

TENDER SPECIFICATION NO.
 CLW/ES/R-34 WITH STUB No.
 CLW/ES/SK.1/R-34A/C
 CLW/ES/SK.2/R-34A/C

SPECIFICATION FOR DIAPHRAGM
 TYPE AIR FLOW RELAY FOR 25KV
 AC ELECTRIC LOCOMOTIVES
 CLASS WAG-5, WAP, WAG-7, WCM-6/WCG-3.

TOTAL SHEETS - 10

CHITTARANJAN LOCOMOTIVE WORKS
 CHITTARANJAN: BURDWAN
 WESTBENGAL
 INDIA

SPECIFICATION FOR
 DIAPHRAGM TYPE
 AIR FLOW RELAY.

Rajal Chandra
 (S.T.C.E.E. (S.D.))

CHITTARANJAN LOCOMOTIVE WORKS
 WEST BENGAL, INDIA.

No. # CLW/ES/R-34/C

DATE: JULY 1991

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C	19-8-98	SHEET NO-6 DELETED, SHEET-6A ADDED, PICK UP, DROP OUT, DIFFERENTIAL VALUE AND TOLERANCES ARE ADDED VIDE R.D.S.O. / LKO LETTER NO. EL/3-2-39/4 DATED 18/13-6-98	19-8-98 19-8-98
B	30-10-97	CUT-IN AND CUT-OUT VALUE IS CHANGED IN SHEET-6 VIDE R.D.S.O./LKO LETTER NO. EL/3/2-B9/4 DATED 16-5-96.	30-10-97
A	31-8-94	BASKET DRAWING INCLUDED	31-8-94

ALT	DATE	DESCRIPTION	SIGNATURE	REMARKS
		SPECIFICATION FOR DIAMBAH TYPE AIR FLOW RELAY		
		CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL, INDIA.		
		No. CLW/ES/R-34/C		
		DATE: JULY, 1991		

Signed
 (D.C.E.E. (S.D.))

SCOPE

This specification covers the manufacture and supply of Diaphragm type Air Flow Relay for installation on the 25 KV Single Phase, 50 C/s., A.C. Electric Locomotive of the Indian Railways.

SERVICE CONDITIONS.

The Relay covered by this specifications are mounted on Locomotives they shall be subjected to considerable vibrational and buffing shocks during service.

The relays shall be suitable for working satisfactorily in an ambient temperature varying from 0°C to 60°C and a maximum relative humidity of 100%. The locomotive shall be working in an altitude upto a maximum of 1000 metres above mean sea level.

1.0 DESIGN AND WORKMANSHIP

1.1 The relay offered shall be

- Simple in Design.
- of Good Workmanship.

1.2 Wholly indigenous equipment if coming up to the standards of this specification shall be given preference consistent with the reasonableness of the offer.

5.0 DEVIATION

5.1 Any deviation from the standards laid down with a view to improve the performance, may be given due consideration provided, full particulars with justification, thereof, are furnished.

5.0 APPROVAL OF SAMPLES

5.1 The supplier shall make available at least two prototypes of the relays proposed to be supplied by him for inspection and test at his works and advise the Dy. Chief Electrical Engineer (Design), Chittaranjan and controller of Stores, Calcutta, as and when he is ready with the prototype and necessary testing and measuring apparatus and facilities of carrying out the test.

5.2 After the above tests, if it is considered necessary by the Dy. Chief Elect. Engrg/Design or his authorised representative to carry out any further tests or trials of the prototype at Chittaranjan the supplier will arrange for the same by the quickest means.

5.3 Any short comings or defects in the design and workmanship of the equipment, shall be pointed out after the tests, to enable the manufacturer to incorporate the necessary improvement before bulk manufacture is commenced, without affecting the guaranteed deliveries or guaranteed performance characteristics.

5.4 Any testing and approval by the purchaser of the design, working drawing and prototype shall in no way absolve the supplier of his responsibilities under the terms of the contract for equipments supplied.

CHKD.

DRN.

SPECIFICATION FOR
DIAPHRAGM-TYPE AIR FLOW
RELAY.

Sudhakar

f. (DY. C. E. E. (DESIGN))

CHITTARANJAN LOCOMOTIVE WORKS
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Suppliers shall provide all facilities to the inspecting officer at his works to inspect and to test the equipment. The suppliers shall not offer a series of production to the Inspector authorised under the contract until the prototype has been finally approved.

6. CONDITIONS OF CONTRACT

The standard I.R.S condition of contract will be applicable for the supply of the relays.

7. TECHNICAL DOCUMENTS AND BOMME DRAWINGS TO BE FURNISHED BY THE SUPPLIER AS PART OF CONTRACT.

The following drawings and ~~xxxx~~ documents ~~sh~~ shall be supplied by the supplier.

TYPE TEST REPORT OR CERTIFICATE

This shall be supplied in standard 'A4' size of sheets with punched holes for filing. It shall be suitably enclosed in cover. Type test reports shall have to be signed both by the suppliers engineers & and CLM's engineers. Ordinarily 10 copies of the report shall be supplied.

II. ROUTINE TEST CERTIFICATE

This shall be supplied in standard 'A4' size of sheets with punched holes for filing. Routine test certificate shall be submitted along with each individual relay in 4 copies.

III. MAINTENANCE/INSTRUCTION MANUALS.

The supplier shall prepare maintenance instruction booklets in standard 'A4' size of papers for this equipments order. Besides maintenance instruction these books must ~~xxxx~~ include full technical particulars, detailed dimensional drawing and description of any component which may require replacement. Ten (10) copies of such maintenance instruction booklets shall be furnished by the supplier to Dy. Chief Elect. Engrg/Design along with the supply of the first consignment of these equipments.

IV. DRAWINGS

The supplier shall submit at least six (6) copies of drawings for the complete unit of the equipment ordered on him within two weeks from the date of receipt of the Purchase Order to Dy. Chief. Elect. Engrg/Design, for approval. Any discrepancy correction considered necessary will be indicated on the drawings and ~~xxxx~~ supplier shall take due note ~~for~~ them and effect supply accordingly.

8. SUBMISSION OF TENDER QUOTATION

All tender documents including the quotation shall be submitted in duplicate. The tenderer shall inter-alia furnish the following along with the quotation.

SEE SHEET- 5

SPECIFICATION FOR
DIAPHRAGM TYPE AIR
FLOW RELAY.

Equal Charge
BY C.E.E. (M.D.)

CHITTARANJAN LOCOMOTIVE WORKS
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- 1) Detailed dimensional drawings in six(6) copies.
- ii) Full technical particulars of the offer.
- iii) Sufficient information to prove that the manufacturer has adequate facilities and capacity to manufacture and test the equipment offered.
- iv) Quotation shall not be considered complete unless all information is furnished and are therefore liable to be rejected.

9. TECHNICAL SPECIFICATIONS:

The air flow relay covered by this specification shall be used to indicate the correct working condition of various blowers on which it to be mounted.

9.1 Ratings

9.2 Contact ratings

- i) Break rating for cyclic duty - 0.5 amp. inductive load (I_h/I_e 40±5 m/s)
Life - 2 LAKH OPERATIONS AT 125V D.C.
- ii) Maximum breaking capacity - 2 amp. inductive load at 125V D.C. (I_h/I_e 40 ± 5 m/s) - ONLY 180 OPERATIONS.
- iii) Contact pressure - Not less than 25 gms. ± 25%
- iv) Insulation level - 2 KV, 50 c/s for one minute
- v) Connection terminal - M4 or M5 slotted hex screw, with hex nut, spring washer and plain washer.
- Plain with rubber grommet
- vi) Cable entry - Dust and drip proof.
- vii) Enclosure - Dust and drip proof.
- viii) Contact gap - 2.5 ± 0.5 mm.
0 1 mm.
- ix) No. of contact - 1N/O and 1N/C
- x) Terminals - Suitable for 2 nos of 3mm² crimped copper cables.
- XI) CONTINUOUS MAKE RATING - 5 Amp at 125V D.C.

9.3 Relay contact:

The diaphragm type air flow relay shall be provided with calcium silicate contacts of M/s Modicon/ Bombay of equivalent. The contacts maximum breaking capacity shall be 2amps inductive load at 125V. D.C., I_h/I_e = 40 ± 5m/s. The contacts cyclic duty breaking capacity shall be 0.5 amp inductive load at 125V D.C I_h/I_e 40±5 m/s for 2 lakh operations. The maximum permissible temperature rise of contact is specified as 70°C.

CHKD.	SPECIFICATION FOR DIAPHRAGM TYPE AIR FLOW RELAY.	Chatterjee	CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL INDIA
DRN.		Dt. C. E. E. (1981)	No. CLW/ES/R-34/C DATE: JULY, 1981

SPECIFICATION IS CHANGED FOR PICK UP, DROP OUT AND DIFFERENTIAL VALUE (TOLERANCES) VIDE R.D.S.O./L&D LETTER NO. EL/3.2.39/4 DATED 18/11-6-98

- 9.4 The relay shall be supplied with micro switch snap action type with 1 N/C * 1 N/C contact block. Micro switch shall be operated by diaphragm with suitable lever mechanism.
- 9.5 Operating Particulars of Relays:
- 9.5.1 Operating range . . 5 to 50 mm W.G. (Model)
No. * GM- 021- 00 - D4C - 5 "
- 9.5.2 Differential range . 6 + 1 WG & 7 + 1 WG
- 9.5.3 Name of Relay - Pick up Drop out Differential
(mm WG) (mm WG) (mm W.G.)
- | | | | |
|------|----|-------|-------|
| QVRH | 13 | 8/6 | 6 ± 1 |
| UVGL | 13 | 8/6 | 6 ± 1 |
| UVMT | 50 | 44/42 | 7 ± 1 |
- 9.6 Diaphragm : The diaphragm of air flow relay shall be made of time proven seamless hydraulically formed stainless steel or phosphor bronze or synthetic rubber and shall not deteriorate by heat up to 180°C or damaged by pressure of lubricating oil. However preference shall be given to the above mentioned seamless stainless steel or phosphor bronze diaphragm.
- 9.7 Enclosure :
- 9.7.1 The enclosure of diaphragm type air flow relay shall be weather proof and flame proof. The enclosure shall be preferably of pressed sheet steel or pressed dia cast aluminium. suppliers should specifically mention the type of enclosure to be provided for the relays in their offer.
10. standards: Indian standard specification No. IS: 3231 or IEC-60255 (1-2-3) shall be applicable for the material used in its manufacturing.
11. Drawings: The relay shall be fabricated to confirm mounting dimensions to drawing No. CLM/ES/SK-1/R-34
- 11.1 *CLW RESERVE THE RIGHT TO PROCURE MATERIAL ONLY FROM ISO CERTIFIED FIRMS.*

SPECIFICATION FOR
DIAPHRAGM TYPE AIR
FLOW RELAY.

19.8.98

19.8.98
DY. CEE. (D)

चितरंजन रेल इंजन कारखाना
वीरवाड़ा, राज.
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA
क्रमांक/NO. No. CLM/ES/R-34/C.
दिनांक/DATE : 05 - 8 - 1998

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Sl.No.	Type tests	Routine tests
12.1	Check dimensions, workmanship and finish 9999 etc.	Same as type test.
12.2	Check the quality of materials, cadavine plating and timing	-do-
12.3	Relays shall be picked ^{up} or drop out as per specified value vide para 9.5.2	-do-
12.4	measure contact gap specified value 2.5 ± 0.51 mm	-do-
12.5	Measure contact pressure specified value not less than 25gms. $\pm 25\%$	-do-
12.6	Measure insulation Resistance i.e resistance between contacts etc. by a 500V megger. The insulation value shall not be less than 10 megohms.	-do-
12.7	Operate the relay for 20 times and measure pick up and drop out value	-do-
12.8	Measure milli volt drop across the contact at the rated voltage and rated current before and after Electrical endurance test.	
12.9	<u>Vibration test:</u> The contact of the relay switch shall be loaded with the rated current and the relay to be mounted on the vibration table and tested for 6 hrs. At the end of test check any looseness of component or any other abnormalities.	
12.10	<u>Electrical Endurance test:</u> The contact of the relay switch shall be loaded with 0.15 inductive load at 110V, D.C, $I/R=40$ amp. and shall operate at 20,000 ON & OFF operations at an interval of 30 seconds between two operations. Contact resistance and millivolt drop of the contact in closed position shall be measured before and after the endurance test. The variation shall not be more than 10% of the initial value. Millivolt drop shall also be measured at the end of every 2,500 operations.	

C. S. Chandra
DY. CEE (S)

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DATE: JULY, 1991

12.11

Mechanical endurance test:

The load across the relay's contact shall be removed and relay shall be operated for 1 Lakh operations. At the end of the test there shall not be any abnormal vibration in pickup and drop out values.

12.12

Breaking capacity test-

The contact of the relay shall be loaded with a load of 2amp at 110V.D.C(inductive) and operated for 100 times at an interval of 2 minutes between two operations. The contact shall break the current efficiently. At the end of test measure millivolt drop across the contacts.

12.13

Making capacity test:

The contacts of relay shall make a current of 5amps resistive at 110V.D.C for 100 times with an interval of 2 minute between two operations. Ensure that the relay gives normal breaking current only. At the end of test there should not be any abnormalities.

12.14

Dielectric test:

A.C.Sine wave voltage of 2000V,50/2 rms - Same as shall be applied for one minute between type test.

1. Live parts and earthed body
2. Two ends of N/O contacts.

13.

Guarantee: The suppliers shall give a guarantee of clear 18 months from the date of commissioning of the relay or 24 months after the date of supply whichever is earlier for free replacement due to defective design, material and workmanship.

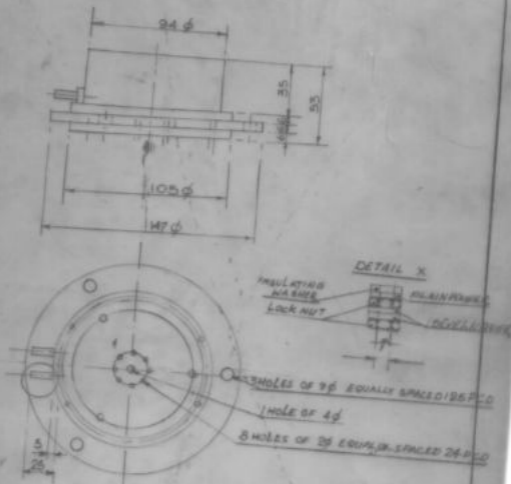
14.

Special condition:

Once a prototype is approved no contractor shall be permitted to change his source of supply or sub contractors for purchased components and sub-assemblies without CLW's approval

Sudh Anand
for Dy. CEE (D)

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No. CLW/ES/R-34/C
DATE: JULY 1991



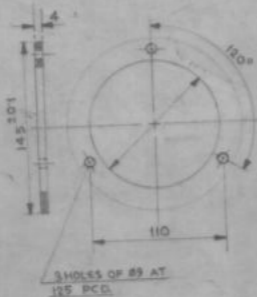
NOTE

1. CONTACT SHALL BE OF CADMIUM SILVER OXIDE.
2. CONTACTS SHALL BE MADE AT A PRESSURE AS SPECIFIED IN PARA 9.3.2
3. DIAPHRAGM SHALL BE PREFERABLY OF STAINLESS STEEL OR PHOSPHOR BRONZE.

AIR FLOW RELAY

Signal Chamber
Dr. S. R. S. (S.F.)
Dr. C. E. (D)

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL INDIA
W.D. NO. : CAP/RS/RS-1/R-3A/C
Rev. DATE :



MATERIAL - HARD RUBBER IS: 65B

GASKET FOR DIAPHRAGM TYPE
AIR FLOW RELAY

CHKD.

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SPECIFICATION FOR
DIAPHRAGM TYPE
AIR FLOW RELAY.

DR. C. E. E. (D)

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA.

No. CLW/ES/SK-2/R-34/A
DATE :