



**SECTOR<sup>II</sup>**

## PRE-INSTALLATION BUYERS' GUIDE

Precision engineering, impressive speed  
best performance



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# 1. Pre-Installation flow diagram

Key Chart	
1	Installation mainstream
2	Sub installations

Client needs-analysis / First site visit  
Section 3

Buying decisions  
Section 4

Is this a **Sector II** upgrade?  
Section 4.1

No

Boom pole length  
Section 4.2

Yes

Note necessary changes  
Section 4.1

Barrier colour  
Section 4.4

Corrosion protection level  
Section 4.3

Orientation  
Section 4.5

Mode of Operation  
Section 4.7

Ancillaries  
Section 4.9

Tools and equipment  
Section 4.8

Second site visit  
Section 5

Install earth spike  
Section 5

Install concrete plinth  
Section 5

## 2. General description

The **SECTOR II** barrier has been designed to safely and cost-effectively apply high-duty vehicular access control to roadways between 3m and 6m wide. The battery backed-up system ensures continued operation in the event of a power-failure. The fail-safe position and collision-detection system have been designed and tested to set the standard in safety of operation and to provide an unparalleled level of reliability and durability in operation. The pole travel-limits are managed by a sealed opto-electronic system that ensures precise position and trajectory control. A precision die-cast gearbox and novel speed and trajectory control algorithm ensures smooth and rapid operation even after many years of service.

The **SECTOR II** control card has been designed to be easy and intuitive to use with helpful instructions on the status of the operation during, and after installation. Additionally, the clever design of the cabinet ensures that all electronics are easily accessible from the top of the unit.

**Some of the advanced features offered by the SECTOR II controller are:**

- Interactive GUI (Graphical User Interface) via a backlit LCD display to facilitate and simplify the installation process
- Fully automated single-button limit setup
- Independent memory input, non-memory input, barrier raise and barrier lower inputs
- Advanced closed-loop speed control to maintain safe and reliable operation in windy conditions
- Independent control of opening and closing speeds
- Selectable and adjustable Autolower
- Selectable mains-failure raise
- Smooth, adjustable start/stop (ramp-up and ramp-down)
- Multiple operating profiles
- Onboard receiver with full channel-mapping capability (limited to 500 buttons)
- A status LED output to indicate the barrier status remotely
- Advanced and proven lightning protection

### Lightning Protection

The **SECTOR II** electronic controller utilises the same proven surge protection philosophy that is used in all CENTURION products. While this does not guarantee that the unit will not be damaged in the event of a lightning strike or power surge, it greatly reduces the likelihood of such damage occurring. The earth-return for the surge protection is provided via the mains power supply earth.



**In order to ensure that the surge protection is effective, it is essential that the unit is properly earthed.**

### 3. Client needs-analysis / First site visit

The following questions should be considered to ensure that the correct barrier is purchased and installed.

- Is this a replacement, or new installation? (See Section 4.1)
- Does the site require a 3m, 4.5m or a 6m barrier? (Section 4.2)
- Does the site require a left-hand or right-hand barrier orientation? (Section 4.5)
- Does the site require a barrier with specific corrosion resistance? (Section 4.3)
- Is this a high-security site that may require roadway spikes? (Section 6 - CLAWS)
- Is a Jack-knife assembly required to meet limited height restrictions such as undercover parking? (Section 6)
- Are extra ancilliary products such as, traffic lights, breakaway couplers, and barrier fences required? (Section 6)
- Is Simplex or Complex Mode of barrier operation required? (see Section 4.6)
- What safety devices are required to meet regulatory requirements? e.g. inductive loops and/or IR Beams (Section 6)
- Does this site require extended battery backup? (Section 6 - 33Ah Battery)
- Does the site require any equipment to meet country-specific regulatory requirements? (electrical isolation, etc.)
- Does the product require custom colour coding? (Section 4.4)



Create a buyer's list of the items required. A checklist is supplied in Sections 4.7 and Section 4.8

## 4. Buying Decisions

### 4.1. Compatibility

The **SECTOR** and the **SECTOR II** are retro-fittable should there be a situation where an existing **SECTOR** needs to be replaced with a **SECTOR II**. The following considerations need to be acknowledged before performing a retrofit installation.

- The **SECTOR II** fits within the **SECTOR** footprint. This may have implications with respect to cable entry (Figure 1)
- The wiring will need to be lengthened, due to the difference in mounting points of the controllers in the respective units
- If a FLUX 11-Pin loop detector needs to be installed, its base must be purchased
- Compatibility with ancillaries such as **CLAWS**, and Midi traffic lights

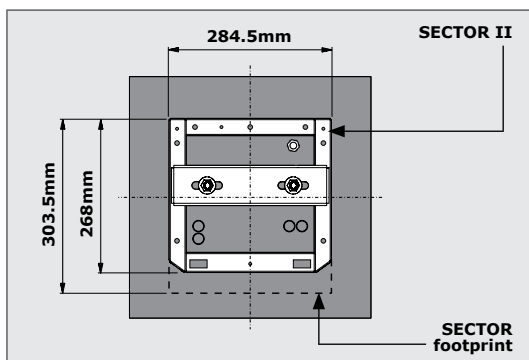


FIGURE 1

### 4.2. Deciding on the required boom pole length

The **SECTOR II** barrier is available in 3m, 4.5m & 6m boom pole variants. In most cases, the site will determine the length of the boom pole. Please note that the operator type and speed varies depending on the chosen pole length.

More detail on the specifications of each variant is mentioned in the user manual supplied with the **SECTOR II**.

### 4.3. Decide on the corrosion protection level required

The **SECTOR II** is available in varying degrees of corrosion protection to suit different environmental conditions. Refer to Table 1 to choose the most appropriate cabinet material based on the location of the installation site and the requirements of the customer.

Reference	SECTOR II Standard	SECTOR II Grade 430	SECTOR II Grade 316
Application	Inland Areas	Coastal Plains	Marine Areas
Main Housing Surface Protection	Pre-galvanised plate with epoxy coating	Grade 430 stainless steel with epoxy coating	Grade 316 brushed stainless steel
Housing Construction	Sheet metal housing, 1.6mm wall thickness with separate fabricated base frame to raise the housing off ground		
Cabinet Colour	Traffic Yellow (Other options are available on request)		
Mass of unit Packed (excluding pole)	45 kg		

TABLE 1

#### 4.4. Choosing the colour of the SECTOR II

The **SECTOR II** barrier is manufactured in traffic-yellow with a red lid as standard, but custom colours are available from Centurion Systems (Pty) Ltd upon request. Please note that the custom colours will require longer lead times and possibly include price premiums.

#### 4.5. Deciding on the orientation of the unit

The **SECTOR II** can be installed in different configurations. It is important to fully understand the site requirements before purchasing the unit. The following steps detail the differences between the orientations:

##### Step 1

Look at the site and decide where the unit will be positioned.

##### Step 2

Determine which direction the pole will face. This will enable you to ascertain whether a right-hand or left-hand barrier is needed for the installation.

Left-Hand Barrier	Right-Hand Barrier
<ul style="list-style-type: none"> <li>A left-hand barrier is a unit that is installed on the left-hand-side of the road from which the vehicle approaches. The door always faces the approaching vehicle</li> <li>If a left-hand unit is required, it may be necessary to convert the barrier to a left-hand barrier(see next point)</li> <li>A left-hand configured <b>SECTOR II</b> is available from Centurion Systems (Pty) Ltd upon request. Please note that left-hand configurations may require longer lead times</li> </ul>	<ul style="list-style-type: none"> <li>A right-hand barrier is a unit that is installed on the right-hand-side of the road from which the vehicle approaches. The door always faces the approaching vehicle</li> <li>All units are manufactured as right-hand units, unless otherwise specified</li> <li>It is always recommended to mount the barrier with the access-door facing the oncoming traffic. This ensures that if a vehicle hits the pole, the pole is knocked away from the barrier housing</li> </ul>

TABLE 2

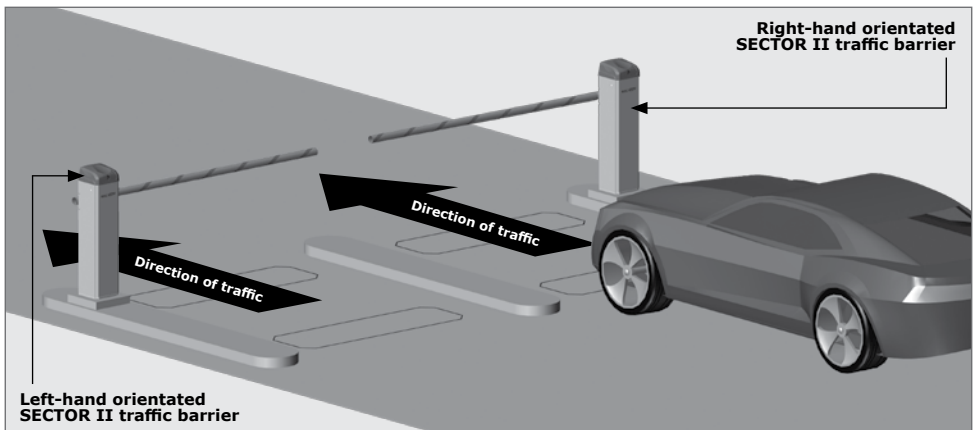
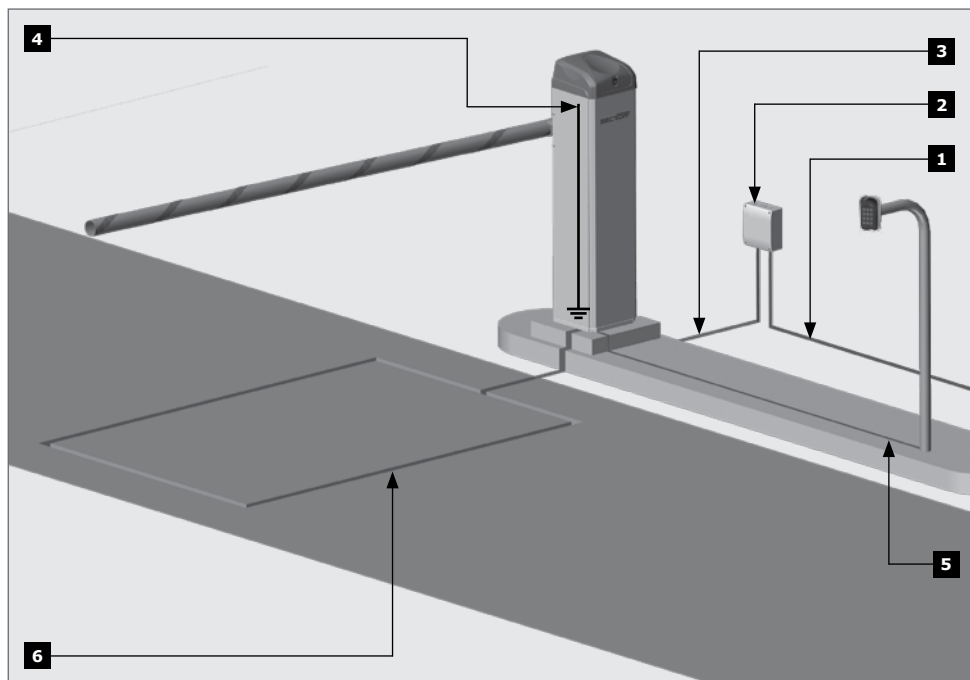


FIGURE 2



## 4.6. Cabling requirements



**FIGURE 3. COMPLEX MODE (BASIC)**

1. 90 - 240V AC mains cable (three-core LNE 1.5mm<sup>2</sup>)<sup>1</sup>
  2. A two-pole 220V AC Mains isolator<sup>2</sup>
  3. 90 - 240V AC mains cable (three-core LNE 1.5mm<sup>2</sup>)<sup>1</sup>
  4. Barrier earth to earth spike cable (5mm<sup>2</sup> copper-weave conductor)
  5. Low voltage ancillaries (0.5mm<sup>2</sup> multi-strand)
  6. Inductive-Loop(s) (1.5mm<sup>2</sup> multi-strand, silicon-coated)
1. The type of cable used must adhere to municipal bylaws but typically SWA (steel-wire-armoured) cable is recommended. The armouring provides excellent screening, which gives better protection against lightning - earth only one end of the screen
  2. Although the **SECTOR II** includes an AC mains Isolator as standard equipment, certain country-specific regulations mandate external AC mains isolation (typically within arms reach of the equipment in use).

## 4.7. Selecting a Mode of Operation for the installation

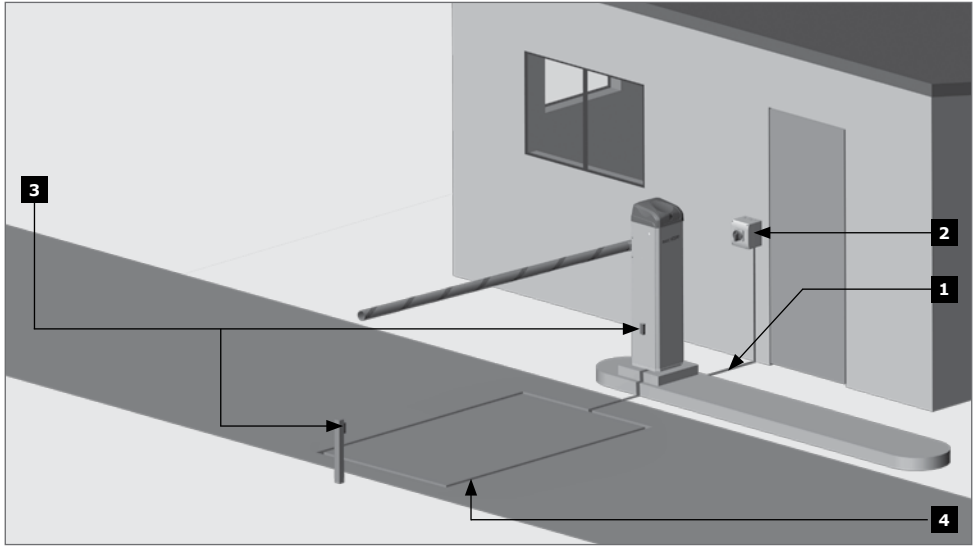
The **SECTOR II** barrier can be set up to work in different modes depending on the site requirements. The various modes are detailed below for clarification. Determine which mode is suitable for the installation in order to understand the site preparations that are necessary before installing the physical barrier.

### 4.7.1. Simplex Mode

Simplex Mode is the most basic mode for operating the barrier. The boom pole raises when a remote button linked to the onboard receiver is pressed, or the TRG (trigger input) is activated on the controller. This input can be triggered by a number of ancillary devices such as a pushbutton, keypad, proximity-card reader etc.

The controller must be set to Autolower after a pre-determined time has elapsed. See the installation manual for information relating to the Autolower function.

For vehicle and pedestrian safety, it is necessary to have safety beams or an inductive safety-loop installed, to ensure that the pole does not close on a vehicle.

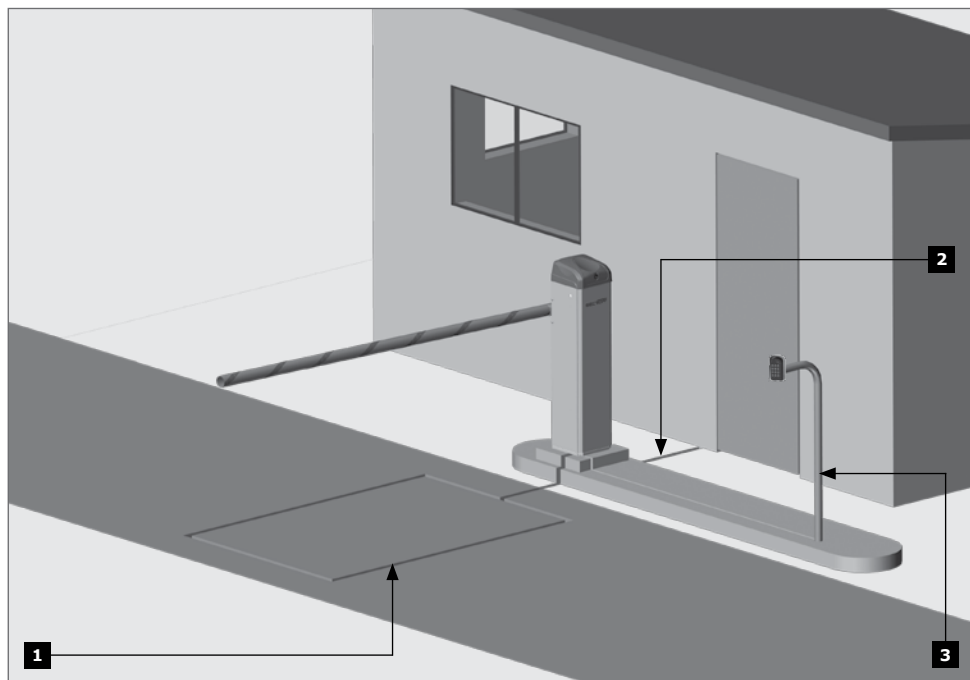


**FIGURE 4. SIMPLEX MODE**

1. 90 - 240V AC mains cable (three-core LNE 1.5mm<sup>2</sup>)<sup>1</sup>
  2. Pushbutton control (0.5mm<sup>2</sup> multi-strand)
  3. Infrared safety beams (0.5mm<sup>2</sup> multi-strand)  
The beams in Figure 4 are Photon wireless infrared safety beams.
  4. Inductive-Loop (preferred) (1.5mm<sup>2</sup> multi-strand, silicon-coated)
1. The type of cable used must adhere to municipal bylaws but typically SWA (steel-wire-armoured) cable is recommended. The armoring provides excellent screening, which gives better protection against lightning - earth only one end of the screen

### 4.7.2. Complex Mode

The **SECTOR II** can be triggered by any number of devices - such as proximity readers, card readers, keypads, remote controls, etc., and will raise in the event that one or more of these external devices are activated. It requires a closing-loop and the pole will lower once the vehicle has cleared the closing-loop. It is possible to use an infrared beam but an inductive-loop is preferred.

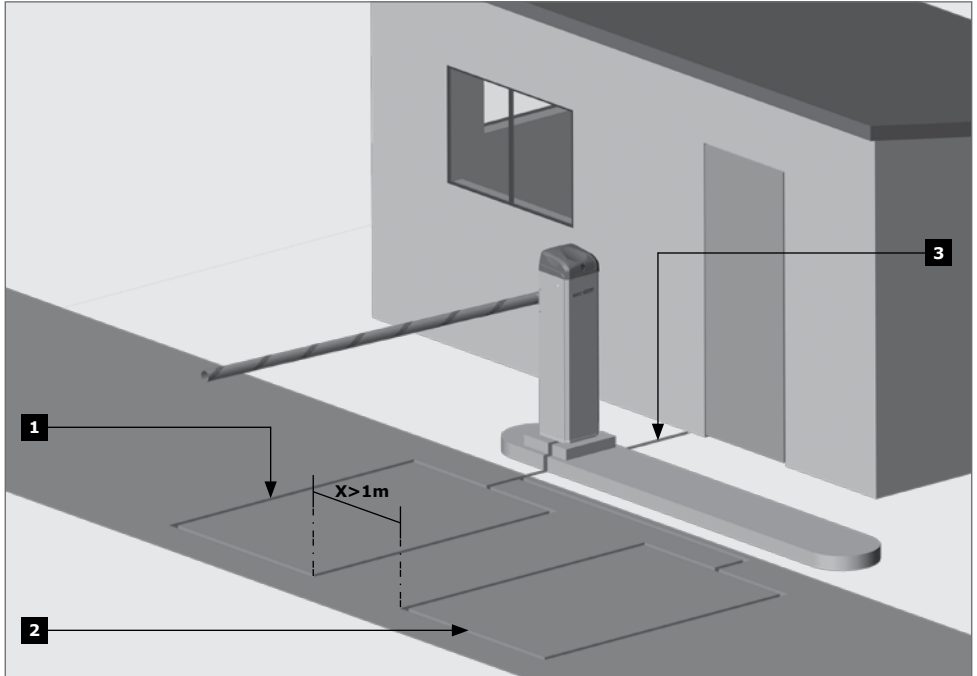


**FIGURE 5. COMPLEX MODE (BASIC)**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Inductive-Loop(s)<br/>(1.5mm<sup>2</sup> multi-strand, silicon-coated)</li> <li>2. 90 - 240V AC mains cable<br/>(three-core LNE 1.5mm<sup>2</sup>)<sup>1</sup></li> </ol> | <ol style="list-style-type: none"> <li>3. Access control device<br/>(0.5mm<sup>2</sup> multi-strand)</li> </ol> |
|---|---|
1. The type of cable used must adhere to municipal bylaws but typically SWA (steel-wire-armoured) cable is recommended. The armouring provides excellent screening, which gives better protection against lightning - earth only one end of the screen

### 4.7.3. Free-exit for uni-directional traffic mode

The free-exit function allows vehicles to exit a facility by automatically raising the barrier. It is recommended that an inductive-loop detector be used to activate the free-exit facility. Infrared beams can be used for this function but a loop is preferred. The free-exit method can be used for Uni-directional traffic with a free-exit facility where the closing-loop will be used to lower the boom pole the moment that the vehicle has cleared the inductive loop.



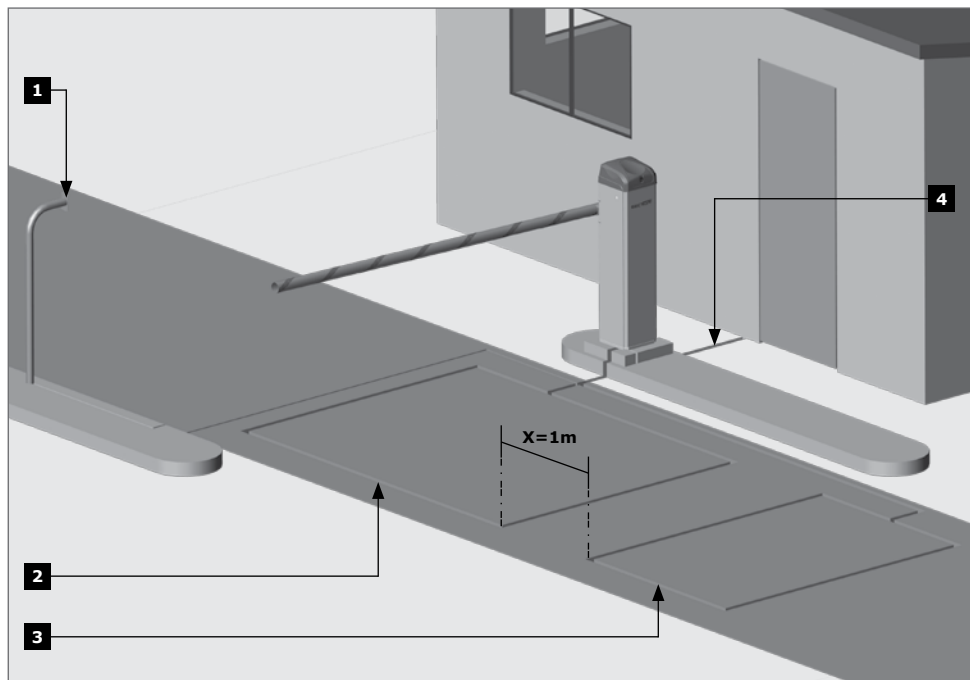
**FIGURE 6. COMPLEX MODE - FREE-EXIT FOR UNI-DIRECTIONAL TRAFFIC**

1. Inductive-loop detector for closing or safety (1.5mm<sup>2</sup> multi-strand, silicone-coated)
  2. Inductive-loop detector for free-exit (1.5mm<sup>2</sup> multi-strand, silicone-coated)
  3. 90 - 240V AC mains cable (three-core LNE 1.5mm<sup>2</sup>)<sup>1</sup>
- Dimension "X" for uni-directional free-exit traffic must be greater than 1m. If it is less than 1m, it may cause interference between the two loops. If autoclose is enabled, ensure it is set with sufficient time for the vehicle to reach the safety / closing loop.
1. The type of cable used must adhere to municipal bylaws but typically SWA (steel-wire-armoured) cable is recommended. The armoring provides excellent screening, which gives better protection against lightning - earth only one end of the screen

#### 4.7.4. Free-exit for bi-directional traffic mode

This allows access for traffic from both directions. In this case, the same barrier provides access control for vehicles entering and free-exit for vehicles exiting. A triggering device can be used for the access function and the loop for the free-exit function.

The free-exit loop must be mounted close enough to the closing-loop so that the vehicle exiting is still present on this loop when it reaches the closing-loop. However, these must not be too close together, or magnetic interference will be experienced. In this case the triggering loop (3) will trigger the barrier to open and the safety-loop (2) will ensure that the barrier stays up until the vehicle has passed over it and will then allow the barrier to close.



**FIGURE 7. COMPLEX MODE - FREE-EXIT FOR BI-DIRECTIONAL TRAFFIC**

- |   |  |
|---|--|
| 1. Access control device<br>(0.5mm <sup>2</sup> multi-strand)   | 3. Inductive-loop detector for free-exit<br>(1.5mm <sup>2</sup> multi-strand, silicone coated) |
| 2. Inductive-loop detector for closing or<br>safety (1.5mm <sup>2</sup> multi-strand,<br>silicone-coated) | 4. 90 - 240V AC mains cable<br>(three-core LNE 1.5mm <sup>2</sup> ) <sup>1</sup>               |
- Dimension "X" for bi-directional free-exit traffic must be 1m. If it is less than 1m, it may cause interference between the two loops. If it is more than 1m, it may result in the exiting vehicle leaving the free-exit loop before driving onto the closing-loop.
1. The type of cable used must adhere to municipal bylaws but typically SWA (steel-wire-armoured) cable is recommended. The armouring provides excellent screening, which gives better protection against lightning - earth only one end of the screen

## 4.8. Checklist for tools and equipment required

Tools	Yes
Marking pen/pencil and chalk	
Measuring tape	
Spade and/or Pick	
Spirit-level	
Angle-grinder for cutting channels for loops and power conduit	
Electric drill	
Masonry bit – 14mm (if using M12 chemical anchors)	
Masonry bit – 20mm (if using M12 rawlbolts)	
Steel bit – 8.5mm (for boom pole)	
Hammer	
13mm spanner	
2x 17mm spanners	
¼" & ½" ratchet spanner	
19mm socket for spring tensioning (3m barrier)	
24mm socket for spring tensioning (4.5m and 6m barrier)	
Extended length T30 TORX bit & extension for ¼" ratchet (to adjust endstops)	
Screwdriver – 3.5mm flat	
Side cutters	
8mm Allen key	
Crimping tool and pin lugs	
Self-locking pliers (vice-grip)	
Long-nose pliers	
Extension cord	
Safety equipment, gloves, goggles, etc.	
Coupler puller (Available from Centurion Systems (Pty) Ltd)	
<b>Consumables</b>	
1.5mm <sup>2</sup> three-core LNE cable (recommended Steel-Wire Armoured)	
Inductive Loop Wire (silicon-coated 1.5mm <sup>2</sup> , multi-strand)	
0.5mm <sup>2</sup> Multi-strand cable (Cores to suit ancillary requirements)	
5mm <sup>2</sup> Copper-weave cable (for earth spike)	
90 - 220VAC 2-Pole mains isolator (if required) <sup>1</sup>	
Conduit (as required)	
2x M12 throughbolt rawlbolts <b>OR</b> 2x M12 chemical anchors	
Earth spike	
Cable ties 100mm x 2.5mm	
Loctite 290 (Green Thread-Locker) – if converting a RH to LH Barrier	

**TABLE 3**

1. Although the **SECTOR II** includes an AC mains Isolator as standard equipment, certain country-specific regulations mandate external AC mains isolation (typically within arms reach of the equipment in use).

#### 4.9. Product and ancillary check list *(tick items you require)*

Barrier Variant	Barrier	Pole	TRAPEX	Jack-knife	
3m	3m	3m	-	-	<input type="checkbox"/>
3m TRAPEX	4.5m	3m	3m	no	<input type="checkbox"/>
3m+Jack-knife	4.5m	3m	no	yes	<input type="checkbox"/>
4.5m	4.5m	4.5m	-	-	<input type="checkbox"/>
4.5m TRAPEX	6m	4.5m	4.5m	no	<input type="checkbox"/>
4.5m+Jack-knife	6m	4.5m	no	yes	<input type="checkbox"/>
6m	6m	6m	no	no	<input type="checkbox"/>

Corrosion protection level	Galv PC <sup>1</sup> <input type="checkbox"/>	430SS <sup>2</sup> PC <input type="checkbox"/>	316SS	<input type="checkbox"/>
Colour	Std <input type="checkbox"/>	Custom cabinet		
Orientation	Left-hand <input type="checkbox"/>		Right-hand	
12V DC Battery (CP4C)				<input type="checkbox"/>

Ancillary Items:				
Loop Detector (FLUX SA)			Safety loop (1x Flux SA)	<input type="checkbox"/>
			Safety & Free-exit loop (2x Flux SA)	<input type="checkbox"/>
Loop Detector (FLUX 11-Pin) (Base Required)			Safety loop (1x Flux 11)	<input type="checkbox"/>
			Safety & Free-exit loop (2x Flux 11)	<input type="checkbox"/>
Safety Beams (i5)	1 set	<input type="checkbox"/>	2 sets	<input type="checkbox"/>
Safety Beams (Photon)	1 set	<input type="checkbox"/>	2 sets	<input type="checkbox"/>

Remote transmitter - 1 Button (NOVA)	<input type="checkbox"/>
Remote transmitter - 2 Button (NOVA)	<input type="checkbox"/>
Remote transmitter - 3 Button (NOVA)	<input type="checkbox"/>
Remote transmitter - 4 Button (NOVA)	<input type="checkbox"/>
Pushbutton switch	<input type="checkbox"/>
Keypad (SMARTGUARD)	<input type="checkbox"/>
Keypad (SMARTGUARDair)	<input type="checkbox"/>
Proximity Card Readers (SOLO)	<input type="checkbox"/>
Proximity Card Readers (Lattice)	<input type="checkbox"/>
Proximity Card Readers (SAFLEC)	<input type="checkbox"/>
Contact Centurion Systems (Pty) Ltd for further information	<input type="checkbox"/>
Biometric Reader (ViRDI)	<input type="checkbox"/>
Intercom System (G-SPEAK)	<input type="checkbox"/>





## 5. Second site visit

### Preparing the site

If the civil and electrical preparation of the site has not been taken care of, then proceed with the site preparations as below.

#### Step 1

Determine whether there is a requirement for a foundation plinth based on where the unit will be positioned. (See Figure 10 and Figure 11 for the recommended foundation plinth dimensions).

#### Step 2

Using conduit, run mains power to the site of the foundation plinth or mounting point (Figure 8). Adhere to governing regulatory requirements when routing the mains cable (Section 4.6).

#### Step 3

Similarly, decide where all the wires will be routed and where the inductive loops will be positioned based on which form of loop detection will be used (Section 4.7).

#### Step 4

Choose an option from the different modes shown in Section 4.5, as this will determine the wiring requirements for ancillaries.

#### Step 5

Cut the channels into the road and run the loops and their cables to the position of the plinth or mounting point. This is only applicable in the event that your installation requires an inductive loop or loops.

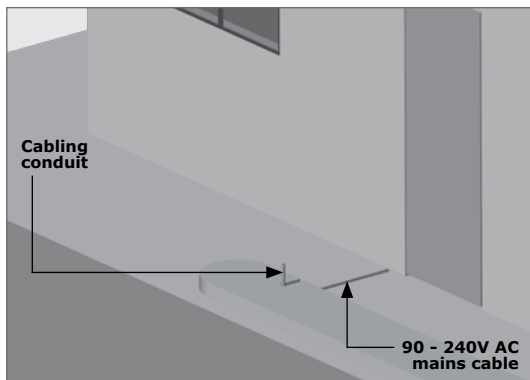


FIGURE 8

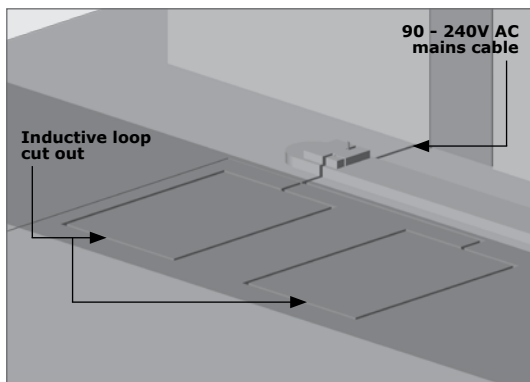


FIGURE 9



Install an earth-spike and hold down studs (if not using rawl bolts), as shown in Figure 10 and Figure 11 before casting the plinth.

**Step 6**

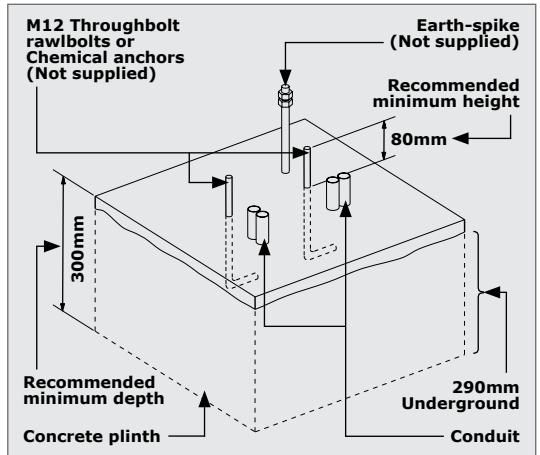
Using medium strength concrete (25Mpa), cast the plinth with dimensions as shown in Figure 10 and Figure 11. Allow to dry.



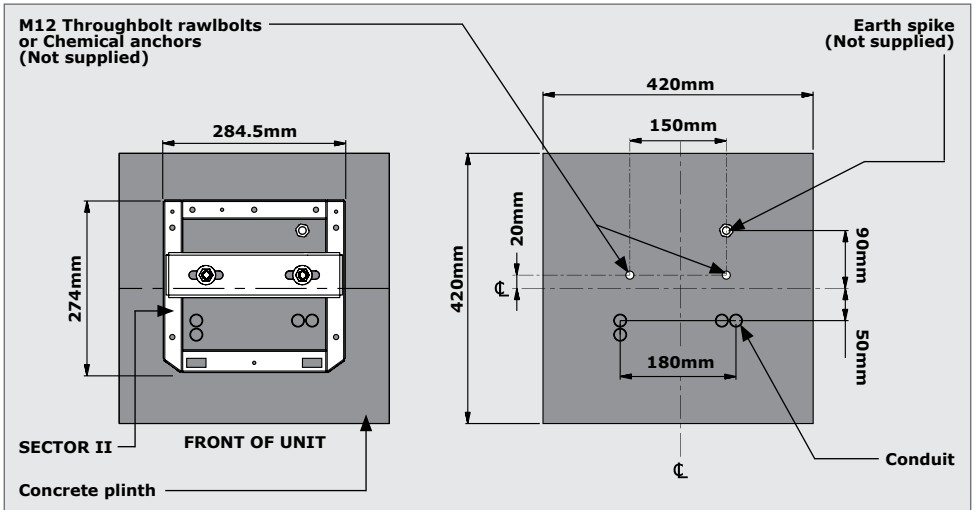
Ensure that 30mm of conduit protrudes above the concrete, and that the mains wires will emerge within the cabinet at least 400mm in length.



Should a 33Ah battery need to be installed, the studs need to be cut to length subsequent to the **SECTOR II** being secured to the plinth.



**FIGURE 10. PLINTH DIMENSIONS**



**FIGURE 11**

For the remainder of the installation of the **SECTOR II** traffic barrier, please refer to the Installation manual.

## 6. Ancilliary installation equipment

A number of additional devices are available which can be interfaced with the **SECTOR II** traffic barrier to increase security or otherwise enhance the installation.



**FIGURE 12. BREAKAWAY COUPLING**

**Description:**

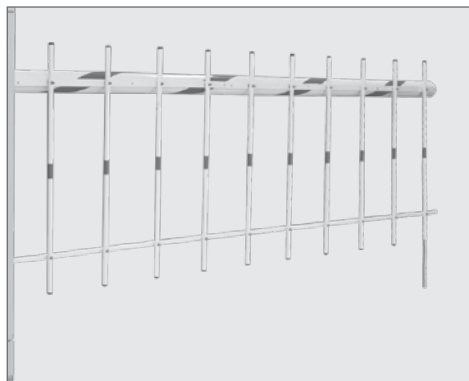
Pole hinges away from barrier if accidentally knocked, reducing the chance of damage.



**FIGURE 13. JACK-KNIFE ASSEMBLY**

**Description:**

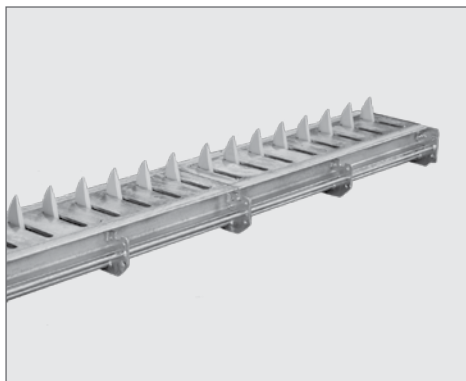
Used in cases where there are height restrictions such as undercover parking



**FIGURE 14. TRAPEX**

**Description:**

Stops pedestrians from circumventing the **SECTOR II**. Available for 3m and 4.5m boom poles.



**FIGURE 15. CLAWS - FLUSH MOUNT**

**Description:**

Add real security with seamless integration with the **SECTOR II**. Available in 1m and 1.5m sections.



FIGURE 16. CLAWS - SURFACE MOUNT

**Description:**  
 Add real security with seamless integration with the **SECTOR II**. Available in 1m and 1.5m sections.



FIGURE 17. FLUX 11-PIN

**Description:**  
 Required to enable the free-exit or the closing / safety loop facilities



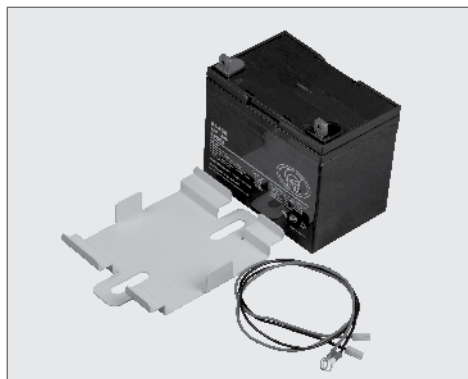
FIGURE 18. FLUX SA

**Description:**  
 Required to enable the free-exit or the closing / safety loop facilities



FIGURE 19. MIDI TRAFFIC LIGHT

**Description:**  
 Visually indicates when it is safe for a vehicle to proceed into or out of an access controlled area



**FIGURE 20. 33AH BATTERY KIT**

**Description:**

A 33Ah battery can supplement or replace the 7Ah battery for extended battery back-up. Requires a bracket and harness to connect the 33Ah battery to the existing harness.

**Other Ancillaries:**

- Keypad
- SOLO
- Lattice
- G-SWITCH-22
- SMARTGUARDair
- G-SPEAK
- SupaHelix
- NOVA Remote
- NOVA Receiver



Ancillary product documentation is available for download at [www.centsys.com](http://www.centsys.com)







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