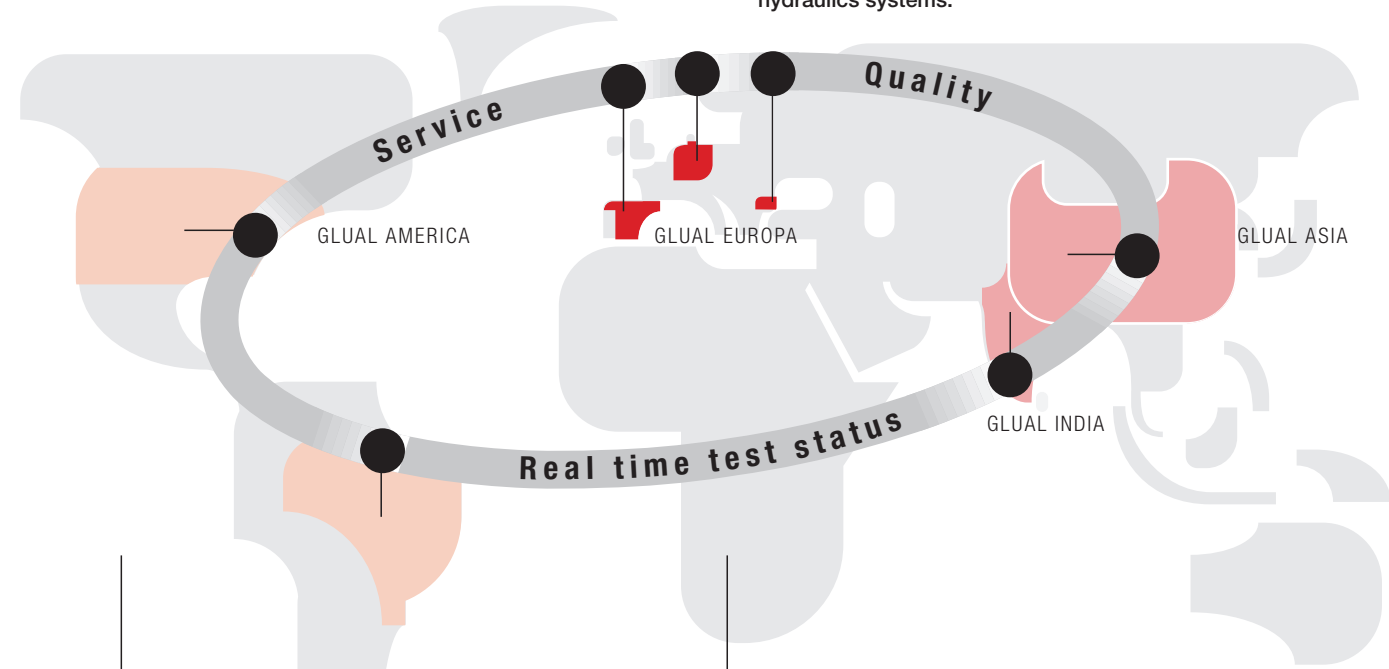


Solutions in hydraulics

THE GROUP

global coverage

As we are present in all the continents, we provide worldwide coverage to anything you may need for hydraulics systems.



R+D+i

TECHNOLOGY

GLUAL has a team of highly qualified and experienced engineers. We work with advanced design tools by graphical simulation of hydraulic drives and 2D/3D design. Our technical department in close collaboration with the technical office develops customer optimal solutions in hydraulic and electronic systems.

We invest every year in different R+D+i projects participating with companies and research centers to different markets and products.

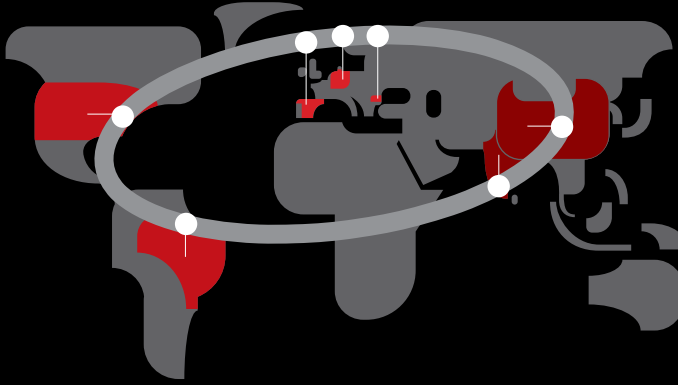
After-sales service

SERVICE

As we are high experienced in hydraulics, we are able to provide any kind of service, from start up of a complete hydraulic system to any individual hydraulic component repair and maintenance service.

GLUAL
HYDRAULICS

Your partner in hydraulic technologies



www.glual.com

GLUAL 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

GLUAL BULGARIA

Montana Hydraulics
Golzo Mitov #3
3400 Montana
BULGARIA
Tel.: +35 996 399 247
bulgaria@glual.com

GLUAL CHINA

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

GLUAL USA

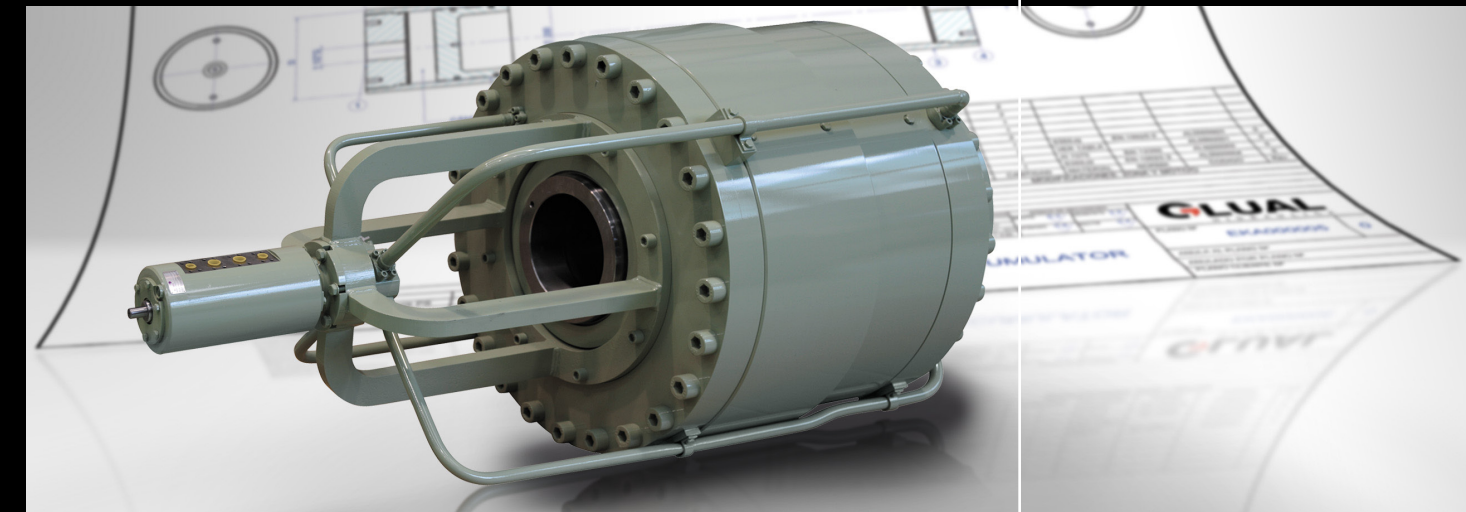
DOVER HYDRAULICS
2996 Progress Street Dover,
Ohio 44622 USA
Tel.: +1 330 364 1617
Fax: +1 309 364 9701
usa@glual.com

GLUAL BRASIL

Condominio industrial MTC, Sorocaba-Galpão E-5
Avenida Liberdade nº 4.565, Bairro Iporanga,
Sorocaba, São Paulo CEP 18087-170, Brasil
Tel.: +55 11 3728-9423
Fax: +55 11 3728-9201
Mobile: +55 11 95755-0909
brasil@glual.com.br

GLUAL INDIA

Plot nº 8 - Gudalore Industrial Area - III
Nagavalliamman Koll Street - 603209 Maraimatal
Nagar - Tamil Nadu
india@glual.com



A world of solutions in rotating unions

Rotating unions
Customized | **KU** |

GLUAL
HYDRAULICS

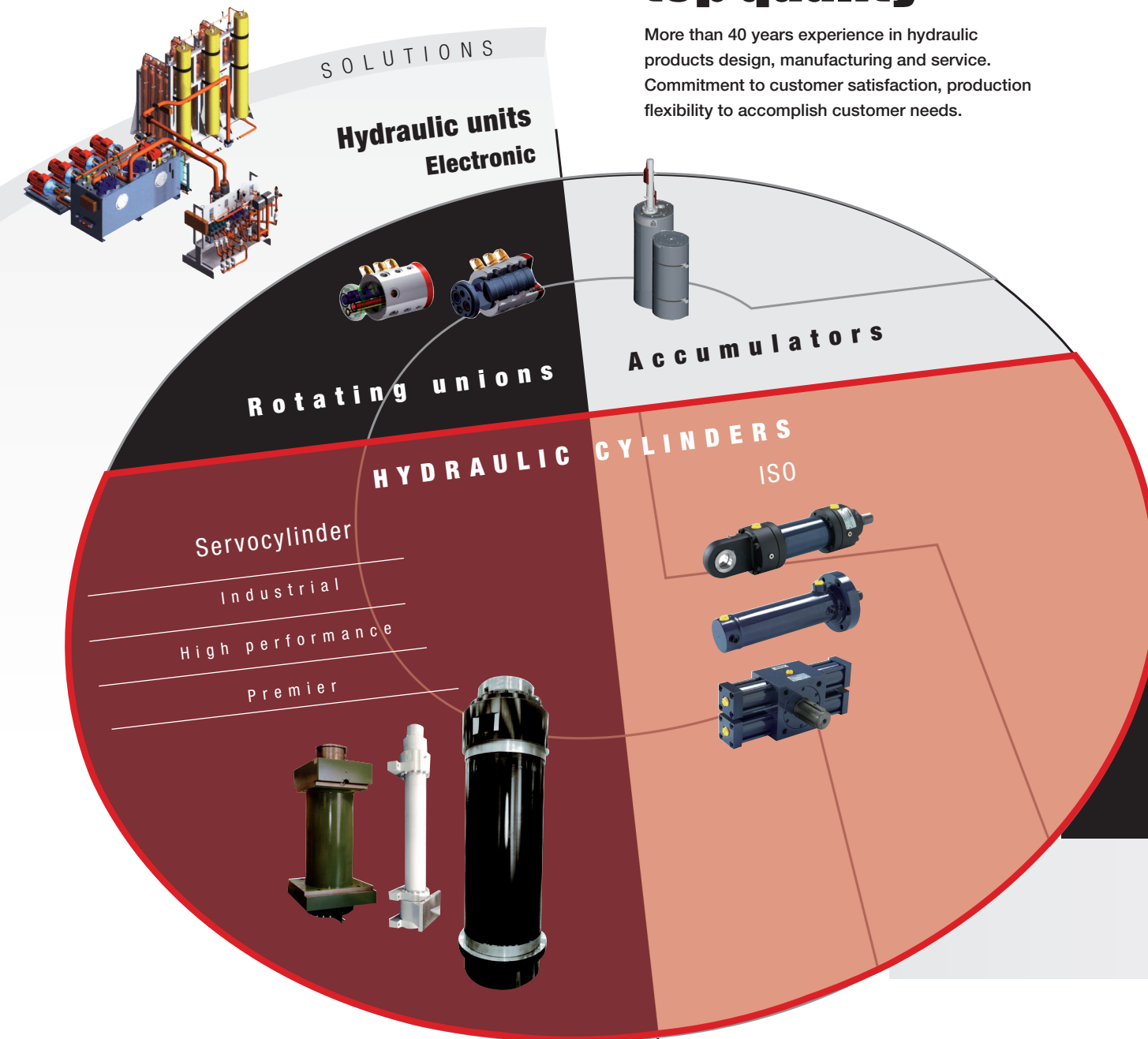
GLUAL
HYDRAULICS

A world of so

PRODUCTS

top quality

More than 40 years experience in hydraulic products design, manufacturing and service. Commitment to customer satisfaction, production flexibility to accomplish customer needs.



Customized | ISO

KU

Rotating unions



Rotating unions

For over 40 years Glual Hydraulics develops, designs and manufactures a wide range of rotary unions.

Glual is especially focused on custom solutions, because that, our efforts are mainly dedicated to a thorough application analysis carried out by our engineer and R&D department.

Glual rotating unions (KU) are employed in many industries to transfer fluid between stationary pressurized supply lines to a rotating machine part.

Main markets for KU:

- Steel industry: Rolling mills, ladle turrets, coiler expanding mandrel...
- Wind energy: Blade
- Hydroelectric Turbines
- Mining, tunnel boring machines
- Machine tool: Drilling, milling machines...
- ...

There is a wide range of applications and different kind of sealing systems:

- Leakage free elastomeric seals with optimized profile and wear resistant shaft coating
- Contactless gap seals
- Hydrodynamic cushion

The sealing system prevents fluid flowing from high pressure side to low pressure side. It also withstand wear at the rotor union interface and minimize resistance to turning with a low coefficient of friction.

In accordance with the application, different parameters are considered:

- Seals technology
- Fluid type (seals materials)
- Bearing type
- Rotational speed and torque
- Operating pressure and temperature
- ...

Those and others factors are considered to guarantee minimal wear and long service life.

KU

Rotating unions



Steel Industry

In metal industry, the rotating unions are used for several applications

Rolling mill

Coiler expanding mandrel

In heavy steel industry rotating unions, each application is different and our engineer department customized the rotating union in accordance the application:

- Port Type
- Fluid types
- Mounting type
- Material
- ...

Typical working parameters are:

Pressure	100 to 400 bar
Temperature	10 to 65°C
Rotational speed	1 to 1000 rpm
Fluid	HLP, HFDU...
Mounting type	Customised

Glual Multi-passage

Rotating union

Multi-passage rotator unions are employed mainly in steel industries to transfer more than one fluid between fixed and rotating elements.

The main function of the multi-passage rotating union is to provide multiple independent lines for different fluids or gas to different rotating feed points in the same axis.

Each line is isolated from other lines to avoid their mix. Depending working conditions (fluid type, temperature, pressure...) different sealing solutions are used.

In the multi passage definition, some information is considered to ensure a correct design:

N° Passages:	2 to 30 passages			
Port type for each passage	Thread G (BSPP)	Thread NPT	SAE-3000 or 6000 PSI Flange	Others
Port size for each passage	1/4"G to 2"	1/4"G to 2"	1/2"G to 2 1/2"	Others
Fluid or gas for each passage	Oil, Grease, Nitrogen, Argon, cutting fluid...			Others
Mounting type	Standard Flange	Customised Flange	Axial ports or Radial ports	Others
Speed	2 rpm to 10 rpm			

KU

Rotating unions



Wind energy

Glual provide rotating unions for hydraulic blade pitch system. All of them are designed and manufactured according the strict requirement:

- Low friction (low rotating resistance)
- High reliability
- Off-Shore environment conditions
- Low internal leakage
- Connected with electrical and optical Slip Ring
- Compact design

In accordance the strict and tough working conditions, the are designed to supply and return oil for the HPU (Nacelle) to the blade hydraulic cylinders (Hub). Due the customized design, the electric and optical cables are provided from Nacelle to Hub thought the rotating union and for that, electrical slip rings are integrated.

Working pressure	200 ÷ 300 bar
Working Temperature	-10°C ÷ 65 °C
Survival Temperature	-40°C ÷ 70°C
Flow	80 ÷ 200 l/min
Environmental conditions	Off-Shore

KU

Rotating unions



Hydroelectric Turbines

In hydroelectric applications (i.e: Kaplan turbine) Glual rotating unions are design to assembly directly into turbine governor.

Our assembly and testing team specializes in performing a compact design to assembly and fully test to customer specific requirements prior to shipping.

Kaplan turbine

Pressure	50 bar
Type	Two passages front flange
Speed	300 rpm
Fluid	Mineral oil

Electric rotating unions

Glual electric Slip Rings

Glual high quality electric slip rings have high reliability in the electric signal and communication buses transmission. The fibre brush and multicontact (gold/gold) technologies give a perfect signal transmission (analogical and digital) and different buses:

- Profibus
- CAN-bus
- Device-Net
- Ethernet 100 Mbs (Sercos and others...)
- 10 Base T and Firewire

Our Slip rings DON'T need maintenance and lubrication. They have:

- A minimum wear in the contact surfaces and they are able to work in high rotating speed.
- A high power density by circuit and low dynamic resistance (noise)
- No need to remove abrasion dust, and good communication at high transmission speed can be achieved.
- The high quality bearings give very low mechanic looseness, this precision is traduced in low vibrations and collector long life.

- Our Slip rings combine any type of signal ring with power ring in a unique collector and there are different types:
 - Encapsulated connectors (with or without hollow shaft)
 - With rotor and stator separated
 - Miniature
 - Concentric rings
 - Flat connectors (more than 50 compact design)
 - Different IP protection
 - With metallic housing (improve sealing)
 - Shielded cables, harting connectors
 - Optical slip rings

For low temperature and exigent applications, an internal self-regulating heater is added and it is automatically activated according set temperatures. That allows reducing the air condensation inside and near the rotating union (e.g wind turbine application).

Glual Slip rings are used in several applications:

- Wind energy
- CNC machines
- Radar
- Packing and palletizing
- Rotating doors
- Centrifugadoras
- Robotics