Accurex Kitchen Controls

Provide Kitchen Controls as shown on plans and in accordance with the following specifications:

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The Accurex Kitchen Control system shall be a UL-listed outlet center, which shall standardly consist of a NEMA-1 rated stainless steel enclosure, printed circuit board (PCB), full-color user interface, hood, audible alarm, sensor(s), and variable frequency drive(s) (VFD) or motor starters, with options for room temperature sensors and fan control through relays or 0-10 VDC signals. The PCB shall be capable of controlling multiple exhaust and supply fans via VFDs or analog signals. The control system shall utilize a combined control panel and hood light power connection with options for 110-120V / 50-60Hz / 1Ph input voltage or 220-240V / 50-60Hz / 1Ph input voltage, to be protected by a 15 Amp breaker. The control system shall be equipped with either Modbus or BACnet® MSTP Building Management interfacing. Standard Kitchen Control enclosure fitted with handled, quarter-turn, slotted latched doors, or optional prison package configuration with handled, tamper-proof quarter-turn latched doors.

The user interface shall be a full-color user interface with fan and light control, gas valve reset (optional), and balancing interfacing for proper kitchen fan balancing. The user interface shall have the capability to simultaneously control all fans and lights connected to the control panel with a single button. The user interface shall be configured to push fit into a junction box, with no visible/exposed screws.

- In the event of the failure consisting of, but not limited to, temperature sensor(s), VFD(s), and fire, the user interface will automatically go to a fault page, which will describe the current fault. The fault will remain until the failure is corrected.
- The user interface shall be lighted, full color, and utilize simple plug-and-play connections. User interfaces shall be mounted on the exhaust hood, a utility cabinet on the hood or wall, or shipped loose for remote mounting. If user interface is shipped loose for remote mounting, it shall be provided alongside an optional 50 ft or 100 ft plug-and-play CAT5E cable for connection to the main control PCB. All user interface mounting options will set the full-color user interface centered on a stainless steel faceplate, with no visible screws or fasteners on the faceplate.

Standard Constant Volume System Operation (XKC-CV-S):
The standard constant volume Kitchen Controls shall utilize resistive-type temperature sensors that are mounted in the capture tank of the hood to monitor exhaust air temperatures, and an optional room temperature sensor, shipped loose, to be installed to detect ambient air temperatures in the kitchen space. Temperature sensors shall be made of stainless steel and shall be installed in a UL-approved coupling. The standard constant volume system shall be capable of accepting hood temperature readings from up to 8 hood-mounted temperature sensors, controlled via a single user interface, with control for up to 8 fans (4 of which may be supply fans).

The system shall be capable of serving as an IMC-compliant auto start-up control to automatically start the fans during cooking operations. Auto start-up operation is controlled by the measurement of an excess offset temperature between the exhaust temperature caused by cooking and the ambient room temperature in the kitchen (default offset temperature: 25°F, adjustable). If not equipped with a room temperature sensor, auto start-up operation shall be controlled by the measurement of an excess offset temperature between the exhaust temperature caused by cooking and the constant, preset room temperature (default preset room temperature set point: 75°F, adjustable, default offset temperature: 25°F, adjustable, default auto start-up initiates at 100°F as measured by the hood temperature sensor(s)). If any fan(s) are activated through the auto start-up operation, the fan(s) will not shut off automatically until the measured hood temperature(s) remains [temp interlock hysteresis]°F below the room temperature (preset or actual) for the length of the hysteresis timer (default temp interlock hysteresis: 10°F, adjustable, default hysteresis timer: 10 minutes).

After fan initiation is triggered, either manually, through the user interface, or through the auto start-up operation, the controller shall operate the associated exhaust and supply fan(s) at their design speeds via motor starters, VFDs, or analog signals. Control system shall also be fully compatible with 24VAC coil motor starters.

Advanced Constant Volume System Operation (XKC-CV-A):
The advanced constant volume Kitchen Controls shall utilize resistive type temperature sensors that are mounted in the capture tank of the hood to monitor exhaust air temperatures, and an optional room temperature sensor, shipped loose, to be installed to detect ambient air temperatures in the kitchen space. Temperature sensors shall be made of stainless steel and shall be installed in a UL-approved coupling. The advanced constant volume system shall be capable of accepting temperature readings from up to 16 individual kitchen hood sections, controllable via as many as 16 hood user interfaces , with control for up to 8 fans (4 of which may be supply fans). Advanced controls also allow for control of Accurex wash-style hoods.

The system shall be capable of serving as an IMC-compliant auto start-up control to automatically start the fans during cooking operations. Auto start-up operation is controlled by the measurement of an excess offset temperature between the exhaust temperature caused by cooking and the ambient room temperature in the kitchen (default offset temperature: 25°F, adjustable). If not equipped with a room temperature sensor, auto start-up operation shall be controlled by the measurement of an excess offset temperature between the exhaust temperature caused by cooking and the constant, preset room temperature (default preset room temperature set point: 75°F, adjustable, default offset temperature: 25°F, adjustable, default auto start-up initiates at 100°F as measured by the hood temperature sensor(s)). If any fan(s) are activated through the auto start-up operation, the fan(s) will not shut off automatically until the measured hood temperature(s) remains [temp interlock hysteresis]°F below the room

temperature (preset or actual) for the length of the hysteresis timer (default temp interlock hysteresis: 10°F, adjustable, default hysteresis timer: 10 minutes).
After fan initiation is triggered, either manually, through the user interface, or through the auto start-up operation, the controller shall operate the associated exhaust and supply fan(s) at their design speeds via motor starters, VFDs, or analog signals. Control system shall also be fully compatible with 24VAC coil motor starters.

Standard Variable Volume System Operation (XKC-DCV-S):
The standard variable volume (DCV-S: Standard Demand Control Ventilation) Kitchen Controls shall utilize resistive-type temperature sensors that are mounted in the capture tank of the hood to monitor exhaust air temperatures, and an optional room temperature sensor, shipped loose, to be installed to detect ambient air temperatures in the kitchen space. Temperature sensors shall be made of stainless steel and shall be installed in a UL-approved coupling. The standard variable volume system shall be capable of accepting temperature readings from up to 8 hood-mounted temperature sensors, controlled via a single user interface, with control for up to 8 fans (4 of which may be supply fans).

The system shall be capable of serving as an IMC-compliant auto start-up control to automatically start the fans during cooking operations. Auto start-up operation is controlled by the measurement of an excess offset temperature between the exhaust temperature caused by cooking and the ambient room temperature in the kitchen (default offset temperature: 25°F, adjustable). If not equipped with a room temperature sensor, auto start-up operation shall be controlled by the measurement of an excess offset temperature between the exhaust temperature caused by cooking and the constant, preset room temperature (default preset room temperature set point: 75°F, adjustable, default offset temperature: 25°F, adjustable, default auto start-up initiates at 100°F as measured by the hood temperature sensor(s)). If any fans(s) are activated through the auto start-up operation, the fan(s) will not shut off automatically until the measured hood temperature(s) remains [temp interlock hysteresis]°F below the room temperature (preset or actual) for the length of the hysteresis timer (default temp interlock hysteresis: 10°F, adjustable, default hysteresis timer: 10 minutes).

After fan initiation is triggered, either manually, through the user interface, or through the auto start-up operation, the controller shall modulate the speed of the fans via VFD(s) or analog signal(s), from maximum speed down to a minimum speed percentage (minimum speed to be determined by building test and balance, minimum speed is factory defaulted to 50%). After fan initiation is triggered, the initial activation temperature is recorded as the room temperature at activation plus the offset temperature (default offset temperature: 25°F, adjustable). If not equipped with a room temperature sensor, the activation temperature shall be recorded as the preset room temperature plus the offset temperature (default preset room temperature set point: 75°F, adjustable, default offset temperature: 25°F, adjustable, default activation temperature shall be 100°F as measured by the hood temperature sensor(s)). Speed modulation of the fans shall be controlled through the difference between activation temperature and the highest current temperature recorded at the hood temperature sensor(s). Minimum fan speed shall occur when the current hood temperature equals the activation temperature, and maximum fan speed shall occur when the current hood temperature is equal to or exceeds the activation temperature plus the modulation temp range (modulation temp range default: 30°F, adjustable). Speed control shall be controlled through VFD(s) or analog signal(s) shall allow modulation of the fan speeds. The controller must be compatible with modulation turndown of up to 50% of maximum fan speed. Upon pressing the “Max Fan” button, exhaust fan speeds shall go to maximum speed for 10 minutes (adjustable), or until the “Max Fan” button is pressed again, which shall return the system to full temperature control.

If provided, variable frequency drives shall be Yaskawa brand (or equivalent), mounted in the control enclosure, a utility cabinet, or at the exhaust/supply fan itself. If variable frequency drives are mounted within the control enclosure, enclosure shall be equipped with a cooling fan and louver to facilitate ventilation for the variable frequency drives. Variable drives shall provide thermal overload protection to fans and eliminate the need for magnetic starters for 3-phase motors. To ensure proper building pressurization, the supply fans shall respond to changes in the exhaust fans' speeds. The speed of the associated supply fan(s) is either determined by the weighted average percent speed of that supply fan(s) associated exhaust fan(s) (default) or is controlled by maintaining the original design exhaust/supply CFM differential.

Advanced Variable Volume System Operation (XKC-DCV-A):
The advanced variable volume (DCV-A: Advanced Demand Control Ventilation) Kitchen Controls shall utilize resistive-type temperature sensors that are mounted in the capture tank of the hood to monitor exhaust air temperatures, and optional room temperature sensor(s), shipped loose, to be installed to detect ambient air temperatures in the kitchen space. Temperature sensors shall be made of stainless steel and shall be installed in a UL-approved coupling. The advanced variable volume system shall be capable of accepting temperature readings from up to 16 individual kitchen hood sections, controllable via as many as 16 hood user interfaces , with control for up to 8 fans (4 of which may be supply fans). Advanced controls also allow for control of Accurex wash-style hoods and can optionally incorporate optic sensors from exhaust hoods. Optional capture tank-mounted listed optic sensors can be used to detect visible emissions to control exhaust fan(s) speed.

The system shall be capable of serving as an IMC-compliant auto start-up control to automatically start the fans during cooking operations. Auto start-up operation is controlled by the measurement of an excess offset temperature between the exhaust temperature caused by cooking and the ambient room temperature in the kitchen (default offset temperature: 25°F, adjustable). If not equipped with room temperature sensor(s), auto start-up operation shall be controlled by the measurement of an excess offset temperature between the exhaust temperature caused by cooking and the constant, preset room temperature (default preset room temperature set point: 75°F, adjustable, default offset temperature: 25°F, adjustable, default auto start-up initiates at 100°F as measured by the hood temperature sensor(s)). If any fans(s) are activated through the auto start-up operation, the fan(s) will not shut off automatically until the measured hood temperature(s) remains [temp interlock hysteresis]°F below the room temperature (preset or actual) for the length of the hysteresis timer (default temp interlock hysteresis: 10°F, adjustable, default hysteresis timer: 10 minutes).

After fan initiation is triggered, either manually, through the user interface, or through the auto start-up operation, the controller shall modulate the speed of the fans via VFD(s) or analog signal(s), from maximum speed down to a minimum speed percentage (minimum speed to be determined by building test and balance, minimum speed is factory defaulted to 50%). After fan initiation is triggered, the initial activation temperature is recorded as the room temperature at activation plus the offset temperature (default offset temperature: 25°F, adjustable). If not equipped with a room temperature sensor, the activation temperature shall be recorded as the preset room temperature plus the offset temperature (default preset room temperature set point: 75°F, adjustable, default offset temperature: 25°F, adjustable, default activation temperature shall be 100°F as measured by the hood temperature sensor(s)). Speed modulation of the fans shall be controlled through the difference between activation temperature and the highest current temperature recorded at the hood temperature sensor(s). Minimum fan speed shall occur when the current hood temperature equals the activation temperature, and maximum fan speed shall occur when the current hood temperature is equal to or exceeds the activation temperature plus the

modulation temp range (modulation temp range default: 30°F, adjustable). If equipped with optic sensors, upon optics threshold being met or exceeded (optics threshold default: 20%, adjustable), fans will be forced to maximum fan speed. Once optics threshold is no longer met, fans will continue at max speed operation until optics override timer is completed (optics override timer default: 15 seconds, adjustable). If optics threshold is still not met after optics override timer has finished, system will return fans to operation based off exhaust temperatures.

Speed control shall be controlled through VFD(s) or analog signal(s) shall allow modulation of the fan speeds. The controller must be compatible with modulation turndown of up to 50% of maximum fan speed. Upon pressing the “Max Fan” button, exhaust fan speeds shall go to maximum speed for 10 minutes (adjustable), or until the “Max Fan” button is pressed again, which shall return the system to full temperature control.

If hoods are provided with supply plenum(s), the supply plenum(s) may be equipped with temperature sensor(s) (maximum of 2 supply plenum temp sensors per hood section). The supply air temperature can be viewed via BMS integration for monitoring purposes.

If provided, variable frequency drives shall be Yaskawa brand (or equivalent), mounted in the control enclosure, a utility cabinet, or at the exhaust/supply fan itself. If variable frequency drives are mounted within the control enclosure, enclosure shall be equipped with a cooling fan and louver to facilitate ventilation for the variable frequency drives. Variable drives shall provide thermal overload protection to fans and eliminate the need for magnetic starters for 3-phase motors. To ensure proper building pressurization, the supply fans shall respond to changes in the exhaust fans' speeds. The speed of the associated supply fan(s) is either determined by the weighted average percent speed of that supply fan(s) associated exhaust fan(s) (default) or is controlled by maintaining the original design exhaust/supply CFM differential.

Standard Sump Wash Only System Operation (XKC-SWO-S):
The standard sump wash only Kitchen Controls shall allow the connection of up to 8 duct sump solenoids to a single controller.

The system shall be capable of washing on a predetermined schedule, on command, via a building management system binary point, or through a digital input to the board. The wash shall consist of an initial rinse (default rinse time: 60 seconds, adjustable), detergent wash (default detergent time: 120 seconds, adjustable), soak (default soak time: 60 seconds, adjustable), and drain (default drain time: 60 seconds, adjustable). During the wash sequence, the user interface shall optionally display the wash status, allowing the user to identify the amount of time remaining for each portion of the wash sequence.

Each duct sump shall be provided with a ¾-inch solenoid valve with 24 VAC electrical connections. Each valve will need to be wired back to the sump wash only control panel using minimum of 18-gauge low-voltage conductors. Duct sump wash will be aborted if a fire condition is detected or an optional digital input configured for disabling the wash is closed.

Additional Information:
In a fire condition, the control panel shall be capable of forcing the exhaust to maximum speed, shutdown of supply air, and shutdown of lights regardless of current fan speeds via integration with a fire system. Optional features may include, but are not limited to:

- BACnet® IP Building Management System Interface
- Fan Proving Options
    - Optional “Supply Only” proving; proving supply fan(s) are operational within a configurable time limit before exhaust fan(s) can operate
    - Options “Exhaust and Supply” proving; supply must prove operation before exhaust can operate. After initial operation, both must prove operation with a time limit to keep all fans running.
- High Temperature Alarm
- Wash Interface
- Prison Package Configuration
    - Replaces exterior, visible screws with tamper-proof screws and provides a keyed door latch.

Due to continuous research, Accurex reserves the right to change specifications without notice.

Engineering simplicity into kitchen ventilation systems.