1. CHARACTERISTICS OF THE OPERATOR

1.0 GENERAL CHARACTERISTICS

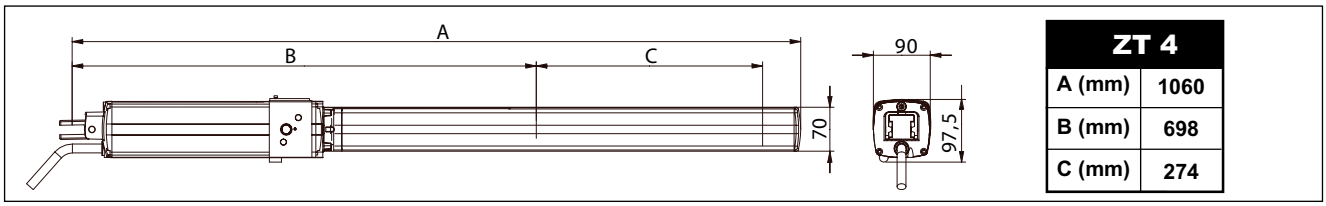
- **ZT 4** is a **hydraulic swing gate operator**, specially designed for residential use.
- ***The ZT 4 operator, if installed correctly, conforms to the current safety standards.***

List of versions:

C: Hydraulic lock for closing only (with lock inaccessible when the gate is open)

SF: No hydraulic lock - braking action (the gate leaf can be moved by hand with a minimum of resistance, if moved slowly; there is also a release device to facilitate opening -needs an electric lock)

- The **C** version, with hydraulic closing lock, does not require the use of the electric lock and keeps gate leaves of less than 1.8 m in closed position.
- The emergency release (to be used in the event of a power failure) is safe to use and easily manoeuvrable and enables the user to move the gate by hand using the triangular key provided. The release is easily accessible via a hatch on the upper cover of the operator.
- Safety against entrapment risks is guaranteed by sensing valves, settable during installation.



ZT 4	
A (mm)	1060
B (mm)	698
C (mm)	274

1.1 TECHNICAL DATA

CARACTÉRISTIQUES	*ZT4 C*	*ZT4 SF*
Single-phase system voltage	*230 V±10% 50 Hz*	*230 V±10% 50 Hz*
Power absorption	*250W*	*250W*
Mean pressure	*30 bar*	*30 bar*
Thrust force at 10 bar	*962 N*	*962 N*
Traction force at 15 bar	*1140 N*	*1140 N*
Rod retraction time (max. stroke)	*17,5 sec*	*17,5 sec*
Rod extension time	*21,5 sec*	*21,5 sec*
Max leaf length	*1,8 m*	*3 m*
Min leaf length	*1,2 m*	*1,2 m*
Operating temperature range	*-20° / + 70°C*	*-20° / + 70°C*
Max distance between centres for mounting holes with fully extended rod	*1002 mm ± 5*	*1002 mm ± 5*
Max stroke - standard arm	*270 mm*	*270 mm*
Weight with oil	*8 Kg*	*8 Kg*
Oil quantity	*0,6 lt.*	*0,6 lt.*
Oil type	*Aprimatic Oil HC13*	*Aprimatic Oil HC13*
Protection degree	*IP 55*	*IP 55*

Warning

The noise level of the above models, referred to the working of the operator, independently of the gate leaf and the post, falls within the maximum limits set by EEC standards.

1.2 CHOOSING THE TYPE OF AUTOMATION

Before mounting, choose the type of automation on the basis of the characteristics and dimensions of the element to be operated.

Caution

- ***The choice of the most suitable type of automation assures an efficient operation of the unit and minimises the possibility of failures.***

Warning

- ***The versions listed above are also recommended for use with solid gate leaves (with the operator inaccessible when the gate is open).***
- ***The C version model, suitable for use in windy areas, must not be fitted to gate leaves of up to 1.8 m.***

Warning

The peripheral speed of the gate leaf must always fall within the limits of the current safety regulations. Also, it is important to avoid the use of high-speed operators on wide gate leaves, as this could cause the leaves to bang violently against the gate stop (see the "Technical Data" table).

English

English

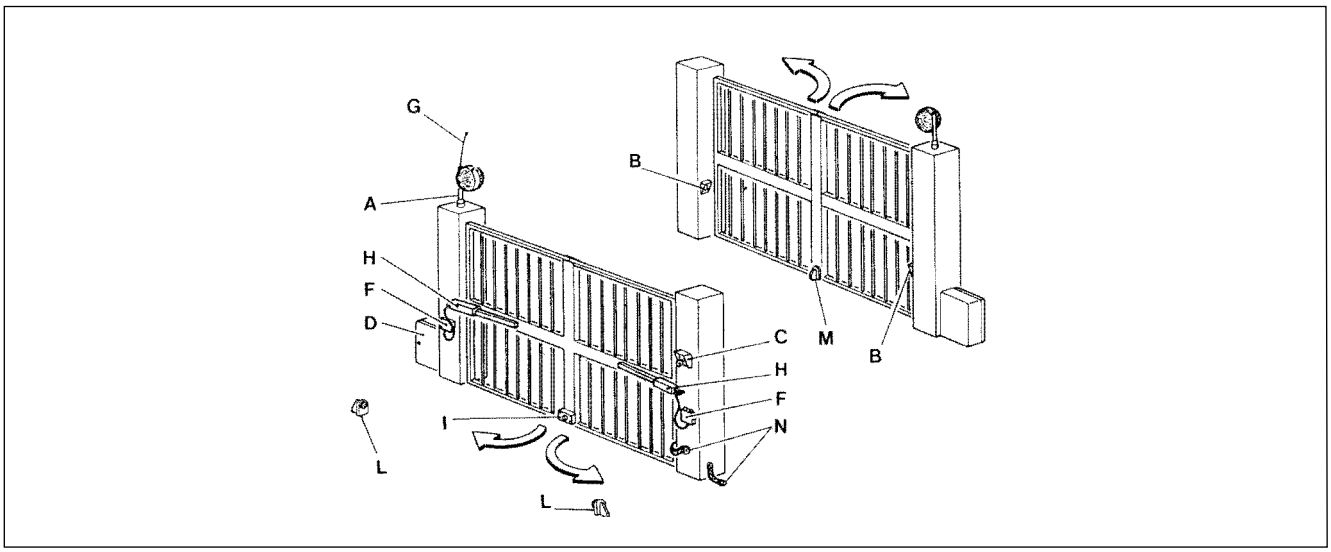
2. DESCRIPTION OF THE AUTOMATION SYSTEM

2.0 COMPONENTS LAYOUT (B2)

A - Aprimatic flashing warning/courtesy lamp (to be positioned at a point clearly visible from both approaches)
B - Aprimatic safety photocell
C - Manual key-operated control unit (magnetic, digital, keyboard combination lock, mechanical, etc.)
D - Aprimatic microprocessor control unit in watertight container (if possible, to be fitted in a position sheltered from atmospheric agents)
F - Watertight operator electricity supply junction box (recommended), to be positioned so that cables are not subject to dangerous stretching during the gate motion
G - Antenna
H - Aprimatic ZT series operators
I - Electric lock (optional)
L - Open position gate stop
M - Close position gate stop
N - Ground connection for metal framework

Information

Consult the price-list for additional (optional) safety devices.



2.1 SYSTEM ELECTRICAL CONNECTION

- When making the electrical connections,carefully follow the instructions for each of the components, referring to the wiring diagram **D1**.

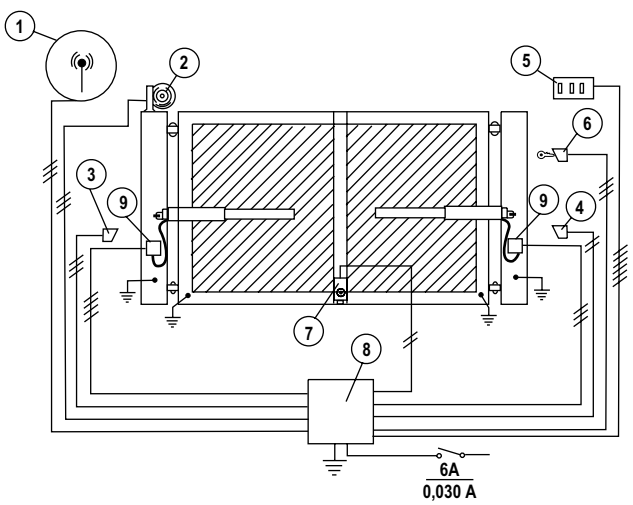
Warning

- ***Make the electrical connection of the single components after having completed their installation.***
- ***The entire circuit must be made consistent with the current safety regulations.***
- ***Use cables with a cross-section of 1.5 mm² for the wiring.***
- ***Protect the operator power cable with a sheath if necessary; do this before connecting the cable to the junction boxes.***

Warning

- ***Every operator comes complete with a pickup capacitor. During installation, connect the capacitor to the electrical equipment according to the wiring diagram supplied.***
- After making the electrical connections, check the thrust force at the end of the gate leaf; if necessary, adjust the pressure of the operator according to the procedure described in the specific paragraph.

D1



1 Antenna
2 Flashing lamp
3 Receiver photocell
4 Transmitter photocell
5 Internal control panel
6 Key control
7 Electrical lock
8 Electronic control unit
9 Junction box

3. CHECKS AND OPERATIONS PRIOR TO THE INSTALLATION OF THE OPERATOR

3.0 CHECKING THE GATE

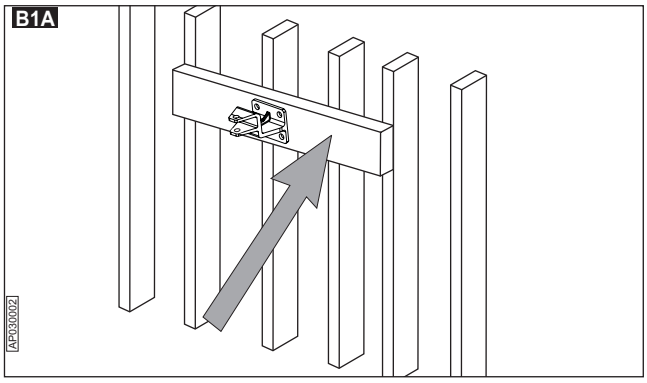
- Before proceeding with the mounting, do a complete check on the gate leaves making sure that they are in good condition and not broken or damaged in any way.
- Ensure the motion of the gate leaves is uniform and the hinges have no play and do not rub.

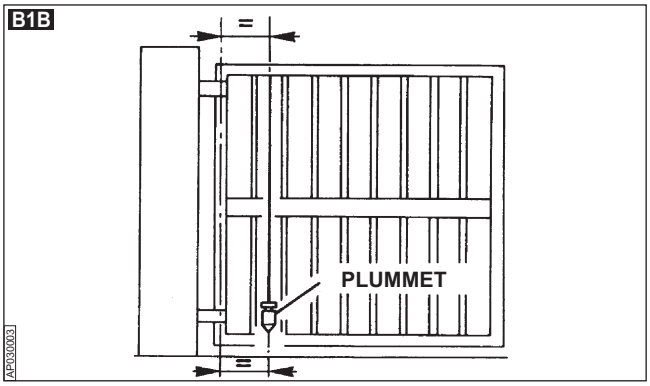
Otherwise, hinges must be repaired so that the gate leaves can be moved easily by hand or, if repair is impossible, hinges must be replaced.

- Check that the gate leaves are plumb (when perfectly still at any point in the swing) (**B1B**); when the gate leaves are completely closed, check that the closure is even throughout the whole height of the gate leaves.
- Using a dynamometer, check that the opening and closing effort of the gate, to be measured from the end of the gate leaf, does not exceed 15 kg (147 N).

Before deciding on the final position of the mountings, it is necessary to:

- Choose the most suitable height on the gate leaf for the operator front mounting. If possible, it should be positioned halfway up the gate leaf. As a rule, the ideal point is always in the strongest area where the fixing of the gate leaf has the least effect. If there is not a broad strip of steel in the gate framework, then a suitable support needs to be welded on in the area where the front mounting is to be positioned in order to spread the load over a wide zone (**B1A**).
- Check whether the chosen area needs reinforcing or strengthening in any way. Make the same check on the gate leaf support posts.



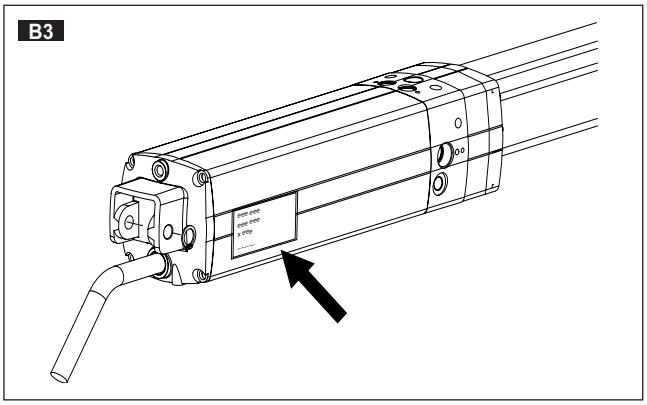


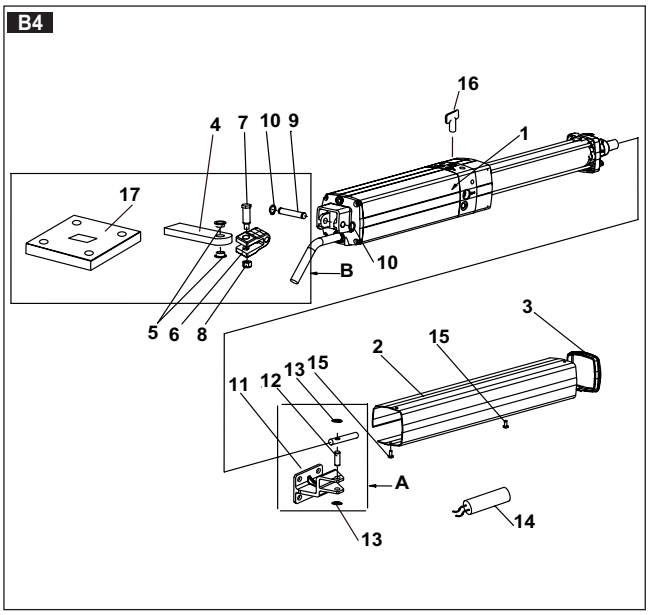
3.1 CHECKING THE OPERATOR COMPONENTS

Check that the model code displayed on the operator packaging corresponds to the code on the identification plate on the operator itself (**B3**).

Also,before starting with the mounting procedure, check that the packaging contains all the components listed below (**B4**) and that none of them is damaged.

1 - Operator
2 - Rod protection casing
3 - Rod proctection casing cover
4 - Rear mounting
5 - Bushes
6 - Fork
7 - Rear pin
8 - Locknut
9 - Fork pin
10 - Snap ring
11 - Front mounting
12 - Front mounting pin
13 - Snap ring
14 - Capacitor
15 - Self-threading screw
16 - Release key
17 - Plate for rear mounting
A - Complete front mounting assembly
B - Complete rear mounting assembly





English

3.2 MOUNTING TOOLS

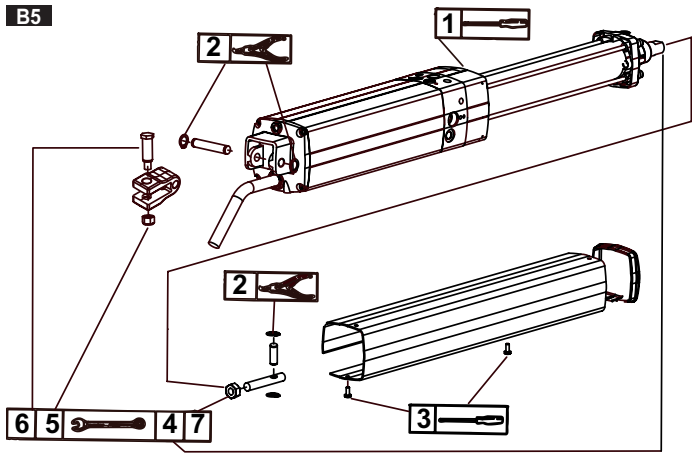
To mount the operator, a number of preparatory on-site jobs need to be done on the structure that is to be moved; for this, it is better to be equipped with the correct tools, so that the installer is able to work independently.

Caution

The list of required tools is shown in the illustration and table (B5).

Electric disk grinder - 230 V
Protective goggles
Electric welder - min. power 230 V/100 amp.
Protective mask
Electrodes - min. ø 2
Soldering iron
Suitably powered electric drill - 230 V
Drill bits
Hollow cutter ø 67 for photocells and control panel mounting holes
Extension cable for welder
Electric cable, cross-section 1.5 mm^2, various colours + various types of terminals
Electrical scissors
Pliers for cable terminals
Tester
1/20 gauge
Rule
Goniometer
Dynamometer
Plumb line
Spirit level (3-D)
Graphitized grease
Oil - AprimOil HC 13 (specially formulated for Aprimatic)
Zinc-spray cylinder
Anti-rust paint
Paintbrushes
Thinner for cleaning paintbrushes
Wire brush
Files
Hacksaws
Scribers
Hammer
Chisel for steel and masonry
Detergent wipes
Paper hand-towels
First aid kit

B5



POS.	TOOL	
1	Screwdriver	USAG 326/5x150
2	Gripper for snap ring on shaft	USAG 128 P/1025
3	Screwdriver TC	USAG 326 TC/2
4	Combined wrench 12	USAG 285/12
5	Combined wrench 13	USAG 285/13
6	Combined wrench 14	USAG 285/14
7	Combined wrench 17	USAG 285/17

4. INSTALLING THE OPERATOR

4.0 POSITIONING THE MOUNTINGS

The following table (**C1**) indicates the recommended data for defining the position of the operator mountings in relation to the centre of rotation of the gate leaf.
The distances **A** and **B** will give:

- The useful stroke length (**C**) of the piston
- The peripheral velocity of the gate leaf
- The angle of maximum opening of the gate leaf
- The holding capacity of the lock in relation to distance **E** (which must always be less than **B** when the operator is fitted with a hydraulic lock); the distance **E** is obtained, in practice, by measuring the distance between front mounting fulcrum and gate hinge axis (see fig. **C1**).

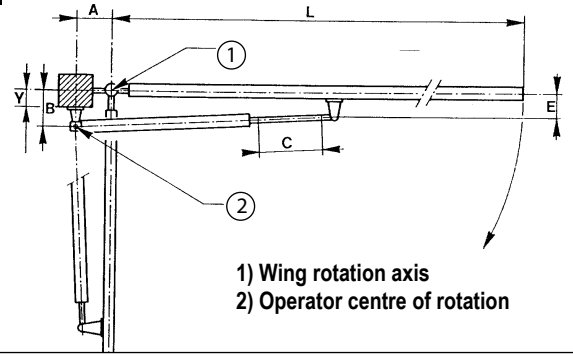
Caution

- ***The sum A+B corresponds to the useful stroke length of the piston (C) for a 90° opening of the gate leaf.***
- ***The minimum value of distances A and B is 70 mm; the maximum one is indicated in column B of the table (see fig. C1).***
- ***Distances A and B must be as equal as possible in order to have a uniform peripheral velocity.***
- ***If the gate leaf shall be opened by more than 90°, first of all find the best A and B measurements for mounting, then reduce distance B to the desired opening angle, making sure, by checking the distance Y, that the corner of the post does not interfere with the operator action.***

Warning

- ***The greater the distance B in relation to E, the more efficient the holding capacity of the hydraulic lock (for all types of operator).***
- ***If the gate leaf is closed with an electric lock, then E must always be less than or equal to B (never greater).***

C1



1) Wing rotation axis
2) Operator centre of rotation

VALUES IN MILLIMETRES				
L	A	B	C	Y Max.
1200 ÷ 3000	130	140	275	90

4.1 PREPPING FOR THE REAR MOUNTING

4.1.1 Operator fixed on iron posts

If the gate supporting posts are made of iron, it is necessary to fit a reinforcing plate for welding the rear operator mounting.
Perfectly clean the welding zone for the rear mounting with the special tool (**C2** pos.**1**); make sure to remove any traces of paint or zinc coating.
Position the reinforcing plate (**C3** pos. **2**) in the rear mounting welding zone and weld it on the column, covering it from edge to edge.
The size of the reinforcing plate must be in proportion to the size of the column.

Warning

- ***If the size of the column allows for it, use the Aprimatic standard plate provided.***

4.1.2 Operator fixed on wooden posts

If the gate supporting posts are made of wood, it is necessary to fit a reinforcing plate on the column, covering it from edge to edge, in the rear mounting welding zone. The plate shall be fixed firmly on the column by means of fixing screws (**C4**).
The size of the reinforcing plate must be in proportion to the size of the column.

Warning

- ***If the size of the column allows for it, use the Aprimatic standard plate provided.***

4.1.3 Operator fixed on masonry posts

If the supporting posts for the gate leaves are made of masonry, fix the special metal plate complete with anchor bolts used to weld on the rear mounting of the operator to each of them.

Preparing the insets

If mounting insets have to be made in the posts for the rear operator mounting with metal plates, the measurements shown in fig.**C6** must be adhered to.

Warning

Remember that the inset is necessary when the distance between the edge of the post and the centre of rotation of the gate leaf is greater than the distance **Y** (C1), or when the gate leaf is anchored to a continuous wall.

Fixing the anchoring plates

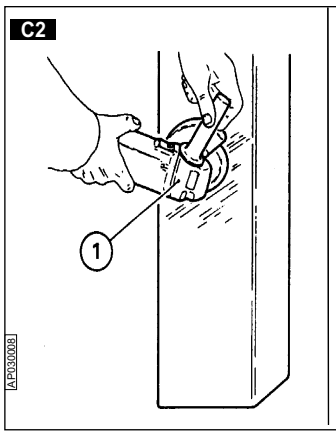
Fig. C5 shows some fixing examples by means of different types of plates:

A - Plate with hooked fitting

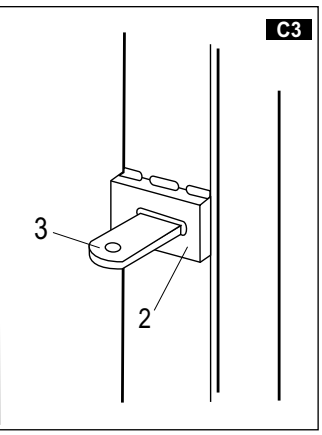
B - Plate with stud bolts, either glued or pressure-fitted

C - L-plate with stud bolts, either glued or pressure-fitted

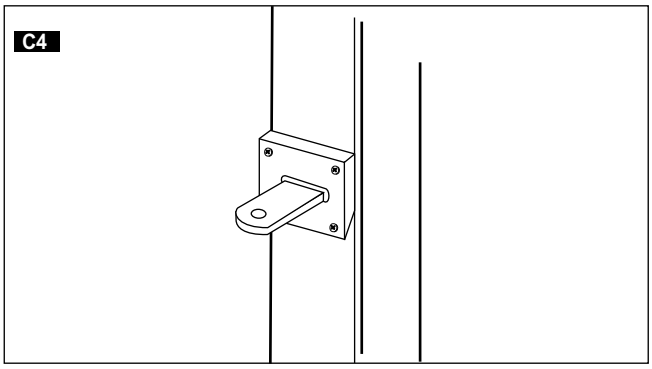
C2



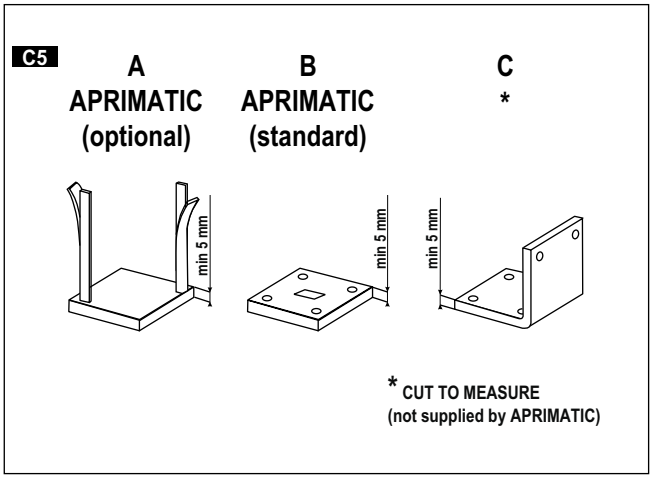
C3



C4



C5



Caution

- ***The size of the plates, apart from standard APRIMATIC plates, must be proportioned to the size of the columns.***
- ***If the A-type plate is used and has to be positioned in line with the operator axis, the hook fittings must be modified as shown in fig. C7.***

Clean out any traces of cement or sand.
Drill four holes (**C8** pos. **1**), after marking the position of the holes, using the anchorage plate itself as a drilling guide mask.
Attach the plate with *"FISCHER"* expansion anchors of minimum ø 15 with M8 steel or cast iron screws (**C8** pos. **2**) (if the material the column is made of is able to hold the screws), or, if not, attach with glue as follows:

- Insert the mesh sheaths (**C8** pos. **3**) into the holes and inject the quick-dry glue (**C8** pos. **4**); see attached instructions for application method and quantity.

If the B-type plate is used:

- Insert the stud bolts (**C8** pos. **5**) into the sheaths (if the B-type plate is used).
- Fit the anchoring plate (**C8** pos. **7**) to the stud bolts.

If, on the contrary, the C-type plate is used:

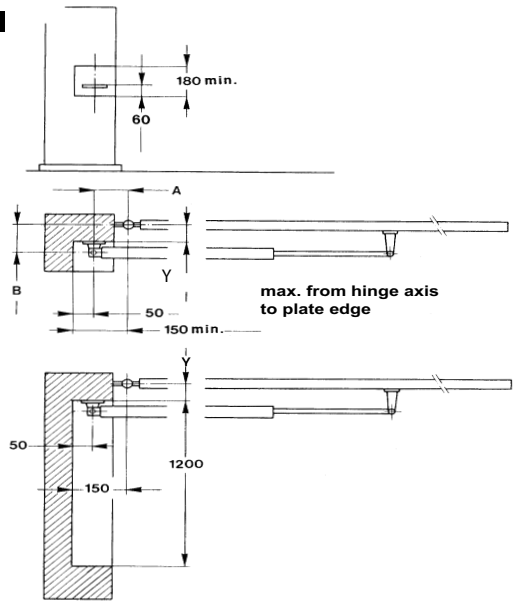
- Insert the stud bolts (**C8** pos. **5**) into one of the two sides of the inset.
- Fit the anchoring plate (**C8** pos. **7**) to the stud bolts.
- Insert the two remaining stud bolts (**C8** pos. **8**).

At this point, if plates B or C are used, screw in all the fittings, nuts and washers by hand, without tightening; after about half an hour tighten up the stud bolts with a setscrew wrench.
When finished, cut off the protruding parts of the stud bolts using the correct tool.

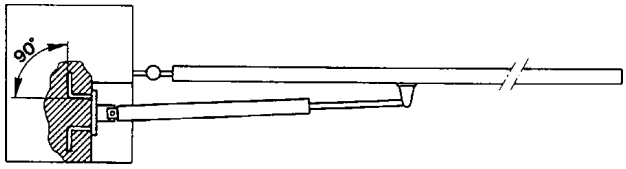
4.1.4 Rear operator mounting - special cases

For outward-opening gate leaves, the rear mounting has to modified using an L-plate as shown in (**C9**).

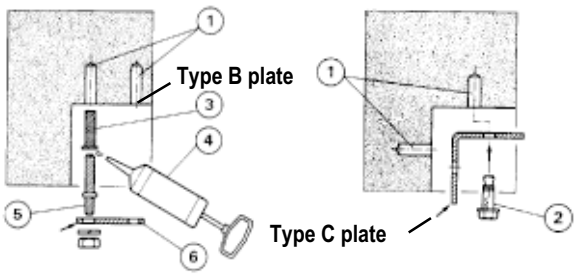
C6



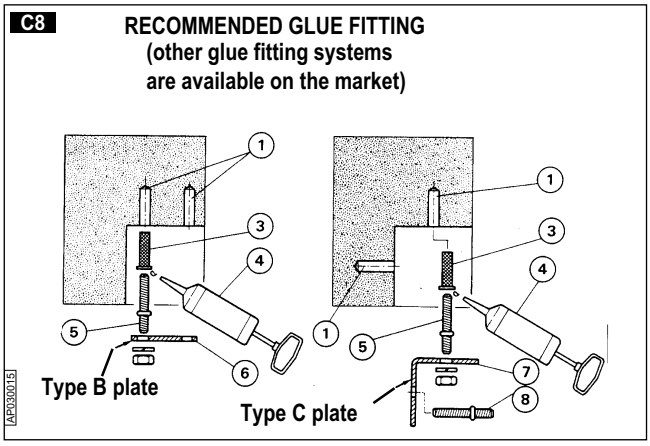
C7



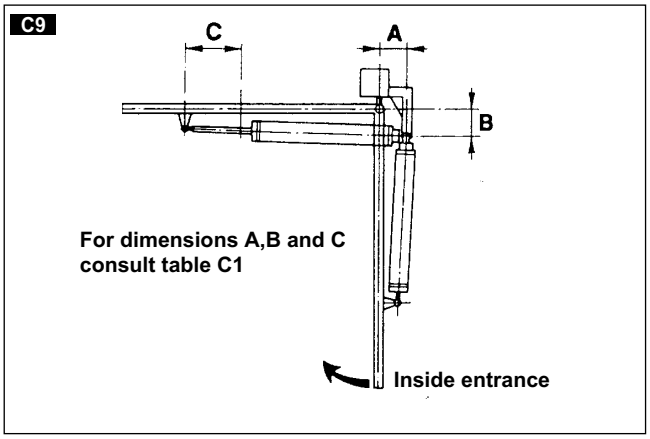
C8



C8



C9



4.2 FIXING THE REAR OPERATOR MOUNTING

Position the rear mounting (**B4** pos. **4**) at the height previously measured and weld it on the anchorage plate with two weld points (**C9**).
Check the lengthwise and crosswise alignment of the mounting (**C10**) with a water level.
Complete the welding and clean away the residues with a wire brush.

Warning

- ***Before welding, ensure that there are no bushes (B4 pos. 5) in the mounting, and that the fitting hole is properly protected from weld residues.***
- ***When the welded zone has cooled down, apply a coat of anti-rust paint.***

4.3 TEMPORARY INSTALLATION OF THE OPERATOR

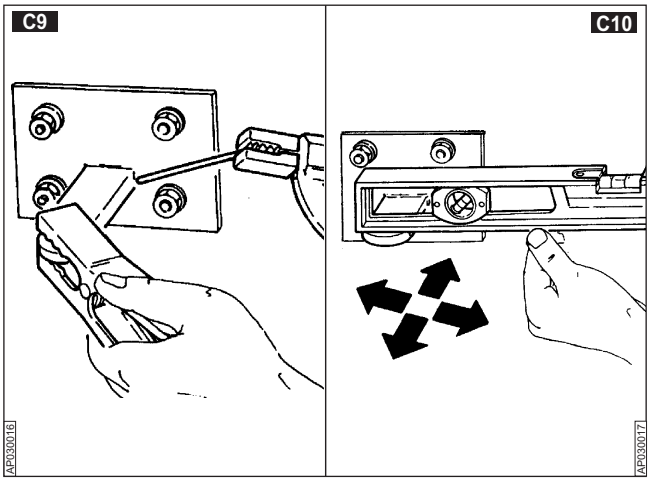
Temporarily mount the operator to find the correct fixing position of the front mounting.

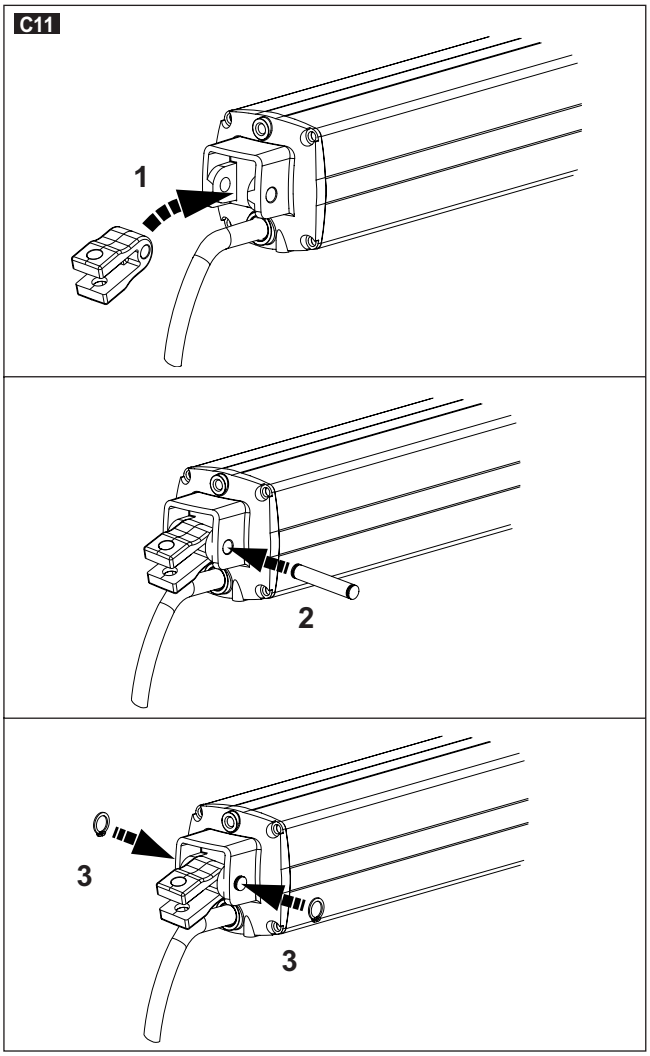
Warning

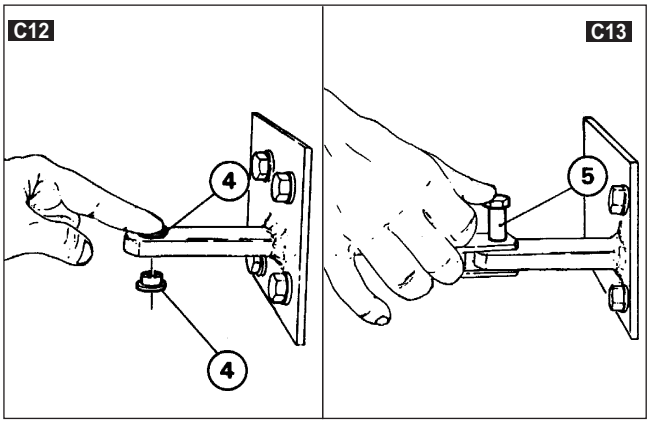
Handle the operator with care during assembly.
Fit the fork (**C11** pos. **1**) to the operator bottom. Lock the fork with the special pin (**C11** pos. **2**) and fix both with the two snap rings (**C11** pos. **3**).
Fit the two vibration damping bushes (**C12** pos. **4**) above and below the mounting.
Position the fork of the operator on to the mounting and lock it with the vertical pin (**C13** pos. **5**) after greasing abundantly.

Warning

Grease both the pin and the housings abundantly.







English

English

4.4 POSITIONING THE FRONT MOUNTING

Smear the hole of the operator rod with grease (**C14** pos. **1**). Position the end of the rod into the front mounting (**C14** pos. **2**), then fit the locking pin (**C14** pos. **3**) without tightening the snap rings (**C14** pos. 4).
If it has been decided to use the maximum useful length of the rod (distance A+B = useful piston stroke length), proceed as follows:

- Position the key (**see paragraph 6**) onto the unlock screw and rotate counter-clockwise to hand-unlock the operator.
- Slowly extend the rod to end stroke.
- Withdraw the rod of 5 mm.
- Protect the rod (**C17** pos. **3**).
- Perfectly clean the welding zone for the front mounting with a suitable tool (**C15** pos. **4**); be especially sure to remove any traces of paint or zinc coating.

Warning

- ***Check the strength of the mounting zone; if necessary, fit a strengthening plate of the correct size; the strengthening plate is especially important with gate leaves made from thin sheet steel.***
- ***When cleaning the mounting zone for the operator front mounting, remove the operator and protect it from flying sparks.***

Rest a water level (**C16** pos. **1**) on the operator body (**C16** pos. **2**) and level the operator.

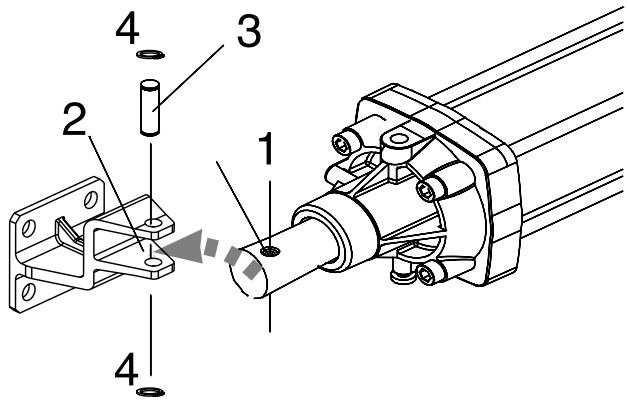
Weld the front mounting of the rod to the gate leaf with two weld-points, protecting the rod from weld residues with a clean cloth (**C17** pos. **4**).

Withdraw the rod from the front mounting and remove the operator itself from the temporary mountings to complete the welding. Protect the pin (using a clean cloth or adhesive tape) from weld residues, then clean off the residues with a wire brush.
After cooling, apply a coat of rustproof paint to the welded zone.

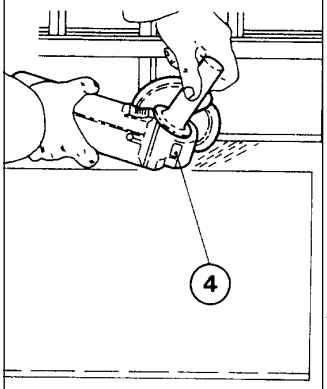
Warning

- ***While welding the points on the front mounting with the electrode, always cover the rod with a clean cloth; a splinter of molten metal can cause irreparable damage to the machined surface and make the operator unusable.***
- ***During welding, the operator must be disconnected from the electricity supply.***

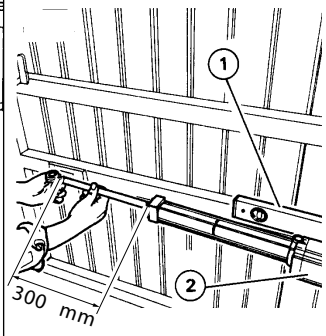
C14



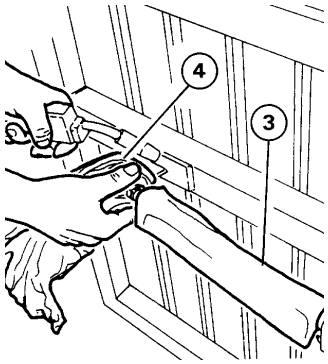
C15



C16



C17



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4.5 FINAL INSTALLATION OF THE OPERATOR

4.5.1 Mechanical fixing

Fix both ends of the operator to the respective mountings.

Front fixing
Smear the front anchoring pin of the ball-joint and the rod with graphitized grease.
Position the end of the rod into the front mounting (**C11** pos. **4**). Fit the locking pin (**C11** pos. **5**) and fix with the snap rings.

Rear fixing

Fix the operator to the rear mounting using the fork pin (**C18** pos. **3**) and the relevant lock nut (**C18** pos. **4**).
With the gate leaf fully closed, re-check that the rod comes out from the operator of the defined measure.

4.5.2 Checking the motion

Warning

- ***When the mounting is completed, neutralize the hydraulic lock (if present in the operators) by turning the correct key through 180° counter-clockwise, and move the gate-leaves manually to check on the smoothness of the movement; this should be done very slowly, otherwise the operators will take in air and, consequently, will have to be bled.***
- ***Open and close the gate leaf to check that the operator can move freely without rubbing and without going against either the gate leaf or the gate post.***
- ***After making the checks, reset the hydraulic lock by turning the release key fully in a clockwise direction.***

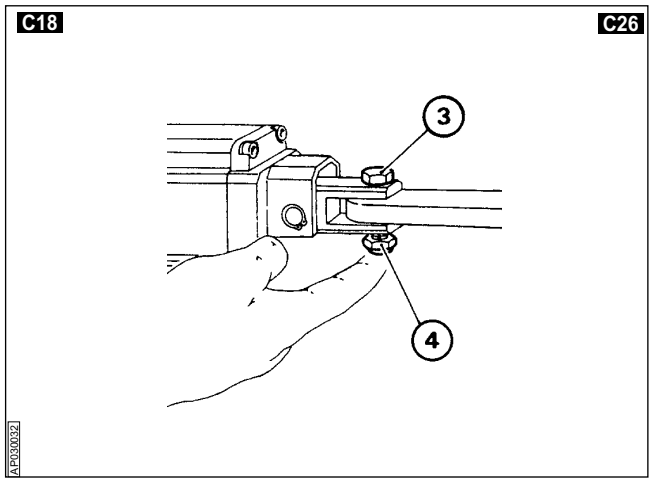
4.5.3 Electrical connection

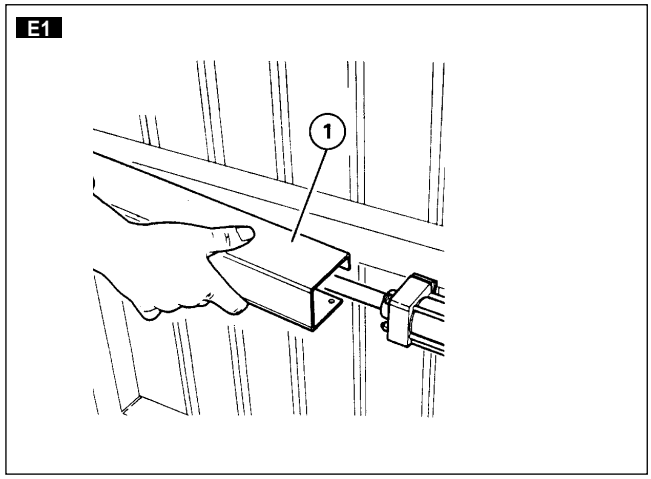
Make the electrical connection according to the wiring diagram (**D1**) - see paragraph “System electrical connection”.
Connect the supplied capacitor (**B4** pos. **12**) to the electric control unit according to the wiring diagram of the unit itself.

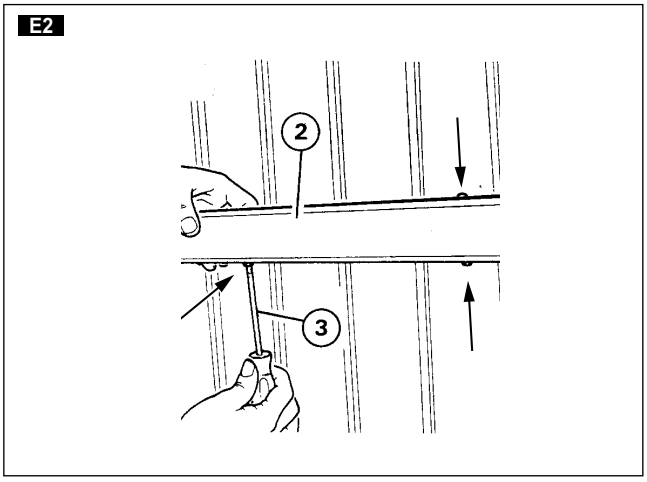
4.5.4 Fitting the protection casing and removing the bleed screw

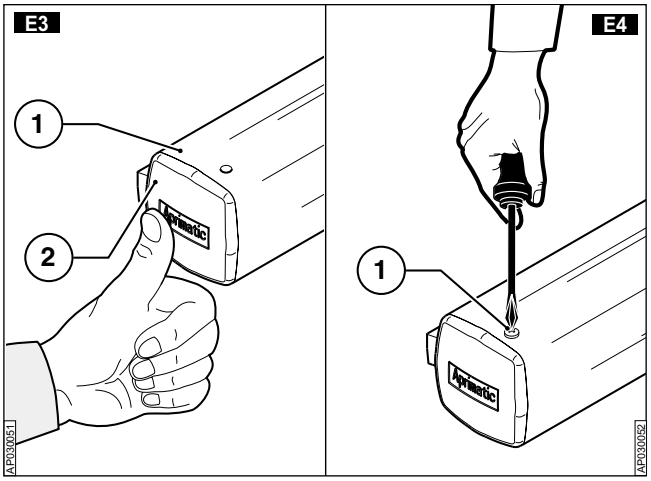
Fit the protective casing (**E1** pos. **1**) to rod and insert into the operator.

Hold the casing bottom (**E2** pos. **2**) in position with a cross-head screwdriver (**E2** pos. **3**).
Fit the push-on cover (**E3** pos. **2**) on to the protective casing (**E3** pos.**1**).
Tighten the fixing screw of the protective casing (**E4** pos.**1**).
On completion of the assembly, remove the bleed screw (**E5** pos. **4**) using a CH7 hexagonal wrench.









Fit the protective sheath to the power supply cable (**E5** pos. **5**) if necessary.

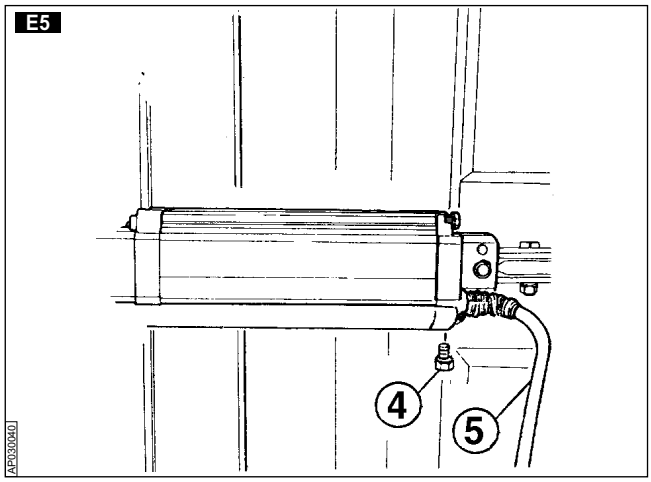
Caution

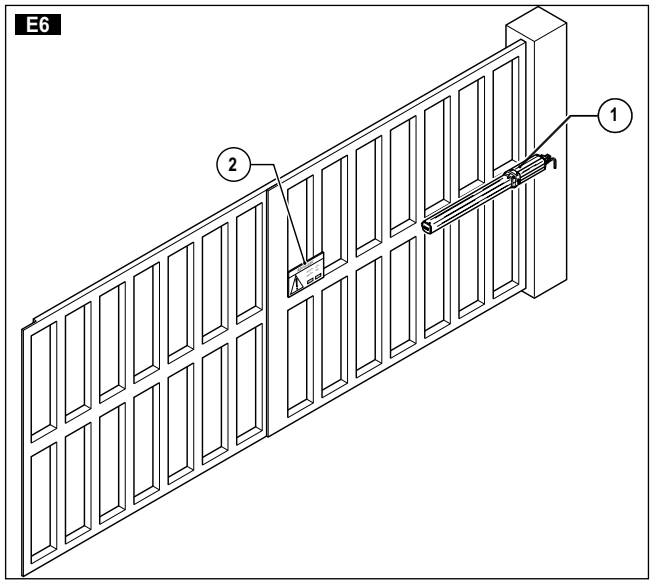
One drop of hydraulic oil coming out of the duct created by the screw elimination (E5 pos. 4) is normal.

Information

After installation, an appropriate warning sign must be attached to the gate (E6 pos. 2.)

When completely assembled, the operator should appear as shown in the figure (**E6** pos. **1**).





4.5.5 Bleeding

Warning

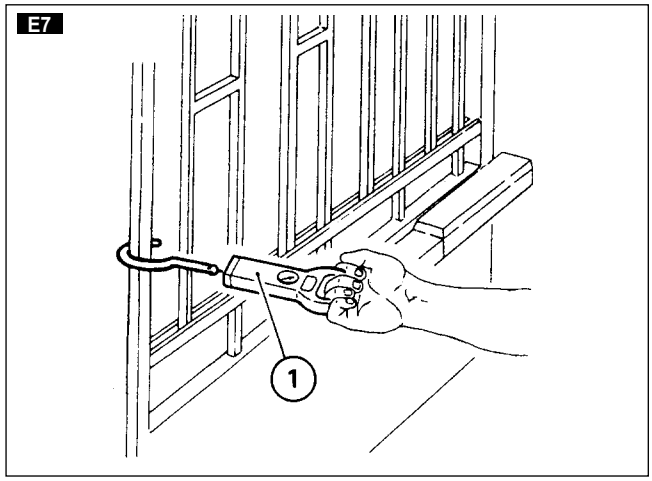
Before proceeding in setting the operator, bleed it.

Start the operator after having checked the setting of the pressure relief valves and move it to stroke end either in open or close position. Rotate on the key (see paragraph **6**) and lock and unlock the operator a dozens of times.

5. CHECKS AND ADJUSTMENTS

5.0 CHECKING AND ADJUSTING THE THRUST FORCE

With the gate leaf moving, measure the thrust force at the end of the gate leaf, using a dynamometer (**E7** pos. **1**).
The thrust force must never exceed 15 Kg (147 N).
If necessary, adjust the working pressure of the operator.
Using a broad, flat-headed screwdriver, turn the control valves clockwise to increase the pressure and counter-clockwise to reduce it.
Adjust both opening (silver - **E8** pos. **2**) and closing pressure (gold - **E8** pos. **1**).



Caution

- ***The opening thrust of the gate leaf should be set slightly higher than the closing thrust.***
- ***After making the settings, make another check with the dynamometer to see if the thrust force corresponds to the setting; if it doesn't, then the setting needs to adjusted again.***
- ***If the gate leaf requires an excessively high pressure to move it, then make another thorough check of the mechanical parts, the plumb and the free movement of the gate leaf itself.***

6.0 EMERGENCY MANOEUVRE - USE OF THE MANUAL RELEASE

In the event of a power failure, release the operator in order to open the gate by hand.

To gain access to the release valve, it is enough to loosen the screw (**E9** pos. **2**) and open the small cover (**E9** pos. **3**) by rotating it.

Unlock the operator by turning the triangular key provided (**E9** pos. **1**) counter-clockwise.

After the operation, re-lock the operator by turning the key clockwise.

Warning

After locking and releasing operations, remember to re-close the cover.

7. NOTES FOR THE INSTALLER

7.0 Maintenance

Information

Periodically check the proper functioning of the operator. Do this check at least every 12 months

Warning

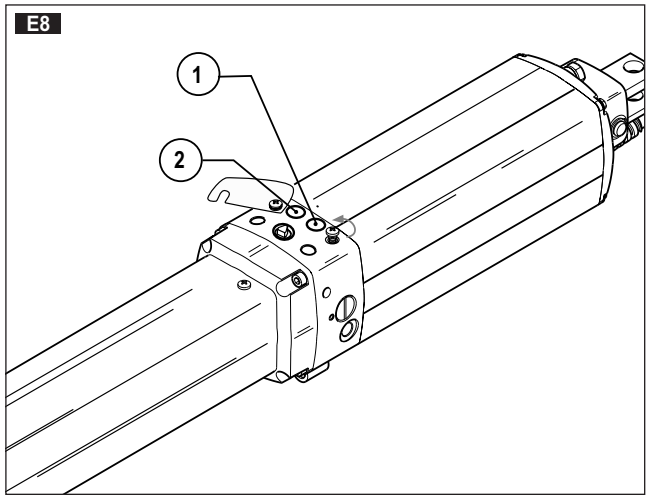
Maintenance must be performed only by skilled technicians.

Warning

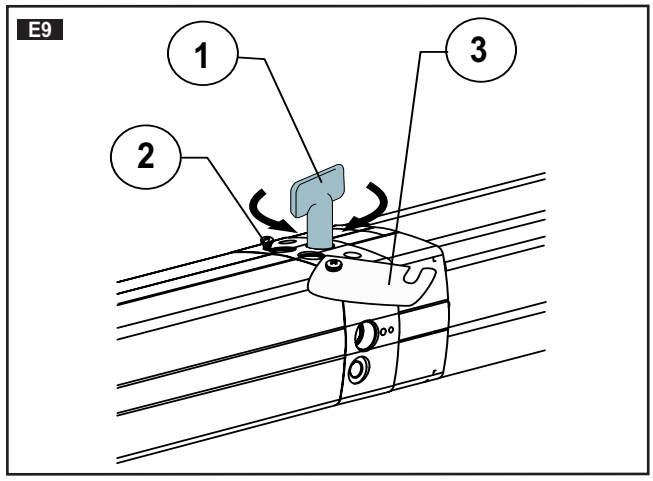
Before doing any maintenance job, turn the operator off by means of the differential switch of the electric system.

- Grease the joints with graphitized grease every year.
- Check the general condition of the gate structure.
- Check the mechanical resistance of hinges, operator mountings and stops.
- Ensure the installed safety devices are in working order (photocells, rubber barriers,...) and adjust the thrust force at the end of the gate leaf (max. 147 N).
- Ensure the electrical system and the differential switch are efficient.
- Check the setting of the pressure relief valve.
- Check the tightening of the safety lock.
- Depending on the use of the operator, check the oil level of the system.

E8



E9



7.1 Troubleshooting

Fault type	*Probable cause*	*Solution*
By operating the opening control, the leaf does not move and the electric motor of the operator does not run.	No power supply.	Turn the power on.
	Defective fuse.	Replace the defective fuses with new ones having the same amperage.
	The power cable of the operator is damaged.	Replace the power cable and find and rectify the fault.
By operating the opening control, the electric motor of the operator runs but the leaf does not move.	If the operator has a hydraulic release, check that the release valve setting is closed.	Turn the valve fully in a clockwise direction (E9 pos.1).
	If the operator doesn't have a hydraulic release, adjiust the opening pressure setting.	Screw the pressure setting valve clockwise (par.5 - E8 pos.2)
	If the operator has been exposed to the sun for a long period, with the gate closed, check that the operator piston is not in the fully advanced position, i.e. with the rod completely out.	Check the operator mounting, as described in this manual. Check the measure of the piston stroke.
During the motion, the operator jerks.	Probably air in the cylinder.	Detach the operator from its front mounting and make a few opening and closing movements; then re-fit to the front mounting.
	Oil in the cylinder not enough.	Check for oil leaks; if any, address to an APRIMATIC Repair Centre.
	The front and rear operator mountings move or have been fitted incorrectly.	Repair or strengthen the mountings.

SPACE RESERVED TO THE INSTALLER
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