Data Sheet for Joysticks

Hand Joystick — Series 891

- Cobra head ergonomic multifunction handle
- Outstanding quality of mechanics and sensors
- Equipped with conductive plastic potentiometers or Hall sensors (optional redundant)
- Available with spring return to centre position or with friction brake
- Versions with 1 to 4 axes available, special versions with fully rotatable cobra knob available
- Optional up to six micro switches, plus four pushbuttons and two switches

The 891 series large handheld joysticks with Cobra handle are specially designed for multi-axis machine control in harsh environments, where quality and tactility are paramount and many additional functions are required. The 891 joysticks are a guarantee of success in these demanding applications.

Technical Data Joystick

Angle of Movement X-, Y-Axis	±22 to ±26° from center
Angle of Movement Z1-, Z2-Axis	15° ±4 °
Vibration	10 G
Shock	30 G
Length of Wires	300 mm
Return to Center Accuracy X / Y	±3%
Operating Force	2N to 12 N
Expected Life	10 million cycles
Operating Temperature	-20 °C up to +60 °C
Weight (depending on configuration)	ca. 950 g
IP protection (above panel):	Standard minimum IP40, up to IP65 depending on configuration

Options and Customizations

The axis mechanism of the 891 series is made of metal. The sensors of the two main axes can be configured independently of one another:

- The handle can either be configured to automatically return to its centre position by means of a spring (various spring strengths available), or it can be configured to remain in the current position by means of a friction brake.
- Detent positions (for the X and Y axes) can be implemented to haptically indicate to the operator that certain positions have been reached.

The design can be customized for the application by adding specific functions such as mini-joysticks, rockers, dead man's switches, buttons above and below the joystick head. Multiple rockers can be fitted as an option, giving the joystick a large number of degrees of freedom. The ergonomic design of the Cobra handle ensures that the additional functions are within easy reach.

For safety-critical applications, trigger switches can be integrated into the handle and micro-switches can be ordered to detect the operating status and switch to a customer-specified position when the X and Y axes are deflected. Redundant switch assemblies are also available.

As a special option, the entire handle can be rotated as the third degree of freedom of the main axes. In this case, however, only 6 leads can be routed through the main shaft. If common wires are used for grounding and powering the controls in the knob, the following options are available:

- 1 rocker (3 wires), 2 pushbuttons (1 wire per button, common ground with rocker)
- 2 rockers (4 wires, common supply and ground), no pushbuttons
- 5 pushbuttons (common ground, incl. or excl. trigger switch, no illuminated switches)

Please contact us for information on possible combinations of the above options, minimum order quantities and customization costs.

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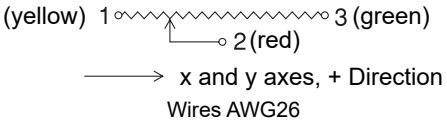
Technical Data Potentiometers X- / Y-Axis

Total Resistance Value	10 kOhm ±15%
Electrical Rotating Angle	44° ±5°
Expected Life	approx. 5 million cycles
Power Rating	max. 0.2 W
Independent Linearity	±3%
Return to Center Accuracy	±1.5%

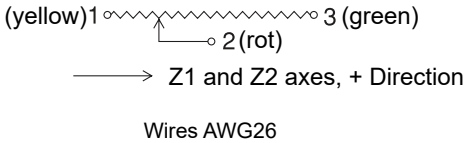


Wires AWG26

The main sensors are only wired when the joystick is ordered with a housing. These are then led to the outside through a cable outlet.

Technical Data Potentiometers Z1, Z2

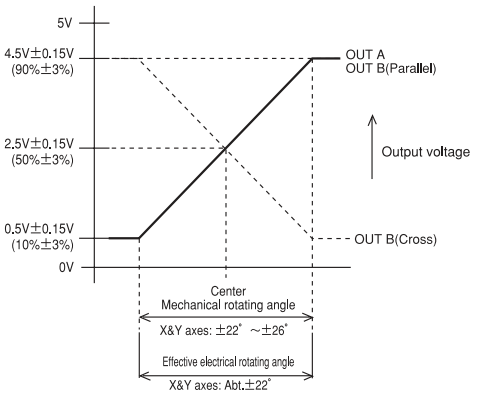
Total Resistance Value	10 kOhm ±15%
Electrical Rotating Angle	30° ±5°
Expected Life	approx. 2 million cycles
Power Rating	max. 0.2 W
Independent Linearity	±3%
Return to Center Accuracy	±3%



Wires AWG26

Technical Data Hall Sensor Type H

Supply Voltage	5 VDC ±10%
Current Consumption	approx. 6 mA
Output Voltage	0.5 .. 4.5 VDC
Impedance	> 100 kOhm
Independent Linearity	±3%
Temperature Drift Out	< ±2.5% U_{Out} FS
Temperature Drift Center	< ±0.5% U_{Out} FS
Dielectric Strength	1 minute at 250 VAC
Insulation Resistance	> 100 MOhm at 250 VDC
Operating Temperature	-20 °C up to +65 °C
Expected Life	approx. 5 million cycles
Note: Max. Voltage < 50 VAC resp. < 75 VDC, additionally max. power rating must be considered.	



Technical Data Micro Switches (activated by handle deflection)

Joysticks of Series 891 can be optionally supplied with micro switches. For each axis, up to 3 angles for activation of these switches are possible. The specification of suitable angles can be given by the customer. E.g. one variant could be: One switch for the detection of center position (Joystick at rest) plus additional positions at +10° and -10° on each axis.
Please note that certain variants can only be ordered without housing pot.

	Angle Position (without / with housing)	Center Detection
Voltage, Current	50 VAC, 5 A / 30 VDC, 100 mA	50 VAC, 5 A
Expected Life approx.	200.000 / 100.000	200.000

Data Sheet for Joysticks

Hand Joystick — Series 891

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

Order Code

Series	**891**										
Axes											
1 Axis		1									
2 Axes		2									
3 Axes, with rocker Z1		3									
3 Axes, with rocker Z2		4									
3 Axes by rotating cobra handle[2]		5									
4 Axes, with rockers Z1 + Z2		6									
Sealing:											
Rubber Boot			5								
Return mechanism/axis behaviour:											
Spring return to center position				1							
Without spring return (only for x and y axes)				2							
Friction clutch with detent in center position (only for x and y axes) [1]				5							
Friction clutch (only for x and y axes)				6							
Handle configuration											
Cobra handle					1						
Cobra handle with trigger SW7					2						
Cobra handle with pushbutton SW3					3						
Trim function:											
No trim function (standard)						1					
With trim function (only w/ pot and w/o housing)						3					
Sensors											
Potentiometer F (X-/Y-Axis), rocker (type PW30, Z-Axis)							4				
Hall sensors (X-/Y-Axis), rocker (type PW30, Z-Axis)							H				
Housing											
Without housing								0			
With housing [1]								1			
Limiters											
Round									1		
Square									2		
„L“-Shape									3		
Single axis Y									6		
Single axis X									7		
Plus shape „+“									9		
Micro Switches											
Without center detecting switch										0	
Center detect X-/Y-Axis [1]										1	
Position switch X-/Y-Axis ON at ±5° deflection [1]										2	
Position switch X-/Y-Axis ON at ±5° deflection & center detecting switch [1]										3	
Pushbuttons											
None											0
1 Pushbutton SW6											1
2 Pushbuttons SW1, SW2											2
3 Pushbuttons SW6, SW1, SW2											3
Switches											
None											0
1 Switch SW4											1
2 Switches SW4, SW5											2

[1] Micro switches, rotatable handle and detents are only available for versions without housing
[2] Available with friction hold. If the handle is rotatable, only 6 connection strands are available for wiring the cobra handle. See notes on what input elements are possible on page 1.

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

Please see page 1 for a description of the possible configurations.

Data Sheet for Joysticks

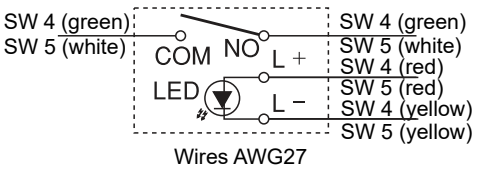
Hand Joystick — Series 891

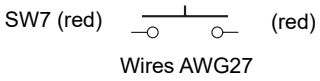
Limiters

	Square	- Option	“2“		1-axis “X“	- Option	„7“
	Round	- Option	“1“		1-axis “Y“	- Option	„6“
	L Shape	- Option	“3“		X/Y Plus “+“	- Option	„9“

Technical Data Pushbuttons

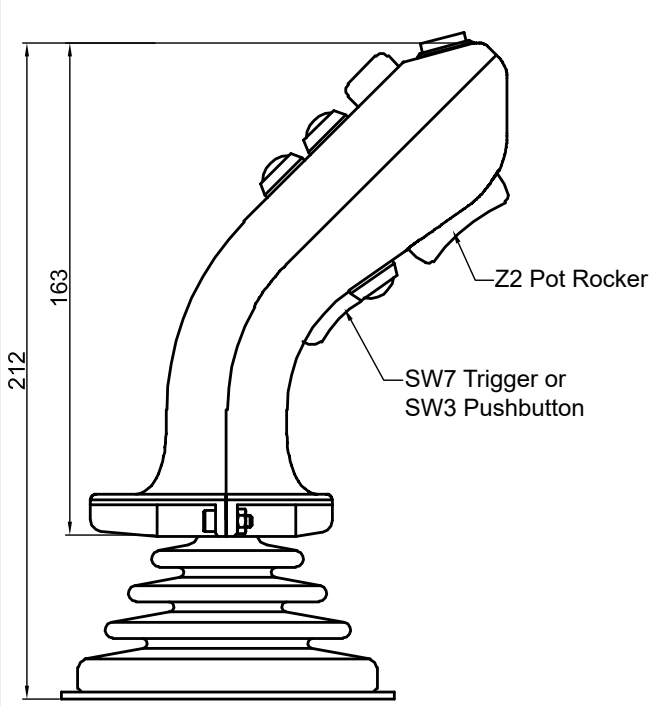
Pushbuttons SW1, SW2, SW3, SW6	
Operating Characteristics	ON when pushed (momentary)
Insulation Resistance	> 1.000 MOhm at 500 VDC
Expected Life	approx. 500.000 operations
Rating	50 VDC / 0,1 A
Dielectric Strength	1 minute at 1.000 VAC
Pushbuttons SW4, SW5, illuminated	
Operating Characteristics	Alternate type
Insulation Resistance	> 200 MOhm at 500 VDC
Expected Life	approx. 10.000 operations
Rating	30 VDC / 5 A
Rating LED	1,85 VDC / 20 mA
Trigger SW7	
Operating Characteristics	ON when pushed (momentary)
Insulation Resistance	> 100 MOhm at 500 VDC
Expected Life	approx. 100.000 operations
Rating	30 VDC / 100 mA
Dielectric Strength	1 minute at 600 VAC

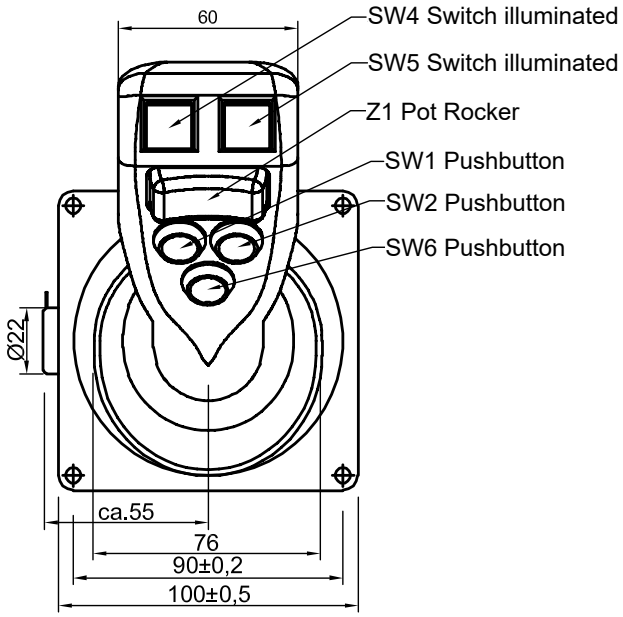


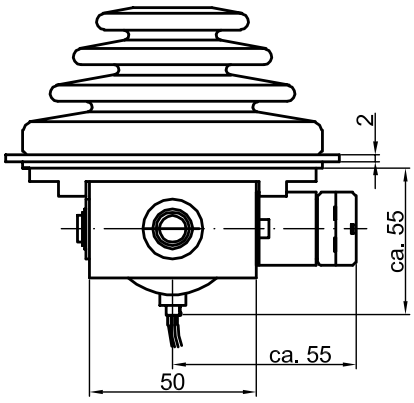


Hand Joystick — Series 891

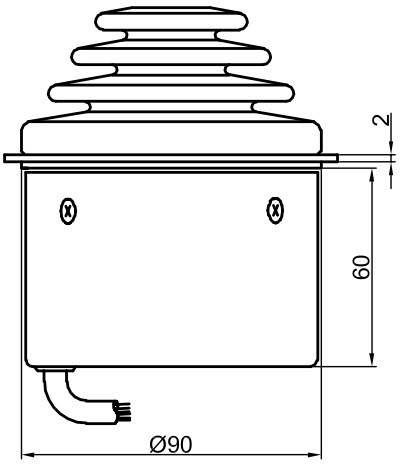
Technical Drawings







Without Housing

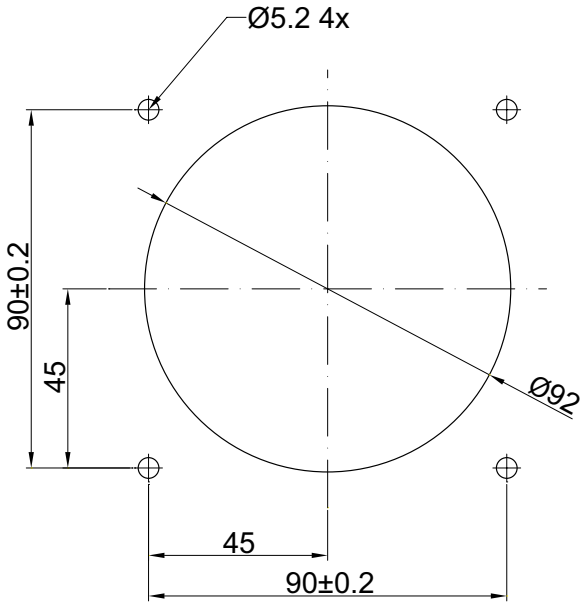


With Housing

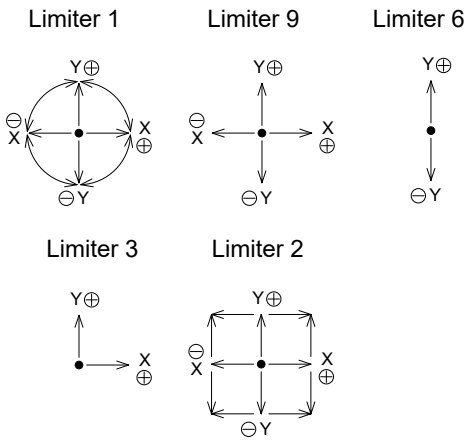
All Dimensions in mm

Hand Joystick — Series 891

Mounting Cut-Out and Orientation of Limiters



Orientation of Limiters



All Dimensions in mm