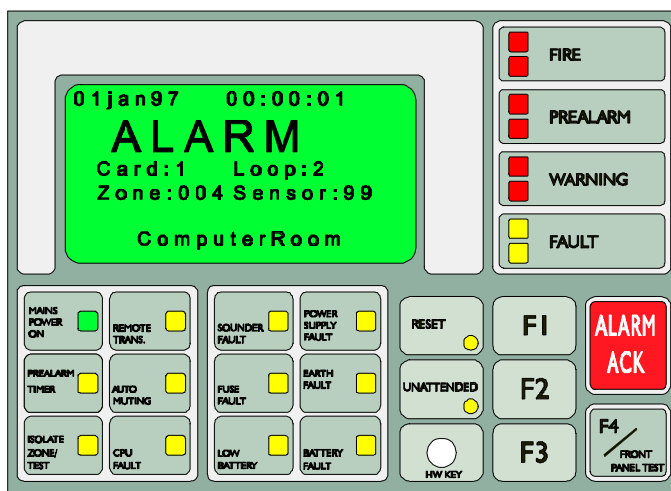




FIRE CONTROL PANEL PMT - 350 MKII

INSTALLATION

MANUAL



CONTENTS

| | |
|---|-----------|
| GENERAL | 5 |
| <i>PMT - 350 System Description</i> | 5 |
| <i>Fire alarm control panel PMT - 350</i> | 7 |
| METAL CASE | 8 |
| <i>Description of the metal case</i> | 8 |
| <i>Specifications of the metal case</i> | 8 |
| <i>Wall mounting of the metal case</i> | 9 |
| <i>Flush mounting of the metal case</i> | 9 |
| MAIN UNIT | 10 |
| <i>Keyboard</i> | 10 |
| KEYBOARD LAYOUT | 11 |
| <i>Visual indications</i> | 11 |
| <i>The keyboard and the hardware key</i> | 14 |
| <i>Audible warning signals</i> | 15 |
| Power Supply | 16 |
| <i>Power supply terminal block</i> | 17 |
| <i>Standby Battery</i> | 18 |
| The PMT350 control panel terminal block | 18 |
| <i>Control panel terminal block</i> | 19 |
| <i>Relay output connections</i> | 20 |
| <i>Connection to the sounder loops</i> | 20 |
| <i>The Open Collector repeater output connections</i> | 21 |
| <i>The Serial Ports</i> | 22 |
| <i>Serial port connection cables</i> | 23 |
| ADDITIONAL CARDS | 25 |
| PMT - 301 CARD (CONVENTIONAL 8 ZONES) | 26 |
| <i>General Description</i> | 26 |
| <i>PMT-301 Front panel layout</i> | 27 |
| <i>Status description</i> | 27 |

| | |
|---|-----------|
| Fire pre-alarm..... | 27 |
| Fire alarm | 28 |
| Fault..... | 28 |
| CPU fault | 28 |
| Isolating / restoring a zone | 29 |
| Conventional zones test..... | 29 |
| PMT - 301 Terminal Block..... | 30 |
| Installation of the detection zones | 31 |
| Type of detectors that can be connected..... | 32 |
| Connection of the alarm repeater open collector outputs..... | 32 |
| PMT-301 Technical Specifications..... | 33 |
| <hr/> THE ADDRESSABLE DETECTORS ZONE..... | 34 |
| General Description..... | 34 |
| Description of the states..... | 35 |
| Fire pre-alarm..... | 35 |
| Fire alarm | 35 |
| Technical alarm..... | 36 |
| Fault..... | 36 |
| Maintenance of a detector I/O module | 36 |
| Isolating / restoring a software zone / detector / I/O module | 37 |
| Installation of the detection zones | 37 |
| Detector specifications..... | 37 |
| Specifications of the AB401/PMT addressable bases..... | 38 |
| PMT-100 Input/Output module specifications..... | 38 |
| PMT-102 zone separator module specification | 42 |
| Detection loop connection types..... | 43 |
| Closed loop configuration..... | 44 |
| Open loop configuration..... | 45 |
| Alarm repeater connection..... | 46 |
| <hr/> PMT - 303 UNIT (8 RELAY OUTPUTS)..... | 47 |
| General Description..... | 47 |
| PMT-303 Front panel layout..... | 48 |
| PMT-303 Unit technical specifications | 48 |
| PMT - 303 Terminal block..... | 49 |
| <hr/> PMT - 304 UNIT (1 EXTINGUISHING CHANNEL)..... | 50 |
| General Description..... | 50 |

| | |
|---|----------------------|
| <i>PMT-304 Front panel layout.....</i> | <i>51</i> |
| <i>Extinguishing channels activation modes.....</i> | <i>51</i> |
| <i>Manual activation</i> | <i>52</i> |
| <i>Automatic/manual release status.....</i> | <i>53</i> |
| <i>Automatic mode of operation of the extinguishing channel</i> | <i>54</i> |
| <i>The release halt push-button.....</i> | <i>54</i> |
| <i>Fault indications</i> | <i>55</i> |
| <i>Unit reset.....</i> | <i>55</i> |
| <i>PMT-304 Technical specifications.....</i> | <i>55</i> |
| <i>PMT - 304 Terminal block.....</i> | <i>56</i> |
| <i>Installation of the PMT-304 Unit.....</i> | <i>57</i> |
| <i>Activation input connections</i> | <i>57</i> |
| <i>Connection to the extinguishant release and inhibit pushbutton loops</i> | <i>57</i> |
| <i>Remote key –switch connection.....</i> | <i>57</i> |
| <i>Pressure switch loop connection.....</i> | <i>58</i> |
| <i>Extinguishant loop connection</i> | <i>58</i> |
| <i>Open collector repeater output connections.....</i> | <i>59</i> |
| <i>UNIT CONNECTION.....</i> | <i>60</i> |
| <i>Power supply.....</i> | <i>60</i> |
| <i>Communication line connection.....</i> | <i>61</i> |

GENERAL

PMT - 350 System Description

The control panel is constructed to meet the following standards CEI-EN60950, CEI 14-6, CEI 64-8, UNI 9795, EN 54-1 and the draft standards EN 54-2, EN 54-4, as well as the harmonised European standard on electromagnetic compatibility CE.

The PMT-350 is a modular, programmable stand-alone fire alarm control panel and is comprised of a control panel connected to a number of modules.

A list of the principal operating features appears below:

❑ MODULARITY

Subject to specific requirements, the system can be configured simply by the installation of a suitable number of modules and as such, a wide range of applications can be resolved with ease.

The control panel is equipped with one analogue detection loop which can be connected to 99 detectors and/or 99 intelligent I/O modules.

The control panel communicates with the modules, using a suitable communications protocol, and is able to both send and receive appropriate messages.

Each connected module can perform a well-defined function.

The standard models of module available are listed below:

- PMT-301: fire detection unit supporting conventional detectors.
- PMT-303: relay unit, 8 relays, each with a programmable delay time, which for example can be used to control illuminated panels and sounders for visual and acoustic warning of the alarm status.
- PMT-304: single extinguishing channel module.

In its maximum configuration the system can accommodate any configuration of the above modules with a maximum of 3 modules.

❑ LARGE SCALE DETECTION CAPABILITY

- The PMT-301 module has 8 zone loops, each of which can accommodate up to 31 conventional detectors giving a total of up to 248 detectors

The control panel is equipped with one analogue detection loop which can be connected to 99 detectors and/or 99 intelligent I/O modules.

❑ REDUNDANCY

All system components employ a 16 bit Microprocessor, RAM memory, EPROM resident program memory and EEPROM non-volatile memory for storing configuration data.

Therefore, any CONTROL PANEL failure does not mean a malfunction of the modules, in that these units are able to continue functioning autonomously, carrying out their primary functions through suitable outputs.

Similarly a failure or fault in a module is quickly communicated to the CONTROL PANEL, which will display a specific pre-set message describing the event and indicate the fault via the Flashing FAULT LED situated on the front panel of the control.

❑ PROGRAMMING AND CONTROL USING A PC

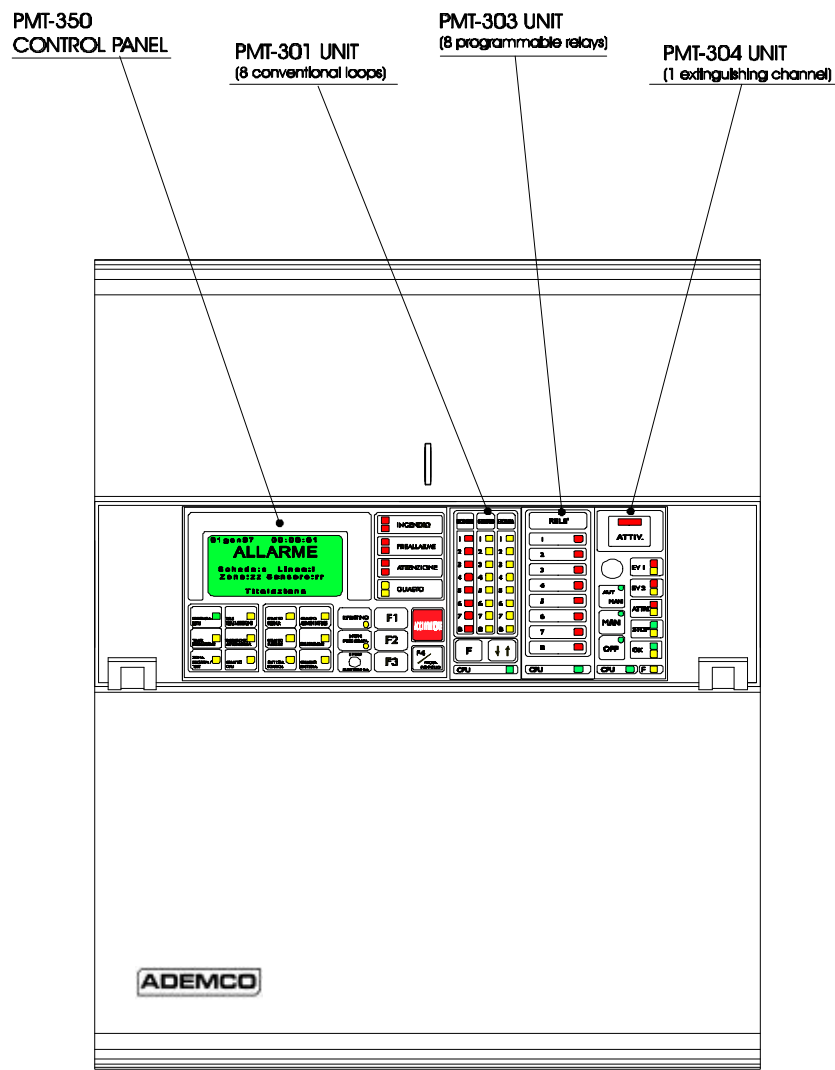
Dedicated software permits the programming of the control panel under Windows operation system (ver. 3.11 and '95).

PLEASE NOTE

During first power-up of the control panel, or during power up after the panel has been not been powered for approximately 3 months or more, do not attempt to carry out any programming of the panel, once powered, for at least 30 minutes. In this way the Ni-Cd backup battery, used by the time clock and the microprocessor clock, will have sufficient time to be charged up to its correct working voltage necessary for the control panel to function correctly.

Fire alarm control panel PMT - 350

The following diagram shows the front panel of the PMT - 350.



METAL CASE

Description of the metal case

All the electronics parts of the PMT-330 Fire Detection System (Main Unit and Additional Cards) are housed in a steel metal case, painted with epoxy resins.

Both the main unit and the additional cards are fixed to the case by means of a removable support, that allows the operator to easily mount the various models and then to mount the support onto the case. This results in a quick installation of the electronic parts and in an easy interchangeability of the system's components.

The access to the operator panels of the main unit and to the additional cards is very simple, because there is a transparent plastic (lexan) flap door, equipped with lock.

Cable entry is through suitable cut holes located in the upper, in the lower and in the rear part of the case.

In order to ensure a correct grounding of the case, all the removable metal parts are interconnected by suitable copper wires with thimbles, provided with the case.

The sealed lead acid batteries can also be located inside the metal case of the fire panel.

The aesthetic design of the enclosure is particularly pleasant, and the case is also suitable for both wall and flush mounting, in order to satisfy all the installation requirements.

Specifications of the metal case

The physical specifications of the metal case are listed in the following table:

Dimensions (W x L x D)455 x 355 x 120 mm

Protection rating.....I.P. 44

Weight (batteries excluded)15 Kg.

MaterialSteel

Sheet thickness.....1,5 mm

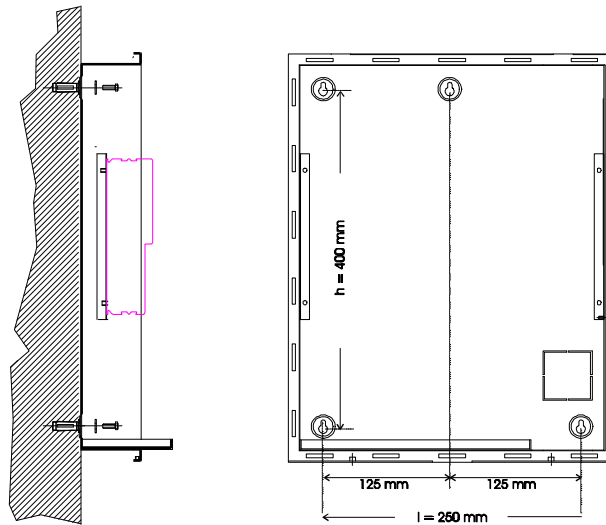
Painting.....Epoxy resin

ColourRAL 7035

Wall mounting of the metal case

4 eye holes are available on the rear side of the case. They are used for the wall mounting of the fire panel.

The following drawing refers to the PMT-350 control panel:

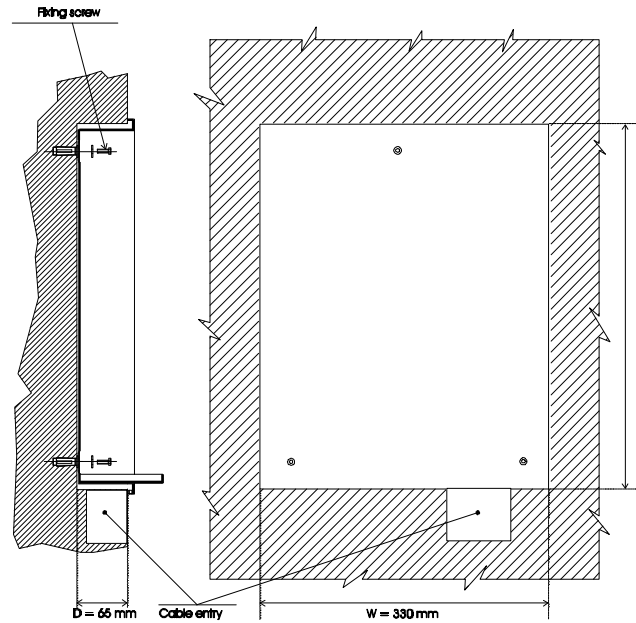


To install the panel drill four 10 – 12mm holes in the wall with centres as shown in the diagram.

NOTE: locate the panel so as to have the cable entry access accessible.

Flush mounting of the metal case

The dimensions for the PMT350 control panel are the following:



MAIN UNIT

The main unit is composed of the following parts:

1. A self extinguishing enclosure in ABS plastic.
2. A CPU board with 4 layers, equipped with a 16 bit microprocessor.
3. A power supply / battery charger that, thanks to its stabilised supplied voltage, ensures a correct power supply to all the electronics components and a perfect charge to the backup batteries.
4. An operator panel provided with a graphic LCD that display all the programming data and the status messages of all the components of the system.
5. A terminal block that allows a quick and simple connection to the peripheral elements of the system; Each terminal block is protected from interference induced on the connection cabling using suitable transient suppressers (transil).

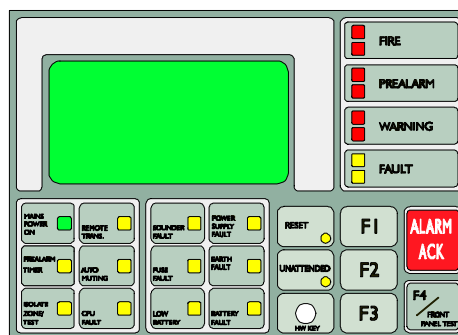
Keyboard

The status of the system is indicated by a series of LEDs and a retro illuminated LCD display on the control panel keyboard and it is possible to control the control panel using the seven push buttons on the keypad.

The keyboard consists of the following components:

- Graphic LCD with 8 lines x 21 alphanumeric characters (64 x 128 pixel), backlit.
- 4 pairs of LED's to signal the alarms and general faults.
- 14 LED's for various indications (faults, mains ON, etc.).
- A dual-tone buzzer for alarms and faults.
- 7 control keys (keyboard).
- Electronic pass key to access the different operator levels

The layout of the keyboard is shown below:

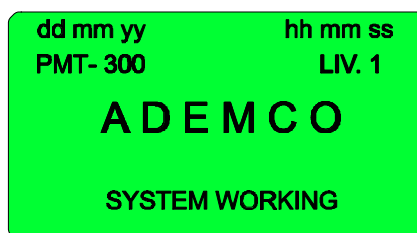


KEYBOARD LAYOUT

The detailed description of each visual indication on the front panel is explained in this section with the exception of the LCD display which is dealt with in the User Manual.

ALPHANUMERIC DISPLAY

The status of the system is clearly shown on the 21 character 8 line alphanumeric display, this aids the operator in both normal operation and in the set-up of the control panel. The normal operating display shown in figure:



On the second line is displayed the control panel name and the access level for the operational procedures: The higher the number the greater the number of steps permitted.

Whenever a fault occurs text describing what was happened is automatically displayed. Refer to the User Manual for a list of the available messages.

Visual indications

22 LEDs are to be found on the front panel, when describing the operational state of the LED *on* means permanently lit, *flashing* means alternatively on for 500ms and off for 500ms.

During normal operation all the LED's are off with the exception of the "MAINS POWER ON" LED which is on indicating connection to the 230 VAC supply.

Below is a list of all the indications to be found on the operator panel.

1. FIRE (Double Red LED):
 - fire alarm status
 - off = no alarm present
 - flashing = alarm present (to be acknowledged)
 - on = alarm acknowledged
2. PRE ALARM (double Red LED): pre-alarm status
 - off = no pre-alarm present
 - flashing = pre-alarm

- On = pre-alarm acknowledged
3. **WARNING (Double RED LED):** Technical alarm
- off = no Technical alarm present
- flashing = Technical alarm
- On = Technical alarm acknowledged
4. **FAULT (Double Yellow LED):** fault status
- Off = no fault
- Flashing = fault present
- On = fault acknowledged
5. **MAINS PRESENT (Green LED):** Mains power present
- Off = Mains power not present
- On = Mains power present
6. **TIMER PRE-ALARM (Yellow LED):** pre-alarm timer on status
- Off = no pre-alarm timer in operation
- Flashing = pre-alarm timer in operation
7. **ZONE BYPASSED / TEST (Yellow LED):** Test status of the conventional loops (PMT301)
- Off = normal operation
- Flashing = undergoing test
- On = zone bypassed
8. **BYPASSED RELAYS (Yellow LED):** Warning indication that the relays have been isolated (alarm, Temp. alarm., pre-alarm, Technological Alarms, Fault).
- Off = relays enabled
- On = relays disabled
9. **AUTO MUTING (Yellow LED):** Auto muting status
- off = no automatic muting
- flashing = alarm has been automatically muted
- On = automatic muting acknowledged
10. **CPU FAULT (Yellow LED):** CPU fault monitoring
- off = no CPU fault present

on = CPU fault present

11. SOUNDER FAULT (Yellow LED): Sounder wiring monitor

Off = Sounder wiring operational

Flashing = Sounder wiring fault detected

On = Sounder wiring fault acknowledged

12. FUSE FAULT (Yellow LED): 12VDC and 24VDC Fuse Status Monitor

Off = no fuse faults present

Flashing = Fuse fault present

On = Fuse fault acknowledged

13. LOW BATTERY (Yellow LED): Battery status monitor

off = battery correctly charged

on = battery low ($15 < V_{batt} < 20.5$) volt

on = battery overcharged ($V_{batt} > 28$ volt)

14. POWER SUPPLY FAULT (Yellow LED): Power supply status monitor

Off = Power supply working correctly

On = Power supply fault ($V_{lim} < 13V - V_{lim} > 30V$)

15. BATTERY FAULT (Yellow LED): Battery fault status monitor

Off = Battery operational

On = Battery fault ($V_{batt} < 15$ volts)

16. RESET (Yellow LED) : Control panel reset monitor

linked to the push-button

Off = control panel operational

On = control panel in a reset status

17. UNATTENDED (Yellow LED) : Attended/unattended mode of operation monitor

linked to the push-button

Off = Control panel attended

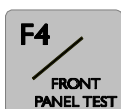
On = Control panel unattended

The keyboard and the hardware key

The keyboard is made up of 7 buttons, whose functions are as follows:



Pressing this button silences (disactivates) the sounders (at operation lev. 2 and higher) and the audible warning signals following alarm or fault conditions, and acknowledges the alarm or fault condition. All visual indications remain active on all the panels but permanently on. A subsequent alarm re-activates the audible. It is possible to remote the command.



Pressing this button activates the audible and visual warning signals of the control panel and those of the outstations for a short period (approximately 5 seconds), so as to verify their correct operation.



Reset Indication LED

Pressing this button resets the whole system to its quiescent state, after an alarm or fault conditions. Any alarm or fault condition still remaining will produce again the relative warning signals. It is possible to remote the command.



Pressing this button permits the selection of one of two states of operation of the system. It is possible to remote this command. For a more detailed description of this command refer to the User Manual.



Function Buttons useful in programming the system.



Hardware Key controls the access to various operational levels.

Audible warning signals

A two tone sounder is fitted on the control panel to signal alarm and fault warnings, these warning signals are silenced once the conditions have been acknowledged.

Power Supply

The input voltage is 230 VAC $\pm 10/-15\%$; mains filters and protection devices are provided in order to ensure a full compliance with the electromagnetic compatibility standards.

The nominal operating voltage for all the units is 24 VCA, supplied by the power supply that is also a battery charger and is equipped with the following two outputs, on the terminal block:

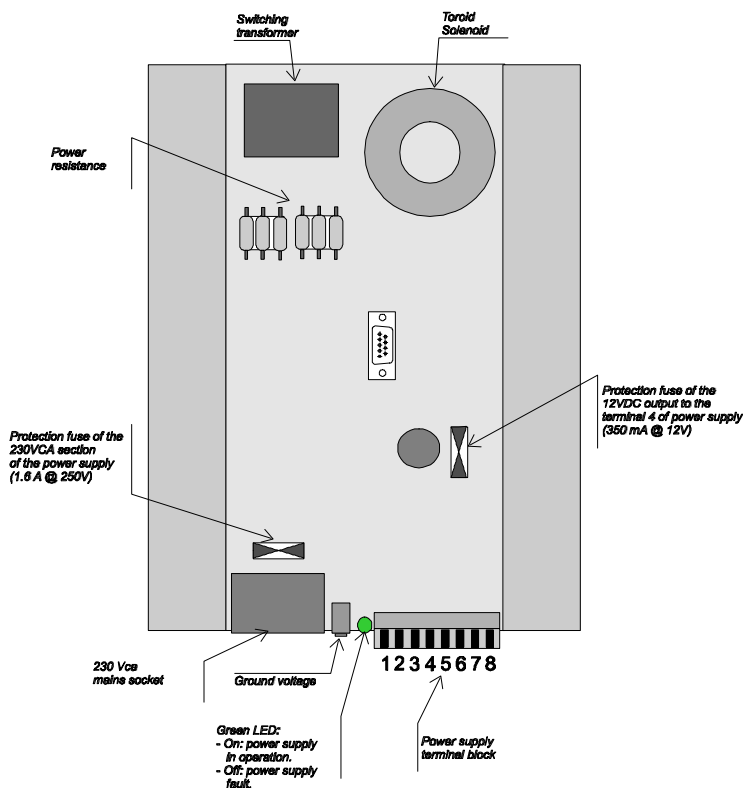
- **12VDC output** with a maximum current of 350 mA (protected by a fuse integrated in the power supply);
- **24 VDC output** with a maximum current of 500 mA (protected by a fuse externally accessible).

The power supply is also equipped with control circuits that are able to identify the following conditions:

- mains ON / mains fuse interrupted;
- battery polarity inversion;
- battery charger fault;
- battery low: $15V < V_{batt} < 20.5V$
- no battery;
- battery overcharged: $V_{batt} > 28V$
- battery loop short circuit;
- battery fault: $V_{batt} < 15V$.

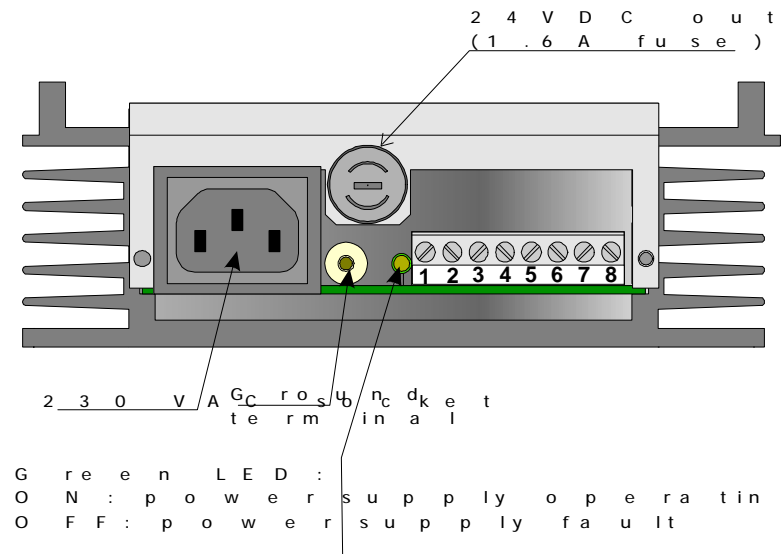
The above mentioned malfunctioning conditions are all displayed through flashing LEDs and self-explaining messages on the LCD of the front panel.

The following diagram shows the power supply without its louvered cover so as to show the position of certain components:



Power supply terminal block

There are 8, 2.5mm diameter terminals on the power supply. The following diagram shows a front view of the power supply with the external fuse and the terminal numbering highlighted:



The description of the terminals is shown in the following table:

| Terminal No. | Description |
|--------------|--|
| 1 | Permanent Negative Supply |
| 2 | Positive Battery Supply (+24V dc) |
| 3 | Negative Battery Supply |
| 4 | 12Vdc output. Positive. (Fuse protected) |
| 5 | Permanent Negative Supply |
| 6 | Permanent Negative Supply |
| 7 | 24Vdc output. Positive. (Fuse protected) |
| 8 | 24Vdc output. Positive. (Fuse protected) |



Standby Battery

The control panel is equipped with two standby batteries so as to ensure correct operation of the control panel whenever the mains supply might fail. As previously described the primary supply maintains the standby batteries and checks that they are functioning correctly.

The Following tables show the battery characteristics as well as the maximum space available for them in the cabinet:

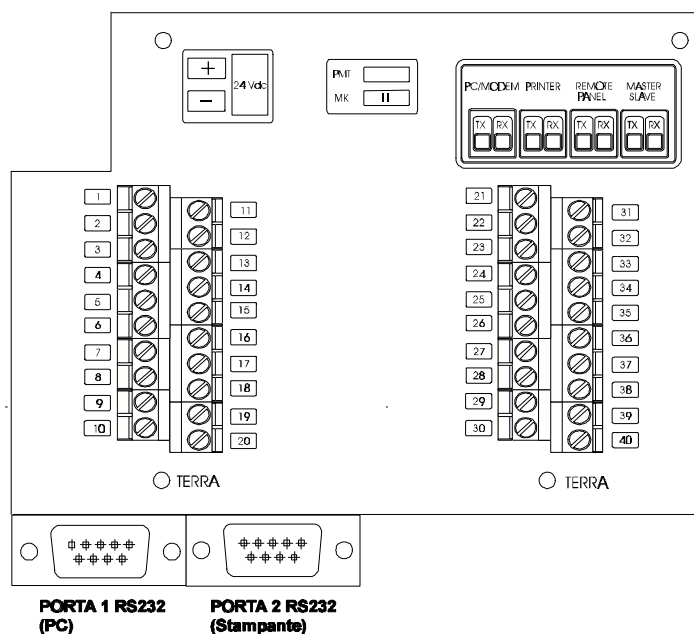
| PMT350 CONTROL PANEL STANDBY BATTERIES | |
|--|-------------------------------|
| Electrical Specifications | N° 2, 12Vdc @ 24 Ah batteries |
| Maximum Dimensions | (LxHxD) = (300x95x100)mm |

The PMT350 control panel terminal block

Terminal block is made up of 40, 2.5 mm. terminals, laid out in 4 rows; There are also 2, male 9 pin sockets available on the control panel for connection to the two serial ports:

- Serial Port 1: RS 232 used for connecting to the system programming PC;
- Serial Port 2: RS232 used for connecting to a 80 column serial printer which gives a hard copy of the events both in real-time or by request of the operator;

The following diagram shows the terminal numbering and the positions of the 9 way sockets:



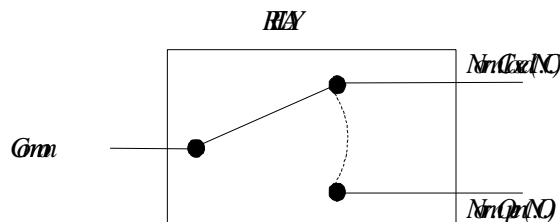
Control panel terminal block

The following table shows the Number, description and electrical specifications for each terminal:

| n° | Description | Electrical specifications |
|----|---|-----------------------------------|
| 1 | ALARM 1 repeater relay (COMMON) | 1 A / 125 VCA spdt |
| 2 | ALARM 1 repeater relay (NC) | |
| 3 | ALARM 1 repeater relay (NO) | |
| 4 | ALARM 2 repeater relay (COMMON) | |
| 5 | ALARM 2 repeater relay (NC) | |
| 6 | ALARM 2 repeater relay (NO) | |
| 7 | ALARM 3 repeater relay (COMMON) | |
| 8 | ALARM 3 repeater relay (NC) | |
| 9 | ALARM 3 repeater relay (NO) | |
| 10 | FAULT repeater relay (COMMON) | |
| 11 | FAULT repeater relay (NC) | |
| 12 | FAULT repeater relay (NA) | |
| 13 | Timed GEN. ALARM relay (COMMON) | |
| 14 | Timed GEN. ALARM relay (NC) | |
| 15 | Timed GEN. ALARM relay (NA) | |
| 16 | Relay reset (NO = 0VDC in normal condit.) | 24 VDC in RESET 0 VDC in RESET |
| 17 | Relay reset (NC = + 24 VDC in nor. condit.) | |
| 18 | GND | 0,5 A 24 VDC Polarity of the |
| 19 | + Line monitored for one siren | |
| 20 | - Line monitored for one siren | |
| 21 | Open C. repeater of detectors 1..9 alarm | 200 mA 30VDC Open C. |
| 22 | Open C. repeater of detectors 10..19 alarm | |
| 23 | Open C. repeater of detectors 20..29 alarm | |
| 24 | Open C. repeater of detectors 30..39 alarm | |
| 25 | Open C. repeater of detectors 40..49 alarm | |
| 26 | Open C. repeater of detectors 50..59 alarm | |
| 27 | Open C. repeater of detectors 60..69 alarm | |
| 28 | Open C. repeater of detectors 70..79 alarm | |
| 29 | Open C. repeater of detectors 80..89 alarm | |
| 30 | Open C. repeater of detectors 90..99 alarm | |
| 31 | + Detector loop open circuit | |
| 32 | - Detector loop open circuit | |
| 33 | + Detector loop closed circuit | |
| 34 | - Detector loop closed circuit | |
| 35 | MAINS PRESENT repeater | 200 mA 30Vdc Open C. |
| 36 | ZONES ISOLATED repeater | |
| 37 | POWER SUPPLY FAULT repeater | |
| 38 | + 24 VDC output (fuse protected) | +24 VDC |
| 39 | GND | |
| 40 | GND | |

Relay output connections

6 Relay outputs are available at the terminal block (125Vac @ 1A s.p.d.t.) each of which is activated by a specific event; the description of each terminal of the s.p.d.t relay is illustrated in the following diagram:



Note: activation of the relay connects the COMMON terminal to the NORMALLY OPEN terminal.

- *FAULT* Relay: activated whenever a fault condition is signalled from any of the monitored equipment
- *FIRE ALARM* Relay: activated whenever a *FIRE ALARM* condition is signalled from any detector connected to the detection units (PMT301- Analogue Loop).
- *DELAYED FIRE ALARM* Relay: the conditions to activate this relay are the same as for the previous relay (Fire Alarm); the activation delay is however programmable via the appropriate menu. (Refer to the 'Programming manual')
- *PRE-ALARM* Relay: activated when a pre-alarm condition is signalled by one of the connected detectors; This condition is specific to detectors programmed as *CONFIRMED* or when the control panel is operating in a manned condition. (Refer to the appendix of the 'Programming manual')
- *TECHNOLOGICAL ALARM* Relay: activated whenever an alarm condition is signalled from a technological alarm detector (configured in a technological zone) or when the Extinguishing module PMT304 has been activated.
- *RESET* Relay: This relay is activated during a system reset so as to provide a suitable output to reset external apparatus connected to the control panel. In quiescent conditions the *NORMALLY CLOSED* terminal is at +24Vdc (fuse protected) with respect to DC power supply, (e.g. terminal 13) whilst the terminal *NO* is voltage free.

Connection to the sounder loops

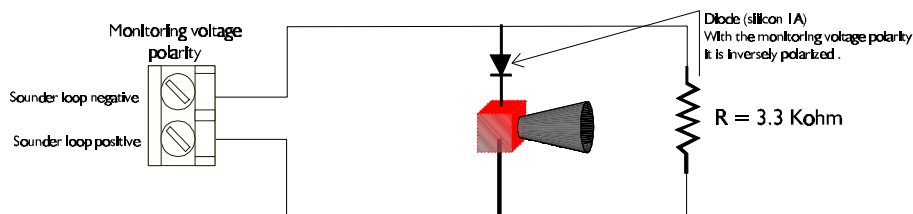
One sounder loop is available at the terminal block which is used to control a siren when a *FIRE ALARM* condition is signalled, having been detected by detection modules. It is possible to set the activation delay using the appropriate programming menu. Please refer to the 'Programming Manual' for the delay settings as well as the silencing menu.

The loop is monitored for open circuit and closed circuit conditions (3.3Kohm end of line resistor); These fault conditions are signalled both by the LED on the front panel and a specific message displayed on LCD.

In quiescent conditions there is a monitoring current through the end of line resistance (3.3Kohm); in this case the monitoring voltage is approximately 2.7 Vdc the polarity of which is shown in the table showing the electrical characteristics of the terminal block; so as to avoid that the sounder is “seen” as a load in parallel to the end of line resistance IT IS NECESSARY to connect a diode in series with the siren. (see the following diagram).

When an alarm condition is generated the monitoring voltage polarity is inverted and rises to 24Vdc (nominal), the diode now conducts and therefore the sounder receives its activation signal.

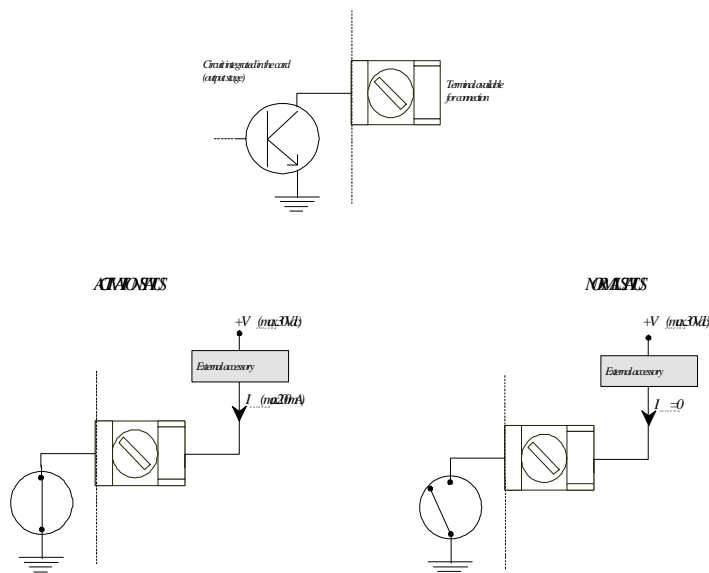
The following diagram shows the connections to the sounder loop:



The Open Collector repeater output connections

Seven Open Collector outputs are available at the terminal block used as repeater signals for a number of different conditions.

The following figure shows the connection diagram for an Open Collector output:



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Following are the descriptions of each output:

-**DETECTORS- GROUP ALARM Repeaters:** each of the 10 Open collector repeaters is active when one or more detectors belonging to a group is in alarm condition.

- **POWER SUPPLY FAULT repeater:** Active when the standby battery output voltage (Vbatt.) satisfies the following criteria:

$$(15 < V_{batt.} < 20.5) \text{ V}$$

$$V_{batt.} > 28.5 \text{ V}$$

- **DETECTOR TEST repeater:** Active when a test procedure on one or more of the conventional detector loops of the PMT301 modules has been initiated using the appropriate programming menu. Refer to the 'Programming Manual'.

- **MAINS FAIL repeater:** Active when the mains voltage has not been present for 15 minutes (230 Vac).

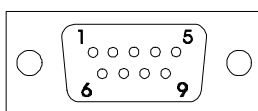
The Serial Ports

As previously indicated, the control panel is equipped with two serial ports which permits communication with external devices, e.g. PC's Printers.

The transmission specifications of the serial ports are as follows: 8 data bits, no parity, one stop bit and the baud rate is programmable from the control panel.

Connection to the serial port is via a male 9 pin connector, the pin connections of which are shown in the tables below.

The pin numbering is the same for all the serial ports and shown in the following diagram:



FRONT VIEW (the same as the solder side of the female connector)

PORT 1 SERIAL RS 232 for connection to a PC or MODEM

| Signal Direction | Signal | Number pin |
|------------------|---------------------|------------|
| -- | Data Carrier Detect | 1 |
| <<<< | Transmitted Data | 2 |
| >>>> | Data Terminal Ready | 3 |
| <<<< | Clear To Send | 4 |
| -- | Ground | 5 |
| >>>> | Data Set Ready | 6 |
| <<<< | Request To Send | 7 |
| >>>> | Received Data | 8 |
| >>>> | Ring Indicator | 9 |

PORTA 2 : SERIAL RS 232 for connection to a

| Signal Direction | Signal | Number pin |
|------------------|---------------------|------------|
| -- | Data Carrier Detect | 1 |
| <<<< | Transmitted Data | 2 |
| >>>> | Received Data | 3 |
| <<<< | Data Terminal Ready | 4 |
| -- | Ground | 5 |
| >>>> | Data Set Ready | 6 |
| <<<< | Request To Send | 7 |
| >>>> | Clear To Send | 8 |
| >>>> | Ring Indicator | 9 |

Serial port connection cables

In the following paragraph the connections between the 9 pin connector at the control panel end and the corresponding serial port connectors on the peripheral equipment, Port No. 1 (PC) & Port No. 2 (Printer), useful for construction suitable connection cables.

The type of cable recommended is:

- Minimum cross sectional area of the conductors: 0.22 mm².
- Type of cable: Screened, Twisted pairs.

RS232 SERIAL CABLE FOR CONNECTION TO A PC

The table shows how the cable should be constructed:

| 9 pin connector control panel end | 25 Pin connector PC end |
|--|-------------------------|
| 8 | 2 |
| 2 | 3 |
| 5 | 7 |
| The cable screen must be connected to the metal housing of the connector | |

Use the following connection if the PC connector is a 9 pin connector:

| 9 pin connector control panel end | 9 Pin connector PC end |
|--|------------------------|
| 2 | 2 |
| 8 | 3 |
| 5 | 7 |
| The cable screen must be connected to the metal housing of the connector | |

RS232 SERIAL CABLE FOR CONNECTION TO PRINTER

The transmission specifications of the serial printer port are: 8 data bits, Even parity, 1 Stop bits, Baud rate programmable at the control panel. The serial printer must accommodate 80 column printing.

The table shows how the cable should be constructed:

| 9 pin connector control panel end | 25 Pin connector Printer end |
|--|-------------------------------------|
| 3 | 2 |
| 2 | 3 |
| 8 | 4 |
| 7 | 5 |
| 5 | 7 |
| The cable screen must be connected to the metal housing of the connector | |

ADDITIONAL CARDS

As reported in the previous chapters, the PMT-350 330 fire control panel has a compact and modular structure that, depending on the various requirements, can be configured by means of the available additional cards.

The above mentioned cards are available in 4 standard models:

PMT - 301: conventional 8 zone card..

PMT - 303: 8 relay programmable delay card.

PMT - 304: extinguishing channel card.

INTERNAL DETECTION LOOP: up to 99 detectors and 99 I/O modules.

Each unit is made up of a CPU card, a terminal block, and a display panel and a an additional card interconnected using DIN connectors.

The hardware architecture has been designed so as to permit rapid and simple substitution of the constituent parts if necessary due to failure.

All the units have the same CPU and terminal block and are differentiated from each other by the additional card and the status display panel.

The CPU card is equipped with a Toshiba 16 bit microprocessor, RAM memory, the program memory in EPROM and an EEPROM for the non volatile storage of the programming parameters.

PMT - 301 CARD (CONVENTIONAL 8 ZONES)

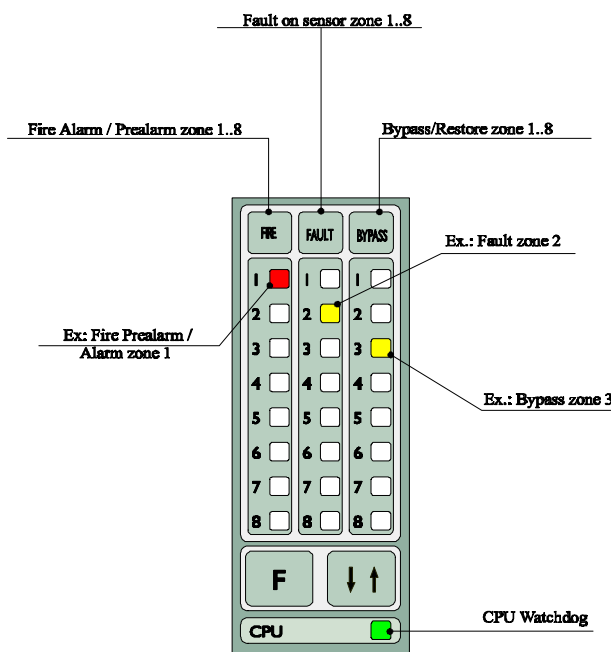
General Description

The main functional specifications of this unit are as follows.

- ☐ Controls 8 conventional detectors zone.
- ☐ Type of loops: termination resistance 3,3K Ω .
- ☐ 31 conventional detectors can be installed on each zone.
- ☐ 8 Open Collector outputs (one for each line) for the repetition of the alarm signals.
- ☐ Indication of the following states, via the LEDs on the front panel:
 - Fire Alarm for each zone.
 - Fire Pre-alarm for each zone.
 - General zone fault.
 - Enabling/disabling indication for each zone.
 - CPU fault.
- ☐ The following operations can be executed on this module, by means of suitable programming procedures in the main unit:
 - Enabling / Disabling of each zone.
 - Single or double knock configuration for each zone.
 - Individual zone titling using words with a maximum of 20 characters.
 - Single zone test to check the correct installation of detectors.
- ☐ The card can be installed remotely, up to 800m from the main unit.

PMT-301 Front panel layout

The PMT-301 front panel is shown in figure:



Status description

The flash frequency of the LEDs situated on the front panel are listed in the following table:

| TYPE | TIMES | |
|------|----------------|----------------|
| A | ON = 500 m sec | OFF = 500 msec |
| B | ON = 900 msec | OFF = 1.1 sec |

Fire pre-alarm

The pre-alarm status on any zone is activated by one of the detectors on that zone providing that detector has been configured as "Double Knock" during programming the control panel.

The pre-alarm status has the following effect:

- The RED LED (fire) flashes intermittently, Type A, together with the number of the zone generating the Pre-alarm status.
- The Status message is sent to the control panel

Pressing the ACKNOWLEDGE button situated on the operator panel of the control panel switches the RED LED (fire) from type A flashing to steady lit.

Fire alarm

The alarm status on any zone is activated by at least one detector on that zone going into alarm providing that the zone is configured as single knock during programming of the control panel.

If the zone is configured as Double Knock the alarm status is activated when at least two detectors go into alarm on that zone.

The ALARM status activates:

- RED LED (fire) flashes (Type A) together with the number of the zone in alarm.
- Activation of the corresponding repeater open collector output.
- The status message is sent to the control panel.

Pressing the ACKNOWLEDGE button situated on the operator panel of the control panel toggles the RED LED (fire) from flashing (type A) to permanently on..

Fault

The FAULT status is activated by:

- Open circuit of the detector loop.
- Short circuit of the detector loop.
- Removal of a detector from the detector loop.

The FAULT status activates:

- The YELLOW LED (fault) flashes (Type A) together with the number of the zone which has generated the fault condition.
- The status message is sent to the control panel.

Pressing ACKNOWLEDGE button on the operator panel toggles the YELLOW (fault) LED from Type A flashing to permanently on.

CPU fault

The CPU fault condition is identified by the GREEN LED to be found on the unit front panel being switched off.

Isolating / restoring a zone

The isolation or restoration of one of the 8 zones configured during programming can be carried out only by a specific message sent from the control panel.

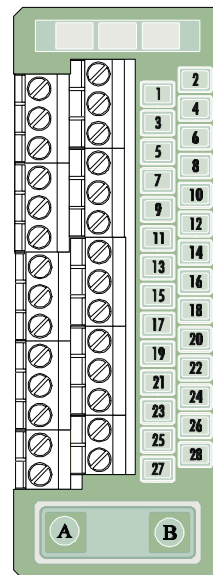
The isolation or the restoration of one of the 8 zones will switch on or off respectively the YELLOW LED (Isolate) corresponding to that zone.

Conventional zones test

The test procedure is described in detail in the Programming Manual.

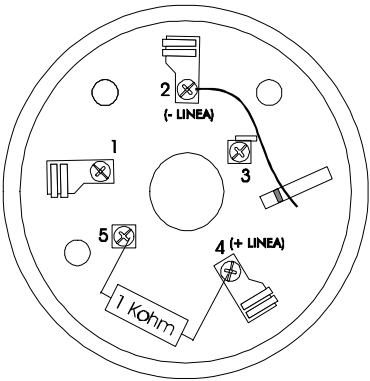
PMT - 301 Terminal Block

| PMT - 301 | |
|------------------|---|
| N° | DESCRIPTION |
| 1 | + Detector zone n°1 |
| 2 | - Detector zone n°1 |
| 3 | + Detector zone n°2 |
| 4 | - Detector zone n°2 |
| 5 | + Detector zone n°3 |
| 6 | - Detector zone n°3 |
| 7 | + Detector zone n°4 |
| 8 | - Detector zone n°4 |
| 9 | + Detector zone n°5 |
| 10 | - Detector zone n°5 |
| 11 | + Detector zone n°6 |
| 12 | - Detector zone n°6 |
| 13 | + Detector zone n°7 |
| 14 | - Detector zone n°7 |
| 15 | + Detector zone n°8 |
| 16 | - Detector zone n°8 |
| 17 | Ground |
| 18 | ALARM ZONE repeater 1 (Open C. 200mA 30VDC) |
| 19 | ALARM ZONE repeater 2 (Open C. 200mA 30VDC) |
| 20 | ALARM ZONE repeater 3 (Open C. 200mA 30VDC) |
| 21 | ALARM ZONE repeater 4 (Open C. 200mA 30VDC) |
| 22 | ALARM ZONE repeater 5 (Open C. 200mA 30VDC) |
| 23 | ALARM ZONE repeater 6 (Open C. 200mA 30VDC) |
| 24 | ALARM ZONE repeater 7 (Open C. 200mA 30VDC) |
| 25 | ALARM ZONE repeater 8 (Open C. 200mA 30VDC) |
| 26 | Not Used |
| 27 | Not Used |
| 28 | Not Used |
| A | Screen connection terminals |
| B | |



Installation of the detection zones

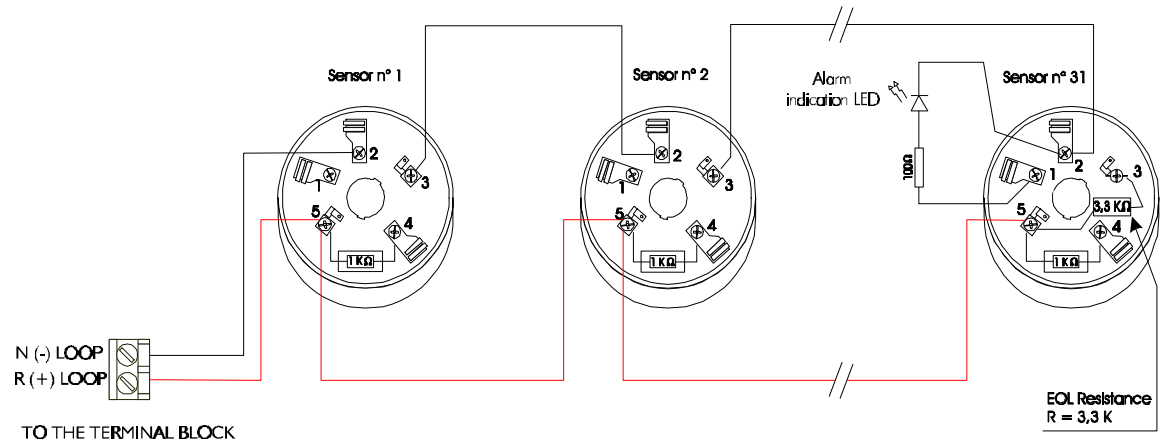
The layout of the base ADEMCO B401RM is shown in the figure:



TERMINAL CONNECTION

| Terminal n° | Description |
|-------------|---|
| 1 | (+) alarm repeat |
| 2 | (-) detection loop (negative repeater) |
| 3 | (-) detection loop to the next detector |
| 4 | (+) detection loop through R = 1 KΩ |
| 5 | (+) detection loop |

The wiring layout is shown in the figure.



Type of detectors that can be connected

The following table lists the conventional detector models that can be installed:

| DESCRIPTION | CODE |
|--|---|
| CONVENTIONAL LOW PROFILE SMOKE DETECTORS | 1600, 2600, 3600 |
| CONVENTIONAL SMOKE DETECTORS | 1451E, 2451E, 2451TH, 4451E, 5451E |
| CONVENTIONAL DETECTORS FOR DUCTING | DH 400DC |
| CONVENTIONAL HEAT DETECTORS | CC 501, CC 502, CC EPB 501, CC EPB 502, CC 601, CC 602, AD502, AD503, AD504 |

TECHNICAL SPECIFICATIONS OF THE DETECTION ZONES

Recommended Cable (twisted, shielded) 2 x 0.5 mm² (up to 250 mt)

2 x 0.75 mm² (up to 770 mt)

2 x 1 mm² (up to 1000 mt)

2 x 1.5 mm² (up to 1500 mt)

Resistor in series with the detector 1 K Ω (1/4 W)

End of line resistor 3.3 K Ω (1/4 W)

Repeater LED resistor 100 Ω (1/4 W)

Maximum N° of detectors per zone 31

Maximum zone length 1500 mt

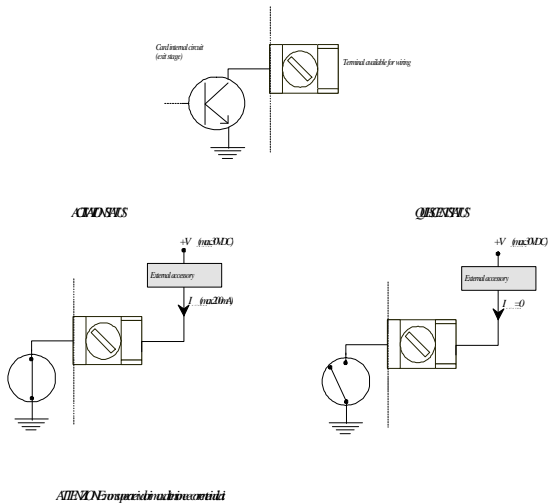
Connection of the alarm repeater open collector outputs

An alarm repeater output is associated to each alarm zone, which is activated every time a detector signals an alarm state.

8 Open Collector repeater outputs are available at the terminal block, each output can supply a voltage and current equal to **200 mA** and **30VDC**.

Turn to the unit terminal block table to see the relative terminal block number.

The operation of an O.C. output is illustrated in the following diagram:



PMT-301 Technical Specifications

| | |
|--|---------------------------------|
| Supply voltage | 24VDC nominal |
| Current consumption in standby | 90 mA |
| Maximum current consumption in alarm | 500 mA |
| N. of zones | 8 |
| N. of detectors per zone | 31 |
| Maximum zone length | 1500 mt |
| N 8 status (ALARM) repeater outputs | Open collector 200 mA 30VDC max |
| Operating temperature | From -10 to +50 °C |
| Humidity | 10 - 95% R.H. |

THE ADDRESSABLE DETECTORS ZONE

General Description

The main operating specifications of this loop are described below:

- ☐ Monitor 1 zone of addressable detectors and/or in/out modules
- ☐ Zone configuration: closed or open loop connection
- ☐ 99 detectors and 99 I/O modules can be connected to each zone
- ☐ Each zone can be divided into 10 hardware groups.
- ☐ Each zone can be configured as Single or Double Knock.
- ☐ 10 Open Collector outputs for the alarm status repetition.
- ☐ LED indication on the front panel of the following states:
 - Fire alarm on the zone
 - Fire Alarm from each of the 10 groups that the zone has been divided into.
 - Pre-alarm.
 - Pre-alarm from each of the 10 groups that the zone has been divided into.
 - General fault
 - Warning of zone Isolate/Restore of software zones together with detectors and I/O modules.
 - CPU fault.
- ☐ Using the correct programming procedures it is possible, via the control panel, to carry out the following:
 - Configuration of a maximum of 99 software zones, single or double knock.
 - Detector configuration: Types of detectors used and description
- Input and output module configuration: type of module, description, release delay and release formula (only if configured as an output module).
 - Isolate/reset the configured software zones.
 - Isolate/reset of the detectors/modules configured.

Description of the states

The flash frequency of the front panels LEDs are listed in the following table:

| TYPE | TIMES | |
|------|----------------|----------------|
| A | ON = 500 m sec | OFF = 500 msec |
| B | ON = 900 msec | OFF = 1.1 sec |

Fire pre-alarm

The Fire Pre-Alarm status of a particular loop and a particular zone is activated by at least one of the detectors belonging to that loop and zone going into alarm, only when the detector in question belongs to a software zone which has been configured as "Double Knock" during the programming of the unit.

The pre-alarm status is indicated by:

- The DOUBLE RED LED flashing (pre-alarm) on the front panel.
- The detected status is shown on the alphanumeric display (see user manual).

Pressing the ACKNOWLEDGE button situated on the operator panel of the control panel toggles the DOUBLE RED LED from flashing to permanently on.

Fire alarm

The alarm status on any loop and zone is activated by at least one detector on that loop and zone going into alarm only when that software zone is configured as a single knock during programming of the control panel.

If the zone is configured as Double Knock the alarm status is activated when at least two detectors go into alarm on that zone.

The ALARM status activates:

- The DOUBLE RED LED flashing (fire alarm) on the front panel.
- The detected status is shown on the alphanumeric display (see user manual).
- Activation of the corresponding repeater open collector output (see terminal block).

Pressing the ACKNOWLEDGE button situated on the operator panel of the control panel toggles the DOUBLE RED LED from flashing to permanently on.

Technical alarm

The TECHNICAL ALARM status activates:

- The DOUBLE RED LED flashing (warning) on the front panel.
- The detected status is shown on the alphanumeric display (see user manual).

Pressing the ACKNOWLEDGE button situated on the operator panel of the control panel toggles the DOUBLE RED LED from flashing to permanently on.

Fault

The FAULT status is activated by:

- Open circuit of the detector / I/O module loop.
- Short circuit of the detector / I/O module loop.
- Removal of a detector / module from the loop.
- During the interrogation phase of the unit a signal from at least one detector / I/O module.

The FAULT status activates:

- The DOUBLE YELLOW LED flashing (fault) on the front panel.
- The detected status is shown on the alphanumeric display (see user manual).

Pressing the ACKNOWLEDGE button situated on the operator panel of the control panel toggles the DOUBLE YELLOW LED from flashing to permanently on.

Maintenance of a detector I/O module

The MAINTENANCE status is activated by:

- At least one detector on I/O module signalling a service request during the interrogation phase.

The MAINTENANCE OF A DETECTOR status activates:

- The detected status is shown on the alphanumeric display.

Pressing the ACKNOWLEDGE button on the operator panel the detected status is acknowledged and the display is reset in normal condition.

Isolating / restoring a software zone / detector / I/O module

The isolation or the restoration of one of the software zones / detectors / modules configured during programming, can be carried out only by a specific message sent from the control panel.

Isolation of one or more programmed units will result in the YELLOW (isolated) LED of the corresponding zone to flash, Flash type B.

Installation of the detection zones

4 types of device can be connected:

- ADDRESSABLE DETECTORS OF ADEMCO SERIES.
- ADDRESSABLE BASES AB401PMT.
- INPUT / OUTPUT MODULES.
- ZONE SEPARATOR MODULES.

The devices are explained in detail in the following paragraphs.

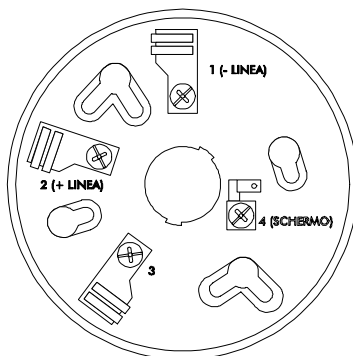
Detector specifications

A maximum of 99 detectors can be connected

TYPES OF DETECTOR WHICH CAN BE CONNECTED (for more details on these detectors see the Programming Manual)

| DESCRIPTION | CODE |
|---|-------------------|
| LOW PROFILE IONIZATION SMOKE DETECTORS | 1700 ECB/A |
| LOW PROFILE OPTICAL ADDRESSABLE SMOKE DETECTORS | 2700 ECB/A |
| LOW PROFILE RATE OF RISE DETECTOR | 3700ECB/A |

The typical layout of the base of an analogue addressable detector ADEMCO B501 is shown in the figure:



TERMINAL CONNECTIONS

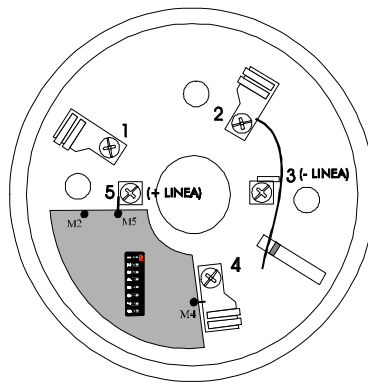
| Terminal n° | Description |
|-------------|--|
| 1 | (-) detection loop (-) Alarm repeater LED |
| 2 | (+) detection loop |
| 3 | (+) alarm repeat |
| SCH. | Loop shield |

Specifications of the AB401/PMT addressable bases

The AB401/PMT addressable bases contain an electronic circuit which permits a conventional, resistance change, detector to have an address.

The maximum number of addressable bases for each loop is 50.

The following diagram shows the structure of the base:



TERMINAL CONNECTIONS

| Terminal n° | Description |
|-------------|-------------------|
| 5 | (+) protocol loop |
| 3 | (-) protocol loop |

PMT-100 Input/Output module specifications

The functional specifications are as follows:

- 99 modules can be connected on each zone.
- Each module is individually identifiable by its address, which is programmed by the installer on the DIP-Switch mounted on the unit.

- Programmability: It is possible to select the mode of operation of the unit as; an input module, An output module or an input/output module and assign a name to the module during the system programming.
- Input module: it interfaces the loop with either analogue signals (4-20 mA) or ON/OFF types.
- Output module: an opto-isolated normally open contact is available.
- Input/output module: This allows the dual operation from only one device.

PMT100 MODULES TECHNICAL SPECIFICATIONS

Supply voltage 0 ÷ 30 V pulsed (communication)

Current consumption in standby 0,5 mA

Local indication Red LED

Output stage current consumption when activated..... 10 mA 36VDC

Maximum current of the output stage (opto-isolated) 50 mA (36 VDC)

The maximum number of output module that can be activated at the same time 25

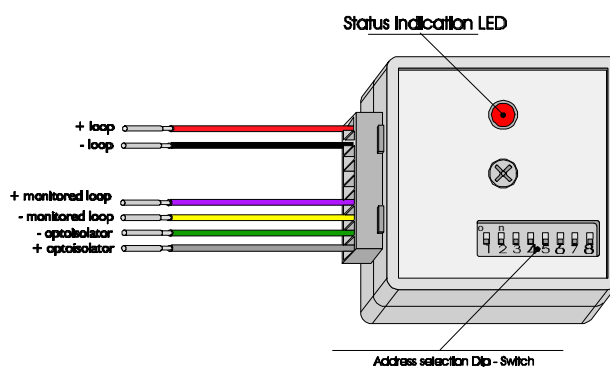
Programmability Dip - Switch

Operating temperature (-10 ÷ +50) °C

Humidity 10 - 93% R.H.

Dimensions (H x D x L)..... 40 x 14 x 40 mm

The I/O module is shown in figure:

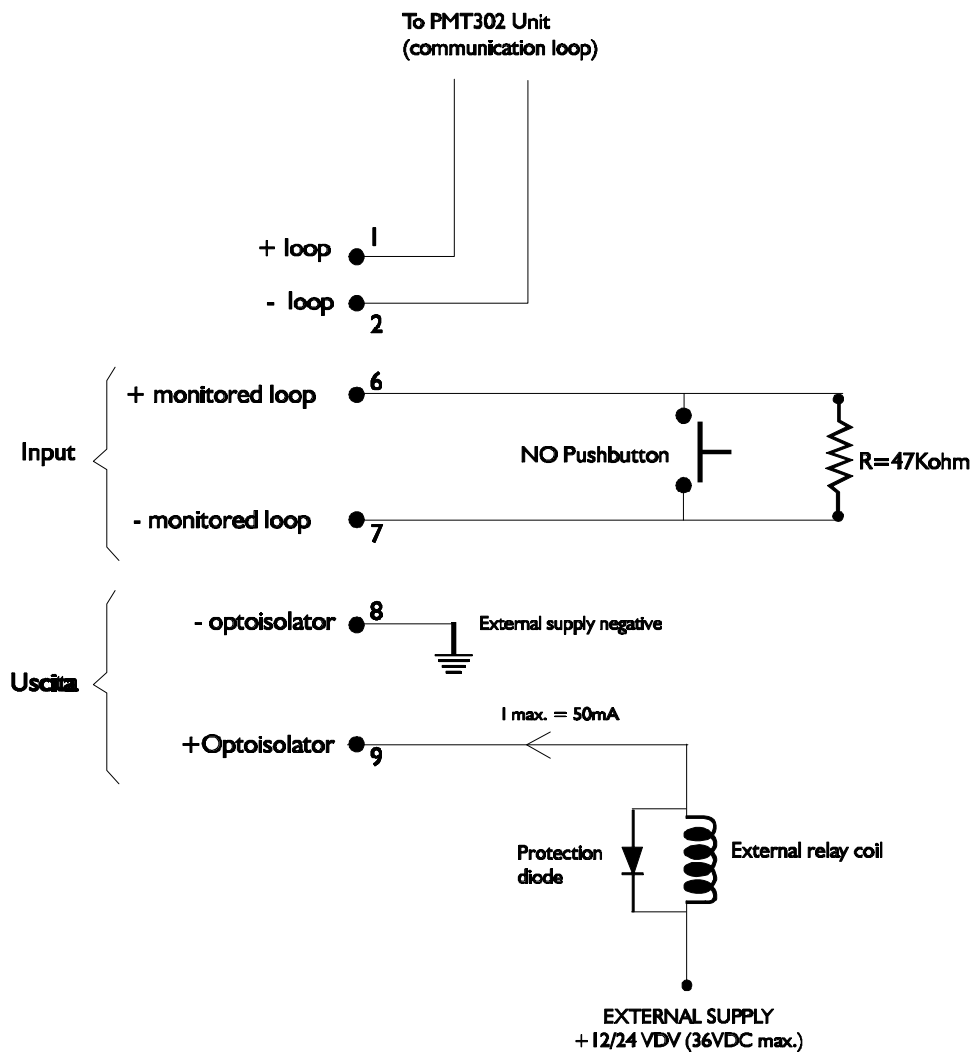


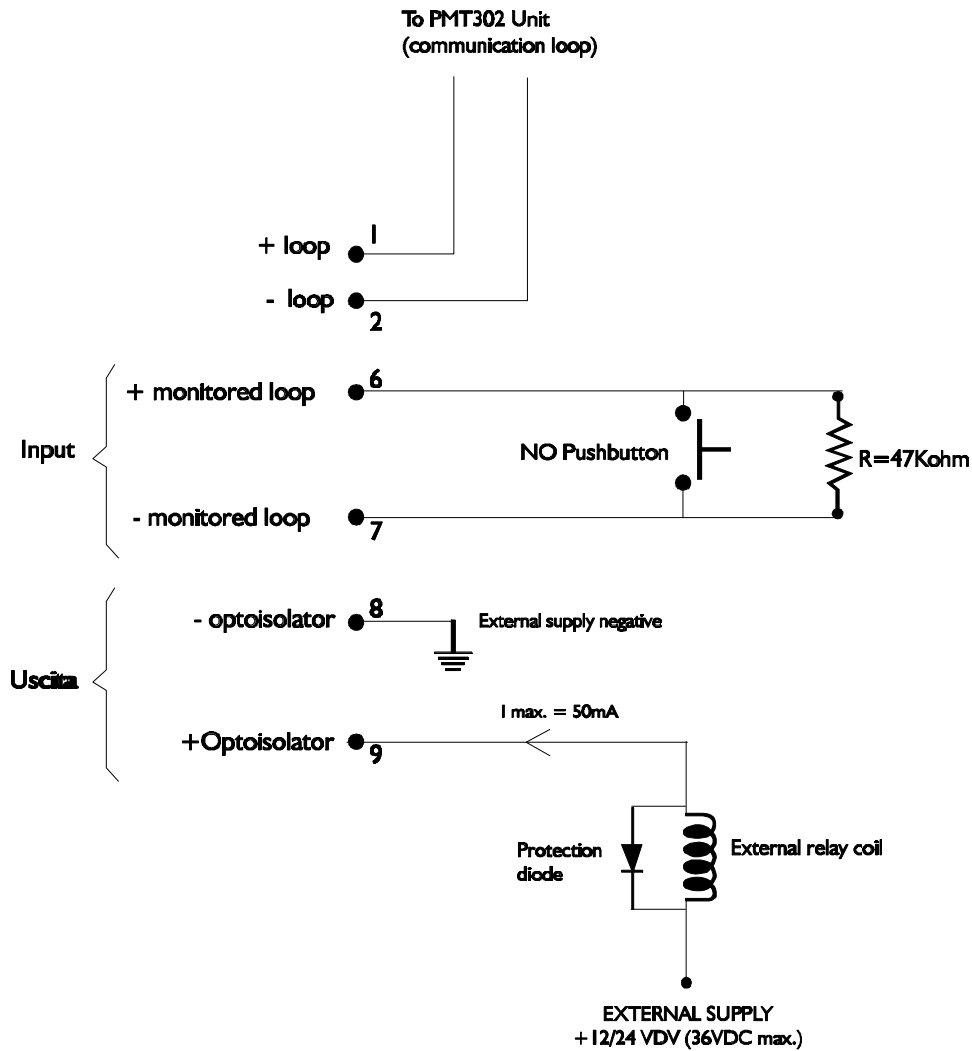
TERMINAL BLOCK CONNECTIONS

| Terminals | Description |
|-------------------|---|
| 1 (Red) | (+) loop |
| 2 (Black) | (-) loop |
| 3 ÷ 5 | Not used |
| 6 (Blue) | (+) monitored loop ($R_{fine\ linea} = 47\ Kohm$) |
| 7 (Yellow) | (-) monitored loop |
| 8 (Green) | (-) optoisolated output |
| 9 (Grey) | (+) optoisolated output |

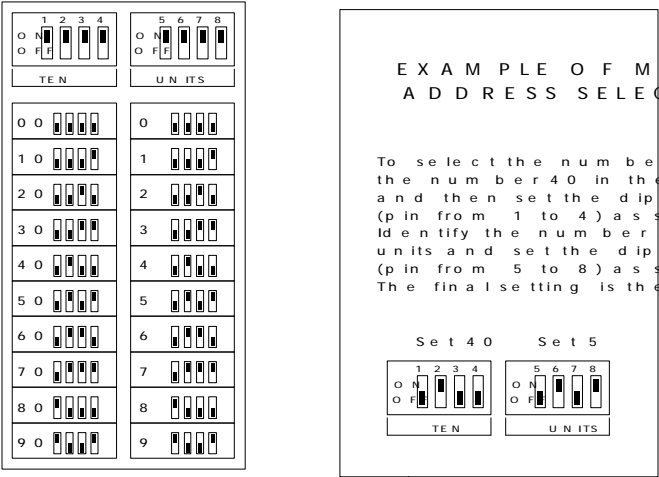
EXAMPLE OF THE CONNECTIONS TO A PMT-100 I/O MODULE:

The following diagram shows an example of the connections to a module:





MODULE ADDRESS SELECTION:



PMT-102 zone separator module specification

The zone separator modules permit the isolation of a part of the loop when a short circuit condition is detected in that part of the loop. Connected in series with the loop itself, **in the case of a closed loop configuration**, to isolate the part of the loop affected by the short circuit, whilst maintaining the correct operation of the rest of the loop.

A relay is mounted in each one, which opens when the current is greater than **250mA**.

The maximum number of zone separator modules is 5 on each loop.

TECHNICAL SPECIFICATIONS OF THE ZONE SEPARATOR MODULE:

Supply voltage..... 24 V (communication protocol)

Local indication..... Red LED (on = short circuit)

Step-in current 250mA

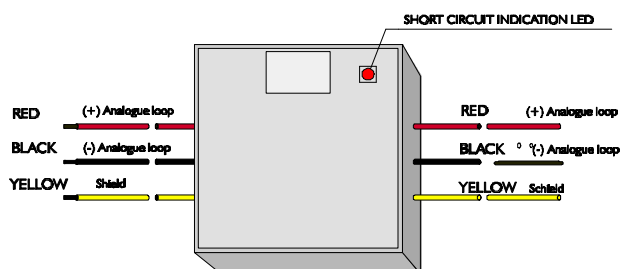
The maximum N° of zone separator modules on each loop 7

Operating temperature..... (-10 ÷ +50) °C

Humidity 10 - 93% R.H.

Dimensions (H x D x L) 40 x 15 x 40 mm

The zone separator module is shown in the figure:



TERMINAL BLOCK CONNECTIONS

| Terminals | Description |
|-----------|-------------|
| Red | (+) loop |
| Black | (-) loop |
| Yellow | shield |

Detection loop connection types

The detection loops can be configured in two ways:

- Connection in closed loop.
- Connection in open loop.

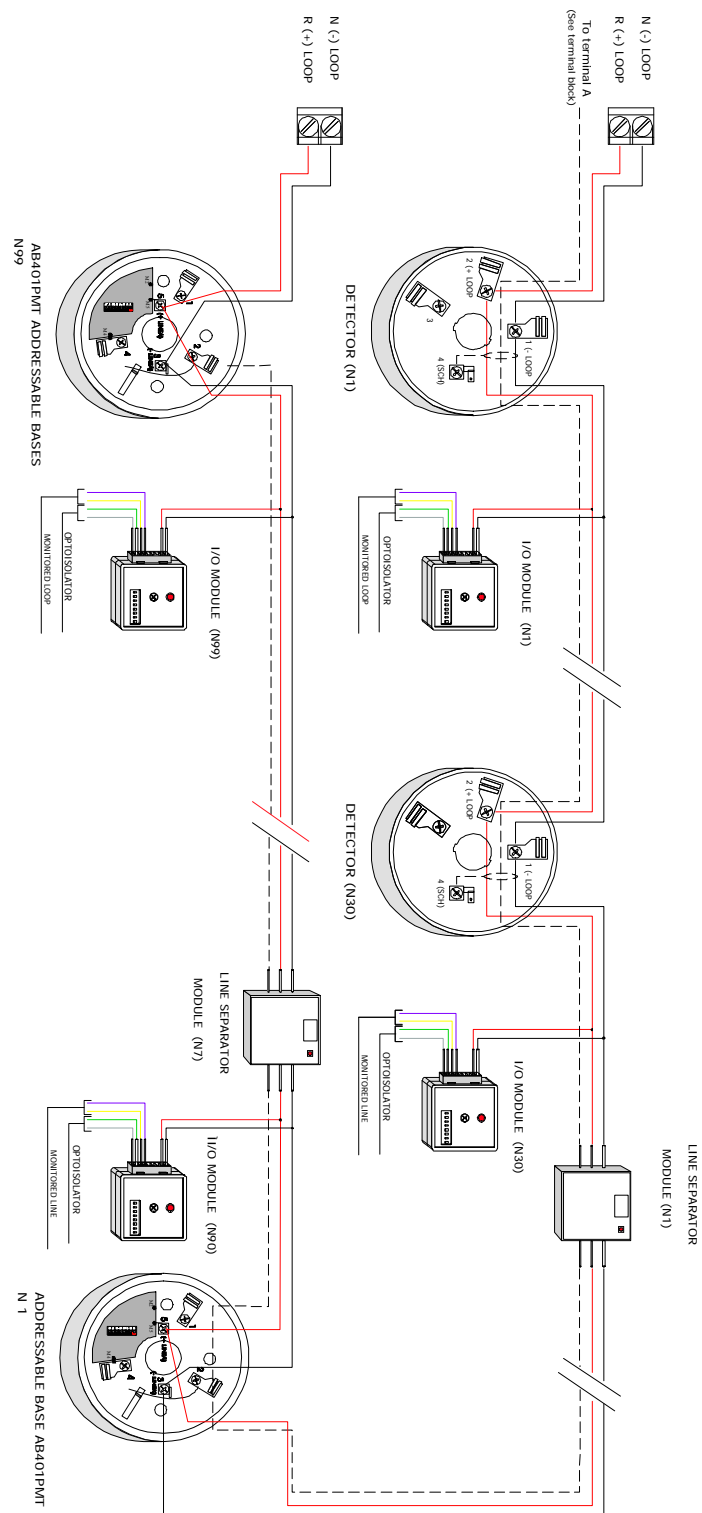
TECHNICAL SPECIFICATIONS OF THE DETECTION LOOPS

| | |
|--|--|
| Recommended cable (twisted, shielded) | 2 x 0.5mm ² (up to 250 mt) |
| | 2 x 0.75mm ² (up to 750 mt) |
| | 2 x 1mm ² (up to 1000 mt) |
| | 2 x 1.5mm ² (up to 1500 mt) |
| | 2 x 2mm ² (up to 2000 mt) |
| | 2 x 2.5mm ² (up to 2500 mt) |
| Maximum loop length | 2500 mt |
| Maximum number of detectors per loop | 99 |
| Maximum number of I/O modules for each PMT100 loop..... | 99 |
| Maximum number of B401PMT addressable bases | 99 |
| Maximum number of PMT102 zone separator modules per loop | 7 |

The two methods of connecting the detection loops are dealt with in greater depth in the following paragraphs.

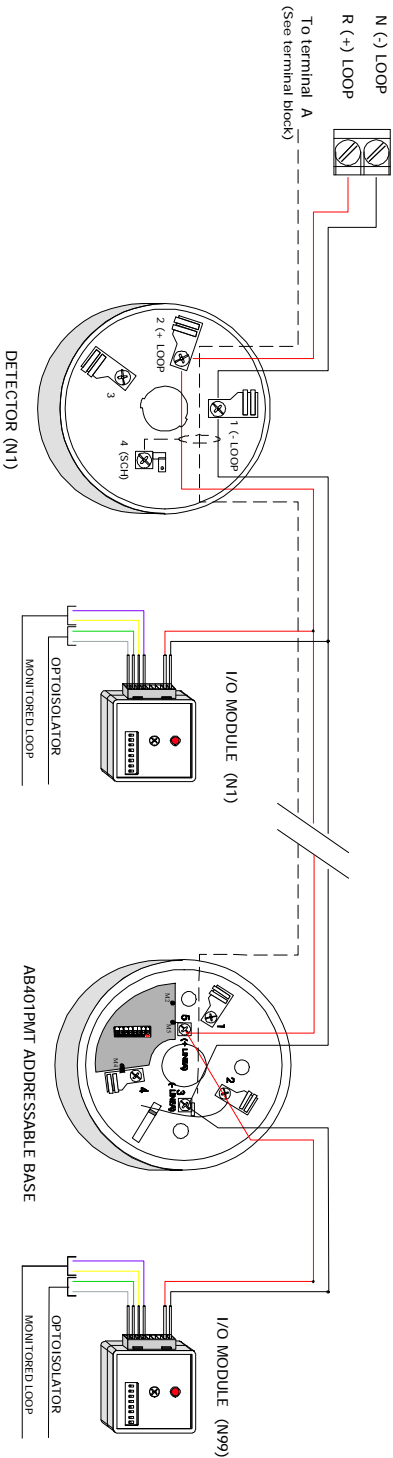
Closed loop configuration

On the next page is illustrated a closed loop configuration of a zone of detectors / I/O modules and AB401PMT addressable bases.



Open loop configuration

The following diagram shows an open loop configuration of a zone of detectors / I/O modules and addressable bases:



Alarm repeater connection

Each detection zone has been divided into 10 groups.

To each group has been assigned a number of detectors, based on their addresses, following the order below:

| GROUP N. | DETECTOR / MODULI I-O ADDRESS |
|----------|-------------------------------|
| 1 | 1..9 |
| 2 | 10..19 |
| 3 | 20..29 |
| 4 | 30..39 |
| 5 | 40..49 |
| 6 | 50..59 |
| 7 | 60..69 |
| 8 | 70..79 |
| 9 | 80..89 |
| 10 | 90..99 |

An alarm repeater output is associated to each sector obtained in this manner, which will be activated every time a detector, whose address belongs to this sector, goes into an alarm condition.

10 **Open Collector** outputs which can switch currents and voltage equal to **200 mA** and **30VDC** are available on the terminal block.

The installation method of these outputs is the same as for the, above mentioned, PMT301 unit.

PMT - 303 UNIT (8 RELAY OUTPUTS)

General Description

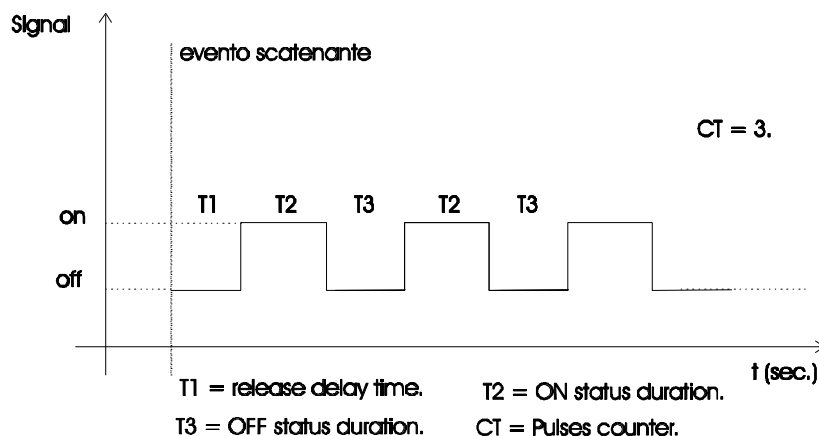
The main operating specifications are detailed below.

☐ Control of 8 programmable relays:

Using the correct programming sequence it is possible via the control panel to configure each relay in the following manner ($T_n \text{ max} = 59' 59''$):

- T1 = release delay time;
- T2 = relay ON status Duration
- T3 = Relay OFF status duration;
- CT = Count the number of impulses (sequence T2 + T3).

The following figure shows the relay status:

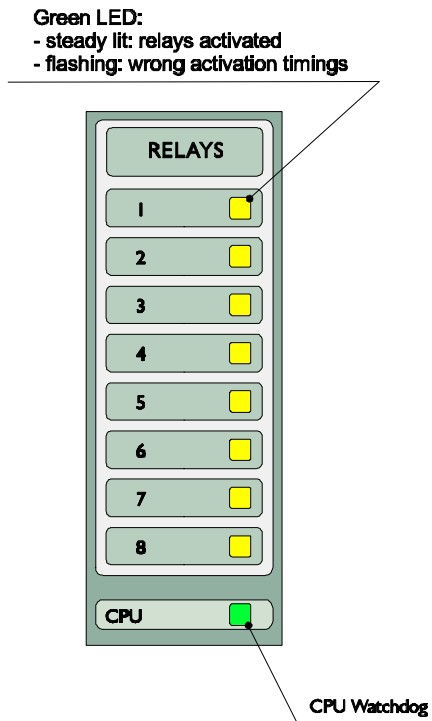


Please refer to the 'Programming manual' for a more detailed explanation of programming the relays.

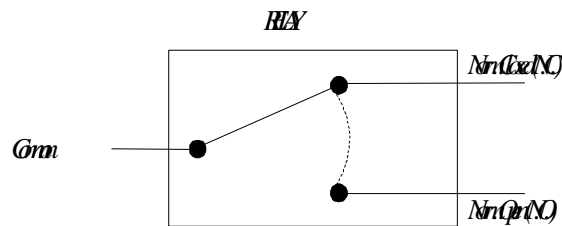
- ☐ Activation formulae: It is possible to define, for each relay, the parameters (formula) that govern the activation of that relay.
- ☐ Display of the status of each relay via the 8 LEDs situated on the front panel.
- ☐ Visual indication of the CPU watchdog (GREEN LED).
- ☐ The unit can be remotely installed up to 800 mt from the control panel.

PMT-303 Front panel layout

The PMT - 303 front panel is shown in figure.



The following illustration shows the s.p.d.t. relay layout:

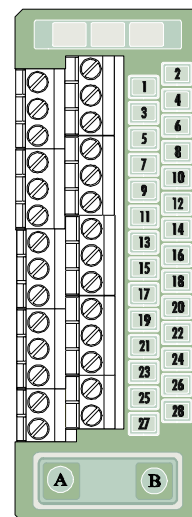


PMT-303 Unit technical specifications

| | |
|--|---------------|
| Supply voltage..... | 24VDC nominal |
| Current consumption in standby | 20 mA |
| Maximum current consumption (8 relays activated). 100 mA | |
| Number of relays | 8 |
| Relay type (s.p.d.t.)..... | 1A/125VAC |
| Operating temperature..... | -10 +50 °C |
| Relative Humidity..... | max. 95 % |

PMT - 303 Terminal block

| PMT - 303 | |
|------------------|--------------------|
| N° | DESCRIPTION |
| 1 | Relay 1 (COMMON) |
| 2 | Relay 1 (N.C.) |
| 3 | Relay 1 (N.O.) |
| 4 | Relay 2 (COMMON) |
| 5 | Relay 2 (N.C.) |
| 6 | Relay 2 (N.O.) |
| 7 | Relay 3 (COMMON) |
| 8 | Relay 3 (N.C.) |
| 9 | Relay 3 (N.O.) |
| 10 | Relay 4 (COMMON) |
| 11 | Relay 4 (N.C.) |
| 12 | Relay 4 (N.O.) |
| 13 | Relay 5 (COMMON) |
| 14 | Relay 5 (N.C.) |
| 15 | Relay 5 (N.O.) |
| 16 | Relay 6 (COMMON) |
| 17 | Relay 6 (N.C.) |
| 18 | Relay 6 (N.O.) |
| 19 | Relay 7 (COMMON) |
| 20 | Relay 7 (N.C.) |
| 21 | Relay 7 (N.O.) |
| 22 | Relay 8 (COMMON) |
| 23 | Relay 8 (N.C.) |
| 24 | Relay 8 (N.O.) |
| 25 | NOT USED |
| 26 | NOT USED |
| 27 | NOT USED |
| 28 | NOT USED |
| A | Ground terminals |
| B | |



PMT - 304 UNIT (1 EXTINGUISHING CHANNEL)

General Description

The main functional specifications of the unit are dealt with in the following.

- ❑ 1 extinguishing channel for the activation of 2 monitored actuator outputs or SOYUS explosive actuators (operator selectable).

- ❑ User settable time intervals:

- *actuator mode*:

T_{1a} = release delay timer 1^a actuator.

T_{1b} = release timer 1^a actuator.

T_{2a} = release delay timer for the 2^a actuator with respect to the 1^a.

T_{2b} = release delay timer for the 2^a actuator with respect to the 1^a.

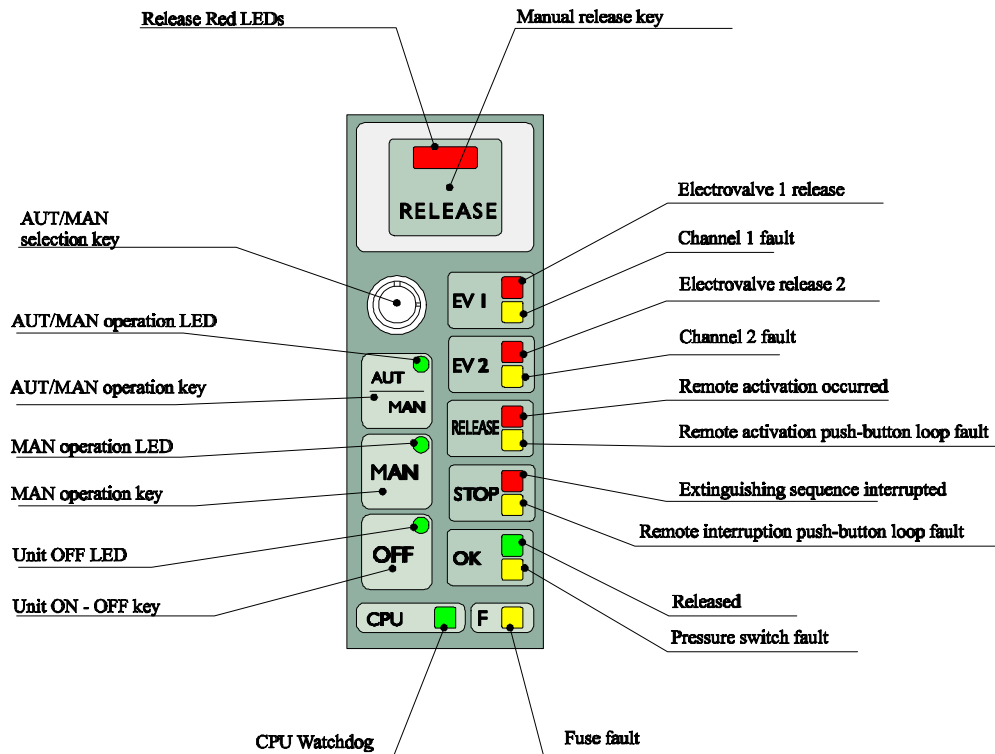
- *SOYUS mode*:

T_{ev} = Evacuation timer.

- ❑ 1 monitored remote manual release loop.
- ❑ 1 monitored remote manual release inhibit loop.
- ❑ 1 monitored input for a remote Automatic/manual release key-switch
- ❑ 1 monitored pressure switch loop.
- ❑ 2 Open Collector repeater outputs for remote indication of evacuation / extinguishant release.
- ❑ 2 Open Collector repeater outputs for Manual / Automatic release status.
- ❑ The unit can be installed up to 800mt from the control panel.

PMT-304 Front panel layout

The PMT - 304 front panel is shown in figure:



Extinguishing channels activation modes

Two distinct operating modes are catered for:

- MANUAL mode.
- AUTOMATIC/MANUAL mode.

The operating mode is selected as follows:

- MANUAL: Key + “MAN” push-button to be found on the front panel.
- AUTOMATIC/MANUAL: Key + “AUT/MAN” push-button to be found on the front panel.

For security reasons switching between modes of operation requires the use of the key.

Pressing one of the above mentioned buttons will cause the GREEN LED to the side of the button to light.

During the programming of the unit, it is possible to set the operating times and sequence of the two actuators.

Please refer to the ‘Programming Manual’ for more details on the activation timings.

Manual activation

With this mode of activation of the extinguishing channel can occur ONLY using:

- The "ATTIV" pushbutton situated on the unit front panel
- The REMOTE ACTIVATION units connected on the monitored loop provided for this function (see the terminal block).

Pressing one of the activation pushbuttons will, subject to what has been selected, the following phases:

ACTUATOR MODE:

1) THE START OF THE TIMER T_{1a} (Release delay timer 1st actuator).

During this period the following indications will light:

- The 3 RED LEDs situated above the "RELEASE" push-button will start to flash.
- The RED "RELEASE" LED will start to flash.
- The Open Collector repeater will switch on for visual / acoustic indication to evacuate the area.
- A specific message identifying the release is sent to the control panel.

2) THE START OF THE TIMER T_{2a} (release delay timer for the 2nd actuator with respect to the 1st).

The start of this timer happens at the end of the timer in step 1).

This cause in addition to the visual and acoustic indications of step 1 but also:

- Release of the 1st actuator;
- The RED LED EV1 situated on the front panel lights;

3) THE START OF THE TIMER T_{2b} (release duration of the 2nd actuator).

The start of this timer happens at the end of the timer in step 2).

This causes:

- The activation of the 2nd actuator;
- The RED LED EV2 situated on the front panel lights;
- The 3 "RELEASE" LEDs (from step 1) switch from flashing to permanently on.
- The Open Collector repeater output to give Acoustic / Visual indication of release in progress.
- The GREEN "OK" LED situated on the front panel will light (this will only happen when a pressure switch has been connected to the appropriate monitored loop, which will monitor the release of the extinguishant).

Pressing the ACKNOWLEDGE key to be found on the front panel of the control panel will switch the "RELEASE" LED from flashing to permanently on.

SOYUS MODE:**1) THE START OF THE TIMER T_{ev}** (Evacuation time).

During this period the following indications will light:

- The 3 RED LEDs situated above the "RELEASE" push-button will start to flash.
- The RED "RELEASE" LED will start to flash.
- The Open Collector repeater will switch on for visual / acoustic indication to evacuate the area.
- A specific message identifying the release is sent to the control panel.

2) ACTIVATION OF THE EXTINGUISHING ZONES

At the end of the timer of step 1) the following indications are activated:

- activation of both extinguishing zones;
- The RED V1 and EV2 LEDs, situated on the front panel of the unit, lit permanently on;
- The change from flashing to permanently on of the three "ATTIV" LEDs of step 1).
- Activation of the Open Collector repeater for the optical/audible signalling of "Extinguishant Released".
- The GREEN "OK" LED, situated on the front panel of the unit, being lit permanently on (this will only occur if a pressure switch, which monitors that the extinguishant has been released, has been connected to the monitored zone available on the terminal block).

Pressing the 'ACKNOWLEDGE' pushbutton, situated on the front panel of the unit will cause the 'ATTIV' LED to change from flashing to permanently on.

Automatic/manual release status

The selection of this status is carried out in the manner seen at the beginning of the chapter.

The GREEN "ON" LED on the front panel is lit together with the "AUT/MAN" push-button.

In this mode of operation the release of the two extinguishing channels can occur both manually, as fully described in the preceding paragraph as well as automatically.

Automatic mode of operation of the extinguishing channel

Automatic release of the extinguishing channel occurs after the evaluation of the result from the appropriate release formula, which are resident in the EEPROM, and are settable by operator during programming.

A release formula is a logical expression of a sequence of events that take place to verify the formula. The formula is made up of OPERATORS and OPERANDS.

Three different type of formula are available, each differing from each other due to the operands needed to make the formula itself:

1. **REDUCED FORMULA:** is expressed by 4 conditions; the programming of which be done either using the appropriate programming menu or by PC using dedicated software.
2. **ACTIVATION FORMULA:** the operands are formed by the 4 inputs to be found on the unit terminal block. During programming it is possible to create activation formulae using AND (&) and OR (|) operators which use these inputs as operands. If our system has detection units with fire alarm repeater outputs on four different sectors, we can connect these outputs to the aforementioned terminal block inputs. This will allow the activation of the extinguishing channel to be completely independent of the control panel.
3. **COMPLEX FORMULA:** this condition can ONLY be set using the programming software.

The REDUCED FORMULA, the ACTIVATION FORMULA and the COMPLEX FORMULA are linked together by the logical operator OR.

The release timings for this type of operation are completely analogous to those seen in the manual mode of operation.

Also the visual and acoustic indications are the same as for the manual mode of operation, with the sole exception to the RED "RELEASE" LED associated with the remote release push-button, which in this case remains OFF.

The release halt push-button

A monitored input is available on the terminal block for the connection of Release Halt push-buttons.

Pressing one of the above mentioned push-buttons during the evacuation period, will cause the release sequence to stop using one of three different modes which can be set during programming:

1. The extinguishing release sequence will be stopped until the push-button released.
2. The permanent stop to extinguishing release sequence.
3. The extinguishing release sequence will be stopped and the timers will be reset when the push-button is released.

Fault indications

The extinguishing, release halt push-buttons and pressure switch loops are all monitored loops (end of line resistance linea = 3.3 Kohm) and as such will give indication of open circuit or short circuit of each.

This indication is given by the YELLOW FAULT LEDs situated on the front panel of the unit switching ON (see the layout of the front panel).

Unit reset

The unit reset can occur only by using the OFF button on the front panel of the unit itself

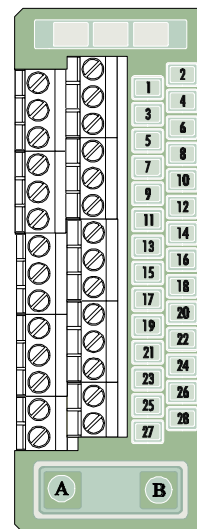
This status is indicated by the lighting of the GREEN LED to be found at the side of the push-button.

PMT-304 Technical specifications

| | |
|---|--|
| Supply Voltage | 24VDC nominal |
| Current consumption in standby | 75 mA |
| Operating current consumption (per channel) | 1 A (Actuators) |
| | 1,7 A (SOYUS: see product technical documentation) |
| N° extinguishing channels | 2 |
| N° SOYUS per channel | 8 cartridges of 300 gr. each |
| | 1 rack ER08/A with 8 cartridges of 300 gr. |
| | 15 rack ER08/B with 8 cartridges of 300 gr. each |
| Maximum length of the extinguishing loops | 1000 mt |
| Suggested cable (shielded, twisted) | 2 x 0.5 mm ² (up to 250 mt) |
| | 2 x 0.75 mm ² (up to 770 mt) |
| | 2 x 1 mm ² (up to 1000 mt) |
| Fuse | 2 A (semi-fast) |
| Operating temperature | -10 +50 °C |
| Relative Humidity | max. 95% |

PMT - 304 Terminal block

| PMT - 304 | |
|------------------|---|
| N° | DESCRIPTION |
| 1 | Event 1 input |
| 2 | Event 2 input |
| 3 | Event 3 input |
| 4 | Event 4 input |
| 5 | + Remote release push-button loop (contact closure) |
| 6 | - Remote release push-button loop |
| 7 | + Remote release inhibit push-button loop (contact closure) |
| 8 | - Remote release inhibit push-button loop |
| 9 | + Remote AUT/MAN Key loop |
| 10 | - Remote AUT/MAN Key loop |
| 11 | + Pressure switch loop |
| 12 | - Pressure switch loop |
| 13 | + Extinguishing loop 1 |
| 14 | - Extinguishing loop 1 |
| 15 | + Extinguishing loop 2 |
| 16 | - Extinguishing loop 2 |
| 17 | + 24VDC (fuse protected) |
| 18 | + 24VDC (fuse protected) |
| 19 | EVACUATION Repeater (Open C. 0.5 A 30VDC) |
| 20 | GAS DISCHARGED Repeater (Open C. 0.5 A 30VDC) |
| 21 | + 24VDC (not fuse protected) |
| 22 | AUTOMATIC OPERATION Repeater (Open C. 200mA) |
| 23 | MANUAL OPERATION Repeater (Open C. 200mA) |
| 24 | N.C. |
| 25 | N.C. |
| 26 | N.C. |
| 27 | N.C. |
| 28 | N.C. |
| A | Shield connection terminals |
| B | |



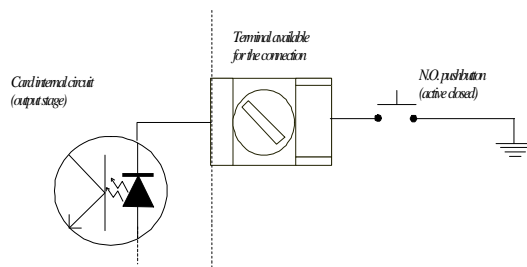
Installation of the PMT-304 Unit

All the information necessary to connect all the installable units onto the terminal block of the PMT-304 are supplied in this paragraph.

Activation input connections

The first inputs on the terminal block and shown as 'Event input 1 .. 4' can be used, as already shown previously, to activate the extinguishing channel. These inputs are active when connected to GND.

The following diagram shows an example of a connection of a normally open pushbutton, connected to GND, to an input.



Another application would be to connect a local pushbutton to the Open Collector output of a detection module (e.g.: PMT-301 or Internal analogue loop).

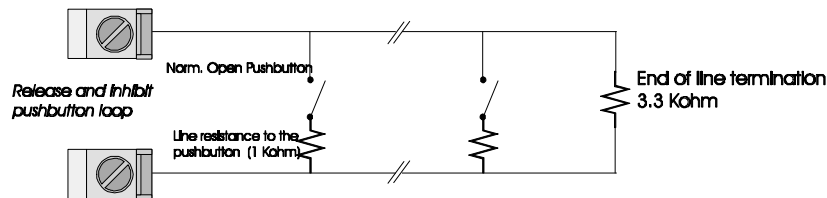
Connection to the extinguishant release and inhibit pushbutton loops

Two monitored loops for either the activation of, or the inhibition of the extinguishant channel.

These loops are terminated with a 3.3 Kohm end of line resistor and are monitored for conditions of open or closed circuit.

The modes of operation are described at the start of the chapter.

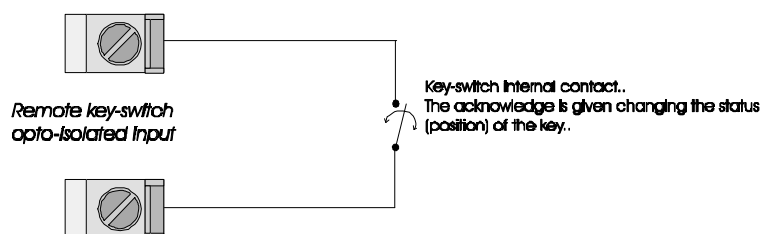
In the following diagram the connection methodology (the same for both loops):



Remote key –switch connection

An opto-isolated input, for connection to an ON-OFF key-switch, is available at the terminal block. The change of state of the key-switch will change the operation from MANUAL to AUT/MAN and vice-versa.

The following diagram shows the operation of this input:

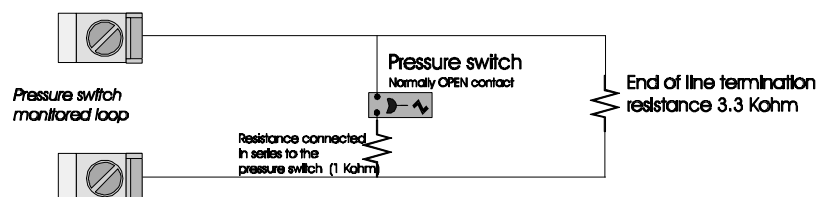


Pressure switch loop connection

This loop is a monitored input for the connection of a contact (Confirmation) from a pressure switch to ensure the effective release of the extinguishant.

The loop is terminated with a 3.3 Kohm end of line resistance and is therefore monitored for open or short circuit conditions.

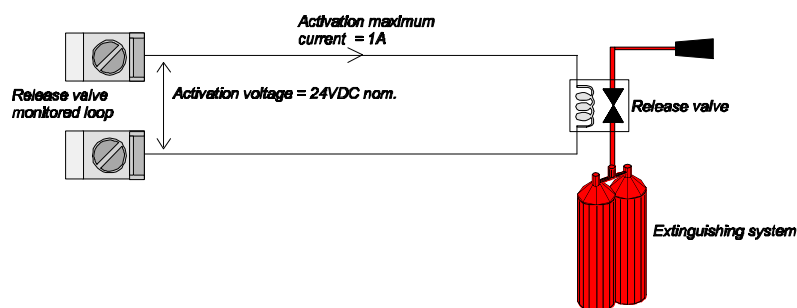
The following diagram shows how to connect pressure switch contact to the loop:



Extinguishant loop connection

The PMT-304 is equipped with 2 monitored loops to drive both extinguishing systems employing 2 release-valves (Release and Distribution) and systems employing electro-explosive actuators such as Soyus. The firmware used permits the loop to be monitored for open circuit conditions but does not permit monitoring of short circuit conditions. The programming of the mode of operation linked to the activation timings is described in the programming manual.

The following diagram shows how to connect the release valve to the monitored loop:



Please refer to the Soyus technical documentation to obtain information of connecting such electro-explosive actuators.

Open collector repeater output connections.

Four open collector repeater outputs are available at the terminal block:

- *EVACUATION Repeater*: active when, once the activation is confirmed, the evacuation timer has started.

This output is isolated only when the unit is reset.

Maximum external load voltage (e.g.: targa) = 30 Vdc

Maximum acceptable current = 500mA.

- *EXTINGUISHANT RELEASED Repeater*: active at the end of the evacuation timer. This output is isolated only when the unit is reset.

Maximum external load voltage (e.g.: targa) = 30 Vdc

Maximum acceptable current = 500mA.

- *AUTOMATIC OPERATION Repeater*: active if the automatic mode of operation of the extinguishing channel has been selected using the key-switch on the unit or the remote.

Maximum external load voltage = 30 Vdc

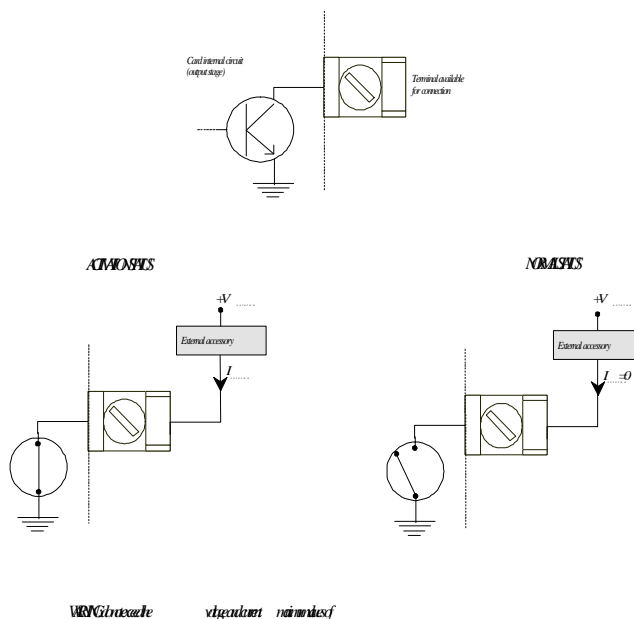
Maximum acceptable current = 200mA.

- *MANUAL OPERATION Repeater*: active if the manual mode of operation of the extinguishing channel has been selected using the key-switch on the unit or on the remote.

Maximum external load voltage = 30 Vdc

Maximum acceptable current = 200mA.

The following diagram shows the operating principle of an open collector output:



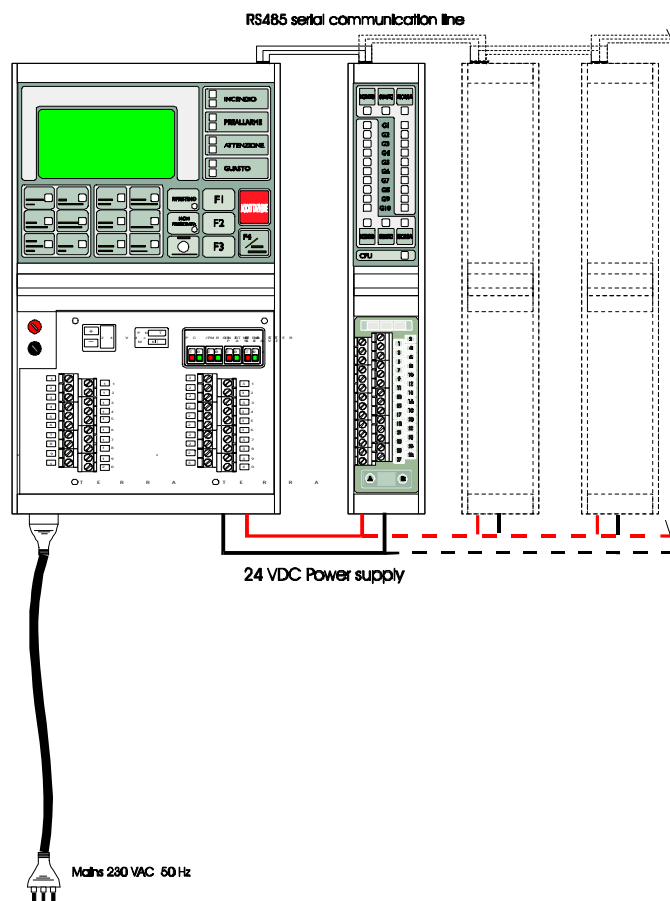
UNIT CONNECTION

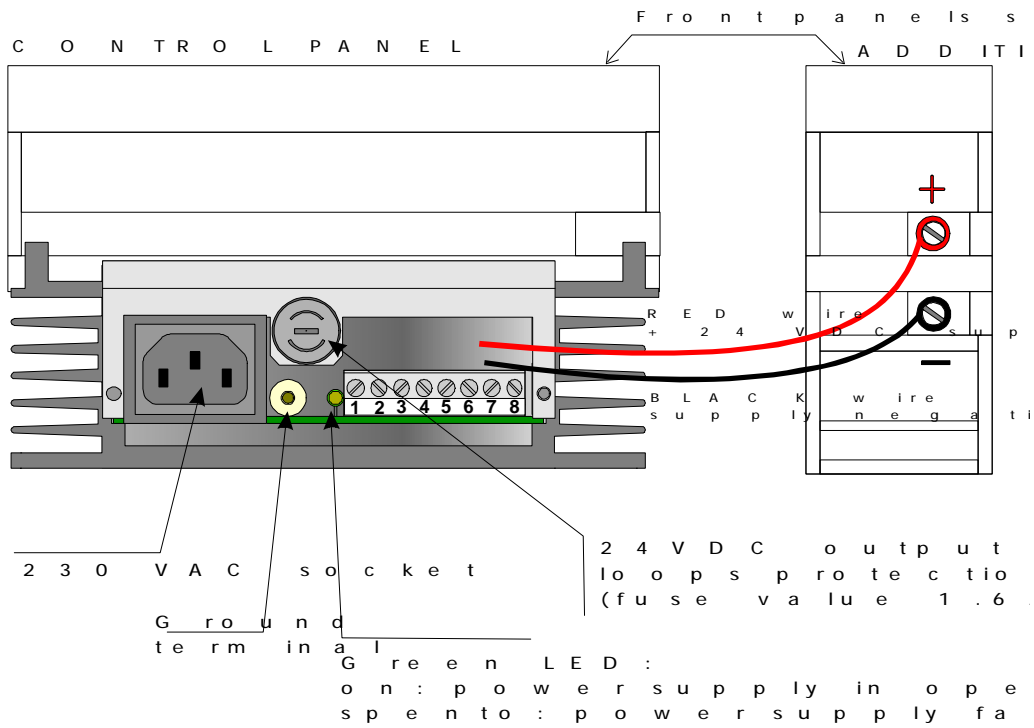
Power supply

The nominal supply voltage (230VAC 50 Hz) is supplied from the mains.

Should the mains supply fail, full operation is guaranteed by the backup battery.

The following diagrams show the position of the power supply terminals.





Communication line connection

A RS485 bus is used to interconnect the units (control panel and additional cards).

The required connection terminals are shown in the following diagram:

