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**ENCLOSURES:**  
DRG.NO. CLW/ES/3/SK-1/0012 Alt 'G' H

# **SPECIFICATION FOR TIME RELAY MACHINE ROOM BLOWER CONSISTING OF CONTACTOR/RELAY & TIME DELAY MODULE USED FOR 3-PHASE ELECTRIC LOCOMOTIVE OF INDIAN RAILWAYS**

Specification No: CLW/ES/3/0012, Alt. 'G' H  
ISSUE DATE: 12.05.1999

ISSUED BY:  
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### Alteration Record Sheet

SL No	Date of Amendment	Page no.	Alt. No.	Reason	Authority
1	02.07.2001	5, 7 & 8	A	As per modification release no. 427 dated 30.05.98 type no. of Time delay module and Qty./Loco of time delay module and contactor has been changed from TEL-LA4DTOU to TEL-LA4DT2U and One no. each to two nos. each respectively.	Sd/
2	05.03.2003	7	B	All the non-metallic parts of this item should be fire retardant/self-extinguishing properties as per IS:11731 (Part I & II) or any other equivalent DIN, IEC standards. This clause has been added in sheet no. 7.	Sd/
3	26.10.10	11	C	Alternating Type no. has been mentioned in Sheet no. 11 of this specification.	Sd/
4	26.04.13	04	D	Correction in drawings no. as figure 01 & figure 02.	Sd/
5	22.03.21	4,5 & 7,10	E	1. Para-4, Para-8 & Note- i) has been deleted as Per approval of Note No. ELDD/Misc dated 26.02.2021 by PCEE.  2. Mounting and overall dimension shall be as per drawing. The other dimensions of drg. are for guidance only added in sheet No. 10.	Sd/

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6	10.12.21	05, 11	F	For implementation of RDSO/2018/EL/MS/0475 dated 12.12.2018, one number of contactor/Relay has been included for WAG-9, WAP-7 & 5 and one number of Time Delay Module has been included only for WAP-5.	Sd/
7	17.02.2022	05,11	G	As per Modification to Drive MR Blower and SCMR Blower by three Phase supply from BUR-2, Time Relay Machine Room Blower consisting of contactor/Relay (02 nos.), Time Delay Module (02 nos.), End Stopper, Din Rail has been removed from specification vide letter no. C-D&D/T/42 (part) dated 27.01.2022.	Sd/
8		06	H	RDSO/2018/EL/MS/0475 Rev. '1' dated 26.10.2023 has been implemented. Qty. of Time Delay Module has been changed for WAG-9 and remains same for WAP-5. Contactor/Relay remains same for WAP-7 & 5 and not required for WAG-9.	

Note: Specification has been digitized and all alterations have been incorporated.

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## **SPECIFICATION FOR TIME RELAY MACHINE ROOM BLOWER CONSISTING OF CONTACTOR/RELAY & TIME DELAY MODULE**

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## SPECIFICATION FOR TIME RELAY MACHINE ROOM BLOWER CONSISTING OF CONTACTOR/RELAY & TIME DELAY MODULE

### 1. SCOPE

This specification applicable for SPECIFICATION FOR TIME RELAY MACHINE ROOM BLOWER CONSISTING OF CONTACTOR/RELAY & TIME DELAY MODULE for three phase electric locomotives.

### 2. CLIMATIC AND ENVIRONMENTAL CONDITION

- Maximum atmospheric temperatures : +70°C (In Sun) & + 50°C(In Shade)
- Maximum Humidity : 100% saturation during rainy season.

Reference site condition:

- Ambient Temperature : Max 55°C, Min 0°C
- Humidity : 60%.
- Altitude : 1000 m above mean sea level.
- Rainfall : Very heavy in certain areas. The locomotive Will be designed in such a way as to permit its running at 10 Km/hr in flood water level of 102 millimeter above rail level.
- Atmosphere during hot weather : Extremely dusty and desert terrain in certain areas.
- Coastal areas : Locomotive and equipment will be designed to work even in coastal areas in humid and salt laden atmosphere.
- Vibration. : The equipment , subsystem and their mounting arrangement will be designed to withstand vibration and shock encountered in service as specified in corresponding IEC publication unless otherwise prescribed.

3. **STANDARD:** As per relevant IS/ IEC.

4. **TEST:** Type test and Routine test shall be carried out according to the relevant IS/IEC standard.

5. **DRAWINGS:** The following drawings are attached with the specification:

Drg. No.: Figure no. 1 & Figure no. 2.

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## 6. SUBMISSION OF TENDER QUOTATION:

- 6.1** The tenderer shall give sufficient information to prove that his factory has adequate facilities and capacities to manufacture the above materials to meet fully the technical requirements of the specification and quality of materials and workmanship.
- 6.2** Quotation shall not be considered complete unless all information is furnished and are therefore liable to be rejected.
- 6.3** Detailed drawings of the above materials should be submitted for approval of purchaser.
- 6.4** Past test reports (if any).

## 7. SCOPE OF SUPPLY:

SL No.	Description	Ident No.	Qty./ Loco	Fig No.	Type No.
TIME RELAY M/C ROOM BLOWER CONSISTING OF					
1	CONTACTOR/RELAY	HBTB585683R4227	NIL	1	TEL-LP1D12008FW or Similar
2	TIME DELAY MODULE	3EHP590028R0003	NIL	2	TEL-LA4DT2U or Similar
3	CONTACTOR/RELAY For VCU reset in SB-1	HBTB585683R4227	1	1	TEL-LP1D12008FW or Similar For WAP-5 & 7 only.
4	TIME DELAY MODULE For VCU reset in SB-1 Rev. '0' dated 12.12.18 and Rev. '1' dated 26.10.23	3EHP590028R0003	4 2 nos. for WAG-9 01 no. for WAP-5	2	TEL-LA4DT2U or Similar

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## 8. TECHNICAL DATA FOR CONTACTOR / RELAY:

ENVIRONMENT	CHARACTERISTICS	TYPE LP1-D12
Rated Insulation Voltage (U <sub>i</sub> )	Conforming to IEC 60158-1	750 V
Degree of Protection	Conforming to VDS 0106	Protection against direct finger contact
Ambient air temperature around the device	Storage Operation Permissible	-60.....+80°C -5.....55 (0.8....1.1 U <sub>C</sub> ) -40.....+70, for operation at U <sub>C</sub>
Shock resistance ½ sine wave=11 ms	Contact open Contact closed	8g 11g
Vibration resistance (1) 5.....300Hz	Contact open Contact closed	2g 3g

## 9. POLE CHARACTERISTICS :

Number of Poles		4
Rated Insulation current (I <sub>e</sub> )	In AC-3, 55°C	12 A
	In AC-1, 40°C	25 A
Rated Insulation Voltage (U <sub>e</sub> )	Upto	690 V
Frequency Limit	Of the operational current	25.....400
Rated thermal current	$\theta \leq 40^\circ\text{C}$	25 A
Rated making capacity	I <sub>rms</sub> confirming to IEC 60947-4	250 A
Rated breaking capacity	I <sub>rms</sub> 220-380-415-440 V	250 A
	Confirming to 500 V	175 A
	IEC 60947-4 660-690 V	85 A
Permissible short time rating from cold state, no current flowing for preceding 15 minutes, at $\theta \leq 40^\circ\text{C}$	For 1s	210 A
	For 5s	130 A
	For 10s	105 A
	For 30s	76 A
	For 1 min	61 A
	For 3 min	44 A
	For 10 min	30 A
Average impedance per Pole	At R <sub>h</sub> and 50 Hz	2.5 mΩ
Power dissipation per Pole	AC-3	0.20 W
Contact Position		2 NO- 2 NC

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# 10. TECHNICAL DETAILS FOR TIME DELAY MODULE:

ENVIRONMENT	CHARACTERISTIC	TYPE LA-4DT (On- Delay)
Relevant standard		IEC 60255
Degree of Protection	Confirming to VED 0106	Protection against direct finger contact
Ambient temperature around the device	Storage Operation For operation at $U_c$	-40.....+80°C -25.....+55°C -25.....+70°C
Rated insulation voltage ( $U_i$ )		250 V
Built in Protection	On input Suppressor	By varistor By varistor
Rated control circuit voltage ( $U_c$ )		70.....125 V
Permissible variation		0.8.....1.1 $U_c$
Type of Control		By mechanical control only
Timing ranges		1.5.....30 s
Reset time	During the time delay After the time delay	100 ms 50 ms
Indication of time delay	By LED	Illuminates during the time delay
Maximum power dissipated		2 W
Leakage current		<5 ma
Residual voltage		3.3 V
Over voltage protection		3 KV, 0.5 joule
Electrical Life	In millions of operating cycles	30

## Supplier: Telemecanique, France

- I. **Note:** i) The Tenderer shall fix name plate on the equipment indicating:-
- Manufacturer's name and also monogram/brand.
  - Range of electrical ratings in watts.
  - Maximum rated voltage.
  - Month and year of manufacture.
  - Sl. no. of equipment.
- ii) Hardware are to be used should be any of the following make:-
- Un-brako (Precision Fasteners)
  - Laxmi Precision (LPS)
  - Sundaram Fasteners (TVS)
  - All spring washers of Forbes Gokak Ltd. moka, Mumbai only.
- iii) All the non-metallic Parts of this item should be fire retardant/self extinguishing properties as per IS: 11731 (Part I & II) or any other equivalent DIN,IEC standards.

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## 11. TESTS DETAILS :

TYPE TEST	CLAUSE No.	ROUTINE TEST
Preliminary Checking	11.1	Same as type test
Contact alignment	11.2	Same as type test
Contact gap and contact pressure	11.3	-----
Resistance of the Coil	11.4	Same as type test
Operating value test	11.5	Same as type test
Timer contact checking	11.6	Same as type test
Temperature rise test	11.7	-----
Determination of Pick up & Drop out	11.8	-----
Switching capacity test	11.9	-----
Breaking capacity test	11.10	-----
Making capacity test	11.11	-----
Electrical Endurance test	11.12	-----
Mechanical Endurance test	11.13	-----
Vibration test	11.14	-----
Di-electric test	11.15	Same as type test

The details test schedule are described below:

11.1 **Preliminary checking.**

11.2 **Contact alignment** : The aux. contact shall be examined visually. They shall be coplanar.

11.3 **Contact gap and contact pressure** : Contact gap and contact pressure to be measured and recorded.

11.4 **Resistance of the Coil** : Resistance of the Coil shall be measured and recorded.

11.5 **Operating value test** : The relay shall be energized for two hours and after this relay shall operate satisfactorily between 70 to 125 volts.

11.6 **Timer contact checking** : The operating time of the timer contact shall be measured at all the marked time setting.

11.7 **Temperature rise test** : The auxiliary contacts shall be subjected to the rated current and the relay coil shall be subjected to maximum operating Voltage for 6 HRS or till such time steady temperature is reached.

11.8 **Determination of Pick up & Drop out** : The Pick up and drop out values of the relay, to be measured and recorded.

11.9 **Switching capacity test** : The Switching performance tests are intended to verify that the auxiliary contacts are capable of making and breaking the rated circuit at rated voltage without welding, flashover prolong arcing or any other sign of distress.

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- 11.10 **Breaking capacity test** : The relay under test is to be connected in a circuit equal to the rated breaking capacity (3 amps inductive) of the relay at a time constant ( $L/R=40 \pm 5$  m/seconds). The relay shall perform successfully under its own control, 180 interruptions at 2 minutes interval.
- 11.11 **Making capacity test** : The relay under test shall be connected to a circuit, so adjusted as to obtain a current (15 amps resistive) corresponding to the making capacity of the relay at rated voltage. The relay shall be successfully perform 180 operations at 2 min intervals. The current can be broken by another switch.
- 11.12 **Electrical Endurance test** : The auxiliary contacts shall be connected to a inductive load of 0.5 amps.  $L/R=40 \pm 5$  m/seconds and 20,000 make and break operations to be carried out with the coil fed at 110 V D.C. The frequency of operations shall be 12 operation per minute. At the expiry of the test the relay shall be able to operate normally without any special attention.
- 11.13 **Mechanical Endurance test** : The inductive load to the auxiliary contacts shall be disconnected and the relay operation is discontinued and the relay operation to be continued upto 1,00,000 operations with the coil fed at 110 V DC at the rate of 12 operations/min. operating values of pick up, drop out, contact pressure, contact gap shall be measured at the commencement of the test after every 25,000 operations and at the end of the test. At the expiry of the test the relay shall be visually examined and it should be able to operate normally without special attention. The variation of the time lag shall not be more than  $\pm 10\%$  of the present value.
- 11.14 **Vibration test**: The test shall be conducted as stipulated in IEC-60077- 1968.
- 11.15 **Di-electric test**: A voltage of AC sine wave of voltage of 1500 V rms shall be applied for one minute as under:
- Between open contacts
  - Contacts and metal parts
  - Adjacent contacts
  - Coil and magnetic circuit
- 11.16 Weight of the relay shall be recorded.

## 12. ALTERNATING SCOPE OF SUPPLY:

Sl. No	Description	Type No.	Qty./loco
1	Contact/Relay for VCU Reset in SB-1	TEL-LP1D12008FW, LC1D128FD or Similar	<del>1 No for 3-Phase loco</del> For WAP-5 & 7 only
2	Time Delay Module for VCU Reset in SB-1 Rev. '0' dated 12.12.18 and Rev. '1' dated 26.10.23	TEL-LA4DT2U, RE11RMMW or Similar	1 No for WAP-5 only and 2 nos. for WAG-9

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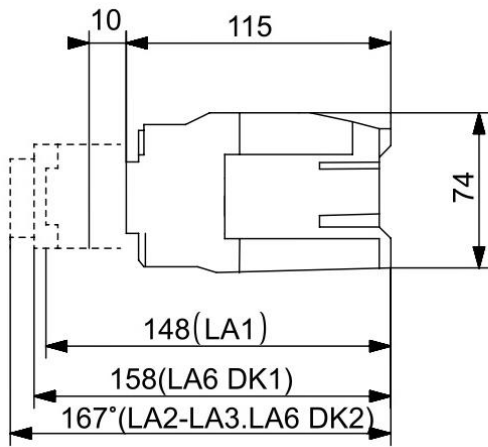
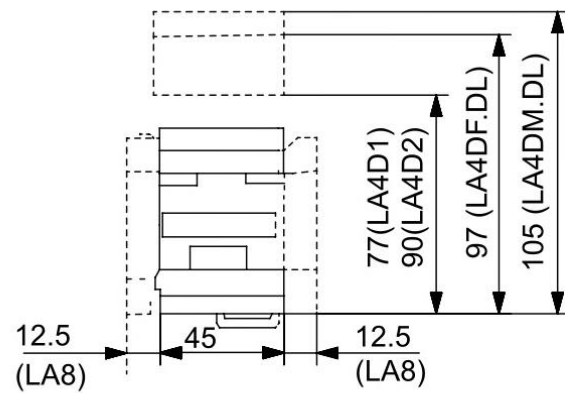


FIG NO. 1



with or without circuit module LA4 D.1

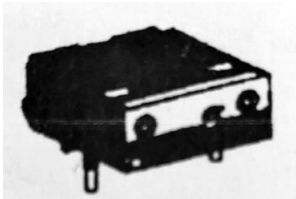
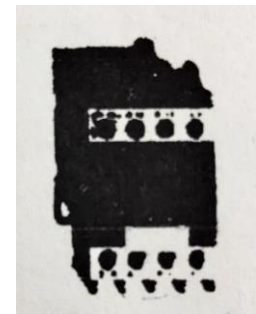
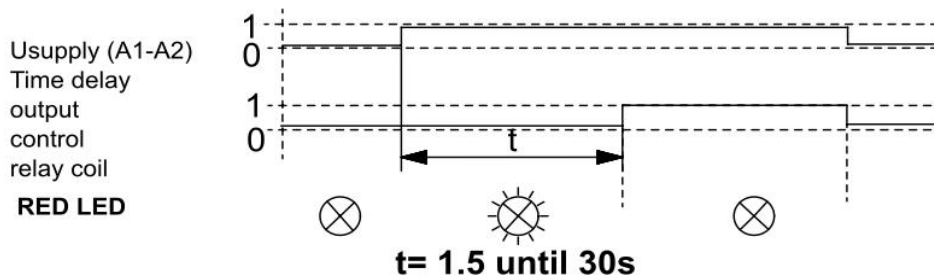


FIG NO.2


Type: LA4DT2U  
LA4-DT On -delay electronic timers



Type :- LP1D12008FW



**Note:** Mounting and Overall dimensions shall be as above drawing. The other dimensions of drawing are for guidance only.

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