Honeywell

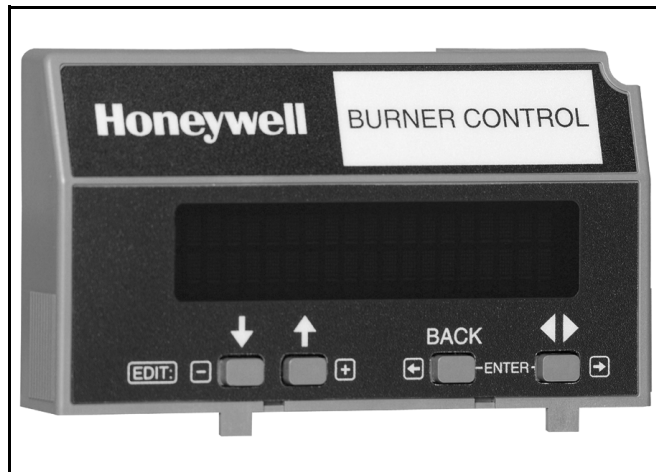# 7800 SERIES
S7800A1142 Keyboard Display Module

The S7800A1142 KDM offers the following technical advancements to the 7800 SERIES devices:

• Compatible with installed Honeywell 7800 SERIES systems.
• When used with the new 7800 SERIES with Valve Proving Feature, the KDM allows for programming the Valve Proving Control feature and timing (Pass Code protected feature).
• Allows for naming the S7830 Expanded Annunciator terminals to match your system drawings. (Displayed message only.)(Pass Code protected feature.)
• A three screen two-row by twenty-column readout set of "Call Service" (Business Card) alpha/numeric directions can be displayed instead of the standard lockout display message. (Pass Code protected feature). This "business card" can be cloned to other displays to save setup time.
• Enable ModBus Communication feature.

The Business Card (Call Service) and Expanded Annunciator can be made up using:

• Capital letters (A through Z).
• Lower case letters (a through z).
• Numbers (1 through 0).
• Symbols (!, @, #, $,%, etc.).
• Spanish symbols.

APPLICATION

The S7800A1142 Keyboard Display Module (KDM) provides current system status along with first-out annunciation and system diagnosis using a two-row by twenty-column readout. The KDM provides local or remote annunciation of operation and fault information, remote reset, report generation, burner control data and diagnostic information. The KDM is part of the 7800 SERIES of microprocessor-based burner controls for gas, oil, coal or combination fuel single burner applications.

The 7800 SERIES is programmed to provide a level of safety, functional capabilities and features beyond the capacity of conventional controls.

The S7800A1142 is required to program the Valve Proving feature of select 7800 Series devices.

Programming can be done with the S7800 KDM mounted on a 7800 SERIES Relay Module or with a 13 Vdc power source connected to the KDM through the 203541 5-wire connector.

Since your Business Card (Call Service) S7800A1142 will be left at the job site, programming your personal three-number password and personal lockout message can be set up ahead of time without being connected to a 7800 SERIES device. A clone function allows you to make multiple Business Cards from the original display.

Contents

Contents

Mounting KDM on 7800 SERIES Relay Module.

1. Align the two interlocking ears of the KDM with the two mating slots on the 7800 SERIES Relay Module. See Fig. 2.

Fig. 2. Keyboard Display Module mounting.

2. Insert the two interlocking ears into the two mating slots and, with a hinge action, push on the lower corners of the KDM to secure it to the 7800 SERIES Relay Module.
3. Make sure the KDM is firmly in place.

Remote Mounting KDM

The KDM can be mounted either on the face of a panel door or on other remote locations. See Fig. 3. When mounting the KDM on the face of a door panel, closely follow these instructions:

Door Panel Mounting

Fig. 3. Panel mounting of a Keyboard Display Module.

1. Select the location on the door panel for flush mounting.
2. Pay attention to the insertion dimensions of the two KDM screws, two interlocking ears, and the two plug-in connections to allow for sufficient clearance.
3. Use the KDM or Data ControlBus Module™ as a template (Fig. 19) and mark the two screw locations, interlocking ear locations and the two plug-in connector locations.

4. Drill the pilot holes for the mounting screws.
5. Cut holes in the door panel for the interlocking ears and the two plug-in connectors.
6. Mount the KDM, securing it with the two screws provided in the KDM bag assembly.

Remote Display Mounting Bracket

Use the 203765 Remote Display Mounting Bracket when mounting the KDM on a wall or remote location:

1. Use the 203765 Remote Display Mounting Bracket as a template to mark the four screw locations.
2. Drill the pilot holes for the four mounting screws.
3. Mount the 203765 Remote Display Mounting Bracket by securing the four no. 6 screws (M3.5 x 0.6). See Fig. 4.
4. Mount the KDM by aligning the two interlocking ears with the two mating slots on the remote mounting bracket.
5. Insert the two interlocking ears into the two mating slots.
6. Push on the lower corners of the KDM to secure it to the remote mounting bracket.
7. Make sure the KDM is firmly in place.

Fig. 4. Remote mounting of a Keyboard Display Module using a 203765 Remote Display Mounting Bracket.

WIRING

⚠ WARNING

Electrical Shock Hazard.
Can cause severe injury or death.
To prevent electrical shock and equipment damage, disconnect the power supply from the main disconnect before beginning installation. More than one disconnect can be involved.

1. Refer to Fig. 5, 6, and 7 for proper wiring.
2. Make sure all wiring complies with all applicable electrical codes, ordinances and regulations.
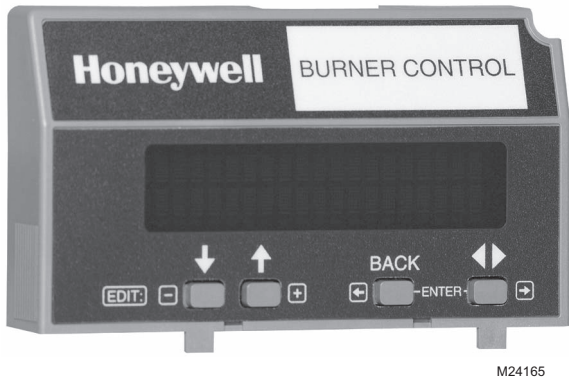3. For recommended wire size and type, see Table 1.

Fig. 9. S7800 Keyboard Display Module.

Keyboard Functions

The keyboard contains four push-buttons with separate functions (SCROLL-down, SCROLL-up, MODE, and CHANGE-LEVEL). The MODE and CHANGE-LEVEL, when pressed together, provide a SAVE function. When in the Setup Screen—Mode and Change Level serves as Menu or Enter.

1. Down-up arrow push-buttons. See Fig. 10. The down-up arrow push-buttons are used to scroll through the selectable messages. The double-headed arrow ($\updownarrow$), which is located in the lower left position of the second line of the display, represents the down-up push-buttons. The down-up push-buttons can be pressed to display the selectable messages one at a time or held down to scroll through the selectable messages at the rate of two per second. When the last item of the selectable message is viewed, the display wraps around and displays the first selectable message again.

2. The ◄ ► push-button, see Fig. 11. The ◄ ► push-button is used to change between the first hierarchy of selectable messages to a subset of selectable messages. The ◄ ► push-button can also be used to change from a subset message to a first level selectable message. The symbol located on the second line in the lower right corner of the display, represents a subset of selectable messages.

3. BACK push-button, see Fig. 12. Use the BACK push-button to instantaneously switch the display from a second-line selectable message to a second-line preempted message. The sixty second time-out function can also be used for this task. The BACK push-button only works if there is a second-line preempted message or a lockout message.
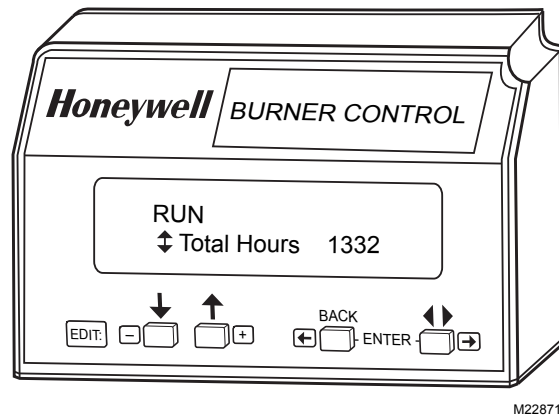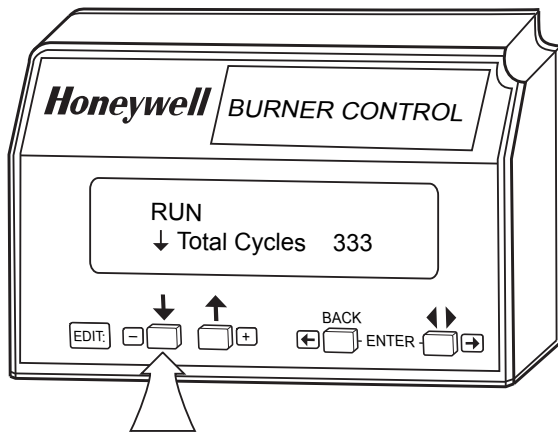

Fig. 10. ↑↓ Push-button function.
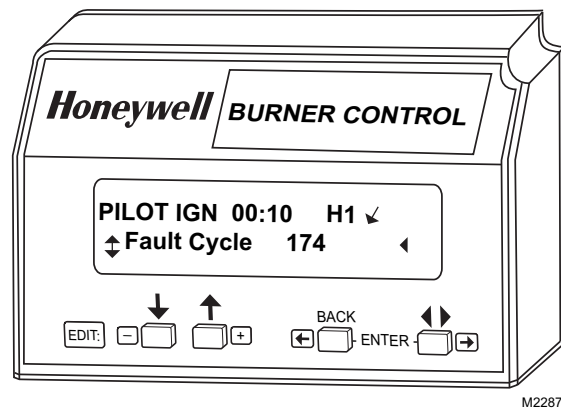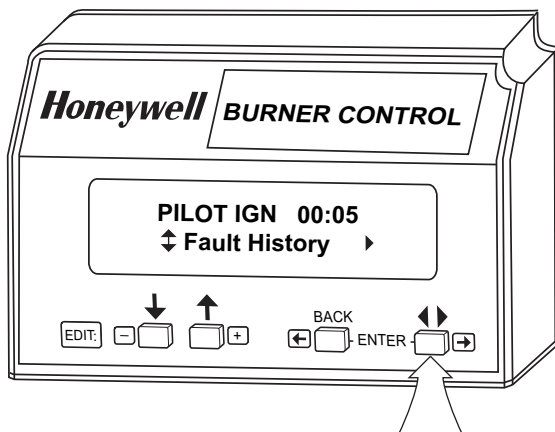
Fig. 11. ◄ ► push-button function.
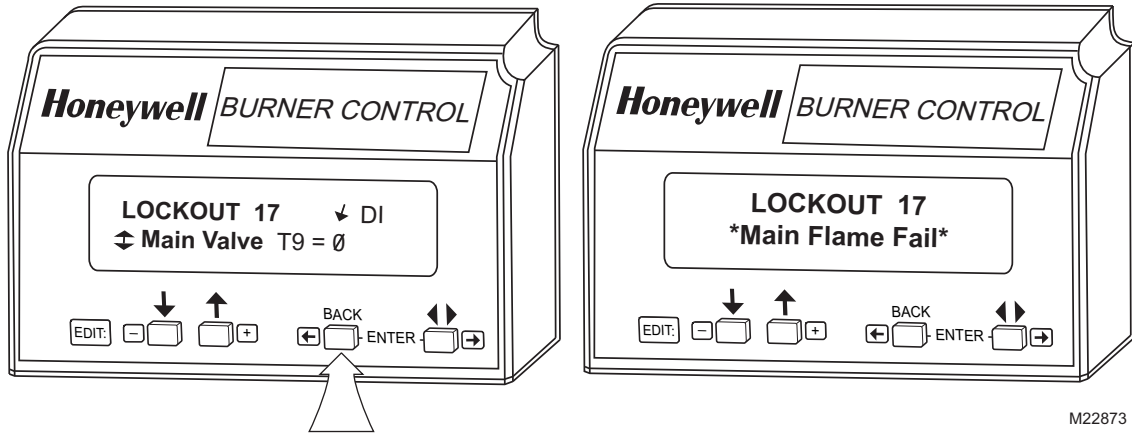
Fig. 12. BACK push-button function.

4. SAVE function, see Fig. 13, 14, and 15.
   a. Enables users to identify the selectable 2nd line message they want to view upon power restoration. (See "Total Cycles" instead of "Flame Signal" for example.) The second line selectable message is restored to the most recently saved selection when power returns.
   b. Press the down-up arrows until the desired second line is displayed. Press the ENTER function. (See Fig. 13.)
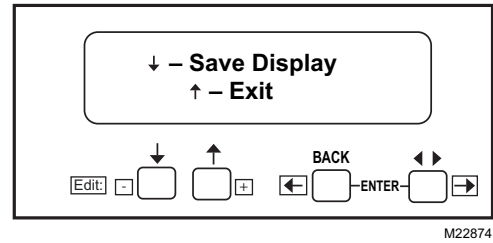
Fig. 14. Save Display/Exit screen

   d. Press the ↓ to save the desired second line. Pressing the ↑ will EXIT without changing the second line.
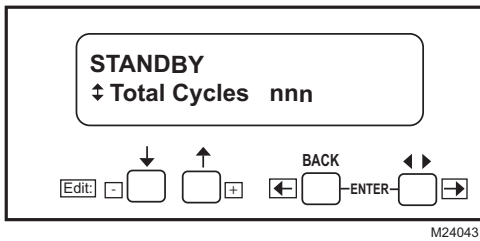
Fig. 13. SAVE function.

   c. The following Display will appear:

Fig. 15. Save Display...Saving screen.

The second line of the display is now changed to the new selected message.

Table 3. Selectable Messages .

Selectable Message/Display		Description	Possible States/ Range (Terminals)	Comments
⬍Flame Signal		Flame signal strength.	0 - 5.0 Vdc Flame Amp (+ and - (Com))	Flame relay pull-in and drop-out value 1.25 Vdc.
⬍Total Cycles		Total number of equipment operating cycles.	0 - 99,999 (250,000; 999,999[c]) cycles[a]	Cycle will be updated each time main valve is energized.
⬍Total Hours		Total number of equipment operating hours.	0 - 99,999 (250,000; 999,999[c]) hours[a]	Hour will be updated each time main valve output is energized for 60 minutes.
⬍Fault History > (Six most recent faults)		First level prompt for history information. Has subset level.	—	—
⬍Fault Cycle	↙ H1	Cycle when fault occurred.	0 - 99,999 cycles (250,000; 999,999[c]) cycles	—
⬍Fault Hours	↙ H1	Run hour when fault occurred.	0 - 99,999 (250,000; 999,999[c]) hours[a]	—
⬍Fault Code	↙ H1	Number that identifies the reason for lockout.	0 - 999	—
⬍*Fault Message*	↙ H1	Indicates cause of lockout.	—	—
⬍Sequence Message	↙ H1	Indicates where in the sequence the lockout occurred.	—	—
⬍(Second Line Message)	↙ H1	Second line message explains any further information that is available from the 7800 SERIES or may be blank if there is not a preemptive second-line. H2…H6 etc.	—	—
⬍Diagnostic Information >		First level prompt for diagnostic information. Has subset level.	—	—
⬍Device		Device type number.	RM78XXX, R7140, or EC78XXX	—
⬍Device Suffix		Device suffix number.	nnnn	—
⬍Run/Test Sw.		Position of Run/Test Switch.	RUN or TEST	Indicates if 7800 SERIES is in RUN or TEST mode.
⬍OperControl	T6	Operating Control Input.	= 1 or 0	Indicates if input is on or off, energized or de-energized.
⬍Interlock	T7	Running/Lockout Interlock.	= 1 or 0	Indicates if input is on (1) or off (0), energized or de-energized.
⬍Pilot Valve		T8 Pilot Valve.	= 1 or 0	Indicates if output terminal is on or off, energized or de-energized.
⬍Main Valve		T9 Main Fuel Valve.	= 1 or 0	Indicates if output terminal is on or off, energized or de-energized.
⬍Ignition		T10 Ignition.	= 1 or 0	Indicates if output terminal is on or off, energized or de-energized.
⬍LowFire Sw		T18 Low Fire Switch.	= 1 or 0	Indicates if input is on or off, energized or de-energized.
⬍HighFireSw		T19 High Fire Switch.	= 1 or 0	Indicates if input is on or off, energized or de-energized.
⬍PreIgn ILK		T20 or T17[b] Pre-Ignition Interlock	= 1 or 0	Indicates if input is on or off, energized or de-energized.

Table 3. Selectable Messages (Continued).

Selectable Message/Display	Description	Possible States/ Range (Terminals)	Comments
⬍Valv/Start	T21 Interrupted/Intermittent Pilot Valve, First Stage Oil Valve or Start Input.	= 1 or 0	Indicates if output is on or off, energized or de-energized.
⬍Jumper 1	Pilot Flame Establishing Period (PFEP).	INTACT/CLIPPED	Display shows state of PFEP jumper. If jumper is intact, 7800 SERIES was 10 second PFEP. If jumper is clipped, 7800 SERIES has 4 second PFEP.
	First Safety Time (for RM/EC7850).	INTACT/CLIPPED	Display shows state of First Safety Time (EC7850) jumper. If jumper is intact, EC7850 has 5 second First Safety Time. If jumper is clipped, the EC7850 has 3 second First Safety Time.
⬍Jumper 2	Pilot Valve.	INTACT/CLIPPED	Display shows state of Pilot Valve (terminal no. 21). If jumper is intact, RM7800G has Intermittent Pilot Valve. If jumper is clipped, RM7800G has 15 or 30 second Interrupted Pilot Valve.
	Main Trial Time (for RM/EC7850).	INTACT/CLIPPED	Display shows state of Main Trial Time (EC7850)Valve (terminal no. 21). If jumper is intact, EC7850 has 5 second Main Trial Time. If jumper is clipped, EC7850 has 3 second Main Trial Time.
⬍Jumper 3	Start-up Airflow Switch (AFS) check.	INTACT Disabled/CLIPPED Enabled	Display shows state of Start-up AFS check jumper. If jumper is clipped, RM7800 AFS check is enabled and if jumper is intact, AFS check is disabled.
⬍Amp Type	Defines type of amplifier installed.	STANDARD/AMP-CHECK/SHUTTER	Display shows type of flame detection system installed (i.e., as STANDARD, AMP-CHECK/AMPLI-CHECK™ and SHUTTER/ Dynamic Self-Checking).
⬍Flame Response	Amplifier Flame Failure Response Time (FFRT) in seconds.	0.8 second, 1 second, 2 seconds, or 3 seconds	—
⬍Purge Time	Timing value of purge card.	mm:ss	Two seconds to 30 minutes.

[a]European Approved Controls.

[b] Pre-Ignition Interlock Terminal 17 or 20 is model dependent.

[c] Valve Proving Device or RM7897.

[d] The display values are as follows:
> **n** represents a numbered value.
> **T** represents the terminal number.
> **x** represents the suffix letter of the Relay Module.

Expanded Annunciator Messages (Table 4)

The Expanded Annunciator (EA) may or may not be connected because it is an optional device. If the EA is not connected, a display message of "(EA not connected)" is shown. If the EA is connected, display messages are shown; see Table 4 (Note that 1 means ON and 0 means OFF). When accessing Expanded Annunciator messages, follow the same operations as used with the Selectable messages.

Table 4. Expanded Annunciator.

Selectable Message[a] (Second Line)	Display Value (Second Line)	First Line Message
Expanded Annunciator↔		
⬍Expanded Annunciator (EA not connected)<		↓EA
⬍Current Status (CS:)[a]	EA Message<	↓EA
⬍Valve Closure (Valve Close)	T5 = 1 or 0<	↓EA
⬍Burner Switch (Burner Sw.)	T5 = 1 or 0<	↓EA
⬍Operating Control (OperControl)	T6 = 1 or 0<	↓EA
⬍Auxiliary Limit (Aux Limit 1)	T7 = 1 or 0<	↓EA
⬍Auxiliary Limit (Aux Limit 2)	T8 = 1 or 0<	↓EA
⬍Low water Cutoff (LWCO)	T9 = 1 or 0<	↓EA
⬍High Limit (High Limit)	T10 = 1 or 0<	↓EA
⬍Auxiliary Limit (AuxLimit 3)	T11 = 1 or 0<	↓EA
⬍Oil Selection Switch (Oil Select)	T12 = 1 or 0<	↓EA
⬍High Oil Pressure Switch (Hi OilPres)	T13 = 1 or 0<	↓EA
⬍Low Oil Pressure Switch (LowOilPres)	T14 = 1 or 0<	↓EA
⬍High Oil Temperature Switch (Hi OilTemp)	T15 = 1 or 0<	↓EA
⬍Low Oil Temperature Switch (LowOilTemp)	T16 = 1 or 0<	↓EA
⬍Atomizing Switch (Atomize Sw)	T19 = 1 or 0	↓EA
⬍Gas Selection Switch (Gas Select)	T17 = 1 or 0<	↓EA
⬍High Gas Pressure Switch (Hi GasPres)	T18 = 1 or 0<	↓EA
⬍Low Gas Pressure Switch (LowGasPres)	T19 = 1 or 0<	↓EA
⬍Airflow Switch (Airflow Sw)	T20 = 1 or 0<	↓EA
⬍Auxiliary Interlock (Aux ILK 4)	T21 = 1 or 0<	↓EA
⬍Auxiliary Interlock (Aux ILK 5)	T22 = 1 or 0<	↓EA
⬍EA Fault Code	nnn<	↓EA
⬍Software Revision (SW Rev.)	nnnn<	↓EA

[a] See Table 8 for optional messages.

TROUBLESHOOTING

After the KDM is installed, return the 7800 SERIES to normal operation, restore power and run the system through at least one complete automatic cycle. For complete Troubleshooting and System Checkout information, see form 65-0229.

7800 SERIES System Diagnostics

Troubleshooting control system equipment failures is made easier with the 7800 SERIES self-diagnostics and first-out annunciation. The S7800 provides visual annunciation by displaying a fault code and fault or hold message on the display.

Self-diagnostics of the 7800 SERIES enables it to detect and annunciate both external and internal system problems. Internal faults and external faults such as interlock failures, flame failures and false flame signals are annunciated by the KDM via the 7800 SERIES Relay Module.

The KDM displays a sequence status message indicating STANDBY, PREPURGE, PRE-IGNITION, SAFETY 1, PILOT IGN, PILOT STAB., MAIN IGN, RUN or POSTPURGE, as appropriate. The selectable messages also provide visual indication of current status and historical status of the equipment, such as: Flame Signal, Total Cycles, Total Hours, Fault History, Diagnostic Information and Expanded Annunciator terminal status (if used). With this information, most problems can be diagnosed without extensive trial-and-error testing.

Table 21 provides the sequence and status hold messages.

Table 5. Keyboard Display Module Sequence and Status Hold Messages .

Sequence	Status
INITIATE mm:ss	The Keyboard Display Module (KDM) indicates the burner status, INITIATE, a stabilization period for the relay module to check for any fluctuations in ac line voltage inputs or control inputs on power up or during normal operation. The timing of the INITIATE period is either two seconds or ten seconds, depending on the model, before entering STANDBY.
If the relay module is in an INITIATE HOLD status, the following conditions could exist:	
INITIATE HOLD: (AC Frequency/Noise)	The KDM indicates the burner status and that it is waiting for excess line noise to clear up, which prevents sufficient reading of the line voltage inputs. The burner sequence does not advance into STANDBY until the excess line noise ceases or a line frequency error occurs; this is caused by using a 60 Hz device on a 50 Hz line, or vice versa on devices with a date code earlier than 9804, is corrected.
INITIATE HOLD: (AC Line Dropout)	The KDM indicates the burner status and that ac line power has momentarily dropped out. The burner sequence does not advance into STANDBY until the ac line voltage has stabilized throughout the INITIATE sequence.
INITIATE HOLD: (AC Frequency)	The KDM indicates the burner status and that line frequency is faster than the expected value. The burner sequence does not advance into STANDBY until the line frequency returns to the proper value; this is perhaps caused by using a 60 Hz device on a 50 Hz line for devices with a date code earlier than 9804.
INITIATE HOLD: (Low Line Voltage)	The KDM indicates the burner status and that low line voltage (10% lower than rated voltage) has occurred. The burner sequence does not advance into STANDBY until the line voltage is at a sufficient level for proper operating parameters.
STANDBY	The KDM indicates the burner status, STANDBY. The burner can be placed in STANDBY by opening the burner switch or if the operating controller indicates its setpoint is satisfied. If a demand is present for burner operation, the burner sequence does not advance from STANDBY to PURGE until the recycle limits close. If an Expanded Annunciator is connected, the display messages are enhanced.
If the relay module is in a STANDBY HOLD status, the following conditions could exist:	
STANDBY HOLD: F/G (Flame Detected)	The KDM indicates the burner status and that a flame is detected. A demand is present for burner operation. The sequence does not advance to PREPURGE until the flame signal clears. If the flame signal does not clear within 40 seconds, the relay module locks out.
STANDBY HOLD: T20 (Pre-Ignition Interlock)	The KDM indicates the burner status and that the Pre-Ignition Interlock is not closed. A demand is present for burner operation, but the burner sequence does not advance to PREPURGE until the Pre-Ignition Interlock proves closed. If this time exceeds a 30 second hold, the relay module locks out.
STANDBY HOLD: T7 (Lockout Interlock)	The KDM indicates the burner status and that the Lockout Interlock is closed. A demand is present for burner operation, but the burner sequence does not advance to PREPURGE until the Lockout Interlock proves open. If this time exceeds the 120 second hold, the relay module locks out.
STANDBY HOLD: T7 (Running Interlock) EC/RM7850	The KDM indicates the burner status and that the Running Interlock is closed. A demand is present for burner operation, but the burner sequence does not advance to PREPURGE until the Running Interlock proves open. If this time exceeds the 120 second hold, the relay module locks out.
PURGE	The KDM indicates the burner status, PURGE, which is the period of time the blower motor is running before the Ignition period. The timing of the PURGE period is selectable.
If the relay module is in a PURGE HOLD status, the following conditions could exist:	
PURGE HOLD: T19 (High Fire Switch)	The KDM indicates the burner status and that the High Fire Switch is not closed. The firing rate motor is driving to its PURGE rate position. If this time exceeds four minutes and fifteen seconds, the relay module locks out.
PURGE DELAY: T19 (High Fire Switch Jumpered)	The KDM indicates the burner status and that the High Fire Switch is jumpered. The High Fire Switch is bypassed, welded or otherwise prematurely closed. The system automatically adds 30 seconds to allow the firing rate motor additional drive time to reach or near the open damper position before starting the PURGE sequence.
PURGE HOLD: TEST (Run/Test Switch)	The KDM indicates the burner status and that the Run/Test Switch is in the TEST position. The sequence does not continue until the Run/Test Switch is placed in the RUN position.
PURGE HOLD: T18 (Low Fire Switch Jumpered)	The KDM indicates the burner status and that the Low Fire Switch is jumpered. The Low Fire Switch is bypassed, welded or otherwise prematurely closed. The system automatically adds 30 seconds to allow the firing rate motor additional drive time to reach or near the closed damper position before starting the ignition sequence.
PURGE HOLD: F/G (Flame Detected)	The KDM indicates the burner status and that a flame is detected. The burner sequence does not advance through PREPURGE because a flame is detected as being present. The sequence holds waiting for the flame signal to clear. If the time exceeds 30 seconds, the relay module locks out.

Table 5. Keyboard Display Module Sequence and Status Hold Messages (Continued).

Sequence	Status
PURGE HOLD: T18 (Low Fire Switch)	The KDM indicates the burner status and that the Low Fire Switch is not closed. The firing rate motor is driving to its Low Fire position in preparation for Ignition Trials. If this time exceeds four minutes and fifteen seconds, the relay module locks out.
PURGE HOLD: T7 (Running Interlock)	The KDM indicates the burner status and that the Running Interlock is not closed. The sequence does not advance to ignition until the Running Interlock proves closed. If this time exceeds 30 seconds, the relay module locks out.
PILOT IGN mm:ss	The KDM indicates the burner status, PILOT IGN, and the timing of the PILOT IGN trial begins, in seconds. During this period, the relay module permits the pilot valve to open and the pilot flame to establish.
If the relay module is in a PILOT HOLD status, the following conditions could exist:	
PILOT HOLD: TEST (Run/Test Switch)	The KDM indicates the burner status, PILOT IGN, and that the Run/Test Switch is in the TEST position. The sequence does not continue until the Run/Test Switch is placed in the RUN position.
MAIN IGN mm:ss	The KDM indicates the burner status, MAIN IGN, and the timing of the MAIN IGN trial begins, in seconds. During this period, the relay module permits the main valve to open and the main flame to establish.
RUN	The KDM indicates the burner status, RUN, which is the period of time after the Ignition Trials and before the operating controller setpoint is reached. During this time, the burner is firing under control of the firing rate control.
If the relay module is in a RUN HOLD status, the following condition could exist:	
RUN LOWFIRE: TEST (Run/Test Switch)	The KDM indicates the burner status and that the Run/Test Switch is in the TEST position. Normal modulation or operation does not continue until the Run/Test Switch is placed in the RUN position.
POSTPURGE mm:ss	The KDM indicates the burner status, POSTPURGE, which is the period of time after the RUN period when the blower motor continues to run. The timing of the POSTPURGE period is fifteen seconds.
Waiting for connection...	The KDM has power but is waiting to receive a signal from the relay module to continue operation.
RESET/ALARM TEST	The KDM indicates the burner status, RESET/ALARM TEST. This condition indicates that the reset button is pressed. If it is held for more than four seconds, the alarm output is energized. The alarm output is de-energized when the reset button is released.
Additional Sequence Status Information When An Expanded Annunciator is Connected to the Relay Module:	
BURNER OFF: T6 (Burner Switch)	The KDM indicates the Burner Switch is not closed. The burner sequence does not advance to PREPURGE until the Burner Switch closes.
STANDBY	The KDM indicates the burner status, STANDBY, and that the Operating Control is not closed. The burner sequence does not advance to PREPURGE until the Operating Control closes.
STANDBY HOLD: T6 (EA Hold Message)	The KDM indicates the burner status, STANDBY, and that a limit is not closed. The burner sequence does not advance to PREPURGE until one or all limits close downstream from the Operating Control.
STANDBY HOLD: T6 (Circuit Fault)	The KDM indicates the burner status, STANDBY, and that the control input is not closed. The burner sequence does not advance to PREPURGE until the control input closes.

The S7800 provides diagnostic information to aid the service mechanic in obtaining information when troubleshooting the system. See Table 6 for information on accessing historical and diagnostic selectable messages. Information available in the Diagnostic Information includes Device Type, Device Suffix, Software Revision, Manufacturing Code, Flame Amplifier Type, Flame Failure Response Time (FFRT), Selectable Jumper Configuration Status, Run/Test Switch Status and Terminal Status.

Historical Information Index

The S7800 displays historical information for the six most recent lockouts. Each of the six lockout records retains the cycle when the fault occurred, a fault code, a fault message, and burner status when the fault occurred. See Table 6. The Fault History is NOT available if the Service Call Feature is active.

Table 6. Accessing Historical and Diagnostic Selectable Messages.

Step	Operation	Press	Display	Comments
1.	Press ↑↓ keys to access Diagnostic Information.	↑↓	STANDBY Diagnostic Info>	Use the Down/Up SCROLL keys to access the selectable message. The second line will display Diagnostic Information.
2.	Press ◀ ▶ key to Access Diagnostic Information.	◀ ▶	STANDBY Diagnostic Info>	Use the Change Level key to access the Diagnostic Information.
3.	Continue display of Diagnostic Information.	↑↓	STANDBY ↙ DI Device RM7800<	Push the SCROLL key to scroll to the next Diagnostic Message.
4.	Continue through remaining Diagnostic Information display following step 3 as required.	—	—	—
5.	Press the ◀ ▶ key to return to the first level of Diagnostic Information data prompt or to other selectable messages.	◀ ▶	STANDBY Diagnostic Info>	Another display can be selected or discontinue accessing Diagnostic Information review.

SERVICE NOTE: If the Keyboard Display Module screen is scrambled, remove and reinstall the Keyboard Display Module and reset the 7800 SERIES Relay Module.

SERVICE NOTE: Reset the 7800 SERIES Relay Module by pressing the reset push button on the relay module or pressing a remote reset push button wired through the Keyboard Display Module, Data ControlBus™ Module or Remote Reset Module. A power-up reset will cause an electrical reset of the 7800 SERIES Relay Module but will not reset a lockout condition.

Lockout Messages

When the 7800 SERIES is locked out, it displays a repeating cycle of messages unless the Call Service Feature is Active. Then the Fault message is displayed followed by the Customer Service message. The Fault History is NOT available if the Call Service is Active. See Table 7. There are four states in the cycle:

1. State 1 (Fig. 16). A first state message display lasts six seconds. First line displays the word LOCKOUT followed by the fault code number and possibly a lower case letter if an Expanded Annunciator is connected. The letter corresponds to the first-out code supplied by the Expanded Annunciator. The lockout reason corresponding to the fault code number is displayed on the second line, highlighted by asterisks on each side.
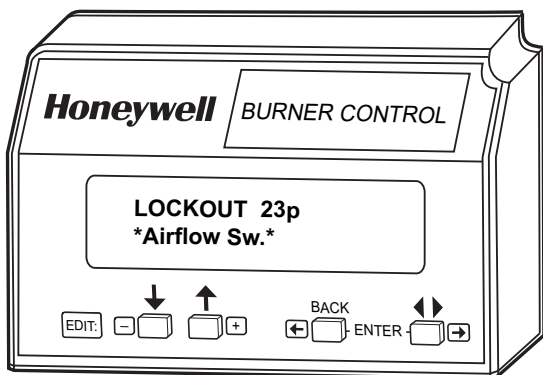

Fig. 16. Lockout message, State 1.

2. State 2 (Fig. 17). Display of the second state message lasts two seconds.
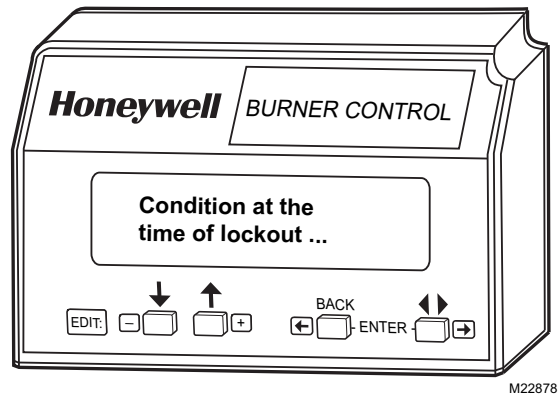

Fig. 17. Lockout message, State 2.

3. State 3 (Fig. 18). Display of the third state message lasts three seconds. It is a replica of the burner status as it existed at the time of the lockout. The second line is blank if the burner status at the time of the lockout did not include a preemptive message (in parentheses) for the second line.
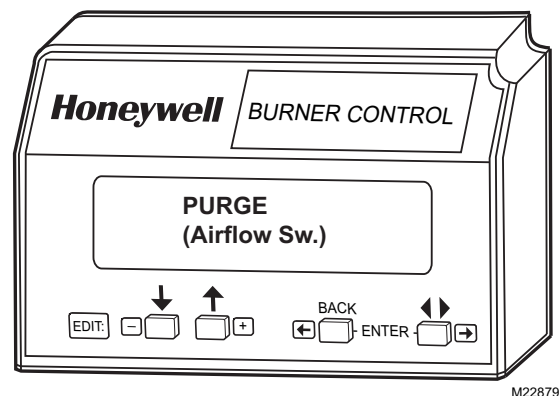

Fig. 18. Lockout message, State 3.

4. State 4: In the fourth state, both lines are blanked for one-half second, then the display sequences to the first state.

NOTE: For further explanation of Lockout Messages, Troubleshooting and Checkout, refer to form 65-0229.

Table 7. Hold and Fault Message Summary.

Fault Code	System Failure	Recommended Troubleshooting
Fault 1 *No Purge Card*	No card is plugged into the purge card slot.	**1.** Make sure the purge card is seated properly. **2.** Inspect the purge card and connector on the relay module for damage or contaminants. **3.** Reset and sequence the relay module. **4.** If the fault code reappears, replace the purge card. **5.** Reset and sequence the relay module. **6.** If the fault persists, replace the relay module.
Fault 2 *AC Frequen/Noise	Excess noise or device running on slow ac.	**1.** Check the relay module and display module connections. **2.** Reset and sequence the relay module. **3.** Check the relay module power supply and make sure that both frequency and voltage meed the specifications. **4.** Check the backup power supply, as appropriate.
Fault 3 *AC Line Dropout	Ac line dropout detected.	
Fault 4 *AC Frequency*	Device running on fast ac.	
Fault 5 *Low Line Voltage*	Low ac line detected.	
Fault 6 *Purge Card Error*	Purge card timing changed since card was initially read.	**1.** Make sure the purge card is seated properly. **2.** Inspect the purge card and connector on the relay module for damage or contaminants. **3.** Reset and sequence the relay module. **4.** If the fault code reappears, replace the purge card. **5.** Reset and sequence the relay module. **6.** If the fault persists, replace the relay module.
Fault 7 *Flame Amplifier*	Flame sensed when flame not present.	**1.** Check wiring and correct any errors. Make sure that the flame sensor wires are in separate conduits. Check for noise coupling into the flame detector leadwires. **2.** Make sure that flame detector and flame amplifier are compatible. **3.** Remove the flame amplifier and inspect connections. Reset the flame amplifier. **4.** Reset and sequence the relay module. **5.** If the code reappears, replace the amplifier. **6.** If the fault persists, replace the flame detector. **7.** If the fault persists, replace the relay module.
Fault 8 *Flame Amp/Shutr*	Flame sensed when no signal expected during shutter-check or Ampli-Check™ versions.	
Fault 9 *Flame Detected*	Flame sensed when no flame is expected during STANDBY.	**1.** Check that flame is not present in the combustion chamber; correct any errors. **2.** Check wiring and correct any errors. Make sure that flame sensor wires are in separate conduits. Check for noise coupling into flame detector leadwires. **3.** Remove the flame amplifier and inspect its connections. Reset the amplifier. **4.** Reset and sequence the relay module. **5.** If the code reappears, replace the amplifier and/or the flame detector. **6.** If the fault persists, replace the flame detector. **7.** If the fault persists, replace the relay module.
Fault 10 *Pre-Ignition ILK*	Pre-Ignition Interlock fault during STANDBY	**1.** Check wiring and correct any errors. **2.** Check Pre-Ignition Interlock switches to assure proper functioning. **3.** Check fuel valve operation. **4.** Reset and sequence the relay module; monitor the Pre-Ignition Interlock status. **5.** If the code persists, replace the relay module.

Table 7. Hold and Fault Message Summary. (Continued)

Fault Code	System Failure	Recommended Troubleshooting
Fault 11 *Running ILK On*	Running Interlock powered at improper sequence point.	1. Check wiring to make sure that interlocks are connected properly between terminals 6 and 7. Correct any errors.
Fault 12 *Lockout ILK On*	Lockout Interlock powered at improper sequence point.	2. Reset and sequence the relay module. 3. If the fault persists, measure the voltage between terminals 6 and L2(N) (ground), then terminals 7 and L2(N). If there is line supply voltage present at terminal 6 when the controller is off, the controller switch may be bad or jumpered.
Fault 13 *Airflow Sw. On*	Combustion airflow interlock fault during STANDBY.	4. If steps 1 through 3 are correct and there is line supply voltage present at terminal 7 when the controller is closed and the fault persists, check for a welded or jumpered Running Interlock, Lockout Interlock, or Airflow Switch. Correct any errors. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 14 *High Fire Sw.*	High Fire Interlock Switch failure to close during PREPURGE.	1. Check wiring and correct any errors. 2. Reset and sequence the relay module. 3. Use either the manual motor potentiometer to drive the motor to the High Fire position or use the Run/Test Switch option, if available. Sequence to Prepurge drive to High Fire and place in the Test position. Adjust the High Fire Switch while in this state to make sure that it closes properly. 4. Measure the voltage between terminal 19 and L2(N) while in the Prepurge drive to High Fire state. Line supply voltage should be present. If not, the switch adjustment is incorrect and/or the switch is defective and needs replacing. 5. Reset and sequence the relay module. If the line supply voltage was present between the High Fire Switch and terminal 19, and the fault still persists, replace the relay module.
Fault 15 *Flame Detected*	Flame sensed when no flame is expected during STANDBY.	1. Check that the flame is not present in the combustion chamber; correct any errors. 2. Make sure that the flame amplifier and flame detector are compatible. 3. Check wiring and correct any errors. 4. Remove the flame amplifier and inspect the connections. Reset the flame amplifier. 5. Reset and sequence the relay module. 6. If the code reappears, replace the amplifier and/or the flame detector. 7. If the fault persists, replace the relay module.
Fault 16 *Flame-Out Timer*	No-flame detected during Pilot Flame Establishing Period.	1. Measure the flame signal. If one exists, make sure it meets specifications. Make any necessary burner adjustments using manufacturer instructions. 2. Make sure that the flame amplifier and flame detector are compatible. 3. If the code reappears, replace the amplifier and/or the flame detector. 4. If the fault persists, replace the relay module.
Fault 17 *Main Flame Fail*	Main flame failure during RUN after flame is established an on for at least 10 seconds.	1. Inspect the main fuel valve(s) and connection(s). 2. Make sure that the fuel pressure is high enough to supply fuel to the combustion chamber. 3. Check the flame detector sighting for adequate flame signal throughout the burner firing rate.
Fault 18 *Flame Detected*	Flame sensed when the shutter is open and no flame is expected during PREPURGE.	1. Check that flame is not present in the combustion chamber. Correct any errors. 2. Make sure that the flame amplifier and flame detector are compatible. 3. Check the wiring and correct any errors. Make sure F and G wires are in individual conduits and protected from stray noise pickup. 4. Remove the flame amplifier and inspect the connectors. Reset the flame amplifier. 5. Reset and sequence the relay module. 6. If the code reappears, replace the flame amplifier and/or the flame detector. 7. If the fault persists, replace the relay module.

Table 7. Hold and Fault Message Summary. (Continued)

Fault Code	System Failure	Recommended Troubleshooting
Fault 19 *Main Flame Ign.*	Flame was lost during MFEP or the first 10 seconds of the RUN state.	1. Inspect the main fuel valve(s) and connection(s). 2. Make sure the fuel pressure is high enough to supply fuel to the combustion chamber. 3. Make sure the flame detector is positioned to obtain the required flame signal strength; reset and recycle.
Fault 20 *Low Fire Sw. Off*	Low Fire Interlock switch failure to close during PREPURGE.	1. Check wiring and correct any errors. 2. Reset and sequence the relay module. 3. Use either the manual motor potentiometer to drive the motor to the Low Fire position or use the Run/Test Switch option, if available. Sequence to Prepurge drive to Low Fire and place in the Test Position. Adjust the Low Fire Switch to make sure it closed properly. 4. Measure the voltage between terminal 18 and L2(N) while in the Prepurge drive to Low Fire state. Line supply voltage should be present. If not, the switch adjustment is incorrect and/or the switch is defective and needs replacing. 5. Reset and sequence the relay module. If line supply voltage was present between the Low Fire Switch and terminal 18, and the fault still persists, replace the relay module.
Fault 21 *Running ILK*	Running Interlock fault during PREPURGE.	1. Check wiring and correct any errors. 2. Inspect the fan; make sure there is no blockage of the air intake and that it is supplying air. 3. Make sure the Interlock Switches are working properly and that all switch contacts are free of contaminants. 4. Reset and sequence the relay module to PREPURGE (place the Run/Test Switch in the Test position, if available). Measure the voltage between terminals 7 and L2(N). Line voltage should be present. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 22 *Lockout ILK*	Lockout Interlock fault during PREPURGE.	
Fault 23 *Airflow Switch*	Combustion airflow interlock fault during PREPURGE.	
Fault 24 *Call Service*	The flame interlock (relay module) was on when it should be off.	1. Check for F leadwire routing. Make sure routing is in its conduit and isolated from noise-producing circuits.
Fault 25 *Call Service*	The flame interlock (relay module) was off when it should be on.	
Fault 26 *Man-Open Sw. Off*	The Manual Open Valve Switch was off when it should be on (Device specific).	1. Check wiring and correct any errors. 2. Make sure that the Manual Open Valve Switch is fully open. 3. Make sure that the Manual Open Valve Switch is functioning properly and that the switch contacts are free from contaminants. 4. Reset and sequence the relay module. 5. Make sure that the Manual Open Valve Switch provides an electrical path when closed. Verify that the relay module is receiving power at terminal 17. 6. If steps 1 through 5 are correct and the fault persists, replace the relay module.
Fault 27 *Start Switch On*	Start Switch was on during PREPURGE (Device specific).	1. Start Switch held on too long. 2. Check wiring; verify that Start Switch is correctly connected. 3. Make sure that the Start Switch is functioning properly and that the switch contacts are free of contaminants. 4. Reset and sequence the relay module to PREPURGE; set the Run/Test Switch to Test. Make sure there is no power at terminal 6 during PREPURGE. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 28 *Pilot Flame Fail*	Pilot flame failure.	1. Check pilot valve wiring and operation. Correct any errors. 2. Check fuel supply. 3. Check pilot pressure and repeat pilot turndown test. 4. Check ignition transformer electrode, flame detector, flame detector sighting and flame amplifier. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.

Table 7. Hold and Fault Message Summary. (Continued)

Fault Code	System Failure	Recommended Troubleshooting
Fault 29 *Lockout ILK*	Lockout Interlock fault.	1. Check wiring and correct any errors. 2. Inspect the fan; make sure that there is no blockage of the air intake and that it is supplying air. 3. Make sure that the Lockout Interlock Switches are working properly and that all switch contacts are free from contaminants. 4. Reset and sequence the relay module to PREPURGE (place the Run/Test Switch in the Test position, if available). Measure the voltage between terminals 7 and L2(N). Line voltage should be present. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 30 *Running ILK*	Running Interlock fault.	1. Inspect the Running Interlocks, including the Airflow Switch, and the connections. 2. Make sure that the Running Interlocks, including the Airflow Switch, are functioning properly and that switch contacts are free from contaminants. 3. Reset and sequence the relay module to PREPURGE. Set the Run/Test Switch, if available, to Test. Measure the voltage between terminal 7 and L2(N). Line voltage should be present. 4. If steps 1 through 3 are correct and the fault persists, replace the relay module.
Fault 31 *Low Fire Sw. Off*	Low Fire Interlock Switch failure to close during RUN (Device specific).	1. Check wiring and correct any errors. 2. Reset and sequence the relay module. 3. Use either the manual motor position to drive the motor to the Low Fire position, or use the Run/Test Switch option, if available. Sequence to Run drive to Low Fire and place the switch in the Test position. Adjust the Low Fire Switch while in this state to make sure it is closing properly. 4. While in Run, drive to Low Fire state, measure the voltage between terminal 18 and L2(N). Line voltage should be present. If not, the switch adjustment is incorrect and/or the switch is defective and needs replacement. 5. Reset and sequence the relay module. If line voltage was present between the Low Fire Switch and terminal 18, and the fault persists, replace the relay module.
Fault 32 *Airflow Switch*	Combustion Airflow Interlock fault.	1. Check wiring and correct any errors. 2. Inspect the fan; make sure there is no blockage of the air intake and it is supplying air. 3. Make sure the Airflow Interlock Switches are working properly and all switch contacts are free from contaminants. 4. Reset and sequence the relay module to PREPURGE. Place the Run/Test Switch in the Test position, if available. Measure the voltage between terminals 7 and L2(N). Line voltage should be present. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 33 *Pre-Ignition ILK*	Pre-Ignition Interlock fault.	1. Check wiring and correct any errors. 2. Inspect the Pre-Ignition Interlock switches and make sure they function properly. 3. Check fuel valve operation. Valve must close within five seconds. 4. Reset and sequence the relay module. 5. During STANDBY or PREPURGE, measure the voltage between terminal 20 and L2(N). Line voltage should be present. If not, the Pre-Ignition Interlock switches can be defective and need replacing. 6. If the fault persists, replace the relay module.
Fault 34 *Control On*	CTL input was energized at the wrong time for the relay module. This fault implies a field wiring error.	1. Check wiring and correct any errors. 2. Reset and sequence the relay module. 3. If fault persists, replace the relay module.

Table 7. Hold and Fault Message Summary. (Continued)

Fault Code	System Failure	Recommended Troubleshooting
Fault 35 *Call Service*	Safety relay was off when it should be on or the internal fuse has blown.	1. Reset and sequence the relay module. If fault repeats, replace relay module, but be sure to test for excessive loads on appropriate terminals described by fault code. 2. If fault does not repeat on next cycle, check for electrical noise being coupled into the relay module through the loads on appropriate terminals described by the fault code. 3. Possibly check for bouncing running on Lockout Interlock. 4. If fault persists, replace the relay module.
Fault 36 *Call Service*	Main valve terminal was off when it should be on, or the internal fuse has blown.	
Fault 37 *Call Service*	Pilot (ignition) valve terminal was off when it should be on, or the internal fuse has blown.	
Fault 38 *Call Service*	Ignition terminal was off when it should be on, or the internal fuse has blown.	
Fault 39 *Call Service*	V2S valve terminal (usually terminal 21) was off when it should be on, or the internal fuse has blown.	
Fault 40 *Call Service*	Safety relay was on when it should be off.	
Fault 41 *Main Valve On*	Main valve terminal was on when it should be off.	⚠ **WARNING** **Explosion Hazard.** **Can cause severe injury, death or property damage.** 1. Remove system power, turn off fuel supply. 2. Check for wiring errors that could provide power to terminals described by the fault. Correct any errors. 3. Re-power system; reset and sequence the relay module. 4. If fault persists, replace the relay module. 5. When fault is corrected, turn on fuel supply.
Fault 42 *Pilot Valve On*	Pilot (ignition) valve terminal was on when it should be off.	
Fault 43 *Ignition On*	Ignition terminal was on when it should be off.	
Fault 44 *Pilot Valve 2 On*	V2S valve terminal, used as a pilot, is on when it should be off.	
Fault 45 *Low Fire Sw. Off*	Low Fire Interlock switch failure to close or stay closed.	1. 1. Check wiring and correct any errors. 2. 2. Reset and sequence the relay module. 3. 3. Use either the manual motor position to drive the motor to the Low Fire position, or use the Run/Test Switch option, if available. Sequence to Run, drive to Low Fire and place in the Test position. Adjust the Low Fire Switch while in this state to make sure it is closing properly. 4. 4. While in Run, drive to Low Fire state, measure the voltage between terminal 18 and L2(N). Line voltage should be present. If not, the switch adjustment is incorrect and/or the switch is defective and needs replacement. 5. 5. If steps 1 through 4 are correct and the fault still persists, replace the relay module.
Fault 46 *Flame Amp Type*	Device specific.	1. Remove power to the device. 2. Reset the flame amplifier and reset and sequence the relay module.
Fault 47 *Jumpers Changed*	The configuration jumpers differ from the sample taken at startup.	1. Inspect the jumper connections. Make sure that clipped jumpers are completely removed. 2. Reset and sequence the relay module. 3. If fault persists, replace the relay module.
Fault 48 *Delayed MV On* (2nd Stage Valve)	V2S valve terminal, used as a delayed main valve, was on when it should be off.	⚠ **WARNING** **Explosion Hazard.** **Can cause severe injury, death or property damage.** 1. Remove system power, turn off fuel supply. 2. Check wiring; correct any errors. 3. Inspect the V2S Fuel Valve and its connections. Make sure the switch is working correctly and is not jumpered or welded. 4. Reset and sequence the relay module. 5. If fault persists, replace the relay module.

Table 7. Hold and Fault Message Summary. (Continued)

Fault Code	System Failure	Recommended Troubleshooting
Fault 49 *Man-Open Sw. On*	The manual open switch was on when it should be off.	⚠ **WARNING** **Explosion Hazard.** **Can cause severe injury, death or property damage.** 1. Remove system power, turn off fuel supply. 2. Check wiring; correct any errors. 3. Inspect the Manual-Open Switch and its connections. Make sure the switch is working correctly and is not jumpered or welded. 4. Reset and sequence the relay module. 5. If fault persists, replace the relay module.
Fault 50 *Jumpers Wrong*	The sequence logic detected a combination of jumpers that is illegal for the sequence, e.g., if it is correct to clip jumper JR1 or Jumper JR2, but not both, this fault would be used when both are clipped (Device specific).	1. Inspect the jumpers and refer to the installation instructions for compatible jumper configurations. 2. Make sure that clipped jumpers are completely removed. 3. Reset and sequence the relay module. 4. If fault persists, replace the relay module.
Fault 51 *Flame Too Strong*	Flame signal value is too high to be valid.	1. Make sure that flame detector and flame amplifier are compatible. 2. Remove the flame amplifier and inspect the connections. Reset the flame amplifier. 3. Reset and sequence the relay module. 4. Check the flame detector sighting position, reset and cycle. 5. Verify that no ignition noise is present in the F lead due to wire routing. 6. Measure the flame strength. Verify it meets specifications. If not, refer the flame amplifier and/or flame detector checkout procedures. 7. If the code reappears, replace the flame amplifier. 8. If the code reappears, replace the flame detector. 9. If the fault persists, replace the relay module.
Fault 52 *Call Service*	Pilot Valve 2 (terminal 21) was off when it should be on.	1. Inspect terminal 21 and connections. Make sure that the valve is operating properly. 2. Reset and sequence the relay module. 3. If the fault persists, replace the relay module.
Fault 53 *Lockout Switch*	Lockout Input fault (EC/RM7850 only).	1. Check wiring and correct any errors. 2. Inspect the Lockout Switch to make sure it is working properly. 3. Reset and sequence the relay module. During STANDBY or PREPURGE, measure the voltage between terminal 20 and L2(N). Supply voltage should be present. If not, the lockout switch is defective and needs replacing. 4. If the fault persists, replace the relay module.
Fault 54 *Comb. Pressure*	Combustion pressure switch fault (Fulton pulse only).	1. Check wiring and correct any errors. 2. Inspect the Combustion Pressure Switch to make sure it is working correctly. 3. Reset and sequence the relay module. 4. During STANDBY and PREPURGE, measure the voltage between terminal 20 and L2(N). Supply voltage should be present. If not, the Combustion Pressure Switch is defective and needs replacing. 5. If the fault persists, replace the relay module.
Fault 55 *Purge Fan Sw. On*	Purge fan switch is on when it should be off (Fulton pulse only).	1. Check wiring and correct any errors. 2. Inspect the Purge Fan Switch terminal 18 and its connections. Make sure the switch is working correctly and is not jumpered or welded. 3. Reset and sequence the relay module. 4. If the fault persists, replace the relay module.

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Table 7. Hold and Fault Message Summary. (Continued)

Fault Code	System Failure	Recommended Troubleshooting
Fault 56 *Block Intake*	Block intake fault (Fulton pulse only).	1. Check wiring and correct any errors. 2. Inspect the Block Intake Switch and make sure it is working properly. 3. Reset and sequence the relay module. 4. During PREPURGE, measure the voltage between terminal 7 and L2(N). Supply voltage should be present. If not, the Block Intake Switch is defective and needs replacing. 5. If the fault persists, replace the relay module.
Fault 57 *Purge Fan Sw. Off*	Purge Fan Switch is off when it should be on (Fulton pulse only).	1. Inspect the Prepurge Fan Switch terminal 18 and the connections. Make sure the fan is working properly. 2. Reset and sequence the relay module. 3. If the fault persists, replace the relay module.
Fault 58 - 60 *Call Service*	Unused faults.	—
Fault 61	MV1 Off (Terminal 9); should be ON.	1. Check wiring and correct any errors. 2. Reset and sequence the control. 3. If fault persists, replace relay module (Before installing the new relay module, verify current draw of terminal 9).
Fault 62	MV2 Off (Terminal 17); should be ON.	1. Check wiring and correct any errors. 2. Reset and sequence the control. 3. If fault persists, replace relay module (Before installing the new relay module, verify current draw of terminal 17).
Fault 63	MV1 ON (Terminal 9); should be OFF.	1. Check wiring and correct any errors. 2. Reset and sequence the control. 3. If fault persists, replace relay module (Before installing the new relay module, verify current draw of terminal 9).
Fault 64	MV2 ON (Terminal 17); should be OFF.	1. Check wiring and correct any errors. 2. Reset and sequence the control. 3. If fault persists, replace relay module (Before installing the new relay module, verify current draw of terminal 17).
Fault 65 *VPS Off*	Valve Proving Switch (Terminal 16) OFF; should be ON. (VPS High Test)	1. Check wiring and correct any errors. 2. Check MV2 for leaking valve seat. 3. Reset and sequence control.
Fault 66 *VPS On*	Valve Proving Switch (Terminal 16) ON; should be OFF. (VPS Low Test)	1. Check wiring and correct any errors. 2. Check MV1 for leaking valve seat. 3. Reset and sequence control.
Fault 67 *AC Phase*	L1 and L2 miswired/exchanged (EC/RM7850 only).	1. Check L1 and L2 for proper line phasing.
Fault 68 *Pre-Ignition ILK*	Pre-Ignition Interlock fault.	1. Check wiring and correct any errors. 2. Inspect the Pre-Ignition Interlock switches and make sure they work properly. 3. Check fuel valve operation. Valve must close within five seconds. 4. Reset and sequence the relay module. 5. During STANDBY or PREPURGE, measure the voltage between terminal 17 and L2(N). Supply voltage should be present. If not, the Pre-Ignition Interlock switches are defective and need replacing. 6. If the fault persists, replace the relay module.
Faults 69 - 70 *Call Service*	Unused faults.	—
Fault 71 *Dynamic LFS*	Low Fire Switch closed, High Fire Switch must be open (EC/RM 7850 only).	1. Check firing rate position switches (usually in Modutrol® Motor) for proper operation. 2. Check wiring and correct any errors. 3. Reset and sequence the relay module. 4. If the fault persists, replace the relay module.
Fault 71 *Limits Complete*	Limit Input (terminal 7) is off when it should be on (RM7888 only).	1. Check limits to make sure they are satisfied after resetting. 2. Check electrical connections to terminal 7 of wiring subbase. 3. Reset relay module. 4. If the fault persists, replace the relay module.

Table 7. Hold and Fault Message Summary. (Continued)

Fault Code	System Failure	Recommended Troubleshooting
Fault 72 *Dynamic HFS*	High Fire Switch closed; Low Fire Switch must be open (EC/RM7850 only).	1. Check firing rate position switches (usually in Modutrol® Motor) for proper operation. 2. Check wiring and correct any errors. 3. Reset and sequence the relay module. 4. If the fault persists, replace the relay module.
Fault 72 *Spec.Func.2*	Special Function 2 Input (terminal 17) is off when it should be on (Device specific).	1. Check operation of Special Function 2 of PLC. 2. Check electrical connection to terminal 17 of wiring subbase and confirm presence of supply power when Special Function 2 is activated. 3. Reset relay module. 4. If the fault persists, replace the relay module.
Fault 73 *Spec.Func.3*	Special Function 3 Input (terminal 19) is off when it should be on (Device specific).	1. Check operation of Special Function 3 of PLC. 2. Check electrical connection to terminal 19 of wiring subbase and confirm presence of supply power when Special Function 2 is activated. 3. Reset relay module. 4. If the fault persists, replace the relay module.
Fault 75 *Flame Proven Feedback*	Flame Indication Feedback (terminal 21) either on when it should be off or off when it should be on (Device specific).	1. Remove wire to terminal 21 and reset relay module. 2. If the fault persists, replace relay module. 3. Reconnect wire to terminal 21. If the fault returns, verify wiring.
Faults 76 - 87 *Accessory Fault*	—	—
Fault 88 *Accessory Fault*	T17 powered without Valve Proving feature setup.	1. Follow Valve Proving Selection Setup in Appendix B on selected Relay Module. 2. If No Valve Proving (NEVER) is required, connect controller (Demand) to terminal 6.
Fault 89 *Accessory Fault*	T6 and T17 powered at the same time.	1. Correct wiring error.
Fault 90 *Accessory Fault*	T7 opens on RM7890 with VPS Feature	1. Determine what interrupted terminal 7. 2. Correct any wiring issues. 3. Reset Relay Module.
Faults 91-93 *Accessory Fault	—	1. —
Faults 94 - 104 *Call Service*	—	—
Fault 105 *Call Service*	Relay Module self-test failure.	1. Reset and sequence the relay module. 2. If the fault reappears, remove power from the relay module and reapply the power; reset and sequence the relay module. 3. If the fault persists, replace the relay module.
Fault 106 *Call Service*	Relay Module self-test failure.	—
Fault 107 *Call Service*	Relay Module flame signal crosscheck failure.	—
Fault 108 *Call Service*	Lost E2 or device shipped unprogrammed.	1. Reset control; if fault persists, replace control. 2. If device resets and operates, verify earth grounding practices.
Fault 109 *Call Service*	Negative cycle test failed, earth ground absent or line voltage phasing improper.	1. Make sure a good earth ground connection exists at the installation site and all earth ground connections are complete and correct. 2. Make sure the relay module and all loads operate at the same line voltage phase. 3. Reset and sequence the relay module. 4. If the fault persists, replace the relay module.

7800 SERIES Fault Codes

Table 23 is a complete list of fault codes that may appear in the fault code register. The Fault String Code register will contain the corresponding String code identified in the table.

Table 23. 7800 SERIES Fault Codes.

Fault Code (Reg 40001)	Fault Message (NOTE: FAULT n: is not in the Fault and Strings Code)	Fault String Code (Table 22)
0	*Blank (no fault)*	0
1	FAULT 1: NO PURGE CARD	73
2	FAULT 2: AC FREQUENY/NOISE	8
3	FAULT 3: AC LINE DROPOUT	9
4	FAULT 4: AC FREQUENCY	7
5	FAULT 5: LOW LINE VOLTAGE	60
6	FAULT 6: PURGE CARD ERROR	88
7	FAULT 7: FLAME AMPLIFIER	34
8	FAULT 8: FLAME AMP/SHUTR	33
9	FAULT 9: FLAME DETECTED	35
10	FAULT 10: PRE-IGNITION ILK	85
11	FAULT 11: RUNNING ILK ON	100
12	FAULT 12: LOCKOUT ILK ON	53
13	FAULT 13: AIRFLOW SW. ON	12
14	FAULT 14: HIGH FIRE SWITCH	40
15	FAULT 15: FLAME DETECTED	35
16	FAULT 16: FLAME-OUT TIMER	37
17	FAULT 17: MAIN FLAME FAIL	64
18	FAULT 18: FLAME DETECTED	35
19	FAULT 19: MAIN FLAME IGN.	65
20	FAULT 20: LOW FIRE SW OFF	57
21	FAULT 21: RUNNING ILK	99
22	FAULT 22: LOCKOUT ILK	54
23	FAULT 23: AIRFLOW SWITCH	13
24	FAULT 24: CALL SERVICE	24
25	FAULT 25: CALL SERVICE	24
26	FAULT 26: MAN-OPEN SW. OFF	70
27	FAULT 27: START SWITCH ON	107
28	FAULT 28: PILOT FLAME FAIL	76
29	FAULT 29: LOCKOUT ILK	54
30	FAULT 30: RUNNING ILK	101
31	FAULT 31: LOW FIRE SW OFF	57
32	FAULT 32: AIRFLOW SWITCH	13
33	FAULT 33: PRE-IGNITION ILK	85
34	FAULT 34: CONTROL ON	27
35	FAULT 35: CALL SERVICE	24
36	FAULT 36: CALL SERVICE	24
37	FAULT 37: CALL SERVICE	24
38	FAULT 38: CALL SERVICE	24
39	FAULT 39: CALL SERVICE	24
40	FAULT 40: CALL SERVICE	24

Table 23. 7800 SERIES Fault Codes. (Continued)

Fault Code (Reg 40001)	Fault Message (NOTE: FAULT n: is not in the Fault and Strings Code)	Fault String Code (Table 22)
41	FAULT 41: MAIN VALVE ON	69
42	FAULT 42: PILOT VALVE 1 ON	80
43	FAULT 43: IGNITION ON	47
44	FAULT 44: PILOT VALVE 2 ON	81
45	FAULT 45: LOW FIRE SW OFF	57
46	FAULT 46: FLAME AMP TYPE	32
47	FAULT 47: JUMPERS CHANGED	50
48	FAULT 48: DELAYED MV ON	28
49	FAULT 49: MAN-OPEN SW. ON	71
50	FAULT 50: JUMPERS WRONG	51
51	FAULT 51: FLAME TOO STRONG	36
52	FAULT 52: CALL SERVICE	24
53	FAULT 53: LOCKOUT SWITCH	55
54	FAULT 54: COMB. PRESSURE	26
55	FAULT 55: PURGE FAN SW ON	91
56	FAULT 56: BLOCK INTAKE	20
57	FAULT 57: PURGE FAN SW OFF	90
58	FAULT 58: COMB. PRESS/FLAME	26
59	FAULT 59: CALL SERVICE	24
60	FAULT 60: CALL SERVICE	24
61	FAULT 61: MV1 OFF	218
62	FAULT 62: MV2 OFF	219
63	FAULT 63: MV1 ON	220
64	FAULT 64: MV2 ON	221
65	FAULT 65: VPS OFF	222
66	FAULT 66: VPS ON	223
67	FAULT 67: AC PHASE	10
68	FAULT 68: PRE-IGNITION ILK	85
69	FAULT 69: CALL SERVICE	24
70	FAULT 70: CALL SERVICE	24
71-75	FAULT 71-75: DEVICE SPECIFIC	29
76-93	FAULT 76-93: ACCESSORY FAULT	11
94-127	FAULT 94-127: CALL SERVICE	24
128	FAULT 128: POOR FLAME SENSOR	82
129–141	FAULT 129-141: CALL SERVICE	24
142	FAULT 68z: OTHER PREIGN ILK[EA]	75
143	FAULT 68y: VALVE CLOSURE[EA]	109
144	FAULT 33z: OTHER PREIGN ILK[EA]	75
145	FAULT 33y: VALVE CLOSURE[EA]	109
146	FAULT 32s: OTHER INTERLOCKS[EA]	74
147	FAULT 32r: AUX INTERLOCK #5[EA]	16
148	FAULT 32q: AUX INTERLOCK #4[EA]	15
149	FAULT 32p: AIRFLOW SWITCH[EA]	13

Table 23. 7800 SERIES Fault Codes. (Continued)

Fault Code (Reg 40001)	Fault Message (NOTE: FAULT n: is not in the Fault and Strings Code)	Fault String Code (Table 22)
150	FAULT 32o: LOW GAS PRESSURE[EA]	59
151	FAULT 32n: HIGH GAS PRESSURE[EA]	41
152	FAULT 32m: ATOMIZING SW[EA]	14
153	FAULT 32k: LOW OIL TEMP[EA]	62
154	FAULT 32j: HIGH OIL TEMP[EA]	44
155	FAULT 32i: LOW OIL PRESSURE[EA]	61
156	FAULT 32h: HIGH OIL PRESSURE[EA]	43
157	FAULT 32g: BOTH FUELS SELECT[EA]	21
158	FAULT 32f: FUEL SELECT OFF[EA]	38
159	FAULT 32e: AUX LIMIT #3[EA]	19
160	FAULT 32d: HIGH LIMIT[EA]	42
161	FAULT 32c: LWCO[EA]	63
162	FAULT 32b: AUX LIMIT #2[EA]	18
163	FAULT 32a: AUX LIMIT #1[EA]	17
164	FAULT 30s: OTHER INTERLOCKS[EA]	74
165	FAULT 30r: AUX INTERLOCK #5[EA]	16
166	FAULT 30q: AUX INTERLOCK #4[EA]	15
167	FAULT 30p: AIRFLOW SWITCH[EA]	13
168	FAULT 30o: LOW GAS PRESSURE[EA]	59
169	FAULT 30n: HIGH GAS PRESSURE[EA]	41
170	FAULT 30m: ATOMIZING SW[EA]	14
171	FAULT 30k: LOW OIL TEMP[EA]	62
172	FAULT 30j: HIGH OIL TEMP[EA]	44
173	FAULT 30i: LOW OIL PRESSURE[EA]	61
174	FAULT 30h: HIGH OIL PRESSURE[EA]	43
175	FAULT 30g: BOTH FUELS SELECT[EA]	21
176	FAULT 30f: FUEL SELECT OFF[EA]	38
177	FAULT 30e: AUX LIMIT #3[EA]	19
178	FAULT 30d: HIGH LIMIT[EA]	42
179	FAULT 30c: LWCO[EA]	63
180	FAULT 30b: AUX LIMIT #2[EA]	18
181	FAULT 30a: AUX LIMIT #1[EA]	17
182	FAULT 29s: OTHER INTERLOCKS[EA]	74
183	FAULT 29r: AUX INTERLOCK #5[EA]	16
184	FAULT 29q: AUX INTERLOCK #4[EA]	15
185	FAULT 29p: AIRFLOW SWITCH[EA]	13
186	FAULT 29o: LOW GAS PRESSURE[EA]	59
187	FAULT 29n: HIGH GAS PRESSURE[EA]	41

Table 23. 7800 SERIES Fault Codes. (Continued)

Fault Code (Reg 40001)	Fault Message (NOTE: FAULT n: is not in the Fault and Strings Code)	Fault String Code (Table 22)
188	FAULT 29m: ATOMIZING SW[EA]	14
189	FAULT 29k: LOW OIL TEMP[EA]	62
190	FAULT 29j: HIGH OIL TEMP[EA]	44
191	FAULT 29i LOW OIL PRESSURE[EA]	61
192	FAULT 29h: HIGH OIL PRESSURE[EA]	43
193	FAULT 29g: BOTH FUELS SELECT[EA]	21
194	FAULT 29f: FUEL SELECT OFF[EA]	38
195	FAULT 29e: AUX LIMIT #3[EA]	19
196	FAULT 29d: HIGH LIMIT[EA]	42
197	FAULT 29c: LWCO[EA]	63
198	FAULT 29b: AUX LIMIT #2[EA]	18
199	FAULT 29a: AUX LIMIT #1[EA]	17
200	FAULT 23s: OTHER INTERLOCKS[EA]	74
201	FAULT 23r: AUX INTERLOCK #5[EA]	16
202	FAULT 23q: AUX INTERLOCK #4[EA]	15
203	FAULT 23p: AIRFLOW SWITCH[EA]	13
204	FAULT 23o: LOW GAS PRESSURE[EA]	59
205	FAULT 23n: HIGH GAS PRESSURE[EA]	41
206	FAULT 23m: ATOMIZING SW[EA]	14
207	FAULT 23k: LOW OIL TEMP[EA]	62
208	FAULT 23j: HIGH OIL TEMP[EA]	44
209	FAULT 23i LOW OIL PRESSURE[EA]	61
210	FAULT 23h: HIGH OIL PRESSURE[EA]	43
211	FAULT 23g: BOTH FUELS SELECT[EA]	21
212	FAULT 23f: FUEL SELECT OFF[EA]	38
213	FAULT 23e: AUX LIMIT #3[EA]	19
214	FAULT 23d: HIGH LIMIT[EA]	42
215	FAULT 23c: LWCO[EA]	63
216	FAULT 23b: AUX LIMIT #2[EA]	18
217	FAULT 23a: AUX LIMIT #1[EA]	17
218	FAULT 22s: OTHER INTERLOCKS[EA]	74
219	FAULT 22r: AUX INTERLOCK #5[EA]	16
220	FAULT 22q: AUX INTERLOCK #4[EA]	15
221	FAULT 22p: AIRFLOW SWITCH[EA]	13
222	FAULT 22o: LOW GAS PRESSURE[EA]	59
223	FAULT 22n: HIGH GAS PRESSURE[EA]	41
224	FAULT 22m: ATOMIZING SW[EA]	14
225	FAULT 22k: LOW OIL TEMP[EA]	62