



DuraPro

**Hardness testing modules
for automated systems**

EMCO·TEST
YOUR FACTOR OF SAFETY.











Over 50 years of experience.

In the hardness testing segment.



Nowadays many new production plants and existing machines are developed and upgraded with modular components. As the hardness testing section of EMCO Maier GmbH was founded in 1954 EMCO-TEST can offer decades of experience in this field. Their entire know-how has been packed into the DuraPro series hardness testing modules to be able to provide modular machine components for a wide range of hardness testing applications. An EMCO-TEST hardness testing module always consists of a testing unit and control unit with connecting leads.

DuraPro 100, 200, 500 and 1000.

Depth gauging procedures		Optical gauging procedures																					
Rockwell according to EN ISO 6508, ASTM E-18 HBT, HVT (norm free)		Brinell according to EN ISO 6506, ASTM E-10 Vickers according																					
DuraPro 100		 Rockwell acc. to EN ISO 6508, ASTM E-18 HRA HRB HRC																					
		 Brinell Depth measurement (not acc. to standards) HBT 2.5/62.5 HBT 2.5/187.5																					
DuraPro 200		 Rockwell acc. to EN ISO 6508, ASTM E-18 HRA HRB HRC																					
		 Brinell Depth measurement (not acc. to standards) HBT 2.5/62.5 HBT 2.5/187.5																					
	DuraPro 500		 Brinell acc. to EN ISO 6506, ASTM E-10 <table border="1" data-bbox="1230 1682 1544 1816"> <tr> <td>1/30</td> <td>2.5/31.25</td> <td>2.5/62.5</td> <td>2.5/187.5</td> </tr> <tr> <td>5/25</td> <td>5/62.5</td> <td>5/125</td> <td>5/250</td> </tr> <tr> <td>5/750</td> <td>10/100</td> <td>10/250</td> <td>10/500</td> </tr> <tr> <td>10/1000</td> <td>10/1500</td> <td>10/3000</td> <td></td> </tr> <tr> <td colspan="4">HBT (not acc. to standards)</td> </tr> </table>	1/30	2.5/31.25	2.5/62.5	2.5/187.5	5/25	5/62.5	5/125	5/250	5/750	10/100	10/250	10/500	10/1000	10/1500	10/3000		HBT (not acc. to standards)			
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Hardness testing modules with know-how.

Premium technology in modular units.



Expand existing systems

This testing module is ideal for the task of expanding on existing systems. Hence expense can be spared as there is no need to acquire special machinery, plants or lines.



Integration into new systems

The testing module can also be integrated into new plants, systems and production lines. This enables hardness testing to be added directly to the flow of production as early as the planning phase. Work pieces do not need to be removed from the production process and 100% of the pieces can be tested.



Customised Hardness Testers

Logical interfaces and exact assembly instructions facilitate the construction of custom-built hardness testing systems, tailored to the exact needs of each user. The only precondition is the existence of a device capable of accommodating and moving the testing module according to the technical information provided.



Universal application

Whether expanding and upgrading an existing plant, integrating hardness testers into a new production line or setting up a hardness tester as a stand-alone solution, the modular construction of the DuraPro series means it can be used in any situation.

to EN ISO 6507, ASTM E-92, ASTM E-384

Surface preparation

for optical gauging procedures



Vickers

acc. to EN ISO 6507, ASTM E-92, ASTM E-384

HV 20	HV 30	HV 50	HV 100
HVT (not acc. to standards)			



Rockwell

acc. to EN ISO 6508, ASTM E-18

HRA-HRV	HR30-N/T/W/X/Y
HR45-N/T/W/X/Y	



Rockwell

acc. to EN ISO 6508, ASTM E-18

HRC	HRG	HRK	HRP
HRV			



The integrated milling unit allows the test surface to be prepared optimally for the gauging process.

Detailed documentation for planning purposes. Construction drawings, assembly plans etc.



Documentation for planning purposes

To give users and plant constructors as much support as possible we provide plenty of detailed documentation for our DuraPro series products as early as the planning phases for plants, lines and machines etc. As well as technical data for installation and drilling plans we also provide complete DXF files in 2D and 3D for each individual hardness testing module allowing testing modules to be added to, and positioned in construction drawings simply and easily. All documents needed for planning and construction can be downloaded from our website www.emcotest.com.

Documentation for operation

On receiving a hardness testing device the customer also receives detailed documentation on each individual DuraPro product. This includes assembly and installation instructions, and operating instructions, to ensure the module is installed and used correctly. These instructions are produced in five languages: DE/EN/IT/FR/SP.

All the main features at a glance.

For end users and plant builders.

Use

- ✓ 100% checks possible during manufacture
- ✓ Savings made due to upgradability of existing plants
- ✓ Low maintenance
- ✓ Simple operation
- ✓ Various languages
- ✓ Ports for data link-ups

Planning

- ✓ Logical interfaces
- ✓ Space saving construction
- ✓ Durable and can be used in heavy machine building
- ✓ Exact assembly instructions
- ✓ Flexible integration
- ✓ Downloadable DXF files for plant construction
- ✓ Communication with other control systems
- ✓ Can be used in new systems/lines/plants
- ✓ Can be used in existing systems/lines/plants
- ✓ Can be used as a stand-alone solution



DuraPro 100.

Quickest possible Rockwell tests.



Rockwell
acc. to EN ISO 6508, ASTM E-18

HRA	HRB	HRC
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Brinell
Depth measurement (not acc. to standards)

HBT 2.5/62.5	HBT 2.5/187.5
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DuraPro 100 uses the indent depth gauging hardness testing method. Since optical evaluation of the test indentation is not required, results can be obtained very quickly. Load application occurs via the tried and tested spring bushing system. Spring bushing can be used for a broad spectrum of load ranges and can be changed as required.

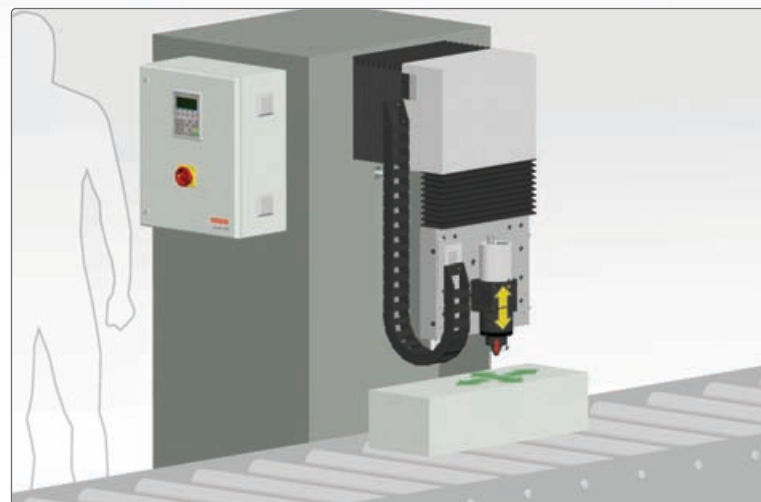
Areas of use

The test unit is not fixed is not able to conduct clamping and testing cycles itself. This must be done by a manoeuvrable device. The area of use focuses on production lines in which the distances from the subject and tester vary greatly.

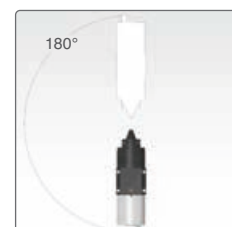
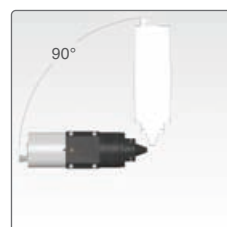
Control unit and gauging electronics

The Siemens operator panel and the Simatic compact CPU are integrated into a compact control cabinet. Being diminutive in stature the control unit can easily be integrated into any given line or plant.

Installation and clamping



- Positioning movements (customer system)
- Clamping / releasing movement (customer system)
- Test cycle movement (EMCO-TEST)



The test module can also be used in a horizontal position or upside-down.



Easy Siemens operation with statistics

All settings can be entered via the four-row, 20-character Siemens Operator Panel OP77A. The unit can be operated in the following languages: DE/EN/IT/SP/FR. By saving the test results setting limits for statistics, as well as normal hardness values it is also possible to present the statistical values on the screen.



Data link-up

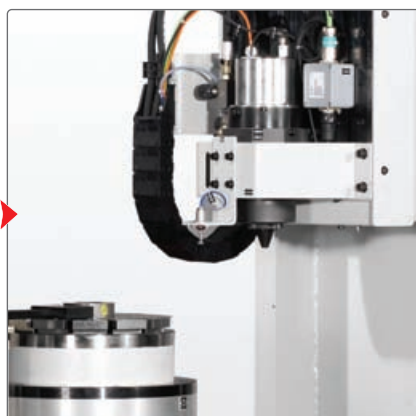
All hardness test results can be transferred to a PC via the RS232 interface. Data is sent in an ASCII format and can be further processed and archived with whatever programme the operator chooses to use.



Communication with plant/line controls

The Siemens controls in use can communicate with other controls via Profibus facilitating easy integration into the plants, lines and systems.

A selection of references



DuraPro 100 built onto the sledge system of a machine for hardness testing according to Rockwell C (HRC) on pipe rings and pipe sections.

DuraPro 200.

The quickest possible testing with hydraulic clamping.



Rockwell
acc. to EN ISO 6508, ASTM E-18

HRA	HRB	HRC
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Brinell
Depth measurement (not acc. to standards)

HBT 2.5/62.5	HBT 2.5/187.5
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DuraPro 200 uses the indent depth gauging hardness testing method. Since optical evaluation of the test indentation is not required, results can be obtained very quickly. Load application occurs via the tried and tested spring bushing system. Spring bushing can be used for a broad spectrum of load ranges and can be changed as required.

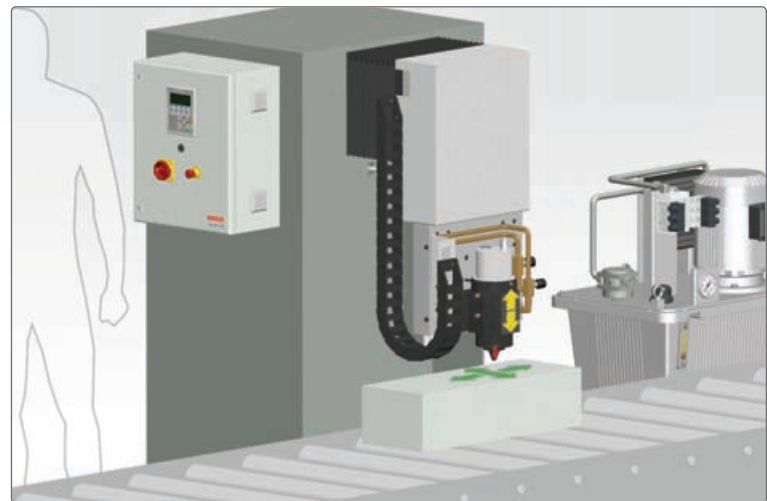
Areas of use

The test unit is hydraulically tensioned and can carry out clamping and test cycle movements itself. The module can also be mounted to an intransigent device. The distance between the test head and the work piece may be max. 45 mm before clamping. Hence this module is best suited to production lines in which the distance between the test piece and test unit hardly varies. A hydraulic motor for the clamping process is delivered the module.

Control unit and gauging electronics

The Siemens operator panel and the Simatic compact CPU are integrated into a compact control cabinet. Being diminutive in stature the control unit can easily be integrated into any given line or plant.

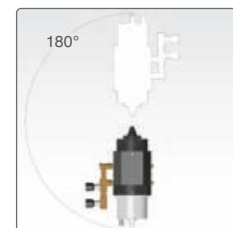
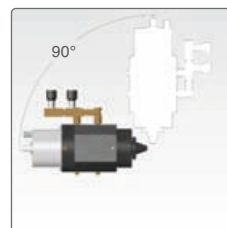
Installation and clamping



■ Positioning movement (customer system)

■ Clamping / releasing movement 45 mm stroke (EMCO-TEST test module)

■ Test cycle movement (EMCO-TEST test module)



The test module can also be used in a horizontal position or upside-down.



Simple Siemens operation with statistics

All settings can be entered via the four-row, 20-character Siemens Operator Panel OP77A. The unit can be operated in the following languages: DE/EN/IT/SP/FR. By saving the test results setting limits for statistics, as well as normal hardness values it is also possible to present the statistical values on the screen.



Data export

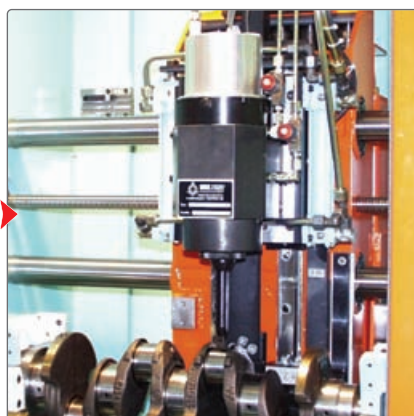
All hardness test results can be transferred to a PC via the RS232 interface. Data is sent in an ASCII format and can be further processed and archived with whatever programme the operator chooses to use.



Communication with plant/line controls

The Siemens controls in use can communicate with other controls via Profibus facilitating easy integration into the plants, lines and systems. Inputs and outputs have been included to accommodate connection to an emergency off button.

A selection of references



DuraPro 200 installed in a machine for very rapid 100% tests on two different types of crankshaft for the automobile industry according to Rockwell C (HRC).

DuraPro 500.

Universal hardness testing module with automatic image analysis.



Brinell

acc. to EN ISO 6506, ASTM E-10

1/30	2.5/31.25	2.5/62.5	2.5/187.5
5/25	5/62.5	5/125	5/250
5/750	10/100	10/250	10/500
10/1000	10/1500	10/3000	

HBT (not acc. to standards)



Rockwell

acc. to EN ISO 6508, ASTM E-18

HRA-HRV	HR30-N/T/W/X/Y
HR45-N/T/W/X/Y	



Vickers

acc. to EN ISO 6507, ASTM E-92, ASTM E-384

HV 20	HV 30	HV 50	HV 100
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HVT (not acc. to standards)

DuraPro 500 is an universal hardness testing module with a high definition 1/2" camera for fully automatic, standardised image analysis of optical testing methods. Load application is done via the tried and tested closed control loop method facilitating a larger test load range.

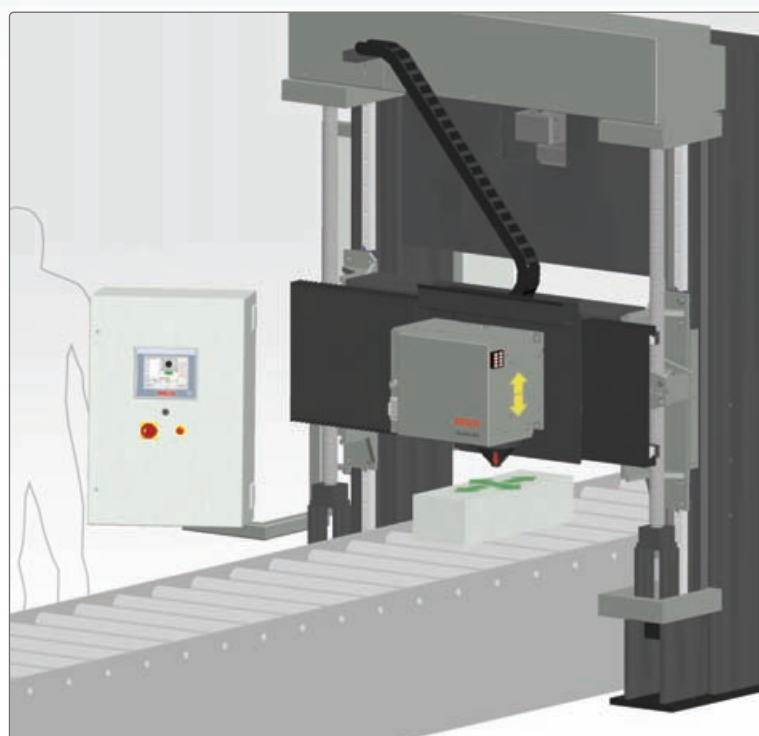
Areas of use

Since optical and depth gauging methods can be carried out this module is very flexible. Nevertheless, for optical test methods it is important, the test object surface must be prepared dependant upon the test method and the respectively valid hardness testing norms.

Control unit and gauging electronics

DuraPro 500 uses common G3 gauging electronics also used in standard hardness testing equipment. The entire gauging electronics and LCD touch screen display are contained in a compact control unit.

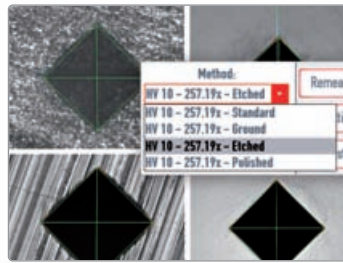
Installation and clamping



- Positioning movements (customer system)
- Clamping / releasing movement (customer system)
- Test cycle movement (EMCO-TEST)



ecos Compact user surface



Fully automatic image analysis

Fully automatic image analysis

Automatic image analysis facilitates excellent repetitive precision. Various surface settings can be saved along with the load and degree of enlargement. This ensures substances are always tested under the same conditions. To ensure the indents are displayed as well as possible and for setting purposes the DuraPro 500 has an 8.4" touchscreen panel that can be operated in the following languages: DE/EN/IT/SP/FR.



Line diagram



Information on the test report

Meaningful results

All test results can be displayed as bar graphs or line charts with tolerance limits overlaid. Statistical considerations and result ranges are included as standard. Test reports and diagrams can be printed out via a USB interface.



Data export

All hardness testing data can be transported with the optional export tool as .csv- or .txt via the Ethernet interface, facilitating continuous, unbroken data administration.



Communication with plant/line controls

There are hardware inputs and outputs in the control cabinet to allow the testing module to be slaved by a master control unit. This enables simple integration into plants, lines and machines.

A selection of references



DuraPro 500 integrated into a small portal system for steel plate testing. Brinell hardness testing and evaluation are fully automatic.

DuraPro 1000.

Universal hardness testing module with surface preparation.



Brinell
acc. to EN ISO 6506, ASTM E-10

10/250	10/500	10/1000	10/1500
10/3000	HBT (not acc. to standards)		



Rockwell
acc. to EN ISO 6508, ASTM E-18

HRC	HRG	HRK	HRP
HRV			

DuraPro 1000 is a hardness testing module with a high definition 1/2" camera for fully automatic, standardised image analysis of optical testing methods. For hardness testing on unprocessed raw items the test unit is equipped with a milling unit to ensure the test surface can be prepared optimally. Load application is done via the tried and tested closed control loop method facilitating a larger test load range.

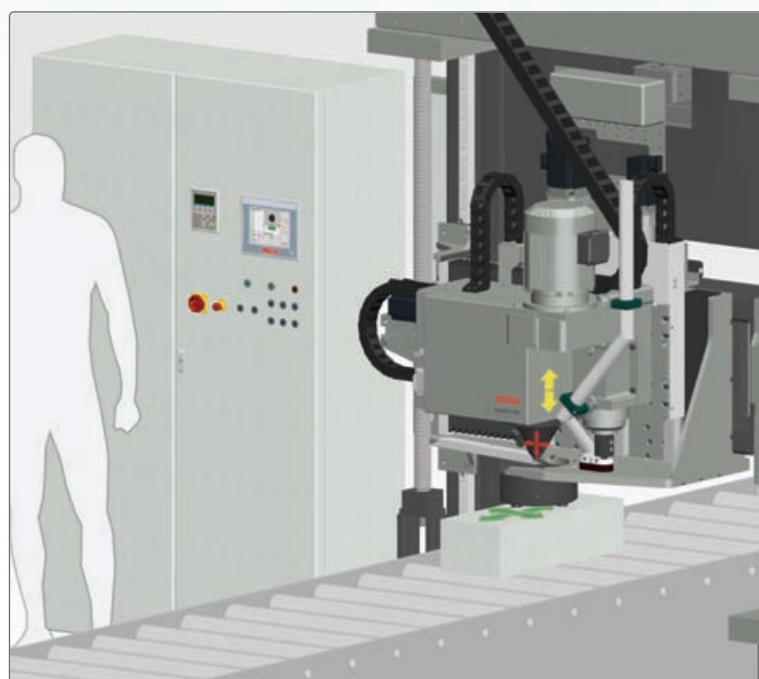
Areas of use

This module can be applied for a wide range of purposes as it uses both optical and depth gauging methods. The integrated milling unit means there is no need for any further manual treatment of test pieces prior to testing

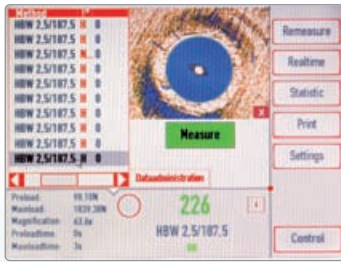
Control unit and gauging electronics

DuraPro 1000 uses a Siemens control system for the entire milling and testing cycle. Gauging is conducted using standard G3 electronics and can also be driven by the Siemens PLC. The entire controls, LCD touch screen display for hardness testing, the Siemens operating panel and the operating buttons for the milling unit are contained in a compact control unit.

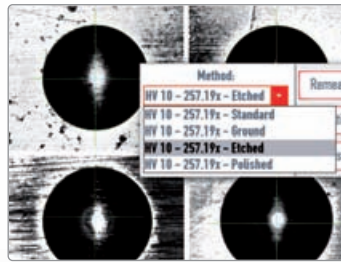
Installation and clamping



- Positioning movement (customer system)
- Clamping / releasing movement (customer system)
- Milling / test cycle movement (EMCO-TEST test module)



ecos Compact user surface



Fully automatic image analysis

Fully automatic image analysis

Automatic image analysis facilitates excellent repetitive precision. Various surface settings can be saved along with the load and degree of enlargement. This ensures substances are always tested under the same conditions. To ensure the indents are displayed as well as possible and for setting purposes the DuraPro 1000 has an 8.4" touchscreen panel that can be operated in the following languages: DE/EN/IT/SP/FR.



Line diagram



Information on the test values

Meaningful statistics

All test results can be displayed as bar graphs or line charts with tolerance limits overlaid. Statistical considerations and result ranges are included as standard. Test reports and diagrams can be printed out via a USB interface.



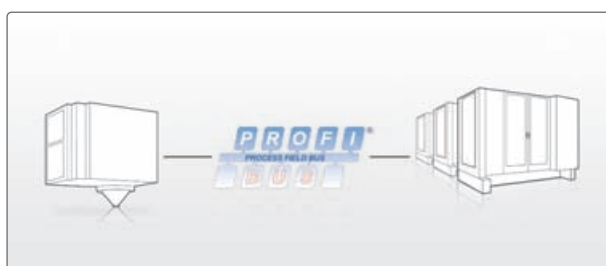
Operating and controlling the milling unit

A Siemens PLC control unit is responsible for the automatic milling and testing cycle for the DuraPro1000. The Siemens OP77A control unit is used to set all necessary milling parameters and is labelled in the following languages DE/EN/IT/FR/SP. The control unit also includes buttons for functions such as start/stop cycle, laser pointer on, etc.



Data export

All hardness testing data can be transported with the optional export tool as .csv- or .txt via the Ethernet interface, facilitating continuous, unbroken data administration.



Communication with plant/line controls

The Siemens controls can communicate with other control systems via Profibus facilitating simple integration into systems and machines. There are hardware inputs and outputs available for the connection of an emergency off button.

DuraPro 1000.

Efficient surface preparation.



Suitable for various test pieces

The Durapro1000 enables tests to be carried out on a wide range of items. The fully automated test point preparation allows untreated materials to be subjected to hardness testing. The integrated grinding unit helps to determine the best possible surface conditions for hardness testing.



Positioning via laser pointer

In order to position a test point on a subject without immense effort the DuraPro 1000 is equipped with a laser pointer. This enables a test point to be accurately manoeuvred to from a remote position because the laser point can be very clearly seen on a test piece.



Setting the grinding depth

Grinding depth can be varied and set between 0 and 6 mm by the operator. The surface is checked with a test head before the grinding process is initiated to ensure the required grinding depth is achieved.

Additional options available:

- Automatic chip suction during the grinding process
- Heating/cooling for all electrics to raise the working temperature range from -10 °C to 50 °C
- Software for the automatic calculation of the average of three test points and the production of an average value for the Ethernet interface

A selection of references



DuraPro 1000 is integrated into a large portal for Brinell hardness testing on shafts, rings, blocks, plates etc. including surface preparation and automatic suction of chips and bits.

Accessories.

Complete accessories catalogue at www.emcotest.com

At www.emcotest.com you will find a complete range of accessories for the hardness testing modules such as: various indenters, special test heads, lenses, test plates etc.



Technical data.



	DuraPro 100	DuraPro 200	DuraPro 500	DuraPro 1000
Test loads	588-1838 N (60-187.5 kgf)	588-1838 N (60-187.5 kgf)	196-29430 N (20-3000 kgf)	1472-29430 N (150-3000 kgf)
Nose cone drilling	7 mm	7 mm	15 mm	13,5 mm
Nose cone contact surface	12 mm	12 mm	27 mm	23 mm**
High resolution 1/2" camera	-	-	1024 x 1280 pixel	1024 x 1280 pixel
Available lenses	-	-	18x/35x/70x/130x	15x
Pro module (W x H x D)	106 x 380 x 106 mm	250 x 380 x 145 mm	530 x 530 x 370 mm	1300 x 1200 x 855 mm
Control unit (W x H x D)	400 x 500 x 210 mm	400 x 500 x 210 mm	600 x 900 x 400 mm	1200 x 2000 x 500 mm
Hydraulic motor 50 bar	-	670 x 520 x 376 mm	-	-
Weight module	approx. 20 kg	approx. 25 kg	approx. 160 kg	approx. 1250 kg
Positioning movement	Customer system	Customer system	Customer system	Customer system
Clamping / releasing movement	Customer system	Pro module (45 mm stroke)	Customer system	Customer system
Test cycle movement	Pro module (integrated into clamping)	Pro module	Pro module	Pro module
Voltage supply	230V~1/N/PE 110V~1/N/PE	400V~3/N/PE	230V~1/N/PE 110V~1/N/PE	400V~3/N/PE
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Room temperature	5 - 40°C	5 - 40°C	5 - 40°C	5 - 40°C
Data port	RS232	RS232	RJ45, USB	RJ45, USB
Communication with controls	Profi Bus	Profi Bus, Hardware input-/output sockets	Hardware input-/output sockets	Profi Bus, Hardware input-/output sockets
Connecting cord standard length*	10 m	10 m	10 m	10 m

* Optional also 20 and 30 metres available.

** Please pay attention to the criteria for clamping work pieces with the downholder (see "Technical data for installation in automated systems").



See the future – www.emcotest.com



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