Operating instructions for actuators (BA3612E)

Index:

Note:  **Notes contain important information.**

Warning:  **Warnings indicate special methods or handling procedures which, if not followed properly, may result in serious injury.**

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1 General

1.1 Safety instructions

During electrical operation certain parts inevitably carry lethal voltages. Work on the electrical system or equipment must only be carried out by a skilled electrician himself or by specially instructed personnel under the control and supervision of such an electrician and in accordance with the applicable electrical engineering rules.

When working in potentially explosive areas, observe the European Standards EN 60079-14 ”Electrical Installations in Hazardous Areas” and EN 60079-17 ”Inspection and Maintenance of Electrical Installations in Hazardous Areas”.

For work carried out in hazardous areas, special regulations (European Standard EN 60079-17) must be observed.

Work at the open actuator under voltage must only be performed if it is assured that for the duration of the work there is no danger of explosion. Pay attention to additional national regulations.

1.2 Fabrication Number

Every actuator has its own fabrication number, which is either seven or eight digits long. Each one starts with the year of manufacture and is listed on the model plate (the plate designating the actuator type can be found underneath the hand lever).
The Schiebel company maintains internal records allowing the definite identification of each actuator according to its fabrication number (type, model size, design, options, technical data and control record).

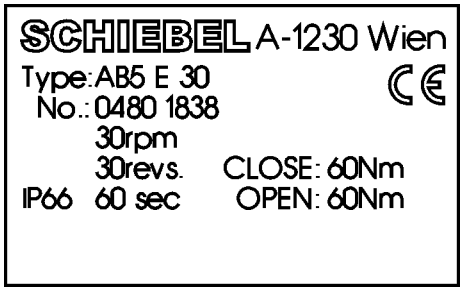


Illustration 1

Actuators which are suitable for operation in explosive atmosphere (see EN 50014 Standard) are separately designated by a special model plate (EEx, TÜV-Standard, see Illustration 2).

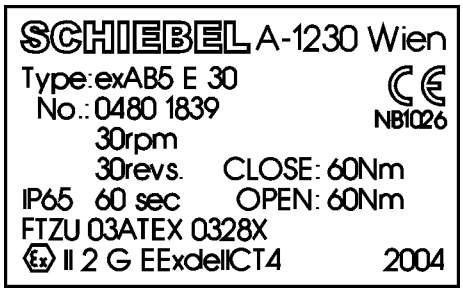


Illustration 2

1.3 Operational Mode

There are two distinct modes of operation: open-loop control operation (operational mode S2 for ON-OFF) and closed-loop control operation (operational mode S4) according to VDE 0530. But since there is a great number of varying and special models made to order, it is recommended to consult the motor model plate for the mode of operation and the running time.

1.4 Degrees of protection provided by enclosures

Actuators with three-phase motors are standardly equipped with the IP 66 protection system (according to DIN-Standard 40050). **Explosion-proof** actuators and actuators with plugs are furnished with the IP 65 protection system. Exceptions are the AC, DC and brake-motor actuators as well as those for other protection systems made to special order.

WARNING: The protection system imprinted on the model plate only applies if the cable screwing likewise corresponds to the requisite protection system, the lids are properly closed and the fitting position according to Section 1.4 (see below) is observed.

We recommend metallic screwed cable glands with a PG thread type according to DIN 40430. Moreover, unused cable entries with dummy screw joints must remain locked.

On explosion-proof actuators cable glands with protection class **EEx e according EN 50019** must be used.

Following removal of lids for assembling or adjusting purposes, care must be taken that the sealings are properly placed upon remounting the lids. Improper placement may result in water penetration and subsequent actuator breakdown.

There should be a sag in the connector cables before reaching the screwed cable glands so that water can drip off from the connector cables without running to the screwed cable glands. This will also reduce the force exerted onto the screwed cable glands (see Section 1.4).

1.5 Installation Position

Generally, there are no specific restrictions. On the basis of practical experience, however, it is recommended that the following instructions be observed when installing outdoors or within areas liable to be splashed by water:

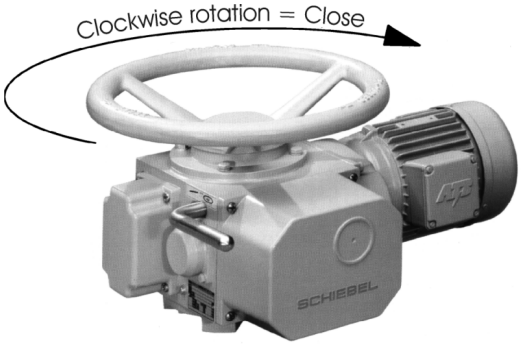
- Mount the actuators with the cable input downwards.
- Do not arrange the motor so that it hangs downwards.
- Ensure that there is sufficient sag in the cable.

1.6 Rotating Direction

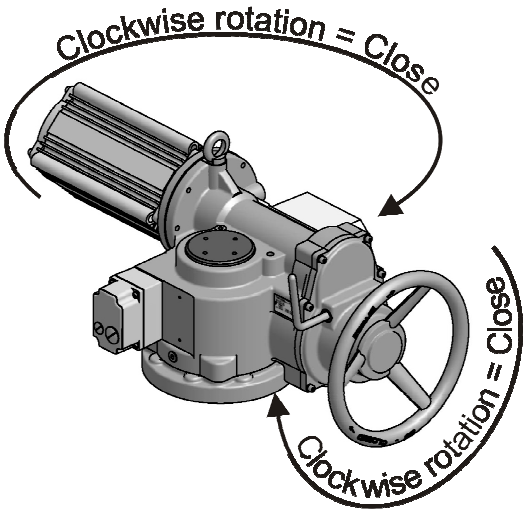
Unless expressly indicated otherwise, the standard rotating direction is:

Clockwise rotation = Close Counter-clockwise rotation = Open

Clockwise rotation of the actuator is when the output shaft turns counter clockwise and look trend on the output shaft respectively by turn of the output shaft clockwise and look trend on the handwheel.



AB3 – AB80



AB100 - AB500

All data in these operating instructions refer to the standard rotating direction.

1.7 Protective Gear

1.7.1 Mechanical Protective Gear

All actuators have at least one torque switch for clockwise and counter-clockwise rotation. These can be separately adjusted and are preset **ex works** to the torque required.

The adjusting screws are varnish-protected and must not be reset without prior consultation with the Schiebel Company.

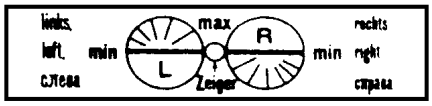
However, the **torque** for the relevant rotating direction can be **reduced** by means of plastic cams on the torque switch.

Counter-clockwise rotation torque is reduced as follows:

Using a screwdriver, turn the plastic cam marked "L" in the direction of the decreasing scale markings (clockwise).

To reduce the clockwise rotation torque, turn the plastic cam marked "R" in the direction of the decreasing scale markings (clockwise). See illustration 3.

Illustration 3



1.7.2 Electrical Protective Gear

All motors have temperature switches as standard equipment (temperature sensors upon special order), which protect the motor from overheating, if properly wired (see proposed wiring diagram).

WARNING: Please observe the technical data sheet of the built-in electrical components.

Further we recommend the installation of a motor protection circuit breaker on site as additional protection for rapid engine warming up (block). The tripping current must be adjusted to 1.2... 1,5-times of the motor current, or at explosion-proof models proceed according to the corresponding guidelines of the National Explosion Protection Authority.

1.8 Ambient Temperature

Unless otherwise defined according to special order, the following operational temperature generally applies:

open-loop control actuators	from -25°C to +80°C
closed-loop control actuators	from -25°C to +60°C
Explosion-proof actuators	from -20°C to +40°C (according to EN50014 Standard).

Warning: The maximum operational temperature also depends on the built-in components. Please observe the technical data sheets.

1.9 Status of Actuators Delivered

For every actuator, a test record is drawn up at the final quality control, during which a 100% optical inspection as well as an adjustment of the shutdown torque and a functionality test of the built-in components are carried out.

Adjustment of the travel switch including any ordered supplementary elements must be done **after** installation on the positioning element.

Warning: The start-up instructions (see Section 4) absolutely must be followed!

If mounting on a provided valve at our company, the electrical components will be preset and this will be documented by attaching a sticker (see Illustration 4) on the indicator lid. On start-up resetting could be necessary

Illustration 4
Label on indicator lid.

Einbaukomponenten sind voreingestellt. Stellantrieb darf weder demontiert noch in seiner Stellung zur Armatur verändert werden, andernfalls ist Neueinstellung erforderlich.	Built-in components are preset. Actuator shall not be dismounted and not be changed in its location. Otherwise a resetting is necessary.
Bei anlagenseitiger Inbetriebnahme können neujustagen erforderlich werden	On start-up resetting could be necessary

SCHIEBEL

1.10 Indications (Tags)

A summary of this operating instructions in two languages is attached to the handwheel of every actuator by means of a red tag (see Illustration 5). Here the internal consignment number can also be found.

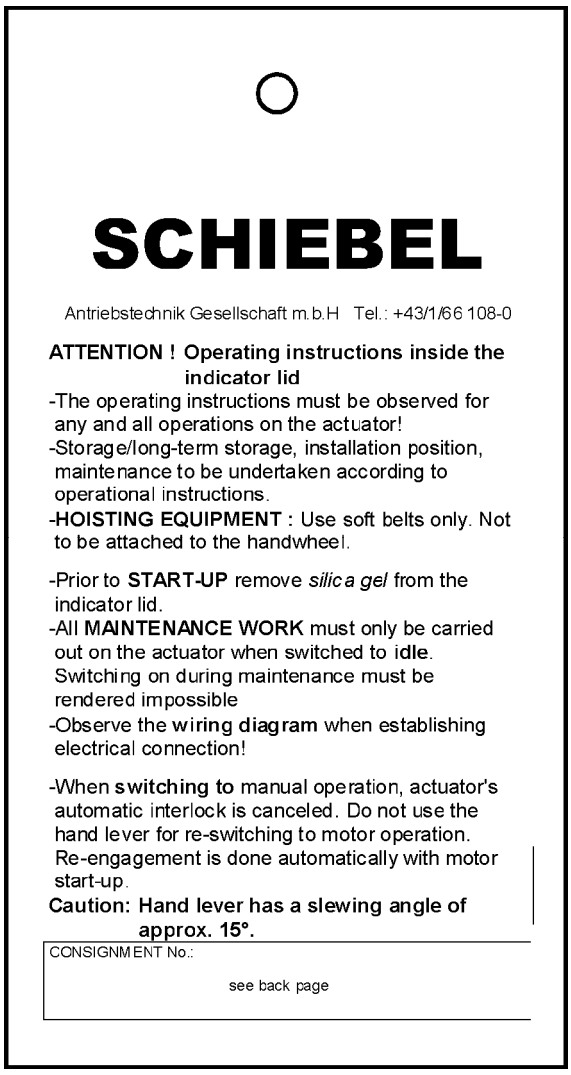


Illustration 5

2 TRANSPORT AND STORAGE

You can order the actuators to be delivered with or without packing. Special packing requirements must be specified along with your order. Use extreme caution when unpacking or repacking the actuator.

Warning: **Use soft belts for hoisting equipment. Do not attach hoisting belts to the handwheel.**

2.1 General

The indicator lids of all actuators contain a minimum of 5 g of silica gel ex factory.

WARNING! Prior to start-up of the actuator (refer to Section 4) all of the silica gel must be removed!

2.2 Storage

CAUTION!

Observing the following precautions will help to avoid damage when storing actuators:

- Store actuators in well-ventilated dry rooms.
- Store actuators on wooden pallets, in skeleton boxes, or on shelves to protect against dampness from the ground.
- Cover actuators with a plastic sheet to protect against dirt and dust.
- The actuators must be protected from mechanical damage.

2.3 Long-term Storage

WARNING!

When storing the actuators for more than six months, the following instructions absolutely must be observed:

- **Warning:** The silica gel contained in the indicator lid **must be replaced within no more than six months (from the date of delivery from the factory of SCHIEBEL Antriebstechnik Gesellschaft m.b.H, Josef-Benc-Gasse 4, A-1230 Wien).**
- When opening the indicator lid and replacing the silica gel, be sure to smear the rubber seal of the indicator lid with glycerine. Afterwards carefully close the indicator lid again.
- Smear the screwheads and exposed surfaces with a resin-free grease or long-term anti-corrosive.
- Wrap the motor (especially the brake motor) with oiled paper.
- Recondition varnished surfaces that may have been damaged during transport or through improper storage or mechanical influence.
- Check actuators every six months to make sure that all measures and precautions are still in effect, and renew anti-corrosives and silica gel.
- If these instructions are not observed, condensation will form which will result in damage of the actuator.

3 INSTALLATION INSTRUCTIONS

Any and all installation work on the actuator must be carried out by skilled personnel only.

3.1 Mechanical Connection

Make sure that the fitting flanges and the actuator flanges match each other, and that the borehole matches the shaft or, in the case of actuator model "A" (threaded bushing), that the actuator and fitting threads match each other.

- Grease the spindle.
- Clean all exposed parts which have been coated with anti-corrosive.
- Thoroughly clean the bolting surfaces of the fittings.
- Lightly grease the connecting joints between the actuator and the fittings.
- Place the actuator on the fittings or the gear.
- Tighten the fastening screws crosswise.

3.2 Electrical Connection

The electrical connection must be installed by skilled personnel only.

Observe the specific safety regulations

Install the electrical connection only when in idle mode.

Beware:

The time delay from the moment the torque switch responds until the motor is in idle mode should not exceed 40 ms.

It is therefore recommended to switch the relevant break contacts of the travel switches directly into the control circuit of the reversing contactor unit (Refer to proposed wiring diagram).

Be sure that the supply ratings on the side of the unit (power, voltage, frequency) correspond to the motor data (see the motor model plate).

The standard model can be ordered with the following connection options:

- Connection of the motor is done via the motor clamping board, and the control voltage is established via the actuator clamping board. For **explosion-proof actuators,** connection of the motor is done via the actuator terminal strip, which may be special-ordered. The largest possible conductor cross-section is 2.5 sq. mm. By special order (or if necessary to handle excess electrical flows), motor clamps for an even larger cross-section can be used according to the electrical current.
- The control line is connected with the motor using plugs with crimp contacts. The largest possible conductor cross-section is 2.5 sq. mm (for the standard model 1.5sq. mm). By special order (or from I_n > 10 A), a corresponding motor plug must be used.
- The control line is connected with the motor using plugs with threaded terminal ends (I_n =16A). The largest possible conductor cross-section is 2.5 sq. mm.

The numbers on the clamps and/or plugs are arranged in accordance with the circuit diagram contained in the appendix of the operating instructions (to be found in the indicator lid).

Operating instructions for actuators (BA3612E)

Motor connection:

- Three-phase motor: Connection of the three-phase system with positive phase sequence (L1, L2, L3):

  Clockwise rotation of the actuator:
  - phase **L1** to **U1**
  - phase **L2** to **W1**
  - phase **L3** to **V1**

  Counterclockwise rotation of the actuator:
  - phase **L1** to **U1**
  - phase **L2** to **V1**
  - phase **L3** to **W1**

Caution: **Before starting up the actuator it is absolutly necessary to check the phase sequence of the three-phase system on correctness and if necessary to correct it!**

Caution: When connecting the motor via the motor clamping board or the terminal-strip wiring , the clamps are labelled with U1, V1, W1.
With plug connection, refer to the inscription on the wiring diagram.

- One-phase motor: These motors are standardly wired to the terminal strip with the labeling R, N, L

  Clockwise rotation of the actuator:
  - neutral conductor to N
  - phase to R

  Counterclockwise rotation of the actuator:
  - neutral conductor to N
  - phase to L

Caution: With plug connection, refer to the inscription on the wiring diagram.

WARNING: Observe the technical data sheets of the built-in components.

Note: Actuators with an output speed of less than 120 rpm interlock automatically. Whenever switched off, actuators not equipped with automatic interlock (≥120 rpm), will relieve stress via the torque. The torque switch will then return to its neutral position.

To prevent undesired re-start in the same direction, **the torque switches of actuators with no automatic interlock must be locked electrically.**

If electrical connection is not immediately followed by start-up and if the unit is located outdoors, the heating resistor should be promptly activated (Be sure the voltage is in accordance with the proposed wiring diagram!) or the silica gel should be left in the indicator unit

Caution: See Section 2 of the operating instructions.

4 START-UP

It is assumed that the actuator has been correctly assembled and electrically connected (see Section 3).

Caution: Remove silica gel from the indicator lid.

4.1 Switching Actuator to Manual Operation

The actuator is switched to manual operation by moving the hand lever (see illustration 7 and 8) by approximately 15°, and by simultaneously turning the hand wheel. The lever remains in this position.

Caution: When switching to manual operation, the actuator's automatic interlock is deactivated. Switching back to motor operation **must not be undertaken with the hand lever.** Switching takes place automatically as the motor runs up.

WARNING!: Hand lever has a slewing angle of approximately 15°, therefore release the hand lever immediately upon activation!

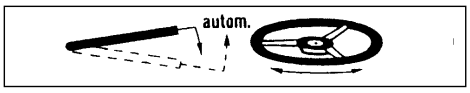
Labels on actuator:

AB3, 5, 100, 200, 500

Illustration 7

AB8, 18, 40, 80

Illustration 8



4.2 Monitoring the Rotating Direction

Move the actuator with coupled fittings to the middle position by hand. Give the actuator the short electrical command "CLOSE".

Caution: The motor couples in automatically.

Monitoring: The output shaft must be rotating in a clockwise direction (see direction arrows on the hand-wheel).

In the case of incorrect rotating direction:

- With three-phase current, exchange L1 and L2.
- With one-phase motor, exchange connections at R and L.

Warning:

The travel and torque switches do not operate if rotating direction is incorrect. The result is destruction of the actuator and/or the fittings!!!

4.3 Setting of the Travel Switch

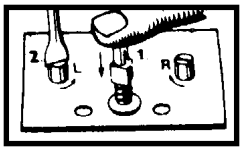
Caution: Depending on the load intensity, special actuators with high output speed display a trailing effect when switched off. This must be taken into consideration accordingly when adjusting the travel switches. The actuator can use either a roller-type counter or a camshaft gear for travel determination, as need be.

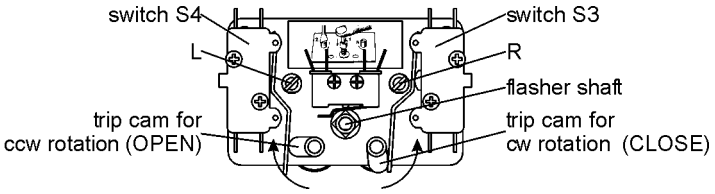
4.3.1 Roller-type Counter (operational range starting at 1 rev. at the output)

- *Setting the position "CLOSE":*

  Move the actuator into the position "CLOSE" by hand.

  To set the final position, push the flasher shaft with square cam (see Illustration 9) downwards with the finger. Using a screwdriver, turn the slotted shaft of the "R" rollers in the direction of the arrow, until the corresponding counter-clockwise trip cam activates the travel switch (see Illistration 10). Release flasher shaft and be sure that the toothed roller locks in.

Illustr. 9 

Illustr. 10 

- *Setting the position "OPEN":*

  Move the actuator into the position "OPEN" by hand.

  To set the final position, push the flasher shaft with square cam (see Illustration 9) downwards with the finger. Using a screwdriver, turn the slotted shaft of the "L" rollers in the direction of the arrow, until the corresponding clockwise trip cam activates the travel switch (see Illistration 10). Release flasher shaft and be sure that the toothed roller locks in.

4.3.2 Camshaft Gear (operational range starting at 0.25 rev. at the output)

General: Camshaft gears are also used if more than two positions, adjustable independently from one another, are required.

- 4.3.2.1 *Setting the position "CLOSE":*

  Move the actuator into the position "CLOSE" by hand.

  Loosen the safety screw and the knurled nuts until the cam disc is turnable by hand. Set the lowest cam disc (while observing the rotating direction), until the travel switch is activated. Fasten the knurled nuts slightly so that the adjusted final position will not be changed during subsequent driveup.

- 4.3.2.2 *Setting the position "OPEN":*

  Move the actuator into the position "OPEN" by hand.

  Loosen the knurled nuts again. Set the upper (second-lowest) cam disc (while observing the rotating direction), until the travel switch is activated. Fasten the knurled screws by hand and secure with a threaded pin.

Warning: If additional intermediate position switches have been ordered, these are arranged via the travel switch and must be set accordingly. An **additional hexagon nut (NAF 13)** is placed between the travel switches and the intermediate-position switches. This nut must be loosened before setting the final-position switch and tightened thereafter. (Then, proceed as under Sections 4.3.2.1. and 4.3.2.2.).

Any built-in components ordered are to be put into operation according to the attached data sheets.
Following completed start-up, be sure to properly seal the lids to be closed and check the cable input once again (see Section 1.3.).
Check the actuators for varnish damage (caused by transport or assembly) and repair them as necessary.

5 MAINTENANCE

No maintenance work must be undertaken unless the actuator has been switched to **IDLE**.

(Switching on during maintenance must be rendered impossible.) Following start-up, the actuators are ready for use. The actuator is standardly filled with grease (oil filling upon customer's request).
Regular Maintenance Inspection:

- Beware of increased running noises. After every three months of non-operation, activate the actuator.
- With actuators having output types A, B and C according to DIN 3210-Standard (types A, B1, B2 and C according DIN ISO 5210-Standrad), re-grease them at the lubricator nipple at least every six months (see Section 7.2.).

As there is no specific restriction on the installation position (see Section 1.5), there is no oil gauge and no oil drain plug in the main casing.
The lubricant changing of the main casing must be made about the hand wheel.

Depending on the frequency of operation,

- change the grease (oil),
- renew the seals and
- check all roller bearings and the worm-wheel unit and replace them, if necessary.

after every 10,000 to 20,000 hours of operation (approximately every five years - refer to Section 7).
See the Table of Lubricants (Section 7) for the types of oil and grease to be used.

6 REPLACEMENT PARTS

When ordering replacement parts, the fabrication number of the actuator must be given (see Section 1). For actuator replacement parts use our exploded diagram 80.B.1.6. and our Replacement Parts List 80.B.1.7. Replacement parts lists for other structural components upon request.

7 RECOMMENDATIONS OF LUBRICANTS (for all manufacturers)

7.1 Main Casing

7.1.1 Application temperature from -35°C to +100°C

Lubricating grease DIN 51826 - GP 00 P-30

i.e. High pressure (EP), complex grease on Li soap basis,

work penetration 0.1 mm	355 to 430
Dripping temperature:	about 200°C
NLGI grade	00

Acid-free, not or only marginally reacting with water.

7.1.2 Spur Gears from -40 to +85°C

Lubricating grease DIN 51826 - KPF -1/2 G-20

i.e. High-graphite, bitumen-free permanent lubricant with outstanding EP properties.
Work penetration 0.1mm: between 265 and 340.

7.1.3 Output Drive Type A and Spindle Drive (Linear Actuators) from -40 to +85°C

Lubricating grease DIN 51862- G 1 -G

i.e. Water-resistant complex grease on Al soap basis, highly resistant to acids and alkalines

work penetration 0.1 mm	around 265
Dripping temperature:	about 260°C
NLGI grade:	1

Acid-free, not or only marginally reacting with water.

7.1.4 Precision Components from -40 to +85°C

Lubricating grease (or spray) DIN 58396- S1

i.e. High-creeping, water-displacing, low-viscosity grease chemically neutral to copper and plastics.

Work penetration 0.1mm:	175 to 385
Dripping temperature:	over 150°C
Evaporation loss:	max. 1%
Water resistance:	Evaluation grade DIN 51807-1-40

7.2 Basic Lubricant Service Interval

The service interval for Schiebel actuators is 10 years (from the date of delivery by Fa. SCHIEBEL Antriebstechnik Gesellschaft m.b.H, A-1230 Vienna)

The functionality and operating life of the lubricants is, however, dependent upon operational conditions. It may be necessary to take reduction factors into account.

Operational condition(s)	Definition	Reduction Factor (Multiplier)
On-period (OP)	(Total of motor running time)	
Extremely high OP	over 1,250 hours/year	0.5
High OP	over 500 hours/year	0.7
Extremely low OP	less than 0.5 hours/year	0.8
Ambient temperature	(Permanent or long-term)	
Extremely changing	between -10 and +50°C	0.5
Extremely high	over +50°C	0.7
Extremely low	below -25°C	0.9
Output speed	(at main shaft of actuator)	
High revolution	over 80 rev./min	0.8
Utilization factor	(with respect to nominal performance)	
Very high	over 90%	0.8
High	between 80 and 90%	0.9

Example:

Extremely low OP + extremely low ambient temperature + high revolution + utilization factor 87%

⇒ 0.8 x 0.9 x 0.8 x 0.9 = 0.51 reduction factor.

Lubricant maintenance interval ⇒ 10 years x 0.51 = 5.1 years (62 months).

WARNING:

A thusly calculated maintenance interval **does not apply** to the maintenance of the output type A (threaded bushing), nor to the maintenance of the linear and spindle actuator units. These must be regularly re-greased (at least once every six months) at the lubricating nipples (Section 7.1.3.)!

During actuator maintenance, the old lubricants must be thoroughly removed and replaced by fresh ones. **No mixing of different makes of lubricant is permitted!**

The quantities needed for lubricant service can be seen from the table below.

7.3 Lubricant Requirements

Type of actuator	Main gear	Spur gears	Linear actuator Pin jack (form B, B1, B2) Threaded bushing (form A) Claw coupling (form C)
AB5	1 kg (1 liter oil)	---	11 ccm 3 ccm 5 ccm 3 ccm
AB8	1 kg (1 liter oil)	1 ccm	15 ccm 3 ccm 5 ccm 3 ccm
AB18	1 kg (1 liter oil)	1 ccm 1 ccm	--- 5 ccm 8 ccm 5 ccm
AB40	1.5 kg (1.5 liters oil)	1.5 ccm	--- 6 ccm 9 ccm 6 ccm

When lubricating precision components, such quantities of lubricant are to be used as to ensure fine moistening of the sliding surfaces.

8 Training

Warning: Should problems arise on site in connection with assembly or adjustment, please contact the SCHIEBEL Antriebstechnik Gesellschaft m.b.H, Josef-Benc Gasse 4, A-1230 Wien, Telephone (43-1) 66 108, in order to avoid any incorrect operations or damage to the actuators.

The Schiebel Company recommends to recruit only qualified personnel for assembly of Schiebel actuators.

Upon special request by the ordering party, personnel can be trained on the premises of the Schiebel Company according to the operations listed in the instructions for use.

9 DECLARATION WITH REFERENCE TO MACHINE PARTS (MACHINE COMPONENTS)

The manufacturer,

SCHIEBEL Antriebstechnik Gesellschaft m.b.H.
Josef-Benc-Gasse 4
A-1230 Wien

hereby declares that the new machine part/component hereinafter described, to wit

for actuators of the model series AB, rAB, exAB, exrAB in rotary, semi-rotary, 90° and linear designs,as well as the model series rM3 and rM10.

1. does not constitute a safety component for machines,
2. is only put on the market for the purpose of installation in a machine or for the purpose of assembly with another machine or machine component, and
3. that it must not be operated until a compatibility declaration for the entire machine has been submitted according to the Machine and Safety Ordinance, Fed.Leg.Gaz.No. 306/1994, thus meeting the Machine Standard 89/392/EEC, as amended.

.....**Vienna**....., on .....**17.03.1998**.....
(Place) (date)

.....
(Signature of Director)

10 Statement of Conformity

The manufacturer,

SCHIEBEL Antriebstechnik Gesellschaft m.b.H.
Josef-Benc-Gasse 4
A-1230 Wien

herewith declares that the following products:

electric actuators model series
AB, rAB, exAB, exrAB and rM
with
three-phase AC-motor,
single phase motor or
pole switchable three-phase AC-motor

with the additional components:

ACTUMATIC
Couplers
Power supply NG5
Potentiometer F and FF
Position indicator ESG
Position transmitter ESM
Positioner SRG
Local control unit V2 und W2

meet the requirements of the directive 89/336/EEC „directive on the approximation of the laws of the member states relating to electromechanical compatibility“ changed by the directive 92/31/EEC and 93/68/EEC, and take into consideration the respective operating instructions.

The fulfillment of the directive has been proved by the following standards:

EN 50081-1 and EN 50081-2
EN 50082-1 and EN 50082-2

As well as the requirements of the directive 73/23/EWG „Low Voltage Directive” and take into consideration the respective operating instructions.

The fulfillment of the directive has been proved by the following standards:

EN 60034-1
EN 60204-1

Vienna,.....**17.03.1998**
(Place) (date)

.....
Klaus Schiebel
General Manager

11 Certificate of Conformity

The producer

SCHIEBEL Antriebstechnik GesmbH
Josef Benc Gasse 4
A-1230 WIEN
Österreich

herewith confirms, that the equipment:

Description	Type	Marking	Certificate-Nr.
Electric Actuator	ex (r) AB	II2G Ex de(q)(ib) II (B)C T4(T6) Gb	FTZU03ATEX0328X
Control Unit	V1 / V2	II2G Ex de II C T4 Gb	FTZU03ATEX0329
Control Unit	CSCex	II2G Ex de II C T4(T6) Gb	TÜV-A04ATEX0009X
Flameproof Induction Motor	D(.).()FUY63/..-.	II2G Ex d II C T4 Gb	FTZU03ATEX0330X
Flameproof Induction Motor	D(.).()FUY80/..-.	II2G Ex d II C T4 Gb	FTZU03ATEX0333X
Flameproof Induction Motor	ex DKF .. .X. ..	II2G Ex d II C T4 Gb	TÜV-A03ATEX0016X
Microswitch	d 515U	II2G Ex d II C Gb	FTZU03ATEX0332U
Flameproof Potentiometer	dP1 / dP2	II2G Ex d II C Gb	FTZU03ATEX0387U
Flameproof capacitor	dK .	II2G Ex d II B Gb	FTZU07ATEX0009U
Control Unit	CSCex FU	II2G Ex de II B T4(T6) Gb	TÜV-A08ATEX0006X

meets the requirement of the EC-directive:

94/9/EG

EC-Directive for Operation of Equipment in Potentially Explosive Atmospheres

and complies with the following harmonised standards in the version valid at sigature date:

EN60079-0:2009
Electrical apparatus for explosive gas atmospheres – General requirements
EN60079-1:2007
Electrical apparatus for explosive gas atmospheres – Flameproof enclosures "d"
EN60079-7:2007
Electrical apparatus for explosive gas atmospheres – Increased safety "e"
EN60079-11:2007
Electrical apparatus for explosive gas atmospheres – Intrinsic safety "i"

Following notified bodies certificate the conform design of the equipment:

FTZU	CZ-716 07 Ostrava Radvanice	NB 1026: Quality system, Type examination certificates
TÜV-Austria	A-1015 Vienna	NB 0408: Type examination certificates

……**Vienna**……, …..**28.09.2012**….
(location) (date)

Klaus Schiebel, general manager