RTK 725 range

Programmable alarm annunciator

- **Modular construction from 1 to 256 alarm channels**
- **Multi-redundant design so there is no single point of failure**
- **Choice of window sizes**
- **Available in six colours with conventional filament lamps or removable LED assemblies**
- **Each channel programmable from the front**
- **Low cost RS485 bi-directional Communications option**
- **Panel or 19" rack mounting or fully integrated into wall mounting or floor standing enclosures**

The RTK 725 range of Alarm Annunciators provide the ideal solution to all your alarm system requirements.

Whatever the size or complexity of your alarm scheme the 725 range can be configured to provide the best solution. With a field proven multi-redundant ASIC design this Annunciator gives the best in reliability, flexibility and programmability for all applications and industries.

With a range of three window sizes, six colours and a choice of bulb or ultra-bright LED illumination, a format and size will be available to match your exact requirements. Each individual alarm way is fully programmable from the front, using the integral programming module. This allows the user to select many different features giving thousands of possible combinations.

Numerous relay outputs are included as standard to connect to external equipment and individual repeat relays or communications can be supplied as an option incorporated as required.

Powering Business Worldwide

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FEATURES & BENEFITS

Modular Construction
The modular design of the RTK 725 range allows units to be assembled in almost any size and shape to suit the individual customer's requirements. Units can be constructed from a single alarm channel to a maximum of 256 channels with a choice of three window sizes.

ASIC Technology
The RTK 725 range of Annunciator builds on the success of previous designs using ASIC technology but taking the design to new levels of reliability.

Multi-Redundant Design
As Annunciators are often used to monitor critical plant alarms it is essential the unit provides the highest reliability possible. With this design there is no common CPU or common services module, which can cause complete system failure. All alarm cards in the RTK 725 range can act as the master controller, if a card does fail then only two alarm points are affected. This design combined with the huge reduction in component count gives a far higher Mean Time Between Failures.

Fully Field Programmable
The user may select from a vast range of different operating functions and alarm sequences including all the standard sequences defined in the ISA publication Alarm Sequences and Specifications S18.1 1979(R1985). The modular design of the 725 range allows units to be assembled in almost any size to suit the customer's exact requirements. Units can be constructed from a single alarm channel to a maximum of 256 channels with a choice of three window sizes. All programmed information is stored in EEPROM giving repeatability, total reliability and requiring no battery backup.

Service From The Front
TAll normal servicing and maintenance is carried out from the front of the unit without the need for special tools. This includes bulb/LED removal, legend changes and all programming. When commissioning the unit it is a simple matter to check and amend all programmed settings from the front of the unit without removing power, boards, backplates or alarm bezels.

This programming module can also be used as a diagnostic tool to indicate the current state of the associated field contacts.

Pushbutton/Programming Module
As standard the bottom right cell is fitted with an integral pushbutton and audible module. This provides six pushbuttons and a 90dB audible together with a 'power on' LED. The rubber keypad is designed for harsh environments with an effective tactile feel to aid operators. It is this keypad that is dropped down to become the programming module when configuring the system.

Shallow Depth
Even with the advanced programming facilities the unit is still only 145mm deep, a fraction of the depth of traditional annunciator systems.

Pre-configured
If specified at the time of ordering, systems can be supplied pre-configured and complete with the associated coloured filters and film legends, ready to install and commission.

Auto-mute and Auto-acknowledge
It is a frequent requirement of alarm systems to have an automatic mute or even automatic acknowledge after a certain time delay. This is another programmable feature supplied as standard on all units.

Expandability
Each Annunciator can be expanded using a factory supplied ribbon cable to link to additional units. Systems consisting of multiple Annunciators can be daisy chained together to form larger systems with common features. All first-up information, synchronised flash rates and pushbutton functions are linked through this ribbon cable.

Sleep Mode
Increasingly Alarm Annunciators are used in applications where the primary supply is produced from batteries, typically substations, which are not permanently manned. To conserve power in these situations the Annunciator can be placed in "Sleep" mode. In this mode the Annunciator works as normal, latching in alarms and driving repeat relays, but the drive to the lamps, horn and pushbutton inputs are disabled.

When the unit is removed from "Sleep" mode all alarm information is available in the normal way.

Serial Communication
Bi-directional RS485 communication is available as a low-cost option. This can be used to receive alarm information from or transmit to third party equipment. Each alarm channel can be configured to accept alarm inputs from the standard alarm contact or via the communications. The communications can be used to create systems linking two or more Annunciators together as repeat or grouped displays.

INPUTS & OUTPUTS

Inputs
All inputs are opto-coupled and comply to the stringent requirements of the European Directive on electromagnetic compatibility and the low voltage directive. This ensures there is no possibility of false alarms. The standard input voltage is 24V but units can be supplied with field contact voltages of 48 or 125V. All versions are capable of accepting AC or DC voltages.

Common Outputs
As standard the 725 range has five relay outputs to cover all normal alarm applications. These are as follows:

1 Critical Audible Relay
2 Non-critical Audible Relay
3 Critical Group Relay
4 Non-critical Group Relay
5 Special Function Relay

Each of the group relays can have a reflash facility to indicate the occurrence of a new alarm within the group. The Special Function Relay can be set to act in a number of different ways to suit the particular application. This function can be selected from one of the following:

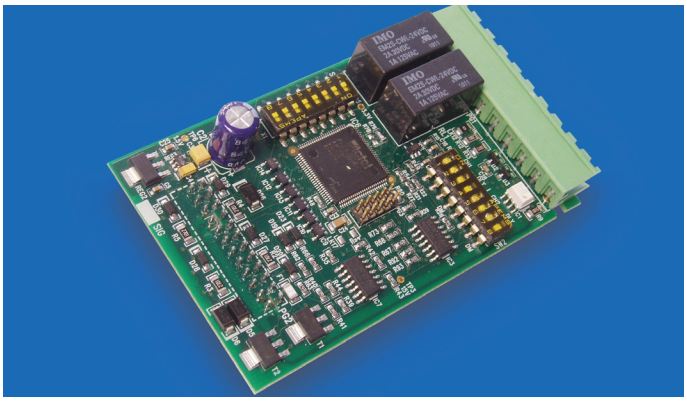
- Total Group Relay
- Ringback Audible Relay
- First-Up Relay
- Watchdog Relay

Audible Outputs
The standard unit will be supplied with an integral 90dB(A) audible and two audible relays (critical and non-critical). Each alarm way can be programmed to be in one, both or neither of these two groups.
The integral audible will always sound on the critical group

Group Outputs With Reflash Facility
Two group relays are provided as standard (critical and non-critical). As with the audible relays, each alarm way can be programmed to be in one, both or neither group. Each group relay can also be set to have a reflash facility. This means the first alarm in the group will change the state of the relay and any subsequent alarms within the same group will cause the relay to pulse for approximately 0.5 seconds.

Auxiliary Relays
Each alarm way can be supplied with an individual repeat relay. Each relay can be programmed to be energised or de-energised on alarm and both normally open and normally closed contacts are available on customer terminals. The repeat relays can be set to follow the alarm logic, follow the field contact or follow the display.

Connections
All connections are made to the rear of the unit, using two part screw terminals capable of taking 2.5mm^2 cable.



DISPLAY

Window Sizes
This flexible unit is designed to be fully modular using a cell based structure.

Each cell can house:

One large window (60 x 60mm)
Two medium windows (60 x 30mm)
Four small windows (30 x 30mm)

Window sizes can be mixed as required.

Backlit Illumination
Each window is backlit by long life incandescent lamps or 'Fit & Forget' removable LED Assemblies. All colours are available for both lamps and LEDs. These colours are red, amber, yellow, white, green and blue.

GENERAL

Complete Alarm System
Everything is contained within the standard 725 Annunciator to provide a complete alarm monitoring system. This includes all pushbuttons and a local audible.

First-Up
In alarm annunciation applications it is often essential to know which alarm occurred first in a particular group. To this end, four different first-up sequences and four different first-up groups are available, all user programmable from the front.

Power Supplies
The supply required to power the Annunciator is nominally 24VDC. This can be a simple unregulated low cost source as the annunciator itself will provide all the necessary smoothing and regulation.
Eaton can supply suitable Power Supplies or DC/DC Converters if converting from higher AC or DC voltages including the RT-AD Dual Reduandant Supplies.

CE Marked
Designed to meet the requirements of European EMC and LVD Directives.

Wall, Panel and Rack Mounting
The standard unit is supplied as a panel mounting version ready for customers to drop into a single cut-out.

The rear of the annunciator must be protected by an enclosure which is at least IP30 and secured by a tool or key.

If required Eaton can supply the 725 Annunciator fully integrated into wall mounting or floor standing enclosures or mounting within standard 19" plates.

CUSTOM SOLUTIONS

ANNUNCIATOR OPTIONS

Illumination (Option LED)
The use of LEDs is becoming more popular and these can be supplied as an optional extra. The 10mm glass wedge bulb is replaced with a small ultra-bright LED Assembly which plugs into the same lampholder as the bulb.

Tropicalised (Option TRO)
In harsh environmental conditions where there may be moisture or chemicals within the atmosphere, there is an option to tropicalise the unit. This consists of covering all the pcbs with a conformal coating and using sealed relays.

Repeat Relays (Option RLY)
The five common relays are always fitted as standard but there is an option of having individual repeat relays for all alarm ways.

Customer Specified Response Time (Option CRT)
As standard the alarm will be activated by signals over 25ms in duration. If this time is either too long or too short to suit the particular application there is an option to increase or decrease this response time.

Disable Horn (Option DHN)
If the integral horn is not required when the audible relays are being used, this can be disabled.

Field Contact Voltage (Option FC)**
The standard unit uses either volt-free contacts or 24V signals to trigger alarms. It is possible to change the field contact voltage to alternatives such as 48V or 125V. All versions are capable of accepting AC or DC voltages.

Rack Mounting
The Annunciators can be supplied premounted in standard 19" aluminium mounting plates. A maximum of 7 cells will fit across a 19" front plate.

RS485 Serial Communications (Option COM)
All 725 range of Annunciators can be fitted with the optional serial communications card, which is usually located in the cell directly above the pushbutton module. This card provides RS485 bi-directional communication to and from third party devices using modbus ASCII or modbus RTU protocols as standard. All pushbutton controls can be local to the annunciator or driven remotely via the communications link. Up to 64 annunciators can be multi-dropped on the same communications connection.

Adjustable Response Time (Option AD*)
If specified at the time of ordering each channel can be supplied with user adjustment of the response time across any range up to 60 seconds.

Three Horn Relay Outputs (Option 3HN)
It is possible to change the operation of the common relays to have three horn relays and a single group relay rather than two of each. With this option the method of programming of the relays remains the same but their operation is altered slightly.

Three Group Relay Outputs (Option 3GP)
It is possible to change the operation of the common relays to have three group relays and a single horn relay rather than two of each. With this option the method of programming of the relays remains the same but their operation is altered slightly.

SYSTEMS AND SPECIALS

Systems
Eaton has extensive systems experience and can supply an alarm annunciator as part of a complete alarm system. This may include installing in wall mounting or floor standing enclosures, integrating into mimic displays or wiring together with other switchgear, power supplies or battery backup systems.
Because of the varied nature of this type of special system, they are priced on application against an agreedspecification.

Greater Ingress Protection
The 725 range facia is rated at IP41. Optional hinged plexiglass covers are available in all sizes for IP54 applications. For extreme environmental conditions enclosures with viewing windows are available to meet IP66 and IP67 standards.

LAMP-ONLY MODULE

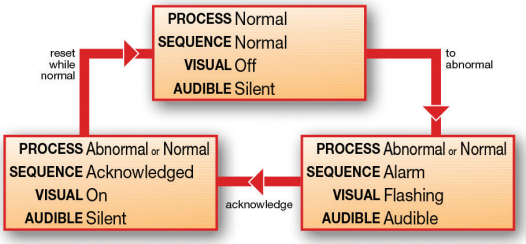
Matching Display
To complement our 725 range of Annunciator the 725LO lamp-only unit is available, which provides the same flexibility of display size, window colours and illumination by lamp or removable LED assemblies. The display can be supplied complete with lamp test facilities or with integral audible and pushbuttons if required. With lamponly versions the lamps or LEDs are simply wired to customer terminals for connection to remote devices as required. See separate datasheet for full details.

ALARM SEQUENCES

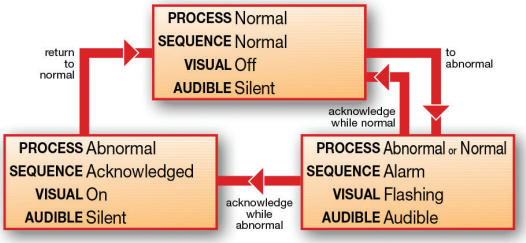
Each alarm channel can be configured to suit the operating sequence required as listed in the ISA publication ***Annunciator Sequences and Specifications S18.1 1979 (R1985)***. Systems can be configured with different features on different alarm ways.

The diagram below shows the most commonly used sequences.

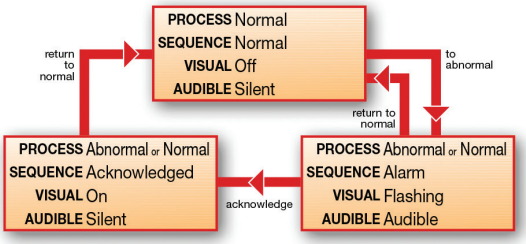
MANUAL RESET — Sequence Code M



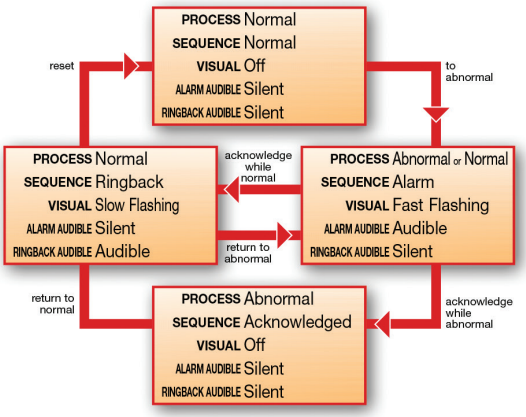
AUTOMATIC RESET — Sequence Code A



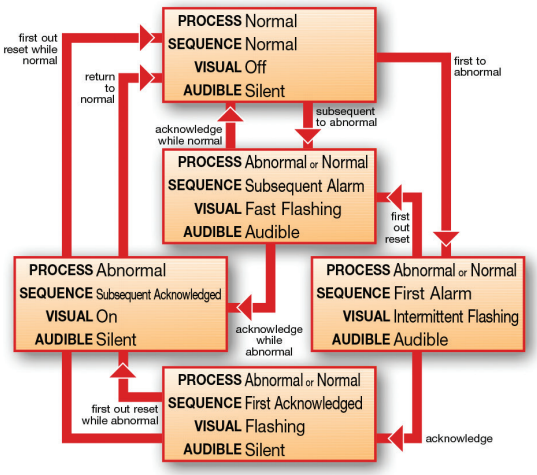
NO LOCK IN



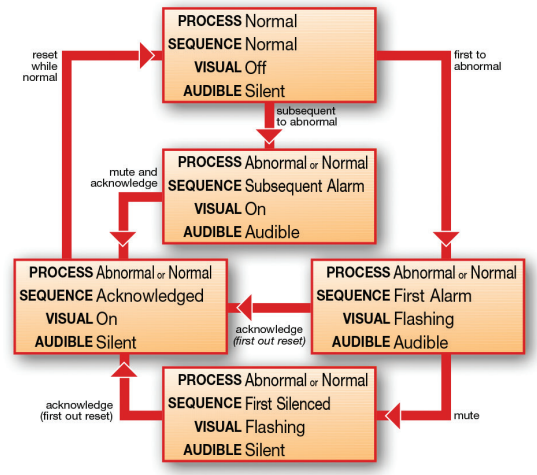
RINGBACK — Sequence Code R



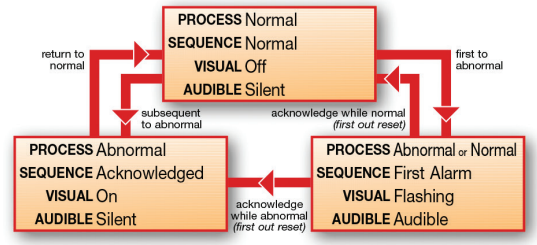
AUTOMATIC RESET FIRST OUT — Sequence F3A
WITH FIRST OUT FLASHING AND RESET PUSHBUTTON



MANUAL RESET FIRST OUT — Sequence F2M-1
WITH NO SUBSEQUENT ALARM FLASHING AND SILENCE PUSHBUTTON



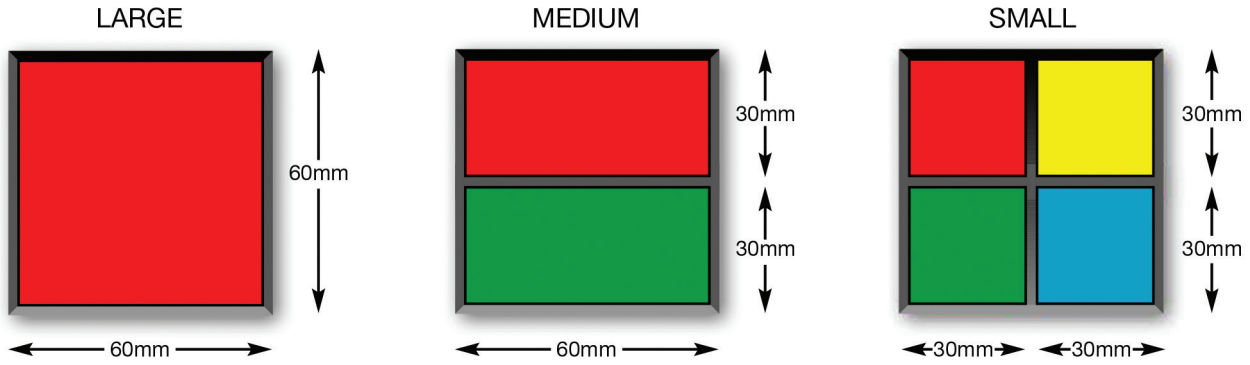
AUTOMATIC RESET FIRST OUT — Sequence F1A
WITH NO SUBSEQUENT ALARM STATE



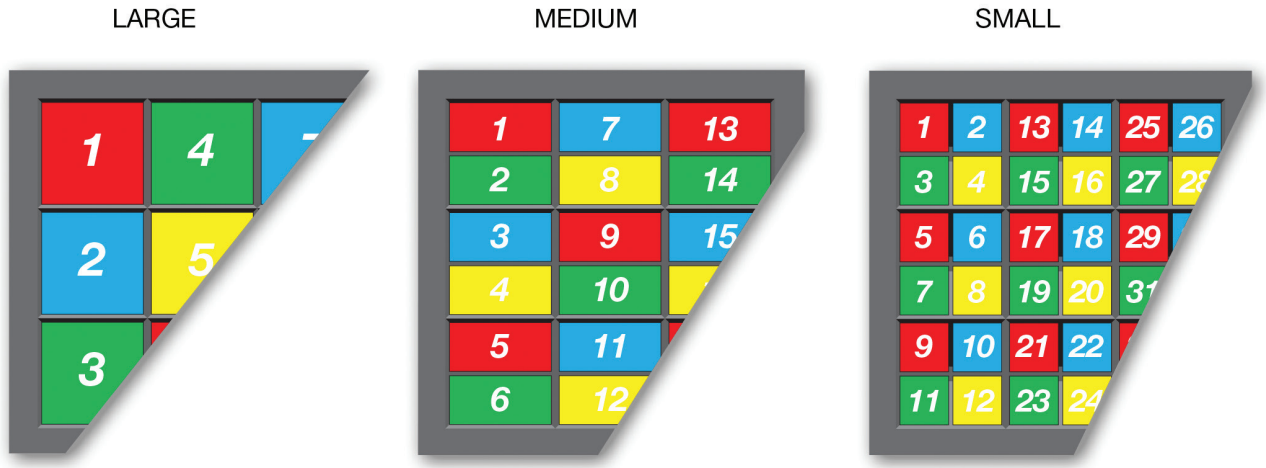
SYSTEM CONFIGURATION

WINDOW SIZE AND LAYOUT

The 725 range of Annunciator is modular in design allowing customers to quickly design each alarm system to suit their exact requirements for both window size and number of windows. The system is built up of multiple cells; each cell has dimensions of 60 x 60mm and can be configured as a single large window (60 x 60mm), two medium windows (60 x 30mm) or four small windows (30 x 30mm). The units are built up from pre-tested components so custom solutions can be provided with the best possible lead times.



Units can be configured into almost any shape and size as long as the overall width or height is less than 30 cells. Windows are numbered depending on window size as shown in the examples below. Please refer to these numbers when providing legend/ configuration details



SYSTEM CONFIGURATION

DIMENSIONS

The dimensions are very simple to work out using the following formula or alternatively read from the table below.

Overall dimensions = [(No of cells) x 60] + 24mm

Cutout dimensions = [(No of cells) x 60] +14mm

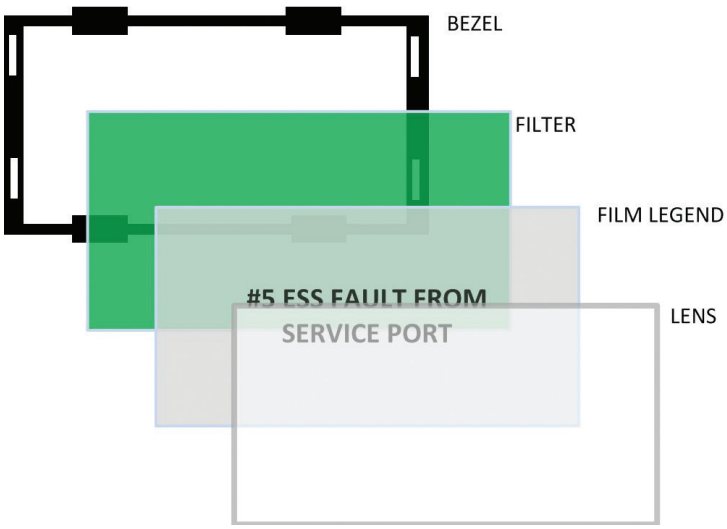
PANEL DIMENSION IN mm						
WIDE				HIGH		
CELLS	Overall	Cut-Out		CELLS	Overall	Cut-Out
1	88	74		1	88	74
2	148	134		2	148	134
3	208	194		3	208	194
4	268	254		4	268	254
5	328	314		5	328	314
6	388	374		6	388	374
7	448	434		7	448	434
8	508	494		8	508	494
9	568	554		9	568	554
10	628	614		10	628	614
11	688	674		11	688	674
12	748	734		12	748	734
13	808	794		13	808	794
14	868	854		14	868	854
15	928	914		15	928	914
16	988	974		16	988	974

FILM LEGENDS

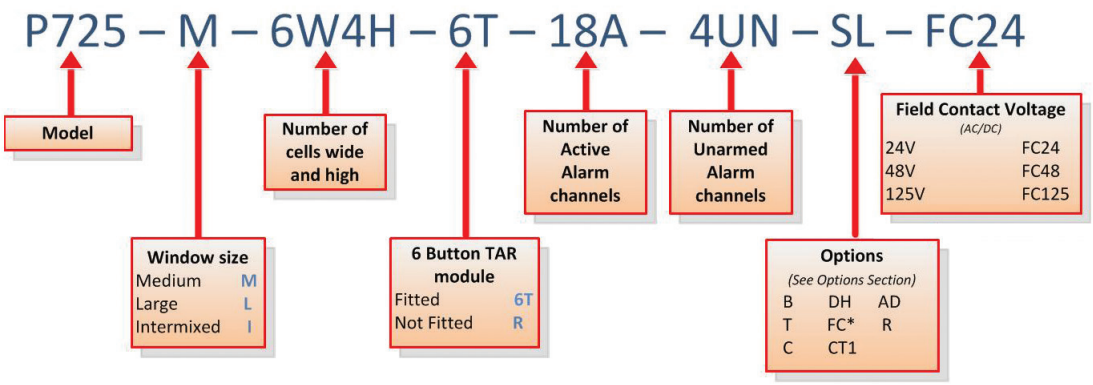
As fully approved details of alarm text is often not available at the time of order, acetate film legends are generally used. Eaton can supply the 725 range of Annunciator complete with alarm legends or they can be generated by the customer using a Microsoft Excel software template. This allows the user to create their own legends locally. Once the details have been entered they can be printed onto acetate film via a laser printer. This software template makes the production of legends in different languages, sizes and fonts very straightforward.

BEZEL ASSEMBLY

The diagram below shows how the bezel assembly is constructed using different layers to diffuse the light, colour and window and show the text using a film legend insert. These assemblies are simple to move around in the Annunciator frame and to change colour or text on site.



ORDER CODE



TECHNICAL SPECIFICATION

INPUTS

The inputs are all bipolar so can accept AC or DC voltages.

Alarm Contacts
The standard unit is suitable for volt-free contacts or 24VDC powered inputs. Each input can be easily set to operate from either a Normally Open or Normally Closed field contact.

Isolation
All customer inputs are optically coupled as standard and are capable of withstanding 1000V Megger test to ground.

Field Contact Voltage
This voltage is distributed through the annunciator to field contacts, 24VDC is supplied as standard. Options for 48 and 125V are available. The inputs are all bipolar so can accept AC or DC voltages.

Response Time
- Standard units 25ms
- Customer defined fixed response time from 1ms to 60s, specified at time of order.
- Selectable response times (Option AD) each channel can be set with one of the following response times 5ms, 10ms, 25ms, 50ms, 200ms, 2s, 5s, 60s

First-up Discrimination
Better than 5ms

Pushbuttons
- Lamp Test
- System Test
- Acknowledge
- Mute
- Reset
- First-up Reset

Optional remote pushbutton/ programming assembly.

OUTPUTS

Common Relays
Common Relays All systems come with the five common, programmable relays fitted behind the Pushbutton Module.

1. Critical Audible
2. Non-critical Audible
3. Critical Group
4. Non-critical Group
5. Special Function Relay

Repeat Relays
Each alarm way can have individual repeat relays. Changeover contact available. Relay contacts rated at 125VDC @ 0.5A, 24VDC @ 2A, resistive. Two relays per channel can be provided (Option RL2).

Audible
3kHz peizoelectric buzzer at 90dB 30cm.

Communications (Optional)
RS485 2 or 4 wire, Modbus, ASCII or Modbus RTU protocol user selectable. Master and Slave configurations. Supports bi-directional communications Ethernet Modbus TCP/IP. Alarm Management software. Other protocols available on request.

DISPLAY

Window Sizes

Small:	30 x 30mm
Medium:	60 x 30mm (W x H)
Large:	60 x 60mm

Window Colours
Red, Amber, Yellow, White, Green and Blue for both Lamp and LED Illumination.

Illumination

Small window	Single Bulb/LED
Medium window	Dual Bulb/dual LED
Large window	Four Bulb/four LEDs

The LEDs are ultra-bright LED Assemblies that plug into the standard 10mm wedge style lampholder.

Lamps
28V 50mA 10mm glass wedge. 14,000 hour design life.

LED Assemblies
10mm base 'Fit and Forget' plug-in LED Assemblies, typically 20mA, minimum 11-year life expectancy.

GENERAL

Supply Voltage
24VDC Nominal (19-28VDC)

Supply Current Per Alarm Point (at 24VDC supply)

Quiescent:		22mA
Lamps:	Small window	45mA
	Medium window	90mA
	Large window	180mA
LEDs:	Small window	20mA
	Medium window	40mA
	Large window	80mA

Relays: All window sizes 10mA per relay

Additional current for pushbutton module, common relay and audible is nominally 100mA.
Standard Power Supplies and DC/ DC Converters can be supplied on request.

Compliance
Emissions to BS EN 61000-6-4:2007 + A1:2011
Immunity to BS EN 61000-6-2:2005
LVD to BS EN 61010-1:2010 and IEC61010-2-201

Surge Immunity
To ANSI/IEEE C37.90.1:1989
BS EN 61000-4-5:2006

Environment
Operating temperature (lamp version) -20 to 50°C
Operating temperature (LED version) -20 to 60°C
Storage temperature -20 to 80°C
Humidity 0-95% RH, non condensing

Protection
Front of panel: IP41
Rear of enclosure: IP20
Optional covers and enclosures to protect from IP54 up to IP67

Connections
Two-part rising clamp type terminals, for conductors up to 2.5mm²

Weight
Two-part rising clamp type terminals, for conductors up to 2.5mm²

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