INTER PLANT STANDARD – STEEL INDUSTRY		
IPSS	**SPECIFICATION FOR DC FLUX DECAY TYPE TIMER RELAYS** *(FIRST REVISION)*	**IPSS:1-04-010-11**
	Corresponding IS Does Not Exist	Formerly: IPSS:1-04-010-84

0. FOREWORD

0.1 This Interplant Standard has been prepared by the Standards Committee on Switchgear & Controlgear, IPSS 1:4, with the active participation of the representatives of all the steel plants and established manufacturers of relays and was adopted in March 2011.

0.2 Interplant standards for steel industry primarily aim at achieving rationalization and unification of parts and sub-assemblies used in steel plant equipment and accessories, and provide guidance in indenting stores or equipment for existing or new installations by individual steel plants. For exercising effective control on inventories, it is advisable to select a fewer number of sizes (or types) from among those mentioned in this standard for the purpose of company standards of individual steel plants. It is not desirable to make deviations in technical requirements.

1. SCOPE

1.1 This Interplant Standard covers the performance requirements of attracted armature type of time delay relays working on the principal of flux decay and employed in the steel plants for delaying the closing or opening of the dc control circuits.

2. TERMINOLOGY

2.1 For the purpose of this standard, definitions given in IS 1885 (Part 9):1992 `Electrotechnical vocabulary: Part 9 Electrical relays' and IS 5834 (Part 1):1994 `Specification for electrical timer relays for industrial purposes: Part 1 Pneumatic' and IS 5834 (Part 2) `Specification for electrical timer relays for industrial purposes: Part 2 Motorized'.

3. SERVICE CONDITIONS

3.1 The following shall constitute the normal site conditions for the purpose of this standard:

a) *Ambient Temperature* - The reference ambient temperature shall be 50°C;

b) *Altitude* - the altitude shall not exceed 1000 m;

c) *Ambient Air* - The ambient air may contain fair amount of conductive dust; and

d) *Humidity* - The maximum relative humidity shall be 100 percent. However, both maximum temperature and 100 percent relative humidity may not occur simultaneously.

3.2 The relays shall be suitable for service on EOT cranes, transfer cars and such other mobile equipment with normal vibrations, and shall be able to withstand vertical impact 2 g, and horizontal impact 1 g.

3.3 The relay shall function reliably up to a maximum ambient temperature of 50°C.

4. DESIGN AND CONSTRUCTION

4.1 The relays shall be in open execution.

4.2 The mounting shall be made of either standard materials or a metal base which forms a part of the flux path to be fixed on to an insulated board. The type of mounting required shall be as specified by the purchaser.

4.3 The time delay shall be effected by one of the following means:

a) Non-magnetic shims, and
b) Adjustment of pull-off spring tension.

Time delay adjustment within the specified ranges shall be possible by the control of the above means at site. One spare set of non-magnetic shims shall be supplied with the relay to adjust the time delay.

4.4 Terminals

4.4.1 The terminals of the relay shall be of adequate size to accommodate at least two numbers of 2.5 mm^2 cables (solid or stranded conductors).

4.4.2 The terminals shall be suitable either for front connection or back connection which shall be interchangeable.

4.5 Contacts

4.5.1 The contacts shall be of adequate size with silver coating to ensure long electrical and mechanical life.

4.5.2 The number of time delay contacts available on the relay shall be four (2 NO + 2 NC).

4.5.3 The contacts shall be field-convertible, that is, it shall be possible to convert on the job from normally closed to normally open contacts or vice-versa.

5. RATINGS

5.1 Rated Coil Voltage

5.1.1 The rated coil voltages shall be one of the following values:

24 V, 48 V, 110 V and 230 V dc.

5.1.2 The coil shall be designed to withstand wide fluctuations in voltage and shall operate reliably within a tolerance limit of - 20 percent and + 10 percent of rated coil voltage.

5.1.3 The coil shall be of Class B or Class F insulation, and shall be able to perform reliably in enclosed Motor Control Centres (MCCs).

5.2 Contact Ratings

5.2.1 Rated contact circuit voltage - The rated contact circuit voltage shall be 450 V ac, 50 Hz; or 230 V dc.

5.2.2 Preferred rated currents

5.2.2.1 The preferred rated operational currents shall be 6 A ac/1 A dc.

5.2.2.2 The preferred rated thermal currents 10 A.

5.2.3 Utilization category - The contacts shall be suitable for conforming the utilization categories AC-11 and DC-11 of IS 13947 (Part 5 / Sec 1).

6. RATED TIME SETTING RANGE

6.1 The rated time setting range of the relay shall be any one of the following ranges:

a) 0.25 s - 1 s
b) 0.8 s - 2.5 s
c) 2.0 s - 3.5 s, and
d) 3.0 s - 5 s

7. OPERATING CHARACTERISTICS AND ACCURACY

7.1 **Rated Resetting Time** - The rated resetting time of the relay shall not be more than 0.1 s (100 ms).

7.2 **Limit of Error** - The permissible variation of the actual operating time from the setting time value shall be within 10 percent of the setting time at specified tolerance limits of voltage for the defined rated time setting ranges.

7.3 **Rated Switching Frequency** - The rated switching frequency of the relay shall be 600 operations per hour.

8. MECHANICAL ENDURANCE

8.1 The relay shall be capable of operating at least 30×10^6 times at the rated switching frequency with the contacts under no-load conditions without any mechanical failure.

9. ELECTRICAL ENDURANCE

9.1 The contacts of the relay shall be capable of making and breaking the currents specified under test conditions for load operation corresponding to the utilization categories [see IS 13947 (Part 5/Sec 1)].

The minimum number of operations shall be 3×10^6 times.

NOTE: For test on contacts for dc L/R shall be taken as equal to 40 ms + 15 percent and this value shall be substituted under relevant place in IS 13947 (Part 5/Sec 1).

11. MARKING

11.1 The following information shall be marked distinctly and permanently on the name-plate of every relay which shall preferably be affixed to the relay in such a position where the markings are visible and legible when the relay is installed:

a) Manufacturer's name;
b) Manufacturer's type reference;
c) Rated coil voltage dc;
d) Rated contact
e) Rated operational current of the contact ac/dc;
f) Rated time setting range;
g) Serial number/year of manufacture; and
h) Reference to this IPSS, that is, IPSS:1-04-010-11.

11.2 All the technical details of the relay shall be given in a separate leaflet which shall include the following details:

a) Overall dimension and mounting details;

b) List of all components with parts numbered;

c) Procedure for maintenance, overhauling, reassembly and adjustment of contact gaps and pressure;

d) Procedure for adjustment of time delay by non-magnetic shims or by the pull-off spring or both, and different ranges of time delay for which these adjustments may be applied;

e) Design, shape and thickness of the shims being used in the relay; and

f) Weight of relay.

12. TESTS

12.1 The tests shall be carried out in accordance with IS 5834 (Part 2):1993. However, for the following type tests, relevant provisions of corresponding tests conforming to IS 13947 (Part 5/Sec 1) are also applicable:

a) Verification of mechanical endurance,
b) Verification of electrical endurance, and
c) Verification of rated making and breaking capacity