

भारतीय मानक

IS 3564 : 2025

Indian Standard

(Amalgamating IS 14912 : 2001)

द्रवचालित डोर क्लोज़र — विशिष्टि

(पाँचवां पुनरीक्षण)

Hydraulically Regulated Door Closers — Specification

(Fifth Revision)

ICS 91.190

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Price Group 8

Builder's Hardware Sectional Committee, CED 15

FOREWORD

This Indian Standard (Fifth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Builder's Hardware Sectional Committee had been approved by the Civil Engineering Division Council.

Hydraulic door closers are now widely used in residential and commercial buildings. They are especially important in places like air-conditioned buildings, restaurants, hospitals and other public spaces where doors are used often. These door closers ensure the doors close automatically after use, reducing outside noise, maintaining indoor temperature, and ensuring privacy. They are also useful for fire-rated doors in emergency exit areas.

Door closers come in different constructions and types. Some are hidden inside the door or frame, while others are visible from the outside. In door closers, spring and hydraulic oil have been used to control the door's movement and prevent it from slamming shut. This standard covers both surface-mounted and concealed hydraulic door closers and specifies their performance requirements.

This standard was first published in 1966 and subsequently revised in 1970, 1975, 1986 and 1995. The present revision has been brought out with a view to incorporating the modifications found necessary based on experience gained and variety of features available in door closers, suitability to higher door mass and door leaf widths. The Indian Standard IS 14912 has been amalgamated into Indian Standard IS 3564.

The following major changes have been incorporated to the revision of the standard:

- a) Scope has been extended to specify the requirements for door closers, both fire rated and non-fire rated, and for doors weighing up to 160 kg;
- b) Surface mounted and concealed type of door closers have been merged in a single standard. It has been made a performance-based standard;
- c) Based on durability, corrosion resistance and other performance parameters, classification codes have been added to harmonize the product marking and selection for easy understanding of the user; and
- d) Marking clause has been modified.

While formulating this standard, considerable assistance has been derived from EN 1154 : 1997 'Building Hardware — Controlled door closing devices — Requirements and test methods' with some modifications to suit Indian conditions.

The composition of the Committee responsible for the revision of this standard is given in [Annex D](#).

For the purpose of deciding whether a particular requirement of this standard is complied 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 should be the same as that of the specified value in this standard.

Indian Standard
**HYDRAULICALLY REGULATED DOOR CLOSERS —
SPECIFICATION**
(Fifth Revision)

1 SCOPE

1.1 This standard specifies the requirements of fire rated and non-fire rated hydraulically regulated and mechanically operated door closers for vertical hinge type doors opening on one side or both sides and door weight up to 160 kg.

1.2 This standard does not cover the requirement of pneumatically regulated, floor springs and electrically operated door closers.

2 REFERENCES

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

IS No.	Title
IS 3614 : 2021	Fire doors and door sets — Specification (<i>first revision</i>)
IS 4905 : 2015/ ISO 24153 : 2009	Random sampling and randomization procedures (<i>first revision</i>)
IS 5528 : 2025/ ISO 9227 : 2022	Corrosion tests in artificial atmospheres — Salt spray tests (<i>second revision</i>)

3 TERMINOLOGY

3.1 Door Closer — A mechanical device that regulates the closing of a door by means of hydraulic force. The basic function of a door closer is to provide a smooth, controlled closing action for the door after the door has been opened manually and released. There are several variations of door closers for a variety of different applications.

3.2 Surface Mounted Door Closer — Most common type of door closer that is fitted onto the door frame/door leaf either on pull or push side of the door, nearer to the hinge side. The arm of the closer retracts to closed position as the door closes.

3.3 Concealed Door Closer — A type of door

closer mounted overhead on the frame's transom or within the door leaf, and whose body is not visible to the user from the floor.

3.4 Arm Assembly — The accessories provided with the door closer assembly to transmit the regulated motion from the door closer to the door.

3.4.1 Standard Arm/Regular Arm — In this configuration, the main arm is attached to the door closer, and the extension arm is attached to the frame through the pivoted clamp, main arm and adjustment arm form a pivoted pair. When the door is in the closed position, the arms project out from the surface of the door. [see Fig. 4(A)].

3.4.2 Hold Open Arm — In this mechanism, both the regular arm and slide arm door closers can be adjusted to stay open at a particular angle. Hold open arms come with pivot screw or hold open unit in the arm and can be set at an angle. Once the door is opened to the position of the set angle, it remains open until it is manually released by a gentle push. Used mostly in high traffic and material movement areas. [see Fig. 4(B)].

3.4.3 Parallel Arm — In this configuration, the main arm is attached to the door closer, and the extension arm is attached to a parallel arm bracket or soffit plate on the underside of the frame header; the two arms are connected to form a pivot joint. When the door is in the closed position, the arms are tucked underneath the frame header and do not project out like the standard arms. [see Fig. 4(C)].

3.4.4 Slide Arm/Track Arm — Slide arm door closer come with a slide channel and a slide arm, so when the door is in the closed position the arm is parallel to the door closer. Slide arm door closer has a limitation in the opening angle. [see Fig. 4(D)].

3.5 Regulating Valves

3.5.1 Closing Speed Valve — An in-built valve, conveniently located on the end of the door closer to control the closing speed.

3.5.2 Latching Speed Valve (Optional) — A separate in-built adjustment valve to accelerate or decelerate the door to ensure positive latching.

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3.5.3 Power Regulating Valve (Optional) — An in-built valve to adjust the power or the strength of the door closer.

3.6 Delayed Closing Action (Optional) — A door closer equipped with a delayed action feature that allows the door to remain open for a certain period of time before closing at the adjusted speed. This is accomplished by the addition of a 'delayed action' adjustment valve on the door closer, in addition to the speed and power regulating valves.

3.7 Back Check (Optional) — An adjustable feature available on many door closers that provides 'resistance' to prevent the door from being thrown open (by people or the wind) and causing personal injury or damage to the door, door handles or walls.

3.8 Closing Moment — The torque generated by the door closing device which acts upon the door leaf during the closing operation.

3.9 Opening Moment — The torque generated by the user which acts upon the door leaf during the opening operation.

3.10 Drop Plate — It is used to mount a door closer where the top rail on the door or the face of the frame header is too narrow to accept a door closer. The drop plate is fastened to the rail or header, and the closer is mounted on the drop plate. This is a very common application for door closers being installed on aluminium storefront doors.

3.11 Closing Speed — The speed at which a door closer closes the door after being released, adjustable through closing speed valves.

3.12 Latching Speed (Optional) — The speed at which a door closer controls the final few degrees of door closing, adjustable through latching speed valves.

3.13 Closing Force — The force exerted by a door closer to move the door into the closed position, determined by the spring strength of the closer.

3.14 Efficiency — The ratio of the opening force applied to the door by the user and the force available for closing the door, expressed as a percentage.

3.15 Power Adjustable by Template — The door closer's power can be changed by altering the position of the door closer on the door in accordance with a template provided by the manufacturer.

3.16 Power Adjustment by Spring — The door closer's power can be adjusted after it is fitted by

adjusting the spring tension of the unit to suit door size and site conditions.

3.17 Rack and Pinion Mechanism — A rack and pinion door closer is one of the most widely used types of door closer mechanism and is so called because it uses a rack and pinion mechanism with a spring(s) to provide power to close the door, and hydraulics to regulate the speed of the door closer.

3.18 Cam Action Mechanism — It uses a cam and follower mechanism with a spring(s) to provide power to close the door, and hydraulics to regulate the closing speed of the door closer.

3.19 Single Action Door Closer — A door closer for use on doors which can open only in one direction, and which close against a fixed stop only.

3.20 Double Action Door Closer — A door closer for use on doors which can open in both directions, that is, inside and outside.

3.21 Right-Handed Door Closer — A door which, when viewed from above, rotates in an anticlockwise direction about its hinges while opening, is a right-hand door, and the door closer suitable for such door is right-handed door closer.

3.22 Left-Handed Door Closer — A door which, when viewed from above, rotates in a clockwise direction about its hinges while opening, is a left-hand door, and the door closer suitable for such door is left-handed door closer.

3.23 Universal Door Closer — The door closer which is suitable for both left- and right-handed doors without any changes is called a universal door closer.

3.24 Angle of Closing — The maximum angle from the fully closed position from which the door closer can complete the closing action.

3.25 Power Size — It is a measure of the closing moment exerted by a door closer (see [Table 1](#)).

3.26 Test Cycle — A complete sequence of operations of the test door, from the closed position, through opening to the required position, and back to the closed position.

4 TYPES OF HYDRAULIC DOOR CLOSERS

Door closers are classified based on mounting, construction, mechanism used, door closer mounting arms and functional controls.

4.1 Door Closer — Mounting and Form

Based on mounting and form, the door closers are classified as follows:

4.1.1 Surface Mounted Door Closers

Surface mounted door closers are further classified into two sub-types as follows:

- Bottle type door closer* — (for typical representation, [see Fig. 1(A)].
- Tubular type door closer* — (for typical representation, [see Fig. 1(B)].

4.1.2 *Concealed Door Closer* (for typical representation, [see Fig. 1(C)].

4.2 Hydraulic Door Closer Mechanism

Based on closer mechanism, door closers are

classified as follows:

- Rack and pinion type* — (for typical illustration, [see Fig. (2)]; and
- Cam type* — (for typical illustration, [see Fig. (3)].

4.3 Door Closer Mounting Arms

Based on mounting arms, door closers are classified as follows:

- Standard arm/Regular arm* — (see 3.4.1 and for typical representation, [see Fig. 4(A)];
 - Hold open arm* — (see 3.4.2 and for typical representation, [see Fig. 4(B)];
- NOTE — Hold-open arms shall not be used for fire/smoke check doors.
- Parallel arm* — (see 3.4.3 and for typical representation, [see Fig. 4(C)]; and
 - Slide arm* — (see 3.4.4 and for typical representation, [see Fig. 4(D)].



FIG. 1(A) SURFACE MOUNTED
— BOTTLE TYPE DOOR
CLOSER



FIG. 1(B) SURFACE
MOUNTED — TUBULAR
TYPE DOOR CLOSER



FIG. 1(C) CONCEALED DOOR CLOSER

FIG. 1 TYPICAL REPRESENTATIONS OF DIFFERENT MOUNTINGS AND FORMS OF DOOR CLOSERS

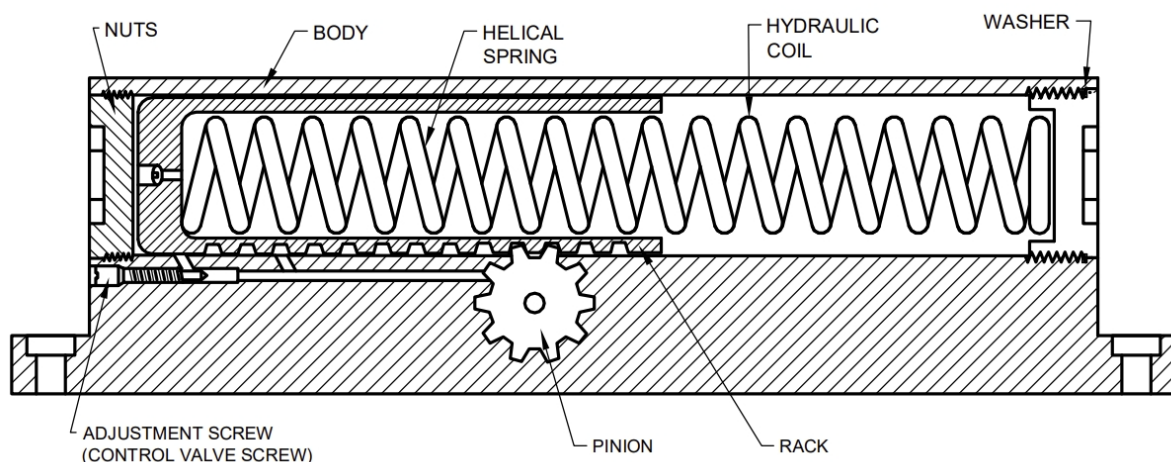


FIG. 2 TYPICAL ILLUSTRATION OF MECHANISM OF RACK AND PINION TUBULAR TYPE HYDRAULIC DOOR CLOSER

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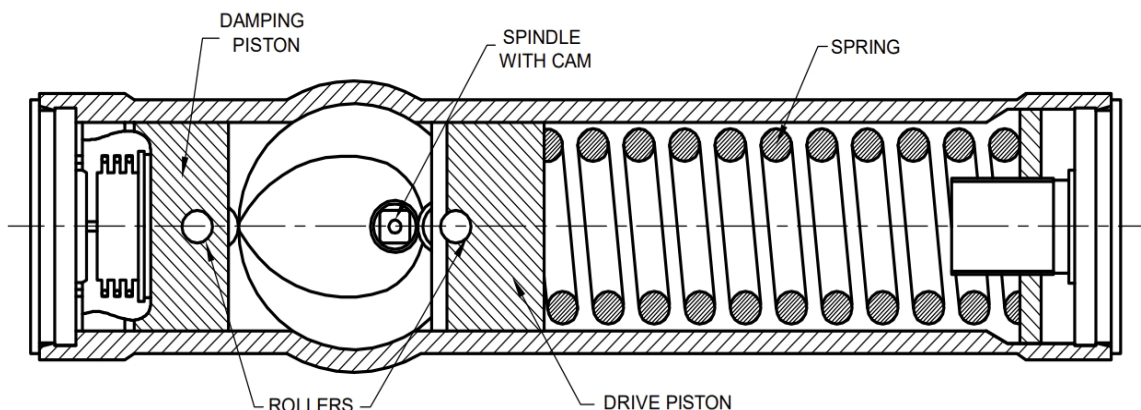


FIG. 3 TYPICAL ILLUSTRATION OF MECHANISM OF CAM ACTION TUBULAR TYPE HYDRAULIC DOOR CLOSER

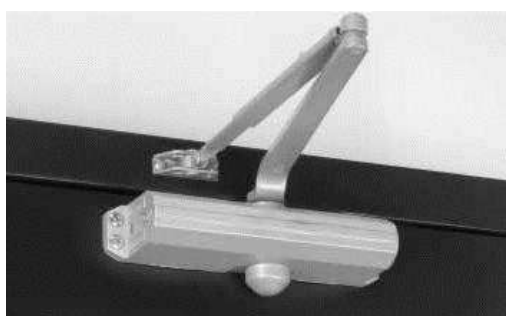


FIG. 4(A) REGULAR ARM



FIG. 4(B) HOLD OPEN ARM



FIG. 4(C) PARALLEL ARM



FIG. 4(D) SLIDE ARM

FIG. 4 TYPICAL REPRESENTATIONS OF DIFFERENT TYPES OF MOUNTING ARMS OF DOOR CLOSERS

5 FUNCTIONAL CONTROLS OF DOOR CLOSERS

5.1 Closing Force (see 3.13)

Door closers are classified into power sizes from 1 to 7 (see Table 1), corresponding to door width and weight. Manufacturer supply door closer with either fixed power size (for example, 2, 3, or 4) or adjustable power size (for example, 2 to 4 or 3 to 6). Adjustable closing force door closer shall be provided with an adjusting valve to increase or decrease the closing force.

5.2 Closing Speed (see 3.11)

Door closer closing speed may vary based on type of door closer and its respective power size. The closing speed shall be operated by single adjustable valve from 180°/105° to 0°. Alternatively, door closer can have multiple adjustable valves to control the closing speed — from 180° to 15° or 105° to 15°, and from 15° to 0° for the final closing operation. For typical illustration through sketch, see Fig 5 .

5.3 Latching Speed

See 3.12 and for typical illustrations, see Fig 5.

5.4 Back Check

See 3.7 and for typical illustrations, see Fig 5.

5.5 Delayed Closing

See 3.6 and for typical illustrations, see Fig 5.

6 NOMINAL SIZES

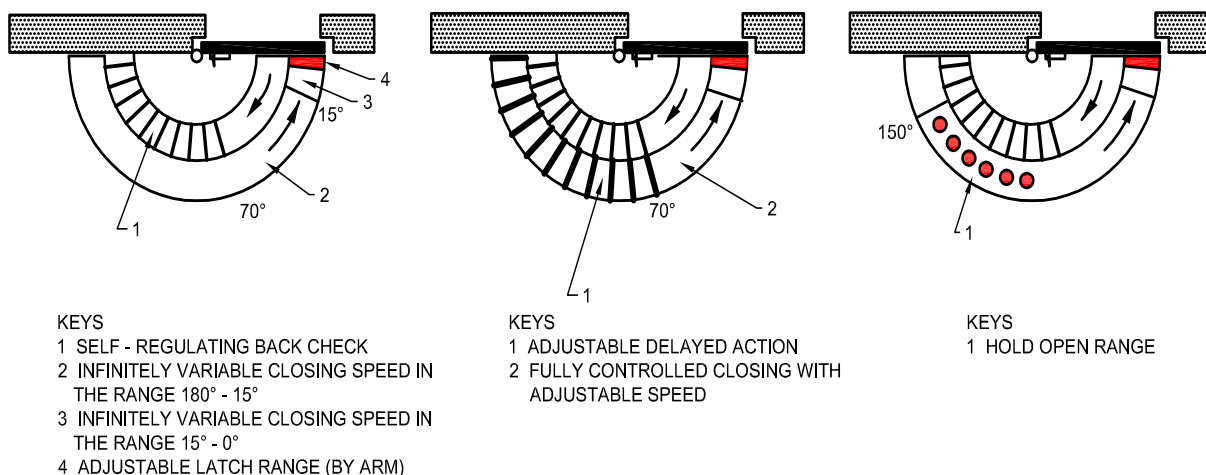
The door closers shall be classified by power sizes, based on suitability for the weight and width of the door leaf, as per Table 1. Where a door closer provides a range of power sizes, both the minimum and maximum shall be defined, for example size 2-4.

NOTE — For door closers of higher power sizes and for door weights more than 160 kg, the performance requirements shall be as agreed between the manufacturer and the purchaser.

7 MATERIALS, FINISH AND WORKSMANSHIP

7.1 The components of a door closer shall be manufactured from suitable materials and plated or coated to meet the performance and corrosion resistance requirements given in this standard.

7.2 The door closer, along with its accessories, shall be free from sharp edges, burrs, flashes, dents, nicks etc. The sub-assembly and necessary accessories shall not show any signs of oil leakage, rust, scales, grease, scratches or dents.



NOTE — The above values and range are indicative only.

FIG. 5 TYPICAL ILLUSTRATIONS OF DOOR CLOSER SPEED CONTROLS AND VARIOUS FUNCTIONS

Table 1 Power Size

(Clauses 3.25, 5.1, 6, 8.3, 9.4.1, 9.4.2, 9.4.3, B-2.1, C-3.1, C-3.8, C-3.9 and C-4.1)

Sl No.	Power Size	Recommended Door Leaf Width, mm	Test Door Weight, kg	Closing Moment, Nm				Opening Moment Between 0° to 60°, Nm	Door Closer Efficiency Between 0° and 4°, percent
				Between 0° to 4°	Between 88° to 92°	Any Other Angle of Opening			
		Max		Min	Max	Min	Min	Max	Min
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	1	750	20	9	13	3	2	26	50
ii)	2	850	40	13	18	4	3	36	50
iii)	3	950	60	18	26	6	4	47	55
iv)	4	1 100	80	26	37	9	6	62	60
v)	5	1 250	100	37	54	12	8	83	65
vi)	6	1 400	120	54	87	18	11	134	65
vii)	7	1 600	160	87	140	29	18	215	65

NOTE — Test door masses shown are only related to door closer power size for the purpose of the test procedure.

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8 CLASSIFICATION CODE

For the purpose of this standard, door closer shall be classified according to following 6 digit coding system.

8.1 Digit 1 — Category of Use

For use on all internal and external doors the grades for classification are as follows:

- a) *Grade 3* — For closing doors from at least 105°;
- b) *Grade 4* — For closing doors from 180° open.

NOTES

1 Grade 4 classification assumes standard installation according to the manufacturer's instructions.

2 For applications subject to extreme abuse, or for a particular limitation of opening angle, door closer incorporating a back check function or provision of a separate door-stopper shall be considered.

8.2 Digit 2 — Durability

Based on the durability aspects, four grades are specified as follows:

- a) *Grade 5* — 50 000 test cycles;
- b) *Grade 6* — 1 00 000 test cycles;
- c) *Grade 7* — 2 00 000 test cycles; and
- d) *Grade 8* — 5 00 000 test cycles.

8.3 Digit 3 — Test Door Mass and Door Closer Power Size

Seven test door mass grades and related door closer power sizes are classified in [Table 1](#). Where the door closer provides a range of power sizes, both the minimum and the maximum sizes shall be mentioned.

8.4 Digit 4 — Fire Resistance

Five grades are classified for the requirement of use of door closer on fire door assemblies are as follows:

- a) *Grade 0* — Not suitable for use on fire/smoke check doors;
- b) *Grade 1* — Minimum fire resistance capacity 30 min;
- c) *Grade 2* — Minimum fire resistance capacity 60 min;
- d) *Grade 3* — Minimum fire resistance capacity 90 min; and
- e) *Grade 4* — Minimum fire resistance

capacity 120 min.

NOTE — Door closer with power size of 1 and 2 are not recommended to use on fire/smoke check doors because of their low closing moments.

8.5 Digit 5 — Safety

All door closers are required to satisfy the essential requirements of safety in use. Therefore, only Grade 1 is identified.

8.6 Digit 6 — Corrosion Resistance

Capability for corrosion resistance are categorized in five grades based on following duration when tested for neutral salt spray test as per IS 5528.

- a) *Grade 1* — Mild resistance, up to 24 h (recommended for dry interiors);
- b) *Grade 2* — Moderate resistance, up to 48 h (recommended for interiors subject to condensation);
- c) *Grade 3* — High resistance, up to 96 h (recommended for damp interior and exterior); and
- d) *Grade 4* — Very high resistance, up to 240 h (recommended for industrial/coastal exterior).

8.7 Examples of Classification

Door closer with fixed power size, can close the door from at least 105° open position, and has been tested for 50 000 cycles of operation, is suitable for door width up to 950 mm and weight up to 60 kg, is not suitable for fire/smoke doors, meets the safety requirements and has a moderate corrosion resistance.

Digit 1	Digit 2	Digit 3	Digit 4	Digit 5	Digit 6
3	5	3	0	1	2

Door closer with variable power sizes, can close the door from at least 180° open position, and has been tested for 2 00 000 cycles of operation, is suitable for door widths starting from 850 mm up to 1 100 mm and weight from 40 kg up to 80 kg, is suitable for up to 60 minutes fire/smoke resistance when installed with an equivalent fire rated door along with recommended accessories, meets the safety requirements and has high corrosion resistance.

Digit 1	Digit 2	Digit 3	Digit 4	Digit 5	Digit 6
4	7	2 4	2	1	3

9 PERFORMANCE REQUIREMENTS

9.1 General

9.1.1 The general test conditions and tolerances on testing parameters shall be as given in [Annex A](#).

9.1.2 When tested as per this standard, the door closer shall meet the performance requirements given in [9.2](#) to [9.8](#) as per the declared classification code (see [8](#)) of the door closer.

9.2 Angle of Operation

The door closer, when installed as per the manufacturer's installation template and instructions, shall permit the door closer to open as per declared classification code (see [8.1](#)), and on closing, shall control the door from a minimum angle of 70°, down to the closed position.

9.3 Durability

9.3.1 The door closer shall be able to close the test door complying with the requirements mentioned in [C-3](#) from an opening angle of 90°. The door closer sample shall be subjected to durability cycles as per declared classification code (see [8.2](#)), with the maximum load specified by the power size of door closer.

9.3.2 At the end of the test, the door closer shall not show any signs of oil leakage, damage to the door closer and arm that will adversely affect its performance. After the test, verify the functioning of the door closer for hold open and delayed closing action features (if available) in accordance with [C-2.2](#) and [C-2.5](#) respectively. The test set-up and method for door closer testing are given at [Annex B](#) and [Annex C](#) respectively.

9.4 Power Size and Efficiency

9.4.1 The door closer manufactured in any of seven power sizes shall confirm to the requirements of efficiency given in [Table 1](#) in accordance with the direction of opening of the door either clockwise or anticlockwise. After 5 000 test cycles and completion of the test as per the method given in [9.3](#), measured door closer efficiency between 0° and 4° of the sample shall not be less than the values mentioned in [Table 1](#) for the particular power size.

9.4.2 For Grade 5 door closer under classification digit 2 (see [8.2](#)), that is, durability, conformity to the requirements of the closing moment, opening moment and door closer efficiency given in [Table 1](#)

shall not be required.

9.4.3 For barrier-free doors (that is, for use on doors intended for persons with disabilities), the door closer shall be of power size 3 and above, with an opening force (between 0° to 30°) not more than 25 N. Conformity to the requirements of the closing moment and opening moment as given in [Table 1](#) shall not be required for such doors.

NOTE — In case of [9.4.2](#) and [9.4.3](#), values of the closing moment and opening moment shall be recorded for the purpose of corrosion resistance test (see [9.7](#) and [C-4](#)).

9.5 Fire Resistance

9.5.1 This requirement is based on the evaluation of the product on test door assemblies as per IS 3614. The manufacturer shall indicate the method of fixing which will be used, along with the details of any additional material necessary to achieve the required performance under this test. The product shall conform to the classification given in [8.4](#).

9.5.2 For fire rated door closer, additional requirements are as follows:

9.5.2.1 The door closer, when installed as per manufacturer's installation instructions, shall be capable of closing the test door from any angle to which it may be opened. Door closer with adjustable closing force shall be capable of adjustment at least to power size 3.

NOTE — For door closer with adjustable closing force, the installation instructions shall include precise instructions to the installer to ensure that the door closer power is adjusted on the site to size 3 or more, to overcome resistance of any seals or latches fitted.

9.5.2.2 Hold open units shall not be allowed on fire rated doors.

9.5.2.3 Control regulators shall be either concealed or operable by only tools.

9.5.2.4 The door closer shall be designed in a manner that it is not possible to inhibit the closing action in anyway without the help of the tools.

9.5.2.5 Any delayed action function shall be capable of adjustment to less than 25 s, from the door closing angle of 120° to the end of the delay zone.

9.5.2.6 Where the door closer is intended to be used with other significantly different arm assemblies like slide arm, which may be supplied separately, that combination shall also be tested and conforms to the requirements given in [9](#).

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9.6 Safety

There shall neither be sharp corners nor sharp edges that may cause injury during installation and usage. The door closer shall also meet the requirements given in [7.2](#).

9.7 Corrosion Resistance

9.7.1 Door closer sample shall be tested for neutral salt spray test as per IS 5528 for the duration as per classification code (see [8.6](#)) grade declared by the manufacturer. At the end of the test, remove the door closer from the salt spray cabinet. After half an hour, carefully remove residues of the spray solution from their surfaces. A suitable method is to rinse or dip the specimens gently in clean running water at a temperature not exceeding 40 °C and then to dry them immediately in a stream of compressed air at a pressure not exceeding 200 kPa, at a distance of approximately 300 mm.

9.7.2 Post rinsing, when measured as per [C-3.4](#), the closing moment of the door closer shall not be less than 80 percent of the closing moment from 0° to 4° measured prior to the corrosion resistance test.

9.8 Operation at Extremes Temperatures

9.8.1 Before setting and before each measurement at the temperature extremes the door closer shall be conditioned in the temperature-controlled chamber for a minimum of 3 h at the relevant temperatures mentioned in [9.8.2](#), [9.8.3](#) and [9.8.4](#). Mount the door closer in accordance with the manufacturer's installation instructions on test door set-up (see [Annex B](#)), and the requirements (see [9.8.5](#)) shall be checked within 15 min of each conditioning.

9.8.2 With the door closer temperature stabilised at 25 °C ± 5 °C for a minimum of 3 h, adjust the closer to provide a smooth closing action from 90° open to fully closed, in a time of 10 s ± 5 s. Take the average of three readings.

9.8.3 Stabilise the door closer temperature at -10 °C ± 2 °C for a minimum of 3 h, open the door slowly to 90° open in a time of not less than 4 s and measure the time taken to return to the fully closed position. Take the average of three readings.

9.8.4 Without readjusting the regulator(s), stabilize the door closer temperature at 40 °C ± 2 °C for a minimum of 3 h and again, measure the closing time from the 90° open position to fully closed. Take the average of three readings.

9.8.5 Verify that the average closing time from 90° open to full closed position, at each temperature

extreme, shall not be decreased to less than 5 s or increased to more than 20 s. It also shall not show any signs of oil leakage.

10 LOT, SAMPLING AND CRITERIA OF CONFORMITY

10.1 Lot

All door closers of the same power size, mounting and forms, mechanism, mounting arms and manufactured under relatively similar conditions of production shall be considered as one lot.

10.2 Sampling

10.2.1 The door closers may be selected at random from a lot as per procedures given in IS 4905.

10.2.2 The minimum quantity of door closers samples to be taken for the each of the testing shall be as follows:

- One door closer for general requirements (workmanship, finish and safety), functional check and operation at extreme temperatures;
- One door closer for durability (including power size and efficiency);
- One door closer for corrosion resistance; and
- One door closer for fire resistance, on test door assemblies as per IS 3614.

NOTE — In case the door closer has adjustable power sizes, in case of a) and b), two door closers shall be drawn from the lot. One door closer shall be set to the minimum power size and other to the maximum power size, and tested as per this standard. For corrosion test, only one door closer set to the minimum power size to be tested.

10.3 The samples of door closer selected for testing for conformity, shall meet the requirements given in this standard.

11 MARKING

11.1 Each door closer body shall be legibly and indelibly marked with the following information:

- Manufacturer's logo or brand name or trademark;
- Marking of control valves; and
- Classification code (see [8](#)).

11.2 The following information shall be legibly marked on the packing:

- Manufacturer's name or brand name or trademark;

- b) Handing of door closer (if applicable) — L, R or U of door closer;
- c) Classification code of the door closer (see 8);
- d) Door closer for barrier-free doors (if applicable) (see 9.4.3);
- e) Quantity and contents in the package;
- f) Batch number; and
- g) Month and year of manufacture.

11.3 BIS Certification Marking

The product 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 may be marked with the Standard Mark.

12 PACKING

12.1 The door closer shall be packed in individual packs. Additionally, it may be suitably reinforced to prevent damage to the packed contents. Packing shall be of such type and quality as to protect the contents from moisture and physical damage during storage and transportation.

12.2 Each door closer shall be supplied with a list of accessories along with instructions for installation, regulation, use and maintenance.

12.3 Where the door closer is recommended for fitting in other than standard application, these instructions shall clearly define the door closer power size for each application of fitting position stated.

12.4 Installation Template

12.4.1 The manufacturer shall provide clear, detailed instructions for its installation, regulation and maintenance which shall include any limitation of opening angle.

12.4.2 Installation templates shall be provided with all types of door closers and shall contain at least the following instructions for users.

- a) Door closer power size (or maximum door weight and maximum door leaf width);
- b) Door closer mounting position and installation template;
- c) Fixing screws;
- d) Recommended drill bit for making holes on doors;
- e) Instruction on spring adjustment (for adjustable power size door closer);
- f) Instructions on closing speed adjustment; and
- g) Any additional information suitable for making proper adjustments and maintenance of door closer.

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ANNEX A

(Clause [9.1.1](#))

GENERAL TOLERANCES IN THE TESTING PARAMETERS

A-1 TOLERANCES

Throughout this standard, the following tolerances shall apply, unless otherwise stated;

- a) Mass in kilograms or grams ± 2 percent (kg or g):
- b) Length in millimetres (mm): ± 2 percent
- c) Force in kilo Newton or ± 2 percent Newton (kN or N):

- d) Torque/moment in ± 2 percent Newton-metre (Nm):
- e) Time in seconds (s): ± 5 s
- f) Temperature in celsius (°C): ± 2 °C
- g) Angular position expressed in ± 2 percent degrees:

A-2 The ambient atmospheric temperature of the test environment shall be controlled throughout the tests in between (25 ± 5) °C.

ANNEX B

(Clauses [9.8](#) and [9.3.2](#))

TEST SET-UP FOR DOOR CLOSER TESTING

B-1 SINGLE ACTION DOOR CLOSER

The test apparatus shall consist of a test door mounted in a frame, capable of manual opening to angles greater than the door closer's maximum opening angle, or up to maximum 180°, with automatic actuating means to enable the required opening angle.

B-2 TEST DOOR

B-2.1 The test door shall be minimum of 2 000 mm high, and of any width between 750 mm and 1 200 mm. The test door shall be mounted vertically on hinges or bearings to ensure a consistent, smooth opening with actuating mechanism, and proper closing of the door under the action of the door closer. It shall have means of attaching weights so that the door mass can be adjusted to suit the power size of the door closer under test in accordance with [Table 1](#). The test door and frame shall be of sufficient rigidity such that no visible distortion occurs during the entire test process.

B-2.2 The centre of gravity shall be approximately at the mid-height position of the test door leaf, and 500 mm from the vertical axis of the hinges or

pivots. The test door shall be mounted vertically on hinges or bearings, or, in the case of door closer with a pivoting action, on the unit under test. (see [Fig. 6](#))

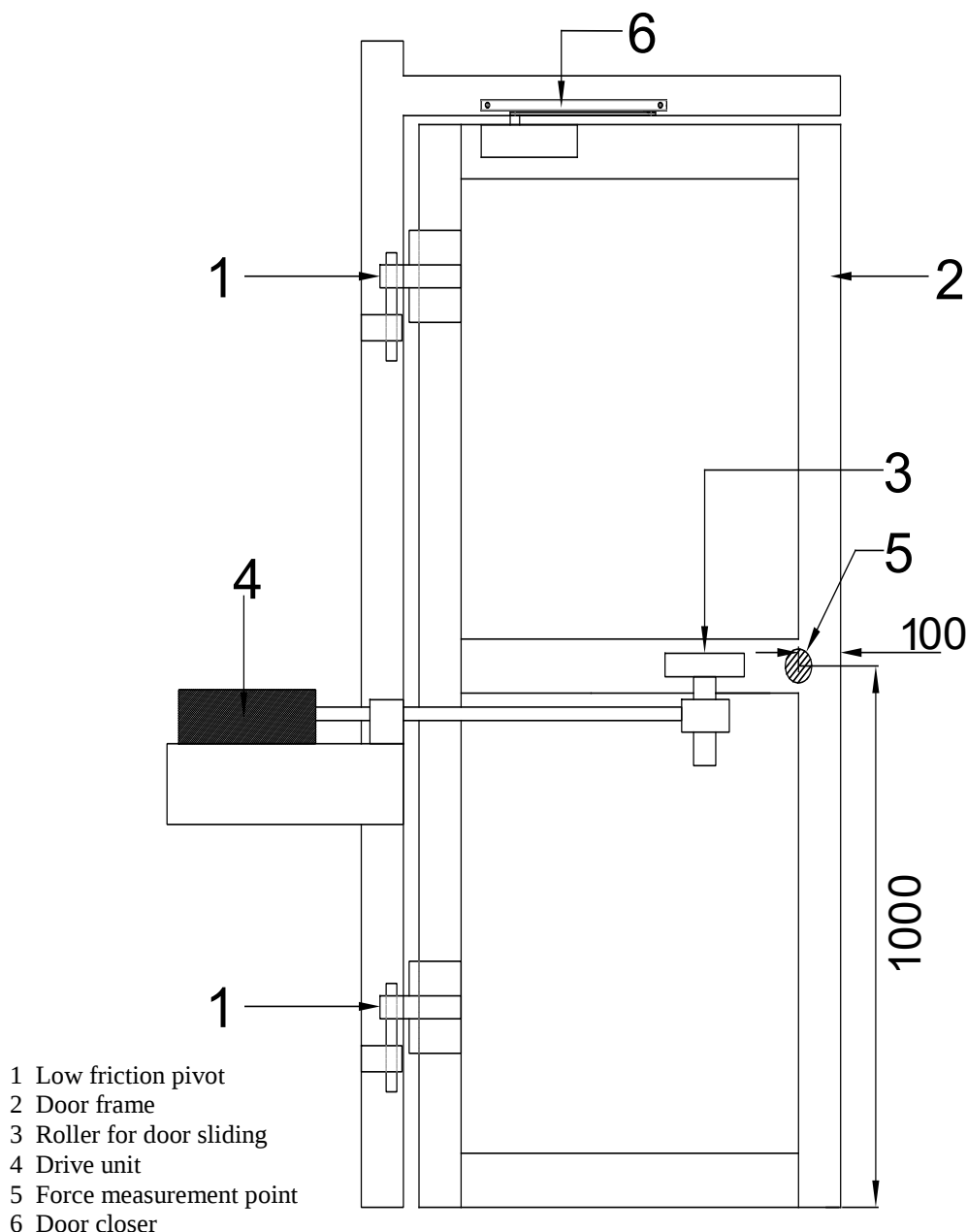
B-2.3 The apparatus must have provision to record the number of operating cycles of the test door. The equipment shall ensure that the test door has fully returned to the closed position before initiating the next operation.

B-3 FORCE MEASUREMENT

A force gauge or other suitable device with a minimum accuracy of 1.5 percent of the reading shall be provided for determining the opening and closing moments in accordance with this test.

B-4 ACTUATING MECHANISM

The actuating mechanism shall not impede the return of the test door to the fully closed position under the action of the door closer being tested. The automatic actuating mechanism shall apply the opening force at a distance between 500 mm to 700 mm from the vertical axis of the rotation of the door.



All dimensions in millimetres.

FIG. 6 TYPICAL TEST SET-UP FOR DOOR CLOSER CYCLE TEST

ANNEX C

(Clause [9.3.2](#))

TEST METHODS FOR DOOR CLOSER TESTING

C-1 GENERAL

Verify the product information given by the manufacturer used for testing of the door closer, including the classification code.

C-2 FUNCTIONAL CHECK

Before performance testing on the door closer, the functional check shall be done as follows:

C-2.1 After being fitted in its position, when the door or fixture is opened through 90° , it shall swing

back to an angle of $10^\circ \pm 5^\circ$ at set closing speed, but thereafter the speed shall automatically reduce, and in case of doors with latches, it shall be regulated so that in its final position the door smoothly engages with the latch. The closing time shall be easily adjustable between 5 s to 20 s.

C-2.2 Mount the door closer on test apparatus or fixture and verify for hold open feature (only if feature is available in the door closer model) at the preset angle for 5 min.

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C-2.3 Latch Control (Optional)

A door closer manufacturer may include separate latch control to the door closing to overcome the resistance of a latch. If incorporated, it shall be effective over a maximum range of 15° from the closed position and shall be adjustable.

C-2.4 Back-Check (Optional)

If provided with a back-check function, the door closer shall be capable of stopping the test door before the 90° open position when tested.

C-2.5 Delayed Closing (Optional)

If delayed closing is provided in the door closer, verify the delayed action closing feature for 5 times. The door closer shall be adjustable with a separate regulator such that the closing time from 90° to the end of the delay zone at an ambient atmospheric temperature of $(25 \pm 5)^\circ\text{C}$ is not less than 20 s. The delay zone shall not extend beyond the 65° open position. The moment required to override manually the delay action shall not exceed 150 Nm when tested. After 500 test cycles, the delayed time shall be between 10 s and 30 s.

C-2.6 Adjustable Closing Force (Optional)

Door closer with adjustable closing force function, the door closer shall comply with the performance requirements of [C-3](#) at both the minimum and maximum power settings declared by the manufacturer.

C-3 DURABILITY, POWER SIZE AND EFFICIENCY

C-3.1 Apply the weights to the test door as per [Table 1](#) for the particular power size of door closer being tested, so that the mass and centre of gravity are in accordance with [B-2.2](#).

C-3.2 Mount the door closer on the test apparatus according to the manufacturer's installation template and installation instruction. Open the door to the maximum angle as per declared classification code and verify if the door closer closes it completely from a minimum angle of 70° to closed position in a regulated manner. The door closer control valves shall be adjusted such that the test door closes smoothly from 90° to fully closed within a time of 3 s to 7 s. If the door closer has additional valve for latch control, adjust it to ensure a smooth transition from closing to latching speed, providing a positive closing, but not slamming action. Disable hold open and delayed action features prior to starting the test or set them to minimum effect.

Adjust the test door actuation mechanism to open the test door smoothly to 90° in time between 3 s to 4 s and then allowing the test door to close under the action of the door closer being tested. Make sure the door has returned fully to the closed position before initiating the next opening cycle.

C-3.3 One opening and closing shall constitute one cycle (see [3.26](#)). Continue the cycling test for a total of 5 000 test cycles. Record the ambient atmospheric temperature. Allow the door closer body surface to cool to within 2° C of ambient atmospheric temperature.

C-3.4 Adjust the closer to a fully open position and measure both the opening and closing forces of the door closer. The forces are measured slowly (not faster than 1°/s) while opening and closing the test door using the force gauge positioned perpendicular to the door face when the door is in an open position from 0° to 4° and 88° to 92°. The maximum value is to be noted. Take the average of three readings.

C-3.5 Use the same method to open the door to 60° opening. Note the maximum opening force obtained during this procedure. Take the average of three readings.

C-3.6 Allow the door to close from its maximum opening angle permitted by the door closer under test to 2° and note the minimum closing force obtained during its travel. Take the average of three readings.

C-3.7 Calculate the opening and closing moments in each case as the product of these average gauge readings and the distance of the force gauge in metres from the vertical axis of the hinges or pivots.

NOTE — This procedure does not preclude the use of automatic measuring and recording equipment.

C-3.8 After 5 000 test cycles, the measured efficiency shall not be less than the values mentioned in Table 1 for the particular power size.

Efficiency of the door closer =

$$\frac{\text{Average of maximum closing force between } 0^\circ \text{ and } 4^\circ}{\text{Average of maximum opening force between } 0^\circ \text{ and } 4^\circ} \times 100$$

C-3.9 Reset the door closer parameters set at [C-3.2](#), and continue the cycle test for its declared performance for the maximum number of cycles as given in [8.2](#), and the regulators remain unaltered until the completion of test. Efficiency shall also be calculated at the end of the test of overall cycles and

shall not be less than the values mentioned in the [Table 1](#).

C-4 CORROSION RESISTANCE

C-4.1 Apply the weights to the test door as per [Table 1](#) for the particular power size of door closer being tested, so that the mass and centre of gravity are in accordance with [B-2.2](#).

C-4.2 Mount the door closer on the test apparatus

according to the manufacturer's installation template and installation instruction. The closing force shall be measured as given in [C-3.4](#).

C-4.3 After removal of the door closer from salt spray test apparatus and post rinsing, the closing force shall be again measured as given in [C-3.4](#).

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ANNEX D

(Foreword)

COMMITTEE COMPOSITION

Builder's Hardware Sectional Committee, CED 15

<i>Organization</i>	<i>Representative(s)</i>
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AOS Door Controls LLP, Chennai	SHRI SYED MOHAMED
Argent Industries, New Delhi	SHRI ANIL CHADHA SHRI VANITA CHADHA (<i>Alternate</i>)
Central Public Works Department, New Delhi	SHRI DINESH K. UJJANIA
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MECH (India) Industries, Delhi	SHRI SUDHIR BATRA SHRI SAMEER ARORA (<i>Alternate I</i>) SHRI ISHAN BATRA(<i>Alternate II</i>)

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<i>Organization</i>	<i>Representative(s)</i>
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NBCC (India) Limited, New Delhi	SHRI APURVA AGARWAL
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Member Secretary
SHRI PRADEEP SINGH SHEKHAWAT
SCIENTIST 'E'/DIRECTOR
(CIVIL ENGINEERING), BIS

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