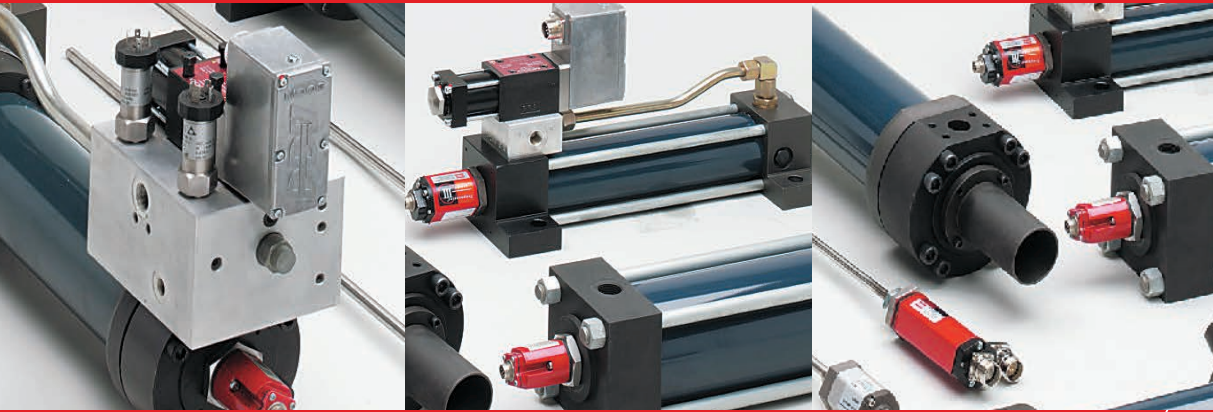
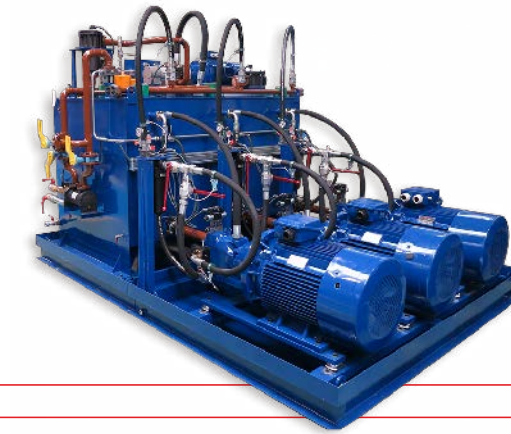


**SPECIALISTS IN
AUTOMATION
SOLUTIONS**





GLUAL
HYDRAULICS

THE STRENGTH OF A GROUP

GLUAL is a company with its **OWN ENGINEERING** department specialized in the automation of industrial processes: hydraulic and electronic systems. With more than 400 professionals, our goal is customer's satisfaction Integrating the best turnkey solutions.

MAIN DIVISIONS

- Design and manufacturing of hydraulic units
- Design and manufacturing of hydraulic cylinders, hydraulic distributors, piston accumulators
- Design and manufacturing of electronic hardware and software (Electric Boards, PLCs)
- Hydraulic and electric components sale
- After sale service, servicing, maintenance, reparations

GLOBAL SUPPLIER

- Glual EUROPA
- Glual CHINA
- Glual USA
- Glual BRAZIL
- Glual INDIA

GAC

TECHNOLOGY AND CONTROL

Our complete quality management systems are a guarantee for safety even in the most demanding work conditions. Our products meet national and international standards in force and can be fitted on any machine; moreover, we have been accredited by international car manufacturers. The quality Standard of the product is sustained by 3D design systems, the latest calculation and simulation by finite elements techniques, as well as test and optimisation procedures.

QUALITY ASSURANCE

Testing on our own hydraulic and electronic test benches with ISO-DIN-CNOMO standard based engineering assure final product quality in the design, manufacturing and after-sales processes. This quality is evident in the application sectors: renewable energy, iron and steel sector, aeronautics, machine tools, automotive and other sectors.



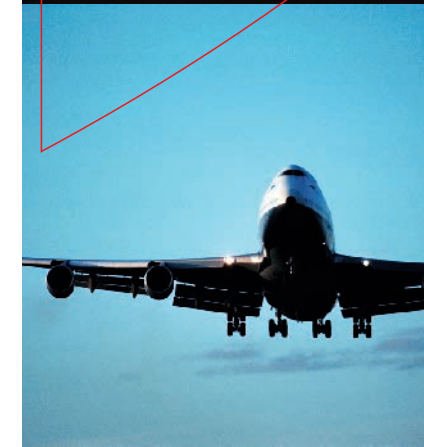
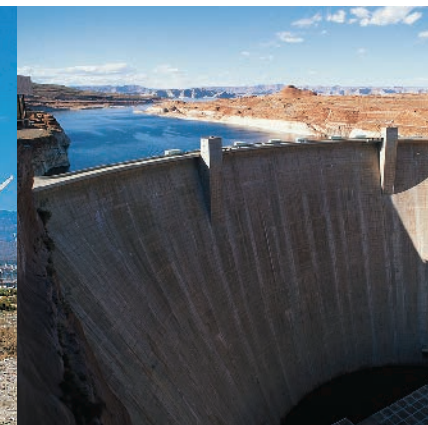
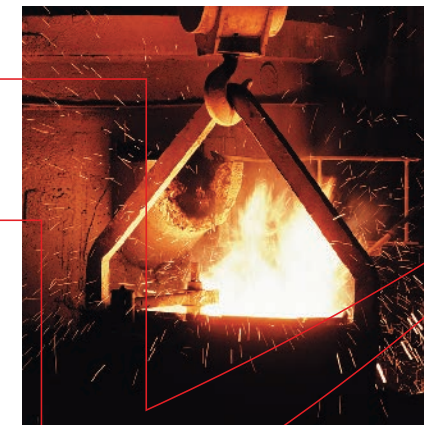
CUSTOMIZED PRODUCTS

- Industrial

- Steel Industry
- Machine Tool
- Presses
- Hydroelectric
- Railway, aeronautics, plastic, paper wood, testing bench, special machines
- Mining, tunneling, public works, cement, elevation
- Naval and Offshore

- Renewable Energies

- Wind
- Solar, Termo-solar
- Marine
- Cogeneration, Biomass, Residues

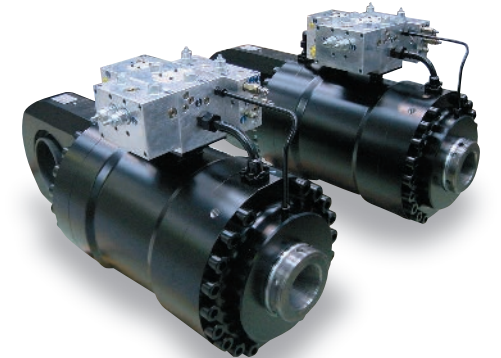
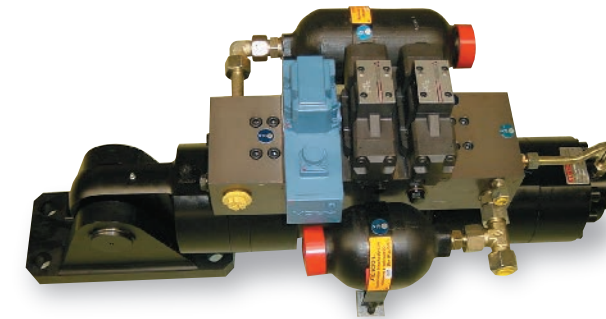


A WORLD OF SOLUTIONS IN SERVO-HYDRAULICS

Glual has an all-round vision of problems and as such provides comprehensive solutions. We can do this because of our many years on the market and with the knowledge gained we have been able to develop a new concept: the Glual

Automation Concept. This concept combines several disciplines varying from fluid technology to tribology, and from electronics to mechatronics. GAC offers a range of products, from engineering to high-tech products providing hydraulic

solutions for a broad field of applications. Whatever the application, the Glual product range provides a sure and complete solution, be it simple or complex and guarantees absolute quality.



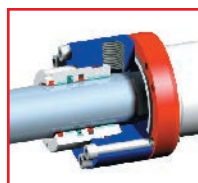
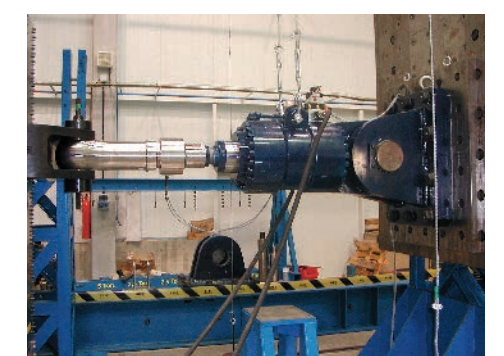
HYDRAULIC CYLINDERS

INDUSTRIAL CYLINDERS AND SERVO CYLINDERS

Glual industrial cylinders feature quality and innovative concepts, such as accurate rod guiding in combination with using the latest seals. Glual Automation Concept offers a new

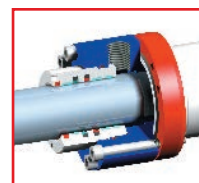
understanding of a servo-cylinder by combining the advantages of digital technology with hydraulics which together with the latest control add up to an Intelligent "Linear Electro Hydraulic Axis".

GLUAL HYDRAULICS	INDUSTRIAL CYLINDERS							INDUSTRIAL SERVO-CYLINDERS				HIGH-OUTPUT SERVO-CYLINDERS		PREMIER SERVO-CYLINDERS		
	NORMALISED						SPECIAL	DERIVED FROM NORMALISED			SPECIAL	DERIVED FROM NORMALISED	SPECIAL	DERIVED FROM NORMALISED	SPECIAL	
	ISO 6020/2	ISO 6020/1	ISO 6022	ISO 3320				ISO 6020/2	ISO 6020/1	ISO 6022		ISO 6022		ISO 6022		
	KI	KR	KD	KM	KZ	KP	Depending On part	KI*	KR*	KD*	Depending On part	SHD	Depending On part	SHD	Depending On part	
WORK PRESSURE	160	160	250	250	200	350		160	160	250		280	320	280	320	
GUIDING TYPE	FRICTION SEALS – DEPENDING ON PRESSURE							FRICTION SEALS – DEPENDING ON PRESSURE		HYDRODYNAMIC		HYDRODYNAMIC		HYDROSTATIC		
FRICTION	DEPENDING ON PRESSURE AND RADIAL FORCE							DEPENDING ON PRESSURE AND RADIAL FORCE		INDEPENDENT OF PRESSURE. DEPENDING ON RADIAL FORCE		INDEPENDENT OF PRESSURE. DEPENDING ON RADIAL FORCE		INDEPENDENT OF PRESSURE. INDEPENDENT ON RADIAL FORCE		
RADIAL LOAD	LIMITED RADIAL LOAD							LIMITED RADIAL LOAD		MEDIA CARGA RADIAL		MEDIUM RADIAL LOAD		HIGH RADIAL LOAD		
TYPE OF SEALS	1		3			8		1,3	8	TRIBOPLAST		TRIBOPLAST	HIDROFLUID	HIDROBEARING		
MAX. FREQUENCY	NO		NO			2		NO	5	25		50	100	LIMITED BY THE SERVOVALVE		
MAX. SPEED (m/sec.)	0,5						1		0,5	1	2		2		5	
POSITION SENSOR	NO							MAGNETOSTRICTIVE - INDUCTIVE - POTENTIOMETRIC				MAGNETOSTRICTIVE LVDT		MAGNETOSTRICTIVE LVDT		
CONTROL BLOCK	NO							YES				YES		YES		



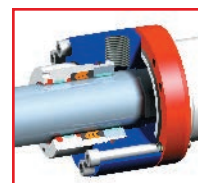
GUIDE-SEAL TYPE 1

- Standard.
- NBR material.
- Friction depends on pressure.
- Single or double rod.
- Max. speed 0.5 m/s.



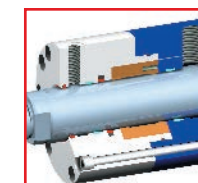
GUIDE-SEAL TYPE 8 – 2

- Optimum friction.
- Min. stick-slip effect.
- Wide range of speeds.
- Single or double rod.
- Max. speed 1 m/s.
- NBR or VITON material.



GUIDE-SEAL TYPE 3 – 5

- Standard.
- Medium speeds.
- Friction depends on pressure.
- Good tolerance against contamination.
- Single or double rod.
- Maximum speed 0.5 m/s.
- NBR or VITON material (5).



GUIDE-TRIBOPLAST TYPE SEAL

- Very low friction.
- Free from stick-slip effect.
- Hydrodynamic effect.
- Single or double rod.
- Vibration-free movement.
- Tribological material.
- High precision and sensitivity.
- Lower heat generation.

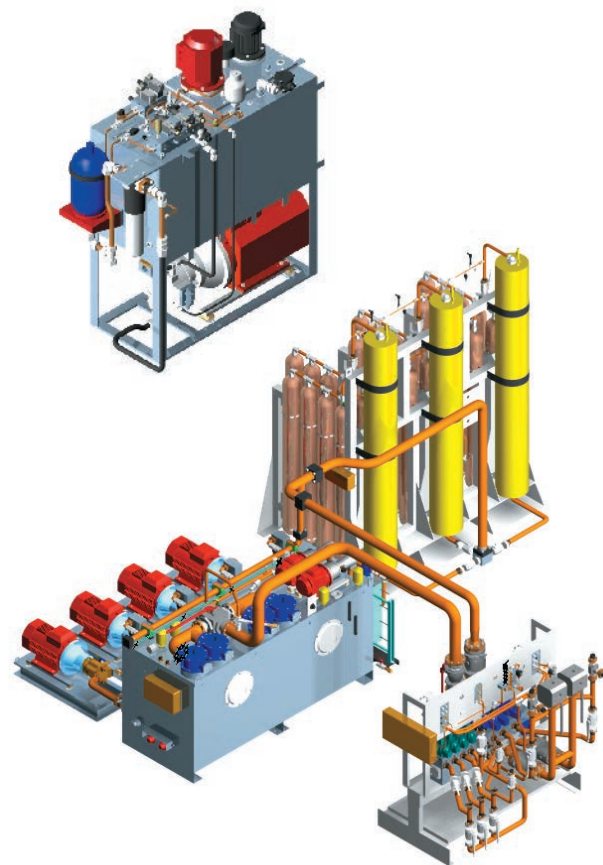
HYDRAULIC UNITS

Hydraulic units are the backbone of hydraulic systems: dimension and design are decisive in obtaining system feasibility on the one hand, and in complying with the increasingly stricter environmental standards on the other.

Glual Hidráulica offers in its products a complete range of parts and accessories such as filters, coolers, instrumentation, electric motors, etc. required for hydraulic units.

The following is an example of dimensions and construction features:

- Standard units.
- Low noise-output units.
- Soundproofed units.
- Special performance units.
- Units with incorporated power and control cabinets.
- Compact units with included hydraulic control unit.
- Mini units.
- Units for operating with different fluids.
- Units with stainless steels tanks.



HIGH-PERFORMANCE SERVO-CYLINDERS

“Glual Automation Concept” includes servo actuators of the SKD series designed to meet the requirements of the most demanding applications. They are double acting servo actuators with one single or double rod designed to receive a variety of instruments such as pick up sensors, pressure or load cell and accessories such as hinges and joints, converting the assembly in a precise servo drive for testing of materials, structures and parts.

PREMIER SERVO-CYLINDERS

The Premier series is a servo-cylinder based on the heavy-duty ISO 6022 compliant KD series insofar as dimensions, modularity and geometrical shape, even though special designs can be manufactured depending on the needs. The main technological features is HIDROFLUID hydrostatic guiding technology (pressure hold) which is used in combination with lock stops and advanced piston geometry which results in a very low friction coefficient independent from pressure.

HYDRAULIC CYLINDERS

Technical characteristics			
Speed	Pressure	Temperature	Fluid
From 0,0005 to 4 m/s	From 0 to 500 Bar	- 40C to + 200C	Mineral oils, water-phosphoric esters
Mechanical or hydraulics blocks			
External or internal position transducers			
Production Capacities			
Weight		Dimensions	
Up to 60 Tn		Up to Ø 1600 piston and 16000 mm length	

ELECTRONICS

The Glual Automation Concept completes its range with electronic control and power units for machine automation, optionally with hydraulic units. Complete equipment can be provided, including:

- Construction, assembly and commissioning.
- Software.
- Maintenance and service.
- Electrical power installation.
- PLC or PC for control.
- SCADAS supervision systems.
- Fitting a variety of systems.
- Documentation compliant with standards.

For fitting of controlled drives in the field of hydraulic servosystems, we provide the specific analogue or digital hardware and software with cutting edge control algorithms that guarantee a correct operation and absolute compatibility with other systems.

The Glual Automation Concept uses the latest control technology in real time in applications requiring high precision and safety.

SPECIAL ROTARY JOINTS

The design of Glual rotary joints was conceived to provide a solution for needs with which machine manufacturers were faced, amongst others, high revolutions, high pressure, low friction, etc. for which rotary joints can be applied to sheet cutting machines, rolling machines, wind-powered generators, etc. Furthermore, we provide the wind power sector a compact solution with the hydraulic-electrical rotary joint designed to guarantee functionality and reliability in very specific work conditions.

The main features are the following:

- Special rust-proof treatment.
- Several connection interfaces between hydraulic joints and electrics.
- High mechanical protection.
- Personalised electrical interface.

PISTON ACCUMULATORS

We design and manufacture piston accumulators under PED (97/23/CE) directive for all type of applications:

- Wind, marine and offshore energies
- Industrial presses, rolling mill, special machines ..
- Mobile: dumpers, suspensions ...

Based in more than 45 years experience in hydraulics, we offer a complete range of Piston accumulators for:

- 250 Bar Working Pressure
- 375 Bar Working Pressure
- Volume from 0,5 to 500 liters

Besides the standard range, we design special accumulators and complete systems taking into consideration the characteristics and requirements of each application:

- Pressure
- Speed
- Volume
- Temperature
- Fluid type
- Time of response
- Mounting orientation



GLUAL HYDRAULICS PRODUCTION CENTRES



SPAIN (HEADQUARTERS)

Avenida de Landeta, 11
20730 Azpeitia
Gipuzkoa - Spain
Tel.: +34 943 15 70 15
Fax: +34 943 81 49 20
comercial@glual.com
export@glual.com



CHINA

No. 18, Fengming Road,
16B Zhisu Hi-Tech
Industrial Park
Wujin District, Changzhou
Jiangsu, 21364, China
Tel.: +86 519 8622 0288
Fax: +86 519 8622 1122
china@glual.com



BULGARIA

Montana Hydraulics
Gotzo Mitov #3
3400 Montana, Bulgaria
Tel.: +35 996 301 247
bulgaria@glual.com

SALES OFFICES



GLUAL ENERGY

Calle Orendaundi 5
20730 Azpeitia, Gipuzkoa, España
Tel.: +34 943 15 70 15
energy@glual.com



**GLUAL USA
DOVER HYDRAULICS**

2996 Progress Street Dover,
Ohio 44622 USA
Tel.: +1 330 364 1617
Fax: +1 309 364 9701
usa@glual.com



GLUAL BRASIL

Condominio industrial MTC Sorocaba
Galpão E-5
Avenida Liberdade nº 4565,
Bairro Iporanga, Sorocaba
Sao Paulo CEP 18087-170, Brasil
Tel.: + 55 15 3316-2370
Mobile: + 55 11 95755-0909
brasil@glual.com.br



GLUAL GERMANY

Breitscheider 117A
40885 Ratingen, Alemania
Tel.: +49 (0) 2102 9291 418
deutschland@glual.com



GLUAL INDIA

Plot nº 8 · Gudallore Industrial Area – III
Nagavalliamman Koil Street · 603209
Maraimalai Nagar · Tamil Nadu
india@glual.com