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TITLE: SPECIFICATION FOR ELECTRONIC EQUIPMENT	PAGE 1 of 5
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COMPILED BY:	REVIEWED BY:	REVIEWED BY:
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CHIEF FINANCIAL OFFICER	CEO

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1. **SCOPE**

- 1.1. This specification covers TPT's requirements for electronic equipment and must be read in conjunction with the main Specification.
- 1.2. The production standard of all electronic equipment shall be in accordance with the relevant and recognized standards and recommendations for the electronics industry such as contained in IEC Publications, British Standard Specifications, DIN Specifications, standards recommended by the Electronic Industries Association or any other pertinent and widely accepted standards/recommendations.
- 1.3. The national or international standards (if any) to which the electronic equipment complies to shall be stated.
- 1.4. TPT reserves the right to inspect and/or test electronic equipment offered and to use relevant standards/ recommendations for the electronics industry as outlined in Clause 1.2. above as a basis for acceptance/rejection of equipment supplied by the successful tenderer.
- 1.5. When the equipment offered includes, or is required to interact with a Programmable Logic Controller or a microprocessor based device the mode of interfacing between the programmable device and other equipment offered shall clearly be described.
- 1.6. An indication of the extent to which the electronic equipment has been service proven in industry (e.g. names of major users, volume of sales etc.) shall be provided.
- 1.7. Tenderers shall certify that electronic equipment is designed and/or protected to operate reliably under the service conditions listed in the main Specification.
- 1.8. Tenderers shall certify that electronic equipment as designed and supplied is capable of operating reliably with the electrical system of supply as specified in the main Specification.
- 1.9. All electronic equipment shall be suitably protected against voltage spikes, over voltage, over current and over temperature. Details of the protection shall be submitted at the time of tendering.
- 1.10. All electronic equipment shall be effectively screened against electromagnetic, radio or microwave interference.

1.11. All electronic cards must be treated (coated) for use in a tropical environment.

- 1.11. Electronic equipment must be installed in a dust free/air-conditioned environment.
- 1.12. The functions of all controls, switches, indications etc. shall be engraved or otherwise clearly and permanently marked on all equipment in English.
- 1.13. Construction and installation of all equipment offered shall be such that overhaul and maintenance will be readily possible.
- 1.14. Microprocessor based devices:
 - 1.14.1. All microprocessor based devices, e.g. Programmable Logic Controllers offered shall be of a standard design with respect to both hardware and software and must be freely available in the Republic of South Africa.
 - 1.14.2. Only the latest generation modules available in South Africa shall be used.
 - 1.14.3. A fully documented and commented source code listing must be supplied for the program used by the PLC.
 - 1.14.4. All software and hardware required for software maintenance must be specified and must be listed with recommended initial spares.
 - 1.14.5. The unit shall be of a heavy duty industrial type specifically designed for this type of application.
- 1.15. All PLC output cards shall be fitted with relays rated at least 4A 230V in preference to semi-conductor switching devices.
- 1.16. Electronic equipment manuals:
 - 1.16.1. Maintenance manuals required in terms of the main specification shall include all the necessary information on electronic equipment to enable SAPO's maintenance staff to fully comprehend the function of the equipment down to module or card level. In order to comply with this condition the following information (as applicable) shall be included in manuals:-
 - 1.16.1.1. Complete circuit diagrams;
 - 1.16.1.2. System block or logic diagrams;
 - 1.16.1.3. Layout and interconnection diagrams;
 - 1.16.1.4. Test procedures (flow chart form preferred) and information to enable testing such as voltage values and tolerances, waveforms, polarities etc;
 - 1.16.1.5. A complete description of the electronic equipment, including the function of all input and output points,

maintenance and calibration procedures, reference to special test instruments required etc.

1.16.2. Symbols used on diagrams shall be in accordance with IEC Publication 117 or BS 3939.

1.16.3. In the case of encapsulated modules (i.e. discrete components permanently enclosed), the complete internal circuitry, including the identification of all discrete components, shall be submitted on diagrams.

1.17. All electronic equipment shall be fully year 2000 compliant and shall be certified by the supplier and/or designer as such. Completed and signed certificates shall be submitted to TPT immediately after final commissioning of the equipment

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END OF SPECIFICATION HE8/2/9 [Version 5]

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