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nice[®]

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QUESTO LIBRETTO È DESTINATO SOLO ALL'INSTALLATORE.

L'installazione dovrà essere effettuata solamente da personale professionalmente qualificato in conformità a quanto previsto dalla legge n° 46 del 5 marzo 1990 e successive modifiche ed integrazioni e nel pieno rispetto delle norme UNI 8612.



**This manual is for use only by technical personnel qualified to carry out the installation
no information given in this manual can be considered of any interest to the end user!**

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IMPORTANT NOTICE:

It is our duty to remind you that you are carrying out operations on machine systems classified in the “Automatic gates and doors” category and as such are considered particularly “Hazardous”; it is your job to make them as “Safe” as is **reasonably possible!** Only qualified, expert personnel must carry out the installation and any servicing required, making the best possible job of it and in accordance with the following laws, standards and directives (norms, decrees of the President of the Republic and law decrees are only valid for Italy; EEC Directives are, on the other hand, applicable for the whole of Europe):

- UNI 8612 standard (Motorised gates and main doors: construction criteria and protection devices against accidents)
- DPR N° 46 of 5/03/1990 (Standards for the safety of electrical installations, authorised personnel)
- Dlgs N° 459/96 of 24/07/96 (EEC directive 89/392, Machine Directive)
- Dlgs N° 615/96 of 12/11/96 (EEC directive 89/336, Directive on Electromagnetic Compatibility)
- Dlgs N° 626/96 of 26/11/96 (EEC directive 93/68, Low Voltage Directive)

When designing and producing its products, **Nice** observes (as regards the equipment) all the above standards but it is of paramount importance that the installer too (as regards the systems) strictly observes the same standards.

Unqualified personnel or those who do not know the standards applicable to the “Automatic gates and doors” category:
Must under no circumstances carry out installations and systems

Whoever carries out systems without observing all the applicable standards:
Will be held responsible for any damages that the system may cause!

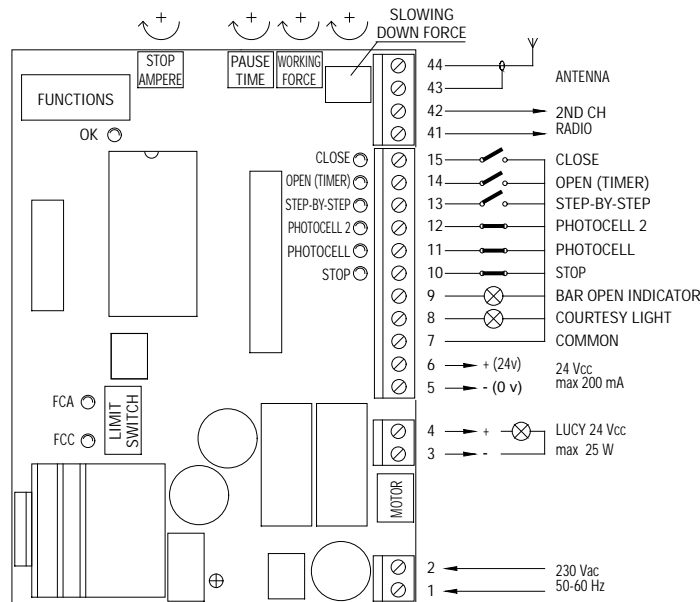
QUICK GUIDE:



Do not install the “Wil” boom gate without having read all the instructions!

Install the “Wil” boom gate, the control (key selector switch or push button panel) and safety devices (emergency stop, photoelectric cells, sensitive edges and flashing lights) after which do the wiring following the diagram:

Fig. 1



Prior to turning power on check that the bar is well balanced, adjusting the balancing spring if necessary.

Release the boom gate using the special spanner and check that the bar can move without any effort for the whole length of travel.

Power the unit and check that on terminals 1-2 voltage is 230 V a.c. and on terminals 5-6 it is 24 V d.c.; the LEDs on the active inputs must turn on and the OK LED must flash at a frequency of 1 flash/second.

Check correspondence of the two FCA and FCC LEDs: when the bar is closed only the FCC LED should turn off and when it is open only the FCA should turn off.

To exploit the slowing down function it is necessary that the limit switch triggers about 20° before the actual stopping point; if necessary adjust the two cams until the limit switch triggers at the point required.

Check that all the function switches are in the “OFF” position. This means it is in the manual functioning mode, that is, with the button pressed. Lock the boom gate with the bar at a 45° angle so it can move freely in both directions. Now give a brief command pulse on the OPEN input and if the bar does not move in the opening direction proceed as follows:

- 1) Turn power off to the boom gate
- 2) Unplug the “MOTOR” connector and replug it after it has been turned 180°
- 3) Unplug the “LIMIT SWITCH” connector and replug it after it has been turned 180°

See if rotation direction is right, repeating the procedure described above.

Temporarily adjust the STOP_AMPERE and WORKING FORCE trimmer to the maximum of the travel, PAUSE TIME to minimum and SLOWING DOWN FORCE to halfway travel. Now try and carry out a complete manoeuvre until the limit switch is reached and the subsequent stopping point and then try the manoeuvre in the opposite order.

Set the FUNCTIONS dip-switches as required:

Switches 1 - 2	Off Off =	“Manual” movement (Man Present)
	On Off =	“Semiautomatic” movement
	Off On =	“Automatic” movement (Automatic Closing)
	On On =	“Automatic + Always Closes” movement
Switch 3	On =	Condominium Functioning Mode
Switch 4	On =	Cancels STOP in the Step-by-Step cycle
Switch 5	On =	Pre-flashing
Switch 6	On =	Flashing also in Pause
Switch 7	On =	Recloses immediately after Photocell (only if on Automatic)
Switch 8	On =	Safety device (Photocell) also in the opening phase
Switch 9	On =	Bar open indicator becomes traffic light in the “one-way” mode
Switch 10	On =	Functioning in the “Traffic light in both directions” mode

Adjust the two trimmers WORKING FORCE and SLOWING DOWN FORCE until obtaining the force and speed required during, respectively, the travelling and slowing down phases; only now adjust the STOP_AMPERE trimmer until the triggering threshold required is obtained.

If in the automatic functioning mode, adjust the PAUSE TIME trimmer as wanted.

1.1) INTRODUCTION:

The electronic card is suitable for controlling road boom gates models “WIL 4” and “WIL 6” with 24 V d.c. motors. This is an entirely new design where the actuator has a limit switch with a speed control system that makes it possible to reach the travel limits by means of a slowing down phase. In addition, the effort the motor is subject to during movement is promptly detected as well as any obstacles that may be in the path and in such an even direction is reversed.

The most advanced techniques and sophisticated components have been employed in the project to guarantee maximum immunity against interference, greater flexibility of use and the widest possible range of programmable functions.

It can be controlled “manually”, “semiautomatically” or “automatically”.

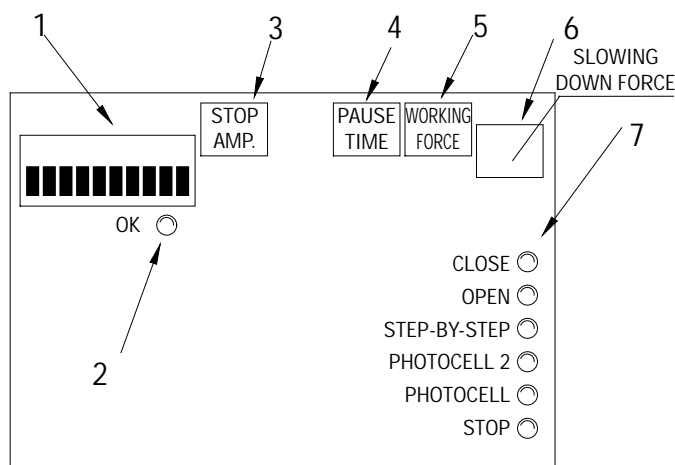
There are also certain highly sophisticated functions like “Reclose immediately after Photocell” or “Reclose always”, “Flashing also in pause” as well as other operating functions such as “Gradual Start-up” and “Slowing down” (a standard feature) plus a sensitive “Brake” that only comes into play if movement has to be stopped hastily.

The whole range of radio receivers of the “K”, “Bio” or “Flo” series produced by Nice can be inserted on the card.

1.2) DESCRIPTION:

In view of the particularity of the product and the use of entirely unconventional techniques, before you start installing the gearmotor and wiring, here is a brief description of the most important elements on the control card:

Fig. 2



- ① Set of micro dip-switches for selecting the FUNCTIONS
- ② LED that flashes at regular intervals and indicates that the unit is working correctly
- ③ “STOP_AMPERE” trimmer to adjust friction and based on an ammetric measurement system
- ④ “PAUSE TIME” trimmer to adjust pause time in the automatic functioning mode
- ⑤ “WORKING FORCE” trimmer to adjust power to motor during the movement phase
- ⑥ “SLOWING DOWN FORCE” trimmer to adjust power to motor during the slowing down phase
- ⑦ Set of LEDs to signal the state of the command inputs

The OK LED ② has the task of signalling the correct functioning of the internal logic and must flash at 1 second intervals; it indicates that the internal microprocessor is active and waiting for commands. Whenever there is a change in the state of an input (whether it is a command input or function switch) a fast double flashing is generated which happens even if the change does not have an immediate effect. Fast flashing at 5 second intervals means that the power voltage is insufficient.

When the unit is powered, the indicator lights on the ⑦ inputs turn on if that particular input is active with the command voltage of 24 V d.c. Normally, the LEDs on the safety inputs, PHOTOCELL, PHOTOCELL2 and STOP, are always on while those on the command inputs, STEP-BY-STEP, OPEN-TIMER and CLOSE, are usually off.

Since the current absorbed by a d.c. motor is in proportion to the force it is subject to, developing an obstacle detection system is very easy. During movement, the current absorbed by the motor is measured; when it exceeds a certain limit (adjustable with the trimmer) the safety system is activated which causes movement to stop with the aid of the brake (removing the residual part of accumulated kinetic energy); then, if one of the automatic functioning modes is active, a movement in the opposite direction starts. To increase the level of safety still further, if the STOP_AMPERE system comes into play three consecutive times without ever reaching any of the natural ends of the movement, a final STOP is carried out.

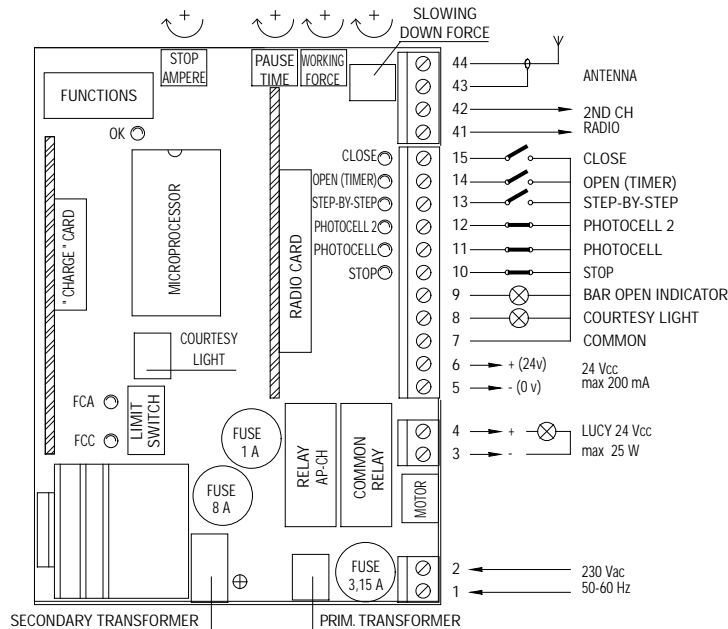
2.1) INSTALLATION INSTRUCTIONS:

When installing the “WIL” road boom gate, all the instructions given in the enclosed instruction manual must be followed. It is necessary to underline that there are standards, laws and regulations that establish limits and ways to make systems: please comply strictly with all the applicable standards.

 **Do not install the “Wil” boom gate unless all the standards regarding the automatic gate category have been complied with!**

Install all the control (key selector switch or push button panel) and safety devices (emergency stop, photoelectric cells, sensitive edges and flashing lights) after which do the wiring following the diagram:

Fig. 3: Wiring diagram



NOTE:
Only qualified, expert personnel must carry out the installation and subsequent maintenance which must be in compliance with the DPR N° 46 dated 5/3/1990 and in total observance of the UNI 8612 standards and following the best indications dictated by “expert workmanship”. Whoever carries out these jobs shall be held responsible for any damage caused.

2.2) DESCRIPTION OF THE CONNECTIONS:

Here is a brief description of the possible connections on the unit to the outside:

- | | | |
|-------|---------------------|---|
| 1-2 | : 230 V a.c. | = 230 V a.c. 50/60 Hz |
| 3-4 | : Flashing light | = Output for connection to the 24 V d.c. flashing light, maximum lamp power: 25 W |
| 5-6 | : 24 V d.c. | = 24 V d.c. output for supplying accessories (Photocell, Radio, etc.) maximum 200 mA |
| 7 | : Common | = Common for all inputs (terminal 6 can also be used as the Common) |
| 8 | : Courtesy Light | = 24 V d.c. output for the courtesy light, maximum output power 10 W |
| 9 | : C.A. Indicator | = 24 V d.c. output for bar open indicator light, maximum indicator power 10 W |
| 10 | : Stop | = Input with STOP function (Emergency, shutdown or extreme safety) |
| 11 | : Photocell | = Input for safety devices (Photocells, pneumatic edges) |
| 12 | : Photocell2 | = Input for safety devices with triggering in the opening phase (Photocells, pneumatic edges) |
| 13 | : Step-by-Step | = Input for cyclic functioning (OPEN STOP CLOSE STOP) |
| 14 | : Open-Timer | = Input for opening (which can be timer controlled) |
| 15 | : Close | = Input for closing |
| 41-42 | : 2nd radio channel | = Output for the second radio receiver channel if existing |
| 43-44 | : Antenna | = Input for the radio receiver antenna |

The remaining connections are done in the factory but for the sake of completeness here is the list:

- | | |
|---------------|---|
| TRANS.PRIM. | = Primary of the power transformer |
| TRANS.SECOND. | = Secondary of the power transformer |
| MOTOR | = Output for 24 V d.c. motor connection |

There are an additional two slots for optional cards:

- | | |
|---------------|--|
| RADIO | = Slot for Nice radio receivers |
| CHARGE | = Slot for battery charge card |

2.3) INSTRUCTIONS FOR CONNECTIONS:

To safeguard the operator and to prevent damaging components when carrying out the connections, whether in low voltage (230 V) or extra low voltage (24 V), or when plugging in the cards:

the unit must, under no circumstances, be electrically powered

We recommend waiting until installation is complete to plug in the optional cards **RADIO** or **CHARGE** and only after having checked that the system is working properly. The optional cards are not necessary for the working of the system and if they are used they make troubleshooting more complex.

We would also like to remind you that if the inputs of the NC (Normally Closed) contacts are not used, they should be jumpered; if there is more than one then they should be placed in SERIES with one another; if the inputs of the NO (Normally Open) contacts are not used they should be left free and if there is more than one then they should be placed in PARALLEL with one another. As regards the contacts, they must only be the mechanical type and free from any potential; no connections are allowed like those defined as "PNP", "NPN", "Open Collector", etc., etc.

A) Carry out the necessary connections, following the diagram in Fig. 3; remember that there are specific standards that must be complied with both as regards the safety of the electrical systems and as regards automatic gates

B) Check that the bar is well balanced and adjust if necessary by means of the balancing spring. Release the boom gate with the spanner and make sure the bar can move without any effort for the whole length of its travel.



Do not supply power to the "Wil" boom gate unless all the standards for the automatic gate category have been complied with!

C) Supply power to the unit, checking immediately that a voltage of 230 V a.c. reaches terminals 1-2 and a voltage of 24 V d.c. reaches terminals 5-6. As soon as the unit is switched on the indicator lights (LEDs) on the active inputs should turn on and after a moment, the "OK" LED should start flashing at a regular rhythm. If none of this happens, switch off immediately and check the connections more carefully.

D) Check correspondence of the two LEDs, FCA and FCC: when the bar is closed only the FCC LED should turn off and when it is open only the FCA should turn off.

To exploit the slowing down function it is necessary that the limit switch triggers about 20° before the actual stopping point is reached; if necessary adjust the two cams until the limit switch triggers at the point required.

E) Now check that the LEDs corresponding to the inputs with NC type contacts are on (all the safety devices are active) and that the LEDs corresponding to inputs of the NO type are off (no command present); if this does not happen check connections and effectiveness of the various devices.

F) Check that all the safety devices of the system are in proper working order (emergency stop, photocells, pneumatic edges, etc.); each time they trigger the relative LEDs, STOP, PHOTOCCELL or PHOTOCCELL 2, should turn off.

G) Check that all the function switches are in the "OFF" position. This means it is in the manual functioning mode, that is, with the button pressed. Lock the boom gate with the bar at a 45° angle so it can move freely in both directions. Now give a brief command pulse on the OPEN input and if the bar does not move in the opening direction proceed as follows:

- 1) Turn the electricity off to the boom gate
- 2) Unplug the "MOTOR" connector and replug it after it has been turned 180°
- 3) Unplug the "LIMIT SWITCH" connector and replug it after it has been turned 180°

Repeat the procedure described above in point G to see if rotation direction is right.

Note:

When direction is reversed then all the three procedures described above have to be carried out. In particular, if, for example, you turn the "MOTOR" connector but not the "LIMIT SWITCH" connector it will cause an error in the slowing down system. In such a case, the motor is controlled, for instance, in the opening phase but the FCA limit switch is never reached and consequently the bar reaches the opening point with maximum force; the ammetric detecting system then comes into play reversing direction in a new manoeuvre which is also wrong.

H) Temporarily adjust trimmers STOP_AMPERE and WORKING FORCE to the maximum length of travel, PAUSE TIME to minimum and then adjust SLOWING DOWN FORCE to half travel.

I) Try and carry out a complete manoeuvre until the bar reaches the point where the limit switch triggers; the braking system should come into play at this point and travel ought to continue for a further 3 seconds at a slower speed.

J) Adjust trimmers WORKING FORCE and SLOWING DOWN FORCE so that the manoeuvre is carried out at the speed and with the force required and that the slowing down phase is such that the bar reaches the stopping points as "gently" as possible without any jerking; of course, a perfect adjustment of the balancing spring is fundamental.

K) Lastly adjust the trimmer STOP_AMPERE so the obstacle detecting system, based on an ammetric friction system, is activated as soon as an appropriate opposite action is applied to the bar. The ammetric friction system comes into play in both directions.

3.1) FUNCTIONING TESTS:

After the connections have been checked and verified (Chapter 2.3) the electrically controlled movement of the bar can be tested; in this case **we suggest you work in the manual mode** with all the functions deactivated (all switches OFF); in all cases, in the manual mode, by releasing the command key the motor stops immediately. If you use the Step-by-Step input command the first movement (after turning on) should be an opening one.

By means of the command inputs, move the bar up to the opening point; about 20° from the stopping point the FCA limit switch should trigger, activating the “slowing down” phase which makes the bar reach the set point at a slower speed. Now carry out a closing phase until the closing point is reached; in this case too, the FCC limit switch should trigger, activating the slowing down phase 20° before movement stops. Now test triggering of the safety devices: PHOTOCCELL in opening has no effect while in the closing phase it causes the bar to stop; PHOTOCCELL 2 has no effect in the closing phase while in the opening phase it causes the bar to stop. The devices connected to the STOP input act both in the opening and in the closing phases, causing the bar to stop.

The UNI 8612 standards state that the maximum thrust of an automatic device must not exceed 150 N (~13.5 kg); this is achieved by adjusting the ammetric friction STOP_AMPERE. There is a trimmer on the card to establish the triggering threshold of this the friction; it has to be adjusted so that it comes into action as soon as a light pressure is applied to the bar in the direction opposite to the way it is moving.

To overcome the initial movement phase that always needs greater motor power, the STOP_AMPERE friction system is excluded from the motor start up phase; to evaluate the effect of the adjustment on the trimmer, you ought to wait until the movement has started and the bar has reached standard speed.

Keep in mind that, always for a question of safety, if the friction comes into play three consecutive times, movement is stopped without any reversal.

If the automatic functioning mode is selected at the end of the opening manoeuvre, there is a “pause time” after which a closing manoeuvre is automatically launched. Pause time is adjusted with the trimmer PAUSE TIME. Pause time is also activated in the semiautomatic functioning mode when, in the closing phase, the triggering of a safety device or the STOP_AMPERE friction, causes a reversal in the opening manoeuvre.

3.2) ADJUSTING PAUSE TIME:

When the automatic closing function (see Chapter 5.1) is selected with the specific dip-switch, following an opening manoeuvre, a timer is activated that controls the so-called “Pause Time”; when this time has elapsed a closing manoeuvre is automatically activated. This time can be adjusted with the PAUSE TIME trimmer from 3 to 120 seconds.

4.1) FUNCTIONS that can be selected:

The FUNCTIONS dip-switch lets you select the various possible functioning modes and to enable the functions you want.

Switches 1-2:	Off Off	= “Manual” movement (Man Present)
	On Off	= “Semiautomatic” movement
	Off On	= “Automatic” movement (Automatic Closing)
	On On	= “Automatic+Always Closes” movement
Switch 3:	On	= Condominium functioning mode
Switch 4:	On	= Cancels STOP in the Step-by-Step cycle
Switch 5:	On	= Preflashing
Switch 6:	On	= Flashing also in Pause
Switch 7:	On	= Recloses straight after Photocell (only if on Automatic)
Switch 8:	On	= Safety (Photocell) also in opening
Switch 9	On	= Bar open indicator becomes traffic light in the “one-way” mode
Switch 10	On	= Functioning in the “Traffic light in both directions” mode

Of course, with each switch OFF the function described will not be activated.

4.2) DESCRIPTION OF THE FUNCTIONS:

Below is a brief description of the functions that can be selected; all the functions can be enabled or disabled without any limit even if some combinations would have no sense and, therefore, not be carried out (for instance, function 6, Flashing also in Pause, would not be carried out if movement is in the manual mode).

Switches 1-2:	Off Off	= "Manual" movement (Man Present)
	On Off	= "Semiautomatic" movement
	Off On	= "Automatic" movement (Automatic Closing)
	On On	= "Automatic+Always Closes" movement

When in the "Manual" functioning mode, movement will only be carried out while the command is being given (button pressed). In the "Semiautomatic" mode just one command pulse is needed and the complete manoeuvre will be carried out until it is either fully open or fully closed. In the "Automatic" functioning mode one command pulse will cause an opening manoeuvre to be carried out followed by a pause and then a closing manoeuvre.

The "Always Closes" function works if, subsequent to a temporary power cut, the bar is still open; in this case, a closing manoeuvre is started automatically preceded by 5 seconds of preflashing.

Switch 3:	On	= Condominium function
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In the Condominium functioning mode, once an opening manoeuvre has started, for instance with a Step-by-Step pulse, it cannot be interrupted by any other command pulses until it has finished.

During a closing manoeuvre, a new command pulse will stop the bar and immediately reverse the direction, opening the bar.

Switch 4:	On	= Cancels STOP in the Step-by-Step cycle
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The Step-by-Step cycle is normally: OPEN-STOP-CLOSE-STOP; in this functioning mode the Step-by-Step cycle becomes: OPEN-CLOSE-OPEN so the bar can never stop midway, but only when completely open or completely closed.

Switch 5:	On	= Preflashing
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The flashing light starts prior to each movement; after 5 seconds (2 seconds if on manual) movement starts.

Switch 6:	On	= Flashing also in Pause
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The flashing light is normally activated only during the opening and closing manoeuvres; with this function the flashing light remains active also during the Pause Time to signal the "closing soon" condition.

Switch 7:	On	= Recloses straight after Photocell (only if on Automatic: Sw 2 = ON)
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With this function the bar can be kept open only for the length of time needed for transit; in fact, it will close automatically always 5 seconds after the last object has passed by the "Photocell", irrespective of the programmed Pause Time.

Switch 8:	On	= Safety (Photocell) also in opening
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As a rule the safety "Photocell" only works in the closing cycle; if switch 8 is "ON" the triggering of the safety device will cause the bar to stop even in the opening phase; if on Semiautomatic or Automatic, movement will start again, in opening, immediately after the last object has passed by the Photocell.

Switch 9:	On	= Bar open indicator becomes traffic light in the "one-way" mode
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As an alternative to the Gate Open indicator, the output can be reprogrammed so that it performs the function of a "one-way" traffic light; this means the output is off when the bar is closed or closing, and on when the bar is opening or is opened. In this way, an indication can be fixed to the exit like: Green = Transit free.

Switch 10:	On	= Functioning in the "Traffic light in both directions" mode
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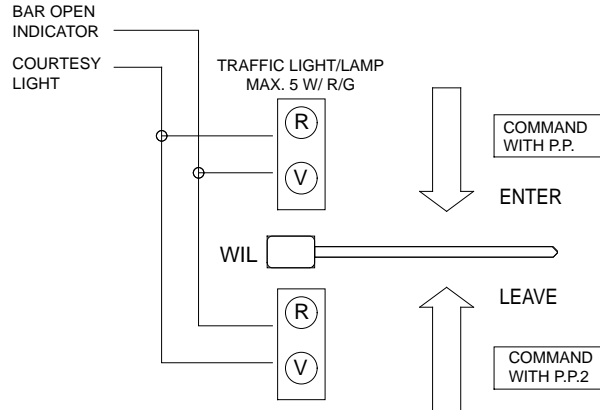
Several changes occur in the control unit when the "Traffic light in both directions" function is activated when Switch 10 is ON: OPEN becomes STEP-BY-STEP 2, while the two outputs, Courtesy Light and Bar Open Indicator become a Green Light in both directions. Due to the specific nature of this function we are giving a separate description.

4.3) TRAFFIC LIGHT IN BOTH DIRECTIONS:

The function of the traffic light in both directions is mainly to control the flow of traffic in both directions as they go across the controlled road barrier.

A different command is placed for opening in both directions: P.P. for entering and P.P.2 (Open) for leaving; two traffic lights are installed with the indications Red and Green, connected to the Bar Open Indicator and Courtesy Light outputs.

Fig. 4



The two outputs are usually off and so are the two traffic lights; when a command is given with P.P. to enter, movement is started and the Bar Open Indicator output is activated: this means there will be a green light to enter and a red light to leave.

But should the command be given with the P.P.2, the Courtesy Light output will be activated and there will be a green light to leave and a red light to enter.

The light will stay on for the entire opening manoeuvre and for the subsequent pause time; during the closing manoeuvre both the green and red lights will be activated (the result being yellow) to indicate there is no longer any transit priority (see table).

Red	Green	Meaning:
OFF	OFF	Bar closed, no passage in either direction
OFF	ON	Bar open, free transit
ON	OFF	Bar open, transit occupied
ON	ON	Bar closing and transit not controlled

The two Bar Open Indicator and Courtesy Light outputs can directly control small 24 V d.c. lamps for a total of 10 W. If stronger lamps have to be used, use the relays piloted by the unit outputs that control, in turn, the traffic lights.

Only now, when all the adjustments have been made and with the electricity off, do we advise you to connect the radio receiver.

5.1) DESCRIPTION OF THE FUNCTIONING MODES:

In the manual functioning mode the OPEN input allows movement up to the opening point; the CLOSE input allows movement up to the closing point; STEP-BY-STEP allows alternative opening and closing manoeuvres; as soon as the command in input stops, movement stops. In the opening phase movement stops when the maximum opening point is reached or if there is no consent from PHOTOCELL 2; to the contrary, in the closing phase movement will stop at the maximum closed point or if there is no consent from the PHOTOCELL. If STOP is triggered it will cause movement to stop immediately both in the opening and closing manoeuvres. Once movement has stopped the command in input has to be stopped before any new movements can be rective)

In either of the automatic functioning modes (semiautomatic-automatic and closes always) a command on the OPEN input will cause an opening manoeuvre; if the command remains (TIMER) once the bar is open, the bar remains "frozen" in an infinite pause; only when the command stops will the bar be able to close. Command pulses on the CLOSE input will cause a closing manoeuvre; if the command remains the bar will stay locked in the closed position until the command ceases and only then can it be reopened. A pulse on STEP-BY-STEP causes alternative opening and closing.

A second pulse on the STEP-BY-STEP or on the same input that started the movement, will cause a Stop.

Whether in the opening or closing phase, if STOP triggers it will cause movement to stop immediately.

In an opening manoeuvre, triggering of the PHOTOCELL has no effect while PHOTOCELL 2 will cause reversal of movement; in a closing manoeuvre, triggering of the PHOTOCELL causes movement to reverse followed by a new pause and lastly reclosing. If at the beginning of an opening movement, the PHOTOCELL input does not give consent, the request to open is cancelled.

If the automatic functioning mode is being used, there will be a pause time subsequent to an opening manoeuvre and followed by a closing manoeuvre. If, during the pause the PHOTOCELL triggers, the timer will be reset with a new time; if, on the other hand, a STOP comes into play during the pause, the reclosing function will be cancelled and there will be a STOP condition.

6.1) "CHARGE" CARD also battery powered:

The road boom gate "Wil" is equipped with a power transformer that can withstand the energy required by both the motor and electronic card so it can all be powered directly by the mains.

If you want the system to work even when there is a power cut then you have to add a suitable battery and relative battery charger card.

The battery must be installed in its own compartment outside the plastic box that protects the gearmotor card and connected to two terminals on the battery charger card; the latter must be connected to the connector on the unit.

TECHNICAL FEATURES OF THE UNIT:

Mains power	: 230 V a.c. \pm 10%, 50-60 Hz
Battery power	: 21-28 V d.c. (> 6Ah capacity)
Max. current accessories, 24 V d.c.	: 200 mA
Max. power flashing light	: 25 W (24 V d.c.)
Max. power Courtesy Light	: 10 W (24 V d.c.)
Max. power Open Bar indicator	: 10 W [24 V d.c.]
Courtesy light time	: 60 seconds
Pause time	: from 3 to 120 seconds
Operating temperature	: -20 to 70° C