

ÖZLEM

TERCÜME BÜROSU

Özlem ŞAHBAZ

Mecidiyeköy Koryangöçmez Sk

No:2 Kurumlar İşhanı Kat:4/34

Zincirlikuyu V. 36 05 95000

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15-Nisan 2009



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TURKISH STANDARD INSTITUTE

PRODUCT CERTIFICATION CENTER TEST REPORT

TS EN 61587-1 January 2008

Subject mechanical structures for electronic equipment- tests for IEC 60917 and IEC 60297- part 1: climatic, mechanical tests and Safety aspects for cabinets, racks, sub racks and chassis

Company name ESTAP Elektrik elektronik ve bilgisayar sistemleri san. Tic. A.Ş.

Company address Organize San. Böl. 14. cad. No: 12 Eskişehir

Examination type TSE mark application

Report date 01.04.2009

Report no 14.10.02/2009-237

Test result positive

Tested by name: Dr. Aysel Engin Name: Yüceer Yılmaz
Signature Signature
Name: Mehmet Evcı
Signature

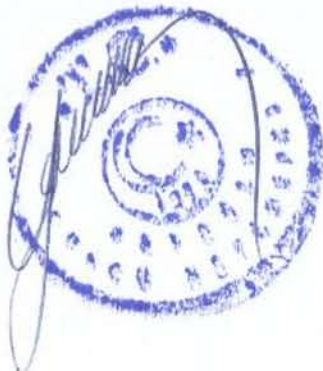
ÜBM-00-FR-091/Rev. date: 26.02.2009/Rev. No: 05



PRODUCT CERTIFICATION CENTER
CERTIFICATION DIRECTORATE FOR MACHINE SECTOR
TS EN 61587-1/January 2008
EXAMINATION AND TEST REPORT

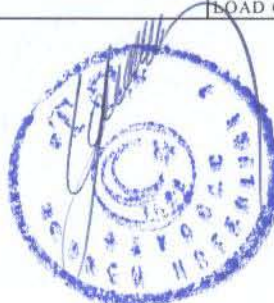
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Document no: UBM-04-FR-001 Publishing date: 14/03/2008 rev. date: 26/02/2009
Rev. No: 02 Page: 1/1
Report reference number: Unit No/ Year-Report No: 14.10.02/2009- 237
Examination type: TSE mark application
Tested by- signature: Dr. Aysel Engin Mehmet Evci
Tested by- signature: Yüceer Yılmaz
Issuing date: 01.04.2009
Result: positive
Name of test laboratory: Estap Elektrik Elektronik ve Bilgisayar Sistemleri San.
Tic. A.Ş.
Address: Organize San. Böl. 14. Cad. No: 12 Eskişehir
Name of the producer: Estap Elektrik Elektronik ve Bilgisayar Sistemleri San.
Tic. A.Ş.
Address: Organize San. Böl. 14. cad. No: 12 Eskişehir
Standard/criteria applied: TS EN 61587-1/January 2008
International standard/criteria:
Test report form number:
TRF source:
Test procedure:
Non-standard test method:
Description of product tested: 1, 7U wall-type, commercial model: PRL, climatic class, C1, industrial atmosphere class: A1, static mechanical load class: SL5, dynamic load class: DL4, impact class: K2, IP20, mechanical structures for electronic equipment (cabinets)
1, 22U erected-type, commercial model: CKR, climatic class, C1, industrial atmosphere class: A1, static mechanical load class: SL7, dynamic load class: DL4, impact class: K2, IP20, mechanical structures for electronic equipment (cabinets)
1, 42U server-type rack cabinet, commercial model: SRV, climatic class, C1, industrial atmosphere class: A1, static mechanical load class: SL7, dynamic load class: DL4, impact class: K2, IP20, mechanical structures for electronic equipment (cabinets)
Product type:
Trade mark:
Model/type number:
Test results provisions:
- This test is not applied to the sample: NU (not applied to the sample)
- Test result is positive: U (fit)
- Test result is negative: UD (not fit)
Note: This report cannot be copied in full or partially without permission of TSE.
Note: Test results in this report is relating to sample tested.

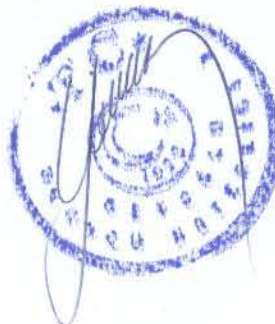


Article no: required by the standard remark result

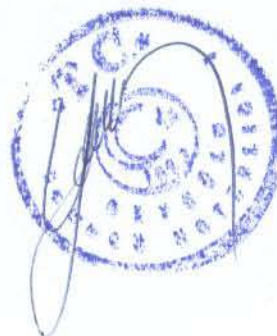
4.	Climatic tests		
4.1	General		
	It is the objective of the climatic tests to ensure that cabinets, racks and sub racks will survive the particular atmosphere in which they will normally operate without degradation or creating a hazard. Climatic tests shall be selected by reference to the application examples given in Table 2 for cabinets, racks and sub racks. In order to claim compliance at a given level, all test criteria for the requirement level shall be met.	WALL TYPE, COMMERCIAL MODEL: PRL, CLIMATIC CLASS: C1, INDUSTRIAL ATMOSPHERE: A1, STATIC MECHANICAL LOAD CLASS: SL5, DYNAMIC LOAD CLASS DL4 IMPACT CLASS: K2, IP20, MECHANICAL STRUCTURES FOR ELECTRONIC EQUIPMENT, (CABINETS) 22U, ERECTED- TYPE, COMMERCIAL MODEL: CKR, CLIMATIC CLASS: C1, INDUSTRIAL ATMOSPHERE: A1, STATIC MECHANICAL LOAD CLASS: SL7, DYNAMIC LOAD CLASS DL4 IMPACT CLASS: K2, IP20, MECHANICAL STRUCTURES FOR ELECTRONIC EQUIPMENT, (CABINETS) 42U SERVER TYPE, RACK CABINET, COMMERCIAL MODEL: SRV, CLIMATIC CLASS: C1, INDUSTRIAL ATMOSPHERE: A1, STATIC MECHANICAL LOAD CLASS: SL7, DYNAMIC LOAD CLASS DL4 IMPACT CLASS: K2, IP20, MECHANICAL STRUCTURES FOR ELECTRONIC EQUIPMENT, (CABINETS)	FIT
4.2	Cold, dry heat and damp heat (cyclic)		
	Table 2- performance levels for cold, dry heat and damp heat Evaluation after tests: a) Visual examination (see IEC 60512-1-1, test la). b) Check of earth bond continuity shall be performed as per 6.1.	CLIMATIC CLASS :C1 IT WAS GIVEN ON THE TEST REPORT DATED 05.03.2009 AND NUMBERED 16.40.01.02/09-42904 AND RESULT IS FIT	FIT
4.3	Industrial atmosphere		
	Table 3- performance levels for industrial atmosphere	INDUSTRIAL ATMOSPHERE CLASS: A1	FIT
5.	Mechanical tests		
5.1	General		
	The object of these mechanical tests to ensure that cabinets, racks, sub racks and chassis will survive normal handling during manufacture, storage, installation and service as well as in-service environment. Mechanical tests shall be selected from the following sub clause as per the required application. Compliance to given sub clause in only achieved when all test criteria of that sub clause are met.	There was no deformation at the end of test. 1200kg,300kg 200kg, 50 kg were applied as static load	FIT
5.2	Static mechanical load tests		
5.2.1	Lifting tests for cabinets and racks		
5.2.2	Stiffness test for cabinets and racks		
	The purpose of this test is to evaluate the structural stiffness of a cabinet or a rack as a minimum measure of durability against handling and transportation forces. Test weights are shown in Table 4 and relevant lifting and stiffness forces and static load values are stipulated. Test conditions Test sample shall be bolted to the floor using Standard bolt-down positions	WALL TYPE, COMMERCIAL MODEL: PRL, CLIMATIC CLASS: C1, INDUSTRIAL ATMOSPHERE: A1, STATIC MECHANICAL LOAD CLASS: SL5, DYNAMIC LOAD CLASS DL4 IMPACT CLASS: K2, IP20, MECHANICAL STRUCTURES FOR ELECTRONIC EQUIPMENT, (CABINETS) 22U ERECTED- TYPE, STATIC MECHANICAL LOAD CLASS: SL7, MECHANICAL	



	<p>No internal static load shall be used for this test. Test procedure: Apply a steady force (P2) evenly distributed over the shaded area of Figure 2, on each side of the cabinet or rack under test, Maintain load minimum for 1 minute Table 4- performance levels for lifting and stiffness Assessment following the tests: a) No deformation of parts affecting form, fit or function regarding to the relevant detailed specification shall be allowed after tests on each side as shown in Figure 2. b) Earth bond continuity check shall be performed as per 6.1</p>	<p>STRUCTURES FOR ELECTRONIC EQUIPMENT (CABINETS) 42U SERVER TYPE RACK CABINET , STATIC MECHANICAL LOAD CLASS: SL7, MECHANICAL STRUCTURES FOR ELECTRONIC EQUIPMENT(CABINETS) There was no deformation at the end of test</p>	FIT
5.2.3	Static mechanical load for sub racks		
5.2.3.1	General		
	<p>The purpose of these tests is to evaluate load bearing capacity of structural parts of sub racks including guide rails. For the simulation of the worst conditions, dummy plug-in units shall be used without front panels (normally bolted on the sub rack) nor connectors nor back panels shall be fixed at the rear. As an indirect measure of the load bearing capability, deflection of horizontal members shall be within limited range. This will prevent disengagement of plug-in unit boards in the guide rails as the dummy loads will widen aperture between guide rails. Test set-up and test sample fitting: Test sample shall be mounted in a test fitting via Standard sub rack mounting flanges as shown in Figure 3; Front panels and connectors shall not be used on dummy load plug-in-units and they shall be distributed within sub rack as detailed in Figures 4 and 6.</p>	NOT APPLIED TO THE SAMPLE	NU
5.2.3.2	Static mechanical load performance level for sub racks of IEC 60297 series		
	<p>Load distribution for performance level SL1. Dummy loads M1 and single load P3 positioned as detailed in Figure 4 and Table 5. For U see IEC 60297-1 and for D and HP see IEC 60297-3-101 Table 5- static mechanical load performance levels for sub racks of IEC 60297 series Assessment following test Acceptance criterion is that maximum deflection will be less than 0,4 mm.</p>	NOT APPLIED TO THE SAMPLE	NU
5.2.3.3	Static mechanical load performance levels for sub racks of IEC 60917 series		



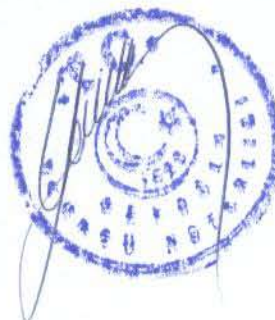
	<p>Load distribution for performance level SL2, SL3 and SL4. Dummy loads positioned as detailed in figure 6, figure 7 and table 6 Note: single point load shall be applied equally to all lower horizontal members along the center line of subrack as detailed in figure 7 and table 6. Table 6- Static mechanical load performance levels for subracks of IEC 60917 series Assessments following the tests Acceptance criteria is that maximum deflection shall be less than 0,4 mm.</p>	NOT APPLIED TO THE SAMPLE	NU
5.3	Dynamic mechanical load tests		
5.3.1	Vibration and shock tests for cabinets		
	<p>Tests shall be carried out on a cabinet set-up as shown in Figure 8 and Table 7. Test cabinet consists of a frame, front door, rear door, two side panels and a top cover. Mounting of test sample on the test table is performed via the bottom mounting points. Vibration and shock performance levels are shown in Table 8.</p>	<p>DYNAMIC LOAD CLASS:DL4 IT WAS GIVEN IN LNE REPORT (DOSSIER K020085 DOCUMENT DE/1 FILE K020085 DOCUMENT DE/2)</p>	FIT
	<p>Table 7- static load distribution in the cabinet</p> <p>Table 8- vibration and shock performance levels for cabinets</p>	<p>IT WAS GIVEN IN LNE REPORT (DOSSIER K020085 DOCUMENT DE/1 FILE K020085 DOCUMENT DE/2)</p>	FIT
	<p>Test conditions In order to simulate operating condition with rear or top structural supports if used, the cabinet or rack under test shall be mounted to the vibration or shock table via intended bolt-down positions. Test procedure according to IEC 60068-2-6 Transit time : 1 octave/min Test axes : x-y-z (Y axis is selected as being the most severe). Test duration/axis : 10 frequency cycles Resonance search : 5 Hz to 100 Hz, 1 m/s² acceleration Resonance test : resonance with a magnification factor of 3 to 4 shall have the vibration amplitude increased until the magnification factor reaches 7 to 8. This level shall be maintained for a period of not less than 10 min. Assessment following the tests a) no deformation or damage of parts that affect form, fit or function shall be allowed after the tests. b) earth bond continuity check to be carried out in accordance with 6.1.</p>	<p>IT WAS GIVEN IN LNE REPORT (DOSSIER K020085 DOCUMENT DE/1 FILE K020085 DOCUMENT DE/2)</p>	FIT
5.3.2	Vibration and shock tests for sub racks		



	<p>Test conditions</p> <p>The set-up of the test samples is described in table 9 and Table 10 and shall be mounted in a test fixture via Standard sub rack mounting flanges as shown in Figure 9.</p> <p>Load equally distributed to plug-in units shall be mounted by their front panels onto subrack using M2,5 screws and shall use connectors either directly mounted to the rear horizontal rails or mounted via a backplane. Loads shall be distributed as defined in Figures 4 and 6 and Table 6.</p> <p>Sub rack are assembled in accordance with the manufacturer's instructions. All mounting to test fittings (see Figure 9) and structural screws shall be tightened to the recommended torque values</p>	NOT APPLIED TO THE SAMPLE	NU
	<p>Table 9- test set-up for sub racks of IEC 60297 series</p> <p>Shock and vibration tests shall be performed on subrack loaded with plug-in units in accordance with cited parts of IEC 60068 in Table 11.</p>	NOT APPLIED TO THE SAMPLE	NU
	<p>Table 11- vibration and shock performance levels for sub racks</p> <p>Test procedure: vibration</p> <p>Test axes :x-y-z</p> <p>Transit duration :1 octave/min</p> <p>Test duration/axis :10 frequency cycles</p> <p>Resonance search : 10 Hz to 150 Hz, 2 m/s² acceleration</p> <p>Resonance test : resonance with a magnification factor of 3 to 4 shall have the vibration amplitude increased until the magnification factor reaches 7 to 8. This level shall be maintained for a period of not less than 10 min.</p> <p>Test procedure : shock</p> <p>Three shocks in both directions for three main axes x-y-z</p> <p>Assessment following the tests</p> <p>a) visual examination in terms of crack formation, retained deformation (dimensions), loosened screw connection, abrasion on the sub rack, abrasion on the plug connector</p> <p>b) Earth bond continuity check to be carried out in accordance with 6.1.</p>	NOT APPLIED TO THE SAMPLE	NU
5.3.3	Impact tests for cabinets		
	<p>The purpose of these tests is to evaluate the impact resistance of the outer parts of a cabinet, such as doors, covers or glazed sections or other transparent materials. Equipment shall not cause a hazard when subjected to impact likely to occur in normal use. To meet this requirement, equipment shall have adequate mechanical strength and electrical insulation. Compliance is checked by performing following tests of IEC 60068-2-75 stated in Table 12.</p>	<p>Impact class:K2</p> <p>THERE WAS NO DEFORMATION AT THE END OF TEST</p>	FIT



	<p>Table 12- Impact performance levels for cabinets Test procedure Impact number: five in each of three axes (x,y,z) of the sample The sample shall be mounted on a rigid plane support that may be assumed to be rigid enough if it does not move more than 0,1 mm under the effect of a directly applied impact of specified level of energy for the test. Tests shall be performed only on individual parts (doors and covers) of a cabinet (not a sub rack) installed in their intended configuration. Parts have their mounting screws tightened with the recommended torque applied. If the pendulum test is not practical, it is allowed to simulate horizontal impacts on vertical or sloping surfaces by mounting the sample at 90° to its normal position and applying the vertical impact test instead of the pendulum test. Impact locations shall be determined on the sample corresponding to where damage is most likely to occur in practice. Assessment following the tests a) no deformation or damage of parts that affect form, fit or function shall be allowed after the tests. b) Earth bond continuity check shall be carried out in accordance with 6.1.</p>	<p>Impact class: K2 2 j spring hammer was used THERE WAS NO DEFORMATION AT THE END OF TEST</p>	FIT
6.	Safety aspects		
6.1	General		
	<p>Safety aspects cover both human hazard and product safety and are mandatory for full compliance with this part of IEC 61587. General safety requirements: the mechanical design of cabinets, racks and sub racks shall have adequate design considerations to prevent danger or hazards for people and to be an adequate barrier against unauthorized access to the interior. The mechanical parts of the enclosure shall be free of sharp edges, burrs, etc. that could present a safety hazard to personnel involved in their assembly, installation, use or maintenance. IEC 60950-1 includes general safety requirements for information technology equipment, including electrical business equipment and shall be applied.</p>	<p>The mechanical parts of the enclosure are free of sharp edges, burrs, etc. that could present a safety hazard to personnel involved in their assembly, installation, use or maintenance.</p>	FIT
6.2	Earth bond		
6.2.1	General		
	<p>Safety aspects shall be in accordance with IEC 61010-1. In order to protect against contact with shock hazard voltages, all metallic components of the cabinet, rack or subrack which can be touched shall be electrically interconnected. Experience has shown that mounting screws alone do not represent sufficiently reliable conductive connections. Additional measures shall be taken such as are required for example in front panels made from insulating material and using metallic locks, hinges, etc. the resistance of the connection between the protective earthing terminal</p>	<p>Multitester was used 10V-25 A, measured : 0.03 OHM</p>	FIT



	Or earthing contact ar parts required to be earthed shall be less than 0,1 Ω .		
6.2.2	Test procedure		
	The test shall be in accordance with IEC 61010-1.	Multitester was used	—
6.3	Flammability		
	All materials used in construction, components and parts inside a cabinet, racks or sub racks shall minimize the propagation of fire. In order to prevent a fire, all materials shall comply with flammability class of V2 or better.	There is no flammability since it is metal.	FIT
6.4	Degrees of protection provided by enclosures (IP code)		
	It is the intention of this sub clause to ensure that relevant level of human protection against hazard is maintained. Use Table 13 for performance level selection only. Refer to IEC 60529 for full details.	IP20	FIT

Result and considerations:

The samples of followings products manufactured with "ESTAP" brand in the production facilities of Estap Elektrik Elektronik ve Bilgisayar Sistemleri San. Tic. A.Ş. at the address of Organize San. Böl. 14. cad. No: 12 Eskişehir,

1, 7U wall-type, commercial model: PRL, climatic class, C1, industrial atmosphere class: A1, static mechanical load class: SL5, dynamic load class: DL4, impact class: K2, IP20, mechanical structures for electronic equipment (cabinets)

1, 22U erected-type, commercial model: CKR, climatic class, C1, industrial atmosphere class: A1, static mechanical load class: SL7, dynamic load class: DL4, impact class: K2, IP20, mechanical structures for electronic equipment (cabinets)

1, 42U server-type rack cabinet, commercial model: SRV, climatic class, C1, industrial atmosphere class: A1, static mechanical load class: SL7, dynamic load class: DL4, impact class: K2, IP20, mechanical structures for electronic equipment (cabinets)

Conform to the standard numbered TS EN 61587-1 January 2008 mechanical structures for electronic equipment- tests for IEC 60917 and IEC 60297 – part 1: climatic, mechanical tests and safety aspects for cabinets, racks, sub racks and chassis.

This report is valid only for sample (s) tested.

This report was issued on 01.04.2009 as 7 (seven) pages and 2 (two) copies.

Tested by:

Name surname: Dr. Aysel Engin Name Surname: Yüceer Yılmaz

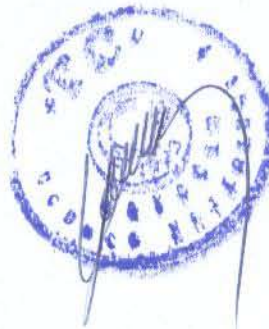
Title: Mechanical Engineer Title: Electrician Technician

Signature: signature:

Name surname: Mehmet Evci

Title: Mechanical Engineer

Signature:



HEADSHIP OF TSE TEST LABORATORIES CENTER ANKARA ELECTRICAL
LABORATORY

12689



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16.40.01.02

Report no: 42904

03.09

EXAMINATION AND TEST REPORT
TEST REPORT

Customer (Name, Address, City etc.) : Estap Elektrik Elektronik ve Bilgisayar Sistemleri San.Tic.A.Ş

Order Date/No. 14.01.2009- 12617

Sample Description (Type,Mark,Model etc.) Rack cabinet

ESTAP brand

Sample receipt date: 02.01.2009

Date of test: 23.01.2009- 05.03.2009

Applied Standard/method: TS EN 61587-1 (article 4.2)

Number of pages of the report: 3

Remarks: TSE mark application

The sample described above PASS/FAIL the applied tests. The test results are given on the following pages.

Seal	date	person in charge of test	reviewer	head of laboratory
	09/03/2009	Hakan UÇAR Electrician	Fatih ÇETİN El. Engi.	Ayşe ÖZTÜRK El. Lab. Head

This report shall not be reproduced other than in full except with the permission of the laboratory. Test reports without signature and seal are not valid. This report is only valid for sample testes and does not replace "product certificate".



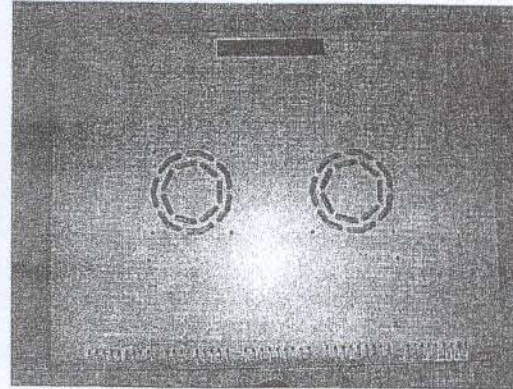
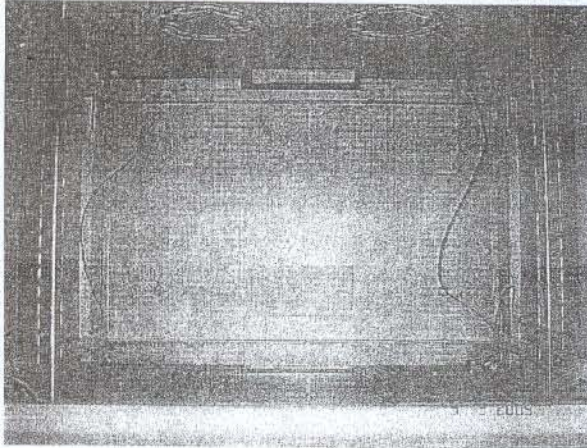
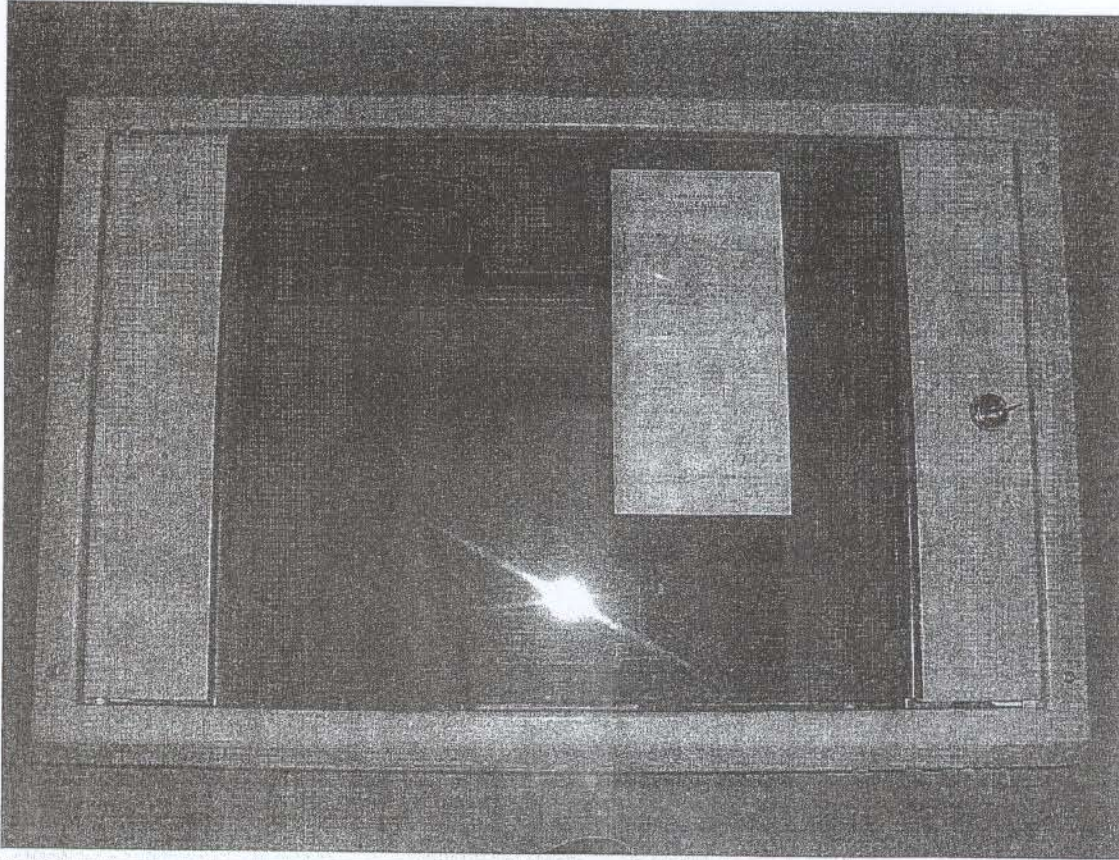
Report no: 16.40.01-02/09-42904

Report date: 05.03.2009

Description of test sample:

Name: Rack cabinet

Brand: ESTAP



TEST

-Damp heat test (article 4:2)

12689

The sample was kept in 2-cycle humidity cabinet as per IEC 60068-2-30 variant.2 and at the end of this 48-hour period it was taken from the humidity cabinet and earthing resistance was measured and it was found as 0, 001 Ω .

-The sample was put in air-conditioning cabinet set to (-10°C) and kept there for 16 hours. At the end of this duration, it was taken from air-conditioning cabinet and visual examination and check were done and no physical deformation was observed.

-The sample was put in air-conditioning cabinet set to (+55°C) and kept there for 16 hours. At the end of this duration, it was taken from air-conditioning cabinet and visual examination and check were done and no physical deformation was observed.

Result: Test conditions applied to sample of rack cabinet of Estap Elektrik Elektronik ve Bilgisayar Sistemleri San. Tic. A.Ş. stated in the annex of letter of certification directorate for machine sector dated 14.01.2009 and numbered 12617 were explained above and physical examination was done at the end of test. It was found out that the machine did not show any damage indications and kept its operation in these controls.

This report is valid for the sample tested.

This report was issued on 05.03.2009 as 3 (three) pages and 3 (three) copies.

İŞ BU TERCÜMENİN AÇIK KİMLİĞİ VE
AÇIK ADRESİ NOTERLİĞİMİZDE MAHFUZ
BULUNAN YEMİNLİ TERCÜMAN Ö. ŞAHBAZ
TARAFINDAN YAPILDIĞINI ONAYLARIM.

Tercüme
edilen işbu tercümenin
ibraz edilen *Tercüme*
aslına uygunluğunu
onaylarım
Noter Yeminli Mütercimi
Özlem Şahbaz

BEYOĞLU ÜÇÜNCÜ NOTERİ
TÜRHAN ENGİN
Vekili Başkatip Yasemin Şahin

