Honeywell

7800 SERIES
RM7800E,G,L,M Relay Module

SPECIFICATION DATA

APPLICATION

The Honeywell RM7800 is a microprocessor based integrated burner control for automatically fired gas, oil or combination fuel single burner applications. The RM7800 system consists of a Relay Module and Keyboard Display Module, Subbase, Amplifier, and Purge Card. Options include Personal Computer Interface, DATA CONTROLBUS MODULE™, Remote Display Mounting, First-Out Expanded Annunciator and Combustion System Manager¨ Software.

The RM7800 is programmed to provide a level of safety, functional capability and features beyond the capacity of conventional controls.

Functions provided by the RM7800 include automatic burner sequencing, flame supervision, system status indication, system or self-diagnostics and troubleshooting.

FEATURES

- **Safety features:**
  - **— Interlock check.**
  - **— Closed loop logic test.**
  - **— Dynamic AMPLI-CHECK™.**
  - **— Dynamic input check.**
  - **— Dynamic safety relay test.**
  - **— Dynamic self-check logic.**
  - **— Expanded safe-start check.**
  - **— High Fire Purge Switch test.**
  - **— Internal hardware status monitoring.**
  - **— Low Fire Start Switch test.**
  - **— Tamper resistant timing and logic.**
- **Access for external electrical voltage checks.**
- **Application flexibility.**
- **Provides 0.8 to 3.0 second Flame Failure Response Time (FFRT), depending on amplifier selected.**
- **Communication interface capability.**
- **Dependable, long-term operation provided by microcomputer technology.**
- **First-out annunciation and system diagnostics provided by 2 row by 20 column Vacuum Fluorescent Display (VFD) located on the Keyboard Display Module.**
- **First-out expanded annunciation with 26 Light Emitting Diodes (LEDs) for limits and interlocks (optional).**
- **Five sequence information LEDs, see Fig. 1.**
- **Five function Run/Test Switch.**
- **Interchangeable plug-in flame amplifiers.**
- **Local or remote annunciation of operation and fault information (optional).**
- **Nonvolatile memory for retaining history files and sequencing status after loss of power.**
- **Remote reset (optional).**
- **Report generation (optional).**
- **Burner controller data:**
  - **— Sequence status.**
  - **— Sequence time.**
  - **— Hold status.**
  - **— Lockout/alarm status.**
  - **— Flame signal strength.**
  - **— Expanded annunciator status.**
  - **— Total cycles of operation.**
  - **— Total hours of operation.**
  - **— Fault history of six most recent faults:**
    - **• Cycles of operation at time of fault.**
    - **• Expanded annunciator data at time of fault.**
    - **• Fault message and code.**
    - **• Hours of operation at time of fault.**
    - **• Sequence status at time of fault.**
    - **• Sequence time at time of fault.**
  - **— Diagnostic information:**
    - **• Device type.**
    - **• Flame amplifier type.**
    - **• Flame failure response time.**
    - **• Manufacturing code.**
    - **• On/Off status of all digital inputs and outputs.**
    - **• Selected prepurge time.**
    - **• Software revision and version of RM7800 and Keyboard Display Module.**
    - **• Status of configuration jumpers.**
    - **• Status of Run/Test Switch.**

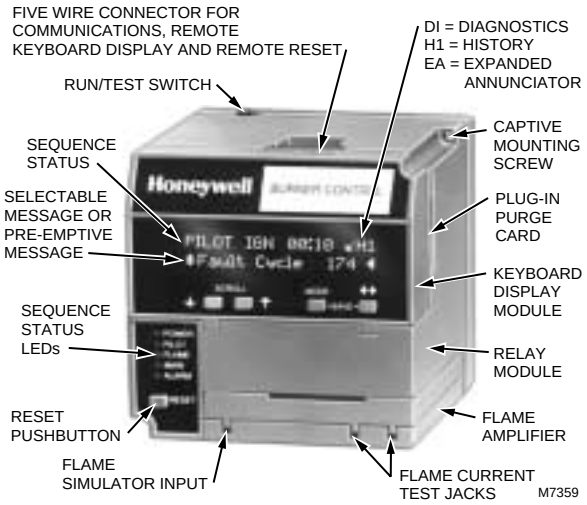

Fig. 1. Keyboard Display Module and sequence status LEDs.

SPECIFICATIONS

Electrical Ratings, see Table 1:
Voltage and Frequency: 120 Vac (+10/-15%), 50 or 60 Hz (+/- 10%)4.
Keyboard Display Module: 13 Vdc peak full wave rectified (+20/-15%).
Power Dissipation:
RM7800: 10 Watts maximum.
Display Module: 3 Watts maximum.
Maximum Total Connected Load: 2000 VA.
Fusing: Total Connected Load: 20A maximum, type FRN or equivalent.

Environmental Ratings:
Ambient Temperature:
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.

Weight:
RM7800: 1 pound 13 ounces, unpacked.
Keyboard Display Module: 4 ounces, unpacked.

Dimensions: See Fig. 2.

Approval Bodies:
Underwriters Laboratories Inc. listed, File No. MP268, Guide No. MCCZ.
Canadian Standards Association certified, LR9S329-3.
Factory Mutual approved, Report No. J.I.1V9A0.AF.
IRI acceptable.
Federal Communications Commission, Part 15, Class B—Emissions.

Mounting: Q7800A for panel mount or Q7800B for wall or burner mount.

Required Components:
Plug-in Flame Signal Amplifier, see Table 2.
ST7800A Plug-in Purge Timer Cards: selectable models: two seconds to 30 minutes.
Q7800A or Q7800B Wiring Subbase.

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Table 1. 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 or 60 Hz (±10%)[b,d]
5	Burner Motor	120 Vac, 9.8 AFL, 58.8 ALR (inrush).
6	Burner Controller and Limits	120 Vac, 1 mA.
7	Lockout/Running Interlock	120 Vac, 8A run, 43A inrush.
8	Pilot Valve/Ignition	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	Firing Rate High Fire	120 Vac, 75 VA pilot duty.
13	Firing Rate Common	120 Vac, 75 VA pilot duty.
14	Firing Rate Low Fire	120 Vac, 75 VA pilot duty.
15	Firing Rate Modulate	120 Vac, 75 VA pilot duty.
16	Unused	—
17	Unused	—
18	Low Fire Switch Input	120 Vac, 1 mA.
19	High Fire Switch Input	120 Vac, 1 mA.
20	Preignition Interlock Input	120 Vac, 1 mA.
21	Interrupted/Intermittent Pilot Valve/First Stage Oil Valve.	120 Vac[c]
22	Shutter	120 Vac, 0.5A.

[a] The RM7800 must have an earth ground providing a connection between the subbase and the control panel or the equipment. The earth ground wire must be capable of conducting the current to blow the 20A fuse (or breaker) in the event of an internal short circuit. The RM7800 needs a low impedance ground connection to the equipment frame which, in turn, needs a low impedance connection to earth ground.

[b] 2000 VA maximum connected load to RM7800 Assembly.

[c] See Tables 3 and 4.

[d] R7800G,M operating frequency determined by relay module selection.

Table 2. Sequence timing for normal operation.

Device	Initiate	Standby	Purge	Flame Establishing Period		Run	Post Purge Timing	Interlock Circuits	Firing Rate Circuit	Energy Saving Prepurge	Approval Code Bodies
				Pilot	Main[a]						
RM7800E	10 sec.	*	**	4 or 10 sec.	10 or 15 sec.	*	15 sec.	Preignition, Lockout, High and Low Fire.	4-wire modulating.	Yes	FM/IRI Modulatin.
RM7800G					10, 15 sec. or intermittent			Preignition, Running, Low Fire		No	UL/CSA Modulating
RM7800L					10 or 15 sec.[b]			Preignition, Lockout, High and Low Fire.			FM/IRI Modulating
RM7800M					10 sec. or intermittent			Preignition, Running, Low Fire.	2-wire isolated On-Off-On contacts		UL/CSA On/Off.

* STANDBY and RUN can be an infinite time period.

** PURGE will be determined by which ST7800A purge card is selected; 15 timings are available, from 2 seconds to 30 minutes.

[a] The MFEP will be determined by which terminal is used, configuration jumper selected, or jumper wire added.

[b] RM7800L1056: 10 seconds or intermittent.

Table 3. Combinations for terminals 8, 9, 10 and 21.

Combination No.	Pilot Fuel 8	Main 9	Ignition 10	Intermittent Pilot Valve 21
1	C	F	No Load	No Load
2	B			
3	No Load			B
4	F		A	No Load
5	No Load			F
6	D			No Load
7	No Load	D		D
8	D			No Load
9	No Load			D

Table 4. 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: 660 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.

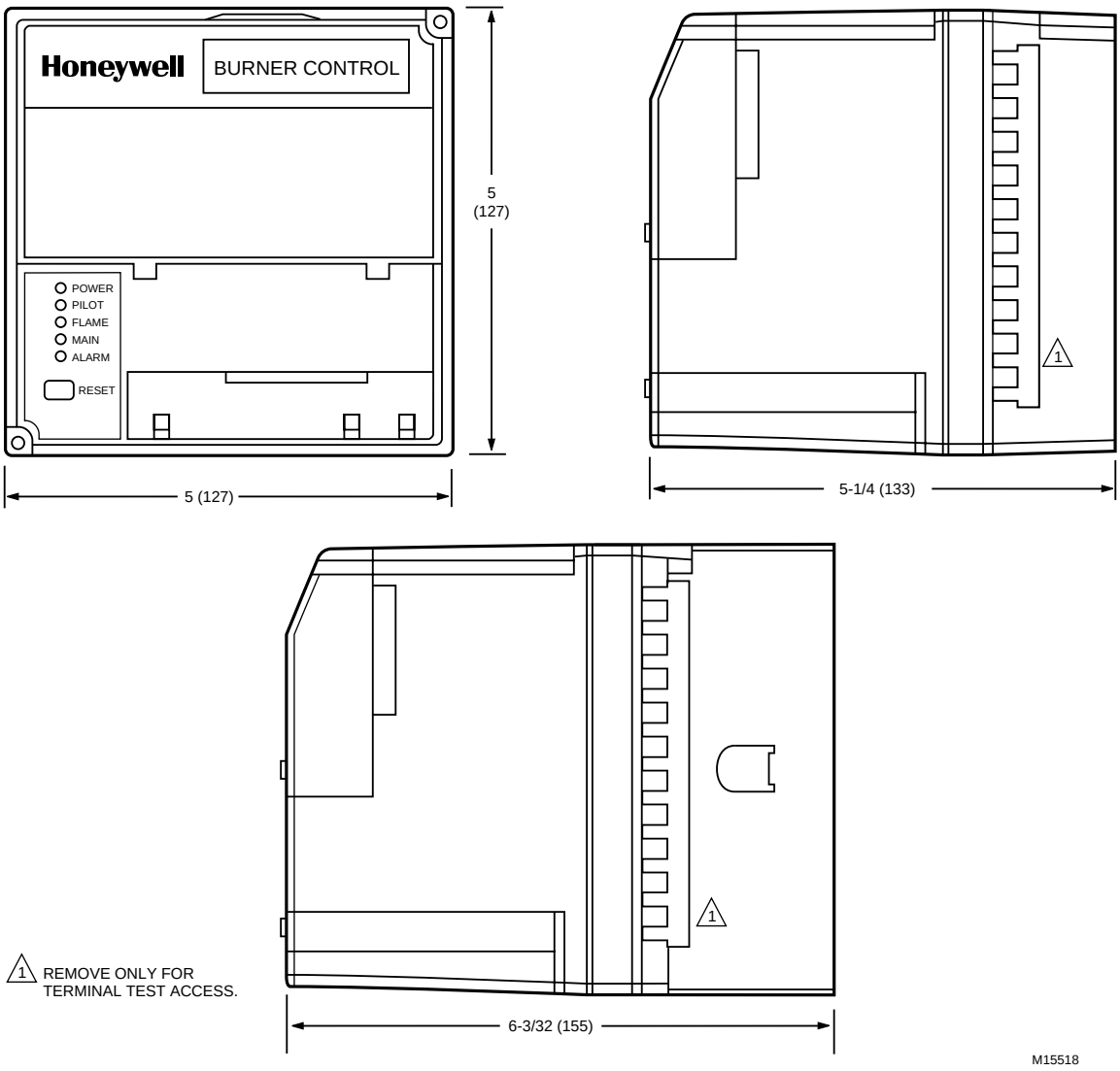

Fig. 2. Mounting dimensions of RM7800 Relay Module, Q7800 Subbase, and Q7800 Subbase, respectively, in in. (mm).

Accessories:

Keyboard Display Modules (KDM):
- S7800A1001 English language (Standard)
- S7800A1035 French language.
- S7800A1043 German language.
- S7800A1050 Italian language.
- S7800A1068 Spanish language.
- S7800A1118 Katakana (Japanese) language.
- S7800A1126 Portuguese language.
- S7800B1009 Chinese 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 5. Flame Detector System.

Plug-In Flame Signal Amplifiers					Applicable Flame Detectors		
Type	**Color**	**Self-Checking**	**Model**	**Flame Failure Response Time**	**Fuel**	**Type**	**Models**
Rectification	Green	No	R7847A	0.8 or 3 sec.	Gas	Rectifying Flame Rod Holders[a]	C7004, C7007, C7011. Complete Assemblies: C7008, C7009, Q179.
					Oil	Rectifying Photocell	C7003, C7010, C7013, C7014.
				3 sec.	Gas, oil, coal	Ultraviolet (Purple Peeper)	C7012A,C[b]
		Dynamic AMPLI-CHECK™	R7847B[C]	0.8 or 3 sec.	Gas	Rectifying Flame Rod Holders[a]	C7004, C7007, C7011. Complete Assemblies: C7008, C7009, Q179.
					Oil	Rectifying Photocell[d]	C7003, C7010, C7013, C7014.
				3 sec.	Gas, oil, coal	Ultraviolet (Purple Peeper)	C7012A,C[b]
		Dynamic Self-Check	R7847C[e,f]			Ultraviolet (Purple Peeper)	C7102E,F.
Infrared	Red	No	R7848A			Infrared (Lead Sulfide)	C7015.
		Dynamic AMPLI-CHECK™	R7848B[c]				
Ultraviolet	Purple	No	R7849A	0.8 or 3 sec.	Gas, oil	Ultraviolet (Minipeeper)	C7027, C7035, C7044[b].
		Dynamic AMPLI-CHECK™	R7849B[c]				
		Dynamic Self-Check	R7861A[e]			Ultraviolet	C7061.
	Blue	Dynamic Self-Check	R7886A[e]	3 sec.	Gas, oil, coal	Ultraviolet (Adjustable Sensitivity)	C7076.
Optical	White	Dynamic AMPLI-CHECK™	R7851B	0.8 or 3 sec.	Gas, oil, coal	Optical (Ultraviolet, infrared, visible light)	C7927, C7935, C7915, C7962.

[a] Order flame rod separately, see holder instructions.

[b] The C7012A,C; C7027, C7035 and C7044 Flame Detectors should be used only on burners that cycle on-off at least once every twenty-four hours. Appliances with burners that remain on continuously for twenty-four hours or longer should use the C7012E,F Flame Detector with the R7847C Amplifier; the C7061A Flame Detector with the R7861 Amplifier, or the C7076A,D Flame Detector with the R7886A Amplifier as the ultraviolet flame detection system.

[c] Circuitry tests the flame signal amplifier at least 12 times a minute during burner operation and shuts down the boiler if the amplifier fails.

[d] Use only Honeywell Photocell, part number 38316.

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

[f] 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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