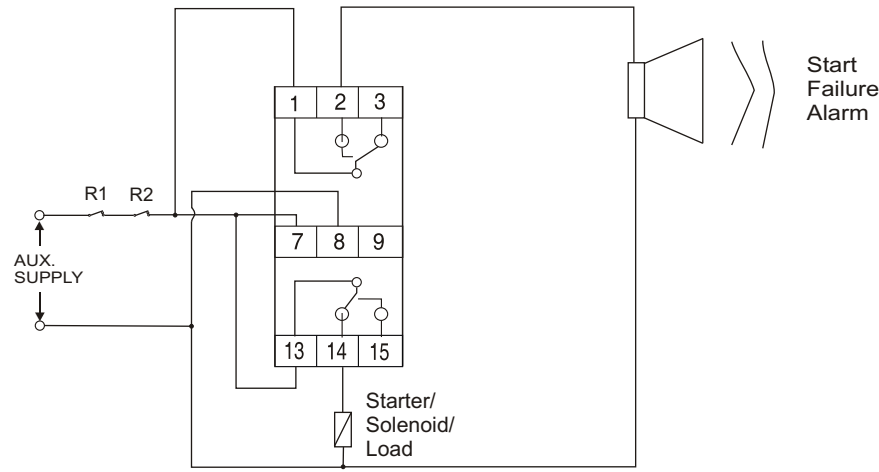


ELECTRICAL CONNECTION IN POWER AND CONTROL WIRING

Fig. 2

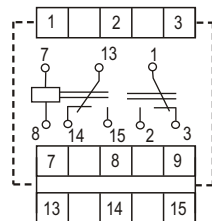


TYPICAL WIRING :

- R1 - Mains failure contact, closes when starting is required.
- R2 - Start inhibit contact, Opens when engine set has started. (See "engine start up detection" in description of function.)
- Relay contacts shown for start relay in energized condition & alarm relay in de-energized condition .

ELECTRICAL CONNECTION DIAGRAM

Fig. 3



INDICATIONS

- ST : START RELAY
- AL : ALARM RELAY

TERMINAL DETAILS

TERMINAL NO.	ESR D1
7 - 8	AUX. SUPPLY
13 - 14 - 15	C1 - NO1 - N C1 (ST)
1 - 2 - 3	C2 - NO2 - N C2 (AL)
9	DUMMY

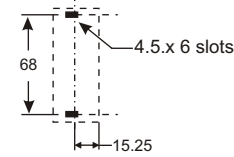
NOTES :

- AUX. SUPPLY TO BE CONNECTED AS MENTIONED ON THE UNIT.
- RELAY CONTACTS SHOWN FOR START RELAY IN ENERGIZED CONDITION & ALARM RELAY IN DE-ENERGIZED CONDITION.
- ALARM RELAY ENERGIZES IF THE START ATTEMPT GETS OVER.

MOUNTING DIMENSIONS

Fig. 5A

DRILLING DETAILS



D1 TYPE BOX

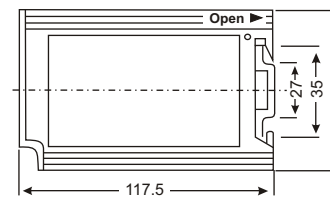
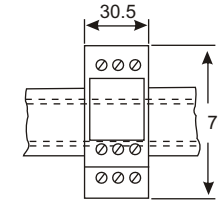
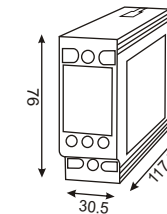


Fig. 5B : DIN RAIL MOUNTING

D1 TYPE BOX

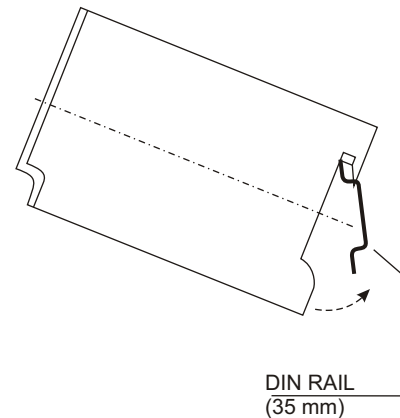


D1 TYPE BOX



MOUNTING ON DIN RAIL

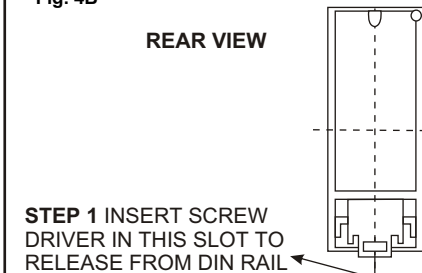
Fig. 4A



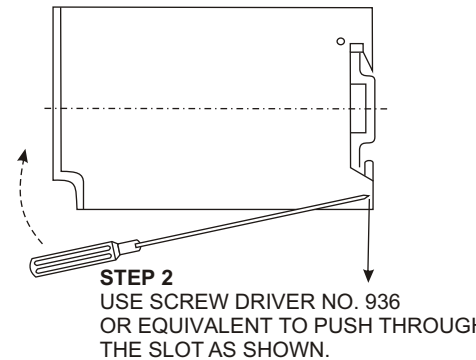
RELEASING FROM DIN RAIL

Fig. 4B

REAR VIEW



STEP 1 INSERT SCREW DRIVER IN THIS SLOT TO RELEASE FROM DIN RAIL



STEP 2 USE SCREW DRIVER NO. 936 OR EQUIVALENT TO PUSH THROUGH THE SLOT AS SHOWN.

INSTALLATION INSTRUCTION MANUAL FOR ELECTRONIC ENGINE START RELAY

ESR D1



IF THE PRODUCT IS NOT INSTALLED AS PER GIVEN GUIDELINES, **MINILEC** WILL NOT BE RESPONSIBLE FOR ANY WRONG CONNECTION, DAMAGE, INJURY, ACCIDENT ETC.

WARRANTY

AGAINST ALL MANUFACTURING DEFECTS FOR 18 MONTHS FROM DATE OF SUPPLY OR 12 MONTHS FROM INSTALLATION WHICHEVER IS EARLIER

Manufactured by :

minilec[®]

www.minilecgroup.com

S. NO. 1073/1-2-3,
AT POST : PIRANGOOT,
TAL : MULSHI, DIST. : PUNE (INDIA)
PIN : 412 111

VERSION 02 (09/01/11)

INSTALLATION INSTRUCTIONS FOR ESRD1

INTRODUCTION

Thank you for selecting and purchasing **MINILEC** make Electronic Engine Start Relay ESR D1. The following installation instructions would guide you in installing ESR D1 and making the best use of it. ESR D1 is an electronic engine start timer operating on digital timing principle. It offers two 1 Change over relay contacts. The contact rating of each relay is 5A,240 VAC(Resistive).ESR D1 is an auxiliary relay and it should be used in control circuit only.

MOUNTING

ESR D1 can be RAIL mounted or PANEL mounted. (see Fig. 4 for mounting on and for releasing from DIN RAIL. Also see Fig. 5 for PANEL mounting and Drilling Details Dimensions.)

CAUTION

Ensure that ESR D1 is -

- Not installed near any heat sources like burner, sunlight, electric arc etc.
- Not subjected to abnormal vibrations.
- Not subjected to direct heat, sunlight, rain, stormy wind and dust.
- Installed as near to starter/solenoid as possible.

ELECTRICAL CONNECTIONS

See Fig. 3 for electrical connection details of ESR D1. See Fig. 2 for power and control wiring. Aux supply must be as marked on front cover plate. The output relay contacts 13 & 14 are to be connected in series with, the no - volt coil of the contactor / solenoid.

TIME SETTING

The engine start relay ESR D1 is provided with individual start time & pause time setting facility. The start time duration is from 1 sec. to 10 secs. Variable via potentiometer. Pause time duration is from 2 secs. To 20 secs. in 2 secs. steps & can be selected by potentiometer.

START ATTEMPT SETTING

No. of attempts are selectable from 1 to 10 via potentiometer provided on front of the unit.

FUNCTIONING

Select the start time, pause time and start attempts as per requirement. Terminal 7 & 8 is aux. Supply. Terminal 13-14-15 are start relay contact (C-NO-NC). Terminal 1-2-3 alarm relay contacts(C-NO-NC).

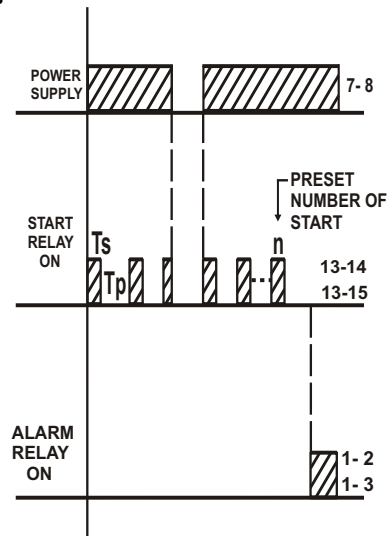
STARTING : As Aux. supply is applied to the ESR D1, the ST relay energises for the set start time duration & provides cranking to the engine. If the aux. Supply to ESR D1 remain uninterrupted the first start attempt will be followed by a succession of starts with set pause time in between. If start attempt is successful, power supply to ESR D1 should be interrupted as soon as engine starts running, thus preventing further cranking. Attempt = Start time + pause time.

START FAILURE ALARM :If the engine set fails to start after the set number of attempts, the starter sequence will be terminated and the start failure alarm relay will energized.

ENGINE START UP DETECTION : Successful start up can be detected by : 1) Monitoring the output frequency the engine set by using minilec S2FMR1 relay.
2)Monitoring the O/P voltage of the engine set by using minilec U/V & O/V relays.

TIMING DIAGRAM

Fig.1

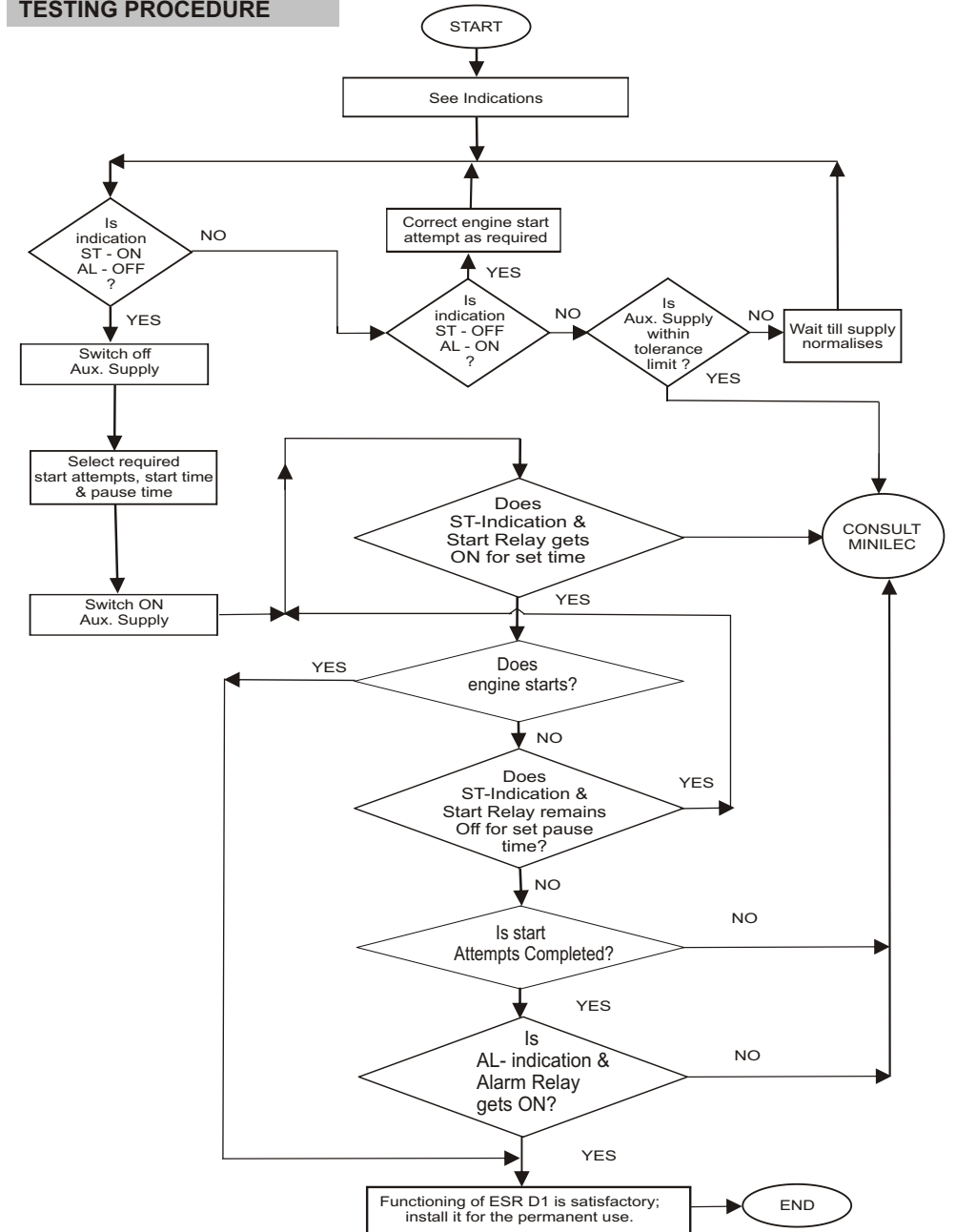


- T_s = START TIME
- T_p = PAUSE TIME

TECHNICAL SPECIFICATIONS

- Aux. Supply :**
12/24 VDC $\pm 10\%$
110 / 220 / 230 /240 VAC $\pm 20\%$
- Frequency :** 50 Hz/ 60 Hz. $\pm 3\%$
- Output Relay Contacts :**
Start Attempts : 1 Change Over
Alarm On : 1 Change Over
- Output contact rating :** 5 Amp, 240VAC [Resistive]
- NO. Of Start Attempts :**
1 to 10 (via front potentiometer)
- Time Range:**
Start Time : 1 to 10 sec. (via potentiometer)
Pause Time : 2 to 20 sec. (via potentiometer)
i.e. 2,4,6,8.....,20. (In steps of 2 sec.)
- Set Accuracy :** $\pm 10\%$ max. w.r.t. Full scale.
- Repeat Accuracy :** $\pm 1\%$ (At normal aux. Supply at 25°C)
A) For Temperature Variation of 25°C to 60°C : $\pm 3\%$ max. of set value.
B) Supply variation of $\pm 10\%$: $\pm 3\%$ max. of set value.
C) For Frequency variation of $\pm 10\%$: $\pm 2\%$ max. of set value.
- Reset :** Power On
- Reset Time :** 0.5 Sec (Approx.)
- Indications**
ST(Green) : Start Time On
AL (Red) : Alarm On
- Enclosure :** ABS
- Dimensions (mm) :**
Overall : 76 X 30.5 X 117.5
Mounting : 68 center to center
- Mounting :** 35mm Rail Mounting & Panel Mounting
- Unit Weight (Approx.) :** 175 gms.
- Life :** Mechanical - 1×10^7
Electrical - 0.5×10^7 @ 100% Ratings
- Operating Conditions :**
Temperature : -5°C To $+60^\circ\text{C}$
Humidity : Up To 95 % Rh
- Consumed Power :** 1 VA for 12 VDC
3 VA for 24 VDC
10 VA for 110 VAC
15 VA for 220/230/240 VAC

TESTING PROCEDURE



NOTE: If Set Engine start attempts completed but Engine fails to start then -
1.Re-adjust start time duration.
2.Re-select start attempts.
3.Consult Engine mfg.