

# Rama

Lamp and bridle of polyamide injection  
2000

## LIGHTING:

## GENERAL DESCRIPTION:

Outdoor lighting to be fitted with high luminosity discharge lamp or compact fluorescent bulb (depending on model) with built-in power supply equipment.

## STRUCTURE AND LAMP HOUSING:

Structure and lamp housing in 6.6 polyamide with 30% GFR.  
Solid colour.

## DIFFUSER:

Tempered glass, 4 mm thick.

## FIXING SYSTEM:

System consisting of the structure and half-flange, also made of 6.6 polyamide with 30% GFR, assembled using stainless steel screws.

## INSPECTION:

The unit is opened from above by giving the closing mechanism a piston that facilitates maintenance. The unit has EPDM foam seals.

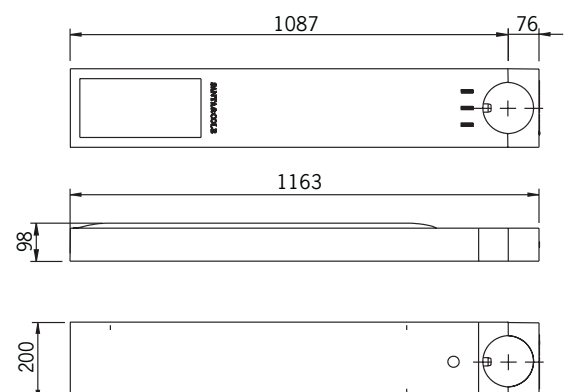
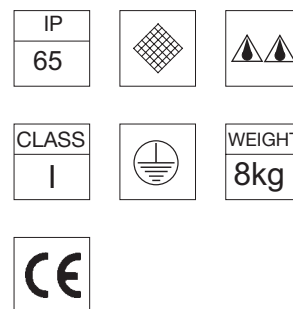
## TECHNICAL SPECIFICATIONS:

|                  |                          |
|------------------|--------------------------|
| Lamp             | 70W / 100W / 150W HIT-CE |
| Lamp holder      | E27 / E40 / E40          |
| Sistem power     | 88W / 115W / 167W        |
| Light efficiency | 59.0%                    |
| FHS rating       | 0.0%                     |

|                  |                       |
|------------------|-----------------------|
| Lamp             | 70W / 100W / 150W HST |
| Lamp holder      | E27 / E40 / E40       |
| Sistem power     | 83W / 115W / 170W     |
| Light efficiency | 59.0%                 |
| FHS rating       | 0.0%                  |

|                  |                 |
|------------------|-----------------|
| Lamp             | 57 / 70W TC-QEL |
| Lamp holder      | GX24q - 5 / 6   |
| Sistem power     | 63W / 77W       |
| Light efficiency | 58.0%           |
| FHS rating       | 0.0%            |

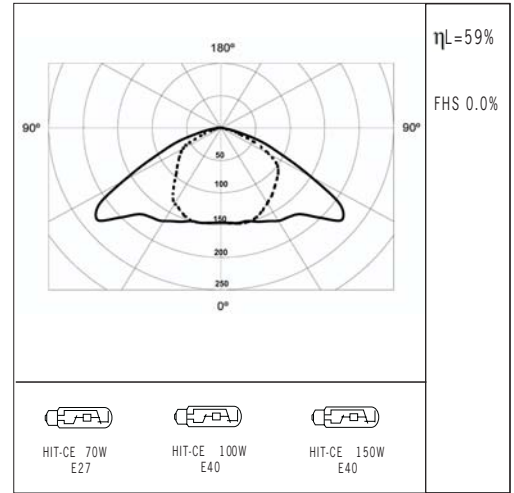
|              |             |
|--------------|-------------|
| Power supply | 230V - 50Hz |
|--------------|-------------|



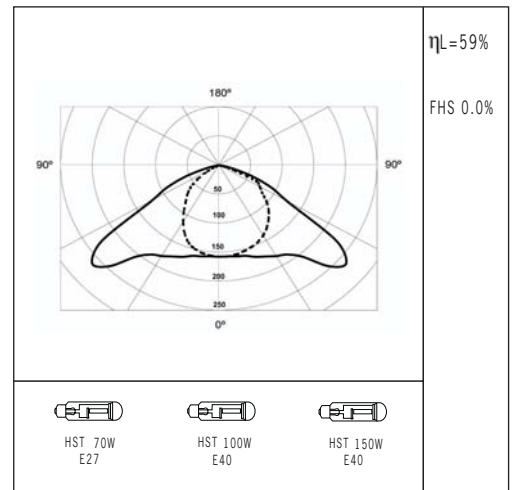
# Rama

Lamp and bridle of polyamide injection  
2000

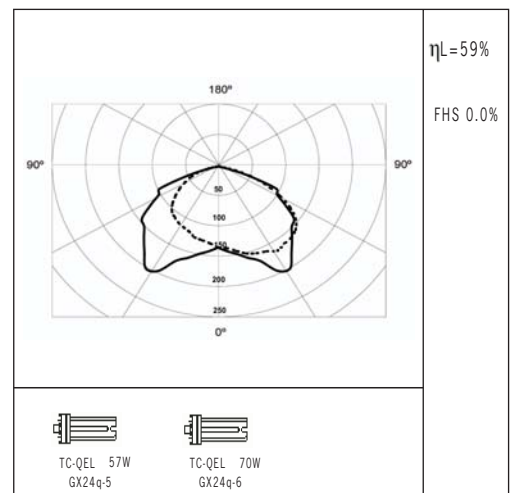
| code  | HM lamp     |     |                         |
|-------|-------------|-----|-------------------------|
| RAF04 |             |     | 88 W<br>230 V<br>50 Hz  |
| RAF05 | 100W HIT-CE | E40 | 115 W<br>230 V<br>50 Hz |
| RAF06 | 150W HIT-CE | E40 | 167 W<br>230 V<br>50 Hz |



| code  | VSAP lamp |     |                         |
|-------|-----------|-----|-------------------------|
| RAF04 | 70W HST   | E27 | 83 W<br>230 V<br>50 Hz  |
| RAF05 | 100W HST  | E40 | 115 W<br>230 V<br>50 Hz |
| RAF06 | 150W HST  | E40 | 170 W<br>230 V<br>50 Hz |



| code  | FC lamp                   |  |                        |
|-------|---------------------------|--|------------------------|
| RAF07 | (*) 57W TC-QEL<br>GX24q-5 |  | 63 W<br>230 V<br>50 Hz |
| RAF07 | (*) 70W TC-QEL<br>GX24q-6 |  | 77 W<br>230 V<br>50 Hz |



(\*) Recommended lamp:  
**OSRAM DULUX T/E IN**

# Rama

Columns  
2000

COLUMN 4.7m HIGH:

Versions with one or two lamps.

Materials and finishes:

- Steel tube (S 275 JR), 127 mm, hot galvanised.
- Stainless steel tube (AISI 304), 129 mm, polished.

COLUMN 6m HIGH:

Versions with one or two lamps at the same or at different heights.

Materials and finishes:

- Steel tube (S 275 JR), 127 mm, hot galvanised.
- Stainless steel tube (AISI 304), 129 mm, polished.

COLUMN 8.2m HIGH:

Versions with one or two lamps at the same or at different heights.

Column made of two lengths of steel tube (S 275 JR) welded together, hot galvanised:

- 1<sup>st</sup> length of steel tube 152.4mm.
- 2<sup>nd</sup> length of steel tube 127mm.

COLUMN 8.2m HIGH:

Version with five lamps.

Column made of two lengths of tube joined by six screws (DIN933 M12x35):

- 1<sup>st</sup> length of steel tube (S 275 JR) 219mm, hot galvanised and painted with "Oxir n" black wrought-iron effect.
- 2<sup>nd</sup> length of stainless steel tube (AISI 304) 129mm, polished.

The columns are fixed by means of anchor bolts set in a reinforced concrete block on site.

The foundation should allow for channelling for the electricity supply cable.



# Rama

Columns  
2000

## BOLTS

### GENERAL DESCRIPTION:

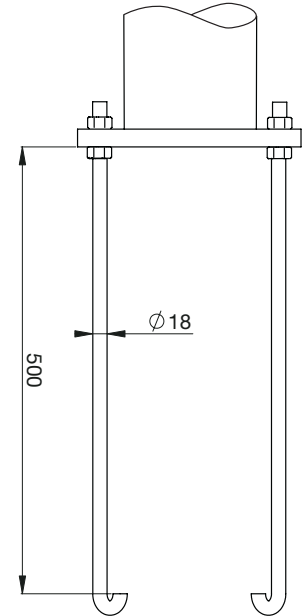
The bolts used to ancor the column have a 180° hook at the end and should be positioned so that the hooks are turned inwards towards the centre of the base plate.

### GEOMETRICAL CHARACTERISTICS:

Length (m): 0.5  
 Diameter (mm): 18  
 Finish: Smooth

### MATERIALS:

Steel S 235 JR  
 Yield stress (MPa): 235  
 Ultimate stress (MPa): 400

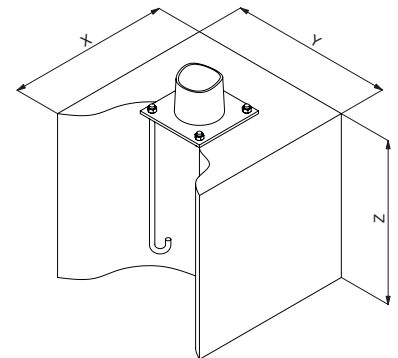


## FOUNDATION PIT

### GEOMETRICAL CHARACTERISTICS:

| Columns | X    | Y    | Z    |
|---------|------|------|------|
| 4.7     | 0.65 | 0.65 | 0.60 |
| 6.0     | 0.80 | 0.80 | 0.70 |
| 8.2     | 0.90 | 0.90 | 0.70 |

(Dimensions in m)



### MATERIAL:

Concrete HM-20  
 Typical resistance: 20 MPa

### TERRAIN TYPE:

Terrain type II (according to UNE-EN40-3-1).  
 Allowable pressure: 1 Kg/cm<sup>2</sup>

# Rama

Columns  
2000

COLUMN 4.7m HIGH

## GENERAL DESCRIPTION:

Made of stainless steel (AISI 304), polished ( 129).

The column is fixed in position by means of a reinforced concrete block made in situ and anchor bolts. The foundation should allow for channelling for the electricity supply cable.

## GEOMETRICAL CHARACTERISTICS:

|   |        |
|---|--------|
| Height (m):                                 | 4.7    |
| Maximum illuminated area (m <sup>2</sup> ): | 0,0993 |
| Thickness (mm):                             | 2      |

## MATERIALS:

|                          |     |
|--------------------------|-----|
| Stainless steel AISI 304 |     |
| Yield stress (MPa):      | 295 |

## CHARACTERISTICS OF WIND PRESSURE:

|                                    |       |
|------------------------------------|-------|
| Reference speed (m/s):             | 28    |
| Terrain category:                  | 1     |
| Wind pressure (N/m <sup>2</sup> ): | 450.8 |

## SAG AT THE END:

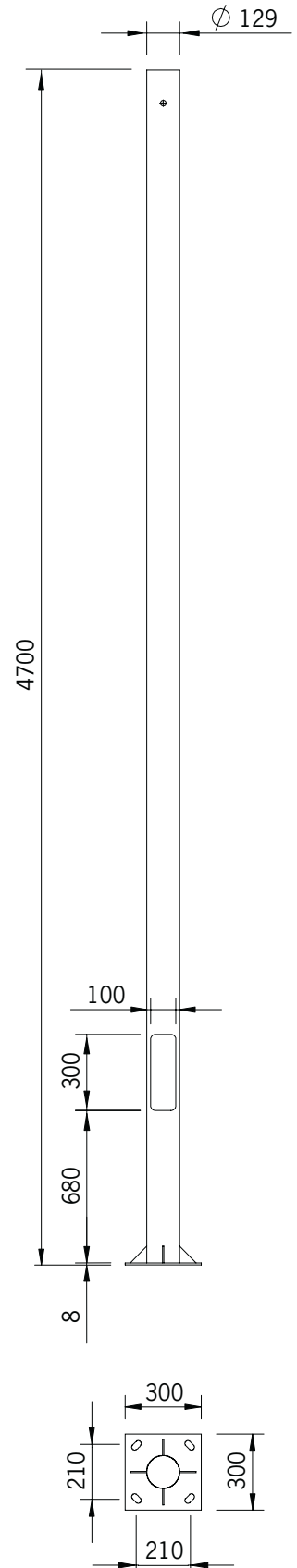
For x L/240  
For y L/185

## CRITICAL STRESSES:

| EMBEDMENT SECTION (h=0m) | 1Lum. / | 2Lum.  |
|--------------------------|---------|--------|
| Weight (KN):             | 0.50 /  | 0.60   |
| Moment X (KNm):          | 2.11 /  | 2.79   |
| Moment Y (KNm):          | 1.69 /  | 1.63   |
| Wind speed X (KN):       | 0.66 /  | 0.66   |
| Wind speed Y (KN):       | 0.77 /  | 0.92   |
| Twisting moment (KNm):   | 0.07 /  | 0.00   |
| Compound stress: X (MPa) | 68.40 / | 66.10  |
| Y (MPa)                  | 85.40 / | 112.60 |

| SECTION OF OPENING (h = 0.68m) | 1Lum. |
|--------------------------------|-------|
|--------------------------------|-------|

|                          |      |
|--------------------------|------|
| Weight (KN):             | 0.45 |
| Moment X (KNm):          | 1.67 |
| Moment Y (KNm):          | 1.30 |
| Wind speed X (KN):       | 0.58 |
| Wind speed Y (KN):       | 0.69 |
| Twisting moment (KNm):   | 0.07 |
| Ultimate moment Y (KNm): | 3.12 |
| Ultimate moment X (KNm): | 5.01 |
| Ultimate stress (KNm):   | 0.95 |



# Rama

Columns  
2000

COLUMN 4.7m HIGHT

## GENERAL DESCRIPTION:

Made of steel (S 275 JR), hot galvanised ( 127).

The column is fixed in position by means of a reinforced concrete block made in situ and anchor bolts. The foundation should allow for channelling for the electricity supply cable.

## GEOMETRICAL CHARACTERISTICS:

|   |        |
|---|--------|
| Height (m):                                 | 4.7    |
| Maximum illuminated area (m <sup>2</sup> ): | 0,0993 |
| Thickness (mm):                             | 3      |

## MATERIALS:

|                     |     |
|---------------------|-----|
| Steel S 275 JR      |     |
| Yield stress (MPa): | 275 |

## CHARACTERISTICS OF WIND PRESSURE:

|                                    |       |
|------------------------------------|-------|
| Reference speed (m/s):             | 28    |
| Terrain category:                  | 1     |
| Wind pressure (N/m <sup>2</sup> ): | 450.8 |

## SAG AT THE END:

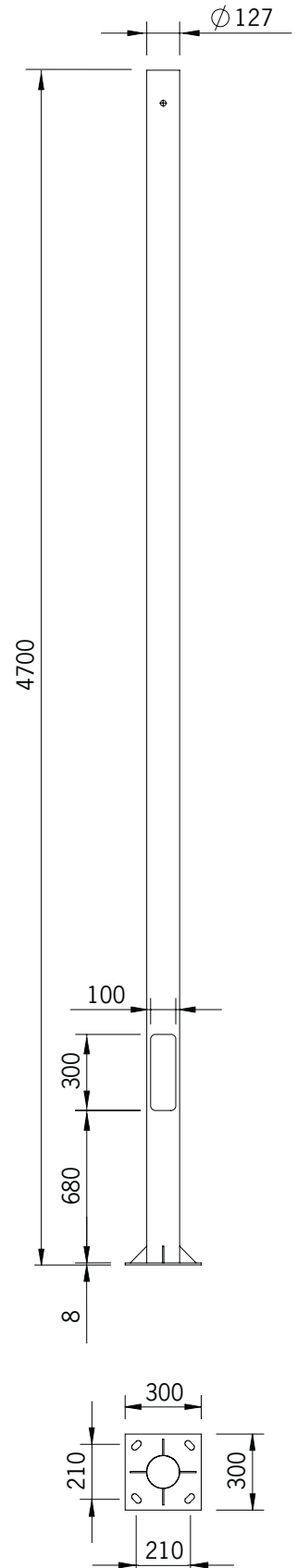
For x L/335  
For y L/260

## CRITICAL STRESSES:

| EMBEDMENT SECTION (h=0m) | 1Lum. / | 2Lum. |
|--------------------------|---------|-------|
| Weight (KN):             | 0.68 /  | 0.79  |
| Moment X (KNm):          | 2.11 /  | 2.79  |
| Moment Y (KNm):          | 1.69 /  | 1.63  |
| Wind speed X (KN):       | 0.66 /  | 0.66  |
| Wind speed Y (KN):       | 0.77 /  | 0.92  |
| Twisting moment (KNm):   | 0.07 /  | 0.00  |
| Compound stress: X (MPa) | 48.30 / | 46.70 |
| Y (MPa)                  | 60.30 / | 79.50 |

| SECTION OF OPENING (h = 0.68m) | 1Lum. |
|--------------------------------|-------|
|--------------------------------|-------|

|                          |      |
|--------------------------|------|
| Weight (KN):             | 0.61 |
| Moment X (KNm):          | 1.67 |
| Moment Y (KNm):          | 1.31 |
| Wind speed X (KN):       | 0.58 |
| Wind speed Y (KN):       | 0.69 |
| Twisting moment (KNm):   | 0.07 |
| Ultimate moment Y (KNm): | 5.14 |
| Ultimate moment X (KNm): | 8.23 |
| Ultimate stress (KNm):   | 1.41 |



# Rama

Columns  
2000

COLUMN 6m HIGHT

## GENERAL DESCRIPTION:

Made of stainless steel (AISI 304), polished ( 129).

The column is fixed in position by means of a reinforced concrete block made in situ and anchor bolts. The foundation should allow for channelling for the electricity supply cable.

## GEOMETRICAL CHARACTERISTICS:

Height (m): 6,0  
 Maximum illuminated area (m<sup>2</sup>): 0,0993  
 Thickness (mm): 2

## MATERIALS:

Stainless steel AISI304  
 Yield stress (MPa): 295

## CHARACTERISTICS OF WIND PRESSURE:

Reference speed (m/s): 28  
 Terrain category: 1  
 Wind pressure (N/m<sup>2</sup>): 450.8

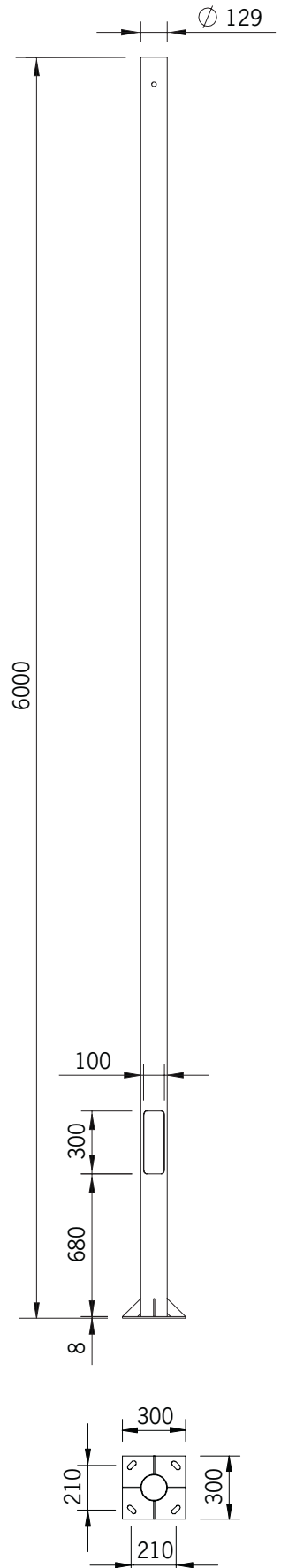
## SAG AT THE END:

For x L/335  
 For y L/260

## CRITICAL STRESSES:

| EMBEDMENT SECTION (h=0m) | 1Lum. /  | 2Lum.  |
|--------------------------|----------|--------|
| Weight (KN):             | 0.61 /   | 0.71   |
| Moment X (KNm):          | 3.74 /   | 4.53   |
| Moment Y (KNm):          | 3.00 /   | 2.95   |
| Wind speed X (KN):       | 0.91 /   | 0.94   |
| Wind speed Y (KN):       | 1.05 /   | 1.21   |
| Twisting moment (KNm):   | 0.09 /   | 0.00   |
| Compound stress: X (MPa) | 121.00 / | 119.00 |
| Y (MPa)                  | 151.00 / | 183.00 |

| SECTION OF OPENING (h = 0.68m) | 1Lum. |
|--------------------------------|-------|
| Weight (KN):                   | 0.55  |
| Moment X (KNm):                | 3.04  |
| Moment Y (KNm):                | 2.39  |
| Wind speed X (KN):             | 0.84  |
| Wind speed Y (KN):             | 0.98  |
| Twisting moment (KNm):         | 0.09  |
| Ultimate moment Y (KNm):       | 3.20  |
| Ultimate moment X (KNm):       | 5.00  |
| Ultimate stress (KNm):         | 1.41  |



# Rama

Columns  
2000

COLUMN 6m HIGHT

## GENERAL DESCRIPTION:

Made of steel (S 275 JR), hot galvanised ( 127).

The column is fixed in position by means of a reinforced concrete block made in situ and anchor bolts. The foundation should allow for channelling for the electricity supply cable.

## GEOMETRICAL CHARACTERISTICS:

Height (m): 6,0  
Maximum illuminated area (m<sup>2</sup>): 0,0993  
Thickness (mm): 3

## MATERIALS:

Stainless steel AISI304  
Yield stress (MPa): 275

## CHARACTERISTICS OF WIND PRESSURE:

Reference speed (m/s): 28  
Terrain category: 1  
Wind pressure (N/m<sup>2</sup>): 450.8

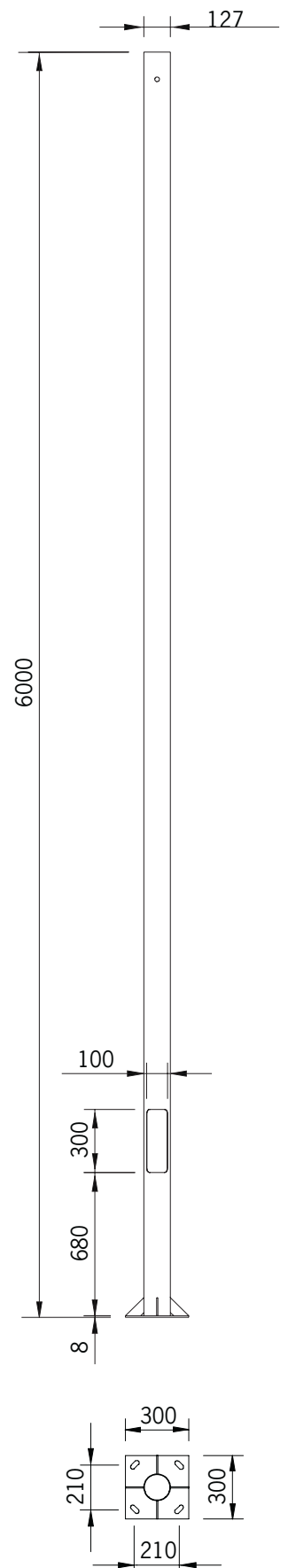
## SAG AT THE END:

For x L/335  
For y L/260

## CRITICAL STRESSES:

| EMBEDMENT SECTION (h=0m) | 1Lum. / 2Lum.   |
|--------------------------|-----------------|
| Weight (KN):             | 0.84 / 0.94     |
| Moment X (KNm):          | 3.74 / 4.53     |
| Moment Y (KNm):          | 3.00 / 2.95     |
| Wind speed X (KN):       | 0.94 / 0.94     |
| Wind speed Y (KN):       | 1.08 / 1.21     |
| Twisting moment (KNm):   | 0.09 / 0.00     |
| Compound stress: X (MPa) | 85.40 / 84.20   |
| Y (MPa)                  | 106.50 / 129.00 |

| SECTION OF OPENING (h = 0.68m) | 1Lum. |
|--------------------------------|-------|
| Weight (KN):                   | 0.75  |
| Moment X (KNm):                | 3.04  |
| Moment Y (KNm):                | 2.39  |
| Wind speed X (KN):             | 0.84  |
| Wind speed Y (KN):             | 0.98  |
| Twisting moment (KNm):         | 0.09  |
| Ultimate moment Y (KNm):       | 5.10  |
| Ultimate moment X (KNm):       | 8.20  |
| Ultimate stress (KNm):         | 1.41  |





# Rama

Columns  
2000

COLUMN 8,2m HIGHT

## GENERAL DESCRIPTION:

Column made of two lengths of steel tube (S 275 JR) welded together, hot galvanised.

- 1<sup>st</sup> length of steel tube 152.4
- 2<sup>nd</sup> length of steel tube 124

The column is fixed in position by means of a reinforced concrete block made in situ and anchor bolts. The foundation should allow for channelling for the electricity supply cable.

## GEOMETRICAL CHARACTERISTICS:

|   |        |
|---|--------|
| Height (m):                                 | 8,2    |
| Maximum illuminated area (m <sup>2</sup> ): | 0,0993 |
| Thickness (mm):                             | 3      |

## MATERIALS:

|                     |     |
|---------------------|-----|
| Steel S 275 JR      |     |
| Yield stress (MPa): | 275 |

## CHARACTERISTICS OF WIND PRESSURE:

|                                    |       |
|------------------------------------|-------|
| Reference speed (m/s):             | 28    |
| Terrain category:                  | 1     |
| Wind pressure (N/m <sup>2</sup> ): | 450.8 |

## SAG AT THE END:

For x L/335  
For y L/260

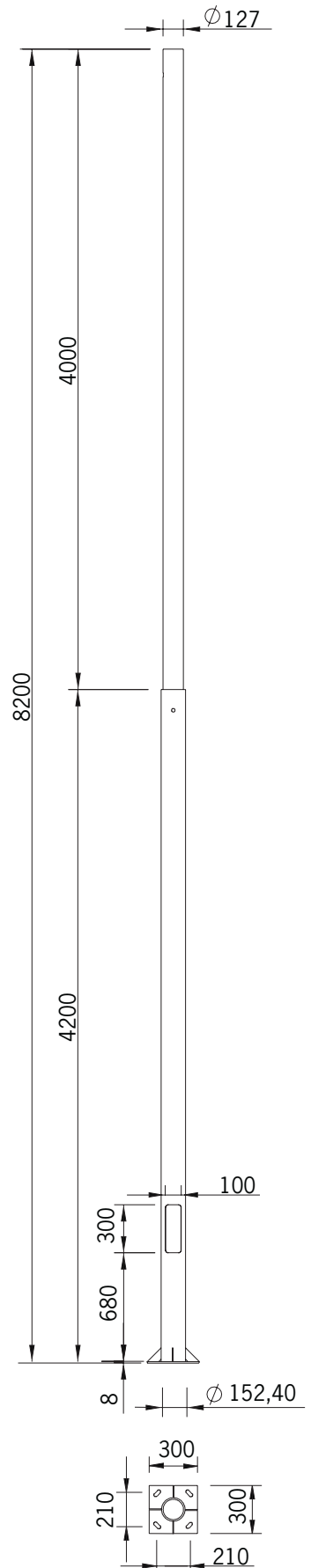
## CRITICAL STRESSES:

EMBEDMENT SECTION (h=0m) 1Lum. / 2Lum.

|                          |                 |
|--------------------------|-----------------|
| Weight (KN):             | 1.22 / 1.33     |
| Moment X (KNm):          | 6.14 / 7.76     |
| Moment Y (KNm):          | 5.25 / 5.35     |
| Wind speed X (KN):       | 1.15 / 1.18     |
| Wind speed Y (KN):       | 1.27 / 1.48     |
| Twisting moment (KNm):   | 0.09 / 0.00     |
| Compound stress: X (MPa) | 102.70 / 104.70 |
| Y (MPa)                  | 120.00 / 151.40 |

SECTION OF OPENING (h = 0.68m) 1Lum.

|                          |       |
|--------------------------|-------|
| Weight (KN):             | 1.12  |
| Moment X (KNm):          | 5.31  |
| Moment Y (KNm):          | 4.48  |
| Wind speed X (KN):       | 1.07  |
| Wind speed Y (KN):       | 1.19  |
| Twisting moment (KNm):   | 0.09  |
| Ultimate moment Y (KNm): | 8.39  |
| Ultimate moment X (KNm): | 12.30 |
| Ultimate stress (KNm):   | 3.00  |



# Rama

Columns  
2000

COLUMN 8,2m HIGHT

## GENERAL DESCRIPTION:

Column made of two lengths of tube joined by six A2 stainless steel screws (DIN 933 M12x50) with intermediate polyurethane seal:

- 1<sup>st</sup> length of steel tube (S 275 JR), 219, galvanised and painted.
- 2<sup>nd</sup> length of stainless steel tube (AISI304), 129, polished.

The column is fixed in position by means of a reinforced concrete block made in situ and anchor bolts. The foundation should allow for channelling for the electricity supply cable.

## GEOMETRICAL CHARACTERISTICS:

|   |        |
|---|--------|
| Height (m):                                 | 8,2    |
| Maximum illuminated area (m <sup>2</sup> ): | 0,0993 |
| Thickness 219 (mm):                         | 4      |
| Thickness 129 (mm):                         | 2      |

## MATERIALS:

|                     |         |
|---------------------|---------|
| Steel S 275 JR      |         |
| Yield stress (MPa): | 275/295 |

## CHARACTERISTICS OF WIND PRESSURE:

|                                    |       |
|------------------------------------|-------|
| Reference speed (m/s):             | 28    |
| Terrain category:                  | 1     |
| Wind pressure (N/m <sup>2</sup> ): | 450.8 |

## SAG AT THE END:

For x L/335  
For y L/260

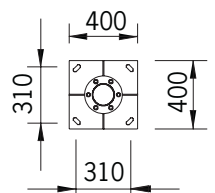
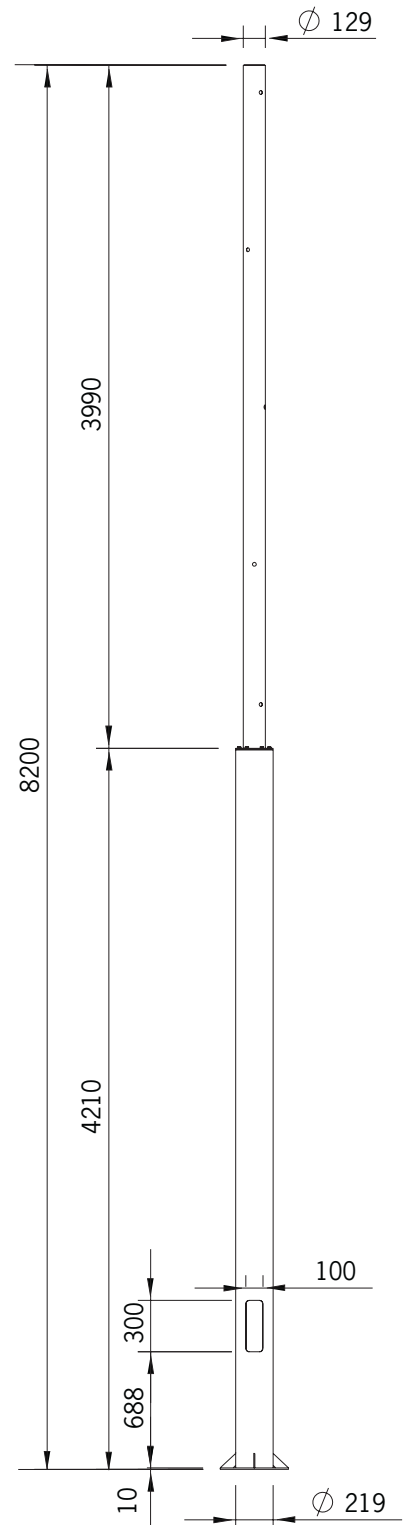
## CRITICAL STRESSES:

EMBEDMENT SECTION (h=0m) 5Lum.

|                          |        |
|--------------------------|--------|
| Weight (KN):             | 1.22   |
| Moment X (KNm):          | 6.14   |
| Moment Y (KNm):          | 5.25   |
| Wind speed X (KN):       | 1.15   |
| Wind speed Y (KN):       | 1.27   |
| Twisting moment (KNm):   | 0.09   |
| Compound stress: X (MPa) | 102.70 |
| Y (MPa)                  | 120.00 |

## SECTION OF OPENING (h = 0.68m)

|                          |       |
|--------------------------|-------|
| Weight (KN):             | 1.86  |
| Moment X (KNm):          | 6.48  |
| Moment Y (KNm):          | 6.80  |
| Wind speed X (KN):       | 1.60  |
| Wind speed Y (KN):       | 1.59  |
| Twisting moment (KNm):   | 0.00  |
| Ultimate moment Y (KNm): | 31.00 |
| Ultimate moment X (KNm): | 39.00 |
| Ultimate stress (KNm):   | 17.34 |



# Rama

wall bracket  
2000

## WALL BRACKET

### GENERAL DESCRIPTION:

A wall bracket of bent AISI 304 stainless steel sheet in either sand-finish.

### AISI 304 MECHANICAL PROPERTIES

|                    |                       |
|--------------------|-----------------------|
| Stretch limit      | 210 N/mm <sup>2</sup> |
| Breaking strength  | 520 N/mm <sup>2</sup> |
| Minimum elongation | 40 %                  |
| HB hardness        | 202 HB                |

### AISI 304 CHEMICAL COMPOSITION

|                |         |
|----------------|---------|
| Carbon (C)     | 0,08 %  |
| Chromium (Cr)  | 18-20 % |
| Nickel (Ni)    | 8-12 %  |
| Manganese (Mn) | 2,00 %  |
| Silicon (Si)   | 1,00 %  |
| Sulphur (S)    | 0,03 %  |
| Nitrogen (N)   | 0,04 %  |

