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UNSW CONTROL SYSTEM STANDARDS HVAC Guidance Notes

TECHNICAL DOCUMENT

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FACILITIES – ENGINEERING SERVICES

ISSUE RECORD		
Revision No.	Date	Approved
A	15 July 03	Preliminary Issue

1 INTRODUCTION

1.1 BACKGROUND

The Control system standard drawings and Generic Control Diagrams have been developed by the UNSW to provide a consistency of design standard.

The Standards provide a minimum standard of functionality that shall be incorporated into new or upgraded control systems.

Designers must address the design for specific installations and inform the UNSW if a lower standard of control or monitoring is proposed.

The Control drawings and logic diagrams are not intended to be used as wiring diagrams or as design or construction documents.

The Standards are not intended to be used for tender or as a design specification without amendment.

1.2 DOCUMENTS

The attached Drawing List and Status provides a schedule of all available drawings and drawing Issue Status.

1.3 GENERAL COMMENTS

Each of the Control Standards drawings comprise of four main sections as indicated in the diagram (Diagram 1) below of a Split System Air Conditioning System, which is used as an example.

These are :-

1. Generic Logic Diagram
2. System Schematic diagram
3. Control System Schedule
4. Control System Equipment Schedule

In most cases all four components of the drawing are contained on one A3 sheet, however for larger systems, the components are on two or more A3 sheets.

Control Standards for larger systems such as the chilled water system schematic are contained on A1 drawing size sheets.

Below is a more detailed description of each component of the Control Standard Drawings.

1.4 SYSTEM SCHEMATIC

The System Schematic diagram is a schematic representation of the system for which the Control Standard is applicable. The System Schematic shows the main components of the system and the schematic location of the main control system elements.

The Control Standard shows the minimum elements required for a typical system of this type.

The Schematic is a typical arrangement of components for a system, and is not intended to specify the actual location of control components for all systems of this type.

For example, for Split System AC units, the temperature room sensor TT-102 may in some cases be located in the return air duct or plenum in lieu of the Air Conditioned space.

1.5 GENERIC LOGIC DIAGRAM

The Generic Logic Diagram is a ladder logic diagram and represents the minimum functionality of the Control System.

Ladder Logic is a commonly used method for programming control systems such as Programmable Logic Controllers, BACS systems or other programmable controllers.

This method of representing the Control Functionality has been chosen because it is widely used and understood by Control System manufacturers and suppliers and it is not a proprietary programming system.

Ladder logic is one of the most basic methods of representing control systems. It comprises the basic elemental logic components of AND gates, OR gates and TIMERS.

Some control system manufacturers provide high level graphical flow chart type programming systems, and these can equally be used to represent Control system

1.6 CONTROL SYSTEM SCHEDULE

The Control System Schedule is a schedule of the main control system monitoring and control items in the system.

The Schedule tabulates the type of Control item (ie whether it is analog or digital) and indicates the required functionality of each control item.

For example a Digital Input is represented as DI and an Analog Input as AI.

Each input and output is allocated a unique number for that Control Standard.

1.7 BACNET MONITORING AND CONTROL

The UNSW has a BACNET compliant network.

The Control Standard nominates the minimum recommended monitoring and control functionality to be provided via the BACNET system.

In the event that the BACNET system is not yet available at a particular site, the Control system should have the functionality to be connected in the future and provide the nominated level of functionality.

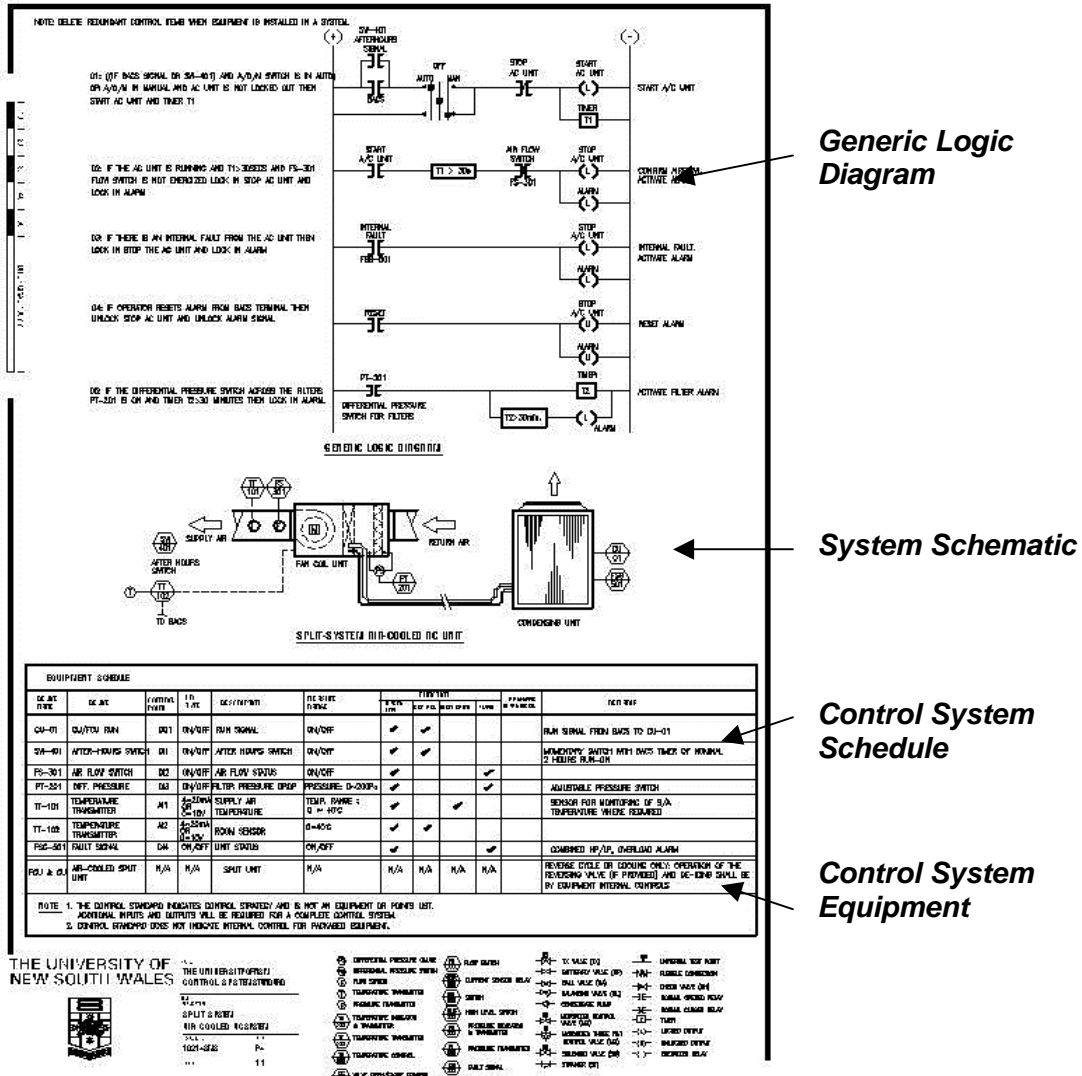


DIAGRAM 1: CONTROL STANDARD FOR AN AIR COOLED SPLIT SYSTEM

2 DRAWING LIST AND STATUS

CONTROL SYSTEM STANDARD DRAWINGS

No.	Title	Revision												
		P4												
102148-M1	Packaged unit - air cooled	P4												
102148-M2	Packaged unit - water cooled	P4												
102148-M3	Split system air cooled AC unit	P4												
102148-M4	DX fan coil unit	P4												
102148-M5	Chilled water fan coil unit	P4												
102148-M6	Fan coil unit DX type with electrical heater	P4												
102148-M7	Fan coil unit with chilled and heating water	P4												
102148-M8	Chiller : Air cooled with reciprocating	P4												
102148-M9	Chiller : Air cooled Helical rotor (screw)	P4												
102148-M10	Chiller : Water cooled with reciprocating	P4												
102148-M11	Chiller : Water Cooled Centrifugal	P4												
102148-M12	Chiller : Water Cooled Centrifugal with VSD	P4												
102148-M13	Cooling Tower : Open circuit	P4												
102148-M14	Cooling Tower : Closed circuit (evaporative)	P4												
102148-M15	Boiler : Gas fired	P4												
102148-M16	AHU with economy cycle dampers	P4												
102148-M25	Fan : Centrifugal fan	P4												
102148-M26	Fan : Axial fan	P4												
102148-M27	Fan : Centrifugal VSD drive	P4												
102148-M29	Air Filter	P4												
102148-M30	Fume cupboard	P4												

Issue Purpose				Date Issued														
I	For Information	D	For Distribution	Day	10													
C	For Comment	PDF	PDF File Softcopy	Month	06													
A	For Review	T	Tender	Year	03													
				Purpose	C													