Honeywell

7800 SERIES
EC7885A/RM7885A Relay Module

1. Torch-ignited main burner using the S445A Start-Stop Station, or any conventional knee or foot operated start-stop station.
2. Torch-ignited pilot using the S445A Start-Stop Station, or any conventional knee or foot operated start-stop station.
3. Direct-ignition oil burner or electrically ignited pilot, using the S445A Start-Stop Station, which maintains electric ignition as long as the Start Switch is depressed (up to 15 minutes).

FEATURES

- **Safety features:**
    - — **Closed loop logic test.**
    - — **Dynamic AMPLI-CHECK™.**
    - — **Dynamic input check.**
    - — **Dynamic safety relay test.**
    - — **Dynamic self-check logic.**
    - — **Expanded safe-start check.**
    - — **Internal hardware status monitoring.**
    - — **Tamper resistant timing and logic.**
- **Provides 0.8 or 3.0 second Flame Failure Response Time (FFRT) depending on amplifier selected.**
- **Lockout if Start Switch is held 15 minutes.**
- **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 are provided by 2 row by 20 column Vacuum Fluorescent Display (VFD) located on the optional KDM.**
- **Five LEDs for sequence information.**
- **Interchangeable plug-in flame amplifiers.**
- **Local or remote annunciation of RM7885A operation and fault information (optional).**
- **Nonvolatile memory; RM7885A retains history files and sequencing status after loss of power.**
- **Remote reset (optional).**
- **Report generation (optional).**
- **Shutter drive output.**

APPLICATION

The Honeywell EC7885/RM7885 is a microprocessor based integrated burner control for semi-automatically fired gas, oil or combination fuel single burner industrial applications. The EC7885/RM7885 system consists of a Relay Module, Subbase and Amplifier. Options include Keyboard Display Module (KDM), Personal Computer Interface, DATA CONTROLBUS MODULE™, Remote Display Module, First-Out Expanded Annunciator and COMBUSTION SYSTEM MANAGER™ Software.

The EC7885/RM7885 is programmed to provide a level of safety, functional capability and features beyond the capacity of conventional controls.

The EC7885/RM7885 is adaptable to continuous firing, high-low or modulating firing rate for semi-automatic burner sequencing. Functions provided by the RM7885 include flame supervision, system status indication, system or self-diagnostics and troubleshooting.

The EC7885/RM7885 will operate with any of the following types of ignitions:

- **Burner controller data (optional):**

    — **Expanded annunciator status.**
    — **Flame signal strength.**
    — **Hold status.**
    — **Lockout/alarm status.**
    — **Sequence status.**
    — **Sequence time.**
    — **Total hours of operation.**
    — **Total cycles of operation.**
    — **Fault history providing the six most recent faults:**
      — **Cycles of operation 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.**
- **Software revision and release of RM7885A and optional Keyboard Display Module.**

SPECIFICATIONS

Table 1. Sequence Timing for Normal Operation.

Device	Initiate	Standby	Ignition	Run
EC7885A/RM7885A	10 sec.	*	**	*

* STANDBY and RUN can be an infinite time period.
** IGNITION is the time the Start Switch is pushed and is limited to 15 minutes.

Environmental Ratings:
Ambient Temperature:
    Operating: -40° to +140°F (-40° to +60°C).
    Storage: -40° to +150°F (-40° to +66°C).
Humidity: 85 percent RH continuous, noncondensing.
Vibration: 0.5G environment.

Dimensions:
Refer to Figs. 2 and 3.

Weight:
RM7885A with Dust Cover: 1 pound 13 ounces, unpacked.

IMPORTANT

Flame Detection System available for use with RM7885A. To select your Plug-in Flame Signal Amplifier and applicable Flame Detector, see Table 5.

Electrical Ratings, See Table 2:
Voltage and Frequency:
RM7885: 120 Vac (+10/-15%), 50 or 60 Hz (±10%).
EC7885: 220 to 240 Vac (+10/-15%), 50 or 60 Hz (±10%).
Power Dissipation: RM7885A: 10W maximum.
Maximum Total Connected Load: 2000 VA.
Fusing: Total Connected Load: 15A Fast Blow, type SC or
    equivalent.

Approval Bodies:
RM7885:
    Underwriters Laboratories Inc.: listed, File No. MP268,
        Guide No. MCCZ.
    Canadian Standards Association: certified, LR9S329-3.
    Factory Mutual: approved.
    IRI: acceptable.
    Federal Communications Commission: Part 15,
        Class B-Emissions.
EC7885: Factory Mutual Approved.

Mounting:
Q7800A for panel mount.

Q7800B for wall or burner mount.

Required Components:
Plug-in Flame Signal Amplifier, see Table 2.
Wiring Subbase Q7800A1005 (panel mounted) or
    Q7800B1003 (wall mounted).

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.

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.
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Table 2. Terminal Ratings.

Terminal No.	Description	Ratings
G	Flame Sensor Ground	—
Earth G	Earth Ground[a]	—
L2(N)	Line Voltage Common	—
3	Line Voltage Supply (L1)	120 Vac (+10%/-15%), 50/60 Hz (±10%).[b]
4	Alarm	120 Vac, 1A pilot duty.
5	Unused	—
6	Stop Station	12 Vac, 8A run, 43A inrush.
7	Unused	—
8	Pilot Valve	120 Vac.[c]
9	Main Fuel Valve	
10	Start Input	
F(11)	Flame Sensor	60 to 220 Vac, current limited.
12 to 21	Unused	—
22	Shutter	120 Vac, 0.5A

[a] The RM7885A 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 enough current to blow the 15A, Fast Blow, type SC or equivalent, fuse (or breaker) in the event of an internal short circuit. The RM7885A needs a low impedance ground connection to the equipment frame that, 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 rather than leadwires are preferred. Be careful to verify that mechanically tightened joints along the ground path, such as pipe or conduit threads or surfaces held together with fasteners, are free of nonconducting coatings and are protected against mating surface corrosion.

[b] 2000 VA maximum connected load to RM7885A Assembly.

[c] See Tables 4 and 5 for device load combinations for terminals 8 and 9.

Table 3. Combinations for terminals 8 and 9.

Combination No.	Pilot Fuel 8	Main 9
1	B	D
2	A	D
3	No Load	D
4	D	D
5	No Load	D
6	C	D
8	C	C
9	No Load	C

Table 4. Composition of each combination.

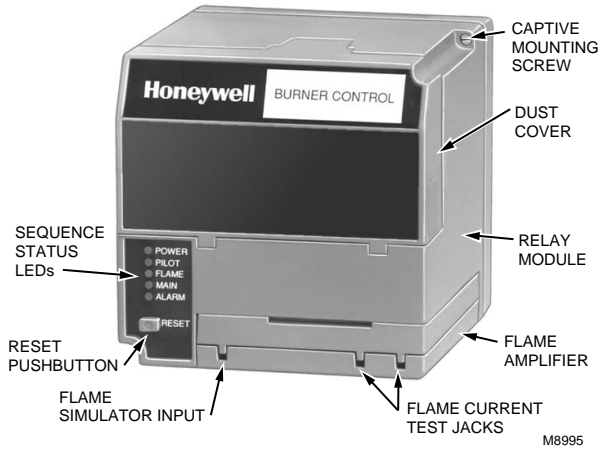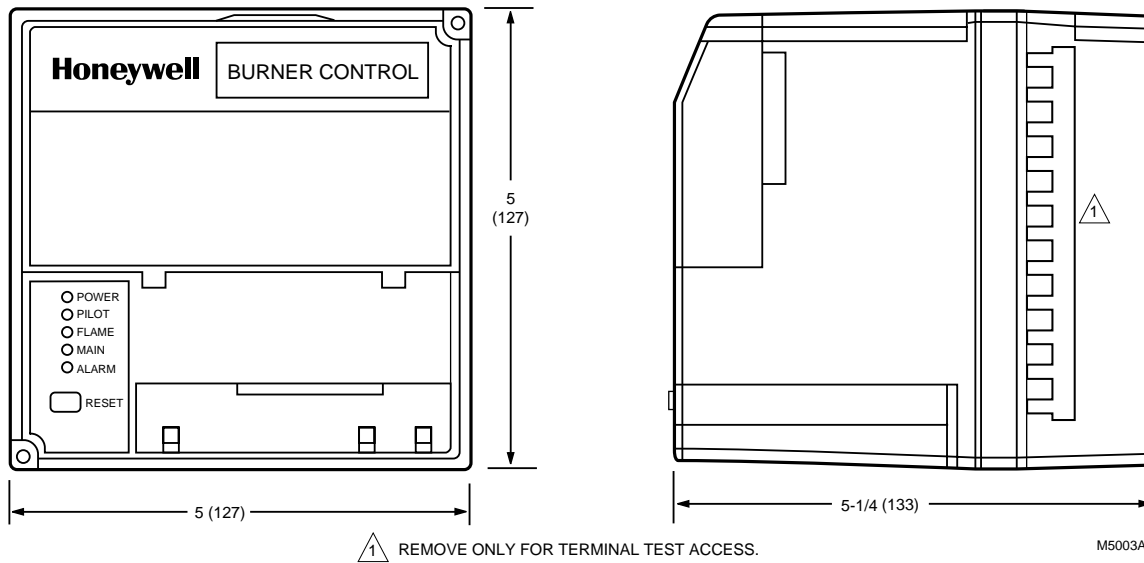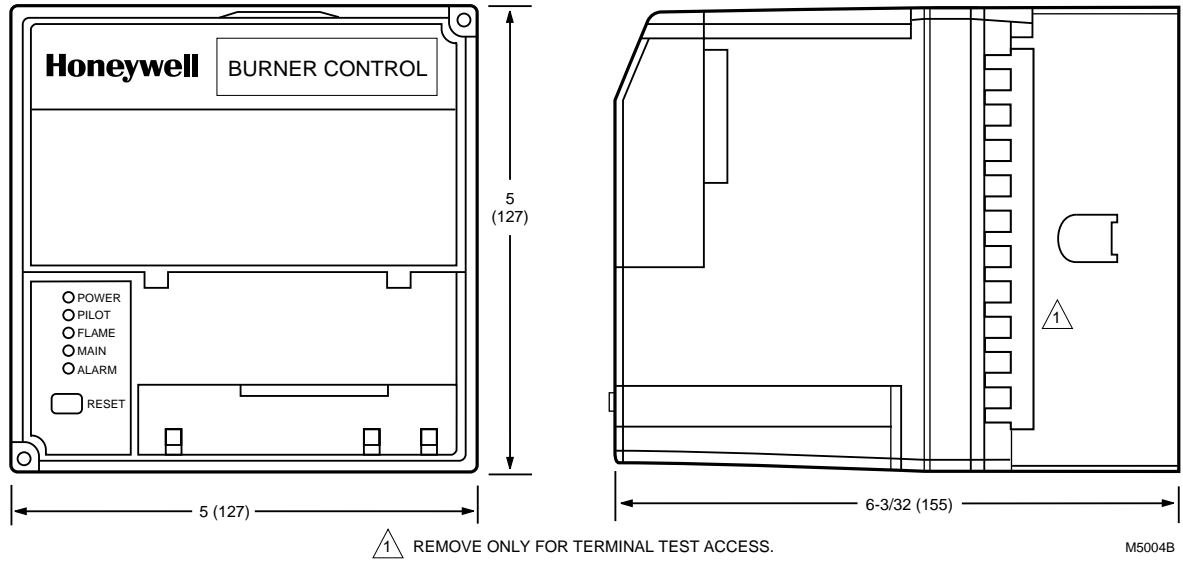| A	B	C	D
50 VA Pilot Duty plus 4.5A Ignition.	180 VA Ignition plus Motor Valves with: 660 VA inrush, 360 VA open, 250 VA hold.	2A Pilot Duty.	65 VA Pilot Duty plus Motor Valves with: 3850 VA inrush, 700 VA open, 250 VA hold.

Fig. 1. Sequence status LEDs.

⚠1 REMOVE ONLY FOR TERMINAL TEST ACCESS.

M5003A

Fig. 2. Mounting dimensions of EC7885A/RM7885A Relay Module and Q7800A Subbase in in. (mm).

1 REMOVE ONLY FOR TERMINAL TEST ACCESS.

M5004B

Fig. 3. Mounting dimensions of EC7885A/RM7885A Relay Module and Q7800B Subbase 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	Dymanic Self-Check	R7824C[b,c,h]	3	Gas, oil, coal	Ultraviolet (Purple Peeper®)	C7024E,F
		No	R7847A[g]	0.8/1 or 2/3	Gas	Rectifying Flame Rod Holders[j]	C7004, C7007, C7011 Complete Assemblies: C7008, C7009, Q179
		No	R7847A[g]	2/3	Gas, oil, coal	Ultraviolet (Purple Peeper®)	C7012A,C.
		Dynamic Ampli-Check®	R7847B[d,g]	0.8/1 or 2/3	Gas	Rectifying Flame Rod Holders[b]	C7004, C7007, C7011 Complete Assemblies: C7008, C7009, Q179
		Dynamic Ampli-Check®	R7847B[d,g]	2/3	Gas, oil, coal	Ultraviolet (Purple Peeper®)	C7012A,C
		Dynamic Self-Check	R7847C[c,e,h]	2/3	Gas, oil, coal	Ultraviolet (Purple Peeper®)	C7012E,F
Infrared	Red	No	R7848A	2/3	Gas, oil, coal	Infrared (Lead Sulfide)	C7015
		Dynamic Ampli-Check®	R7848B[d]	3	Gas, oil, coal	Infrared (Lead Sulfide)	C7015
Ultraviolet	Purple	No	R7849A	0.8/1 or 2/3	Gas, oil	Ultraviolet (Minipeeper)	C7027, C7035, C7044[f]
		Dynamic Ampli-Check®	R7849B[d]	0.8/1 or 2/3	Gas, oil	Ultraviolet (Minipeeper)	C7027, C7035, C7044[f]
		Dynamic Self-Check	R7861A[c,e]	0.8/1 or 2/3	Gas, oil, coal	Ultraviolet	C7061
	Blue	Dynamic Self-Check	R7886A[c,e]	2/3	Gas, oil, coal	Ultraviolet (Adjustable Sensitivity)	C7076
Optical	White	Dymanic Ampli-Check®	R7851B	0.8/1 or 2/3	Gas, oil, coal	Optical (UV, IR, Visible Light)	C7927, C7935, C7915, C7962
		Dynamic Self-Check	R7851C[c]	2/3	Gas, oil, coal	Optical (UV only)	C7961

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

[b] R7824C is used only with the 24 Vdc RM7824 Relay Module and C7024E,F Flame Detectors.

[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] R7824C Series 2 and greater and R7847C Series 4 and greater check flame detector system when flame reaches 1.5 Vdc or at 4.5 seconds, whichever occurs first.

[i] Order flame rod separately; see flame detector Instructions for holder.

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