भारतीय मानक **IS 8067 : 2023**

Indian Standard

सुवाह्य वायुचालित इम्पैक्ट रिंच — विशिष्टि

(दूसरा पुनरीक्षण)

Portable Pneumatic Impact Wrenches — Specification

(Second Revision)

ICS 23.140.10

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

November 2023 **Price Group 5**

Pneumatic and Hydraulic Tools Sectional Committee, PGD 08

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Pneumatic and Hydraulic Tools Sectional Committee had been approved by the Production and General Engineering Division Council.

Portable pneumatic impact wrenches are powered by an air motor and have rotary motion combined with impacting blows. They are used for tightening and loosening the threaded fasteners.

This standard was first published in 1967 and subsequently revised in 1986. In the first revision,alterations have been made in nominal sizes, mass and overall length. Air consumption requirements and the torque values also have been tolerance on the declared values. In this second revision, requirement altered to keep pace with the latest technological developments and international practices.

Keeping in view the current practices adopted by the industry, the major changes incorporated in this revision are:

a) Spindle specification has been updated;
b) Handle types and the corresponding figures have been changed;
c) Routine test method has been updated; and
d) ICS No. has been added on the cover page.

The composition of the Committee responsible for the formulation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is compiled with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard.

Indian Standard

PORTABLE PNEUMATIC IMPACT WRENCHES — SPECIFICATION

(Second Revision)

1 SCOPE

1.1 The standard covers the requirements of pneumatic impact wrenches suitable for steel Bolts up to M64 in size, conforming to property class 8.8 of IS 1367 (Part 3).

1.2 It does not cover the impact wrenches with automatic torque control.

2 REFERENCES

The standards given below contain provisions which, through reference in this standard, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards:

IS No.	*Title*
IS 196 : 1966	Atmospheric conditions for testing (*revised*)
IS 554 : 1999	Pipe threads where pressure-tight joints are made on the threads — Dimensions, tolerances and designation (*fourth revision*)
IS 1367 (Part 3) : 2017/ISO 898-1 : 2013	Technical supply conditions for threaded steel fasteners: Part 3 Mechanical properties of fasteners made of carbon steel and bolts, screws and studs (*fifth revision*)
IS 7993 : 1988	Specification for power operated square drive socket wrenches (impact) (*first revision*)
IS 7996 : 1976	Specification for driving squares for power socket wrenches
IS 11609 : 1986	Technical supply conditions for pneumatic tools

3 TERMINOLOGY

3.1 Gauge Pressure — A steady dynamic pressure (on load operating air pressure) of compressed air measured on the gauge located within three metres from the inlet to the impact wrenches.

3.2 Maximum Air Consumption on Free Run (No Load Condition) — The volume of air corrected to standard atmospheric conditions of temperature and pressure according to IS 196 consumed by the impact wrenches without any fluctuations of pressure during the test.

4 NOMINAL SIZE AND DIMENSIONS

The nominal size and dimension shall be as follow:

Nominal Size	*Capacity Size*	*Driving Length Size, mm*	*Overall Length, mm*	*Mass kg*
(1)	(2)	(3)	(4)	(5)
6	M6	6.3/10	195	1.5
10	M10	10	230	2.5
13	M13	12.55	260	3.5
16	M16	16	280	4.75
20	M20	20	300	7.0
25	M25	25	340	10.5
30	M30	25	370	13.0
32	M32	25	400	13.0
35	M35	25/40	470	14.0
38	M38	40	500	16.0
44	M44	40	540	32.0
52	M52	40	600	35.0
65	M64	63	650	50.0

NOTES

1 The dimensions of across flats and across corners of the driving squares shall conform to IS 7996.

2 Overall length and mass are given for guidance of the manufacturers and users.

3 In case the bolts are of other material or property class, the manufacturer may be consulted for the capacities.

5 MATERIAL

Material shall be of uniform quality and shall be free from defects and imperfections that mightaffect the serviceability of the finished product.

6 GENERAL REQUIREMENTS

6.1 Lubrication

An arrangement shall be made to lubricate bearings, gears, and other moving parts not lubricated from the inline oil lubricator.

6.2 Air Inlet Connection

6.2.1 Air inlet connection shall be fitted with an air strainer or screen forming a part of the nipple bush which shall be effective in retaining solid particles in compressed air supply and shall be readily cleanable.

6.2.2 Air inlet connection shall have pipe threads conforming to IS 554. For wrenches of nominal size up to 16-Rc l/4; for wrenches of nominal sizes 20 and 25-Rc 318; and for wrenches of nominal size above 25-Rc l/2, threads shall be adopted.

6.3 Bearings

Bearings shall be suitably housed and adequately sealed to prevent leakage of lubricant andentrance of dirt and dust.

6.4 Spindle

The driving square of the spindle shall be wear-resistant [impact socket shall be used with the impact wrenches (*see* IS 7993)]. The driving square, when fitted with a socket, shall not show excessive run-out which may adversely affect the operation of the wrench. The driving square shall conform to IS 7996.

6.5 Impact Unit

The impact unit, actuated by motor, shall be designed to convert torque from the motor into rotary impacts and to transmit these impacts to the spindle.

6.6 Drives

The wrenches shall have either straight or angle drive. The wrenches with angle drive shallhave axis of the drive shaft at 90º to the axis of the wrench.

6.7 Handles

a) Type A — Pistol grid (*see* Fig. 1A).
b) Type B — Grip handle (*see* Fig. 1B).
c) Type C — Straight handle (*see* Fig. 1C).
d) Type D — Double hand grip handle (*see* Fig. 1D).

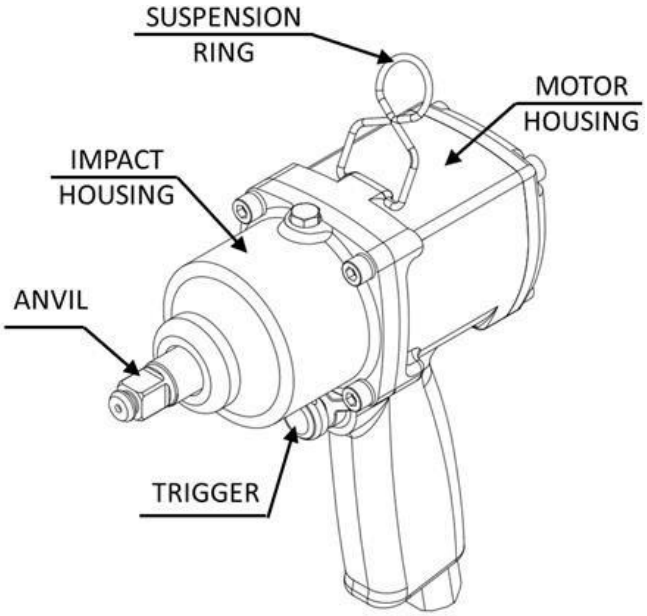

FIG. 1A PISTOL GRIP

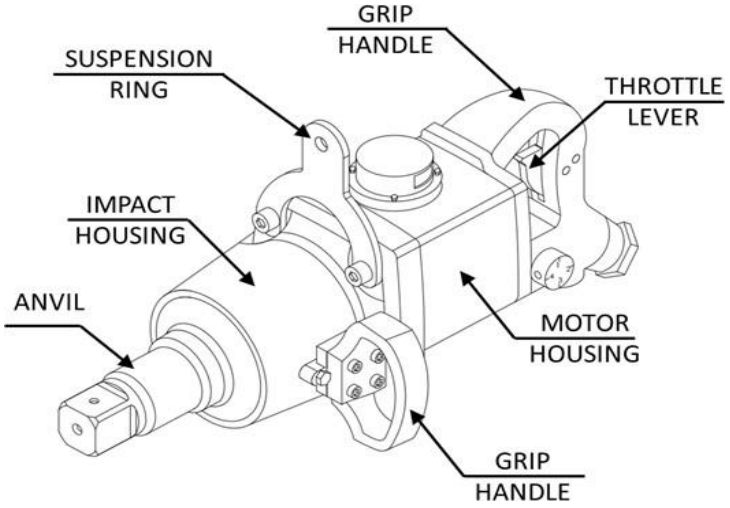

FIG. 1B GRIP HANDLE

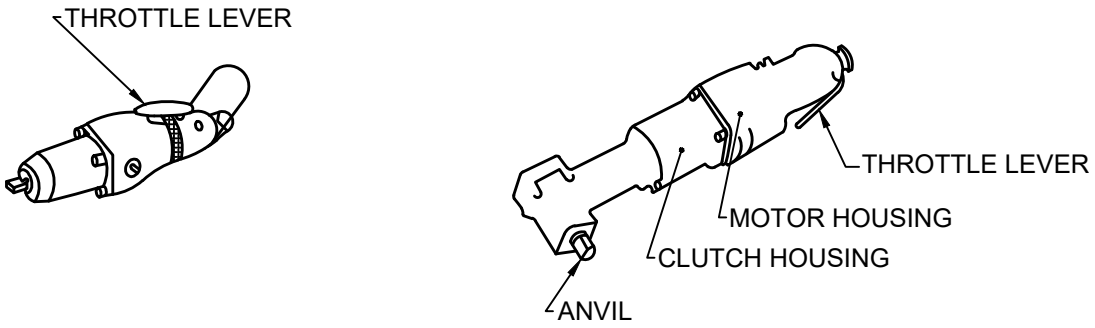

FIG. 1C STRAIGHT HANDLE

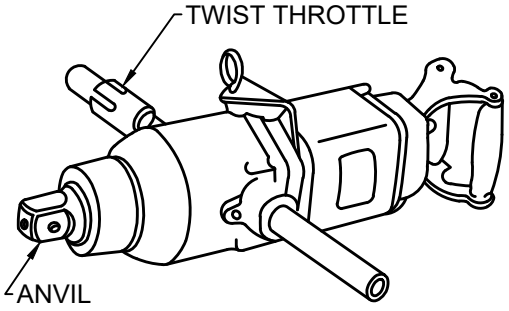

FIG.1D DOUBLE HAND GRIP HANDLE

6.8 Workmanship and Finish

The impact wrench shall be in modular construction, free from harmful flaws and other imperfection and shall be finished satisfactorily.

6.9 Throttle

The wrenches shall be provided with a manual throttle for controlling the supply of air.

6.10 Operation

The wrenches shall be reversible. The rotational direction of wrenchs shall be controlled by conveniently located mechanical devices independent of throttle.

6.11 Instruction Manual

An instruction manual shall be supplied with each tools. Data to be provided in the instruction manual shall be in accordance with IS 11609.

7 TESTS

7.1 Air Consumption Test

Water displacement meter or any other equally suitable instrument shall be used to determine the quantity of air consumed per minute at 6.0 bar ± 0.5 bar pressure measured at a distance of notmore than 3 m from the inlet of the tool. The air consumption corrected to standard atmospheric conditions of testing according to IS 196 shall be within + 5 percent of the declared values.

7.2 Performance Test

The test shall consist of operating the impact wrench to tighten a nut on the test rig to a predetermined torque. The wrench shall be able to tighten the nut on the rig to the ultimate torque as per the 'declared values'. The test rig (*see* Fig. 2) shall consist of a calibrated statimeter having a graduated scale and a nut, or the test rig should have transducer (load cell) (*see* Fig. 3) with track or peak hold function enabling the torque display with desired value.

7.2.1 For conducting the test, the nut on the stat meter shall be tightened by a standard torque wrench set to the ultimate torque of the wrench as per the 'declared value'. The deflection of the needle on the scale shall be suitably marked by a pointer put on the scale. The needle shall then be brought back to indicate zero reading by loosening the nut.

7.2.2 The impact wrench shall then be used to tighten the same nut on the stat meter using a square drive socket conforming to IS 7993. The impact wrench shall be able to tighten the nut to such a torque that the needle deflects to the point already marked by the pointer on the scale as described in **7.2.1.**

7.2.3 The impact wrench conforming to this standard shall be able to deflect the needle to the point already marked by the pointer on the scale as described in **7.2.1**.

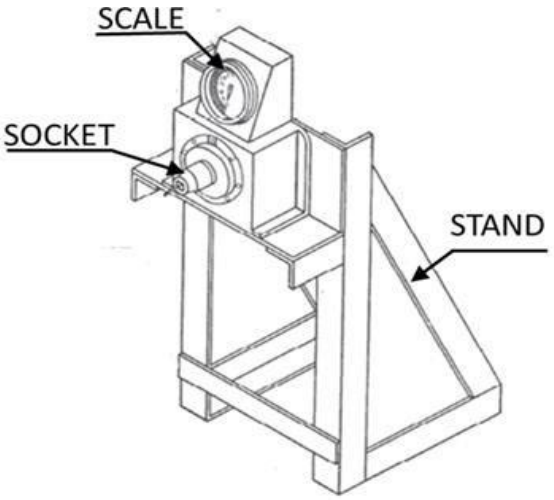

FIG. 2 TEST RIG (TYPICAL)

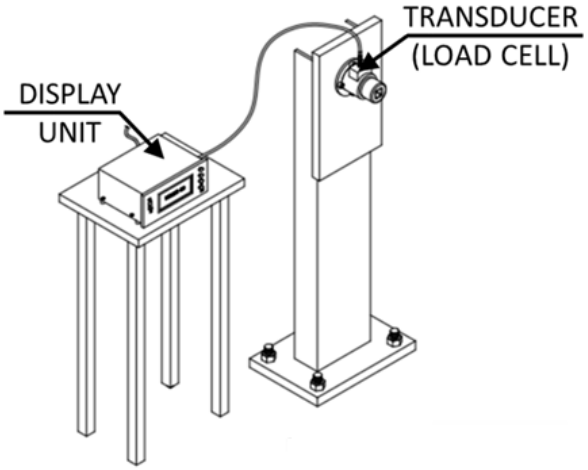

FIG. 3 TEST RIG WITH LOAD CELL AND DISPLAY UNIT (TYPICAL)

7.3 Endurance Test

7.3.1 *For Type Approval*

Each sample conforming to this standard shall be run on the test rig to disseminate energyfor 100 h in the manufacturer's test room (100 h run need not be at a stretch and may be done over a period) after which the tool shall be dismantled and all parts shall be examined. No part shall either break during test or be found broken, cracked or deformed.

7.3.2 *For Routine Testing*

Routine testing shall be done only for newly developed tools. One percent, the minimum being one, of tools on order, if the order is of 50 pieces or more, shall be run on the test rig for 15 h run (need not be at a stretch) after which the tool shall be dismantled and all parts shall be examined. No part shall either break during field use or be found broken, cracked, deformedor show signs of excessive wear on examination.

7.4 Operation Tests

Every impact wrench should be tested for rated rpm, air leakages, and visual checks. It shall also be tested for easy starting and stopping in each forward and reverse direction. It shall also be tested for easy fitment and removal of the socket on the square drive. During testing there shall be no abnormal noise and excessive temperature rise. The impact wrench shall show no flaws which may have been developed during testing.

8 PACKAGING

Before packing, the inlet, exhaust and other openings of each tool shall be adequately protected against entry of dust and other harmful material. Packing shall be done in accordance with IS 11609.

9 MARKING

The impact wrenches shall be marked at a suitable place so that in the course of normal use the markings shall not get damaged. The impact wrench shall be marked with following information:

a) Type, nominal size, and maximum working pressure;
b) Manufacturer's name or trade-mark; and
c) Preferably with serial number and the year of manufacture.

10 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked withthe Standard Mark.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Pneumatic and Hydraulic Tools Sectional Committee, PGD 08

Organization	*Representative*(*s*)
Bharat Heavy Electrical Limited, New Delhi	SHRI M. RAVI **(*Chairperson*)**
Bharat Electronics Limited, Bengaluru	SHRI SUDARSHAN K.
Border Roads Organization, New Delhi	SHRI PANKAJ BHATNAGAR
Directorate General Quality Assurance, New Delhi	DR GURMUKH DAS SHRI G. ARAVINDAN (*Alternate*)
Indian Institute of Technology Madras, Chennai	DR SOMASHEKHAR
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In Personal Capacity (*Flat no. 310, Gulmohar Apartment, Building no. 3, A Block, Talpuri International Colony, Ruabandha, Bhilai – 490009*)	SHRI R. S. CHAUHAN
BIS Directorate General	SHRI RAJIV RANJAN SINGH, SENIOR DIRECTOR/ SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (PRODUCTION AND GENERAL ENGINEERING) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
SHRI AJAY KUMAR
SCIENTIST 'B'/ASSISTANT DIRECTOR
(PRODUCTION AND GENERAL ENGINEERING), BIS

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Review of Indian Standards

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
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