# Safesign (LED, Fluorescent and Halogen lamp) Illuminated Airfield Guidance Signs

Manual


THORN Airfield Lighting

IDMAN

SAFEGATE GROUP

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# SAFESIGN
# MANUAL
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# 1. INTRODUCTION

## 1.1 PRODUCT DESCRIPTION

Safesign illuminated airfield guidance signs are used as information, position and direction indicators in accordance with *ICAO Annex 14, Section 5.4 Signs*.

These signs also meet the current standards for EMC Emission and Immunity and have an IP64 ingress classification.

***Note**: This manual describes Safesign models in the product family number 597503.*

Sign construction includes a housing made from aluminium and a display front of UV-resistant polycarbonate plastic.

## 1.2 SAFESIGN MODELS

There are five different sign models according to power and light source requirements.

| Power | Light |
|---|---|
| 1. Constant Current Regulator (Series Fed) | Current range 2.8 - 6.6 A<br>18, 25 or 28W LED tubes |
| 2. Mains Power System (Parallel system) | Voltage range 120–240VAC, 50/60Hz<br>18, 25 or 28W LED tubes |
| 3. Constant Current Regulator (Series Fed) | Current range 2.8 - 6.6 A<br>36 or 58W Fluorescent tubes |
| 4. Constant Current Regulator (Series Fed) | Current range 2.8 - 6.6 A<br>45 W Halogen lamps |
| 5. Mains Power System (Parallel system) | Voltage range 230–240 VAC<br>36 or 58W Fluorescent tubes |

## 1.3 SAFESIGN USE

Signs are designed for use in areas according the temperature range requirements of the light sources.

| Light source | Temperature |
|---|---|
| LED | -25˚C to 55˚C |
| Fluorescent tubes | -25˚C to 55˚C |
| Halogen lamps | -55°C to 55°C |

## 1.4 SAFESIGN DIMENSIONS

Signs are designed with the following standard dimensions:

| Dimension | Measurement (mm) |
|---|---|
| Height | 700, 900 (un-mounted sign only) |
| Width | 1100, 1300, 1600, 1800, 2100, 2500, 2700 and 3000. |

***Note**: When installed, the total sign heights mounted on poles increases by 150 mm. The height of the front panel (visual plastic part) is 600mm (700mm sign height) and 800mm (900mm sign height)*

## 1.5 DOCUMENTATION

This document aims to give personnel an insight into the benefits of using Safesign Illuminated Airfield Signs and is a guide to general use that is logical and intuitive.

### Copyright



### History

This document is revised according to version management for external use.

| Version | Date | Description |
|---|---|---|
| 1.0 | September 2008 | |
| 1.1 | June 2009 | |
| 1.2 | July 2009 | |
| 1.3 | October 2009 | |
| 1.4 | August 2011 | |
| 1.5 | November 2012 | |
| 1.6 | April 2017 | Updated spare parts |
| 1.7 | May 2017 | Updated spare parts |
| 1.8 | September 2017 | Updated spare parts |
| 1.9 | October 2017 | Updated spare parts and panel replacement. |
| ***Note:*** *Safegate Group is responsible for providing updates, as available.* | | |

### References and trademarks

Safesign is a trademark of Safegate International AB.

Other products and company names mentioned herein may be the trademarks of their respective owners.

Any rights not expressly granted herein are reserved. All illustrations and images are for illustration only and may not accurately depict the actual product.

### Terminology

This document includes a selection of terms, words and abbreviations.

| Term or word | Abbreviation | Comment |
|---|---|---|
| Airfield signs | AFS | |
| Airfield Smart Power SafeControl | ASP-SC | A Safegate Group solution. |

### Language

Original documentation is created in English (U.K.).

***Note****: Images and texts used in this document are reference examples only and may not exactly depict a customer product.* For more information, see www.safegate.com.

## 2. INSTALLATION

Sign installation is a relatively simple and straight forward process, once the location for the sign is properly prepared.

### 2.1 SITE PREPARATION

Some site planning and preparation is required before installation according to ICAO Annex 14 for example, requirements for placement near runways, taxiways and intersections, and requirements for mounting on solid, flat, level surfaces.

#### 2.1.1 Mounting

Signs are delivered with mounting hardware including: poles, clamps, frangible couplings and mounting bases. The sign length determines the number of poles required (delivered) for installation. When installed, the total signs heights mounted on poles increases by 150 mm.

| Sign width (mm) | No. of poles | Sign height (mounted on pole) |
|---|---|---|
| 1100, 1300, 1600, 1800 | 2 | 700 (850) or 900 (1050) |
| 2100, 2500, 2700 | 3 | 700 (850) or 900 (1050) |
| 3000 | 4 | 700 (850) or 900 (1050) |

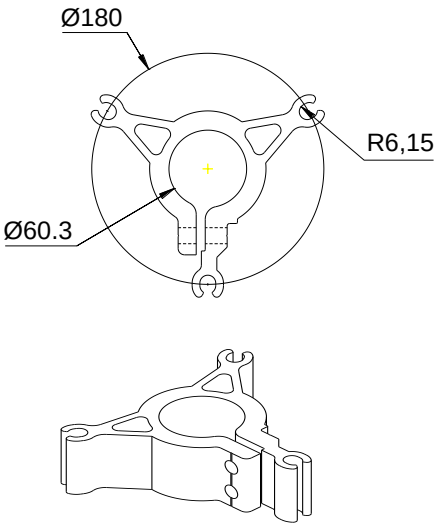
#### 2.1.2 Mounting Distances

Mounting distances between poles are dependent on the sign length. Bases for poles are installed on the surface of the sign location. The number of bases required is equal to the number of poles. Poles are mounted in bases.

**General recommendations, dimensions and appearance of mounting bases**

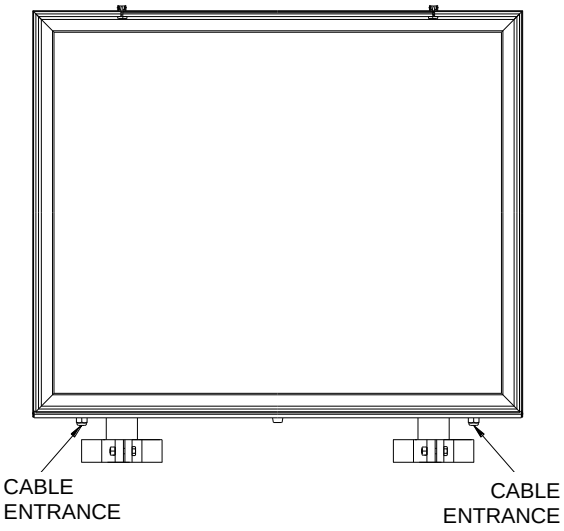
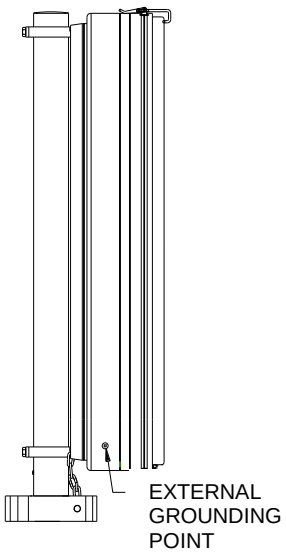
1. The bases require three M12 anchor bolts to fasten them to the foundation.
2. To mate with the base, the anchor bolts must be installed on a diameter of 180 mm with 120° spacing.
3. Use the correct Centre to Centre (C-C) mounting distance to layout anchoring points on the surface according to the sign length and where the sign is to be installed.

| Sign Width (mm) | C-C distances (mm) |
|---|---|
| 1100 | 700 |
| 1300 | 900 |
| 1600 | 1200 |
| 1800 | 1400 |
| 2100 | 850 |
| 2500 | 1050 |
| 2700 | 1150 |
| 3000 | 867 |



### 2.1.3 Connection

Signs are not supplied with external wiring unless specifically requested, as cabling requirements differ from site to site.

| General recommendations for connection | |
|---|---|
| It is recommended to consider the routing of external electrical cables to power signs, for example cable passages and junction boxes may need to be built into the foundations where signs are to be installed.<br>Signs are designed with 2 entrance points for power cables to allow some flexibility for connection. These points are located on the bottom surface of the sign, 150 mm from each end. The cable glands at the entrance points accept cables between 7.5 and 14 mm in diameter.<br>Connection terminals for the power cable are located next to each cable entrance.<br>***Note**: The larger halogen lamp signs that require two isolation transformers for operation have 4 cable entrances: two at each end of the sign.* |  |
| To ground a series fed sign after it is installed, attach a ring type crimp terminal to the ground wire and then fasten it to the side of the sign using the grounding screw (M6 Phillips head screws are located near the bottom of both ends of the sign). |  |

### 2.1.4 Sign Electrical Specifications

Signs have electrical specifications according to LED, Fluorescent or Halogen lamp types for reference when planning installation.

#### 2.1.4.1 Signs with LED tubes

| Tube length (mm) | LED tubes (pcs) | Tube length (m) | LED tube rating (W) | Power consum -ption (W) | Recommended isolation transformer (W) |
|---|---|---|---|---|---|
| 1100 | 1 | 0.97 | 1x 18 | 43 | 65 |
| 1300 | 1 | 1.20 | 1x 25 | 51 | 65 |
| 1600 | 1 | 1.50 | 1x 28 | 54 | 65 |
| 1800 | 2 | 0.97 | 2x 18 | 64 | 65 |
| 2100 | 2 | 1.20 | 2x 25 | 77 | 100 |
| 2500 | 2 | 1.20 | 2x 25 | 77 | 100 |
| 2700 | 2 | 1.50 | 2x 28 | 84 | 100 |
| 3000 | 2 | 1.50 | 2x 28 | 84 | 100 |

#### 2.1.4.2 Signs with LED tubes (constant light output 100% between 2.8-6.6A)

*This version is only available in limited market areas*

| Tube length (mm) | LED tubes (pcs) | Tube length (m) | LED tube rating (W) | Sign power consum -ption (W) | Recommended isolation transformer (W) |
|---|---|---|---|---|---|
| 1100 | 1 | 0.97 | 1x 18 | 43 | 65 |
| 1300 | 1 | 1.20 | 1x 25 | 51 | 65 |
| 1600 | 1 | 1.50 | 1x 28 | 54 | 65 |
| 1800 | 2* | 0.97 | 2x 18 | 89 | 100 |
| 2100 | 2* | 1.20 | 2x 25 | 104 | 150 |
| 2500 | 2* | 1.20 | 2x 25 | 104 | 150 |
| 2700 | 2* | 1.50 | 2x 28 | 112 | 150 |
| 3000 | 2* | 1.50 | 2x 28 | 112 | 150 |

*This version of sign contains 2 LED Power cassettes.

2.1.4.3 Signs with Fluorescent tubes

| Sign width (mm) | Tubes (pcs) | Tube length (m) | Lamp rating (W) | Total power consumption (W) | Recommended isolation transformer (W) |
|---|---|---|---|---|---|
| 1100 | 1 | 1.0 | 1x 36 | 55 | 65 |
| 1300 | 1 | 1.2 | 1x 36 | 55 | 65 |
| 1600 | 1 | 1.5 | 1x 58 | 77 | 100 |
| 1800 | 2 | 1.0 | 2x 36 | 94 | 150 |
| 2100 | 2 | 1.2 | 2x 36 | 94 | 150 |
| 2500 | 2 | 1.2 | 2x 36 | 94 | 150 |
| 2700 | 2 | 1.2 | 2x 36 | 94 | 150 |
| 3000 | 2 | 1.5 | 2x 58 | 138 | 150 |

2.1.4.4 Signs with Halogen Lamps

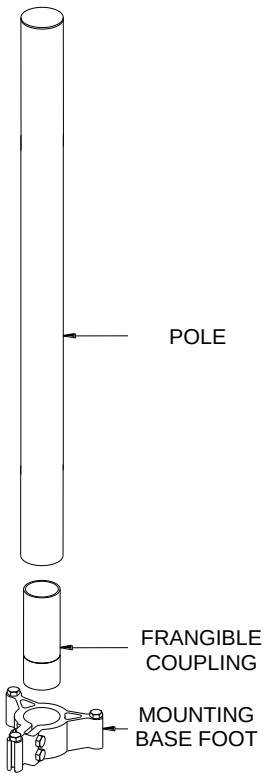
| Sign width (mm) | Lamps (pcs) | Lamp Rating (W) | Recommended isolation transformers |
|---|---|---|---|
| 1100 | 4 | 4x 45 | 1x 200W |
| 1300 | 5 | 5x 45 | 1x 300W |
| 1600 | 6 | 6x 45 | 1x 300W |
| 1800 | 8 | 8x 45 | 2x 200W |
| 2100 | 8 | 8x 45 | 2x 200W |
| 2500 | 10 | 10x 45 | 2x 300W |
| 2700 | 12 | 10x 45 | 2x 300W |
| 3000 | 12 | 12x 45 | 2x 300W |

## 2.2 STANDARD HARDWARE

### 2.2.1 Before you start

Standard tools are required, for example a socket set with a 15 cm or 6“ extension bar.

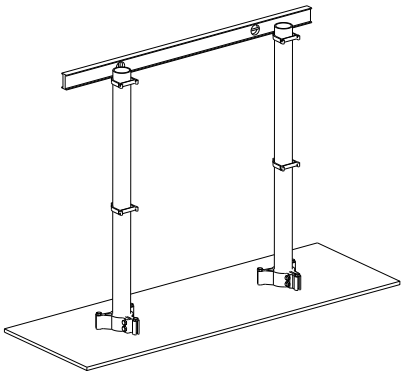
Once site preparation is complete, the correct poles and frangible couplings must be identified for a sign installation.

| Poles and frangible couplings | Image example |
|---|---|
| Poles with their respective frangible couplings are pre-assembled at the factory. All of the poles are shipped in the same crate. Before packing, the poles are packaged together in groups of 2, 3 or 4 poles to help indicate which sign they are to be used with.<br>Since frangible couplings are not universal, this means there are different models that are intended to be used with different sign sizes. The label on the frangible coupling must be checked to make sure that it is installed with the correct size sign.<br>An example of the pertinent information to check appears on the label as follows:<br>For Sign(s) SG597503 (718), (727), (911).<br>The numbers in the parentheses indicate the sign sizes that the frangible couple can be used with, and in this example they are: **7**00x**18**00, **7**00x**27**00 and **9**00x**11**00.<br>The image example shows the relation between the pole, the frangible coupling and the mounting base/foot.<br>***Note**: The pole and frangible coupling are pre-assembled before delivery.* |  |

### 2.2.2 Install with Standard Hardware

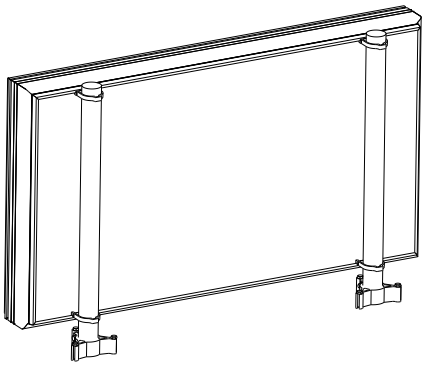
1. Install the mounting bases and poles for the sign.
   - If the tethering chain is to be used, place the end link over one of the anchor bolts before installing the anchor bolt nut.

   ***Note**: Do not tighten the fasteners completely, as the poles may need to be adjusted slightly to line up with the mounting flanges on the sign*.
2. Mount clamps with notches facing downwards, approximately halfway up each pole. Hand-tighten the set screws on the clamps.
3. Make a mark on one of the mounting poles, approximately 25 mm from the top. Install an upper clamp with its top surface in line with the mark on the mounting pole.
   ***Note**: This clamp is installed with its notches facing upward.*



4. Install mounting clamps on the remaining poles. Use a spirit level or other levelling device to locate the upper clamps at the same height as the first clamp.
   ***Note**: The orientation of these clamps is also with the notches facing upward*.
5. Lift the sign into position on the upper clamps.
   ***Note**: The poles may need to be adjusted so that the notches in the clamps line up with the mounting flange on the back of the sign*.
6. With the sign hanging on its upper mounting flange, loosen one of the lower clamps on a pole and slide the clamp into position until it mates with the lower mounting flange on the sign. Tighten the set screw on the clamp until the bracket slightly shapes to the contours of the pole.
   ***Note**: Do not over tighten*.
7. Slide each of the remaining clamps, one at a time, downward until they mate with mounting flanges and tighten each set screw.
8. Fasten the loose end of the tethering chain to the sign by attaching the spring clip to the bottom mounting flange at the nearest hole.
9. Tighten all fasteners holding the base plate against the installation surface. The finished assembly should have the same appearance as the sign shown in the image example.
10. Run the power cable through the cable gland.
11. Open the sign and attach the leads to the appropriate terminal contacts.

    ***Note**: If series fed, fluorescent lamp signs to be used in a lighting system controlled by a Safegate ASP-SC system, a converter filter (Safegate Group part no. 590591) needs to be installed in each sign. Installation instructions are supplied with the filter.*
12. Tighten the cable gland.
13. Energise the power circuit to which the sign is connected and check for proper operation.



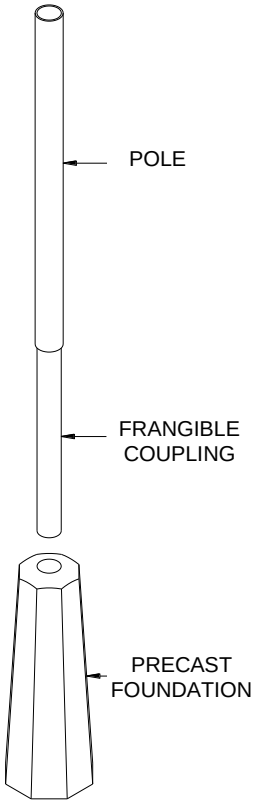
## 2.3 PRECAST CONCRETE, LAMP POST FOUNDATIONS

***Note**: (Scandinavia only)*

### 2.3.1 Before you start

Once site preparation is complete, the correct poles and frangible couplings must be identified for a sign installation.

***Note**: This is solution is only available in Scandinavia.*

| Poles and frangible couplings | Image example |
|---|---|
| Poles with their respective frangible couplings are pre-assembled at the factory. All of the poles are shipped in the same crate. Before packing, the poles are packaged together in groups of 2, 3 or 4 poles to help indicate which sign they are to be used with.<br>Since frangible couplings are not universal, this means there are different models that are intended to be used with different sign sizes. The label on the frangible coupling must be checked to make sure that it is installed with the correct size sign.<br>An example of the pertinent information to check appears on the label as follows:<br>For Sign(s) SG597503 (718), (727), (911).<br>The numbers in the parentheses indicate the sign sizes that the frangible couple can be used with, and in this example they are: **7**00x**18**00, **7**00x**27**00 and **9**00x**11**00.<br>In Scandinavia, the signs can be delivered with frangible couplings that can be used in pre-cast concrete, lamp post foundations, as in the image example.<br>***Note**: For these installations the standard Y-shaped mounting base is not used and is therefore not supplied.* |  <br>***Note**:*<br>*A pre-cast foundation is not supplied.* |

**Pre-cast foundation**

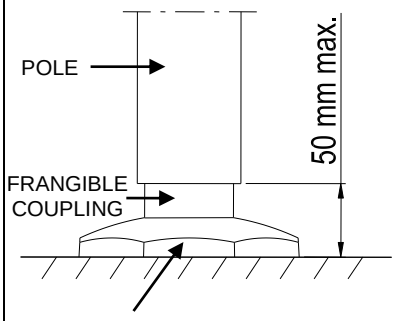
Pre-cast foundations and their collar shims are not included as part of the sign assemblies, if required they must be ordered separately using both the following article numbers 060 0700 (concrete foundation) and 301 0061 (collar).

The frangible couplings are only designed to be used with foundations that accept 60 mm diameter pipe and have an insertion depth for the pipe of 625 mm.

### 2.3.2 Install using precast concrete, lamp post foundations

***Note**: This solution is only available in Scandinavia.*

1. Prepare the holes where the lamp post foundations are to be placed in accordance the manufacturer's instructions and with depths that prevent frost heaving.
2. Space the foundations according to the centre to centre pole spacing distances. For more information, see 2.1.2 Mounting Distances, step 4.
3. Make sure that the tops of the foundations are level with each other after insertion in the holes.
4. Make sure the centres of the foundations are in line with each other. To aid this alignment:
   (a) Install a pole assembly in each of the foundations and adjust the foundations so that the poles are vertical and in a straight line with each other.
   (b) Check the positions of the break-off points on the pole assemblies are within 5 mm of being at the same level with each other, they must not be positioned more than 50 mm above surface of the ground.
   (c) If necessary remove the pole assemblies and cut off excess material from each assembly so that break-off points are positioned correctly.
   (d) When removing the pole assemblies, carefully mark the positions of the alignment rings and collars that hold the assemblies in place. Do this to assure that the poles have the correct alignment when they are re-installed in the foundations.




**Foundation**
Maximum height of break off point from ground surface.

5. After the poles are aligned, refill and repack the earth around the foundations. Make sure not to disturb the pole alignment when repacking and refilling.
6. Once the foundations are in place, re-check the positions of the break-off points on the pole assemblies.
7. Install mounting clamps on the remaining poles. Use a spirit level or other levelling device to locate the upper clamps at the same height as the first clamp.
   ***Note**: The orientation of these clamps is also with the notches facing upward.*
8. Lift the sign into position on the upper clamps.
   ***Note**: The poles may need to be adjusted so that the notches in the clamps line up with the mounting flange on the back of the sign.*
9. With the sign hanging on its upper mounting flange, loosen one of the lower clamps on a pole and slide the clamp into position until it mates with the lower mounting flange on the sign. Tighten the set screw on the clamp completely.
10. Slide each of the remaining clamps, one at a time, downward until they mate with mounting flanges and tighten each set screw completely.
11. Run the power cable through the cable gland and then tighten the cable gland.
12. Open the sign and attach the leads to the appropriate terminal contacts.
    ***Note**: If series fed, fluorescent lamp signs are to be used in a lighting system controlled by a Safegate ASP-SC system, a converter filter (Safegate Group part no. 590591) needs to be used with each sign.*
14. Energise the power circuit to which the sign is connected and check for proper operation.

## 3. OPERATION

Safesign units are usually connected to the airfield power system and made available to other airport power control systems if required, for example Safegate ASP-SC.

Safesign units are easy to read in daylight, in darkness and with limited visibility. The high readability is a result of a high quality front panel, a unique screen painting technique and customized light distribution inside the sign. This is also combined with a robust aluminium construction, state-of-the-art electronics and an outstanding lifetime of the light sources, making a Safesign uniquely versatile and suitable for airport environments around the world.

**Safesign Front Example**

## 4. MAINTENANCE

Safesign units require minimal maintenance. It is recommended that a routine inspection is performed at least once a year with checks as follows:

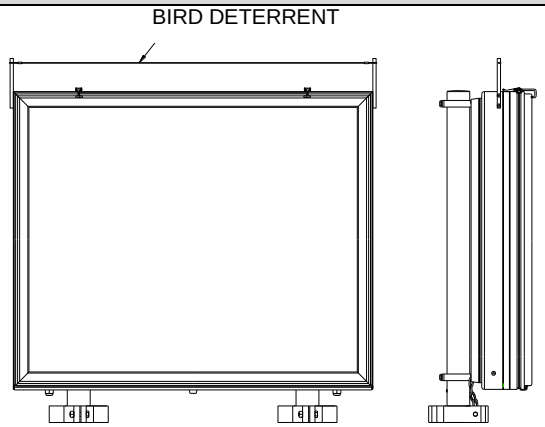
- Damage to Sign front, housing and any exposed cabling.
- Weather gaskets are intact and prevent water or dirt from entering the sign.
- Tightness of all of the fasteners holding the sign securely in place.
- With the power off, check the terminal contacts to make sure the power cable wiring is securely fastened.

### 4.1 BIRD DETERRENT (OPTION)

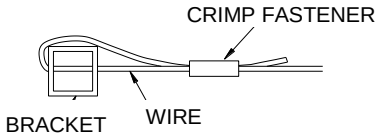
Material for installing bird deterrent wires on the sign is available as an option.
The material consists of the following:
brackets, wire, screws for attaching the brackets to the sign and crimp fasteners for attaching the wire to the brackets.

#### 4.1.1 Install a bird deterrent (option)

1. Attach one bracket at one end of the sign and tighten the mounting screws tightly.
2. Loosely attach the other bracket at the other end of the sign.
3. Place the crimp fasteners on the wire, but do not crimp them.




4. Starting from the sign side of the firmly mounted bracket:
   (a) Feed one end of the wire through the hole in bracket.
   (b) Loop it around the bracket and then feed it back through the crimp fastener, as shown.
5. Slide the crimp fastener towards the bracket and crimp in place.
6. Repeat step 4 at the other end of the sign.
7. Apply tension to the wire so that the wire is tautly suspended between the two brackets.
8. Slide the crimp fastener towards the bracket and crimp in place.
9. Tighten the bracket's mounting screws.

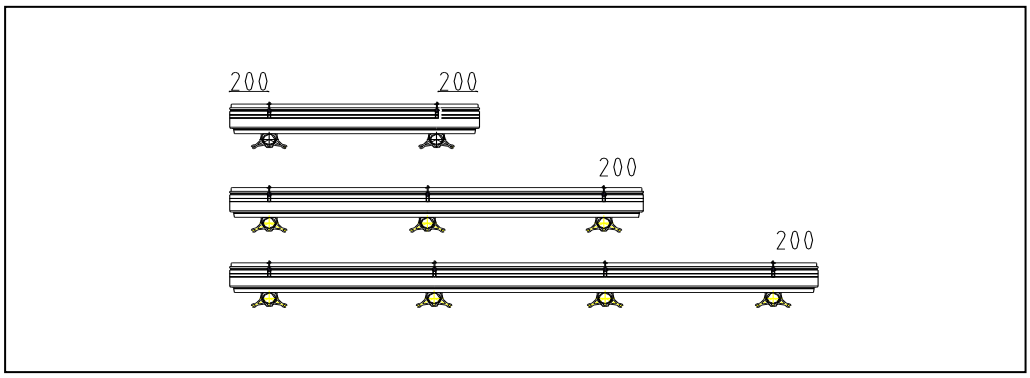



***Note**: As seen from above.*

## 4.2 ADJUSTMENT OF THE CLAMPS

### 4.2.1 Adjustment of the positions of the clamps.

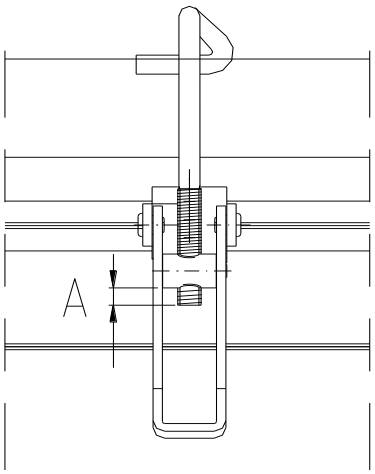
There is one clamp in front of each pole. The clamps are assembled in the aluminium profile. They can be moved sideways into the correct position.




### 4.2.2 Adjustment in the clamps with a new gasket

When the gasket between the front panel and the sign frame is new, the distance A (as shown), is 4-5 mm.

- As the gasket ages, the elasticity decreases slightly and the clamps need to be adjusted to achieve a good water resistance in the sign.
- Tighten the clamps by rotating them 4-5 turns. Check the pressure of the clamps every time the sign is opened.




### 4.2.3 Safesign front panel lock

This section describes how to replace the front panel locks on a Safesign.

Equipment required

- Cordless jigsaw with blade for metals.
- Grey paint.

1. Use the jigsaw to “open” the track on one side of the top profile by sawing a 3 mm cut from the centre to both sides of the track, see Figure 1.
2. Remove the old locks by pulling them out of the open track, see Figure 2.
3. Assemble the new locks in the track.
4. Adjust the hook to make sure the pressure on the front door is normal.
5. Apply grey paint to the aluminium at the end of the profile.

FIGURE 1 - OPEN THE TRACK MARKINGS

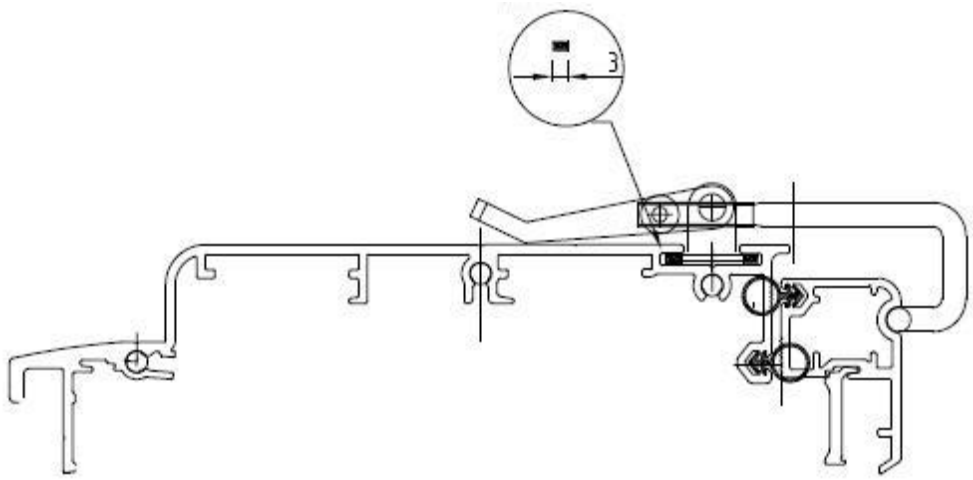



FIGURE 2 - OPEN THE TRACK drawing

## 4.3 SAFESIGN FRONT PANEL REPLACEMENT

Tools and material needed for **removal** of old panel:

- Drill with metal drillbit (size 10)
- Flathead screwdriver (same size as drill)
- Torx T-20
- Strong rigid knife (e.g.: Hultafors HVK Craftsman knife)
- Clean cloth
- Soapy water (dishwashing detergent)

List of used instruments for this frame disassembly:

- Drill with metal drillbit (size 10)
- Flathead screwdriver (same size as drill)
- Torx T-20

Attention:

- Use a large flat work surface with upstanding edge to disassemble the sign. This will also come in handy when re-assembling it later.

- **Be careful not to pull on the lists too hard. If they get bend or deformed they will be much harder to re-install.**

- A proper technique is to gently 'roll' the list away from you in an upward motion while pulling it back.

### Panel disassembly

- Lay sign frame upside down on a clean flat surface
- Remove earthing lead (torx T-20w) [A]
- Drill a hole on the shorter back list until you reach the underlying rubber [B]
- Use a flat screwdriver to lever the profile out of the frame [C] Be careful to avoid permanent deformation of the lists.
- Repeat steps 2-4 for the other short lists.
- Use the same technique to remove the longer lists. (it helps to unlock the lists by 'rolling' the lists away from you in an upward motion)
- With the lists removed, turn the panel with the sign facing up.
- Gently push down the corners of the panel until the silicone comes off.
- Lift the frame from the panel and put it aside.

[A] Remove earthing cable

[B] drill a hole on the shorter back list until you reach the underlying rubber

[C] use a flat screwdriver to lever the profile out of the frame

List of used instruments for frame cleaning:

- Strong rigid knife (e.g.: Hultafors HVK Craftsman knife)
- Clean cloth
- Soapy water (dishwashing detergent)

**Frame Cleaning**

1. Remove moss and dust from the frame using soapy water and cloth.
2. Do the same for the 4 lists.
3. Remove silicone residue (best done by cautiously cutting the silicone on both sides of the groove with a strong knife. Then use a non-sharp flathead screwdriver and cloth to rub it off. Small traces/leftovers are not an issue, important is that the rim touching the panel is clear from any residue.)

**New panel installation**
Tools and material needed**:**

- Plastic hammer (Bohle)
- Plastic spatula
- Clean cloth
- Soapy water (dishwashing detergent)
- Silicone Soudal Silirub 2/s
- Silicone removal spatula


**Assembly new panel.**
<u>List of used instruments:</u>

- Clean cloth
- Silicone gun
- Blue spatula
- Plastic hammer

<u>Points of attention:</u>

- Install the long lists first, then the shorter ones
- Make sure to have the hinges on the short lists on the lower side of the panel.

**Prepare the sign for new panel**

1. Inspect the new sign panel for damages.

2 Remove any sand and debris from the sign/panel.

3 Pull back the protective foil from the borders (approx. 10cm) all around the panel.

4.Clean the frame with a cloth

5. Apply silicone in the groove (Soudal Silirub 2/S)

6.Lay the sign in the frame. Make sure the frame nicely fits the sign's edge.

7.Lay the long list along the edge and gently push it against the frame

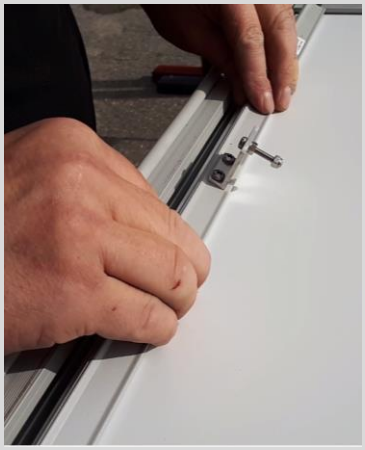
8.Tilt the list slightly by pushing it down. You should feel the list partially shifting into place [A].

9.Hold the list firmly and place the blue spatula tool on one end of the list [B]

10.Whack the spatula with a plastic hammer. the list should now lock gradually into place [C].

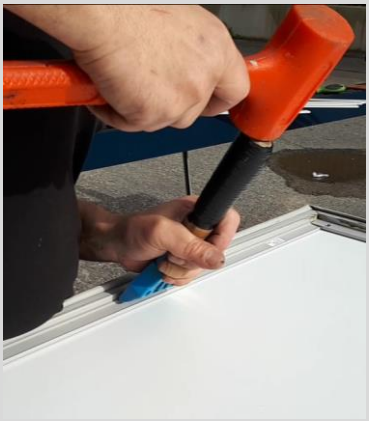
11.Repeat this along the full length of the list until it is fully locked and no space (no yellow aluminium) between frame and list is visible anymore

12.Repeat for the other lists (be careful to put the short lists on the correct side! the hinge/screw should be on the lower side of the sign)



[A] tilt the list slightly by pushing it down.

[B] hold the list firmly, place the spatula tool on one end of the list



[C] whack the spatula with a plastic hammer.

[D] apply soapy water on the borders of frame and sign

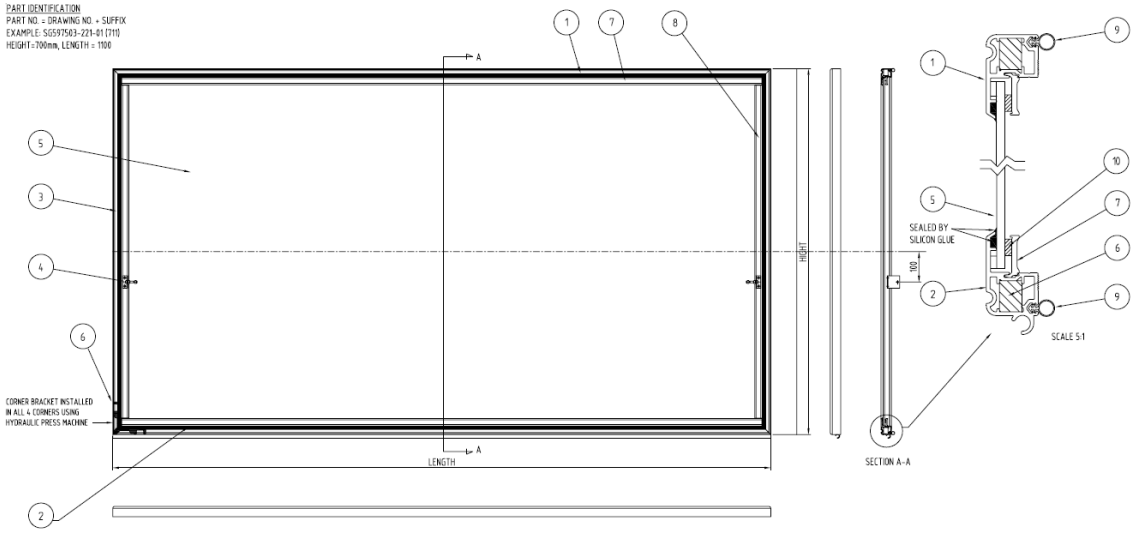
[E] remove the silicone with a plastic spatula

List of used instruments

- Clean cloth
- Soapy water (dishwashing detergent)

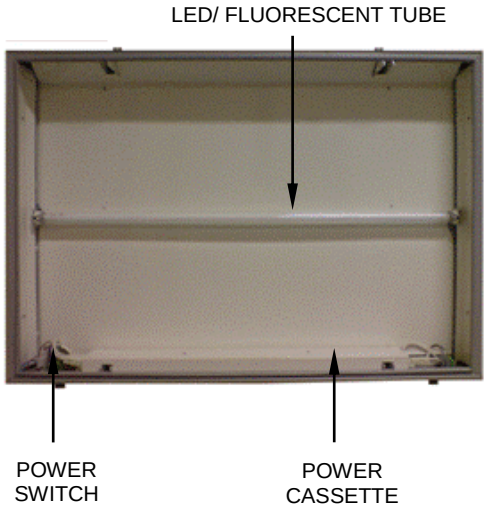
**Clean residue**

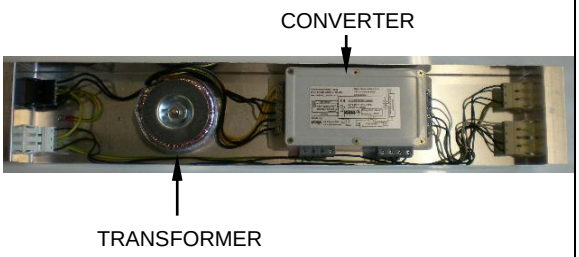
1. turn the sign face up, there will be silicone residue on the sign
2. apply soapy water (dishwashing liquid) to the border of the frame and sign [D]
3. remove the silicone with a plastic spatula. (any leftover traces will catch debris)[E]

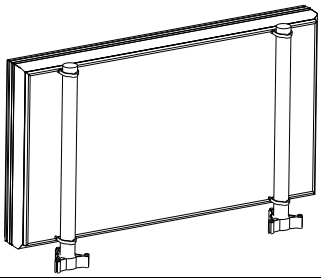


## 4.4 SPARE PARTS

Safesign is designed for ease of service with spare parts.

| Safesign Spare Parts | Article Number | Image examples |
|---|---|---|
| **LED tube** | | Sign (Front removed)   |
| LED tube 24VDC, 970mm | 15960 | |
| LED tube 24VDC,1200mm | 15961 | |
| LED tube 24VDC, 1500mm | 15962 | |
| **Fluorescent tube** | | |
| 18W/840, WHITE, L = 0,59 m Pack of 10 | 16548 | |
| 36W/840, WHITE, L = 1,0 m Pack of 10 | 14641 | |
| 36W/840, WHITE, L = 1,2 m, Pack of 10 | 14640 | |
| 58W/840, WHITE, L = 1,5 m Pack of 10 | 14642 | |
| **Halogen lamp** | | |
| 45 W, PK30d BASE | 11991 | |
| Film cut-out G2 45-90W CAT 48159 | 10128 | |
| **Front Panel** | | |
| 1100x700mm | 13956 | |
| 1300x700mm | 13957 | |
| 1600x700mm | 13958 | |
| 1800x700mm | 13959 | |
| 2100x700mm | 13960 | |
| 2500x700mm | 13961 | |
| 2700x700mm | 13962 | |
| 3000x700mm | 13963 | |
| 1100x900mm | 13964 | |
| 1300x900mm | 13965 | |
| 1600x900mm | 13966 | |
| 1800x900mm | 13967 | |
| 2100x900mm | 13968 | |
| 2500x900mm | 13969 | |
| 2700x900mm | 13970 | |
| 3000x900 | 13971 | |

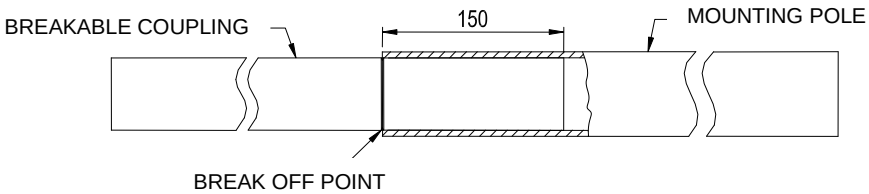
| Safesign Spare Parts | Article Number | Image examples |
|---|---|---|
| **Power Switch** | | Power cassette LED/fluorescent tube, series system<br>  <br> |
| 230 V Signs | 15331 | |
| Series fed Signs | 15332 | |
| Tube Light Socket G13, with locking | 24502 | |
| Tube Light Socket G13, with locking + spring clip | 24503 | |
| **Converter** | | |
| Quicktronic Professional 230V QTP1x36 | 15327 | |
| Quicktronic Professional 230V QTP1x58 | 15328 | |
| Quicktronic Professional 230V QTP2x36 | 15329 | |
| Quicktronic Professional 230V QTP2x58 | 15330 | |
| Single Lamp, 36/58W, 2.8-6.6A | 13632 | |
| Double Lamp, 36/58W, 2.8-6.6A | 13633 | |
| Safesign LED converter 230V | 15965 | |
| Safesign LED converter 6.6A | 15853 | |
| **Transformer** | | |
| For single lamp sign | 13634 | |
| For double lamp sign | 13635 | |
| Safesign LED transformer | 15854 | |

| Safesign Spare Parts | Article Number | Image examples |
|---|---|---|
| **Installation Material** | | **Poles, Clamps, Frangible Coupling**  |
| **Mounting Base** | | |
| 3 Bolt, Y-Shape | 13993 | |
| **Poles** | | |
| 700 mm high signs | 13994 | |
| 900 mm high signs | 13995 | |
| Clamp | 13996 | |

**Frangible Couplings**

| Sign Size | For 3 Bolt, Y-Shape, Mounting Base | For Pre-cast Foundation |
|---|---|---|
| 700 x 1100 sign | 13979 | 597503-256 (1,3) |
| 700 x 1300 sign | 13980 | 597503-256 (1,6) |
| 700 x 1600 sign | 13981 | 597503-256 (1,8) |
| 700 x 1800 sign | 13982 | 597503-256 (2,2) |
| 700 x 2100 sign | 13980 | 597503-256 (1,6) |
| 700 x 2500 sign | 13981 | 597503-256 (1,8) |
| 700 x 2700 sign | 13982 | 597503-256 (2,2) |
| 700 x 3000 sign | 13981 | 597503-256 (1,8) |
| 900 x 1100 sign | 13982 | 597503-256 (2,2) |
| 900 x 1300 sign | 13983 | 597503-256 (2,6) |
| 900 x 1600 sign | 13984 | 597503-256 (3,1) |
| 900 x 1800 sign | 13985 | 597503-256 (3,5) |
| 900 x 2100 sign | 13984 | 597503-256 (3,1) |
| 900 x 2500 sign | 13984 | 597503-256 (3,1) |
| 900 x 2700 sign | 13985 | 597503-256 (3,5) |
| 900 x 3000 sign | 13984 | 597503-256 (3,1) |

When replacement frangible couplings are delivered, they need to be mounted in existing poles. Do this by inserting the end of the frangible coupling that is 150 mm from the break-off point, into the pole until the end of the pole is centred over the break off point of the frangible coupling.

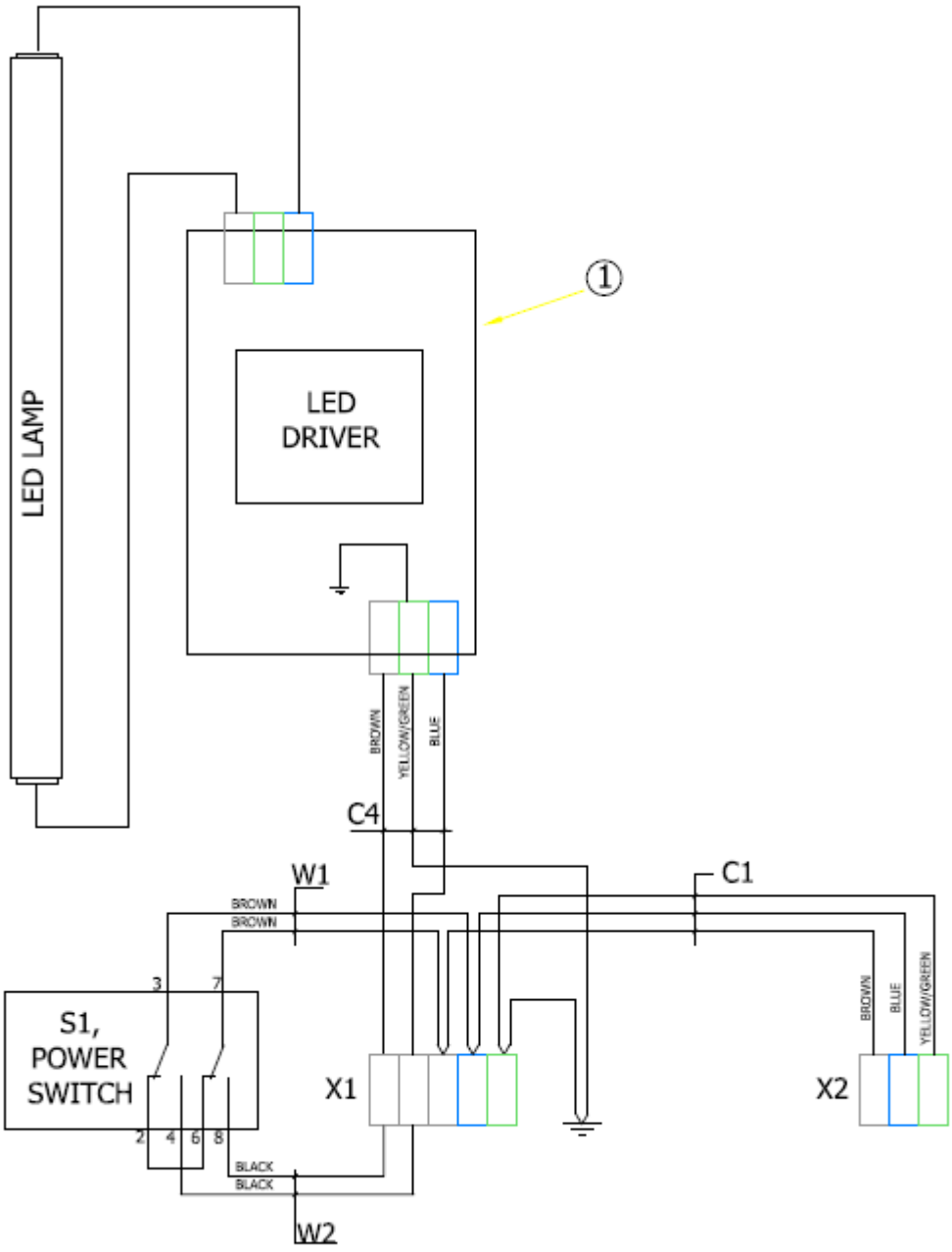



Fasten the two together using the self-drilling, self-threading screws that were supplied with the original assembly.

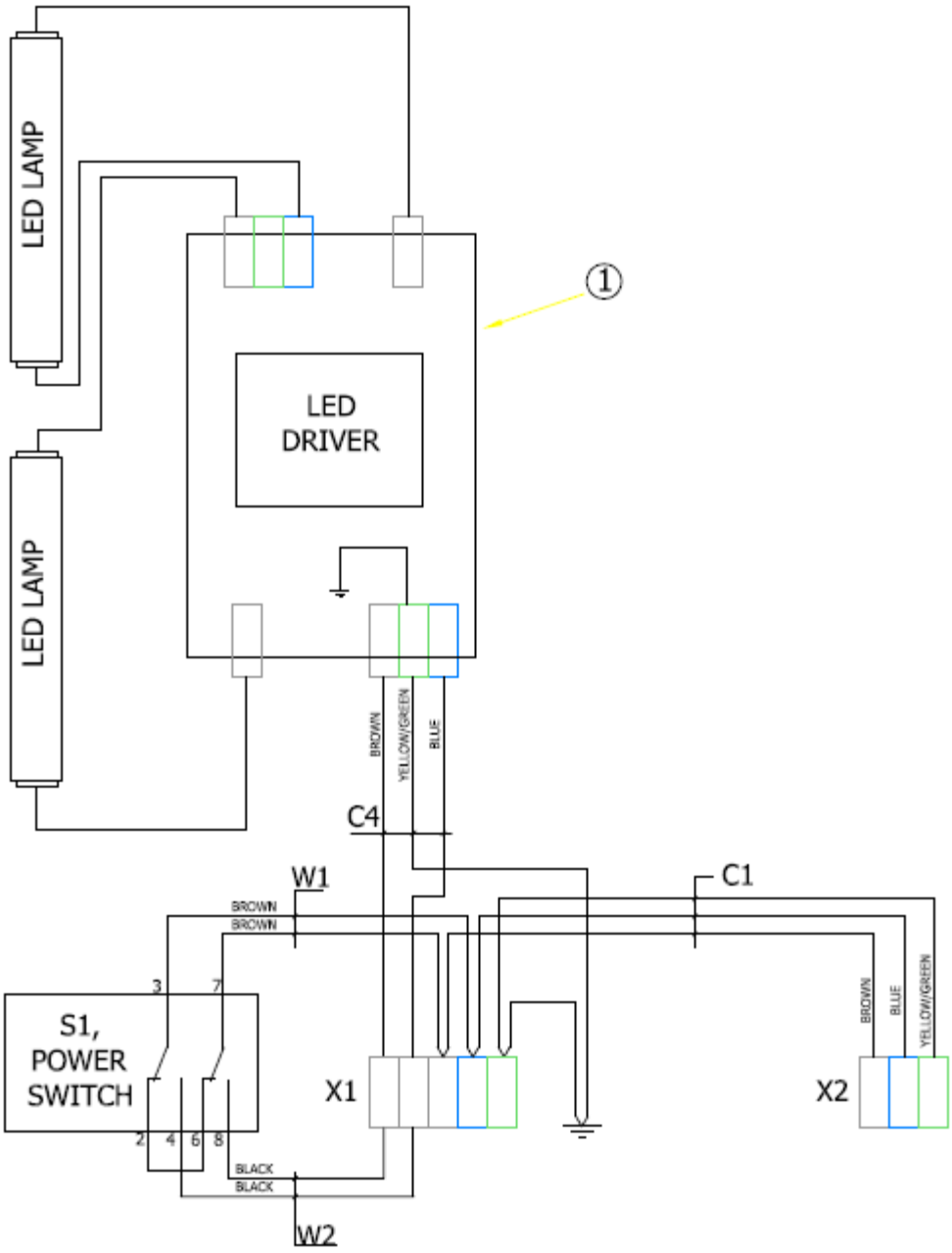
# 5. DRAWINGS

## 5.1 CONNECTION DIAGRAMS

### 5.1.1 Series Power LED tube (single LED tube)

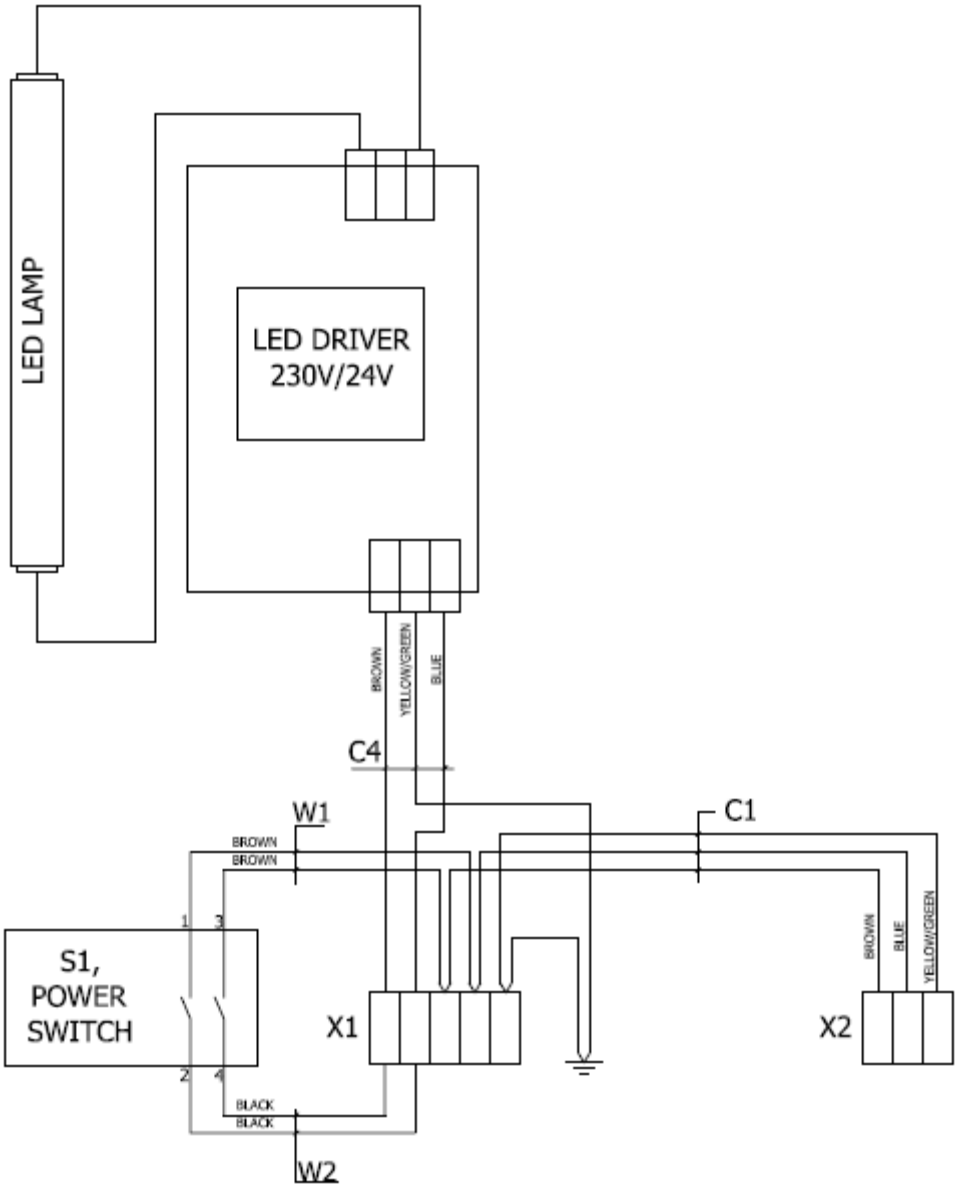


### 5.1.2 Series Power LED tube (double LED tube)

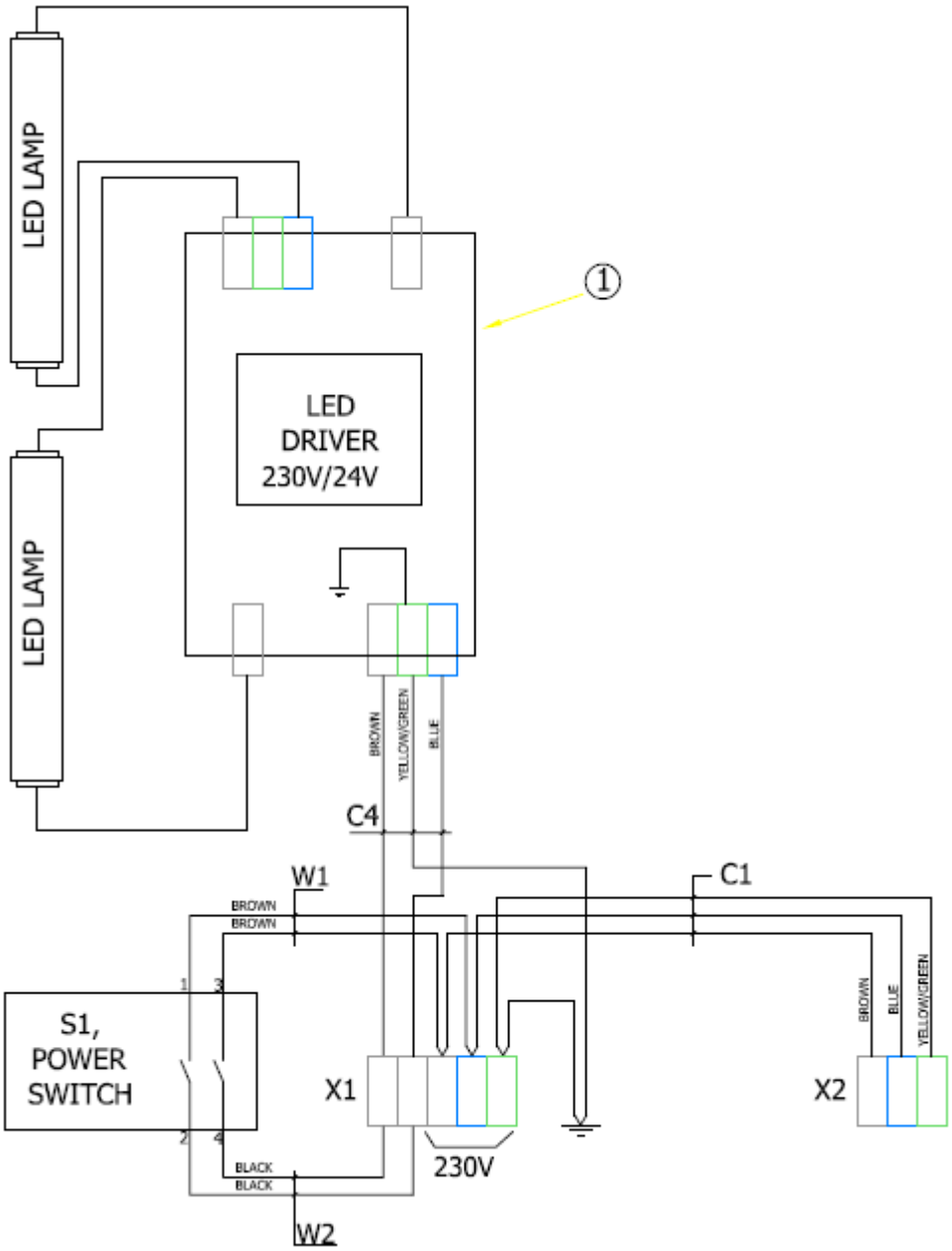



**Signs with constant light output 100% between 2.8-6.6A require double converters for the sign version 2100, 2500, 2700 and 3000mm. See chapter 2.1.4.2*

### 5.1.3 Parallel Power LED tube (single LED tube)

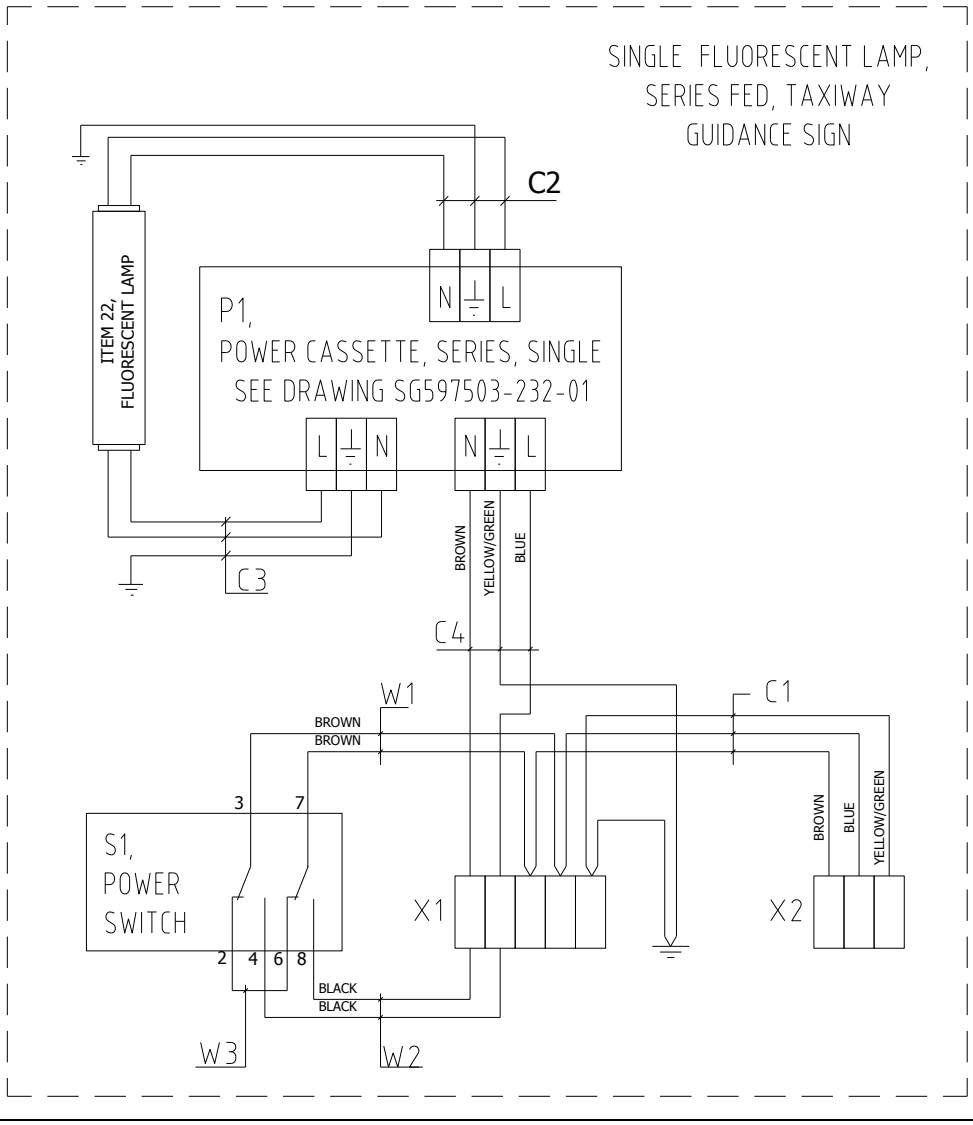


### 5.1.4 Parallel Power LED tube (double LED tube)



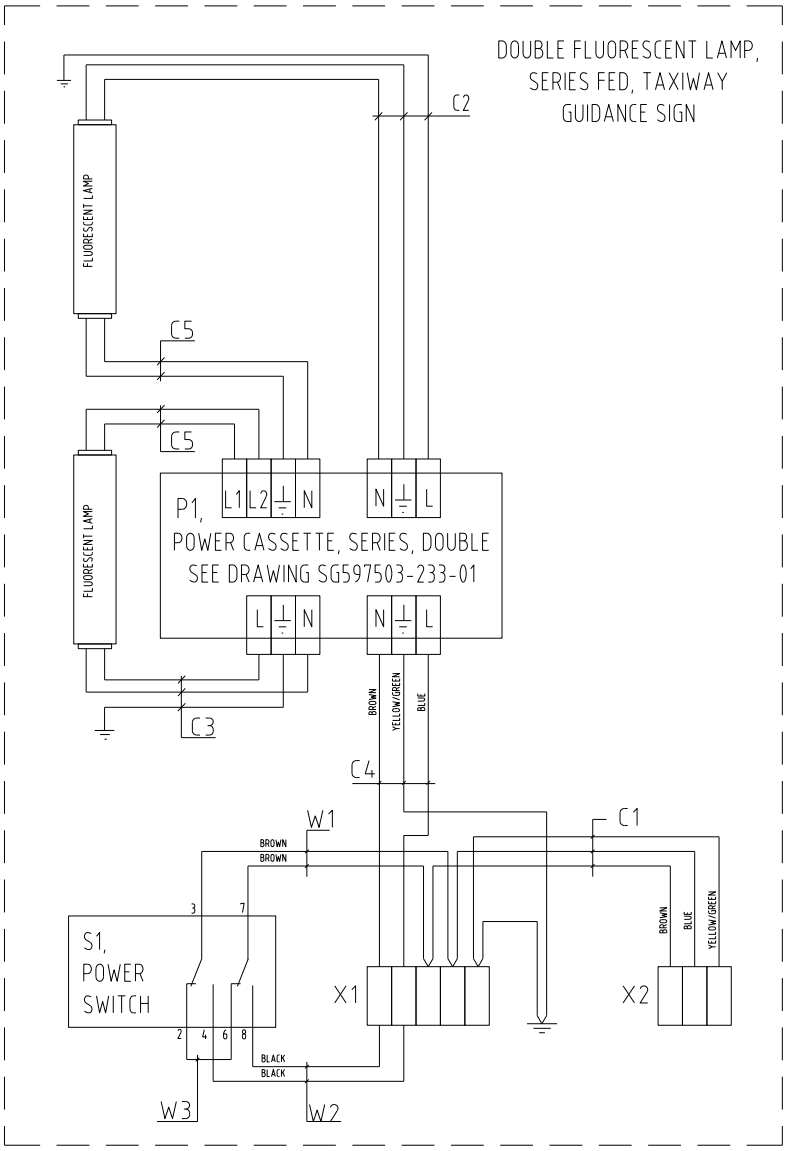
### 5.1.5 Series Power Fluorescent Lamp Signs, Single 36 W or 58 W Lamp.

**Connection diagram example**



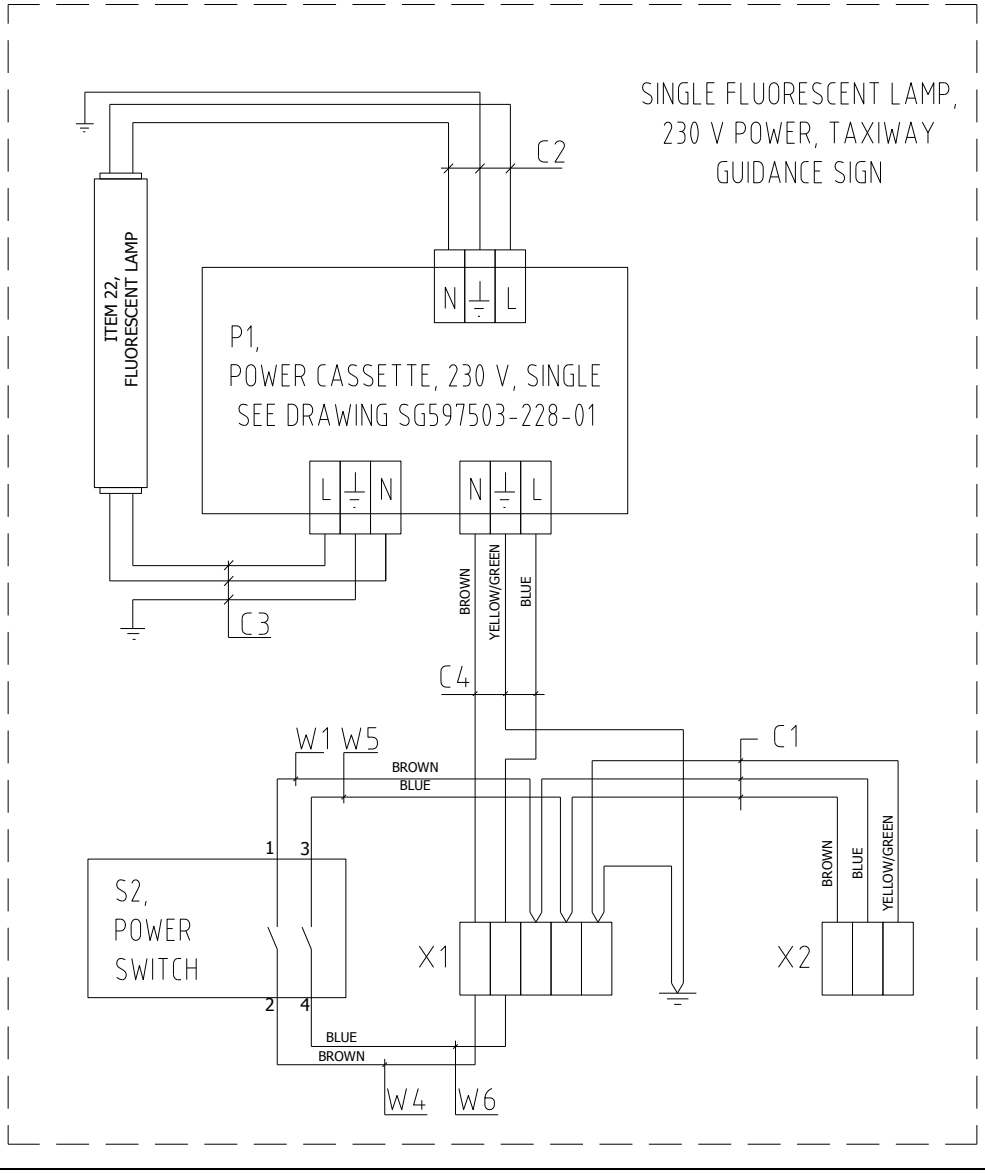
### 5.1.6 Series Power Fluorescent Lamp Signs, Double 36 W or 58 W Lamps

**Connection diagram example**



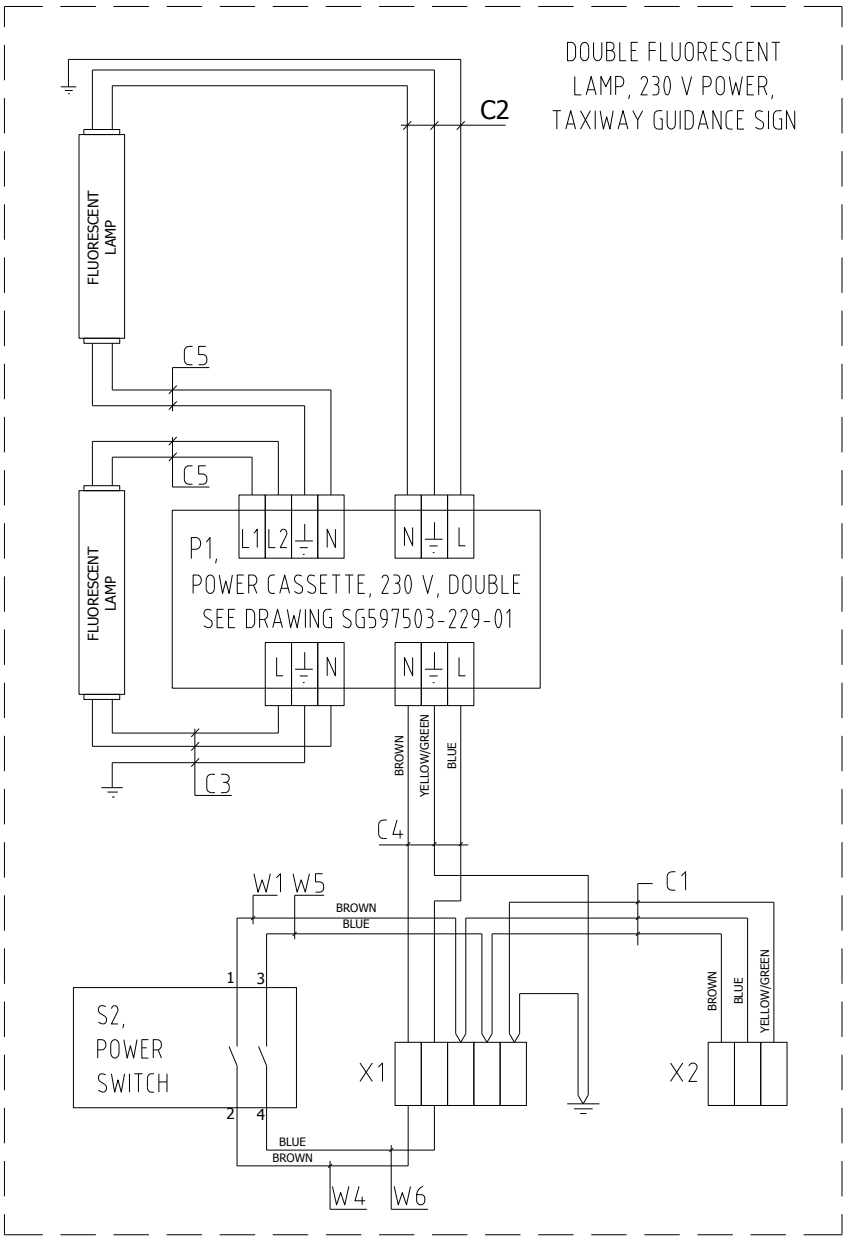
### 5.1.7 230 V Power, Fluorescent Lamp Signs, Single 36 W or 58 W Lamp

**Connection diagram example**



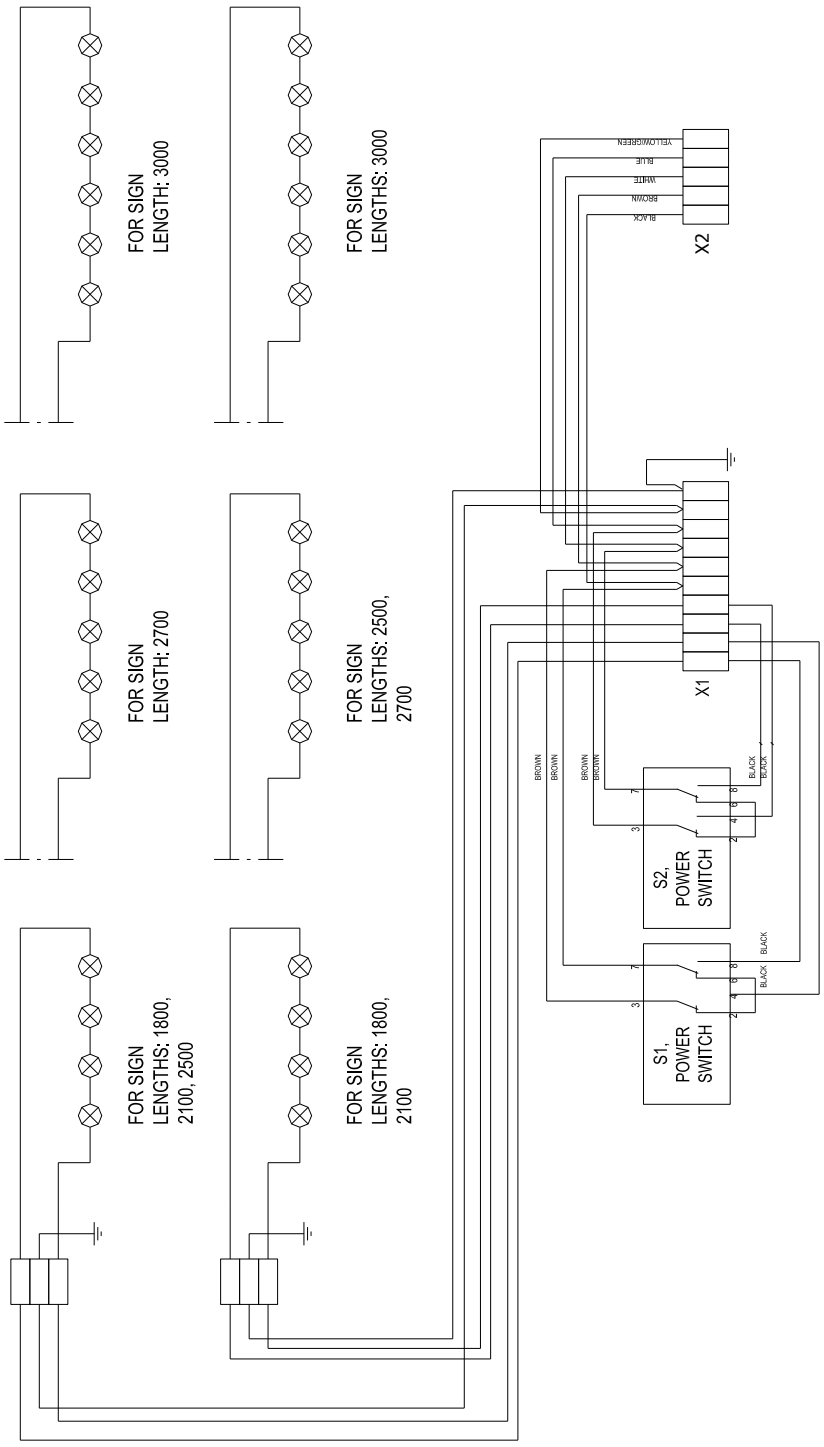
### 5.1.8 230 V Power, Fluorescent Lamp Signs, Double 36 or 58 W Lamp

**Connection diagram example**



### 5.1.9 Series Power Halogen Lamp Signs

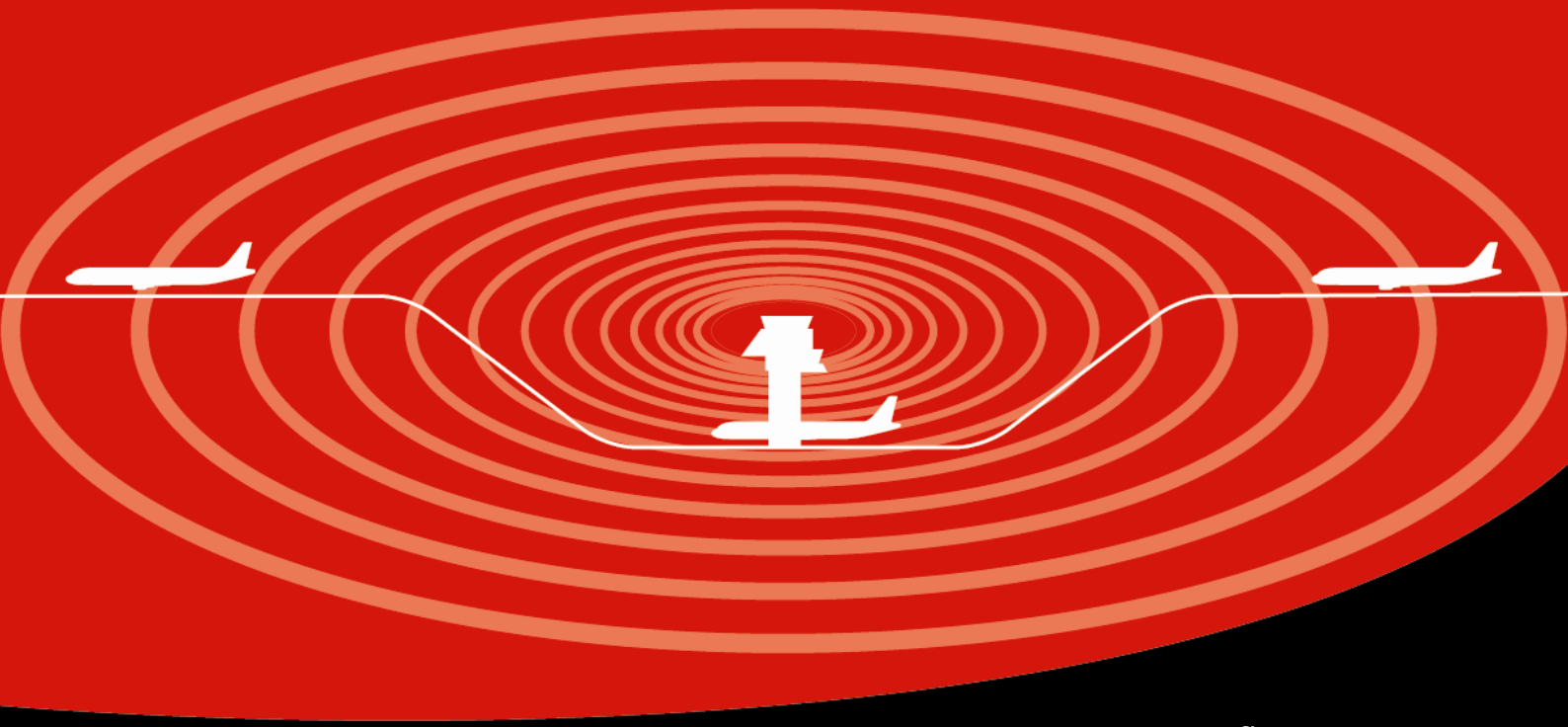
**Connection diagram example**



***Note**: This page is blank for convenient double-sided printing.*

# Check in to the future

How many aircraft can your airport handle today?
Can this number be increased without adverse effects on the airport's safety level?
It is a known fact that traffic volume will rise in the foreseeable future. More movements will demand monitoring of the entire airport. Requirements will be sharpened and the development of an integrated system controlling not only ground movements but also air traffic close to the airport is of the highest interest.
The International Civil Aviation Organization (ICAO) already describes A-SMGCS, Advanced Surface Movement Guidance and Control System, as the answer to the future modern airport need to control the entire airport space in one superior system.
To a larger extent than today's systems, A-SMGCS will rely on automated processes to give both pilots and traffic controllers exact information about positions and directions. Safegate Group delivers complete A-SMGCS solutions already, as well as all vital parts relating to it.
Safegate Group can check your airport into the future – today!

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