# FENWAL CONTROLS

...the name OEMs have trusted for over 80 years.

Fenwal Controls was founded in 1935, and versions of our original THERMOSWITCH® control are still in production today. With over 80 years of expertise, we offer a broad range of gas ignition and temperature controls for applications such as HVAC, commercial cooking, industrial fire protection, medical and agriculture. Trust Fenwal Controls to provide reliable and cost-effective products custom configured to your needs.



Kidde-Fenwal Inc., Headquarters - Ashland, Massachusetts USA

## Gas Ignition Controls

Fenwal Controls pioneered automatic gas burner technology and today offers a complete line of globally-approved gas ignition controls. Direct spark, hot surface and intermittent pilot configurations are available in a wide range of input voltages. Our microprocessor-based controls provide precise, repeatable and safe operation for all types of gas-fired equipment.

## Temperature Controllers

Fenwal Controls' long tradition started with the Fenwal Controls THERMOSWITCH® controller, and has expanded to include both temperature controllers and bimetal thermostats for control and limiting applications. We specialize in high-precision, custom-configured products for air-sensing and immersion-type applications.

## Fire & Overheat Detection

Fenwal Controls is a world leader in mechanical heat detectors. We offer rate-compensated heat detectors suitable for initiating an alarm or actuating a fire suppression system. Featuring a hermetically sealed, tamper-proof mechanism, the Fenwal Controls DETECT-A-FIRE® heat detector provides reliable performance even under harsh environmental conditions.

## Global Approvals

We offer a complete line of Globally Approved Gas Ignition and Temperature Sensing Controls conforming to the following standards where applicable:

FM APPROVED   CSA®   UL   CE   AGA   RoHS 2011/65/EU

# Gas Ignition Controls

# Bimetal Thermostats, Hi-Limits, Temperature Limiting Switches

# THERMOSWITCH®
# Temperature Controller

# DETECT-A-FIRE®
# Fire & Overheat Detection

# Resources

# GAS IGNITION CONTROLS —
# 12 VDC, 24 VAC and 120 VAC

**Advanced, microprocessor-based designs safely operate the gas valve and the ignition source while continually supervising the proper operation of the gas burner.**

## Features

Ignition types: Direct Spark (DSI),
Hot Surface (HSI), Intermittent Pilot (IP)

- DETECT-A-FLAME® technology for exceptional flame sensitivity
- Configurable timings to a wide range of gas-fired appliances & requirements.
- Optional Combustion Blower Relay with Airflow Monitoring
- On-board Diagnostic LED
- Remote or Local Flame Sense
- Flame Current Test Pins
- Optional one hour Automatic Reset
- EN298 Approved Models meet RoHS2

### 35-40 and 35-50 Series for 12 VDC/24DC

Ignition types: Direct Spark (DSI) and Hot Surface (HSI)

**Typical Applications**
- Mobile equipment such as RV water heaters and furnaces, construction heaters, fuel cells
- Commercial cooking, furnaces, gas appliances using universal power

| SERIES NUMBER | TYPE | DESCRIPTION | ENCLOSURE | DIMENSIONS | APPROVALS |
|---|---|---|---|---|---|
| **Without Combustion Blower Relay** | | | | | |
| 35-40 | DSI | • SMT with Pin Connector<br>• Non-volatile lockout with manual reset | Board Only<br>Cover & Base | 4.70" x 3.10" x 2.00"<br>5.32" x 3.29" x 2.00" | ⑤Ⓟ CE 🔥 |
| 35-52 | DSI | • Edge connector<br>• No LED Diagnostics | Board Only | 4.00" x 2.30" x 1.50" | ⑤Ⓟ ⓊⓁ |
| **With Combustion Blower Relay** | | | | | |
| 35-535 | DSI | • Edge or Pin connector<br>• Airflow switch monitoring | Board Only<br>Cover & Base | 4.25" x 3.25" x 1.75"<br>4.42" x 3.42" x 1.94" | ⑤Ⓟ CE |
| 35-533 | DSI | • Small footprint<br>• Advanced technology | Board Only | 4.25" x 2.60" x 1.50" | ⑤Ⓟ |

## 35-60 Series for 24 VAC

Ignition types: Direct Spark (DSI), Intermittent Pilot (IP) and Hot Surface (HSI)

### Typical Applications
• Boilers, Furnaces, Water Heaters, Unit Heaters, Pool Heaters, Commercial Cooking Equipment

| SERIES NUMBER | TYPE | DESCRIPTION | ENCLOSURE | DIMENSIONS | APPROVALS |
|---|---|---|---|---|---|
| **Without Combustion Blower Relay — QC Connections (unless noted)** | | | | | |
| 35-60 | DSI | • Full-featured control suitable for any 24VAC DSI application<br>• EN298 approved models available | Cover & Base | 5.69" x 3.97" x 2.30" | |
| | | | Board Only | 5.50" x 3.75" x 1.98" | |
| 35-608 | DSI | • QC terminals or Pin Connector<br>• Non-volatile lockout with manual reset<br>• 5A gas valve relay | Board Only | 5.00" x 3.73" x 2.50" | |
| | | | Cover & Base | 5.20" x 3.95" x 2.50" | |
| 35-602 Mini | DSI | • Small footprint Model with multi-pin connector<br>• No LED diagnostics | Board Only | 4.00" x 2.30" x 2.33" | |
| | | | Potted Module | 5.37" x 2.53" x 2.35" | |
| 35-62 | DSI | • Dual Point Ignition model with dual flame sensing<br>• Ideal for many Commercial Cooking applications | Cover & Base | 5.69 " x 5.31" x 2.30" | |
| | | | Board Only | 5.5" x 5.12" x 1.84" | |
| 35-63 | IP | • Up to 90 seconds TFI for pilot applications<br>• Mounts directly on 4" junction box | Cover & Base | 5.69" x 3.97" x 2.30" | |
| | | | Board Only | 5.50" x 3.75" x 1.98" | |
| 35-63J | IP | • Johnson Controls® form/fit/function replacement - All ¼" QC with Rajah HV terminal | Cover & Base | 4.92" x 3.32" x 2.80" | |
| | | | Board Only | 4.70" x 3.10" x 2.80" | |
| 35-65 | HSI | • Remote or Local Flame sensing in same unit<br>• CSA, EN298 and FM Approved models available<br>• Optional dual 120/240 VAC model available | Cover & Base | 5.69" x 3.97" x 1.62" | |
| | | | Board Only | 5.50" x 3.75" x 1.85" | |
| **With Combustion Blower Relay — QC Connections** | | | | | |
| 35-61 | DSI | • Airflow Switch monitoring and diagnostics<br>• EN298 approved models available | Cover & Base | 5.69" x 3.97" x 2.30" | |
| | | | Board Only | 5.50" x 3.75" x 1.98" | |
| 35-66 | HSI | • Airflow Switch monitoring<br>• Optional Dual Speed Blower<br>• Optional dual 120/240 VAC model available | Cover & Base | 5.67" x 3.97" x 1.62" | |
| | | | Board Only | 5.50" x 3.75" x 1.85" | |
| 35-67 | HSI | • Proven Ignition applicable for 400K to 2.5 million BTU<br>• Airflow Switch and Low-voltage monitoring<br>• Manual or Automatic reset with CSD-1 versions available | Cover & Base | 5.69" x 5.31" x 1.81" | |

## 35-80 Series for 24 VAC

Ignition types: Direct Spark (DSI)

### Typical Applications
• Space Heaters; Rooftop HVAC Units, Furnaces

| SERIES NUMBER | TYPE | DESCRIPTION | ENCLOSURE | DIMENSIONS | APPROVALS |
|---|---|---|---|---|---|
| 35-80 | DSI | • Integrated Indoor and combustion blower functions with airflow and limit switch monitoring<br>• Heat/Cool or Heat Only models | Board Only | 5.75"x4.50"x1.80" | |

NOTE: For detailed product information and specifications, visit **fenwalcontrols.com**. If a specific design, capability, or combination of features is not shown, please contact us, as custom control solutions for OEMs are our daily business.

## 35-70 Series for 120 VAC

Ignition types: Direct Spark (DSI), Intermittent Pilot (IP) and Hot Surface (HSI)

### Typical Applications
• Radiant and Infrared Heaters, Construction Heaters, Agricultural Equipment, Gas Lighting

| SERIES NUMBER | TYPE | DESCRIPTION | ENCLOSURE | DIMENSIONS | APPROVALS |
|---|---|---|---|---|---|
| **Without Combustion Blower Relay** | | | | | |
| 35-70 | DSI | • Multi-pin or quick-connect versions<br>• Option for 24VAC thermostat signal | Cover & Base | 5.11" x 3.55" x 2.00" | CSA UL FM |
| | | | Board Only | 4.92" x 3.37" x 1.99" | |
| | | | Potted Module | 6.16" x 3.81" x 1.80" | |
| 35-703 | IP | • Intermittent Pilot operation<br>• Multi-pin or quick-connect versions | Cover & Base | 5.11" x 3.55" x 2.00" | CSA |
| | | | Board Only | 4.92" x 3.37" x 1.99" | |
| | | | Potted Module | 6.16" x 3.81" x 1.80" | |
| 35-72 | DSI | • Compact footprint<br>• No LED diagnostics<br>• Multi-pin connector | Board Only | 4.00" x 2.30" x 2.33" | CSA |
| | | | Potted Module | 5.37" x 2.53" x 2.35" | |
| 35-72P | IP | • Ideal replacement for Mercury Flame switches<br>• Pilot Re-lighter applications | Board Only | 4.00" x 2.30" x 2.33" | CSA |
| | | | Potted Module | 5.37" x 2.53" x 2.35" | |
| 35-75 | HSI | • Compact footprint<br>• Multi-pin connector | Board Only | 4.00" x 2.30" x 1.58" | CSA |
| | | | Potted Module | 5.37" x 2.53" x 1.50" | |
| **With Combustion Blower Relay** | | | | | |
| 35-71 | DSI | • Airflow Switch monitoring and diagnostics<br>• Multi-pin or quick-connect versions | Cover & Base | 5.11" x 3.55" x 2.00" | CSA UL |
| | | | Board Only | 4.92" x 3.37" x 1.99" | |
| | | | Potted Module | 6.16" x 3.81" x 1.80" | |

## Gas Ignition Control Accessories
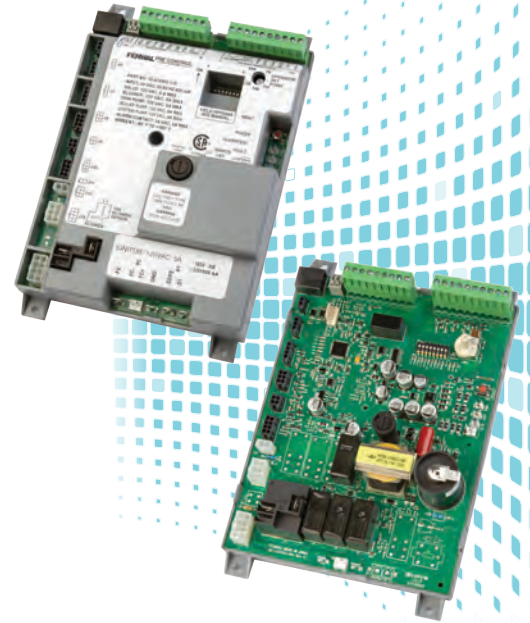• A wide variety of electrodes, flame sense rods and cable assemblies custom configured to OEM applications

| DESCRIPTION | SPECIFICATIONS | OPTIONS | APPROVALS |
|---|---|---|---|
| • 05 and 22 Series<br>• Spark Electrodes<br>• Flame Sensors | • High temperature electrode materials (1,400°C)<br>• Alumina Ceramic Insulators | • Bracket Mounting Styles<br>• Cable Extensions<br>• Quick Connects<br>• Rajah Connectors | CSA |
| • 05 Series<br>• Cable Assemblies | • High Voltage Cables<br>• Suppression Cables<br>• Multi-pin Harnesses | • Boot Styles<br>• Quick Connects<br>• Multi-Pin Connectors<br>• Agency Listed Components | |

# MODULATING COMBUSTION AND SYSTEM CONTROL

**The FENWAL CONTROLS PIM® Control series integrates gas burner control, modulation, temperature control, Hi-limit control and system wiring onto one platform. Suitable for HVAC, Commercial Cooking or any appliance that requires demand-driven modulation, the Fenwal Controls PIM is a flexible, scalable solution for a broad range of applications.**

## Features

- DETECT-A-FLAME® technology for exceptional flame sensitivity
- Supports all popular ignition formats
- Operating temperature control
- PWM and 4-20ma modulating outputs
- UL-353 Hi-Limit
- RS485/Modbus communications
- Seven temperature sensor inputs
- Three discrete proving inputs
- Local and remote diagnostics
- Non-volatile lockout with manual reset
- Three assignable 5A relays
- Master/Member capability
- 0-10V or 4-20ma direct drive capability
- Compatible with tekmar® BTC-II controllers

Boiler Application

Fryer Application

## 35-9X Series for 24VAC

### Typical Applications
- Premix modulating boilers, water heating, commercial cooking

| SERIES NUMBER | TYPE | DESCRIPTION | ENCLOSURE | DIMENSIONS | APPROVALS |
|---|---|---|---|---|---|
| 35-91 | DSI | • Integrated Hi-Energy Spark Output<br>• Feature optimized versions available for commercial cooking or modulating burners | Cover & Base | 8.50" x 6.50" x 2.50" | ⓈⓅ CE ⌂ |
| 35-92 | DSI | • External Spark Transformer model | Cover & Base | 8.50" x 6.50" x 2.50" | ⓈⓅ CE ⌂ |
| 35-96 | HSI | • Flame sensing by igniter or remote rod | Cover & Base | 8.50" x 6.50" x 2.50" | ⓈⓅ CE ⌂ |
| 35-97 | HSI | • Proven Ignition | Cover & Base | 8.50" x 6.50" x 2.50" | ⓈⓅ CE ⌂ |

NOTE: For detailed product information and specifications, visit **fenwalcontrols.com**. If a specific design, capability, or combination of features is not shown, please contact us, as custom control solutions for OEMs are our daily business.

# Bimetal Temperature Limiting Thermostats

**Fixed setting devices designed specifically for temperature limiting applications.**

## Features
Snap Action Switching, Hermetically Sealed (Probe Style), Tamper-proof, Pre-set Temperatures, Automatic Reset, Shock and Vibration Resistant

### 08-80 and 08-81 — Probe style

**Typical Applications**
• Commercial Equipment: Cooking, Medical, Plastics Processing, Refrigeration, Boilers

| TEMPERATURE RANGE | CURRENT RATING | CONTACT ACTION | APPROVALS | OPTIONS |
|---|---|---|---|---|
| **08-81 Series**<br>35 to 350°F<br>(2 to +176°C) | 5A Resistive @ 120/240VAC<br>120/240VA Pilot Duty<br>3A Resistive @ 30VDC | SPST contacts —<br>opens OR closes on<br>temperature rise | ⓈⓇ CE Ⓤ | • Mounting Threads<br><br>• Terminations |
| **08-80 Series**<br>240 to 500°F<br>(116 to 260°C) | 3A Resistive @ 120/240VAC<br>120/240VA Pilot Duty<br>3A Resistive @ 30VDC | | | |

### 08-02 and 08-03 — Surface Mount Style

**Typical Applications**
• Commercial Equipment: Cooking, Packaging, Food Processing, Plastic Processing, Communications, Solar Heating, Refrigeration Compressors, Power Supplies

| TEMPERATURE RANGE | CURRENT RATING | CONTACT ACTION | APPROVALS | OPTIONS |
|---|---|---|---|---|
| **08-02 Series**<br>35 to 350°F<br>(2 to 176°C) | 12A @ 240VAC | SPST contacts —<br>opens OR closes on<br>temperature rise | ⓈⓇ CE Ⓤ | • Mounting Brackets<br>• Terminations |
| **08-03 Series**<br>240 to 550°F<br>(116 to 288°C) | 10A @ 240VAC | | | |

### 08-05 and 08-06 — Surface Mount Style

**Typical Applications**
• Boilers, Pool Heaters, Domestic Hot Water Systems, Hi-Limit and Automatic Gas Shut-off

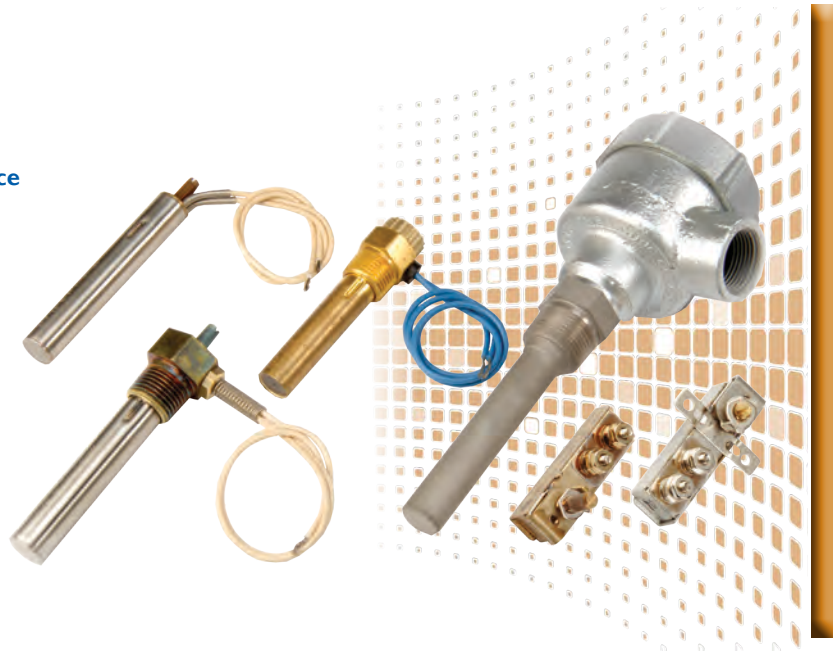| TEMPERATURE RANGE | CURRENT RATING | CONTACT ACTION | APPROVALS | OPTIONS |
|---|---|---|---|---|
| **08-05 Series**<br>110 to 210°F<br>(43 to 95°C) | 1A @ 30VDC<br>1A Resistive @ 120VAC | SPST contacts —<br>opens on temperature rise | ⒸⓈⓇus | • Mounting Brackets<br>• Mounting Threads<br>• Terminations |
| **08-06 Series**<br>300 to 450°F<br>(148 to 252°C) | 0.5A @ 50VDC<br>15A Resistive @ 120VAC<br>Manual Reset | | | |

# THERMOSWITCH® Controller

**Slow make-break devices for immersion and flat surface temperature control applications that require close temperature control. Differential expansion between the internal struts and external shell provides fast response and close control.**

## Probe Style Features

Adjustable, Narrow Differential,
Extreme Sensitivity, Vibration Resistant,
No Power Supply Required,
Brass or Stainless Steel Shell

## Surface Mount Features

Fully Adjustable, Narrow Temperature Differential,
Compact Size, Factory Preset Temperature Settings

### 17000/18000 Series — Probe Style Models, Slow Make and Break

**Typical Applications**
• Commercial Equipment: Cooking, Dishwashing, Medical, Packaging, Laminating, Heat Transfer Systems, Agricultural Equipment

| TEMPERATURE RANGE | CURRENT RATING | CONTACT ACTION | APPROVALS | OPTIONS |
|---|---|---|---|---|
| Two overlapping ranges from -100°F to 600°F (-73° to 316°C) | 10A @ 120VAC 5A @ 240VAC Resistive | SPST Contacts Open OR Close on temperature rise | 🇷🇺 ⓤ ⓢ (up to 500°F) | • Various Mounting Styles • Factory Temperature Settings • Extended Wire Leads • Extended Shell Lengths |

### 80016 Series — Thermowell for Hazardous Locations

**Typical Applications**
• To be used with 17000 Series THERMOSWITCH®
• Explosion-proof well assembly: Class I, Group D and Class II, Groups E, F, and G, Division 1 and 2 locations.

### 30000 Series — Surface Sensing Models, Slow Make and Break

**Typical Applications**
• Commercial Equipment: Cooking, Dental, Packaging, Laminating, Hot Stamping, Pressure Washing, Steam Cleaning, Vending Machines, Water Heaters

| TEMPERATURE RANGE | CURRENT RATING | CONTACT ACTION | APPROVALS | OPTIONS |
|---|---|---|---|---|
| Two overlapping ranges from 50° to 600°F | 10A @ 10VAC 5A @ 240VAC Resistive | SPST contacts Opens on Temperature Rise | 🇷🇺 ⓢ | • Temperature Preset • Adjusting Screw Lengths • Mounting Brackets |

NOTE: For detailed product information and specifications, visit **fenwalcontrols.com**. If a specific design, capability, or combination of features is not shown, please contact us, as custom control solutions for OEMs are our daily business.

## DETECT-A-FIRE® —
## Fire & Overheat Detection

### The world standard in mechanical heat detectors.

**Rate-compensated heat detectors suitable for initiating alarm systems to provide precise and quick response.**

#### Features

Hermetically Sealed, Tamper-proof, Pre-set Temperatures, Shock and Vibration Resistant

### Horizontal Mount

**Typical Applications**
• Protection of Commercial, Industrial, and Public Facilities, Vehicle Protection

| TEMPERATURE SETTINGS | CURRENT RATING | CONTACT ACTION | APPROVALS | OPTIONS |
|---|---|---|---|---|
| 6 Fixed Settings from 140° F to 325°F | 5 A @ 125VAC 0.5 A @ 125VDC — 1A @ 48VDC | SPST Contacts open or close on temperature rise | UL cUL FM APPROVED | • Mounting for exposed or concealed wiring |

### Vertical Mount

**Typical Applications**
• Protection of Commercial, Industrial and Public Facilities, Range Hoods, Paint Spray Booths, Vehicles, Hazardous or Explosive Environments, Offshore Oil Rigs, Service Stations

| TEMPERATURE SETTINGS | CURRENT RATING | CONTACT ACTION | APPROVALS | OPTIONS |
|---|---|---|---|---|
| 12 Fixed Settings from 140° F to 725°F | 5.0 A @ 125VAC 0.5 A @ 125VDC 1A @ 48VDC | SPST Contacts open or close on temperature rise | UL cUL FM APPROVED | • Hex or coupling head mounting • Brass or stainless steel head |

For other listings and approvals, please consult factory.

## For more information visit fenwalcontrols.com



## Your complete resource for:

- Datasheets
- Cross reference and conversion guides
- Frequently asked questions
- Sales representatives
- Worldwide distribution

## Your sales and support contact:

PLACE BUSINESS CARD OR STICKER HERE.

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