



Flame Detectors

Model: ZT-20EX / ZT-500EX

User Guide

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<User Guide of ZT-20EX & ZT-500EX>

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1 Unpack & Checking contents

- Unpack the delivered pack and check the following contents.

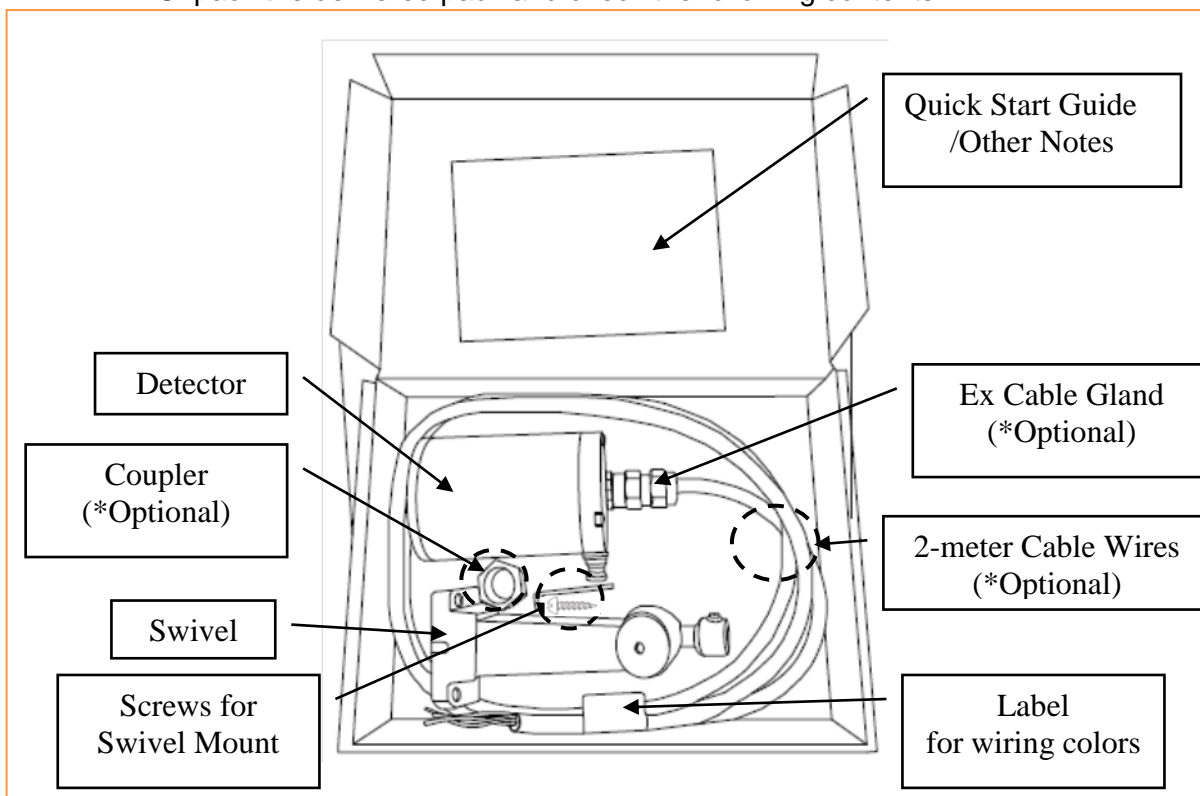
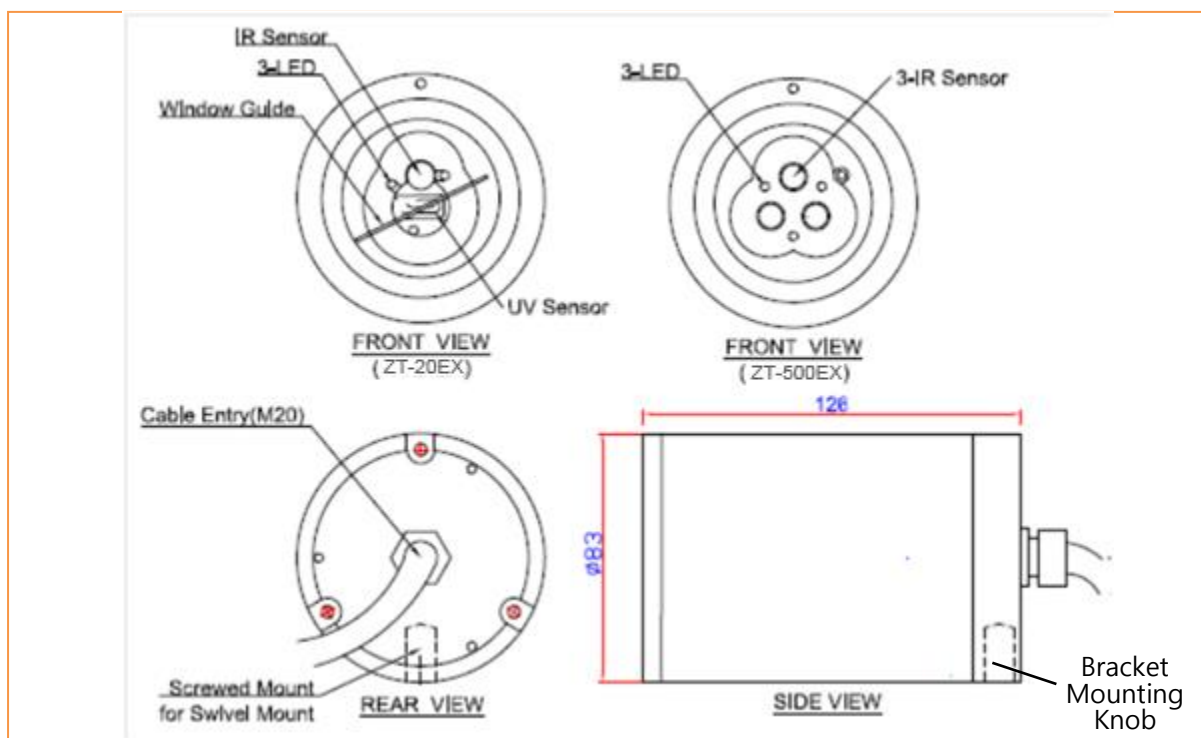


Figure 1. Product Contents & Outline Indication



2 Internal Wire Cabling & DIP SW setting

- 1). Loose the 3(three) socket-head cap screws of back cover and separate the back cover from the middle cover, as follows.
At this time, the internal connection harness (connecting the internal circuit boards) may be inevitably removed.

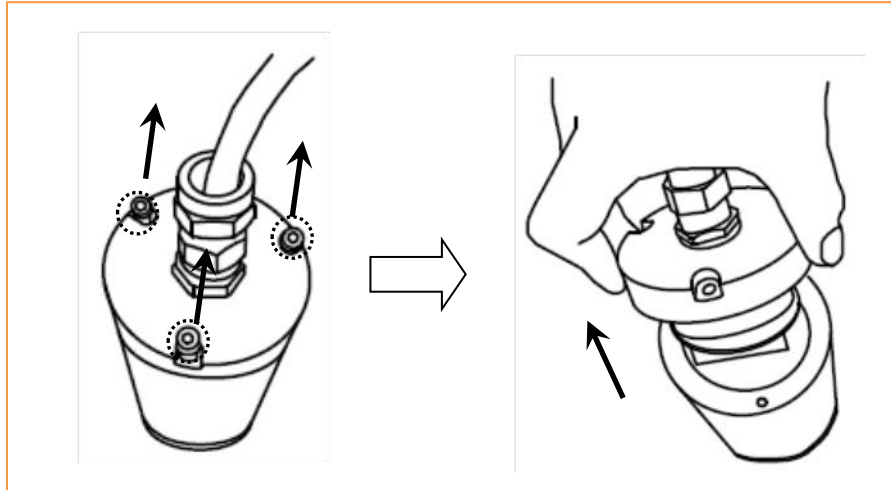


Figure 2. Removing the back cover

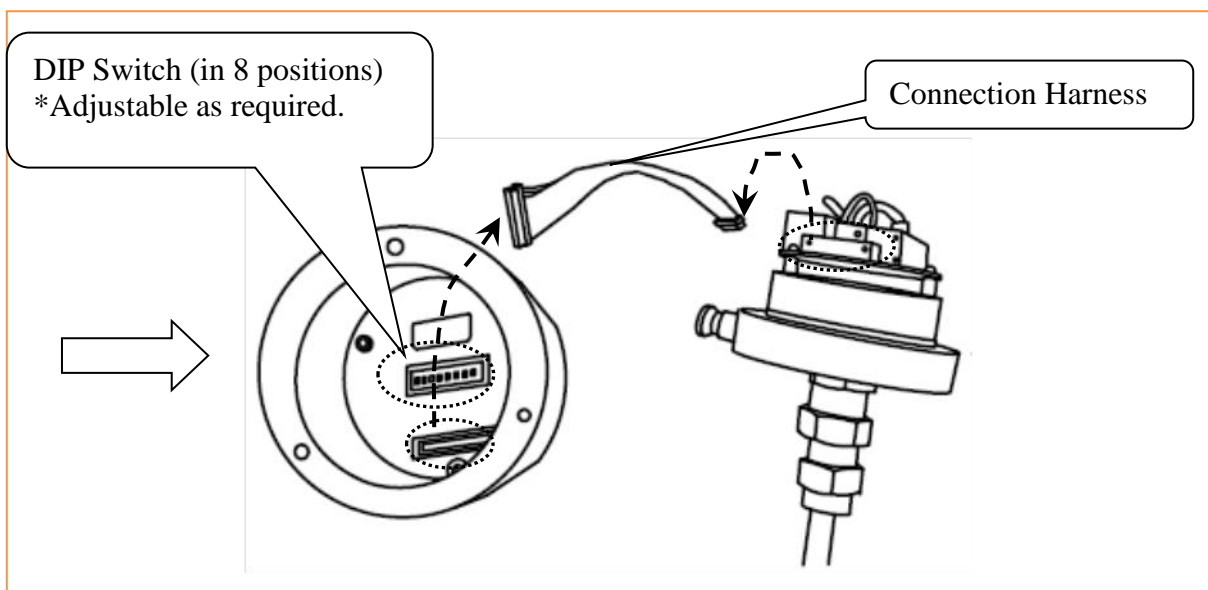


Figure 3. Arranged for wire cabling

- 2). If you need to change the sensitivity & any other user selectable settings, change it, referring to Table 2. DIP Switch Setting.
- 3). Connect(plug) the external cable wires into the relevant positions of terminal block on the connection PCB ,referring to the wiring configuration, as shown in Table 3. (Output Interface of Connection PCB).
- 4). After completion of internal wires connection, make sure to secure tightly the relevant Ex-proof cable gland into the Back Cover for ultimate water proof.

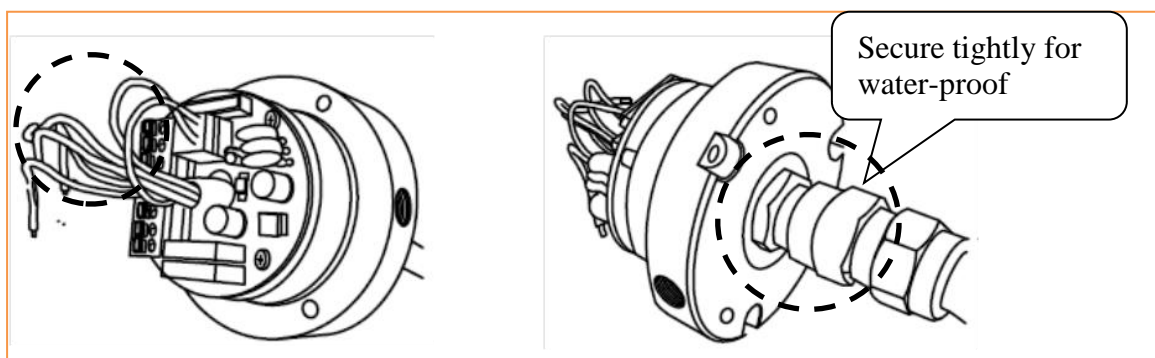


Figure 4. Connecting Wires & Securing the cable gland

- 5). Plug the end of removed connection harness first into the relevant connector on PCB of middle cover and then, into the relevant connector on PCB of back cover.
- 6). Pull the back cover into middle cover to combine these both covers
*Make sure to SECURELY plug each ends of connection harness to each connectors inside both covers. If not securely done, both PCBs would be disconnected.

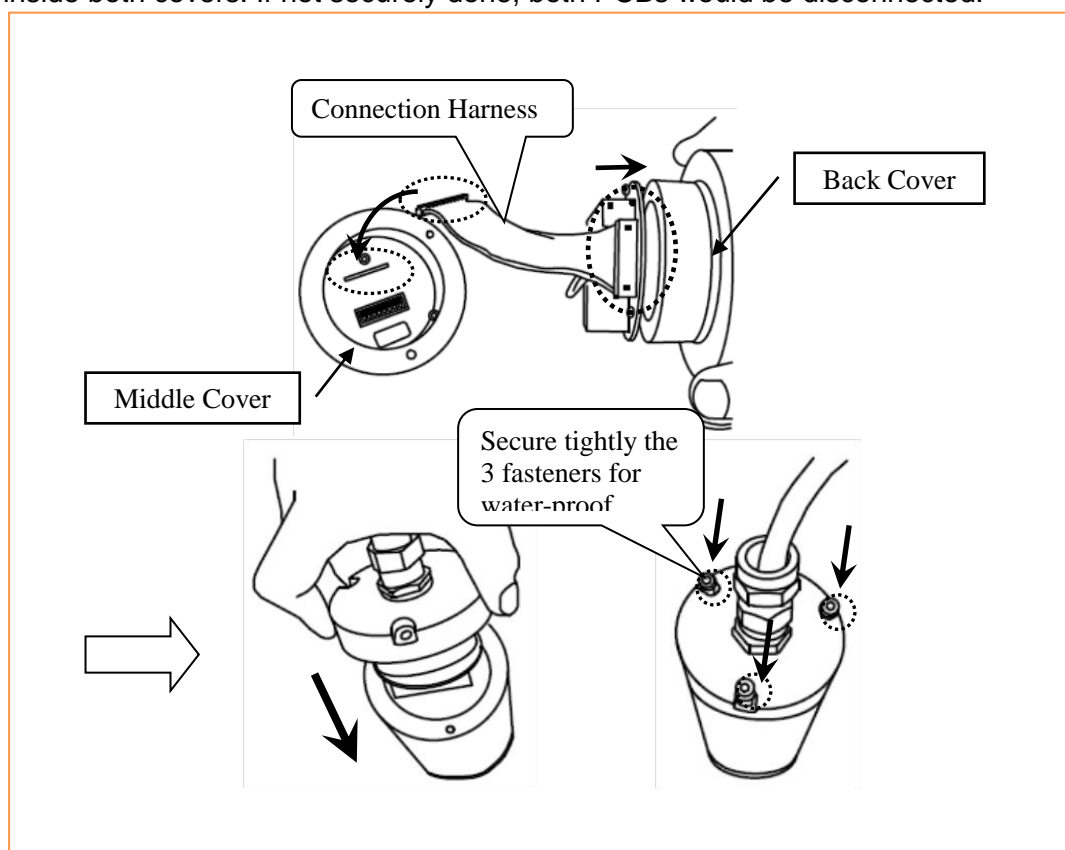


Figure 5. Assembling & Combining the covers

- 7). Screw up the 3(three) socket-head cap screws of back cover to combine the back cover with the middle cover.
Make sure that this screwing-up be done SECURELY and, otherwise, the detector may fail to meet the waterproof.

3 Installation

The detector can be mounted on the wall with either of two kinds of Swivel Mounts, (TM-AL10 in aluminum and TM-ST10 in SS316) which are optionally selectable by customers when ordering the detector.

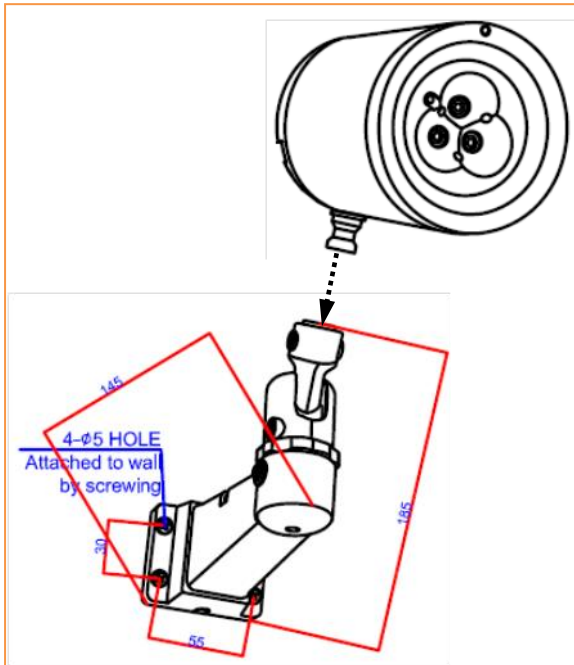


Figure 6. Swivel Mount (TM-AL10)

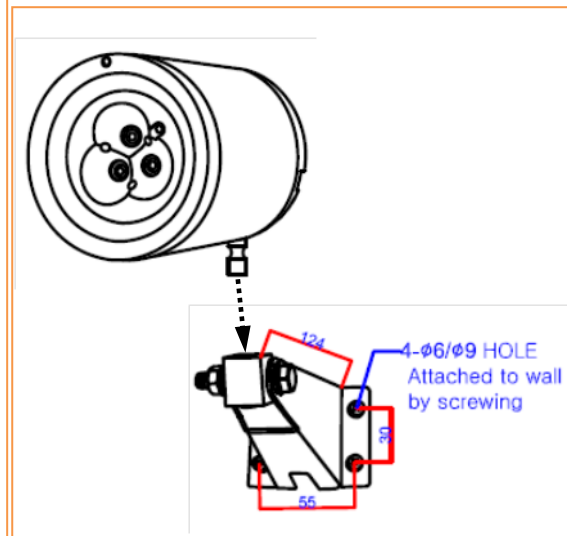


Figure 7. Swivel Mount (TM-ST10)

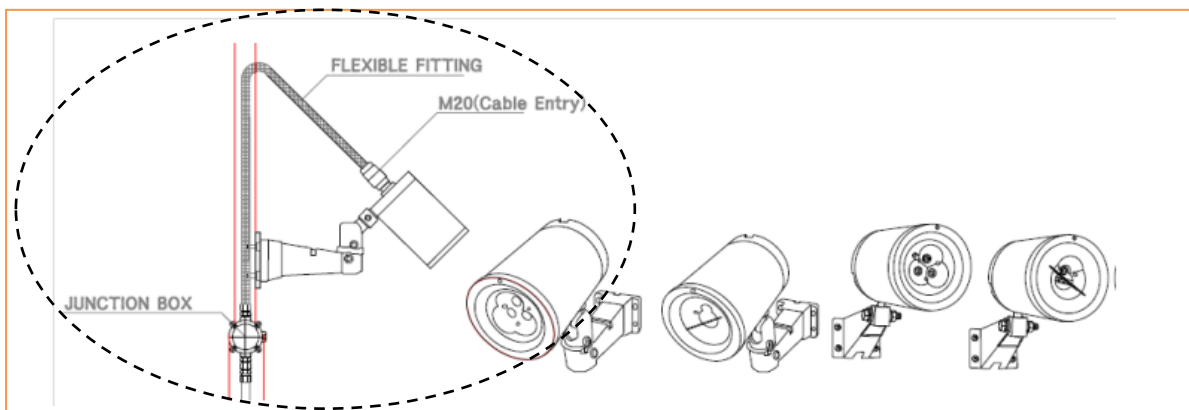


Figure 8. Installed Detectors on wall

- 1). Place the Swivel Mount in its designated location on the wall and secure it with the provided four (4) fasteners through four (4) holes of dia. 5.0 or 6.0mm.
- 2). Put the mounting pole of detector into the mounting hole of Swivel Mount and secure the detector by screwing the locking screws on Swivel Mount.
- 3). Release the locking screws on Swivel Mount in such a way that allows rotating the Detector which is combined the mounting hole of Swivel Mount. Point the detector towards the protected area and make certain that the view of

the area is unobstructed. Secure the detector in that position by tightening the locking screws on the Swivel mount.

The detector is now correctly located, aligned and ready to be connected to the system.

4 Operation

Once powered up, the detector will begin appr. 20 sec start-up routine.

During this time, all three (3) LED indicators will be blinking.

Once the start-up procedure has finished and no faults are present, the detector will begin Normal operation (Green LED will remain on).

Table 1. Output Signals/LED Indications versus Detector State

| Detector Status | Green LED (Power) | Red LED (Alarm) | Yellow LED (Fault) | 4-20mA Output |
|---|----------------------------------|-----------------|--------------------|---------------|
| Power up – 20 second start delay | Blinking | | | 2 mA |
| Internal Power Fault or system power out of range / Fault | Off | Off | Blinking | 0 mA |
| Normal Operation | Solid | Off | Off | 4 mA |
| Fire Detection(Warning) | Off | Solid | Off | 16 mA |
| Fire confirmed | All LEDs blinking simultaneously | | | 20 mA |

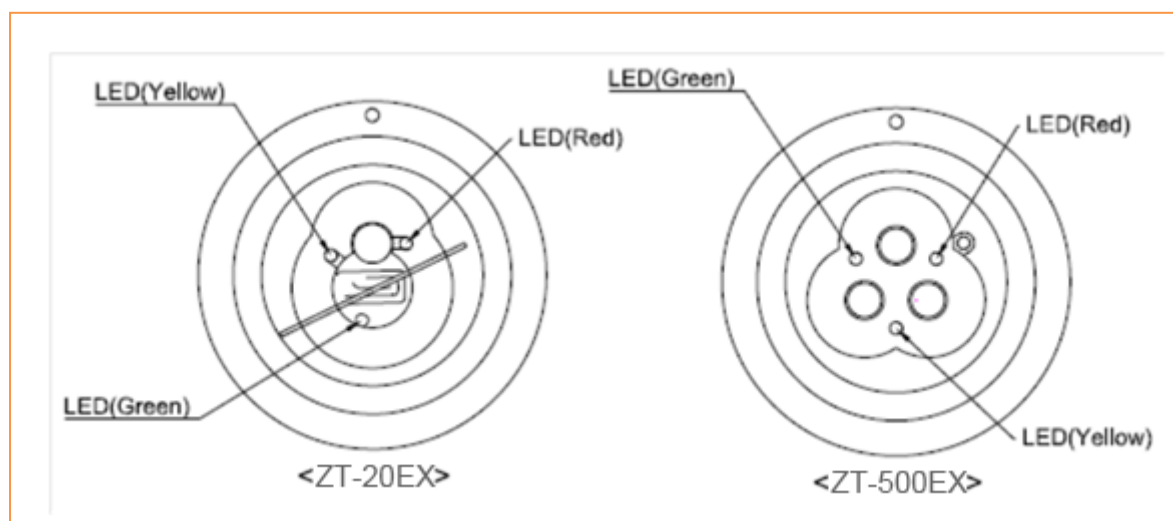


Table 2. DIP Switch Settings

| DIP Switch Position No. | | | | | | | | Mode Selections |
|-------------------------|---|---|---|---|---|---|---|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| | | | | | | | | ON "1" OFF "0" |
| ⊙ | ⊙ | | | | | | | Sensitivity Range (1) OFF-OFF(00) : Highest OFF-ON(01) : High ON-OFF(10) : <u>Medium<default></u> ON-ON(11) : Low |
| | | ⊙ | ⊙ | | | | | Alarm Delay Time (2) OFF-OFF(00) : 1 sec OFF-ON(01) : 3 sec ON-OFF : 5 sec ON-ON : <u>7 sec<default></u> |
| | | | | ⊙ | | | | Alarm Latch Setting (3) OFF(0) : <u>20 sec<default></u> ON(1) : until reset |
| | | | | | ⊙ | | | Reserved (for design setting) OFF(0) : <default> |
| | | | | | | ⊙ | | Reserved (for design setting) ON(1) : <default> |
| | | | | | | | ⊙ | Alarm Relay Setting (4) OFF(0) : <u>N.O<default></u> ON(1) : N.C |

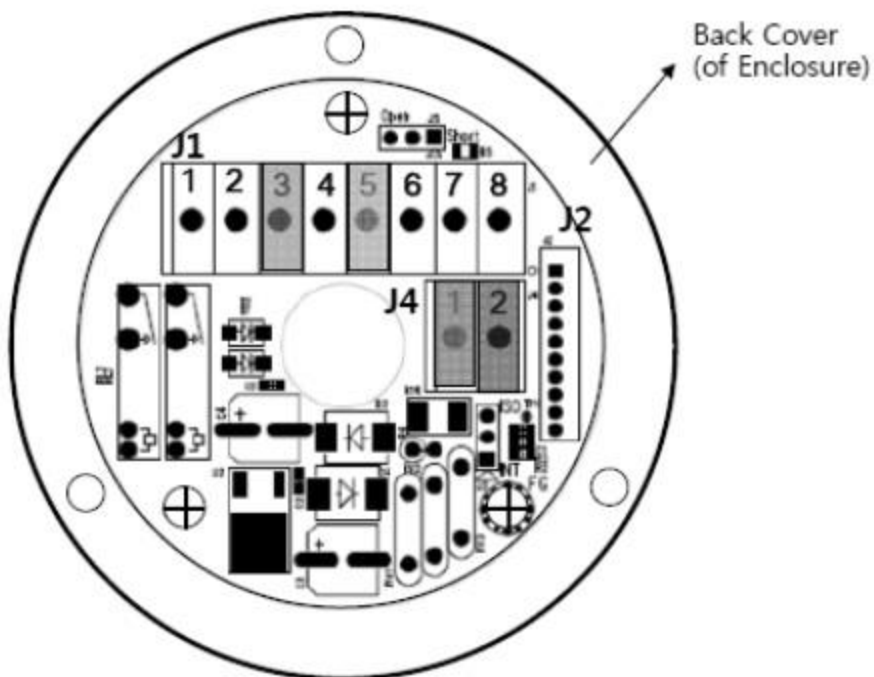
Notes:

- (1). The detector offers four (4) sensitivity settings. The settings refer to the n-Heptane fire of 1ft-sq.
- (2). When an Alarm (Detection) level condition is encountered, the detector delays the execution of the Alarm output relay by the specified period of time. The detector will then, additionally, evaluate the fire condition during the specified Alarm Delay Time. If the Alarm level is still present, the Alarm outputs will be activated. If this condition no longer exists, the detector will return to its standby state. The LED will indicate warning level during the delay time only if the fire condition exists.
- (3). The detector has a selectable latched alarm output capability, which operates according to the selectable function. If selected, upon the detection of a fire, the detection signal is latched until manually reset (disconnecting the power supply or

performing a manual BIT). Latching affects the ALARM RELAY, 4-20mA output, the ALARM LED.

- (4). The detector has a selectable option over alarm relay initialization between normally open, N.O. (as Default) and normally closed, N.C.

Table 3. Output Interface of Connection PCB



Output Interface of Connection PCB

| J1 | |
|-----------|------------------|
| 1 | Alarm Relay(N.O) |
| 2 | Alarm COM |
| 3 | Fault Relay(N.C) |
| 4 | Fault COM |
| 5 | 4-20mA |
| 6 | ISO |
| 7 | RS485_P |
| 8 | RS485_M |
| J4 | |
| 1 | Power(DC24V) |
| 2 | Return(-) |

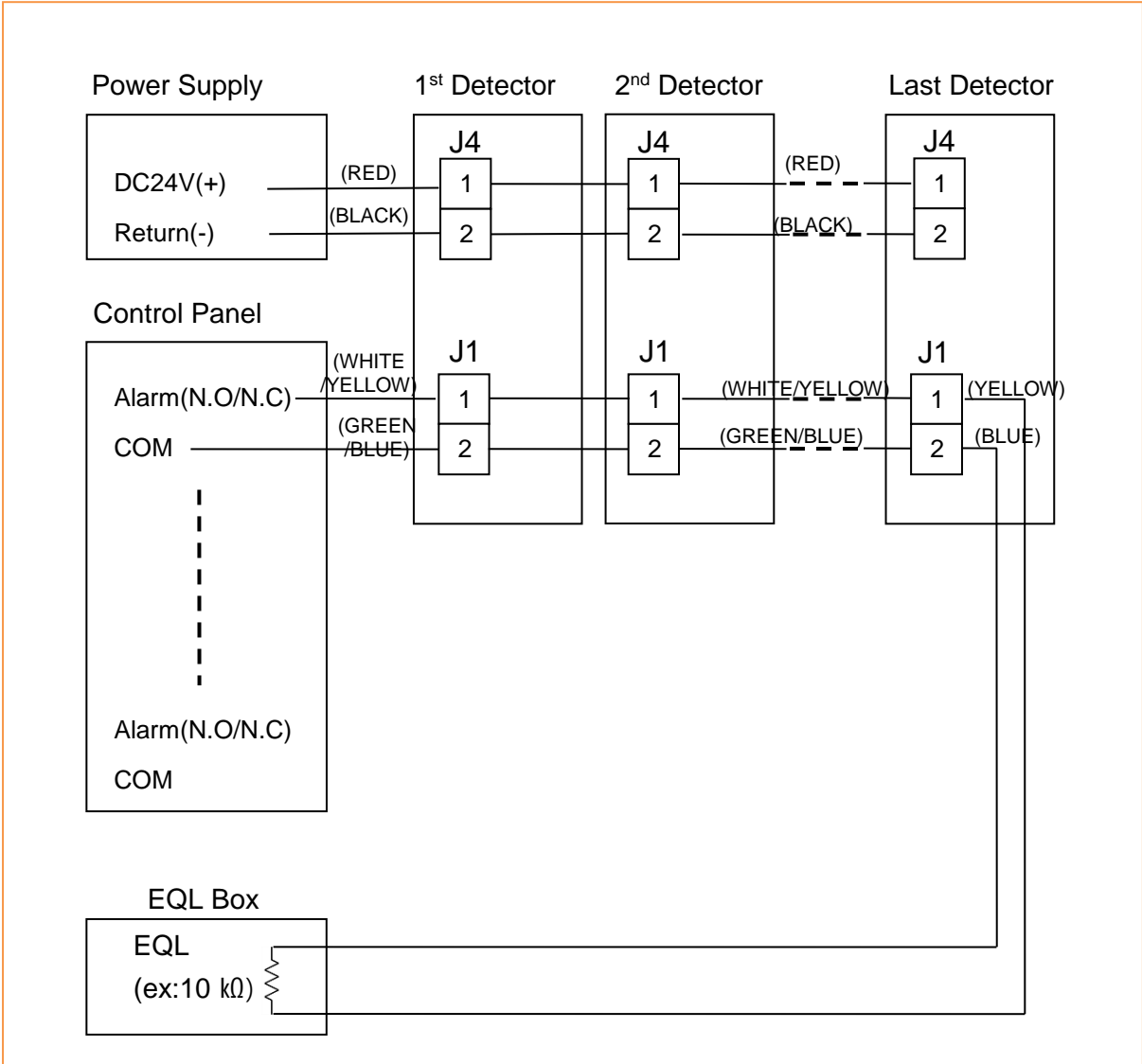


Figure 9. Typical 4-Wiring for Relay Contact Output

Notes: 1. () denotes an example of optional colour wirings.

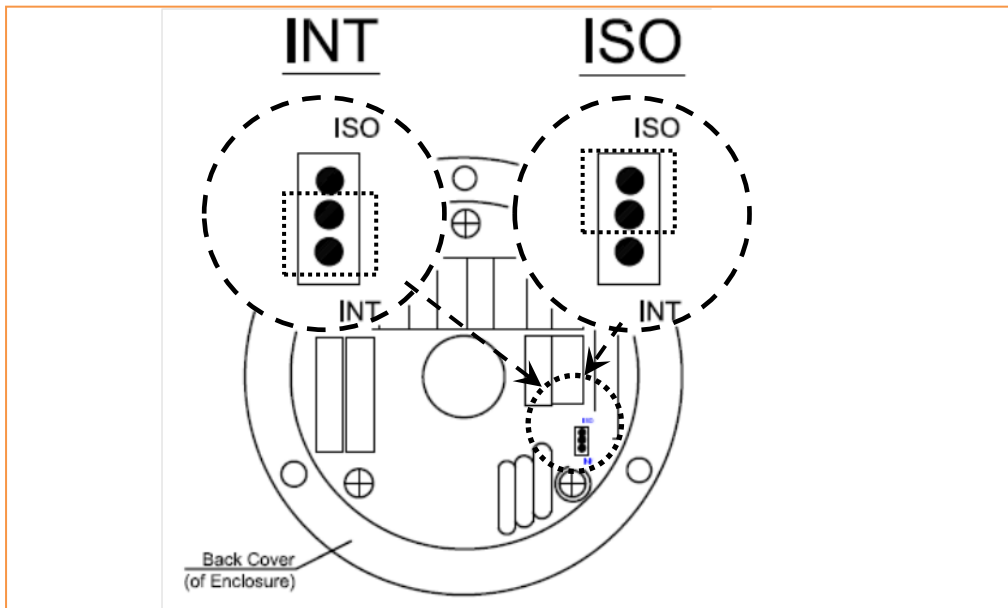


Figure 10. 4-20mA Output Jumper Placement

Note the INT and ISO Jumper position for each configuration.

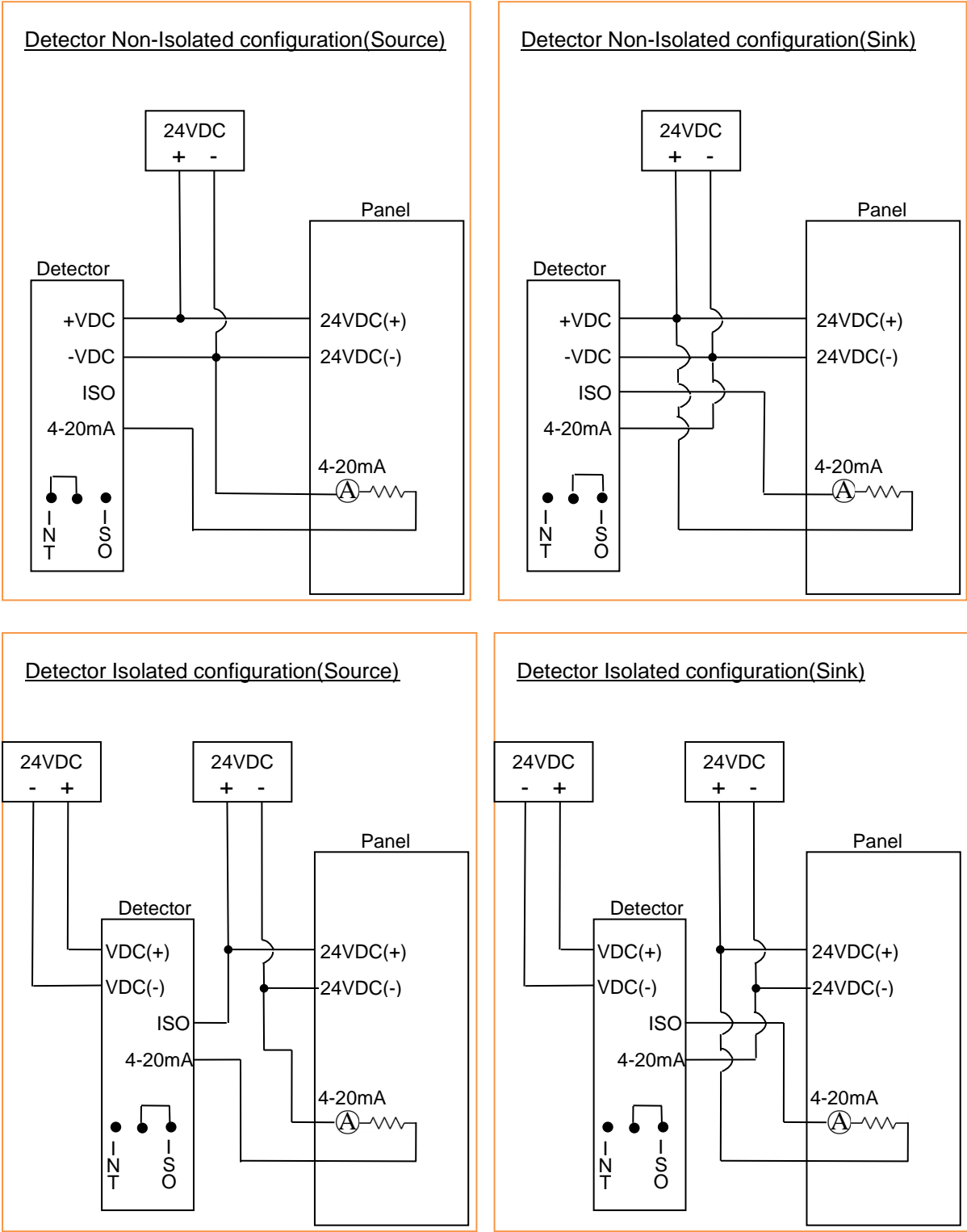


Figure 11. 4-20mA Source and Sink

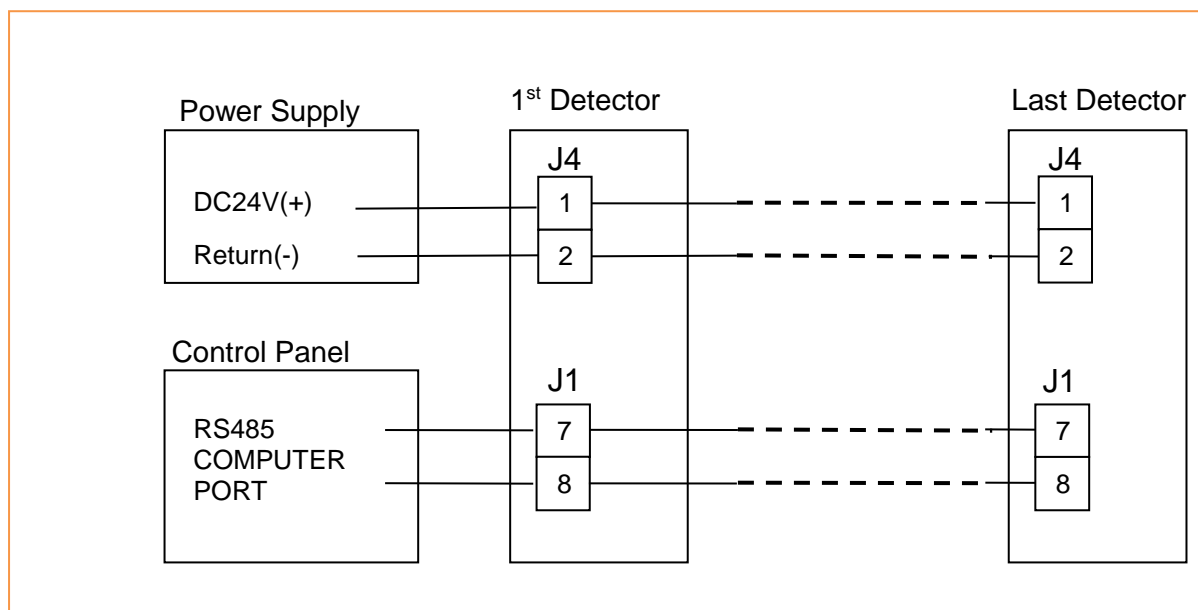


Figure 12. RS-485 Networking

5 Technical Specification

| | ZT-20EX (UV/IR) | ZT-500EX (IR3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--|-----------------|----------|-----------|-----|----------|-----|--------|-----|------|-----|---------|-----|-----|-----|-----------|-----|---------------------------------|--|------------------|--|--|------|----------|-----------|-----|----------|-----|--------|-----|------|-----|---------|-----|-----|-----|-----------|-----|---------------------------------|--|------------------|--|
| GENERAL SPECIFICATION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spectrum Response | UV/IR (Dual Bands) | Triple IR bands | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Detection Range | <table border="1"> <thead> <tr> <th>Fuel</th> <th>Distance</th> </tr> </thead> <tbody> <tr><td>n-Heptane</td><td>30m</td></tr> <tr><td>Gasoline</td><td>30m</td></tr> <tr><td>Diesel</td><td>20m</td></tr> <tr><td>LPG*</td><td>20m</td></tr> <tr><td>Ethanol</td><td>20m</td></tr> <tr><td>IPA</td><td>25m</td></tr> <tr><td>Methane**</td><td>20m</td></tr> <tr><td colspan="2">*0.5m-high/0.2m-wide plume fire</td></tr> <tr><td colspan="2">**30" plume fire</td></tr> </tbody> </table> | Fuel | Distance | n-Heptane | 30m | Gasoline | 30m | Diesel | 20m | LPG* | 20m | Ethanol | 20m | IPA | 25m | Methane** | 20m | *0.5m-high/0.2m-wide plume fire | | **30" plume fire | | <table border="1"> <thead> <tr> <th>Fuel</th> <th>Distance</th> </tr> </thead> <tbody> <tr><td>n-Heptane</td><td>65m</td></tr> <tr><td>Gasoline</td><td>65m</td></tr> <tr><td>Diesel</td><td>45m</td></tr> <tr><td>LPG*</td><td>30m</td></tr> <tr><td>Ethanol</td><td>40m</td></tr> <tr><td>IPA</td><td>40m</td></tr> <tr><td>Methane**</td><td>35m</td></tr> <tr><td colspan="2">*0.5m-high/0.2m-wide plume fire</td></tr> <tr><td colspan="2">**30" plume fire</td></tr> </tbody> </table> | Fuel | Distance | n-Heptane | 65m | Gasoline | 65m | Diesel | 45m | LPG* | 30m | Ethanol | 40m | IPA | 40m | Methane** | 35m | *0.5m-high/0.2m-wide plume fire | | **30" plume fire | |
| Fuel | Distance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| n-Heptane | 30m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gasoline | 30m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diesel | 20m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LPG* | 20m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ethanol | 20m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IPA | 25m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Methane** | 20m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *0.5m-high/0.2m-wide plume fire | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **30" plume fire | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fuel | Distance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| n-Heptane | 65m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gasoline | 65m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diesel | 45m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LPG* | 30m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ethanol | 40m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IPA | 40m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Methane** | 35m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *0.5m-high/0.2m-wide plume fire | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **30" plume fire | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Response Time | Typically 5 seconds | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adjustable Time Delay | 1/3/5/7 seconds | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sensitivity Range | 4(four) ranges | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Field of View | Horizontal 90°, Vertical 90° | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature Range | Operation/Storage: -40°C to 75°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Humidity | Up to 95% non-condensing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ELECTRICAL SPECIFICATION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Voltage | 24VDC nominal (18-32VDC) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power Consumption | Standby: max.65mA , Alarm: max.80mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cable Entry | 1 x M20 (ISO) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wiring | AWG 16-26 (Str 1.5mm ² to 0.13mm ²) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Electromagnetic Compatibility | EMI/RFI protected to EN61000 series | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OUTPUTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relays | Alarm(N.O/ N.C selectable), Fault(N.C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | |
|----------------------------------|-----------------------------|---|
| | | SPST volt-free contacts rated 5A at 30VDC or 250VAC |
| | 0-20mA (stepped) | Source & Sink, Isolated/Non-isolated configuration Fault: 0 +1mA Normal: 4mA±10% Warning: 16mA±5% Alarm: 20mA±5% Resistance Loop : max. 500Ω |
| | RS-485 <optional> | RS-485 Modbus compatible communication link that can be used in computer controlled installations |
| MECHANICAL SPECIFICATIONS | | |
| | Materials | - Heavy duty copper free aluminium with bright grey - Stainless Steel 316L |
| | Mounting Bracket <Optional> | - Heavy duty copper free aluminium with bright grey - Stainless Steel 316L |
| | Dimensions | Detector: 83(D) x 126(L) mm |
| | Weight | Detector (aluminium): 1.0 kg Detector (ST 316L): 2.7kg Mounting Bracket (aluminium/ St.): 0.3kg / 0.7kg |
| APPROVALS | | |
| | Hazardous Area | ATEX Ex II 2 G, Exd IIC T6, -40°C to +75°C |
| | Performance | - Designed to meet FM3260/EN-54-10 - KFI(for Korea) approved |

For additional details or assistance, please contact:



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