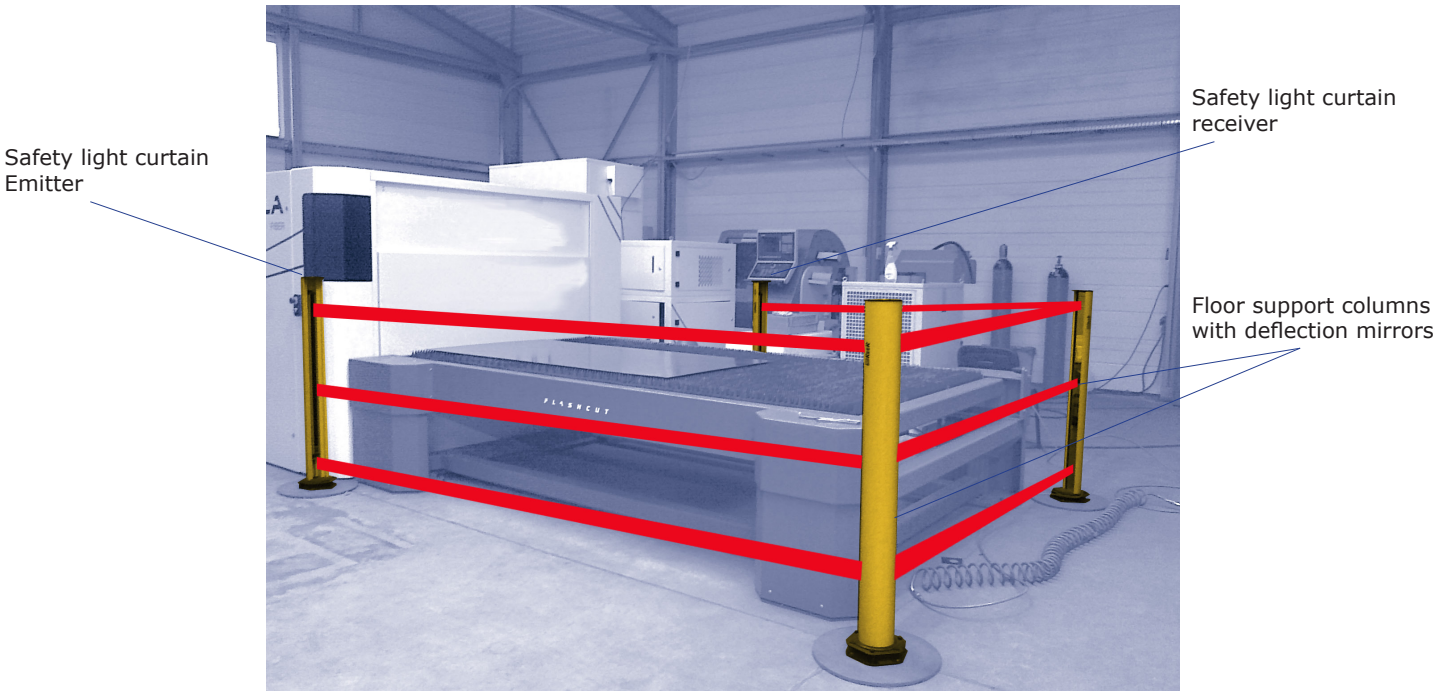
Progressive Code A.N.	Product	Date
AN_07	**Floor support columns with deflection mirrors**	10/02/2015
Application	Permeter protection of areas with access point on multiple sisdes	
Description	Combined application of safety light curtains and deflector mirrors	

Request

For perimeter protections up to 4 sides, floor support columns with deflection mirrors can be used in combination with safety light curtains. An example of application is illustrated in the following figure.



Machine for laser cutting perimeter protection

Columns with deflection mirrors range offer from ReeR is the following:

Models	FMC-S2	FMC-SB2	FMC-S3	FMC-SB3	FMC-S4	FMC-SB4	FMC-S1700	FMC-S2000
Ordering codes	1200620	1200645	1200621	1200646	1200622	1200647	1200625	1200623
Description	single mirror for 2 beams light curtains	2 mirrors for 2 beams light curtains	single mirror for 3 beams light curtains	3 mirrors for 3 beams light curtains	single mirror for 4 beams light curtains	four mirrors for 4 beams light curtains	controlled height up to 1360 mm	controlled height up to 1660 mm
Overall height with base (mm)	1055		1255		1385		1725	2025

The SP deflection mirrors make it possible to create perimeter protection of areas with access point on multiple sides with large distances between the protection elements.

Normally the light curtains used in this type of applications are those with 2, 3 and 4 beams for detecting the presence of the body in a hazardous area. However, You can also use light curtains with different resolutions. In this case, do not apply the measures listed in the table of the next page. For these applications it is necessary to assess the safety distances depending on the type of plant.

The layout of safety light curtains and columns with the deflection mirrors clearly depend on the type and the specific requirements of the protection system we intend to create.

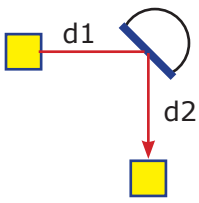
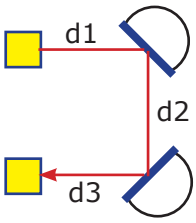
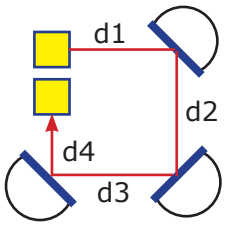
There are three factors to take into account in calculating the distances between safety barriers and columns:

- Divergence between the beams - Should be taken into account that the beams emitted from the light curtain emitter present a certain degree of divergence, so there are never perfectly parallel.
- Any problems of flatness of the mirror - This factor, as the previous increases its influence with increasing distances.
- Absorption coefficient of mirrors - For each mirror used is necessary to take into account the reduction in power of the optical beam emitted from the light curtain emitter. Refer to the following diagram:
  - FMC (S2 - S3 - S4) - 15% for light curtains with range up to 20 m
    - 20% for light curtains with range higher than 20 m.
  - FMC (SB2 - SB3 - SB4) - 10% for light curtains with range up to 20 m
    - 15% or light curtains with range higher than 20 m.

  This reduction is due to the specific characteristics of the mirror and takes account of the dirt and dust that settles on the same, especially in industrial environments. This reduces the range of the system mirror/light curtains.

These three factors determine the choice of the barrier model and the minimum distances for the positioning of the elements of the protection system.
The following table is intended to provide a guide for:

- choice of the type of column and light curtain to be used;
- define the maximum distance allowed for the correct placement of the devices taking into account the factors mentioned above and the maximum range of the light curtain used.

			INSTALLATION TYPE		
COLUM WITH DEFLECTION MIRROR TYPE	**LIGHT CURTAINS MODEL**	**LIGHT CURTAINS RANGE**			
			Max. Distance	**Max. Distance**	**Max. Distance**
FMC S2 FMC S3 FMC S4	EOS	4 - 12 m	(d1+d2) < 10 m	(d1+d2+d3) < 8,5 m	(d1+d2+d3+d4) < 6,5 m
	EOS H	10 - 20 m	(d1+d2) < 17 m	(d1+d2+d3) < 14,5 m	(d1+d2+d3+d4) < 12 m
	ADMIRAL	6 - 18 m	(d1+d2) < 15 m	(d1+d2+d3) < 13 m	(d1+d2+d3+d4) < 11 m
	VISION	6 - 16 m	(d1+d2) < 13,5 m	(d1+d2+d3) < 11,5 m	(d1+d2+d3+d4) < 9,5 m
	JANUS LR	30 - 60 m	(d1+d2) < 48 m	(d1+d2+d3) < 38 m	(d1+d2+d3+d4) < 30 m
	ADMIRAL LR	22 - 60 m			
	VISION LR	22 - 60 m			
	JANUS LR ILP	40 - 80 m	(d1+d2) < 64 m	(d1+d2+d3) < 51 m	(d1+d2+d3+d4) < 41 m
FMC SB2 FMC SB3 FMC SB4	EOS	4 - 12 m	(d1+d2) < 11 m	(d1+d2+d3) < 10 m	(d1+d2+d3+d4) < 9 m
	EOS H	10 - 20 m	(d1+d2) < 18 m	(d1+d2+d3) < 16 m	(d1+d2+d3+d4) < 14,5 m
	ADMIRAL	6 - 18 m	(d1+d2) < 16 m	(d1+d2+d3) < 14,5 m	(d1+d2+d3+d4) < 13 m
	VISION	6 - 16 m	(d1+d2) < 14,5 m	(d1+d2+d3) < 13 m	(d1+d2+d3+d4) < 11,5 m
	JANUS LR	30 - 60 m	(d1+d2) < 51 m	(d1+d2+d3) < 43 m	(d1+d2+d3+d4) < 36,5 m
	ADMIRAL LR	22 - 60 m			
	VISION LR	22 - 60 m			
	JANUS LR ILP	40 - 80 m	(d1+d2) < 68 m	(d1+d2+d3) < 58 m	(d1+d2+d3+d4) < 49 m

Note: For small distances the column with single mirror is enough; for longer distances, which amplify all the factors mentioned above, are required multiple mirrors that let you retrieve the divergence of beams parallelism.