IT'S ON FIRE!

Lesman Chronicle

VOLUME BCS-2008 • LESMAN INSTRUMENT COMPANY

With our partners at Honeywell, Maxon, Fireye, and Kromschroder, we can provide you a one-stop source for all your combustion needs.

Seeing Dollar ign?

In this day and age, who's NOT concerned about saving time, energy and money? But where do you start? How about with reduced fuel costs? Or reduced downtime?

Did you know...

- Mechanical linkages don't always provide precise fuel-air ratio control.
- You could be spending 10% to 30% more on fuel than necessary.
- You can reduce service and downtime by replacing your mechanical cam and linkage systems.

For more, check out Honeywell's ControLinks™ linkageless fuel air ratio control system on page 10.

WHY GAMBLE?

...Are you willing to risk worker safety for the chance to keep your boiler, furnace, thermal oxidizer, or process heater running?

Honeywell

flame safeguard control products let you maximize process availability under safe operating conditions.

Flame Safeguard and Burner Control Systems Catalog

Due to contractual agreements with our manufacturers, some items in this catalog may not be available in all geographic areas or markets. Prices are current as of publication date, and are subject to change without notice.
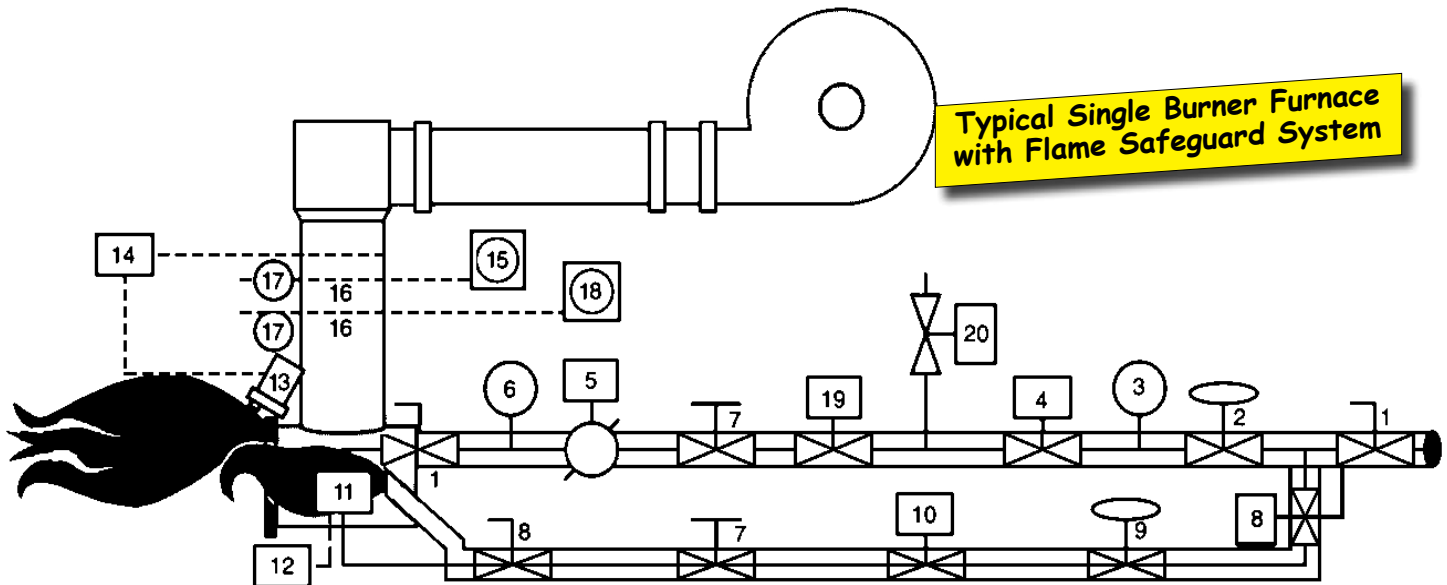
Typical Single Burner Furnace with Flame Safeguard System

1. Manual shutoff cock
2. Gas pressure regulator
3. Low pressure interlock
4. Motorized gas valve manual reset
5. Control valve operator
6. High gas pressure interlock
7. Test cock
8. Pilot gas cock
9. Pilot pressure regulator
10. Pilot solenoid valve
11. Gas pilot burner assembly
12. Solid-state ignition transformer
13. Flame detector
14. Primary control relay mounting base
15. High limit safety shutdown
16. Thermocouple leadwire
17. Thermocouple sensor
18. Burner valve controller
19. Main gas valve operator (automatic)
20. Vent valve (normally open)

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**IT'S ON FIRE
CATALOG 2008**

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Expanded Combustion Product Lines to Serve You Better!

Dear Friends,

As you can see in this catalog, we've expanded our product offering to include combustion solutions.

With all that you hear about "going green", we thought it would be helpful to bring you products that can help improve burner efficiency and reduce energy costs. It doesn't matter if you have a thermal oxidizer, boiler, process heater, kiln or furnace, we've got products to help improve your burner efficiency and use less natural gas or heating oil. No matter how big or how small the burner, we've got your solution for energy savings.

If it's safety your interested in, we have flame safety controls to help you meet all of your insurance requirements and keep your workers safe. Lighting burners with flares isn't safe, and neither is running a process without the controls that ensure proper startup and shutdown sequences.

If you no longer have "the folks that know flame safety" on staff, give us a call. Our specialists will make sure that your upgrades meet all codes and keep your people safe. Don't let something as simple as flame safety controls jeopardize your people or shut down your process.

Need to focus on reducing "greenhouse" gases? We've teamed up with vendors that have solutions to reduce NOx and other environmental pollutants. Through innovative burners and sensors, we've got you covered. And with our ownership in RAECO, we can even help measure and document stack gas emissions to help you comply with EPA rules.

We even have the expertise to help you implement flame safety or burner control systems. So, if you'd like to do some upgrades to save energy costs, but don't have either the time or expertise, just give us a call and let us know. Our partners have years of experience and can minimize downtime, maximize your uptime, and do it safely and professionally.

You shouldn't keep walking by your old controls that need replacing. There's no need for an unplanned furnace or boiler "relocation" that can happen because your old controls simply don't work. Being safe is best for you and your people, so give us a call and we'll help you start upgrading.

Sincerely,

Mike

Mike DeLacluyse

Watch our website for even more helpful tips and product information on flame safety and burner control products.

Combustion Systems Training

At Lesman, our goal is to make sure you get the right product, understand how it works, make sure it's installed properly, and get the most out of it. To help you with that, we've created a set of classes to teach you what you need to know about combustion systems, burner controls, and flame safety.

Courses are done in a lecture style with question/answer periods. Where necessary, they include some hands on examples. Classes can be held at your plant or in a Lesman Training Center, and can be customized to meet your needs. Here's a sample of what you can expect from our Lesman U course on combustion.

❐ **Lesson 1: When is Flame Safety Required?**
- Types of applications
- Basics of flame detection
- Introduction to basic burner systems and terminology
- Main functions of flame safety controls
- A fully implemented burner system

❐ **Lesson 2: Burner Controls**
- Four categories: Flame switches, primary controls, programmers, microprocessor control systems
- Functions of flame safety systems: System checks, burner system sequencing, supervisory functions and shutdown

❐ **Lesson 3: Advanced Flame Safety Control Programmers**
- System components
- System functions and applications

❐ **Lesson 4: Advanced Flame Safety Concepts**
- Valve proving systems
- Linkageless control systems (Honeywell ControLinks™)
- Energy savings with pulse firing

❐ **Lesson 5: Gas Trains and Valves**

Meet Dan...

Dan Weise, Lesman product specialist, instructs our customers on process instrumentation theory, hardware and software.

Dan's recent courses have included Honeywell UDC controllers, Trendview and X-Series paperless recorders, and Siemens SIMATIC PDM HART software. Other course curricula include basics of instrumentation (temperature, pressure, level, and flow) and basics of Modbus protocol.

Dan has been involved in all facets of data acquisition and process instrumentation, from sales and commissioning to service and product support since 1978. He's a long-time member of ISA, and has been with Lesman since 1988.

In his words, Dan is the guy "who reads all the manuals nobody else reads." In our customers' words, he's the trainer to call if you want to "cut to the SO WHAT of instrumentation," so it's easy to understand.

Call 800-953-7626 to schedule your Lesman U combustion training!

BURNER CONTROLS 4 · V 10.2008

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Microprocessor-Based Burner Controls

Honeywell

Choosing the Right Honeywell 7800 Series Burner Control

Model	RM7840	RM7890	RM7895	RM7898
Control Type	Programming	On-Off Primary	On-Off Primary	On-Off Primary
Added Function	Selectable Pre-Purge Timing, Air Flow Check	Units Available with Valve Proving (VPS)	Selectable Pre-Purge Timing	Selectable Pre-Purge Timing, Shutter Drive, Programmable Post-Purge, Valve Proving
Required Components	Q7800 Wiring Subbase R78 Flame Signal Amplifier ST7800 Purge Timer Card S7800A1142 Keyboard Display (for VPS)	Q7800 Wiring Subbase R78 Flame Signal Amplifier S7800A1142 Keyboard Display (for VPS)	Q7800 Wiring Subbase R78 Flame Signal Amplifier ST7800 Purge Timer Card	Q7800 Wiring Subbase R78 Flame Signal Amplifier ST7800 Plug-In Purge Timer Card, S7800A1142 Keyboard Display (for VPS)

RM7840 Programming Control Unit for Forced-Air Burners

Programming control with valve proving for automatically fired gas-, oil-, coal-, or combination fuel single-burner applications.

- Interrupted pilot type
- Airflow check feature
- Valve proving feature tests valve seat integrity to detect a leak greater than 0.1% of burner input capacity
- Five LEDs provide sequence information. Power LED blinks fault code on Lockout.
- CSA, FM, and UL approved

Required components: Q7800 universal wiring subbase, R78 series flame signal amplifier, ST7800A plug-in purge timer cards, S7800A1142 keyboard display module for advanced diagnostics, and to set up valve proving

Model Selection Guide

Flame Establishing Period		Interlocks	Catalog Number	Price
Pilot	Main			
4 or 10 seconds	10, 15, or 30 seconds, or intermittent	Running and low-fire (LHL-LF)	RM7840G1022	$1805.30
4 or 10 seconds	10 or 15 seconds	Lockout, low-fire and high-fire (LHL-LF&HF)	RM7840L1075	2150.57

RM7890 On-Off Primary Control Unit for Forced-Air Burners

Microprocessor-based integrated primary burner control for automatically fired gas, oil, coal, or combination fuel single burner applications.

- Five LEDs for sequence information
- Closed loop logic test, expanded safe-start check, internal hardware status monitoring and tamper-resistant timing and logic
- Valve proving feature tests valve seat integrity to detect a leak greater than 0.1% of burner input capacity
- Selectable recycle/lockout on loss of flame
- UL, CSA, FM, FCC approved

Required components: Q7800 universal wiring subbase, R78 series flame signal amplifier, S7800A1142 keyboard display module (shown) for advanced diagnostics and to set up valve proving

Model Selection Guide

Flame Establishing Period		Pilot Type	Special Features	Catalog Number	Price
Pilot	Main				
4 or 10 seconds	Intermittent	Intermittent		RM7890A1015	$482.49
4 or 10 seconds	Intermittent	Intermittent	Shutter Drive Capability	RM7890B1014	506.27
4 or 10 seconds	Intermittent	Intermittent	Valve Proving (VPS) Check Feature, Blinking LED Fault Annunciation	RM7890A1056	435.25
4 or 10 seconds	Intermittent	Intermittent	Shutter Drive Capability, VPS Check, Blinking LED Fault Annunciation	RM7890B1048	432.90

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BURNER CONTROLS

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RM7895 On-Off Primary Control Unit for Forced-Air Burners

Microprocessor-based integrated primary burner control for automatically fired gas, oil, or combination fuel single burner applications.

- On/off primary control with prepurge
- Five LEDs for sequence information
- Airflow switch check
- Selectable relight or lockout on loss of flame
- Optional local or remote annunciation of operation and fault information, remote reset capability

Required components: Q7800 universal wiring subbase, R78 series flame signal amplifier, ST7800 plug-in purge timer card

Model Selection Guide

Flame Establishing Period Pilot	Main	Pilot Type	Airflow Check	Delayed Main Valve	Interlocks	Catalog Number	Price
4 or 10 seconds	Intermittent	Intermittent	No	No	Selectable	L RM7895A1014	$643.51
4 or 10 seconds	Intermittent	Intermittent	Dynamic	No	Selectable	RM7895B1013	643.51
4 or 10 seconds	10 Seconds	Interrupted	Dynamic	Yes	Selectable	RM7895D1011	832.29

RM7898 On-Off Primary Control Unit with Valve Proving

Microprocessor-based integrated primary burner control for automatically fired gas, oil, or combination fuel single burner applications.

- On/off primary control
- Programmable post purge and valve proving feature available through keyboard display module
- Five LEDs for sequence information, power LED blinks fault code on safety shutdown
- Airflow switch check and shutter drive output
- Selectable recycle or lockout on loss of airflow or flame
- Local or remote annunciation of operation and fault information

Required components: Q7800 universal wiring subbase, R78 series flame signal amplifier, ST7800 plug-in purge timer card, S7800A1142 keyboard display module

Model Selection Guide

Flame Establishing Period Pilot	Main	Pilot Type	Special Features	Catalog Number	Price
4 or 10 seconds	Intermittent or 10 seconds	Selectable	Shutter drive output, programmable post purge, valve proving	L RM7898A1000	$569.44

Q7800A or B Wiring Subbases for RM7800 Burner Controls

Select either the panel-mount or burner-mount version of the Z7800A,B 22-terminal universal wiring subbase to accommodate your 7800 series relay module. Both are fully compatible with all relay modules, to let you specify a wiring termination approach that meets your application requirements.

Model Selection Guide

Description	Catalog Number	Price
22 Terminal Universal Wiring Subbase		
Panel Mount	L Q7800A1005	$36.56
Burner/Wall Mount	Q7800B1003	36.56

Learn more about Honeywell burner controls and flame safeguard products online at www.lesman.com

Download specification datasheets, installation instructions, wiring diagrams and more. Most products available to buy through our secure online store.

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R78 Series Flame Signal Amplifier Modules

Honeywell

- Flame signal strength 0.0 to 5.0 VDC
- Test jacks measure amplifier signal voltage
- Dynamic Ampli-Check™ or Self-Check rectification available, with safety shutdown on amplifier or system failure
- UL, CSA, FM approved

Solid-state flame signal amplifiers detect the presence of flame in response to a signal from a rectifying, ultraviolet, or infrared flame detector.

Dynamic Ampli-Check™ circuitry tests flame amplifier during burner operation; 7800 series relay module locks out on safety shutdown with amplifier failure.

Dynamic Self-Check Rectification Amplifier and Dynamic Self-Check Ultraviolet Amplifier test electronic components in the flame detection system 10 to 12 times per minute. The 7800 series relay module locks out on safety shutdown with flame detection system failure.

R7849A flame detectors should be used only on burners that cycle on and off at least once every 24 hours. Appliances with burners that remain on for 24 hours or longer should use ultraviolet flame detection systems (C7012E/F detector and R7847C amplifier or C7076A detector and R7886A amplifier).

Model Selection Guide

Color Code	Type	Flame Failure Response Time	Self-Checking	Compatible Flame Sensors	Catalog Number	Price
Rectification-Type Flame Amplifiers, Green						
Green	Rectification	3.0 Seconds	Dynamic	C7024E, F Flame Detector	R7824C1002	$605.36
Green	Rectification	0.8 or 1.0 Second	Standard	Gas: Rectifying Flame Rods C7004/7005/7007/7008/7009, Q179	R7847A1025	241.51
Green	Rectification	2.0 or 3.0 Second	Standard	Gas: Rectifying Flame Rods C7004/7005/7007/7008/7009, Q179; Gas, Oil and Coal: Ultraviolet Flame Sensors C7012A, C	R7847A1033	241.51
Green	Rectification	0.8 or 1.0 Second	Standard	Gas: Rectifying Flame Rods C7004/7005/7007/7008/7009, Q179*	R7847A1074	241.51
Green	Rectification	2.0 or 3.0 Second	Standard	Gas: Rectifying Flame Rods C7004/7005/7007/7008/7009, Q179* Gas, Oil, and Coal: Ultraviolet Flame Sensors C012A, C	R7847A1082	241.51
Green	Rectification	0.8 or 1.0 Second	Ampli-Check	Gas: Rectifying Flame Rods C7004/7005/7007/7008/7009, Q179	R7847B1023	693.71
Green	Rectification	2.0 or 3.0 Second	Ampli-Check	Gas: Rectifying Flame Rods C7004/7005/7007/7008/7009, Q179 Gas, Oil, and Coal: Ultraviolet Flame Sensors C7012A, C	R7847B1031	693.71
Green	Rectification	0.8 or 1.0 Second	Ampli-Check	Gas: Rectifying Flame Rods C7004/7005/7007/7008/7009, Q179*	R7847B1064	693.71
Green	Rectification	2.0 or 3.0 Second	Dynamic	Gas, Oil, and Coal: Ultraviolet Flame Sensors C7012E, F	R7847C1005	548.49
Infrared-Type Flame Signal Amplifier, Red						
Red	Infrared	2.0 or 3.0 Second	Standard	Gas, Oil, and Coal: Infrared Lead Sulfide Flame Sensors C7015	R7848A1008	453.29
Red	Infrared	2.0 or 3.0 Second	Ampli-Check	Gas, Oil, and Coal: Infrared Lead Sulfide Flame Sensors C7015	R7848B1006	483.97
Ultraviolet-Type Flame Signal Amplifier, Purple						
Purple	UV	0.8 or 1.0 Second	Standard	Gas, Oil: Minipeeper C7027A, C7035A, C7044	R7849A1015	241.51
Purple	UV	2.0 or 3.0 Second	Standard	Gas, Oil: Minipeeper C7027A, C7035A, C7044	L R7849A1023	241.51
Purple	UV	0.8 or 1.0 Second	Ampli-Check	Gas, Oil: Minipeeper C7027A, C7035A, C7044	R7849B1013	377.08
Purple	UV	2.0 or 3.0 Second	Ampli-Check	Gas, Oil: Minipeeper C7027A, C7035A, C7044	R7849B1021	377.08
Ultraviolet-Type Flame Signal Amplifier, Purple						
Purple	UV	2.0 or 3.0 Second	Dynamic	Gas, Oil, and Coal: Ultraviolet Flame Sensor C7061	R7861A1026	635.99
Purple	UV	0.8 or 1.0 Second	Dynamic	Gas, Oil, and Coal: Ultraviolet Flame Sensor C7061	R7861A1034	635.99

* Leadwire runs greater than 50 ft.

ST7800A Plug-In Purge Timer Cards

Don't see the timer card you need? Call Lesman.

Purge timers let you purge unburned fuels from the combustion chamber. The plug-in cards install easily into the 7800 series relay module. They are available in 15 timing ranges from 2 seconds to 30 minutes.

- Compatible with selected 7800 series relay modules.
- CSA, FM approved, UL recognized

Model Selection Guide

Description	Catalog Number	Price	Description	Catalog Number	Price	Description	Catalog Number	Price
2-Second Pre-Purge	ST7800A1005	$67.88	30-Second Pre-Purge	ST7800A1039	$67.88	2.5-Minute Pre-Purge	ST7800A1070	$67.88
7-Second Pre-Purge	ST7800A1013	67.88	60-Second Pre-Purge	ST7800A1054	67.88	4-Minute Pre-Purge	ST7800A1088	67.88
10-Second Pre-Purge	ST7800A1021	67.88	1.5-Minute Pre-Purge	ST7800A1062	67.88	6-Minute Pre-Purge	ST7800A1096	67.88

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FLAME SAFEGUARD

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Burner Control Plug-In Accessory Modules
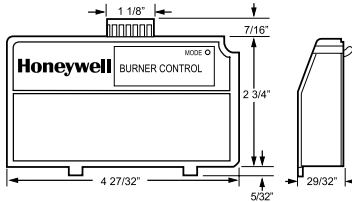
S7800A1142 Universal Keyboard Display Module

Provides current status of burner sequence, timing, hold, and lockout information plus selective or preemptive messages. Required for programming Valve Proving and Post Purge features on 7800 series relay modules.

- First-out annunciation and system diagnostics provided in 2-row by 20-column display
- Provides burner control data, remote reset, and report generation
- Local or remote operation, fault information
- UL listed, CSA certified, FM approved, and FCC rated

Model Selection Guide

Description	Catalog Number	Price
Universal Keyboard Display	L S7800A1142	$485.61

S7810A1009 Data ControlBus Module

Lets you connect a remote reset switch, a remote keyboard display module, or communicate to a personal computer.

- Installs directly on front of 7800 relay modules
- Communications interface, remote reset
- Use with remote mounted keyboard display

Model Selection Guide

Description	Catalog Number	Price
Remote Mounting of Keyboard Display Module PC Interface, and Remote Reset Function	S7810A1009	$206.64

S7820A1007 Remote Reset Module

Links a remote reset switch (push-button) that allows the 7800 series burner control to be reset from a remote location.

- Installs directly on front of 7800 relay module
- Allows reset of 7800 series relay module by a remote reset push-button up to 1000 feet away

Model Selection Guide

Description	Catalog Number	Price
Remote Module for Resetting 7800 Series Relay Module	S7820A1007	$228.75

S7830A1005 First-Out Expanded Annunciator Panel

Monitors the status of a series string of limit, control, and interlock contacts. It enhances fault and status messages of the 7800 series burner control.

- 26 LEDs — 22 LEDs to annunciate limits and interlocks, 4 LEDs to annunciate power, current status, first-out status, and system lockout
- Enhances keyboard display module sequence hold and lockout messages
- Connects to 7800 series relay module via RS485
- UL listed, CSA, FM approved

Model Selection Guide

Description	Catalog Number	Price
First-Out Expanded Annunciator	S7830A1005	$935.07
Connector for Keyboard Display	203541	45.30

Hey Lesman... Where's My Stuff?

Want to know when your Lesman order will arrive? Use the Order Status checker, right on the Lesman.com homepage!

- Enter your PO number and 5-digit zip code, and click the "Check Status" button.

We'll show your order details and a clickable tracking link at UPS or FedEx. If the order hasn't shipped, it'll give you the expected ship date.

Flame Detectors

Honeywell

Model	C7008, C7009	Q340A	C7012 Purple Peeper®	C7027 Minipeeper®	C7035 Minipeeper®	C7061 Purple Peeper®	C7076
Detector Type	Flame Rod	Thermocouple	Rectification Ultraviolet	Ultraviolet	Ultraviolet	Ultraviolet	Ultraviolet
Burner Type	Gas-Fired	Gas-Fired	Coal, Gas, or Oil-Fired	Coal, Gas, or Oil-Fired	Coal, Gas, or Oil-Fired	Gas or Oil-Fired	Gas or Oil-Fired
Pilot Type	Intermittent or Standing	Intermittent or Standing	Intermittent or Interrupted	Intermittent or Interrupted	Intermittent or Interrupted	Intermittent or Interrupted	Intermittent or Interrupted
Unique Feature	100% Fail-Safe Operation	Low Cost Units for Process Applications	Dynamic Self-Check, Shutter	1/2" Sight Pipe Mount	1" Sight Pipe Mount	Dynamic Self-Check	Dynamic Self-Check, Adjustable Sensitivity
Flame Amplifier	R7247A,B, R7847A, B, R7257, R7289	Typically Connected via UDC	R7247C, R7847C, R7747C	R7249A,B, R7849A, B, R7749B, R7259, R7290	R7249A,B R7849A,B R7749B, R7259, R7290	R7861	R7476A1015, R7886A1001

C7008, C7009 Rectification Flame Rods

Kantal A-1 flame rod with sparkplug-type rod holder, threaded base, and snap-on cover.

100% fail-safe flame detection. For use with gas-fired systems and intermittent pilots only. Use with Honeywell flame safeguard controls that require rectification-type flame detectors. Can be used with or without cover and cut to desired length. Includes flame rod holder and Rajah electrical connector.
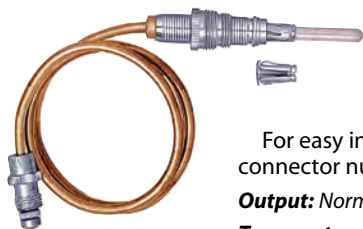
Approvals: UL, CSA, FM.

Model Selection Guide

Flame Rod Length	Holder Dimensions		Electrical Connection	Catalog Number	Price
	Length	Diameter			
12"	3-3/4"	7/8"	1/4" NPT Male	C7008A1174	$166.01
24"	3-3/4"	7/8"	1/4" NPT Male	C7008A1182	246.46
4"	2-3/8"	3/8"	1/8" NPT Male	C7009A1009	103.84
12"	2-3/8"	3/8"	1/8" NPT Male	C7009A1025	135.98

Q340 Thermocouples for Gas-Fired Pilot Flame Detection

Premium long-life, durable 30mv thermocouples generate a thermoelectric current that senses a pilot flame on gas-fired heating systems.

For easy installation, the Q340A comes with a push-in clip, split nut, and an adapter assembly, plus a 11/32 male connector nut for Pilotstat® safety control power units.

Output: *Normal:* 26 to 32 mV; *Lowest Acceptable:* 18 mV; *Turndown:* 2 mV

Temperature Rating: 1400°F at hot junction, 780°F at cold junction

Replacement for: Robertshaw 1980, T45, T46, White Rogers HO series, Penn-Baso K15, K16, K19, 88D, ITT-General 2500 and 2600 series, and Jade TK5

Model Selection Guide

Lead Length	Catalog Number	Price
36" (914mm)	Q340A1090	10.72
48" (1219mm)	Q340A1108	11.92
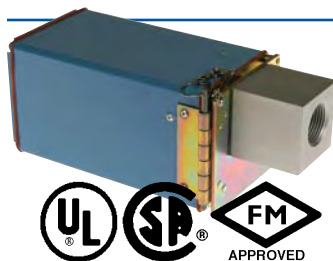
C7076 UV Detector with Adjustable Sensitivity

Dual adjustable sensitivity with 400:1 dynamic range, for use with intermittent or interrupted pilots on gas- or oil-fired burners. Compatible with R7476A and R7886A dynamic self-check UV flame amplifiers. Closed-loop self-checking circuit ensures integrity of both amplifier and flame detector.

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FLAME DETECTORS

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Available soon! UV/IR flame detectors from IRIS Systems. Call Lesman for details. **IRIS** 👁

C7012 Purple Peeper® Solid-State UV Flame Detectors

Solid-state UV flame detector with dynamic self-check, for coal-, gas-, or oil-fired burners. Can be used with intermittent or interrupted pilots. Compatible with R7247C, R7847C, and R7747C UV flame amplifiers on Honeywell RM7800 series relay modules.

Mounts horizontally, vertically, or at any angle in between. Provides quick electrical hookup with threaded conduit fitting and color-coded leadwires. Reduces nuisance shutdowns by wiring two in parallel.

Mounting: Mounting flange with NPT internal threads for attaching to sight pipe

Approvals: UL, CSA, FM.

Model Selection Guide

Description	Catalog Number	Price
Dynamic Self-Checking Ultraviolet Detector		
120 VAC, 3/4" NPT	C7012E1104	$3161.29
120 VAC, 1" NPT	C7012E1112	3161.29

C7027 Minipeeper® Ultraviolet Flame Detectors

Compact UV flame detectors for use on coal-, gas-, oil-fired or combination burners. Can be used with either intermittent or interrupted pilots. Compatible with R7248A/B, R7849A/B, R7749B, R7259, and R7290 solid-state UV flame amplifiers on Honeywell RM7800 series relay modules and controls.

Compact size allows for blast-tube mounting. Seals against pressures up to 5 psi when correctly installed. Wire in parallel for difficult sighting applications.

Mounting: 1/2" sight pipe with integral collar or 1/2" NPT threaded spud connector.

Dimensions: 1-1/8" diameter (with mounting nut), 3-7/8" length, 8-foot lead.

Electrical Connections: Two NEC Class 1 leadwires

Approvals: UL, CSA, FM.

Model Selection Guide

Ambient Temp. Range	Sight Pipe Mounting	Catalog Number	Price
-40° to 215°F	Integral nut	C7027A1031	$166.75
-40° to 215°F	Integral nut*	C7027A1072	166.75
0° to 215°F	Integral nut	C7027A1023	150.41
0° to 215°F	Integral nut*	C7027A1049	150.41
0° to 215°F	Integral nut**	C7027A1080	186.95

* 1/2" NPT threaded spud connector
** Includes 136733 heat block and 390427B bushing

C7035 Minipeeper® Ultraviolet Flame Detectors

Compact ultraviolet flame detectors with field-replaceable UV sensing tubes. For use on coal-, gas-, oil-fired or combination burners. Can be used with either intermittent or interrupted pilots. Compatible with R7248A/B, R7849A/B, R7749B, R7259, and R7290 solid-state UV flame amplifiers on Honeywell RM7800 series relay modules and controls.

Shield protects sensing tube. Seals against pressures up to 5 psi when correctly installed. Can be wired in parallel for difficult sighting applications.

Mounting: 1" sight pipe with integral collar

Dimensions: 1-1/2" diam. (with collar), 4-1/8" length, 72" leads

Approvals: UL, CSA, FM.

C7035

129464M

Model Selection Guide

Description	Catalog Number	Price
0° to 215°F temperature range, 6' lead	C7035A1023	$330.90
Replacement UV sensing tube for C7035	129464M	301.68
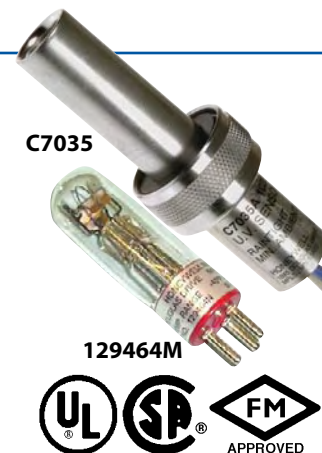
C7061 Purple Peeper® Solid-State UV Flame Detectors

Ultraviolet flame detector with dynamic self-check for gas-, or oil-fired burners. Can be used with intermittent or interrupted pilots. Compatible with R7861 dynamic self-check UV flame amplifiers on Honeywell RM7800 series relay modules.

Mounts horizontally, vertically, or at any angle in between. Reduces nuisance shutdowns by wiring two in parallel. Field-replaceable UV sensing tube and quartz viewing window.

Mounting: Mounting flange with 3/4" NPT internal threads

Dimensions: 5-1/4" diam. (with flange), 7-7/32" long, 96" leads

Approvals: UL, CSA, FM.

Model Selection Guide

Description	Catalog Number	Price
120 VAC, 3/4" NPT	C7061A1012	$1377.66
120 VAC, 3/4" NPT*	C7061A1038	1398.48
UV Sensing Tube	129464N	335.68

* With Brad Harrison 41310 connector

129464N

ControoLinks™ Fuel Air Ratio Control System **Honeywell**

Honeywell ControoLinks™ fuel air ratio control system helps you realize energy savings, increased turndown, reduced emissions, and system reliability in an easy-to-install, powerful, and cost-effective package.

Features

- Stand-alone parallel positioning control system designed for easy retrofit
- Dynamic safety checks: failsafe potentiometer check, anti-swap of actuators, and curve verification algorithms, relay test for limit control input/output (LCI-LCO) contact set
- Integrated shock protection algorithms: Water or stack temperature low fire hold, flue gas recirculation (FGR) hold, FGR and low-fire hold
- Controller LEDs: Power, alarm, motor 1, 2, 3, 4 for status, and fault code annunciation (60 possible)
- Two independent fuel profiles with or without FGR
- Programmable positioning for non-selected fuel actuator, standby, purge, light-off, or minimum/maximum modulation
- Up to four universal parallel positioning actuators: Combustion air, fuel 1, fuel 2, FGR/flexible usage
- Fourth channel actuator flexible usage: FR, secondary air control, secondary modulating fuel valve
- Auto/manual firing rate input
- Seven to 24 points per profile curve with quick setup feature, providing minimum three-point profile curve
- Actuator CW/CCW switches for manually driving hub —useful for installation and service
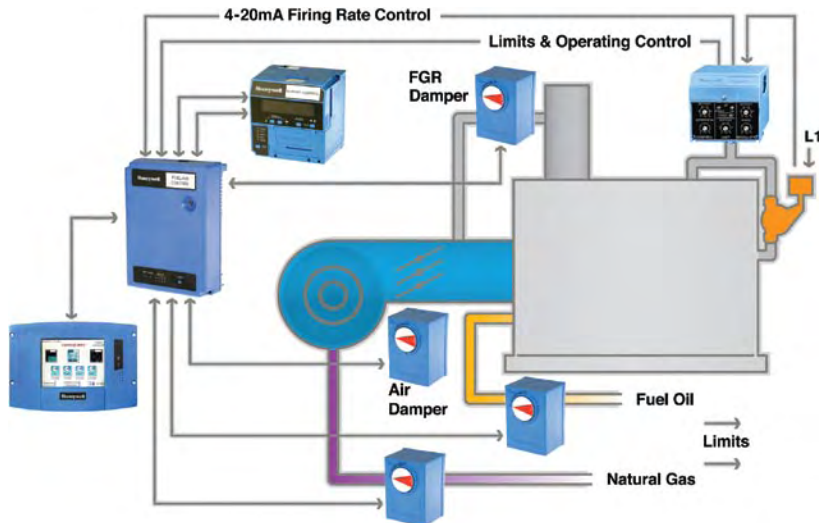- Actuator LED annunciation for unconfigured, configured, on-line, or faulty actuator states

Typical boiler application with Honeywell ControoLinks™ fuel ratio control system installed.

Honeywell ControoLinks™ replaces the traditional single point modulation of a mechanical cam-and-linkage assembly that controls the relationship between fuel, airflow, and flue gas recirculation on a power burner. The linkageless fuel air ratio control provides more accuracy and efficiency in actuator positioning and burner firing, reducing your service requirements and downtime. It can be installed as part of a retrofit or a new burner application —anywhere increased efficiency is desired.

Up to four independently controlled universal parallel positioning actuators (UPPAs) are managed by the ControoLinks controller, which responds to load and firing rate demands.

ControoLinks can be used on single or combination fuel single burner applications, including power burners, boilers, process furnaces, ovens, smelting, kilns, paint drying booths, VOC burn-off, ceramics, make-up air heaters, or any full modulating burner.

R7999A ControoLinks™ Fuel Air Controller

Uses the latest microprocessor technology to simultaneously control up to four actuators. Use with ML7999 actuators to replace mechanical cam-and-linkage assembly controlling the relationship between fuel, airflow, and flue gas recirculation (FGR) on a power burner.

Fast burner setup vial PC or laptop. Two independent fuel profiles with or without FGR. Programmable behaviors of all actuators during purge and standby. Programmable behavior of non-selected fuel actuator. Independent light off and minimum modulation positions. Auto/manual input and manual mode firing-rate input. Multipurpose communications port.

ZM7999A ControoLinks™ configuration software tool lets you create burner modulation curves (profiles) for your burners, for safe and efficient operation at all points along the curve. Wizards step you through the commissioning process. Save files on your PC to use over again.

Complete System Requires: R7999 controller, Q7999 wiring subbase, ML7999 positioning actuator, and ZM7999 configuration software.

Model Selection Guide

Description	Catalog Number	Price
Fuel air ratio controller, 100-120 VAC, 50/60 Hz	R7999A1005	$774.90
Field wiring terminal subbase for R7999A controller. Panel mount, NEMA 1 enclosure	Q7999A1006	98.53
ControoLinks™ Windows-based configuration software for R7999A controllers	ZM7999A1006	365.93

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FUEL AIR RATIO CONTROL   **11** **L**

ML7999 Universal Parallel-Positioning Actuators

ControLinks™ actuators control the position of primary and secondary fuel valves, combustion air damper, and flue gas return dampers. UL, CSA, CE approved.

Vibration: 0.0 to 0.5g continuous

Environmental Conditions: *Ambient Temperature:* -40° to 140°F; *Operating Temperature:* -40° to 150°F; *Operating Humidity:* 5% to 95% RH, non-condensing

Call for adapter assemblies for connecting to shaft sizes other than 1/2".

Model Selection Guide

Actuator Description and Function	Catalog Number	Price
Pulse-width modulating control of combustion air dampers, butterfly gas valves, oil modulation valves, and flue gas recirculation systems. Includes precise feedback potentiometer and integral power supply. Parallel-positioning actuator.	ML7999A2001	$272.80
Provides 4-20 mA control input to control combustion air dampers and modulation valves. Includes precision drive shaft control and integral power supply capable of direct line voltage connection. Direct coupled actuator.	ML7999B1002	540.84

S7999B ControLinks™ Configuration Display

Monitor up to 99 burner systems connected via Modbus. Each burner control, fuel/air ratio control, expanded annunciator or other Modbus devices present on the burner system can be viewed individually to determine its status.

Display: Color 3.5" x 4.6" touchscreen interface with screen saver, contrast and volume controls

Communications: Two RS485 Modbus ports for monitoring up to 99 unique controls

Function: Allows setup and monitoring of R7999 ControLinks controller, programmable expanded annunciator terminal remaining, and R7999 EEPROM backup and restore

Model Selection Guide

Description	Catalog Number	Price
Touchscreen display for ControLinks™ system. 12 VDC input power	S7999B1000	$1193.07

P7810C Pressuretrol® Controller

Line voltage pressure controller that eliminates the need for a controller and transmitter. One unit does on/off control, high limit and 4-20 mA modulation.

Accuracy: ±4.0% full scale output over operating temperature (32° to 140°F)

Model Selection Guide

Description		Catalog Number	Price
Solid State Pressuretrol® Controller with On/Off Control, Limit Control, and 4-20 mA Modulation. FM, CSA, UL Approvals. LED Indicators for Power, Call for Heat Function, and Lockout Status	0–15 PSI	P7810C1000	$524.81
	0–150 PSI	P7810C1018	583.72
	0–300 PSI	P7810C1026	651.85
Siphon Loop with 1/4" NPT Threads for P7810C		209731A	32.61

ControLinks™ Accessories

Model Selection Guide

Description	Catalog Number	Price
ML7999 actuator shaft adapter for and 3/8" round or square valve shaft	201391	$3.23
ML7999 actuator weatherproofing kit (1 corner stop, 2 gaskets)	32002935-001	18.56
ML7999 actuator 3/4" shaft adapter assembly	32003168-001	44.22
ML7999 actuator 5/8" shaft adapter assembly	32003168-002	50.07
ML7999 actuator 9/16 shaft adapter assembly	32003168-003	50.07
V51E mounting plate for 1.5" and 2" valves	32003396-001	43.48
V51E mounting plate for 2.5" 3", and 4" valves	32003396-002	47.34
R7999 3-pin electrical connector	32002515-001	9.53

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Mechanical Burner Controls and Safety Switches

C6097 Safety Limit Switches

Limit switches for positive or differential pressure systems to sense natural gas, liquid propane gas, or air. Removable clear protects scaleplate and adjusting knob.

Temperature Range: -40° to 140°F

Switch Ratings: 3.0 AFL, 18.0 ALR, 5.0 Amp resistive. Can be wired to turn on alarms.
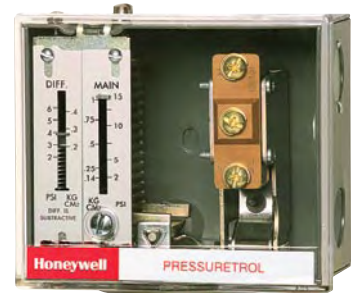
Model Selection Guide

| Operating Range | Pressure Differential at | | Switch Operation | Mounting | Catalog Number | Price |
	Min. Setpoint	Max. Setpoint				
Diaphragm-Actuated Safety Limit Switch, Brake on Pressure Fall, 1/8" NPT Internal Threaded Connection						
0.4" to 5"WC	0.6"WC	0.25"WC	Manual Reset	1/4" NPT	C6097A1095	$117.40
3" to 21"WC	—	—	Auto Recycle	1/4" NPT	**L** C6097A1053	96.26
Diaphragm-Actuated Safety Limit Switch, Break on Pressure Rise, 1/8" NPT Internal Threaded Connection						
12" to 60 "WC	10"WC	12"WC	Manual Reset	1/4" NPT	C6097B1002	124.96
1.5 to 7 PSI	1.1"WC	1.4"WC	Manual Reset	1/4" NPT	**L** C6097B1051	136.22

L404F Pressuretrol® Controllers

Operating control with automatic limit protection for pressure systems. Use with steam, air, noncombustible gases, or fluids non-corrosive to pressure sensing element

Switching Action: SPDT snap-action switch to open or close a circuit on pressure rise

Connections: *Pipe (main or high pressure):* 1/4" NPT internal thread; *Electrical:* Screw terminals

Model Selection Guide

Operating Range	Sustained Pressure	Adjustable Differential	Sensor Element	Unit Includes	Catalog Number	Price
2 to 15 PSI	25 PSI max.	2 to 6 PSI	Stainless Steel Diaphragm	Siphon Loop	L404F1060	$172.29
5 to 50 PSI	85 PSI max.	6 to 14 PSI	Stainless Steel Diaphragm	Ground Screw	L404F1375	175.01
10 to 150 PSI	225 PSI max.	10 to 22 PSI	Stainless Steel Diaphragm	—	L404F1102	192.05

RA890 Protectorelay® Electromechanical Primary Control

Non-programming primary control provides flame safeguard protection for industrial and commercial single or dual fuel burners. With SPDT alarm contacts.

Use with flame rods, rectifying photocells and C7012A,C Purple Peeper ultraviolet flame detectors. Recycles once after failure to re-establish pilot. No start if failure occurs in flame detector circuit.

Power Rating: *50 Hz:* 8.5w, 17VA max.; *60 Hz:* 7w, 13 VA max.

Ambient Temperature: -20º to 105°F

Approvals: CSA, FM, UL

Model Selection Guide

Description	Safety Switch Timing	Flame Failure Response*	Catalog Number	Price Each
Rectification-Type	15 Seconds	3.0 Seconds	**L** RA890F1288	$1385.97
Ultraviolet-Type	15 Seconds	3.0 Seconds	**L** RA890G1260	1385.94
Q270A Protectorelay® Mounting Subbase			Q270A1024	116.04

Compatible flame detectors on pages 8–9.

S8610U3009 Intermittent Pilot Ignition Control

Provides ignition sequence, flame monitoring, and safety shutoff for intermittent pilot ignition systems used on natural or LP gas-fired furnaces, boilers, and heating applications.

Electrical Rating: 24 V, 60 Hz; *Current Draw:* 1A pilot valve, 2A main valve; *Contact Rating:* 0.2A

Field Replacement: For most Honeywell, Robertshaw, Johnson, UTEC (HCS) intermittent pilot ignition modules

Model Selection Guide

Description	Catalog Number	Price
Intermittent pilot control. 15- or 90-sec trial for ignition, 0- or 30-sec configurable pre-purge	S8610U3009	$164.37

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ACTUATOR CONTROLS   **13**

Honeywell Low-Torque Rotary Actuator Motors

Modutrol IV

Low torque, light duty, rotary action Modutrol IV motor is designed for accurate positioning of dampers and valves in industrial ovens, furnaces, and process heaters.

Torque Rating: 25 to 300 Lb-In

Timing: 15 to 240 seconds

Stroke: Fixed or adjustable, 90° and 160° dual on some models

Limit Switches: Two end-of-travel limit switches standard

Approvals: CSA, UL

More models available online. Visit www.lesman.com/get/modutrol.php for series specifications, model selection, and part number cross references.

Model Selection Guide

* Field-addable auxiliary switches

Stroke Timing 90°	160°	Torque Rating	Auxiliary Switches	Product Includes	Functional Replacement for These Obsolete Models	Catalog Number	Price
Proportional-Reversing Motors, 135 Ohm Input Signal, 90° to 160° Field-Adjustable Stroke (Unless otherwise specified)							
15 sec	30 sec	75 Lb-in	0			M9184D1005	$806.09
15 sec	30 sec	75 Lb-in	1	Tapped Shaft	M9484D1002, D1036, and E1116	M9484E1009	965.43
30 sec	60 sec	35 Lb-in	0	Adjustable Zero/ Span, Transformer	M8161A1024 and A1032, M9161A1008, M9164A1021 and A1054	M9164A1005	682.92
30 sec	60 sec	35 Lb-in	0*		M9164A1120, A1062, A1047, and A1096	L M9164D1009	608.10
30 sec	60 sec	60 Lb-in	0*	24 VAC, Spring Return	M7285A1052, M7282A1006, M9175D1014, D1006, and D1014	M9185D1004	905.25
30 sec	60 sec	60 Lb-in	1			M9185E1019	1013.40
30 sec	60 sec	150 Lb-in	0		M9484D1028, D1044, and D1051	M9484D1010	822.55
30 sec	60 sec	150 Lb-in	0*		M9184A1012, A1035, B1009, B1017, B1025, M9184D1013, D1047, and D4009	M9184D1021	836.50
30 sec	60 sec	150 Lb-in	1		M9484E1090 and E4003	M9484E1017	965.43
30 sec	60 sec	150 Lb-in	1	Motor Crank Arm, Ships in 90° Position	M9484E1025, E1041, E1058, E1066, M9484E1074, and E1082	M9484E1033	954.42
30 sec	60 sec	150 Lb-in	2	Ships in 90° Position		M9484F1007	1014.01
30 sec	60 sec	150 Lb-in	2	Tapped Shaft, Ships in 90° Position		M9484F1031	1024.93
30 sec	60 sec	150 Lb-in	2		M9184F1000 and F1018	M9184F1034	1008.54
30 sec	—	35 Lb-in	2			M9184C1031	1008.54
—	60 sec	60 Lb-in	2	24 VAC, Spring Return		M9185C1006	1094.20
—	60 sec	150 Lb-in	0		M9181A1012, M9184A1001	M9184A1019	806.09
Proportional-Reversing Motors, 120 VAC Power, Modulating 4-20 mA Input, Adjustable Zero and Span. Transformer and Screw Terminal Adapter Included							
15 sec	30 sec	75 Lb-in	0			M7284A1038	984.96
30 sec	60 sec	150 Lb-in	0		M281A1007, M7284A1046	L M7284A1004	940.89
30 sec	60 sec	150 Lb-in	0		M7284A1020	M7284A1012	940.89
30 sec	60 sec	150 Lb-in	2		M7284C1018, M7284C1026	L M7284C1000	1103.17
30 sec	60 sec	150 Lb-in	2		M7284Q1017	L M7284Q1009	1103.17
60 sec	120 sec	300 Lb-in	2			M7294Q1007	1106.72
Motors with Switched SPDT or Floating Output, 120 VAC Power, SPDT Input, 3-Wire, Line Voltage, or Position Proportional Controller							
—	30 sec	75 Lb-in	0			M6184A1023	606.46
30 sec	—	150 Lb-in	0		M6284A1014, A1002, A1048, A1071, and 1063	M6284A1055	733.15
Motors with Switched SPDT or Floating Output, 24 VAC Power, 3-Wire, SPDT or Voltage Input							
15 sec	30 sec	75 Lb-in	0	Low Voltage		M6184D1001	554.23
30 sec	60 sec	150 Lb-in	0*	Low Voltage	M6181A1018, D1004, F1009, F1017, M6161A1004, M6184A1007 and B1021	M6184D1035	544.29
30 sec	60 sec	150 Lb-in	2	Line Voltage		M6184F1014	714.91

Stroke Timing	Stroke (Deg)	Torque Rating	Auxiliary Switches	Product Includes	Functional Replacement for These Obsolete Models	Catalog Number	Price
Two-Position Spring Return Motors, SPST, 2-Wire, Voltage Inputs							
30 sec	75°	20 Lb-in	1	120 VAC Power	M436A1041 A1082, A1090, A1165, and A1181	M436A1116	$350.76
60 sec	160°	60 Lb-in	0	120 VAC Power		M4185A1001	554.32
60 sec	160°	60 Lb-in	1	120 VAC Power	M4182B1002	M4185B1009	587.40
30 sec	90°	60 Lb-in	1	120/208/240 VAC	M4185B1017	L M4185B1058	610.07
20 sec	45°	30 Oz-In	0			M847A1072	123.66
30/60	90/160	60 Lb-in	0*	24 VAC	M8185B1000 and B1034 (w/ 220736A)	M8185D1006	456.87

Valves and Actuators

Honeywell

V4055 On-Off Gas Valve Actuator

Use with Honeywell V5055 gas valves where smooth light off is important to control gas supply to industrial burners.

One second maximum closing time. Continuous display of valve position with a red (open) or yellow (closed) indicator. Provides final safety shutoff service when used with V5055 valves.

Temperature Range: -40° to 150°F

Operating Pressure: 5 psi maximum

Electrical Rating: 120 VAC, 60 Hz

Auxiliary Switch Contact Ratings: 9.8 AFL, 55.8 ALR, 1/2 hp;

Proof of Closure Switch Contact Ratings (V4055D): 4.9 AFL, 29.4 ALR, 1/2 hp; 9.8 AFL, 58.8 ALR, 1/2 hp

Model Selection Guide

Timing (Open)	Internal Auxiliary Switch	Damper Shaft	Catalog Number	Price
On-Off Actuator, Use with V5055/V5097A,B Valve Bodies				
13 sec	Yes (90° Stroke)	No	V4055A1296	$559.16
13 sec	No	Yes	V4055A1098	499.13
13 sec	No	No	V4055A1031	499.13
26 sec	No	Yes	V4055A1064	462.11
26 sec	No	No	V4055A1007	462.11
26 sec	No	No	V4055A1312*	976.96
On-Off Actuator with Proof of Closure Switch, Use with V5055C/V5097C Valve Bodies				
13 sec	Yes	No	**L** V4055D1035	600.71
13 sec	No	Yes	V4055D1019	540.65
13 sec	No	No	V4055D1043	540.65
26 sec	No	Yes	V4055D1001	505.95

* NEMA 4 Enclosure

V5055 Industrial Gas Safety Shutoff Valve

Safety shutoff valves used with V4055 fluid power actuators to control natural or LP gas flow to commercial and industrial burners. Mounts directly in gas supply line.

Temperature Range: -40°F to 150°F

Includes: 1/4"–18 NPT upstream and downstream taps and plugs

Proof of Closure: V5055C valves have double seal and are used with V4055D and V4055E actuators to provide proof-of-closure switch and valve seal over-travel interlock

Approvals: FM, CSA, and UL

Model Selection Guide

Pipe Size	Capacity	Max Operating Differential*	Functions	Catalog Number	Price
Safety shutoff valves for use with V4055 valve actuators					
1.5" NPT	1717 cf/Hr – 48.6 m3/Hr	5 PSI max	On/off safety shutoff	V5055A1020	$301.74
2" NPT	3620 cf/Hr – 102.5 m3/Hr	5 PSI max	On/off safety shutoff with double seal	V5055C1000	731.15
2.5" NPT	4250 cf/Hr – 120 m3/Hr	5 PSI max	On/off safety shutoff with double seal	V5055C1018	861.65
3" NPT	4250 cf/Hr – 148 m3/Hr	5 PSI max	On/off safety shutoff	V5055A1053	674.84

* When used with V4055A or D models. 15 PSI when used with V4055B, E, F, or G models.

V51E Butterfly Firing Rate Gas Valve

Provides modulating control of natural, manufactured, LP gases or air.

Use in commercial and industrial installations where large amounts of gas must be closely controlled. Do not use as a safety shutoff valve. Use with mod motor and Q100 linkage. Includes strain release.

Temperature Range: 32° to 140°F

Pressure: *Rating:* 5 psi max.; *Inlet/outlet pressure tapping:* Two downstream 1/4" NPT taps
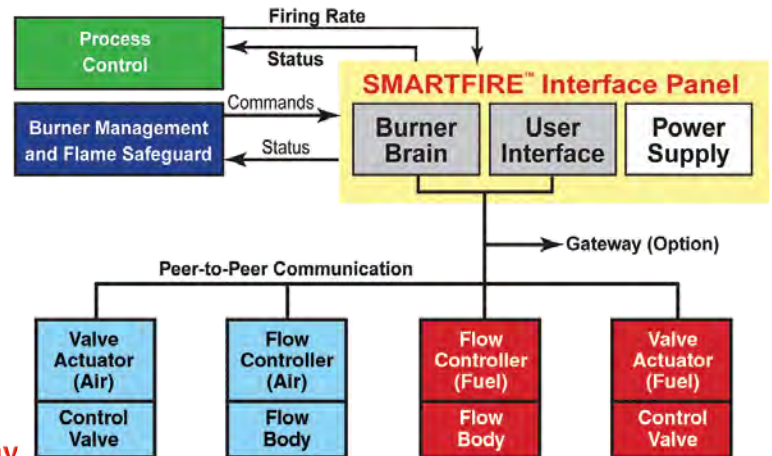
Material: Aluminum body

Approvals: UL

Model Selection Guide

Pipe Size	Capacity	Catalog Number	Price
1.5"	4200 cf/Hr – 118.9 m3/Hr	V51E1000	$396.95
2"	9210 cf/Hr – 260.7 m3/Hr	V51E1018	448.72
2.5"	8390 cf/Hr – 199.8 m3/Hr	V51E1034	474.85
3"	14640 cf/Hr – 414.5 m3/Hr	V51E1059	500.35
Bracket for 2" valve/Modutrol motor		127413	169.18
Bracket for 2.5" valve/Modutrol motor		127415	203.18
Strain release assembly		49085B	214.28
Stop screws for stop bracket (2 reqd.)		80897BC/0021	2.93
Linkage kit V51 to M941 Modutrol		Q100B1006	99.81

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COMBUSTION CONTROLS

15

MAXON Combustion Control Systems

SMARTFIRE® Intelligent Combustion Control System

- Precise electronic control of air and fuel flow to the burner to maximize efficiency and minimize emissions simultaneously

- Maintains emissions or fuel efficiency over the entire operating range of the burner, not just at one burner setpoint

- Automatically compensates for changes in combustion or process conditions with full cross-limited ratio control, maximizing burner performance and ensuring a highly repeatable heat source

- Integrates easily with all burner management systems, reducing engineering costs in retrofit applications

- Advanced diagnostics and troubleshooting provide real-time information about combustion and process system performance

- Remote monitoring gateway option reduces process downtime by providing immediate off-site technical support over a phone line

- Redundant system safety checks built into intelligent components significantly reduces the risks associated with combustion system commissioning and maintenance neglect

- FM and CSA approved, and meets requirements of European EMC and low-voltage directives

Safety Shutoff Valves

- Cast iron, carbon steel, low-temp carbon steel, and stainless steel bodies with internal trim options for general purpose or corrosive gases

- Unique bonnet design eliminates packing adjustments, reducing maintenance and minimizing drag on closing

- Oxygen compatibility available

- Meet Fluid Control Institute 70-2 control valve standard for Class VI seat leakage; Full assessment to IEC 61508 as SIL-3 capable

Series 5000 Electromechanical Valves

- Electrically actuated valves with powerful closing spring, provides closure in <1 second for reliable operation

- 3/4" to 6" line sizes, pressures to 125 psig

- Field-rotatable top assemblies in 90° increments to fit your application

- Actuators available with manual reset or automatic reset operators

- Ambient, gas temperatures: -20° to 140°F

- Available normally closed or normally open

- FM, CSA, UL, and CE approved; Available for non-incendive Class I, Div 2 areas

Series 8000 Air-Actuated Valves

- Pneumatically actuated valves with powerful closing spring for reliable operation

- 3/4" to 6" line sizes, pressures to 255 psig

- Compact design with integral solenoid, quick exhaust and position switches that protects components, simplifies piping, and minimizes space needs

- Temperature ranges: Ambient: -40° to 140°F; Gas: -40° to 212°F

- FM, CSA, and CE approved safety shutoff and vent valves; Available in intrinsically safe and non-incendive constructions for hazardous location use

- NACE-compliant trims available

MICRO-RATIO® Flow Control Valves

These assemblies are used for air, gas, and oil proportioning control. The multiple screw cam assembly provides mechanical adjustment capabilities to the air/fuel ratio at each valve position throughout the entire capacity range of your burner system.

Throttling range is fully adjustable and designed to operate over the wide turndown capabilities of Maxon's burner systems.

Stand-by fuel requirements are simplified by using tandem-linked "air-gas-oil" valves to provide single point control for multiple fuel or multiple zone systems.

A complete system using Maxon flow control valves will typically include a burner, gas and/or oil pipe trains, mixing equipment, pressure blower, and a control panel.

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Burner Systems for Industrial Applications

MAXON®
A Honeywell Company

Finding the right Maxon burner for your application	APX®	NP-LE AIRFLO®	CROSSFIRE®	TUBE-O-FLAME®	TUBE-O-THERM®	OVENPAK® LE	M-PAKT®	KINEMAX®	OVENPAK® 400	MEGAFIRE®	KINEDIZER® LE	OPTIMA™ SLS	UNI-RAD®
Heat Treating and Furnace Burners								✓			✓		✓
Low Emissions			✓			✓	✓				✓	✓	
Make-Up Air (Food or Spray Dryers, Food Processing)		✓	✓										
Oven Burners	✓					✓	✓		✓				
Oxidizers								✓			✓		
Paper Mill Dryers	✓		✓				✓	✓	✓			✓	
Pre-Heated Combustion Air			✓					✓	✓		✓		✓
Rotary Dryers and Kilns									✓	✓	✓		
Solution Heating and Finishing Systems	✓			✓	✓	✓	✓						
Steel Mills								✓			✓		✓

APX®

- Nozzle-mixing line burner for use with low pressure natural gas, propane and butane
- Single-piece aluminum extrusion body design eliminates leakage
- Cooler oven walls due to deeper penetration inside the oven (wall-mount); Independent of variable process air flows (in-duct)
- Corrosion-resistant main gas/air body and durable stainless steel mixing plates
- Up to 1.0 MMBtu/h per foot; Up to 40:1 turndown
- Packaged units up to 15 foot in length

NP-LE AIRFLO®

- Designed for direct-fired make-up air and process applications
- Improved emissions over Maxon's earlier NP AIRFLO units, with significantly lower CO and NO2 levels
- Shorter flame length
- Available in low pressure version and corrosion-resistant materials
- Easily meets ANSI/CSA standards
- Up to 1 MMBtu/h per foot; Up to 30:1 turndown

CROSSFIRE®

- Nozzle-mixing line burner for use with low pressure natural gas firing
- Extremely low emissions — Capable of NOx levels of 25ppm and CO levels of 250ppm at 3% O2
- Temperature uniformity to enhance product quality
- Also available in stainless steel housings or nickel-plated body
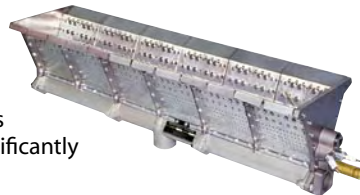- Up to 2.5 MMBtu/h per foot; Up to 25:1 turndown

TUBE-O-FLAME®

- Nozzle-mixing refractory-less burners for tube firing
- Burns any clean low-pressure fuel gas
- Increases heat transfer efficiencies with long swirling flame pattern
- Flange-mounted compact design for easy installation
- Low horsepower requirements reduce initial and operating costs
- Produces low levels of NOx in combustion products
- Generates less noise than open-port tube firing
- Capacities to 5 MMBtu/h; Up to 20:1 turndown

TUBE-O-THERM®

- Burns natural gas, propane, or butane
- Burner-to-tube direct firing system allows uniform heat transfer, eliminates hot spots, and produces faster bring-up times
- Fires directly into small-bore immersion tubes
- Designed with integral low-horse-power blower to lower costs and save energy
- Wall- or tube-mount design for no-hassle installation and easy maintenance access
- UV flame scanner capability for all four sizes
- Capacities to 5.3 MMBtu/h

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INDUSTRIAL BURNERS

17 **L**

OVENPAK® LE

- Burns any clean fuel gas, and operates on low gas supply pressures
- Provides clean combustion with low NOx and CO levels
- Compact burner design provides quick and easy installation
- Balanced pressure design and visible ignition action for easy commissioning, adjustment and maintenance
- Up to 6.5 MMBtu/h; Up to 100:1 turndown

M-PAKT®

- Burns natural gas or propane
- Extremely low emissions — Capable of single-digit NOx and CO levels at 3% O2
- Flame contained almost entirely inside the discharge sleeve
- Durable steel outer construction with stainless steel internals
- Compact design with a variety of control methods
- Up to 8.4 MMBtu/h; Up to 13.5:1 turndown

KINEMAX®

- Burns most clean low-pressure gaseous fuels or light oil; Can be used with oxygen-enriched combustion air
- Lower fuel consumption using preheated combustion air (up to 800°F)
- Operate on-ratio with excess fuel or excess oil to meet specific demands of your combustion process
- Exit velocities up to 275 ft/s to promote workload heat penetration and better furnace temperature uniformity
- Refractory block for chamber temperatures up to 3000°F
- Removable backplate gives easy access for inspection, maintenance
- Seven sizes, capacities to 8.4 MMBtu/h; Up to 48:1 turndown

OVENPAK® 400

- Burns any clean fuel gas; Requires only low-pressure gas
- Fires into passing air streams
- Provides clean combustion with low NOx levels
- Simple field adjustment and maintenance
- Compact burner design provides quick and easy installation
- More than 90 different styles and sizes — including cost-effective external blower versions
- Capacities to 16.5 MMBtu/h; Greater than 40:1 turndown

MEGAFIRE®

- Provides clean burning of #2 oil, natural gas or propane; Fires gas, oil, or both simultaneously
- Inline blower version includes energy-efficient centaxial direct drive combustion air blower
- Quiet operation with exceptionally low horsepower requirement
- Nine different styles, three different sizes
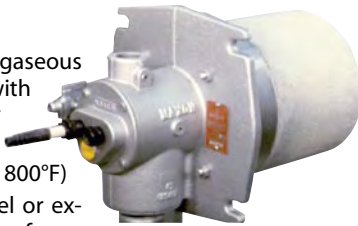- Capacities to 45 MMBtu/h; 10:1 turndown on #2 oil, 15:1 turndown on natural gas

KINEDIZER® LE

- Burns natural gas, propane, or other fuel gases
- Accepts preheated and vitiated combustion air
- Field-proven low emissions; State-of-the-art NOx firing, adjustable for application flexibility
- Rugged design for oxidizers, process heaters, kilns, furnaces, dryers, waste incineration, and other high-temperature applications
- Excellent stirring and mixing with medium velocity exhaust
- Six sizes, capacities up to 75 MMBtu/h; Up to 22:1 turndown, with the lowest NOx and excess air in the KINEDIZER® family!

OPTIMA™ SLS

- Fuel flexible with natural gas, propane, and butane capability
- Low NOx and CO production levels for extremely clean, reliable heat — and easy air permitting and environmental compliance
- Large capacity heat releases with a compact, robust flame geometry
- Intelligent ratio control provides reliable operation and optimal fuel efficiency
- All steel and high temperature alloy construction for reduced weight, increased durability
- Configurable for dryers, air heaters, ovens, kilns, process heaters, paper machines, and a variety of industrial heating equipment
- Direct factory operational support with SMARTFIRE® control and communication gateway
- Five sizes, capacities to 93.5 MMBtu/h; Up to 17.8:1 turndown

UNI-RAD®

- Radiant tube burner for fuel gas inputs
- Suitable for use on pressure tubes, negative pressure tubes, and electrified radiant tubes
- Flame length adjustable by changing combustion air-to-ignition ratios — produces optimum tube temperature uniformity over a wide range of firing rates and preheated air temperatures
- Continuous plasma spark provides instantaneous ignition, so burner can operate from the DAT output of a PID control loop
- Can be used in conjunction with UV flame supervision equipment

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MicroM Flame Safeguard Burner Control System

fireye

MicroM Flame Safeguard controls are compact, modular burn management systems designed to provide automatic ignition and continuous flame monitoring for commercial-sized heating and process burners firing any type of fuel.

The MicroM incorporates remote reset capability and serial communications via MODBUS. The optional ED510 display can be used to access burner hours and cycles, system hours, the last 6 lockouts with burner cycle time stamp and programmer configuration. MODBUS communications capability allows the integration of the MicroM control into upper level energy management/data acquisition systems.

A complete MicroM system consists of the appropriate flame scanner/detector, plug-in amplifier, and programmer modules connected to a chassis and wiring base. Interchangeable programmer and amplifier modules allow versatility in selecting control function, timing, and flame scanning method.

All amplifiers are available with flame failure response times of 0.8 or 3 seconds nominal (4 seconds max), and each provide a set of test jacks with a range of 0-10VDC for the measurement of flame signal intensity.

Smart LED indicators on all programmer modules indicate the current operating status of the control, and during a safety lockout, display the fault as a coded sequence, simplifying troubleshooting during a shutdown. A run-check switch is provided on the MEP500 series programmers to assist in testing size, position, and stability of the pilot. A safety checking circuit runs on each start. If flame (real or simulated) is detected prior to a start or during purge, the fuel valves will not be energized and the control will lock out.

Model Selection Guide

Component	Description	Catalog Number	Availability	Price
Chassis	120VAC Input, Standard Board	MEC120	• • • •	$339.00
	120 VAC Input with Remote Reset Capability, Interface to Alphanumeric Display, Communications, Modbus Capability	MEC120RC	• • • •	493.00
Programmer	Relight Operation, 10 Sec. PTFI	MEP100	• • • •	151.00
	Selectable Purge Timing, PTFI Timing, Recycle/Non-Recycle, Post Purge, Prove Air Open at Start	MEP230	• • • •	365.00
	Selectable Purge Timing to 60 Min.	MEP536	• • • •	458.00
Flame Scanners (See pg 20 for details)	Non Self-Checking Scanner, 3 Ft. Flexible Cable, 1/2" NPT Connector	UV1A3	↓	160.00
	Non Self-Checking Scanner, 6 Ft. Flexible Cable, 1/2" NPT Connector	UV1A6	↓	189.00
	Infrared Scanner, 8 Ft Shielded Cable with 90° Head	48PT2-9003	↓	252.00
	Ultraviolet Self-Checking Scanner, 120 VAC Shutter, 1" NPT Threads	45UV5-1009	↓	1373.00
	Flame Rod for Gas Flames, 12" Length, 1/2" NPT Connection	69ND1-1000K4	↓	106.00
Amplifier Modules	UV Amplifier, 0.8 Sec Flame Failure Response Rate (FFRT)	MEUV1	•	74.30
	UV Amplifier, 3 Sec FFRT	MEUV4	•	74.30
	Infrared Amplifier, 0.8 Sec FFRT	MEIR1	•	149.00
	Infrared Amplifier, 3 Sec FFRT	MEIR4	•	149.00
	UV Self-Check Amplifier, 0.8 Sec FFRT	MEUVS1	•	160.00
	UV Self-Check Amplifier, 3 Sec FFRT	MEUVS4	•	160.00
	Flame Rod/Photocell Amplifier, 0.8 Sec FFRT	MERT1	•	74.30
	Flame Rod/Photocell Amplifier, 3 Sec FFRT	MERT4	•	74.30
Wiring Base	Closed Wiring Base, Surface Mount	61-3060	• • • •	64.50
	Open Wiring Base, Cabinet Mount	61-5042	• • • •	68.50
Add functionality to your existing MicroM chassis*.				
Option Boards	Standard Local Reset Switch	MED1	• • • •	35.10
	Standard Local Reset Switch with Display Output	MED2	• • • •	58.30
	Standard Local Reset Switch with Remote Reset	MED3	• • • •	81.70
	Standard Local Reset Switch with Communications	MED7	• • • •	129.00
	Standard Local Reset Switch, Display Output, and Remote Reset	MED4	• • • •	117.00
	Standard Local Reset Switch with Display Output, Communications	MED5	• • • •	142.00
	Standard Local Reset Switch with Display Output, Remote Reset, and Communications	MED6	• • • •	175.00

*MicroM chassis model MEC120RC includes all these options.
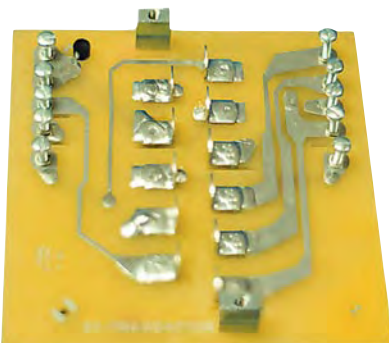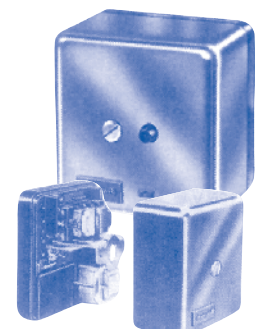

MicroM Subbase Mounting Adapters

The MicroM can fit directly onto your existing Honeywell Flame Safeguard mounting subbase with the addition of a single mounting adapter. No need to do any rewiring or expensive re-engineering for retrofits.

Model Selection Guide

Description	Catalog Number	Price
MM-2 Mounting Adapter to Retrofit to R4795 Systems	60-1765	$96.60

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BURNER CONTROLS

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BurnerLogix™ Burner Management System

Features

- Keypad-configurable parameters — no dip switches to set!
- Smart LEDs provide status and lockout codes — and provide operation without the need for the optional display
- Alphanumeric display provides clear, concise messaging
- Valve proof-of-closure during standby, startup, and shutdown
- Modbus communications built in — adjustable baud rates allow for easy adaptation to burner control system
- Open wiring base with terminal block allows testing with control installed; pigtail wiring base has color-coded and labeled leadwires
- 4-20 mA test jack signal
- New design with smaller footprint saves cabinet space

BurnerLogix

The Fireye Burner Logix System provides the proper burner sequencing, ignition and flame monitoring protection on automatically ignited oil, gas, and combination fuel burners. In conjunction with limit and operating controls, it programs the burner/blower motor, ignition and fuel valves to provide for proper and safe burner operation.

A complete BurnerLogix system includes the YB110 chassis equipped with a flame amplifier, appropriate flame detector, plug-in programmer module, wiring base and optional alphanumeric display. The chassis/flame amplifier module comes complete with mounting screws and blank display module.

Interchangeable programmer modules allow for complete versatility in selection of control function, timing, and flame scanning means. The programming module determines functions like pre-purge time, recycling or non-recycling interlocks, high fire proving interlock, and trial for ignition timing of the pilot and main flame.

The BurnerLogix system can be used with ultraviolet, auto-check infrared, flame rod, self-check ultraviolet flame scanners, or direct coupled by choosing the proper chassis/flame amplifier module.

BurnerLogix' operational characteristics are determined by the selection of the programmer module (e.g. modulation, recycle, non-recycle, fixed firing, flame failure response time, etc.). The programmer module incorporates a plug-in design for easy installation.

Wiring bases for the BurnerLogix control are available pre-wired with 4 foot lead wires color coded and marked for easy installation or with an integral terminal block capable of accepting up to 2X 14 AWG wires. The wiring base terminal block is available with knockouts for conduit, or open ended for cabinet mounting.

Display Modules

The BurnerLogix system offers vacuum fluorescent (VFD) and liquid crystal (LCD) displays that can be either plugged in or mounted remotely to give full language descriptors of current status and diagnostic lockout information.
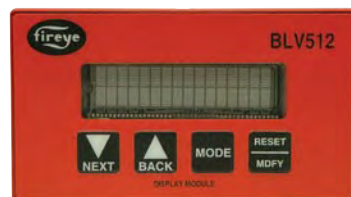
Both displays contain a fully functional keypad so you can easily scroll through the various menus to view the current operating status, and review programmer configuration and lockout history.

Remote mounted displays meet NEMA 4X requirements.

Model Selection Guide

Description	Catalog Number	Price
Step 1: Select Your BurnerLogix Chassis/Amplifier Module		
120 VAC 50/60 Hz, with UV non-self-check amplifier	YB110UV	$1023.00
120 VAC 50/60 Hz, with UV self-check amplifier	YB110UVSC	1262.00
120 VAC 50/60 Hz, with IR auto-check amplifier	YB110IR	1192.00
120 VAC 50/60 Hz, with flame rectification amplifier	YB110FR	1017.00
120 VAC 50/60 Hz, with direct-coupled amplifier, for use with Phoenix and Insight scanners	YB110DC	1192.00
Step 2: Select Your BurnerLogix Programmer Module		
Keypad-selectable parameters, non-recycle operation, modulation, open damper proving, 4 second FFRT	YP100	905.00
Keypad-selectable parameters, non-recycle operation, modulation, open damper proving, 2 second FFRT	YP102	905.00
Keypad-selectable parameters, non-recycle operation, fixed TFI times, pilot proving, modulation, open damper proving, 1 second FFRT	YP113	905.00
Keypad-selectable parameters, non-recycle operation, modulation, open damper proving, indefinite pilot hold, revert to pilot from auto, 4 second FFRT	YP138	905.00
Keypad-selectable parameters, recycle operation, modulation, 4 second FFRT	YP200	699.00
Keypad-selectable parameters, recycle operation, modulation, 2 second FFRT	YP202	699.00
Keypad-selectable parameters, recycle operation, low fire start, early spark termination, 4 second FFRT	YP300	525.00
Keypad-selectable parameters, recycle operation, low fire start, early spark termination, 4 second FFRT	YP302	525.00
Step 3: Add an Optional BurnerLogix Display Module		
Vacuum fluorescent display (VFD), Good -40° to 140°F	BLV512	520.00
Liquid crystal display (LCD), Good -4° to 140°F	BLL510	520.00
NEMA 4 remote mount kit for display, 4 foot cable	129-178-4	56.00
NEMA 4 remote mount kit for display, 8 foot cable	129-178-8	61.00
Step 4: Select a Wiring Base		
4" x 5", 4 foot pigtail wires, color coded and labeled	60-2810-1	93.20
4" x 7" closed base with terminal block and knockouts	60-2812-1	93.20
4" x 7" open base with terminal block	60-2814-1	93.20
Step 5: Add an Optional Expansion Module		
Expansion module for first-out annunciation	YZ300	996.00
Step 6: Select a Flame Scanner (See page 20 for details)		
Non Self-Checking Scanner, 3 Ft. Flexible Cable	UV1A3	160.00
Non Self-Checking Scanner, 6 Ft. Flexible Cable	UV1A6	189.00
Infrared Scanner, 8 Ft Shielded Cable with 90° Head	48PT2-9003	252.00
Ultraviolet Self-Checking Scanner 120 VAC Shutter	45UV5-1009	1373.00
12" Flame Rod for Gas Flames, 1/2" NPT Connection	69ND1-1000K4	106.00

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Flame Monitor Series Burner Control System

fireye

Flame-Monitor Series

The Flame-Monitor Series provides the proper burner sequencing, ignition and flame monitoring protection on automatically ignited oil, gas and combination fuel burners. Interchangeable programmer and flame amplifier modules allow complete versatility in selecting control function. The flame-monitor control uses the same wiring base as the Fireye D-Series and C-Series Controls and is directly interchangeable with most models with out rewiring.

The Flame-Monitor control can be used with ultraviolet, AUTOCHECK® infrared, photocell, flame rod or self-check ultraviolet flame scanners. Special features include remote reset, remote display, expanded annunciation of safety lockouts, programmability of safety interlock messages, and remote data communications capability.

The complete Flame-Monitor control consists of a chassis, display module, programmer, amplifier, scanner and a wiring base.

EP Programmer Module

The Fireye EP Programmer Modules provide start-up programming, safe start check, and flame monitoring supervision. They ensure open damper high fire purge interlock, proof of low fire position and fuel valve end switch safety checks.

A running interlock circuit constantly monitors the limit switches, air flow switches and fuel pressure switches throughout the programmer. EP programmer modules will de-energize all fuel valve circuits within 4 seconds following a flame failure or at the end the pilot-trail-for-ignition period if no flame is detected.

The EP programmers provide a Check-Run switch to stop the control in its firing sequence at any time (except MTFI) to aid in setup, start-up, and check out of the burner and its associated interlocks.

EP programmers offer the following functions: an increase of purge timing and air flow switch opened at the start of the operating cycle. EP programmers include an RJ45 style connector to interface with the ED510 display module. EP programmers store the burner cycle and on-time history, as well as lockout history (with burner cycle and burner hour time stamp).

ED510 Display Module

- LCD backlit display with 2 lines of 16 characters each
- RJ style connector
- Mounts directly onto front face of programmers
- Continuous display of current burner status, including first out annunciation in the event of a lockout condition
- Remote display using DIN-sized opening and remote mounting kit.
- 3-key keypad provides historical data from the burner, the last 6 lockout conditions (with burner cycle and burner hour time stamp)

Flame Scanners

69ND1: Flame rod made of high temperature resistant metal. Can only be used to detect gas flames. Rods are available in 12", 18", and 24" lengths.

UV1A: Ultraviolet miniature non self-checking scanners suitable for fuel gases and #2 oil. Non-replaceable tube. Mounting collar 1/2" NPT.

48PT2: Lead sulfide scanner is designed to detect low frequency IR signals from gas or oil flames. Mounting collar is 1/2" NPT with straight or 90° mounts. 8 ft. flexible conduit. Replaceable sensor cell.

45UV5: Self-checking ultraviolet scanner for continuously fired applications where recycling in infrequent or absent. The self-checking circuit checks the electronics and the UV tube for proper operation every 4 seconds during the firing period. Suitable for fuel gases and oil. Replaceable UV tube and shutter mechanism. Mounting 1" NPT. Must be installed with metal shielding over the scanner leads.

Flame Amplifier Module

Flame amplifier modules are used with the appropriate flame scanner to provide flame scanning capability. Fireye offers ultraviolet amplifiers and flame rectification amplifiers for use with flame rods, photocells and auto-check infrared amplifiers.
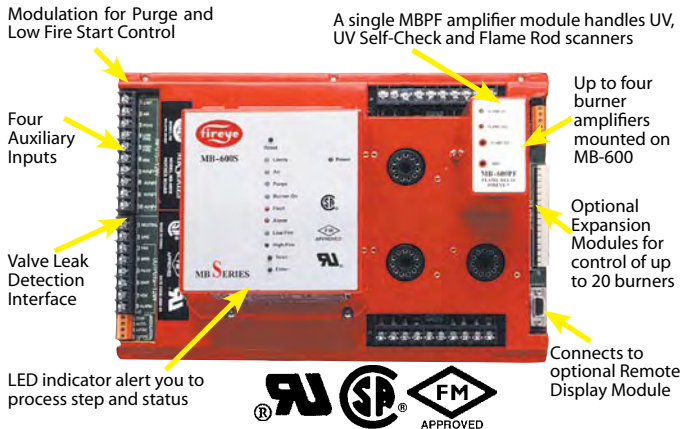
Self-checking ultraviolet scanners and amplifiers should be used in applications where burner firing operation is continuous or where the burner is on for long periods of time without cycling.

Model Selection Guide

Component	Description	Catalog Number	Avail-ability				Price
Chassis	120VAC Chassis with Mounting Screws and Dust Cover	E110	•	•	•	•	$701.00
Program Module	30 Sec. Purge, 10/15 Sec. TFI, 4 Sec. FFRT, Non-Recycle Modulation	EP160	•	•	•	•	952.00
Display	2 Line x 16 Character LCD Display with Keypad	ED510	•	•	•	•	494.00
Flame Scanner	Non Self-Checking Scanner, 3 Ft. Flexible Cable, 1/2" NPT Conn.	UV1A3	↓				160.00
	Non Self-Checking Scanner, 6 Ft. Flexible Cable, 1/2" NPT Conn.	UV1A6	↓				189.00
	Infrared Scanner, 8 Ft Shielded Cable with 90° Head	48PT2-9003		↓			252.00
	Ultraviolet Self-Checking Scanner 120 VAC Shutter, 1" NPT Thread	45UV5-1009			↓		1373.00
	12" Flame Rod for Gas Flames, 1/2" NPT Connection	69ND1-1000K4				↓	106.00
Amplifier Module	Standard Ultraviolet Amplifier	EUV1	•				373.00
	Autocheck Infrared Amplifier	E1R1		•			552.00
	Self-Check Ultraviolet Amplifier	EUVS4			•		625.00
	Flame Rectification Amplifier	ERT1				•	367.00
Wiring Base	Surface Mount	60-1386-2	•	•	•	•	105.00
	Panel Mount	60-1466-2	•	•	•	•	105.00

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BURNER CONTROLS 21 **L**

MB Series Industrial Multiburner Flame Safeguard System

Modulation for Purge and Low Fire Start Control

A single MBPF amplifier module handles UV, UV Self-Check and Flame Rod scanners

Four Auxiliary Inputs

Up to four burner amplifiers mounted on MB-600

Optional Expansion Modules for control of up to 20 burners

Valve Leak Detection Interface

Connects to optional Remote Display Module

LED indicator alert you to process step and status

The Fireye Multi-Burner Monitoring System controls the start-up sequence and monitors the flame of up to 20 individual gas, oil or combination gas/oil burners connected to a common valve train. Dynamic on-board diagnostics check for faulty relays, proof of valve closure, high and low fire switch interlocks, and shortened air switch. The MB is even able to specifically identify which burner caused the initial flame failure.

Plug-in flame sensor modules that can sense UV, UV self-check or flame rod provide for easy replacement on an individual basis. Configuration and startup time is reduced through use of on-board DIP switches, which also allow sequencing and timing functions.

The MB-600S chassis directly powers pilot and main gas valves and ignition transformers. The built in blower output, purge timing and modulation control, let you add independent limits and a controller to create a complete combustion control system for furnace, oven or other multi-burner applications.

Specifications

Number of Burners: 20 max.

Pilot Proving Time: 7 seconds

Purge Time: 0 sec to 60 min

Pilot Trial for Ignition: 5, 10 or 15 seconds

Flame Failure Response Time: 3 (±0.5) seconds

Valve Operation: Simultaneous (all burners operate from one fuel train)

Supply Voltage: 120VAC, 50/60 Hz; *Power Consumption:* 25VA

Temperature Rating: -32° to 122°F (-36° to 50°C)

Contact Ratings: *Fan Motor:* 15 Amp Resistive; *Others:* 10 Amp Resistive

UV7A4 UV Scanner

UV7R4 90° UV Scanner

UV7SC Self-Check UV Scanner
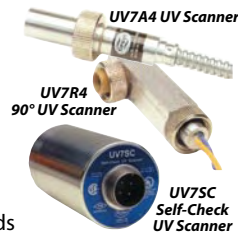
Model Selection Guide

Description		Catalog Number	Price
Step 1: Select a Chassis for your Multiburner Control System			
Chassis	120VAC 50/60Hz, Motherboard, Relay Board, Logic Module, and Power Module. 4 Auxiliary Inputs, Purge Modulation, Valve Leak Testing	MB-600S	$1769.00
	120VAC 50/60Hz, Motherboard with RS-232 Communications, Relay Board, Logic Module, Power Module. 4 Auxiliary Inputs, Purge Modulation, Valve Leak Testing	MB-632S	1903.00
	120VAC 50/60Hz, Motherboard with RS-485 Communications, Relay Board, Logic Module, Power Module. 4 Auxiliary Inputs, Purge, Modulation, Valve Leak Testing	MB-685S	1903.00
Step 2: Select a Flame Sensor Module			
Sensor Module	Plug-In Flame Sensor Module, UV/FR Plastic Case with Mounting Screws	MB-600PF	354.00
Step 3: For Systems with More than 4 Burners, Select Expansion Board Modules and Cables			
Expansion Modules	Expansion Board for up to 4 Burners	MB-604E	316.00
	Expansion Board for up to 8 Burners	MB-608E	638.00
	6" Cable for Expansion Board	59-506-1	34.40
	36" Cable for Expansion Board	59-506-3	48.60
Step 4: Select Optional Remote Display and Cable			
Display	Remote Display with Keypad	MB510	448.00
	6 Ft. Cable for Remote Display	59-507-6	23.60
	10 Ft. Cable for Remote Display	59-507-10	35.40
Step 5: Select One Flame Scanner for Each Burner on Your System			
Scanners and Accessories	1/2" NPT Straight UV Scanner, 4 Ft. Flex Conduit, Insulated Nylon Coupling	UV7A4	181.00
	1/2" NPT UV Scanner, NEMA 4, 4 Ft. Flex Conduit, Insulated Nylon Coupling	UV7A4W	241.00
	1/2" NPT 90° UV Scanner, 6 Ft Shielded Cable	UV7R4	148.00
	1" NPT Self-Check Scanner	UV7SC	970.00
	10 Ft Cable for UV7SC Self-Check Scanner	59-504-010	150.00
	Scanner Support, Max Temp 200°F	36-935	35.60
	Magnifying Lens Assembly	46-185	90.60
	Magnifying Lens	46-186	22.20
	Non-Magnifying Lens	46-187	28.20
	1/2" NPTF Insulated Nylon Coupling	35-319	17.40

Tip: If your system has between 4 and 8 burners, select 1 MB-604E module and a connecting cable. If your system has between 9 and 13 burners, select 1 MB-608E module and a connecting cable. For systems that have 14 to 20 burners, you can mix MB-604E and MB-608E modules to fit.

65UV5 Integrated Flame Scanner with Internal Flame Relay

The 65UV5 flame scanner incorporates an internal single pole, single throw (normally open) flame relay with a fixed on/off threshold to provide flame on/flame off indication, eliminating the need for an external flame amplifier.

The scanner uses an ultraviolet tube-type sensor, and electromechanical self-checking shutter mechanism. The NEMA 4X/IP66 housing is suit-able for use in Class I Division II, Group C and D hazardous environments.

The Fireye 65UV5 flame scanner is powered by 24 VDC and includes an integral 10-foot four-conductor cable with cable gland. Two color-coded internal LEDs indicate flame status (off/on) and alarm condition. These can be viewed through the removable rear access screw opening.
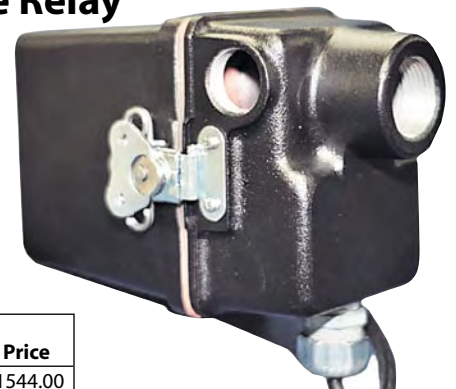
Model Selection Guide

Description	Catalog Number	Price
Integrated Flame Scanner, 1" NPT Mounting Flange, 4 Second Flame Failure Response Time	65UV5-1004	$1544.00

krom//schroder
Flame Relays and Burner Control Units

Choosing the Right Kromschroder Burner Control

	IFS 258	IFS 110IM	BCU 370
Operating Time	< 24 Hours	< 24 Hours	> 24 Hours
Ignition Type	Direct	Direct	Direct or Pilot Burner
Signal Line Length	75M Max	50M Max	50M Max
Behavior at Flame Failure	Switchable: Fault Lockout or Restart	Fault Lockout and/or Restart	Programmable
Gas Valve Outputs	1	2	2

IFS 258 Burner Control Unit

For use in single- and multiburner atmospheric or forced-air burner systems. Can be used with on/off, high/low or proportional control. Add external timer to provide purge timing.

- Compatible with flame rods or UV detectors
- Front panel indicators display burner unit on, flame on, and flame failure information
- Start/stop/reset switch on front of unit
- Can be programmed to restart or immediate fault lockout following flame failure
- CSA, FM approved

Model Selection Guide

Description	Pilot Flame Establishing Period	Catalog Number	Price
Burner control unit for intermittent operation with switchable fault lockout or restart, FFRT 2 seconds			
IFS 258T-3/2R	3 seconds	84620420	$307.00
IFS 258T-5/2R	5 seconds	84620440	307.00
IFS 258T-10/2R	10 seconds	84620460	307.00

IFS 110IM Burner Control Unit

Automatic burner control for ignition and control of gas burners in gas-firing installations of all types. Designed for high cycling frequency and long life.

- Flame control by means of flame rods or UV detectors
- Performs flame simulation check before starting burner and after switching off
- Semiconductor output for ignition transformer — no switch contacts
- High cycling frequency
- Remote reset
- External fault indication
- FM approved
- Can be used for multiburner control by adding flame relay IFW 15T

Add an IFW 15T flame relay to your IFS 110 IM for multiburner control.

Model Selection Guide

Description	Pilot Flame Establishing Period	Catalog Number	Price
Burner control unit for intermittent pilots, FFRT 2 seconds, fault lockout and restart following flame failure			
IFS 110IMT-3/2/2N	3 seconds	84367700	$414.00
IFS 110IMT-5/2/2N	5 seconds	84367710	414.00
IFS 110IMT-10/2/2N	10 seconds	84367720	414.00
Burner control unit for intermittent operation FFRT 2 seconds, restart following flame failure			
IFS 110IMT-W-3/2/2N	3 seconds	84367750	434.00
IFS 110IMT-W-5/2/2N	5 seconds	84367760	434.00
IFS 110IMT-W-10/2/2N	10 seconds	84367770	434.00

IFW 15T Flame Relay

Detect and signal existing flame.

- Compatible with flame rods or UV detectors
- Potential-free contacts
- Integrated ON lamp
- Use with IFS 110IM for multiburner control
- Great for letting your PLC know when flame is present

Model Selection Guide

Description	Catalog Number	Price
Flame relay. Use with IFS 110IM burner control for multiburner apps.		
IFW 15T-N Flame Relay	84359100	$200.00

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BURNER CONTROLS   **23**   **L**

BCU 370 Burner Control Unit

Controls, ignites, and monitors industrial forced-air burners of unlimited capacity in intermittent or continuous operation. Can be used for direct-ignited or pilot-burner systems.

- Controls fan and butterfly valve, monitors gas and air pressure
- Manual operating mode and informative operating, warning, and fault messages make startup, service, and and maintenance simple
- Optional integrated tightness control function checks valves with a DG gas pressure switch
- Quick-start option allows standard-compliant startup of forced air burner without pre-purge after normal shutdown
- Programmable via optical interface and BCSoft PC software

Model Selection Guide

Description	Catalog Number	Price
For controlling, igniting, and monitoring industrial forced-air burners, intermittent operation, ionization or UV control. 120 VAC 50/60 Hz power, fan (blower) and butterfly valve control		
BCU 370QFEU0D1 No ignition unit, flame control DGmax	88600122	$530.00
BCU 370QI1FEU0D1 Single-pole electronic ignition, flame control DGmax	88600249	650.00
BCU 370QI1FEU0D1B1 Single-pole electronic ignition, flame control DGmax, ProfiBUS-DP interface	88600236	858.00
BCU 370QFEU0D3B1-3 No ignition unit, integrated tightness control, ProfiBUS-DP interface and butterfly valve control over ProfiBUS	88600121	1111.00
Opto Adapter and BCSoft CD-ROM for BCU 370s	74960437	263.00

UVS 8T Ultraviolet Flame Detector

For use in forced and induced draft burners, ovens, gas-fired boilers, industrial furnaces, and installations for the flaring of excess gas.

- High sensitivity over an ambient temperature range -40° to 176°F
- Insensitive to sunlight, daylight, infrared radiation, and incandescent lamps
- UV tube life expectancy of 10,000 operating hours
- Protects against interruptions or short circuits in the flame signal line
- Rugged aluminum construction with integral 1/2" NPTF threaded collar and 6-foot leads
- FM approved

Model Selection Guide

Description	Catalog Number	Price
UVS 8T Ultraviolet Detector	84333120	$134.00
UV Replacement Tube	74960445	111.00

When you need to learn more, the Lesman website has:

- Downloadable specifications
- Dimensional drawings
- 24/7/365 availability

Visit us anytime at www.lesman.com

krom schroder

Pressure Switches for Gas Applications

DG Pressure Switches

Monitors positive air and gas pressures, negative or differential air pressures in industrial and commercial applications.

- Accurate repeatable switching action with low hysteresis
- Die-cast aluminum alloy base, glass fiber-reinforced plastic switch housing, nitrile rubber diaphragm, and high-quality injection-molded plastic covers
- One normally open and one normally closed contact in each switch (5A resistive or 0.5A inductive
- Automatic and manual reset models
- 8A quick-acting fuse for short circuit protection
- FM approved, cULus listed

Model Selection Guide

Description	Adjustable Range	Connection	Catalog Number	Price
DG..T pressure switch with 110V control lamp (green) for positive, negative, and differential pressure, automatic reset				
DG 6T	0.2" to 2.4" WC	1 x 1/4" NPT	84447800	$64.00
DG 10T	0.4" to 4" WC	1 x 1/4" NPT	84447810	64.00
DG 50T	1.0" to 20" WC	1 x 1/4" NPT	84447820	64.00
DG 150T	12" to 60" WC	1 x 1/4" NPT	84447830	64.00
DG 500T	40" to 200" WC	1 x 1/4" NPT	84447840	64.00
DG 6T	0.2" to 2.4" WC	2 x 1/4" NPT	84447802	63.00
DG 10T	0.4" to 4" WC	2 x 1/4" NPT	84447812	63.00
DG 50T	1" to 20" WC	2 x 1/4" NPT	84447822	63.00
DG 150T	12" to 60" WC	2 x 1/4" NPT	84447832	63.00
DG 500T	40" to 200" WC	2 x 1/4" NPT	84447842	63.00
DG..HT pressure switch with manual reset, locks on pressure rise				
DG 10HT	0.4" to 4" WC	2 x 1/4" NPT	84447912	77.00
DG 50HT	1.0" to 20" WC	2 x 1/4" NPT	84447922	77.00
DG 150HT	12" to 60" WC	2 x 1/4" NPT	84447932	77.00
DG 500HT	40" to 200" WC	2 x 1/4" NPT	84447942	77.00
DG..NT pressure switch with manual reset, locks on pressure fall				
DG 10NT	0.4" to 4" WC	2 x 1/4" NPT	84447962	77.00
DG 50NT	1.0" to 20" WC	2 x 1/4" NPT	84447972	77.00
DG 150NT	12" to 60" WC	2 x 1/4" NPT	84447982	77.00
DG 500NT	40" to 200" WC	2 x 1/4" NPT	84447992	77.00

DG..VT Safety Limit Pressure Switches

Diaphragm-actuated safety limit switch controls rising or falling pressures that must not overshoot or undershoot a set limit value, and controls the minimum or maximum gas inlet pressure of a gas control line.

- For use with natural gas and air
- Die-cast aluminum base, glass-filled PBT switch housing, NBR diaphragm, and polycarbonate cover
- Available with Valvario mount for direct connection to Kromschroder modular valve trains
- Ambient temperatures 5° to 140°F
- 4-pin DIN/Amp plug wiring connector

Model Selection Guide

Description	Adjustable Range	Connection	Catalog Number	Price
DG pressure switch with 4-pin plug, socket, and 18" flexible leads				
DG 17VCT6-6W	0.8" to 6.8" WC	1/8 NPTM	84448040	$49.00
DG 40VCT6-6W	2.0" to 16" WC	1/8 NPTM	84448840	49.00
DG 110VCT6-6W	12" to 44" WC	1/8 NPTM	84448440	49.00
DG 300VCT6-6W	40" to 120" WC	1/8 NPTM	84448940	49.00
DG 17VCT8-6W	0.8" to 6.8" WC	1/4" NPTM	84448090	49.00
DG 40VCT8-6W	2.0" to 16" WC	1/4" NPTM	84448890	49.00
DG 110VCT8-6W	12" to 44" WC	1/4" NPTM	84448490	49.00
DG 300VCT8-6W	40" to 120" WC	1/4" NPTM	84448990	49.00
DG 17/VCT1-6W	0.8" to 6.8" WC	Valvario	75454583	78.00
DG 40/VCT1-6W	2.0" to 16" WC	Valvario	74214174	78.00
DG 110/VCT1-6W	12" to 44" WC	Valvario	75454585	78.00
DG 300/VCT1-6W	40" to 120" WC	Valvario	75454586	78.00

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BUTTERFLY VALVES

25 **L**

krom// schroder **Butterfly Valves and Actuators**

BV Butterfly Valves

High accuracy valves for control of gas flow rates. Mount on IC 20 or IC 40 actuators to regulate flow rates for modulating or stage-controlled combustion systems.

- Low leakage rate and pressure loss
- Other models available for flue gas and high temperature air flow rates to 840°F. Call Lesman for details

Model Selection Guide

Model	Temperature Range	Bore Size	Nominal Diameter	Reduced Nominal Diam.	Compatible Actuator	Catalog Number	Price
Butterfly valve for continuous control of gas flow rates, ratio of 10:1. Maximum inlet pressure 7.25 PSI.							
BVG 40TW05	-4° to 140°F	Full	1 1/2"		IC 20 or IC 40	74105790	$196.00
BVG 65TW05	-4° to 140°F	Full	2 1/2"		IC 20 or IC 40	74105792	226.00
BVG 50TW05	-4° to 140°F	Full	2"		IC 20 or IC 40	74105791	208.00
BVG 80TW05	-4° to 140°F	Full	3"		IC 20 or IC 40	74105793	257.00
BVG 100TW05	-4° to 140°F	Full	4"		IC 20 or IC 40	74105794	273.00
BVG 40/32TW05	-4° to 140°F	1X Reducing	1 1/2"	1 1/4"	IC 20 or IC 40	74214264	255.00
BVG 50/40TW05	-4° to 140°F	1X Reducing	2"	1 1/2"	IC 20 or IC 40	74214263	294.00
BVG 65/50TW05	-4° to 140°F	1X Reducing	2 1/2"	2"	IC 20 or IC 40	74214262	316.00
BVG 80/65TW05	-4° to 140°F	1X Reducing	3"	2 1/2"	IC 20 or IC 40	74105783	361.00
BVG 100/80TW05	-4° to 140°F	1X Reducing	4"	3"	IC 20 or IC 40	74105784	376.00
BVG 40/25TW05	-4° to 140°F	2X Reducing	1 1/2"	1"	IC 20 or IC 40	74214267	255.00
BVG 65/40TW05	-4° to 140°F	2X Reducing	2 1/2"	1 1/2"	IC 20 or IC 40	74214265	316.00
BVG 50/32TW05	-4° to 140°F	2X Reducing	2"	1 1/4"	IC 20 or IC 40	74214266	294.00
BVG 80/50TW05	-4° to 140°F	2X Reducing	3"	2"	IC 20 or IC 40	74105875	361.00
BVG 100/65TW05	-4° to 140°F	2X Reducing	4"	2 1/2"	IC 20 or IC 40	74105782	401.00

Need a butterfly valve for flue gas or high temperature air flow rates? Call Lesman for pricing and availability.

Compatible Valve Actuators for BV Butterfly Valves

Reversible gear motors to transmit rotary movements between 0° and 90°.

- IC 20 for basic applications with continuous or three-point step control, automatic/manual mode changeover for easy commissioning. IC 20..E is controlled by 0/4-20 mA or 0-10V signal
- IC 40 for complex applications with programmable functions for flexible adjustment to the process. Compatible with BCSoft for data monitoring, troubleshooting, and programming

Model Selection Guide

Description	Torque (Lb-in)	Run Time (Over 90° Stroke)	Controlling Signal	Catalog Number	Price
IC 20 Reversible gear motor, 120 VAC, 50/60 Hz					
IC 20-07Q2	22 Lb-in	7.5 seconds	Three-point step	74105712	$311.00
IC 20-15Q3	26.5 Lb-in	15 seconds	Three-point step	74105713	311.00
IC 20-30Q3	26.5 Lb-in	30 seconds	Three-point step	74105714	311.00
IC 20-60Q3	26.5 Lb-in	60 seconds	Three-point step	74105715	311.00
IC 20-07Q2E	22 Lb-in	7.5 seconds	Continuous	74105998	741.00
IC 20-15Q3E	26.5 Lb-in	15 seconds	Continuous	74105999	741.00
IC 20-30Q3E	26.5 Lb-in	30 seconds	Continuous	74106000	741.00
IC 20-60Q3E	26.5 Lb-in	60 seconds	Continuous	74106001	741.00

Description	Torque (Lb-in)	Additional Input/Output Functions		Catalog Number	Price
IC 40 Reversible gear motor, 100-230 VAC, 50/60 Hz					
IC 40TA2	22 Lb-in	—		74105760	$603.00
IC 40TA2A	22 Lb-in	4-20 mA input		74105761	620.00
IC 40TA2R10	22 Lb-in	1000Ω feedback potentiometer		74105762	691.00
IC 40TA2AR10	22 Lb-in	4-20 mA input and 1000Ω feedback potentiometer		74105763	746.00
IC 40TSA3	26.5 Lb-in	Safety closing function		74105764	736.00
IC 40TSA3A	26.5 Lb-in	Safety closing, 4-20 mA input		74105765	795.00
IC 40TSA3R10	26.5 Lb-in	Safety closing, 1000Ω feedback potentiometer		74105766	820.00
IC 40TSA3AR10	26.5 Lb-in	Safety closing, 4-20 mA input, 1000Ω feedback potentiometer		74105767	879.00

	Loose (/B)		Assembled /E	
IC 20/40 Attachment Set	74921671	$74.00	74921747	$69.00
IC 20/40 Adapter - Free Shaft End	74921676	60.00	74921677	68.00
IC 20/40 Adapter - Manual Adjustment	74921678	47.00	74921679	52.00
IC 20/40 Adapter - Square Shaft	74921674	74.00	74921675	69.00
IC 40 Accessory: Fastening Set IC-BV	74921082	8.00	74921084	9.00

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**krom schroder**

Compact Solenoid Valves
Valvario® VAS Safety Shut-Off Solenoid Valves

Normally closed solenoid valves for gas. For safeguarding and controlling air and gas supply to gas burners and appliances. For use in gas control and safety systems in all sectors of the iron, steel, glass, and ceramics industries, plus commercial heat generation in packaging, paper, and food industries.

- Modular design saves space and piping work
- Main gas valve, pilot valve, regulator and pressure switch are all available for direct "stack" mounting for one small modular footprint
- Changeable mounting plates make it easy to reduce input/output size and flange size. Reduces need for keeping multiple sizes in inventory
- Modular-mount mercury-free pressure switch has test port and <25% deadband
- Can be equipped with Proof of Closure visual indicator
- High flow rate and low pressure drop
- CSA, FM, CE approvals

CSA® FM APPROVED CE

valvario VAS
Flow Rates
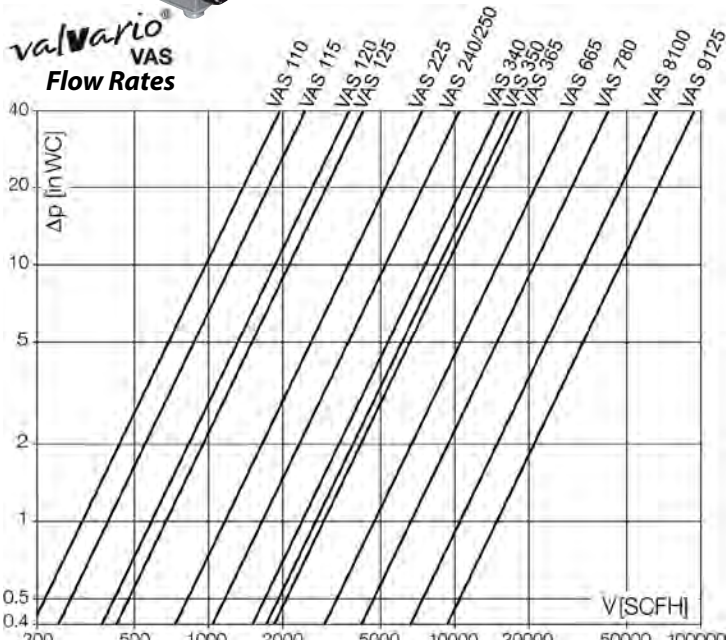
Specifications

Inlet Pressure: (pe): 7 PSIG max

Non-Operational Pressure: *FM approved:* 10 PSIG; *CSA approved:* 5 PSIG

Flow Adjustment: Limits max flow between 20% and 100%. On VAS 1-3 sizes, the setting can be monitored on an indicator

Adjustment of Start Gas Rate: 0% to 70%

Opening Times: *VAS/N quick opening:* ≤1sec; *VAS/L slow opening:* up to 30 sec

Closing Time: <1 second

Ambient Temperature: -4° to 140°F

Safety Valve: Class A, Group 2, pursuant to EN 13611 and EN 161; FM research class 7410 and 7411, ANSI Z21.21, CSA 6.5

Materials: IP65 enclosure; *Valve housing:* Aluminum, *Valve seal:* NBR

Voltage: 120 VAC, 50/60 Hz

Current Consumption (at 68°F): *Pickup:* 1.8 amp; *Holding:* 0.3 amp

Switching Frequency: 5x per minute, except VAS 9: Once per minute

Switching Cycles: *0.1 amp:* 500,000; *0.5 amp:* 300,000; *1 amp:* 200,000; *3 amp:* 100,000

Model Selection Guide

Series	Valve Size	Inlet/Outlet Flange Size	Catalog Number	Price
VAS Quick Opening, NPT Threaded Connection				
VAS 1T10N/NQ	1	3/8"	88001831	$181.00
VAS 1T15N/NQ	1	1/2"	88001832	181.00
VAS 1T20N/NQ	1	3/4"	88001842	215.00
VAS 1T25N/NQ	1	1"	88001830	224.00
VAS 2T25N/NQ	2	1"	88001849	288.00
VAS 2T32N/NQ	2	1 1/4"	88001850	288.00
VAS 2T40N/NQ	2	1 1/2"	88001851	296.00
VAS 2T50N/NQ	2	2"	88001852	296.00
VAS 3T40N/NQ	3	1 1/2"	88001853	404.00
VAS 3T50N/NQ	3	2"	88001854	404.00
VAS 3T65N/NQ	3	2 1/2"	88001855	432.00
VAS Quick Opening, ANSI Flanged Connection, No Accessory Connection				
VAS 6T65A05NQP	6	2 1/2"	88200132	854.00
VAS 7T80A05NQP	7	3"	88200148	1357.00
VAS 8T100A05NQP	8	4"	88200162	1835.00
VAS 9T125A05NQP	9	5"	88200160	2923.00
VAS Quick Opening, ANSI Flanged Connection, Two Screw Plug Connections for Accessory Connections at Right Inlet/Outlet				
VAS 6T65A05NQP/PP/PP	6	2 1/2"	88200385	1028.00
VAS 7T80A05NQP/PP/PP	7	3"	88200390	1533.00
VAS 8T100A05NQP/PP/PP	8	4"	88200394	2014.00
VAS 9T125A05NQP/PP/PP	9	5"	88200427	3106.00
VAS Slow Opening, NPT Threaded Connection				
VAS 1T10N/LQ	1	3/8"	88001856	226.00
VAS 1T15N/LQ	1	1/2"	88001857	226.00
VAS 1T20N/LQ	1	3/4"	88001858	269.00
VAS 1T25N/LQ	1	1"	88001859	269.00
VAS 2T25N/LQ	2	1"	88001860	333.00
VAS 2T32N/LQ	2	1 1/4"	88001861	333.00
VAS 2T40N/LQ	2	1 1/2"	88001862	342.00
VAS 2T50N/LQ	2	2"	88001863	342.00
VAS 3T40N/LQ	3	1 1/2"	88001864	450.00
VAS 3T50N/LQ	3	2"	88001865	450.00
VAS 3T65N/LQ	3	2 1/2"	88001869	479.00
VAS Slow Opening, ANSI Flanged Connection, No Accessory Connection				
VAS 6T65A05LQP	6	2 1/2"	88200133	936.00
VAS 7T80A05LQP	7	3"	88200149	1439.00
VAS 8T100A05LQP	8	4"	88200163	1917.70
VAS Slow Opening, ANSI Flanged Connection, Two Screw Plug Connections for Accessory Connections at Right Inlet/Outlet				
VAS 6T65A05LQP/PP/PP	6	2 1/2"	88200387	1110.00
VAS 7T80A05LQP/PP/PP	7	3"	88200391	1615.00
VAS 8T100A05LQP/PP/PP	8	4"	88200395	2095.00

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SOLENOID VALVES

27 **L**

ASCO® Solenoid Valves for Combustion Systems

NORMALLY AVAILABLE FROM STOCK

Comparing ASCO Combustion Valves

UL CSA FM APPROVED

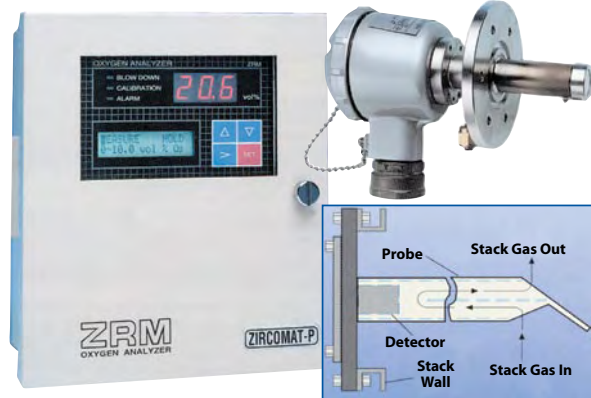|	**8030**	**8040**	**8210**	**8214**	**8215**	**8262**
Valve Parts In Contact with Fluids	Brass body 305 SS core tube NBR seals/disc 430F SS core/plugnut Copper shading coil 302 SS springs	Aluminum body 305 SS core tube NBR seals/disc 430F SS core/plugnut Copper shading coil 302 SS springs Zinc-plated steel pipe plug	Brass body 305 SS core tube NBR seals/disc 430F SS core/plugnut Copper shading coil	Aluminum body 305 SS core tube NBR seals/disc 430F SS core/plugnut Copper shading coil 302 SS springs Zinc-plated steel pipe plug	Aluminum body 305 SS core tube NBR seals/disc/ diaphragm 430F SS core/plugnut 302 SS or 17-7 PH springs Copper shading coil CA core guide 305 SS core tube	Brass body 305 SS core tube NBR seals/disc 430F SS core/plugnut Copper shading coil Inconel 600 springs Acetal core guide PTFE rider ring
Approvals	UL, FM, CSA	UL, CSA, FM (3/8" to 3/4" only)	UL, FM, CSA	UL, FM, CSA	UL, CSA, FM (except 8215A090 and 8215A040)	UL, FM, CSA

Model Selection Guide

120 volts AC/60 Hz — All Valves Shown Here are Normally Closed (Closed when De-Energized), Suitable for Use in Fluids to Maximum Temperatures 125°F

Pipe Size	Orifice Size	Cv Flow Factor	Gas Capacity BTU/Hr	Operating Pressure Differential (PSI)		Watt Rating/ Class of Coil Insulation	Solenoid Valve		Repair Kit		Replacement Coil	
				Min.	Max.		Catalog Number	Price Each	Catalog Number	Price Each	Catalog Number	Price Each
Direct Acting Gas Shutoff Valves												
1/8"	5/16"	1	53,700	0	15	6.1/F	8040H006	$64.00	318247	$66.00	238210-032-D	$61.00
1/4"	9/32"	0.96	51,700	0	40	10.1/F	8262G078	65.00	306631	47.00	238610-032-D	69.00
1/4"	5/16"	1.1	59,000	0	15	10.1/F	8040H007	65.00	318247	66.00	238210-032-D	61.00
3/8"	3/8"	1.8	97,000	0	15	10.1/F	8030G068	154.00	306628	104.00	238610-032-D	69.00
1/2"	7/16"	2.8	151,000	0	8	10.1/F	8030G069	157.00	306629	108.00	238610-032-D	69.00
1/2"	3/4"	5.4	291,000	0	2	10.1/F	8040G022	127.00	306633	63.00	238610-032-D	69.00
3/4"	3/4"	9.5	512,000	0	2	10.1/F	8040G023	132.00	306633	63.00	238610-032-D	69.00
1"	1-5/8"	16.8	900,000	0	0.5	15.4/F	8040C004	158.00	304079	104.00	099257-001-D	91.00
Pilot Operated Gas Shutoff Valves												
3/8"	5/8"	2.8	150,000	0	50	10.1/F	8210G074	179.00	304076	128.00	238610-032-D	69.00
3/8"	3/4"	3.4	183,000	0	50	10.1/F	8215G010	135.00	302350	104.00	238610-032-D	69.00
1/2"	5/8"	3.6	193,000	0	50	10.1/F	8210G075	179.00	304076	128.00	238610-032-D	69.00
1/2"	3/4"	4.4	238,500	0	50	10.1/F	8215G020	135.00	302350	104.00	238610-032-D	69.00
3/4"	5/8"	5.0	295,000	0	50	10.1/F	8210G076	196.00	304076	128.00	238610-032-D	69.00
3/4"	3/4"	5.1	247,500	0	50	10.1/F	8215G030	139.00	302350	104.00	238610-032-D	69.00
3/4"	1-5/8"	11	580,000	0	50	15.4/F	8215 135	250.00	302352	184.00	099257-001-D	91.00
1"	1-5/8"	21	1,119,000	0	25	15.4/F	8215B050	252.00	302352	184.00	099257-001-D	91.00
1-1/4"	1-5/8"	32	1,730,000	0	25	15.4/F	8215B060	252.00	302352	184.00	099257-001-D	91.00
1-1/2"	1-5/8"	35	1,900,000	0	25	15.4/F	8215B070	292.00	302352	184.00	099257-001-D	91.00
2"	2-3/32"	60	3,251,000	0	25	15.4/F	8215B080	428.00	302353	221.00	099257-001-D	91.00
2-1/2"	3"	117	5,821,000	0	5	28.2/F	8215A090	835.00	302354	362.00	206409-011-D	188.00
3"	3"	138	7,430,000	0	5	28.2/F	8215A040	835.00	302354	362.00	206409-011-D	188.00
Gas Shutoff Valves with Waterproof Enclosures												
3/8"	3/4"	3.4	183,000	0	5	17.1/F	8214G010	135.00	316233	143.00	238610-132-D	83.00
1/2"	3/4"	4.4	238,500	0	5	17.1/F	8214G020	135.00	316233	143.00	238610-132-D	83.00
3/4"	3/4"	5.1	247,500	0	5	17.1/F	8214G030	139.00	316233	143.00	238610-132-D	83.00

Looking for another ASCO solenoid valve? Call Lesman's solenoid valve specialists at 800-837-1700. We stock deep!

L 28 **STACK GAS ANALYZER**

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Fax: 262-923-1797

Stack Gas and Combustion Efficiency Analyzers

COSA INSTRUMENT

Zircomat In-Situ Stack Gas Oxygen Analyzer

Features

- Simple to install and maintain
- One detector fits all Zircomat probes
- Detector removes for easy cleaning and repair; probe stays in place
- Calibrates automatically

- Field selectable ranges
- Selectable memory hold feature
- Hi-Lo and self-diagnostic alarms
- Interactive message panel
- Isolated 4-20 mA output signal
- Extractive sample cell available

Probe · Stack Gas Out · Detector · Stack Wall · Stack Gas In

Refineries and power plants measure excess oxygen to improve their energy efficiency and reduce fuel consumption.

In most oxygen analyzers, the electronic sensor comes in direct contact with the sample gas, so you have to remove the hot probe every time you service the sample gas filter or the sensor. And, you need to stock probe-length-specific spare parts inventory for these systems.

Cosa Zircomat oxygen analyzers are more user-friendly. In the Zircomat system, the sample gas is deflected to the sensor. To increase safety, the probe always stays in the stack. The small, hand-held oxygen detector is quickly detachable for service. And, one detector fits all Zircomat probes, any model any length!

Small and easily detachable, the Zircomat detector can be serviced without removing the probe from the flue stack. You won't need to shut down your plant just to remove the probe. A replaceable sample gas diffuser on the end of the detector provides sensor protection.

The microprocessor-based transmitter has a large LED display for oxygen concentration and a 4-20 mA isolated output signal. It's simple to run a manual or automatic calibration check using known value gases to flow a calibration gas through the detector's calibration gas port — without removing the detector from the process.

The Zircomat transmitter can monitor and analyze performance of up to seven parameters online. Failure to meet any of these specifications will activate alarm contact. The self-cleaning probe feature is programmable from the keypad, and activates a solenoid valve for blow-back probe cleaning. You can use the interactive panel to customize response time to process changes to suit existing combustion control parameters.

Call Lesman for help specifying the right model for your application.

Specifications

Sensor: Zirconia oxide

Measurement Range: 0-2%, Up to 50% 0.5% steps

Output Signal: 4-20 mA, linear isolated

Accuracy: ±2% of reading; *Repeatability:* ±0.5%

Response Time: Initial 0.1 sec./90% 7 sec; *Warm Up Time:* 5 minutes

Probe Materials: *ZFK/ZTB:* Steel, *ZTA:* Carbide, *ZFK-ST:* Mullite

Probe Flange: *ZTB/ZFK/ZFK-ST:* 4" 150#RF; *ZTA:* 2.5" 150#RF

Cable: 20 ft. Sealtite flexible conduit, up to 1000 ft. optional

Air Requirement: *Self-Cleaning Probe:* 15 SCFM, 40-120 PSI; *ZTA Probe Sample Loop:* 10-20 SCFH

ZTA Probe: Low temperature alarm below 100°C, volt; free 1A 115V contact closure

Transmitter

Ambient Temperature: 0-130°F

High/Low Alarms: Rated N/O volt free 2A 250V

Contacts: *Outputs:* Rain resistant; *Inputs:* Autocal start/inhibit; *Alarm:* Failure in service, maintenance blow down

Calibration: Manual or automatic

Output Signal Hold: Selectable, for self-cleaning or maintenance

Finish: Epoxy painted steel/SS

Mounting: Wall, panel, or 2" pipe mount

Options: Combustion efficiency, RS485 communication, remote calibration unit with solenoids and flow meter; Hazardous area transmitter

Looking for COSA portable combustion efficiency analyzers? Call Lesman.

Selecting the Right Zircomat Analyzer System

Please issue all orders to: Cosa Instruments, c/o Lesman Instrument Company

Fuel Type	Gas or Oil	Gas or Oil	Coal, Oil, or Gas	Coal, Oil, or Gas
Sample Gas	Up to 1150°F	Up to 2200°F	Up to 2900°F	Up to 1150°F
Available Probe Lengths	12, 20, 30, 40, 60, 80, 100, 120, 140	20, 40	20, 30, 40, 60	12, 20, 30, 40, 60, 80, 100, 120, 140
Applications	Utility/Industrial Power Boilers, Process Heaters, Marine Boilers, Drying Furnaces, Steam Generators, Inert Gas Generators	Process Heaters, Steam Generators, Power Boilers	Soaking Pits, Blast Furnaces, Coke Ovens, Incinerators, Glass Furnaces, Boiler Fireboxes, Process Heaters, Reheat Furnaces	Utility/Industrial Power Boilers, Incinerators, Blast Furnaces, Coke Ovens, Black Liquor Boilers
Use Model...	ZRM-ZFK	ZRM-ZFK-ST	ZRM-ZTA	ZRM-ZTB
Prices Start at...	$4796.00	$4996.00	$7216.00	$5073.00

Portable Combustion Efficiency Analyzers

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RAECO Rents

Our partners at RAECO make it easy to get the combustion efficiency analysis equipment you need, without a major outlay of cash. When you need portable combustion analyzers for short-term use, RAECO Rents! has units for daily, weekly, or monthly rental. So you get the best monitor/analyzer for your needs, just for the time you need it. No big purchase, no maintenance and upkeep costs. Call 866-736-8347 and ask for Patricia or Rick.

Testo 330-2 Industrial Combustion Analyzer

- Measures O2, CO, NO (CO2 and NOx calculated), temperature °F, pressure, efficiency, and excess air
- Automatic sensor protection (CO dilution to 30,000 ppm); Automatic moisture protection; includes visual alarm and pump shut-off
- Datalogs 200 measuring records, with address and system numbers
- Infrared (IrDA) interface for working with a handheld PDA, infrared printer, or laptop PC, USB interface for configuration and data uploads

Testo 330-2 Kit comes with *12" click-and-go probe, 7' hose, rechargeable Lithium Ion battery, charger with cord, infrared printer with paper, carrying strap, standard case with foam insert, USB cable, software, and user manual.*

D $100.00 Daily
W $250.00 Weekly
M $700.00 Monthly
Buy One to Keep! $3590.00 to Buy

Testo 335 Portable Flue Gas Analyzer

- Measures O2, CO, NO draft, flow, velocity, mass, differential pressure
- Automatic dilution expands CO range to 50000 ppm, NO to 6000 ppm
- Pre-calibrated plug-and-play sensors eliminate the need for calibration gas in all but the most demanding applications
- Datalogging for up to two hours
- Infrared interface for printer, handheld PDA, or laptop PC

Testo 335 NOx Kit comes with *standard 12" probe, 7-foot Teflon®-lined hose, Type K thermocouple, sensors for NOx, O2, CO, and NO, infrared printer with 6 rolls of paper, power adapter with Lithium Ion battery, extra battery and charger, 10-pack of filters, Easy Emission software, USB cable, and standard case with foam insert.*

D $123.00 Daily
W $410.00 Weekly
M $1025.00 Monthly
Buy One to Keep! $3795.00 to Buy

Testo 350-XL Portable Emissions Analyzer Kit

- Sensors for O2, CO, NO, NO2 (NOx), SO2
- Temperature-controlled sensors extend testing range
- Sample conditioning with Peltier gas chiller and water removal system
- Dilution system 40:1 max. extends CO range to well over 100,000 ppm
- Fresh air purge; Rapid set-up for easy measuring
- Large backlit display has multipage scroll-down, zoom function, and pull-down menus

Testo 350-XL Engine Kit comes with *gas sensors for CO, O2, NO, NO2 and SO2, control unit, particulate filters, printer paper, carrying case and strap, transport case with sliding drawer, 12" engine probe with 7' hose and 12" thermocouple probe with 16' cable, RS232 cable, software, and 16' remote control cable.*

D $200.00 Daily
W $500.00 Weekly
M $1500.00 Monthly
Buy One to Keep! $8990.00 to Buy

CA-Calc 6213 Combustion Analyzer for O2, CO, NO, SO2

- Real-time measurement seconds after power-up
- Calculates efficiency, excess air, CO2, and emission rates, provides NO2 values
- Adjustable CO high limit pump shutdown; Adjustable O2 reference
- Data history sorted by system, or individual sample for printouts and report generation

CA-Calc 6213 includes 12" probe with 9-foot sampling tube, Teflon-lined sampling probe, water trap, carrying case, AC adapter, four C Alkaline batteries, and operation manual.

D $100.00 Daily
W $200.00 Weekly
M $700.00 Monthly

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Portable Combustible Gas Detectors from

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Choosing the Right Combustible Gas Detector for Your Application

Product	Alarms					Data Logging	Infrared Port	Intrinsically Safe	Weekly Rental Price
	Visible	Audible	Vibrating	STEL	TWA				
Honeywell ImpactPro	✔	✔	✔		✔	✔			100.00
MSA Altair 4	✔	✔	✔			✔	✔		125.00
MSA Orion	✔	✔		✔	✔	✔		✔	100.00
MSA Solaris	✔	✔	✔		✔	✔	✔	✔	125.00
MSA Passport PID II	✔	✔		✔	✔	✔			250.00
MSA Sirius	✔	✔		✔	✔	✔			350.00

Honeywell Impact Pro Multigas Monitor

- Simultaneously monitors and displays readings for O2, CO, H2S, and %LEL
- Three levels of instantaneous alarm, plus time-weighted average alarms on toxic gases
- Base station combines functionality of data interface and battery charging
- Event and timed data logging

Impact Pro kit includes *sensors for CO, O2, H2S, and LEL; integral pump and pump adapter, charger with charging base, rechargeable NiMH batteries, belt clip, flow adapter, 30' sample tube with inline adapter, ball float, base station PC link cable, software CD, quick-start guide, user manual, and carrying case.*

D *$40.00 Daily*
W *$100.00 Weekly*
M *$350.00 Monthly*
Buy One to Keep! *$1304.00 to Buy*

Honeywell Enforcer Calibrator for Impact Pro

- Calibrates Honeywell Impact Pro multigas monitors fitted with oxygen, flammable, carbon monoxide, and hydrogen sulfide sensors
- Records calibration results for printing via PC software
- Built-in indicator tells you when gas cylinder needs replacing
- Recognizes Impact Pro immediately, and completes tests and calibration in less than two minutes

Enforcer kit includes *one multigas cylinder, wall-mount plate, and carrying case.*

D *$15.00 Daily*
W *$42.00 Weekly*
M *$105.00 Monthly*
Buy One to Keep! *$268.00 to Buy*

MSA Altair4 Multigas Detector with Pump Probe

- High-contrast LCD shows simultaneous readings for LEL, CO, H2S, and O2
- Ultra-bright LEDs, 95 dB horn, and vibrating alarms for warnings you can't miss!
- MotionAlert signals "man down" by detecting lack of motion for 30 seconds, InstantAlert lets you sound a manual alarm to warn others of hazards
- 16-hour battery run time when fully charged

Altair 4 kit includes *detector with universal pump probe, sensors for 0-100% Pentane LEL, 0-25% O2, 0-999 ppm CO, and 0-200 ppm H2S, power supply/charger, MSA-Link software CD-ROM, JetEye infrared adapter with USB connector, user manual, and carrying case.*

D *$40.00 Daily*
W *$125.00 Weekly*
M *$300.00 Monthly*
Buy One to Keep! *$1239.00 to Buy*

Save 20% off the listed purchase price on all MSA portables when you buy before 12/31/2008!

Passport® PID II Personal Organic Vapor Monitor

- Range 0–10,000 ppm with no dilution tube or internal adjustment
- Peak, short-term exposure (STEL) and time-weighted average (TWA)
- 69 pre-programmed and 10 user-defined response factors
- Digital display shows numeric and bargraph detail of VOC concentration
- 5-second access to change battery pack, clean or replace lamp

Passport PID II includes *NiCad battery pack, 110 VAC charger, 10' coiled Teflon sampling line, PVC case, protective rubber boot, pistol grip with wrist strap, and 8" screw-on probe.*

Call for pricing on a gently-used model

D *$50.00 Daily*
W *$250.00 Weekly*
M *$700.00 Monthly*

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COMBUSTIBLE GAS MONITORS **31** **L**

Save 20% off the listed purchase price on all MSA portables when you buy before 12/31/2008!

Solaris Multigas Detector for Monitoring Combustible Gases

- 1-, 2-, 3-, and 4-gas configurations for O_2, H_2S, CO, and combustibles
- 100+ dB horn, super-bright LED, and vibrating alarm
- Large, easy-to-read alphanumeric digital display
- Lightweight unit; IP65 rated for superior protection against liquid/dust ingress
- One-button calibration with built-in logic
- Lithium Ion battery with runtime of 14+ hours

Kit includes *detector, battery charger, charging station, calibration cap, tubing, two male fittings, infrared reader, Solaris software, quick reference card and manual on CD.*

D $40.00 **Daily**
W $125.00 **Weekly**
M $300.00 **Monthly**
Buy One to Keep! $1409.00 **to Buy**

Sirius Multigas Detector for VOCs and Combustible Gases

- One unit simultaneously monitors VOCs with low vapor pressures and measures for combustible, toxic, and oxygen-deficient atmospheres
- PID sensor includes humidity resistance, stable zero readings, and fast response and clear times
- Multidirectional visible LED alarm and audible horn alarm
- Display shows combustible gas, CO, H2S, O2, %LEL, and VOCs with their character names, also includes battery life indicator
- Interchangeable battery packs keep instrument running 24x7

Sirius kit includes *PID lamp, 0-100% LEL, H2S, CO, and O2 sensors, power supply, AC adapter and battery charging unit, sample line and probe, carrying case, orange Cordura jacket with harness, and instructions.*
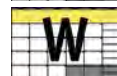
D $100.00 **Daily**
W $350.00 **Weekly**
M $750.00 **Monthly**
Buy One to Keep! $3617.00 **to Buy**

Orion™ Multigas Detector for LEL, CO, O2, and H2S

- One-button calibration simplifies calibration, reduces training needs
- Large easy-to-read display for low light conditions and many angles
- Long-life durable sensors provide up to 50 times the silicone poison tolerance
- Zoom expands any portion of a graph to focus on an activity detail
- Software to view gases simultaneously or focus on one at a time
- Resistant to water/dust; Nylon case for use in tough environments
- Long-life battery provides up to 20 hours in the non-pump mode

Orion kit includes *pump module, sensors for %LEL pentane, O2, CO, and H2S, 10' sample line, 1' probe, NiMH battery pack, battery charger and cord, screwdriver, filters, hose adapter, manual, FiveStar™ Link software, carrying case, orange Cordura jacket, and integral PulseCheck pump.*

D $50.00 **Daily**
W $100.00 **Weekly**
M $350.00 **Monthly**
Buy One to Keep! $2123.00 **to Buy**

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