

Electrical Demand Specification

(Reference SOP: _____)

Project:	Project No:
Equipment Description:	
Location:	
Equipment No.:	Protocol No.:

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3. ENCLOSURE

3.1. Approved manufacturers

Obtain the enclosure from an company approved switchboard manufacturer.

3.2. Degrees of protection

- General: IP54.
- In plant rooms: IP55.
- Sterile production areas IP56.
- Switchboards for outdoor use: IP56.

Internally all components are to be IP2X rated to prevent accidental contact with conductors, or terminals.

3.3. Spare facilities

Provide the following spare capacities:

- 20% spare capacity in enclosure ducts
- 25% spare space in enclosure gear trays
- 10% spare penetrations (plugged) in gland plates
- 50% free space on trays
- 50% free space in conduits
- 10% spare cores in interconnecting cables between panels to panels, panels to junction boxes, junction boxes to junction boxes and in cables run inside drag chains. These spare cores should be terminated and labelled as spare.
- 10% spare connections on multipin connectors where used. Where multipin connectors are used to terminate cables, then all spare cable cores must be terminated onto connector.
- 20% spare capacity in drag chains
- 20% spare CB locations in panel bus systems or distribution panels

3.4. Layout

Equipment on doors: Mount control switches, indicating lights and meters on doors set out in a logical manner in functional unit groups. Shield door mounted equipment to prevent inadvertent contact with live terminals or wiring.

3.5. Access

Adequate space shall be provided around a switchboard to enable all electrical equipment to be safely operated and adjusted. All switchboards shall be accessible at the perimeter of the machine.

3.6. Cable Entries

Wherever possible they should be bottom entry, through removable gland plates fitted with gaskets to maintain the degree of protection.

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Time switches:

Operation: Provide manual override facilities.

Mains failure operation: by a battery with 100 hour operating capacity and a life of 10 years.

Contact rating: 16A at 240 Vac to utilisation category AC-22.

Provide dual channel unit.

6.3. Control relays

Standards: Apply suitable standard.

Construction: Latch plug-in types to the receptacle base using a captive clip, which may be applied and released by hand.

For all control relays include an inbuilt status indicator.

Minimum contact rating: 5A at 240V for ac applications to utilisation category AC-22.

Time delay relays: Use time delay relays that are adjustable over the full timing range and have a timing tolerance within 12.5% of the nominal setting.

Electronic relays: Incorporate a LED, which indicates the energization state of the relay.

Supply failure controls: Where the installation is sensitive to voltages exceeding +/- 6% of the nominal voltage, protection relays and surge protection shall be installed.

Protection relays should detect, under-voltage, over-voltage, phase failure and phase sequence faults. And have adjustable time delay, and trip set point function.

6.4. DC Power Supplies

Regulated supply only.

0V must be earthed, and provision should be made for isolation of 0V via a link terminal.

Where an installation includes > 2 electric solenoid-locking guards, provide a dedicated DC supply for guard solenoids, sized appropriately.

6.5. Sensors

VDC sourcing (PNP)

Use sensors with integral plug connection, for ease in replacement.

Proximity sensors shall have a minimum sensing range of 4mm.

Avoid the use of reflectors or reflective tape where possible.

The use of 3 pole terminals is encouraged for connection of 3 wire sensors.

6.6. Contactors

Standard: Apply suitable standard.

Minimum size: 16A for 3 phases at 415Vac at utilisation category AC-3. 16A for single phase 240Vac.

Auxiliary contacts: Provide auxiliary contacts with minimum two normally open and one normally closed separate contact with rating of 4A at 240Vac.

Reversing Contactors: Shall be mechanically and electrically interlocked.

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10.2. Press to test

Compartments with greater than 4 indicating lamps, provide a fitted integral lamp test actuator

10.3. Extra-low voltage transformers

Standard: Apply suitable standard.

Primary and secondary windings: Terminate on opposite sides of the transformer case.

Output loading: Do not exceed 80% of the transformer continuous rating taking account of the degree of ventilation and ambient temperature of the transformer and supplied load.

11. PROGRAMMABLE LOGIC CONTROLLERS

Complete programmable logic controllers including central processing unit, input /output modules and mounting hardware which have interconnectivity with existing SCADA monitoring and control systems via direct Profibus FMS and be supplied complete with I/O drivers for the identified SCADA systems.

Are modular in construction and of the same manufacture, with interchangeable peripherals and software.

Have an integral power supply of sufficient capacity to satisfy the requirements of the central processing unit and input / output module combinations which can be located within the mounting hardware.

Are designed and constructed to operate in electrically noisy environments

Are located in the LOW voltage control section of the associated functional unit.

Standard:

- Siemens S7.
- S7 200 PLC must include MPI connectivity.
- No PLC shall require the disconnection of any device to allow the programmer to connect to the CPU.

12. CENTRAL PROCESSING UNITS

12.1. General: Provide the following

Separate run, monitor and program functions.

Operating system stored in Non-volatile memory.

Preferred memory backup is via EEPROM. Battery only backup will not be acceptable.

Programmed software: Stored so that loss of power to the unit for a period up to 1 year will not cause corruption of data and will allow automatic restarting and correct operation immediately on restoration of power.

12.2. Inputs and Outputs minimum.

External inputs: 24

External Outputs: 16.

Must include 20% spare I/O Capacity.

12.2.1. Input/output modules

Status: to be clearly identified and indicated by LED.

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	Name / Position	Signature	Date
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Reviewed by:			