FACTORY MUTUAL
CODE REQUIREMENTS APPLICABLE TO PARKER BOILERS

I. FACTORY MUTUAL:

A. Factory Mutual (FM) is composed of a group of associated Factory Mutual fire insurance companies. These companies specialize in protection for manufacturing plants and other large properties against fire, explosion, wind damage, and other types of losses, including loss of use and occupancy. They also set certain standards for members and policyholders pertaining to boilers and boiler safety controls.

B. FM Trim is not normally required on gas fired boilers 50 H.P. (2,500 MBH) and smaller, nor on oil fired boilers 66 H.P. (2,800 MBH) and smaller. FM will normally accept these smaller boilers with their standard trim and controls, if they are Listed by a nationally recognized testing laboratory. However, if a boiler is critical to a process, there is not a backup, and there is a risk of a business interruption: they may specially require the full FM Trim.

C. FM will accept or not accept each plant or job on its own merits. FM requires an "Installer's Application for Acceptance" form for each installation in addition to a wiring diagram and a fuel line piping diagram for the Boiler before approval. The final approval is based on a field inspection by a local Factory Mutual Inspector.
FM requires that the boiler be equipped with controls, which have been approved by their laboratory and are listed in the FM Approval Guide. FM Loss Prevention Data Sheet 6-4 sets forth certain standards for oil or gas fired Boilers and furnaces. These recommendations would apply to Parker Steam and Hot Water Boilers.

II. CONTROLS:

The controls listed below are required on Parker Steam and Hot Water Boilers to comply with FM requirements. FM will accept Boilers with IRI Trim even though some items they do not require are included. Since standards are often revised and new interpretations made, it is always advisable to consult the local FM office for approval before ordering the Boiler to be certain the controls listed below meet current standards.

1. FLAME SAFEGUARD SYSTEM:

A. **Atmospheric gas burners up to 5,000M BTU Input.** Fireye M or Honeywell RM Series Electronic Flame Safeguard and Electric Pilot Safety Shutoff Valve provide non-recycling, electronic flame supervision with electric ignition, 10 second trial for ignition and intermittent pilot. Boilers between 2,500 and 5,000 M BTU Input that are equipped with modulating or two stage firing are furnished with interrupted pilots.

B. **Atmospheric gas burners above 5,000M BTU Input.** Same as A., above, except all boilers have an interrupted pilot.

C. **All Power Burners, Oil, Gas and Gas/Oil Fired.** Fireye M or Honeywell RM Series up to 2,500 MBTU input (20 GPH Oil) and Fireye E Series Electronic Flame Safeguard on larger sizes provide non-recycling electronic flame supervision. This system features Ultraviolet or Infrared flame detection, electric ignition, prepurge, and 10-second trial for ignition. Burners for two stage or modulating firing include a high fire air interlock and interlocked low fire light off. Gas and Gas/Oil Fired have gas pilots with electric pilot valves. NOTE: A gas pilot may be required even on straight oil fired boilers (Consult local FM office for requirements).

2. SAFETY LOCKOUT (FLAME FAILURE) ALARM LIGHT:

This alarm light is furnished to indicate safety lockout.

3. AUTOMATIC SAFETY SHUT-OFF FUEL VALVES:

A. **Gas Fired Up To 2,500 MBTU Input:** An approved motorized safety shutoff gas valve must be installed on all burners. The standard second electric gas valve is recommended to remain on the burner.

B. **Gas Fired Between 2,500 - 5,000 MBTU Input:** Two approved safety shutoff valves with position indicators (one acceptable with proof of closure switch).

C. **Gas Fired Above 5,000 MBTU Input:** Two approved safety shutoff valves with position indicators, one of which must have proof of closure switch.

D. **Oil Fired:** An approved safety shutoff electric oil valve must be installed on all Boilers. A secondary oil valve is provided.

4. GAS COCKS:

One is required to be installed upstream of all controls and a second gas cock is required to be installed downstream of the motorized electric gas valve to facilitate leakage testing of the valves.

5. LOW WATER CUT-OFF:

One is required to be factory installed and wired to immediately open a circuit to the fuel valves when a low water condition exists. The low water cut-off is manual reset.

6. MANUAL RESET HIGH LIMIT AND OPERATING CONTROL:

These controls provide shutdown when the pressure or temperature reaches the set point. The high limit is for the excess pressure or temperature and shuts the boiler down only if the operating control fails to function.

7. GAS PRESSURE REGULATORS:

Main and pilot line gas pressure regulators are required on all Boilers.

8-9. FUEL PRESSURE SWITCHES:

A. **Gas Fired:** High and low gas pressure switches are required on all burners to provide gas pressure supervision. They are interlocked to accomplish non-recycling safety shutdown in the event of either high or low fuel gas pressures.

B. **Oil Fired:** A low oil pressure switch is required on all burners. It is interlocked to accomplish non-recycling safety shutdown in the event of low fuel oil pressure.

10. PARKER-LITE SEQUENCE INDICATOR SYSTEM:

Recommended by the Boiler Manufacturer to provide a visual indication of the state of the operation of the burner. Lights may be provided for:

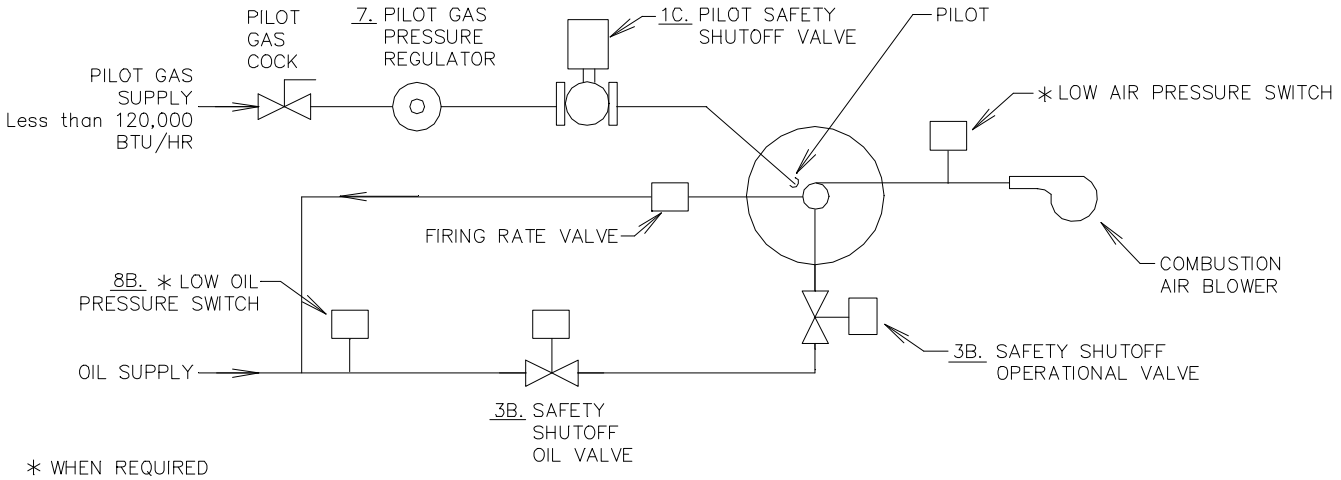
A. **Atmospheric Gas:** Control Power On, Level Safe, Limit Safe, Pilot On and Burner On.

B. **Power Burners:** Control Power On, Level Safe, Limit Safe, Call for Heat, Pilot On, Main Fuel and Flame Failure.

FACTORY MUTUAL (F.M.) FUEL TRAIN SCHEMATICS

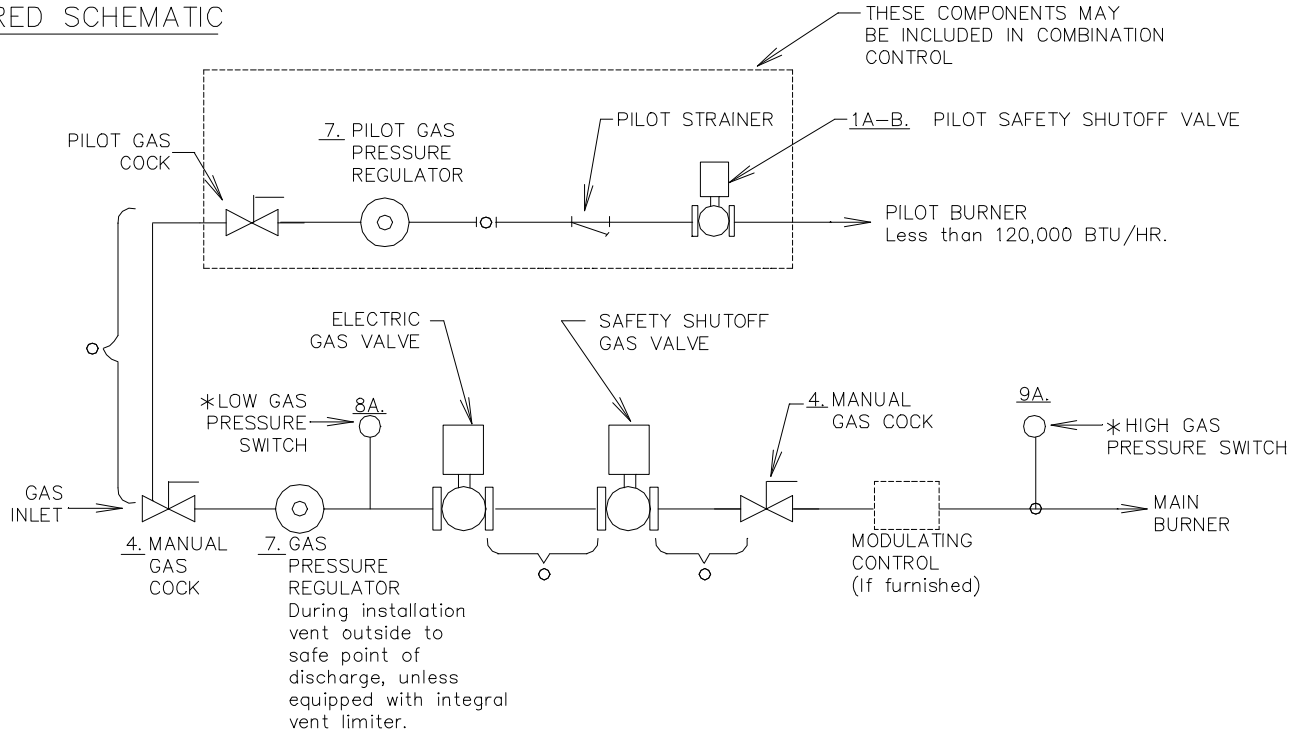
OIL FIRED SCHEMATIC

Note: Gas/Oil Burners are standard with gas pilots for both fuels. Straight Oil–Fired are standard with direct spark ignition unless gas pilot is specified. Consult local FM office for requirement.



∗ WHEN REQUIRED

GAS FIRED SCHEMATIC



O PLUGGED PRESSURE TAP FOR LEAKAGE TESTING & GAS PRESSURE READINGS

∗ WHEN REQUIRED

CAT\FM.DWG

USED ON	PARKER STEAM & HOT WATER BOILERS	PART NAME	FUEL LINE PIPING
	GAS & OIL FUEL TRAIN SCHEMATICS FOR F.M. SPECIFICATIONS		
BY RPC	DATE 8C	PARKER BOILER CO.	SCALE NONE
CH. MB		5930 BANDINI BLVD.	SUPERCEDES NO. 5A
APPROVED		LOS ANGELES, CALIF. 90040	DWG. NO. 101–210 F.M.