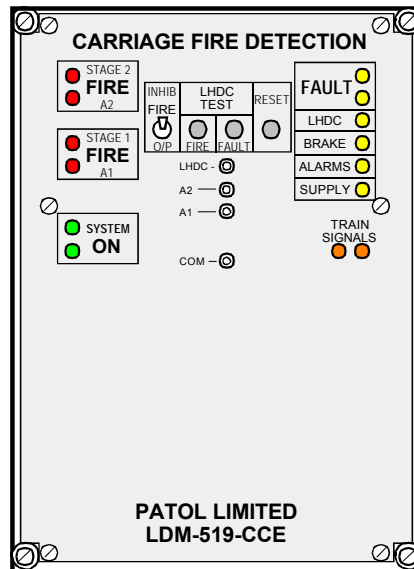


TRAFIX CARRIAGE CONTROL UNIT LDM-519-CCE **Rail Vehicle Fire Protection : Detection, Alarm & Control.**



The unit is designed for installation in railway vehicles and to provide fire detection by monitoring a length of analogue Linear Heat Detecting Cable (LHDC) for elevated temperature states. Two adjustable levels of alarm are provided (A1 & A2).

The LHDC is also monitored for fault conditions (open and short circuit)

Outputs are provided for both a sounder/beacon alarm circuit, and a Train Brake Line solenoid valve. Both of these circuits are monitored for open and short circuit fault conditions.

The controller interfaces with a TRAFIX train signal bus scheme thus providing alarm indications at the locomotive driving position.

The unit operates from the carriage / train supply and has an associated battery and integral charger in order to provide maintained operation.

The primary features of the controller are:-

- .. **Linear Heat Detecting Cable fire & fault monitoring.**
- .. **Two adjustable levels of alarm set point - Two stage operation.**
- .. **Alarm circuit output - Fault monitored.**
- .. **Automatic Train Brake operation**
- .. **Wide d.c. train supply operation - 40 to 75 Vdc**
- .. **LED indication of Fire, Fault, Supply & Signal Bus status.**
- .. **Inhibit / Isolate switch.**
- .. **Integral Test & Reset push-buttons.**
- .. **Alarm and Fault signalling to locomotive.**
- .. **Integral battery for maintained operation.**
- .. **Maintenance test meter jacks for LHDC and analogue & Alarm set points.**

TRAFIX CARRIAGE CONTROL UNIT LDM-519-CCE

Principles

The unit is operated in conjunction with a length of Line Heat Detector Cable (LHDC) which is installed within the carriage at ceiling level. The exact method of mounting is determined by the construction of the vehicle. In general however, the detector can be readily mounted in a manner that provides protection from both accidental damage and vandalism. The LHDC loop is connected at both ends to the Carriage Control Unit (CCU). The LHDC is a coaxial cable of the analogue integrating type which will register a fire alarm for both hot spots over very short lengths and elevated temperature conditions throughout the carriage. Reference should be made to the (separate) data sheet on the Line Heat Detector for specification of its performance.

Also connected to the unit is an electrically operated solenoid valve which initiates the Train Braking System. This circuit is open and short circuit fault monitored.

The vehicle is equipped with sounder / beacon alarms which are connected to the CCU by a fault monitored cable.

The controller interfaces with the TRAFIX train signal bus in a manner that enables the reporting of fire alarms and fault warnings at the locomotive. Driver Display Unit.

The unit has two LHDC alarm level set points. Triggering of the lower level results in reporting to the locomotive Driver's Display. (First Stage)

Triggering of the upper level activates the Train Brake and Carriage Alarms, together with Driver's Display notification. (Second Stage)

The unit incorporates a 24 V battery charger and has an associated battery. Whilst the Train Supply is connected the battery is charged. On supply removal the unit stays in operation for up to 18 hours. When the battery reaches the end of its usable capacity the CCU automatically shuts down thus protecting the battery from deep discharge stress. On supply reinstatement the battery is automatically re-charged.

A block diagram is shown in Fig.1

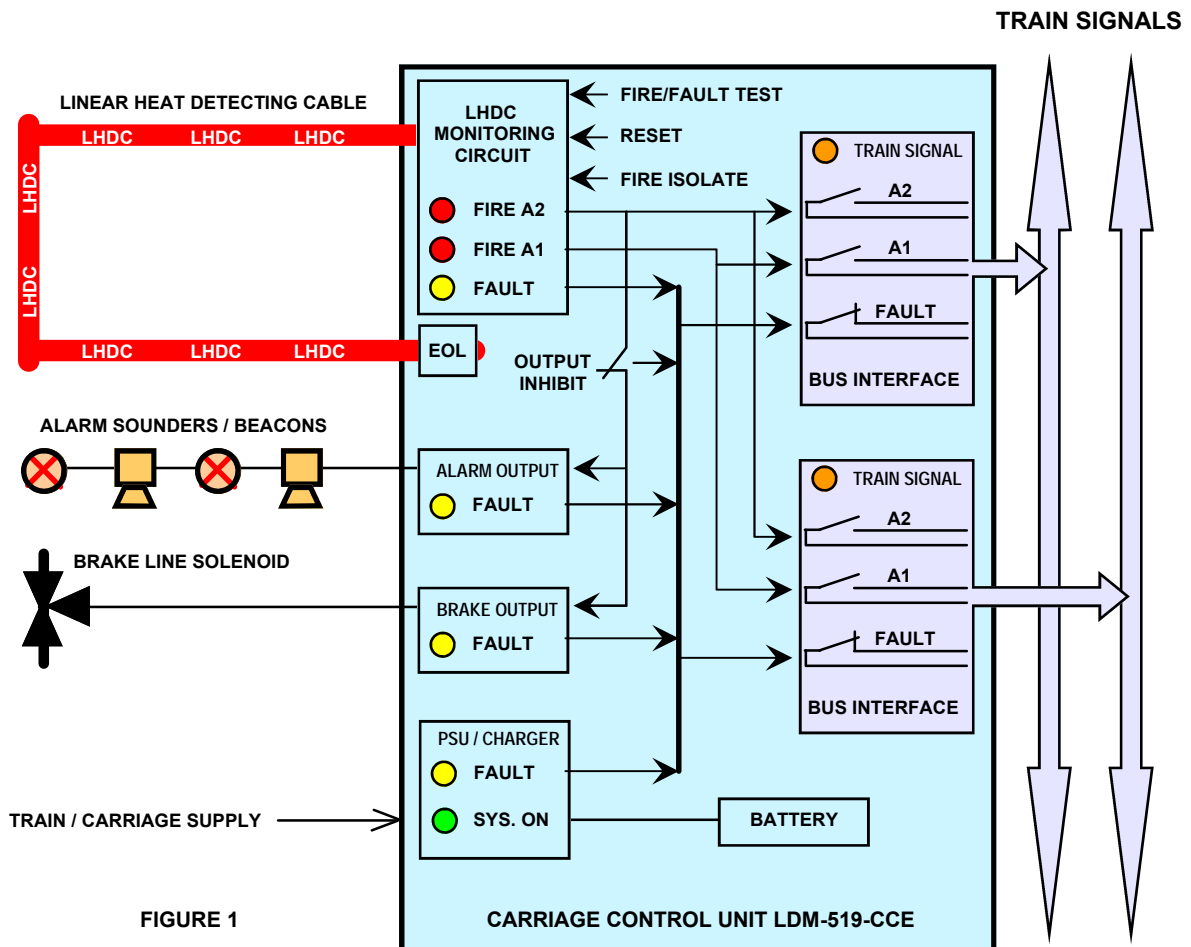
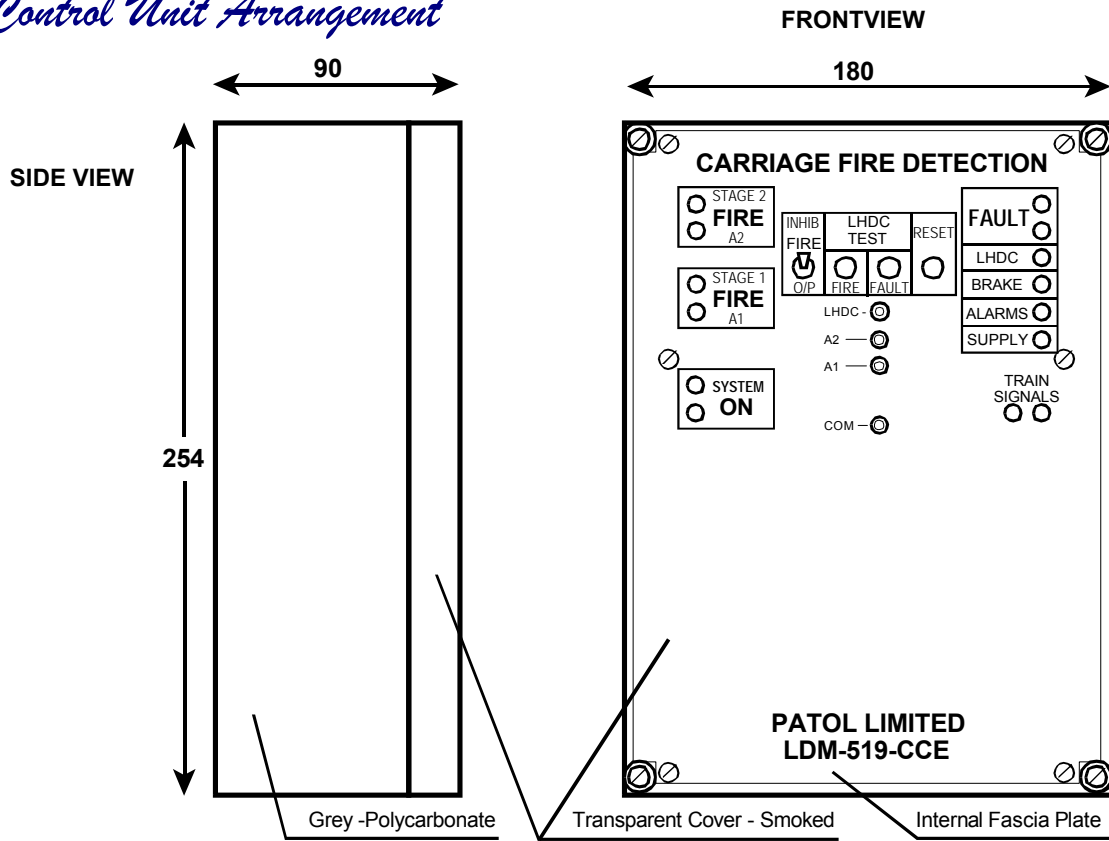


FIGURE 1

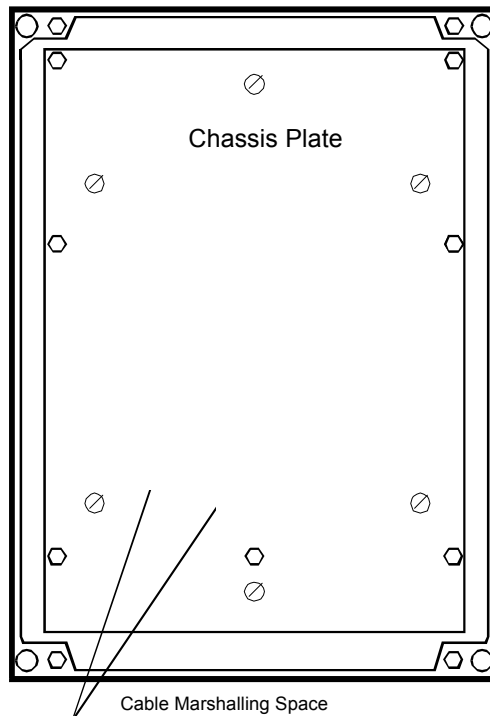
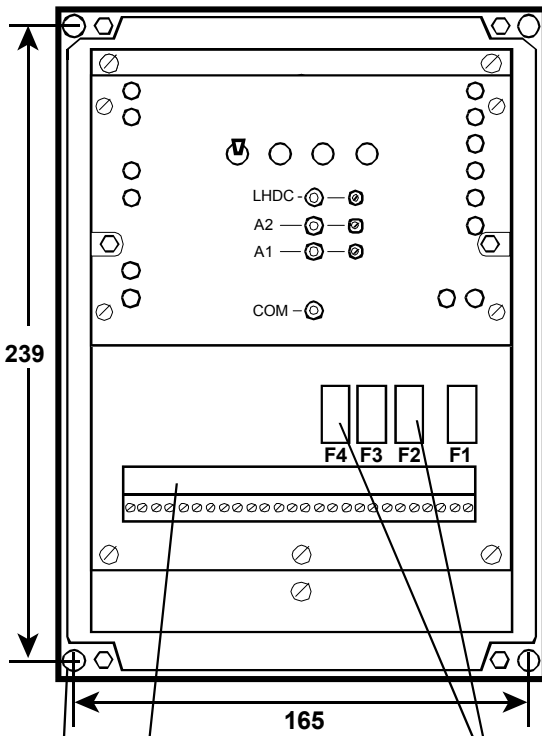
TRAFIX CARRIAGE CONTROL UNIT LDM-519-CCE

Control Unit Arrangement



VIEW WITH COVER & FASCIA REMOVED

INTERNAL VIEW WITH MODULE REMOVED



- Two Part Terminals
- Fuses 20 mm
- F1 - Supply - 1A
- F2 - Battery - 1A
- F3 - Brake Solenoid - 400mA
- F4 - Alarm Circuit (Beacons / Sounders) - 400mA
- Mounting Points 4.5 mm Dia
- Cable Marshalling Space

TRAFIX CARRIAGE CONTROL UNIT LDM-519-CCE

Specification

Construction: Grey polycarbonate case with smoked transparent cover.
Size 254 h x 180 w x 90 d (mm)
Rating IP 67

Train Supply:

Voltage: 40 Vdc to 75 Vdc
Current: Quiescent - 50 mA
 Max (Alarm) - 400mA
Fuse Protection F1 - 1A 20mm QB

Battery: 2 off - 12 Vdc 1.2 Ahr SLA
Charge Voltage: 27.6 Vdc
Current Limit: 200 mA
Fuse Protection F2 - 1A 20mm QB
Standby 18 Hrs nominal
Re-charge 7 Hrs nominal

LHDC Input: Two levels of alarm - A1 & A2
Fault Monitored Open & Short circuit
EOL Integral to CCU

Brake Output: Reverse Polarising Circuit
Solenoid: 24 Vdc 4.8 W 120 R
Fault Monitored O/C & S/C coil & cable
Alarm Drain 200 mA nominal
Fuse Protection F3 - 400 mA 20mm QB

Alarm Output: Reverse Polarity Monitored
Sndrs / Beacons 24 V dc - Polarised
Fault Monitored Open & Short circuit
End Of Line 10k 0.25W Resistor
Max Load 200 mA
Fuse Protection F4 - 400 mA 20mm QB

Train Signals: 2 off - Bus Interfaces
Fault 18.6 Vdc
A1 Fire 13.2 V dc
A2 Fire 7.2 Vdc
Registration Negative loop cross switched

Indicators:-

Stage 1 Fire Twin Red LEDs
 A1 Alarm Trip.
Stage 2 Fire Twin Red LEDs
 A2 Alarm Trip.
System On Twin Green LEDs
 CCU Operating.
Fault Twin Yellow LEDs
 Any fault as below.
LHDC Single Yellow LED
 Open or Short circuit Fault
Brake Single Yellow LED
 Open or Short circuit Fault
Alarms Single Yellow LED
 Open or Short circuit Fault
Supply Single Yellow LED
 Supply / Battery / Charge Fault
Train Signals 2 off - Orange LEDs
 Train Signals Connected.

Controls:

Inhibit Switch Three position Isolate switch -
 Centre position normal.
O/P - Down Brake and Sounder / Beacon
 outputs inhibited. Detection
 maintained.
Fire - Up Fire detection function Isolated.
Fire Test Push Button
 Simulates LHDC fire condition
 Operable when O/P Inhibited.
Fault Test Push Button
 Simulates LHDC fault
Reset Push Button
 Resets latched Fire alarms

Remote Reset: N/O contact

Adjustments & Test Points:

LHDC Analogue: Potentiometer & 2mm socket
A1 Trip Set: Potentiometer & 2mm socket
A2 Trip Set: Potentiometer & 2mm socket
Meter Common 2mm meter probe socket

Auxiliary Relay: Operates on A2 Fire
Contacts 1 set - One pole change over
Rating 1 A @ 24 Vdc / 120 Vac

TRAFIX CARRIAGE CONTROL UNIT LDM-519-CCE

Connections & Carriage Wiring

