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1. **INTRODUCTION**

The Alpha 580 is highly reliable industrial remote control system. The versatile features of the Alpha 580 permit its use in many different remote control applications. The system can be used to control cranes, hoists, trolleys, mining equipment, building construction equipment, automatic control systems, and many others.

The Alpha 580 radio control system incorporates numerous redundant safety circuits that guaranty maximum security and ensure the system is resistant to outside interference. The major features of the Alpha 580 are as follow:

- * The system uses advanced microprocessors which utilizes highly evolved software that have redundant error checking and correcting capabilities to ensure 100 % error-free transmission, decoding, and control of the output relays. These highly evolved software include CRC (Cyclic Redundancy Check codes) and Hamming Codes.
- * To insure maximum operating safety, the Alpha 500 series incorporate many safety features. Some of these safety features include receiver self-diagnosing, transmitter pushbutton self-diagnosing, transmitter low voltage detection/warning, and transmitter/receiver auto shutdown after 1 minute of transmitter low voltage warning.
- * The encoder/decoder system utilizes advanced microprocessor. The availability of 32,768 sets of unique ID codes will ensure that only commands from the matching control transmitter can be carried out without any interference from other radio systems. A special programmable integrated circuit is used to insure the unit can not simultaneously command conflicting movements.
- * Full SMT design for system stability.

The Alpha 580 radio control system consists of a transmitter handheld, and a receiver unit. The transmitter casing is molded using an industrial strength composite material which is impervious to dust, water, oil, acids, alkaline, heat, sunlight, and as well as being resistant to deformation due to long term use in harsh environments. The pushbuttons are also constructed from industrial strength composite material with a minimum of up to one million cycles. For power saving, the transmitter unit uses special high efficiency power saving circuits that requires only two 'AA' alkaline batteries (UM-3).

2. SAFETY INSTRUCTION

The Alpha 580 system is relatively simple to use. However, it is very important to observe the proper safety procedures during operation. When use properly the Alpha 580 system will enhance productivity and efficiency in the workplace.

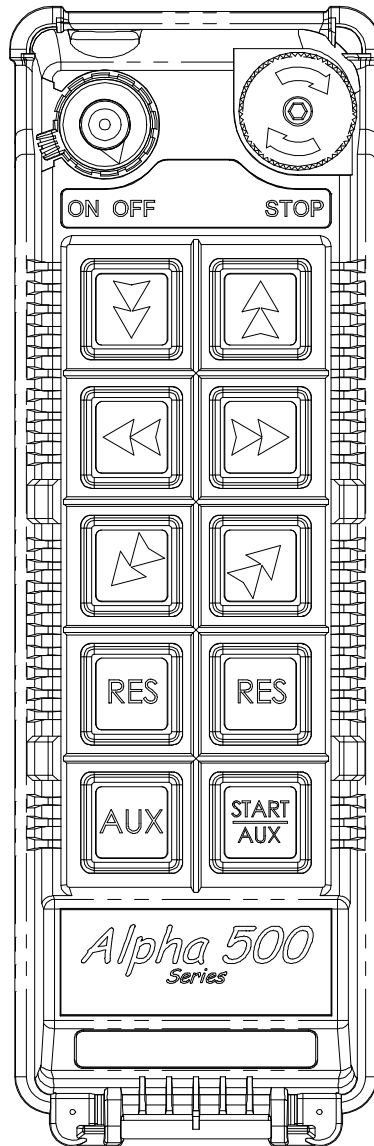
The following instructions should be strictly followed:

1. Make a daily check of the transmitter casing and pushbuttons. Should it appear that anything could inhibit the proper operation of the transmitter unit, it should be immediately removed from service.
2. The transmitter voltage should be checked on a daily basis. If the voltage is low, the two "AA" alkaline batteries should be replaced.
3. The emergency stop pushbutton (EMS) should be checked at the beginning of each shift to ensure they are in the proper working order.
4. In the event of an emergency, activate the emergency stop pushbutton immediately. Then turned the power off from the main power source of the equipment.
5. The power switch should be turned "off" after use and should never left the power "on" when the unit is unattended.
6. Do not use the same RF channel and ID code as any other unit in use at the same facility.
7. Ensure the wrist strap is worn at all time during operation to avoid accidental dropping.
8. Never operate a crane or equipment with two (2) transmitter units at the same time with same RF channel and ID code.



3. **PUSHBUTTON CONFIGURATION**

The Alpha 580 model can be configured from 3 to 5 motions with 2-speed pushbuttons and an emergency stop button (EMS).

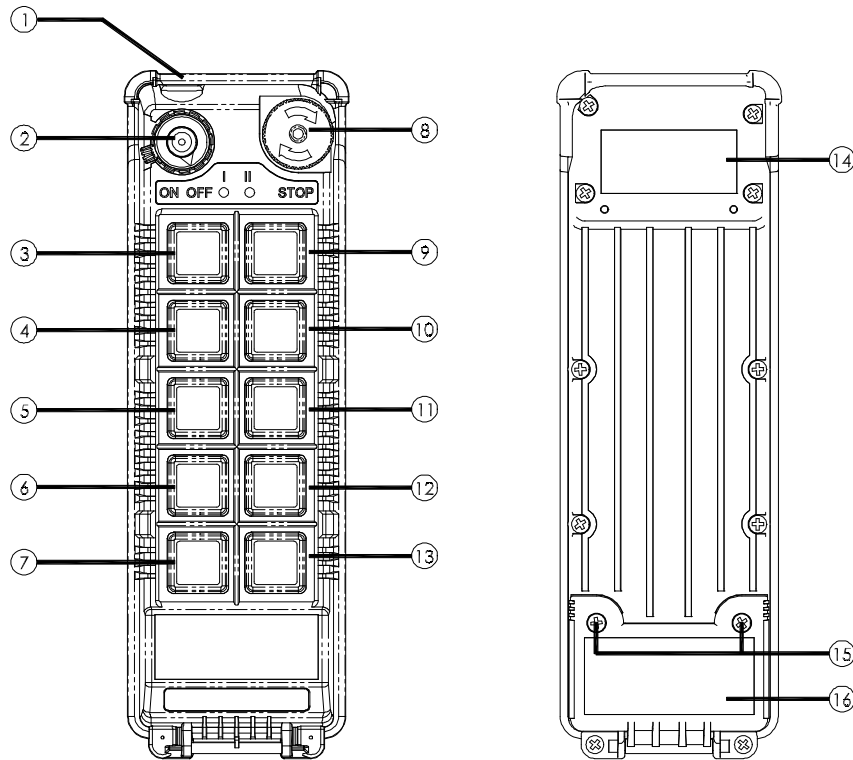


(Fig. 1) Pushbutton Placements

- RES** 2-Speed pushbuttons which can be used for the 4th motion or for any other functions.
- AUX** 2-Speed pushbuttons which can be used for the 5th motion or for any other functions.

4. TRANSMITTER OUTLINE

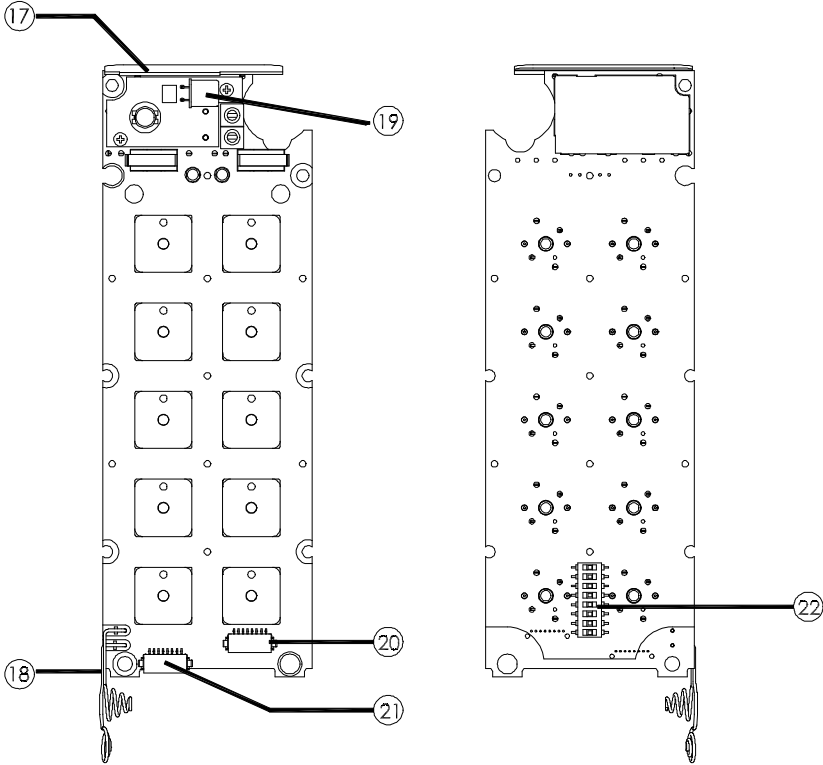
4.1 External View



(Fig. 2) Front View

- | | | |
|--------------------------|-------------------------|-------------------------|
| 1) Transmitter enclosure | 8) Emergency Stop (EMS) | 15) Battery Screws |
| 2) Power switch (ON/OFF) | 9) Pushbutton #1 | 16) Batter Cover/FCC ID |
| 3) Pushbutton #2 | 10) Pushbutton #3 | |
| 4) Pushbutton #4 | 11) Pushbuttons #5 | |
| 5) Pushbutton #6 | 12) Pushbutton #7 (A1) | |
| 6) Pushbutton #8 (A2) | 13) Pushbutton #9 (A3) | |
| 7) Pushbutton #10 (A4) | 14) System Information | |

4.2 Internal View



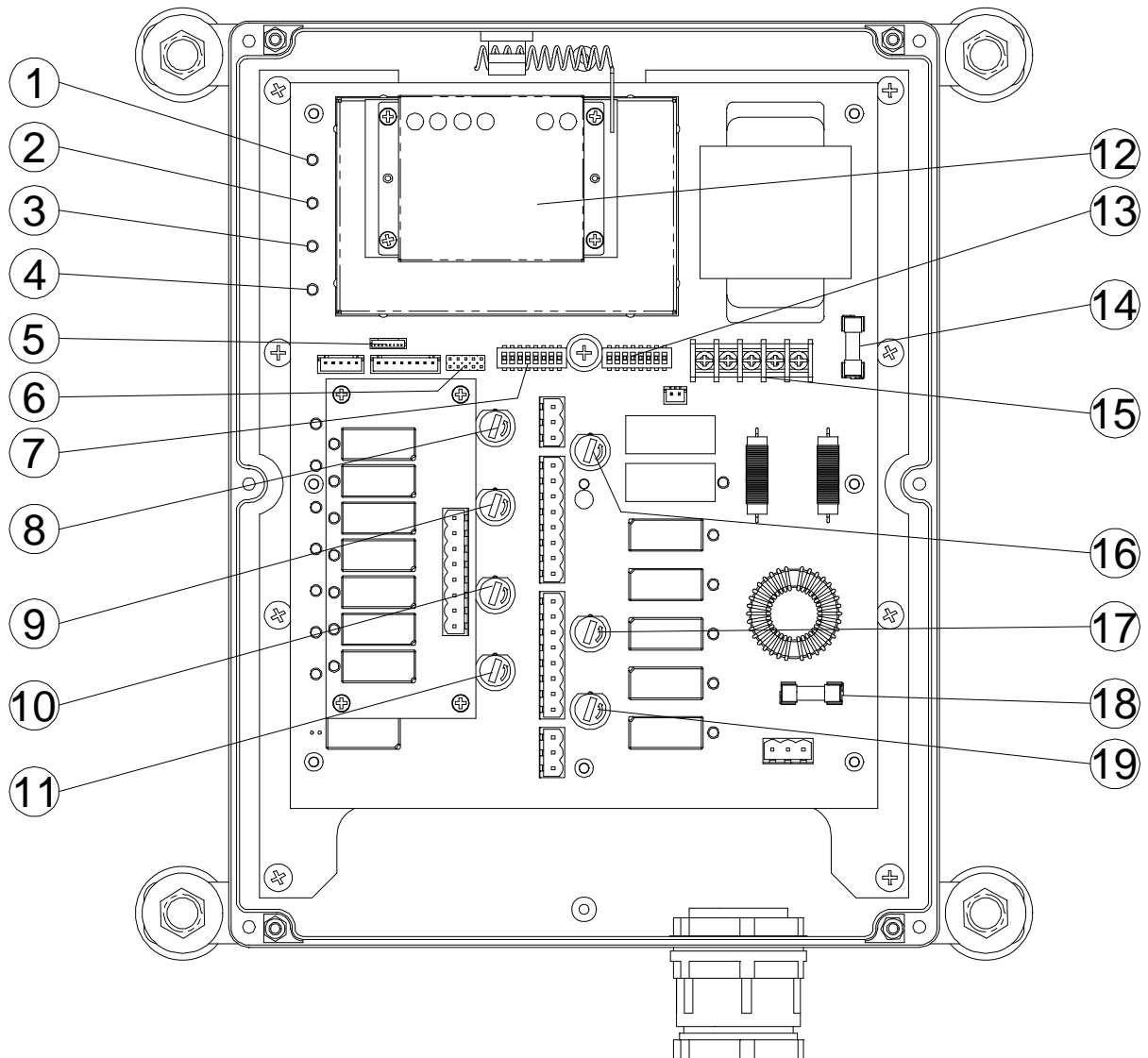
Front

(Fig. 4)
View

(F

- 17) TX Module/Antenna
- 18) Battery Contact
- 19) TX Quartz Crystal
- 20) Auxiliary Connector
- 21) Programming Port
- 22) ID Code Dip-Switch

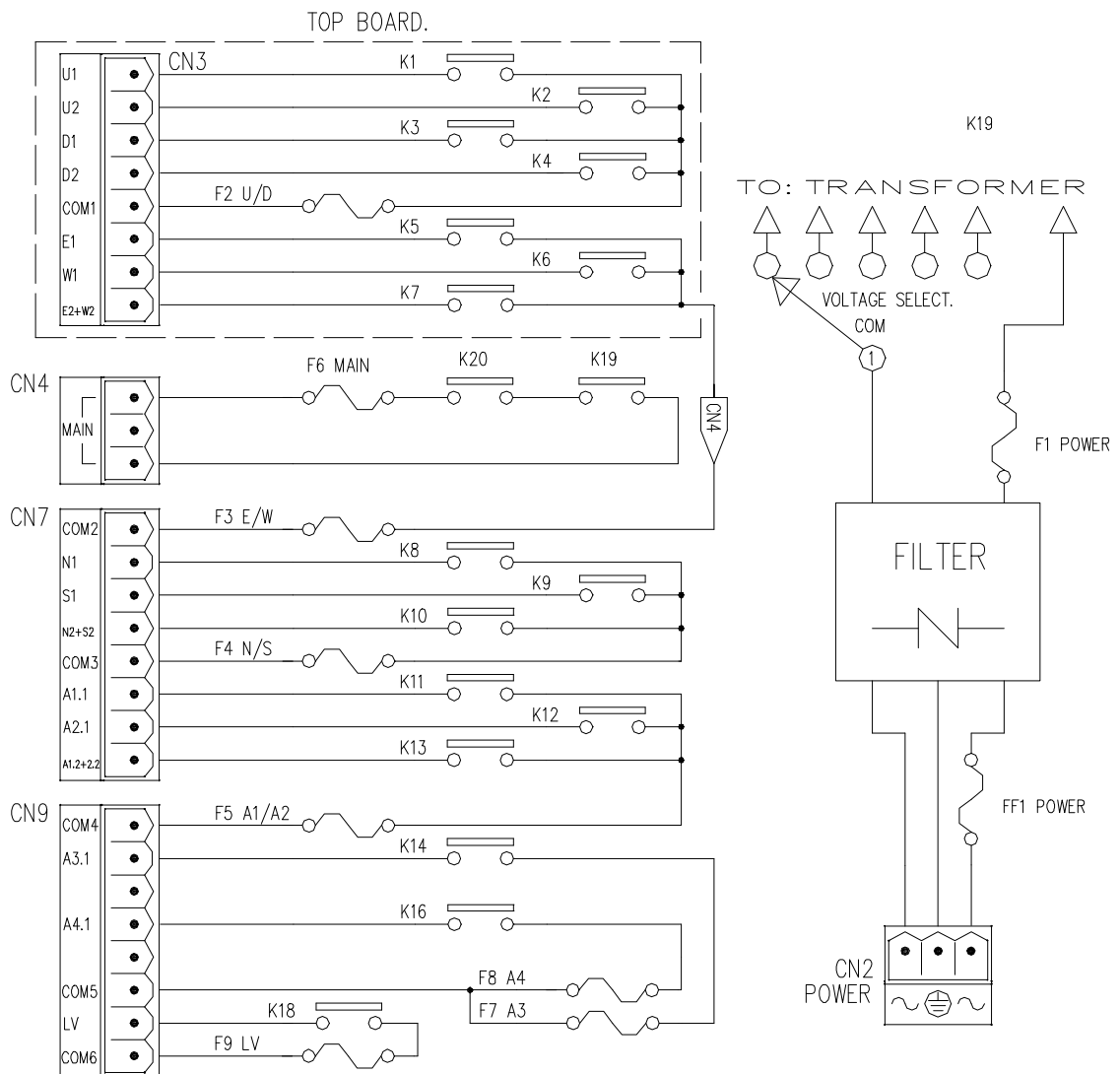
5. RECEIVER OUTLINE



(Fig. 6) Receiver Internal Assembly

- | | | |
|------------------------------|--------------------------|------------------------|
| 1) Power LED Display | 8) E/W Fuse | 15) Voltage Selector |
| 2) SQ Led Display | 9) N/S Fuse | 16) MAIN Fuse |
| 3) System Status LED Display | 10) A1/A2 Fuse | 17) A4 Fuse |
| 4) Relay COM LED Display | 11) A3 Fuse | 18) Primary Power Fuse |
| 5) Programming Port | 12) RX Module | 19) L/V Fuse |
| 6) Jumper Settings | 13) ID Code Dip-Switch | |
| 7) Function Settings | 14) Secondary Power Fuse | |

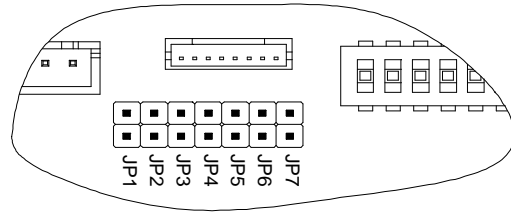
6. OUTPUT CONTACT DIAGRAM



NC No connection

7. SYSTEM SETTING CONFIGURATION

7.1 Jumper Settings (JP3)



Manufacture settings.

JP3	Open	Low voltage warning only; receiver MAIN will not be deactivated.
	Short	After one minute of low voltage warning, the transmitter power and the receiver MAIN will be deactivated. (see note B)

Note A: JP1, JP2, JP4, JP5, JP6, and JP7 not applicable for the Alpha 580 model.

Note B: If transmitter low voltage occurs during operation, other than transmitter itself will display visual warning, it will also send out a low voltage signal to the receiver to activate its external low voltage warning device. By connecting a horn, buzzer, or siren to the LV-relay output will ensure that the operator will clearly notice the low voltage warning even in hard to see or hear environments. After one minute of low voltage warning, to insure maximum safety, both the transmitter power and the receiver MAIN will be deactivated. For proper battery replacement, you must first turn “off” the transmitter power, replace the batteries, and then turn the power switch back “on” again to reactivate the transmitter and the receiver unit.

JP3 Short	System On	Work in Progress	Transmitter Low Voltage Occurs	LV Warning	Change Batteries within 1 Minute	YES	Work Resumes
						NO	Transmitter and Receiver MAIN Deactivated.
JP3 Open	System On	Work in Progress	Transmitter Low Voltage Occurs	LV Warning	Change Batteries within 1 Minute	YES	Work Resumes
						NO	Only Transmitter Unit Deactivated.

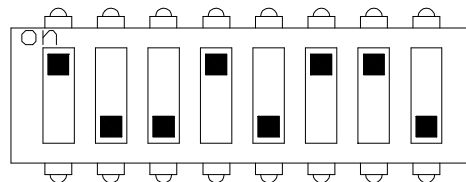
7.2 Security ID Code Setting

The ID code dip-switch is located on the back side of the encoder board (refer to Fig. 5 on page 6) and the decoder/relay board (refer to Fig. 6 on page 7).

Example : ID code 10010110

Top location : 1”

Bottom location : 0”



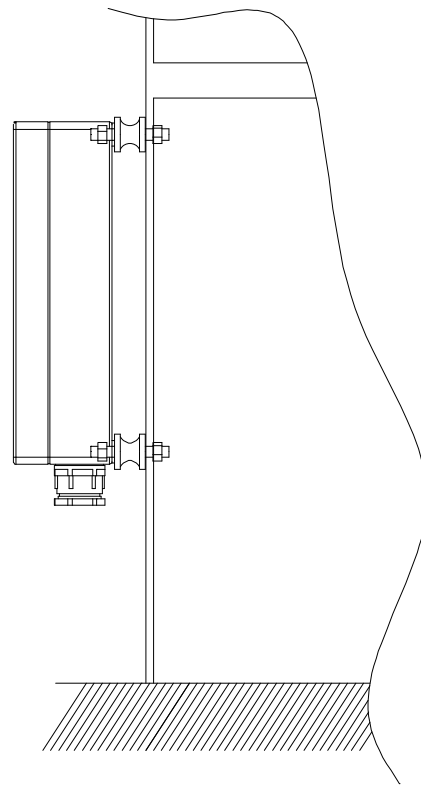
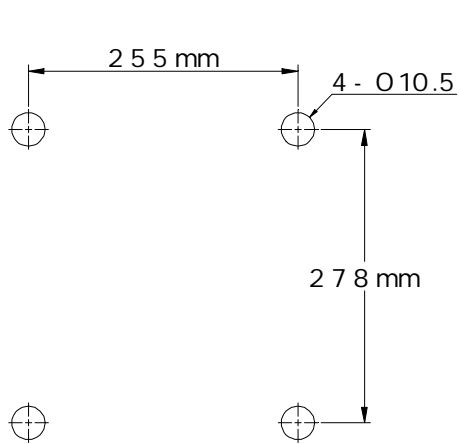
8. RECEIVER INSTALLATION

8.1 Preparation For Installation

1. Required Tools:
 - (1) Flat Head Screwdriver (-)
 - (2) Phillips Head Screwdriver (+)
 - (3) Multi-Meter
 - (4) 14mm Wrench x 2
 - (5) 10.5mm Drill-Bit
2. Ensure receiver is not set to the same channel and ID code as any other units in operation at the same facility.
3. Prior to installation, make sure the equipment itself is working properly.
4. Use the multi-meter to check the voltage source available and ensure receiver voltage setting is correct for this voltage.
5. Prior to installation, switch off the main power source to the equipment.

8.2 Step By Step Installation

1. 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.
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 (see diagram next page).
6. Drill 4 holes on the control panel (10.5mm).
7. Tightened the bolt nuts provided.
8. If the control panel has a plastic surface, extended grounding wire should be used.
9. For system wiring, please refer to the output contact diagram on page 9.
10. Ensure all wiring is correct and safely secured and all screws are fastened.



8.3 System Testing

1. Connect the power source to the receiver and test the operation of each function to ensure it operates in the same manner as the pendant controller.
2. Ensure the receiver MAIN can be properly controlled by the remote control.
3. Ensure the limit switches on the equipment that limit all travels are working properly.
4. Ensure the pendant controller is located in a safe location where it would not interfere with remote operation.

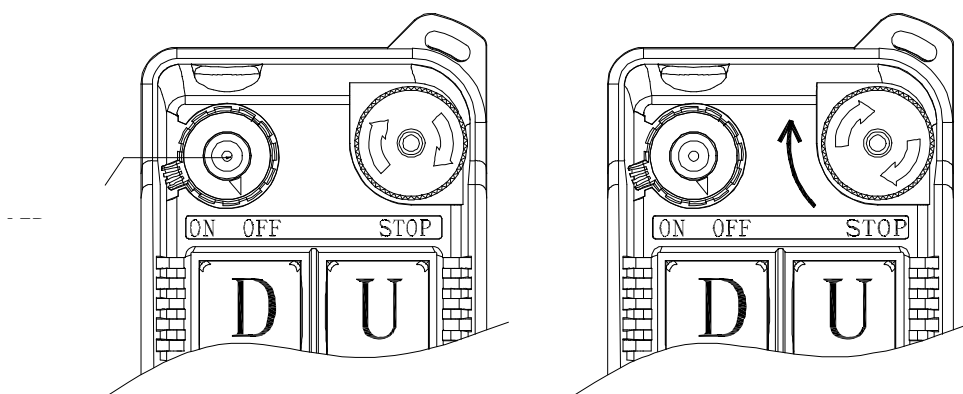
9. TRANSMITTER OPERATION

1. Make sure the two alkaline batteries are installed correctly. Do make sure to use alkaline type batteries for longer operating time between battery replacements. Rechargeable batteries can also be used (1,600mA or higher recommended).
2. Turn "on" the power switch located on the top left hand corner of the transmitter unit (refer to diagram below). The Status LED on the face of the transmitter will display a green light for up to two seconds when the power switch is turned "on". Make sure the red EMS pushbutton is elevated (on), by twisting it 1/4 turn clockwise.

If the Status LED displays a red blinking light with on 0.1 second and off 2.0 seconds or no light at all, this indicates that the two "AA" batteries in the transmitter must be replaced. If the Status LED light is blinking red, on 2.0 seconds and off 0.1 second, it means that the transmitter unit is locked due to a jammed (closed) or defective pushbutton contact. This important safety feature is designed to prevent any unexpected crane movement at system start-up caused by a defective or jammed (closed) pushbutton contact.

After turning "on" the transmitter unit, the system will go into self-diagnosing procedure. After 0.5 second, the transmitter key functions and receiver MAIN will be activated.

3. In case of an emergency, press down the red EMS button will immediately deactivates the receiver MAIN contact relay. To reset the EMS function and restart the system, just turn the red EMS button clockwise to enable the red button to elevate to its non-active position.
4. Please note that conflicted movements are interlocked to one another for safety purpose. Pressing conflicted commands at the same time will result in a non-transmission.



10. TROUBLE SHOOTING

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

SYMPTOM	REASON	SOLUTION
Transmitter does not communicate to 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 to receiver.	Low or no transmitting power from the transmitter unit.	Turn on the transmitter and with EMS in its elevated position. 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 power indicator (AC) is still not lit, please check the receiver for any burned 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.

Receiver System Status LED Display (please refer to Fig. 6 on page 7).

TYPE	LED INDICATION (Red)	REASON
1	Constant red light.	EEPROM error, manufacture reprogramming required.
2	ON 1.0 second OFF 1.0 second	Incorrect ID code, please readjust accordingly.
3	Dim or no light.	Under-voltage, check the main power supply.
4	ON 2.0 seconds OFF 0.1 second	System error, manufacture reprogramming required.
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 (pressed).

11. SYSTEM SPECIFICATION

Transmitter Unit

Frequency Range	:	433 MHz
Transmitting Range	:	150 feet
Hamming Distance	:	4
Channel Spacing	:	25KHz
Frequency Control	:	Quartz Crystals
Frequency Drift	:	< 5ppm @ -20 ~ +70
Frequency Deviation	:	< 1ppm @ 25
Spurious Emission	:	- 50dB
Transmitting Power	:	~.1mW
Emission	:	F1D
Antenna Impedance	:	50 ohms
Enclosure	:	IP-66
Source Voltage	:	3.0 VDC (AA'alkaline batteries X 2)
Current Drain	:	10 ~ 20 mA
Operating Temp.	:	-20 ~ +70
Dimension	:	213mm X 86mm X 33mm
Weight	:	290g (include batteries)

Receiver Unit

Frequency Range	:	433 MHz
Channel Spacing	:	25KHz
Hamming Distance	:	4
Frequency Control	:	Quartz Crystals
Frequency Drift	:	< 5ppm @ -20 ~ +70
Frequency Deviation	:	< 1ppm @ 25
Sensitivity	:	0.4 V
Antenna Impedance	:	50 ohms
Data Decoder Reference	:	Quartz Crystals
Responding Time	:	40mS (Normal)
Enclosure	:	IP-65
Source Voltage	:	110 VAC, 50/60 Hz.
Power Consumption	:	11VA
Operating Temp.	:	-20 ~ +70
Output Contact Rating	:	250V @ 10A
Dimension	:	300mm X 230mm X 86mm
Weight	:	3,400g (Include shock absorbers)