auma®

Solutions for a world in motion

AUMA MARINE

Electric automation solutions for valves on civil vessels

ABOUT THIS BROCHURE

AUMA has five distinct divisions - Water, Power, Oil & Gas, Drives, Industry & Marine; each focus on their specific markets. Every single division excels by its individual competence.

This brochure deals with actuators deployed on civil vessels. The market segment is the responsibility of the Division AUMA Industry & Marine. AUMA actuators described in this brochure are particularly suited for valve automation in this environment. The major features of these devices are explained including the comprehensive service performance offered by AUMA for this outstanding product range.

Further documents such as technical and electrical data sheets for detailed device dimensioning are available for all actuators described in this document. Our local sales/service staff will be glad to provide you with advice and support.

The latest information on AUMA products can be found on the Internet at www.auma.com. All documents, including dimensional drawings, wiring diagrams, technical and electrical data sheets are available for free download.

AUMA's Industry & Marine Division also provides specific brochures for automation on military vessels and industrial applications.

2017.02.09

Multi-turn actuators:
Gate valves

Linear actuators:
Globe valves

Part-turn actuators:
Butterfly valves, ball and plug valves

AUMA - THE SPECIALIST FOR ELECTRIC ACTUATORS

Armaturen- **U**nd **M**aschinen**A**ntriebe - **AUMA** - is one of the leading manufacturers worldwide of electric actuators for automating industrial valves. Since 1964, the founding year of the company, AUMA has focused on development, manufacture, sales and service of electric actuators.

The brand AUMA is synonym to long-standing experience and knowledge. AUMA is specialised in electric actuators for the energy, water, oil & gas, as well as industrial sectors. All these market applications are equally available on ships.

As an independent partner of the international valve industry, AUMA supplies customer-specific products for electric automation of all industrial valves, whether onshore or offshore.

Long standing experience
AUMA actuators work in the background and are not the prime focus of designers or freight and passenger ship companies. Therefore, it is all the more important knowing that AUMA actuators have been installed on ships for the last 40 years, working discretely to the benefit of all parties involved.

Innovation on a day-to-day-business
As specialists for electric actuators, AUMA sets the market standard for innovation and sustainability. Within the framework of continual improvement, the in-house manufacturing process ensures prompt implementation of innovation at product or sub-assembly level. This applies to all areas relating to device function - mechanics, electrical engineering, electronics, and software.

Success is reflected by growth - worldwide

Since the foundation in 1964, AUMA has evolved into a company with 2,300 members of staff around the globe. AUMA proudly possesses a global sales and service network with more than 70 sales organisations and representative offices. Customers appreciate our expertise and competence in product consultation and our efficient after-sales service.

Selecting AUMA:

> Provides valve automation in compliance with submitted specifications
> Assures safety for design and implementation for the shipbuilding industry on the basis of certified interfaces
> Guarantees the freight and passenger ship companies global service on site including commissioning, comprehensive support, and product training.

AUMA'S BENEFITS

The objective of freight and passenger ship companies is efficient deployment of the vessel respecting stringent safety requirements. Hence, initial financial investments are of crucial importance. When considering the total lifetime, further economic factors have to be considered. In particular, operating and maintenance cost might build up which can be decisive for the competitiveness of a vessel.

YOUR ADVANTAGE - SAFETY THANKS TO CERTIFICATIONS

Internationally approved test authorities certify that AUMA actuators are suitable for safe operation on vessels. The devices were subjected to thorough inspection by external test authorities providing sound planning dependability and the certainty of proven operational product reliability.

AUMA's daily business includes the provision of certifications, since our actuators are premium products for the oil & gas industry as well as for nuclear power plants. Certifications are the core of our development, production and service departments and are integral part of our daily routine.

Please also refer to page 10.

YOUR ADVANTAGE - MAXIMUM AVAILABILITY

Simply reliable - highest safety and continuous availability considerably contribute to maximising efficiency. Our actuators are designed and lifetime tested to withstand hostile environmental conditions.

YOUR ADVANTAGE - LOW OPERATING COST

Electrical actuators contribute twice to reducing your operating expenses. On the one hand, they excel by their superior control properties compared to other systems, on the other hand, electric actuators require less energy than for example their pneumatic counterparts.

YOUR ADVANTAGE - SIMPLE AND SAFE ENERGY SUPPLY

Compared to pneumatic or hydraulic connections, electrical cables are exempt of any mechanical components such as valves, flanges and seals which are usually subjected to pressure under normal operation.

YOUR ADVANTAGE - SOLUTIONS FIT FOR THE FUTURE

With our innovative operation concept, actuation technologies and communication interfaces, we are at the forefront of valve automation. This makes us your expert partner worldwide.

REFERENCES

The following list is an extract of separate reference lists available upon request.

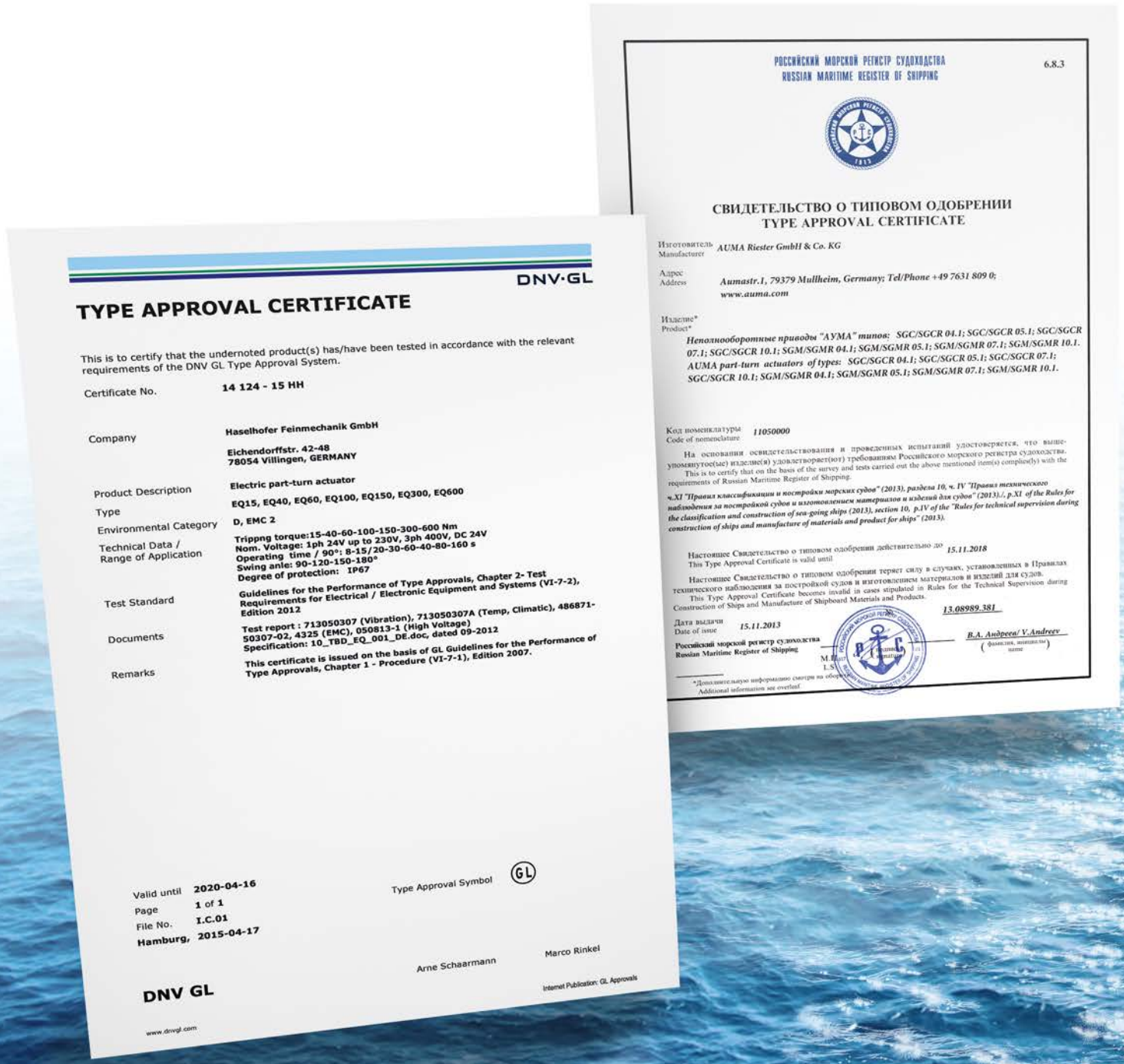
Macuru Arrow	Cargo vessel	2015
Colombo Express	Container vessel	2015
"Hamburg Express Klasse"	Container vessel	2015
Osaka Express	Container vessel	2014
Glasgow Express	Container vessel	2014
Ramform Atlas	Research vessel	2014
Harmony of the Seas	Cruise ship	2013
Ramform Titan	Cruise ship	2013
Victoria	Research vessel	2010
GasChem Warnow	LPG tanker	2010
Sevilla Knutsen	LNG tanker	2009
Pantonio	Container vessel	2008
Lingedijk	Heavy-duty crane	2007
Pegasus J	Container vessel	2006
Maruba Africa	Container vessel	2006
OOCL Zhoushan	Container vessel	2006
Liberty of the Seas	Cruise ship	2006
CMA CGM Grenadines	Feeder vessel	2006
Ambra	Cargo vessel	2005
Aland	Cargo vessel	2005
Broevig Breeze	Chemical tanker	2005
Maersk Nagoya	Container vessel	2005
Hatsu Courage	Container vessel	2005
Maersk Neustadt	Container vessel	2005
Maersk Nashville	Container vessel	2005
WMS Vlissingen	Container vessel	2005
Tucana J	Container vessel	2005
Maria S. Merian	Research vessel	2005
GasChem Mosel	LPG tanker	2005
AIDAdiva	Cruise ship	2005
Lodbrog	Cable-laying vessel	2004
Catalonia	Cargo vessel	2004
Astina	Chem./oil tanker	2004
Maersk Naples	Container vessel	2004
Kota Pusaka	Container vessel	2004
Maersk Narvik	Container vessel	2004
CSAV Morumbi	Container vessel	2004
Anna	Feeder vessel	2004
Kronprins Frederik	RoPax ferry	2004
Annette	Cargo vessel	2003
Admiral	Chem. tanker	2003
Suula	Chem./oil tanker	2003
Olivia Maersk	Container vessel	2003
Southern Moana	Container vessel	2003
Queen Mary 2	Passenger vessel	2003
El Djazair	RoPax ferry	2003
Toccata	Chem./oil tanker	2002
Maersk Norfolk	Container vessel	2002
Ville d'Aquarius	Container vessel	2002
CMA CGM Balzac	Container vessel	2002
Hanjin Madrid	Container vessel	2002
CMA CGM Voltaire	Container vessel	2002
Lykes Envoy	Container vessel	2002
Liao He	Container vessel	2002
CMA CGM Intensity	Container vessel	2002
AIDAvita	Cruise ship	2002
Beachy Head	Ro/Ro ferry	2002
Pascal Paoli	RoPax ferry	2002
King of Scandinavia	RoPax ferry	2002
Pont-Aven	RoPax ferry	2002
Hanseatic Scout	Cargo vessel	2001
Anette	Cargo vessel	2001
Isarstern	Chem. tanker	2001
P&O Nedlloyd Remuera	Container vessel	2001
Safmarine Cunene	Container vessel	2001
Sydney Express	Container vessel	2001
Safmarine Zambezi	Container vessel	2001
P&O Nedlloyd Palliser	Container vessel	2001
CSAV Rio Petrohue	Container vessel	2001
Norwegian Sun	Cruise ship	2001
MSC Opera	Cruise ship	2001
Island Princess	Cruise ship	2001
Crystal Serenity	Cruise ship	2001
Seven Phoenix	Pipe layer	2001
Arklow Rally	General cargo ship	2001
AIDAaura	Cruise ship	2001
Mont Saint Michel	RoPax ferry	2001
NCC Yamamah	Chem. tanker	2000
Euro Storm	Container vessel	2000
Canmar Promise	Container vessel	2000
Cap San Lorenzo	Container vessel	2000
Cap San Antonio	Container vessel	2000
Columbus	Cruise ship	2000
Pride of America	Cruise ship	2000
Superstar Libra	Cruise ship	2000
Le Grand Bleu	Mega Yacht	2000
Pex	Bulk carrier	2000
CGN Montreux	Paddle steamer	2000
Nils Holgersson VI	RoPax ferry	2000
Superfast IX / X	Ferry	2000
Amazone	Cutter suction dredger	2000
Grietje	Cargo vessel	1999
Lone Bres	Cargo vessel	1999
Weichselstern	Chem. tanker	1999
Maersk Mendoza	Container vessel	1999
Canmar Honour	Container vessel	1999
OOCL Belgium	Container vessel	1999
Beluga Advertising	Heavy-duty crane	1999
Talisman	Ro/Ro Cargo vessel	1999
Kronprins Harald	RoPax ferry	1999
Geco Bluefin	Research vessel	1999
Geo Atlantic	Research vessel	1999
Superfast V	Ferry	1999
Safmarine Gonubie	Container vessel	1998
CMA CGM Azteca	Container vessel	1998
Norasia Scarlet	Container vessel	1998
Cielo di San Francisco	Container vessel	1998
ZIM Singapore	Container vessel	1998
P&O Nedlloyd Singapore	Container vessel	1998
SeaDream II	Mega yacht	1998
Komet	Surveying vessel	1998
Vasco da Gama	Suction dredge vessel	1998
Frank	Super tanker	1998
Contship Spirit	Container vessel	1997
P&O Nedlloyd Pantanal	Container vessel	1997
Monteverde	Container vessel	1997
P&O Nedlloyd Mahe	Container vessel	1997
Norasia Sheba	Container vessel	1997
P&O Nedlloyd Sao Paolo	Container vessel	1997
P&O Nedlloyd Santiago	Container vessel	1997
P&O Nedlloyd Arica	Container vessel	1997
Rotterdam	Cruise ship	1997
Mercury	Cruise ship	1997
Norwegian Sky	Cruise ship	1997
Nordsee	Dredger	1997
Maido	LPG/VCM tanker	1997
Tomke	Multi-purpose vessel	1997
Ben-my-Chree	RoPax ferry	1997
Mary Ann	Container vessel	1996
Borussia Dortmund	Container vessel	1996
Charlotte Borchard	Feeder vessel	1996
Prinsesse Benedikte	RoPax ferry	1996
Alexander von Humboldt	Suction dredge vessel	1996
Lanzarote	Bulk material carrier	1995
Katrin S	Container vessel	1995
P&O Nedlloyd Tema	Container vessel	1995
P&O Nedlloyd Amazonas	Container vessel	1995
Contship Sydney	Container vessel	1995
Norasia Savannah	Container vessel	1995
Norasia Samantha II	Feeder vessel	1995
Kalina	Feeder vessel	1995
Stena Shipper	Ro/Ro ferry	1995
Frej	Cargo vessel	1994
Alsterstern	Chem. tanker	1994


SKANDI SKANSEN


DNV·GL
ABS
РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА
РС
1913

CERTIFICATIONS/REFERENCES

The certificates shown are an extract of certifications with relevance for the shipbuilding industry. Please refer to our website for downloading our complete list: www.auma.com



DNV·GL

TYPE APPROVAL CERTIFICATE

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the DNV GL Type Approval System.

Certificate No. **14 124 - 15 HH**

Company **Haselhofer Feinmechanik GmbH**
Eichendorffstr. 42-48
78054 Villingen, GERMANY

Product Description **Electric part-turn actuator**

Type **EQ15, EQ40, EQ60, EQ100, EQ150, EQ300, EQ600**

Environmental Category **D, EMC 2**

Technical Data / Range of Application **Trippng torque:15-40-60-100-150-300-600 Nm**
Nom. Voltage: 1ph 24V up to 230V, 3ph 400V, DC 24V
Operating time / 90°: 8-15/20-30-60-40-80-160 s
Swing anle: 90-120-150-180°
Degree of protection: IP67

Test Standard **Guidelines for the Performance of Type Approvals, Chapter 2- Test Requirements for Electrical / Electronic Equipment and Systems (VI-7-2), Edition 2012**

Documents **Test report : 713050307 (Vibration), 713050307A (Temp, Climatic), 486871-50307-02, 4325 (EMC), 050813-1 (High Voltage)**
Specification: 10_TBD_EQ_001_DE.doc, dated 09-2012

Remarks **This certificate is issued on the basis of GL Guidelines for the Performance of Type Approvals, Chapter 1 - Procedure (VI-7-1), Edition 2007.**

Valid until **2020-04-16**
Page **1 of 1**
File No. **I.C.01**
Hamburg, 2015-04-17

Type Approval Symbol GL

Arne Schaarmann

Marco Rinkel

DNV GL

www.dnvgl.com

Internet Publication: GL Approvals

РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА
RUSSIAN MARITIME REGISTER OF SHIPPING

6.8.3

СВИДЕТЕЛЬСТВО О ТИПОВОМ ОДОБРЕНИИ
TYPE APPROVAL CERTIFICATE

Изготовитель / Manufacturer *AUMA Riester GmbH & Co. KG*

Адрес / Address *Aumastr.1, 79379 Mullheim, Germany; Tel/Phone +49 7631 809 0; www.auma.com*

Изделие* / Product* ***Неполнооборотные приводы "АУМА" типов: SGC/SGCR 04.1; SGC/SGCR 05.1; SGC/SGCR 07.1; SGC/SGCR 10.1; SGM/SGMR 04.1; SGM/SGMR 05.1; SGM/SGMR 07.1; SGM/SGMR 10.1.***
AUMA part-turn actuators of types: SGC/SGCR 04.1; SGC/SGCR 05.1; SGC/SGCR 07.1; SGC/SGCR 10.1; SGM/SGMR 04.1; SGM/SGMR 05.1; SGM/SGMR 07.1; SGM/SGMR 10.1.

Код номенклатуры / Code of nomenclature *11050000*

На основании освидетельствования и проведенных испытаний удостоверяется, что вышеупомянутое(ые) изделие(я) удовлетворяет(ют) требованиям Российского морского регистра судоходства.
This is to certify that on the basis of the survey and tests carried out the above mentioned item(s) complies(fy) with the requirements of Russian Maritime Register of Shipping.

ч.XI "Правил классификации и постройки морских судов" (2013), раздела 10, ч. IV "Правил технического наблюдения за постройкой судов и изготовлением материалов и изделий для судов" (2013)./. p.XI of the Rules for the classification and construction of sea-going ships (2013), section 10, p.IV of the "Rules for technical supervision during construction of ships and manufacture of materials and product for ships" (2013).

Настоящее Свидетельство о типовом одобрении действительно до / This Type Approval Certificate is valid until *15.11.2018*

Настоящее Свидетельство о типовом одобрении теряет силу в случаях, установленных в Правилах технического наблюдения за постройкой судов и изготовлением материалов и изделий для судов.
This Type Approval Certificate becomes invalid in cases stipulated in Rules for the Technical Supervision during Construction of Ships and Manufacture of Shipboard Materials and Products.

Дата выдачи / Date of issue *15.11.2013*

13.08989.381

Российский морской регистр судоходства
Russian Maritime Register of Shipping

M.P. L.S.

B.A. Андреев/ V.Andreev
(фамилия, инициалы / name)

*Дополнительную информацию смотри на обороте / Additional information see overleaf

DNV·GL

Certificate No:
TAA00000T1

TYPE APPROVAL CERTIFICATE

This is to certify:
That the Electric Actuator

with type designation(s)
SGC/SGCR 04.1, SGC/SGCR 05.1, SGC/SGCR 07.1, SGC/SGCR 10.1, SGC/SGCR 12.1

Issued to
AUMA Industry & Marine GmbH
Villingen- Schwenningen, Germany

is found to comply with
DNV GL rules for classification – Ships

Application :
Product(s) approved by this certificate is/are acce
by DNV GL.

Type	Temperature	Humidity	Vibrati
SGC/SGCR 04.1	D	B	B
SGC/SGCR 05.1	D	B	B
SGC/SGCR 07.1	D	B	B
SGC/SGCR 10.1	D	B	B
SGC/SGCR 12.1	D	B	B

This Certificate is valid until 2021-10-13.
Issued at Hamburg on 2016-10-14

DNV GL local station: Augsburg

Approval Engineer: Marco Rinkel

This Certificate is subject to terms and conditions overleaf. Any significant
The validity date relates to the Type Approval Certificate and not to the a

Form code: TA 1411a Revision: 2015-05
© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV

DNV·GL

Certificate No:
TAA00000M4

TYPE APPROVAL CERTIFICATE

This is to certify:
That the Electric Actuator

with type designation(s)
2 SB 61, 2 SB 62, 2 SB 63, SBA 12, SBA 20, SBA25, SBA 80, SBA 200

Issued to
AUMA Industry & Marine GmbH
Villingen- Schwenningen, Germany

is found to comply with
DNV GL rules for classification – Ships

Application :
Product(s) approved by this certificate i
by DNV GL.

Type	Temperature	Humidity	Vibr
2 SB 61			
2 SB 62			
2 SB 63			
SBA 12			
SBA 20			
SBA25			
SBA 80			
SBA 200			

ambient temperature: -20 °C to 60 °C
This Certificate is valid until 2021-07-24.
Issued at Hamburg on 2016-07-25

DNV GL local station: Augsburg

Approval Engineer: Marco Rinkel

This Certificate is subject to terms and conditions overleaf. Any
The validity date relates to the Type Approval Certificate and re

Form code: TA 1411a Revision: 2015-05
© DNV GL 2014. DNV GL and the Horizon Graphic are tradema

ABS

CERTIFICATE NUMBER
11-HS780194-PDA

DATE
02 September 2011

ABS TECHNICAL OFFICE
Houston SED - Ship Equipment

CERTIFICATE OF
DESIGN ASSESSMENT

This is to Certify that a representative of this Bureau did, at the request of
AUMA ACTUATORS, INC. - CANONSBURG

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

PRODUCT: Actuator

MODEL: Series SA & SAR, Type Range: SA07.1-SA16.1

This Product Design Assessment (PDA) Certificate 11-HS780194-PDA, dated 02/Sep/2011 remains valid until 01/Sep/2016 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

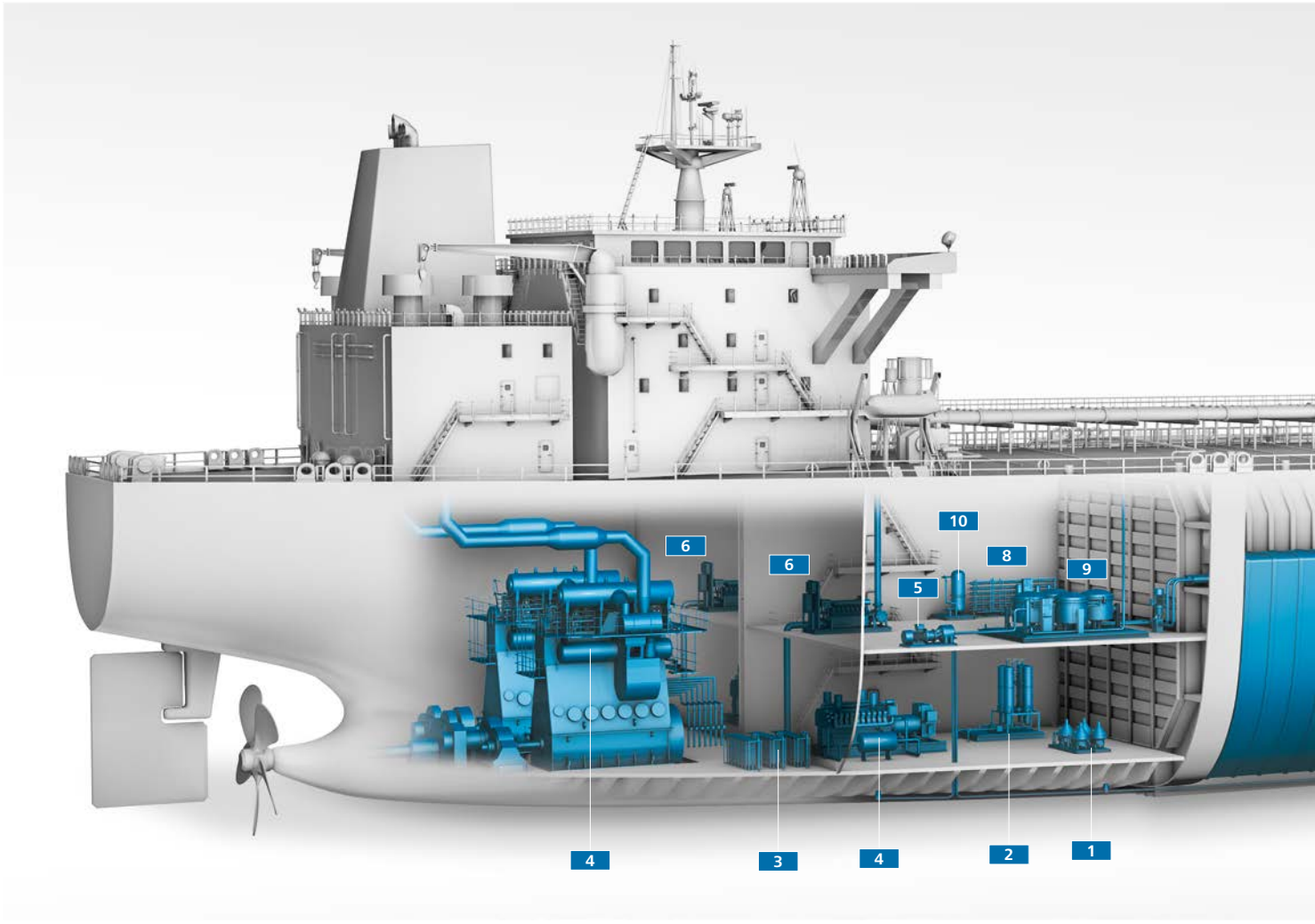
This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING

Tim Kimpton
Engineer



ELECTRIC ACTUATORS ON VESSELS - APPLICATIONS

Virtually all vessels require actuation technology. The mission of actuators is to optimally control energy flows, to maintain temperatures at the desired level or to raise them to a new target value and further to control media flow.

Actuators are not only crucial for operating vessels but also to automate systems utilised by the crew and passengers.

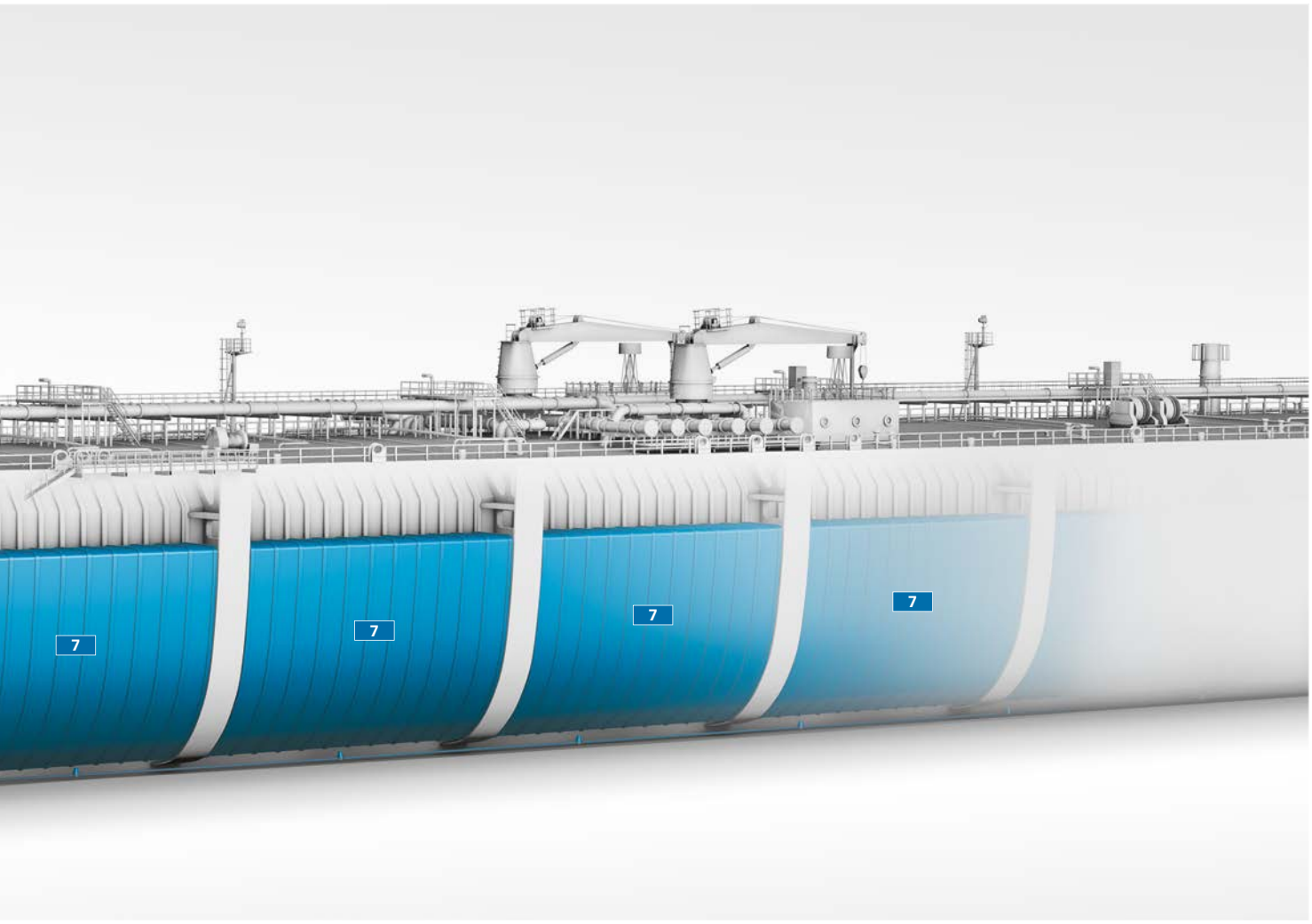
Device reliability ranks top and is part of AUMA's daily business. For decades, AUMA devices have also been deployed in segments other than the shipbuilding industry where operational safety is an absolute must. This does not only include operation in potentially explosive areas but also the deployment of AUMA devices in nuclear power plants all around the globe.

For this reason, it goes without saying that AUMA products were awarded appropriate certifications.

Medium flow control and shutting off
AUMA actuators are the perfect solution for flow control of any type, under any conditions, on the basis of electric power provision. Electric power supply is extremely advantageous in terms of installation, maintenance and operating costs compared with other sources of energy.

The process descriptions shown inside the fold-out pages are representative of systems on ships automated by AUMA actuators.

Compact design
Compared to other actuator types, the space-saving design of electric actuators is ideally suited when space available is scarce. All components - including local controls - are located in one housing. Space constraints prevailing on ships are consequently one of the prime benefits of electric actuators.



Example of an oil tanker

Oil tankers are prime examples of a large application field for AUMA actuators. This can be applied to any other type of vessel, provided the systems listed below are available.

1 Lubricating grease processing
2 Fuel processing
3 Cooling systems on ships
4 Energy recuperation
5 Bilge systems
6 Fire fighting systems
7 Ballast water distribution
8 Drinking water treatment
9 Hot water treatment
10 Wastewater treatment

Actuators for all conditions, for any purpose

AUMA actuators are available in premium enclosure protection IP68, with excellent corrosion protection coating, withstanding strong vibration. They are ideally suited for use in a wide environmental temperature range.

These are the perfect features for performing any mission on vessels.

The dimensions of the systems shown depend on the type and size of the vessel in question. Quite naturally, passenger ships require vast drinking water treatment systems compared to container ships.

For this reason, AUMA provides different actuator sizes to suit all requirements. The torque range varies from a few to several hundred thousand Newton metres.

AUMA ACTUATORS INTEGRATION INTO TYPICAL PROCESSES

ACROSS THE SEVEN SEAS

The vessels illustrated are not merely representative examples but they show a small selection of vessels where AUMA actuators are actually installed. The multitude of vessel types fulfilling distinguished tasks and showing the many applications possible significantly underlines the flexibility of our products.

Please refer to page 7 for an extract of our reference list.

The applications below are representative of the many possible processes on vessels. AUMA actuators are deployed in all these processes.

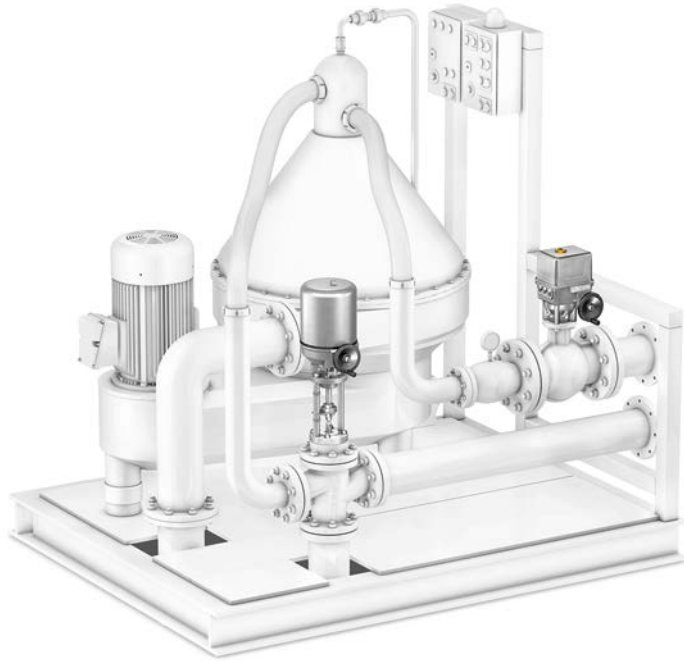
HEAT EXCHANGER/TEMPERATURE CONTROL

Applications
> Motor cooling systems
> Fuel preheating
> Hot water treatment

Working method
Part of the last run is mixed to the first run by means of a mixing valve. This allows quick setting of the desired temperature. Generally, a 3-way valve operated by means of a modulating actuator is used as mixing valve.

Suitable AUMA actuators
> SBA linear actuators
> SVC globe valve actuators

SEPARATORS

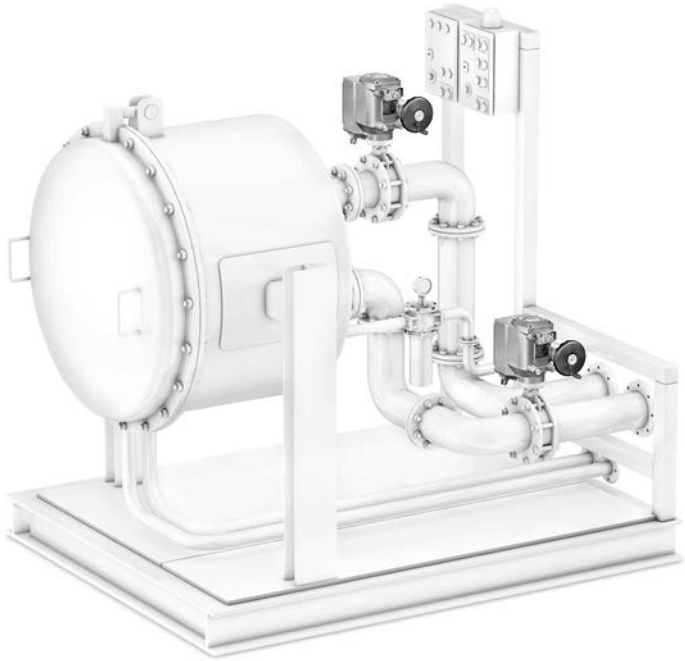


Applications
> Lubricating oil cleaning
> Crude oil cleaning
> Wastewater treatment

Working method
Polluting agents and water are removed from the lubricating oil by means of a separator. The percentage of oil within the separated water mass is automatically controlled and re-fed to the separator if necessary. Accumulation of sludge within the separator is also monitored and if needed, fully automatic flushing of the separator is performed. For these processes, supply, re-feed and drain have to be precisely coordinated. Ball valves and 3-way valves are used as ideal automation solution.

Suitable AUMA actuators
> EQ part-turn actuators
> SGC part-turn actuators
> SBA linear actuators

EVAPORATORS



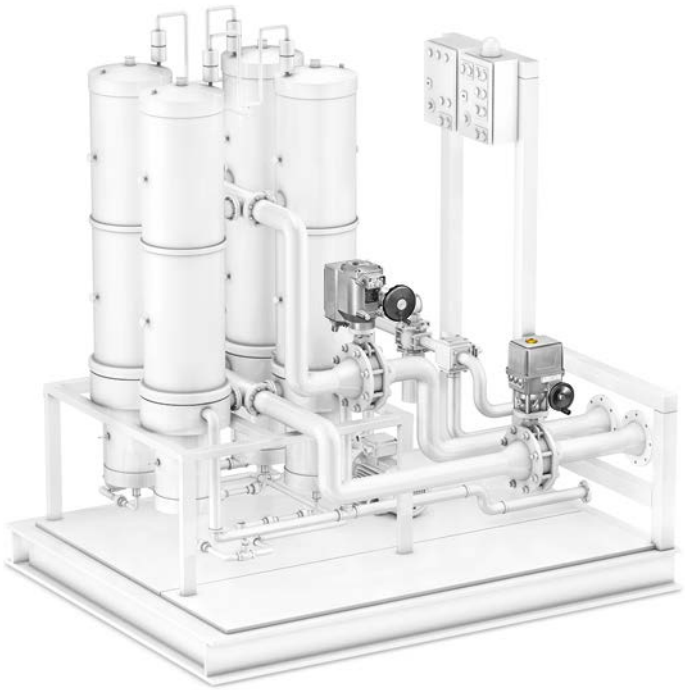
Typical applications
> Desalination/fresh water processing

Working method
Cold seawater flows through the condenser installed within the boiler prior to spreading within the boiler. The seawater is vaporised by a heat exchanger which is typically fed by the waste heat of the ship's diesel. This is supported by creating a vacuum within the boiler. The steam, now free of salt, condensates at the condenser as fresh water and is redirected. The natural brine at the bottom of the boiler is fed to the sea, In a next step, the fresh water obtained is checked for its salt concentration and, according to the result, fed to the fresh water tanks or the bilge.

Up to ten shut-off valves equipped with actuators can participate in this process, depending on the desired degree of automation.

Suitable AUMA actuators
> EQ part-turn actuators
> SGC part-turn actuators

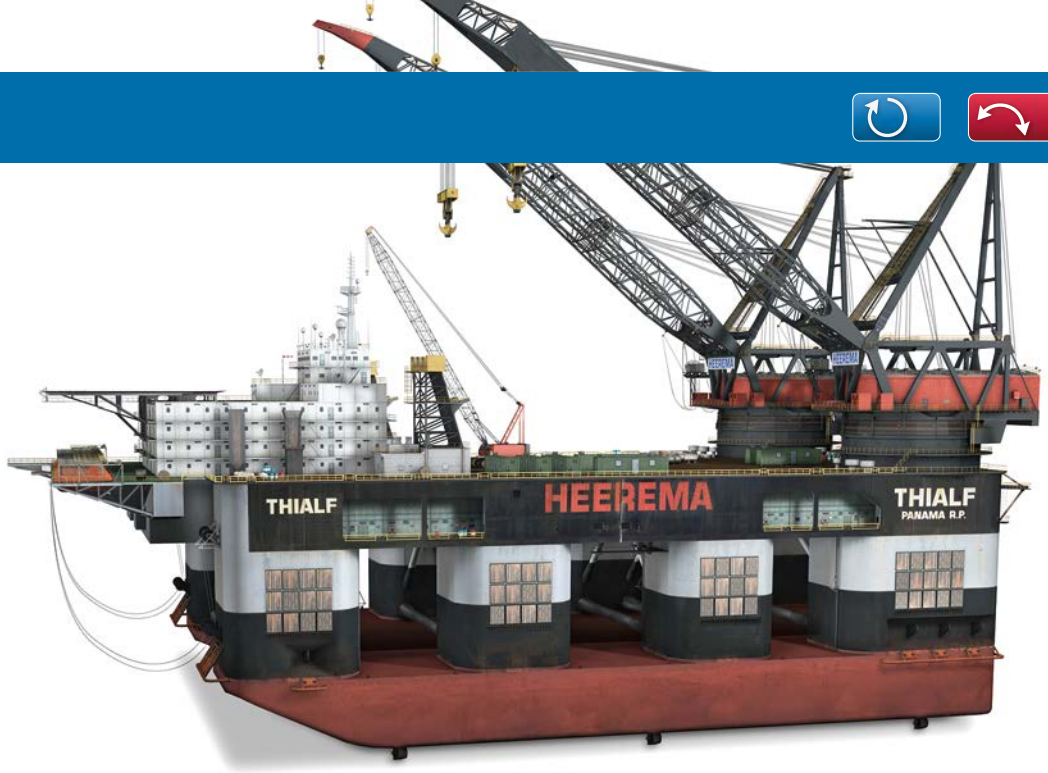
FILTERING



Typical applications
> Ballast water processing
> Wastewater treatment

Working method
Filtering also includes the automatic filter flushing, once a certain degree of contamination has been reached. During this process, the pressure difference between filter inlet and outlet is determined. In case a limit value is pre-set, the flushing procedure is automatically started. Actuators position the valves to ensure that the flushing liquid is separated from the medium flow itself. This is particularly important for ballast water processing. Typically, these systems have various cleaning levels. However, all the processes must be strictly coordinated. Hence, valves and actuators play a crucial role.

Suitable AUMA actuators
> EQ part-turn actuators
> SGC part-turn actuators


THIALF
HEEREMA
THIALF
PANAMA R.P.

BASIC RANGE

Simple control and basic functions as well as feedback signals – these are the major characteristics required by our customers. BASIC range actuators ensure reliable service over many years, following the install and forget philosophy. Operation commands and setpoints are implemented by means of binary or analogue current or voltage signals.

In the event of power failure, the valve can be operated by manual emergency operation included as standard. Device handling is intuitive and simple - for the rare occasions when manual intervention by the operator is required.

SBA linear actuators
High positioning accuracy - the perfect choice for modulating applications.

> Seven sizes
> Thrust range: 0.6 kN – 25 kN
> Stroke range: 35 mm – 100 mm

Applications: control valves, shut-off valves

Further information is available as of page 22.

ED/EQ part-turn actuators
Simple and reliable part-turn actuators for open-close and modulating duty.

> Eight sizes
> Torque range: 25 Nm – 600 Nm
> Swing angle range: 90° – 180°

Applications: control butterfly valves and ball valves, shut-off butterfly and ball valves

Further information is available as of page 26.

SMART RANGE

Variable speed actuators for modulating applications requiring high positioning accuracy and/or for integration into DCS placing higher demands on the functionality of the field devices.

Speed control is used for soft starts and stops acting gently on all mechanical components. Operation profiles with variable speed help to avoid critical states within the valve such as pressure surges or cavitation.

SGC part-turn actuators and SVC globe valve actuators
High torques or operating forces at higher operating speeds. SGC and SVC actuators are ideally suited for fast opening and closing. Internal speed control nevertheless protects the mechanics of actuator and valve.

SGC part-turn actuators
> Five sizes
> Torque range: 25 Nm – 1,000 Nm
> Swing angle ranges: 82° – 98°

Applications: control butterfly valves and ball valves, shut-off butterfly and ball valves

SVC globe valve actuators
> Three sizes
> Torque ranges: 10 Nm – 100 Nm
> Stroke ranges: 60 mm or 70 mm

Applications: control valves, shut-off valves

Further information is available as of page 32.

BASIC RANGE

Focus on the basics

> Swift and precise positioning
> Limit seating
> Thrust/torque monitoring
> Simple functionality
> Optional simple fieldbus interface

BASIC RANGE - SBA LINEAR ACTUATORS

Simple opening and closing of valves. Simple precise positioning. Simple DCS integration. Simply reliable and dependable.

SBA is the perfect actuator choice when requiring simple and straightforward automation. The proven mechanics paired with prime basic functions is the SBA principle.

Each SBA size is available in stall-proof version for continuous operation. Combined with high positioning accuracy, SBA actuators are often deployed in heating and cooling systems for demanding temperature control.

The actuators are specifically designed for harsh offshore conditions whereby both premium enclosure protection and excellent corrosion protection significantly contribute to their suitability.

Besides the limit seating feature in end positions, thrust is additionally monitored. If the actuator is demanded to exceed the preset thrust threshold, because an object is jammed in the valve, for example, the actuator automatically switches off, thus protecting both itself and the valve.

SERVICE CONDITIONS

Corrosion protection
> Standard: C2 according to EN ISO 12944-2
> Option: C3/C4 according to EN ISO 12944-2

Ambient temperatures
> Standard: –20 °C to +60 °C
> Option: –40 °C to +60 °C

Enclosure protection
> IP43 (SBA 06-1/-2/-3)
> IP54 (SBA06-4)
> IP65 (SBA 12 – SBA 200)

TECHNICAL DATA

Type	Operating speed at 50 Hz	Thrust	Stroke	Type of duty	Number of starts max.	Valve attachment
	[mm/min]	[kN]	Max.[mm]	Type of duty	[1/h]	EN ISO 5210 DIN 3210
SBA 06-1	8	0.6	35	S1 - 100 %	1,200	F05
	10					
SBA 06-2	13.2	0.9				
	16					
SBA 06-3	20	1.2				
SBA 06-4	8	2.0				
	10					
	13.2					
SBA 12	25	1.2	75	S1 - 100 %	1,200	F05
SBA 20	15	2.0	75	S1 - 100 %	1,200	F05
SBA 45-2	25	3.5	75	S1 - 100 %	1,200	F05
	50					
SBA 45-3	25	4.5				
	50					
SBA 45-4	17	6.0				
	34					
SBA 80-1	13.5	6.0	80	S1 - 100 %	1,200	G0
SBA 80-2	25	8.0				
SBA 80-3	50	12		S3 - 50 %	600	
SBA 80-4	13.5	15		S1 - 100 %	1,200	
	22					
	40			S3 - 50 %	600	
SBA 200-1	15	15	100	S1 - 100 %	1,200	G0
SBA 200-2	25	20		S3 - 50 %	600	
	50					
SBA 200-3	25	25				

POWER SUPPLY

Type of current	Voltage/frequency
3-phase AC	50 Hz: 380 V; 400 V 60 Hz: 400 V; 440 V
1-phase AC current	50 Hz: 230 V; 24 V; 115 V; 60 Hz: 220 V; 24 V; 110 V
1-phase DC current	24 V

INTERFACE TO THE DCS

Basic version
Two end position switches to cut-off the actuator upon reaching the end position

Options
> Two additional limit switches for end position signalling
> Two digital inputs for operation commands Run OPEN and Run CLOSE in combination with reversing contactors.
> Positioner for analogue current or voltage signal
> Position feedback as current or voltage signal
> Integrated Profibus DP-V0 interface

1 Hood
Made of steel in standard version. Available in aluminium as an option. The hood is removed by unfastening the centre screw for subsequent connection of the actuator to the power supply and to perform end position setting.

2 End position seating
As standard, load-dependent end position switches 2a are integrated allowing actuator cut-off when reaching the end position.

Alternatively, cut-off can be performed via optional limit switches, 2b operated via cams. Thanks to these switches, precise setting of switching points across the complete stroke range is possible. Up to four additional limit switches can be integrated.

Integral reversing contactors (option)
Refer to EQ part-turn actuators on page 28. As standard, the end position switch signals are connected to external controls where the motor is cut-off via external reversing contactors when reaching the end position. Available as an option, the reversing contactors can be integrated into the actuator. The cut-off is then performed by the actuator.

3 Position feedback signal (option)
Either via a potentiometer or in case of larger distances as 0/4 – 20 mA signal, generated by an electronic position transmitter in 2-wire, 3-wire or 4-wire technology.

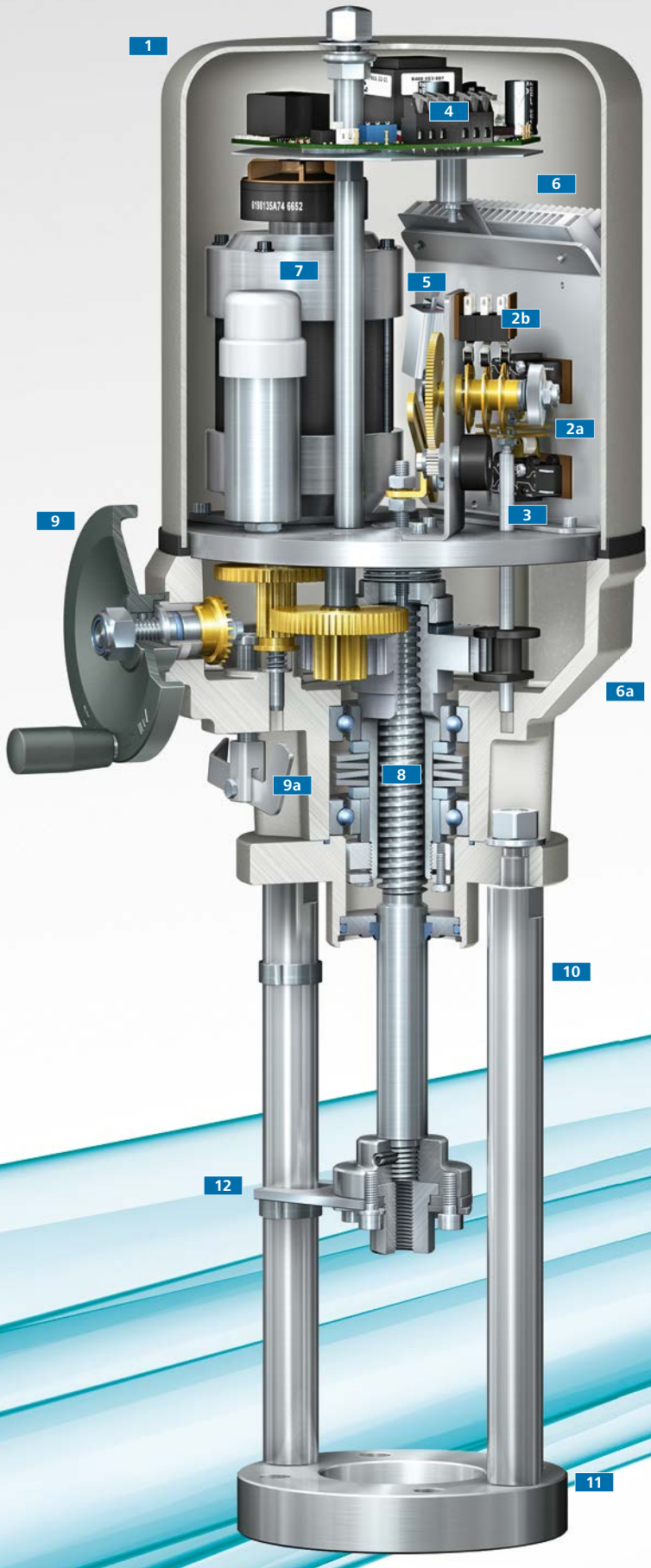
4 Positioner (option)
Positions the actuator in compliance with an external setpoint signal. The setpoint is selected as 0 – 10 V or 0/4 – 20 mA signal. In combination with a positioner, position feedback is possible using the same signals.

5 Heater (option)
To reduce condensation within the device.

6 Electrical connection
For electrical connection of power supply and control cables. Connection is made using standard terminal blocks. Cable entries 6a are located in the lower part of the housing. Cable glands are not part of the AUMA delivery and must be selected in compliance with the desired enclosure protection.

7 Motor
Depending on the version selected, the robust motors are synchronous or asynchronous with fixed speeds. Thermoswitches are integrated to protect against excessive temperatures allowing actuator cut-off on demand. As an option, many sizes are available with stall-proof motor.

8 Stem drive
Several gear stages transmit the motor or handwheel rotary movement to a hollow shaft equipped with an internal stem. The counterpart is a thrust rod equipped with an external stem. This creates the linear movement. The ball bearing of the hollow shaft considerably contributes to the superior efficiency. The pre-tensioned axial spring system eliminates gear backlash and consequently allows for high actuator positioning accuracy.



9 Handwheel
For emergency actuator operation in the event of power failure. Motor is disengaged and handwheel operation engaged when operating the change-over lever 9a.

10 Pillar yoke (option)
Available in different lengths and pillar distances.

11 Valve attachment
The valve attachment for mounting on the valve is designed according to EN ISO 5210.

12 Position indicator (option)
The optional distortion lock of the thrust rod acts simultaneously as position indicator.

Local controls (option)
Refer to EQ part-turn actuators on page 29. The desired control mode is defined via MANUAL/AUTO selection. If MANUAL is selected, the actuator can be operated locally via buttons OPEN and CLOSE.

BASIC RANGE - ED/EQ PART-TURN ACTUATORS

The perfect solution to operate shut-off butterfly and ball valves or venting and flue gas dampers. Superior positioning accuracy makes the ED/EQ series the perfect choice for automating control butterfly and ball valves.

Like all AUMA actuators, ED/EQ actuators excel by their sophisicated design and use of premium materials. This guarantees reliable operation over many years requiring minimum maintenance.

The actuators get down to essentials in terms of functionality. When the prime focus is on basic functions like precise opening, closing or controlling butterfly and ball valves, ED/EQ actuators are your perfect choice.

The self-retaining feature within the actuators ensures that the valve position is maintained even without power, also in case of force impact at the closing element. This often occurs with butterfly valves in intermediate positions caused by the media flow.

SERVICE CONDITIONS

Corrosion protection
> Standard: C2 according to EN ISO 12944-2
> Option: C3/C4 according to EN ISO 12944-2

Enclosure protection
> Standard: IP67
> Option: IP68

Ambient temperatures
> Standard: –20 °C to +70 °C
> Option: -40 °C to +70 °C

TECHNICAL DATA

Consider the limits of type of duty S3 - 15 min (class A) in open-close duty. S3 - 50 % applies to modulating duty paired with a maximum number of starts of 1,200 per hour

Type	Operating time for 90° at 50 Hz	Open-close duty	Modulating duty	Valve attachment
	[s]	Maximum torque [Nm]	Maximum modulating torque [Nm]	Standard EN ISO 5211
ED 25	15	25	25	F03; F04; F05; F07
	30			
	70			
ED 50	15	50	50	F03; F04; F05; F07
	30			
	70			
EQ 40	15	40	20	F04; F05; F07; F10
	30			
	60			
EQ 60	20	60	40	F05; F07; F10
	30			
	60			
EQ 100	20	100	60	F05; F07; F10
	30			
	60			
EQ 150	20	150	80	F05; F07; F10
	30			
	60			
EQ 300	40	300	180	F07; F10; F12
	80			
	160			
EQ 600	80	600	300	F07; F10; F12
	160			

POWER SUPPLY

Type of current	Voltage/frequency
3-phase AC	50 Hz: 380 V; 400 V 60 Hz: 400 V; 440 V
1-phase AC current	50 Hz: 230 V; 24 V; 115 V 60 Hz: 220 V; 24 V; 110 V
DC current	24 V

INTERFACE TO THE DCS

Basic version
> Two end position switches to cut-off the actuator upon reaching the end position
> One torque switch each per direction to switch off the actuator when reaching the tripping torque

Options
> Two additional limit switches for end position signalling
> Two additional torque switches
> Two digital inputs for operation commands Run OPEN and Run CLOSE in combination with reversing contactors.
> Positioner for analogue current or voltage signal
> Position feedback as current or voltage signal
> Integrated Profibus DP-V0 interface
> Emergency operation module for performing a predefined emergency operation

1 Hood
Made of polycarbonate in standard version. Available in aluminium as an option. The hood is removed by unfastening the four screws for connection of the actuator to the power supply and to perform end position setting.

2 End position switches
Both end position switches are operated via cams. They are set at the time of commissioning. An additional end switch per end position can be integrated as an option.

3 Integral reversing contactors (option)
As standard, the end position switch signals are connected to external controls where the motor is cut-off via external reversing contactors when reaching the end position. Available as an option, the reversing contactors can be integrated into the actuator. The cut-off is then performed by the actuator.

4 Position feedback signal (option)
Either via a potentiometer or in case of larger distances via 0/4 – 20 mA signal, generated by the electronic position transmitter.

Positioner (option)
Refer to SBA linear actuators on page 24. Positions the actuator in compliance with an external setpoint signal. The setpoint is selected as 0 – 10 V or 0/4 – 20 mA signal. In combination with a positioner, position feedback is performed using the same signal types.

5 End stops
For part-turn valves, they limit the travel and allow precise approaching of end positions during manual operation. At the time of commissioning, end stops are set to the desired position.

Heater (option)
Refer to SBA linear actuators on page 24. To reduce condensation within the device.

6 Electrical connection
For electrical connection of power supply and control cables. Connection is made using standard terminal blocks. Cable glands are not part of the AUMA delivery and must be selected in compliance with the desired enclosure protection 6a.

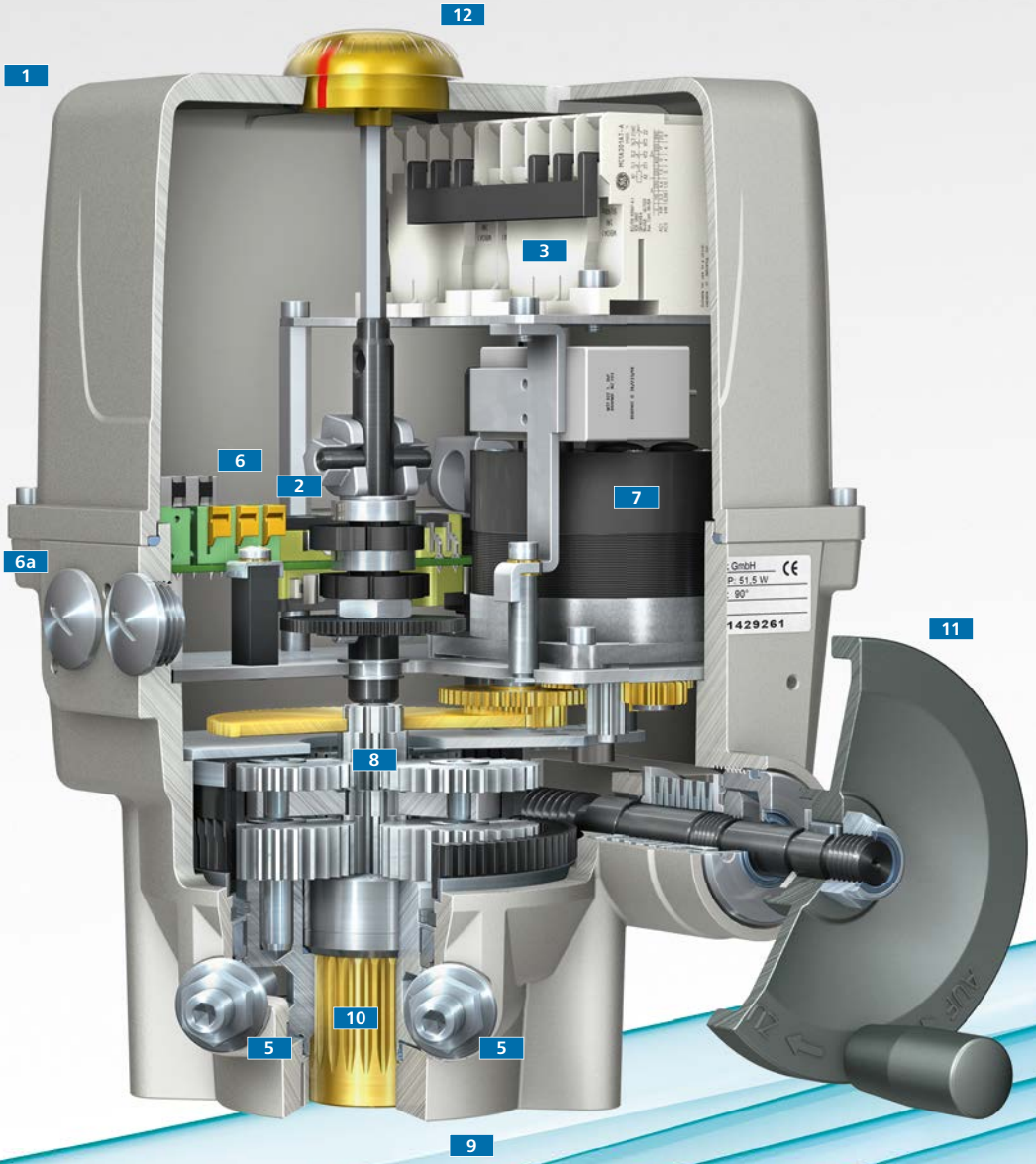
7 Motor
Robust synchronous motor with fixed output speed. Thermoswitches are integrated to protect against excessive temperatures allowing actuator cut-off if required. As an option, many sizes are available with stall-proof motor.

8 Gearing
Planetary gearing for reducing the high speed into the required output speed.

9 Valve attachment
The valve attachment for mounting on the valve is designed according to EN ISO 5211.

10 Coupling
For torque transmission to the valve shaft. During assembly, the coupling is simply pushed onto the valve shaft and secured against axial movement. In the next step, the actuator is placed onto the coupling and screwed to the valve flange. Upon request, the coupling is supplied with a suitable bore in accordance with the valve drive coupling.

13



4

11 Handwheel
For emergency actuator operation in the event of power failure. The handwheel does not rotate during motor operation.

Single-handed handwheel operation is possible.

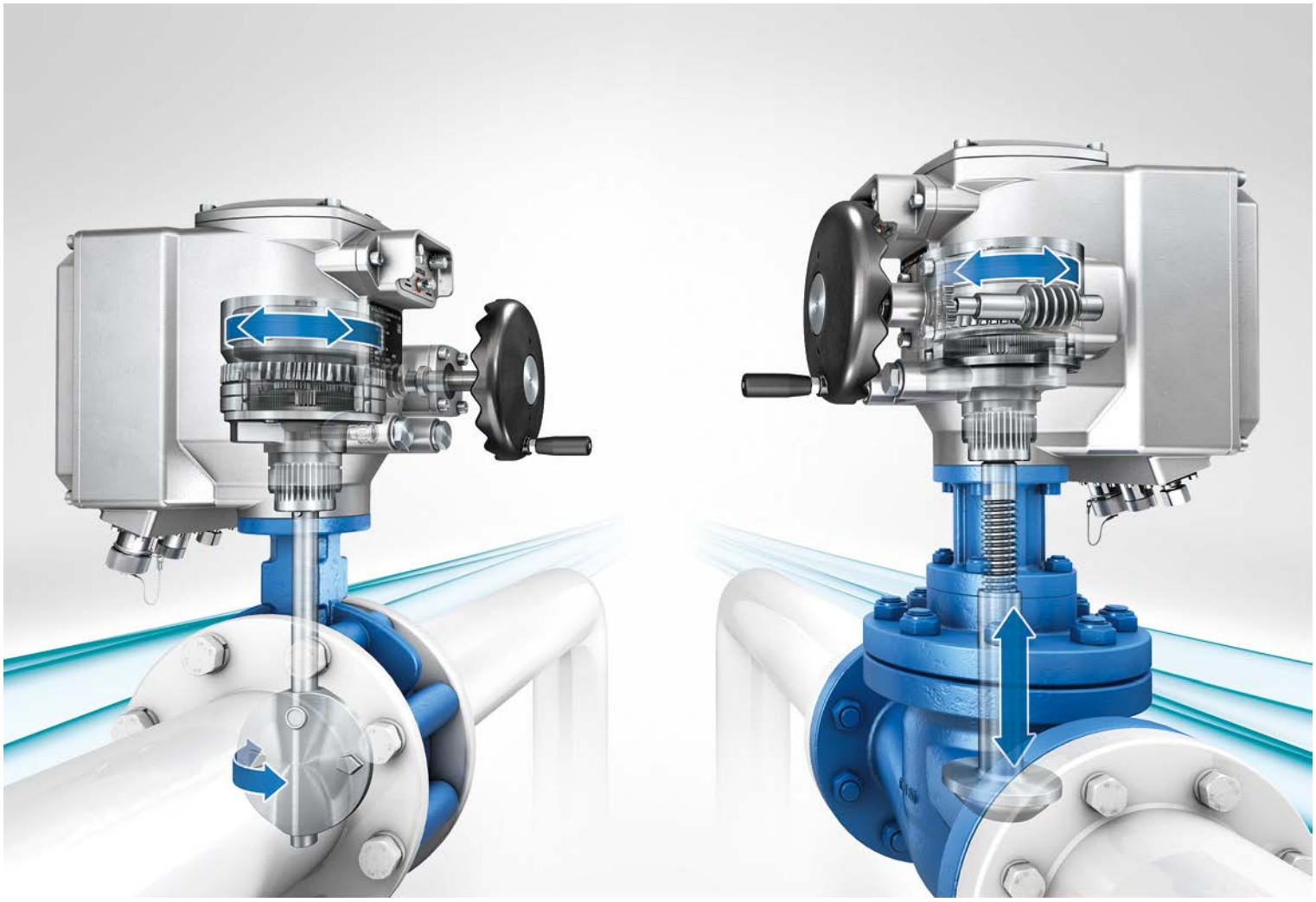
12 Position indication
Local indication of current valve position.

13 Local controls (option)
The desired control mode is defined via MANUAL/AUTO selection. If MANUAL is selected, the actuator can be operated locally via buttons OPEN and CLOSE.

SMART RANGE

When you need precision!

> Variable speed actuators
> Gentle approaching of end positions
> Speed profiles to prevent cavitation and pressure surges
> Local controls
> Optional integration into fieldbus systems



SMART RANGE - SGC PART-TURN / SVC GLOBE VALVE ACTUATORS

SGC part-turn actuators and SVC globe valve actuators excel by their compact design. Whenever high torques or operating forces are required, these actuators are the perfect choice. Variable speed provides excellent positioning accuracy.

Both actuator types are based on the same design principle, and follow the same pattern in terms of commissioning, integration into the DCS and subsequent operation. This facilitates joint operation of both type ranges within a single installation.

SGC and SVC are suitable for open-close duty, SGCR and SVCR versions for modulating duty.

Soft start and soft stop

Operations out of an end position start at zero speed. By means of a ramp function, speed is increased until the predefined setpoint value is reached. Soft stop is the exact opposite: Prior to reaching the end position, the speed is linearly decreased. The advantage is gentle service for all valve and actuator components subject to wear.

Higher positioning accuracy

Like for operation into the end position, the actuator decreases the operating speed when approaching the setpoint valve position down to zero speed. This allows for more accurate actuator positioning to the setpoint compared to the sudden tripping of a fixed speed actuator. This ability is particularly crucial for the SGCR and SVCR modulating duty models.

External impact on speed

The variable actuator speed is an additional control variable to optimise a control process within the control system. To this end, the actuator speed can be adjusted by an external controller.

Extremely robust

Not only is AUMA spearheading technology with regard to ambient temperatures, corrosion protection and enclosure protection, the SGC and SVC type ranges are also resistant to vibration. This is due to the compact design and was particularly noted during tests proving the suitability of the devices for use on military vessels. The actuators are the optimum solution for applications with difficult service conditions.

APPLICATION CONDITIONS FOR SGC/SGCR AND SVC/SVCR ACTUATORS

Corrosion protection
C5 according to EN ISO 12944-2

Ambient temperatures
> –25 °C to +70 °C

Enclosure protection
> IP68: Submersible up to 8 m head of water up to 96 hours at 10 operations during immersion.

Special approvals
> DNV GL
  DNV GL certifies the suitability of the products for use in environmental categories D, G, EMC2.
> RMR (Russian Marine Register)
  This certification proves the suitability of the products for use on civil ships and in offshore plants

SGC/SGCR PART-TURN ACTUATORS

Type	Operating time for 90° – adjustable in 9 steps	Setting range for tripping torque	Maximum run torque of SGC (open-close duty) Maximum modulating torque SGCR (modulating duty)	Number of starts Max.	Output mounting flange	Adjustable swing angle range
	[s]	[Nm]	[Nm]	[1/h]	EN ISO 5211	
SGC/SGCR 04.1	4 – 63	25 – 63	32	1,800	F05/F07	82° – 98°
SGC/SGCR 05.1	4 – 63	50 – 125	63	1,800	F05/F07	82° – 98°
SGC/SGCR 07.1	4 – 63	100 – 250	125	1,800	F07	82° – 98°
SGC/SGCR 10.1	5.6 – 90	200 – 500	250	1,800	F10	82° – 98°
SGC/SGCR 12.1	20 – 275	400 – 1,000	500	1,800	F12	75° – 105°

SVC/SVCR GLOBE VALVE ACTUATORS

Type	Speed – adjustable in 9 steps	Setting range for tripping torque	Maximum run torque of SVC (open-close duty) Maximum modulating torque SVCR (modulating duty)	Number of starts Max.	Output mounting flange	Turns per stroke	Max. stem stroke for rising stem
	[rpm]	[Nm]	[Nm]	[1/h]	EN ISO 5211	in segments	[mm]
SVC/SVCR 05.1	1.6 – 22	10 – 25	13	1,800	F05/F07	1 – 40	60
SVC/SVCR 07.1	1.6 – 22	20 – 50	25	1,800	F07	1 – 40	70
SVC/SVCR 07.5	0.6 – 8.0	40 – 100	50	1,800	F07	1 – 40	70

POWER SUPPLY

The actuators are operated with 1-phase AC current.

Voltage	Frequency
[V]	[Hz]
115	50/60
230	50/60

The operating times above apply to both 50 Hz and 60 Hz.

INTERFACES TO THE DISTRIBUTED CONTROL SYSTEM (DCS)

Parallel interface
> Four digital inputs
> One analogue input 0/4 – 20 mA for setpoint definition
> Four output contacts
> One analogue output 0 – 20 mA or 4 – 20 mA for position feedback

Fieldbus interfaces
> Profibus DP-V0
> Profibus DP-V0/V1
> Modbus RTU (line topology)
> Modbus RTU loop redundancy (loop topology)

1 Integral controls
Contain switchgear units, power supply unit, interface to the DCS and are designed to process commands from the DCS and supply feedback signals. Controls automatically switch the actuator off once either the valve end position or the specified tripping torque has been reached.

Connection to the control system is either made via parallel interface or fieldbus. Profibus DP and Modbus RTU are available as fieldbus interfaces.

2 Local controls
The actuator can be operated locally via push buttons. One of the push buttons is used to select the control mode, i.e. the operator selects whether the actuator is operated via local controls or via DCS. A padlock protects the device against unauthorised operation.

The wall bracket allows separate mounting of local controls in case access to the actuator is difficult. The connection is then made via cable.

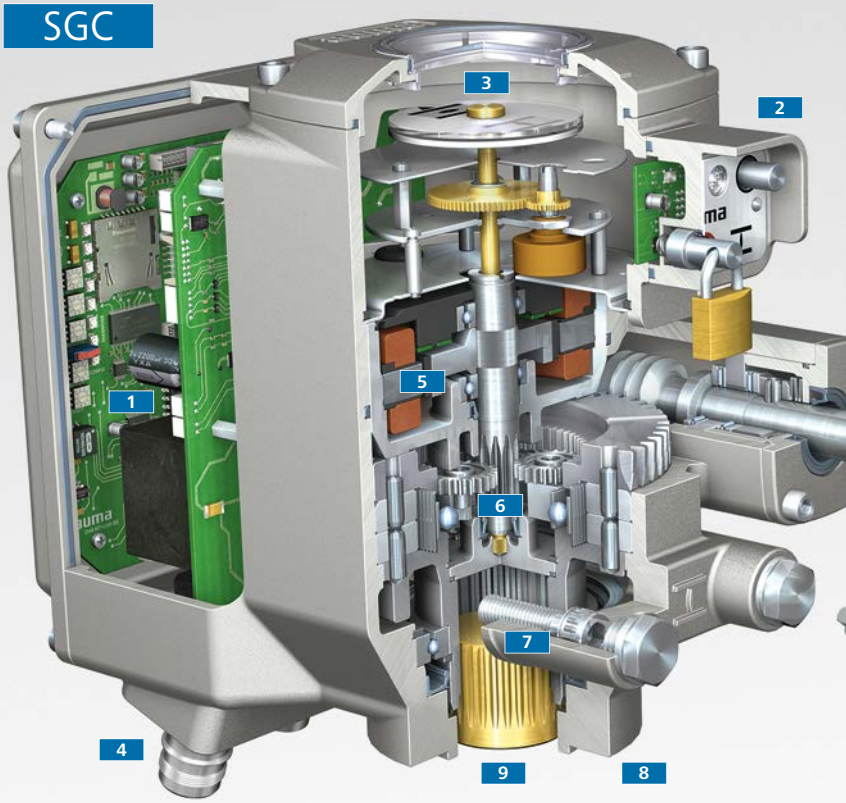
3 Position indication
Local indication of current valve position.

4 Electrical connection
For electrical connection of power supply and control cables. A compact plug/socket connector with crimp connection in basic version.

5 Motor
The electronically settable variable speed motor requires approximately one-third of the height of an equivalent conventional motor, thus contributing to the compact design of the actuator.

6 Gearing
Patented ellipto-centric gearing with premium efficiency. One stage 80:1 reduction gearing within a minimal space envelope.

SGC



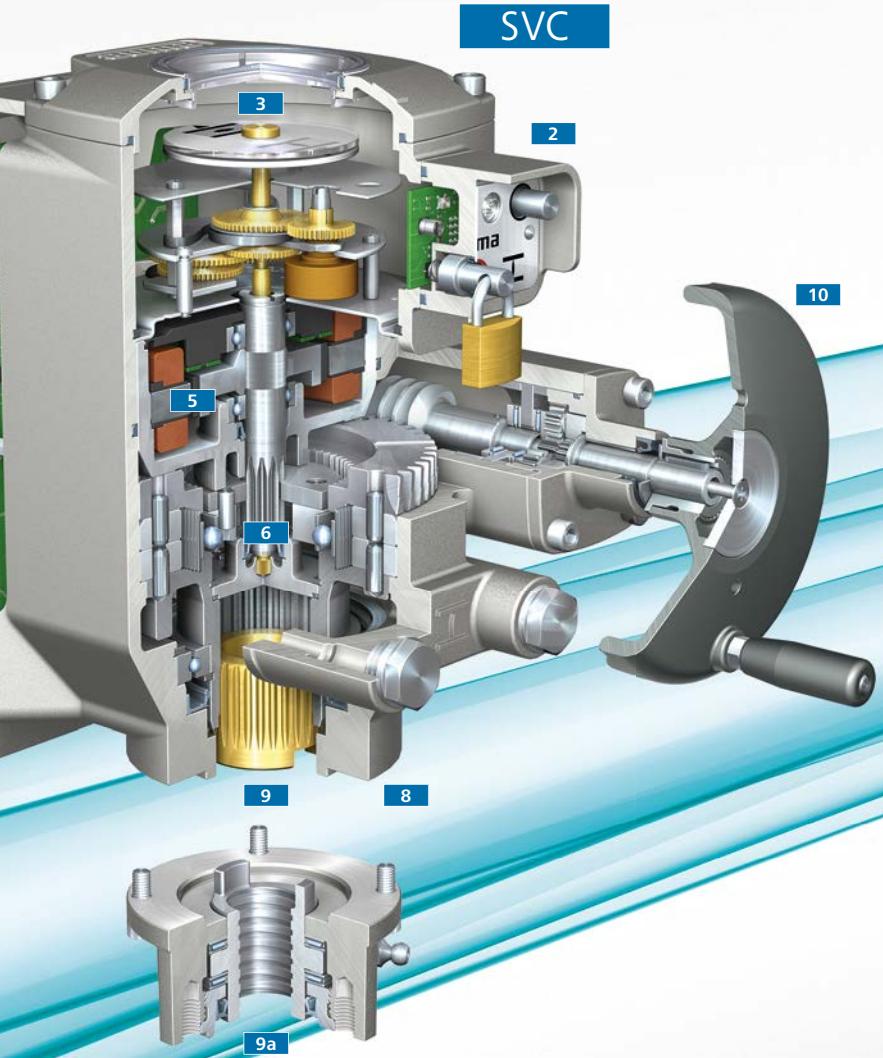
7 End stops (for SGC only)
During manual operation of part-turn valves without internal end stops such as butterfly valves and ball valves, these integrated end stops enable precise approaching of end positions.

8 Valve attachment
The valve attachment for mounting on the valve is designed according to EN ISO 5211.

9 Coupling
For torque transmission to the valve shaft. During assembly, the coupling is simply pushed onto the valve shaft and secured against axial movement. In the next step, the actuator or the gearing is placed onto the coupling and screwed to the valve flange. Upon request, the coupling is supplied with a suitable bore in accordance with the valve drive coupling.

SVC actuators are particularly suited for automating multi-turn valves with non-rising valve stems. For valves with rising, non-rotating stems, the actuator is additionally equipped with output drive type A 9a - threaded stem. The coupling is replaced by an output drive sleeve into which the rising stem is led.

10 Handwheel
For emergency actuator operation in the event of power failure. The handwheel does not rotate during motor operation.



OTHER TYPE RANGES

Besides satisfying the requirements of the Division of AUMA Industry & Marine, the AUMA product portfolio offers further devices meeting specific needs:

> Higher torques or operating forces
> Explosion protection
> Fire resistance
> Special enclosure protection
> Low and high temperature versions
> FO cable or Wireless communication
> Further fieldbus interfaces

SA/SQ RANGE

Multi-turn and part-turn actuator meeting a torque range of 10 Nm – 675,000 Nm. This wide range is an outstanding feature of this modular range family. This is also achieved in combination with valve gearboxes. In their basic version, the actuators are available with fixed speed and in explosion-proof design.

All actuators can be supplied with or without actuator controls. Modern actuators are generally combined with integral actuator controls. AM actuator controls offer basic functions. However, the software-based AC provides comprehensive functions and a large variety of interfaces.

Open-close and modulating duty

In SA or SQ version, the actuators are designed for open-close duty. SAR or SQR version are designed for modulating duty.

Variable speed

AC actuator controls are also available with integral frequency converter - turning then into ACV. This feature allows that actuators of this type range can be operated at variable speed. This is required when customers demand premium positioning accuracy, soft start and soft stop or operation profile schemes.

Explosion protection

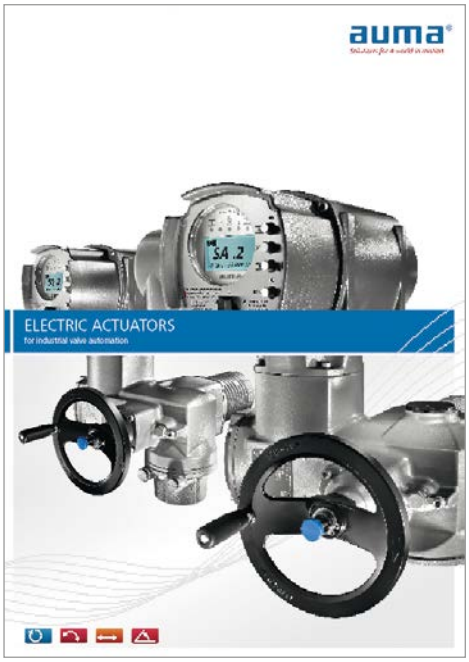
SAEx and SQEx are the type designations for the explosion-proof version of this product family. All required certifications are available to allow their worldwide use. In version SAREx and SQREx, these actuators are additionally designed for modulating duty.

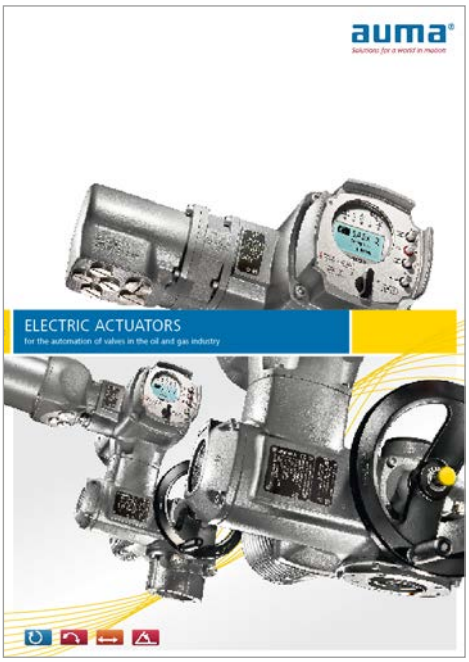
If required, the actuators can be supplied with special fire protection coating ensuring that safe actuator operation is guaranteed - in the event of fire - for a duration of minimum 30 minutes at temperatures up to 1,100 °C.

Brochures

For more detailed information on these actuators, please refer to the following brochures:

> Electric actuators for industrial valve automation
> Electric actuators for the automation of valves in the oil and gas industry





SA/SAR multi-turn actuators
Particularly suited for gate valves.

> Eleven sizes
> Torque ranges:
10 Nm – 32,000 Nm

Applications: Shut-off and control gate valves with high differential pressures and/or large diameters.

SQ/SQR part-turn actuators
Particularly suited for part-turn valves.

> Five sizes
> Torque ranges:
150 Nm – 2,400 Nm
> Swing angle ranges:
75° – 225°

Applications: Automation of butterfly and ball valves in all process engineering schemes.

SA/GS part-turn actuator combinations
Combination consisting of SA multi-turn actuator and GS part-turn worm gearbox

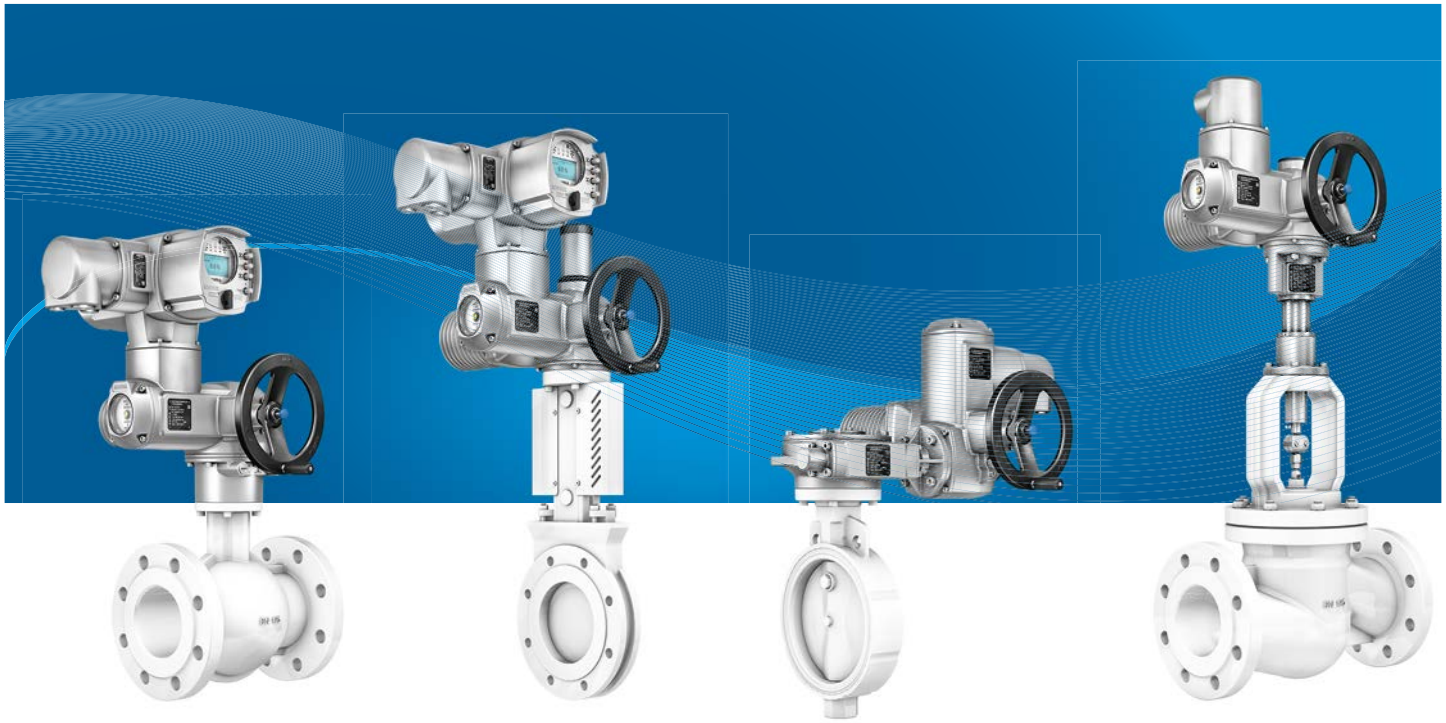
> Torques up to 675,000 Nm

Applications: Automation of butterfly and ball valves with diametrers of several metres

SA/LE linear actuator combination
LE linear thrust unit converts the rotary SA actuator movement into a linear movement.

> Thrust ranges:
11.5 kN – 217 kN
> Stroke ranges:
50 mm – 400 mm

Applications: Operation of shut-off and control valves requiring higher thrust



SERVICE

The shipbuilding industry depends on reliability and availability. Sophisticated design and careful device manufacture are an absolute must – and a worldwide service network ensuring availability of our AUMA actuators throughout their entire product life.

Advice and service throughout the entire product life

We at AUMA strive for long-term customer satisfaction and partnership by warranting the safe and smooth operation of our actuators. We attach great importance to customised advice and comprehensive service – throughout our products' lifetime.

SERVICES

EXPERTISE IN YOUR NEIGHBOURHOOD

We do not go for call centres with endless waiting loops or online device configuration systems with direct order placement. As soon as the automation requirements become more complex - and actuators are part of systems with different levels of complexity - the direct support and advice provided by our service staff cannot be replaced by automatic ordering systems. This is how we ensure that our customers select the most suitable actuator solution.

AUMA's global service network with subsidiaries and representatives, established in 70 countries, is even subdivided in sections of competence at country level. The AUMA sales staff are informed about the latest developments by regular sales training.

Your special advantage: Competent support for AUMA products is available worldwide, helping you in selecting the suitable device - in your neighbourhood.

COMPREHENSIVE SERVICE

Whatever applies to customer support also applies to customer service. Our sales network is also a service network. We always care for you and our products.

Our service engineers know the AUMA devices by heart and their technical expertise in the field of device deployment is common knowledge. The best practice database is available for the AUMA service network, beneficial for both, the service staff and the customers.

Our AUMA service offers our customers all around the globe comprehensive service performance for actuators, actuator controls, and gearboxes. With our versatile service portfolio, we are your competent partner from installation and commissioning to training, maintenance, and overhaul or repair right through to global availability and supply of spare parts.

We guarantee availability for spare parts for at least 10 years after discontinuation of a product.

THE RIGHT TIME - THE RIGHT PLACE

Waiting times are very costly. Consequently, service deployment must be planned in detail. Once a ship enters the harbour, the AUMA service technician readily waits, equipped with the required approvals, the needed spare parts and tools for the upcoming intervention.

TAILORED MAINTENANCE

Preventive maintenance maximises availability. In compliance with the specified application conditions, we develop individual and tailored actuator maintenance plans for any vessel.

auma®
Solutions for a world in motion

AUMA Industry & Marine GmbH
Eichendorffstr. 42 – 48
78054 Villingen-Schwenningen
Germany
Tel +49 7720 8540-0
Fax +49 7720 8540-50
info.industry-marine@auma.com

AUMA subsidiaries and representatives are implanted in more than 70 countries. For detailed contact information, please refer to our website.
www.auma.com

ISO 14001 TÜV SÜD ISO 9001
Certificate Registration No. 12 100/104 4269

ELECTRIC ACTUATORS

FOR USE ON CIVIL VESSELS

auma®