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IS 14912 (2001): Door Closers, Concealed Type (Hydraulically Regulated) - [CED 15: Builder Hardware]

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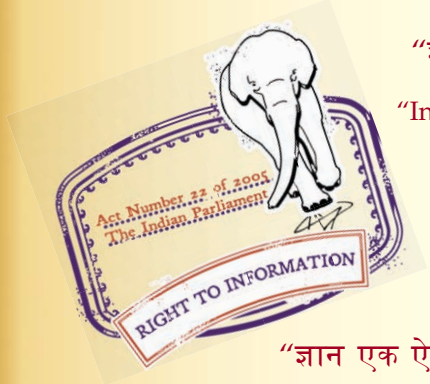

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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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Indian Standard

DOOR CLOSERS, CONCEALED TYPE (HYDRAULICALLY REGULATED) — SPECIFICATION

ICS 91.190

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

March 2001

Price Group 3

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Builders Hardware Sectional Committee had been approved by the Civil Engineering Division Council.

This standard lays down the requirements for manufacture and performance of concealed type, hydraulically regulated door closers. In this type of door closers, rotation of the pinion is on two needle bearing rollers. The closer is fixed in concealed position to give a clean look to the panel of the door.

The composition of technical committee responsible for the formulation of this standard is given at Annex C.

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 : 1960 'Rules for rounding off numerical values (*revised*)'. 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

DOOR CLOSERS, CONCEALED TYPE (HYDRAULICALLY REGULATED) — SPECIFICATION

1 SCOPE

1.1 This standard covers the requirement for concealed type hydraulically operated door closers, fixed in concealed position within the thickness of the panel on vertical hinge type doors opening to one side only and not weighing more than 80 kg.

1.2 This standard does not cover overhead type door closers covered in IS 3564 : 1995 'Hydraulically regulated door closers (*fourth revision*)' or pneumatic type door closers or closers working only on mechanical devices.

2 NORMATIVE REFERENCES

The Indian Standards listed at Annex A contain provisions which through reference in this text, constitute provision 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 editions of the standards indicated in Annex A.

3 TERMINOLOGY

3.0 For the purpose of this standard, following definitions shall apply.

3.1 Door Closers (Hydraulically Regulated)

A hydraulic door closer herein after called closer, is an equipment for automatic closing of doors by the help of springs such that the phase of closing is slowed down by the hydraulic damper and speed can be regulated by adjusting the speed adjustment valve.

3.2 Anti-Clockwise Door (Right-Hand Door)

A door which, when viewed from top, rotates in an anti-clockwise direction about its hinges while opening.

3.3 Clockwise Door (Left-Hand Door)

A door which, when viewed from top, rotates in an clockwise direction about its hinges while opening.

3.4 A Right Closer

A closer which is required to be used on an anti-clockwise door.

3.5 A Left Closer

A closer which is required to be used on clockwise door.

3.6 A Universal Closer

A closer which is suitable for both anti-clockwise and clockwise doors without any change in the parts of closer.

4 COMPONENTS

The names of the main components of a concealed hydraulic door closer are shown in Fig. 1 while typical illustration is shown in Fig. 2.

5 NOMINAL SIZES

The nominal sizes of door closers in relation to the mass and the width of the door size to which it is intended to be fitted shall be given in Table 1.

Table 1 Types and Designation of Door Closers
(*Clause* 5)

Designation	Mass of Door	Width of Door
No. 1	Up to 60 kg	Up to 850 mm
No. 2	61 to 80 kg	851 to 1 000 mm

6 MATERIALS

The materials to be used for main components and parts of door closer are given in Table 2.

7 ESSENTIAL REQUIREMENTS

7.1 The closer shall be manufactured in two sizes conforming to the requirements given in Table 1, in accordance with the direction of the opening of the door either clockwise or anti-clockwise.

7.2 The closing time shall be easily adjustable between 5 to 20 s by means of regulating screws.

7.3 Hydraulic oil filling shall work satisfactorily at all temperatures between 50°C and –10°C without requiring any change except adjustment of the regulating screw. The closer shall be tested as given in **7.3.1**.

NOTE — Necessary instructions shall be furnished by the manufacturer for this purpose at the time of supply.

7.3.1 The closer before testing shall be conditioned to a temperature of 50°C ± 2°C and -10°C ± 2°C for not less than 3 h separately. The conditioned closer shall be tested for its performance requirements as given in **7.2** and **B-1.4**. The above performance requirements

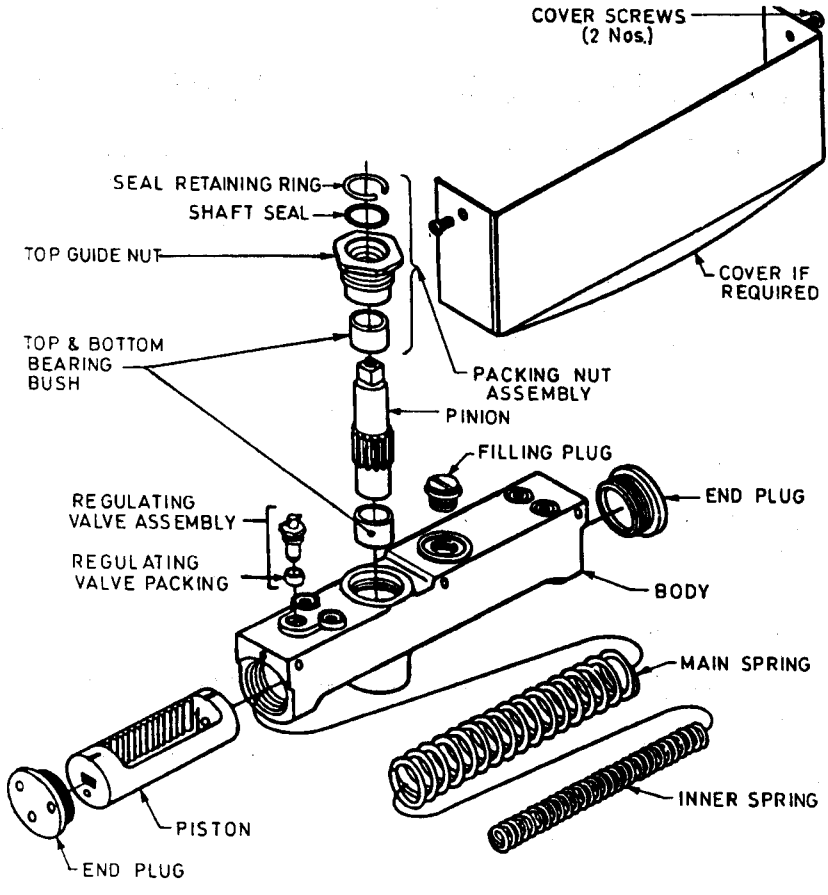

FIG. 1 MAIN COMPONENTS OF HYDRAULICALLY REGULATED CONCEALED TYPE DOOR CLOSER

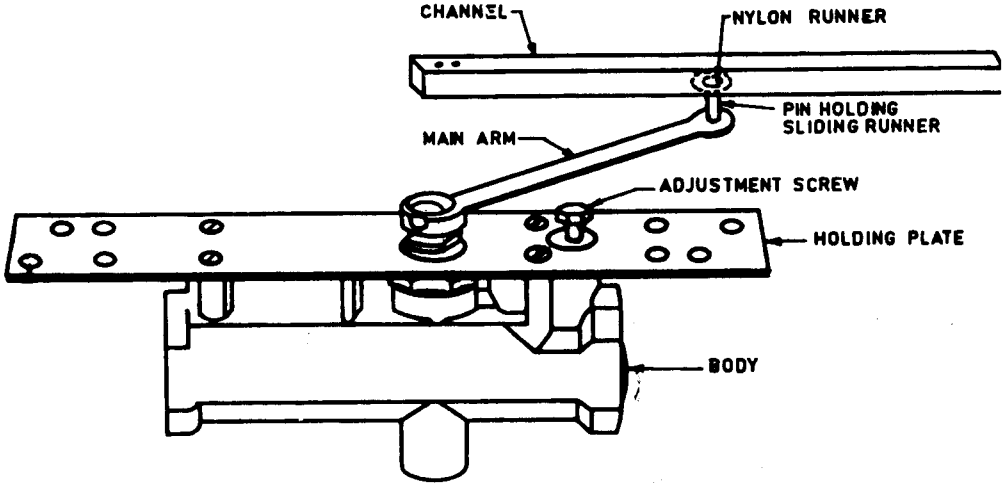

FIG. 2 TYPICAL ILLUSTRATION OF HYDRAULICALLY REGULATED CONCEALED TYPE DOOR CLOSER

Table 2 Materials for Component Parts of Concealed Door Closers (Hydraulically Regulated)

(*Clause* 6)

Sl No.	Component Part	Material	Indian Standard
i)	Non-Porous body	Aluminium alloy	IS 617
ii)	Piston	Steel/Cast iron	IS 7283/IS 210
iii)	End plug	Steel/Cast iron Aluminium alloy	IS 7283/IS 210/ IS 617
iv)	Main spring Inner spring	Steel	IS 7283
v)	Regulating valve packing	Neoprene rubber	IS 4253 (Part 1)
vi)	Regulating valve	Brass/Steel	IS 292/ IS 7283
vii)	All weather resistant homogeneous high viscosity hydraulic fluid	Hydraulic oil	IS 3098
viii)	Top and bottom Bearing/Bush	Needle bearing/ Brass alloy bush	IS 292
ix)	Pinion	Steel/Cast iron/	IS 7283/IS 210
x)	Top guide nut	Brass/Steel Cast iron	IS 292/IS 7283/ IS 210
xi)	Shaft seal	Mineral oil resistant material	—
xii)	Seal retaining ring	Brass/Steel	IS 292/IS 7283
xiii)	Aluminium sheet cover (if used)	Aluminium sheet/ extruded section	IS 737
xiv)	Holding plate	Mild steel sheet	IS 513
xv)	Main arm	Steel forging/ Cast iron	IS 1875/IS 210
xvi)	Nylon runner	Nylon	IS 4253 (Part 1)

shall be checked within 15 min of its conditioning. At the end of the test the closer shall show no defects or leakage of oil.

7.4 The main arm shall be securely fitted to the shaft by a square or hexagonal profile or profile of any other suitable shape or by any other suitable means, and a nut and a washer.

7.5 Provisions shall be made for securely fixing the door closer to the door frame in the channel provided for the runner connected to the main arm with a pin. The body shall be secured in the hole in the frame with screws on the holding plate. In case width of frame is equal to width of door closer, a set of plates shall be provided to cover the body from both surface of the panel with the help of screws.

7.6 The closers shall not show any signs of fatigue or leakage.

7.7 The top guide nut, end plugs shall be tightened firmly on the body and it shall be possible to remove the same whenever necessary for carrying out repairs, such as replacement of broken springs, oil seal etc.

7.8 The closer shall be capable to regulate the speed by extending spring or adjustment in control value screw, as the case may be.

7.9 A typical illustration of a door closer is given in Fig. 2.

NOTE — Figure 2 is intended to show component parts only and is not intended to limit shape or design.

8 FINISH

8.1 The door closer may be polished or painted and finished with lacquer in colours as agreed to between the purchaser and the manufacturer. In case of aluminium body, it may be anodized. In case anodizing is done, the thickness of the anodic coating shall not be less than Grade AC 15 of IS 1868.

8.2 Mild steel parts shall be given the treatment as given in **8.2.1** and **8.2.2**.

8.2.1 All dents, burrs and sharp edges shall be removed from various components and they shall be pickled, scrubbed and rinsed to remove grease, rust, scale or any other foreign element.

8.2.2 After pickling, all the mild steel parts shall be given phosphating treatment in accordance with IS 3618.

NOTE — Filler shall be applied to all surfaces requiring filling and shall conform to IS 110.

9 TESTS

The tests on door closers shall be carried out at ambient temperature given in Annex B.

10 MARKING

10.1 Each closer shall be marked with the following information :

a) Manufacturer's name or trade-mark;
b) Right closer, left closer or universal closer or 'R', 'L' or 'U' respectively;
c) Size of the closer;
d) Type of the closer; and
e) Serial number.

10.2 Each door closer may also be marked with the Standard Mark.

10.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standard Act,* 1986 and the rules and regulations made thereunder. Details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

11 PACKING

11.1 The door closer shall be packed in individual cardboard/ wooden boxes, with reinforcing boards or straw to prevent damage to painting. Packing shall be of such type and quality that it prevents ingress of the moisture during storage.

11.2 Each door closer shall be supplied with a list of accessories mentioned in **12** along with a leaflet furnishing instruction for its installation, use and maintenance.

12 ACCESSORIES

Each closer shall be supplied with one fitting key or a suitable spanner for adjusting speed regulating screw.

13 SAMPLING AND CRITERIA FOR CONFORMITY

13.1 Lot

All the door closers of the same nominal size and shape and from the same batch of manufacture, in one consignment, shall constitute a lot.

13.2 Sample Selection

13.2.1 The number of door closers to be selected at random from a lot shall depend upon the size of the lot and shall be in accordance with col 1 to 4 of Table 3.

13.2.2 The door closers shall be selected at random from the lot. For random selection of the door closers, the procedures for simple random sampling or systematic sampling as given in IS 4905 may be adopted.

13.3 Number of Tests and Criteria for Conformity

13.3.1 *For Construction, Finish, Dimensions, Interchangeability of Parts and Performance Tests*

All the door closers drawn in accordance with **13.2.1** and Table 3 shall be examined for construction, finish, dimensions, and interchangeability of parts and tested for performance. Any door closer failing in any one or more of these characteristics shall be considered as defective. If in the first sample, the number of defective door closers is less than or equal to the corresponding acceptance number, the lot shall be declared as conforming to the requirements of these characteristics. If the number of defective door closers is greater than or equal to the rejection number, the lot shall be deemed as not meeting with the requirements of these characteristics. If the number of defectives is greater than the acceptance number but less than the rejection number, a second sample of the size equivalent to that of the first shall be taken to determine the conformity or otherwise of the lot. The number of defective door closers found in the first and the second sample shall be combined and if the combined number of defectives thus obtained is less than or equal to the corresponding acceptance number, the lot shall be declared as conforming to the requirements of these characteristics.

13.3.2 *Endurance Test*

Two door closers in case of lot size 280 or less and five door closers in case of lot size more than 280 shall be selected from those already found satisfactory under **13.3.1**. These door closers shall be tested for the endurance test (*see* **B-1.5**). If all the door closers tested for the endurance test satisfy the requirements of the standard, the lot shall be deemed as having satisfied the requirements of the endurance test, otherwise not.

Table 3 Sample Size and Criterion for Conformity for Construction, Finish, Dimensions, Interchangeability of Parts and Performance Test

(*Clauses* 13.2.1 *and* 13.3.1)

No. of Door Closers in the Lot	Sample	Sample Size	Cumulative Sample	Acceptance Sample	Rejection Number
(1)	(2)	(3)	(4)	(5)	(6)
Up to 50	First	8	8	0	2
	Second	8	16	1	2
51 to 90	First	13	13	0	2
	Second	13	26	1	2
91 to 150	First	20	20	0	3
	Second	20	40	3	4
151 to 280	First	32	32	1	4
	Second	32	64	4	5
281 to 500	First	50	50	2	5
	Second	50	100	6	7
501 to 1 200	First	80	80	3	7
	Second	80	160	8	9
1 201 to 3 200	First	125	125	5	9
	Second	125	250	12	13
3 201 and above	First	200	200	7	11
	Second	200	400	18	19

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*	*IS No.*	*Title*
110 : 1983	Ready mixed paint, brushing, grey filler, for enamels for use over primers (*first revision*)	1868 : 1996	Anodic coatings on aluminium and its alloys (*second revision*)
210 : 1993	Grey iron castings (*third revision*)	1875 : 1992	Carbon steel billets, blooms, slabs and bars for forging (*fifth revision*)
292 : 1983	Leaded brass ingots and castings (*second revision*)	2507 : 1975	Cold rolled steel strips for springs (*first revision*)
513 : 1994	Cold rolled low carbon steel sheets and strips (*fourth revision*)	3098 : 1983	Specification for oil, hydraulic, mineral oil type (*second revision*)
617 : 1994	Aluminium and aluminium alloy ingots and casting for general engineering purposes (*third revision*)	3618 : 1966	Phosphate treatment of iron and steel for protection against corrosion
737 : 1986	Wrought aluminium and aluminum alloy sheet and strip for general engineering purposes (*third revision*)	4253 (Part 1) : 1980	Cork composition sheets: Part 1 Plain cork
742 : 1981	Zinc base alloy die castings (*second revision*)	4905 : 1968	Method for random sampling
		7283 : 1992	Hot rolled bars for production of bright bars and machined parts for engineering applications (*first revision*)

ANNEX B

(*Clause* 9)

TESTS ON CLOSERS

B-1 DETAILS OF TESTS

B-1.1 The closers shall be tested according to the sequence of instructions given in **B-1.2** to **B-1.5**.

B-1.2 Visual Inspection

The packing of the closers shall be inspected for conformity to **12**.

B-1.3 Surface

The surface of the closers shall be clean, without sharp edges, free from cracks, dents, burrs, or any other visible surface defects.

B-1.4 Performance Requirements

After being fitted in its position when the door is opened through 90°, the same should swing back to an angle of 20° ± 5° with normal speed, but thereafter, the speed should get automatically retarded and in case of doors with latches, it should be so regulated that in its final position the door smoothly negotiates with the latch.

B-1.5 Endurance Test

The closer selected in accordance with **13** shall be fitted to the test piece which shall be subjected to total 50 000 operations against the maximum load specified for the type of closer. The number of operations that shall be carried out continuously at any time during the test shall not be less than 2 500 to 3 000. One opening and closing shall constitute one operation. The test shall be conducted at the rate of 4 to 6 operations per minute. At the end of the test, the closer shall show no defects, failure or leakage of oil etc.

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Builders Hardware Sectional Committee, CED 15

Chairman

SHRI P. KRISHNAN

103, Charak Sadan, Vikaspuri, New Delhi 110 018

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