INTERPLANT STANDARD — STEEL INDUSTRY

IPSS	SPECIFICATION FOR ELECTRIC WINCH	IPSS : 1 - 07 - 033 - 86
	CORRESPONDING INDIAN STANDARD DOES NOT EXIST	...ED COPY

0. Foreword

0.1 Interplant standardization activity in steel industry has been initiated under the aegis of the Bureau of Indian Standards (BIS) and the Steel Authority of India Ltd (SAIL). This Interplant Standard prepared by the Standards Committee on Paints and Portable Maintenance Equipment, IPSS 1:7, with the active participation of the representatives of all the steel plants and established manufacturers of winches, was adopted by the Approval Committee on Consumable Stores and General Equipment, IPSS 1, on 14 October 1986.

0.2 Interplant Standards for steel industry primarily aim at achieving rationalization and unification of parts and assemblies used in steel plant equipment and accessories, and provide guidance in indenting stores or equipment (or while placing orders for additional requirements) 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.

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1. Scope - This Interplant Standard specifies the operation, manufacture and testing of electrically operated portable (Type 1) and base mounted (fixed) (Type 2). These winches are suitable for hauling of material during erection and transfer of material from pre-determined location.

1.1 The detailed classifications, ratings, etc, have been separately indicated in Table 1 for portable type and Table 2 for fixed type winches.

2. Portable Winch (Type 1)

2.1 The portable winch shall be light yet sturdy in construction. The winch shall be provided with tabular towing arrangement.

2.2 The winch shall conform to the ratings specified in Table 1.

TABLE 1 RATINGS OF PORTABLE WINCHES

Sl No.	Capacity in tonnes	Maximum Speed in m/min	Rope dia in mm	Motor in kW (H.P.)
1	3	5	19	4(5.5)

2.3 The arrangement consists of electric motor, drum with wire rope, V belt drive and spur gear with pinion system, for transmitting power to the rope-drum.

2.4 The winding drum shall be easily disengaged from the drive for pulling out the wire ropes and to couple with the load.

2.5 The size and type of wire rope to be used shall be right hand lay, fibre core 6 x 36 construction and 19 mm dia.

2.6 If a rope-guide is provided, it shall be suitable to withstand oblique pull up to 15.

Amendments Issued (*to be filled up by the user department*) :

No.	Date of Issue	No.	Date of Issue
1		3	
2		4	

UDC 621.864-83

3. Components (Type1)

3.1 *Mechanical*

3.1.1 The open spur gear and pinion arrangement shall be grease lubricated. The pinion shall be made of 42 Cr. Mo. 4 steel forgings (*see* IS 1570:1961 Schedules for inrought steel for general engineering purposes) and the gear shall be machined from C 50 rolled stock conforming to IS 2004:1978 'Specification for carbon steel forgings for general engineering purposes (*second revision*)'.

3.1.2 The drums and spurgear shall be mounted on the same shaft. The drum shall be made of rolled or cast steel conforming to IS 1030:1982 'Specification for carbon steel castings for general engineering purposes *(third revision)*' with flanged and grooves conforming to Fig 1.

3.1.3 The winch shall be operated from pre-determined locations by having a cast iron anchor fact embedded in concrete foundations. The connection between C.I. anchor foot and the winch shall be by a detachable pin.

3.1.4 The winch trolley shall be provided with 2 number of solid cured on type rubber tyred wheel of 16" x 4" size (ITTAC - 1977) fitted with antifriction bearing and dust seal.

3.2 Electrical

3.2.1 Heavy duty air-brake fuse switches conforming to IS 4064:1978 shall be provided at a suitable location on the winch.

3.2.2 The control panel shall be front wired, wall mounting totally enclosed, dust and vermin proof, direct on line reversing type and suitable for 415V, 3 phase 50Hz supply system. The control panel componants have been mentioned in 7.1.1.

4. Fixed Winch (Type-2)

4.1 Fixed type consists of a M.S. fabricated rope drum driven by squirrel cage induction motor through totally enclosed worm gear boxes fitted from both sides. The gearboxes shall be connected to the motors through flexible couplings.

4.2 The winch shall conform to the ratings specified in Table 2.

TABLE 2 RATINGS OF FIXED WINCH

Sl No.	*Capacity in tonnes*	*Maximum Speed m/min*	*Rope dia in mm*	*Motor kW (HP)*
1	3	10	19 (6/36 hemp core)	7.5 (12.5)

5. Components (Type 2)

5.1 *Mechanical*

5.1.1 *Gear box* - Under driven worm reduction gearbox, 1 000 CD, with 100:1 reduction ratio, input kW 7.5 (12.5 HP).

5.1.2 *Rope drum* - Drums made of rolled or cast steel (*see* IS 1030:1982) with flanges and grooves conforming to Fig. 1.

5.1.3 *Coupling* - Bush pin type flexible coupling conforming to IPSS : 1 - 01 - 003 - 86 (*under revision*)shall be used.

5.2 Electrical

5.2.1 *Motor* - Two numbers squirrel cage induction motors of 415V, 50Hz, 3 mounted and crane duty type (7.5 kW), rated at 40 percent cycle duration factor, duty type S4 and 1C 0141 cooling (IS 6362:1971) and shall conform to IS 325:1978 'Specification for three - phase induction motors *(fourth revision)*'.

5.2.2 *Brake* - D.C. electromagnetic shoe type (203 mm drum dia) brake shall be used. The brake shall be adequately covered and shall conform to IPSS : 1 - 08 - 005 - 86.

5.2.3 *Limit switch* - Two numbers rotary type limit switch shall be used and be provided with 2 N.C. contacts for either limit. It shall be connected to the output shaft extension of the gear box.

6. **General Specification** - The mentioned requirements shall be applicable for both Types 1 and 2 winches.

6.1 *Control Panel* - The panel shall be front wired (with 2.5 mm² copper PVC cables and Elmex type terminal) wall mounting, totally enclosed, dist and vermin proof, direct-on-line reversing type and suitable for 415 V, 3 ϕ, 50 Hz supply system. The control voltage shall be 110 V, ac, 50 Hz.

6.1.1 Panel componants

a) Two numbers 70 A TP contactor;

b) One number TP, bimetal, overload relay (12-24A);

c) One number Ammeter 96 x 96 mm (0-50/150-A);

d) One number TP incoming switch (60 A);

e) Three numbers incoming fuses (60 A);

f) Four numbers control fuses;

g) One number 415/110 V, control transformer;

h) Two numbers push botton for forward/reverse;

i) One number push button for stop; and

k) One number pilfer - proof lock with key.

6.2 *Safety Aspects*

6.2.1 There shall not be any moving part uncovered and no protrusions which might cause obstruction are permissible.

6.2.2 The paul and ratchet type locking mechanism shall be obsolutely sturdy and defect free.

6.2.3 There shall be 2 indicating lamps, one for overload relay trip and the other for power on.

6.3 *Painting* - The complete equipment (except motors, brakes, internal componants, cables, etc) shall be pained with suitable primer and two finish coats of anticorrosive paints [*see* IS 5:1978Colour for ready mixed paints and enamels (*third revision*)]

6.4 *Testing and Inspection*

6.4.1 The winch shall be load tested at 25 percent overload. Test certificate shall be furnished by the manufacturer.

6.4.2 The winch shall take on overload for 2 min beyond which the motor shall trip.

6.5 *Approval* - The manufacturer before taking up the job shall furnish three copies of general arrangement of the winches giving the following information:

a) Overall dimensions of mountings,

b) Bearing detail,

c) Rope clamping arrangement,

d) Electrical schematic and wiring diagram,

e) Lubrication details, and

f) Details of electric and their make.

6.6 *Guarantee* - The party shall replace defective spares free, if the failure occurs within 18 months from the date of supply or 12 months from the date of comissioning, whichever is earlier.

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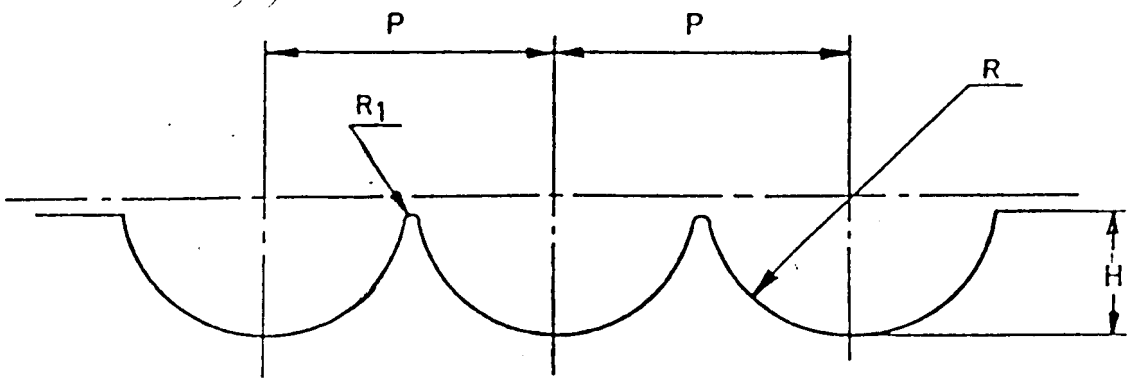

Sl No.	ROPE DIA	P	R	R_1	H
1.	14	16.5	5	0.5	6
2.	16	18.5	9	0.75	6.5
3.	20	22.5	11	1	8
4.	22	25	12	1.25	9
5.	26	29.5	14	1.5	10.5
6.	28	32	15	1.75	12
7.	32	36	17	2	14
8.	36	40	19	2	15
9.	40	45	21	2	19

FIG.1 ELECTRIC WINCH

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