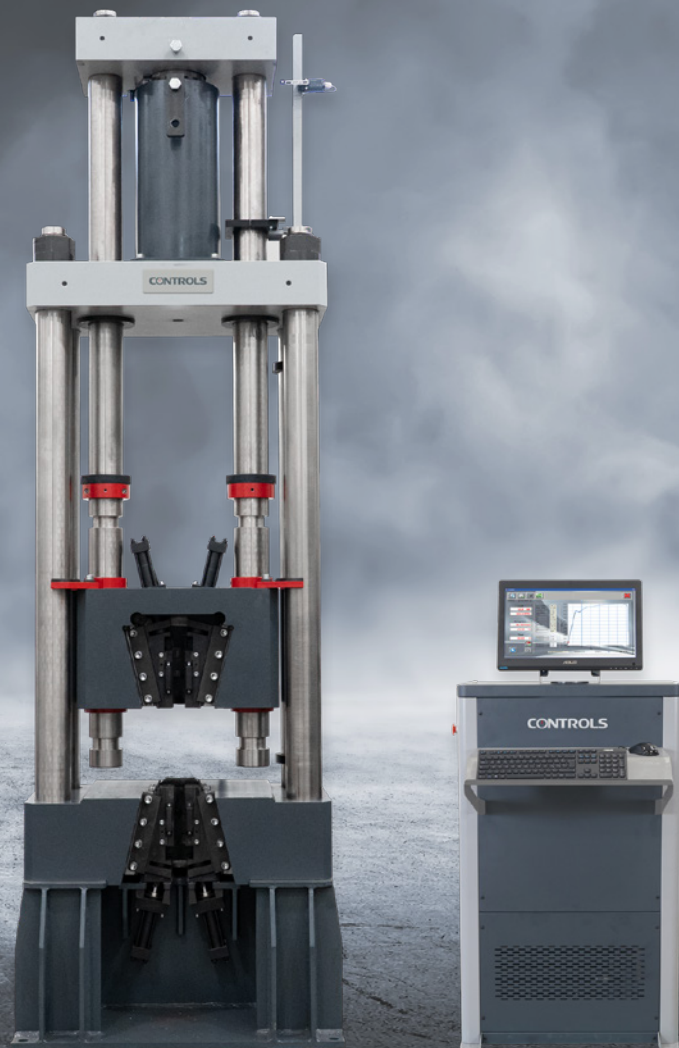


CONTROLS

**CONSTRUCTION
MATERIALS
TESTING**

C0822

1200kN Tensile Testing Machine



www.controls-group.com

Introduction to C0822

C0822 is a high-performance and versatile tensile testing machine, used for tests on steel products such as rebars, flats, wire strands, nuts and bolts. Thanks to its wide vertical daylight, piston stroke and a nominal capacity of 1200kN, it allows for reliable tests onto critical specimens and is the ideal system for high volumes of samples and intense operational conditions. C0822 features servo-hydraulic technology through HPU200 power unit and computer-based control and data processing thanks to an all-in-one PC with integrated software.

IDEAL FOR THE CONSTRUCTION INDUSTRY

suitable to perform tensile tests onto steel rounds and flats, wire strands, nuts and bolts, electro-welded nets, full range of accessories available.

RUGGED FOUR COLUMNS FRAME

Extremely rigid frame with four fixed columns. Three selectable crossbar positions to test a wide range of specimens.

EASY SPECIMEN INSERTION

Specimens are frontally inserted between dedicated grips which can be independently opened or closed via an ergonomic key-panel.



HANDY GRIPS INTERCHANGE

Grips are equipped with convenient handles for quick insertion and removal inside the tensile jaws and are fixed in position through a simple locking mechanism, without need for complex manual operations.

HIGH ACCURACY LOAD CELL

high-precision load cell, Class 1 to EN ISO 7500-1.

SECOND UTILITY AVAILABLE

On request, console HPU200 can be upgraded for connection to an additional compression frame up to 5000kN in capacity, for tests onto concrete, cement and masonry units.

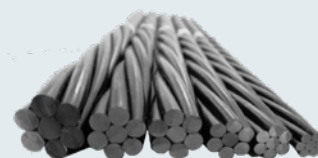
SOFTWARE PACKAGES INCLUDED

Integrated software packages to perform a wide range of tests onto steel and other construction materials.

Steel strands in construction industry

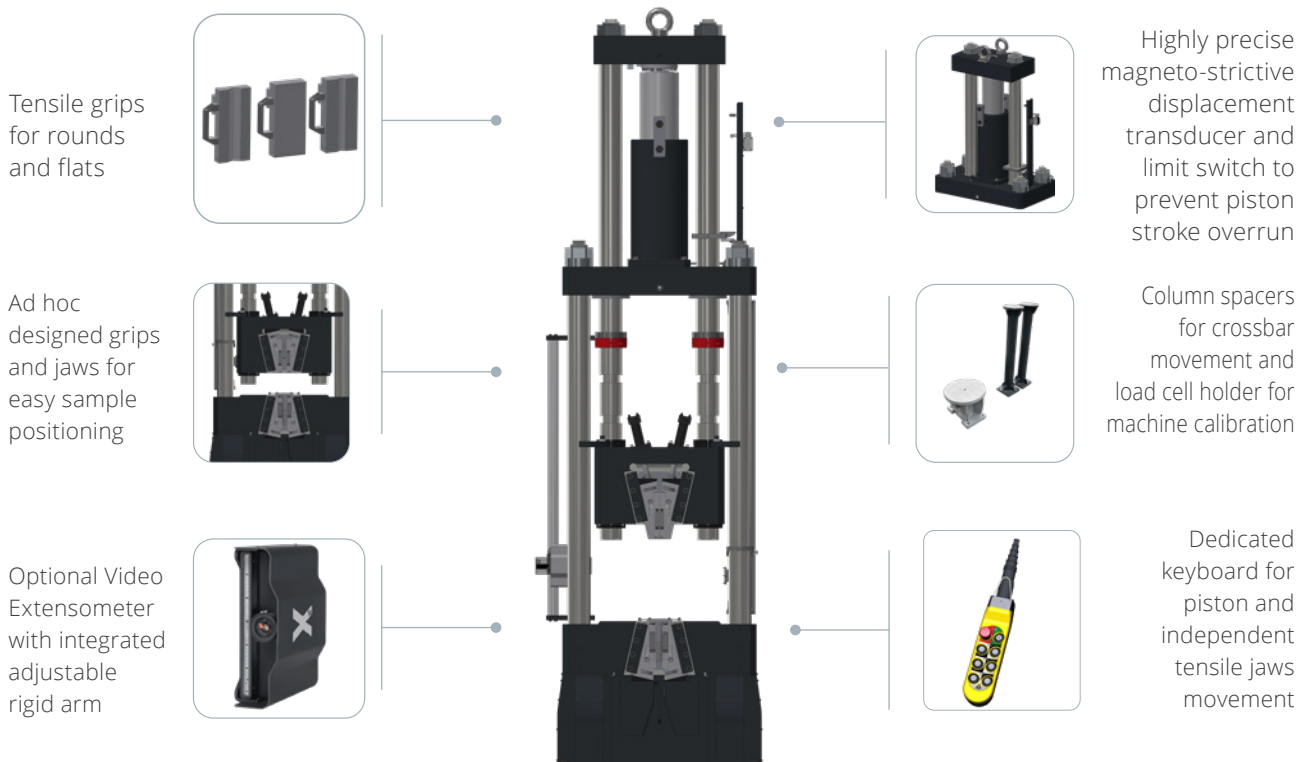
Steel strands are composed of twisted steel wires used to reinforce concrete in constructions. There are several types of steel strands that are used for different applications to increase performance of buildings (as in post-tensile structures).

The new C0822 1200kN machine has ad-hoc designed jaws and grips to test wire strands 12.8mm and 15.2mm in diameter according to EN ISO 15630-3, preventing specimen slipping and guaranteeing reliable results even for long specimens.



Technical Features of C0822

- **Nominal capacity of 1200kN**, to accommodate failure of high strength materials such as tempered steel.
- **Horizontal daylight of 710mm**, to guarantee necessary operational space for sample positioning and handling.
- **Open four columns rigid structure** without side panels, for maximum visibility during operation and accessibility before and after the test.
- **Three selectable crossbar positions**, for a minimum vertical daylight between jaws of respectively 155/280/490mm.
- **Simplified crossbar movement** employing piston stroke. Positioning performed using two spacer columns (included) and locking on dedicated column grooves through handy half-rings.
- **Real piston stroke of 520mm**, which combined with jaws' length of 240mm allows to test samples up to 1400mm in length.
- **Advanced safety system** with limit switch and mechanical bumpers to avoid piston over-travel due to failure of long and high-strength specimens.
- **Each grip is moved through a dedicated piston**, in order to minimize undesired lateral stresses. Synchronization between pairs of grips is ensured by connecting metallic plates, so that symmetric gripping on the specimen is always guaranteed.
- **Five sets of grips**, for round specimens 10/26mm, 28/40mm and 42/50mm (optional) in diameter, flat specimens 90x30mm (WxT), wire strands 12.8mm and 15.2mm in diameter (optional).
- **Integrated magneto-strictive transducer** to measure crosshead displacement.
- **Video Extensometer** available as option, for contactless measurement of radial and longitudinal extension of steel specimens. The accessory includes rigid support arm for stability during test execution and advanced Video Extensometer software integrated with CONTROLS' Software.



Technical Specifications

Code	C0822	C0824	C0822/FR
Nominal piston travel	460 mm	460 mm	460 mm
Maximum piston travel	520 mm	520 mm	520 mm
Grips for rounds (diameters)	10/26 mm, 28/40mm, 42/50mm (opt.)	10/26 mm, 28/40mm, 42/50mm (opt.)	10/26 mm, 28/40mm, 42/50mm (opt.)
Grips for flats (W x T)	90 x 30 mm	90 x 30 mm	90 x 30 mm
Grips for wire strands (diameter)	12.8 and 15.2 mm (opt.)	12.8 and 15.2 mm (opt.)	12.8 and 15.2 mm (opt.)
Tensile jaws length	240mm	240mm	240mm
Min. vertical daylight (L - M - H)	155 - 280 - 490 mm	155 - 280 - 490 mm	155 - 280 - 490 mm
Max. vertical daylight (L - M - H)	615 - 740 - 950 mm	615 - 740 - 950 mm	615 - 740 - 950 mm
Horizontal daylight	710 mm	710 mm	710 mm
Max. piston speed	500 mm/min	500 mm/min	X
Load resolution	0.01 kN	0.01 kN	0.01 kN
Crosshead displacement resolution	0.01 mm	0.01 mm	0.01 mm
Machine Class 1 range	120 - 1200 kN	120 - 1200 kN	X
Frame size (W x D x H)	775 x 1050 x 3530mm	775 x 1050 x 3530mm	775 x 1050 x 3530mm
Frame height (with max piston stroke)	4050mm	4050mm	4050mm
Frame weight	4700 Kg	4700 Kg	4700 Kg
Console size (W x D x H)	800 x 900 x 1550 mm	800 x 900 x 1550 mm	X
Console weight	180 Kg	180 Kg	X
Magneto-strictive transducer included	Yes	Yes	Yes
Full system footprint area (W x D)	1020 x 2070 mm approx.	1020 x 2070 mm approx.	X
Power supply	380V/50Hz/3Ph	220V/60Hz/3Ph	X

Standards

EN ISO 6892-1 | ISO 7500-1 | EN ISO 15630-1 | EN ISO 15630-2
 EN ISO 15630-3 | ASTM A370 | EN ISO 898-1 | UNI EN 15048

HPU200 Power Control Unit

The well-known and reliable control console HPU 200 features space-saving ergonomic design with small footprint and houses the hydraulic power unit, the electronic system and the PC to manage all the control functions.

- 131.000 points effective resolution
- Control frequency 250 Hz
- Sampling rate 250 Hz
- Closed-loop P.I.D.control
- 6 channels (one dedicated to crosshead displacement) to measure elongation/displacement/strain with potentiometric, conditioned LVDT and magnetostrictive transducers
- 4 channels for strain measurements with strain gauges
- Digital linearization of the calibration curve (multi-coefficient)
- Dual stage pump: centrifugal low pressure for fast approach automatically switching to radial multi-piston high pressure for loading
- Oil flow control by servo-controlled proportional valve and oil temperature controlled by air cooling system
- Console cabinet lined with soundproofing material for operator's comfort
- Hydraulic connection available for control of a second compression frame with capacity up to 5000kN



Management and Analysis Software

Software Packages

C0822 Tensile Testing Machine is supplied complete with Real Time Management user interface environment allowing:

- Remote control of the complete system for automatic test execution: zeroing, test execution.
- Storage of single and multiple tests.
- Printing of customized test reports for both single and multiple tests.
- Real time and deferred management of tests data and results, either in numeric or in graphic format.
- Language selection (Latin characters only).
- Units selection

DATAMANAGER Software

DATAMANAGER Software for compression, flexure and indirect tensile test on concrete, cement specimens and other construction materials. These tests can be performed with a second optional compression frame to be connected to console HPU200.

UTS Software

UTS Software Specifically designed for tensile testing under load/stress control and crosshead separation control, allowing:

- Simultaneous display of stress/time, stress/elongation %, elongation/time and stress/elongation.
- Possibility to overlap two elongation/stress graphs: one obtained with the included displacement transducer measuring crosshead separation travel and the other obtained with an optional extensometer.
- Elaboration of tension test results: tensile strength, yielding points, total and uniform elongation, elongation at break, elongation at maximum force, elastic modulus etcetera, all conforming to EN ISO 6892-1, EN 15630-1, EN 898-1 for steel rebars, flats, wire strands, nuts and bolts, electro-welded nets.

Introduction to the Video Extensometer

The Video Extensometer represents the frontier of technology in the field of deformation measurements. Utilizing the most advanced techniques of Digital Image Correlation (DIC), this instrument offers unparalleled precision in detecting deformations without direct contact with the sample being analyzed.

Precision in the Finest Details:

The Video Extensometer excels in measuring dimensional deformations, both axial and radial, without the need for markings or references on the analyzed material. This capability makes it ideal for monitoring the elongation of a variety of specimens flat, round, or ribbed, up to the point of rupture.

Broad Applicability on Diverse Materials:

Thanks to its advanced technology, the Video Extensometer is perfectly suited for use on a wide range of materials, including those on which traditional extensometers or strain gauges cannot be applied. From steel products, composite materials such as FRP (Fiber Reinforced Polymer) and FRCM (Fiber Reinforced Cementitious Matrix) to technical fabrics and geosynthetics like geonets and geogrids, the Video Extensometer adapts easily, ensuring accurate and reliable results in a multitude of application contexts.

Video Extensometer on C0822:

the Video Extensometer is mounted onto C0822 through a mobile rigid arm, to guarantee stability and the necessary freedom to focus the instrument. The Video Extensometer is provided with advanced imaging Software and is integrated into Controls' Software for data collection and analysis, with full compliance to EN 6892-1 and ASTM E8.



Technical Specifications

Technical data	2000 Series
Resolution	8.9 MPx
FPS at full view	32 Hz
Typical sampling rate	75 Hz
Measurement length class 0.5	220 mm
Measurement length class 1	440 mm
Measurement length class 2	880 mm
Interface	USB 3.0
Dimensions	221 x 187 x 80 mm
Horizontal daylight	950 mm
Weight	1.4 kg
Lensmount	C

Codes

Optional Accessories and Customization Options

C0822 is compatible with a wide range of accessories to customize the system for specific test requirements:

Tensile tests:

- Specimens up to 50mm in diameter
- Wire strands
- Nuts and bolts
- Inclined test on nuts and bolts
- Node shear resistance on electro-welded nets

Compressive and flexural tests (with suitable second frame):

- Compression on concrete cubes and cylinders
- Compression on masonry units
- Indirect Tensile Tests
- Splitting on concrete products and bricks
- Flexural tests concrete beams
- Modulus of Elasticity on concrete cylinders (with dedicated software)
- Displacement-controlled tests on fibre-reinforced concrete (with dedicated software)

Various:

- Video Extensometer
- Aluminium anti-sliding plates for wire strands
- Coaxial and universal extensometers
- Hydraulic connection for a second frame

Frame and Consoles

C0822	1200kN Tensile Testing Machine - 380V/50Hz/3Ph
C0824	1200kN Tensile Testing Machine - 220V/60Hz/3Ph
C0822/FR	1200kN Tensile Testing Machine - HPU200 power unit not included
C20H02	HPU200 power unit - 380V/50Hz/3Ph
C20H04	HPU200 power unit - 220V/60Hz/3Ph

Accessories

C0822/VE: Video Extensometer for contactless measurement of radial and longitudinal extension of steel specimens. Rigid support arm and advanced Video Extensometer software are included

C0822/50: set of four grips for tensile tests on round specimens with diameter 42/50mm

C0822/WS: set of four grips for tensile tests on wire strands with diameter 12.8mm and 15.2mm

C0822/NAB: set for tensile tests onto nuts and bolts to UNI EN 898-1, from M10 up to M30

C0822/INC: set of washers for inclined tensile tests onto nuts and bolts to UNI EN 898-1, from M10 up to M20, 4/6/10 degrees of inclination. To be used with C0822/NAB

C0901/20: grip for node-shear test onto electro-welded nets to UNI EN 15630-2

C0901/36: aluminium anti-sliding plates for wire strands. Set 50 pieces

C0954/C1: electronic universal extensometer to measure elongation on wires, flat and round specimens. To be removed before failure

C0961/H: coaxial electronic extensometer to measure elongation up to failure on round specimens 6/26mm in diameter

C0961/G: coaxial electronic extensometer to measure elongation up to failure on round specimens 16/40mm in diameter

C0961/E: coaxial electronic extensometer to measure elongation of wire strands up to failure

T10/2F: upgrading HPU200 power unit for connection of a second frame up to 5000kN capacity

CONTROLS Customer Care

As one of the longest established manufacturing companies in the world of Construction Materials Testing solutions, we are dedicated to supplying high quality, accurate, affordable, easy to use systems.

As a valued customer of CONTROLS, you will receive continuous, expert support and advice for your equipment. Furthermore, we can offer full installation and training in the correct operation of your CONTROLS equipment.

For support from our expert Customer Care Team, contact your local CONTROLS office / distributor or email customercare@controls-group.com.

For more information, please visit www.controls-group.com.

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