PAINT STORAGE ROOM
EXHAUST FAN
CONTROL NARRATIVE

EXHAUST FAN "HAND" CIRCUIT:

- Turning the (3) position, maintained contact "**H-O-A"** selector switch to the "Hand" position will close switch contacts **"1A-2A"** and**"1B-2B"** thus energizing the coil of magnetic motor starter **"M"** closing main power contacts to energize the exhaust fan motor**.** As well as enable the operation of thermostat "TS1"circuit.
- Pilot Light **"B"** will illuminate via thermostat **"TS1"** circuit, if room air temperature is below high temp alarm set point of 100 degrees Fahrenheit
- Exhaust fan **"RUN"** pilot light **"G"** will illuminate via auxiliary contact **"M(aux)-1"** located on the motor starter frame.
- If room air temperature rises above 100 degrees Fahrenheit, the thermostat **"TS-1" N.O.** Relay Circuit will close. Pilot light **"B"** will extinguish and initiate the room **High Temperature Alarm** circuit will initiate per the sequence of operation as described below.

EXHAUST FAN "AUTO" CIRCUIT:

- Turning the (3) position, maintained contact "**H-O-A"** selector switch to the "Auto" position will close switch contacts **"3A-4A"** and **"3B-4B"** thus enabling the operation of thermostat **"TS1"** and illuminating System **"Auto"** pilot light **"W"**.
- Temperature **"Normal"** pilot light **"B"** is illuminated in the **"Auto"** mode of operation as long as the room temperature is below the **High Temperature Alarm Set Point** of 100 degrees Fahrenheit.
- A rise in the room air temperature to the **High Temperature Alarm Set Point** of 100 degrees Fahrenheit will cause thermostat **"TS1"** to close it's **N.O.** contact (close on temperature rise) thus energizing control relay coil **"CR1"** and closing **N.O.** relay contact **"CR1-1"** energizing the coil of magnetic motor starter **"M"** closing main power contacts to energize the exhaust fan motor**.** The temperature **"Normal"** pilot light **"B"** will extinguish and the exhaust fan **"RUN"** pilot light **"G"** will illuminate via auxiliary contact **"M(aux)-1"** located on the motor starter frame. The room **High Temperature Alarm** circuit will initiate per the sequence of operation as described below.
- A drop in the room air temperature below the **High Temperature Alarm Set Point** of 100 degrees Fahrenheit will cause thermostat **"TS1"** to open it's (close on temperature rise) contact thus de-energizing relay coil **"CR1"**, magnetic motor starter **"M"** and the exhaust fan motor.
- An abnormal condition when the exhaust fan is running that causes it's drive motor to draw excessive current will open **N.C.** overload relay contact **"OL"** thus interrupting the coil circuit to motor starter **"M"**. The motor cannot be restarted until the condition is corrected and overload relay **"OL"** is reset.
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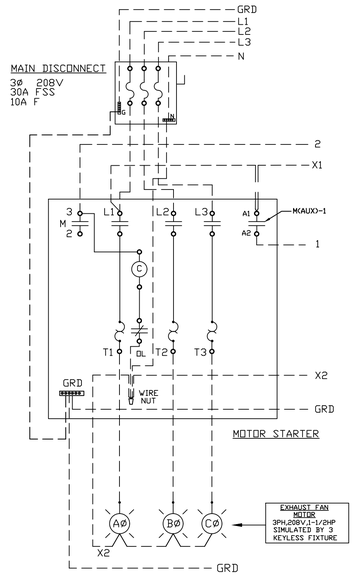
HIGH TEMPERATURE "ALARM" CIRCUIT:

- Thermostat **"TS1" N.O.** switch contact will close upon sensing a rise above the normal room temperature to the **High Temperature Alarm Set Point** of 100 degrees Fahrenheit thus energizing control relay coil **"CR1"**.
- The alarm horn **"H"** will sound and the **"High Temperature Alarm"** pilot light **"R"** will illuminate via the closure of **N.O.** relay contact **"CR1-2"**.
- Silence alarm horn **"H"** by momentarily depressing the "**Alarm Silence**" push button thus closing its **N.O.** switch contact to energize relay coil "**CR2**". The **N.O.** relay contact **"CR2-1"** will close thus sealing relay coil "**CR2**" in the energized position. The **N.C**. relay contact, "**CR2-2**" will open thus silencing alarm horn **"H"**.
- A decrease in the room temperature below the **High Temperature Alarm Set Point** of 100 degrees Fahrenheit will open the switch contact on thermostat **"TS1"** thus deenergizing control relay **"CR1"** causing **N.O.** relay contact **"CR1-2"** to open. The **High Temperature Alarm** pilot light **"R"** will extinguish and relay coil **"CR2"** will deenergize. The operation of the **High Temperature Alarm** circuit is reset to normal.

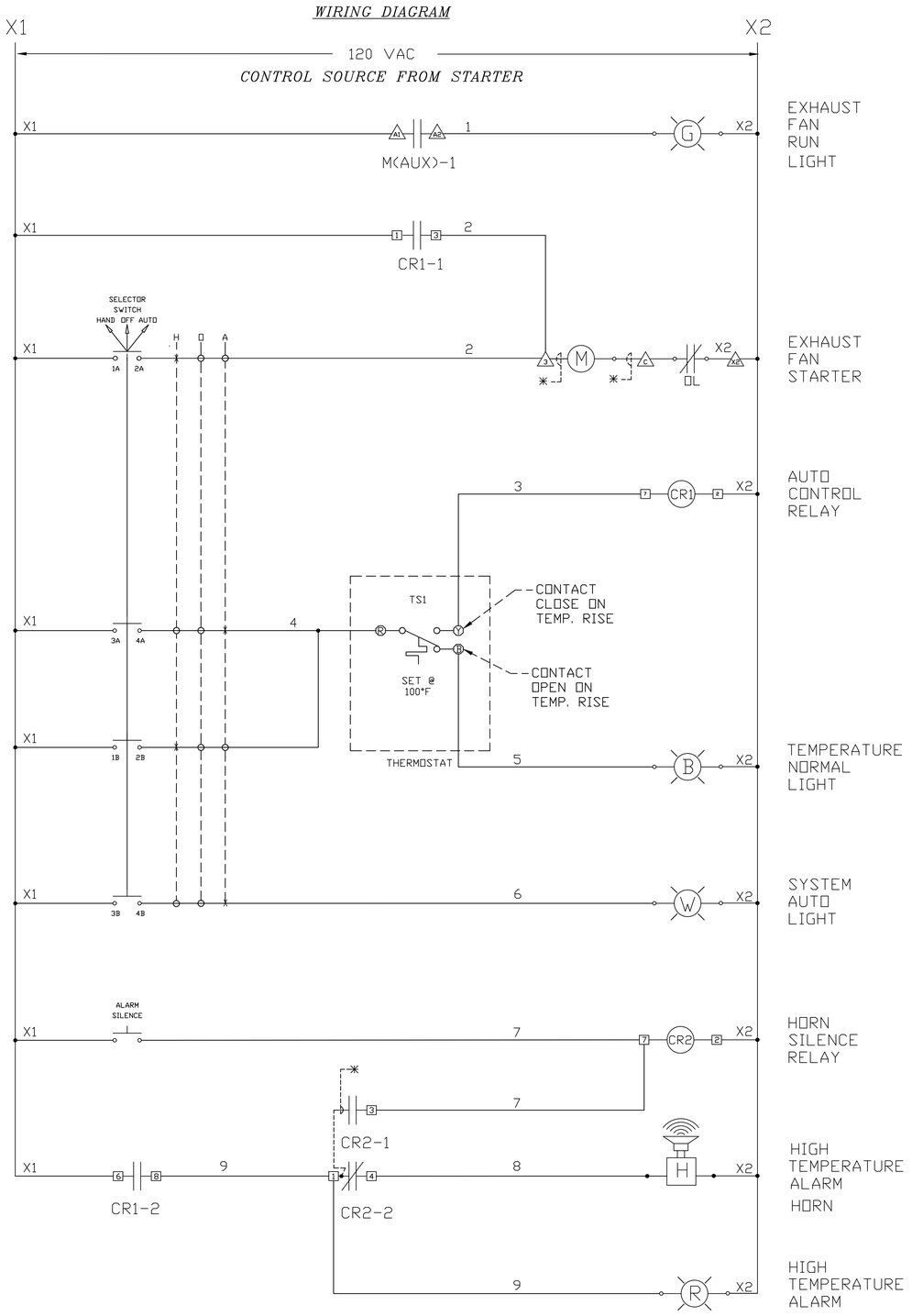


SELECTOR SWITCH LOGIC TABLE

CONTACT LOCATION			SWITCH POSITION		
BLOCK	SIDE	TERMINALS	HAND	OFF	AUTO
A	LEFT	1-2	(X)-CLOSED	(O)-OPEN	(O)-OPEN
		3-4	(O)-OPEN	(O)-OPEN	(X)-CLOSED
B	RIGHT	1-2	(X)-CLOSED	(O)-OPEN	(O)-OPEN
		3-4	(O)-OPEN	(O)-OPEN	(X)-CLOSED

LEGEND

- MOTOR STARTER
- PILOT LIGHT (G) COLOR
- N/O CONTACTS
- N/C CONTACTS
- MOMENTARY PUSH BUTTON
- CONTROL RELAY
- AUDIBLE HORN
- SELECTOR SWITCH HAND-OFF-AUTO
- THERMAL OVERLOAD
- OVER LOAD RELAY CONTACT
- THERMOSTAT
- WIRE LEAD CONNECTION
- RELAY TERMINAL
- MAGNETIC STARTER TERMINAL
- CONTROL DEVICE TERMINAL
- THERMOSTAT TERMINAL
- INTERNAL FACTORY CONNECTION
- FIELD WIRING
- KEYLESS FIXTURE 120V



INDUSTRIAL MOTOR CONTROL
STATE CONTEST

STATE OF MARYLAND
SKILLS-USA
2018

IEC
CHESAPEAKE

REVISIONS:

DATE: 02/15/18
AUTOCAD: RHD
DRAWN BY: MJL
SCALE: N/A
TITLE: EQUIPMENT WIRING DIAGRAM

EXHAUST FAN
MOTOR CONTROL

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