	KIT APRIPORTA EM15 - 12/24V	Doc . N. 9.00.338 SHEET 1 - 14

ELECTRIC DOOR SYSTEM

TYPE EM15-12 or 24V.

USE AND MAINTENANCE BOOK

Rev.	Descrizione Description	Eseguito Prepared	Controllato Checked	Approvato Approved	Data Date
1	Revisione	CB	CB	CB	12/07/12
0	Emissione	AD	CB	CB	27/04/09

SUMMARY

DESCRIPTION OF THE MOTOR

Electro mechanic motor
Maximum angle of rotation 360°
Working voltage 12/24 V

The motor is complete with:

- Eelectrical wires for the connection to the control box (see below).
- N° 3 limit micro swithcs with lever (door open, door closed, inhibition of the anti-squashing system)
- N°1 micro switch with wheel to signal that the emergency release has been activated.
- N°1 anti-squashing micro switch
  - Emergency release system: the actuator is equipped with a manual emergency release system (internal and / or external to the vehicle) that allows to open the door manually in case of system failure or lack of tension on the vehicle.

DESCRIPTION OF THE COMPLETE SYSTEM

In addition to the motor, the system is also composed by the following components:

1. CONTROL PANEL or PUSH BUTTON

The opening command is given by a button which can be:

- CONTROL PANEL: : it is equipped with a command button, four signaling LED (red, green, yellow and orange) and a beeper. The red LED lights up when the door opens, and remains so until it is completely closed; the green LED lights up only when the door is completely closed; the yellow LED lights up when you pull one of the two emergency handles .The orange LED lights up when the external emergency handle is blocked.

- ROUND BUTTON: it is red and lights up when the door is not fully closed; it is normally supplied with a yellow LED which is used to signal that one of the emergency handles is pulled and a flashing red LED that is used to report the key lock of the external emergency handle; Finally, a buzzer that must report both situations;

- OTHER BUTTONS: it can be of any type and form, the important thing is to have a push - push command; it is possible to take both from the control box and the electric system the pulses which can signal all emergency or breakdown situations to the driver.

2. SWING ARM (DOOR PILLAR)

The swing arm is composed by a vertical pillar and two arms, horizontally welded, where the door is anchored.
The swing arm encloses a mechanism which allows to change the rotary movement of the motor box to a vertical movement; in this way the door will vertically move as soon as it meets an obstacle, both in opening and closing sense.
The vertical movement of the door has two functions: detect the presence of an obstacle and to make sure that the door, in the closing phase, comes into abutment in its compartment, begin to lift up and inserts itself in the appropriate strikers to ensure a perfect closure.

3. EXTERNAL EMERGENCY HANDLE

It is supplied complete the Bowden, clamp and lock with key pair; the handle has two micro switches: the first one is used to detect the lock of the key pawl, the second one, if correctly connected, acts as opening device with electric command.
The opening micro switch is connected to the mass of the pawl's micro switch, so if the handle is locked from outside, even in case of forcing and even if the micro is also activated, it can't work electrically. It doesn't allow the opening of the door.
This handle is also available in the versions with actuator and with actuator and key.

4. INTERNAL EMERGENCY HANDLE

It is supplied with bowden and clamp. You can mount two micro switches on the handle which indicate if the cover has been open and if the handle has been pulled.

5. FOUR PAIRS OF STRIKERS FOR DOOR AND DOORWAY.

6. ONE STABILIZER ARM.

7. CONTROL BOX

The control unit supplies and controls the motor and it is responsible for the anti-squashing function. For settings, see below.

DESCRIPTION OF THE FUNCTIONNING

1) Opening function

To fully open the door just press the button on the dashboard of the vehicle. By pressing the button, the door begins to descend into its compartment, freeing himself from the strikers and continuing in its rotary motion it moves to the exterior of the vehicle until it is fully open; the opening rotation is stopped by the opening limit switch or (in case of failure of the micro) it is stopped by the abutment of the buffer on the swing arm.
If the door meets an obstacle while opening, it will automatically stop even if the driver is still pushing the button.

2) Closing function

Simply push the same button with one pulse in order to fully close the door. When the door is almost at closing, touching the door compartment it is unable to continue the rotation and start to lift up in the appropriate strikers.
The rotation of the motor is stopped by the closing limit switch.
If during the closing phase the door meets an obstacle, it re-opens automatically (even if the driver is still pushing the button) and the opening button will be excluded for the whole time of reopening until the door is completely re open,
If, during re-opening, the door encounters an obstacle again, it will automatically stop.
NOTE- OPTIONAL: You can stop the door at any time, both during the opening and during the closing phase, by pressing the button, if you properly set the control box (see pag. 15)

3) Anti squashing system

The EM15 device is equipped with 2 anti-squashing systems: if the door is in closing phase and it encounters an obstacle it will re-open. If it's in opening phase, it will stop.
The first anti squashing system is based on the reading of the current absorbed by the motor by the control unit.
The second anti-squashing system is based on the micro switch that detects the vertical movement of the door during closing or opening phase;
The device is also equipped with a micro switch which excludes the anti-squashing system. This micro is activated by the motor only during the rotation in closing phase and only in the vicinity of the abutment of the door in its compartment. This excludes the 2 anti-squashing systems.
It follows that if the doors arrive to its compartment without encountering any obstacles, the motor, activating it, allows the perfect closing of the door.
NOTE.: all the times that the device is powered by the voltage of the vehicle, the first command that is given on the command button opens the door. Only if the door it's completely open it will close when push the button for the first time.
NOTE: the control box feeds the motor for maximum 15 seconds after every pulse received on the button.
NOTE: if the electric motor doesn't work or it's electrically disconnected, the control box detects the problem and stops feeding the motor.

OPTIONAL

Vehicles where the pneumatic lock of the emergency manual opening system is required when the vehicle is moving

On these vehicles, on the motor EM15 you find a pneumatic actuator: the purpose is to lock the emergency release system if the vehicle is running over 3km/h.

EMERGENCY RELEASE

In the case of electric system breakdown or other inconvenience, the door can be opened in emergency from both inside and outside the vehicle.
The emergency manual release is connected with cables (bowdens) to the red emergency handle that is placed near the doorway.
By pulling the handle you can therefore, in case of emergency, manually open the door from the inside or from the outside of the vehicle by mechanically unlock the engine which keeps the door closed. At this point, since the motor is "in neutral" you can manually push the door.

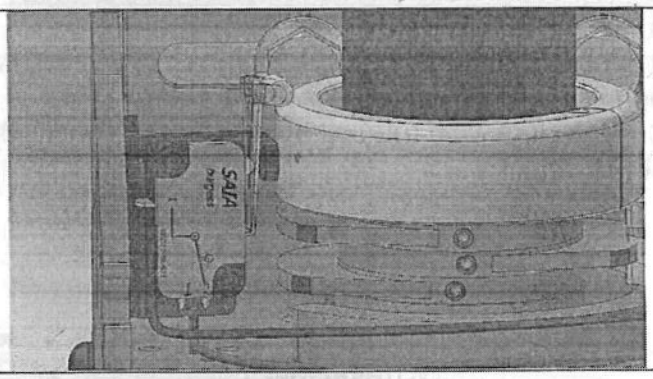
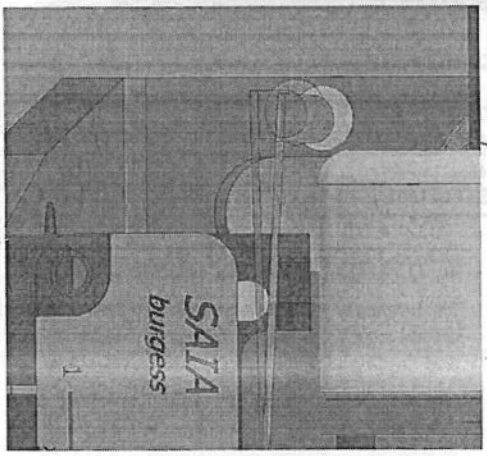
- Internal emergency: the vehicle is fitted with a red handle
- External emergency: outside of the vehicle is mounted a handle of red color on a yellow background with an arrow indicating the direction of rotation to open the door in emergency conditions;
    - EMERGENCY HANDLE WITH KEY: closing the pawl prevents the opening of the the door from outside when the vehicle is at stop (to prevent theft, tampering, etc ..).
    - EMERGENCY HANDLE WITH ACTUATOR: the actuator is connected to the central locking of the vehicle; all the times the central locking is released, the actuator free the handle while it locks it when central locking is activated; the actuator make a signal both in opening and closing position;
    - EMERGENCY HANDLE WITH ACTUATOR AND KEY: in the case of vehicles without driver door you fit this version of the handle; in case of actuator failure, you can lock and unlock the handle using the key;

NOTE: the block of the opening handle external emergency though the key, however, allows the automatic use of the door and the eventual manual release of the door in an emergency from inside the vehicle.
NOTE: according to existing rules we remember you that the failure to release the emergency handles must be reported to the driver (as soon as he switches on the ignition) by means of an audible warning and / or by an indicator light. The light and beeper indicator work until the driver does not unlock the external emergency opening handle with the key. When you pull one of the emergency handles you activate the micro switch which activates the buzzer and the warning light.
When you release emergency handle, you deactivate the micro switch.

ADJUSTEMENT OF THE DOOR'S FORCE

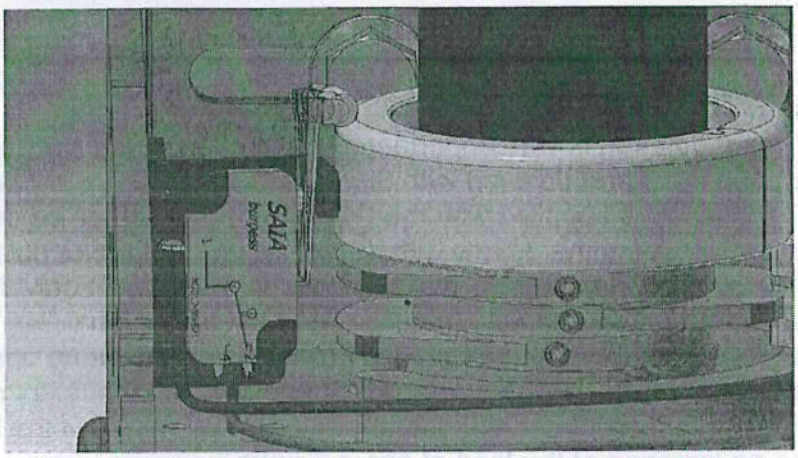
During the installation of the device and its corresponding door on the vehicle, it is necessary to adjust the strength of the mechanism with contrast springs mounted in the top of the swing arm ("CANNOTTO");
This regulation is very important as it is intended to confer the required stability of the door during its operation even with the vehicle position in the downhill or uphill.
The device is supplied with the "N" terminal which comes out 20 mm from the swing arm.
After mounting the device with its swing arm and upper support, it is necessary to act on the pin "M" by screwing it so that the terminal "N" comes out only 15mm from the swing arm: this measure corresponds to the first notch on the terminal "N".
In the event that the door should still be unstable during operation (this could happen only for particularly heavy doors over 50/60 kg), it is possible to increase the strength by screwing the "X" pin of the upper shelf: the displacement of 1 mm of the terminal "N" downwards corresponds to an increase of the load of about 12,5kg.
The maximum additional load applied is equal to 50Kg. corresponding to the second notch on the terminal "N".

ADJUSTEMENT OF THE ANTI SQUASHING MICRO SWITCH

The picture shows the micro already fixed on its bracket; it has to be mounted on the motor.	
Verify carefully that the distance between the lever of the micro switch and the ring of the swing arm is 0.3 mm	

CAUTION

If you fix the micro to the motor housing and after it you mount the door swing arm, the ring could bend and break the lever of the micro; in order to avoid this problem please fix the micro when the door is already mounted

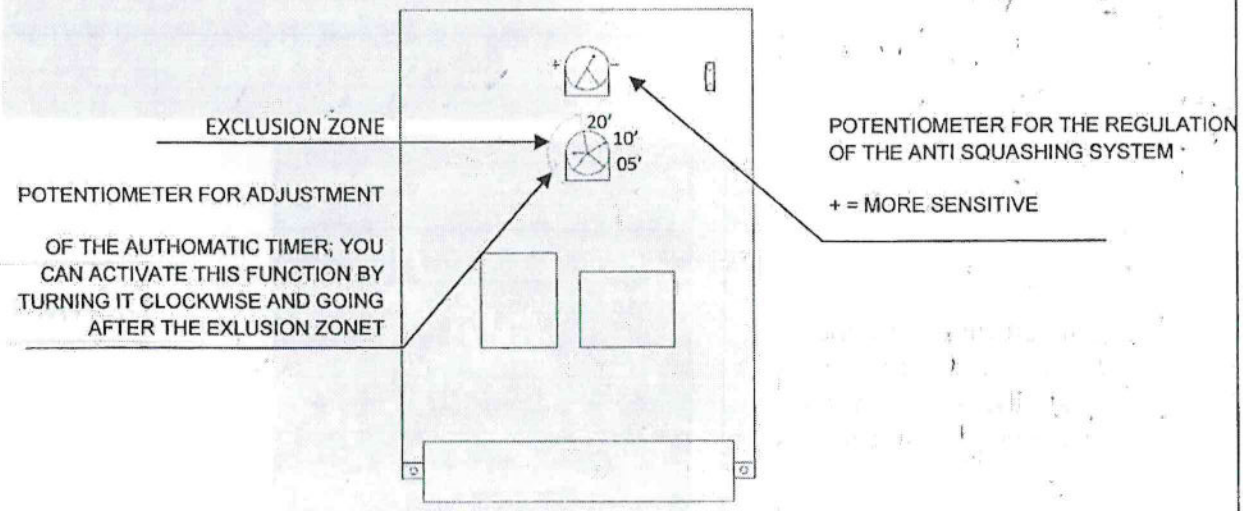


ADJUSTEMENT OF THE SENSITIVITY OF THE ANTI SQUASHING SYSTEM

NOTE: THIS ADJUSTMENT MUST BE MADE ONLY IN PARTICULAR CASES AND ALWAYS AFTER SUGGESTION OF OUR TECHNICIANS.

It is possible to set up the operating point of the anti-squashing system both in closing and opening with the potentiometer of the control unit.

The counterclockwise rotation increases the sensitivity, clockwise rotation will decrease the sensitivity.



ADJUSTEMENTS AND SET UP

-Make sure that the door is mechanically free both in opening and closing phase when the motor is mechanically free
- Place the door in the fully open position and adjust the opening limit switch by turning the appropriate cam; then lock it and close the two grains;
- Make sure the spring module respects the dimensions required in the position of door open.
- Bring the door to closing position; when it begins to lean to the door compartment, adjust the anti-squashing micro switch locking the respective cam and close the 2 grains.
- Bring the door in position completely closed and make sure that the gaps between the door and the door compartment match those of the supplied drawing. If necessary, you can horizontally regulate the door brackets; you can also vertically regulate the swing arm's pins.
- Adjust the closing limit switch as in previous cases.
- Attention: the closing limit switch stops the engine with the door closed and also commands the shutdown of the open door warning light and if connected, any step lights.
- Check the functionality of the system.
- In case of improper opening or closing of the door repeat the recordings of the limit switch
- Check the functionality of the anti-squashing system; you can adjust it operating on the sensitivity via the potentiometer on the control unit and on the position of the micro switch for the exclusion of the anti-squashing system.
- Electrically close the door and check that when the it stops and hits in his compartment, it begins to move vertically at least 8 / 10mm. It has to be locked in the appropriate strikers mounted on the compartment.

ORDINARY MAINTENANCE

The device requires no periodic lubrication or maintenance.
For the maintenance of the electrical system, refer to the "Use and Maintenance book" by the manufacturer.

POSSIBILE FAULTS AND THEIR CAUSES

The red leds does not switch off;	Check the closing micro switch. Check that the red/black cable is not "ground";
The door closes but when it's near to touch the compartment it comes back to opening without touching any obstacle;	Check the regulation of the micro switch for the exclusion of the anti-squashing system; if it doesn't act before the door begins to lift, the anti-squashing system will make the door re open;
When it touches an obstacle, the door does not reverse the direction in closing and opening and it does not stop when it encounters an obstacle;	Check the regulation and the functioning of the micro for the anti-squashing system;
The yellow led and the buzzer are permanently on;	Check the functioning of the micro switch on the motor. Adjust the screw on the plate of the motor in order to adjust the micro switch;
The orange led or flashing red signal and the buzzer are permanently on;	Check the functioning of the micro switch, which locks the pawl on the external emergency handle;

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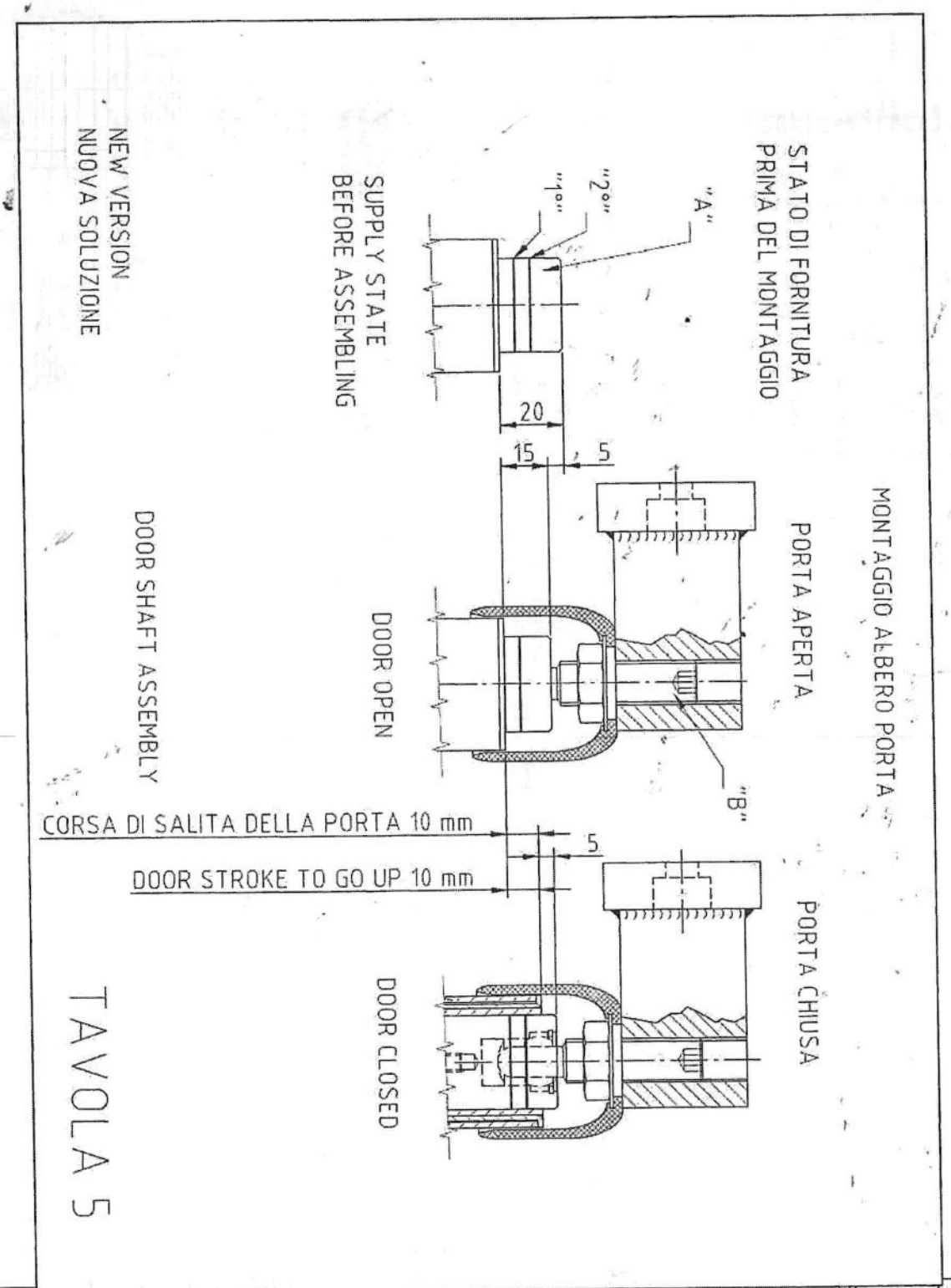

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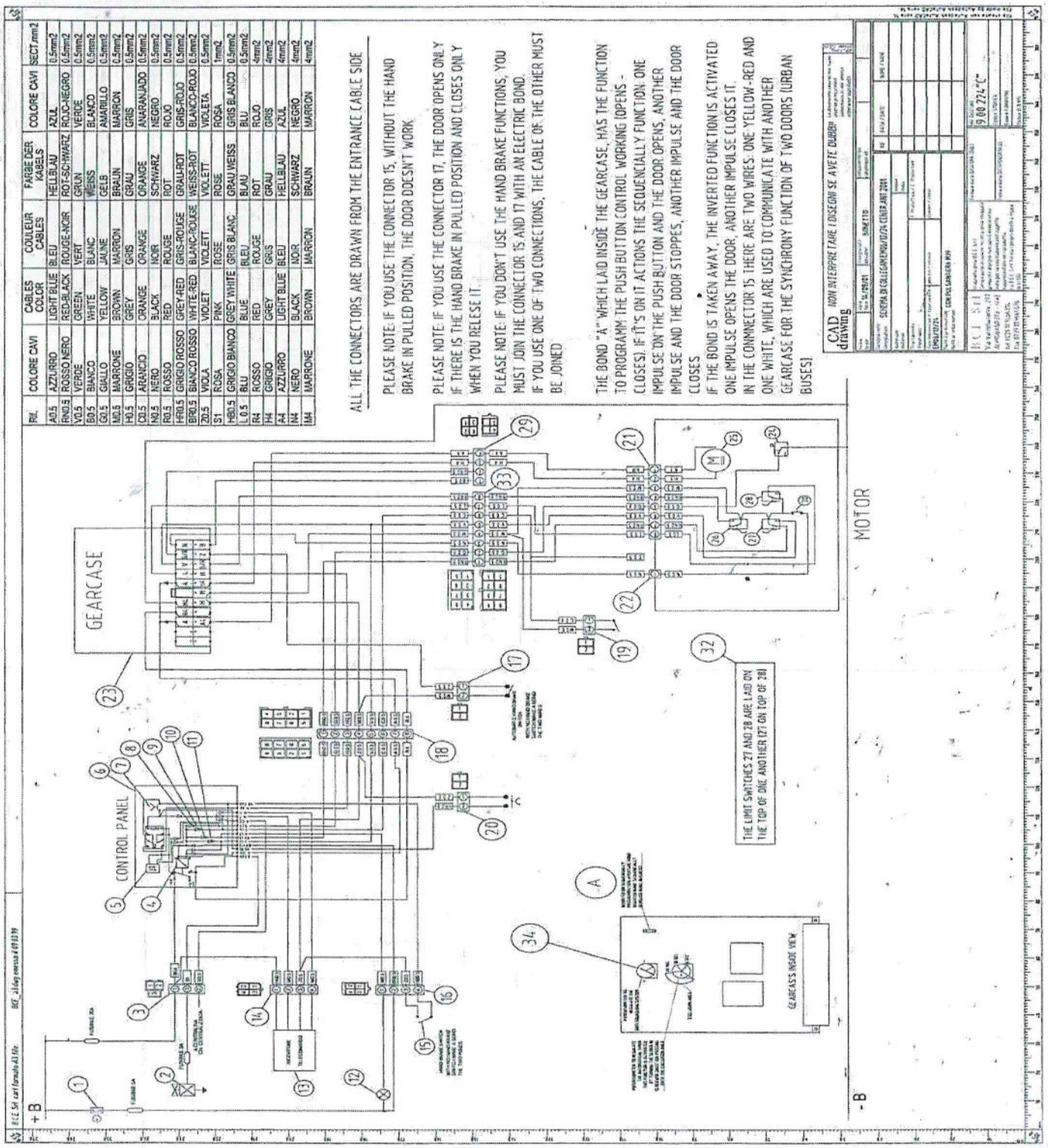

Rif.	COLORE CAVI	CABLES COLOR	COULEUR CABLES	FARBE DER KABELS	COLORE CAVI	SECT.mm2
A0,5	AZZURRO	LIGHT BLUE	BLEU	HELLBLAU	AZUL	0,5mm2
RNG,5	ROSSO NERO	RED-BLACK	ROUGE-NOIR	ROT-SCHWARZ	ROJO-NEGRO	0,5mm2
V0,5	VERDE	GREEN	VERT	GRUN	VERDE	0,5mm2
B0,5	BIANCO	WHITE	BLANC	WEISS	BLANCO	0,5mm2
G0,5	GIALLO	YELLOW	JAUNE	GELB	AMARILLO	0,5mm2
M0,5	MARRONE	BROWN	MARRON	BRAUN	MARRON	0,5mm2
H0,5	GRIGIO	GREY	GRIS	GRAU	GRIS	0,5mm2
C0,5	ARANCIO	ORANGE	ORANGE	ORANGE	ANARANJADO	0,5mm2
N0,5	NERO	BLACK	NOIR	SCHWARZ	NEGRO	0,5mm2
R0,5	ROSSO	RED	ROUGE	ROT	ROJO	0,5mm2
HR0,5	GRIGIO ROSSO	GREY-RED	GRIS-ROUGE	GRAU-ROT	GRIS-ROJO	0,5mm2
BR0,5	BIANCO ROSSO	WHITE-RED	BLANC-ROUGE	WEISS-ROT	BLANCO-ROJO	0,5mm2
ZO,5	VIOLA	VIOLET	VIOLETT	VIOLETT	VIOLETA	0,5mm2
S1	ROSA	PINK	ROSE	ROSE	ROSA	1mm2
HBG,5	GRIGIO BIANCO	GREY WHITE	GRIS BLANC	GRAU WEISS	GRIS BLANCO	0,5mm2
L0,5	BLU	BLUE	BLEU	BLAU	BLU	0,5mm2
R4	ROSSO	RED	ROUGE	ROT	ROJO	4mm2
H4	GRIGIO	GREY	GRIS	GRAU	GRIS	4mm2
A4	AZZURRO	LIGHT BLUE	BLEU	HELLBLAU	AZUL	4mm2
N4	NERO	BLACK	NOIR	SCHWARZ	NEGRO	4mm2
M4	MARRONE	BROWN	MARRON	BRAUN	MARRON	4mm2

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BCE	**KIT APRIPORTA EM15 - 12/24V**	Doc . N. **9.00.338** SHEET 13 - 14

Via Valdellatorre 194, 10091 – Alpignano (TO) ITALIA
Tel. 0039/011/9664314 – 9664676 Fax. 0039/011/9665762
info@bcesrl.it
assistenza@bcesrl.it

Via Valdellatorre 194, 10091 – Alpignano (TO) ITALIA
Tel. 0039/011/9664314 – 9664676 Fax. 0039/011/9665762
info@bcesrl.it
assistenza@bcesrl.it

GM#6299

WARRANTY COUPON

This document is necessary for warranty claims.
In case of need, please call our office from Monday to Friday, from 8.00 a.m. to 12.30 a.m. and from 1.30 p.m. to 5.30 p.m.
Before making any kind of reparation, please keep in contact with our office.

N. OF WARRANTY:

BCE Tel.+39/011/9664314

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2025/0001152

COLLAUDATO/TESTED 11.06.2025

COPY FOR THE USER

WARRANTY COUPON

COMPANY
ADDRESS
TELEPHONE
FAX
MAIL
VAT NUMBER
VEHICLE 1FDFF6KT2RDA14518
COACH BUILDER
SELLER

HOMOLOGATION DATE.

PLEASE ATTACH PHOTOCOPY OF HOMOLOGATION DOCUMENT

N°OF WARRANTY:

BCE Tel.+39/011/9664314

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