

## LT02 Series Robust Industrial Joystick

### Product Features

- 1.Single axis, dual axis or 3 axis control;
- 2.Potentiometer sensor or Hall effect sensor;
- 3.Available with various shape multi function grips;
- 4.Mechanical spring-return to center or Friction-hold operation;
- 5.Excellent analog proportional control, CANbus 2.0 or RS232 signal output;
- 6.Easy to install, flexible operation, uniform texture, maintenance-free



### Application

LT02 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 Specifications

| Environment Specifications  |                                                                                     |
|-----------------------------|-------------------------------------------------------------------------------------|
| Storage temperature         | -50℃～+80℃                                                                           |
| Operating temperature       | -40℃～+80℃                                                                           |
| protection grade            | IP64                                                                                |
| Vibration                   | Amplitude of vibration ±3g, frequency 10HZ-200HZ                                    |
| Shock                       | 20g, 6ms, half sine type                                                            |
| EMC anti-interference grade | 100V/m, 30MHZ-1GHZ, 80% Sine-wave modulation, satisfy EN 50082-2 (1995) standards   |
| Transmit grade              | 150KHZ—30MHZ, grade B, satisfy EN 50081-2 (1993) standards                          |
| ESD anti-interference grade | Level 4, 8kv contact discharge, 15kv air discharge, satisfy IEC 61000-4-2 standards |

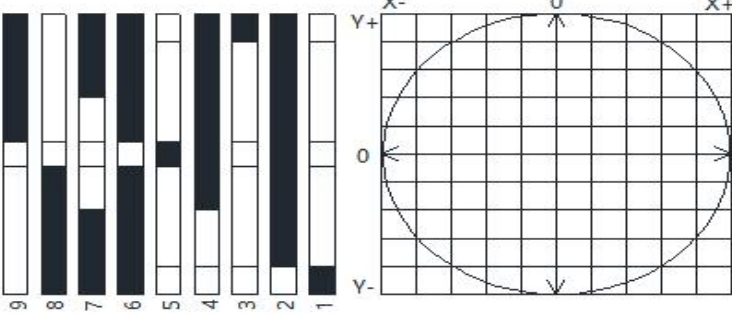
## Mechanical Specifications

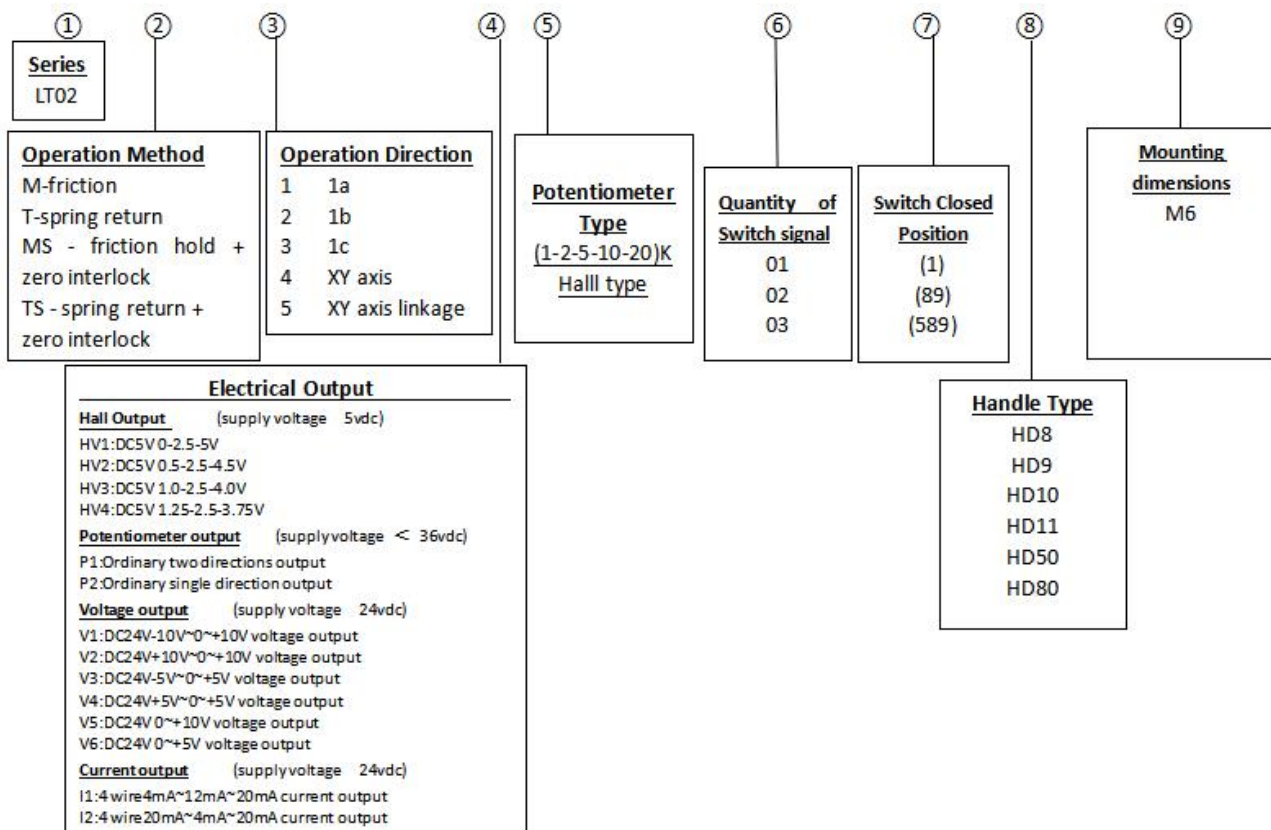
|                      |                                                                 |
|----------------------|-----------------------------------------------------------------|
| Mechanical rotation  | $\pm 32^{\circ}$ (potentiometer) $\pm 20^{\circ}$ (hall sensor) |
| Operating torque     | 5N (50Nmax)                                                     |
| Mechanical life      | 5,000,000 cycle                                                 |
| Mechanical tolerance | $\pm 0.5^{\circ}$                                               |

## Electrical Parameters

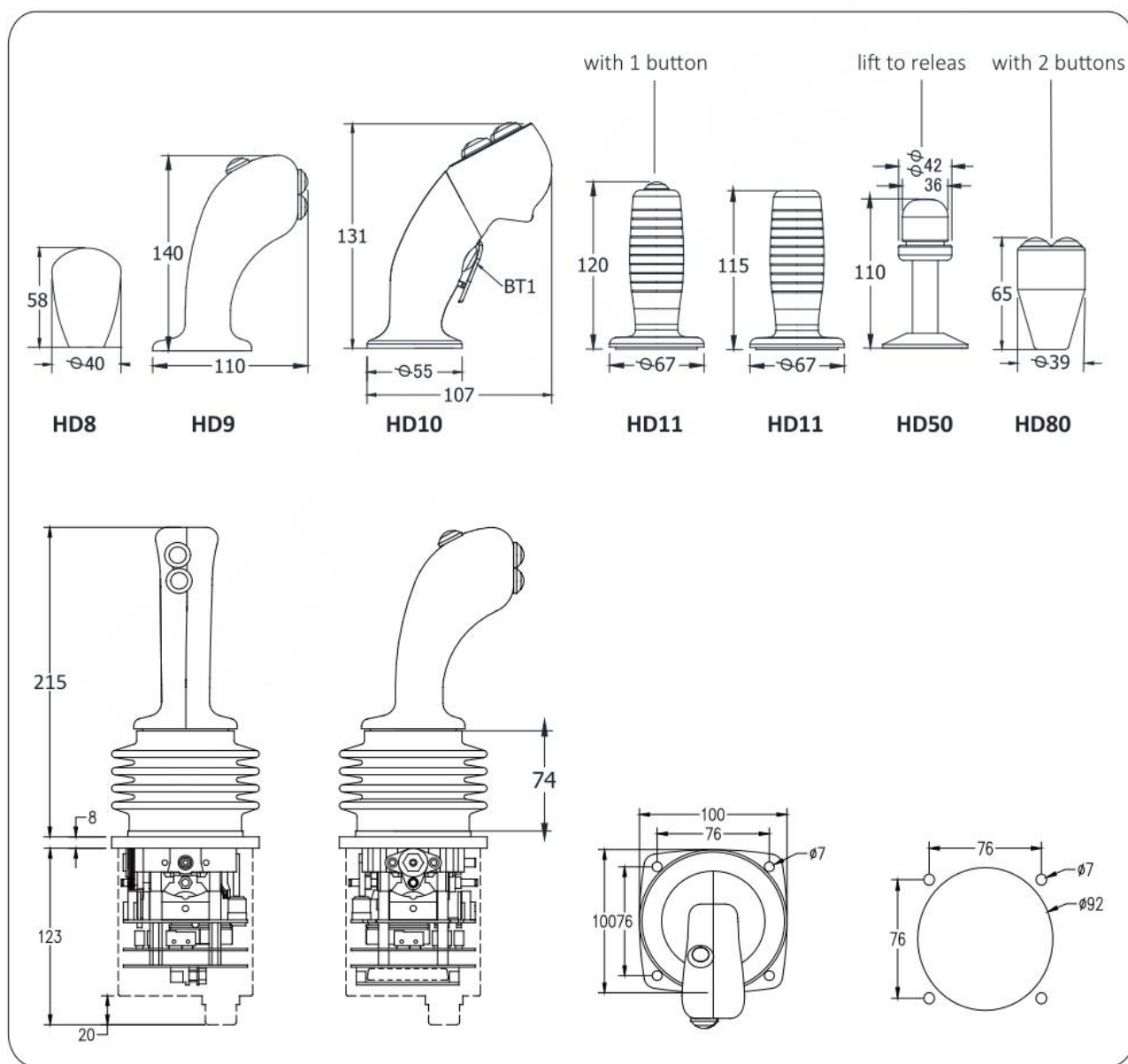
|                      |                                                    |                                 |
|----------------------|----------------------------------------------------|---------------------------------|
| <b>Hall type</b>     | Power supply voltage                               | $5 \pm 0.5\text{VDC}$           |
|                      | The power consumption of current                   | 6.5 mA/each hall chip           |
|                      | Resolution                                         | Infinite                        |
|                      | Maximum voltage                                    | 15 VDC continuous               |
|                      | Reverse polarity maximum voltage                   | 14.5VDC                         |
|                      | Load resistance                                    | 5K $\Omega$                     |
|                      | The median voltage (no-load)                       | 48~52%Vs                        |
| <b>Potentiometer</b> | Power supply voltage                               | DC24V                           |
|                      | Power supply current                               | <20mA                           |
|                      | Resolution                                         | Infinite                        |
|                      | Resistance (10%)                                   | 5K $\Omega$ , 10K $\Omega$      |
|                      | Electrical rotation                                | $\pm 32^{\circ}$                |
|                      | Output voltage range (Relative voltage)            | 0~100%; 10~90%                  |
|                      | Maximum voltage                                    | 48%~52%                         |
|                      | Potentiometer maximum load of voltage              | 32VDC                           |
|                      | Maximum power consumption (25 $^{\circ}\text{C}$ ) | 0.25W                           |
|                      | The direction of the switch                        | Switch position $\pm 3^{\circ}$ |

| <b>Product Configuration</b> |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       |
|------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| No.                          | Project                                | Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |
| 1                            | Series                                 | LT02 Series Robust Industrial Joystick                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                       |
| 2                            | Operation Method                       | M-friction<br>T-automatic spring return<br>MS - friction hold + zero interlock<br>TS - spring return + zero interlock                                                                                                                                                                                                                                                                                                                                                                                                  |                                       |
| 3                            | Operation Direction                    |     <br>1a      1b      1c      2 - Y/X axis cross direction      3 - Y/X axis full direction |                                       |
| 4                            | Electrical Output Form<br>Table LT02-1 | Hall Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | HV1:DC5V 0-2.5-5V                     |
|                              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | HV2:DC5V 0.5-2.5-4.5V                 |
|                              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | HV3:DC5V 1.0-2.5-4.0V                 |
|                              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | HV4:DC5V 1.25-2.5-3.75V               |
|                              |                                        | Potentiometer Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | P1:Ordinary two directions output     |
|                              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | P2:Ordinary single direction output   |
|                              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 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 wire4mA~12mA~20mA current output |
|                              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | I2:4 wire20mA~4mA~20mA current output |
| 5                            | Potentiometer Type                     | 1K,2K,5K,10K,20K,H-Hall                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |
| 6                            | Quantity of Switch signal              | 01,02,03(the quantity of directional switch signal in each axis)                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       |
| 7                            | Common Closed Position                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       |

|   |                     |                                                                                                                                                                                                                |
|---|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                     | <p>Black means the switch is closed</p>   |
| 8 | Handle Type         | HD8, HD9, HD10, HD11, HD50, HD80                                                                                                                                                                               |
| 9 | Mounting dimensions | M6 : 76 × 76, central hole 92                                                                                                                                                                                  |



## Optional Handle



## 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.

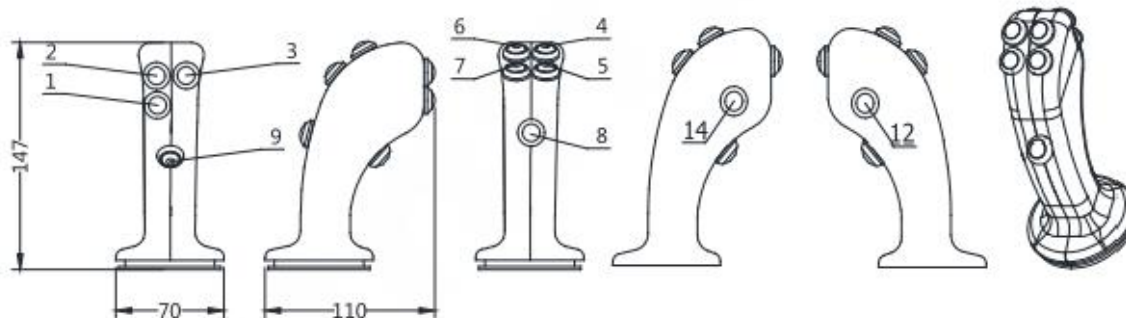
HD9 handle use PA66 + 305GF, to achieve excellent high temperature performance and can be installed in YJ300or YJ02 series joysticks to achieve multi-axis control.

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

Figure 1 consists of two hierarchical diagrams. The left diagram shows a hierarchy where 'button type (momentary or maintained)' is the root, branching into 'handle type' and 'button quantity'. 'button quantity' further branches into 'button location' and 'button color'. The right diagram shows a hierarchy where 'button type (momentary or maintained)' is the root, branching into 'button color' and 'button quantity'. 'button quantity' further branches into 'button location' and 'button type (momentary or maintained)'.

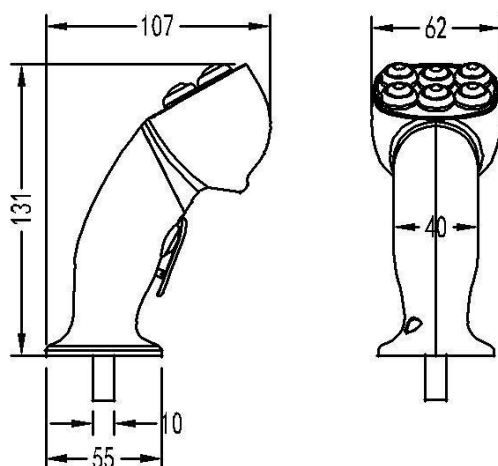
## HD10 Handle

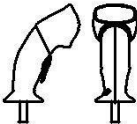
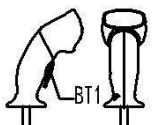


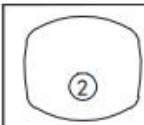
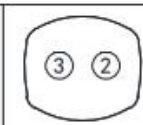
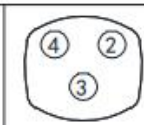
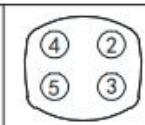
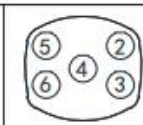
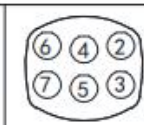
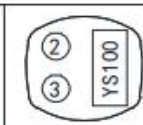
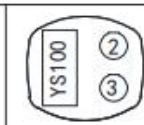
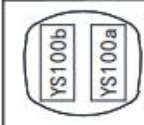
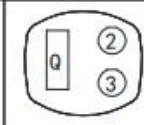
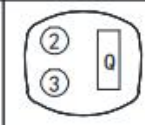
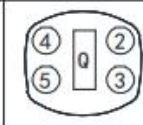
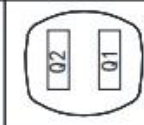
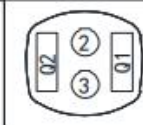
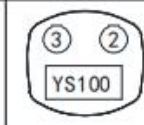
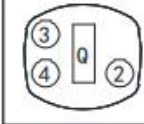
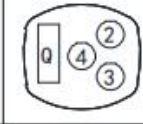
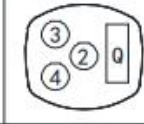
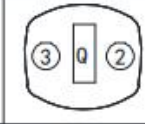
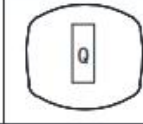
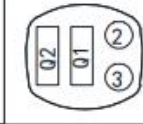
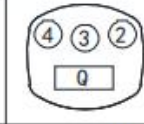
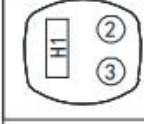
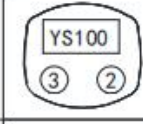
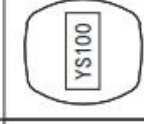
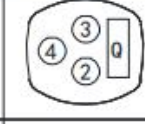
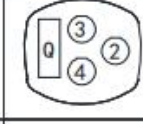
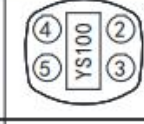
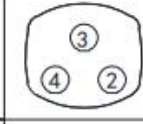
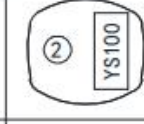
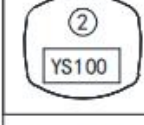
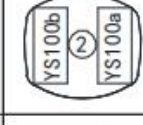
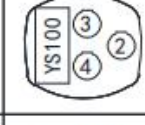
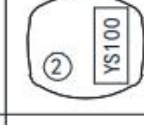
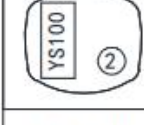
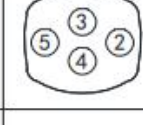
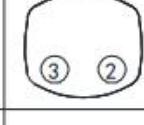
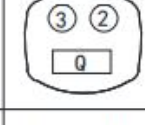
HD10 industrial handle is ergonomically designed, provides a high degree of comfort, highly integrated, multi-channel buttons control output, and the handle can be installed with a variety of accessories: analog output finger dial wheel, self-locking button, self-resetting button. With different combinations to meet the industry's needs: solenoid valve amplifier control, variable frequency motor control. We can customize satisfied technical parameters according to your requirements. HD10 handle use PA66 + 305GF, with excellent high temperature performance, can be installed in YJ100, YJ300, YJ01, and YJ02 to achieve multi-axis control

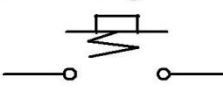
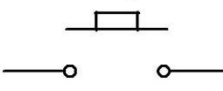
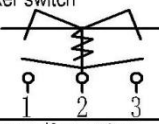
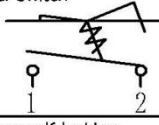
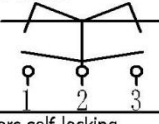
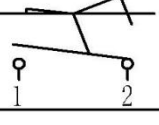
Handle operating Limit

|                       |            |
|-----------------------|------------|
| Operation Temperature | -40-85℃    |
| Storage Temperature   | -40-85℃    |
| Meet                  | IEC68 2-30 |
| Protection Grade      | IP64/65    |



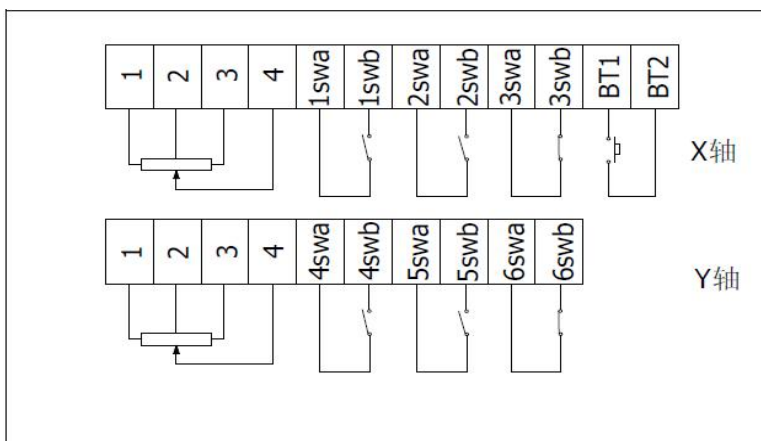
| Model Selection | Style                                                                               | Description (all functions selection reference the table2-1) |
|-----------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|
| HD10a           |  | No Dead man's button                                         |
| HD10b           |  | Dead man's button                                            |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|    |    |    |    |    |    |    |    |
| 一按钮<br>1                                                                            | 二按钮<br>2                                                                            | 三按钮<br>3                                                                            | 四按钮<br>4                                                                            | 五按钮<br>5                                                                            | 六按钮<br>6                                                                             | 左二按钮<br>右一指拨轮<br>7                                                                    | 右二按钮<br>左一指拨轮<br>8                                                                    |
|    |    |    |    |    |    |    |    |
| 二指拨轮<br>9                                                                           | 一指拨轮<br>10                                                                          | 右二按钮<br>左一翘板开关<br>11                                                                | 左二按钮<br>右一翘板开关<br>12                                                                | 四按钮<br>一翘板开关<br>13                                                                  | 二翘板开关<br>14                                                                          | 二按钮<br>二翘板开关<br>15                                                                    | 上二按钮<br>下一指拨轮<br>16                                                                   |
|   |   |   |   |   |   |   |   |
| 三按钮<br>一翘板开关<br>17                                                                  | 右三按钮<br>左一翘板开关<br>18                                                                | 左三按钮<br>右一翘板开关<br>19                                                                | 二按钮<br>一翘板开关<br>20                                                                  | 一翘板开关<br>21                                                                         | 右四按钮<br>左一翘板开关<br>22                                                                 | 右二按钮<br>左二翘板开关<br>23                                                                  | 上三按钮<br>下一翘板开关<br>24                                                                  |
|  |  |  |  |  |  |  |  |
| 右二按钮<br>左一滑动开关<br>25                                                                | 下二按钮<br>上一指拨轮<br>26                                                                 | 一指拨轮<br>27                                                                          | 左三按钮<br>右一翘板开关<br>28                                                                | 右三按钮<br>左一翘板开关<br>29                                                                | 四按钮<br>一指拨轮<br>30                                                                    | 三按钮<br>31                                                                             | 左一按钮<br>右一指拨轮<br>32                                                                   |
|  |  |  |  |  |  |  |  |
| 上一按钮<br>下一指拨轮<br>33                                                                 | 一按钮<br>二指拨轮<br>34                                                                   | 左一按钮<br>右一翘板开关<br>35                                                                | 右三按钮<br>左一指拨轮<br>36                                                                 | 右一按钮<br>左一翘板开关<br>37                                                                | 一旋转电位器<br>一钮子开关<br>一指拨轮<br>38                                                        | 一旋转电位器<br>一钮子开关<br>三个按钮<br>39                                                         | 左一按钮<br>右一指拨轮<br>40                                                                   |
|  |  |  |  |                                                                                     |                                                                                      |                                                                                       |                                                                                       |
| 右一按钮<br>左一指拨轮<br>41                                                                 | 四按钮<br>42                                                                           | 二按钮<br>43                                                                           | 上二按钮<br>下一翘板开关<br>44                                                                |                                                                                     |                                                                                      |                                                                                       |                                                                                       |

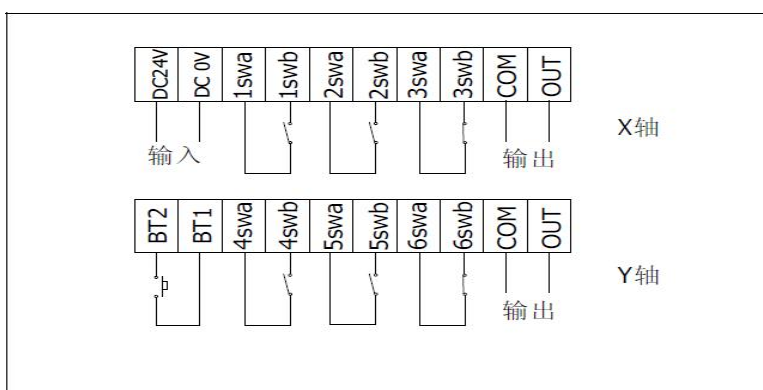
| No. | Type      | Description                                                                                                                 | Parameter                         | Additional                                            |
|-----|-----------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------|
| 1   | BT        | Self-resetting button<br>                  | 24V2A                             | Button color: Red-R<br>Black-B<br>Yellow-Y<br>Green-G |
| 2   | BS        | Self-locking button<br>                    | 24V2A                             | Button color: Red-R<br>Black-B<br>Yellow-Y<br>Green-G |
| 3   | QTOT      | 3 gears self-resetting rocker switch<br>  | 3 pins<br>250V15A                 |                                                       |
| 4   | QTO       | 2 gears self-resetting rocker switch<br> | 2 pins<br>250V15A                 |                                                       |
| 5   | QSOS      | 3 gears self-locking rocker switch<br>   | 3 pins<br>250V15A                 |                                                       |
| 6   | QSO       | 2 gears self-locking rocker switch<br>   | 2 pins<br>250V15A                 |                                                       |
| 7   | QSOT      | 3 gears with one side self-resetting, another side self-locking                                                             | 3 pins<br>250V15A                 |                                                       |
| 8   | YS100     | Hall Finger dial wheel                                                                                                      | input5V<br>output0-2. 5-5V        | Warning: Do not bring magnetic objects close          |
| 9   | YS100 (□) | Potentiometer                                                                                                               | 1KΩ<br>2KΩ<br>5KΩ<br>10KΩ<br>20KΩ |                                                       |

## Wiring instructions

### Potentiometer output



### DC24V Power,voltage,current output



### Hall type voltage output

