Test Report issued under the responsibility of:
EMITECH ANGERS

TEST REPORT **EN 60065** **Audio, Video and Similar Electronic Apparatus: Safety Requirements**	
Report Reference No. ..... :	**RS051-14-102370-1/A Ed. 0**
Tested by ..... :	J-F RICHARD
Approved by ..... :	B. CALLENS
Date of issue ..... :	2-Jun-14
Testing Laboratory ..... :	**EMITECH ANGERS – Site de JUIGNE/LOIRE**
Address ..... :	PA de Lanserre- 21 rue de la Fuye 49610 JUIGNE/LOIRE (France)
Testing location/ procedure ..... :	CBTL☐RMT☐SMT☐WMT☐TMP☐Other☒
Testing location/ address ..... :	PA de Lanserre- 21 rue de la Fuye 49610 JUIGNE/LOIRE (France)
Applicant's name ..... :	**AYKOW**
Address ..... :	7, rue Alfred Kastler 14000 CAEN (FRANCE)
Test specification:	
Standard ..... :	☐ IEC 60065:2001 / A1:2005 ☒ EN 60065: 2002 / A1: 2006 / A11:2008 (Amendment A12 was not evaluated at manufacturer's request)
Test procedure ..... :	ETAG-CUAP document, sub-clause 2.4.3
Non-standard test method……..:	—
Test Report Form No. ..... :	IECEN 60065G (modified by EMITECH)
Test Report Form(s) Originator ..... :	ASTABEAB
Master TRF ..... :	2006-03

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This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole manufactured products of the tested sample.

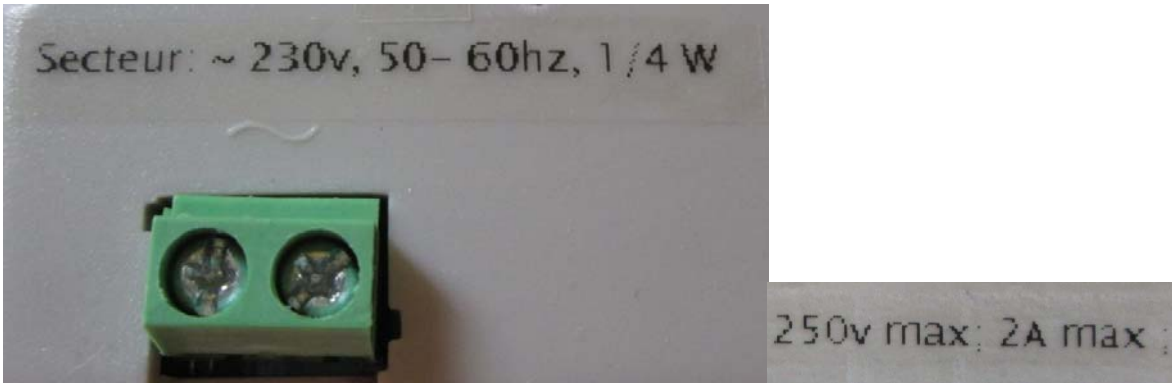
SUMMARY

TITLE **PAGE**

Test item description ..... :	RADON DETECTOR
Trade Mark .....:	**AYKOW**
Manufacturer .....:	AYKOW
Model/Type reference .....:	RADOSTAT
Ratings.....:	230Vac, 50-60Hz, 1/4W 250V max., 2A max.

Copy of marking plate

Trademark



Testing procedure and testing location:		
☒ **Testing Laboratory**:	**EMITECH ANGERS – Site de Juigné/Loire**	
Testing location/ address:	PA de Lanserre – 21 rue de la Fuye – 49610 JUIGNE/LOIRE (France)	
Tested by (name + signature)..... :	JF RICHARD	
Approved by (name + signature) :	B CALLENS	
☐ **Associated CB Laboratory:**		
Testing location/ address:		
Tested by (name + signature)..... :		
Approved by (name + signature) :		
☐ Testing procedure: **TMP**		
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Approved by (name + signature) :		
☐ Testing procedure: **WMT**		
Testing location/ address:		
Tested by (name + signature)..... :		
Witnessed by (name + signature) :		
Approved by (name + signature) :		
☐ Testing procedure: **SMT**		
Testing location/ address:		
Tested by (name + signature)..... :		
Approved by (name + signature) :		
Supervised by (name + signature:		
☐ Testing procedure: **RMT**		
Testing location/ address:		
Tested by (name + signature)..... :		
Approved by (name + signature) :		
Supervised by (name + signature:		

General product informations

Radon detector model: RADOSTAT is an equipment for building-in.

Only front side of plastic enclosure of this equipment is an accessible part.

No insulation on printed circuit board. All circuits used inside equipment and metal enclosure inside equipment are designed primary circuits in the meaning of standard.

Reinforced insulation must be provided between accessible plastic enclosure on front side and circuits inside equipment.

This test report is based on previous test report n° RS051-13-100114-1/A Ed. 0 dated April 19, 2013.

The non compliant sub-clauses (8.3, 8.6, 10.2, 10.3, 13.1, 13.2, 13.4) of the previous test report have been checked in this new test report. Commentaries and results of the already compliant sub-clauses have not been modified.

Summary of testing

Testing according to sub-clauses 7, 8, 9, 10, 12, 13, 20 of EN 60065: 2002 / A1: 2006 / A11:2008 standard.

Test item particulars:	
Classification of installation and use..... :	Class II
Supply connection ..... :	Permanently connected equipment
Possible test case verdicts:	
- test case does not apply to the test object .....:	N/A
- test object does meet the requirement.....:	Pass (P)
- test object does not meet the requirement .....:	Fail (F)
Testing:	
Date of receipt of test items……..:	May 07, 2014
Date(s) of performance of tests .....:	May 12, 2014 – May 27, 2014
General remarks:	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report, a point is used as the decimal separator. List of test equipment must be kept on file and available for review.	

EN 60065			
CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT
7	**HEATING UNDER NORMAL OPERATING CONDITIONS**		
7.1	Temperature rises not exceeding specified values, no operation of fuse links	(see appended table)	P
7.1.1	Temperature rise of accessible parts	(see appended table)	P
7.1.2	Temperature rise of parts providing electrical insulation	(see appended table)	P
7.1.3	Temperature rise of parts acting as a support or as a mechanical barrier	(see appended table)	P
7.1.4	Temperature rise of windings	(see appended table)	P
7.1.5	Parts not subject to a limit under 7.1.1 to 7.1.4	(see appended table)	P
7.2	Softening temperature of insulating material supporting parts conductively connected to the mains carrying a current > 0,2 A at least 150 °C	Already certified connectors used. Housing : UL94 V-0	N/A

EN 60065			
CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT
8	**CONSTRUCTIONAL REQUIREMENTS WITH REGARD TO THE PROTECTION AGAINST ELECTRIC SHOCK**		
8.1	Conductive parts covered by lacquer, paper, untreated textile oxide films and beads etc. considered to be bare	Considered	P
8.2	No shock hazard when changing voltage setting device, fuse-links or handling drawers etc.	No risk of shock hazards. See also sub-clause 9.1.1	P
8.3	Insulation of hazardous live parts not provided by hygroscopic material	See sub-clause 10.2	P
8.4	No risk of electric shock following the removal of a cover which can be removed by hand	Only plastic front enclosure accessible. Equipment for building-in fixed by two screws. No accessible removal cover	N/A
8.5	Class I equipment	Class II equipment	N/A
	Basic insulation between hazardous live parts and earthed accessible parts	Refer above	N/A
	Resistors bridging basic insulation complying with 14.1 a)	Refer above	N/A
8.6	Class II equipment and Class II constructions within Class I equipment	Refer below	P
	Reinforced or double insulation between hazardous live parts and accessible parts	Considered	P
	Components bridging reinforced or double insulation complying with 14.1 a) or 14.3	No resistors bridging reinforced insulation	P
	Basic and supplementary insulation each being bridged by a capacitor complying with 14.1 a)	No basic and supplementary insulation	N/A
	Reinforced or double insulation being bridged with 2 capacitors in series complying with 14.2.1 a)	Not used	N/A
	Reinforced or double insulation being bridged with a single capacitor complying with 14.2.1 b)	Not used	N/A
	Basic insulation bridged by components complying with 14.3.4.3	No basic insulation	N/A
8.7	This clause is void	Considered	—
8.8	Basic or supplementary insulation > 0,4 mm (mm) :	No basic or supplementary insulation	N/A
	Reinforced insulation > 0,4 mm (mm) :	Thickness of plastic enclosure: 2.0 mm min.	P

EN 60065			
CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT
	Thin sheet insulation (excluding non-separable thin sheet insulation. See 8.22)	Transformer inside equipment not used as reinforced insulation	N/A
	Basic or supplementary insulation, at least two layers, each meeting 10.3	No basic or supplementary insulation	N/A
	Basic or supplementary insulation, three layers any two of which meet 10.3	No basic or supplementary insulation	N/A
	Reinforced insulation, two layers each of which meet 10.3	Transformer inside equipment not used as reinforced insulation	N/A
	Reinforced insulation, three layers any two which meet 10.3	Transformer inside equipment not used as reinforced insulation	N/A
8.9	Adequate insulation between internal hazardous live conductors and accessible parts	No internal insulated conductors	N/A
	Adequate insulation between internal hazardous live parts and conductors connected to accessible parts	Refer above	N/A
8.10	Double insulation between conductors connected to the mains and accessible parts. Double insulation between internal hazardous live parts and conductors connected to accessible parts.	No conductors	N/A
8.11	Detaching of wires	No internal conductors and external conductors provided	N/A
	No undue reduction of creepages or clearance distances if wires become detached	Refer above	N/A
	Vibration test carried out :	Refer above	N/A
8.12	This clause is void	Considered	—
8.13	Adequate fastening of windows, lenses, lamp covers etc. (pull test 20 N for 10 s)	Not used	N/A
8.14	Adequate fastening of covers (pull test 50 N for 10 s)	No such covers used	N/A
8.15	No risk of damage to the insulation of internal wiring due to hot parts or sharp edges	No hot parts or sharp edges inside equipment under test	P
8.16	Only special supply equipment can be used	No special supply equipment used	N/A
8.17	Insulated winding wire without additional interleaved insulation	Transformer inside equipment not used as reinforced insulation	N/A
8.18	Endurance test as required by 8.17	Transformer inside equipment not used as reinforced insulation	N/A

EN 60065			
CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT
8.19	Disconnection from the mains	Refer below	P
8.19.1	Disconnect device	Refer below	P
	All-pole switch or circuit breaker with >3mm contact separation	Circuit breaker in building installation considered	P
8.19.2	Mains switch ON indication	No mains switch used	N/A
8.20	Switch not fitted in the mains cord	No switch in the mains cord	P
8.21	Bridging components comply with clause 14	No such components used	N/A
8.22	Non-separable thin sheet material	Transformer inside equipment not used as reinforced insulation	N/A
9	**ELECTRIC SHOCK HAZARD UNDER NORMAL OPERATING CONDITIONS**		
9.1	Testing on the outside		P
9.1.1	For voltages >1000 V ac or >1500 V dc complies with clause 13.3.1 for basic insulation	No such voltage	N/A
9.1.1.1	a) Open circuit voltages	Open circuit voltage on accessible front enclosure and two metal screws: 0 V	P
	b) Touch current measured from terminal devices using the network in annex D .....:	Refer above	N/A
	c) Discharge not exceeding 45 µC	AC only	N/A
	d) Energy of discharge not exceeding 350 mJ	AC only	N/A
9.1.1.2	Test with test finger and test probe	Checking by test probes (test probe B, test probe 13,test probes 18 and 19: IEC 61032 standard)	P
9.1.2	No hazardous live shafts of knobs, handles or levers	No shafts of knobs, handles or levers	N/A
9.1.3	Ventilation holes and other holes tested by means of 4 mm x 100 mm test pin	Checked by test probe	P
9.1.4	Terminal devices tested with 1 mm x 20 mm test pin (10 N); test probe D of IEC 61032	No terminal devices	N/A
	Terminal devices tested with 1 mm x 100 mm straight wire (1 N); test probe D of IEC 61032	Refer above	N/A

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CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT
9.1.5	Pre-set controls tested with 2.5 mm x 100 mm test pin (10 N); test probe C of IEC 61032	No pre-set controls	N/A
9.1.6	No shock hazard due to stored charge on withdrawal of the mains plug; voltage (V) after 2 s .....:	No mains plug used	N/A
	If C is not greater than 0,1 µF no test needed	Refer above	N/A
9.1.7	a) Enclosure sufficiently resistant to external force	Refer below	P
	Test probe 11 of IEC 61032 for 10 s (50 N)	Checked for accessible front side only	P
	b) Test hook of fig. 4 for 10 s (20 N)	Checked for accessible front side only	P
	c) 30 mm diameter test tool for 5 s (100 or 250 N) :	Checked at 250N for accessible front side only	P
9.2	No hazard after removing a cover by hand	Only plastic front enclosure accessible. Equipment for building-in fixed by two screws. No accessible removal cover	N/A

10	**INSULATION REQUIREMENTS**		
10.1	Insulation resistance (MΩ) at least 2 MΩ min. after surge test for basic and 4 MΩ min. for reinforced insulation .....:	No terminals for the antenna connection	N/A
10.2	Humidity treatment 48 h or 120 h .....:	48 h; 93%; 40°C	P
10.3	Insulation resistance and dielectric strength between mains terminals	(see appended table)	P
	Insulation Resistance and dielectric strength across BASIC or SUPPLEMENTARY insulation (Class I)	No basic or supplementary insulation	N/A
	Insulation resistance and dielectric strength across REINFORCED insulation (Class II)	(see appended table)	P

EN 60065			
CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT
12	**MECHANICAL STRENGTH**		
12.1.1	Bump test where mass >7 kg	Mass < 7 kg (0.1 kg)	N/A
12.1.2	Vibration test	Not a transportable apparatus	N/A
12.1.3	Impact hammer test	0.5 J, three blows. No hazard	P
	Steel ball test	2 J on accessible plastic front side	P
12.1.4	Drop test for portable apparatus where mass < 7 kg	Not portable apparatus	N/A
12.1.5	Thermoplastic enclosures strain relief test	Checked at 70°C during 7 hours on all plastic enclosure. No hazard in the meaning of standard	P
12.2	Fixing of knobs, push buttons, keys and levers	No such parts used	N/A
12.3	Remote controls with hazardous live parts	No remote control used	N/A
12.4	Drawers (pull test 50 N, 10 s)	No drawers	N/A
12.5	Antenna coaxial sockets providing isolation	No antenna coaxial	N/A
12.6	Telescoping or rod antennas construction	No such antenna	N/A
12.6.1	Telescoping or rod antennas securement	Refer above	N/A

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CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT
13	**CLEARANCE AND CREEPAGE DISTANCES**		
13.1	Clearances in accordance with 13.3	Considered	P
	Creepage distances in accordance with 13.4	Considered	P
13.2	Determination of operating voltage	230 Va.c.	P
13.3	Clearances	Refer below	P
13.3.1	General	Considered	P
13.3.2	Circuits conductively connected to the mains comply with table 8 and, where applicable, table 9	(see appended table)	P
13.3.3	Circuits not conductively connected to the mains comply with table 10	(see appended table)	P
13.3.4	Measurement of transient voltages	Not required	N/A
13.4	Creepage distances	Refer below	P
	Creepage distances greater than table 11 minima	(see appended table)	P
13.5	Printed boards	No insulation on printed circuit boards	N/A
13.5.1	Clearances and creepage distances between conductors on printed circuit boards, one of which may be conductively connected to the mains, as in fig. 10	Refer above	N/A
13.5.2	Type B coated printed circuit boards complying with IEC 60664-3 (basic insulation only)	Refer above	N/A
13.6	Conductive parts along uncemented joints clearances and creepage distances comply with 13.3 and 13.4	Not used	N/A
	Conductive parts along reliably cemented joints comply with 8.8	Refer above	N/A
	Temperature cycle test and dielectric strength test	Refer above	N/A
13.7	Enclosed, enveloped or hermetically sealed parts: not conductively connected to the mains: clearances and creepage distances as in table 12	Not used	N/A
13.8	Parts filled with insulating compound, meeting the requirements of 8.8	See sub-clause 8.8	N/A

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CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT
20	**RESISTANCE TO FIRE**		
20.1	Electrical components and mechanical parts		N/A
	a) Exemption for components contained in an enclosure of material V-0 to IEC 60695-11-10 with openings not exceeding 1 mm in width	Plastic enclosure: UL94 HB (UL file number: E108538) See sub-clauses 20.1.1 to 20.1.4	
	b) Exemption for small components as defined in 20.1	See sub-clauses 20.1.1 to 20.1.4	N/A
20.1.1	Electrical components meet the requirements of Clause 14 or 20.1.4	See sub-clause 20.1.4	P
20.1.2	Insulation of internal wiring working at voltages > 4 kV or leaving an internal fire enclosure, or located within the areas mentioned in Table 21, not contributing to the spread of fire	No internal insulated wiring	N/A
20.1.3	Material of printed circuit boards on which the available power exceeds 15 W at a voltage between 50 V and 400 V (peak) a.c. or d.c. meets V-1 or better to IEC60707, unless used in a fire enclosure	Printed wiring board: UL94 V-0	P
	Material of printed circuit boards on which the available power exceeds 15 W at a voltage >400 V (peak) a.c. or d.c. meets V-0 to IEC 60707	Voltage less than 400 V	N/A
20.1.4	Components and parts not covered by 20.1.1, 20.1.2 and 20.1.3 (other than fire enclosures) mounted nearer to a potential ignition source than the distances in Table 21 comply with the relevant flammability category in Table 21	Plastic enclosure: UL94 HB (UL file number: E108538) Connectors UL94 V-0 Printed wiring board: UL94 V-0	P
	Components and parts as above but shielded from a potential ignition source, with the barrier area in accordance with Table 21 and fig. 13	No shielded part	N/A
	Apparatus with voltages >4kV under normal operating conditions and distances to the enclosure exceed those specified Table 21, flammability classification HB40 or better is required for the enclosure.	Voltage less than 4000 V	N/A

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CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT
20.2	Fire enclosure	Refer below	N/A
20.2.1	Potential ignition sources with open circuit voltage > 4 kV (peak) a.c. or d.c. contained in a fire enclosure to V-1	Voltage less than 4000 V	N/A
20.2.2	Internal fire enclosures with openings not exceeding 1 mm in width and with openings for wires completely filled	No internal fire enclosure	N/A
20.2.3	Requirements of 20.2.1 and 20.2.2 met by an internal fire enclosure	No internal fire enclosure	N/A
Z1	Resistance to candle flame ignition	Not a television set	N/A

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CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT

7.1	**TABLE: temperature rise measurements**		**P**
	Power consumption in the OFF/Stand-by	—	—
	Position of the functional switch (W) .....:	—	—

Cond.	Un (V)	Hz	In (A)	Pn (W)	Uout (V)	Pout (W)	Operating Condition / Status
1	207	50	0.0056	—	—	—	See Note
2	230	50	0.0071	—	—	—	See Note
3	253	50	0.0088	—	—	—	See Note

Operating conditions			
Note: Normal mode “On” and 65W additional load added on dry contact output			
	Loudspeaker impedance (Ω) .....:	No loudspeakers used	—
	Several loudspeaker systems	Not used	N/A
	Marking of loudspeaker terminals	No markings provided	N/A

Temperature Rise dT of Part	dT (K)			Limit max dT (K)
Test Condition No.	No 1	No 3	No ___	
Mains connector, plastic part	14	18	—	—
Mains transformer, plastic enclosure, top	30	45	—	120
Mains transformer, plastic enclosure, side	27	41	—	120
Printed wiring board, between transformer and relay	24	34	—	—
Relay, plastic enclosure	19	24	—	85
Output connector, plastic part	14	17	—	—
External plastic enclosure, top	7	9	—	60
External plastic enclosure, bottom	15	19	—	60

	Winding temperature rise measurements		—
	Ambient temperature t1 (°C) .....:	—	—
	Ambient temperature t2 (°C) .....:	—	—

Temperature rise dT of winding:	**R_1 (Ω)**	**R_2 (Ω)**	**dT (K)**	**Limit dT (K)**	**Insulation class**
—	—	—	—	—	—

EN 60065			
CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT

7.2	TABLE: softening temperature of thermoplastics		N/A
Temperature T of part	**T - normal conditions (°C)**	**T - fault conditions (°C)**	**T softening (°C)**
—	—	—	—

10.3	TABLE: insulation resistance measurements	P
Insulation resistance R between:	**R (MΩ)**	**Required R (MΩ)**
Primary circuits (Line and Neutral) and accessible front side covered by metal foil	> 10000	Min 4
Primary circuits (dry contact outputs) and accessible front side covered by metal foil	> 10000	Min 4

10.3	TABLE: electric strength measurements	P
Test voltage applied between:	**Test voltage (V)**	**Breakdown**
Primary circuits (Line and Neutral) and accessible front side covered by metal foil	3000 Va.c.	No
Primary circuits (dry contact outputs) and accessible front side covered by metal foil	3000 Va.c.	No

EN 60065			
CLAUSE	REQUIREMENT – TEST	RESULT - REMARK	VERDICT

13.3 & 13.4	**TABLES: clearances and creepage distances**				P
Rated supply voltage:	230 V	Pollution degree:	II	Material Group:	IIIb
2 N force on internal parts applied:				—	
30 N force on outside of conductive enclosure applied:				—	

Location	Operating Voltage		Clearance (mm)		Creepage (mm)	
	V rms	V peak	Min	Actual	Min	Actual
Circuits conductively connected to the mains (use Tables 8, 9 and 11): see note below.						
Between all primary circuits and accessible metal screws	230	—	≥ 4.0	11.5	≥ 5.0	12.5
Between all primary circuits and accessible front side	230	—	≥ 4.0	7.0	≥ 5.0	> 10.0

Notes:

1. Secondary circuits of Class II apparatus which have connector terminals that could be earthed (e.g. antenna signal input), are subjected to the requirements for circuits conductively connected to the mains in Tables 8 and 9.

2. Floating secondary circuits of Class I apparatus which have connector terminals that could be earthed (e.g. antenna signal input), are subjected to the requirements for circuits conductively connected to the mains in Tables 8 and 9 unless the floating secondary circuit is separated from the primary circuits by an earthed metal screen (e.g. in the power transformer), or the floating secondary circuit is connected to earth via a component such as a capacitor.

3. For insufficient clearances and creepage distances from secondary to secondary circuits and from secondary circuits to earth, see Cl. 4.3.1, 4.3.2 and 11.2.

4. If the minimum creepage distance in Table 11 is less than the minimum required clearance in Tables 8, 9 or 10 as required, then the value for clearance is used as the minimum creepage distance.

"Min" = minimum required.

"Actual = Actual dimensions measured.

□□□ End of report, 2 annexes to be forwarded □□□

ANNEX 1: PHOTOS OF THE EQUIPMENT UNDER TEST

Overall view, rear

Overall view, rear

Overall view, front

Internal view

Internal view

Top cover, internal view

ANNEX 2: LIST OF TEST EQUIPMENT

N° EMITECH	CATEGORY	TRADEMARK	TYPE
5429	Thermocouple	TC	K
1765	Ambient temperature holder	EMITECH	Sup. T°
1559	Physimeter	Erichsen	906MC(9712)
1560	Dynamometer	ERICHSEN	906 1000 N
0761	Impact Hammer	FRIBORG	0.5 Nm
8753	Safety electrical test	Séfélec	SMG500
8937	Pretest box	—	—
8686	Caliper square	Stainless hardened	150 mm
1547	Vernier caliper	Mitutoyo	CD-15DC
1563	Safety test case	EMITECH	CEI 60950
4698	Chronometer	RS	3656230
8509	Power source AC	KIKUSUI	PCR2000L
2330	Climatic enclosure	ANGELATONI	CH 500V
6973	Data logger	LASCAR Electronics	EL-USB-2
1652	Dull black painted plywood support	EMITECH	*
8162	Current measurement equipment	HIOKI	ST5540
0392	Measure exchange	FLUKE	2625A
4117	Multimeter	FLUKE	187
4702	Multimeter	KEITHLEY	2010
2649	Test finger ∅ = 8.6	EMITECH	CEI 60335
8922	Test finger ∅ = 5.6	EMITECH	CEI 60065
4504	Hook of test	EMITECH	CEI 60065
8632	Climatic enclosure	MEMMERT	UFB 500
4406	Scale	TERRAILLON	10g- 10Kg
8667	Meter	Stanley	3M