TOCSIN 102C
CCTV CAMERA
INSTALLATION
AND
USER INSTRUCTIONS

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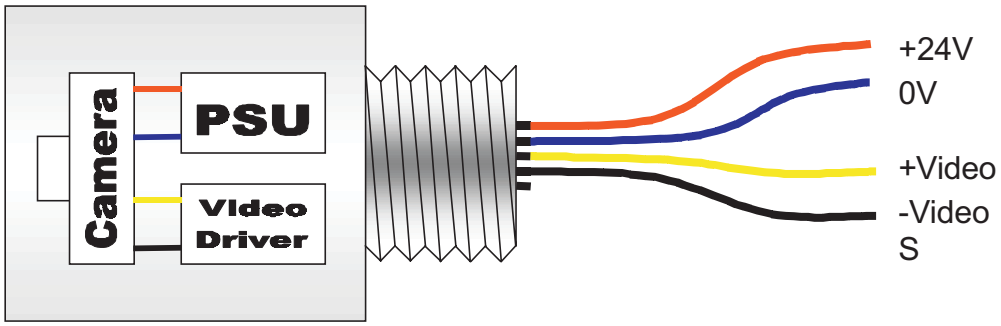
Contents

1. Overview

The Tocsin T102 camera [herein referred to as the ‘camera’] is a self contained CCTV camera suitable for use in industrial locations. The camera comprises three functional blocks:

- The Colour CCTV Camera Module
- The 24V Power Supply Unit (PSU)
- The Video Line Driver



2. Product Modes and Functions

The primary function of the camera is to provide video surveillance monitoring in classified hazardous areas, such as Zone 1. This is achieved by housing the camera electronics in a ATEX certified explosion proof enclosure [Eex-d]. The camera has two modes of operation ON and OFF.
When power is applied to the camera it turns ON and immediately begins video transmission.

2.1 CCTV Colour Camera

The CCTV camera is a self contained unit with integrated fixed focal length optical lens, imaging sensor, automatic IRIS and video image generator.

2.2 Power Supply Unit

The power supply converts a nominal 24Vdc into two voltage supplies (+/-9Vdc) used internally to energise the CCTV Colour Camera and Video Line Driver, all supplies have a common ground (GND) connection. The CCTV camera is powered from the +9Vdc . The video line driver is powered from +/-9Vdc (e.g. 18Vdc).

2.3 Video Line Driver

The video line driver converts the 1V composite video output from the CCTV Camera into a 2V differential composite video signal (balanced line) suitable for transmission over either a 75R coaxial cable or 150R twisted pair cable.

3. Product Interfaces

The camera has one signal interface with an option for differential output, Power Supply Input and Video Signal Output.

3.1 Power Supply Input

Supply Specification	Units	Min	Max
Supply Voltage Range	V	19	32
Absolute Voltage Limits	V	18.50	36
Supply Power Consumption	mW	70	1200

3.2 Video Signal Output

Video Signal Specification	Units	Min	Max
Coaxial Composite Signal	Vpp	1	Composite into 75R
Differential Twisted Pair	Vpp	2	Composite into 150R (optional output P/N 5114902)
Typical distance (PSU/cable dependant)	M	500	

3.3 Mechanical Interfaces

Housing Specification	Units	Min	Max
Operating Temperature Range	C	-20	+55
Operating Humidity Range	%RH	0	99 Non condensing
Storage Temperature	C	-20	+70
Storage Humidity Range	%RH	0	99 Non condensing
Ingress Protection	IP	67	
Enclosure Surface Temperature	C	Ambient + 10	
Connections		See fig.1 below	

3.4 Man-Machine Interface

Not Applicable. The camera does not have any indications or controls.

4. Product Environment

The camera has been ATEX certified for use in Zone 1 hazardous areas.

4.1 Mechanical Requirements

The camera is mounted within the surveillance area. The M20 thread allows the camera to be mounted directly into a junction box for connection to suitable field cabling. A simple mechanical bracket can be used to mount the camera to a suitable structure.
The camera should be oriented to obtain a clear and unobstructed view of the area. Ideally when mounted outside the camera will face away from the sun and other intense direct light sources, whilst this will not damage the sensor the cameras automatic exposure control will darken the video image to compensate. This results in less than optimal video picture quality. Care should be taken to site the camera in areas free from sources of mechanical vibration or where damage might result from on-going site operations. The camera should be mounted in such a way to minimise the likelihood of damage from sharp knocks or moving machinery/tools.

4.2 Environmental Requirements

There are no special storage requirements.

4.3 Electrical Power

The camera requires a 24V DC supply.

4.4 Product Safety Requirements

Refer to ATEX certification.

5. Product Attributes

5.1 CCTV Camera

Video Sensor Specification	Units	Min	Max
Sensor type	--	Full Colour (PAL or NTSC sensor option) Sensor needs to be specified at time of order.	
Video Signal (EU)	PAL	290 (H) x 320(V)	380 lines, 50 fields/sec
Light Sensitivity	Lux	0.5Lux @ F2 5600ºK	--
Signal to Noise Ratio	db	48	--
Lens Field of View (FOV)	degrees	Select fixed board type lens from 10 to 150	
Focus		Fixed	
Iris		Automatic	

5.2 Camera Lens (Field of View) note f3.6 lens as standard all other options contact product support.

Lens (/ mm)	FOV(^{0})	Recognition Distance (M)	Depth of Vision (M)
1.9	150	2	4
2.5	130	3	6
2.9	92	3.5	8
3.6	78	4	10
4.3	57	6	12
6.0	38	8	16
8.0	26	12	24
12	15	16	32
16	10	30	60

5.3 Reliability

Reliability	Units	Min	Max
Mean Time Between Failure	Hrs	80,000	

5.4 Maintenance & Fault Finding

Common Camera Faults

Symptoms	Cause	Corrective Action
No Video Picture	No Power Connection	Ensure that the power supply is connected properly
	No Video Signal	Ensure that the video output connections are connected properly
Video Picture Corrupted (Noise)	Video Signal Polarity Wrong	Ensure the video cables are connected to the correct video signals from the camera
	Poor Video Cabling	Ensure that the camera enclosure is connected to a clean earth Ensure that the cable screen is connected to a clean earth at the one end only (generally the video equipment/monitor) Ensure that all electrical connections and terminals are properly made-off and tight
	Interference	Ensure that the video signal cables are not run parallel to or mixed in with other high power/frequency signals Ensure that the video signal cabling does not run nearby any high power switching or transforming equipment
Video Picture Blurred	Camera Out Of Focus	Return to the manufacturer
	Camera Optics Fouled	Clean with a suitable optical glass cleaner or using a weak solution of detergent and water
Video Picture Too Dark	Low Light Level	In dark or low light areas the video picture quality will reduce and the picture will become dark – consider installing conventional or Near-IR light sources

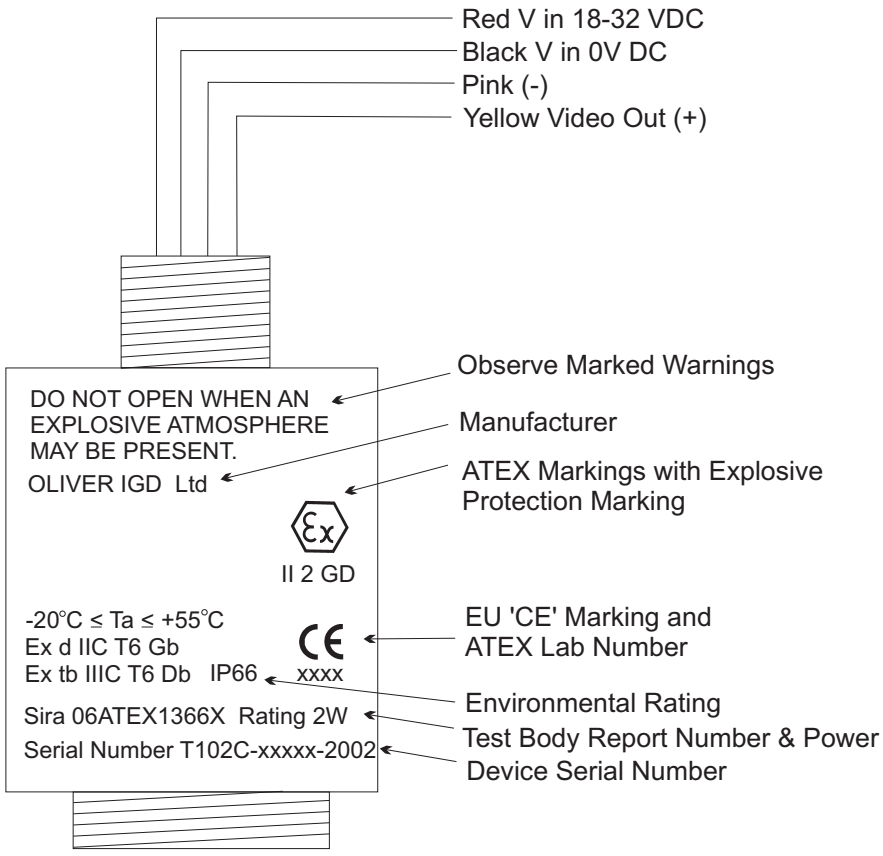
5.5 Training

Installers and operators should be familiar with all regulation and codes of practice applicable to the site.

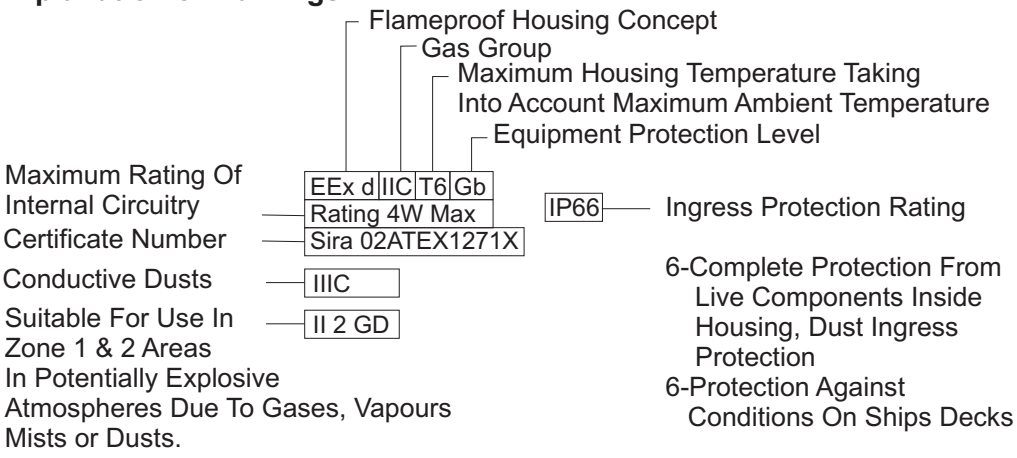
5.6 ATEX INFORMATION

Always ensure the ATEX certification matches the hazardous area zone of intended use.

TOCSIN 102 Hazardous Area CCTV Camera Module



Explanation of Markings

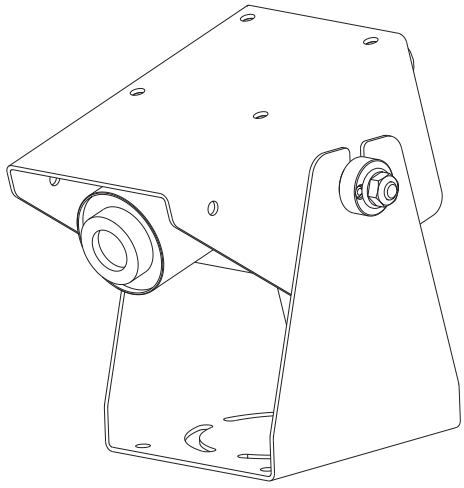


TOCSIN 102C

Appendix 1. Accessories, Adjustments.

TOCSIN 102C

Hazardous Area Cameras & Accessories



Camera Part Number	Lens Option (f)
5121901	2.9mm
5114901	3.6mm
5122001	4.3mm
5122101	6.0mm
5122201	8.0mm
5122301	12.0mm
5122401	16.0mm
Accessory	**Part Number**
Universal Mounting Bracket	5078701
Junction Box	5045801
Anti-Glare Shield	5126001
Air Blow Adapter	5127001

Camera Lens Selection

The standard camera lens option is 3.6mm and will cover the majority of applications. It is advisable for a new application to check that the standard 3.6mm lens option is correct. Normally with a fixed format camera there will be a specific item or area that is under surveillance. The lens option is calculated from having a rough idea of the height or width of this object and its proposed distance from the camera. The following formulas can then be applied for selection. It must be remembered that with any camera there is only a certain resolution available when viewed on the monitor. It is therefore important that the area of importance to be viewed makes maximum use of that resolution. The lens options listed can also be factory set for a particular 'best picture' distance for a given depth of field. Applications should be referred to Oliver IGD Ltd for advice on selection for best performance.

For Known Object Height

f = 2.4 x Distance to Object / Height of Object

Camera is to be mounted 8M from an object 2.2M high

f = 2.4 x 8 / 2.2 = 8.7 Nearest Lens Option P/N 5122201 (f8.0)

For Known Object Width

f = 3.4 x Distance to Object / Width of Object

Camera is to be mounted 7M from an object 6.5M wide

f = 3.4 x 7 / 6.5 = 3.7 Nearest Lens Option P/N 5114901 (f3.6)

TOCSIN 102C

Camera Viewing angles

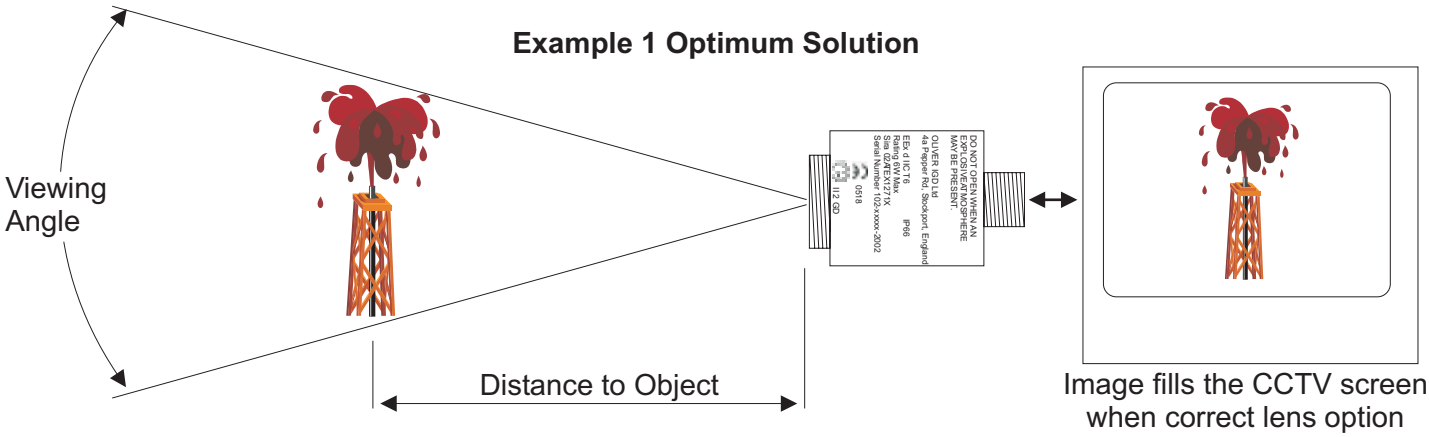
Indicated below are the camera viewing angles verses lens option. In general the larger the lens number the wider the viewing angle.

The equations in the previous section are designed to ensure that the correct lens is fitted such that the final image fills the CCTV screen.

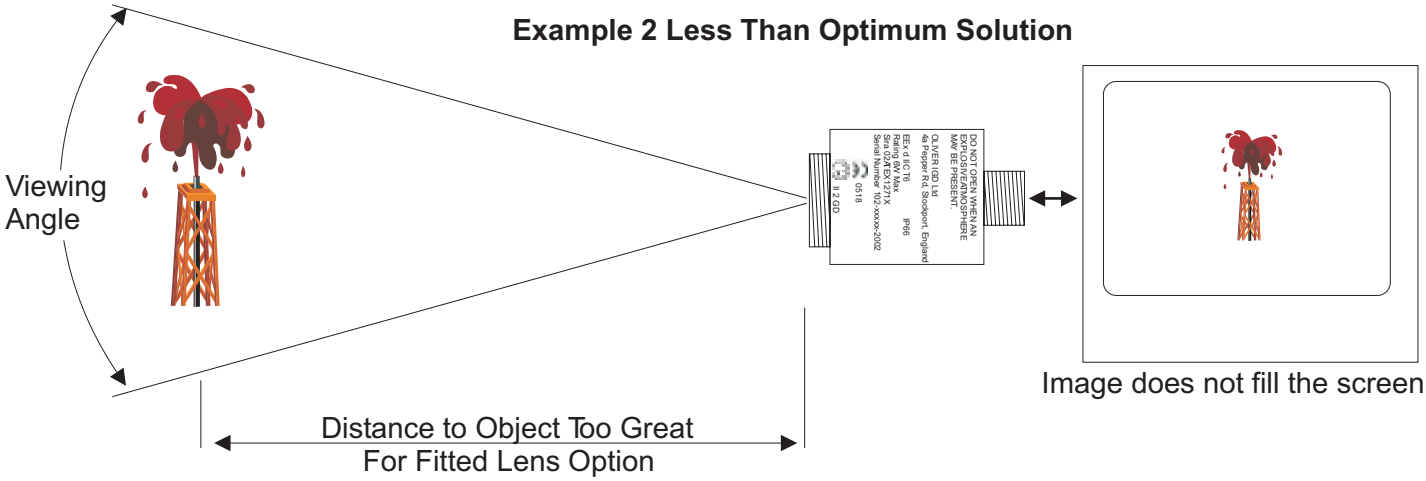
It is also worth noting that once the lens option is selected for a given optimum image distance it is still possible to adjust the optimum distance on site. The following section indicates how to do this. at some point however if large adjustments are made then it may be worth recalculating and selecting another lens option.

Camera Part Number	Viewing Angle Degrees	Lens Option (f)
5121901	92	2.9mm
5114901	78	3.6mm
5122001	57	4.3mm
5122101	38	6.0mm
5122201	26	8.0mm
5122301	15	12.0mm
5122401	10	16.0mm

Example 1 Optimum Solution



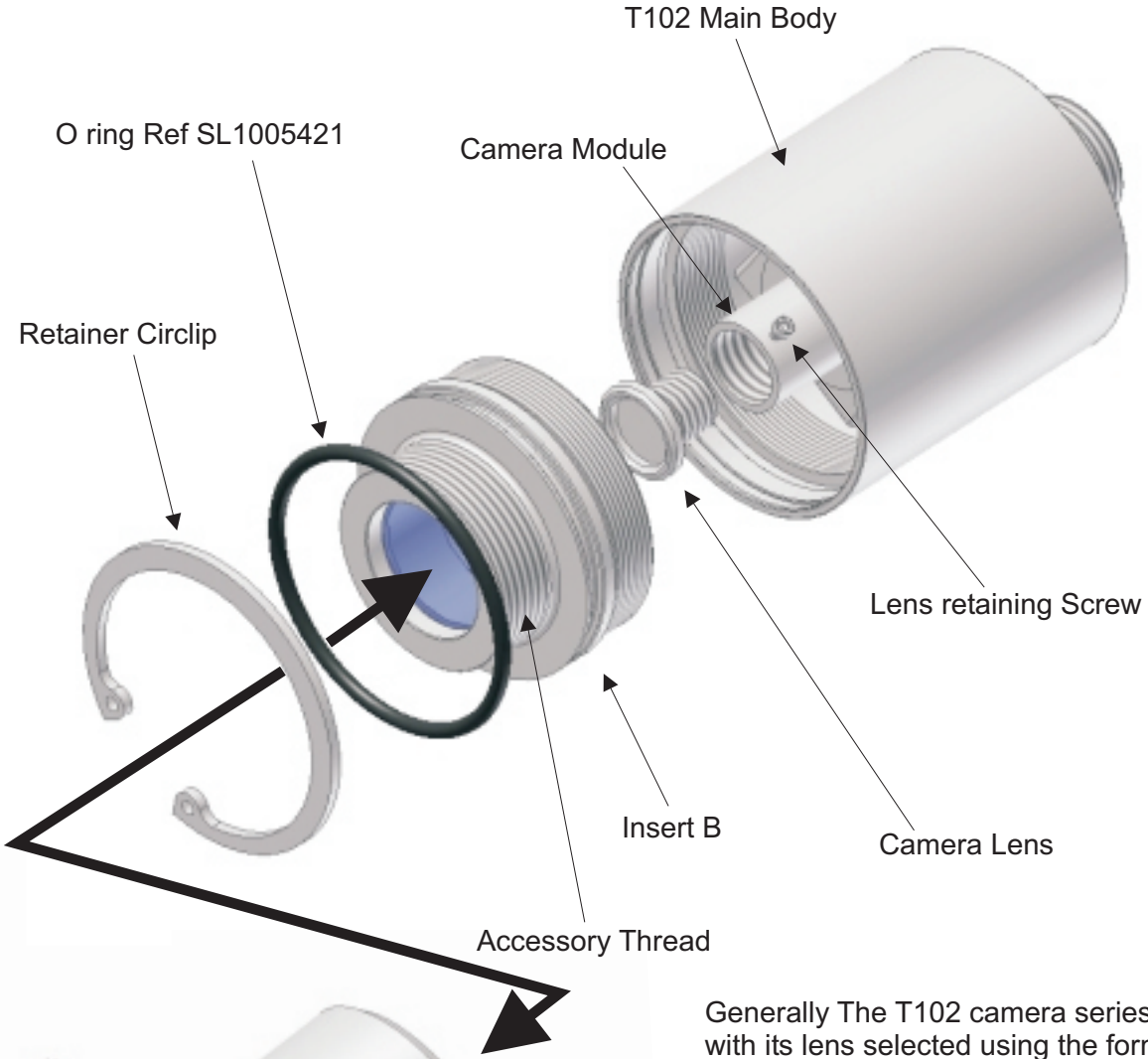
Example 2 Less Than Optimum Solution

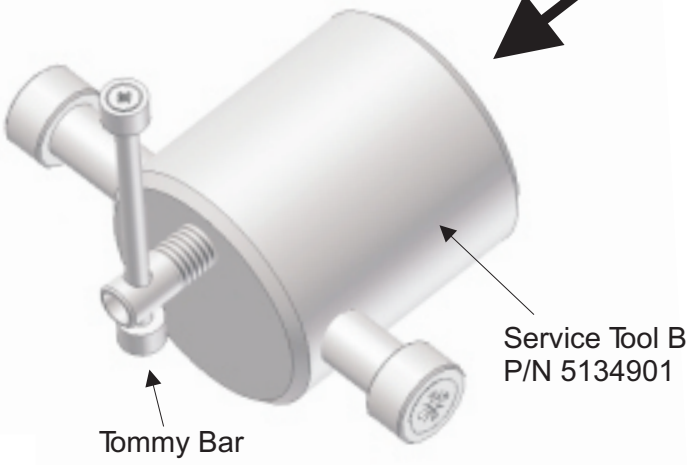


In these two examples in example 1 the lens and focal distance are optimal so the image fills the screen. In the second example the distance has increased. The lens can be re-focused but the resulting image no longer fills the screen display. In such cases re-calculate and select another lens for a better result.

TOCSIN 102C

Maintenance and Adjustments





Generally The T102 camera series is ordered with its lens selected using the formula's indicated in the previous sections.

When ordering the required optimum distance to object will have been stated and Oliver IGD Ltd will have set the camera to have optimum picture quality for the stated distance. This will be shown on the certificate of conformity shipped with the camera.

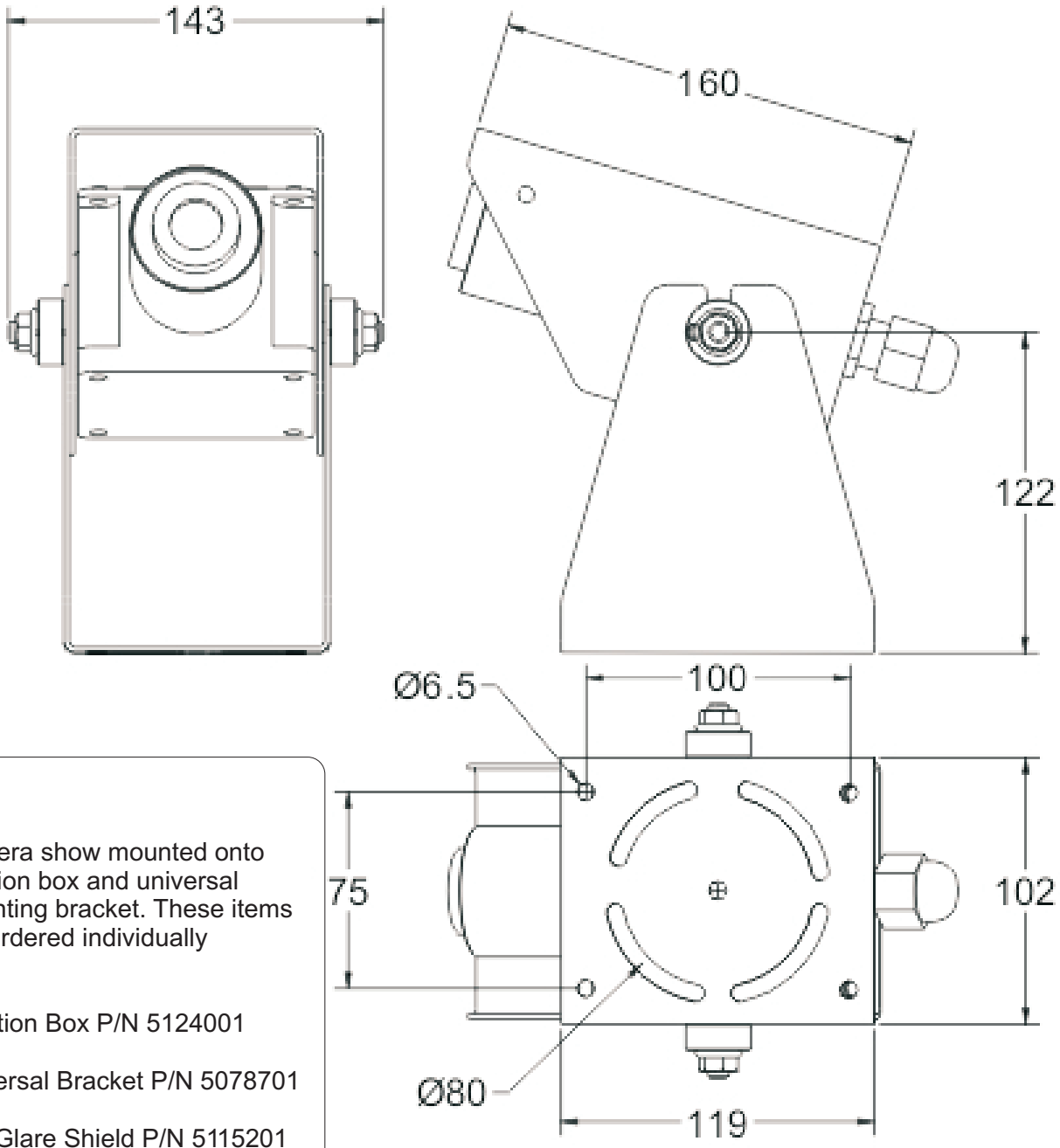
If it proves necessary to either change the lens option or re-focus to a different optimum distance this can be undertaken as follows:

WARNING DO NOT OPEN THE HOUSING IN A ZONED HAZARDOUS AREA. THIS WILL VOID THE HOUSINGS APPROVAL RATING.

Remove the retainer circlip. If available screw service tool B onto the accessory thread and tighten the tommy bar indicated. The front insert B can now be unscrewed. Check the condition of the O ring and replace if necessary. Note the threads are lubricated using a copper or silicone based anti seize compound to prevent the threads galling. The camera module is now visible. Slacken the lens retaining screw using a 1.5mm Allen Key. The lens can now be either replaced or re-focused by screwing it in and out whilst observing an image at the correct focal distance on the CCTV screen. Once correct gently tighten the retaining screw and re-fit insert B. ensure the circlip is replaced.

TOCSIN 102C

Hazardous Area Camera
Overview Drawing



Note

Camera show mounted onto junction box and universal mounting bracket. These items are ordered individually

Junction Box P/N 5124001

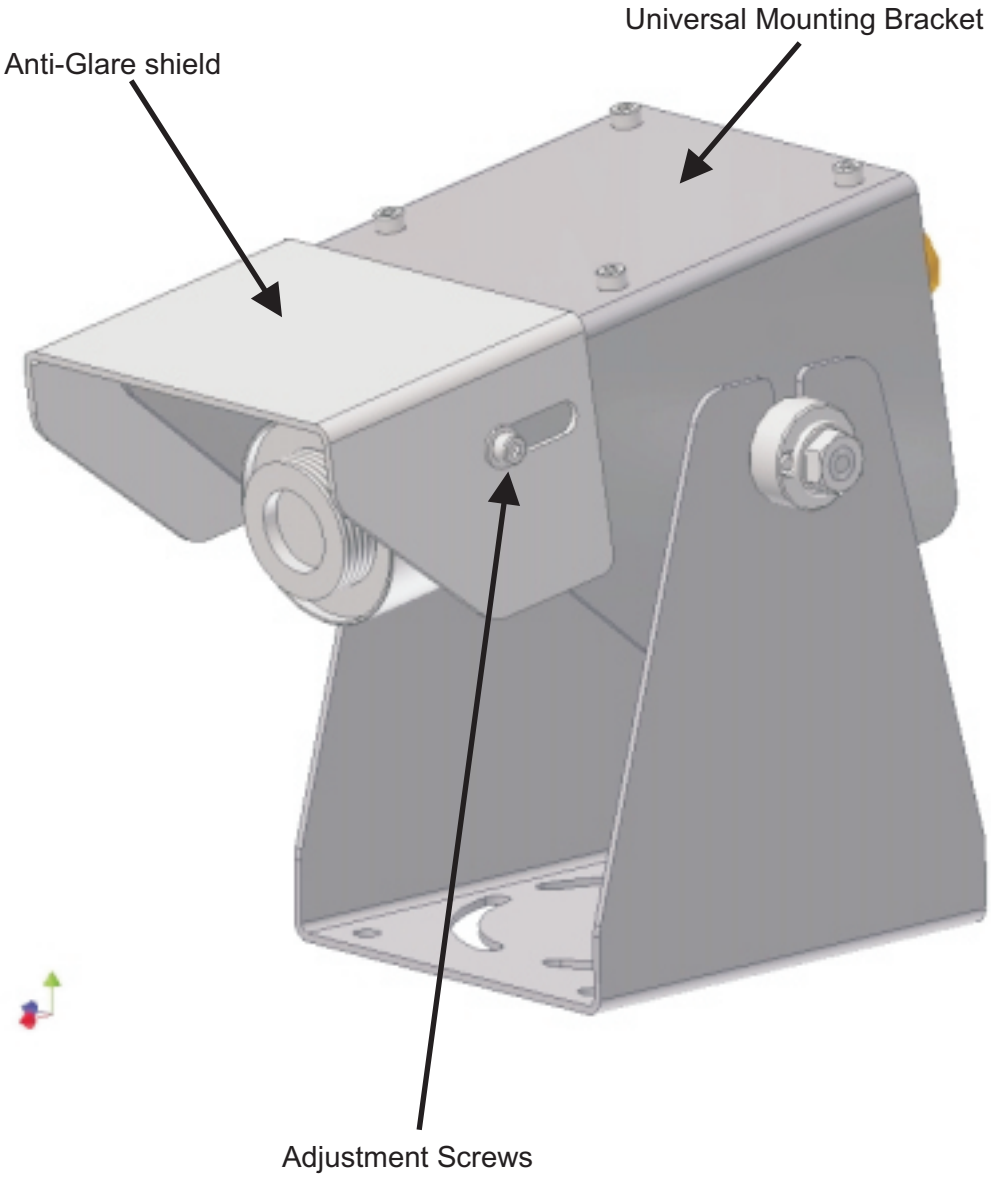
Universal Bracket P/N 5078701

Anti Glare Shield P/N 5115201

Airblow Adaptor P/N 5127001

TOCSIN 102C

Hazardous Area Camera
Air Blow Adaptors And Glare Shields



The Anti-Glare shield is used where high levels of incident light cause glare problems on the CCTV image.