

7800 SERIES RM7888A Relay Module

SPECIFICATION DATA



APPLICATION

The Honeywell RM7888A Relay Module is a microprocessor-based integrated burner control for industrial process semi-automatically fired gas, oil, coal or combination fuels for single and multiple burner industrial applications. The RM7888 system consists of the relay module, wiring subbase and amplifier. Options include keyboard display module (KDM), personal computer interface, Data ControlBus™ Module, remote display mounting, first-out expanded annunciator and Combustion System Manager™ software. The RM7888 intended use is in conjunction with a master system control. The master system control determines the purge timing and confirms air supply and air flow.

The RM7888 is programmed to provide a level of safety, functional capability and features beyond the capacity of conventional controls.

The basic functions of the RM7888A include semi-automatic burner startup sequencing, five user selectable operating (run) sequences, four line voltage sequence control inputs (commonly controlled with a Programmable Logic Controller [PLC]), flame supervision, system status indication, system or self-diagnostics and troubleshooting.

FEATURES

- Safety features:
 - Closed loop logic test.
 - Dynamic input check.
 - Dynamic safety relay test.
 - Dynamic self-check logic.
 - Expanded safe-start check.
 - Internal hardware status monitoring.
 - Tamper resistant timing and logic.
- Access for external electrical voltage checks.
- Application flexibility.
- Communication interface capability.
- Dependable, long-term operation provided by microcomputer technology.
- First-out annunciation and system diagnostics provided by a 2 row by 20 column vacuum fluorescent display (VFD) located on the KDM (optional).
- Five LEDs for sequence information (see Fig. 1).
- Interchangeable plug-in flame amplifiers.
- Local or remote annunciation of RM7888 operation and fault information (optional).
- Nonvolatile memory; RM7888 retains history files and sequencing status after loss of power.
- Remote reset (optional).
- Report generation (optional).
- Burner control data (optional):
 - Flame signal strength.
 - Hold status.
 - Lockout/alarm status.
 - Sequence status.
 - Sequence time.
 - Total cycles of operation.
 - Total hours of operation.
 - Fault history providing the six most recent faults:
 - Cycles of operation at the time of the fault.
 - Expanded annunciator data at the time of the fault.
 - Fault message and code.
 - Hours of operation at the time of the fault.
 - Sequence status at the time of the fault.
 - Sequence time at the time of the fault.
 - Diagnostic information:



- Device type.
- Flame amplifier type.
- Flame failure response time (FFRT).
- Manufacturing code.
- On/off status of all digital inputs and outputs.
- Software revision and version of RM7824 and optional KDM.
- Status of configuration jumper.

SPECIFICATIONS

Electrical Ratings (See Table 1):

Voltage and Frequency: 120 Vac (+10/-15%), 50 or 60 Hz (±10%).

Power Dissipation: 10W maximum.

Maximum Total Connected Load: 2000 VA.

Fusing (Total Connected Load): 15A, Fast Blow, type SC or equivalent.

Environmental Ratings:

Ambient Temperatures:

Operating: -40°F to 140°F (-40°C to 60°C).

Storage: -40°F to 150°F (-40°C to 66°C).

Humidity: 85% RH continuous, noncondensing.

Vibration: 0.5G environment.

Dimensions: See Fig. 2.

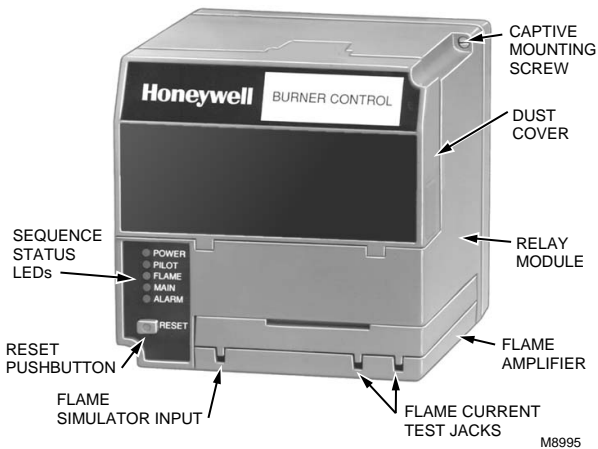


Fig. 1. Sequence status LED.

Weight:

RM7888 with Dust Cover: 1 pound, 13 ounces, unpacked.

IMPORTANT:

Flame Detection System available for use with RM7888. Select your plug-in Flame Signal Amplifier and applicable Flame Detector from Table 5.

Approvals:

Underwriters Laboratories Inc. Component Recognized.

Canadian Standards Association Certified: LR9S329-3.

Factory Mutual: Approved.

Federal Communications Commission: Meets Part 15, Class B—Emissions.

Mounting:

Q7800A Wiring Subbase for panel mount.

Q7800B Wiring Subbase for wall or burner mount.

Required Components:

Plug-in Flame Signal Amplifier (See Table 5).

Q7800A or Q7800B Wiring Subbase.

Accessories:

Keyboard Display Modules (KDM):

S7800A1001 English language.

S7800A1035 French language.

S7800A1043 German language.

S7800A1050 Italian language.

S7800A1068 Spanish language.

S7800A1118 Katakana (Japanese) language.

S7800A1126 Portuguese language.

Communications:

Q7700A1014 Network Interface Unit, 120 Vac, 50/60 Hz applications, external modem required.

Q7700B1004 Network Interface Unit with universal 100 to 250 Vac, 50/60 Hz external power supply, external modem required.

QS7800A1001 ControlBus Module, standard.

QS7800B1000 ControlBus Module, multidrop.

QS7850A1006 ControlBus Module, General Purpose Interface.

ZM7850A1001 Combustion System Manager™ software.

S7810A1009 Data ControlBus™ Module (if no KDM is used).

S7810B1007 Data ControlBus™ Module, Multi-Drop Switch Module.

S7810M1003 ModBus Module.

Miscellaneous:

A7800A1002 7800 SERIES Tester.

S7820A1007 Remote Reset Module.

S7830A1005 Expanded Annunciator, 120 Vac, 50/60 Hz.

203541 Data ControlBus Connector, 5-wire.

203765 Remote Display Mounting Bracket.

221729 Dust Cover, Relay Module.

204718A Keyboard Display Module Cover, NEMA 4, clear.

204718B Keyboard Display Module Cover, NEMA 1, clear.

204718C Keyboard Display Module Cover, NEMA 4, clear with reset button.

205321B Flush Display mounting kit.

221818A Extension Cable, display, 5 ft (1524 mm).

221818C Extension Cable, display, 10 ft (3048 mm).

123514A Rectification Flame Simulator.

203659 Ultraviolet Flame Simulator.

203968A Remote Display Power Supply, 13 Vdc, plug-in.

Table 1. RM7888A Terminal Ratings.

| Terminal No. | Description | Ratings |
|--------------|----------------------------------|---------------------------------------------------|
| G | Flame Sensor Ground ^a | — |
| Earth G | Earth Ground ^a | — |
| L2(N) | Line Voltage Common | — |
| 3 | Alarm | 120 Vac, 1A pilot duty. |
| 4 | Line Voltage Supply (L1) | 120 Vac (+10/-15%), 50/60 Hz (±10%). ^b |
| 5 | Air Valve | 120 Vac, 9.8A FL, 58.8A LR (inrush). |
| 6 | Special Function 1 | 120 Vac, 1 mA. |
| 7 | Limits Complete | 120 Vac, 8A run, 43A inrush. |
| 8 | Pilot Valve | 120 Vac. ^c |
| 9 | Main Fuel Valve | 120 Vac. ^c |
| 10 | Ignition | 120 Vac. ^c |
| F(11) | Flame Sensor | 60 to 220 Vac, current limited. |
| 12(B) | Firing Rate High Fire | 120 Vac, 75 VA Pilot Duty. |
| 13(R) | Firing Rate Common | 120 Vac, 75 VA Pilot Duty. |
| 14(W) | Firing Rate Low | 120 Vac, 75 VA Pilot Duty. |
| 15 | Firing Rate Modulate | 120 Vac, 75 VA Pilot Duty. |
| 16 | Unused | — |
| 17 | Special Function 2 | 120 Vac, 1 mA. |
| 18 | @Low Fire Input | 120 Vac, 1 mA. |
| 19 | Special Function 3 | 120 Vac, 1 mA. |
| 20 | Special Function 4 | 120 Vac, 1 mA. |
| 21 | Flame Proven | 120 Vac, 2A pilot duty. |
| 22 | Shutter | 120 Vac, 0.5A. |

^a The RM7888 must have an earth ground providing a connection between the subbase and the control panel or burner. The earth ground wire must be capable of conducting the current to blow the 15A fuse or breaker in the event of an internal short circuit. The RM7888 needs a low impedance ground connection to the equipment frame which, in turn, needs a low impedance connection to earth ground. For a ground path to be low impedance at RF frequencies, the connection must be made with minimum length conductors having maximum surface areas. Wide straps or brackets are preferred rather than leadwires. Make sure that mechanically tightened joints along the ground path, such as pipe or conduit threads or surfaces held together with fasteners, are free of nonconductive coatings and are protected against mating surface corrosion.

^b 2000 VA maximum connected load to RM7888A Assembly.

^c See Tables 2 and 3 for device load combinations.

Table 2. Combinations for RM7888A Terminals 8, 9 and 10.

| Combination No. | Pilot Fuel 8 | Main 9 | Ignition 10 |
|-----------------|-----------------|-----------|----------------|
| 1 | C | F | No Load |
| 2 | B | F | No Load |
| 3 | No Load | F | No Load |
| 4 | F | F | A |
| 5 | No Load | F | A |
| 6 | D | F | A |
| 7 | No Load | D | A |
| 8 | D | D | A |
| 9 | No Load | D | A |

Table 3. Composition of Each Combination.

| A | B | C | D | F |
|---------------|---------------------------------------|---------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------|
| 4.5A ignition | 50 VA Pilot Duty, plus 4.5A ignition. | 180 VA Ignition plus Motor Valve with: 650 VA inrush, 360 VA open, 250 VA hold. | 2A Pilot Duty | 64 VA Pilot Duty plus Motor valves with: 3850 VA inrush. 700 VA Open 250 VA hold. |

Table 4. Sequence Timing for Normal Operation.

| RM7888A Sequence | Initiate | Standby | Purge | Pilot Flame Establishing Period (PFEP) | Main Flame Establishing Period (MFEP) | Pilot Relight | Run |
|-----------------------|------------|---------|-------|----------------------------------------|---------------------------------------|-----------------------|-----|
| Pilot: PV Return | 10 seconds | * | ** | 10 seconds | 15 seconds | 5 seconds to infinity | * |
| Pilot: MV Lo Fire | 10 seconds | * | ** | 10 seconds | 15 seconds | — | * |
| DSI Normal | 10 seconds | * | ** | 4 seconds | — | — | * |
| DSI High/Low Stepfire | 10 seconds | * | ** | 4 seconds | — | — | * |
| DSI On/Off Stepfire | 10 seconds | * | ** | 4 seconds | — | — | * |

* STANDBY and RUN can be an infinite time period.
 ** PURGE will be determined by the system master controller.

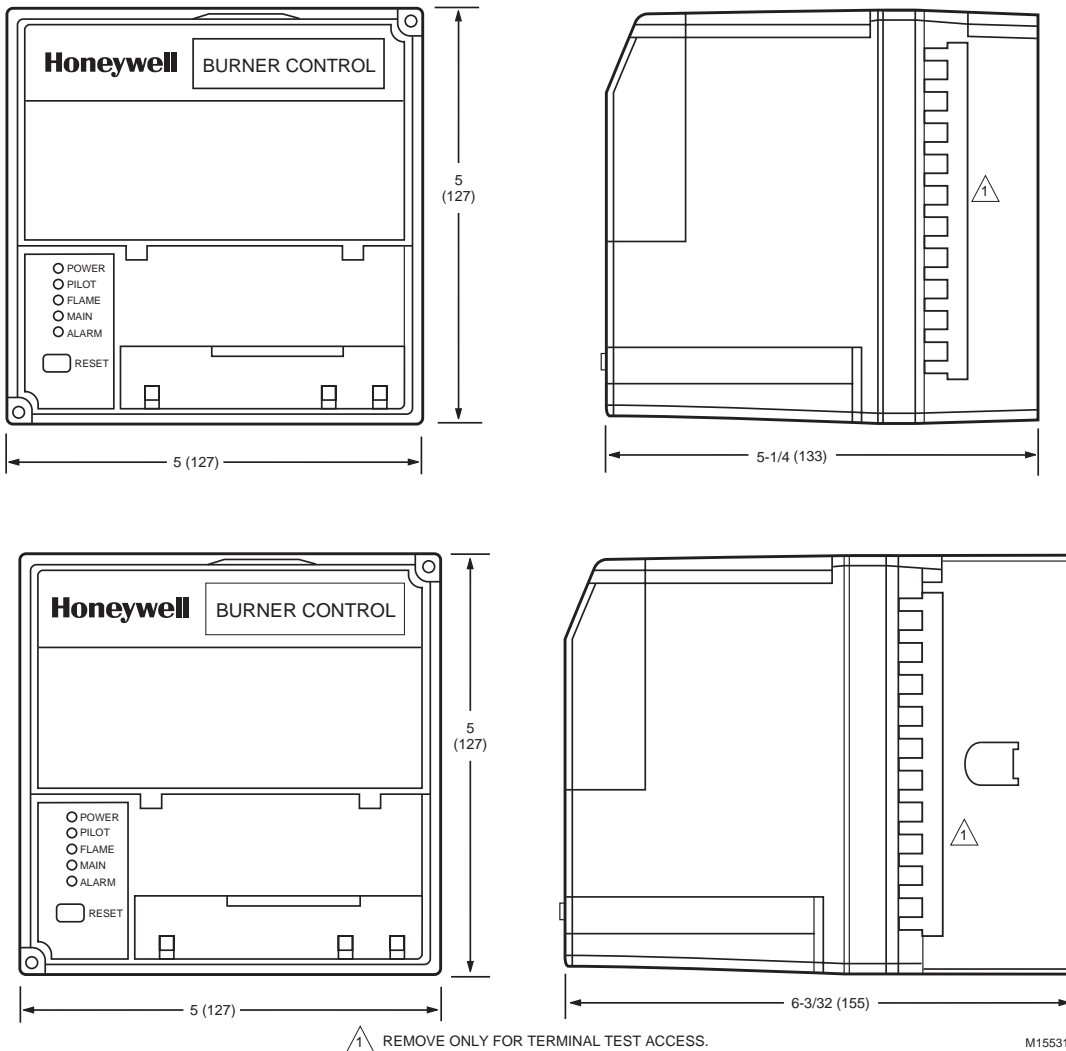


Fig. 2. Mounting dimensions of RM7888 Relay Module and Q7800A and Q7800B Wiring Subbases in in. (mm).

Table 5. Flame Detection Systems.

| Plug-in Flame Signal Amplifiers | | | | Applicable Flame Detectors | | | |
|---------------------------------|--------|----------------------|-------------------------|------------------------------------------------|----------------|-------------------------------------------|-------------------------------------------------------------|
| Type | Color | Self-Checking | Model | Flame Failure Response Time (sec) ^a | Fuel | Type | Models |
| Rectification | Green | No | R7847A ^{b,c,g} | 0.8 or 3 | Gas | Rectifying Flame Rod Holders | C7004, C7007, C7011 Complete Assemblies: C7008, C7009, Q179 |
| | | No | R7847A ^g | 3 | Gas, oil, coal | Ultraviolet (Purple Peepers®) | C7012A,C. |
| | | Dynamic Ampli-Check® | R7847B ^{d,g} | 0.8 or 3 | Gas | Rectifying Flame Rod Holders ^b | C7004, C7007, C7011 Complete Assemblies: C7008, C7009, Q179 |
| | | Dynamic Ampli-Check® | R7847B ^{d,g} | 3 | Gas, oil, coal | Ultraviolet (Purple Peepers®) | C7012A,C |
| | | Dynamic Self-Check | R7847C ^{c,e,h} | 3 | Gas, oil, coal | Ultraviolet (Purple Peepers®) | C7012E,F |
| Infrared | Red | No | R7848A | 3 | Gas, oil, coal | Infrared (Lead Sulfide) | C7015 |
| | | Dynamic Ampli-Check® | R7848B ^d | 3 | Gas, oil, coal | Infrared (Lead Sulfide) | C7015 |
| Ultraviolet | Purple | No | R7849A | 0.8 or 3 | Gas, oil | Ultraviolet (Minipeeper) | C7027, C7035, C7044 ^f |
| | | Dynamic Ampli-Check® | R7849B ^d | 0.8 or 3 | Gas, oil | Ultraviolet (Minipeeper) | C7027, C7035, C7044 ^f |
| | | Dynamic Self-Check | R7861A ^{c,e} | 0.8 or 3 | Gas, oil, coal | Ultraviolet | C7061 |
| | Blue | Dynamic Self-Check | R7886A ^{c,e} | 3 | Gas, oil, coal | Ultraviolet (Adjustable Sensitivity) | C7076 |
| Optical | White | Dynamic Ampli-Check® | R7851B | 0.8 or 3 | Gas, oil, coal | Optical (UV, IR, Visible Light) | C7927, C7935, C7915, C7962 |
| | | Dynamic Self-Check | R7851C ^c | 3 | Gas, oil, coal | Optical (UV only) | C7961 |

^a Flame Failure Response Time (FFRT) depends on selection of amplifier and 7800 SERIES Relay Module.

^b Order flame rod separately; see flame detector Instructions for holder.

^c Circuitry tests all electronic components in flame detection system (amplifier and detector) 12 times a minute during burner operation and shuts down burner if detection system fails.

^d Circuitry tests flame signal amplifier 12 times a minute during burner operation and shuts down burner if amplifier fails.

^e 200/220/240 Vac applications require a 120 Vac, 10 VA minimum stepdown transformer (not provided) to drive the shutter. Applies to R7847C series 3 or greater; R7886A series 2 or greater; R7861 series 1 or greater. Fig. 2 shows flame detector wiring.

^f Use C7027, C7035 and C7044 Flame Detectors only on burners that cycle on-off at least once every twenty-four hours. Use C7012E,F Flame Detector with R7847C Amplifier, C7061A Ultraviolet Detector with R7861A Amplifier or C7076A Flame Detector with R7886A Amplifier as ultraviolet flame detection system for appliances with burners that remain on continuously for twenty-four hours or longer.

^g R7847A,B Amplifiers with 0.8/1 second FFRT should not be used with C7012A,C Solid State Ultraviolet Detectors.

^h R7847C Series 4 and greater check flame detector system when flame reaches 1.5 Vdc or at 4.5 seconds, whichever occurs first.

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