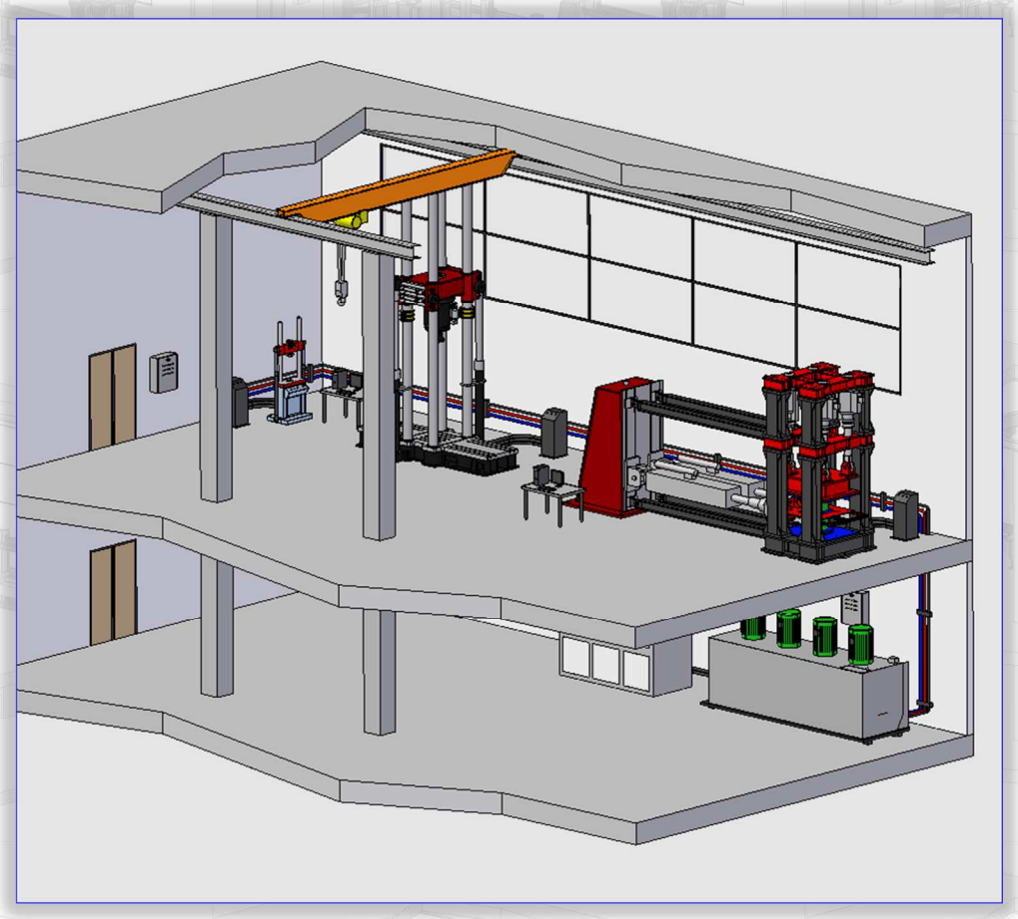
ITALSIGMA

TESTING MACHINES AND SYSTEMS FOR STRUCTURAL AND SEISMIC ENGINEERING

Giuliani Federico group



TOGETHER IS BETTER

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Italsigma S.r.L. has been operating in the material testing field since 1982, with the aim to provide **turnkey systems** to its customers.
Any company that wants to stay competitive in today's market cannot be done without testing. Moreover, only static and dynamic experimental tests on specimens or components can provide evident values for strength calculation and evaluation of day by day durability.
Undoubtedly, laboratory tests carried out by simulation under any load conditions, therefore very close to real-life conditions, allow a company to **save time and money** by detecting functional limitations.

<< In the testing field, if something seems simple, you might not have understood it well >>

Accurate planning and great attention to our customers' needs have enabled us to successfully interface with structured, cutting-edge companies, **such as our collaboration with the most important Italian research centres.** Over the years Italsigma has developed and made various testing machines 'night after night', supported only by the passion of achieving a result that places us among companies that **work hard** in the research world.

1960
Foundation of the company Giuliani S.n.C.

1975
Start of activities in the testing field for Giuliani S.n.C.

1982
Foundation of the company Italsigma S.r.L. operating in the testing field

1995
Start of activities in the alimentar industry field for Giuliani S.n.C.

2012
Merge of the two societies all activities are exercised by the company Italsigma S.r.L.

2013
Italsigma is rapporteur for a report on the stress tests at the "International Reliability & Technologies" fair

2013
Italsigma is rapporteur for a report on the testing machines at the AIM conference

2015
Italsigma is the main sponsor of the international conference of Stress Analysis in Messina attended by all the Italian Universities

2016
Italsigma is sponsor of the international conference about the "Analysis of fracture" in Catania attended by scholars from all around the world

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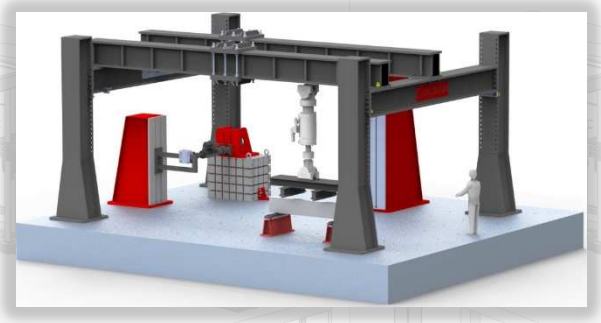
AT CUSTOMER SERVICE FROM PLANNING TO ASSISTANCE

We are suppliers since over 20 years of laboratories in structural and seismic engineering:



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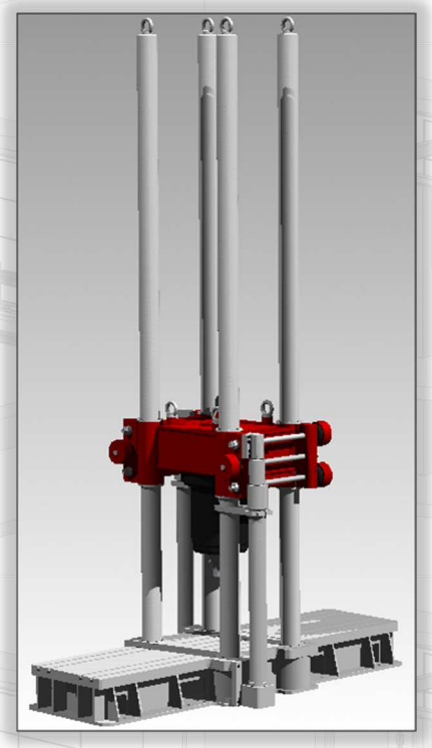
3 MN (300 TON) MACHINE FOR COMPRESSION TESTS



TECHNICAL FEATURES:

4-columns load frame with high stiffness for compression tests.

The upper cross-head is mobile by hydraulic lifting cylinders and hydraulically clamped on the columns.

The basement is grooved to allow the clamping of the specimen.

Features:

Cross-head stroke: 6 m

Max height: 7 m
Max specimen height: 4,5 m
Columns spacing: 900 mm
Basement dimensions: 4 x 1 m
Hydraulic working pressure: 210- 280 bar
Max force (compression): 3 MN
Frame stiffness (cross-head at 1,3 m from base): 4.5 x 10^9 N/m

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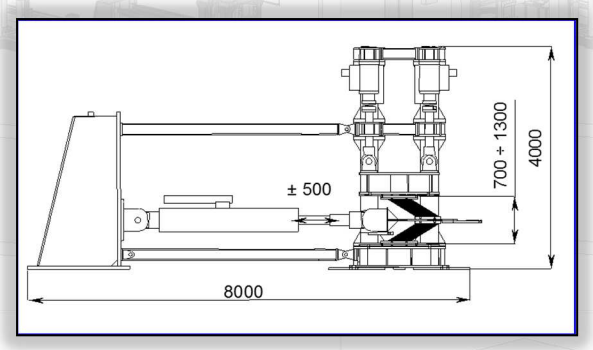
BI-AXIAL MACHINE FOR SHEAR TESTS ON STRUCTURAL ELEMENTS

TECHNICAL FEATURES:

Load frame with high stiffness able to apply simultaneously compression and shear loads orthogonally oriented. 2-dimensional panels (walls) or structural elements (seismic isolators) can be tested.

Long working strokes can be applied to test low elastic modulus components (elastomeric bearings).



Vertical force: 4 MN

Horizontal force: 2 MN

Vertical stroke 500 mm

Horizontal stroke 1 Mt

Column spacing: 1200 mm

Max specimen height: 1300 mm

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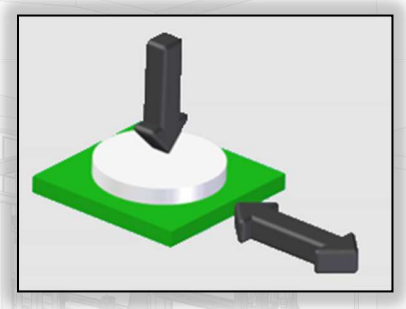
TEST SYSTEM MOD 10-025-0000 FOR CHARACTERISATION OF MATERIALS FOR SLIDING

The Italsigma 10-025-0000 is a machine designed for the determination of the coefficient of friction between sliding elements of structural supports, in accordance with EN 1337-2: 2002.

It consists of the following elements:



- frame 4 columns dimensioned for a vertical force of 500 kN
- vertical axis hydraulic actuator able to apply a maximum force of 500 kN, stroke 100 mm.
- horizontal axis hydraulic actuator able to apply a maximum force of 100 kN, stroke 100 mm.
- No. 3 transducers of strain gauge force for the vertical axis, F.S. 500 kN
- horizontal transfer units equipped with linear roller bearings, horizontally connected to the actuator;
- strain gauge force transducer for the horizontal axis, F.S. 100 kN
- containment pan lubricant
- specimen of Teflon refrigeration system between -50 ° C and + 70 ° C with a cryostat system

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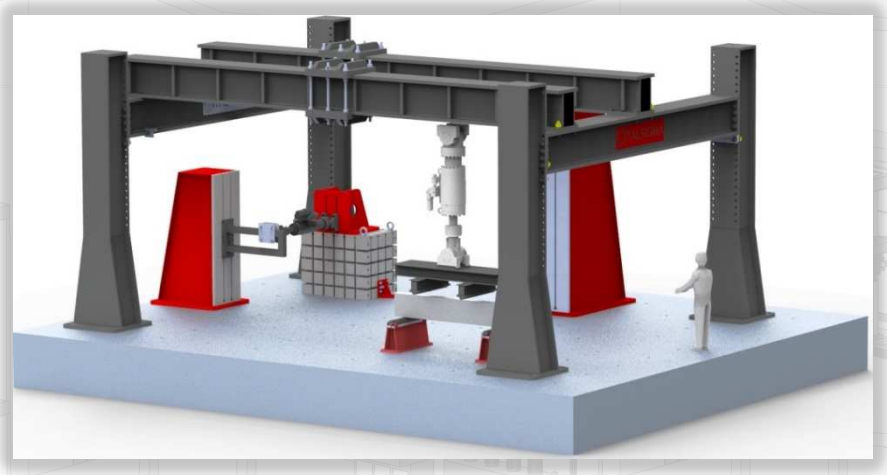
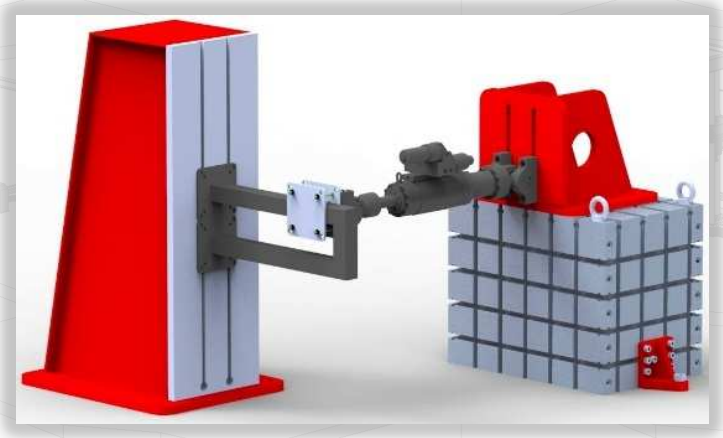
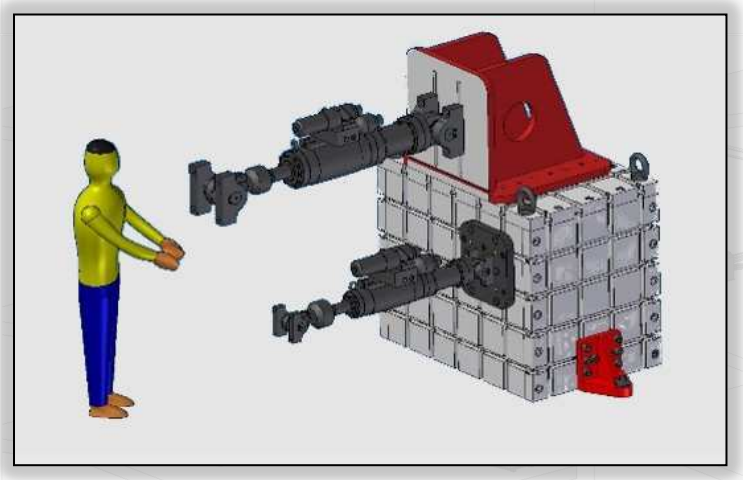
CUSTOMIZED
LOAD FRAMES





CLAMPING SQUARES
WITH T SLOTS

MANUFACTURED WITH
MAXIMUM PRECISION



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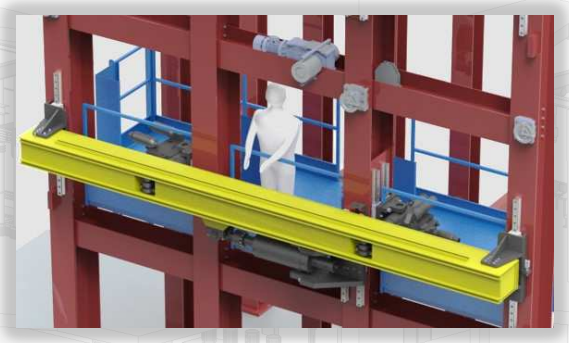
TESTS ON SEISMIC CONTINUOUS FACADES GLASS FOR BUILDINGS

The mechanical testing system, in addition to traditional air-water-wind tests necessary for the certification of continuous façades, allows to assess the seismic response in both static and dynamic conditions of continuous façades, thanks to the presence of seismic beams can urge the façade system in the plane and out of the plane.



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BIAXIAL MACHINE FOR TESTING OF PENDULUM SEISMIC ISOLATORS

High stiffness chassis able to apply simultaneously vertical compression forces and cyclic horizontal displacements, to test earthquake resistant devices “pendulum” type.

N° 4 vertical servo cylinders 7.500kN

N° 1 horizontal servo cylinders 3.000 kN

N° 2 sledges horizontal scroll with a low friction either for loads until 3000 kN

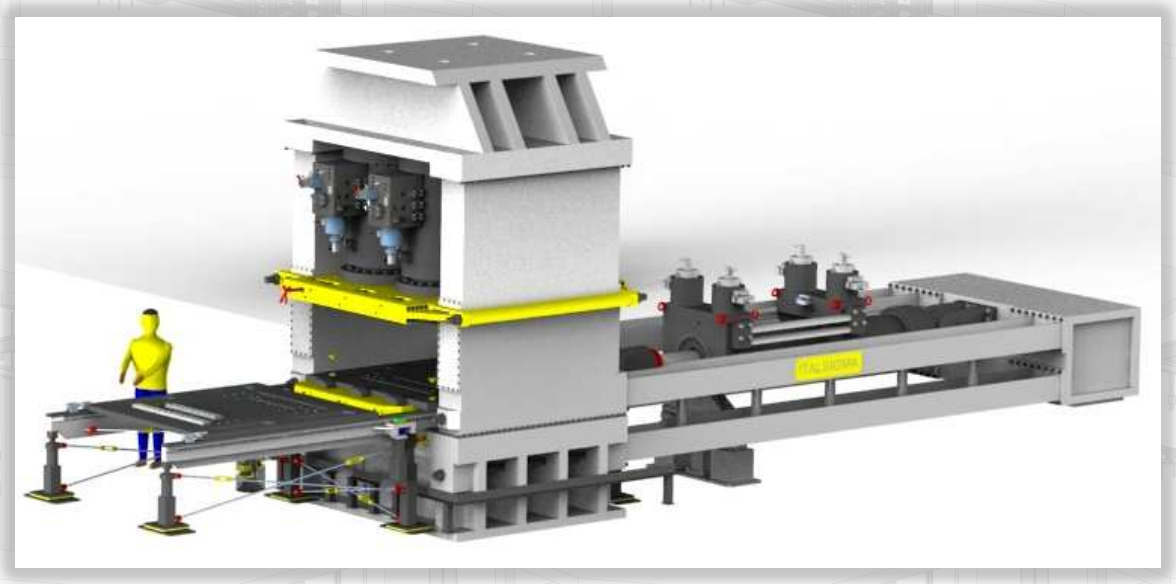
Vertical force :30.000 kN

Horizontal force 3000 kN

Vertical stroke: 0,7 m

Horizontal stroke 1 m

Useful space for the sample:1500 x 1500 mm



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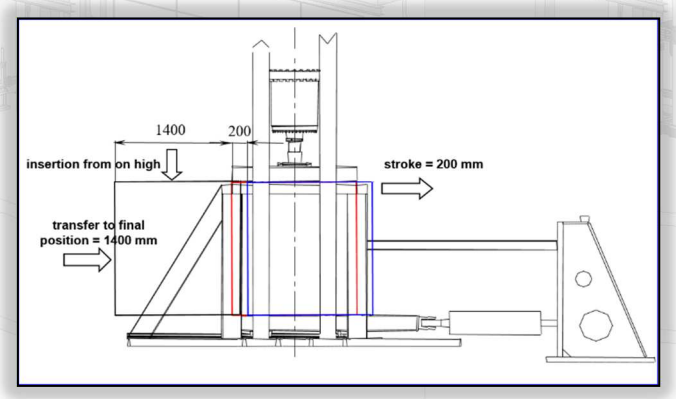
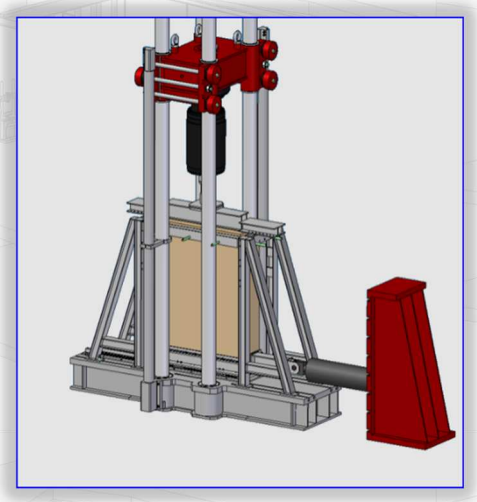
TEST SYSTEM FOR WALL STRUCTURES

WALL CONSTRAINING LOAD FRAME

The system is made by a basement connected to a frame for vertical load. On the load base 4 roller bearings are located. The upper side of the wall under test is constrained to simulate a hinge or a jam.

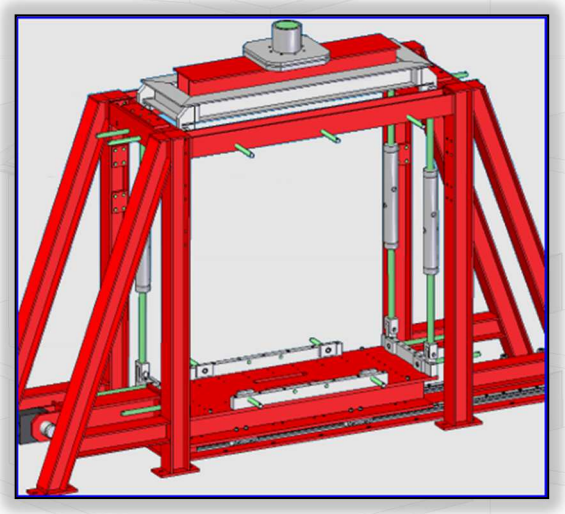
The lower side of the wall stands on the roller bearings in order to apply the shear force for distortion.





The maximum vertical load is 500 KN.

To make easier the positioning, the wall is inserted from on high, then (by means of roller bearings) it is transferred to the final position.



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FPF 20 – 250 LOAD FRAMES FOR TENSILE-COMPRESSIONS TESTS

Load frames are developed and produced for rated loads up to 250 kN. Special models are manufactured for special applications, for example for higher rated loads or lateral load frames.

The load frames are equipped with a stationary lower cross-head, two round steel columns which guarantee precise guiding of the moving upper crosshead. The height of the upper crosshead is easily adjustable manually or via hydraulic lifting cylinders. The crosshead is mechanically clamped on the columns. The dual acting servo-actuator is incorporated in the lower crosshead.

The servo valve which controls the oil flow to the actuator is mounted directly on the actuator.

The load cell, which is directly attached to the upper crosshead, complements the extremely rigid load frame.

Force rating	kN	20	50	100	250
Column spacing	mm	530	530	530	635
Max specimen height	mm	1165	1165	1165	1165
OVERALL DIMENSIONS					
height	mm	2300	2300	2515	2515
width	mm	600	700	890	890
depth	mm	610	610	610	765
weight	kg	360	400	550	800

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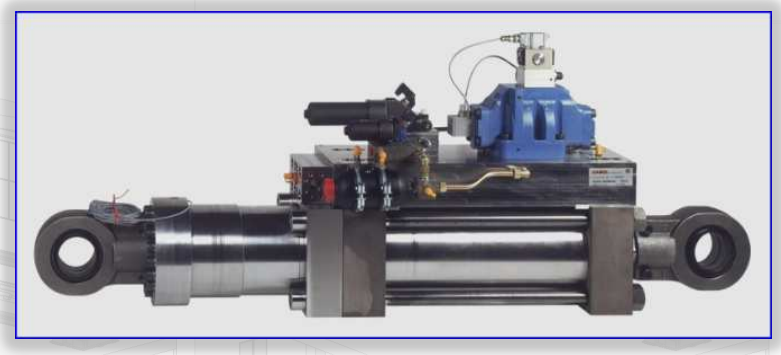
SERVO-CYLINDERS

The range of high duty linear servo-actuators has been specifically designed to meet the exacting requirements of the most demanding test laboratory.

Low-friction design ensures a high level of control accuracy and reliability.

A modular test fixture system permits the quick design and assembly of associated test structures, including a full range of integrated hydraulic manifolds, transducers and mounting attachments.

A range of manifolds enables to use different servo valves depending on the actuator performance required. The valve and associated manifold are mounted directly on the actuator to minimize the volume of oil between valve and piston. Besides the manifold provides mounting facilities for pressure and return accumulators, an oil filter and safety interlock valves.



Test load	**kN**	250	500	1000
Nominal pressure	**bar**	207	207	207
Stroke	**mm**	da +/- 50 a +/- 100		

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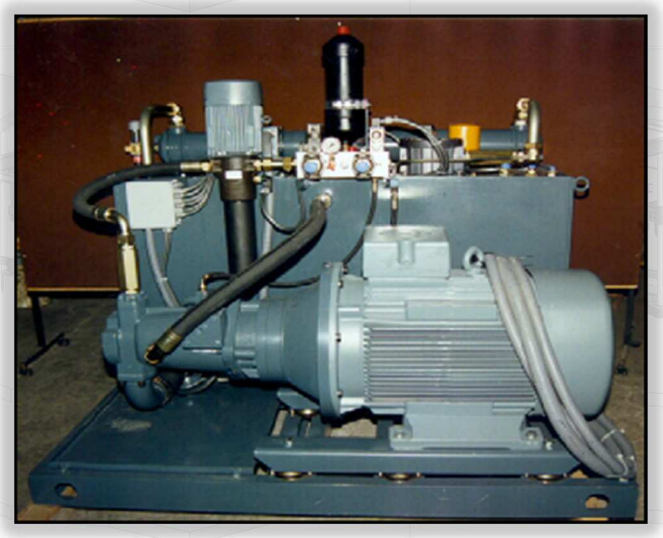
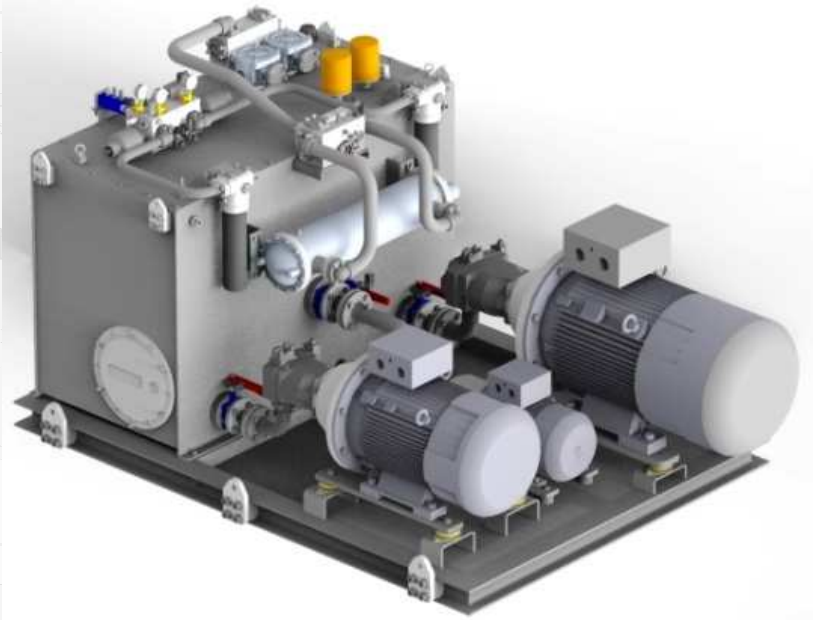
HYDRAULIC POWER UNITS

The range of hydraulic power units (HPU) incorporates only the highest-grade components and is specifically designed to satisfy the most demanding fatigue testing applications.

Designed for continuous operation, safety interlocks for fluid level, fluid temperature and filter condition ensure that the power unit is always protected.

Great emphasis is placed on filtration to ensure the maximum reliability of both hydraulic power unit and testing equipment. This is achieved by incorporating only high-quality filter assemblies accurately rated for the system.





Optional accumulator can be fitted to the main output for dampening pulsations and noise reduction.

The HPUs are designed to interface with the electronic control system. This connection permits remote control of the hydraulic supply and comprehensive safety monitoring for unattended operation.

Pump delivery	**l/min**	300	400	500
Nominal pressure	**Bar**	210*	210	210
Power	**kW**	140	190	240
Reservoir capacity	**litre**	1500	2000	2500
Cooling water flowrate	**l/min**	450	600	750
Weight	**kg**	4500	6000	7500
Dimensions	**m**	3×2×1.5	3×2×2	3×2.4×2.5

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HYDRAULIC POWER UNITS
SILENT VERSION

The SILENT version is designed and executed to specifically to guarantee a very low noise level in a very compact design. With an amazing 58 dB(A) sound level and a negligible heat dispersion it's possible to put the hydraulic unit directly in the laboratory or office, eliminating the need for pump room that's expensive to build, air ventilation system and cleaning.

All the hydraulic components are designed to operate up to 280 bar hydraulic pressure.

Special liquid cooled electric motor immersed in the oil reservoir and variable displacement pump are for maximum efficiency.

All the hydraulic components are packaged and integrated on the reservoir to obtain a compact enclosure and allow an easy maintenance.

The offline circuit for cooling and filtration ensure the maximum reliability of both hydraulic power unit and testing equipment.

Designed for continuous operation, safety interlocks for fluid level, fluid temperature and filter condition ensure that the power unit is always protected.

The HPUs with touch screen control panel are designed to interface with the electronic control system. This connection permits remote control of the hydraulic supply and comprehensive safety monitoring for unattended operation.

Pump delivery	**l/min**	50	100	200
Nominal pressure	**Bar**	210*	210	210
Power	**kW**	25	50	95
Reservoir capacity	**litre**	600	800	1400
Cooling water flowrate	**l/min**	60	110	290
Weight	**kg**	700	1000	1500
Dimensions	**m**	2×1×1.5	2×1×1.5	2.2×1.4×1.7

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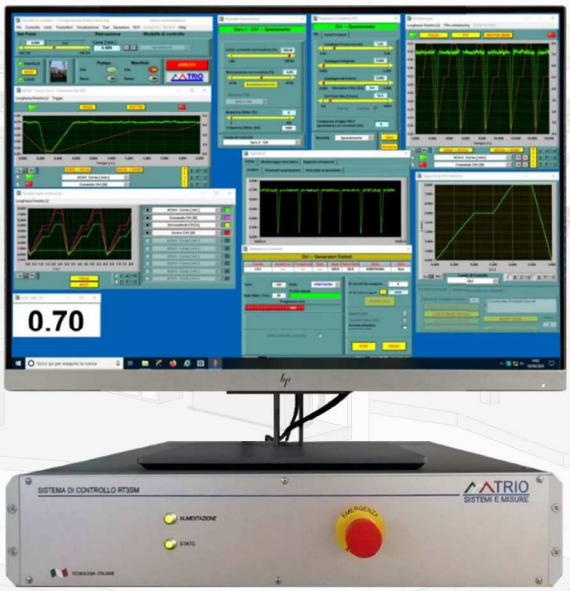
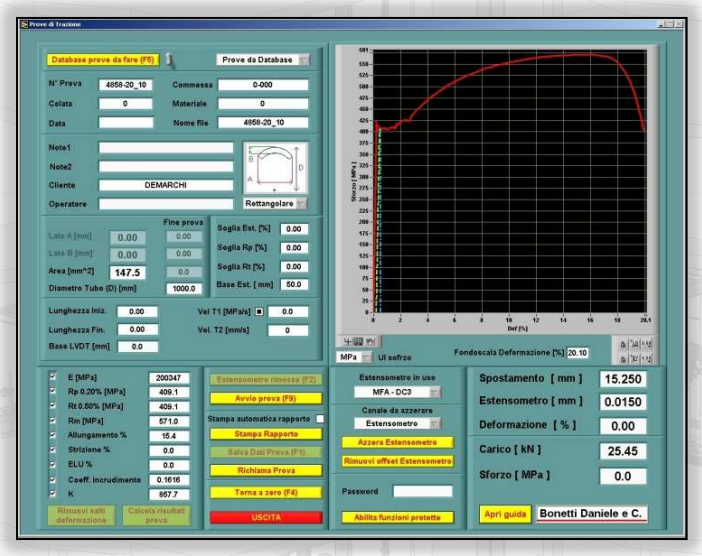
ELECTRONIC CONTROLLER RT3

The Electronic Controller RT3 is the result of a custom design based on the integration of advanced technology components, reliable, easy to find and to replace with the same that the market will offer in the more advanced versions.

It's built on the Real Time National Instrument hardware platform and the software is entirely developed in LabVIEW. In particular, RT3 system is made up by an embedded computer and by one or more acquisition and generation boards that are selected and combined according to the specific features of the final application. The different components are available on the market and are easy to find in case of update or of an improbable failure.



The RT3 control system is managed by an application software that works with a Real-Time operating system (working in deterministic mode without the inconvenient of the latency times caused by Windows environment) and is interfaced by an Ethernet link with a normal PC in a Windows environment, where reside application software developed with LabVIEW for the system management, the user interface, the configurations database, the data acquisition and operator front-end.



Into the RT3 system there are the electronic modules for the transducer conditioning, the drive of the servo valves and the management of the hydraulic devices.

According to these ideas and considering the versatility of his software, the system will maintain its value and its actuality in the years to satisfy the growing future operative needs. The particular initial configuration of RT3 can be upgraded to increase the number of control and acquisition channels to build complex testing devices.

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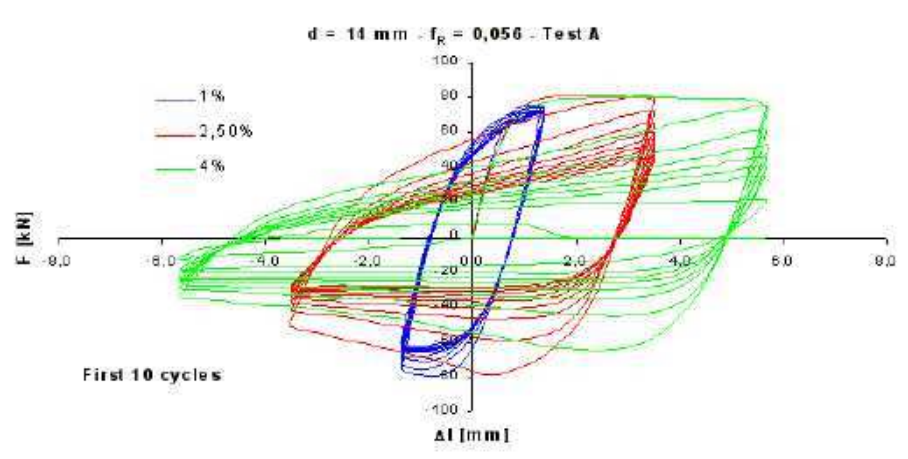

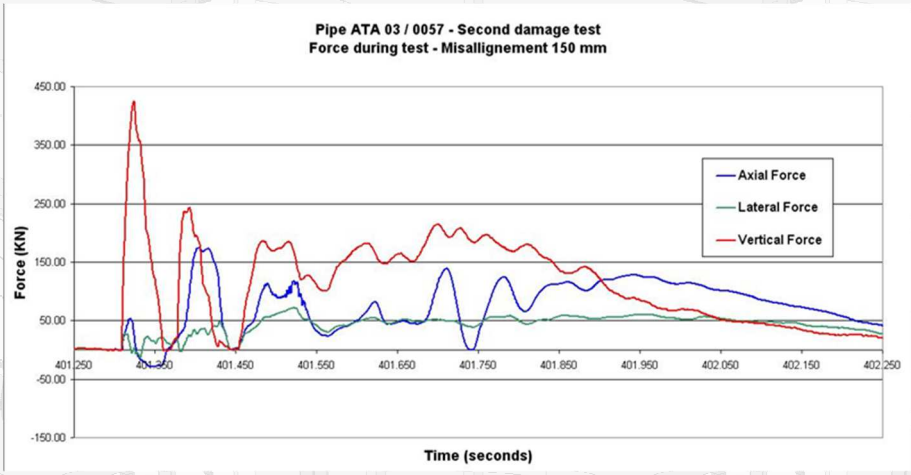

Features:

- Real Time National Instrument hardware platform
- software developed in LabVIEW in Windows environment
- Acquisition and generation boards with a resolution of 16 bits (18 bits optional).
- Flexible configuration for more control channels according to the selected hardware (from 1 to 4).
- 32 acquisition channels (optionally expandable)
- Add on software for specific testing request
- Control of hydraulic and/or electromechanical testing systems
- Automated start-up and shut-down sequences
- Continuous data acquisition with high response real-time graphics
- Integrated safety system

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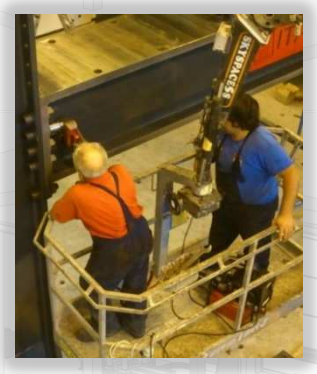
SERVICES

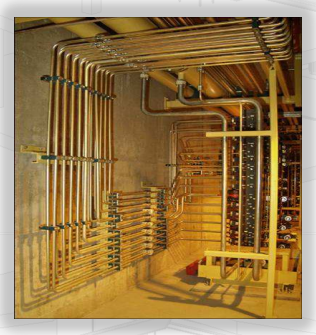
Global service

Assembly of mounting hydraulic pipe and **testing** of the system plan.
Verification of the general conditions acceptable for correct use of the operations of **Internal and external cleaning of the tank** and shift of hydraulic oil with replacement filter elements and control and charging of accumulators.
Revision of the servo valves and spare parts.
Check and calibration high and low pressure.



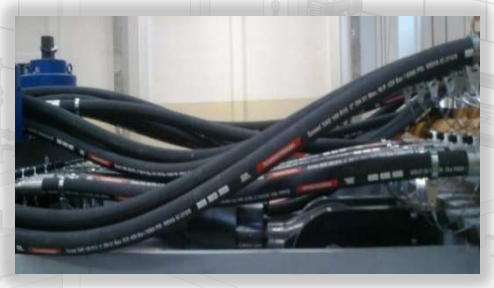
After Sales Service

One of our major strengths is the ability to **provide "turnkey" systems**.
After sales service is an integrant part of co-operation process with Italsigma.
Our team, made of experts in mechanics, hydraulic and electronics **ensure that the installation is totally available**.



Scheduled maintenance

Scheduled preventive maintenance is the key to obtain high productivity.
It significantly reduces cost and machine downtime, ensure reliability and prolongs the life of part, system and installations.



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REFERENCES: Universities - Industries - Research Centers

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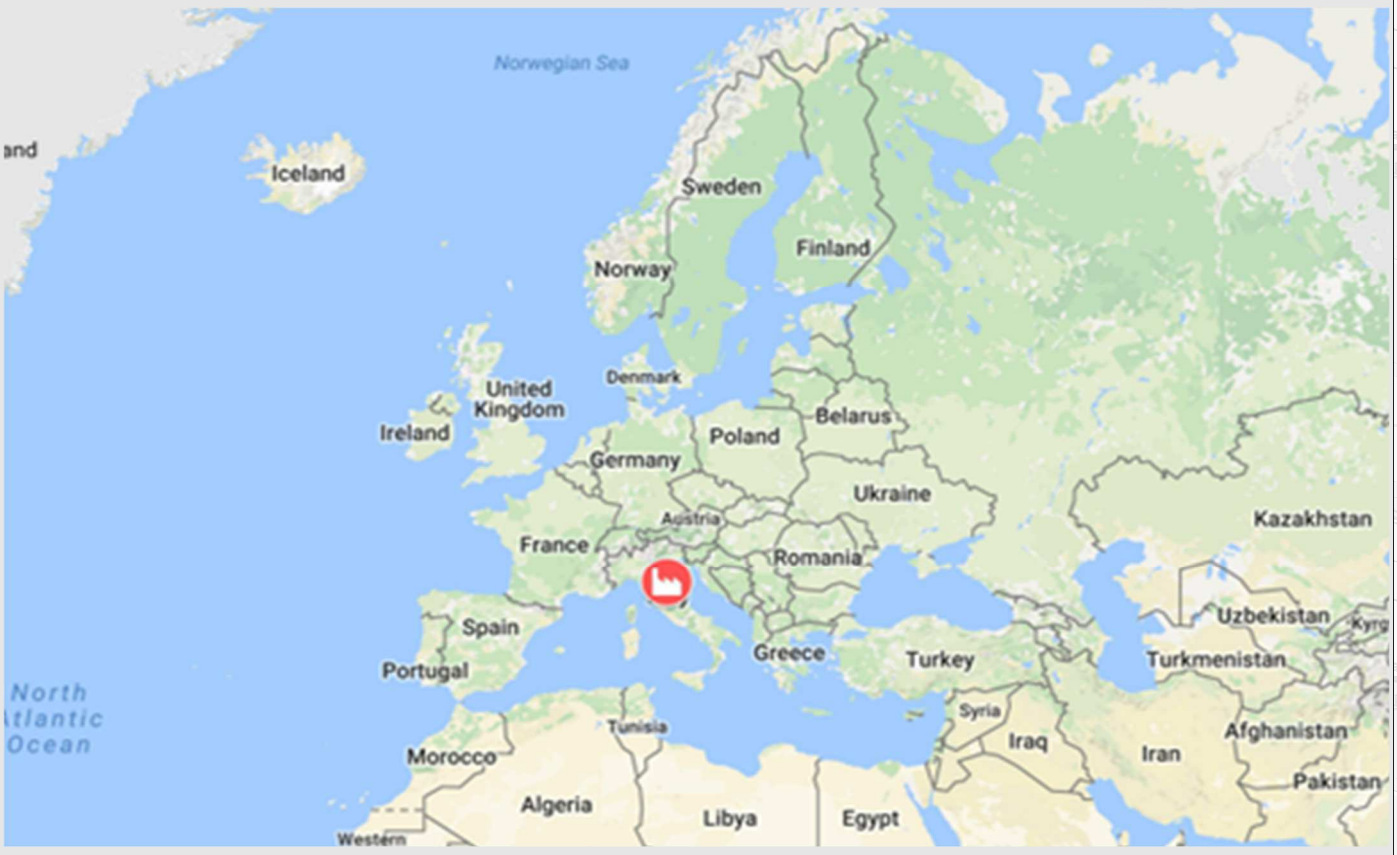

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