



## VERTICAL SINGLE COLUMN MACHINE

### CYCLIC FATIGUE TESTING MACHINE with servo-pneumatic actuator

**LiTeM** series **VSC-A (Vertical Single Column - Air)** systems are modular table top fatigue testing machines complete with external frames and guards, equipped with a pneumatic actuator with a load range of 0 to 2 kN and stroke up to 500 mm.

The **VSC-A** series is made of modular aluminium profile members and can be ordered in its standard versions or tailor-made to meet client's needs.

**VSC-A** machines are the solution for manufacturers and research centers who want to optimize their design and development processes.

The load is applied by special low wear pneumatic actuators with contactless displacement sensors integrated into the rod. This ensures that the sensor itself is completely unaffected by wear.

Each machine has a **RTC9001-S (standard) controller**, complete with **RTC PN (Pneumatic) - STD (Standard) software** with Start Stop test and acquisition and display functions for the data coming from the load and displacement sensor or an auxiliary sensor.

### APPLICATIONS

- 1** STATIC YIELD/FAILURE TESTING,  
for composite components, biological components, dental implants, etc.
- 2** RIGIDITY TESTING  
for single components and assemblies, composite products
- 3** DYNAMIC TESTING with sine, pulsed square wave with settable duty cycle or constant speed triangle wave  
(e.g. for characterization of suspensions/shock absorbers)
- 4** CONSTANT AMPLITUDE FATIGUE TESTING  
to characterize the life under cyclic/repeated loads for any type of component (Wöhler curves)
- 5** CONSTANT AMPLITUDE BLOCK FATIGUE TESTING  
for determining the Palmgren-Miner relation and the effective damage value
- 6** VARIABLE AMPLITUDE FATIGUE TESTING  
using the reproduction/simulation in the laboratory of real world load curves acquired on-site
- 7** REPRODUCTION OF LOAD CURVES  
defined by the user during the design phase

## CONTROLLER AND SOFTWARE

**RTC9001-S (standard)** and **RTC9001-P (pro) controllers** are designed for easy and comprehensible control of structural mechanical tests, with full control of an actuator, a force channel, a displacement channel and an auxiliary  $\pm 10V$  channel. **RTC9000** controllers have been proved to be ideal for static, dynamic and fatigue testing.

### CONTROLLER TECHNICAL SPECIFICATIONS RTC 9001

#### REAL TIME CONTROLLER

**PROCESSOR** DUAL-CORE 667 MHZ  
(PRO VERSION DUAL-CORE 1.33 GHZ)

**FORCE CHANNEL**  $\pm 10V$ , 16BIT

**DISPLACEMENT CHANNEL**  $\pm 10V$ , 16BIT

On request software version for simultaneous control of two actuators.

Easy and safe to configure tests, with full display of graphs and parameters in a single screen with overlapping layers, and logged data that is of genuine use to the operator - these are the keys to success of the **RTC-Pneumatic control software**.

### CONTROL SOFTWARE SPECIFICATIONS RTC PNEUMATIC

**CONTROL MODE:** LOAD - POSITION - AUX 1

**SETTINGS OF PID COEFFICIENTS**

**BUMPLESS CONTROL MODE CHANGE**

**SIGNAL AMPLITUDE CONTROL**

**WAVEFORM:** RAMP SETPOINT - SINE - TRIANGLE - SQUARE

**WAVEFORM:** USER DEFINED PROFILE

**CYCLE COUNTER**

**RECORDING VS. TIME - VS. CYCLE**

**EXPORT DATA:** TEXT FORMAT - EXCEL - GRAPH IMAGES

### GENERAL TECHNICAL SPECIFICATIONS

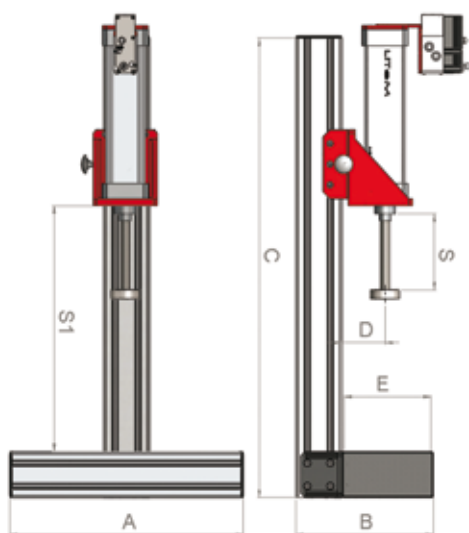
ACTUATOR MODEL	VSC-A-1	VSC-A-1,5	VSC-A-2,5
<b>STATIC FORCE (*)</b>	1,2 kN	1,8 kN	3 kN
<b>DYNAMIC FORCE (**)</b>	1 kN	1,5 kN	2,5 kN
<b>STROKE (mm) (***)</b>	50-400	50-400	50-400
<b>FORCE SENSOR</b> Mounted to the base or to the actuator	5 kN	5 kN	5 kN
<b>FORCE ACCURACY</b>	$\pm 2N$	$\pm 2N$	$\pm 2N$
<b>DISPLACEMENT ACCURACY (****)</b>	$\pm 0,02mm$	$\pm 0,02mm$	$\pm 0,02mm$
<b>SENSOR READ LIMIT</b>	1kHz	1kHz	1kHz
<b>WORKING FREQUENCY</b>	1-30 Hz	1-30 Hz	1-30 Hz
<b>DIMENSIONS (mm)</b>	500X300x1000		
<b>SOFTWARE</b>	RTC Pneumatic Standard		
<b>CONTROLLER</b>	RTC9001 Standard		

\* The values are expressed in thrust with 6 bar pressure

\*\* The dynamic force decreases as the displacement and cycle frequency increase

\*\*\* It's recommended to use 50mm stroke for fatigue testing and 100mm for stiffness testing to optimize the air consumption

\*\*\*\* Accuracy expressed in mm per 100 mm stroke of the sensor



### DIMENSIONS

<b>S (mm)</b>	50-1000
<b>S1 (mm)</b>	200-800
<b>D (mm)</b>	90
<b>E (mm)</b>	200-300

### ACCESSORIES\*

<b>T-GROVE PLANE</b>	300x200 M6-M8
<b>FLAT TEST PLATE</b>	D80
<b>FLAT PLATE FOR SPRING</b>	D80 M8
<b>VICE GRIP PA SERIES</b>	S25-45 mm
<b>VICE GRIP PT SERIES</b>	S50-70-100 mm
<b>HIGH STIFFNESS SUPPORT TABLE WITH PROTECTION</b>	800x800x1000 mm

\* See ACCESSORIES brochure

#### GENERAL INFORMATION

info@litem.info

#### SALES

sales@litem.info

#### TECHNICAL

support@litem.info

#### DRC Srl

sales and production

Via Montesicuro snc - 60131 Ancona (Italy)

Tel (+39) 071 80 36 077

#### EnginLAB Srl

research and development

Via Verità 3/a - 35131 Padova (Italy)

Tel (+39) 049 20 21 489

[www.litem.info](http://www.litem.info)