

# Data Sheet for Joysticks

Hand Joystick

Series 890



- Large heavy duty hand joystick of the highest quality with stock grip handle
- Detection by conductive plastic potentiometers or Hall sensors
- Handles available with button, rocker, or third axis (z rotation)
- IP65
- Spring Return to Center or Friction Clutch
- Wide range of configuration options for switches, latching positions

The large Hand Grip Joysticks of the 890 series with stock grip handle were specially developed for the multi-axis control of machines in tough, demanding environments, where the highest requirements on quality and feel must be met and where the sensors must be configurable. The joysticks are a guarantee for success in demanding applications with up to three axes.

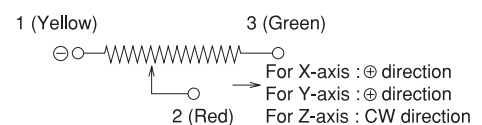
## Technical Data Joystick

|                               |  |
|-------------------------------|--|
| Sensor                        | Potentiometer or Hall Effect                 |
| Expected Life                 | typ. 5 million cycles                        |
| Angle of Movement X-, Y-Axis  | $\pm 22^\circ$ .. $\pm 26^\circ$ from center |
| Angle of Movement Z-Axis      | $\pm 45^\circ$ .. $\pm 50^\circ$             |
| Return to Center Accuracy X/Y | $\pm 2^\circ$                                |
| Operating Force X-, Y-Axis    | 2..12 N                                      |
| Operating Force Z-Axis        | 0,02..0,085 Nm                               |
| Protection Class              | IP65 (above panel)                           |
| Vibrations                    | 10..55 Hz 98 m/s <sup>2</sup>                |
| Shock                         | 294 m/s <sup>2</sup>                         |
| Operating Temperature         | -20°C .. +65°C                               |
| Weight                        | ca. 650 g (2 Axes), ca. 750 g (3 Axes)       |

## Technical Data Potentiometer

|                                      | X- & Y-Axis Type F   | Z-Axis Type D        |
|--------------------------------------|----------------------|----------------------|
| Technology                           | Conductive Plastic   | Conductive Plastic   |
| Bearing                              | Sleeve Bearing       | Sleeve Bearing       |
| Resistance                           | 10 kOhm              | 10 kOhm              |
| Resistance Tolerance                 | $\pm 15\%$           | $\pm 15\%$           |
| Independent Linearity Tolerance      | $\pm 3\%$ full-scale | $\pm 3\%$ full-scale |
| Max. Current / Sensitivity $V_{out}$ | 1 mA                 | 1 mA                 |
| Power Rating at 70°C                 | 0,2 W                | 0,3 W                |
| Electrical Rotating Angle            | 44°                  | 90°                  |
| Expected Life (cycles)               | typ. 5 million       | typ. 5 million       |

Only when the joystick is configured with a housing, lead wires (AWG26, length approx. 300 mm) are supplied as standard. In versions without a housing, the sensors are directly accessible for connection to their terminals. If case of ongoing demand, we are happy to provide customized cabling for you.



Note: Max. Voltage < 50 VAC resp. < 75 VDC, additionally max. power rating must be considered.

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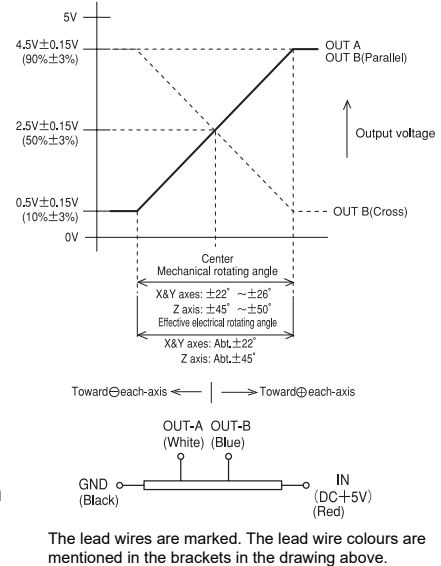
Hand Joystick

Series 890

## Technical Data Hall Sensor

|                          |                            |
|--------------------------|----------------------------|
| Supply Voltage           | 5 VDC $\pm 10\%$           |
| Current Consumption      | ca. 6 mA                   |
| Output Voltage           | 0,5..4,5 V                 |
| Impedance                | > 10 kOhm                  |
| Independent Linearity    | $\pm 3\%$                  |
| Temperature Drift Output | $< \pm 2,5\% U_{Out} * FS$ |
| Temperature Drift Center | $< 0,5\% U_{Out} * FS$     |
| Dielectric Strength      | 1 minute @ 250 VAC         |
| Insulation Resistance    | > 100 MOhm @ 250 VAC       |
| Operating Temperature    | -20°C .. +65°C             |
| Expected Life            | typ. 5 million cycles      |

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 In versions without a housing, the sensors are directly accessible for connection to their terminals. If case of ongoing demand, we are happy to provide customized cabling for you.

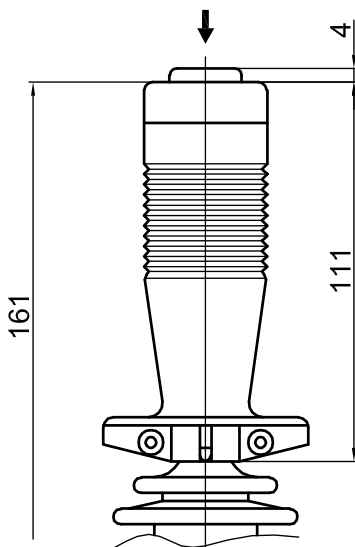


## Technical Data Micro Switches

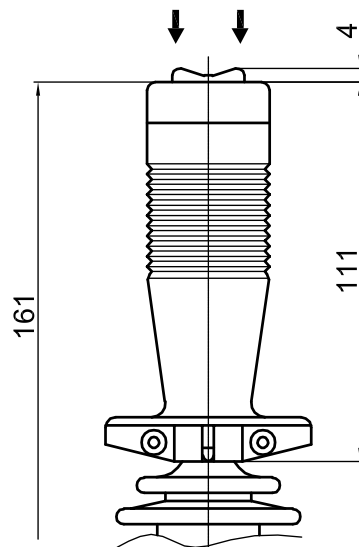
Joysticks of series 890 can be provided with directional switches for X- and Y-axis. For each axis up to three switching positions can be defined. Deflection angles can be specified by the customer. For example, one micro switch can be installed for detecting the handle resting at center position (or when moved away from center), and additional micro switches at  $\pm 10^\circ$  on each axis detecting the degree of deflection for further switching or control scenarios.

|                      | Pushbutton Handle | Micro switches (w/o / with Housing) | Micro switch at Center |
|----------------------|-------------------|-------------------------------------|------------------------|
| Voltage, Current     | 50 VAC, 10 A      | 50 VAC, 5 A (30 VDC, 100 mA)        | 50 VAC, 5 A            |
| Expected Life (typ.) | 300.000 actions   | 200.000 (100.000) actions           | 200.000 actions        |

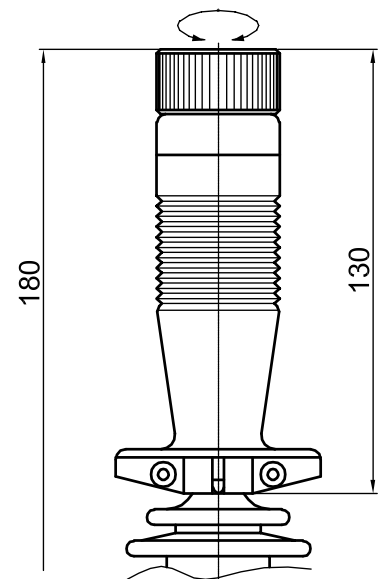
Handle 6 with Pushbutton



Handle A with Rocker



Handle 8 with 3. Axis



Dimensions in mm

# Data Sheet for Joysticks

Hand Joystick

Series 890

Please contact us for information regarding stock articles, delivery times and minimum order quantities.

## Order Code

| Series   | 890 |  |  |  |  |  |  |  |  |     |
|--|-----|--|--|--|--|--|--|--|--|-----|
| <b>Axes / Functions:</b>   |     |  |  |  |  |  |  |  |  |     |
| 1 Axis   |     |  |  |  |  |  |  |  |  | 1   |
| 1 Axis with Pushbutton   |     |  |  |  |  |  |  |  |  | 7   |
| 1 Axis with Rocker   |     |  |  |  |  |  |  |  |  | 5   |
| 2 Axes   |     |  |  |  |  |  |  |  |  | 2   |
| 2 Axes with Pushbutton   |     |  |  |  |  |  |  |  |  | 3   |
| 2 Axes with Rocker   |     |  |  |  |  |  |  |  |  | 6   |
| 3 Axes   |     |  |  |  |  |  |  |  |  | 4   |
| <b>Sealing:</b>  |     |  |  |  |  |  |  |  |  |     |
| Rubber Boot  |     |  |  |  |  |  |  |  |  | 5   |
| <b>Return Mechanism:</b>   |     |  |  |  |  |  |  |  |  |     |
| Spring Return to Center Position   |     |  |  |  |  |  |  |  |  | 1   |
| Without Spring Return  |     |  |  |  |  |  |  |  |  | 2   |
| Friction Clutch with Center Detect Switch  |     |  |  |  |  |  |  |  |  | 5   |
| Friction Clutch  |     |  |  |  |  |  |  |  |  | 6   |
| <b>Handles</b>   |     |  |  |  |  |  |  |  |  |     |
| Stock Grip, for 1 or 2 Axes  |     |  |  |  |  |  |  |  |  | 1   |
| Stock Grip, with Pushbutton, for 1 or 2 Axes   |     |  |  |  |  |  |  |  |  | 6   |
| Stock Grip, with Rocker, for 1 or 2 Axes   |     |  |  |  |  |  |  |  |  | A   |
| Stock Grip incl. 3rd Axis  |     |  |  |  |  |  |  |  |  | 8   |
| No Trim Function   |     |  |  |  |  |  |  |  |  | 1   |
| <b>Sensor</b>  |     |  |  |  |  |  |  |  |  |     |
| Potentiometer, Type F X-/Y-Axis, Type D Z-Axis   |     |  |  |  |  |  |  |  |  | 4   |
| Hall Sensor X-/Y-Axis (Type D Z-Axis if applicable)  |     |  |  |  |  |  |  |  |  | H   |
| <b>Housing</b>   |     |  |  |  |  |  |  |  |  |     |
| Without Housing  |     |  |  |  |  |  |  |  |  | 0   |
| With Housing   |     |  |  |  |  |  |  |  |  | 1   |
| <b>Limiters</b>  |     |  |  |  |  |  |  |  |  |     |
| Round (Standard)   |     |  |  |  |  |  |  |  |  | 1   |
| Square   |     |  |  |  |  |  |  |  |  | 2   |
| „L“-Shape  |     |  |  |  |  |  |  |  |  | 3   |
| Single Axis Y  |     |  |  |  |  |  |  |  |  | 6   |
| Single Axis X  |     |  |  |  |  |  |  |  |  | 7   |
| Plus Shape „+“   |     |  |  |  |  |  |  |  |  | 9   |
| <b>Micro switches (*)</b>  |     |  |  |  |  |  |  |  |  |     |
| None   |     |  |  |  |  |  |  |  |  | 0   |
| Center Detect X & Y (with Handle „1“)  |     |  |  |  |  |  |  |  |  | 1   |
| 2 Position Switches, 1 Axis, ON at $\pm 5^\circ$   |     |  |  |  |  |  |  |  |  | 2y  |
| 2 Position Switches, 1 Axis, ON at $\pm 15^\circ$  |     |  |  |  |  |  |  |  |  | 3   |
| 2 Position Switches per axis, 2 Axes, ON at $\pm 15^\circ$ each                                    |     |  |  |  |  |  |  |  |  | 3xy |
| 2 Position Switches, 1 Axis, ON at $\pm 10^\circ$  |     |  |  |  |  |  |  |  |  | 4   |
| Center Detect, 1 Axis (Handle „6“)   |     |  |  |  |  |  |  |  |  | 5   |
| Center Detect, 2 Axes (Handles „6, 8, A“)  |     |  |  |  |  |  |  |  |  | 6   |
| 2 Position Switches, 1 Axis, ON at $\pm 5^\circ$   |     |  |  |  |  |  |  |  |  | 7x  |
| 2 Position Switches per axis, 2 Axes, ON at $\pm 5^\circ$  |     |  |  |  |  |  |  |  |  | 7xy |
| Center Detect & Position Switches, 2 Axes,<br>ON at $\pm 5^\circ$ , Handles „6, 8, A“              |     |  |  |  |  |  |  |  |  | 8xy |
| Center Detect & Position Switches, 1 Axis,<br>ON at $\pm 5^\circ$ , Handles „6, 8, A“, w/o Housing |     |  |  |  |  |  |  |  |  | 8x  |
| 2 Position Switches / axis, 2 Axes, ON at $\pm$ max. Deflection                                    |     |  |  |  |  |  |  |  |  | 9   |

(\*) For custom versions, the feel of the x and y axes can be customized independently of each other. Versions with detent positions can only be realized without housing.

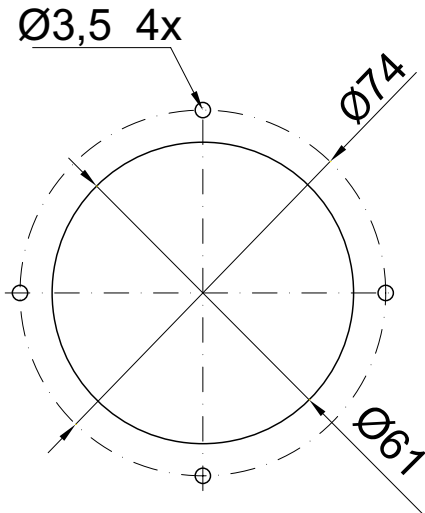
(\*\*) Micro switches can be realized also for different angles and as redundant versions.

### For higher quantities or on-going demand, additional options are available

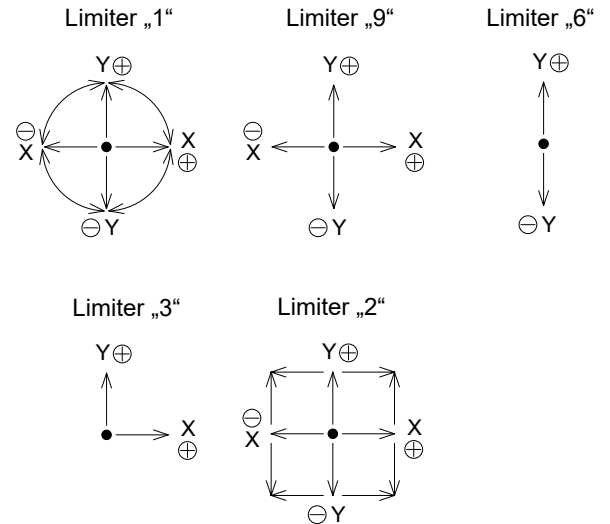
Please contact us. Because of the broad configuration options, we suggest personal advice to find the optimum solution for your requirements.

## Mounting Cut-Out and Orientation of Limiters

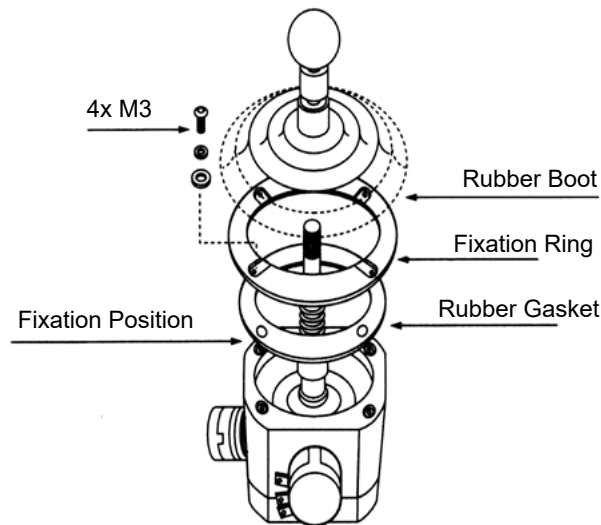
### Panel Cut-Out



### Limiters



### Mounting (schematic)



Dimensions in mm

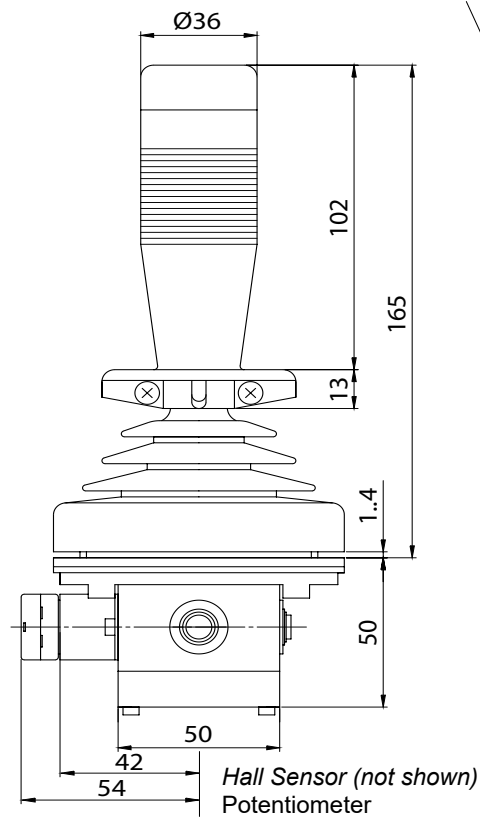
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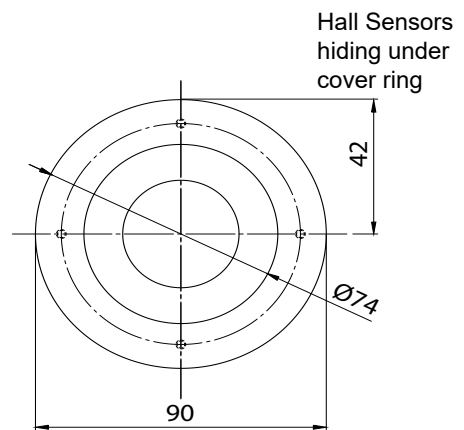
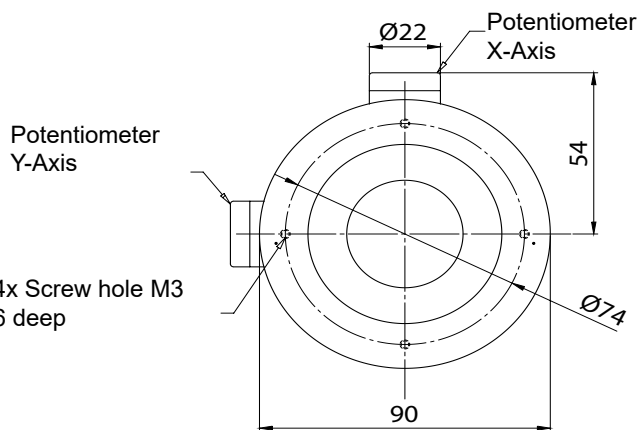
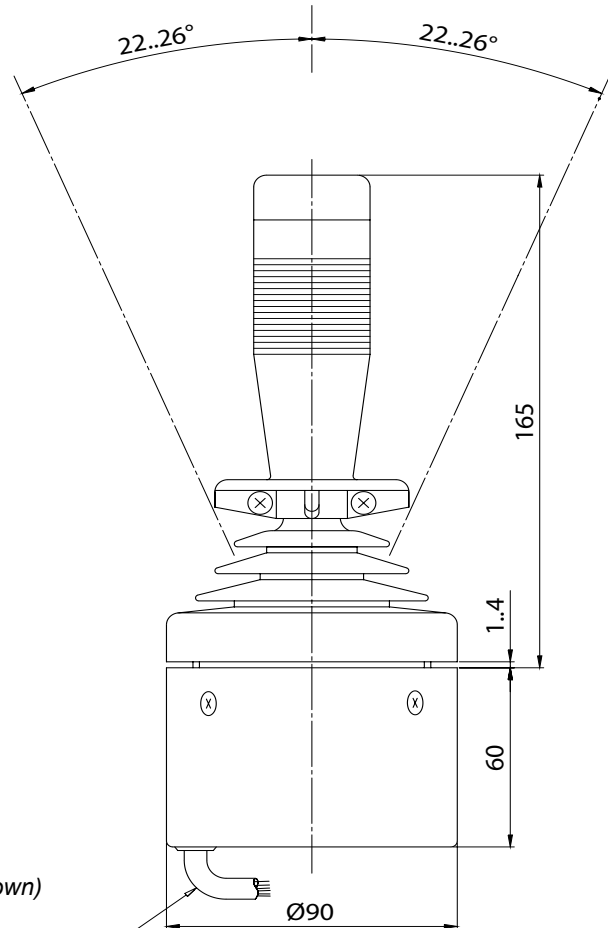
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## Drawing

Housing Option „0“



Housing Option „1“



Dimensions in mm