



control units

robo, thor, otto

Instructions and warnings for the fitter



COMPANY
WITH QUALITY SYSTEM
CERTIFIED BY DNV
ISO 9001



control unit

gearmotors

robo, thor, otto

Table of contents:		page			page
1	Description of the product	5	6	Programmable functions	11
2	Installation	6	6.1	Description of functions	12
2.1	Typical system layout	6	7	Using 2 control units on opposed leafs	13
2.2	Electrical connections	6	8	Accessories	14
2.2.1	Electrical diagram	7	9	Maintenance	14
2.2.2	Description of connections	7	10	Disposal	14
2.2.3	Phototest	8	11	What to do if...	15
2.2.4	Checking connections	9	12	Technical specifications	15
3	Adjustments	9			
4	Testing	10			
5	Operating modes	11			

Warnings:

⚠ This manual has been especially written for use by qualified fitters. No information given in this manual can be considered as being of interest to end users!
This manual only refers to this control unit and may not be used for different products.
Do not install the unit before you have read all the instructions at least once.

1) Description of the product:

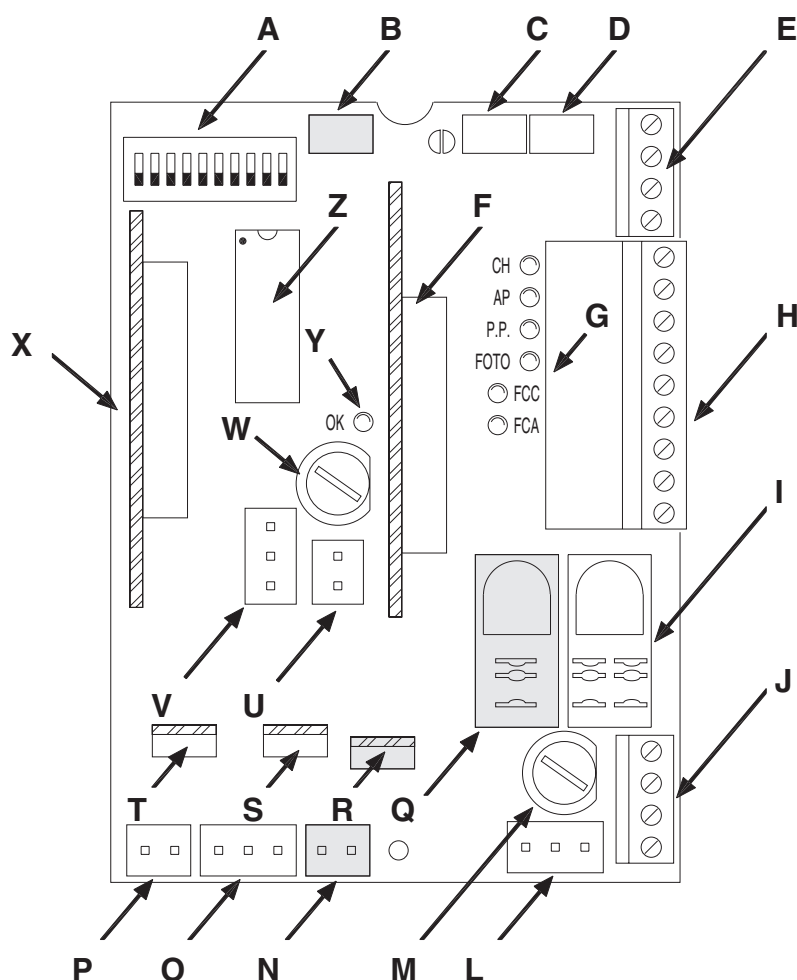
This gate and door automation unit controls the ROBO, OTTO and THOR gearmotors with single-phase alternating current.

The control unit varies depending on the type of gearmotor to control, e.g.: Force Adjustment, Gate Open Indicator and Courtesy Light.

It also features a series of functions that can be selected by "Dip-Switches" (mini-switches) and adjustments performed by Trimmers.

The control unit features input status Led's located near such inputs, while another Led near the microprocessor indicates that the internal logic works correctly.

To make it easier to recognise the various parts, **fig.1** shows the main components.



- A** Function selection Dip-Switch
- B** Force adjustment trimmer (only on RO1000)
- C** Working Time TL adjustment trimmer
- D** Pause Time TP adjustment trimmer
- E** Terminal board for aerial and 2nd channel
- F** RADIO board slot
- G** Input status LED's
- H** Input/output control terminal board
- I** "Common" relay
- J** Power input terminal board / Flashing light
- L** Primary transformer connector
- M** Line fuse (5A)
- N** "Courtesy Light" output connector (only on OTTO)
- O** Motor power output
- P** Capacitor slot connector
- Q** "Torque" relay
- R** Triac "Courtesy Light" (only on OTTO)
- S** Triac Close
- T** Triac Open
- U** Secondary transformer connector
- V** FCA / FCC limit switch input
- W** Low voltage rapid fuse (500mA)
- X** PIU board slot
- Y** OK Led
- Z** Microprocessor

1

	Product Code*	Control Unit Code*	Additional Function
ROBO	RO1000	ROA3	Force adjustment Trimmer
	RO1020		
	RO1010	ROA4	"Torque" Relay
THOR	TH1551	THA5	
OTTO	OT21	OTA1	"Courtesy Light" output

* = add to code V1 for the 120 V 50/60 Hz version.

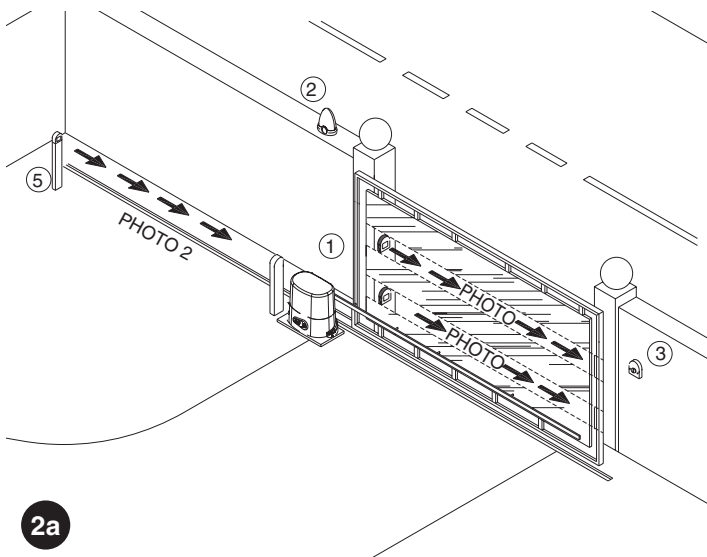
2) Installation:

⚠ Automatic gate and door systems may only be installed by qualified fitters in the full respect of the law. Comply with the warnings shown in the “Warnings for fitters” file.

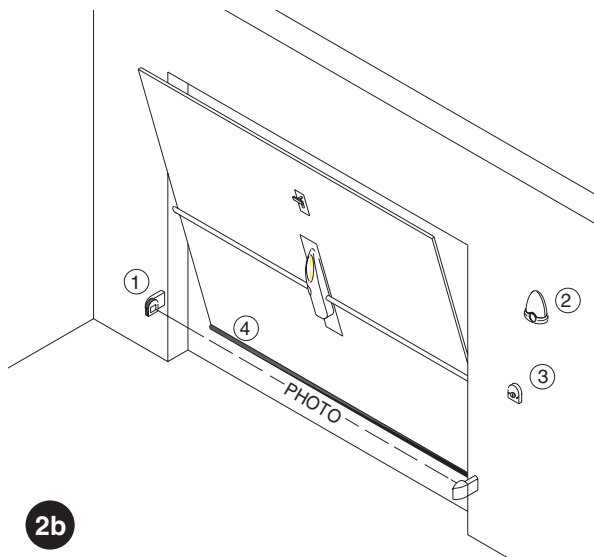
2.1) Typical system layout

In order to explain certain terms and aspects of an automatic door or gate system, we will now illustrate a typical system layout.

ROBO / THOR



OTTO



- 1) Pair of “Photo” photocells
- 2) Flashing lamp
- 3) Keylock selector
- 4) Pneumatic edge
- 5) Pair of “Photo 2” photocells

In particular, please note that:

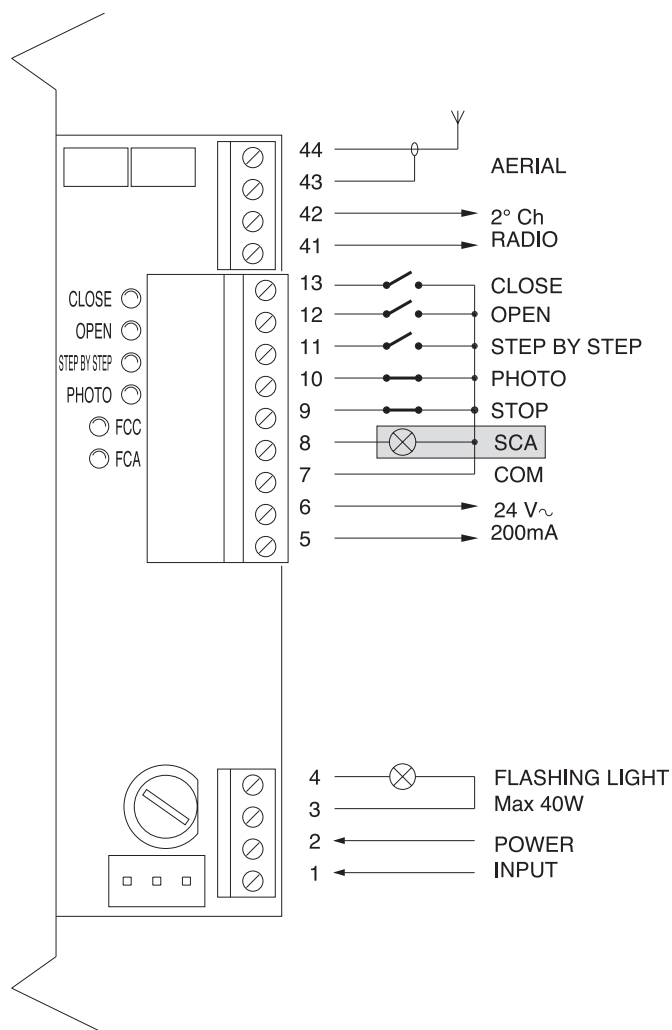
- All the photocells produced by NICE feature the synchronism system which eliminates the problem of interference between two pairs of photocells (please consult the photocell instructions for further details).
- The “Photo” pair of photocells have no effect during opening while they invert movement during closing.
- The “Photo2” pair of photocells have no effect during closing while they invert movement during opening.

2.2) Electrical connections

⚠ To safeguard the operator and avoid damaging the components while you are wiring or plugging in the various cards: under no circumstances may the unit be electrically powered.

- Power the unit using a 3 x 1.5 mm² cable: should the distance between the unit and the earth connection exceed 30m, install an earth plate near the unit.
- Use wires with a minimum cross-section of 0.25mm² to connect low voltage safety circuits.
- Use shielded wires if the length exceeds 30m and only connect the earth braid to the control unit side.
- Do not make connections to cables in buried boxes even if they are completely watertight.
- If the inputs of the Normally Closed (NC) contacts are not used they should be jumped with the “24V common” terminal except for the photocell inputs if the phototest function is enabled, for further information please see the “Phototest” paragraph.
- If there is more than one (NC) contact on the same input, they must be connected in SERIES.
- If the inputs of the Normally Open (NA) contacts are not used they should be left free.
- If there is more than one (NA) contact on the same input, they must be connected in Parallel.
- The contacts must be mechanical and potential-free; no stage connections are allowed, such as those defined as “PNP”, “NPN”, “Open Collector”, etc..

2.2.1) Electrical diagram



3

2.2.2) Description of connections

A brief description of the possible control unit output connections follows.

Terminals	Functions	Description
1-2	Power input	= Mains power line
3-4	Flashing light	= Output for connecting flashing light to mains voltage (max. 40W)
5-6	24 Vac	= 24Vac output to 24Vac services (Photo, Radio, etc.) Max. 200mA
7	Common	= Common for all inputs
8	Gate open indicator	= Max. 24 Vac output for gate open indicator 2W (Not used on OTTO)
9	Stop	= Input with "Stop" function
10	Photo	= Input for safety devices (photocells, pneumatic edges)
11	Step-by-step (PP)	= Input for cyclic functioning ("Open" - "Stop" - "Close" - "Stop")
12	Open	= Input for opening
13	Close	= Input for closing
41-42	2nd Radio Ch	= Output for the second radio receiver channel if there is one
43-44	Aerial	= Input for the radio receiver aerial

2.2.3) Phototest

“Phototest” is the best possible solution for safety devices in terms of reliability and it puts the control unit and safety photocells in “category 2” according to UNI EN 954-1 standard (ed. 12/1998).

Before every manoeuvre is begun, the relative safety devices are checked and only if everything is in order will the manoeuvre start. Should the test be unsuccessful (the photocell is blinded by the sun, cables have short circuited, etc.) the failure is identified and the manoeuvre is not carried out.

To obtain the Phototest function:

- Using the additional “PIU” board.
- Setting Dip Switch 10 to ON
- Creating a special layout in the safety device connections as shown in **fig. 4a** so that the photocell transmitters are no longer directly powered by the service output but from terminals 7 and 8 of the “PIU” board. The maximum current that the “PIU” board can use on the “Phototest” output is 100mA (2 pairs of nice photocells)
- Powering the receivers directly from the service output of the control unit (terminals 5-6).

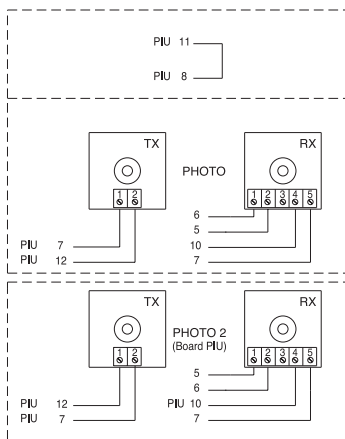
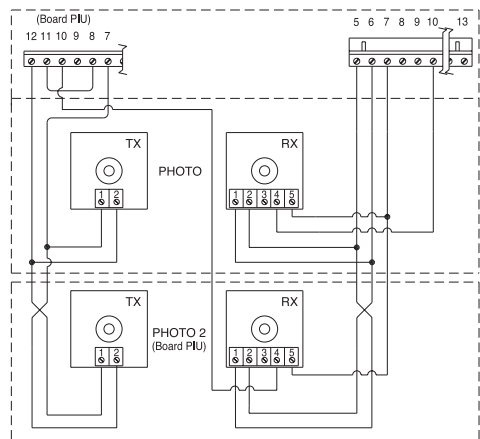


If at a later time the Phototest function is no longer required, lower Dip Switch 10 and modify the connection layout as shown in **fig. 4b**.

The photocells are tested as follows: when movement is required, it is first checked that all the receivers involved in the movement give their consent, then power to the transmitters is disconnected after which it is checked that all the receivers signal the fact by removing their consent; the transmitters are then powered and the consent of all the receivers is verified once more. Only if this sequence is successfully carried out will the manoeuvre be performed.

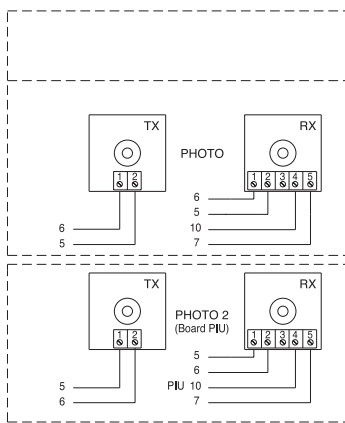
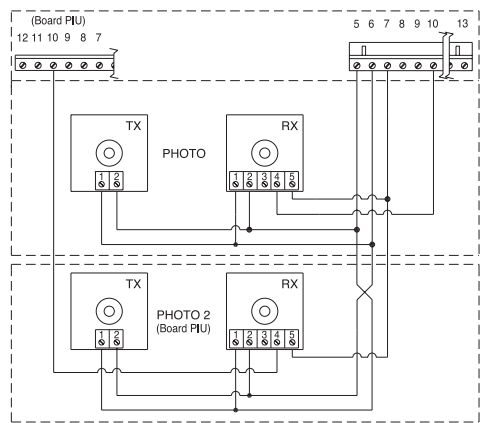
Synchronism should always be activated on the two transmitters by cutting the jumpers; this is the only way of ensuring that the two pairs of photoelectric cells do not interfere with one another. Check the instructions in the photocell manual regarding synchronised operation.

If a “Phototest” input is not used (e.g.: Photo2) but the “phototest” function is required, jumper the unused input as shown in **fig. 4c**.



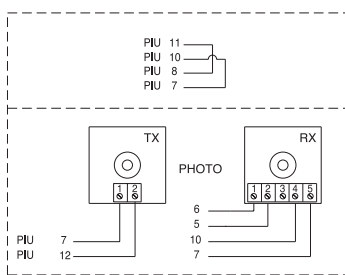
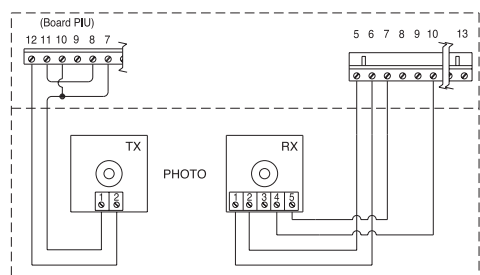
4a

“Photo” and “Photo2” with “Phototest”



4b

“Photo” and “Photo2” without “Phototest”



4c

“Photo” with “Phototest”

2.2.4) Checking connections

⚠ The following operations entail working on live circuits; most of these run on extra-low safety voltage so they are not dangerous but some contain mains voltage which means they are **HIGHLY DANGEROUS!** Pay the greatest of attention to what you are doing and **NEVER WORK ALONE!**

- Power the unit and check that voltage between terminals 5-6 is approx. 24 Vac.
- Check that the "OK" Led flashes rapidly for a few moments and then that it flashes at a regular frequency.
- Now check that the Led's relative to the N.C. (Normally Closed) contacts are on (all safety devices active) and that the Led's relative to the N.A. (Normally Open) inputs are off (no command present); if this is not the case, check the connections of the various devices and make sure they are in good working order. The STOP input switches off both FCA and FCC.
- Make sure the limit switches are connected properly; move the limit switch lever and check that the relative limit switch cuts in and switches off the relative Led on the control unit.
- Release the leaf, take it to the halfway point and then block it; it is now free to move in either the opening or closing direction.
- Now make sure that movement occurs in the right direction, that is, see whether the movement set on the unit corresponds to that of the leafs. This check is of paramount importance, if the direction is wrong, in some cases (in the "Semiautomatic" mode, for instance) the "Automatic" system might appear to be working properly; in fact, the "Open" cycle is similar to the "Close" cycle

but with one basic difference: the safety devices are ignored in the closing manoeuvre which is normally the most dangerous, and they will trigger in the opening manoeuvre causing the gate to close against the obstacle with disastrous results!

- To see whether or not the direction of rotation is correct, give a short pulse to the Step-by-Step (PP) input; the first manoeuvre the unit will carry out after being powered is always an "Open" one, so simply verify that the automatic system moves in the opening direction; if this movement is incorrect, proceed as follows:
 - ➡ Turn the power off
 - ➡ Turn the motor and the limit switch power connectors 180°. (Ref. "O" and Ref. "V" of **Fig.1**)
 - ➡ Once this has been done, check whether the direction of rotation is now correct by repeating previous point.



The "OK" Led located in the centre of the board has the task of signalling the status of the internal logic: regular flashing at 1 second intervals indicates that the internal microprocessor is active and waiting for commands. When the microprocessor recognises a variation in the state of an input (whether it is a command or a function Dip-Switch input) it generates a rapid double flash even if the variation does not have any immediate effect. Extremely rapid flashing for 3 s means that the control unit has just been powered or is carrying out internal testing. Irregular flashing, lastly, means that the test has been unsuccessful and that a fault has occurred.

3) Adjustments:

Adjustments can be made with the trimmers that modify the following parameters:

Working time (TL):

Adjusts the maximum duration of the opening or closing manoeuvre.

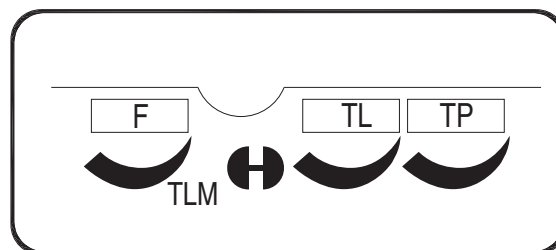
To adjust the working time TL, select the "Semiautomatic" operating mode by moving Dip-Switch 1 to ON and adjust the TL trimmer to halfway along the travel distance. Then run a complete opening cycle followed by a complete closing cycle and readjust the TL trimmer in order to leave enough time for the whole manoeuvre plus a margin of about 2 to 3 s.

If the trimmer is at maximum and there still is not enough time, cut the TLM jumper on the printed circuit between the TL and the TP trimmers in order to provide more working time.

Pause Time (TP):

In the "Automatic" mode, this adjusts the delay between the end of the opening manoeuvre and the beginning of the closing manoeuvre.

To adjust Pause Time TP, select the "Automatic" operating mode by moving Dip-Switch 2 to ON and adjust the TP trimmer as required. Then carry out an opening manoeuvre and check the time elapsed before "Automatic" closing manoeuvre.



Force (F):

Fitted on the RO1000 control unit, this adjusts maximum Force.

Take great care when adjusting the Force (F) trimmer as this may affect the level of safety of the automatic system. Trial by error is required to adjust this parameter, measuring the force applied to the leaf and comparing it with regulatory values.

In the RO1010 and RO1020 control units, Force is adjusted with a multi-position Switch located on the casing of the control unit power transformer.

4) Testing

After the above checks and adjustments, the system can now be tested.

⚠ The automation system must be tested by qualified and expert personnel who must establish what tests to perform according to the relative risk.

Testing is the most important part of the whole installation phase. Each single component, e.g. the gearmotor, emergency stop, photocells, etc., may require a specific test phase; please follow the procedures shown in the respective instructions manuals.

To test the control unit, perform the following operations:

-
1. Function selection:
 - Set Dip-Switch 1 to ON ("Semiautomatic" operation)
 - If the connections shown in **fig.4a** have been made in order to use the "Phototest" function, (if the PIU board is fitted) set Dip-Switch 10 to ON ("Phototest" function).
 - Set all the other Dip-Switches to OFF

 2. Press the "Open" or "Step-by-Step" button and check that:
 - the flashing lamp activates
 - an opening manoeuvre starts
 - the movement stops when the opening limit switch FCA is reached.

 3. Press the "Close" or "Step-by-Step" button and check that:
 - the flashing lamp activates
 - a closing manoeuvre starts
 - the movement stops when the closing limit switch FCC is reached

 4. Start an opening manoeuvre and check that during the manoeuvre the cut-in of a device:
 - Connected to the "Stop" input immediately stops movement
 - Connected to the "Photo" input has no effect
 - Connected to the "Photo2" input stops and inverts the manoeuvre (if the PIU board is fitted).

 5. Start a closing manoeuvre and check that during the manoeuvre the cut-in of a device:
 - Connected to the "Stop" input immediately stops movement
 - Connected to the "Photo" input stops and inverts the manoeuvre
 - Connected to the "Photo2" input has no effect (if the PIU board is fitted).

 6. On the connected inputs, check that the activation of the input causes a step in the sequence:
 - Step-by-step input: Sequence = "Open" – "Stop" – "Close" – "Stop"
 - Open input: Sequence = "Open" – "Stop" – "Open" – "Stop"
 - Close input: Sequence = "Close" – "Stop" – "Close" – "Stop"
 - Partial Open input: Sequence = "Partial Open" – "Stop" – "Close" – "Stop" (if the PIU board is fitted).

 7. If the "Phototest" function is used, check the test is efficient (if the PIU board is fitted):
 - Interrupt the "Photo" photocell, then start a manoeuvre and check this is not performed
 - Interrupt the "Photo2" photocell, then start a manoeuvre and check this is not performed
 - Short the "Photo" photocell contact, then start a manoeuvre and check this is not performed
 - Short the "Photo2" photocell contact, then start a manoeuvre and check this is not performed

 8. Perform the tests for detecting Impact Forces as required by EN 12445.
-

If further functions are activated after testing has finished that could reduce the safety of the system, specific testing of these functions must be performed.

5) Operating modes

In the manual operating mode, the “Open” input enables the opening manoeuvre and the “Close” input enables the closing manoeuvre. The “Step-by-Step” input enables an alternating closing and opening manoeuvre.

Movement stops as soon as the command in input stops. If the limit switches trigger or “Photocell2” (on the PIU card) fails to enable during an opening manoeuvre, movement will stop; during a closing manoeuvre, on the other hand, movement will stop if “Photocell” does not enable. Both in the opening or closing phases, movement will be brought to an abrupt halt by means of “Stop”. When a movement is stopped, stop the input command before giving a command to start a new movement.

When one of the automatic functioning modes (“Semiautomatic”, “Automatic” or “Close Always”) is operational, a command impulse on the Open input will begin an opening manoeuvre. An impulse to the “Step-By-Step” input begins an alternating closing and opening manoeuvre. A second impulse on the “Step-By-Step” input or on the input that started movement will cause it to stop.

Both in the opening or closing phases, movement will be brought to an abrupt halt by means of “Stop”.

If, instead of an impulse to a command input a continuous signal is maintained, a state of “priority” will be created in which the other command inputs are disabled **(useful if you want to connect a timer or a Night-Day selector)**.

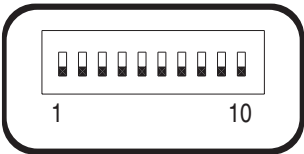
If an automatic functioning mode has been chosen, the opening manoeuvre will be followed by a pause and then a closing manoeuvre. If “Photocell” triggers during the pause, the timer will be reset with a new pause time; if, on the other hand, there is a “Stop” during the pause, the closing function will be cancelled and the system will “Stop”.

Nothing will happen if “Photocell” triggers during an opening manoeuvre but if “Photocell2” (on the PIU card) triggers, this will invert the direction of movement; if “Photocell” triggers during a closing manoeuvre, this will invert the direction of movement followed by a pause and then a closing manoeuvre.

6) Programmable functions

The unit features a set of microswitches used to operate various functions so as to make the system more suitable to user needs and safer in various conditions of use. All the functions can be activated by moving the relative Dip-Switch to the “On” position and deactivated by moving them to “Off”.

⚠ Some of the programmable functions are linked to safety aspects; carefully evaluate the effects of a function and see which gives the highest possible level of safety.



Use the Dip-Switches to select the various operating modes and add the functions required according to this table:

Switch 1-2:	Off-Off	= “Manual” movement (i.e.: man Present)		
	On -Off	= “Semiautomatic” movement		
	Off-On	= “Automatic” movement (i.e.: automatic closing)		
	On -On	= “Automatic + always “Closes” movement		
Switch 3:	On	= Condominium operating mode <not available in the manual mode>		
Switch 4:	On	= Pre-flashing		
Switch 5:	On	= Close 5” after “Photo” <in “Automatic”> or “Close” after “Photo” <in “Semiautomatic”>		
Switch 6:	On	= “Photo” safety also in opening		
Switch 7:	On	= Gradual departure		
Switch 8:	On	= Deceleration		
Switch 9:	On	= Brake		
Switch 10:	Without PIU board	(on Robo)	On	= Gate open indicator with proportional flashing
		(on Otto)	On	= Courtesy light time = 4 minutes
	With PIU board		On	= “Phototest” function

N.B.: Some functions are only possible in determined conditions, these are indicated in the notes placed between the symbols “<...>”.

6.1) Description of functions

Here is a brief description of the functions that can be added by moving the relative Dip-Switch to "ON".

Switch 1-2: Off-Off	= "Manual" movement (man present)
On-Off	= "Semiautomatic" movement
Off-On	= "Automatic" movement (automatic closing)
On-On	= "Automatic + Always Closes" movement

In the "Manual" operating mode, the gate will only move as long as the relative control button is held down.

In the "Semiautomatic" operating mode a command impulse will perform the whole movement until the Working Time limit expires or the mechanical stop is reached. In the "Automatic" operating mode, an opening manoeuvre is followed by a pause and then an automatic closing manoeuvre.

The "Always Closes" function comes into play following a power failure; if the gate is open, a closing manoeuvre takes place, automatically preceded by 5 seconds of pre-flashing.

Switch 3: On	= Condominium operating mode (not available in the Manual mode)
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In the Condominium operating mode, once an opening manoeuvre has started it cannot be interrupted by other command pulses on "Step-by-Step" or "Open" until the gate has finished opening.

During a closing manoeuvre, a new command pulse will stop the gate and reverse the direction of movement in order to open the gate.

Switch 4: On	= Pre-flashing
---------------------	----------------

A command impulse activates the flashing lamp followed by movement 5 s later (2 s later in the manual mode).

Switch 5: On	= "Close" 5 s after "Photo" <in the "Automatic" mode> or "Close" after "Photo" <in the "Semiautomatic" mode>
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This function, if in the "Automatic" mode, allows the gate to be kept open only for the time required for transit; when "Photo" finishes, the manoeuvre stops. After 5 s a closing manoeuvre will automatically begin. If "Photo" triggers in the "Semiautomatic" mode during a closing manoeuvre the "Automatic" closing manoeuvre is activated with the adjusted pause time.

Switch 6: On	= Safety "Photo" also during the opening manoeuvre
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The "Photo" safety device is normally just active during the closing manoeuvre; if Dip-Switch 6 is turned "On" the safety device will also trigger during the opening manoeuvre.


In the "Semiautomatic" or "Automatic" modes, the opening manoeuvre will start again immediately after the photocell has been disengaged.

Switch 7: On	= Gradual departure
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Starts the manoeuvre gradually, preventing the automatic system from being jolted.

Switch 8: On	= Deceleration
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Deceleration reduces speed to 30% of rated speed in order to prevent unnecessary jolts at the end of a manoeuvre.

 As well as reducing the speed of the manoeuvre, the deceleration function also reduces motor torque by 70%.
For systems requiring elevated torque, this decrease may cause the motor to stop immediately.

ROBO – THOR version:
Following the opening or closing manoeuvre which takes place at the end of the Working Time, a deceleration phase is carried out which lasts another 1/2 of Working Time (TL).
If the manoeuvre is terminated by the limit switches and the deceleration phase is not performed, adjust Working Time so that deceleration begins 30-50 cm before the limit switches cut in.

OTTO version:
Following the closing manoeuvre the deceleration phase lasts 3 s if triggered by the limit switches and 1/4 of TL if triggered by the termination of the Working Time (the deceleration function works better with the limit switches).
During the opening manoeuvre a gradual stopping function is used instead of the deceleration feature.

⚠ If the deceleration function is used on sensitive installations and if this lasts more than 3 s, install a mains filter of at least 6A with attenuation of 30dB on the mains power terminals near the control unit in order not to exceed the limits of electromagnetic emission specified in the EN 50081-1 standard.

Switch 9: On = Brake

At the end of the movement a motor brake procedure is performed, initially slight and then more incisive in order to stop the gate rapidly but without jolts.

Switch 10: On

ROBO - THOR

Without the PIU board fitted:

- Gate open indicator with proportional flashing

With the PIU board fitted:

- "Phototest"

OTTO

Without the PIU board fitted:

- Courtesy light time = 4 minutes

With the PIU board fitted:

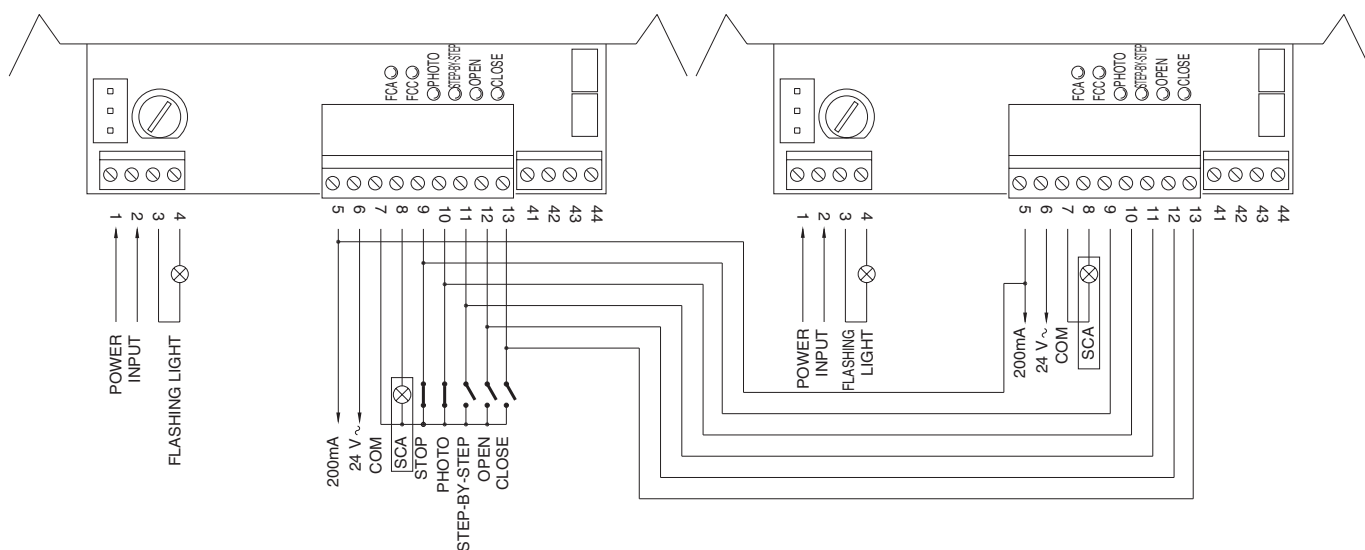
- "Phototest"

This function controls photocell efficiency at the beginning of each manoeuvre. See the "Phototest" chapter.

7) Using 2 control units on opposed leafs

To create an automation system working with 2 opposed leafs:

- Use two motors with the control units connected as indicated in **fig. 5**.
- Connect the flashing light and the "Gate Open Indicator" to any one of the two control units.
- The inputs must be connected in parallel.
- The "Common" of the inputs can be connected to one of the 2 control units.
- Connect the 0Volts (Terminal 5) of the two control units.
- The "Phototest" function must not be used
- The "Condominium" function (Dip-Switch 3) should be fitted as this allows the leafs to be resynchronised if the 2 control units become unsynchronised.



8) Accessories

“PIU” Card

The control unit is already fitted with all the functions used in a normal installation. In order to allow the system to be used in special installations, an optional card called “PIU” has been produced which adds new functions such as traffic light signalling, courtesy light, electric locking, “Photocell2”, partial opening and “Phototest”.

Red	= Red traffic light This is normally always off and switches on when the gate moves.	Partial open	= Input for partial opening (Partial Open, Stop, Close, Stop). This performs the same function as the “Step-by-Step” on the main board, with the difference that the open manoeuvre lasts for the time set up on the T.A.P.P. trimmer on the “PIU” board.
Green	= Green traffic light This is normally on and switches off when the gate moves		
Electric lock	= Output for electric lock command. The electric lock is activated for 1.5 s. at the start of the opening movement.	Photo 2	= 2nd safety device input. This safety device cuts in just during the opening manoeuvre causing the gate to stop and eventually close if a “Semiautomatic” or “Automatic” operation mode is programmed on the control unit.
Courtesy light/ Phototest	= Output that if used to control the courtesy light, turns on a courtesy light at the beginning of each movement which remains on after the movement has finished for a time programmed with the T.Cor. trimmer on the “PIU” board. If the “Phototest” function is activated (Dip-Switch 10 = ON) this output allows the photocells to be tested at the beginning of each manoeuvre.	24 V	= 24V output used to power services such as photocells or the like. Terminal 11 is also the common for the inputs.

“RADIO” Card

The control unit features a connector for plugging in a radio card, produced by Nice, which activates the “Step-by-Step” input and allows the control unit to be remote-controlled with a transmitter.

9) Maintenance

The control unit, being electronic, needs no particular maintenance. However, periodically make sure (at least once every six months) that the device adjusting motor force is in perfect working order; adjust with the trimmer if necessary.	Carry out the whole test phase again to check that the limit switches, safety devices (photocells, pneumatic edges, etc.) and the flashing light are in perfect working order.
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10) Disposal

This product is made from various kinds of material, some of which can be recycled. Make sure you recycle or dispose of the product in compliance with current laws and bye-laws.	▲ Some electric components may contain polluting substances; do not dump them.
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11) What to do if

This section will help fitters to solve some of the most common problems that may arise during installation.

No LED is on:

- Check whether the control unit is powered (check mains voltage is present at terminals 1-2 and a voltage of approx. 24Vac at terminals 5-6).
- Check the 2 mains fuses have not blown; if none of the Led's is on a serious fault has probably occurred and the control unit should therefore be replaced.

The OK LED flashes regularly but the INPUT Led's do not reflect the state of the respective inputs

- Carefully check the connections on input terminals 7-13.

The manoeuvre does not start

- Check that the Led's of the "Stop" (FCA + FCC), "Photo" and "Photo2", if installed, safety device are on and that the relative command Led that is activated ("Step-By-Step", "Open" or "Close") remains on for the whole duration of the command.

The gate changes direction during a manoeuvre

An inversion is caused by:

- The photocells triggering ("Photo2" during the opening manoeuvre, or "Photo" during the closing manoeuvre); in this case, check the connections of the photocells and check the input Led's.

12) Technical specifications

Mains power input	: 230 Vac 50/60 Hz
Versions /V1	: 120 Vac 50/60 Hz
Max. current for 24V services	: 200mA
Flashing lamp output	: For flashing lamps at mains voltage, maximum power 40 W
Gate open indicator output "SCA"	: For indicator lamps at 24 Vac, maximum power 2 W
Operating temperature	: -20 ÷ 70 °C
Working Time on ROBO/THOR	: Adjustable from 2.5 to >60 s, or from <50 a to >120 s with TLM
Working Time on OTTO	: Adjustable from 2.5 to >20 s, or from <20 to >40 s with TLM
Pause Time	: Adjustable from 5 to > 160 s.

On the PIU card

Partial opening time ROBO/THOR	: Adjustable from 1 to > 30 s.
Partial opening time OTTO	: Adjustable from 1 to > 14 s.
Courtesy light time	: Adjustable from 1 to > 180 s.

(secondo Direttiva 98/37/EC, Allegato II, parte B) (according to 98/37/EC Directive, Enclosure II, part B)

Revisione / Revision: 0

Accessori / Accessories: Scheda PIU, Ricevitore radio opzionale mod. K, BIO, FLO, FLOR
PIU Board, Optional Radio receiver mod. K, BIO, FLO, FLOR

Riferimento n°	Titolo
Reference n°	Title
73/23/CEE, 93/68/CEE	DIRETTIVA BASSA TENSIONE e successiva modifica/ Low Voltage Directive and subsequent modification
89/336/CEE	DIRETTIVA COMPATIBILITA' ELETTROMAGNETICA (EMC) / EMC Electromagnetic Compatibility Directive
98/37/CE (EX 89/392/CEE)	DIRETTIVA MACCHINE/Machinery Directive

Riferimento n°	Edizione	Titolo	Livello di valutazione	Classe
Reference n°	Issue	Title	Assessment level	Class
EN60335-1	04/1998	Sicurezza degli apparecchi elettrici d'uso domestico e similare – Norme generali. Safety of household and electrical appliances – General requirements		
EN60204-1	09/1993	Sicurezza del macchinario-Equipag. elettrico delle macchine-Parte 1:Reg.generali Safety of machinery-Electrical equipment of machines-Part 1:General requirements		
EN55022	09/1998	Apparecchi per la tecnologia dell'informazione. Caratteristiche di radiodisturbo. Limiti e metodi di misura Information technology equipment – Radio disturbance characteristics Limits and methods of measurement		B
ENV50204	04/1996	Campo elettromagnetico irradiato dai radiotelefoni numerici - Prova di immunità. Radiated electromagnetic fields from digital radio telephones - Immunity test	10V/m	A
EN61000-3-2-3	03/1995	Parti 2-3: Armoniche/Flicker Parts 2-3: Harmonic/Flicker		A
		Compatibilità elettromagnetica (EMC) / Electromagnetic compatibility (EMC) Parte 4: Tecniche di prova e di misura / Part 4: Testing and measurement techniques		
EN61000-4-2	09/1996	Parte 2: Prove di immunità a scarica elettrostatica Part 2: Electrostatic discharge immunity test	6KV, 8KV	B
EN61000-4-3	11/1997	Parte 3: Prova d'immunità sui campi irradiati a radiofrequenza Part 3: Radiated, radio-frequency, electromagnetic field immunity test	10V/m,	A
EN61000-4-4	09/1996	Parte 4: Test sui transienti veloci/ immunità ai burst Part 4: Electrical fast transient/burst immunity test.	2KV, 1KV	B
EN61000-4-5	06/1997	Parte 5: Prova di immunità ad impulsi Part 5: Surge immunity test	4KV, 2KV	B
EN61000-4-6	11/1997	Parte 6: Immunità ai disturbi condotti, indotti da campi a radiofrequenza Part 6: Immunity to conducted disturbances, induced by radio-frequency fields.	10V	A
EN61000-4-8	06/1997	Parte 8: Prova di immunità a campi magnetici a frequenza di rete Part 8: Power frequency magnetic field immunity test.	30A/m	A
EN61000-4-11	09/1996	Parte 11: Prove di immunità a buchi di tensione, brevi interruzioni e variazioni di tensione Part 11: Voltage dips, short interruptions and voltage variations immunity tests		B-C

Riferimento n°	Edizione	Titolo	Livello di valutazione	Classe
Reference n°	Issue	Title	Assessment level	Class
EN 12445	11/2000	Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Test methods		
EN 12453	11/2000	Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Requirements		

Oderzo, li 2 Febbraio 2001

(Amministratore Delegato)
(General Manager)
Lauro Buono

