



उत्पाद मैनुअल
GAS WELDING EQUIPMENT – PRESSURE REGULATORS AND PRESSURE REGULATORS WITH FLOW METERING DEVICES FOR GAS CYLINDERS USED IN WELDING, CUTTING AND ALLIED PROCESSES UP TO 300 BAR (30 MPA)

IS 6901:2018 के अनुसार

PRODUCT MANUAL
FOR GAS WELDING EQUIPMENT – PRESSURE REGULATORS AND PRESSURE REGULATORS WITH FLOW METERING DEVICES FOR GAS CYLINDERS USED IN WELDING, CUTTING AND ALLIED PROCESSES UP TO 300 BAR (30 MPA)
ACCORDING TO IS 6901:2018

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में अभ्यास और पारदर्शिता के संचालन में पारदर्शिता सुनिश्चित करने के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन लाइसेंस/प्रमाणपत्र प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	उत्पाद Product	:	IS 6901:2018/ISO 2503:2009
	शीर्षक Title	:	GAS WELDING EQUIPMENT – PRESSURE REGULATORS AND PRESSURE REGULATORS WITH FLOW METERING DEVICES FOR GAS CYLINDERS USED IN WELDING, CUTTING AND ALLIED PROCESSES UP TO 300 BAR (30 MPA)
	संशोधनों की संख्या No. of amendments	:	0
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Materials for pressure regulators and pressure regulators with flow-metering devices shall conform to the requirements of IS 15946/ISO 9539. If pressure gauges or flow gauges are used, they shall conform to ISO 5171. Conformity of raw materials and or components like pressure gauges and flow devices may be established

		through test certificate of supplier, test report from BIS recognized/empanelled lab or accredited lab or in-house testing or combination thereof. The manufacturer shall submit the details of the materials used to make the regulators along with a declaration that properties of the materials shall be such that the function for which they are intended can be performed correctly within the intended temperature range.
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	: Each type and model to be tested. <i>The manufacturer shall declare the types and models of pressure regulators intended to be manufactured as well as the applicable functional parameters (see 6 (d) and (e) below) for each model to BIS.</i>
c)	नमूने का आकार Sample Size	: 2 regulators of each type and model – (Product is being certified on Factory Testing basis since no third party lab is available)
3.	परीक्षण उपकरणों की सूची List of Test Equipment	: Please refer Annex – A
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	: Please refer Annex – B
5.	एक दिन में संभावित परीक्षण Possible tests in a day	
	All tests – Product is being certified on Factory Testing basis since no third-party testing lab is available	
6.	लाइसेंस का दायरा /Scope of the Licence:	
	“Licence is granted to use Standard Mark as per IS 6901:2018 with the following scope:	
a)	Name of the product	GAS WELDING EQUIPMENT – PRESSURE REGULATORS AND PRESSURE REGULATORS WITH FLOW METERING DEVICES FOR GAS CYLINDERS USED IN WELDING, CUTTING AND ALLIED PROCESSES UP TO 300 BAR (30 MPA)
b)	Type	PRESSURE REGULATORS WITHOUT FLOW METERING DEVICES AND/OR PRESSURE REGULATORS WITH FLOW METERING DEVICES
c)	Designations of the models	MODELS OF PRESSURE REGULATORS WITHOUT FLOW METERING DEVICES: MODELS OF PRESSURE REGULATORS WITH FLOW METERING DEVICES:
d)	For each model of pressure regulators without flow metering devices, the following to be indicated	Single or two stage The pressure-regulator class or outlet pressure (p_2) and Standard discharge (Q_1) in accordance with 6.3: the nominal inlet pressure, p_1, nominated by the

		manufacturer (only for oxygen and other compressed gases):
		the gas intended for use (as per table 5):
e)	For each model of pressure regulators with flow metering devices, the following to be indicated	Single or two stage The accuracy class The nominal discharge Q_n or the flow range; The nominal inlet pressure, p_1; The gas (or range of gas mixtures) intended for use or its specific mass (or range of specific masses).

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN,9, BAHADUR SHAH ZAFAR MARG,
NEW DELHI-110002

ANNEX-A

LIST OF TEST EQUIPMENTS

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests Used In With Clause Reference	Test Equipment/Chemical
1	Pressures, Cl. 6.1 Pressure Relief valve, Cl. 6.4 Accuracy classification of Pressure regulators with flow-metering devices, Cl. 6.6.2.1	Test rigs equipped with Pressure Gauges
2	Flow rates for pressure regulators without flow-metering devices, Cl. 6.2 Stability of the flow of Pressure regulators with flow-metering devices, Cl. 6.6.2.2	Test rigs equipped with Flow meters (e.g. rotameter)
3	Operating temperature range, Cl. 6.5	Apparatus for measurement of operating temperature range (e.g. Dew Point Meter – Temperature Transmitter)
4	Test for performance and operating characteristics of pressure regulators without flowmetering devices, Cl. 9.5 i.e. Maximum discharge Q_{max} Standard discharge, Q_1 Coefficient of pressure increase upon closure, R Irregularity coefficient, i and Test for performance and operating characteristics of pressure regulators with flowmetering Devices, Cl. 9.6, i.e. accuracy classification stability of the flow	Test installation so prepared that All the pipelines of the test installation, together with the valve controlling the flow, shall have a flow capacity greater than that of the pressure regulator to be tested Test Gas - air or nitrogen, free from oil and grease. The ignition test in accordance with 9.7.4 shall be carried out with oxygen. The test bench shall be constructed in such a way that upstream and downstream pressures can be regulated. The equipment may be operated by remote control. Pressure gauges/regulating devices flow-measuring apparatus Temperature recorders test apparatus for the measurement of the dynamic expansion curves (Irregularity coefficient, i)
5	Tests for mechanical resistance of pressure regulators or pressure regulators with a flow-metering device, Cl. 9.7 i.e. Test for mechanical resistance to	Test installation so prepared that All the pipelines of the test installation, together with the valve controlling the flow, shall have a flow capacity greater than that of the pressure regulator to be tested

	internal pressure Leakage tests i.e. External leakage, Internal leakage Ignition test for pressure regulators and pressure regulators with flow-metering devices for Oxygen Pressure-relief valve tightness test	Test Gas - air or nitrogen, free from oil and grease. The ignition test in accordance with 9.7.4 shall be carried out with oxygen. The test bench shall be constructed in such a way that upstream and downstream pressures can be regulated. The equipment may be operated by remote control. blind plugs Pressure gauges/regulating devices flow-measuring apparatus Temperature recorders test apparatus used for the external leakage test test bench for ignition test
6	Test for durability of markings, Cl. 9.8	Distilled water , petroleum spirit, cloth

Note 1 :

For the tests, the following samples and documents shall be available:

- _ three samples of the pressure regulator without and with a flow-metering device (five samples in the case of oxygen);
- _ one set of general-arrangement drawings with material lists;
- _ two sets of detail drawings;
- _ if necessary, a declaration from the manufacturer giving the material specifications and fitness for purpose.

The tests shall be carried out with pressure regulators, and with pressure regulators with flow-metering devices, which are in accordance with the drawings.

Note 2: The list above is indicative only and may not be considered as exhaustive

ANNEX B

SCHEME OF INSPECTION AND TESTING

1. **LABORATORY-** A laboratory shall be maintained, which shall be suitably equipped (as given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the method given in the specification.

1.1 The manufacturer shall prepare and implement a calibration plan for the test equipment.

2. **TEST RECORD-** The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. **PACKING AND MARKING** - The Standard Mark as given in the Schedule of the license shall be clearly and permanently marked on the pressure regulator body or cover or on a label permanently fixed to the pressure regulator and on the packaging (if any), and the marking shall be done as per the provisions of the Indian Standard, provided always that the product thus marked conforms to all the requirement of the specification.

3.1 **Instructions for use:** The manufacturer, supplier or distributor shall supply instructions for use with each pressure regulator, and with each pressure regulator with a flow-metering device as per Clause 8 of **IS 6901:2018**.

4. **CONTROL UNIT-** For the purpose of this Scheme, entire quantity of pressure regulators of the same type and model, manufactured from the same materials under similar conditions of manufacture in a day, shall be taken as a control unit.

5. **LEVELS OF CONTROL :-** The tests as indicate in Table 1 and at the levels of controls in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and records maintained in accordance with paragraph 2 above.

6. **REJECTION** - Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act,2016.

TABLE1**LEVELS OF CONTROL**

(1)				(2)	(3)		
Test details					Levels of Control		
Clause	Requirements	Test Method		Test Equipment requirement R: Required or S- Sub contracting permitted	No. of samples	Frequency	Remarks
		Clause	Reference				
5.1	Materials	-	IS 15946:2018 /ISO 9539:2010	S	One	Each Consignment	Conformity of raw materials may be established through test certificate of supplier, test report from BIS recognized/empanelled lab or accredited lab or in-house testing or combination thereof.
5.2	Design & Construction	5.2	IS 6901				
5.2.1	Oxygen pressure regulators	5.2.1	-do-	R	Each piece		
5.2.2	Acetylene pressure regulators	5.2.2	-do-	R	Each piece		
5.2.3	Connections	5.2.3	-do-	R	Each piece		
5.2.4	Filter	5.2.4	-do-	R	Each piece		
5.2.5	Outlet shut-off valve	5.2.5	-do-	R	Each piece		

5.2.6	Pressure-adjusting device	5.2.6	-do-	R	Each piece		
5.2.7	Flow-control valve	5.2.7	-do-	R	Each piece		
5.2.8	Pressure-relief device	5.2.8	-do-	R	Each piece		
5.2.9	Pressure gauges		ISO 5171	R	One	Each consignment of pressure gauges purchased	Each consignment of pressure gauges shall be accompanied by test certificate of supplier indicating conformity to the standard
5.2.10	Leakage	5.2.10, 9.7.3	IS 6901	R	Each piece		
5.2.11	Mechanical resistance	5.2.11, 9.7	-do-	R	Each piece		
9.7.4	Ignition test for pressure regulators and pressure regulators with flow-metering devices for oxygen	9.7.4	-do-	R	One		
6	Physical performance and Operating characteristics						
6.1	Pressures	6.1	IS 6901	R	One	Each Control Unit	
6.2	Flow rates for pressure regulators without flow-metering devices	6.2, 9.5.1, 9.5.2	IS 6901	R	One	Each Control Unit	
6.3	Equipment classes for pressure regulators without flow-metering devices	6.3	IS 6901	R	One	Each Control Unit	
6.4	Pressure relief valve	9.7.5	IS 6901	R	One	Each Control Unit	
6.5	Operating-temperature range	6.5	IS 6901	R	One	Each Control Unit	
6.6	Performance and operating characteristics						

6.6.1	Pressure regulators without flow-metering devices						
6.6.1.1	Coefficient of pressure increase upon closure R	6.6.1.1, 9.5.4	IS 6901	R	One	Each Control Unit	
6.6.1.2	Irregularity coefficient i	6.6.1.2, 9.5.5	IS 6901	R	One	Each Control Unit	
6.6.2	Pressure regulators with flow-metering devices						
6.6.2.1	Accuracy classification	6.6.2.1, 9.6.1.	IS 6901	R	One	Each Control Unit	
6.6.2.2	Stability of the flow	6.6.2.2, 9.6.2.	IS 6901	R	One	Each Control Unit	
7	Marking (including durability of marking)	7, 9.8	IS 6901	R	Manufacturer shall put in place adequate inspection and in process controls to ensure conformity		

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

Note-3: One consignment of material is defined as all material of one defined type and quality, delivered to the manufacturer by one supplier according to one dispatch note.