BETAFENCE

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# BT 4 – BT 5

## SINGLE/ DOUBLE ELECTROMECHANICAL TURNSTILE FOR PUBLIC ACCESS

INSTALLATION MANUAL

June 2012

**General safety measures**

This manual has been written for professionals and their employees.

- The installation, electrical wiring and settings must be installed according to the rules and statutory regulations.
- Carefully read the instructions prior to installing the equipment. Incorrect installation can be dangerous or void the warranty.
- If you have any suggestions or remarks about this installation manual, please send an e-mail to documents@betafence.com

**All rights reserved**

- All specifications are written and reviewed with the greatest care and attention. However, we do not accept any responsibility to third parties for possible faults or shortcomings.
- We reserve the right to make any technical alterations to the product without prior notice.
- Nothing from this manual may be copied or distributed in any form without the prior permission of the manufacturer.

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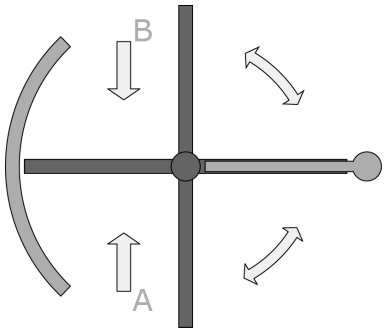
# 1. GENERAL

## 1.1 Principle

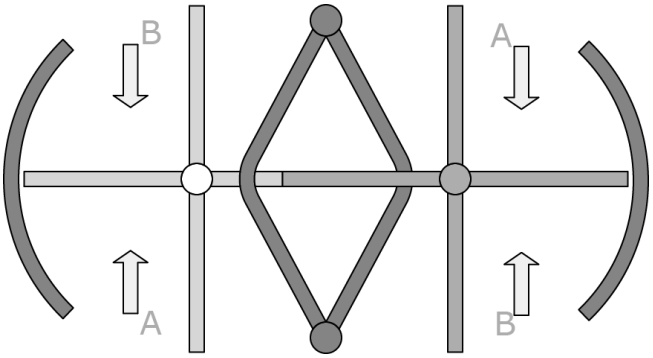
A turnstile is a physical barrier, designed to control the flow and direction of visitors at a certain point.

The turnstile mainly consists of two parts: a fixed section (frame or cage) and a mobile section (rotor). The rotor revolves on its axis when pushed by a visitor. The space created by the rotor has been calculated to provide a comfortable passage for only one person at a time.




## 1.2 Number of rotors

The turnstile is available with a single or double rotor. Aside from doubling the capacity, two rotors also provide the option to separate arriving and exiting visitors.



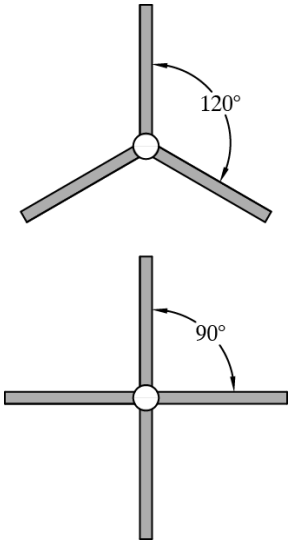

## 1.3 Rotating direction

The rotor will always rotate clockwise for walkways A; and always anti-clockwise for walkways B.

## 1.4 Number of rotor arms

Rotors are available with three arms at a 120° angle or four arms at a 90° angle.

Rotor arms at a 120° angle provide the visitor with a more comfortable passage in comparison to the 90° angle. A 120° rotor is used when user comfort and flow prevail over security, for example in fitness clubs, football stadia, recreation parks etc. A 90° rotor is used when security prevails over comfort and flow, i.e. to guarantee that only one person enters the turnstile at a time and this without any large equipment or bags, for example, in banks, computer rooms etc.

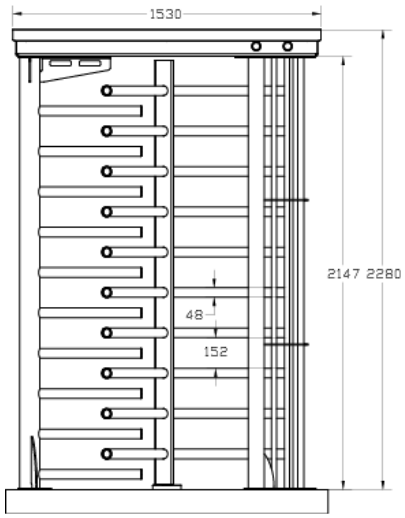


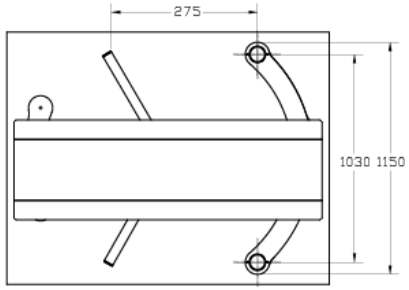
# 2. SPECIFIC FEATURES

## *2.1 General measurements*

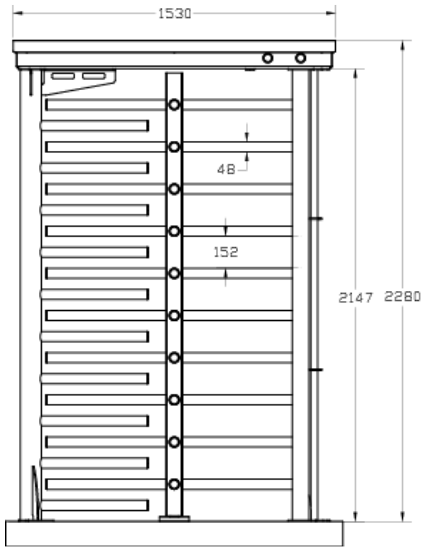
### BT 4

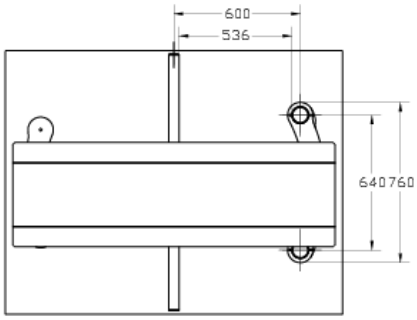
Single 120°



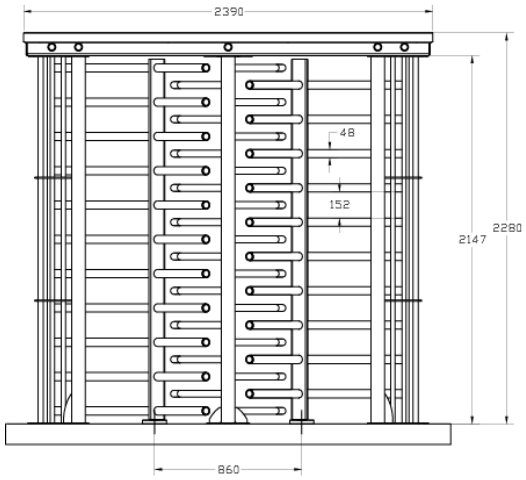

Single 90°

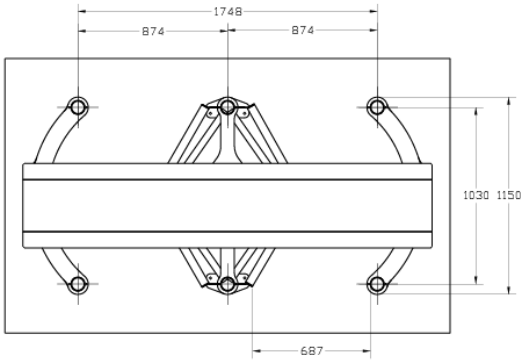


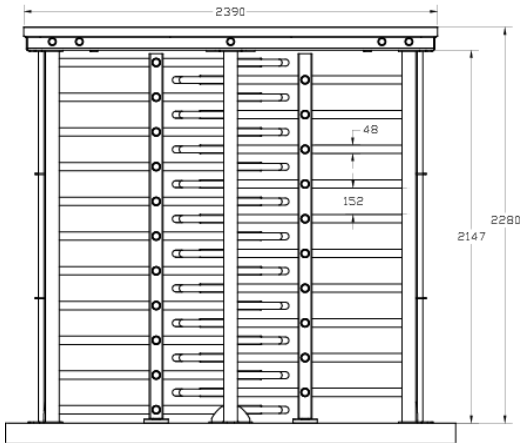
# BT 5

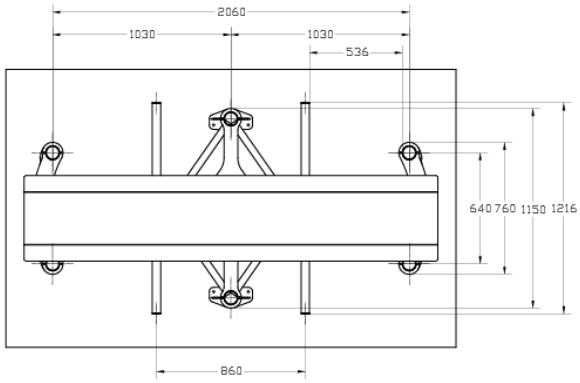
Double 120°




Double 90°




## 2.2 Material

The entire construction is built from and finished with a two-colour powder coating, dark grey (RAL7016) and white aluminium (RAL9006).

## 2.3 Mechanism

The mechanism is directly accessible via the roof panel. The rotation of the column is controlled by a self-centering system which automatically places the column in the next starting position after every cycle. The rotor is blocked in its initial position by solid catches. A spring provides the necessary rotation resistance.

A cloverleaf tracer enables a gradual slow-down when nearing the end position after a passage, preventing the turnstile from stopping abruptly.

A magnetic sensor detects the intermediate position (45° or 60°) which prevents the rotor from jamming mid-way through a rotation.
In case of power failure, the rotor will automatically be released (fail-safe).

The turnstile has an adjustable working mechanism, suitable for bidirectional use (checked when entering, free when exiting, or combinations). This setting can easily be changed on-site.

## 2.4 Control unit

All control parts are directly accessible via the roof panel. The passage(s) is controlled by microprocessor operated electronics. Access can be controlled externally using push buttons, token machines, card readers etc. The open structure of the control unit enables the turnstile to be connected to existing infrastructure.

## 2.5 Technical specifications

| | | |
|---|---|---|
| Power supply (V) | 230 | 230 |
| Frequency (Hz) | 50-60 | 50-60 |
| Nominal power (A) | 0.5 | 0.5 |
| Capacity (W) | 110 | 110 |
| Impulse length (sec) | 1 | 1 |
| Temperature range (°C) | -15/+75 | -15/+75 |

# 3. OPERATION

When a pulse input is activated for a certain direction, the turnstile will be released for this direction. If the rotor is not set into motion within the preset time (5 seconds default) after the pulse is received, it will lock again. If the rotor is set into motion within this time, access can take place for an unlimited time, i.e. there is no time limit on the movement of the rotor.

Once the rotation has started, there are two stages. Stage one is the movement of the rotor up to 45° (with a 90° rotor) or 60° (with a 120° rotor), during which it is still possible to return to the starting position. However, as soon as the rotor has returned to the starting position, it will be impossible to restart the rotation unless a new pulse is received.

The second stage is the movement of the rotor beyond 45° (with a 90° rotor) or 60° (with a 120° rotor) after which it is only possible to complete the full rotation to the next 90° position (with a 90° rotor) or 120° (with a 120° rotor), or to return to 45° (or 60°).

# 4. INSTALLATION

## 4.1 Foundations

A concrete slab of minimum depth 150mm is required. Minimum measurements according to floor plan. If the finishing layer consists of bricks or floor tiles, they must first be laid on top of the concrete slab before the turnstile can be installed. The finishing layer (whether this is concrete, bricks...) must be perfectly leveled.

## 4.2 Conduit

A Ø40 conduit must be provided. See floor plan for possible positions (positions no. 3).

## 4.3 Cable

The cable must be **6m** long above the finishing layer.

## 4.4 Holes

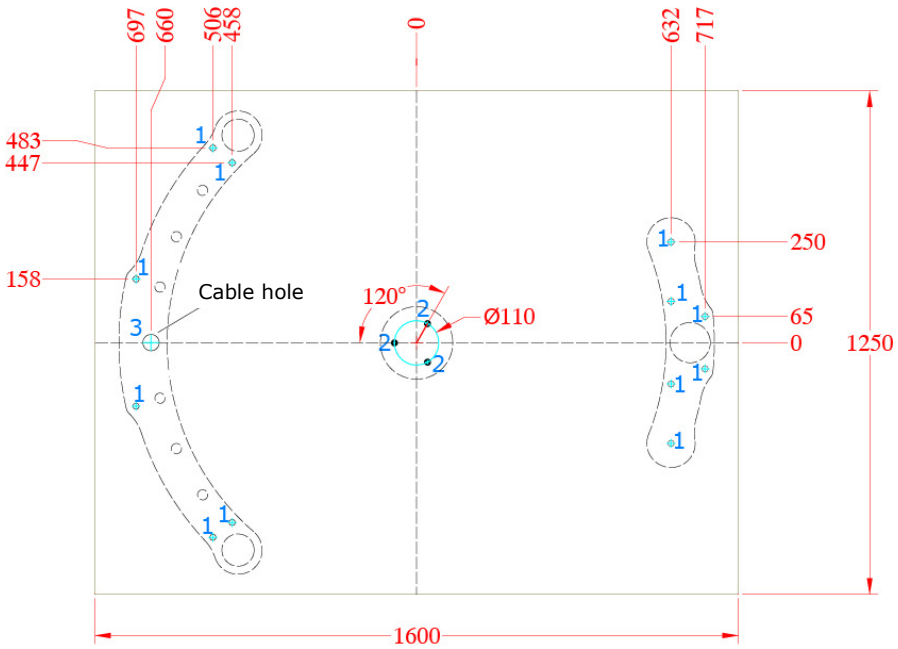
See floor plan for the position of the holes.

| *Position number* | *Hole type* | *Holes for* |
|---|---|---|
| 1 | Φ 12x150 deep | Cage |
| 2 | Φ 12x100 deep | Rotor |

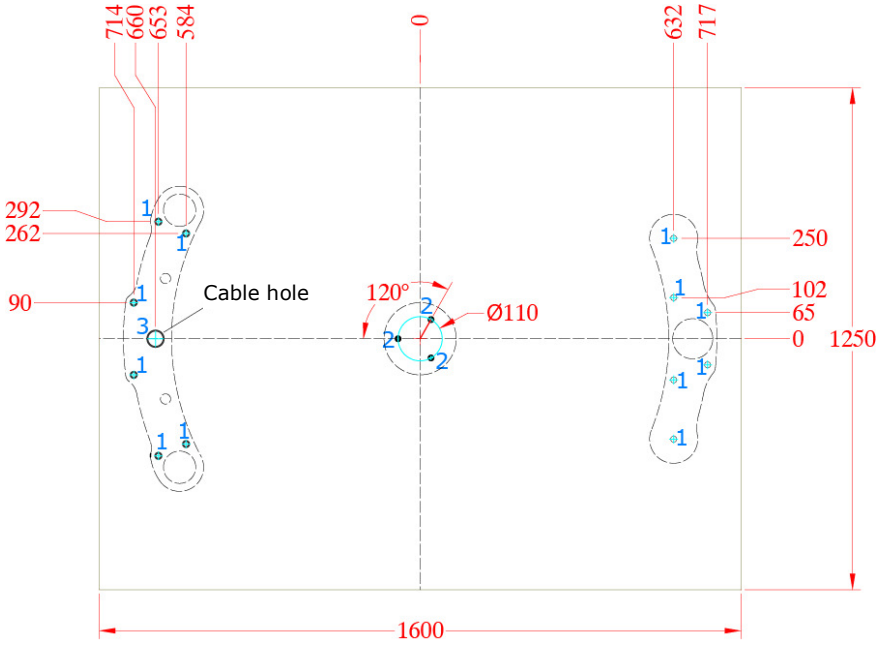
A template may be used to gauge the drilling. There is a type available for every model.

## 4.5 Floor plan

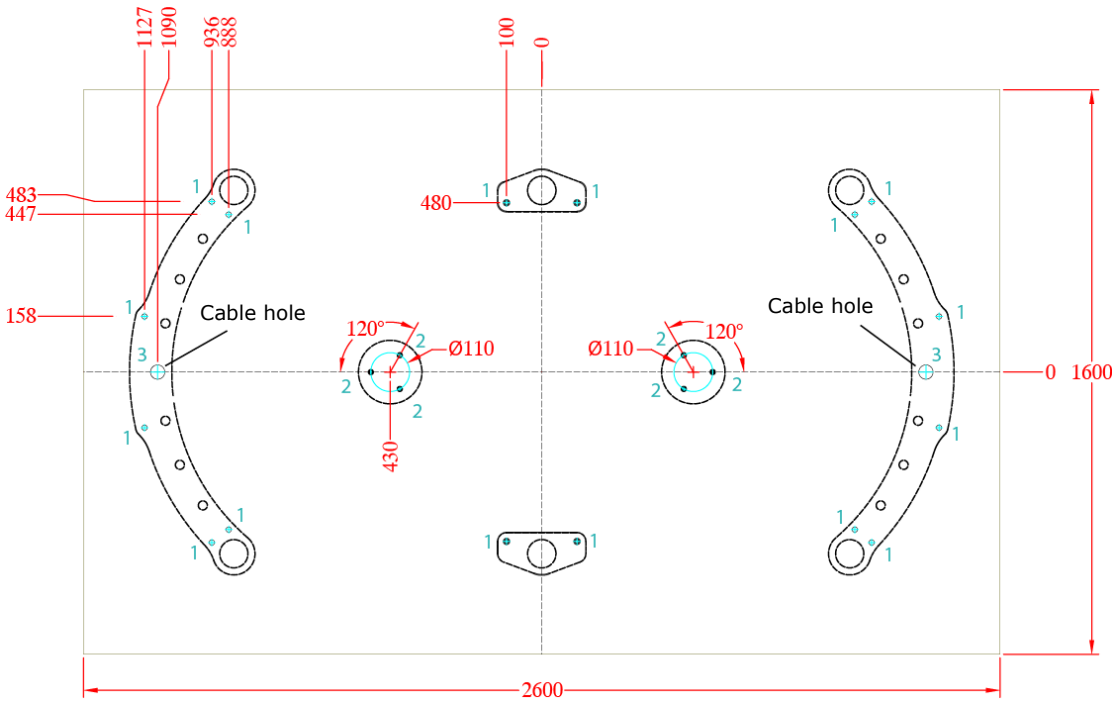
Single 120°



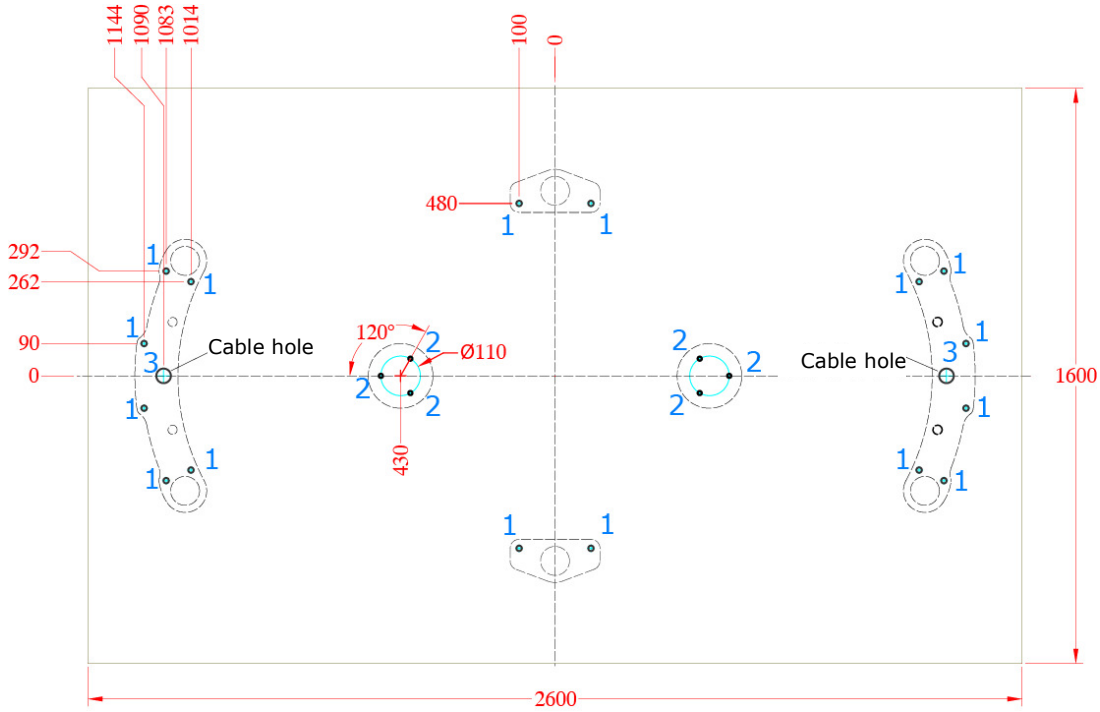
Single 90°




Double 120°



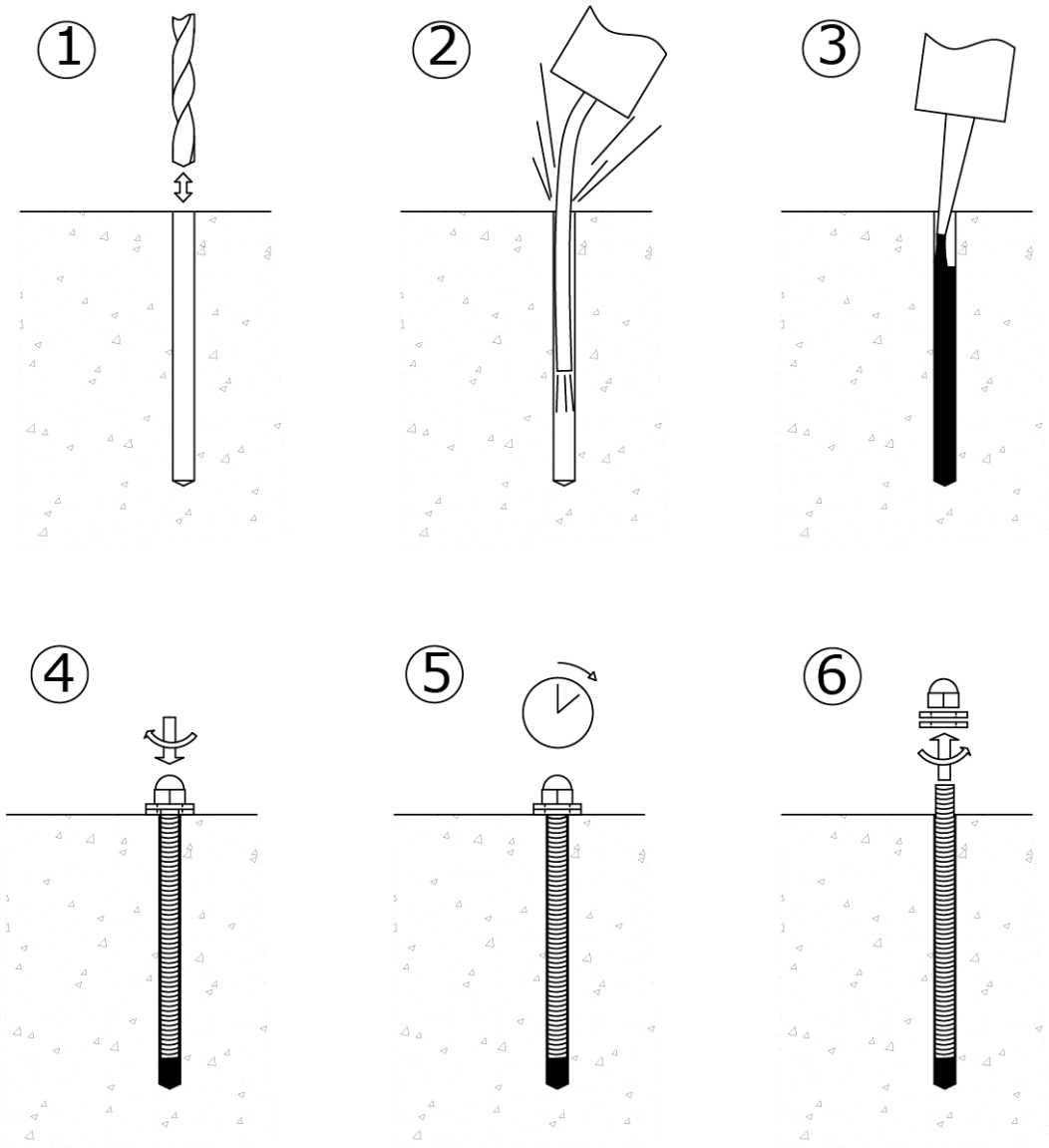
Double 90°


1144
1090
1083
1014
100
0
480
292
262
90
0
Cable hole
120°
Ø110
430
Cable hole
1600
2600

## *4.6 Securing cage section*

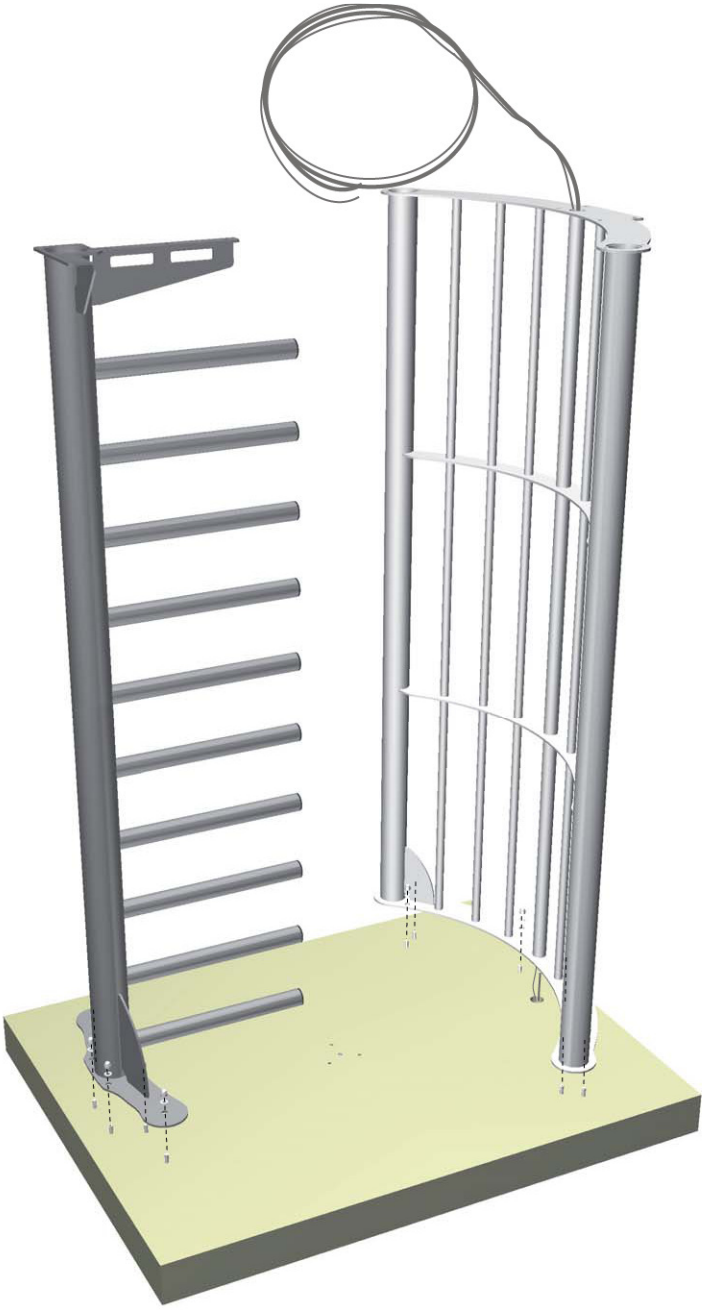
The cage must be secured using threaded rods (M10), washers and button head screws. After drilling, the holes must be cleared using an air pump or compressor. The threaded rods can be secured with two component epoxy (e.g. Hilti Hit or Würth C100).

Procedure:



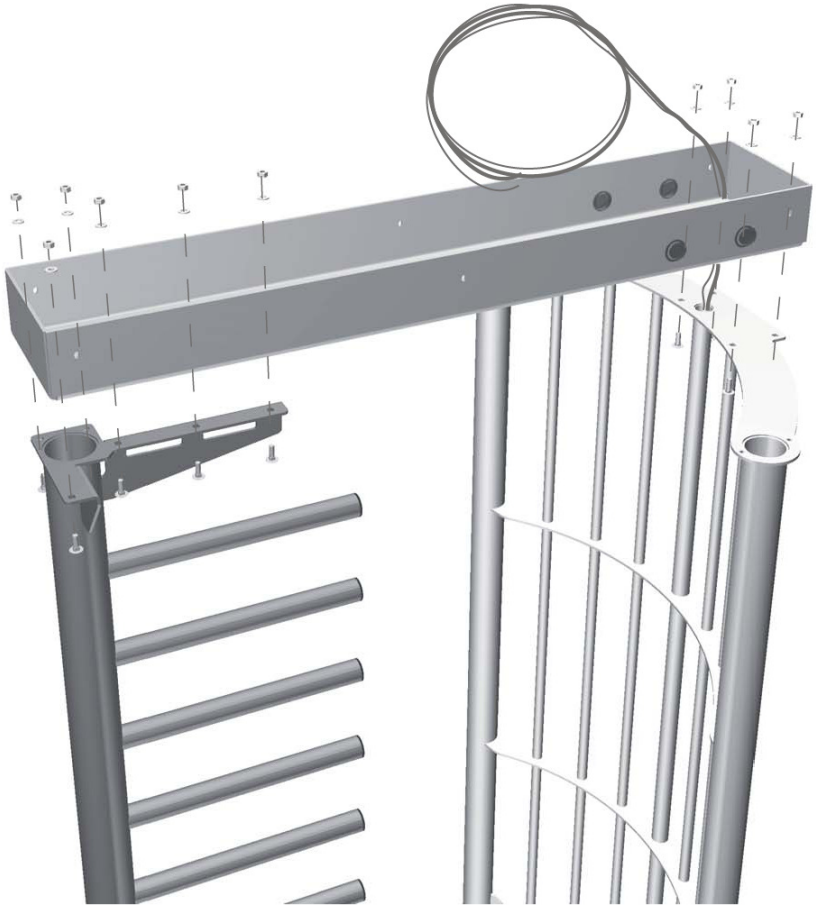
## *4.7 Positioning*

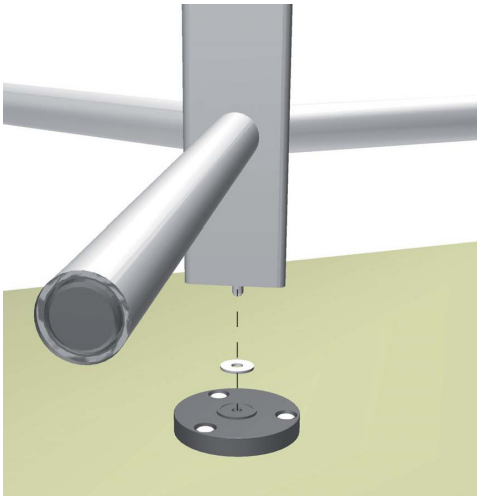
Position the cage (including the middle section in the case of a double turnstile). Feed the cable through the fitted cable hole. Secure with washers and button head screws M10.



The central plate for the rotor must be secured with 3x Φ12 screw plugs, washers and 10x80mm hexagon-head bolts.

The roof panel is secured next with 10 button head bolts, washers and screws M10.





Position the rotor on the central plate and insert a greased mudguard washer M12 in between.

Position the mechanism on the rotor and secure with 4 button head bolts, washers and screws M10.

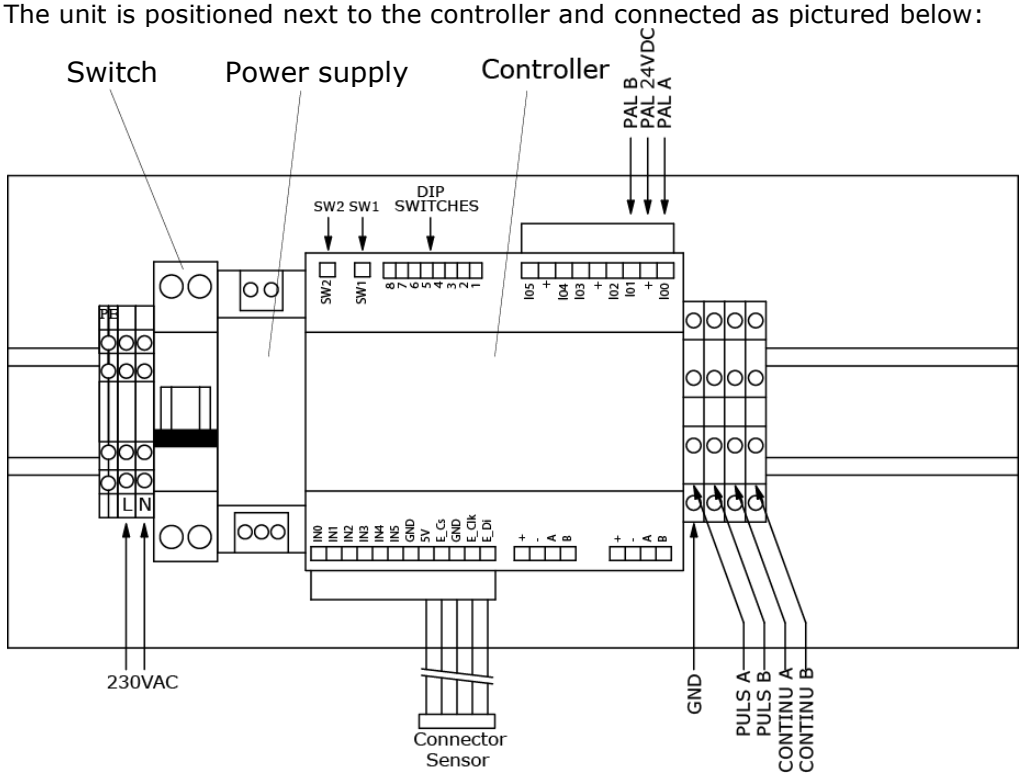
Position the control unit next to the mechanism and set up the required connections (also see 'Control Unit' chapter').

When everything works correctly, the panel can be installed using the screws M4 (6x) supplied.

# 5. CONTROL UNIT

## 5.1 General

The control unit comes precabled and consists of a microprocessor operated controller, a lead, switch and the necessary terminal clamps.
The unit is positioned next to the controller and connected as pictured below:



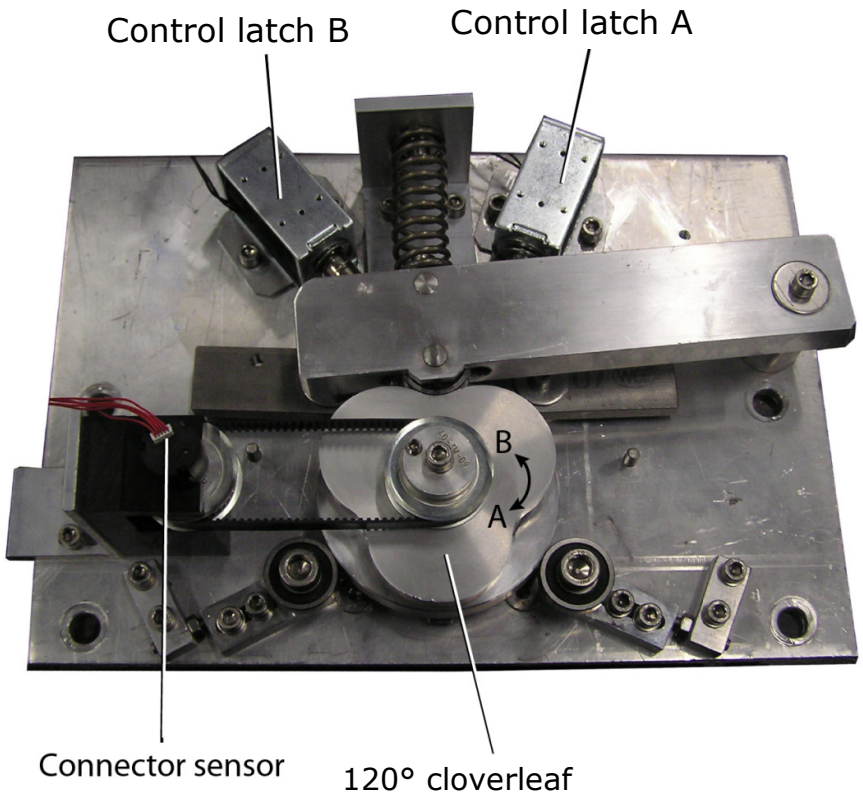

DIP switch
Dip 7 ON continuously opens the turnstile in direction A.
Dip 8 ON continuously opens the turnstile in direction B.
The other DIP switches must be in the OFF position.

Push buttons (also see configuration)
SW1: a quick push initiates a pulse in direction A (testing purposes)
SW2: a quick push initiates a pulse in direction B (testing purposes)

## 5.2 Connection to the mechanism

Control unit Catch A and control unit Catch B must be connected to the **+ terminal** and **I00** or **I01** of the controller. As the common terminal, the '+' terminal provides a 24 VDC power supply for the reels to operate the catches.

Note the connection of the position sensor on the below figure:




## *5.3 Control from a distance*

**PULSE A/B**
The entrance must be connected to the 'Common' terminal using a normal open contact. By closing the contact when inactive, access for A or B will be granted for a previously set period. When the rotor receives a pulse when active, the instruction will be saved in the memory. This will also be the case if the rotor rotates in the opposite direction when the pulse is received. In both cases, the second access will be granted once the first one is complete.

**CONTINUOUS A/B**
When this entrance is connected to the 'Common' terminal, e.g. using a switch, the turnstile is released for the appropriate direction. No pulse is required at the relevant **PULSE** entrance in order to gain access. When the connection to the 'Common' terminal is disconnected during the movement of the rotor, the action will first be completed before the rotor is locked again.

# 6. CONFIGURATION

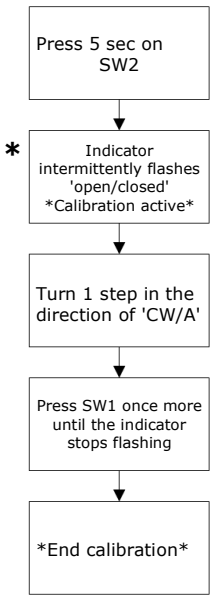
## *6.1 Calibration*

### 6.1.1 General

Before the turnstile can be used, the control unit must be calibrated, i.e. the control unit and the mechanism must be fine-tuned to one another. This can take place during the production or at a later stage on-site, for example, during recalibration after replacement of the control unit or repair of the mechanism.

Remark: calibration is identical for every type of rotor. The type will be automatically recognised during calibration.

### 6.1.2 Procedure




(*)
Indication = LEDs under DIP switches 5...8.

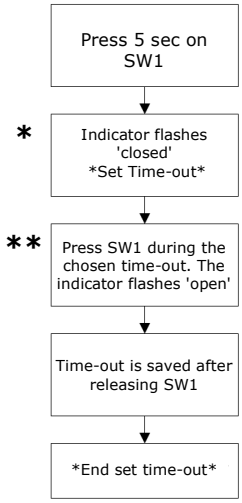
## *6.2 Time-out*

### 6.2.1 General

Time-out is the time during which the turnstile is released in a certain direction after a pulse is received for this direction.

During production, time-out is set to 5 seconds, which can be changed on-site.

## 6.2.2 Procedure




(*)
Indication = LEDs under DIP switches 6 and 8.

(**)
Indication = LEDs under DIP switches 5 and 7.

# GENERAL WARNINGS

## *Precautions for installation and user*

- After unpacking, please check if the turnstile is intact. In case of doubt, do not use the turnstile and consult with the qualified personnel. The packaging consists of plastic bags, expanded polystyrene, nails, etc., and must therefore be kept away from children, as they may pose danger.
- The turnstile may only be used for the purpose intended by the manufacturer. Any other use should be considered inappropriate and therefore dangerous. The producer declines responsibility for any damage that may follow from unprofessional, incorrect and unreasonable use.
- In the case of breakdown and/or incorrect use of the turnstile, please contact the manufacturer or an authorized service in order to perform the necessary repairs.

## *Important remarks*

- Avoid proximity to the spindle, as body parts and clothing may get caught in them.
- Please remember that the turnstile may be exposed to significant forces (e.g., wind), which can be a source of danger. Keep a safe distance from the turnstile while it is moving.
- Don’t allow children to play within the working range of the turnstile even when it is not working.
- Make sure that the person who opens or closes the turnstile holds it correctly and leads it throughout its movement.
- Inform all users of these warnings. You may post this information in an appropriate location.
- It is essential to follow the instructions of the manufacturer in order to ensure correct installation and functioning.

## *Maintenance*

- The functioning of the turnstile must be checked at least every two months.
- With normal use you have to put some grease between the spindle/foot plate and washer. (see picture)
- In the case of repairs, only original parts should be used.
- Damage to the coating should only be refinished with special paint by an authorized service.