






KM300 Carbon Monoxide Detection System Installation Manual

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	2012/19/EU (WEEE Directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: http://www.recyclethis.info/ .
	2006/66/EC (Battery Directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: http://www.recyclethis.info/ .

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Important information

Introduction

This is the installation manual for the KM300 Series Carbon Monoxide Detection Control Panels. Read these instructions and all related documentation entirely before installing or operating this product.

Limitation of liability

Installation in accordance with this manual, applicable codes, and the instructions of the authority having jurisdiction is mandatory. UTC Fire & Security (UTCFS) shall not under any circumstances be liable for any incidental or consequential damages arising from loss of property or other damages or losses owing to the failure of UTCFS products beyond the cost of repair or replacement of any defective products. UTCFS reserves the right to make product improvements and change product specifications at any time.

While every precaution has been taken during the preparation of this manual to ensure the accuracy of its contents, UTCFS assumes no responsibility for errors or omissions.

Advisory messages

Advisory messages alert you to conditions or practices that can cause unwanted results. The advisory messages used in this document are shown and described below.

WARNING: Warning messages advise you of hazards that could result in injury or loss of life. They tell you which actions to take or to avoid in order to prevent the injury or loss of life.

Caution: Caution messages advise you of possible equipment damage. They tell you which actions to take or to avoid in order to prevent the damage.

Note: Note messages advise you of the possible loss of time or effort. They describe how to avoid the loss. Notes are also used to point out important information that you should read.

Introduction

Product description

The UTC Fire & Security KM300 series panels are the ideal solution for the detection of dangerous levels of carbon monoxide (CO) gas in enclosed spaces.

System features

The KM300 offers robust and efficient CO detection with the following characteristics:

- Detection response of less than 10 seconds (using UTC Fire & Security KM170 and KMD300 CO Detectors).
- Up to 15 detectors per zone.
- Coverage from 300 m² (single zone) up to 18,000 m² (four zones) using a single panel.
- Three relay outputs (two for ventilation, one for alarm) triggered by user-defined CO levels.
- Advanced system testing and self-testing functions to ensure reliable detection at all times.

Product range

The KM300 series comprises four models:

Table 1: KM300 series models

Model	Number of zones	Cabinet size
KM301	1	297 x 307 x 109 mm
KM302	2	297 x 307 x 109 mm
KM303	3	420 x 336 x 118 mm
KM304	4	420 x 336 x 118 mm

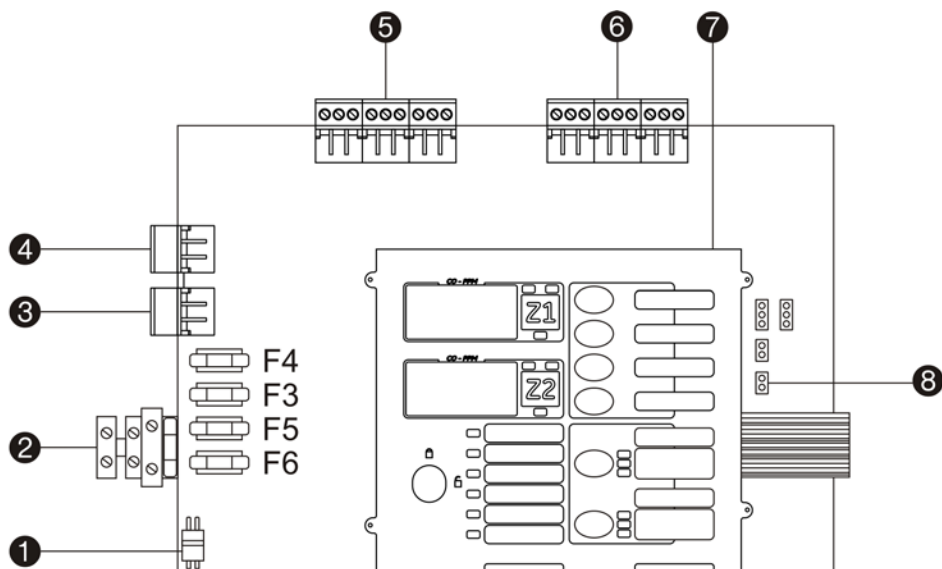
Product compatibility

All models are compatible with UTC Fire & Security KM170 and KMD300 CO detectors. Compatibility with third-party products cannot be guaranteed. Contact your local supplier for further information.

Installation

Panel layouts

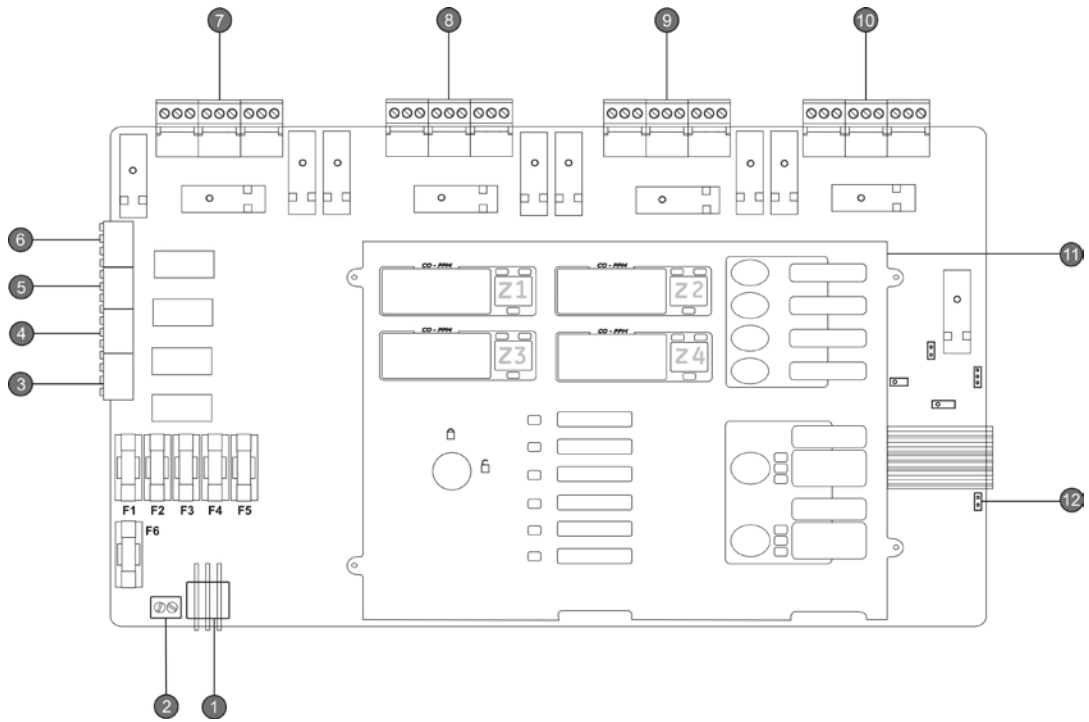
Figure 1: KM302 control panel layout



- | | |
|------------------------------------|---------------------------------------|
| 1. External power supply connector | 5. Zone 1 relay outputs |
| 2. Mains connection | 6. Zone 2 relay outputs |
| 3. Zone 2 output | 7. User interface |
| 4. Zone 1 output | 8. External power supply jumper (JP2) |

See "Technical specifications" on page 11 for specifications of the fuses F3, F4, F5, and F6.

Figure 2: KM304 control panel layout



- | | |
|------------------------------------|--|
| 1. External power supply connector | 7. Zone 1 relay outputs |
| 2. Mains connection | 8. Zone 2 relay outputs |
| 3. Zone 4 output | 9. Zone 3 relay outputs |
| 4. Zone 3 output | 10. Zone 4 relay outputs |
| 5. Zone 2 output | 11. User interface |
| 6. Zone 1 output | 12. External power supply jumper (JP2) |

See “Technical specifications” on page 11 for specifications of the fuses F1, F2, F3, F4, F5, and F6.

Installation and cabling recommendations

Installation

Fix the cabinet to the wall at an approximate height of 1.5 m from the floor, in a location that affords easy access to the panel. Ensure that the zone module LED is at eye level. Install the cabinet in a clean, dry place free from vibration that offers protection from mechanical damage. Temperatures should be between 0°C and 40°C. Relative humidity must not exceed 95% and there should be no condensation. The installation location should be protected by the CO detection system.

Caution: Create the cable holes you require in the metal cabinet before fixing it to the wall. Do not perforate the panel in places other than those indicated. Avoid dropping shavings or pieces of removed casing inside the cabinet. PG11-type cable glands may be used.

Cabling requirements

The mains cable must have a minimum cross-section of 1.5 mm² and must include an earth wire.

For zone lines and outputs use a screened and twisted cable with a minimum section of 1.5 mm². The maximum cable length for zones is 300 m.

For zone communications use screened cable with a minimum section of 1.5 mm².

Use of cable glands

Use PG11-type cable glands to ensure clean connections at the control panel. The use of pressure-sensitive flanges to fix the cables to the housing of the control panel is also recommended. When a cable flange is not used, devices should be earthed using the earth studs on the control panel chassis.

Radio frequency interference

Connect the cable shield to the cable gland and make sure that the installation is correctly earthed.

If the system is exposed to an electromagnetic environment, connect ferrite as close as possible to the connection terminal.

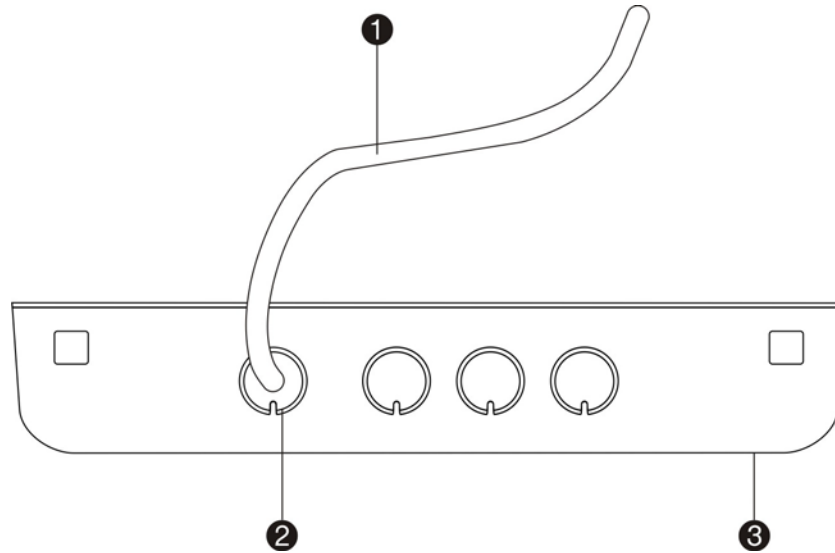
Connecting the power supply

Caution: Mains power for this product should be sourced directly from a separate circuit breaker in the building electrical supply distribution board. This group should be clearly marked, have a bi-polar disconnect device, and only be used for CO detection equipment.

The control panel must be powered from a 230 VAC source. Use the mains cable entry hole at the top left of the control panel as indicated in Figure 3 **Error!**

Bookmark not defined.. Never make any connections while the power supply is on.

Figure 3: Top view of control panel with mains cable entry hole



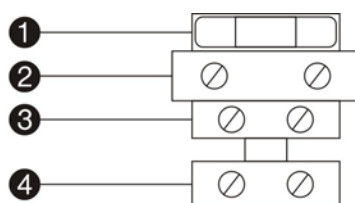
1. Mains cable
2. Mains cable entry hole
3. Front of the panel

The mains cable must be separated from the other cables inside the chassis (feed the mains cable to the mains connector to the left of the power supply) in order to avoid potential short circuits and interference.

The cable should be fixed to the control panel chassis using cable holders to prevent movement. An adequate earth connection is required. For safety reasons it is recommended that the earth cable be longer than the other cables so that it is the last cable to be disconnected if the cable is pulled.

Connect the power supply cables to the correct terminals on the mains connector and ensure that the mains fuse is installed into the correct holder as shown in Figure 4 on page 6.

Figure 4: Power supply connections



1. Fuse
2. Live 230 VAC
3. Earth
4. Neutral AC

Connecting an external power supply

The control panel can be connected to an optional external power supply. This must be connected using the provided connector and the jumper JP2 must be short circuited (see Figure 1 on page 2). Ensure that the mains connection has been completed before connecting the external power supply. The jumper JP2 must be short circuited when using an external power supply.

Caution: the external power supply will only work with KMD300 detectors.

The external power supply requirements are as follows:

Control panel	External power supply	Output	Capacity
KM301 and KM302 control panels	PM812	12 V / 2 A	7.2 Ah
KM303 and KM304 control panels	PM814	12 V / 4 A	7.2 Ah

Connections

Zone connection

Each zone module has a three-terminal zone output connector and three relay outputs (two for ventilation, one for the alarm output).

Zone line connection

The zone line terminal block has three connectors: positive, negative and data.

Figure 5: Zone line connection for KM170 detectors

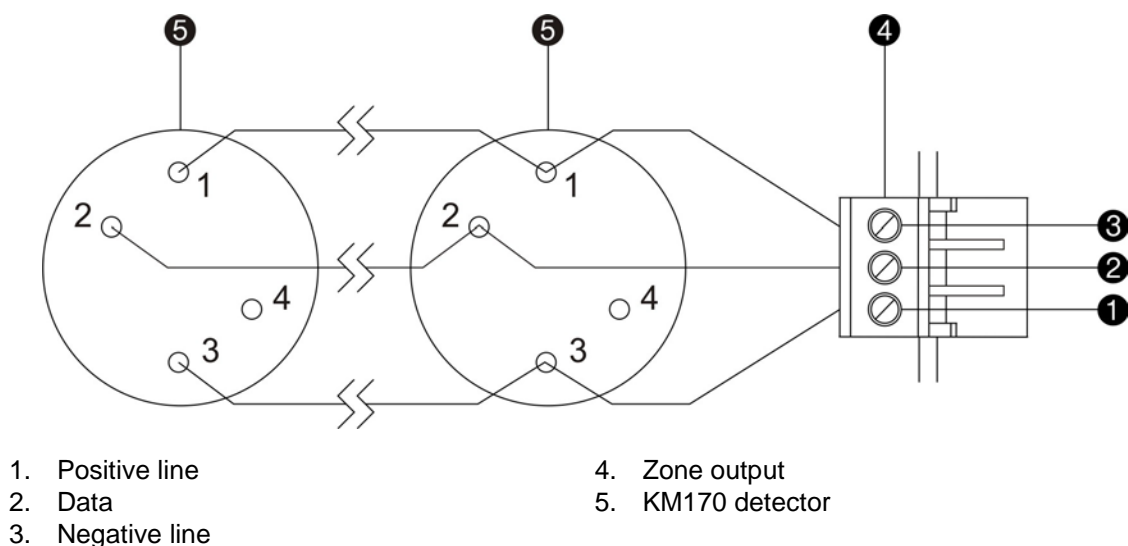
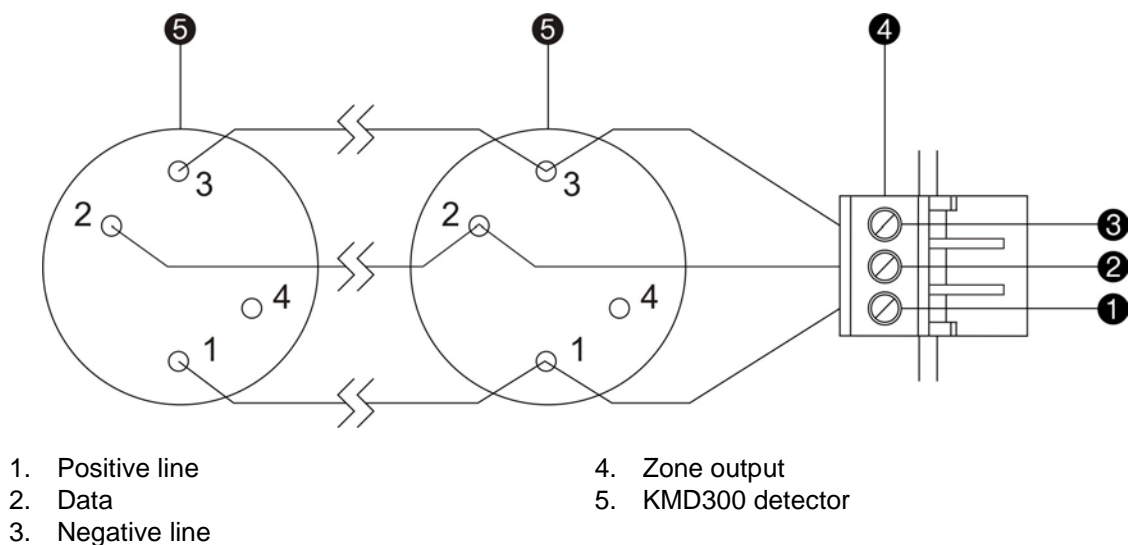


Figure 6: Zone line connection for KMD300 detectors

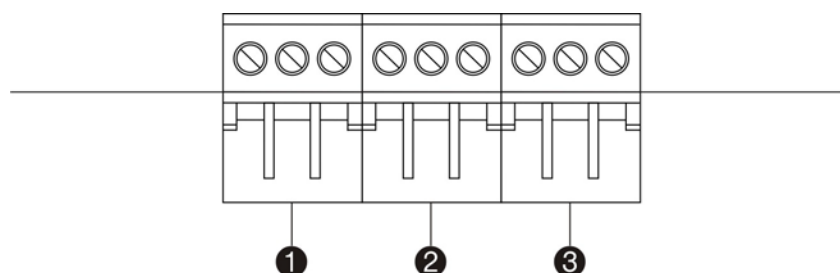


Caution: For detailed detector installation and wiring information, see your detector installation sheet.

Zone relay outputs

Every zone module has three relay outputs each with three terminals.

Figure 7: Zone relay outputs



1. Alarm relay output (NC, NO, C)
2. Ventilation relay 1 output (NC, NO, C)
3. Ventilation relay 2 output (NC, NO, C)

System startup

When you have completed all connections and installed the zone detectors, you can switch on the system.

To switch on and commission the system, follow these steps for each zone (Z1, Z2 etc.):

1. Press the zone Disable/Enable button.

When a zone module is first switched on the zone selection LED is lit and the zone display indicates ON until the zone module detectors provide an initial CO reading. During this initial period the Zone selection LED will flash. Once the initial CO reading is confirmed the LED will remain constant.

2. Press the zone Auto Search/Test button.

This step is required to initialize any newly installed system. The system will search for and store information on the number of elements installed in the selected zone. Pressing this button will also perform a general test for interface LEDs, zone module LEDs and the internal buzzer.

Maintenance and safety

The following maintenance procedures should be performed. by qualified personnel adhering to any applicable local authority laws.

System maintenance

Built-in system and self-testing functions should ensure that your CO detection system is always working correctly.

For increased safety we recommend that you:

- Perform regular inspections of the system. The frequency of such inspections will be determined by environmental factors such as relative humidity, excessive dirt or dust and concentration of any other gas.
- Keep a logbook of all faults reported by the system (or the result of an inspection) and record the resolution date. Refer to the logbook regularly to ensure all faults have been repaired.

Caution: Do not tamper with zone module circuit board or electronics.

For detector lifespan information, see your detector installation sheet.

Detector calibration

A calibration service is provided by UTC Fire & Security. Contact your local supplier for details.

Carbon monoxide safety levels

The following table of CO levels and health effects is provided as a guide only.

Table 2: CO effects on health

	2 minutes	5 minutes	15 minutes	40 minutes	120 minutes
200 ppm					Headache
400 ppm				Headache	Dizziness
800 ppm			Headache	Dizziness	Unconsciousness
1600 ppm		Headache	Dizziness	Unconsciousness	Death
3200 ppm	Headache	Dizziness	Unconsciousness	Death	
6400 ppm	Dizziness	Unconsciousness	Death		
12800 ppm	Unconsciousness	Death			

Caution: Maximum recommended CO levels and exposure guidelines vary from country to country. Your detection system should be calibrated to comply with local safety levels and regulations.

Technical specifications

Mechanical and environmental specifications

Dimensions

KM301 and KM302	297 x 307 x 109 mm
KM303 and KM304	420 x 336 x 118 mm

Weight

KM301 and KM302	3 kg
KM303 and KM304	4.65 kg

Cable entry holes

KM301 and KM302	4 x Ø 20 mm at top of cabinet
KM303 and KM304	10 x Ø 20 mm at top of cabinet

Operating temperature	0°C to +40°C
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Storage temperature	-10°C to +70°C
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Relative humidity (noncondensing)	10% to 95%
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Current consumption

Standby

KM301	150 mA
KM302	190 mA
KM303	280 mA
KM304	300 mA

Alarm

KM301	204 mA
KM302	298 mA
KM303	442 mA
KM304	516 mA

Zone output

Maximum number of detectors per zone	15
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Maximum number of relays per zone	3
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Zone output voltage (maximum)	20 VDC
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Zone output voltage (minimum)	10 VDC
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Maximum zone current consumption	1 A
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Maximum length of zone line	300 m
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Relay specifications

Relay contact rating	30 VDC / 5 A or 250 VAC / 8 A
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Maximum switching power	150 W / 2000 W
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Contact material	Silver alloy
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Ventilation relay levels	User defined. Default values: 50 / 100 / 150 ppm
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CO detection specifications

Measuring range	0 to 300 ppm
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Programmable alarm level	0 to 295 ppm
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Resolution

Resolution between 0 to 100 ppm	1 ppm
Resolution between 100 to 300 ppm	2 ppm

Power supply specifications

Operating voltage	230 VAC / 115 W
Voltage tolerance	±10%
Rated current	
KM301 and KM302	3.4 A
KM303 and KM304	6.3 A

Fuses

F1 Fuse zone 4 (KM304)	T 2 A 250 V
F2 Fuse zone 3 (KM303, KM304)	T 2 A 250 V
F3 Fuse zone 2 (KM302, KM303, KM304)	T 2 A 250 V
F4 Fuse zone 1 (KM301, KM 302, KM303, KM304)	T 2 A 250 V
F5 Central power supply fuse	T 1 A 250 V
F6 External power supply fuse	T 5 A 250 V
F12 Mains fuse	T 0.5 A 250 V

Wiring specifications

Mains cable (cross-sectional area)	1.5 mm ² min.
Zone/output cable (cross-sectional area)	1.5 mm ² min.
Communication cable (cross-sectional area)	1.5 mm ² min.
