MARTINENGHI

Leak Tester for laminate collapsible tubes

P Series

Index

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Ver.: LX/LC Series ver. 0

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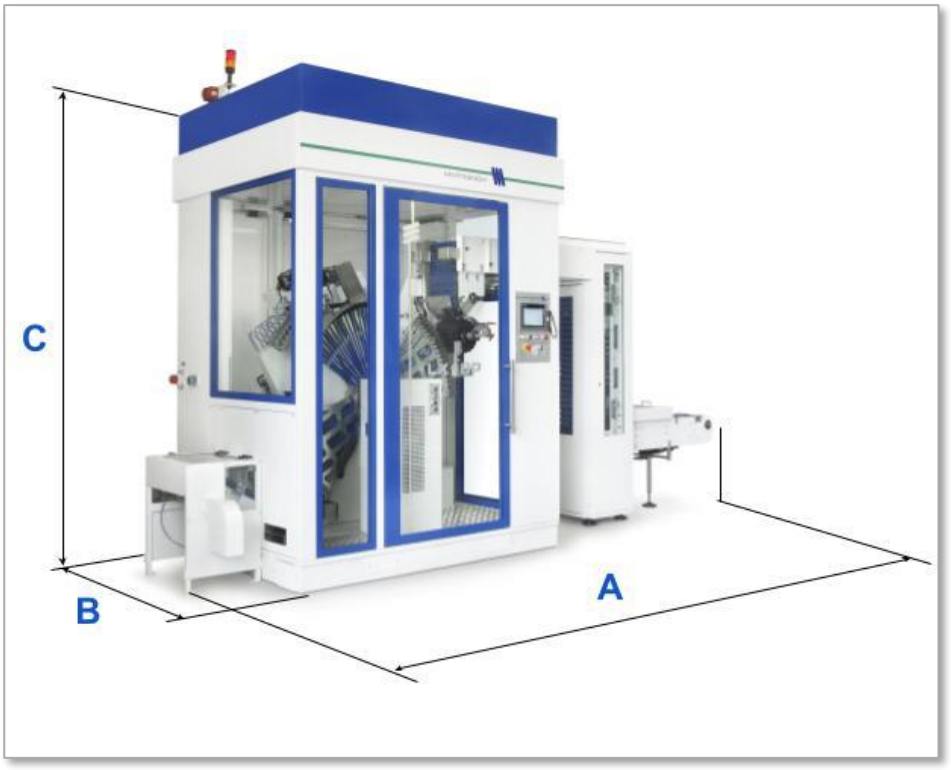
TECHNICAL FEATURES

	iLC200P	*LC200P-L*	*LC200P*	*LC208P*	*LC208P-ER*	*LX12P/LX16P*	*LX18P*
N° of sectors:	4	4	4	4	4	4	4
N° of seats per sector:	16	12	12	8	8	12/16	18
Diameter range: (mm)	13,5 - 19	19 – 35	19 – 35	19 – 40	19 - 50	35 - 60	19 – 35
Prod. rate up to: (ppm)	240	120	200	200	240	240	240
Installed power: (kW)	12	25	12	12	12	35	40
Air consumption (nl/m)	750	750	750	500	500	800	800
Compensator	N/A	N/A	Avail.	Avail.	Avail.	Avail.	Avail.
Leak detection capacity	See diagram below						
Foot print A (mm) including man passage	3.500	3.800	3.800	3.800	3.800	4.800	4.000
Foot print B (mm)	1.900	1.900	1.900	1.900	1.900	2.800	2.100
Height C (mm)	3.000	3.000	3.000	3.000	3.000	3.000 / 3.450	3.000
Weight (kg)	3.000	3.000	3.000	3.000	3.000	6.000	4.200



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GENERAL DESCRIPTION

The leak testers “P Series” are automatic machines installed into production lines, which carry out the 100% quality control of laminated tubes - by accurate pressure test - in order to eject incorrect parts which could be affected by holes, fissures or other leakages.

The machine layout is similar and foresees:

- two segments moved by servomotors.
- four vacuum-assisted holding sectors fixed on the segments.
- Monitoring station equipped by pressure sensors.
- infeed system, optionally provided by accumulator.
- discharging system.

Machines take full advantage of the innovative conveying system made of two independent segments rotating in a coordinated way, each driven by a servomotor. On each holder two segments are fitted at 180°, each with a number of seats, able to hold the tubes during the working operations.

Tubes coming from the upstream machine are lifted to the loading area by means of a basket conveyor. It releases the tubes into a vacuum star-wheel which aligns the tubes and provides the piece transfer from the elevator to the vacuum holding sectors. This device collects the tubes and, according to a designed kinematics, quickly transfers the tubes in front of the testing station, where an extended dwell time allows a very reliable and accurate pressure test. After having performed the pressure test, tubes are released in another vacuum drum, which transfers them to an unloading conveyor. Tubes that fail the test are rejected by air blow from the production stream.
All “P Series” machines are designed to handle finished tubes (with caps)

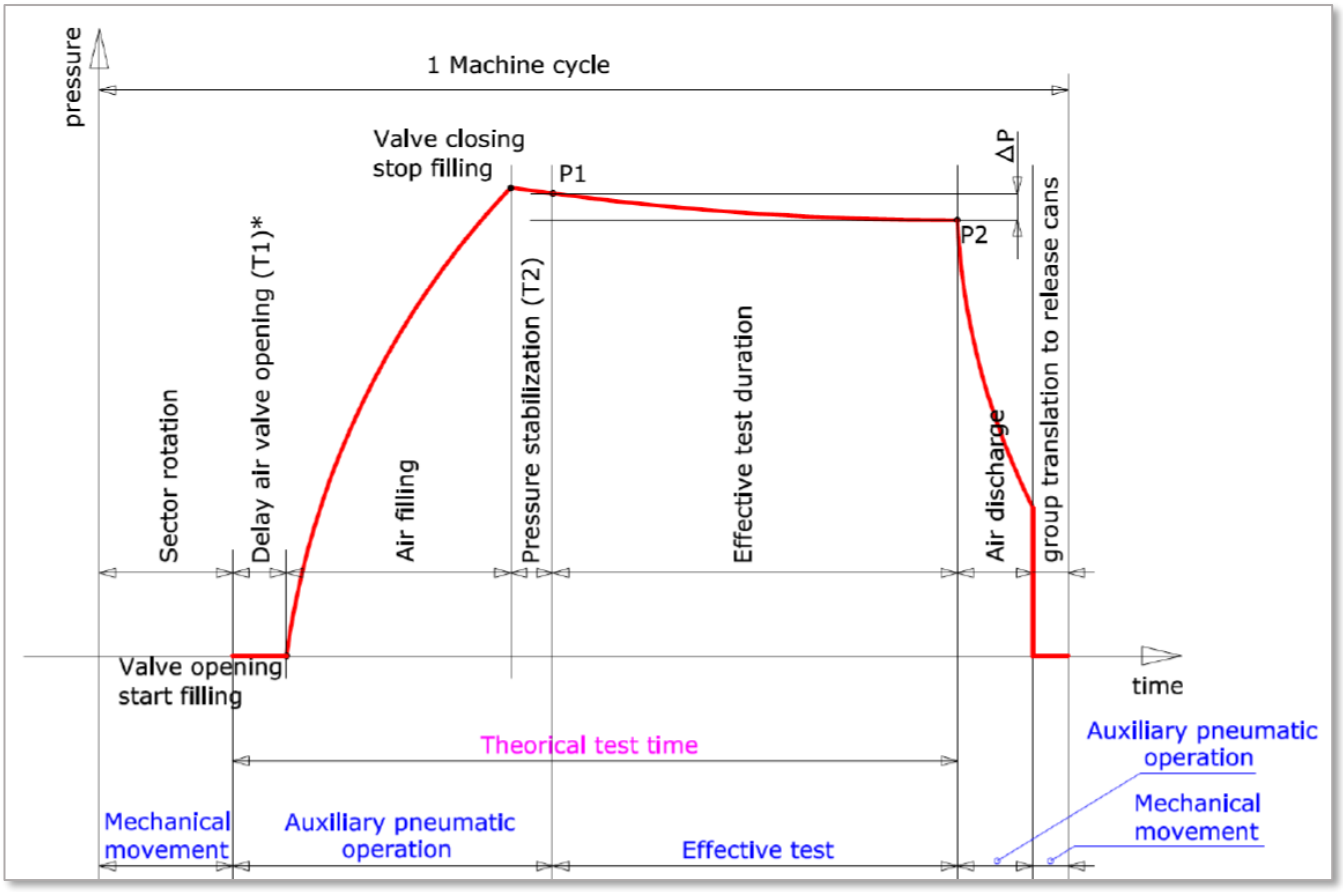
Main features of the machine are:

- 100% in-line production control
- precise and smooth tube transfer along the machine parts
- certified “ZERO defect” system, thanks to monitored ejection of the damaged tube.
- automatic statistical sampling for quality control
- immediate change-over system for tube length, with set-up storing function.
- quick change-over system for diameter, with set-up storing function.
- control inspection certificate and reporting that can be linked to the internal ERP software.
- Easy installation, even in existing lines

DETECTION TECHNOLOGY

Process description

The control process is carried out by means of differential pressure comparison. It means that internal tube volume is sealed for a dwell time according to the production speed. The volume is filled by compressed air, and pressure value is measured and recorded. Before releasing the sealed tube, another pressure value is measured and compared to the first one.



According to the values comparison and the data stored into the PLC, the machine detects the leaking tubes which will be ejected from the production flow. It means that all the tubes that compose a batch are controlled.

Detection accuracy is the ability of the machine to detect small leakages, expressed as *equivalent hole diameter*, measured in µm, that will always be rejected (100% controlled and **"ZERO defect"** concept).

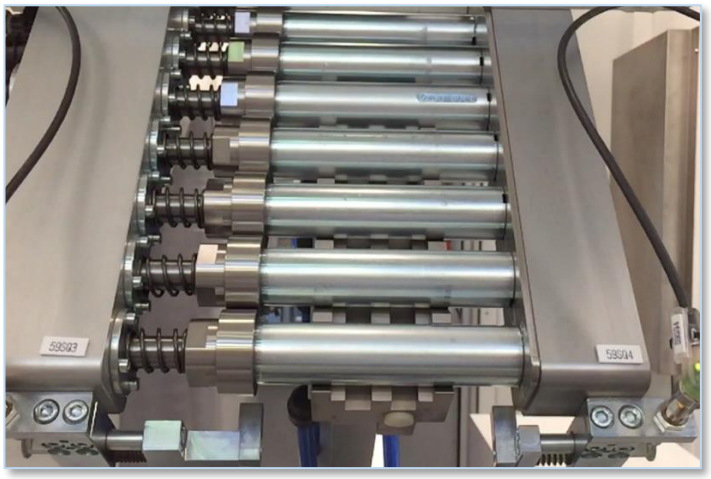
It mainly depends on:

- Production speed.
- Tube volume.
- Number of monitoring heads.

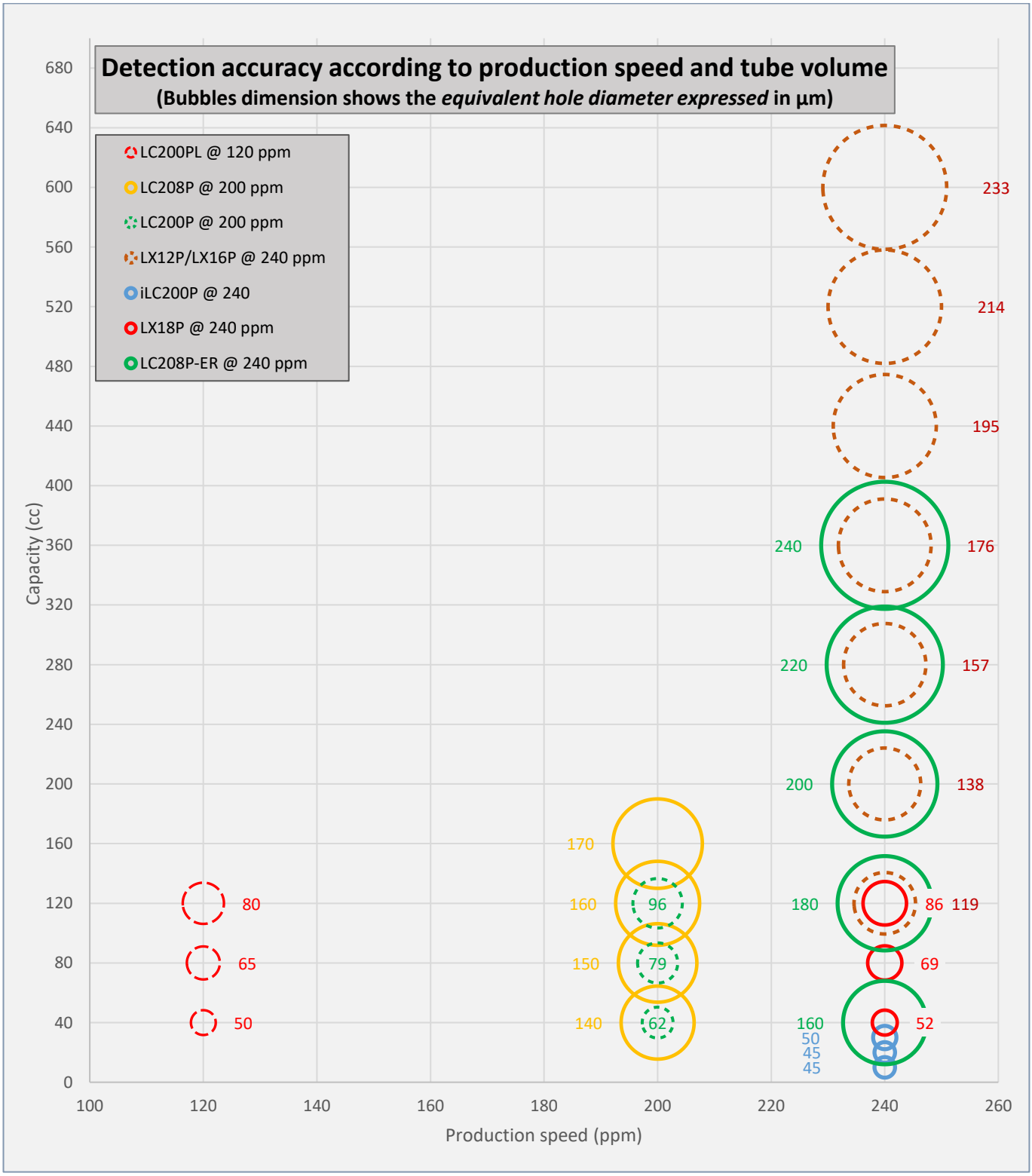
Each model has its own detection accuracy, shown in the attached diagram

Calibration process

This is the operation that establishes a relation between the values provided by the machines and the corresponding indications provided by a calibrated tool. The machine is controlled by a process which involves a known measurement device (dummy tubes on which nipples with calibrated holes are fitted) placed on each seat and checking each monitoring heads. The machine reproduce a given number of detection cycles while the results are memorized.



The detection capability of the machine can be easily checked at set intervals, using the same system. The machines have an internal auto-diagnosis system, which is able to detect any unevenness related to the production detection. For instance, the behaviour of the single monitoring head is continuously compared to the other ones, in order to keep the general process under control all the time.



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GENERAL DESCRIPTION

- *Machine loading unit*
  Tubes are transferred into the machine by means of a basket conveyor, which releases the tubes into a vacuum drum, this device could be equipped with a buffer for dampen the speed difference during the ramp-up transitions.
- *Control unit*
  It is made by a given number of pressure gauges, fed by a pneumatic circuit equipped with pressure, flow regulators and air filtering. The gauges are installed on a sliding support, equipped with special heads, suitable to seal the open side of the tubes.
- *Machine unloading unit*
  By vacuum drum rotating with continuous motion and releasing tubes on the following basket conveyor. This conveyor will supply the tubes to downstream machine.
- *Electrical installation*
  The electrical cabinet is made in accordance with CEI specifications. The cabinet is fitted on the backside of the machine and it can be easily moved in order to facilitate the access to the back components of the machine for maintenance operations.
- *Safety requirements*
  The machine fulfils safety standards. Specifically, all moving parts are protected by safety guards.
- *Remote diagnostics & Industry 4.0*
  The machine can be installed as part of the Industry 4.0 "smart factory" concept. In fact, “P Series” Leak Testers is able to communicate with the internal ERP software, being an active part of the production process.

MEDIA:

DESCRIPTION OF OPTIONAL DEVICES

- *Loading device with accumulator*
  All models can be equipped by a loading device complete of a built-in accumulator, which allows a soft starting rump-up. It can also be used for giving to the machine a larger dwell time for a reinforced test.
- *Size part*
  Each size part for different external diameter foresees:

- 4 Vacuum assisted segments
- 1 Vacuum-assisted loading drum
- 1 Vacuum assisted downloading drum (if needed)

- *Data collection and analisy*

- The machine can be equipped with proper devices for production data collecting broadcasting to ERP internal software

AFTER SALE SERVICES AND ASSISTANCE

- Hot-line service for remote assistance on hardware and software.
- Periodical new release for both proprietary and 3rd parts software.
- Helpdesk for trouble shooting.
- Martinenghi@Home: Our technicians will periodically[1] visit the customer plant for:
  - General inspection of the machine. (mechanical, hardware and software)
  - Eventual support to your technicians for maintenance operations.

[1] According to different models, a specific duration is foreseen.