

# TIGRON



**suma**<sup>®</sup>

Solutions for a world in motion.

## Electric **MULTI-TURN ACTUATOR**

for valve automation in  
potentially explosive  
atmospheres



More than 50 years experience in development, production and distribution of electric actuators. This is an excellent background for combining classic values of the oil & gas industry like reliability and safety with the requirements for digitalisation.

AUMA has broken new ground.

The result:

**Powerful, flexible and clever,**  
the Tiger is the perfect namesake.

# THE TIGRON



## economic

- > Low standby consumption
- > Simple and low-maintenance power supply
- > High availability



## smart

- > Commissioning assistant
- > Signalling and display still available in case of power failure
- > Separately mounted controls for installations in confined spaces



## user-friendly

- > Simple installation
- > Intuitive menu navigation
- > Combi-Switch as robust operation element





## certified

- > Global certification
- > ATEX/IECEx IIC T4
- > Class I, Division 1 for US and Canada
- > INMETRO, PESO, KOSHA, ITRI, CCC, CML, etc.



## compact

- > Low space requirements
- > Low weight and advantageous centre of gravity
- > Large performance range



## Robust

- > Engineered & made in Germany
- > Flameproof enclosure
- > Wide temperature range
- > Premium corrosion protection

# TIGRON – YOUR BENEFITS



# MULTI-TURN ACTUATOR FOR GATE VALVES

The TIGRON is a multi-turn actuator with classic mission: Automation of gate valves with or without rising stem.

## **Virtually unlimited stroke**

Rising stems are lead through the multi-turn actuator hollow shaft driving the stem thread. The stem protection tube protects the stem from pollution and people from injuries.

## **Open-close and modulating duty**

TIGRON actuators are available in versions for both types of duty.

## **Combinations with multi-turn gearboxes**

In combination with GK or GST gearboxes, torques up to 16,000 Nm can be reached.





### **TIGRON within manifold**

Manifolds are typical for a large number of gate valves.

For operating the illustrated gate valves, torques of approx. 700 Nm are required.

### **TIGRON torque range**

30 Nm to 1,000 Nm  
across six sizes.

The actuators can be mounted onto the manifold gate valves without requiring an additional gearbox.

### **Robust and future-proof**

Manifolds are often installed in salty maritime environments. The premium AUMA corrosion protection is also decisive for TIGRON's long life cycle.

TIGRON multi-turn actuators are designed to satisfy digitalisation demands. The numerous actuators within the manifold are easy to integrate into the DCS environment.

# TIGRON – THE MULTI-TURN ACTUATOR

Display with plain text  
indication in more than  
30 languages

Combi-Switch as robust  
operator

Five clearly visible indication lights  
can be programmed to user  
specifications

Handwheel activation via push button

Protection against unauthorised use

Plug-in electrical connection

# COMBINATIONS FOR BALL, BUTTERFLY AND GLOBE VALVES

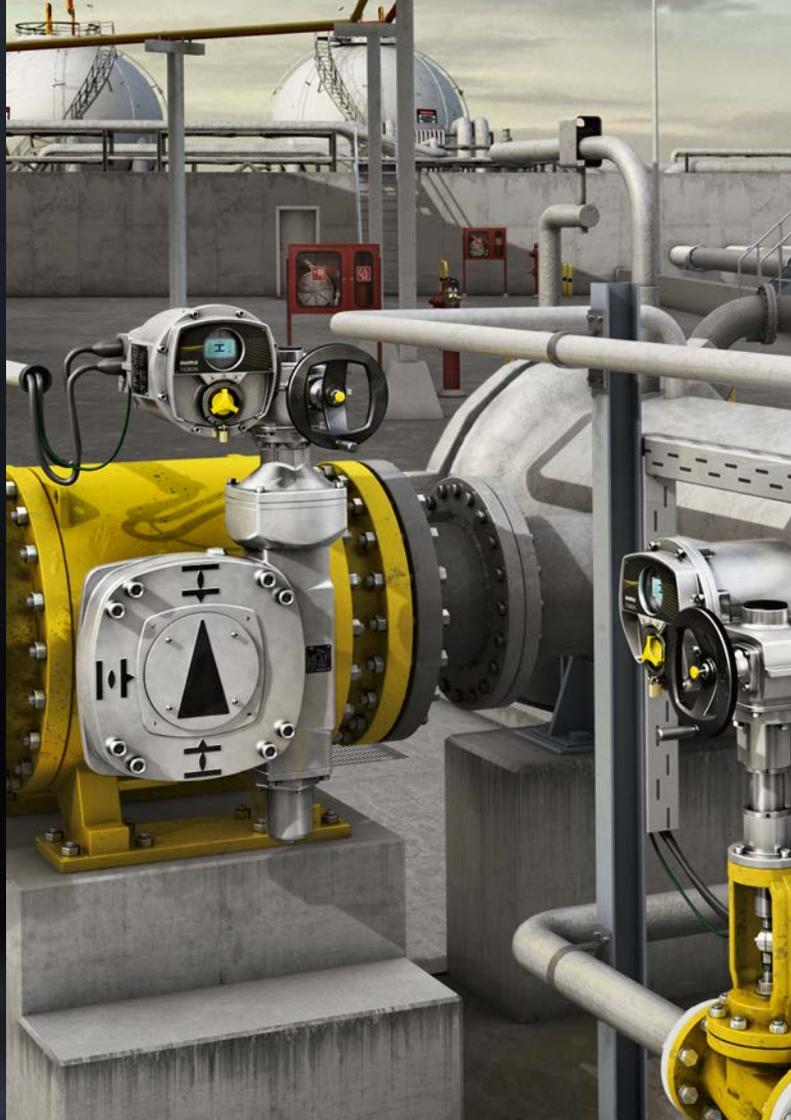
## Modular AUMA scheme

Six gearbox type ranges are part of AUMA's product portfolio. They are ideally suited to complete and enhance TIGRON's application range even to other valve designs.

This includes numerous butterfly valves or the conventional ball valves of the oil and gas industry requiring a part-turn movement of mostly 90 degrees.

In these cases, TIGRON is combined with AUMA part-turn gearboxes.

AUMA linear thrust units convert TIGRON's multi-turn movement into a thrust movement which is required for globe valve automation.





### **TIGRON within pig traps**

The ball valve must be precisely set to position OPEN to ensure that the pig can smoothly enter the piping. The bypass valve is designed as globe valve.

**TIGRON multi-turn actuator combined with a GS part-turn gearbox on a ball valve**  
Torques up to 675,000 Nm.

**TIGRON multi-turn actuator combined with LE linear thrust unit on a globe valve**  
Thrusts up to 217 kN,  
strokes up to 500 mm

# TIGRON – PART-TURN & LINEAR ACTUATORS

### **Modularity:**

Uniform

> Automation

> Installation

> Device integration

> Commissioning

> Operation

> Service schemes

> Spare parts management

**for all valves at the site.**

## SEPARATELY MOUNTED CONTROLS

### When do you dislodge TIGRON's controls?

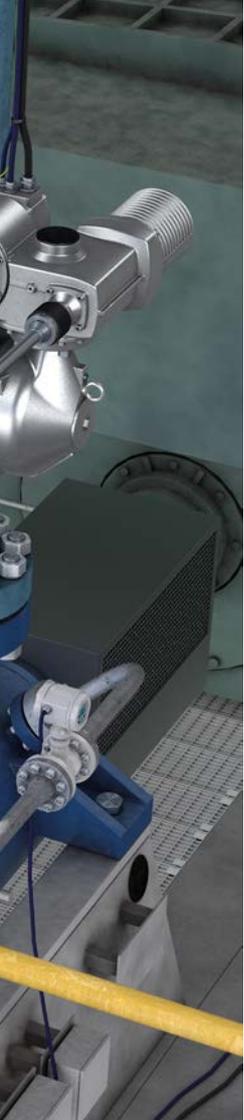
Pipes and consequently valves are mounted within ducts, below ceilings or in between other pipes. TIGRON's accessibility is then difficult and potential dangers like high temperatures might be related, causing people to refrain from approaching the actuator.

The solution: TIGRON's controls can be dislodged from the actuator in an own housing and be installed at a perfectly accessible position. The connection to the actuator is made via cable set, supplied by AUMA, to cover the required distance.

At AUMA, the scheme of dislodged controls has been proven for several decades.

Another reason for separate mounting might be strongly vibrating valves thus avoiding to subject the sensitive electronics to vibration.





## **TIGRON within cracker & coker system**

When using decoking control valves, separately mounted controls are the best option to operate the actuator locally, to request device status or perform settings.

In the illustration, the cable length between TIGRON and separately mounted controls is roughly 40 m. Cable lengths up to 100 m are feasible.

The handwheel extension allows for manual actuator operation from a safe position.

# TIGRON – DISLODGED

## **When to decide in favour of dislodged controls?**

- > difficult accessibility
- > potential dangerous environment for people
  - > High ambient temperatures
  - > strongly vibrating valves

## CLEAR TEXT

TIGRON is locally set via the display and the Combi-Switch, no additional setting tools are required.

Unauthorised operation and setting changes are prevented by password protection.

The display indicates the device status in clear text with clear and straightforward symbols. TIGRON speaks more than 30 languages.

The display is backlit allowing good legibility even under unfavourable lighting conditions.

The display scheme is completed by five indication lights. Besides the standard display scheme, colours and blinking behaviour of the LEDs can be adapted to user specifications. Consequently, the device status is clearly visible even from a larger distance.





**The commissioning assistant –  
Pointing the way ahead right from scratch!**

The commissioning assistant leads through the setting menu, showing all steps in the correct order – fast and safe for operators, valve and TIGRON.

**Robust Combi-Switch or  
magnetic pen operation**

Single hand operation possible even when wearing protective gloves as personal protective equipment – this is the asset of the new Combi-Switch. It is used to locally operate and perform settings at TIGRON.

Alternatively, a version is available in combination with a magnetic pen instead of the Combi-Switch to navigate through the menu.

# TIGRON – SIMPLE OPERATION

**Clear communication  
-> safe actions**

What to do if I  
have to intervene?

TIGRON clearly shows the  
current status to the user  
– the perfect basis to  
do the right thing.

# SERVICE MADE EASY

## Plug-in electrical connection

TIGRON's electrical connection is a separate unit which can be completely removed from the actuator without requiring to separate individual connections. A proven principle contributing to TIGRON's service friendliness.

Many device-internal electrical connections are ready to plug in.

## The 90 degrees housing scheme

All of TIGRON's housing elements can be arranged in four different positions, shifted by 90 degrees. This allows to optimise the local controls' position to the operator's needs and to mount the electrical connection to suit the available cable inlet.

Required tools: An Allen key and a Phillips head screwdriver. That's all you need to optimise the housing orientation within minutes.





### Easy opening of the housing

Thanks to the design of the flameproof enclosure, the inside of the housing is isolated from the environment. This is the basic principle of a standardised protection scheme: Even an explosion inside the housing does not ignite a potentially explosive surrounding atmosphere.

TIGRON's required flameproof joints are made as combined conical joint.

When removing or replacing the housing cover, the pressure compensation is immediately active. This design also prevents jamming of cover and housing.

This considerably facilitates opening and closing of the TIGRON housing compared to conventional flameproof joints in parallel design.

Caution: Opening of TIGRON's housing is only permitted if the atmosphere is not potentially explosive.

# TIGRON – FRIENDLY HANDLING

### Worldwide service network

TIGRON is reliable and service-friendly but requires expert care.

Therefore, the AUMA Service is available for expert handling via a worldwide network.

AUMA is globally represented in more than 70 countries. An AUMA Service expert with required qualifications as always in your proximity.

## KEEP COOL – TIGRON FOR EXCEPTIONAL SITUATIONS

Power supply failure is a nuisance and you need to anticipate actions to stay on top of things.

TIGRON considerably contributes to a controlled situation. There are two options to preserve TIGRON's electronics and sensors in full operation. All status signals are comprehensively available and the on-site staff or control room is reliably informed by TIGRON.

- > TIGRON's electronics can be supplied via a separate 24 V DC input by an independent power supply.
- > TIGRON's electronics can be supplied by an optional internal battery.

Both systems can be combined.



### **Power supply failure!**

TIGRON's internal battery (option) takes over the supply of the basic electronics functions and ensures that the valve position is correctly signalled and indicated on the display even in the event of manual operation. Electric operation of TIGRON is not possible.

If an intact connection is available to the control room for output contact requests, all signals are transmitted.



# TIGRON – ON TOP OF THINGS

### **Commissioning even if power supply is not available**

The internal power buffer does not only increase the capacity to act in case of power failure, it provides valuable support during commissioning if the power supply is not yet available.

## FLEXIBLE AND RESISTANT

Tigers are used to both life in jungles and Siberia. They are elegant in power moves, extremely fast on land and in water.

Our TIGRON reliably operates on platforms in tropical seas as well as on pipelines in Alaska. TIGRON is used to the same environmental conditions and extremes like the oil & gas industry.

High or low temperatures, corrosive atmospheres and rough handling in a challenging working environment – TIGRON has been designed to satisfy these demanding requirements.

AUMA's experience of more than 50 years in this market segment have been combined for product development.





+75 °C

-65 °C

Wide temperature range

IP68

Highest enclosure protection

C5-M/C5-I

or C5/CX

according to EN ISO 12944-2

**Premium  
corrosion protection**

Flameproof housing  
enclosure

Ex d

Type of protection

# TIGRON – GLOBALLY ROBUST

Engineered & made in  
Germany

Double layer powder  
coating of the individual  
housing parts. The power  
coating remains undamaged  
even when opening the housing.

## TIGRON MULTI-TURN ACTUATORS – Torques and operating speed



Setting range for tripping torque in Nm

## PART-TURN ACTUATORS: TIGRON WITH GS PART-TURN GEARBOX – Torques and operating speeds



Torque range in Nm

## LINEAR ACTUATORS: TIGRON WITH LE LINEAR THRUST UNIT – Thrusts, strokes and operating speeds



Setting range for thrust in kN

# TIGRON – BASIC DATA

Operating speed range in turns per minute

50 Hz: 4  180

60 Hz: 4.8  216

1,000 M1000X 

**GS 630.3**

Operating time range  
in seconds

 286  
792

360,000

675,000 

Operating speed range in millimetres per minute



20 – 220

20 – 225

24 – 270

28 – 315

28 – 315

217 LE 200.1 

32 – 360

Open-close and modulating  
duty

Limit and torque seating can be  
configured

Operating time/operating speed  
fine-tuning possible

Standardised valve attachments

## Explosion protection

### Zone system (ATEX/IECEx)

> II2G Ex db h IIC T4 or T3 Gb

> II2G Ex db eb h IIC T4 or T3 Gb

> II2D Ex tb h IIIC T130 °C or T190 °C Db

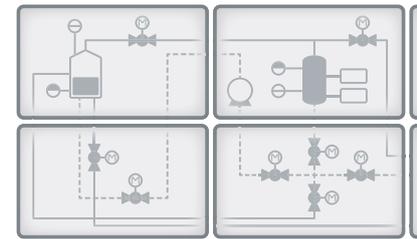
### Class/Division System (North America)

> Class I, Division 1, Group B, C, D T4

> Class II, III, Division 1, Group E, F, G T130°C

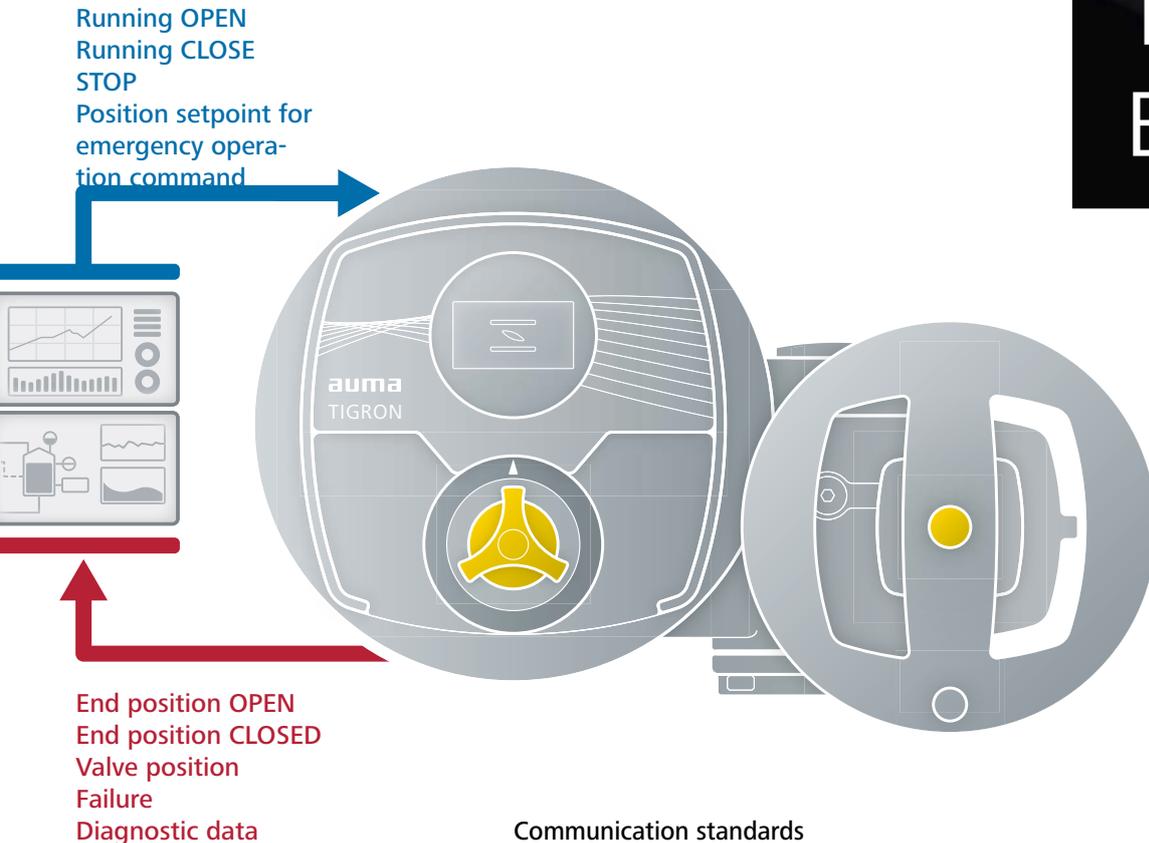
## TIGRON – IN BRIEF

- Positioning of valves depending on DCS operating commands and setting specifications.
- Signals the valve position to the DCS.
- Receives and sends commands or signals via selected communication technology either parallel or serial (fieldbus/Ethernet).
- Equipped with two independent automatic seating facilities:
  - > Limit seating: Tripping once end position is reached.
  - > Torque seating: Tripping once the limit value within the valve is reached – permanent overload protection. Can also be used for conventional end position tripping.
- Versions for both: OPEN - CLOSE duty and modulating duty.
  - > OPEN - CLOSE valves: Approaching the end positions.
  - > Modulating valves: Flow control for valve position.
- Safety functions ensure predictable valve behaviour in case of functional deviations, e.g. for signal loss.
- Handwheel in particular for emergency operation in case of power failure. Easier device setting during commissioning.



DCS

# TIGRON – BASICS



## Communication standards

AUMA exclusively uses open data protocols, including PROFISAFE, which was especially designed for use in potentially explosive atmospheres. TIGRON actuators are compatible in communication with other field devices.

TIGRON masters conventional data exchange without digitised signals.

# BE ON THE SAFE SIDE!

For more than 50 years, AUMA has been developing, manufacturing and distributing electric actuators for the oil & gas industry.

AUMA is renowned in this market segment for supplying safe and reliable products.

This confidence is based on numerous successfully passed certification procedures with notified bodies as well as for vendor approvals. AUMA is qualified as supplier with many major oil and gas companies.

## Selection of vendor approvals

- |                  |                                      |                         |
|------------------|--------------------------------------|-------------------------|
| > ADNOC          | > Equinor                            | > PTT                   |
| > AMEC Paragon   | > ERG                                | > Qatar Energy          |
| > BANAGAS        | > ExxonMobil                         | > Repsol                |
| > BP             | > HPCL                               | > Satorp                |
| > BPCCL          | > IOC                                | > SAUDI ARAMCO          |
| > Chevron        | > Kuwait Petroleum Corporation (KPC) | > Shell                 |
| > CNOOC          | > North Oil Company                  | > Sinopec               |
| > CNPC           | > OMV                                | > Socar                 |
| > ConocoPhillips | > ONGC                               | > S-Oil                 |
| > DOW            | > OPET                               | > TotalEnergies         |
| > DUPONT         | > Orlen                              | > Turkish Petroleum OTC |
| > EIL            | > Pertamina                          |                         |
| > ENAGAS         | > Petronas                           | and many more.          |
| > ENI            |                                      |                         |







# auma®

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