

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;
- 5 million life cycles.

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.

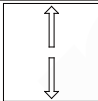
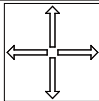
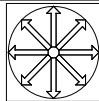


Technical Information

Environment Parameter		
Storage Temperature	-50℃～+80℃	
Operating Temperature	-40℃～+80℃	
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	M - Friction hold T - Spring return to center MS - Friction hold & Self-lock																	
3	Limiter Plate	   1. Y axis 2. Y & X axis cross direction 3. Y & X axis full direction																	
4	Electrical Output Form	<table><tr><td rowspan="4">Hall sensor</td><td>HV1: DC 5V, 0~2.5~5V (rail to rail)</td></tr><tr><td>HV2: DC 5V, 0.5~2.5~4.5V</td></tr><tr><td>HV3: DC 5V, 1.0~2.5~4.0V</td></tr><tr><td>HV4: DC 5V, 1.25~2.5~3.75V</td></tr><tr><td rowspan="8">Potentiometer</td><td>P1: Simple 2 directions output (potentiometer with dead zone)</td></tr><tr><td>P2: Simple 1 direction output (potentiometer without dead zone)</td></tr><tr><td>V1: DC24V, -10V~0~+10V (voltage output)</td></tr><tr><td>V2: DC24V, +10V~0~+10V (voltage output)</td></tr><tr><td>V3: DC24V, -5V~0~+5V (voltage output)</td></tr><tr><td>V4: DC24V, +5V~0~+5V (voltage output)</td></tr><tr><td>V5: DC24V, 0~+10V (voltage output)</td></tr><tr><td>V6: DC24V, 0~+5V (voltage output)</td></tr><tr><td rowspan="2"></td><td>I1: 4 wire 4mA~12mA~20mA (current output)</td></tr><tr><td>I2: 4 wire 20mA~4mA~20mA (current output)</td></tr></table>	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	Potentiometer	P1: Simple 2 directions output (potentiometer with dead zone)	P2: Simple 1 direction output (potentiometer without dead zone)	V1: DC24V, -10V~0~+10V (voltage output)	V2: DC24V, +10V~0~+10V (voltage output)	V3: DC24V, -5V~0~+5V (voltage output)	V4: DC24V, +5V~0~+5V (voltage output)	V5: DC24V, 0~+10V (voltage output)	V6: DC24V, 0~+5V (voltage output)		I1: 4 wire 4mA~12mA~20mA (current output)	I2: 4 wire 20mA~4mA~20mA (current output)
Hall sensor	HV1: DC 5V, 0~2.5~5V (rail to rail)																		
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	V6: DC24V, 0~+5V (voltage output)																		
	I1: 4 wire 4mA~12mA~20mA (current output)																		
	I2: 4 wire 20mA~4mA~20mA (current output)																		

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

RT100 - T - 2 - P1 (10K) - 02 (89) - HD8 - M1

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serial number _____

operation mode _____

limiter plate _____

electrical output form _____

_____ mounting dimension

_____ handle/grip type

_____ switch signal closed position

_____ quantity of switch signal

_____ potentiometer type

Product Installation

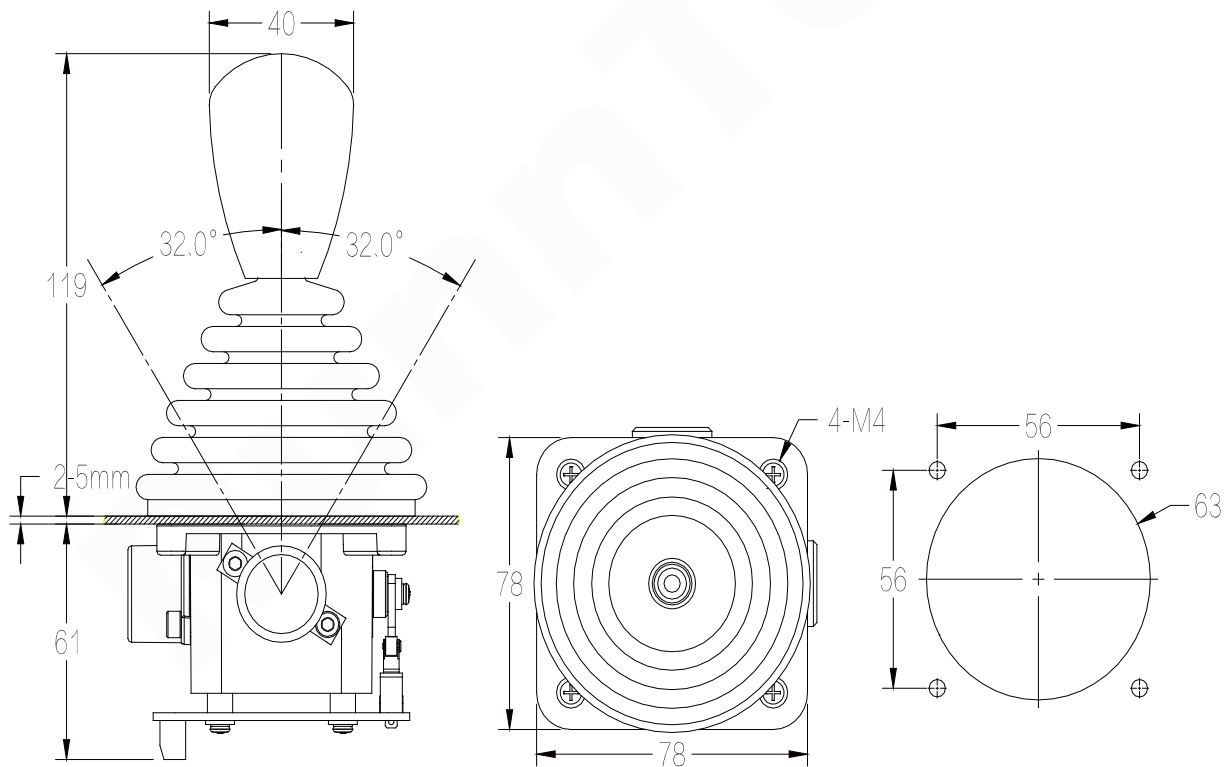


Table 1-1 Handle Type

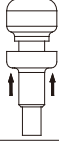
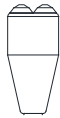
1	HD1		with or without 1 Self-resetting button (BT1) or 1 Self-lock button (BS1) Reference 2-1	Diameter 30×60	
2	HD2			Diameter 32	
3	HD3			Diameter 24×24	
4	HD4		with or without 1 Self-resetting button (BT1) or 1 Self-lock button (BS1) Reference 2-1	Diameter 30×87	
5	HD5		Pull to release *only for friction hold operation; single axis (MS-1) or dual axis cross direction (MS-2)	Diameter 30×60	
6	HD7		with or without 1 Self-resetting button (BT1) or 1 Self-lock button (BS1) Reference 2-1	Diameter 34×105 max Diameter 45	
7	HD8			Diameter 40×58	
8	HD10		Multi-combinations, Refer to Table 1-5 ~1-7	Diameter 30×60	
9	HD15		1 Self-resetting rocker switch (QTOT) 1 Dead man's button (BT1) Refer to Table 1-8		
10	HD80		with or without 2 Self-resetting button (BT) or 2 Self-lock button (BS) Reference 2-1	Diameter 39×61	

Table 1-5 Handle HD10

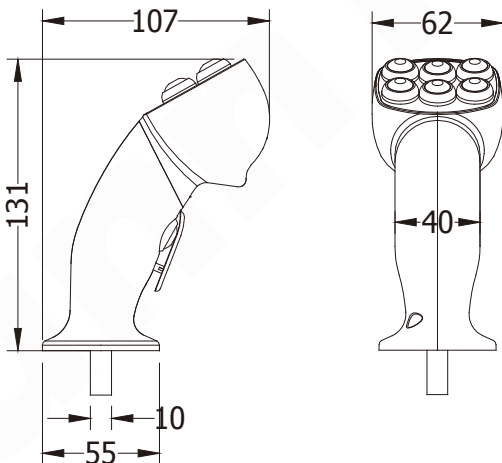
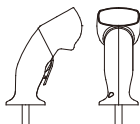
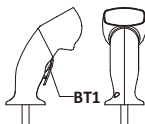
HD10 Handle										
	HD10 handle is ergonomically designed, provides a high degree of comfort, highly integrated, multi-channel buttons control output and the handle can be installed with a variety of accessories: analog output of thumbwheel controller, self-resetting (momentary) push button, self-locking push button or rocker switch. With different combinations to meet demands of industrial application for example: solenoid valve amplifier and variable frequency motor control. HD10 handle/grip uses PA66 + 305GF, with excellent high temperature performance, can be installed in joystick of RT100, RT300, RT01 and RT02 to achieve multi-axis control. <table><tr><td>Operation Temperature</td><td>-40~-85°</td></tr><tr><td>Storage Temperature</td><td>-40~-85°C</td></tr><tr><td>Meet Standard</td><td>IEC68. part 2-30</td></tr><tr><td>Protection Grade</td><td>IP64/65</td></tr></table>		Operation Temperature	-40~-85°	Storage Temperature	-40~-85°C	Meet Standard	IEC68. part 2-30	Protection Grade	IP64/65
Operation Temperature	-40~-85°									
Storage Temperature	-40~-85°C									
Meet Standard	IEC68. part 2-30									
Protection Grade	IP64/65									
										
Model Selection	Style	Description (all functions selection refer to the Table 2-1								
HD10a		without Deadman trigger								
HD10b		with Deadman trigger								

Table 1-6 Handle HD10 Button Panel

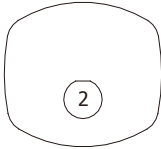
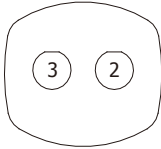
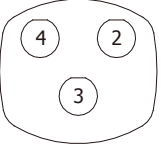
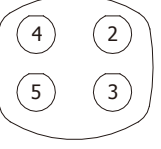
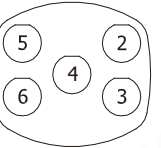
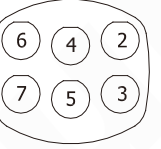
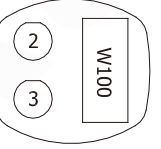
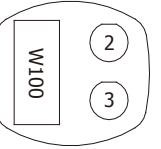
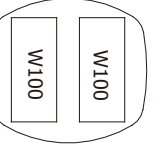
Model Selection	Style	Description (all functions selection refer to the Table 2-1)
1		Can install 1 self-resetting button (BT) / self-locking button (BS)
2		Can install 2 self-resetting button (BT) / self-locking button (BS)
3		Can install 3 self-resetting button (BT) / self-locking button (BS)
4		Can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

Table 1-6 Handle HD10 Button Panel

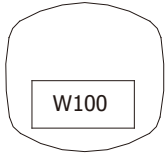
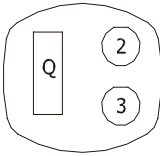
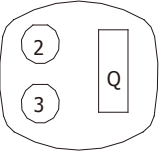
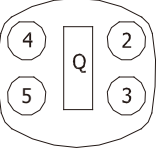
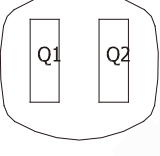
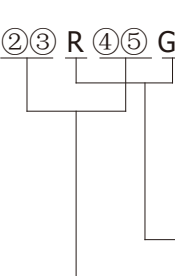
Model Selection	Style	Description (all functions selection reference Table 2-1)
10		1 proportional thumbwheel controller (W100) or rocker switch (QTOT)
11		Can install 2 Self-resetting button (BT) / Self-locking button (BS), and 1 proportional thumbwheel (W100) or rocker switch (QTOT)
12		Can install 2 Self-resetting button (BT) / Self-locking button (BS), and 1 proportional thumbwheel (W100) or rocker switch (QTOT)
13		Can install 4 Self-resetting button (BT) / Self-locking button (BS), and 1 proportional thumbwheel (W100) or rocker switch (QTOT)
14		2 proportional thumbwheel controller (W100) or rocker switch (QTOT)
HD10b 13 - BT 4 handle type handle panel model code self-resetting (momentary) button button quantity ②③ R ④⑤ G - QTOT  3 position self-resetting rocker switch button color button location button selection refer to Table 2-1		

Table 1-8 Handle HD15

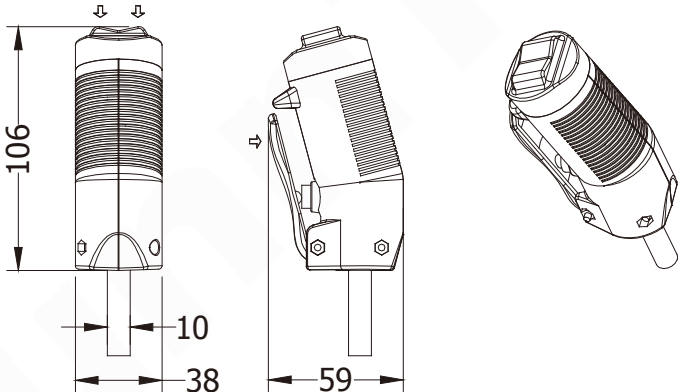
HD15 Handle	
	HD15 industrial handle is ergonomically designed, provides a high degree of comfort, highly integrated, multi-channel buttons control output, and the handle can be installed with QTOT Rocker switch and Dead man's button. HD15 handle use PA66 + 305GF, with excellent high temperature performance, long-life high-current and good hand feeling, can be installed in joystick RT100, RT300, RT01 and RT02 to achieve multi-axis control Operation Temperature: -25-85 °C Storage Temperature: -25-85 °C Meet the standard: IEC68, part 2-30 Protection Grade: IP64/65
	
HD15 - BT1 -QTOT handle type Deadman's trigger 250V2A 3 position self-resetting rocker switch	

Table 2-1 Accessories

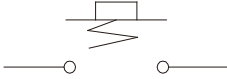
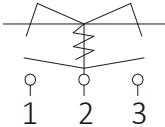
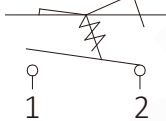
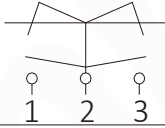
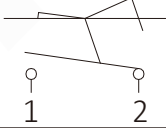
No.	Type	Description	Parameter	Remark
1	BT	Self-resetting button 	24V2A	button color : Red - R Blue - BL Black - B Yellow - Y Green - G White - W
2	BS	Self-locking button 	24V2A	button color : Red - R Blue - BL Black - B Yellow - Y Green - G White - W
3	QTOT	3 position self-resetting rocker switch 	3 pins 250V15A	
4	QTO	2 position self-resetting rocker switch 	2 pins 250V15A	
5	QSOS	3 position self-locking rocker switch 	3 pins 250V15A	
6	QSO	2 position self-locking rocker switch 	2 pins 250V15A	
7	QSOT	3 position with one side self-resetting, another side self-locking	3 pins 250V15A	
8	W100	Thumbwheel Controller (Hall Sensor)	input 5V output 0-2.5-5V	Warning: Please Far away from the magnetic object

Table 3-1 Mounting Dimension

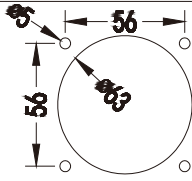
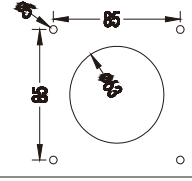
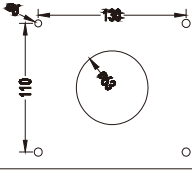
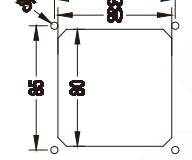
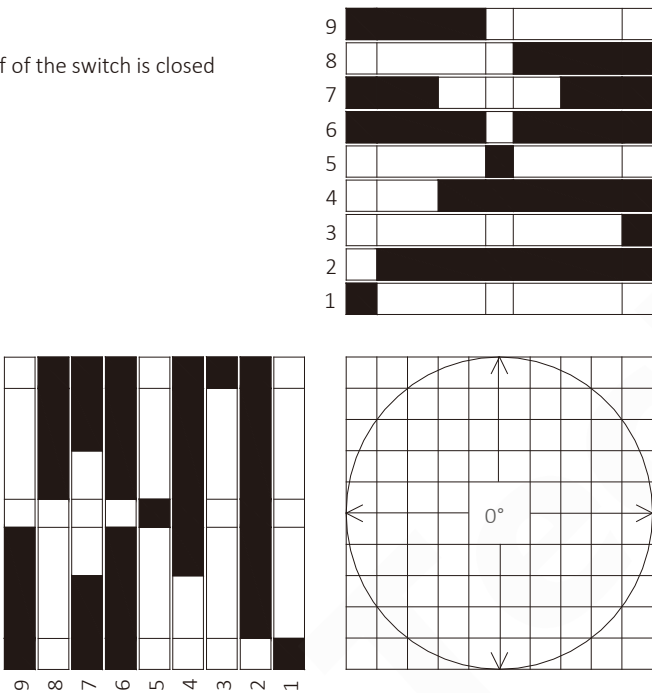
No.	Mounting Code	Mounting Size	Description	Application
1	M1		56×56 central hole 63	
2	M2		85×85 central hole 63	
3	M3		130×110 central hole 63	
4	M7		85×85 central hole 80×80	for HD10 grip

Table 4-3 Directional Switch Signal Closed Position

Entity on behalf of the switch is closed  Analog output refer to the following figure		
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
	Potentiometer	P1: Simple 2 directions output (potentiometer with dead zone)
		P2: Simple 1 direction output (potentiometer without dead zone)
		V1: DC24V, -10V~0~+10V (voltage output)
		V2: DC24V, +10V~0~+10V (voltage output)
		V3: DC24V, -5V~0~+5V (voltage output)
		V4: DC24V, +5V~0~+5V (voltage output)
		V5: DC24V, 0~+10V (voltage output)
		V6: DC24V, 0~+5V (voltage output)
		I1: 4 wire 4mA~12mA~20mA (current output)
		I2: 4 wire 20mA~4mA~20mA (current output)