

PROCONTROL

GENERAL CATALOGUE



QUARTER TURN & LINEAR STEEL ACTUATORS

Efficiency
and Design



ProControl the Company



ProControl GMBH
factory in
Landau-Pfalz,
Germany



ProControl is an independent highly flexible versatile and professional company specializing in the manufacture and supply of complete valve actuation. Our customers can rely on many years of industry experience and dedicated service, our products have been designed to meet tomorrow's requirements in order to achieve maximum efficiency, safety and reliability.

From our factory located in Castell'Arquato, ProControl personnel have built up a sound and strong reputation in being able to supply first class support to our clients, by offering innovative solutions and designs for all applications.

ProControl's talented workforce is also ideally suited to offer clients' purpose built specifically engineered products as well as a standard product range. ProControl technical expertise can offer creative solutions to clients' problems thanks to years of experience from the field and to continual research into new technology.

Our highly trained personnel is committed to meet today's fast response demands, responding rapidly and efficiently to clients requirements from the initial inquiry stage throughout contract handling to final delivery and commissioning.

Our clients can count on first class after sales support thanks to our efficient rapid response after sales service department, which coordinates together with our service support centres located in all key territories around the world. If required, ProControl's highly qualified English speaking service engineers can be deployed from our factory at a moment's notice, and can be onsite anywhere in the world within 24 hours from callout.



ProControl
factory in Aksai,
Kazakistan



ProControl srl Headquarter in Italy

factory area m² 8.500

Our Design Process

ProControl continual expansion and growth has meant that it has been necessary to further invest in a new production management system. ProControl management have given careful consideration to selecting a system which suits our business style.

Most valve actuators are generally required for on / off applications. The single greatest cause of actuator operational failure is corrosion and deterioration of operating parts. ProControl actuators have been engineered with these problems in mind and the basis of our design is in order to ensure long term product reliability.

ProControl carries out every element of design, assembly and material selection, and all of the latest industry requirements and regulations have been implemented in our current design. Our technical department works with the latest cad design software.

Quality control is continually monitored in order to ensure that the products reach the customer as expected and all actuators and control systems are tested according to ProControl internal test procedures, which include, operational test, static leakage tests, dynamic leakage tests and torque testing.

ProControl is a product orientated company where quality is a must. Quality not just of the product itself, but also quality of the service that our products and organization supply.

EXPANSION

ProControl continual expansion and growth has meant that it has been necessary to further invest in a new production management system. ProControl management has given careful consideration to selecting a system which suits our business style (professional project management, flexibility and customer service).

E-SIGIP

Based on these elements, ProControl has selected, and is currently implementing the E-SIGIP system which is based on the most innovative manufacturing techniques of MRP II - MRP III - CRP - KANBAN. This product allows us to have a winning product/solution to overcome all problems related to the manufacturing process, key elements are SCM (Supply Chain Management) & CRM (Customer Relationship Management).

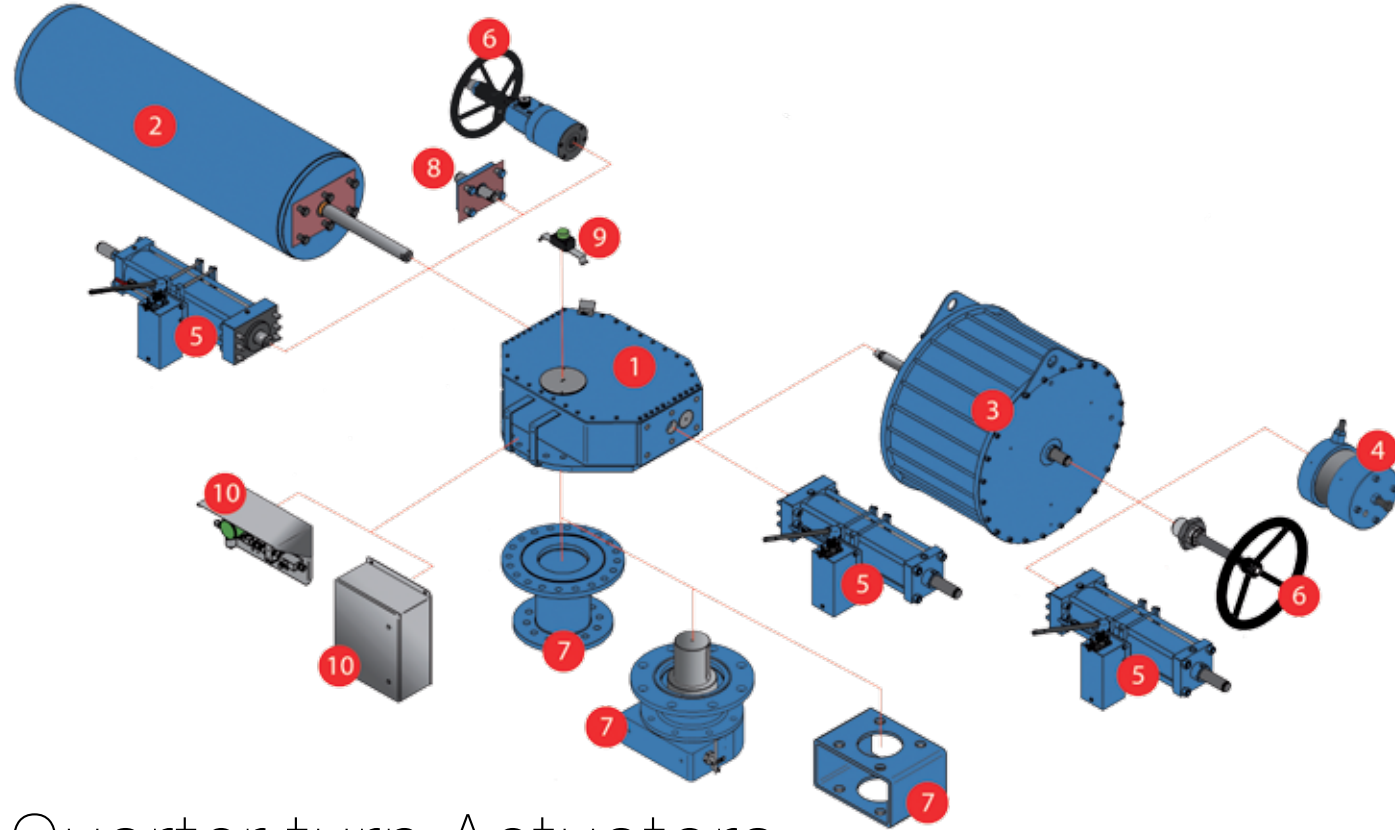
COMPANY CERTIFICATIONS

Every aspect of our company's activities complies with SO 9001:2008 certified by Det Norske Veritas, no: 65458-2009-AQ-ITA-SINCERT, ISO 14001:2004 certified by TÜV Rheinland, no: 01 104 1419947, BS OHSAS 18001:2007 certified by TÜV Rheinland, no: 01 113 1419947

ProControl range of products holds the following international accreditations:
SIL (Certified by RWTÜV), TR-CU.
ProControl actuators are also in accordance with European directive 94/9/EC art.8.1.b.II group II category 2 - ATEX, -and the European Pressure Equipment directive PED 97/23/EC.



Modular Design Construction



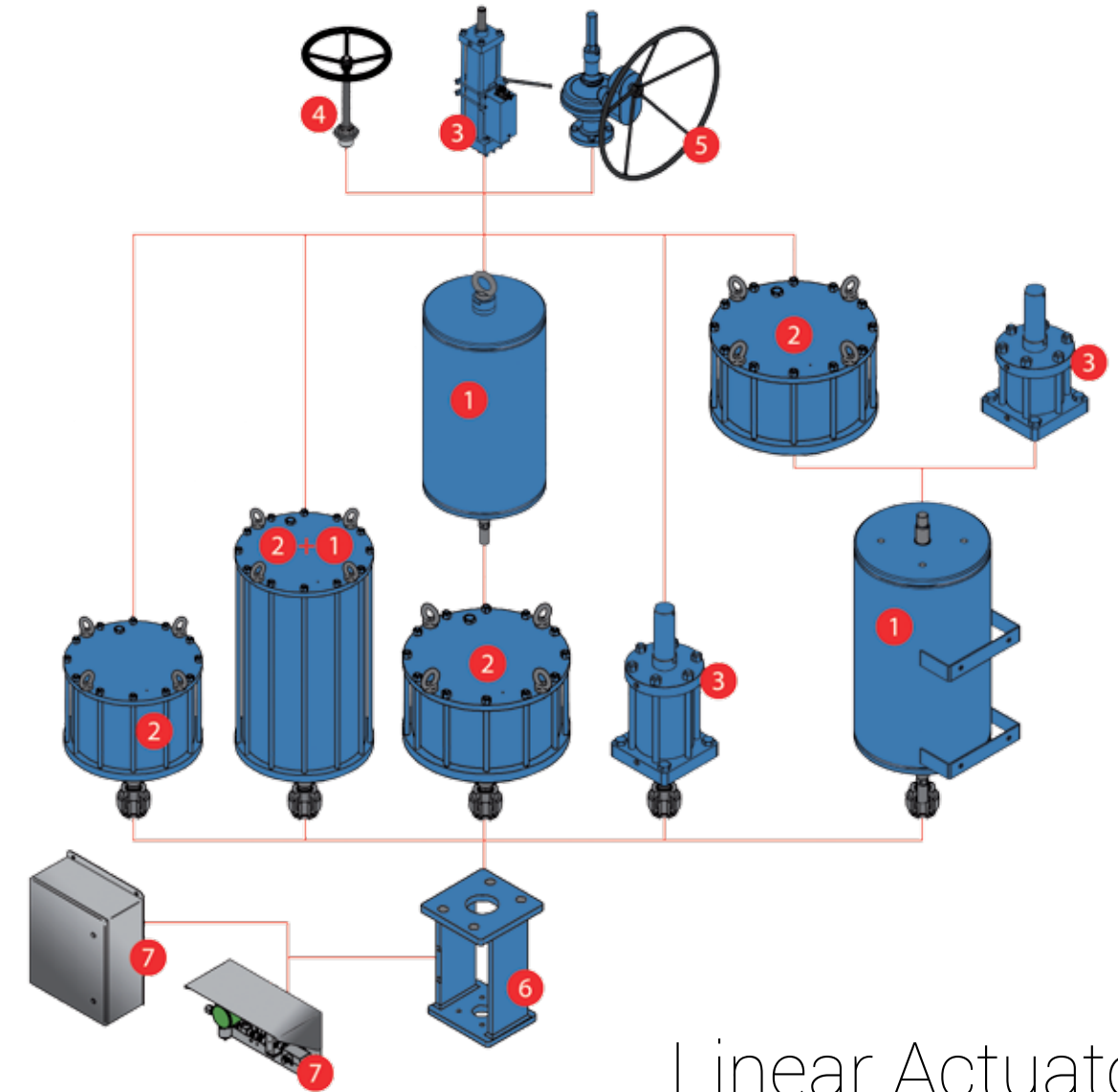
Quarter turn Actuators

ITEM	DESCRIPTION	NOTES
1	Scotch yoke mechanism	- Symmetric or canted type - 10 main center body sizes
2	Spring container	- Several spring containers available
3	Pneumatic cylinder	- Widest variety of cylinders available
4	Integral quick exhaust & damper	- Suitable to achieve very short stroking times and dampen the last degrees of the stroke
5	Hydraulic cylinder	- Widest variety of cylinders available - Implemented with hydraulic pump for manual override HP
6	Jack screw with hand-wheel	- HW manual override suitable for smaller actuators
7	Mounting bracket	- Open or closed type (optional) - Pro Lock device for mechanical partial stroke test also available
8	Closure plate	- For double acting actuators
9	Limit switch box	- Implementable or interchangeable with accessories such as positioner, signaling limit switches, position transmitters, etc.
10	Control system	- Panel or cabinet version - Customized design

ProControl actuators all share a common construction philosophy known as **modularity**, which is achieved by utilizing a consistent engineering design throughout our complete range.

Power cylinders, spring containers, manual overrides, control systems and other features can be assembled in various different positions thus allowing to cover all requests in terms of fail position and additional features.

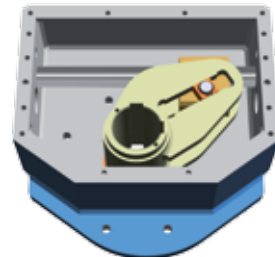
With **large stock** of finished and semi-finished components always available, actuators can be assembled and supplied with very **fast deliveries**.



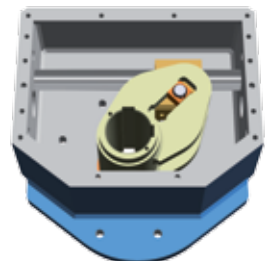
Linear Actuators

ITEM	DESCRIPTION	NOTES
1	Spring container	- Several spring containers available
2	Pneumatic cylinder	- Widest variety of cylinders available - Optional: version with spring included inside pneumatic cylinder
3	Hydraulic cylinder	- Widest variety of cylinders available - Implemented with hydraulic pump for manual override HP
4	Jack screw with hand-wheel	- HW manual override suitable for smaller actuators
5	Hand-wheel with gearbox	- Manual override suitable for medium size actuators
6	Mounting bracket	- Open type
7	Control system	- Panel or cabinet version - Customized design

Scotch Yoke Mechanism



CANTED YOKE



SYMMETRIC YOKE



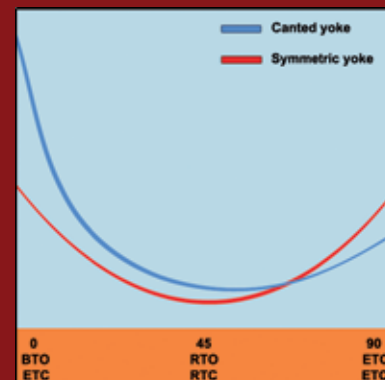
CANTED AND SYMMETRIC SCOTCH YOKE MECHANISM

The **scotch yoke mechanism** is precisely positioned inside a perfectly sealed housing which protects it against corrosion in the most adverse environments. The housing also encompasses a stem thrust support device suitable to withstand the transversal forces generated during rotation and to ensure the proper alignment of the piston rod with the sliding blocks. Low rotational friction is also ensured by means of oversized precise fitted bronze yoke shaft bushings which contribute to extend heavy duty working life span.

The **scotch yoke mechanism** transforms the linear movement (thrust) of the piston into a 90° rotation (torque). ProControl actuators can be supplied with an inclined scotch yoke (canted) or a symmetric scotch yoke.

The **symmetric scotch yoke** is normally employed when the valve torque requirements are highest during the intermediate positions of the valves rotation (running), whilst lower at the beginning (valve unseating) and the end (valve reseating) of the valve 90° rotation. The symmetric scotch yoke mechanism is normally used for plug and some ball valve designs.

The **canted scotch yoke** is advantageous when the valve torque requirements are highest at the beginning (valve unseating) and the end (valve reseating) of the valve 90° rotation, whilst lowest during the intermediate position (running). The canted scotch yoke mechanism covers most ball and butterfly valve torque requirements.



Cylinders & Springs



PNEUMATIC / HYDRAULIC CYLINDERS & SPRING CONTAINERS

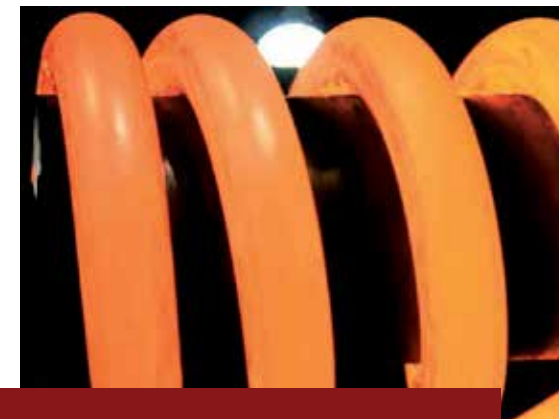
The **cylinder** tubes are machined, **polished** to mirror finish and **electro less nickel plated** internally in order to reduce surface roughness to the lowest value and to provide highest protection against corrosion and low maintenance.

For pneumatic actuators the sealing with flanges and piston is performed by means of a floating O-ring design and guided internally by a sliding ring in Teflon graphite.
For hydraulic actuators the sealing with flanges and piston is performed by means of O-rings and guided internally by a sliding ring in Teflon bronze.
All seals are specifically designed and chosen on the basis of the use cases: ambient temperature, supply medium type, etc.

Pneumatic cylinders (supply medium can be air or gas) are suitable for supply pressures up to **160 bar**.
Hydraulic cylinders are suitable for supply pressures up to **400 bar**.

The springs are fully encapsulated in a welded container, which encloses the spring assembly in a safety frame arrangement that does not allow it to extend beyond a given value and ensures personnel safety.

Quality Procedures



Quality control has top priority throughout all stages of **design** and **manufacturing**. Each phase of the process is executed according to defined policies necessary to guarantee that the final product exceeds the customers' expectations and has an increased reliability. Any arisen non conformities are thoroughly checked and any reasons which have caused the non-conformity are removed by the implementation of the necessary corrective actions.

In order to **protect from corrosion**, before the assembly each actuator's component is **individually** degreased, phosphate cleaned & treated, shot-blasted and **epoxy primer coated**.

All components here described (yokes, cylinders and springs) are available in several sizes, allowing a wide range of combinations thus satisfying all market requirements.

Product Overview

During the conceptual stages our goal was to differentiate from the rest of the world, so we designed a true range of heavy duty high performance actuators for valve automation, noticeable in the following general overview of our product range.



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- Electro hydraulic page 28
- Subsea actuators page 36



LINEAR ACTUATORS

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SPECIAL PRODUCTS

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ACCESSORIES

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QUARTER TURN COMPACT PNEUMATIC ACTUATORS

SINGLE & DOUBLE ACTING
SPS-K & SPD-K series



DESCRIPTION

ProControl has created the **SPS-K & SPD-K** series actuators based on the markets requirements for a new compact heavy duty high performance design actuator. For single acting models the cylinder assembly also contains the spring, thus the advantage of a compact design.

KEY FEATURES

- Fabricated entirely from **low temperature carbon steel** according to ASTM A352 gr. **LCB** and ASTM A350 **LF2**
- Totally enclosed **weatherproof** housing
- **Scotch yoke mechanism** to suit valve torque requirements
- Relief vent to expel undesired overpressure
- Low pressure pneumatic cylinder for supply pressures up to **12 bar design** suitable for instrument air or sweet / inert gas applications or special application with material according to **NACE** requirements for sour gas supply medium
- **Carbon steel piston** with dynamic floating O-ring seals coupled with lubricating piston guide rings
- **Alloy steel spring** (only for single acting)
- **17.4 PH shaft** and **mechanical position indicator** (fully sealed **IP68** to avoid ingress into the scotch yoke area) and square male output shaft complete with **VDI/VDE 3845 NAMUR** drive slot for monitoring devices
- **Bronze sliding blocks** which ensure minimum friction, allowing for a long service life and reducing maintenance costs
- **Bronze thrust bearings** which guides the actuators shaft & yoke throughout its stroke and supports all transverse loads generated
- **ASTM A 320 L7 alloy steel tie rods**, with standard electrolytic zinc coating according to **ASTM B633 FeZn 12** (thickness 12 µm)
- **AISI 316 stainless steel end travel stops** allow for accurate angular stroke adjustment
- Integral manual override facilities
- **Design allows 4 x 90° actuator rotation**
- **AISI 316 stainless steel external bolting**

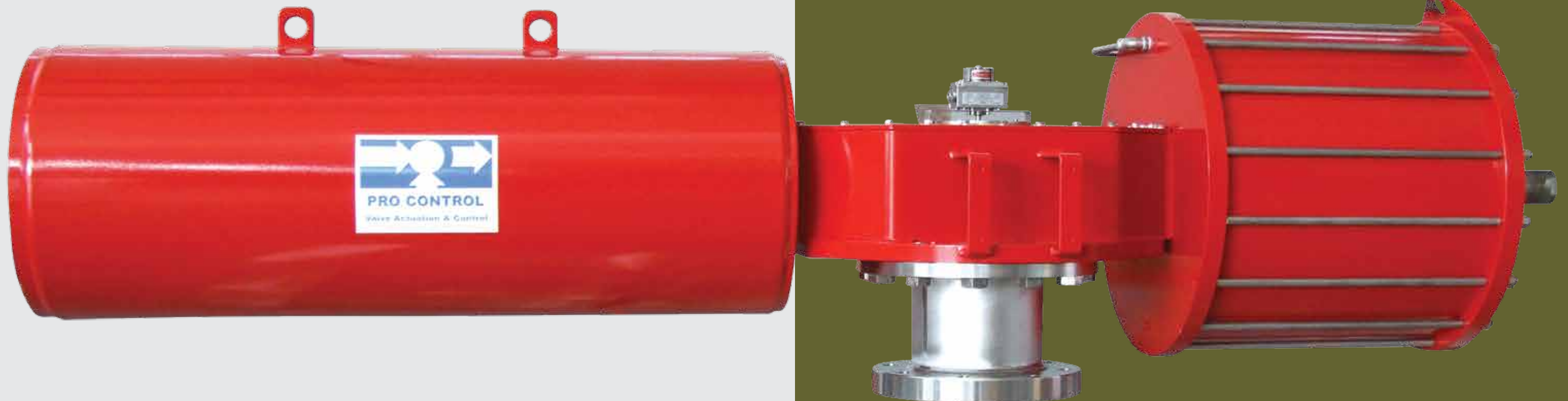


TECHNICAL SPECIFICATIONS

- Supply pressure up to **12 bar design**
- Actuator torque output up to **2.500 Nm**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**
- Special high temperature application up to **+200°C**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1** and **EN 13445**
- All ProControl actuators are designed for **30 years' service life**

QUARTER TURN PNEUMATIC ACTUATORS

SINGLE & DOUBLE ACTING
SPS & SPD series



DESCRIPTION

The **SPS** & **SPD** series, heavy duty high performance design actuators, are for ProControl the long-standing products of the range. The reliability and firmness that distinguish them arise from a constant innovation research combined with the experience gained over the years.

KEY FEATURES

- Fabricated entirely from **carbon steel**
- Totally enclosed **weatherproof** housing
- **Scotch yoke mechanism** to suit valve torque requirements
- Relief vent to expel undesired overpressure
- Low pressure pneumatic cylinder for supply pressures up to **12 bar design** suitable for instrument air or sweet / inert gas applications or special application with material according to **NACE** requirements for sour gas supply medium
- **Carbon steel piston** with dynamic floating O-ring seals coupled with lubricating piston guide rings
- **Carbon steel spring cartridge** (only for single acting) with safety facility which allows safe installation and removal of the whole cartridge assembly
- **AISI 316SS mechanical position indicator** (fully sealed **IP68** to avoid ingress into the scotch yoke area) complete with **VDI/VDE 3845 NAMUR** drive slot for monitoring devices
- **Bronze sliding blocks** which ensure minimum friction, allowing for a long service life and reducing maintenance costs
- **Bronze thrust bearings** and **high strength alloy steel chromium plated thrust reaction bar** which guides the scotch yoke throughout its stroke and supports all transverse loads generated
- **ASTM A 320 L7 alloy steel tie rods**, with standard electrolytic zinc coating according to **ASTM B633 FeZn 12** (thickness 12 µm)
- **Alloy steel end travel stops** allow for accurate angular stroke adjustment
- Integral manual override facilities
- **Design allows 4 x 90° actuator rotation**

TECHNICAL SPECIFICATIONS

- Supply pressure up to **12 bar design**
- Actuator torque output up to **1.000.000 Nm** for single acting and up to **2.000.000 Nm** for double acting
- Spring starting torque up to **400.000 Nm**
- Spring ending torque up to **250.000 Nm**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**
- Special high temperature application up to **+200°C**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1** and **EN 13445**
- All ProControl actuators are designed for **30 years' service life**

QUARTER TURN
COMPACT HYDRAULIC ACTUATORS

SINGLE & DOUBLE ACTING
SHS-K & SHD-K series



DESCRIPTION

ProControl **SHS-K** & **SHD-K** series actuators are similar to the SPS-K & SPD-K range. Many components are interchangeable, such as the centre housing, yokes, guide block; the only major difference is the hydraulic power cylinder.

KEY FEATURES

- Fabricated entirely from **low temperature carbon steel** according to ASTM A352 gr. **LCB** and ASTM A350 **LF2**
- Totally enclosed **weatherproof** housing
- **Scotch yoke mechanism** to suit valve torque requirements
- Low pressure **carbon steel hydraulic cylinder** suitable for supply pressures up to **120 bar design**
- High pressure **carbon steel hydraulic cylinder** suitable for supply pressures up to **400 bar design**
- **Carbon steel piston** with dynamic floating O-ring seals coupled with lubricating piston guide rings
- **Alloy steel spring** (only for single acting)
- **17.4 PH shaft** and **mechanical position indicator** (fully sealed **IP68** to avoid ingress into the scotch yoke area) and square male output shaft complete with **VDI/VDE 3845 NAMUR** drive slot for monitoring devices
- **Bronze sliding blocks** which ensure minimum friction, allowing for a long service life and reducing maintenance costs
- **Bronze thrust bearings** which guides the actuators shaft & yoke throughout its stroke and supports all transverse loads generated
- **ASTM A 320 L7 alloy steel tie rods**, with standard electrolytic zinc coating according to **ASTM B633 FeZn 12** (thickness 12 µm)
- **AISI 316 stainless steel end travel stops** allow for accurate angular stroke adjustment
- Integral manual override facilities
- **Design allows 4 x 90° actuator rotation**
- **AISI 316 stainless steel external bolting**

TECHNICAL SPECIFICATIONS

- Supply pressure up to **400 bar design**
- Actuator torque output up to **2.500 Nm**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**
- Special high temperature application up to **+200°C**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1** and **EN 13445**
- All ProControl actuators are designed for **30 years' service life**

QUARTER TURN
HYDRAULIC ACTUATORS

SINGLE & DOUBLE ACTING
SHS & SHD series



DESCRIPTION

ProControl **SHS** & **SHD** series actuators are similar to the SPS & SPD range. Many components are interchangeable, such as the centre housing, yokes, guide block and spring cans, the only major difference is the hydraulic power cylinder.

KEY FEATURES

- Fabricated entirely from **carbon steel**
- Totally enclosed **weatherproof** housing
- **Scotch yoke mechanism** to suit valve torque requirements
- Low pressure **carbon steel hydraulic cylinder** suitable for supply pressures up to **120 bar design**
- High pressure **carbon steel hydraulic cylinder** suitable for supply pressures up to **400 bar design**
- **Carbon steel piston** with dynamic floating O-ring seals coupled with lubricating piston guide rings
- **Carbon steel spring cartridge** (only for single acting) with safety facility which allows safe installation and removal of the whole cartridge assembly
- **AISI 316SS mechanical position indicator** (fully sealed **IP68** to avoid ingress into the scotch yoke area) complete with **VDI/VDE 3845 NAMUR** drive slot for monitoring devices
- **Bronze sliding blocks** which ensure minimum friction, allowing for a long service life and reducing maintenance costs
- **Bronze thrust bearings** and **high strength alloy steel chromium plated thrust reaction bar** which guides the scotch yoke throughout its stroke and supports all transverse loads generated
- **ASTM A 320 L7 alloy steel tie rods**, with standard electrolytic zinc coating according to **ASTM B633 FeZn 12** (thickness 12 µm)
- **Alloy steel end travel stops** allow for accurate angular stroke adjustment
- Integral manual override facilities
- **Design allows 4 x 90° actuator rotation**

TECHNICAL SPECIFICATIONS

- Supply pressure up to **400 bar design**
- Actuator torque output up to **1.000.000 Nm** for single acting and up to **2.000.000 Nm** for double acting
- Spring starting torque up to **600.000 Nm**
- Spring ending torque up to **400.000 Nm**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1** and **EN 13445**
- All ProControl actuators are designed for **30 years' service life**

LINEAR PNEUMATIC ACTUATORS

SPRING RETURN & DOUBLE ACTING LPS & LPD series



DESCRIPTION

ProControl **LPS** & **LPD** series actuators are specifically engineered in order to meet each individual requirement to operate rising stem valves such as gate valves, globe valves and rising stem non-contact ball valves. ProControl take advantage of the same power cylinder mechanisms of the quarter turn range, with the only difference being the final length which depends on the valves stroke. In order to maintain an efficient production program many parts such as cylinder flanges and pistons are stock items, although each linear actuator is custom built to suit each valve.

KEY FEATURES

- Fabricated entirely from **carbon steel**
- Low pressure pneumatic cylinder for supply pressures up to **12 bar design** suitable for instrument air or sweet / inert gas applications or special application with material according to **NACE** requirements for sour gas supply medium
- **Carbon steel piston** with dynamic floating O-ring seals coupled with lubricating piston guide rings
- **Carbon steel spring cartridge** (only for single acting) with safety facility which allows safe installation and removal of the whole cartridge assembly
- Visual position indicator directly connected to the valve stem showing actuator / valve full linear stroke
- **17.4 PH stainless steel piston rod**, which prevents corrosion and allows for minimum sliding friction on dynamic seals
- **ASTM A 320 L7 alloy steel tie rods**, with standard electrolytic zinc coating according to **ASTM B633 FeZn 12** (thickness 12 µm)
- **Carbon steel mounting adapter** with bottom flange machined according to the valve top mounting with **carbon steel nickel-plated special coupling mechanism**. Optional for wedge gate valves: coupling with **hammer blow effect** to facilitate valve unseating
- **Alloy steel galvanized end stoppers** available on request
- Integral manual override facilities



TECHNICAL SPECIFICATIONS

- Supply pressure up to **12 bar design**
- Actuator thrust output up to **3.000.000 N**
- Spring thrust up to **400.000 N**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**
- Special high temperature application up to **+200°C**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1** and **EN 13445**
- All ProControl actuators are designed for **30 years' service life**

LINEAR
HYDRAULIC ACTUATORS
SINGLE & DOUBLE ACTING
LHS & LHD series



KEY FEATURES

- Fabricated entirely from **carbon steel**
- Low pressure **carbon steel hydraulic cylinder** suitable for supply pressures up to **120 bar design**
- High pressure **carbon steel hydraulic cylinder** suitable for supply pressures up to **400 bar design**
- **Carbon steel piston** with dynamic floating O-ring seals coupled with lubricating piston guide rings
- **Carbon steel spring cartridge** (only for single acting) with safety facility which allows safe installation and removal of the whole cartridge assembly
- Visual position indicator directly connected to the valve stem showing actuator / valve full linear stroke
- **17.4 PH stainless steel piston rod**, which prevents corrosion and allows for minimum sliding friction on dynamic seals
- **ASTM A 320 L7 alloy steel tie rods**, with standard electrolytic zinc coating according to **ASTM B633 FeZn 12** (thickness 12 µm)
- **Carbon steel mounting adapter** with bottom flange machined according to the valve top mounting with **carbon steel nickel-plated special coupling mechanism**. Optional for wedge gate valves: coupling with **hammer blow effect** to facilitate valve unseating
- **Alloy steel galvanized end stoppers** available on request
- Integral manual override facilities

TECHNICAL SPECIFICATIONS

- Supply pressure up to **400 bar design**
- Actuator thrust output up to **10.000.000 N**
- Spring thrust up to **400.000 N**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1 and EN 13445**
- All ProControl actuators are designed for **30 years' service life**

DESCRIPTION

ProControl **LHS** & **LHD** series actuators are similar to the LPS & LPD range. Many components are interchangeable, the only major difference is the hydraulic power cylinder.

LINEAR & QUARTER TURN GAS OPERATED ACTUATORS

SGS & SGD series



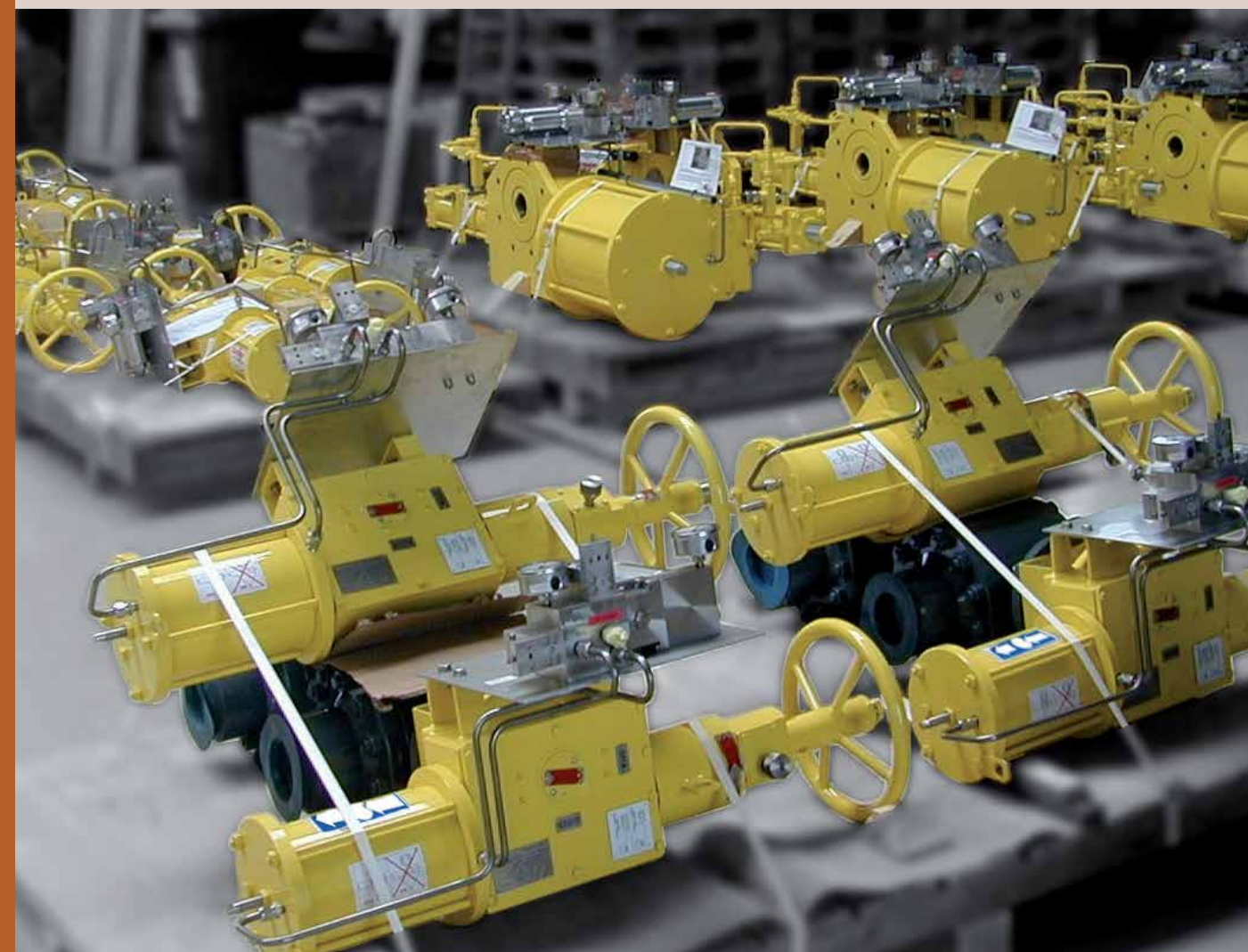
DESCRIPTION

ProControl **SGS** & **SGD** series actuators are similar to the SPS & SPD range. Many components are interchangeable, such as the centre housing, yokes, guide block and spring cans, the only major difference is the high pressure cylinder.

The pipelines gas, which can be either sweet or sour gas, is used as power operating medium.

KEY FEATURES

- Fabricated entirely from **carbon steel**
- Totally enclosed **weatherproof** housing
- **Scotch yoke mechanism** to suit valve torque requirements
- Relief vent to expel undesired overpressure
- High pressure pneumatic cylinder in standard **carbon steel** for sweet or inert gas application or special application with material according to **NACE** requirements for sour gas supply medium
- **Carbon steel piston** with dynamic floating O-ring seals coupled with lubricating piston guide rings
- **Carbon steel spring cartridge** (only for single acting) with safety facility which allows safe installation and removal of the whole cartridge assembly
- **AISI 316SS mechanical position indicator** (fully sealed **IP68** to avoid ingress into the scotch yoke area) complete with **VDI/VDE 3845 NAMUR** drive slot for monitoring devices
- **Bronze sliding blocks** which ensure minimum friction, allowing for a long service life and reducing maintenance costs
- **Bronze thrust bearings** and **high strength alloy steel chromium plated thrust reaction bar** which guides the scotch yoke throughout its stroke and supports all transverse loads generated
- **ASTM A 320 L7 alloy steel tie rods**, with standard electrolytic zinc coating according to **ASTM B633 FeZn 12** (thickness 12 µm)
- **Alloy steel end travel stops** allow for accurate angular stroke adjustment
- Integral manual override facilities
- **Design allows 4 x 90° actuator rotation**



TECHNICAL SPECIFICATIONS

- Supply pressure up to **120 bar design**
- Actuator torque output up to **1.000.000 Nm** for single acting and up to **2.000.000 Nm** for double acting
- Spring starting torque up to **400.000 Nm**
- Spring ending torque up to **250.000 Nm**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**
- Special high temperature application up to **+200°C**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1** and **EN 13445**
- All ProControl actuators are designed for **30 years' service life**

LINEAR & QUARTER TURN
GAS OVER OIL ACTUATORS
SGO & LGO series

PROCONTROL GAS OVER OIL SERIES COMMON APPLICATIONS ARE:

- On-Off Local & Remote operation
- LBV Local & Remote operation with liquid line break detection system
- Local & Remote operation with pneumatic line break detection system
- Local & Remote operation with electronic line break detection system (option: power source from solar panel)
- ESD Local & Remote operation with High - Low pressure detection system
- Local & Remote operation with ESD fail safe system

All systems can be supplied with N2 power supply bottles rack or Gas emergency backup tank, Open Inhibitor under ΔP, partial stroke test, delay intervention system, mechanical torque limiting device and others upon request.



DESCRIPTION

ProControl **SGO & LGO** series actuators are composed by a SHD / SHS actuator (please find detailed description at page 20) or a LHD / LHS actuator (please find detailed description at page 24) and suitable accessories configuration specifically engineered and designed to cover the most demanding isolation service applications for automating valves located in Oil & Gas transmission pipelines.

PHILOSOPHY

Oil & Gas pipelines typically run hundreds of miles through inhospitable and undeveloped areas where no low pressure pneumatic instrument air or high pressure hydraulic supply lines are available, carrying pressurized gas and oil typically up to 1,440 psi. **GOV actuators use the pressurized pipeline medium as their power source.** Since gas can be of a corrosive nature when "sour & wet" and also a potential cause of explosion, gas hydraulic operators utilize an oil barrier to ensure that clean, non-explosive hydraulic fluid is used to drive the actuator rather than using the high pressure gas directly.

- **Power gas** supply is taken from both upstream and downstream of the valve
- The highest gas supply pressure is always used to **power the actuator**
- The supply pressure to the actuator is always equal to or greater than the differential pressure across the valve

All **SGO series actuators** are supplied as standard with **two gas-hydraulic tanks** and with a **stainless steel lockable cabinet** including a basic control system (for **valve local open / close**) as well as a **hydraulic hand pump** for emergency control. The cabinet is then **custom-designed** to enclose the proper controls and equipment on the basis of the required functions.

KEY FEATURES

- Suitable for **all types of gas composition** including sour & wet gas
- Available in **single acting or double acting** configuration
- Metallic components (including cylinder, piston, piston rod) come into contact only with **hydraulic fluid containing anti-wear and anti-corrosion additives**
- Proper IP protection to allow installation even under **severe climatic conditions** as well as a solution against **unattended and non-authorized operations** or vandalism. Optional for **remote control**: an **electrical interlock** can be incorporated to signal when the cabinet door is opened
- Control system equipment provided with **modular block design** for easy **interchangeability** and to reduce as much as possible the piping (**limiting potential leakage points**)
- **Common exhaust port** outside of the cabinet to convey all items which vent
- Flow control valves for both directions to allow independent adjustable opening and closing times
- Cabinet back plate made of **reinforced material** (10 mm thickness) to ensure stability during hand pump operation with lever
- Optional: special **insulated control station** complete with an **internal explosion proof heating system** to operate in **low temperatures and arctic conditions**
- Optional: **emergency back-up tank** to perform the fail action
- Optional: **mechanical interlocking system** to disable remote control while door is open, thus ensuring workers safety during local operation or servicing activities. This device also ensures the correct remote control position of local controls (manual override) when the cabinet door is shut



TECHNICAL SPECIFICATIONS

- Supply pressure up to **120 bar design**
- Actuator torque output up to **1.000.000 Nm** for single acting and up to **2.000.000 Nm** for double acting
- Spring starting torque up to **600.000 Nm**
- Spring ending torque up to **400.000 Nm**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1 and EN 13445**
- All ProControl actuators are designed for **30 years' service life**

LINEAR & QUARTER TURN ELECTRO HYDRAULIC ACTUATORS

EHS & EHD series



DESCRIPTION

ProControl EHS & EHD series actuators are composed by a SHS or SHD actuator (please find detailed description at page 20) combined with an electro hydraulic power unit.

ProControl electro hydraulic system is suitable for **several applications**, such as **on/off, total modulating service** and **partial stroke testing**. It can also achieve an **ultra-fast fail safe stroke within < 200 MS** by means of the **special integrated hydraulic discharging system, complete with damping device** to **absorb the shock** in the last part of the stroke.

ProControl can supply central hydraulic units designed to operate any **number of actuators/valves from a single control centre**.

ProControl's electro hydraulic actuators give client **peace of mind** due to the **reliability** of the product due to complete **independence from pipeline pressure** as power source.

RENEWABLE ENERGY ENABLES INDEPENDENT POWER SUPPLY

ProControl developed a dedicated technology for valve automation in remote locations or areas where no proper power sources are available.

In particular, it is a **photovoltaic system** complete with a **solar panel** to convert **solar energy into electricity**, a **battery pack** to store energy for use during **periods of darkness** or shade and a **proper control unit**, which provides **battery management**, monitoring and protection.

The complete system is suitable for **applications in hazardous areas**.

KEY FEATURES

Standard equipped with following hardware design:

- Designed for hazardous areas **II2G EEx-de IIC** T4-T6 according **ATEX**
- **Stainless steel HPU cabinets** with min. **IP65**
- **ATEX certified** electric control system
- 2 off 2-way solenoid valves with hand operated lever (optional voltages on request)
- **Electric motor pump** 400V AC / 3 Phase 50 Hz (optional voltages on request)
- **Typical power range** from 1.1 kW up to 4 kW and from 1000 – 3000 turns in single and three phases
- **Hydraulic hand pump** for emergency operation in case of power failure or pressure drop
- **Pressure control** with analogue signal
- **Safety valve**, oil filter, stainless steel oil reservoir
- **Hydraulic accumulator** (bladder or piston type) sized on client demand for numbers of required powerless strokes
- Optional: special **insulated control station** complete with an **internal explosion proof heating system** to operate in **low temperatures and arctic conditions**

Standard equipped with following signals and contacts:

- **ESD Signal** "Emergency-Shut-Down"
- **Remote & Local PST "Partial Stroke Test"**
- **APST "Automatic-Partial-Stroke-Test"**
- **Remote & Local open / Remote & Local close**
- **Pressure alarm** (hydraulic pressure is below the minimum allowed value)
- **Voltage alarm** (fuse or voltage failure)
- **Oil-Level-Protection** (continuous monitoring to protect the motor pump unit against dry-running), pump will stop by this alarm
- **Electronic pressure transmitter (4-20mA)** to allow custom setting of actuator torque output and min/max operating pressure to suit safe valve operation
- **Position Feedback-Device 4-20 mA** and SPDT switches
- Optional: free configurable contacts available for individual customer signals
- NEW: STEP by STEP Modulating-Service over **4-20 mA analogue signal**
All control signals available by 24VDC hardwire and / or via integrated **Software-Solution**. The technology provides steady accessibility and is monitoring all process required signals.

Programmable Input and output system

- Upgradeable **digital and analogue I/O's for multi-flexibility**
- Bidirectional Ethernet interface
- **Integrated web-server** for web-visualization, auto reset by system error (Watchdog)
- Suitable to interact with the most common **field bus-systems** available on the market (**Profibus, CAN-Bus, ...**)



TECHNICAL SPECIFICATIONS

- Supply pressure up to **350 bar design**
- Actuator torque output up to **1.000.000 Nm** for single acting and up to **2.000.000 Nm** for double acting
- Spring starting torque up to **600.000 Nm**
- Spring ending torque up to **400.000 Nm**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1** and **EN 13445**
- All ProControl actuators are designed for **30 years' service life**

Self Contained Control System

HYDRAULIC ACTUATORS
SINGLE ACTING



SELF CONTAINED HYDRAULIC CONTROL SYSTEM

ProControl has been providing reliable solutions for the oil & gas market since last 15 years.

We have committed ourselves as an innovator, with products capable to fully automate valve operation under the most challenging conditions in the most remote areas of the globe.

Quality Management System in compliance ISO9001 is continuously monitored and ensure our customer that most stringent requirements are met. Each individual unit is fully inspected and tested prior shipment to guarantee trouble free operation once at site.

SELF CONTAINED HYDRAULIC SHUTDOWN SYSTEM solution provide dependable zero emission capability when external supply is either not available or not reliable, it also fits basic safety system requirement as well. It is suitable for any linear and quarter turn/rotary valve application.

DESIGN FEATURE ACTUATORS

The actuator is spring-return, hydraulically operated for use on quarter turn or linear valves.

The valve is opened and closed by the application and release of hydraulic pressure.

Excellent serviceability of the hydraulic seals. Seals can be easily accessed even with the actuator mounted on the valve, providing ease of maintenance and minimum downtime.

Spring container is factory assembled and fully welded.

Spring cannot be released inadvertently providing increased safety; sealed canister protect internal parts (coated spring included) from harsh environment such as moisture, dust, sand and salt laden atmosphere.

ENP Lined Cylinders with Chrome Plated Piston Rod ensure prolonged lifespan and promote reliability with minimal friction and increased corrosion resistance.

Effective piston seal, guarantee higher and lower oil pressure optimum performances, with low friction and high sensitivity assuring long service life and preventing stick/slip issues. **Both linear and quarter turn actuator are SIL3 rated by TUV.**

BENEFITS

- **Zero emission solution;** no hazardous gas fugitive emission in critical application (sour gas, etc....).
- **No need of external power source.**
- **Modular manifold design** to maximum extent, easier and improved maintainability, reduce downtime.
- Designed **for non-powered, unmanned and remote service.**
- Standard hydraulic assembly available for **all valve sizes and configurations.**
- **High pressure, zero leakage control.**
- **Reduced working parts.**
- Scalable and adaptable for use with **telemetry systems, SCADA or other remote control signals.**
- Inherent spring **fail safe design.**
- **Closed loop arrangement** prevent system breathing in harsher environmental condition.
- Mounted either on-board or remote as per customer requirement.
- Large capacity accumulator to handle.
- Fast operating time due to **optimized design of hydraulic flow path.**



DESIGN FEATURE CONTROL

- The Self-Contained Hydraulic System is supplied with a manifold mount control assembly that provides a one-way local control using the hand-pump. Minimized use of external tubing reduces potential leak path minimize potential risk of damage at site
- Where required NACE compliance can be provided with either SS316 or anodized aluminum on wetted parts
- Single system pressure - no need for low pressure regulators and relief valves on the control pilot circuit, reduced maintenance-increased reliability
- Reduced swept volume
- Full 316 Stainless Dual scale pressure gauges
- Filtered hydraulic system: suction filter on hand pump to prevent contamination of the system. Last chance filter additionally foreseen to guarantee trouble free operation
- Closed loop arrangement and pressure vacuum filler cap prevent system breathing in harsher environmental condition prevent formation of condensation into the fluid reservoir
- Local manual override for quick shutdown
- Integrated pressure pilots reduce need of external tubing connection
- Suitable trim to operate in low and high ambient temperature: **50C (-58F) / +93C (+200F)**
- Hydraulic fluid alternate choice to meet ambient temperature requirement
- Local hydraulic fluid level indicator on reservoir
- First - Out indication of tripped pressure pilots available
- Foam-less design to prevent air entrapment into hydraulic fluid
- On request: 2-position, 3-way normally open block & bleed, temperature sensitive flow control device returning fluid into the reservoir prevent oil spill in the event of a fire
- Full SS316 encased solution available upon request
- Double ferrule fittings and **A4-70 (SS316)** fasteners
- The system can be tripped by several means. Typical are pressure pilots which trip the system when pressure fluctuations are sensed outside of the specified control range. Scalable and adaptable for use with telemetry systems, SCADA or other remote control signals (e.g. solenoid valve) and/or temperature sensitive device

ELECTRONIC HIPPS

System Overview

SIL3
Safety Integrity Level



A **High-Integrity Pressure Protection System (HIPPS)** is a safety instrumented system (SIS) designed to prevent over-pressurization in gas, chemical and oil refinery plants. The **HIPPS** acts as a **barrier** between a high-pressure and a low-pressure section of an installation, shutting off the source of the high pressure before it exceeds the system design pressure, thus **preventing loss of containment through rupture (explosion)** of the line or vessel.

The loss of containment can result in:

- **impact to human life** and the **environment**, when flammable, explosive, or toxic chemicals are released to the atmosphere
- **economic impact** due to production unit replacement/repair costs and production losses

HIPPS are **independent reliable systems** that operate on a **higher Safety Integrity Level (SIL 3)** than normal **Process Shut Down (PSD)** and **Emergency Shut Down (ESD)** systems.

Procontrol is a **HIPPS** system integrator, not only a manufacturer of specially designed HIPPS actuators and related control systems. Together with our partners, who count on many years of experience in the Oil & Gas sector, we are able to supply ultimate integrated customized solutions to meet our clients requirements.

The complete HIPPS system consists of the following main components:

- **ProControl Actuators** (Hydraulic & Pneumatic, Quarter turn or Linear - **SIL 3 Certified**)
- **Valves** (Ball, Gate - **SIL 3 Certified**)
- **Logic Solver** (Programmable or Solid State - **SIL3 or SIL 4 Certified**)
- **Pressure Transmitter** (High Response, Hart Protocol - **SIL 2 Certified**)
- **Manifold** (Individual Flange Manifolds or Interlocking Manifold)
- **Skid** (designed according to A.I.S.C. – ASD89 – API RP-2A – UBC 97D)
- **Certifications** (**FAT Tests** and **SIL level** are under supervision and **certified by TÜV**)
- **Complete integrated shut down system**

MECHANICAL HIPPS

System Overview

SIL3
Safety Integrity Level



Procontrol is a **HIPPS** system integrator, not only a manufacturer of specially designed HIPPS actuators and related control systems. Together with our partners, with many years of experience in the Oil & Gas sector, we are able to supply ultimate integrated customized solutions to meet our clients requirements.

The complete HIPPS system consists of the following main components:

- **ProControl Actuators** (Hydraulic & Pneumatic, Quarter turn or Linear - **SIL 3 Certified**)
- **Valves** (Ball, Gate - **SIL 3 Certified**)
- **Power supply** : hand pump in self-contained execution or by gas pipeline
- **Mechanical logic solver** built up with pressure switches in 1oo2 configuration (option : voting 2oo3)
- **Manifold** (Individual Flange Manifolds or Interlocking Manifold)
- **Skid** (designed according to A.I.S.C. – ASD89 – API RP-2A – UBC 97D)
- **Certifications** (**FAT Tests** and **SIL level** are under supervision and **certified by TÜV**)
- **Complete integrated shut down system**
- **Reduced cost/working parts**
- **Stand alone system**

QUARTER TURN
SUB SEA ACTUATORS
HYDRAULIC SINGLE & DOUBLE ACTING
SS series



DESCRIPTION

ProControl **SS** series actuators are suitable to operate small, medium and large size valves both in **shallow** or **deep water** applications and can also be supplied **complete with ROV receptacle for subsea local override**.
Fully pressure compensated design: actuator internals are fully sealed and filled with pressure compensation oil which shall act as lubrication and **guarantees constant equalized internal and external pressures**, allowing to easily achieve depths in **excess of 1.000 meters**.

KEY FEATURES

- Fabricated entirely from **carbon steel**
- Totally enclosed fully sealed waterproof housing filled with **biodegradable protective pressure compensation fluid**
- **Scotch yoke mechanism** to suit valve torque requirements
- **AISI 316** grade stainless steel **piston type pressure compensator** / **carbon steel bladder type pressure compensator** / open **compensation tank**, to balance external and internal pressure of actuators center body
- **316SS closed loop breather system** on the pneumatic cylinder in order to avoid ingress of sea water inside the actuator
- Low pressure pneumatic cylinder for supply pressures up to **12 bar design**
- High pressure carbon steel hydraulic cylinder suitable for supply pressures up to **400 bar design**
- **Carbon steel piston** with dynamic floating O-ring seals coupled with lubricating piston guide rings
- **Carbon steel spring cartridge** (only for single acting) with safety facility which allows safe installation and removal of the whole cartridge assembly
- **AISI 316SS fully sealed mechanical T bar position indicator**, which shall also **activate the remote position indicator** (where applicable)
- **Remote actuator position** signaling also available by means of inductive micro switches suitable for submerged service
- **Special specular type visual position indicator** available upon request
- **Bronze sliding blocks** which ensure minimum friction, allowing for a long service life and reducing maintenance costs
- **Bronze thrust bearings** and **high strength alloy steel chromium plated thrust reaction bar** which guides the scotch yoke throughout its stroke and supports all transverse loads generated
- **ASTM A 320 L7 alloy steel tie rods**, with standard electrolytic zinc coating according to **ASTM B633 FeZn 12** (thickness 12 µm)
- **Alloy steel end travel stops** allow for accurate angular stroke adjustment complete with **stainless steel end caps**
- **Integral manual override** (AISI 316 grade stainless steel hand wheels or horizontal / vertical **AISI 316 grade stainless steel ROV receptacle for subsea override**) facilities
- Connection for **portable diver pump override**
- **Design allows 4 x 90° actuator rotation**
- **AISI 316** stainless steel external bolting



TECHNICAL SPECIFICATIONS

- Supply pressure up to **400 bar design**
- Actuator torque output up to **1.000.000 Nm** for single acting and up to **2.000.000 Nm** for double acting
- Spring starting torque up to **600.000 Nm**
- Spring ending torque up to **400.000 Nm**
- All ProControl pressure containing parts are designed according to **ASME VIII div.1** and **EN 13445**
- All ProControl actuators are designed for **30 years' service life**

HYDRAULIC DAMPERS

HDD series

DESCRIPTION

ProControl has created the **HDD hydraulic damper** series bearing in mind the users interests and engineering requirements in order to **reduce surge pressure hammer blow**, resulting from rapid valve closure typical of non-return valves.

The working principle consists in the **dissipation in oil of the energy** generated by the valve disc during its closing / opening movement.

KEY FEATURES

- **Special design of the hydraulic chamber cavities** allowing easy and efficient drainage of hydraulic fluid from one chamber to the other through an interconnecting manifold which has an incorporated flow regulator allowing for **fine throttling** and **different speed settings** across the valves stroke
- Several models available to cover all **swing check valves** and **eccentric butterfly valves** without dimensions or torques limitations

Following available options:

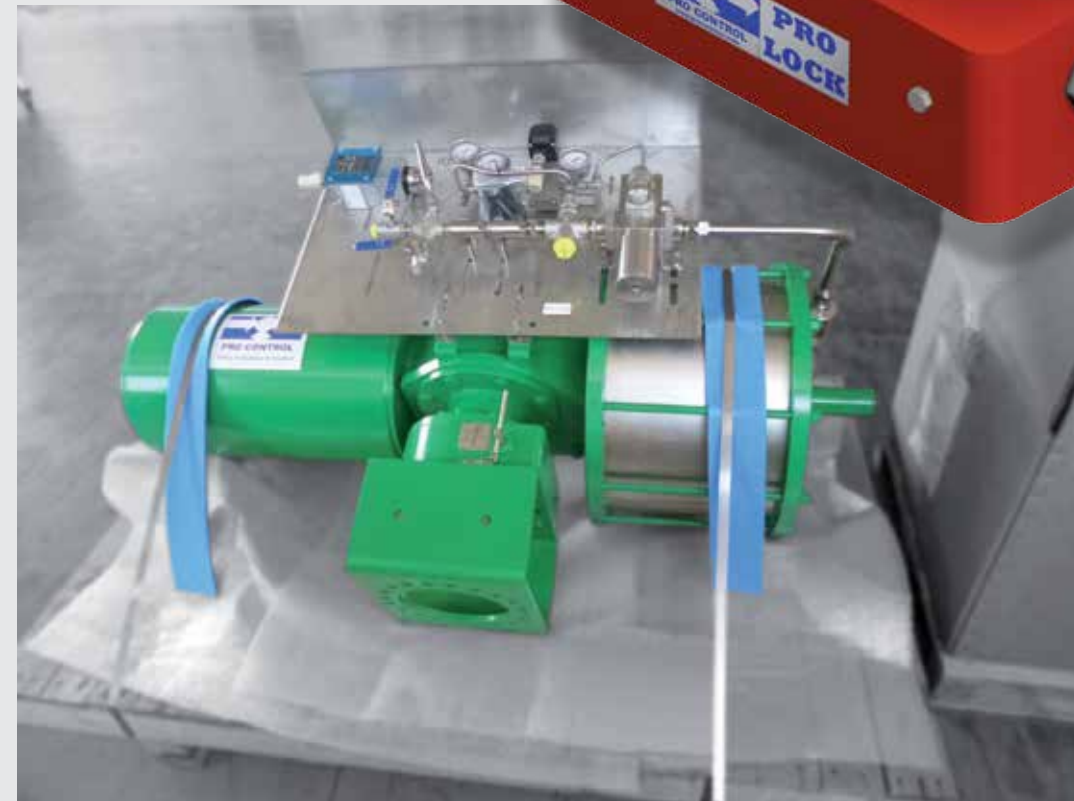
- **Speed control device** which allow the adjustment of the operating time in **two sequential steps**, faster for the first part of the stroke and slower for the last segment
- For **butterfly valves** it is possible to fit the damper with an **eccentric counterweight** allowing to reach the complete closure of the terminal part
- **Compact solution** consisting of a fully enclosed **cylindrical rotational device**, consequently ideally suited for **heavy duty operation** which allows our clients **long maintenance free periods** due to **non-exposed rotating components**



TECHNICAL SPECIFICATIONS

- Dampening torque up to **500.000 Nm**
- Standard operating temperature range **-30°C / +100°C**
- Special low temperature application up to **-60°C**

Pro Lock Mechanical Partial Stroke Device



DESCRIPTION

ProControl designed a **Carbon Steel** epoxy coated **declutchable mechanical blocking device** which when engaged allows a pre-set valve / actuator **partial stroke** of approximate 20°.

The **Pro Lock mechanical blocking device** is located between the valve and the actuator and consists of a **heavy duty steel** self-contained unit, therefore it does not stress the valves shaft nor the actuators yoke. It is **pad lockable** and can also be fitted with a **limit switch** if required by the client to signal that it is engaged. During normal operation the **device is passive** and **will allow the valve to ESD on demand**.

When a partial stroke test is required, the device is **"engaged"** and the **ESD valve** will only travel to the specified percentage of stroke.

Fast & Ultra Fast Actuators



DESCRIPTION

ProControl designed an **ultra-fast application** by developing the **single acting actuators, both pneumatic and hydraulic**. The fast operation is performed by the spring, but for this special APPLICATION the cylinder is fitted with a **special INTEGRAL DAMPER**.

The integral damper consists of a 2 way 2 position **special piloted integral high flow discharge valve**, complete with an **integral end of stroke damper** which **safe guards the valve shaft and seating elements**. The quick discharge of air / oil from the cylinder occurs for approximately **80-85%** of the stroke, then the last part of the stroke is **dampened**. The device is fitted with a dedicated flow regulator, which allows also adjusting the end stroke speed.

The **INTEGRAL DAMPER** is available in different executions: **aluminium alloy or AISI 316**.

Customized Executions

ProControl is a customer oriented company and our objective is to be able to always supply first class support to our clients by offering innovative solutions and design for all applications respecting both safety and environment.

SPECIAL APPLICATIONS

- Closed loop system
- Special execution with ultra fast shut off for turbine applications
- Conveyed quick exhaust system
- Special application for Geo-Thermal environment
- Stainless steel mountings
- Stainless steel cylinders
- Stainless steel external boltings and rods



Control Systems & Accessories

ProControl actuators are usually integrated with control systems and accessories, which are designed in order to satisfy all customers' requirements and project specifications



Control Systems

Control systems are generally an integral part of each actuator / valve assembly installation. They can consist in local or remote operation by electric or pneumatic signals.

ProControl is able to supply advanced engineering technology for all types of pneumatic and hydraulic control systems.

KEY FEATURES

- All control systems can be either mounted directly on the actuator, panel mounted or enclosed within a weatherproof cabinet
- Typical applications: On/Off, Modulating and Emergency Shut Down

Remote Indicators

ProControl can offer a wide variety of limit switch boxes and positioners with body materials from techno-polymers (polyester powder coated), aluminium and 316 (ASTM A351 CF8M) stainless steel.

KEY FEATURES

- External shafts, mounting kits and fasteners made in stainless steel
- Several cable entries size and type available
- Different switches available: electro-mechanical, inductive, magnetic or proximity switches
- 4 - 20 mA position transmitter available
- VDI/VDE3845 output shaft dimensions and ISO F05 drilling (in accordance with international standard)
- Various executions: weatherproof, waterproof, explosion proof and intrinsically safe certified



Passive Fire Protection



DESCRIPTION

Passive fire protection is a key issue in hydrocarbon process industry **plant safety** and is considered a reliable method of **lowering plant risks**. Often this requirement is also extended to the valve actuators, which must guarantee safe operation in the event of a fire scenario.

ProControl is able to supply various solutions of **passive fire protection** depending on specific project requirements and related accessories against flame temperatures in **excess of 1100°C**

KEY FEATURES

Following available options:

- **Rigid stainless steel panel** assembly boxes, which enclose both actuator and related accessories (and in some cases also the valve itself)
- **Flexible mattress type** blankets which wrap around the actuators and are held together by stainless steel clips
- **Resin based in tumescent compound**, which is moulded onto the actuators

All options are certified and tested according to **UL1709**

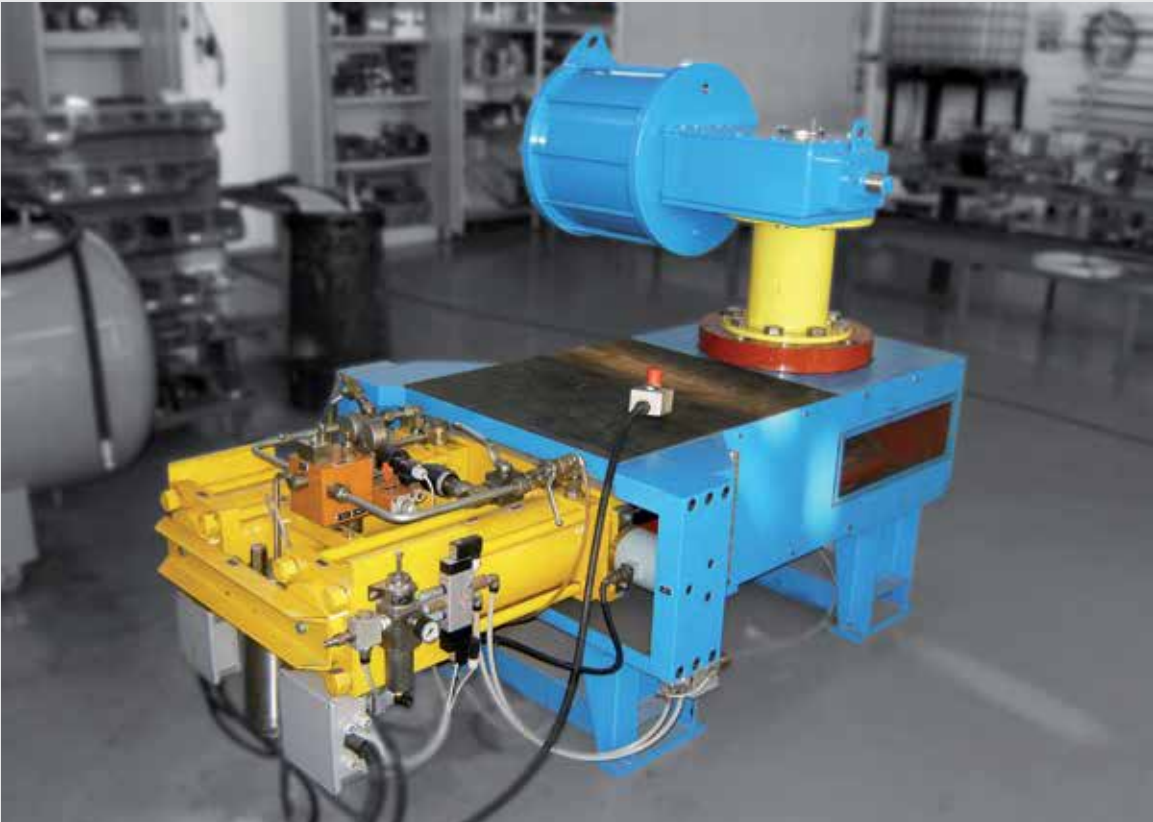
Valve Automation & Testing Facility

In recent years with business growing in an extremely quick pace, ProControl realized that clients had a growing need for **obtaining good quality products fast**. Therefore the Company has invested in an additional important Industry service: **"Valve Automation & Testing centre"**.



VALVE AUTOMATION

This service enables the possibility to ship valves with **fast deliveries** directly from manufacturers, stockists or distributors to our facilities in Castell'Arquato. Here a **professional assembly** of our complete range of actuators onto the **free issued valves**, position settings and **final FAT** testing of the combined assemblies take place, meeting the required fabrication deadlines.



TESTING

ProControl has a full range of valve test flanges allowing for Flanged RF and RTJ connections. Our test facility permits full differential pressures up to 790 BARG.

FAT testing is performed according to API or other clients' specific normative. Third party inspection and certification is also available and can be organized by ProControl's experienced staff.

Our aim is to supply our customers with the most versatile service available to the industry since we feel a satisfied customer is our future.

