

Guide to

Selection and use of thermostatic radiator valves

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- Association of Manufacturers of Domestic Unvented Supply Systems Equipment (MODUSSE)
- BEAMA Ltd. [Association of Control Manufacturers (TACMA)]
- British Gas plc
- British Plumbing Fittings Manufacturers' Association
- British Valve and Actuator Manufacturers' Association
- Building Services Research and Information Association
- Department of the Environment (Property Services Agency)
- Hevac Association
- Institute of Domestic Heating Engineers
- Institute of Refrigeration
- Institution of Gas Engineers
- Society of British Gas Industries

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Foreword

This guide has been prepared under the direction of the Refrigeration, Heating and Air Conditioning Standards Policy Committee to provide guidance to the user and installer of heating systems on thermostatic radiator valves.

These temperature sensing valves are installed in place of manually operated radiator valves, enabling individual rooms to be controlled at different temperatures. Additionally thermostatic radiator valves (TRV) automatically compensate for heat gains from other sources, such as cooking, open fires, solar gain, additional occupancy, etc. Each TRV has its own temperature sensing actuator, which enables the valve to admit more or less hot water to the radiator as the room temperature falls or rises, thereby maintaining comfort conditions and economizing on fuel. Since TRVs are entirely automatic, no manual adjustment is needed once the desired temperatures have been set. To obtain these benefits it is important that the guidelines given in this standard are adhered to.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1 Scope

This British Standard gives guidance on the selection, application and use of thermostatic radiator valves (TRV) manufactured in accordance with BS EN 215-1 for use in domestic and commercial wet central heating systems up to a water temperature of 120 °C.

This standard covers two areas of TRV use, these are domestic installation and commercial installation.

It is assumed that the installations to which the TRV is to be added are installed in accordance with BS 5449, for domestic heating systems and in accordance with BS 6880 and CIBSE Commissioning Code Series W "Water distribution systems" for commercial installations.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions and symbols

2.1 Definitions

For the purposes of this British Standard the following definitions apply.

2.1.1

two degree deviation

the temperature change in kelvins which, from the closed position, results in 60 % of maximum flow rate through the TRV

NOTE 1 A TRV generally moves from a closed to a fully open position for a temperature change of 6 K. This magnitude of temperature change would obviously be unsuitable for controlling space temperature. For this reason a smaller deviation is normally chosen, typically 2 K.

NOTE 2 It can be seen from the graph in Figure 1 that more than 60 % of the maximum flow through the valve occurs with a temperature change of 2 K from the closed position. This valve characteristic has been found to give the optimum control.

2.1.2

maximum K_v (K_{vs})

a means of identifying the maximum capacity of a TRV in the fully open position, in terms of flow (m^3/h) at a differential pressure of 1 bar¹⁾

NOTE This enables the capacity of one valve to be compared with another. This position is normally reached for a temperature change of 6 K.

2.1.3

differential pressure (Δp)

the difference in pressure between the valve inlet and the valve outlet

2.1.4

static pressure

the pressure existing in a central heating system when no water is flowing

2.1.5

maximum working pressure

the sum of the static and the differential pressures

2.1.6

valve authority (N)

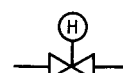
the ratio between the pressure loss across the valve when in the two degree position and the total pressure loss in the circuit

NOTE The ratio is used to determine the suitability of a valve for a particular purpose. Typical ratios for TRVs lie between 0.3 and 0.5.

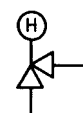
2.2 Symbols

For the purposes of this British Standard the following symbols apply:

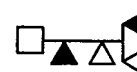
a) two-port thermostatic radiator valve (straight pattern)



b) two-port thermostatic radiator valve (angle pattern)



c) four-port thermostatic radiator valve



d) isolation valve



e) lockshield regulating valve (angle pattern)



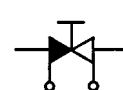
f) lockshield regulating valve (straight pattern)



g) double regulation valve (regulation and isolation with adjustable regulation stop)



h) isolation valve with calibrated orifice and pressure tappings for flow measurements



i) two-port motorized valve



j) circulation pump



¹⁾ 1 bar = 10^5 N/m^2 = 100 kPa.

k) radiator



l) direction of flow

