Torque testing systems
Sales brochure
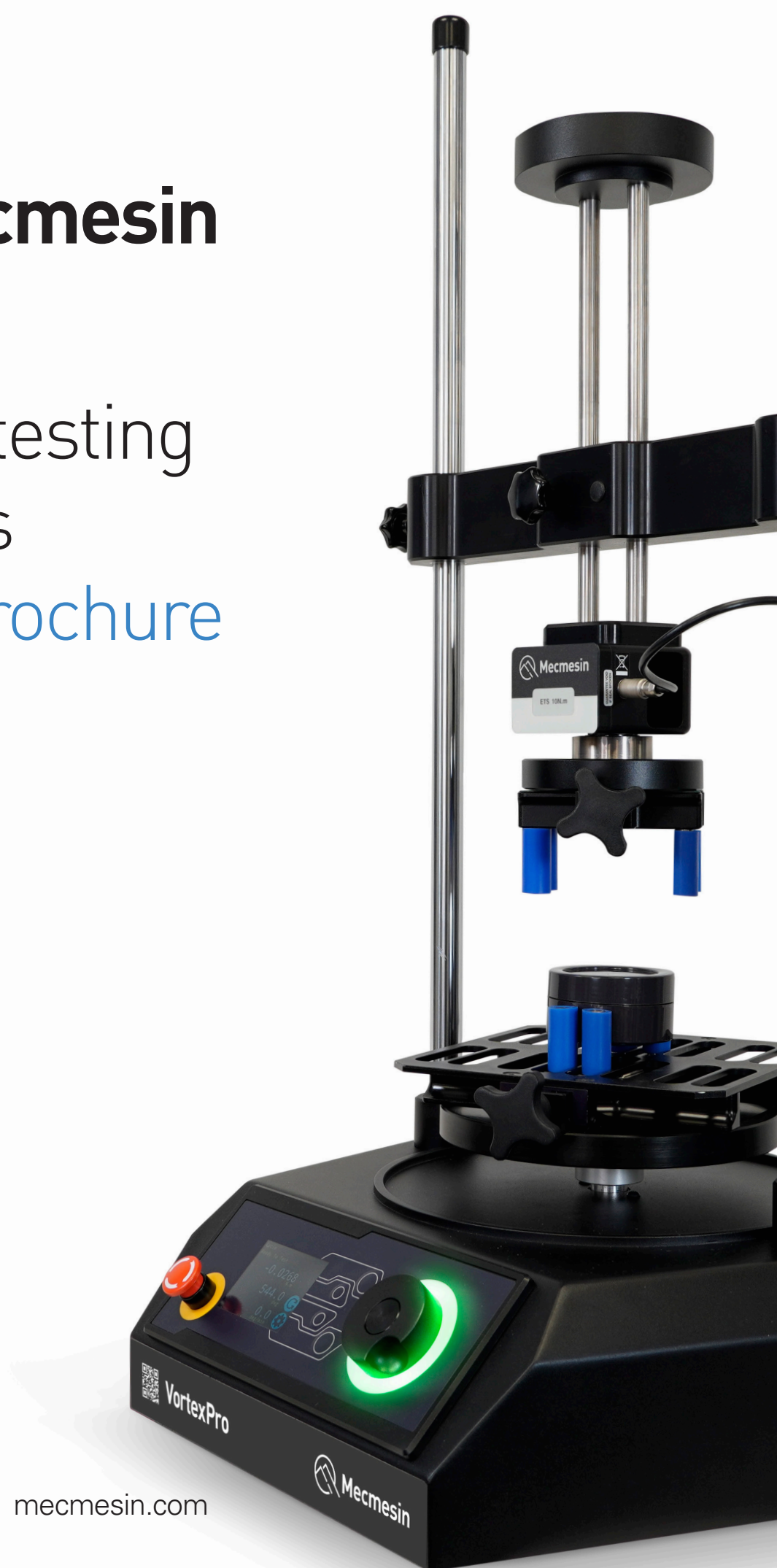
Ensure product quality

In today's manufacturing landscape, static torque measurement has become a crucial part of the overall quality control process, ensuring that components and finished products function flawlessly and safely.

Mecmesin's range of software-controlled, motorised torque systems empowers you with unmatched precision and versatility, enabling you to conquer the challenges of your testing with ease.

Mecmesin

Choosing a torque testing system

Your step-by-step guide to torque testing

Torque testing is an important part of design and quality control for ensuring product safety and performance. It is also an essential part of the testing regime that helps deliver cost-effective consistency and efficiency in manufacturing and assembly.

Whether for incoming Quality Assurance, Research & Development or Quality Control in production, you can select the most appropriate Torque Testing System for your requirements by following these six simple steps.

01 **Define your testing requirements**

Does your application require the measurement of dynamic (high-speed) or static (low-speed) torque? What will be the maximum torque you will apply to the component or product?

02 **Choose the suitable torque sensors**

Choose the appropriate sensors for your application, to ensure optimum precision when testing in the lower and upper ranges of your torque tester.

ETS 6 N.m

◄ **10 N.m** ►

**03** **Check grip and fixture requirements**

Review the materials and surface finish of products for testing. Choose appropriate fixtures to securely hold the test specimen without slipping.

04 **Choose the suitable travel stroke**

How much space will be required to fit your specimen and the set of grips? Is the specimen going to unwind on a thread and move upwards or will it turn on it's axis?
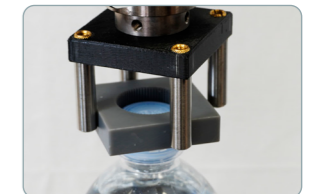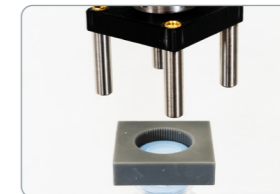
05 **Consider the testing speed**

Static torque testing is performed at slow speeds typically below 30 rpm. Stiff specimens with minimum rotation need very slow test speeds compared to threaded components.
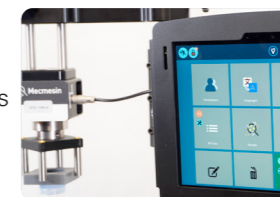
06 **Consider the testing environment**

Determine the specific data you need to collect and the experience level of your operators. Ensure the test software matches your needs.

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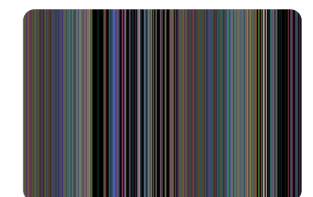
HelixaPro

Semi–automated Precision Torque Tester

The HelixaPro has been designed for precision alignment between the torque sensor and drive motor. Combined with a counterbalanced crosshead to eliminate the weight of a grip, it ensures optimum accuracy and repeatability particularly when testing at extremely low torque.

It is supplied with VectorPro testing software for installation on your computer, laptop or tablet. Alternatively, when ordering an HelixaPro Touch, the tester is supplied with a touchscreen console pre-installed with VectorPro software.

The compact design of the HelixaPro testers, allied to their ease-of-use for measuring small, sensitive components, heightens their appeal to users, whatever their skill or experience level. Ideal for use in QC and R&D laboratories.

HelixaPro

Part	Model	Capacity
876-450	HelixaPro	6 N.m / 50 lbf.in / 60 kgf.cm

HelixaPro Touch

Part	Model	Capacity
886-450	HelixaPro Touch	6 N.m / 50 lbf.in / 60 kgf.cm

Mecmesin

VortexPro

Semi-automated Torque Tester

The VortexPro features a twin-column design allowing torque testing right up to 10N.m (90 lbf.in)*. An adjustable crosshead and sensor carriage provide the space to accomodate larger specimens up to 350 mm in height*.

It is supplied as standard with VectorPro testing software for installation on your computer, laptop or tablet. Alternatively, when ordering a VortexPro Touch, the tester is delivered with a touchscreen console pre-installed with VectorPro software, making it the ideal integrated, stand-alone solution.

The versatility and ease-of-use of the VortexPro testers appeal to users, whatever their skill or experience.They fit comfortably on your bench-top, making them ideal for use in QC, R&D laboratories or in the Production area.
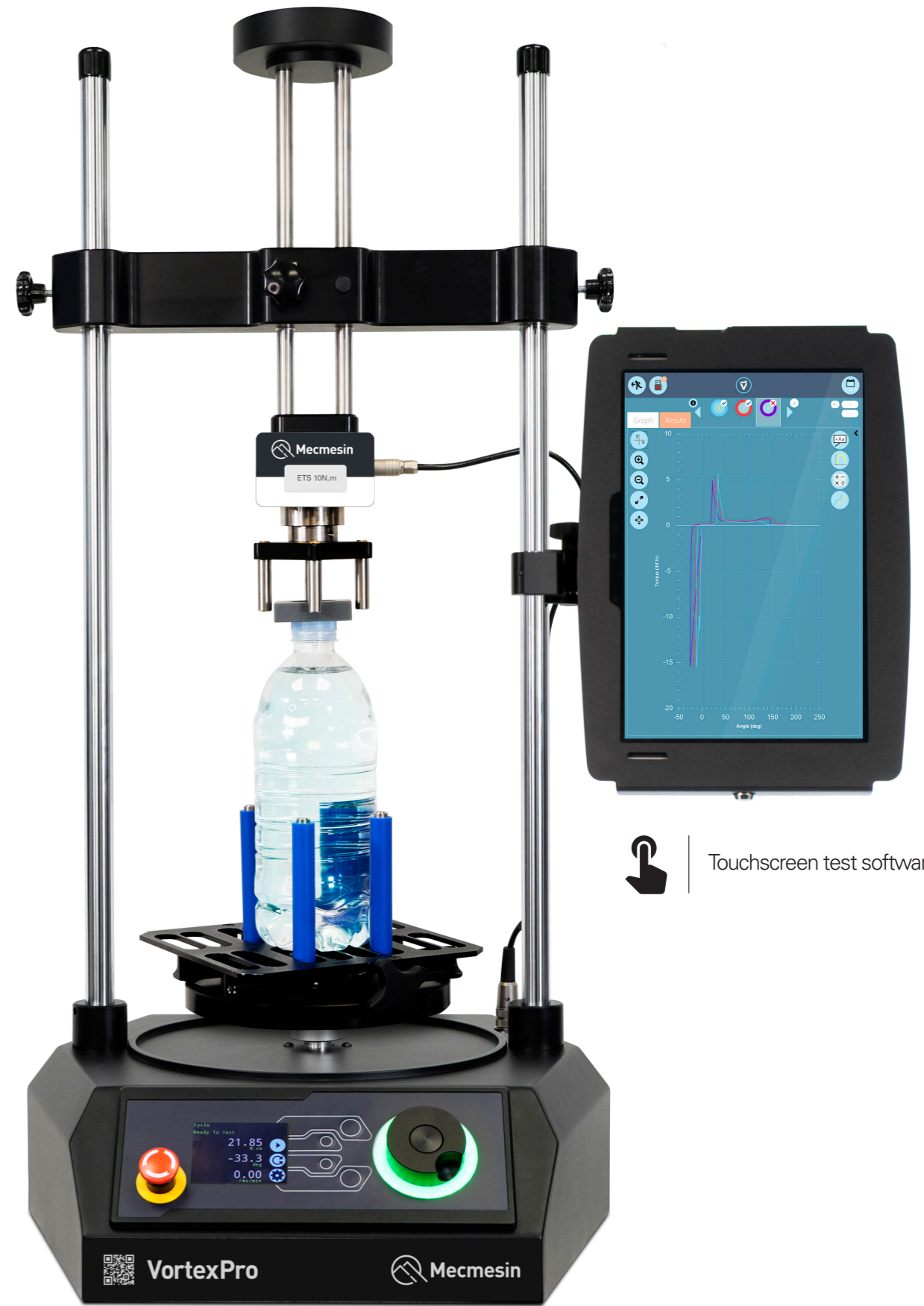
VortexPro

Part	Model	Capacity
876-650	VortexPro	10 N.m / 90 lbf.in / 100 kgf.cm

VortexPro Touch

Part	Model	Capacity
886-650	VortexPro Touch	10 N.m / 90 lbf.in / 100 kgf.cm

* Special versions of VortexPro are available with:-
- increased torque capacity (= slower speed range)
- greater distance bewteen columns

Touchscreen test software

Sensors

Enhanced Torque Sensors (ETS)

A range of ETS torque sensors are available to ensure that you can test with optimum precision across the full capacity of your HelixaPro and VortexPro torque testers.

By selecting several ETS torque sensors you can accurately test from the slightest of torque values right up to several N.m. Each torque sensor is automatically detected by the HelixaPro / VortexPro without the need for user configuration.

Sensors

Type	Models available	Capacity
ETS	8	0.1- 10 N.m / 0.9- 90 lbf.in / 1- 100 kgf.cm

Discover sensors online -
visit mecmesin.com/ets-sensors

Enhanced Torque Sensor range

Designed for use with both the HelixaPro and VortexPro Torque Testers, the ETS is easily mounted to the sensor carriage to minimise the set-up time for testing. A 3/8" square-drive allows fixtures to be rapidly fitted to the ETS.

All ETS sensors read from zero up to their full nominal capacity and are accurate to ±0.5% of full scale. A calibration certificate, traceable to national standards, is supplied with each ETS.

Enhanced Torque Sensor (ETS) - range

	ETS 0.1*	ETS 0.2*	ETS-0.3	ETS 1	ETS 1.5	ETS 3	ETS 6	ETS 10**
Part number	880-506	880-507	880-500	880-501	880-502	880-503	880-504	880-505
N.m	0 - 0.1	0 - 0.2	0 - 0.3	0 - 1	0 - 1.5	0 - 3	0 - 6	0 - 10
lbf.in	0 - 0.9	0 - 1.8	0 - 2.7	0 - 9	0 - 13	0 - 26	0 - 53	0 - 90
kgf.cm	0 -1	0 - 2	0 - 3	0 - 10	0 - 15	0 - 30	0 - 60	0 - 100

Accuracy: ±0.5% of full scale
* not recommended for VortexPro
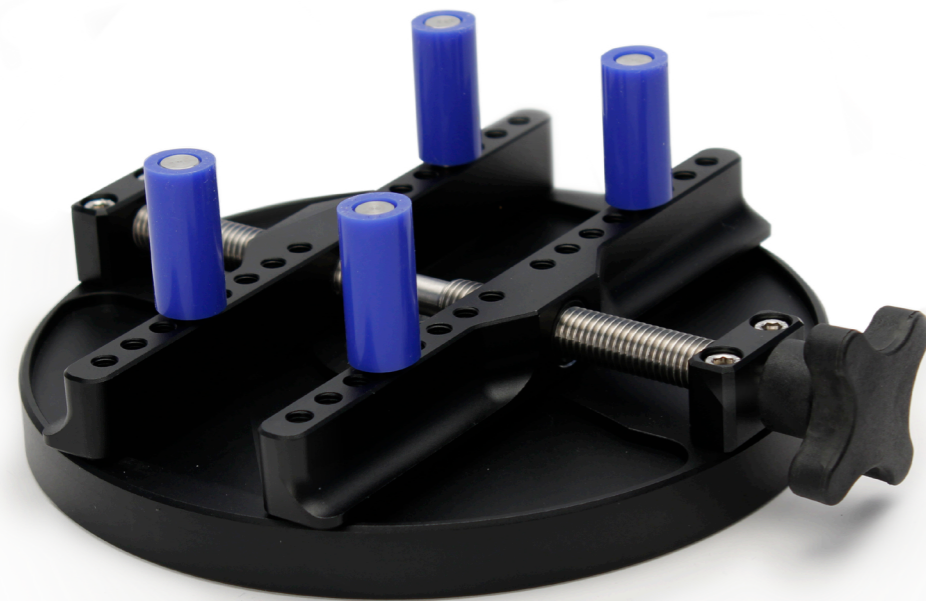** not recommended for HelixaPro

Accessories

Standard fixtures

General purpose fixing tables and chucks are useful in holding certain specimens. However the diversity in shape and size of products and components to be tested often requires custom fixturing to be designed and produced.

Machine Chuck

Adjustable chuck with interchangeable jaw faces suitable for gripping round components.

Fixing Table

A general purpose plate which can affix to an ETS sensor or the motor spindle of the tester. Features adjustable runners with threaded holes for fitting fixing pegs or secondary grips. Stainless-steel leadscrew allows runners to open and close.

Pin Chuck

Miniature chuck for holding small circular components.

Saddle plate

For use with Fixing Tables to support containers with an uneven base.

Discover Mecmesin accessories
online - visit mecmesin.com/accessories

Custom fixtures

Mecmesin has an in-house engineering team with over 30 years experience of delivering custom gripping solutions for awkwardly shaped specimens.
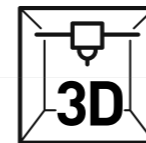
3D From dedicated closure mandrels, rapidly produced with the latest 3D printing technology, through to heavy-duty metal fixturing, we have a solution for you.

X-Y Micrometer alignment stage

For applications requiring perfect alignment of offset components, an XY stage is used to precisely centre the fixture.

Split-mandrel

To hold round or oval closures with smooth surfaces a split-mandrel is ideal. Serrated or rubber-coated jaws are mounted to a small fixing table.

Stirrup Fixture

For low torque applications where components are gripped by a fixture which must move vertically as torque is applied.

Applications

Typical application examples

Whether striving for precision, reliability, or safety, countless sectors rely on static torque testing to ensure their products and processes meet the highest standards of quality and performance.

Engineers and scientists rely on it as a fundamental tool for product innovation and improvement to assess the performance of prototypes, validating their designs and fine-tuning their creations.

Static torque testing plays a pivotal role in quality control to evaluate the integrity of fasteners and closures ensuring that they are tightened to the appropriate specifications in various industries, from automotive and aerospace to medical devices and cosmetics.
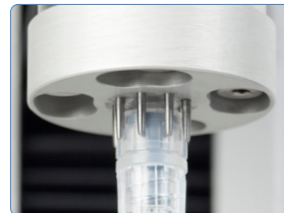

△ Syringe cap removal
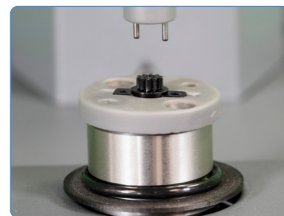
△ Micro cog friction

△ Child resistant closure torque

△ Luer connector

△ Lipstick barrel rotation torque

△ Tightening torque of cosmetic container

△ Dosage torque of injector pen

△ Dispensing dropper testing

Standards

Test standards for quality control

There is a widespread recognition that manually operated torque testers do not provide sufficient accuracy and repeatability. This is mainly due to variability caused by operators applying torque at different speeds. Motorised semi-automated testers, which allow testing at a consistent speed and to a defined torque or angle, are increasingly referenced within international and corporate standards as recommended test equipment.

Example torque test standards

ASTM D7860 - 14 (2022)

Standard Test Methods for Measurement of Torque Retention for Child Resistant and Non-Child Resistant Packages with Continuous Thread Closures Using Automated Torque Testing Equipment.

6. Apparatus

6.1 Automated Transducer Based Torque Meter, with a programmable, fixed velocity or fixed torque ramp rate, a rotational torque head and digital output that accurately measures within the expected torque range for the particular container/continuous thread closure system to be evaluated.
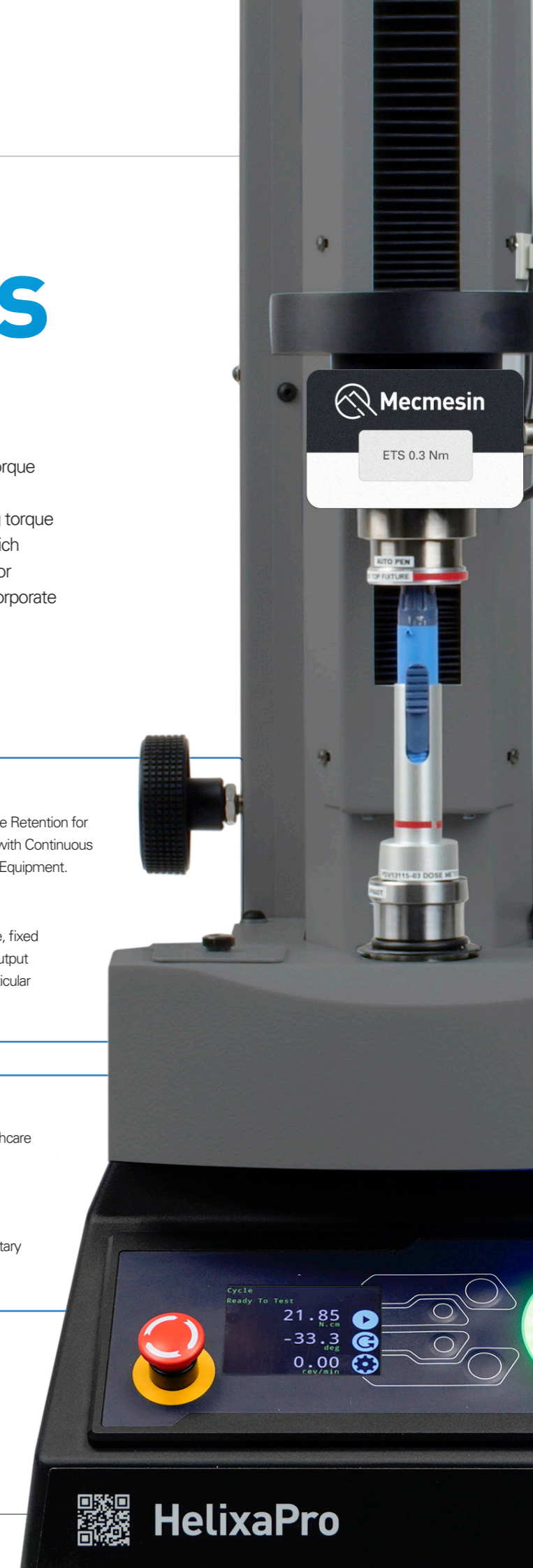
ISO 80369 - 20 (2015)

Small-bore connectors for liquids and gases in healthcare applications. Part 20: Common test methods

Apply an unscrewing torque to the connector under test at a rate of 2 r/min until the connection separates. Do not apply any supplementary force in other directions.

Discover more torque testing standards online - mecmesin.com/torque-testing

HelixaPro

VectorPro® software

Software core functionality

VectorPro® is dedicated software for use with the VortexPro and HelixaPro range of torque testing systems. It enables and stores test routines, acquires data from torque sensors and angle encoders then performs calculations on the data before generating test results for export and reporting.

By connecting the VortexPro and HelixaPro to your own PC (or the touchscreen console of the Touch models) you can take advantage of running in a VectorPro® environment to create a more sophisticated test system. Your configuration is automatically detected and the software guides you through the whole process with only the relevant parameters presented.

Key Features

- Real-time graph plotting
- Immediate display of results
- Full data export
- Customised report generation
- Drag and drop interface
- Personalised workspace
- Secure user accounts

Powered by
VectorPro®

Discover VectorPro software - visit mecmesin.com/vectorpro
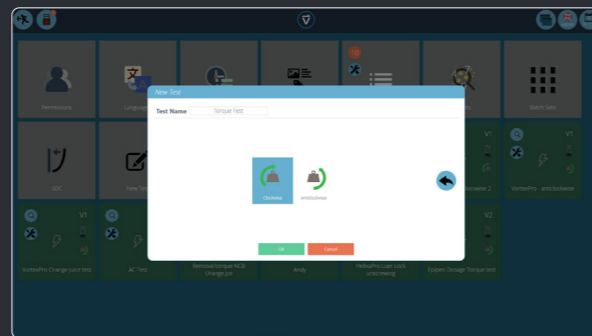
Touchscreen test software

VortexPro

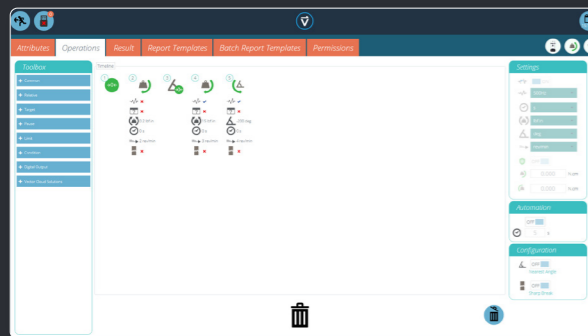Mecmesin

VectorPro® setup

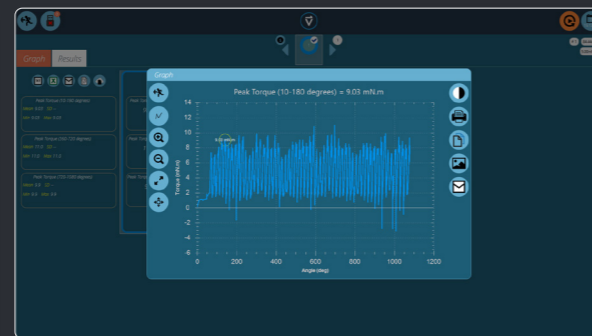Your step-by-step guide to getting started
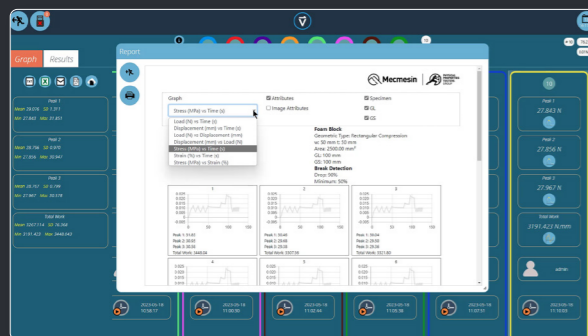
01 | Login

02 | Select
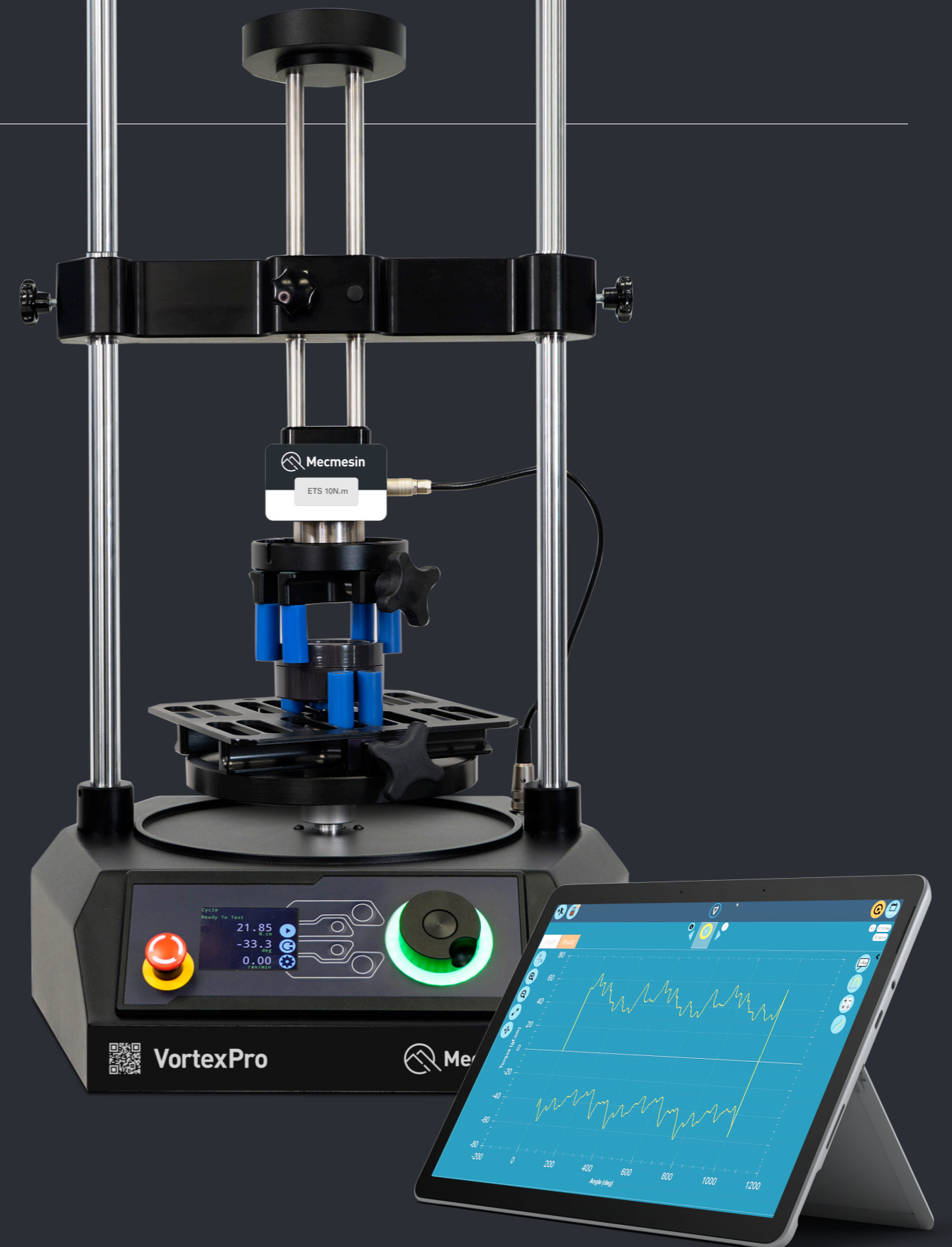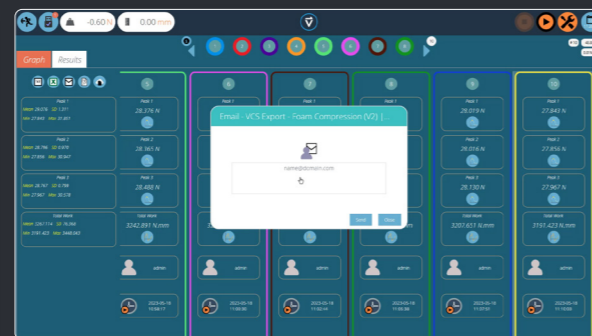

03 | Design

04 | Analyse

05 | Report

06 | Share

By connecting the Helixa/VortexPro to your own PC (or the touchscreen controller of the Helixa/VortexPro Touch) you can unlock the power of VectorPro® to create a trully exceptional testing system to meet all your component and product testing requirements.

Touchscreen test software

Control

Take control of your testing requirements

The VortexPro Touch and HelixaPro Touch feature a touchscreen controller which has been designed as an alternative to a desktop or laptop PC.

It provides full PC capability, operating with Microsoft Windows®, specifically optimised for and pre-installed with Mecmesin's VectorPro™ software making it ready for immediate use without further configuration.

For complete flexibility it is attached directly to the side of the test stand column and can be tilted or rotated for optimum ease of viewing.

VortexPro and HelixaPro manual settings and controls

Designed specifically for ease-of-use and precision when selecting test parameters. A simple and convenient control panel ensures easy selection of display parameters and a precise jog-control for quick positioning of the motor spindle and lower fixture.

Control panel

▲ Colour display of speed, angle and torque
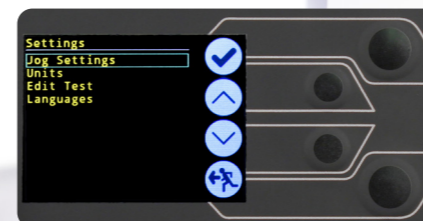
▲ Four multifunction buttons for all settings and operation. Multi-language display.

▲ Lights indicate stand status

HelixaPro Specifications

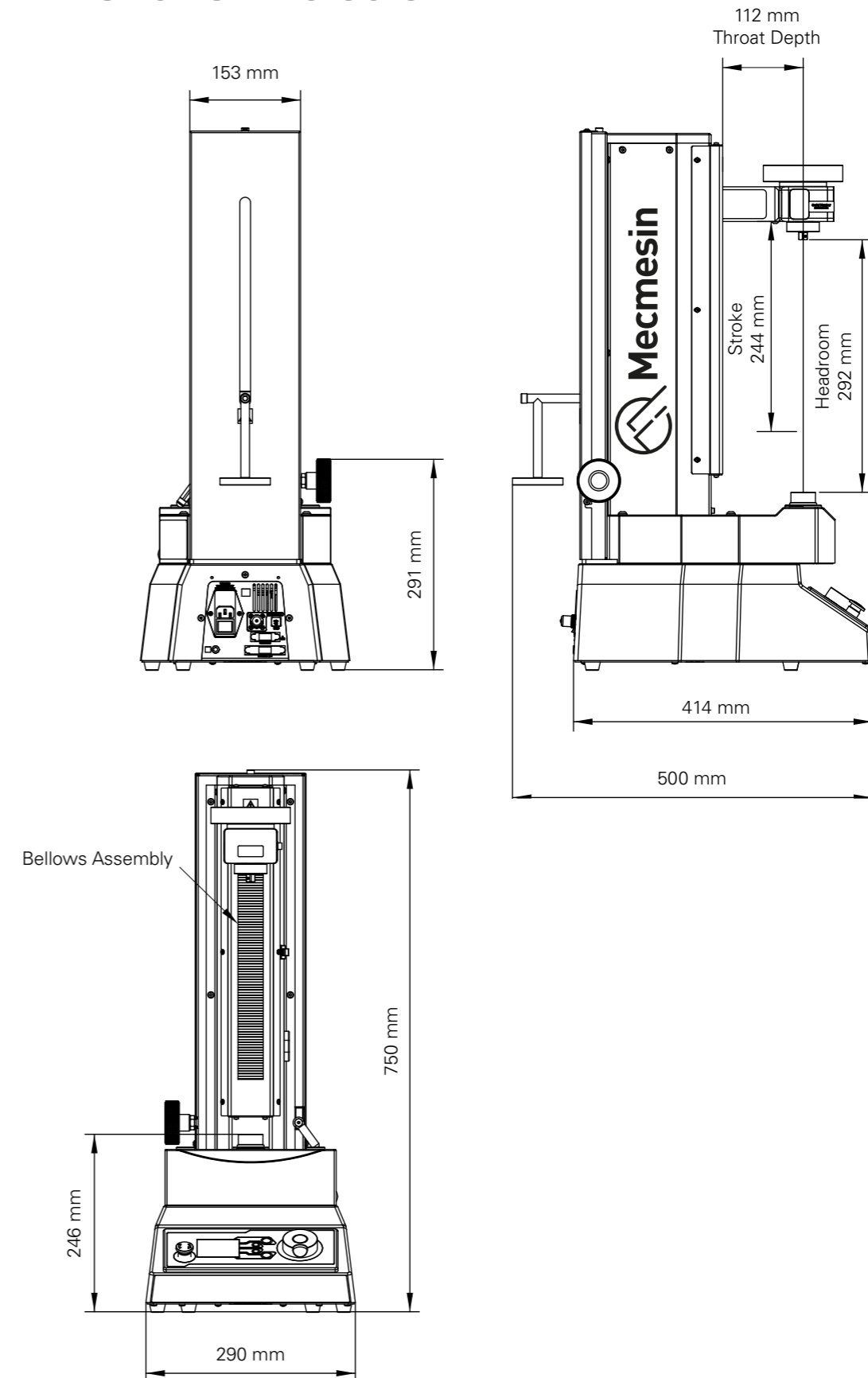| Torque Capacity		HelixaPro	HelixaPro Touch
Test frame (rated torque)	N.m	0 - 6	
	kgf.cm	0 - 60	
	lbf.in	0 - 53	
Torque Measurement			
Torque Sensors (ETS)		7 models, from 0.1 - 6 N.m	
Accuracy		±0.5% of full scale	
Resolution		1:50,000	
Unit display		mN.m, N.cm, N.m, gf.mm, gf.cm, kgf.cm, kgf.m, ozf.in, lbf.in, lbf.ft	
Sampling rate		Selectable: 10 - 1,000 Hz	
Speed			
Range		0.1 - 30 rev/min (clockwise or anticlockwise)	
Accuracy		±1% of indicated speed	
Resolution		0.001 rev/min	
Displacement			
Angular displacement (from tared position)		max. 2999 revs	
Angular displacement accuracy		±0.2°	
Angular displacement resolution		0.1°	
Linear headroom (without fixtures)		292 mm	
Linear crosshead stroke		244 mm	
Throat depth		112 mm	
Axial alignment			
Total runout (without fixtures)		Better than ±0.25mm	
Static weights			
Rear counterbalance		40 N (maximum)	
Torque cell mass platen		60 N (maximum)	
Dimensions			
Height		750 mm	
Width		290 mm	520 mm (incl. Touch console)
Depth		500 mm (without external weight hanger) 499 mm (with external weight hanger and weights)	
Weight		33 kg	35 kg (incl. Touch console)
Software and Communications			
Stand connectivity		USB-B (for communication to PC/Console)	
Console connectivity (HelixaPro Touch)		–	1 x USB-C (Power/Data), 3 x USB-A (Data)
PC requirements for VectorPro software (recommended)		Intel Core i5, 8 GB RAM, USB 2.0 or 3.0 port, graphics- Full HD (1080p), 128 GB SSD storage To make use of Vector Cloud Solutions, an internet connection is required.	
Operating Systems		Windows 10 or 11 Pro (recommended) or better- 64 bit only	
Communication with PLC/Digital Control Interface		Digital I/O- 8 input, 8 output (TTL)	
Data output		PDF, XLSX, CSV, TXT, email and image files can all be exported from VectorPro Software	
Environment Specification			
Operating temperature		10°C - 35°C (50°F - 90°F)	
Operating relative humidity		Normal industry and laboratory conditions (30-80%), non-condensing	
Electrical Supply			
Voltage		230 V AC 50 Hz or 110 V AC 60 Hz	
Max Power		120 W	

* Mecmesin reserves the right to alter equipment specifications without prior notice. E&OE

HelixaPro Dimensions

112 mm Throat Depth

153 mm

291 mm

Stroke 244 mm

Headroom 292 mm

414 mm

500 mm

Bellows Assembly

750 mm

246 mm

290 mm

VortexPro Specifications

Torque Capacity		VortexPro	VortexPro Touch
Test frame (rated torque)	N.m	0 - 10	
	kgf.cm	0 - 100	
	lbf.in	0 - 90	
Torque Measurement			
Torque Sensors (ETS)		6 models, from 0.3 - 10 N.m	
Accuracy		±0.5% of full scale	
Resolution		1:50,000	
Unit display		mN.m, N.cm, N.m, gf.mm, gf.cm, kgf.cm, kgf.m, ozf.in, lbf.in, lbf.ft	
Sampling rate		Selectable: 10 - 1,000 Hz	
Speed			
Range		0.1 - 30 rev/min (clockwise or anticlockwise)	
Accuracy		±1% of indicated speed	
Resolution		0.001 rev/min	
Displacement			
Angular displacement (from tared position)		max. 2999 revs	
Angular displacement accuracy		±0.2°	
Angular displacement resolution		0.1°	
Linear headroom (without fixtures)		483 mm	
Linear travel of adjustable carriage		182 mm	
Width between columns		280 mm	
Static weights			
Torque cell mass platen		60 N (maximum)	
Dimensions			
Height		1000 mm	
Width		400 mm	630 mm (incl. Touch console)
Depth		372 mm	
Weight		20 kg	23 kg (incl. Touch console)
Software and Communications			
Stand connectivity		USB-B (for communication to PC/Console)	
Console connectivity (VortexPro Touch)		–	1 x USB-C (Power/Data), 3 x USB-A (Data)
PC requirements for VectorPro software (recommended)		Intel Core i5, 8 GB RAM, USB 2.0 or 3.0 port, graphics- Full HD (1080p), 128 GB SSD storage. To make use of Vector Cloud Solutions, an internet connection is required.	
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Operating temperature		10°C- 35°C (50°F- 90°F)	
Operating relative humidity		Normal industry and laboratory conditions (30-80%), non-condensing	
Electrical Supply			
Voltage		230 V AC 50 Hz or 110 V AC 60 Hz	
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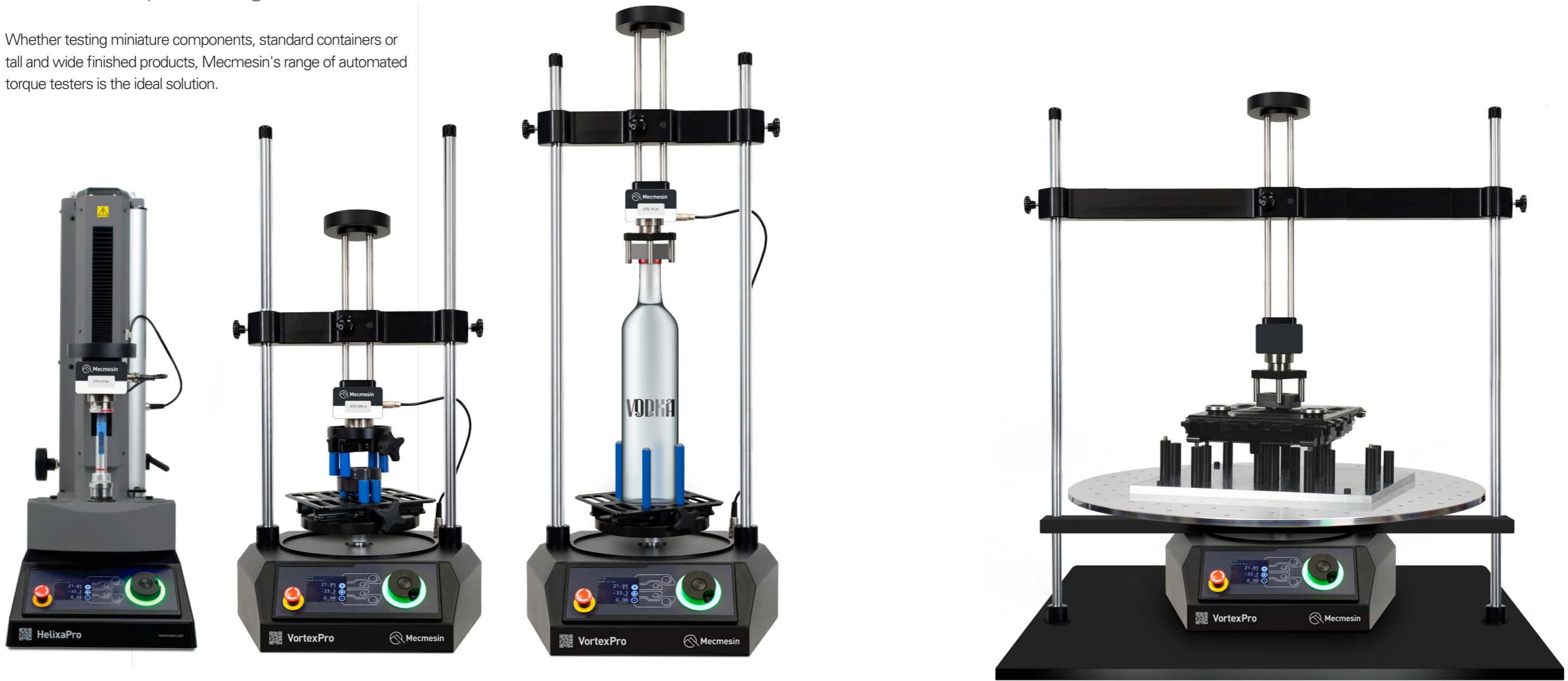
VortexPro Specifications
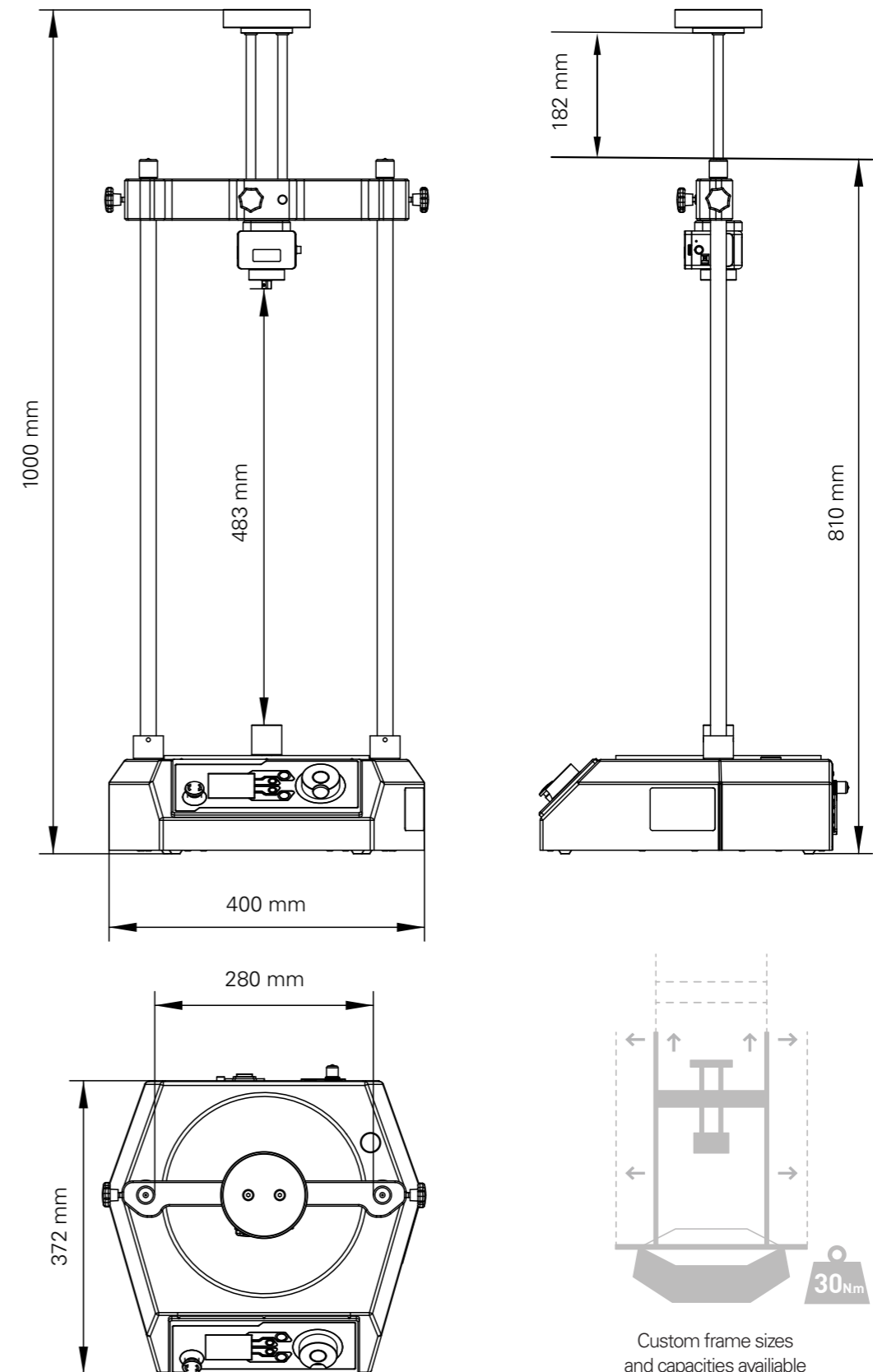
Custom frame sizes
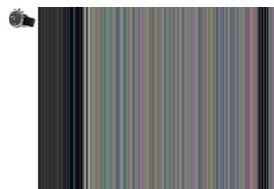and capacities availiable

Versatility

Versatile torque testing solutions

Whether testing miniature components, standard containers or tall and wide finished products, Mecmesin's range of automated torque testers is the ideal solution.

Small

Large

PPT Group

Discover your torque tester online:
visit mecmesin.com/torque-testing

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