

**C.L.A.W. ELECTRICAL SPECIFICATION PART EJ CONTROL SYSTEMS
2008 ISSUE**

INDEX TO CLAUSES

EJ.01.0	GENERAL
EJ.02.0	CONTROL PANEL
EJ.03.0	FIELD WIRING
EJ.04.0	FIELD EQUIPMENT
EJ.05.0	INFORMATION VARIANCE

**C.L.A.W. ELECTRICAL SPECIFICATION PART EJ CONTROL SYSTEMS
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EJ.01.0 GENERAL

- EJ.01.01 The control system will be detailed in Part MP of the Specification Document and the Contract drawings.
- EJ.01.02 All control systems shall be directed by the Mechanical Services Installer who shall engage the services of a Controls Specialist
- EJ.01.03 Prior to the commencement of any works on site the Controls Specialist shall submit to the Contract Administrator for approval three copies of all schematic drawings, point schedules, valve schedules, panels and ancillary equipment
- EJ.01.04 Following approval of the items contained in Clause EJ.01.03, all field wiring information will be made available to the Electrical Services Installer.
- EJ.01.05 The controls field wiring installation shall be carried out by the Electrical Services Installer under the direction of the Controls Specialist as an integral part of the controls package and carried out in conjunction with and the Mechanical Services Installer.

EJ.02.0 CONTROL PANEL

- EJ.02.01 The control panel shall be supplied and installed by the Controls Specialist.
- EJ.02.02 The electrical supply to the control panel shall be provided by the Electrical Services Installer as detailed on the Contract Drawings and in part EL of the Specification Document

EJ.03.0 FIELD WIRING

- EJ.03.01 The field wiring shall be carried out by the Electrical Services Installer liaising with the Controls Specialist following approval of the drawings submitted in clause EJ.01.03.
- EJ.03.02 The Controls Specialist, as an integral part of the Controls Package, shall install all control panels and field equipment.
- EJ.03.03 The installation shall comply with the regulations for Electrical Installations issued by BS 7671: 2008, Requirements for Electrical Installations Wiring Regulations Seventeenth Edition and Section ED of the Specification Document. These shall be adhered to in conjunction with the following requirements.

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**C.L.A.W. ELECTRICAL SPECIFICATION PART EJ CONTROL SYSTEMS
2008 ISSUE**

EJ.03.0 FIELD WIRING (Cont'd)

- EJ.03.04 Critchley type ferrule numbers shall be used to clearly identify all field wiring at both the equipment and control panel ends. The numbers shall match the terminal numbers shown on control panel drawings.
- EJ.03.05 Communication cables between outstations shall be clearly identified at both ends with Critchley type ferrule numbers and stating cable destination. All LAN and WAN drawings shall be updated with this information after each project.
- EJ.03.06 Electrical isolation of field equipment shall ensure complete isolation of ELV control circuits in addition to Phase power supplies. E.g. 24-volt control circuits to boilers, chillers, pressure units etc. Sufficient poles shall be provided to meet any design requirement.
- EJ.03.07 Inverters shall be installed with full isolation on both the input and output sides. An early break contact on the output side should be allowed for as a fourth pole in accordance with the manufacturer's recommendations. All control circuits must be isolated on the input side through additional poles on the local isolator.
- EJ.03.08 All low voltage input / output wiring from outstations to field equipment shall be wired in screened, twisted-pair cable with the screen (where specified) grounded to earth at the Outstation end only. The field end of the cable shall have the screen removed and the cable end insulated with Neoprene type sleeving to protect against inadvertent connection to earth.
- EJ.03.09 Outstation communication cable shall be installed in screened four core cable as standard with the screen earthed in accordance with the Control Specialist's recommendations.
- EJ.03.10 Where field equipment is supplied with "flying leads" attached, e.g. damper actuators, valve actuators etc, then these must be left intact and joint boxes used for final terminations.
- EJ.03.11 The wiring shall be contained in trunking, basket and or conduit as specified in Part EL of the Specification Document and the Contract drawings.
- EJ.03.12 All cables shall be drawn in after the erection of the conduit and trunking systems complete with all outlet boxes etc. Cable runs between terminal points shall be installed without intermediate joints.

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**C.L.A.W. ELECTRICAL SPECIFICATION PART EJ CONTROL SYSTEMS
2008 ISSUE**

EJ.03.0 FIELD WIRING (Cont'd)

- EJ.03.13 Where it is necessary to make direct connection between the hard wiring and flexible cables, the wiring is to terminate in a circular conduit box behind the fitting which shall contain a porcelain shielded connector and heat resisting tails shall connect to the equipment item.
- EJ.03.14 Care shall be taken over bends and Tees to avoid undue cable stress. **Never** pull / stretch structured cables with more than 25 pounds (3.456kgs) of force.
- EJ.03.15 Care shall be taken to ensure that bends do not exceed 4 times the cable overall diameter as a minimum radius and that conduits do not exceed 40% capacity.
- EJ.03.16 Cables shall be fixed to the wire basket by means of Velcro straps in such a manner to avoid 'pinching'.
- EJ.03.17 During installation the Electrical Services Installer shall ensure that no undue stress is placed upon any cables. Cables shall not be left coiled trailing from cable baskets on to the floor where they may be trodden upon or otherwise damaged. Any cable found to be in a degraded condition will be rejected.
- EJ.03.18 Where controls cables are contained in trunking / basket with other cables they shall be taped together at intervals of no more than 2 metres using pvc marking tape bearing the words 'control cables'.

EJ.04.0 FIELD EQUIPMENT

- EJ.04.01 All field equipment shall be installed to the manufacturer's recommendations. by the Control Specialist Services Installer's who shall be responsible for identifying the optimum position of all field equipment at the appropriate time in the contract.
- EJ.04.02 The Electrical Services Installer shall ensure that local means of electrical isolation is provided to each item of electrical equipment by means of industrial plug and socket complying to BS EN 60309-2:1999 and multi-core LSF insulated and sheathed cable.

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EJ.05.0 INFORMATION VARIANCE

- EJ.05.01 Should at any point during the installation there is a discrepancy between the information supplied by Control Specialist Services Installer and the standards contained either in the C.L.A.W. Electrical Specification and/or BS 7671: 2008, Requirements for Electrical Installations Wiring Regulations Seventeenth Edition, such discrepancy shall be referred to the Contract Administrator for clarification.