

FEATURES & BENEFITS

- Combines six control & monitoring functions.
- Saves fuel and improves safety.
- Multiple draft control functions.
- Flue gas temperature indicator/transmitter.
- Electronic draft gauge.
- Draft range transmitter.
- Menu-driven setup.
- ISA Sequence M FGT alarm.
- Integral lowdraft/high pressure cutoff switch.
- Economical: long-term returns on low initial investment.
- Replaces Series 7710 & DCR controllers & others.
- DEP, CUL & UL Approvals.
- Modbus Serial Communications.
- Field Configurable for all control & monitoring functions.
- Processor Diagnostic LED's.

INTRODUCTION

The **Hays Cleveland C-07720 Draft Control System** is a state of the art product that combines, in one package, all the components of draft control, flue gas monitoring and safety:

- High performance microprocessor for accurate draft control.
- Draft sensor (No external transmitter is required.)
- Draft range signal for monitoring.
- Electronic draft reading.
- Flue gas temperature transmitter and reading.
- Flue gas temperature alarm.
- Low draft or high pressure cutoff switch.

The solid-state design eliminates the repair expenses associated with draft controllers that use mechanical switching mechanisms or general purpose controllers.

WHY DRAFT CONTROL?

Draft control is essential to both fire tube and water tube boiler applications. Boilers with stack heights of 25–30 feet (or even boilers with stub stacks) benefit from proper draft control and monitoring: it improves heat transfer and combustion efficiency, reduces room heat loss, improves flame stability, reduces pilot light failure and improves flame retention. Efficiency improves dramatically when a **Hays Cleveland C-07720 Draft Control System** is applied!

SERIES C-07720

Draft Control System



STANDARD PACKAGE

Standard **C-07720** features provide a simple operator interface and accurate control. The unit is field-configured by means of the front panel pushbuttons (ENTER, INCREASE, DECREASE, RESET) and simple jumper changes on the processor board. Draft control logic functions include non-sequencing, sequencing, pre- and post-purge, and adjustable start. The bright, two-line, vacuum-fluorescent display shows the control parameters, alarms and sensor values in engineering units.

Since the draft pressure is displayed on the draft controller, there is no need for a separate mechanical gauge and its piping. The draft signal is retransmitted as 4-20 mA DC for a range of -2.0 to + 2.0" w.c. A 3-mode selector switch (CLOSE/AUTO/OPEN) allows manual damper positioning.

The integral draft sensor is a piezoresistive, silicon element capable of measuring positive or negative pressure directly. The sensor is temperature-compensated and produces an electrical signal directly proportional to the pressure in the boiler. The controller output through zero-crossover-switching relays is selectable for bi-directional, switched 117v AC or 24v AC to operate the damper electric actuator. Adjustable dead band and damping circuits filter out process noise, eliminating cycling.

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The **C-07720** Draft Control System interfaces with any burner management system. The 10 amp burner interface relays ensure reliable service.

Processor diagnostic LED displays are employed for troubleshooting, alarms and operations. The LED's indicate status functions such as processor running, increase/decrease control action, modulation mode, alarms, and status with the burner management system.

CONTROL FUNCTIONS & UPGRADES

The standard **C-07720** Draft Control System package provides suitable draft control for any fire tube or industrial water tube boiler. It is **fully field-configurable**: simply set the jumpers on the processor board to select the appropriate sequence of operation to interface with the burner management system (BMS) and final control actuator. The **C-07720** Draft Control System is factory-configured to one of the following four model designations, which can be reconfigured onsite.

Model C-07720-*0-1- Non-Sequencing Action:

This model provides non-sequencing modulation of the damper when used with Hays Cleveland F-09140-010-1 Linear Actuator or equal. It does not interface with a burner management system. **Model C-07720-*0-1** replaces Hays Cleveland 7711 & DCP-E units.

Model C-07720-*0-2- Sequencing With Adjustable Start Actuator Positioning:

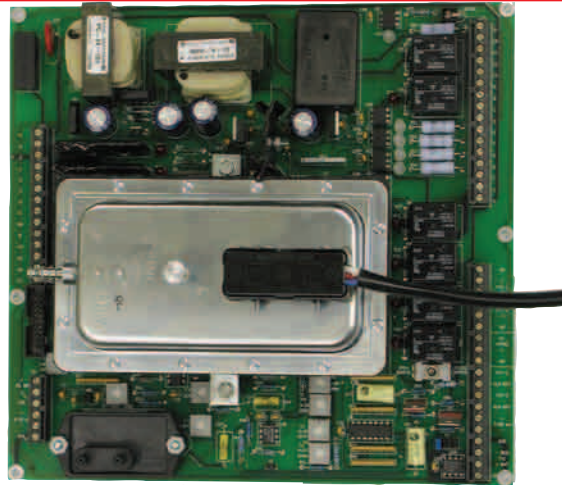
This model permits adjustable start at a pre-selected "light-off" position when used with Hays Cleveland F-09140-010-1 Linear Actuator or equal, and interfaces with the burner management system to open and close the damper. When the safe flame is established, the actuator modulates over the complete range. **Model C-07720-*0-2** is also used for stoker applications and replaces Hays Cleveland 7712-41 & DCR-AS-G units.

Model C-07720-*0-3- Sequencing with Adjustable Start & Post-purge:

This model functions the same as the C-07720-*0-2 but with **post-purge capability** when used with Hays Cleveland F-09140-010-1 Linear Actuator or equal. When the damper is at the adjustable start position during boiler startup, the post-purge timer is energized. Upon boiler shutdown, the damper remains open for 20 seconds and then closes. **Model C-07720-*0-3** replaces Hays Cleveland 7713-43 & DCR-AS-PP-G units.

Model C-07720-*0-4- Sequencing With Adjustable Start, Post Purge & Pre-Purge:

This model functions the same as the C-07720-*0-3 but with **pre-purge, adjustable 20 to 120 seconds, and post-purge, adjustable 0 to 120 seconds**, when used with Hays Cleveland F-09140-010-1 Linear Actuator or equal. When the boiler is starting up through the burner management system limits, the damper opens completely and the pre-purge timer starts. When the pre-purge time expires, the actuator closes to the adjustable start position. Upon boiler shutdown the post-purge function commences as set with the adjustable timer. **Model C-07720-*0-4** replaces Hays Cleveland 7714-20-A & DCR-111 units.



Optional integral Low Draft/High pressure switch mounted on C-07720 Printed circuit Board Assembly.

OPTIONS

Optional features add the functions of several instruments to the basic **C-07720 Draft Control System** without increasing the panel space required. Installation is much simpler than when separate instruments are used, and the panel connections are centralized for further convenience.

Low Draft/High Pressure Switch: traditional installations required a separate safety switch and separate piping for it. The **C-07720 Draft Control System** has an optional **integral** UL-approved switch that prevents the firing of the boiler when the draft (whether natural or induced) is insufficient. On balanced draft systems, the switch cuts off firing when the draft falls **below** a selected minimum set point. On pressure-fired systems, the switch cuts off firing when the pressure rises **above** a selected maximum set point. In either case, nuisance shut-downs due to momentary "puffs" or fluctuations are avoided by means of an 9±3 second delay relay. The set point for the switch is adjustable, .05±.02" to 12.0" w.c.

Flue Gas Temperature Alarm & Indicator Transmitter: traditionally, this function has been accomplished with a separate instrument such as the Hays Cleveland Model D-06111 Thermocouple Meter or equivalent. The optional integral instrumentation of the **C-07720 Draft Control System** reduces equipment and installation costs. This option meets ISA Sequence M requirements for monitoring flue gas temperature and causing an alarm to occur when the flue gas exceeds safe limits. A Type J thermocouple is provided. The temperature range (32 to 999 deg F or 0 to 537C, selectable) is displayed on the front panel and re-transmitted as a 4-20 mADC signal. Dual alarm outputs are standard for visual alarm (Lo/Hi) and burner shutdown (Hi/Hi). Alarm set points are adjustable. The Lo/Hi alarm resets automatically. There is a choice of local manual reset, remote manual reset, or automatic reset for the Hi/Hi alarm. Thermocouple fault is displayed on the front panel, and the output goes to maximum.

