TEST REPORT

IEC / EN 60950-1, First Edition

Information technology equipment – Safety – Part 1: General requirements

Report reference No .....: 8512309357

Tested by
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Date of issue .....: 31/07/2005

Testing Laboratory Name .....: The Standards Institution of Israel

Address .....: 42 Chaim Levanon St., 69977 Tel Aviv, Israel

Testing location .....: CBTL ☒ CCATL ☐ SMT ☐ TMP ☐

Address .....: As above

Applicant's Name .....: Synel Industries Ltd.

Address .....: P.O.B. 142, Yokneam Industrial Park 20692, Israel

Test specification

Standard.....: IEC 60950-1:2001, EN 60950-1:2001, First Edition

Test procedure .....: N/A

Non-standard test method .....: N/A

Test Report Form No.....: IECEN60950_1A

TRF originator .....: SGS Fimko Ltd

Master TRF .....: dated 2002-03

Test item description .....: Time and Data Collection Terminal

Trademark .....: Synel

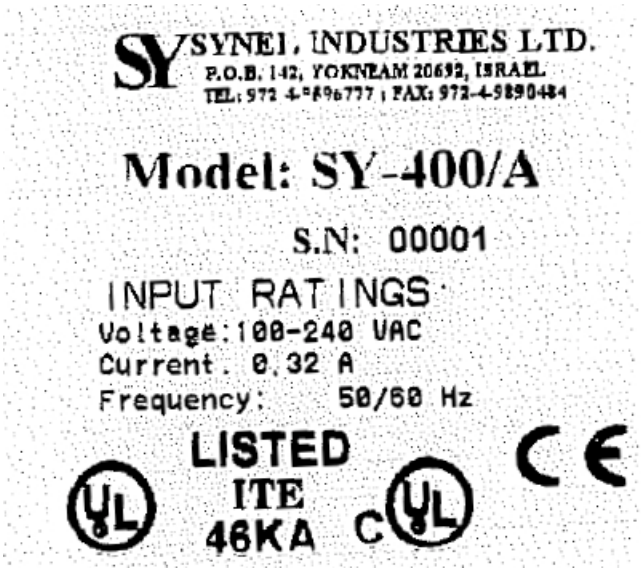
Manufacturer .....: Synel Industries Ltd.

Model and/or type reference .....: SY-400A

Serial number .....: --

Rating(s).....: 100-240 Vac, 50/60 Hz, 0.32 A

Copy of marking plate and summary of test results (information/comments):



Particulars: test item vs. test requirements		
Equipment mobility	:	Fixed (wall mountable)
Operating condition	:	continuous
Mains supply tolerance (%)	:	+6%, -10%
Tested for IT power systems	:	No
IT testing, phase-phase voltage (V)	:	N/A
Class of equipment	:	Class I (earthed)
Mass of equipment (kg)	:	0.75 kg
Protection against ingress of water	:	IPX0
Test case verdicts		
Test case does not apply to the test object	:	N/A
Test item does meet the requirement	:	P(ass)
Test item does not meet the requirement	:	F(ail)
Testing		
Date of receipt of test item	:	21/10/04
Date(s) of performance of test	:	24/10/04 –30/05/05

General remarks

"This report is not valid as a CB Test Report unless appended by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02".

The test result presented in this report relate only to the object(s) 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 comma (point) is used as the decimal separator.

Appendices:

Appendix 1 – Photographs

Appendix 2 – Test data sheets

Appendix 3 – Electrical Schematics

General product information:

1. The subject unit is a programmable data collection terminal. The product consists mainly of a metal enclosure, housing safety approved power supply and printed circuit boards located in SELV.

2. The maximum operating ambient temperature declared by the manufacturer for the equipment is 50°C.

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
1	GENERAL		P
1.5	Components		P
1.5.1	General	Safety critical components comply with IEC 60950 or relevant component standards (see appended table)	P
	Comply with IEC 60950 or relevant component standard	(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components		P
1.5.3	Thermal controls		N/A
1.5.4	Transformers	Not provided outside of certified power supply module	N/A
1.5.5	Interconnecting cables		N/A
1.5.6	Capacitors in primary circuits ..... :	Not provided outside of certified power supply module	
1.5.7	Double insulation or reinforced insulation bridged by components	Not provided outside of certified power supply module	N/A
1.5.7.1	General		N/A
1.5.7.2	Bridging capacitors		N/A
1.5.7.3	Bridging resistors		N/A
1.5.7.4	Accessible parts		N/A
1.5.8	Components in equipment for IT power systems	The equipment is not intended for IT power systems	N/A
1.6	Power interface		P
1.6.1	AC power distribution systems	Intended for TN power system	P
1.6.2	Input current	(see appended table 1.6.2)	P
1.6.3	Voltage limit of hand-held equipment	Not hand-held equipment	N/A
1.6.4	Neutral conductor	Basic insulation is provided by certified power supply module	P
1.7	Marking and instructions		P
1.7.1	Power rating		P
	Rated voltage(s) or voltage range(s) (V) ..... :	100-240 Vac	P

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Symbol for nature of supply, for d.c. only ..... :		N/A
	Rated frequency or rated frequency range (Hz) :	50/60Hz	P
	Rated current (mA or A) ..... :	0.32 A	P
	Manufacturer's name or trademark or identification mark ..... :	Synel Industries LTD	P
	Type/model or type reference..... :	SY-400A	P
	Symbol of for Class II equipment only ..... :		N/A
	Other symbols ..... :	Warning symbol "Hazardous voltage"	P
	Certification marks ..... :		N/A
1.7.2	Safety instructions		P
1.7.3	Short duty cycles	The equipment is intended for continuous operation	N/A
1.7.4	Supply voltage adjustment ..... :	Auto-range power supply	N/A
1.7.5	Power outlets on the equipment ..... :		N/A
1.7.6	Fuse identification ..... :	Fuses are not located in operator access area - unambiguous reference to service documentation is provided.	P
1.7.7	Wiring terminals		P
1.7.7.1	Protective earthing and bonding terminals ..... :	Protective earthing stud is located on the bottom enclosure and marked with correct symbol.	P
1.7.7.2	Terminal for a.c. mains supply conductors	Mains plug is provided	N/A
1.7.7.3	Terminals for d.c. mains supply conductors		N/A
1.7.8	Controls and indicators	No safety related controls	N/A
1.7.8.1	Identification, location and marking ..... :		N/A
1.7.8.2	Colours ..... :		N/A
1.7.8.3	Symbols according to IEC 60417 ..... :		N/A
1.7.8.4	Markings using figures ..... :		N/A
1.7.9	Isolation of multiple power sources ..... :	Single connection to AC mains	N/A
1.7.10	IT power distribution systems		N/A
1.7.11	Thermostats and other regulating devices		N/A
1.7.12	Language ..... :	English	—
1.7.13	Durability		P

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
1.7.14	Removable parts	Marking is not located on removable parts	P
1.7.15	Replaceable batteries	Warning marking about batteries replacement and dispose is provided	P
	Language ..... :	English	—
1.7.16	Operator access with a tool ..... :	A tool is not necessary to gain access.	N/A
1.7.17	Equipment for restricted access locations ..... :		N/A

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	Only SELV circuits and earthed parts are accessible	P
2.1.1.1	Access to energized parts		P
	Test by inspection ..... :	Only SELV circuits and earthed are accessible	P
	Test with test finger ..... :	No ELV or hazardous voltage accessible	P
	Test with test pin ..... :	No ELV or hazardous voltage accessible	P
	Test with test probe ..... :	No TNV circuits	N/A
2.1.1.2	Battery compartments ..... :	No battery compartments	N/A
2.1.1.3	Access to ELV wiring		N/A
	Working voltage (V); minimum distance (mm) through insulation	(see appended table 2.10.5)	—
2.1.1.4	Access to hazardous voltage circuit wiring		N/A
2.1.1.5	Energy hazards ..... :	No energy hazard in operator area	P
2.1.1.6	Manual controls	No shafts of knobs etc. at ELV or hazardous voltages	P
2.1.1.7	Discharge of capacitors in equipment		P
	Time-constant (s); measured voltage (V) ..... :	0V after 0.2 sec	—

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
2.1.2	Protection in service access areas	Unintentional contact with hazardous voltages or energy parts is unlikely during service operations. Accidental contact with hazardous parts of power supply module is prevented by protective cover installed above the power supply and by warning mark "Hazardous Voltage".	P
2.1.3	Protection in restricted access locations		N/A

2.2	SELV circuits		P
2.2.1	General requirements		P
2.2.2	Voltages under normal conditions (V) ..... :	The voltages are less than 60 Vdc or 42.4 Vp	P
2.2.3	Voltages under fault conditions (V)..... :	The voltages are less than 120 Vdc or 71 Vp within 0.2 sec	P
2.2.3.1	Separation by double insulation or reinforced insulation (method 1)	Separation is provided by certified power supply module	P
2.2.3.2	Separation by earthed screen (method 2)		N/A
2.2.3.3	Protection by earthing of the SELV circuit (method 3)		N/A
2.2.4	Connection of SELV circuits to other circuits.....:	SELV to SELV	P

2.3	TNV circuits		N/A
2.3.1	Limits		N/A
	Type of TNV circuits ..... :		—
2.3.2	Separation from other circuits and from accessible parts		N/A
	Insulation employed..... :		—
2.3.3	Separation from hazardous voltages		P
	Insulation employed..... :		—
2.3.4	Connection of TNV circuits to other circuits		N/A
	Insulation employed..... :		—
2.3.5	Test for operating voltages generated externally		N/A

2.4	Limited current circuits	N/A

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
2.4.1	General requirements		N/A
2.4.2	Limit values		N/A
	Frequency (Hz) ..... :		—
	Measured current (mA)..... :		—
	Measured voltage (V) ..... :		—
	Measured capacitance (µF)..... :		—
2.4.3	Connection of limited current circuits to other circuits		N/A

2.5	Limited power sources		N/A
	Inherently limited output		N/A
	Impedance limited output		N/A
	Overcurrent protective device limited output		N/A
	Regulating network limited output under normal operating and single fault condition		N/A
	Regulating network limited output under normal operating conditions and overcurrent protective device limited output under single fault condition		N/A
	Output voltage (V), output current (A), apparent power (VA)..... :		—
	Current rating of overcurrent protective device (A)		—

2.6	Provisions for earthing and bonding		P
2.6.1	Protective earthing	All accessible conductive parts are connected to protective earthing terminal	P
2.6.2	Functional earthing		N/A
2.6.3	Protective earthing and protective bonding conductors		P
2.6.3.1	General		P
2.6.3.2	Size of protective earthing conductors	Protective earthing conductor of certified power supply cord	P
	Rated current (A), cross-sectional area (mm^2), AWG ..... :	0.32 A, min. 0.75 mm^2, 18 AWG	—
2.6.3.3	Size of protective bonding conductors	No bonding conductors	N/A
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—

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Clause	Requirement – Test	Result – Remark	Verdict
2.6.3.4	Resistance (Ω) of earthing conductors and their terminations, test current (A) ..... :	See Test Data Sheets	P
2.6.3.5	Colour of insulation ..... :	Green/Yellow	P
2.6.4	Terminals		P
2.6.4.1	General		P
2.6.4.2	Protective earthing and bonding terminals	Protective earthing stud is located on the bottom enclosure	P
	Rated current (A), type and nominal thread diameter (mm) ..... :	Protective earthing stud: 0.32 A, 3 mm	—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors	No bonding conductors	N/A
2.6.5	Integrity of protective earthing		P
2.6.5.1	Interconnection of equipment	Not intended to provide power to another equipment	N/A
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switches/fuses in the protective conductor	P
2.6.5.3	Disconnection of protective earth	It is impossible to break the protective earthing conductor without disconnecting the supply conductors	P
2.6.5.4	Parts that can be removed by an operator	Protective earthing connection makes earlier and breaks later than the phase and neutral pins of the mains plug/socket combination.	P
2.6.5.5	Parts removed during servicing		P
2.6.5.6	Corrosion resistance	No risk of corrosion	P
2.6.5.7	Screws for protective bonding		N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system		N/A

2.7	Overcurrent and earth fault protection in primary circuits		P
2.7.1	Basic requirements	Protection is provided by mains fuse located in the certified power supply module	P
	Instructions when protection relies on building installation		N/A
2.7.2	Faults not covered in 5.3		N/A
2.7.3	Short-circuit backup protection		P

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Clause	Requirement – Test	Result – Remark	Verdict
2.7.4	Number and location of protective devices ..... :	Mains fuse located in the certified power supply module	P
2.7.5	Protection by several devices		N/A
2.7.6	Warning to service personnel ..... :		N/A

2.8	Safety interlocks		N/A
2.8.1	General principles		N/A
2.8.2	Protection requirements		N/A
2.8.3	Inadvertent reactivation		N/A
2.8.4	Fail-safe operation		N/A
2.8.5	Moving parts		N/A
2.8.6	Overriding		N/A
2.8.7	Switches and relays		N/A
2.8.7.1	Contact gaps (mm) ..... :		N/A
2.8.7.2	Overload test		N/A
2.8.7.3	Endurance test		N/A
2.8.7.4	Electric strength test	(see appended table 5.2)	N/A
2.8.8	Mechanical actuators		N/A

2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	No hygroscopic materials or natural rubber are used as insulation	P
2.9.2	Humidity conditioning		N/A
	Humidity (%) ..... :		—
	Temperature (°C) ..... :		—
2.9.3	Grade of insulation	Basic insulation between primary and Ground. Reinforced insulation between primary and SELV circuits.	P

2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General		P
2.10.2	Determination of working voltage	240Vac	P
2.10.3	Clearances		P

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Clause	Requirement – Test	Result – Remark	Verdict
2.10.3.1	General		P
2.10.3.2	Clearances in primary circuit	(see appended table 2.10.3 and 2.10.4)	P
2.10.3.3	Clearances in secondary circuits	(see appended table 2.10.3 and 2.10.4)	P
2.10.3.4	Measurement of transient voltage levels		N/A
2.10.4	Creepage distances	(see appended table 2.10.3 and 2.10.4)	P
	CTI tests .....:	None	—
2.10.5	Solid insulation		P
2.10.5.1	Minimum distance through insulation	(see appended table 2.10.5)	P
2.10.5.2	Thin sheet material		P
	Number of layers (pcs) .....:	Provided in certified power supply	—
	Electric strength test	(see appended table 5.2)	—
2.10.5.3	Printed boards		N/A
	Distance through insulation		N/A
	Electric strength test for thin sheet insulating material	(see appended table 5.2)	—
	Number of layers (pcs) .....:		N/A
2.10.5.4	Wound components		N/A
	Number of layers (pcs) .....:		N/A
	Two wires in contact inside wound component; angle between 45° and 90° .....:		N/A
2.10.6	Coated printed boards		N/A
2.10.6.1	General		N/A
2.10.6.2	Sample preparation and preliminary inspection		N/A
2.10.6.3	Thermal cycling		N/A
2.10.6.4	Thermal ageing (°C) .....:		N/A
2.10.6.5	Electric strength test	(see appended table 5.2)	—
2.10.6.6	Abrasion resistance test		N/A
	Electric strength test	(see appended table 5.2)	—
2.10.7	Enclosed and sealed parts .....:		N/A
	Temperature $T_1=T_2 = T_{ma} - T_{amb}$ +10K (°C).....:		N/A
2.10.8	Spacings filled by insulating compound.....:		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	Electric strength test	(see appended table 5.2)	—
2.10.9	Component external terminations		N/A
2.10.10	Insulation with varying dimensions		N/A

3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	Internal wires are adequate for the current they are intended to carry (see appended table 4.5). Overcurrent protection is provided by mains fuse of certified power supply module.	P
3.1.2	Protection against mechanical damage	No sharp edges or corners	P
3.1.3	Securing of internal wiring	Internal wiring is routed and clamped	P
3.1.4	Insulation of conductors	(see appended table 5.2)	P
3.1.5	Beads and ceramic insulators		N/A
3.1.6	Screws for electrical contact pressure	At least two complete threads into a metal plate are provided	P
3.1.7	Insulating materials in electrical connections		N/A
3.1.8	Self-tapping and spaced thread screws	Not used for electrical connections	P
3.1.9	Termination of conductors	All conductors are terminated by appropriate connectors	P
	10 N pull test		P
3.1.10	Sleeving on wiring		N/A

3.2	Connection to an a.c. mains supply or a d.c. mains supply		P
3.2.1	Means of connection .....:		P
3.2.1.1	Connection to an a.c. mains supply	The equipment is provided with non-detachable power supply cord	P
3.2.1.2	Connection to a d.c. mains supply		N/A
3.2.2	Multiple supply connections	Single connection to AC mains	N/A
3.2.3	Permanently connected equipment		N/A
	Number of conductors, diameter (mm) of cable and conduits .....:		—
3.2.4	Appliance inlets		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
3.2.5	Power supply cords		P
3.2.5.1	AC power supply cords		P
	Type ..... :	3-wire PVC UL approved (ZJCZ), non-detachable power supply cord	—
	Rated current (A), cross-sectional area (mm^2), AWG ..... :	0.32 A, min. 0.75 mm^2, 18 AWG	—
3.2.5.2	DC power supply cords		N/A
3.2.6	Cord anchorages and strain relief	See test data sheets	P
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
3.2.7	Protection against mechanical damage	No sharp or cutting edges	
3.2.8	Cord guards		N/A
	D (mm); test mass (g) ..... :		—
	Radius of curvature of cord (mm) ..... :		—
3.2.9	Supply wiring space		P

3.3	Wiring terminals for connection of external conductors		P
3.3.1	Wiring terminals	Mains terminal block is a part of certified power supply module	P
3.3.2	Connection of non-detachable power supply cords		P
3.3.3	Screw terminals		N/A
3.3.4	Conductor sizes to be connected		P
	Rated current (A), cord/cable type, cross-sectional area (mm^2) ..... :	0.32 A, 0.75 mm^2, 18 AWG	—
3.3.5	Wiring terminal sizes		P
	Rated current (A), type and nominal thread diameter (mm) ..... :		—
3.3.6	Wiring terminals design		P
3.3.7	Grouping of wiring terminals		P
3.3.8	Stranded wire		P

3.4	Disconnection from the mains supply		P
3.4.1	General requirement		P

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
3.4.2	Disconnect devices	Mains plug acts as disconnect device	P
3.4.3	Permanently connected equipment		N/A
3.4.4	Parts which remain energized	No such parts	P
3.4.5	Switches in flexible cords	No switches in flexible cords	N/A
3.4.6	Single-phase equipment and d.c. equipment	Provided by mains plug	P
3.4.7	Three-phase equipment		N/A
3.4.8	Switches as disconnect devices		N/A
3.4.9	Plugs as disconnect devices	Installation instructions state that wall socket outlet should be easily accessible	P
3.4.10	Interconnected equipment		N/A
3.4.11	Multiple power sources		N/A

3.5	Interconnection of equipment		P
3.5.1	General requirements	Continued conformance to sub-clause 2.2 is provided	P
3.5.2	Types of interconnection circuits .....:	SELV circuits	P
3.5.3	ELV circuits as interconnection circuits	No ELV circuits are provided	N/A

4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N/A
	Angle of 10°	Wall mountable equipment	N/A
	Test: force (N).....:		N/A

4.2	Mechanical strength		P
4.2.1	General		P
4.2.2	Steady force test, 10 N		P
4.2.3	Steady force test, 30 N		P
4.2.4	Steady force test, 250 N		P
4.2.5	Impact test		P
	Fall test		P
	Swing test		N/A
4.2.6	Drop test		N/A

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
4.2.7	Stress relief test	Metal enclosure	N/A
4.2.8	Cathode ray tubes		N/A
	Picture tube separately certified .....:	(see separate test report or attached certificate)	N/A
4.2.9	High pressure lamps		N/A
4.2.10	Wall or ceiling mounted equipment; force (N) ...:	Tested, see Test Data Sheets	P

4.3	Design and construction		P
4.3.1	Edges and corners	No sharp or cutting edges or corners	P
4.3.2	Handles and manual controls; force (N).....:	No safety related handles or controls	N/A
4.3.3	Adjustable controls	No adjustable controls	N/A
4.3.4	Securing of parts		P
4.3.5	Connection of plugs and sockets		P
4.3.6	Direct plug-in equipment	Not direct plug-in equipment	N/A
	Dimensions (mm) of mains plug for direct plug-in .....:		N/A
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N) .....:		N/A
4.3.7	Heating elements in earthed equipment	No heating elements	N/A
4.3.8	Batteries	The equipment contains a non-rechargeable lithium battery BT1 Protection against reverse charging and rapid discharging is provided by Diode D2 and IC U16.	P
4.3.9	Oil and grease	The equipment is not exposed to grease, oil or similar substances	N/A
4.3.10	Dust, powders, liquids and gases	The equipment neither produces nor uses gases, dust or liquids	N/A
4.3.11	Containers for liquids or gases	No liquids	N/A
4.3.12	Flammable liquids.....:	No liquids	N/A
	Quantity of liquid (l).....:		N/A
	Flash point (°C).....:		N/A
4.3.13	Radiation; type of radiation .....:		N/A
4.3.13.1	General		N/A
4.3.13.2	Ionizing radiation		N/A
	Measured radiation (pA/kg) .....:		—

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Measured high-voltage (kV) .....:		—
	Measured focus voltage (kV) .....:		—
	CRT markings .....:		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		N/A
	Part, property, retention after test, flammability classification .....:		N/A
4.3.13.4	Human exposure to ultraviolet (UV) radiation .....:		N/A
4.3.13.5	Laser (including LEDs)		N/A
	Laser class .....:		—
4.3.13.6	Other types .....:		N/A

4.4	Protection against hazardous moving parts	No moving parts	N/A
4.4.1	General		N/A
4.4.2	Protection in operator access areas		N/A
4.4.3	Protection in restricted access locations		N/A
4.4.4	Protection in service access areas		N/A

4.5	Thermal requirements		P
4.5.1	Maximum temperatures	(see appended table 4.5)	P
	Normal load condition per Annex L ..... :		P
4.5.2	Resistance to abnormal heat		N/A

4.6	Openings in enclosures		P
4.6.1	Top and side openings	No openings in top, sides, or rear enclosure are provided	P
	Dimensions (mm) ..... :		—
4.6.2	Bottoms of fire enclosures		P
	Construction of the bottom ..... :	metal without openings	—
4.6.3	Doors or covers in fire enclosures		N/A
4.6.4	Openings in transportable equipment		N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature (°C)/time (weeks) ..... :		—

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame		P
	Method 1, selection and application of components wiring and materials	(see appended table 4.7)	P
	Method 2, application of all of simulated fault condition tests	(see appended table 5.3)	P
4.7.2	Conditions for a fire enclosure	Fire enclosure is required	P
4.7.2.1	Parts requiring a fire enclosure	All parts	P
4.7.2.2	Parts not requiring a fire enclosure		N/A
4.7.3	Materials		P
4.7.3.1	General		P
4.7.3.2	Materials for fire enclosures	Metal enclosure	P
4.7.3.3	Materials for components and other parts outside fire enclosures		N/A
4.7.3.4	Materials for components and other parts inside fire enclosures	All components are flame rated min. 94V-2 and mounted on PCB flame rated min. 94V-1	P
4.7.3.5	Materials for air filter assemblies		N/A
4.7.3.6	Materials used in high-voltage components		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		P
5.1.1	General		P
5.1.2	Equipment under test (EUT)		P
5.1.3	Test circuit	Fig.5A	P
5.1.4	Application of measuring instrument		P
5.1.5	Test procedure		P
5.1.6	Test measurements	Fig.D.1	P
	Test voltage (V) .....:	254 Vac	—
	Measured touch current (mA) .....:	See Test Data Sheets	—
	Max. allowed touch current (mA) .....:	3.5 mA	—
	Measured protective conductor current (mA) ....:	See Test Data Sheets	—
	Max. allowed protective conductor current (mA) :	3.5 mA	—
5.1.7	Equipment with touch current exceeding 3.5 mA .....:		N/A
5.1.8	Touch currents to and from telecommunication networks and cable distribution systems and from telecommunication networks		N/A
5.1.8.1	Limitation of the touch current to a telecommunication network and a cable distribution system		N/A
	Test voltage (V) .....:		—
	Measured touch current (mA) .....:		—
	Max. allowed touch current (mA) .....:		—
5.1.8.2	Summation of touch currents from telecommunication networks .....:		N/A
5.2	Electric strength		P
5.2.1	General	(see appended table 5.2)	P
5.2.2	Test procedure	(see appended table 5.2)	P
5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P

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Clause	Requirement – Test	Result – Remark	Verdict
5.3.2	Motors	(see appended Annex B)	N/A
5.3.3	Transformers	(see appended Annex C)	N/A
5.3.4	Functional insulation ..... :	Functional insulation was shorted (meets requirements c).	P
5.3.5	Electromechanical components		N/A
5.3.6	Simulation of faults		P
5.3.7	Unattended equipment	No thermostats, thermal cut-outs or temperature limiters	N/A
5.3.8	Compliance criteria for abnormal operating and fault conditions	No fire occurred, no molten metal was emitted, no breakdowns during electric strength tests.	P

6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N/A
6.1.1	Protection from hazardous voltages		N/A
6.1.2	Separation of the telecommunication network from earth		N/A
6.1.2.1	Requirements		N/A
	Test voltage (V) ..... :		—
	Current in the test circuit (mA) ..... :		—
6.1.2.2	Exclusions..... :		N/A

6.2	Protection of equipment users from overvoltages on telecommunication networks		N/A
6.2.1	Separation requirements		N/A
6.2.2	Electric strength test procedure		N/A
6.2.2.1	Impulse test	(see appended table 5.2)	N/A
6.2.2.2	Steady-state test	(see appended table 5.2)	N/A
6.2.2.3	Compliance criteria		N/A

6.3	Protection of the telecommunication wiring system from overheating		N/A
	Max. output current (A) ..... :		—
	Current limiting method..... :		—

7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS	N/A

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Clause	Requirement – Test	Result – Remark	Verdict
7.1	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N/A
7.2	Protection of equipment users from overvoltages on the cable distribution system		N/A
7.3	Insulation between primary circuits and cable distribution systems		N/A
7.3.1	General		N/A
7.3.2	Voltage surge test	(see appended table 5.2)	N/A
7.3.3	Impulse test	(see appended table 5.2)	N/A

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Clause	Requirement – Test	Result – Remark	Verdict

A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
A.1	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)		N/A
A.1.1	Samples ..... :		—
	Wall thickness (mm) ..... :		—
A.1.2	Conditioning of samples; temperature (°C) ..... :		N/A
A.1.3	Mounting of samples..... :		N/A
A.1.4	Test flame		N/A
A.1.5	Test procedure		N/A
A.1.6	Compliance criteria		N/A
	Sample 1 burning time (s) ..... :		—
	Sample 2 burning time (s) ..... :		—
	Sample 3 burning time (s) ..... :		—
A.2	Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)		N/A
A.2.1	Samples, material ..... :		—
	Wall thickness (mm) ..... :		—
A.2.2	Conditioning of samples		N/A
A.2.3	Mounting of samples		N/A
A.2.4	Test flame		N/A
A.2.5	Test procedure		N/A
A.2.6	Compliance criteria		N/A
	Sample 1 burning time (s) ..... :		—
	Sample 2 burning time (s) ..... :		—
	Sample 3 burning time (s) ..... :		—
A.2.7	Alternative test acc. To IEC 60695-2-2, cl. 4, 8		N/A
	Sample 1 burning time (s) ..... :		—
	Sample 2 burning time (s) ..... :		—
	Sample 3 burning time (s) ..... :		—
A.3	Hot flaming oil test (see 4.6.2)		N/A
A.3.1	Mounting of samples		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
A.3.2	Test procedure		N/A
A.3.3	Compliance criterion		N/A

B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		N/A
B.1	General requirements		N/A
	Position .....:		—
	Manufacturer .....:		—
	Type .....:		—
	Rated values .....:		—
B.2	Test conditions		N/A
B.3	Maximum temperatures	(see appended table 5.3)	N/A
B.4	Running overload test	(see appended table 5.3)	N/A
B.5	Locked-rotor overload test		N/A
	Test duration (days) .....:		—
	Electric strength test: test voltage (V) .....:		—
B.6	Running overload test for d.c. motors in secondary circuits		N/A
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
B.7.1	Test procedure	(see appended table 5.3)	N/A
B.7.2	Alternative test procedure; test time (h).....:		N/A
B.7.3	Electric strength test	(see appended table 5.2)	N/A
B.8	Test for motors with capacitors	(see appended table 5.3)	N/A
B.9	Test for three-phase motors	(see appended table 5.3)	N/A
B.10	Test for series motors		N/A
	Operating voltage (V) .....:		—

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		N/A
	Position .....:		—
	Manufacturer .....:		—
	Type .....:		—
	Rated values .....:		—
	Method of protection ..... :		—
C.1	Overload test	(see appended table 5.3)	N/A

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Clause	Requirement – Test	Result – Remark	Verdict
C.2	Insulation	(see appended table 5.2)	N/A
	Protection from displacement of windings ..... :		N/A

D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS		P
D.1	Measuring instrument	Fig. D1	P
D.2	Alternative measuring instrument		N/A

E	ANNEX E, TEMPERATURE RISE OF A WINDING	N/A

F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10)	P

G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N/A
G.1	Summary of the procedure for determining minimum clearances		N/A
G.2	Determination of mains transient voltage (V) ..... :		N/A
G.2.1	AC mains supply		N/A
G.2.2	DC mains supply		N/A
G.3	Determination of telecommunication network transient voltage (V)..... :		N/A
G.4	Determination of required withstand voltage (V) :		N/A
G.5	Measurement of transient levels (V)..... :		N/A
G.6	Determination of minimum clearances ..... :		N/A

H	ANNEX H, IONIZING RADIATION (see 4.3.13)	N/A

J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N/A
	Metal used .....:		—

K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)		N/A
K.1	Making and breaking capacity		N/A
K.2	Thermostat reliability; operating voltage (V)..... :		N/A
K.3	Thermostat endurance test; operating voltage (V) ..... :		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
K.4	Temperature limiter endurance; operating voltage (V) ..... :		N/A
K.5	Thermal cut-out reliability		N/A
K.6	Stability of operation	(see appended table 5.3)	N/A

L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.1)		P
L.1	Typewriters		N/A
L.2	Adding machines and cash registers		N/A
L.3	Erasers		N/A
L.4	Pencil sharpeners		N/A
L.5	Duplicators and copy machines		N/A
L.6	Motor-operated files		N/A
L.7	Other business equipment	Maximum normal load: continuous operation with software running.	P

M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N/A
M.1	Introduction		N/A
M.2	Method A		N/A
M.3	Method B		N/A
M.3.1	Ringing signal		N/A
M.3.1.1	Frequency (Hz) ..... :		—
M.3.1.2	Voltage (V) ..... :		—
M.3.1.3	Cadence; time (s), voltage (V) ..... :		—
M.3.1.4	Single fault current (mA)..... :		—
M.3.2	Tripping device and monitoring voltage..... :		N/A
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
M.3.2.2	Tripping device		N/A
M.3.2.3	Monitoring voltage (V)..... :		N/A

N	ANNEX N, IMPULSE TEST GENERATORS (see 2.10.3.4, 6.2.2.1, 7.3.2 and clause G.5)		N/A
N.1	ITU-T impulse test generators		N/A
N.2	IEC 60065 impulse test generator		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
P	ANNEX P, NORMATIVE REFERENCES		N/A
Q	ANNEX Q, BIBLIOGRAPHY		N/A
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N/A
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6)		N/A
R.2	Reduced clearances (see 2.10.3)		N/A
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N/A
S.1	Test equipment		N/A
S.2	Test procedure		N/A
S.3	Examples of waveforms during impulse testing		N/A
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N/A
			—
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N/A
			—

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Clause	Requirement – Test	Result – Remark	Verdict
CENELEC COMMON MODIFICATIONS [C], SPECIAL NATIONAL CONDITIONS [S] AND A-DEVIATIONS (NATIONAL DEVIATIONS) [A] (EN 60950-1:2001)			P
General	C: Delete all the "country" notes in the reference document according to the following list: 1.1.5 Note 2, 1.5.8 Note 2, 1.6.1 Note 1.7.2 Note 4, 1.7.12 Note 2, 2.6 Note 2.2.3 Note, 2.2.4 Note, 2.3.2 Note 2, 7, 8 2.3.3 Note 1, 2, 2.3.4 Note 2,3, 2.7.1 Note 2.10.3.1 Note 4, 3.2.1.1 Note, 3.2.3 Note 1, 2 3.2.5.1 Note 2, 4.3.6 Note 1,2, 4.7.2.2 Note 4.7.3.1 Note 2, 6.1.2.1 Note, 6.1.2.2 Note 6.2.2 Note, 6.2.2.1 Note 2, 6.2.2.2 Note 7 Note 4, 7.1 Note G2.1 Note 1, 2, Annex H Note 2		P
1.2.4.1	S (DK): Certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.		N/A
1.5.1	A (SE, Ordinance 1990:944) and (CH, Ordinance on environmentally hazardous substances SR 814.013, Annex 3.2, Mercury): Add NOTE – Switches containing mercury such as thermostats, relays and level controllers are not allowed.	No Mercury switches, relays, etc.	N/A
1.5.8	S (NO): Due to the IT power system used (see annex V, Fig. V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).	The equipment is not intended for IT power system	N/A
1.7.2	S (FI, NO, SE): CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows:		N/A
	FI: «Laite on liitettдvд suojamaadoitus-koskettimilla varustettuun pistorasiaan»		N/A
	NO: "Apparatet må tilkoples jordet stikkontakt"		N/A
	SE: «Apparaten skall anslutas till jordat uttag»		N/A
	A (DK, Heavy Current Regulations): Supply cords of class I equipment, which is delivered without a plug, must be provided with a visible tag with the following text:		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket  eller  If essential for the safety of the equipment, the tag must in addition be provided with a diagram which shows the connection of the other conductors, or be provided with the following text: "For tilslutning af de øvrige ledere, se medfølgende instalationsvejledning."		
1.7.5	S (DK): Socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For stationary equipment the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a.	No socket-outlets	N/A
1.7.5	A (DK, Heavy Current Regulations): CLASS II EQUIPMENT shall not be fitted with socket-outlets for providing power to other equipment.	Not Class II equipment	N/A
1.7.12	A (DE, Gesetz über techische Arbeitsmittel (Gerätesicherheitsgesetz) [Law on technical labour equipment {Equipment safety law}], of 23rd October 1992, Article 3, 3rd paragraph, 2nd sentence, together with the "Allgemeine Verwaltungsvorschrift zur Durchführung des Zweiten Abschnitts des Gerätesicherheits-gesetzes" [General administrative regulation on the execution of the Second Section of the Equipment safety law], of 10th January 1996, article 2, 4th paragraph item 2): Directions for use with rules to prevent certain hazards for (among others) maintenance of the technical labour equipment, also for imported technical labour equipment shall be written in the German language. NOTE: Of this requirement, rules for use even only by service personnel are not exempted.		N/A
1.7.15	A (CH, Ordinance on environmentally hazardous substances SR 814.013): Annex 4.10 of SR 814.013 applies for batteries.		P
	A (DE, Regulation on protection against hazards by X-ray, of 8th January 1987, Article 5 [Operation of X-ray emission source], clauses 1 to 4):		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	2. . A licence is required by those who operate an X-ray emission source. b) A licence in accordance with Cl. 1 is not required by those who operate an X-ray emission source on which the electron acceleration voltage does not exceed 20 kV if 2. . the local dose rate at a distance of 0,1 m from the surface does not exceed 1 ìSv/h and 2) it is adequately indicated on the X-ray emission source that 2. . X-rays are generated and 2. . the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer. c) A licence in accordance with Cl. 1 is also not required by persons who operate an X-ray emission source on which the electron acceleration voltage exceeds 20 kV if 2. . the X-ray emission source has been granted a type approval and 2) it is adequately indicated on the X-ray emission source that 2. . X-rays are generated ii) the device stipulated by the manufacturer or importer guarantees that the maximum permissible local dose rate in accordance with the type approval is not exceeded and 2. . the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer. d) Furthermore, a licence in accordance with Cl. 1 is also not required by persons who operate X-ray emission sources on which the electron acceleration voltage does not exceed 30 kV if 2. . the X-rays are generated only by intrinsically safe CRTs complying with Enclosure III, No. 6, 2) the values stipulated in accordance with Enclosure III, No. 6.2 are limited by technical		

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Clause	Requirement – Test	Result – Remark	Verdict
	measures and specified in the device and 3) it is adequately indicated on the X-ray emission source that the X-rays generated are adequately screened by the intrinsically safe CRT.		
2.2.4	S (NO): Requirements according to this annex, 1.7.2 and 6.1.2.1 apply.		N/A
2.3.2	S (NO): Requirements according to this annex, 6.1.2.1 apply.		N/A
2.3.3 and 2.3.4	S (NO): Requirements according to this annex, 1.7.2 and 6.1.2.1 apply.		N/A
2.6.3.3	S (GB): The current rating of the circuit shall be taken as 13 A, not 16 A.		P
2.7.1	C: Replace the subclause as follows: *Basic requirements* To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): 2. . except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.		P

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Clause	Requirement – Test	Result – Remark	Verdict
	S (GB): To protect against excessive currents and short-circuits in the PRIMARY CIRCUIT OF DIRECT PLUG-IN EQUIPMENT, protective device shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT.		N/A
2.7.2	C: Void.		
2.10.2	C: Replace in the first line "(see also 1.4.7)" by "(see also 1.4.8)".		P
2.10.3.1	S (NO): Due to the IT power distribution system used (see annex V, Fig. V.7), the A.C. MAINS SUPPLY voltage is considered to be equal to the line-to-line voltage and will remain at 230 V in case of a single earth fault	The equipment is not intended for IT power system	N/A
3.2.1.1	S (CH): Supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: SEV 6532-2.1991, Plug type 15, 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991, Plug type 11, L+N 250 V, 10 A SEV 6534-2.1991, Plug type 12, L+N+PE 250 V, 10 A In general, EN 60309 applies for plugs for currents exceeding 10A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: SEV 5932-2.1998, Plug type 25, 3L+N+PE 230/400 V, 16 A SEV 5933-2.1998, Plug type 21, L+N 250 V, 16 A SEV 5934-2.1998, Plug type 23, L+N+PE 250 V, 16 A		P

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Clause	Requirement – Test	Result – Remark	Verdict
	S (DK): Supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If ply-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.		P
	S (ES): Supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994. Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994. If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.		P
	S (GB): Apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 – The Plugs and Socket etc. (Safety) Regulations 1994, unless exempted by those regulations. NOTE – 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		P

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Clause	Requirement – Test	Result – Remark	Verdict
	S (IE): Apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 – National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.		P
3.2.3	C: Delete Note 1 and in Table 3A, delete the conduit sizes in parentheses.		P
3.2.5.1	C: Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2". In Table 3B, replace the first four lines by the following: Up to and including 6 0,75[1)] Over 6 up to and including 10 (0,75)[2)] 1,0 Over 10 up to and including 16 (1,0)[3)] 1,5 In the Conditions applicable to Table 3B delete the words "in some countries" in condition [1)]. In Note 1, applicable to Table 3B, delete the second sentence.		P
3.2.5.1	S (GB): A power supply cord with conductor of 1,25 mm^2 is allowed for equipment with a rated current over 10 A and up to and including 13 A.	The equipment is rated 0.32 A	N/A
3.3.4	C: In table 3D, delete the fourth line: conductor sizes for 10 to 13A, and replace with the following: "Over 10 up to and including 16 1,5 to 2,5 1,5 to 4 Delete the fifth line: conductor sizes for 13 to 16 A.	The equipment is rated 0.32 A	N/A
3.3.4	S (GB): The range of conductor sizes of flexible cords to be accepted by terminals for equipment with A RATED CURRENT of over 10 A up to and including 13 A is: - 1,25 mm^2 to 1,5 mm^2 nominal cross-sectional area.		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
4.3.6	S (GB): The torque test is performed using a socket outlet complying with BS 1363 and the plug part OF DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C.	Not direct plug-in equipment	N/A
	S (IE): DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 – National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.	Not direct plug-in equipment	N/A
4.3.13.6	C: Add the following note: NOTE Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this recommendation are currently under development.		N/A
6.1.2.1	S (FI, NO, SE): Add the following text between the first and second paragraph: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either 2.□.□ two layers of thin sheet material, each of which shall pass the electric strength test below, or 2.□.□ one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES AND CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition 2.□.□ passes the tests and inspection criteria of 2.10.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.7 shall be performed using 1,5 kV), and 2.□.□ is subject to ROUTINGE TESTING for electric strength during manufacturing,		N/A

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2. A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions: 2.□.□ the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950:2000, 6.2.2.1; 2.□.□ the additional testing shall be performed on all the test specimens as described in EN 132400; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400, in the sequence of tests as described in EN 132400.		
6.1.2.2	S (FI, NO, SE): The exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a Y6ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a service person.		N/A
7.1	S (FI, NO, SE): Requirements according to this annex, 6.1.2.1 and 6.1.2.2 apply with the term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.		N/A
G.2.1	S (NO): Due to the IT power distribution system used (see annex V, Fig. V.7), the A.C. MAINS SUPPLY voltage is considered to be equal to the line-to-line voltage, and will remain at 230 V in case of a single earth fault.		N/A

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
Annex H	C: Replace the last paragraph of this annex by: At any point 10 cm from the surface of the operator access area, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see note). Account is taken of the background level. Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete Note 2.		N/A
Annex P	C: Replace the text of this annex by: See annex ZA.		P
Annex Q	C: Replace the title of IEC 61032 by "Protection of persons and equipment by enclosures – Probes for verification". Add the following notes for the standards indicated: IEC 60127 NOTE Harmonized as EN 60127 (Series) (not modified) IEC 60269-2-1 NOTE Harmonized as HD 630.2.1 S4:2000 (modified) IEC 60529 NOTE Harmonized as EN 60529:1991 (not modified) IEC 61032 NOTE Harmonized as EN 61032:1998 (not modified) IEC 61140 NOTE Harmonized as EN 61140:2001 (not modified) ITU-T Recommendation K.31 NOTE in Europe, the suggested document is EN 50083-1.		P

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
Annex ZA	C: NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR RELEVANT EUROPEAN PUBLICATIONS This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments). NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.		P

—	IEC 60050-151
—	IEC 60050-195
EN 60065:1998 + corr. June 1999	IEC 60065 (mod):1998
EN 60073:1996	IEC 60073:1996
HD 566 S1:1990	IEC 60085:1984
HD 214 S2:1980	IEC 60112:1979
HD 611.4.1.S1:1992	IEC 60216-4-1:1990
HD 21 [1)] Series	IEC 60227 (mod) Series
HD 22 [2)] Series	IEC 60245 (mod) Series
EN 60309 Series	IEC 60309 Series
EN 60317-43:1997	IEC 60317-43:1997
EN 60320 Series	IEC 60320 (mod) Series
HD 384.3 S2:1995	IEC 60364-3 (mod):1993
HD 384.4.41 S2:1996	IEC 60364-4-41 (mod):1992 [3)]
EN 132400:1994 [4)] + A2:1998 + A3:1998 + A4:2001	IEC 60384-14:1993
EN 60417-1	IEC 60417-1
HD 625.1 S1:1996 + corr. Nov. 1996	IEC 60664-1 (mod):1992
EN 60695-2-2:1994	IEC 60695-2-2:1991
EN 60695-2-11:2001	IEC 60695-2-11:2000
—	IEC 60695-2-20:1995
—	IEC 60695-10-2:1995
—	IEC 60695-11-3:2000
—	IEC 60695-11-4:2000
EN 60695-11-10:1999	IEC 60695-11-10:1999
EN 60695-11-20:1999	IEC 60695-11-20:1999
EN 60730-1:2000	IEC 60730-1:1999 (mod)
EN 60825-1:1994 + corr. Febr. 1995 + A11:1996 + corr. July 1997	IEC 60825-1:1993
EN 60825-2:2000	IEC 60825-2:2000
—	IEC 60825-9:1999
EN 60851-3:1996	IEC 60851-3:1996
EN 60851-5:1996	IEC 60825-5:1996
EN 60851-6:1996	IEC 60851-6:1996
—	IEC 60885-1:1987
EN 60990:1999	IEC 60990:1999
—	IEC 61058-1:2000

IEC / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	EN 61965:2001 — IEC 61965:2000 EN ISO 178:1996 — ISO 178:1993 EN ISO 179 Series — ISO 179 Series EN ISO 180:2000 — ISO 180:1993 — — ISO 261:1998 — — ISO 262:1998 EN ISO 527 Series — ISO 527 Series — — ISO 386:1984 EN ISO 4892 Series — ISO 4892 Series — — ISO 7000:1989 EN ISO 8256:1996 — ISO 8256:1990 — — ISO 9772:1994 EN ISO 9773:1998 — ISO 9773:1998 — — ITU-T:1988 Recommendation K.17 — — ITU-T:2000 Recommendation K.21 1) The HD 21 series is related to, but not directly equivalent with the IEC 60227 series 2) The HD 22 series is related to, but not directly equivalent with the IEC 60245 series 3) IEC 60364-4-41:1992 is superseded by IEC 60364-4-41:2001 4) EN 132400, Sectional Specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains (Assessment level D), and its amendments are related to, but not directly equivalent to IEC 60384-14		

1.5.1	TABLE: list of critical components				P
object/part No.	Manufacturer/ trademark	type/model	technical data	standard	mark(s) or declaration of conformity[1])
Power supply	Hitron Electronics	HVI12-09013	Input: 100-240Vac, 50/60Hz, 0.32-0.16A; Output: 9Vdc, 1.3A, SELV		UL, TUV
Plastic cover above PS	GE Plastics	8010V	approx. 82 by 60 mm, 2 mm thick, secured to enclosure by screws, 94V-2		UL
Insulation sleeving (located over PS output wires)	Various	Various	600V, 125°C		UL
Connectors	Various	Various	min. 94V-2, all RJ type connectors are marked with their intended functions (“Reader”, “I^2C”, “Net”, “F.P.”, “Host”)		UL
Power supply cord	Various	Various	250Vac, 18AWG, 0.75 mm^2, VW-1, 75°C		SEV, VDE
Strain relief	Micro Plastics (MP)	6N34	Round, 18 AWG		UL
Printed wiring board	Various	Various	min. 94V-1, 105°C		UL
Lithium battery	Renata	CR2032	3Vdc, max abnormal charging current 25mA, protection is provided by Diode D2 and IC U16		UL
Alternate	FDK	CR2032	3Vdc, max abnormal charging current 5 mA		UL
Alternate	JL World	CR2032	3Vdc, max abnormal charging current 10 mA		UL
Fuse F1	Schurter	OMF125	F 125mA, 63Vac/dc		UL
Relays K1, K2	GoodSky	GS-SH-205T	Coil: 5Vdc, 40A Contacts: 24Vdc/2A, 120Vac/1A,		UL

1.6.2	TABLE: electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (mA)	Ifuse (mA)	condition/status
--	--	--	--	--	--	--
See attached Test data Sheets						

2.10.3 and 2.10.4	TABLE: clearance and creepage distance measurements					P
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
Primary to Ground under power supply PCB (Basic)	--	240Vac	2.0	5	2.5	5
Primary to SELV (Reinforced)	--	240Vac	4.0	>4*	5.0	>5*
*) Provided by certified power supply						

2.10.5	TABLE: distance through insulation measurements			P
distance through insulation di at/of:	Up (V)	test voltage (V)	required di (mm)	di (mm)
Primary to SELV (Reinforced)	--	--	--	--
Provided by certified power supply				

4.5	TABLE: maximum temperatures						P
	test voltage (V) .....:	--	--	--	--	--	—
	t_{amb1} (°C) .....:	--	--	--	--	--	—
	t_{amb2} (°C) .....:	--	--	--	--	--	—

maximum temperature T of part/at::	T (°C)					allowed T_{max} (°C)
--	--	--	--	--	--	--
See attached Test Data Sheets						

temperature T of winding:	R_1 (Ω)	R_2 (Ω)	T (°C)	allowed T_{max} (°C)	insulation class
--	--	--	--	--	--

4.5.2	TABLE: ball pressure test of thermoplastic parts		N
	allowed impression diameter (mm) ..... :	≤ 2 mm	—

part	test temperature (°C)	impression diameter (mm)
--	--	--

4.7	TABLE: resistance to fire			N
part	manufacturer of material	type of material	thickness (mm)	flammability class
--	--	--	--	--

5.2	TABLE: electric strength tests, impulse tests and voltage surge tests	P

test voltage applied between:	test voltage (V) a.c. / d.c.	breakdown Yes / No
--	--	--
supplementary information		
See attached Test Data Sheets		

5.3	TABLE: fault condition tests		P
	ambient temperature (°C) ..... :	--	—
	model/type of power supply ..... :	--	—
	manufacturer of power supply ..... :	--	—
	rated markings of power supply ..... :	--	—

component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
--	--	--	--	--	--	--
See attached Test Data Sheets						

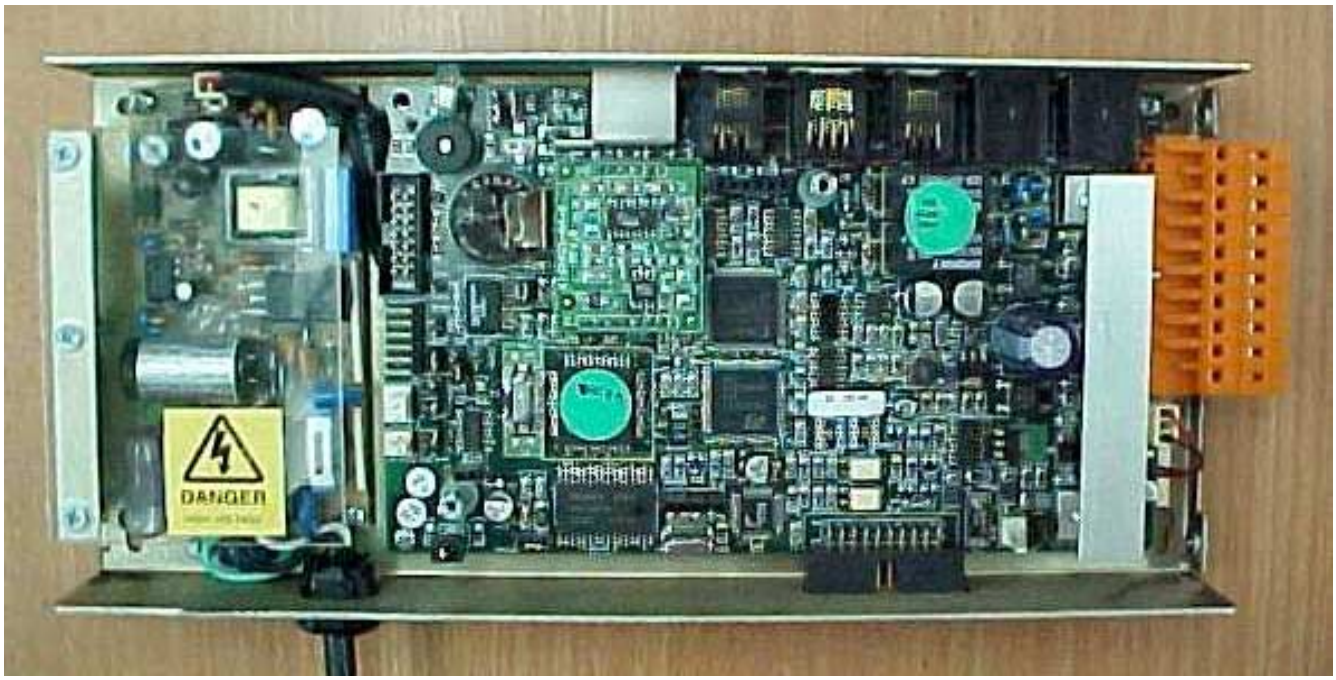
Test instruments						
SII Ref. No.	Instrument Type	Manufacturer	Model	Calibration Date		SII Location
				Last	Due	
4875	Power Analyzer	Avpower	PA2200	07/05	07/06	Telem. Lab
4028	Power Analyzer	Avpower	PA2200	04/05	04/06	Telem. Lab
4876	Electrical Safety Tester	Sefelec	SMG 5000	08/04	08/05	Telem. Lab
4612	Leakage Current Tester – IEC 60950	SII	--	05/05	05/06	Telem. Lab
4498	Digital Storage Oscilloscope	PHILIPS	PM3375	04/05	04/06	Telem. Lab
3390	DVM + thermocouple module	FLUKE	77 + 80TK	08/05	08/06	Telem. Lab
4650	AC/DC Clamp Meter	APPA	36	03/05	03/06	Telem. Lab
5047	True RMS Multimeter	Fluke	87 III	12/04	12/05	Telem. Lab
5048	True RMS Multimeter	Fluke	87 III	12/04	12/05	Telem. Lab
52654	Jointed test finger	PTL	P 10.04	01/05	01/06	Telem. Lab
52655	Test probe Telecom	SII	--	01/05	01/06	Telem. Lab
52839	Test probe 250N	PTL	P10.64	05/05	05/06	Telem. Lab
52746	Test gauge	PTL	L25.84	01/05	01/06	Telem. Lab
52697	Digital Caliper	Mitutoyo	CD-6"R	04/05	04/06	Telem. Lab
52656	Steel ball for Impact test	SII	--	01/05	01/06	Telem. Lab
53821	Test pin	SII	--	01/05	01/06	Telem. Lab
53929	Industrial Scopemeter	Fluke	DM7540063	12/04	12/05	Telem. Lab
53930	Industrial Scopemeter	Fluke	DM7540064	04/05	04/06	Telem. Lab
5004 53937	Data Acquisition/Switch Unit with Thermocouples Type J 20-Channel Armature Multiplexer	Agilent	34970A S/N US37030301 34901A S/N US37242809	02/05	02/06	Telem. Lab
5003 53935	Data Acquisition/Switch Unit with Thermocouples Type J 20-Channel Armature Multiplexer	Agilent	34970A S/N US37028438 34901A S/N US37242807	03/05	03/06	Telem. Lab
5005 53936	Data Acquisition/Switch Unit with Thermocouples Type J 20-Channel Armature Multiplexer	Agilent	34970A S/N US37030252 34901A S/N US37242808	03/05	03/06	Telem. Lab
5002 53934	Data Acquisition/Switch Unit with Thermocouples Type J 20-Channel Armature Multiplexer	Agilent	34970A S/N US37030311 34901A S/N US37242806	02/05	02/06	Telem. Lab
51754	Test finger with force gauge	PTL	P10.38	06/05	06/06	Elec. Lab
53820	Ball Pressure Test Instrument	PTL	P10.02	12/04	12/05	Telem. Lab
4065	Temperature/Humidity Cabinet	Heraeus Votsch	HCZ-003L	08/04	08/05	Elec. Lab
4081	Temperature Chamber	Heraeus Votsch	HC4030	11/04	11/05	Elec. Lab
54046	Ground Bond Tester	Zentech	9570	12/04	12/05	Telem. Lab Medical div.
54045	AC/DC Withstanding Voltage Test	Zentech	9072A	05/05	05/06	Telem. Lab Medical div.
54412	Sharp Edge Tester	Underwriters Laboratories	Set-50	05/05	05/06	Telem. Lab
4141	Scales	Mettler	PM30000-K	06/05	06/06	Calibration Lab
52885	Torque	Torqueleader	TT250	05/05	05/06	Electronics Lab
560339	Hygro-Thermometer	Extech Instruments	445703	05/05	05/06	Telem. Lab
560340	Digital Force Gauge	Lutron	FG-20KG	04/05	04/06	Telem. Lab

APPENDIX 1
PHOTOGRAPHS

Fig. 1
Overall front/top/side view of the subject unit

Fig. 2
Overall rear/bottom/side view of the subject unit

Fig. 3
Internal view of the subject unit



APPENDIX 2
TEST DATA SHEETS

Instrument Code / Range : 4028

1.6.2 - INPUT TEST:
SINGLE-PHASE

METHOD

The unit was connected to a variable voltage as indicated and then operated normally under the conditions noted below until well warmed. The input current and average power were measured.

RESULTS

1.6.2	TABLE: electrical data (in normal conditions)					
fuse #	I rated (A)	U (V)	P (W)	I (mA)	I fuse (mA)	condition/status
--	0.32	254V/50Hz	6.1	54	--	Maximum normal load
--	0.32	240V/50Hz	5.9	55	--	Maximum normal load
--	0.32	100V/60Hz	4.8	84	--	Maximum normal load
--	0.32	90V/60Hz	4.8	92	--	Maximum normal load
Supplementary information: The steady state input current [~~did~~] [did not] exceed the rated current at the rated voltage by more than 10 percent under maximum normal load.						

Comments:

1.7.13 - DURABILITY OF MARKING TEST:

METHOD

A sample of the marking label was subjected to this test. The surface of each marking as noted below was rubbed by hand for a period of 15 seconds with a water soaked cloth, and again for a period of 15 seconds with a cloth soaked with the ~~petroleum spirit~~ _[hexane] [ ].

RESULTS

TEST CONDITIONS:		
Use of Marking	Nameplate	
Material	Polyester	
Held by	Adhesive	
Applied Surface Material	Plastic	

OBSERVATIONS:						
	Water	Hexane		Water	Hexane	
Any Damage?	no	no				
Legible?	yes	yes				
Curled?	no	no				
Edge Lifted?	no	no				
Easily Removed Intact?	no	no				

The marking [was] [~~was not~~] durable and legible. The label [~~was~~] [was not] easily removed and [~~did~~] [did not] show curling.

Comments:

Instrument Code / Range : 52654, 53821, 52655

2.1.1.1, 2.8.2 - ACCESS TO ENERGIZED PARTS TEST: (Engineer to perform)

METHOD

[√] A sample with all operator access doors and covers removed was subjected to this test. A test finger, Figure 2A was applied without appreciable force to all apertures in an attempt to contact hazardous parts. Operator detachable connectors were tested during and after disconnections. Openings preventing the entry of the test finger were further tested by means of a straight unjointed version of the test finger, which was applied with a force of 30 N (6.75 lbs). If entry of the unjointed version was possible, the test with the articulated test finger was repeated with the finger being pushed through the aperture, if necessary.

[√] A sample with all operator detachable parts, including fuseholders and lamps left in place and operator access doors and covers closed, was subjected to this test. A test pin, Figure 2B was applied to all apertures located in electrical enclosures in an attempt to contact hazardous parts.

[] For TNV circuits, the test probe, Figure 2C was applied to contacts of connector(s).

[] A sample employing a safety interlock was subjected to this test. The test finger, Figure 2A was applied to all covers, guards, doors, etc., to determine if inadvertent reactivation of the interlock circuit did occur.

[] For parts exceeding 1000 V ac or 1500 V ac, the test finger, Figure 2A and/or the test pin, Figure 2B, as appropriate, were inserted and placed in the most unfavorable position. The clearance was then measured as specified in Annex F, Figure F.12, Point A to verify compliance with the requirements for basic insulation, or the relevant Electric Strength Test for basic insulation was performed.

Instrument Code / Range : 52654, 53821, 52655

RESULTS

[√] It was not possible to touch hazardous parts with the standard test finger and test pin.

[] It was not possible to touch TNV connector contacts with the test probe.

[] The safety interlock [could] [could not] be reactivated using the test finger.

[] The clearances from parts exceeding 1000 V ac or 1500 V dc to the test finger and/or test pin [were] [were not] greater than those values specified for basic insulation.

[] The clearances from parts exceeding 1000 V ac or 1500 V dc to the test finger and/or test pin were evaluated with an Electric Strength Test. See 5.3 - Electric Strength Test for results.

[] It was possible to touch the following part(s) with the standard test finger, test point and/or test probe.

	Location		
	Pin	Finger	Probe
[]Bare parts at ELV			
[]Bare parts at hazardous voltages			
[]Functional or basic insulation of parts or wiring at hazardous voltages			
[]Functional or basic insulation of parts or wiring at ELV			
[]Unearthed conductive parts separated from parts at ELV or hazardous voltages by functional or basic insulation only			
[]Two bare parts, in an operator access area, one of which may be an earthed conductive part, between which a hazardous energy level exists			
[]Part which would present a risk of personal injury			
[]Insulation of internal parts or wiring at ELV			
[]TNV connector contacts			

Instrument Code / Range : 53929

2.1.1.7 - CAPACITANCE DISCHARGE TEST:

METHOD

The unit was connected to 254 V ac, 50 Hz. A storage oscilloscope was connected across the external point of disconnection of the

was disconnected from the supply source. The voltage at the time of disconnection, V_o, and the voltage, V_{tc}, at [1.0] ~~[10.0~~] second(s) [was] [~~were~~] recorded.

[] A photograph or printout of the scope waveform was provided.

[√] The test was repeated with the primary fuse removed.

[] The test was repeated with all switches in all possible positions.

RESULTS

Measurement Locations	Fuse In/Out	Switch Position	V_o (V pk)	37% V_o (V pk)	V_{tc} (V pk)
Line - Ground	In	--	359	133	0.0
Line - Neutral	In	--	359	133	0.0
Line - Ground	Out	--	359	133	0.0
Line - Neutral	Out	--	359	133	0.0

The voltage at the external point of disconnection [did] [did not] decay to less than 37 percent of its original value in [1.0] [10.0] second(s).

Instrument Code / Range : 5047, 53929

2.2.2, 2.2.3, 2.2.4 - SELV RELIABILITY TEST:

METHOD

The unit was connected to 240 V ac, 50 Hz] ~~[V dc~~] and operated normally. After the introduction of a fault, as noted below, voltages between the following points were measured.

RESULTS

[√] After the fault introduction, the voltage did not exceed 42.4 V pk or 60 V dc for longer than 0.2 seconds. In addition, a limit of 71 V pk or 120 V dc was not exceeded.

	Component						Result
No.	No.					Fuse	Specify
Accessible Part	(Voltage		Test	Test time	Fuse	Current	Maximum Vpk or
From - To	(Limiting)	Fault	Voltage	(Duration)	No.	(A)	V dc
Vch - GND	R46	shorted	12Vdc	--	--	--	14.5 Vdc

NOTE: Only record the duration for voltages that exceed 42.4 V pk or 60 V dc

Comments:

Instrument Code / Range : 53929, 4650

2.6.3.4, 2.6.1 - EARTHING TEST I:

METHOD I - For circuit under test with a current rating of 16 A or less.

Using a maximum 12 V [~~ac~~] [dc] power source, a current of 40 A, was passed between the equipment earthing terminal and the part in the equipment that is required by 2.6.1 to be earthed listed below for a period of 120 second(s). [√] The voltage drop from the earthing terminal to the accessible metal part required to be earthed was recorded and the resistance was calculated.

[] The resistance reading was recorded.

RESULTS I

Accessible Conductive Part	Current (Amps)	Voltage Drop (Volts)	Resistance (Ohms)
Top panel	40	2.20	0.055
Bottom	40	2.04	0.051

[√] The resistance [~~did~~] [did not] exceed 0.1 ohm from any accessible conductive part and earth.

Comments:

Instrument Code / Range : 4424, 4272

3.2.6, 4.2.1, 4.2.7 - STRAIN RELIEF TEST:

METHOD

[ ] After the Stress Relief Test, [the] [The] non-detachable power supply cord or interconnecting cable shown below was marked at its entry into the unit. The cord was pushed in the direction back into the unit. The unit was then anchored so that a 30 N pulling force was applied for one second. This was repeated a total of 25 times with the cord in the most unfavorable direction or directions throughout the test. Any displacement of the cord was recorded.

RESULTS

Strain Relief Manufacturer	Micro Plastics (MP)		
Part No.	6N34		
Hole Size	0.625 x 0.53		
Cord Use			
Type	SVT		
Size (AWG)	18		
Push Test			
Cord Disp.	0		
Pull Test			
Cord Disp.	1.2 mm		

[√] Following the Strain Relief test, an Electric Strength (ES) potential of 4242 V[~~ac~~] [dc] (which is the test voltage appropriate for reinforced insulation) was applied between the power supply cord conductors and the accessible chassis for one minute.

It [~~was~~] [was not] possible to push the cord back into the unit to such an extent that the cord or its conductors, or both, could be damaged or internal parts of the unit could be displaced.

The cord [~~did~~] [did not] slip in its anchorage.
The cord [~~was~~] [was not] displaced by more than 2 mm.
There [~~was~~] [was no] strain to the internal connections.
[√] There [~~was~~] [was no] indication of breakdown.

Comments:

Instrument Code / Range : 52839

4.2.1 - 4.2.4 - STEADY FORCE TESTS:

METHOD

[] Wire-wrap Terminals used for connection of SELV and TNV Circuits - using the unjointed probe in the shape of the standard test finger which incorporates the force gauge, a steady force of 2.5 ± 0.25 N (0.56 lbs) was applied to the wire-wrap terminals for a period of 5 seconds. After the application of the test force, clearances were measured internal with covers or guards deflected.

[] Parts of the Enclosure in Operator Access area protected by cover or door (Internal enclosure or barrier) Using the unjointed probe in the shape of the standard test finger which incorporates the force gauge, a steady force of 30 ± 3 N (6-3/4 lbs) was applied to internal covers or guards for a period of 5 seconds. After the application of the test force, clearances were measured with the internal covers or guards deflected.

[√] External Enclosures - Using a test tool having a 30 mm (1.2 in.) circular diameter contact surface, a force of 250 ± 10 N (56 lbs) was applied to external covers or guards for a period of 5 seconds. After the application of the test force, clearances were measured with the external enclosure deflected.

RESULTS

Part/Location	Thickness	Force	Observations
Front enclosure	1.5 mm	250 N	No damage
Top enclosure	1.5 mm	250 N	No damage
Side enclosure	1.5 mm	250 N	No damage

During the application of the test force, clearances behind earthed or unearthed conductive enclosures [~~were~~][were not] reduced to a level that would result in an energy hazard.

Instrument Code / Range : 52656, 4876

4.2.5, 4.2.1 - IMPACT TEST:

METHOD

The unit was placed on a solid supporting surface with the surface that was impacted positioned horizontally. One impact was imparted to the surface by a smooth steel sphere 50 mm (2 in.) in diameter and weighing 0.5 kg (1-3/16 lbs). The sphere was allowed to fall freely through a distance of 1.3 m (51-3/16 in.) and/or swung as a pendulum when it was difficult to place the surface in a horizontal position.

[√] Following the impacts, the unit was subjected to an Electric Strength Test for one minute.

	Location		Potential Used (V)	
	From	To	[] ac	[√] dc
A	Phase/Neutral	Ground	--	2121 V
B	--	--	--	--

RESULTS

Material	Impact Area	Observations
Metal	Top enclosure	No damage
Metal	Front enclosure	No damage
Metal	Side enclosure	No damage

It [~~was~~] [was not] possible to access hazardous parts.

[√] There was no indication of a dielectric breakdown.

Instrument Code / Range : 4424

4.2.10 - LOADING TESTS:

METHOD

After filling any containers to rated capacity and attaching any accessories, the equipment, Model SY-780A and its mounting means were secured to the [wall] [~~ceiling~~
construction as described. Adjustable equipment was adjusted to the position that gives the maximum projection from the wall.

A force equal to four times the weight of the unit (the equipment plus three times its weight), but not less than 50 N, was applied through a strap approximately 75 mm wide at the dimensional center of the appliance and was increased in 5 - 10 second intervals until the maximum load was applied to the mounting system. The full load was sustained for 1 minute.

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RESULTS

Weight of the equipment: 0.75 kg

Force applied: 50 N, ~~which was 3 times the weight of the equipment~~.

[√] The mounting means [did] [~~did not~~] withstand the force applied without breaking or damaging the mounting bracket, its securing means, or that portion of the unit to which it was attached.

Comments:

. . . . . .

NOTES TO LAB:

1. If no mounting surface is specified, use a wall construction of 1.3 cm (1/2 in.) thick plasterboard mounted on a 4-5 by 8-10 cm wood, 41 cm on center (2 by 4 - 16 in. on center).

2. If any of the mounting material is plastic, perform this test after conducting Stress Relief Test.

NOTES TO ENGINEER:

1. The force applied to the mounting means is four times the weight of the equipment. Therefore, when the equipment is mounted, the weight of the equipment times three will equal a force of four times the weight of the unit.

Instrument Code / Range : 54412

4.3.1 - SHARP EDGE TEST:

METHOD

Accessible edges or corners of the unit, except those required for proper functioning of the equipment, were subjected to this test. Surfaces described below were judged using the Sharp Edge Tester. The curved face of the tester head was covered with three layers of tape: bottom layer 1.6 mm (1/16 in.) black vinyl foam tape; middle layer 0.8 mm (1/32 in.) white vinyl foam tape; outer layer 0.08 mm (3 mil) Teflon tape skived. The tape covered head of the tester was positioned on the edge to check for sharpness. The arm of the tester was calibrated so that a 6.7 N (1-1/2 lbs) force was present at the center of the head when the arm was between stops. This force was applied on the sharp edge. The tester was immediately moved 50.5 mm (2 in.) along the edge and then back to its starting position without removing the tester so that total distance traveled was 101 mm (4 in.). The time of travel was no longer than 5 seconds nor less than 2 seconds.

RESULTS

	Penetration of Two Outer Tapes
Edge Location	[Yes] [No]
Front-top edge	No
Front-side edge	No
Front-bottom edge	No
Side-top edge	No

The edges and corners [were] [~~were not~~] considered to be rounded and smooth.

Comments:

Instrument Code / Range : 5047, 53929

4.3.8 - LITHIUM BATTERY REVERSE CURRENT MEASUREMENT TEST:

METHOD

With the lithium battery removed from the circuit, the sample was connected to 240 Vac, 50 Hz. A dc ammeter replaced the battery in the circuit and the normal reverse (charging) current was measured. The reverse current protection component was shorted and the abnormal reverse (charging) current was measured.

RESULTS

Battery Type	Normal Reverse Charging Current (mA)	Abnormal Condition	Abnormal Reverse Current (mA)
CR2032	0mA	D2 shorted	0 mA

Comments: max. 5 mA.

. . . . . .

NOTES TO LAB:

1. CAUTION: Risk of explosion. Remove battery before performing this test.

2. Notify engineer if maximum abnormal charging current exceeds ____ mA.

NOTES TO ENGINEER:

1. This test is conducted to confirm maximum abnormal current specified in

Instrument Code / Range : 5004, 53937

4.5.1, 1.4.12, 1.4.13 - HEATING TEST:

METHOD

The sample was connected to a source of supply, as noted below, and operated until temperatures became stable. Temperatures were measured using the thermocouple method.
[] Rise in temperature of windings of motors and transformers were additionally determined by the change-of-resistance method.

[√] Before starting the Heating Test, each special non-detachable power supply cord connection was pulled with a force of 5 N (1.12 lbs) for one minute. During the Heating Test, the temperature of its connections were recorded. (Maximum 85°C per 3.3.2.)

The sample operated under normal load as follows:

[√] Continuous operation, until steady conditions were established.

[] Rated intermittent operation of _____ on _____ off, until steady conditions were established.

[] Rated short-time operation of _____ .

[√] The test conditions were as follows: continuous operation in following conditions:

90Vac/60Hz
B - 253Vac/50Hz

Tma was 50 °C.

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RESULTS

4.5	TABLE: maximum temperatures							P
	test voltage (V)	90V/ 60Hz	253V/ 50Hz	90V/ 60Hz	253V/ 50Hz	--	--	—
	t_{amb1} (°C)	24	24	50*	50*	--	--	—
	t_{amb2} (°C)	24	24	50*	50*	--	--	—

maximum temperature T of part/at::	T (°C)						allowed T_{max} (°C)
Condition:	A	B	A*	B*	--	--	--
Power Supply:							
Primary wire	40.3	44.9	66.3	70.9	--	--	75
Inductor L1	42.9	45.7	68.9	71.7	--	--	90
Capacitor C2	44.8	52.8	70.8	78.8	--	--	85
Transformer T1	54.5	64.4	80.5	90.4	--	--	90
Capacitor C14	48.0	53.0	74.0	79.0	--	--	85
General:							
Secondary wire	38.6	40.6	64.6	66.6	--	--	75
Capacitor C60	45.0	44.9	71.0	70.9	--	--	85
Relay K1	42.0	41.8	68.0	67.8	--	--	75
Capacitor C68 (main card)	43.5	43.5	69.5	69.5	--	--	85
Top enclosure	31.4	32.4	57.4	58.4	--	--	70
Bottom enclosure	30.6	31.1	56.6	57.1	--	--	70

*) calculated to the ambient temperature 50 °C.

Instrument Code / Range : 5004, 53937

NOTES TO ENGINEER

1. All temperature measurements should take into account the parameters defined (also in sub-clause 1.4.12.1) below:

2.
T - is the temperature given of the part measured under the prescribed test condition

Tmax - is the maximum temperature specified for compliance with the test

Tamb - is the ambient temperature during test

Tma -
specification

2. Temperature Dependent Equipment - per Sub-clause 1.4.12.2 for Temperature Dependent Equipment, the temperature measurement is made at the least favorable

not exceed Tmax

3. Non- -clause 1.4.12.3, the method described in sub-clause 1.4.12.2 (above) may be used or alternatively, testing may be performed at any value of
operating range provided: T shall not exceed (Tmax + Tamb - Tma).

Instrument Code / Range : 4612, 53929

5.1, ANNEX D - TOUCH CURRENT TEST:
(Single-Phase/Polyphase; TN/TT System)

METHOD

The equipment was connected to 253 Vac, 50 Hz. The equipment was placed on an insulating surface and all connections to external equipment were disconnected to prevent stray leakage paths. The unit protective earthing connection was broken during the test. [] An isolating transformer was used.

The tests were conducted using the measuring instrument for touch current tests (meter), described in Annex D of UL 60950, Third Edition. Terminal B of the measuring instrument was connected to the earthed (neutral) conductor of the supply (see Figure 5A or 5B).

/
which can be operated during normal use, were opened and closed in all possible combinations.

For an accessible non-conductive part, the test was made to metal foil having dimensions of 10 by 20 cm in contact with the part. If the area of the foil is smaller than the surface under test, the foil was moved so as to test all parts of the surface. Where adhesive metal foil was used, the adhesive was conductive. Precautions were taken to prevent the metal foil from affecting the heat dissipation of the equipment.

Accessible conductive parts that are incidentally connected to other parts were tested both as connected and disconnected parts.

[√] For equipment having a protective earthing connection or a functional earthing connection, terminal A of the measuring instrument was connected via measurement
earthing terminal of the EUT, with the earthing conductor

[] The test was conducted on all equipment, with terminal A of the measuring
-conductive
accessible part and each unearthed accessible circuit, in turn, with the earthing

Measuring instrument used:

[] Annex D.1 [] Simpson Meter 228
(√) Fig. D1 of UL60950

[] Annex D.2 [] Simpson Meter 229-2
[] _____

Instrument Code / Range : 4612, 53929

[√] SINGLE- 5A.

The test was made in all combinations to the normal and reverse polarity of the supply circuit (Polarity Switch P1).

of Measuring Instrument Connected to:	Position	Touch Current (mA r.m.s.) Polarity P1/Primary Switch Condition			
		Normal/On	Normal/Off	Reverse/On	Reverse/Off
Grounded terminal	open	0.50 mA	--	0.44 mA	--
Grounded terminal	closed	0 mA	--	0 mA	--

[√] The touch current [~~did~~] [did not] exceed 3.5 mA r.m.s with terminal A

[√] The touch current [~~did~~] [did not] exceed 0.25 mA r.m.s with terminal A

Instrument Code / Range : 4876

5.2.2 - ELECTRIC STRENGTH TEST:

METHOD

While the unit was in a well heated condition, an ac or dc potential was gradually increased from zero to the test potential given below. The voltage was applied and maintained for a period of one minute between the points indicated. All switches, relays, contactors, triacs or equivalent in the test circuit were closed or shunted.

RESULTS

5.2	TABLE: electric strength tests and impulse tests			
test voltage applied:			test voltage (V ac / V dc)	breakdown
From	To	Insulation Type		
Phase and Neutral conductors	Ground	Basic	2121 V dc	No
--	--	--	--	--
supplementary information: There [~~was~~] [was no] indication of breakdown.				

Comments:

Instrument Code / Range : 5004, 53937, 4876, 5047

5.3.1, 5.3.4, 5.3.6 - COMPONENT FAILURE TEST:

METHOD

The sample was placed on a tissue paper covered softwood surface and covered with a single layer of cheesecloth. The sample was connected to a voltage source and operated normally. Once the unit was operating normally, the abnormal condition (i.e., short or open) was applied to each component noted below.

[] The output of TNV circuits were monitored with a 500 ohms resistor connected [between a conductor and ground] [between two conductors].

The unit was operated until ultimate results occurred, such as the opening of a reliable component, or thermal equilibrium was reached. During the test, all switches in the primary circuit were closed. Temperatures on the coils of safety isolating transformers were monitored.

If the circuit was interrupted by the opening of a component of unknown reliability, the test was repeated twice (three times total) using new components as necessary.

[] If a wire or printed wiring board trace in the primary circuit opened, the gap was electrically shorted and the test continued until ultimate results occurred for each occurrence.

[] If a trace in a secondary circuit was designed to intentionally open in a repeatable manner, the test was conducted three times to determine if the circuit does open repeatedly.

[] An oscilloscope was used to monitor all output voltages immediately following the application of the abnormal condition.

The following electric strength (ES) potentials were applied where indicated for one minute:

	Location		Potential Used (V)	
	From	To	[] ac	[√] dc
A	Phase/Neutral	Ground	--	2121 V
--	--	--	--	--

The following key and corresponding comments may be used to describe the final results.

Comments Key:

IP - Internal protection operated (list component)

CT - Constant temperatures were obtained

TW - Transformer winding opened

CD - Components damaged (list damaged components)

NB - No indication of dielectric breakdown

YB - Dielectric breakdown (indicate time and location)

NC - Cheesecloth remained intact

YC - Cheesecloth charred or flamed

NT - Tissue paper remained intact

YT - Tissue paper charred or flamed

Instrument Code / Range : 5004, 53937, 4876, 5047

RESULTS

5.3.1	TABLE: fault condition tests		P
	ambient temperature (°C) .....:	23 °C	—
	model/type of power supply .....:	HVI12-09013	—
	manufacturer of power supply .....:	Hitron	—
	rated markings of power supply .....:	In: 100-240Vac, 0.32-0.16A, 50/60Hz; Out: 9Vdc, 1.3A;	—

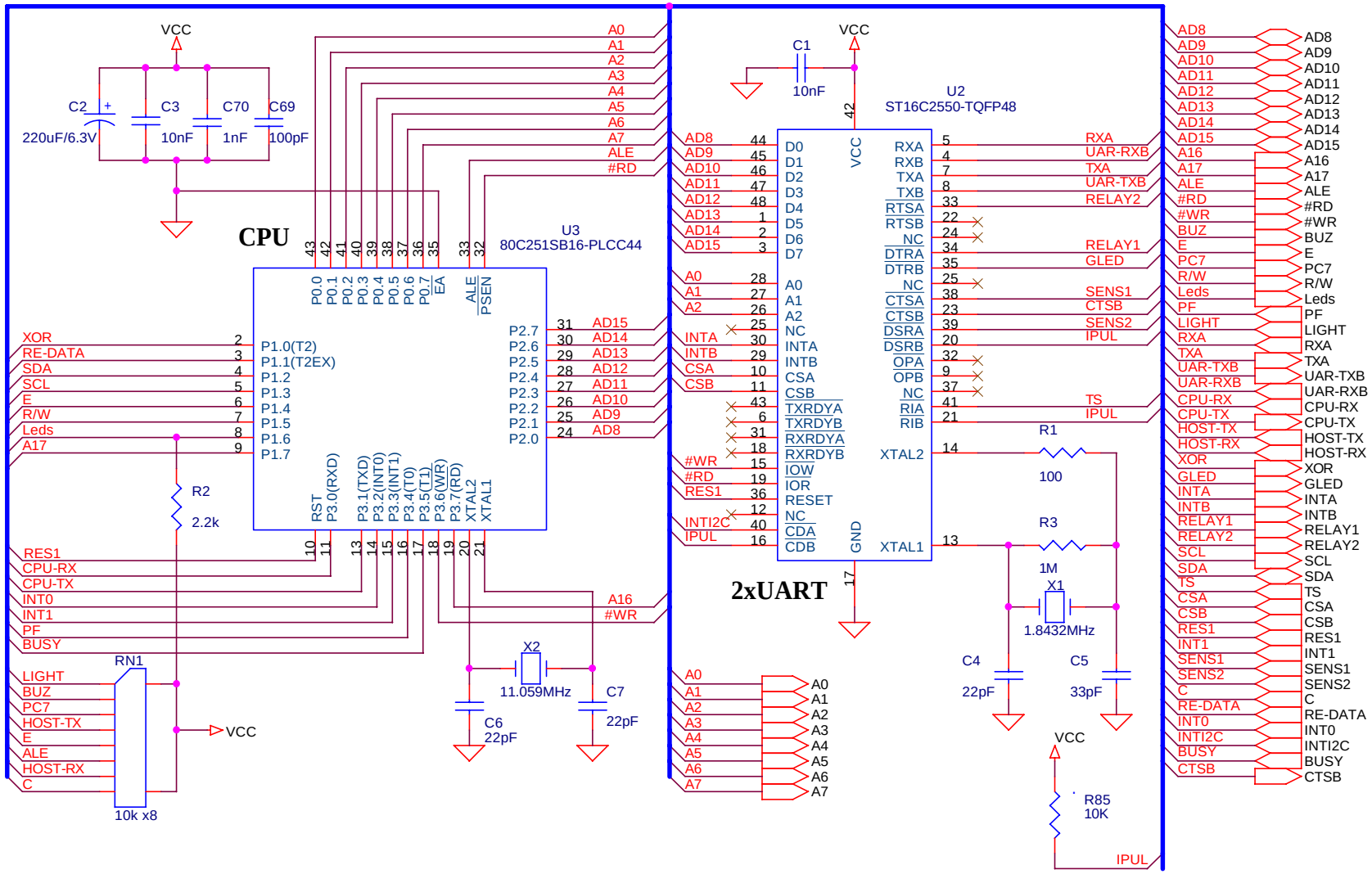
No.	Component No.	Fault	test voltage	test time	fuse No.	fuse current (A)	Result
1	Interface I/O card, Conn. P1	Pin 1 (VCC) to Ground shorted	240Vac	1 h	--	--	NB, NC, NT, CT. The short current was 2.1A. Max. measured temperature on flat cable was 39°C. No hazard.
2	Main card, Cap. C60	shorted	240Vac	--	--	--	IP, NB, NC, NT. Internal protection of power supply module operated immediately. No hazard.
3	Main card, Cap. C49	shorted	240Vac	--	--	--	IP, NB, NC, NT. The short current was 0.3A. No hazard.

Supplementary Information:

Report No. 8512309357

APPENDIX 3
ELECTRICAL SCHEMATICS

(7 pages attached not including this cover page)



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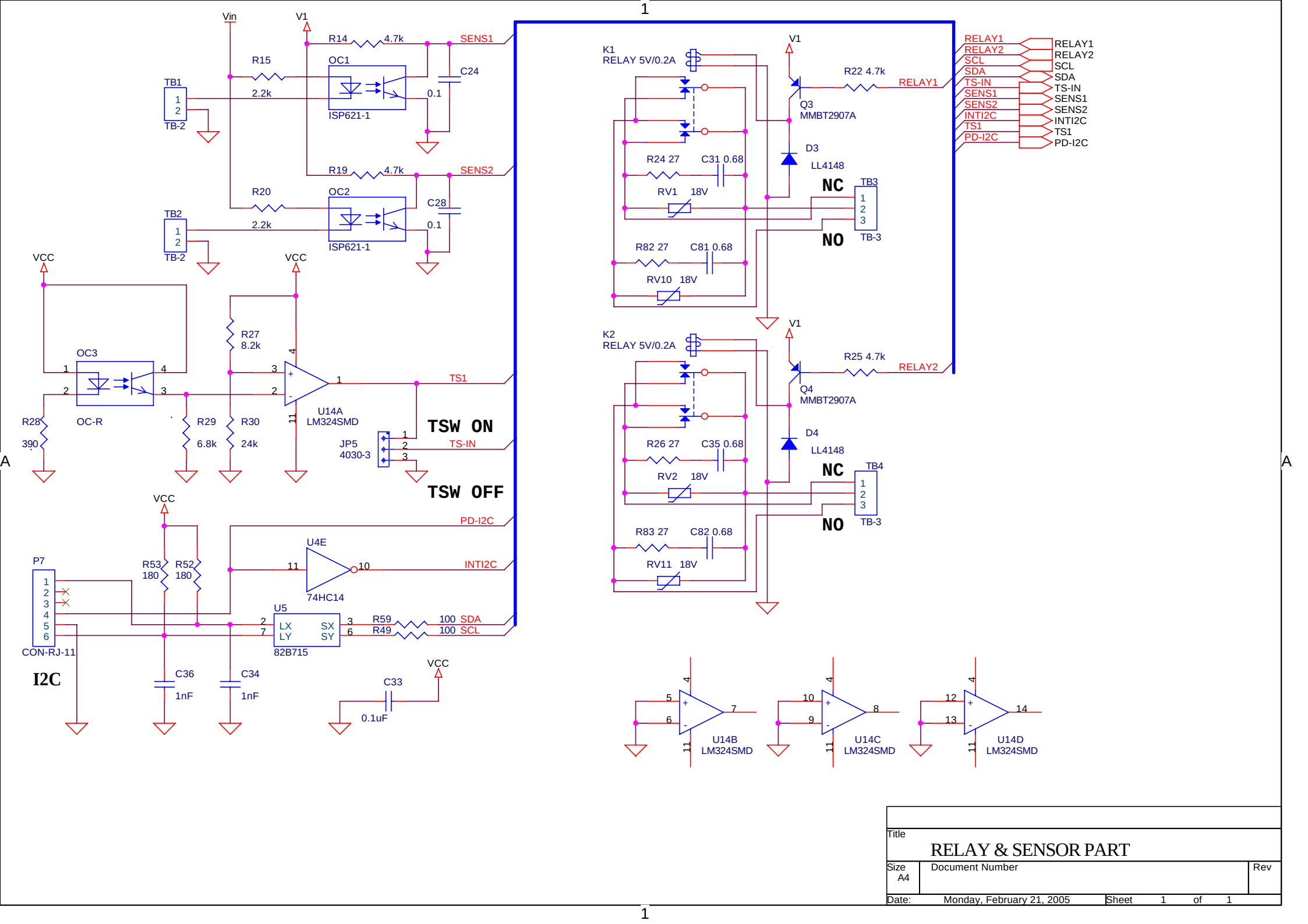
Date: Monday, February 21, 2005	Sheet 1 of 5	



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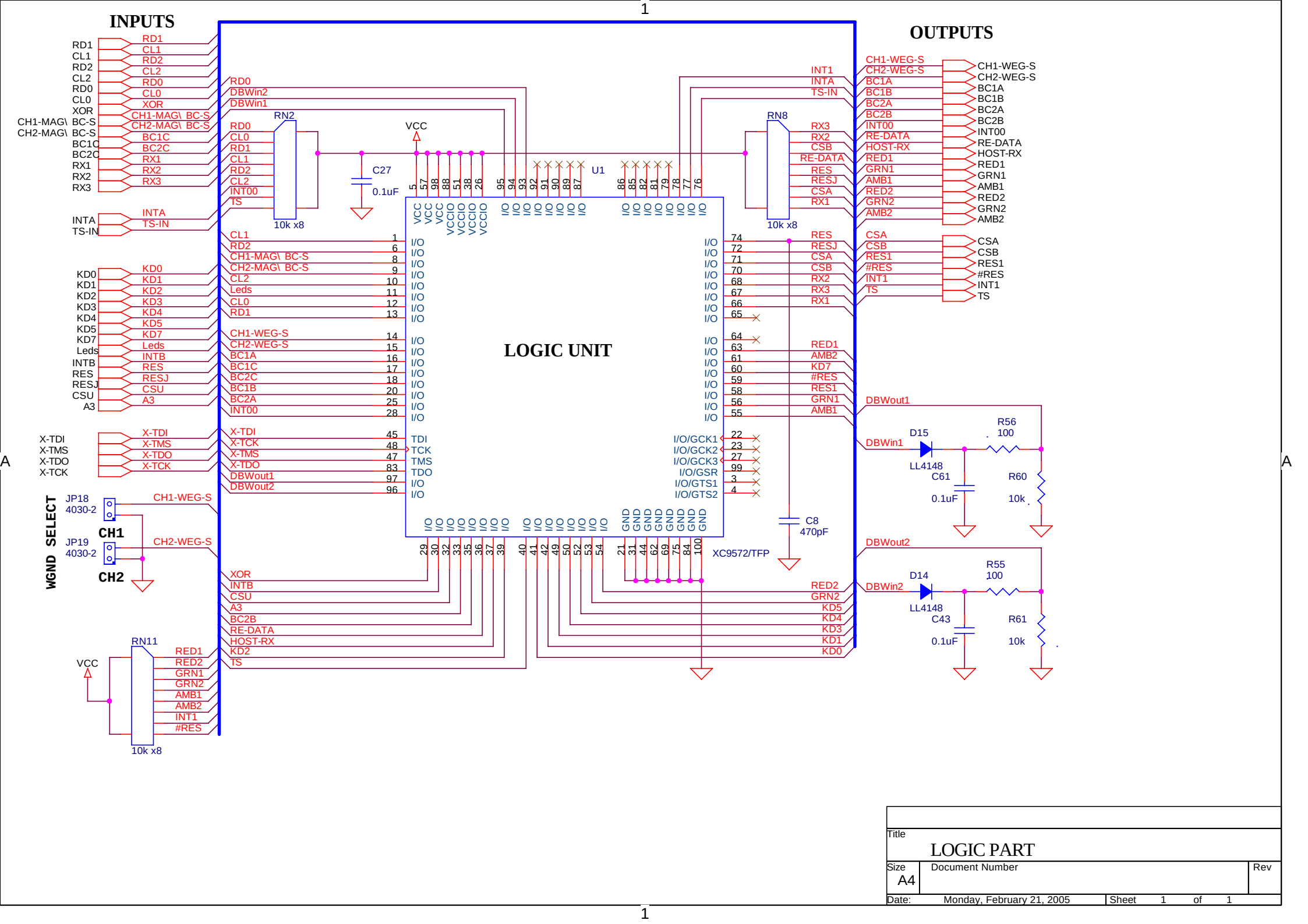
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XC9572/TFP
RN2
RN8
RN11
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C27
0.1uF
C8
470pF
JP18
JP19
4030-2
CH1
CH2
WGND SELECT
D15
D14
LL4148
R56
R55
R60
R61
C61
C43
100
10k
DBWout1
DBWout2
DBWin1
DBWin2
VCC
RD1
CL1
RD2
CL2
RD0
CL0
XOR
CH1-MAG\ BC-S
CH2-MAG\ BC-S
BC1C
BC2C
RX1
RX2
RX3
INTA
TS-IN
KD0
KD1
KD2
KD3
KD4
KD5
KD7
Leds
INTB
RES
RESJ
CSU
A3
X-TDI
X-TMS
X-TDO
X-TCK
DBWin2
DBWin1
INT1
TS-IN
BC1A
BC1B
BC2A
BC2B
INT00
RE-DATA
HOST-RX
RED1
GRN1
AMB1
RED2
GRN2
AMB2
CSA
CSB
RES1
#RES
TDI
TCK
TMS
TDO
I/O
I/O/GCK1
I/O/GCK2
I/O/GCK3
I/O/GSR
I/O/GTS1
I/O/GTS2
GND
VCCIO
RX3
RX2
CSB
RE-DATA
RES
RESJ
CSA
RX1
AMB2
KD7
#RES
RES1
GRN1
AMB1
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KD5
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KD3
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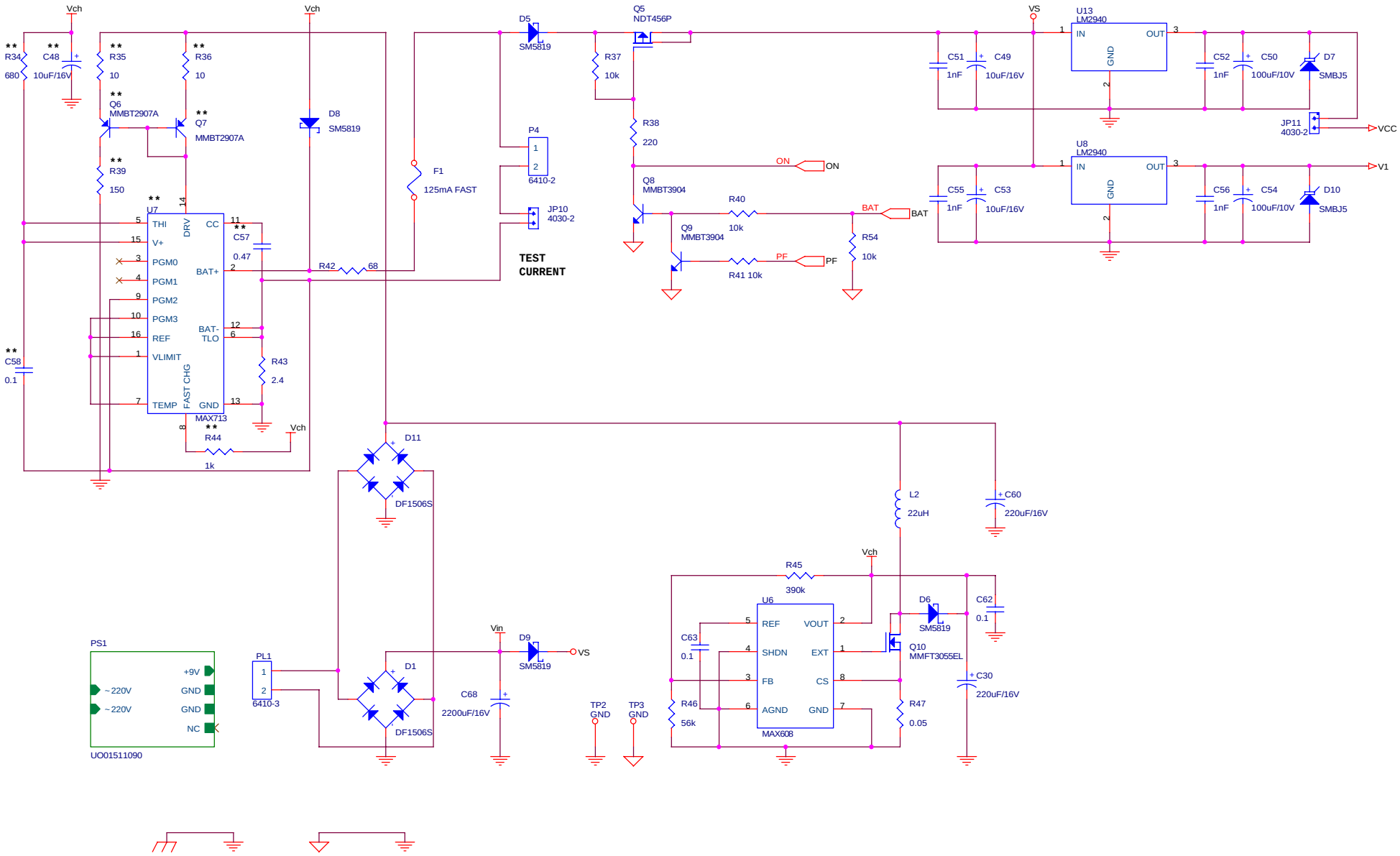

** OPTIONAL COMPONENTS

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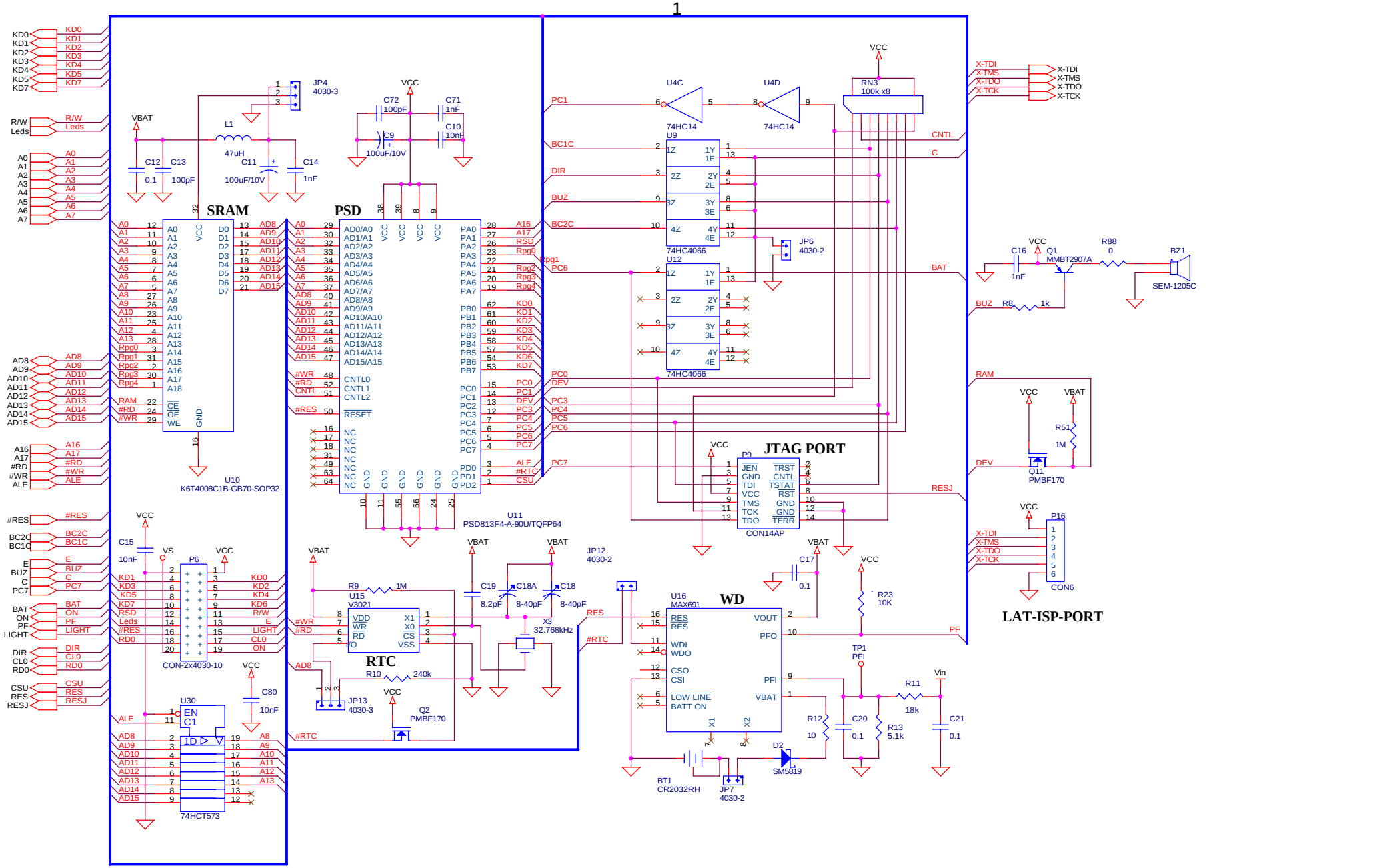
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PSD
JTAG PORT
WD
RTC
LAT-ISP-PORT
U10
K6T4008C1B-GB70-SOP32
U11
PSD813F4-A-90U/TQFP64
U12
74HC4066
U4C
U4D
74HC14
U9
RN3
100k x8
P9
JEN
GND
TDI
VCC
TMS
TCK
TDO
TRST
CNTL
TSTAT
RST
GND
GND
TERR
CON14AP
P16
CON6
P6
CON-2x4030-10
U15
V3021
U16
MAX691
U30
74HCT573
JP4
4030-3
JP6
4030-2
JP7
4030-2
JP12
4030-2
JP13
4030-3
X3
32.768kHz
BT1
CR2032RH
D2
SM5819
Q1
MMBT2907A
Q2
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BZ1
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MEMORY & RTC
Monday, February 21, 2005
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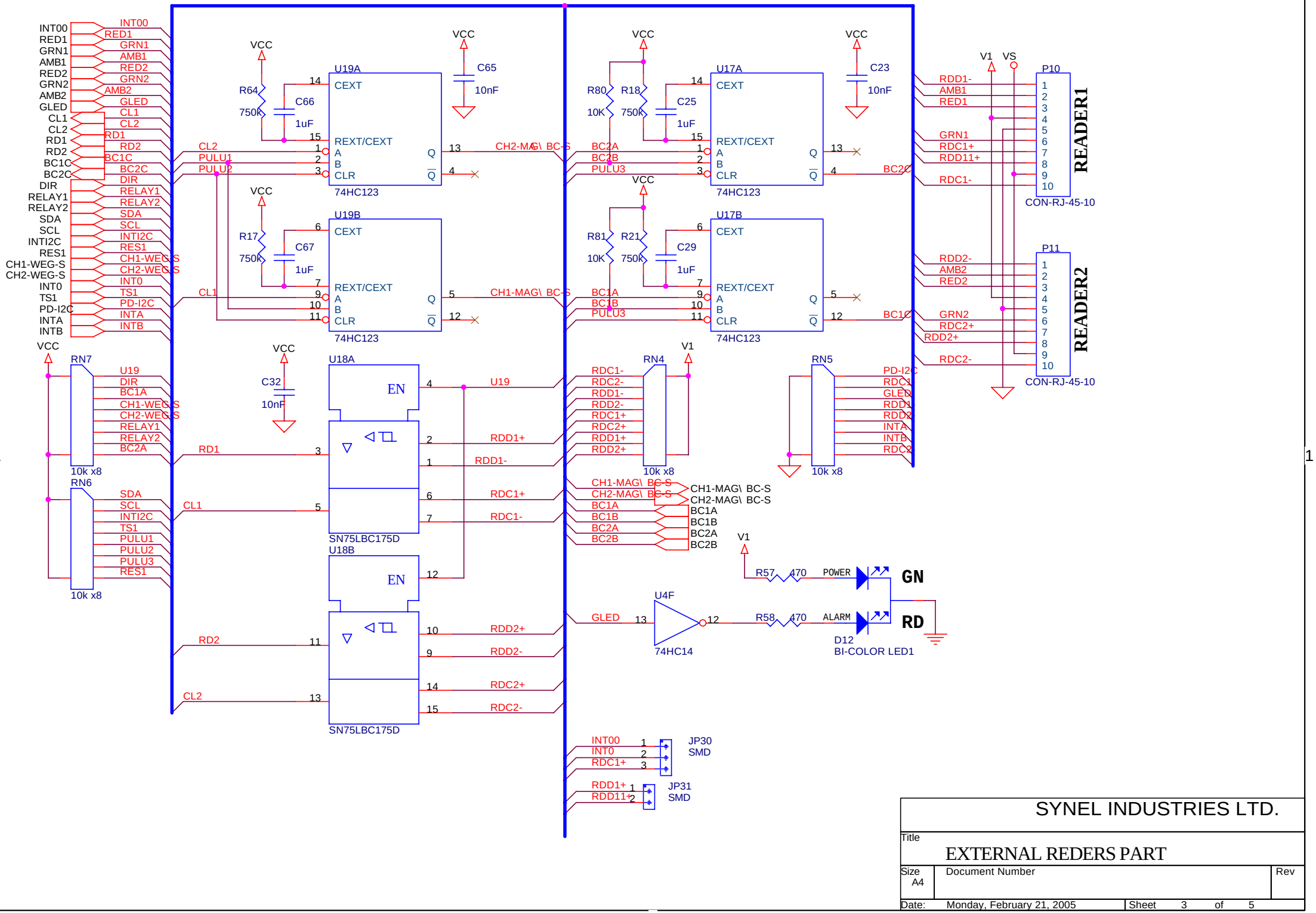
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RELAY1
RELAY2
SDA
SCL
INTI2C
RES1
CH1-WEG-S
CH2-WEG-S
INT0
TS1
PD-I2C
INTA
INTB
VCC
U19A
U19B
74HC123
R64
R17
C66
C67
1uF
750k
C65
10nF
CL2
PULU1
PULU2
CL1
CH2-MAG\ BC-S
CH1-MAG\ BC-S
U17A
U17B
R80
R18
R81
R21
C25
C29
C23
10K
BC2A
BC2B
PULU3
BC1A
BC1B
BC2C
BC1C
V1
VS
P10
P11
READER1
READER2
CON-RJ-45-10
RDD1-
RDD2-
RDC1-
RDC2-
RDD1+
RDD2+
RDC1+
RDC2+
RN7
RN4
RN5
RN6
10k x8
U19
U18A
U18B
EN
C32
10nF
SN75LBC175D
RD1
RD2
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RDD1-
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R58
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JP30
JP31
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Size
A4
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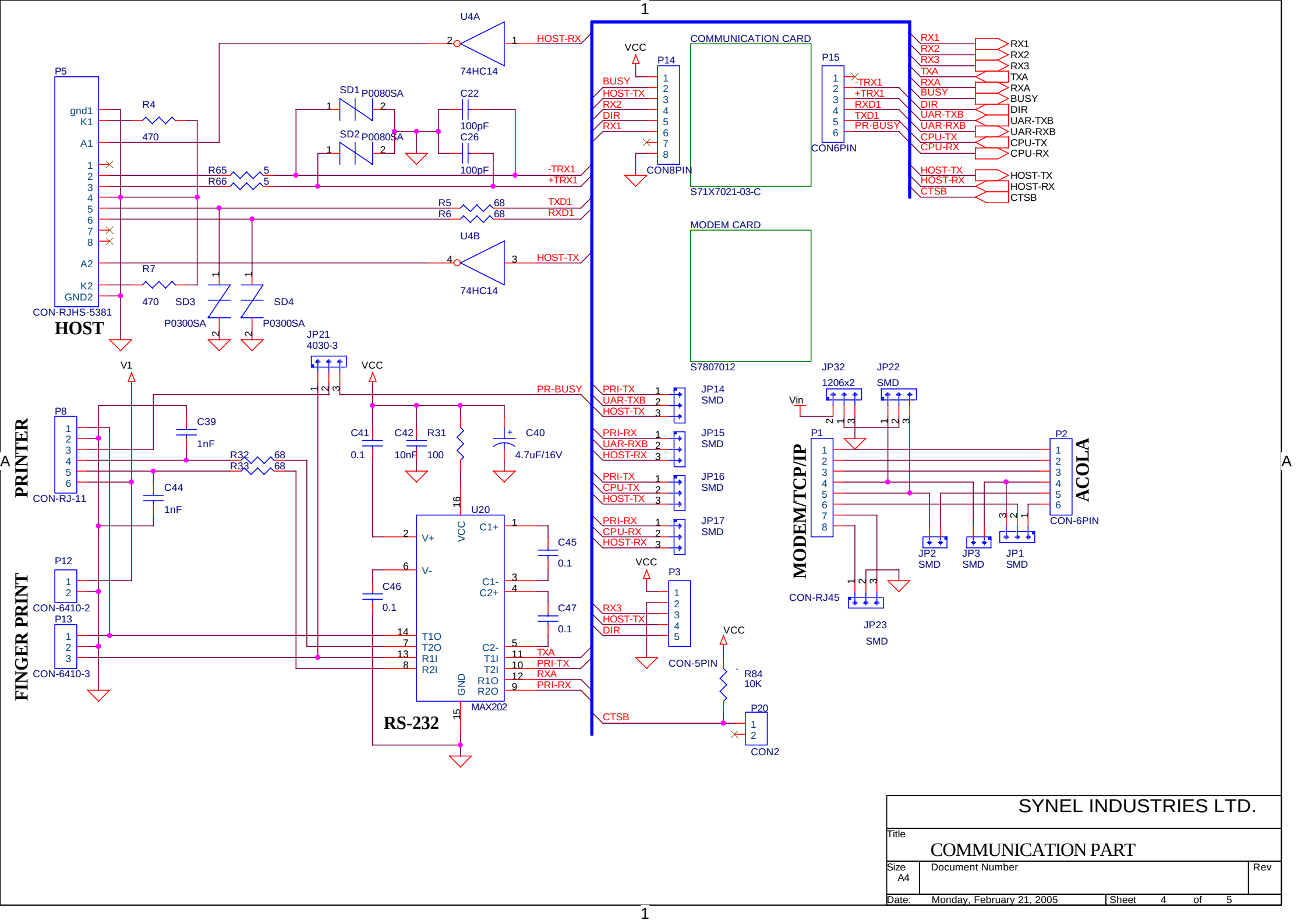
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CON2
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P0300SA
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HOST-RX
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RXD1
PR-BUSY
TXA
PRI-TX
PRI-RX
RXA
CTSB
BUSY
DIR
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RX2
RX3
TXA
RXA
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PR-BUSY
Vin
VCC
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COMMUNICATION PART
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