INTER PLANT STANDARD - STEEL INDUSTRY

IPSS	SPECIFICATION FOR ARC WELDING TRANSFORMER *(THIRD REVISION)*	IPSS:1-07-001-95
	Based on IS 1851:1975	Formerly: IPSS:1-07-001-88

0. FOREWORD

0.1 This Inter plant 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 Welding Cable Connector and was adopted in January 1995.

0.2 This Inter plant Standard which was based on IS 1851:1966 and was originally published in April 1975. Subsequently it was revised first in 1982 and then in 1988.

0.3 A Seminar-cum-Workshop on Welding Equipment was held at Bangalore in June 1989 where representatives of the steel plants and manufacturers presented several papers relating to the subject and problems relating to each manufacturers were discussed. Based on the feedback, this third revision has been carried which envisages welding transformers of current rating of 400 and 600 A as well as provision relating to swivelling arrangement, draw-bar spring, body stability, cable connecting terminals, dual continuous control system and earthing.

1. SCOPE

1.1 This Interplant Standard covers the requirements for portable, single operator type arc welding transformer for 400 & 600 A for manual metal-arc welding and is generally based on IS 1851:1975 'Specification for single operator type arc welding transformers (second revision)'.

2. SITE CONDITIONS

2.1 Site conditions shall be as given in Basic Parameters for Standardization of Steel Plant Equipment, IPSS:1-02-020-84.

2.2 For special applications where steam and corrosive fumes are present, details shall be as agreed to between the manufacturer and purchaser.

3. REQUIREMENTS

3.1 General

3.1.1 The set shall be mounted on solid wheels. The solid wheels shall be constructed with UHMWPE (Ultra High Molecular Weight Polyethelene) having 254 mm O.D.x 50 mm width x 25 mm bore and shall have the following properties:

Hardness: 70-80 Shore-D	-	ASTM D 785
Heat Deflection temp: 100 deg C (At 4.5 Kg/sq cm)	-	ASTM D 648

Tensile strength: 500 kg/sq cm	-	ASTM D 638
Abrasion Loss: 3 x 10^{-3}/ 100 revolution on Tabor abrasion wheel	-	DIN 53754

3.1.2 An efficient swivelling arrangement with front wheels to be steered by a draw bar shall be provided. However, for air cooled sets, two wheel arrangement is permissible.

3.1.3 The draw bar shall be provided with a spring axially mounted at its hinge for automatic return to the vertical position. It shall also be provided with a hook at a suitable location for the purpose of locking in vertical position while being hoisted for transportation.

3.1.4 Four numbers of eye bolts shall be provided for lifting of the set.

3.1.5 The minimum ground clearance (clearance between the lowest part of the enclosure of the transformer set and the ground) shall be 150 mm.

3.1.6 The design of the welding machine shall be such that it is stable while being manually transported.

3.1.7 Voltmeter and ammeter of suitable rating shall be provided with the set, if specified. The mounting of volt meter and ampere meter shall be a matter of agreement between the supplier and the user.

3.1.8 Oil level indicator of dip stick type marked with minimum and maximum levels shall be provided for oil cooled welding machines.

3.2 Technical

3.2.1 The requirement with respect to terminology, rating, normal service conditions, design and construction, control and protective devices, performance, marking and tests as specified in IS 1851:1975 shall apply to this Interplant Standard.

3.2.2 The set shall be of drip-proof construction.

3.2.3 The transformer primary shall be suitable for connection to two lines of 415 V $\pm$ 6 percent, 3 phase, 50 Hz $\pm$ 3 percent, supply. An additional tapping for 380 volts shall be provided, if so specified.

3.2.4 The rated secondary open-circuit voltage of the welding transformer shall have two settings one of 80 V and the other of 100 V.

3.2.5 A robust, heavy duty, sheet metal-clad air-break double pole, 100 A, 415 V, non-fusible switch conforming to Parts 1 and 2 of IS 4064:1978 shall be suitably mounted on the set. The transformer primary shall be connected to the switch by two single-core cables of adequate size and protected against mechanical injury.

3.2.6 Coils shall be firmly fitted in the core of the transformer.

3.2.7 Output cable connection to the machine shall not be directly to the terminal. For this purpose, an L-shaped bracket shall be provided for cable connection, with one end of the bracket fixed to the terminal.

3.2.8 Stepless control shall be provided for current regulation, suitable for operation on load.

3.2.9 The internal windings and wiring up to the terminals of the transformer shall be of copper.

3.2.10 All the terminals and lugs provided in the transformer set and switch shall be suitable for connection to aluminium conductor cables of appropriate size.

3.2.11 Maximum continuous hand welding current shall be 400 A corresponding to an open circuit voltage of 80 V at 60% duty cycle with a 5 minute cycle time. The minimum rating at 60% duty cycle for both 400 & 600 A (for users'guidance only) at various temperatures shall be as follows:

	40°C	45°C	50°C
For 400 A machines	400	375	350
For 600 A machines	600	565	530

3.2.12 The kVA at rated output of 400 A & 600 A machines shall be 32 kVA and 48 kVA respectively.

3.2.13 The operator shall be able to change the current settings while the machine is in operation with the help of a suitable current regulator which is not affected by vibrations.

3.2.14 Transformer shall be air-cooled/oil cooled sets, the transformer oil shall conform to IS 335:1972 'Specification for new insulating oils for transformers and switchgear (second revision)'.

4. EARTHING

4.1 Two earthing terminals shall be provided for two separate and distinct connections to earth of all metallic parts which are not intended to carry current. Earthing terminals shall be suitably protected against corrosion and shall be metallically clean. Earthing terminals shall be indelibly marked with symbol.

5. INFORMATION TO BE FURNISHED BY THE SUPPLIER

5.1 The supplier shall furnish the following with the transformer:

a) illustrative catalogue with detailed description for the operation and maintenance of the machine,

b) recommended list of spares, and

c) type test report.