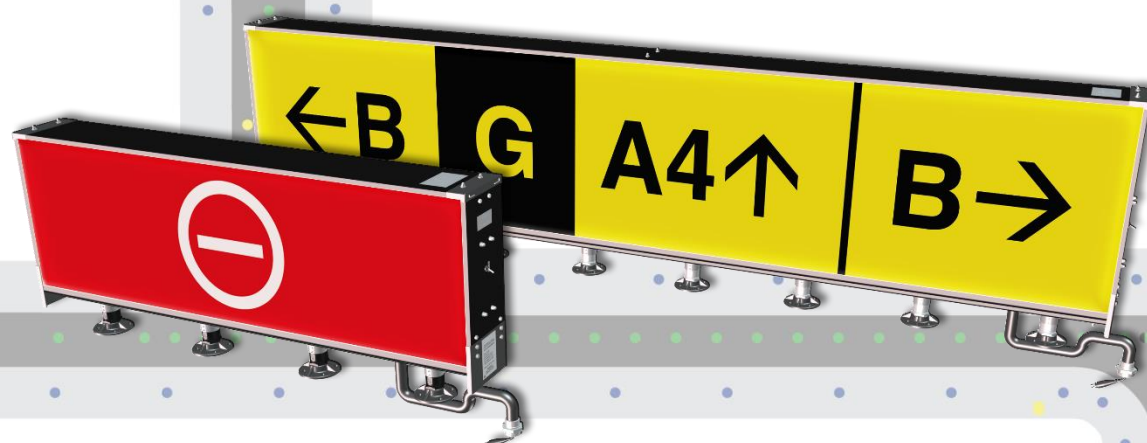


Use and Maintenance Manual



LED LUMINOUS GUIDANCE SIGN



Contact us

OCEM AT



+39 051 66 56 611



info@ocem.com

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LED LUMINOUS GUIDANCE SIGN INSTRUCTION MANUAL FOR USE, INSTALLATION AND MAINTENANCE

LIMITED PRODUCT WARRANTY

THE FOLLOWING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT BY WAY OF LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

OCEM - ENERGY TECHNOLOGY warrants to each original Buyer of Products manufactured by the Company that such Products are at the time of delivery to the Buyer, free of material and workmanship defects, provided that no warranty is made with respect to:

- (a) any Product, which has been repaired or altered in such a way, in Company's judgement, as to affect the Product adversely;
- (b) any Product which has, in Company's judgement, been subject to negligence, accident or improper storage;
- (c) any Product which has not been operated and maintained in accordance with normal practice and in conformity with recommendations and published specification of Company;
- (d) the breaking of the warranty seals, if present, determines the immediate termination of the warranty; and,

OCEM - ENERGY TECHNOLOGY's obligation under this warranty is limited to use reasonable efforts to repair or, at its option, replace, during normal working hours at the facility of the Company, any Product which in its judgement proved not to be as warranted within the applicable warranty period. All costs of transportation of Products claimed not to be warranted and of those repaired or replaced, to or from the facility of the Company shall be borne by Purchaser. Company may require the return of any Product claimed not to be as warranted to its facility, transportation prepaid by Purchaser, to establish a claim under this warranty. The cost of labour for the installation of a repaired or replaced Product shall be borne by Purchaser. Replacement parts provided under the terms of this warranty are warranted for the remainder of the warranty period of the Products upon which they are installed to the same extent as if such parts were original components thereof. Warranty services provided under the Agreement do not assure uninterrupted operations of Products; Company does not assume any liability for damages caused by any delays involving warranty service.

IMPORTANT: READ THIS DOCUMENT

Before proceeding to the operations of installation, commissioning, operation, maintenance or disposal, carefully read the entire document.

SAFETY INFORMATION

Extreme caution should be exercised when working with this equipment; it is normally used or connected to circuits that operate at dangerous voltages and can be fatal.

The following section contains important safety information that you must follow when installing and using the apparatus.

Misuse of the equipment or lack of care in applying safety procedures and prescriptions specified in this document, may result in a hazard.

Avoid contact with voltage or current sources.

For no reason the protections and the safety devices must be removed.

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OPERATION ON THE EQUIPMENT - SKILLS

Operation on the equipment and access to its internal parts shall be done by experienced personnel, adequately trained and aware of the risks related to electricity and high voltages.

Safety rules shall be adopted when operating on the equipment, or on cables and other apparatus connected to the it

DO NOT OPERATE ON ENERGIZED CIRCUITS

Do not carry out any operation on the converter or on apparatus connected to it when the circuits are energized.

WHEN HANDLING AND SERVICING THIS EQUIPMENT, OBSERVE PRECAUTIONS FOR HIGH VOLTAGE EQUIPMENT.

Before any access, inspection or intervention, be sure to have switched-off the unit, opened the main circuit breaker and removed the supply to the unit (by opening the circuit breaker/switch on the distribution board at the beginning of the supply line).

Then wait discharge time (at least 5 minutes), ground carefully the system, and check for voltage presence before accessing..

REANIMATION

The maintenance staff must be aware of the risks related to electricity, criteria to prevent the risk of electric shock and resuscitation techniques

CE MARK



This equipment complies with the requirements of European regulations for the CE mark. The user has to respect all prescriptions reported in this document.

This equipment complies with the requirements of the EEC directives 2004/108/EEC and 2006/95/EEC with regard to "Electromagnetic Compatibility" and "Low Voltage Electrical Apparatus" respectively.

OUT OF SERVICE

In case of dismantling, decommissioning, destruction, disposal, the user shall follow all the required precautions for component and material elimination, according to local rules and applicable law.

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1 GENERAL

The internally LEDs illuminated LIGS01 signs are designed to be used on airport taxiways and runways to convey a mandatory instruction, information on a specific location or destination on a movement area or to provide other information to meet the requirements of Surface Movement Guidance.

White on Red, Yellow on Black and Black on Yellow colour combination may be ordered with any desired message.

Signs are available as single or double faced.

The LED light signs LIGS01 can be powered in two ways:

- Current power supply:

The signs must be powered by series circuits through isolation transformers, connected to constant current regulating units (CCR) variable from 2.8 A to 6.6 A (5-step CCR) or from 4.8 A to 6.6 A (3-step CCR) or fixed at 6.6 A (1-step CCR).

The power to be used for sizing the isolation transformer and the CCR depends on the length of the sign and are shown in paragraph 3.2.1

- Voltage Power supply:

The signs must be powered from the 230V / 50Hz by placing a 230V-37V / 50Hz transformer.

NOTE: THE TRANSFORMER IS NOT PART OF THE SIGN AND IS NOT PROVIDED BY OCem Airfield Technology

The minimum recommended power for the transformer depends on the length of the sign and is shown in paragraph 3.2.2.

LIGS signs are in compliance with ICAO - Annex 14 Vol.1, EASA CS-ADR-DSN and NATO-STANAG 3316.

Consult ICAO Specs - Annex 14 and ICAO Aerodrome Design Manual - Part 4 - Visual aids, for sign features and use.

2 CLASSIFICATION OF SIGNS

2.1 Type/message

Mandatory signs	White legend on Red background
Information (location) signs	Yellow legend on Black background
Information (direction, uscita pista, destination, runway vacated, TORA, VOR) signs	Black legend on Yellow background

Table 1 - Types of signs

A sign may consist of multiple arrays of the above messages.

2.2 Legend Sizes

Height of large legend	400 mm
Height of mid legend	300 mm

Table 2 - Legend Sizes

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2.3 Part Number Identification

LIGS 01 – 32 – 1 – XX

Basic Part Number: _____

Version: _____

Size: _____
 3 = Sign, 300 mm Legend Height (Frame 600)
 4 = Sign, 400 mm Legend Height (Frame 800)

Number of Faces: _____
 1 = Single Face
 2 = Double Face

Number of Modules*: 1 to 4 _____

Options: _____
 01 = Tether
 10 = Monitoring
 18 = Double power supply for 3 and 4 module signs
 48 = Reinforced version 480 km/h (FAA mode 3)
 69 = Orange rear side for single face signs (Italy ENAC only)
 70 = Bird Spikes
 71 = ON-OFF Key switch
 D2 = Supply voltage (an external 230/37 Vac transformer is required)
 S4 = Frame H600mm with legend H400mm

*** One module corresponds to (approx.) 1 meter. 4 modules signs are not compliant with the recommendations of ICAO Aerodrome Design Manual - Part 6 - Frangibility (maximum length of the signs: 3m), but are available upon request.**

3 MAIN FEATURES

3.1 Environmental Data

Temperature	-40°C to +55°C
Weather	All outdoor conditions, exposure to: driving rains, snow and icing, salt-laden atmospheres, relative humidity from 5 % to 95 %.
Wind Speed	322 km/h ICAO Aerodrome Design Manual Part 6 Frangibility (standard version; 480km/h with option 48)
Radio Interference	None

Table 3 - Environmental Data

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3.2 Electrical Data

3.2.1 Current Power Supply

The luminous signs are powered by series circuits through isolating transformers, meeting FAA Specs FAA L830-L831, in the following ratings (see table 4), depending on the type of Constant Current Regulator (CCR) that is feeding the signs:

SIZE TRANSFORMERS case SCR CCR					
TRANSFORMER RATING [W] to the currents of:		Sign modules			
		1	2	3	4
6,6A		65	150	200	300
4,8 - 6,6A		100	150	300	300
2,8A - 6,6A	STANDARD	150	300	400	500
	Opt.18	//	//	//	2x300

SIZE TRANSFORMERS case Sinusoidal					
TRANSFORMER RATING [W] to the currents of:		Sign modules			
		1	2	3	4
6,6A		65	100	150	200
4,8 - 6,6A		65	150	200	300
2,8A - 6,6A	STANDARD	100	200	300	400
	Opt.18	//	//	//	2x200

Table 4 -Series Insulating Tranformer size

The power required to CCR per each sign is (depending on the number of current steps with which the circuit is feeding the signs):

Sign Modules	CCR Total Load		
	2.8 A-6.6 A 5 STEP	4.8 A-6.6 A 3 STEP	6.6 A 1 STEP
1	92 VA	53 VA	39 VA
2	176 VA	103 VA	75 VA
3	260 VA	152 VA	110 VA
4	344 VA	201 VA	146 VA

Table 5 - CCR Total Load

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3.2.2 Voltage power Supply

The light signs are powered with voltage 230V / 50Hz, through transformers 230V-37V / 50Hz, of the following minimum size (**NOTE: THE TRANSFORMER IS NOT PART OF THE SIGN AND IS NOT PROVIDED BY OCEM Airfield Technology**)

The minimum rating of the transformers 230V-37V / 50Hz are:

SIGN MODULES	1	2	3	4
TRANSFORMER RATING [VA]	60	110	160	220

Table 6 - Rating of the transformers 230V/37V-50Hz

The Power absorbed by each sign is (input 37V):

SIGN MODULES	1	2	3	4
ABSORBED POWER [W]	29	57	85	113

Table 7 - Power absorbed by the signs (37V input)

The maximum input current to the signs (input 37V) and to the relative transformer (input 230V) are:

SIGN MODULES	1	2	3	4
MAXIMUM CURRENT Input signs [Arms]	1.6	4.1	4.7	6.2
MAXIMUM CURRENT Input transofrmer [Arms]	0.4	0.7	1.0	1.4

Table 8 - Input current to the signs (37V) and relative transformer (230V)

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3.3 Luminance Data

The luminance of the sign faces is practically constant for any value of the series circuit current from 2.8 A through 6.6 A and the relevant values of OCEM LIGS are shown in the following table:

LEGEND SIZE	HEIGHT OF SIGN FACES	COLOURS		
		RED	YELLOW	WHITE
400 mm	800 mm	50	190	350
300 mm	600 mm	55	210	390

Table 9 - Luminance Data in cd/m² 6.6 A

ICAO requirements where operations are conducted in runway visual range (RVR) conditions less than a value of 800 m, average sign luminance shall be at least:

Red 30 cd/m²

Yellow 150 cd/m²

White 300 cd/m²

NOTE: the electrical and luminous data are referred to constant current regulators and isolating transformers manufactured and/or distributed by OCEM. The data may change with constant current regulators and/or transformers manufactured by other Companies.

3.4 Description of the Signs

The signs practically include the following sections (See Figure 1 – Overall Dimensions)

- main structure
- panels for faces
- LEDs luminous source
- electronic boards.

3.4.1 Main Structure

The main structure principally consists of a bearing bottom structure, two sides, one top cover and assembling-supporting components.

Bottom structure, sides and top cover are made of extruded aluminium profiles, realized according to our design.

The signs may be considered as divided in modules, each approx 1000 mm long.

Quantity and types of assembling-supporting components depend on the number of sign modules. Each module is supported by two mountings, each including a leg, a breakable coupling and a floor flange. All these components are cast aluminium.

The signs are equipped with a single top cover, locked to the main structure by means of four hexagonal knob. The main structure is matt black outside painted.

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3.4.2 Panels for Faces

The panels for faces are made of high performance methacrylate 5 mm thick.

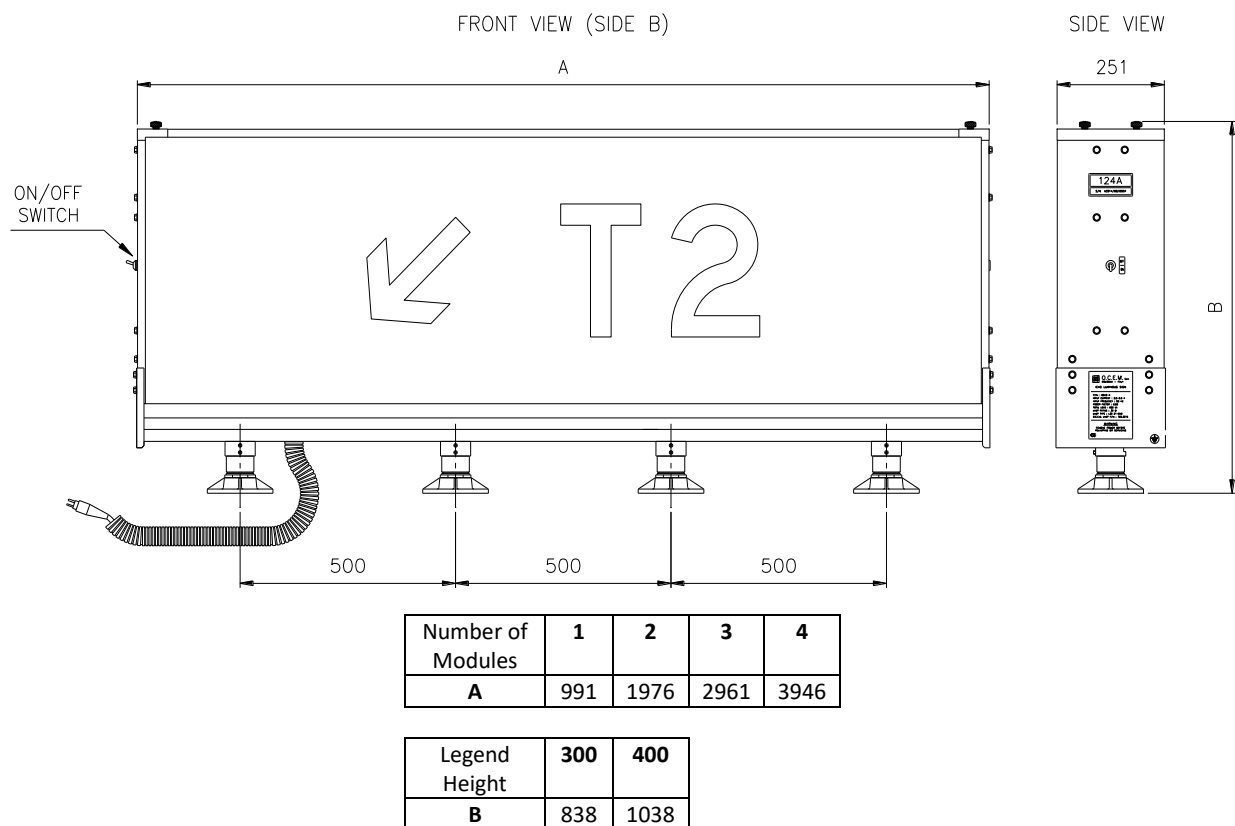


Figure 1 – Overall Dimensions

3.4.3 LEDs Luminous Source

Each sign module is illuminated by two luminous sources.

LEDs are high efficiency type, white colour with average life 60.000 hours.

The positioning of the LEDs has been determined through photometric tests so to meet the illumination values as required by ICAO Specs - Annex 14.

LEDs provide constant level illuminance.

3.4.4 Electronic Boards

3.4.4.1 Current power Supply

In case of current supply, the sign is equipped with a current converter completely assembled on an encapsulated electronic board.

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By varying the current of the CCR in the range 2.8 - 6.6 A, the current converter provides a constant current to each luminous source. This allows a constant luminance regardless the step of the CCR.

For the electrical connection to the isolating transformer the sign is equipped with a two-pole cable lead with L-823 plug, 1650 mm long (the standard item; or 2,5 m special length).

A flexible plastic pipe of suitable length is provided for cable protection; the pipe has to be fitted inside a coupling (included in the supply) with G 2" threaded lower section.

3.4.4.2 Voltage Power Supply

In case of voltage supply, the sign is equipped with an AC voltage / DC current converter, consisting of an electronic board housed in an aluminum "tank" entirely filled with resin for the protection of humidity.

The converter always supplies a constant current to each light source. This allows for constant illumination.

For the electrical connection to the isolating transformer the sign is equipped with a two-pole cable lead with L-823 plug, 1650 mm long.

A flexible plastic pipe of suitable length is provided for cable protection; the pipe has to be fitted inside a coupling (included in the supply) with G 2" threaded lower section.

3.4.5 External power switch

An external power disconnecting ON-OFF switch is provided to break all electrical connections to the sign for safe maintenance.

See from Figure 4 – 1 MODULE 6.6A Signs- Wiring Diagram a Figure 12 – 4 MODULES 6.6A Signs with OPTION 18 - Wiring Diagram for the wiring diagram of each type of sign.

4 INSTALLATION

- a) Take as reference Figure 1 – Overall Dimensions, for spacing between breakable couplings.
- b) Remove the sign from the relevant packing.
- c) The signs are normally installed so that the cable entry is located toward the runway or taxiway edge. As general rule when facing side B the cable entry is placed on the left side.
- d) The concrete foundation for the sign should be flat and levelled. Refer to Figure 3 for relevant data. The isolating transformer must be placed inside a concrete pit complete with pipe elbow for the secondary cable passage or inside a steel base complete with upper plate with 2"-11 GAS threaded coupling for the plug-socket connection.

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- e) It is recommended that the anchor bolts, used for the flange anchoring, are mounted after the completion of the concrete foundation. The anchor bolts have to be walled accurately as shown in Figure 2 – Flange Installation with Anchor Bolts. Be careful to position the threaded flanges with the ribs parallel to the table axis as indicated on the flanges themselves and in a manner to ensure the parallelism of the centreline marked on the flange and the centreline sign.
- f) Remove the frangible couplings/floor flanges from the bottom of the sign by loosening the locking screws (set screw M8x14).
- g) Taking care of the levelling of the floor flanges is very important to ease the installation of the sign. Place a long carpenter level across the top of the breakable couplings to verify their alignment and levelling. Do not tighten the flanges anchor nuts, tight (only finger-tight) until the sign installation is complete.
Lower the sign with the legs onto the frangible couplings and tight the locking screws. Check the sign to be sure that it is levelled. Shim the floor flanges as required and put drying grout under the flange if necessary.

NOTE: some vertical adjustment can be obtained by rotating the frangible couplings a turn or two in the floor flanges.

- h) Once the sign has been levelled, tighten the anchor nuts securely. (**NOTE: anchor hardware is not supplied with the sign**). Anchor hardware should be corrosion resistant.

i) **IMPORTANT**

CONNECT THE GROUND CABLE of the airport circuit to the ground terminal of the sign located on the bottom panel of the sign itself (6 mm² recommended).

- j) Pass the cable lead with plug through the coupling for flexible pipe and connect the cable lead with plug of the sign to the socket of the isolating transformer (be sure that the cable lead with plug be passed through the coupling for flexible pipe). The plug-socket connection should be secured inside the pipe elbow by using the suitable pair of plastic rings or inside the baseplate by using the relevant supporting ring. Screw the coupling to the pipe elbow or to the baseplate, fit the flexible pipe inside it and provide sealing between pipe and coupling.
- k) After the signs have been installed, turn the circuit on to the lowest step and check to see that all the signs are lighted.

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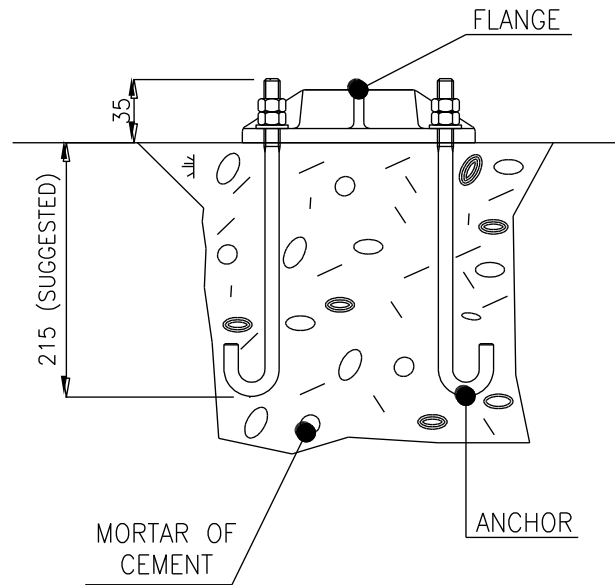
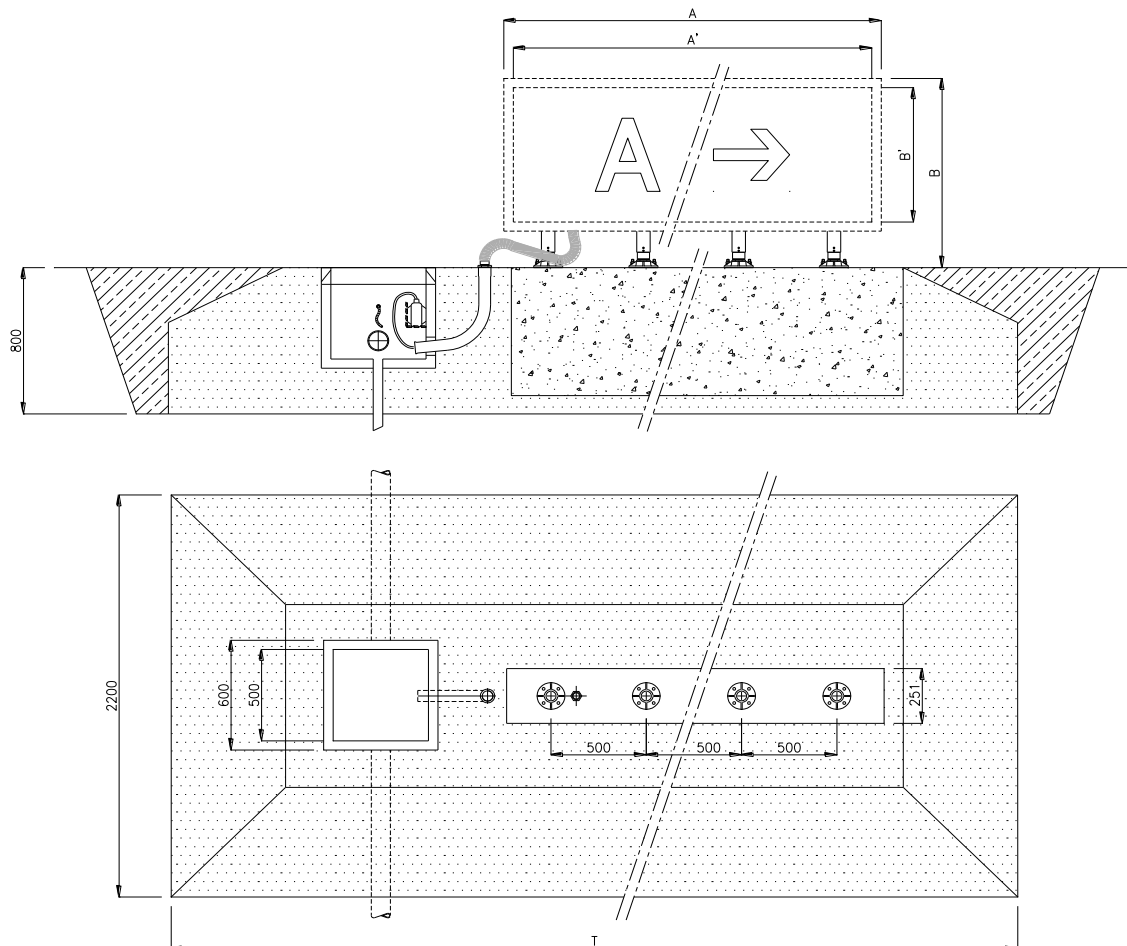


Figure 2 – Flange Installation with Anchor Bolts



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	Number of Modules			
DIMENSION	1	2	3	4
A	991	1976	2961	3946
A'	955	1940	2925	3910
T	3366	4351	5336	6321

	Legend Height	
DIMENSION	300	400
B	838	1038
B'	600	800

Figure 3 – Concrete Foundation

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5 MAINTENANCE

ATTENTION!

Never operate on electrical and electronic equipment while the CCR is ON.

5.1 Periodical Checks

Daily	Check for burned-out led
Monthly	Check for dirty panels
Semi-Annual	Check for loose wire connections
	Check for cracked or deteriorated wires

5.2 LEDs Luminous Source Replacement

LEDs used in the sign have a long average life. When replacement becomes necessary, follow the procedure below:

- Be sure that the series circuit is de-activated (regulator unit CCR off or Main switch of the 230Vac line open according to the type of sign); in any case turn the main switch to OFF position
- Loose the four screws of the cover and remove it
- Disconnect the connectors of the damaged LEDs luminous source and loosen the four nuts at the angles of the support, then slide and lift the support to extract it from its seat
- Unscrew the six screws of the damaged LEDs luminous source, replace it and restore the initial condition
- Mount the top cover with reverse procedure
- Turn the main switch to ON position, turn On the CCR or close the 230V main switch and check the correct operation of the sign.

5.3 Electronic Equipment Replacement

If troubles to the electrical/electronic are suspected proceed as follows:

- Be sure that the series circuit is de-activated (regulator unit CCR off or Main switch of the 230Vac line open according to the type of sign); in any case turn the main switch to OFF position
- Remove the top cover by loosening the relevant four screws
- Check the wiring, the connection to the terminal strips and the continuity

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- d) If necessary replace the power supply board
- e) Mount the top cover with reverse procedure
- f) Turn the main switch to ON position, turn On the CCR or close the 230V main switch and check the correct operation of the sign.

5.4 Troubleshooting

Problem	Problem cause	Solution
The sign is totally or partially not lighted	Defective LED(s) on luminous source(s)	Replace the LED(s) luminous source(s)
	Defective isolating transformer	Replace isolating transformer
	Defective power supply board	Replace power supply board
	The main switch is left to OFF position	Turn the switch to ON position
	Bad connection	Check wiring

Table 10 - Troubleshooting

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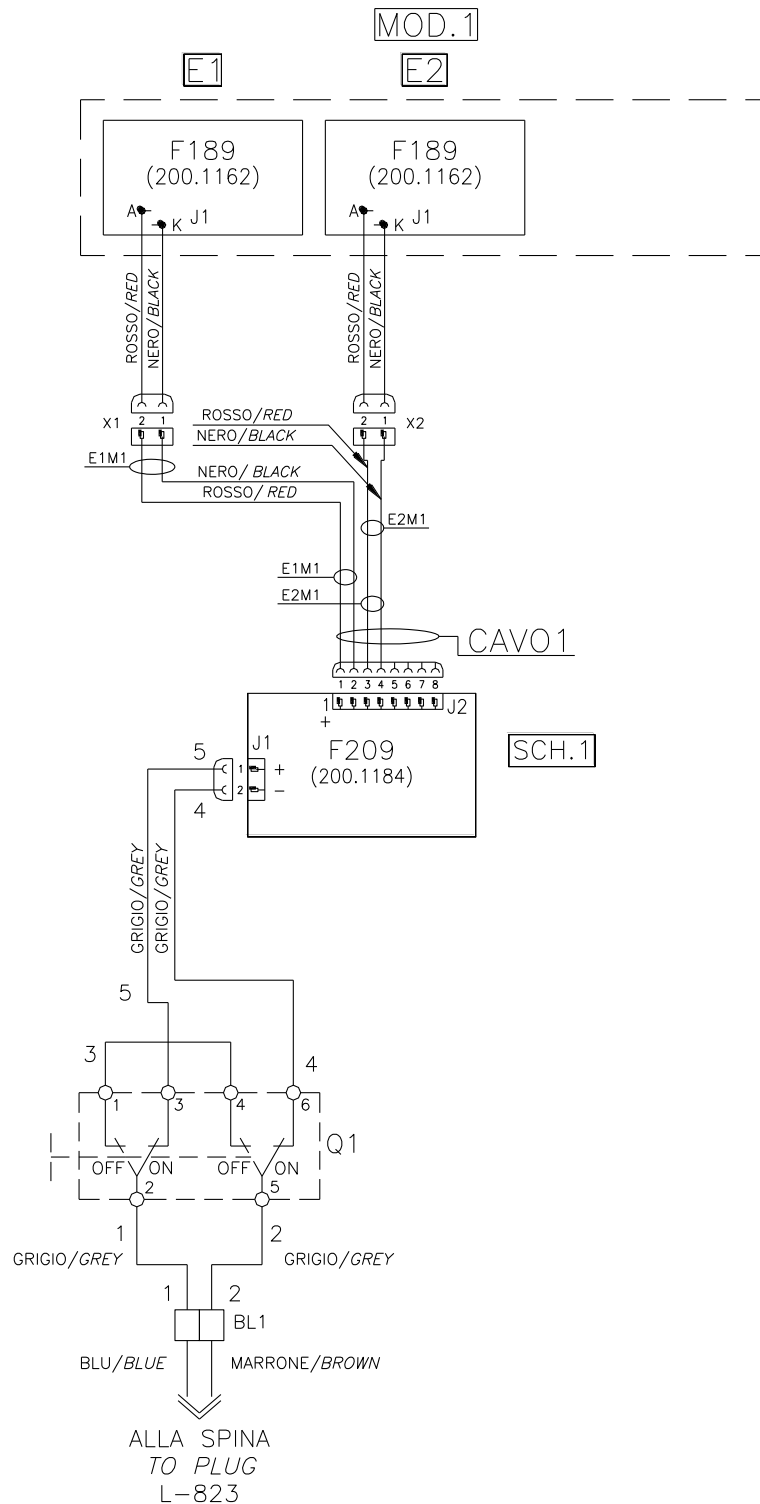


Figure 4 – 1 MODULE 6.6A Signs- Wiring Diagram

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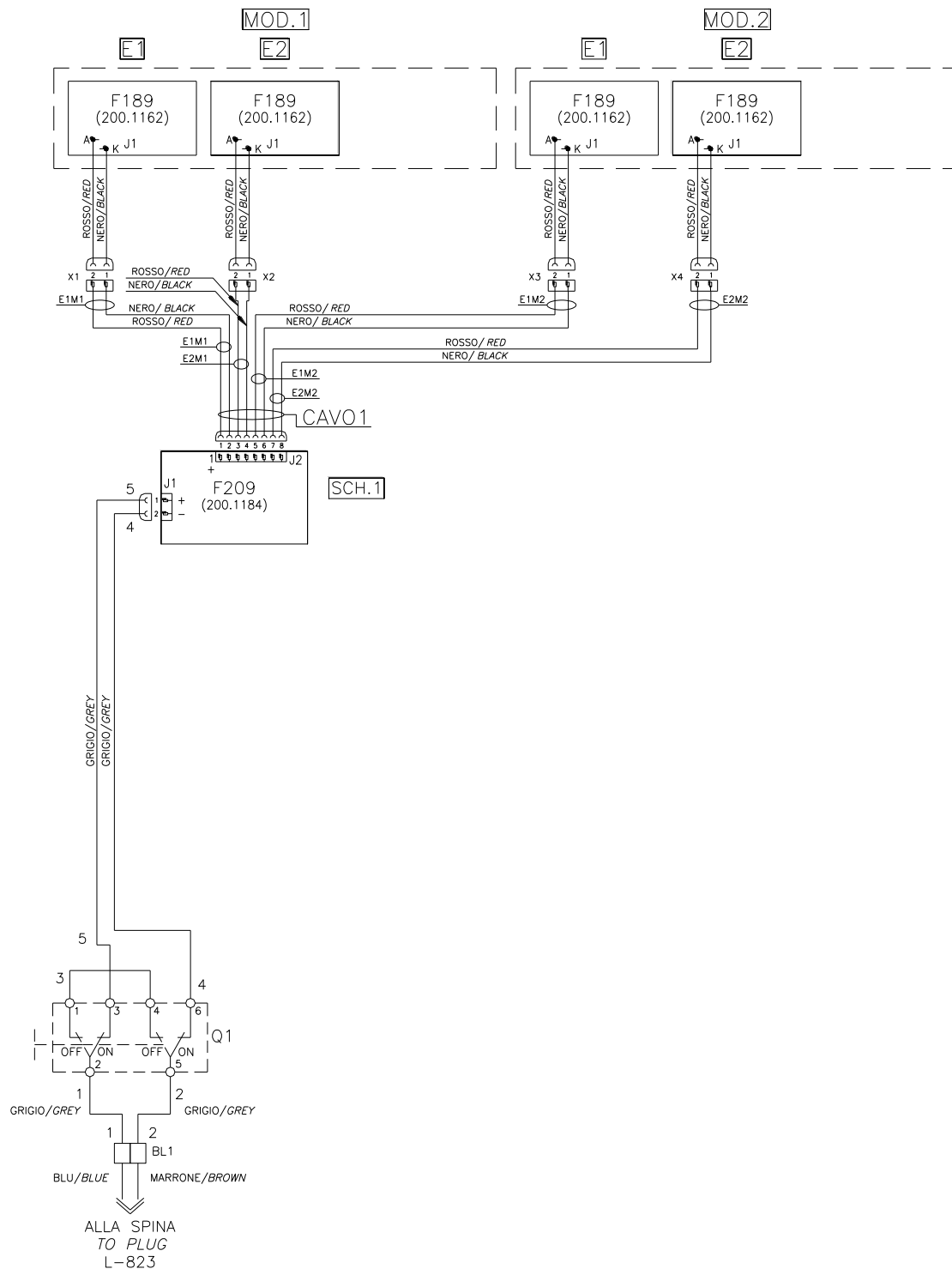


Figure 5 – 2 MODULES 6.6A Signs - Wiring Diagram

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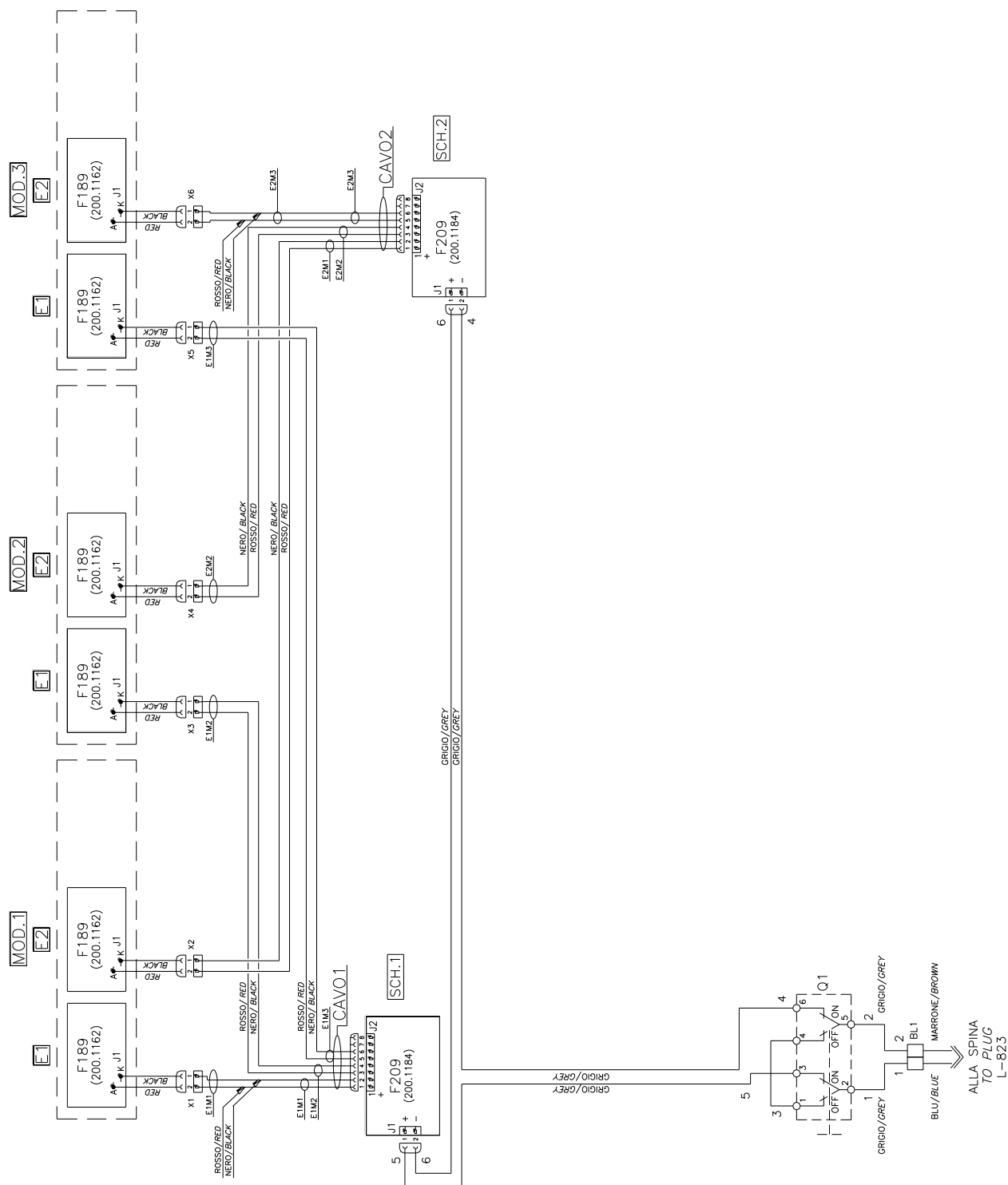


Figure 6 – 3 MODULES 6.6A Signs - Wiring Diagram

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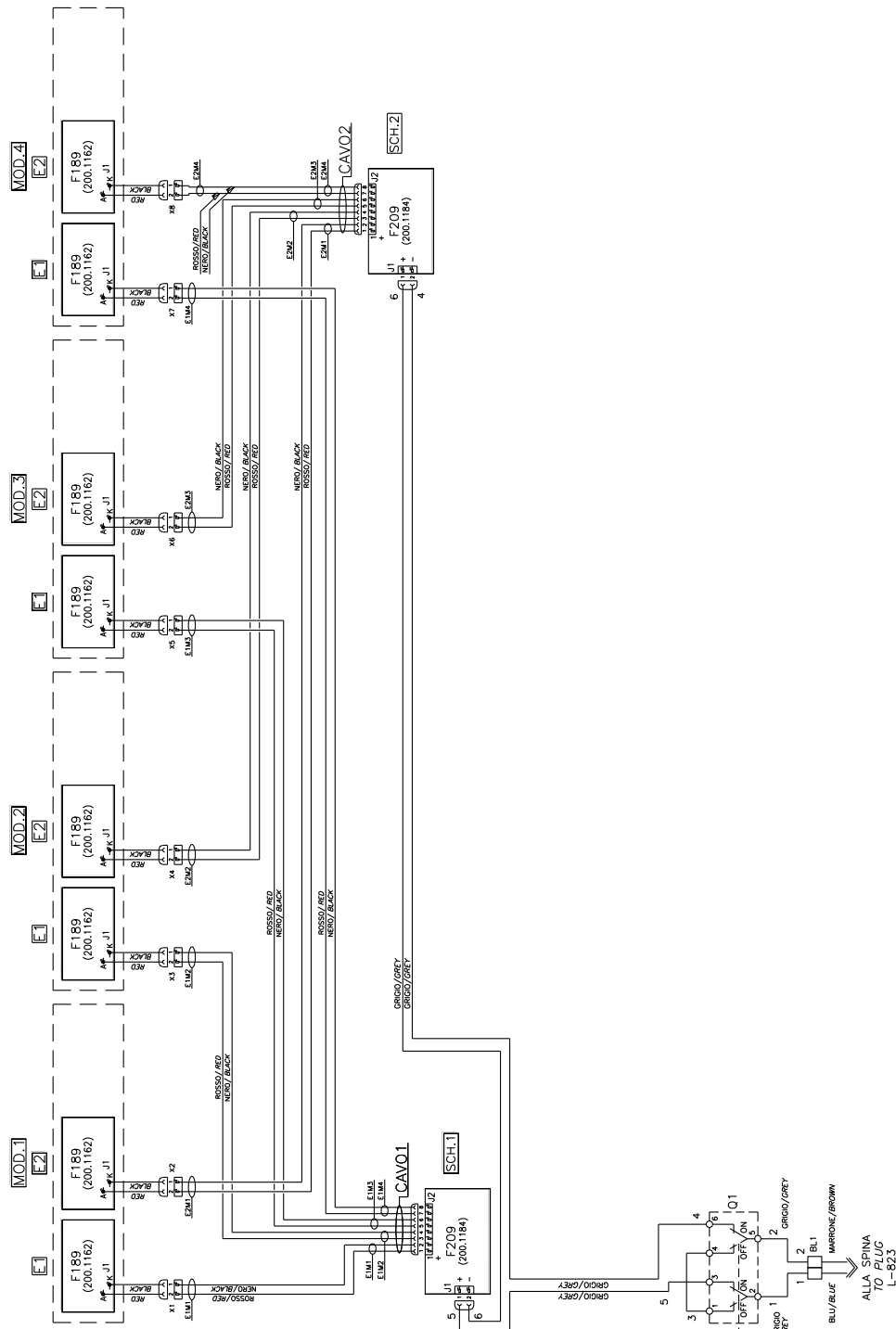


Figure 7 – 4 MODULES 6.6A Signs - Wiring Diagram

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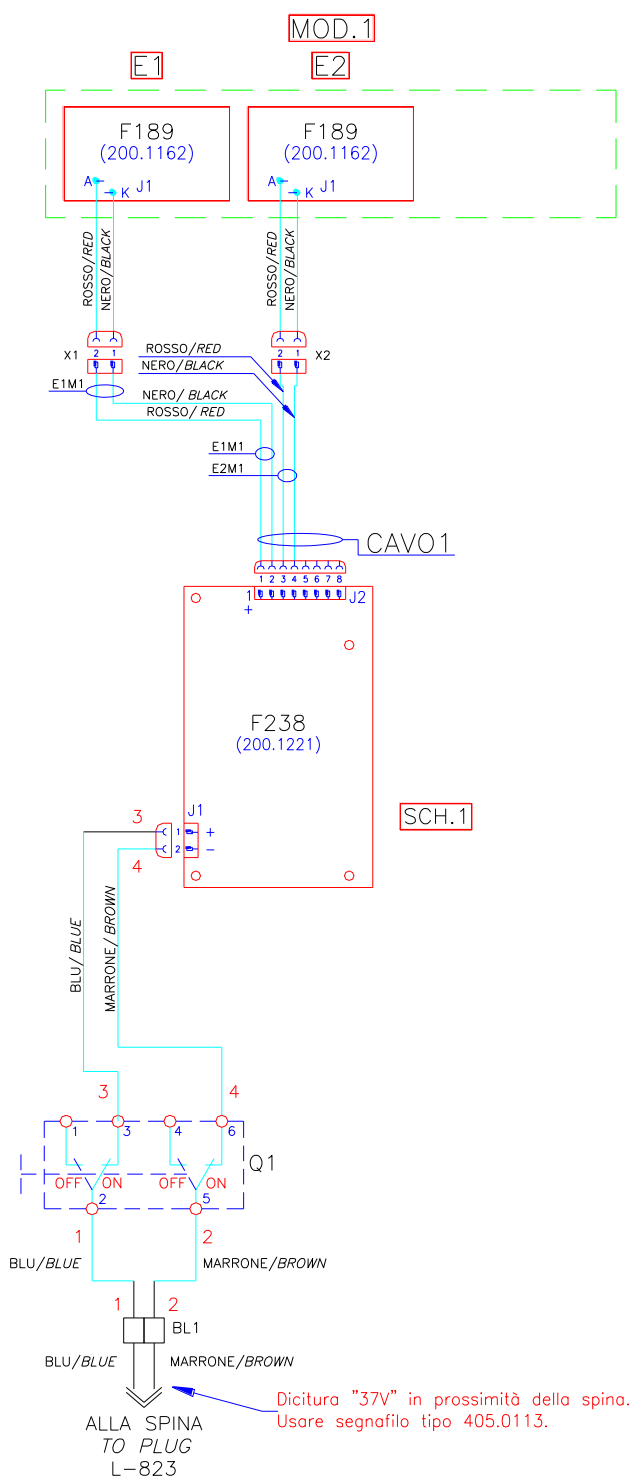


Figure 8 – 1 MODULE 230V/37V Signs - Wiring Diagram

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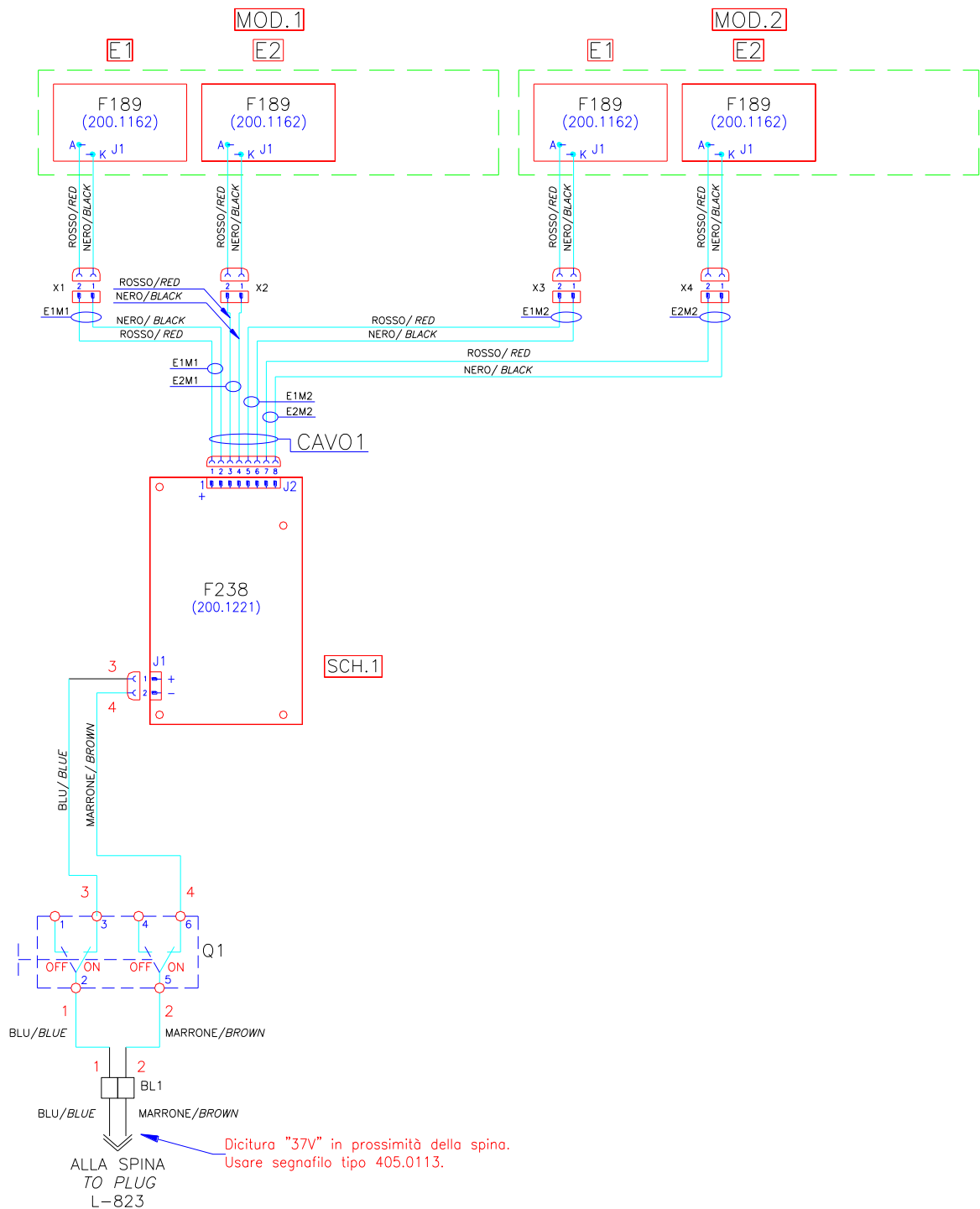
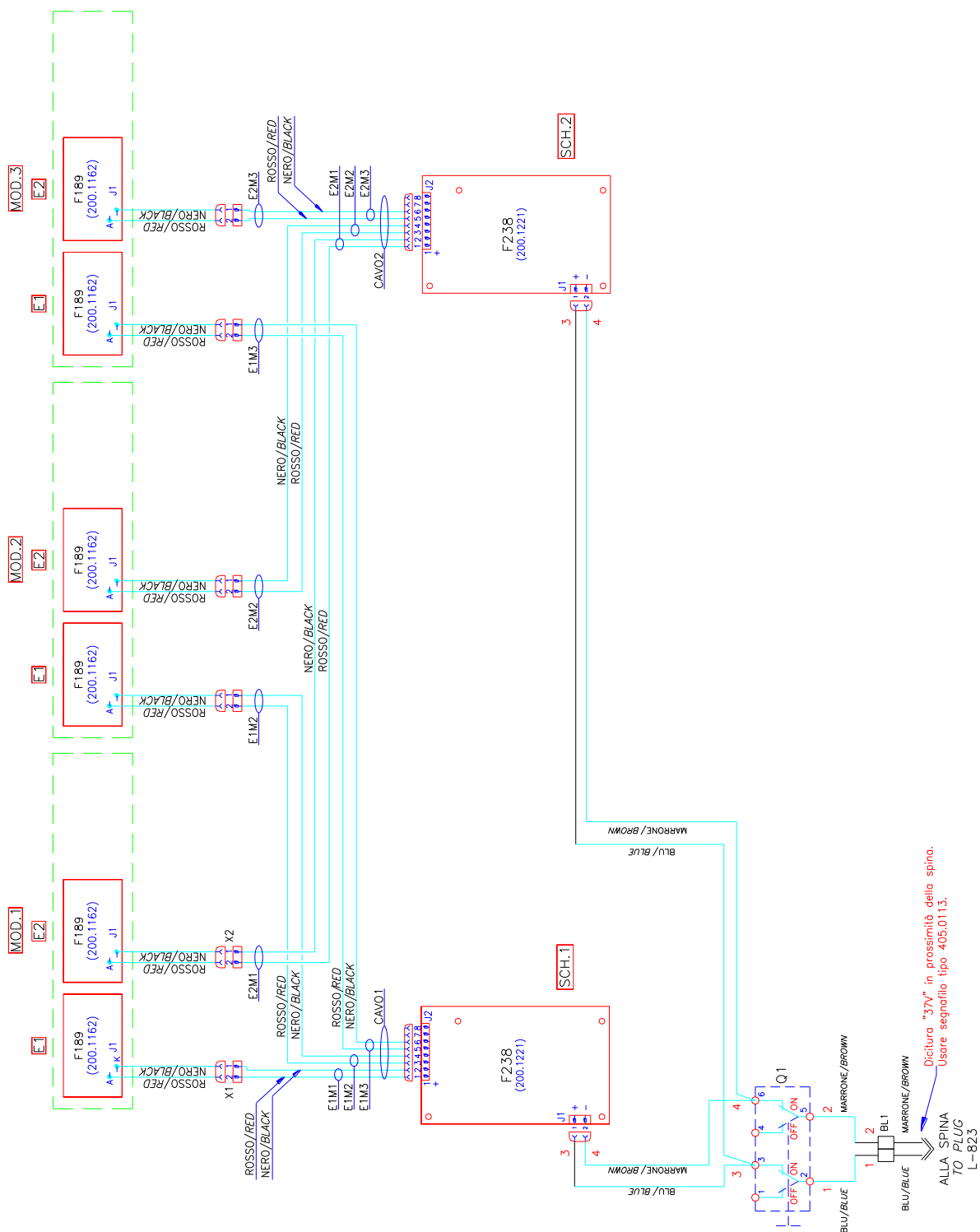


Figure 9 – 2 MODULES 230V/37V Signs - Wiring Diagram

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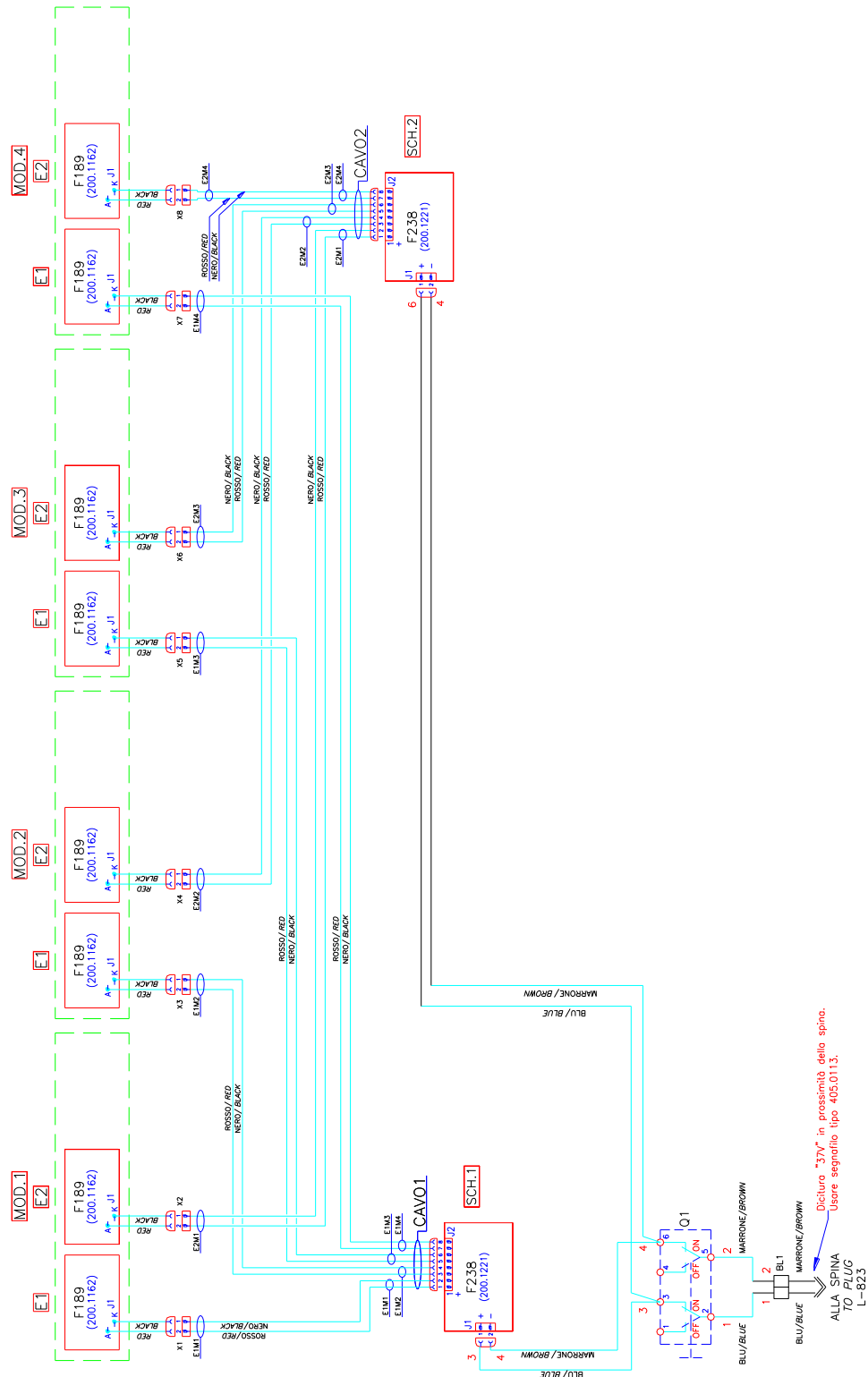


Figure 11 – 4 MODULES 230V/37V Signs - Wiring Diagram

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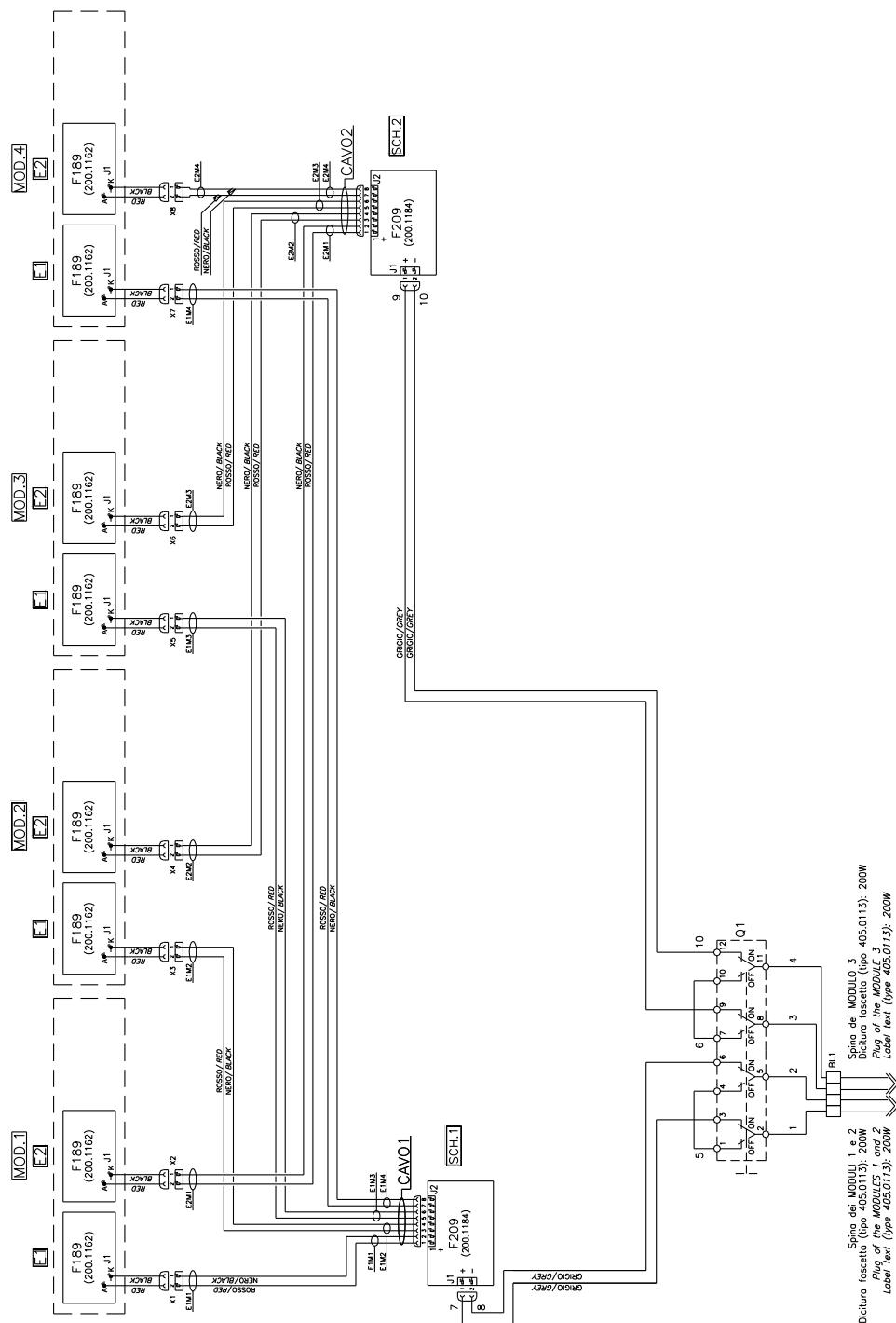


Figure 12 – 4 MODULES 6.6A Signs with OPTION 18 - Wiring Diagram

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6 LIST OF RECOMMENDED SPARE PARTS

CODE	DESCRIPTION
RISLG0001	S.P. Sch. F189 LEDs luminous source board LSDS LIGS (two Spare Part kits are needed for each Module LIGS sign)
RISLG0002	S.P. Sch.F317 power supply board resin-coated in a box LSDS LIGS (6.6A Current power supply, SMD*)
RISLG0005	S.P. Cable lead with plug 2P 271 2x2.5 L1.65 LSDS LIGS, standard item 1,65m
RISLG0006	S.P. ON-OFF toggle switch 16A 125V LSDS LIGS, standard item
RISLG0007	S.P. ON-OFF toggle switch, for option 18 LIGS signs
RISLG0008	S.P. FRONT PANEL 1M H400 with inscription digital print, standard item
RISLG0009	S.P. FRONT PANEL 2M H400 with inscription digital print, standard item
RISLG0010	S.P. FRONT PANEL 3M H400 with inscription digital print, standard item
RISLG0011	S.P. FRONT PANEL 4M H400 with inscription digital print, standard item
RISLG0012	S.P. FRONT PANEL 1M H300 with inscription digital print, standard item
RISLG0013	S.P. FRONT PANEL 2M H300 with inscription digital print, standard item
RISLG0014	S.P. FRONT PANEL 3M H300 with inscription digital print, standard item
RISLG0015	S.P. FRONT PANEL 4M H300 with inscription digital print, standard item
RISLG0016	S.P. FRONT PANEL 1M S4 H600 with inscription digital print, standard item
RISLG0017	S.P. FRONT PANEL 2M S4 H600 with inscription digital print, standard item
RISLG0018	S.P. FRONT PANEL 3M S4 H600 with inscription digital print, standard item
RISLG0019	S.P. FRONT PANEL 4M S4 H600 with inscription digital print, standard item
RISLG0020	S.P. Breakable coupling Kit Tab.1M H300 LIGS, standard item (320km/h)
RISLG0021	S.P. Breakable coupling Kit Tab.2M H300 LIGS, standard item (320km/h)
RISLG0022	S.P. Breakable coupling Kit Tab.3M H300 LIGS, standard item (320km/h)
RISLG0023	S.P. Breakable coupling Kit Tab.4M H300 LIGS, standard item (320km/h)
RISLG0024	S.P. Breakable coupling Kit Tab.1M H400 LIGS, standard item (320km/h)
RISLG0025	S.P. Breakable coupling Kit LSDS + Tab 2M H400 LIGS, standard item (320km/h)
RISLG0026	S.P. Breakable coupling Kit Tab.3M H400 LIGS, standard item (320km/h)
RISLG0027	S.P. Breakable coupling Kit Tab.4M H400 LIGS, standard item (320km/h)
RISLG0028	S.P. Breakable coupling Kit Tab.1M H400 LIGS, option 480Km/h
RISLG0029	S.P. Breakable coupling Kit Tab.2M H400 LIGS, option 480Km/h
RISLG0030	S.P. Breakable coupling Kit Tab.3M H400 LIGS, option 480Km/h
RISLG0031	S.P. Breakable coupling Kit Tab.4M H400 LIGS, option 480Km/h
RISLG0032	S.P. Cable lead with plug 2P 271 2x2.5 L2.50 LIGS (special length 2,5m, option72)
RISLG0033	S.P. Kit Tether LSDS/LIGS
RISLG0034	S.P. SCH.F238 power supply board 230V/37V LSDS/LIGS (Voltage Power Supply)
RISLG0048	S.P. FRONT PANEL 1M H400 with inscription (adhesive film, special item)

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CODE	DESCRIPTION
RISLG0049	S.P. FRONT PANEL 2M H400 with inscription (adhesive film, special item)
RISLG0050	S.P. FRONT PANEL 3M H400 with inscription (adhesive film, special item)
RISLG0051	S.P. FRONT PANEL 4M H400 with inscription (adhesive film, special item)
RISLG0052	S.P. FRONT PANEL 1M H300 with inscription (adhesive film, special item)
RISLG0053	S.P. FRONT PANEL 2M H300 with inscription (adhesive film, special item)
RISLG0054	S.P. FRONT PANEL 3M H300 with inscription (adhesive film, special item)
RISLG0055	S.P. FRONT PANEL 4M H300 with inscription (adhesive film, special item)
RISLG0056	S.P. FRONT PANEL 1M S4 H600mm panel with H400mm inscription (adhesive film, special item)
RISLG0057	S.P. FRONT PANEL 2M S4 H600mm panel with H400mm inscription (adhesive film, special item)
RISLG0058	S.P. FRONT PANEL 3M S4 H600mm panel with H400mm inscription (adhesive film, special item)
RISLG0059	S.P. FRONT PANEL 4M S4 H600mm panel with H400mm inscription (adhesive film, special item)

Legend, acronyms and note for LIST OF RECOMMENDED SPARE PARTS:

S.P. = Spare Part

Sch. ("Scheda" Elettronica) = Italian acronym that means electronic board

LSDS = Led Stanag Distance Sign (OCem LED Runway Distance Signs/marker)

SMD = Surface Mount Device. This version of power supply board supersedes the previous version, called F209, PTH (Pin Through Hole) version. For "F323" power supply board (for 2 levels of brillancies, with monitoring option and resin-coated), ask OCem

M = Module

H300 = H 300 mm inscription height that usually corresponds to H 600 mm visible panel height

H400 = H 400 mm inscription height that usually corresponds to H 800 mm visible panel height

S4 = H 600 mm visible panel height with H 400mm inscription height

2P = two-Pin L-823 plug for a two pole cable lead

Tab. ("Tabella") = Italian acronym that means (guidance) sign

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7 ACCESSORIES

CODE	DESCRIPTION
013.0010	Set of two ryton rings for receptacle support inside pipe elbow
013.0008	Galvanized steel pipe elbow with upper threaded end only
315.1228	Base L-867, Class I, Size B, 24" deep
315.1062	Baseplate for L-867B base with gasket and cable clamp, with one opening 2" - 11 GAS thread
011.2300	Transformer pack for series circuits FAA L-831 2x300 W 6.6/6.6 A, suitable for secondary grounding
011.3100	Consolidating harness
315.4150	M12x60 anchoring rod, 250 mm long, complete with hardware (4 pieces needed for each floor flange)

Contact us

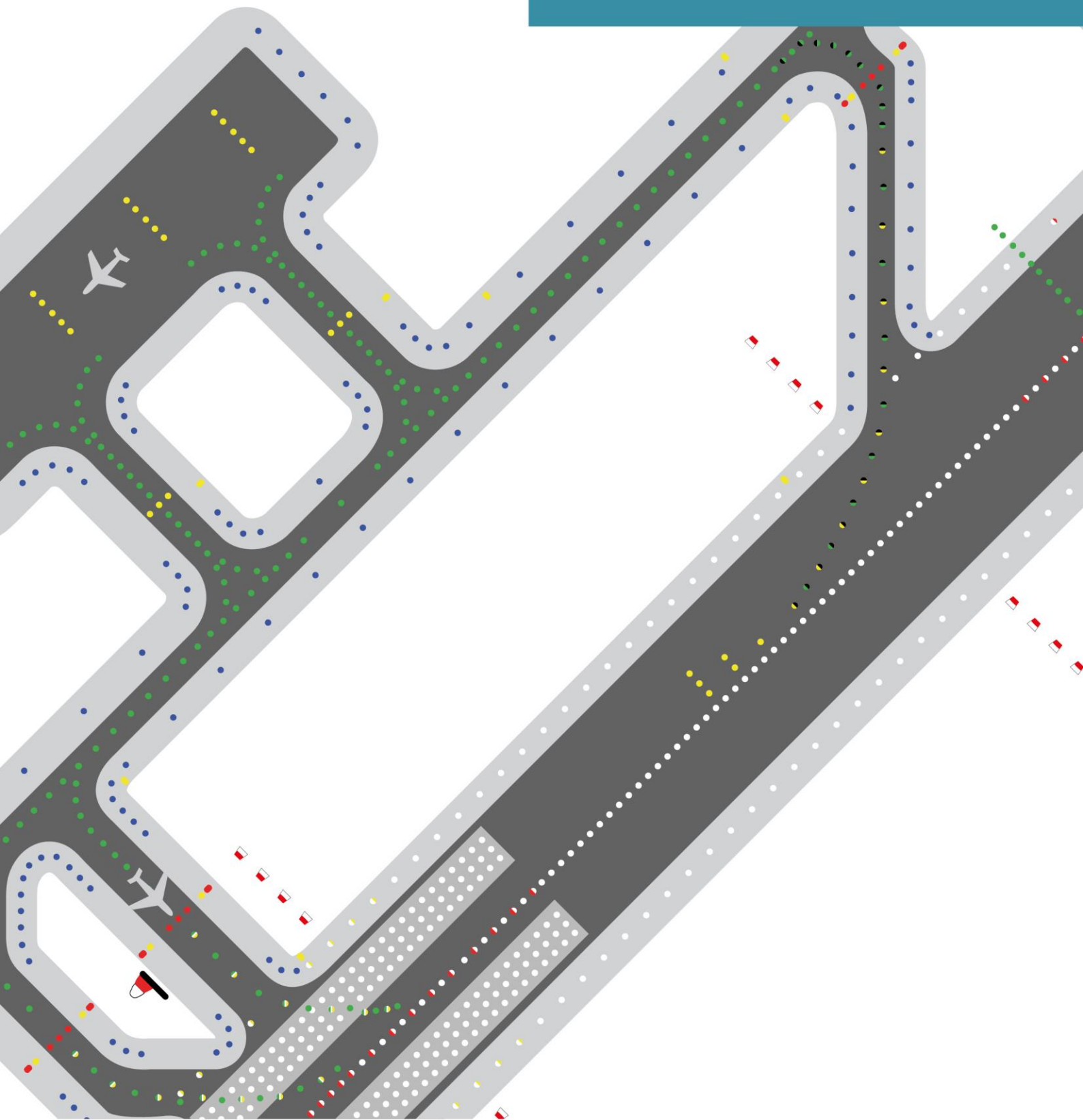
OCEM AT



+39 051 66 56 611



info@ocem.com



OCEM AT a division of ENERGY TECHNOLOGY S.r.l.
Via della Solidarietà, 2/1 - 40056 Valsamoggia (Bologna) - Italy
ocem.com

ocem.com

