

## North American Valve and Flow Profiler

Bulletin 8390



Characterize multiple valves or flows over the whole range of demand input

- Precise positioning of up to four valves in relationship to each other
- Commonly used on air heaters, boilers, process heaters, ...
- Up to six profiles available
- Demand and trim inputs
- Temperature inputs
- Replaces complex mechanical linkages linkages
- Complete flexibility in profiling
- On line profile entry
- Touchscreen HMI
- User selectable name for each loop
- Selection of a feedback signal and alarming per loop
- Closed loop control

Most valves have a characteristic non-linear relationship between flow and percent open. In most combustion systems, controlling multiple valve positions simultaneously allows for efficient combustion over the full operating range. North American's 8390 Valve and Flow Profiler is an easy-to-use controller that replaces linked-valve arrangements and provides precise positioning of air, fuel, O<sub>2</sub>, FGR, and other valves.

The Valve and Flow Profiler accepts a 4-20 mA signal as its demand input from any process control device (PC, PLC, or single loop controller). This signal dictates the loop setpoints or valve positions according to their respective predefined profiles. Each valve is entirely independent of the others and depends only on the demand signal and its own profile.

Minor adjustments to each valve position can be made based on a trimming input signal. Valve positions can also be configured (via operator input) with a constant bias. These features can be enabled separately for any of the four valve positions. The trim input signal can represent O<sub>2</sub> trim, XSA trim or any other 4-20 mA trim signal.

Two 4-20 mA temperature inputs are available to temperature compensate flows used for loop feedback. Each loop can be configured to use either input or none.

Configuring the 8390 Valve and Flow Profiler is easy. Each of the six possible profiles consists of up to 11 demand settings between 0% and 100%, and each profile can contain up to four motors. Setup requires only the entry of the loop setpoints or valve positions of each valve in use. Parameters in the setup also determine the behavior of each valve with respect to furnace conditions of purge, low fire, light-off, and excess air. Profiles can be adjusted at any time, even while in use.

The Valve and Flow Profiler can be factory configured if a completed configuration sheet (8390-1) is supplied.

## SPECIFICATIONS

### Processor and I/O (Panel Mounted)

**Operating temperature:** 0 to 130 F (-17 to 55 C)  
**Approvals:** CE, CSA, UL, CUL  
**Power supply - Voltage:** 85 to 264 VAC  
**Power Supply - Current:** 0.3 A at 120 VAC (0.15 A at 240 VAC)  
**Line Frequency:** 50/60 Hz  
**Power Dissipation:** 18.5 W  
**Built in 24VDC Power Supply:** 400mA Max (not for customer use)  
**Dimensions:** 8" x 4.57" x 3" (204 x 116 x 75 mm)  
**Profinet Port Address:** 10.1.220.198

### Operator Interface Terminal (Door Mounted)

**Operating Temperature:** 32 to 122 F (0 to 50 C)  
**Enclosure Type 4X** ( Indoor use only)  
**Approvals:** CE, CSA, UL, CUL Listed 74D7  
**Power Supply Voltage:** 24 VDC (19.2 to 28.8 VDC)  
**Power Supply Current:** 0.35 A  
**Dimensions - Front Panel:** 8.424" x 6.22" (214 x 158 mm)  
**Dimensions - Panel Cutout:** 7.756" x 5.551" (197 x 141 mm)  
**Display:** 6" Touch screen with 6 pushbuttons  
**Profinet Port Address:** 10.1.220.199

### External 24 VDC Power Supply (Required)

**Power Supply - Voltage:** 19.2 to 28.8 VDC  
**Power Supply - Current :** 0.55 Amp (minimum)

### Digital Inputs (Quantity 13)

**Voltage:** 24 VDC  
**Current:** 4 mA nominal

### Digital Outputs (Quantity 8)

**Type:** Relay, Dry Contact  
**Voltage:** 5 to 30 VDC or 5 to 250 VAC  
**Current:** 2.0 A max

### Analog Inputs - Current (Quantity 8)

**Range:** 0 to 20 mA, 0-5 VDC  
**Impedance:** 250 ohm  
**Max Voltage:** +/-35 VDC  
**Max Current:** +/-40 mA  
**Cable Length:** 100 meters twisted and shielded

### Analog Outputs (Quantity 4)

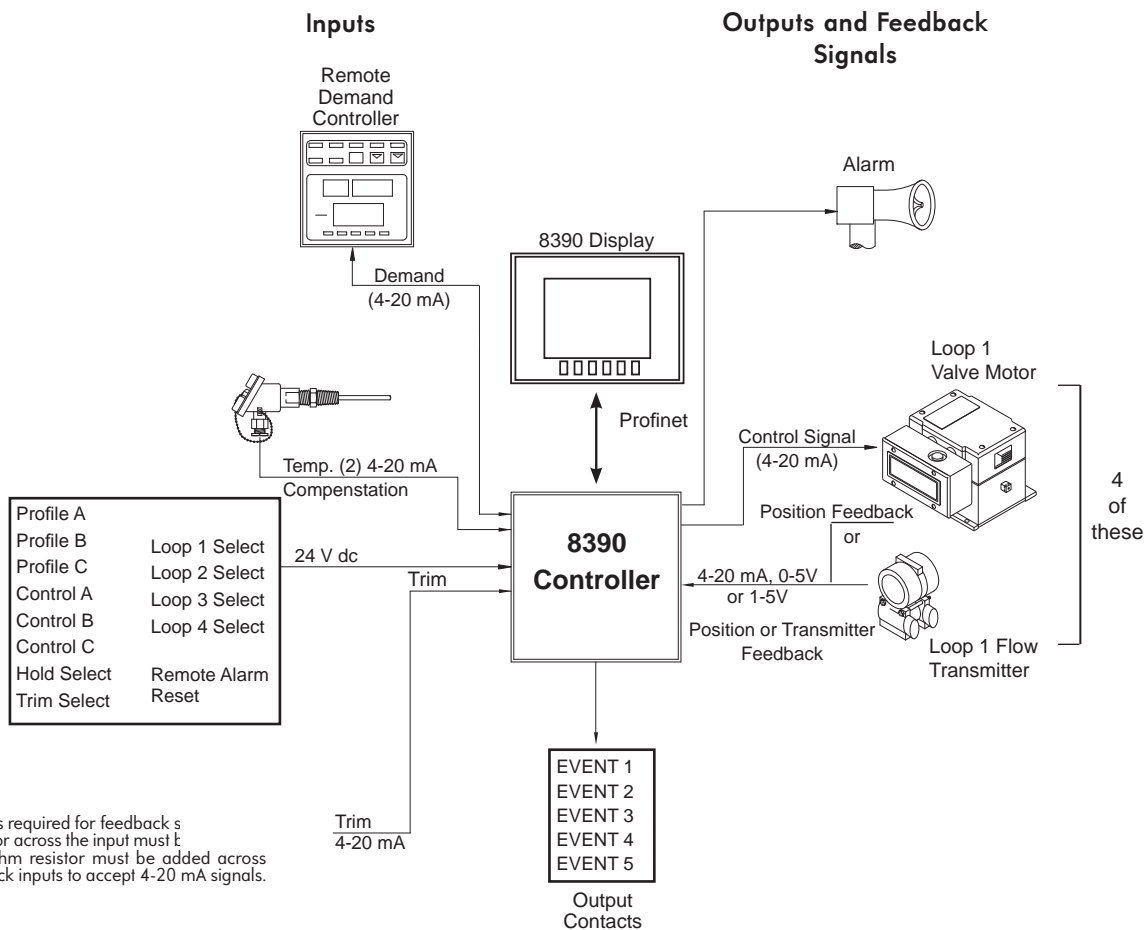
**Range:** 0 to 20 mA  
**Load Impedance:** <600 ohms  
**Cable Length:** 100 meters twisted and shielded

### Control Valve Actuators

**Modulating Accuracy:** Minimum 160 repositions through 90 degrees of travel are recommended (North American 1615 series or similar).

Note: Low accuracy actuators will likely produce large flow variations and continuous hunting. Models with 55 repositions through 90 degrees of travel are not recommended.

## TYPICAL 8390 SYSTEM



**NOTE:** If 0-5 VDC is required for feedback the 250 ohm resistor across the input must be added. Similarly, a 250 ohm resistor must be added across the desired feedback inputs to accept 4-20 mA signals.

**WARNING:** Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160F in operation and present a contact hazard. Fives North American Combustion, Inc. urges compliance with National Safety Standards and Insurance Underwriters' recommendations, and care in operation.