

CE DECLARATION OF MACHINE CONFORMITY

(DIRECTIVE 89/392/EEC, ANNEX II, PART B)

Manufacturer : FAAC S.p.A.

Address: Via Benini, 1 - 40069 Zola Predosa BOLOGNA - ITALY

Declares that: Operator mod. 748-24V,

- is manufactured to be incorporated in a machine or for assembly with other machines to constitute a machine under the provisions of Directive 89/392/EEC, and subsequent amendments 91/368/EEC, 93/44/EEC, 93/68/EEC;
- conforms to the essential safety requirements of the following further EEC Directives:

73/23/EEC and subsequent amendment 93/68/EEC.
89/336/EEC and subsequent amendment 92/31/EEC and 93/68/EEC

and, furthermore, declares that putting the machine into service is forbidden until the machine in which it will be incorporated or of which it will become a part has been identified and it has been declared as conforming to the conditions of Directive 89/392/EEC and subsequent amendments enacted by the national implementing legislation.

Bologna, 01 January 2000

The Managing Director
A. Bassi



WARNING FOR THE INSTALLER

GENERAL SAFETY OBLIGATIONS

- CAUTION! It is important for personal safety to follow all the instructions carefully. Incorrect installation or misuse of the product may cause people serious harm.**
- Read the instructions carefully before starting to install the product.
- Packaging material (plastic, polystyrene, etc.) must not be left within reach of children as it is a potential source of danger.
- Keep the instructions in a safe place for future reference.
- This product was designed and manufactured strictly for the use indicated in this documentation. Any other not expressly indicated use may damage the product and/or be a source of danger.
- FAAC accepts no responsibility due to improper use of the automation or use other than that intended.
- Do not install the appliance in an area subject to explosion hazard: inflammable gasses or fumes are a serious safety hazard.
- Mechanical construction elements must meet the provisions of UNI8612, CEN pr EN 12604 and CEN pr EN 12605 standards.
To obtain an adequate level of safety in non EU countries, the above mentioned standards must be observed in addition to national standards.
- FAAC will not accept responsibility if the principles of good workmanship are disregarded in constructing the closing elements to be motorised, and if any deformation occurs during use of the said elements.
- Installation must meet the following standards: UNI8612, CEN pr EN 12453 and CEN pr EN 12635.
The safety class for the automation must be C+D.
- Before carrying out any work on the system, switch off the electricity supply.
- The mains electricity supply of the automation must be fitted with a single-pole switch with contact opening distance of 3mm or greater. Use of a 6A thermal breaker with single-pole circuit break is recommended.
- Make sure there is a differential switch with 0.03A threshold upstream of the system.
- Check that the earthing system is correctly made and connect the closure metal parts to it. Also connect the Yellow/Green wire of the automation to the earthing system.
- The automation includes an intrinsic anti-crushing device consisting of a torque control which, however, must be installed together with other safety devices.
- The safety devices (e.g.: photocells, sensitive edges, etc...) protect any dangerous areas against **Movement mechanical risks**, such as, crushing, dragging, or shearing.
- Use of at least one indicator-light is essential for each system (e.g.: FAAC LAMP MINILAMP, etc.) as well as a sign adequately fixed to the frame structure, in addition to the devices mentioned at point "16".
- FAAC accepts no responsibility regarding safety and correct operation of the automation, should components made by manufacturers other than FAAC be used in the system.
- Use only FAAC original spare parts for maintenance.
- Do not make any alterations to the components of the automation.
- The installer must supply full information regarding manual operation of the system in the event of an emergency and provide the user of the system with the "User's Guide" included with the product.
- Do not allow children or other persons to stand near the product while in operation.
- Keep remote controls or any other pulse generator well away from children, to prevent the automation from being activated accidentally.
- The user must refrain from attempting to repair or adjust the system personally and should contact qualified personnel only.
- Anything not expressly provided for in these instructions is not permitted.**

748-24V AUTOMATION SYSTEM

These instructions apply to the following models:

Operators 748-24V and 724MPS

The FAAC 748-24V automation system for sliding residential gates is an electromechanical operator that transmits the leaf movement by means of a pinion coupled to a rack fixed to the gate. The irreversible system locks mechanically when the motor is not running, so it is not necessary to install a lock.

1. DESCRIPTION AND TECHNICAL SPECIFICATIONS

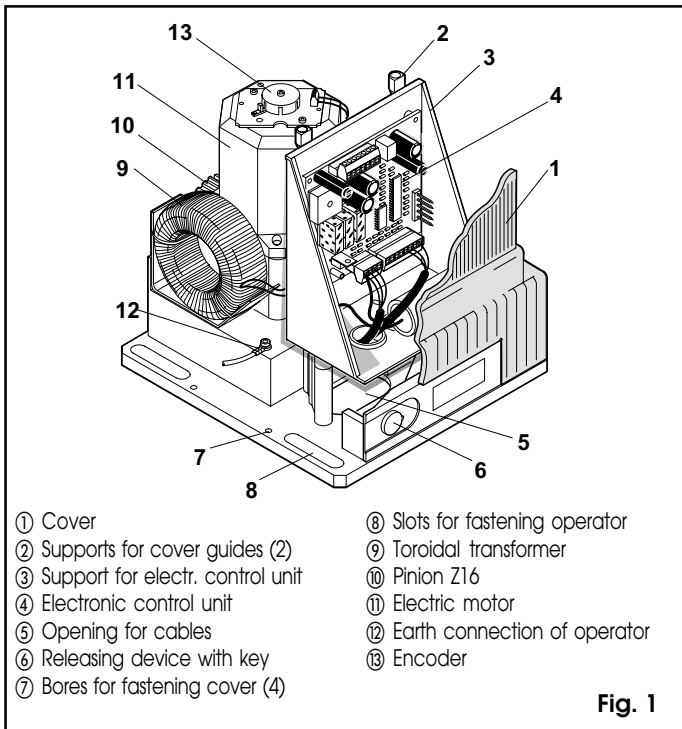


Fig. 1

Table 1: Technical specifications of "748-24V Operator"

Power supply	24Vdc
Absorbed power (W)	70
Current drawn (A)	3
Electric motor	1400 rpm
Pinion	Z16
Rack	module 4 - pitch 12.566
Max. torque (Nm)	13.5
Max. thrust (daN)	40 (Z16)
Duty cycle	70% (see paragraph 1.1)
Temperature range (°C)	-20 ÷ +55 °C
Weight of operator (Kg)	10
Housing protection	IP 44
Max. gate weight (Kg)	400
Gate speed (m/min)	12 (Z16)

1.1. MAXIMUM DUTY CYCLE CURVE

The curve makes it possible to determine the maximum operating time (T) as a function of the duty cycle (F), e.g., the 748-24V operator can work continuously at a duty cycle of 70%.

To ensure smooth running, operation should be kept within the duty area below the curve.

Important: the curve was plotted on the basis of operation at 24 °C. Allow for up to 20% reduction of duty cycle in case of exposure to direct sunlight.

Calculating the duty cycle

The duty cycle is the proportion of the actual operating time (opening + closing) with respect to the total time of the cycle (opening + closing + pause time).

The formula for calculating it is the following:

$$\%F = \frac{T_o + T_c}{T_o + T_c + T_p + T_i} \times 100$$

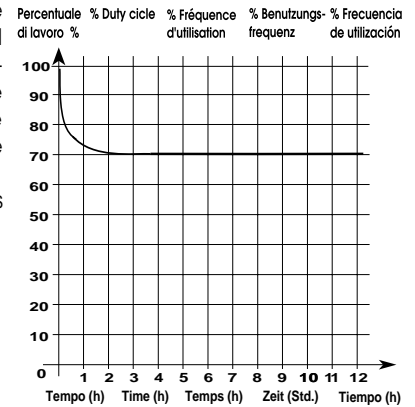
where:

T_o = opening time;

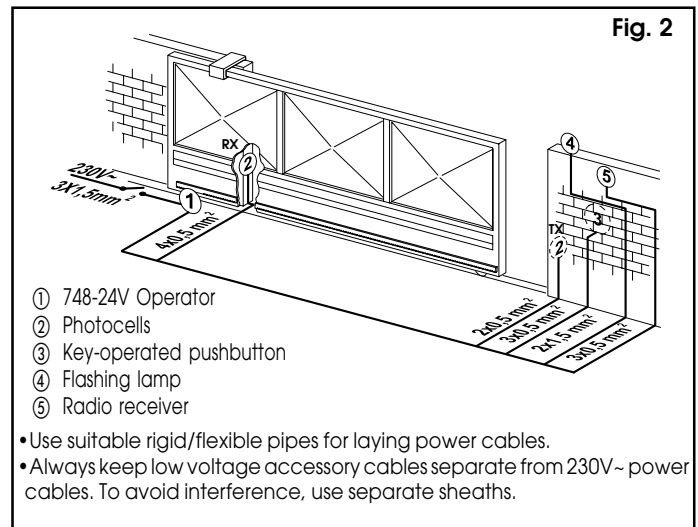
T_c = closing time;

T_p = pause time;

T_i = duration of interval between a complete cycle and the next one.



2. STANDARD INSTALLATION LAYOUT



- Use suitable rigid/flexible pipes for laying power cables.
- Always keep low voltage accessory cables separate from 230V - power cables. To avoid interference, use separate sheaths.

3. INSTALLATION OF AUTOMATION SYSTEM

3.1. PRELIMINARY CHECKS

To ensure trouble-free operation, make sure that the gate (whether existing or yet to be installed) has the following specifications:

- Max. gate weight 400 kg.
- Strong and rigid leaf frame.
- Flat leaf face, with no protruding parts and no vertical members.
- Smooth and even movement of the gate over its entire travel.
- No sideways oscillation of the leaf.
- Upper and lower sliding system in perfect conditions. The use of floor tracking with a rounded channel is preferable to reduce friction in the sliding movement.
- Only two slide wheels.
- **Mechanical safety stops to avoid risk of derailment. These stops must be firmly fixed to the ground or to the floor track, about 2 cm beyond the travel limit.**
- No mechanical locks.

If any welding or brazing is required on the gate, it should be done before installing the automation system.

The condition of the structure directly affects the reliability and safety of the automation system.

3.2. INSTALLING THE OPERATOR

1) Dig out a hole for the base plate as shown in fig. 3.

In order to ensure the correct engaging of the pinion and rack, the base plate must be placed in the position shown in fig. 4a (right closing) or 4b (left closing).

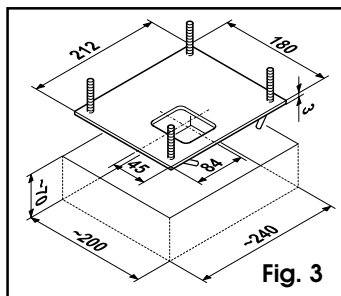


Fig. 3

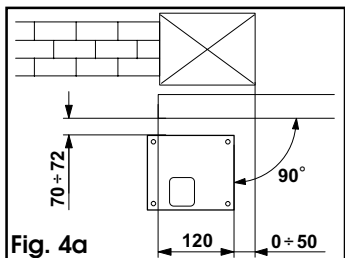


Fig. 4a

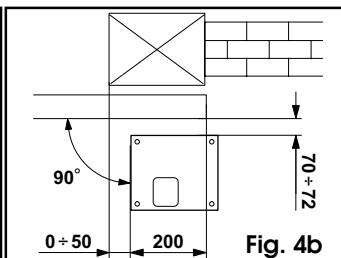


Fig. 4b

N.B. it is advisable to place the base plate on a concrete foundation at about 50 mm from the ground (fig. 5).

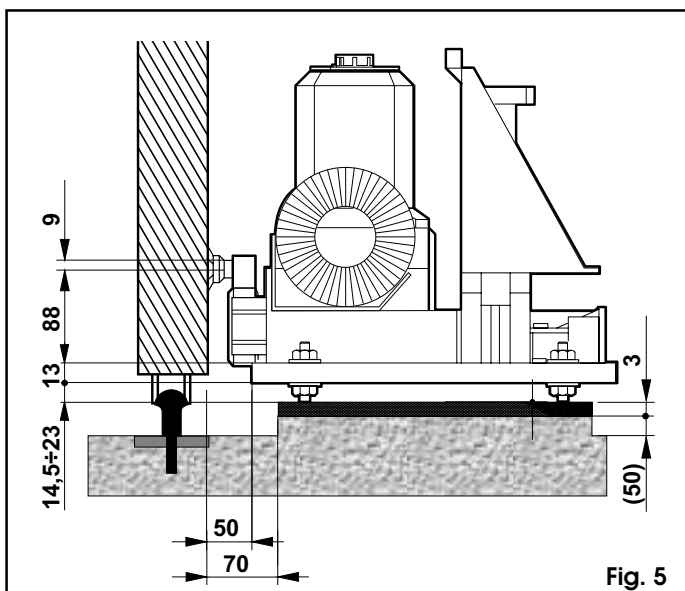


Fig. 5

2) Lay the flexible pipes for connection cables between operator, accessories, and power supply. The flexible pipes must protrude by approximately 3 cm from the opening on the plate (fig. 3).

3) Cement in the plate, ensuring that it is perfectly level.

4) Wait for the concrete to set in the hole.

5) Lay the cables for connection with accessories and power supply. To facilitate the electrical wiring on the electronic unit, about 30 cm of cable should come out of the opening on the base plate.

6) Fasten the operator to the base plate by means of the screws and washers supplied, as shown in fig. 6.

The positioning of the operator is shown in fig. 5.

Pass the electrical cables through the relevant opening (fig. 1 - ref. 5) on the base of the operator.

7) Pass the electrical connection cables through the relevant opening on the base of the electronic control unit support (fig. 1 - ref. 3), using the cable clamp supplied.

8) Connect up the cables to the electronic control unit.

Important: connect up the earth cable of the system to the position shown in fig. 1 - ref. 12.

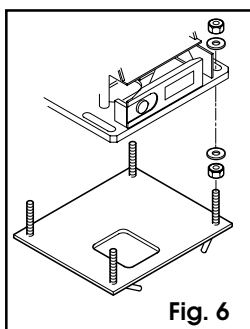


Fig. 6

3.3. ASSEMBLING THE RACK

1) Fit the rack by means of the screws TE 8 x 25 and the spacers provided, as shown in figure 7.

To avoid welding to the gate, galvanized passing spacers with screws TE 8 x 50 are provided.

N.B. it is advisable to tighten the rack fixing screws at the top of the slot. This allows the rack to be raised if, with time, the gate tends to sink.

2) Release the operator (see paragraph 13).

3) Slide the gate leaf open, by hand.

4) Place the first section of the rack on the pinion, aligning the latter with the first spacer (fig. 8).

5) Fix the rack section to the leaf by means of a clamp (fig. 8).

6) Slide the gate leaf by hand towards its closed position, until it is in line with the third spacer on the rack, and spot weld the spacer in position.

7) Completely weld the three spacers to the gate.

To fasten the other rack sections needed to reach the position of complete closing, proceed as follows:

8) Line up another rack section to the last one fixed to the gate. Use a section of rack of about 150 mm and ensure that the teeth are correctly spaced (fig. 9).

9) Slide the gate by hand towards its closed position until the third spacer of the section to be fastened is aligned with the pinion (fig. 9).

N.B. ensure that all the rack sections are correctly centered on the pinion teeth. If not, adjust the position of the operator.

10) Weld the three spacers of the section (fig. 9).

Caution:

- a) do not weld the rack sections to the spacers or to each other;
- b) do not use grease or other lubricants on the pinion and rack.

11) To obtain a correct slack between the pinion and rack, lower the operator by 1.5 mm, by means of the support nuts of the base plate (fig. 10).

When this adjustment has been completed, tighten the screws that fasten the operator.

Caution: If the gate is new, check the slack (fig. 11) after a few months.

12) Manually check whether the gate can open completely and the movement of the leaf is smooth and even, over its entire travel.

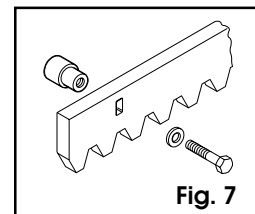


Fig. 7

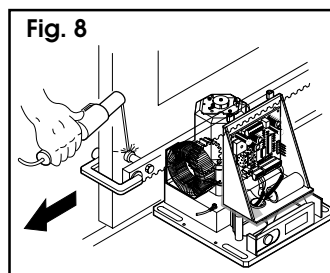


Fig. 8

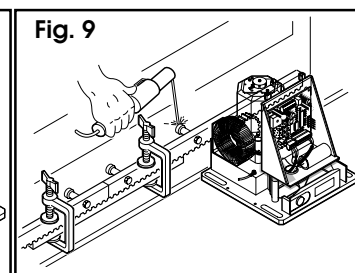


Fig. 9

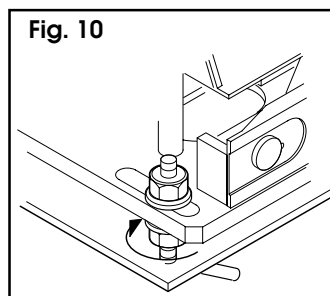


Fig. 10

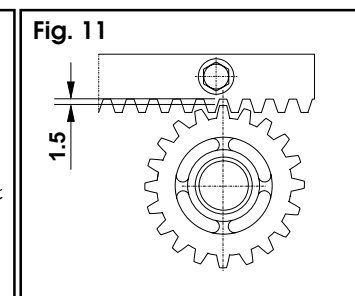


Fig. 11

724MPS - MICROPROCESSOR CONTROL UNIT FOR 24 Vdc SLIDING GATES WITH ENCODER

4. GENERAL CHARACTERISTICS

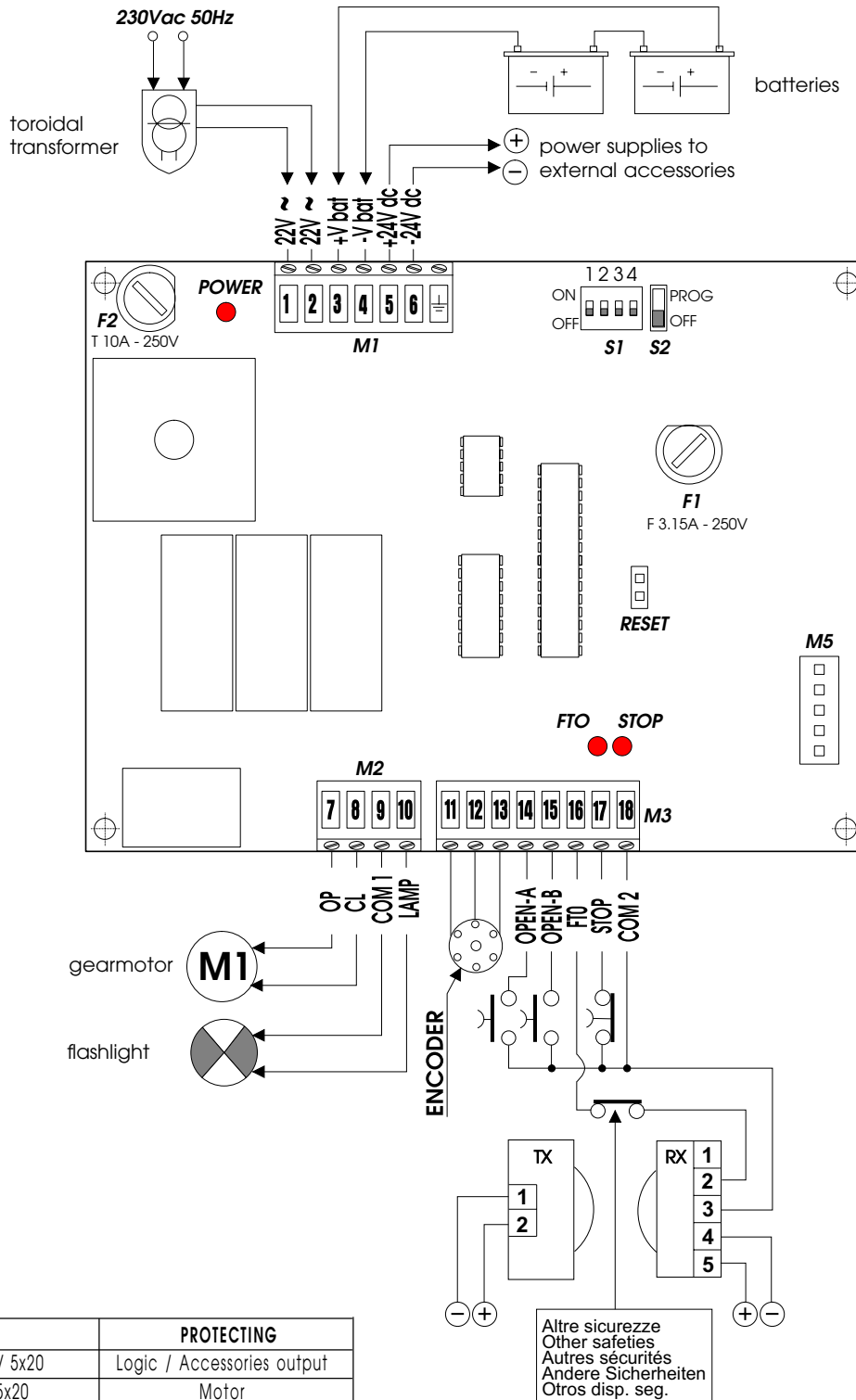
Thank to its high powered microprocessor, this control unit for 24 Vdc sliding gates offers a wide range of functions and adjustments, including deceleration and motor control.

A sophisticated electronic control monitors the power circuit at all times and disables the control unit in the event of malfunctions that could impair efficiency of the electronic clutch.

Main settings and function modes are executed by dip switches, whereas timing, and also power of motor are adjusted through self-learning at installation.

3 built-in LEDs constantly indicate status of both control unit and gearmotor.

The control unit is designed for installation in a container on the gearmotor itself or in the watertight container for outdoor use, which is also designed to house 2 optional batteries and a toroidal transformer, with the characteristics in the table below.



FUSE	PROTECTING
F1 = F 3.15A 250V 5x20	Logic / Accessories output
F2 = T 10A 250V 5x20	Motor

Fig. 12

5. TECHNICAL SPECIFICATIONS

Supply voltage of transformer	230V~ (+ 6 % - 10 %) 50Hz
Supply voltage of control unit	22V~ (+ 6 % - 10 %) 50Hz
Power consumption	3 W
Motor max. load	70 W
Accessories max. load	24Vdc 500mA
Flashlight max. load	24Vdc 15W max
Ambient temperature	-20 ÷ +55 °C
Fuse	2
Function logics	Automatic / Stepped
Opening / closing time	Through self-learning at installation
Pause time	Through self-learning at installation
Thrust force	Two levels selected by Dip-switch
Deceleration	At opening and closing through self-learning
Terminal board inputs	Encoder / 22V~ Power supply / Battery power supply Total opening / Opening for pedestrians / Stop / Photocells
Quick connector	For decoding - RP receivers card
Terminal board outputs	24 Vdc accessories power supply / 24Vdc Motor 24 Vdc Flashlight
Card dimensions	150 x 130 mm
Characteristics of toroidal transformer	
prim. 230V~ sec. 22V~ / 150VA / dimens. Ø 105 x 40 mm	
Characteristics of optional batteries	
12V 4.5Ah / dimensioni 90 x 70 x 108 mm	
Characteristics of outdoor container	
305 x 225 x 125 mm - IP55	

6. INSTRUCTIONS

WARNING: To ensure people's safety, all warnings and instructions in this booklet must be carefully observed. Incorrect installation or use of the product could cause serious harm to people.

Make sure there is an adequate differential switch upstream of the system as specified by current laws, and install a thermal breaker with all-pole switch on the electrical mains.

To lay electrical cables, use adequate rigid and/or flexible tubes.

Always separate connection cables of low voltage accessories from those operating at 230 V~.

To prevent any interference whatever, use separate sheaths.

In the version with control unit installed on the gearmotor, some connections and units described in these instructions (motor, transformer, encoder, etc) are factory prewired.

In the version with control unit housed in the watertight outdoor use container, maximum length of connection cables between control unit and motor/encoder must not exceed 3 m., using 2x2.5mm² cables for the motor and 3x0.5mm² cables for the encoder.

Procedure (referring to fig. 13) for securing components in the watertight container:

1) Secure the support of the toroidal transformer in position **A** by fitting three Ø3.9x6.5 self-tapping screws (supplied) in the guides of the watertight container.

N.B.: the support is sized to house a transformer with characteristics and dimensions specified in the table in paragraph 5.

2) Secure the transformer on the support with 2 clamps (supplied).

3) If using floating batteries, secure the relevant support in position **B** by fitting four Ø3.9x6.5 self-tapping screws (supplied) in the crossover holes of the guides of the watertight container.

N.B.: the support is sized to house two batteries (not supplied) with characteristics and dimensions specified in the table in paragraph 5.

4) Position the batteries on the support.

5) Secure the control unit in position **C** by fitting four Ø3.9x6.5 self-tapping screws (supplied) in the guides of the watertight container.

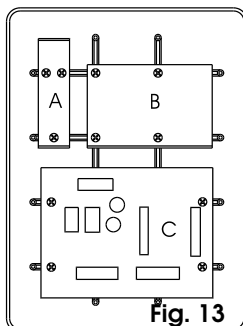


Fig. 13

Procedure for securing the encoder on the gearmotor (fig. 14) :

- Using the four M4x10 screws **C** (supplied), secure card **B** on cover **A**, locating the spacers **D** between cover and card.
- Using the M4x30 screw **F** (supplied), secure encoder **E** directly on the thread on the rotor of the gearmotor.
- Wire up terminal board **G** as described below.

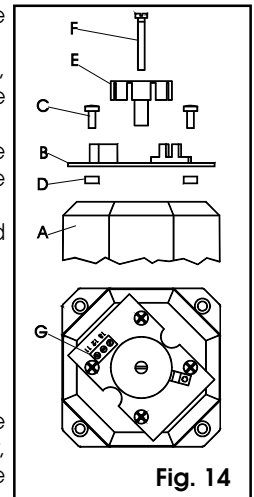


Fig. 14

7. CONNECTIONS

7.1 TERMINAL BOARD M1

22V~ Power supply

Terminals "1-2". This is the input to which the secondary winding of the transformer, powered at 22 V~ 50Hz, should be connected. When power is supplied by the transformer, this is signalled by the POWER LED lighting up.

Batteries

Terminals "3-4". The control unit is designed to operate with two floating batteries (optional item) with minimum characteristics as indicated on the table in paragraph 5.

When powered, the control unit keeps the batteries charged. The batteries begin to operate when the transformer no longer supplies power.

N.B.: power supplied by batteries should be considered an emergency situation - the minimum number of gate operations is about 10/15.

In any event, the number of possible operations depends on the quality of the batteries, structure of gate, and time elapsing since mains power failed, etc, etc..

N.B.: observe the power polarity of the batteries

Accessories

Terminals "5-6". Output for powering external accessories (24 Vdc).

N.B.: maximum load of accessories is 500 mA.

7.2 TERMINAL BOARD M2

Gearmotor

Terminals "7-8". Connect the motor to the power supply of 24Vdc 70W max.

Flashlight

Terminals "9-10". Use a flashlight with fixed light operating voltage of 24Vdc 15W max. We advise you to connect it before programming, as it indicates programming stages.

On opening, it pre-flashes steadily for 0.5 seconds, and for 1.5 seconds at closing.

If the automatic logic is on, when the gate reaches the opening gate stop, the flashlight stays on for 5 sec to inform the user it will re-close automatically.

When the gate is open, the flashlight is off, and only flashes when the safety devices are in use.

If the devices are in use for a long time, flashing only lasts 10 sec.

7.3 TERMINAL BOARD M3

Encoder

Terminals "11-12-13". Use the encoder supplied with the control unit. Connect the return signal from encoder terminal "11" to terminal "11", connect encoder terminals "12-13" to terminals "12-13".

N.B.: the control unit will not operate without an encoder.

N.B.: observe the encoder's cable terminals.

Open-A

Terminals "14-18". Any device (e.g. push-button, remote control, etc.) can be connected to this circuit.

By closing a contact, the circuit generates a pulse for total opening and/or closing of the gate. Its operating mode is set by dip-switch 3 - see paragraph 9.

N.B.: a OPEN-A pulse during the pedestrian stage always has priority over that stage

N.B.: to install several pulse generators, connect the contacts in parallel.

Open-B (For pedestrian use)

Terminals "15-18". Any device (e.g. push-button, remote control, etc.) can be connected to this circuit.

By closing a contact, the circuit generates a pulse for partial opening (30% of total opening) of the gate.

N.B.: an OPEN-A pulse during the pedestrian stage always has priority over that stage.

N.B.: to install several pulse generators, connect the contacts in parallel.

Photocells

Terminals "16-18". Any safety device (e.g. photocell, sensitive strip, etc.) can be connected to this circuit.

By opening a contact, the circuit protects closing motion.

The status of this input is signalled by the FTO LED.

It also has an effect on opening motion, depending on how dip-switch 4 was set - see paragraph 9.

N.B.: if safety devices are not connected, fit a jumper at input. To install several safety devices, connect the NC contacts in series.

Stop

Terminals "17-18". Any device (e.g. push-button, remote control, etc.) can be connected to this circuit.

By opening a contact, the circuit stops gate movement.

The status of this input is signalled by the STOP LED.

The set cycle will restart only if a successive opening or closing pulse is received.

N.B.: if STOP devices are not connected, fit a jumper at input. To install several STOP devices, connect the NC contacts in series.

8. FITTING DECODING/RP RECEIVER CARDS

Installation procedure: turn off power and fit the module in container M5 inside the control unit. Then observe the radio-receiver instructions to store data on the remote-control. After the necessary data has been stored, the remote-control activates OPEN-A like any other command device.

9. SETTINGS WITH DIP-SWITCH S1

SW1	ELECTRONIC CLUTCH	
	ON	Maximum force, minimum sensitivity
	OFF	Minimum force, maximum sensitivity
SW2	FUNCTION LOGIC	
	ON	Automatic
	OFF	Stepped
SW3	OPERATION OF OPENING COMMAND	
	ON	One state only at each pulse: open, stop, close, stop, open etc.
	OFF	One movement only at each pulse: open, close, open, close, etc.
SW4	OPERATION OF PHOTOCELLS	
	ON	Stops at opening, restarts on release, stops at closing and reverses
	OFF	Stops and reverses at closing only

10. CONTROL LEDS

LED	LIGHTED	OFF
POWER - power	with transformer	on battery (if used)
FTO - photocells	photocells not covered	photocells covered
STOP - stop	command inactive	command active

N.B.: LED status shown in bold with gate closed and control unit powered.

11. PROGRAMMING

Programming of work times, deceleration and electronic clutch is executed during self-learning. At this stage, leaf movement is at slow speed.

Procedure:

- 1) Release the leaf, take it to about midway through opening travel, and then lock it.
- 2) Power up the control unit (power ON is signalled by the POWER LED).
- 3) Turn switch **S2** to **PROG**: the flashlight goes on at steady light to signal programming.
- 4) Press the push-button connected to the OPEN-A terminals or the remote-control, if already programmed. The first operation the automation performs must be CLOSING.

5) If the gate moves to open, touch the two **RESET** pins with a screwdriver - the control unit will immediately stop the movement generated by the automation.

6) Cut power to the control unit, reverse polarity of the two cables powering the motor, and repeat the operation at point 1.

7) After the OPEN-A command is given, the gate moves to close, until it reaches the closing gate stop.

8) After about two seconds, the gate restarts opening automatically until it reaches the opening gate stops.

9) The control unit begins counting pause time. After the required time has elapsed, press the OPEN-A command again, and the gate will close completely.

10) Programming is now finished. Turn switch **S2** back to **OFF** - the flashlight goes off.

11) Fit the cover on the operator by means of the screws provided, as shown in figure 15.

12. OPERATION OF ELECTRONIC CLUTCH

This is a very important device for safety. Its setting does not alter through time, as the device is not subject to wear or setting changes.

It is active both at closing and opening. When it operates it reverses motion direction without inhibiting automatic closing if enabled.

If it operates twice in succession, it moves to STOP position, disabling any automatic command.

This is why: if the clutch operates twice, this means the obstacle is still present and any further manoeuvres could be dangerous, thus obliging the user to give an opening or closing command.

In that case the control unit executes an EMERGENCY procedure as follows: full opening at slow speed up to the opening gate stop, followed by automatic closing to enable the gate stops to re-synchronise independently.

13. MANUAL OPERATION

Should the need arise to operate the gate manually because of a power failure or malfunction, release it by means of the releasing device (fig. 1 - ref. 6).

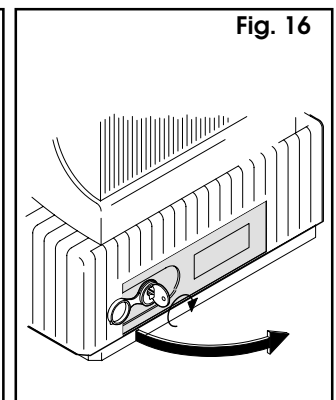
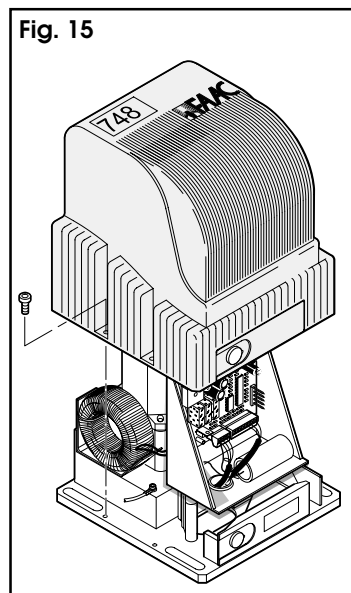
Proceed as follows:

- open the lid of the lock and insert the relative key in the lock (fig. 16);
- turn the key clockwise and open the cover of the releasing device as shown in figure 16.

To re-lock the system, return the cover of the releasing device to its initial position.

Important: before giving a signal, ensure that the gate cannot be moved manually.

N.B.: re-lock always the operator with gate in closed position.



USER'S GUIDE

748-24V AUTOMATION

Read the instructions carefully before using the product and keep them for future reference.

GENERAL SAFETY INSTRUCTIONS

The 748-24V automation, when installed and used correctly, affords a high level of safety.

However, some simple rules should be followed to avoid accidents:

- Do not stand in the vicinity of the automation or allow anyone else, especially children, to do so, and do not place objects in the vicinity of the automation. This is particularly important during operation.
- Keep remote controls or any other control devices out of the reach of children to prevent them from accidentally operating the automation.
- Do not allow children to play with the automation.
- Do not deliberately obstruct the movement of the gate.
- Make sure that branches or bushes do not interfere with the movement of the gate.
- Ensure that the signalling lights are efficient and clearly visible.
- Do not attempt to move the gate manually without first releasing it.
- In the event of a malfunction, release the gate to allow access and call a qualified technician for service.
- After setting manual operation, disconnect the electricity supply from the system before returning to normal operation.
- Do not make any modifications to components of the automation system.
- Do not attempt to perform any repair work or tamper with the automation. Call FAAC qualified personnel for repairs.
- At least once every six months have the automation, the safety devices and the earth connection checked by a qualified technician.

DESCRIPTION

The FAAC 748-24V automation is ideal for controlling vehicle access areas with medium-high transit frequencies.

The FAAC model 748-24V automation for sliding gates are electromechanical operators which transmit movement to the leaf by means of a pinion with rack coupled in appropriate manner to the sliding gate.

The operation of the sliding gate is controlled by an electronic control unit housed inside the operator.

When the gate is closed, on receipt of an opening impulse from a remote control or other suitable control device, the control unit will start the motor to move the gate to the open position.

If automatic operation has been selected, sending an impulse causes the gate to reclose on its own after the selected pause time.

If semiautomatic operation has been selected, a second impulse must be sent to reclose the gate.

A stop command (if available) stops movement at any time. For detailed information on operation of the sliding gate in the various operating modes, contact the installation technician.

The automations have safety devices (photocells) which prevent the gate from reclosing when an obstacle lies within the area they are protecting.

The system ensures mechanical locking when the motor is

not in operation, so it is not necessary to install a lock. For this reason the release system must be operated before the gate can be opened manually.

A convenient manual release device allows the gate to be operated in the event of a power failure or malfunction. The light flashes while the gate is moving.

MANUAL OPERATION

Should the need arise to operate the gate manually because of a power failure or malfunction, release it by means of the releasing device.

Proceed as follows:

- open the lid of the lock and insert the relative key in the lock (fig. 1);
- turn the key clockwise and open the cover of the releasing device as shown in figure 1.

To re-lock the system, return the cover of the releasing device to its initial position.

Important: before giving a signal, ensure that the gate cannot be moved manually.

N.B.: re-lock always the operator with gate in closed position.

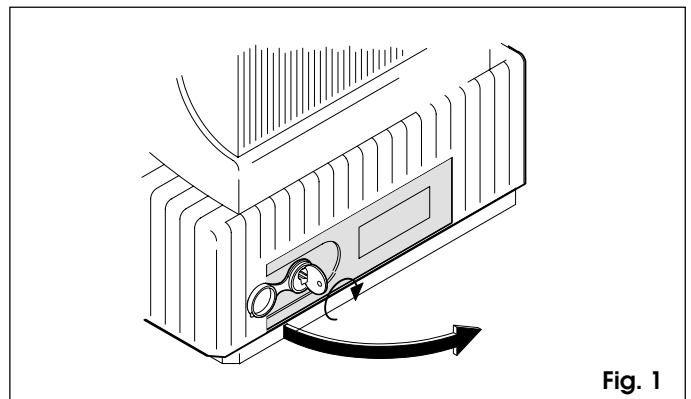


Fig. 1