

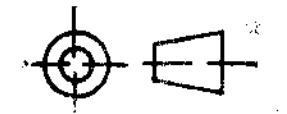
NOTE:

- 1) ALL DIMENSIONS ARE IN MM.
- 2) RATING OF THE SHUNT FOR OF RELAY - 1000 AMPS/285 mV.
- 3) ALL BRASS PARTS ARE TO BE NICKEL PLATED.
- 4) ALL STEEL PARTS ARE TO BE CADMIUM PLATED & PASSIVATED.
- 5) SHUNT AND BLOCKS TO BE ELECTRO TINNED INCLUDING THE BEARING JOINTS.
- 6) A BLACK ENAMEL COATING IS TO BE PROVIDED ON THE SURFACE OF THE MANGANIN WIRE.
- 7) 'A' & 'B' ARE THE LOCATIONS WHERE TEMPERATURE RISE IS TO BE MEASURED.
- 8) NICKEL AND CADMIUM PLATING SHALL BE CARRIED OUT IN ACCORDANCE WITH IS: 2016.

QTY.	MATL.	SPECN.	WT.
4	STEEL	IS:1364	CAD PLTD.
4	SPR.STL	IS: 3063	-DO-
6	STEEL	IS: 2016	-DO-
4	BRASS	IS: 2016	-DO-
2	SPR. STEEL	IS: 3063	-DO-
-	MANGANIN	-	-
2	COPPER	IS:1897	ELECTRO TINNED
2	STEEL	IS:1364	CAD PLTD.
2	BRASS	IS: 2389	NICKEL PLTD.

RATING -
1000 AMPS, 285 mV.
SHUNT FOR OF
RELAY FOR WAG-7
& WAP-4/6 CLASS
OF LOCOMOTIVES

CHITTARANJAN
 LOCOMOTIVE WORKS
 WEST BENGAL, INDIA



APPROVED -
 No. CLW/ES/SK-1/S-30
 SEE SHEET END.

TENDER SPECIFICATION

No. CLW/ES/S-30

ALT

ENCLOSURES :

1. DRG.No. CLW/ES/SK.1/5-30

ALT

2. DRG.NO.

ALT

TOTAL NO. OF SHEETS IN THIS SPEC. --- 9

ALT.
SHEETSSPECIFICATION OF
SHUNT FOR GP RELAY
25 KV AC ELECTRIC LOCOMOTIVES
CLASS: WAG7 & WAP1ISSUED BY
DY.CHIEF ELECTRICAL ENGINEER(D&D)
CHITTARANJAN LOCOMOTIVE WORKS
P.O. CHITTARANJAN - 713331
DIST. BURDWAN, WEST BENGAL, INDIA.

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SPECIFICATION OF SHUNT
FOR GP RELAY FOR WAG-7
WAP1 CLASS OF LOCOS.विद्युत रेल इंजन कारखाना
वीरभद्र नगर, बर्धम
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIAप्रा.सि.व. (अ.सि.)
DY. CEE. (D)क्रमा/NO. CLW/ES/ S-30
दिनांक/DATE : NOV, 2000

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SPECIFICATION OF SHUNT
FOR OF RELAY FOR WAG7 &
WAP4 CLASS OF LOCOM.


डि. जे. सी. ई. (डी.)
DY. CEE (D)

चितरंजन लोकोमोटिव वर्क्स
वर्क्स प्रा. लि.
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA

क्रमांक/NO. CLW/ES/S-30
दिनांक/DATE: NOV, 2000

1.0 SCOPE

1.1 This specification covers the requirements of shunts for QF Relay for use on Electric locomotives.

2.0 GOVERNING SPECIFICATION

2.1 Assistance has been taken for the preparation of this specification from appendix C of IS:1248-1983 for Direct acting Electrical indicating instruments and shunts. IS:1068:1993 have been referred for Electroplated Coating of Nickel and Cadmium.

3.0 SERVICE CONDITIONS

3.1 The shunts for QF Relay covered by this specification are mounted on Hylam bars in panels of electric locomotives and are subjected to work in an ambient temperature varying from 0°C to 55°C with a maximum humidity of 100% and at an altitude of 1000 metres above mean sea level. The environment is dusty and the shunts are subjected to continuous vibrations as encountered on Electric Locomotives.

4.0 TECHNICAL SPECIFICATION

4.1 a) Materials-(i) Manganin Resistance strips/wires as resistance elements. The wire/conductor used for winding precision shunt resistor should preferably undergo negligible changes in resistance over a wide range of operating temperature. Manganin wire/conductor having resistance/temperature curves that follow parabolic curve are recommended as ideal for this purpose, provided that their temperature of peak resistivity occurred as near as ambient temperature.

(ii) Electrolytic copper to IS:1697.

b) Resistance - Resistance of shunt - 285 micro ohms $\pm 1\%$ under hot condition (i.e. at 147°C)

c) Voltage drop at rated current - 285 $\pm 1\%$ millivolt under hot condition.

d) Temperature rise-(i) With the rated current passing through the shunt, the temperature rise at the middle of the manganin element when stabilised shall not exceed 92°C corresponding to an ambient of 55°C (Total temperature not to exceed 147°C)

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DIN.

SPECIFICATION OF SHUNT
FOR QF RELAY FOR WAG7 &
WAP4 CLASS OF LOCOMOTIVES


14/11/88
अधीन (अधीन.)
DY. CEE (D)

विद्युत रेल इन्जन वाहक
संकेत अधीन, अधीन
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WEST BENGAL, INDIA
अधीन/NO. CLM/ES/S-30
दिनांक/DATE: NOV, 2000

(ii) Temperature rise at the end terminals shall not exceed 52°C corresponding to an ambient of 55°C (Total temperature not to exceed 117°C).

4.2 The shunts for QP relays shall conform to the dimensions specified in CLW Drg.No. CLW/ES/SK-1/S-30

4.3 Marking-Each shunt shall be distinctly and idelibly marked with the following information:—

a) Manufacturer identification marks, Sl.No., Month & year of manufacture.

b) Rated current and corresponding voltage drop in millivolt.

5.0 TESTS

5.1 Visual Examination & checking for Mechanical and Physical requirements.

5.2 Each shunt for Inspection, shall be examined visually for any cracks as well as checked for physical, mechanical and marking requirements as well as quality.

5.3 Voltage drop at rated w current

The voltage drop test shall be carried out by injecting full rated current of 1000 A into the shunt. The value of voltage drop ~~at~~ condition shall be within $265 \pm 1\%$ millivolt.

5.4 Temperature rise test

The test shall be carried out at the rated current of 1000 Amps. After attaining the steady state condition of temperature, the temperature rise shall be measured by using thermo couple or a precision thermometer at the ends and at the middle as shown in the Drg.No. CLW/ES/SK-1. The temperature rise at the middle of the shunt shall be the average of temperature measurements taken on individual elements. The temperature rise shall not exceed the limits laid down under Clause 4.1(d) of this specification.

5.5 Load Test

The test shall be carried ^{out} as per para-5.4. This test is conducted to determine the hot resistance at full load current and the voltage drop at steady state condition.

- 1) Measure Hot resistance after stabilising of temperature at full load current of 1000 Amps.

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SPECIFICATION OF SHUNT
FOR QP RELAY FOR WAG7 &
WAP4 CLASS OF LOCOMOTIVES


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WEST BENGAL INDIA

क्रमांक/NO. CLW/ES/S-30
दिनांक/DATE: Nov, 2000

- ii) Measure voltage drop at full load current of 1000 amps. and shall not exceed 285 mV \pm 1% in hot condition.

5.6 Special test

After removing the hardware, from the shunt particularly the spring washers, the shunt shall be hung in an oven by one end terminal with a load of about 2 Kg. hung from the other(Lower) terminal. The shunt shall be subjected to a temperature of 250°C for 5 hours. This test shall not show any sign of softening of brazing alloy at the joints of manganin elements with the end terminals and shall also not result in change of the value of 285 mV when passing 1000 Amps. compare the readings recorded earlier.

6.0 TYPE TEST/ROUTINE TESTS

The test given under type tests shall be conducted on prototype samples as well as on samples required for consistency test and such tests from time to time to ascertain the consistency in the quality of the shunts. Routine tests shall be conducted on each shunt.

Sl. No.	Type Test	Routine Test
i)	Dimensional checks	Yes.
ii)	Visual Examination & checking for mechanical & physical requirement	Yes.
iii)	Cold resistance	Yes.
iv)	Temperature rise test	-
v)	Load test for determining the hot resistance of the shunts	-
vi)	Voltage drop test at rated current	Yes.
vii)	Special test	-

7. APPROVAL OF SAMPLES

- 7.1 The contractor shall make two prototype samples of shunts proposed to be supplied by him for inspection/tests at their works and advise the Dy. Chief Electrical Engineer(Design)/CLW/Chittaranjan and Controller of Stores, Calcutta as and when they are ready with the prototype samples and necessary testing & measuring apparatus and facilities for carrying out the test.

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SPECIFICATION FOR SHUNT FOR GP RELAY FOR WAG7 & WAP4 CLASS OF LOCOMOTIVES


N. J. D.
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क्रमांक/NO. CLW/ES/5-30
दिनांक/DATE: NOV, 2000

7.2 The contractor shall not offer shunts of series production to the Inspector authorized under the contract until prototype has been finally approved.

7.3 Technical Documents to be furnished by the contractors.

7.4 The following documents shall be supplied by the contractors.

i) Type test report.

This shall be supplied in 'A4' size of sheets with punched holes. It shall be suitably enclosed in a cover. Type test reports shall be signed both by the Contractors Engineers & CLW's Engineer. Ordinarily 4 copies of the report shall be supplied.

ii) Routine Test certificate.

This shall be supplied in Standard 'A4' size of sheets with punched holes. Routine test certificates shall be submitted along each batch of shunts in 3 copies.

8.0 Tender Papers

8.1 All tender documents including the quotation shall be submitted in duplicate.

The tenderer shall give sufficient information to prove that their factory has adequate facilities and capacity to manufacture and test the shunts for QF Relay to meet fully the technical requirements of the specification and quality of material and workmanship. The data asked for in Annexure 'A' must be supplied with Tender documents. Quotations shall not be considered complete until all technical data, drawings and other relevant information are furnished along with the tender. Tenders not accompanied by these documents are liable for rejection.

9. CONDITION OF CONTRACT

The standard IRS Conditions of contract will be applicable for the supply of the equipment.

100 GUARANTEE

The contractor shall give a guarantee of clear 18 months from the date of supply or 12 months on all shunts for QF relay from the date of commissioning of the shunts on the locomotives whichever is earlier for the shunts with any damage or defect, noticed during the period due to defective material or workmanship will have to be replaced by the contractor free of cost.

SPECIFICATION FOR SHUNT
FOR QF RELAY FOR WAG7 &
WAP4 CLASS OF LOCOM.


14/11/04
अ.स.वि.व. (अ.स.)
DY. CEE. (D)

निर्दिष्ट रेल इंजन कारखाना
वीरक बंगला, मुर्शिदाबाद
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL INDIA
क्रमांक/NO. CLW/ES/5-30
दिनांक/DATE: NOV, 2000

अधिकारी
DRN.
अधीन
CHKO

11. SPECIAL CONDITION

Once a prototype is approved no contractor shall change this source of supply or sub-contractor for purchased components and sub-assemblies without CLW's approval.

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DRN. / CHKD

SPECIFICATION OF SHUNT
FOR OF DELAY FOR WAG7
& WAP 4 CLASS OF LOCOMS.

[Signature]
DY. CEE (D)

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WEST BENGAL INDIA
क्रमांक/NO. CLW/ES/S-30
दिनांक/DATE: NOV, 2000

ANNEXURE 'A' TO SPECIFICATION NO. CLW/ES/S-3o FOR SHUNT
FOR QP RELAY

Along with the tender documents the following data must be supplied by the tenderers in a separate sheet, failing which their offer will be considered incomplete and is likely to be ignored/rejected.

1. The tenderers shall indicate whether they have supplied/are supplying identical/similar/items/equipments to Indian Railway/Public Sector undertaking/other agencies. If so, full details should be furnished along with the service performance of their products.
2. Full technical details with regard to manufacturing facilities, plant & Machineries, testing equipment/facilities, measuring instruments, available at their works.
3. The tenderers shall furnish full details with regard to the quality assurance department working in their factory together with the full details of the documents maintained by their inspectors. They should also ensure that to sustain the quality of their products, type tests are conducted by them at appropriate intervals without affecting the delivery stipulations to suit CLW's Loco Production requirements.
4. They must ensure that the hardware items, such as bolts, screws etc. are procured by them from the manufactories of repute. It should also be ensured that necessary identification marks are available on the supplies at conspicuous location.
5. Complete data sheet of the product clearly indicating the deviations, if any, with respect to the specs./Drgs. is to be enclosed. In case such deviation is not required a declaration that "No deviation is required" shall be indicated by the tenderers.

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SPECIFICATION OF SHUNT
FOR QP RELAY FOR WAG7
& WAP4 CLASS OF LOCOMS.


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CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL INDIA
क्रमांक/NO. CLW/ES/S-30
दिनांक/DATE: NOV, 2000

संज्ञित
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