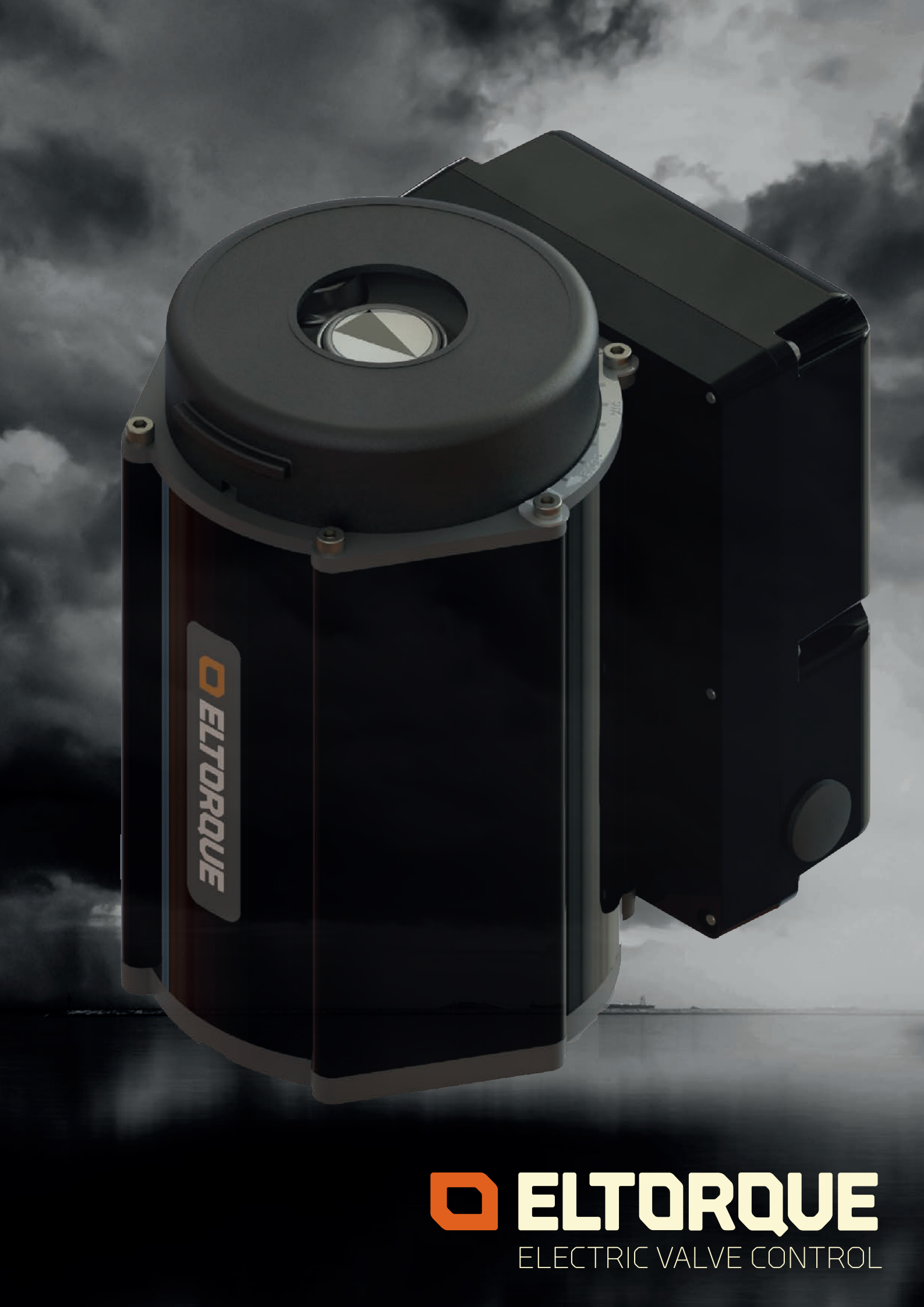


ELTORQUE

ELECTRIC VALVE CONTROL

TABLE OF CONTENTS

Eltorque develops, manufactures, and markets electric actuators and control systems for the international shipbuilding and onshore industries.

www.eltorque.com


Over 150.000 Eltorque actuators
have been installed onboard
over 1200 vessels

THE STORY OF ELTORQUE

The starting point for Eltorque was an idea of implementing permanent magnet motor technology into an electric actuator.

Eltorque was founded in 1996 and enjoyed rapid growth in developing and manufacturing actuators from a unique electric patented motor concept into electronic remote actuation of valves. After breaking into the high-end fishing vessel market in 2000, Eltorque developed a complete remote-control valve system with a wide range of actuators for the shipbuilding industry.

By 2006, Eltorque had introduced a new generation of actuators specifically designed for the offshore market. This innovation propelled Eltorque to the forefront, making it a market leader in Northern Europe. The company has successfully completed over 1,200 projects, supplying 150,000 high-quality actuators, thereby establishing a solid foundation of trust and reliability.

Valve-control devices were traditionally pneumatic or hydraulic designs. However, Eltorque saw the potential of electronic actuators to enable remote control of valves around the ship. Such a system allows an operator on the bridge to easily monitor and control the ballast water, fuel system, and the loading and unloading of liquid cargo.

At Eltorque, we believe that innovation is the key to success. We are committed to pushing the boundaries and investing significant efforts into developing the products and solutions of the future. Our ambition is to lead the market and set new standards in technical performance and product portfolio, ensuring an exciting future for our

The **Eltorque** valve control solution can replace any conventional system.

THE FUTURE IS ELECTRIC

SOLUTIONS FOR ALL SEGMENTS

Eltorque holds such a strong market position by expanding into more segments, pursuing a vision to be globally recognized as the “best in class” supplier of valve control systems for maritime and offshore industries.

With our key locations around the globe, loyal partners, and an efficient sales force, we will be able to take on all the projects that come along. We believe the future will be highly automated with remotely operated systems, even the ship itself. Automated enabled vessels will be the future of fuel efficiency and safety.

Eltorque is well-positioned for this future, which is right around the corner, providing our compact actuators and control system in several market segments.

- OFFSHORE
- FISHING
- YACHT
- AQUA CULTURE
- MERCHANT
- LIVE FISH CARRIERS
- CRUISE
- ROPAX
- RORO
- SUPPLY
- NAVY
- CHEMICHAL TANKERS


ELTORQUE

THE ELTORQUE SOLUTION

The Eltorque actuators and control system functions include remote and local control of the valve operations. As a result, the actuators can be configured precisely to the valves' torque requirements.

SAVE SPACE AND WEIGHT

The actuators are compact and economical. When comparing Eltorques solutions with conventional solutions, many benefits are evident for both owners and yards, like reduced weight and volume.

ROBUST AND FUTURE ORIENTED

Eltorque places enormous efforts into developing the products and solutions of the future designed to last the vessel's lifetime.

REAL-TIME FEEDBACK

The actuators are highly intelligent units with an encoder instead of the limit switch. The real-time encoder maximizes safety and reliable operation for the customers.

MAINTENANCE FREE

The actuators are highly intelligent units with no need for maintenance, designed to last the vessel's lifetime. The end-users are provided with a cost-effective solution securing carefree remote valves control.

ENVIRONMENTALLY FRIENDLY

Reliability and flexibility are proven through more than 150.000 full-electric actuators in a broad specter of ship designs meeting all relevant safety requirements.

SAFE VALVE CONTROL

The actuators offer a Failsafe option. The Failsafe is a local emergency power source (battery) integrated into the actuator; it is specially made to control and monitor electronics in case of power supply loss. The actuators can enter a safe state.

SAVE TIME AND MONEY

Our goal is to simplify our customers with everyday operations. By focusing on the entire value chain and actively meeting the market demand, we can reduce our customer's costs and offer a higher product quality.

CLASS LEADING OPERATIONAL FLEXIBILITY

The backbone of the Eltorques valve control solution is found in the actuators. They have a series of unique qualities that make up one of the most durable valve control systems available on the market.

- Fully electric and serial connected
- Real-time feedback on valves
- Maintenance free
- Fire resistant
- Several failsafe and redundancy option

FOCUS ON THE GREEN SHIFT

Eltorque has focused on sustainability and the green shift for many years. Today, we are a qualified player covering our product group with one of the most energy-saving products you can get in the market.

The International Maritime Organization works towards a 40% reduction of greenhouse gases within 2030 compared to the 2008 level. To provide electric, pollution-free actuators is a small but essential part of this transformation. Therefore, vessels' electrification applies to the electrification of all instruments and components, including actuators.

Our actuators are compact and economical. When not operating, the actuators minimize energy consumption by using low energy idle state. Over a lifespan on larger system implementations, the minimized energy consumption implies substantial energy and fuel savings. Moreover, the electrical actuators comprise non-hazardous and fully recyclable materials.

When comparing Eltorques solutions with conventional solutions, many benefits are evident for both owners and yards, and our ambition is to always be in the lead in developing sustainable products. As a result, our actuators are pollution-free, have minimized energy consumption, have no oil leakage, and the actuators are made with fully recyclable materials.

01 SUSTAINABILITY	The Eltorque actuators are sustainable with the pollution-free Eltorque solution.
02 MAINTENANCE FREE	Eltorque actuators are highly intelligent units with no need for maintenance, designed to last the vessel's lifetime.
03 ENERGY SAVING	Eltorque electric actuators minimizes energy consumption.
04 WEIGHT & VOLUME	Eltorque actuators are compact and economical with reduced weight and volume.

THE GREEN SHIFT

SMART, SAFE AND CLEAN VALVE CONTROL

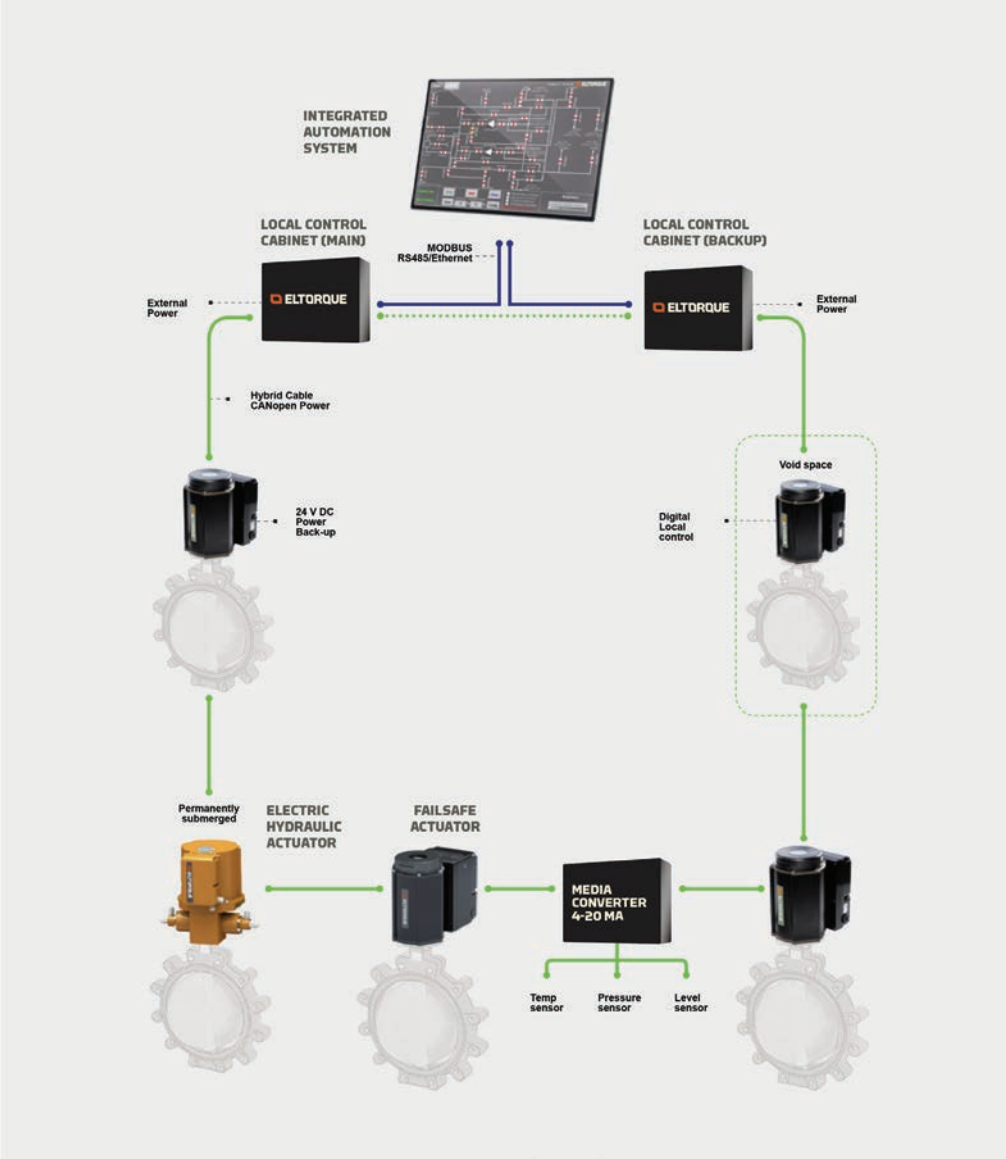
Eltorque delivers a fully customizable, robust, and simplistic flow control solution. With built-in intelligence, the Eltorque valve control differs from all conventional systems, such as pneumatics and hydraulics.

SMARTEST

It has taken many years to convince the conservative Shipbuilding industry to leave their traditional old school actuation to modern electronic actuation and valve control. The huge benefit and the revolution to the industry is the automatic shut off of power to the electric motor when the valve has reached its designated position. A patented self-lock technology unique for the Eltorque actuators to hold the valve in the designated position without using power. This is a massive power and fuel saver compared to all other actuators on the market. Moreover, if needed, the actuators may be reconfigured after installation, reducing the cost of specification changes.

The communication protocols used by the actuators and the control systems are based on industrial standards such as Modbus and CANopen. A large number of embedded communication protocols eases the integration between the valve-control system and other systems in the vessels, as seen for integrated Automation System (IAS) or local touch panels.

The huge benefit and the revolution to the industry is the automatic shut off of power to the **electric** motor when the valve has reached its designated position.



SAFEST AND CLEANEST

Redundant communication is supported using a ring topology; hence two logical controllers can handle communication with all actuators. This set-up is fault-tolerant to a range of scenarios, such as loss of main controller, short-circuiting, loss of communication signals, loss of power, etc. Therefore, power redundancy is offered with a Failsafe option. The Failsafe option comprises a battery serving as a power source and control electronics. Failsafe automates switching valves into a' safe state', a task that is otherwise error-prone and work-intensive. Moreover, the Failsafe actuator can connect to the vessel's operated emergency supply.

When not operating, the actuators minimize energy consumption by using low energy idle state. Over a lifespan on larger system implementations, the minimized energy consumption implies substantial energy and fuel savings.

THE ELTORQUE QUARTER-TURN RANGE

Our quarter-turn actuators with permanent magnet motor technology are the original Eltorque actuators. Excellent controlling possibilities with built-in encoders ensure highly intelligent units with a low cost of installation and operation. Moreover, a patented self-lock technology – unique to Eltorque actuators – holds the valve in the designated position without losing power. This is a massive power and fuel saver compared to all other actuators on the market.

All information, including software, manuals, datasheets, and drawings, are available under the product location at our website: www.eltorque.com/products.

Quarter-turn actuators for butterfly and ball valves between DN25 and DN800*

QT50

Max torque	50 Nm
Min close time	5 s
Valve size	DN25-80
Weight	4.5 kg
Dim	17/12/17 cm
Protection	IP68
Temp	-25 ° to 70 °C
Interface	CAN bus, Digital, Analog

QT70

Max torque	70 Nm
Min close time	3 S
Valve size	DN80-100
Weight	11 kg
Dim	23/16/21 cm
Protection	IP68
Temp	-25 ° to 70 °C
Interface	CAN bus, Digital, Analog
Options	OpenDeck**, Dual Power, Failsafe

QT250

Max torque	250 Nm
Min close time	13 s
Valve size	DN80-100
Weight	11 kg
Dim	23/16/21 cm
Protection	IP68
Temp	-25 ° to 55 °C
Interface	CAN bus, Digital, Analog
Options	OpenDeck**, EX, Dual Power, Failsafe

QT400

Max torque	380 Nm
Min close time	20 s
Valve size	DN80-300
Weight	11 kg
Dim	23/16/21 cm
Protection	IP68
Temp	-25 ° to 55 °C
Interface	CAN bus, Digital, Analog
Options	OpenDeck**, EX, Dual Power, Failsafe

*Valve dimensions for exemplary purposes only. Requirements and suitability may vary in different applications.
** Check details with Eltorque agent

- Encoder instead of a limit switch
- Temperature surveillance and control
- Epoxy encapsulated electronics
- Specially designed planetary gear
- Extensive lifetime testing secures durability

QT800

Max torque	800 Nm
Min close time	45 s
Valve size	DN250-400
Weight	21 kg
Dim	33/20/24 cm
Protection	IP68
Temp	-25 ° to 70 °C
Interface	CAN bus Digital, Analog
Options	OpenDeck**, EX, Dual Power, Failsafe

QT1000

Max torque	1000 Nm
Min close time	63 s
Valve size	DN250-400
Weight	21 kg
Dim	33/20/24 cm
Protection	IP68
Temp	-25 ° to 70 °C
Interface	CAN bus, Digital, Analog
Options	OpenDeck**, EX, Dual Power, Failsafe

QT2500

Max torque	2500 Nm
Min close time	30 s
Valve size	DN400-600
Weight	69kg
Dim	54,3/29/25 cm
Protection	IP68
Temp	-25 ° to 55 °C
Interface	CAN bus, Modbus Digital, Analog

QT4000

Max torque	4000 Nm
Min close time	45 s
Valve size	DN600-800
Weight	69 kg
Dim	**54,3/29/25 cm**
Protection	IP68
Temp	-25 ° to 55 °C
Interface	CAN bus, Modbus Digital, Analog

EX ACTUATORS

ACTUATORS FOR HAZARDOUS AREAS

Eltorque offers specialized versions of the QT actuators for use in EX classified zones. These actuators are technically similar to the standard maritime version but are upgraded with key features to secure durability in hazardous areas. The basic principle employed is that the actuator will not cause an explosion in the surrounding atmosphere.

The actuators are suitable with an operating torque between 0-1000 Nm and are offered in our QT range from QT250 - to QT1000.

QT250 EX

QT400 EX

QT800 EX

QT1000 EX

EXD ACTUATORS

The EXd actuators are designed for the harshest and most hazardous environments. A flameproof enclosure ensures safe and reliable operation. The Exd actuators deliver robust performance and uncompromising safety in Zone 1 and Zone 2 classified areas.

The actuators are suitable with an operating torque between 0-2500 Nm and are offered in our QT range QT250, QT800 and QT2500.


ELTORQUE


ELTORQUE
SAFE INTELLIGENCE

FAILSAFE ACTUATORS

THE FAILSAFE OPTION

Our new generation Eltorque actuators are offered with a Failsafe option. This option is a local emergency power source (battery) integrated into the actuator and specially made control and monitoring electronics.

Failsafe actuators provide extended functionality in case of main power supply loss. The Failsafe actuators automate the task of switching valves into a safe state, which is otherwise error-prone and work-intensive. The possibility of configuring different failsafe modes to cope with power loss and short signal breaks represents the next step compared to spring return. Reconfiguration of failsafe modes after installation provides another layer of functionality.

Eltorque Failsafe actuators are offered in the range QT70 - QT1000.

ELECTRIC MULTI-TURN ACTUATORS

The multi-turn series of actuators are designed for globe and gate valves. A form factor makes the MT-series ideal for manifold actuation; moreover, it offers the same reliable operation as the QT-series. Most multi-turn applications are covered with a maximum operating torque of 150 Nm. The Eltorque MT actuators are suitable for remote control of Rolls-Royce Marine UT multi-turn bilge and Cross-over valve manifolds.

MT50

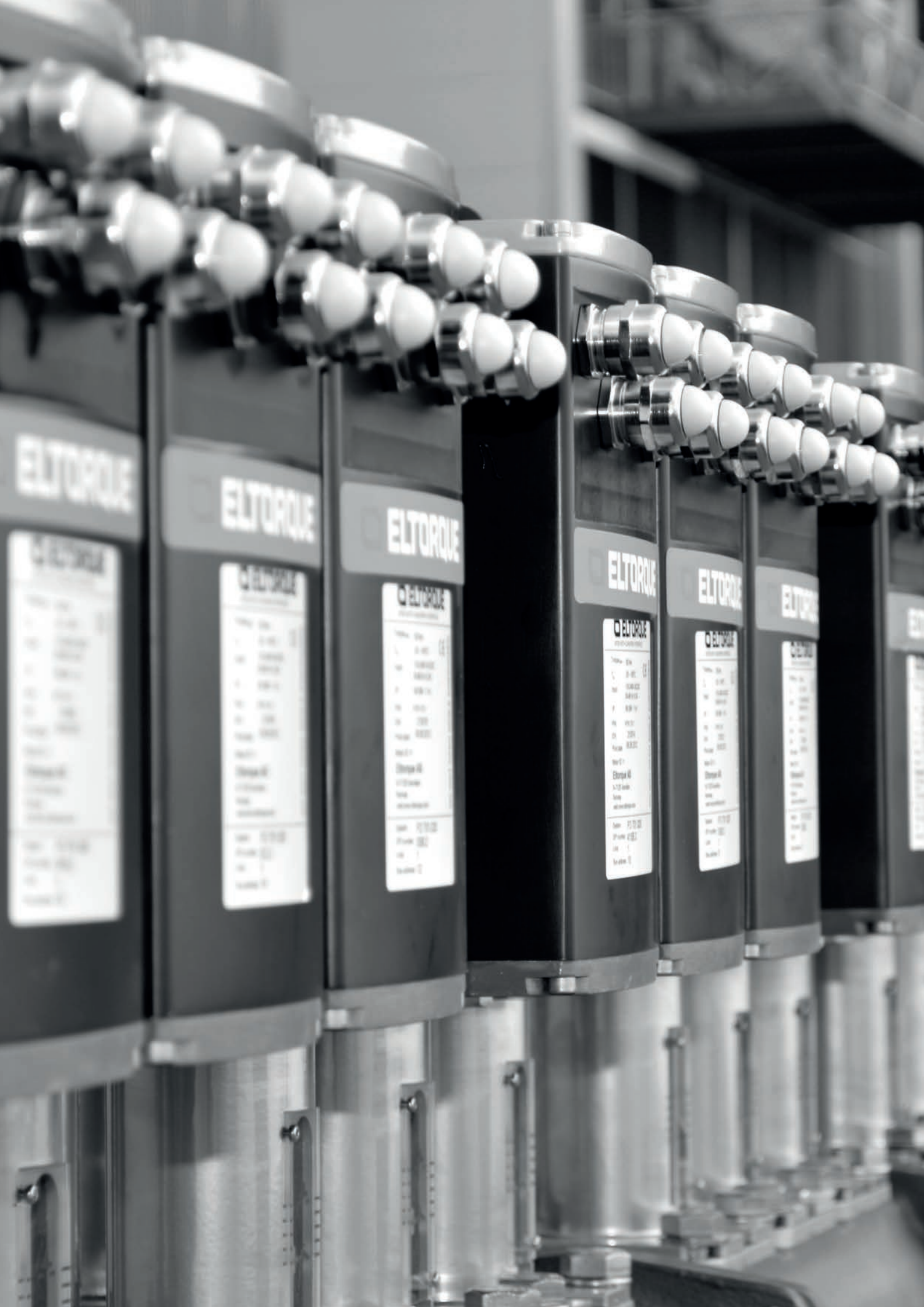
MT50 is Eltorque`s most compact multi-turn actuator and is specially developed for multi-turn bilge and crossover valve manifolds with rising steam.

Max Torque	50 Nm
Max spindle speed	17 RPM
Valve size	DN50/80/100
Min Close time	20/25/30 s
Weight	10.5 Kg
Dim	28/12/22 cm
Protection	IP68 10 m 72 hrs
Temp	-25 to 55 °C
Interfaces	CANbus, Digital

MT150

MT150 is Eltorque`s largest multi-turn actuator developed for multi-turn bilge and crossover valve manifolds with a rising stem. An operating torque of up to 150 Nm is suitable for gate or globe valves up to DN150. Available with Digital or CANbus interfaces.

Max Torque	150 Nm
Max spindle speed	15 RPM
Valve size	DN125/150
Min Close time	60/65 s
Weight	19 Kg
Dim	36/15/27 cm
Protection	IP68 10 m 72 hrs
Temp	-25 to 55 °C
Interfaces	CANbus, Digital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RETROFIT AND SHIPBUILDING

The unique and innovative valve control solution manufactured by Eltorque can replace any conventional system. As a result, Eltorque is a trusted partner for shipyards and shipowners seeking to achieve climate-friendly goals when retrofitting or building ships.

Yards and ship owners increasingly look for electric valve control solutions due to the advantages in both installation and operation. Through an intensive development effort, we have become one of the frontrunners in this market with our maintenance-free actuators, market-leading functionality, and the latest concept for the safety and reliability of the system.

Eltorque believes that ships need to be, and be built, increasingly intelligent and cost-effective. Higher safety requirements will put new demands on products and solutions. In addition, emission regulations will pressure the ship's power consumption. Eltorque supports ship owners, yards, and designers to take advantage of the latest technologies available in building vessels for the future.

Retrofitting existing vessels is a valuable option. Moreover, Eltorque focuses on the green shift and offers environmentally friendly solutions. Many shipowners and shipyards are now looking ahead to new times to meet new regulatory energy and emissions standards. Eltorque, with its unique and innovative solutions, will be a trusted partner to achieve climate-friendly goals with retrofitting and shipbuilding.

HYBRID CABLE AND SENSORS

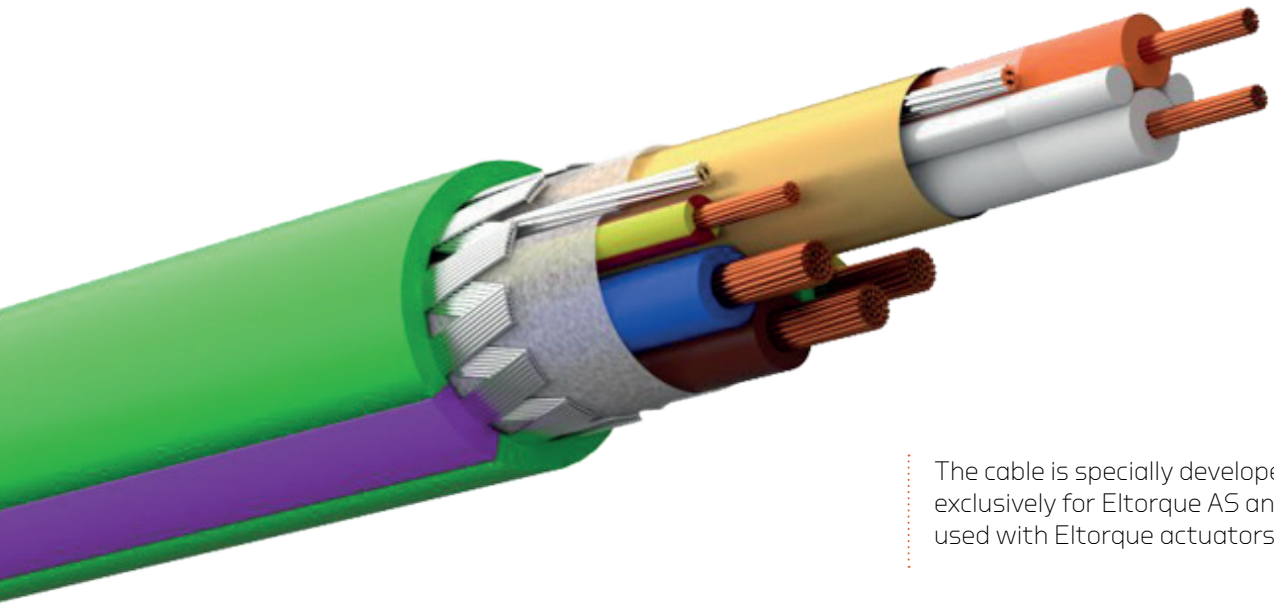
In addition to our compact actuators, Eltorque can offer several system features. Such as our unique hybrid marine cable and sensors.

HYBRID MARINE CABLE FOR POWER AND CONTROL

The serial connection of actuators is undoubtedly the most cost-effective installation methodology. In addition, Eltorque has developed a groundbreaking Hybrid CANbus / Power cable specially designed for maritime applications.

The Eltorque Hybrid Marine Cable simplifies installation and saves time. Moreover, fewer cable glands reduce the risk of errors, making this the new benchmark for efficiency and safety.

Eltorque revolutionizes installation methodology with the new Hybrid Marine installation cable. It combines CANbus signal and 2.5mm2 Class 5 power conductors into one simplistic and cost-effective product. The cable has a Type Approval Certificate, is Halogen-free, and EMC approved. In addition, the hybrid cable is double shielded and designed for robustness and is suitable for even the most demanding conditions.



The cable is specially developed and produced exclusively for Eltorque AS and should only be used with Eltorque actuators.

SENSORS

Eltorque offers various sensors and systems for every application and requirement, from temperature transmitter to valve position indicator. Low complexity and a low-cost alternative is a redundant set-up that mixes high-accuracy pressure sensors with digital float switches for any liquid-level sensing. Control signal redundancy may be used similarly to nonelectrical actuators. Alternatively, the actuators may be configured through the CANopen bus (supported by the electrical actuators).

SIDE MOUNTING PRESSURE TRANSMITTER

The Side Mounting Pressure transmitter's ambient operation applies to corrosive liquids such as seawater and oil.

TOP MOUNTING PRESSURE TRANSMITTER

The Top Mounting Pressure transmitter's ambient operation applies to corrosive liquids such as seawater and oil.

VALVE POSITION INDICATOR

Eltorque valve position indicator is installed on top of the actuator, used for transfer open/closed position signals to PLC/ IAS system.

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