New ATEX light curtains
New Admiral and MOSAIC models

REER

SAFETY AUTOMATION MEASUREMENT AND CONTROL

Short Form Catalog

Catalog Nr. 23

INTRODUCTION

Since 1959, ReeR has had a long history in the field of safety and automation.
ReeR is now the biggest manufacturer of safety sensors in Italy, and one of the major ones in the word. We are present in the whole industrialized world with an effective and qualified sales network.

This Short Form catalog illustrates our product range in clear, straightforward format. For more in-depth information, please consult our full catalog containing detailed data on all products plus a useful Safety Guide.

Full details are also available on **www.reer.it**

However, the Short Form Catalog contains all basic data on all our product lines.

CONTENTS

SELECTION GUIDE

	EOS 4 A	EOS 4 X	ADMIRAL AD	ADMIRAL AX	ADMIRAL AX BK
Sensor	Light curtain				
Safety level	Type 4 - SIL 3 - SIL CL 3 - PL e - Cat. 4		Type 4 - SIL CL 3 - PL e - Cat. 4		
Resolution (mm)	14				
Protected heights (mm)	160 ... 1810				
Max. range (m)	6	6	5	5	5

	EOS 4 A	EOS 4 X	JANUS M	JANUS J LR	ADMIRAL AD	ADMIRAL AX	ADMIRAL AX BK
Sensor	Light curtain						
Safety level	Type 4 - SIL 3 - SIL CL 3 - PL e - Cat. 4				Type 4 - SIL CL 3 - PL e - Cat. 4		
Resolution (mm)	20, 30, 40	20, 30, 40	30, 40	40	20, 30, 40	20, 30, 40	20, 40
Protected heights (mm)	160 ... 1810	160 ... 1810	310 ... 1810	610 ... 1210	160 ... 2260*	160 ... 2260*	160 ... 2260*
Max. range (m)	12 or 20	12 or 20	16 or 60	16 or 60	18	18	18

* ADMIRAL AD, AX, AX BK with 20 mm resolution: max. protected height 1810 mm.

	PHARO	EOS 2 A	EOS 2 X	VISION V	VISION VX	VISION VXL	VISION MXL
Sensor	Laser scanner	Light curtain					
Safety level	Type 3 - SIL 2 - SIL CL 2 - PL d - Cat. 3	Type 2 - SIL 1 - SIL CL 1 - PL c - Cat. 2		Type 2 - SIL CL 1 - PL c - Cat. 2			
Resolution (mm)	30, 40	30, 40	30, 40	20, 30, 40	20, 30, 40	30, 40	30, 40
Protected heights	-	160 ... 1810	160 ... 1810	160 ... 1810	160 ... 1810	160 ... 1810*	160 ... 1810*
Max. range (m)	2,6 (radius)	12	12	16	18	8	8

* VXL and MXL with 30 mm resolution: max. protected height 1210 mm .

Note: Pharo Laser Scanner is not illustrated in this Short Catalog. Please refer to the General Catalog.

	EOS 4 A	EOS 4 X	JANUS M	ADMIRAL AD	ADMIRAL AX	ADMIRAL AX BK
Sensor	Light curtain					
Safety level	Type 4 - SIL 3 - SIL CL 3 - PL e - Cat. 4			Type 4 - SIL CL 3 - PL e - Cat. 4		
Resolution (mm)	50, 90	50, 90	90	50, 90	50, 90	90
Protected heights (mm)	160 ... 1810	160 ... 1810	310 ... 1810	310 ... 2260	310 ... 2260	310 ... 2260
Max. range (m)	12 or 20	12 or 20	16 or 60	18	18	18

	PHARO	EOS 2 A	EOS 2 X	VISION V	VISION VX
Sensor	Laser scanner	Light curtain			
Safety level	Type 3 - SIL 2 - SILCL2 - PL d - Cat. 3	Type 2 - SIL 1 - SIL CL 1 - PL c - Cat. 2		Type 2 - SIL CL 1 - PL c - Cat. 2	
Resolution (mm)	50, 70	50, 90			
Protected heights (mm)	-	160 ... 1810	160 ... 1810	310 ... 1810	310 ... 1810
Max. range (m)	4 (radius)	12	12	16	18

	EOS 4 A	EOS 4 X	JANUS M	JANUS J	ADMIRAL AD	ADMIRAL AX	PHARO
Sensor	Light curtain						Laser scanner
Safety level	Type 4 - SIL 3 - SIL CL 3 - PL e - Cat. 4				Type 4 - SIL CL 3 - PL e - Cat. 4		Type 3 - SIL 2 - SIL CL 2 - PL d - Cat. 3
Number of beams	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	-
Resolution (mm)	-	-	-	-	-	-	150
Protected heights (mm)	510 ... 910	510 ... 910	510 ... 910	510 ... 910	510 ... 910	510 ... 910	-
Max. range (m)	12 or 20		16 or 60		18	18 or 60	4 (radius)

	EOS 2 A	EOS 2 X	VISION V	VISION VX	VISION VXL	VISION MXL	ILION	ULISSE
Sensor	Light curtain						Single beam photocells	
Safety level	Type 2 - SIL 1 - SIL CL 1 - PL c - Cat. 2		Type 2 - SIL CL 1 - PL c - Cat. 2					
Number of beams	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	1, 2, 3, 4	
Resolution (mm)	-	-	-	-	-	-	-	-
Protected heights (mm)	510 ... 910	510 ... 910	510 ... 910	510 ... 910	510 ... 910	510 ... 910	-	-
Max. range (m)	12		16	18 or 60	8	8	8	6

SAFETY LEVEL AND SAFETY TYPE

Safety level and safety type - Standard IEC 61496

Light curtains are electro sensitive devices using one or more light beams, emitted by an Emitter and received by a Receiver, to create an intangible controlled area.

Safety type defines the self-monitoring and safety principles contained in the device. The type must be chosen as a function of the risk level characterising the machine.

When the chosen safety device is a photo-electric curtain (AOPD Active Optoelectronic Protective Device), this shall necessary belong to TYPE 2 or TYPE 4 as established by the International Standard IEC 61496 1-2.

New safety parameters for Type 2 light curtains

With the publication of Edition 3 of the harmonized EN 61496-1 standard, it is no longer possible to use a Type 2 safety light curtains for safety functions assessed as SIL 2 / PL d. If a safety level of SIL 2 / PL d (or higher) is required and it is required the use of a safety light curtain, then it will be necessary to use a Type 4 safety light curtain.

This regulatory requirement derives from the fact that the reduction of risk that can be obtained via a photoelectric safety light curtain is not only a function of the safety level of its electronic parts, but is also determined by its systematic capabilities (for example: environmental influences, EMC, optical performance and detection principle).

The systematic capability of a Type 2 light curtain may in fact not be sufficient to ensure adequate risk reduction for SIL 2 / PL d applications.

The standard also establishes that the labelling of Type 2 safety light curtains must indicate such limitation to SIL 1 / PL c.

The PFHd values declared for the electronic control part of the device, on the other hand, are not limited and therefore it is possible to use the PFHd value provided by the manufacturer of the device in the global assessment of the safety function, even if it exceeds the SIL 1 / PL c range.

EOS4

EOS4 is a compact Type 4 safety light curtain with competitive performance and innovative features.

Its features include:

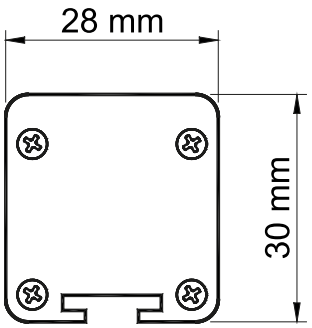
- Minimal cross section: 28 x 30 mm.
- No blind area on one side: the position of first beam ensures that the sensitive area extends to end of the light curtain.
- Minimal blind area on connector side.
- The solution with two L-mounted light curtains, e.g. Master-Slave, maintains 40 mm resolution in corner (models with resolution up to 40 mm).
- Easy connection and installation thanks to the M12 connectors and the use of unshielded cables up to 100 m.
- Integrated safety functions, including self-monitoring of static outputs, control of external contactors (EDM) and automatic/manual selectable Restart.
- Exceptional mechanical and electrical robustness are the result of extensive experience gained hands-on with all kinds of applications.
- Operating temperature range: -10 ... 55 °C.
- Protection rate: IP 65 and IP 67 at the same time.
  High resistance to infiltration by dust and liquids in a highly compact light curtain.
- Models Master/Slave for cascade connection of two or three light curtains.
- 2 safety PNP static outputs.

Special versions with IP 69K watertight enclosure (WTF and WTHF), also suitable for Food & Beverage industry (**see page 27**).

Special models in conformity with the "ATEX Directive" 94/9/CE - Dust zone 22 - Gas Zone 2 available (**see page 20**).

EOS4 light curtains may be connected to the dedicated safety interfaces series AD SR, or directly to contactors actuated and controlled by the light curtain, or to MOSAIC or to suitable commercial safety modules or safety PLCs.

Cross section



1:1 scale

< of safety light curtain resolution = no blind zone

Two L-mounted light curtains maintain 40 mm resolution in the corner (models with resolution up to 40 mm)

Safety level: Type 4 – SIL 3 – SIL CL 3 – PL e – Cat. 4

Safety level:

TYPE 4

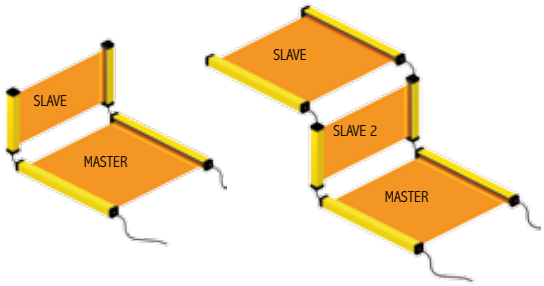
SIL 3 – SILCL 3
PL e – Cat. 4

- 2006/42/EC "Machine Directive".
- 2004/108/EC "Electromagnetic Compatibility Directive".
- 2006/95/EC "Low Voltage Directive".
- EN 61496-1:2004 + A1:2008 "Safety of machinery - Electro sensitive protective equipment - General requirements and tests".
- IEC 61496-2:2006 "Safety of machinery - Electro-sensitive protective equipment - Particular requirements for equipment using active opto-electronic protective devices (AOPDs)".
- IEC 61508-1:1998 "Functional safety of electrical/electronic programmable electronic safety related systems - General requirements".
- IEC 61508-2:2000 "Functional safety of electrical/electronic/programmable electronic safety related systems - Requirements for electrical/electronic/programmable electronic safety-related systems".
- IEC 61508-3:1998 "Functional safety of electrical/electronic programmable electronic safety related systems: Software requirements".
- IEC 61508-4:1998 "Functional safety of electrical/electronic programmable electronic safety related systems - Definitions and abbreviations".
- IEC 62061:2005 "Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems".
- EN ISO 13849-1:2008 "Safety of machinery:- Safety-related parts of control systems - Part 1: General principles for design".
- EN 50178:1997 "Electronic equipment for use in power installations".
- EN 55022:2006 "Information Technology Equipment- Radio Disturbance Characteristics- Limits and Methods of Measurement".
- UL (C+US) mark for USA and Canada.
- ANSI / UL 1998: "Safety Software in Programmable Components".

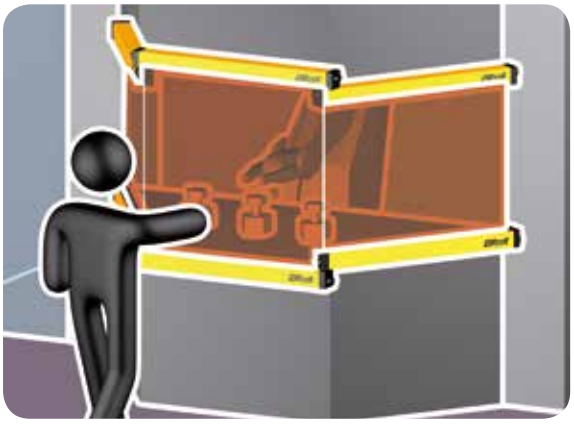
EOS4

THE EOS4 RANGE

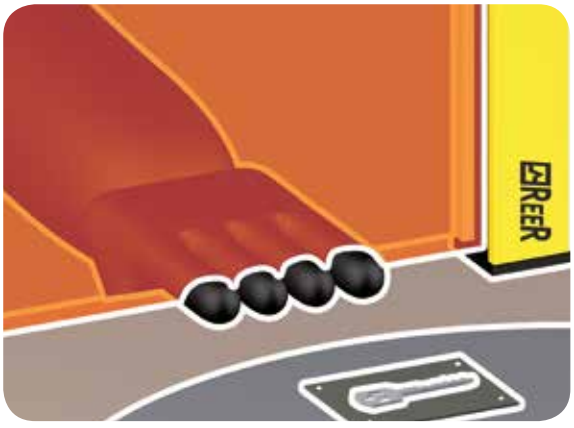
EOS4 A	EOS4 AH	EOS4 X	EOS4 XH	EOS4 XS - XM - XS2
Operating range selectable: 0 ... 4 m - low range 0 ... 12 m - high range 14 mm resolution models: 0 ... 3 m - low range 1 ... 6 m - high range	Operating range selectable: 0 ... 10 m - low range 3 ... 20 m - high range	Operating range selectable: 0 ... 4 m - low range 0 ... 12 m - high range 14 mm resolution models: 0 ... 3 m - low range 1 ... 6 m - high range	Operating range selectable: 0 ... 10 m - low range 3 ... 20 m - high range	Operating range selectable: 0 ... 4 m - low range 0 ... 12 m -high range 14 mm resolution models: 0 ... 3 m - low range 1 ... 6 m - high range
Automatic Start/Restart		Integrated, selectable manual or automatic Start/Restart		Master and Slave models for series connection of 2 or 3 light curtains regardless of height or resolution
External relay monitoring (EDM) through external AD SR1, MOSAIC or safety PLC interface		Feedback input for external relay monitoring (EDM)		
Electrical connections: M12 5-pole connectors		Electrical connections: M12 5-pole connector for emitter M12 8-pole for receiver		
Protected height range 160 to 1810 mm				
Types of detection: Resolution 14 mm for finger detection Resolution 20, 30, 40 mm for hand detection Resolution 50, 90 mm for detection of the body in a dangerous area 2, 3, 4 beams for detection of the body in access control				
2 safety static outputs PNP with auto-test protected against short circuits and overloads				



Master, Slave models permit series connection of up to three light curtains and combined detection of hand and presence of a person or of more sides of the machine



Example of series connection of one master and two slave light curtains for the protection of three sides of the machine



The protected area extends until the light curtain end maintaining the resolution

The resolution is maintained (up to 40 mm) in the junction between the 2 protected areas

ADMIRAL

The Admiral Type 4 family of safety light curtains is the ideal solution for the protection of the majority of high-risk industrial applications.

Its features include:

- Extremely easy connection and installation, thanks to the M12 connectors and the use of standard cables up to 100 m.
- Integration of the main safety functions, including self-monitoring of the safety circuits and, for the AX models, the external device monitoring (EDM) and the Start / Restart interlock functions.
- The utmost reliability in the field, thanks to the rugged construction and to the high level of immunity to external interference (optical, EMC, etc.).
- The breadth of the range, including Master / Slave models for cascade connection of two light curtains, models with floating blanking, and the widest variety of heights and resolutions.
- Models with 2, 3 and 4 beams Long Range, Max. 60 or 80 meters available.

Special versions in WT/WTH watertight enclosure available on request (**see page 27**).

Admiral light curtains may be connected to the dedicated safety interfaces series AD SR, or directly to contactors actuated and controlled by the light curtain, or to MOSAIC or to suitable commercial safety modules or safety PLCs.

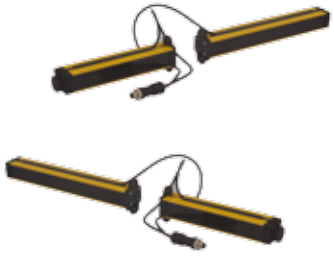
In this case it's possible to realize a muting sistem using the following accessories:

SLA & STA - Additional arms for L and T muting - Accessory for Admiral and Vision

The 2 SLA additional arms with built-in muting crossed beams photoelectric sensors, combined with the ADMIRAL or VISION light curtains series form a one way access control system with L logic (exit only).

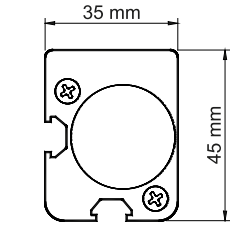
The 4 SLA additional arms with built-in muting crossed beams photoelectric sensors, combined with the ADMIRAL or VISION light curtains series form a bi-directional access control system with T logic (entry and exit).

Can be mounted on ADMIRAL or VISION light curtains of any height and resolution.



The muting function is realized connecting safety light curtain and and additional arms to external modules such as MOSAIC or AD SRM.

Cross section



1:2 scale

Safety level: Type 4 – SIL CL 3 – PL e – Cat. 4

- 2006/42/EC: "Machine Directive".
- 2004/108/EC: "Electromagnetic Compatibility Directive".
- 2006/95/EC: "Low Voltage Directive".
- IEC 61496-1:2012 "Safety of machinery - Electro sensitive protective equipment - General requirements and tests".
- IEC 61496-2:2013 "Safety of machinery - Electro-sensitive protective equipment - Particular requirements for equipment using active opto-electronic protective devices (AOPDs)".
- IEC 62061:2005 "Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems".
- ISO 13849-1:2006 "Safety of machinery:- Safety-related parts of control systems - Part 1: General principles for design".
- EN 50178:1997 "Electronic equipment for use in power installations".
- EN 55022:2010 "Information Technology Equipment- Radio Disturbance Characteristics- Limits and Methods of Measurement".
- UL (C+US) mark for USA and Canada.
- ANSI / UL 1998: "Safety Software in Programmable Components".

Safety level:

TYPE 4

SILCL 3
PL e – Cat. 4

ADMIRAL

THE ADMIRAL RANGE

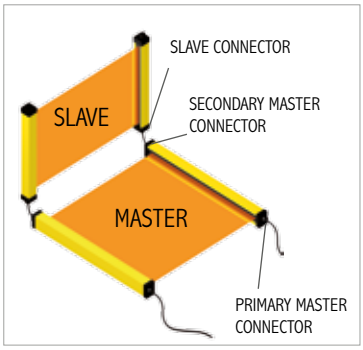
ADMIRAL AD	ADMIRAL AX	ADMIRAL AXM - AXS	ADMIRAL AX LR Long Range	ADMIRAL AX LR DB	ADMIRAL AX BK
Automatic Start/ Restart	Built-in manual or automatic restart, selectable	Master and Slave models for serial connection of two light curtains even of different height and resolution	Max. range 60 m	Special version of the Admiral Long Range features an innovative Dual Beam System See **NOTE 1**	Built-in functions of floating blanking with 5 selectable configurations See **NOTE 2**
The ideal light curtain for a simple interface with MOSAIC, safety modules or PLC	The ideal light curtain for directly controlling and monitoring the circuits of the machine, without the need for external safety modules	Ideal solution for connecting two light curtains in series to perform a combined detection of the hand and of the presence of the person or of two different sides of the machine	Ideal light curtain for large size protection applications, also on several sides using deflection mirrors	Ideal light curtain in outdoor applications or in harsh environments for decreasing the sensitivity of the light curtain to small objects that could interrupt the light link, i.e. birds or leaves but also heavy rain or snow	The ideal light curtain for protecting press brakes, automatic machines and robotised areas, where the material being processed or moving parts of the machine cross the field protected by the light curtain
Start/Restart interlock and EDM via external MOSAIC, AD SR1 interface	Feedback input for control of external relays (EDM).				Start/Restart interlock and EDM via external MOSAIC, AD SR1 interface
Electrical connections: M12 5-pole connectors for emitter and receiver	Electrical connections: M12 5-pole for emitter M12 8-pole for receiver				
Operating range selectable: 0 ... 6 m - low range 1 ... 18 m - high range 14 mm resolution models: 0 ... 2 m - low range 0 ... 5 m - high range			Operating range selectable: 10 ... 22 m - low range 18 ... 60 m - high range	Operating range selectable: 12 ... 25 m - low range 22 ... 80 m - high range	Operating range selectable: 0 ... 6 m - low range 3 ... 18 m - high range 14 mm resolution models: 0 ... 2 m - low range 0 ... 5 m - high range
Types of detection: resolution 14 mm for finger detection resolution 20, 30, 40 mm for hand detection resolution 50, 90 mm for detection of the body in a hazardous area 2, 3, 4 beams for detection of the body in access control			Types of detection: 2, 3, 4 beams for detection of the body in access control	Types of detection: 2, 3 beams for detection of the body in access control	Types of detection:: resolution 14 mm for finger detection resolution 20, 40 mm for hand detection resolution 90 mm for detection of the body in a hazardous area
2 self-testing solid state PNP safety outputs protected against short circuits and overloads					

NOTE 1 Available with heated IP 67 WTH case for outdoor use **(see page 27)**.

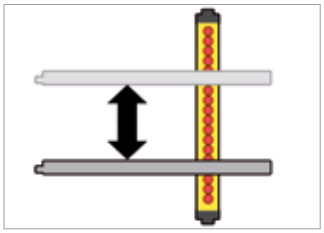
NOTE 2: With the blanking models with 14 and 20 mm resolution, it is also possible to have the Master/Slave function.

Admiral Long Range with the innovative Dual Beam system

IP 67 watertight enclosure, with heating system



Master/Slave models permit series connection of two light curtains



Floating Blanking allows the detected object to move freely inside the light curtain's protected field, under the condition that the intercepted beams are adjacent and that their number is not higher than the configured one.

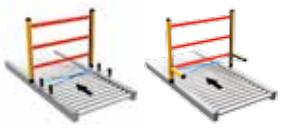
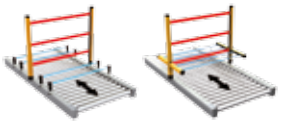
JANUS

The Janus type 4 family of safety light curtains is the ideal solution for the protection of a vast number of high-risk industrial applications, in particular those requiring a high level of integration of the safety functions.

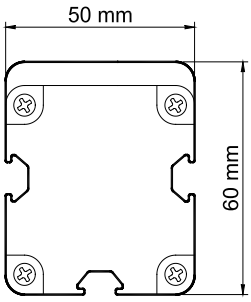
For example, in the models with built-in Muting function, Janus guarantees the independence of the light curtain from the control circuits of the system (often distant from the protected gate) and, where necessary, also the integration of the Muting sensors.

The features of the Janus range include:

- Settings of each function integrally performed via the main connector. No need of configuration via software.
- Integration of the main safety functions, including self-testing of the solid state outputs, external device monitoring (EDM) and the Start/Restart interlock function.
- Integration of the Muting function for the MI models and of the Muting sensors for the ML and MT models.
- The utmost reliability in the field, thanks to the rugged construction and to the high level of immunity to external interference (optical, EMC, etc.).

"L" Logic Crossed beams		Suitable solution for any applications of pallet exit.
"L" Logic Parallel beams		Suitable solution for transparent material: glass and bottling industry of pallet exit.
"T" Logic Crossed beams		Ideal solution in case of a continuous flow of pallets even without separation between the pallets.
"T" Logic Parallel beams		Suitable solution for transparent material and application with presence of a pallet with reduced width or not centred with respect to the conveyor. Through the verification of the 4 sensors, allows to set infinite muting time-out.

Cross section



1:2 scale

Safety level: Type 4 – SIL 3 – SIL CL 3 – PL e – Cat. 4

Safety level:

TYPE 4

SIL 3 – SILCL 3
PL e – Cat. 4

- 2006/42/EC: "Machine Directive".
- 2004/108/EC: "Electromagnetic Compatibility Directive".
- 2006/95/EC: "Low Voltage Directive".
- EN 61496-1/A1:2008 "Safety of machinery - Electro sensitive protective equipment - General requirements and tests".
- IEC 61496-2:2006 "Safety of machinery - Electro-sensitive protective equipment - Particular requirements for equipment using active opto-electronic protective devices (AOPDs)".
- IEC 61508-1:1998 "Functional safety of electrical/electronic programmable electronic safety related systems - General requirements".
- IEC 61508-2:2000 "Functional safety of electrical/electronic/programmable electronic safety related systems - Requirements for electrical/electronic/programmable electronic safety-related systems".
- IEC 61508-3:1998 "Functional safety of electrical/electronic programmable electronic safety related systems: Software requirements".
- IEC 61508-4:1998 "Functional safety of electrical/electronic programmable electronic safety related systems - Definitions and abbreviations".
- IEC 62061:2005 "Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems".
- EN ISO 13849-1:2008 "Safety of machinery:- Safety-related parts of control systems - Part 1: General principles for design".
- EN 50178:1997 "Electronic equipment for use in power installations".
- EN 55022:2006 "Information Technology Equipment- Radio Disturbance Characteristics- Limits and Methods of Measurement".
- UL (C+US) mark for USA and Canada.
- ANSI / UL 1998: "Safety Software in Programmable Components".

JANUS

THE JANUS RANGE

JANUS M
Built-in Muting Function

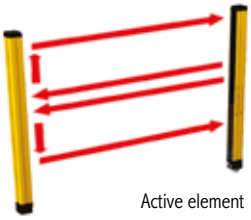
MI SERIES

The MI series features dedicated connections for connecting external Muting sensors of any type such as photocells, proximity sensors, limit switches, etc. It can manage the Muting function in both two-way and one-way mode.

A wide range of models with protected height from 310 mm to 1810 mm with resolution of 30, 40, 90 mm and models with 2, 3, 4 beams provides the solution to any application problem.

JANUS MI
Operating range selectable:
0 ... 6 m - low range
1 ... 16 m - high range

JANUS MI Long Range
Operating range selectable:
8 ... 30 m - low range
18 ... 60 m - high range



JANUS MI TRX and TRXL SERIES

Janus MI TRX and MI TRXL is composed of an active element and of a passive retro-reflector element requiring no wiring.
Operating range: 0 ... 6 m.
It features dedicated connections for connecting external muting sensors of any type such as photocells, proximity sensors, limit switches, etc. The MI series can manage the muting function in both two-way and one-way mode.

Models with 2, 3, 4 beams provide the solution to any application problem in access control.

JANUS MI TRX
2 or 4 external sensors

JANUS MI TRX L
2 external sensors -
Single connector for all connections

JANUS ML SERIES

The ML series, with 2 or 3 beams for body detection, uses an original system of horizontal arms (one for the emitter and one for the receiver) with built-in pre-wired and pre-aligned photoelectric Muting sensors which do not require any adjustment.

The arms can be adjusted in height in order to create a detection plane that is more or less angled, with the purpose to achieve correct and constant detection of the material in transit and therefore reliable operation of the protection system.

This ensures the maximum speed and simplicity of installation. The ML series manages the Muting function in one-way mode and is particularly suitable for protecting the outfeed gates of palletizing systems.

JANUS ML
Built-in muting sensors with crossed beams.
Operating range: 1 ... 2,5 m

JANUS ML S2
Special models for the correct detection of transparent object.
Built-in muting sensors with parallel beams
Operating range: 0 ... 2 m

JANUS ML TRX, ML TRX G and ML TRX V SERIES

Also this series uses an original system of horizontal arms (one for the emitter and one for the receiver) with built-in, pre-wired and pre-aligned, photoelectric muting sensors which do not require any adjustment.

Both the light grid and the sensor arms are composed of an active, emitter/receiver element and of a passive, retro-reflector element, requiring no wiring.

The ML TRX series manages the muting function in one-way mode and is particularly suitable for protecting the outfeed gates of palletizing systems.
Operating range: 0 ... 3,5 m ML TRX and ML TRX V
Operating range: 0 ... 2 m ML TRX G and ML TRX GV

JANUS ML TRX

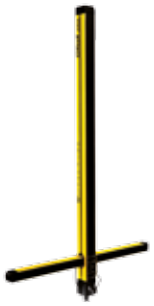
JANUS ML TRX G
(Glass models) with special built-in Muting sensors to optimise correct and consistent detection of glass and transparent materials in general.

JANUS ML TRX V
Models with longer built-in muting arms available for high-speed conveyors.

CONTINUE

JANUS

JANUS M
Built-in Muting Function

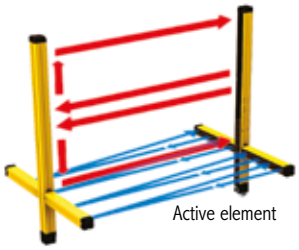


JANUS MT SERIES
The MT series features four horizontal arms (two for the emitter and two for the receiver) with built-in pre-wired and pre-aligned photoelectric Muting sensors that do not require any adjustment.

The MT series manages the Muting function in two-way mode for the protection of the infeed/outfeed gates in palletizing systems.

JANUS MT
Built-in muting sensors with crossed beams
Operating range: 0 ... 2,5 m

JANUS MT S4
The MT series also includes MT S4 special models for the correct detection of transparent objects.
Built-in muting sensors with parallel beams
Operating range: 0 ... 2 m



JANUS MT TRX, MT TRX G and MT TRX V
Janus MT TRX and MT TRX G features four horizontal arms (two for the emitter and two for the receiver) with built-in pre-wired and pre-aligned photoelectric muting sensors that do not require any adjustment.

Both the light grid and the sensor arms are composed of an active, emitter/receiver element and of a passive, retro-reflector element, requiring no wiring.

The MT TRX series manages the muting function in two-way mode for the protection of the infeed/outfeed gates in palletizing systems.
Operating range: 0 ... 3,5 m MT TRX and MT TRX V
Operating range: 0 ... 2 m MT TRX G and MT TRX GV

JANUS MT TRX

JANUS MT TRX G
(Glass models) with special built-in Muting sensors to optimise correct and consistent detection of glass and transparent materials in general

JANUS MT TRX V
Models with longer built-in muting arms available for high-speed conveyors

JANUS MM TRX

JANUS MM TRX
Janus MM TRX is a modular system with 2, 3 and 4 beams which permits to add pre-wired muting arms in order to get either a ML TRX (one way) or a MT TRX (entry/exit) model with a few simple steps. SL TRX and ST TRX are the pre-wired muting arms and can be ordered separately.

Janus MM TRX can also be used with external Muting sensors, with 2 or 4 sensors logic.

Muting logics for models MM TRX are:
- one-way (only exit), together with SL TRX
- two-way (entry/exit) together with SL TRX and ST TRX.

Operating range: 0 ... 6 m (0 ... 3,5 m if used with SL TRX and ST TRX).

JANUS J
Models, without Muting Function

JANUS J
Models with 2, 3, 4 beams.

JANUS J
Operating range selectable:
0 ... 6 m - low range
1 ... 16 m - high range

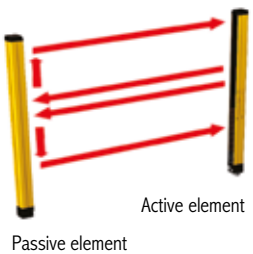
JANUS J - Long Range and Long Range M12
Models with 2, 3, 4 beams and models with 40 mm resolution and protected height from 610 to 1210 mm.
Long Range models with 2, 3 and 4 beams are also available in M12 version with a M12 8-pole connector for the receiver.

JANUS J - LR, LR M12
Operating range selectable:
0 ... 6 m - low range
1 ... 16 m - high range

JANUS J LRH M12, J LRH M12 ILP
Models with 2, 3 and 4 beams
Operating range selectable:
8 ... 30 m - low range (LRH M12); 18 ... 40 m - low range (LRH MI2 ILP)
18 ... 60 m - high range (LRH M12); 25 ... 80 m - high range (LRH M12 ILP)

JANUS J LRH M12
Long Range models

JANUS J LRH M12 ILP
With integrated laser pointer



JANUS J TRX, TRXL SERIES
Janus J TRX and J TRXL are safety light grids with 2, 3, 4 beams consisting of an active element (emitter/receiver) and a retro-reflector passive element which does not require electrical connections.
Operating range: 0 ... 6 m
JANUS series J TRX and TRXL are the simplest and quickest installation solutions for detection of a person in access control in hazardous areas, and the ideal solutions for all applications in which it is difficult or costly to cable electrical lines.

Janus J TRX
M12 8-pole connector

Janus J TRX L
M23 19-pole connector

JANUS MJB - CONNECTION BOX

Connection boxes Janus MJB are accessory devices designed for quick, reliable connection of Janus light grids and to ensure that major operating controls needed for operation are available in the guarded area.

Its features include:

- Lighted button for light curtain Start/Restart with green LED for indicating output status and weak signal.
- Key selector controlling the override function.
- Indicator lamp for Muting function active.
- Connector for connection to the light curtain.
- Dip switches for configuration of light curtain functions.
- 2 Built-in safety relay with guided contacts driven and controlled by the light curtain.
- Internal terminal blocks for cable connections.
- Selector for connection of external Muting lamp.
- Selector for internal or external relay control.
- Electrical connection through cable gland.
- Versions without Start/Restart and Override commands for connection with Janus J light curtain without Muting.

Complying with:

- 2004/108/EC "Electromagnetic Compatibility (EMC)"
- 2006/95/EC "Low Voltage Directive (LVD)"
- UL (C+US) mark for USA and Canada.

JANUS SL TRX and ST TRX - ACCESSORY MUTING SENSOR ELEMENTS FOR JANUS MM TRX

Janus SL TRX muting arm, with active and passive retro-reflector elements, in combination with Janus MM TRX models form a one-way access control system with L logic (only exit).

Together with Janus SL TRX and ST TRX muting arms, Janus MM TRX models become a two-way access control system with T logic (entry/exit).

Note for ordering

- To form a L logic system you need:
  Light curtain JANUS MM TRX + SL TRX
- To form a T logic system you need:
  Light curtain JANUS MM TRX + SL TRX + ST TRX

JANUS SL - ACCESSORY MUTING SENSOR ELEMENTS FOR JANUS MI

The SL series accessory muting sensor element (arms) can be combined with the Janus MI light curtain models, making it possible to create a L logic (only exit).

- Janus SL have 2 built-in sensors, pre-wired and pre-aligned with crossed beams.
- Janus S2L have 2 built-in sensors, pre-wired and pre-aligned with parallel beams.
- Janus S2L V have 2 built-in sensors, pre-wired and pre-aligned with parallel beams for high speed conveyors.

EOS 2

EOS2 is a compact Type 2 safety light curtain with competitive performance and innovative features.

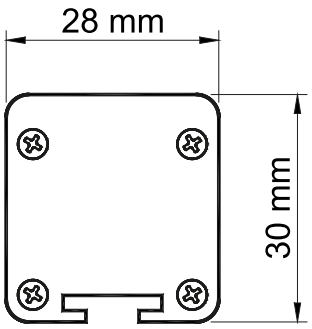
Its features include:

- Minimal cross section: 28 x 30 mm.
- No blind area on one side: the position of first beam ensures that the sensitive area extends to end of the light curtain.
- Minimal blind area on connector side.
- The solution with two L-mounted light curtains, e.g. Master-Slave, maintains 40 mm resolution in corner (models with resolution 30 and 40 mm).
- Easy connection and installation thanks to the M12 connectors and the use of unshielded cables up to 100 m.
- Integrated safety functions, including self-monitoring of static outputs, control of external contactors (EDM) and automatic/manual selectable Restart.
- Exceptional mechanical and electrical robustness are the result of extensive experience gained hands-on with all kinds of applications.
- Operating temperature range: -10 ... 55 °C.
- Protection rate: IP 65 and IP 67 at the same time.
- High resistance to infiltration by dust and liquids in a highly compact light curtain.
- Models Master/Slave for cascade connection of two or three light curtains.
- 2 safety PNP static outputs.

Special versions with IP 69K watertight enclosure (WTF and WTHF), also suitable for Food & Beverage industry (**see page 27**).

EOS2 light curtains may be connected to the dedicated safety interfaces series AD SR, or directly to contactors actuated and controlled by the light curtain, or to MOSAIC or to suitable commercial safety modules or safety PLCs.

Cross section



1:1 scale

< of safety light curtain resolution = no blind zone

Two L-mounted light curtains maintain 40 mm resolution in the corner (models with resolution 30 and 40 mm)

Safety level: Type 2 – SIL 1 – SIL CL 1 – PL c – Cat. 2*

- 2006/42/EC: "Machine Directive".
- 2004/108/EC: "Electromagnetic Compatibility Directive".
- 2006/95/EC: "Low Voltage Directive".
- IEC 61496-1:2004 + A1:2008 "Safety of machinery - Electro sensitive protective equipment - General requirements and tests".
- IEC 61496-2:2006 "Safety of machinery - Electro-sensitive protective equipment - Particular requirements for equipment using active opto-electronic protective devices (AOPDs)".
- IEC 61508-1:1998 "Functional safety of electrical/electronic programmable electronic safety related systems - General requirements".
- IEC 61508-2:2000 "Functional safety of electrical/electronic/programmable electronic safety related systems - Requirements for electrical/electronic/ programmable electronic safety-related systems".
- IEC 61508-3:1998 "Functional safety of electrical/electronic programmable electronic safety related systems: Software requirements".
- IEC 61508-4:1998 "Functional safety of electrical/electronic programmable electronic safety related systems - Definitions and abbreviations".
- IEC 62061:2005 "Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems".
- EN ISO 13849-1:2008 "Safety of machinery:- Safety-related parts of control systems - Part 1: General principles for design".
- EN 50178:1997 "Electronic equipment for use in power installations".
- EN 55022:2006 "Information Technology Equipment- Radio Disturbance Characteristics- Limits and Methods of Measurement".
- UL (C+US) mark for USA and Canada.
- ANSI / UL 1998: "Safety Software in Programmable Components".

Safety level:
TYPE 2
SIL 1 – SILCL 1
PL c – Cat. 2

CE

TÜV SÜD

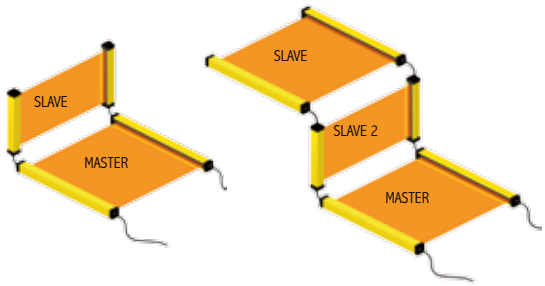
c UL us LISTED ESPE

* **See note on page 5**

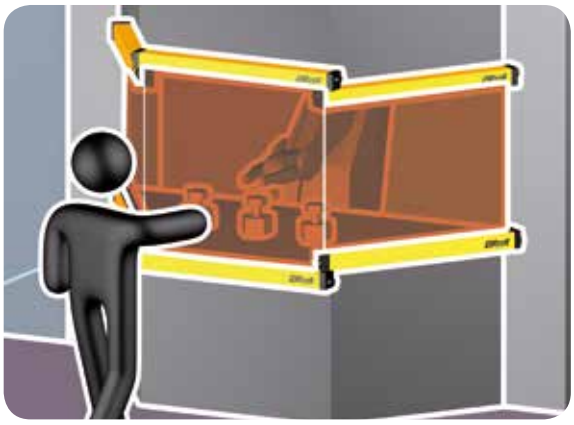
EOS2

THE EOS2 RANGE

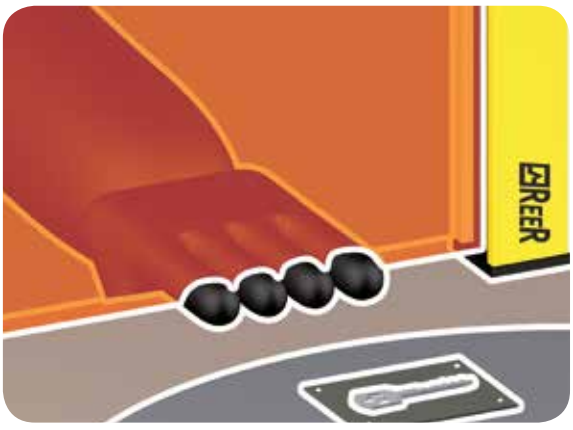
EOS2 A	EOS2 X	EOS4 XS - XM - XS2
Automatic Start/Restart	Built-in, selectable manual or automatic Start/Restart	Master and Slave models for series connection of two or three light curtains regardless of height or resolution
External relay monitoring (EDM) through external AD SR1 interface, MOSAIC or safety PLCs	Feedback input for external relay monitoring (EDM)	
Electrical connections: M12 5-pole connectors	Electrical connections: M12 5-pole connector for emitter M12 8-pole for receiver	
Operating range selectable 0 ... 4 m - low range 0 ... 12 m - high range		
Protected height range 160 to 1810 mm		
Types of detection: resolution 30, 40 mm for hand detection resolution 50, 90 mm for detection of the body in a dangerous area 2, 3, 4 beams for detection of the body in access control		
2 safety static outputs PNP with auto-test protected against short circuits and overloads		



Master, Slave models permit series connection of up to three light curtains and combined detection of hand and presence of a person or of more sides of the machine



Example of series connection of one master and two slave light curtains for the protection of three sides of the machine



The protected area extends until the light curtain end maintaining the resolution

The resolution is maintained (up to 40 mm) in the junction between the 2 protected areas

VISION

The Vision Type 2 family of safety light curtains is the ideal solution for the protection of the majority of industrial applications in Category 2.

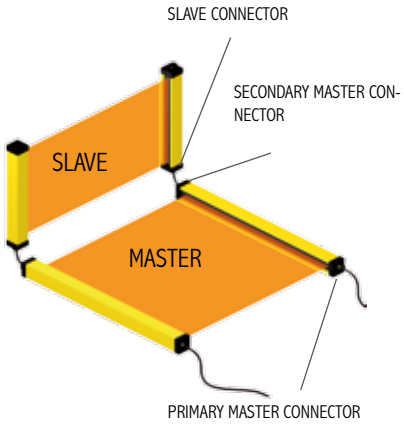
Its features include:

- Extremely easy connection and installation, thanks to the M12 connectors and the use of standard cables.
- Integration of the main safety functions, including self monitoring of the safety circuits and, for the VX / VXL / MXL models, external device monitoring (EDM) and the Start / Restart interlock function.
- The built-in auto-test function, activated automatically and periodically, without interruption of the operation of the machine being controlled.
- The breadth of the range, including Master / Slave models for cascade connection of two light curtains, the VXL models, with the lowest cost/performance ratio and the MXL models with built-in Muting function.
- The utmost reliability in the field, thanks to the rugged construction and to the high level of immunity to external disturbances (optical, EMC, etc.).

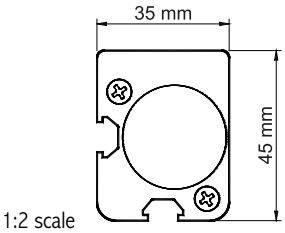
Special versions in WT/WTH watertight housing available on request (**See page 27**).

Vision light curtains may be connected to the dedicated safety interfaces series AD SR, or directly to contactors actuated and controlled by the light curtain, or to MOSAIC or to suitable commercial safety modules or safety PLCs.

Master/Slave models permit series connection of two safety light curtains



Cross section



1:2 scale

Safety level: Type 2 – SIL CL 1 – PL c – Cat. 2*

- 2006/42/EC: “Machine Directive”.
- 2004/108/EC: “Electromagnetic Compatibility Directive”.
- 2006/95/EC: “Low Voltage Directive”.
- IEC 61496-1 (ed.3) “Safety of machinery - Electro sensitive protective equipment - General requirements and tests”.
- IEC 61496-2 (ed.3) “Safety of machinery - Electro-sensitive protective equipment - Particular requirements for equipment using active opto-electronic protective devices (AOPDs)".
- IEC 62061 (ed.1) “Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems”.
- EN ISO 13849-1:2008 “Safety of machinery:- Safety-related parts of control systems - Part 1: General principles for design”.
- EN 50178:1997 “Electronic equipment for use in power installations”.
- EN 55022:2010 “Information Technology Equipment- Radio Disturbance Characteristics- Limits and Methods of Measurement”.
- UL (C+US) mark for USA and Canada.
- ANSI / UL 1998: “Safety Software in Programmable Components”.

* **See note on page 5**

Safety level:

TYPE 2

SILCL 1
PL c – Cat. 2

VISION

THE VISION RANGE

VISION V L	VISION V H	VISION VX	VISION VX LR Long Range	VISION VX M - S	VISION VXL	VISION MXL See following table
Operating range: 0 ... 6 m	Operating range: 1 ... 16 m	Operating range selectable: 0 ... 6 m - low range 1 ... 18 m - high range	Operating range selectable: 10 ... 22 m - low range 18 ... 60 m - high range	Operating range selectable: 0 ... 6 m - low range 3 ... 18 m - high range	Operating range: 0,3 ... 8 m	Operating range: 0,3 ... 8 m MXL and MXL U 1 ... 2,5 m MXL L 1 ... 2,5 m MXL T
The ideal Type 2 safety light curtain for a simple interface with safety modules or PLC		The ideal Type 2 safety light curtain for directly controlling and monitoring the circuits of the machine, without the need for external safety modules	The ideal safety light curtain for protection applications with a long range, also on several sides using deflection mirrors	Ideal solution for connecting two light curtains in series and constituting a combined detection of the hand and of the presence of a person or of two different sides of the machine	Similar to the VX models but available in a limited number of versions; especially conceived to satisfy the most frequent application needs at a very competitive price	Can offer a complete range of essential functions and satisfy the most common application needs where the Muting function is required, together with a very competitive price
Types of detection: resolution 20, 30, 40 mm for hand detection resolution 50, 90 mm for detection of the body in a hazardous area 2, 3, 4 beams for detection of the body in access control			Types of detection: 2, 3, 4 beams for detection of the body in access monitoring	Types of detection: resolution 30, 40, 50 mm for hand detection 2, 3 beams for detection of the body in access control	Types of detection: resolution 30, 40 mm for hand detection 2, 3, 4 beams for detection of the body in access control	
Electrical connections: M12 5-pole connectors	Electrical connections: M12 5-pole connectors for emitter and M12 8-pole connectors for receiver					Electrical connections: M12 5-pole connectors for emitter and M16 12-pole connectors for receiver
Automatic Start/Restart	Built-in manual or automatic Start/Restart selectable					
External relay monitoring (EDM) through external AD SR1 interface	Feedback input for control of external relays (EDM)					
2 self-testing solid state PNP safety outputs protected against short circuits and overloads						

THE VISION MXL RANGE

MXL SERIES

MXL and MXL U SERIES

Both have two dedicated inputs on the M16 connector for connection of external Muting sensors of any type such as photocells, proximity switches, limit switches, etc.

MXL

The MXL series is recommended for Muting applications:

- Where personnel is supposed to access the area under control during the non-dangerous part of the machine cycle (e. g. manual load/unload of product).
- For two-way transit of material through the gate to be controlled by the light curtain (e.g. palletizers).

MXL U

Only for muting applications where one-way transit (exit only) of material through the gate is controlled by the light curtain (e.g. palletizers).

MXL L SERIES

MXL L SERIES

The MXL L series, with 2 or 3 beams for access control, uses an original system of 2 horizontal arms (one for the emitter and one for the receiver) with built-in, pre-wired and pre-aligned photoelectric Muting sensors.
The arms can be adjusted in height and angle in order to create a detection plane that is more or less angled, with the purpose to achieve correct and constant detection of the material in transit and therefore reliable operation of the protection system.
This ensures the maximum speed and simplicity of installation. The MXL L series manages the Muting function in one-way mode and is particularly suitable for protecting the outfeed gates of palletizing systems.

MXL T SERIES

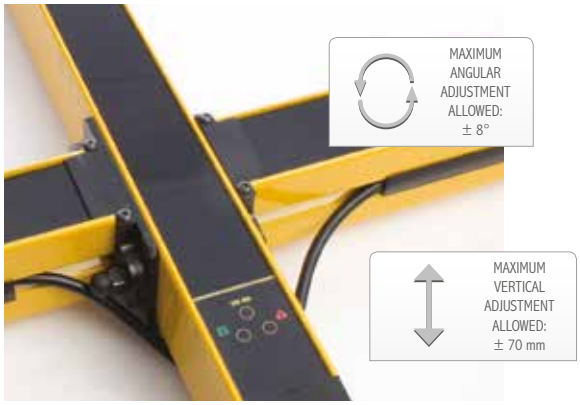
MXL T SERIES

The MXL T series, with 2 or 3 beams for access control, features four horizontal arms (two for the emitter and two for the receiver) with built-in, pre-wired and pre-aligned photoelectric Muting sensors.
The arms can be adjusted in height and angle in order to create a detection plane that is more or less angled, with the purpose to achieve correct and constant detection of the material in transit and therefore reliable operation of the protection system.
This ensures the maximum speed and simplicity of installation. The MXL T series manages the Muting function in two-way mode for the protection of the infeed/outfeed gates in palletizing systems.

VISION

SLA & STA - Additional arms for L and T muting - Accessory for Vision

Additional arms with built-in muting crossed beams photoelectric sensors for L and T muting (**see page 8**).



The sensor elements present in the Vision MXL L and MXL T versions are adjustable in height and angle.

This important and unique feature enables the inclination of the detection plane of the sensors to obtain correct and constant detection of irregular materials in transit.

MXJB - CONNECTION BOX FOR VISION MXL LIGHT CURTAINS

Connection boxes MXJB are accessory devices designed for quick, reliable connection of Vision MXL light curtains and to ensure that major operating controls needed for operation are available in the guarded area.

Its features include:

- Start/Restart push button.
- Key selector switch for Override control function.
- Muting-on indicator lamp.
- Light curtain connectors.
- Dip-switch for light curtain functions configuration.
- 2 guided-contacts safety relays operated and controlled by the light curtain.
- Internal terminal blocks for cable connections.
- Selector for connection of external Muting lamp.
- Selector for internal or external relay control.
- Connection for Muting enable input.
- Connection with cable gland for cable passage in output towards the machine.

MXJB is pre-set as manual Restart. By means the dedicated 5 meters cable CJBR5A, available as accessory, it is possible to make it work as automatic Restart.

Complying with:

- 2004/108/EC "Electromagnetic Compatibility (EMC)"
- 2006/95/EC "Low Voltage Directive (LVD)"
- UL (C+US) mark for USA and Canada.

ILION

MAIN FEATURES

ILION is a Type 2 safety photocell with M18 cylindrical metal body.

The photocells must be connected to control unit for esample: standard AU SX or AU SXM control unit with Muting or Mosaic to form a protection system that can be composed of 1, 2, 3 or 4 single beam photocells.

In case of connection with Mosaic safety controller, the number of photocells depends to the configuration of the protection system. (For details on the interface see AU SX, AU SXM and Mosaic control units).

The compact size of the photocells makes it possible to fit the protection system into very small spaces, while the possibility to use more photocells provides the maximum flexibility in positioning the protective beams.

ULISSE

MAIN FEATURES

ULISSE is a Type 2 safety photocell with metal body and M8 3-pole connector.

The photocells must be connected to control unit for esample: standard AU SX or AU SXM control unit with Muting or Mosaic to form a protection system that can be composed of 1, 2, 3 or 4 single beam photocells.

In case of connection with Mosaic safety controller, the number of photocells depends to the configuration of the protection system. (For details on the interface see AU SX, AU SXM and Mosaic control units).

Thanks to the very small size, the anodised aluminium case and the glass lenses free from electrostatic dust attraction, ULISSE is the ideal solution for the protection of weaving machines as well as of other applications characterised by high levels of mechanical stress or very restricted spaces.

EOS4 ATEX

EOS4 version with ATEX protective housing. Designed to secure operators working in industrial pontentially explosive atmospheres.

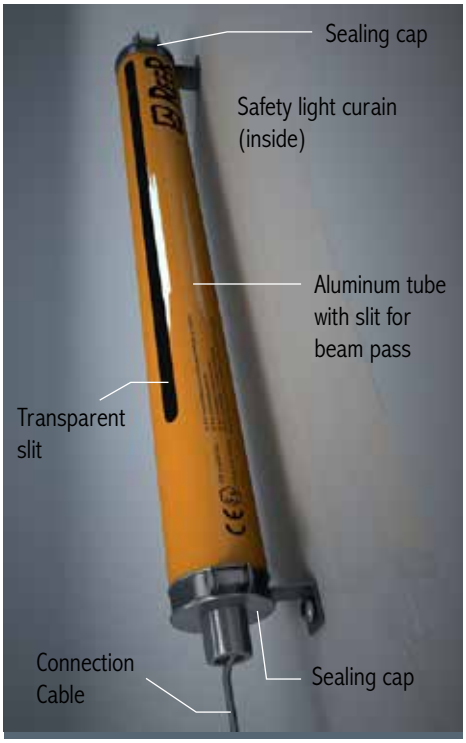
Integrated anti-condensation system through the GORE™ vent.

Degree of protection: IP 65

ATEX degree of protection (2014/34/EU):
- Gasses: II 3G Ex nA IIC T6 Gc
- Dust: II 3D Ex tc IIIC T 60°C Dc

Operating temperature: -10° ... 55°C.

Material	Trasparent slit	PC (Polycarbonate tube) Ø 50mm
	Protective tube	Aluminum yellow painted RAL1003
	Sealing caps	Stainless steel (AISI 316L) - Ø 56mm / Silicone O-RING
Electrical connections	10 meter cable pre-wired with cable gland.	
Fastenings	Stainless steel fastening brakets (AISI 316L)	



Safety level:

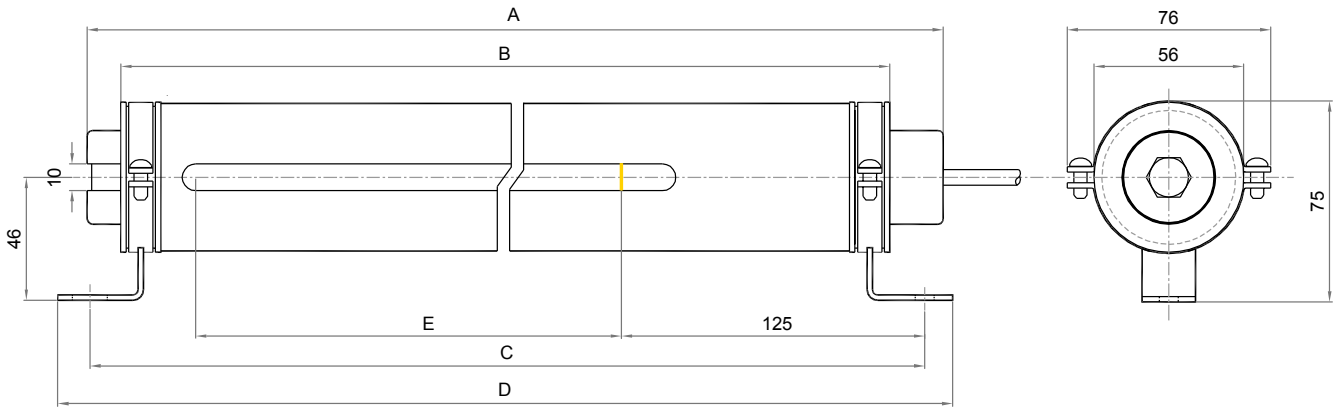
TYPE 4

SIL 3 – SILCL 3
PL e – Cat. 4

Integrated anti-condensation system through the GORE™ vent

EOS4 ATEX MODELS

Model	600	900	1203	1503	2B	3B	4B
Dimension A mm	767	1067	1367	1667	767	1067	1167
Dimension B mm	735	1035	1335	1635	735	1035	1135
Dimension C (± 3) mm	760	1060	1360	1660	760	1060	1160
Dimension D mm	780	1080	1380	1680	780	1080	1180
Dimension E mm	600	900	1200	1500	600	900	1000



MOSAIC

Mosaic is a modular, configurable safety controller for protecting machines or plants.

Mosaic is capable of monitoring several safety sensors and commands, such as safety light curtains, laser scanners, photocells, mechanical switches, mats, emergency stops, two-hand controls, concentrating management of these in a single, flexible device.

Thanks to MCT modules, parts of the Mosaic System can be decentralized in remote cabinets with respect to the master unit M1.

Mosaic offers numerous advantages compared with safety solutions based on traditional components, such as relay type safety modules, as it:

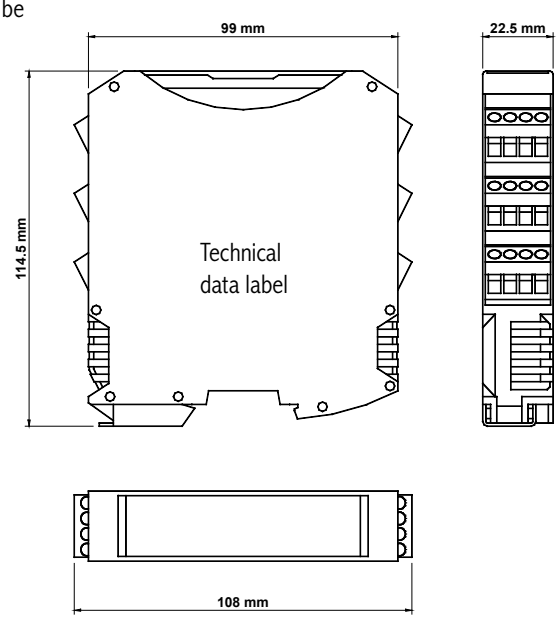
- reduces the number of components and therefore footprint and wiring. Promotes faster electrical cabinet construction;
- affords the necessary logical configuration using a single, simple programming software, facilitating modifications by machine designers;
- makes it possible to set up tamper-proof safety systems;
- simplifies machine maintenance through the MCM memory card, which can be used to transfer the configuration program to a new Mosaic in just a few simple steps.

Mosaic is certified to the highest safety levels established by industrial safety standards: SIL 3, SILCL 3, PL e, Cat. 4.

SYSTEM DESCRIPTION

Mosaic comprises a master unit M1 configurable via the MSD (Mosaic Safety Designer) graphic interface - provided with each master unit at no extra cost - and a maximum of 14 expansion units connectable to M1 via the MSC proprietary bus. The main features can be summarized in the following list:

- can be used with the main safety sensors and commands;
- digital safety inputs, programmable individually or in pairs, with the possibility of monitoring via dedicated output signals;
- wide range of software-configurable safety functions and logical operators;
- possibility of programming filters and delays for each single input and possibility of programming output activation and de-activation delays;
- possibility of independent control of pairs of outputs;
- max. 14 expansion units in addition to the M1 Master, excluding relay modules;
- max. 128 inputs, 16 OSSD pairs, 16 feedback restart e/o interlock inputs and 32 status outputs;
- simple diagnostics via front led signalling and configuration software;
- compact design: single module dimensions 22.5 x 99 x 114.5 mm;
- removable terminal blocks, screw contacts.

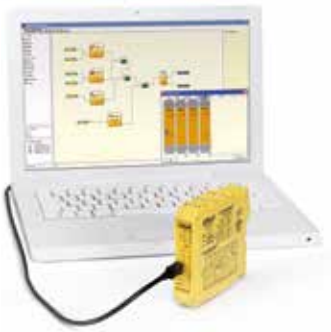


Safety level: **SIL 3 – SILCL 3 – PL e – Cat. 4 – Type 4**

Safety level:
SIL 3
SIL 3 – SILCL 3 PL e – Cat. 4

- 2006/42/EC: “Machine Directive”.
- 2004/108/EC: “Electromagnetic Compatibility Directive”.
- 2006/95/EC: “Low Voltage Directive”.
- EN 61496-1:2013 “Safety of machinery - Electro sensitive protective equipment - General requirements and tests”.
- EN 61131-2:2007 "Programmable controllers - Part 2. Equipment requirements and tests".
- EN 61508-1:2010 “Functional safety of electrical/electronic programmable electronic safety related systems - General requirements”.
- EN 61508-2:2010 “Functional safety of electrical/electronic/programmable electronic safety related systems - Requirements for electrical/electronic/programmable electronic safety-related systems”.
- EN 61508-3:2010 “Functional safety of electrical/electronic programmable electronic safety related systems: Software requirements”.
- EN 61508-4:2010 “Functional safety of electrical/electronic programmable electronic safety related systems - Definitions and abbreviations".
- EN 62061:2005 “Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems”.
- EN ISO 13849-1:2008 “Safety of machinery:- Safety-related parts of control systems - Part 1: General principles for design”.
- IEC 61784-3:2008 "Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions".
- UL (C+US) mark for USA and Canada.
- ANSI / UL 1998: “Safety Software in Programmable Components”.

MOSAIC



Configurable from PC via USB interface using MSD software.

Master module M1

Main unit, also usable as a stand-alone device, able to control any other expansion units.

8 digital inputs + 2 inputs for Restart and external device monitoring (EDM)

2 OSSD pairs + 4 test outputs + 2 digital outputs.

MSC Mosaic Safety Communication

MCM configuration memory card

Expansion modules

- **MOSAIC MI802** - I/O expansion unit
  - 8 digital inputs + 2 inputs for Restart and external device monitoring (EDM)
  - 2 OSSD pairs + 4 test outputs + 2 digital outputs.
- **MOSAIC MI12T8** - Input expansion unit for safety mats/edges

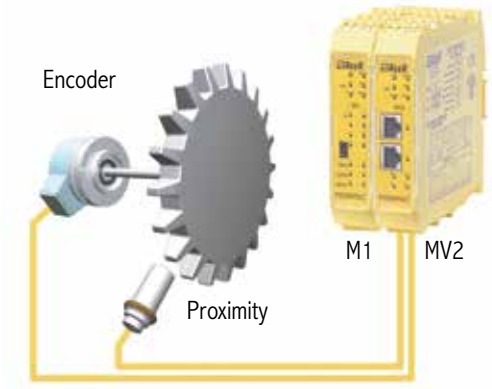
- **MOSAIC MI8 – MI16** - Input expansion unit
  - 8 or 16 digital inputs
  - 4 test outputs.
- **MOSAIC MO2 – MO4** - Output expansion units
  - 2 or 4 inputs for Restart and external device monitoring (EDM)
  - 2 or 4 OSSD pairs + 2 or 4 digital outputs.

- **MOSAIC MOR4 - MOR4 S8** - Safety relay expansion units with configurable outputs
  - 4 forcibly guided contact relays (Normally open)
  - 4 inputs for Restart and external device monitoring (EDM)
  - The relay outputs can be configured via the MSD software as: 4 single-channel outputs (safety cat. 1 or 2) or 2 dual-channels outputs (safety cat 4)
  - Model MOR4 S8 also has 8 programmable digital signal outputs.
- **MOSAIC MR2 – MR4** - Safety relay modules
  - MR2 - 2 forcibly guided contact relays for 1 OSSD pair 2 NO / 1 NC / 1 FB contatcts
  - MR4 - 4 forcibly guided contact relays for 2 OSSD pair 2 NO / 1 NC / 1 FB + 2 NO / 2 NC / 1 FB contacts

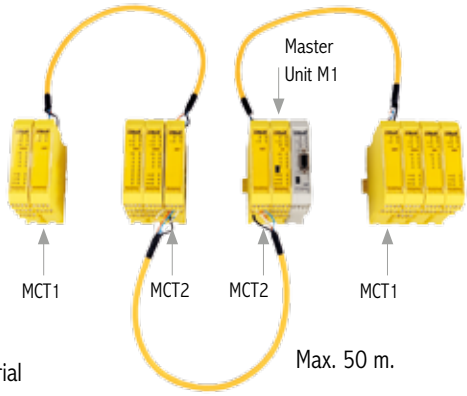
  The MR expansion units do not require MSC as they are wired directly to the selected OSSD.

MOSAIC

- **MOSAIC MV** - Expansion modules forsafety speed monitoring.
  - MV0 - Input for 2 PNP/NPN proximity switches
  - MV1T - Input for 1 TTL incremental encoders and 1 or 2 PNP/NPN proximity switches
  - MV1TB - Input for 1 TTL incremental encoders 24 VDC powered and 1 or 2 PNP/NPN proximity switches
  - MV1H - Input for 1 HTL incremental encoders and 1 or 2 PNP/NPN proximity switches
  - MV1S - Input for 1 SIN/COS incremental encoders and 1 or 2 PNP/NPN proximity switches
  - MV2T - Input for 1 or 2 TTL incremental encoders and 1 or 2 PNP/NPN proximity switches
  - MV2TB - Input for 1 or 2 HTL incremental encoders 24 VDC powered and 1 or 2 PNP/NPN proximity switches
  - MV2H - Input for 1 or 2 HTL incremental encoders and 1 or 2 PNP/NPN proximity switches
  - MV2S - Input for 1 or 2 SIN/COS incremental encoders and 1 or 2 PNP/NPN proximity switches.

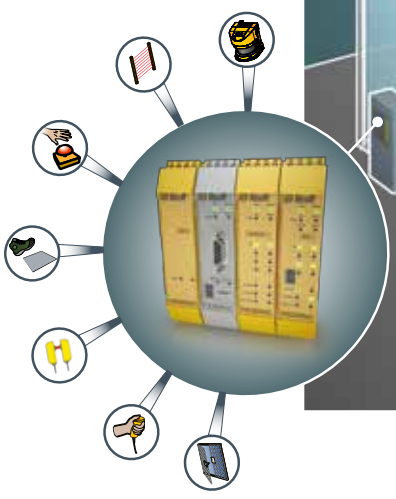


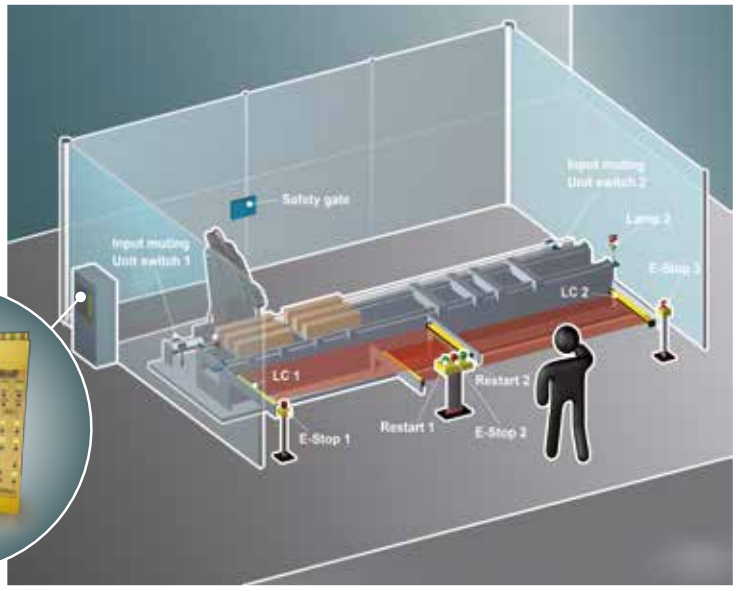
- **MOSAIC MCT** - Interface module allowing the connection of remote expansions via the MSC bus.
  - MCT1 - 1 connection interface (1 I/O cable)
  - MCT2 - 2 connections interface (2 I/O cable).
    Max. 6 MCT units can be used in a Mosaic system.



- **MOSAIC MB** - Expansion unit for connection to the most common industrial Fieldbus systems.
  - MBP Profibus DP
  - MBD DeviceNET
  - MBC CANopen
  - MBEI Ethernet IP
  - MBEI2B Ethernet IP with 2 connectors
  - MBEC EtherCAT
  - MBEP PROFINET
  - MBMR ModBus RTU;
  - MBEM ModBus TCP/IP;
  - MBU - Universal Serial Bus.

- **HM1** - Mosaic Operator Panel.





MAGNUS - MAGNETIC SAFETY SWITCHES

MG S - RECTANGULAR COMPACT HOUSING

- Compact and robust thermoplastic enclosure (PBT):
  - 22 mm fixing
  - IP67 rating.
- Operating temperature: -25 ... +75°C.
- Coded magnetic operation – Tamper resistant.
- Switching distance: 3 ... 10 mm.
- Sensor with 4 wires: 2 NO contacts.
- M8 4-pole connector.

Can be connected to Mosaic safety configurable controller (PL e) or to the dedicated safety control unit MG d1 (PL d).

MG B - RECTANGULAR HOUSING

- Robust thermoplastic enclosure (PBT):
  - 78 mm fixing
  - IP67 rating.
- Operating temperature -25 to 75°C.
- Coded magnetic operation – Tamper resistant.
- Switching distance 4 ... 16 mm; 7 ... 18 mm with magnet MG B M+.
- Sensor with 4 wires: 2 NO contacts.
- M8 4-pole connector.

Can be connected to MOSAIC safety configurable controller (PL e). or to the dedicated safety control unit MG d1(PL d).

MG M - M30 HOUSING

- Robust cylindrical thermoplastic enclosure (PBT):
  - 30 mm diameter
  - IP67 rating.
- Operating temperature -25 to 75°C.
- Coded magnetic operation – Tamper resistant.
- Switching distance 4 ... 16 mm; 7 ... 20 mm with magnet MG M M+.
- Sensor with 4 wires: 2 NO contacts.
- M8 4-pole connector.

Can be connected to MOSAIC safety configurable controller (PL e) or to the dedicated safety control unit MG d1(PL d).

MG d1 - SAFETY CONTROL UNIT

- Max Safety Level: PL d – SIL2 – Cat. 3.
- Can control up to 8 magnetic safety switches in series.
- Spring terminals.
- 2 NO safety relay outputs, 3 A.
- 94 mm x 75 mm x 25 mm.

Safety level:
PL d
PL d – SIL 2 – Cat. 3

SAFE CODER

The safety Sin/Cos incremental encoder SAFECODER, together with Mosaic, comprise a SIL 3 certified safety function for speed monitoring.

MAIN FEATURES

- Incremental encoder for use in safety-related applications up to SIL3.
- Shaft or Hollow Shaft versions.
- Protection rate: housing and flange side IP67, shaft IP65 (optional IP67).
- Safety-Lock™. Allow high rotational speed and high shaft load capacity.
- Shock and vibration resistant. Insensitive to strong magnetic fields.
- 2048 pulse rate.

Hollow Shaft version

Shaft version

Safety level:
SIL 3
SIL 3 – SILCL 3
PL e – Cat. 4

SAFETY SPEED MONITORING INTERFACE

SV MR0 – SV MR0 U - PL e - SIL 3 SAFETY SPEED MONITORING INTERFACE

- SV MR0 - Safety speed monitoring relay for Overspeed and Zero speed control.
- SV MR0 U - Safety speed monitoring realy for Underspeed control.

Manual or Automatic restart selectable. EDM feedback input for external contactors monitoring.
Enable inputs used, for instance, when monitoring the same axis, in different working phases, with more SV MR0 configured with different thresholds.

Safety level:
SIL 3
SIL 3 – SILCL 3
PL e – Cat. 4

Faults are signalled by LED "Fault" and a PNP system status output.

PNP status output indicating overspeed or underspeed thresholds crossing.
2 inputs for PNP proximity switches.

3 front panel selectors allow configuration of the speed threshold.

TYPE 4 SAFETY INTERFACES

AD SR1 - TYPE 4 SAFETY INTERFACE FOR LIGHT CURTAINS

Interface module between the safety light curtains EOS4 A, EOS2 A, Admiral AD, Admiral AX BK, Vision V with self-testing solid state safety outputs, and the machine control circuits.
With guided-contact safety relays, 2 NO contacts and PNP output for relay status signalling.

Start/Restart interlock. EDM Feedback input for extra external contactors monitoring.

Safety level:
TYPE 4
SILCL 3
PL e – Cat. 4

AD SRM - TYPE 4 SAFETY INTERFACE WITH MUTING FOR LIGHT CURTAINS

Interface module between the safety light curtains EOS4, EOS2, Admiral, Vision, the safety laser PHARO and the machine control circuits with 2-sensor logic integrated Muting.

With guided contact safety relays, 2 NO contacts and PNP output for relay status signalling.

Start/Restart interlock. EDM Feedback input for extra external contactors monitoring.
Muting Time-out selectable.
Integrated Override with 2 operating modes selectable. Muting Enable input.

PL e SAFETY INTERFACES

AD SRT - PL e SAFETY INTERFACE FOR TWO-HAND CONTROL

Safety relays for two-hand control. With 2 NO + 1 NC guided-contact safety relays.

EDM Feedback input for external contactors monitoring.

Safety level:
PL e
Cat. 4
Type III C

The AD SRT can be used up to Cat. 4, PL e.
It is certified as Type III C according to the EN 574 standard and monitors the simultaneity between the two inputs (< 0.5 sec).

AD SRE4 – AD SRE4C - PL e SAFETY INTERFACES FOR EMERGENCY STOP BUTTONS AND SAFETY SWITCHES

Safety relays for monitoring emergency stop buttons, safety switches.
With 3 NO + 1 NC guided-contact safety relays.

The Start/Restart can be either Automatic/Manual with the AD SRE4 or Manual Monitored with the AD SRE4C.

Safety level:
PL e
PL e – Cat. 4

EDM Feedback input for external contactors monitoring.
Both models can be used up to safety category 4, PL e according to EN ISO 13849-1:2008.

PL d SAFETY INTERFACES

AD SRE3 – AD SRE3C - PL d SAFETY INTERFACES FOR EMERGENCY STOP BUTTONS AND SAFETY SWITCHES

Safety relays for monitoring emergency stop buttons, safety switches.

With 2 NO + 1 NC guided-contact safety relays.

The Start/Restart can be either Automatic/Manual with the AD SRE3 or Manual Monitored with the AD SRE3C.

EDM Feedback input for external contactors monitoring.

Both models can be used up to safety category 3, PL d according to EN ISO 13849-1:2008.

Safety level:
PL d
Cat. 3

Certified by TÜV NORD CERT GmbH

TYPE 2 SAFETY INTERFACES

AU SX - TYPE 2 SAFETY INTERFACE FOR ILION AND ULISSE PHOTOCELLS

Control unit for safety photocells ILION and ULISSE, which can be combined to form a Type 2 safety system.

Up to 4 photocells may be connected.

With guided-contact safety relays, 2 NO contacts and PNP output for status signalling.

Start/Restart interlock.
EDM Feedback input for external contactors monitoring.

Self test every 5 seconds.

Safety level:
TYPE 2
SILCL 1
PL c – Cat. 2

AU SXM - TYPE 2 SAFETY INTERFACE WITH MUTING FOR ILION AND ULISSE PHOTOCELLS

AU SXM control unit, with integrated Muting functions, for safety photocells ILION and ULISSE, which can be combined to form a Type 2 safety system.
Up to 4 photocells may be connected.

2-sensor Muting logics.
Muting Time-out selectable.
Integrated Override with selectable 2-mode operation.
Muting Enable input.

Start/Restart interlock.
EDM Feedback input for extra external contactors monitoring.

Self test every 5 seconds.

SAFETY RELAY MODULES

AD SR0 – AD SR0A - SAFETY RELAY MODULES FOR DEVICES WITH INTEGRATED FEEDBACK INPUT FOR EDM

Interface relay modules for safety light curtains with feedback input for EDM, such as EOS4 X, Admiral AX, EOS2 X, Vision VX/VXL/MXL and Janus.

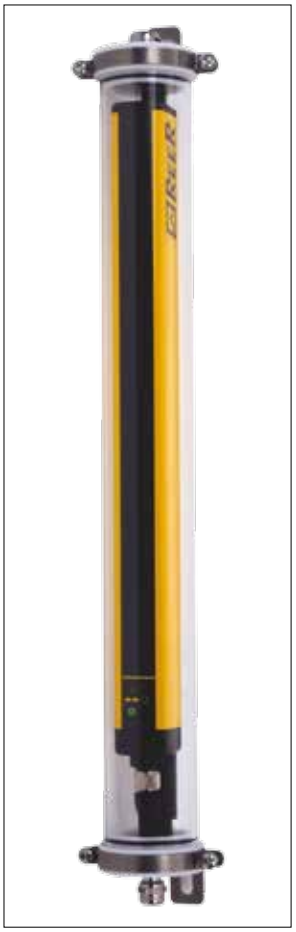
With 2 forcibly guided safety relays, 2 NO + 1 NC (AD SR0) or 2 NO contacts (AD SR0A).

Additional NC contact line for the monitoring by light curtain (EDM).

The 2 forcibly guided safety relays integrated in this product are DOLD type OA 5643 or OA 5644 are:

Certified by **TÜV Rheinland** Product Safety GmbH

EOS4 and EOS2 WTF and WTHF versions
IP 69K WATERTIGHT ENCLOSURE, WITH OR WITHOUT HEATING SYSTEM



Watertight enclosures allow light curtains and light grids to be used in a harsh working environments with exposure to water and steam.

Thanks to its inert (non-toxic) components, no residuals are left when the light curtains are washed down or when they come directly in contact with food. This makes WTF and WTHF enclosures suitable for the Food & Beverage industry.

The watertight enclosure is made of:
- PMMA (polymethyl methacrylate) transparent enclosure
- POM-C (acetal resin – DELRIN®) sealing caps
- Anti-condensation system trough integrated GORE™ valve
- POM-C and Stainless steel fastening brackets (AISI 316L).

The small EOS WTF and WTHF cylindrical enclosure (only 56mm diameter) is IP 69K protection rate tested and can withstand up to 80 bar of water jets pressure at the temperature of 80°C.

Enclosure incorporates a valve to drain humidity and avoid condensation.

WTHF version (Heated) has a thermostatically-controlled heating system and can work down to – 25° C.

Available models:

EOS4 X WTF/WTHF
- protected height 160 ... 1810 mm and 2, 3, 4 beams.
- resolution 14 mm, Max. range 5 m.
- resolution 30 mm and 2, 3, 4 beams, Max. range 17 m.

► See EOS4 at page 6

EOS2 X WTF/WTHF
- protected height 160 ... 1810 mm and 2, 3, 4 beams.
- resolution 30 mm and 2, 3, 4 beams, Max. range 10 m.

► See EOS2 at page 14

The safety light curtain/grid is delivered already enclosed into its watertight tube with a 10m long pre-wired cable and the related fastening brackets.

ADMIRAL AX and VISION VX WT and WTH versions
IP 67 WATERTIGHT ENCLOSURE, WITH OR WITHOUT HEATING SYSTEM

Models for light curtains with 2, 3, 4 beams, 1660 mm and 1810 mm protected height, 30 mm resolution.

IP 67 protection rate.
Valve to drain humidity and avoid condensation. Tightness to 40 bar water jet pressure.

Electrical connections by 10 m pre-wired cable.

Polycarbonate transparent housing. PVC sealing caps.

Available models:

ADMIRAL AX, AX LR; AX LR DB, VISION VX, VX LR WT/WTH
- protected height 160 ... 1810 mm and 2, 3, 4 beams.
- Max. range 50 m.

► See Admiral at page 8

► See VIsion at page 16

The safety light curtain/grid is delivered already enclosed into its watertight tube with a 10 m long pre-wired cable and the related fastening brackets.

Micron

Light curtains for industrial and civil applications where it is necessary to detect, measure, and recognise objects.

Depending on the number and position of the beams engaged by an object, Micron can provide real time information to a PLC or PC in order to:

- Detect the presence or absence of objects
- Perform a count
- Detect a position
- Detect a shape or a profile
- Measure dimensions.

Models MI AV equipped with two analog outputs (0 ... 10 VDC) with programmable functions and two programmable digital outputs

Models MI AC equipped with two analog outputs (4 ... 20 mA) with programmable functions and two programmable digital outputs

Models MI B equipped with an RS-485 serial interface with programmable functions and two programmable digital outputs

Models MI C Models 25, 50, 75 mm equipped with 2 solid state 0 o 24 V antivalent digital output (PNP 100 mA a 24 VDC). Models 10, 30 mm equipped with 2 solid state 0 o 24 V antivalent digital output (Push - Pull). PNP or NPN accordingly to the connected load.

MicronConfigurator software for PC, with graphic user interface, is supplied with each light curtain (models A and B only). Models A and B are provided with an M5 4-pole connector for parameter configuration and monitoring of the light curtain. It's a USB interface to be connected to a PC using the CSU M5 cable.

Beam spacing available from 10 mm to 75 mm. Controlled heights: from 150 mm to 3000 mm

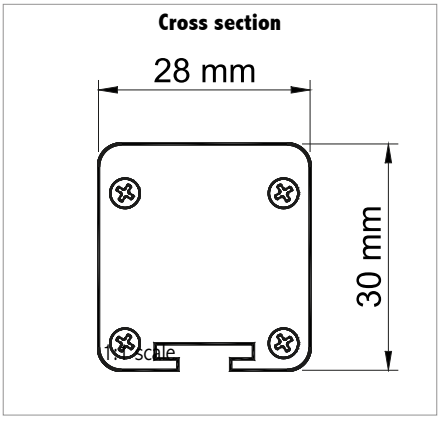
Operating range

- model for automatic warehouses with beams spacing 25, 50, 75 mm: 0 ... 6 m
- models with beams spacing 10, 30 mm: selectable 0 ... 2 m - low range
  1 ... 10 m - high range
- models with beams spacing 25, 50, 75 mm: selectable 0 ... 8 m - low range
  1 ... 18 m high range.

Connections with M12 connectors.

Possibility of connection of up to 8 Micron B light curtains as nodes of an RS-485 serial line for simultaneous detection of multiple dimensions and complex measurements.

Micron - Model C



THE MICRON RANGE

MICRON A

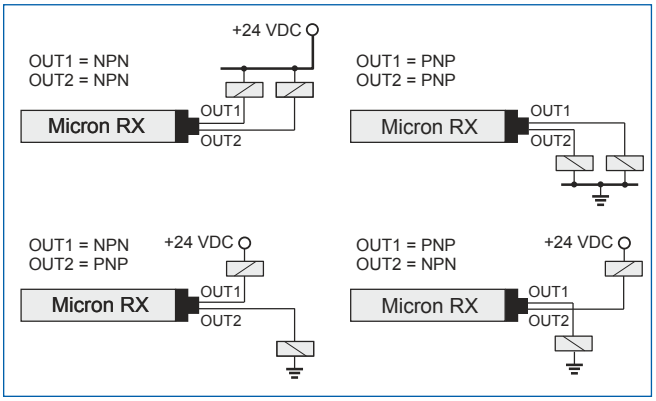
Solution providing simple measurement with easy interfacing.
Ideal for object measurement and detection of dimensional limits.
Can be provided in WT and WTH version but must be factory programmed.

MICRON B

Solution providing complete and detailed information on the status of each beam via the RS 485 serial line and, by means of the two solid state outputs, further on/off information related to the occurrence of the programmed conditions.
Ideal for dimensional measurement, detection of object profile and position.
Can be provided in WT and WTH version but must be factory programmed.

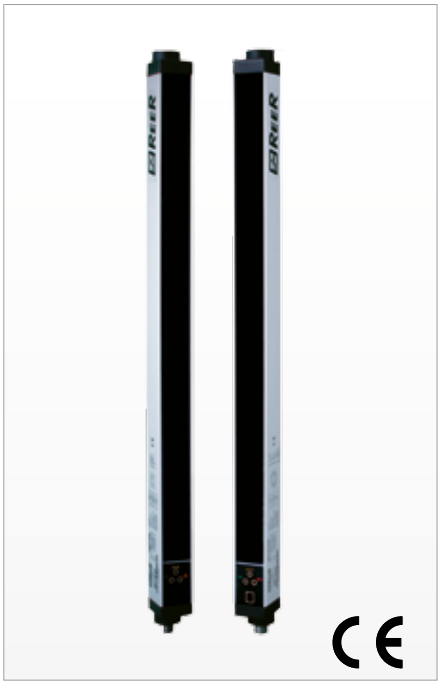
MICRON C

Solution providing simple on/off information related to the status of the controlled area.
Ideal for piece counting and detection of object presence/absence in the controlled field.
Can be provided in WT and WTH version.



Models C with 10 mm, 30 mm beam spacing are provided with digital outputs 0-24VDC Push-Pull type.

METRON



Light curtains for industrial and civil applications where it is necessary to detect, measure, and recognise objects.

Depending on the number and position of the beams engaged by an object, METRON can provide real time information to a PLC or PC in order to:

- Detect the presence or absence of objects
- Perform a count
- Detect a position
- Detect a shape or a profile
- Measure dimensions.

Models A equipped with 4 programmable solid state outputs.

Models B equipped with 2 programmable solid state outputs and an RS-485 serial interface.

Models C equipped with two antivalent solid state outputs.

The Metronconf Configuration software for PC, with graphic user interface, is supplied with each light curtain (models A and B only).

Beam spacing available from 5 mm to 75 mm.

Controlled height from 140 mm to 2525 mm.

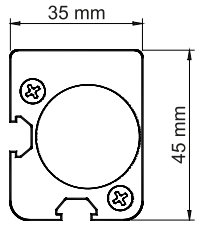
Operating range:

- Models with beam spacing 5 mm: selectable	0,2 ... 1 m low range 0,8 ... 2 m high range
- Models with beam spacing 25 - 50 - 75 mm: selectable	0,2 ... 2,5 m low range 1,5 ... 6 m high range
Models with beam spacing 10 - 30 mm: selectable	0 ... 6 m low range 1 ... 16 M high range.

Connections with M12 and M16 connectors.

Possibility of connection of up to 8 Metron B light curtains as nodes of an RS-485 serial line for simultaneous detection of multiple dimensions and complex measurements.

Cross section



1:2 scale

THE METRON RANGE

METRON A

Solution providing simple on/off information related to the occurrence of the programmed conditions.
Ideal for object recognition, quality control, detection of dimensional limits.

METRON B

Solution providing complete and detailed information on the status of each beam via the RS-485 serial line and, by means of the two solid state outputs, further on/off information related to the occurrence of the programmed conditions.
Ideal for dimensional measurement, detection of object profile and position.

METRON C

Solution providing simple on/off information related to the status of the controlled area.
Ideal for piece counting and detection of object presence/absence in the controlled field.

ACCESSORIES

FMC - FLOOR SUPPORT COLUMNS

Support columns for ReeR safety light curtains and deflection mirrors, designed to provide secure fastening to the floor, fast installation, and a simple and precise adjustment of the optical alignment of the system.

FMC-B12 - FMC-B18 - SUPPORT COLUMNS

Simplified version for 2, 3, 4 beams light grids. It permits the use with light grids with integrated Muting sensors: Janus MT and ML, Vision MXL L and MXL T.

FMC-B12 can also be used with: Admiral, Vision, EOS4 and EOS2, Micron and Metron.

SP - DEFLECTION MIRRORS

The SP deflection mirrors make it possible to create perimeter protection of areas with access points on multiple sides, with a considerable reduction of costs.

This solution eliminates the need to use more than one safety light curtain.

LAD - LASER ALIGNMENT DEVICE

The LAD laser alignment device makes it possible to obtain a fast and reliable optical alignment of the ReeR safety light curtains of the EOS4 and EOS2, Admiral, Vision, Micron, Metron and Janus series; they are also compatible with the use of the FMC floor mounting columns. The LAD devices emit a laser beam with visible red light with useful range up to 100 m. Their use is recommended for aligning light curtains that operate over long distances or multiple sides with the use of deflection mirrors.

SAV - VIBRATION DAMPERS

The SAV vibration dampers have been designed to avoid mechanical damage to the light curtains installed in those applications which have a high level of vibrations. The unprotected light curtains might resent the vibrations produced by e.g. presses, weaving machines, etc.

In these cases, the use of SAV vibration dampers is highly recommended.

- SAV 4E-8E-12E dampers are to be used with EOS4/EOS2 and Micron light curtains.
- SAV 1 and SAV 2 dampers are to be used with Janus light curtains.
- SAV 3 and SAV 4 dampers are to be used with Admiral, Vision and Metron.

PROTECTIVE SCREEN FOR EOS

PSE is a polycarbonate protective screen that preserves the light curtain's front screen from damages due to welding sparks or due to the presence of acids in the workspace.

Once no more usable the protective screen can be quickly replaced thanks to its fast and easy stainless steel clamping system. The protective screens are available for any protected heights of the EOS and Micron range.

SFB – SFB 4J - SFBE – SFB E180 - FE 4 BRACKETS

The SFB/SFBE/SFB180E swivel brackets allow the rotation of the light curtain around its longitudinal axis, as well as the adjustment of its vertical and horizontal position. The use of the SFB/SFBE/SFB180E swivel brackets is recommended to align those light curtains which are employed in applications having a long range or using deflector mirrors.

- SFB: are to be used with Admiral, Vision and Metron.
- SFB 4J: are to be used with Janus.
- SFB 4E - SFB 6E - SFB E180: are to be used with EOS4, EOS2 and Micron.

FE 4 - Flat brackets for light curtains EOS4, EOS2 and Micron.

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