

Specification for

Chart ranges for temperature recording instruments

Co-operating organizations

The Instrument Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:—

Admiralty	Engineering Equipment Users Association*
Association of Scientific Workers	Gauge and Tool Makers Association
British Ceramic Research Association	Incorporated Association of Kinematograph
British Clock and Watch Manufacturers Association	Manufacturers Limited
British Electrical and Allied Industries Research Association	Institute of Physics
British Electrical and Allied Manufacturers Association*	Institution of Chemical Engineers
British Electricity Authority and Area Boards*	Institution of Electrical Engineers*
British Industrial Measuring and Control Apparatus Manufacturers Association*	Institution of Heating and Ventilating Engineers
British Iron and Steel Federation*	Institution of Mechanical Engineers*
British Nautical Instrument Trade Association	Iron and Steel Institute
British Non-Ferrous Metals Federation	Meteorological Office
British Photographic Manufacturers Association Limited	Ministry of Education
British Railways, The Railway Executive	Ministry of Health
British Scientific Instrument Research Association*	Ministry of Housing and Local Government
Council of British Manufacturers of Petroleum Equipment	Ministry of Supply*
	National Coal Board
	National Physical Laboratory*
	Oil Companies Materials Committee*
	Radio Industry Council
	Scientific Instrument Manufacturers Association*
	Society of Instrument Technology
	Water-Tube Boilermakers Association

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committees entrusted with the preparation of this standard:—

British Coal Utilization Research Association	Institute of Metals
Gas Council	Physical Society
	Society of Chemical Industry

This British Standard, having been approved by the Instrument Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 16 April 1952

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Foreword

This British Standard, which has been prepared under the aegis of the Instrument Industry Standards Committee, makes recommendations for the temperature ranges of charts used in recording instruments actuated by:

- Gas expansion
- Mercury-in-steel
- Platinum/rhodium v platinum thermocouple
- Resistance thermometer
- Radiation pyrometer

As the preferred ranges have been compiled from data supplied by many instrument manufacturers their calculation has been achieved by grouping and consolidating the ranges favoured by individual users. Where minor differences in starting point and range were encountered during compilation they were embodied, wherever possible, in one range containing their maximum and minimum temperatures.

It will be readily appreciated that there are in use many preferred ranges which are peculiar to a particular industry or process; these have been included in the ranges specified in this standard. In most cases these special ranges have developed from the need to provide openness of scale at important temperatures and their use requires some special arrangement of the measuring system in order to provide the necessary sensitivity.

Although these chart ranges embrace the whole of the useful temperature scale it is appreciated that not every instrument manufacturer will be in a position to adopt them in their entirety, especially since some of them are for use in conjunction with particular types of measuring systems. Further, the use of the whole of such a comprehensive selection of ranges is unnecessary when instruments are manufactured for a particular section of industry.

The ranges for base metal thermocouples are not classified according to their various types, viz., copper v constantan,¹⁾ iron v constantan, and nickel/chromium v nickel/aluminium (chromel v alumel and T₁ alloy v T₂ alloy types)²⁾ as most ranges have been used up to the individual maximum working temperatures. Due to the different characteristics of the temperature/thermo-electric relationships of the couples, charts of the same temperature range require different spacings according to the thermocouple being used. Hence, the total number of different charts required is considerably greater than the number of chart ranges tabulated.

Suggested preferred ranges for temperature recorders

The suggested preferred ranges for temperature recorders are given in the following tables:—

Table 1 — Even scale recorders (gas expansion, mercury-in-steel, etc.) °C. and °F

Table 2 — Base metal thermocouple recorders °C

Table 3 — Base metal thermocouple recorders °F

Table 4 — Platinum/rhodium v platinum thermocouple recorders °C

Table 5 — Platinum/rhodium v platinum thermocouple recorders °F

Table 6 — Resistance thermometer recorders °C

Table 7 — Resistance thermometer recorders °F

Table 8 — Radiation pyrometer recorders °C.

¹⁾ *Constantan*. The generally accepted name of an alloy having a nominal composition of approximately 55–60 per cent copper, 45–40 per cent nickel.

²⁾ Attention is drawn to the fact that the names chromel, alumel, T₁ alloy and T₂ alloy are proprietary trade names.