SIL725
Safety Annunciator

Configurable SIL2 Annunciator certified to IEC61508

SIRA certified at safety integrity level SIL2 to IEC61508

Modular construction from 1 to 128 alarm channels

Multi-redundant design

Choice of window sizes

Ultra-bright LED illumination as standard in six colors

Each channel configurable from the front

Panel or 19" rack mounting or fully integrated into wall mounting or floor standing enclosures

The SIL725 Safety Annunciator is designed and manufactured to provide a high safety integrity for critical alarm applications and for use as a component part of a safety instrumented system. The unit is third party certified by SIRA using the CASS methodology to a safety integrity level of SIL2. Whatever the size or complexity of your alarm scheme the SIL725 can be configured to provide the best solution. With a field proven multi-redundant design this Annunciator gives the best in reliability, flexibility and configurability for all applications and industries.

With a range of two window sizes, six colors and ultra-bright LED illumination, a format and size will be available to match your exact requirements. Each individual alarm point is fully configurable from the front, using the integral configuration module. This allows the user to select many different features giving thousands of possible combinations.

Features & Benefits

Functional Safety Description
The SIL725 will provide a highly reliable alarm system which, when used as specified, will provide functional safety as defined below

- On alarm contact opening or loss of signal voltage on an input channel the related alarm window will be illuminated
- On an alarm being triggered, the integral horn shall sound until muted or acknowledged
- When an alarm input that is configured to drive a horn relay is triggered, the horn relay shall de-energize, for both Horn A and Horn B.
- When an input that is configured to drive a group relay is triggered, the group relay shall de-energize, for both Group A and Group B.

Limits of Application
In order to maintain the SIL2 certification the unit is subject to the following limitations as detailed in the operating manual.

a) a 10-year lifetime
b) A periodic proof test of the complete system
c) Operation within the specified environmental and electrical limits
d) Alarm contacts must be normally closed, open to alarm
e) Relays must be energized in normal use and de-energize on alarm

Modular Construction
The modular design of the SIL725 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 128 channels with a choice of two window sizes.

Technology
The SIL725 Annunciator builds on the success of previous designs but taking the design to new levels of safety and 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 SIL725 can act as the master controller. Also each window is driven by two cards in a 1oo2 (1 out of 2) arrangement so that a card failure will not prevent an alarm being tripped.

Fully Field Configurable
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 SIL725 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 128 channels with a choice of two window sizes.
All configured information is stored in EEPROM giving repeatability, excellent reliability and requiring no battery backup.

Service From The Front
All normal servicing and maintenance is carried out from the front of the unit without the need for special tools. This includes LED removal, legend changes and all configuration. 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.

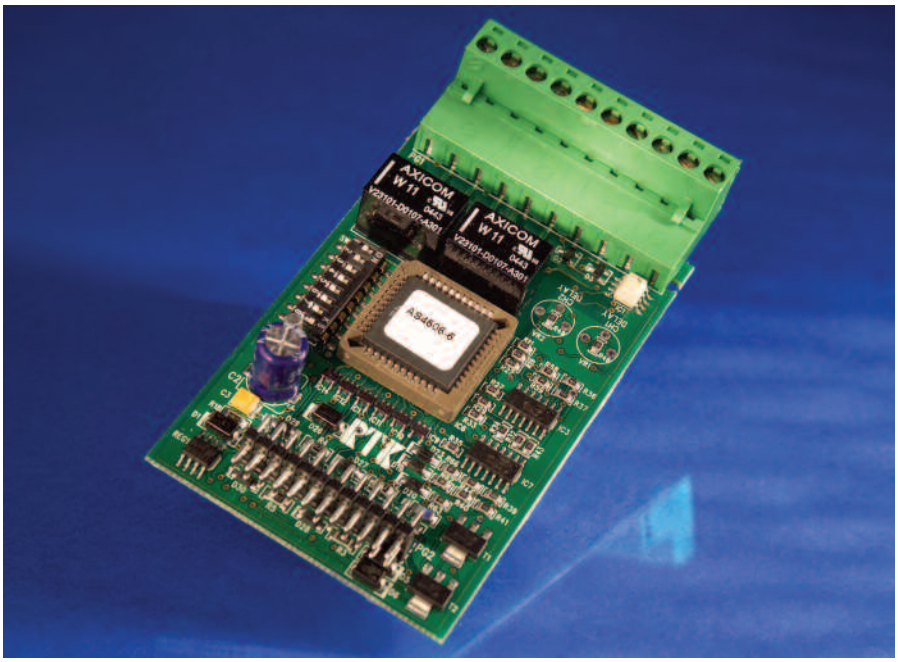
This configuration module can also be used as a diagnostic tool to indicate the current state of the associated field contacts.

Pushbutton/Configuration 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 configuration module when configuring the system.

Shallow Depth
Even with the advanced configuration facilities the unit is still only 5.7" (145mm) deep, a fraction of the depth of traditional annunciator systems.

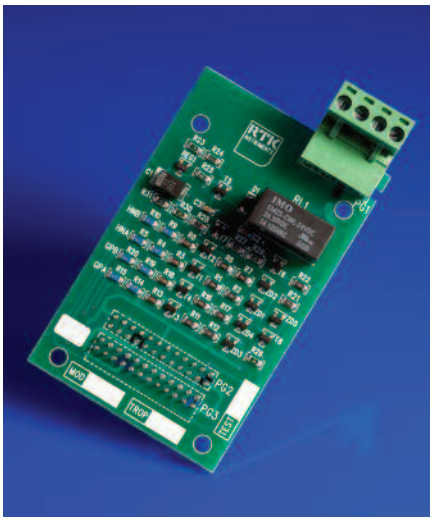
Pre-configured
If specified at the time of ordering, systems can be supplied pre-configured and complete with the associated colored filters and film legends, ready to install and commission.

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 configurable feature supplied as standard on all units.



Features & Benefits

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 Safety Outputs
The SIL725 can have up to four SIL2 compliant common relay outputs to provide the following

1 Horn Relay A (HNA)
2 Horn Relay B (HNB)
3 Group Relay A (GPA)
4 Group Relay B (GPB)

The standard configuration is two common relays (HNA and GPA). Other configurations from zero to four common relays can be accommodated - please specify at the time of ordering.

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

Individual Repeat Relays (Non SIL)
Each alarm way can be supplied with a non-SIL individual repeat relay. Each relay can be configured to be energized or de-energized 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 12 AWG (2.5mm^2) wire.

Diagnostic Relay
In order to avoid the possibility of undetected faults within the Annunciator, there is an additional diagnostic board fitted with a watchdog relay output. This monitors supply voltage tolerance, Alarm Board voltage tolerance and voltage levels on all common lines including the calibration line

Display

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

Each cell can house:
One large window
2.36" x 2.36" (60 x 60mm)
Two medium windows
2.36" x 1.18" (60 x 30mm)

Backlit Illumination
Each window is backlit by 'Fit & Forget' removable LED Assemblies. A choice of six colors are available. These colors are red, amber, yellow, white, green and blue.

General

Complete Alarm System
Everything is contained within the standard SIL725 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, three different first-up sequences and two different first-up groups are available, all user configurable from the front.

Power Supplies
The supply required to power the SIL725 Annunciator is nominally 24VDC. The supply should have internal voltage protection or switch over to a second unit. Where the power supply has internal over volt protection the output must not exceed 31VDC.

CE Marked
Designed within the stringent requirements of the European EMC and LVD directives ensures that the Annunciatior conforms to the highest standards of both safety and function.

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.
If required RTK can supply the SIL725 Annunciator fully integrated into wall mounting or floor standing enclosures or mounting within standard 19" plates.

Tropicalized
As the RTK Safety Annunciator is designed for applications around the world in many different environments all units are supplied tropicalized as standard to help prevent any problem with moisture or contaminants in the atmosphere.

Custom Solutions

Annunciator Options

Repeat Relays (Option R)
There is an option of individual repeat relays for all alarm points although these are not SIL certified outputs and should not be used as part of a safety instrumented system.

Common Safety Relays
The SIL725 can have up to four SIL2 compliant common safety relay outputs to provide the following

1 Horn Relay A (HNA)
2 Horn Relay B (HNB)
3 Group Relay A (GPA)
4 Group Relay B (GPB)

The standard configuration is two common relays (HNA and GPA). Other configurations from zero to four common relays can be accommodated - please specify at the time of ordering.

Customer Specified Response Time (CRT Option 0,1,2)
As standard the alarm will be activated by signals over 22ms 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.

If specified at the time of ordering each channel can be supplied with user adjustment of the response time across any range up to 2 seconds.

Field Contact Voltage (Option 1,2,3)
The standard unit uses either volt-free contacts or 24V signals to trigger alarms. It is possible to request alternative Field Contact Voltages of 48VAC/VDC or 125VAC/VDC. These alternative must be requested at time of order.

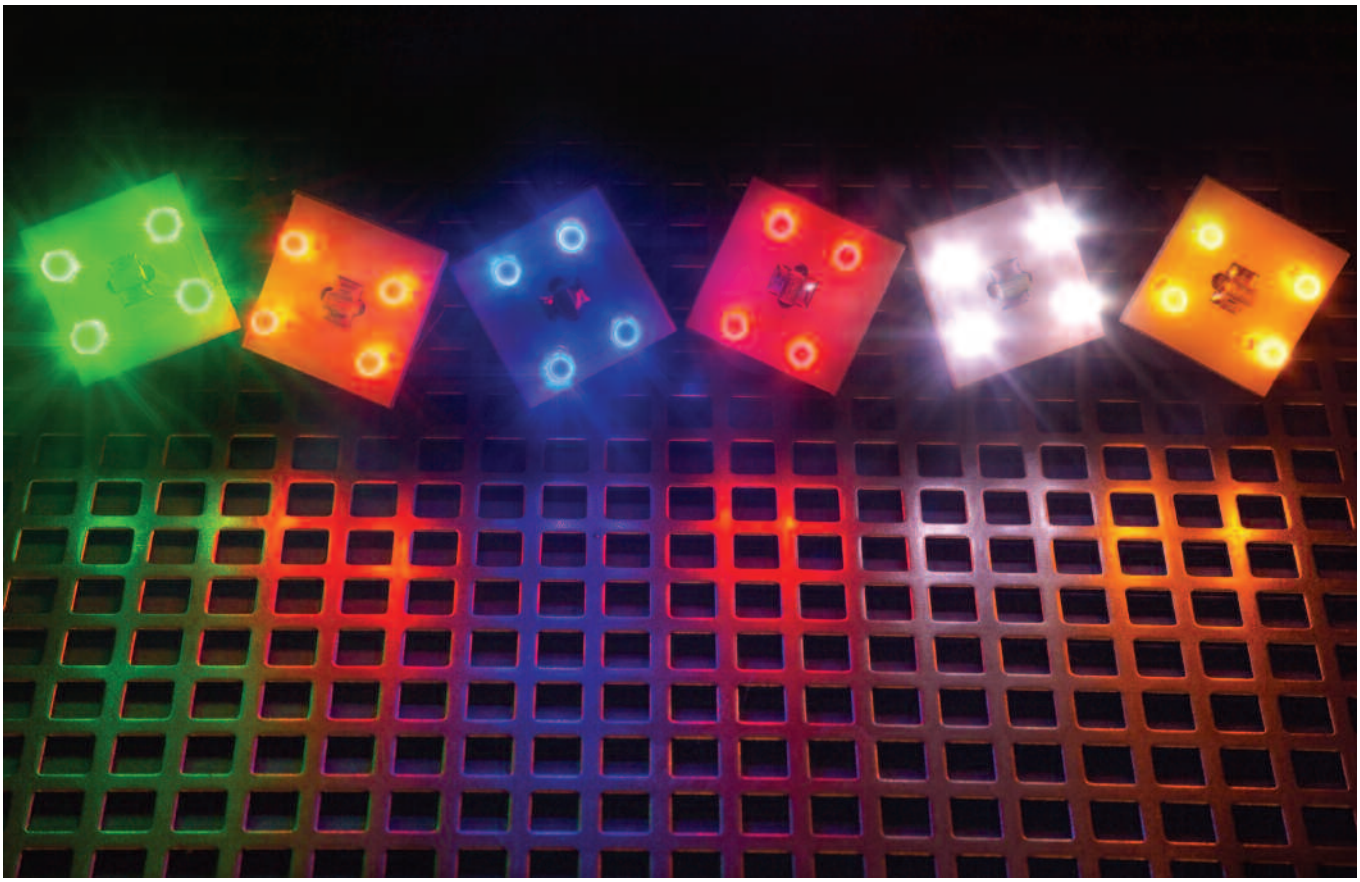
Rack Mounting
The Annunciators can be supplied pre-mounted in standard 19" aluminium mounting plates. A maximum of 7 cells will fit across a 19" front plate.

Systems and Specials

Systems
RTK Instruments 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 agreed specification.

Greater Ingress Protection
The SIL725 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.

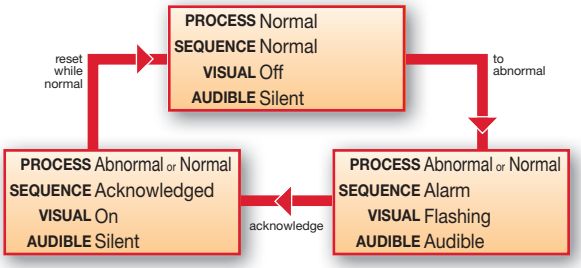


Alarm Sequences

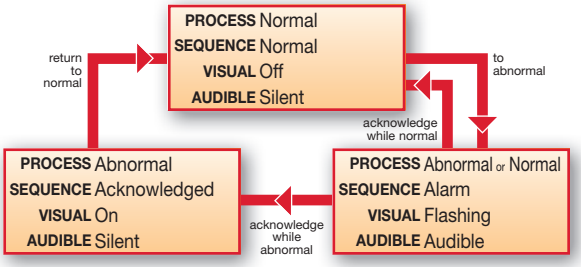
Each alarm channel can be configured to suit the operating sequence required as listed in the ISA publication *Annunciator Sequences and Specifications S18.1 1979 (R1985)*. Systems can be configured with different features on different alarm ways.

The diagram below shows the most commonly used sequences.

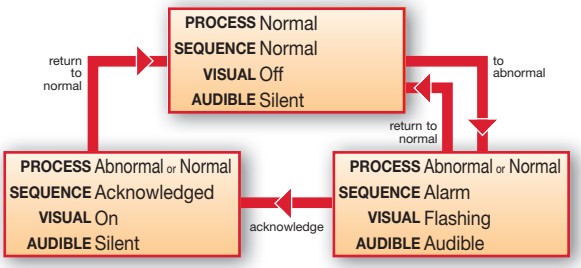
MANUAL RESET — Sequence Code M



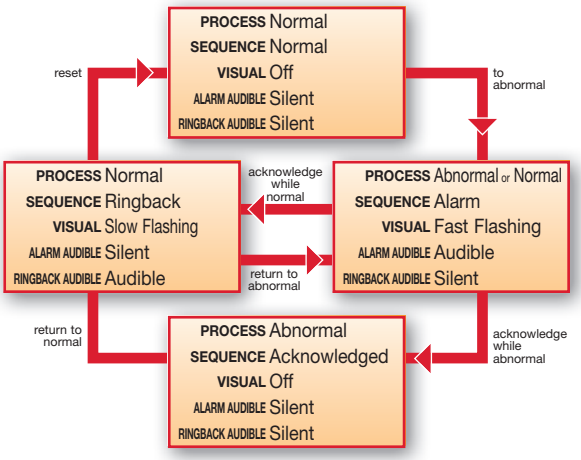
AUTOMATIC RESET — Sequence Code A



NO LOCK IN

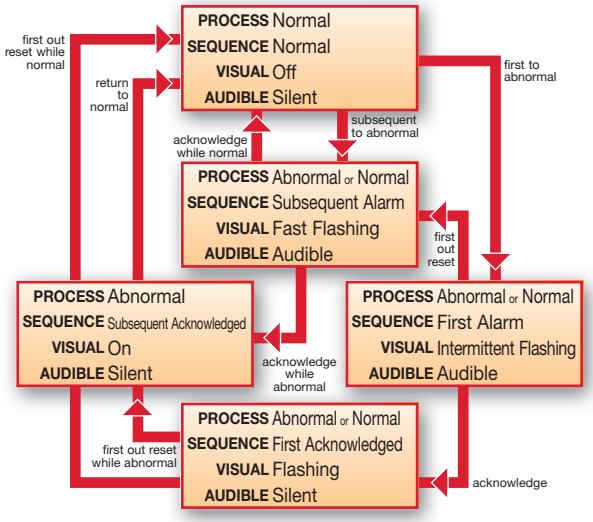


RINGBACK — Sequence Code R



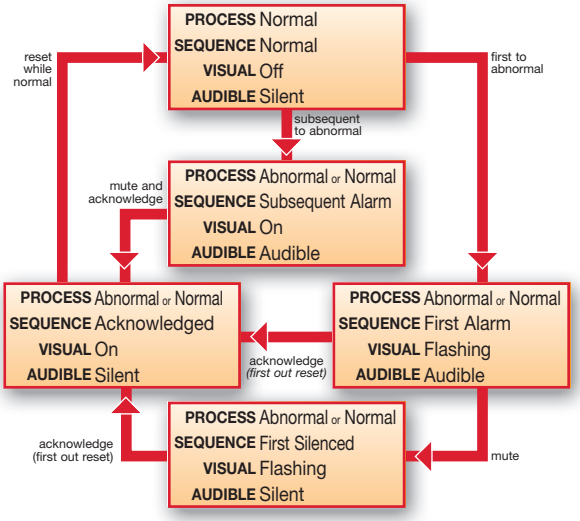
AUTOMATIC RESET FIRST OUT — Sequence F3A

WITH FIRST OUT FLASHING AND RESET PUSHBUTTON



MANUAL RESET FIRST OUT — Sequence F2M-1

WITH NO SUBSEQUENT ALARM FLASHING AND SILENCE PUSHBUTTON

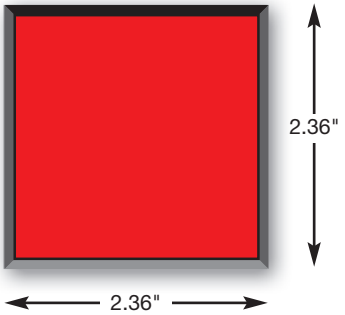


System Configuration

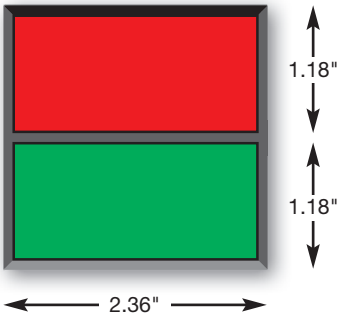
Window Size & Layout

The SIL725 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 2.36" x 2.36" (60 x 60mm) and can be configured as a single large window 2.36" x 2.36" (60 x 60mm) or two medium windows 2.36" x 1.18" (60 x 30mm). The units are built up from pre-tested components so custom solutions can be provided with the best possible lead times.

LARGE



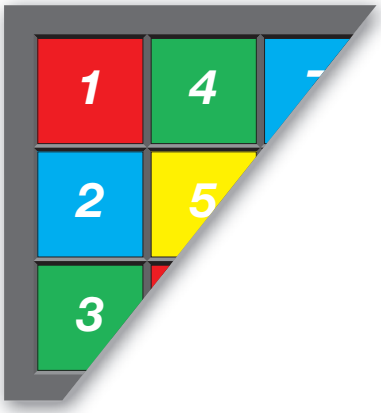
MEDIUM



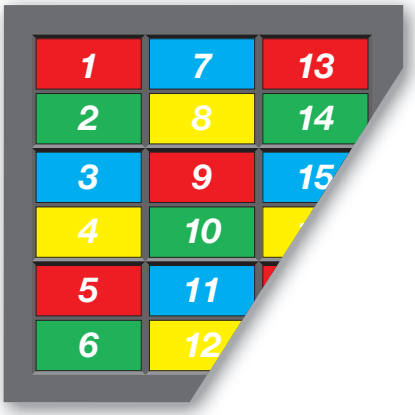
Units can be configured into almost any shape and size as long as the overall width or height is less than 30 cells.

Windows are numbered depending on window size as shown in the examples below. Please refer to these numbers when providing legend/configuration details

LARGE



MEDIUM



Rear View/Removable Customer Terminals

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

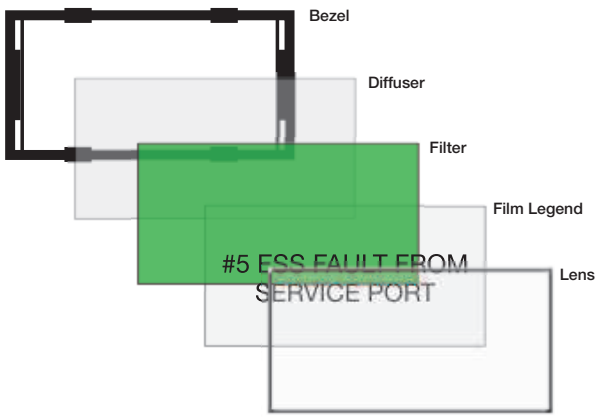
No of Cells	Overall	Cutout
1	3.31" (84mm)	2.91" (74mm)
2	5.67" (144mm)	5.27" (134mm)
3	8.03" (204mm)	7.69" (194mm)
4	10.39" (264mm)	10.00" (254mm)
5	12.75" (324mm)	12.36" (314mm)
6	15.11" (384mm)	14.72" (374mm)
7	17.48" (444mm)	17.09" (434mm)
8	19.84" (504mm)	19.45" (494mm)
9	22.20" (564mm)	21.81" (554mm)
10	24.56" (624mm)	24.17" (614mm)
11	26.93" (684mm)	26.53" (674mm)
12	29.29" (744mm)	28.90" (734mm)
13	31.65" (804mm)	31.26" (794mm)
14	34.01" (864mm)	33.62" (854mm)
15	34.38" (924mm)	35.98" (914mm)
16	38.74" (984mm)	38.35" (974mm)

Film Legends

As fully approved details of alarm text is often not available at the time of order, acetate film legends are generally used. RTK can supply the SIL725 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, color 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 color or text on site.



Order Code

SIL725 – M – 3 – 4 – 022 – X – 3 – H – G – X – X – 0

Product designation for SIL725 Annunciator

Window size
Medium M
Large L
Intermixed I

Number of cells wide

Number of cells high

Number of active alarm channels

Repeat Relays
(Not SIL2 certified)
Not fitted X
Relays fitted R

Field Contact Voltage
24V (standard) 1
48V 2
125V 3

Additional Safety Relay
(SIL2)
Horn fitted HNA H
No extra common relays X

Additional Safety Relay
(SIL2)
Group fitted GPA G
No extra common relays X

Additional Safety Relay
(SIL2)
No extra common relays X
Horn fitted HNB H

Additional Safety Relay
(SIL2)
No extra common relays X
Group fitted GPB G

CRT Options
Standard 0
AD1 1
AD2 2

Technical Specification

Safety Requirements

Refer to the Certificate and the Operating Manual for the full details on using the SIL725 as part of a safety instrumented system.

Certification

Sira certified using CASS methodology at safety integrity level SIL2 to IEC 61508-2:2000

Certificate No: Sira FSP 09006/01

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 is triggered from a 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 22ms
- Customer defined fixed response time from 1ms to 2s, specified at time of order
- Adjustable response time typically 5-50ms (Option AD1)
  25ms-2s (Option AD2)

First-up Discrimination
Better than 5ms

Pushbuttons
Both integral and terminals for remote fitting
- LED Test
- Acknowledge
- Reset
- System Test
- Mute
- First-up Reset

Optional remote pushbutton/ configurable assembly.

Outputs

Common Safety Relays
The standard configuration is two common relays (HNA and GPA). Other configurations from zero to four common relays can be accommodated - please specify at the time of ordering. The common outputs are forced guided relays and have contacts rated at 24VDC @ 4A, 110VDC @ 1A, 240VAC @ 4A resistive

Repeat Relays
Each alarm point can have individual repeat relays. Changeover contact available.
Relay contacts rated at 220VDC (250VAC) max, 125VDC @ 0.5A,
24VDC @ 2A, resistive.

Audible
3kHz peizoelectric buzzer at 90dB 1ft.

Display

Window Sizes
Medium:
2.36" x 1.18" (60 x 30mm) (W x H)
Large: 2.36" x 2.36" (60 x 60mm)

Window Colors
Red, Amber, Yellow, White, Green and Blue.

Illumination

Medium window	Assemblies/dual LED
Large window	Assemblies/four LEDs

The LEDs are ultra-bright LED Assemblies that plug into the standard 0.39" (10mm) wedge style lampholder.

LED Assemblies
0.39" (10mm) base 'Fit and Forget' plug-in LED Assemblies, typically 20mA, minimum 11-year life expectancy.

General

Supply Voltage
24VDC Nominal (21-28VDC)

Supply Current Per Alarm Point (at 24VDC supply)

Quiescent:	18mA
Medium window	40mA
Large window	80mA

Relays: All window sizes 10mA per relay

Additional current for pushbutton module and audible 120mA

Each SIL2 compliant Common Relay will add 50mA each

Power Supplies can be supplied on request

Compliance
Immunity to EN61000-6-2:2005
Emissions to EN61000-6-4:2001
LVD to EN61010-1:1993

Surge Immunity
To AMSI/IEEE C37.90:1989

Environment
Operating temperature
-4 to 140°F (-20 to 60°C)

The SIL725 can work up to 140°F (60°C) but should not be exposed to an ambient temperature with an average (over its working life) greater than 122°F (50°C) as this will affect the operating life of the product.

Storage temperature
-4 to 176°F (-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 12 AWG (2.5mm^2) wire

Weight
Approximately 0.7lbs (0.3kg) per module.

Warning: Safety integrity of the SIL725 relies on none of the electrical or environmental limits being exceeded

RTK Instruments
1531 Stuyvesant Avenue
Union
New Jersey 07083
USA
A member of the MTL Instruments Group

Telephone: 908 688 6709
Facsimile: 908 688 9040
Email: sales@rtkinstruments.com
Web: www.rtkinstruments.com