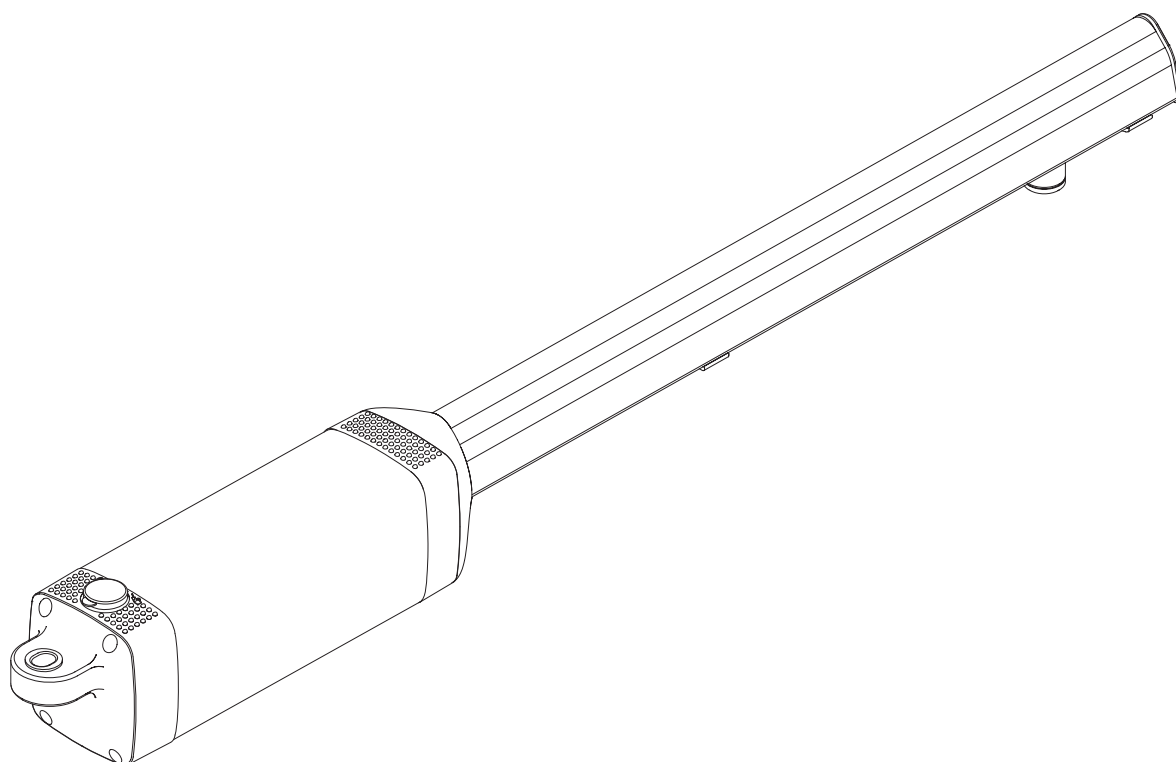


- I** AUTOMAZIONI A PISTONE PER CANCELLI A BATTENTE
- GB** ELECTROMECHANICAL PISTON FOR SWING GATES
- F** VERIN ELECTROMECHANIQUE POUR PORTAILS A VANTAUX
- D** ELEKTROMECHANISCHER KOLBEN FÜR FLÜGELTORE
- E** PISTON ELECTROMECHANICO PARA CANCELAS DE BATIENTE
- P** AUTOMATIZAÇÕES DE PISTÃO PARA PORTÕES DE BATENTE

## PHOBOS L BT



**ISTRUZIONI D'USO E DI INSTALLAZIONE**  
**INSTALLATION AND USER'S MANUAL**  
**INSTRUCTIONS D'UTILISATION ET D'INSTALLATION**  
**MONTAGE- und BEDIENUNGSANLEITUNG**  
**INSTRUCCIONES DE USO Y DE INSTALACION**  
**INSTRUÇÕES DE USO E DE INSTALAÇÃO**



**AZIENDA CON SISTEMA QUALITÀ**  
**CERTIFICATO DA DNV**  
**=UNI EN ISO 9001/2000=**

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Nel ringraziarVi per la preferenza accordata a questo prodotto, la ditta è certa che da esso otterrete le prestazioni necessarie al Vostro uso. Leggete attentamente l'opuscolo "Avvertenze" ed il "Libretto istruzioni" che accompagnano questo prodotto in quanto forniscono importanti indicazioni riguardanti la sicurezza, l'installazione, l'uso e la manutenzione. Questo prodotto risponde alle norme riconosciute della tecnica e della disposizioni relative alla sicurezza. Confermiamo che è conforme alle seguenti direttive europee: 89/336/CEE, 73/23/CEE (e loro modifiche successive).

### 1) GENERALITÀ

Pistone elettromeccanico progettato per automatizzare cancelli di tipo residenziale. Il motoriduttore mantiene il blocco in chiusura ed apertura senza necessità di elettroserratura per ante di lunghezza massima di 3m. Per ante di lunghezza compresa tra 3m e 5m l'elettroserratura risulta indispensabile. L'attuatore è provvisto di limitatore di coppia elettronico. Deve essere comandato da un quadro comandi elettronico dotato di regolazione di coppia. Il funzionamento a fine corsa è regolato da due finecorsa elettromeccanici. L'attuatore è provvisto di un sistema di rilevamento ostacoli secondo le normative EN12453 e EN 12445.

Sono disponibili i seguenti accessori opzionali:

#### - Kit batteria tampone mod. BT BAT

Consente il funzionamento dell'automazione anche se manca per un breve periodo l'alimentazione di rete.

### 2) SICUREZZA

L'automazione, se installata ed utilizzata correttamente, soddisfa il grado di sicurezza richiesto.

Tuttavia è opportuno osservare alcune regole di comportamento per evitare inconvenienti accidentali.

- Prima di usare l'automazione, leggere attentamente le istruzioni d'uso e conservarle per consultazioni future.
- Tenere bambini, persone e cose fuori dal raggio d'azione dell'automazione, in particolare durante il funzionamento.
- Non lasciare radiocomandi o altri dispositivi di comando alla portata dei bambini onde evitare azionamenti involontari dell'automazione.
- Non contrastare volontariamente il movimento dell'anta.
- Non modificare i componenti dell'automazione.
- In caso di malfunzionamento, togliere l'alimentazione, attivare lo sblocco di emergenza per consentire l'accesso e richiedere l'intervento di un tecnico qualificato (installatore).
- Per ogni operazione di pulizia esterna, togliere l'alimentazione di rete.
- Tenere pulite le ottiche delle fotocellule ed i dispositivi di segnalazione luminosa. Controllare che rami ed arbusti non disturbino i dispositivi di sicurezza (fotocellule).
- Per qualsiasi intervento diretto all'automazione, avvalersi di personale qualificato (installatore).
- Annualmente far controllare l'automazione da personale qualificato.

### 3) MANOVRA DI EMERGENZA

Ogni operatore è dotato di sblocco a chiave. Alzato il tappo copriserratura (fig.1), inserire la chiave di sblocco in dotazione e ruotare di 90° in senso orario. Spingere manualmente l'anta per aprire il cancello. Per ripristinare il funzionamento motorizzato, ruotare la chiave al contrario e rimettere il tappo di copertura.

### 4) MANUTENZIONE E DEMOLIZIONE

La manutenzione dell'impianto va fatta eseguire regolarmente da parte di personale qualificato.

Se il cavo di alimentazione è danneggiato esso deve essere sostituito dal costruttore o dal suo servizio assistenza tecnica o comunque da persona con qualifica simile, in modo da prevenire ogni rischio.

I materiali costituenti l'apparecchiatura e il suo imballo vanno smaltiti secondo le norme vigenti. **Le pile non devono essere disperse nell'ambiente.**

### AVVERTENZE

Il buon funzionamento dell'operatore è garantito solo se vengono rispettate i dati riportati in questo manuale. La ditta non risponde dei danni causati dall'inosservanza delle norme di installazione e delle indicazioni riportate in questo manuale.

Le descrizioni e le illustrazioni del presente manuale non sono impegnative. Lasciando inalterate le caratteristiche essenziali del prodotto, la Ditta si riserva di apportare in qualunque momento le modifiche che essa ritiene convenienti per migliorare tecnicamente, costruttivamente e commercialmente il prodotto, senza impegnarsi ad aggiornare la presente pubblicazione.

Thank you for buying this product, our company is sure that you will be more than satisfied with the product's performance. The product is supplied with a "Warnings" leaflet and an "Instruction booklet". These should both be read carefully as they provide important information about safety, installation, operation and maintenance. This product complies with the recognised technical standards and safety regulations. We declare that this product is in conformity with the following European Directives: 89/336/EEC and 73/23/EEC (and subsequent amendments).

### 1) GENERAL OUTLINE

Electromechanical piston designed to automate residential gates.

The gearmotor keeps the gate locked on closing and on opening, without needing an electric lock for leaves up to 3 m long. For leaves ranging between 3m and 5m long, the electric lock becomes indispensable. The operator is provided with an electronic torque limiter. It must be controlled by an electronic control panel provided with torque setting. The end-of-stroke operation is regulated by two electromechanical limit devices. The operator is provided with an obstacle detection system complying with EN12453 and EN 12445 standards.

The following optional accessories are available on request:

#### - Buffer battery kit mod. BT BAT

Allows operation of the automation even when there is no mains power supply for a short period of time.

### 2) SAFETY

If correctly installed and used, this automation device satisfies the required safety level standards.

However, it is advisable to observe some practical rules in order to avoid accidental problems.

- Before using the automation device, carefully read the operation instructions and keep them for future reference.
- Keep children, people and things outside the automation working area, particularly during its operation.
- Keep radio control or other control devices out of children's reach, in order to avoid any unintentional automation activation.
- Do not intentionally oppose the leaf movement.
- Do not modify the automation components.
- In case of malfunction, disconnect the power supply, activate the emergency release to have access to the automation and request the assistance of a qualified technician (installer).
- Before proceeding to any outside cleaning operation, disconnect the power supply.
- Keep the photocell optical components and light signal devices clean.
- Check that the safety devices (photocells) are not obscured by branches or shrubs.
- For any direct assistance to the automation system, request the help of a qualified technician (installer).
- Have qualified personnel check the automation system once a year.

### 3) EMERGENCY MANOEUVRE

All controllers feature a key release mechanism. After lifting the lock cover (fig.1), insert the release key supplied and turn it clockwise by 90°.

Push the leaf manually to open the gate. To reset the motorised operation, turn the key in the opposite direction and refit the cover.

### 4) MAINTENANCE AND DEMOLITION

The maintenance of the system should only be carried out by qualified personnel regularly.

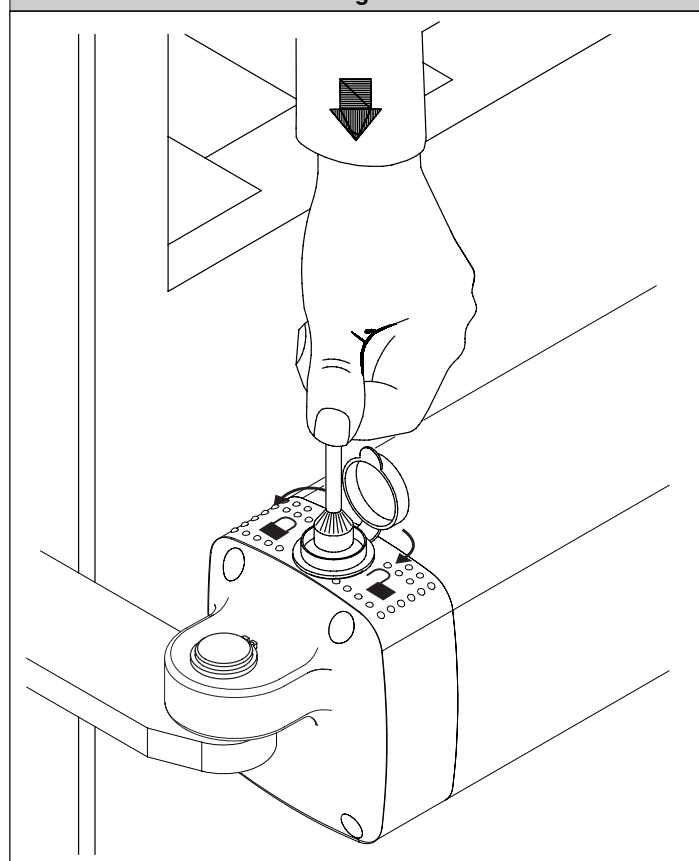
If the power supply cable is damaged, it must be replaced by the manufacturer or its technical assistance service, or else by a suitably qualified person, in order to prevent any risk. The materials making up the set and its packing must be disposed of according to the regulations in force. **Batteries must be properly disposed of.**

### WARNINGS

Correct controller operation is only ensured when the data contained in the present manual are observed. The company is not to be held responsible for any damage resulting from failure to observe the installation standards and the instructions contained in the present manual.

The descriptions and illustrations contained in the present manual are not binding. The Company reserves the right to make any alterations deemed appropriate for the technical, manufacturing and commercial improvement of the product, while leaving the essential product features unchanged, at any time and without undertaking to update the present publication.

Fig. 1



Thank you for buying this product, our company is sure that you will be more than satisfied with the product's performance. The product is supplied with a "Warnings" leaflet and an "Instruction booklet". These should both be read carefully as they provide important information about safety, installation, operation and maintenance. This product complies with the recognised technical standards and safety regulations. We declare that this product is in conformity with the following European Directives: 89/336/EEC and 73/23/EEC (and subsequent amendments).

## 1) GENERAL SAFETY

**WARNING! An incorrect installation or improper use of the product can cause damage to persons, animals or things.**

- The "Warnings" leaflet and "Instruction booklet" supplied with this product should be read carefully as they provide important information about safety, installation, use and maintenance.
- Scrap packing materials (plastic, cardboard, polystyrene etc) according to the provisions set out by current standards. Keep nylon or polystyrene bags out of children's reach.
- Keep the instructions together with the technical brochure for future reference.
- This product was exclusively designed and manufactured for the use specified in the present documentation. Any other use not specified in this documentation could damage the product and be dangerous.
- The Company declines all responsibility for any consequences resulting from improper use of the product, or use which is different from that expected and specified in the present documentation.
- Do not install the product in explosive atmosphere.
- The construction components of this product must comply with the following European Directives: 89/336/CEE, 73/23/EEC, 98/37/EEC and subsequent amendments. As for all non-EEC countries, the above-mentioned standards as well as the current national standards should be respected in order to achieve a good safety level.
- The Company declines all responsibility for any consequences resulting from failure to observe Good Technical Practice when constructing closing structures (door, gates etc.), as well as from any deformation which might occur during use.
- The installation must comply with the provisions set out by the following European Directives: 89/336/CEE, 73/23/EEC, 98/37/EEC and subsequent amendments.
- Disconnect the electrical power supply before carrying out any work on the installation. Also disconnect any buffer batteries, if fitted.
- Fit an omnipolar or magnetothermal switch on the mains power supply, having a contact opening distance equal to or greater than 3mm.
- Check that a differential switch with a 0.03A threshold is fitted just before the power supply mains.
- Check that earthing is carried out correctly: connect all metal parts for closure (doors, gates etc.) and all system components provided with an earth terminal.
- Fit all the safety devices (photocells, electric edges etc.) which are needed to protect the area from any danger caused by squashing, conveying and shearing.
- Position at least one luminous signal indication device (blinker) where it can be easily seen, and fix a Warning sign to the structure.
- The Company declines all responsibility with respect to the automation safety and correct operation when other manufacturers' components are used.
- Only use original parts for any maintenance or repair operation.
- Do not modify the automation components, unless explicitly authorised by the company.
- Instruct the product user about the control systems provided and the manual opening operation in case of emergency.
- Do not allow persons or children to remain in the automation operation area.
- Keep radio control or other control devices out of children's reach, in order to avoid unintentional automation activation.
- The user must avoid any attempt to carry out work or repair on the automation system, and always request the assistance of qualified personnel.
- Anything which is not expressly provided for in the present instructions, is not allowed.

## 2) GENERAL OUTLINE

Electromechanical piston designed to automate residential gates.

The gearmotor keeps the gate locked on closing and on opening, without needing an electric lock for leaves up to 3 m long. For leaves ranging between 3m and 5m long, the electric lock becomes indispensable.

The operator is provided with an electronic torque limiter. It must be controlled by an electronic control panel provided with torque setting.

The end-of-stroke operation is regulated by two electromechanical limit devices.

The operator is provided with an obstacle detection system complying with EN12453 and EN 12445 standards.

The following optional accessories are available on request:

### - Buffer battery kit mod. PHOBOS-BT BAT

Allows operation of the automation even when there is no mains power supply for a short period of time.

## 3) TECHNICAL SPECIFICATIONS

### 3.1) PHOBOS BT

Power supply :	24V d.c.
Motor revolutions :	3800 min <sup>-1</sup>
Absorbed power :	40 W
Absorbed current :	1.5 A
Push and pull force :	2000 N (~200 kg)
Working stroke :	410 mm
Stem speed :	14 mm/s approx.
Impact reaction :	Torque limiter aboard Libra control board
End-of-stroke limitino devices:	Electromechanical, built-in and adjustable
Manual manoeuvre :	CLS release key
No. of manoeuvres in 24hours:	60 manoeuvres
Maximum leaf length without electric lock :	3 m
Maximum leaf length with electric lock:	5 m
Max. leaf weight :	2500 N (~250 kg)
Environmental conditions:	from -10 °C to +50 °C
Protection level :	IP X4
Dimensions :	See fig.1
Controller weight :	50N (~5kg)
Lubrication :	permanent grease

### 3.2) BATTERY KIT BT BAT

Charging voltage:	27.2V d.c.
Charging current:	130mA
Outside temperature when values were measured:	25°C
Battery capacity:	2x (12V 1.2Ah)
Flat battery protection threshold:	20.4Vdc
Battery charging time:	12/14 hrs

## 4) INSTALLATION OF THE ACTUATOR

### 4.1) Preliminary checks

Check that:

- The gate structure is sufficiently sturdy.
- Also make sure that the actuator pushes against the leaf reinforced section.
- The leaves move manually and without effort all along their stroke.
- The door stop plates are fitted at the end of both closing and opening strokes.
- If the gate has not been recently installed, check the wear condition of all components.
- Repair or replace faulty or worn parts.  
The automation reliability and safety are directly influenced by the state of the gate structure.

The diagram in fig. 2 should be used as a reference for installation and consult the table for the distances in mounting the gate post.

The diagram in fig. 2 uses the following legend:

P	Gate post rear fastening bracket
F	Front leaf fastening bracket
a-b	"P" bracket installation value
C	Distance between fixing points (C = 805 mm)
D	Gate length
X	Distance from gate axis to the edge of the post
Z	Always over 45 mm (b - X)
kg	max. weight of leaf
α°	leaf opening in degrees

### 4.2) How to read the installation distance tables

Select "a" and "b" according to the angle in degrees α° that the gate has to open.

If there is too large a difference between "a" and "b", the leaf will not travel smoothly and the pushing or pulling force will fluctuate during its stroke. To respect the opening speed and ensure the controller operates correctly, it is best to keep the difference between "a" and "b" as low as possible. When "a" and "b" are at their maximum, the piston develops the maximum force.

### 4.3) Off-standard installations.

Fig. 3 shows an installation with a recess when there is not sufficient space between the leaf and perimeter wall.

When the leaf's position does not allow for an "a" value listed in the table, the leaf's hinge pivot can be shifted (fig. 4), or a recess can be made cut out of the actual gate-post (fig. 5).

### 4.4) Mounting the brackets to the gate-post and to the gate.

Fix the bracket "P" (fig. 6) to the gate-post with a good welding. The bracket "F" should be welded in the same way to the gate taking care that the actuator can then be mounted perfectly horizontal to the line of travel of the gate fig. 7.

If the gate operates on a slope (opening inwards with an uphill driveway), fig. 7 gives the maximum oscillations of the piston with respect to its horizontal.

- If the gate-post is in brick, the plate "PF" must be set soundly into the post using adequately sized cramps "Z" welded to the back of the plate (fig. 8).
- If the gate-post is in stone and the gate is small, the plate "PF" can be mounted with four metal expansion plugs "T" (fig. 9). If a larger gate is being installed it would be better to use a corner plate "PF" (fig. 10).
- **WARNING!** Fixing bracket "F" must be welded before fitting the operator. Then, with reference to Fig. 7, fully insert bush "B" in the bracket, position spacer ring "R", insert the operator pivot and fix the pivot to the bracket by means of ring "S".

### 5) GROUND GATE STOPS

For the controller to operate correctly the gate stop "B" must be used both in opening and closing, as shown in fig. 11.

### 6) THE ELECTRICAL PLANT SET-UP (fig. 12).

Lay out the electrical installation (fig. 16) with reference to the CEI 64-8 and IEC 364 provisions, complying with the HD 384 and other national standards in force for electrical installation.

The mains power supply connections must be kept totally separate from the service connections (photocells, electric edges, control devices etc.).

**WARNING! For connection to the mains, use a multipolar cable with a minimum of 3x1.5mm<sup>2</sup> cross section and complying with the previously mentioned regulations. For example, if the cable is outside (in the open), it has to be at least equal to H07RN-F, but if it is on the inside (or outside but placed in a plastic cable channel) it has to be or at least equal to H05VV-F with section 3x1.5mm<sup>2</sup>.**

Connect the control and safety devices in compliance with the previously mentioned electrical installation standards.

Fig.12 shows the number of connections and the cross section for power supply cables having a length of approximately 100 metres; in case of longer cables, calculate the cross section for the true automation load.

When the auxiliary connections exceed 50-metre lengths or go through critical disturbance areas, it is recommended to decouple the control and safety devices by means of suitable relays.

The main automation components are (fig.12):

- I** Type-approved omnipolar circuit breaker with at least 3mm contact opening, provided with protection against overloads and short circuits, suitable for cutting out automation from the mains. If not already installed, place a type-approved differential switch with a 0.03A threshold in the circuit just before the automation system.
- Qr** Control panel and incorporated receiver.
- S** Key selector
- AL** Blinker tuned in with antenna
- M** Controller
- Fte** Pair of outside photocells (transmitters)
- Fre** Pair of outside photocells (receivers)
- Fti** Pair of inside photocells with column (transmitters)
- Fri** Pair of inside photocells with column (receivers)
- T** 1-2-4 channel transmitter
- RG58** Antenna cable

For the connection from the controller to the control board, three cables have been provided having the following functions:

- red motor +
- black motor -
- white end-of-stroke control

Fig. 16 shows the wiring diagram of the LIBRA control unit.

Should the opening or closing direction be incorrect, it is possible to invert the connections of motor + and motor - (red/black) on the control board.

The first command after an interruption of the power supply should be an opening manoeuvre.

The cable sections and numbering are indicated in the diagram (fig. 12). For distances of over 100 meters, the cable section must be increased. All metal masses in the housings of equipment and automation must be earthed.

### 7) ADJUSTING THE PUSHING FORCE



**WARNING: Check that the impact force value measured at the points established by the EN 12445 standard is lower than that specified in the EN 12453 standard.**

The pushing force is calibrated by means of the torque regulator in the control unit. The optimum torque must allow a complete opening or closing cycle with the minimum force necessary. An excessive torque can reduce the anti-crush safety. In the other case, an insufficient torque can impede the manoeuvres. Consult the control unit's instruction manual.

### 8) LIMIT DEVICE ADJUSTMENT

End-of-stroke adjustment is carried out by correctly positioning the limit devices (FC1 and FC2 in Fig. 1).

#### 8.1) Closing limit device adjustment (Fig. 13):

Bring the leaf to the required closing position, loosen the two closing limit fixing screws (FC1 in Fig. 1) and move the limit device towards the fixing bracket until the microswitch is heard clicking.

Carry out a closing manoeuvre to check the exact limit activation point; if the leaf stops before the required closing point, slightly move the limit device towards the rod end; if, on the contrary, the leaf reaches the closing ground stop plate and the operator reverses its movement, slightly move the limit device towards the operator body. After identifying the correct limit position, fix the device by means of the two screws.

#### 8.2) Opening limit device adjustment (Fig. 14):

Bring the leaf to the required opening position, loosen the two opening limit fixing screws (FC2 in Fig. 1) and move the limit device towards the fixing bracket until the microswitch is heard clicking.

Carry out an opening manoeuvre to check the exact limit activation point; if the leaf stops before the required opening point, slightly move the limit device towards the operator body; if, on the contrary, the leaf reaches the opening ground stop plate and the operator reverses its movement, slightly move the limit device towards the rod end. After identifying the correct limit position, fix the device by means of the two screws.

N.B. When using the LIBRA control board, remember to slightly anticipate the intervention of the limiting devices because the stem, after intercepting the limiting devices, continues to move for a further 1-2 cm. (100 ms). In this way a perfect strike of the leaves against the ground supports is guaranteed.

### 9) MANUAL OPENING

All controllers feature a key release mechanism. After lifting the lock cover (fig.15), insert the release key supplied and turn it clockwise by 90°. Push the leaf manually to open the gate. To reset the motorised operation, turn the key in the opposite direction and refit the cover.

### 10) ELECTRIC LOCK



**WARNING: In the case of leaves longer than 3m, it is indispensable to install an electric lock.**

Fig. 16 shows an example of how a 12 Va.c. ECB electric lock is to be connected to a LIBRA control panel.

In order to control the electric lock, the Libra panel requires an appropriate ME BT board.

### 11) CHECKING THE AUTOMATION

Before considering the automation completely operational, the following checks must be made with great care:

- Check that all the components are firmly anchored.
- Control all the safeties work properly (i.e. photocells, pneumatic skirt, etc.).
- Check the emergency manoeuvre control.
- Check the opening and closing manoeuvres using the controls.
- Check the control unit's electronic logic in normal (or customised) operation.

### 12) USE OF THE AUTOMATION

Since the automation may be remote controlled either by radio or a Start button, it is essential that all safeties are checked frequently.

Any malfunction should be corrected immediately by a qualified specialist. Keep children at a safe distance from the field of action of the automation.

**13) THE CONTROLS**

With the automation the gate has a power driven opening and closing. The controls can come in various forms (i.e. manual, remote controlled, limited access by magnetic badge, etc.) depending on needs and installation characteristics. For details on the various command systems, consult the specific instruction booklets.

Anyone using the automation must be instructed in its operation and controls.

**14) MAINTENANCE**

When carrying out maintenance operation on the controller, disconnect it from the mains power supply. The actuator does not require periodical maintenance operations.

- Check the safety devices of the gate and automation.
- Periodically check the pushing force and correct the value of the electric torque in the control board if necessary.
- In case of unsolved operation failures, disconnect the unit from the mains power supply and ask for the intervention of qualified personnel (installer).

When the unit is out of order, activate the manual release to perform manual opening and closing manoeuvres.

**15) NOISE**

The aerial noise produced by the gearmotor under normal operating conditions is constant and does not exceed 70dB(A).

**16) SCRAPPING**

Materials must be disposed of in conformity with the current regulations. In case of scrapping, the automation devices do not entail any particular risks or danger. In case of recovered materials, these should be sorted out by type (electrical components, copper, aluminium, plastic etc.).

**17) DISMANTLING**

When the automation system is disassembled to be reassembled on another site, proceed as follows:

- Disconnect the power supply and the entire electrical installation.
- Remove the gearmotor from its fixing base.
- Disassemble the control panel, if separate, and all installation components.
- In the case where some of the components cannot be removed or are damaged, they must be replaced.

**18) TROUBLES AND SOLUTIONS****18.1) Incorrect operation of gearmotor**

- Check for the presence of power supply to the gearmotor using a suitable instrument after opening or closing commands have been given.
- If the moving direction of the leaf is opposite to the right one, invert the motor running connections (motor +red/ motor - black).
- Should the gate stop and hit the ground stopping device and the actuator reverse its moving direction, it means that the limiting devices have not been adjusted correctly. If this happens on the opening stopping device, move the opening limiting device towards the hinge of the gate until the correct position is found (see adjustment of the limiting devices).  
If, on the contrary, this happens on the closing stopping device, move the closing limiting device towards the stem plug until the correct position is found (see adjustment of the limiting devices).

**18.2) Incorrect operation of the electrical accessories**

All control and safety devices can cause, in case of failure, malfunctioning or stoppage of the automation.

To identify the failure, it is advised to disconnect all the devices of the automation one by one until the one causing the problem is found.

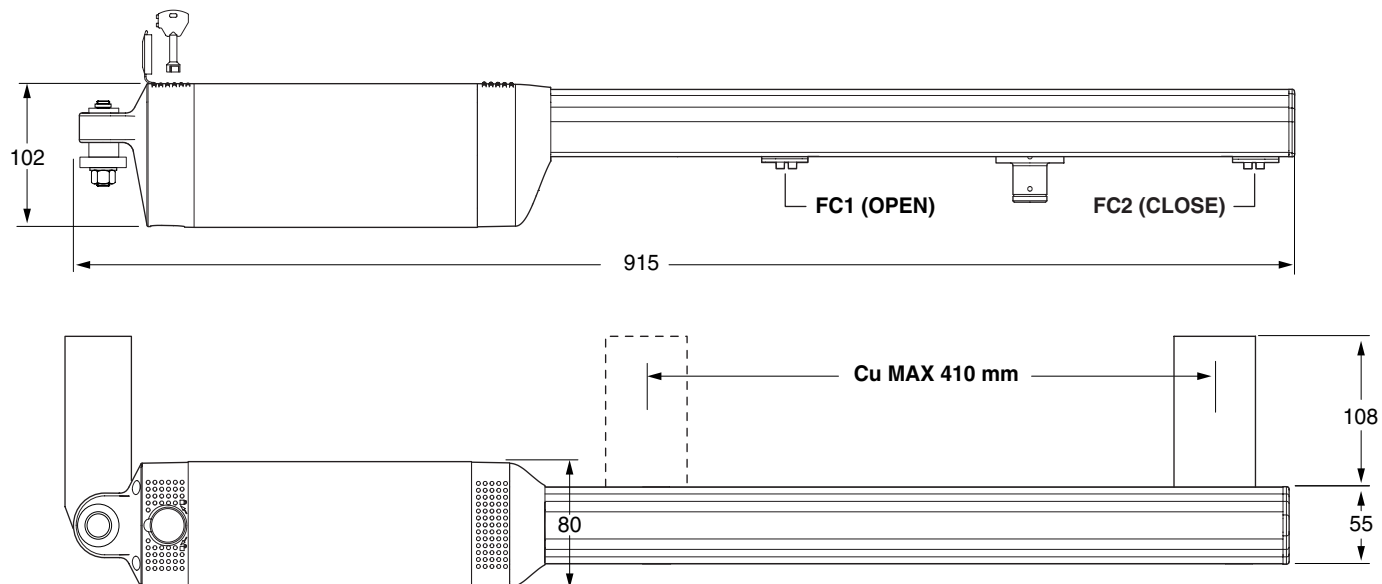
After fixing or replacing the defective device, reset all the devices previously disconnected. Refer to the relevant instruction manual for all the devices installed on the automation.

**WARNINGS**

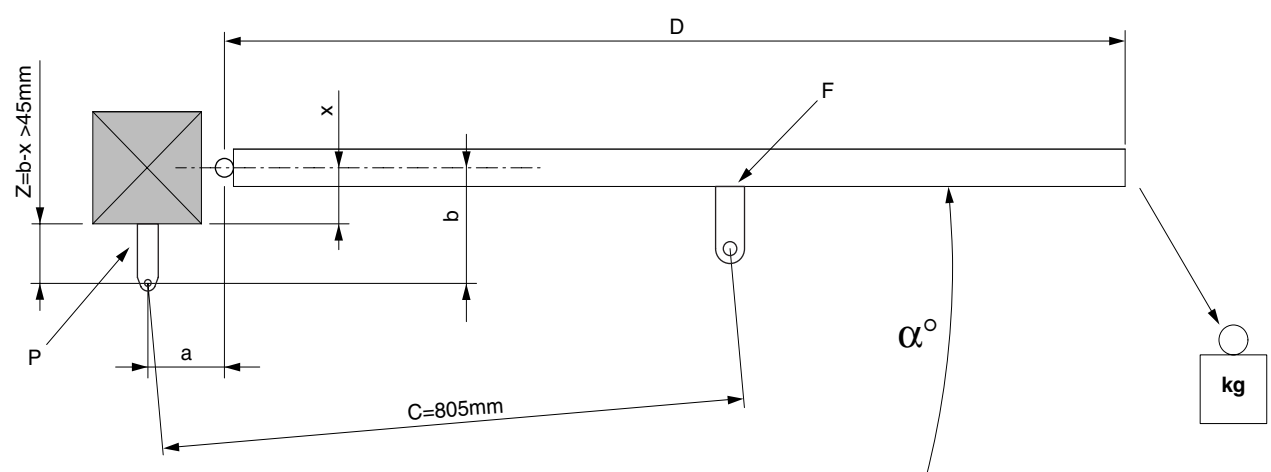
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**Fig. 1**

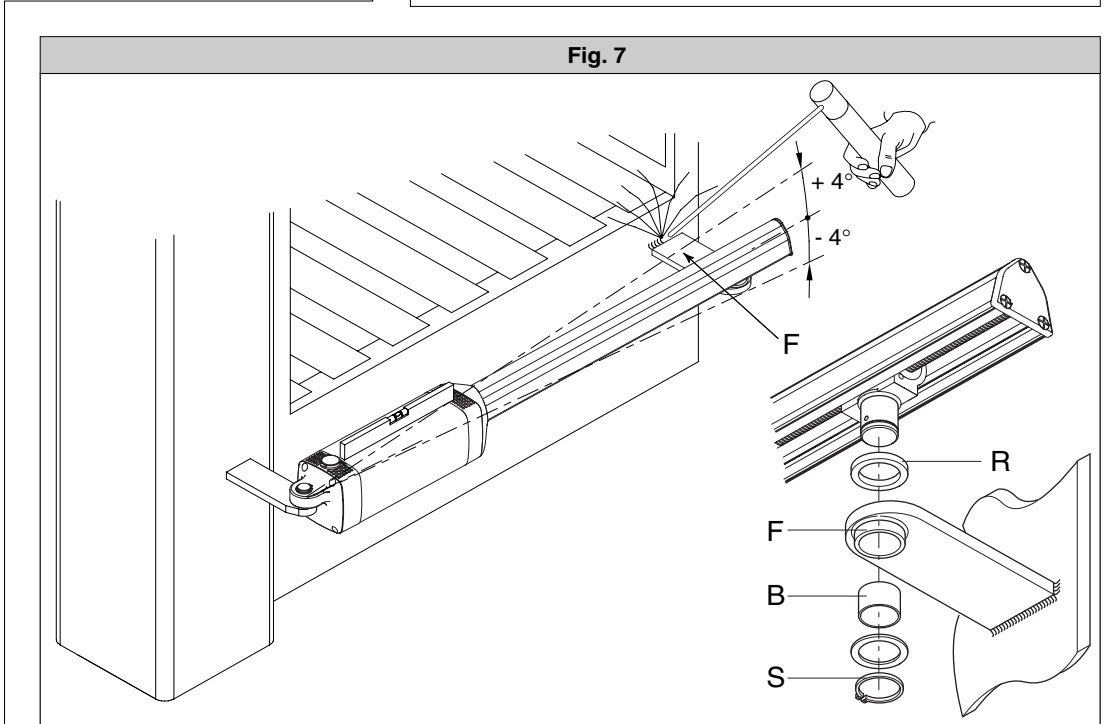
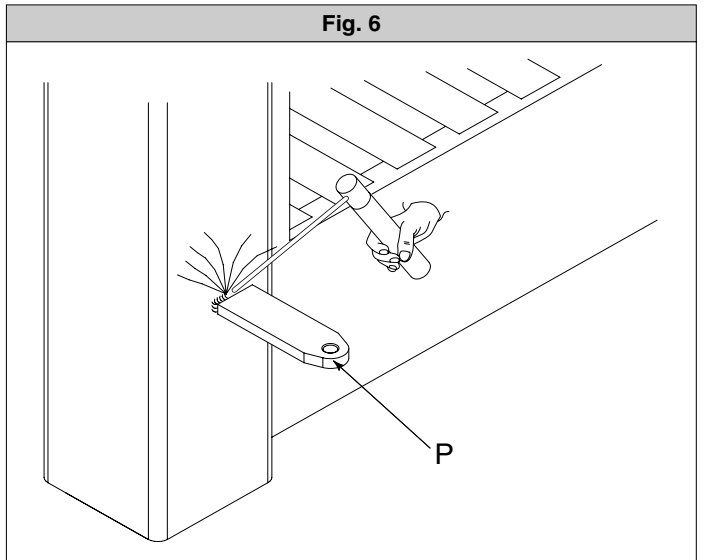
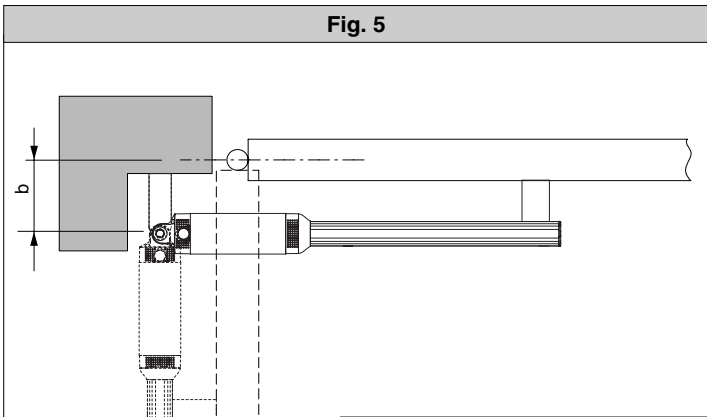
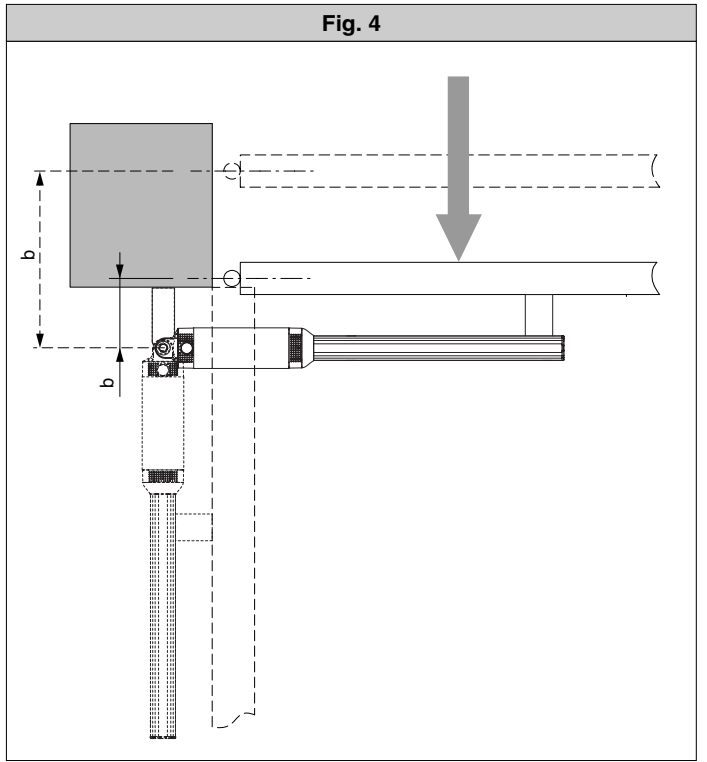
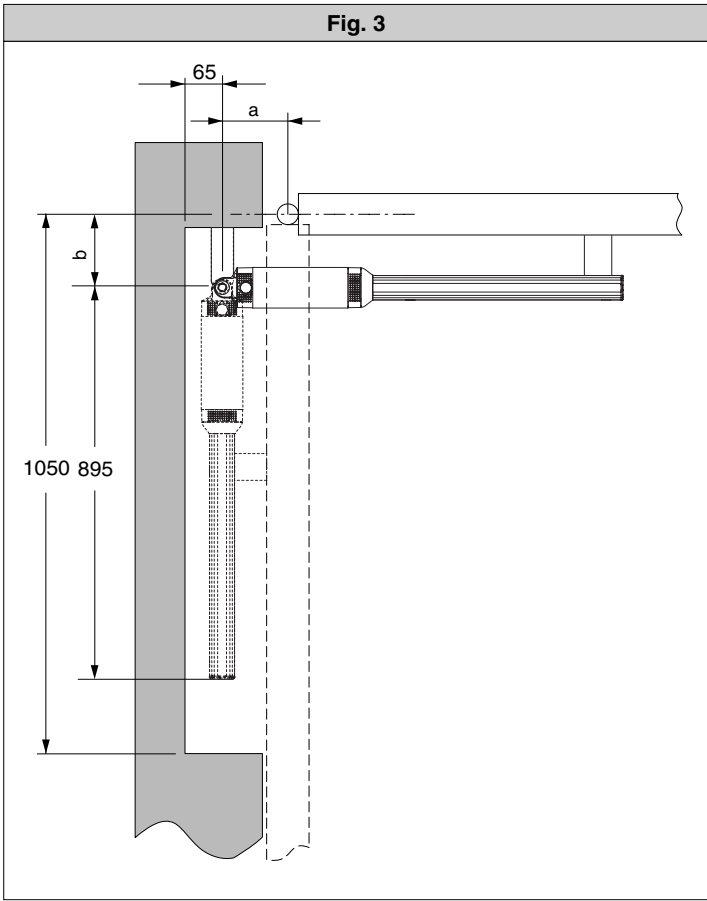


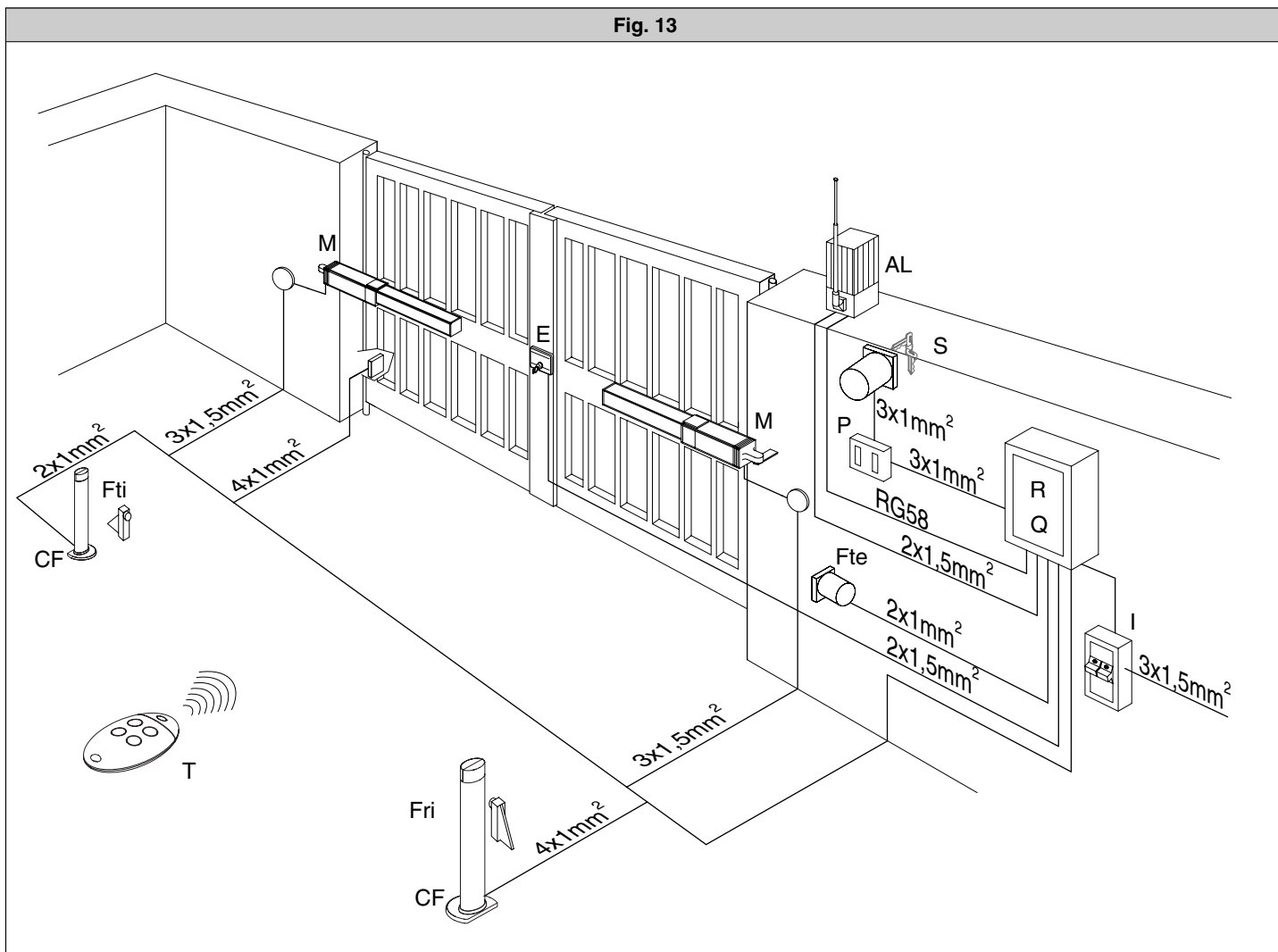
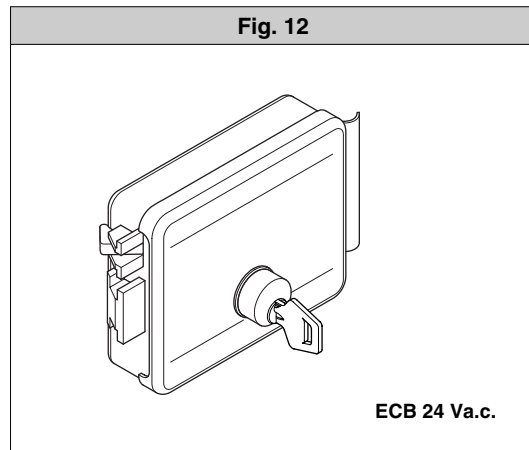
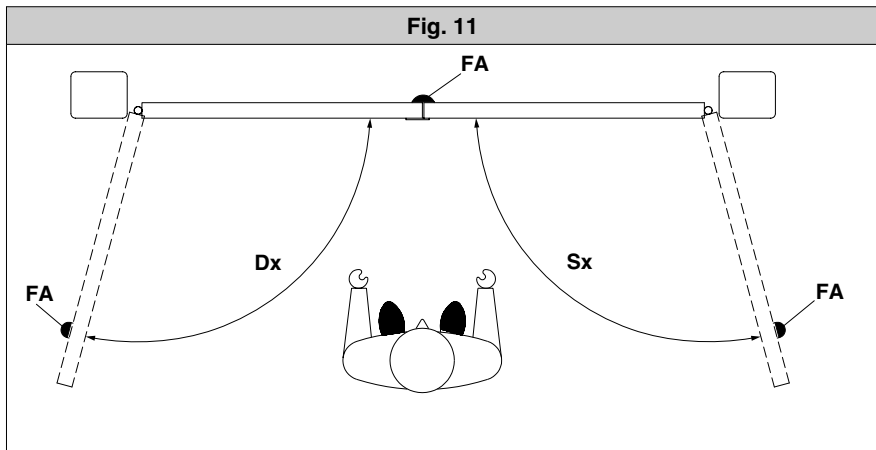
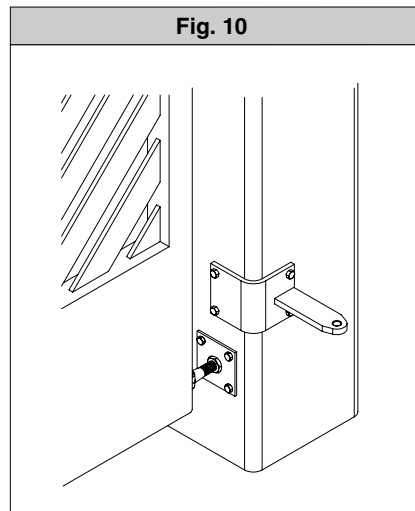
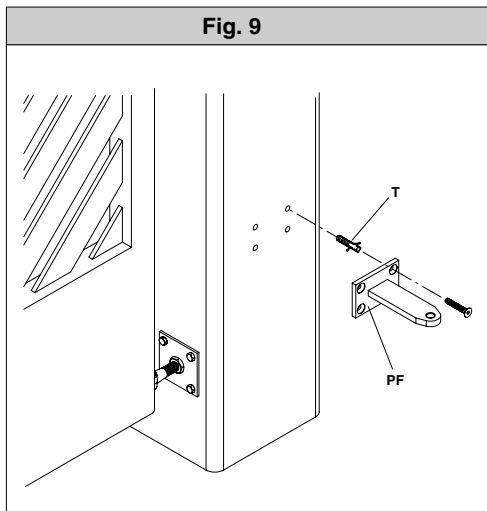
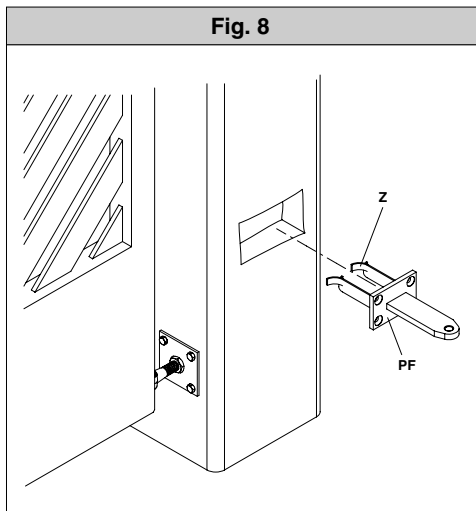
**Fig. 2**



B (mm) \ A	100	110	120	130	140	150	160	170	180	190	200	210	220	230
130	103	106	110	112	116	118	121	123	126	124	113	107	103	99
140	102	105	109	111	113	117	120	122	124	119	109	103	99	97
150	101	104	108	110	112	116	118	120	123	112	105	100	96	94
160	100	103	106	109	112	114	117	119	121	106	101	97	94	92
170	100	102	105	108	111	113	116	118	109	102	98	94	91	
180	99	102	104	107	110	112	114	117	103	98	94	91		
190	98	101	104	107	109	111	113	107	99	95	91			
200	98	101	103	106	108	110	112	100	95	91				
210	97	100	103	105	107	109	103	95	91					
220	97	100	102	104	106	108	95	91						
230	96	99	101	104	105	97	90							
240	96	99	101	103	101	91								
250	95	98	100	102	91									
260	95	98	100	92										$\alpha^{\circ}$

*Installazioni consigliate / Recommended installation  
 Installations conseillées / Empfohlene Installationen  
 Instalaciones aconsejadas / Instalações Aconselhadas*

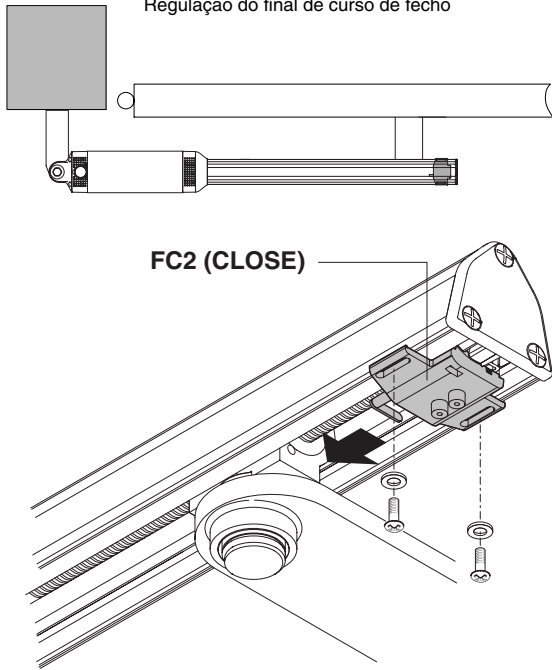






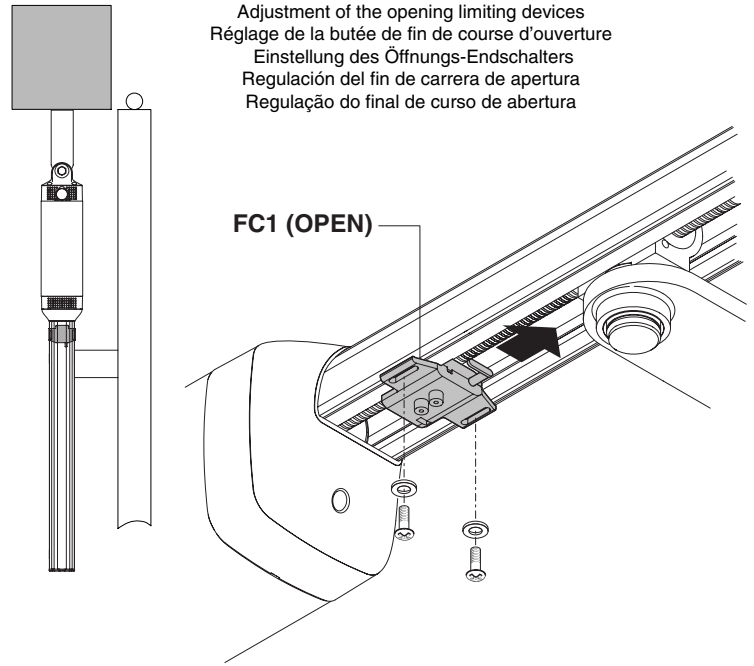
**Fig. 13**

Regolazione fine corsa chiusura  
 Adjustment of the closing limiting devices  
 Réglage de la butée de fin de course de fermeture  
 Einstellung des Schließungs-Endschalters  
 Regulación del fin de carrera de cierre  
 Regulação do final de curso de fecho

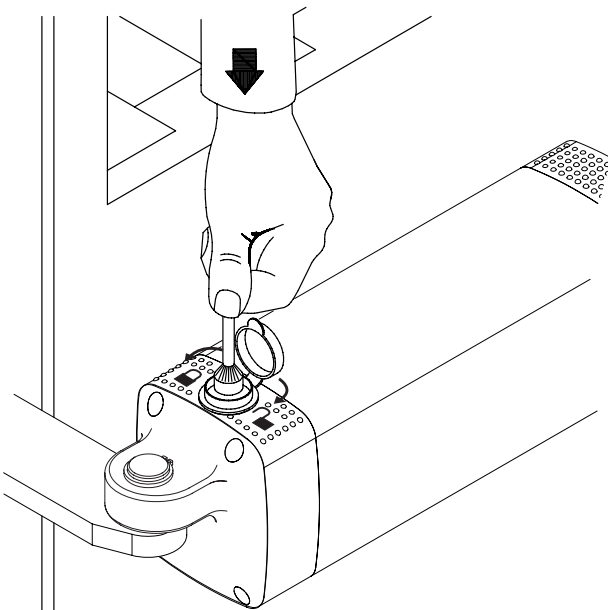


**Fig. 14**

Regolazione fine corsa apertura  
 Adjustment of the opening limiting devices  
 Réglage de la butée de fin de course d'ouverture  
 Einstellung des Öffnungs-Endschalters  
 Regulación del fin de carrera de apertura  
 Regulação do final de curso de abertura



**Fig. 15**



**Fig. 16**

**JP3**    1sec    5sec  
 Impostazione tempo  
 attrazione relè  
 Setting of relay  
 operation time  
 Introduction du temps  
 d'attraction du relais  
 Einstellung anzugsdauer  
 relais  
 Configuración del  
 tiempo de excitación relé  
 Definição do tempo  
 de excitação do relé

