Ref. No. R262.330.1

TEST REPORT
IEC 950 2nd Edition, 1991 + Amd. 1, 1992 + Amd. 2, 1993 + Amd. 3, 1995 + Amd. 4, 1996

Product	Single Board Computer	
Name and address of the applicant	Kontron Embedded Modules GmbH Brunnwiesenstraße 16 94469 Deggendorf Germany	
Name and address of the manufacturer	Kontron Embedded Modules GmbH Brunnwiesenstraße 16 94469 Deggendorf Germany	
Name and address of the factory	Kontron Embedded Modules GmbH Brunnwiesenstraße 16 94469 Deggendorf Germany	
Rating and principal characteristics		
Trade mark	Kontron	
Model/type	JRex-GX1	
Serial no	GA2210004	
Tested according to	IEC 950, 2nd edition, 1991 + Amd. 1, 1992 + Amd. 2, 1993 + Amd. 3,1995 + Amd. 4, 1996	
Common Modifications, Special National Conditions and National Deviations	EN 60 950 : 1992 + A1 : 1993 + A2:1993 + A3:1995 + A4:1997 + A11:1997. Common Modifications Special National Conditions and National Deviation. (See Appendix EN 60 950 : 1992 + A1 : 1993 + A2:1993 + A3:1995 + A4:1997, confer countries indicated in the summary of testing)	X
Other requirements		
Name and address of the testing laboratory	EMV TESTHAUS GmbH, Gustav-Hertz-Str. 35,94315 Straubing, Germany Telephone: +49 (0)9421- 92 30 33, Fax: +49 (0)9421- 92 30 35	
Accreditation	Deutscher Akkreditierungs Rat DAR	Nr: TTI–P–G 101/95-20
Tested by	Michael Hofmann signature	date 12 December 2002
	Michael Hofmann name in block letters	
Verified by	 signature	Date
	Carsten König name in block letters	12 December 2002

P = Pass, **F** = Fail, **N** = Not applicable. Placed in the column to the right.

Due to the computerised handling of test reports the layout of this form is modified compared to the original TRF/ form published by the Electrical Inspectorate (SETI). However the content cover fully the original.

	SUMMARY OF TESTING		
	DESCRIPTION OF EQUIPMENT UNDER TEST:		
	The single board computer integrates the functionality of a motherboard with CPU, System-BIOS, memory, keyboard-controller, real time clock, COM-port, LPT1, Floppy- and Harddisk-interface, USB and Ethernet access. A power adapter is needed to supply the single board computer with SELV. This adapter is not included in this test. The single board computer can be installed by the Operator.		
	NAME AND ADDRESS OF PRODUCTION-SITES (FACTORIES):		
	See front page.		
	INFORMATION ABOUT THE STANDARDS / DOCUMENTS CONSIDERED:		
	See front page.		
	TESTED ACCORDING TO NATIONAL REQUIREMENTS FOR THE FOLLOWING COUNTRIES:		
	All CENELEC Deviations considered		
	In Addition UL and CSA requirements have been checked.		
	LIST OF APPENDIXES / ENCLOSURES TO THE TEST REPORT:	Pages:	
	Compliance to CENELEC Common Modifications, Special National Conditions and A -Deviations	8	
	Temperature Diagram	1	
	Photo Report	1	

	SUMMARY OF TESTING:	
Clause	Information/Remarks	Comments
1	**GENERAL**	
1.2 – 1.7	Applicable Paragraphs	P
2	**PROTECTION FROM HAZARDS**	
2.1	To be provided in end unit	N
2.2	Applicable Paragraphes	P
2.3 – 2.9	To be provided in end unit	N
2.10	Applicable Paragraphes	P
2.11	No limited power source	N
3	**WIRING, CONNECTIONS AND SUPPLY**	
3.1	Applicable Paragraphes	P
3.2 – 3.3	To be provided in end unit	N
4	**PHYSICAL REQUIREMENTS**	
4.1 – 4.3	To be provided in end unit	N
4.4	Applicable Paragraphes	P
5	**THERMAL AND ELECRICAL REQUIREMENTS**	
5.1	Measurement of individual temperatures	P
5.2 – 5.3	To be provided in end unit	N
5.4	Method c) and alternate 4.4.1 no. 1 used	P
6	**CONNECTION TO TELECOMMUNICATION NETWORKS**	
6.2 – 6.5	Device not intended to be connected to TNV circuits	N
APPENDIX	**CENELEC common modification, Special National condition, National deviation and Other information**	P

In addition to the compliance to EN 60950 the single board computer also complies with the Bi-National Standard UL 1950 / CSA 22.2 No. 950 (1995)

1.1.00	**GENERAL**		
1.1.01	The equipment is within the scope	Information technology equipment	**P**
1.1.02	Additional requirements:		**N**
	Exposure to extreme temperatures, excessive dust, moisture or vibration; to flammable gases; to corrosive or explosive atmospheres		**N**
	Electromedical equipment connected to the patient		**N**
	Equipment used in vehicles, ships or aircraft's, in tropical countries or at elevations >2000m		**N**
	Equipment subject to transient overvoltages exceeding those for Installation Category II (IEC 664)		**N**
	Equipment intended for use where ingress of water is possible		**N**
	IP-classification (IEC 529) (IP)		**N**
1.2.01	**EQUIPMENT ELECTRICAL RATINGS**		
1.2.01.01	- 1.2.01.02 Rated voltage / voltage range as declared by the manufacturer		**N**
1.2.01.03	Rated current as declared		**N**
1.2.01.04	- 1.2.04.05 Rated frequency / frequency range		**N**
1.2.02	**OPERATING CONDITIONS**		
1.2.02.01	Normal load as described in Annex L or as close as possible to the most severe normal use		**N**
1.2.02.02	Rated operating time as assigned by the manufacturer		**N**
1.2.02.03	- 1.2.02.05 Continuous operation / Short-time / Intermittent operation	Continuous operation	
1.2.03	**EQUIPMENT MOBILITY** The mass of the appliance (kg)		**N**
1.2.03.01	- 1.2.03.03 Movable equipment / Hand-held equipment / Stationary equipment	None	**N**
1.2.03.04	- 1.2.03.06 Fixed equipment / Equipment for building-in / Direct plug-in equipment	Equipment for Building-in	**P**

1.2.04	**CLASS OF EQUIPMENT**		
1.2.04.01	- 1.2.04.3 Class I II or III equipment		**N**
1.2.05	**CONNECTION TO THE SUPPLY**		
1.2.05.01	- 1.2.05.05 Type of connection to the supply	SELV supplied by external power supply	**N**
1.2.08	**CIRCUIT CHARACTERISTICS**	SELV	**P**
1.2.12	**POWER DISTRIBUTION**		
1.2.12.01	- 1.2.12.03 Tested for power system type		**N**
	Phase-to-Phase Voltage		**N**
1.5.00	**COMPONENTS**		
1.5.01	Comply with IEC 950 or the relevant component standard	see Ref. LIST OF CRITICAL COMPONENTS	**P**
1.5.02	Evaluation and testing of components		**P**
1.5.03	Transformers		**N**
1.5.04	Flammability class of high-voltage components operating at U_{p-p}>4kV		**N**
1.5.05	Interconnecting cables		**N**
1.5.06	X- Capacitors		**N**

1.5.01	LIST OF CRITICAL COMPONENTS					
Part No	Component/ Object	Manufacturer	Type / Model / Order number	Ratings / Technical Data	Complies with the following standard	Marks of conformity granted
	PCB	AT&S	M	130°C; 94V-0	UL94	UL E67138
J2	VGA (CRT)	SUYIN	7322S-15G2T-08			1)
X6	Memory socket	FOXCONN	AT08403-D9			1)
X11	JFLEX	MOLEX	53627-1205			1)
X14	Power ATX	AMP	794415-1			1)
X19	FDD	MOLEX	52030-2610			1)
X20	Compact Flash socket	3M	N7E50-7516VY-20			1)
X21	HDD	SUYIN	6501S-??G2			1)
X22	USB	SUYIN	2522A-08G2T-B-M011			1)
X23	PS/2	SUYIN	35236S-06T1			1)
X24	Printer	SUYIN	6501S-??G2			1)
X25	Serial	SUYIN	7511P-09G2			1)
X26	Display	BURNDY	SFV-series			1)
X27	Ethernet	YCL	PTC1111-21			1)
	Battery	VARTA	CR2032	3V, Ia = 5mA		UL MH13654
	Comments:					
	Usage of other components or materials is possible if they have the same flammability class and/or the same ratings as the above listed one.					
	1) used plastic materials declared as 94V-0 in accordance with manufacturers specification					

1.6.00	**POWER INTERFACE**	Power supply not included in test	
1.6.01	Normal Load according to Cl.1.2.02.01		**N**
	Test voltage (rated voltage or the lowest voltage in the voltage range)		**N**
	Rated current		**N**
	Measured current		**N**
	Deviation%. (Negative deviation is not limited)		**N**
1.6.02	Rated voltage of hand-held equipment (not exceed 250V)		**N**
1.6.03	Neutral conductor insulated from earth		**N**
1.6.04	Components connected between phase and earth in equipment intended for IT power system		**N**
1.6.05	Designed for a supply tolerance min. -10 %, +6 % -10 %, +10 % (230V rating)		**N**
1.7.00	**MARKING AND INSTRUCTIONS**		
1.7.01	Location of marking	Marking on box or container	**N**
	Rated voltage / voltage range / multiple rated voltages (V)		**N**
	For d.c. operated equipment; symbol for nature of supply		**N**
	Rated frequency / frequency range (Hz)		**N**
	Rated current / multiple current ratings (A)		**N**
	Manufacturers name, Trade Mark or ID-mark	Kontron	**P**
	Type / model	JRex-GX1	**P**
	Symbol of Class II		**N**
	Additional marking do not give rise to misunderstanding		**P**
	Certification marks		**N**
1.7.02	Safety instructions	See user manual	**P**

	Operating instructions		**P**
1.7.03	Short duty cycles		**N**
1.7.04	Mains voltage adjustment (voltage/frequency setting)		**N**
1.7.05	Marking at power outlets		**N**
1.7.06	Marking at fuseholders		**N**
1.7.07	Terminal indications		**N**
1.7.08.1	Clear indication of switches and other controls		**N**
1.7.08.2	Colours of controls and indicators where safety is involved		**N**
1.7.08.3	Symbols used are according to IEC 417		**N**
1.7.08.4	Figures used for indicating positions of controls		**N**
1.7.08.5	Location of markings and indications for switches and controls		**N**
1.7.09	Marking when more than one power supply		**N**
1.7.10	Instructions for installation to IT power system		**N**
1.7.11	Instructions when protection relies on building installation		**N**
1.7.12	Marking when leakage current exceeds 3.5 mA		**N**
1.7.13	Marking at thermostats and similar		**N**
1.7.14	Language of safety markings/instruction	See 1.7.17	**P**
	Language	See 1.7.17	**P**
1.7.15	Durability and legibility		**P**
1.7.16	Markings on removable parts		**N**
1.7.17	Warning text for replaceable lithium batteries		**P**
	Language	NO, SE, DK, FI, GB, German	**P**
1.7.18	Operator access with a tool		**N**

1.7.19	Equipment for restricted access location		**N**
2.1.00	**PROTECTION AGAINST ELECTRIC SHOCK AND ENERGY HAZARDS**		
2.1.02	Protection against electric shock	located in operator access area, supplied by SELV	**N**
2.1.03	Internal wiring at ELV		**N**
2.1.04.01	Service access area		**N**
2.1.04.02	Restricted access location		**N**
2.1.05	Energy hazard		**N**
2.1.06	Clearances behind conductive enclosures		**N**
2.1.07	Shafts of knobs, handles etc.		**N**
2.1.08	Insulation of conductive handles, knobs etc.		**N**
2.1.09	Insulation of capacitors		**N**
2.1.10	Risk of electric shock from the pins of a plug		**N**
	Time-constant		**N**
2.2.00	**INSULATION**		
2.2.01	Insulation achieved by	Creepages and clearances	**P**
2.2.02	Insulating materials	No natural rubber, asbestos, hygroscopic material used	**P**
2.2.03	Humidity treatment		**N**
2.2.07.05	Electric strength		**P**
2.3.00	**SELV CIRCUITS**		
2.3.02	Voltage between accessible parts or accessible part and protective earthing terminal	depending on power supply of end unit	**N**
2.3.03	Voltage in accessible parts of SELV in the event of a single fault condition		**N**
	Method used for separation		**N**

2.4.00	**LIMITED CURRENT CIRCUITS**		
2.4.00	Test voltage (V)		**N**
2.4.02	Circuits tested:		**N**
	Measured current through 2000 Ω		**N**
	Measured Working Voltage (Vp/Vrms)		**N**
	Measured frequency (Hz)		**N**
	Limit used max (mA)		**N**
2.4.03	Measured capacitance (µF)		**N**
2.4.04	Measured charge (µC)		**N**
2.4.05	Measured energy (mJ)		**N**
2.5.00	**PROVISIONS FOR PROTECTIVE EARTHING**		
2.5.01	Reliable connection		**N**
2.5.02	Earthing in Class II equipment		**N**
2.5.03	Switches or fuses in earthing conductors		**N**
2.5.04	Assured earth connection in systems		**N**
2.5.05	Green/yellow or transparent insulation		**N**
2.5.06	Continuity of earth connections		**N**
2.5.07	Operator-removable parts with earth connections		**N**
2.5.08	Disconnection		**N**
2.5.09	Protective earthing terminals		**N**
2.5.10	Risk of corrosion		**N**
2.5.11	Earth connector resistance ≤ 0.1Ω		**N**
	Test current (A)		**N**
2.6.00	**PRIMARY POWER ISOLATION**		
2.6.01	Disconnect device		**N**
2.6.02	Type of disconnect device		**N**

	Contact separation		**N**
2.6.03	Disconnect device in permanently connected equipment		**N**
2.6.04	Protection against parts on supply side		**N**
2.6.05	Placing of isolating switch		**N**
2.6.06	Disconnection of both poles simultaneously		**N**
2.6.07	Disconnection of all phases		**N**
2.6.08	Marking at switch		**N**
2.6.09	Installation instructions if plug on power cord is disconnect device		**N**
	Language		**N**
2.6.11	Disconnection of group of units		**N**
2.6.12	Marking at each disconnect device		**N**
2.7.00	**OVERCURRENT AND EARTH FAULT PROTECTION IN PRIMARY CIRCUITS**		
2.7.01	Type of protective device		**N**
2.7.02	Faults not covered in 5.4		**N**
2.7.03	Adequate breaking capacity		**N**
2.7.04	Number and location		**N**
2.7.05	Protection by several devices		**N**
2.7.06	Warning to service personnel		**N**
2.8.00	**SAFETY INTERLOCKS**		
2.8.02	Design		**N**
2.8.03	Protection against inadvertent reactivation		**N**
2.8.04	Reliability		**N**
2.8.05	Override system		**N**
2.8.06	Contact gap		**N**
2.8.07	Protection against overstress		**N**

2.9.00	**CLEARANCES, CREEPAGE DISTANCES AND DISTANCES THROUGH INSULATION**	On the board there is only operational insulation. Distances need not to be measured in case of compliance with conditions of 5.4.4.	
	Test voltage	12 V DC	
	Pollution degree	pollution degree 2 / installation category II	
	CTI tests:	100 < CTI < 175	
2.9.02	Clearances		**N**
2.9.03	Creepage distances		**N**
2.9.04	Distances through insulation		**N**
2.9.05	Distances on coated printed boards		**N**
2.9.06	Internal creepage distances in hermetically sealed components		**N**
2.9.07	Internal distances in potted comp.		**N**
2.9.08	Spacing between external termination's of components		**N**
2.10.00	**CONNECTION TO OTHER EQUIPMENT**		
2.10.01	Connection of SELV and TNV circuits	only SELV circuits	**P**
2.10.02	Type of interconnection circuits	SELV	**P**
2.10.03	Connection to host equipment		**N**
2.11	**LIMITED POWER SOURCE**		
2.11.00	Use of limited power source		**N**
3.1	**WIRING, CONNECTIONS AND SUPPLY**		
3.1.01	Cross-sectional area and protection	Following remark in user manual: To protect the external powerlines of peripheral devices the customer has to take care about: · that the wires have the right diameter to withstand the maximum available current · that the enclosure of the peripheral device fulfils the fire protecting requirements of IEC/EN 60950.	**P**
3.1.02	Wireways		**N**
3.1.03	Fixing of internal wiring		**N**
3.1.04	Fixing of uninsulated conductors		**N**
3.1.05	Suitable insulation		**N**

3.1.06	Wires coloured green/yellow (only for protective earth connection)		**N**
3.1.07	Fixing of beads and similar insulators		**N**
3.1.08	Required electrical contact pressure		**N**
3.1.09	Reliable electrical connections		**N**
3.1.10	End of stranded conductor		**N**
3.1.11	Use of spaced thread screws		**N**
3.2.00	**CONNECTION TO PRIMARY POWER**		
3.2.01	Type of connection		**N**
3.2.02	Provision for permanent connection		**N**
3.2.03	Appliance inlet		**N**
3.2.04	Type and cross-sectional area of power supply cord		**N**
3.2.05	Cord anchorage		**N**
	Test at 25 x		**N**
	Longitudinal displacement ≤ 2 mm		**N**
3.2.06	Protection of power supply cord		**N**
3.2.07	Cord guard		**N**
	D = (mm)		**N**
	Test with mass of (g)		**N**
	r of curvature of the cord ≤ 1.5 D		**N**
3.2.08	Supply wiring space		**N**
3.3.00	**WIRING TERMINALS FOR EXTERNAL POWER SUPPLY CONDUCTORS**		
3.3.01	Terminals		**N**
3.3.02	Special non-detachable cord		**N**
	Type of connection		**N**
	Pull test at 5 N		**N**
3.3.03	Screws and nuts		**N**

3.3.04	Fixing of conductors		**N**
3.3.05	Connection of conductors		**N**
3.3.06	Size of terminals		**N**
	Nominal thread diameter (mm)		**N**
3.3.07	Protection against damage of conductors		**N**
3.3.08	Terminal location		**N**
3.3.09	Test with 8 mm stranded wire		**N**
4.0.00	**PHYSICAL REQUIREMENTS**		
4.1.00	**STABILITY AND MECHANICAL HAZARDS**		
4.1.01	Stability tests		**N**
	Tilt to an angle of 10°		**N**
	Applying 20% of the weight (max. 250N), (Floor-standing unit)		**N**
	Applying 20% of the weight (max. 250N), (Unit 1m or more in height and having a mass 25 kg or more 25 kg)		**N**
	Downward force of 800N (Floor-standing unit)		**N**
4.1.02	Protection against personal injury		**N**
4.1.03	Warning and means provided for stopping the moving part		**N**
4.1.04	Edges and corners		**N**
4.1.05	Enclosure of a high pressure lamp		**N**
4.2.00	**MECHANICAL STRENGTH AND STRESS RELIEF**		
4.2.02	Internal enclosures; steady force test, 30 N ± 3 N/5 s		**N**
4.2.03	External enclosures; steady force test, 250 N ± 10 N/5 s		**N**
4.2.04	Steel ball tests		**N**
	Fall test		**N**
	Swung test		**N**

4.2.05	Drop test		**N**
4.2.06	Stress relief test; heat test (°C/7h)		**N**
4.2.08	Mechanical strength of cathode ray tubes		**N**
4.3.00	**CONSTRUCTION DETAILS**		
4.3.01	Changing of setting for different power supply voltages		**N**
4.3.02	Adjustment of accessible control devices		**N**
4.3.04	Prevention of dangerous concentration of dust, liquid and gas		**N**
4.3.05	Fixing of knobs, grips, handles, levers		**N**
	Test at (N)		**N**
4.3.06	Driving belts/couplings shall not ensure electrical insulation		**N**
4.3.07	Retaining of sleeves		**N**
4.3.09	Protection of loosening parts		**N**
4.3.11	Resistance to oil and grease		**N**
4.3.12	Protection against harmful concentration of ionizing radiation or ultraviolet light or laser		**N**
4.3.13	Securing of screwed connections		**N**
4.3.14	Openings in the top and side of enclosure (See Cl.4.3.15 and 16)		**N**
4.3.15	Openings in the top of enclosure		**N**
4.3.16	Openings in the sides of enclosure		**N**
4.3.17	Interchangeable plugs and sockets		**N**
4.3.18	Torque test of equipment with built-on plug		**N**
4.3.19	Protection against excessive pressure		**N**
4.3.20	Protection of heating elements in Class I equipment		**N**

4.3.21	Protection of lithium batteries, construction of protection circuit		**N**
4.4.00	**RESISTANCE TO FIRE**	Method 1 used	**P**
4.4.02	Minimizing the risk of ignition	Components mounted on PC board of V-0	**P**
4.4.03.2	Flammability of materials and components	Components material min. V-2	**P**
4.4.03.4	Wiring harnessed		**N**
4.4.03.5	Cord anchorage bushings		**N**
4.4.03.6	Air filter assemblies		**N**
4.4.04	Flammability of outer enclosures and decorative parts		**N**
4.4.05.1	Components which require fire enclosure	Components mounted on PC board of V-0, no fire enclosure needed, final decision in end product depending on power supply	**P**
4.4.06	Fire enclosure construction		**N**
4.4.07	Doors and covers in fire enclosure		**N**
4.4.08	Protection against spreading of flammable liquids		**N**
5.1.00	**HEATING**		**P**
Comments	The heating test needs to be performed in the final application because the ambient temperature inside an enclosure, the proximity to other boards and the cooling effect of a fan considerably influences the result.		
	see appendix temperature diagram for individual temperatures on board		
5.2.00	**EARTH LEAKAGE CURRENT**		
5.2.02	Leakage current		**N**
	Test voltage (V)		**N**
	Measured current		**N**
	Max. allowed current (mA)		**N**
5.2.05	Equipment with earth leakage current exceeding 3.5mA		**N**
5.3.00	**ELECTRIC STRENGTH**		**N**
Comments	SELV is considered to be connected to ground, therefore no test between SELV and ground can be performed		

5.4.00	**ABNORMAL OPERATING AND FAULT CONDITIONS**		
5.4.02	Motors		**N**
5.4.03	Transformers		**N**
5.4.04	Compliance of operational insulation		**P**
	Method used	Method c) used. No short circuit performed because components are mounted on V-0 material	**P**
5.4.05	Electromechanical components in secondary circuits		**N**
5.4.06	Other components and circuits	Alternative 4.4.1 (Flame retardant Material) was used	**N**
5.4.07	Test in any expected condition and foreseeable misuse		**N**
5.4.08	Unattended use of equipment having thermostats, temperature limiters etc.		**N**
5.4.09	Compliance		**N**
5.4.10	Ball-pressure test of thermoplastics		**N**
6.2.00	**TNV CIRCUITS AND PROTECTION AGAINST ELECTRIC SHOCK**	Device not intendet to be connected to TNV circuits	
6.2.01.1	Limits of the TNV circuits		**N**
6.2.01.2	Separation from other circuits and from accessible parts		**N**
6.2.01.3	Operating voltages generated externally		**N**
6.2.01.4	Separation from hazardous voltages		**N**
	Insulation between TNV circuit and circuit at hazardous voltage		**N**
	Method used		**N**
6.2.01.5	Connection of TNV circuits to other circuits		**N**
	Insulation (mm) between TNV circuit supplied conductively from secondary circuit and hazardous voltage circuit		**N**
6.2.02.1	Protection against contact with bare conductive parts of TNV-2 and TNV-3 circuits		**N**

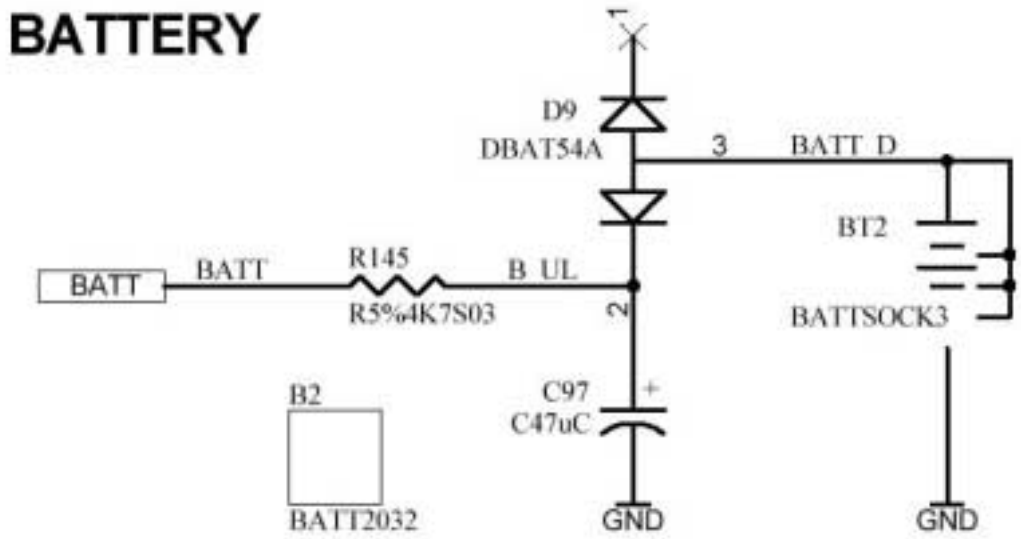
6.2.02.2	Battery compartments		**N**
	Marking next to door/on door		**N**
6.3.00	**PROTECTION OF TELECOMMUNICATION NETWORK SERVICE PERSONNEL, AND USERS OF OTHER EQUIPMENT CONNECTED TO TELECOMMUNICATION NETWORK, FROM HAZARDS IN THE EQUIPMENT**		
6.3.01	Protection from hazardous voltages		**N**
6.3.02	Use of protective earthing		**N**
	Language of installation instructions		**N**
6.3.03.1	Insulation between TNV circuit and parts or circuitry that may be earthed		**N**
6.3.03.2	Exclusions		**N**
6.3.04.1	Limitation of leakage current (mA) to telecommunication network		**N**
6.3.04.2	Summation of leakage currents from telecommunication network		**N**
6.4.00	**PROTECTION OF THE EQUIPMENT USER FROM VOLTAGES ON THE TELECOMMUNICATION NETWORK**		
6.4.01	Separation requirements		**N**
6.4.02	Test procedure		**N**
6.4.02.1	Impulse test: separation between TNV-1 Circuts/TNV-3 circuits and		**N**
6.4.02.1 a)	Unearthed conductive parts/ nonconductive parts of the equipment which are held or touched during normal use Test at 2.5 kV		**N**
6.4.02.1 b)	Parts and circuitry that can be touched by the test finger except contacts of connectors that cannot be touched by test probe Test at 1.5 kV		**N**
6.4.02.1 c)	Circuitry which is provided for connection of other equipment Test at 1.5 kV		**N**

6.4.02.2	Electric strength test: separation between TNV-1 circuits/TNV-3 circuits and		
6.4.02.2 a)	Unearthed conductive parts/nonconductive parts of the equipment which are held or touched during normal use Test at 1.5 kV		**N**
6.4.02.2 b)	Parts and circuitry that can be touched by the test finger except contacts of connectors that cannot be touched by test probe Test at 1.0 kV		**N**
6.4.02.2 c)	Circuitry which is provided for connection of other equipment Test at 1.0 kV		**N**
6.4.02.3	Compliance criteria		**N**
6.5.00	**PROTECTION OF TELECOMMUNICATION FROM OVERHEATING**		
	Maximum continuous output current (A)		**N**

APPENDIX	**BATTERIES**		**P**

Battery category	Lithium
Manufacturer	VARTA
Type / model	CR2032
Voltage	3V
Capacity	--
Tested and Certified by	UL
Ref. no	MH13654
Chemical leaks	No chemical leaks affecting required insulation.
Is it possible to install the battery in a reverse polarity position?	yes
Temperature	--

Circuit protection diagram :



MARKINGS AND INSTRUCTIONS (1.7.15)

	DK	FI	GB	NO	SE
Inside the equipment	no	no	no	no	no
In the service manual	no	no	no	no	no
In the user's manual	yes	yes	yes	yes	yes
Location of replaceable battery	In operator access area.				
Comment	Instructions also in German				

APPENDIX	**EN 60950:1992+A1:1993+A2:1993+A3:1995+A4:1997+A11:1997 TEST REPORT** **(IEC Publ. 950 2nd edition, 1991 + Adm. 1, 1992 + Amd. 2, 1993 + Amd. 3, 1995 + Amd.4, 1996)** CENELEC common modification, Special National condition, National deviation and Other information	

EXPLANATION FOR ABBREVIATIONS
C = CENELEC common modification, **S** = Special National condition, **D** = National deviation, **F** = Other information
AT = Austria, **GB** = Great Britain, **CH** = Switzerland, **DE** = Germany, **DK** = Denmark, **FI** = Finland**, FR** = France, **NO** = Norway, **SE** = Sweden.
P = Pass, **F** = Fail, **N** = Not applicable. Placed in the column to the right.

1.2.4.1 **S**	(DK). In Denmark certain types of Class I appliances (see § 3.2.1) may be provided with a plug not establishing earthing continuity when inserted into Danish socket-outlets.		**N**
1.5.1 **F**	(ALL) Mains plugs used in different countries		**N**
1.5.1 **D**	(SE). Add the following: NOTE: Switches containing mercury such as thermostats, relays and level controllers are not allowed.		**N**
1.6.4 **S**	(N) Due to the IT power system used, capacitors are required to berated for the applicable phase-to-phase voltage (230 V).		**N**
1.7 **F**	(ALL) certification mark used on certified product		**N**
1.7. **F**	(SE). The following text shall be added to a separate power supply unit: "Endast för kontorsmaskin" or alternatively the information supplied with the product shall include a statement according to which the product is intended for office machine/equipment only		**N**
1.7. **F**	(DE). The following text shall be added to a separate power supply unit: "For IEC 950 only" or alternatively the information supplied with the product shall include a statement according to which the product is intended for office machine/equipment only		**N**
1.7.2 **S**	(NO). If separation between the mains and a communication system/network, other than public telecommunication networks, relies upon connection to safety earth, the equipment shall have a marking stating that it must be connected to an earthed mains socket-outlet. NOTE: For requirements for equipment to be connected to a public telecommunication network: See 6.2.1.4.Text is: "Apparatet må kun tilkoples jordet stikkontakt" or "Jordet stikkontakt skal benyttes når apparatet tilkoples datanett".		**N**

1.7.2 **S**	(SE). If the separation between the mains and a SELV terminal relies upon connection to the safety earth, the apparatus shall have a marking stating that it must be connected to an earthed mains socket-outlet when a SELV circuit is connected to a network passing both unearthed and earthed electrical environment. The marking text shall be in Swedish and as follows: "Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk".		**N**
1.7.2 **D**	(DK). Supply cords of Class I appliances, which are delivered without a plug, must be provided with a visible tag with the following text: „Vigtigt. Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket ⏚ eller ⏚ „ If essential for the safety of the appliance, the tag must in addition be provided with a diagram, which shows the connection of the other conductors, or be provided witht he following text: "For tilslutning af de øvrige ledere, se med-følgende installationsvejledning."		**N**
1.7.5 **S**	(DK). Socket-outlets for providing power to other appliances 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 appliances of Class I.		**N**
1.7.5 **D**	(DK). Class II appliances shall not be fitted with socket-outlets for providing power to other appliances.		**N**
1.7.14 **D**	(DE). 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 German language. NOTE: Of this requirement, rules for use even only by service personnel are not exempted.		**N**
1.7.17 **F**	(DK, NO, SE, FI). Warning texts for lithium batteries , see Appendix 2 in EMKO-TSE(74-SEC)207/94. Languages:	DK, FI, NO, SE, GB, D	**P**
1.7.17 **D**	(CH). Annex 4.10 of SR 814.013 (Ordinance on environmentally hazardous substances) applies for batteries.		**N**
2.3.3.3 **S**	(F). Method 3 is not acceptable.		**N**
2.3.5 **S**	(N). Marking and insulation requirements according to this annex, subclauses 1.7.02 and 6.2.01.4. b) apply		**N**
2.3.7 **C**	Replace the text of this sub-clause by: Void.		**N**
2.5.2 **S**	(DK, NO). Add after the first paragraph: The above exception is not acceptable in pluggable equipment Type A		**N**

2.7.1 **C**	Replace the text of this sub-clause by: Basic requirements: To protect against excess current, short-circuits and earth faults in primary circuits, protective devices shall be included either as integral parts of the equipment or as a part of the building installation, subject to all of the following a),b),c) and d): (a) Except as detailed in (b) and (c), protective devices necessary to comply with the requirements of Sub-clause 5.4 shall be included as integral parts of the equipment. (b) For components in series with the mains input to the equipment such as the supply cord, appliance coupler, RFI filter and switch, short circuit and earth fault protection may be provided with protective devices in the installation. (c) It is permitted for equipment with a rated current exceeding 16 A, which is 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 instruction. (d) If reliance is based on protection in the building installation, the installation instructions shall comply with Sub-clause 1.7.11 except that for plugable equipment Type A the building installation shall be regarded as providing protection in accordance with the rating of the wall outlet and Sub-clause 1.7.11 does not apply".		**N**
2.7.2 **C**	Replace the text of this sub-clause by: Void.		**N**
2.9.1 **S**	(NO). Due to the IT power systems used, the mains supply voltage is considered to be equal to the phase-to-phase voltage (230V).		**N**

2.9.4.4 **C**	Modify the title as follows - Wound Components Replace the first paragraph and the two dashed paragraphs as follows - „Unless one of the following situations applies, interleaved BASIC, SUPPLEMENTARY or REINFORCED INSULATION complying with 2.9.4.1 or 2.9.4.2 shall be provided between the windings. BASIC, SUPPLEMENTARY, DOUBLE or REINFORCED INSULATION is permitted in a wound component without interleaved insulation using one of the following situations: – the insulation on the winding wire complies with 2.9.4.1; or – the winding wire complies with annex U; or – the insulation between the windings is provided for separation between TNV circuits and other parts in compliance with 6.4.1. NOTE - Examples of insulation of winding wire complying with annex U are polyimide and FEP.		**N**
3.2.1 **S**	(DK). Supply cords of single phase appliances having a rated current not exceeding 10 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 poly-phase equipment and single-phase equipment having a rated current exceeding 10 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations Section 107-D1 or EN 60 309-2		**N**
3.2.1 **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 884-1 and one of the following dimensions sheets: – SEV 6532-2:1991: plug type 15 3P+N+PE 250/400V, 10A – SEV 6533-1:1991: plug type 11 L+N 250V, 10A – SEV 6534-2:1991 plug type 12 L+N+PE 250V, 10A EN 60 309 applies for plugs for currents exceeding 10A		**N**

3.2.1 **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-1786:1994 - the plug and sockets etc. (Safety) Regulations: 1994, unless exempted by those regulations. Note: „Standard plug“ is defined in SI 1786:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		**N**
3.2.2 **C**	Delete the note and in table 10, delete the values in parentheses.		**N**
3.2. 4 **S**	(GB). A power supply cord with conductor of 1.25 mm² is allowed for equipment with rated current over 10 A and up to and including 13 A.		**N**
3.2.04 **C**	Replace "245 IEC 53" by "H05 RR-F", "227 IEC 52" by "H03 VV-F or H03 VVH2-F" and "227 IEC 53" by "H05 VV-F or H05 VVH2-F". In table 11, replace the first four lines by the following: Up to and including 6 0.75 1) Over 6 up to and including 10; 1,0; 0,75 2) Over 10 up to and including 16; 1,5; 10,0 3) In the conditions applicable to table 11, delete the words "in some countries" in condition 1. In the note delete the second sentence.		**N**
3.3.5 **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 and up to and including 13 A is: 1.25 mm² to 1.5 mm² nominal cross- sectional area.		**N**
3.3.5 **C**	In table 13, replace the fourth and the fifth lines by "Over 10 up to and including 16: 1.5 to 2.5, 1.5 to 4".		**N**
4.3.12 **C**	Replace the third compliance paragraph by: For equipment using LEDs or lasers, compliance is checked according to EN 60825-1		**N**
4.3.18 **S**	(GB) this test should be performed using an appropriate socket-outlet with an earthing contact		**N**
5.4.9 **S**	(NO). The electric strength test includes testing of basic insulation in Class I pluggable equipment Type B and permanently connected equipment.		**N**

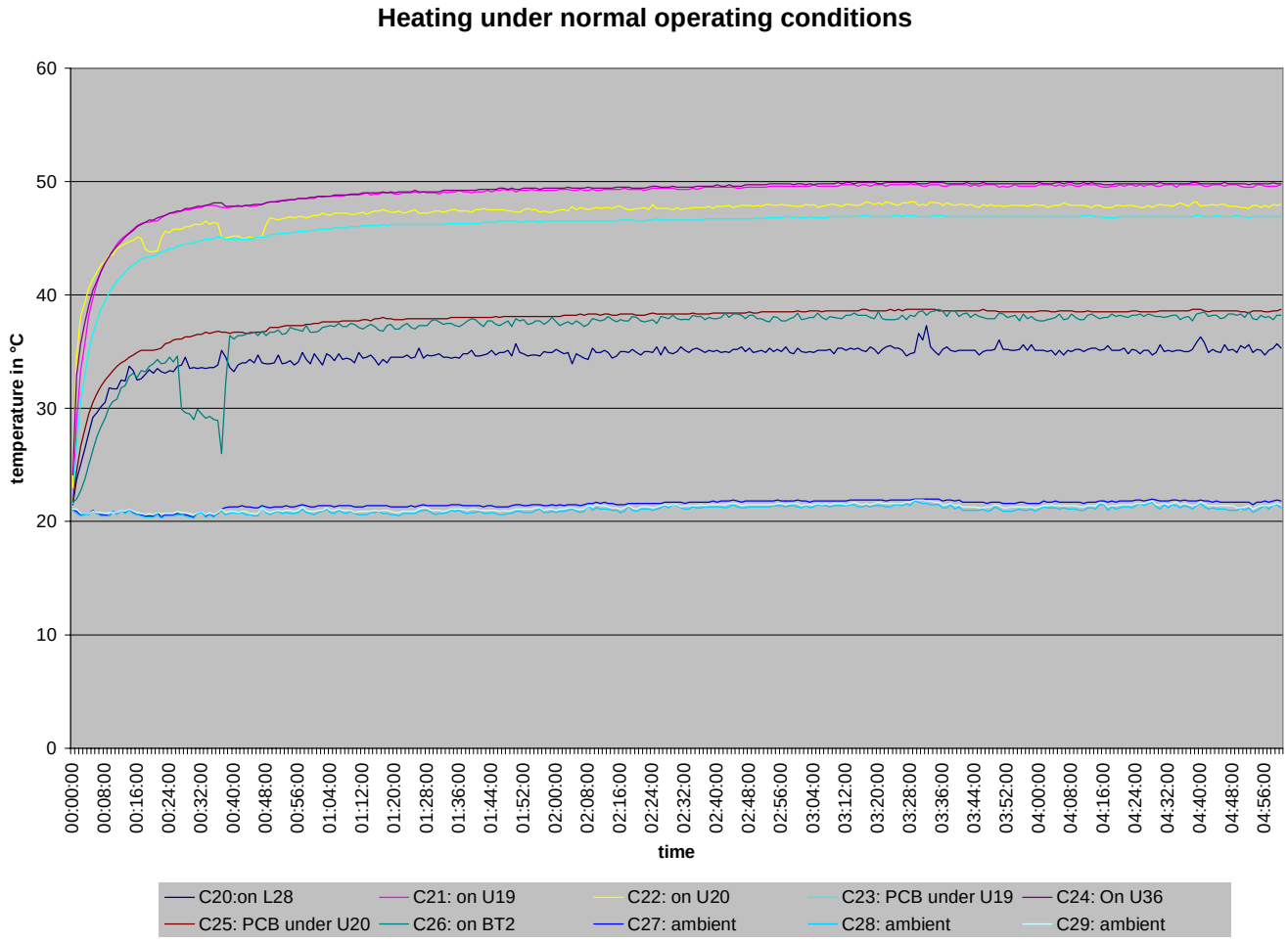
6.2.1.2 **S**	(N, SE) Supplementary insulation for a primary insulation is required between any TNV circuit and any circuit that has a connection to a protective earth. (N) This requirement does not apply to permanently connected equipment or to pluggable equipment Type B, installed in areas where equipotential bonding has been applied, e.g. a telecommunication Central Office. (SE) This requirement does not apply to permanently connected equipment or pluggable equipment type B.		**N**
6.2.1.4 b) **S**	(NO). Method b) is not permitted . Insulation between parts conductively connected to the supply mains and parts connected to a public telecommunication network shall comply with the requirements for double or reinforced insulation.		**N**
6.2.1.4 b) **S**	(FI). This method is only permitted for permanently connected equipment or for pluggable equipment type B.		**N**
6.2.1.5 **S**	(NO). Requirements according to this annex , subclause 6.2.1.4, b) apply		**N**
6.3.3.1 **S**	(NO) Requirements according to this annex, subclauses 6.2.1.2, 6.2.1.4 b) and 6.3.3.2 apply		**N**
6.3.3.1 **S**	(SE) Requirements according to this annex, subclause 6.2.1.2 apply		**N**
6.3.3.2 **S**	(N) Exclusion are applicable for permanently connected equipment and pluggable equipment Type B only.		**N**
6.4.2.1 **D**	(AT). Equipment shall comply with Uc = 2.0 kV in cases b) and c).		**N**

Annex H. **D**	(DE). a) A licence is required by those who operate an X-ray emission source. b) A licence in accordance with clause 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 1) The local dose rate at a distance of 0.1 m from the surface does not exceed 1 µSv/h and 2) it is adequately indicated on the X-ray emission source that i) X-rays are generated and ii) The electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer. c) A licence in accordance with clause 1 is also not required by persons who operate an X-ray emission source on which the electron acceleration voltage exceeds 20 kV if 1) the X-ray emission source has been granted a type approval and 2) it is adequately indicated on the X-ray emission source that i) 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 iii) the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer. d) Furthermore, a licence in accordance with clause 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 1) The X-rays are generated only intrinsically safety CRTs complying with Enclosure III, No. 6, 2) The values stipulated in accordance with Enclosure III, No. 6.2 are limited by technical measured 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.		**N**
Annex P **C**	Normative references Replace the text of this annex by: See annex ZA.		**N**

Annex Q **C**	Bibliography Add for IEC 127-1: NOTE: Harmonized as EN 60 127-1:1991 (not modified) Add for IEC 127-2: NOTE: Harmonized as EN 60 127-2:1991 (not modified Add for IEC 127-3: NOTE: Harmonized as EN 60 127-3:1991 (not modified Add for IEC 529: NOTE: Harmonized as EN 60529: 1991 (not modified). Add for IEC 707: NOTE: Harmonized as HD 441: 1983 (not modified). Add for IEC 1032: NOTE: Harmonized as HD 601 S1:1991 (not modified Add for IEC 1058-1: NOTE: Endorsed by EN 61058-1:1992 (not modified).		**N**

Temperature Diagram

■ Ref. No. R262.330.1



maximum measured temperatures under normal operating conditions in °C

37,3	C20: on L28
49,8	C21: on U19
48,2	C22: on U20
47,0	C23: PCB under U19
49,9	C24: on U36
38,7	C25: PCB under U20
38,7	C26: on BT2
22,0	C27: ambient
21,8	C28: ambient
21,9	C29: ambient

Photo report

- Ref. No. R262.330.1

Picture 1 top view

Picture 2 bottom view