



APPLICATION DATA

AD353-102

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PAC 353™ COMBUSTION MANAGEMENT SOLUTIONS PARALLEL POSITIONING CONTROL

INTRODUCTION

This paper is one in a series that discusses Moore Products Co.'s Combustion Management Solutions. This installment discusses Parallel Positioning Control.

BACKGROUND

The primary function of combustion control is to deliver air and fuel to the burner at a rate that satisfies the firing rate demand and results in a mixture (air/fuel ratio) that provides safe, efficient combustion. Insufficient air flow wastes fuel due to incomplete combustion and the overly rich mixture can be ignited explosively by hot spots in the furnace. Too much air flow wastes fuel by carrying excess heat up the stack. Combustion controls are designed to achieve the optimum air/fuel ratio while guarding against the hazard caused by insufficient air damper.

The parallel positioning control system uses a similar strategy as single point positioning (see AD353-101) for combustion control. However, parallel positioning refers to two outputs used in parallel to control the fuel valve and the air damper.

MEASUREMENT

In a parallel positioning control strategy only one measurement is used. This is either the steam header pressure or the hot water outlet temperature, depending upon the type of boiler. Both the fuel control valve and the air control valve are positioned based on this signal.

Steam Header Pressure

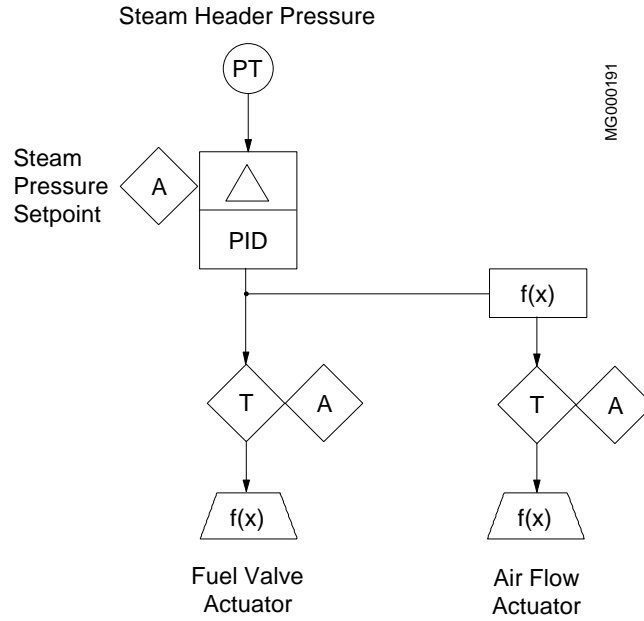
The steam header pressure measurement can be made using a gauge pressure transmitter. Select a transmitter with significant over-pressure protection to avoid damage from pressure spikes.

Hot Water Outlet Temperature

Temperature measurement can be made using either a thermocouple or resistance temperature detector and a smart transmitter. Select a transmitter that has a universal input and can accept many different types of T/Cs and RTDs.

CONTROL

Parallel positioning control is commonly used on package boilers. The process input is typically the steam header pressure or the hot water outlet temperature in the case of a hot water boiler. The following figure shows the parallel positioning control scheme. The two controller outputs go to the fuel valve and the air damper. The jackshaft used in single-point positioning is replaced by a characterizer within the PAC 353 controller.



Parallel Positioning Control

The table below lists typical instruments for a parallel positioning control system. This list is a guide. Consult your Moore representative for more information.

Instrumentation List

ITEM	MODEL
Steam Header Pressure Transmitter	340GGBHAAB5N113
Controller	353A2FNNNNNNNA4
Water Temperature Transmitter	344BN5N11G

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