BOX L VF1D/EA
UNIVERSAL CONTROL PANEL
For gates with 1 three-phase 230VAC motor with frequency converter

INSTRUCTION MANUAL
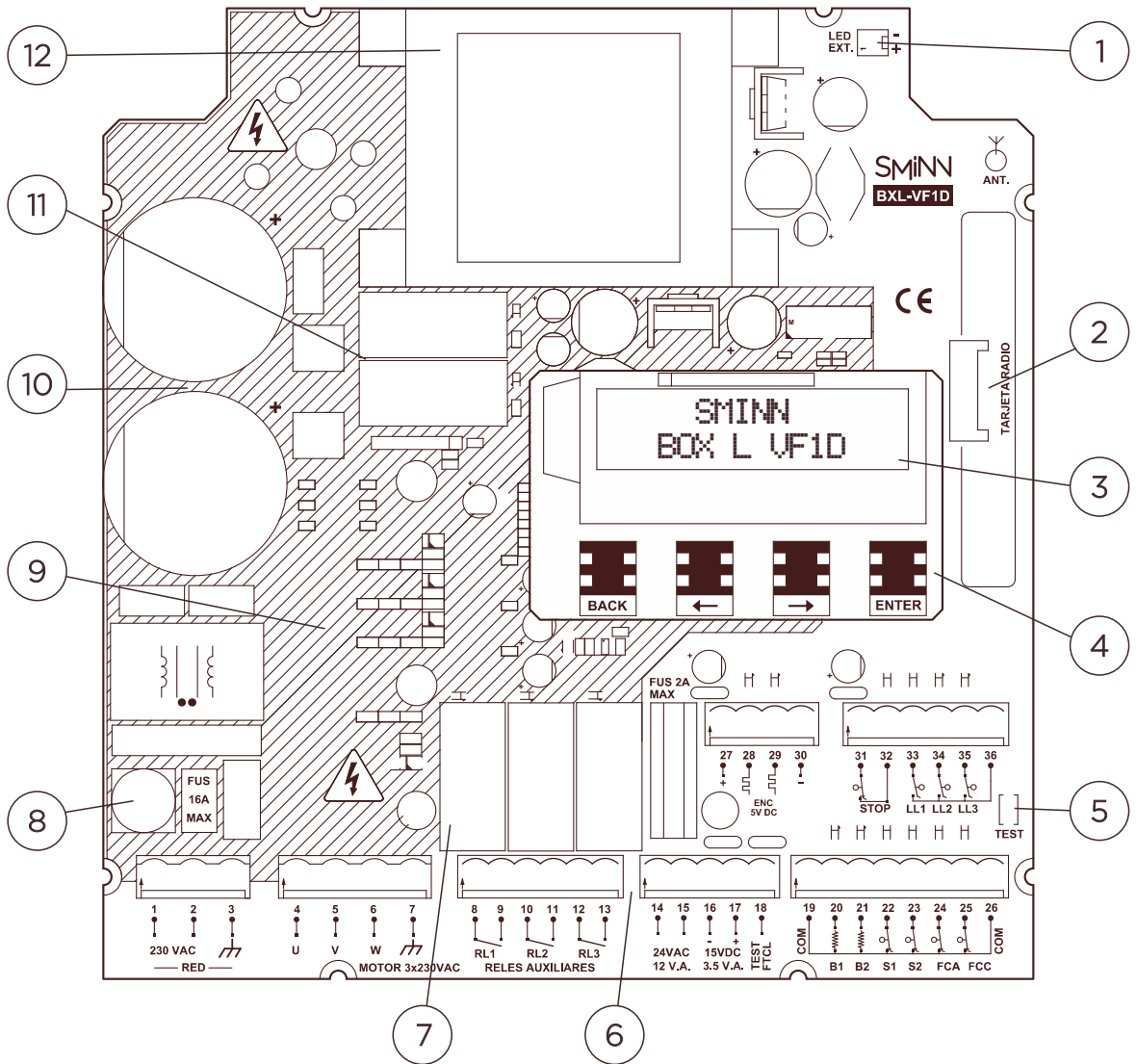
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innovative in electronics

COMPONENTS SITUATION

Fig.1

1. LED connector panel cover
2. TRSH radio card socket
3. LCD display
4. Options selection keypad
5. TEST Run button
6. Connection terminals
7. Auxiliary output relays
8. AC power input fuse
9. High voltage zone 230VAC
10. Bus capacitors
11. Bus load relays
12. Power transformer

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INDEX OF FIGURES

Symbols

 .... Encoder pulses

 . Relay output (NO contact)

 .... Safety edge

 ....Normally open contact

 ....Normally closed contact

 .... Earth

 .... High voltage area

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DESCRIPTION

The BXL-VF1D / BXL-VF1EA universal control panel is designed to form part of a 230VAC three-phase motor automation system for high-speed, up-and-over, up-and-over or sliding gates.

The board has the following features:

- Control of 1 three-phase 230VAC motor up to 1.5kW (delta connection).
- Intuitive multilingual programming menu via 4 keys and backlit LCD display.
- Support of 1-channel or 2-channel encoder (pulse and direction or quadrature) in the VF1D version and absolute encoder by RS485 in the VF1EA version.
- Independent regulation of power and speed in each phase of the manoeuvre.
- Configurable test of safety devices before each opening or closing.
- Three independent key inputs for different activation modes.
- Three programmable potential-free relays with different functions.
- Socket for SMINN radio card (6 pins).
- Independent inputs for two strips (resistive or contact) and two photocells.
- LEDs indicating the status of the inputs and outputs of the panel.
- Voltage outputs for peripherals of 24VAC (12W) and 15VDC (3.5W), protected by resettable fuses.
- Optocoupled inputs with high electrical isolation.
- Storage of number of manoeuvres (partial and total) and events to facilitate maintenance. Configurable maintenance signal on external LED.
- Manoeuvre learning system that facilitates start-up and configuration.
- Obstacle detection with configurable sensitivity by amperometric sensor and/or encoder.

LIMITATIONS ON THE USE OF THE CONTROLLER

Use is not guaranteed when installed on equipment other than that specified.

The manufacturer reserves the right to change the specifications of the switchgear and this manual without prior notice. The switchgear must only be handled by specialised and/or suitably instructed personnel.

WARNING

The product must be used for its intended purpose and any other use is considered inappropriate. Packaging and containers must not be disposed of in the environment. Keep products, packaging, containers, documentation, etc. out of the reach of children. Observe applicable local, national and European regulations. The information contained in this document may contain errors which will be corrected in subsequent editions. The manufacturer reserves the right to modify the contents of this document or the product without prior notice.

SMINN CONTROL PANELS ARE EQUIPPED WITH AN INDICATOR LIGHT THAT LETS US KNOW IF THE EQUIPMENT IS POWERED

INSTALLATION

The box is fixed to the wall with only three screws, all of them external (see Fig.3).

Drill three holes in the wall according to the cut-out template printed on the bottom of the box. Use the screws and plugs supplied.

Cut out the rubber plugs located at the bottom of the box and pass the cable conduit through them into the equipment. Observe the safety instructions for installation.

Connect the power, motor and device cables to the terminals on the terminal strips as indicated on the printed circuit board. Refer to the following sections of the manual for wiring and configuration specific to each element.

Power the panel and the ON LED will light up (See Fig.1).For the initial operation check, connect at least the motor, the brake (if necessary) and the limit switches or absolute encoder (VF1EA) and use the keys -> to open and <- to close in dead man's mode, checking the operation of the motor (in slow speed and dead man's mode).

Connect the rest of the automation elements and carry out a learning manoeuvre to start up the control panel. After finishing, customise the configuration if necessary.

IMPORTANT SAFETY INSTRUCTIONS FOR INSTALLATION

Before installing the panel::

* Check that the door/blind is in good mechanical condition and properly counterbalanced.
* Remove everything that is not necessary from the environment and switch off the AC power.
* Install the panel at a minimum height of 1.5 m, preferably next to the door.
* Use power and motor cables of suitable cross-section.
* Power the panel via a circuit breaker/emergency switch that is easily accessible by the user.

The European door standards EN 12453 and EN 12445 specify the minimum levels of protection and safety for doors installed in single-family dwellings and communal and public facilities. The moving door must be prevented from making contact with any object or limiting the contact force (e.g. safety edge), and in the case of automatic closing, it is necessary to supplement it with a presence detector (e.g. photocell).

Check that the configured photocells and strips act by means of the LED associated with each of these inputs. The LEDs of the strips will not activate if this strip has not been previously activated in the menu (See Fig. 1).

Make sure that the safety edge is not activated when the door is completely closed.

Once the manoeuvre programming and configuration have been carried out, test the manoeuvre using the TEST button (Fig.1), or using the appropriate key input to validate that the configuration and operation are correct.

IMPORTANT SAFETY INSTRUCTIONS FOR USAGE

Once the mechanism is installed and as a precaution, the user must:

* Keep the control mechanism out of the reach of children.
* Monitor the movement of the door, keeping the area clear of people and objects.
* Exercise caution when operating the door manually (unlocked) as it may move uncontrollably due to the weight of the door, the condition of the fixings, springs and counterweights.

If a malfunction of the system is observed, the user should IMMEDIATELY contact the technical support service. The mechanism must not be used as it may cause damage.

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WIRING

1 2 3

230 VAC   ⏚

—— RED ——
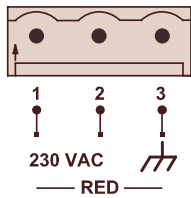
The panel is supplied with 230VAC 50Hz via terminals 1 and 2. The earth connection is made at terminal 3.

4 5 6 7

U V W ⏚
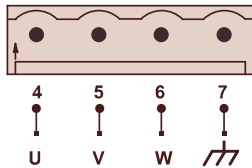
The control unit can control a three-phase 230VAC motor. Connect the three phases to terminals 4, 5 and 6 and connect the earth terminal 7 to the motor housing. If the direction of rotation is incorrect, swap two of the phases.
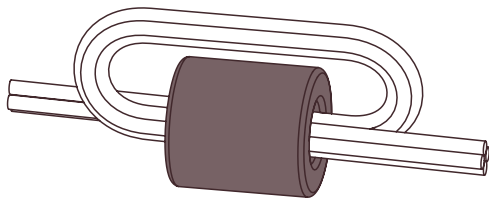
NOTE: In order to comply with European standards regarding electromagnetic interference, it is mandatory to pass the motor cables back through the ferrite core included with the product.

8 9 10 11 12 13

RL1 RL2 RL3
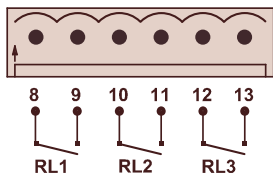
The panel has three potential-free relay contacts normally open to perform different functions such as control of lamps, traffic lights, brake, electric lock... These relays can withstand 16A over 24VDC or 230VAC. See page 24 for electromechanical brake wiring instructions.

14 15 16 17 18

24VAC   15VDC   TEST
12 V.A. 3.5 V.A. FTCL
   -    +
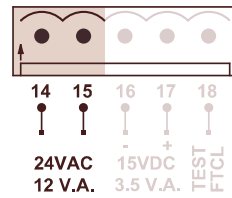
Terminals 14-15 provide 12W with 24VAC via a resettable fuse to power external devices such as lamps or an electric lock.

14 15 16 17 18

24VAC   15VDC   TEST
12 V.A. 3.5 V.A. FTCL
   -    +
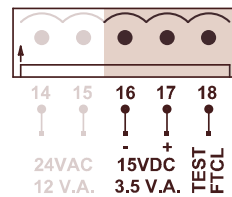
At terminals 16 and 17, the panel has a voltage output for peripherals of 15VDC - 3.5VA protected by a resettable fuse for powering external circuits such as photocells.

Additionally, terminal 18 serves as a specific negative for photocell testing. According to standard.

19 20 21 22 23 24 25 26

COM B1 B2 S1 S2 FCA FCC COM
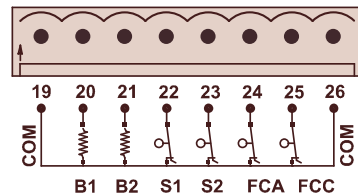
Terminals 20 and 21 allow the connection of one or two resistive or contact strips. Terminals 22 and 23 allow the connection of one or two normally closed safety circuits (normally photocells). Terminals 24 and 25 are used to manage two limit switches, the opening limit switch on terminal 24 and the closing limit switch on terminal 25.

Terminals 19 and 26 serve as common terminals for the connection of all the above elements.

NOTE: The limit switches must be connected for the correct operation of the system, except if an absolute encoder is used in the VF1EA version.

WIRING

27 28 29 30
+   —
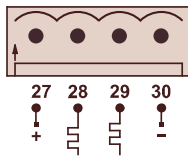
VF1D: Terminals 27 and 30 provide an incremental encoder with 5VDC power supply. Terminals 28 and 29 are used to connect the encoder signals, either one-channel encoder (signal to terminal 28) or two-channel encoder in quadrature or direction and signal mode (one signal to terminal 28 and one signal to terminal 29).

27 28 29 30
+   B   A   —
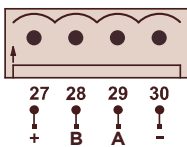
VF1EA: Terminals 27 and 30 provide an absolute encoder with 12VDC power supply. Terminals 28 and 29 are used to connect the RS485 signals of the encoder. For correct operation it is necessary to connect each terminal to the encoder terminal marked with the same symbol (A to A and B to B). See page 25 for connection instructions.

31 32 33 34 35 36
STOP   LL1 LL2 LL3
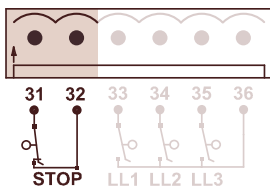
Terminals 31 and 32 are used for the connection of a normally closed safety device for emergency stop, such as an emergency stop mushroom.

31 32 33 34 35 36
STOP   LL1 LL2 LL3
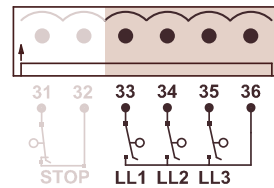
The control unit has three independent key inputs which are configured with different functions depending on the selected operating mode.

Normally, input LL1 serves as an opening command and input LL2 serves as a closing or pedestrian opening command. Terminal 36 serves as common for all key inputs.

TARJETA RADIO

The radio card socket allows a SMINN radio card (6 pins) to be plugged in, enabling the opening command to be given via radio transmitters.

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CONFIGURATION

To facilitate the configuration and maintenance of the panel, it has an advanced menu system accessible by means of an integrated 4-key keypad and data presentation on a backlit LCD display that allows the panel to be configured simply, quickly and intuitively.

Press the BACK + ENTER keys simultaneously to access the configuration menu. The LCD will light up. To move through the menu, the panel has 4 keys which are:

BACK (exit)

ENTER (accept)

<- (back)

-> (forward)

While using the configuration menu, the two lines of the screen are normally used; on one of them, the symbols < and > will appear at the ends to indicate that the user is navigating on that line. Navigating on the top line navigates between menus and parameters (with the current value, if applicable, appearing on the bottom line). Navigating on the bottom line navigates between the possible values of the selected parameter, shown on the top line.

Therefore, the <- / -> keys are used to move between the elements of the current navigation level, the ENTER key is used to select an element or validate the selection of a value, and the BACK key is used to cancel the modification of a parameter and, in general, to go backwards.
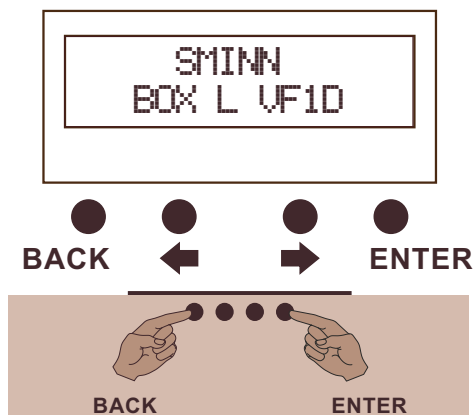
Temporarily and depending on its use, the installation must be subjected to a complete operation test by qualified personnel in order to detect any signs of wear or deterioration.

If for any reason the panel needs to be repaired, contact the manufacturer or the nearest official service centre.

Once the manoeuvre has been programmed, we must ensure that the power and soft stop settings are suitable for compliance with standard EN 12453:2018+A1:2022, taking the measurements in accordance with the method described in the standard. See force graph.

If, due to the characteristics of the installation, these values are not met, additional protection elements must be installed.

The dynamic force Fd must not exceed the following measurements:

< 400N in spaces between 5-50cm

< 1400N in spaces larger than 50cm

Force diagram
Fd: Dynamic force
Fs: Static force
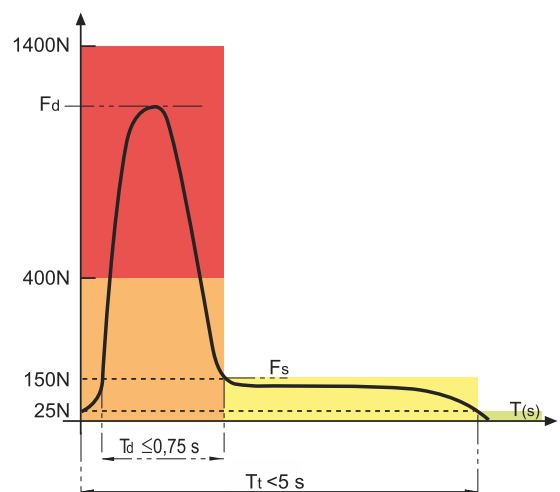
MANOEUVER PROG.

The control panel has a configuration wizard that allows you to select the most important parameters and start up the control panel quickly.

To start the wizard, with the door closed, enter the configuration menu by pressing BACK+ENTER, the parameter GATE TYPE will appear.

Press ENTER and use the <-/-> keys to scroll through the options until the desired type is selected. Press ENTER to validate. Then press -> and MANIOB MODE will appear.

Press ENTER to access the submenu and use the <-/ -> keys to select the desired mode. Press ENTER to validate. Then press -> until the MAINTENANCE menu appears. Press ENTER to access the submenu. Press -> to select the OPEN and/or CLOSE commands.

In either command, pressing ENTER will operate the door (opening or closing) in deadman mode at soft stop speed and power. In this way it is checked that the connections of the phases to the motor are correctly made and the direction of rotation of the motor is correct, or not, in which case the parameter INVERT MOTOR can be used or any 2 phases can be swapped between them.

Once these steps have been carried out, press -> until PROG MANEUVER appears on the screen and accept by pressing ENTER.

After this, the panel will ask one by one for the vital parameters of the configuration. Choose the desired value for each option with the <- and -> keys and press ENTER to accept and continue or BACK to go back.

If the door interrupts the photocell installed at input S1 during its movement, it is possible to configure the panel to learn the inhibition interval automatically by setting the parameter INHIB. SEG1 parameter to YES.

In the case of the VF1EA version with absolute encoder enabled, the panel will instruct you to position the door at the opening and closing points using the <- and -> keys to memorise their positions.

After configuring the basic parameters, the panel will indicate that after pressing ENTER again, the learning manoeuvre will begin.

From here you can carry out the following steps using the ENTER key, the LL1 key input, or by means of a radio transmitter:

- Press to start opening.
- Press to start soft stop (if the parameter SOFT STOP is activated).
- Wait until the opening limit switch is reached (the door will stop by itself).
- Press to start closing.
- Press to start soft stop (if parameter SOFT STOP is activated).
- Wait until the closing limit switch is reached (the door will stop by itself).
- The control panel will record by default both the opening and closing time (with a 10% increment) as a safety measure in case of failure in the limit switches.

The programming manoeuvre will change the following parameters:

- TOTAL PULSES
- SOFT STOP AP
- SOFT STOP CR
- M1 SENSIB.
- M1 ENC SENS
- M1 LIM. PRES.
- OPENING TIME (with a 10% increase)
- CLOSING TIME (with a 10% increase)
- POLARITY ENC
- ENC ABS POS I (for the VF1EA model)
- ENC ABS POS F (for the VF1EA model)

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ACTIVATION

The key inputs (marked LL1, LL2 and LL3) and a radio card installed in the radio socket can be used to start a manoeuvre when the control panel is idle.

The functions of the key inputs LL1, LL2 and the radio card are determined by the selected manoeuvre mode, while input LL3 can be set separately to operate differently (using the POLARITY and MODE parameters within the LL3 menu). It is possible to disable any of the LL1, LL2 or LL3 inputs using the LL1 BLOCK, LL2 BLOCK or LL3 BLOCK parameters, so that any stimulus on these inputs will be ignored.

Each input is assigned a transit direction to enable the use of discriminating traffic lights. LL1, LL2, and the radio card are used for the incoming transit direction and LL3 for the outgoing transit direction.

NOTE: The radio card operates by default the same as LL1 unless the parameter RADIO ALT STOP is activated, in which case it shall operate in alternate stop (regardless of the general manoeuvre mode selected).

MANOEUVRE MODES

The MANOEUVER MODE parameter sets the functions that the key and radio inputs perform.

STANDARD

In STANDARD mode, Ll1 will give an open command if the door is closed and a close command if the door is open and at rest. LL2 will work in the same way except that the opening will be in pedestrian mode. None of the keys perform any function while the door is moving unless the parameter INVER ON KEY is activated, in which case during closing LL1 and LL2 will cause a soft manoeuvre inversion to be performed. In this mode, AUTO CLOSING is activated by default, although in OPTIONS, by accessing this command, it can be deactivated by selecting NO.

OPEN/CLOSE

The OPEN/CLOSE mode uses LL1 as the opening command and LL2 as the closing command. When the door is in motion the opposite direction input will cause a smooth reversal of manoeuvre (without passing through stop). In this mode, AUTO CLOSE is disabled by default, although in OPTIONS, by accessing this command it can be activated by selecting YES.

ALT. STOP

The ALT STOP mode works in the same way as the STANDARD mode, except that if LL1 or LL2 is used while the door is moving, it stops. The next press will make the door continue the manoeuvre in the opposite direction to the previous one. In this mode, the AUTO CLOSE is disabled by default, although in OPTIONS, by accessing this command, it can be activated by selecting YES.

DEADMAN

The DEADMAN mode only allows the door to move while the LL1 or radio input is active (opening) or the LL2 input is active (closing). The manoeuvre is interrupted when the input in use is deactivated. In this mode, the safeties only pause the manoeuvre.

SEMI. DEADMAN

The SEMI DEADMAN mode performs full opening in the normal way when using LL1 or LL2, but requires using either of the inputs in deadman mode to close.

AUXILIARY DEADMAN

The parameter AUX DEAD MAN parameter allows the panel to temporarily operate in deadman mode when one of the safeties fails the test, allowing the door to be opened in case of problems. When this option is activated, in the event of a failure, simply press and hold the usual key or radio input for a few seconds.

MANOEUVER

PHASES

SAFETY TESTS

The safety tests phase is performed in the beginning of every maneuver before moving the gate. The controller first checks for obstructed safeties (corresponding led off in the board) that are relevant to the maneuver. If there is any obstructed safety it waits for them to enter idle state and will show a message in the display to this effect. Then the board checks the resistive values of safety edges and performs a test procedure on light barriers removing power from the transmitter to check the system is in order.

UNLOCKING

The unlocking phase performs many different functions simultaneosly before starting the movement phase:

- Activates the garage light relay during the time interval specified by the GARG LIGHT T parameter. This paremeter can be set to any time from 1 sec. to 240 sec., thus saving the need to use an external timer.

- Activates the electrolock relay if any of the relays is configured as such and the ELECTROLOCK parameter is set with a time interval.

- When the electrolock is activated and the maneuver will open the gate the controler performs a reversing stroke in soft stop speed (OP SOFT VEL parameter) with normal power (OP NORMAL POW parameter) for a duration specified by the REVERS. STROKE parameter.

- Performs preflashing through a relay configured for light beacon during the time interval specified by the PREFLASH OP T parameter for opening and the PREFLASH CL T for closing. Preflashing is managed following the mode specified by the PREFLASH MODE parameter. If the FLASHING SEM. parameter is set preflashing will be performed through a relay configured as red semaphore light.

MOVEMENT

The movement phase comprises the actual gate movement and management of the safety devices. First the red semaphore light is activated if any relay is set as such and the maneuver counters are incremented (once per gate movement direction). The electrolock, if activated in the previous phase, is held active until the time specified by the ELECTROLOCK parameter passes. If there is a relay set up as a beacon light it will be managed following the mode set in the FLASH MODE MOV parameter.

Motor speed and power are adjusted in different phases:

- Acceleration ramp: The acceleration ramp is performed at maximum power and goes from stopped motor to the transit speed in the time specified by the OP ACCEL RAMP parameter for opening and CL ACCEL RAMP for closing. The shorter the ramp time the more abrupt the speed change is, and the longer the ramp, softer the speed change.

- Transit: In transit the motor spins with the the speed and power adequate to the maneuver. Most maneuvers are performed in normal speed (OP NORMAL VEL for opening and CL NORMAL VEL for closing) and power (OP NORMAL POW for opening and CL NORMAL POW for closing). Deadman maneuvers before the first learning maneuver are performed in soft stop speed (OP SOFT VEL for opening and CL SOFT VEL for closing) and power (OP SOFT POW for opening and CL SOFT POW for closing).

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- Soft stop ramp: If the SOFT STOP parameter is set, when the gate reaches the position set as a percentage of the gate limits (OP SOFT STOP for opening or CL SOFT STOP for closing), the controller starts the soft stop phase. The soft stop ramp regulates the speed and power from the ones used in transit to the the ones set for the soft stop phase (OP SOFT VEL and OP SOFT POW for opening or CL SOFT VEL and CL SOFT POW for closing) and lasts the time set in the OP SOFT RAMP parameter for opening or the CL SOFT RAMP parameter for closing.

- Soft stop: if the SOFT STOP parameter is set the motor will spin using the soft stop speed and power (OP SOFT VEL and OP SOFT POW for opening or CL SOFT VEL and CL SOFT POW for closing).

- Decceleration before limit: if the DCEL OP MARGIN parameter when closing or the DCEL CL MARGIN when closing are greater than zero the controller will progressively deccelerate when the remaining gate movement reaches the margin specified by the corresponding parameter, reaching the end with the speed specified by the DCEL OP VEL parameter when opening or the DCEL CL VEL parameter when closing.

- Decceleration ramp: when the gate reaches its end position (PEDEST LIM. parameter for pedestrian opening maneuvers) or the maneuver time runs out a final decceleration ramp to stop the motor is performed. The ramp lasts the time specified by the OP DECC RAMP parameter when opening or the CL DECC RAMP parameter whenclosing. If the motor must be stopped immediately the ramp time should be set to zero seconds.

The movement phase finishes either because the maneuver time runs out, a limit switch has been reached, the programmed encoder position has been reached (VF1EA, ABS ENC I POS and ABS ENC F POS parameters) or, in pedestrian mode, the gate reaches the configured position (PEDEST LIM parameter). The maneuver time is set in the OPEN TIME parameter for opening and CLOSE TIME parameter for closing. When the maneuver is inverted the controller calculates the needed time using the current gate position as reference, If the gate does not reach its end point in this situation it is possible to apply some extra time (EXTRA TIME parameter).

Safeties can alter maneuvers (inversion, safety stop...). Ending a maneuver because of a safety is considered a cancellation and can be followed automatically by another maneuver (inversions).

When the opening movement phase ends succesfully, the red semaphore light is deactivated and the green semaphore light is activated.

LOCKING

The locking phase when closing, if an electrolock is installed, performs a final stroke in soft stop speed (CL SOFT VEL) and in normal power (CL NORMAL POW parameter) lasting the time specified by the FINAL STROKE parameter.

PAUSE

The pause phase is performed after opening if the AUTO CLOSE parameter is set. This phase lasts the time specified by the AUTO CLOSE T parameter for normal maneuvers, the AUTO C PED T parameter for pedestrian maneuvers and the FAST PHOTO CLOSE parameter for light barrier inversions. If a light beacon relay is configured it will follow the configuration set in the FLASH MODE PAUS parameter. When the pause ends a new closing maneuver starts.

If the OPTIONAL AUTO parameter is set, any key switch activation will terminate the pause phase. If OPTIONAL AUTO is not set but KEY RES. AUTO is set, key switch inputs will restart the pause timer, also when held.

If the CLOSE ON BEAM parameter is set with an specific time, a light barrier obstruction during pause will reset the timer to the value set in the parameter.

MANOEUVER

SAFETIES

The controller supports many safety devices that can affect the maneuver: STOP, light barriers, safety edges, current sensor and encoder.

STOP

The STOP input supports a normally closed contact for emergency stop. In case no device is installed the terminals should be bridged (led off) for the controller to work.

Opening the stop contact will make the motor stop immediately and will cancel the current maneuver no matter in which phase it is currently in.

LIGHT BARRIERS

The controller has two separate inputs for light barrier use that can be independtly enabled and configured. These inputs work as normally closed contacts, so in case of more than two light barriers they should be connected in series. If more than one light barrier share the same board input the same configuration will apply to all of them.

To enable a light barrier input first the input needs to be enabled using the BEAM 1 parameter or the BEAM 2 parameter. Once the input is enabled it is possible to configure the safety test and the behavior both when opening and when closing.

To activate the safety test the TEST BEAM 1 parameter or the TEST BEAM 2 parameter must be used. Once set, the default testing strategy is to test both before opening and closing. It is possible to adjust this strategy using the TEST BEAM 1 OP, TEST BEAM 1 CL, TEST BEAM 2 OP and TEST BEAM 2 CL parameters.

To perform the safety test it is neccesary to interrupt the power line to the peripheral or, in some cases, provide a test impulse. For maximum flexibility the controller provides two ways of performing the test: terminal 18 can be used as DC negative supply for testable devices or one of the dry relay contacts can be used using the TEST function.

Below all possible values for BEAM 1 OPEN, BEAM 1 CLOSE, BEAM 2 OPEN and BEAM 2 CLOSE are detailed.

NO	The light barrier is ignored.
PAUSE	The light barrier pauses the maneuver while obstructed. When unobstructed, the controller waits for three seconds and resumes the maneuver.
INVERT	The light barrier inverts the maneuver direction.
STOP	The light barrier stops and cancels the maneuver.
SHORT INV.	The light barrier inverts the maneuver direction during the time set in the SHORT INV. T. parameter and then stops and cancels the maneuver.
DELAYED INV.	When the light barrier is unobstructed the gatye stops, waits during the time set in the DEL. INV. T. parameter and then inverts the maneuver.

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SAFETY EDGES

The panel has two inputs for safety edges that can be enabled and configured independently. These inputs work by monitoring the connected resistive value and support 8K2 or 4K1 resistive edges and contact edges, either normally open or normally closed. If you want to connect several strips to the same input, it is necessary to connect them in series if they are normally closed contact, and in parallel if they are normally open contact or resistive. In the case of resistive strips, the panel only supports two connected in parallel on the same input, configuring the input for 4K1.

In order to use a band input, it is necessary to configure the input by modifying parameter `EDGE 1` or parameter `EDGE 2`.

The possible options for the parameters `EDGE 1 APER`, `EDGE 1 CLOSE`, `EDGE 2 APER` and `EDGE 2 CLOSE` are detailed below, with the selected action being applied when the safety is activated in the chosen direction.

`NO`	The safety edge is ignored.
`INVERT`	The safety edge inverts the maneuver.
`STOP`	The safety edge stops and cancels the maneuver.
`SHORT INV.`	The safety edge inverts the maneuver direction during the time set in the `SHORT INV. T.` parameter and then stops and cancels the maneuver.

CURRENT SENSOR
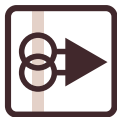
The BOX L VF1D controller monitors the current draw on each motor phase in real time so it can be displayed in the LCD screen and to implement three different protections :

- Obstacle detection: When the controller detects an abrupt rise in motor current draw or detects that it is higher than a configurable limit (`M1 OBST. LIM`) during a short span of time the obstacle detection safety activates. This safety only works if the `M1 SENSIB.` parameter is 1 or greater; this parameter set the sensitivity to rises in current draw, being 1 the lowest and 9 the highest. If this safety is activated the controller will log an error for future reference. NOTE: This safety does not work during speed ramps and performs best when the motor spins with reduced power.

- Overcurrent protection: If the controller detects that the motor current draw rises above a limit set in the `OC LIMIT` parameter for a brief span of time the maneuver will be cancelled immediately and an error will be logged for future reference.

- Shortcircuit protection: If the controller detects that the motor current draw rises above an internal limit close to the maximum supported by the board the maneuver is cancelled immediately and an error is logged for future reference.

OBSTACLE DETECTION

The controller has many means to detect an obstacle. The behaviour of the gate when one is encountered is set by the `PUSH SEC. OPEN` and `PUSH SEC. CLOSE` parameters in a similar fashion to safety edges (see table above).

MANOEUVER

ENCODER

When the encoder is enabled it can be used as a safety measure too. The controller monitors the time lapse between position changes and implements two protections::

- Obstacle detection: If the controller detects an abrupt rise in time between position changes the obstacle detection safety activates. This safety only works if the **M1 ENC SENS.** parameter is 1 or greater; this parameter set the sensitivity to rises in current draw, being 1 the lowest and 9 the highest. If this safety is activated the controller will log an error for future reference.. NOTE: This safety does not work during speed ramps.

- Locking detection: If the controller tries to make the motor spin but no significative position change is detected the maneuver is cancelled to avoid damage and an error is logged for future reference.

MOTOR

The BOX L VF1D allows independent control of speed and power for a 230VAC three-phase motor (delta wiring). Speed can be set between 10Hz (Hertz) and 100Hz (**OP NORMAL VEL**, **CL NORMAL VEL**, **OP SOFT VEL** and **CL SOFT VEL** parameters) and power can be set from 30% to 100% (**OP NORMAL POW**, **CL NORMAL POW**, **OP SOFT POW** and **CL SOFT POW**).

It is important to consider that three-phase motors are usually designed with 50Hz and 100% power in mind. Using these values is equivalent to powering the motor with direct three-phase power. Frequency modification, specially close to the limits, can make the motor spin badly, cause higher power drain and general malfunction. Also, reducing the delivered power can make the motor spin slower than intended or general malfunction. It is recommended to test thoroughly the selected parameter values.

The controller has two complementary brake systems: electrical brake and electromechanical brake. The electrical brake is performed by applying DC power in the motor phases and practicaly locks the motor in place, eliminating inertia and relieving the electromechanical brake from unneeded friction. The electromechanical brake is activated through one of the output relays and primarily serves the function of locking the motor in place when the gate is idle.

The electrical brake strength can be regulated using the **BRAKE POW OP** and **BRAKE POW CL** parameters. This parameters accepet any value from 0 to 4, 0 being electrical brake disabled and 4 being the highest power setting. NOTE: It is not recommended to change the brake strength if not actually needed, specially setting level 4 as it can damage the motor.

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ELECTRICAL WIRING DIAGRAM

1	230VAC phase
2	230VAC neutral
3	Earth terminal
4	U motor phase
5	V motor phase
6	W motor phase
7	Motor earth terminal
8	RL1 output relay
9	
10	RL2 output relay
11	
12	RL3 output relay
13	
14	24VAC 12W power output
15	
16	Negative — 15VDC power output for light barriers and others
17	Positive
18	Power negative for light barrier transmitter with autotest function
19	Input electrical common
20	Safety edge 1- R8K2 / NC
21	Safety edge 2 - R8K2 / NC
22	Light barrier 1 NC
23	Light barrier 2 NC
24	Opening limit switch
25	Closing limit switch
26	Input electrical common
27	Encoder power negative
28	ENC1 encoder input
29	ENC2 encoder input
30	Encoder power positive
31	STOP (NO contact)
32	
33	LL1 Input
34	LL2 Input
35	LL3 Input
36	Input common

Fig.2

1 2 3 4 5 6 7 8 9 10 11

230 VAC U V W RL1 RL2

— RED — MOTOR 3x230VAC RELES AUXILIA
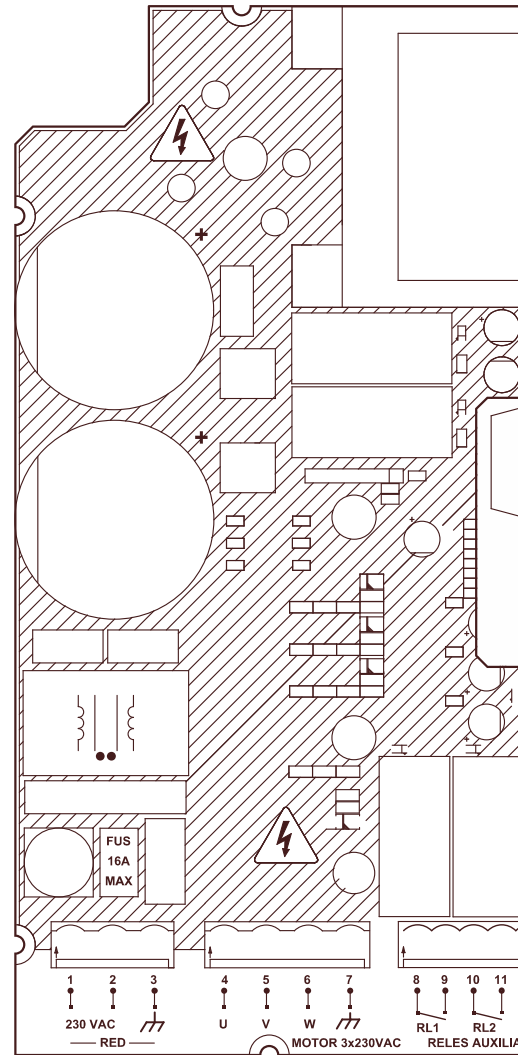
LIGHT BARRIER POWER DIAGRAM

See page 25 for correct shielding of the receiver

RX
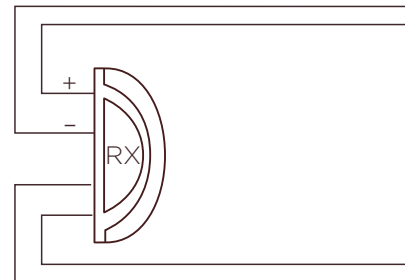
The negative of the light barrier transmitter mu
to facilitate the light barrier test function.

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ACCESORIES AND PERIPHERALS

LED
EXT. - +

SMiNN
BXL-VF1D

ANT.

CE

TARJETA RADIO

SMINN
BOX L VF1D

BACK   ←   →   ENTER

FUS 2A
MAX

27 28 29 30
+
ENC
5V DC

31 32 33 34 35 36
STOP LL1 LL2 LL3

TEST

12 13
RL3
ARES

14 15 16 17 18
24VAC 15VDC TEST
12 V.A. 3.5 V.A. FTCL

19 20 21 22 23 24 25 26
COM B1 B2 S1 S2 FCA FCC COM

TX
+
−
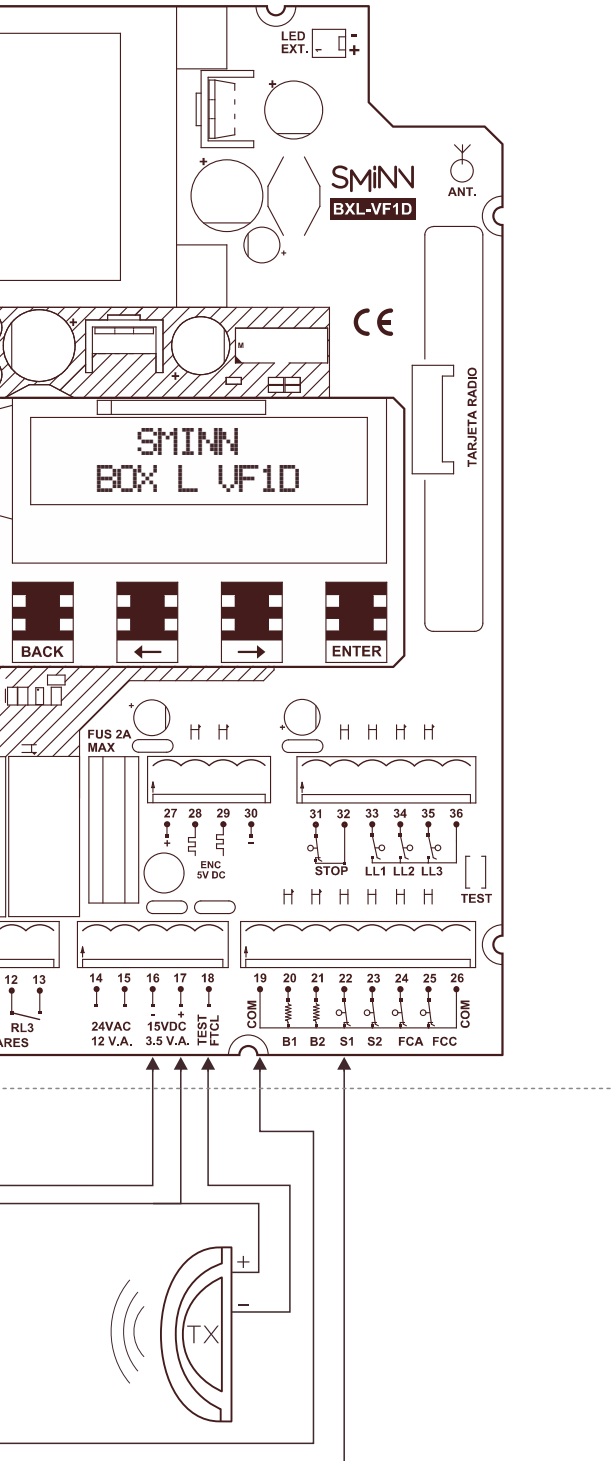
...st be connected to pin 18 of the terminal block
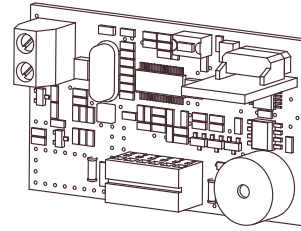
Radio card

Transmitter-receiver light barrier set
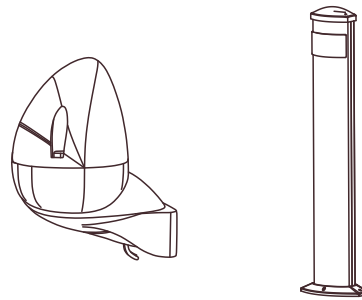
Beacon light and light barrier stand

15

MANOEUVER

OUTPUTS

The controller has three configurable outputs that support many different functions in order to adapt to different installations, Each output has its own submenu (called RL1, RL2 y RL3) with two associated parameters, POLARITY and RELAY MODE.

POLARITY: Allows configuring the output polarity between NO CONTACT (normally open) and NC CONTACT (normally closed). It is important to consider that the physical relay contact available in the terminal strip is normally open, so if the board is unpowered the relay will always open the contact no matter the configuration..

RELAY MODE: Allows selecting the function each relay will perform.

RELAY – GARAGE LIGHT

The GARAGE LIGHT mode uses the relay to deliver power or a signal to a device each time a maneuver begins during the time span specified by GARG LIGHT T parameter.

RELAY – FLASH LAMP

The FLASH LAMP mode uses the relay to deliver power to a beacon light during the unlocking phase (preflashing), the movement phase and during pause. It is possible to modify the behavior of the output in each phase (off, intermitent or on) using the PREFLASH MODE, FLASH MODE MOV and FLASH MODE PAUS parameters.

RELAY - BRAKE

The BRAKE mode uses the relay to unlock or lock the electromechanical brake of the motor. The brake is released just before spinning the motor and is lock immediately after stopping it.
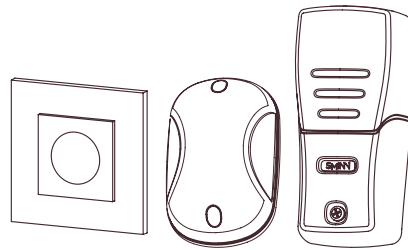
RELAY - MAINTENANCE

The MAINTENANCE mode uses a relay to signal or power an external device when the maneuver partial counter rises above the limit set in the MAINT. LIM. parameter.

RELAY - SAFETY TEST

The SEC. TEST mode performs a safety test on devices that are powered externally or that need a test signal. The controller will activate the relay to perform the test and deactivate it when the safety switches state.

RELAY – ELECTROLOCK

The ELECTROLOCK mode activates an electrolock before opening the gate. Setting this mode for a relay enables other parameters related to the electrolock function (ELECTROLOCK, REVERS. STROKE, FINAL STROKE).

RELAY – RED SEMAPH

The RED LIGHT IN and RED LIGHT OUT modes use a relay to activate a red semaphore light for a given transit direction. If the FLASHING SEM. parameter is set preflashing will be performed in this relay too.

RELAY – GREEN SEMAPH

The GREEN LIGHT IN and GREEN LIG. OUT modes use a relay to activate a green semaphore light for a given transit direction.

RELAY – GATE STATE

The GATE CLOSED mode activates the relay while the gate is completely closed.

The GATE OPENED mode activates the relay while the gate is completely open.

The GATE OPENING mode activates the relay while the gate is opening.

The GATE CLOSING mode activates the relay while the gate is closing.

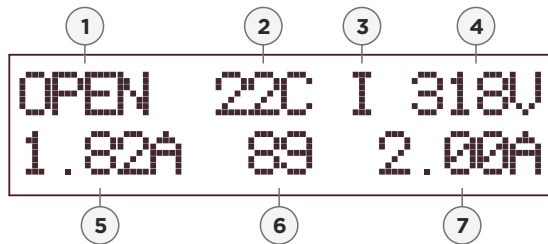### RELAY – IN PAUSE

The IN PAUSE mode activates the relay while the maneuver is in the pause phase.

MANOEUVER

DISPLAY

The LCD display shows during maneuver many useful runtime values easing maintenance and initial installation.

1. Current phase

2. Controller temperature

3. Input inhibition indication

4. Bus voltage

5. Real-time current draw

6. Percentage-based gate position / Remaining pause time.

7. Maneuver maximum current draw.

When idle, the controller might show four E in the display borders to indicate there are one or more logged errors. When entering the menu the controller will show one by one the logged error, waiting for ENTER to be pressed n between. NOTE: The controller will still work normally even if there are logged errors.

ENCODER (VF1D)

It is possible to use an incremental encoder (ENCODER parameter) to enhance the precision of the gate position management and have some additional safety measures. The controller supports both one channel encoders (1 CHANNEL) and two channel encoders (2 CHANNELS).

NOTE: Two channel encoders are more precise since they indicate rotation direction and double the quantity of pulses..

If a two channel encoder is used the learning maneuver automatically establishes the correct encoder polarity.

For more information on safety related encoder settings check page 13.

ENCODER (VF1EA)

It is possible to use an absolute encoder via RS485 bus (ENCODER parameter) to control the gate position. The controller supports the most widely available motors with included absolute encoder in Europe.

The learning maneuver automatically detects the correct encoder polarity. Before the actual learning maneuver the instaler is prompted to move the gate to the opening and closing positions to learn their encoder values. These positions can be adjusted after the learning maneuver using the ABS ENC I POS and ABS ENC F POS parameters.

For more information on safety related encoder settings check page 13.

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OPTIONS

	TEXTO LCD	VALOR POR DEFECTO	PAGINAS
AUTOMATIC CLOSING Enables automatic closing after the pause phase	AUTO CLOSE	YES	8, 10
FAST LIGHT BARRIER CLOSING The pause after a photocell reversal lasts for the time set as photocell closure.Only visible if CLOSE ON BEAM is not NO	FAST PHOTO CLS	NO	10
OPTIONAL AUTO Terminates the pause phase with an impulse.. Only visible if AUTO CLOSE is enabled	OPTIONAL AUTO	NO	10
AUTO DELAY ON KEY Restarts the pause phase with each comand impulse. Only visible if OPTIONAL AUTO is disabled and AUTO CLOSE is enabled	KEY RES. AUTO	YES	10
INVERT ON KEY Inverts the maneuver with an impulse. Only visible in STANDARD mode	INVER TECLA	YES	8
BEAM 1 / 2 Enables control of each of the light barrier inputs.	BEAM 1 BEAM 2	NO NO	11
TEST BEAM 1 / 2 Enables safety test on the connected light barrier	TEST BEAM 1 TEST BEAM 2	NO NO	11
TEST BEAM 1 / 2 OPENING/CLOSING Enables the light barrier safety test before a maneuver in the corresponding direction.	TEST BEAM1 AP TEST BEAM1 CR TEST BEAM2 AP TEST BEAM2 CR	NO NO NO NO	11
LIGHT BARRIER 1 / 2 MODE Establishes the behaviour of the light barrier when opening or closing. Options.: NO / PAUSE / INVERT / STOP / SHORT INV. / DELAYED INV.	BEAM 1 OPEN BEAM 1 CLOSE BEAM 2 OPEN BEAM 2 CLOSE	NO INVERT NO INVERT	11
EDGE 1 / 2 Enables control of each safety edge input. Supports resistive and contact safety edges. Options: NO / 8K2 / 4K1 / NO CONTACT / NC CONTACT	EDGE 1 EDGE 2	NO NO	12
EDGE 1 / 2 MODE OPEN / CLOSE Establishes the behaviour of the safety edge when opening or closing. Options: NO / STOP / SHORT INV. / INVERT	EDGE 1 OPEN EDGE 1 CLOSE EDGE 2 OPEN EDGE 2 CLOSE	NO INVERT NO INVERT	12
OBSTACLE DETECTION OPEN / CLOSE Establishes the behaviour of the obstacle detection system when opening or closing. Options: NO / STOP / SHORT INV. / INVERT	PUSH SEC. OPEN PUSH SEC.CLOSE	STOP SHORT INV.	12
SOFT STOP Enables soft stop	SOFT STOP	YES	7, 10

OPTIONS

	TEXTO LCD	VALOR POR DEFECTO	PAGINAS
CLOSE ON BOOT After a power failure it causes the door to close if it is not closed.	CLOSE ON BOOT	NO	
PREFLASH MODE Establishes the behaviour of the light beacon during the unlocking phase. Options: NO / INTERMITTENCE / ON	PREFLASH MODE	INTERMITTENCE	9,14
FLASH MODE MOVEMENT Establishes the behaviour of the light beacon during the movement phase. Options: NO / INTERMITTENCE / ON	FLASH MODE MOV	INTERMITTENCE	9,14
FLASH MODE PAUSE Establishes the behaviour of the light beacon during the pause phase. Options: NO / INTERMITTENCE / ON	FLASH MODE PAUS	NO	10,14
FLASHING SEMAPHORE Uses the red semaphore light for preflashing.	FLASHING SEM.	NO	9,14
AUXILIARY DEAD MAN If the safety test phase detects any failure the mode swtiches to dead man temporally.	AUX DEAD MAN	NO	8
ENCODER Enables maneuver control via encoder. Options: NO / 1 CHANNEL / 2 CHANNELS Options (VF1EA): NO / KOSTAL / GFA	ENCODER	NO	15
ENCODER POLARITY Establishes the spin direction interpreted by the encoder. Options : NORMAL / INVERTED	ENC POLARITY	NORMAL	7
OPENING LIMIT SWITCH (VF1EA) Enables the opening limit switch input when encoder is selected.	OPEN LS	NO	
CLOSING LIMIT SWITCH (VF1EA) Enables the closinglimit switch input when encoder is selected.	CLOSE LS	NO	
LL1/LL2/LL3 BLOCK Blocks any signal in the LL1 / LL2 /LL3 keyswitch inputs. Only visible with enabled password.	LL1 BLOCK LL2 BLOCK LL3 BLOCK	NO NO NO	8
RADIO ALTERNATING STOP Makes the radio card input work in alternating stop mode.	RADIO ALT STOP	NO	8
RL1/RL2/RL3 POLARITY Establishes the polarity of each relay output. Options: NO CONTACT / NC CONTACT	RL1/POLARITY RL2/POLARITY RL3/POLARITY	NO CONTACT NO CONTACT NO CONTACT	14
RL1/RL2/RL3 RELAY MODE Establishes the function of each relay. Options: See page 14	RL1/RELAY MODE RL2/RELAY MODE RL3/RELAY MODE	GARAGE LIGHT FLASH LAMP BRAKE	14
LL3 POLARITY Establishes the polarity of the LL3 input Options: NA CONTACT / NC CONTACT	LL3/POLARITY	NO CONTACT	8
LL3 MODE Establishes the function of the LL3 input. Options: STANDARD / ALT STOP / SEMI. DEADMAN	LL3/MODE	ALT STOP	8
INVERT MOTOR Establishes the spin direction of the motor.	INVERT MOTOR	NO	7

TIMINGS

	LCD TEXT	DEFAULT VALUE	ADJUSTMENT	PAGES
Opening time	OPEN TIME	15 sec.	0-1800 sec.	7,10
Closing time	CLOSE TIME	15 sec.	0-1800 sec.	7,10
Automatic closing time	AUTO CLOSE T	15 sec.	1-60000 sec.	10
End position of pedestrian maneuver	PEDEST LIM.	50%	0-100 %	10
Pedestrian automatic closing time	AUTO C PED T	15 sec.	1-60000 sec.	10
Opening soft stop position	OP SOFT STOP	0%	0-100 %	7,10
Closing soft stop position	CL SOFT STOP	0%	0-100 %	7,10
Extra time	EXTRA TIME	0 sec.	0-1800 sec.	10
Close on beam time	CLOSE ON BEAM	NO	NO/2-240 sec.	10,16
Delayed inversion time	DEL. INV. T.	5 sec.	0-1800 sec.	11
Short inversion time	SHORT INV. T.	1,5 sec.	0-100 sec.	11,12
Electrolock time	ELECTRIC LOCK	NO	NO/1-10 sec.	9,14
Reversing stroke time	REVERS. STROKE	0 sec.	0-1800 sec.	14
Final stroke time	FINAL STROKE	0 sec.	0-1800 sec.	14
Opening motor normal power	OP NORMAL POW	100%	30-100 %	9,13
Closing motor normal power	CL NORMAL POW	80%	30-100 %	9,10,13
Opening motor normal speed	OP NORMAL VEL	50Hz	10-100Hz	9,13
Closing motor normal speed	CL NORMAL VEL	50Hz	10-100Hz	9,13
Opening motor soft power	OP SOFT POW	80%	30-100 %	9,10,13
Closing motor soft power	CL SOFT POW	80%	30-100 %	9,10,13

TIMINGS

	LCD TEXT	DEFAULT VALUES	ADJUSTMENT	PAGES
Opening motor soft speed	OP SOFT VEL	25Hz	10-100Hz	9,10,13
Closing motor soft speed	CL SOFT VEL	25Hz	10-100Hz	9,10,13
Opening acceleration ramp time	OP ACCEL RAMP	1,5 sec.	0-100 sec.	9
Closing acceleration ramp time	CL ACCEL RAMP	1,5 sec.	0-100 sec.	9
Opening soft stop ramp time	OP SOFT RAMP	1,5 sec.	0-100 sec.	10
Closing soft stop ramp time	CL SOFT RAMP	1,5 sec.	0-100 sec.	10
Opening decceleration ramp time	OP DECC RAMP	1 sec.	0-100 sec.	10
Closing decceleration ramp time	CL DECC RAMP	1 sec.	0-100 sec.	10
Opening decceleration final speed	DCEL OP VEL	10 Hz	0-100 Hz	10
Closing decceleration final speed	DCEL CL VEL	10 Hz	0-100 Hz	10
Opening decceleration margin	DCEL OP MARGIN	15 %	0-15 %	10
Closing decceleration margin	DCEL CL MARGIN	15 %	0-15 %	10
Absolute encoder closed position (VF1EA)	ABS ENC I POS	0	0-65536	7,10,15
Absolute encoder opened position (VF1EA)	ABS ENC F POS	0	0-65536	7,10,15
Opening preflashing time	PREFLASH OP T	0 sec.	0-1800 sec.	9
Closing preflashing time	PREFLASH CL T	0 sec.	0-1800 sec.	9
Garage light time	GARG LIGHT T	0 sec.	0-60000 sec.	9,14
Opening electric brake power	BRAKE POW OP	2	0-4	13
Closing electric brake power	BRAKE POW CL	2	0-4	13
Current sensing obstacle detection sensitivity	M1 SENSIB.	5	0-9	7,12,23
Encoder obstacle detection sensitivity	M1 ENC SENS.	5	0-9	7,13
Obstacle detection current limit	M1 OBST. LIM.	3 A	0-16 A	7,12,23
Overcurrent limit	OC LIMIT	10 A	0-16 A	12

MAINTENANCE

This menu allows checking maneuver counters, input status, setting a maintenance password and loading default values.

VERSION

Shows the firmware version of the controller.

PARTIAL COUNTER

Shows the number of maneuvers performed since the last counter reset..Pressing ENTER will prompt for counter reset..

TOTAL COUNTER

Shows the number of maneuvers performed since the controller was last reset to default values.

INPUT STATUS

Shows the input status in the display. NOTE: Only enabled inputs will be shown..

RL1/RL2/RL3

These options allow activating in dead man mode all the relay outputs to test connected peripherals.

ENCODER

Shows the current gate position in form of encoder pulses.

MAX CONS.

Shows the maximum current draw registered during normal maneuvers.

MAX CON LEARN

Shows the maximum current draw registered during a learning maneuver.

OPEN/CLOSE

From this menu it is possible to control the motor in dead man mode with the ENTER key. This function ignores most of the controller safety measures so its use is only recommended to check the spin direction. It is recommended to use the <- and -> keys to move the gate in dead man mode when the controller is idle.

DEFAULT VALUES

Resets all configuration to default values (Factory defaults).

MENU MODE

It allows changing the menu system to an advanced version (explained later).

MAINT. LIM.

Allows setting a partial counter value from which the controller will blink the external power LED to indicate maintentenance is needed.

It is possible to have a relay close its contact in this situation by setting it to the MAINTENANCE function.

ENABLE PASSWD

Activates a password prompt to access the configuration menu. The default password is 1234.

CHANGE PASSWD

Allows chaning the password.

LANGUAGE

This allows changing the menu language.

ERROR LOG

The BOX L VF1D controller stores while it is powered the errors that occur during maneuvers. When there are errors to check the board will display an E in each border of the display. Find below a list of possible errors.

FAILED TEST SEG1/SEG2

Safety test has failed for the shown light barrier. Check the wiring and power.

CONFIG ERROR

An error has been detected in the configuration storage memory. If the error persists contact the technical service.

LOG ERROR

An error has been detected in the log storage memory. If the error persists contact the technical service.

OVERCURRENT MOTOR

A current draw higher than the configured limit has been detected.

MOTOR OC IGBT

An overcurrent event has been detected in the power circuit.

MOTOR OC

An overcurrent event has been detected in the hardware shortcircuit detector.

OBSTACLE MOTOR SENS

An obstacle has been detected using the current sensor. If no actual collision happened, reduce M1 SENSIB.

OBSTACLE MOTOR ENC

An obstacle has been detected using the encoder. If no actual collision happened, reduce M1 SENS. ENC.

OBSTACLE MOTOR LIM

An obstacle has been detected because of the configured current limit. If no actual collision happened, increment M1 LIM. PRES.

ENCODER STOP

The controller detected that the motor could not spin properly using the encoder. This can happen because the motor itself is locked or because it reached a limit.

LEARNING MISSING

It is mandatory to perform a learning maneuver before operating the gte normally.

SEC HELD

At least one safety is held active before starting the maneuver.

IGBT TEMP TOO HIGH

The power electronics temperature has risen above the safety limit.

LOW BUS VOLTAGE

Thecontroller does not receive enough input voltage or the motor is demanding more power than the controller can output.

INPUTS NOT AVAILAB.

The input reading circuit has stopped working. If the problem persists contact technical service.

ENCODER NOT AVAILAB.

The encoder reading circuit has stopped working. If the problem persists contact technical service.

ERROR ENCODER

Encoder readings are incorrect or unstable. Check the wiring, possible interference and encoder physical state.

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BRAKE CONNECTION

When using a motor with an electrome-chanical brake, it is necessary to pay attention to its connection; with frames without a 400V inverter, neutral and one of the motor phases are usually used to supply the brake rectifier, but with an inverter, the motor voltage cannot be used.

Motors with brakes normally have a rectifier tablet that transforms 230 VAC input into approximately 105 VDC to supply the brake coil, so that when 230 VAC is supplied, the brake is released and when it stops being supplied, it is blocked.

To ensure that the brake is released when the motor moves, 230VAC must be injected into the rectifier, for which the control unit provides a potential-free relay (RL3 by default). For correct operation, pass a 230VAC phase through this relay as shown in the figure below. Translated with www.DeepL.com/Translator (free version)
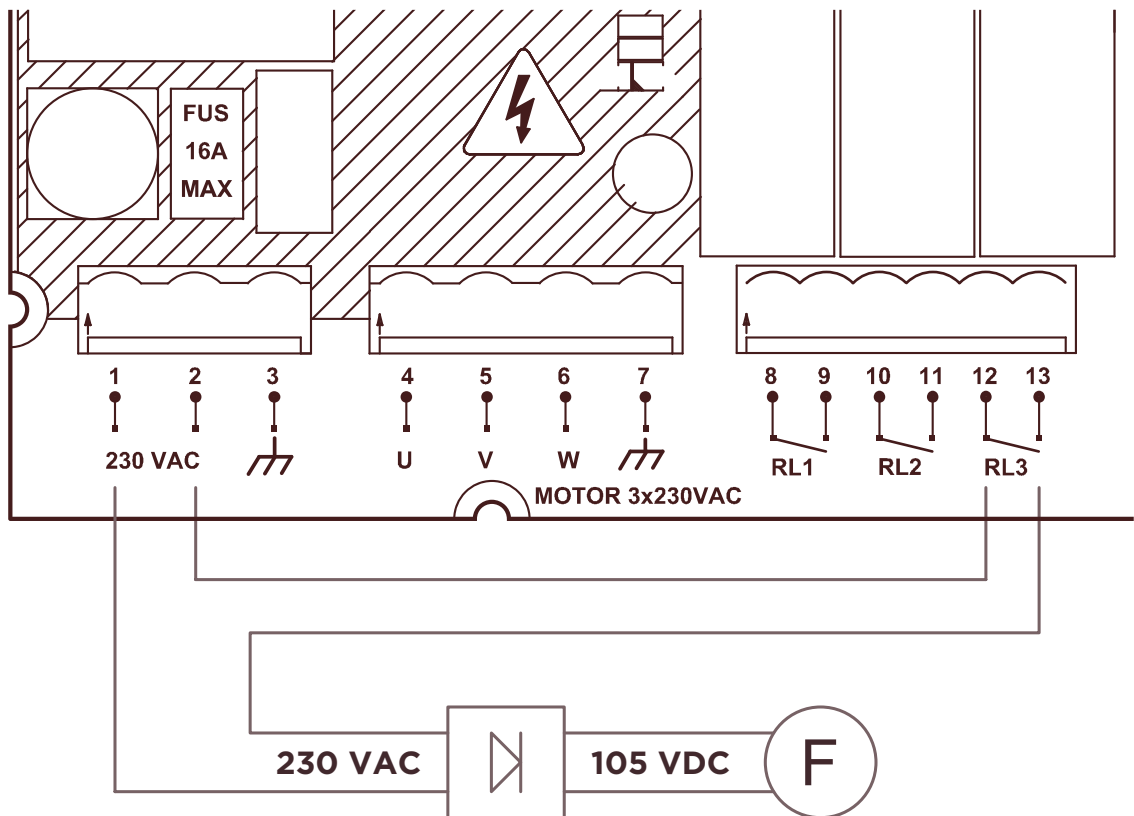
ABSOLUTE ENCODER WIRING

The BOX L VF1EA allows the connection of GFA-ELEKTROMATEN, SOMMER, MFZ-OVITOR and HORMANN motors to absolute encoders.

A special shielded cable for this connection is supplied with the control unit. Use the cable provided to avoid operating problems with the encoder.

The encoder of these motors is very sensitive to electromagnetic noise; normally these motors can be used without an inverter without problems but with an inverter it is necessary to take additional precautions for correct operation.

- Move the motor power cable as far away as possible from the encoder in the motor junction box; be careful with the coloured cables that usually go under the encoder as these also carry the motor power signal.

- Use the correct size of motor power cable and avoid making loops with it. Excess cable winding generates a lot of electromagnetic interference that affects the encoder and other sensitive devices.

- Install the ferrite included with the panel on the motor power cable as explained on page 4 next to the motor power output of the panel (terminals 4, 5, 6 and 7).

LIGHT BARRIER SHIELDING

Many light barriers are particularly sensitive to electromagnetic noise generated by inverters or modulating electronics. If the light barrier installed is working correctly when the motor is stopped but fails when in motion, it is being affected by this noise.

To solve this problem, the first thing to do is to make sure that the light barrier is correctly aligned and that the distance is not greater than that specified in the specifications.

If the problem persists :

- Supply the light barrier receiver with direct current either from the control panel power supply output (terminals 16 and 17) or from an external power supply.

- Run a short cable from the negative power supply terminal of the photo barrier receiver to the post or metal structure of the gate on which it is mounted, as shown in the figure below.

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RX

- (NEG)

TX
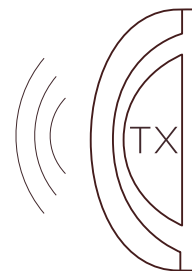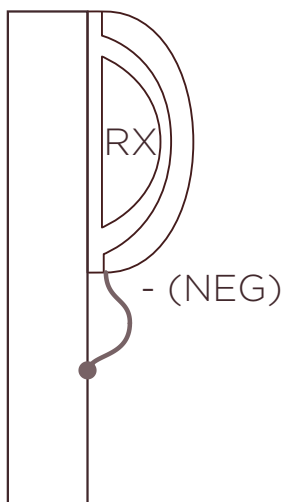
WARRANTY

This product has undergone a complete TEST during its manufacturing process that guarantees its reliability and proper operation. The manufacturer provides 24 months of warranty to the product from the date printed in the product and against any anomaly that it may present in its appearance or operation.

Any damage caused by third parties, natural causes (flooding, fire, lightning, etc), arising from improper handling or installation, vandalism or any other cause non attributable to the manufacturer will void the warranty.

The warranty only covers repairs or replacement of the damaged device.
Any expenses derived from assembling, travelling, transport, natural wear of parts, etc., and, in general, any expenses that are not part of the repairs or replacement of the damaged element of the system are excluded.

The installer/provider will ask the manufacturer for a RMA number or authorization for transport of the system in warranty. Without this previous requisite, the manufacturer will not be able neither to process nor provide warranty service.

WASTE OF ELECTRICAL AND ELECTRONIC DEVICES (WEEE)

In accordance with the European Directive 2012/19/EU about waste electrical and electronic equipment (WEEE), the presence of this symbol (see symbol at the bottom of this text) in the product or in the packaging, means that this article shall not be disposed in local non-classified waste streams.
It is the user's responsibility to dispose this product taking it to a collection point designed for waste recycling of electrical and electronic devices. The separate collection of this product helps optimize the waste sorting and recycling of any recyclable material and also decreases the impact on health and the environment. For more information about the correct wasting of this product, please contact the local authority or the distributor where you acquired this product.

TECHNICAL CHARACTERISTICS

Power supply	230VAC
Maximum load	2CV / 1,5kW
AC main fuse	10A
Power outputs	24VAC 12W / 15VDC 3,5W
Power output protection	Fusibles rearmables
Maneuver control inputs	8 high insulation optocoupled inputs 2 analog
Plug-in cards	Radio
LCD Display	2x16 characters Chip-on-glass technology - Backlight
Working temperature	-20ºC / 70ºC
Casing	ABS
Dimensions	L280 x W196 x H90 mm
Weight	2250 gr
Watertightness	IP54 (IP65 with cable glands)

ESPAÑOL

ENGLISH

FRANÇAIS

ITALIANO

PORTUGÊS

DEUTSCH

NEDERLANDS

CE DECLARATION OF CONFORMITY

The company	ELSON ELECTRÓNICA, S. A. Pol. Torrelarragoiti, P6 – A3 48170 Zamudio – Vizcaya (SPAIN)
Declares: The product Manufactured	BOX L VF1D motor controller
Under the trademark	**SMINN**
For use in	Residential, Commercial or light industry environments.

This device meets the provisions as long as its usage is compliant to what was envisaged, having applied the following regulations.

Directive 2014/30/EU - Electromagnetic compatibility

Directive 2014/35/EU - Low voltage

Directive 2006/42/EC - Machinery

Directive 2011/65/EU - RoHs

Directive 2012/19/EU - WEEE

Zamudio - 02.26.2016
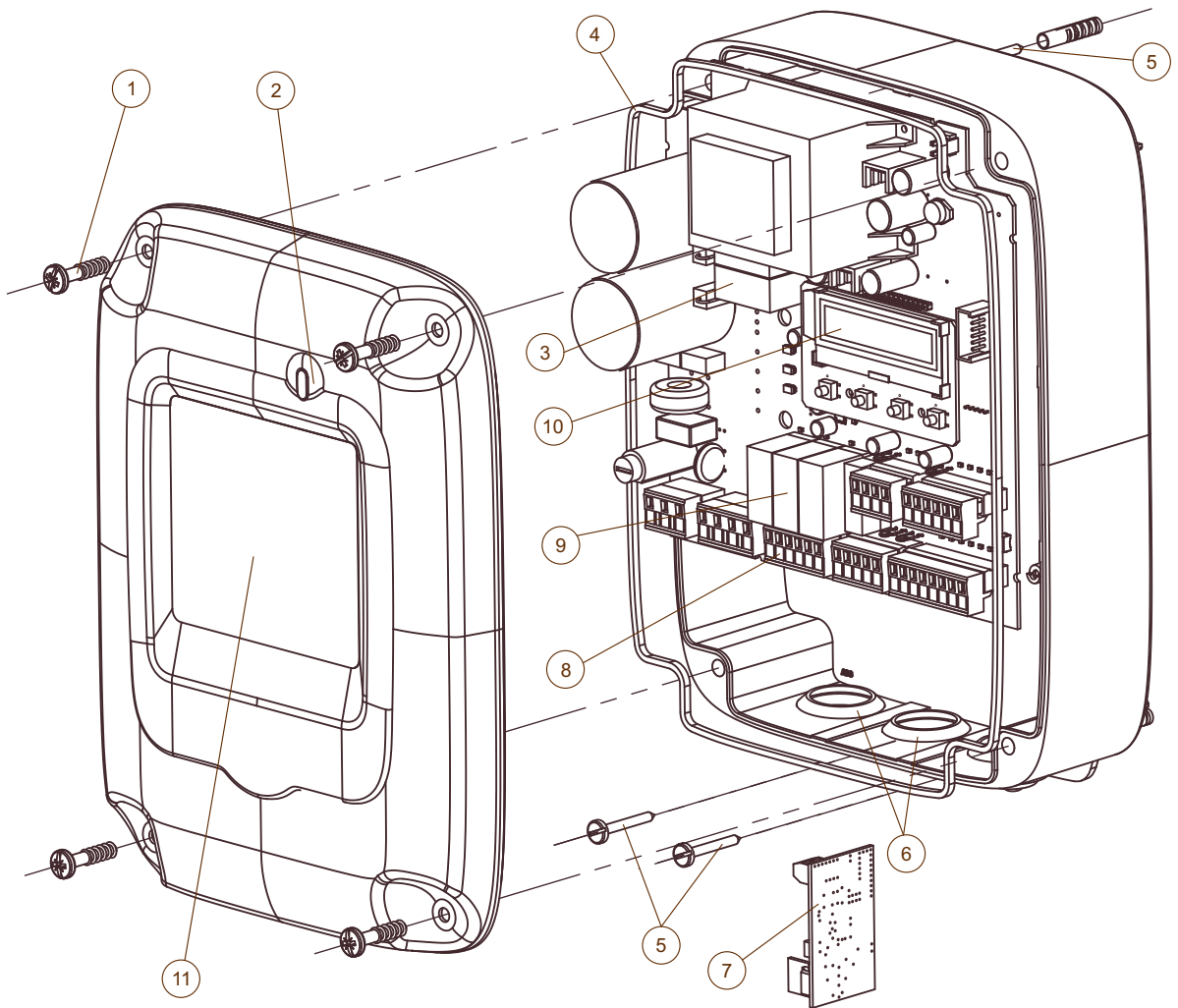
José Miguel Blanco Pérez
Chief Technical Officer

SMiNN
innovative in electronics

NOTES

VF1D EXPLOSION

Fig3

1. Captive screws
2. Power status LED
3. Bus charging relays
4. Vacuum rubber gasket
5. External fixing with just three screws
6. Access ports for 16/24mm tubes

7. Radio card
8. Plug-in terminal blocks
9. Power relays
10. Display
11. Frontal space for installer/revision sticker

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