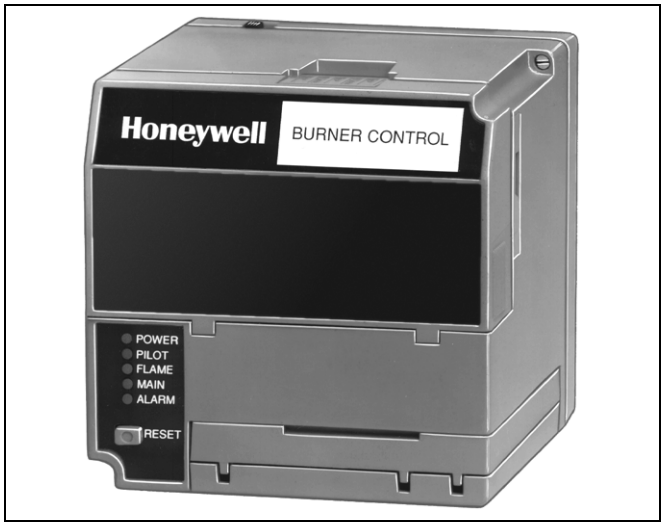
Honeywell

7800 SERIES RM7840E,G,L,M; EC7840L Relay Module

SPECIFICATION DATA



APPLICATION

The Honeywell RM7840 is a microprocessor based integrated burner control for automatically fired gas, oil or combination fuel single burner applications. The RM7840 system consists of a Relay Module, Subbase, Amplifier and Purge Card. Options include Keyboard Display Module, Modbus Module™, DATA CONTROLBUS MODULE™, Remote Display Mounting, and First-Out Expanded Annunciator.

The RM7840 is programmed to provide a level of safety, functional capability and features beyond the capacity of conventional controls.

Functions provided by the RM7840 include automatic burner sequencing, flame supervision, system status indication, system or self-diagnostics and troubleshooting.

RM7840G1022, RM7840L1075, RM7840L1091 and EC7840L1014 offer Valve Proving Feature.

RM7840L1091 has a 4 second main flame establishing period.

Using the S7800A1142 Keyboard Display (standard on RM7800L1087) the following features can be set up:

- **Post Purge time—Up to 60 minutes—Device shipped with 15 seconds Post purge.**
- **Valve Proving features including:**
  - — VPS test time
  - — When (Never, Before, After, Split or Both)

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.**
- **0.8 or 3.0 second Flame Failure Response Time (FFRT), depending on amplifier selected.**
- **Communication interface capability using Modbus.**
- **Dependable, long-term operation provided by microcomputer technology .**
- **First-out annunciation and system diagnostics are provided by an optional 2 row by 20 column Vacuum Fluorescent Display (VFD) located on the Keyboard Display Module (optional).**
- **First-out expanded annunciation with 26 Light Emitting Diodes (LEDs) for limits and interlocks (optional).**
- **Five LEDs for sequence information. See Fig. 1.**
- **Five function Run/Test Switch.**
- **Interchangeable plug-in flame amplifiers.**
- **Local or remote annunciation of RM7840 operation and fault information (optional).**
- **Nonvolatile memory RM7840 retains history files and sequencing status after loss of power.**
- **Remote reset (optional).**

SIL3 Capable

66-2027-04

- **Burner controller data (optional):**
  - **— Expanded annunciator status.**
  - **— Flame signal strength.**
  - **— Hold status.**
  - **— Lockout/alarm status.**
  - **— Sequence status.**
  - **— Sequence time.**
  - **— Total cycles of operation.**
  - **— Total hours of operation.**
  - **— Fault history, providing for 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.**
    - **• Manufacturing code.**
    - **• On/Off status of all digital inputs and outputs.**
    - **• Selected prepurge time.**
    - **• Software revision and version of RM7840 and optional Keyboard Display Module.**
    - **• Status of configuration jumpers.**
    - **• Status of Run/Test Switch.**
- **SIL3 Capable**
  SIL3 Capable in a properly designed Safety Instrumented System See form *65-0312* for Certificate Agreement.

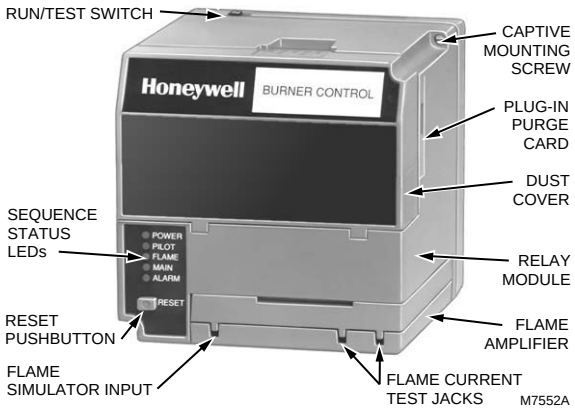


Fig. 1. Relay Module and sequence status LEDs.

SPECIFICATIONS

Electrical Ratings (See Table 1):
Voltage and Frequency: 120 Vac (+10/-15%), 50 or 60 Hz (+/- 10%).5
Power Dissipation: RM7840: 10W maximum.
Maximum Total Connected Load: 2000 VA.
Fusing: Total Connected Load: 15A fast blow, type SC 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: RM7840 with Dust Cover: 1 pound 13 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. 1V9A0.AF.
SwissRe (formerly IRI) acceptable.
Federal Communications Commission: Part 15, Class A—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 two seconds to 30 minutes.
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.
S7800A1142 English language (to program VPS feature).
S7800A1167 Spanish language (to program VPS feature).

Communications:
S7810A1009 Data ControlBus™ Module
S7810M1003 ModBus™ Module.

Miscellaneous:
A7800A1010 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.
50023821-001 Keyboard Display Module Cover, NEMA 4, clear.
204718B Keyboard Display Module Cover, NEMA 1, clear.
50023821-002 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.

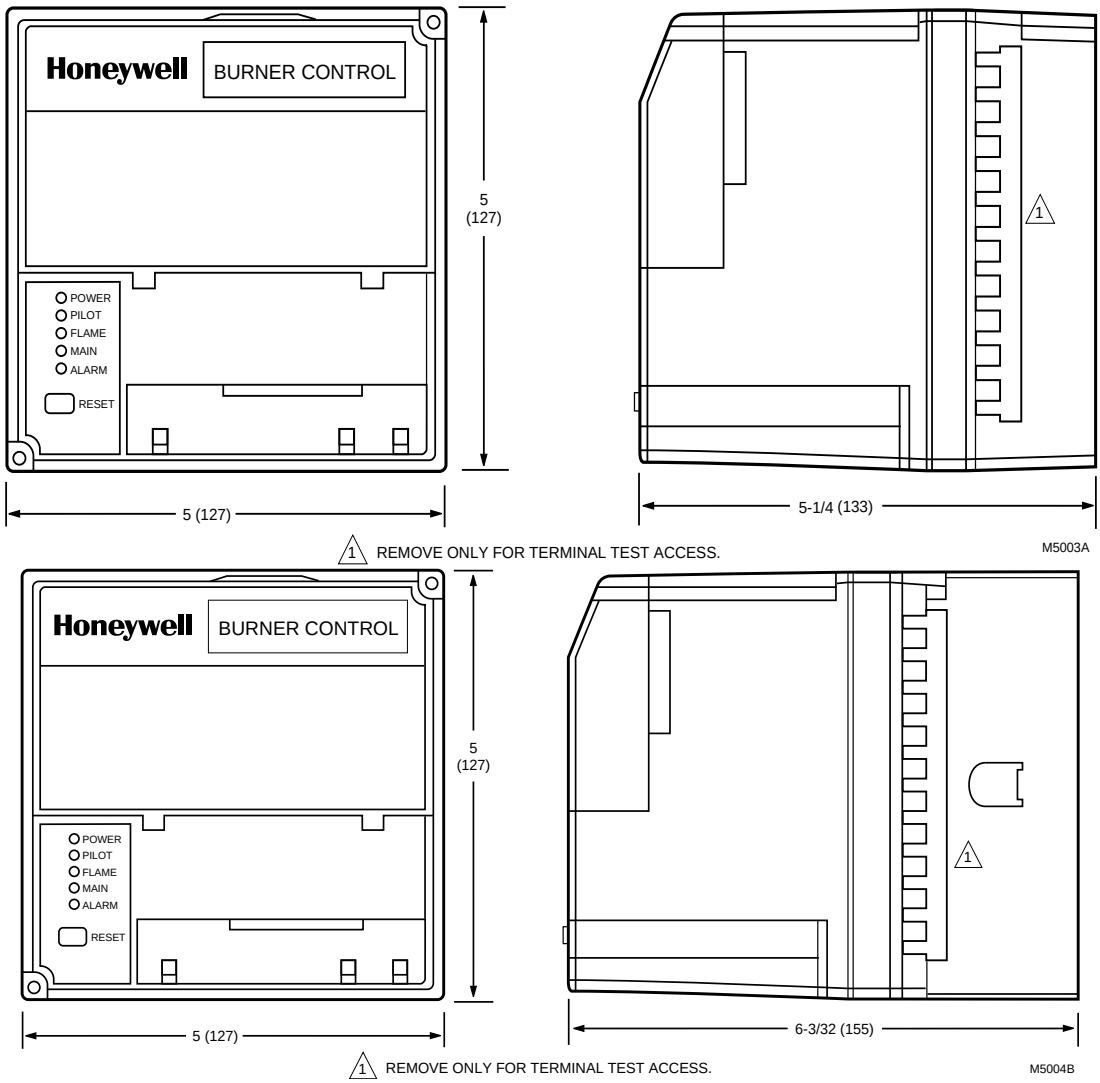


Fig. 2. Mounting dimensions of RM7840 Relay Module, Q7800A Subbase and Q7800B Subbase, respectively, in in. (mm).

Table 1. Terminal Ratings[c].

Terminal No.	Description	Ratings
G	Flame Sensor Earth 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%)
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.[b]
9	Main Fuel Valve	120 Vac.[b]
10	Ignition	120 Vac.[b]
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.[b]
22	Shutter	120 Vac, 0.5A.

[a] The RM7840 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 15A fast blow fuse (or breaker) in the event of an internal short circuit. The RM7840 needs a low impedance ground connection to the equipment frame, which, in turn, needs a low impedance connection to earth ground.

[b] See Tables 3 and 4.

[c] See form *66-1162* for terminal ratings for the EC7840L.

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						
RM7840E	10 sec.	*	**	4 or 10 sec.	10 or 15 sec.	*	15 sec.	Preignition, Lockout, High and Low Fire	4-wire modulating	Yes	FM/IRI Modulating
RM7840G	10 sec.	*	**	4 or 10 sec.	10, 15 sec. or intermittent.	*	15 sec.	Preignition, Running, Low Fire		No	UL/CSA Modulating
RM/ EC7840L	10 sec.	*	**	4 or 10 sec.	10 or 15 sec.[a]	*	15 sec.	Preignition, Lockout High and Low Fire		No	FM/IRI Modulating
RM7840M	10 sec.	*	**	4 or 10 sec.	10 sec. or intermittent	*	15 sec.	Preignition, Running, isolated Low Fire.	2-wire isolated On-Off-On contacts	No	UL/CSA On-Off.

[a] RM7840L1026 Main Flame Establishing Period (MFEP) is 10 seconds or intermittent.

* 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.

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

Pilot Fuel 8	Main 9	Ignition 10	Valve 2 21
C	F	No Load	No Load
B	F	No Load	No Load
No Load	F	No Load	B
F	F	A	No Load
No Load	F	A	F
D	F	A	No Load
No Load	D	A	D
D	D	A	No Load
No Load	D	A	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 valves with: 660 VA inrush, 360 VA open, 250 VA hold.	2A Pilot Duty.	65 VA Pilot Duty plus Motor valves with: 3850 VA inrush, 700 VA open, 250 VA hold.

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 Complete Assemblies: C7005, C7008, C7009, Q179
				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 Complete Assemblies: C7005, C7008, C7009, Q179
				3 sec.	Gas, oil, coal	Ultraviolet (Purple Peeper)	C7012A,C[b]
		Dynamic Self-Check	R7847C[d]			Ultraviolet (Purple Peeper)	C7012E,F
Infrared	Red/ White	No	R7852A			Infrared (Lead Sulfide)	C7915
		Dynamic AMPLI-CHECK™	R7852B[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[d]			Ultraviolet	C7061
	Blue	Dynamic Self-Check	R7886A[d]	3 sec.	Gas, oil, coal	Ultraviolet (Adjustable Sensitivity)	C7076
Optical	White	Dynamic AMPLI-CHECK™	R7851B[c]	0.8 or 3 sec.	Gas, oil, coal	Optical (Ultraviolet, visible light)	C7927, 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 C7061 Flame Detector with the R7861 Amplifier, or the C7076 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] 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.

NOTE: R7847C Series 4 or greater, pulse the shutter when the flame signal of 1.5 is sensed. Display readings of 0.7 to 2.4Vdc are common.

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