



Vital Surveys

70 Daniel Close, Warrington
WA3 6QL

01925 387 029

Client: Shrewsbury House

37 Langrove Street, Everton, Liverpool, L5 3PE

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BMS Specification

Name	William Harrop
Email	info@vitalbuildingservices.co.uk
Contact Number	07850 249 676
Checked By	W.Harrop

Revision Schedule

Revision	Description	Document Reference	Date of Issue
A	Issue 1	VBS-0126 L5 3PE BMS Specification	13/04/2026

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1. INTRODUCTION

1.1. General

- 1.1.1. This document defines the performance specification for the design and installation of Building Management Systems (BMS) and associated works.
- 1.1.2. This document shall be read in conjunction with Preliminaries and associated Specification documents. All works shall be provided and installed in accordance with the current British and European standards as detailed in this and the associated specifications.
- 1.1.3. Reference shall be made to all other documentation produced by the Client, Quantity Surveyor and Contract Administrator, together with any other relevant party inclusive of the contract conditions.
- 1.1.4. The Performance Specification details the principal requirements for the installation but does not relieve the Contractor of his responsibilities for any part of the installation to achieve the necessary performance.

2. BMS SYSTEM INSTALLATION

2.1. General

- 2.1.1. As part of the installation the Contractor shall design, supply, install, test, commission, set to work and demonstrate (to the Engineering Consultant, the building management team and the Client representatives) a control system and associated panel, head end and graphics incorporating the full controls wiring, touch screen controller and input / output devices including all necessary power supplies and transformers.
- 2.1.2. The Contractor shall ensure that there is spare capacity within the controller and within the control panel to allow for future expansion and adaptation (25% minimum).
- 2.1.3. The Contractor shall obtain the operating hours during the design/commissioning period from the Project Manager. The Contractor shall programme the time schedules into the controller.
- 2.1.4. Where an existing control panel is being adapted, the Touchscreen icons and head end graphics shall be modified to suit the equipment served.
- 2.1.5. The Contractor shall connect a fire alarm signal into the BMS. In the event of a fire alarm signal, plant and equipment shall shut down as required by the site specific requirements.
- 2.1.6. All controls wiring and associated containment shall be undertaken in its entirety as part of the Controls package of works and shall be included by the Contractor. The Contractor shall ensure that all wiring shall be terminated with sufficient 'slack', at the proposed control panel / termination location.
- 2.1.7. To facilitate remote access by the Client, controls system shall be designed with the necessary hardware and software to ensure remote access is available, is connected to and is functional at the Client's remote monitoring station. This shall allow the Client to make remote adjustments to all parameters available and pick up common faults, error and fault codes, energy usage, time scheduling, set points, set point adjustment, % filter dirty etc.
- 2.1.8. The Controls specialist shall be engaged as part of the Mechanical Services works, or direct by the Client to complete the installation inclusive of the following:-
 - 2.1.8.1. Supply and install of a main control panel housing the Data Manager, Controllers, Expansion Modules and the Cellular Router (where and if required), pre-configured with all the control strategy required for the project.
 - 2.1.8.2. Supply and install a controller Power Supply Unit (PSU)
 - 2.1.8.3. Make connections to the field wiring terminated at the panel location, including but not limited to:-
 - Associated electrical controls equipment.
 - Mechanical plant and equipment.
 - Make connections to the electricity metering equipment (where required) including all communication protocol interfaces.
 - Make connections to gas equipment (where required) including all communication protocol interfaces.
 - Make connections to water metering equipment including all pulse interfaces where required.
 - 'Last Person out Switch' (override switch) / or Intruder Alarm interface.

- Fire alarm system (unless specified otherwise).
 - Security system
- 2.1.8.4. Undertake on-site testing, commissioning and proving of the controls interfaces.
- 2.1.8.5. Demonstration and handover to the Client's appointed representatives and the Engineering Consultant.
- 2.1.8.6. Provide warranty period maintenance to report faults and error codes, address time and temperature changes and seasonal commissioning.
- 2.1.9. The BMS shall be a central controller based system located in the Plant room.
- 2.1.10. The Contractor shall use a manufacture's recognised and certified design and installer.
- 2.1.10.1. Recognised manufacturers and installers are
- Ambiflex – Ref: P10255/NJ/dl -Neil Jackson
 - Nordomatic – Ref: Q-10709 Shrewsbury House Youth Centre Rev1 Stage 3 – Andy Minchington
 - Vaillant -
- 2.1.11. The Contractor shall ensure the building occupants/building management team have control over the final adjustment of space temperatures. The control system shall include all control strategy software and complete graphics packages to ensure a fully monitored and operational system.
- 2.1.12. Automatic control shall allow the sports hall, Youth centre, church and Hostel to operate at different times during a 24-hour period, without operating the entire building and minimise energy usage.
- 2.1.13. A qualified Controls Engineer familiar with the installation shall instruct the building users and the building management team in those areas of the operation of the control equipment for which they have responsibility and or involvement.
- 2.1.14. The Contractor shall commission the controls in accordance with CIBSE and BSRIA commissioning codes and issue the CP's, reports, schematics, points schedules, logic and sequences diagrams and descriptions in the operating and maintenance manuals.
- 2.1.15. The Contractor shall provide in new BMS installations or major upgrades for a Trend, Ambiflex, ISMA Tridium, Vaillant BMS installation and include for front-end supervisors as per the guidance below:-
- Digital display built into the control panel with graphic pages matching the HVAC design
 - Remote connectivity with emailing alarm functions.
 - Communication protocol such as BAC Net, MOD Bus, MBUS and open protocols
 - Controller / Controls manual override switch.
- 2.1.16. The Contractor shall identify the BMS controls they are proposing to install and detail communications capability for any proposed off-site remote interrogation system and associated hardware.
- 2.1.17. The Contractor shall include for any dedicated site BMS Ethernet network wiring from the control's equipment to a suitable location for the router.
- 2.1.18. Refer to VBS Doc B Mechanical and PH Workmanship and VBS Doc A Electrical workmanship for services specification

3. BMS MINIMUM REQUIREMENTS

3.1. General

- 3.1.1. The BMS shall provide the following minimum requirements for the complete installation:-

3.2. Analogue and Digital Inputs and Outputs:

- 3.2.1. Provision for utility Metering.
- 3.2.2. Provision for sub-metering of electric, gas and water secondary heat meters.
- 3.2.3. Alarm status of all plant installed.

- 3.2.4. Fire alarm interface.
- 3.2.5. Fire alarm activated Gas Safety Interlocks for gas fired plant (boilers, water heaters, space heaters, kitchen Vent, Catering Appliances) solenoid valves with valve positioning monitoring, thermal links, CO and CO2 monitoring together with emergency knock off operated button.
- 3.2.6. Fire alarm test override facility shall prevent nuisance tripping of boilers, water heaters and kitchen vent during fire alarm testing.
- 3.2.7. Running status.
- 3.2.8. Plant Enabled status.
- 3.2.9. Plant operational status for each primary and secondary plant in plant rooms and above or below ceilings including interfaces with primary plant, pmps, boilers, fan coil units & valves
- 3.2.10. Temperature monitoring and control:- Room, external, LTHW / Hot flow and returns.
- 3.2.11. Temperature monitoring and control.
- 3.2.12. All actuators and valves shall provide position feedback status.
- 3.2.13. Status, Fault and Error codes for all plant and equipment.

3.3. Functions

- 3.3.1. Optimum Start / stop of primary plant.
- 3.3.2. Sequential control of plant to match load and maximize seasonal efficiencies.
- 3.3.3. Weather Compensation of LTHW systems.
- 3.3.4. Night set back.
- 3.3.5. 3 stage frost protection.
- 3.3.6. Free cooling.
- 3.3.7. Zone control of LTHW system to facilitate out of hours use.
- 3.3.8. Proportional control of actuators with feedback to BMS.
- 3.3.9. Speed Control of Pumps
- 3.3.10. Optimum Energy Control.
- 3.3.11. Integration of all other Building systems where existing such as security or fire systems
- 3.3.12. Refer to VBS Doc B Mechanical and PH Workmanship and VBS Doc A Electrical workmanship for services specification

3.4. Fire Alarm Monitoring

- 3.4.1. All fire detection control panels shall have monitoring as a minimum as follows:
- 3.4.2. 1st Stage
- 3.4.3. 2nd Stage
- 3.4.4. Fire
- 3.4.5. Fault

3.5. Power Meter Monitoring

- 3.5.1. Power metering is to be installed as per the electrical schematic, with each meter reporting the following parameters as a minimum;
- 3.5.2. Three Phase Meter;
- 3.5.3. kVA (Total)
- 3.5.4. kW (Total)
- 3.5.5. PF (Total)
- 3.5.6. V
- 3.5.7. Hz
- 3.5.8. A (L1, L2, L3)
- 3.5.9. kVA (L1, L2, L3)
- 3.5.10. kW (L1, L2, L3)
- 3.5.11. PF (L1, L2, L3)
- 3.5.12. kWh

3.6. Single Phase Meter;

- 3.6.1. kVA (Total)
- 3.6.2. kW (Total)
- 3.6.3. PF
- 3.6.4. V
- 3.6.5. Hz
- 3.6.6. A
- 3.6.7. kWh

3.7. Heat Meter;

- 3.7.1. kWh (Total)
- 3.7.2. kW (Instant)
- 3.7.3. °C Flow Temperature
- 3.7.4. °C Return Temperature
- 3.7.5. M³/h Instant Flow

4. PRE-CONSTRUCTION INFORMATION

4.1. The Contractor shall provide at Contractors Proposal stage

- 4.1.1. Analogue and Digital Input and output points schedule
- 4.1.2. Plant Interface schedule
- 4.1.3. Control panel schedules showing on /off auto switches, lamps, MCB's, cabling, outstations
- 4.1.4. Details of outstations, front end displays
- 4.1.5. Detailed description of operation
- 4.1.6. Metering strategy
- 4.1.7. Graphics screen formats
- 4.1.8. Schedule of all user adjustable control parameters
- 4.1.9. Control valve schedule
- 4.1.10. BMS prints schedule
- 4.1.11. Control panel wiring diagrams and schematics
- 4.1.12. Schedule of equipment
- 4.1.13. The Contractor shall adapt the front-end graphics, where required, for all alterations in the building and ensure local access to all of the BMS functions. The Contractor will provide a copy of the BMS software loaded in the installation in CD format. Energy metering, condition monitoring and hours run monitoring will normally be included.
- 4.1.14. The BMS shall be capable of being monitored offsite via Vodafone machine link 4G and hardware enabled interface. The interface shall be capable of monitoring of temperatures, plant status, fault alarms, energy consumption / hour run etc.

APPENDIX A – BMS SERVICES SUMMARY OF TENDER

MECHANICAL ENGINEERING SERVICES

SUMMARY OF TENDER (FIXED PRICE)

<u>Item</u>	<u>Description</u>	<u>Price</u>	
1	Preliminaries & General Conditions	£	
2	Stripping Out	£	
3	BMS Control Panel Installation	£	
4	Gas pipework, Valves and interlock controls connections	£	
5	Heat Meter installations	£	
6	Pump sets (Primary, CT, VT, DHW) connections	£	
7	Pressurisation units	£	
8	Testing and Inspection	£	
9		£	
Sub Total		£	

	<u>Included Sums</u>	<u>Price</u>	
	Contingency Sum	£	
		£	
Grand Total		£	