



ITALSIGMA

**MACHINES FOR THE
BIOMEDICAL INDUSTRY**

 **Giuliani Federico**
group



TOGETHER IS BETTER

ITALSIGMA S.r.l. - Via Masetti, 50 - 47122 Forlì (FC) ITALY

Tel: +39 0543 796603 - Fax: +39 0543 750897

[www. Italsigma.it](http://www.Italsigma.it) - info@italsigma.it

ITALSIGMA S.R.L.

TOGETHER IS BETTER

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.

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.

Thanks to our work we have developed an innovative system for mechanical tests related to the kinematics of the human spine.

The regional commission has **granted us the highest score** for our work:

"...the Committee has assessed the project as excellent: its objectives and realization methodology has great technical and scientific importance. Even if the impact of the market is currently not expected to be very high in numbers, a potential product will improve the patients' quality of life and the quality of the products of companies dealing with prostheses and implants"

1975

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

1995

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

2013

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

2015

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



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

Handwritten signature



1960

Foundation of the company Giuliani S.n.C.

1982

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

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 testing machines at the AIM conference

2016

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

ITALSIGMA S.R.L.

TOGETHER IS BETTER

AT CUSTOMER SERVICE FROM PLANNING TO ASSISTANCE

We are suppliers since over 20 years since laboratories in biomedical sector:



POLITECNICO
DI MILANO



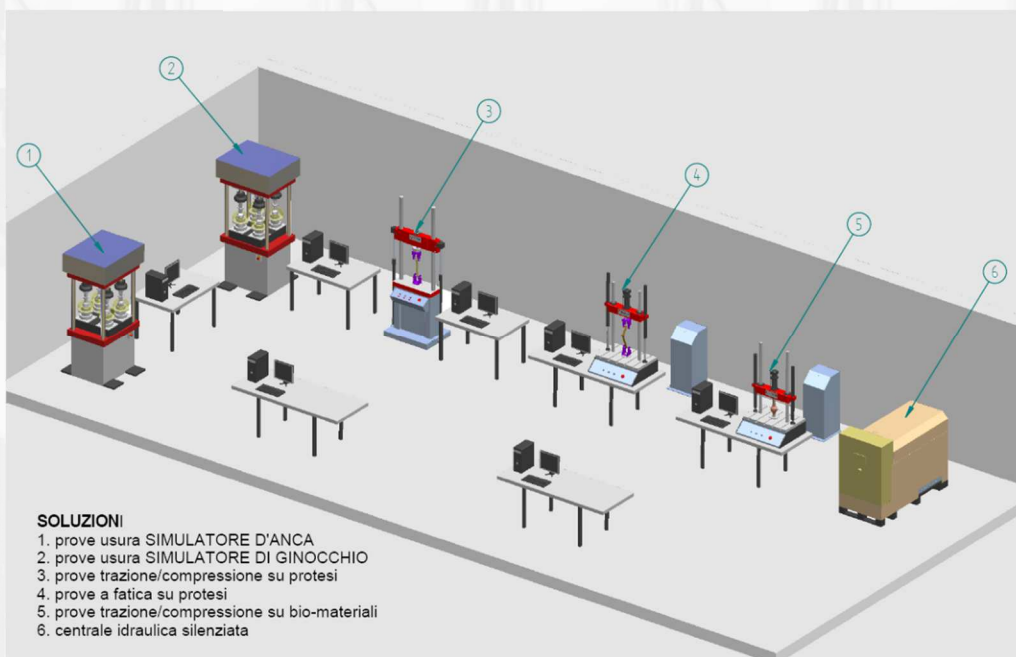
UNIVERSITÀ DEGLI STUDI
DI MESSINA



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Istituto Ortopedico Rizzoli di Bologna
Istituto di Ricovero e Cura a Carattere Scientifico



SOLUZIONI

1. prove usura SIMULATORE D'ANCA
2. prove usura SIMULATORE DI GINOCCHIO
3. prove trazione/compressione su protesi
4. prove a fatica su protesi
5. prove trazione/compressione su bio-materiali
6. centrale idraulica silenziosa

Since 1982 Italsigma operates in test materials by designing and building custom systems to submit several products or to test samples provided by law or for scientific research purposes.

The production program contemplates a broad spectrum of use testing machines, extremely flexibles thanks to the complete programmability and to the modular design.

The Italsigma strength point is the installation phase, setup and assistance, fundamental to achieve the objectives of our client.

ITALSIGMA S.R.L.

TOGETHER IS BETTER

TESTING MACHINE ML 2/10/UP-BS WITH TWO COLUMNS WITH ELECTRIC ACTUATOR IN UPPER CROSSHEAD

Technical specifications:

Special load frame two columns, complete with bench.

Strong compact for a ± 10 kN dynamic axial load:

- Maximum height : 1.5 m
- Overall dimensions in plan : (6500x450) mm
- Between columns : 450 mm
- Overall height for the sample : 500 mm
- Base useful support of the machine : (400x260) mm

Tour of painted steel support with four adjustable feet:

- Maximum height : 700 m
- Overall dimensions in plan : (1050x570) mm

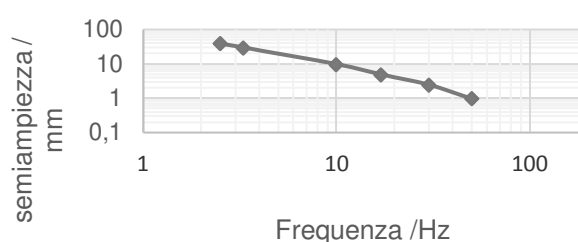
Electric actuator for static and dynamic tests,
with the following benefits;

- Maximum dynamic force : ± 10 kN
- Maximum continuous static force : ± 5 kN
- Stroke : 100 mm



Load	kN	20	50	100	250
Gap between the columns	mm	530	530	530	635
Net height vertical	mm	1165	1165	1165	1165
DIMENSION					
Height	mm	2300	2300	2515	2515
Width	mm	600	700	890	890
Depth	mm	610	610	610	765
Weight	kg	360	400	550	800

Prestazioni Dinamiche



ITALSIGMA S.R.L.

TOGETHER IS BETTER

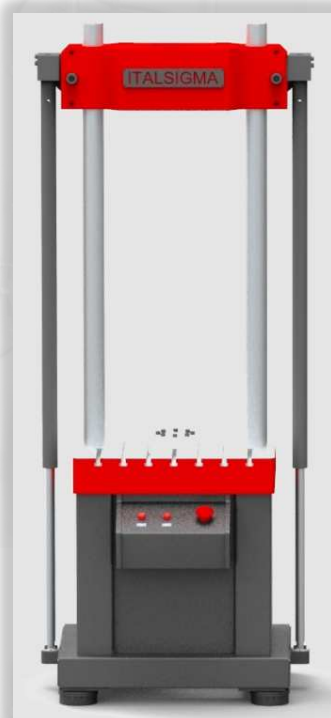
FRAMES FPF 20 – 250

FOR TEST OF TRACTION - COMPRESSION

The FPS frames are developed for nominal loads up to 250 kN. Customized versions are possible for special applications, for example higher loads or frames for side loads.

The load frame consists of a lower base which can be or not grooved, 2 cylindrical columns with high accuracy and rigidity and a movable upper crosspiece. The upper crosspiece can be moved and locked on the columns hydraulically to vary the working height.

The double-acting servo cylinder is fixed on the base and is equipped by a servo valve providing high dynamic performance. The load and position controls are made through load cell and high precision LVDT.



Load	kN	20	50	100	250
Gap between the columns	mm	530	530	530	635
Net height vertical	mm	1165	1165	1165	1165
DIMENSION					
Height	mm	2300	2300	2515	2515
Width	mm	600	700	890	890
Depth	mm	610	610	610	765
Weight	kg	360	400	550	800

ITALSIGMA S.R.L.

TOGETHER IS BETTER

TORSIONAL MACHINES

High stiffness frame for torsion testing on femoral prosthesis. The load is generated by a motor controlled electronically on the torsion angle.

The lower table is rotating and can apply a pre-load on the prosthesis.



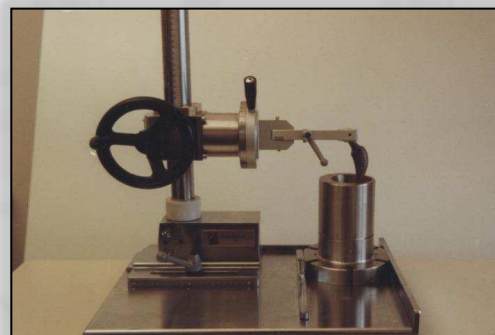
ITALSIGMA S.R.L.

TOGETHER IS BETTER

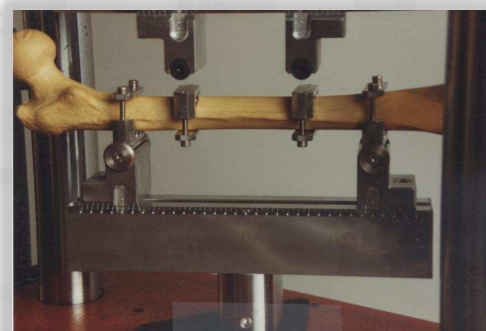
ACCESSORIES FOR THE GRIPPING

MANIPULATOR FOR FEMORAL PROSTHESES:

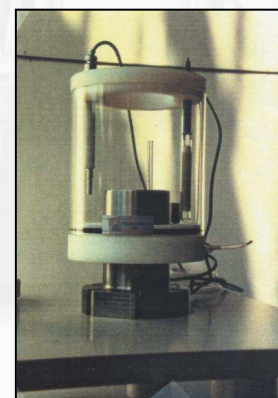
It locks the head of the articulations in order to maintain the desired orientation during the various insertion stages.



GRIPPING FOR BENDING TEST 4 POINT ON FEMORAL PROSTHESIS



GRIPPING FOR TESTS ON HIP PROSTHESIS APPLICATION OF LOAD DEVICE WITH SHOES BALL FOR ELIMINATION OF COMPONENTS CROSS HEATING SYSTEM AND AERATION OF SOLUTIONS FOR PERFORMANCE OF TESTS ON HEARING FEMORAL.



ITALSIGMA S.R.L.

TOGETHER IS BETTER

HYDRAULIC POWER UNIT

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.

Features:

- long life
- low maintenance costs
- comprehensive safety monitoring
- selection of sizes to suit test
- compact modular design
- high-strength filters
- water or air blast cooling option
- comprehensive safety interlocks for unattended running
- off-line cooling available
- local or remote operation
- optional acoustic hood for low noise levels



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

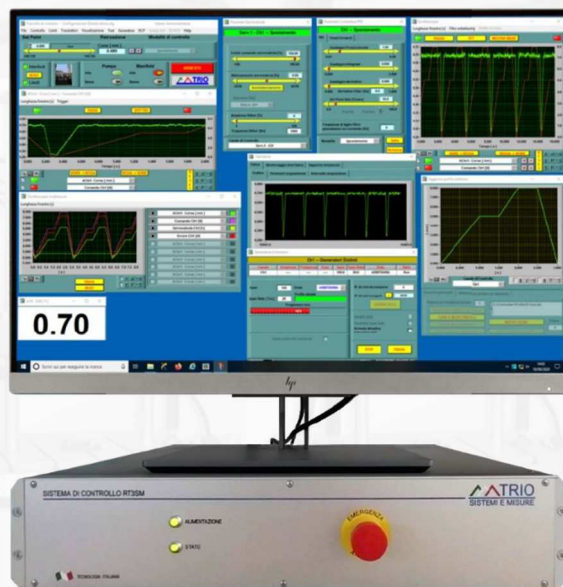
ITALSIGMA S.R.L.

TOGETHER IS BETTER

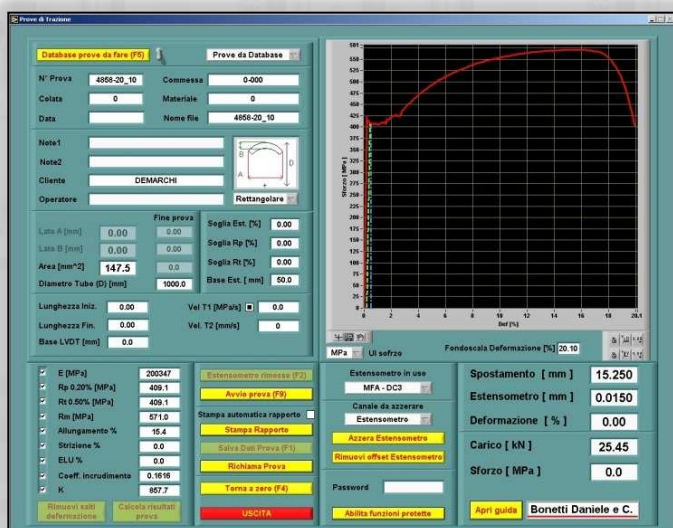
ELECTRONIC CONTROLLER RT3

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.

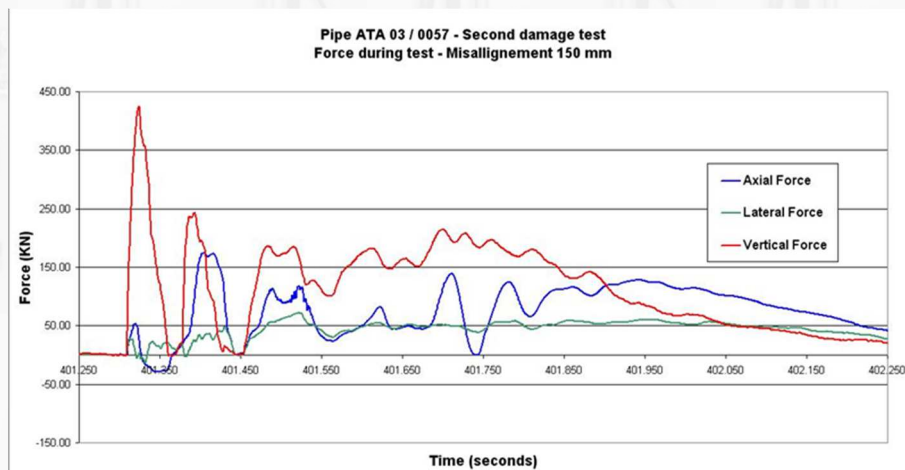
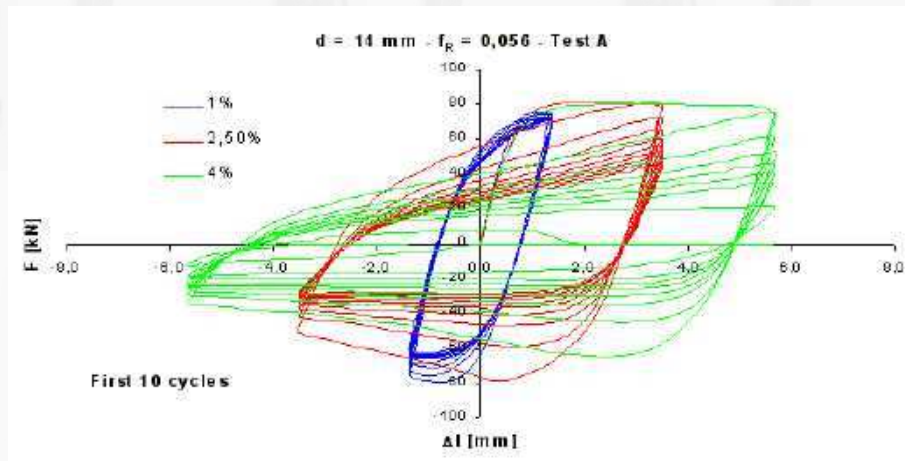


Into the RT3 system there are the electronic modules for the transducer conditioning, the drive of the servo valves and the management of the hydraulic devices.

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.

ITALSIGMA S.R.L.

TOGETHER IS BETTER



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

ITALSIGMA S.R.L.

TOGETHER IS BETTER

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**.



ITALSIGMA S.R.L.

TOGETHER IS BETTER

REFERENCES: Universities - Industries - Research Centers





Italsigma S.r.l.

via Antonio Masetti, 50
47122, Forlì (FC), Italy

Email: info@italsigma.it

Phone: +39 0543 796603