

SECTION 23 38 13

COMMERCIAL-KITCHEN HOODS

PART 1 GENERAL

1.01 SYSTEM DESCRIPTION

- A. Operating Sequences: Operating sequences outlined below are a guideline only. Modify operating sequences as appropriate for each building and each project.
1. Initial State: This state would exist anytime there is a power outage, control power is off, or after an alarm condition has been cleared.
 2. Gas Reset Condition: After power is restored and/or all alarm conditions are reset, the automatic gas valve must be manually reset (to avoid standing pilot gas entering the kitchen). Manual reset of the gas valve cannot be accomplished unless all alarm conditions are normal, the control power is on, and the hood exhaust fan is running. Standing pilots shall be lit manually.
 3. Cooking State: This is the normal condition. The kitchen hood exhaust fan must be turned on in order to activate the make-up air fan (automatically started) and to enable the electrical power under the hood. Hood lights can be controlled manually independent of the kitchen hood exhaust fan operation by a wall mounted toggle switch.
 4. Ansul Activation: This is activated by either melting the fusible link under the range hood or by manual pull at the Ansul system pull station. Activation of the Ansul system allows discharge of fire suppression chemicals on the range, fryers or other under-hood equipment where code-required fire suppression is mandatory. Ansul system activation will also turn on the hood exhaust fan (if not on already), turn off the make-up air unit, close the automatic gas valve, shut down all electrical power under the hood, turn off the hood lights and signal the building fire alarm system that an alarm condition exists.
- B. Relay Logic:
1. Reference drawing at end of section for relay ladder diagram operation described below.
 2. A motorized gas valve is installed in the gas piping serving the appliances under the hood. The gas valve opens when power is applied to it. To reset the gas valve, power is applied to relay R2 by pressing the momentary pushbutton energizing R2 and closing contact R2-2, which will hold in relay R2. Whenever the gas valve is energized, a green LED on the front of the panel turns on indicating "GAS VALVE ON".
 3. To turn on the hood exhaust fan, make-up air fan and electrical circuits for appliances under the hood, turn on the fan switch. This energizes relay R1, which closes contacts R1-1, R1-2 and R1-3. R1-1 energizes a multi-pole contactor that controls electric circuits serving equipment under the hood, such as steamers, fryers, and stoves. When the contactor is energized, a green LED on the front of the panel indicates "APPLIANCES ON". Contact R1-2 allows the gas valve to open once the exhaust fan is running. Contact R1-3 automatically starts the make-up air fan. Once the make-up air fan is running, it automatically starts the hood exhaust fan. A green LED on the front of the panel indicates "HOOD EXHAUST FAN ON". Another green LED on the front of the panel indicates "MAKE-UP AIR FAN ON".
 4. When the chemical fire suppression system (Ansul system) is activated, relay A1 is energized. Contact A1-3 opens, which de-energizes relay TD and closes the gas valve. Contact A1-5 closes turning on the hood exhaust fan (if it is not on already). Contact A1-1 opens, de-energizing relay EC and opening the contactor, which de-energizes all electric circuits under the hood. Contact A1-4 opens and turns off the make-up air fan. Contact A1-3 energizes sending an alarm to the building fire alarm system (dedicated zone). Contact A1-2 will also open de-energizing the lights under the hood.
 5. Power is removed from the under-hood lights when the wet chemical system is activated.

6. TABLE OF STATES FOR VARIOUS CONDITIONS

ACTION	EXHAUST HOOD FAN	MAKE -UP AIR FAN	UNDER HOOD POWER	UNDER HOOD LIGHTS	GAS VALVE	FIRE ALARM	ANSUL SYSTEM
Initial state (control power off)	OFF	OFF	Automatic OFF	ON/OFF	Closed	Normal	Normal
Gas (Reset) Activation	ON	ON	Automatic ON	ON/OFF	Open	Normal	Normal
Cooking State (normal)	ON	Automatic ON	Automatic ON	ON/OFF	Open	Normal	Normal
Ansul Activation	Auto ON	Auto OFF	Auto OFF	Auto OFF	Auto Closed	Alarm	Activated

1.02 SUBMITTALS

A. Product Data:

1. Component and accessories list.
2. Submit shop drawings of the kitchen hood fire control panel showing all relays, contacts and contactors required for the operation of the system.
3. Shop drawings must be coordinated with the range hood submittal, make-up air unit submittal, automatic gas valve submittal, etc.

B. Operation and Maintenance Data:

1. Provide complete ladder diagram of the panel operation, which includes relay numbers and the devices they control. Relays within the panel must be numbered to correspond to the diagram. Provide a diagram for the Operations and Maintenance Manual and install a diagram within the panel.
2. Provide documentation of the panel re-start procedure.

PART 2 PRODUCTS

2.01 FABRICATION

- A. Panel Manufacturer: Easter Owens or pre-approved equivalent.
- B. Fabricate the panel from commercially available parts. Panel shall not be fabricated in the field. Panel shall be fabricated by a panel shop and shall be UL listed as an assembly or Factory Mutual label or other third party label acceptable to the State of Colorado Electrical Board for the use intended.
- C. The panel shall be a surface-mounted steel or aluminum box with a keyed lock. Comply with Division 26.

2.02 INDICATING LIGHTS

- A. Provide LED type indicating lights to show the conditions of the system per diagram at end of section.

2.03 IDENTIFICATION AND TAGGING

- A. Comply with division 26 for panel and wiring identification.
- B. Label components, such as relays and pushbuttons in the panel, as well.

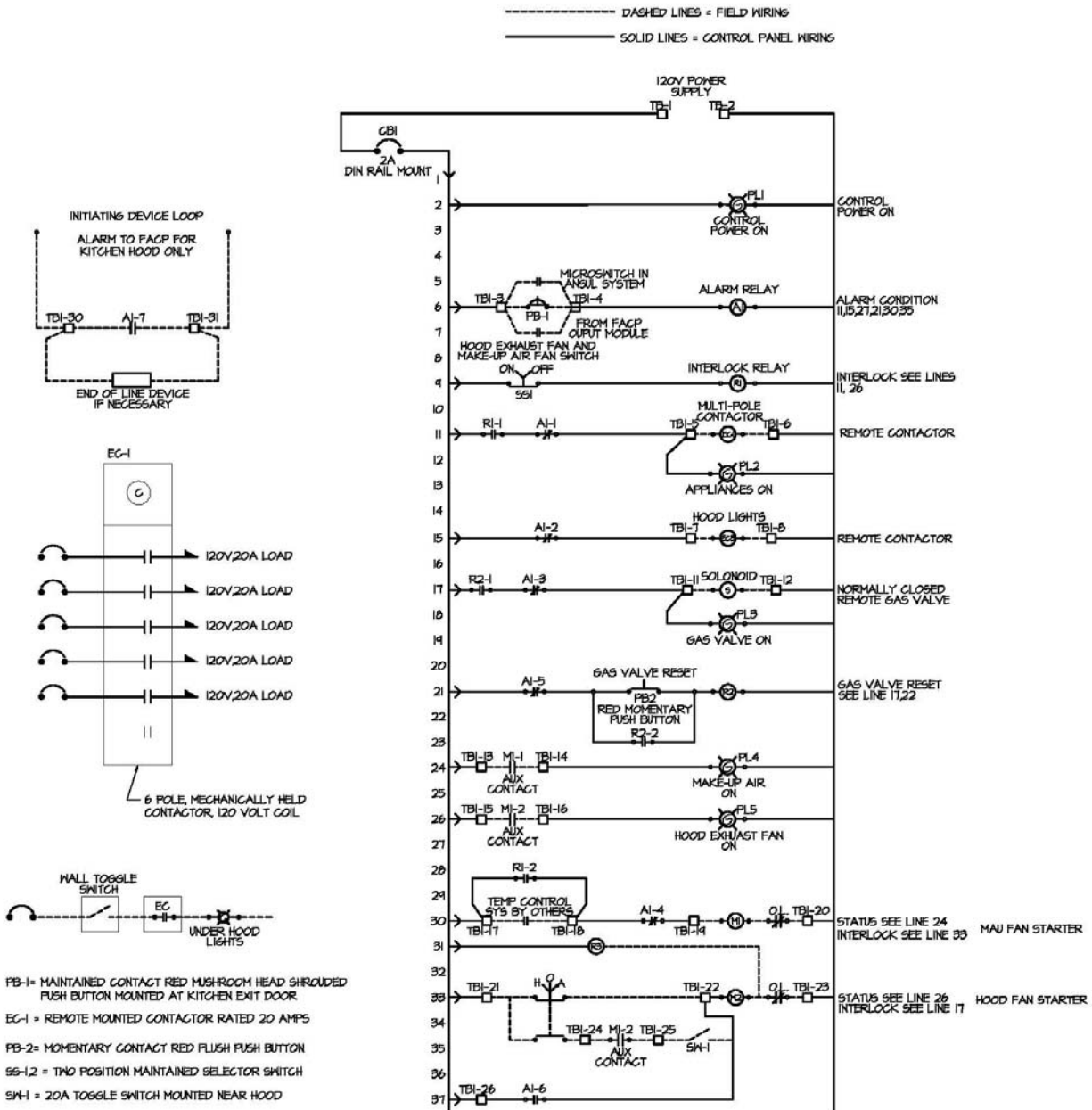
PART 3 EXECUTION

3.01 INSTALLATION

- A. Contractor shall install panel and interconnect wiring with range hood, makeup air unit, underhood lights and power, range hood control panel, fire suppression panel, gas reset buttons, fire alarm system, and exhaust hood.
- B. Top of panel mounted maximum 6'6" above finished floor.

3.02 TESTING AND DEMONSTRATION

- A. The completed system must be tested in the presence of the DPS Project Manager. The proper operation of the panel must be demonstrated, including the re-start procedure.
- B. Panel testing and demonstration for DPS personnel will be in addition to tests and inspections required by Code Authorities having jurisdiction.



KITCHEN HOOD CONTROL DIAGRAM

SCALE: N.T.S.

NOTE: THIS DIAGRAM IS TO PROVIDE DIRECTIONAL INTENT ONLY. CONTRACTOR TO SUBMIT SHOP DRAWING OF PROPOSED CONTROL PANEL WHICH MEETS THE INTENT OF DPS SPECIFICATION SECTION 16.194.

END OF SECTION 23 38 13