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Standard Generator Control Systems – Master Control

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Standard Generator Control Systems - Master Control

Systems Insight is a generator systems specialist, with extensive experience in the design engineering, manufacture and installation of custom built generator control packages. A range of standard control systems have been designed by Systems Insight, suitable for use in a variety of applications and incorporating the most commonly requested features.

Where project size and complexity demand, a 'Master' control system is available, as an extension to our standard generator control package.

The 'Master' control cubicle provides a 'Programmable Logic Controller' for supervisory control of generators, power distribution and shared ancillary equipment. The Master Control system is fully self contained and is powered from its own 24V battery power supply.

Features include selectable duty cycle for multiple generators, power distribution control & management (eg: load shedding) and supervision and operation of fuel transfer and storage systems. In particular, the Master Control system is programmed to provide extensive monitoring and control of power reticulation by interface to external transfer switches, mechanical and building management systems, elevator systems or load shed contactors in power distribution switchboards. This capability enables the sequential re-connection of customer loads to generator supply according to generator capacity and priorities specified by the customer.

The 'Master Control' panel is ideally suited to projects which require a tailored solution for reliable management of emergency power reticulation and supervision of the total generator plant and ancillary equipment.

The Master control system is supplied in a floor standing, powder coated steel cabinet, mounted to a 76mm galvanised steel plinth. The cabinet has a lockable, full height hinged door with concealed swing handle and 3 point locking mechanism. A smaller, wall mounting cubicle can also be provided for smaller systems.

Systems Insight has introduced its range of standard control systems to provide ready made, adaptable packages to suit a variety of generator and power distribution control applications. On request, our systems can be further customised to comply with the customer's specific requirements.

Standard Generator Control Systems - Master Control

Main Features:

Generator Control & Management:

- High level PLC monitoring of Woodward EGCP-2 generator controllers via RS-422/232 communications (where fitted as part of a separate package).
- Control and monitoring to generator proprietary control panels (if fitted).
- Selectable duty cycling for prioritising the operation of multiple generators (Generator lead/lag status)
- Automatic starting of generator(s) on mains failure or by remote start from Building Management System
- Automatic sequencing of generators according to load demand with configurable stop/start load levels
- Control switch for Online and Offline testing of generator system

Power Distribution Control & Management:

- Continuous monitoring of supply authority mains
- Signalling for automatic load shedding of up to 10 controlled circuits on detection of mains failure *
- Low level contact closure signals to call load shed of non essential loads (such as mechanical plant and elevator systems) on mains failure
- Programmed PLC operation of up to 10 power transfer switches, with staged transfer according to a set priority.
- Programmed PLC operation of up to 10 user designated load shed points (eg: bad shed contactors, mechanical services, elevators, etc)
- Automatic connection and disconnection of controlled loads to generator supply according to available generating plant capacity *

* Note: Load staging of up to 10 transfer switches and 10 user specified load shed points is pre-programmed and prioritised as standard. Expansion for additional transfer switches and load shed points is available as an option.

Communications:

- RS-232 communications of available data to remote monitoring equipment or Building Management System via a designated RJ-45 port on Master PLC ('Modbus' protocol).

Fuel Transfer & Storage System Management (Optional):

- PLC monitoring of fuel levels for two fuel day tanks as standard, with the option to monitor up to six day tanks **
- PLC monitoring of fuel levels for a single fuel storage tank **

** Note: allowance is for digital signals using customer supplied and fitted fuel level switches

- PLC Control to fuel transfer pump motor starters (supplied separately) according to fuel requests from day tanks
- Alarming of low and high bulk fuel levels via audible and visual (LED) indication.
- Fully programmed high level PLC interface to optional Systems Insight manufactured 'Fuel Transfer Control Panel (Type 1)'

Standard Generator Control Systems - Master Control

Other Features:

- Electronic audible alarm fitted to control cubicle door
- Space provision for installation of 'Master Synchroniser', used for paralleling the generator system with an external supply. *
- System Operating Mode Selector Switch:
 - Off (Generator System offline & disabled)
 - Auto (System started remotely – eg: Mains fail relay)
 - Test Offline (System Started with no Load Transfer)
 - Test Online (System Started with transfer of building loads to generator under simulated mains failure)
- Control system power supply, including sealed lead acid batteries & charger, charge fail & low/high volts alarm, battery volts & charge amps meter.
- Fluorescent light & power point fitted inside Master Control panel
- Standard LED indicators to control panel door:
 - Normal Mains Supply Failed
 - Normal Mains Supply Available
 - Normal Mains Supply Connected
 - Generator Start Called
 - Generator Bus Live
 - Controls Battery Charger Failed
 - Control Battery Voltage Out of Range
 - System Control 'Off Auto'
 - Fuel Level Out of Limits
 - PLC Fault
- Optional LED indicators to control panel door:
 - Fuel Transfer Pump No.1 Running
 - Fuel Transfer Pump No.1 Fault
 - Fuel Transfer Pump No.2 Running
 - Fuel Transfer Pump No.2 Fault
 - Fuel Transfer Pump No.1 on Duty
 - Fuel Transfer Pump No.2 on Duty
 - Normal Mains Supply Circuit Breaker Closed
 - Normal Mains Supply Circuit Breaker Open
 - Emergency Supply Circuit Breaker Closed
 - Emergency Supply Circuit Breaker Open

Other LED indicators added to customer request as a further option. An LCD text message display panel can also be provided as a further option, to annunciate equipment operational status and alarms.

- Optional Mains & Generator supply circuit breaker/contactors open & close control interposing relays
- Optional anti-condensation heater with thermostat fitted to cubicle
- Electronically drafted construction drawings & wiring schematics supplied with all systems

Standard Generator Control Systems - Master Control

Note:

Installation of the 'Master Control' system and site wiring on the customer's premises is excluded and available separately as an option according to specific project requirements.

Each 'Master Control' system includes up to a maximum of 16 labour hours to test and commission the fully installed system.

Installation and commissioning allowances are based on works within the Melbourne Metropolitan area. Travel and other associated costs apply for interstate and overseas works.

* Where mains paralleling is employed, the local supply authority or project engineer may impose specific electrical protection requirements. Incorporation of this protection into the control systems would incur additional cost.

Exclusions:

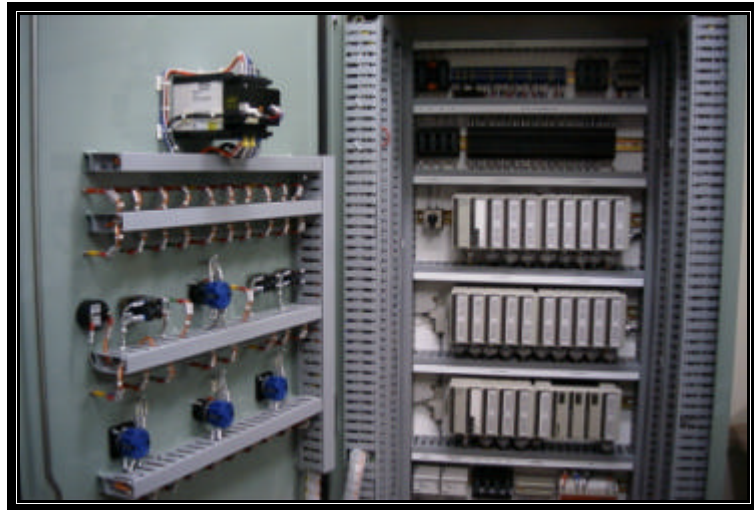
The following items are normally excluded from our standard package but are available as options:

- ❖ Provision of licensed PLC programming software
- ❖ Supply and installation of site cabling to switchgear and other external equipment

Standard Generator Control Systems - Master Control

Master Control Cubicle:

Internal Layout:



Front Panel Layout:



The above pictures are provided for demonstration purposes and depict a version of our standard 'Master Control' panel that has been supplied with options to suit specific customer requirements.

Electronically drafted construction drawings and control wiring schematics are supplied with all standard generator control systems. A recommended site cable installation schedule is also provided, referenced to the wiring schematics.