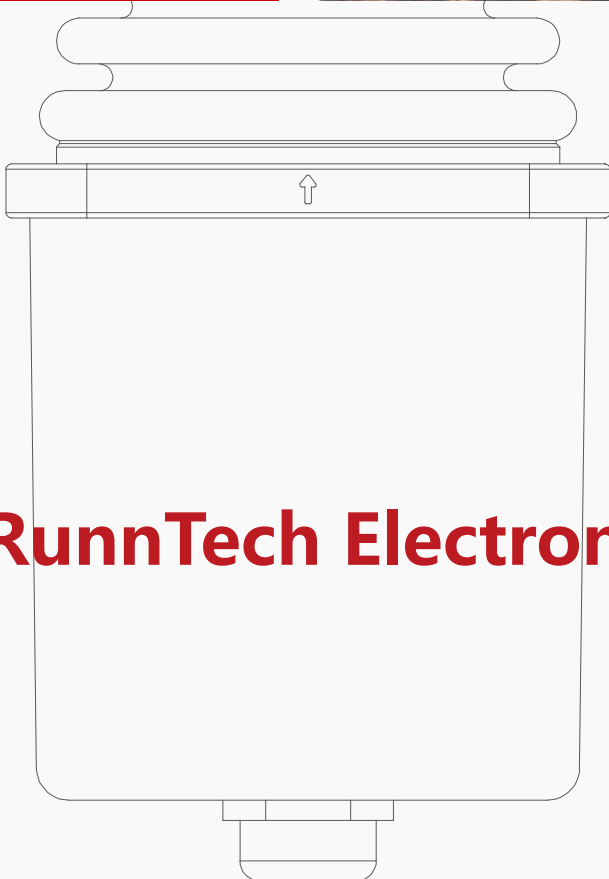


# RunnTech

Industrial Joysticks & Controllers



**RunnTech Electronics (Changzhou) Corp.**

## Company Presentation

RunnTech [/rən'tek/] specializes in research, development and manufacturing joysticks and controllers (Potentiometer or Hall sensors) for industrial applications. All our joysticks and controllers are mainly used in hydraulic proportional control or variable frequency motor control, such as Crane lifting control, Mine hoisting winch, Offshore drilling equipment, Maritime machinery, CNC turning machinery, Rolling mill control desk, Industrial robotics, Welding or Cutting machine, Audio video editing equipments, Photography CCTV control system, Medical imaging system, Loaders, Tractors, Harvesters, Excavators, Shield tunneling machine, Rotary table (drilling rig), Electric forklift truck, Aerial work platform, etc.

Our company is located in Yangtze River Delta, one well-developed and dynamic economic region in the east China, Changzhou city is around 180km away from Shanghai and 260km away from Hangzhou.

With a view to supply our customers with satisfied products and services, we are always dedicated ourselves to improve the quality of the products and unswervingly implementing the management mode with customer oriented. We believe that we will be your reliable partner in the field of industrial control through our best solutions and excellent services. We are looking forward to sincere cooperate with you to create bright future and prospect.

## Mission Statement

We are committed to achieve sustainable growth to the benefit of our stakeholders by providing a comprehensive range of high quality Joystick & Controller products to the industrial applications and by fostering mutually beneficial relationships with all our customers.

## Business Philosophy

- We put our Customers first and strive to meet their demands through innovative and responsive solutions.
- We value our Employees and seek to help them achieve their full potential.
- We embrace Professionalism and seek Excellence in everything we do.
- To work together with our employees and contribute to the communities in which we operate.

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# RT100 Multi-axis Joystick Controller

## Product Features

- Potentiometer sensor or Hall sensor;
- Single axis, dual axis or 3 axis control;
- Available with various shape multifunction grips;
- Mechanical spring-return to center or Friction-hold operation;
- Excellent analog proportional control output or switch signal output;
- Easy to install, flexible operation, uniform texture, maintenance-free;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

RunnTech 100 series industrial multi-axis joystick controller is mainly used in hydraulic proportional control, variable frequency motor control, remote control or electro-hydraulic applications such as Rotary table (drilling rig), Crane, Aerial work platforms, Forklift trucks, Mobile hydraulics, Shield tunneling machine, Hoist, Marine, Construction machinery, Civil engineering, Military vehicles, Cabin vehicles, Military robotics, Precision machine tools, Material handling equipment, etc.



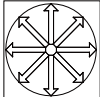


## Technical Information

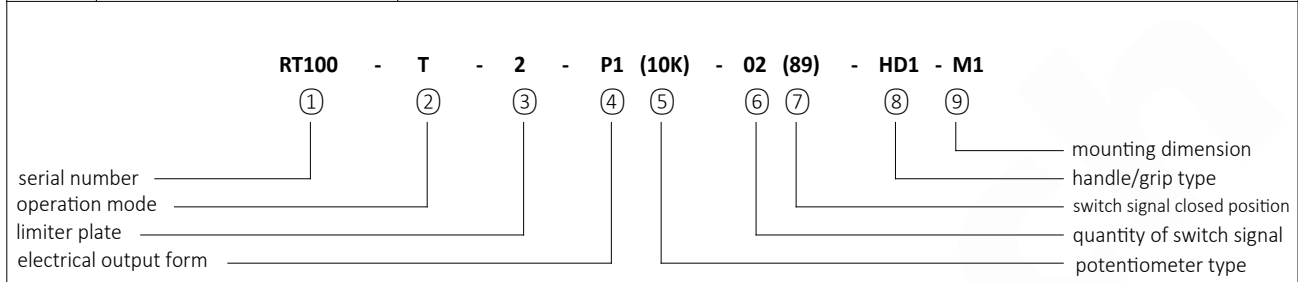
Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-40°C...+80°C	
Protection Grade	IP64	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Potentiometer: ±32°, Hall sensor: ±20°	
Operating Torque	5N (50N max)	
Mechanical Life	5 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor

Hall Sensor	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5KΩ
	Median Voltage (no-load)	48 - 52%Vs
Potentiometer	Power Supply Voltage	DC24V
	Power Supply Current	<20mA
	Resolution Ratio	infinite
	Resistance (10%)	5KΩ and 10KΩ
	Electrical Angle	±32°
	Output Voltage Range (relative voltage)	0...100%; 10...90%
	Median Voltage	48%...52%
	Potentiometer Maximum Load Voltage	32VDC
	Maximum Power Consumption (25°C)	0.25W
	Switch Direction	switch position ±3°

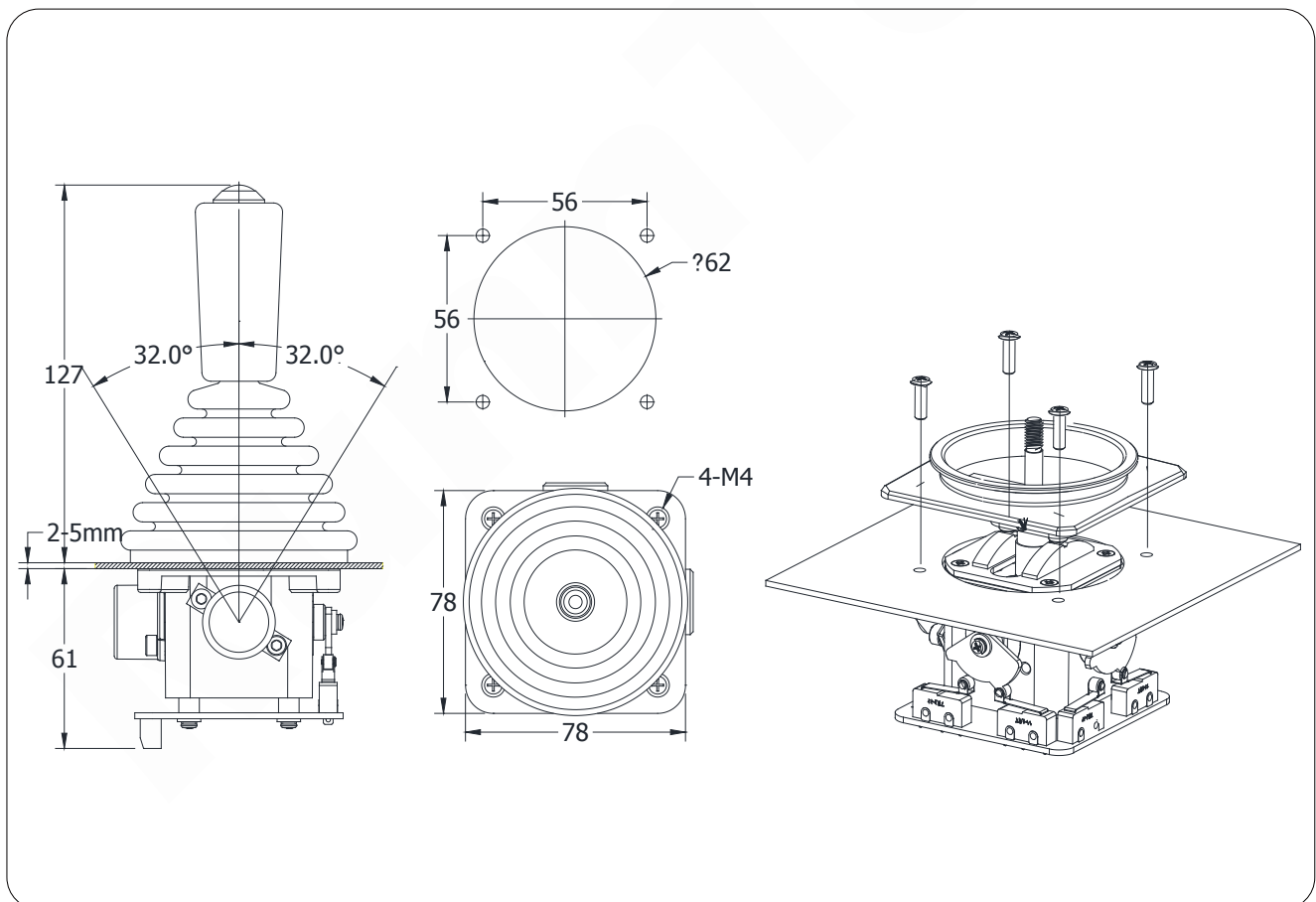
### Product Configuration

No.	Item	Content																
1	Serial Number	RT100 series multi-axis joystick controller																
2	Operation Mode	<b>M</b> - Friction hold <b>T</b> - Spring return to center <b>MS</b> - Friction hold & Self-lock																
3	Limitier Plate	   <p><b>1.</b> Y axis                                      <b>2.</b> Y/X axis cross direction                                      <b>3.</b> Y/X axis full direction</p>																
4	Electrical Output Form	<table border="1"> <tr> <td rowspan="4">Hall Sensor</td> <td><b>HV1:</b> DC 5V, 0...2.5...5V (rail to rail)</td> </tr> <tr> <td><b>HV2:</b> DC 5V, 0.5...2.5...4.5V</td> </tr> <tr> <td><b>HV3:</b> DC 5V, 1.0...2.5...4.0V</td> </tr> <tr> <td><b>HV4:</b> DC 5V, 1.25...2.5...3.75V</td> </tr> <tr> <td rowspan="8">Potentiometer</td> <td><b>P1:</b> Simple 2 directions output (potentiometer with dead zone)</td> </tr> <tr> <td><b>P2:</b> Simple 1 direction output (potentiometer without dead zone)</td> </tr> <tr> <td><b>V1:</b> DC24V, -10V...0...+10V (voltage output)</td> </tr> <tr> <td><b>V2:</b> DC24V, +10V...0...+10V (voltage output)</td> </tr> <tr> <td><b>V3:</b> DC24V, -5V...0...+5V (voltage output)</td> </tr> <tr> <td><b>V4:</b> DC24V, +5V...0...+5V (voltage output)</td> </tr> <tr> <td><b>V5:</b> DC24V, 0...+10V (voltage output)</td> </tr> <tr> <td><b>V6:</b> DC24V, 0...+5V (voltage output)</td> </tr> <tr> <td><b>I1:</b> 4 wire 4mA...12mA...20mA (current output)</td> </tr> <tr> <td><b>I2:</b> 4 wire 20mA...4mA...20mA (current output)</td> </tr> </table>	Hall Sensor	<b>HV1:</b> DC 5V, 0...2.5...5V (rail to rail)	<b>HV2:</b> DC 5V, 0.5...2.5...4.5V	<b>HV3:</b> DC 5V, 1.0...2.5...4.0V	<b>HV4:</b> DC 5V, 1.25...2.5...3.75V	Potentiometer	<b>P1:</b> Simple 2 directions output (potentiometer with dead zone)	<b>P2:</b> Simple 1 direction output (potentiometer without dead zone)	<b>V1:</b> DC24V, -10V...0...+10V (voltage output)	<b>V2:</b> DC24V, +10V...0...+10V (voltage output)	<b>V3:</b> DC24V, -5V...0...+5V (voltage output)	<b>V4:</b> DC24V, +5V...0...+5V (voltage output)	<b>V5:</b> DC24V, 0...+10V (voltage output)	<b>V6:</b> DC24V, 0...+5V (voltage output)	<b>I1:</b> 4 wire 4mA...12mA...20mA (current output)	<b>I2:</b> 4 wire 20mA...4mA...20mA (current output)
Hall Sensor	<b>HV1:</b> DC 5V, 0...2.5...5V (rail to rail)																	
	<b>HV2:</b> DC 5V, 0.5...2.5...4.5V																	
	<b>HV3:</b> DC 5V, 1.0...2.5...4.0V																	
	<b>HV4:</b> DC 5V, 1.25...2.5...3.75V																	
Potentiometer	<b>P1:</b> Simple 2 directions output (potentiometer with dead zone)																	
	<b>P2:</b> Simple 1 direction output (potentiometer without dead zone)																	
	<b>V1:</b> DC24V, -10V...0...+10V (voltage output)																	
	<b>V2:</b> DC24V, +10V...0...+10V (voltage output)																	
	<b>V3:</b> DC24V, -5V...0...+5V (voltage output)																	
	<b>V4:</b> DC24V, +5V...0...+5V (voltage output)																	
	<b>V5:</b> DC24V, 0...+10V (voltage output)																	
	<b>V6:</b> DC24V, 0...+5V (voltage output)																	
<b>I1:</b> 4 wire 4mA...12mA...20mA (current output)																		
<b>I2:</b> 4 wire 20mA...4mA...20mA (current output)																		





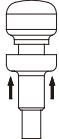



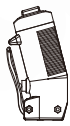
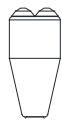
5	Potentiometer Type	<b>1K, 2K, 5K, 10K, 20K</b> or <b>H</b> (Hall sensor)
6	Quantity of Switch Signal	<b>01, 02</b> or <b>03</b> (the quantity of directional switch signal in each axis)
7	Switch Signal Closed Position	Refer to Table 4-3 <b>Directional Switch Signal Closed Position</b> (Page: 43)
8	Handle/Grip Type	Refer to Table 1-1...1-8 Handle: <b>HD1, HD2, HD3, HD4, HD5, HD7, HD8, HD10, HD15, HD80</b>
9	Mounting Dimensions	<b>M1:</b> 56×56, central hole 63, <b>M2:</b> 85×85, central hole 63, <b>M3:</b> 130×110, central hole 63, <b>M7:</b> 85×85, central hole 80×80 (for HD10 grip)



## Product Installation



**Table 1-1 Handle Type**

1	HD1		with or without 1 self-resetting button ( <b>BT1</b> ) or 1 self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 30×60	
2	HD2		ball shape grip	Diameter 32	
3	HD3			Diameter 24×24	
4	HD4		with or without 1 self-resetting button ( <b>BT1</b> ) or 1 self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 30×87	
5	HD5		Lift to release *only for friction hold operation; single axis ( <b>MS-1</b> ) or dual axis cross direction ( <b>MS-2</b> )	Diameter 30×60	
6	HD7		with or without 1 self-resetting button ( <b>BT1</b> ) or 1 self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 34×105	
7	HD8			Diameter 40×58	
8	HD10		Multi-combinations Refer to Table 1-5...1-7 (Page 38)	Diameter 30×60	
9	HD15		1 Self-resetting rocker switch ( <b>QTOT</b> ) 1 Deadman trigger ( <b>BT1</b> ) Refer to Table 1-8 (Page 41)		
10	HD80		with or without 2 Self-resetting button ( <b>BT2</b> ) or 2 Self-lock button ( <b>BS2</b> ) Refer to Table 2-1 (Page 42)	Diameter 39×61	

# RT200 Series Single-axis Industrial Joystick

## Product Features

- Potentiometer sensor or Hall sensor;
- All metal construction, fully sealed design;
- Available with various shape multifunction grips;
- Mechanical spring-return to center or Friction-hold operation;
- Excellent analog proportional control output or switch signal output;
- Easy to install, flexible operation, uniform texture, maintenance-free;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

RunnTech 200 series industrial single-axis joystick controller is mainly used in hydraulic proportional control, variable frequency motor control, remote control or electro-hydraulic applications such as Rotary table (drilling rig), Crane, Aerial work platforms, Forklift trucks, Mobile hydraulics, Shield tunneling machine, Hoist, Marine, Construction machinery, Civil engineering, Military vehicles, Cabin vehicles, Military robotics, Precision machine tools, Material handling equipment, etc.



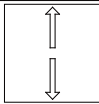
## Technical Information

Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-40°C...+80°C	
Protection Grade	IP64	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Potentiometer: ±32°, Hall sensor: ±20°	
Operating Torque	5N (50N max)	
Mechanical Life	5 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor

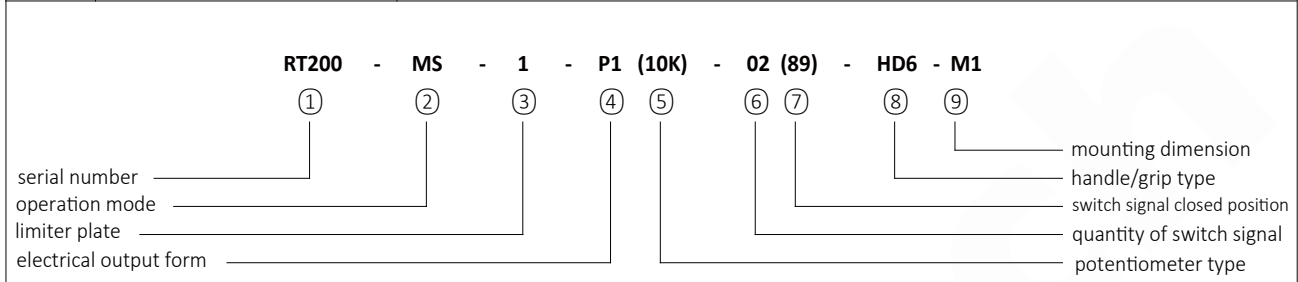


Hall Sensor	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5K $\Omega$
	Median Voltage (no-load)	48 - 52%Vs
Potentiometer	Power Supply Voltage	DC24V
	Power Supply Current	<20mA
	Resolution Ratio	infinite
	Resistance (10%)	5K $\Omega$ and 10K $\Omega$
	Electrical Angle	$\pm 32^\circ$
	Output Voltage Range (relative voltage)	0...100%; 10...90%
	Median Voltage	48%...52%
	Potentiometer Maximum Load Voltage	32VDC
	Maximum Power Consumption (25°C)	0.25W
	Switch Direction	switch position $\pm 3^\circ$

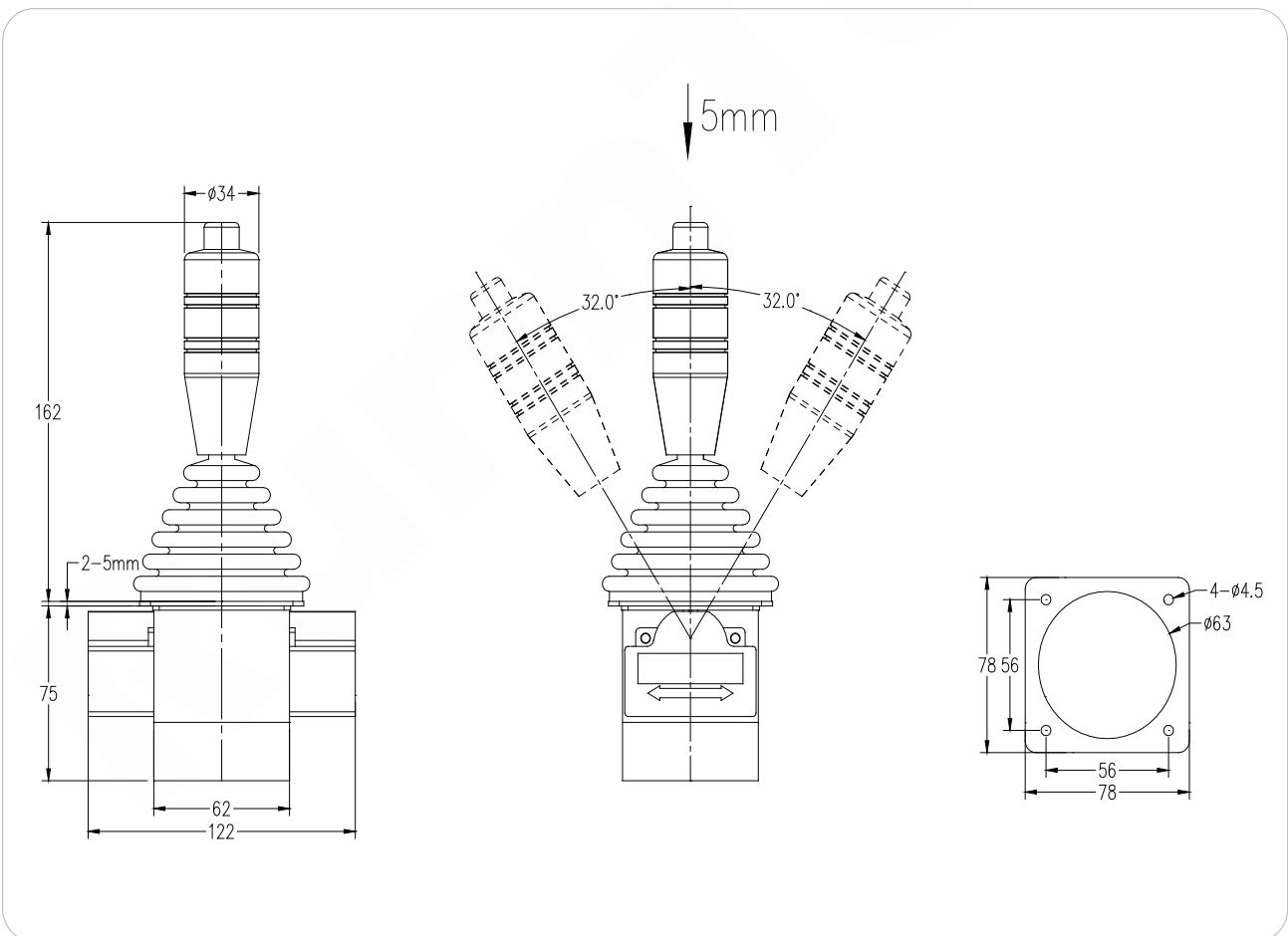
## Product Configuration

No.	Item	Content	
1	Serial Number	RT200 series single-axis joystick controller	
2	Operation Mode	<b>M</b> - friction hold, <b>MS</b> - friction hold & center-lock, <b>T</b> - spring return to center, <b>TS</b> - spring return to center & center-lock	
3	Limiter Plate	 <p>1. Y axis (default)</p>	
4	Electrical Output Form	Hall Sensor	<b>HV1</b> : DC 5V, 0...2.5...5V (rail to rail)
			<b>HV2</b> : DC 5V, 0.5...2.5...4.5V
			<b>HV3</b> : DC 5V, 1.0...2.5...4.0V
			<b>HV4</b> : DC 5V, 1.25...2.5...3.75V
		Potentiometer	<b>P1</b> : Simple 2 directions output (potentiometer with dead zone)
			<b>P2</b> : Simple 1 direction output (potentiometer without dead zone)
			<b>V1</b> : DC24V, -10V...0...+10V (voltage output)
			<b>V2</b> : DC24V, +10V...0...+10V (voltage output)
			<b>V3</b> : DC24V, -5V...0...+5V (voltage output)
			<b>V4</b> : DC24V, +5V...0...+5V (voltage output)
			<b>V5</b> : DC24V, 0...+10V (voltage output)
			<b>V6</b> : DC24V, 0...+5V (voltage output)
<b>I1</b> : 4 wire 4mA...12mA...20mA (current output)			
<b>I2</b> : 4 wire 20mA...4mA...20mA (current output)			


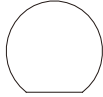


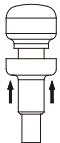




5	Potentiometer Type	<b>1K, 2K, 5K, 10K, 20K</b> or <b>H</b> (Hall sensor)
6	Quantity of Switch Signal	<b>01, 02</b> or <b>03</b> (the quantity of directional switch signal in each axis)
7	Switch Signal Closed Position	Refer to Table 4-3 <b>Directional Switch Signal Closed Position</b> (Page 43)
8	Handle/Grip Type	Refer to Table 1-1...1-8 Handle: <b>HD1, HD2, HD3, HD4, HD5, HD6, HD7, HD8, T Shape</b>
9	Mounting Dimensions	<b>M1</b> : 56×56, central hole 63, <b>M2</b> : 85×85, central hole 63, <b>M3</b> : 130×110, central hole 63



## Product Installation



**Table 1-1 Handle Type**

1	HD1		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 30×60	
2	HD2		ball shape grip	Diameter 32	
3	HD3			Diameter 24×24	
4	HD4		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 30×87	
5	HD5		Lift to release	Diameter 30X60	
6	HD6		Press to release (mechanical button)	Diameter 34X96	
7	HD7		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 34×105	
8	HD8			Diameter 40×58	
9	HD80		with or without 2 Self-resetting button ( <b>BT2</b> ) or 2 Self-lock button ( <b>BS2</b> ) Refer to Table 2-1 (Page 42)	Diameter 39x61	

# RT300 Series Crane & Hoist Joystick

## Product Features

- Single axis or dual axis control;
- Pure silver contacts to ensure durable;
- Spring return in 0-position or Friction brake adjustable;
- Resistant to oil, maritime climate, ozone and UV radiation;
- Support horizontal and vertical contact drive arrangements;
- The energized current up to 380V 10A, with reliable performance;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

RunnTech 300 series industrial crane & hoist joystick (master controller) is mainly used in the occasion of the harbor, docks, coal, or open-air operations, AC 50Hz, 60Hz voltage 380V and 220V DC to control the hoist crane transport operators as well as the similar electrical control equipment, such as motor starting, speed control and brake.

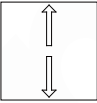
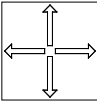
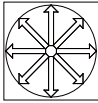


## Technical Information

Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-40°C...+80°C	
Protection Grade	IP64	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Potentiometer: ±32°, Hall sensor: ±20°	
Operating Torque	5N (50N max)	
Mechanical Life	5 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor

Hall Sensor	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5KΩ
	Median Voltage (no-load)	48 - 52%Vs
Potentiometer	Power Supply Voltage	DC24V
	Power Supply Current	<20mA
	Resolution Ratio	infinite
	Resistance (10%)	5KΩ and 10KΩ
	Electrical Angle	±32°
	Output Voltage Range (relative voltage)	0...100%; 10...90%
	Median Voltage	48%...52%
	Potentiometer Maximum Load Voltage	32VDC
	Maximum Power Consumption (25°C)	0.25W
	Switch Direction	switch position ±3°

### Product Configuration

No.	Item	Content	
1	Serial Number	RT300 Series Crane & Hoist Joystick Controller	
2	Operation Mode	<b>M</b> - friction hold, <b>MS</b> - friction hold & center-lock, <b>T</b> - spring return to center, <b>TS</b> - spring return to center & center-lock	
3	Limiter Plate	   <p><b>1.</b> Y axis                      <b>2.</b> Y/X axis cross direction                      <b>3.</b> Y/X axis full direction</p>	
4	Switch Assembly Type	<b>L</b> : switch assembled <b>Horizontal</b> (default), <b>I</b> : switch assembled <b>Vertical</b>	
5	Electrical Output Form	Hall Sensor	<b>HV1</b> : DC 5V, 0...2.5...5V (rail to rail)
			<b>HV2</b> : DC 5V, 0.5...2.5...4.5V
			<b>HV3</b> : DC 5V, 1.0...2.5...4.0V
			<b>HV4</b> : DC 5V, 1.25...2.5...3.75V
		Potentiometer	<b>P1</b> : Simple 2 directions output (potentiometer with dead zone)
			<b>P2</b> : Simple 1 direction output (potentiometer without dead zone)
			<b>V1</b> : DC24V, -10V...0...+10V (voltage output)
			<b>V2</b> : DC24V, +10V...0...+10V (voltage output)
			<b>V3</b> : DC24V, -5V...0...+5V (voltage output)
			<b>V4</b> : DC24V, +5V...0...+5V (voltage output)
			<b>V5</b> : DC24V, 0...+10V (voltage output)
			<b>V6</b> : DC24V, 0...+5V (voltage output)
			<b>I1</b> : 4 wire 4mA...12mA...20mA (current output)
<b>I2</b> : 4 wire 20mA...4mA...20mA (current output)			

6	Potentiometer Type	<b>1K, 2K, 5K, 10K, 20K</b> or <b>H</b> (Hall sensor)
7	Contact Arrangement	Refer to Table 4-1...4-2 <b>Contact Arrangement</b>
8	Handle/Grip Type	Refer to Table 1-1...1-8 Handle: <b>HD1, HD2, HD3, HD4, HD5, HD7, HD8, HD10, HD15, HD80</b>
9	Mounting Dimensions	<b>M2</b> : 85×85, central hole 63, <b>M5</b> : 85×85, central hole 78

**RT300 - MS - 2 - L - P1 (10K) - 3(1) - HD39 - M5**

①
②
③
④
⑤
⑥
⑦
⑧
⑨

serial number \_\_\_\_\_ ①

operation mode \_\_\_\_\_ ②

limiter plate \_\_\_\_\_ ③

handle assembly type \_\_\_\_\_ ④

electrical output form \_\_\_\_\_ ⑤

\_\_\_\_\_ ⑥

\_\_\_\_\_ ⑦

\_\_\_\_\_ ⑧

\_\_\_\_\_ ⑨

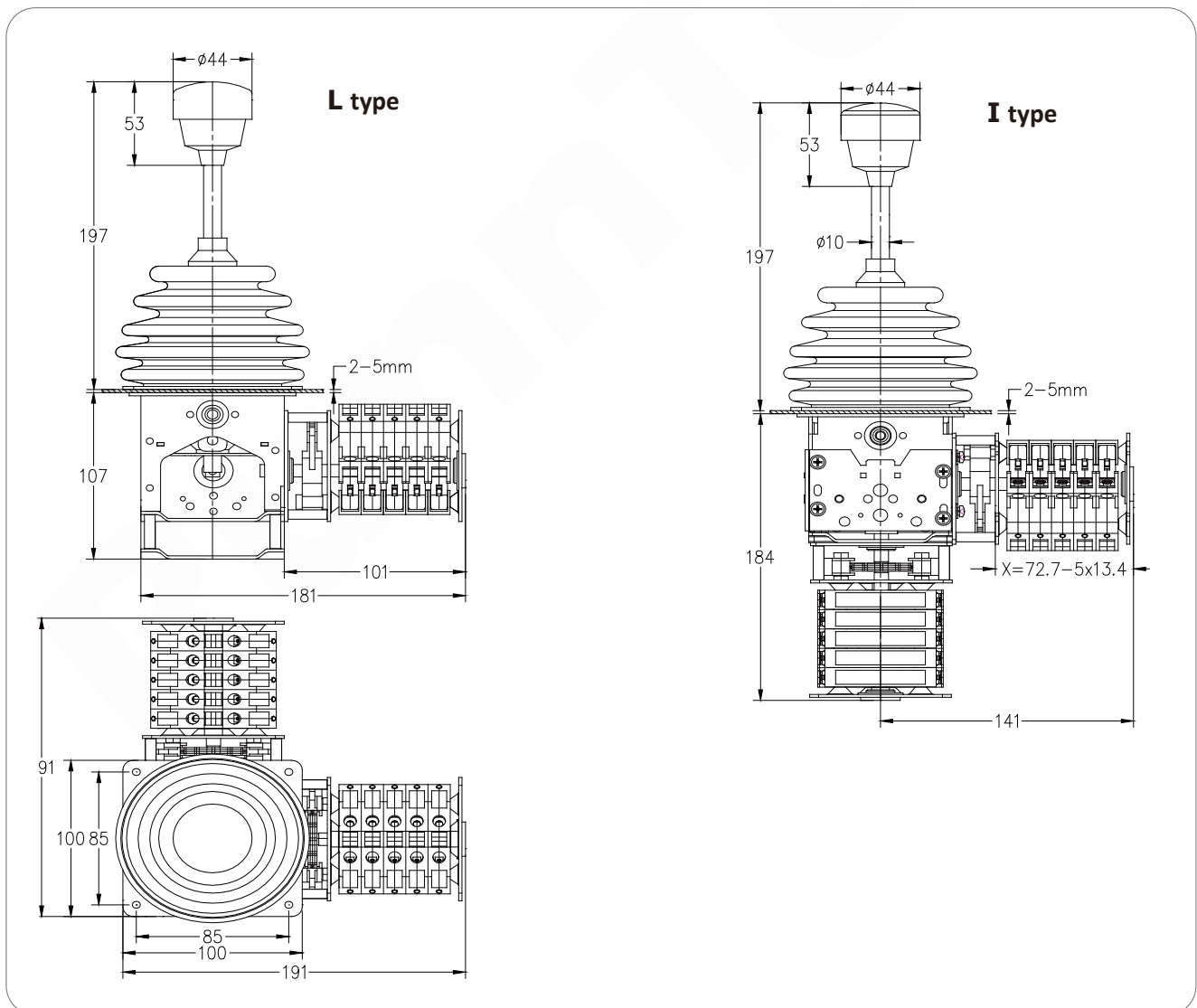
\_\_\_\_\_ mounting dimension

\_\_\_\_\_ handle/grip type


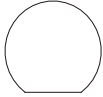





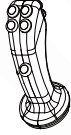

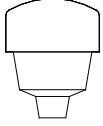

\_\_\_\_\_ contact arrangement

\_\_\_\_\_ potentiometer type

### Product Installation



**Table 1-1 Handle Type**

1	HD1		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 30×60	
2	HD2		ball shape grip	Diameter 32	
3	HD3			Diameter 24×24	
4	HD4		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 30×87	
5	HD6		Press to release (mechanical button)	Diameter 30x60	
6	HD7		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 34×105 max Diameter 45	
7	HD8			Diameter 40×58	
8	HD9		Multi-combinations Refer to Table 1-4 (Page 37)		
9	HD10		Multi-combinations Refer to Table 1-5...1-7 (Page 38)	Diameter 30×60	
10	HD39		Lift to release with latch for mechanical zero interlock	Diameter 44x54	
11	HD80		with or without 2 Self-resetting button ( <b>BT2</b> ) or 2 Self-lock button ( <b>BS2</b> ) Refer to Table 2-1 (Page 42)	Diameter 39x61	

**Table 4-1 Contact Arrangement**

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**Table 4-2 Contact Arrangement**

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# RT600 Series Hall Effect Fingertip Joystick

## Product Features

- Hall effect sensor;
- Single axis, dual axis or 3 axis control;
- Mechanical spring-return to center operation;
- Excellent analog proportional control signal output;
- Easy to install, flexible operation, uniform texture, maintenance-free;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

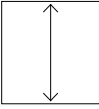
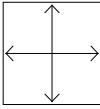
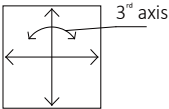
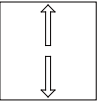
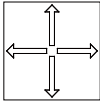
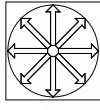
RunnTech 600 series non-contact Hall effect fingertip joystick is ideal for: Medical imaging system, Measurement equipments, Automotive control, Picture disposal devices, Move photography CCTV control system, Robotic operations, Optical instruments, Surveillance monitoring, Studio related apparatuses, Audio video editing equipments, Navigation systems, Powered wheelchairs, CMM machines, Professional camera control, Military equipment, Special vehicles, etc.



## Technical Information

Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-25°C...+80°C	
Protection Grade	IP65	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Hall sensor: ±20°	
Operating Torque	4.5N (50N max)	
Mechanical Life	5 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor
	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5KΩ
	Median Voltage (no-load)	48 - 52%Vs

### Product Configuration

No.	Item	Content	
1	Serial Number	RT600 Series Hall Effect Fingertip Joystick	
2	Operation Mode	<b>T</b> - spring return to center position	
3	Operation Axis	   <b>1.</b> single axis <b>2.</b> dual axis <b>3.</b> three axis	
4	Limiter Plate	   <b>01.</b> Y axis <b>02.</b> Y/X axis plus direction <b>03.</b> Y/X axis full direction	
5	Electrical Output	Hall Sensor	<b>HV1:</b> DC 5V, 0...2.5...5V (rail to rail)
			<b>HV2:</b> DC 5V, 0.5...2.5...4.5V
			<b>HV3:</b> DC 5V, 1.0...2.5...4.0V
			<b>HV4:</b> DC 5V, 1.25...2.5...3.75V
			<b>HV5:</b> DC 5V, 1.1...2.5...3.9V
6	Handle/Grip Type	Refer to Table 1-2 Handle: <b>HD12, HD13</b> and <b>HD14</b>	
7	Mounting Dimensions	<b>M11:</b> 36x36, central hole 38	

**RT600 - T - 3 - 03 - HV1 - HD12 - BT2 - M11**

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦                      ⑧

serial number ——— ①

operation mode ——— ②

operation axis ——— ③

limiter plate ——— ④

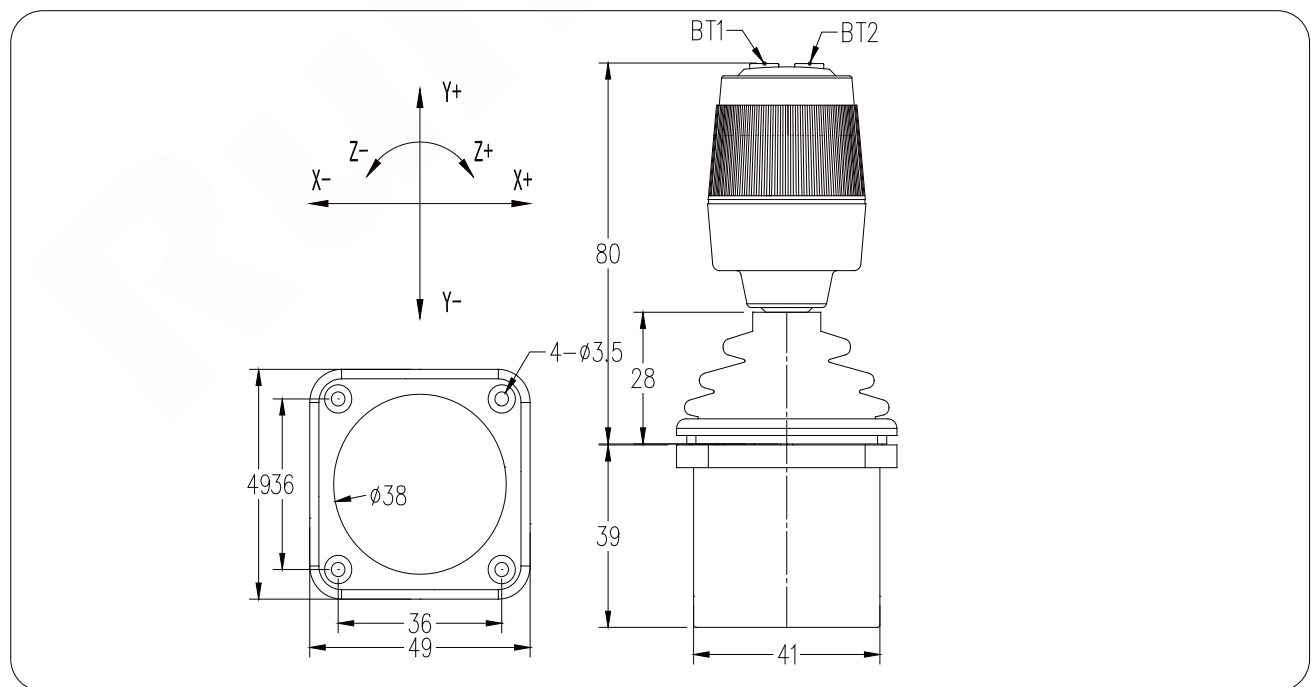
mounting dimension ——— ⑧

self-resetting button ——— ⑦




handle/grip type ——— ⑥

electrical output form ——— ⑤

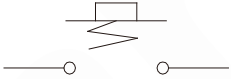
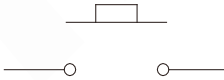
### Product Mounting



**Table 1-2 Handle Type**

1	HD12		with or without 1 self-resetting button ( <b>BT1</b> ) or 2 self-resetting buttons ( <b>BT2</b> ) * only black colors button	Diameter 35x52
2	HD13		with or without 1 self-resetting button ( <b>BT1</b> ) or 1 self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 24x60
3	HD14		with or without 1 self-resetting button ( <b>BT1</b> ) or 1 self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 24x50

**Table 2-1 Accessories**

No.	Type	Description	Parameter	Remark
1	<b>BT</b>	self-resetting button 	24V2A	button color: Red - <b>R</b> Blue - <b>BU</b> Black - <b>BK</b> Yellow - <b>Y</b> Green - <b>G</b> White - <b>W</b>
2	<b>BS</b>	self-locking button 	24V2A	button color: Red - <b>R</b> Blue - <b>BU</b> Yellow - <b>Y</b> Green - <b>G</b>

# RT800 Series Switch Stick Joystick

## Product Features

- Mechanical self-centering operation;
- Single/dual axis, switched output, fingertip size;
- Available with 1 pushbutton (top of grip);
- Bushing or screw mount;
- Durable switch, current up to 250V, 10A;
- Easy to install, flexible operation, uniform texture, maintenance-free;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

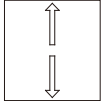
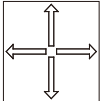
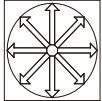
RunnTech 800 series industrial switch stick joystick controller is suitable for control of Electric cars, Electric wheelchairs, Robots, Human-computer Remote video operating systems, Heavy mobile machinery, Measurement systems, Navigation systems, Studio stage lighting equipment, Military equipment, etc.



## Technical Information

Environment Parameter	
Storage Temperature	-30°C...+80°C
Operating Temperature	-25°C...+80°C
Mechanical Parameter	
Mechanical Angle	Potentiometer: $\pm 32^\circ$ , Hall sensor: $\pm 20^\circ$
Operating Torque	5N (50N max)
Mechanical Life	5 million
Electrical Parameter	
Power Supply Voltage	125V 5A, 250V 3A, 250V 10A
Each switch has 3 wiring terminals, including normal open contact and normal close contact.	

### Product Configuration

No.	Item	Content
1	Serial Number	RT800 series switch stick joystick
2	Operation Mode	<b>T</b> - mechanical self-centering operation
3	Limiter Plate	   1. Y axis                      2. Y/X axis cross direction                      3. Y/X axis omnidirectional
4	Quantity of Switch Signal	Refer to Table 4-3 <b>Directional Switch Signal Closed Position</b> only can select 02(89)
5	Common Closed Position	
6	Handle Type	Refer to Table 1-2 Handle: <b>HD2, HD16, HD17 or HD18</b>
7	Remark	

**RT800 - T - 2 - 02 (89) - H16**

①

②

③

④

⑤

⑥

serial number

operation mode

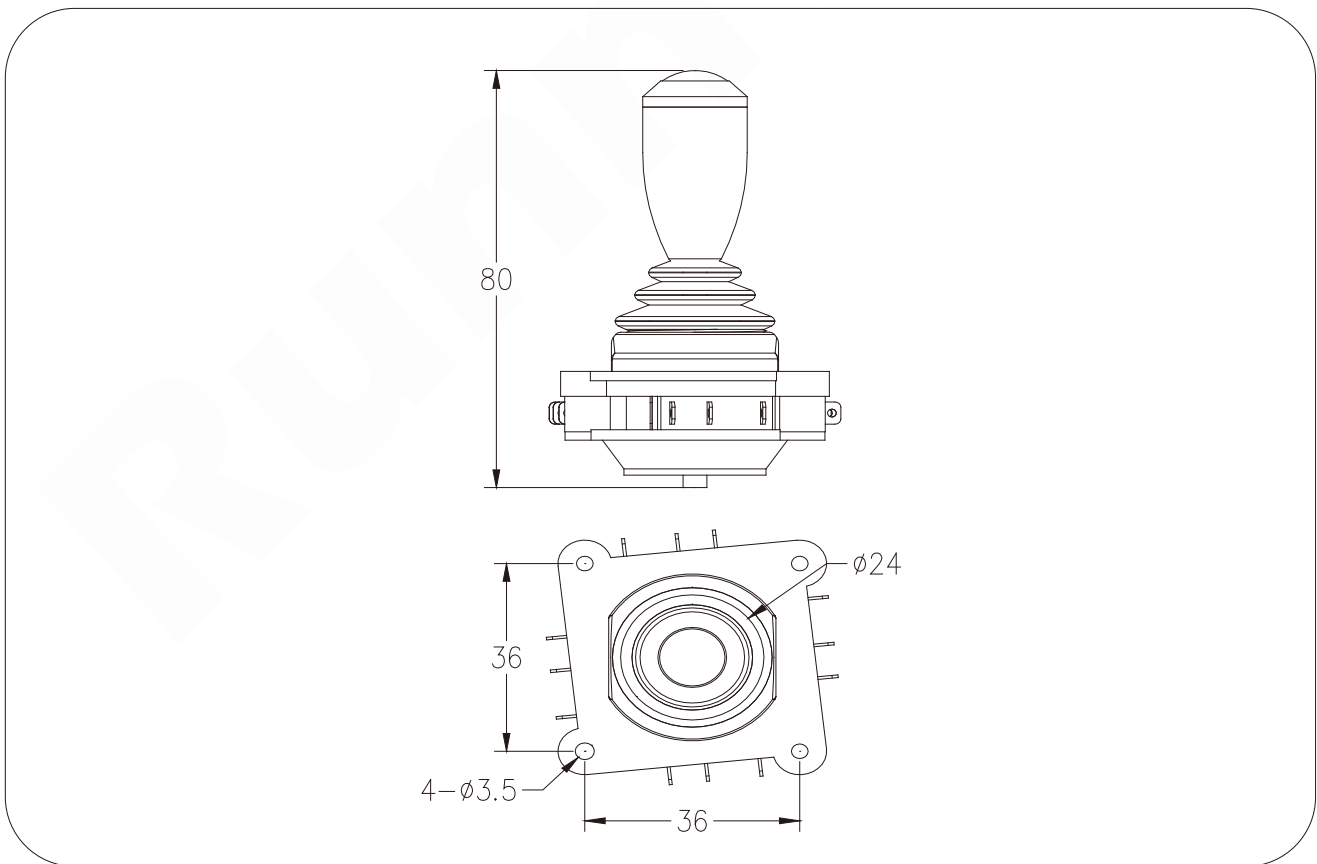
limiter plate

handle/grip type




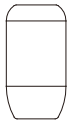
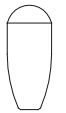
switch signal closed position

quantity of switch signal

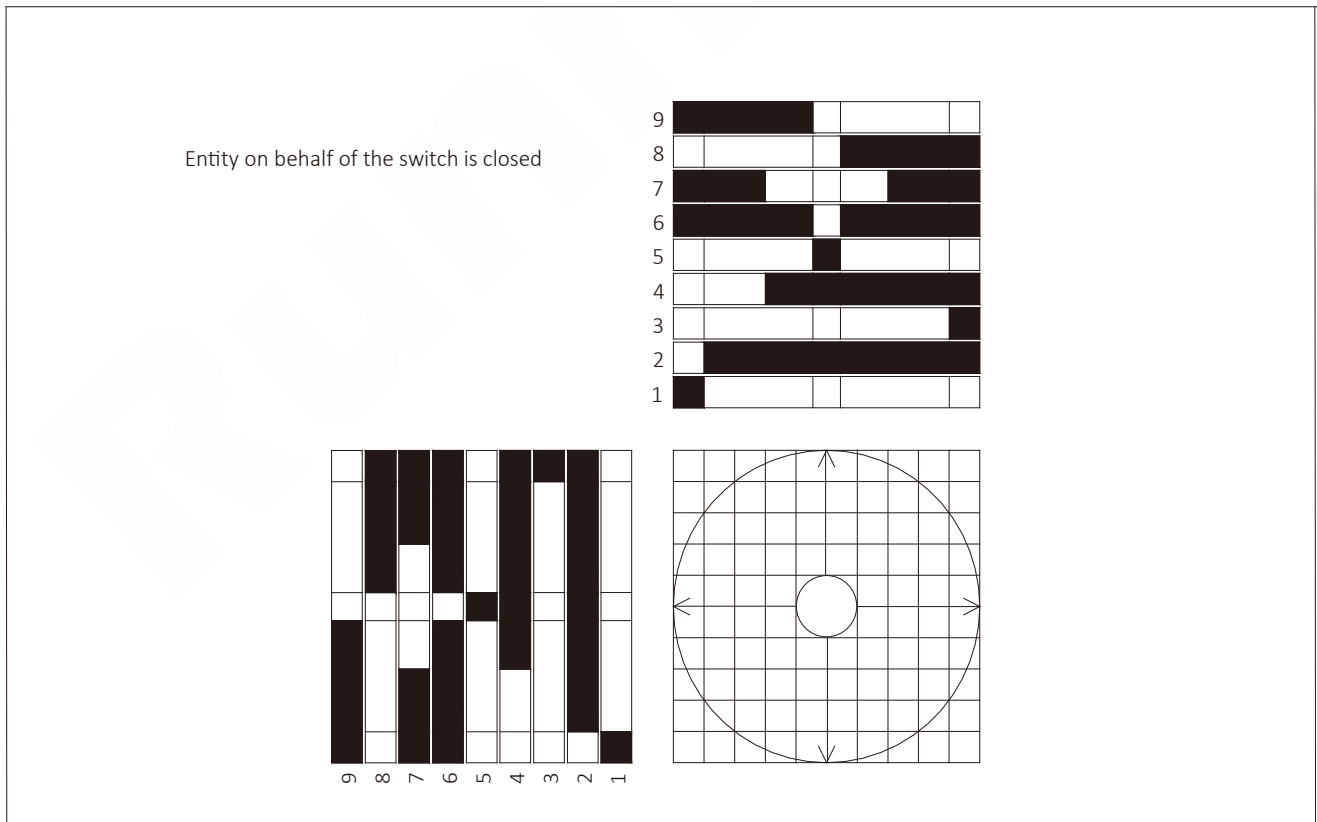
### Product Installation



**Table 1-1 Handle Type**

	Handle	Handle Photo	Accessory	Reference (mm)	Remark
1	HD2		ball shape grip	Diameter 32	
2	HD16			Diameter 15×20	
3	HD17			Diameter 13×35	
4	HD18			Diameter 17×31	
5	HD19		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 17×31	

**Table 4-3 Directional Switch Signal Closed Position**



# RT01 Cobra-head Shaped Joystick

## Product Features

- Potentiometer sensor or Hall sensor;
- Single axis, dual axis or 3 axis control;
- Available with various shape multifunction grips;
- Mechanical spring-return to center or Friction-hold operation;
- Excellent analog proportional control output or switch signal output;
- Easy to install, flexible operation, uniform texture, maintenance-free;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

RunnTech 01 series Cobra-head shaped joystick controller is mainly used in hydraulic proportional control, variable frequency motor control, remote control or electro-hydraulic applications such as Rotary table (drilling rig), Crane, Aerial work platforms, Forklift trucks, Mobile hydraulics, Shield tunneling machine, Hoist, Marine, Construction machinery, Civil engineering, Military vehicles, Cabin vehicles, Military robotics, Precision machine tools, Material handling equipment, etc.



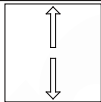
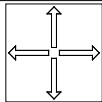
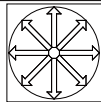
## Technical Information

Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-40°C...+80°C	
Protection Grade	IP64	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Potentiometer: ±32°, Hall sensor: ±20°	
Operating Torque	5N (50N max)	
Mechanical Life	5 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor



Hall Sensor	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5KΩ
	Median Voltage (no-load)	48 - 52%Vs
Potentiometer	Power Supply Voltage	DC24V
	Power Supply Current	<20mA
	Resolution Ratio	infinite
	Resistance (10%)	5KΩ and 10KΩ
	Electrical Angle	±32°
	Output Voltage Range (relative voltage)	0...100%; 10...90%
	Median Voltage	48%...52%
	Potentiometer Maximum Load Voltage	32VDC
	Maximum Power Consumption (25°C)	0.25W
	Switch Direction	switch position ±3°

### Product Configuration

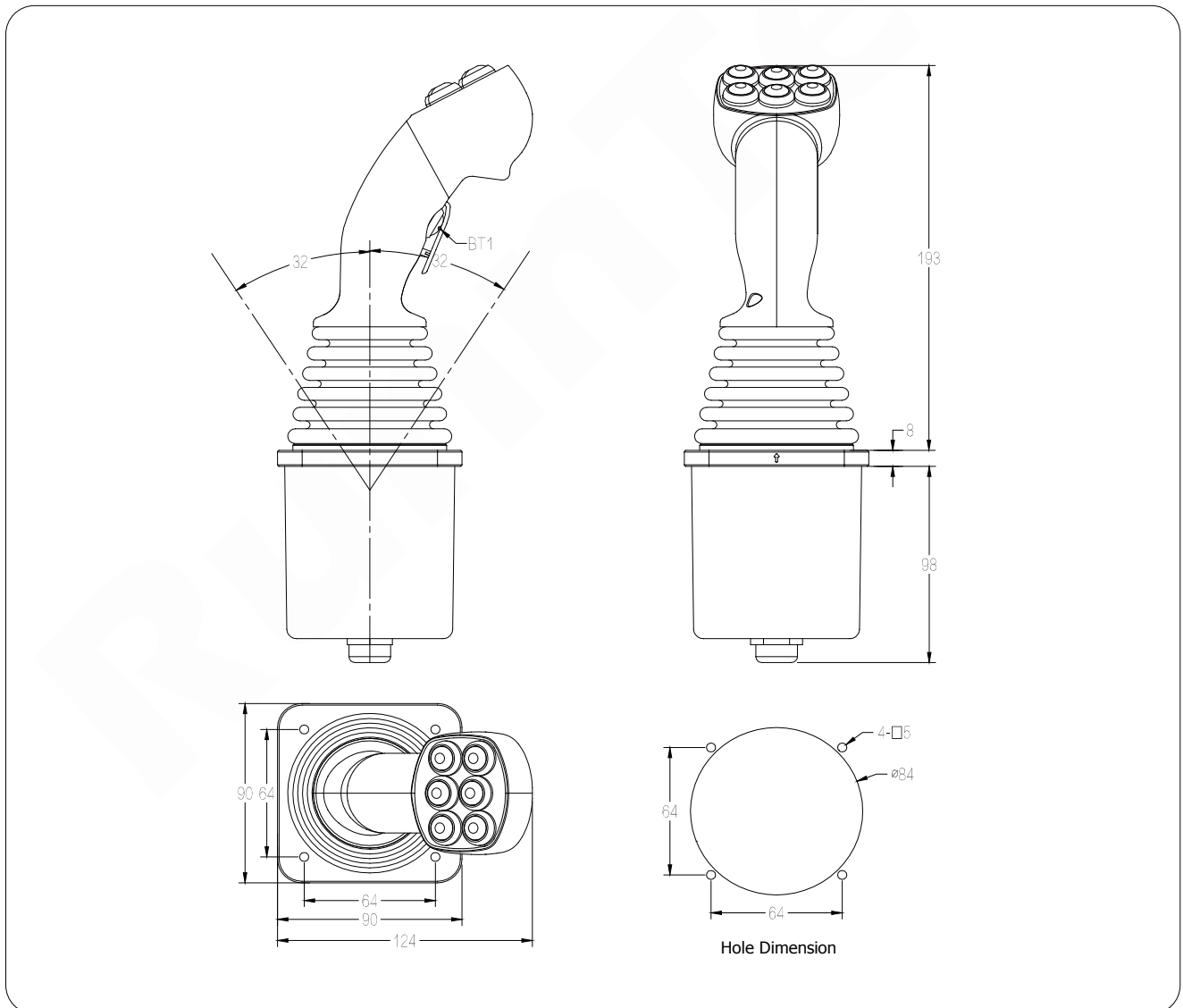
No.	Item	Content	
1	Serial Number	RT01 Cobra-head Shaped Joystick Controller	
2	Operation Mode	<b>M</b> - Friction hold <b>T</b> - Spring return to center <b>MS</b> - Friction hold & Self-lock	
3	Limiters Plate	   <p><b>1.</b> Y axis                                      <b>2.</b> Y/X axis cross direction                                      <b>3.</b> Y/X axis full direction</p>	
4	Electrical Output Form	Hall Sensor	<b>HV1:</b> DC 5V, 0...2.5...5V (rail to rail)
			<b>HV2:</b> DC 5V, 0.5...2.5...4.5V
			<b>HV3:</b> DC 5V, 1.0...2.5...4.0V
			<b>HV4:</b> DC 5V, 1.25...2.5...3.75V
		Potentiometer	<b>P1:</b> Simple 2 directions output (potentiometer with dead zone)
			<b>P2:</b> Simple 1 direction output (potentiometer without dead zone)
			<b>V1:</b> DC24V, -10V...0...+10V (voltage output)
			<b>V2:</b> DC24V, +10V...0...+10V (voltage output)
			<b>V3:</b> DC24V, -5V...0...+5V (voltage output)
			<b>V4:</b> DC24V, +5V...0...+5V (voltage output)
			<b>V5:</b> DC24V, 0...+10V (voltage output)
			<b>V6:</b> DC24V, 0...+5V (voltage output)
<b>I1:</b> 4 wire 4mA...12mA...20mA (current output)			
<b>I2:</b> 4 wire 20mA...4mA...20mA (current output)			

5	Potentiometer Type	<b>1K, 2K, 5K, 10K, 20K</b> or <b>H</b> (Hall sensor)
6	Quantity of Switch Signal	<b>01, 02</b> or <b>03</b> (the quantity of directional switch signal in each axis)
7	Switch Signal Closed Position	Refer to Table 4-3 <b>Directional Switch Signal Closed Position</b> (Page 43)
8	Handle/Grip Type	Refer to Table 1-1...1-8 Handle: <b>HD1, HD2, HD3, HD4, HD5, HD7, HD8, HD10, HD80</b>
9	Mounting Dimensions	<b>M4</b> : 64×64, central hole 83


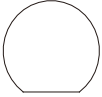







  

**RT01 - T - 2 - P1 (10K) - 02 (89) - HD10b4-BT2③⑤RBS2②④Y - M4 - 50** (wire outlet length 50cm)

## Product Installation



**Table 1-1 Handle Type**

1	HD1		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 30×60	
2	HD2		ball shape grip	Diameter 32	
3	HD3			Diameter 24×24	
4	HD4		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 30×87	
5	HD5		Pull to release *only for friction hold operation; single axis ( <b>MS-1</b> ) or dual axis cross direction ( <b>MS-2</b> )	Diameter 30×60	
6	HD7		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 34×105 max diameter 45	
7	HD8			Diameter 40×58	
8	HD10		Multi-combinations Refer to Table 1-5...1-7 (Page 38)	Diameter 30×60	
9	HD80		with or without 2 Self-resetting button ( <b>BT2</b> ) or 2 Self-lock button ( <b>BS2</b> ) Refer to Table 2-1 (Page 42)	Diameter 39×61	

# RT02 Series Robust Industrial Joystick

## Product Features

- Potentiometer sensor or Hall sensor;
- Single axis, dual axis or 3 axis control;
- Resistant to oil, maritime climate, ozone and UV radiation;
- Mechanical spring-return to center or Friction-hold operation;
- Excellent analog proportional control, CANbus 2.0 or RS232 signal output;
- Easy to install, flexible operation, uniform texture, maintenance-free;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

RunnTech 02 series robust industrial joystick controller is designed for hydraulic proportional control and variable frequency motor control, such as Construction machinery, Precision machine, Military robotics, Refuse handling trucks, offshore, Rotary drilling rigs, Cranes, Marine etc. Available in one, two or three axis configurations, this joystick can be supplied with non-contact Hall effect sensors or long life potentiometer tracks.

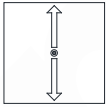
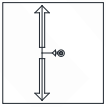
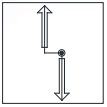
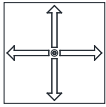
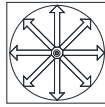


## Technical Information

Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-40°C...+80°C	
Protection Grade	IP64	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Potentiometer: ±32°, Hall sensor: ±20°	
Operating Torque	5N (50N max)	
Mechanical Life	5 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor

Hall Sensor	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5KΩ
	Median Voltage (no-load)	48 - 52%Vs
Potentiometer	Power Supply Voltage	DC24V
	Power Supply Current	<20mA
	Resolution Ratio	infinite
	Resistance (10%)	5KΩ and 10KΩ
	Electrical Angle	±32°
	Output Voltage Range (relative voltage)	0...100%; 10...90%
	Median Voltage	48%~52%
	Potentiometer Maximum Load Voltage	32VDC
	Maximum Power Consumption (25°C)	0.25W
	Switch Direction	switch position ±3°

### Product Configuration

No.	Item	Content																
1	Serial Number	RT02 Series Robust Industrial Joystick																
2	Operation Mode	<b>M</b> - Friction hold <b>T</b> - Spring return to center <b>MS</b> - Friction hold & Self-lock <b>TS</b> - Spring return & Self-lock																
3	Limiter Plate	     <b>1</b> <b>1b</b> <b>1c</b> <b>2</b> : Y/X axis cross direction <b>3</b> : Y/X axis full direction																
4	Electrical Output Form	<table border="0"> <tr> <td rowspan="4">Hall Sensor</td> <td><b>HV1</b>: DC 5V, 0...2.5...5V (rail to rail)</td> </tr> <tr> <td><b>HV2</b>: DC 5V, 0.5...2.5...4.5V</td> </tr> <tr> <td><b>HV3</b>: DC 5V, 1.0...2.5...4.0V</td> </tr> <tr> <td><b>HV4</b>: DC 5V, 1.25...2.5...3.75V</td> </tr> <tr> <td rowspan="9">Potentiometer</td> <td><b>P1</b>: Simple 2 directions output (potentiometer with dead zone)</td> </tr> <tr> <td><b>P2</b>: Simple 1 direction output (potentiometer without dead zone)</td> </tr> <tr> <td><b>V1</b>: DC24V, -10V...0...+10V (voltage output)</td> </tr> <tr> <td><b>V2</b>: DC24V, +10V...0...+10V (voltage output)</td> </tr> <tr> <td><b>V3</b>: DC24V, -5V...0...+5V (voltage output)</td> </tr> <tr> <td><b>V4</b>: DC24V, +5V...0...+5V (voltage output)</td> </tr> <tr> <td><b>V5</b>: DC24V, 0...+10V (voltage output)</td> </tr> <tr> <td><b>V6</b>: DC24V, 0...+5V (voltage output)</td> </tr> <tr> <td><b>I1</b>: 4 wire 4mA...12mA...20mA (current output)</td> </tr> <tr> <td><b>I2</b>: 4 wire 20mA...4mA...20mA (current output)</td> </tr> </table>	Hall Sensor	<b>HV1</b> : DC 5V, 0...2.5...5V (rail to rail)	<b>HV2</b> : DC 5V, 0.5...2.5...4.5V	<b>HV3</b> : DC 5V, 1.0...2.5...4.0V	<b>HV4</b> : DC 5V, 1.25...2.5...3.75V	Potentiometer	<b>P1</b> : Simple 2 directions output (potentiometer with dead zone)	<b>P2</b> : Simple 1 direction output (potentiometer without dead zone)	<b>V1</b> : DC24V, -10V...0...+10V (voltage output)	<b>V2</b> : DC24V, +10V...0...+10V (voltage output)	<b>V3</b> : DC24V, -5V...0...+5V (voltage output)	<b>V4</b> : DC24V, +5V...0...+5V (voltage output)	<b>V5</b> : DC24V, 0...+10V (voltage output)	<b>V6</b> : DC24V, 0...+5V (voltage output)	<b>I1</b> : 4 wire 4mA...12mA...20mA (current output)	<b>I2</b> : 4 wire 20mA...4mA...20mA (current output)
		Hall Sensor		<b>HV1</b> : DC 5V, 0...2.5...5V (rail to rail)														
				<b>HV2</b> : DC 5V, 0.5...2.5...4.5V														
				<b>HV3</b> : DC 5V, 1.0...2.5...4.0V														
			<b>HV4</b> : DC 5V, 1.25...2.5...3.75V															
		Potentiometer	<b>P1</b> : Simple 2 directions output (potentiometer with dead zone)															
			<b>P2</b> : Simple 1 direction output (potentiometer without dead zone)															
			<b>V1</b> : DC24V, -10V...0...+10V (voltage output)															
			<b>V2</b> : DC24V, +10V...0...+10V (voltage output)															
			<b>V3</b> : DC24V, -5V...0...+5V (voltage output)															
			<b>V4</b> : DC24V, +5V...0...+5V (voltage output)															
			<b>V5</b> : DC24V, 0...+10V (voltage output)															
			<b>V6</b> : DC24V, 0...+5V (voltage output)															
<b>I1</b> : 4 wire 4mA...12mA...20mA (current output)																		
<b>I2</b> : 4 wire 20mA...4mA...20mA (current output)																		

5	Potentiometer Type	<b>1K, 2K, 5K, 10K, 20K</b> or <b>H</b> (Hall sensor)
6	Quantity of Switch Signal	<b>01, 02</b> or <b>03</b> (the quantity of directional switch signal in each axis)
7	Switch Signal Closed Position	Refer to Table 4-3 <b>Directional Switch Signal Closed Position (Page 43)</b>
8	Handle/Grip Type	Refer to Table 1-1...1-8 Handle: <b>HD9, HD10, HD11, HD50</b>
9	Mounting Dimensions	<b>M6: 76x76</b> , central hole 92

**RT02 - T - 2 - P1 (10K) - 02 (89) - HD10b4-BT2 ③⑤RBS2 ②④Y - M6 - 50** (wire outlet length 50cm)

① serial number

② operation mode

③ limiter plate

④ electrical output form

⑤ potentiometer type

⑥ mounting dimension

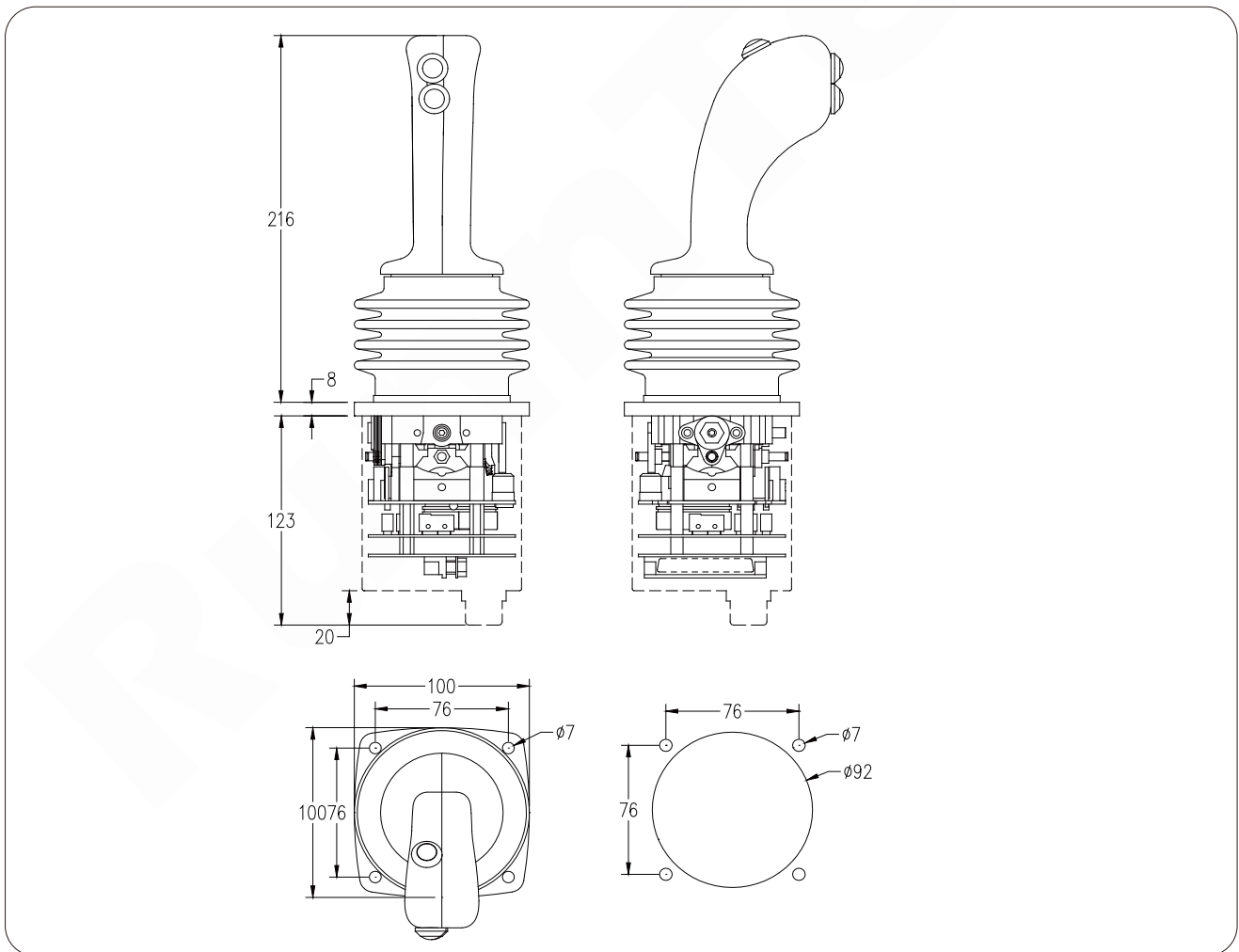
⑦ button location

⑧ handle type

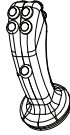



⑨ switch signal closed position

⑩ quantity of switch signal

## Product Installation



**Table 1-1 Handle Type**

1	HD9		Multi-combinations Refer to Table 1-4 (Page 37)		
2	HD10		Multi-combinations Refer to Table 1-5...1-7 (Page 38)	Diameter 30x60	
3	HD11		with or without 1 Self-resetting button ( <b>BT1</b> ) or 1 Self-lock button ( <b>BS1</b> ) Refer to Table 2-1 (Page 42)	Diameter 67x120	
4	HD50		Lift to release		

# F100 Series Proportional Accelerator Pedal

## Product Features

- Potentiometer sensor or Hall sensor;
- 0-10V modular circuit control;
- With a set of switch 125V5A, 250V3A;
- Mechanical spring-return operation;
- Excellent analog proportional control or switch signal output;
- Easy to install, flexible operation, maintenance-free;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

RunnTech F100 series proportional accelerator pedal is mainly used in hydraulic proportional and variable frequency motor control, such as Rotary Drilling Rig, Aerial Fire Engine, Battery Cars, etc.



## Technical Information

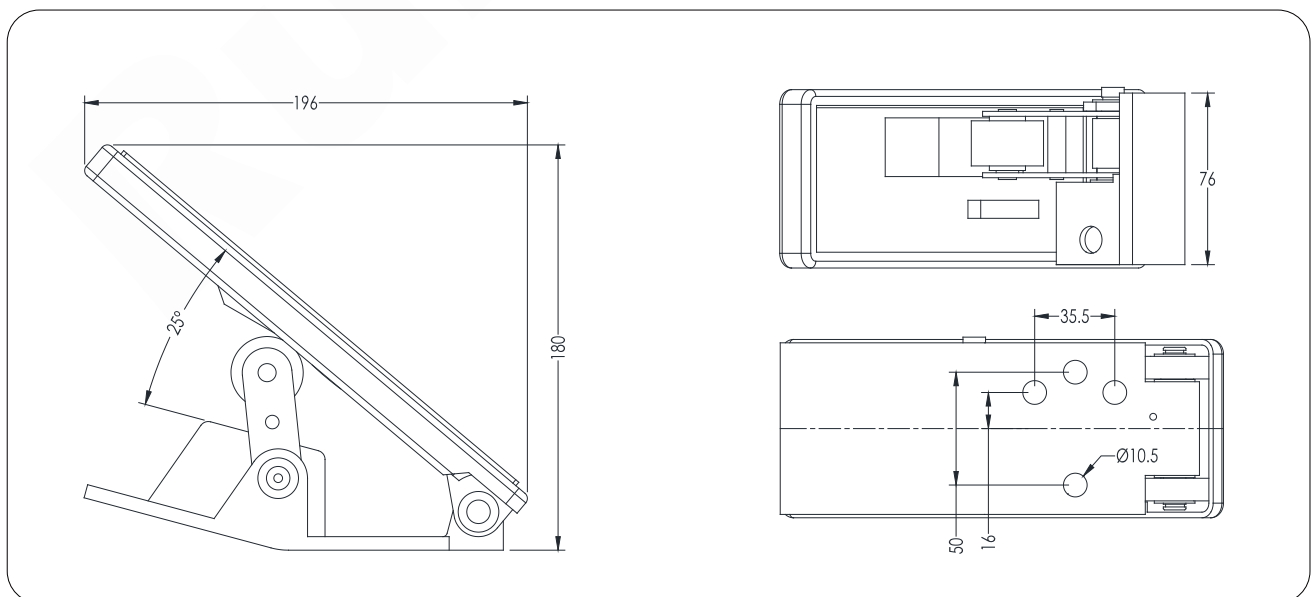
Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-40°C...+80°C	
Protection Grade	IP64	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Potentiometer: ±32°, Hall sensor: ±20°	
Operating Torque	5N (50N max)	
Mechanical Life	5 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor
	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5KΩ
	Median Voltage (no-load)	48 - 52%Vs
Potentiometer	Power Supply Voltage	DC24V
	Power Supply Current	<20mA
	Resolution Ratio	infinite
	Resistance (10%)	5KΩ and 10KΩ



Potentiometer	Electrical Angle	±32°
	Output Voltage Range (relative voltage)	0...100%; 10...90%
	Median Voltage	48%...52%
	Potentiometer Maximum Load Voltage	32VDC
	Maximum Power Consumption (25°C)	0.25W
	Switch Direction	switch position ±3°

### Product Configuration

No.	Item	Content	
1	Serial Number	F100 series proportional accelerator pedal	
2	Operation Mode	<b>T</b> - spring return	
3	Electrical Output Form	Hall Sensor	<b>HV1</b> : DC 5V, 0...2.5...5V (rail to rail)
			<b>HV2</b> : DC 5V, 0.5...2.5...4.5V
			<b>HV3</b> : DC 5V, 1.0...2.5...4.0V
			<b>HV4</b> : DC 5V, 1.25...2.5...3.75V
		Potentiometer	<b>P2</b> : Simple 1 direction output (potentiometer without dead zone)
			<b>V5</b> : DC24V, 0...+10V (voltage output)
			<b>V6</b> : DC24V, 0...+5V (voltage output)
			<b>I1</b> : 4 wire 4mA...12mA...20mA (current output)
4	Potentiometer Type	<b>1K, 2K, 5K, 10K, 20K</b> or <b>H</b> (Hall sensor)	
5	Quantity of Switch Signal	<b>01</b> (only 1 directional switch signal)	
6	Switch Signal Closed Position	Refer to Table 4-3 <b>Directional Switch Signal Closed Position</b> (Page 43)	
<p><b>F100 - T - V5 (10K) - 01 (2)</b></p> <p>①      ②      ③ ④      ⑤ ⑥</p> <p>serial number      _____</p> <p>operation mode      _____</p> <p>electrical output form      _____</p> <p>switch signal closed position      _____</p> <p>quantity of switch signal      _____</p> <p>potentiometer type      _____</p>			



# F200 Series Hall Sensor Accelerator Pedal

## Product Features

- Hall sensor;
- 5 to 48V wide range input voltage;
- With a set of switch 125V5A, 250V3A;
- Mechanical spring-return operation;
- Excellent analog proportional control or switch signal output;
- Easy to install, flexible operation, maintenance-free;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

RunnTech F200 series Hall accelerator pedal is mainly used in hydraulic proportional and variable frequency motor control, such as Rotary Drilling Rig, Aerial Fire Engine, Battery Cars.



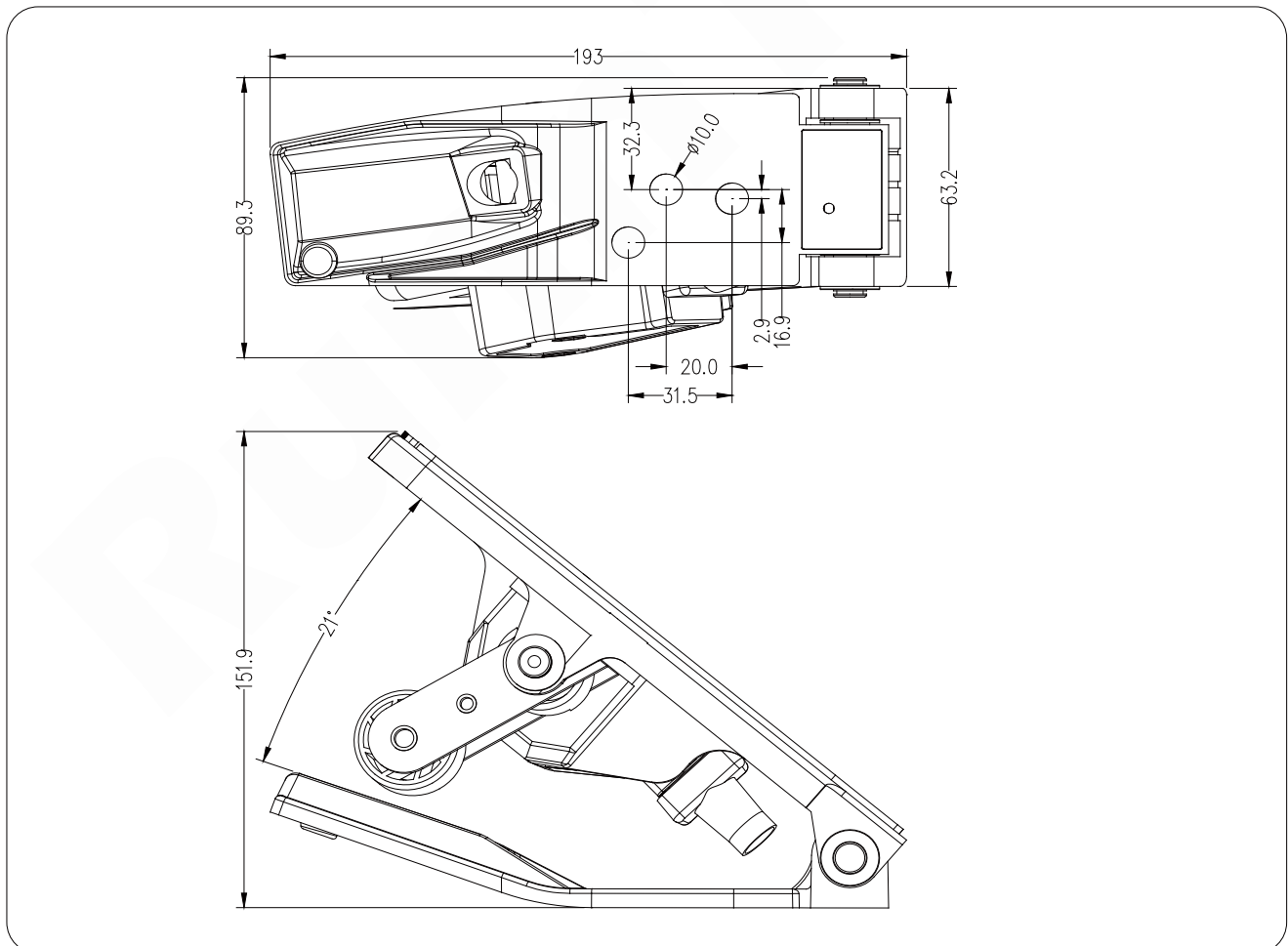
## Technical Information

Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-40°C...+80°C	
Protection Grade	IP64	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Potentiometer: ±32°, Hall sensor: ±20°	
Operating Torque	5N (50N max)	
Mechanical Life	5 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor
	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5KΩ
	Median Voltage (no-load)	48 - 52%Vs

## Product Configuration

No.	Item	Content
1	Serial Number	F200 series Hall sensor accelerator pedal
2	Operation Mode	T - spring return
3	Electrical Output Form	Hall Sensor
		<b>HV1:</b> DC 5V, 0...2.5...5V (rail to rail)
		<b>HV2:</b> DC 5V, 0.5...2.5...4.5V
		<b>HV3:</b> DC 5V, 1.0...2.5...4.0V
	<b>HV4:</b> DC 5V, 1.25...2.5...3.75V	
4	Quantity of Switch Signal	01 (only 1 directional switch signal)
5	Switch Signal Closed Position	Refer to Table 4-3 <b>Directional Switch Signal Closed Position (Page 43)</b>
<p><b>F200 - T - HV1 - 01 (1)</b></p> <p>①      ②      ③      ④      ⑤</p>		
	serial number	_____
	operation mode	_____
	electrical output form	_____
		_____ switch signal closed position
		_____ quantity of switch signal

## Product Installation



# W100 Series Thumbwheel Controller

## Product Features

- Hall sensor;
- Miniature design;
- Bilateral control;
- Mechanical spring-return operation;
- Excellent analog proportional control signal output;
- Designed for joystick, armrest and panel mounting;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.

## Application

RunnTech W100 series thumbwheel controller is a revolutionary Hall effect control providing proportional control, can be used to install on the console alone, also can be installed in HD10 grip or armrest and panel mount integration.



## Technical Information

Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-40°C...+80°C	
Protection Grade	IP64	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Potentiometer: ±32°, Hall sensor: ±20°	
Operating Torque	5N (50N max)	
Mechanical Life	1 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor
	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5KΩ
	Median Voltage (no-load)	48 - 52%Vs
Wire Instruction	Red	5V DC
	Grey	GND
	Yellow	OUT

### Product Configuration

No.	Item	Content	
1	Serial Number	W100 series thumbwheel controller	
2	Operation Mode	T - spring return to center	
3	Electrical Output Form	Hall Sensor	HV1: DC 5V, 0...2.5...5V (rail to rail)
			HV2: DC 5V, 0.5...2.5...4.5V
			HV3: DC 5V, 1.0...2.5...4.0V
			HV4: DC 5V, 1.25...2.5...3.75V

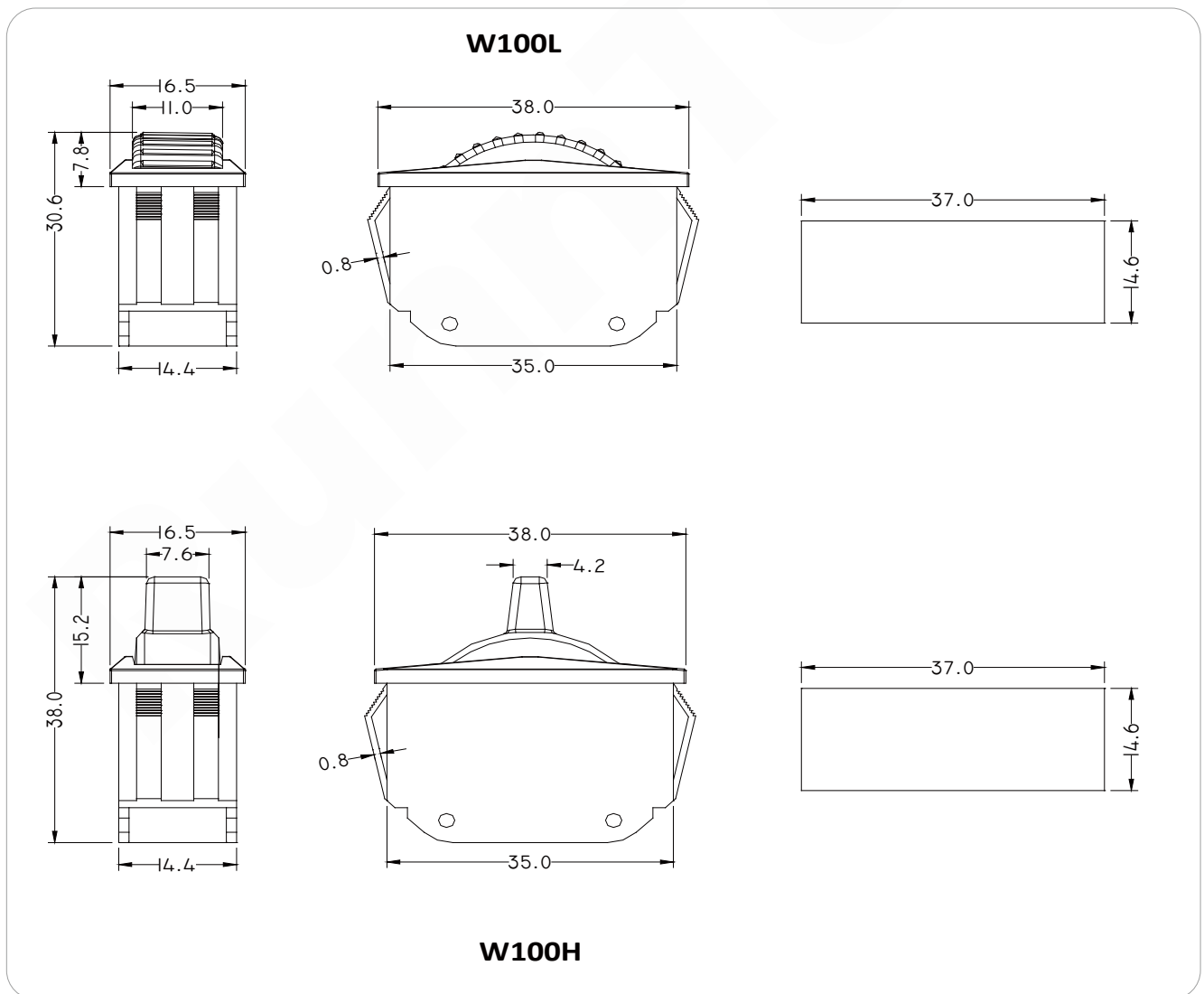
**W100L - T - HV1**

①                      ②                      ③

serial number      \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_      electrical output form

operation mode    \_\_\_\_\_

### Product Installation



# H100 Series Multi-function Control Handle

## Product Features

- **Hall sensor;**
- 5 to 48V wide range input voltage;
- Mechanical spring-return operation;
- Excellent 0 to 5V analog proportional control output;
- Easy to install, flexible operation, maintenance-free;
- Ergonomics design, multifunction control handle comes equipped with large dual thumb wheels, lift, lower and horn buttons for simplified operation of all controls with either hand;
- CE approved, RoHS 2011/65/EU, Annex II, including (EU) 2015/863 compliant.



## Application

RunnTech H100 Multifunction control handle, also known as Tiller head is mainly used in electric-vehicle applications, for example in electric pallet truck, pedestrian industrial truck, transport trolleys, cleaning machinery, special applications, etc.

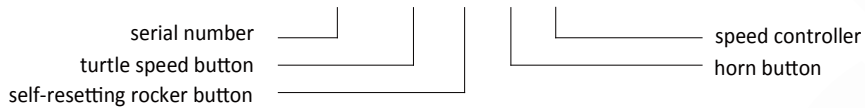
## Technical Information

Environment Parameter		
Storage Temperature	-50°C...+80°C	
Operating Temperature	-40°C...+80°C	
Protection Grade	IP64	
Vibration	Amplitude±3g, Frequency: 10Hz-200Hz	
Impact	20g, 6ms, Semi-sinusoidal	
EMC Anti-interference Rank	100V/m, 30MHz to 1GHz, 80% sine-wave modulation, meet EN50082-2 (1995) standard	
EMC Emission Rank	Rank B, 150KHz to 30MHz, meet EN50081-2 (1993) standard	
ESD Anti-interference Rank	Rank 4, 8KV contact discharge, 15KV air discharge, meet IEC61000-4-2 standard	
Mechanical Parameter		
Mechanical Angle	Potentiometer: ±32°, Hall sensor: ±20°	
Operating Torque	5N (50N max)	
Mechanical Life	5 million	
Mechanical Error	± 0.5°	
Electrical Parameter		
Hall Sensor	Power Supply Voltage	5±0.5V DC
	Power Supply Current Consumption	6.5mA/hall sensor
	Resolution Ratio	infinite
	Maximum Voltage	15VDC
	Reversed Polarity Maximum Voltage	14.5VDC
	Load Resistance	5KΩ
	Median Voltage (no-load)	48 - 52%Vs

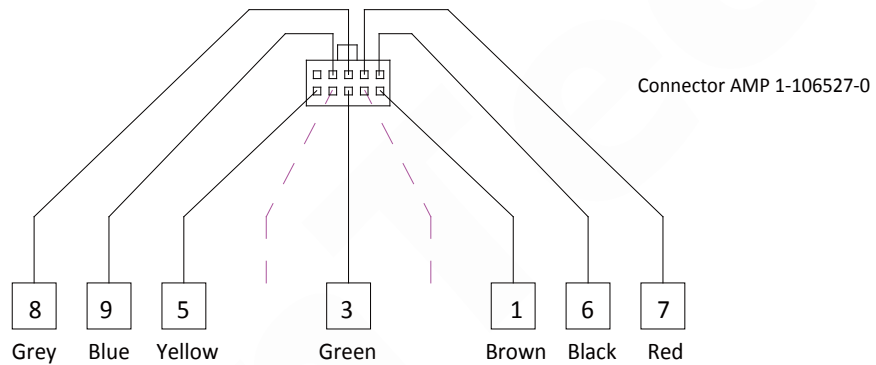
## Product Configuration

No.	Item	Content
1	Serial Number	H100 multifunction control handle (tiller head)
2	Turtle Speed Button	G
3	Self-resetting Rocker Button	Q
4	Horn Button	L
5	Speed Controller	T

**H100 - G - Q - L - T**

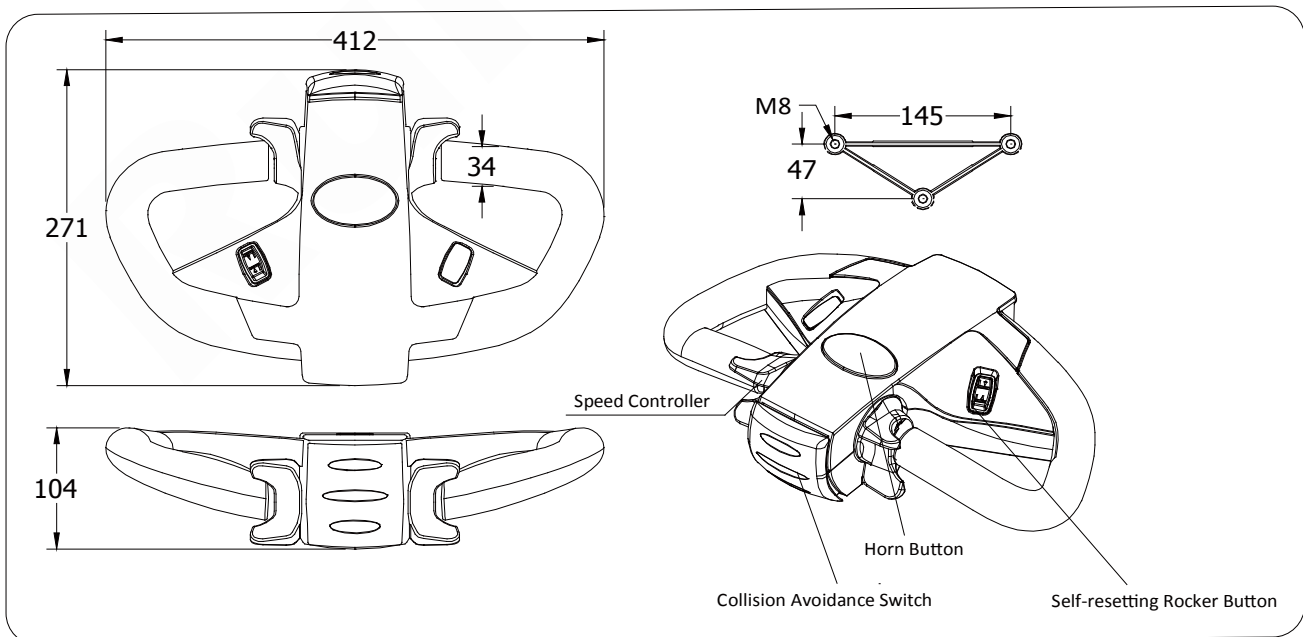


### Speed Controller Connector Definition



- 8: Collision Avoidance Switch (always open)      9: Go Forward (always open)      5: Out (0 - 5V)
- 1: Collision Avoidance Switch (always close)      3: Go Backward (always open)      6: 0V      7: 24V

## Product Installation



**Table 1-4 Handle HD9**

# HD9 Handle

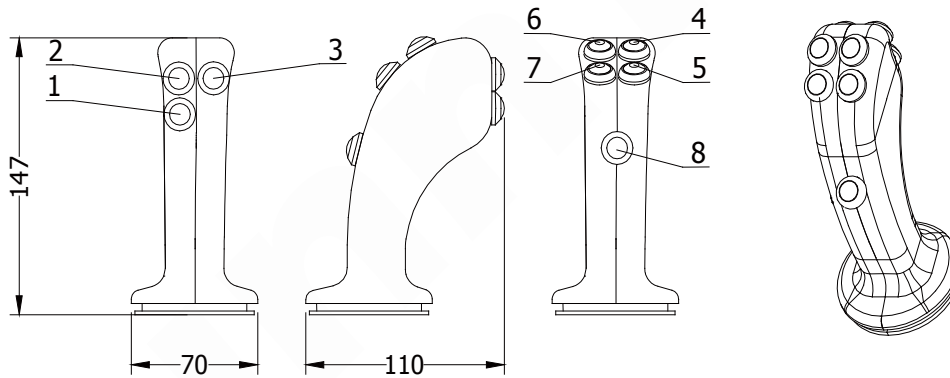


HD9 handle can be installed with a variety of accessories: self-lock button and self-resetting button.

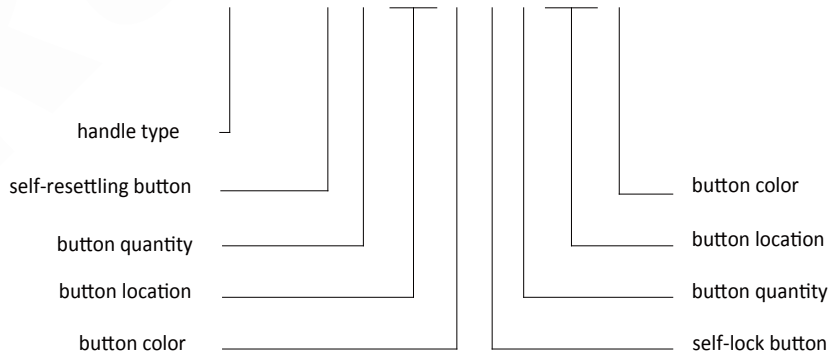
We also can customize special technical parameters to meet your requirements.

HD9 handle use PA66 + 305GF, to achieve excellent high temperature performance and can be installed in RT300 or RT02 series joysticks to achieve multi-axis control.

Operation Temperature: -40-85 °C  
 Storage Temperature: -40-85 °C  
 Meet IEC68 part 2-20  
 Protection Grade: IP64/65



HD9 - BT 2 ⑤⑦ R BS 2 ④⑥ G



button selection reference Table 2-1



**Table 1-5 Handle HD10**

# HD10 Handle

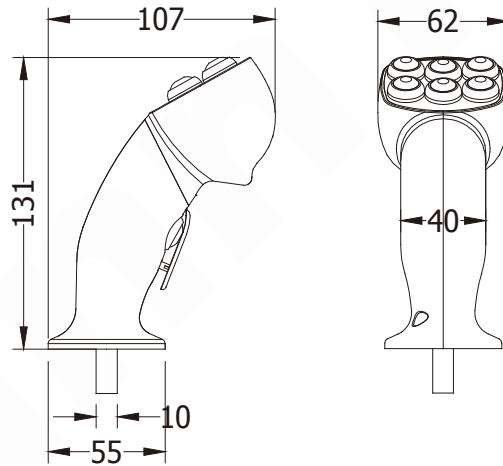


HD10 handle is ergonomically designed to provide a high degree of comfort, highly integrated, the handle can be installed with a variety of accessories: self-resetting (momentary) push button, self-locking push button, analog thumbwheel controller (W100) or rocker switch (QTOT).

We also can customize special technical parameters to meet your requirements.

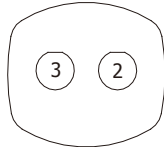
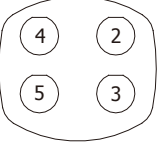
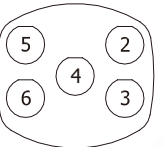
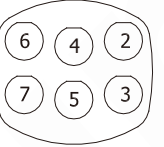
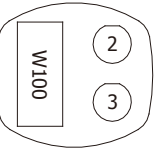
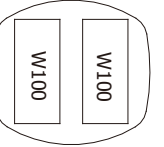
HD10 handle use PA66 + 305GF, to achieve excellent high temperature performance and can be installed in RT100, RT200, RT300 RT01 or RT02 series joysticks to achieve multi-axis control.

Operation Temperature: -40-85 C  
 Storage Temperature: -40-85 C  
 Meet IEC68 part 2-20  
 Protection Grade: IP64/65

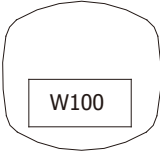
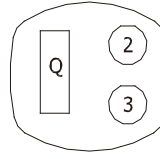
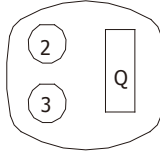
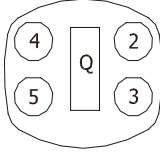
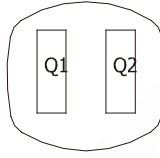


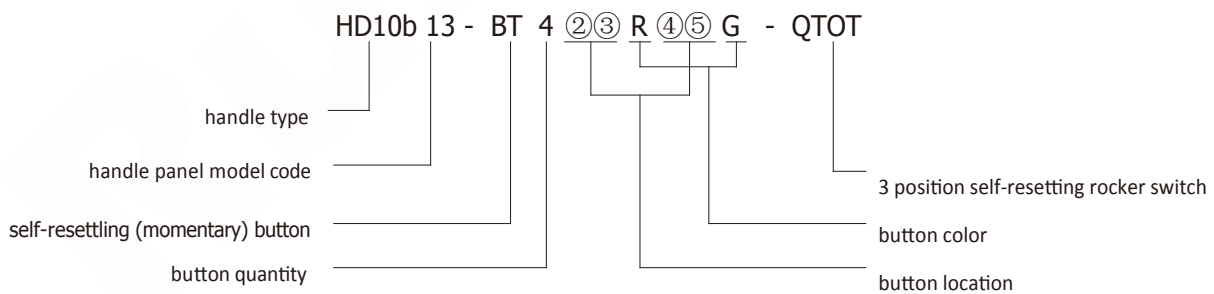
Model Selection	Style	Description
HD10a		without Deadman trigger
HD10b		with Deadman trigger

**Table 1-6 Handle HD10 Button Panel**

Model Selection	Style	Description (all functions selection refer to the Table 2-1)
1		install 1 self-resetting button ( <b>BT</b> ) / self-locking button ( <b>BS</b> )
2		install 2 self-resetting button ( <b>BT</b> ) / self-locking button ( <b>BS</b> )
3		install 3 self-resetting button ( <b>BT</b> ) / self-locking button ( <b>BS</b> )
4		install 4 self-resetting button ( <b>BT</b> ) / self-locking button ( <b>BS</b> )
5		install 5 self-resetting button ( <b>BT</b> ) / self-locking button ( <b>BS</b> )
6		install 6 self-resetting button ( <b>BT</b> ) / self-locking button ( <b>BS</b> )
7		install 2 self-resetting button ( <b>BT</b> ) / self-locking button ( <b>BS</b> ) and 1 proportional thumbwheel ( <b>W100</b> ) or rocker switch ( <b>QTOT</b> )
8		install 2 self-resetting button ( <b>BT</b> ) / self-locking button ( <b>BS</b> ) and 1 proportional thumbwheel ( <b>W100</b> ) or rocker switch ( <b>QTOT</b> )
9		2 proportional thumbwheel controller ( <b>W100</b> ) or rocker switch ( <b>QTOT</b> )

**Table 1-6 Handle HD10 Button Panel**

Model Selection	Style	Description (all functions selection reference Table 2-1)
10		1 proportional thumbwheel controller ( <b>W100</b> ) or rocker switch ( <b>QTOT</b> )
11		install 2 Self-resetting button ( <b>BT</b> ) / Self-locking button ( <b>BS</b> ), and 1 proportional thumbwheel ( <b>W100</b> ) or rocker switch ( <b>QTOT</b> )
12		install 2 Self-resetting button ( <b>BT</b> ) / Self-locking button ( <b>BS</b> ), and 1 proportional thumbwheel ( <b>W100</b> ) or rocker switch ( <b>QTOT</b> )
13		install 4 Self-resetting button ( <b>BT</b> ) / Self-locking button ( <b>BS</b> ), and 1 proportional thumbwheel ( <b>W100</b> ) or rocker switch ( <b>QTOT</b> )
14		2 proportional thumbwheel controller ( <b>W100</b> ) or rocker switch ( <b>QTOT</b> )



button selection refer to Table 2-1

**Table 1-8 Handle HD15**

# HD15 Handle



HD15 handle is ergonomically designed to provide a high degree of comfort, highly integrated, the handle can be installed with one deadman trigger and rocker switch (QTOT).

We also can customize special technical parameters to meet your requirements.

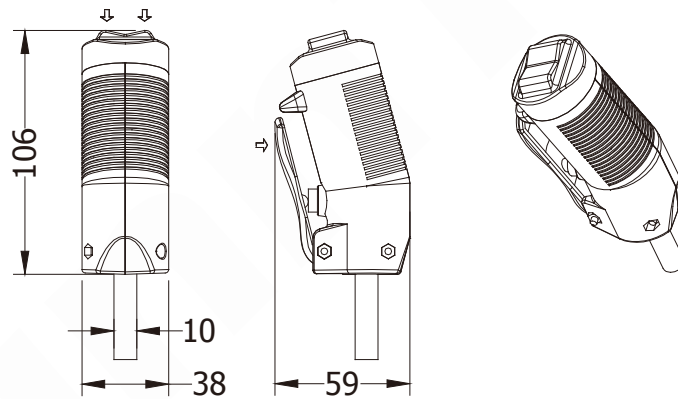
HD15 handle use PA66 + 305GF, to achieve excellent high temperature performance and can be installed in RT100 series joysticks to achieve multi-axis control.

Operation Temperature: -40-85 °C

Storage Temperature: -40-85 °C

Meet IEC68 part 2-20

Protection Grade: IP64/65



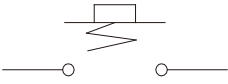
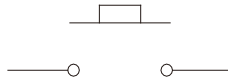
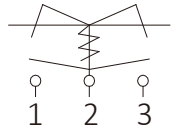
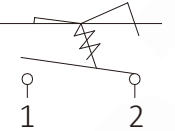
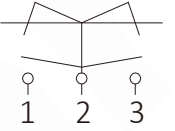
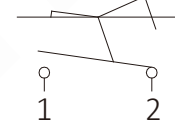
HD15 - BT1 -QTOT

handle type

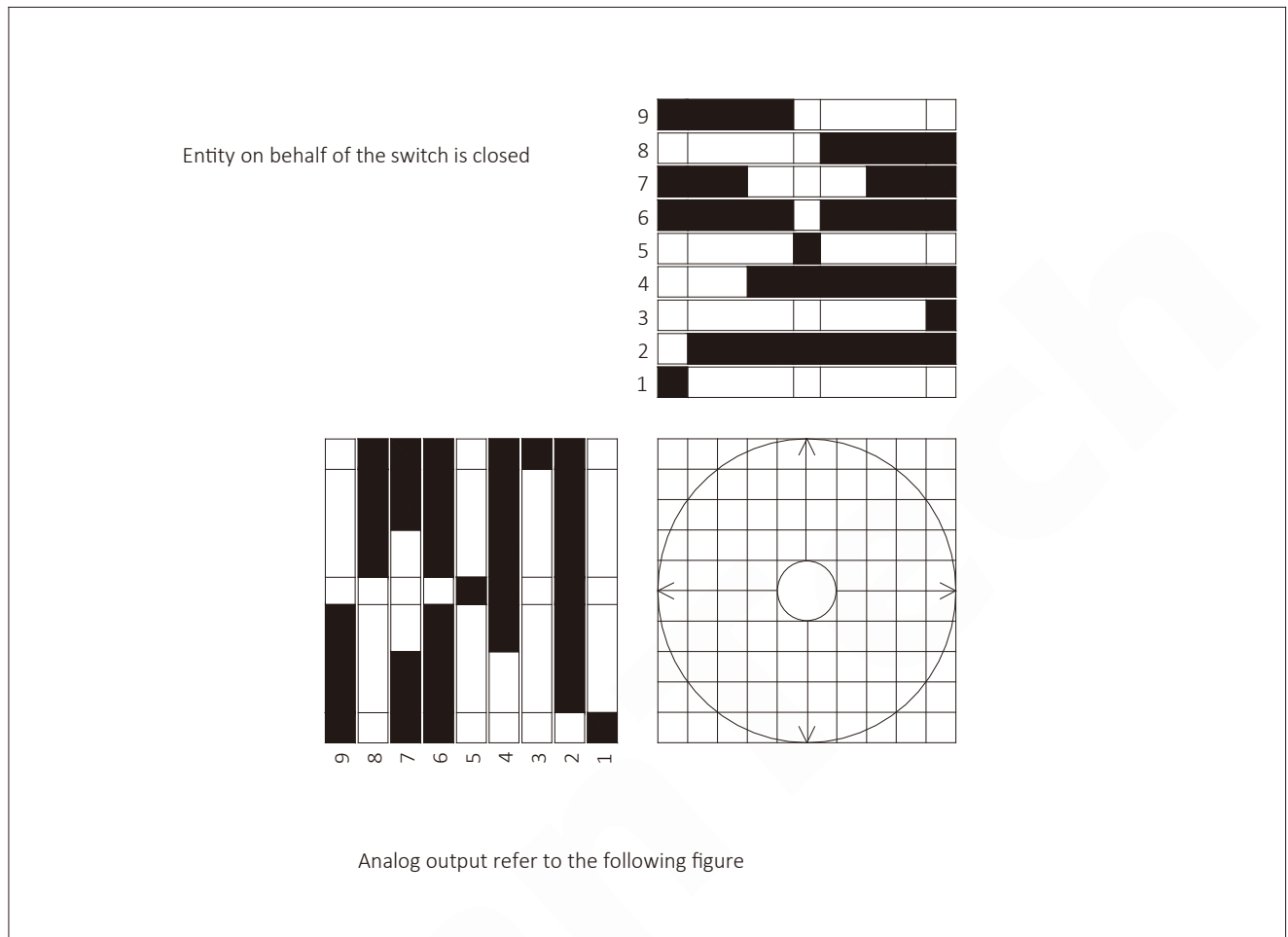
Deadman trigger 250V2A

3 position self-resetting rocker switch

**Table 2-1 Accessories**

No.	Type	Description	Parameter	Remark
1	<b>BT</b>	Self-resetting button 	24V2A	button color : Red - <b>R</b> Blue - <b>BU</b> Black - <b>BK</b> Yellow - <b>Y</b> Green - <b>G</b> White - <b>W</b>
2	<b>BS</b>	Self-locking button 	24V2A	button color : Red - <b>R</b> Blue - <b>BU</b> Yellow - <b>Y</b> Green - <b>G</b>
3	<b>QTOT</b>	3 position self-resetting rocker switch 	3 pins 250V15A	
4	<b>QTO</b>	2 position self-resetting rocker switch 	2 pins 250V15A	
5	<b>QSOS</b>	3 position self-locking rocker switch 	3 pins 250V15A	
6	<b>QSO</b>	2 position self-locking rocker switch 	2 pins 250V15A	
7	<b>QSOT</b>	3 position with one side with self-resetting, another side self-locking	3 pins 250V15A	
8	<b>W100</b>	Thumbwheel Controller (Hall Sensor)	input 5V DC	Remark: Please keep far away from the magnetic object

**Table 4-3 Directional Switch Signal Closed Position**



Electrical Output Form	Hall Sensor	<b>HV1:</b> DC 5V, 0...2.5...5V (rail to rail)
		<b>HV2:</b> DC 5V, 0.5...2.5...4.5V
		<b>HV3:</b> DC 5V, 1.0...2.5...4.0V
		<b>HV4:</b> DC 5V, 1.25...2.5...3.75V
	Potentiometer	<b>P1:</b> Simple 2 directions output (potentiometer with dead zone)
		<b>P2:</b> Simple 1 direction output (potentiometer without dead zone)
		<b>V1:</b> DC24V, -10V...0...+10V (voltage output)
		<b>V2:</b> DC24V, +10V...0...+10V (voltage output)
		<b>V3:</b> DC24V, -5V...0...+5V (voltage output)
		<b>V4:</b> DC24V, +5V...0...+5V (voltage output)
		<b>V5:</b> DC24V, 0...+10V (voltage output)
		<b>V6:</b> DC24V, 0...+5V (voltage output)
		<b>I1:</b> 4 wire 4mA...12mA...20mA (current output)
		<b>I2:</b> 4 wire 20mA...4mA...20mA (current output)

**Table 3-1 Handle Gallery**

<b>HD1</b> without button		<b>HD9</b> with 2 buttons		<b>HD11</b>	
<b>HD1</b> with 1 button		<b>HD9</b> with 6 buttons		<b>HD12</b> with 2 buttons	
<b>HD2</b> ball shape grip		<b>HD9</b> with 9 buttons		<b>HD13</b> with 1 button	
<b>HD3</b>		<b>HD10</b> with 1 button		<b>HD14</b>	
<b>HD4</b> without button		<b>HD10</b> with 2 buttons		<b>HD15</b> with deadman + rocker switch	
<b>HD4</b> with 1 button		<b>HD10</b> with 3 buttons		<b>HD16</b>	
<b>HD5</b> lift to release		<b>HD10</b> with 5 buttons		<b>HD17</b>	
<b>HD6</b> press to release		<b>HD10</b> with 6 buttons		<b>HD18</b>	
<b>HD7</b> with 1 button		<b>HD10</b> with 2 buttons + 1 thumbwheel		<b>HD39</b> lift to release	
<b>HD8</b>		<b>T Shape</b> press to release		<b>HD50</b> lift to release	



**RunnTech Electronics (Changzhou) Corp.**

Phone number: +86 519 8223 0053

Fax number: +86 519 8886 5269

E-mail: [info@runntech.com](mailto:info@runntech.com)

Address: B2-5F, Hutang Technology Industrial Park, Changzhou, Jiangsu 213161 China

