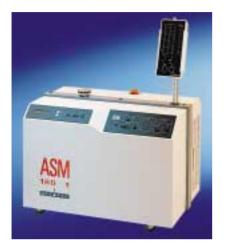
ASM 180 Series

POWERFUL AND SENSITIVE HELIUM LEAK DETECTORS





The ASM 180 Series: high performance helium leak detectors designed for the most sensitive applications.







The list of applications for which helium leak testing is or can be used includes a wide variety of systems large and small as well as conditions under which the leak tests are performed. They range from tiny parts to be tested at a work station to chambers of varying size that must be tested in various environments. Most of these applications required high sensitivity coupled with fast response time. Meeting the challenge, Alcatel has designed a series of powerful leak detectors that consists of six different models built around a single, proven leak testing concept. Each model is fitted uniquely to a subset of the total list of applications based on the size and shape of the outer cabinet, the pumping capacity of its vacuum system, and the presence or absence of oil within the primary roughing pumps.

The ASM 180 series provides solutions which are particularly suitable for:

- Testing volumes up to 1000 liters without auxiliary pumping system.
- Testing parts of various volumes with a stand-alone leak detector.
- Pinpointing very small leaks in large installations.
- Detecting leaks as small as the 10⁻¹¹ atm.cc/s range.
- Conducting high performance testing in space restricted area.
- Avoiding hydrocarbon contamination in a clean system or installation.
- Performing leak detection in a "clean room" environment.
- Having the convenience of a work surface.
- Easily integrating a leak detector in a production or test assembly.

A solution for a wide range of applications

The Alcatel ASM 180 series is extremely flexible and easy to operate. It provides automatic operation throughout the range from atmospheric sniffer tests, test of long gas lines or tubings, large gross leak mode and ultra sensitive vacuum fine leak test mode. It can be used for the test of components, systems or complete installations.

• Automotive industry

Air conditioning compressors, evaporators and lines, ABS valves and lines, air bags inflators and ignitors, fuel injectors, heat exchangers, gear boxes, shock absorbers, batteries, rims, sealed beam lamps and assemblies.

• Aeronautics - Aerospace

Test of satellites, fuel tanks, window seal systems, engine injection valves, pumps, hydraulic components, oxygen lines.

• Electrical

Lamps and tubes manufacture, photomultiplier tubes, high voltage relays, circuit breakers and transformers, underground cables and distribution systems, maintenance of power plants generators, heat exchangers.

• Semiconductor/Electronics

Hermetically sealed integrated circuits, liquid crystal displays, quartz displays, feedthroughs, captors, vacuum systems maintenance, gas panels and lines, mass flow controllers.

• Chemical and mechanical

Reservoirs and storage vessels, distillation columns, filters, vapor generators, transfer lines, ovens, controlled environments, vacuum systems, storage tanks, heat exchangers, freeze dryers, fire extinguishers.

• Refrigeration/Air conditioning

Compressors, evaporators, heat exchangers, lines, and dryers, complete systems.

• Packaging industry

Hermetic medical and pharmaceutical packaging, food containers, food and beverage cans, drums.

• Medical and Pharmaceutical

Catheters, blood filters, instrumentation, analyzers, hermetically sealed packaging, blister packs.

Nuclear Physics/Research & Development

Particle accelerator vacuum and beam lines, cryogenic lines and vessels, vacuum valves and components, vacuum systems and instruments, high energy physics, accelerators, surface sciences.



Leak testing of vacuum valves with ASM 181 T



Leak testing of a 1000 liters chamber on a sputtering system with ASM 181 T2D+

General concept: a family based on a single proven leak testing unit ...

Analyzer cell and associated:

Sensitivity

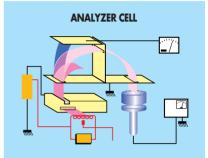
Amplification system for the mass spectrometer is the most critical part of a helium leak detector.

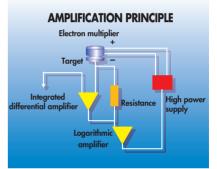
The electronic current received by the target is extremely small ($\approx 10^{-15}$ amperes).

Alcatel has developed an original amplification system (patented) using an electron multiplier.

The Alcatel solution provides unmatched stability and sensitivity: minimum detectable signal of 5×10^{-12} atm.cc/sec Helium and a wide and continuous measurement via a LED bargraph display covering the full measurement range. The Alcatel amplification system coupled with the Alcatel design magnetic deviation analyzer cell is a helium partial pressure captor recognized for its stability, sensitivity, ease of operation and low, simplified maintenance.

Alcatel with its high performance amplification technology, remains the reference for high sensitivity and high performance helium leak detection.





Electronics:

Automation

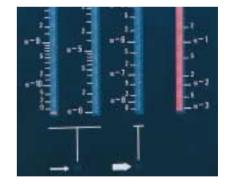
The ASM 180 series continues Alcatel's philosophy for reliability modular design, standardized components and simple easy to use controls and operation.

The ASM 180 electronics are central to this design philosophy and employ:

- a microprocessor to control and monitor test and safety parameters
- an integrated controller for start-up and main operation functions
- a multi-function command controller with continuous bargraph leak rate display and critical test mode status lamps for stationary and hand-held remote indications.



Hand-held remote control





User-friendly control panel



... and dedicated options to meet your specific requirements



Outer cabinet



Compact cabinet: model 180 To operate in space restricted areas.

Console cabinet: model 181

Extended capability pumping speed suitable to a production environment.



Pumping package

Wet model: option "T"

These versions are equipped with a 20m³/h (15 cfm) Alcatel rotary vane mechanical pump and a Helium inlet pumping speed of 4.4 l/s enabling short test cycles, fast pumpdowns and response times.

Dry model: option "TD+"

An unique "DRY" leak detector offering including:

- 2 compact models
- a powerful console model.

These dry leak detectors are equipped with oil free pumps for ultra-clean applications.

Extended capabilities: option "2"

The console version allows extended capabilities models with unique roughing capacity and helium pumping speed up to 20 l/s.

Presentation of the range



Leak testing and verification of semiconductor fabrication vacuum components with ASM 180 TD+

Two compact models:

- ASM 180 T

Powerful leak detection system with a 20 m³/h (15 cfm) rotary vane oil sealed mechanical roughing pump, for individual and varied tests of volumes up to 50 liters without auxiliary pumping.

- ASM 180 TD+

Dry leak detector, with an unique high capacity oil-free frictionless dry pump combined with a molecular dry pump for contamination free leak detection of volumes up to 200 liters without auxiliary pumping.

Four console models:

- ASM 181 T

Console model with a 20 m³/h (15 cfm) rotary vane mechanical roughing pump, for production, individual and varied tests of volumes up to 50 liters without auxiliary pumping. An enhanced pumpdown capability with 2 x 20 m³/h (2x15 cfm) rotary vane mechanical roughing pumps operating in parallel is proposed as an option for shortened roughing time, individual and varied tests of volumes up to 100 liters without auxiliary pumping.

- ASM 181 T2

Essentially the same as ASM 181 T but with enhanced high vacuum inlet pumping with an additional 100 l/s turbomolecular pump. To test large volumes up to 200 liters without auxiliary pumping. The most powerful leak detector.

- ASM 181 TD+

Console version of ASM 180 TD+. An enhanced pump down capability with 2 oil free frictionless dry pump operating in parallel is proposed as an option.

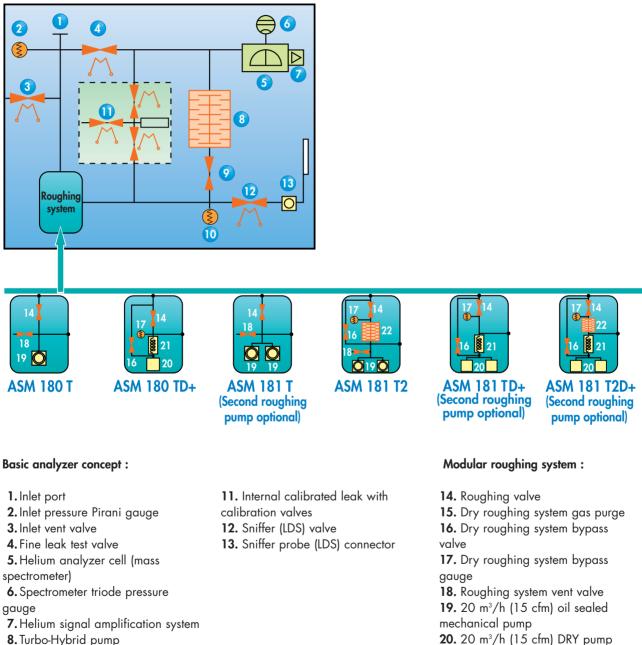
- ASM 181 T2D+

Dry leak detector, with enhanced pumping speed capabilities with a 100 l/s turbomolecular pump combined with the oil-free roughing package of the ASM 180 TD+. Enhanced oil-free pumpdown capabilities is proposed as an option with 2 frictionless dry pumps operating in parallel at high pressure for contamination free leak detection of volumes up to 1000 liters without auxiliary pumping.

General architecture

Structure of the ASM 180 series - Operational schematic

The ASM 180 series includes a modular design with adaptable pumping capacity



- 9. Gross leak test valve
- 10. Turbo-Hybrid pump exhaust Pirani gauge

- **21.** 10 l/s molecular drag pump
- 22. 100 l/s turbomolecular pump

Characteristics allowing well adaptation in harsh environments (industry, clean rooms)

Rugged design

Alcatel's modular design, using robust components and strength provides an exceptional reliability in the most severe industrial application or environment.

Automatic protection integrates all safety controls to enable the instrument to withstand severe accidental air in-rushes and shocks due to the movement or transport as well as power failures and incorrect operations.

Modular design provides easy access to internal components.

"DRY " leak detectors ASM 180 TD+, ASM 181 TD+ and ASM 181 T2D+ for oil-free leak detection

The Alcatel "DRY" leak detectors are without risk of hydrocarbon oil contamination of the test system or component.

It is the result of Alcatel's commitment for improving the capability and utilization of helium leak detection fitted to the most demanding and ultra-clean research in emerging semiconductor, medical, pharmaceutical, nuclear, specialty gas and chemical industries.

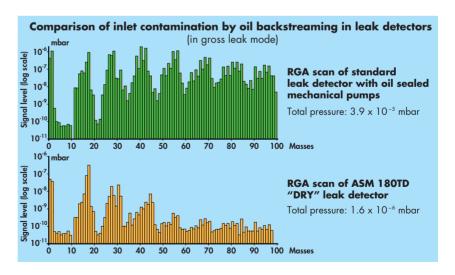
The Alcatel "DRY" leak detectors are ideally suited for:

- UHV and UCT environments
- high energy particle physics accelerators and experiments
- semiconductor manufacturing
- medical and pharmaceutical hermetic packaging
- ultra-pure gas manufacturing and handling systems

System integration capability

The ASM 180 series can easily be integrated into industrial or process environments via the RS 232 interface, 13 discrete I/O and 1 analog output.







Main characteristics

MODELS	ASM 180T	ASM 180TD+	ASM 181T	ASM 181T2	ASM 181TD+	ASM 181T2D+
VERSIONS	Compact	Compact	Console	Console	Console	Console
Standard Roughing System	20 m ³ /h (15 cfm) oil sealed pump	25 m ³ /h (18 cfm) multistage Roots + 10 l/s MDP	1 or 2 x 20 m ³ /h (1 or 2 x 15 cfm) oil sealed pump	2 x 20 m ³ /h (2 x 15 cfm) oil sealed pump + 100 l/s TMP	1 or 2 x 25 m ³ /h (1 or 2 x 18 cfm) multistage Roots + 10 l/s MDP	1 or 2 x 25 m ³ /h (1 or 2 x 18 cfm) multistage Roots + 10 l/s MDP + 100 l/s TMP
High vacuum pump	130 l/s Hybrid pump	130 l/s Hybrid pump	130 l/s Hybrid pump	130 l/s Hybrid pump	130 l/s Hybrid pump	130 l/s Hybrid pump
*Smallest detectable signal at full pumping speed (atm.cc/s)	5.10 ⁻¹²	5.10 ^{.12}	5.10 ⁻¹²	5.10 ⁻¹²	5.10 ⁻¹²	5.10 ⁻¹²
Helium signal reading range (atm.cc/s)	2.10 ^{.11} to 1.10 ^{.1}	2.10 ^{.11} to 1.10 ^{.1}	2.10 ^{.11} to 1.10 ^{.1}	2.10 ⁻¹¹ to 1.10 ⁻¹	2.10 ^{.11} to 1.10 ^{.1}	2.10 ⁻¹¹ to 1.10 ⁻¹
Helium pumping speed at Inlet port (I/s)	4.4	4.4	4.4	20	4.4	20
Cross-over pressure at inlet (mbar) (for Large Leak test mode)	6	6	6	6	6	6
Power consumption (kVA)	1.2	1.2	1.2 or 1.8	2.0	1.6 or 2.4	1.6 or 2.4
Width (mm / inch)	600 / 23.6	600 / 23.6	600 / 23.6	600 / 23.6	600 / 23.6	600 / 23.6
Depth (mm / inch)	410 / 16.1	450 / 17.7	730 / 28.7	730 / 28.7	730 / 28.7	730 / 28.7
Height (mm / inch)	450 / 17.7	460 / 18.1	885 / 34.8	885 / 34.8	885 / 34.8	885 / 34.8
Weight (kg / lbs)	80 / 176	96 / 212	125 / 275 or 155 / 341	155 / 341	155 / 341 or 185 / 407	155 / 341 or 185 / 407
Inlet port size (DN)	40	40	40	50	40	50

(*): according to AVS 2.1 and ISO 3530 standards.

Available options allowing extended adaptability

- 3 masses
- Metal seals
- Clean room compatible cover (on compact TD+ version)
- Alphanumeric control & display panel for extended capabilities
- Calibrated leaks
- Test chambers
- Protection of the control panel
- Gas line "bullet test" (on compact TD+ version)



Cleanroom compatible cover



Protection of the control panel



A complete range of calibrated leaks



Alphanumeric control and display panel with a test chamber



Available accessories allowing extended adaptability

DESCRIPTION	PART NUMBER
Long distance sniffer probe with 5 meters tube (16 ft)	072301
"ALSTAT" software (the RS 232 interface is available as standard)	785911
Transport cart (for compact version only)	072654
Foot pedal for cycle command (1.5 meters/5" cable)	100913
Printer 220V 50 Hz*	102873
Printer 115V 60 Hz*	103593
Printer 100V 50/60 Hz*	103594
Exhaust air stainless steel box for clean room compatible casing (ASM 180 TD+ only)	102867

* the ADC option is recommended to get all benefits of the printer



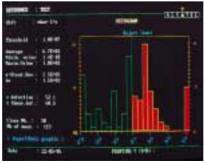
Long distance sniffer



Helium spray probe



Transport cart



ALSTAT statistical software



Ordering information

ASM 180 T

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Leak dete	ctor Autocali	: 											
ASM 18	OT compens	sated calibrate	ed leak (RS	5 232 +									
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ode 0	3												
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* A.D.C. - Alphanumeric Display and Control panel (A). Used to control a test sequence automatically, to signal the test results on LEDs and to display the helium signal. Includes a RS 232 interface for controlling a printer.

** Automatic test chambers (integrating the ADC) :
 Hemispherical test chamber Ø 72 mm, depth 31 mm, with start of cycle contact [1]
 Cylindrical test chamber Ø 85 mm, depth 68 mm, with start of cycle contact (P)
 Cylindrical test chamber Ø 160 mm, depth 100 mm, with start of cycle contact (G)



0

Ordering information

ASM 180 TD+ С Autocalibration with Leak detector built-in temperature compensated ASM calibrated leak (RS 232 +13 I/O as 180 TD+ Code С a standard features) Masses 3 Masses (3). This option allows the leak detector to detect masses 2, 3 and 4. Helium 3 masses Code 0 3 Seals for the vacuum module The leak detector can be provided with Elastomer Metal Elastomer seals (for the high vacuum as well as the inlet bloc) as standard (E) or with Elastomer metal seals for specific applications (M). Code Е М This seal assures that the mass spectrometer is Seal at the spectrometer leak tight. It can be made of special elastomer and can be re-usable (E) or made of special editional soft metal (L). Reusable Metal (Lead) Code Е The elastomer seal is the standard configuration Control panel cover Hinged, locking Plexiglas cover which protects With Without the control panel located on the leak detector. Code 0 1 Gas line "bullet test" (G). This option allows to leak test long gas lines with very small diameter. Using a ultra clean purge gas such as nitrogen as a carrier gas, the line is maintained in a viscous regime to allow fast response time. Detection option Standard Gas line Code S G **Operator interface** Autom. test chamber Autom. test chamber Autom. test chamber Standard A.D.C.* large model** small model** medium model** G Code S A Т P

	0	ver	U.C.T Ultra Clean Technology (C)
P	Painted	U.C.T.	Front and rear covers and frame in stainless steel. Compatible with a connecting accessory for the extraction of cooling air through an airtight tube.
Code	Р	С	accessory for the extraction of cooling air through an airtight tube.

	-	note control	-			
	3.5 m/10 ft	7 m/20 ft	25 m/75 ft			
Code	1	3	7			
			M	ain po	ain power supply	ain power supply
	115V - 60H	z 220V - 5	0Hz 240V	- 50Hz	- 50Hz 220V-50/60Hz	- 50Hz 220V-50/60Hz 100V-50/60Hz
Code	1	2	3		4	4 5

		Main pow	ver cable	type	
	U.S.A.	France/Germany	U.K.	Italy	Switzerland
Code	1	2	3	4	5

* A.D.C. - Alphanumeric Display and Control panel (A). Used to control a test sequence automatically, to signal the test results on LEDs and to display the helium signal. Includes a RS 232 interface for controlling a printer.

** Automatic test chamber (integrates the ADC): - Hemispherical test chamber Ø 72 mm, depth 31 mm, with start of cycle contact (T) - Cylindrical test chamber Ø 85 mm, depth 68 mm, with start of cycle contact (P)

- Cylindrical test chamber Ø 160 mm, depth 100 mm, with start of cycle contact (G)

Ordering information

ASM 181 T

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Leak de	ector Autoca	libration with l	built-in tempera	ture					
ASM 1	81 T comper	nsated calibrat as a standard	ted leak (RS 23	2 +					
Code D	131/0	as a standard	a reatures).						
Ma	3		is option allows						
	3	e leak detector and 4.	to detect mass	es 2,					
Code 0	3								
Seals fo	r the vacuun			r can be provided with : for the high vacuum as					
Elastor	er Me	tal v	vell as the inlet l	oloc) as standard (E) or					
Code E	M		vith metal seals	for specific applications	(M).				
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Seal at Reusab	the spectrom le Metal (Lea	leak tig	ght. It can be m						
Code E		or mac	de of special sol	ft metal (L).					
	L	The eld	astomer seal is t	he standard configurati	on.				
Ca	ntrol panel c								
Wit	iout			l Plexiglas cover which p el located on the leak d					
Code 0		1							
Data	ction option								
Standa		h 40 m ³ /h	(R) : adds anoth	ner 20 m³/h roughing j	ump during pum	q			
Code 0	R	down (tot	tal capacity : 40) m ³ /h or 29.2 cfm).	1 01				
	, N								
			perator inte		1				
Standa	rd A.D.C.*		est chamber model**	Autom. test chame medium model*					
Code S	•	small	T	P meaium model		model**			
Loue 3	A		1	r		G			
	Remote cor	trol unit							
3.5 m/1	0 ft 7 m/20)ft 25 m/	75 ft						
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			M						
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*A.D.C. - Alphanumeric Display and Control panel (A). Used to control a test sequence automatically, to signal the test results on LEDs and to display the helium signal. Includes a RS 232 interface for controlling a printer.

- ** Automatic test chambers (integrating the A.D.C. :
 Hemispherical test chamber Ø 72 mm, Depth 31 mm, with start of cycle contact [T]
 Cylindrical test chamber Ø 85 mm, Depth 68 mm, with start of cycle contact [P]
 Cylindrical test chamber Ø 160 mm, Depth 100 mm, with start of cycle contact [G]



Ordering information

ASM 181 T2

E S P	
Leak detector Autocalibration with built-in temperature	
ASM 181 T2 compensated calibrated leak (RS 232 + 131/O as a standard features).	
Masses 3 Masses (3). This option allows	
Helium 3 Masses the leak detector to detect masses 2, 3 and 4.	
Code 0 3 Sana 4.	
Sands for versions module. The leak detector can be provided with :	
Elastomer seals (for the high vacuum as well	
Elastomer Metal as the inlet bloc) (E) or with metal seals for specific applications (M).	
Code E M specific applications (m).	
This seal assures that the mass spectrometer is	
Seal at the spectrometer leak tight. It can be made of :	
Reusable Metall (Lead) Special elastomer and can be re-usable (E) or made of special soft metal (L).	
Code E L The elastomer seal is the standard configuration.	
Control panel cover Without With Hinged, locking Plexiglas cover which protects the control panel located on the leak detector.	
Operator Interface A.D.C Alphanumeric Display and Control panel (A)	
Standard A.D.C. Used to control a test sequence automatically, to signal the test results on LEDs and to display the helium signal.	
Code S A Includes a RS 232 interface for controlling a printer.	
Coue 5 A	
Remote control unit	
3.5 m/10 ft 7 m/20 ft 25 m/75 ft	
Code 1 3 7	
Main power supply	
115V - 60Hz 220V - 50Hz 240V - 50Hz 220V-50/60Hz 100V-50/60Hz 200V-50/60Hz	
Code 1 2 3 4 5 6	
Main power cable type	
U.S.A. France U.K. Italy Switzerland Germany	
Code 1 2 3 4 5 6	

Ordering information

ASM 181 TD+ and ASM 181 T2D+

Masses 3 Masses (3). This option allows Helium 3 masses Helium 3 masses Code 0 2, 3 and 4. Seals for the vacuum module Elastomer Metal as the inlet bloc) as standard (E) or with metal seals for specific applications (M). Code E Masses This seal assures that the mass spectrometer is leak tight. It can be made of special elastomer and can be re-usable (E) or made of special scription	
Leck Greector built-in temperature compensated ASM ASM 181 TD+ 181 T2D+ Code J K a standard features). a standard features). Masses 3 Masses (3). This option allows Helium 3 masses Helium 3 masses Code 0 2. 3 and 4. Seals for the vacuum module Elastomer Metal Code E Metal Elastomer Metal This seal assures that the mass spectrometer is leak tight. It can be made of special elastomer and can be re-usable [E) or made of special Secal at the spectrometer This seal assures that the mass spectrometer is leak tight. It can be made of special elastomer and can be re-usable [E) or made of special Code Metal (Lead) Not be re-usable [E) or made of special	
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Seal at the spectrometer This seal assures that the mass spectrometer is leak tight. It can be made of special elastomer and can be re-usable (E) or made of special	
Section Spectrometer leak tight. It can be made of special elastomer Reusable Metal (Lead) and can be re-usable (E) or made of special c L soft metal (U).	
Control panel cover Without With Hinged, locking Plexiglas cover which protects	
Code 0 1 the control panel located on the leak detector.	
Roughing system Standard 50 m ³ /h Standard 50 m ³ /h code S T	
Operator interface	
Standard A.D.C.* Autom. test chamber small model** Autom. test chamber medium model** Autom. test chamber large model**	
Code S A T P G	
Remote control unit	
3.5 m/10 ft 7 m/20 ft 25 m/75 ft	
Code 1 3 7	
M 1 1	
Main power supply 11.04 6004 5044	
115V - 60Hz 220V - 50Hz 240V - 50Hz 220V-50/60Hz 100V-50/60Hz 200V-50/60Hz	
115V - 60Hz 220V - 50Hz 240V - 50Hz 220V-50/60Hz 100V-50/60Hz 200V-50/60Hz Code 1 2 3 4 5 6	
115V - 60Hz 220V - 50Hz 240V - 50Hz 220V-50/60Hz 100V-50/60Hz 200V-50/60Hz	

A.D.C. - Alphanumeric Display and Control panel (A).
 Used to control a test sequence automatically, to signal the test results on LEDs and to display the helium signal.
 Includes a RS 232 interface for controlling a printer.

** Automatic test chamber (integrates the ADC):
 - Hemispherical test chamber Ø 72 mm, depth 31 mm, with start of cycle contact (T)
 - Cylindrical test chamber Ø 85 mm, depth 68 mm, with start of cycle contact (P)
 - Cylindrical test chamber Ø 160 mm, depth 100 mm, with start of cycle contact (G)

