

GP 15-01-01	Instrumentation for Fired Heaters	April 2005
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Instrumentation for Fired Heaters

GP 15-01-01

Scope

- 1) [I] This Global Practice (GP) covers instrumentation and protection systems for single, dual, and multi-fuel fired heaters. Specific heater arrangement, design, and operating conditions require Owner's Engineer to select alternatives and provide further definition of requirements.
 - 2) [I] An asterisk (*) indicates that either a decision by the Owner's Engineer or Purchaser is required, that additional information is to be furnished by the Owner's Engineer, or that information for the Owner's Engineer's approval is to be supplied by Vendor or Purchaser.
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1. Required References

[I] This Section lists Practices and Standards that are generically referenced and assumed to be a part of this document. Unless otherwise specified herein, use the latest edition.

1.1. Global Practices–ExxonMobil Engineering Practices

GP 01-01-01	Drawings, Diagrams, and Line Lists
GP 03-04-01	Piping for Fired Equipment
GP 03-06-01	Piping for Instruments
GP 03-06-02	Piping at Control and Protective System Valve Stations
GP 03-12-01	Valve Selection
GP 07-01-01	Fired Heaters
GP 15-02-01	Temperature Instruments
GP 15-03-01	Pressure Instruments
GP 15-04-01	Flow Instruments
GP 15-07-02	Protective Systems
GP 15-07-03	Alarm Systems
GP 15-09-01	Control Valves

1.2. API–American Petroleum Institute

API RP 551	Process Measurement Instrumentation
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2. Additional Requirements

* [I] The following Practice shall be used with this GP as specified by Purchaser.

2.1. Global Practices–ExxonMobil Engineering Practices

GP 16-02-01	Power System Design
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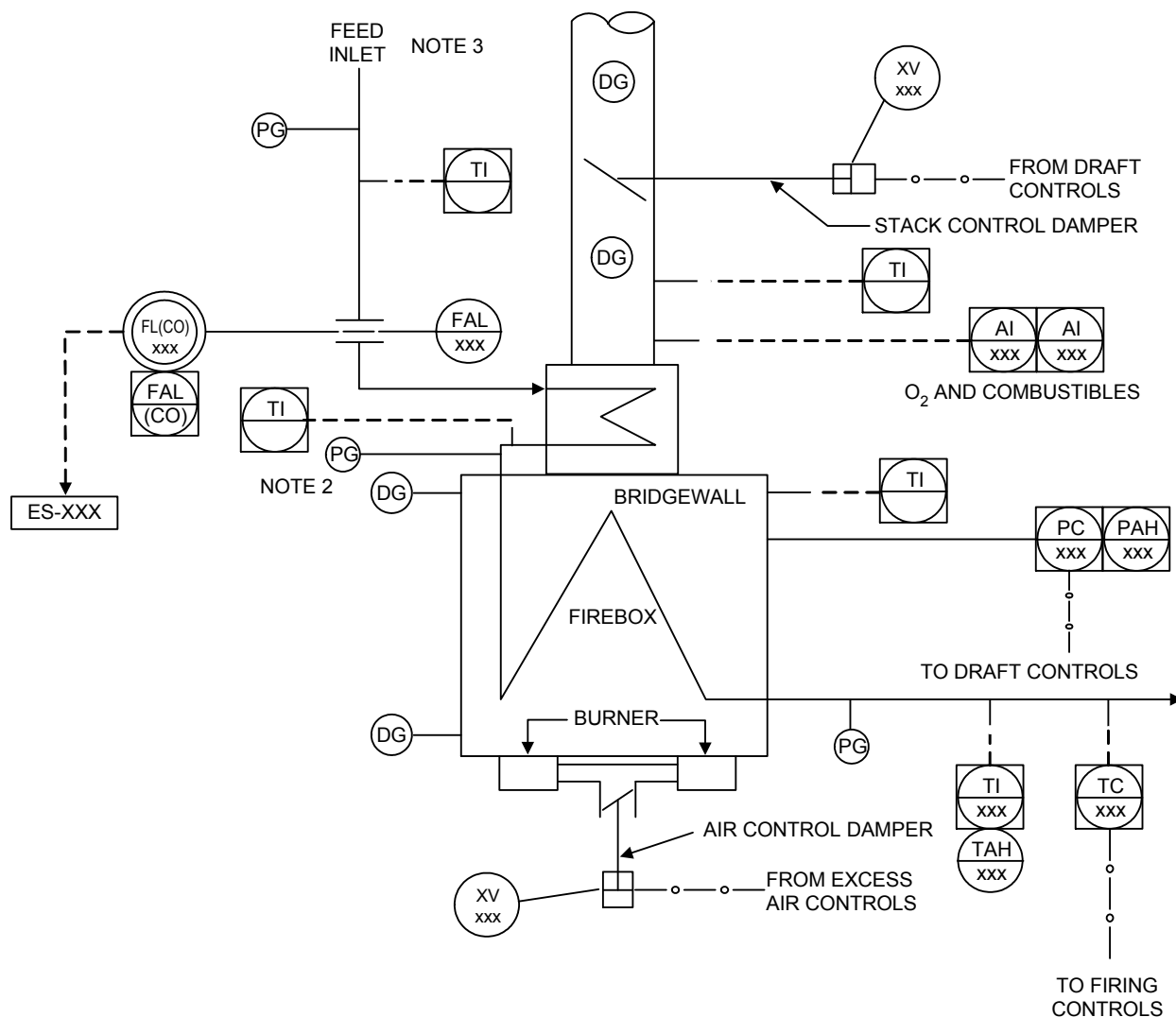
3. Definitions

Term	[I] Description
Reliable Pilot Gas Source	A source that supplies pilot gas to the fired heater battery limit and meets all of the following conditions: a) Separate from the main fuel gas supply such that both supplies will not be simultaneously interrupted by a single contingency such as power or instrument air failure or inadvertent valve closing. b) Available during startup. c) Liquefied petroleum gas vaporizers are not considered a reliable source.
Fail-Action (Fail-Safe) Design	Failure or loss of energy or loss of circuit continuity to any protective system component causes the protective system to take a predetermined corrective action and move the process to its safe state. A circuit that is energized and uses closed contacts during normal operation is fail-action.
Control Damper	A damper used to regulate flue gas or combustion air flow or firebox draft.

4. General Requirements

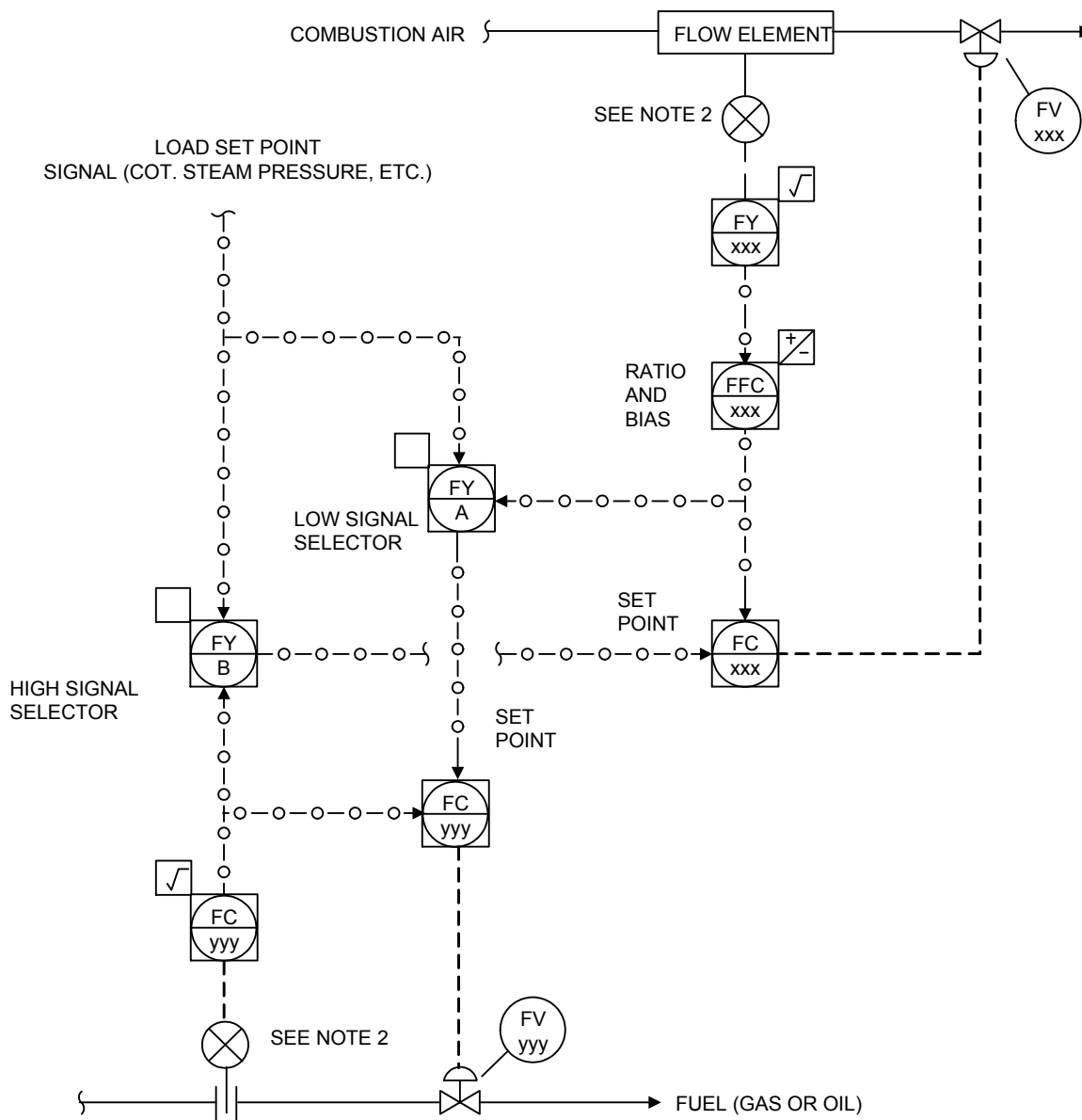
- 1) * [O] All natural draft fired heaters shall, as a minimum, have the instrumentation and controls shown in Figure 1, unless specified otherwise.
- 2) * [S], [E] Control systems for the regulation of fuel, air, or both, shall maintain a safe air-fuel mixture under all conditions. Cross limiting air-fuel ratio control shall be provided for fired heaters with forced draft fans in accordance with the minimum requirements as shown in Figure 2. The design of airflow measurement devices shall be approved by the Owner's Engineer.

Figure 1: General Instrumentation and Controls for Natural Draft Fired Heaters



NOTES:

- (1) Refer to **GP 01-01-01** for explanation of symbology.
- (2) Pressure gauge (PG) required only if in vaporizing service.
- (3) Instrumentation shown except for combustion air control is also applicable for forced draft heaters. Refer to **Figure 5** for other forced draft heater requirements.

Figure 2: Minimum Requirements for Air–Fuel Crosslimiting Control**NOTES:**

- (1) Refer to **GP 01-01-01** for explanation of symbology.
- (2) Where high fired heater reliability is a requirement, use dual transmitters for the combustion controls.

5. Flue Gas Instrumentation

- 1) [O] A draft gauge or draft transmitter shall be provided at the following locations.
 - a) The bridgwall

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