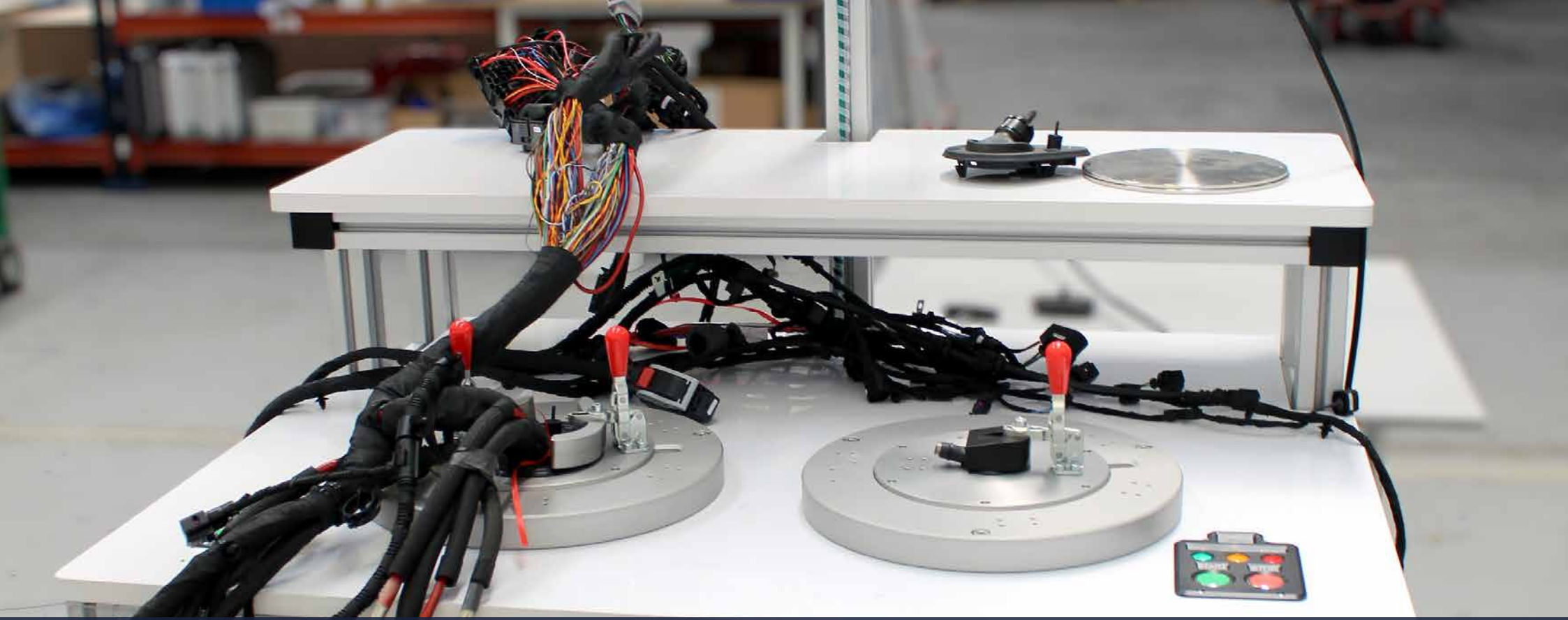
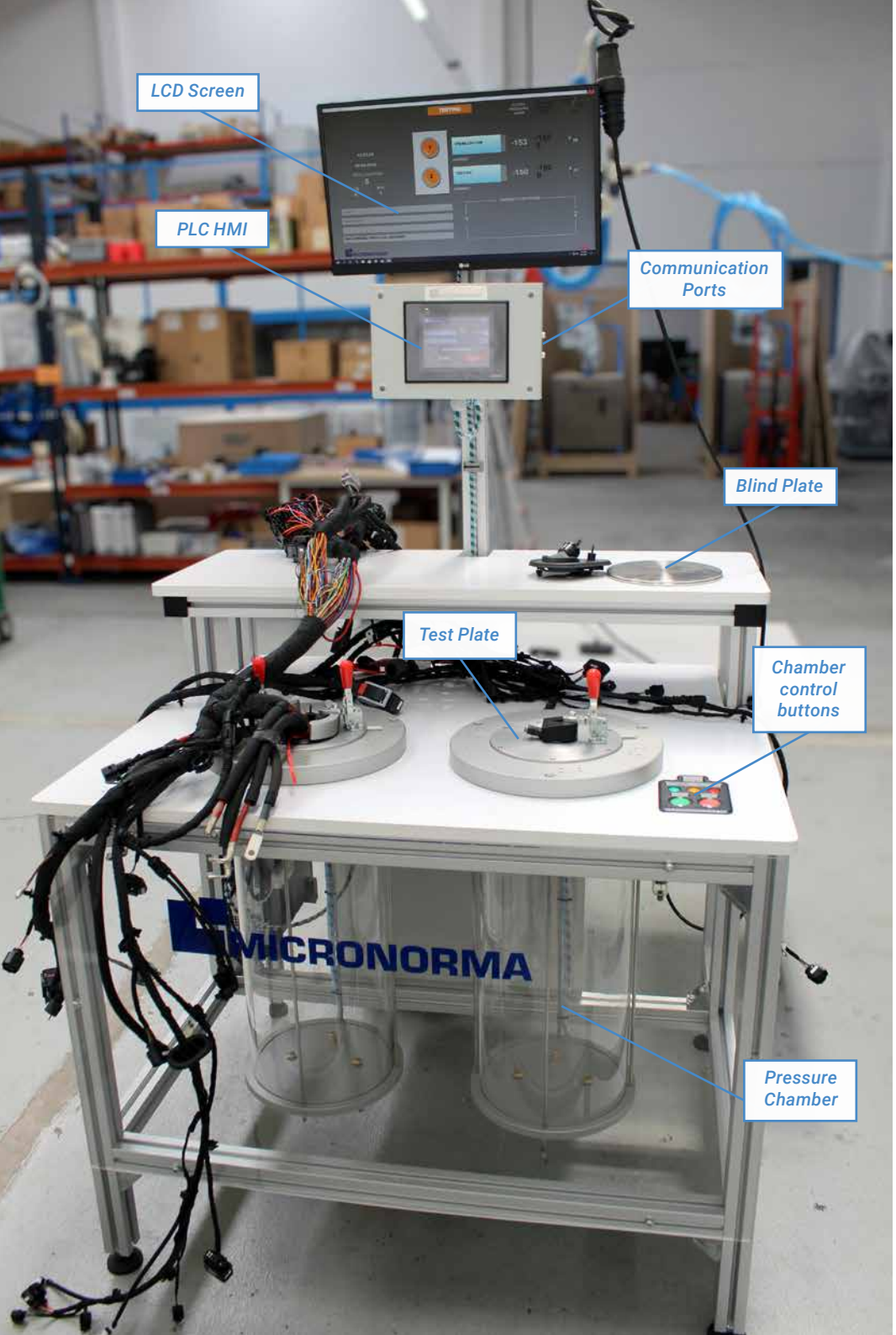


GROMMET AIR LEAK TEST EQUIPMENT

PORTFOLIO

MICRONORMA

DEVELOPING PRECISION FOR THE FUTURE



MICRONORMA

We are an equipment manufacturer company that designs and builds according to client specifications. We manufacture tailor-developed machinery and equipment, normally in small series or even prototypes.

We supply our costumers with turn-key solutions: design, manufacturing, assembly, and testing, as well as start-up of equipments, training and after sales services.

Over the time we have developed some equipment types that became standard in our clients production process.

That is the case of Grommet Air Leak Test Equipment which represents about 40% of our business value.

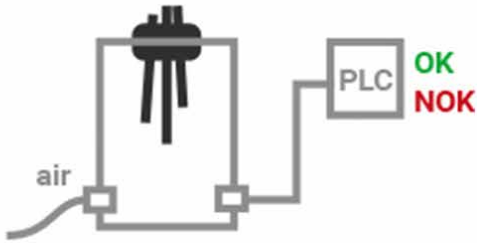
GROMMET AIR LEAK TEST EQUIPMENT

This equipment was developed to detect leaks in grommets using an air pressurized chamber to simulate real conditions of water pressure applied to grommet, without destroying or causing damage to the electrical harness wires.

Air leak test ensures reliability and short cycle time, allowing to test every single unit of batch production.

The equipment is mainly constituted by a workbench, a pressure chamber with pressure control device, PLC and HMI control interface. There are several features available for customization. All equipment ensure KSK integration and HV compatibility.

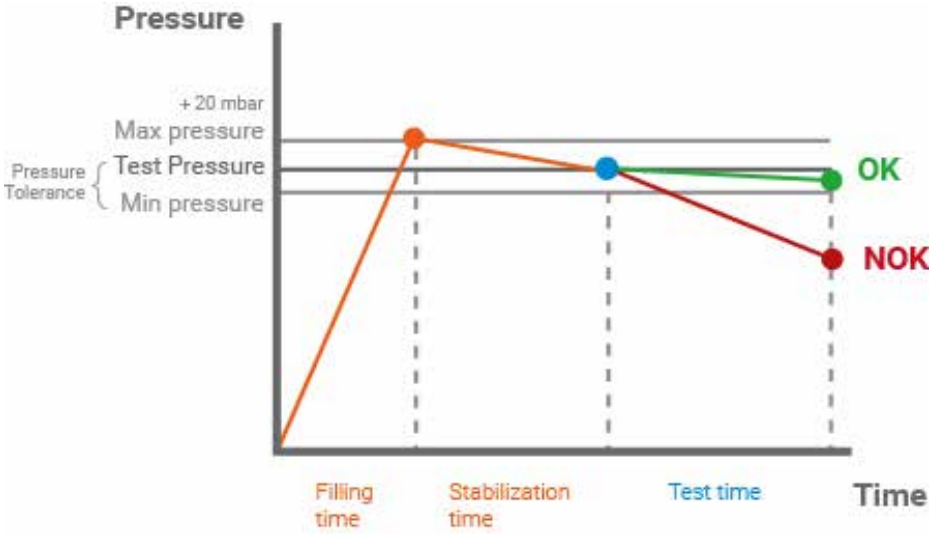
GROMMET AIRLEAK TEST



This equipment apply pressure (air) into a sealed chamber, where the grommet is assembled as it would be in the vehicle. The chamber has a pressure device connected to a PLC that reads the pressure inside the chamber comparing it to pre-defined parameters that determine if the grommet is OK or NOK.

ADVANTAGES

- The pressure test is faster and reliable than a water test;
- It detects very small leaks;
- It does not damage the grommet;
- It reduces the cycle time because it is not necessary to clean the grommets as it would be in a water test;
- Ensures traceabilty;
- Allow to define tolerance specification for determine each grommet as OK or NOK;



TEST STAGES

1. FILLING
The chambers fills to more 20 mbar than the test pressure

2. STABILIZATION
Pressure stabilizes to reach test pressure

3. TESTING
If the pressure is stable whithin predefined values, test result will be OK, if the pressure drops below established minimum pressure the grommet is NOK.

TEST TYPE

PRESSURE OR VACUUM

Our equipment is developed to perform the test with:
PRESSURE - positive pressure between [0;300[*
VACUUM - negative pressure between [-300;0[*
BOOTH - allowing the operator to choose to test with pressure or vacuum for each test.

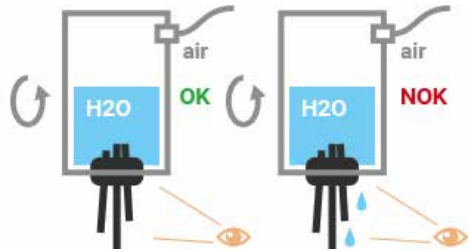
**Some models may test up to 500mbar or -500mbar.*

WATER

These models include a water chamber for visual inspection.
This allows to detect large leaks faster than using only air pressure, because the systems needs some minutes to stabilize and ensure the accuracy of the result.

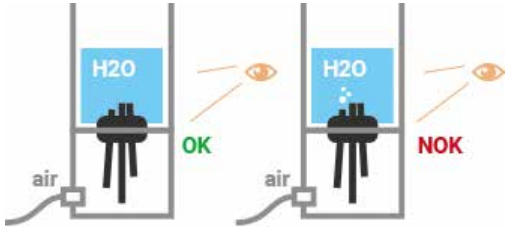
WATER ROTATING CHAMBER

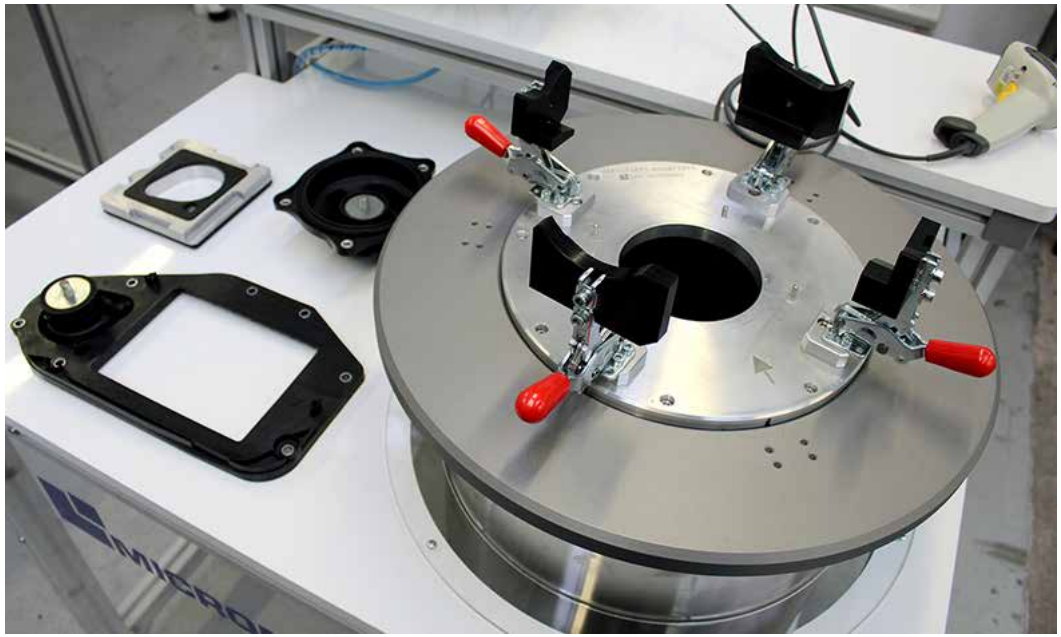
One single chamber that is filled with water, where the grommet is assembled, the chamber is closed and turned upside down.
When the test starts the chamber is filled with pressure. If water drops are viewed the grommet is NOK. If there are no water drops is most certainly OK. The test result will confirm it.



WATER NON-ROTATING CHAMBER

Two connected chambers, where the grommet is assembled between them.
The upper chamber that is filled with water and the lower chambers is filled with pressure.
If air bubbles are viewed the grommet is NOK. If there are no air bubbles the grommet is most certainly OK. The test result will confirm it.





FEATURES

EXCHANGEABLE TEST PLATES

Allows to test several grommets in the same equiment by changing the test plate. All test plates are tailored made according to each grommet geometric configuration and specification. Some grommets require special test plates with clamps and fixtures.

Depending on grommet size and requirements, it is possible to test up to 3-4 grommets per test plate, simultanously.

CUSTOMIZABLE CHAMBERS & WORKBENCH

Chambers available in acrylic or inox, in different sizes according to the grommet harness to be tested.

There are single or multichamber equipment, up to 14 chambers to test multiple grommets, or even the whole harness, simultaneously, and in different configurations depending on the KSK specification.

The workbench is customizable with guide rail, and other features upon request.

INTERFACE INTEGRATION

- Communication Ports for Scanner, RFID and Printer integration, allowing User /Harness identification and label printing;
- Ethernet Port;
- PC integration;
- KSK integration;

INTERFACE & CONTROL

- HMI – Interface and control thru a touch screen PLC;
- Extra user interface control and visual aid available upon request;
- Workbench operation buttons and indication lights for each chamber;
- Easy user friendly interface;

TEST SETTINGS

- Test pressure up to 500 mbar;
- Pressure tolerance defined by the difference between pressure test and minimum pressure;
- Flexi Program: ability to configure test programs, choosing which chambers are enabled for test, as well as test parameters for each chamber;
- Independent chambers test;

OTHER FEATURES

- User ID validation required to operate the equipment (storage capacity up to 30 users);
- Password required to acess Test and Machine Settings;
- Machine Lock (set the amount of NOK tests to which machine will block);
- Tests results statistics for traceability (test result, harness nr. date, time and operator ID) recorded on a usb flash drive in CVS file;
- Total counters (OK, NOK and Total);

FAQ

What is the time limit and is it possible to reduce that value?

The test limit defines the maximum time acceptable for infill and stabilization – if the test doesn't start in the time defined the test result it will be a NOK automatically. Big leakages are detected during this period, sparing the time it takes to complete the test.

This parameter is not important for the test process but for the machine process, keep it between 60 to 90sec when using our standard chambers (Ø250mm x 400mm).

How much is it possible to reduce test time?

Since the leakage will impose a certain loss of pressure during a certain timeframe it is important to relate the acceptable tolerance together with the time window for this monitoring.

The higher the timeframe is, the higher the probability of labeling a part as NOK. It takes some time to detected properly.

If you lower the test time you should close the tolerance window.

What would be the best pressure test value?

The test pressure creates the base condition for the test; the higher the value the more stressed is the insulation membrane or foaming, and allows for greater flux of air thru leakages; the pressure value is an analogy of the water column test, such that 1m of water column is equivalent to 100mbar of relative pressure. Proportionally a 200mbar test is a 2m water column and so on. Higher pressures can damage the insulation on the production parts and/or create big stress on the mechanical components of the machine, so we recommend up to 300mbar on our standard chambers (Ø250mm x 400mm).

How can I configure the test tolerance?

During the test stage, if a leakage is present, the pressure inside the chamber will gradually go down and thus it is important to define the minimum threshold at which you will label a part as NOK.

The machine must be setup for such conditions that will detect all of your NOK quality dpt labeled parts and accept all of the defined OK parts. One good exercise is to use master samples to define the test parameters, by making small changes on the existing setup and checking what happens with your master samples.

Does the machine sensors require calibration?

The sensors are factory calibrated. At Micronorma we do some verifications as well and if everything is OK we install the sensor on the machine. If requested, we can send the sensor to an external certification institute.

It is advisable to verify sensor calibration periodically?

Yes. The periocity should be defined by each local production unit quality department.

Micronorma has developed a Sensor Verification Machine, to allow that verification locally and autonomouslly without production downtime and expensive costs of calibrating sensors externally. Contact us for more information.

SPECIFICATIONS TABLE

Micronorma has some standard models with reduced leadtimes.
The table below provides all main features of the equipment for standard and custom models.
All machines include a blind plate per chamber. Test plates are tailored made for each grommet (not included).
All machines are provided with CE Declaration of Conformity and Operation and Maintenance Manuals.
For further information contact us: marketing@micronorma.com

TEST TYPE / NUMBER OF CHAMBERS	1	2	3	4	5	more ... (up to 14)
Pressure	● ●	● ●	●	●	●	●
Vacuum	● ●	● ●	●	●	●	●
Pressure & Vacuum	● ●	● ●	●	●	●	●
Pressure & Water Rotating Chamber	●	N / A				
Pressure & Water Non Rotating Chamber	●	N / A				

CHAMBERS TYPE / SIZE	Ø250X400	Ø250X600	Ø150X400	Ø300X400	Ø325X650	custom
Acrylic	● ●	● ●	●	●	●	●
Inox	● ●	● ●	●	●	●	●

WORKBENCH	upper shelf	guide rail	chamber control buttons	tower signal light
Standard (~ 1065 x 850 mm)	● ●	N / A	●	N / A
Only stand-alone chamber	N / A	N / A	●	N / A
Custom	●	●	●	●

INTERFACE / PERIFERALS	HMI 5'	HMI 7'	extra LCD screen	PC	scanner	printer	RFID
Standard	● ●	●	●	●	●	●	●
Custom	●	●	●	●	●	●	●

● *STANDARD MODELS*
● *CUSTOM MODELS OPTIONS*

STANDARD MODELS

SINGLE

ACRYLIC CHAMBER

Chamber Ø250X400 or Ø250X600
Workbench ~ 1065 x 850 mm
~ 800 height with upper shelf

Optional:
PC
Extra LCD Screen

INOX CHAMBER

Chamber Ø250X400 or Ø250X600
Workbench ~ 1065 x 850 mm
~ 800 height with upper shelf

Optional:
PC
Extra LCD Screen

DOUBLE

ACRYLIC CHAMBERS

Chamber Ø250X400 or Ø250X600
Workbench ~ 1065 x 850 mm
~ 800 height with upper shelf

Optional:
PC
Extra LCD Screen

INOX CHAMBERS

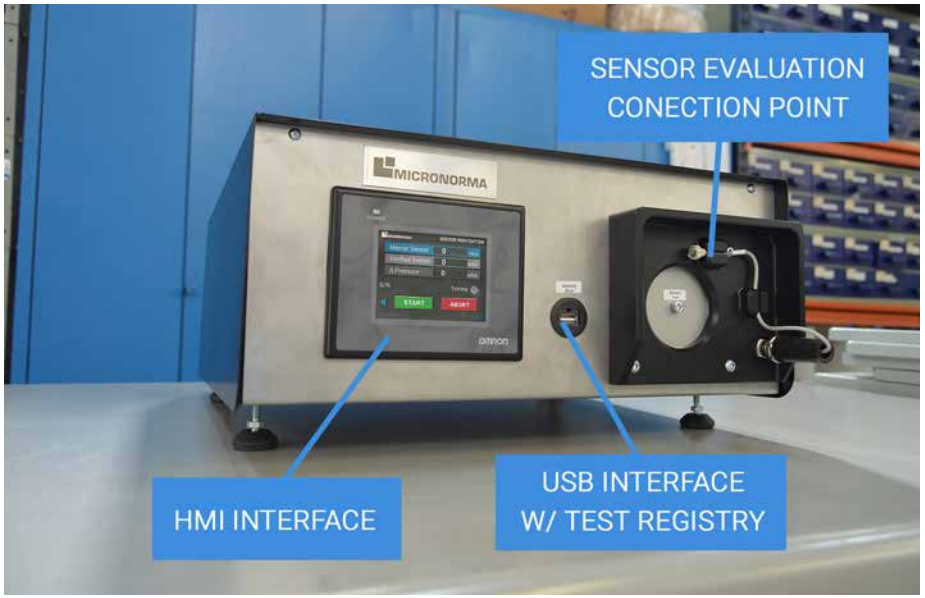
Chamber Ø250X400 or Ø250X600
Workbench ~ 1065 x 850 mm
~ 800 height with upper shelf

Optional:
PC
Extra LCD Screen

SENSOR VERIFICATION MACHINE

FACTORY AUTONOMOUS SELF VERIFICATION OF SENSORS

Micronorma has developed a machine to verify the condition of the sensors used in the Grommet Air Leak Equipment.
This machine tests the sensor by comparing it with a calibrated, higher accuracy, pressure transducer. For this it has a chamber where pressure/ vacuum is applied according to the test desired and sensor to be tested.



COMPATIBILITY

This machine is prepared for sensors SMC:

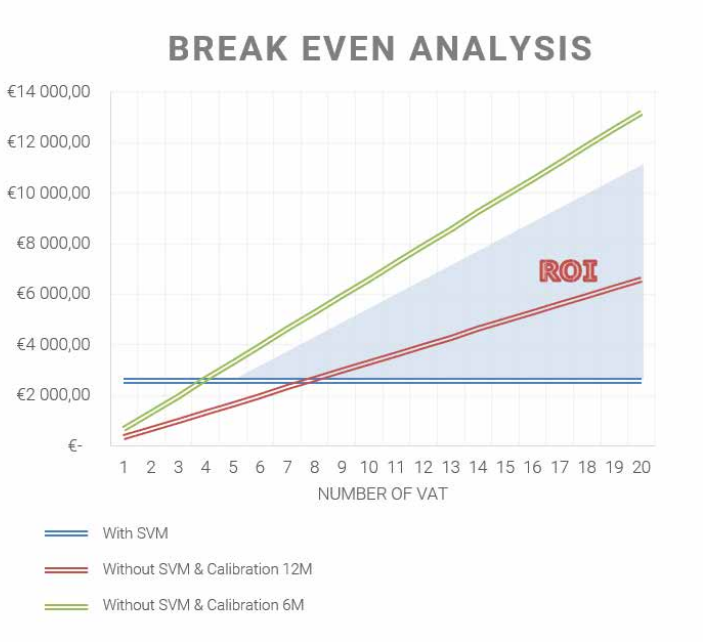
- PSE530 - pressure
- PSE531 - vacuum
- PSE533 - pressure & vacuum

FEATURES

- Pre-programmed test procedures for different types of testing (vacuum / pressure / different limits / and more)
- Easy to use HMI interface
- Easy to assemble interface for the sensor
- Registry of test results according to pn / date / time / test results
- Full customization according to metrology requirements

ROI

Guaranteed cost reduction and downtime.
Estimated amortization in 5 years.



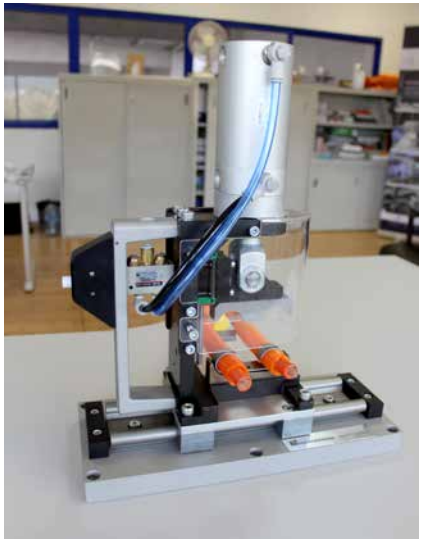
OTHER GROMMET HARNESS RELATED SOLUTIONS

GROMMET CUTTING MACHINE

SENSOR VERIFICATION MACHINE

HARNESS CLEANING SOLUTIONS

TERMINAL BENDING SOLUTIONS



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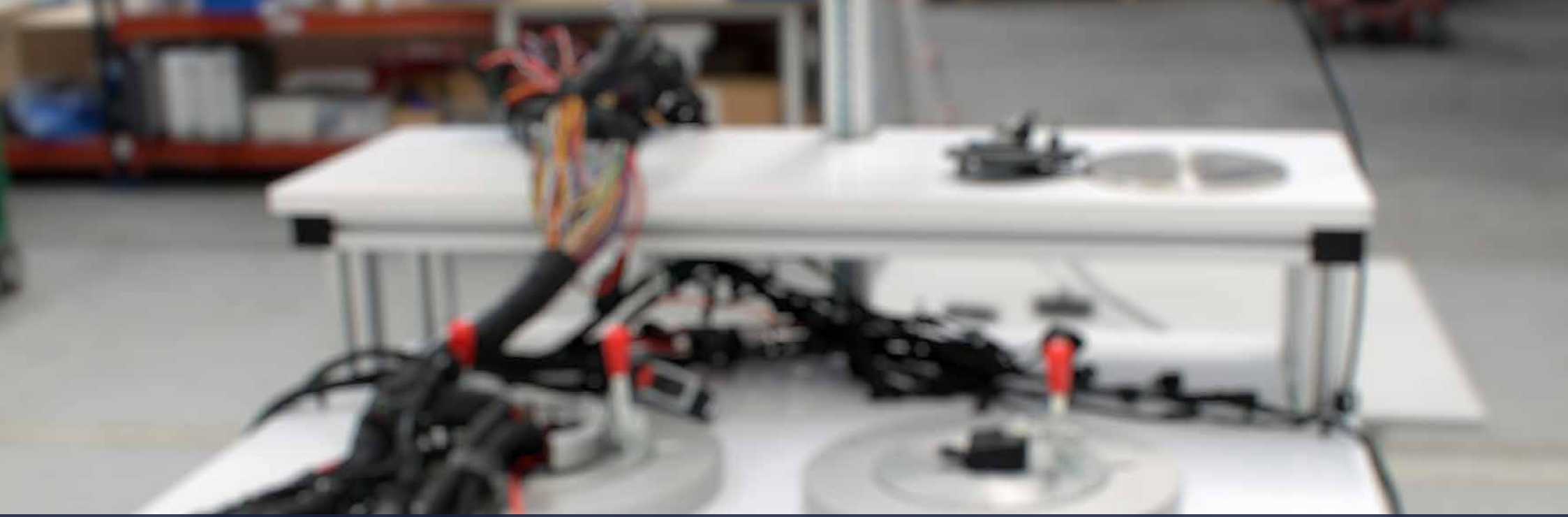

MICRONORMA

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