

## 7800 SERIES EC7895A,C; RM7895A,B,C,D and RM7896A,B,C,D Relay Modules

SPECIFICATION DATA



### APPLICATION

The Honeywell EC7895/RM7895/RM7896 is a microprocessor based integrated burner control for automatically fired gas, oil, or combination fuel single burner applications. A Relay Module, Subbase, Amplifier and Purge Card are required to complete the EC7895/RM7895/RM7896 system. 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 Relay Module is programmed to provide a level of safety, functional capability and features beyond the capacity of conventional controls.

Functions provided by the Relay Module include automatic burner sequencing, flame supervision, system status indication, system or self-diagnostics and troubleshooting. The RM7896 also provides 15 seconds postpurge.

### FEATURES

- **Safety features:**
  - Interlock check.
  - Closed loop logic test.
  - Dynamic AMPLI-CHECK®.
  - Dynamic input check.
  - Dynamic safety relay test.
  - Dynamic self-check logic.
  - Internal hardware status monitoring.
  - Tamper resistant timing and logic.
- Access for external electrical voltage checks.
- Airflow switch check feature (RM7895B,D/RM7896B,D).
- Application flexibility.
- Communication interface capability.
- Delayed main valve (EC7895C; RM7895C,D; RM7896C,D).
- The EC7895/RM7895/RM7896 provides either 0.8 or 3 second Flame Failure Response Time (FFRI), depending on the amplifier selected.
- Dependable, long-term operation provided by microcomputer technology.
- First-out annunciation and system diagnostics are provided by a 2 row by 20 column Vacuum Fluorescent Display (VFD) located on the optional Keyboard Display Module.
- First-out expanded annunciation with 26 Light Emitting Diodes (LED) for limits and interlocks (optional).
- Five (LED) for sequence information, see Fig. 1.
- Two function Run/Test Switch (EC7895C; RM7895C,D; RM7896C,D).
- Interchangeable plug-in flame amplifiers.
- Local or remote annunciation of EC7895/RM7895 and RM7896 operation and fault information (optional).



- Nonvolatile memory; retains history files and sequencing status after loss of power.
- Report generation (optional).
- Remote reset (optional).
- Selectable recycle or lockout on loss of airflow.
- Selectable recycle or lockout on loss of flame (RM7895C1053 does not have the selectable option. It locks out on loss of flame.)
- Shutter drive output.
- 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 EC7895/RM7895/RM7896 and optional Keyboard Display Module.
    - Status of configuration jumpers.
- Status of Run/Test Switch (EC7895C/RM7895C,D/RM7896C,D).

## SPECIFICATIONS

### Electrical Ratings, see Table 1:

Voltage and Frequency:

EC7895A,C: 220 to 240 Vac (+10/-15%), 50 or 60 Hz (±10%).

RM7895/RM7896: 120 Vac (+10/-15%), 50 or 60 Hz (+/- 10%).

Power Dissipation:

EC7895/RM7895/RM7896: 10W maximum.

Maximum Total Connected Load: 2000 VA.

Fusing: Total Connected Load: 20A maximum, fast-acting fuse.

### Environmental Ratings:

Ambient Temperature:

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

Storage: -60°F to +150°F (-40°C to +66°C).

Humidity: 85% RH continuous, noncondensing.

Vibration: 0.5G environment.

**Weight:** 1 pound 13 ounces, unpacked.

**Dimensions:** See Fig. 2.

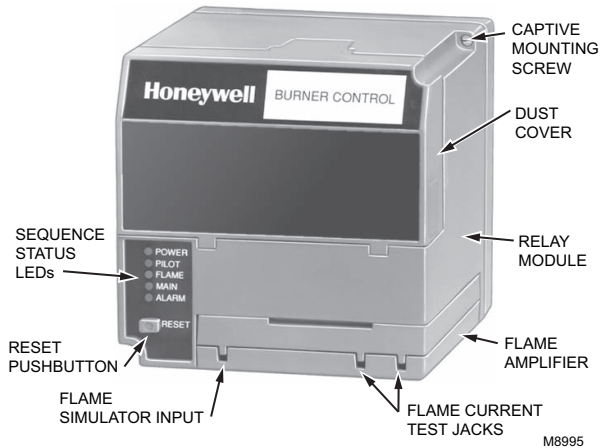


Fig. 1. Relay Module and sequence status LEDs.

Table 1. Terminal Ratings.

Terminal Number	Description	Ratings	
		RM7895/RM7896	EC7895
G	Flame Sensor Ground	—	—
Earth G	Earth Ground <sup>a</sup>	—	—
L2(N)	Line Voltage Common	—	—
3	Alarm	120 Vac, 1A pilot duty.	220 to 240 Vac, 1A pilot duty.
4	Burner Motor	120 Vac, 9.8AFL, 58.8ALR (inrush).	220 to 240 Vac, 4A @ PF =0.5, 20A inrush.
5	Line Voltage Supply (L1)	120 Vac (+10%/-15%), 50 or 60 Hz ( $\pm 10\%$ ) <sup>b</sup> .	220 to 240 Vac (+10%/-15%), 50 or 60 Hz ( $\pm 10\%$ ).
6	Burner Control and Limits	120 Vac, 1 mA.	220 to 240 Vac, 1 mA.
7	Airflow Interlock	120 Vac, 8A run, 43A inrush.	8A @ PF= 0.5, 40A inrush, 2A @ PF = 0.2.
8	Pilot Valve/Ignition	120 Vac <sup>c</sup> .	220 to 240 Vac, 4A @ PF = 0.5, 20A inrush.
9	Main Fuel Valve	120 Vac <sup>c</sup> .	220 to 240 Vac, 4A @ PF = 0.5, 20A inrush.
10	Ignition	120 Vac <sup>c</sup> .	220 to 240 Vac, 2A @ PF = 0.2.
F(11)	Flame Sensor	60 to 220 Vac, current limited.	60 to 220 Vac, current limited.
12 to 20	Unused	—	—
21	Delayed Main Valve (EC7895C, RM7895C, RM7896C,D)	120 Vac <sup>c</sup> .	220 to 240 Vac, 4A @ PF = 0.5, 20A inrush.
22	Shutter	120 Vac, 0.5A.	220 to 240 Vac <sup>d</sup> .

<sup>a</sup> The relay module 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 event of an internal short circuit. The relay module needs a low impedance ground connection to the equipment frame which, in turn, needs a low impedance to earth ground.

<sup>b</sup> 2000 VA maximum connected load to relay module.

<sup>c</sup> See Tables 3 and 4.

<sup>d</sup> 220 to 240 Vac application. Requires 220 to 240 Vac to 120 Vac, 10 VA stepdown transformer to operate the shutter.

Table 2. Sequence timing for normal operation.

Device	Initiate	Standby <sup>a</sup>	Purge <sup>b</sup>	Flame Establishing Period		AFSC <sup>c</sup>	DMV <sup>d</sup>
				Pilot	Main		
EC7895A/RM7895A, RM7896A	10 sec.			4 or 10 sec.	No	No	No
RM7895B/RM7896B					Yes		
EC7895C/RM7895C/RM7896C				4 or 10 sec. <sup>e,f</sup>	10 sec.	No	Yes
RM7895D/RM7896D				4 or 10 sec.	10 sec.	Yes	

<sup>a</sup> STANDBY and RUN can be an infinite time period.

<sup>b</sup> PURGE will be determined by which ST7800 Purge Card is selected.

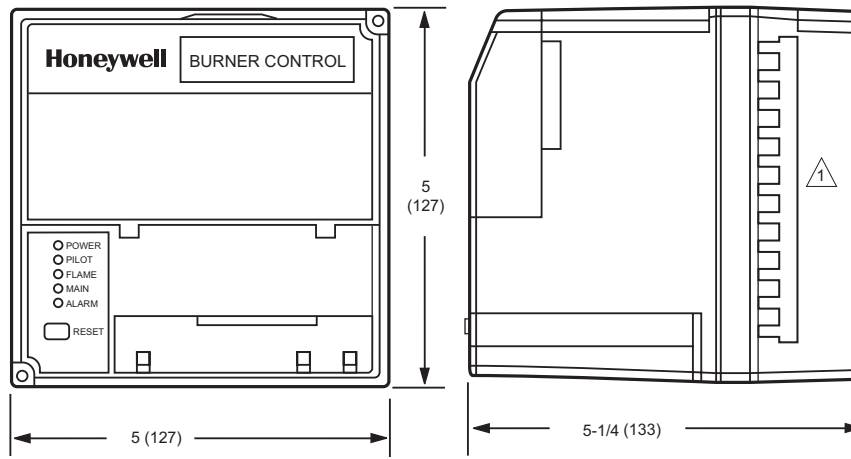
<sup>c</sup> AFSC is Air Flow Switch Check.

<sup>d</sup> DMV is Delayed Main Valve.

<sup>e</sup> RM7895C1020, RM7896C1036 have a fixed Pilot Flame Establishing Period of 10 seconds.

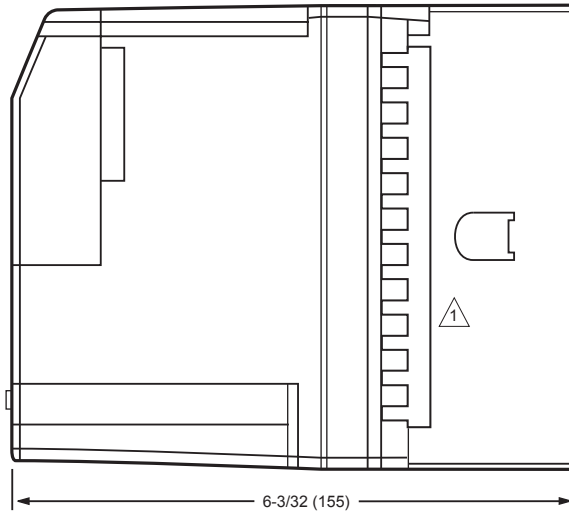
<sup>f</sup> RM7895C1053 has a fixed Pilot Flame Establishing Period of 4 seconds.

7800 SERIES EC7895A,C; RM7895A,B,C,D AND RM7896A,B,C,D RELAY MODULES



 REMOVE ONLY FOR TERMINAL TEST ACCESS.

M5003A



M17791

**Fig. 2. Mounting dimensions of EC7895; RM7895; RM7896 Relay Module, Q7800A Subbase and Q7800B Subbase, respectively, in in. (mm).**

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

Combination No.	Pilot Fuel 8	Main 9	Ignition 10	Delayed Main Valve 21
1	C	F	No Load	No Load
2	B	F	No Load	No Load
3	F <sup>a</sup>	No Load	No Load	No Load
4	F	F	A	No Load
5	F <sup>a</sup>	No Load	A	F
6	D	F	A	No Load
7	D <sup>a</sup>	No Load	A	D
8	D	D	A	No Load
9	D <sup>a</sup>	No Load	A	D

<sup>a</sup> RM7895C,D: EC7895C, RM7896C,D Jumper terminals 8-9.

**Table 4. Composition of each combination.**

A.	B.	C.	D.	F.
4.5A ignition	50 VA Pilot Duty <sup>a</sup> plus 4.5A Ignition.	180 VA Ignition plus Motor valves with: 660 VA inrush, 360 VA open, 250 VA hold.	2A Pilot Duty. <sup>a</sup>	65 VA Pilot Duty <sup>a</sup> plus Motor valves with: 3850 VA inrush, 700 VA open, 250 VA hold.

<sup>a</sup> Pilot Duty relates to solenoid-type valves.

**Approval Bodies:**

RM7895, RM7896 only:

Underwriters Laboratories Inc. listed, File No. MP268,  
Guide No. MCCZ.

Canadian Standards Association certified, LR9S329-3.

Factory Mutual Approved: J.I.1V9A0.AF.

IRI acceptable.

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

EC7895A,C:

Factory Mutual Report J.I.OYOA9.AF.

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

**Required Components:**

Plug-in Flame Signal Amplifier, see Table 2.

Plug-in Purge Timer Cards: selectable ST7800A: two seconds  
to 30 minutes.

Wiring Subbase Q7800A or Q7800B.

**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.

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.

S7810M 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 Detection 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 <sup>a</sup>	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 <sup>b</sup> .
		Dynamic AMPLI-CHECK®	R7847B <sup>c</sup>	0.8 or 3 sec.	Gas	Rectifying Flame Rod Holders <sup>a</sup>	C7004, C7007, C7011. Complete Assemblies: C7008, C7009, Q179.
					Oil	Rectifying Photocell <sup>d</sup>	C7003, C7010, C7013, C7014.
				3 sec.	Gas, oil, coal.	Ultraviolet (Purple Peeper®)	C7012A,C <sup>b</sup> . C7012E,F.
Infrared	Red	No	R7848A	3 sec.	Gas, oil, coal.	Infrared (Lead Sulfide)	C7015.
		Dynamic AMPLI-CHECK®	R7848B <sup>c</sup>				
Ultraviolet	Purple	No	R7849A	0.8 or 3 sec.	Gas, oil.	Ultraviolet (Minipeeper)	C7027, C7035, C7044 <sup>b</sup> .
		Dynamic AMPLI-CHECK®	R7849B <sup>c</sup>			Ultraviolet	C7061.
		Dynamic Self-Check	R7861A <sup>e,f</sup>				
	Blue	Dynamic Self-Check	R7886A <sup>e,f</sup>	3 sec.	Gas, oil, coal.	Ultraviolet (Adjustable Sensitivity).	C7076.
Optical	White	Dynamic AMPLI-CHECK®	R7851B	0.8/1 or 2/3 sec.		Optical (UV, IR, Visible Light).	C7927, C7935, C7915, C7962.

<sup>a</sup> Order flame rod separately; see holder instructions.

<sup>b</sup> 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.

<sup>c</sup> Circuitry tests the flame signal amplifier 12 times a minute during burner operation and shuts down the boiler if the amplifier fails.

<sup>d</sup> Use only Honeywell Photocell, part number 38316.

<sup>e</sup> Circuitry tests all electronic components in the flame detection system (amplifier and detector) at least 12 times a minute during burner operation and shuts down the burner if the detection system fails.

<sup>f</sup> 220 to 240 Vac application. Requires 220-240 Vac to 120 Vac, 10 VA stepdown transformer to operate the shutter.



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