MKF-AT-01

MKF-TS03 Series

ON/OFF Switch

MKF-JS18
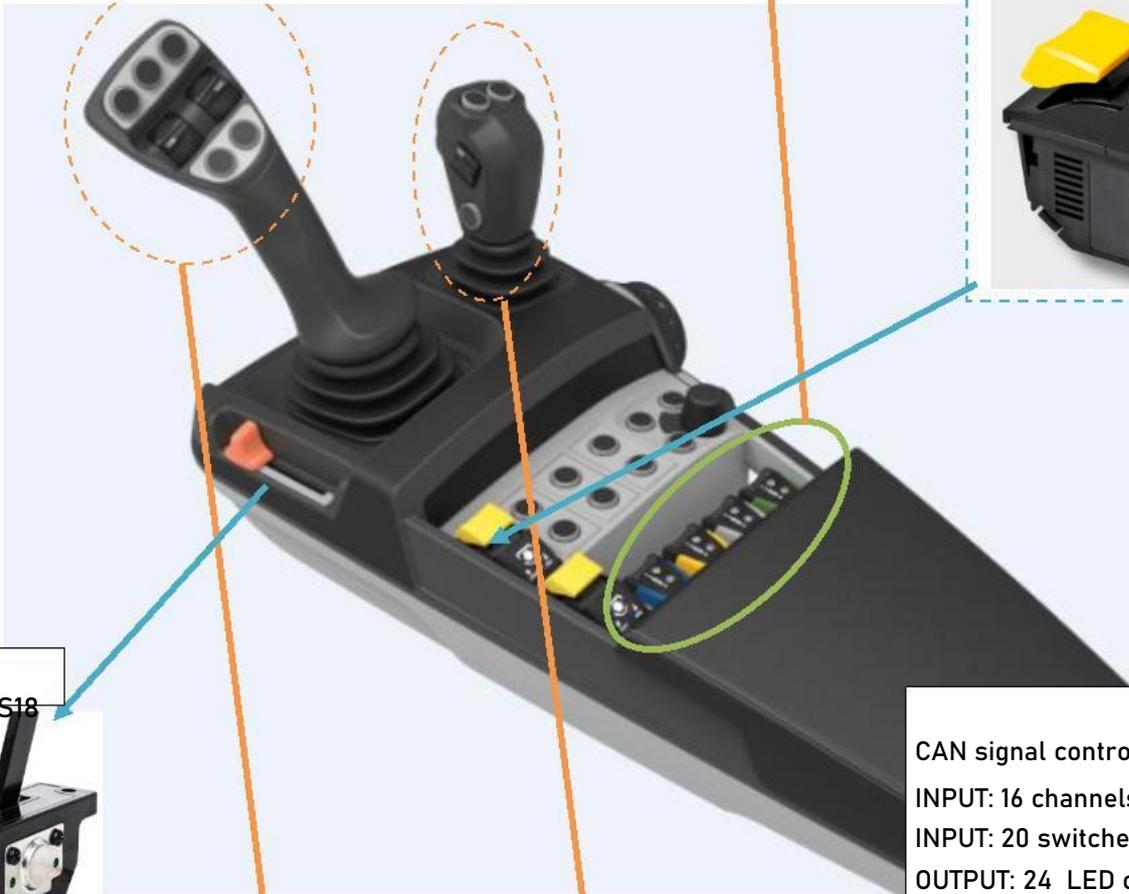
MKF-JS60

MKF-JS63

CAN signal control J1939

INPUT: 16 channels analog

INPUT: 20 switches

OUTPUT: 24 LED control
(backlight adjustable)

Connector: CANX1

Power supply: DC10-36V

Multiple Function Joystick

2 axes + 1 thumbwheel, 4 illuminated push button
Spring return to center/or with both ends locked (latched) optional
Square operation limiter, cross/T shape can be customized

MKF-TS03 series

Single axis, spring return to center, both ends locked optional
DC5V power supply, 0.5-2.5-4.5V signal output

Electronic hand throttle MKF-JS18

DC5V power supply, dual signal output, support the electronic throttle function of diesel engine.

Compatible with all brands of diesel engines.

Power switch

White/green bi-color backlight
Switch contact capacity 100MA/DC30V
Life span greater than 2 million times
Protection: above the flange IP67

LED push button MKF-B12S

Button switch with backlight, a variety of PVC patterns are optional, IP67 protection, life of more than 2 million times, Monochrome backlight, contact capacity 100mA/DC30V

Hall effect Joystick MKF-JS60

Bi-colors backlight push buttons, various PVC patterns for optional, 6 push buttons with 3 thumb wheels, square operation limiter, CAN2.0B signal output, DC 24V power supply.

CAN PCB board
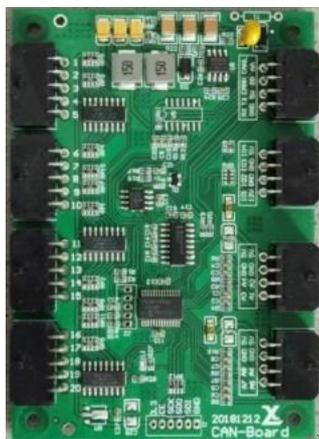
CAN signal control board
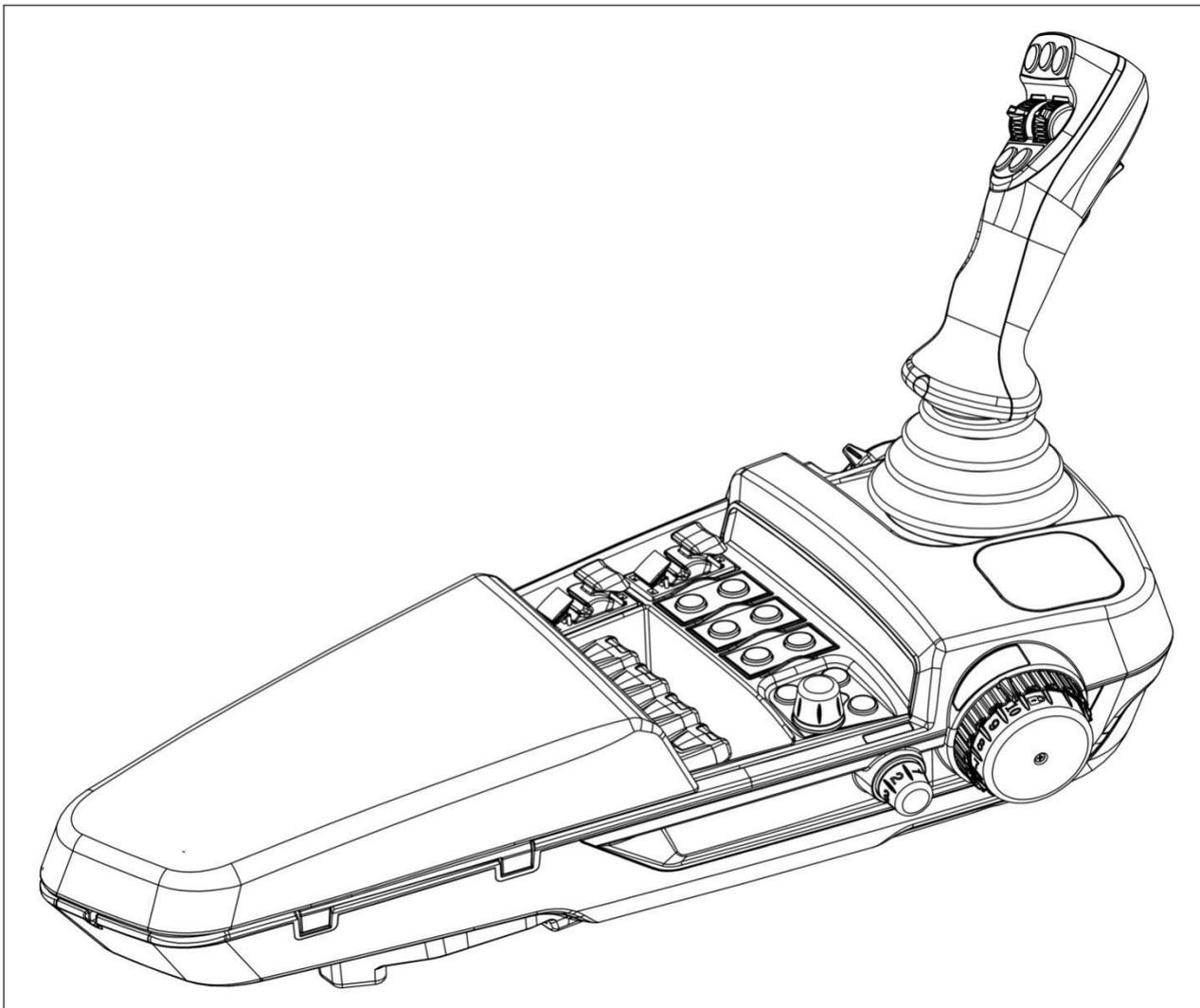J1939
Input: 16 channels of analog
Input: 20 switches
Output: 24 LED light control
        (brightness adjustable)
Interface: CANX1
Power supply: DC10-36V

The MATE armrest box series products have multiple layouts and can be customized; Equipped with one 500mA TYPE-A phone charging interface

Equipped with dual color backlight buttons.

Power supply: DC24V power supply

Minimum working voltage: 9V

Maximum working voltage: DC36V

Power consumption: maximum 24W

Communication interface: CAN

Working temperature: -40-+85 ℃

Storage temperature: -50-+85 ℃

TECHNICAL DRAWINGS

Direction A

333

135.8

581.8

70.5

242.1

631.1

121.3

333

136.3

View A

333

136.3

227.6
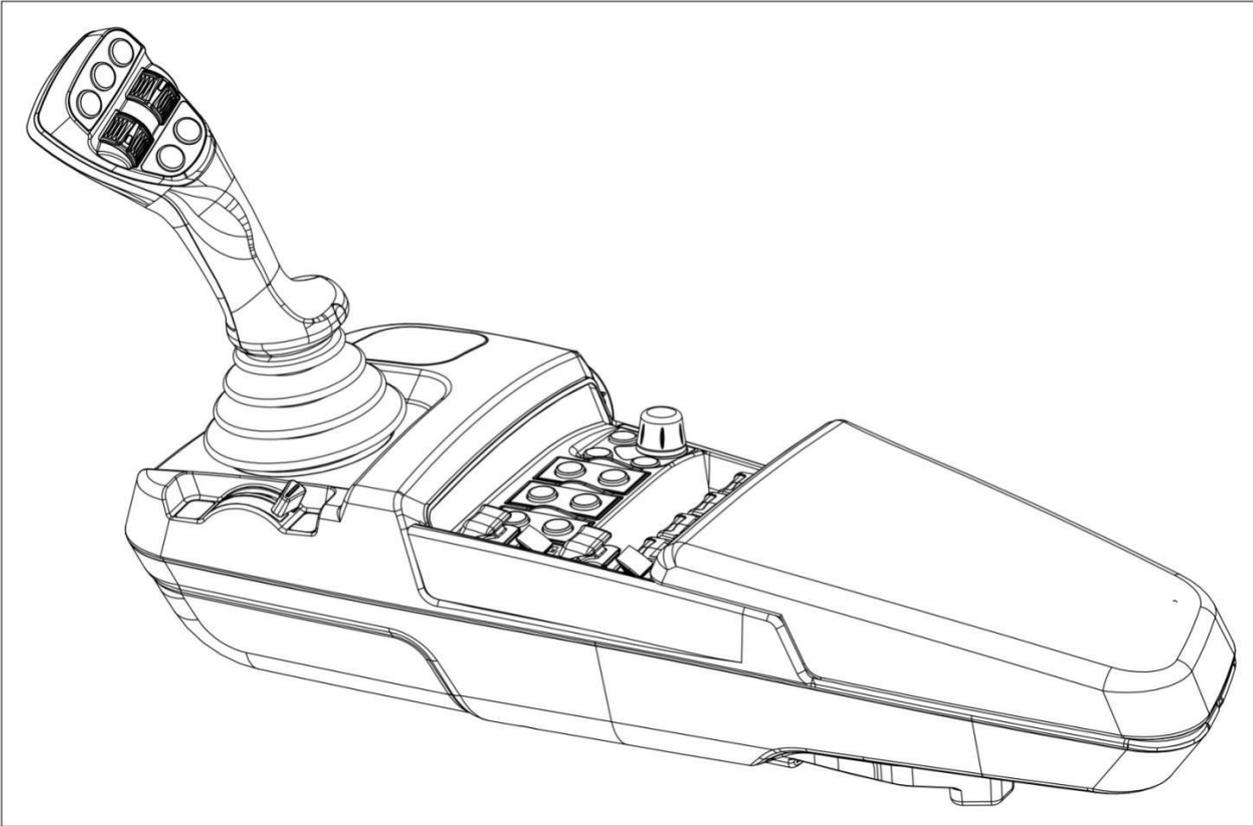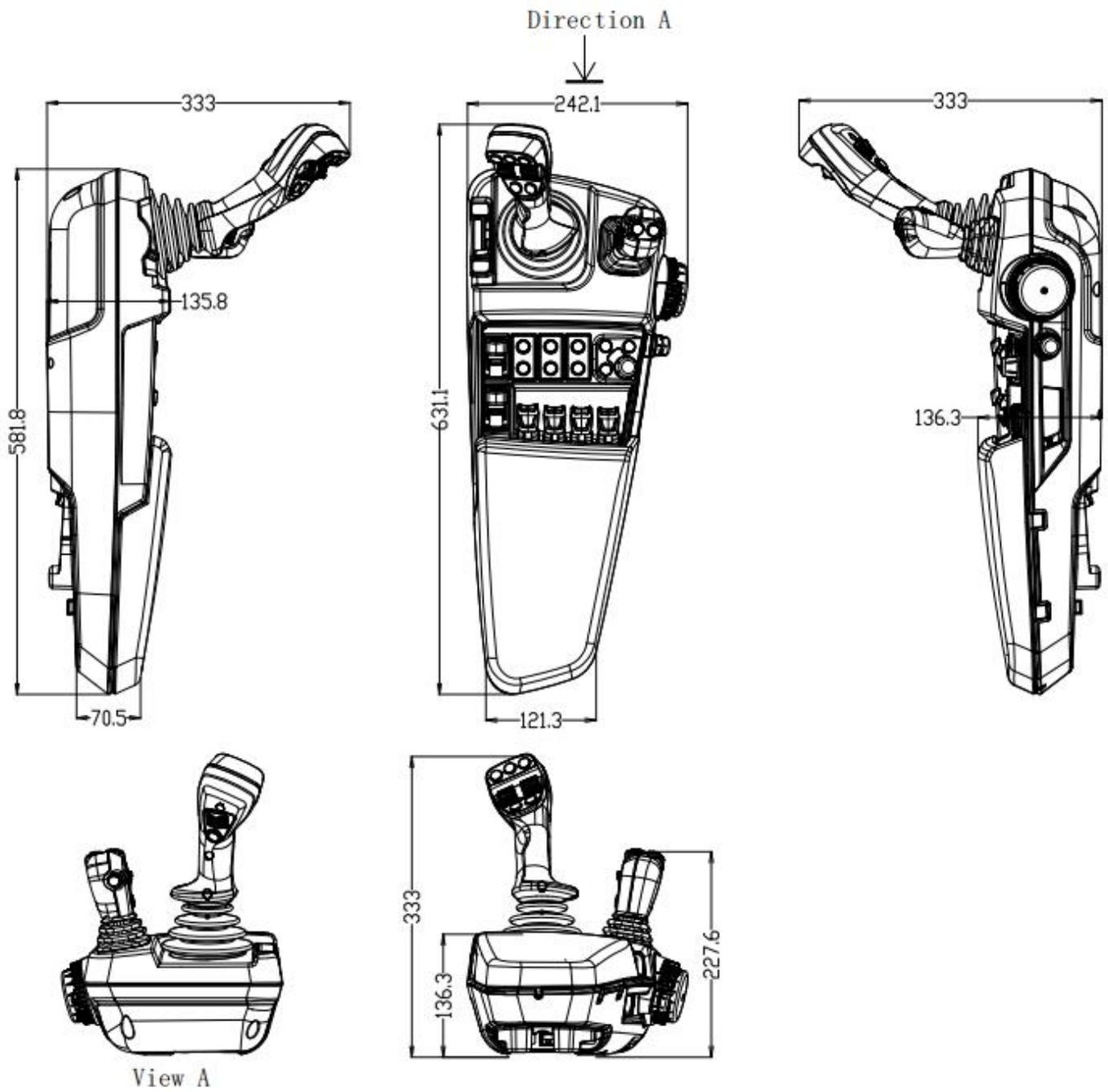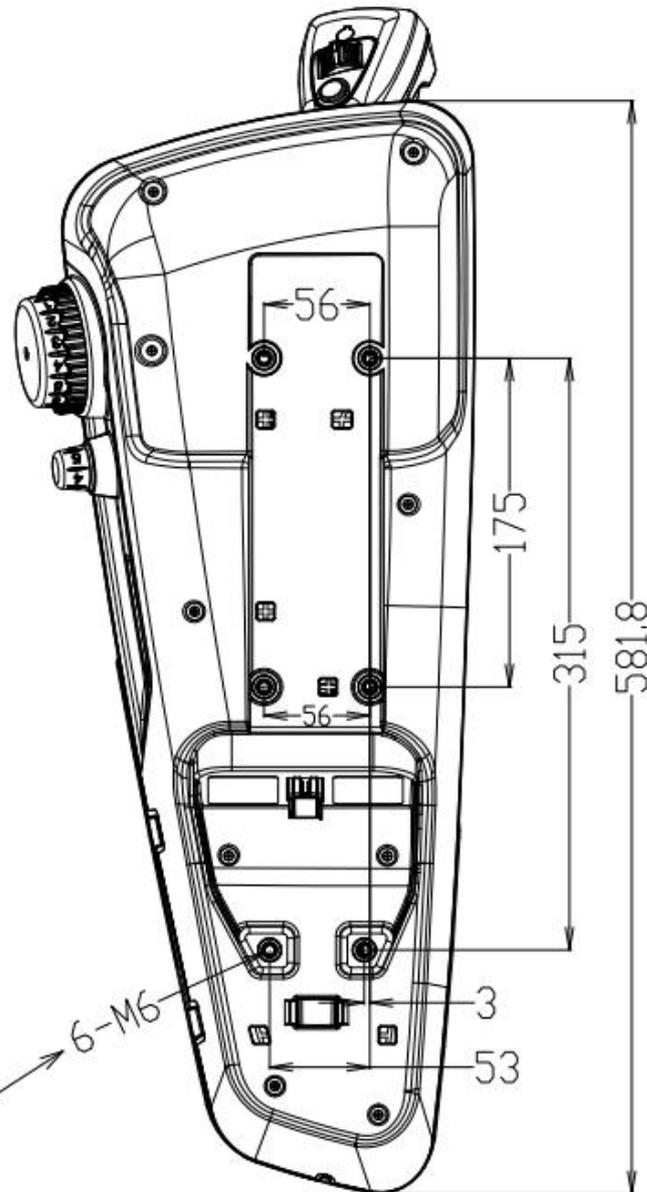
Definition of external pins for armrest box
1. UB: Power input+/DC12V (10–36V)
2. GND: Power input negative
3. CAN–H: Communication line CAN–H
4. CAN–L: Communication line CAN–L

B
Stecker / connector

Tyco Junior Power Timer
Housing   965641-3
Locking plate   968271 1
Terminal   1-962841-1
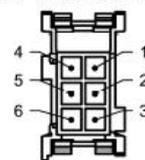
Stecker / connector

PIN	Funktion / function
1	UB
2	GND
3	CAN_H
4	CAM_L
5	Ignition
6	-

Joystick 1

Joystick 2

Electronic throttle

Big size knob potentiometer

PTO Switch1(with LED) Front power control

Small size knob potentiometer

S8 S6 S4 S1 S3

S9 S7 S5 S2

Rotary encoder With button function /Control of LCD screen together with S1, S2, and S3

PTO Switch2(with LED) Back power control

1 2 3 4

4 thumb wheels, spring return, both ends with lock

S14 S15 S16 S17

4 buttons
Inside the armrest box cover
Open the cover and you can see them

Joystick 1 (The button backlight of Joystick 1 is white and green, and the button backlight can be controlled)
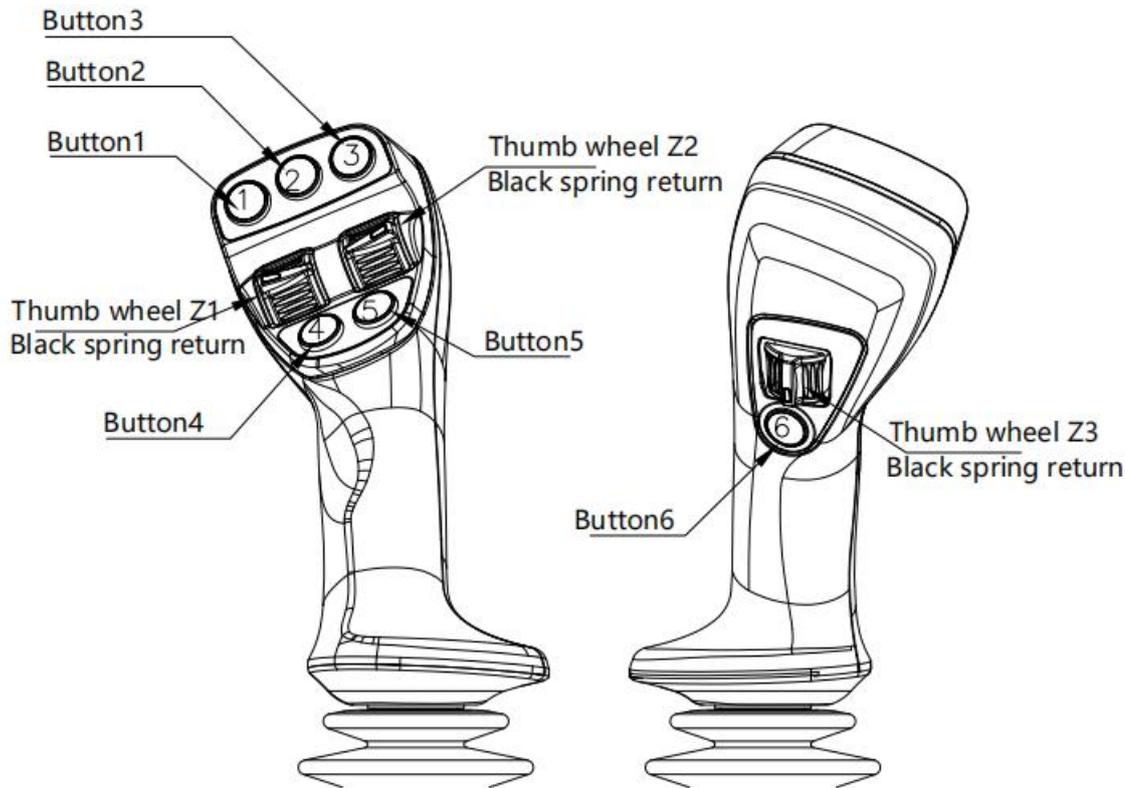
1. Joystick 1 command

Joystick 1 sends data

Command direction: Armrest box → Main unit

CAN extension frame ID=0X0CFDD601 Baud rate: 250K, cycle: 50ms

	BIt7	BIt6	BIt5	BIt4	BIt3	BIt2	BIt1	BIt0	description
Byte0					right	left	back	front	base direction
Byte1	A7	A6	A5	A4	A3	A2	A1	A0	Axis1: Y Angle value/0-255 center 0
Byte2	B7	B6	B5	B4	B3	B2	B1	B0	Axis 2: X Angle value/0-255 center 0
Byte3			Z3-	Z3+	Z2-	Z2+	Z1-	Z1+	Thumb wheel direction
Byte4	C7	C6	C5	C4	C3	C2	C1	C0	Axis 3: Z1Thumb wheel Angle value/0-240 center 0
Byte5	C7	C6	C5	C4	C3	C2	C1	C0	Axis 4: Z2 Thumb wheel Angle value/0-240 center 0
Byte6	C7	C6	C5	C4	C3	C2	C1	C0	Axis 5: Z3 Thumb wheel Angle value /0-240 center 0
Byte7		Grip capacitive switch	button6	button5	button4	button3	button2	button1	Switching input

Note:Thumb wheel direction: up+, down -/right+, left -; Front+, Back-

Button: 1=pressed, 0=released

2-4 Axis joystick Protocol

Joystick 1 sends data

Command direction: Armrest box → Main unit

CAN extension frame ID=0X0CFDD601 Baud rate: 250K, cycle: 50ms

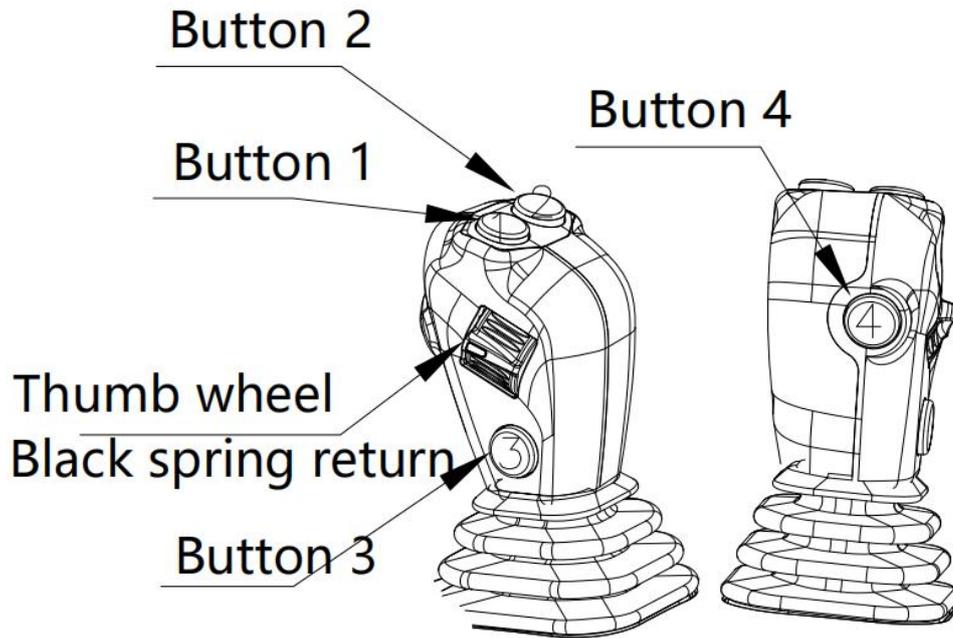| Byte	Biyt7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	Description
Byte0	Z2_RG Right	Z2_LG Left	Z1_DG Down	Z1_UG Up	right brake	Left drive	Backward	forward	
Byte1	A7	A6	A5	A4	A3	A2	A1	A0	Axis 1 (value) Y
Byte2	-	A6	A5	A4	A3	A2	A1	A0	Axis 2 (value) X
Byte3	A7	A6	A5	A4	A3	A2	A1	A0	Axis 3 (value)Z1
Byte4	A7	A6	A5	A4	A3	A2	A1	A0	Axis 4 (value)Z2
Byte5			S14	S13	S12	S11	S10	S09	Digital inputs (palm grip)
Byte6	S08	S07	S06	S05	S04	S03	S02	S01	Digital inputs (palm grip)
Byte7									0x00

Note: ① 2 Axis: AXIS3,AXIS4 value=0x00

② Value of 3-axis AXIS4=0x00

③ Direction: Effective=1, Invalid=0; Up (front)+, Down (back) -, Right+, Left-

Joystick 2

The button backlight of joystick 2 is white, constantly on, uncontrollable

1、 Joystick 2 command

Joystick 2 sends data

Command direction: Armrest box → Main unit

CAN extension frame ID=0X0CFDD602 Baud rate: 250K, cycle: 50ms

	BIt7	BIt**6**	BIt5	BIt4	BIt3	BIt2	BIt1	BIt0	Description
Byte0			Thumb wheel down	Thumb wheel up	Right	Left	Back	Front	Base direction
Byte1	A7	A6	A5	A4	A3	A2	A1	A0	Axis 1: Y Angle value/0-255 Center 0
Byte2	B7	B6	B5	B4	B3	B2	B1	B0	Axis 2: X Angle value/0-255 center 0
Byte3	C7	C6	C5	C4	C3	C2	C1	C0	Axis3: Z1 Thumb wheel Angle value/0-240 center 0
Byte4									00
Byte5									00
Byte6									00
Byte**7**					Button4	Button3	Button2	Button1	

Note: Thumb wheel direction: up+, down-

Button: 1=pressed, 0=released

2. Middle panel - Analog

2.Middle panel - Analog part (including electronic throttle, knob, and 4 thumb wheel)
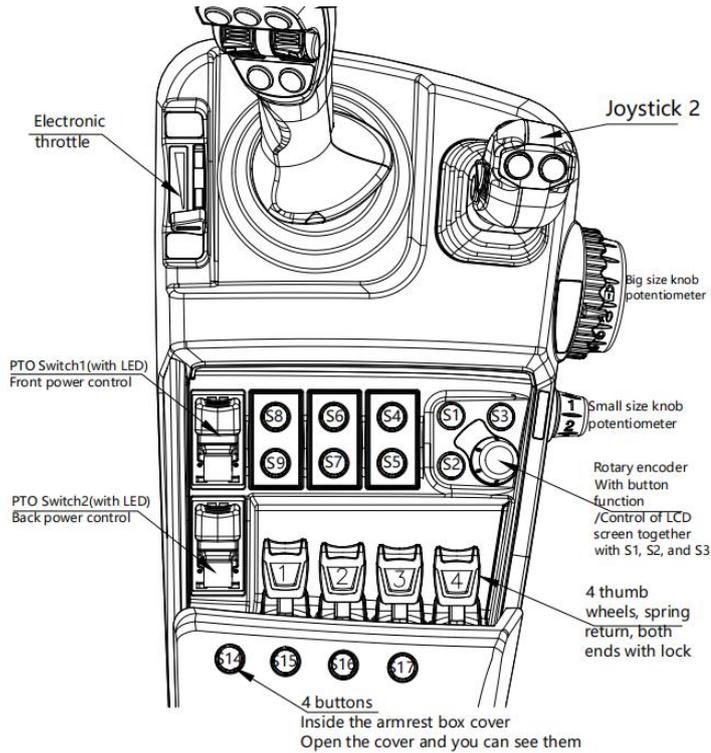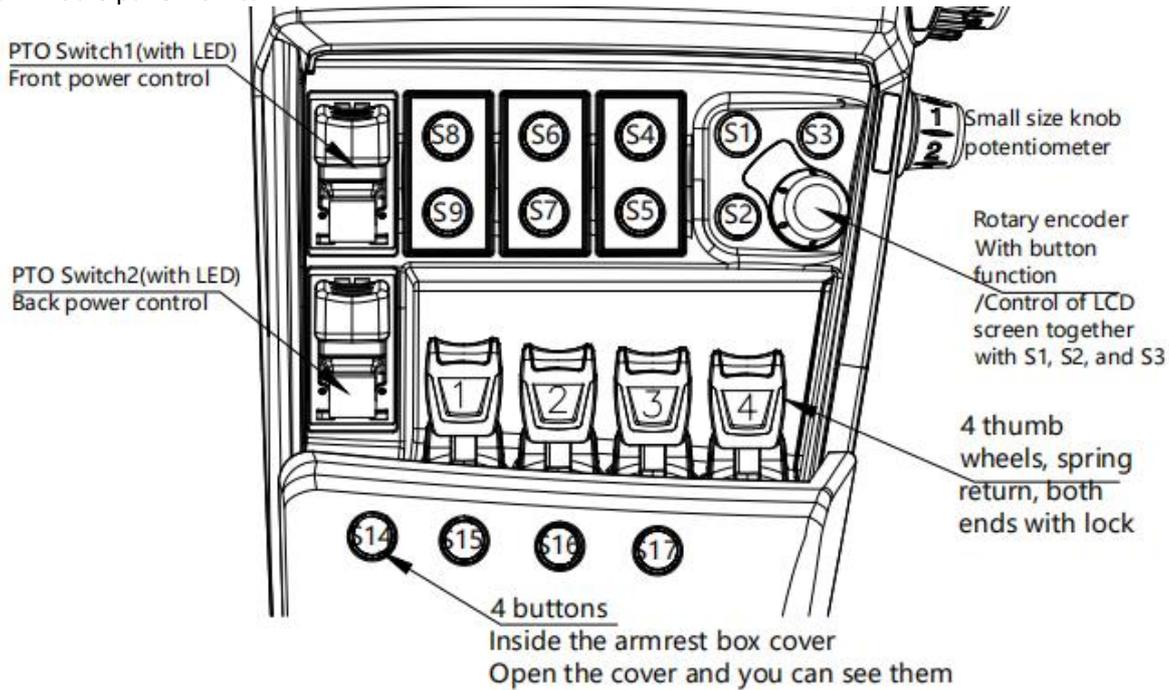
Command direction: Armrest box → Main unit

CAN extension frame ID=0X0CFDD603 Baud rate: 250K, cycle: 50ms

	BIt7	BIt6	BIt5	BIt4	BIt3	BIt2	BIt1	BIt0	Description
Byte0	A7	A6	A5	A4	A3	A2	A1	A0	Electronic throttle 0-100
Byte1	A7	A6	A5	A4	A3	A2	A1	A0	Big knob 0-100
Byte2	A7	A6	A5	A4	A3	A2	A1	A0	Small size knob 0-100
Byte3	Thumb wheel 4 Down	Thumb wheel 4 Up	Thumb wheel 3 Down	Thumb wheel 3 Up	Thumb wheel 2 Down	Thumb wheel 2 Up	Thumb wheel 1 Down	Thumb wheel 1 Up	Thumb wheel direction description
Byte4	A7	A6	A5	A4	A3	A2	A1	A0	Thumb wheel1 Angle 0-255，center=0
Byte5	A7	A6	A5	A4	A3	A2	A1	A0	Thumb wheel2 Angle 0-255，center=0
Byte6	A7	A6	A5	A4	A3	A2	A1	A0	Thumb wheel3 Angle 0-255，center=0
Byte7	A7	A6	A5	A4	A3	A2	A1	A0	Thumb wheel4 Angle 0-255，center=0

3. Middle panel - switch

PTO Switch1(with LED)
Front power control

PTO Switch2(with LED)
Back power control

1/2 Small size knob potentiometer

Rotary encoder
With button function
/Control of LCD screen together with S1, S2, and S3

4 thumb wheels, spring return, both ends with lock

4 buttons
Inside the armrest box cover
Open the cover and you can see them

3.Middle panel button switch (including buttons, PTO switch)
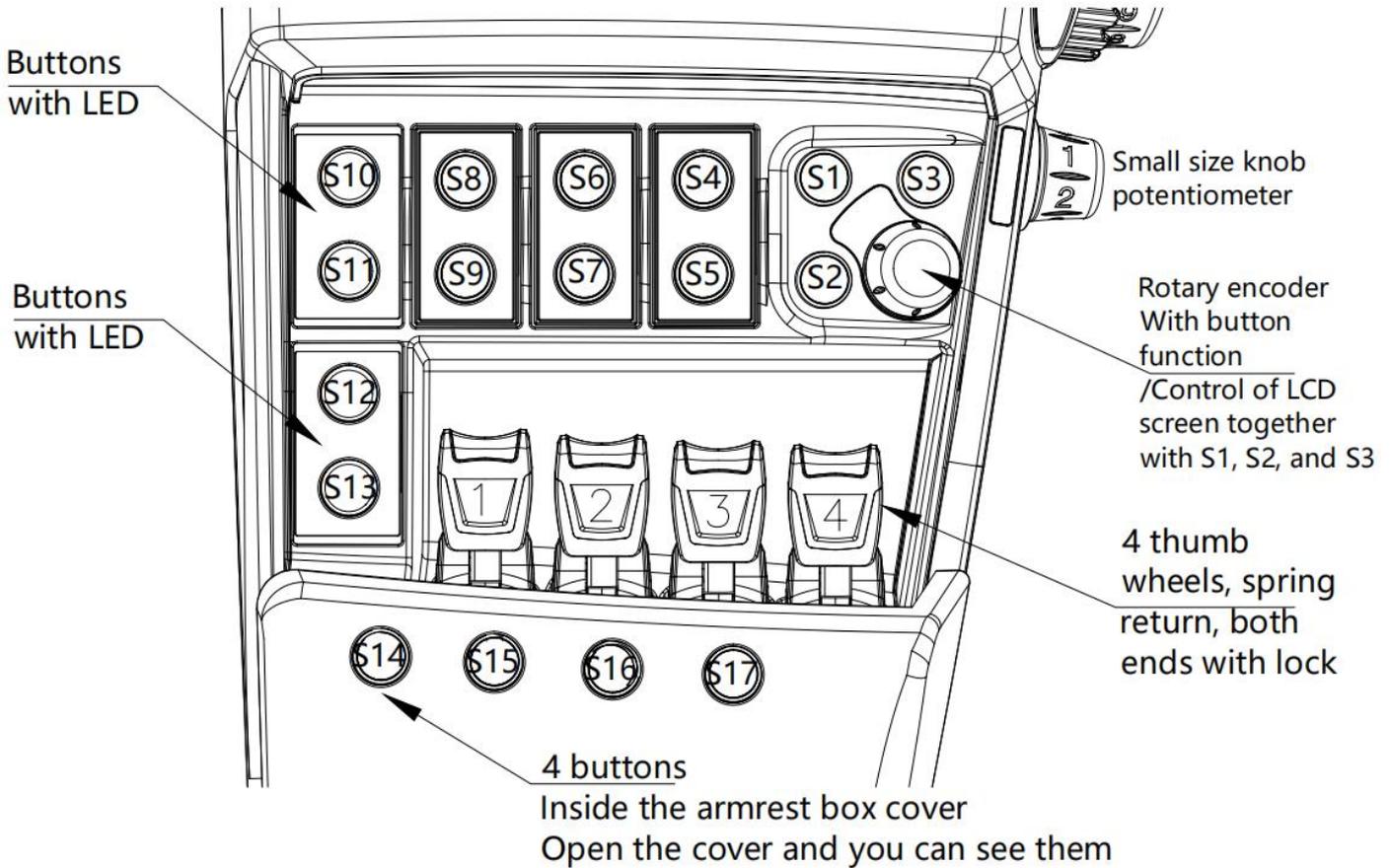Command direction: Armrest box → Main unit
Send the switch status in the middle to the host
CAN extension frame ID=0X0CFDD604 Baud rate: 250K, cycle: 50ms

	BIt7	BIt6	BIt5	BIt4	BIt3	BIt2	BIt1	BIt0	Description
Byte0	S8	S7	S6	S5	S4	S3	S2	S1	Panel button switch1-8
Byte1	S16	S15	S14	PTO2 ON	PTO2 OFF	PTO1 ON	PTO1 OFF	S9	Panel button switch9-16
Byte2								S17	Panel button switch17-24
Byte3									00
Byte4	0-31 pulse count					Encoder button	N	P	Knob encoder/Bit1Bit0: 01=clockwise/02=counterclockwise /00=No rotation
Byte5									00
Byte6									00
Byte7									00

Button: 1=ON (pressed), 0=OFF (released)/PTO switch: 1 valid, 0 invalid

Middle panel button switch
Command direction: Armrest box → Main unit
Send the switch status in the middle to the host

Buttons with LED
Buttons with LED
Small size knob potentiometer
Rotary encoder With button function /Control of LCD screen together with S1, S2, and S3
4 thumb wheels, spring return, both ends with lock
4 buttons Inside the armrest box cover Open the cover and you can see them

CAN extension frame ID=0X0CFDD604 Baud rate: 250K, cycle: 50ms

	BIt7	BIt6	BIt5	BIt4	BIt3	BIt2	BIt1	BIt0	Description
Byte0	S8	S7	S6	S5	S4	S3	S2	S1	Button 1-8
Byte1	S16	S15	S14	S13	S12	S11	S10	S9	Button 9-16
Byte2								S17	panel button switch 17-24
Byte3									00
Byte4	0-31 pulse count					Encoder button	N	P	Knob encoder/Bit1Bit0: 01=clockwise/02=counterclockwise /00=No rotation
Byte5									00
Byte6									00
Byte7									00

Button: 1=ON (pressed), 0=OFF (released)/PTO switch: 1 valid, 0 invalid

4、Armrest box receiving command - joystick 1

Joystick LED control

Command direction: Host → Armrest box

CAN extension frame ID=0X0CFDDF01 Baud rate: 250K, cycle: 50ms

	BIt7	BIt6	BIt5	BIt4	BIt3	BIt2	BIt1	BIt0	Description
Byte0	0	0	Button2 00 white/01 green/02=blink/03 off		0	0	Button1 00white/01green/ 02=blink/03off		Joystick backlight control
Byte1	0	0	Button 4 00white/01 green/02=blink/03 0ff		0	0	Button3 00White/01Green/ 02=blink/03off		Joystick backlight control
Byte2	0	0	00		0	0	Button5 00white/01green/ 02=blink/03off		Joystick backlight control
Byte3	0	0	Front right thumb wheel 00 Off/01 On/02=blink		0	0	Front left thumb wheel 00 off/01on/02=blink		
Byte4									
Byte5									
Byte6									
Byte7	0XA5								

Note: The backlight of the joystick buttons is controllable, with a dual color backlight of white and green, but the brightness cannot be adjusted

4.Armrest box receiving command - button backlight
Middle button backlight control
Command direction: Host → Armrest box
CAN extension frame ID=0X0CFDDF02 Baud rate: 250K, cycle: 50ms

	BIt7	BIt6	BIt5	BIt4	BIt3	BIt2	BIt1	BIt0	Description
Byte0	Button S4 00white/01green/ 02=blink/03off		Button S3 00white/01green/ 02=blink/03off		Button S2 00white/01green/ 02=blink/03off		Button S1 00white/01green/ 02=blink/03off		Armrest box buttons S1-S4
Byte1	ButtonS8 00white/01green/ 02=blink/03off		ButtonS7 00white/01green/ 02=blink/03off		ButtonS6 00white/01green/ 02=blink/03off		ButtonS5 00white/01green/ 02=blink/03off		Armrest box buttons S5-S8
Byte2	PTO2 00white/01green/ 02=blink/03off				PTO1 00white/01green/ 02=blink/03off		ButtonS9 00white/01green/ 02=blink/03off		Armrest box buttons S9-S12
Byte3	ButtonS16 00white/01green/ 02=blink/03off		ButtonS15 00white/01green/ 02=blink/03off		ButtonS14 00white/01green/ 02=blink/03off				Armrest box buttons S13-S16
Byte4							ButtonS17 00white/01green/ 02=blink/03off		Armrest box buttons S17-S20
Byte5									0x00
Byte6									0x00
Byte7	0XA5								0XA5

Note: The buttons and PTO switch have a dual color backlight of white and green. The backlight is white, the function color is green, and the brightness cannot be adjusted.

There is no PTO switch on the middle panel, all are button schemes

	BIt7	BIt6	BIt5	BIt4	BIt3	BIt2	BIt1	BIt0	Description
Byte0	ButtonS4 00white/01green/ 02=blink/03off		ButtonS3 00white/01green/ 02=blink/03off		ButtonS2 00white/01green/ 02=blink/03off		ButtonS1 00white/01green/ 02=blink/03off		Armrest box buttons S1-S4
Byte1	ButtonS8 00white/01green/ 02=blink/03off		ButtonS7 00white/01green/ 02=blink/03off		ButtonS6 00white/01green/ 02=blink/03off		ButtonS5 00white/01green/ 02=blink/03off		Armrest box buttons S5-S8
Byte2	ButtonS12 00white/01green/ 02=blink/03off		ButtonS11 00white/01green/ 02=blink/03off		ButtonS10 00white/01green/ 02=blink/03off		ButtonS9 00white/01green/ 02=blink/03off		Armrest box buttons S9-S12
Byte3	ButtonS16 00white/01green/ 02=blink/03off		ButtonS15 00white/01green/ 02=blink/03off		ButtonS14 00white/01green/ 02=blink/03off		ButtonS13 00white/01green/ 02=blink/03off		Armrest box buttons S13-S16
Byte4							ButtonS17 00white/01green/ 02=blink/03off		Armrest box buttons S17-S20
Byte5									0x00
Byte6									0x00
Byte7	0XA5								0XA5

Note: The buttons and PTO switch have a dual color backlight of white and green. The backlight is white, the function color is green, and the brightness cannot be adjusted.

MKT-AT-0-F1-XL factory settings

ID=00ED0512, Baud rate 250K

(1) Calibrate the zero point position: AF 09 00 00 00 00 00 F5 00

The minimum position of the electronic throttle, the minimum position of the large and small knobs, the thumb push rod, and the control lever should all be at the natural zero point position before issuing commands.

(2) Calibrate the maximum value of the electronic throttle: AF 09 01 05 00 00 F5 00. Command the maximum position of the electronic throttle again.

(3) Calibrate the maximum value of the electronic throttle: AF 09 02 05 00 00 F5 00. Send a command again at the maximum position of the large knob.

(4) Calibrate the maximum value of the electronic throttle: AF 09 03 05 00 00 F5 00. Send the command again at the maximum position of the small knob.

(5)   MKF-JS63-X maximum value: AF 09 04 05 00 00 F5 00 MKF-JS63-Left maximum position resend command. (05 is dead zone, maximum 0X31)

(6)   MKF-JS63-Y maximum value: AF 09 05 05 00 00 F5 00 MKF-JS63- resend command at the front maximum position.

(7)   MKF-JS63-Z maximum value: AF 09 06 05 00 00 F5 00 MKF-JS63- command to be sent from the top position of the wheel.

(8)   MKF-TS03-1 maximum value: AF 09 07 05 00 00 F5 00 MKF-TS03-1 maximum position resend command.

(9)   MKF-TS03-2 maximum value: AF 09 08 05 00 00 F5 00 MKF-TS03-2 maximum position resend command.
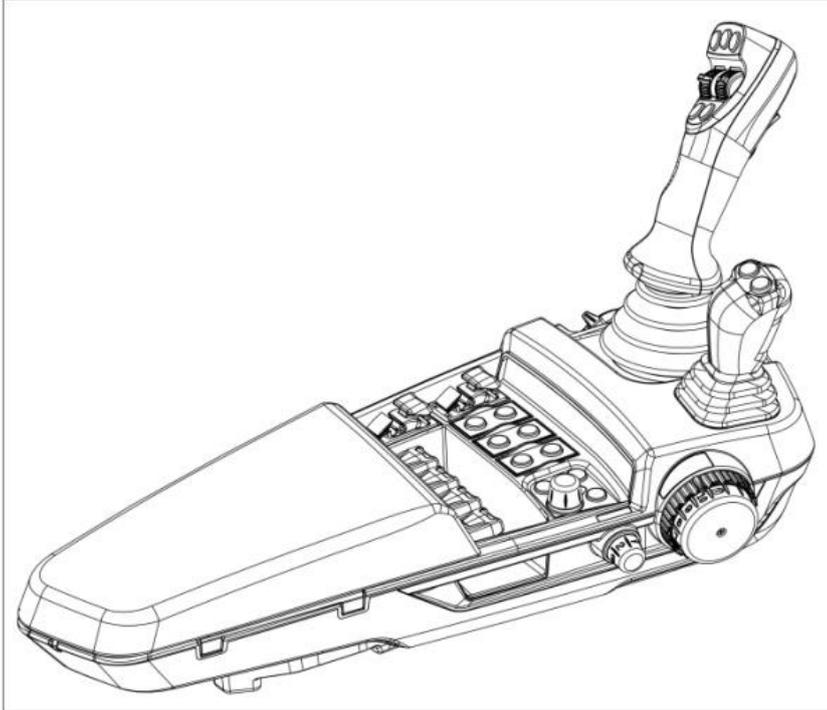
(10)   MKF-TS03-3 maximum value: AF 09 09 05 00 00 F5 00 MKF-TS03-3 sends a command at the topmost position.

(11)   MKF-TS03-4 maximum value: AF 09 0A 05 00 00 F5 00 MKF-TS03-4 sends command again at the topmost position.
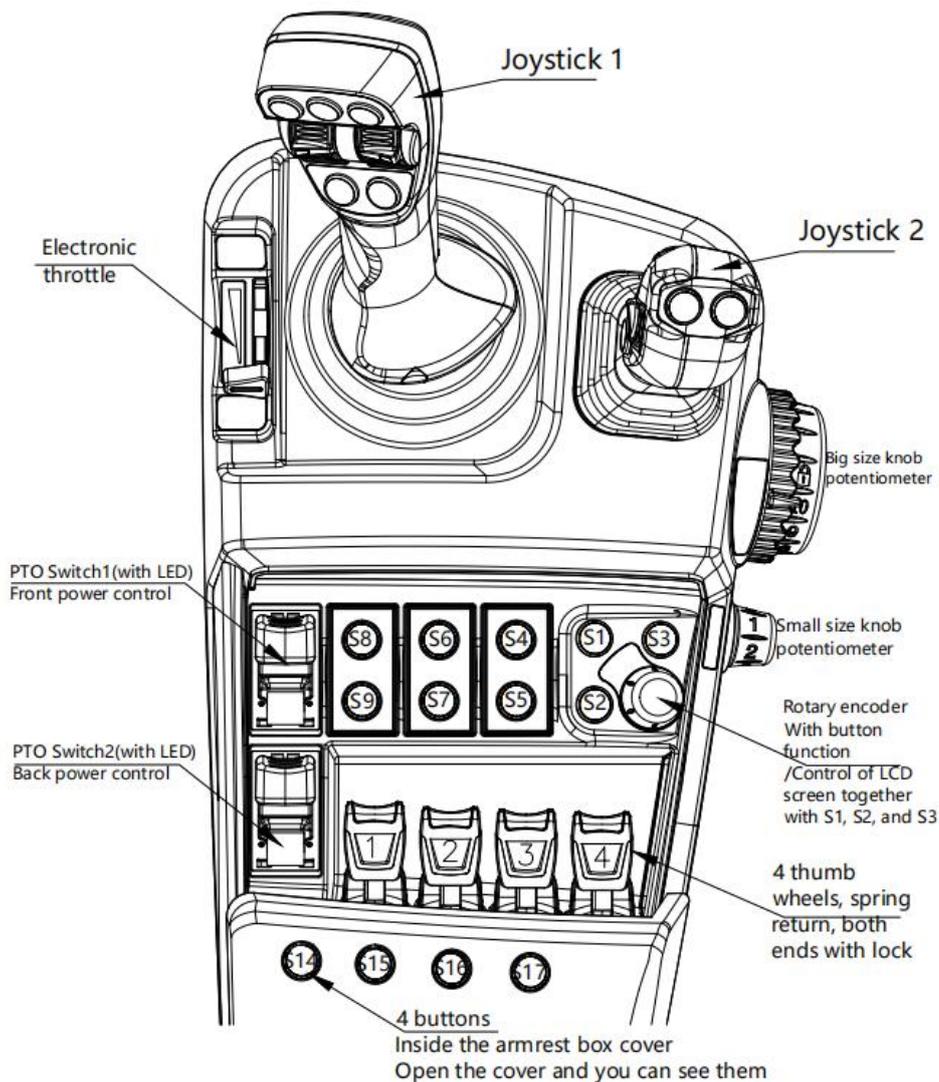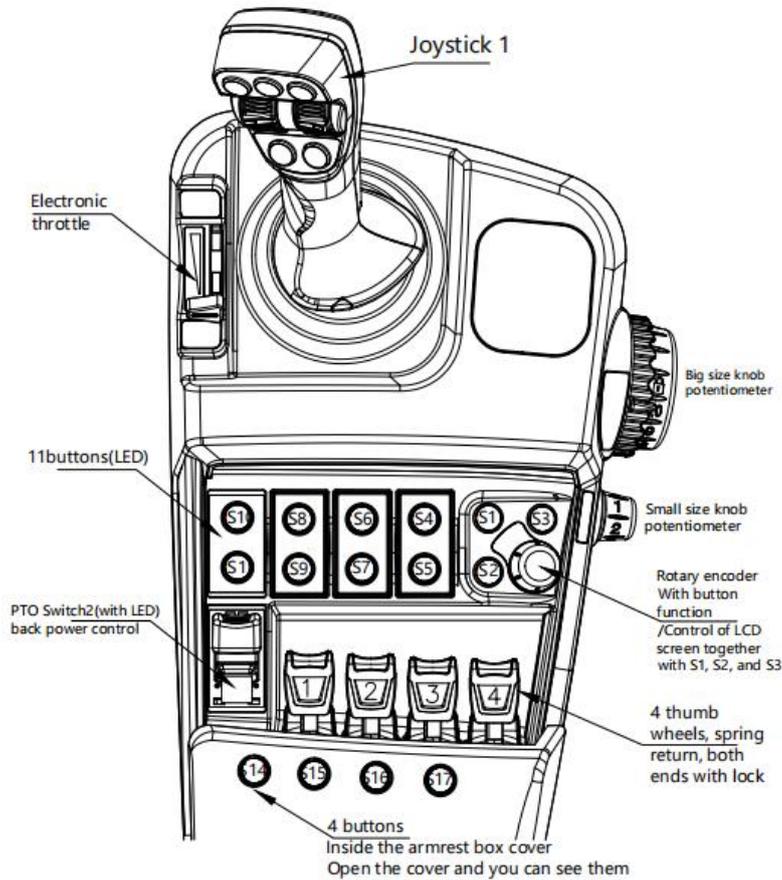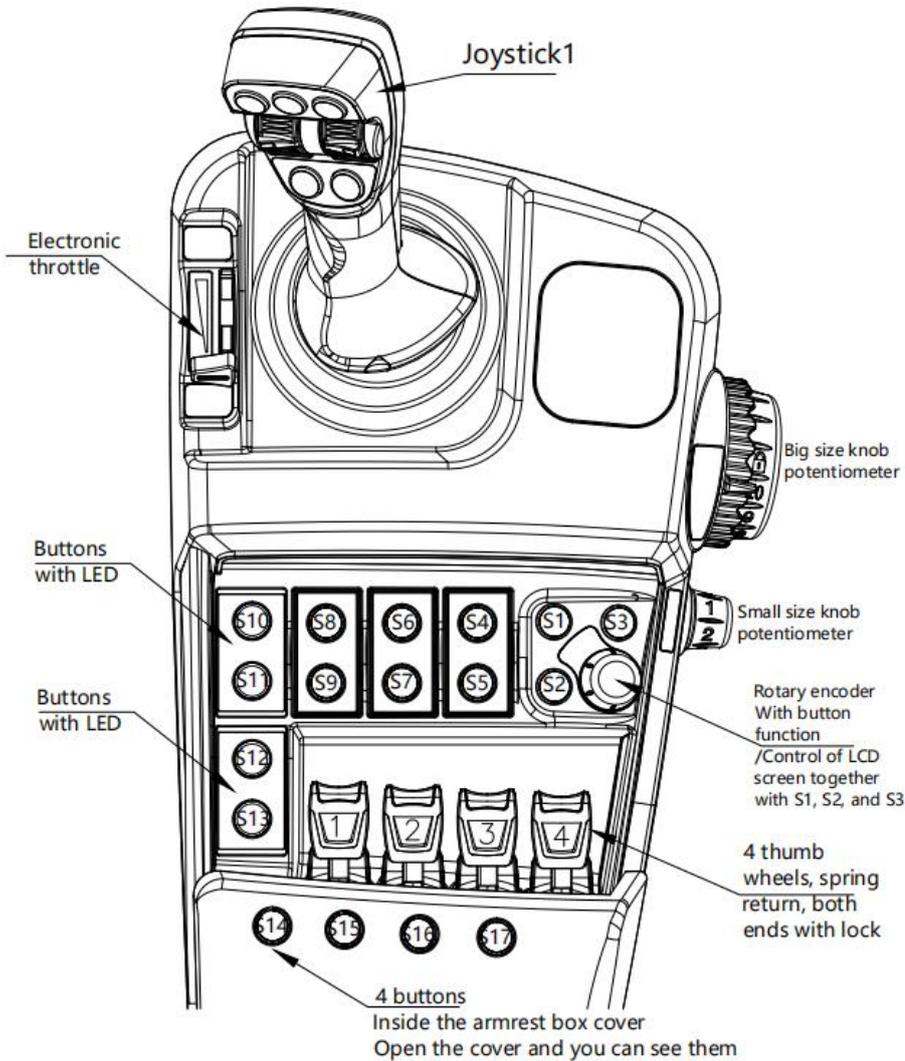
Product configuration settings

No1: ModelMKT-AT-01-F1-XL1: AF 0A00 00 00 00 F5 00 (with MKF-JS63, dual PTO switch)

No2: Model MKT-AT-01-F1-XL2: AF 0A 00 01 00 00 F5 00 (without MKF-JS63, 1 PTO switch)

No3: Model MKT-AT-01-F1-XL3: AF 0A 00 02 00 00 F5 00 (withoutMKF-JS63, without PTO1-2 switch/changed to button 10-13)

Joystick1
Electronic throttle
Big size knob potentiometer
Buttons with LED
Small size knob potentiometer
Rotary encoder With button function /Control of LCD screen together with S1, S2, and S3
Buttons with LED
4 thumb wheels, spring return, both ends with lock
4 buttons
Inside the armrest box cover
Open the cover and you can see them

Joystick selection:
MKF-JS60 joystick: AF 05 01 00 00 00 00 F5 00 Five axis (RS232115200)
MKF-JS12 joystick: AF 05 02 00 00 00 F5 00 2-4 axis (RS232115200)