

Alpha 500i Series

Industrial Radio Remote Control System

Operation & Parts Manual

Williams USA, LLC

38113 Plymouth Rd., Livonia, Michigan 48150

Phone: 1-734-416-5520, Fax: 1-734-416-1907

Web site: www.williamsyrless.com

E-mail: williamsusallc@aol.com

IMPORTANT NOTES!

1. **Startup Procedure** _ You must make sure that the red EMS button located on the top right-hand side of the transmitter is elevated prior to turning “on” the power (battery) switch, by twisting it 1/4 turn clockwise, it will pop up. Then turn “on” the power (battery) switch located on the top left-hand side of the transmitter. The Status LED at the center of the power switch will display a green light for up to 2 seconds when the power switch is turned “on”.

Note A: Whenever the EMS button is depressed you must reenact the Startup Procedure, that is, elevate the EMS button then turn the power (battery) switch “Off” then back “On”.

Note B: Depressing (holding down) any buttons during the “Startup Procedure” will disable the transmitter.

2. **Receiver Main Relay will remain closed until the Stop command is received.** The factory default setting for the “JP2” Jumper is open; that is, the Main Relay will remain closed until the Stop command has been received. Replacing the “JP2” Jumper (shorted) will cause the Main Relay to time open 5 minutes after the last command was received. Note that depressing any transmitter button (except select) will close the Main Relay and instituted the appropriate command. If your crane or hoist is equipped with a VFD drive shorting the “JP2” can cause an unacceptable delay, in this situation we suggest you leave the JP2 jumper off (open), then the Main relay will remain closed until the Stop command is received, see Section 7.3 for details.
3. **Caution! Improper Storage of your Spare Transmitter is a Safety Hazard!** _ During the initial installation of your remote control system the spare (second) transmitter should be tested to confirm that it is functioning properly and then the batteries must be removed and the transmitter stored in a secured place. **Failure to follow this safety procedure can result in the inadvertent operation of your crane or hoist by unauthorized personnel resulting in serious injury or death!**

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1. SAFETY INSTRUCTION

The Alpha 500i series are relatively simple to use, however, it is very important to observe the proper safety procedures before, during, and after operation. When used properly, the Alpha 500i series will enhance safety, productivity and efficiency in the workplace.

The following procedures should be strictly followed:

1. Do not change the IDs on transmitter encoder and receiver decoder boards at will.
2. Be sure to replace the batteries with the same brand and specification at the same time. Do not replace only one battery in the battery compartment otherwise there will have the condition of limited transmitter operating time, battery leakage and overheating when charging.
3. Check the transmitter casing and pushbuttons daily. Should any damage that could inhibit the proper operation of the transmitter be found the unit should be immediately removed from service.
4. Check the transmitter voltage whenever it is operated.
5. The red emergency stop button (EMS) should be checked at the beginning of each shift to ensure it is in proper working order and the "Stop" command is being received by the receiver.
6. In the event of an emergency press down the EMS button will immediately deactivates the receiver MAIN relay and the transmitter power. Then turned the power "off" from the main power source to the crane or equipment.
7. Do not use the same RF channel and ID code as any other system in use at the same facility or within 300-meter distance.
8. Ensure the waist belt is worn at all time during operation to avoid accidental damage to the transmitter.
9. Rotate the power switch to OFF position when the transmitter is not operated temporarily or the operation is finished.
10. Any repair or adjustment should be proceeding by repair technician for radio remote controls.
11. The operator should not change any electrical parts at will.
12. This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.
13. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Note: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The term "IC:" before the radio certification number only signifies that Industry Canada Specifications were met.

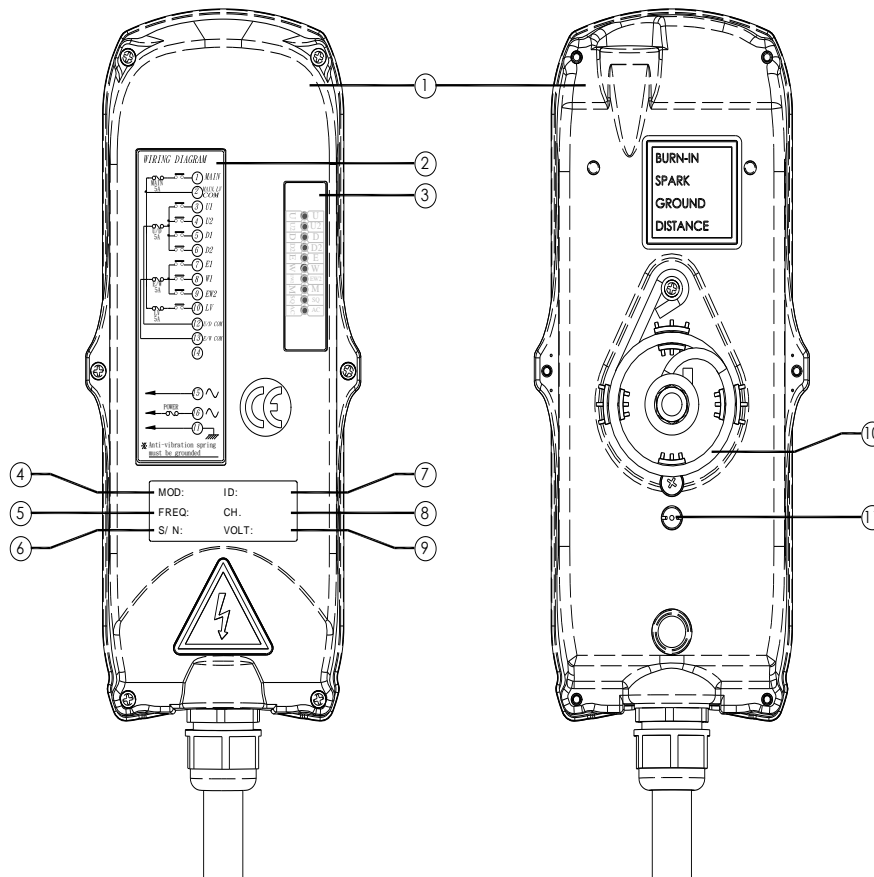
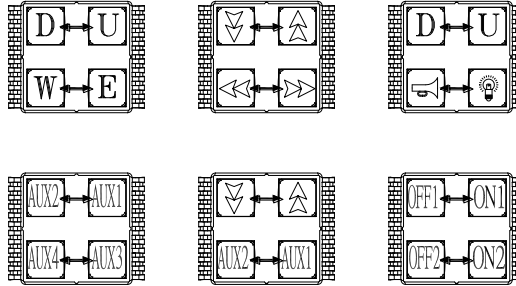
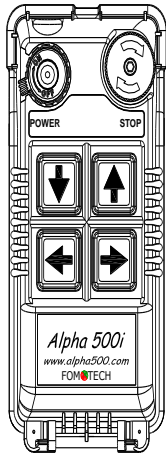
2. PUSHBUTTON CONFIGURATION

2.1 Alpha 504i Subgroup

1. Alpha 504A -- (4) single speed pushbuttons
2. Alpha 504B -- (4) double speed pushbuttons

Below are some of many types of pushbutton configurations that are also available, please contact your dealer for more details.

↔ Interlocked (Can also be set to non-interlocked via an external programmer unit)



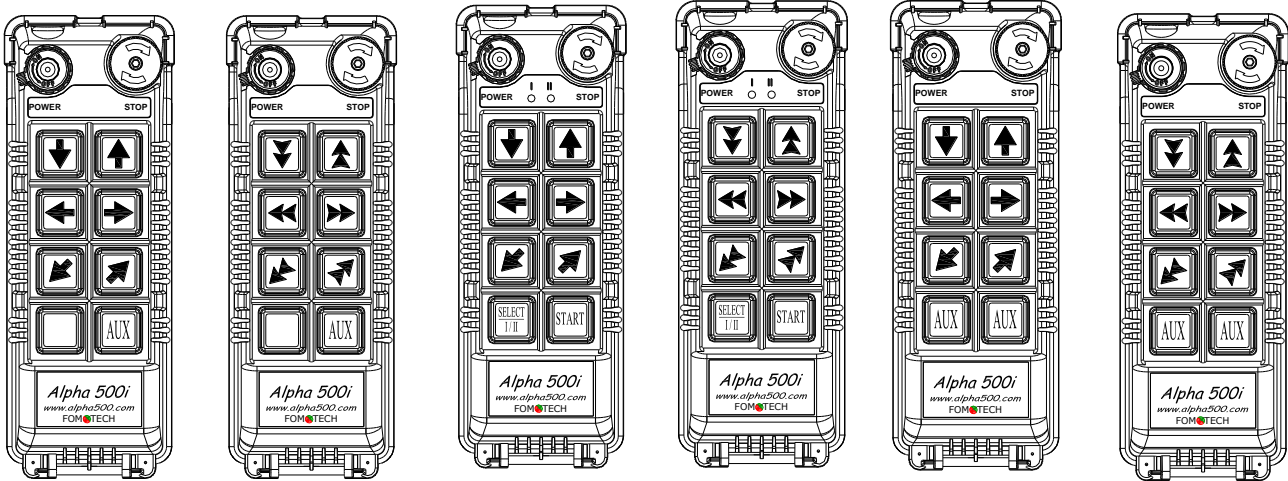
Front View

Back View

- | | | |
|---------------------------|-------------------------|---------------------------|
| 1) Receiver enclosure | 5) System frequency | 9) Supplied voltage |
| 2) Wiring diagram | 6) System serial number | 10) Anti-vibration spring |
| 3) Receiver LED displays* | 7) System ID code | 11) Grounding (GND) |
| 4) Type model | 8) System RF channel | |

2.2 Alpha 508i Subgroup

1. Alpha 507A -- (7) single speed pushbuttons
2. Alpha 507B -- (6) double speed pushbuttons + (1) single speed pushbuttons
3. Alpha 507AT -- (6) single speed pushbuttons + (1) SELECT I/II pushbutton
4. Alpha 507BT -- (6) double speed pushbuttons + (1) SELECT I/II pushbutton
5. Alpha 508A -- (8) single speed pushbuttons
6. Alpha 508B -- (6) double speed pushbuttons + (2) single speed pushbuttons



(Alpha 507A)

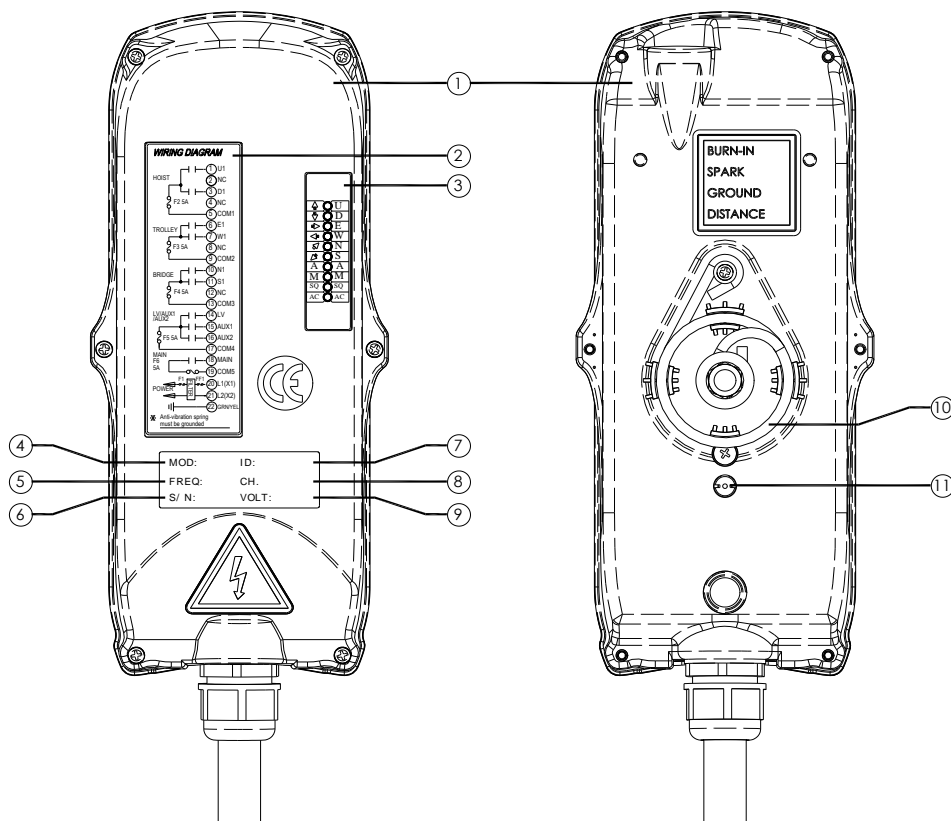
(Alpha 507B)

(Alpha 507AT)

(Alpha 507BT)

(Alpha 508A)

(Alpha 508B)



Front View

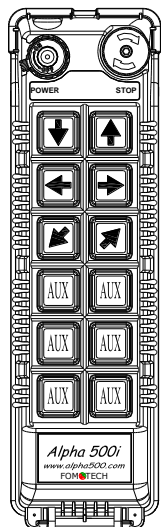
Back View

- | | | |
|---------------------------|-------------------------|---------------------------|
| 1) Receiver enclosure | 5) System frequency | 9) Supplied voltage |
| 2) Wiring diagram | 6) System serial number | 10) Anti-vibration spring |
| 3) Receiver LED displays* | 7) System ID code | 11) Grounding (GND) |
| 4) Type model | 8) System RF channel | |

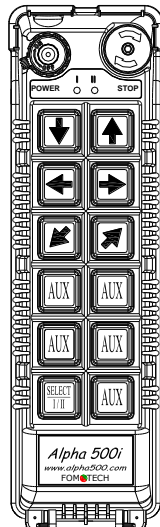
2.3 Alpha 512i Subgroup

1. Alpha 512A -- (12) one-speed pushbuttons
2. Alpha 512B -- (11) one-speed pushbuttons + I/II select pushbutton*
3. Alpha 512C-1 -- (6) two-speed + (6) one-speed pushbuttons
4. Alpha 512C-2 -- (8) two-speed + (4) one-speed pushbuttons
5. Alpha 512D -- (10) two-speed + (2) one-speed pushbuttons
6. Alpha 512E-1 -- (6) two-speed + (5) one-speed pushbuttons + I/II select pushbutton*
7. Alpha 512E-2 -- (8) two-speed + (3) one-speed pushbuttons + I/II select pushbutton*

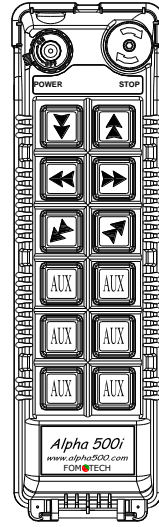
* For cranes with auxiliary hoist and trolley (changeover function).



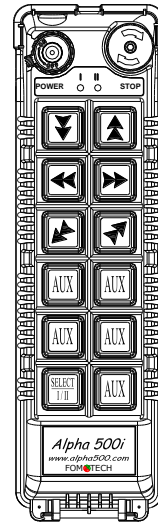
α 512A



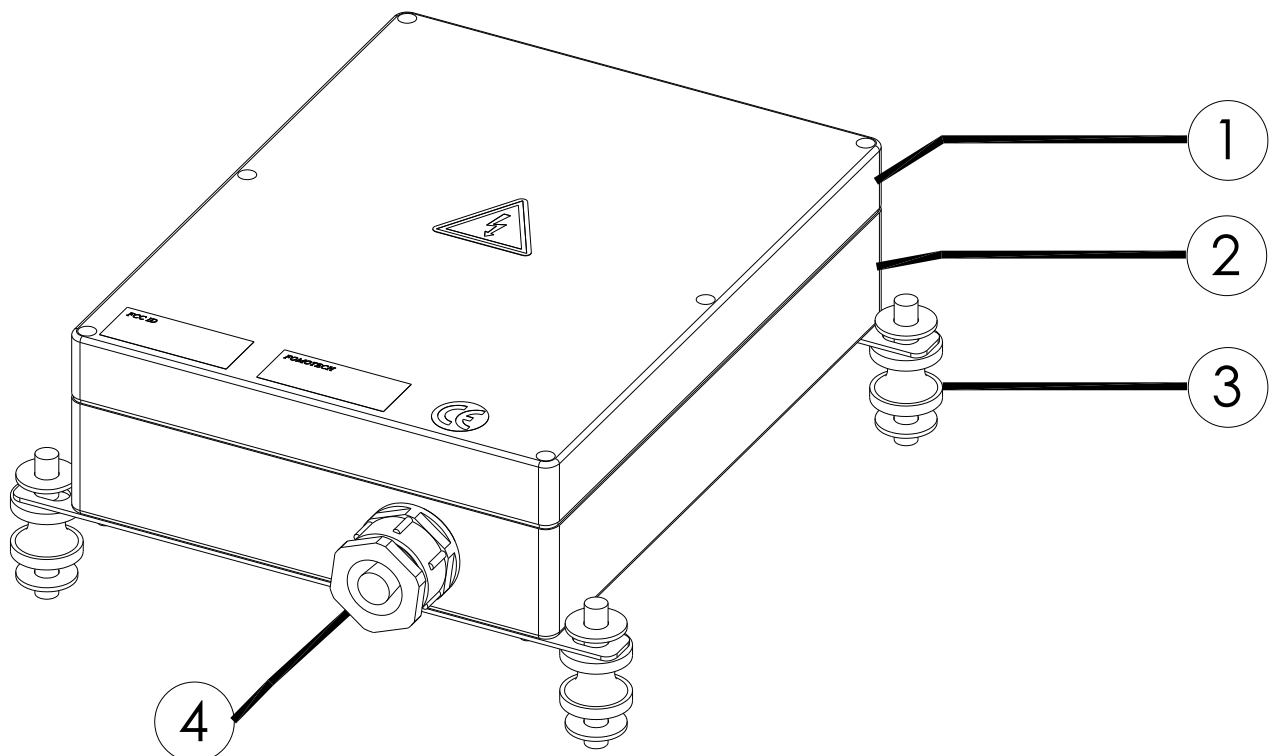
α 512B



α 512C-1/C-2/D



α 512E-1/E-2

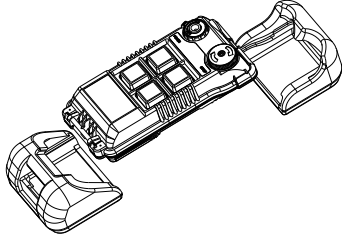


- | | |
|----------------------------|--|
| 1) Transparent top cover | 3) Mounting bracket with shock absorbers |
| 2) Light-gray colored base | 4) Cable gland / Cord grip |

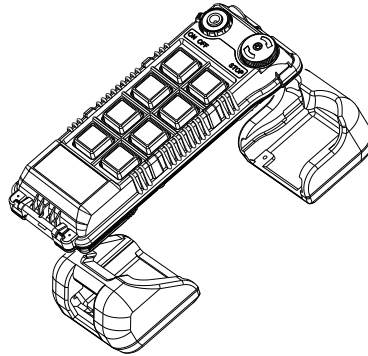
3. TRANSMITTER OUTLINE

Alpha 504i transmitter size : 140mm x 68mm x 30mm
 Alpha 508i transmitter size : 189mm x 68mm x 30mm
 Alpha 512i transmitter size : 235mm x 68mm x 30mm

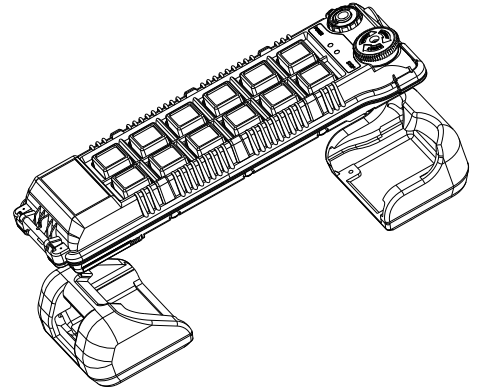
(Alpha 504i)



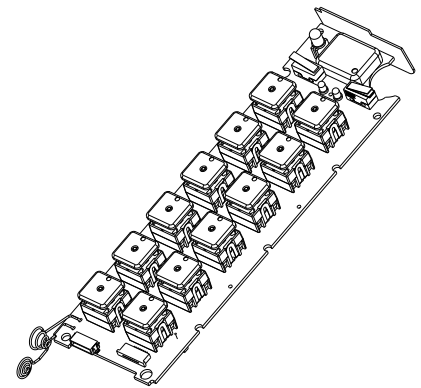
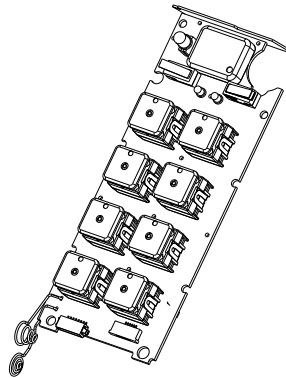
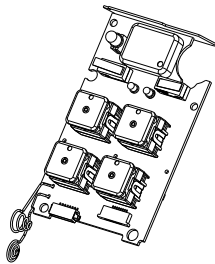
(Alpha 508i)



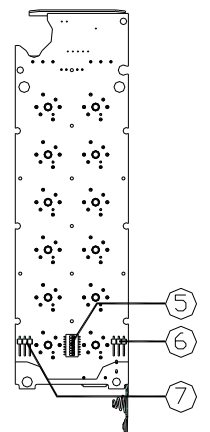
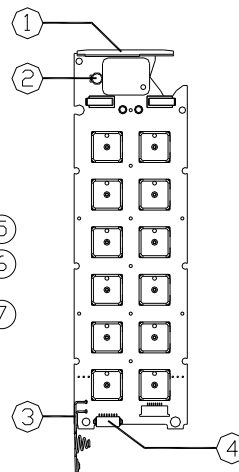
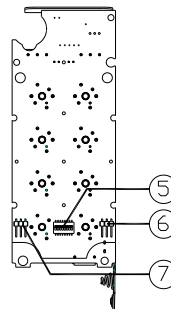
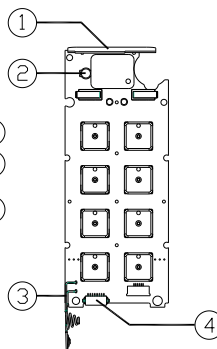
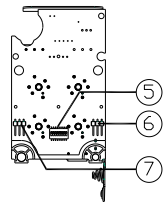
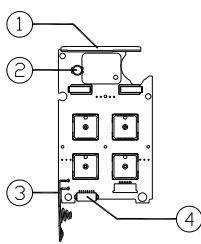
(Alpha 512i)



Transmitter encoder board and induction charging board:

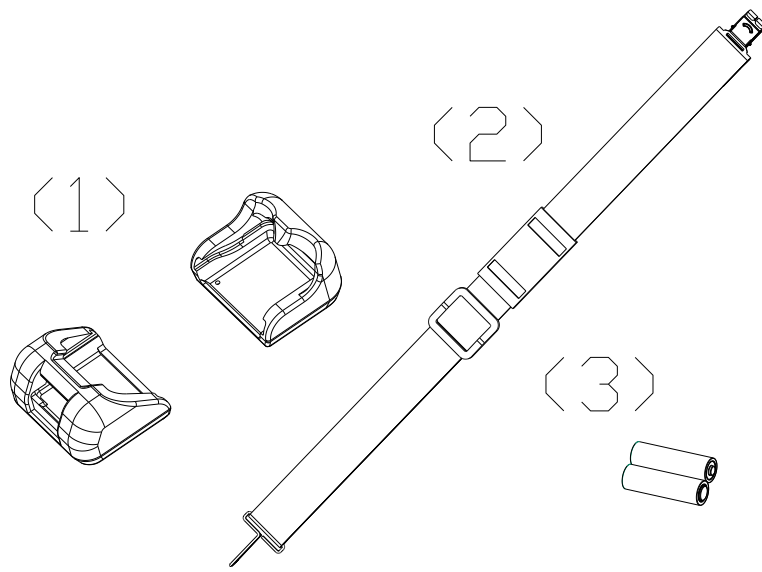


Transmitter Internal Assembly:



- (1) Internal antenna
- (2) Status LED display
- (3) Battery contact
- (4) Programming port
- (5) Function setting
Dip-switch
- (6) JP2 setting pin
- (7) JP1 setting pin

3.2 Spare Parts



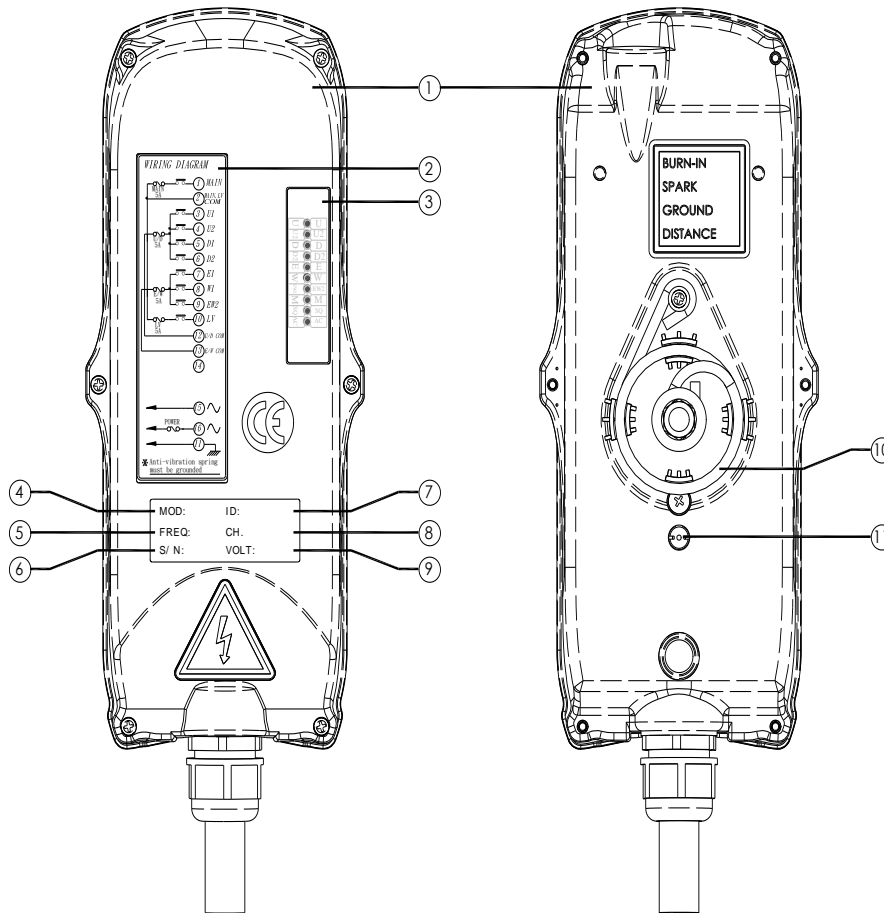
- (1) Transmitter shock-absorbing rubber
- (2) Shoulder strap
- (3) AA alkaline batteries

4. RECEIVER OUTLINE

4.1 Alpha 504i

4.1.1 External Assembly

SIZE : 310mm X 134mm X 72mm



Front View

Back View

- | | | |
|---------------------------|-------------------------|---------------------------|
| 1) Receiver enclosure | 5) System frequency | 9) Supplied voltage |
| 2) Wiring diagram | 6) System serial number | 10) Anti-vibration spring |
| 3) Receiver LED displays* | 7) System ID code | 11) Grounding (GND) |
| 4) Type model | 8) System RF channel | |

* **A** ~ AUX Relay Contact Indicator (for Alpha 540A/560A models only).

* **M** ~ MAIN and 2nd Speed Relay Contact Indicator.

Green "on" → MAIN activated (All models).

Red "on" → 2nd speed activated (for Alpha 560S/A models only).

* **SQ** ~ RF Signal Indicator (Red).

"on" → RF signal detected and received.

"off" → No RF signal detected or received.

Blinking at transmitter power "off" → Other radio interference.

* **AC** ~ Power Source Indicator (red) "on" → AC input power supplied.

"off" → No AC input power.

4.1.2 Alpha 504i Internal Assembly

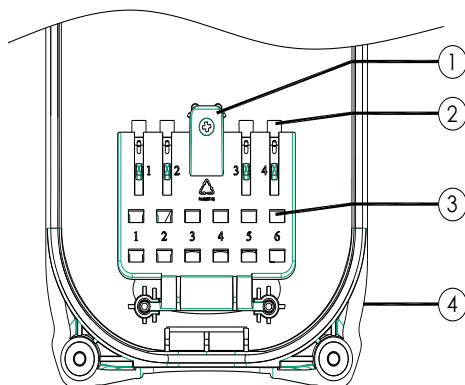
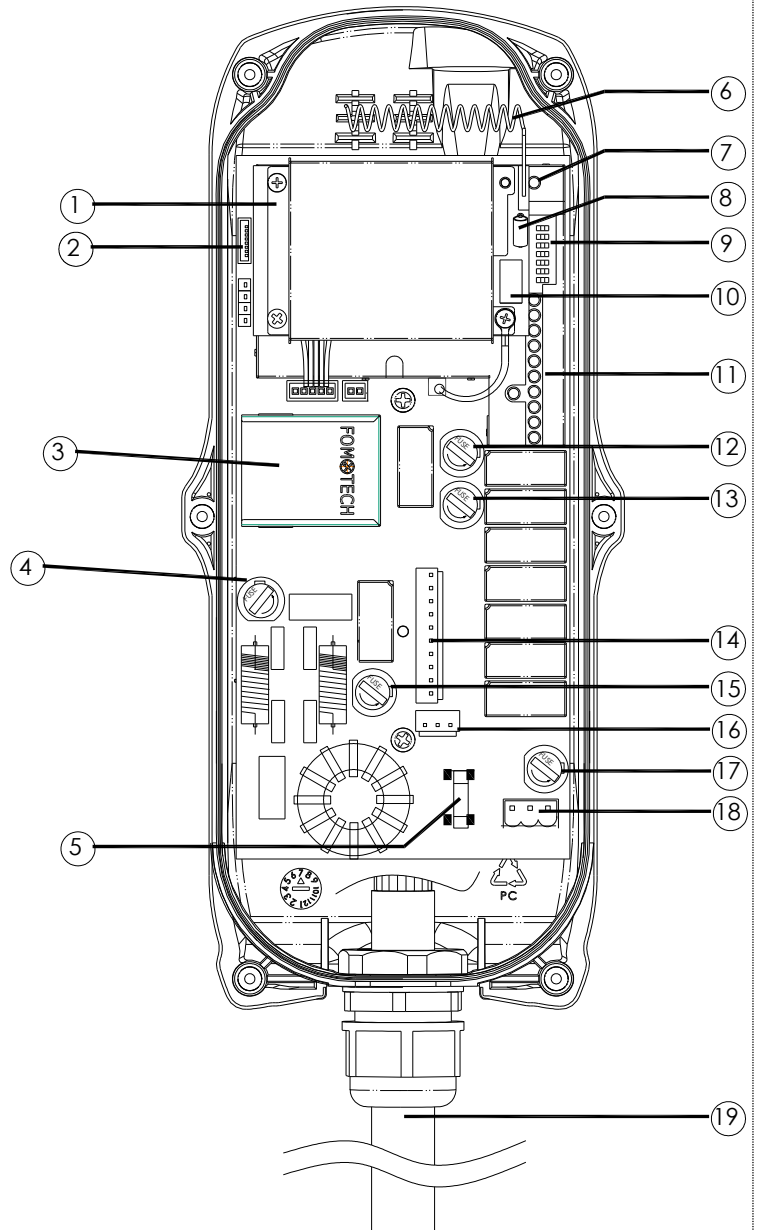
(Fig. 15) Internal Parts Assembly

- 1) Receiving RF module
- 2) External programming port
- 3) Power module *
- 4) Secondary power AC fuse (F1)
- 5) Primary power AC fuse (FF1)
- 6) Internal Antenna
- 7) System status LED display*
- 8) External antenna port
- 9) ID code dip-switch
- 10) RF channel dip-switch
- 11) Contact relay LED display
- 12) Pushbutton #1 and #2 fuse (5.0A)
- 13) MAIN fuse (5.0A)
- 14) Contact output seat (CN3)
- 15) Low-voltage (LV) fuse (5.0A)
- 16) Contact output seat (CN4)
- 17) Pushbutton #3 and #4 fuse (5.0A)
- 18) AC power input seat (CN2)
- 19) Cable gland & output cable

* Power module: Including transformer or full-voltage module.

* Please refer to the following table for Alpha 504/507/508/512 receiver power fuse list.

** Please refer to page 34 for system status LED display information.

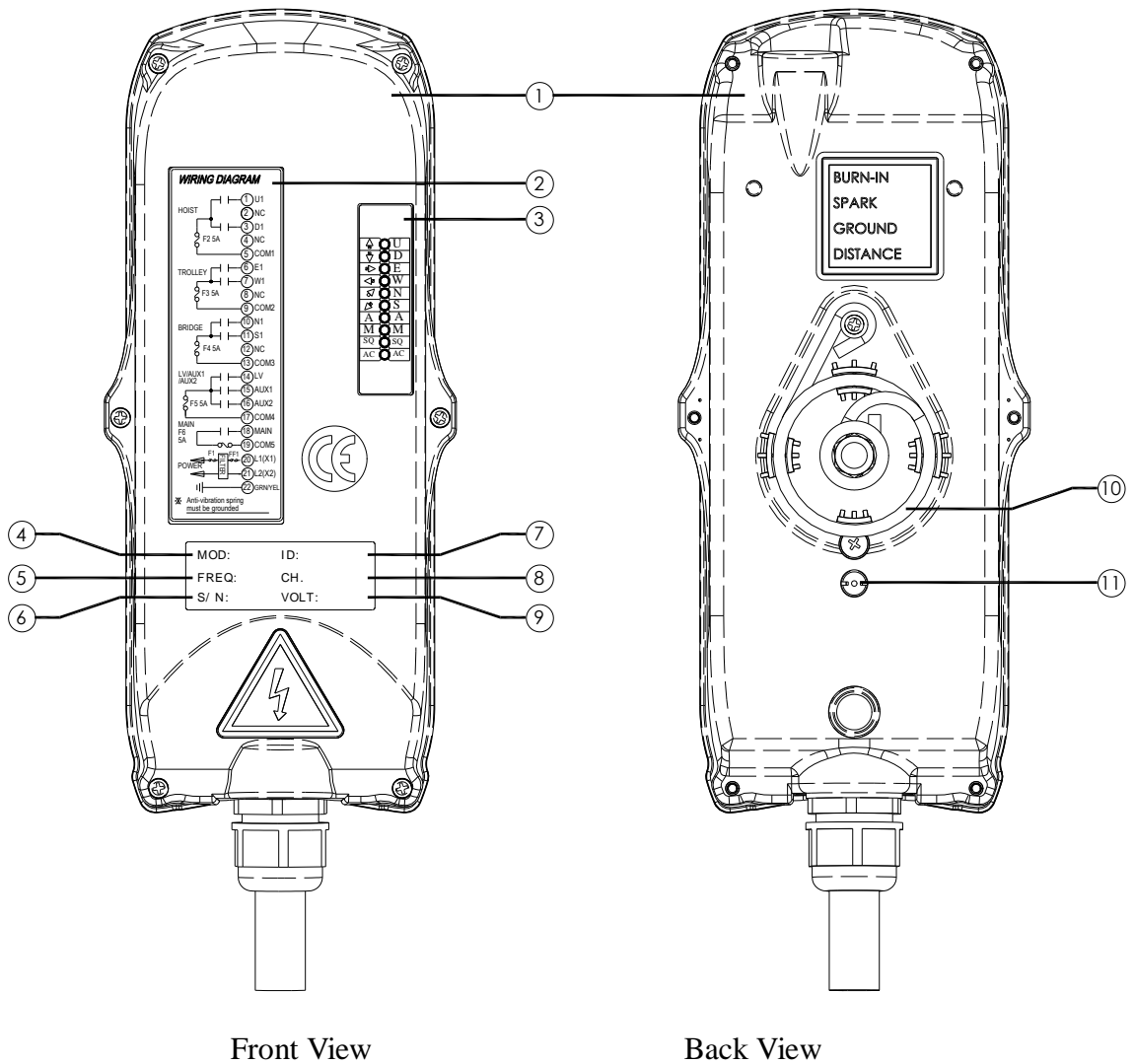


- 1) Spare fuse & jumper compartment
- 2) Spare Jumper slots
- 3) Spare fuse slots
- 4) Receiver top casing

4.2 Alpha 508i

4.2.1 External Assembly

SIZE : 310mm X 134mm X 72mm

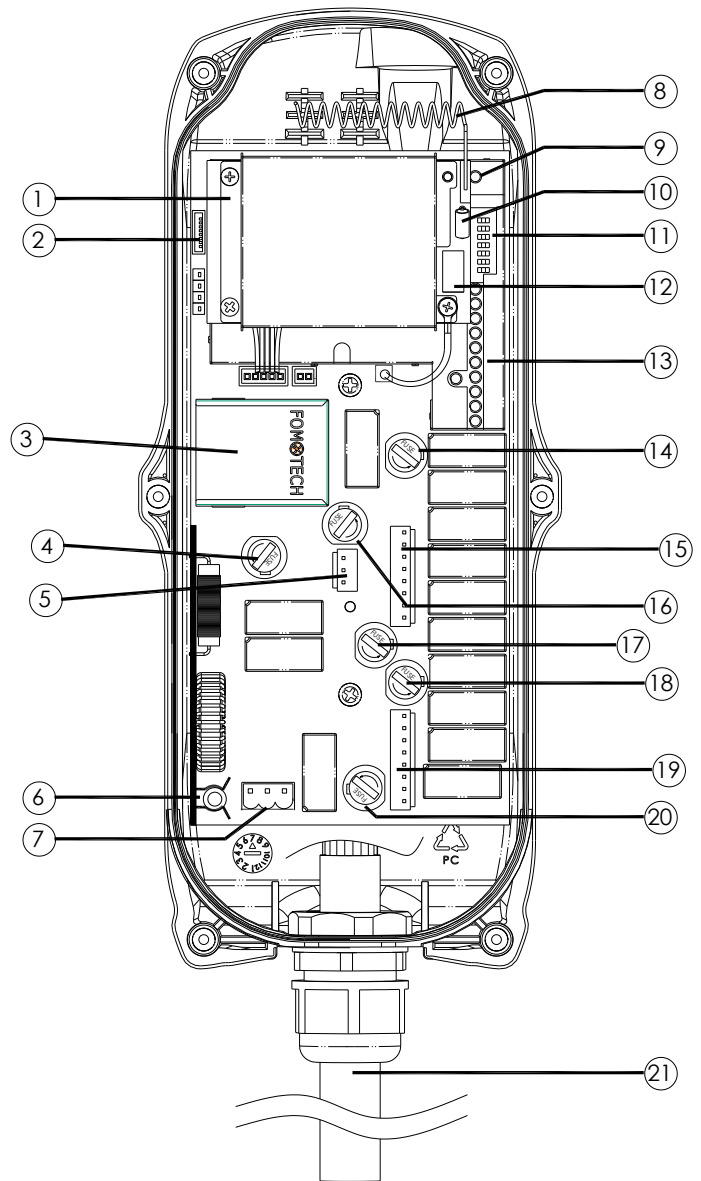


- | | | |
|---------------------------|-------------------------|---------------------------|
| 1) Receiver enclosure | 5) System frequency | 9) Supplied voltage |
| 2) Wiring diagram | 6) System serial number | 10) Anti-vibration spring |
| 3) Receiver LED displays* | 7) System ID code | 11) Grounding (GND) |
| 4) Type model | 8) System RF channel | |

4.2.2 Alpha 508i Internal Assembly

(Fig. 16) Internal Parts Assembly

- 1) Receiving RF module
- 2) External programming port
- 3) Power module
- 4) Secondary power AC fuse (F1)
- 5) Contact output seat (CN8)
- 6) Primary power AC fuse (FF1)
- 7) AC power input seat (CN2)
- 8) Internal Antenna
- 9) System Status LED display**
- 10) External antenna port
- 11) ID code dip-switch
- 12) RF channel dip-switch
- 13) Contact relay LED display
- 14) Pushbutton #1 and #2 fuse (5.0A)
- 15) Contact output seat (CN3)
- 16) MAIN contact fuse (5.0A)
- 17) Pushbutton #3 and #4 fuse (5.0A)
- 18) Pushbutton #5 and #6 fuse (5.0A)
- 19) Contact output seat (CN4)
- 20) LV & AUX fuse (5.0A)
- 21) Cable gland & output cable



* Power module: Including transformer or full-voltage module.

* Please refer to the following table for Alpha 504/507/508/512 receiver power fuse list.

** Please refer to page 34 for system status LED display information.

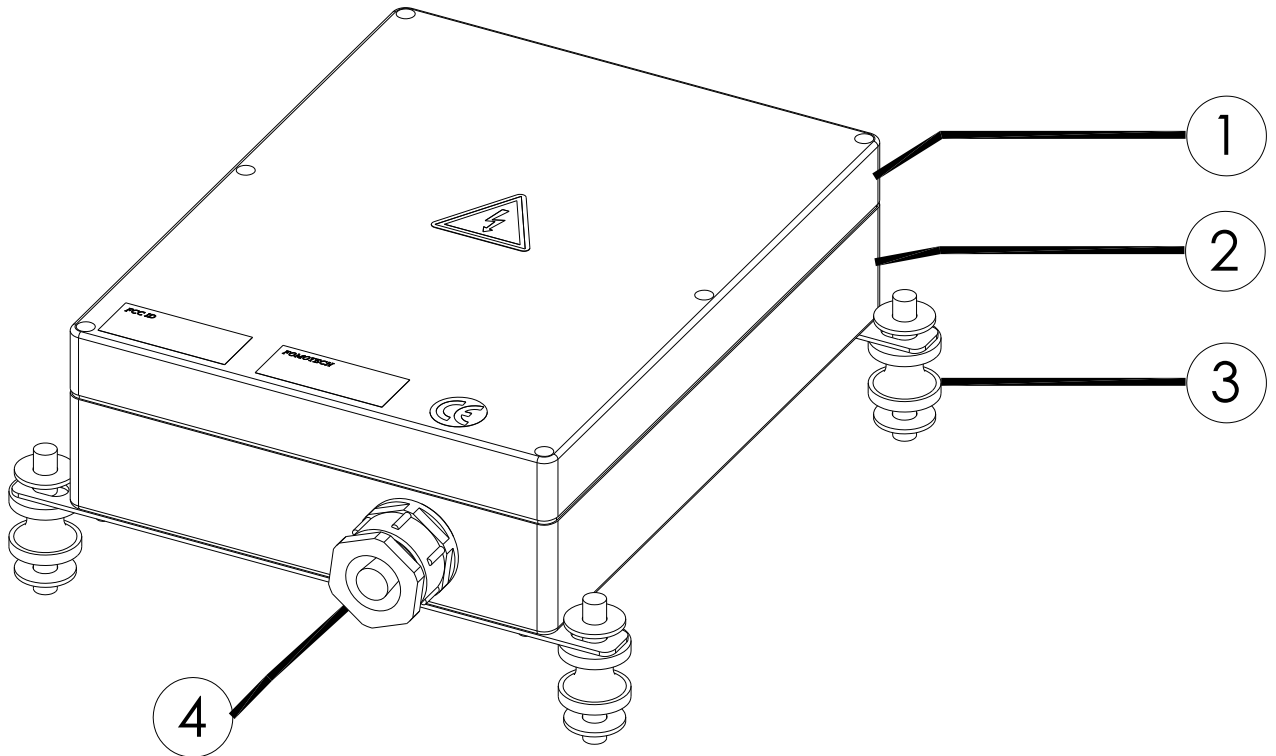
Alpha 504/507/508/512 Receiver Power Fuse List

Type	Parts No.	Voltage						
		DC12V~24V	AC24	AC36~48V	AC100~120 V	AC220~240 V	AC380~440 V	AC100~240V Full-Voltage
α504	FF1	3A			1A		2A	
α508	F1	3A	2A		0.5A		1A	
A512	FF1	3A			1A			
	F1	3A	2A		0.8A			

4.3 Alpha 512i

4.3.1 External Assembly

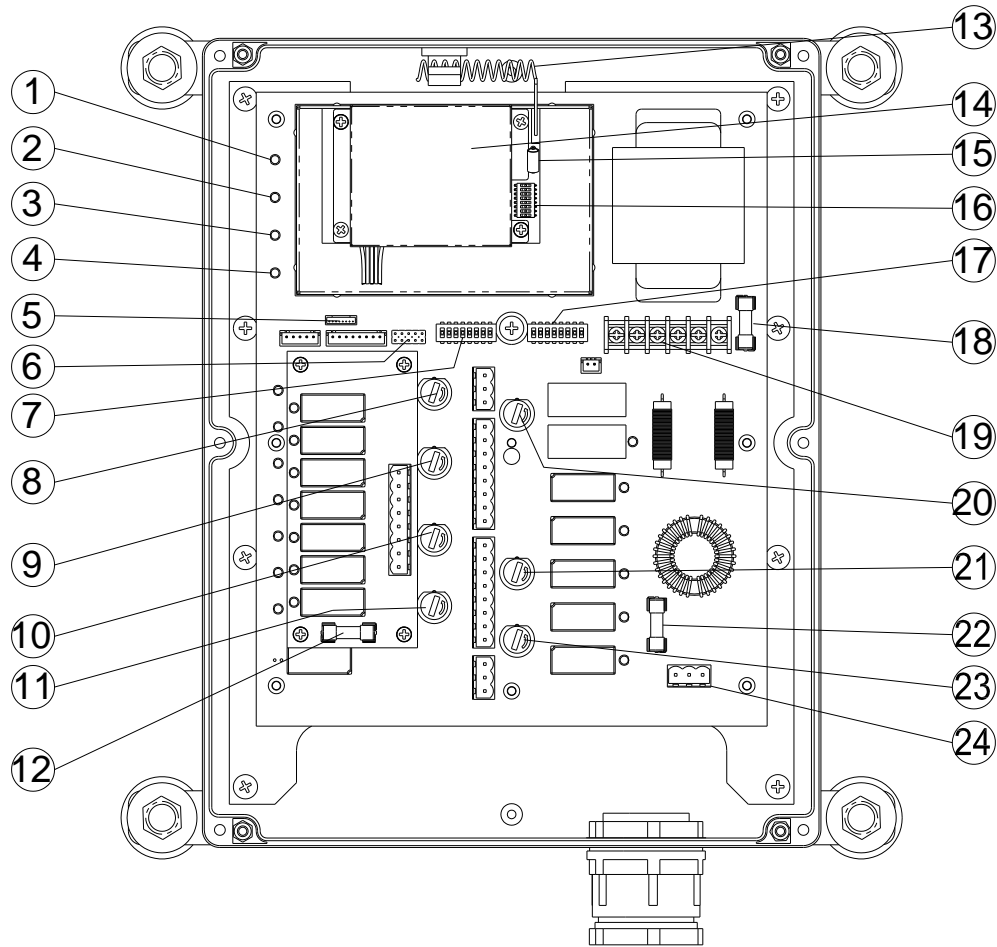
SIZE : 300mm X 230mm X 86mm



External Parts Assembly

- | | | | |
|----|-------------------------|----|---------------------------------------|
| 3) | Transparent top cover | 3) | Mounting bracket with shock absorbers |
| 4) | Light-gray colored base | 4) | Cable gland / Cord grip |

4.3.2 Alpha 512i Internal Assembly



Internal Parts Assembly

- | | |
|--|---|
| 1) Power LED display* | 13) Internal Antenna |
| 2) SQ LED display** | 14) Receiving RF module |
| 3) Status LED display**** | 15) External antenna port |
| 4) DC power relay LED display*** | 16) RF channel dip-switch |
| 5) Programming port | 17) ID code dip-switch |
| 6) Jumper settings | 18) Secondary power fuse F1*(Please refer to table 4.3) |
| 7) Function dip-switch | 19) Voltage selector seat |
| 8) Pushbutton #3 and #4 relay fuse (5.0A) | 20) MAIN relay fuse (5.0A) |
| 9) Pushbutton #5 and #6 relay fuse (5.0A) | 21) Pushbutton A4 relay fuse (5.0A) |
| 10) Pushbutton A1 and A2 relay fuse (5.0A) | 22) Primary power fuse FF1*(参考下列对照表 4.3) |
| 11) Pushbutton A3 relay fuse (5.0A) | 23) Low-voltage (LV) relay fuse (5.0A) |
| 12) Pushbutton #1 and #2 relay fuse (5.0A) | 24) Power port CN2 |

* **POWER** ~ AC Power Source Indicator "on" → AC input power supplied.
 "off" → No AC input power.

** **SQ** ~ RF Signal Indicator "on" → RF signal detected and received.
 "off" → No RF signal detected or received.

Blinking at transmitter power "off" → Other radio interference.

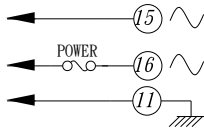
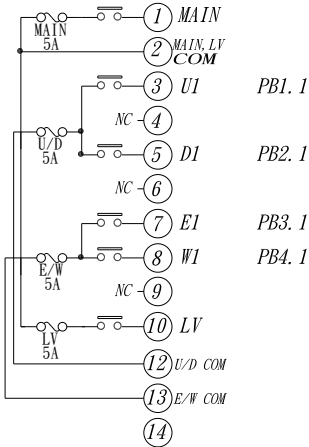
*** **RELAY_COM** ~ DC Power Source to Relays "on" → DC power to relays.
 "off" → No DC power to relays.

**** **STATUS** ~ Receiver System Status LED Display → Please refer to page 34.

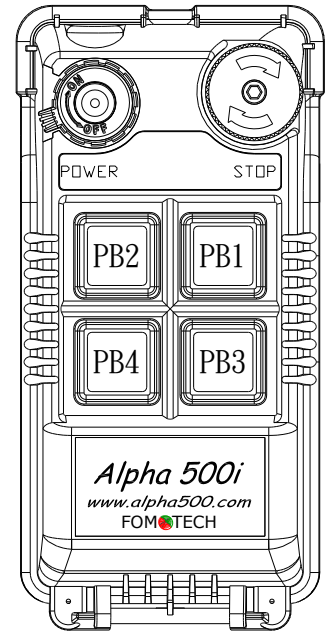
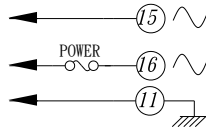
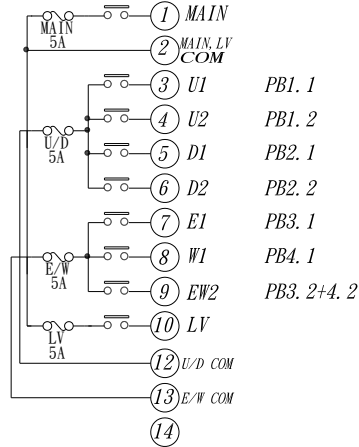
5. OUTPUT CONTACT DIAGRAMS

5.1 Alpha 504i Models

(Alpha 504A)

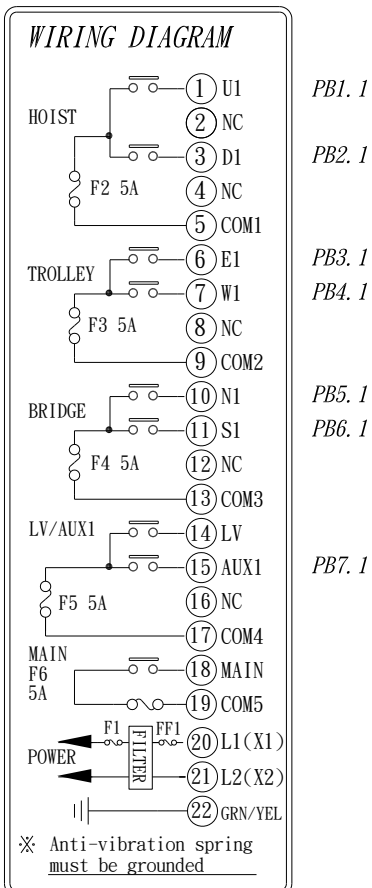


(Alpha 504B)

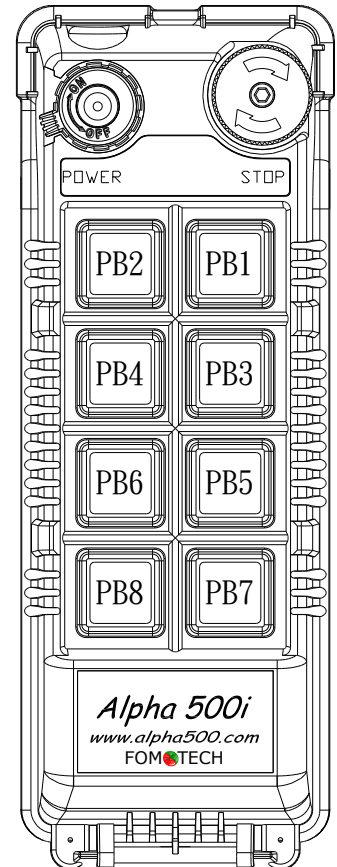
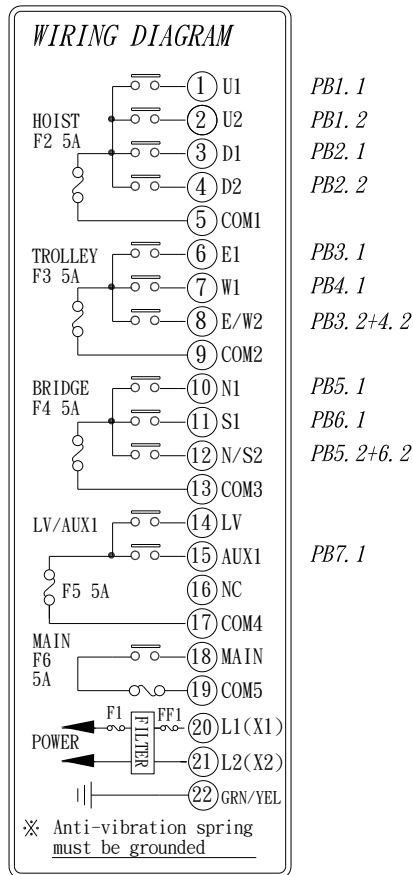


5.2 Alpha 508i Models

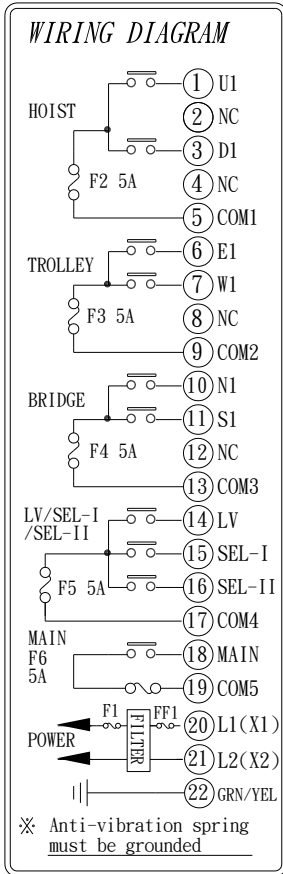
(Alpha 507A)



(Alpha 507B)



(Alpha 507AT)



PB1. 1

PB2. 1

PB3. 1

PB4. 1

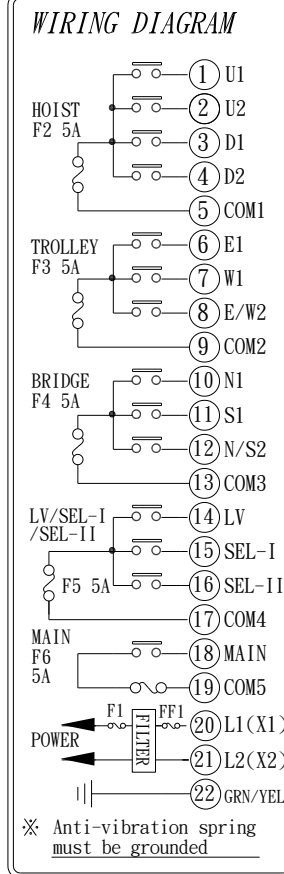
PB5. 1

PB6. 1

PB8. 1

PB8. 2

(Alpha 507BT)



PB1. 1

PB1. 2

PB2. 1

PB2. 2

PB3. 1

PB4. 1

PB3. 2+4. 2

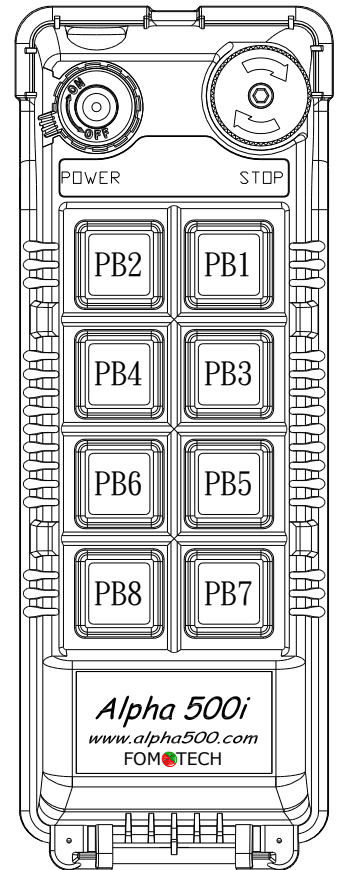
PB5. 1

PB6. 1

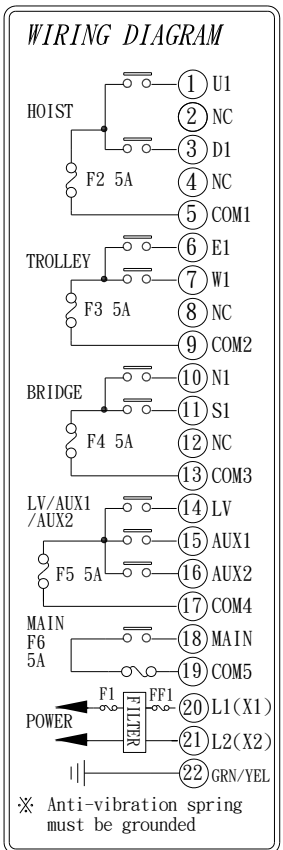
PB5. 2+6. 2

PB8. 1

PB8. 2



(Alpha 508A)



PB1. 1

PB2. 1

PB3. 1

PB4. 1

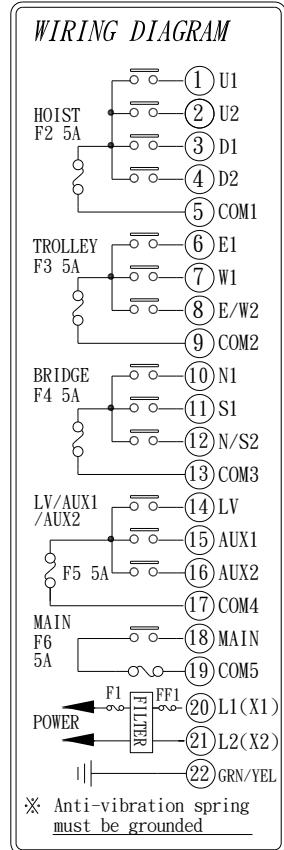
PB5. 1

PB6. 1

PB7. 1

PB8. 1

(Alpha 508B)



PB1. 1

PB1. 2

PB2. 1

PB2. 2

PB3. 1

PB4. 1

PB3. 2+4. 2

PB5. 1

PB6. 1

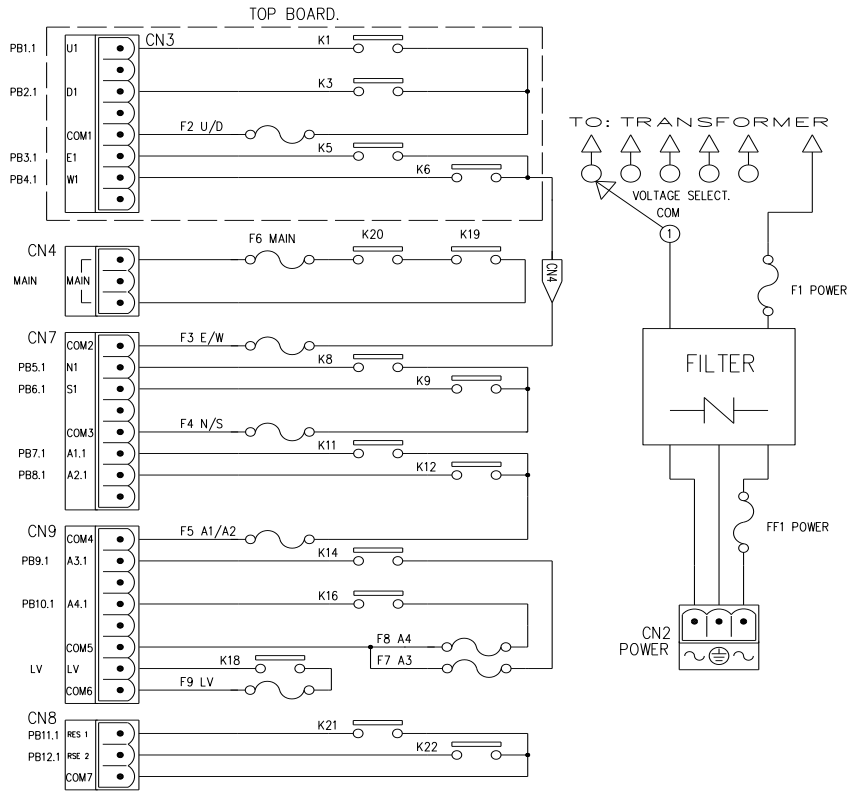
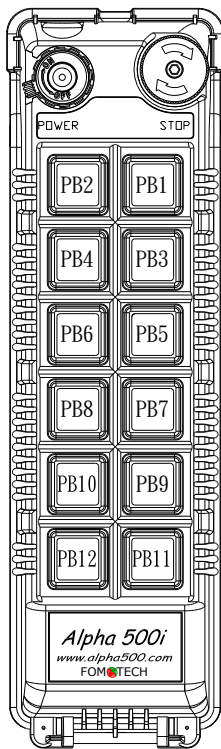
PB5. 2+6. 2

PB8. 1

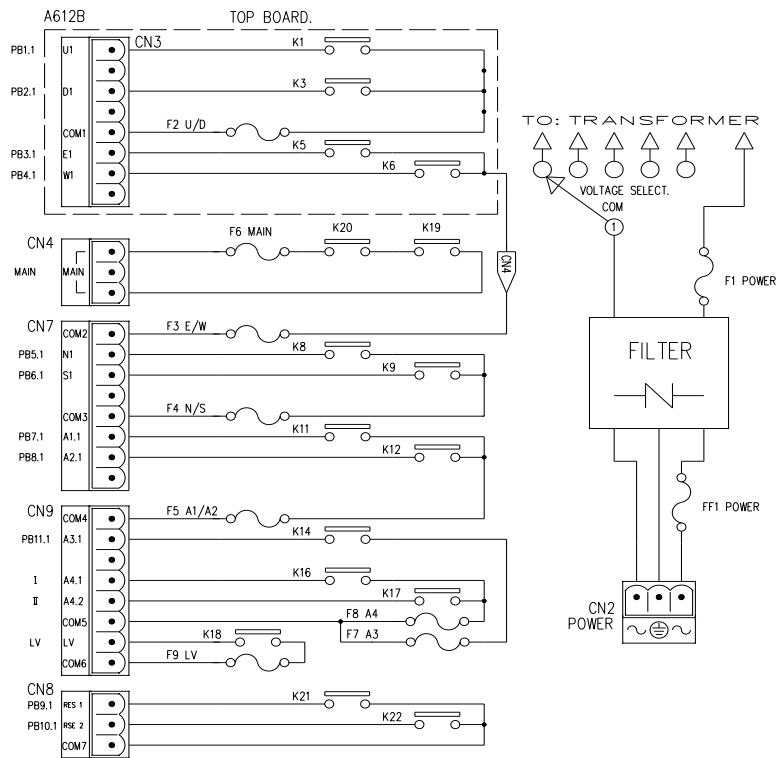
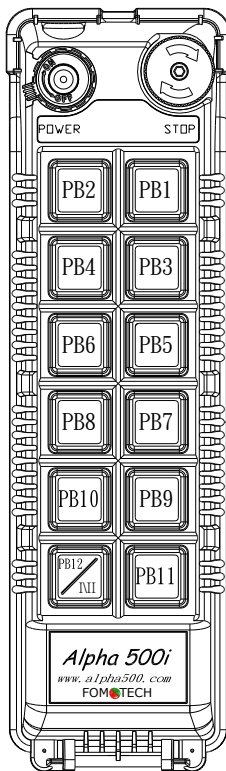
PB8. 2

5.3 Alpha 512i Models

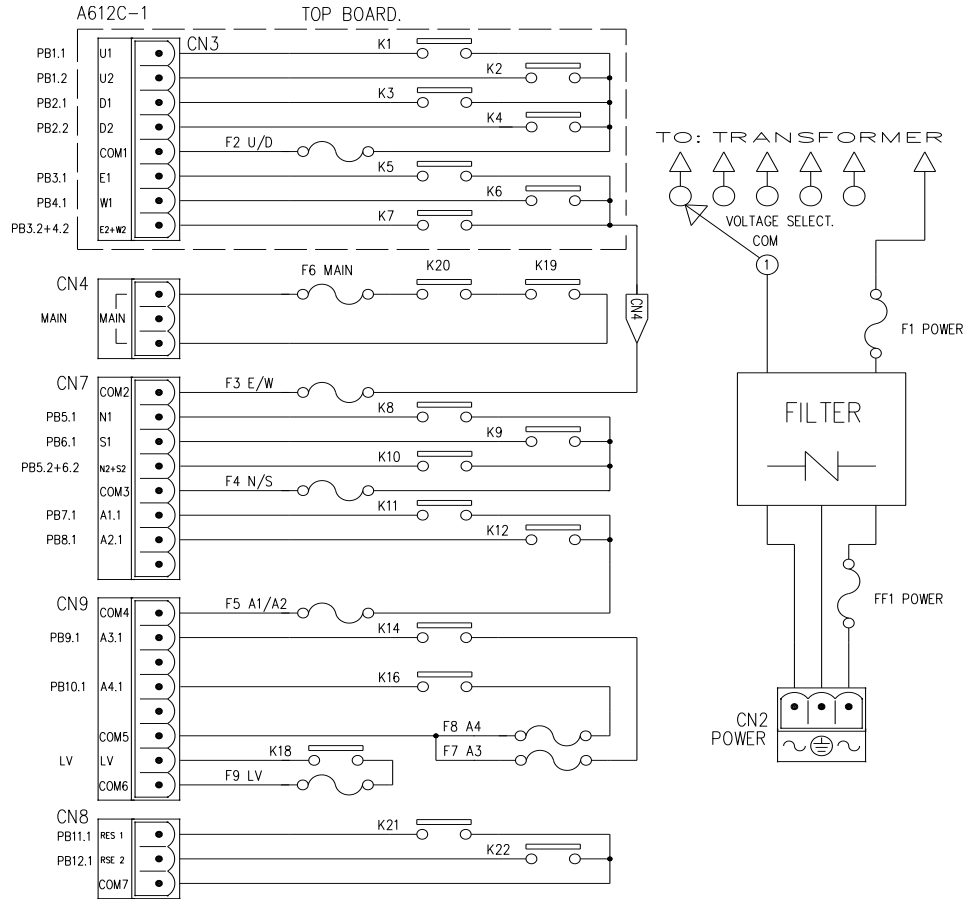
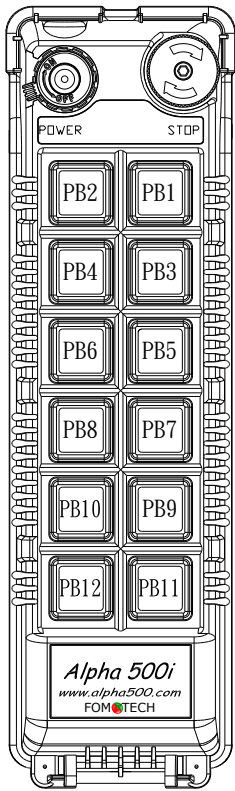
(Alpha 512A)



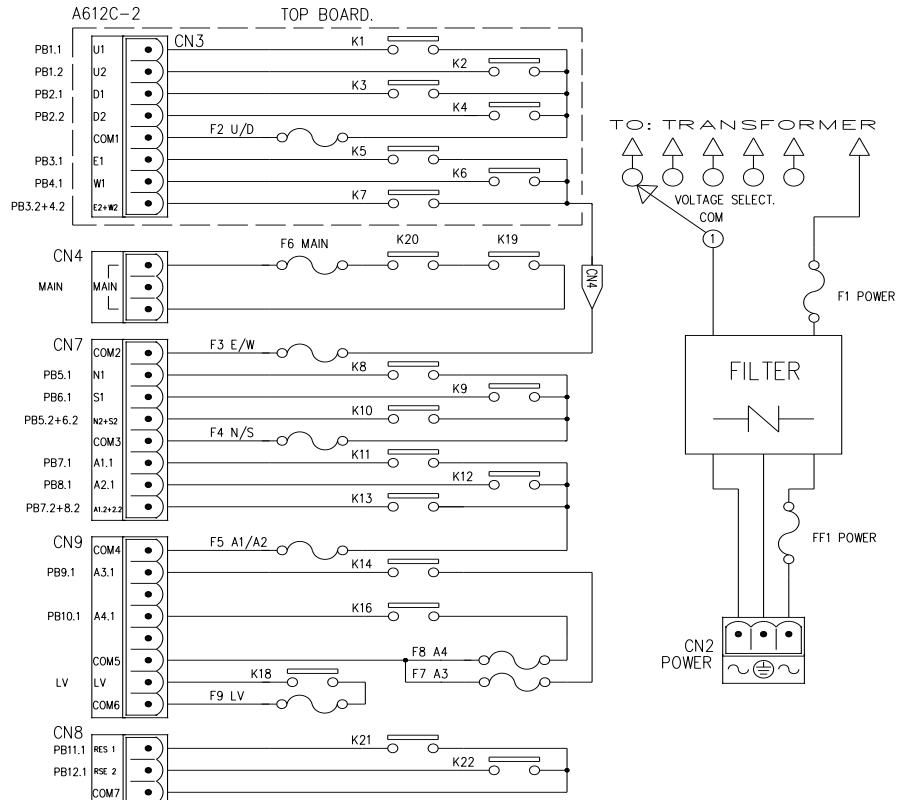
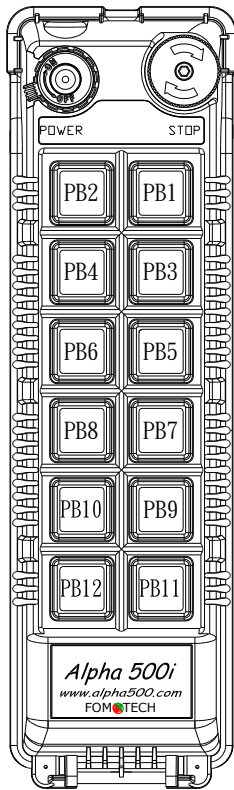
(Alpha 512B)



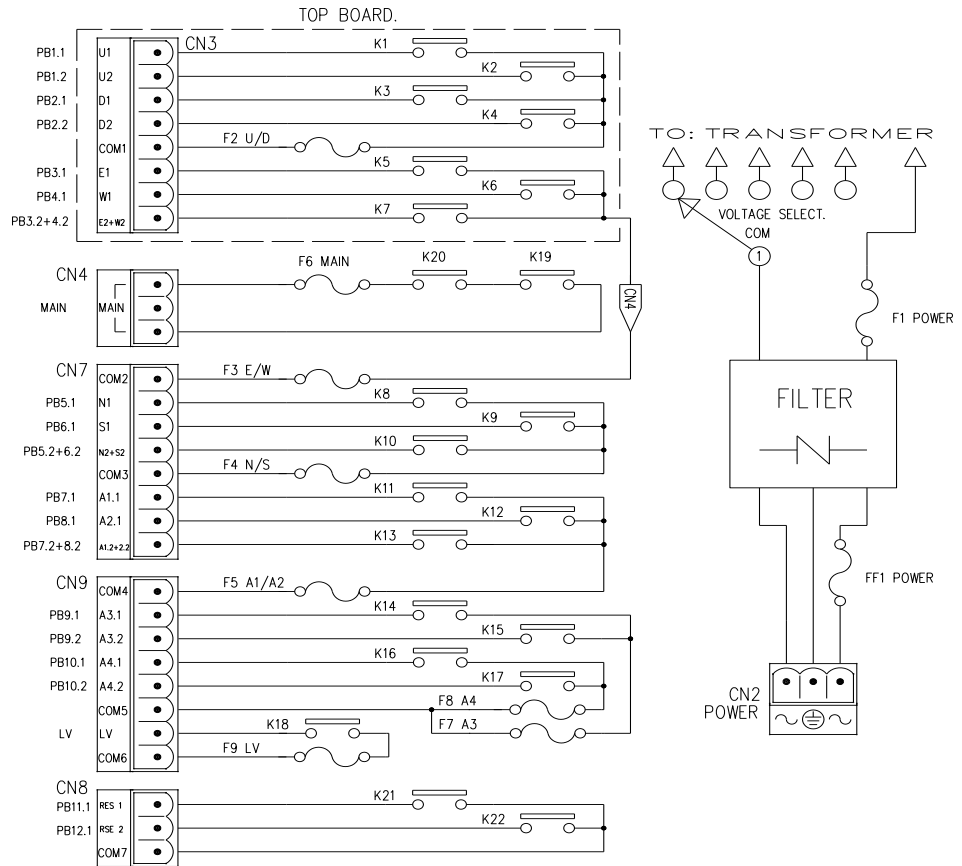
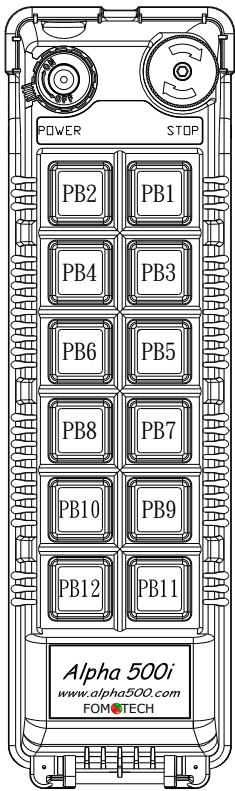
(Alpha 512C-1)



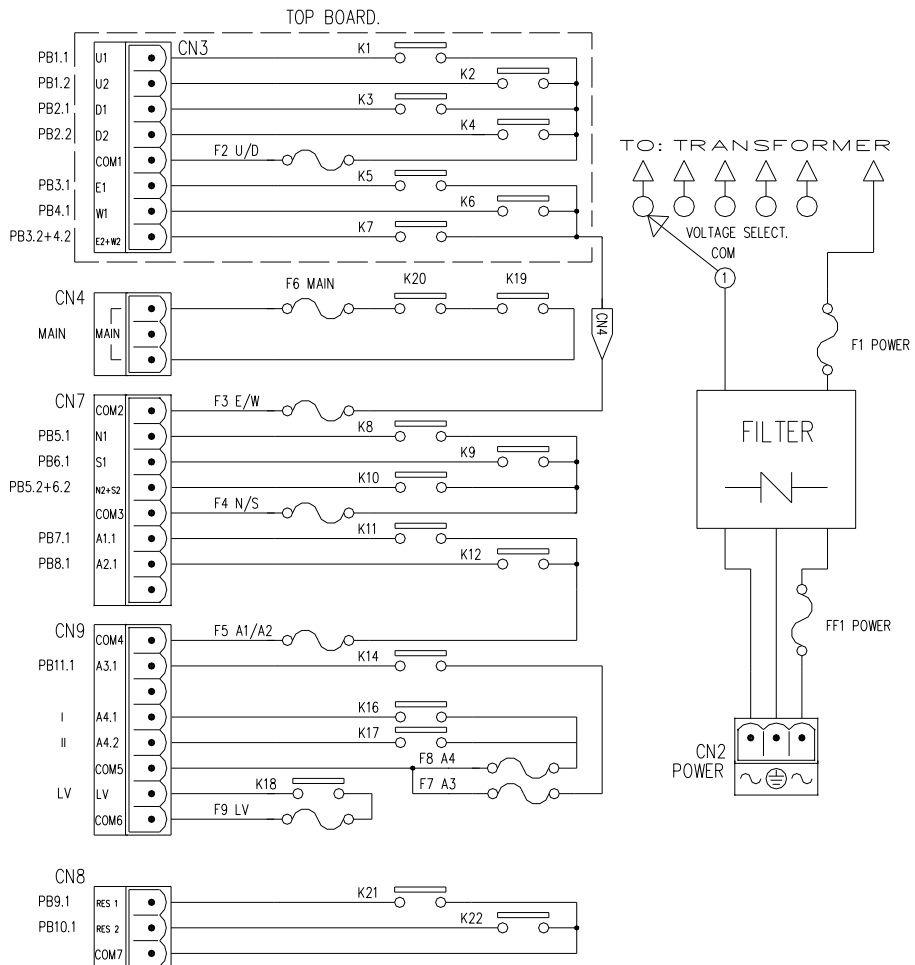
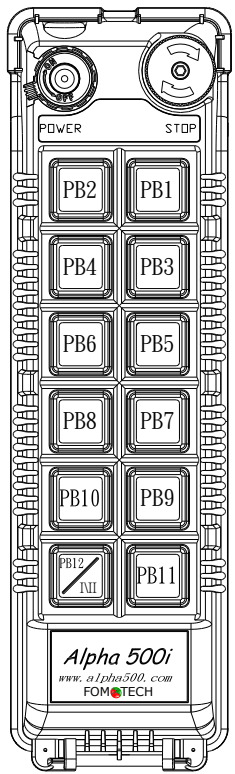
(Alpha 512C-2)



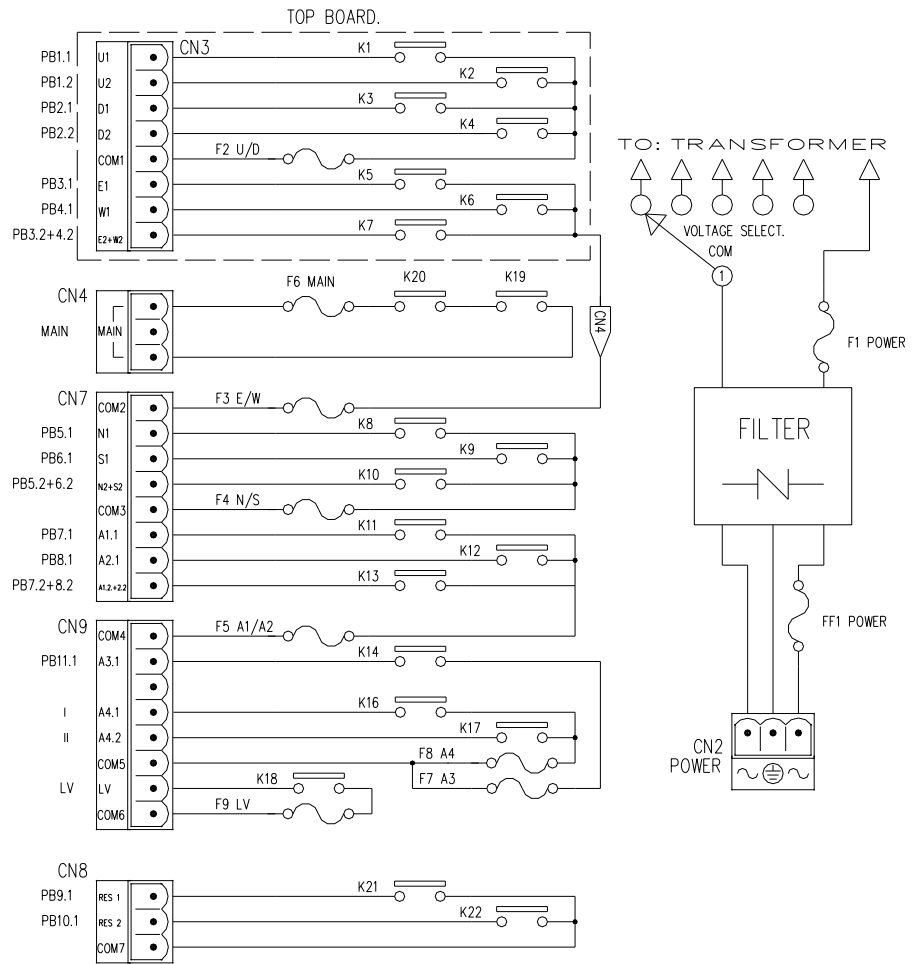
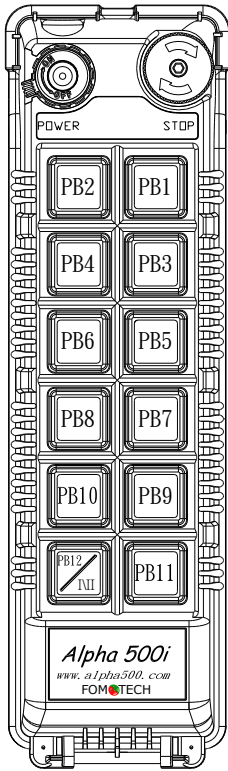
(Alpha 512D)



(Alpha 512E-1)



(Alpha 512E-2)



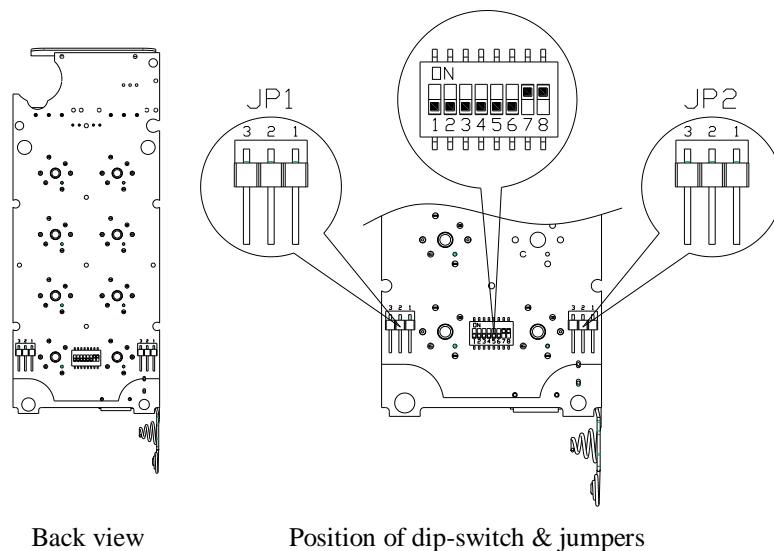
6. TRANSMITTER SETTINGS

6.1 How to Set ID Codes

Set by programming tool or adjust encoder board JP1, 1st / 2nd pin and dip-switch.

For the location of the jumper of Alpha 504/507/508 models, please refer to page 10.

- (1) Rotate the transmitter power to OFF position
- (2) Disassemble shock-absorbing rubber
- (3) Put the transmitter pushbutton downward and disassemble transmitter bottom casing.
- (4) Set the transmitter ID code with the dip-switch on the encoder board and put jumper on the 1st and 2nd pin of JP1.
- (5) Make sure the batteries are installed properly.
- (6) Rotate the transmitter power switch to ON position.
- (7) Green status LED ON for 0.1 sec, OFF for 0.1 sec, flash for 1 sec. (5 times)
- (8) Green status LED steady ON indicates the setting is completed. If the LED status light is changed to red, the setting is failed. Please repeat the above setting steps until the setting is successful.
- (9) After setting is completed and successful, remove jumper on 1, 2 pin of JP1.
- (10) Rotate transmitter power switch to OFF position.



Top slot ON → “1”; bottom slot → “0”. The setting above is 00000011.

6.2 Transmitter Channel Settings

Set by programming tool or adjust encoder board 2nd & 3rd pin of JP1 and dip-switch.

Available channels form 01 ~ 68.

When setting frequency on TX board JP1, put jumper on 2nd & 3rd pin of JP1.

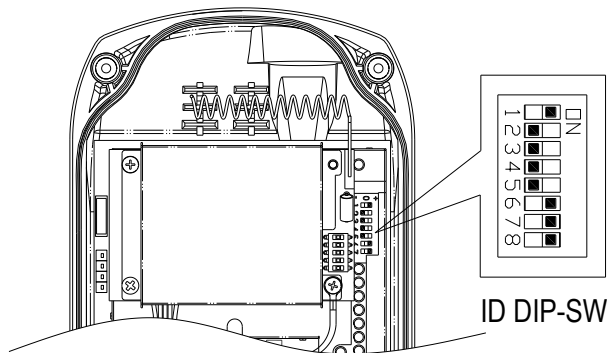
Change the frequency needed by changing the dip-switch setting. Repeat the previous steps to set frequency.

Example : Set channel as 03→(00000011) → Correct setting



7. RECEIVER SETTINGS

7.1.1 How to Set Alpha 504i and 508i Receiver ID Code



Top slot → “1” Bottom slot → “0”

Set the ID codes needed on the decoder board dip-switch.

For example: the ID codes set above → 10000111.

7.1.2 How to Set Alpha 512i Receiver ID Code

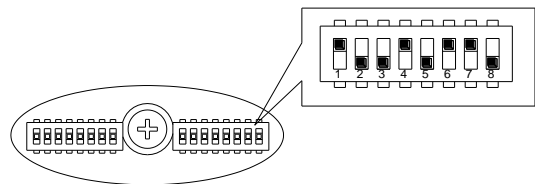
Please refer receiver internal parts assembly for ID code 8-position dip-switch to set receiver ID code.

Top slot → “1” ; bottom slot → “0”

Set the ID codes needed on the decoder board dip-switch.

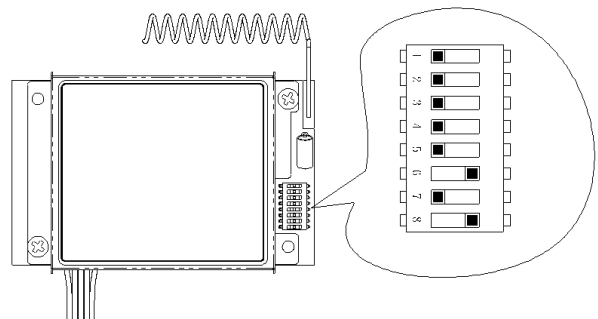
For example: the ID codes → 10010110

(“1” value adds up must to be “4”)



7.2 Receiver RF Channel Setting

There are 68 sets of user-adjustable receiving RF channels that can be set manually via a 8-position dip-switch located to the right of the receiving RF module. Change the receiving RF channel simply by resetting these 8-position dip-switch. For the location of the receiving RF module, please refer to fig. 15, 16, and 18 on page 12, 13, and 14.



Top slot → “1” ; bottom slot → “0”

For example : the channel dip-switch set above → 00000101, channel 05.

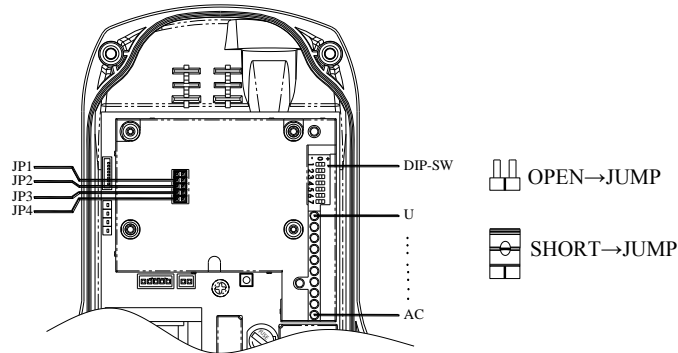
7.3 Receiver Function Setting

Alpha 504i/ 508i Receiver Function Setting

Set by programming tool or set Jumper setting function.

How to Set Receiver Jumper functions:

- Select any pushbutton or ON/OFF power switch to start the system. The MAIN relay will be activated when system is started. (After the receiver power is started and emergency stop button is elevated)
- The MAIN relay auto shutdown time can be set as 5 minutes or depends on customer's single request. (Remark 1)
- When transmitter voltage is low, relays for the receiver MAIN and LV (Remark 1) will be auto shutdown after one minute.



Alpha 504i, 508i models

Jumper Set table: in-plant setting (default).

JP1 (Mode 0)	Open	The 7 th pushbutton (AUX) start (when MAIN is off)
	Short	Power switch start (when MAIN is off)
JP1 (Mode 1)		Power switch start
JP2	Open	No auto shutdown time on Main relay
	Short	The receiver MAIN will be deactivated after consecutive 5 minutes of standby time.
JP3	Open	When the transmitter voltage is low, LV relay activates/deactivates every second.
	Short	* 4 pushbuttons: When either relay of pushbutton 1~4 is activated, LV relay will also be activated. * 8 pushbuttons: When either relay of pushbutton 1~6 is activated, LV relay will also be activated.
JP4	Open	7 th AUX: "Normal" pushbutton setting
	Short	7 th AUX: "Toggle" pushbutton setting

※ Open → no Jumper

Short → put Jumper

Remark 1 : The setting of auto shutdown time can be done by manufacturer or distributor. Setting range: 0~30 minutes. (In-plant setting: 5 minutes)

Remark 2 : When the transmitter voltage is low, LV relay will be activated and siren or lights will be ON. (one second of interval)

Remark 3 : Every time when you change jumper settings you must first turn the receiver power off and then turn it back on so that the new settings can be stored in memory.

Alpha 512i Receiver Function Setting

Set by programming tool or set jumper function

How to Set Receiver Functions:

Jumper Set table: In-plant setting (default).

JP1	Open	The 9 th pushbutton (AUX) start (when MAIN is off)
	Short	Power switch start (when MAIN is off)
JP2 (Mode 0)	Open	No auto shutdown time on Main relay
	Short	The receiver MAIN will be deactivated after consecutive 5 minutes of standby time.
JP3	Open	When the transmitter voltage is low, LV relay activates/deactivates every second.
	Short	When either relay of pushbutton 1~8 is activated, LV relay will also be activated.

※ Open → No jumper

Short → Put Jumper

Remark 1 : The setting of auto shutdown time can be done by manufacturer or distributor. Setting range: 0-30 minutes. (In-plant setting: 5 minutes)

Remark 2 : When the transmitter voltage is low, LV relay will be activated and siren or lights will be ON. (One second of interval)

Remark 3 : Every time when you change jumper settings you must first turn the receiver power off and then turn it back on so that the new settings can be stored in memory.

Alpha 512i Dip-Switch Function Table

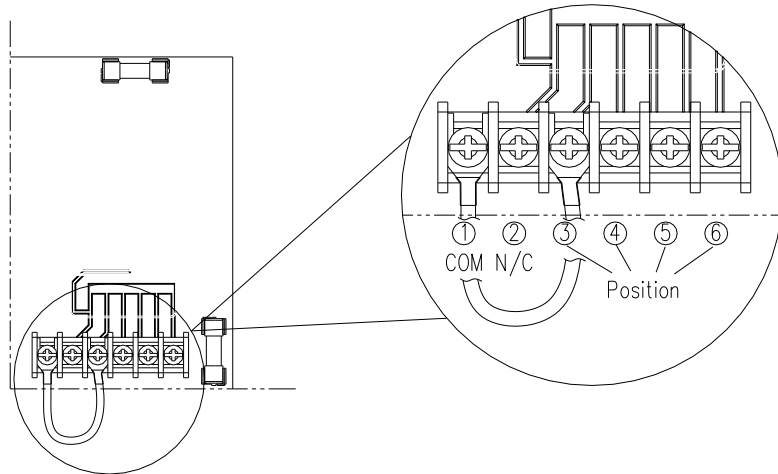
Model	Pushbutton	Dip-Switch Setting		Description		
512A	1 & 2 3 & 4 5 & 6	DIP 1	→ 1	Not Interlocked		
			→ 0	Interlocked		
	7 & 8	DIP 2	→ 1	Not Interlocked		
			→ 0	Interlocked		
	7 & 8	DIP 3	→ 1	Latching/toggle relay contact		DIP2 Set at "1"
			→ 0	Momentary relay contact		
	9 & 10	DIP 4	→ 1	Not Interlocked		
			→ 0	Interlocked		
512B	9	DIP 5	→ 1	Latching/toggle relay contact	DIP4 Set at "1"	
			→ 0	Momentary relay contact		
	10	DIP 6	→ 1	Latching/toggle relay contact	DIP4 Set at "1"	
			→ 0	Momentary relay contact		
512B	7 & 8	DIP 1	→ 1	Not Interlocked		
			→ 0	Interlocked		
	7	DIP 2	→ 1	Latching/toggle relay contact		
			→ 0	Momentary relay contact		DIP4 Set at "1"
	8	DIP 3	→ 1	Latching/toggle relay contact		DIP4 Set at "1"

	9	DIP 4	→ 0	Momentary relay contact	
			→ 1	Latching/toggle relay contact	
512C	1 & 2 (2 nd speed)	DIP 1	→ 1	Both 1 st and 2 nd speed contact relay interlocked when pressed to 2 nd speed	Both 1 st and 2 nd speed contact relays activated
			→ 0	Both 1 st and 2 nd speed contact relay activated when pressed to 2 nd speed	Only 2 nd speed contact relay activated
	9	DIP 2,3	→ 00	Momentary relay contact	
		DIP 2,3	→ 01	Latching/toggle relay contact	
		DIP 2,3	→ 10	Activate the 3 rd speed	
	10	DIP 4	→ 1	Latching/toggle relay contact	
			→ 0	Momentary relay contact	
512D	1 & 2 (2 nd speed)	DIP 1	→ 1	Both 1 st and 2 nd speed contact relay interlocked when pressed to 2 nd speed	Both 1 st and 2 nd speed contact relays activated
			→ 0	Both 1 st and 2 nd speed contact relay activated when pressed to 2 nd speed	Only 2 nd speed contact relay activated
	---	DIP 2,3,4	→0	Momentary relay contact	DIP2&3 Must set to "0" all the time (In-plant set at "0")
512E	1 & 2 (2 nd speed)	DIP 1	→ 1	Both 1 st and 2 nd speed contact relay interlocked when pressed to 2 nd speed	Both 1 st and 2 nd speed contact relays activated
			→ 0	Both 1 st and 2 nd speed contact relay activated when pressed to 2 nd speed	Only 2 nd speed contact relay activated
	7 & 8	DIP 2	→ 1	Not Interlocked	
			→ 0	Interlocked	
	7	DIP 3	→ 1	Latching/toggle relay contact	DIP2 Set at "1"
→ 0			Momentary relay contact		
512 A/B/C/D/E	11	DIP 7	→ 1	Latching/toggle relay contact	
			→ 0	Momentary relay contact	
	12	DIP 8	→ 1	Latching/toggle relay contact	
			→ 0	Momentary relay contact	

※ In-plant all set at "0"

7.3.4 Alpha 612 Receiver Voltage Settings

1. Select the voltage of the place where the receiver is installed.
2. Select the position of the “Y” terminal base on the label marked on the transformer.
If the default voltage setting is different from the place where the receiver is installed, please change the setting base on below steps:
 - 2.1 Please first refer to below figure. Keep the “COM” end of the wire in the position as it is, remove the “Y” terminal from the other end of the wire, then screw the position originally with “Y” terminal tightly.
 - 2.2 Select the voltage needed base on the label of the transformer. Unscrew the position selected, put the “Y” terminal into the position selected and screw it tightly.



Transformer type no. : K-2367

- Position ③ AC 110V → AC 100V ~ AC 125V
- Position ④ AC 240V → AC 200V ~ AC 240V

Transformer type no. : K-2368

- Position ⑤ AC 380V → AC 350V ~ AC 380V
- Position ⑥ AC 460V → AC 400V ~ AC 460V

Transformer type no. : SSB-2665

- Position ③ AC 24 V
- Position ④ AC 36 V
- Position ⑤ AC 42 V
- Position ⑥ AC 48 V

3. Please make sure that the wire and the 5 screws are securely screwed.

7.4 Frequency (RF) Channels Table

Band 301MHz	Dip-Switch Setting	Channel
301.1050 MHz	00000001	01
301.1300 MHz	00000010	02
301.1550 MHz	00000011	03
301.1800 MHz	00000100	04
301.2050 MHz	00000101	05
301.2300 MHz	00000110	06
301.2550 MHz	00000111	07
301.2800 MHz	00001000	08
301.3050 MHz	00001001	09
301.3300 MHz	00001010	10
301.3550 MHz	00001011	11
301.3800 MHz	00001100	12
301.4050 MHz	00001101	13
301.4300 MHz	00001110	14
301.4550 MHz	00001111	15
301.4800 MHz	00010000	16
301.5050 MHz	00010001	17
301.5300 MHz	00010010	18
301.5550 MHz	00010011	19
301.5800 MHz	00010100	20
301.6050 MHz	00010101	21
301.6300 MHz	00010110	22
301.6550 MHz	00010111	23
301.6800 MHz	00011000	24
301.7050 MHz	00011001	25
301.7300 MHz	00011010	26
301.7550 MHz	00011011	27
301.7800 MHz	00011100	28
301.8050 MHz	00011101	29
301.8300 MHz	00011110	30
301.8550 MHz	00011111	31
301.8800 MHz	00100000	32
301.9050 MHz	00100001	33
301.9300 MHz	00100010	34

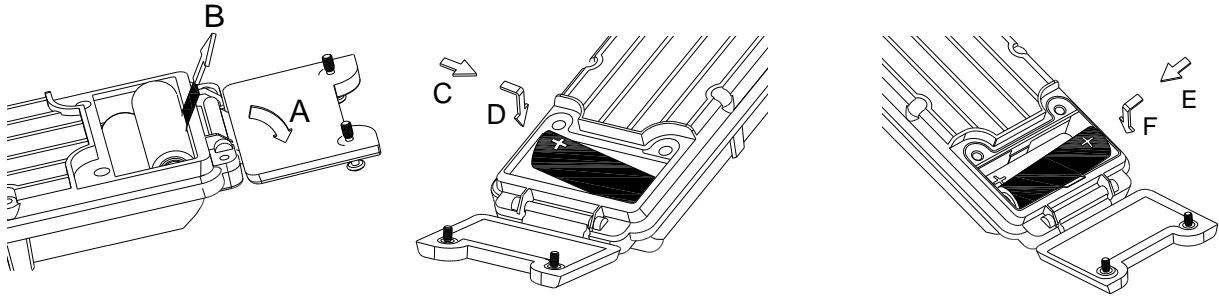
Band 301MHz	Dip-Switch Setting	Channel
301.9550 MHz	00100011	35
301.9800 MHz	00100100	36
302.0050 MHz	00100101	37
302.0300 MHz	00100110	38
302.0550 MHz	00100111	39
302.0800 MHz	00101000	40
302.1050 MHz	00101001	41
302.1300 MHz	00101010	42
302.1550 MHz	00101011	43
302.1800 MHz	00101100	44
302.2050 MHz	00101101	45
302.2300 MHz	00101110	46
302.2550 MHz	00101111	47
302.2800 MHz	00110000	48
302.3050 MHz	00110001	49
302.3300 MHz	00110010	50
302.3550 MHz	00110011	51
302.3800 MHz	00110100	52
302.4050 MHz	00110101	53
302.4300 MHz	00110110	54
302.4550 MHz	00110111	55
302.4800 MHz	00111000	56
302.5050 MHz	00111001	57
302.5300 MHz	00111010	58
302.5550 MHz	00111011	59
302.5800 MHz	00111100	60
302.6050 MHz	00111101	61
302.6300 MHz	00111110	62
302.6550 MHz	00111111	63
302.6800 MHz	01000000	64
302.7050 MHz	01000001	65
302.7300 MHz	01000010	66
302.7550 MHz	01000011	67
302.7800 MHz	01000100	68

NOTE!!! It is prohibited to use Channel 221 and 255.

8. TRANSMITTER OPERATION & STATUS LIGHT

8.1 Transmitter Operating Steps

1. Make sure the two “AA” alkaline batteries are installed correctly and battery voltage > 2.2V.
2. Battery replacement steps
 - A. Screw open the battery cover.
 - B. Pull up the ribbon (to take out the exhausted batteries)
 - C. & D. Put and press the first battery into the battery compartment. (Note the polarity and position)
 - E. & F. Put and press the second battery into the battery compartment. (Note the polarity and position)



3. **Status lights:** To operate the transmitter, please rotate the power key on the top-left corner clockwise to “on” position. The status LED (green and red) will be steady “on” for 2 seconds and then “off”. If the transmitter Status LED displays a red blinking light that is “on” → 0.1 second and “off” → 1.9 seconds, this indicates that the two “AA” batteries in the transmitter must be replaced.
If the transmitter Status LED is blinking red, “on” → 1.9 seconds and “off” → 0.1 second, it means that the transmitter handset is locked due to a damaged or closed pushbutton contact. Also possibly the operator is pressing a pushbutton while going through the start-up sequence. This important safety feature is designed to prevent any unexpected crane movement at system startup caused by closed or defective pushbutton contacts.
4. **EMS & Restarting** _ In case of an emergency, pressing down the red EMS button will send the “Stop” command which will immediately deactivates the receiver MAIN relay.
When the red EMS button is pressed, the transmitter Status LED will display a blinking red light that is “on” → 0.5 second and “off” → 0.5 second, telling the operator that the “Stop” command is being sent to the receiver. On the other hand, turning the transmitter power key “off” will also deactivate the receiver MAIN relay, but this method of MAIN relay deactivation is not recommended in an emergency situation. For added safety, always use the red EMS button in time of an emergency.
To reactivate the receiver MAIN relay after pressing down the red EMS button, first elevate the red EMS button, turn the transmitter power key “off”, wait for 3 seconds until the red blinks disappeared from the Status LED and then turn the power key back “on” again.
5. **Shutting Off the Transmitter** _ To disconnect the transmitter power just turn the power key to “off” position. When the power key is switched from “on” to “off”, the transmitter will also send a “Stop” command to the receiver for 3 seconds, the red status light flashes 3 times and at the same time deactivate the MAIN relay.

6. The emergency stop button is a right-rotate momentary spring-return type. To turn on the transmitter and activate the MAIN relay, please elevate the emergency stop button again and rotate the transmitter power key to “ON” position.
7. Note that the transmitter cannot be hit by outer force, so that malfunction can be prevented.
8. The operating temperature is $-10 \sim +60^{\circ}\text{C}$ ($\pm 10^{\circ}\text{C}$). Avoid operating the transmitter in high temperature workshop. If operating temperature is higher than 80°C , the auto shutdown protection installed inside CPU will shut down the transmitter and deactivate the MAIN relay.
9. To operation normally, the battery power must over 2.2V. If the voltage is lower than 2.2V, the system cannot be started and low voltage will be showed until the MAIN is completely shutdown.
10. If the power voltage is lower than 2.2V when transmitter is operated, the LV code will be “1” and low voltage status light will be shown. For standard system, the transmitter will stop sending signals when voltage is lower than 2.0V. But for EN ISO 13849-1 version, the transmitter will stop sending signals when voltage is lower than 1.8V.

8.2 SMI, SSI, MSS/FSI Features

1. SMI (Select Motion Interlock) Feature

The SMI feature is programmed into all Alpha 500 Series transmitters and blocks the Select command if any direction button is pressed. The SMI feature prevents the operator from changing the Select state while in motion.

Direction Button Layout for North America (Left to Right):

U (PB2), D (PB1), N (PB4), S (PB3), E (PB6), W (PB5)

U (PB2), D (PB1), E (PB4), W (PB3), N (PB6), S (PB5)

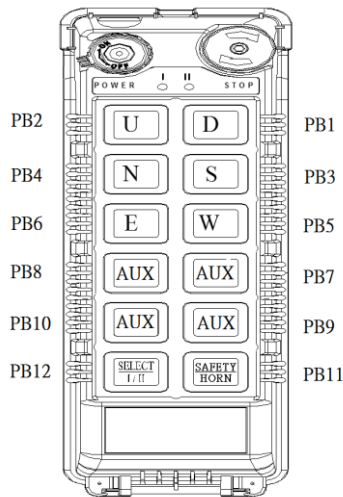
Direction Button Layout Factory Default (Right to Left):

U (PB1), D (PB2), N (PB3), S (PB4), E (PB5), W (PB6)

U (PB1), D (PB2), E (PB3), W (PB4), N (PB5), S (PB6)

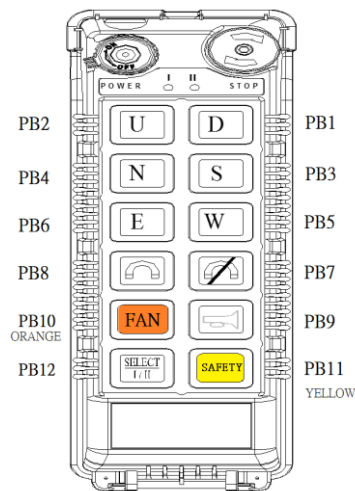
2. SSI (Select Safety Interlock) Feature

In addition to the above SMI feature the SSI feature can be added which blocks the Select command unless the SAFETY/HORN button (PB11) is depressed and held first. As noted when using the SSI feature, button (PB11) will be labeled SAFETY/HORN and in addition to interlocking the Select command it will also control the HORN relay K14. Note that no other buttons can be depressed prior to pressing and holding the SAFETY button. The SSI feature prevents the operator from accidentally changing the Select state without first depressing and holding the SAFETY/HORN button and sounding the Horn simultaneously.



3. MSSI/FSI (Magnet Select Safety Interlock with Fan Safety Interlock)

The MSSI/FSI is a custom program developed for cranes with a magnet On/Off circuit and magnet Fanning. The Mag ON, Mag OFF, *FAN and SELECT I/II commands are interlocked with the SAFETY button (PB11), and cannot be sent without first pressing and holding the Safety button. Note that no other buttons can be depressed while pressing and holding the SAFETY button, and then you are limited to only one command, example: press and hold SAFETY then press Mag. ON and the magnet is turned on. To turn the magnet off release the Safety button, then press and hold the Safety button again and press Mag. OFF and the magnet is turned off.

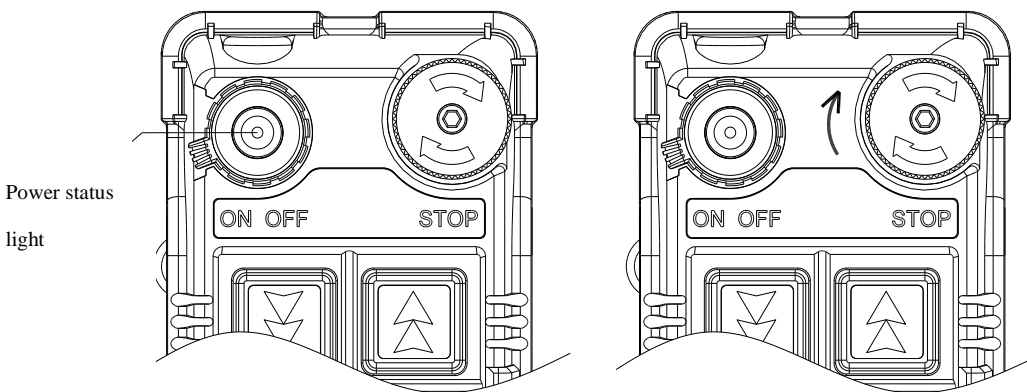


*The FSI feature requires the operator to press and hold the Safety button (PB11) first then press and hold the FAN button (PB10) for 2 seconds at which time the LED lamp in the Battery On/Off switch (top left-hand side) will flash yellow confirming the FAN command is active. With the LED flashing the operator can Fan the magnet, lift the load (Hoist Up) or Fan the Magnet and lift the load (Hoist Up) simultaneously. Pressing any other button while in the FSI mode will cancel the FAN command and the LED will stop flashing.

MSSI/FSI Notes:

1. The HORN button (PB9) is not interlocked with any button.
2. The direction buttons: U & D, N & S, E & W are interlocked in pairs, that is, depressing U and

- D simultaneously cancels both commands.
3. The direction buttons and the Mag On, Mag OFF, Fan and Safety buttons are interlocked, that is, depressing any direction button will block these commands.
 4. To enter MSSI/FSI mode, the direction buttons U, D, N, S, E, W, Magnet, Select and Fan buttons must not be pressed. Press and hold the Safety button first, then press any one of three buttons, Mag ON, Mag OFF or Select I/II and that command will be sent. For example, Safety + Mag ON = Magnet ON. To enter the FSI mode, press the Safety button first then press the Fan button and hold both for 2 seconds, please see above explanation for *FSI feature details.
 5. Only one Mag ON, Mag OFF, *FAN and SELECT I/II command will be accepted at a time. If the operator should depress two buttons at the same time, both of the commands will be canceled. For example, Safety + Mag On + Select I/II = no command. Please refer to point #4 for correct operation.
 6. Magnet and Select button operation: All the direction, magnet, select and fan buttons must be released first, then start again from point # 4.
 7. Depressing the red e-stop button will disable the MSSI feature. To reactivate the receiver Main relay after pressing down the red EMS button, just elevate the red EMS button and then turn the transmitter power off and then back on again.



STOP: press → lock (emergency stop)

STOP: Elevate clockwise → reset (Turn on the transmitter at any time)

8.3 Transmitter Status Light

Type	Status	Solution	LED Indication
1	Power on when voltage is low	BATT<2.2V	Red light flash ON_0.1/OFF_1.9 sec (until power off)
2	Setting failed or invalided	Set data by using JUMPER & dip-switch without following rules	Red light ON_0.1/OFF_0.1 sec
3	Setting completed	JP1 or JP2 inserted	Green light ON until power off.
4	EEPROM ID error	EEPROM ID code does not match CPU	Red light ON until power off
5	RF module abnormal	PLL UNLOCK	Red light ON_0.1/OFF_0.1 sec
6	ID even number error	Setting error	Red light ON_1/OFF_1 sec

7	Pushbutton locked	Power on pushbutton connected	Red light ON_1.9/OFF_0.1 sec (until power off)
8	Normal power on	BATT \geq 2.2V and all the pushbuttons are not depressed	All the lights ON_2 sec
9	STOP status	STOP button is pressed	MODE 0: Red light ON_0.5/ OFF_0.5sec, flash 30sec. MODE 1: all the lights OFF
10	Low voltage during operation	BATT $<$ 2.2V and press pushbutton	Red light flash ON_0.1/OFF_1.9 sec.
11	High temperature	Encoder board temperature over 80°C	When depress button: Blinking Red light ON_0.05/ OFF_0.15 sec. When release button: Status light OFF
12	FSI Mode	Enable MSS/FSI feature: press and hold Fan + Safety buttons for 3 sec.	Red/Green lights ON_0.1/OFF_0.1 sec.
13	Normal operation	Press pushbutton	Green light flash ON_0.1/OFF_1.9 sec

9. RECEIVER INSTALLATION

9.1. Preparation for Installation

1. Required Tools for Receiver Installation:

- (1) Flat Head Screwdriver (-)
- (2) Phillips Head Screwdriver (+)
- (3) Multi-Meter
- (4) 14mm Wrench x 2
- (5) Power Drill with φ 10.5mm Drill-Bit

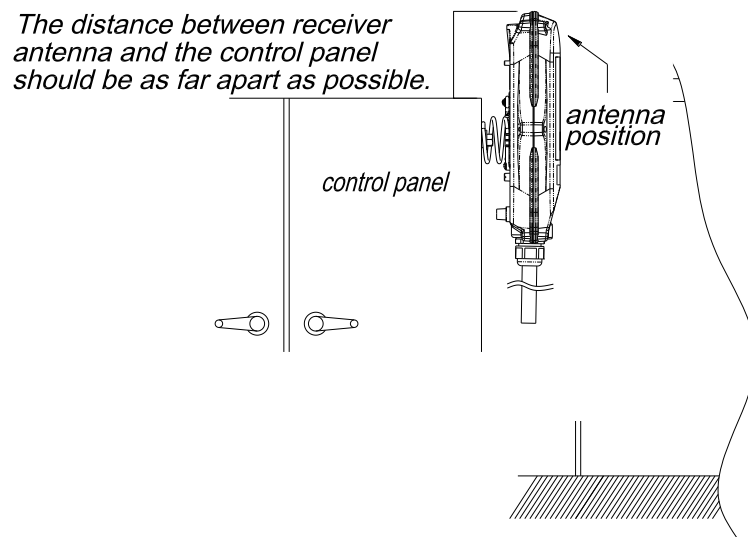
2. Check to ensure that your receiver is not set to the same RF channel and ID code as any other systems in operation at the same facility or within 300-meter distance.
3. Prior to installation, make sure that the crane or equipment itself is working properly.
4. Use a multi-meter to check the voltage source available and ensure the receiver voltage setting matches your power source.
5. Prior to installation, switch off the main power source to the crane or equipment.

9.2 Step by Step Installation

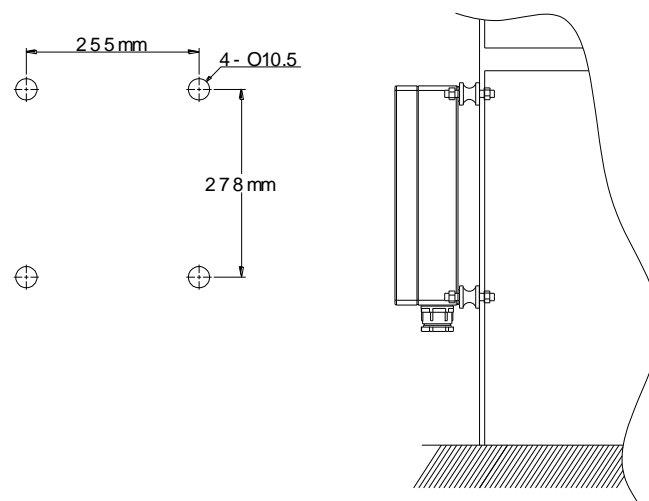
1. For better reception, the location selected should have the antenna visible from all areas where the transmitter is to be used.
2. The location selected should not be exposed to high levels of electrical noise. Mounting the receiver next to an unshielded variable frequency control (inverter) may cause minor interference. Always

locate the receiver unit as far away from inverter controls as possible.

3. Ensure the selected location has adequate space to accommodate the receiver enclosure.
4. Make sure the receiver unit is in upright position (vertical).
5. The distance between the antenna and the control panel should be as far apart as possible (refer to the fig.22 on page 40).
6. If a crane or equipment's runway is longer than 100 meters, an external antenna should be added. The Alpha 504i/508i receiver housing has provisions for an external factory installed antenna available as an option, contact your dealer for price and delivery.
7. Drill a hole on the control panel (10.5mm).
8. Tightened the bolt nuts provided.
9. If the control panel has a plastic surface, extended grounding wire should be used.
10. For system wiring, please refer to the output contact diagrams from page 2.
11. Ensure all wiring is correct and safely secured and all screws are fastened.



Alpha 504i and Alpha 508i

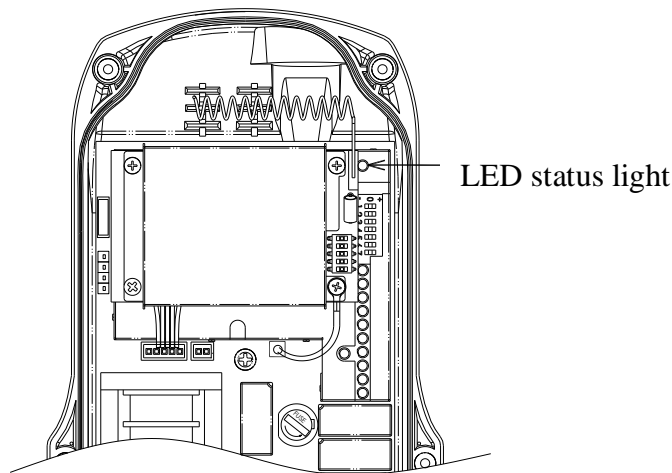


Alpha 512i

9.3 System Testing

1. Connect the power source to the receiver and test the MAIN relay output by pressing the red emergency stop button (EMS) and observe that it properly opens and closes the main line disconnect contactor.
2. Test the operation of each function to ensure it corresponds to the transmitter direction labels and/or the pendant it is replacing.
3. Test the limit switches on the hoist and/or crane and verify they are working properly.
4. If your new remote control is replacing an existing pendant, make sure it is completely disconnected to prevent unwanted control commands, i.e. snick circuits.
5. If your new remote control is replacing an existing pendant make sure it is stored in a safe location where it will not interfere with remote operation (get torn off).

9.4 Receiver system Status LED Display



Receiver system Status LED Display

Type	Led Indication	Problem and Solution
1	Constant red light.	EEPROM error – reprogramming required.
		Incorrect receiver ID code setting (see note below).
2	ON → 1.0 second OFF → 1.0 second	ID code not matched on both the transmitter and receiver unit, please readjust accordingly.
3	Dim or no light.	Under-voltage, check the main power-supply.
4	ON → 2.0 seconds OFF → 0.1 second	MAIN contact relay jammed or defective.
5	ON → 0.1 second OFF → 2.0 seconds	System normal with transmitter pushbutton either in neutral or in transmitter power “off” position.
6	ON → 0.1 second OFF → 0.1second	System normal with transmitter pushbutton in non-neutral position (pushbutton depressed).

Note: Please refer to section 7.1 on page 22 for correct ID code setting.

9.4.1 Alpha 512i Receiver System Status LED Display

Led Indication		Reason	Solution
Power LED display	ON	Normal-voltage	
	OFF	Under-voltage	
SQ, Status LED display	ON	Transmitted signals detected and received	
	OFF	No transmitting signal detected	
	BLINK	1. Transmitter standby	Turn on the transmitter
2. Interference		Turn off the transmitter	
Relay LED display	ON	Normal operation	
	OFF	Receiver defective	Repair decoder board

10. TROUBLE SHOOTING

Should the operator find the equipment not operating normally, please check the chart below for simple trouble shooting tips.

Problem	Possible Reason	Solution
Transmitter does not communicate with the receiver.	Transmitter and the receiver are not on the same RF channel (SQ lamp not lit) or ID code.	Ensure the correct transmitter is in use. The labels on the receiver and the transmitter will identify the RF channel and ID code in use.
Transmitter does not communicate with the receiver.	Low or no transmitting power from the transmitter unit.	Turn “on” the transmitter with EMS elevated. If the status LED shows blinking red light or no light at all, then turn the power “off” and replace the two alkaline “AA” batteries.
No power to the receiver (AC power indicator on the receiver unit not lit).	Blown fuse or no input power connection.	Ensure power input to the receiver unit is correct. If the power indicator (AC) is still not lit, please check the receiver for any open fuse.
Outputs do not operate correctly.	Receiver configuration is not set properly or output wiring is incorrect.	Please refer to section 6 and 7 to ensure receiver is correctly wired and configured for your application.
Transmitter does not communicate with the receiver.	Transmitter is turned on with the EMS activated (pressed down).	Elevate the EMS first and then turn the power switch off and then on again.

11. SYSTEM SPECIFICATION

Transmitter Unit

Source Voltage	: Ni-MH AA size x 2 batteries 2.4V (no contact charging) Or AA size alkaline x 2 batteries 3.0V
Antenna Impedance	: Internal Antenna 50 ohms. External antenna is available.
Alpha 504i dimension	: 140mm x 68mm x 30mm
Alpha 508i dimension	: 189mm x 68mm x 30mm
Alpha 512i dimension	: 235mm x 68mm x 30mm
Alpha 504i weight	: 220g (include batteries)
Alpha 508i weight	: 280g (include batteries)
Alpha 512i weight	: 350g (include batteries)
Enclosure Rating	: IP-65
Operating Temperature	: -10°C ~ +60°C (> 80°C high temperature protection)
Transmitting Power Consumption	: ≤20mA@3V (Various from encoding mode and transmitting power) ≤30mA@3V (Various from encoding mode and transmitting power) Alpha 512B /Alpha 512E-1/Alpha 512E-2
Continue Operating Time	: > Consecutive 100hrs @batteries full (2000mA), Transmitting power 1mW
LV Voltage	: 2.2V – 2.0V

Transmitting RF Board Unit

Frequency Range	: 301 MHz
Transmitting Power	: 0.1mW – 10mW
Frequency Control	: TCXO + PLL
Frequency Deviation	: < 1ppm @ 25°C
Spurious Emission	: < - 50dB
Emission	: F1D
Antenna Impedance	: 50 ohms
Operating Temperature	: -10°C ~ +60°C

Receiver Unit

Frequency Band	: 301 MHz
Channel Spacing	: 25KHz
Frequency Control	: VTCXO (PLL)
Frequency Drift	: < 5ppm @ -20°C ~ +70°C
Frequency Deviation	: < 1ppm @ 25°C
Sensitivity	: <-115dBm
Spurious Emission	: - 50Db
Antenna Impedance	: 50 ohms
Responding Time	: 40ms (Normal)
Enclosure Rating	: IP-65
Source Voltage	: α 504i/ 508i: DC12-24V, AC48V, AC110V, AC220V, AC380V, Full voltage module AC100-240V @50/60Hz α 512i: DC12-24V, AC25/36/42/50V, AC110V/240V, AC380-460V @50/60Hz
Power Consumption	: α604: 8 Watt, α607/8: 10 Watt, α612: 15 Watt
Operating Temperature	: -10°C ~ +70°C
Output Contact Rating	: 250V @ 5A
Alpha 504i dimension	: 310mm x 134mm x 72mm
Alpha 508i dimension	: 310mm x 134mm x 72mm
Alpha 512i dimension	: 300mm x 230mm x 86mm
Alpha 504i weight	: 1,770g (include output cable)
Alpha 508i weight	: 2,022g (include output cable)
Alpha 512i weight	: 3,500g (include output cable)

12. PARTS LIST

Transmitter

	Part No.
1. Encoder board (Alpha 504A)	BEN504A
Encoder board (Alpha 504B)	BEN504B
Encoder board (Alpha 507A)	BEN507A
Encoder board (Alpha 507B)	BEN507B
Encoder board (Alpha 507AT)	BEN507AT
Encoder board (Alpha 507BT)	BEN507BT
Encoder board (Alpha 508A)	BEN508A
Encoder board (Alpha 508B)	BEN508B
Encoder board (Alpha 512A)	BEN512A
Encoder board (Alpha 512B)	BEN512B
Encoder board (Alpha 512C-1)	BEN512C-1
Encoder board (Alpha 512C-2)	BEN512C-2
Encoder board (Alpha 512D)	BEN512D
Encoder board (Alpha 512E-1)	BEN512E-1
Encoder board (Alpha 512E-2)	BEN512E-2
2. Transmitter enclosure (Alpha 504i)	BCT504
Transmitter enclosure (Alpha 507i & 508i)	BCT507
Transmitter enclosure (Alpha 512i)	BCT512
3. Battery cover	BC600
4. 2-step pushbutton	B50001
1-step pushbutton	B50002
5. EMS red cap	EMS01
6. EMS pushbutton mechanism (All models, red cap included)	B50003
7. Pushbutton rubber fixing holder (Alpha 504i)	BFH504
Pushbutton rubber fixing holder (Alpha 507i & 508i)	BFH507/508
Pushbutton rubber fixing holder (Alpha 512i)	BFH512
8. Pushbutton rubber boot (Alpha 504i)	PRB01
Pushbutton rubber boot (Alpha 507i & 508i)	PRB02
Pushbutton rubber boot (Alpha 512i)	PRB03
9. Transmitter shock-absorbing rubber (All models)	SAR02
10. Transmitter vinyl protective cover (Alpha 504i)	VPC01
Transmitter vinyl protective cover (Alpha 507i & 508i)	VPC02
Transmitter vinyl protective cover (Alpha 512i)	VPC03
11. A512i waist strap	WS01
12. Alkaline AA battery	ALB01

13. A500i pushbutton direction label

DL01

Receiver

1. Decoder board (Alpha 504A)	BDE504A
Decoder board (Alpha 504B)	BDE504B
Decoder board (Alpha 507A)	BDE507A
Decoder board (Alpha 507B)	BDE507B
Decoder board (Alpha 507AT)	BDE507AT
Decoder board (Alpha 507BT)	BDE507BT
Decoder board (Alpha 508A)	BDE508A
Decoder board (Alpha 508B)	BDE508B
Decoder board (Alpha 512A)	BDE512A
Decoder board (Alpha 512B)	BDE512B
Decoder board (Alpha 512C-1)	BDE512C-1
Decoder board (Alpha 512C-2)	BDE512C-2
Decoder board (Alpha 512D)	BDE512D
Decoder board (Alpha 512E-1)	BDE512E-1
Decoder board (Alpha 512E-2)	BDE512E-2
2. 301MHz receiver RF module (All models)	BRX301
3. Receiver enclosure (Alpha 504i/507i/508i)	BCR507
Receiver enclosure (Alpha 512i)	BCR512
4. Receiver mounting spring (Alpha 504i/507i/508i)	RMS500i
5. Regular Output Contact Relay-blue (All Models)	RLY01
6. Safety MAIN Contact Relay-DC12V (All Models)	RLY02
7. Transformer (12/24VDC – Alpha 504i-508i)	T24VDC
Transformer (24VAC – Alpha 504i-508i)	T24VAC
Transformer (48VAC – Alpha 504i-508i)	T48VAC
Transformer (110/120VAC – Alpha 504i-508i)	T120VAC
Transformer (220/230VAC – Alpha 504i-508i)	T230VAC
Transformer (380VAC – Alpha 504i-508i)	T380VAC
Transformer (220/230VAC – Alpha 504i-508i)	T230VAC
8. Full voltage module (100-240VAC – Alpha 504i/507i/508i)	FV100-240V
9. 2-meter Output Cable with 5 Common Circuits Cable (24C*2m V3.5, Alpha 508i)	OC507
10. Optional External 301 MHz Antenna (All Models)	ANT301

USB programming parts

1. USB programming board (All Models)	USBPCB
2. USB connecting cable (1m – All models)	USBC