

BS EN ISO 7291:2010+A1:2015



BSI Standards Publication

# Gas welding equipment — Pressure regulators for manifold systems used in welding, cutting and allied processes up to 30 MPa (300 bar)

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## National foreword

This British Standard is the UK implementation of EN ISO 7291:2010+A1:2015. It supersedes BS EN ISO 7291:2010 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO text carry the number of the ISO amendment. For example, text altered by ISO amendment 1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee WEE/18, Gas welding and cutting appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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| Date        | Text affected                                                       |
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| 31 May 2015 | Implementation of ISO amendment 1:2015 with CEN endorsement A1:2015 |

English Version

Gas welding equipment - Pressure regulators for manifold  
systems used in welding, cutting and allied processes up to 30  
MPa (300 bar) (ISO 7291:2010)

Matériel de soudage aux gaz - Détendeurs de centrale de  
bouteilles pour le soudage, le coupage et les techniques  
connexes jusqu'à 30 MPa (300 bar) (ISO 7291:2010)

Gasschweißgeräte - Hauptstellendruckregler für  
Schweißen, Schneiden und verwandte Prozesse bis 30  
MPa (300 bar) (ISO 7291:2010)

This European Standard was approved by CEN on 23 October 2010.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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## **Foreword**

This document (EN ISO 7291:2010) has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" in collaboration with Technical Committee CEN/TC 121 "Welding" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.

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### **Endorsement notice**

The text of ISO 7291:2010 has been approved by CEN as a EN ISO 7291:2010 without any modification.

## **Foreword to amendment A1**

This document (EN ISO 7291:2010/A1:2015) has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" in collaboration with Technical Committee CEN/TC 121 "Welding and allied processes" the secretariat of which is held by DIN.

This Amendment to the European Standard EN ISO 7291:2010 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2015, and conflicting national standards shall be withdrawn at the latest by October 2015.

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### **Endorsement notice**

The text of ISO 7291:2010/Amd 1:2015 has been approved by CEN as EN ISO 7291:2010/A1:2015 without any modification.

## Contents

Page

|                                                                  |    |
|------------------------------------------------------------------|----|
| Foreword .....                                                   | iv |
| 1 Scope .....                                                    | 1  |
| 2 Normative references .....                                     | 1  |
| 3 Terms and definitions .....                                    | 2  |
| 4 Units .....                                                    | 3  |
| 4.1 Pressure .....                                               | 3  |
| 4.2 Flow .....                                                   | 3  |
| 4.3 Temperature .....                                            | 3  |
| 5 Manufacturing requirements .....                               | 3  |
| 5.1 Materials .....                                              | 3  |
| 5.2 Design, machining and assembly .....                         | 4  |
| 6 Physical characteristics .....                                 | 6  |
| 6.1 General .....                                                | 6  |
| 6.2 Pressures .....                                              | 7  |
| 6.3 Flow rates .....                                             | 7  |
| 6.4 Operating characteristics .....                              | 9  |
| 7 Marking .....                                                  | 10 |
| 7.1 Pressure regulator .....                                     | 10 |
| 7.2 Pressure relief devices .....                                | 10 |
| 8 Instructions for use .....                                     | 10 |
| 9 Type test procedure .....                                      | 11 |
| 9.1 General .....                                                | 11 |
| 9.2 Test conditions .....                                        | 11 |
| 9.3 Functional tests .....                                       | 11 |
| 9.4 Tests for mechanical resistance of pressure regulators ..... | 14 |
| 9.5 Test for durability of markings .....                        | 18 |
| Bibliography .....                                               | 19 |

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 7291 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 8, *Equipment for gas welding, cutting and allied processes*.

This third edition cancels and replaces the second edition (ISO 7291:1999), which has been technically revised.

Requests for official interpretations of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 8 via your national standards body. A complete listing of these bodies can be found at [www.iso.org](http://www.iso.org).

# Gas welding equipment — Pressure regulators for manifold systems used in welding, cutting and allied processes up to 30 MPa (300 bar)

## 1 Scope

This International Standard specifies requirements and test methods for pressure regulators in manifold systems used in welding, cutting, and allied processes for:

- a) compressed gases up to 30 MPa<sup>1)</sup> (300 bar);
- b) dissolved acetylene;
- c) liquefied petroleum gases (LPG);
- d) methylacetylene-propadiene-mixtures (MPS);
- e) carbon dioxide (CO<sub>2</sub>).

It is not applicable to pressure regulators fitted directly to the gas cylinders, as defined in ISO 2503<sup>[2]</sup>.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5171, *Gas welding equipment — Pressure gauges used in welding, cutting and allied processes*

ISO 9090, *Gas tightness of equipment for gas welding and allied processes*

ISO 9539, *Gas welding equipment — Materials for equipment used in gas welding, cutting and allied processes*

ISO 15296, *Gas welding equipment — Vocabulary — Terms used for gas welding equipment*

ISO 10225, *Gas welding equipment — Marking for equipment used for gas welding, cutting and allied processes* <sup>[A1]</sup>

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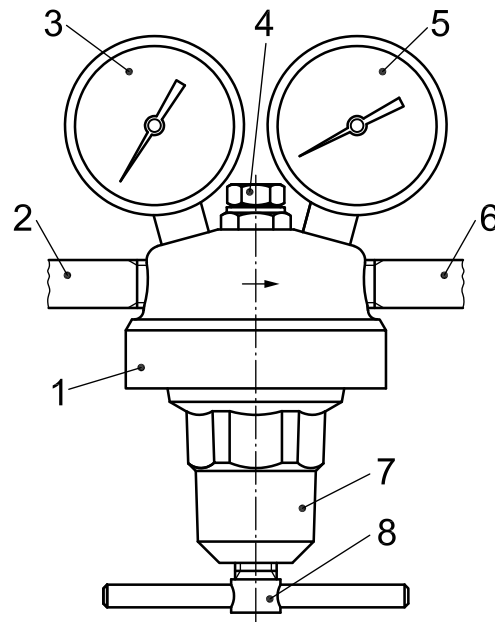
1) The value 30 MPa relates to maximum cylinder filling pressure at 15 °C.

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15296 and the following apply.

**3.1**  
**pressure regulator for manifold systems**  
device for regulating a generally variable inlet pressure to as constant as possible an outlet pressure when controlling the output of a manifold of cylinders

NOTE The diagram of the pressure regulator is an example only. Optional design characteristics are to be compatible with the safety requirements specified in this International Standard. See Figure 1.



#### Key

- 1 pressure regulator body
- 2 inlet connector
- 3 upstream pressure gauge
- 4 relief valve
- 5 downstream pressure gauge
- 6 outlet connector
- 7 pressure regulator cover
- 8 pressure adjusting screw

**Figure 1 — Example of pressure regulators and designation of its components**

**3.2**  
**manifold**  
assembly of devices generally linking two or more gas sources coupled to a user pipeline system, delivering a regulated pressure under specified safe conditions

NOTE A manifold can include components like collectors, safety devices, and pressure regulators.

## 4 Units

### 4.1 Pressure

The pressures measured are gauge pressures<sup>2)</sup> and are expressed in megapascals or bars.

### 4.2 Flow

Flow rates are measured in cubic metres per hour corrected to a standard atmosphere<sup>3)</sup>, taking into account the relevant conversion coefficient for the gas used (see Table 1).

**Table 1 — Conversion coefficient,  $U$**

| Test gas | Conversion coefficient |        |          |       |          |        |           |                   |                 |
|----------|------------------------|--------|----------|-------|----------|--------|-----------|-------------------|-----------------|
|          | air                    | oxygen | nitrogen | argon | hydrogen | helium | acetylene | LPG, e.g. propane | CO <sub>2</sub> |
| air      | 1                      | 0,950  | 1,02     | 0,851 | 3,81     | 2,695  | 1,05      | 0,800             | 0,808           |
| nitrogen | 0,983                  | 0,930  | 1        | 0,837 | 3,75     | 2,65   | 1,03      | 0,784             | 0,792           |

The conversion coefficient,  $U$ , is given by Equation (1):

$$U = \sqrt{\frac{\gamma_0}{\gamma_1}} \quad (1)$$

where

$\gamma_0$  is the density of test gas;

$\gamma_1$  is the density of gas used.

### 4.3 Temperature

Temperatures are measured in degrees Celsius.

## 5 Manufacturing requirements

### 5.1 Materials

Materials for pressure regulators shall conform to the requirements of ISO 9539.

2) Pressure exceeding atmospheric pressure.

3) A standard atmosphere at 23 °C and 0,101 3 MPa (1,013 bar), ISO 554<sup>[1]</sup>.