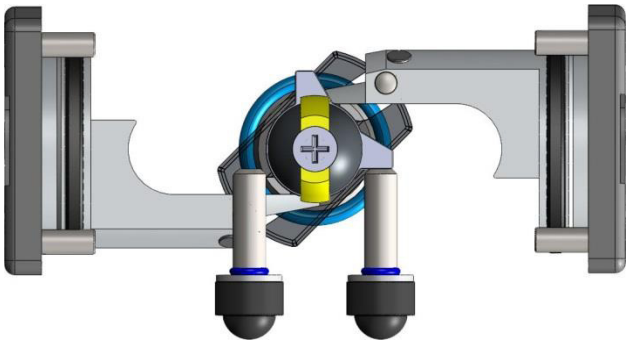
Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

The basic function, including rotation direction and operation of pneumatic rotary actuators, is defined in DIN EN 15714-3:2010-02, section 4.5, and marked according to VDI/VDE3845 Sheet 2 – Figures 1-4. Our rotary actuators comply with these standards. Different rotation directions and functions are permitted if specified by the manufacturer. The standard function for JAG rotary actuators is described in section 2.3 of this original operating and installation manual. We recommend ordering the actuators in the required configuration and having them assembled by the manufacturer. You may change the direction of rotation and function, but this will void the manufacturer's warranty, and the actuator will require a new nameplate and updated rotation direction marking. Additionally, each actuator will need a new retaining washer, which can be obtained from the manufacturer.

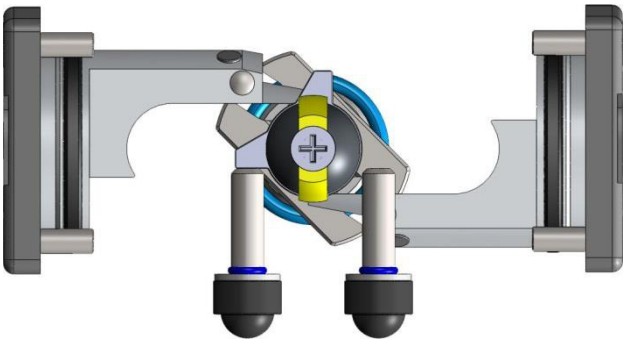
If necessary, the actuator's direction of rotation can be changed. The following steps are required:

Double-acting JAG…-DA:

1. Remove the cover and pistons as described in section 4.2.1. Note the end position of the pistons (before removal), along with the shaft, yoke plate, and stop washer as shown below (left image)
2. Remove the drive shaft (13) with the slot perpendicular to the actuator housing by pulling it downward out of the housing. Then, as shown in the right image, reinsert the yoke plate (19) and stop plate into the drive shaft (13) with the slot perpendicular to the actuator housing, snapping them into place.
3. To reverse the direction of rotation, turn each piston 180°, then reassemble as described in section 4.2.2. Continue following the instructions in 4.2.2 until the actuator is completely reassembled.
4. Label the actuator with the correct direction of rotation.
5. Check the desired safety position of the solenoid valve (whether it is open or closed when not powered), as well as the direction of rotation and function of any additional accessories such as limit switch boxes or positioners that may need to be installed.
6. After assembly, the actuator and its components should match the appearance shown in the image on the right.



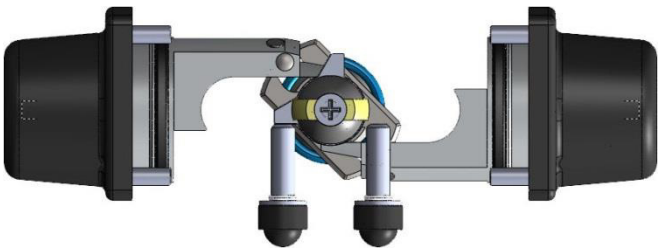
Counterclockwise to open - Clockwise to close (Standard)



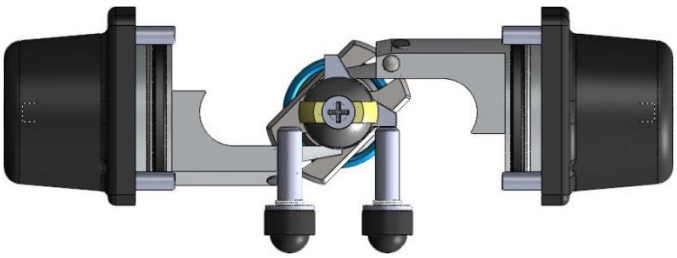
Clockwise to open - Counterclockwise to close (Optional)

Single-acting JAG…-SR:

1. Disassemble the cover and piston as described in section 4.3.1. Before removal, refer to the left image for the end position of the pistons, shaft, yoke plate, and stop plate.
2. Pull the drive shaft (13) with the slot perpendicular to the actuator housing downward out of the housing; reinsert the yoke plate (19) and stop plate into the drive shaft (13), and ensure the slot is perpendicular to the housing as shown in the right image.
3. To reverse the rotation direction, rotate each piston 180°, then reassemble as outlined in 4.3.2. Continue following section 4.3.2 until the actuator is fully assembled.
4. Label the actuator with the correct direction of rotation.
5. Confirm the desired fail-safe position of the solenoid valve (de-energized open or closed), as well as the direction of rotation and function for any additional accessories such as limit switch boxes or positioners.
6. After installation, the actuator and its components should resemble the image on the right.



Counterclockwise to open - Clockwise to close



Clockwise to open - Counterclockwise to close

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

(Standard) (Optional)

4.5 Converting the Rotary Actuator from Double-Acting to Single-Acting Operation

We recommend ordering the rotary actuators in the required configuration—either double-acting or single-acting—directly from the manufacturer. While it is possible to convert a double-acting actuator to a single-acting version, this will void the manufacturer's warranty, and the actuator will require a new type label and direction-of-rotation marking. Additionally, two spring-loaded end caps are needed for the conversion, which can be obtained from the manufacturer.

⚠	WARNING! Never perform work or adjustments on rotary actuators while they are under auxiliary power! Only work on actuators when they are fully depressurized!

To convert from double-acting to single-acting operation, follow these steps (starting from the open position of the actuator, with the shaft slot parallel to the housing):

1. To remove the flat covers with gaskets (end caps), follow the steps in section 4.2.1, point 1.
2. Turn the external square of the shaft (13), which is in the OPEN position, 90° clockwise to push both pistons (2) out of the housing (1). Then, rotate the shaft back 90° counterclockwise to return it to the open position.
3. Install the pistons mirrored by 180°, as shown in the diagram, and rotate the external square of the shaft 90° clockwise.
4. Place the spring assembly from one spring cover into the designated pocket in the piston (2).
5. Attach the first spring cover (6) using the cover screws (7). Tighten the screws (7) in a crisscross pattern with the specified torque (see Table 4.3.2). Always complete the work on one cover side at a time.
6. Repeat steps 9 and 10 for the second spring cover.
7. Check the shaft position in the “CLOSED” setting. The corners of the internal square shaft should be aligned with the actuator’s axis cross, and the slot of the external square should be perpendicular to the actuator.

⚠	WARNING! Spring covers should only be removed again when the actuator is in the safety position, meaning the springs are not under load. Risk of injury!
⚠	WARNING! Spring covers are under tension when loosened! Springs are energy storage devices and can cause injuries if handled improperly!

To convert from single-acting to double-acting operation, follow these steps, starting with the actuator in the closed position (the shaft slot is perpendicular to the housing—this is the safety position):

1. To remove the spring covers with seals (end caps), follow steps 1 and 2 in section 4.3.1.
2. Rotate the external square of the actuator shaft (13), which is currently in the OPEN position, 90° clockwise to push both pistons (2) out of the housing (1). Then, rotate the shaft a total of 90° counterclockwise to return it to the open position.
3. Install the pistons mirrored by 180° according to the diagram, and rotate the shaft 90° clockwise via the external square.
4. Place the spring set from one spring cover into the designated pocket of the piston (2).
5. Secure the first spring cover (6) with the cover screws (7). Tighten the screws (7) in a cross pattern to the specified torque (see Table 4.3.2). Always complete these steps fully on one side before moving to the other.
6. Repeat steps 9 and 10 for the second spring cover.
7. Check the shaft position in the “CLOSED” state. The corners of the internal octagon of the shaft should align with the actuator’s axis center, and the slot in the external square should be perpendicular to the actuator.

5.0 Maintenance and Service Intervals

JAG rotary actuators are factory lubricated for life, making them maintenance-free under standard conditions.

The expected service life is rated for 500,000 switching cycles (OPEN-CLOSE-OPEN).

Requirements for this include:

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

1. Proper installation of actuators
2. Use of clean, suitable control media
3. Standard environmental conditions
4. Compliance with intended use.

The warranty is void if the actuator is modified or altered.

⚠	ATTENTION: Typically, the maintenance interval for a rotary actuator is significantly longer than that of the maintenance interval for a valve. Whenever the valve is serviced, you should at least check and confirm that the rotary actuator is functioning properly and ensure reliable operation.

6.0 Liability and Warranty

Liability and warranty become void if the actuators are not used as intended.

All information and instructions for operation and maintenance are based on our experience and knowledge and are provided to the best of our ability.

The original version of this installation and maintenance manual was written in German and has been thoroughly reviewed by our team. The translation into the relevant national or contract language was carried out by a recognized translation agency.

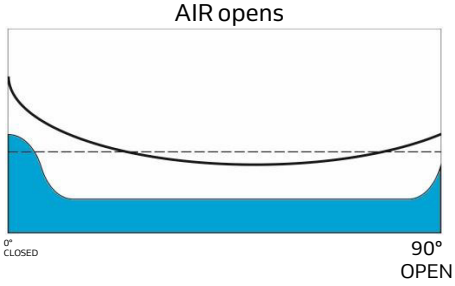
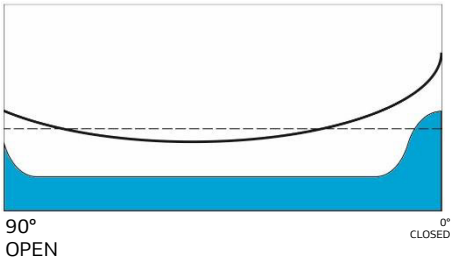
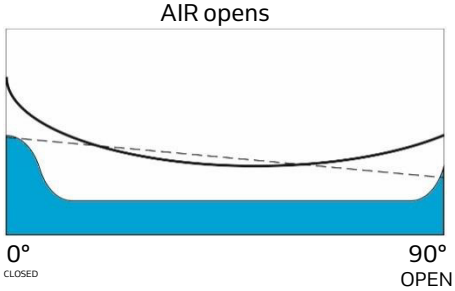
This operating manual has been compiled with the utmost care. However, if you notice any omissions or errors, please let us know in writing.

The warranty expires 12 months after the delivery date (which is the same as the sale date).

7.0 Technical Data Overview

7.1 Yoke Kinematics

JAG rotary actuators use the yoke drive system (also known as yoke kinematics or oscillating system). Compared to rack and pinion drives with the same piston diameter, this system offers significantly greater torque for opening and closing due to its longer lever arm. The torque profile is perfectly suited to the variable torque demands of ball valves and butterfly valves. In some cases, a yoke drive actuator can be selected in a smaller size than a rack and pinion drive, helping to reduce costs for purchase, compressed air usage, installation space, and weight.

<table>
<tr><td colspan="3">A key feature of yoke actuators is that they deliver up to 50% higher torque at end positions compared to rack-and-pinion actuators.</td></tr>
<tr><td>The torque profile of the double-acting JAG yoke actuator shows that torque is available wherever it's needed by the ball valve or butterfly valve.</td><td>AIR opens
 
</td><td>AIR closes
 
</td></tr>
<tr><td>The torque curve of the single-acting JAG yoke actuator shows a steadily increasing torque in the spring return position (safety position), where reliable operation is absolutely critical.</td><td>AIR opens
 
</td><td>SPRING closes
 
</td></tr>
</table>

Legend:

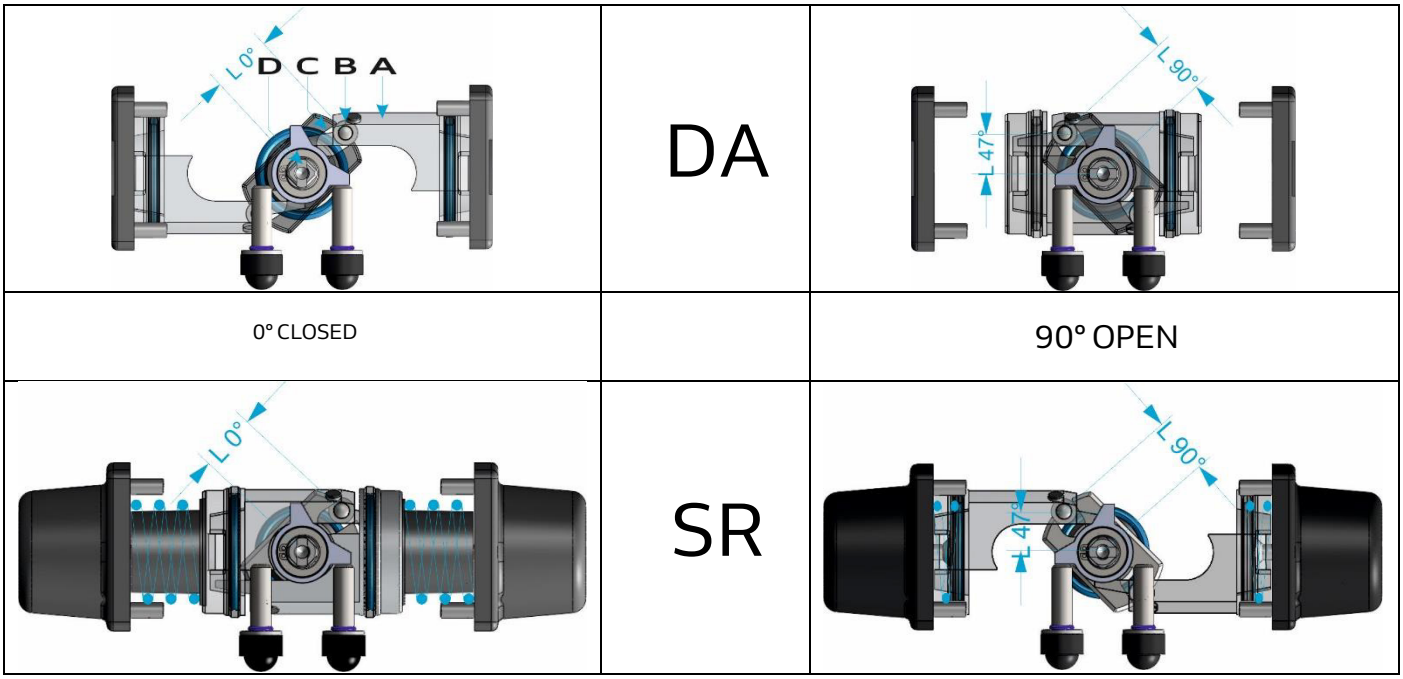
JAG actuator with yoke mechanism

Oskar-von-Miller Street 8,
D-88069 Tettnang,
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
www.jochantriebe.com

Rack-and-pinion drives
Required Torque for Valve

Force Transmission:

When piston A is pressurized, the force is transferred via roller B to the control yoke C, which is firmly attached to shaft D and thus to the valve shaft. Lever L is at its longest at 0°, delivering maximum force when closing (as needed for ball valves and butterfly valves). In the middle position, the lever is shortest, and in the open position, it becomes long again (as required for a ball valve).



7.2 Torque Tables JAG DA and SR

Torques for Double-Acting Rotary Actuators JAG DA Series (AIR-AIR)									
Model	α°	2.5 bar	3 bar	4 bar	5 bar	5.6 bar	6 bar	7 bar	8 bar
JAG10DA	0°	5.3	6.4	8.5	10.6	11.9	12.8	14.9	17.0
	45°	2.6	3.1	4.2	5.2	5.8	6.3	7.3	8.4
	90°	4.2	5.1	6.8	8.5	9.5	10.2	11.9	13.6
JAG30DA	0°	14.8	17.8	23.7	29.7	33.2	35.6	41.6	47.5
	47°	7.1	8.5	11.3	14.2	15.9	17.1	19.9	22.8
	90°	9.4	11.3	15.1	18.9	21.1	22.6	26.4	30.2
JAG60DA	0°	31.7	38.0	50.7	63.4	71.0	76.1	88.8	101.5
	47°	14.6	17.5	23.3	29.2	32.7	35.0	40.9	46.7
	90°	19.0	22.9	30.5	38.1	42.7	45.8	53.4	61.0
JAG120DA	0°	56.4	67.7	90.3	112.9	126.5	135.5	158.1	180.7
	45°	29.5	35.4	47.2	59.0	66.1	70.8	82.6	94.4
	90°	47.7	57.3	76.4	95.5	107.0	114.6	133.7	152.8

Torque values for single-acting rotary actuators Series JAG SR (air-spring)									
Model	α°		3 bar / Spring Pack S3				6 bar / Spring Pack S6		
			Air	Spring			Air	Spring	
JAG30S6	0°		On request				21.6	21.6	
	47°						14.3	14.3	
	90°						18.8	18.8	
JAG60S6	0°		12.1	13.1			35.7	35.7	

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D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
info@jochantriebe.com
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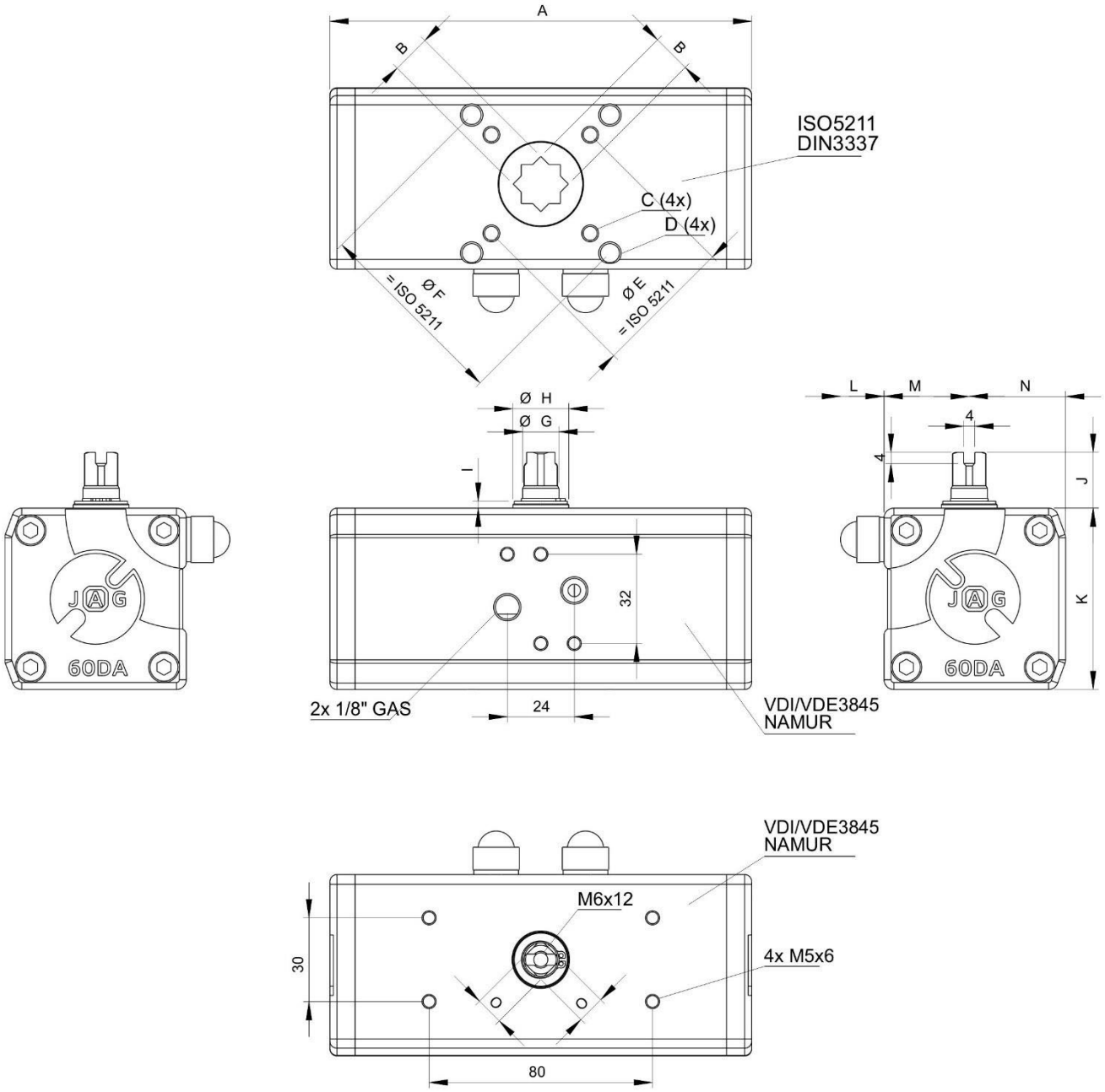
	47°		11.0	11.0			22.8	22.8	
	90°		13.1	12.1			35.4	35.4	
JAG120S6	0°		Available upon request				70.2	70.2	
	45°						35.0	35.0	
	90°						70.0	70.0	

7.3 Dimension Table for Double-Acting Rotary Actuators JAG DA



Model	JAG10DA	JAG30DA	JAG60DA	JAG120DA
A	76	122	151	198
B	9	9-11-14	9-11-14	11-14-17
C	M5x8	M5x8	M6x10	M6x10
D	-	M6x10	M8x12	M8x12
Ø E	36 - F03	36 - F03	50 – F05	50 – F05
Ø F	-	50 – F05	70 – F07	70 – F07
Ø G	7.0	9.2	13	13
Ø H	13.0	16.0	20	20
I	2.25	2.5	2.5	2.5
J	20	20	20	20

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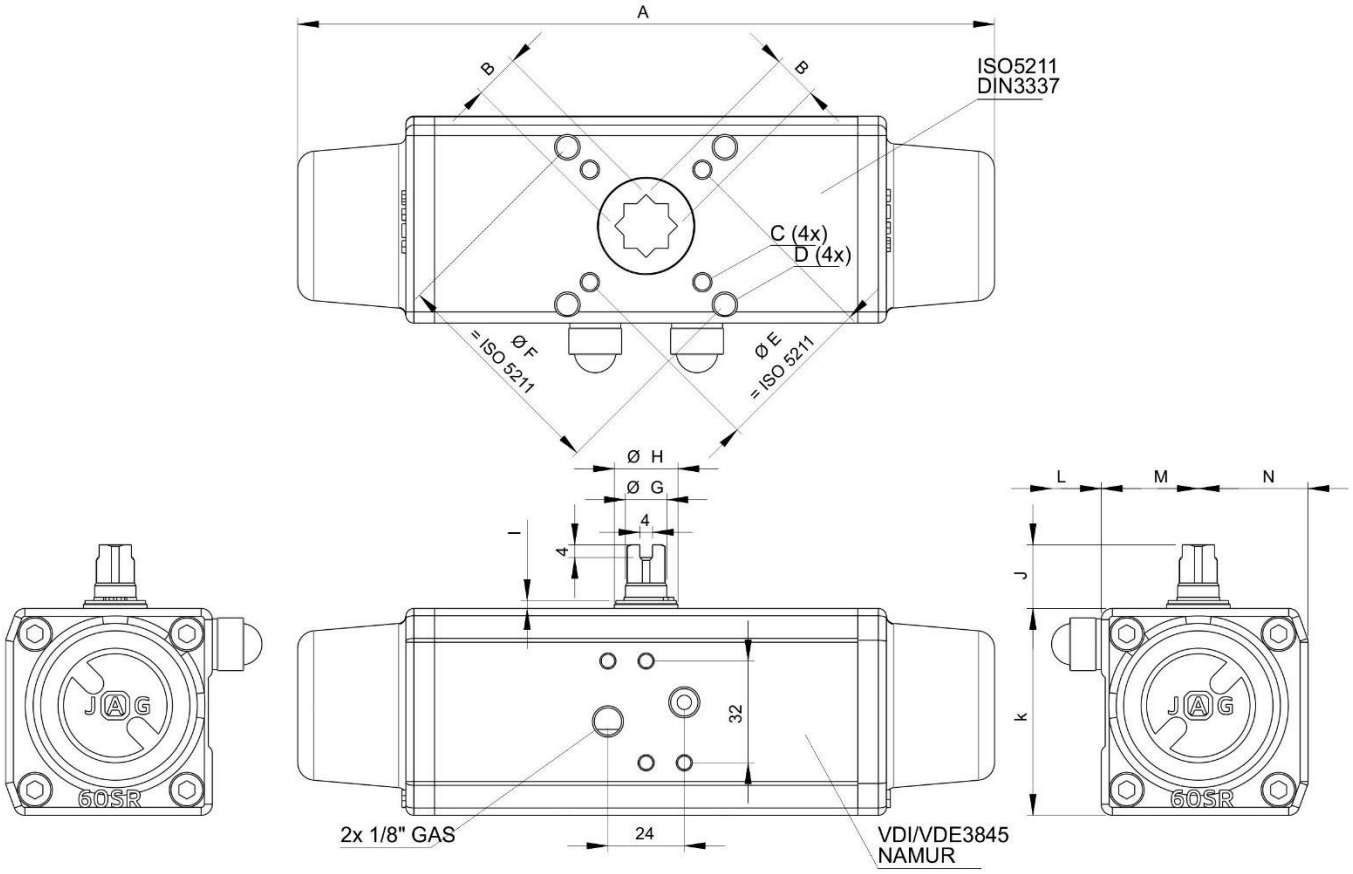
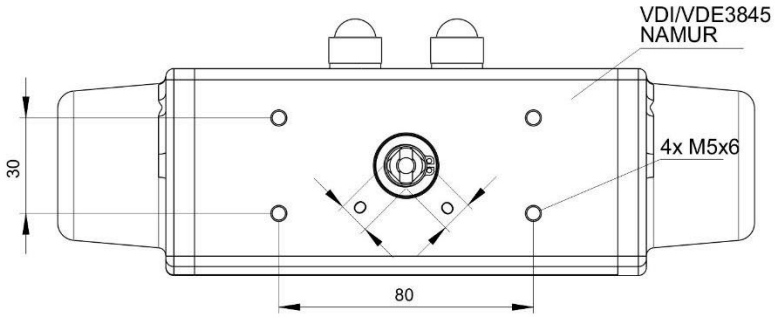
K	45	52	65	80
L	10.7	13.5	15.6	15.6
M	20.5	24.0	30.5	37.5
N	24.5	28.0	34.5	42.5
O	6.6	8.0	10.0	10.0

7.4 Dimension Table for JAG SR Single-Acting Rotary Actuators





Model	JAG10SR	JAG30SR	JAG60SR	JAG120SR
A		195	219	300
B		9-11-14	9-11-14	11-14-17
C		M5x8	M6x10	M6x10
D		M6x10	M8x12	M8x12
Ø E		36 - F03	50 – F05	50 – F05
Ø F		50 – F05	70 – F07	70 – F07
Ø G		9.2	13	13
Ø H		16.0	20	20
I		2.5	2.5	2.5
J		20	20	20

Oskar-von-Miller Strasse 8
D-88069 Tettnang
Germany Phone: ++49 7542 938226 Fax: ++49 7542 938227
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K		52	65	80
L		13.5	15.6	15.6
M		24.0	30.5	37.5
N		28.0	34.5	42.5
O		8.0	10.0	10.0

7.5 Air consumption for JAG DA and SR in liters per switching cycle 0-90-0°

Model	JAG10DA	JAG30DA	JAG60DA	JAG120DA
Liters	0.03	0.14	0.28	0.55
Model	JAG10SR	JAG30SR	JAG60SR	JAG120SR
Liters	-	0.08	0.15	0.32

7.6 Visual Indicators

!	A properly installed actuator will display the valve position with its visual indicator.

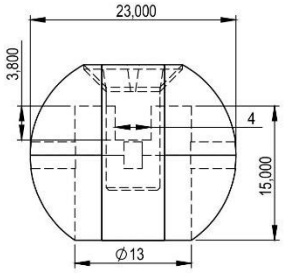
2-Wege
2-ways
2-vie
"I"

3-Wege L-Bohrung
3-ways L-bore
3-vie sfera L
"L"

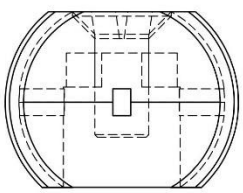
3-Wege T-Bohrung
3-ways T-bore
3-vie sfera T
"T"

4-Wege
4-ways
4-vie
"X"

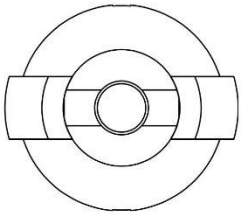
Pos.	Art.	Beschreibung	Description	Descrizione	Stk. Pcs. Pzi.	Werkstoff Material Materiale
1	VIP-BA-Øi13	Ball	Ball	Palla	1	ABS anthrazit - anthracite
2	VIP-OSG-Øi13	Anzeige	Indicator	Indicatore	2	ABS gelb - yellow - giallo
3	DIN965 M6x14 A2	Schraube	Screw	Vite	1	DIN965 M6x14 1.4301-AISI304-A2



alle abmessungen in **mm**



all dimensions in **mm**



tutti dimensioni in **mm**