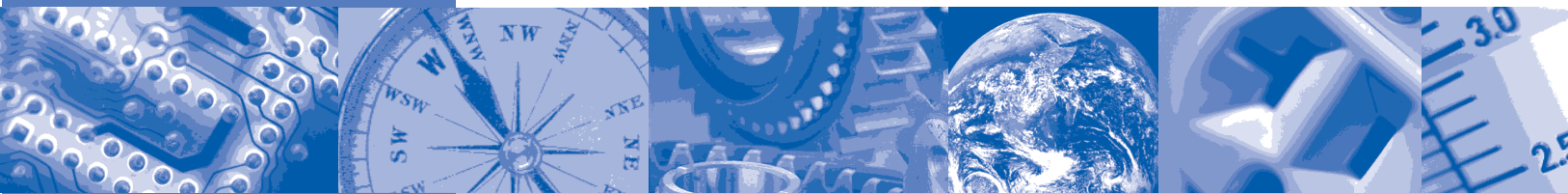


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Fossil Fuel Power Plant Steam Temperature Control System — Drum Type



**ISA—The Instrumentation,
Systems, and
Automation Society**

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Fossil Fuel Power Plant Steam Temperature Control System — Drum Type

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ISA
67 Alexander Drive
P. O. Box 12277
Research Triangle Park, North Carolina 27709

Preface

This preface, as well as all footnotes and annexes, is included for information purposes and is not part of ANSI/ISA-77.44.01-2000.

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Functional drawings in annex C are provided using ANSI/ISA-5.1-1984 (R1992) symbology and established power industry conventions.

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This standard is part of a series of standards resulting from the efforts of ISA Subcommittee SP77.40, Boiler Controls. It should be used in conjunction with the other SP77 series of standards for safe, reliable, and efficient design, construction, operation, and maintenance of fossil-fired power plants. It is not intended that this standard establish any procedures or practices that are contrary to any other standard in the series.

A variety of steam temperature control systems have been developed and used over the years to maintain steam temperature within limits and at the required setpoint. This standard is intended to establish minimum requirements for steam temperature control.

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NAME

COMPANY

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D. Bishop	Consultant
P. Brett	Honeywell, Inc.
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1 Scope

The scope of this standard addresses the major steam temperature control subsystems in boilers with steaming capacities of 200,000 lb/hr (25 kg/s) or greater. These subsystems include, but are not limited to, superheat temperature control and reheat temperature control. Specifically excluded from consideration are turbine bypass control, motor control logic, combustion control, sootblower control, and controls associated with fluidized bed- and stoker-fired furnace combustion units.

2 Purpose

The purpose of this standard is to establish the minimum requirements for the functional design specification of steam temperature control systems for drum-type fossil fuel power plant boilers.

3 Definitions

The following definitions are provided to clarify their use in this standard and may not be relevant to the user of the words in other texts. For other definitions, please refer to ANSI/ISA-51.1-1979 (R1993), "Process Instrumentation Terminology."

3.1 attemperator:

a mechanical device used for maintaining and controlling the temperature of superheated steam.

3.2 attemperator (direct contact type):

a mechanical device in which the steam and the cooling medium (water) are mixed.

3.3 boiler:

the entire vessel in which steam or other vapor is generated for use external to the vessel. This includes the furnace, consisting of waterwall tubes; the firebox area, including burners and dampers; the convection area, consisting of any superheater, reheater, economizer sections or any combination thereof, as well as drums and headers.

3.4 cascade control system:

a control system in which the output of one controller (the outer loop) is the setpoint for another controller (the inner loop). The outer loop is normally a slow responding process as compared to the inner loop.

3.5 control:

maintaining a desired setpoint of steam temperature during operation.

3.6 control loop:

a combination of field devices and control functions arranged so that a control variable is compared to a setpoint and returns to the process in the form of a manipulated variable.

3.7 controller:

a manual or automatic device or system of devices used to regulate the boiler steam temperatures within defined parameters as set forth by a turbine/boiler manufacturer.

3.8 desuperheater:

see 3.2 attemperator (direct contact type).

3.9 deviation:

the difference between the loop setpoint and the process variable.

3.10 error:

see 3.9 deviation.