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Stationary type single phase AC spot welding machines

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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JAPANESE INDUSTRIAL STANDARD

JIS C 9303 : 1993
(Reaffirmed: 1998)

Stationary type single phase AC spot welding machines

1 Scope This Japanese Industrial Standard specifies stationary type spot welding machine, hereafter referred to as "welder" , composed mainly of a single phase transformer of a frequency of 50 Hz or 60 Hz, electronic switch and a pneumatic electrode pressing device, and principally used for welding thin steel plates.

Remarks : The normative references to this Standard are as follows.

JIS C 9305 *General rule for resistance welding machines*

JIS C 9313 *Control equipments of resistance welding machines of lap joint*

JIS C 9319 *Thyristorstacks for resistance welding machine*

JIS G 3452 *Carbon steel pipes for ordinary piping*

2 Definitions For the purpose of this Standard, the following definitions apply:

(1) **duty cycle** The ratio of on-load time to the total period when a constant load is intermitted, as expressed in percentage.

(2) **rated capacity** The on-load input power which complies with the specified temperature rise when a welder is loaded at the rated input voltage of rated frequency and a duty cycle of 50 % by adjusting the load, as expressed in kVA.

(3) **maximum input voltage at no-load** The maximum voltage which can be applied across input terminals of a welder.

(4) **input voltage at maximum load** A voltage across input terminals of a welder when the rated maximum welding current is passed.

(5) **maximum secondary no-load voltage** A secondary open-circuit voltage when the rated input voltage is applied to the tap which can produce the maximum current of a welding transformer.

(6) **maximum short-circuit current** A current flowing through the secondary circuit when the maximum on-load input voltage of rated frequency is applied to the tap which can produce the maximum current of a welding transformer while the upper and lower electrodes are short-circuited under the standard throat dimensions.

(7) **maximum welding current** A current equal to 90 % of the maximum short-circuit current.

(8) **rated maximum welding current** A nominal current stated in the nameplate corresponding to 90 % of the maximum short-circuit current.

(9) **rated maximum welding input power** The apparent power at the input side when the rated maximum welding current is passed, as expressed in kVA.

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(10) **allowable duty cycle at rated maximum welding current** The allowable value of duty cycle in compliance with the specified temperature rise when the relay interrupts the rated maximum welding current under the rated voltage of rated frequency, provided the period of interrupting the rated maximum welding current is 60 sec.

(11) **rated welding force** A pressing force of electrodes which is guaranteed when compressed air of 490 kPa is used under the standard throat dimensions.

(12) **standard throat depth** The distance between the center line of electrode holders and the front face of a welder body.

(13) **horn spacing** The distance between the upper arm mechanism and lower arm mechanism when movable parts thereof are set to their standard positions.

The standard positions of upper and lower arms are such positions where the upper arm is raised 15 mm above the lowest position of electrode stroke and the lower arm is so adjusted that the interval between the two arms is minimum.

(14) **stroke of electrode** A vertical span in which the upper electrode of a welder can make up-and-down movements.

(15) **standard height of working place** The height from the floor to the center line of the horn spacing (standard value).

3 Classification Welders are classified by the types and characteristics as given in Table 1.

Table 1 Classification of welders

Type		Rated capacity (duty cycle 50 %) kVA	Standard throat dimensions		Rated maximum welding current A	Rated welding force kN	Stroke of electrode mm	(informative) Allowable duty cycle for rated maximum welding current (approximate value) %
Press type	Rocker-arm type		Throat depth mm	Horn spacing mm				
P1	R1	15	400	200	9 000	2.9	40	8
P2	R2	25	600		12 000	4.4	50	7
P3	R3	30	400		15 000	5.9		6
P4	R4	35	600					
P5	R5	50	400		18 000	9.8	60	8
P6	R6	75			22 000			7

Remarks 1 Symbols used for type designation mean the following:

P : press type R : rocker-arm type

2 When there is no ambiguity, type P1 and type R1 may be called type 1, and this can be extended to types 2 to 6.

4 Standard service conditions The standard service conditions shall comply with 3 of JIS C 9305.

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