TCB-LDS Product Installation Manual For Commercial Use

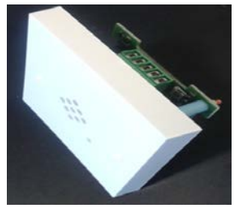
Product Overview

The leak detector is designed to shut down the air-conditioner in the event of a discharge of refrigerant into the detected space. In the event of the leak detector operating there is visual and audible indication. The visual indication is via a flashing LED and the audible indication is via buzzer.
In accordance with BS EN 378:2016 The leak detector MUST be connected too a separate power supply breaker than that of the indoor unit (FCU). The connection between sensor and indoor unit is completed via CN80 port on the indoor PCB
In the event of a leak the indoor unit will stop and a L30 fault code will be generated. This fault code will be displayed on the local remote controller and the network based controls connected.

Specification

Model Name		TCB-LDS1	TCB-LDS2
Model Group		VRF	VRF
Function		Refrigerant Leak Detector	Refrigerant Leak Detector
Height	mm	85	85
Width	mm	85	85
Depth	mm	32	32
Mounting Screw Pitch	mm	60	60
Weight	kg	0.085	0.085
Facia Plate Material		Plastic	Stainless Steel
Colour		White	Stainless Steel
Installation Type		Recessed	Recessed
Audible Alarm		Yes	Yes
Audible Alarm Sound Level	dB	85 (2300Hz ±300)	85 (2300Hz ±300)
Alarm Mute		Powered Off	Powered Off
Visual Indicator (Neon)		3 x Coloured LED	3 x Coloured LED
Fault Code generated to Local Remote Controller		Yes (L30)	Yes (L30)
Interconnecting Cable Max Length (Sensor to FCU)	m	10	10
Interconnecting Cable Type (Sensor to FCU)	mm^2	0.75mm^2 Multi Core	0.75mm^2 Multi Core
Interconnecting Cable Max Length (Sensor to LD1)	m	50	50
Interconnecting Cable Type (Sensor to LD1)	mm^2	0.75mm^2 Multi Core	0.75mm^2 Multi Core
Power Supply		12-24V AC/DC	12-24V AC/DC
Suggested Fuse Size	Amps	N/A	N/A
Circuit Protection Fuse supplied With Cable	mA	125 (Fuse supplied as part of Loom)	125 (Fuse supplied as part of Loom)
Cable Link For Remote On / OFF (Ving Card)		Yes	Yes
Fail Safe Relay Operation		Yes	Yes
Recommended Mounting Height Above floor Level	mm	150 ~ 250	150 ~ 250

TCB-LDS1

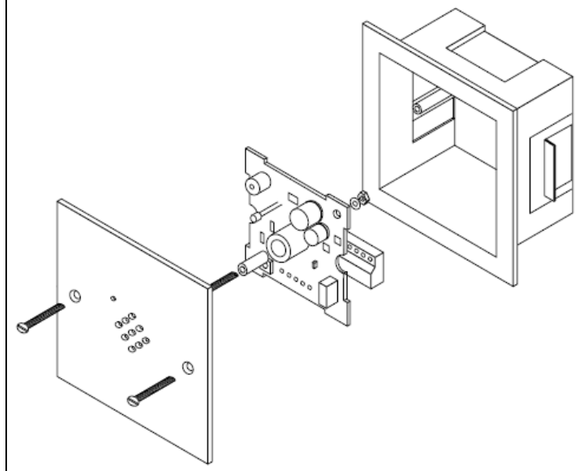


TCB-LDS2

Mounting Method

The TCB-LDS1/2 is intended to be mounted within a single gang back box, wall box. A minimum depth of 45mm is required to suite all variants.

Model Name	TCB-LDSBB1	TCB-LDSBB2
Mounting Method	Flush - Dry Lining	Flush - Wall (concrete)
Mounting Depth	46mm	47mm
Height	86mm	68.3mm
Width	86mm	68.3mm
Material	Plastic	Metal



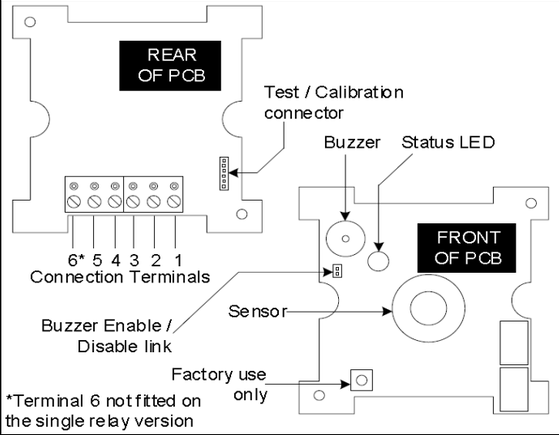
Example: LDS2 with LDSBB1

Electrical Connections

PIN No.	Usage	
1	Power (V1)	12 > 24v AC / DC
2	Power (V2)	
3	Relay (NO)	
4	Relay (C)	
5	Relay (NC)	

Note:
In accordance with BS EN 378:2016 the leak detector MUST be connected to a separate power supply breaker than that of the indoor unit (FCU).

PCB Layout (Front & Rear View)



Sensor Testing

Measure the Gv voltage on the testing connector (Pins 1 & 4), as shown above.
Refer to the table below for the expected voltages.

Installation Location

Refrigerants are significantly heavier than air. Therefore in order for the sensor to operate as effective as possible the refrigerant detector must be positioned at a low level inside the room, where the indoor air conditioning unit is fitted. See diagram showing recommend installation guidelines.
The unit is designed to fit on the surface or over a standard single socket recessed box. The refrigerant detector PCB can be accommodated inside a standard single gang electrical back box (locally procured). The minimum depth of the back box is dependent on the style of face plate, however all designs will fit inside a 47mm deep enclosure , which can be flush mounted into the wall.

Distance – The detector is to be mounted a maximum of 10m from the indoor unit.

Low Level – As HFC refrigerants are heavier than air, the TCB-LDS should be mounted as close as practical to floor level
(150mm ~ 250mm above floor level), preferably
directly below the air conditioning unit.

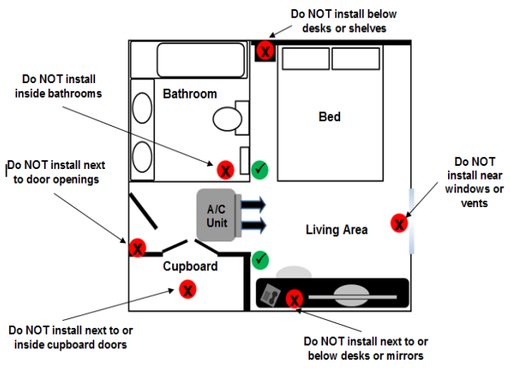
Accessible for Maintenance - The TCB-LDS should be mounted in a position where it can be easily accessed for maintenance and repairs.

Minimize Damage - Mount the sensor in a position that minimizes the risk of mechanical damage to the unit.

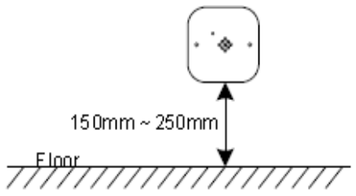
Minimize false alarms - Semi-conductor sensors can be 'poisoned' by contaminants and after exposure may take considerable time to recover. Solvent paints and silicon mastic are typical contaminants and exposure from these substances must be avoided.

Ensure leaks can be detected – Do not mount the sensor next to doors or windows, where fresh air may influence readings.

Typical Hotel Application



Installtion Height of Sensor from Floor



Sensor Operation Characteristics

Item No.	LDS1/2 Sensor Status			CN80 Operation Pattern		FCU Status		
	Operating Condition	LED Status	Buzzer Status	Gv Volts	Relay Status	Power Status	Fault Code	Operating Condition
1	Power Off	Off	Off	N/A	LDS1/2 Sensor / CN80 (FCU): NO ③, COM ④–①, NC ⑤–③	Power Off	None	None
2	Warm Up (5 minutes)	Flashing Green/Red (1Hz)	Off	N/A	LDS1/2 Sensor / CN80 (FCU): NO ③, COM ④–①, NC ⑤–③	Power On	None	Thermal On
3	Normal Operation	Constant Green	Off	<2.0V DC	LDS1/2 Sensor / CN80 (FCU): NO ③, COM ④–①, NC ⑤–③	Power On	None	Thermal On
4	Sensor Fault (>180 seconds)	Flashing Red (1Hz) + one (1) Amber flash per minute	Pulse 1 per minute	<0.1V DC	LDS1/2 Sensor / CN80 (FCU): NO ③, COM ④–①, NC ⑤–③	Power On	L30	Thermal Off
5	Level 1 (500ppm) Gas Concentration Level exceeded (> 2 seconds)	Flashing Green (2 Hz)	Off	>2.5V DC	LDS1/2 Sensor / CN80 (FCU): NO ③, COM ④–①, NC ⑤–③	Power On	None	Thermal On
6	Level 2 (1000ppm) Gas Concentration Level exceeded (> 2 seconds)	Flashing Red (2 Hz)	Off	>3.5V DC	LDS1/2 Sensor / CN80 (FCU): NO ③, COM ④–①, NC ⑤–③	Power On	None	Thermal On
7	Level 2 (1000ppm) Gas Concentration Level exceeded (> 30 minutes)	Flashing Red/Amber (2 Hz)	Pulses (2Hz)	>3.5V DC	LDS1/2 Sensor / CN80 (FCU): NO ③, COM ④–①, NC ⑤–③	Power On	L30	Thermal Off
8	Level 3 (4000ppm) Gas Concentration Level exceeded (> 30 seconds)	Flashing Red/Amber (4 Hz)	Pulses (4Hz)	>4.2v DC	LDS1/2 Sensor / CN80 (FCU): NO ③, COM ④–①, NC ⑤–③	Power On	L30	Thermal Off
9	Gas concentration level drops below Level 1 (Sensor Reset)	Constant Green	Off	<2.0V DC	LDS1/2 Sensor / CN80 (FCU): NO ③, COM ④–①, NC ⑤–③	Power On ↓ Power Off to On	L30 ↓ None	Thermal Off ↓ Thermal On

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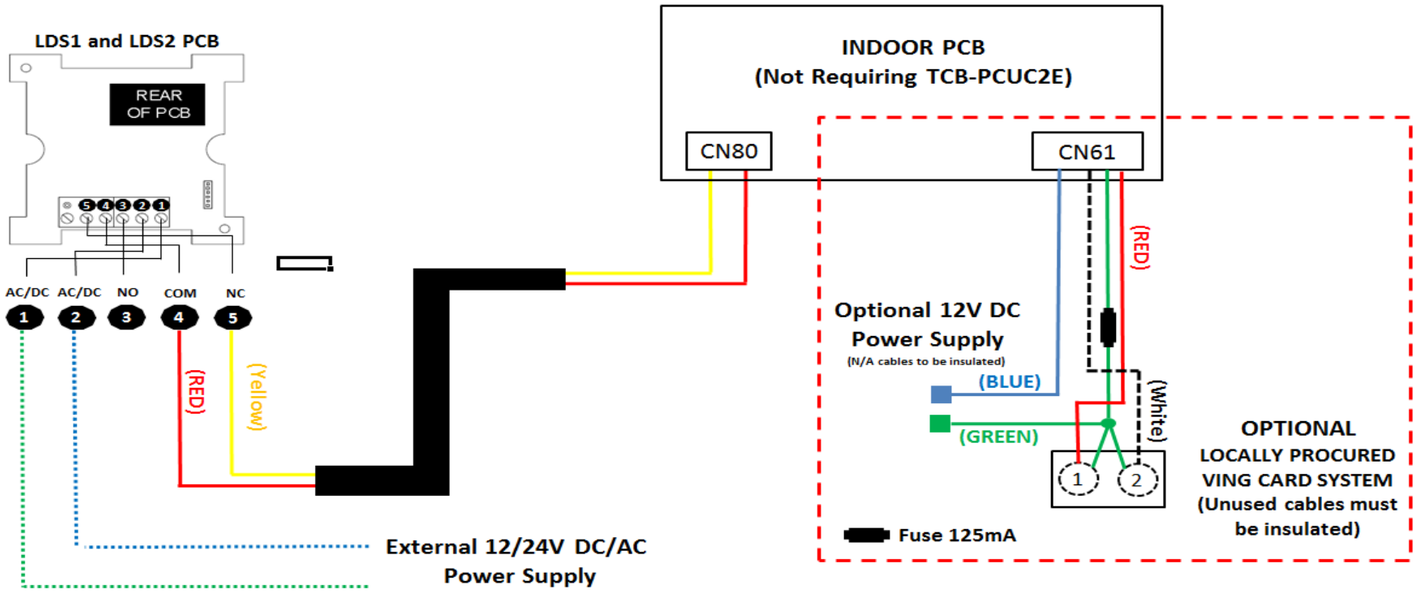
PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this “PRECAUTIONS FOR SAFETY” carefully before installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
- Read this Manual to explain how to use and maintain the unit.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep this installation owner’s manual.

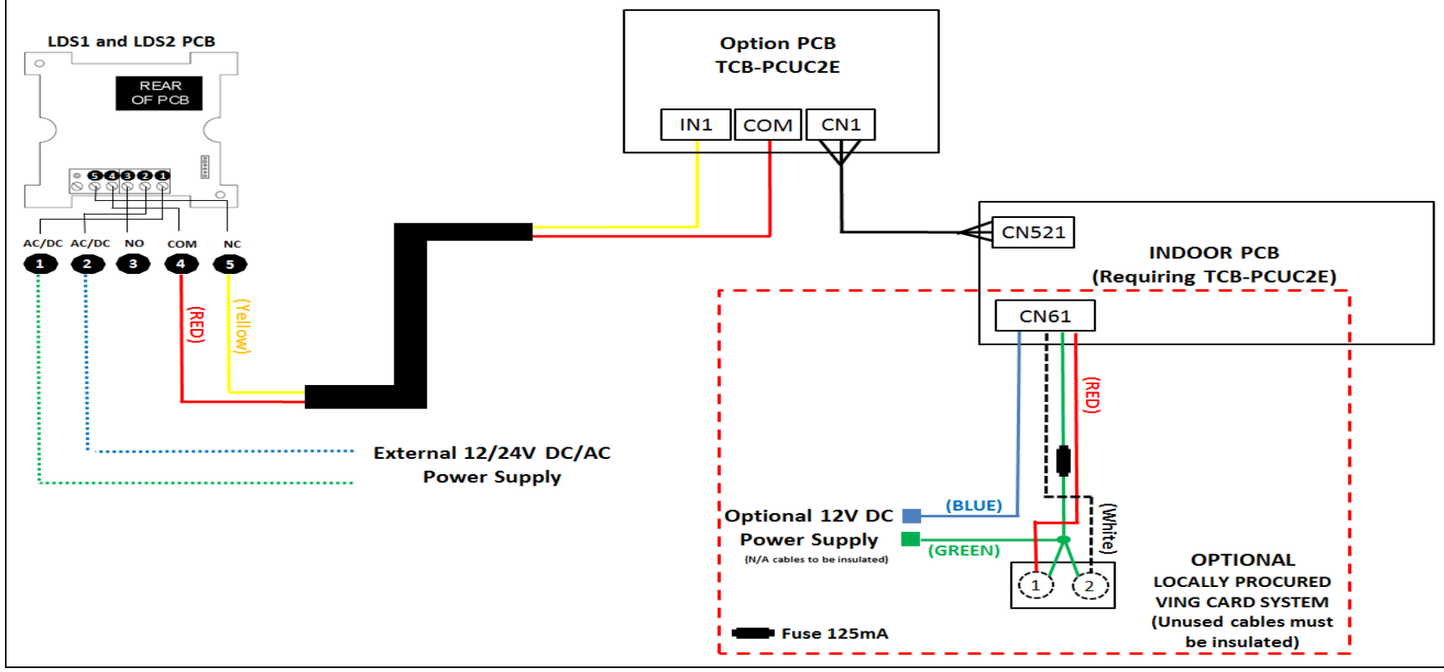
BOX CONTENTS

- PCB with mounted sensor
- White plastic or stainless steel facia depending on model purchased
- 1 x wiring loom for CN80 and CN61 connection (inc optional ving card connection)
- 1 x Installation manual (9 languages)

Wiring Schematic For FCU's Not Requiring Option Accessory TCB-PCUC2E



Wiring Schematic For FCU's Requiring Option Accessory TCB-PCUC2E



NOTES

1. To be EN378:2016 compliant, the leak detection sensor must be powered from a separate power source to that of the FCU.
2. If EN378:2016 compliance is not required, it is possible to power the sensor direct from CN61 of the indoor PCB, using the supplied wiring loom.
3. When using the External power supply option TCB-LD12V, please refer to the installation diagram supplied with the product.
4. Power supply wire and interconnecting wires are procured locally.
5. Using the specified wires, ensure to connect the wires and fix wires securely, so that the external tension to the wires does not affect the connecting part of the terminals. Incomplete connection or fixation may cause a fire, etc.
6. Be sure to connect earth wire (grounding work) on indoor PCB. Incomplete grounding causes an electric shock. Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone wires.
7. Appliance shall be installed in accordance with national wiring regulations. Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

OPTIONAL VING CARD SETUP PROCEDURE

SWITCH TO POSITION (1) -UNIT STARTS (e.g. KEY CARD INSERTED)

SWITCH TO POSITION (2) -UNIT STOPS AND REMOTE CONTROLLER

ON/OFF FUNCTION IS LOCKED (e.g. CARD REMOVED)

NOTE: JUMPER 01 TO BE CUT ON INDOOR UNIT MAIN PCB BOARD

ASSOCIATED PART NUMBERS

1. TCB-LDS1 - Refrigerant leak detector with white plastic facia
2. TCB-LDS2 - Refrigerant Leak detector sensor with stainless steel facia
3. TCB-LDSBB1 - White, plastic dry lining box, for mounting the LDS1/2 into a dry line cavity wall.
4. TCB-LDSBB2 - Galvanised Steel Knockout Box, for mounting the LDS1/2 into a concrete wall.
5. TCB-PCUC2E - Application control kit
6. TCB-LD12V - 12V transformer supply

DISCLAIMER

Gases and vapours other than the target refrigerant gas, may cause semi-conductor sensors to react. Sensors exposed to silicon fumes may be permanently damaged.The accumulation of volatile organic compounds resulting from human occupation in a poorly ventiliated room may cuase inaccurate operation. Adequate room ventilation should be maintained at all times.