FLUORESCENT FIXTURES,LAMPS, SOCKETS, AND BALLASTS

1. GENERAL

1.1 Work Included

.1 Supply fluorescent fixtures complete with lamps, sockets, ballasts and all necessary fittings and accessories.

1.2 Codes

.1 Fixtures: to CSA C22.2 No. 9, accessories and components to applicable CSA Standards.

.2 Lamps: dimensions and electrical characteristics to meet ANS C78.

.3 Ballasts: to CSA C22.2 No. 74. ANS C82.1.

2. PRODUCTS

2.1 Fluorescent Fixtures

.1 Fixture housing of 20 gauge steel, prime coated and finished in high reflectance baked white enamel, two coats minimum on exposed and reflective surfaces, giving reflectance of 85 percent.

.2 Reflective ballast covers may be constructed of 22 gauge metal. Hinged frames to be removable without the use of tools for cleaning with suitable catches. Support lay-in lenses on four sides with flip ends on short dimension.

.3 Provide gasketting, stops and barriers to form light traps and prevent light leaks.

.4 Design fixture for adequate dissipation of ballast and lamp heat and provide, if requested, test reports from an independent laboratory.

.5 Construct rigid and well aligned fixture, using formed or ribbed type backplates, endplates, reinforcing channels, etc. as required.

.6 Diffusers: 100 per cent pure acrylic, 0.125 in. thick minimum.

2.2 Fluorescent Lamps & Sockets

.1 Fluorescent lamps: T-8, rapid start, 4100K

.2 Sockets: for 48" T-8 fluorescent lamps shall be rated 660 watts, 600 volts, twist, turn contacting type for medium bi-pin lamp. Sockets for other lamps shall be suitable for the lamps used.

.3 Manufacturer: Phillips, Osram Sylvannia or GE. All lamps shall be supplied by one manufacturer, unless specifically noted otherwise.

2.3 Ballasts for Fluorescent Fixtures

.1 General: with rated voltage matching supply voltage indicated on the drawings, and output current and voltage matching current and voltage ratings of lamps they are designed to operate. Unless otherwise noted, ballasts are to be supplied prewired integral with fixtures.

.2 Characteristics: rapid start, electronic, < 20% THD sound rating group A. Utilize two lamp ballasts wherever possible. Ballasts to have power factor correction of 95% or more. In general, interior ballasts shall be capable of reliably starting lamps operating in an ambient temperature of +40°F.

.3 Enclosures: for remote mounted ballasts, provide suitable enclosures for concealing wiring.

.4 Special Ballasts: ballasts for circline lamps, dimming ballasts, germicidal lamps, etc., are specified with the fixtures.

.5 Manufacturer: Advance, Magnatek, ".

.6 Labels: to show electrical characteristics and typical wiring diagram.

3. EXECUTION

3.1 General

.1 Refer to Section 16500 - General Provisions for Interior Lighting.

END OF SECTION

EXIT LIGHTS

1. GENERAL

1.1 Product Data

.1 Submit duct data in accordance with Section 16010 - Electrical General Requirements.

2. PRODUCTS

2.1 Standard Units

.1 Housing: cold rolled steel minimum 1.0 mm thick, satin aluminum enamel finish.

.2 Face and back plates: die formed cold rolled steel.

.3 Lamps: LED-2W 347 V.

.4 Operation: designed for 25 years of continuous operation without relamping.

.5 Letters: 150 mm high x 19 mm, with 13 mm thick stroke, red on die-cast aluminum face, reading EXIT.

.6 Face plate to remain captive for relamping.

.7 Universal mounting.

3. EXECUTION

3.1 Installation

.1 Install exit lights.

.2 Connect fixtures to exit light circuits.

.3 Connect to emergency circuits.

.4 Ensure that exit light circuit breaker is locked in on position. Provide breaker lock-on device

END OF SECTION

FLOODLIGHTING – EXTERIOR

1. GENERAL

1.1 Shop Drawings and Product Data

.1 Submit shop drawings and product data in accordance with Section 16010 - Electrical General Requirements and Division 01 - Submittals.

.2 Indicate vertical and horizontal beam spread, beam lumens, beam efficiency and complete photometric data as shown by independent laboratory tests.

2. PRODUCTS

.1 As indicated drawing luminaire schedule

.1 Photo-electric control: Plug-in twistlock, located where indicated on drawings or on north side of building.

3. EXECUTION

3.1 Installation

.1 Install luminaires in accordance with manufacturer's instructions and as indicated.

END OF SECTION

UNIT EQUIPMENT FOR EMERGENCY LIGHTING

1. GENERAL

1.1 Work Included

.1 Supply emergency lighting units complete with all accessories.

1.2 Special Codes

.1 Canadian Electric Code, Part 1, Section 46 "Emergency Systems, Unit Equipment and Exit Signs".

.2 CSA Standard C22.2 No. 141 "Unit Equipment for Emergency Lighting".

.3 Building Code

1.3 Product Data

.1 Submit product data in accordance with Section 16010 - Electrical General Requirements.

.2 Data to indicate system components, mounting method, source of power and special attachments.

1.4 Warranty

.1 For batteries, the 12 months warranty period prescribed in subsection GC 32.1 of General Conditions "C" is extended to 120 months, with a no-charge replacement during the first 5 years and a pro-rate charge on the second 5 years.

2. PRODUCTS

2.1 General

.1 Supply and install battery power emergency lighting where shown on the drawings. Lights are to switch "ON" automatically in the event of failure of emergency power, and "OFF" on restoration of power. The batteries shall be automatically recharged from a 120 VAC supply.

2.2 Equipment

.1 Supply voltage: 120 V, ac.

.2 Output voltage: 12 V dc.

.3 Operating time: 60 min.

.4 Charger: solid state, multi-rate, voltage/current regulated, inverse temperature compensated, short circuit protected with regulated output of plus or minus 0.01 V for plus or minus 10% input variations.

.5 Solid state transfer circuit.

.6 Low voltage disconnect: solid state, modular, operates at 80% battery output voltage.

.7 Signal lights: solid state, for 'AC Power ON' and 'High Charge'.

.8 Lamp heads: integral on unit and remote, 345° horizontal and 180° vertical adjustment. Lamp type: tungsten, 18 W, minimum.

.9 Cabinet: suitable for direct or shelf mounting to wall and c/w knockouts for conduit. Removable or hinged front panel for easy access to batteries.

.10 Finish: standard colors

.11 Auxiliary equipment:

.1 Test switch
.2 Time delay relay
.3 Battery disconnect device

2.3 Line Connection

.1 Each battery unit shall be equipped with AC line cord and plug.

2.4 Batteries

.1 Unless specifically indicated provide batteries of sufficient watt-hour capacity to power the loads connected to each individual unit for 60 minutes, 12 volt, long life, maintenance free, sealed lead acid batteries, contained within the units.

2.5 Wiring of Remote Heads

.1 Conduit: type to Section 16111 - Conduits, Conduit Fastenings and Conduit Fittings.

.2 Conductors: type to Section 16010- Electrical General Requirements and sized in accordance with manufacturer's recommendations.

3. EXECUTION

3.1 Installation

.1 Mount battery units with the bottom of the enclosure not less than 2.2 m above the floor, where practicable.

.2 Install duplex receptacle adjacent to unit and connect to 1Ø, 120V unswitched area lighting circuit.

.3 Where applicable wire from unit to third (DC) lamp in exit lights.

.4 Wiring from units to remote heads and/or exit lights shall be sized to prevent voltage drop of more than 5%.

.5 All emergency heads shall be properly aimed.

END OF SECTION

LIGHTING CONTROL EQUIPMENT – LOW VOLTAGE

1. GENERAL

1.1 Description of System

.1 Low voltage control system designed to provide remote switching of lighting loads by use of:

.1 Low voltage momentary contact switches
.2 Low voltage relays
.3 Control transformers

1.2 Shop Drawings

.1 Submit shop drawings in accordance with Section 16010 - Electrical General Requirements.

2. PRODUCTS

2.1 Materials

.1 Control system: by one manufacturer and assembled from compatible components.

2.2 Relay Panels

.1 Factory pre-assembled relay panel complete with hinged door assembly.

.2 Suitable divider separating the class 1 and class 2 compartments.

.3 Low voltage relays as required by switched circuits as shown on schedules.

.4 Standard of acceptance: Douglas PWEx series.

2.3 Remote Control Switches

.1 Remote control switches and hardware to mount to standard wall boxes, up to 3 switches per gang.

.2 Switches shall have integral LED's that indicate both the on and off status

.3 Standard of acceptance: Douglas WR-8501

2.4 Low Voltage Relays

.1 1 pole HID rated relays suitable for all types of lamps loads up to 20 A.

.2 Built in operating lever marked on / off for manual switching at the relay panel.

.3 Standard of acceptance: Douglas WR-6161

2.5 Control Transformer

.1 Low voltage power Class 2, input 347 V, ac, 60 Hz, output as recommended by manufacturer at 24 V plus 20% spare capacity.

2.6 Relay Scanners

.1 Solid state, 24 relay outputs, capable of switching the connected relays

.2 Standard of acceptance: Douglas WR-8824.

3. EXECUTION

3.1 Installation

.1 Locate and install equipment in accordance with manufacturer's recommendations and as indicated.

3.2 Tests

.1 Perform tests in accordance with Section 16980 - Testing, Adjusting and Balancing of Electrical Equipment and Systems and Section 16010 - Electrical General Requirements.

.2 Actuate control units in presence of Consultant to demonstrate lighting circuits are controlled as designated.

END OF SECTION

1. GENERAL

1.1 Related Work

.1 Cast-In-Place Concrete – installation of anchor services, setting templates: Division 03

.2 Cast-In-Place Concrete – Concrete Pad: Division 03

.3 Fuel System: Division 15

.4 Ventilation System: Division 15

.5 Exhaust System: Division 15

1.2 Description of System

.1 Generation system consists of:

.1 Relocation of existing 250kW diesel fired generator

.2 Installation, and connections

.3 Site commissioning and demonstration by manufacturer

.2 Generator set and automatic transfer switch system is designed for automatic emergency standby power generation.

1.3 Standards

.1 Canadian electrical code and provincial and local amendments.

.2 Provincial building code.

.3 Local building code.

.4 NEMA Motor and Generator Standards.

.5 CSA Standard C282 – Emergency Electrical Power Supply in Building.

1.4 Shop Drawings

.1 Not required

1.5 Operation and Maintenance Data

.1 Incorporate existing maintenance data into new Operations and Maintenance Manual.

.2 Provide copy of onsite testing and commissioning reports.

1.6 Warranty

.1 For the diesel engine driven generator set, provide 12 month warranty period.

1.7 Automatic Transfer Switch

.1 Refer to Section 16627 – Automatic Load Transfer Equipment.

1.8 Equipment Identification

.1 Provide equipment identification in accordance with Section 16010 – Electrical General Requirements.

.2 Control Panel:

.1 Nameplates for controls such as alternator breakers and program selector switch.
.2 Nameplates for meters, alarms, indicating lights, and minor controls.

1.9 Manufacturer

.1 Caterpillar

2. EXECUTION

2.1 Installation

.1 Locate generating unit and install as indicated.

.2 Install fuel supply system as indicated, and coordinate work with Division 15.

.3 Install ventilation components as indicated.

.4 Pipe muffler drains to nearest floor drain.

.5 Complete wiring and interconnections as indicated.

.6 Remove air shipping blocks, packing, etc.

.7 Start generating set and test to ensure correct performance of components.

2.2 Field Quality Control

.1 Perform tests in accordance with Section 16980 – Testing, Adjusting, and Balancing of Electrical Equipment and Systems, and as specified herein.

.2 Operation of all components to be demonstrated – battery charger, alarm devices, transfer switch, block heaters, controls, and all other components making up the overall system.

.3 Using a resistive load bank, 100% of alternator rating, perform a functional test of all equipment and record the following:

.1 Engine oil pressure

.2 Water temperature

.3 Cranking time to start

.4 Time to achieve standby power operation

.5 Time delay on start

.6 Time delay on retransfer to normal

.7 Voltage current, every 15 minutes, for 1 hour.

.4 Perform a 5-hour full load acceptance test, using a 110% rated resistive load bank, as follows:

.1 100% rated kW load (at 100% PF) for 4 hours, followed immediately by 110% rated kW load for 1 hour.

.2 If the generator system fails testing, make any necessary adjustments or repairs and repeat testing for 8 hours at 100% load and 1 hour at 110% load.

.3 The above on-site tests are to be carried out only after the unit has been verified in writing by the manufacturer or his representative as being installed and assembled correctly and all associated components and utilities are properly connected.

.4 Include all fuel costs for testing in tender, and upon completion of testing, leave tanks filled to capacity.

.5 Observe and document voltage, current, oil pressure, water temperature, and frequency at 15 min. intervals.

.5 Upon completion of successful testing, arrange and pay for demonstration and training to the Owner by an authorized factory representative.

END OF SECTION

DIESEL GENERATOR ACCESSORIES

1. GENERAL

1.1 Work Included

.1 Relocate and install an exhaust system and a fuel system for an emergency diesel generator.

1.2 Related Work

.1 Mechanical — Division 15

1.3 Code Requirements

.1 NFPA Number 37, Installation and Use of Stationary Combustion Engines and Gas Turbines.

.2 CSA standard B139, Installation Code for Oil Burning Equipment.

.3 The Fire Prevention Act, Alberta Regulation 356, Bulk Plant Regulations.

.4 The Fire Prevention Act, Alberta Regulation 357, Service Station and Garages Regulation.

.5 CSA standard 183, including all supplements.

.6 All codes are as amended or supplemented by Provincial, Municipal or other regulatory agencies having jurisdiction.

2. PRODUCTS

2.1 Muffler

.1 Existing to be relocated.

2.2 Exhaust Flexible Connection

.1 Flexible connection, bellows type, 18 inch total length, mild steel construction.

2.3 Exhaust Pipe

.1 ASTM-A-120-55 Schedule 20 steel.

.2 Carbon steel welding fittings or flanged as required.

.3 Diameter to suit manufacturer's recommendations.

2.4 Rain Cap

.1 Cast aluminum body, aluminum flapper c/w stainless steel pin.

3. EXECUTION

3.1 Diesel Generator Exhaust System

.1 Install exhaust system as detailed on the drawings.

.2 Exhaust pipe mechanical jointing to be welded with flanges

END OF SECTION

AUTOMATIC LOAD TRANSFER EQUIPMENT

1. GENERAL

1.1 System Description

.1 Automatic load transfer equipment which electrically operated, mechanically held to:

.1 Monitor voltage on all phases of normal power supply.

.2 Initiate cranking of standby generator unit on normal power failure or abnormal voltage on any one phase below preset adjustable limits for adjustable period of time.

.3 Transfer load from normal supply to standby unit [when standby unit reaches rated frequency and voltage pre-set adjustable limits].

.4 Transfer load from standby unit to normal power supply [when normal power restored, confirmed by sensing of voltage on all phases above adjustable pre-set limit for adjustable time period].

.5 Shut down standby unit after running unloaded to cool down using adjustable time delay relay.

1.2 Operation and Maintenance Data

.1 Provide operation and maintenance data for automatic load transfer equipment for incorporation into manual specified in Section 16010 - Electrical General Requirements.

.2 Detailed instructions to permit effective operation, maintenance and repair.

.3 Technical data:

.1 Schematic diagram of components, controls and relays
.2 Illustrated parts lists with parts catalogue numbers
.3 Certified copy of factory test results.

2. PRODUCTS

2.1 Materials

2.2 Circuit Breaker Type Transfer Equipment

.1 Rated: 347/600 V, 60 Hz, 400 A, 3 phase 4 wire, solid neutral.

.1 Fault withstand rating: 42 kA symmetrical for 3 cycles.

2.3 Field Quality Control

.1 Perform tests in accordance with Section 16980 - Testing, Adjusting and Balancing of Electrical Equipment and Systems.

.2 Energize transfer equipment from normal power supply.

.3 Set selector switch in "Test" position to ensure proper standby start, running, transfer, retransfer. Return selector switch to "Auto" position to ensure standby shuts down.

.4 Set selector switch in "Manual" position and check to ensure proper performance.

.5 Set selector switch in "Engine start" position and check to ensure proper performance. Return switch to "Auto" to stop engine.

.6 Set selector switch in "Auto" position and open normal power supply disconnect. Standby should start, come up to rated voltage and frequency, and then load should transfer to standby. Allow to operate for [10] min, then close main power supply disconnect. Load should transfer back to normal power supply and standby should shutdown.

.7 Repeat, at 30 minute intervals, 3 times, complete test with selector switch in each position, for each test.

END OF SECTION

FIRE ALARM SYSTEM

1. GENERAL

1.1 Related Work

.1 Conduits, Conduit Fastenings and Conduit Fittings: Section 16111

.2 Wires and Box Connectors: Section 16161

1.2 References

.1 CAN/ULC-S524, Installation of Fire Alarm Systems.

.2 ULC-S525, Audible Signal Appliances for Fire Alarm.

.3 CAN/ULC-S526, Visual Signal Appliances, Fire Alarm.

.4 CAN/ULC-S527, Control Units, Fire Alarm.

.5 CAN/ULC-S528, Manual Pull Stations.

.6 CAN/ULC-S529, Smoke Detectors, Fire Alarm.

.7 CAN/ULC-S530, Heat Actuated Fire Detectors, Fire Alarm.

.8 CAN/ULC-S531, Smoke Alarms.

.9 CAN/ULC-S536, Inspection and Testing of Fire Alarm Systems.

.10 CAN/ULC-S537, Verification of Fire Alarm Systems.

.11 NBC, National Building Code of Canada.

.12 CSA C22.1 Section 32, Fire Alarm Systems and Fire Pumps.

.13 Local Building Code.

1.3 System Description

.1 Fully supervised, microprocessor-based, fire alarm system, utilizing digital techniques for data control and digital, and multiplexing techniques for data transmission.

.2 System to carry out fire alarm and protection functions; including receiving alarm signals; initiating general alarm; supervising components and wiring; actuating annunciators and auxiliary functions; initiating trouble signals and signalling to monitoring agency.

.3 Zoned, non-coded single stage.

.4 Modular in design to allow for future expansion.

.5 System to include:

.1 Central Control Unit in separate enclosure with power supply, stand-by batteries, central processor with microprocessor and logic interface, main system memory, input-output interfaces for alarm receiving, annunciation/display, and program control/signalling.

.2 Power supplies.

.3 Initiating/input circuits.

.4 Output circuits.

.5 Auxiliary circuits.

.6 Wiring.

.7 Manual and automatic initiating devices.

.8 Audible and visual signalling devices.

.9 End-of-line resistors.

.10 Historic event recorder.

1.4 Requirements of Regulatory Agencies

.1 System components: listed by ULC and comply with applicable provisions of National Building Code. Local/Provincial Building Code, and meet requirements of local authority having jurisdiction.

1.5 Shop Drawings

.1 Submit shop drawings in accordance with Section 16010 - Electrical General Requirements.

.2 Include:

.1 Detail assembly and internal wiring diagrams for control unit[s]. [Consoles] [Auxiliary cabinets].

.2 Overall system riser wiring diagram identifying control equipment initiating zones signaling circuits; identifying terminations, terminal numbers, conductors and raceways.

.3 Details for devices.

.4 Details and performance specifications for control, annunciation and peripherals with item by item cross reference to specification for compliance.

.5 Step-by-step operating sequence, cross referenced to logic flow diagram.

1.6 Operation and Maintenance Data

.1 Provide operation and maintenance data for fire alarm system for incorporation into manual specified in Section 16010 - Electrical General Requirements.

.2 Include:

.1 Instructions for complete fire alarm system to permit effective operation and maintenance.

.2 Technical data - illustrated parts lists with parts catalogue numbers.

.3 Copy of approved shop drawings with corrections completed and marks removed except review stamps.

.4 List of recommended spare parts for system.

1.7 Maintenance Materials

.1 Provide maintenance materials in accordance with Division 01 - Maintenance Materials, Special Tool and Spare Parts.

1.8 Training

.1 Provide on-site lectures and demonstration by fire alarm equipment manufacturer to train operational personnel in use and maintenance of fire alarm system.

2. PRODUCT

2.1 Materials

.1 Equipment and devices: ULC listed and labeled and supplied by single manufacturer.

.2 Power supply: to CAN/ULC-S524.

.3 Audible signal devices: to ULC-S525.

.4 Visual signal devices: to CAN/ULC-S526.

.5 Control unit: to CAN/ULC-S527.

.6 Manual pull stations: to CAN/ULC-S528.

.7 Thermal detectors: to CAN/ULC-S530.

.8 Smoke detectors: to CAN/ULC-S529.

2.2 System Operation: Single Stage - Signals Only

.1 Actuation of any alarm initiating device to:

.1 Cause electronic latch to lock-in alarm state at central control unit [and data gathering panel/transponder].

.2 Indicate zone of alarm at central control unit display.

.3 Cause audible signalling devices to sound continuously throughout building and at central control unit.

.4 Transmit signal to fire department via central station.

.5 Cause air conditioning and ventilation fans to shut down or to function to provide required control of smoke movement.

.6 Cause fire doors and smoke control doors, if normally held open, to close automatically.

.2 Acknowledging alarm: indicated at central control unit.

.3 Possible to silence signals by "alarm silence" switch at control unit, after 60 s period of operation.

.4 Subsequent alarm, received after previous alarm has been silenced, to re-activate signals.

.5 Actuation of supervisory devices to:

.1 Cause electronic latch to lock-in supervisory state at central control unit.

.2 Indicate respective supervisory zone at central control unit display.

.3 Cause audible signal at central control unit to sound.

.4 Activate common supervisory sequence.

.6 Resetting alarm or supervisory device not to return system indications/functions back to normal until control unit has been reset.

.7 Trouble on system to:

.1 Indicate circuit in trouble at central control unit.

.2 Activate "system trouble" indication, buzzer and common trouble sequence. Acknowledging trouble condition to silence audible indication; whereas visual indication to remain until trouble is cleared and system is back to normal.

.8 Trouble on system: suppressed during course of alarm.

.9 Trouble condition on any circuit in system not to initiate alarm conditions.

2.3 Control Panel

.1 Central control unit

.1 Suitable for DCLB communication style: to CAN/ULC-S524.

.2 Features specified are minimum requirements for microprocessor-based system with digital data control and digital multiplexing techniques for data transmission.

.3 Minimum capacity of 250 addressable monitoring and 250 addressable control/signal points. [Points may be divided between 2 communication channels in distributed system, each channel operating independently of other. Faults on one communication channel not to affect operation of other channel].

.4 System to provide for priority reporting levels, with fire alarm points assigned highest priority, supervisory and monitoring lower priority, and third priority for troubles. Possible to assign control priorities to control points in system to guarantee operation or allow emergency override as required.

.5 Integral power supply, battery charger and standby batteries.

.6 Circuitry to continuously monitor communications and data processing cycles of microprocessor. Upon failure, audible and visual trouble indication to activate.

.7 Software and hardware to maintain time of day, day of week, day of month, month and year.

2.4 Power Supplies

.1 120 V, 60 Hz as primary source of power for system.

.2 Voltage regulated, current limited distributed system power.

.3 Primary power failure or power loss (less than 102 V) will activate common trouble sequence.

.4 Interface with battery charger and battery to provide uninterruptible transfer of power to standby source during primary power failure or loss.

.5 During normal operating conditions fault in battery charging circuit, short or open in battery leads to activate common trouble sequence and standby power trouble indicator.

.6 Standby batteries: sealed, maintenance free.

.7 Continuous supervision of wiring for external initiating and alarm circuits to be maintained during power failure.

2.5 Initiating/Input Circuits

.1 Receiving circuits for alarm initiating devices such as manual pull stations, smoke detectors, heat detectors and water flow switches, wired in DCLB configuration to central control unit.

.2 Alarm receiving circuits (active and spare): compatible with smoke detectors and open contact devices.

.3 Actuation of alarm initiating device: cause system to operate as specified in "System Operation".

.4 Receiving circuits for supervisory, N/O devices. Devices: wired in DCLB configuration to central control unit.

.5 Actuation of supervisory initiating device: cause system to operate as specified in "System Operation".

2.6 Alarm Output Circuits

.1 Alarm output circuit: connected to signals, wired in class B configuration to central control unit.

.1 Signal circuits' operation to follow system programming; capable of sounding horns continuously at 20 spm. Each signal circuit: rated at 2 A, 24 VDC; fuse-protected from overloading/overcurrent.

.2 Manual alarm silence, automatic alarm silence and alarm silence inhibit to be provided by system's common control.

2.7 Auxiliary Circuits

.1 Auxiliary contacts for control functions.

.2 Actual status indication (positive feedback) from controlled device.]

.3 Alarm and or supervisory trouble on system to cause operation of programmed auxiliary output circuits.

.4 Upon resetting system, auxiliary contacts to return to normal or to operate as pre-programmed.

.5 Fans: stagger-started upon system reset; timing circuit to separate starting of each fan or set of fans connected to auxiliary contact on system. Timing circuit: controlled by central control unit.

.6 Auxiliary circuits: rated at 2 A, 24 V dc or 120 V ac, fuse-protected.