

PART 1 - GENERAL

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| <u>1.1 SECTION INCLUDES</u> | .1 | Materials and installation for industrial control devices including pushbutton stations, control and relay panels. |
| <u>1.2 REFERENCES</u> | .1 | Canadian Standards Association (CSA International)
.1 CSA C22.2 No.14-10, Industrial Control Equipment. |
| | .2 | National Electrical Manufacturers Association (NEMA)
.1 NEMA ICS 1-2000(R2005, R2008), Industrial Control and Systems: General Requirements. |
| <u>1.3 SHOP DRAWINGS</u> | .1 | Submit shop drawings in accordance with Section 01 33 00. |
| | .2 | Include schematic, wiring, interconnection diagrams. |
| <u>1.4 QUALITY ASSURANCE</u> | .1 | Submit to Departmental Representative one copy of test results. |
| <u>1.5 WASTE MANAGEMENT AND DISPOSAL</u> | .1 | Separate and recycle waste materials in accordance with Section 01 74 20. |

PART 2 - PRODUCTS

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| <u>2.1 AC CONTROL RELAYS</u> | .1 | Control Relays: to CSA C22.2 No.14. |
| | .2 | Convertible contact type: contacts field convertible from NO to NC, electrically held permanent magnet latched double-voltage type with sliding barrier to permit access to contacts only or coil only, with pneumatic solid state timer and poles overlap type. Coil rating: 120V, 50VA. Contact rating: 300V, 15A. |
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| 2.1 AC CONTROL RELAYS
(Cont'd) | .3 | Sealed contact type: electrically held permanent magnet latched with poles and front mounted contact block to provide additional poles. Coil rating: 120V, 50VA. Contact rating: 300V, 15A. |
| | .4 | Universal pole type: electrically held mechanically held latch type with poles, convertible from NO to NC by changing wiring connections. Coil rating: 120V, 50VA. Contact rating: 300V, 15A. |
| | .5 | Fixed contact plug-in type: general purpose low coil current heavy duty with poles. Coil rating: as indicated. Contact rating: as indicated. |
| 2.2 RELAY ACCESSORIES | .1 | Standard contact cartridges: normally-open - convertible to normally-closed in field. |
| 2.5 SOLID STATE TIMING RELAYS | .1 | Construction: AC operated electronic timing relay with solid-state timing circuit to operate output contact. Timing circuit and output contact completely encapsulated to protect against vibration, humidity and atmospheric contaminants. |
| | .2 | Operation: on-delay or off-delay. |
| | .3 | Potentiometer: self contained external to provide time interval adjustment. |
| | .4 | Supply voltage: 120 VAC, 60 Hz. |
| | .5 | Temperature range: minus 10°C to 40°C. |
| | .6 | Output contact rating: maximum voltage 300 V AC or DC. Current: 15 A. |
| | .7 | Timing ranges: minimum 1.0 min, maximum 30 min. |
| 2.6 INSTANTANEOUS TRIP CURRENT RELAYS | .1 | Enclosure: CSA Type 1. |
| | .2 | Contacts: NO, NC automatic reset with adjustable tripping point. |
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<u>2.6 INSTANTANEOUS TRIP CURRENT RELAYS (Cont'd)</u>	.3	Control: 3 wire, with provision for shorting contacts during accelerating period of motor.
	.4	Contact rating: NEMA ICS 1.
<u>2.7 PUSHBUTTONS</u>	.1	Illuminated, Heavy duty Oil tight. Flush mounted on enclosure. Green and red, with 1-NO and 1-NC contacts rated at 10A, 120 VAC, labels as indicated.
<u>2.8 SELECTOR SWITCHES</u>	.1	Maintained, 3 position labelled HAND-OFF-AUTO heavy duty oil tight, knob, contact arrangement as indicated, rated 120V, 10A AC.
<u>2.9 INDICATING LIGHTS</u>	.1	Heavy duty oil tight, full voltage, LED type, push-to-test, lens colour: red and green as indicated, supply voltage: 120 V, lamp voltage: 120 V, labels as indicated.
<u>2.10 CONTROL AND RELAY PANELS</u>	.1	CSA Type 1 sheet steel enclosure with hinged padlockable access door, accommodating relays, timers, labels as indicated, factory installed and wired to identified terminals.
<u>2.11 CONTROL CIRCUIT TRANSFORMERS</u>	.1	Single phase, dry type.
	.2	Primary: 120 VAC, 60 Hz for variable air volume boxes; 208 VAC, 60 Hz for motor starters.
	.3	Secondary: 24 VAC for variable air volume boxes; 120 VAC for motor starters.
	.4	Rating: 500 VA.
	.5	Secondary fuse: 25 A at 24 VAC, 5.
	.6	Close voltage regulation as required by magnet coils and solenoid valves.

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| 2.12 THERMOSTAT
(LINE VOLTAGE) | .1 | Wall mounted, for exhaust fan control. |
| | .2 | Full load rating: 8 A at 120 V. |
| | .3 | Temperature setting range: 5 degrees C to 30 degrees C. |
| | .4 | Markings in 5 degrees increments. |

PART 3 - EXECUTION

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| 3.1 INSTALLATION | .1 | Install pushbutton stations, control and relay panels, control devices and interconnect. |
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| 3.2 FIELD QUALITY
CONTROL | .1 | Depending upon magnitude and complexity, divide control system into convenient sections, energize one section at time and check out operation of section. |
| | .2 | Upon completion of sectional test, undertake group testing. |
| | .3 | Check out complete system for operational sequencing. |