luoyi tech

Electrical Joystick Controller Expert

Luoyi Electronic Control Co., Ltd.

Company Culture

Founding Purpose	Working for better life while enjoying good life.
Mission	To make business partners happy and to better life of all people.
Vision	To become an outstanding company respected by all.
Core Values	Integrity Always; Customer First; Truth-seeking Forever; Refinement Persistently.
Company Spirit	Modesty, Self-surpassing, Altruism, Professionalism.
Quality Policy	Prioritize Quality，Think Systematically，Touch Customers' Hearts, Enhance Wonderful Life.

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LT5 Series Single Axis Joystick

Product Features

- Hall effect without contact angle detection.
- Friction, mechanical lock optional at center or end position
- Wide supply voltage range

Application

Typical application on mining machinery, off-high-way vehicle.

Technical Information

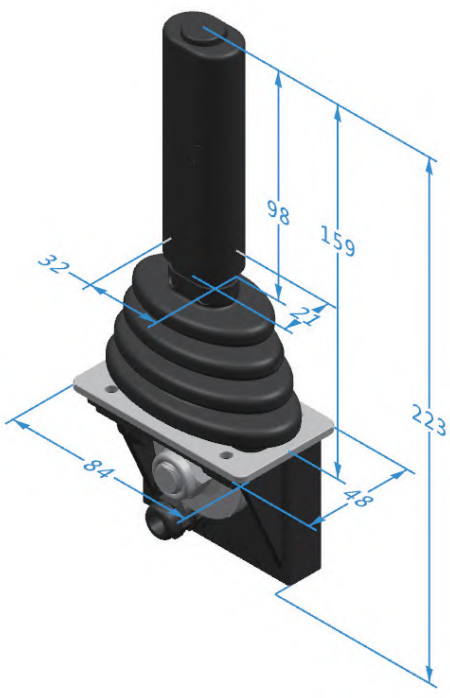
Electrical Data	
Hall	
Power supply	5±0.5Vdc
Power supply current	<11mA
Maximum allowance overload	30Vdc
Reverse polarity voltage (max)	-15Vdc
Center output voltage	2.5±0.1V
Output linearity tolerance	<±0.2V

With electronic amplifier	
Power supply	9~18Vdc (U 11~U 15) ; 18~36Vdc (U 21~U 25)
Power current consumption	20mA

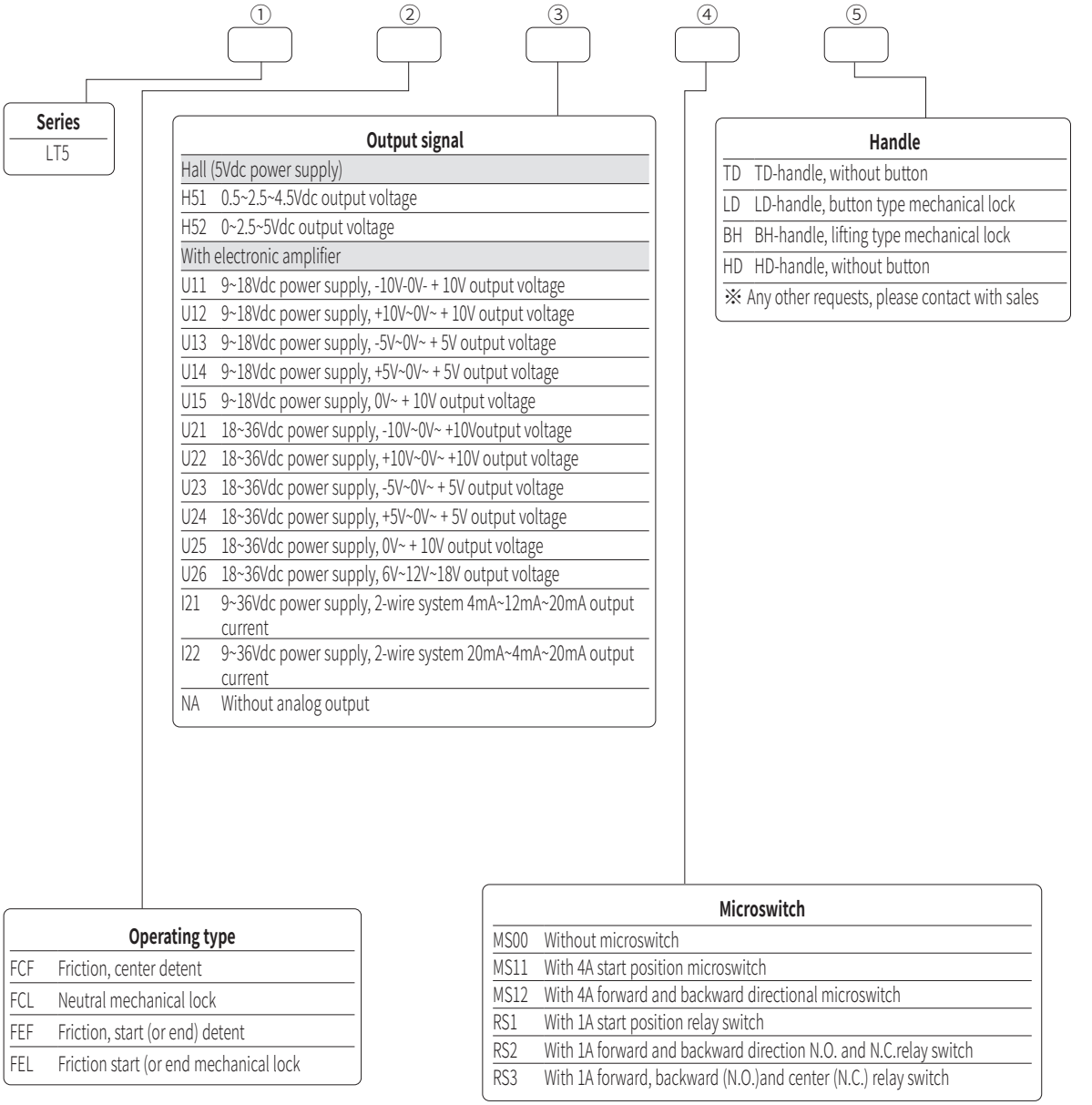
Mechanical features	
Travel angle	±35°, ±45°
Operating type	Friction
Breakout force	28-30N
Maximum allowable force	>300N
Expecting life	about 1 million cycles
Weight	540g (without handle)

Environmental data	
Operating temperature	-30°C~ +70°C
Storage temperature	-40°C~ +85°C
Protection level	IP54(BH handle) IP65(Other handle)

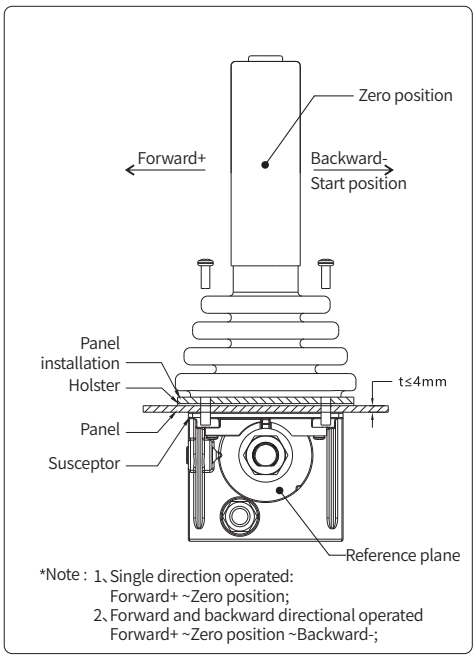
Dimensions

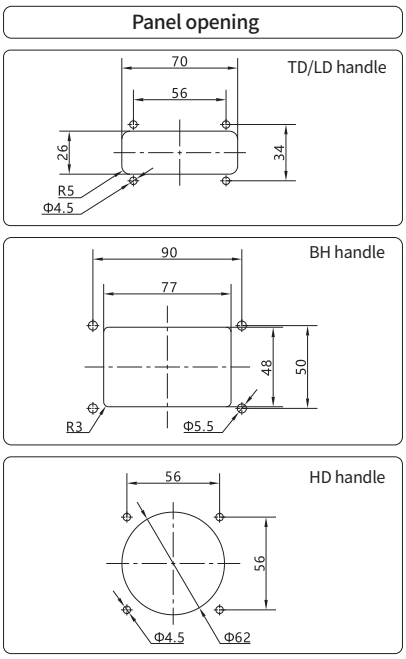


Product Configuration



Product Installation





Electrical Connections

Hall

NO.	Hall	Colour
1	VCC	Red
2	GND	Black
3	OUT	Yellow
4	Normally open switch 1	White
5	Normally open switch 2	Blue

With electronic amplifier connections (output voltage)

No.	Colour	RS2	RS3
1	Brown	9～18Vdc	9～18Vdc
		18～36Vdc	18～36Vdc
2	Blue	0V	0V
3	Black	Output positive	Output positive
4	White	Output negative	Output negative
5	Yellow	com	com
6	Green	Forward switch (N.O.)	Forward switch (N.O.)
7	Red	Backward switch (N.O.)	Backward switch (N.O.)
8	Purple	Forward switch (N.C.)	Center switch (N.C.)
9	Gray	Backward switch (N.C.)	Center switch (N.C.)

Note: See Appendix for wiring diagram and Appendix for output diagram.

LT8 Series Multi Axis Joystick

Product Features

- Hall-effect angle detection, long life.
- Spring return.
- Various output voltage range optional.
- Various handle optional.

Application

Typical application on aerial platform vehicle, fire-fighter platform vehicle, scissor platform vehicle and other off-highway equipment.

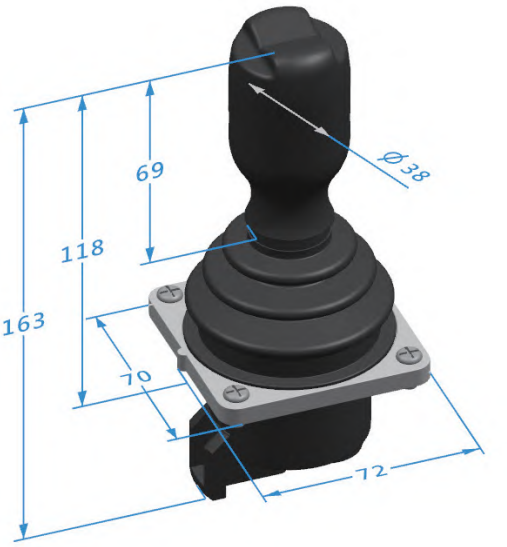
Technical Information

Electrical Data	
Hall or With Electronic Amplifier	
Power supply	5±0.5Vdc OR With electronic amplifier 9~36Vdc
Power supply current	<9mA (without handle) <18mA (with BWH)
Maximum allowance overload voltage	30Vdc
Reverse polarity voltage(max)	15Vdc
Output linearity tolerance	<±0.2V
Analog rocker switch power supply	5.0±0.5Vdc
Analog rocker switch output voltage	1.15~2.5~3.85V

Mechanical features	
Travel angle	±18°
Operating type	Spring return
Breakout force	9N
Operating force (max)	18N
Maximum allowable force	>300N
Expecting life	>2 million cycles
Weight	420g (without handle)

Environmental data	
Operating Temperature	-30°C~+70°C
Storage Temperature	-40°C~+85°C
Protection level	IP67

Dimensions



Product Configuration

① ② ③ ④ ⑤

Series
LT8

Operating type

1A	single-axis forward and back -ward directional operated
2AC	dual-axis arbitrary directional operated(with guide groove)

Output signal

Hall (5Vdc power supply)	
H51	0.5~2.5~4.5Vdc output voltage
H52	0V~2.5~5Vdc output voltage
H53	1.25~2.5~3.75Vdc output voltage
2H51	each axis of redundant hall, 0.5~2.5~4.5Vdc output
2H52	each axis of redundant hall, 0~2.5~5Vdc output
2H53	each axis of redundant hall, 1.25~2.5~3.75Vdc output
With electronic amplifier (9~36V) Exclude dual-axis rocker type	
J33	Can 2.0B output, source address 33
J34	Can 2.0B output, source address 34

Handle

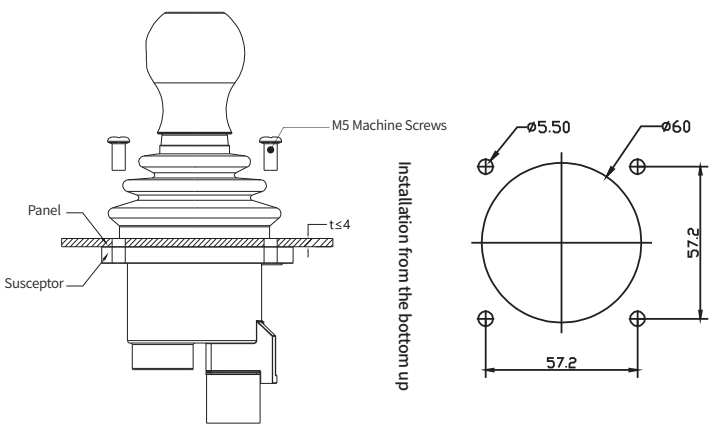
BA	BA handle, top without button
HL	HL handle, top without button
HLS	HLS handle, top with button
BWH	BWH handle, top with hall analog rocker switch

Connection

D	Deutsch connector
L	Direct outline

Product Installation

Mounting and Panel opening

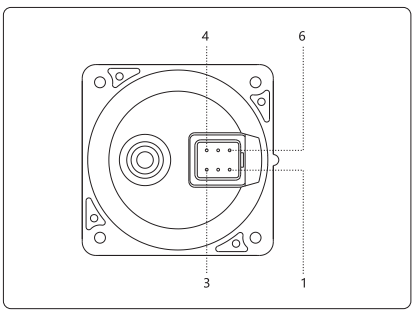


Note: If need special requirements (Installation from the top down), Need to reprovision the mounting plate, the opening size according to customer requirements.

Electrical Connections

Deutsch 6-pin connections

Pin	Function
1	0V
2	5V
3	X out
4	Y out
5	Rocker analog output/Button
6	NA/Button



LT20 Series Single Axis Joystick

Product Features

- Single-axis forward and backward directional or single directional operated.
- Friction lock or spring return.
- Center and start (end) position mechanical lock optional.
- Hall and potentiometer is selectable.
- Microswitch optional (maximum 10A@30Vdc).
- A variety of handle models can be configured.

Application

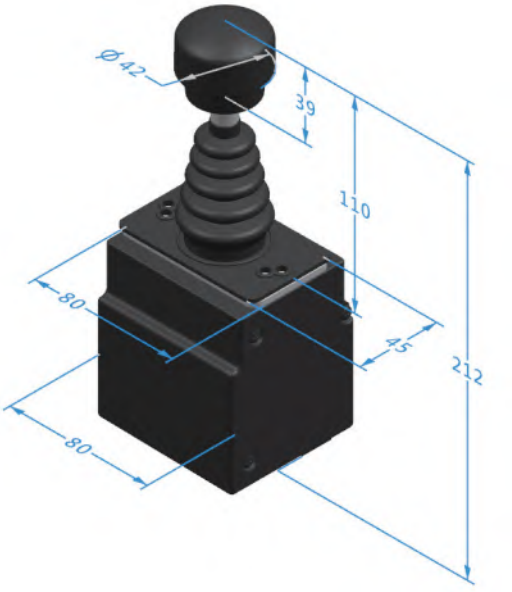
Typical application on various electro-hydraulic control system of engineering vehicles sand other electrical control system.

Technical Information

Electrical Data	
Potentiometer	
Power supply Resistance	<36Vdc
Resistance	2KΩ, 5KΩ, 10KΩ
Center angle	±3°
Maximum dissipation	0.2W
Hall	
Power supply	5±0.5Vdc
Supply current	<11mA (Setting Power supply)
Maximum allowable overload voltage	20Vdc
Reverse maximum allowance voltage	-10Vdc
Output linearity tolerance	<±0.2V
With electronic amplifier	
Supply voltage	18~36Vdc (U 21~U 25) 9~36Vdc (I 21~I 22)
Current consumption	<20mA
Maximum output curren	10mA(Standard power supply)
Microswitch	
Load capacity	10A@30Vdc (Resistive load))
Expecting life	5 million times (Mechanical) 200 thousand times (Electrical))
Insulation resistance	>100MQ (500Vdc Insulating-resistance)
Breakout angle	±5°

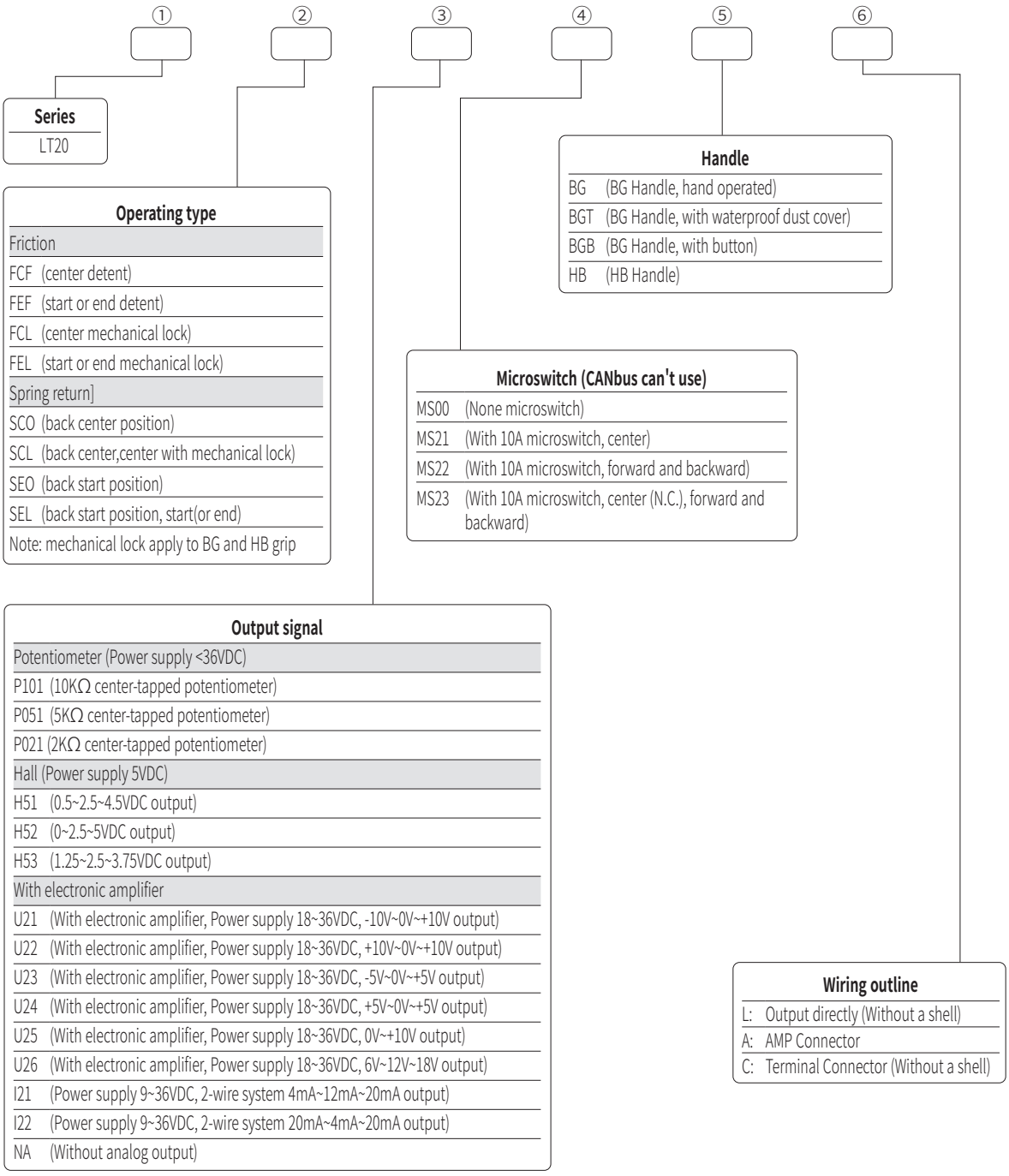
Environmental data	
Operating Temperature	-30°C~+70°C
Storage Temperature	-40°C~+85°C
Protection level	IP65 (Above the Panel)

Dimensions

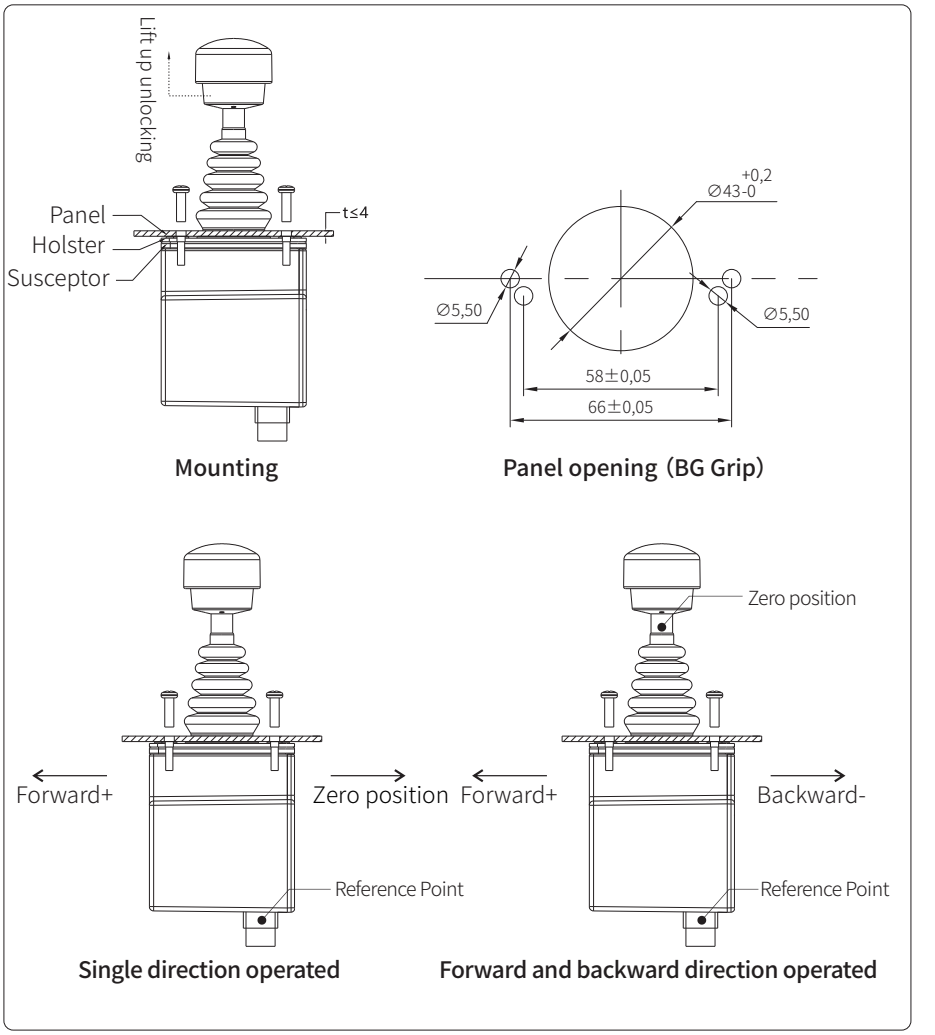


Mechanical features	
Travel angle	±37.5°or 75°(single direction)
Operating type	Spring return or friction
Breakout force	8N (spring) 16N (friction)
Operating force(max)	18N (spring) 16N (friction)
Maximum allowable force	> 260N
Expecting life	>1 million cycles(potentiometer) >5million cycles (hall)
Weight	500g (without handle)

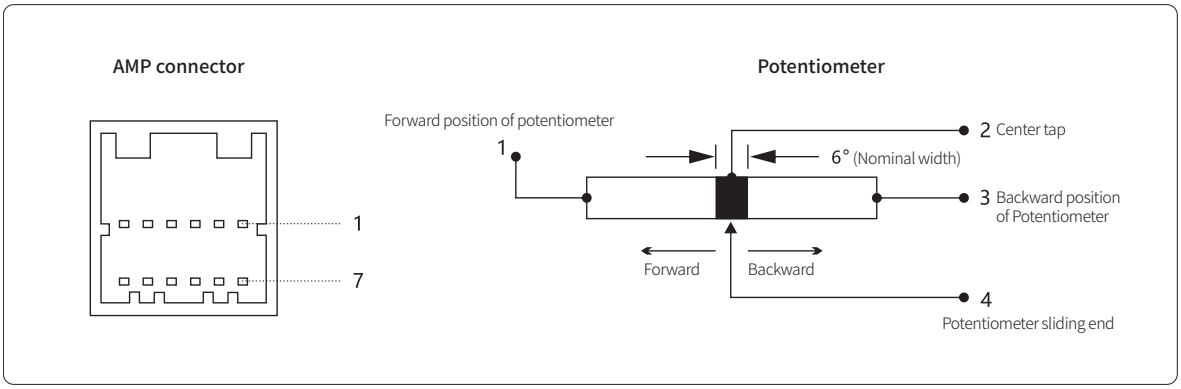
Product Configuration



Product Installation



Electrical Connections



Pin	Potentiometer	Hall	With elctrical amplifier of output voltage	With electrical amplifier of output current
1	Potentiometer forward terminal	5VDC	Power supply	
2	Potentiometer center tap	NA	GND	
3	Potentiometer backward terminal	GND	Output positive (+)	NA
4	Potentiometer sliding end	Output	Output negative (-)	NA
5	Directional switch forward (N.O.) Start position switch of single direction (N.O.)	Directional switch forward (N.O.) Start position switch of single direction (N.O.)	Directional switch forward (N.O.) Start position switch of single direction (N.O.)	Directional switch forward (N.O.) Start position switch of single direction (N.O.)
6	Forward directional switch common terminal Common terminal of start position	Forward directional switch common terminal Common terminal of start position	Forward directional switch common terminal Common terminal of start position	Forward directional switch common terminal Common terminal of start position
7	Directional switch back ward (N.O.) Single direction (N/A)	Directional switch backward (N.O.) Single direction (N/A)	Directional switch backward (N.O.) Single direction (N/A)	Directional switch backward (N.O.) Single direction (N/A)
8	Backward directional common terminal Single direction (N/A)	Backward directional common terminal Single direction (N/A)	Backward directional common terminal Single direction (N/A)	Backward directional common terminal Single direction (N/A)
9	Rocker left directional (N.O.)	Rocker left directional (N.O.)	Rocker left directional (N.O.)	Rocker left directional (N.O.)
10	Handle of top switch common terminal	Handle of top switch common terminal	Handle of top switch common terminal	Handle of top switch common terminal
11	Rocker right directional (N.O.)	Rocker right directional (N.O.)	Rocker right directional (N.O.)	Rocker right directional (N.O.)

LT30 Series Multi Axis Joystick

Product Features

- Spring return,single-axis or dual-axis operated.
- Cross direction or arbitrary direction operated optional.
- Potentiometer or hall effect angle detection, long life.
- Large current microswitch optional (10A@30Vdc).
- Various output optional.
- Various handle optional.

Application

Typical apply on rotary drilling rigs, aerial fire trucks, Cranes shield machine and other electrical and electro-hydraulic control system.

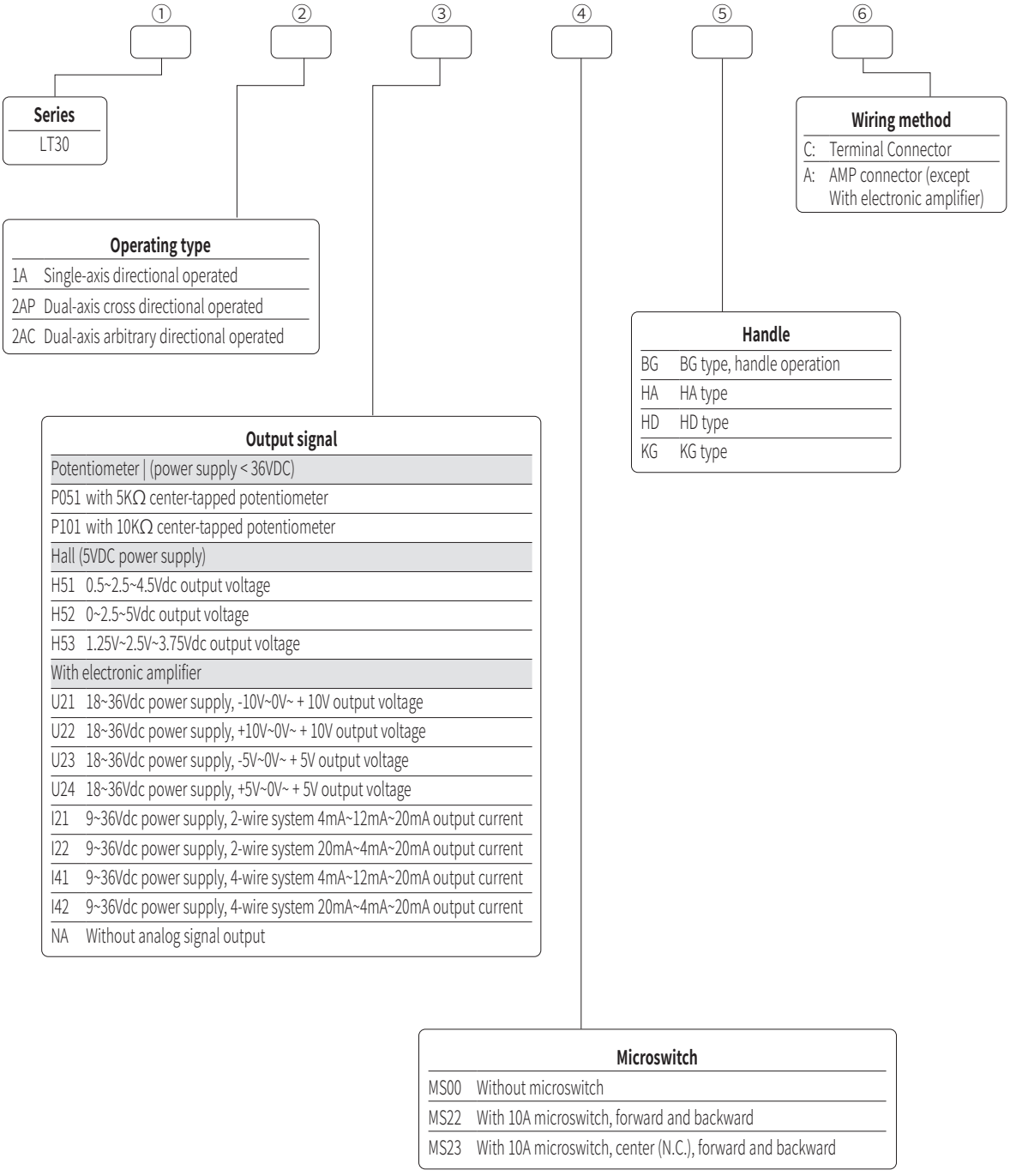
Technical Information

Electrical data	
Potentiometer	
Power supply	<36Vdc
Center angle Power	5KΩ, 10KΩ
Center angle	±3°
dissipation	0.2W
Hall	
Power supply	5±0.5Vdc
Supply voltage Supply current	<11 mA (Single axis), <22mA (Dual-axis)
Maximum allowable overload voltage	20Vdc
Reverse maximum allowable voltage	-10Vdc
Output linearity tolerance	<±0.2V
With electronic amplifier	
Power supply	18~36Vdc (U 21~U 24)
Current consumption	<20mA
Output current (max)	10mA With Standard Voltage Output
2-wire system current	
Power supply	9~36Vdc (I21~I22)
4-wire system current	
Power supply	9~36Vdc (I41~I42)
Microswitch	
Load capacity	10A@30Vdc (Resistance load)
Expecting life	>30 million cycles (Mechanical) >200 thousand cycles (Electrical)
Insulation resistance	>100MΩ 500Vdc Insulating-resistance meter
Breakout angle	±3°~±5°

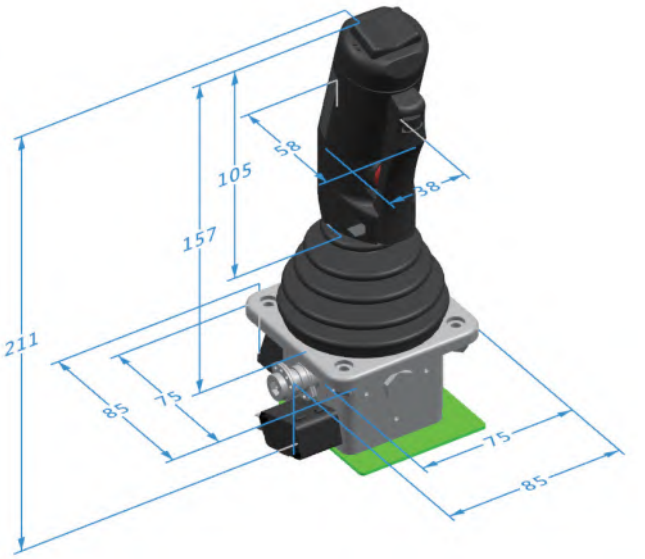
Mechanical features	
Travel Angle	±25°
Operating Type	Spring return
Breakout Force	5N
Operating Force(max)	30N
Maximum Allowable force	>300N
Expecting Life	>2million cycles (Potentiometer) >5 million cycles (Hall)
Weight	460g (Without handle)

Environmental data	
Operating Temperature	-30°C~ +70°C
Storage Temperature	-40°C~+85°C
Protection level	IP65 (Above the flange)

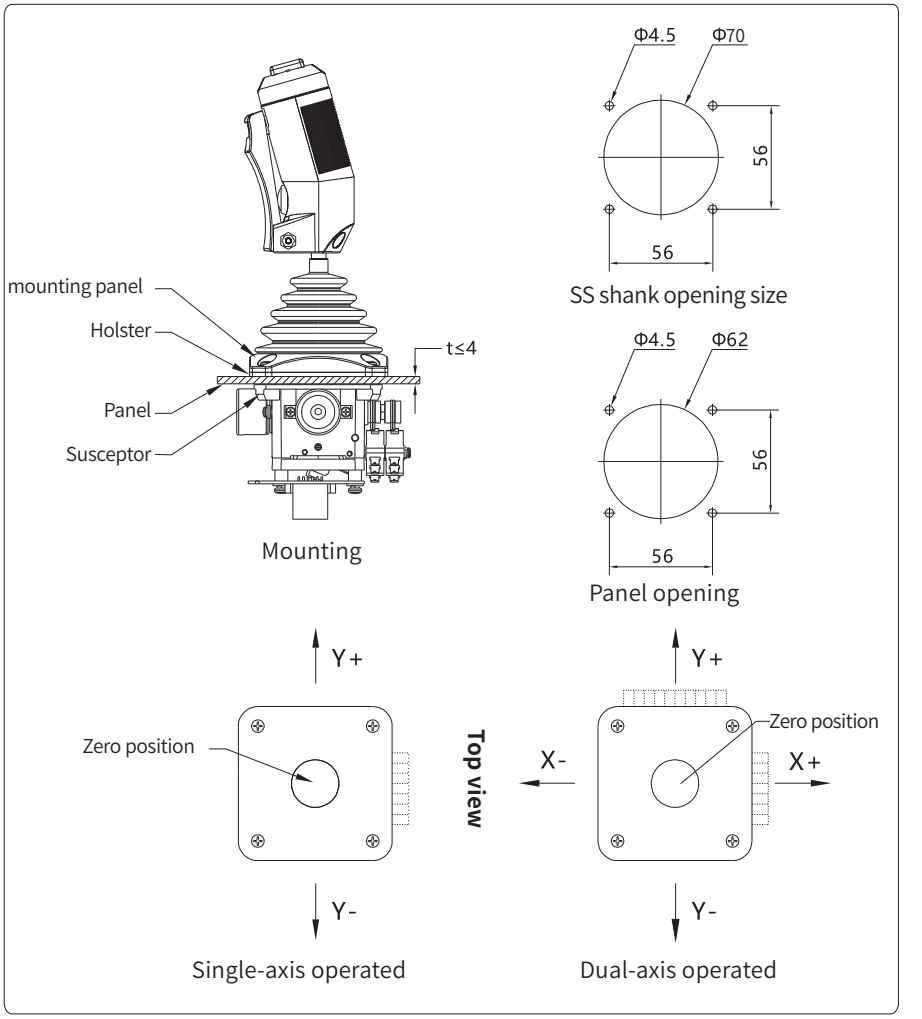
Product Configuration



Dimensions

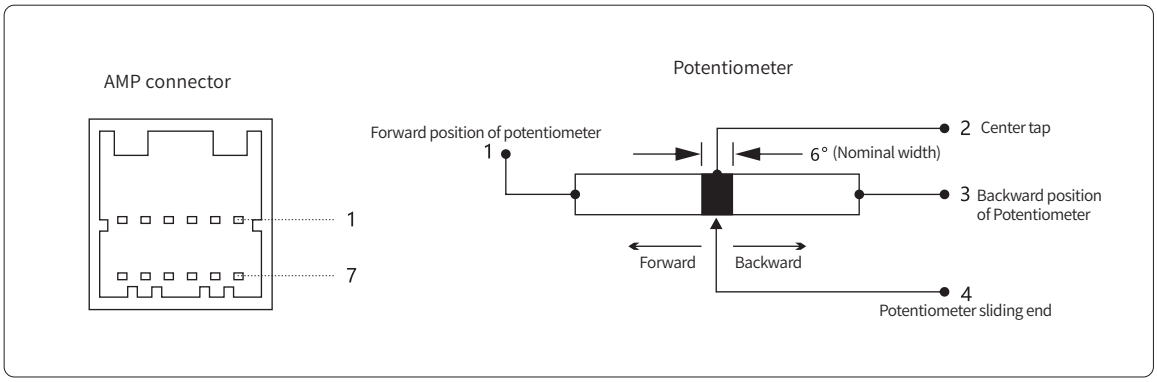


Product Installation



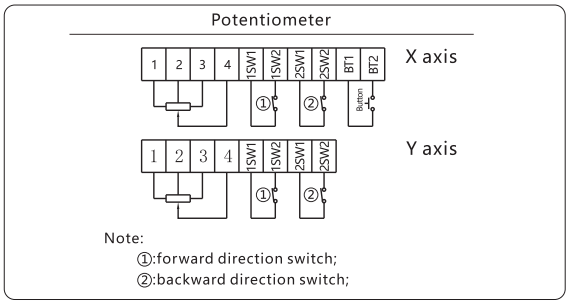
Electrical Connections

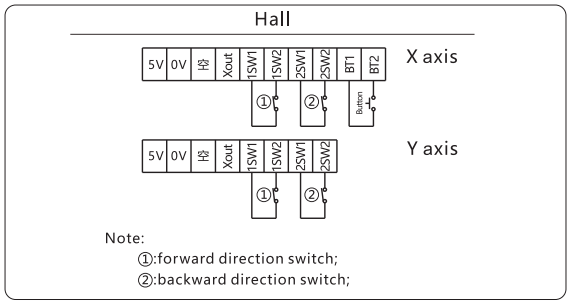
AMP connector

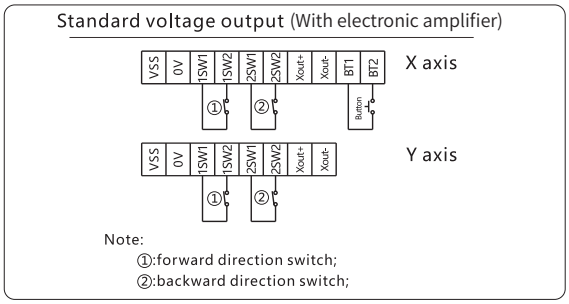


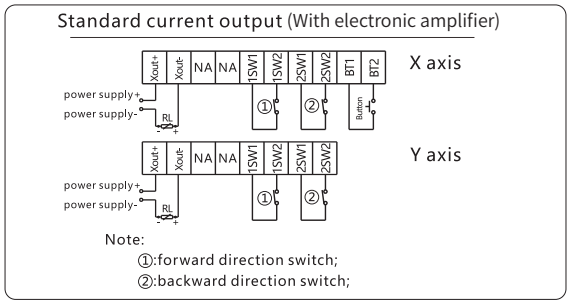
Pin	Potentiometer	Hall
1	Potentiometer forward terminal	+5Vdc
2	Potentiometer center tap Single direction(N/A)	NA
3	Potentiometer backward terminal	0V
4	Potentiometer wiper	Output
5	Forward Directional switch (N.O.)	Forward Directional switch (N.O.)
	Start position switch of single direction (N.O.)	Start position switch of single direction (N.O.)
6	Forward switch common terminal	Forward switch common terminal
	Common terminal of start position	Common terminal of start position
7	Backward directional switch (N.O.)	Backward directional switch (N.O.)
	Single direction(N/A)	Single direction(N/A)
8	Backward directional common terminal	Backward directional common terminal
	Single direction(N/A)	Single direction(N/A)
9	Rocker left direction (N.O.)	Rocker left direction (N.O.)
10	Handle of top switch common terminal	Handle of top switch common terminal
11	Rocker right direction (N.O.)	Rocker right direction (N.O.)
12	Deadman switch	Deadman switch

Connector









LT40 Series Handle

Product Features

- Built-in non-contact Hall device detects Angle changes for long life.
- The spring automatically resets.
- Different output voltage ranges can be selected as required.
- Various handle upper ends can be configured.
- Can replace P+G JC4000 series handle .

Application

This series of products are mainly used in aerial work vehicles, a erial platform equipment and other engineering vehicles.

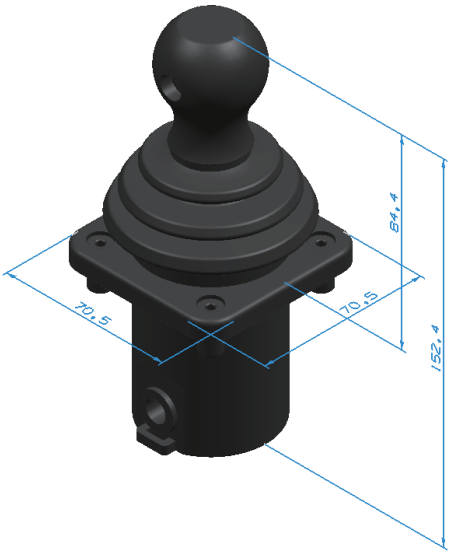
Technical Information

Electrical Data	
Hall or tape conversion circuit	
mains input	5±0.5Vdc or CAN bus 9~36Vdc wide voltage input
supply current	<9mA (No handle) <18mA (BWH handle)
Limit allowable overvoltage	20Vdc
Reverse limit allowable voltage	15Vdc
Output voltage linear error	<±0.2V

Mechanical Parameter	
Shaking angle	±18°
Operating mode	Automatic spring reset
Starting force	9N
Maximum operating force	18N
Limiting force	>300N
Using life	>100 M
Weight	420g (No handle)

Environmental data	
Operating Temperature	-30°C~+70°C
Storage Temperature	-40°C~+85°C
Protection level	IP67 Above the flange

Dimensions



Product Configuration

① ② ③ ④ ⑤

Series

LT40

Operating mode

1A	Single-axis forward and backward direction operation
2AC	2ACDual axis arbitrary operating direction (with guide groove)

Output signal

HALL (Supply Voltage 5Vdc)	
H51	Single hall per axis, 0.5~2.5~4.5Vdc voltage output
H52	Single hall per axis,0V~2.5~5Vdc voltage output
H53	Single hall per axis, 1.25~2.5~3.75Vdc voltage output
2H51	Redundant halls per axis, 0.5~2.5~4.5Vdc voltage output
2H52	Redundant halls per axis, 0~2.5~5Vdc voltage output
2H53	Redundant halls per axis, 1.25~2.5~3.75Vdc voltage output
The output type with the conversion voltage circuit (9~36V) is not suitable for the biaxial stilt plate type	
J33	CAN2.0B bus output, source address is 33
J34	CAN2.0B bus output, source address is 34

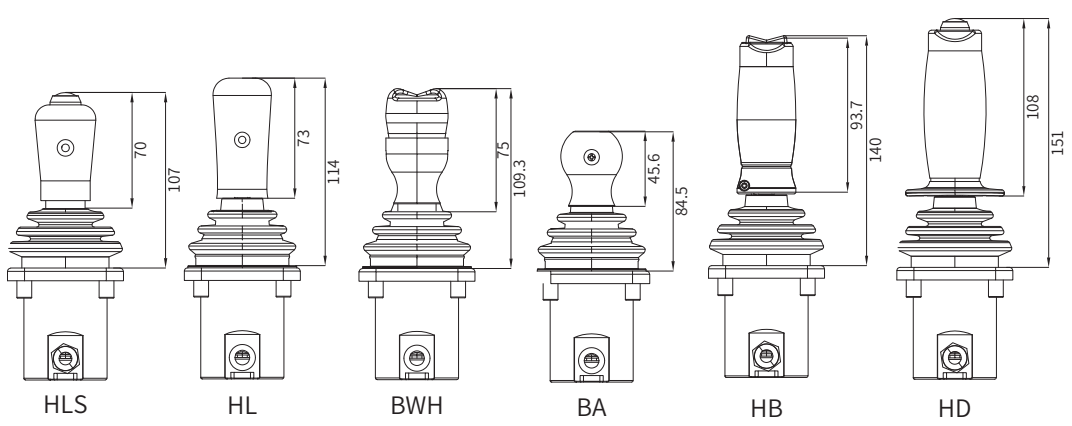
Handle

BA	(BA type, top without butoon)
HL	(HL type, top without butoon)
HLS	(HLS type, top with butoon)
BWH	(BWH type, top with Hall analog stilts)
HB	(HB type)
HD	(HD type)

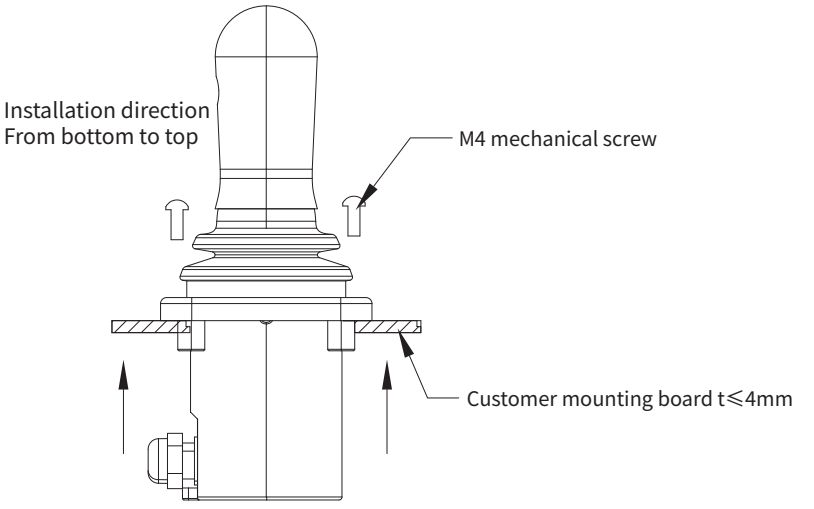
Wiring method

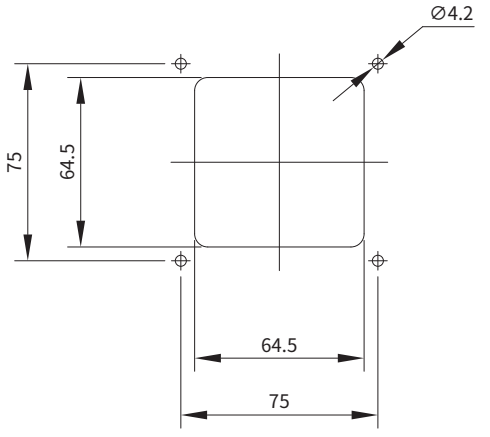
D	(Deutsch)
L	(Wiring method)

Optional handle

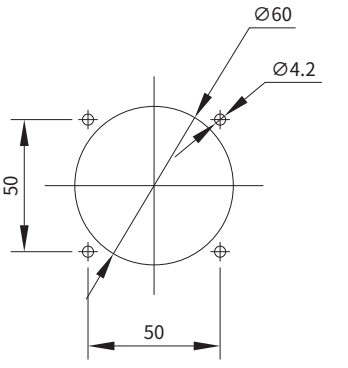


Product Installation





Install openings from top to bottom



Install the holes from the bottom up

Electrical Connections

6-pin

Line colour	Function
black	0V
red	5V
yellow	X out
green	Y out
blue	Stilt analog output/button
brown	Empty/button

LT50 Series Single Axis Joystick

Product Features

- Rugged components designed for the construction environment
- Potentiometer tracks for angular-detecting
- Friction held and spring return
- Center-lock is a mechanical option
- Providing optional grips with different shapes
- The number and position of the switches are customized designed
- PWM output drives proportional solenoid valve
- Depending on the proportional solenoid valve to set starting current, maximum current and PWM frequency
- CAN output is an option

Application

Typically used in cranes, loaders, excavators, forklifts, tractors, harvesters and aerial work platforms.

Technical Information

Electrical Data	
Potentiometrc sensors	
supply voltage	<36Vdc
Total resistance value	200Q, 1KΩ
Potentiometer loading maximum voltage	32Vdc
Potentiometer allows maximum power consumption	2W (200Ω), 0.5W(1KΩ)
Direction switch	
Load capacity	10A at 30Vdc (resistive load)
Initial angle	±5°
Contact resistance	<200Ω
Micro Switch	
Load capacity	10A at 30Vdc (resistive load)
Service life	Over 30 million times (mechanical) Over 200,000 times (electrical)
Insulation resistance	>100M Ω(500Vdc Insulation Resistance Meter)
Initial angle	±3°~±5°
Digital scaling drive	
Supply voltage	9~36Vdc
Output driving	The maximum current of two PWM channels is 3A
PWM freqency	100HZ~1000HZ
Minimum Current	0~0.4A
Maximum Current	0.4~3A

Mechanical features	
Travel angle	±20°
Operating type	Spring return, Friction Held
Breakout force	5N
Operating force(max)	11N
Maximum allowable force	>300N
Expecting life	>2 Million Cycles (Potentiometer)
Weight	470g (Without handle)

Environmental data	
Operating Temperature	-30°C~+70°C
Storage Temperature	-40°C~+85°C
Protection level IP65	(Above the flange)

Product Configuration

① ② ③ ④ ⑤ ⑥

Series
LT50

Operating type

Friction	
FCF	center detent
FCL	center mechanical lock
Spring Return	
SC0	back center position
SCL	back center, center with mechanical lock

Note: mechanical lock only for DG Handle

Output signal

Potentiometer (Power supply＜36VDC)	
P011	10KΩ potentiometer， 0%~50%~100%Vdc output
P101	10KΩ potentiometer， 0%~50%~100%Vdc output
PWM	
PWM224	Power supply DC24V, PWM output drives
PWM212	Power supply DC12V, PWM output drives
Hall (Power supply 5VDC)	
H51	0.5~2.5~4.5Vdc output
H52	0~2.5~4.5Vdc output

Handle

DG	DG type， handle operate
HBR	HBR type, top with rocker switch
HDS	HDS type, top with button
HDR	HDR type, top with rocker switch
KGDN	KG type, with deadman switch, without rocker switch
KGDR	KG type, without deadman switch and rocker switch
SS	See SS page
SA	(See SA page)
SP	(See SP page)

Microswitch

MS00	Withou microswitch
MS11	With 10A N.O.center microswitch
MS12	With 10A N.O.center microswitch
MS13	With 10A N.O.center microswitch
MS21	With 10A start position microswitch
MS22	With 10A start position microswitch
MS23	With 10A start position microswitch

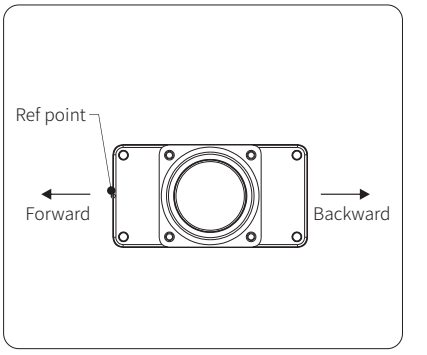
Connection
L: Wire output (without housing)

※Special type:

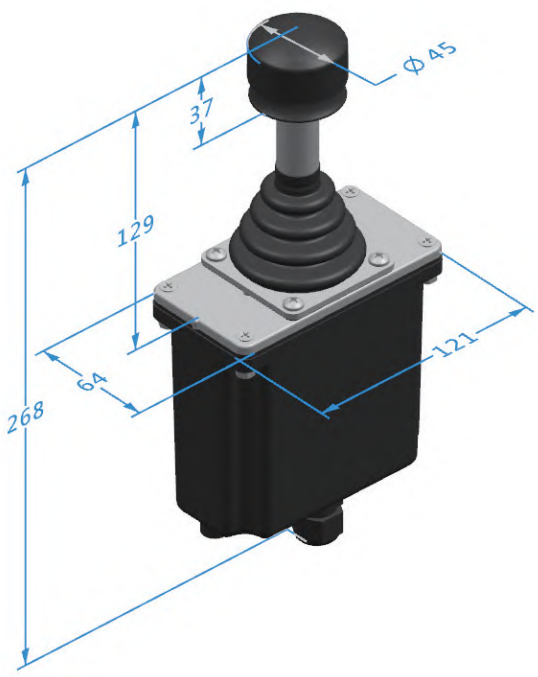
- LT50-20424 is euqual to GE-20424
- LT50-22BC 1033 is euqual to MCH22BC 1033
- LT50-12BC 107 is euqual to MCH 107
- LT50-12BC 1078 is euqual to MCH 12BC 1078

Electrical Connections

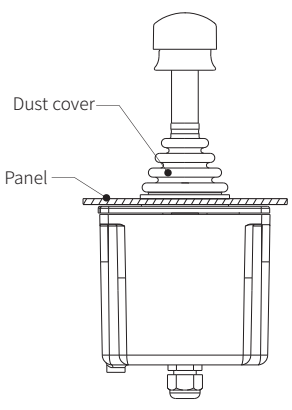
Pin	PWM	Potentiometer
1	9-36V(VCC)	GND
2	Power supply 0V	VIN
3	Forward direction PWM drive output	OUT
4	Backward direction PWM drive output	N/A
5	PWM output common end,power supply 0V	N/A
6	Medium micro switch COM	Medium micro switch COM
7	Medium micro switch NO	Medium micro switch NO
8	Forward switch COM (N.O.)	Forward micro switch COM
9	Backward switch (N.O.)	Forward micro switch NO
10	Backward switch COM (N.O.)	Backward micro switch COM (N.O.)
11	Backward switch NO (N.O.)	Backward micro switch NO(N.O.)



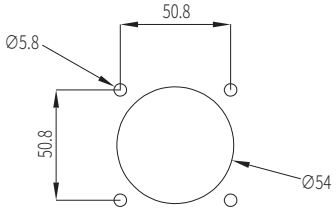
Dimensions



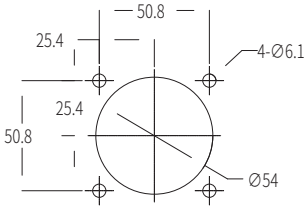
Product Installation



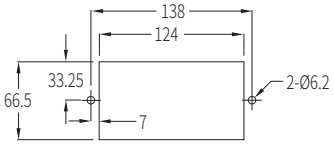
Mounting



Customer Panel Intallation Hol
(standard size, apply to DG & HB handle)



Standard installation diagram



SS handle installation diagram

Note: SS, KG Handles need special installation panel, the hole is138-123X64mm.

LT60 Series Multi Axis Joystick

Product Features

- Ergonomics design on mobile application.
- Uncontact hall effect and long expect-life potentiometer optional.
- Various handle, different number and location of button switches optional.
- CAN bus output optional.

Application

Typical application on Cranes, loaders. Forklifts, excavators, access platform, tractors, harvesters, and so on.

Technical Information

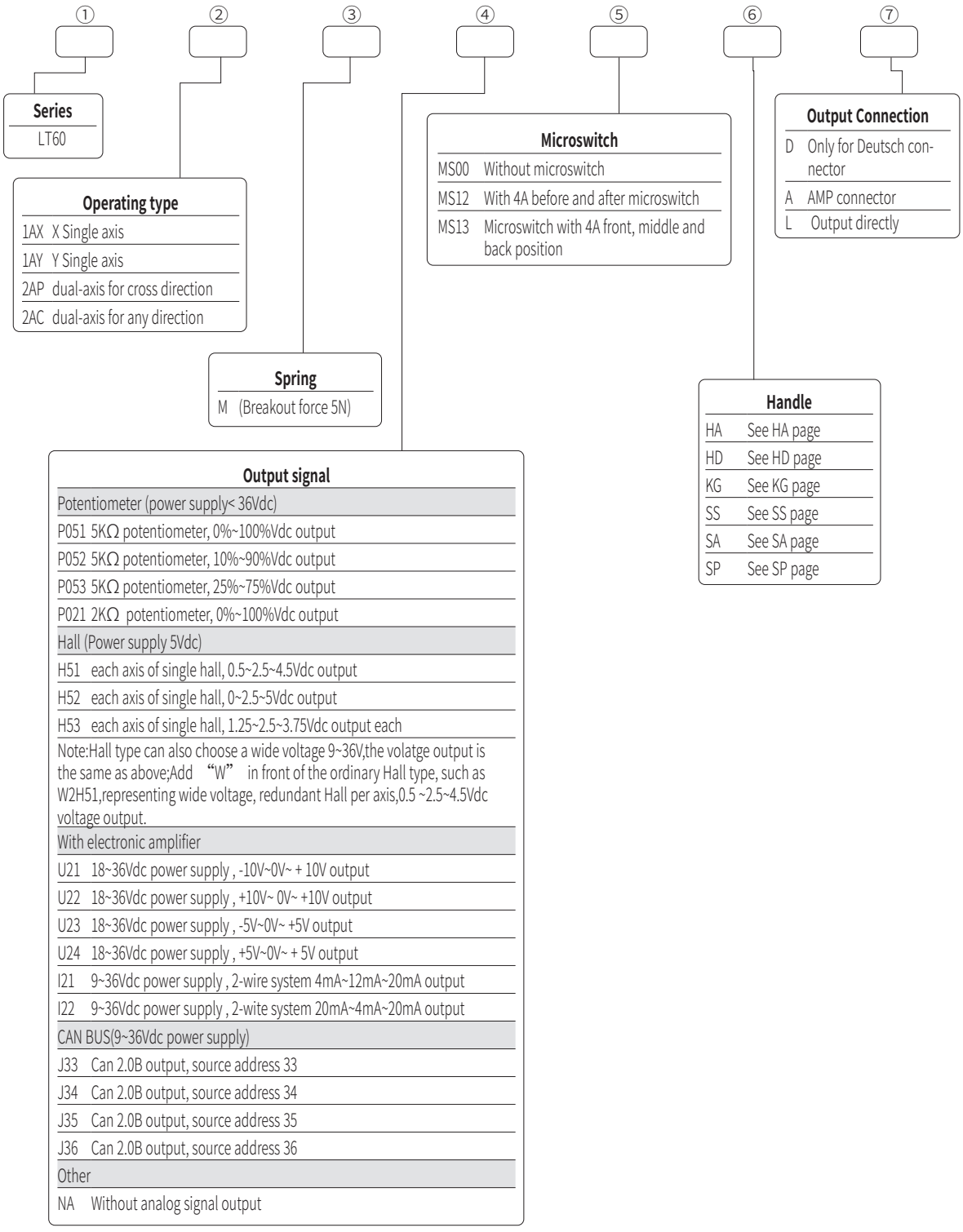
Electrical data	
Potentiometer	
Power supply	<36Vdc
Resistance	2KΩ, 5KΩ
Electrical angle	±18°
Center voltage	48%~52%Vdc (Power supply)
Center tap angle	±2.5°
On-load voltage (max)	32Vdc
Power dissipation	0.25W (25°)
Hall	
Power supply	5±0.5Vdc
Supply current	<11mA (Each of hall)
Maximum allowable overload voltage	20Vdc
Reverse maximum allowable voltage	-10Vdc
Output linearity tolerance	<±4V
Directional switch	
Load capacity	2mA@30Vdc (Resistance load)
Breakout angle	±3°~ 5°
Contact resistance	<200Ω
With electronic amplifier	
Power supply	18~36Vdc (U21~U24) 9~36Vdc
Power current consumption	＜20mA
Maximum output current	10mA
CAN BUS	
Power supply	9~36Vdc
CAN Version	CAN 2.0B

Electrical data	
Protocol	J1939
Connector	6 p-pin (Deutsch)
Microswitch	
Load capacity	4A@30Vdc (Resistance load)
Expecting life	30 million times (Mechanical) 200 thousand times (Electrical)
Insulation resistance	＞100MΩ
Breakout angle	±3°~ 5°

Mechanical features	
Travel angle	±20°
Operating type	Spring return
Breakout force	5N
Operating force(max)	16N
Maximum allowable force	>300N
Expecting life	>2million cycles (Potentiometer) >5 million cycles (Hall effect)
Weight	475g (Without handle)

Environmental data	
Operating Temperature	-30°C~+70°C
Storage Temperature	-40°C~+85°C
Protection level	IP65 (Above the flange)

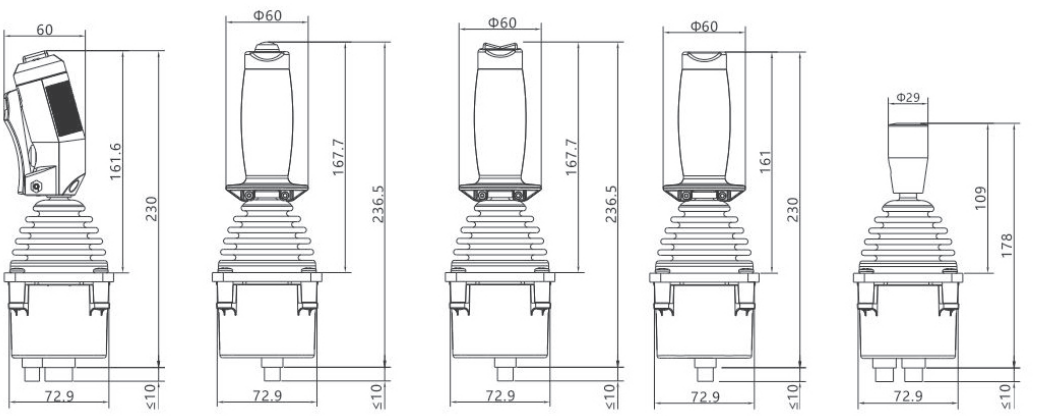
Product Configuration



Dimensions

Optional button color：

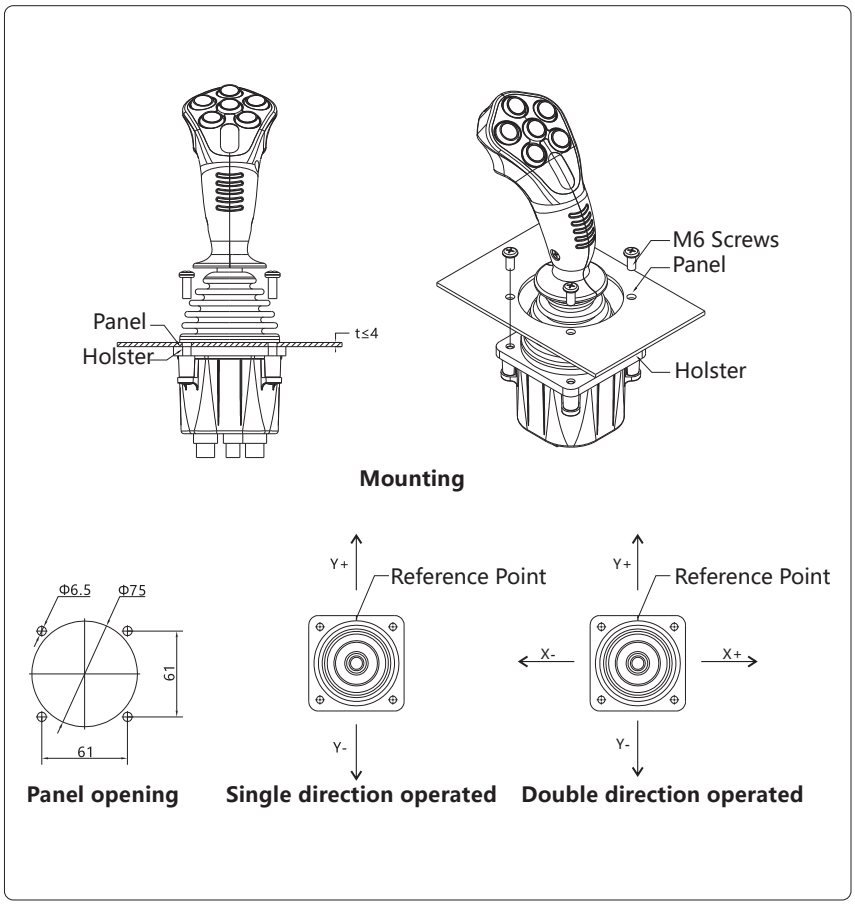
The handle



KGDR HDS HDR HD HA

Notes: Other choice reference other page.

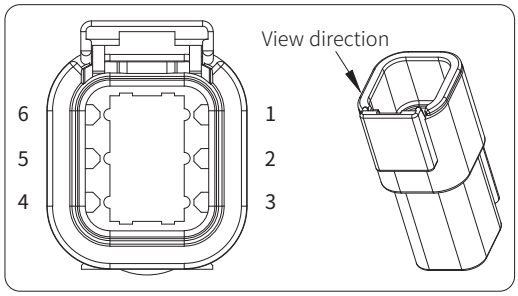
Product Installation



Deutsch connection

Pin	Can output	Color
1	GND	Black
2	VCC	Red
3	CAN high	Yellow
4	CAN low	Green
5	CAN shield	N/A
6	N/A	N/A

Deutsch connector



Electrical Connections

AMP Connector

16 Pin

Pin	Potentiometer	Hall	With electrical amplifier for output voltage	With electrical amplifier for output current
1	Y-axis forward directional switch	Button switch 4	Common terminal of button switch	Common terminal of button switch
2	N/A	Button switch 3	Button switch 1	Button switch 1
3	X-axis pot left terminal	Button switch 2	Button switch 2	Button switch 2
4	X-axis pot wiper	Button switch I	Button switch 3	Button switch 3
5	X-axis pot right terminal	Top Button	Button switch 3	Button switch 3
6	X-axis pot right terminal	Button switch 5	Button switch 5	Button switch 5
7	X-axis switch common terminal	Button switch 6	Button switch 6	Button switch 6
8	X-axis left directional switch	Deadman switch	Top Button	Top Button
9	Y-axis pot backward terminal	Button switch 9	Deadman switch	Deadman switch
10	Y-axis pot wiper	Button switch 10	Deadman switch	Deadman switch
11	Y-axis pot forward terminal	Common terminal of button switch	X-axis left directional switch	X-axis left directional switch
12	Y-axis pot center tap	Deadman switch	X-axis pot right terminal	X-axis pot right terminal
13	Y-axis switch common terminal	N/A	Y-axis backward directional switch	X-axis switch common terminal
14	Y-axis backward directional switch	N/A	Y-axis forward directional switch	Y-axis forward directional switch
15	X-axis right directional switch	N/A	Switch common terminal	Y-axis forward directional switch
16	N/A	N/A	N/A	Y-axis switch common terminal

12 Pin

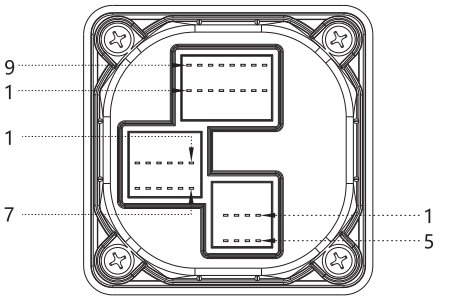
Pin	Potentiometer	Hall
1	Button switch 4	+5V + 5V (redundant hall)
2	Button switch 3	0V (redundant hall)
3	Button switch 2	+5V power supply
4	Button switch 1	0V power supply
5	Top button	Y-axis output (redundant hall)
6	Button switch 5	X-axis output
7	Button switch 6	X-axis output (redundant hall)
8	Deadman switch	Y-axis output
9	Button switch 9	Z1-axis output
10	Button switch 10	Z2-axis output
11	Button switch common terminal	Z1-axis output (redundant hall)
12	Deadman switch	Z2-axis output (redundant hall)

※Standard Hall output, 3/4/6/8 pin outlet

8 Pin

Pin	Hall	Conversion circuit output
1	Forward directional microswitch common terminal	VCC
2	Forward directional microswitch output terminal	GND
3	Backward directional microswitch output terminal	X-axis output
4	Backward directional microswitch common terminal	Y-axis output
5	Left directional microswitch common terminal	Out com
6	Left directional microswitch output terminal	NA
7	Right directional microswitch output terminal	NA
8	Right directional microswitch common terminal	NA

AMP Connector



LT61 Series Friction Joystick

Product Features

- Ergonomics design on mobile application.
- Non-contact Hall type sensor method.
- Friction-type handles can be operated in single - or biaxial cross form.
- The number and position of buttons can be customized.
- Optional CAN bus output.
- Friction positioning type.

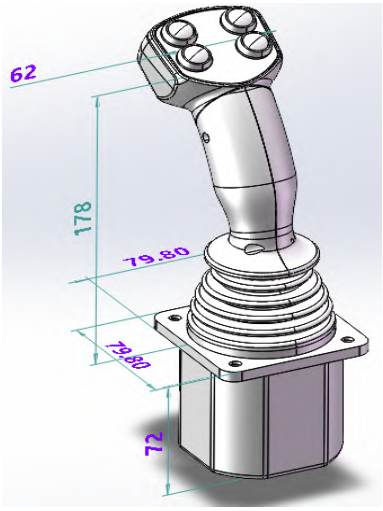
Application

This series of products are mainly used in all kinds of road machinery, construction machinery, agriculture and forestry machinery, mining machinery, usually used in the FNR file of equipment,agriculture and forestry machinery, mining machinery, usually used in the FNR file of equipment, can also be separately installed on the pilot valve operating mechanism for use. can also be separately installed on the pilot valve operating mechanism for use.

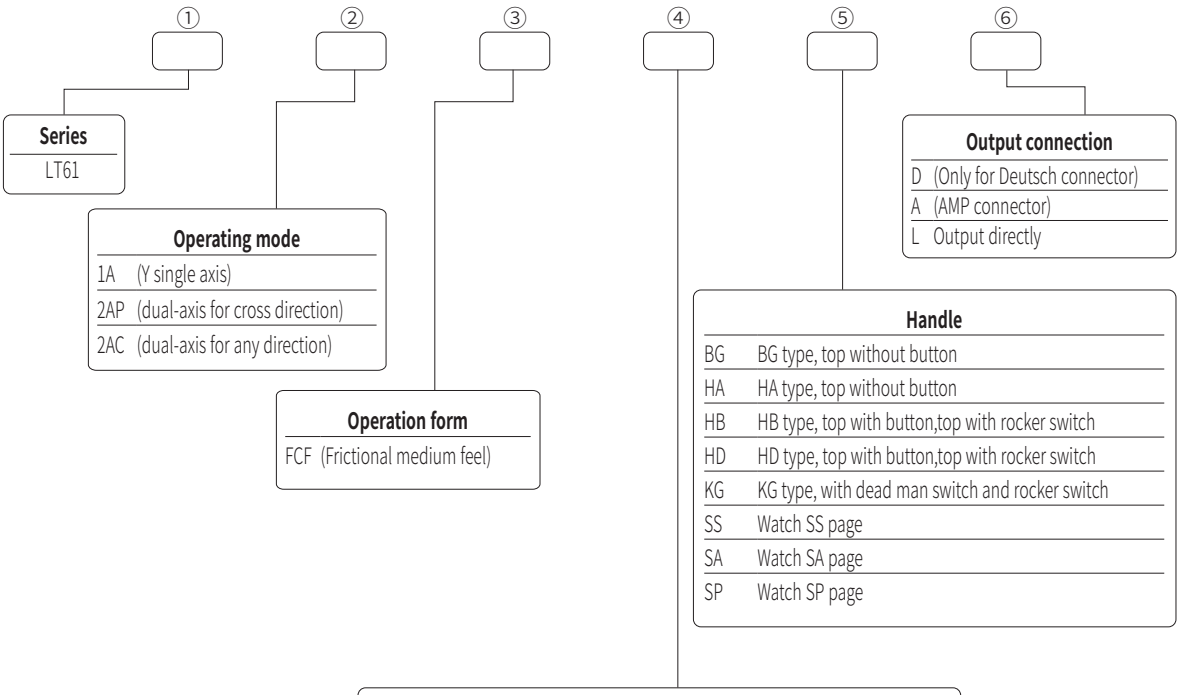
Technical Information

HALL	
Power supply	5±0.5Vdc
Supply Current	<11mA (Hall Sensor)
Limit allowed overvoltage	20Vdc
Reverse limit allowable voltage	-10Vdc
Linear error of output voltage	<±0.2V
CAN Bus	
Supply voltage	9~36Vdc
CAN version	CAN 2.0B
Agreement	J1939
Radio port interface card	6-core socket (Deutsch)
Mechanical data	
Trunk sway angle	±20°
Operating mode	Automatic spring reset
Tripping force	4kgfcm
Maximum operating force	16N
Margin pressure test location	>300N
servicelife	>50 Times
Weight	475g (No Handle)

Environment data	
Working temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP65 (Above mounting panel)



Product Configuration



Output signal	
Hall (Power supply 5Vdc)	
H51	each axis of single hall, 0.5~2.5~4.5Vdc output
H52	each axis of single hall, 0~2.5~5Vdc output
H53	each axis of single hall, 1.25~2.5~3.75Vdc output
Note: Hall type can also choose a wide voltage 9~36V,the volatge output is the same as above; Add "W" in front of the ordinary Hall type,such as W2H51,representing wide voltage, redundant Hall per axis,0.5 ~2.5~4.5Vdc voltage output.	
With electronic amplifier	
U21	18~36Vdc power supply , -10V~0V~ + 10V output
U22	18~36Vdc power supply , +10V~ 0V~ +10V output
U23	18~36Vdc power supply , -5V~0V~ +5V output
U24	18~36Vdc power supply , +5V~0V~ + 5V output
I21	9~36Vdc power supply , 2-wire system 4mA~12mA~20mA output
I22	9~36Vdc power supply , 2-wite system 20mA~4mA~20mA output
CAN BUS(9~36Vdc power supply)	
J33	Can 2.0B output, source address 33
J34	Can 2.0B output, source address 34
J35	Can 2.0B output, source address 35
J36	Can 2.0B output, source address 36

AMP connector

16 Pin

Pin	Potentiometer	Hall	With electrical amplifier for output voltage
1	N/A	Button switch 4	Common terminal of button
2	X-axis pot left terminal	Button switch 3	Button switch 1
3	X-axis pot wiper	Button switch 2	Button switch 2
4	X-axis pot right terminal	Button switch l	Button switch 3
5	X-axis pot center terminal	Top button	Button switch 4
6	Y-axis pot backward terminal	Button switch 5	Button switch 5
7		Button switch 6	Button switch 6
8		Deadman switch	Top button
9	Y-axis pot backward terminal	Button switch 9	Deadman switch
10	Y-axis pot wiper	Button switch 10	Deadman switch
11	Y-axis pot forward terminal	Common terminal of button switch	
12	Y-axis pot center terminal	Deadman switch	
13		N/A	
14		N/A	
15		N/A	
16			

12 Pin

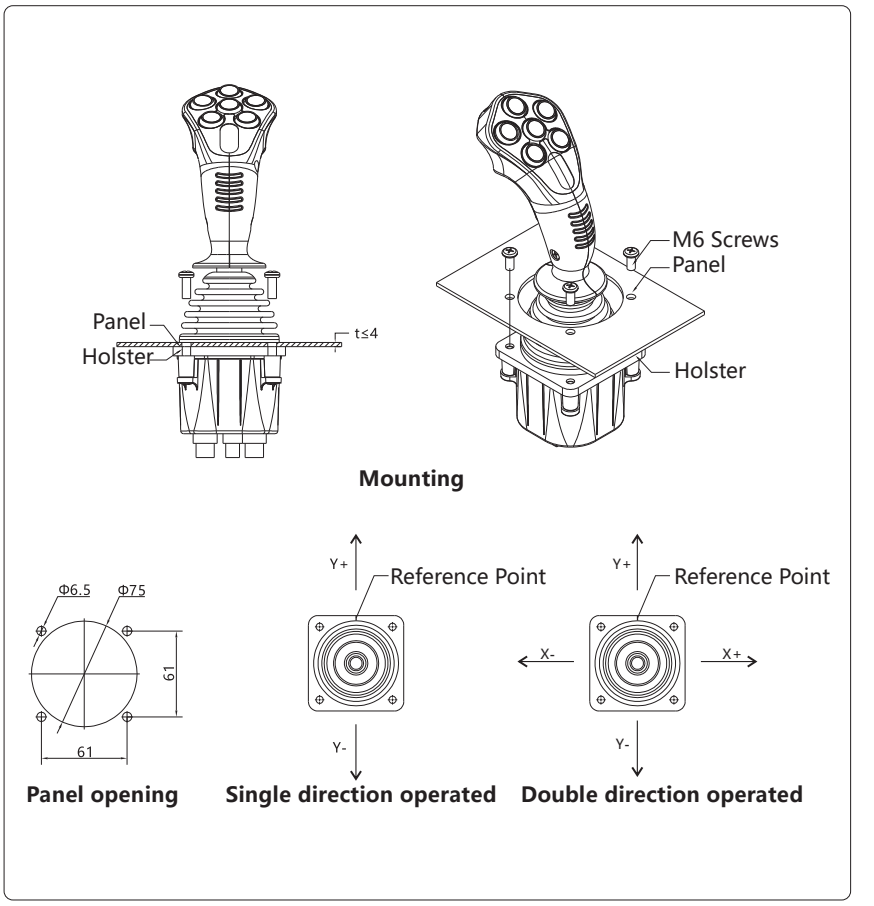
Pin	Potentiometer	Hall
1	Button switch 4	+5V + 5V (redundant hall)
2	Button switch 3	0V (redundant hall)
3	Button switch 2	+5V power supply
4	Button switch 1	0V power supply
5	Top button	Y-axis output (redundant hall)
6	Button switch 5	X-axis output
7	Button switch 6	X-axis output (redundant hall)
8	Deadman switch	Y-axis output
9	Button switch 9	Z1-axis output
10	Button switch 10	Z2-axis output
11	Button switch common terminal	Z1-axis output (redundant hall)
12	Deadman switch	Z2-axis output (redundant hall)

※Standard Hall output, 3/4/6/8 pin outlet

8 Pin

Pin Hall	Conversion circuit output
1	VCC
2	GND
3	X-axis output
4	Y-axis output
5	Out com
6	NA
7	NA
8	NA

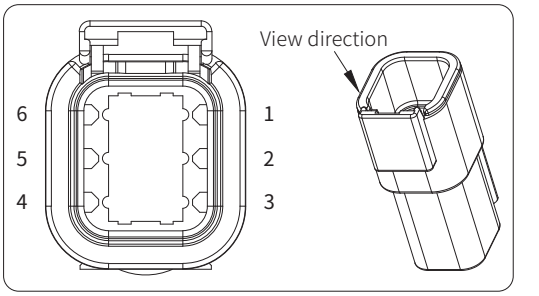
Product Installation



Deutsch connection

Pin	Can output	Color
1	GND	Black
2	VCC	Red
3	CAN high	Yellow
4	CAN low	Green
5	CAN shield	N/A
6	N/A	N/A

Deutsch connector



LT70 Series Multi Axis Joystick

Product Features

- Spring return,single-axis or dual-axis operated.
- Cross direction or arbitrary direction operated optional.
- Hall effect angle detection long life.
- Various output option.
- Optional wide voltage 9 to 36Vdc application environment.

Application

Typical application on Cranes, loaders, Forklifts, excavators, access platform, tractors, harvesters, and so on.

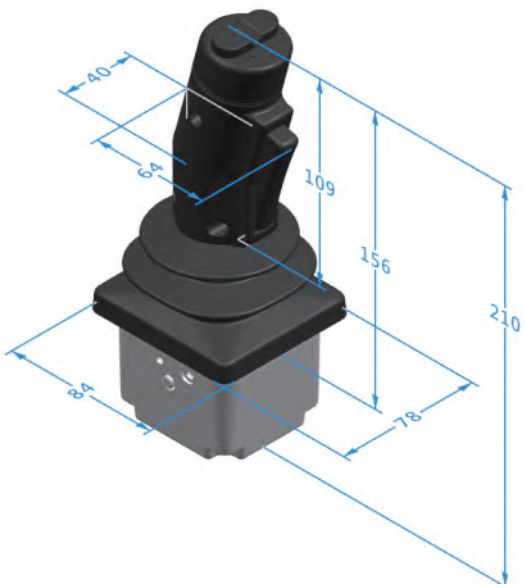
Technical Information

Electrical data	
Hall	
Power supply	5±0.5Vdc
Supply current (nominal power supply):	< 11 mA (Single axis), <22mA (Dual-axis)
Maximum allowable overload voltage	20Vdc
Reverse maximum allowable voltage	-10Vdc
Output linearity tolerance	<±0.2V

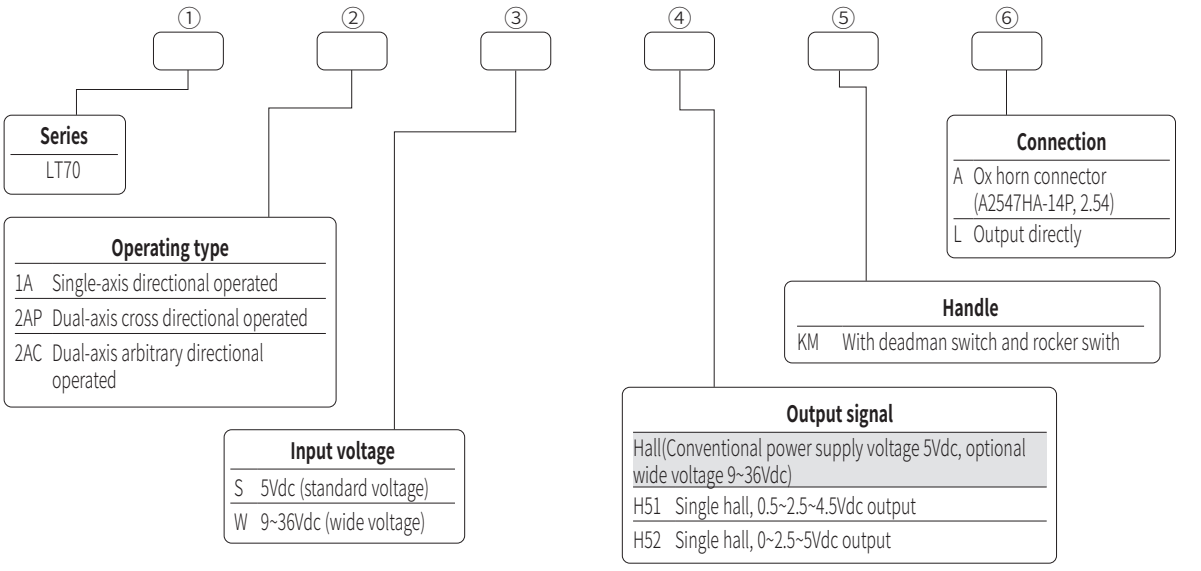
Mechanical features	
Travel angle	±20°
Operating type	Spring return
Breakout force	9N
Operating force(max)	20N
Maximum allowable force	>300N
Expecting life	>1million cycles (Hall effect)
Weight	450g (Without handle)

Environmental data	
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP65 (Above the flange)

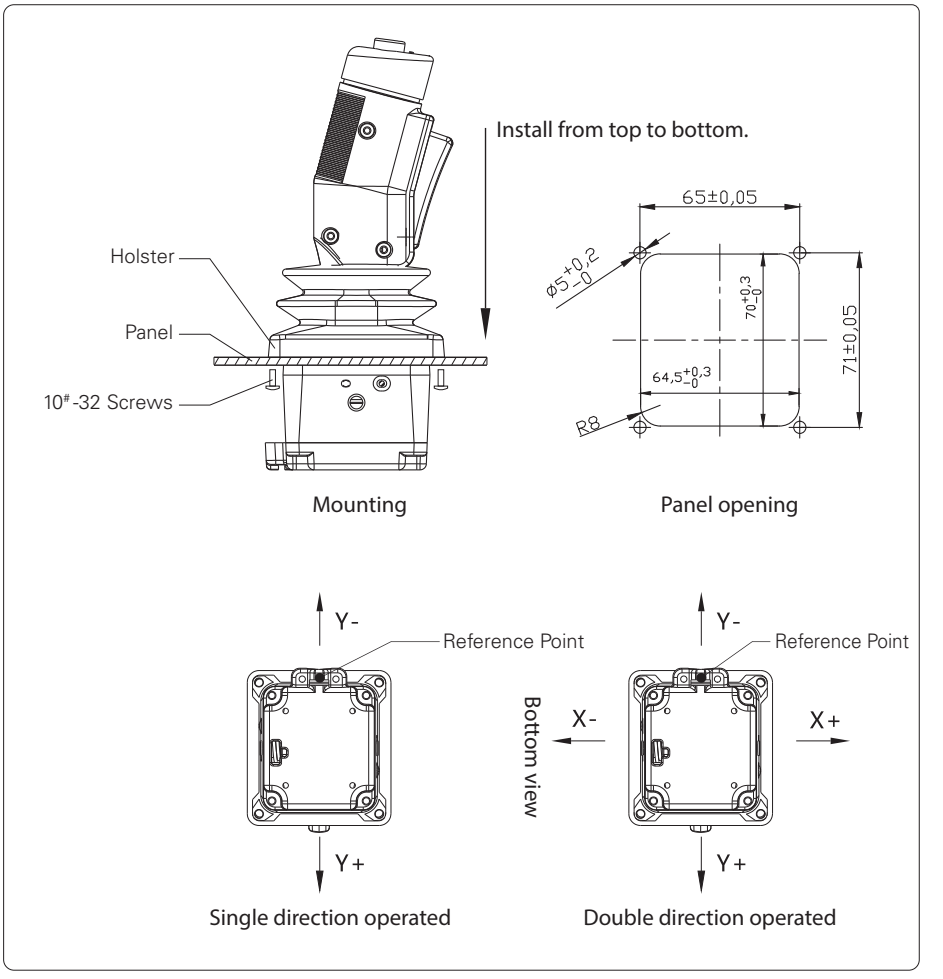
Dimensions



Product Configuration



Product Installation



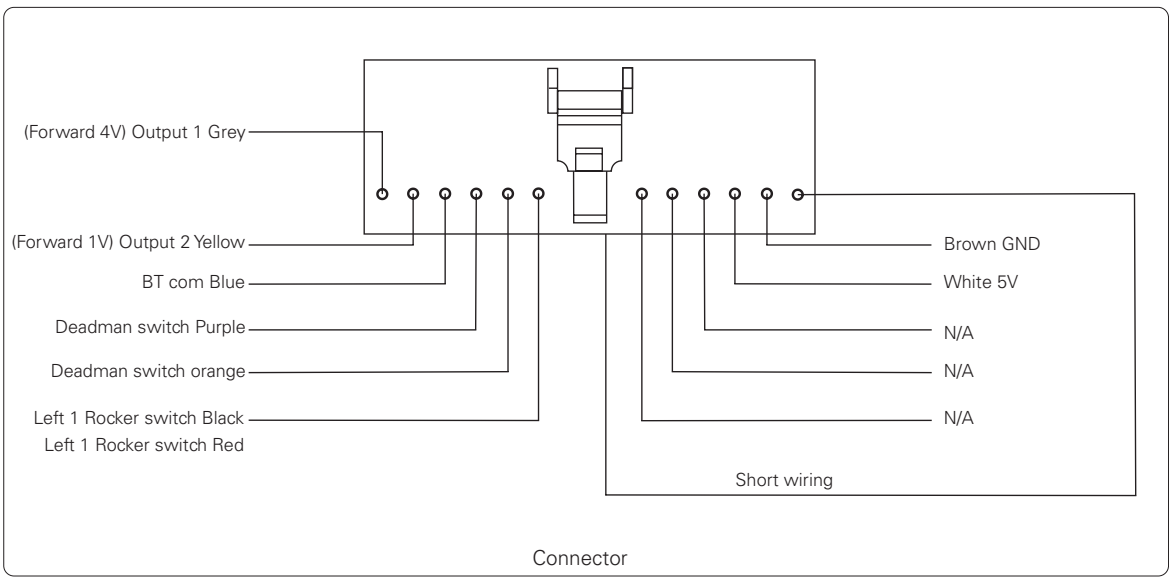
Electrical Connections

Redundant hall

Color	Function
Grey	Y-axis (forward and backward)
Yellow	Y-axis Redundant output (forward and backward)
Blue	Common terminal of Rocker switch
Purple	Deadman switch
Orange	Deadman switch
Black	Rocker switch (left)
Red	Rocker switch (right)
Green	X-axis (left and right)
Green&Black	X-axis Redundant output (left and right)
White	Power supply
Brown	0V

Hall effect

Color	Function
Grey	Y-axis (left and right)
Yellow	X-axis (left and right
Blue	Common terminal of Rocker switch
Purple	Deadman switch
Orange	Deadman switch
Black	Rocker switch (left)
Red	Rocker switch (right)
White	Power supply
Brown	0V



LT76 Series Multi Axis Joystick

Product Features

- Spring return, single-axis or dual-axis operated.
- Cross direction or arbitrary direction operated optional.
- Hall effect angle detection long life.
- Various output option.
- Optional handle upper end.

Application

Typical application on aerial work platform.

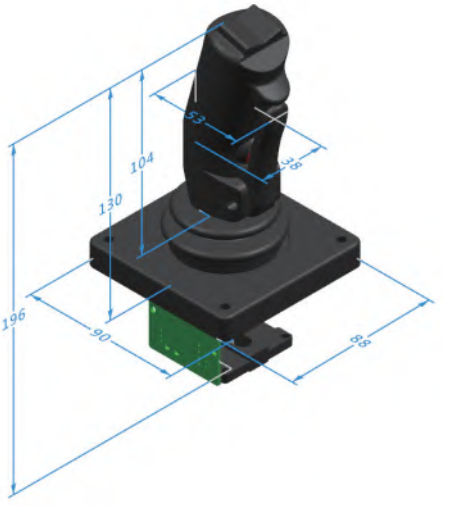
Technical Information

Electrical data	
Hall	
Power supply	5±0.5Vdc
Supply current (nominal power supply)	<11 mA (Single axis), <22mA (Dual-axis)
Maximum allowable overload voltage	20Vdc
Reverse maximum allowable voltage	-10Vdc
Output linearity tolerance	<±0.1V

Mechanical features	
Travel angle	±20°
Operating type	Spring return
Breakout force	5N
Operating force (max)	11N
Maximum allowable force	>300N
Expecting life	>2million cycles (Hall effect)
Weight	450g (Without handle)

Environmental data	
Operating temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP65 (Above the flange)

Dimensions



Product Configuration

① Series
LT76

② Operating type handle series
1A Single-axis directional operated
2AP Dual-axis cross directional operated
2AC Dual-axis arbitrary directional operated

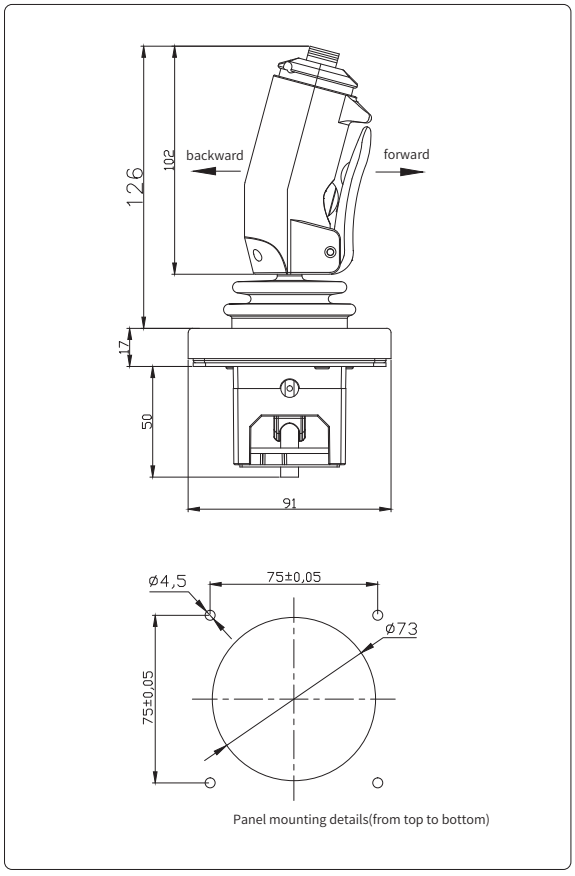
③ Input voltage
S 5Vdc (standard voltage)
W 9~36Vdc (wide voltage)

④ Output signal
Hall (5Vdc power supply)
H51 Single hall, 0.5~2.5~4.5Vdc output
H52 Single hall, 0~2.5~5Vdc output

⑤ Handle
KSDR (with dead man switch and rocker switch)
※HD、HB、KM grip optional

⑥ Output Connection
L Output directly
A AMP connector
※ Other connectors can be customized Line form

Product Installation



Panel mounting details(from top to bottom)

Electrical connections

Output directly	(Single shaft, upper end with stilt plate and safety switch)
Color	Function
White	VCC
Black	GND
Gray	X&Y-axis output
Yellow	left Rocker switch
Purple	Right Rocker switch
Brown	Common terminal of rocker and deadman switch
Red	Deadman switch

LT77 Series Multi Axis Joystick

Product Features

- Ergonomic design, mainly for high-altitude working shear fork vehicle design application.
- The non-contact Hall sensor detects the operating Angle.
- Spring return handle in the form of uniaxial forward and backward direction operation.
- The upper end type and the signal type can be customized.
- Expandable CAN bus output.

Application

This series of products are mainly used in high altitude working shear forklift, can be extended to other construction machinery vehicles.

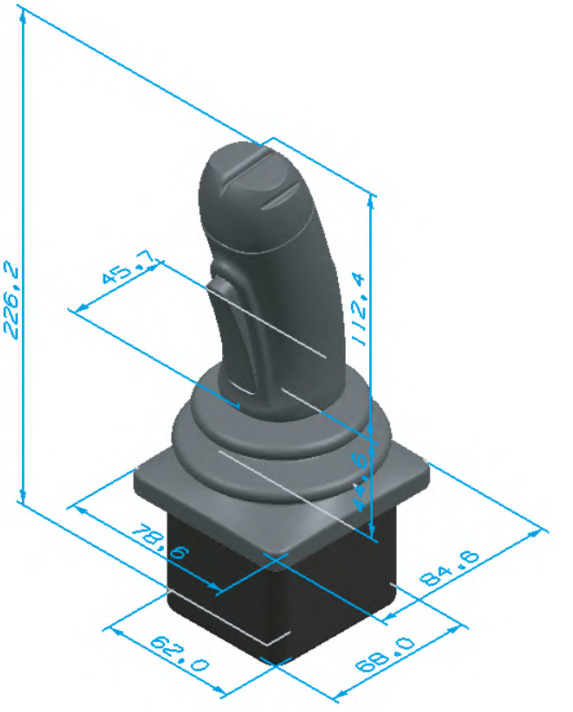
Technical Information

Electrical data	
Hall	
Supply voltage	5±0.5Vdc
Power supply current (rated power supply current)	<11 mA (Single axis), 22mA (Dual-axis)
Limit allowed overvoltage	20Vdc
Reverse limit allowable voltage	-10Vdc
Linear error of output voltage	<±0.1V

Mechanical parameter	
Shaking Angle	±20°
Operating mode	Automatic spring reset
Starting force	5N
Maximum operating force	11N
Limiting force	>300N
Service life	>2M
Weight	About 560g (including handle)

Environmental parameter	
Operating temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP66 (Above mounting panel)

Dimensions



Product Configuration

① Series
LT77

② Operating mode
1A (Uniaxial one-word operation)

③ Output signal

Hall type (supply voltage 5VDC)	
H51	(0.5~2.5~4.5Vdc voltage output)
H52	(0~2.5~5Vdc voltage output)
H53	(1.25V~2.5V~3.75Vdc voltage output)

④ Handle
KY with dead man switch and rocker switch

⑤ Wiring method

L	Output directly
A	AMP connector

Product Installation

Electrical Connections

14 core connector outgoing cable definition

Pin	line color	Function
1	grey	Y-axis output (forward and backward direction
2	yellow	Y-axis redundant output (forward and backward direction)
3	blue	Common rocker switch
4	blue	Deadman switch
5	purple	Deadman switch
6	black	Left rocker switch
7	red	Right rocker switch
8~11	--	--
12	white	Supply voltage 5Vdc
13	brown	Power supply 0V
14	--	--

LT80 Series Multi Axis Joystick

Product Features

- Heavy-duty industrial joystick;
- Spring return, single axis or two axis operation;
- Single or double grip available;
- Upper grip with vibrator optional;
- Hall sensor angle detection;
- Various output are available.

Application

Cranes, loaders, excavators, etc

Technical Information

Electrical data	
Hall	
Power supply	5±0.5Vdc
Supply current (nominal power supply)	<11 mA (Single axis)
Maximum allowable overload voltage	20Vdc
Reverse maximum allowable voltage	-10Vdc
Output linearity tolerance	<±0.2V
CANBUS	
Power supply	9~36Vdc
CAN edition	CAN2.0B
Protocol	J1939
Terminal	6 Pin (Deutsch)

Installation	
Travel angle	±20°
Operating type	Spring return
Breakout force	3N
Operating force(max)	8N
Maximum allowable force	>300N
Expecting life	3 million cycles
Weight	1500g

Environmental data	
Operating Temperature	-30C~+70°C
Storage Temperature	-40°C~+85°C
Protection level	IP65 (Above the flange)

Dimensions

Product Configuration

① Series
LT80

① Operating type
1AY single-axis directional operated
2AC dual-axis arbitrary directional operated

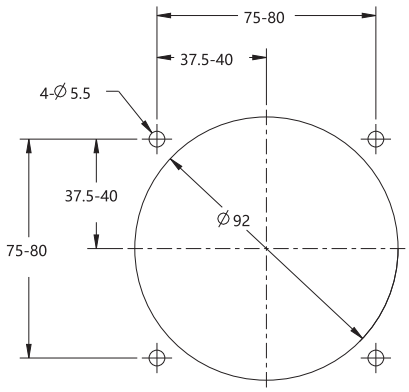
② Output signal
Hall (Voltage 5VDC)
H51 (0.5~2.5~4.5Vdc)
H52 (0~2.5~5Vdc)
CAN Bus
J33 CAN 2.0B, address 33, J1939
J34 CAN 2.0B, address 34, J1939

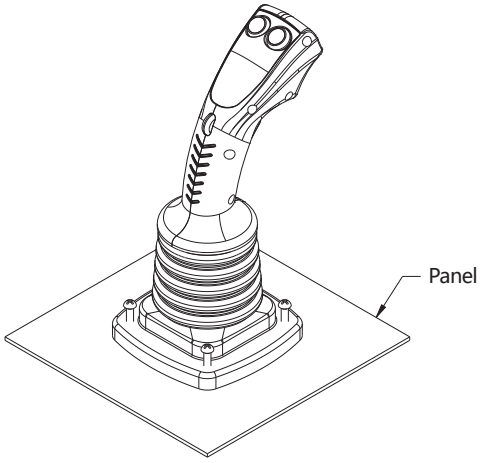
③ Handle
SC SC Handle
2S Dual SC Handle
(Please see Handle grip Type option)
PRA PRA handle upper (z-axis,single button)

④ Wiring method
L output directly
A AMP connector
D Deutsch connector

Product Installation

Hole pattern





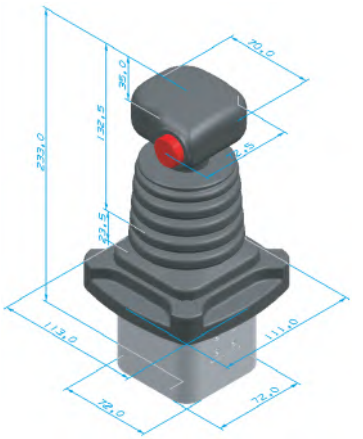
Electrical Connections

Deutsch connector

Pin	CAN output	Color
1	GND	Black
2	VCC	Red
3	CAN High	Yellow
4	CAN Low	Green
5	CAN shield	N/A
6	N/A	N/A

Dimensions

PRA

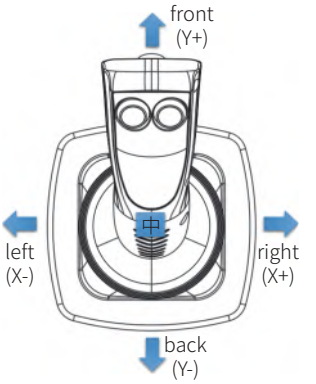


2AC

Qualification definition

PRA

AC



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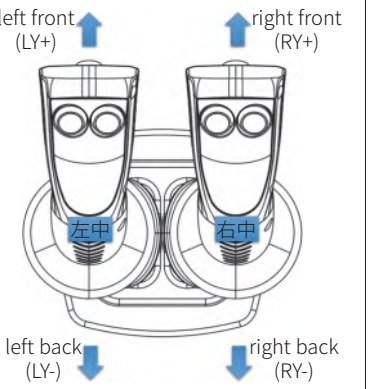


LT81 series lever type multi-head operation handle

Product Features

- Spring return, two - or three-headed handle available;
- Long life new structure;
- Non-contact Hall Angle detection sensor;
- Voltage output or CAN output is optional;

Application

Loaders, etc.

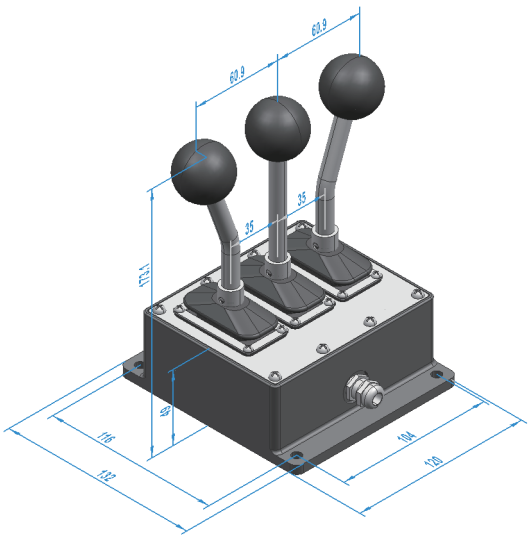
Technical Information

Electrical data	
Hall	
Power voltage	5±0.5Vdc
Power current	<11mA (Each Hall sensor)
Limit allowable overvoltage	20Vdc
Reverse limit allowable voltage	-10Vdc
O utput voltage linear error	<±0.2V
CAN Bus	
Power voltage	9~36Vdc
CAN	CAN2.0B
Agreement	J1939
Connecting port	4-pin Deutsch

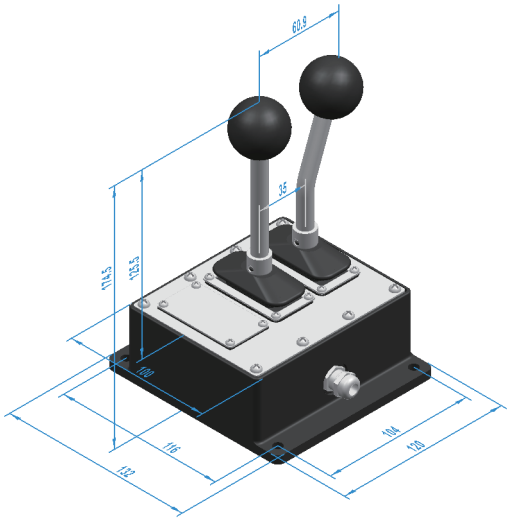
Installation	
Travel angle	± 20 °
Operating type	Automatical spring reset
Breakout force	3N
Operating force(max)	8N
Maximum allowable force	>300N
Expecting life	3 million cycles
Weight	1500g

Environmental data	
Operating Temperature	-30°C ~ +70°C
Storage Temperature	-40°C ~ +85°C
Protection level	IP65(Mounting panel above)

Dimensions



3EG



2EG

Product Configuration

① ② ③ ④ ⑤

Series
LT81

Operating mode

21A	Two handles, single axle spring return in front and rear direction.
31A	Three handles, single axle spring return in front and rear direction.

Output signal (See appendix for other types, which can be customized)

Hall (Power Voltage 5VDC)	
H51	(0.5~2.5~4.5Vdc voltage output)
H52	(0~2.5~5Vdc voltage output)
CAN Bus	
J33	CAN 2.0B,address 33,J1939
J34	CAN 2.0B,address 34,J1939

Handle

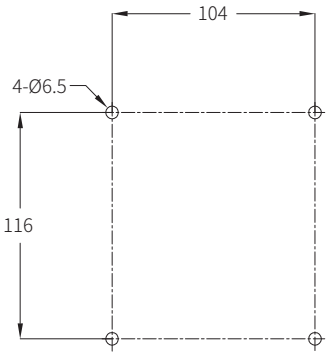
2EG	2 EG handle
3EG	3 EG handle

Wiring method

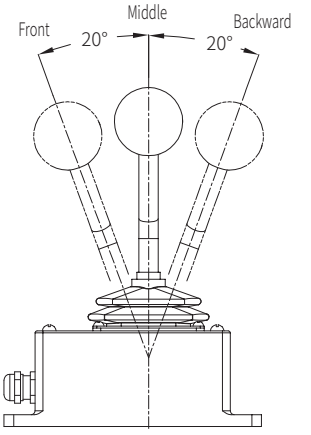
D	(Deutsch connector)
L	(Output directly)

Product Installation

Customer installation panel opening diagram



Dimensions of mounting holes



Electrical Connections

Wiring instructions

Pin	Feature
1	Vcc
2	GND
3	Can High
4	Can Low

DEUTSCH
DTO4-4-CE03

LT86 Series Multi Axis Joystick

Product Features

- Heavy-duty industrial handle, supporting mining machinery and equipment;
- Non-contact Hall sensor detection mode;
- Spring return operation mode;
- There are a variety of different types of handle upper end for choice;
- Optional CAN bus output.

Application

This series of products are mainly used with cranes, loaders, forkl ifts, excavators, harvesters and so on.

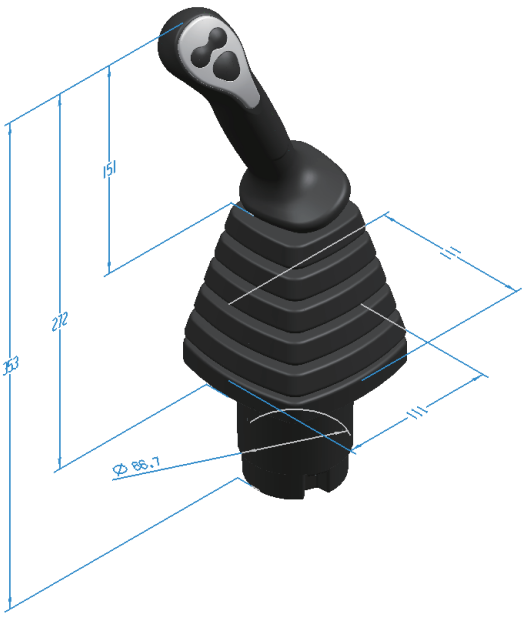
Technical Information

Electrical data	
Hall	
Supply voltage	5±0.5Vdc
Supply current	<11 mA (Each hall sensor)
Limit allowed overvoltage	20Vdc
Reverse limit allowable voltage	-10Vdc
Linear error of output voltage	±0.2Vdc
CANBUS	
Supply voltage	9~36Vdc
CAN	CAN2.0B
Agreement	J1939
Connection port	Customization

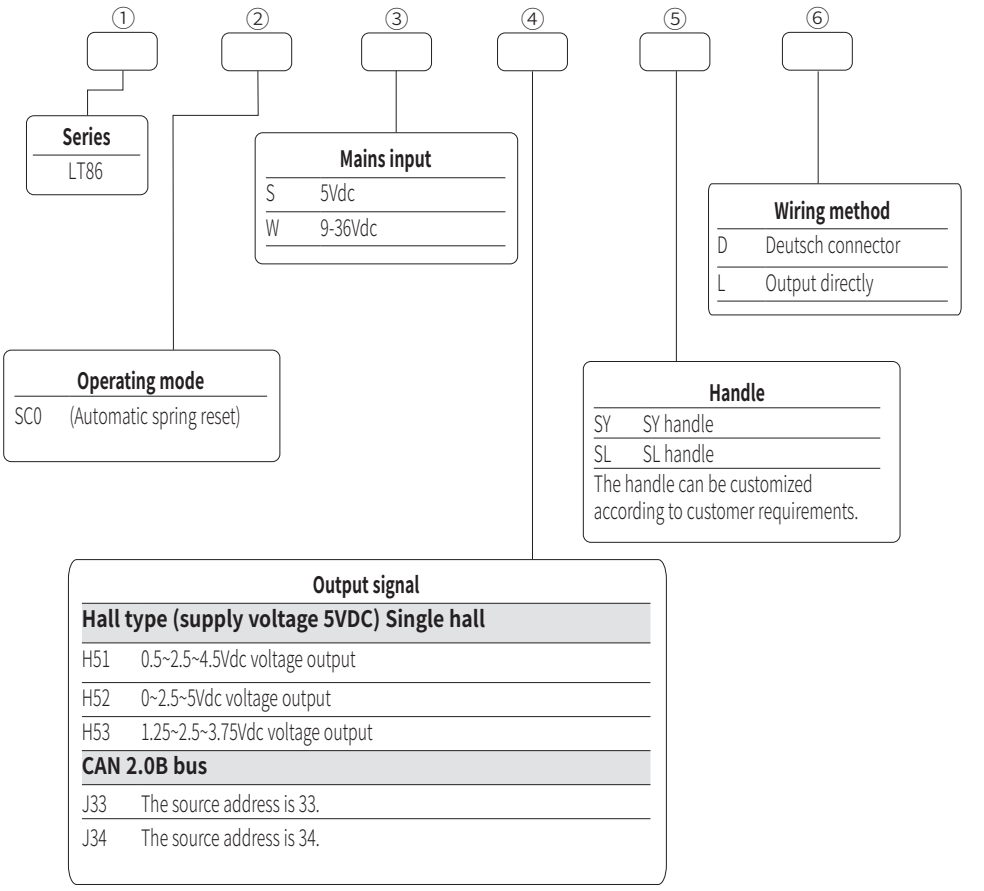
Mechanical parameter	
Shaking angle	±23°before and after±18°
Operating mode	Automatic spring reset
Starting force	4N
Maximum operating force	11N
Limiting force	>300N
service life	>2M
Weight	about 1250g （no handle）

Environmental parameter	
Operating temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP65 (Above mounting panel)

Dimensions



Product Configuration



Electrical Connections

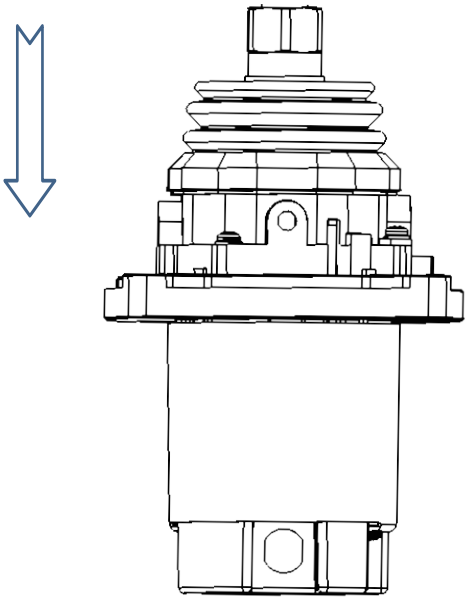
CAN bus

Pin	Outgoing definition
1	Power supply 9-36Vdc
2	The supply voltage is 0V
3	HSCAN
4	LSCAN
5	CAN shield
6	N/A

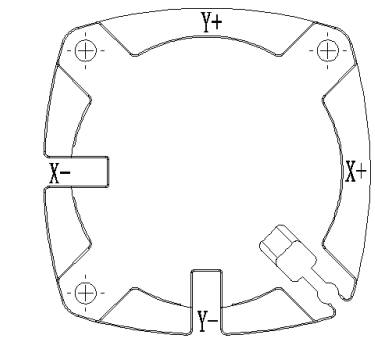
Hall sensor output definition

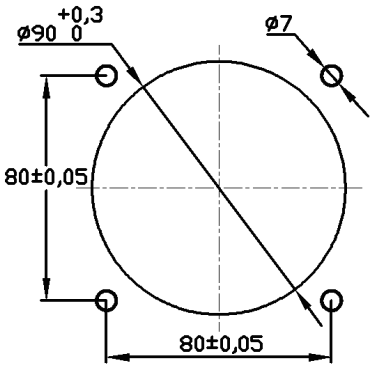
Line color	Function
Red	5Vdc mains input
Black	GND
Yellow	Hall output forward and backward
White	Hall output in left and right direction

Product Installation

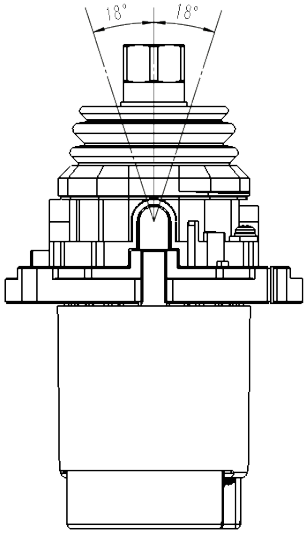


Customer installation diagram

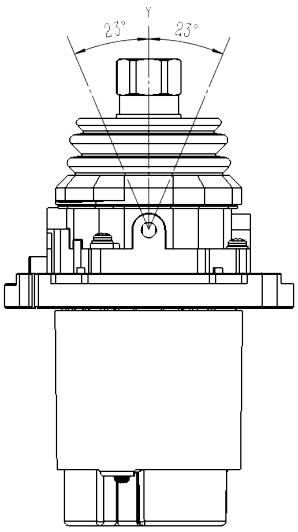




Outline and hole size drawing



Side-to-side shaking angle



Angle of rocking back and forth

LT87 Series Multi Axis Joystick

Product Features

- Ergonomic design, mainly for high altitude working vehicle design application.
- The non-contact Hall sensor detects the operating angle.
- The spring return handle can be operated in any direction of single or double shaft.
- The type of the upper end and the number of switches and whether to configure analog quantity can be customized.
- Optional CAN bus output.

Application

This series of products are mainly used in high-altitude working arm truck, road machinery, fire fighting vehicles, mining machinery and other equipment.

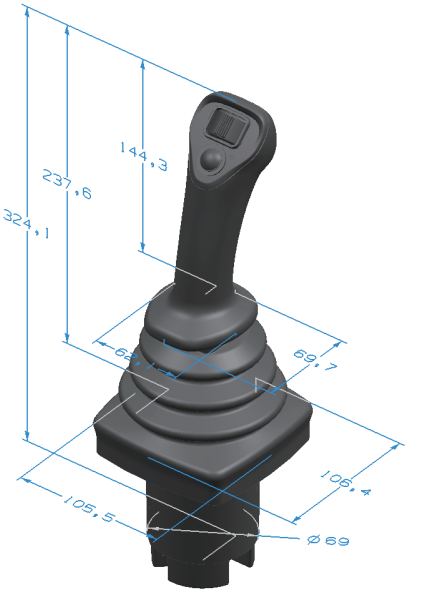
Technical Information

Electrical data	
Hall	
Supply voltage	5±0.5Vdc
Supply current	<11 mA (Each hall sensor)
Limit allowed overvoltage	20Vdc
Reverse limit allowable voltage	-10Vdc
Linear error of output voltage	±0.2Vdc
CAN BUS	
Mains input	9~36Vdc
CAN	CAN2.0B
Agreement	J1939
Connection port	Customization

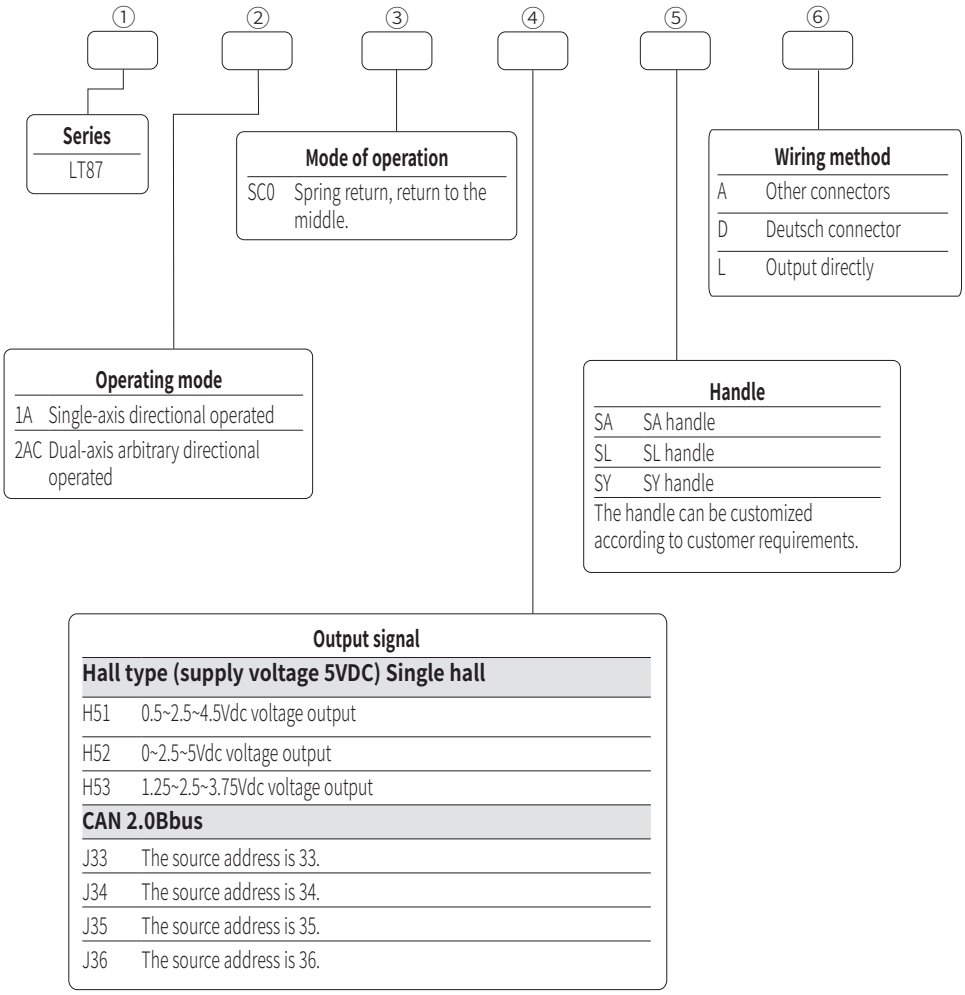
Mechanical parameter	
Shaking angle	±23°before and after±18°
Operating mode	Automatic spring reset
Starting force	4N
Maximum operating force	11N
Margin pressure test location	>300N
Service life	>2M
Weight	About 1KG

Environmental parameter	
Operating temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP65 (Above mounting panel)

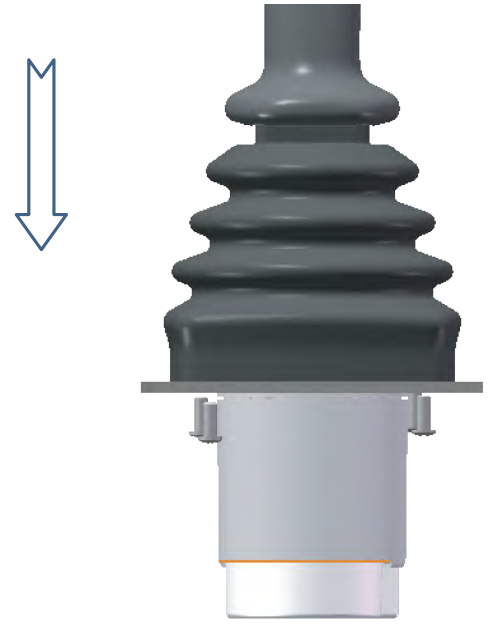
Dimensions



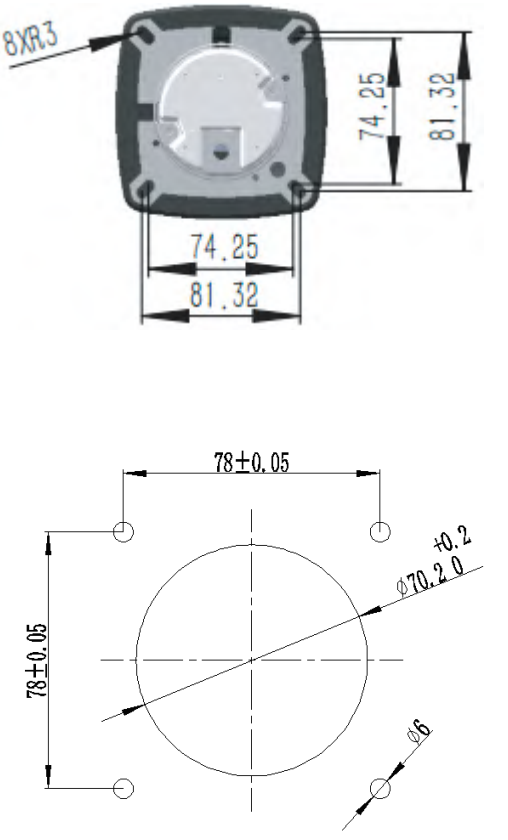
Product Configuration



Product Installation

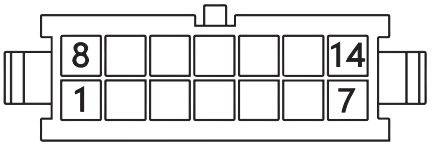


Customer installation diagram



Outline and hole size drawing

Qualification definition



Wiring diagram

The bottom line definition			Top out line definition	
Pin	Line color	Function	Line color	Function
1	Red	The supply voltage is 5Vdc	White	Stilt Plate left (1a)
2~3			Red	Common end of stilt board (1)
4	Black	Power supply 0V	Brown	Stilt Plate right (1a)
5	Blue	The supply voltage is 12Vdc.		
6~8				
9	Green	Hall output.		
10				
11	Gray	Y-output 12V (rear direction)		
12				
13	Brown	Y+ Output 12V (rear direction)		
14				

LT90 Series Multi Gear Joystick

Product Features

- Grip type handle.
- Left and right direction spring self-reset.
- Large current switching output.
- Six gears, front, center, rear.

Application

This series of products are mainly used in engineering vehicle transmission.

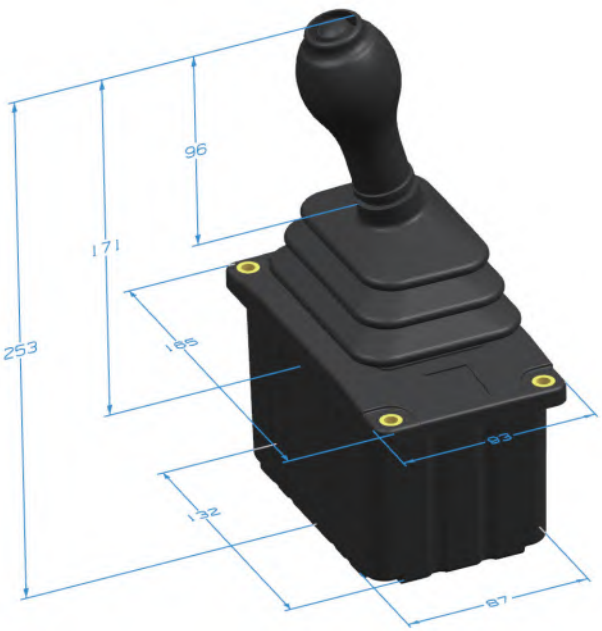
Technical Information

Electrical parameter	
Hall	
Supply voltage	24Vdc
Working voltage	20-32Vdc
Maximum current	4A

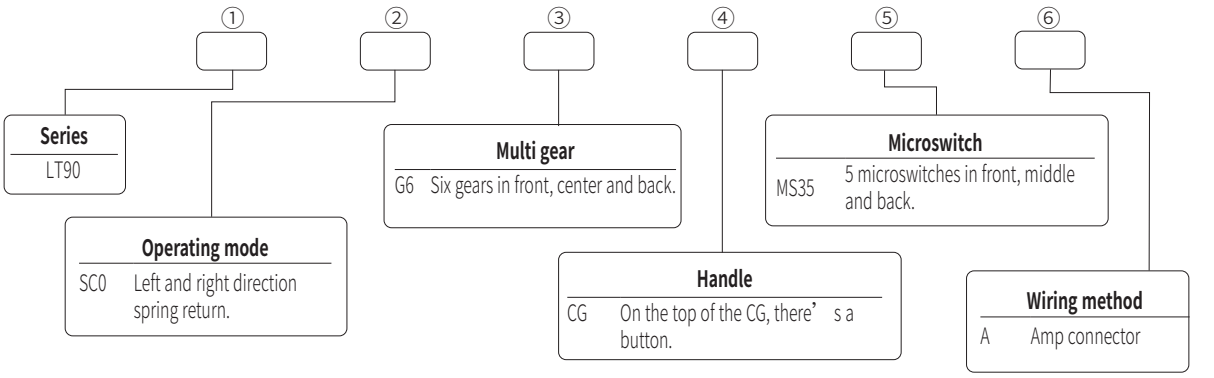
Mechanical parameter	
Shaking angle	±15°(X-axis)
Operating mode	X-axis spring return Y-axis front, center, and rear three gears.
Starting force	5N
Maximum operating force	25N
Limiting force	>300N
Service life	>1M
Weight	1260g

Environmental parameter	
Operating temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP64

Dimensions



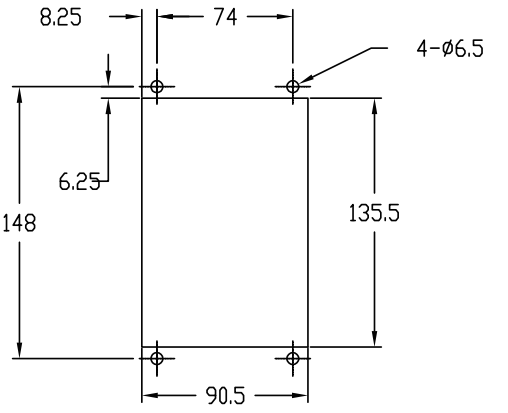
Product Configuration



Product Installation

Customer installation diagram

Note: The handle is installed from top to bottom with M6 screws

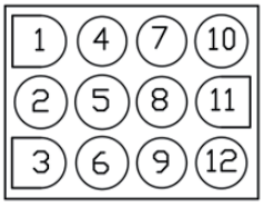


Customer panel opening diagram

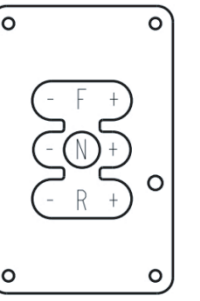
Electrical Connections

Pin	Function
1	N/A
2	COM
3	N/A
4	F
5	N
6	R
7	T+
8	T-
9	N/A
10	Upper button
11	N/A
12	N/A

Interface pin



Direction definition



LT92 Series Single Axis Joystick

Product Features

- Friction type single axis handle with Z limit.
- It CAN be applied to the CAN 2.0B universal protocol
- Customizable CAN protocol for customers.
- Various handle upper ends can be configured.

Application

Agricultural sugarcane machine, cotton picker and other agricultural machinery.

Technical Information

Electrical parameter	
Supply voltage	9~36Vdc
Maximum supply voltage	36Vdc
Maximum overload voltage	36Vdc
Maximum reverse polarity voltage	/
Load resistance	1kΩ
Output type	CAN 2.0B
Linear error of output voltage	＜±0.2V

Mechanical parameter	
Shaking angle	Forward+35° Backward-20°(Angle adjustable)
Operating mode	Back and forth friction type, reset to the feel slot in the middle.
Starting force	Starting force 5kgf±0.5kgf
Maximum operating force	100kgf
Margin pressure test location	>300N
Service life	> 500,000 times
Weight	About 780g
Conventional operating moment	4-55kgfvcm

Environmental parameter	
Operating temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP65

Dimensions

Product Configuration

① Series	
LT92	

② Friction location	
FCF	Middle strap feel Z-sh aped positioning

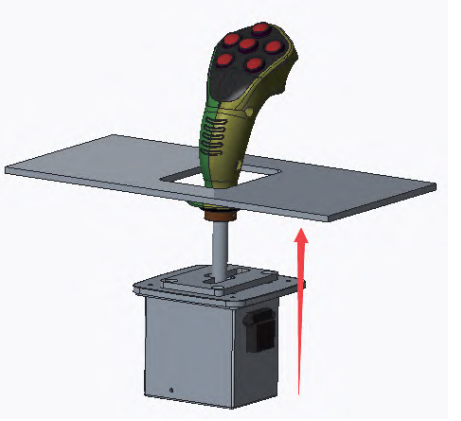
③ Output signal	
Hall type (supply voltage 5VDC)	
H51	0.5~2.5~4.5Vdc voltage output
H52	0~2.5~5Vdc voltage output
CAN 2.0B type (power supply voltage 9~36Vdc)	
J33	The source address is 33.
J34	The source address is 34.

④ Micro switch	
MS00	No microswitch
MS21	With a medium 4A micro switch

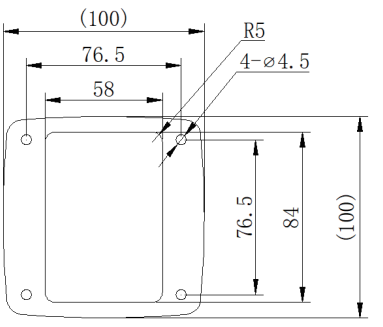
⑤ Handle	
SS	Please refer to SS handle upper end selection
SA	Please refer to SA handle upper end selection
SP	Please refer to SP handle upper end selection

⑥ Wiring method	
D	Deutsch connector
L	Output directly

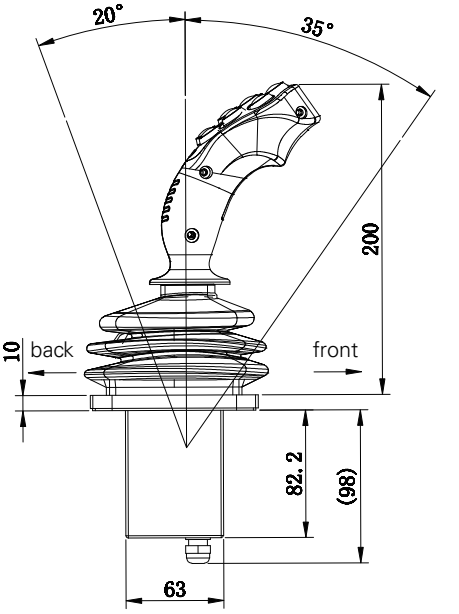
Product Installation



Customer installation diagram



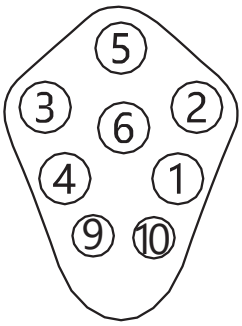
Customer panel opening diagram



Single axis operation direction definition

Note: The installation direction is from bottom to top. You are advised to install the joystick on the panel whose thickness is not greater than 4mm using M4*10 screws.

Electrical Connections



4 core Dechi plug-in wiring

Pin	Connection
1	VCC
2	GND
3	CANH
4	CANL

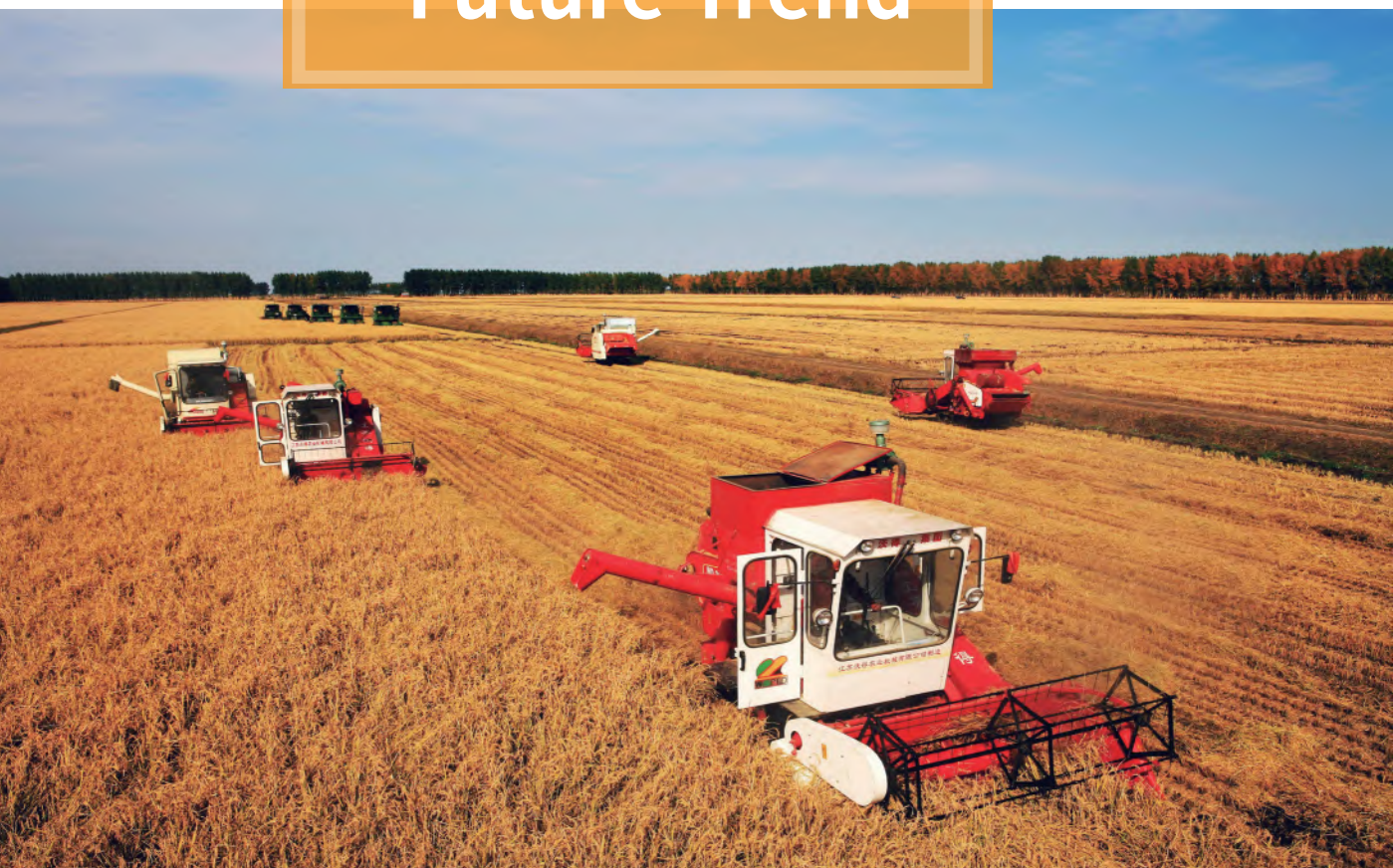
Button definition:

Top button for safety number 7

The switch is number 8

Optional button color:

Future Trend



TJ1 Series Single Axis Joystick

Product Features

- Single-axis finger operated, forward and backward directional operated.
- Spring return.
- The appearance of small, easy to install.
- Potentiometer or uncontact hall effect sensor.
- Different output voltage ranges can be selected as required.

Application

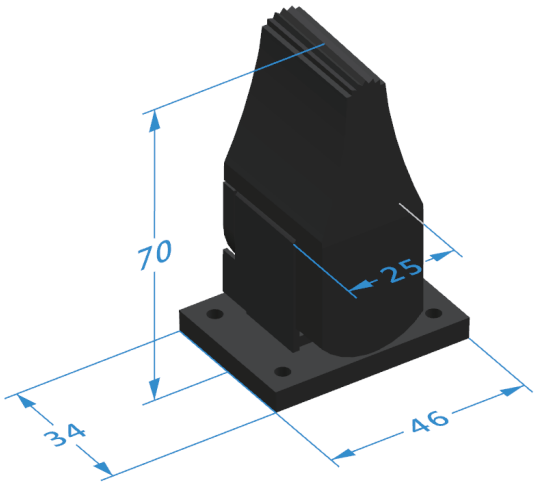
Typical application on remote control unit, off-highway vehicle and industrial panel control.

Technical Information

Electrical data	
Potentiometer	
Power supply	<32Vdc
Total resistance	4KΩ or 5KΩ
Electrical angle	±28°
Centertap angle	±2.5°
Dissipation(max)	0.25W (25°C, Non-load)
Center tap output voltage	48%~52% (±2%)
Directional switch	Power supply: <35Vdc Maximum current: 2mA Breakout angle: ±3° Contact resistance: <500Ω
Hall	
Power supply	5.0±0.5Vdc
Power supply current	<9mA
Maximum allowance over-load voltage	30Vdc
Reverse polarity voltage(max)	-10Vdc
Load resistance	>10KΩ
Resistance tolerance	2.5±0.1V
Output linearity tolerance	<±5%

Environmental data	
Operating Temperature	-30°C~+70°C
Storage Temperature	-40°C~+85°C
Protection level	IP66 (Above flange)

Dimensions

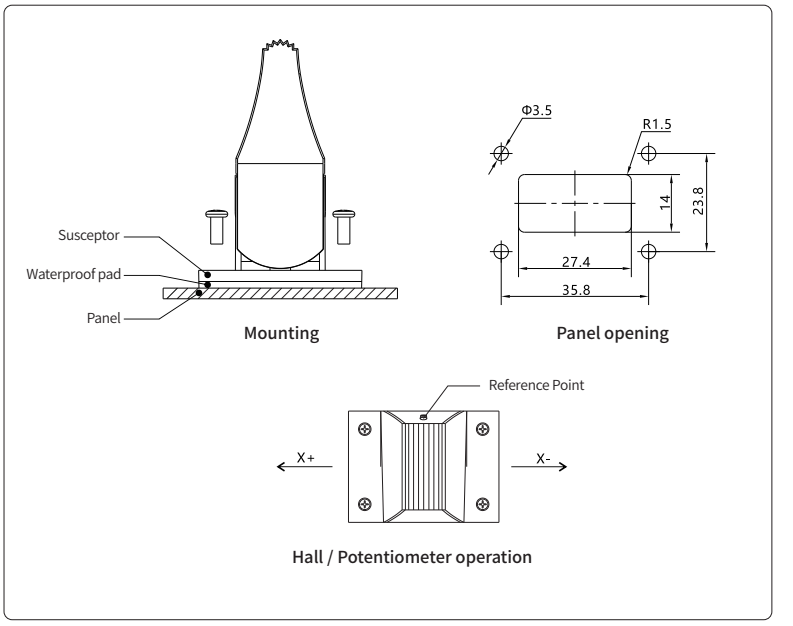


Mechanical features	
Travel angle	about±30°
Operating type	Spring return
Breakout force	1.3N
Operating force(max)	3N
Maximum allowable force	>50N
Expecting life	>2 million cycles (Potentiometer) >5 million cycles (Hall)
Weight	45g

Product Configuration

① Series	② Output signal		③ Output Connection
TJ1	Potentiometer	(Power supply < 32Vdc)	L: output directly
	P041	4KΩ, 0%~50%~100%Vdc Voltage Output, Forward and backward switch	A: connect outline
	P052	5KΩ, 10%~50%~90%Vdc Voltage Output, Forward and backward switch	
	P053	5KΩ, 25%~50%~75%Vdc Voltage Output, Forward and backward switch	
	Hall	(Power supply 5Vdc)	
	H51	Hall, 0.5~2.5~4.5Vdc Voltage Output	
	H52	Hall, 0~2.5~5.0Vdc Voltage Output	

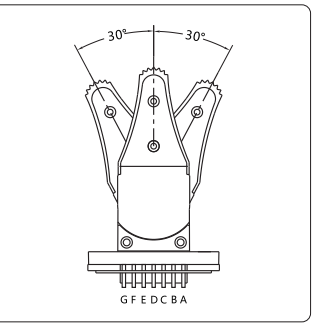
Product Installation



Electrical Connections

Connection plug (FCI DUBOX™ 7 Pin Connection plu 76382-307)

Pin	Potentiometer	Hall	Color
A	Center tap	NA	Red
B	VCC	VCC	Blue
C	Wiper output signal	Bout	Black
D	GND	GND	White
E	Switch terminal (X+)	NA	Yellow
F	Switch terminal (X-)	NA	Green
G	COM	NA	Gray



Note: Mating terminal: FCI DUBOX TM 65240-007 Series Connector, Cable Length 20cm

TJ3 Series Single Axis Joystick

Product Features

- Single-axis finger operated, forward and backward directional operated.
- Spring return.
- The appearance of small, easy to install.
- Un-contact hall effect sensor.
- Various output voltage range optional.
- The value ranges 9~ 36Vdc.

Application

Typical apply on remote control unit, off-highway vehicle and industrial panel control

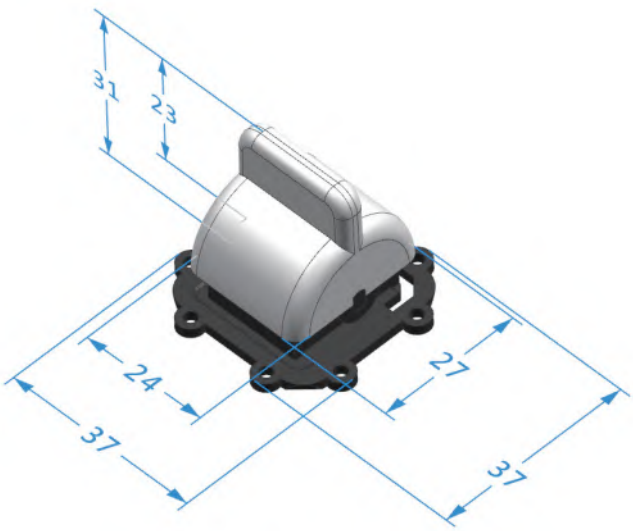
Technical Information

Electrical data	
Power supply	5.0±0.5Vdc (standard voltage)
Power supply	9~36Vdc (wide voltage)
Power supply current	<9mA; 18mA (redundant hall)
Maximum allowance overload voltage	30Vdc
Reverse polarity voltage(max)	-10Vdc
Load resistance	>10KΩ
Resistance tolerance	2.5±0.1V
Output linearity tolerance	<±2%

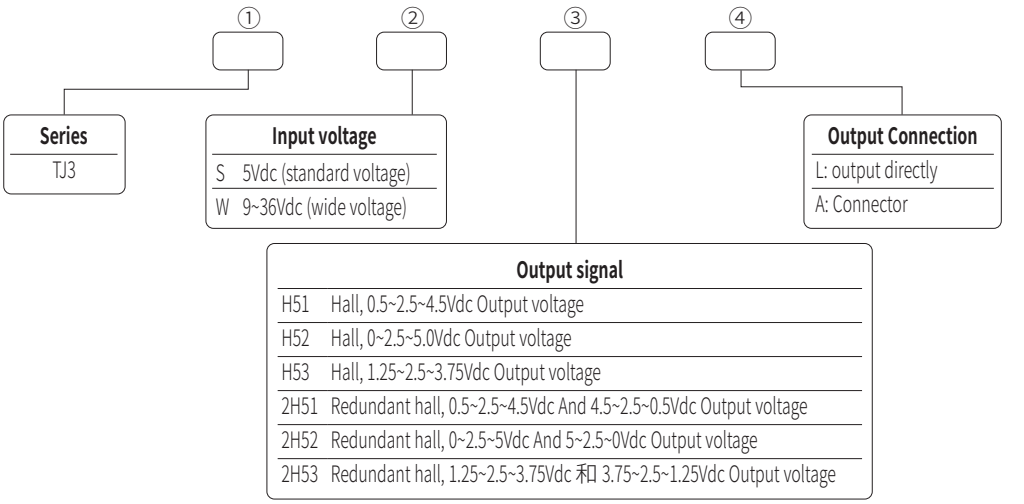
Mechanical features	
Travel angle	About±30°
Operating type	Spring return
Breakout force	1.3N
Operating force(max)	3N
Maximum allowable force	>30N
Expecting life	>2 million cycles
Weight	45g

Environmental data	
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP65 (Only for electronic part)

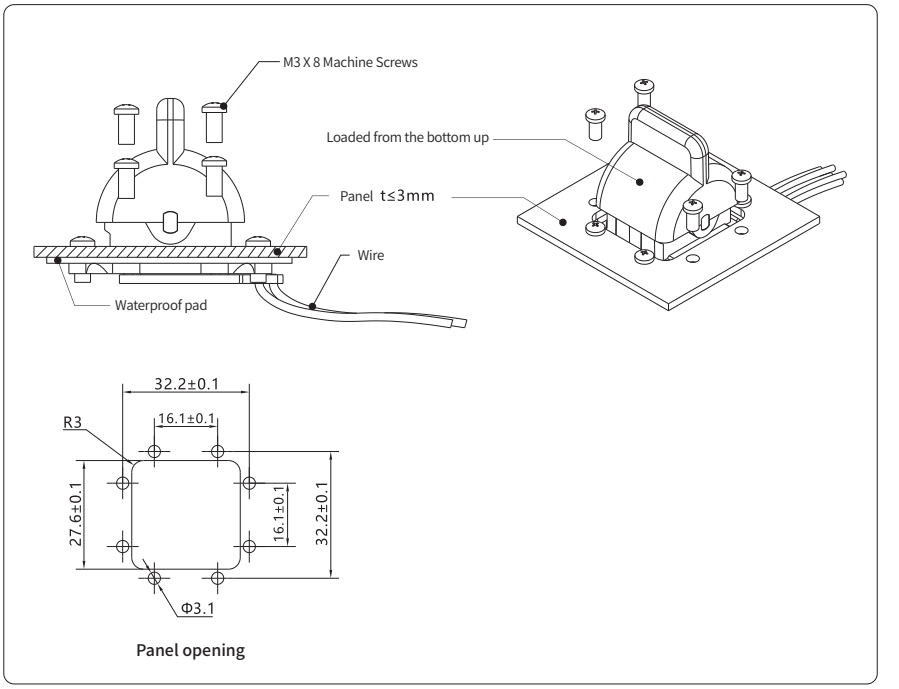
Dimensions



Product Configuration



Product Installation



Electrical Connections

Wire definitions

Number	Function	Color
1	VCC	Red
2	GND	Black
3	Aout	Yellow
4	Bout	Green

Note: See Appendix for wiring diagram. See Appendix for output diagram.

TJ6 Series Dual Axis Joystick

Product Features

- Finger operated , spring return.
- Arbitrary directional operated.
- Various voltage output optional.
- RS232 or USB connector output is available.
- Non-contact Hall sensor.

Application

Typical application on remote electric wheel chair, CCTV, video control equipment and medical equipment.

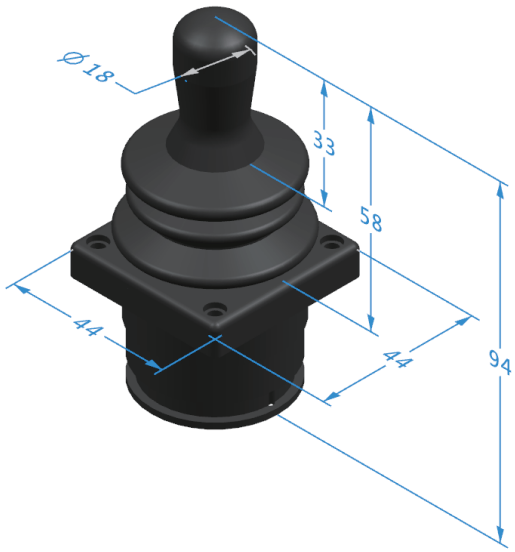
Technical Information

Electrical data	
Power supply	5.0±0.5Vdc (Standard Voltage)
Supply current	<9mA(Single output)
Maximum allowance overload voltage	20Vdc
Reverse polarity voltage(max)	-10Vdc
Load resistance	>10KΩ
Center tap voltage	2.5±0.1V
Output linearity tolerance	<±4%

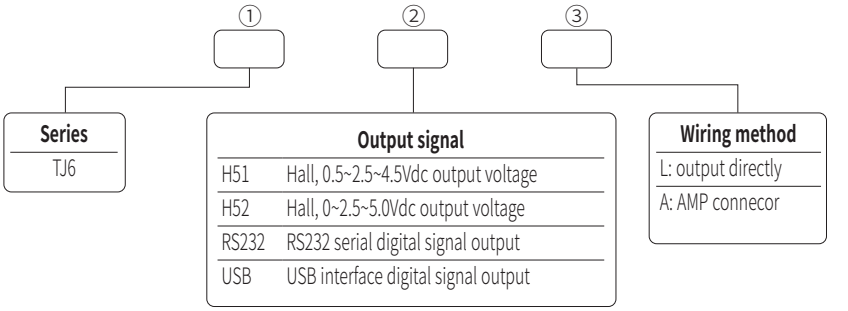
Mechanical features	
Travel angle	About±20°
Operating type	Spring return
Breakout force	2.3N
Operating force(max)	6N
Maximum allowable force	>300N
Service life	>3 million cycles
Weight	120g

Environmental data	
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP65 (Above the flange)

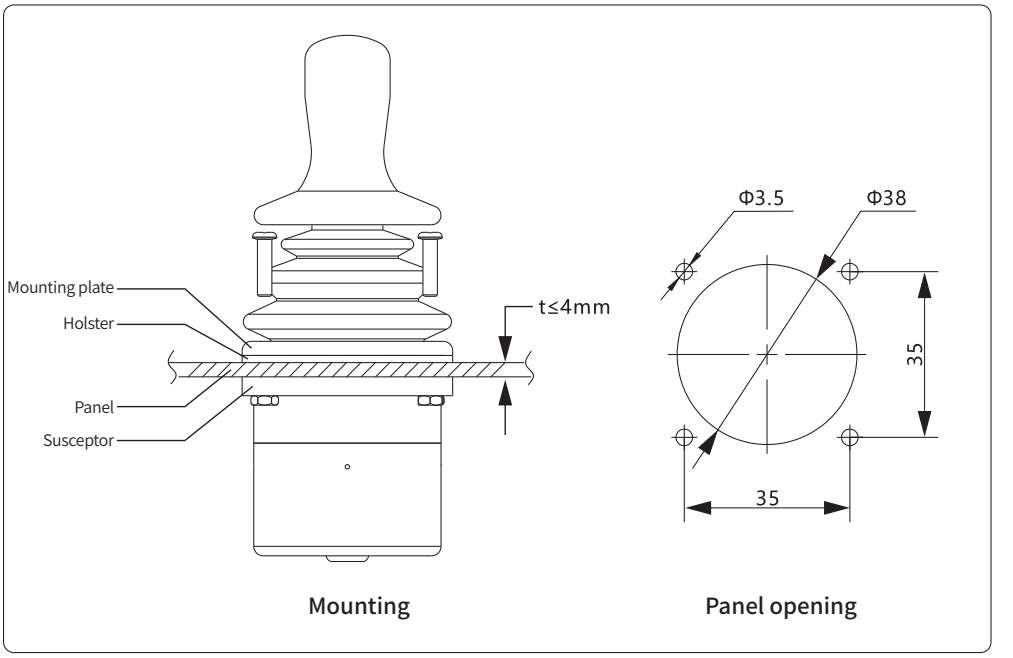
Dimensions



Product Configuration



Product Installation



Electrical Connections

Output Connection

Function	Color
VCC	Red
GND	Black
Xout	Yellow
Yout	Green

Note: See Appendix for schematic diagram of pin connection and Appendix for schematic diagram of output.

TJ9 Series Three Axis Joystick

Product Features

- Based on ergonomic principles, modeling small and operation comfortable.
- Fingertip operation, Spring return.
- Three-axis large operating angle in any direction.
- Handle top with dual button at most.
- RS232 or USB connector output available.

Application

Typical application on CCTV, Video control equipment, electric wheelchairs and medical equipment.

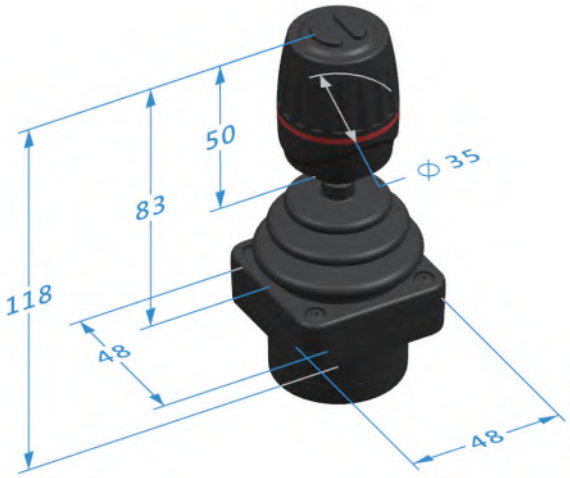
Technical Information

Electrical data	
Power supply	5±0.5Vdc (standard voltage) 9~36Vdc (wide voltage)
Maximum supply current	22mA (XY axis) 33mA (Z axis)
Maximum allowable overload voltage	20Vdc
Reverse maximum allowable voltage load	-10Vdc
Resistance	10KΩ
Center output voltage	2.5±0.1Vdc
Output linearity tolerance	<±4%

Mechanical features	
Travel angle	±28°(XY axis); ±42°(Z axis)
Operating type	Spring return
Breakout force	3N
Operating force(max)	8N
Maximum allowable force	>300N
Expecting life	>3Million (XY axis) >2Million (Z axis)
Weight	143.5g

Environmental data	
Operating Temperature	-30°C~+70°C
Storage Temperature	-40°C~+85°C
Protection level	IP65 (Above the flange)

Dimensions



Product Configuration

① ② ③ ④ ⑤ ⑥

Series
TJ9

Power supply	
S	5±0.5Vdc (stand voltage)
W	9~36Vdc (wide voltage)

Operating type		
1AX	single axis (X axis)	▭
1AY	single axis (Y axis)	▯
2AP	Cross	✚
2AC	Round	◯
2AQ	Square	□
2AG	Round with Guide	⊕

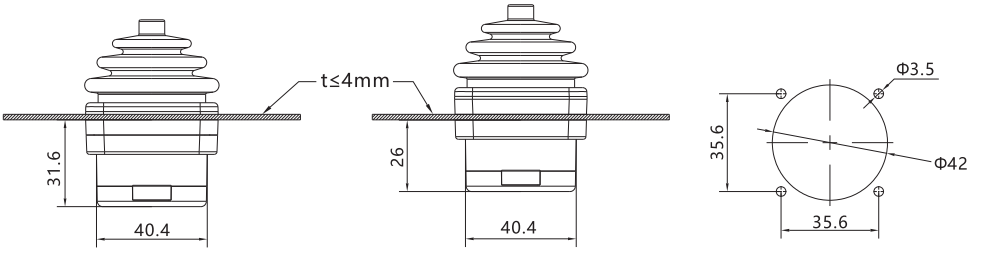
Output signal	
H51	hall type, 0.5~2.5~4.5V output voltage
H52	hall type, 0-2.5~5Voutput voltage
2H51	Redundant Hall type, 10%~50%~90%Vdc redundant voltage output
2H52	Redundant Hall type, 0%~50%~100%Vdc redundant voltage output
RS232	Serial digital signal output (External RS232 Board)
USB	USB interface digital signal output

Wiring method	
L:	Output line
A:	Connector

handle select	
Z0	Z series handle, Z axis, without button
Z1	Z series handle, Z axis, one button
Z2	Z series handle, Z axis, two buttons
ZN0	Z series handle, without Z axis% without button
ZN1	Z series handle, without Z axis, one button
ZN2	Z series handle, without Z axis, two buttons
L0	L series handle, without Z axis, without button
L1	L series handle, without Z axis, one button
L2	L Series handle, without Z axis, two buttons
L3	L3 Series handle, without Z axis, no button
H0	H series handle, Z axis, without button
H1	H series handle, Z axis, one button
H2	H series handle, Z axis, two buttons
HN0	H series handle, without Z axis, without button
HN1	H series handle, without Z axis, one button
HN2	H series handle, without Z axis, two buttons
K0	K series handle, Z axis, without button
K2	K series handle, Z axis, double button
K5	K series handle, Z axis, one button

※Note: Three-axis products only Z series handles and H series handles are available.

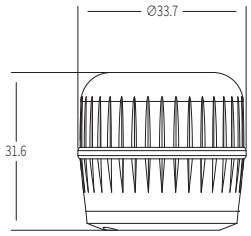
Product Installation



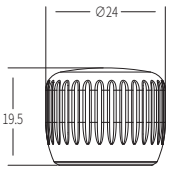
drop-in　　rear mount　　panel cutout dimensions

NOTE: With M3*16 Phillips pan head machine screws

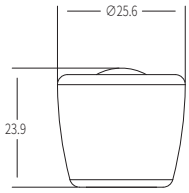
Handle



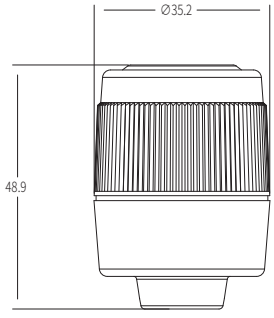
K0S handle (Z axis)



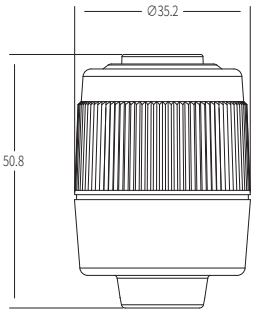
K2 handle (without Z axis)



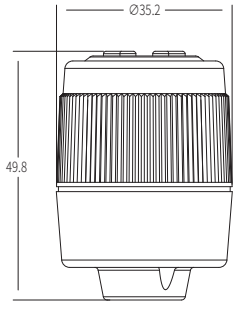
K5 handle (without Z axis)



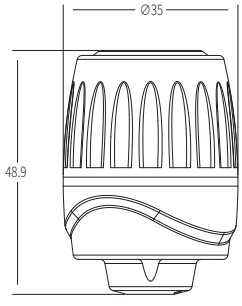
H0 handle (Z axis)



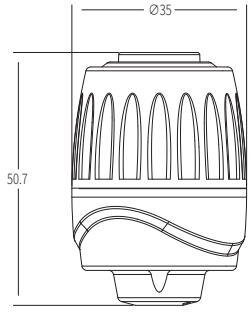
H1 handle (Z axis)



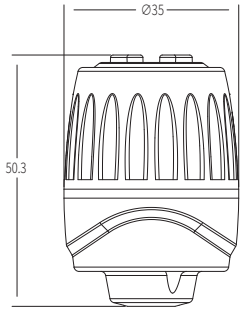
H2 handle (Z axis)



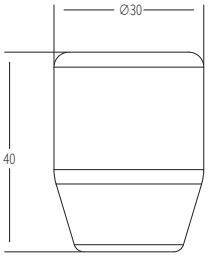
Z0 handle (Z axis)



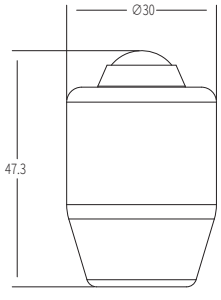
Z1 handle (Z axis)



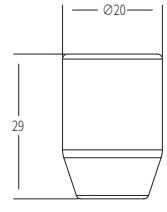
Z2 handle (Z axis)



L0 handle (without Z axis)

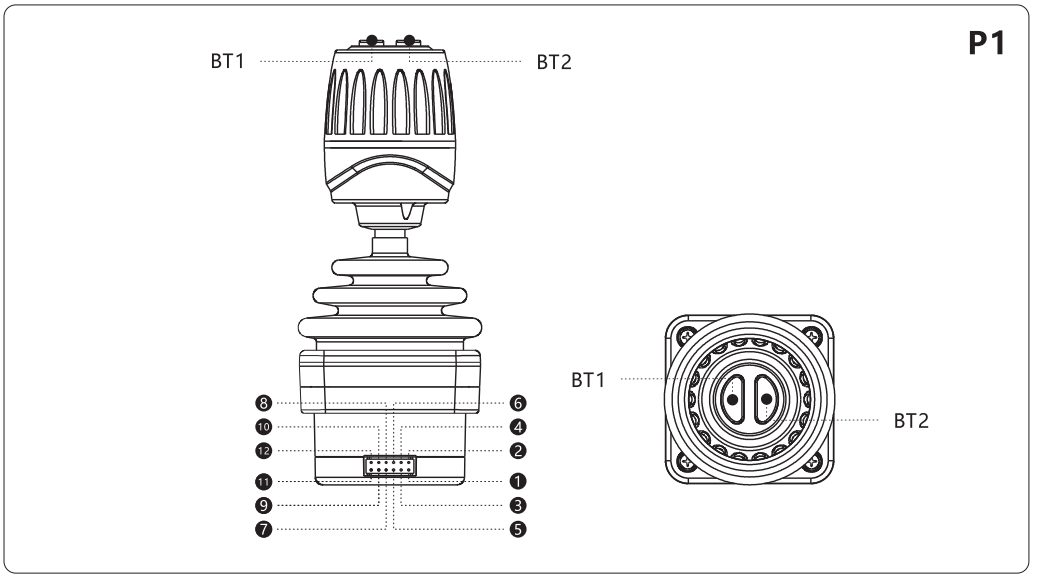


L1 handle (without Z axis)



L3 handle (without Z axis)

Electrical connections



Hall output

8-Pin Connector

Pin	Hall	Colour
1	CND	Black
2	VCC	Red
3	X out	Yellow
4	/	/
5	Y out	Green
6	/	/
7	Z out	Blue
8	/	/
9	BT1	Brown
10	BTcom	White
11	BT2	Purple
12	/	/

Each axis of redundant hall

12-pin connector

Pin	Hall	Colour
1	CND	Black
2	/	/
3	AX out	Yellow
4	BX out	Yellow/White
5	AY out	Green
6	BY out	Green/White
7	AZ out	Blue
8	BZ out	Blue/White
9	BT1	Brown
10	BTcom	White
11	BT2	Purple
12	VCC	Red

USB

USB

USB Male Connector

P2

RS232

RS232

RS232 output PCB

P3

TJ11 Series Dual Axis joystick

Product Features

- Dual-axis finger operated, spring return.
- Spring return
- With center tap potentiometer angle detection.
- Proportional amplifier to direct drive hydraulic proportional valve optional.
- Maximum current 2mA directional switch.
- Potentiometer type sensor.

Application

Typical application on remote control box, off-highway vehicle.

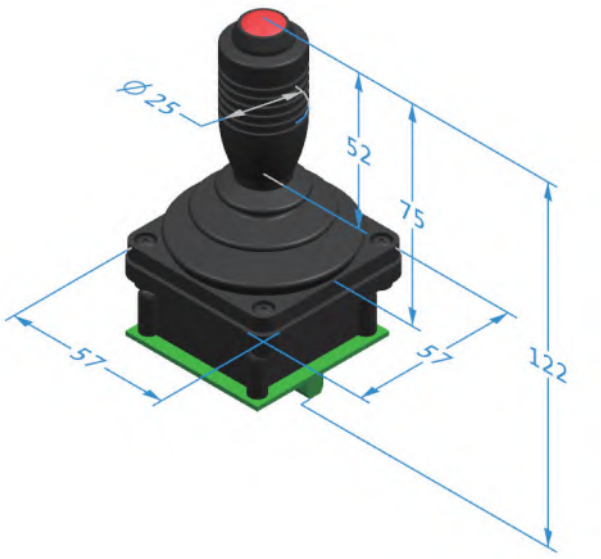
Technical Information

Electrical data	
Power supply	<36Vdc
Total resistance	5KΩ
Electrical angle	±30°
Center tap voltage	48%~52%Vdc
Center tap angle	±2.5°
On-load voltage (max)	32Vdc
Allowance maximum power dissipation	0.25W (25°C)
Load capacity:	2mA@30Vdc (Resistance load)
Breakout angle	±3°~±5°
Contact resistance	<200Ω

Mechanical features	
Travel angle	±32°
Operating type	Spring return
Breakout force	3.3N
Operating force(max)	10.8N
Maximum allowable force	300N (handle H greater than 160N)
Expecting life	>2 million cycles
Weight	125g

Environmental data	
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP65 (above the flange)

Dimensions



Product Configuration

① ② ③ ④

Series

TJ11

Operating type

1A	(Single-axis directional operated)
2AC	(Dual-axis arbitrary directional operated, (with guide groove)

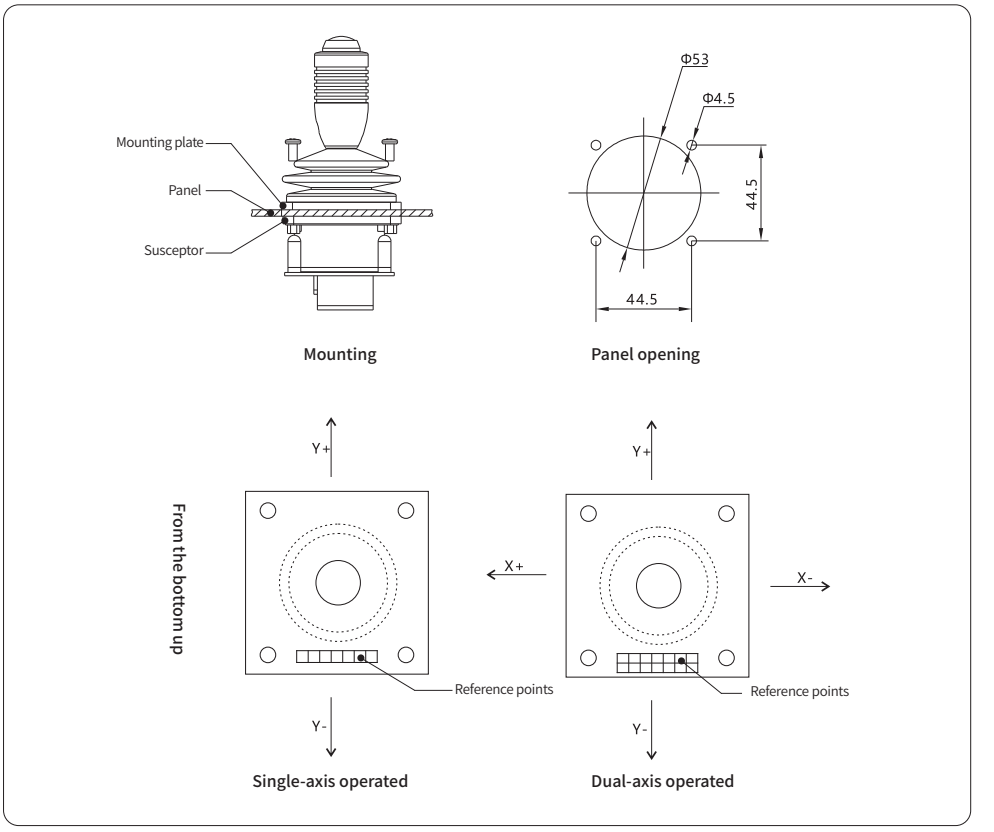
Output signal

Potentiometer (Power supply<36Vdc)	
P051	(5KΩ, 0~100%Vdc coutput voltage, forward and backward directional switch)
PWM with proportional amplifier current output	
PWM 224	(24Vdc, Power supply, 2-way output)
PWM 424	(24Vdc, Power supply, 4-way output)
PWM 212	(12Vdc, Power supply, 2-way output)
PWM 412	(12Vdc, Power supply, 4-way output)
With electronic amplifier	
U21	(18~36Vdc power supply , -10V~0V~ + 10V output)
U25	(18~36Vdc power supply , 0V~ 10V output)
U26	(18~36Vdc power supply , 6V~12V~ 18V output)
I21	(9~36Vdc power supply , 2-wire system 4mA~12mA~-20mA output)
I22	(9~36Vdc power supply , 2-wite system 20mA~4mA~-20mA output)

Handle

S	(S handle, Without button)
L	(L handle, Without button)
H	(H handle, Without button)

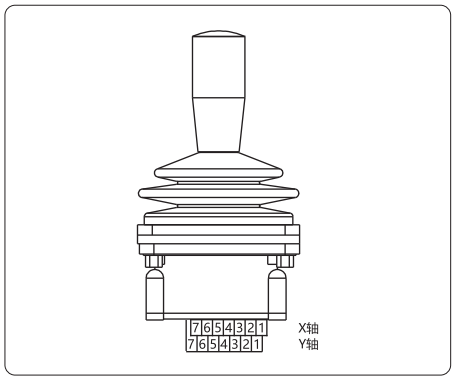
Product Installation



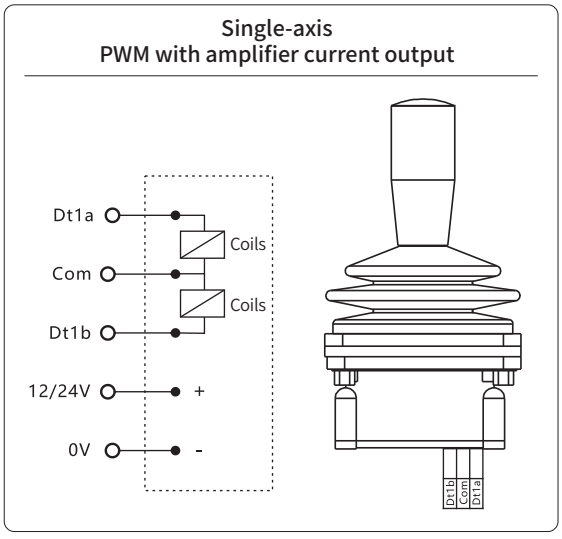
Electrical Connections

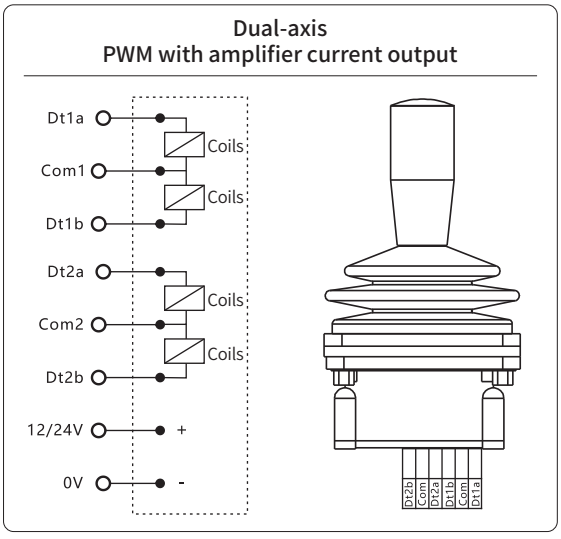
connector

connector	Potentiometer
1	Com
2	Backward switch
3	Potentiometer sliding end
4	Potentiometer terminal A
5	Center tap
6	Potentiometer terminal B
7	Button switch
8	Button switch
9	Button switch

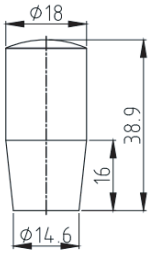


With proportional amplifier

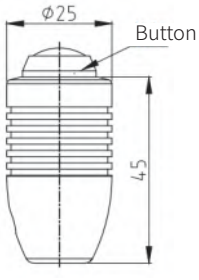




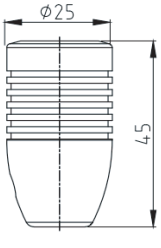
See Appendix



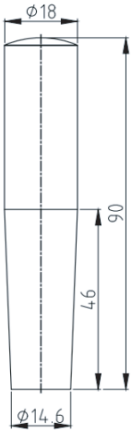
handle L



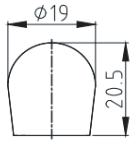
handle H



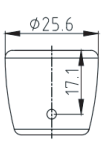
handle H0



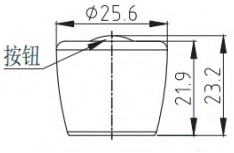
handle L9



handle S



handle K50



handle K5

TJ100 Series Single Axis Joystick

Product Features

- Ergonomic design, comfortable grip, strong and durable.
- Single-axis finger operated, forward and backward directional operated.
- Small size and more joysticks could be installed and operated side by side.

Application

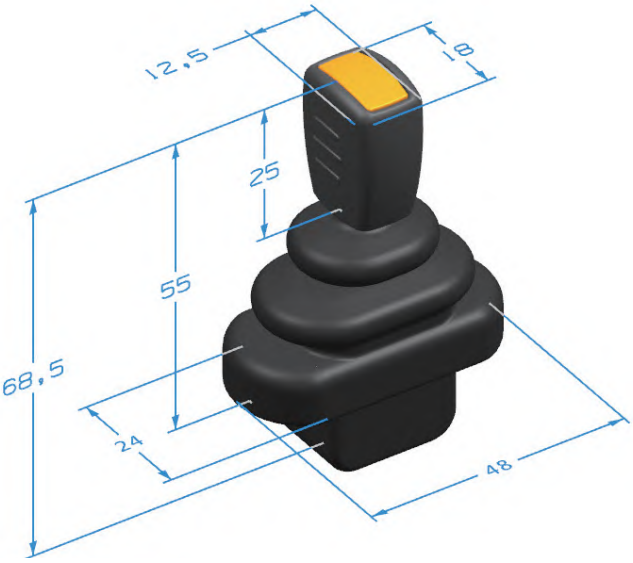
Typical apply on remote control unit, off-highway vehicle and industrial panel control.

Technical Information

Electrical data	
Power supply	5±0.5Vdc
Max Current	<9mA
Maximum allowable overload voltage	30Vdc
Reverse maximum allowable voltage	-10Vdc
Load resistance	10 kΩ
Center voltage	2.5V±0.1V
Output linearity tolerance	<±3%

Mechanical features	
Travel angle	±20°
Operating type	Spring return
Operating force(max)	150～200N
Expecting life	＞1 million
Weight	48±5g
Operating force	5-8N

Environmental data	
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP68



Q Grip

Interface information

- 0.2mm^2 high temperature wire line (color is optional);
- Generally output line directly without connector (connector is optional if request);
- Handle color can be customized;
- Negotiate in advance if has special requirements.

Product Configuration

① Series

Series
TJ100

② Single hall output signal

H51	Voltage output of 0.5~2.5~4.5Vdc
H52	Voltage output of 0~2.5~5.0Vdc
H53	Voltage output of 1.25~2.5~3.75Vdc

③ Handle

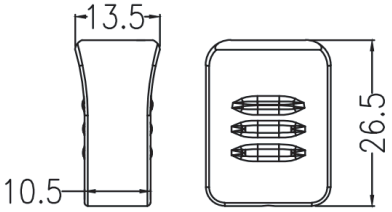
Q	(Q handle)
B	(B handle)
L	(L handle)

④ Dust cover colour

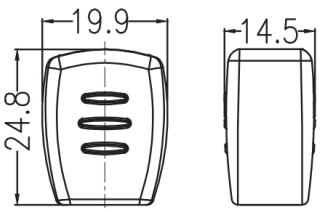
R	Red
Y	Yellow
B	Blue
G	Green
Default	Black

⑤ Wiring method

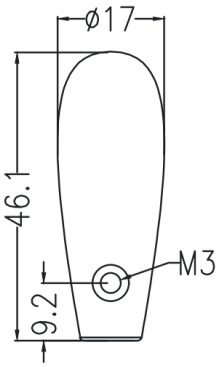
N/A	Directly outline
D	Connect outline



Handle B



Handle Q

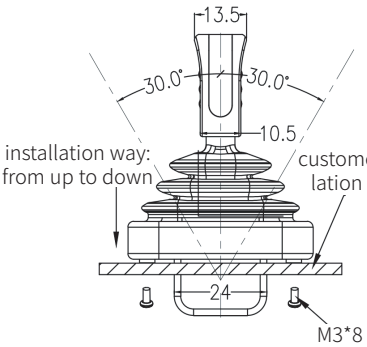


Handle l

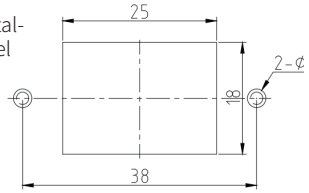
Electrical Connections

Color	Function
Black	GND
Red	5V
Yellow	Output

Product Installation



Hole Size



TJ120 Series Single Axis Joystick

Product Features

- Single-axis control on fore-and-aft direction
- Fingertip control, spring return
- Small size, easy to install
- Potentiometer
- Customize output voltage range IP67

Application

Typical application on remote control unit, off-highway vehicle and industrial panel control.

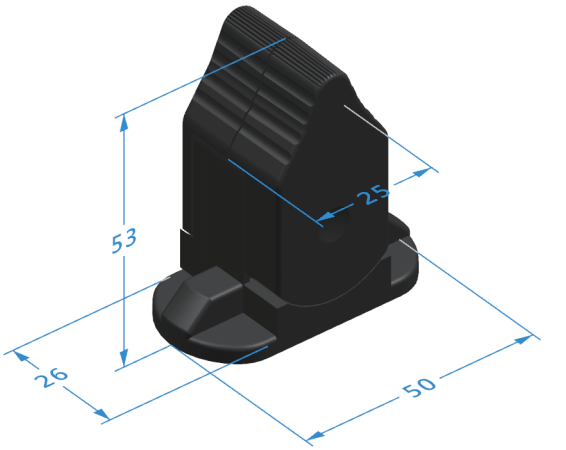
Technical Information

Electrical data	
Power Supply	
Power supply	<32Vdc
Total resistance	4KΩ or 5KΩ
Resistance tolerance	<20%
Electrical angle Center	±28°
Tap angle	±2.5°
Dissipation(max)	0.25W (25°C, no-load)
Center tap output voltage Directional switch	48%~52% (±2%)
Power supply	<35Vdc
Maximum current	2mA

Mechanical features	
Travel angle	about±30°
Operating type	Spring return
Breakout force	1.3N
Operating force(max)	3N
Maximum allowable force	>50N
Expecting life	>2 million cycles (Potentiometer)
Weight	45g

Environmental data	
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP65 (Form above when mounted)

Dimensions



Product Configuration

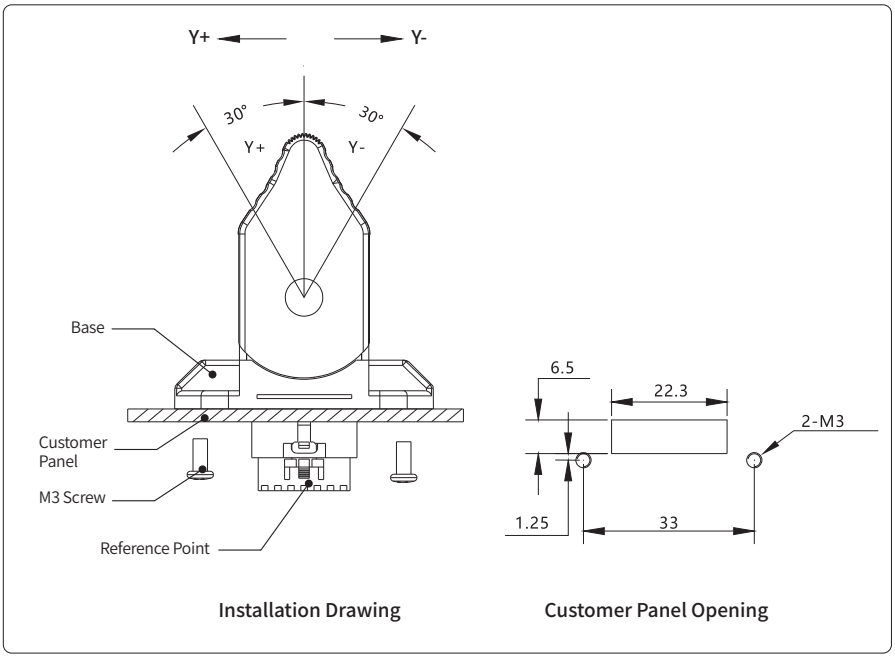
① Series
TJ120

② Output signal	
Potentiometer Power Supply<32Vdc	
P041	(4KΩ, 0%～100%Vdc Voltage Output, Forward and backward switch)
P052	(5KΩ, 10%～90%Vdc Voltage Output, Forward and backward switch)
P053	(5KΩ, 25%～75%Vdc Voltage Output, Forward and backward switch)

③ Dust cover selection	
N/A	With dust cover
N	Without dust cover

④ Wiring method	
N/A	Direct connect
Q	Connect outline

Product Installation

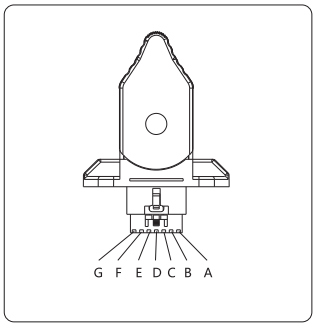


Installation Drawing　　Customer Panel Opening

Electrical Connections

Connection List
(FCI DUBOX™ 7Pin Connection plug 76382-307)

Pin	Potentiometer	HALL	Color
A	Center tap	N/A	Red
B	VCC	VCC	Blue
C	Wiper output signal	B out	Black
D	GND	0V	White
E	Switch terminal (X+)	N/A	Yellow
F	Switch terminal (X-)	N/A	Green
G	COM	N/A	Gray



TJ130/131 Series Single Axis Joystick

Product Features

- Fingertip type single shaft handle, forward and backward direction operation.
- Automatic spring reset.(Note ※TJ131 with positioning lock)
- Compact and easy to install.
- Non-contact Hall sensor.
- Reliable structure, no dust cover, suitable for all kinds of harsh environment.
- The handle is covered with adhesive, comfortable to touch, and the color can be specified.
- Various modes of optional

Application

This series of products are mainly used in industrial remote control, various engineering vehicles or industrial machinery and equipment control panel.

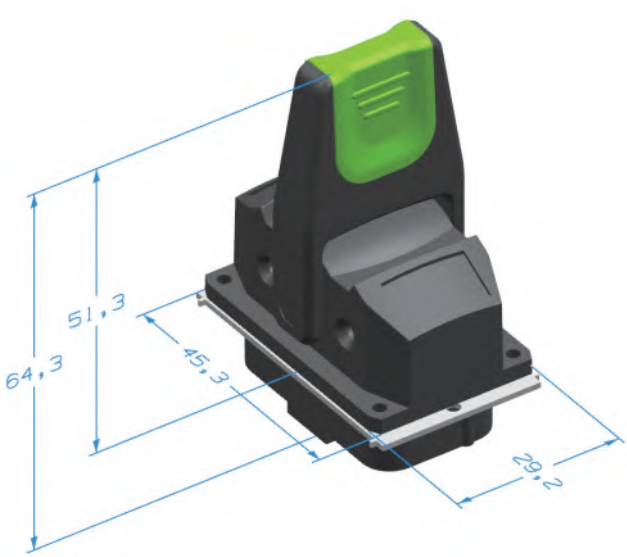
Technical Information

Electrical parameter	
Supply voltage	5.0±0.5Vdc (standard voltage)
Supply current	<9mA
Limit allowable voltage	20Vdc
Reverse limit allowable voltage	-10Vdc
load resistance	>10KΩ
Median output voltage	2.5±0.1V
Linear error of output voltage	<±2%

Mechanical features	
Travel angle	about±30°
Operating mode	Automatic spring reset
Starting force	1.3N
Maximum operating force	3N
Margin pressure test location	>30N
Service life	>2M
Weight	45g

Environmental parameter	
Working temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP65 (Just for the electric part)

Dimensions



Product Configuration

① Series	
TJ130-routine	
TJ131-with lock	

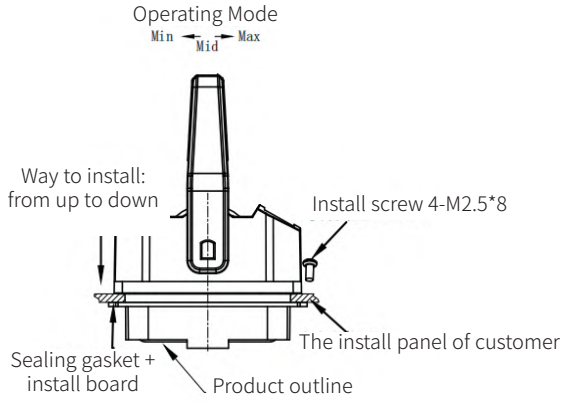
② Output signal	
Single hall	
H51	0.5~2.5~4.5Vdc Voltage output.
H52	0~2.5~5.0Vdc Voltage output.
H53	1.25~2.5~3.75Vdc Voltage output.
Redundant hall(single axis)	
2H51	0.5~2.5~4.5Vdc Voltage output.
2H52	0~2.5~5.0Vdc Voltage output.
2H53	1.25~2.5~3.75Vdc Voltage output.
Wide Voltage(9~36V Single hall)	
H51-W	0.5~2.5~4.5Vdc Voltage output.
H52-W	0~2.5~5.0Vdc Voltage output.
H53-W	1.25~2.5~3.75Vdc Voltage output.

③ Start position	
N/A	Start in the median position.
S	Start in the lateral position.

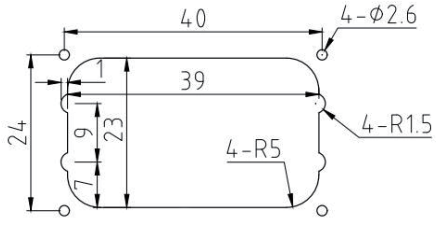
④ Local mode	
N/A	No lock
L	Single lock
BL	Locked position

⑤ Wiring method	
N/A	Direct outline
D	Connect outline
A	Connect outline

Product Installation



Customer installation diagram



Customer panel opening diagram

Electrical Connections

Direct outline

Line colour	Function
Red	Input voltage -5V
Black	0V
Yellow	Output

TS10 Series Press Hall Button

Product Features

- Non-contact hall sensor or long servive life potentiometer test way.
- Designed for Industrial remote control, Dustproof and waterproof with long life.

Application

This series of products is mainly used in industrial throtte switch, used in long distance operation, industrial operation panel analog quantity button.

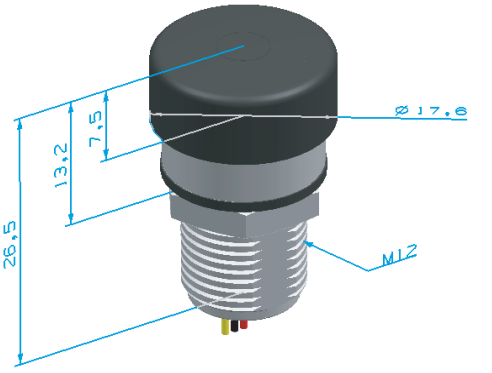
Technical Information

Electrical parameter	
Supply voltage	5.0±0.5Vdc (standard voltage)
Supply current	<9mA
Limit allowable voltage	20Vdc
Reverse limit allowable voltage	-10Vdc
Load resistence	>10KΩ
Linear error of output voltage	<±2%

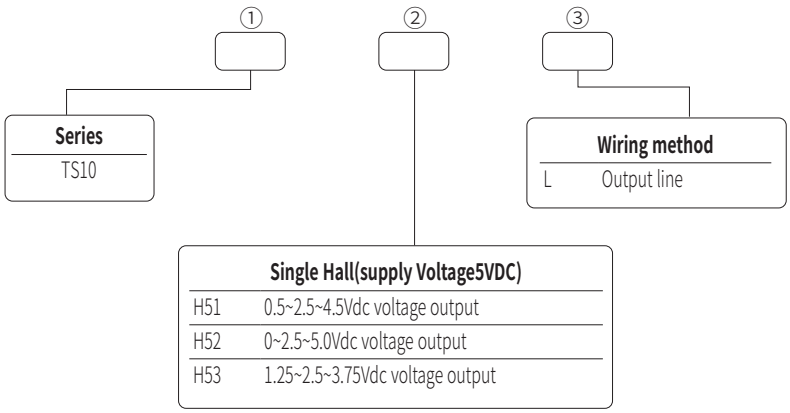
Mechanical parameter	
Shaking angle	4±0.3mm
Operating mode	Automatic spring reset
Maximum operating force	>300N
Limit location force	>2M
Service life	45g
Weight	1Nm Max

Environmental parameter	
Working temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP65 (just for the electrical part)

Dimensions



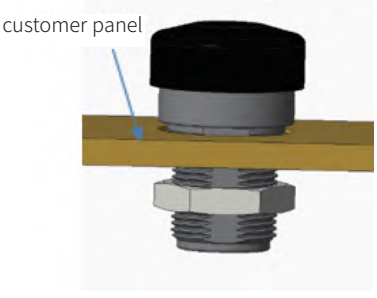
Product Configuration



Product Installation

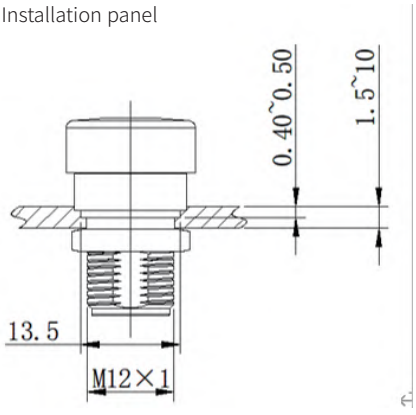
Installation way
Explain: from up to down install button,thread specification M12*1

customer panel



Customer installation diagram

Installation panel



Customer panel opening diagram

Electrical Connections

Direct outlet

Line colour	Function
Red	5V
Black	0V
Yellow	OUT

TS4 Series Fingertip Operating Joystick

Product Features

- Fingertip joystick,turning way operation.
- Compact shape, easy to install.
- Friction location ,starting band feeling.
- Potentiometer and non-contact hall sensor.
- Different output voltage range.

Application

This series of products are mainly used in industrial engerneering remote control、kinds of engerneering vehicle or industrial mechinal equipment control panel.

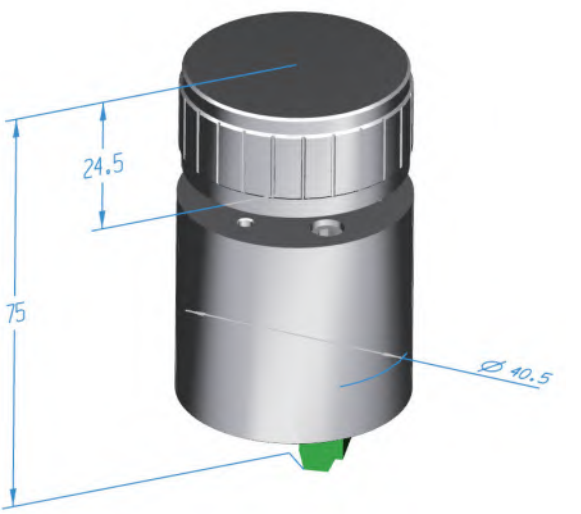
Technical Information

Electrical parameter	
Potentiomertic sensors	
Supply voltage	12Vdc
Working current	＜30mA
Output signal	0.5-4.5Vdc, Dextral augmentation

Mechancial parameter	
Servive life	>3M
Electrical stroke	270°+/-2°

Environmental parameter	
Working temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP64

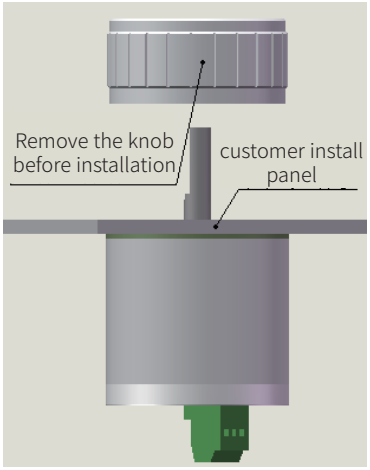
Dimensions



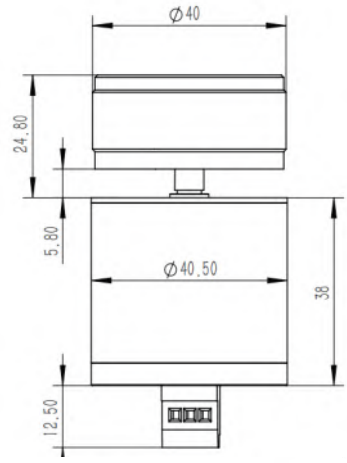
Product Configuration

① Series	② Input voltage	③ Output signal	④ Wiring method
TS4	W 9~36Vdc(wide voltage)	**Oridnary hall(0.5~4.5Vdc)**	C: Connect outline
		H51 (One hall per axis, 0.5~2.5~4.5Vdc voltage output)	
		H52 (One hall per axis, 0~2.5~5Vdc voltage output)	

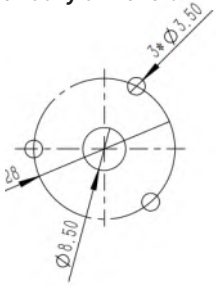
Product Installation



Install diagram



Boundary dimension



Install opening size

Electrical Connections

Terminal	Function
VCC	Supply voltage 9-30Vdc
OV	Power 0V
OUT	Hall output

TS50 Series Fingertip Operating Joystick

Product Features

- Dualing rotation operation or single rotation operation.
- Friction positioning, hand feeling comfortable.
- Hall untouch testing.

Application

This series products are mianly used in the kinds of mechanical, road mechanical control panel.

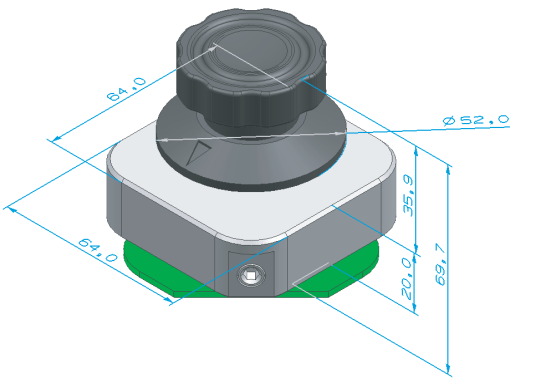
Technical Information

Electrical parameter	
Potentiometric sensors	
Mains voltage	5±0.5Vdc or 9-36V
Maximum supply current	10mA
Median output voltage	2.5±0.1V
Reverse limit allowable voltage	-10Vdc
Linear error of output voltage	<±0.2V
Limit allowable voltage	35Vdc

Mechanical parameter	
Rotation angle	±135°(dual operation, can be customized) 270°(single operation)
Operation mode	Friction location
Starting	About 3N
Maximum operation force	About 15N
Limit location force	About 100N
Serving life	>5M

Environmental parameter	
Working temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP67(just for the electronic part)

Dimensions



Product Configuration

① Series
TS50

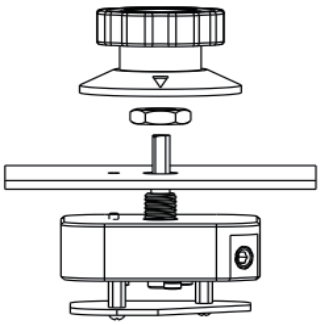
② Operation mode
FCF Friction positioning, median band feeling.
FEF Friction positioning, starting band feeling.

③ Output signal
Hall (power Voltage5VDC)
H51 (0.5~2.5~4.5Vdc outout Voltage)

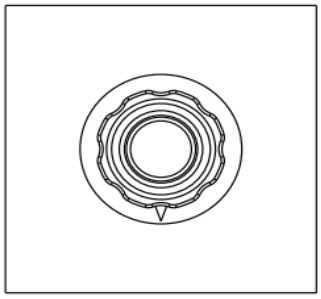
④ Handle
R1 R1 spins the handwheel (ϕ65)
R2 R2 spins the handwheel (ϕ52)

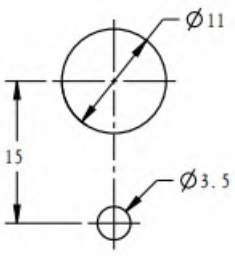
⑤ Wiring method
L Direct outlet
C Terminal Connector

Product Installation



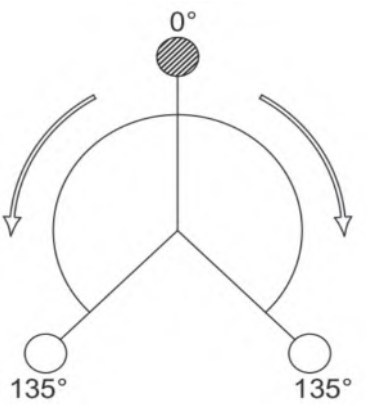
Installation instruction



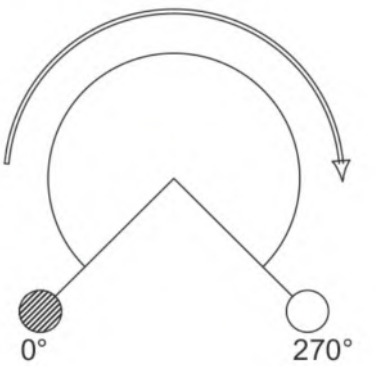


Dimensions of mounting holes

Operation direction



FCF



FEF

TJ140 Series Dual Axis Joystick

Product Features

- Thumb operation
- Spring return
- Uncontact hall effect
- Single/Double axis optional
- Various handle ends can be customized.

Application

Mainly used in various operating joystick, operating panels, and miniature remote control.

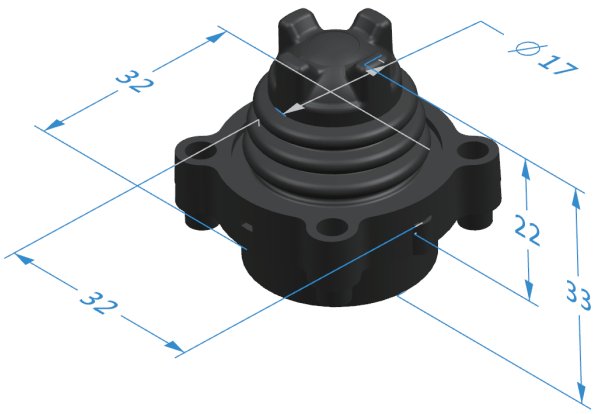
Technical Information

Electrical data	
Power supply	5±0.5Vdc
Electrical angle	±25°
Supply current (max)	<9mA;18mA(Redundant Hall)
Center tap output voltage	2.5±0.15V
Reverse maximum allowable voltage	-10Vdc
Output linearity tolerance	<±0.2V
Maximum allowable overload voltage	30Vdc

Mechanical features	
Travel angle	±25°
Operating type	Spring return
Breakout force	about 2N
Operating force (max)	about 5N
Maximum allowable force	about 100N
Expecting life	>1 M
Weight	about 18g

Environmental data	
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP65

Dimensions



TJS

Product Configuration

① Series	
TJ140 mounting plate	
TJS nut	

② Operating mode	
1A	Single axis front and rear direction of operation
2AC	Dualing axis arbitary direction of operation

③ Output signal	
Reduntant Hall (Power voltage 5VDC)	
2H51	0.5~2.5~4.5Vdc 4.5~2.5~0.5Vdc voltage output
2H52	0~2.5~5Vdc 5~2.5~0Vdc voltage output
Single Hall	
H51	0.5~2.5~4.5Vdc voltage output
H52	0~2.5~5Vdc voltage output

④ GRIP	
TJS	N/A(Button top) N(No button top)
TJ	01handle 03handle 03Ghandle
Note: TJ see handle optional upper end	

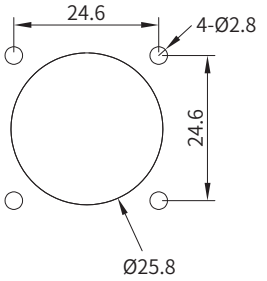
⑤ Wiring mode	
L	Direct outlet
D	Terminal outline

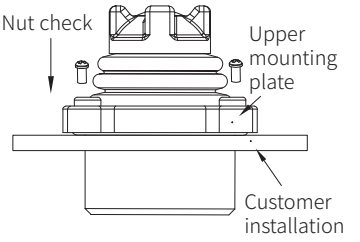
Note: TJ140 use install panel to fixation,TJS use nut to fixation

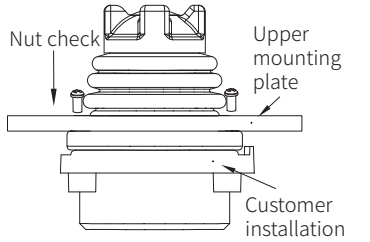
Product Installation

TJ140

Opening size

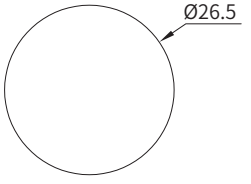




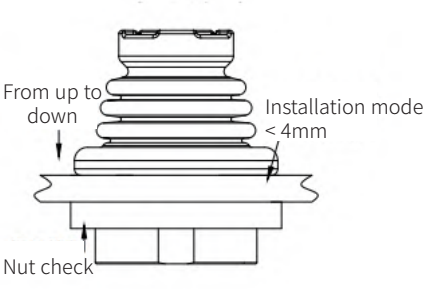


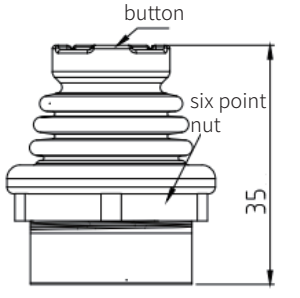
TJS

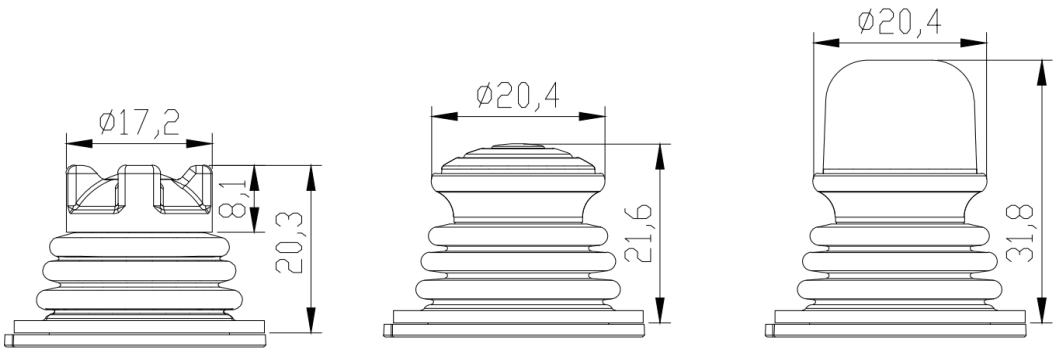
Opening size



Installation mode





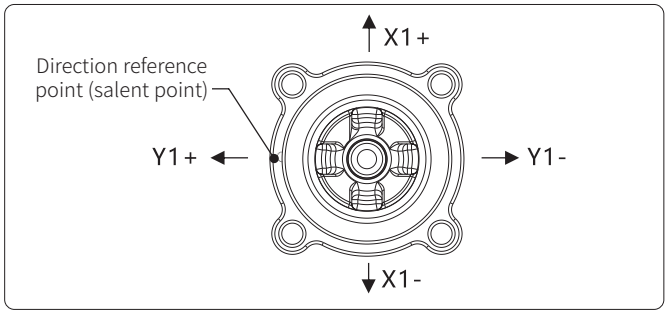


01 Handle **03 Handle** **03G Handle**

※TJS The upper end of handle is fixed.

Electrical Connections

Color	Function	Remark
Black	GND	
Red	VCC	
Yellow	X1out	
Blue	Y1out	
Yellow/White	X2out	Redundancy specific
Blue/White	Y2out	Redundancy specific



TJ200 Series Double Axis Joystick

Product Features

- Thumb operation
- Spring return
- Uncontact hall effect

Application

Typical apply on various joysticks, and operating panel.

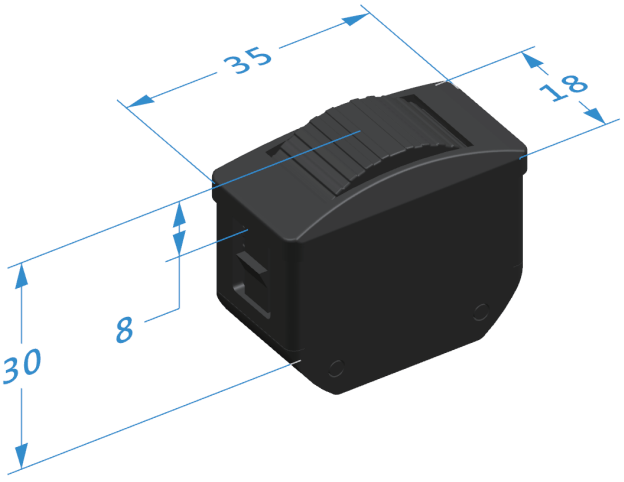
Technical Information

Electrical data	
Power supply	5±0.5Vdc
Electrical angle	±42°
Supply current (max)	10mA
Center tap output voltage	2.5±0.1V
Reverse maximum allowable voltage	-10Vdc
Output linearity tolerance	<±0.2V
Maximum allowable overload voltage	35Vdc

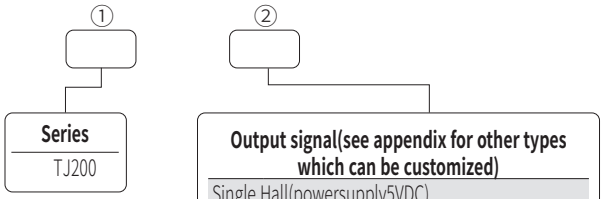
Mechanical features	
Travel angle	±42°
Operating type	Spring return
Breakout force	about 2N
Operating force (max)	about 11N
Maximum allowable force	100N
Expecting life	>100 thousand cycles
Weight	about 15g

Environmental data	
Operating temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP67 (Electron-only part)

Dimensions

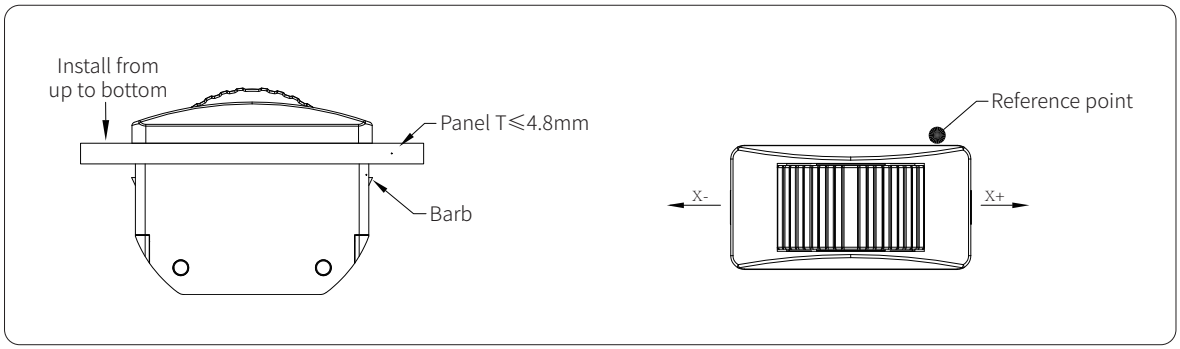


Product Configuration



Output signal(see appendix for other types which can be customized)	
Single Hall(powersupply5VDC)	
H51	(0.5~2.5~4.5Vdc output)
H52	(0~2.5~5Vdc output)
Other outputs can be customized	

Product Installation



Electrical Connections

NO.	Color	Function
1	Red	5V
2	Black	0V
3	Green	OUT

TJ300 Series Single Axis Joystick

Product Features

- Finger operation.
- Spring automaticlly reset.
- Hall no-touch detection.

Application

This series products is mainly used in various operating handle,operating panels.

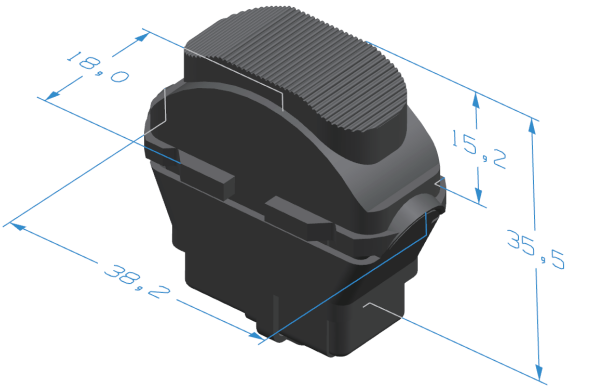
Technical Information

Electrical parameter	
Supply voltage	5±0.5Vdc
Maxium power electricity	10mA
Median output voltage	2.5±0.1V
Reverse limit allowable voltage	-10Vdc
Linear error of output voltage	<±0.2V
Limit allowed voltage	35Vdc

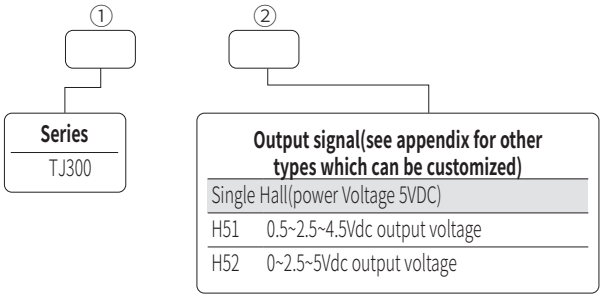
Mechanical parameter	
Shaking angle	±13°
Operating mode	spring automatic resert
Starting force	about 2N
Operating force	about 9N
Margin pressure test location	about 100N
Servive life	>1M
Weight	about 15g

Environmental parameter	
Working temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP67 (just for the electrical part)

Dimensions



Product Configuration



Product Installation

Installation diagram (It cannot be used independently. It must be used with the upper end of the package)

Define direction
(the outgoing edge is in the rear direction)

Electrical Connections

Pin	Colour	Function	Front	Median	Rear
1	Orange	Input 5Vdc	——	——	——
2	Gray	Hall output	4.5±0..2	2.5±0.1	0.5±0.2
3	Black	Power 0V	——	——	——

TJ400 Series Single Axis Joysick

Product Features

- Thumb operation.
- Spring automatic resert.
- Hall no-touch detection.

Application

This series product is mainly used in various operation joystick, operating panels.

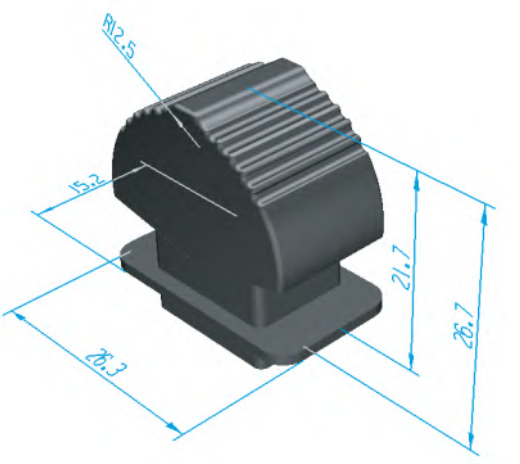
Technical Information

Electrical parameter	
Power voltage	5±0.5Vdc
Maximum supply current	10mA
Median output voltage	2.5±0.1V
Reverse limit allowable voltage	-10Vdc
linear error of output voltage	<±0.2V
limit allowed voltage	35Vdc
Electrical angle in degree	±35°

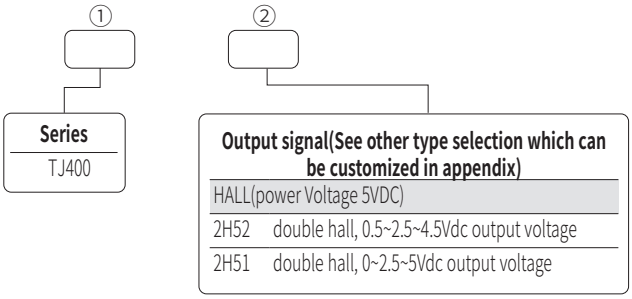
Mechanical parameter	
Shaking angle	±35°
Operating mode	Automatic spring resert
Starting force	about 2N
Operating force	about 3N
Margin pressure test location	about 100N
Servive life	>1M
Weight	about 15g

Environmental parameter	
Working temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Level of protection	IP67 (Just for the electricity part)

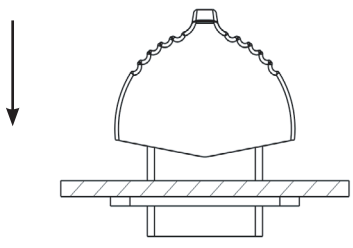
Dimensions



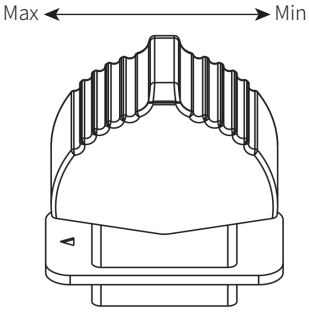
Product Configuration



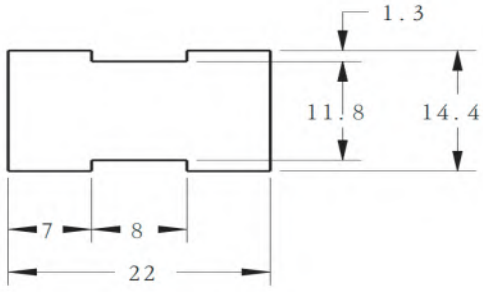
Product Installation



Installation diagram



Define direction
(outgoing edge is rear direction)



Installation hole size

TJ500 Series Single Axis Joystick

Product Features

- Thumb operation
- Spring return
- Uncontact hall effect

Application

Typical applyon various joysticks, and operating panel.

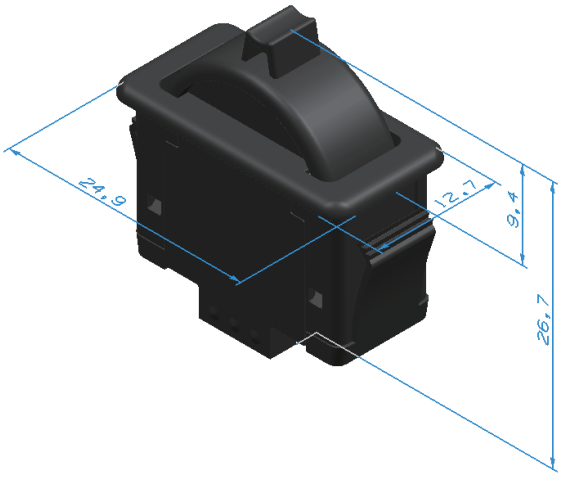
Technical Information

Electrical data	
Power supply	5±0.5Vdc
Electrical angle	±40°
Supply current (max)	10mA
Center tap output voltage	2.5±0.1V
Reverse maximum allowable voltage	-10Vdc
Output linearity tolerance	<±0.2V
Maximum allowable overload voltage	35Vdc

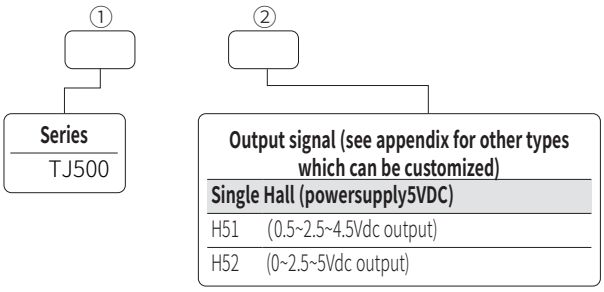
Mechanical Parameter	
Travel angle	±40°
Operating type	Spring return
Breakout force	about 2N
Operating force (max)	about 5N
Maximum allowable force	about 100N
Expecting life	>100 thousand cycles
Weight	about 20g

Environmental data	
Operating temperature	-30C~+70°C
Storage temperature	-40°C~+85°C
Protection level	IP67 (Only for electronic part)

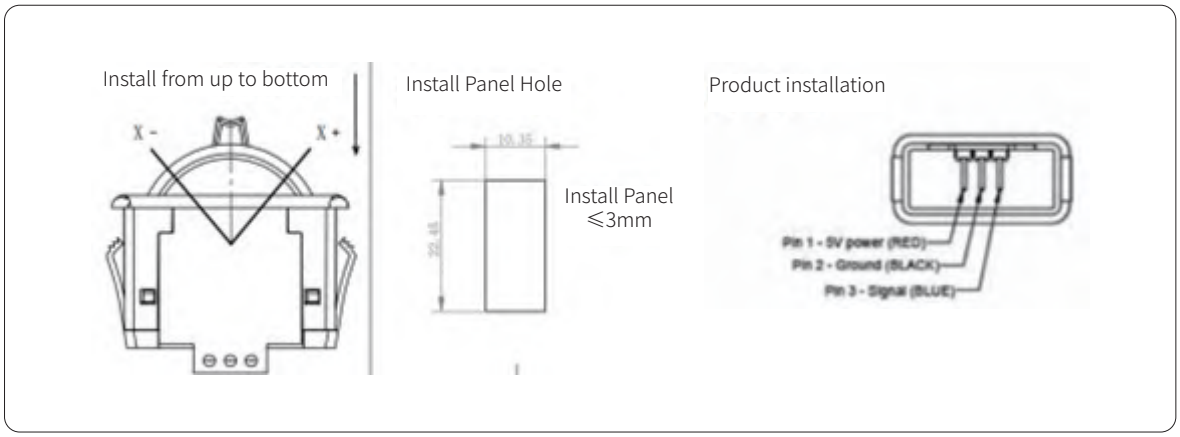
Dimensions



Product Configuration



Product Installation



Electrical Connections

NO.	Color	Function
1	Red	5V
2	Black	0V
3	Green	OUT

SA Series Grip

Product Features

- Ergonomic design, good handle feel
- Using Nylon makes components durable
- Multiple panel combinations can be configured (customizable).
- Dead man switch is an option
- You can configure the security switch

Application

Typically used in cranes, construction equipment, agricultural equipment, mining equipment. Installed on operating mechanism or pilot operated valves.

Environmental Data

Operating temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the installation panel)

Interface Information

- 0.5mm^2 wire with number, 0.2mm^2 colorful high-temperature wire; Normally, directly outlet without terminal.
- The wire length and determination, please refer to the attachment.
- Mechanical interface is customized designed.
- Please connect with the technical leader for special requirements.

Dimensions

Product Configuration

① ② ③ ④ ⑤ ⑥

Series

SA

The panel switch quantities

0	without panel switch
1	with one panel switch
2	with two panel switches
3	with three panel switches
...	
6	with six panel switches

Top switch, dead man switch

	Top Switch	Deadman switch
N	x	x
D	x	○
T	○	x
B	○	○

Note※: 2T take 2 top buttons!

Panel extension options

W	With TJ200 series finger single-axis joystick
S	With marquard rock switch
T	With TJ140 series finger 2-axis joystick with 10A center fore-and-aft micro-switch
SW	With marquard rock switch on the left and finger joystick on the right
WS	With Marquard rock switch on the right and finger joystick on the left

(See the following figure)

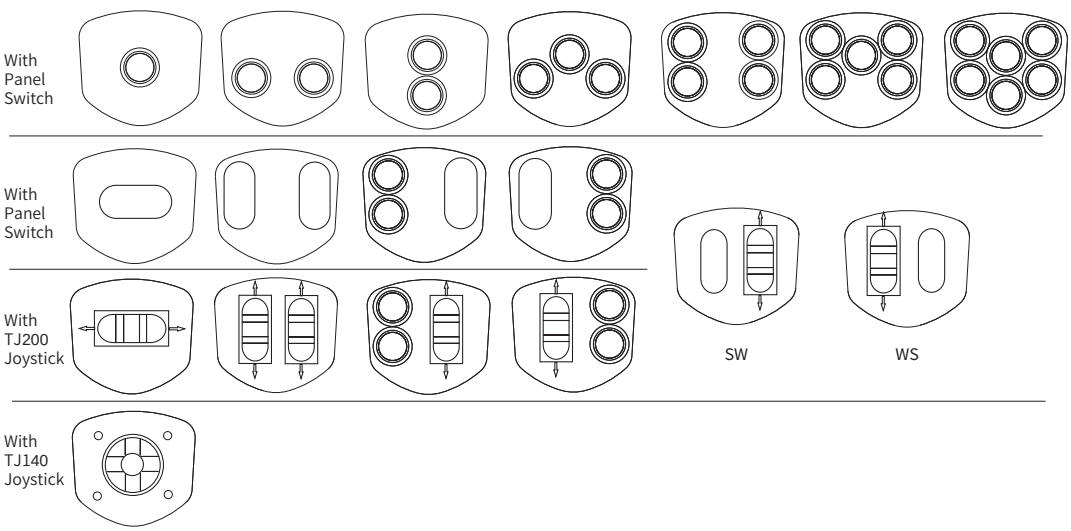
The arrangement of panel extension options

D	With two Marquard rock switches or two TJ200 joysticks (vertical arrangement)
M	With one TJ200 joystick or one Marquard rock switch (horizontalarrangement, on the middle of the panel, other switches are on its upper and below sides)
L	With one TJ200 joystick or one Marquard rock switch (vertical arrangement, on the left half of the panel, other switches are on the right half of the panel)
R	With one TJ200 joystick or one Marquard rock switch (vertical arrangement, on the right half of the panel, other switches are on the left half of the panel)
T	With Marquard rock switch on the right and finger joystick on the left

Wiring method

L	Direct line
D	Deutsch

Panel Layout



SD Series Grip

Product Features

- Overall adhesive handle, beautiful appearance.
- Panel configurable with multiple buttons (up to 3 buttons)
- Optional back button.
- Optional thumb wheel , thumb wheel is maxium with 2 panel buttons.
- Optional outgoing line way,Straight bar bend bar optional.

Application

This product is suitable for the upper end of the handle inside the excavator, It can also be installed separatelyon the pilot valve operating mechanism.

Environmental Data

Environmental data	
Operation temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C

Dimensions

Interface Information

- Use 0.08*50 high-temperature wire for outgoing cables
- Optional Deutsch plug-in cable or harness tin cable
- Lower M 14 or M12 external thread connection (standard screw)

Product Configuration

① Series

SD

② Number of panel buttons

0	No panel button
1	1 panel button
2	2 panel buttons*
3	3 panel buttons
4	4 panel buttons

(3 buttons and 4 buttons without finger wheels)

③ Back button

N	No Back button
B	Back button

④ Handle install

L	life handle
R	right handle

⑤ Thumb wheel* (only two button panels available)

WL	With Thumb wheel, Thumb wheelon the left side of the panel
WR	Thumb wheel, Thumb wheel, is on the panel
WT	With Thumb wheel, Thumb wheelon the right side of the panel

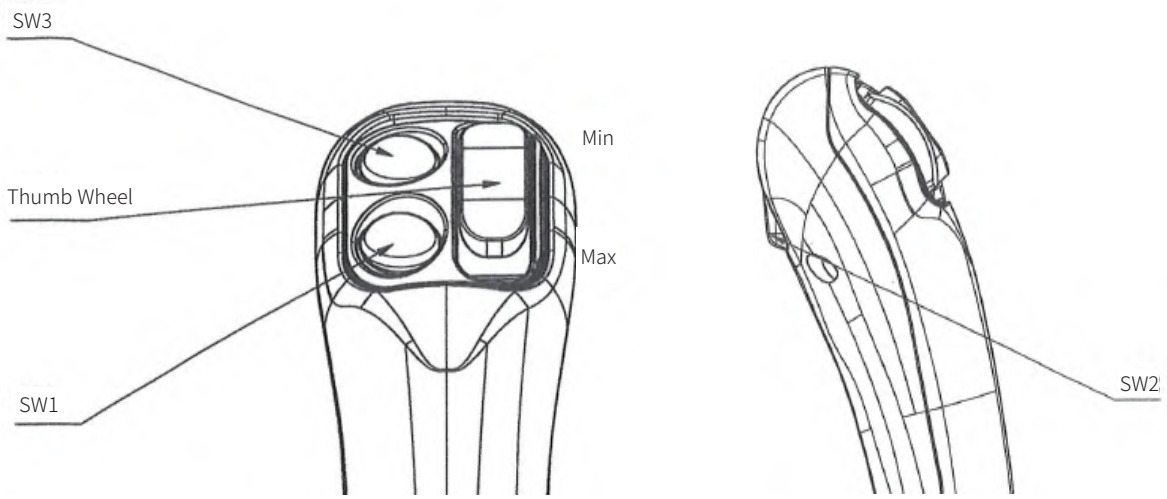
⑥ Wiring method

L	Direct line
D	Deutsch

Outgoing line definition

Deutsch

Line color	Definition
Red	Thumb wheel 5Vdc
Black	Thumb wheel GND
White	Thumb wheelout
Brown	SW1
Blue	SW3
Green	SW1/3 commonport
Yellow	SW2
Gray	SW2



SE Series Upper End of Grip

Product Features

- Ergonomic design comfortable grip.
- Adhesive handle, strong and durable, good waterproof performance.
- Can configure a variety of forms of panel combination.
- One button can be configured on the top.

Application

This series product is mainly used in various of hoisting machinery, building machinery, forest machinery,Mining machinery, It can be assembled on the lower operating mechanism or separately installed on the pilot valve operating mechanism.

Environmental Data

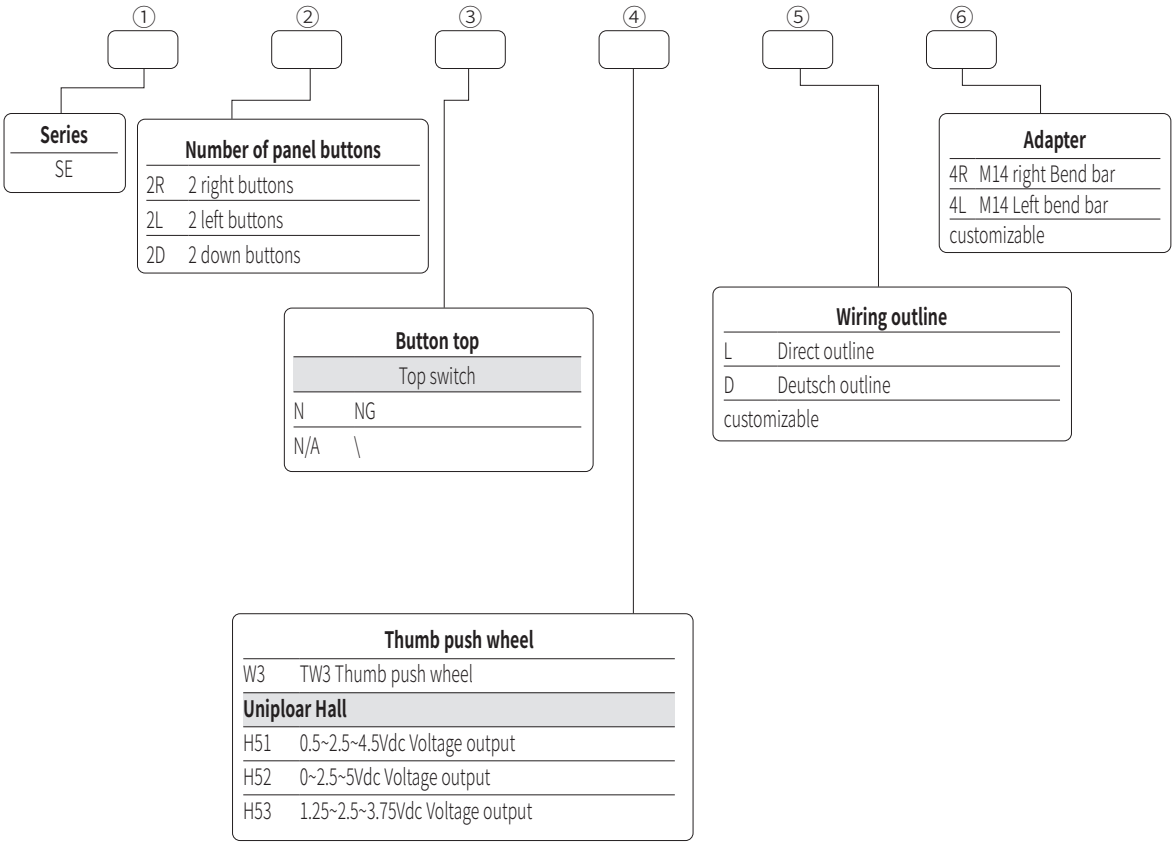
Working temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Level of protection	IP65 (mounting above panel)

Interface Information

- Use 0.08 * 50 high-temperature wire for outgoing cables
- Optional Deutsch plug-in cable or harness tin cable
- Lower M14 or M12 external thread connection (standard screw)

Dimensions

Product Configuration



SL Series Grip

Product Features

- Ergonomic design,touch comfortably
- Coated joystick,suitable for long-term operation;
- Optional combination of various forms of panel;
- One button can be configered on the back.

Application

This series of products are mainly used in a variety of excavators, loaders, lifting equipment and other construction machinery, can be separately installed in all kinds of construction machinery equipment can also be used with a variety of lower end.

Dimensions

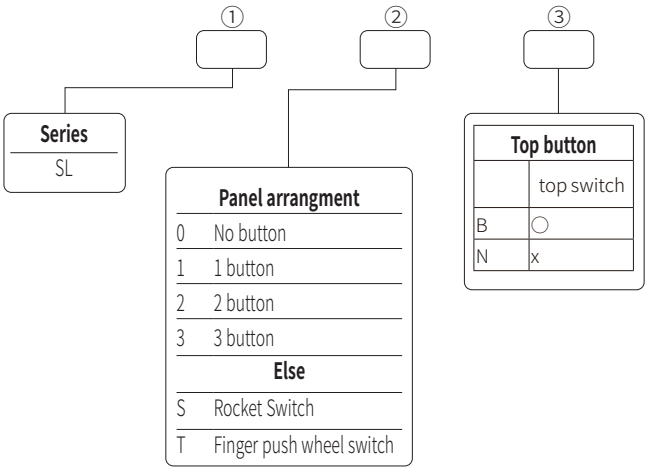
Environmental parameter

Working temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Level of temperature	IP65 (above the installation panel)

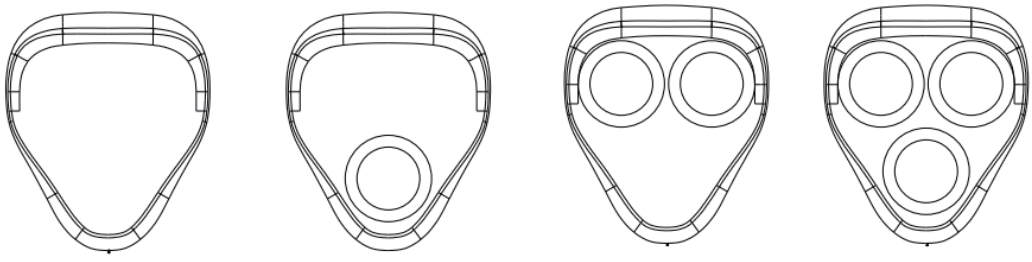
Interface Information

- 0.5mm^2 indicating number, 0.2mm^2 high temperature color line is optional;
- Generally, it is directly outgoing, without connector (optional connect or can be selected according to customer requirements);
- Please refer to the attachment for line length and line definition;
- Joystick connector can be customized;
- Any special request should be negotiated in advance.

Product Configuration



Panel Layout



SP Series Grip

Product Features

- Ergonomic design, good handle feel
- Be made of polypropylene
- Various panel options
- One side switch is an option
- One or Two finger joysticks are optional

Application

Typically used in cranes, construction equipment, agricultural equipment, mining equipment. Installed on operating mechanism or pilot operated valves.

Environmental Data

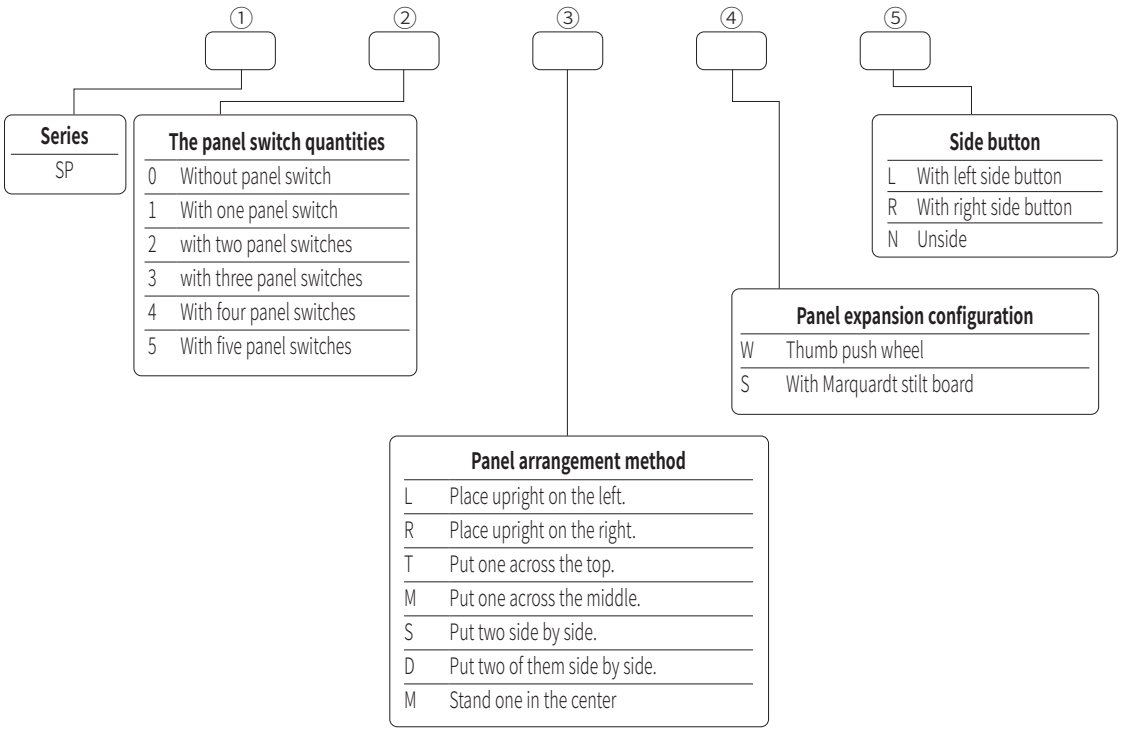
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the installation panel)

Interface Information

- 0.2mm^2 colorful high temperature wire;
- Normally, directly outlet without terminal.
- The wire length and determination, please refer to the attachment
- M12、M14 female mechanical interface.
- Please connect with the technical leader for special requirements.

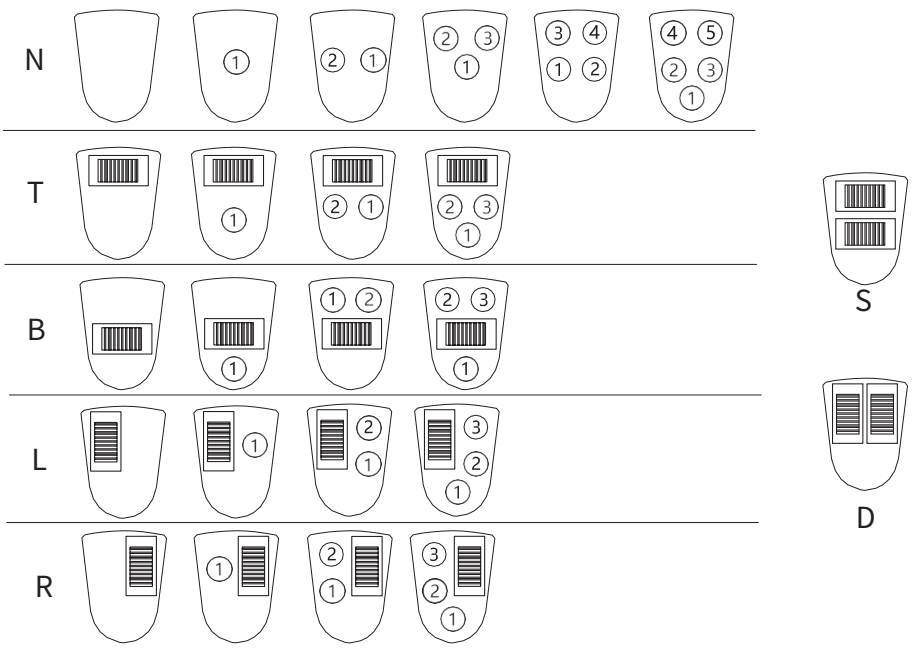
Dimensions

Product Configuration



Panel layout

Note: Panel can be customized.



SS Series Grip

Product Features

- Ergonomic design, good handle feel
- Using Nylon makes components durable
- Various panel options
- One side switch is an option
- Dead man switch is available

Application

Typically used in cranes, construction equipment, agricultural equipment, mining equipment. Installed on operating mechanism or pilot operated valves.

Dimensions

Environmental Data

Operating temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the installation panel)

Interface Information

- 0.5mm^2 wire with number, 0.2mm^2 colorful high-temperature wire; Normally, directly outlet without terminal.
- The wire length and determination, please refer to the attachment.
- M12 female mechanical interface.
- Please connect with the technical leader for special requirements.

Product Configuration

① Series
SS

② The Panel Switch Quantities
0 Without panel switch
1 With one panel switch
2 With two panel switches
3 with three panel switches
And so on.

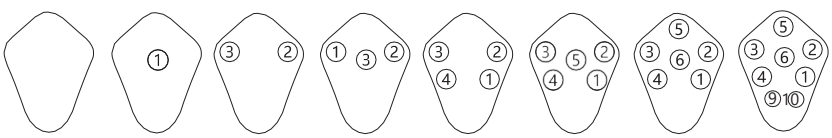
③ Top Switch, dead man switch and sensor switch			
	Top Switch	Dead Man Switch	Sensor Switch
N	x	x	x
D	x	○	x
T	○	x	x
B	○	○	x
A	○	x	○
G	x	x	○

④ Panel extension options	
W	With TJ200 (Thumb Wheel) Thumb single-axis optional joystick.
S	With marquard rock switch
TW	With TJ140 series finger 2-axis joystick, with 10A center fore-and-aft micro-switch
TA	With TJ140 series finger 2-axis joystick, with 10A center fore-and-aft micro-switch
SW	With Marquard rock switch on the left and finger joystick on the right (Note: ⑤ is not available)
WS	With Marquard rock switch on the right and finger joystick on the left (Note: ⑤ is not available)

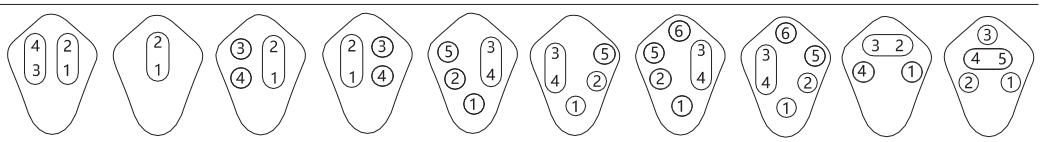
⑤ The arrangement of Panel extension options	
D	with two Marquard rock switches or two TJ200 joysticks (vertical arrangement)
U	with one TJ200 joystick or one Marquard rock switch (horizontal arrangement, on the upper half of the panel, other switches are below it)
M	with one TJ200 joystick or one Marquard rock switch (horizontalarrangement, on the middle of the panel, other switches are on its upper and below sides)
L	with one TJ200 joystick or one Marquard rock switch (vertical arrangement, on the left half of the panel, other switches are on the right half of the panel)
R	with one TJ200 joystick or one Marquard rock switch (vertical arrangement, on the right half of the panel, other switches are on the left half of the panel)
C	with one TJ200 joystick or one Marquard rock switch (vertical arrangement, on the middle of the panel, other switches are bellow it)

Panel Layout

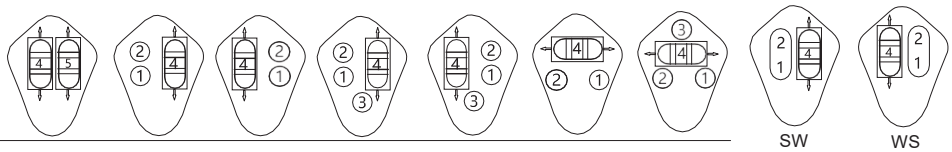
With Panel Switch



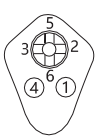
With Rock Switch (S)



With TJ200 Joystick (W)



With TJ140 Joystick (TW/TA)



SY Series Grip

Product Features

- The whole package plastic handle, beautiful appearance;
- Waterproof and dust-proof, feel comfortable;
- Number of buttons panel can be optionaled;
- Optional safety switch;
- Cables can be routed independently, and the routing mode is optional.

Application

Mainly used with excavator handle, can also be separately installed in the pilot valve operating mechanism for use.

Environmental parameter

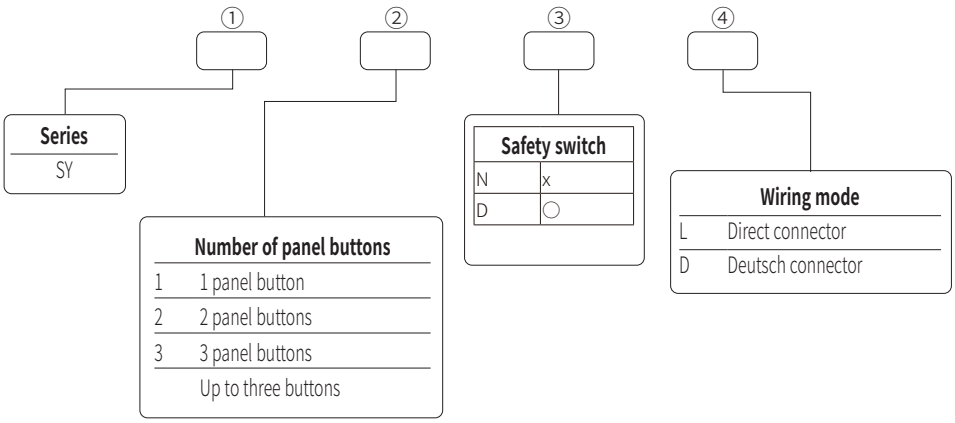
Working temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Level of protection	IP65 (above mounting panel)

Interface Information

- Generally direct wire, 0.08x60 electronic wire color is optional;
- Terminal interface is optional;
- M14 external thread connection.

Dimensions

Product Configuration



Outgoing line definition

Line colour definition	
Black	Upper end microswitch COM
Blue	Left button
Yellow	Right button
Brown	Down button
White	Safety switch COM
Red	Safety switch

HA Series Grip

Product Features

- Ergonomic design, good handle feel
- Using POM makes components sturdy and wear resisting

Application

Typically used in LT30, LT60 series joysticks .

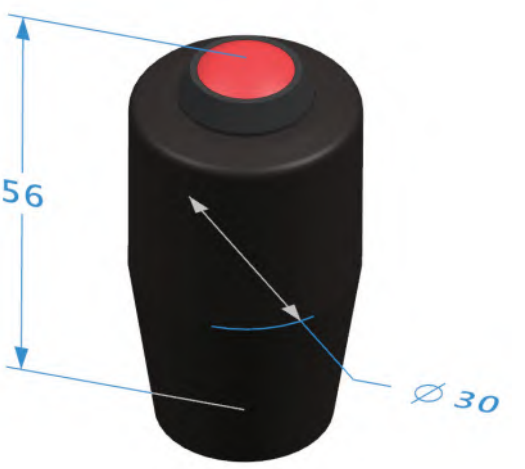
Environmental Data

Environmental data	
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the installation panel)

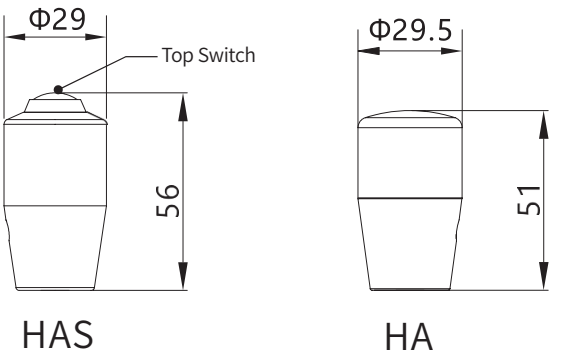
Interface Information

- 0.2mm^2 colorful high temperature wire;
- Normally, directly outlet without terminal.
- The wire length and determination,please refer to the attachment.
- M8 female mechanical connector.
- Special requirements please contact technical.

Dimensions



Product Configuration



HB Series Grip

Product Features

- Ergonomic design, good handle feel
- Using Nylon makes components durable

Application

Typically used in LT20, LT21, LT30, LT60 series joysticks.

Environmental Data

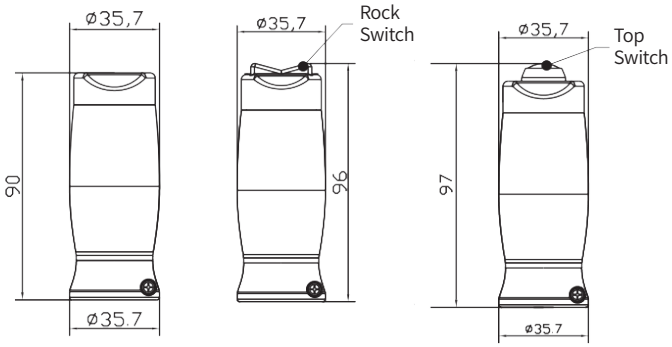
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the installation panel)

Interface Information

- 0.2mm^2 colorful high-temperature wire;
- Normally,directly outlet without terminal.
- The wire length and determination, please refer to the attachment.
- M8 female mechanical connector.
- Special requirements please contact technical.

Dimensions

Product Configuration



HD Series Grip

Product Features

- Ergonomic design, good handle feel
- Using Nylon makes components durable

Application

Typically used in LT20, LT21, LT30, LT60 series joysticks.

Environmental Data

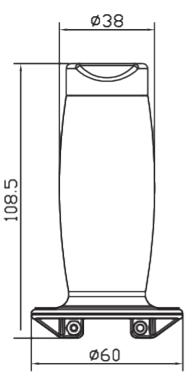
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the installation panel)

Interface Information

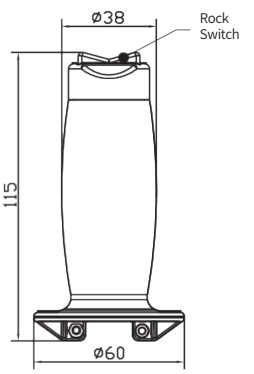
- 0.2mm^2 colorful high temperature wire;
- Normally,directly outlet without terminal.
- The wire length and determination, please refer to the attachment.
- M8 female mechanical connector.
- Special requirements please contact technical.

Dimensions

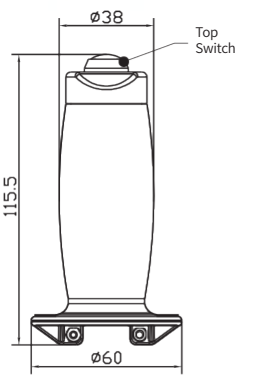
Product Configuration



HD



HDR



HDS

KG Series Grip

Product Features

- Ergonomic design, good handle feel
- Using Nylon makes components durable
- Dead man switch is an option

Application

Typically used in cranes, construction equipment, agricultural equipment, mining equipment. Installed on operating mechanism or pilot operated valves.

Environmental Data

Operating temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the installation panel)

Interface Information

- 0.2mm^2 colorful high temperature wire.
- Normally,directly outlet without terminal.
- The wire length and determination,please refer to the attachment;
- Mechanical connector customized available.
- Special requirements please contact technical;

Dimensions

Product Configuration

① Series	② Deadman switch	③ The rock switch
KG	N Without dead man switch	N Without rock switch
	D With dead man switch	R With rock switch

KM Series Grip

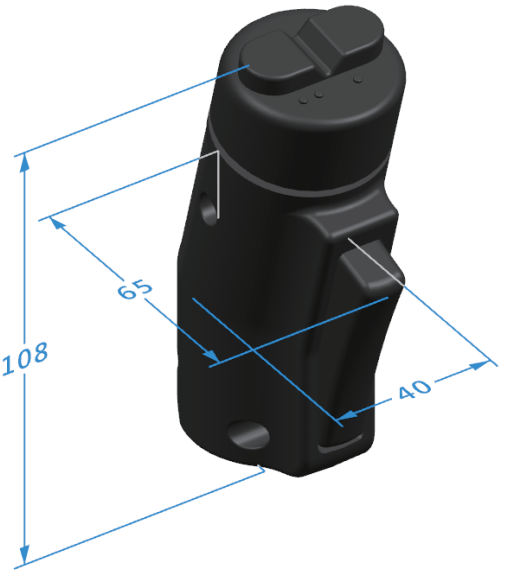
Product Features

- Ergonomic design, good handle feel
- Using Nylon makes components durable
- Deadman switch is an option

Application

Typically used in cranes, construction equipment, agricultural equipment, mining equipment. Installed on operating mechanism or pilot operated valves.

Dimensions



Environmental Data

Operating temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the installation panel)

Interface Information

- 0.2mm^2 colorful high-temperature wire;
- Normally,directly outlet without terminal.
- The wire length and determination, please refer to the attachment.
- Mechanical connector customized available.
- Special requirements please contact technical.

Product Configuration

① Series	② Deadman switch	③ The rock switch
KM	N Without dead man switch	N Without rock switch
	D With dead man switch	R With rock switch

Note: If the hand grip don't have either of them, it should be KM.

KW Series Grip

Product Features

- Ergonomic design, good handle feel
- Using Nylon makes components durable
- Deadman switch available.

Application

Its mainly used in all kinds of lifting machinery, construction machinery, agricultural and forestry machinery, mining machinery, can be assembled in the lower operating mechanism , also installed in the pilot valve operating mechanism separately.

Environmental Data

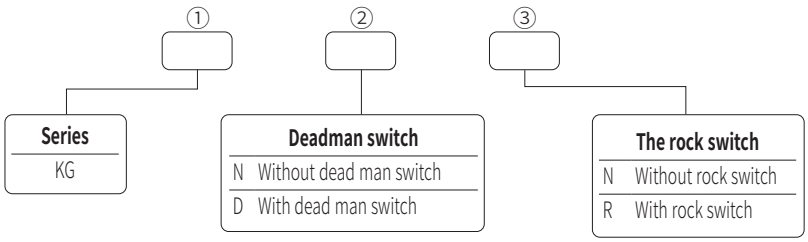
Operating temperature	-30°C~+70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the Panel)

Interface Information

- 0.2mm^2 colorful high-temperature wire;
- Normally, directly outlet without terminal(connector is available);
- The wire length and determination, please refer to the attachment;
- Handle adapter can be customized;
- Please connect with the technical leader for special requirements.

Dimensions

Product Configuration



Crane Joystick

Aerial Work Platform Joystick

Aerial Work Platform Joystick

GE-101005

Used For

Genie

Z45-25JRT、Z60-34RT
Z60/34、Z80/60、Z45/25
Z45/25J、Z135/70、
Z51/30、JZ40/23N、
Z40/23N、RJ Z45/25 IC、
Z45/25J IC

GE-101173

Used For

Genie

Z135/70
Z40/23N
Z40/23N RJ

GE-101174

Used For

Genie

Z60/34、Z80/60、Z45/25
Z45/25J、Z135/70、
Z51/30 J、Z45/25 IC
Z45/25J IC

GE-101175

Used For

Genie

Z60/34、Z80/60、Z45/25
Z45/25J、Z135/70、
Z51/30 J、Z45/25 IC
Z45/25J IC

GE-62161

Used For

Genie

GS1530/1930
GS2032/2632
GS2046/2646/3246
GS2668RT/3268RT
GS2668DC/3268DC
GS3390/4390/5390
GS2668RT/3268RT
Gs3384
GS2668DC/3268DC

GE-78903

Used For

Genie

GS2046/2646/3246
GS3390/4390/5390
GS2668RT/3268RT
GS3384
GS2668DC/3268DC
GS84/90
GS30/32/46
Gs2646
GS2669RT/3369RT
GS4069RT

GE-137634

Used For

Genie

GS1530/1532
GS1930/1932
GS2032/2632
GS3232/2046
GS2646/3246
GS2669DC/3369DC
GS4069DC
GS4047

GE-42032

Used For

Genie

Z45/22 DC 2WD
Z34/22N
Z34/22DC
Z30/20N
Z30/20N RJ

Aerial Work Platform Joystick

GE-111415

Used For

Genie

Z45-25JRT、
Z60-34RT、
S85、
S125、
…

GE-111416

Used For

Genie

Z45-25JRT、
Z60-34RT、
S85、
S125、
…

GE-111417

Used For

Genie

Z45-25JRT、
Z60-34RT、
S85、
S125、
…

GE-40613

Used For

Genie

S60、
S65、
S80、
S85

Dingli00000711

Sinoboom00000604399

Dingli00002324

GE-105108

GE-214544

GE-75443

GE-139598

Aerial Work Platform Joystick

56773

Used For

Genie

Z45/25
Z45/25J
DC and BI Energy
Z30/20N
Z34/22
Z30/20N RJ
Z34/22 N

99164

Used For

Genie

GS2668 RT、GS3268 RT
GS3384、GS84
GS90、GS2669 RT
GS3369 RT、GS4069 RT
GS3384 RT、GS4390 RT
GS5390 RT

GE-20424

Used For

Genie

Z34-22RT
Z45-25JRT
Z60-34RT
S45、S65、S85

GE-72278

Used For

Genie

S40
S45
Z45-22RT

GE-234923

Used For

Genie

Z30-20N
Z34-22N
Z45-25JDC

GE-T110234

Used For

Genie

GR-20J
GR-26J

144065

Used For

Genie GS1932、GS2632
GS324、GS5390 RT
GS3384 RT

119613

Used For

Genie 101005、101174
101175、101173

137611

Used For

Genie Spare

Genie 5 PCB 109503

Used For

Genie Spare

Aerial Work Platform Joystick

1600308

Used For

JLG

260MRT、330CRT
400CRT、3369LE
4069LE、M3369
M4069

1600283

Used For

JLG

400S、460SJ
600A/600AJ
600S/600SJ/660SJ
601S、740AJ
800A/800AJ

1001118416
(1001166538)
(1001212415)
(1600318)

Used For

JLG

1100SB、1100S、1100SJP
340AJ、1850SJ、400S
18RS/18RSJ、24RS/24RSJ
450A/450AJ SERIES 2
510AJ、600A/600AJ
600S/600SJ/660SJ
608S、740AJ
800A/800AJ
800S/860SJ/810SJ

1001118417
(1001129555)
(1001166539)
(1600317)

Used For

JLG

1100S、1100SJP、1200SJP
1350SJP、340AJ、1250AJP
1850SJ、18RS/18RSJ
24RS/24RSJ、400S、460SJ
450A/450AJ SERIES 2
510AJ、600A/600AJ
600S/600SJ/660SJ
600SC/660SJC
600S/600SJ660SJ
740AJ、800A/800AJ
800S/860SJ/810SJ

1001118418
(1600273)
(1001178132)

Used For

JLG

E300AJ、E300AJP
E/M400A、AJPnarrow
W/M450A/AJ
E400AN/E400AJP/E400AJPN
M400AJP/M400AJPN
E45A/AJ/E40AJP
E40AAJPANARROW/M45A
AJ/M40AJP
M40AJPNARROW
E600/E600J/E600JP/M600/
M600J/M600JP

1001118419
(1600274)
(1001178139)

Used For

JLG

E300AJE300AJP
E/M400A/AJPnarrow
W/M450A/AJ
E400AN/E400AJP/E400AJPN
M400AJP/M400AJPN
E45A/AJ/E40AJP/
E40AAJPANARROW/M45A
AJ/M40AJP
M40AJPNARROW
E600/E600J/E600JP/M600
M600J/M600JP

1001134438
(1600402)
(1600345)

Used For

JLG

6RS、10RS、1932RS
3248RS、1532R
1932R、530LRT
4045R、1230ES
2032ES、2632ES
3246ES/2646ES
1930ES
2030ES/2630ES

1600403

Used For

JLG

269MRT、3369LE
M3369、4069LE
M4069、3394RT
4394RT

Aerial Work Platform Joystick

1001100421

Used For

JLG Toucan 10E、Toucan 26E
Toucan 8E、Toucan 20E

1600284

Used For

JLG 600AJ、800AJ
460SJ、600SJ

1600458

Used For

JLG Toucan 8E、Toucan 10E
Toucan 12E

JL-KR0048

Used For

JLG Toucan 800A、Toucan 1010
Toucan 1210、Toucan 1310

159108

Used For

SKYJACK
SJIII3215、SJIII3219
SJIII3220、SJIII3226
SJIII4620、SJIII4626
SJIII4632、SJ3220
SJ3226、SJ46XX

159109

Used For

SKYJACK
SJ6826 RT
SJ6832 RT
SJ8831 RT
SJ8841 RT
SJ9250 RT

159111

Used For

SKYJACK
SJIII4740
SJ12
SJ16
SJ6832 RTE

159230

Used For

SKYJACK
SJ6826 RT
SJ6832 RT
SJ6826 RT
SJ8831 RT
SJ8841 RT
SJ9250 RT

138224

Used For

SKYJACK
260MRT
330CRT
400CRT
3369LE
4069LE
M3369
M4069

138225

Used For

SKYJACK
SJ46 AJ
SJ63 AJ
SJ40 T/45 T
SJ61 T/66 T
SJ82 T/86 T

Aerial Work Platform Joystick

2441305160

Used For

Haulotte

HA16P/PE/PN
HA16PX、HA18P/PX
HA20PX、HA26P
H25TP、H25TPX
H21T/TX
H23T(X/P/PX)
HA20P、HA61JRT
HA26P(3°)
HA51JRT

2441305180

Used For

Haulotte

HA16P/PE/PN
HA16PX、HA18P/PX
HA20PX、HA26PX
H25TP、H25TPX
H21T/TX、H23T(X/P/PX)
HA20P、HA61JRT
HA26P、HA51JRT
HA26P(3°)、HA80JRT

2441305220

Used For

Haulotte

COMPACT2247E
COMPACT2277E
COMPACT8、COMPACT8W
COMPACT8-2032E
COMPACT12-3347E
COMPACT12
COMPACT10-2747E
COMPACT10、OPTIMUM6
OPTIMUM8、HA12IP
HA33JE、COMPACT10 RTE
COMPACT2668 LCE
COMPACT 10N

2441305250

Used For

Haulotte

STAR 8
STAR 10
STAR 13
STAR 22
STAR 26

2441305340

Used For

Haulotte

HA16SPX、HA18SPX
HA16TPX、HA260PX
H14T(X)、HA15X
HA16PX NT、HA46JRT
HA18PX、HA51JRT
HA18PX NT、HA32PX
HA16X、HB44J
HA20PX

2441305350

Used For

Haulotte

HA16SPX、HA18SPX
HA16TPX、HA260PX
H14T(X)、HB40
HA15X、HA16PX NT
HA46JRT、HA18PX
HA51JRT、HA18PX NT
HA32PX、HA16X
HB44J、HA20PX

2441305360

Used For

Haulotte

HA16SPX、HA18SPX
HA16TPX、H14T(X)
HB40、HA15X
HA32PX、HA16X
HB44J、HA20PX
HA61JRT、HA260PX
H21TX、HA120PX
HA80JRT、HA26PX
HA16X、HB44J
HA20PX

2441305370

Used For

Haulotte

COMPACT 10DX
COMPACT 12DX、HA12SXL
COMPACT10/12DX
H15SX(L)、HS3388RT(XL)
HS34388RT(XL)
H18SX(L)、HS5388RT(X
COMPACT2668/3368RT
COMPACT2668RTE
COMPACT12RTE
COMPACT3368RTE
COMAPCT10RTE

Aerial Work Platform Joystick

2901006230

Used For

Haulotte HA16RTJ、HA16RTJPro HA32RTJPro、H23RTJPro

1600287

Used For

JLG JLG 120SX

148707

Used For

Skyjack

1600141

Used For

JLG

60HA, 70H, 60H+6, 60H, 80HX, 80HX+6, 40H, 40H+6, 45HA, 86HX, 150HAX

2901015000

Used For

Haulotte

COMPACT2247E
COMPACT2277E
COMPACT8
COMPACT8W
COMPACT8-2032E
COMPACT12-3347E
COMPACT12
COMPACT10-2747E
COMPACT10

2901011790

Used For

Haulotte STAR8、STAR10 STAR22J、STAR26J

894573

Used For

manitou 80VJR、110VJR 100VJR、105VJR

894575

Used For

manitou 80VJR、110VJR 100VJR、105VJR

066785-000

Used For

UpRight X20N、X26N X32N

679253

Used For

manitou 160ATJ、165ATJ 180ATJ、200ATJ

592604

Used For

manitou 160ATJ、165ATJ 180ATJ、200ATJ

501882-000

Used For

Snorkel AB38N
UpRight AB38E

3087801

Used For

Snorkel S1930E、S1932E
UpRight S2632E

Aerial Work Platform Joystick

7352000936

Used For
Grove

7352000937

Used For
Grove

211751

Used For
SKYJACK

123994

Used For
SKYJACK

Forklift Joystick

Product Features

- Spring return, dual axis for any direction or cross direction
- Hall or Potentiometer available
- Comfortable operating

Technical Information

Mechanical features	
Travel angle	±30°
Operating type	Spring return
Breakout force	9N
Maximum allowable force	>300N
Expecting life	>3 million times (Hall)
Weight	200g/260g

Application

Used on forklift truck and other engineering vehicles, especially for Linde forklift.

Environmental data	
Operating temperature	-30°C~ +70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the flange)

LT12 Series

LT15 Series

LT18 Series

LT12 Series

Dimensions

7919040012

Application

1120, 386-02, 387, 388, 392-02, 393-02, 394-01, 394-02, 396-02

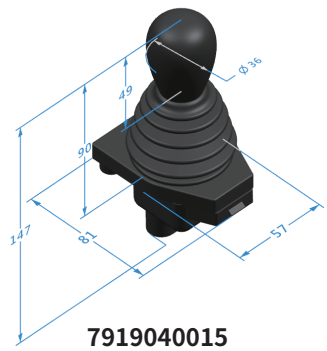
Electrical data

Potentiometer

Power supply	20-80%Vdc
Limiting allowable power consumption	0.125W
Output linearity tolerance	<±5%

LT15 Series

Dimensions



7919040015

Application

1120, 386-02, 387, 388, 392-02, 393-02, 394-01, 394-02, 396-02

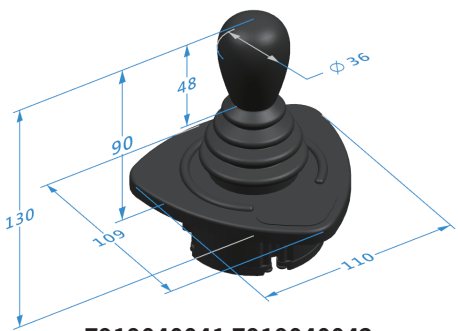
Electrical data

Hall

Power supply	5.0±0.5Vdc
Supply current	<44mA (Rated supply voltage
Supply voltage maximum	30Vdc
Reverse polarity voltage (max)	-15Vdc
Output linearity tolerance	<±4%

LT18 Series

Dimensions



7919040041 7919040042

Application

351 series, 352 series

Electrical data

Potentiometer

Power supply	20-80%Vdc
Limiting allowable power consumption	0.125W
Output linearity tolerance	<±5%

LT42 Series Joystick

Product Features

- Spring return, two axis operation in any direction.
- Hall sensor.
- The output is programmable.
- Set up the output signal device.

Application

Mainly used in proportional valve control.

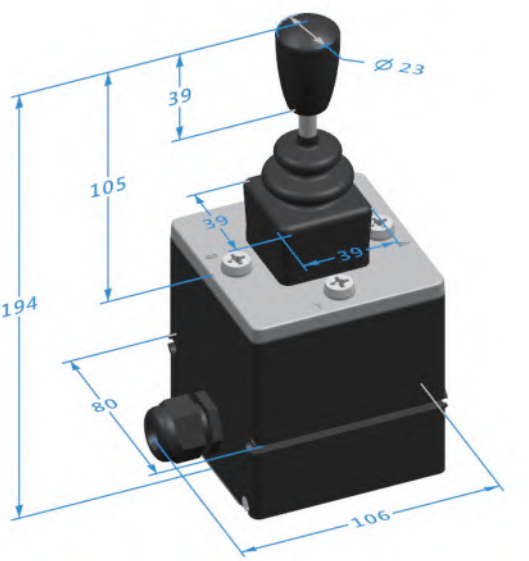
Technical Information

With electronic amplifier	
Hall	
Power supply	9-36Vdc
Supply current	22mA
Maximum allowable overload voltage	45Vdc
Reverse maximum allowable voltage	-10Vdc
Output linearity tolerance	<±0.1V

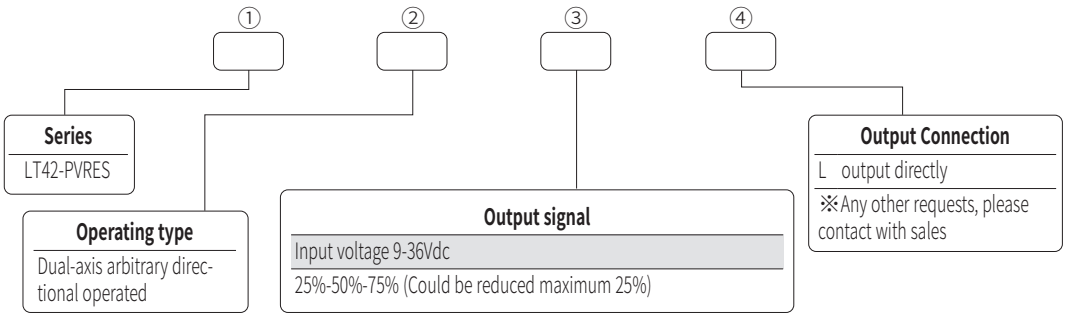
Mechanical features	
Travel angle	±20°
Operating type	Spring return
Breakout force	2.5N
Operating force(max)	5.5N
Maximum allowable force	>300N
Expecting life	>1million cycles
Weight	400g

Environmental data	
Operating temperature	-30°C~ +70°C
Storage temperature	-40°C~ +85°C
Protection level	IP65 (Above the flange)

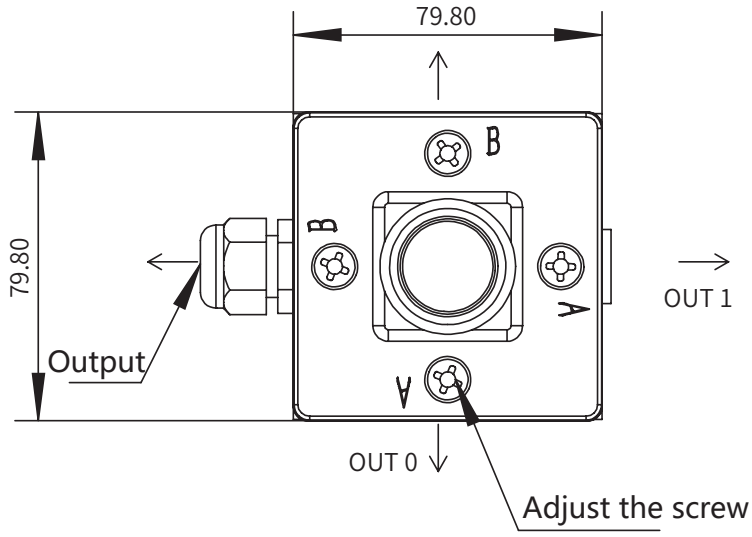
Dimensions



Product Configuration



Product Installation



Electrical Connections

output directly

Color	Function
Red	VCC
Black	GND
White and Red	Mircoswitch 1
White and Blue	Mircoswitch 2
Yellow	OUT0
White and green	OUT1

APPENDIX

Output signal

Output Type

- Hall: Hall contactless sensor, cod e H;
- Potentiometer: Potentiometer output, code P;

Naming rules

- Hall output (H); Generally, distinguish by Hall input voltage, such as H5X; H refers to Hall, 5 refers to Hall input voltage is 5V, X is sequence code 1~9, A~Z(excluding I, O, Z)

Input voltage	Hall	Output	Description	Output Voltage(V)
5V	Single Hall	H51	10%～50%～90%Vdc	0.5～2.5～4.5
		H52	0%～50%～100%Vdc	0～2.5～5
		H53	25%～50%～75%Vdc	1.25～2.5～3.75
		H54	20%～50%～80%Vdc	1～2.5～4
		H55	23%～50%～77%Vdc	1.15～2.5～3.85
		H56	20%～40%～80%Vdc	1～2～4
		H57	5%～50%～95%Vdc	0.25~2.5~4.75
		H58	20%～60%～100%Vdc	1～3～5
		H59	90%～10%～90%Vdc	4.5～0.5～4.5
		H5A(H35)	75%～10%～75%Vdc	3.5~0.5~3.5
		H5B	3.9%～33%～62%Vdc	0.195~1.65~3.1
		H5C	30%~50%~77%Vdc	1.5~2.5~3.85
		H5D	8%~40%~71%Vdc	0.4~2~3.55
		H5E	8%~50%~92%Vdc	0.4~2.5~4.6
		H5F	16%~50%~84%Vdc	0.8~2.5~4.2
		H5G	84%~16%~84%Vdc	4.2~0.8~4.2
		H5H	100%~0%~100%Vdc	5~0~5
		H5Y	……	……
5V	each axis of redundant hall	2H51	10%～50%～90%Vdc	0.5～2.5～4.5
		2H52	0%～50%～100%Vdc	0～2.5～5
		2H53	25%～50%～75%Vdc	1.25～2.5～3.75
		2H54	20%～50%～80%Vdc	1～2.5～4
		2H55	23%～50%～77%Vdc	1.15～2.5～3.85
		2H56	20%～40%～80%Vdc	1～2～4
7V	each axis of Hall	H71(Special)	10%～50%～90%Vdc	0.7～3.5～6.3
		H72(Special)	0%～50%～100%Vdc	0～3.5～7

- Potentiometer output (P); Generally, distinguish by potentiometer input voltage, such as P052; Prefers to potentiometer, 05 refers to 5K potentiometer, 2 is sequence code 1~9, A~Z(excluding I, O, Z)

Input voltage	Potentiometer	Resistance	Description	Note
9~36V	P021	2K	0%～50%～100%Vdc	Rarely used
	P022	2K	10%～50%～90%Vdc	Rarely used
	P023	2K	25%～50%～75%Vdc	Rarely used
	P041	4K	0%～50%～100%Vdc	
	P051	5K	0%～50%～100%Vdc	
	P052	5K/4K	10%～50%～90%Vdc	FJ1 used 4K
	P053	5K	25%～50%～75%Vdc	
	P101	10K	0%～50%～100%Vdc	
	P102	10K	10%～50%～90%Vdc	
	P103	10K	25%～50%～75%Vdc	

- Conversion circuit (U); Common selection, such as U21; The U generation refers to the voltage type, and the 2 generation refers to the power supply voltage 18~36V; 1 generation refers to sequence codes 1~9, A~Z(minus I, O, Z)

Output selection	Supply voltage	Description	Note
U11	9~18V	-10~0~10Vdc voltage output	
U12	9~18V	10~0~10Vdc voltage output	
U13	9~18V	-5~0~5Vdc voltage output	
U14	9~18V	5~0~5Vdc voltage output	
U15	9~18V	0~10Vdc voltage output	
U21	18~36V	-10~0~10Vdc voltage output	
U22	18~36V	10~0~10Vdc voltage output	
U23	18~36V	-5~0~5Vdc voltage output	
U24	18~36V	5~0~5Vdc voltage output	
U25	18~36V	0~10Vdc voltage output	Generally used on one side
U26	18~36V	6~12~18Vdc voltage output	
U27	18~36V	0~2.5~5Vdc voltage output	
U28	18~36V	0~5~10Vdc voltage output	
U29	18~36V	3~0~3Vdc voltage output	
U2A	18~36V	3~6~9Vdc voltage output	

Moldings wiring schematic