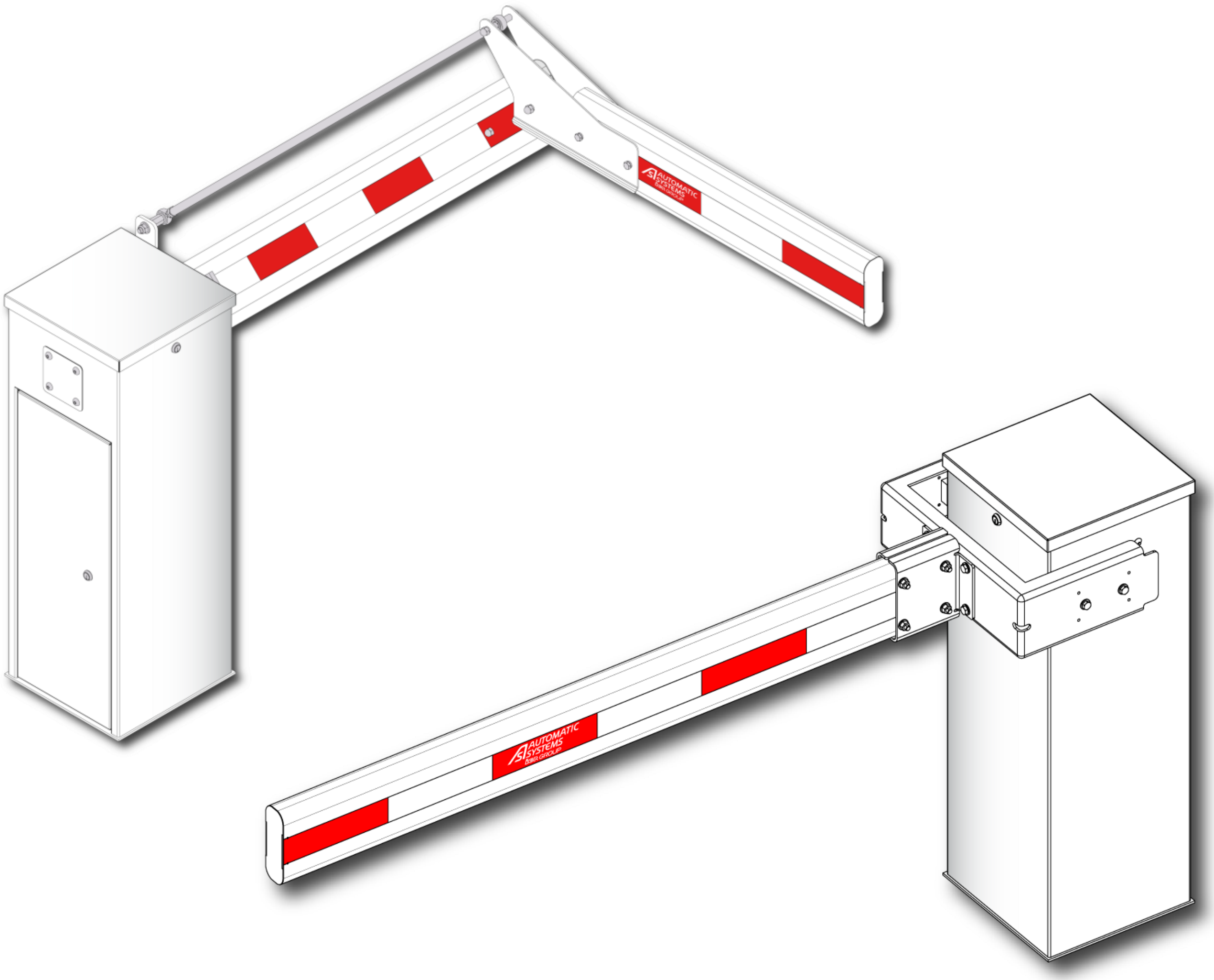
ELECTRIC RISING BARRIERS

ParkPlus

244



TECHNICAL MANUAL

(Original instructions)

Rev. 01

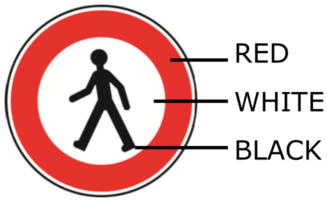
Document revision

Revision	Date	Written	Checked	Purpose
00	24/06/2014	SLu	HBe/CDe/JJH	1st version.
01	27/07/2015	SLu	HBe/CDe/JJH	Ch. 11.7. : Table for balancing ParkPlus 244 with articulated arm updated + note modified.

Contents

1. SAFETY INSTRUCTIONS

- This manual must be made available to any person working on the equipment: installers, maintenance technicians, end users, etc.
- This equipment has been designed to control and manage vehicle access and cannot be applied to any other use without risk to users or to the integrity of the equipment.
  Automatic Systems cannot be held liable for damage resulting from improper use of the equipment.
- The contractor shall comply with local regulations when installing the equipment.
- The end of the arm must always be at least 0.5 m from any object.
- Pedestrian traffic must be prohibited within the area of operation of the barrier, unless its movement is efficiently announced (sound and/or light signal, markings on the ground, etc.).
  In the countries of the European Union, the EC Machines Directive stipulates that a sticker prohibiting pedestrian access must be placed on either side of the equipment (less than 1 metre upstream and downstream of the barrier's arm in horizontal position):



- The installation of detection loops (*optional*) must be validated by qualified personnel who will determine the loop arrangement best suited to the type of vehicle and passage configuration.
  WARNING: There is a risk of injury if standard detection loops are used, as these may incorrectly detect trucks, bicycles or motorcycles and close the obstacle on these vehicles!

  Note: For details, refer to the manuals on loops, available on http://partnerweb.automatic-systems.com
- Any work on the equipment must be performed by qualified personnel. Any unauthorized operation or carried out by a technician not qualified on this product voids the manufacturer’s guarantee automatically.
- The access keys to the mechanism must be used by personnel who are aware of the electric and mechanical risks they incur in the event of negligent handling. The personnel are required to lock the mechanism's access hatch after the intervention.
- Assemble the arm and its accessories before performing any electrical tests (⇨see section 6.1. or section 6.2.).
- **Lift the arm before performing any work inside** the housing to release the tension of the balancing springs and prevent undesired movements of the drive mechanism (⇨see section 11.5.).
- **As soon as the access door to the mechanism is open, cut power via the circuit breaker (⇨see section 11.4.).**
- **Never operate the barrier, even manually, without the adjustable stops (see section 4.1. , item 8).**
- Any internal component likely to be placed under tension or moving must be handled with caution.
- Do not add non-approved accessories (contact between different metals causes a battery effect that decreases the equipment's corrosion resistance).
- The equipment is configured to be in “minimal risk” mode for its users. Any modification of the parameters must be carried out with full knowledge of the facts by qualified personnel and is not the responsibility of Automatic Systems.
- The obstacle must be completely visible to the potential user/operator before being put into operation.
- After a collision, even if there is no visible damage, the equipment must be carefully checked by a qualified technician.

2. PRINCIPLE OF OPERATION

Items referred to in this section can be seen on the images in section4.

Arm opening (24) is controlled by a keyswitch, a push-button, a radio transmitter, a command sent over the network connection, detection loops buried in the roadway, or an external control device (tollbooth, card reader, management centre, etc.).

Closing is controlled in the same way, or automatically via a timer.

The processing of these commands may be made contingent on external information to be received by the barrier. For example, closing is not allowed if a vehicle is detected in the obstacle's path (information received from a detector), or opening is not allowed if the parking lot is full (information received via another device).

The movement initiated by the **gear motor** (5) is directly transmitted to the arm by the **main shaft** (6).

The speed of the arm, controlled by the **variable frequency drive** (16), is adjustable for both opening and closing movements. Movements are factory-configured to provide fast acceleration and slow deceleration at the end of the movement.

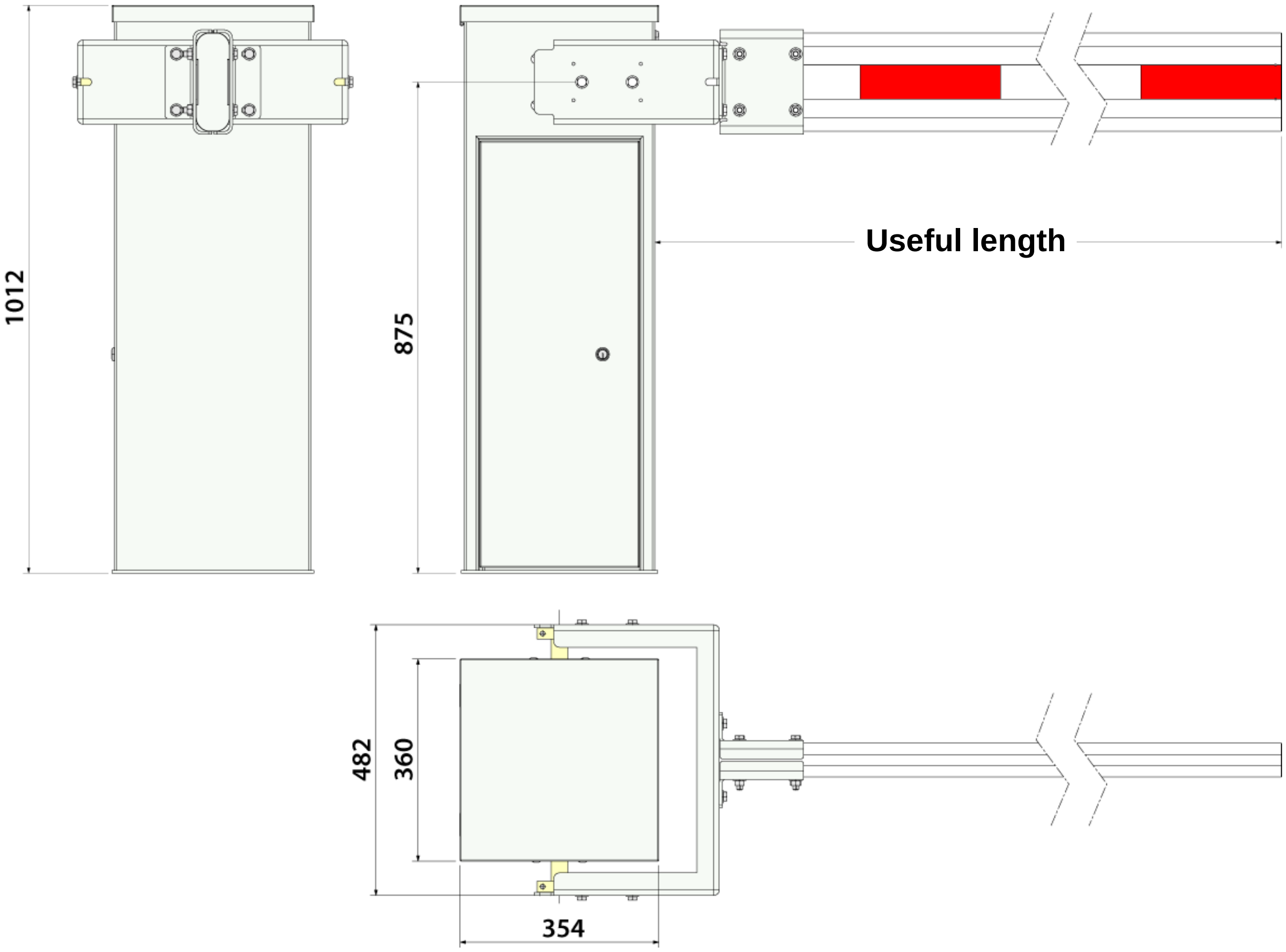
The **control logic** (4) coordinates the activity of the barrier: management of movements and options, input and output information processing, etc. This information can be downloaded and processed by an external terminal (not provided by Automatic Systems).

One or more **compensating springs** (10) act as counterweight. It(they) helps(help) the motor during opening and closing based on accessories and lengths.
For barrier models **with automatic raising** of the arm in case of power failure, the tension of the spring(s) is increased to ensure that it(they) can raise the arm by itself(themselves) in the event of a power failure.

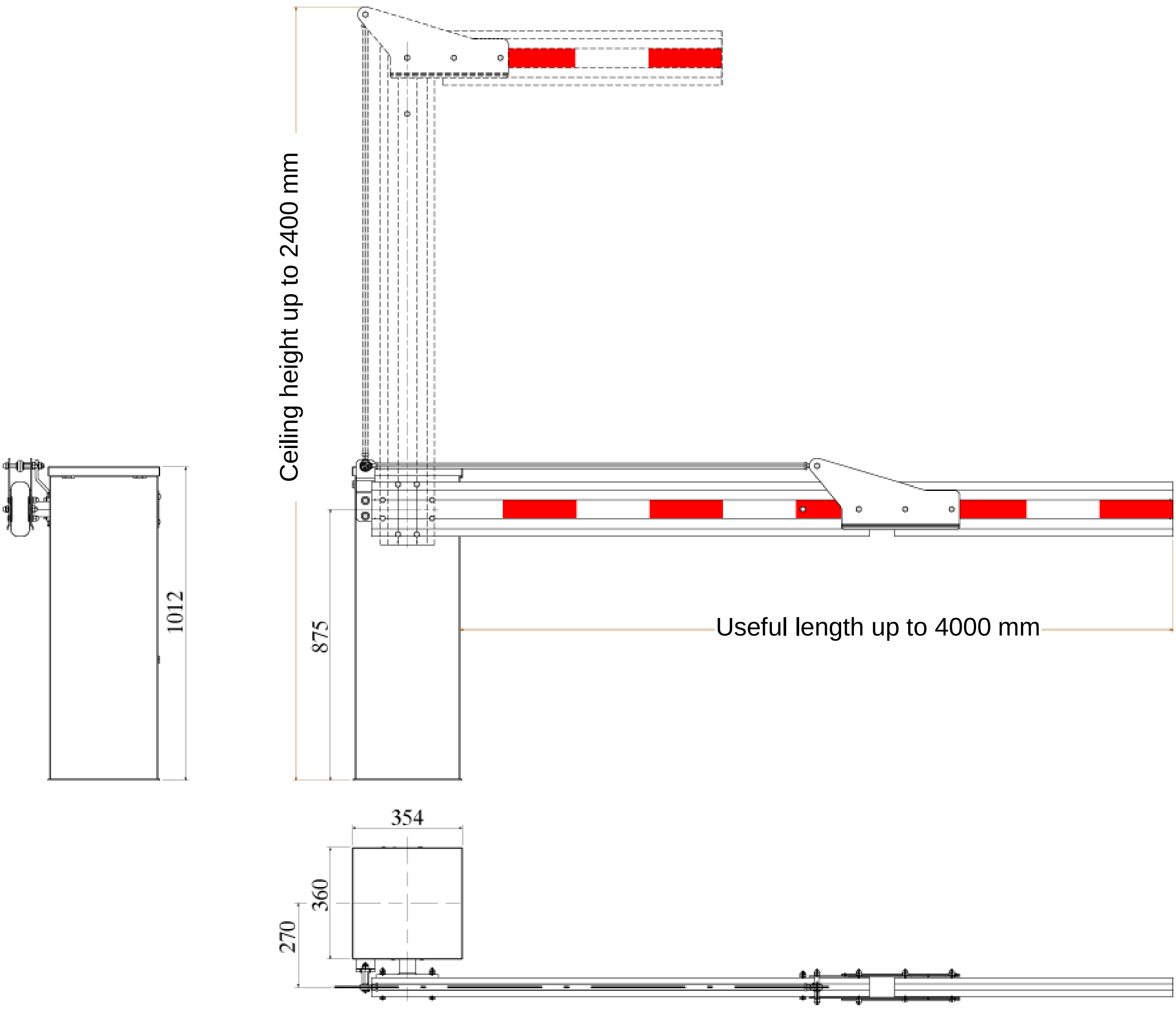
Maintaining the arm in its two extreme positions (open and closed) as well as after a Stop command is achieved by means of an **electromagnetic brake**: Normally Closed Brake (= closed when idle, i.e. not powered on), energized during arm movement to release the arm.
For models with AVR (with automatic raising) (optional), the electromagnetic brake is of the NO type (= open when idle, i.e. not powered on), energized in the two end positions (open / closed) to ensure locking of the arm.

3. FOOTPRINT / SOLUTIONS

3.1. ParkPlus 244 with central arm

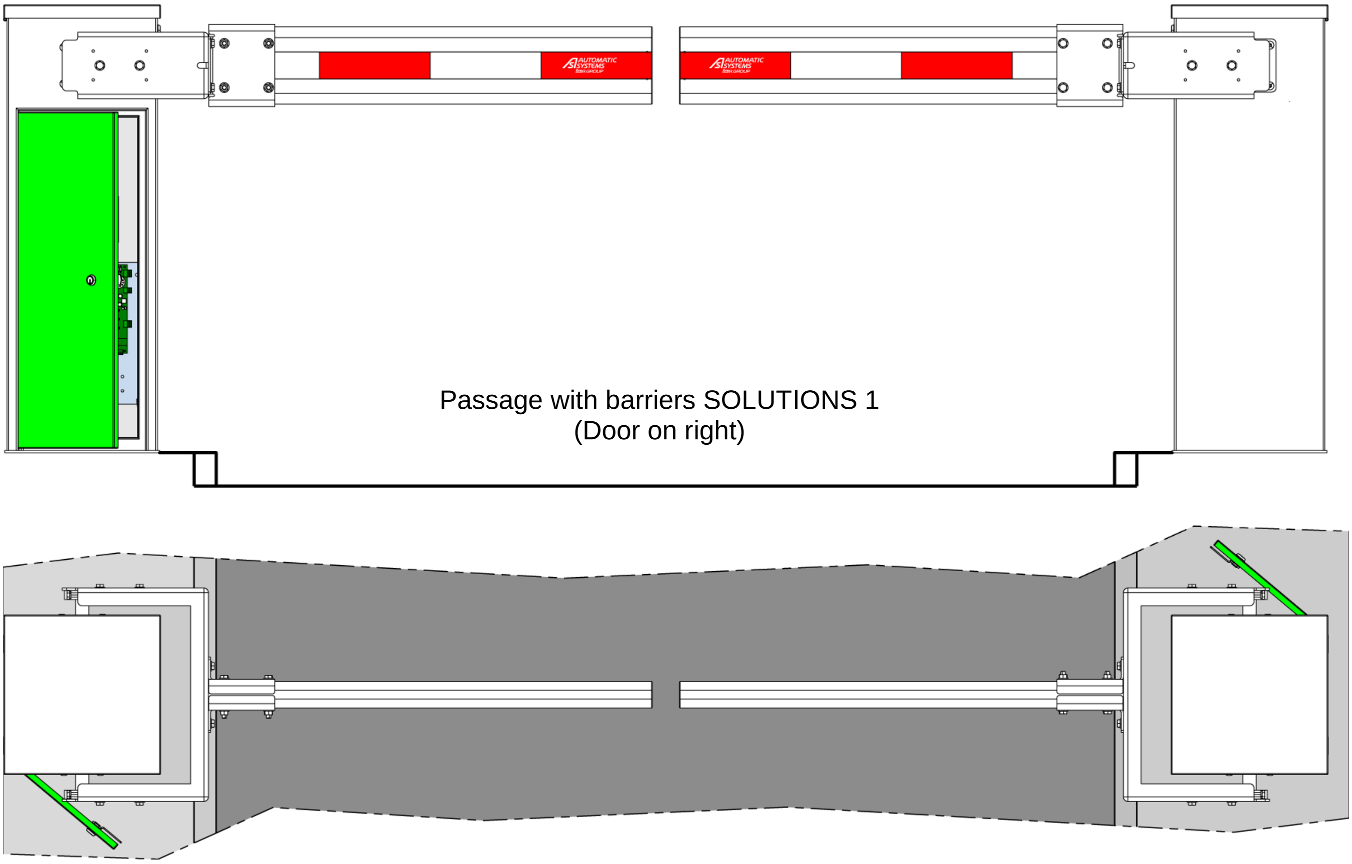


3.2. ParkPlus 244 with articulated arm (Optional)

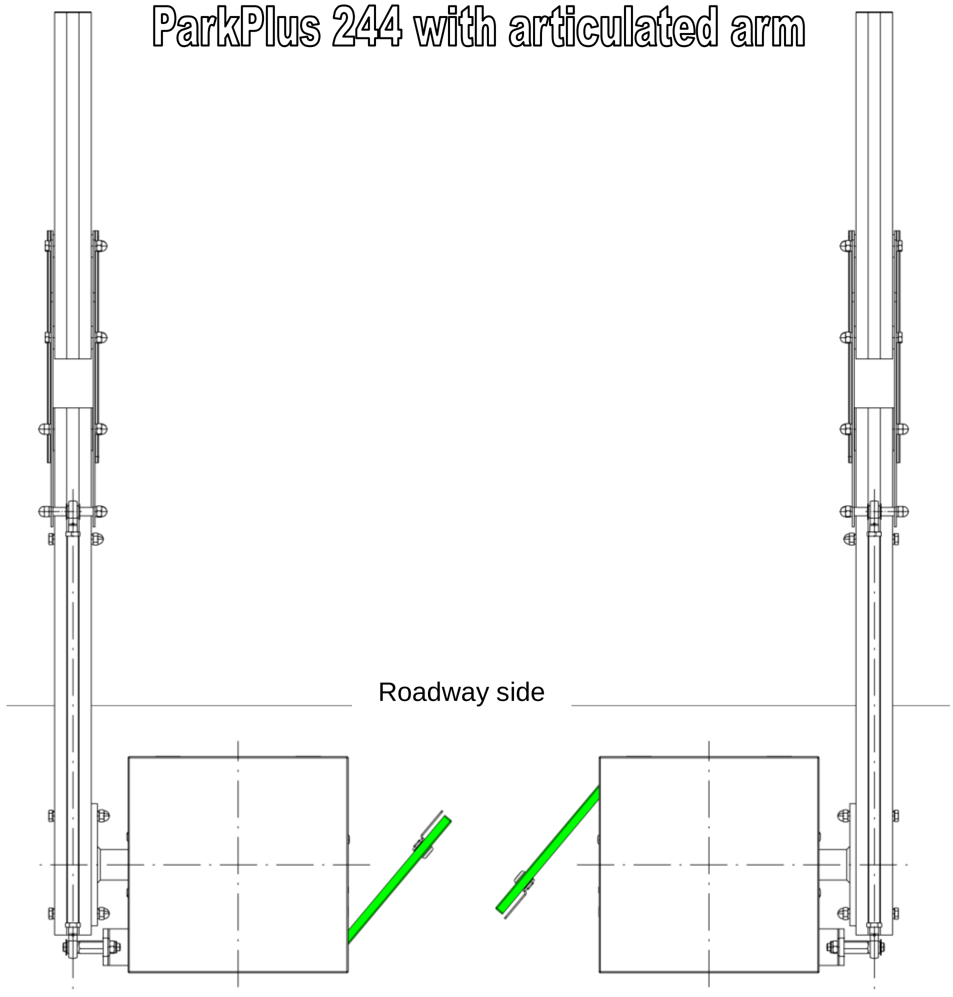


3.3. Solutions

ParkPlus 244 with central arm



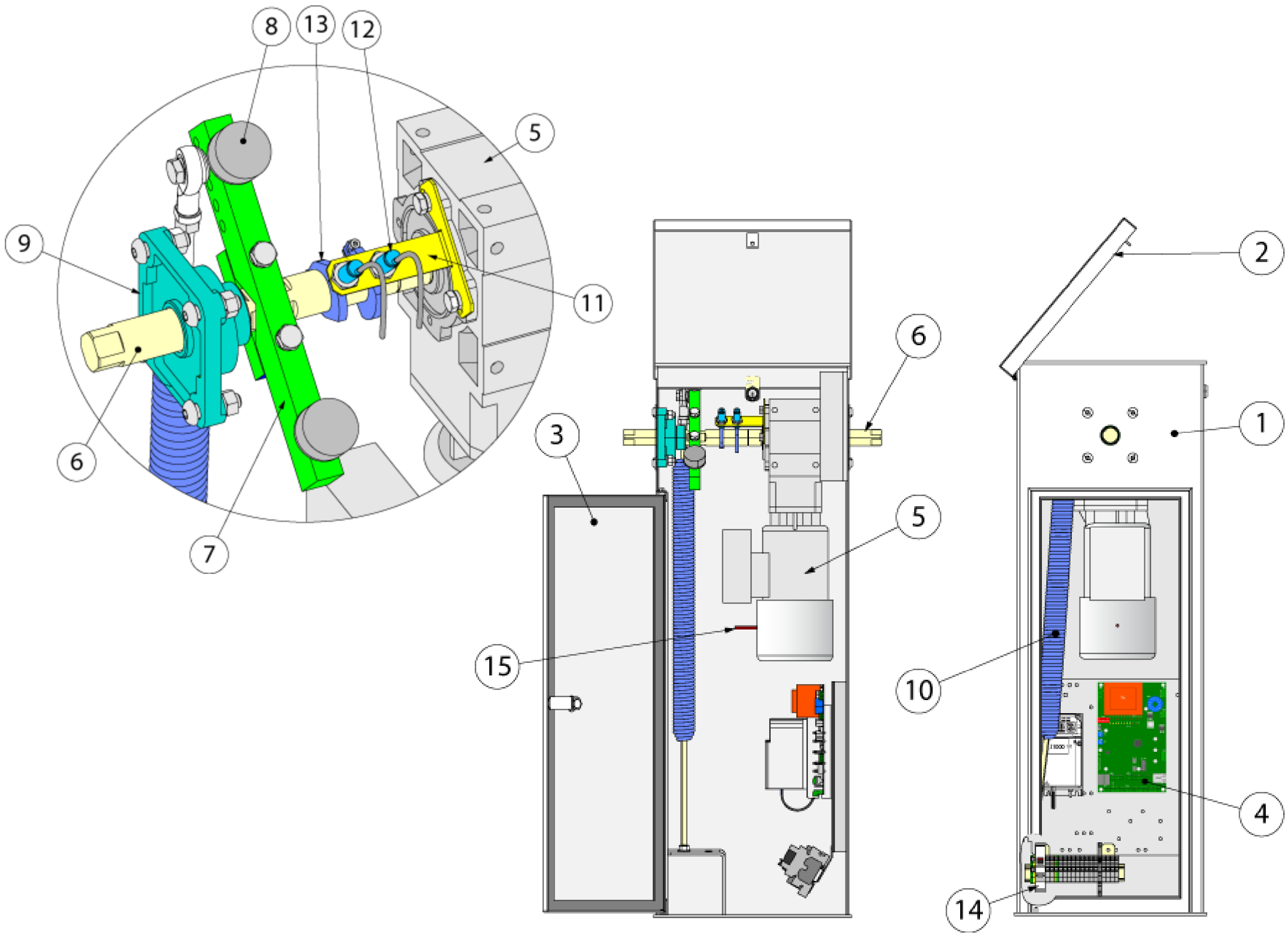
ParkPlus 244 with articulated arm



Switching from one solution to another does not require additional parts.

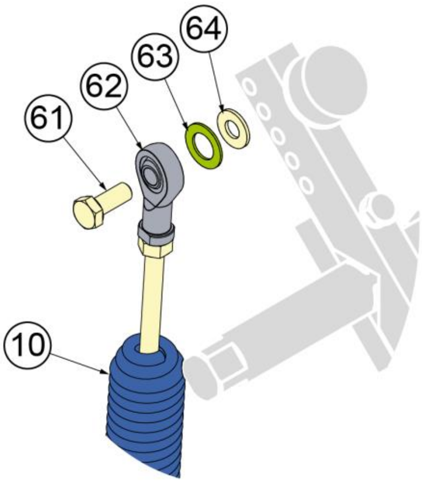
4. LOCATION OF THE COMPONENTS

4.1. Common part



Reference	Description
1	Frame assembly
2	Hood
3	Door
4	Control Board
5	Gear motor A102 SR Gear motor A102 AVR
6	Drive shaft
7	Stop hub
8	Adjustable stop
9	Bearing Ø30mm
10	Spring assembly
11	Detector bracket
12	Inductive position sensor
13	Detection cam(s)
14	Main circuit breaker
15	Motor brake release lever

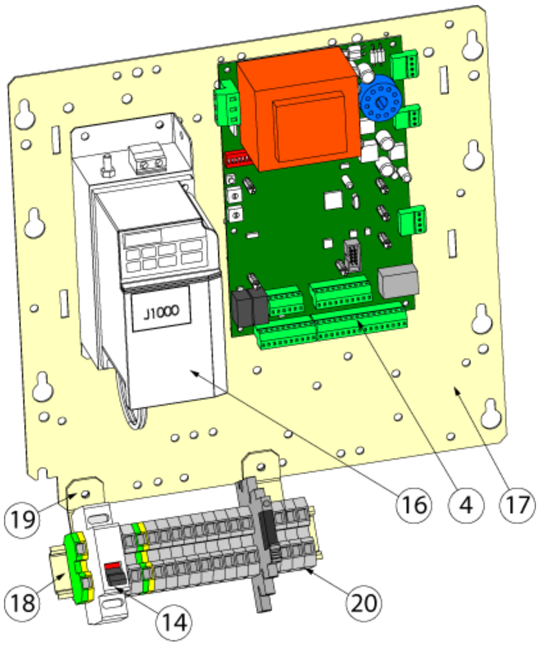
4.2. Compensation Assembly



Item	Description
10	Spring assembly (1)
61	Screw H M10x25 Zn (mounted on thread brake)
62	Hinge/spring
63	Nylon friction washer
64	Washer M10 Zn

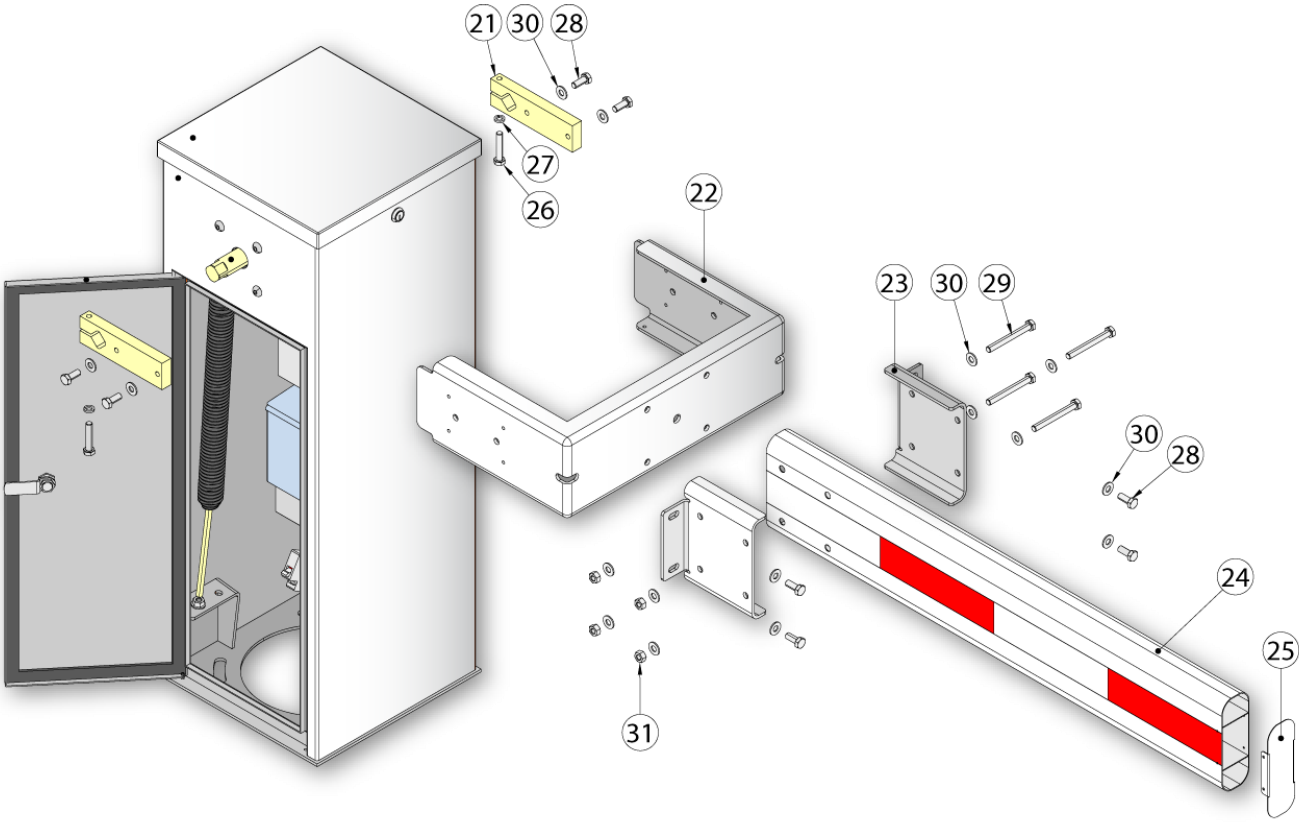
(1) Includes spring and pre-assembled hinge

4.3. Control board



Item	Description
4	Control Board
14	Main circuit breaker
16	Variable speed controller
17	Electronic support plate
18	DIN rail
19	DIN rail support brackets
20	Terminal block

4.4. ParkPlus 244 with central arm



Item	Description
21	Fixing jaw (x2)
22	Central stirrup
23	Arm bracket (x2)
24	Arm 175x60
25	Attachment for arm
26	Stainless steel screw H M10x50 (x2)
27	Stainless steel Grower washer (x2)
28	Stainless steel screw H M10x25 (x8)
29	Stainless steel screw H M10x90 (x4)
30	Stainless steel washer Ø10 M-series (x20)
31	Stainless steel nuts M10 (x8)

5. INSTALLATION

5.1. Equipment storage before installation

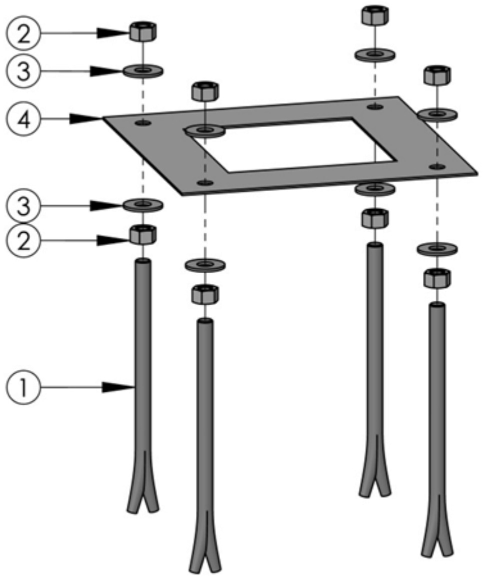
Before installation, avoid all shocks to the equipment and place it in its original packing in a dry place, protected from dust, heat and bad weather.
Storage temperature limits: -30 to +80°C

5.2. Installation of equipment

The barrier must be fastened to the ground, on a concrete base (Fig. b). The top of this base must be perfectly horizontal, and placed high enough to prevent any depression effect.

It is possible to embed the optional CHA0161 seal bracket in this cube. In this case, allow an excess threading length of 40mm for each bolt.

Seal bracket CHA0209 (optional)



1 - Anchoring bolt M14
2 - Hexagon nut M14
3 - Wide flat washer Ø14
4 - Seal bracket

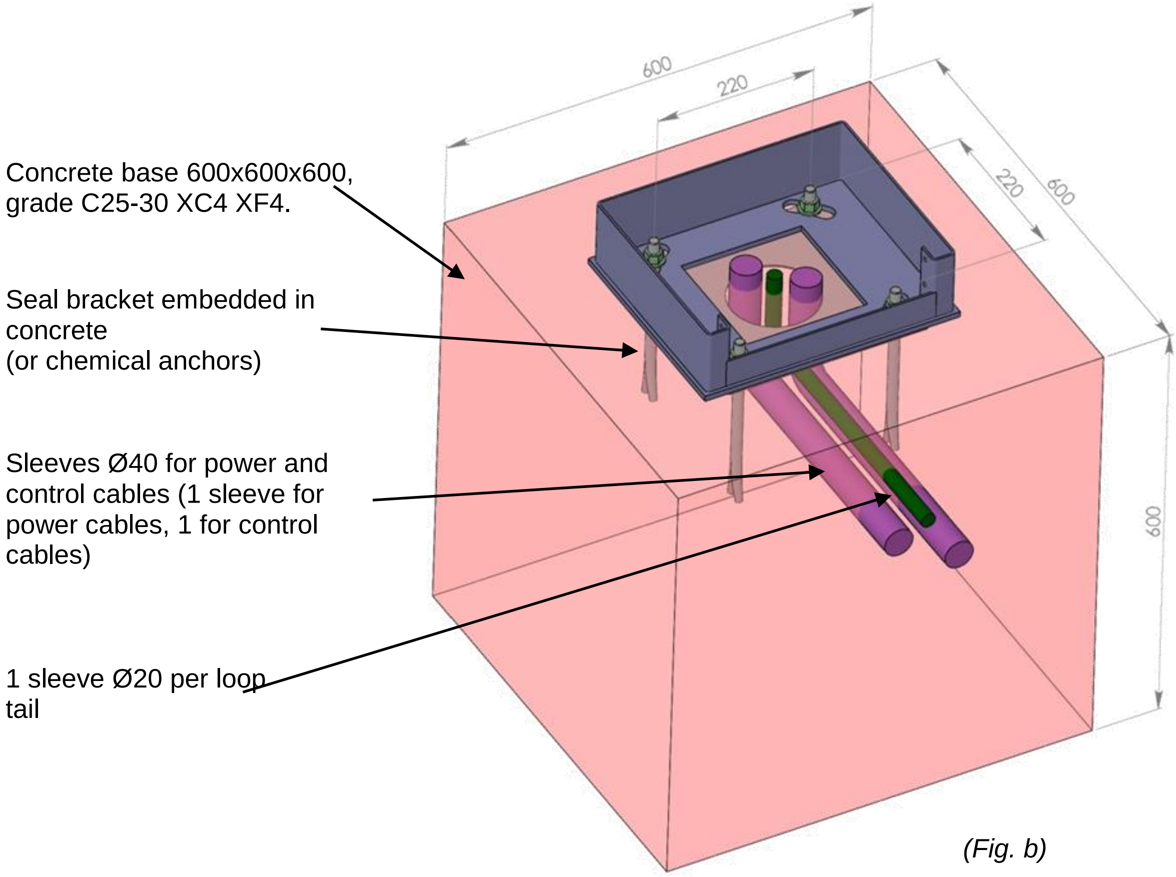
(Fig. a)

Seal bracket assembly:

Insert the four anchoring bolts (1), each with a nut (2) and a flat washer (3), into the holes of the seal bracket (4). The thread must be oriented upward as shown on Fig. a. Attach the anchoring bolts to the seal bracket using the flat washers (3) and nuts (2), ensuring the threads of the anchoring bolts protrude at least 40 mm. Fasten the nuts. Use adhesive tape on the threads protruding from the seal bracket to protect them from concrete splatter.

1. Install 2 sleeves with minimum 40 mm diameter to run the power and control cables (Fig. b).
   Install the required number of sleeves with 20 mm diameter to run the detection loop, blocking photocell and electrical tip support cables (optional).
   Cables must protrude 1 metre from the concrete base.
2. Make a concrete base in which the seal bracket will be centred as defined on Fig. b. The seal bracket must be flush with the surface of the concrete base and perfectly horizontal (Fig. b).

3. When the concrete has set, remove the adhesive tape from the threads, and remove the nuts and the flat washers in the upper part of the seal bracket. Install the sole plate on the concrete base using the previously removed washers and nuts.



(Fig. b)

Note:

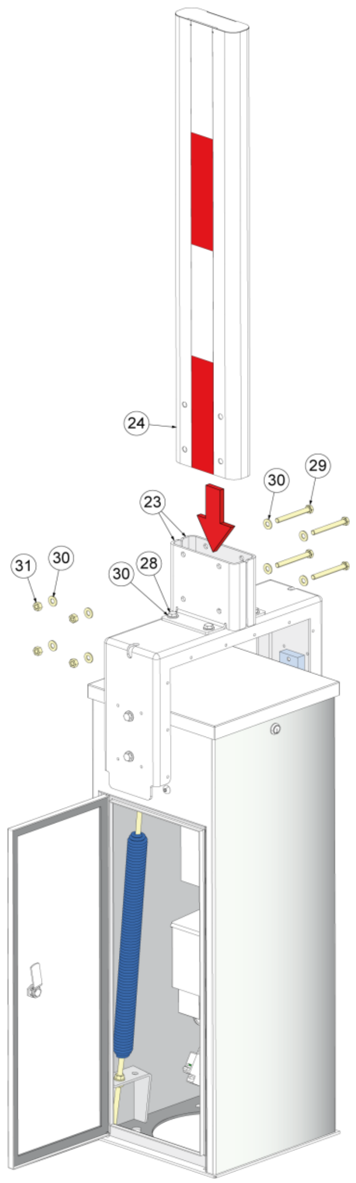
If no seal bracket is available, it is possible to fix the barrier to the ground using 4 chemical anchors M12 minimum. A rubber sole (peplic joint) can be added between the concrete base and the barrier frame.

6. FIRST START-UP

6.1. Assembly of the central arm

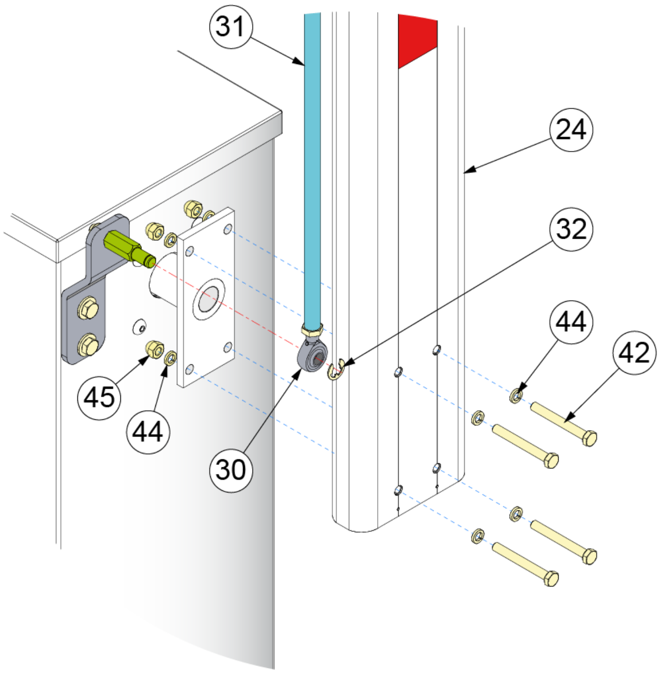
Notes: - All screws should be greased before assembly.
- Nominal tightening torques are given in the legend of the figure.
- The barrier must be open (⇨Ch.11.5.) before proceeding with arm assembly or disassembly.

1. Place the arm (24) between the fixing jaws (23) and tighten with the screws (29), washers (30) and nuts (31).
   To facilitate the work, slightly loosen the screws (28) and open the fixing jaws.
   Once the arm is in place, tighten everything up.
2. Adjust the vertical and horizontal positions of the arm (⇨Ch.6.3.).
3. Adjust spring compensation (⇨Ch.6.5.).



Item	Description
23	Fixing jaw(s)
24	Arm 175x60
28	Stainless steel screw H M10x25 (44 Nm)
29	Stainless steel screw H M10x90 (44 Nm)
30	Stainless steel washer Ø10 M-series
31	Stainless steel nut M10

6.2. Assembly of the articulated arm (Optional)



Item	Description
24	Arm 175x60
26	Arm shaft
28	Locating pin on frame
30	Male hinge M14
31	Bar
32	Radial stop segment
42	Screw H M10x85 (44 Nm)
44	Grower washer Ø10
45	Nut cap M10

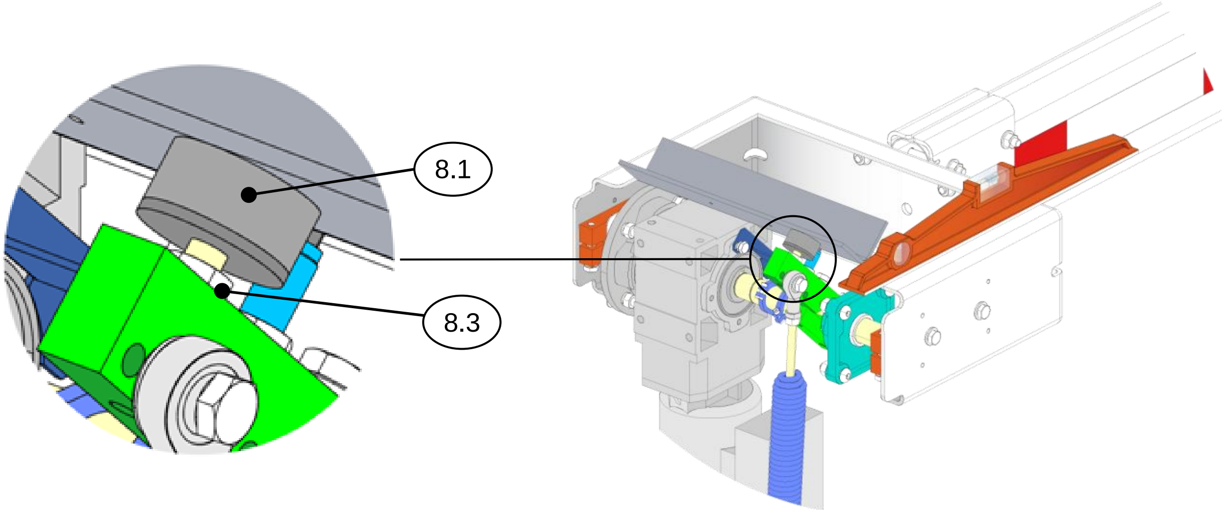
Notes: - All screws should be greased before assembly.
- Nominal tightening torques are given in the legend of the figure.
- The barrier must be open (⇨Ch.11.5.) before proceeding with arm assembly or disassembly.

1. Fasten the arm (24) on the arm shaft (26) and tighten with the 4 screws (42), 8 washers (44) and 4 nuts (45) as shown on the above figure.
2. Position the hinge (30) on the locating pin on the frame (28) and lock by means of the radial stop segment (32).
3. Adjust the vertical and horizontal positions of the arm (⇨Ch.6.4.).
4. Adjust spring compensation (⇨Ch.6.5.).

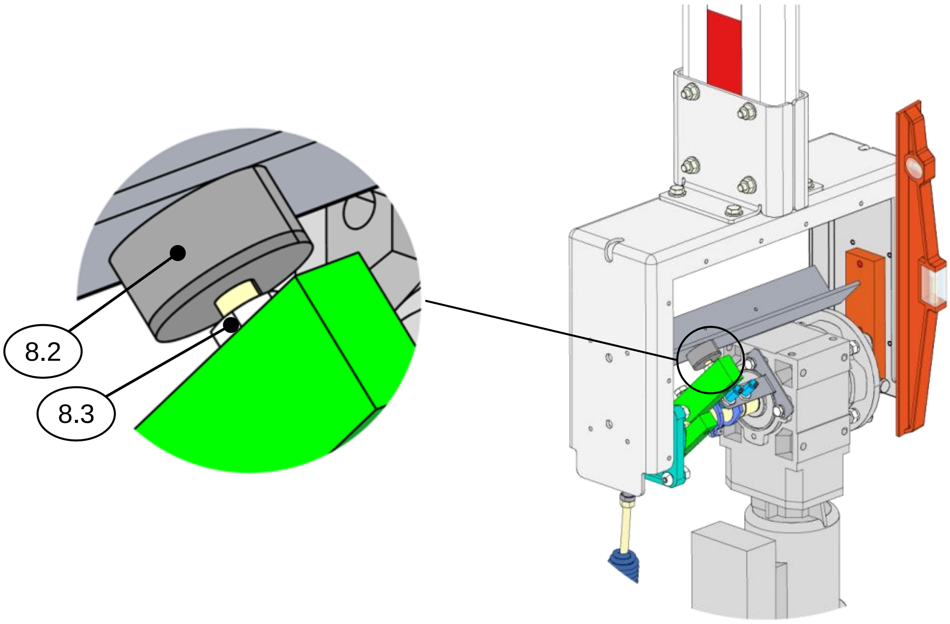
6.3. Adjustment of horizontal/vertical position – Central arm

6.3.1. Barrier model SR

- Turn off the power supply of the barrier (⇨Ch.11.4.).
- Loosen the locknut (8.3).
- Screw or unscrew the lower stop (8.1) until the optimal horizontal position is obtained.



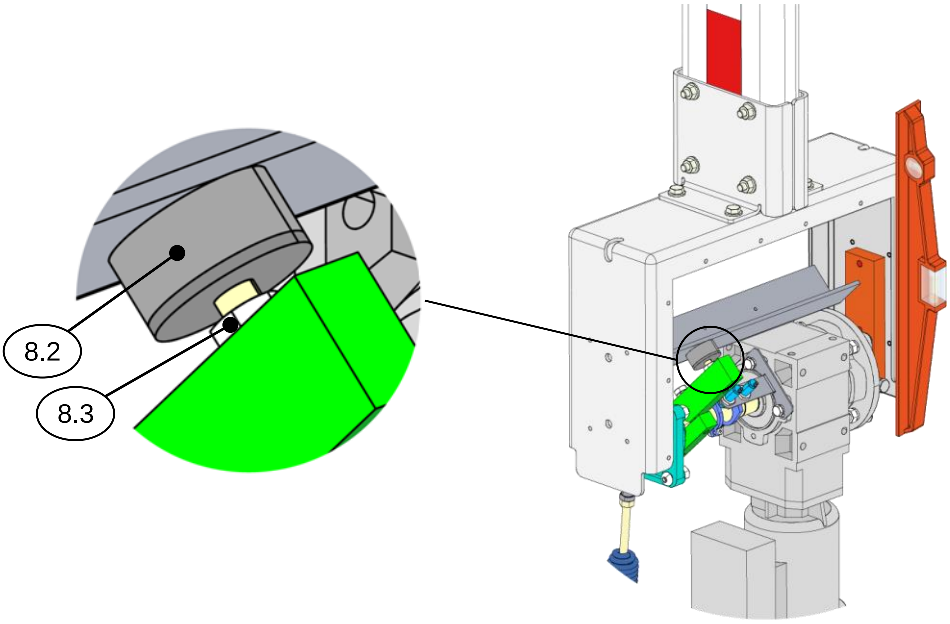
- Tighten the locknut again (8.3).
- Operate the manual brake release lever located on the motor (15, ⇨Ch.4.1.).
- Raise the arm into vertical position.
- Release the brake release lever.
- Loosen the locknut (8.3).
- Screw or unscrew the upper stop (8.2) until the optimal vertical position is obtained.



- Tighten the locknut (8.3).
- Engage the circuit breaker.

6.3.2. Barrier model AVR

- Turn off the barrier's power supply (⇨Ch.11.4.).
- **Important:** Thanks to the spring(s), the arm is raised automatically.
- Loosen the locknut (8.3).
- Screw or unscrew the upper stop (8.2) until the optimal vertical position is obtained.



- Tighten the locknut again (8.3).
- Note down the position of the upper location of the spring on the hub (7) ⇨ Fig. 1.

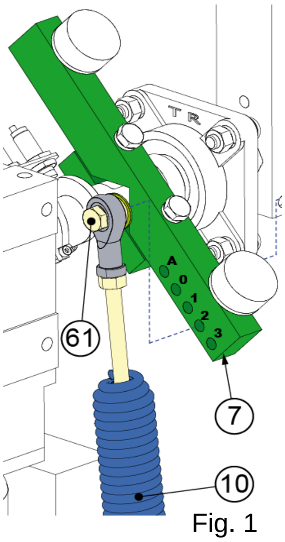


Fig. 1

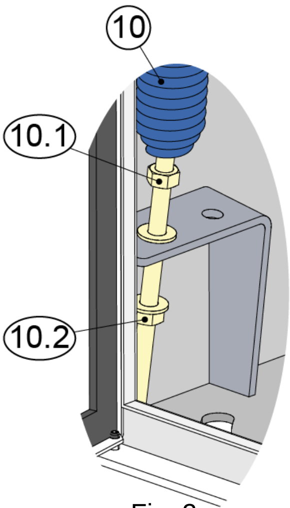


Fig. 2

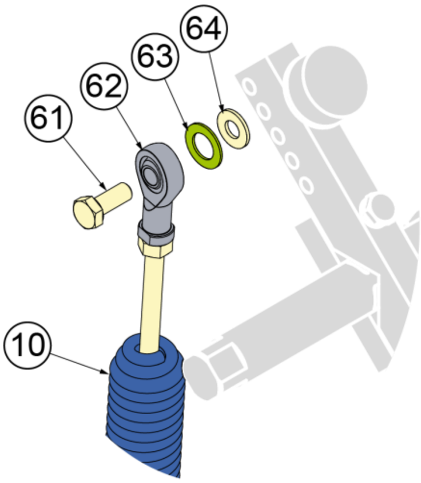
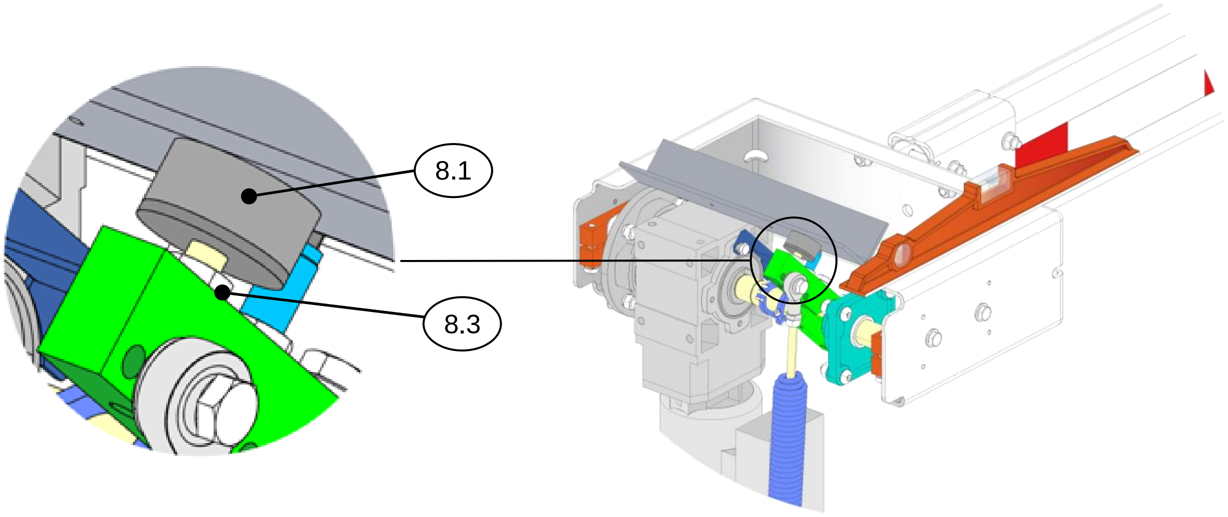


Fig. 3

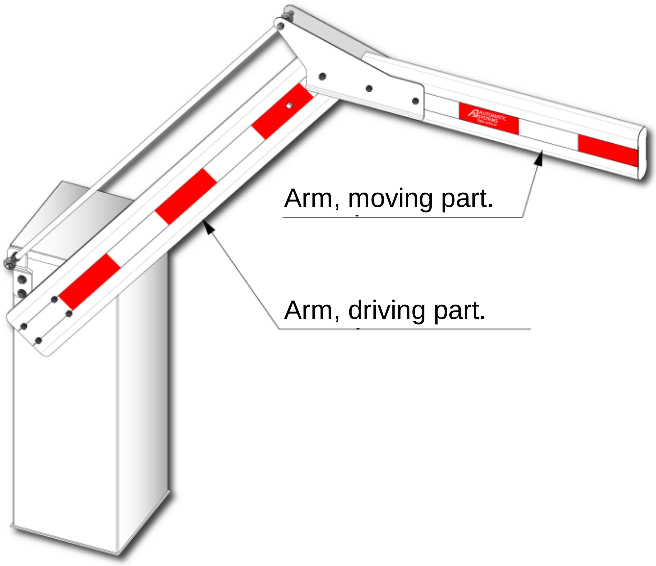
- Loosen the locknut (10.1) and completely release the spring tension by loosening the nut (10.2) ⇨ Fig. 2.
- Maintain the arm in vertical position and release the spring from the upper location on the hub by unscrewing the screw (61) ⇨ Fig. 3.
- Lower the arm into horizontal position.

- Loosen the locknut (8.3).
- Screw or unscrew the lower stop (8.1) until the optimal horizontal position is obtained.

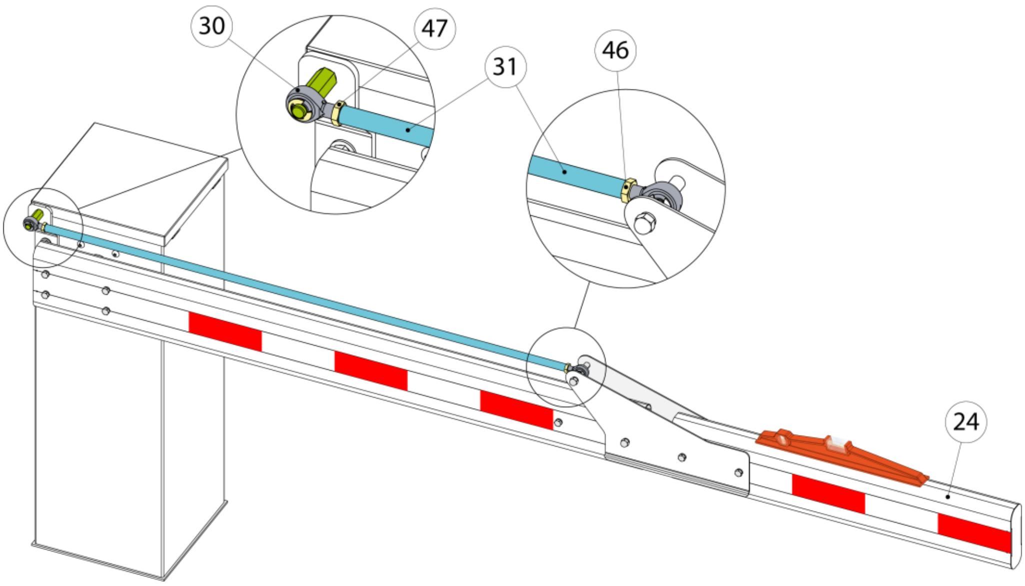


- Tighten the locknut (8.3).
- Raise the spring and adjust its tension (⇨ Ch.11.7.).
- Engage the circuit breaker.

6.4. Adjustment of horizontal/vertical position – Articulated arm (Optional)



- To adjust the horizontal and vertical positions of the driving part of the arm, proceed in the same way as for ParkPlus 244 with central arm (⇨Ch.6.3.).



- To adjust the horizontal position of the moving part of the arm:
  - Loosen the locknuts (46 & 47).
  - Screw or unscrew the bar (31) so as to obtain the optimal horizontal position of the arm (24) (check using a spirit level).
  - Tighten the locknuts (46 & 47).
  - Engage the circuit breaker.

> Make sure sufficient thread remains in the hinge.

6.5. Checking / Adjusting the compensation

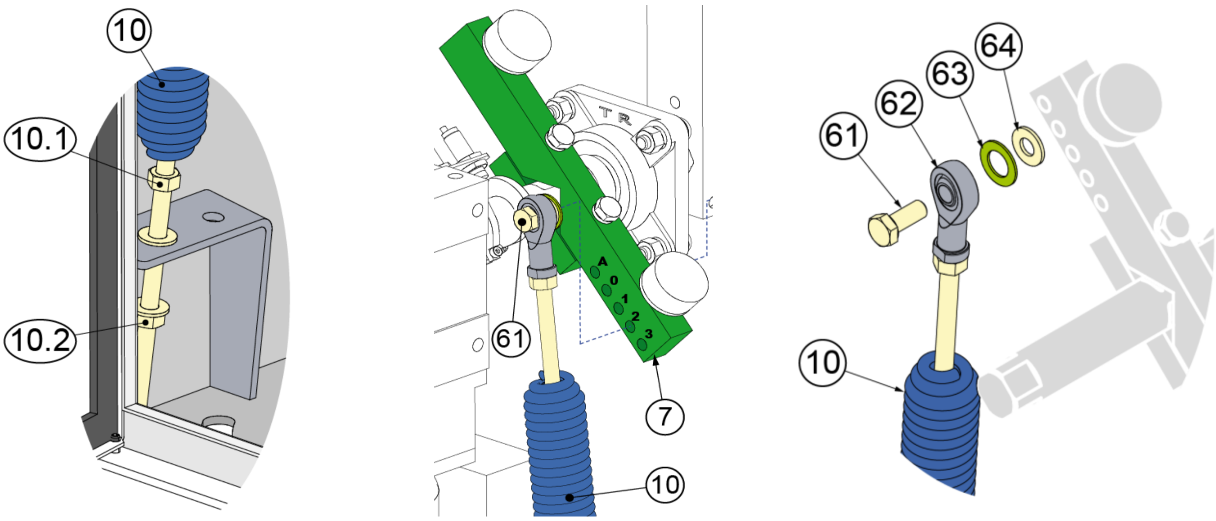
For operation with automatic raising (optional) of the arm in case of power failure, the spring tension should be adjusted so that the arm is raised slowly and completely until it reaches its vertical position. The contact between the upper stop (8.2, Ch. 6.3.) and the frame should not be too violent to avoid rapid deterioration.
If this is not the case, adjust the spring tension (see below).

For operation without automatic raising of the arm in case of power failure (SR models), the spring tension should be adjusted so that a minimal effort is required from the motor both for opening and closing the barrier:

- Enable the motor brake release lever (15, Ch.4.1.).
- Keeping the brake enabled, manually raise and then release the arm: it should remain in balance when positioned at 45°, and remain on its stops in the high and low positions.
  If this is not the case, adjust the spring tension (see next page).
- Release the brake release lever.

Spring tension adjustment:

- Unscrew the nut (10.1).
- Tighten or loosen the nut (10.2) to tension or untighten the spring (10).



- If this adjustment proves insufficient, change the fixing hole of the spring (10) on the hub (7).

  a) Bring the arm to its vertical position.

  b) Turn off the power supply to the equipment (⇨Ch.11.4.).

  c) Decrease the spring tension (10) by loosening the nut a few turns (10.2).

  d) Unscrew the screw (61) and change the position of the location of the spring on the hub (7) according to the table of the main spring adjustments (⇨Ch.11.7.).

- Adjust spring tension.

- Tighten the nuts and locknuts (10.2 & 10.1) and the spring's fastening screw (61) on the hub (7).

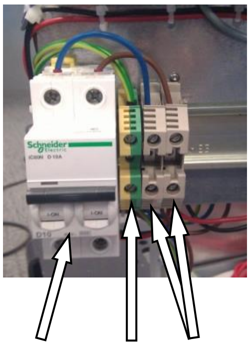
6.6. Electrical connections

THE ARM <u>MUST</u> BE ASSEMBLED BEFORE PROCEEDING WITH ANY TESTS.

<u>WARNING</u>: Do not connect to a floating network or to a high impedance earthed industrial distribution network (high leakage currents).

<u>WARNING</u>: Work must be done in accordance with the safety warnings (⇨Ch.1.)

Connections must be done **<u>in accordance with the wiring diagrams</u>** included **<u>inside the equipment</u>**, as these represent the primary reference instructions (this section is for information purposes only).



<u>WARNING</u>: Raise the arm (⇨Ch.11.5.) before making any electrical connections!

- Open the hood (⇨Ch.11.3.).
- Switch the circuit breaker OFF (⇨Ch.11.4.).
- Connect the power supply cables to the terminal blocks (14.2), ensuring that the characteristics of the power supply meet the required specifications (⇨Ch.10.).
- The terminal block (14.1) must be grounded via a cable with a cross section of **at least 1 mm² or more depending on the applicable legislation.** (high leakage current: above 3.5 mA, but below 5% of the rated current)
- The following must be provided at the feeder head:
  - A 10 A/30 mA super-immune selective differential circuit breaker (for 1 barrier maximum)
  - A 10 A/300 mA differential circuit breaker (for 5 barriers maximum)
- Connect the various control elements and options in accordance with the diagrams supplied, leaving a space of 15 cm with the power cable reaching the terminal blocks (14.2).

6.7. Powering on

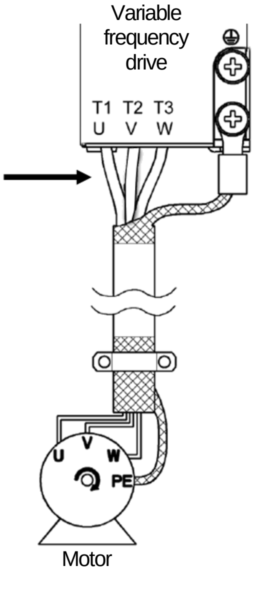
1. Set the circuit breaker (14) to ON ⇨ the control program of the barrier, stored in the PLA1300 control board, takes a few seconds to start up and become operational.

   Start-up progress is displayed on the HMI LEDs. They light up for 5 seconds to indicate that the program is installed and effective. After these 5 seconds, only the OK LED is lit (or blinks), according to the barrier's operating mode.

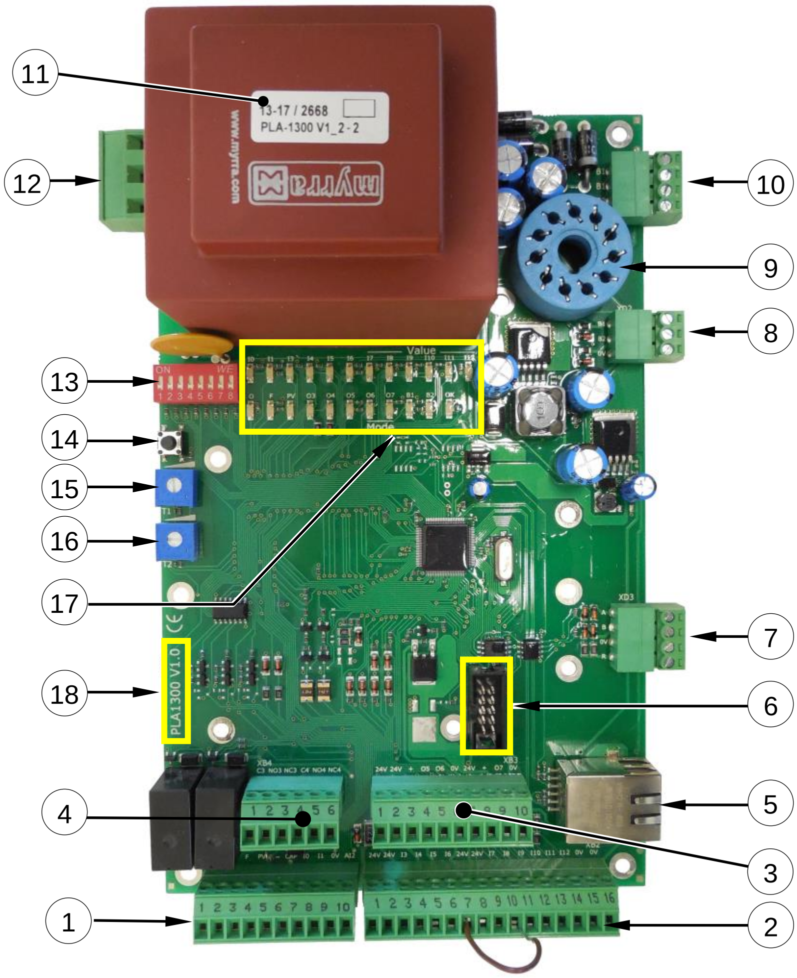
   By default, the barrier is in automatic mode and the (green) OK LED is steadily lit.

2. Once the software is operational, the HMI of the PLA1300 board can be used to issue open/close commands via the push-button. (Refer to the Logic manual)

   If the movement is made in the opposite direction, swap the connection of 2 phase cables between the motor and the variable speed controller after having shut off the power supply (= swap the T1/U and T3/W cables in the figure below):



7. PLA1300 CONTROL LOGIC

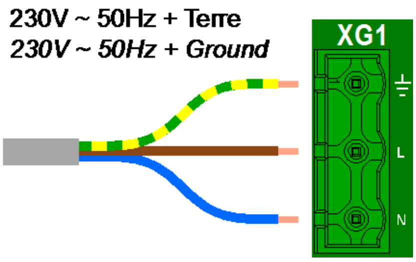


Item	Name
1	Connector XB1 *(Reserved for control of the VSC and for the position sensors)*
2	Connector XB2 *(Terminals 0V, 12V and inputs I3 to I12)*
3	Connector XB3 *(terminals 0V, 12V and + for outputs O5, O6 and O7)*
4	Connector XB4 *(NO and NC contacts for outputs O3 and O4)*
5	XRJ45 Ethernet link connector *(for connection to a network or to a PC)*
6	Serial link connector XSUPP *(for programming the board or for connection of a PLA1301 extension board)*
7	Connector XD3 *(RS485 connector for control of a VSC)*
8	Connector XD2 *(Reserved for special use by Automatic Systems)*
9	Connector B1B2 *(Connector for single (1 loop) or double (2 loops) presence detector)*

Item	Name
10	Connector XD1 *(Connection of detection loop(s))*
11	Label (serial number and software release)
12	Connector XG1 *(Single-phase mains supply 230 VAC, 50/60 Hz + PE)*
13	DIP switches
14	Push-button
15	Timer T1 adjustment potentiometer
16	Timer T2 adjustment potentiometer
17	I/O, Loop and HMI status display LEDs
18	Board model and version

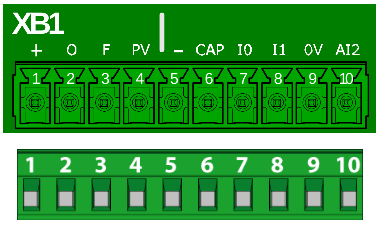
7.1.1. Characteristics of connector terminals

7.1.1.1. Connector XG1



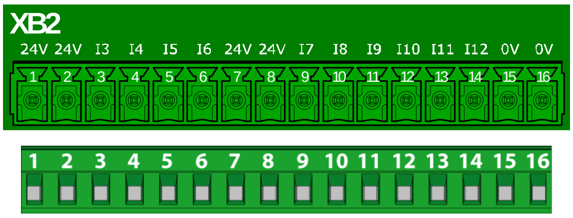
⏚ = Earth
L = Phase
N = Neutral

7.1.1.2. Connector XB1 [1]



+	=	Potential-free terminal [2]
O	=	Open command (⇨ VF)
F	=	Close command (⇨ VF)
PV	=	Slow speed command (⇨ VF)
-	=	Transistor ground
CAP [3]	=	24 VDC power supply of the position sensors
I0	=	Digital input 0
I1	=	Digital input 1
0V	=	0 VDC
AI2	=	0 – 10V analog input [4]

7.1.1.3. Connector XB2 [5]



24 VDC sink/source inputs

24V	=	+24 VDC
24V	=	+24 VDC
I3	=	Digital input 3
I4	=	Digital input 4
I5	=	Digital input 5
I6	=	Digital input 6
24V	=	+24 VDC
24V	=	+24 VDC
I7	=	Digital input 7
I8	=	Digital input 8
I9	=	Digital input 9
I10	=	Digital input 10
I11	=	Digital input 11
I12	=	Digital input 12
0V	=	0 VDC
0V	=	0 VDC

[1] Connector reserved for digital control of a VSC ⇨ ***For example***, see diagram Type ***C220***, Ch.10 of the Technical Manual of PLA1300.

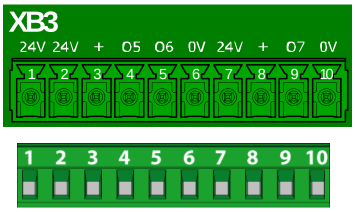
[2] Reserved for transistor outputs to be powered by the 24 VDC of the board or by the 24 VDC of another power source.

[3] Or 5V depending on the shunt ***ALIM CAP***.

[4] This input can also be used as a 24 VDC digital input.

[5] Inputs I7 to I12 operate both in PNP and in NPN. This means they can be used with either 24VDC or 12VDC, or 0V of the board (or of an external power source if the 0V are shared).
NB: That is why two 0V terminals are present on this connector.

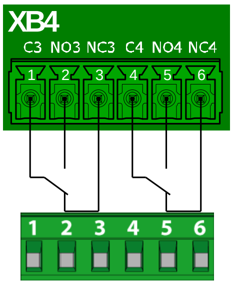
7.1.1.4. Connector XB3



Sink/source outputs 24 VDC

24V = +24 VDC
24V = +24 VDC
\+ = Transistor polarity
O5 [6] = Transistor output limited to 150 mA
O6 [6] = Transistor output limited to 150 mA
0V = 0 V or transistor ground
24V = +24 VDC
\+ = Transistor polarity
O7 [6] = Transistor output limited to 2.5 A
0V = 0 V or transistor ground

7.1.1.5. Connector XB4

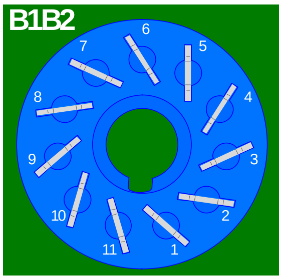


Dry contact outputs (limited to 3A at 230V)

C3 =
NO3 = } Change-over relay contact 230 V, 3 A
NC3 =

C4 =
NO4 = } Change-over relay contact 230 V, 3 A
NC4 =

7.1.1.6. Connector B1B2

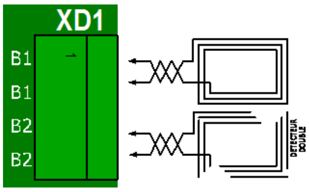


1 = 0VDC
2 = +24VDC terminal block (max 0.75A)
3 = loop 1 (from XD1)
4 = loop 1 (from XD1)
5 = loop 2 (from XD1)
6 = loop 2 (from XD1)
7 =
8 = } Loop 1 relay contacts.
9 = -----
10 =
11 = } Loop 2 relay contacts.

Automatic Systems specific pinout

[6] This output can be powered by an external power source (hence the + and - terminals).

7.1.2. Connector XD1



B1 =
B1 = } Terminal block for connection of detection loop 1

B2 =
B2 = } Terminal block for connection of detection loop 2

If **only one loop** is connected, **a single presence detector has to be used**.
The use of a double presence detector could result in malfunctions.

A double presence detector is necessary if a second loop is connected.

7.1.3. DIP switches

The eight DIP switches (or microswitches) integrated in the PLA1300 programmable control board include, in relation to the active program, a series of functions allowing to rapidly modify the behaviour of the control logic.

Prior to any modification of the DIP switch, it is important to refer to the diagrams supplied with the equipment.

Since priority is given to the web pages, it could be that, depending on the arrangement of the assignments on these pages, changing the position of a DIP switch does not actually modify the behaviour of the device.

7.1.4. Adjustment of hardware timers (potentiometers)

The two potentiometers present on the PLA1300 control logic can be used to adjust the following timers:

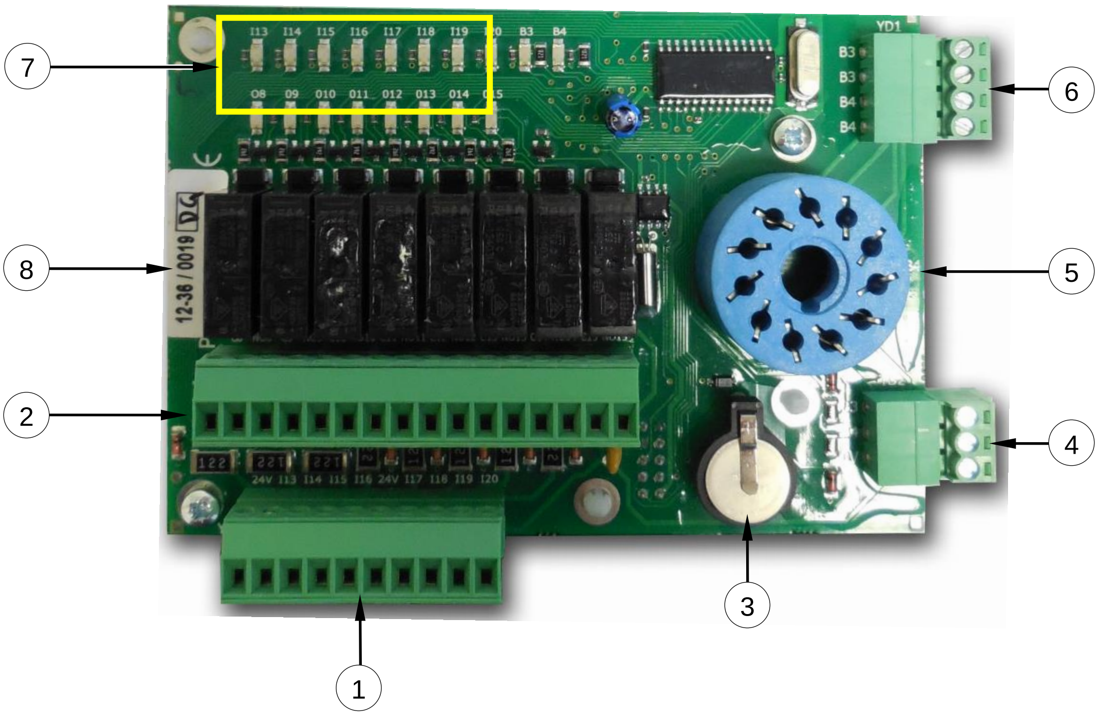
	MAX values	**DEFAULT** values	
T1	60 seconds	30 seconds	Timer for reclosing in case of non-passage
T2	10 seconds	2 seconds	Timer for reclosing after passage

- Turn the potentiometer clockwise to increase the timer value.
- Turn the potentiometer anticlockwise to decrease the timer value.

It is also possible to adjust other timers via the http maintenance interface.

- The assignment of the timers depends on the active program.
- The MAX values of T1 and T2 can be modified via the web pages.

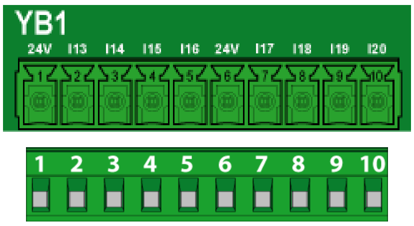
7.2. Additional PLA1301 board (optional)



Item :	Name
1	Connector YB1 *(2 24V terminals and 8 inputs: I13 ⇨ I20)*
2	Connector YB2 *(8 outputs: NO8 ⇨ NO15)*
3	BR1225 battery *(CR1225)*
4	Connector YD2 *(Reserved for special use by Automatic Systems)*
5	Connector B3B4 *(Connector for single (1 loop) or double (2 loops) presence detector)*
6	Connector YD1 *(Connection of detection loop(s))*
7	Input/output display LEDs
8	Label (board serial number and software release)

7.2.1. Characteristics of connector terminals

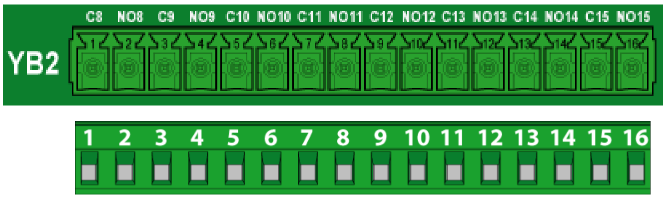
7.2.1.1. Connector YB1



Sink/source inputs
24 VDC

24V	=	+24 VDC
I13	=	Digital input 13
I14	=	Digital input 14
I15	=	Digital input 15
I16	=	Digital input 16
24V	=	+24 VDC
I17	=	Digital input 17
I18	=	Digital input 18
I19	=	Digital input 19
I20	=	Digital input 20

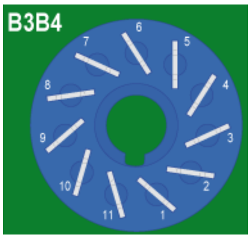
7.2.1.2. Connector YB2



Dry contact outputs
(limited to 3A at 230V)

C8	=	Common output 8
NO8	=	NO output 8
C9	=	Common output 9
NO9	=	NO output 9
C10	=	Common output 10
NO10	=	NO output 10
C11	=	Common output 11
NO11	=	NO output 11
C12	=	Common output 12
NO12	=	NO output 12
C13	=	Common output 13
NO13	=	NO output 13
C14	=	Common output 14
NO14	=	NO output 14
C15	=	Common output 15
NO15	=	NO output 15

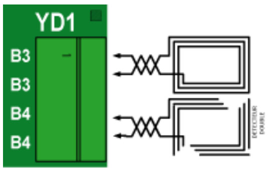
7.2.1.3. Connector B3B4



1	=	0VDC
2	=	+24VDC terminal block (max 0.75A)
3	=	loop 1 (from YD1)
4	=	loop 1 (from YD1)
5	=	loop 2 (from YD1)
6	=	loop 2 (from YD1)
7	=	} Contacts of loop relay 1.
8	=	
9	=	-----
10	=	} Contacts of loop relay 2.
11	=	

Pin assignment specific to Automatic Systems.

7.2.2. Connector YD1



B3	=	Terminal block for connection of detection loop 3
B3	=	Terminal block for connection of detection loop 3
B4	=	Terminal block for connection of detection loop 4
B4	=	Terminal block for connection of detection loop 4

If **only one loop** is connected, **a single presence detector has to be used**.
The use of a double presence detector could result in malfunctions.

A double presence detector is necessary if a second loop is connected.

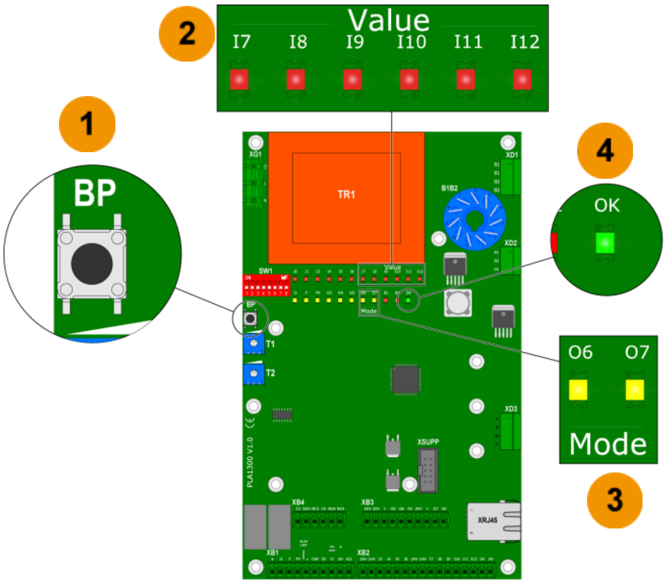
7.3. The HMI

The Human Machine Interface integrated in the PLA1300 control logic allows the user to view the active program number and to access different modes to modify the logic configuration.

7.3.1. Composition

The HMI section consists of:

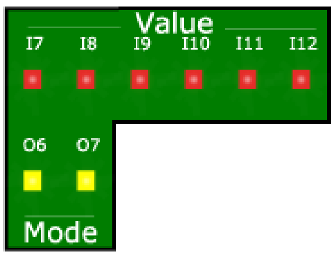
- A push-button ***PB*** 1 to choose and/or modify the value of a parameter;
- The ***VALUE*** 2 LEDs indicating the values of the parameters;
- The ***MODE*** 3 LEDs indicating the tens;
- An ***OK*** 4 LED confirming the entry of a parameter.



7.3.2. Visualization of the active program number

At power up, the ***Mode*** and ***Value*** LEDs indicate, for 5 seconds, the program the board is working under. This is indicated via LEDs I7 toI12, O6 and O7:

It is preferable to note which LEDs are lit before reading the program number.



Prog xy

- The ***Mode*** LEDs (O6 and O7) indicate the tens.

Lit LED(s)	O6	O7	O6 + O7
Value of x	0	1	2

- The ***Value*** LEDs (I7 to I12) indicate the units.

Lit LED(s)	I7	I8	I9	I10	I11	I12	I7+I8	I7+I9	I7+I10	I7+I11
Value of x	0	1	2	3	4	5	6	7	8	9

7.3.3. The modes

The ***9 accessible modes*** are:

- ***Mode 0***: to open/close the barrier or to initialize the analog sensor;
- ***Mode 1***: to modify the timers;
- ***Mode 2***: to modify the loop assignments;
- ***Mode 3***: to modify the predefined functions;
- ***Mode 4***: to modify the Output assignments;
- ***Mode 5***: to modify the Input assignments;
- ***Mode 6***: to modify the PLA1300 board programs;
- ***Mode 7***: to modify the VFD programs and the Opening and Closing %;
- ***Mode 8***: to modify direct actions such as:
    - 1: selection of type of VFD (0 = Digital / 1 = Serial)
    - 2: calibration (0 = no / 1 = yes)
    - 3: Sensor type (0 = Digital / 1 = Analog)
    - 4: Temporary reset of the IP address
    - 5: Factory reset of the IP address
    - 6: Reclosing upon detection of an obstacle (0 = no / 1 = yes)

7.3.4. OK LED display logic

The status of the ***OK*** LED during navigation in the HMI provides an excellent means of reference to the programming step being performed.

The following table presents the 5 possible statuses of the ***OK*** LED:

PLA1300: LED OK status

On	Auto mode
Off	HMI: Choice of mode in progress
50 %	HMI: Choice of parameter in progress or MANUAL
20 %	HMI: Choice of value 1 of parameter in progress
80 %	HMI: Choice of value 2 of parameter in progress
Rapid blinking	HMI: Initialization of analog sensor in progress

7.3.5. Mode 0 – Opening/Closing or analog sensor initialization

MODE 0 → BP action

LED ***OK***

To access the mode:

- Switch off the board's power supply;
- Press and hold down the ***BP*** and restart the board;
- All LEDs of the HMI light up. Release the ***BP***. (do not hold down for more than 3 seconds);
- The ***OK*** LED goes out .
- Repeatedly press the ***PB*** until LED ***I7*** is lit.
- To validate, press the ***PB*** until all LEDs of the HMI are lit. (approx. 3 seconds);
- The ***OK*** LED blinks .

Possible actions:

In this mode, the duration of pressing the ***PB*** is of crucial importance.

Once this mode is selected, a:

- ***brief*** button press will issue a barrier ***open or close command*** (*Remote switch mode / command to a contact)*.
- ***long*** button press (for more than 3 seconds) will launch the ***initialization of the analog sensor*** (the ***OK*** LED blinks rapidly), provided it has been declared.

7.3.6. Mode 6 - Modification of board programs

MODE 6 → Program N° → Value

LED ***OK***

To access the mode:

- Switch off the board's power supply.
- Press and hold down the ***PB*** and restart the board.
- All LEDs of the HMI light up. Release the ***PB***. (do not hold down for more than 3 seconds);
- The ***OK*** LED goes out .
- Repeatedly press the ***PB*** until LEDS ***I7 and I8*** are lit.
- To validate, press the ***PB*** until all LEDs of the HMI are lit. (approx. 3 seconds)
- The ***OK*** LED blinks .

To change the program;

Up to 29 VFD programs may be available in the PLA1300 board.
However, only the programs that are actually present in the board's memory will be available.

HMI display (LEDs)	Program N°
I8-O6	Program 1
I9-O6	Program 2
I10-O6	Program 3
I11-O6	Program 4
I12-O6	Program 5
I8-O6-I7	Program 6
I9-O6-I7	Program 7
I10-O6-I7	Program 8
I11-O6-O7	Program 9
I7-O7	Program 10
I8-O7	Program 11
I9-O7	Program 12
I10-O7	Program 13
I11-O7	Program 14
I12-O7	Program 15

HMI display (LEDs)	Program N°
I7-I8-O7	Program 16
I7-I9-O7	Program 17
I7-I10-O7	Program 18
I7-I11-O7	Program 19
O6-O7-I7	Program 20
O6-O7-I8	Program 21
O6-O7-I9	Program 22
O6-O7-I10	Program 23
O6-O7-I11	Program 24
O6-O7-I12	Program 25
O6-O7-I7-I8	Program 26
O6-O7-I7-I9	Program 27
O6-O7-I7-I10	Program 28
O6-O7-I7-I11	Program 29

If you try to validate a program that does not exist, the validation will not be executed and you will remain in the program choice mode (the ***OK*** LED will continue to blink until a valid program is chosen).

When the PLA1300 board's program is chosen and validated, the board will be reinitialized and the previously chosen program will become active.

The modification of this program must be performed by an informed, qualified technician, because the configuration of inputs, outputs, loops, etc. may be different and may thoroughly alter the behaviour of the PLA1300 board and therefore also that of the connected equipment.

For details on the configuration of the PLA1300 control logic, refer to the appropriate technical manual.

8. ACCESSORIES / OPTIONS

The barrier can be equipped with one or more options.

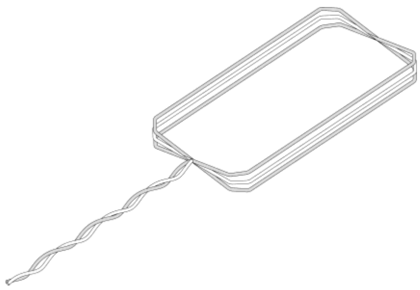
Consult our sales representative to check the feasibility and availability of the chosen options.

8.1. Detection loops

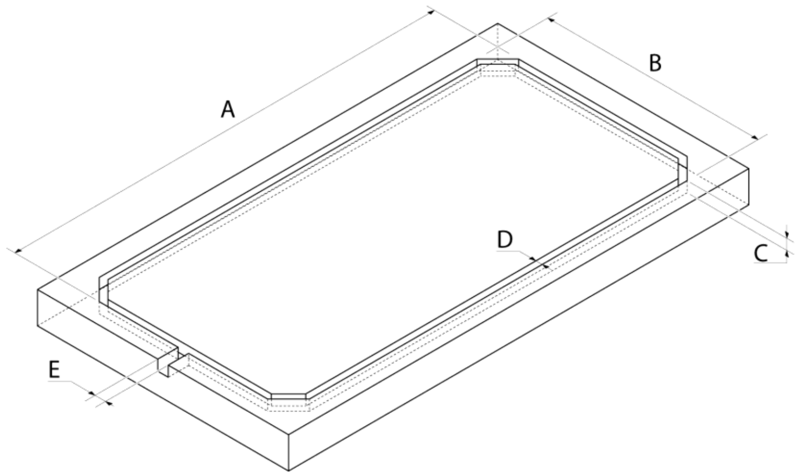
Implementation and installation of magnetic loop(s)

Barrier systems with automatic closing generally use inductive loops to detect the passage of vehicles. These loops can be purchased ready to be installed. You can, however, also manufacture your own loops by observing the following instructions:

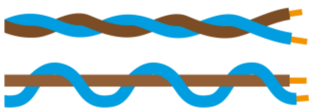
Preformed loop



Recessed mounting



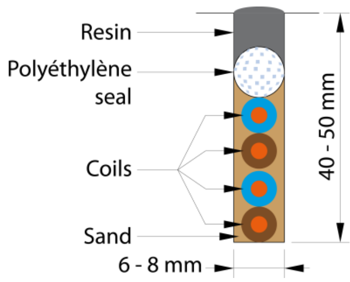
Correct



Incorrect

The corners must be cut at 45° so as not to cut the wire insulation.

Installing the loop



Recessed mounting

A: Passage width less than 60 cm on either side

B: Between 800 and 1000 mm

C: Between 30 and 50 mm

D: 6 - 8 mm

E: 10 mm

Number of turns *

Loop perimeter (metres)	Number of turns
< 6	4
6 – 10	3
> 10	2

- Use individual wire with a cross section of 1.5 to 2.5 mm², type H07 VK

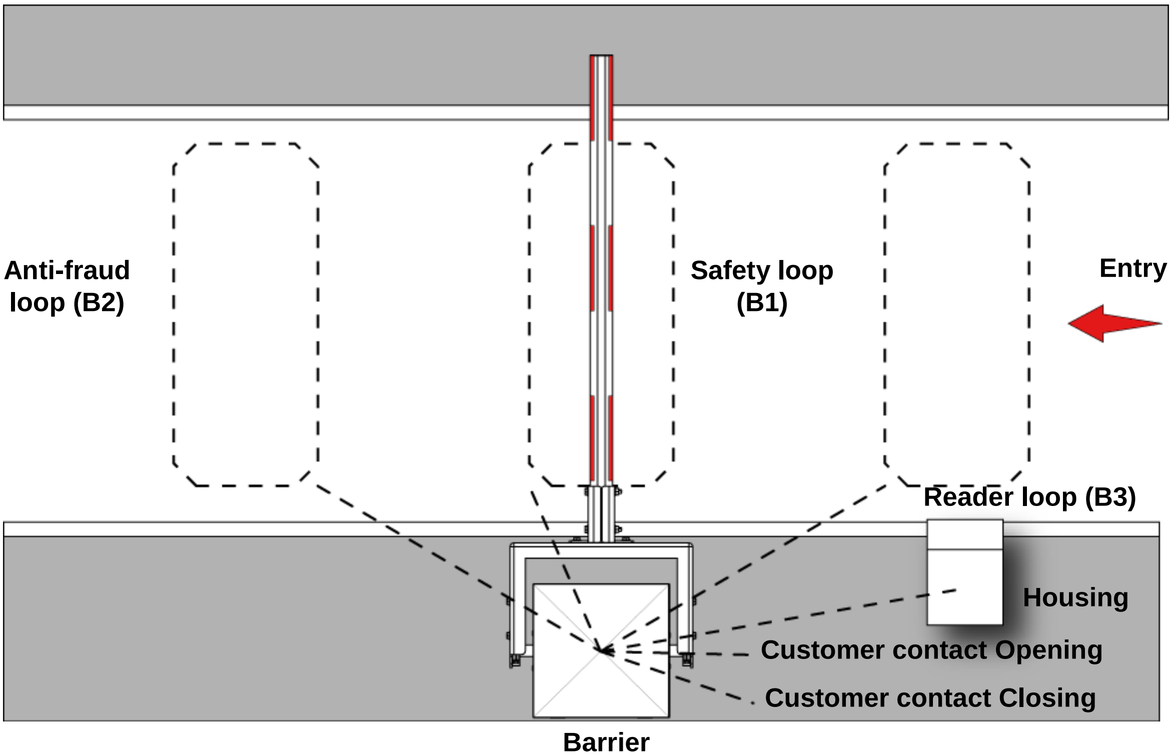
*** Observe the number of turns.**

Notes:

- Twist the wires to form the loop tail, taking at least 10 twists per metre as a minimum, so as to cancel the detection effect on the loop tail. The loop tail may not be longer than 50 m, and must be protected by a sleeve Ø 20mm used exclusively for this purpose.
- Check that the loop inductance falls between 60 and 180 µH.
- The loop must be at least 2 metres away from all power supply cables.
- The loop must be at least 1 metre away from any moving metal object.
- If the loop is positioned in reinforced concrete, it must be at a distance of more than 100 mm from the frame.
- Manhole covers, sewer pipes, water intakes, etc. must be installed more than one metre away from the loop (so as not to reduce the loop's efficiency).
- The underlying ground, and the covering, must be sufficiently dense to prevent the loop moving during the passage of vehicles.
- When installing the loop, make sure that it cannot move afterwards (when closing the opening or installing the pavers). Any movement of the loop is interpreted as an inductance variation and may cause unwanted openings of the barrier or blocking in the open position of the barrier.
- Do not install the loop in a sleeve.

For the passage of heavy weights, install 2 safety loops (use 2 detectors!) or 1 longer loop.

Configuration example:



8.2. Configuration of the Loop Detectors (Optional)

The presence detectors associated with the inductive loops may be one of the following two models:

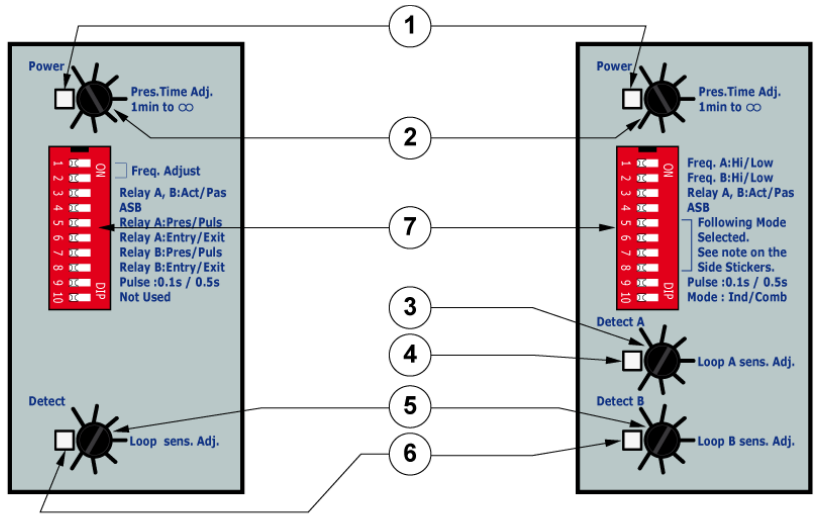
The detectors must be installed and removed carefully so as not to alter, or even destroy, the PLA1300 board.

Because of the specific cabling for the electronic boards delivered with Automatic Systems barriers, standard commercially available detectors cannot be used. For particular settings or in case of failure, please contact our Customer Service.

The presence detectors associated with the inductive loops may be one of the following two models:

8.2.1. Type 1 Detectors

The range of type 1 detectors is a series of single- or double-channel inductive loop detectors:

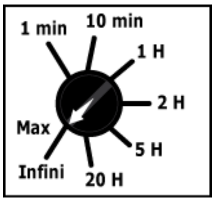


Détecteur simple
pour 1 boucle à induction

Détecteur double
pour 2 boucles à induction

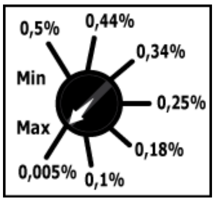
1: **Power supply pilot light**

Green when the module is powered on.



2: Potentiometer used to set the **presence detection time**

= After a presence detection, delay after which the detector reinitializes (i.e., takes the value measured by the loops as reference level).
The default setting is ***Infinite*** (turned fully clockwise), this prevents the detector from reinitializing.



3: Potentiometer used to set the **sensitivity** of loop A (for double detectors).
Setting to be adjusted on site according to environment and loop sensitivity: increase loop detection sensitivity by turning the potentiometer clockwise or decrease the presence detection time (see point 2)

4: Activation pilot light of loop A (for double detectors).

Upon power-on: blinking red. The number of blinks indicates the number of tens of kHz of the loop oscillating frequency.

Error message, based on blinking frequency:

- 1 blink per second: loop frequency too low or loop
- open. Adjust with DIP switches 1 and 2 or modify the number of turns of the loop.
- 2 blinks per second: loop frequency too high Adjust with DIP switches 1 and 2 or modify the number of turns of the loop.
- 1 blink every 2 seconds: loop short-circuited. Check cables.

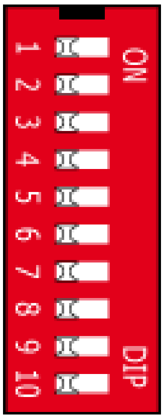
Normal operation: LED not lit, then continuously red during presence detection in the loop.

5: Potentiometer used to set the **sensitivity** of a single loop (for single detectors) or loop B (for double detectors).
Same operation as described in 3.

6: Activation pilot light of a single loop (for single detectors) or of loop B (for double detectors).

Same operation as described in 4.

7: DIP switches.
Default setting (DIP switch is OFF when it is pointing to the number side of the DIP, i.e., on the left when looking at the detector from the front as illustrated below):



Every time a modification is made to a DIP switch, the detector reinitializes (see point 2).

DIP switches 1 and 2: Loop frequency setting:

Dip 1	Dip 2
OFF	OFF
ON	OFF
OFF	ON
ON	ON

Single detector
Single loop
High
Mid-high
Mid-low
Low

Double detector	
Loop A	Loop B
High	High
Low	High
High	Low
Low	Low

DIP switch 3: Relay configuration: active or passive.

DIP switch 4: Automatic Sensitivity Boost. To detect metal vehicles with various heights (trucks, 4x4s, etc.) with greater precision, the DIP switch should be set to ON.
May cause malfunctions and is therefore to be used as a last resort.
The default setting is OFF to increase sensitivity to tailgating fraud (detection of two vehicles close to each other).

DIP switch 5: Operating mode of relay A (presence or pulse).

DIP switch 6: Pulse type of relay A (input or output) or mode of relay B (non-directional or directional A → B.

DIP switch 7: Operating mode of relay B (presence or pulse) or choice of loop (A or B) for pulse.

DIP switch 8: Pulse type of relay B (input or output).

DIP switch 9: To set the pulse duration of both relays (100 ms or 500 ms).

DIP switch 10: Double loop mode (independent of the A→B combination).

Because of the specific cabling for the electronic boards delivered with Automatic Systems barriers, standard commercially available detectors cannot be used. For particular settings or in case of failure, please contact our Customer Service.

8.2.2. Type 2 Detectors

Detector DP134 (1 loop)

PRES : Always to be set to ON.

PULSE : Always to be set to OFF.

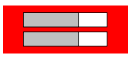
FILTRE : Always to be set to OFF.

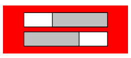
ASB : Sensitivity booster to be used for high vehicles. This function should preferably remain OFF.

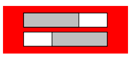
SENS : Detection sensitivity adjustment.
See principle below.

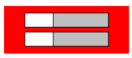
FREQ: Frequency of use adjustment.
See principle below.

There are four sensitivity and frequency settings:


ON
High


ON
Medium high


ON
Medium low


ON
Low

PRESS "RAZ" AFTER MAKING A MODIFICATION - DURING INITIALIZATION, MAKE SURE NO METAL OBJECT IS PRESENT ON OR IN THE PROXIMITY OF THE LOOP

Detector DP234 (2 loops)

PRES : Always to be set to ON.

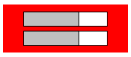
ASB : Sensitivity booster to be used for high vehicles. This function should preferably remain OFF.

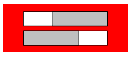
SENS 1 : Detection sensitivity adjustment of loop 1. See principle below.

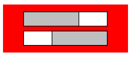
SENS 2 : SENS 1 : Detection sensitivity adjustment of loop 2. See principle below.

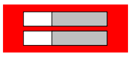
FREQ: Frequency of use adjustment of both loops.
See principle below.

There are four sensitivity and frequency settings:


ON
High


ON
Medium high


ON
Medium low


ON
Low

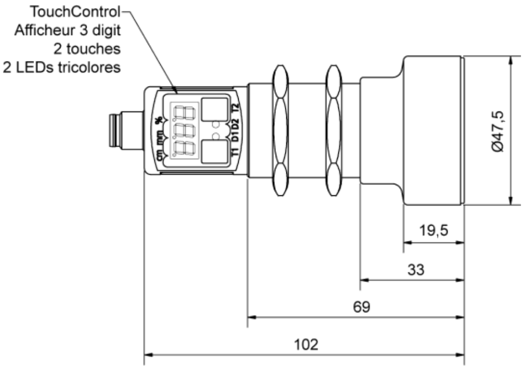
PRESS "RAZ" AFTER MAKING A MODIFICATION.

8.3. Ultrasonic Detector (optional)

8.3.1. Description

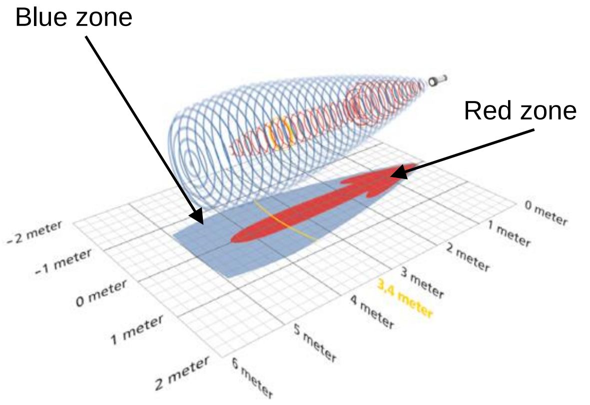
The ultrasonic detector detects any object located within its detection area. This cone-shaped area has a configurable length from 350 to 5000 mm. All adjustments are made by means of two keys and a digital display. Bi-colour LEDS, orange/green, indicate the switching status of the output, which can be configured as normally open (NO) or normally closed (NC).

8.3.2. Mechanical characteristics



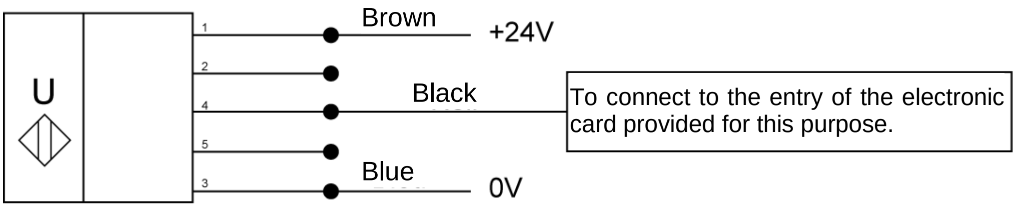
8.3.3. Detection

Dead zone: 350mm
Service range: 3400mm
Limited range: 5000mm



The ultrasonic sensors has a dead zone that is inherent in its detection technology. Detection of an object in this zone is not significant.
The service range corresponds to the distance at which the sensor can be used on normally reflecting objects with a sufficient operating reserve.
This view shows the effective detection volume of the sensor as a function of the distance. The red area is the zone in which a cylindrical bar Ø27mm is detected, and the blue area the zone in which a square plate with 500mm sides, positioned at an optimal angle, is detected.

8.3.4. Electrical connections



8.3.5. Configuration

Any sensor delivered with a barrier is mounted, pre-wired and adjusted according to the following parameters:

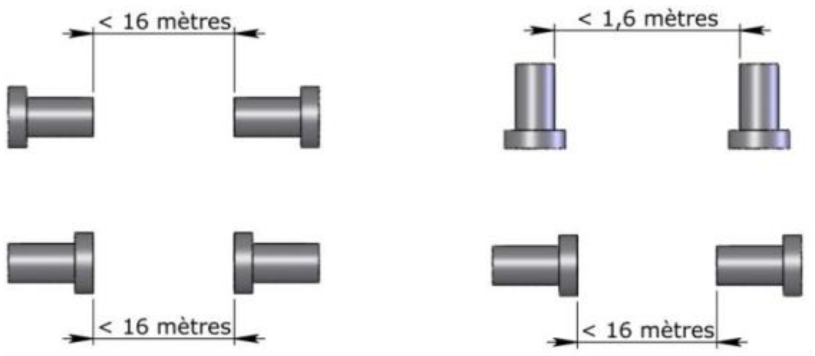
- Output contact: NC (normally closed)
- Detection range: useful length of the arm associated with the barrier

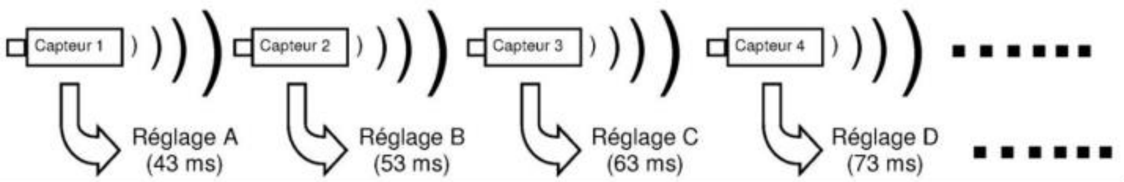
For the configuration of a separately supplied sensor (customer service, later addition), the output contact parameters and the detection range should be checked and/or adjusted by performing the following steps:

1. **Press T1+T2** for approx. 3 seconds until **Hello** followed by **Pro** is displayed.
2. **Release T1+T2**, the display indicates **d**
3. **Press T1+T2** to go to the switching distance setting
Set the switching distance in relation to the useful length of the arm by pressing **T1** (to decrease the value) or **T2** (to increase the value).
4. **Press T1+T2**
5. **Press T2** until the display indicates "**- - -**" (single mode)
6. **Press T1+T2** to go to the NO (¯|_) or NF (_|¯) setting
T1 or **T2** changes the direction
7. **Press T1+T2** until **END** is displayed
8. **Press T1+T2** to return to the **operational mode**

8.3.5.1. Synchronization

If several sensors are to be installed in the same area, and if the distances between the sensors are less than those given in the figure here, the sound signal of the sensors may be severely disturbed. In these cases, a simple solution can be implemented by modifying the value of the A12 parameter in the additional functions. For this, the following principle should be followed:





- **Adjustment A** corresponds to value **670** for parameter **A12**
- **Adjustment B** corresponds to value **770**
- **Adjustment C** corresponds to value **840**
- **Adjustment D** corresponds to value **910**
- **Adjustment E** corresponds to value **980**
- **Adjustment F** corresponds to value **999**

Parameter A12 is modified as follows:

- 1. **Press T1+T2** for approx. 7 seconds until **Add-On**, followed by **A1** is displayed
- 2. **Press T1 or T2** until **A12** is displayed
- 3. **Press T1+T2** to validate
- 4. **Press T1** or **T2** to modify the indicated value
- 5. **Press T1+T2** to validate. **End** is then displayed
- 6. **Press T1+T2** to return to the operational mode

8.3.5.2. Note

Ultrasonic sensors have an internal temperature compensation. The sensor has a normal temperature rise on the inside, so that the compensation becomes optimal after approx. 30 minutes of operation. During normal operation, the yellow LED D2 indicates the switching of the output, and the measured distance is indicated on the 3-digit display in millimetres (up to 999 mm) and then in centimetres. The scale changes automatically and is indicated by a point at the top right of the display. If no object is located within the detection area, the display indicates "- - -".
If no button is operated for 20 seconds during the parameter adjustment phase, the changes made are stored and the sensor returns to normal operating mode.

8.3.5.3. MAINTENANCE

Ultrasonic sensors do not require any particular maintenance. Small quantities of dirt or dust on the surface will not affect their characteristics. In the event of excessive deposits on the sensitive surface, clean it with a damp cloth to preserve the detection reliability.

8.4. Configuration of the CARDIN radio transmitters ref. 4E5445 (optional)

Activation of the transmitters

1. Open the cover of the radio transmitter.
Press and hold down button P1 "Memo".
LED L1 starts to blink slowly.
2. Simultaneously press the key of the transmitter to be programmed. LED 1 stops blinking for a few seconds.
3. When the LED starts to blink again, release button P1.
4. Validate the programming by again pressing the key of the transmitter to be programmed.

Deactivation of the transmitters

1. Press button P2 "Delete". L1 blinks rapidly.
2. Simultaneously press the button to the left of the transmitter. The LED remains lit for 2 seconds, indicating that the transmitter is deactivated.

The key to the left of the receiver corresponds to the receiver's CH1 contact, the key to the right of the receiver to the receiver's CH2 contact.

9. MAINTENANCE

ALL MAINTENANCE OR SERVICING MUST BE PERFORMED WITH THE POWER SWITCHED OFF AND IN ACCORDANCE WITH THE SAFETY WARNINGS (⇨CH.1.).

Every year(*)

- Ensure screws and bolts are properly tightened (torque): bearings, gear motor, hub, sensors, spring assembly, arm attachment, base attachment, etc.
- Clean the body and the arm with a soft cloth impregnated with a non-aggressive detergent.
- For very sunny countries, it is advisable to treat the exterior of the body with a glossing product.
- Shut off the electrical power supply and check the behaviour of the arm:
  - For models with automatic raising, the arm should rise completely but without violently hitting the end stop.
  - For models without automatic raising, the arm should be able to rise manually with more or less effort.
- Blow out the electronic board + frequency converter assembly so as to remove any deposits of exhaust particles.

Every 2 years(*)

- Ensure screws and bolts are properly tightened (torque): bearings, gear motor, hub, sensors, spring assembly, arm attachment, base attachment, etc.
- Check the state of the electrical connections.
- Check the sole plate for absence of leaks.
- Check the inside of the barrier for cleanliness.

(*) To be adapted according to equipment operating conditions, especially when the equipment is located in an oxidizing climate (e.g., near the ocean).

10. TECHNICAL CHARACTERISTICS

Electrical power supply	Single-phase 230 V~ (± 10%) + ground – 50 Hz
Useful power consumption	450 W while moving (44W at rest)
Motor	Three-phase 230 V/250 W
Free passage [L]	2 to 4m, in increments of 0.5 m
Operating time:	Adjustable between 1,2 and 3 seconds (allowing the passage of 1500 vehicles/h)
Operating temperature:	Between –20° and +60°C.
Average relative humidity	95%, without condensation
IP	IP54
Sound level	< 70db
Weight	Net weight (excluding arm): 100kg Arm: 15 kg max.
Wind resistance	120 km/h without hindering operation
MCBF	5.000.000 mean cycles between failures, with recommended maintenance.
CE	Complies with European standards

11. MAINTENANCE AND TROUBLESHOOTING

Prior to any work on the inside of the housing, the arm must be in the high (open) position (⇨Ch.11.5.), in order to reduce the stretching of the spring and to prevent unwanted movements of the drive mechanism, which may cause severe injuries.

11.1. BREAKDOWNS AND REPAIRS

Check power supply voltages of the board's fuse.
PLA1300 board: ***OK*** LED should be steadily lit;
Variable frequency drive: the green square ***FREQ*** should be steadily lit and the green ***RUN*** LED should blink.

SYMPTOM(S)	PROBABLE CAUSE(S)	CHECK(S) OR APPROPRIATE SOLUTION(S)
The barrier remains open	An opening command is sent continuously.	Ensure the opening command is a pulse and not a continuous command.
	The (optional) switch is in "forced opening".	Check condition of the (optional) switch.
	No signal received from the High position sensor. Barrier in calibration with variable frequency drive blocked.	Sensor out of service or maladjusted. Note: - Barrier low → High sensor OFF / Low sensor ON - Barrier high → High sensor ON / Low sensor OFF - Barrier in mid-position → High and Low sensors ON.
	Electronic board is faulty.	Check if the OK LED of the PLA1300 board is steadily lit. Check the external commands via shunts at the board terminal block.
	Variable frequency drive is faulty.	See chapter on error codes of the frequency converter (⇨Ch.11.2.).
	The (optional) loop detector remains active.	Check the detector's sensitivity and reset the loop detector to zero. If the sensitivity setting is too high, it can cause the barrier to be locked open.
		Check whether the LEDs on the detector are signalling a detector or loop failure.
	The (optional) cell is signalling a presence	Check photocell alignment.
		Ensure photocells are not dirty.
The barrier remains closed.	No opening command is received.	Check if the barrier operates by simulating an opening command.
	The (optional) switch is in "forced closing".	Check condition of the (optional) switch.
	Variable frequency drive is faulty.	See chapter on error codes of the frequency converter (⇨Ch.11.2.).

Check power supply voltages of the board's fuse. PLA1300 board: ***OK*** LED should be steadily lit; Variable frequency drive: the green square ***FREQ*** should be steadily lit and the green ***RUN*** LED should blink.		
SYMPTOM(S)	PROBABLE CAUSE(S)	CHECK(S) OR APPROPRIATE SOLUTION(S)
	No signal received from the Low position sensor. Barrier in calibration with variable frequency drive blocked.	Sensor out of service or maladjusted. Note: - Barrier low → High sensor OFF / Low sensor ON - Barrier high → High sensor ON / Low sensor OFF - Barrière in mid-position → High and Low sensors ON.
	Control logic is faulty.	Check if the OK LED of the PLA1300 board is steadily lit. Check the external commands via shunts at the board terminal block.
The barrier takes a long time to close after a vehicle has passed	The closing after passage timer is set for too long	See page *General configuration* of the maintenance interface (see appropriate manual).
	The opening command is given again during the passage.	Set a lower pulse time for the barrier opening command.
The barrier opens for no apparent reason.	The opening loop (optional) is too sensitive.	Adjust the sensitivity and/or frequency of the opening detector. A sensitivity setting that is too high or an improper frequency may cause unwanted openings.
	The access control system sends unwanted commands.	Check the LEDs of the inputs on the PLA1300 board. Check the access control system.
The arm is incorrectly positioned on the (optional) tip support.	The arm strikes the tip support with too much force.	Adjust the lower stop (⇨Ch.6.3. or Ch.6.4.).
	The arm stops before it reaches the tip support.	Adjust the position sensors. (⇨Ch.11.8.3.)
The arm bounces in the high and/or low position	The adjustable stops inside the barrier are too tight.	Adjust the stops (⇨Ch.6.3. or 6.4.). Reinitialize the barrier via the page *Motor tests* of the maintenance interface (see appropriate manual).
The power disconnects when the barrier is turned on	An incorrect differential circuit breaker is being used.	Use a differential circuit breaker as recommended in Ch.0

11.2. VF Error Codes

The factory settings protect the variable frequency drive and the gear motor from all malfunctions. The settings of the variable frequency driver should therefore never be modified.

Any modification of these parameters without prior express permission from Automatic Systems is your full responsibility and will automatically void the product warranty.

During normal operation, the DRV LED is lit. The variable frequency drive then displays the motor's operating frequency.

Main Error Messages

In the event of a fault, in addition to the blinking of the ALM LED, the VFD can indicate the origin of the fault via codes. The most common faults are described below.

After switching off the power supply, this code disappears and will no longer be visible when it is switched on again. It is therefore imperative to record this code before reinitializing the barrier.

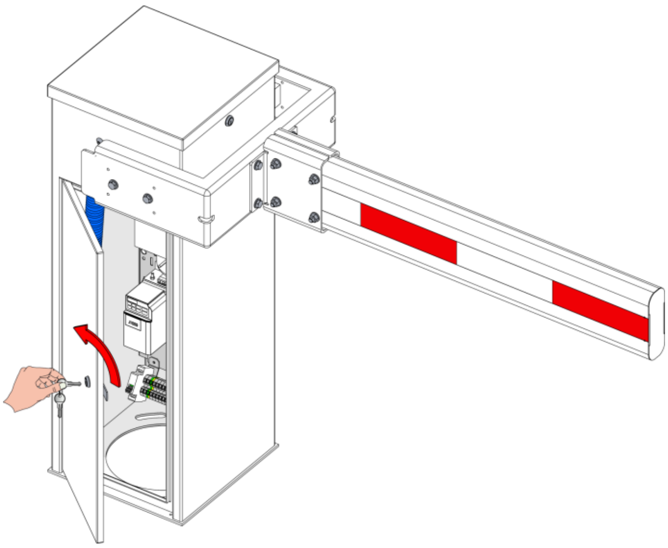
<table>
<tr><th>CODES</th><th colspan="2">DESCRIPTION</th></tr>
<tr><td>Uu 1</td><td colspan="2" rowspan="2">Insufficient supply voltage of the VFD (Uu 2), of faulty motor phase (Uu 2)</td></tr>
<tr><td>Uu 2</td></tr>
<tr><td>Ou</td><td colspan="2">Voltage of the SC bus has exceeded its max. limit</td></tr>
<tr><td>oH
(blinking)</td><td colspan="2">VFD temperature rise</td></tr>
<tr><td>oL1</td><td>Motor overload</td><td rowspan="2">Check the balancing of the arm and perform operational tests to check if the VFD does not make any noise. The barrier may have been vandalised during closing or opening</td></tr>
<tr><td>oL2</td><td>Selector overload</td></tr>
<tr><td>Bb
(blinking)</td><td colspan="2">Check the wiring of the variable frequency drive at the inputs</td></tr>
<tr><td>oC</td><td colspan="2">Short circuit or insulation fault at the VFD output (check motor windings and insulation).</td></tr>
<tr><td>GF</td><td colspan="2">Ground problem.</td></tr>
</table>

11.3. Opening the Side Door and Hood

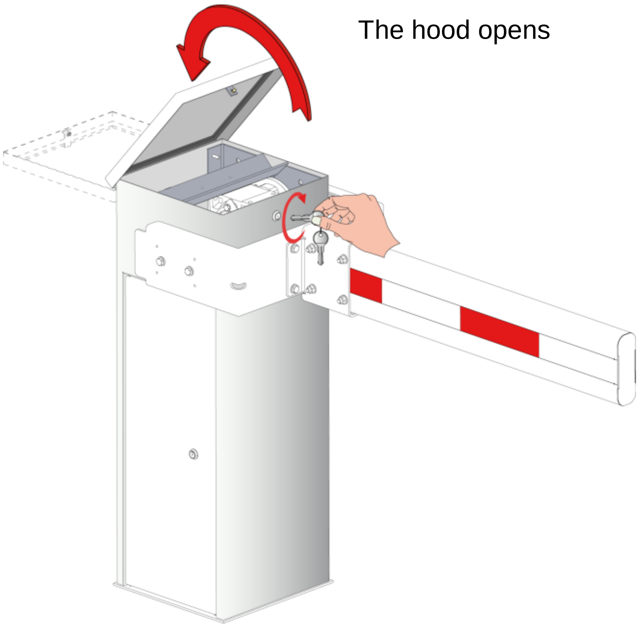
a) Actuate the lock.

b) Cause the door/hood to pivot on its hinge.

The door opens

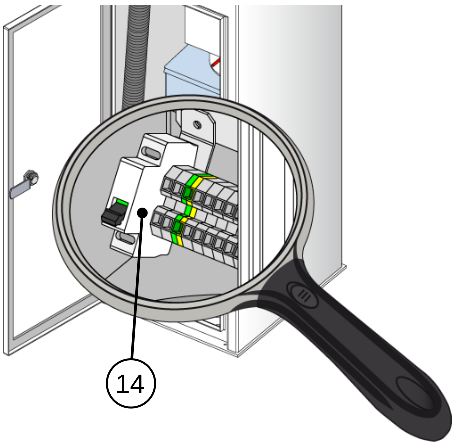


The hood opens



11.4. Switching the Equipment Off

- Open the door (⇨Ch.11.3.).
- Lower the circuit breaker (14) to deactivate the barrier.



11.5. Manual Raising of Arm

The procedure to be followed for manually raising the arm differs according to the configuration, as shown in the following table:

BARRIER CONFIGURATIONS	PROCEDURE
With automatic raising of the arm in the event of power failure. (option)	• Shut off the power supply (⇨Ch.11.4.) ⇨ the spring (⇨Ch.4.1. , item 10) automatically raises the arm.
Without automatic raising of the arm in the event of power failure.	• Shut off the power supply (⇨Ch.11.4.); • Operate the manual brake release lever located on the motor (⇨Ch.4.1. , item 15); • Manually raise the arm. • Release the brake release lever.

11.6. Replacing the Spring Assembly

Tools required: Ratchet and 16-mm ratchet extension.

- Open the door (⇨Ch.11.3.).
- Shut off the power supply (⇨Ch.11.4.).
- Raise the arm slightly past 90° and tighten the upper stop so that the arm does not fall back down.
- Note down the position of the upper location of the spring on the hub (7) ⇨ Fig. 1.

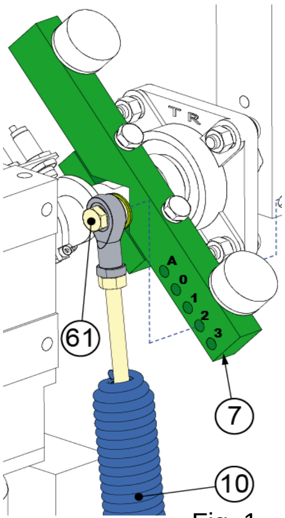


Fig. 1

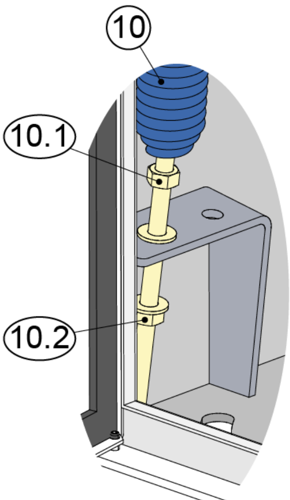


Fig. 2

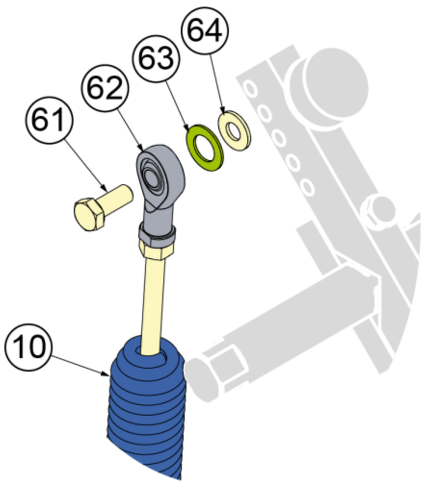
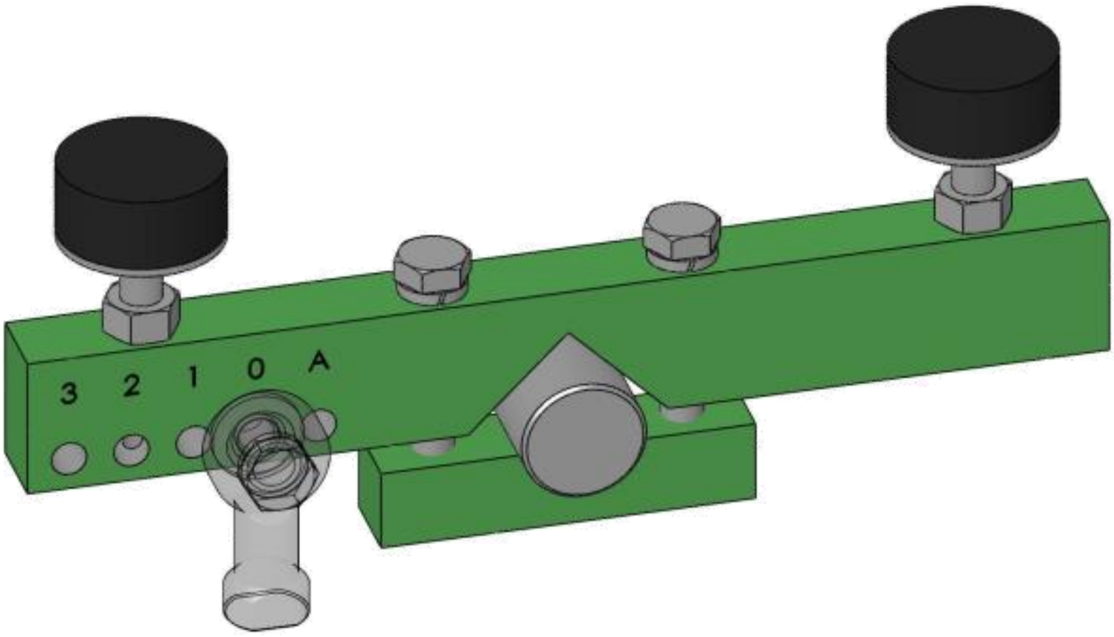


Fig. 3

- Loosen the locknut (10.1) and completely release the spring tension by loosening the nut (10.2) ⇨ Fig. 2.
- Unscrew the screw (61) for retaining the spring assembly on the hub and remove the faulty assembly ⇨ Fig. 3.
- Replace the spring assembly (10) and put the washers (64 & 63) and the fastening screw back in place (61). Screw down everything.
- Adjust the vertical position of the arm (⇨Ch.11.4.).
- Adjust the spring tension (⇨Ch.6.5.).

11.7. Table of Main Spring Adjustments

Position of the spring(s) on the stop hub



***SPRING ADJUSTMENT TABLE* ParkPlus 244 (Central arm)**

	SR		AVR	
	Position of the shaft on the hub		Position of the shaft on the hub	
LU	Bare arm	With suction mechanism*	Bare arm	With suction mechanism*
2000	0	1	1	2
2500	1	A + 0	A + 0	A + 1
3000	A + 1	A + 1	A + 1	0 + 1
3500	1 + 1	1 + 2	1 + 1	1 + 2
4000	1 + 2	2 + 2	2 + 2	3 + 2

SPRING ADJUSTMENT TABLE ParkPlus 244 (Articulated arm)

		SR		AVR	
		Position of the shaft on the hub		Position of the shaft on the hub	
LU	HSP	Bare arm	With suction mechanism*	Bare arm	With suction mechanism*
2000	2000	0	1	A + 0	2
	2200	1	1	A + 0	A + 0
	2400	1	2	A + 1	A + 1
	2500	2	A + 1	A + 1	A + 1
2500	2000	1	1	A + 0	A + 0
	2200	A + 0	A + 0	A + 1	A + 1
	2400	A + 1	A + 1	A + 1	A + 2
	2500	A + 1	3	A + 2	A + 2
3000	2000	1	A + 0	A + 0	A + 1
	2200	2	2	0+1	0+1
	2400	A+1	A+1	0+1	0+1
	2500	3	0+1	0+1	0+2
3500	2000	1	2	A+1	A+1
	2200	A+0	A+1	0+1	0+1
	2400	A+1	A+2	0+2	0+2
	2500	A+2	A+2	0+2	1+2
4000	2000	A+0	2	A+1	0+1
	2200	A+1	A+1	0+2	0+2
	2400	A+2	0+2	0+2	1+2
	2500	A+2	0+2	0+2	1+2

*Suction mechanism used: Ø80.

Reading the table:

The yellow boxes indicate the position of the spring on the hub. If only one number appears, only one spring is needed; if two numbers are indicated, two springs must be mounted.

The adjustment values indicated in the above table are indicative and may vary according to the tolerance of the spring(s).

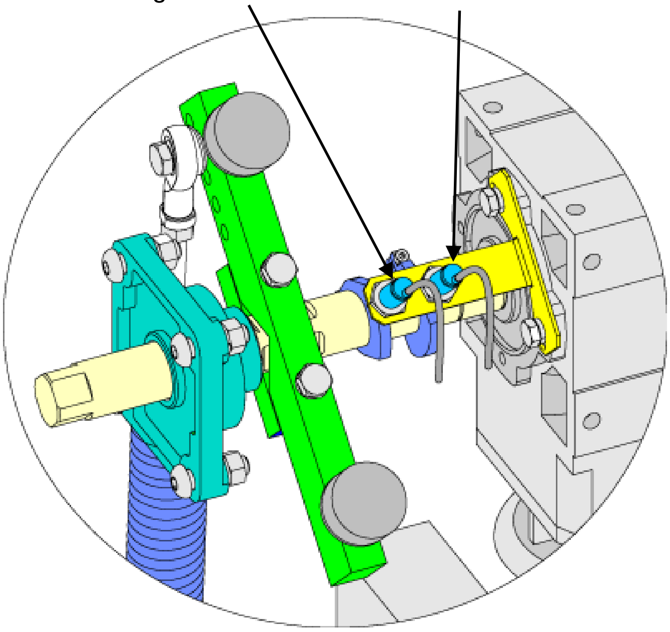
The spring is considered correctly tensioned if it can no longer vibrate with the arm in the high position.

For the high and low threads, contact our Customer Service.

For models equipped with an electromagnet roller, over-dimension the setting to the higher size.

11.8. Replacing the Position Sensor

11.8.1. Location of the Position Sensors



By convention, when the user is located in front of the barrier, the inductive sensor located to his left controls the high position.

11.8.2. Operation of the Position Sensors

- Opening or closing sequence: motor start at high speed after an acceleration ramp.
- Passage of the trough of the cam in front of the sensor: activation of low speed and start of the end-of-movement timer.
- Stopping of movement by mechanical contact of the adjustable stop on the frame.
- Disconnection of electrical power supply of the motor upon expiry of the end-of-movement timer.

The inductive sensors are intended to command the VFD to switch to low speed while at the same time initiating a timer that will shut off the motor's electrical power supply.

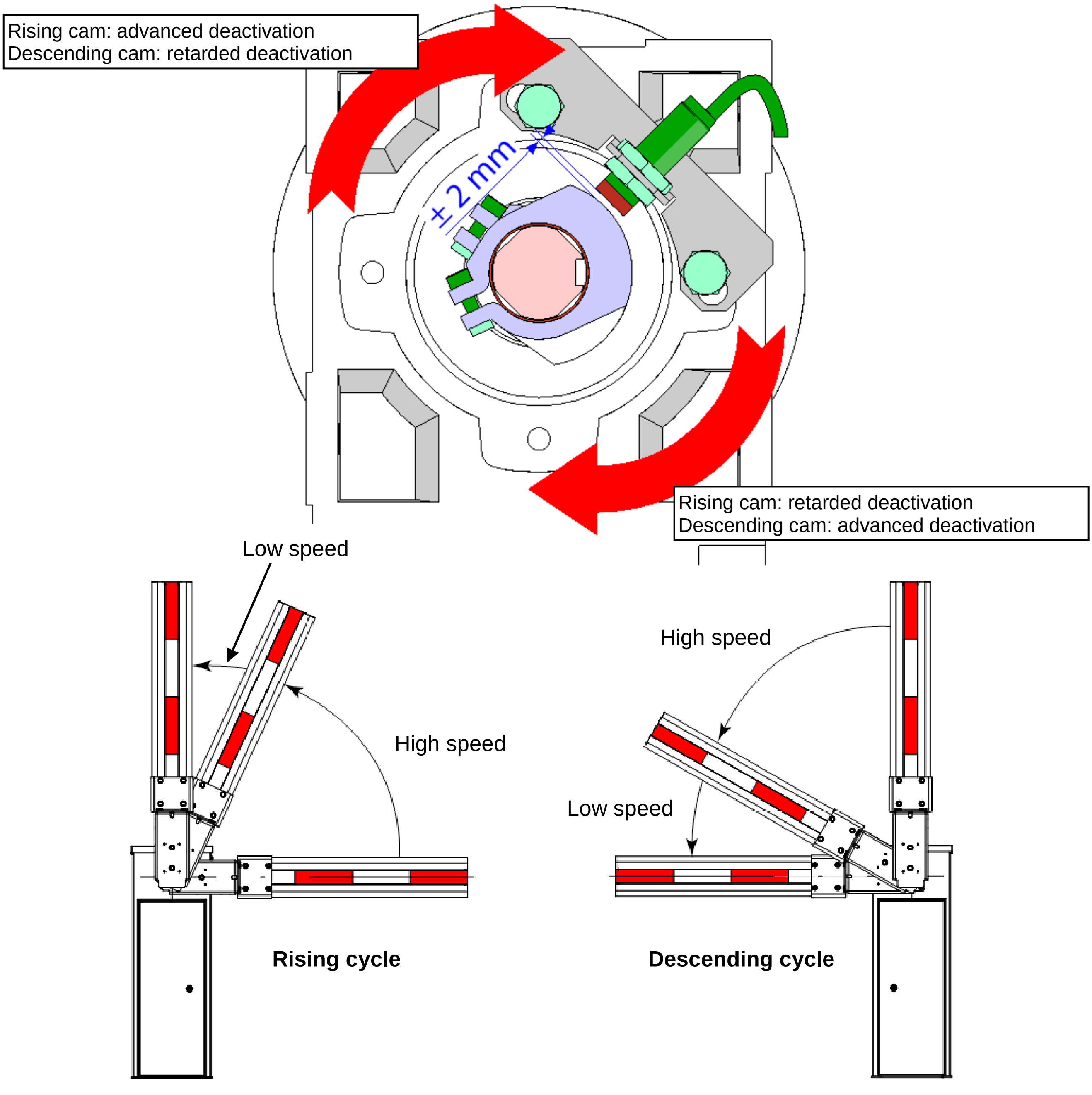
Never operate the barrier, manually or electrically, without the adjustable stops.

11.8.3. Adjusting the Sensors

Fine adjustment of the horizontal and vertical positions of the arm requires only an adjustment of the adjustable stops (Ch.4.1. , point 8). If the barrier is out of adjustment following a problem, if there is rebounding or if the operating speed has been modified, the setting of the detection cams should be altered. For this, proceed as follows:

Loosen the locking screw of the relevant cam and slightly rotate the cam. The low speed should be activated as late as possible and be virtually invisible to the eye, so as to keep the operating time as short as possible.

Adjusting the low speed deactivation during rising or descending, according to the selected cam.



11.8.4. Replacing an Inductive Position Sensor

Tools required: Two 17 mm open-ended wrenches – flat screwdriver – cutting pliers – Rilsan collars

- Open the barrier door (⇨Ch.11.3.) and turn off the electrical power supply (⇨Ch.11.4.).
- Loosen and remove the 2 retaining nuts M12 of the faulty inductive sensor.
- Disconnect the sensor wires from the relevant terminal blocks on the electronic board.
- Replace the sensor and reconnect the wires.
- Ensure that the distance between the sensor's detection head and the boss of the cam is between 2 and 3 mm.
- Check the setting of the barrier during operation and, if necessary, adjust the cam position (⇨Ch.11.8.3.).

11.9. Gearmotor Replacement

Tools required: 10 mm and 17 mm tubular wrenches – 13 mm, 16 mm & 17 mm open-ended wrenches - 3 mm, 4 mm & 6 mm Allen wrenches – flat cross-headed screwdriver – flat file – mallet – bronze drift Ø25 – sandpaper – optional shaft puller (reference ENS0199) - drift punch – circlip pliers

- Open the barrier door (⇨Ch.11.3.) and turn off the electrical power supply (⇨Ch.11.4.).
- Remove the arm (barrier in vertical position)
- ***ParkPlus244 with central arm***: remove the central stirrup and the fixing jaws.
- IF OPTIONAL AVR OR ARM ≥ 4 M : detach the spring from the upper hub (locate the position of the spring shaft on the hub)
- Loosen the 2 screws H M10 to remove the hub
- Disassemble the electronic board + frequency converter sub-assembly
- Loosen the eccentric ring of the bearing using the 4 mm Allen wrench and rotate it by a quarter turn to unlock it
- Detach the sensor support bracket from the gear motor by removing the 2 screws H M8
- Rub the shaft with sandpaper so as to remove the protective varnish
- Open the circlip and the detection cams (locate their positions) and slide them onto the shaft
- File off the marking of the bearing ring locking screw
- Remove the external bearing protection plate by removing the 4 screws CBLH M10
- Take out the shaft using the shaft puller or by tapping on the bearing side with the bronze drift
- Open the motor terminal box, locate and disconnect the wires and then take out the cables
- Place a support under the gear motor to lift it prior to loosening it
- Loosen the 4 fastening nuts M10 of the flange
- Remove the assembly and proceed with the assembly of the new gear motor
- Reinstall in reverse order and check the proper functioning of the barrier

12. PROLONGED SHUTDOWN/DESTRUCTION

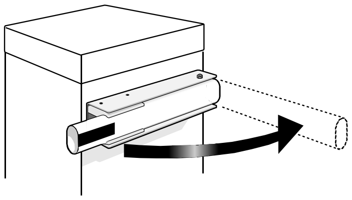
If the barrier is not to be used for a long period, it is recommended:

- To store the barrier in a dry place away from heat and protected against the weather.
- To leave the power on. If the motor remains permananently powered, a certain temperature is maintained in the body. This eliminates problems of condensation and, at low temperature, prevents the gearmotor oil from solidifying, which would have the effect of not reproducing the performance of the barrier during the first operations following a long period of rest.

When the equipment is taken out of service, drain the oil from the gear motor (⇨Ch.4.1. , point 5) and scrap the various components of the machine through the appropriate channel (metal parts, electronic components, etc.) according to the legislation in force in the country concerned.

13. TERMINOLOGY

Swing-off When the arm comes out of its jaw, in the case of vehicle impact:



HMI (Human Machine Interface)
Switches and LEDs located on the PLA1401 motherboard that interface with the unit.

Arm Obstacle to prevent passage that moves up (barrier open) or down (barrier closed).

Direction A By convention, the direction A is the passage from free area to controlled area.

Direction B By convention, the direction B is the passage from controlled area to free area.

VF Variable Frequency Drive

N/A Not Applicable.

14. EC DECLARATION OF CONFORMITY

Déclaration CE de conformité

Nous, soussignés,

AUTOMATIC SYSTEMS s.a.
22 rue du 8 mai 1945
95340 PERSAN
FRANCE

Déclarons que la machine

Barrière levante électrique
type ParkPlus 244

est conforme aux dispositions des Directives, normes et autres spécifications suivantes:

- Directive Sécurité des Machines 2006/42/CE.
- Directive Basse Tension 2006/95/CE.
- Directive Compatibilité électromagnétique 2004/108/CE.
- Directive RoHs 2011/65/EU.
- EN 12100-1 (2003): Sécurité des machines-Terminologie de base et méthodologie.
- EN 12100-2 (2003): Sécurité des machines-Principes techniques et spécifications.
- EN 60204-1 (2009): Sécurité des machines, Equipement des machines- Règles générales.
- EN 61000-6-3 (2007): Compatibilité électromagnétique- Norme générique émission-Résidentiel,
  commercial, industrie légère.
- EN 61000-6-2 (2006): Compatibilité électromagnétique- Norme générique immunité-Résidentiel,
  commercial, industrie lourde.

Fait à PERSAN,
le : 2014.07.01
Nom du signataire : Olivier GUEDON
Fonction : Business Unit Manager

EC declaration of conformity

We, undersigned,

AUTOMATIC SYSTEMS s.a.
22 rue du 8 mai 1945
95340 PERSAN
FRANCE

Herewith declare that the following machine

Electrical rising barrier
type ParkPlus 244

is in accordance with the conditions of the following Directives, standards and other specifications:

- Machinery Directive 2006/42/CE.
- Low-voltage Directive 2006/95/CE.
- Electromagnetic compatibility Directive 2004/108/CE.
- RoHs Directive 2011/65/EU.
- EEN 12100-1 (2003): Machinery – Basic terminology and methodology.
- EN 12100-2 (2003): Machinery – Technical principles and specifications.
- EN 60204-1 (2009): Safety of machinery. Electrical equipment of machines. General requirements.
- EN 61000-6-3 (2007): Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments.
- EN 61000-6-2 (2006): Electromagnetic compatibility (EMC). Generic standards. Immunity standard for industrial environments.

Made in PERSAN,
Date: 2014.07.01
Name: Olivier GUEDON
Function: Business Unit Manager

15. ANNEXES

Wiring diagram(s): the wiring diagram(s) to be used as reference is(are) the diagram(s) delivered with the equipment. It(they) are included in the equipment.

Notes

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Before contacting us for a technical problem, please note the ***serial number*** (on the product only) as well as ***the model*** of your equipment.
This information is needed to properly identify your equipment.