

Manipulator-type industrial radio remote controls

OMNicontrol Series CE

Typical applications :

- ◆ **Handling / Industrial lifting**
 - Travelling cranes, gantry cranes
 - Air handling systems
 - Self-propelled devices
- ◆ **Industrial equipment**
 - Compactors, grinders
 - Drilling machines
 - Special machines
- ◆ **Building industry and civil engineering**
 - Tower cranes, Fast assembly cranes
 - Concrete pumps
 - Concrete mats
- ◆ **Other equipment**
 - Elevating platforms
 - Cinema vehicles
 - Telescopic handlers



1- Description

A radio remote control provides numerous advantages :

- Large freedom of movement
- Easy to use
- Precise, quality movement control
- Visibility
- Productivity

With the **OMNicontrol** radio remote controls, JAY Electronique provides solutions to the broad range of industrial applications and applications implementing manipulators.

To satisfy these requirements, the JAY Electronique system integrates numerous possibilities in terms of :

- Number and type of manipulators
- Number and type of function buttons
- Number and type of outputs

Special attention has been given to ensure operator comfort through the following features :

- Transmitter ergonomics
- Easily accessible manipulators and function buttons
- Functions controlled identified by pictogram
- Light-weight compact transmitters
- Adjustable carrying belt which adjusts to the operator's body, or carrying strap.
- Transmitter endurance, and fast, easy to replace plug-in battery
- Adaptability to all radio configurations of the environment by possibility for changing frequency by trained technician.
- Mechanical protection of manipulators and function buttons to avoid unintentional actions

The receiver is also very easy to install :

- Compact receiver
- Screw-type connection terminals
- Led display (current frequency, coding, outputs activated ...)

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- **Compliance with European directives:**
 - Machinery
Cat.3 safety stop as defined by EN954-1
 - Hertzian equipment and telecommunication terminals (low voltage, EM compatibility, radiofrequency spectrum)

JAY
électronique

E840 B - 0209

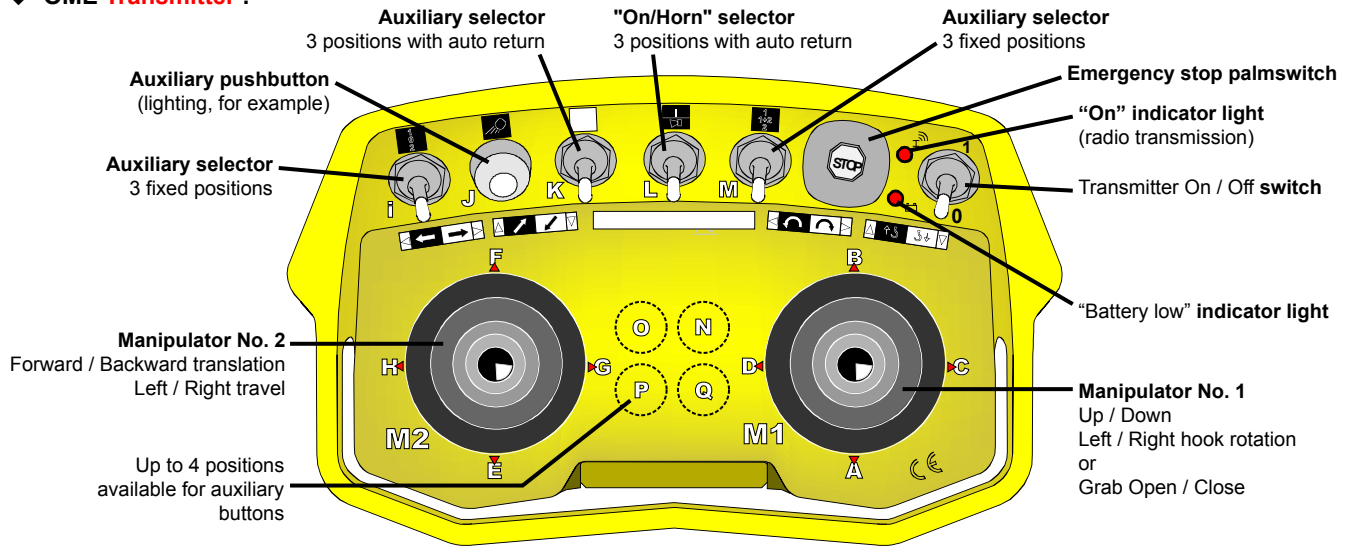
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2- Examples of product features with respect to application

Note : Each product requires a customisation data sheet defining the desired configuration

2.1 Application for control of travelling crane, gantry crane

◆ **OME Transmitter :**



Type of manipulators : proportional or by steps 1, 2, 3, 4 speeds (configurable on each direction)

◆ **OMR Receiver :**

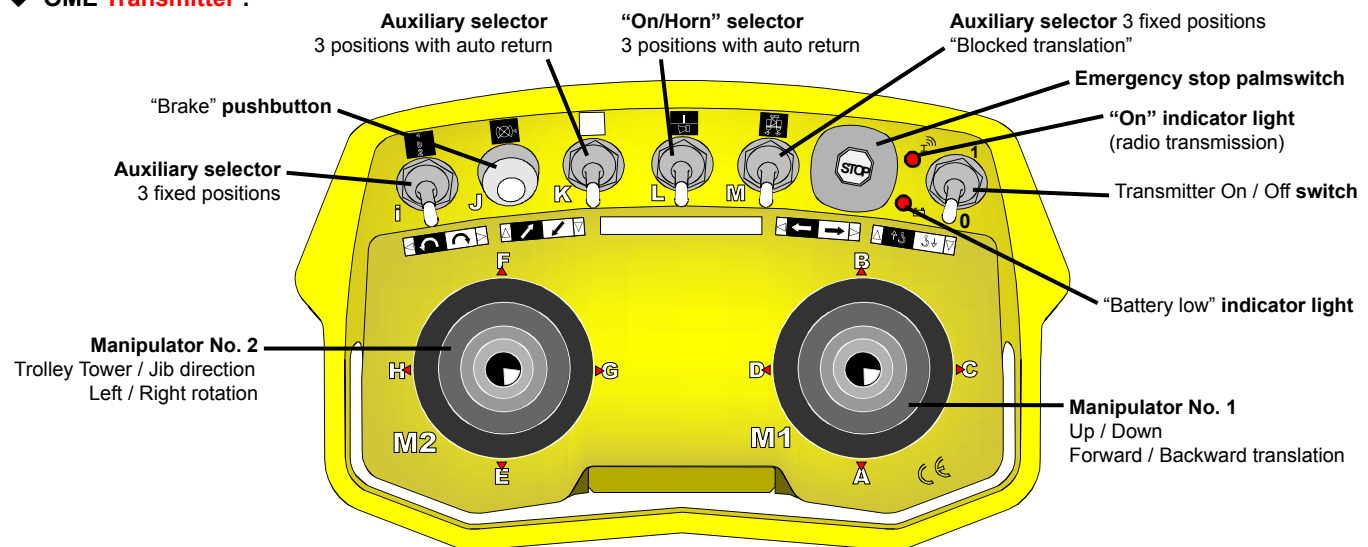
Number and type of function outputs : 21 relays, 25 relays, 17 relays + 6 analogue outputs or 20 relays + 3 analogue outputs
 Additional outputs (on-horn, 2 for safety devices) : 3 relays
 Housing lead-out : connector
 Power supply : 48-115-230 VAC

◆ **OMCU Charger for UMB2 plug-in battery :**

Power supply : 115-230 VAC, European plug

2.2 Application for control of tower crane, fast assembly crane

◆ **OME Transmitter :**



Type of manipulators: proportional or by steps 1, 2, 3, 4 speeds (configurable on each direction)

◆ **OMR Receiver :**

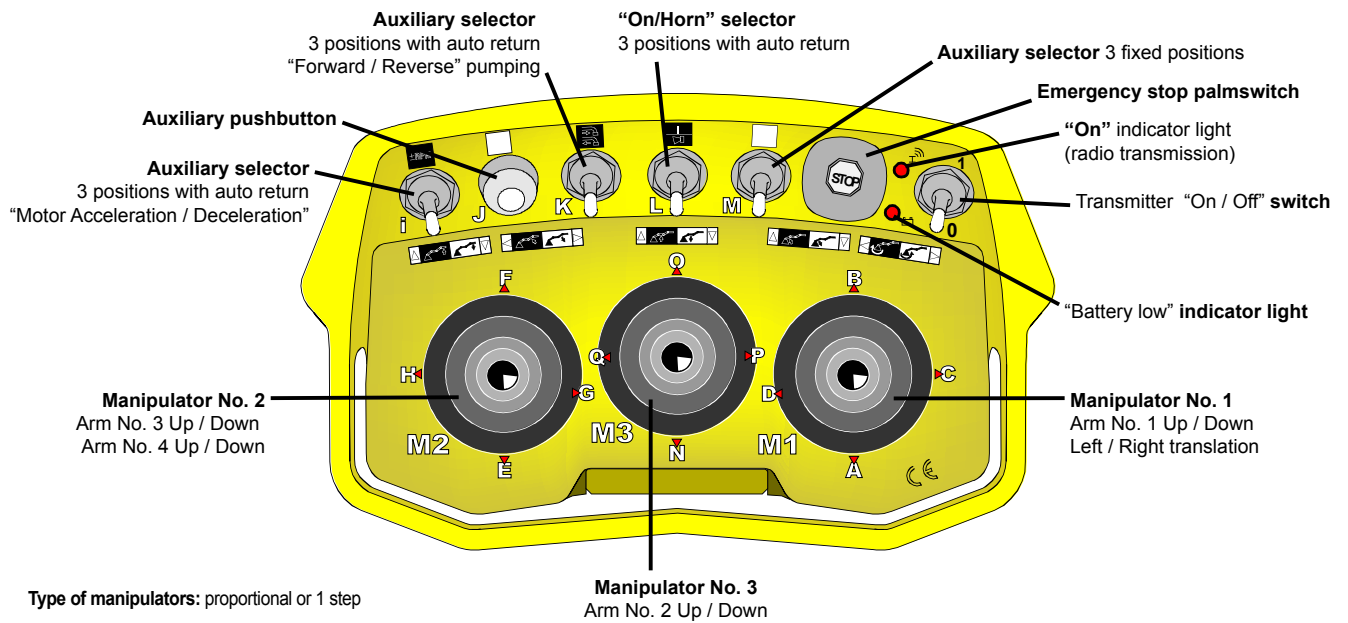
Number and type of function outputs : 21 relays, 25 relays, 17 relays + 6 analogue outputs or 20 relays + 3 analogue outputs
 Additional outputs (on-horn, 2 for safety devices) : 3 relays
 Housing lead-out : connector
 Power supply : 48-115-230 VAC

◆ **OMCU Charger for UMB2 plug-in battery :**

Power supply : 115-230 VAC, European plug

2.3 Application for control of concrete pump

◆ OME Transmitter :



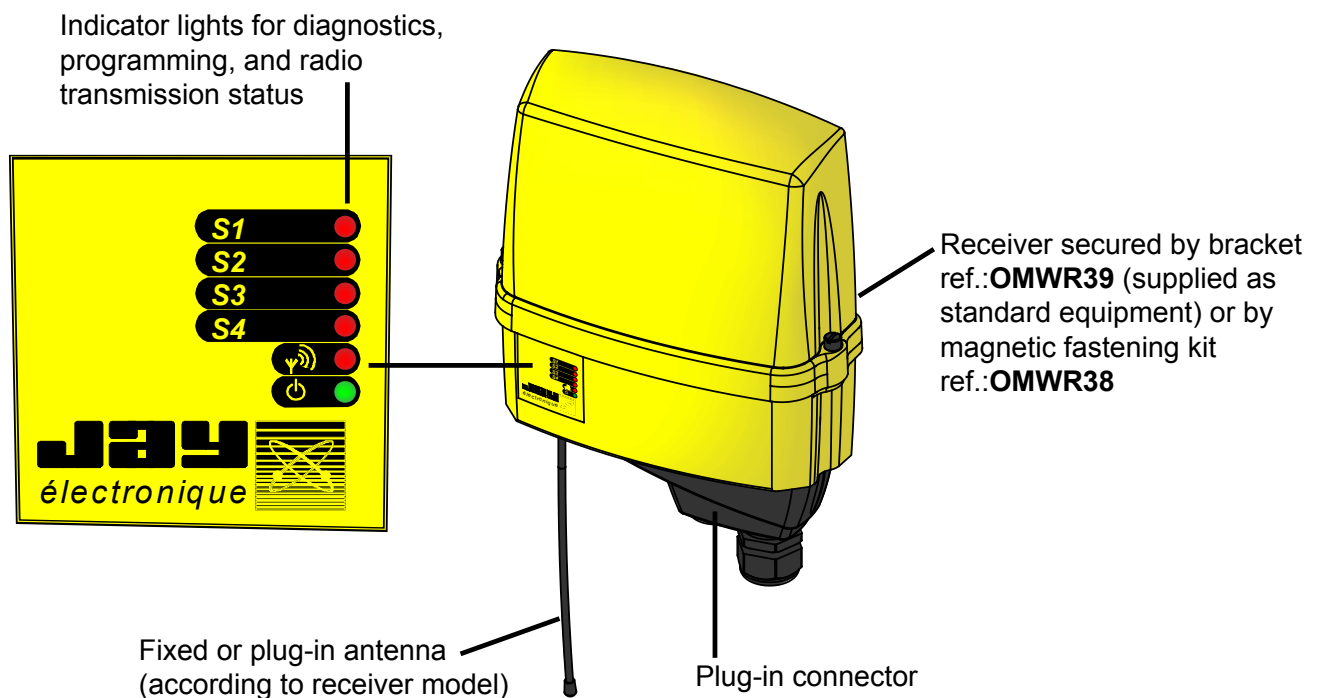
◆ OMR Receiver :

Number and type of function outputs : 21 relays, 25 relays, 17 relays + 6 analogue outputs or 20 relays + 3 analogue outputs
 Additional outputs (on-horn, 2 for safety devices) : 3 relays
 Housing lead-out : connector
 Power supply : 24 VDC

◆ OMC1 Charger for UMB2 plug-in battery :

Power supply : Connector on battery or stabilized 24VDC max. power supply

2.4 OMR Receiver



3- Safety aspects

The **OMNICONTR** remote controls implement numerous safety features, in particular :

Transmitter / receiver communication safety features :

- Permanent radio link : by its non-directional design and insensitivity to the presence of obstacles, the operator is protected from exposure to handling risks during precision manoeuvres and movements.
- Each transmitter + receiver has its own specific code contained in a plug-in memory.
- Message quality is ensured by a high-level communication protocol.

Functional safety features :

- Start-up sequences are implemented to ensure safe operation by a trained, experienced operator.
- 50 ms response time compatible with the movement speeds of equipment controlled.

Receiver safety features :

- A passive shutdown device shuts down the system if the radiolink is jammed.
- Category 3 safety per EN 954-1 is ensured by the use of 2 guided contact safety relays.
- Overload protection by fuses.
- A «Manipulator safety on analogue output» function inhibits a movement if a manipulator is operated too quickly (OPTION).

Transmitter safety features :

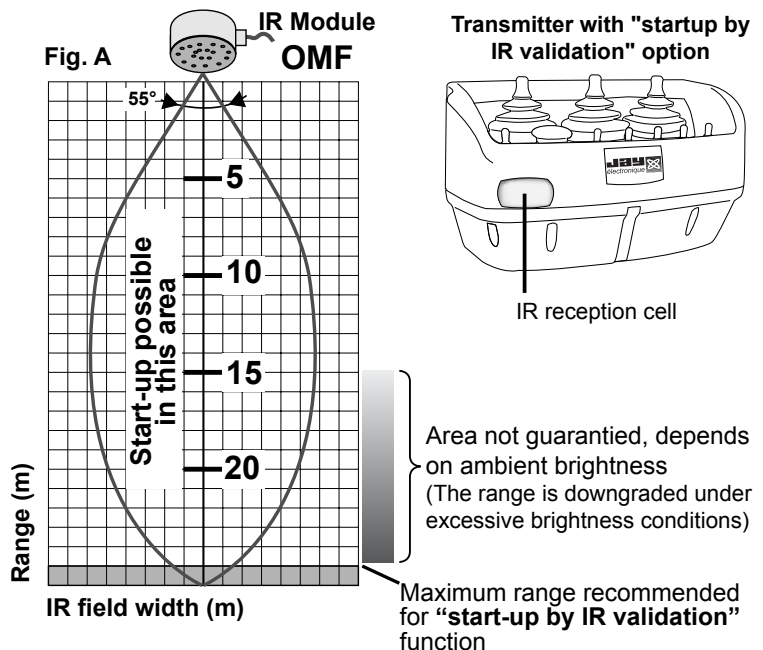
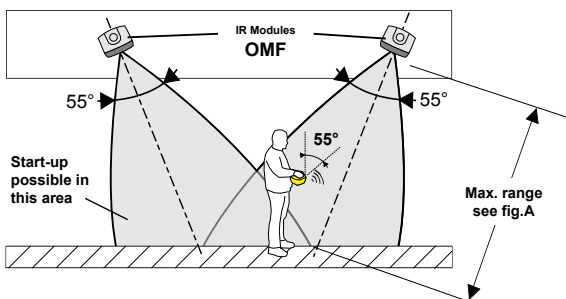
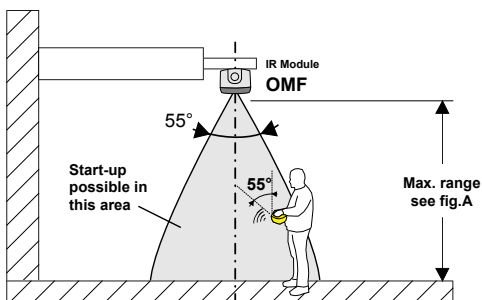
- An active priority general shutdown command is generated when the "palmswitch" is pressed.
- An indicator light indicates an alarm in the event of an insufficiently charged battery (the receiver "horn" output is also activated in this case).
- A "Dead man" function shut downs the transmitter after 5 minutes and 30 seconds (standard) if no command has been generated.
- Manipulators, toggles and function buttons protected mechanically against unintentional actions.

4- Additional functions

Start-up by infrared validation :

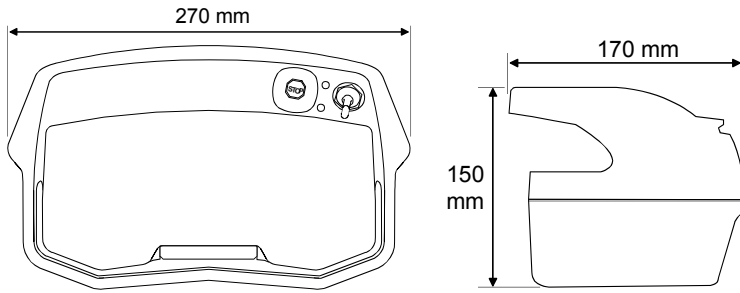
The start-up area of an equipment and the equipment's identification can be secured by an infrared validation on start-up :

- To start up the equipment, the operator must take position in the infrared coverage area of one of the **OMF** modules (called "Start-up area") and actuate the "on/off" switch on the transmitter.
- Once the validation has been performed, the "Transmitter and the Equipment to be controlled" are matched up with no possibility for error. The operator can then move freely with no limitation.
- The infrared start-up function has a range of action of 0 to 25 m (see fig. A). The 15 to 25 m area is not guaranteed as it depends on the ambient brightness.
- **N OMF** infrared modules can be used.
- With this function, two separate buttons are required for the "On" and "Horn" functions.

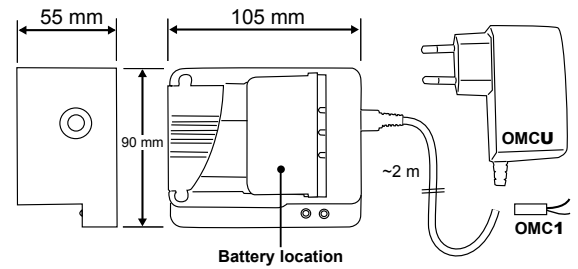


5- Dimensions

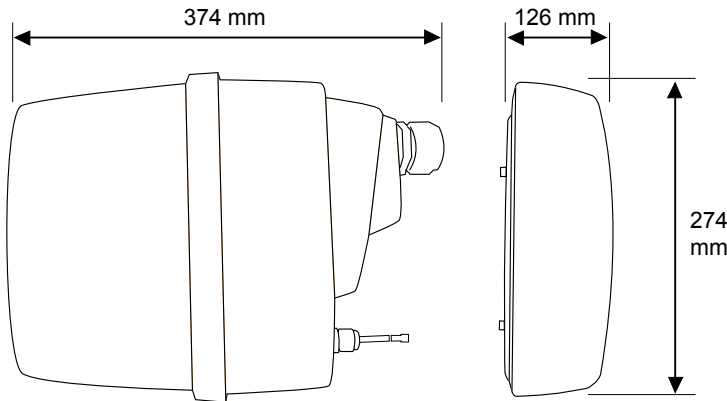
OME Transmitter



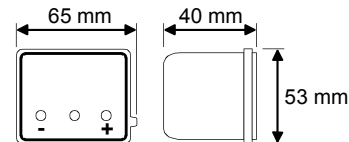
OMC Charger



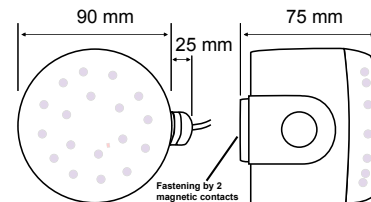
OMR Receiver



UMB2 Battery



OMF IR Module

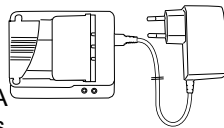


6- Technical characteristics

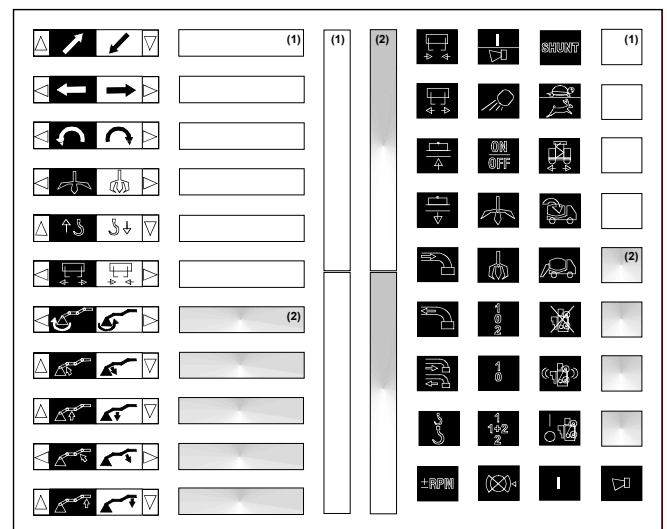
6.1 Accessories

◆ OMC Charger

Consumption : 0,5 A
 Charging current : 120 mA
 Complete charging time : 8 hours
 Protection indicator level : IP30
 Power supply : on 24 VDC for **OMC1** model
 or 115-230VAC for **OMCU** model
 Housing : polyamide 6-6,
 15% glass fibre
 Weight : 400g with battery
 Charging temperature range : .. 0°C to +40°C
 Storage temperature range : -20°C to +80°C
 Overload protection.
 2 indicator lights: power supply present and battery
 charging



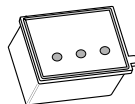
◆ Label sheet **OMWE201** for OME transmitter (one sheet of labels supplied with each transmitter)



(1) = labels for customized marking (indelible felt tip marker)
 (2) = transparent protection labels

◆ UMB2 plug-in battery

Technology : NiMH
 Weight : 200 g



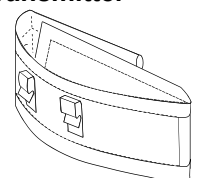
◆ Carrying strap **UWE101** for OME transmitter

Secured to transmitter housing
 by fasteners.
 Strap size is adjustable



◆ Carrying belt **UMP** for OME transmitter

Secured to transmitter housing
 by 2 clips
 Belt size is adjustable.



6.2 OME Transmitter

| Mechanical and environment withstand characteristics | |
|--|--|
| Housing | Polyamide 6-6, 15% glass fibre, yellow IP 65 Mechanical protection for manipulators, selectors and function buttons |
| Weight (with battery) | 1,7 Kg |
| Dimensions | 270x150x170 mm |
| Operating temperature range | - 10°C to + 55°C |
| Storage temperature range | - 20°C to + 80°C |
| Functional characteristics | |
| Type and function of controls | - 2 manipulators (proportional or by steps 1, 2, 3, 4 speeds), or 3 manipulators (proportional or by steps 1, 2, 3, 4 speeds, except for middle manipulator, proportional or by steps 1, 2 speeds) - 4 to 8 auxiliary buttons (pushbutton PB or selector with 2 fixed positions SEL2 or selector with 3 fixed positions SEL3 or selector with 3 auto-return positions SEL3R) - 0 to 2 rotary switches: 10 positions COM10 or 2 positions with metal key COM2CM - 1 selector with 3 positions "on / horn" - 1 active priority general shutdown palmswitch (50 ms response time) - 1 transmitter "on / off" switch |
| «Dead man» function | 5 mn 30 s (1) |
| Indicator lights | - 1 red "battery low" indicator light (remaining endurance: 30 min. approx) - 1 red "on" indicator light |
| Electrical and radio characteristics | |
| Power supply | NiMH plug-in battery |
| Endurance | 11 hours / 100% transmit time |
| Transmit frequency and power | 30 user-programmable UHF 433-434 MHz bands 10mW 64 user-programmable UHF 868-869 MHz bands 5mW |
| Modulation | FM |
| Average range in typical industrial environment (2) | 200 m in 433-434MHz 10mW and 868-869MHz 5mW 100 m in 868-869MHz 5mW receiver with plug-in BNC antenna |

(1)= Time delay programmed by default on delivery of product, except when a value has been specified when drawing up the customisation sheet.

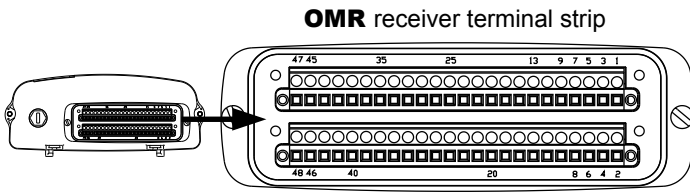
(2)= Range will vary according to environment conditions of transmitter and reception antenna (metal frameworks, walls ...).

6.3 OMR Receiver

| Mechanical and environment withstand characteristics | | | | |
|--|---|--|--|--|
| Housing | Polyamide 6-6, 15% glass fibre, yellow, IP65 | | | |
| Connection | - Screw terminals - Outputs by 48-pin connector | | | |
| Attachment | 1 bracket (supplied by receiver) | | | |
| Weight | 4,2 Kg | | | |
| Dimensions | 374x274x126 mm | | | |
| Operating temperature range | - 10°C to + 55°C | | | |
| Storage temperature range | - 20°C to + 80°C | | | |
| Radio-electric characteristics | | | | |
| Radio frequency | 30 user-programmable UHF 433-434 MHz bands 10mW 64 user-programmable UHF 868-869 MHz bands 5mW | | | |
| Antenna | Fixed, ½ wave "whip" antenna or BNC plug-in type (according to receiver model) | | | |
| Sensitivity | 0,3 µV | | | |
| Electrical characteristics | | | | |
| Power supply | AC Model : three-voltage 48-115-230 VAC (-20%, +15%) DC Model : 24 VDC | | | |
| Max current | AC Model : 0,9 A (48 VAC), 0,5 A (115 VAC), 0,2 A (230 VAC) DC Model : 2 A (24 VDC) | | | |
| Outputs | Relays : - Contact type : 1 T NO - Max. current : 5A (230VAC and 30VDC) , cosØ=0,4 : 3A (250VAC) - Min. current : 10mA at 5VDC - Max. voltage : 380VAC or 125VDC - Service life : 10 ⁶ cycles with 230VAC or 30VDC, 2A, cosØ=1 - Service life : 10 ⁶ cycles with 230VAC or 30VDC, 1,2A, cosØ=0,4 Analog, 3 versions : <table style="display: inline-table; vertical-align: top; margin-right: 20px;"> <tr> <td>1) 2 / 4 / 6 VDC or 3 / 6 / 9 VDC or 6 / 12 / 18 VDC or 2 / 3.5 / 5 VDC or 1.5 / 5 / 8.5 VDC</td> <td>2) 0 / 5 VDC or 0 / 10 VDC or 0 / 15 VDC</td> <td>3) -10 / 0 / +10 VDC or -15 / 0 / +15 VDC</td> </tr> </table> | 1) 2 / 4 / 6 VDC or 3 / 6 / 9 VDC or 6 / 12 / 18 VDC or 2 / 3.5 / 5 VDC or 1.5 / 5 / 8.5 VDC | 2) 0 / 5 VDC or 0 / 10 VDC or 0 / 15 VDC | 3) -10 / 0 / +10 VDC or -15 / 0 / +15 VDC |
| 1) 2 / 4 / 6 VDC or 3 / 6 / 9 VDC or 6 / 12 / 18 VDC or 2 / 3.5 / 5 VDC or 1.5 / 5 / 8.5 VDC | 2) 0 / 5 VDC or 0 / 10 VDC or 0 / 15 VDC | 3) -10 / 0 / +10 VDC or -15 / 0 / +15 VDC | | |
| Active shutdown time | 50 ms (transmitter priority general shutdown palmswitch) | | | |
| Passive shutdown time | 1,9 s (transmitter battery discharged, radio jamming...) | | | |
| Indicator lights | - 1 display with red leds for diagnostics (frequency used, output controlled) - 1 "power on" green led indicator light - 1 "on" red led indicator light - 1 status red led per relay | | | |

7- Wiring diagrams

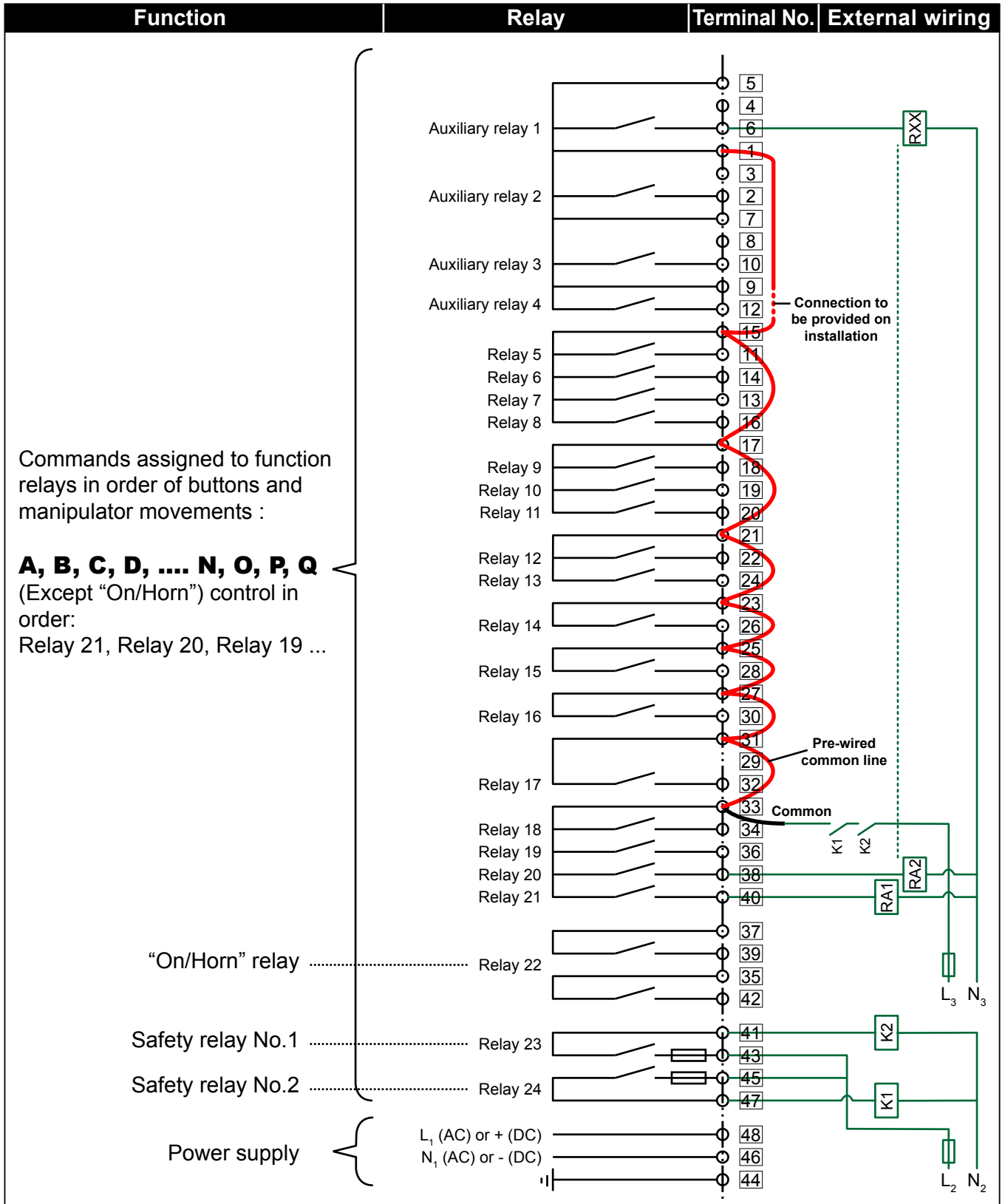
7.1 Diagram for OMR receiver, "21+3" relays model



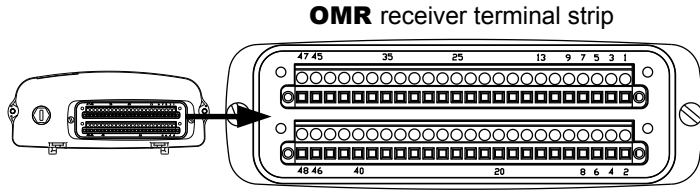
! K1 and K2 are guided contact contactors, to be integrated in the safety circuit of the system controlled.

! The use of overvoltage limiting circuits will increase the service life of the relay contacts (ex: RC circuits with AC, diodes + Zener with DC, etc.)

The 2 safety relays are activated when radio communication is set up between the transmitter and the receiver, and are automatically maintained up to the moment of active or passive shutdown (action on palm switch, loss of radio link, battery discharged, "Dead man" time elapsed ...)



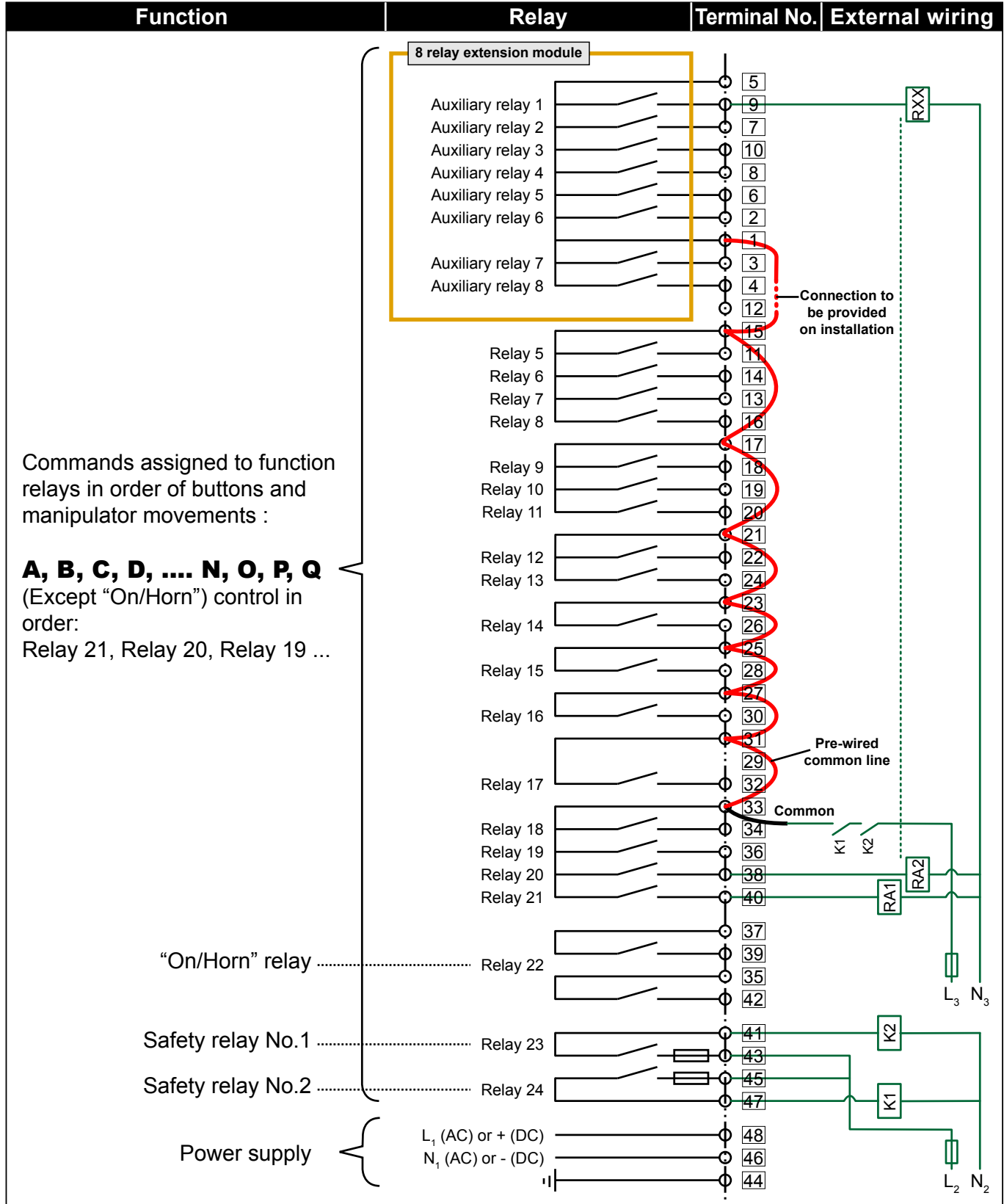
7.2 Diagram for OMR receiver, "25+3" relays model



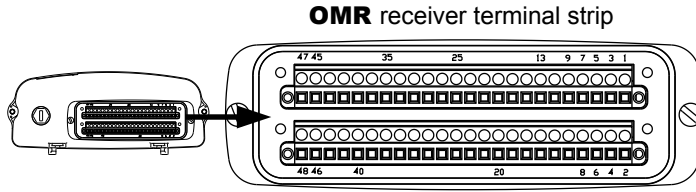
! K1 and K2 are guided contact contactors, to be integrated in the safety circuit of the system controlled.

! The use of overvoltage limiting circuits will increase the service life of the relay contacts (ex: RC circuits with AC, diodes + Zener with DC, etc.)

The 2 safety relays are activated when radio communication is set up between the transmitter and the receiver, and are automatically maintained up to the moment of active or passive shutdown (action on palmswitch, loss of radio link, battery discharged, "Dead man" time elapsed ...)



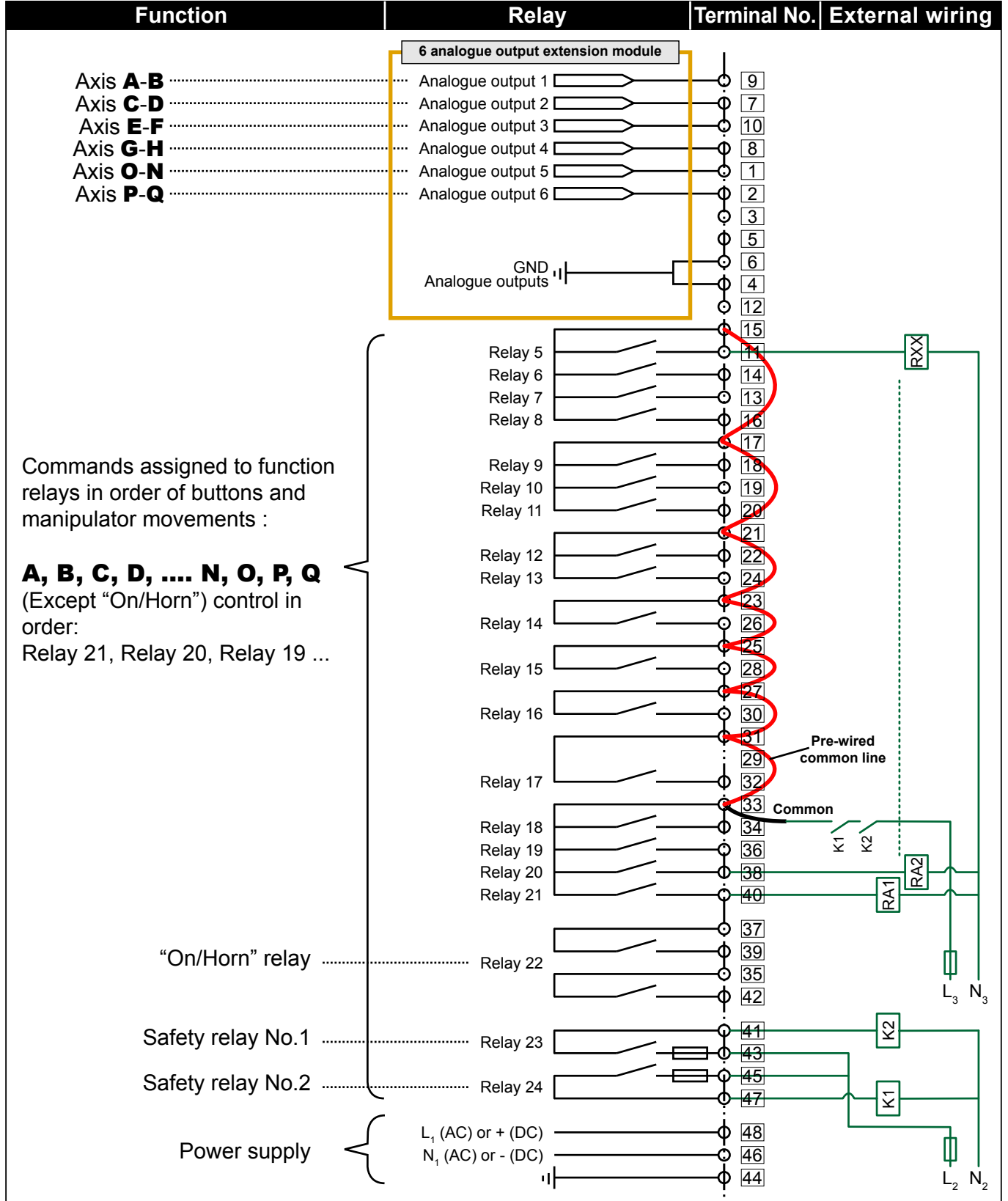
7.3 Diagram for OMR receiver, "17+3" relays + 6 analogue outputs model



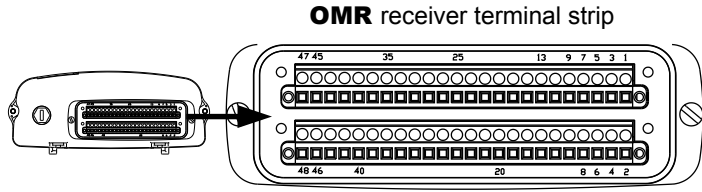
⚠ K1 and K2 are guided contact contactors, to be integrated in the safety circuit of the system controlled.

⚠ The use of overvoltage limiting circuits will increase the service life of the relay contacts (ex: RC circuits with AC, diodes + Zener with DC, etc.)

The 2 safety relays are activated when radio communication is set up between the transmitter and the receiver, and are automatically maintained up to the moment of active or passive shutdown (action on palmswitch, loss of radio link, battery discharged, "Dead man" time elapsed ...)



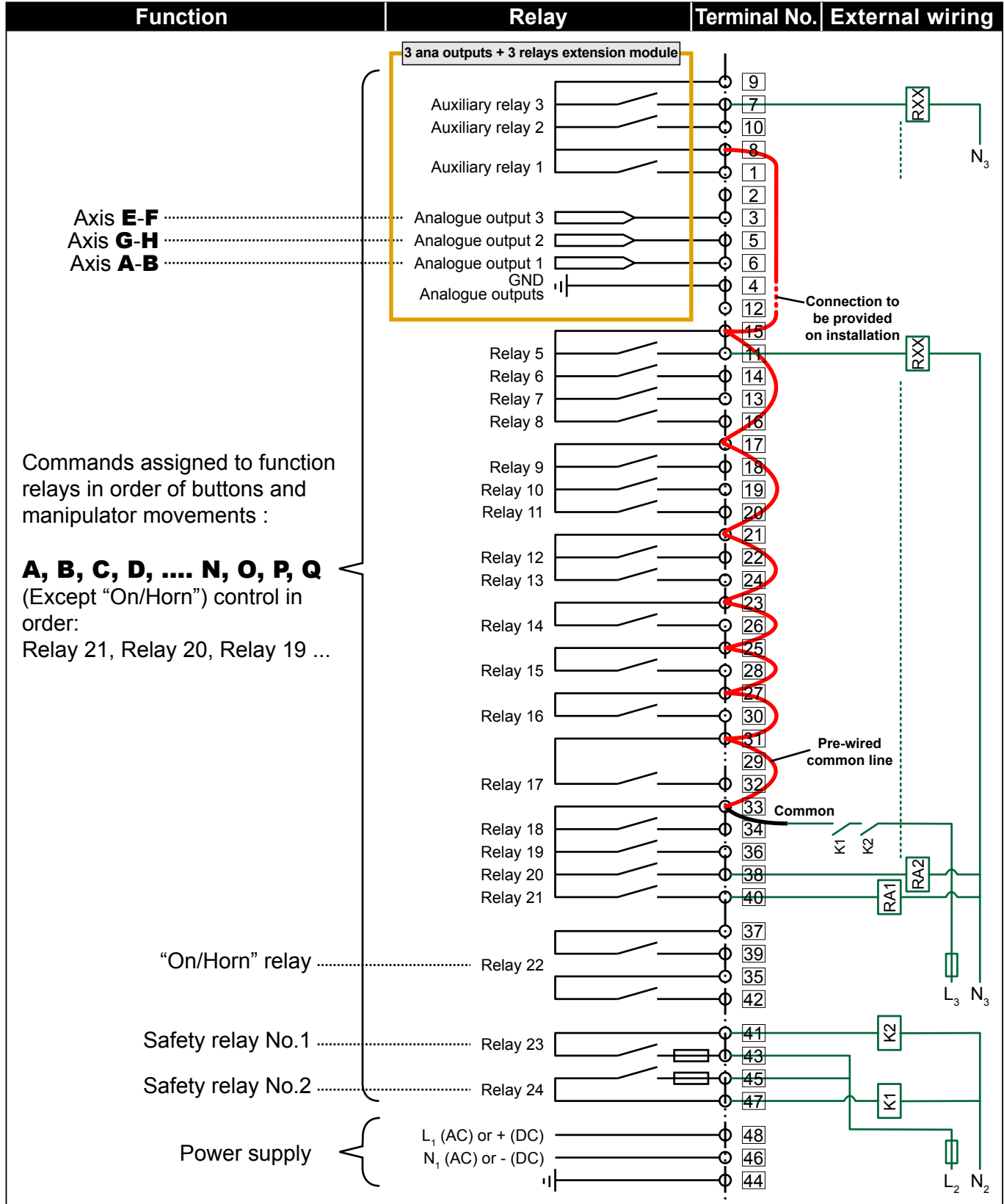
7.4 Diagram for OMR receiver, "20+3" relays + 3 analogue outputs model



⚠ K1 and K2 are guided contact contactors, to be integrated in the safety circuit of the system controlled.

⚠ The use of overvoltage limiting circuits will increase the service life of the relay contacts (ex: RC circuits with AC, diodes + Zener with DC, etc.)

The 2 safety relays are activated when radio communication is set up between the transmitter and the receiver, and are automatically maintained up to the moment of active or passive shutdown (action on palmswitch, loss of radio link, battery discharged, "Dead man" time elapsed ...)



8- Radio frequencies list

8.1 433-434 MHz bands, transmit power = 10 mW (30 available channels)

| Channel n° | Frequency MHz |
|------------|---------------|
| 41 | 434,050 |
| 42 | 434,075 |
| 43 | 434,100 |
| 44 | 434,125 |
| 45 | 434,150 |
| 46 | 434,175 |

| Channel n° | Frequency MHz |
|------------|---------------|
| 47 | 434,200 |
| 48 | 434,225 |
| 49 | 434,250 |
| 50 | 434,275 |
| 51 | 434,300 |
| 52 | 434,325 |

| Channel n° | Frequency MHz |
|------------|---------------|
| 53 | 434,350 |
| 54 | 434,375 |
| 55 | 434,400 |
| 56 | 434,425 |
| 57 | 434,450 |
| 58 | 434,475 |

| Channel n° | Frequency MHz |
|------------|---------------|
| 59 | 434,500 |
| 60 | 434,525 |
| 61 | 434,550 |
| 62 | 434,575 |
| 63 | 434,600 |
| 64 | 434,625 |

| Channel n° | Frequency MHz |
|------------|---------------|
| 65 | 434,650 |
| 66 | 434,675 |
| 67 | 434,700 |
| 68 | 434,725 |
| 69 | 434,750 |
| 70 | 434,775 |

8.2 868-869MHz bands, transmit power = 5 mW (64 available channels)

| Channel n° | Frequency MHz |
|------------|---------------|
| 01 | 868,000 |
| 02 | 868,025 |
| 03 | 868,050 |
| 04 | 868,075 |
| 05 | 868,100 |
| 06 | 868,125 |
| 07 | 868,150 |
| 08 | 868,175 |
| 09 | 868,200 |
| 10 | 868,225 |
| 11 | 868,250 |
| 12 | 868,275 |
| 13 | 868,300 |

| Channel n° | Frequency MHz |
|------------|---------------|
| 14 | 868,325 |
| 15 | 868,350 |
| 16 | 868,375 |
| 17 | 868,400 |
| 18 | 868,425 |
| 19 | 868,450 |
| 20 | 868,475 |
| 21 | 868,500 |
| 22 | 868,525 |
| 23 | 868,550 |
| 24 | 868,575 |
| 30 | 868,725 |
| 31 | 868,750 |

| Channel n° | Frequency MHz |
|------------|---------------|
| 32 | 868,775 |
| 33 | 868,800 |
| 34 | 868,825 |
| 35 | 868,850 |
| 36 | 868,875 |
| 37 | 868,900 |
| 38 | 868,925 |
| 39 | 868,950 |
| 40 | 868,975 |
| 41 | 869,000 |
| 42 | 869,025 |
| 43 | 869,050 |
| 44 | 869,075 |

| Channel n° | Frequency MHz |
|------------|---------------|
| 45 | 869,100 |
| 46 | 869,125 |
| 47 | 869,150 |
| 48 | 869,175 |
| 58 | 869,425 |
| 59 | 869,450 |
| 60 | 869,475 |
| 61 | 869,500 |
| 62 | 869,525 |
| 63 | 869,550 |
| 64 | 869,575 |
| 65 | 869,600 |
| 66 | 869,625 |

| Channel n° | Frequency MHz |
|------------|---------------|
| 70 | 869,725 |
| 71 | 869,750 |
| 72 | 869,775 |
| 73 | 869,800 |
| 74 | 869,825 |
| 75 | 869,850 |
| 76 | 869,875 |
| 77 | 869,900 |
| 78 | 869,925 |
| 79 | 869,950 |
| 80 | 869,975 |
| 81 | 870,000 |

 = Radio channels available only in some countries

9- Product customisation to an application

All our products are customisable to the application. The following special configurations are proposed with realization of special applications by means of customisation sheets :

- different types of manipulators (2 or 3): proportional, with 1, 2, 3 or 4 steps, with adjustment on each direction,
- different types of auxiliary buttons (pushbuttons, selectors with 2 fixed positions, selectors with 3 fixed positions or automatic return type, rotary switches with up to 10 positions) for a maximum number of 8 buttons,
- mechanical cross-locking inhibiting two actions at the same time on a single manipulator (limited to 3 speeds),
- "on-off" switch or rotary switch with metal key on transmitter,
- rotary switch with metal key for cab / radio remote control,
- receiver with up to 25 function relays and 6 analogue outputs,
- 30 frequencies in 433-434 MHz 10mW and 64 frequencies 868-869 MHz bands 5 mW.

10- Selection guide, references for ordering

Note : Each product requires a customisation data sheet defining the desired configuration

10.1 Transmitter and receiver coding principle

OME Transmitter :

O M E ① ② ③ ④ ⑤ ⑥

OMR Receiver :

O M R ③ ⑦ ⑧ ⑨

① Number and type of manipulators

- 2 : 2 Manipulators
- 3 : 3 Manipulators
- C : 2 Manipulators with cross-locking of manipulators
- D : 3 Manipulators with cross-locking of manipulators

④ Additional buttons between 2 manipulators (pushbutton or SEL2 or SEL3 or SEL3R type)

- 0 : No
- 1 : Yes, 1 additional button
- 2 : Yes, 2 additional buttons
- 3 : Yes, 3 additional buttons
- 4 : Yes, 4 additional buttons

⑦ Number and type of outputs

- A : 21 + 3 (1) relays
- B : 25 + 3 (1) relays
- G : 17 + 3 (1) relays and 6 analogue outputs
- F : 20 + 3 (1) relays and 3 analogue outputs

(1) = 2 safety relays + 1 "On-Horn" relay

② IR Option

- 0 : No IR option
- 1 : Start-up by IR validation

⑤ 10-position rotary switch COM10 between 2 manipulators

- 0 : No
- 1 : Yes, 1 10-position rotary switch
- 2 : Yes, 2 10-position rotary switches

⑧ Receiver power supply voltage

- 2 : 24 VDC
- N : 48-115-230 VAC

③ Frequency band

- 1 : 433-434MHz 10mW
- A : 868-869MHz 5mW

⑥ Rotary switch with 2 fixed positions and metal key COM2CM

- 0 : No
- 1 : Yes, 1 rotary switch with 2 fixed positions with metal key

⑨ Type of antenna

- 0 : Antenne fixe
- B : Plug-in antenna with BNC connector output

10.2 Accessories

| Reference | Description |
|----------------|---|
| OMWE401 | Rotary switch with 2 fixed positions and metal key |
| OMCU | Battery charger with voltage adaptor for 115-240 VAC power supply |
| OMC1 | Battery charger to be connected to stabilized power supply or 24 VDC battery |
| UMB2 | Plug-in battery (2) |
| OMF | 1 infrared module for "start-up by infrared validation" option, 48-115-230 VAC power supply |
| UMP | Transmitter carrying belt |
| UWE101 | Transmitter carrying strap |
| OMWE201 | Function label sheet for transmitter (2) |
| UDWR13 | 2m cable with 24-pin connector |
| UDWR14 | 2m cable with 16-pin connector |
| OMWR38 | Fastening Kit for receiver by magnetic contacts |
| OMWR39 | Mecanical fastening Kit for receiver (3) |
| VUB086 | 1/2 wave, straight, plugin BNC antenna, for 433-434MHz frequency bands (4) |
| VUB084 | 1/4 wave, straight, plugin BNC antenna, for 868-869MHz frequency bands (4) |
| VUB170 | 0,5m extension for BNC antenna (without bracket) (5) |
| VUB105 | 2m extension for BNC antenna (with bracket) (5) |
| VUB125 | 5m extension for BNC antenna (with bracket) (5) |
| VUB131 | 10m extension for BNC antenna (with bracket) (5) |

(2) = accessory supplied as standard equipment with transmitter

(3) = accessory supplied as standard equipment with receiver

(4) = accessory supplied as standard equipment with receiver if antenna BNC connector output is present

(5) = Require plug-in antenna with BNC connector output (choice when ordering the receiver)

The products presented in this document are subject to change. Product descriptions and characteristics are not contractually binding. Please go to our internet site www.jay-electronique.fr to download the most recent updates to our documentation.

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