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 large hand joysticks of the 891 series with cobra handle were specially developed for the multi-axis control of machines in harsh environments where the highest demands are placed on quality and feel and many additional functions are required. The 891 joysticks are a guarantee for 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	2 to 12 N
Expected Life	10 million cycles
Operating Temperature	-20..+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 as well as the behaviour of the two main axes can be configured independently of one another:

- The handle can either be configured to automatically return to its center position by a spring (different spring strengths available) or the position can be configured to remain at the current position by a friction brake
- Detent positions (for the x and y axes) can be implemented in order to convey to the operator haptically that certain positions have been reached..
- As a special variant, the entire knob can also be designed to be rotatable as the third degree of freedom of the main axes. Please contact us for such special variants, as the configuration options for these variants cannot be mapped using the order code.

The design for the application can be individualized through specific functional equipment with mini-joysticks, rockers, dead man‘s switch, buttons above and below the joystick head. Multiple rockers can optionally be installed, which means that the joystick can be equipped with a large number of degrees of freedom. The ergonomic design of the Cobra knob ensures that the additional functions can be reached.

For safety-critical applications, dead man‘s switches can be integrated in the handle and micro-switches can be ordered to detect the operating status, which switch to a position specified by the customer when the x and y axes are deflected. Redundant switch assemblies are also possible.

Please contact us for information about the possible combinations of the aforementioned options as well as minimum order quantities and customization cost.

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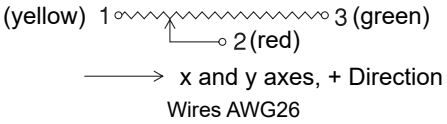
Technical Data Potentiometers X- / Y-Axis

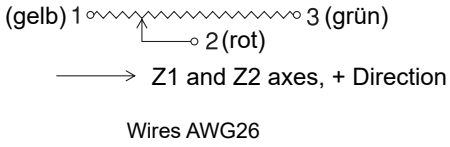
Total Resistance Value	10 kOhm ±15%
Electrical Rotating Angle	44° ±5°
Expected Life	approx. 5 million cycles
Power Rating	max. 0,2 W
Independent Linearity	±3%
Return to Center Accuracy	±1,5%



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

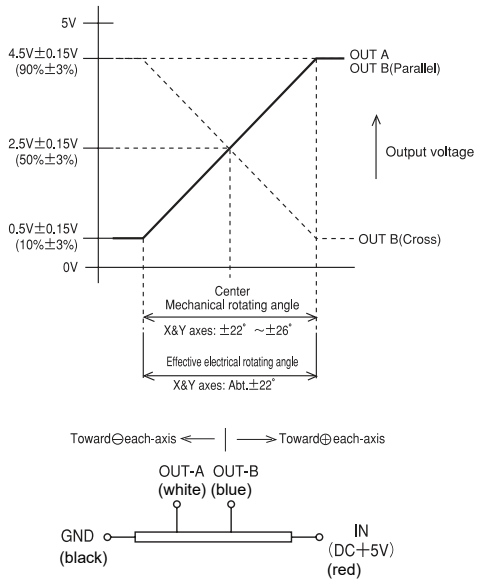
Total Resistance Value	10 kOhm ±15%
Electrical Rotating Angle	30° ±5°
Expected Life	approx. 2 million cycles
Power Rating	max. 0,2 W
Independent Linearity	±3%
Return to Center Accuracy	±3%



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..+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.

	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

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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									
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							
Handles											
Cobra					1						
Cobra with Trigger SW7					2						
Cobra 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), PW30 (Z-Axis)							4				
Hall Sensors (X-/Y-Axis), PW30 (Z-Axis)							H				
Housing											
Without Housing								0			
With Housing [1]								1			
Limiters											
Round (Standard)									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

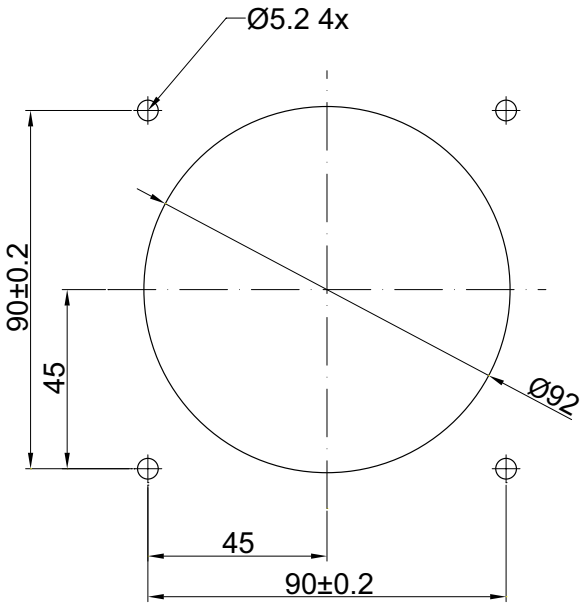
[1] Micro switches and detents are only available for versions without housing

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

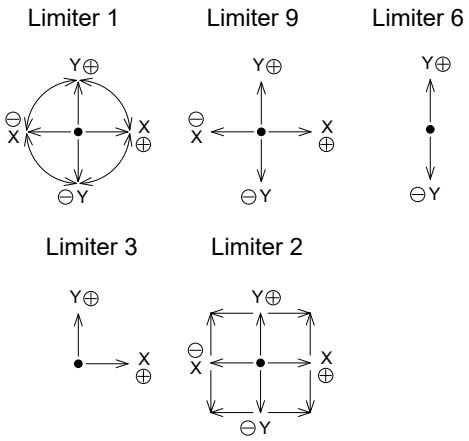
Please see page 1 for a description of the possible configurations.

Hand Joystick — Series 891

Mounting Cut-Out and Orientation of Limiters



Orientation of Limiters

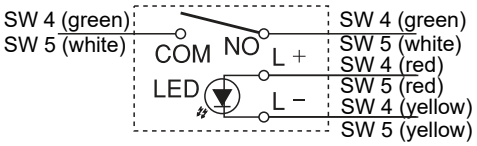


All Dimensions in mm

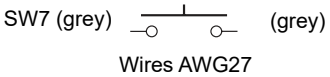
Technical Data Pushbuttons

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

Wires AWG27



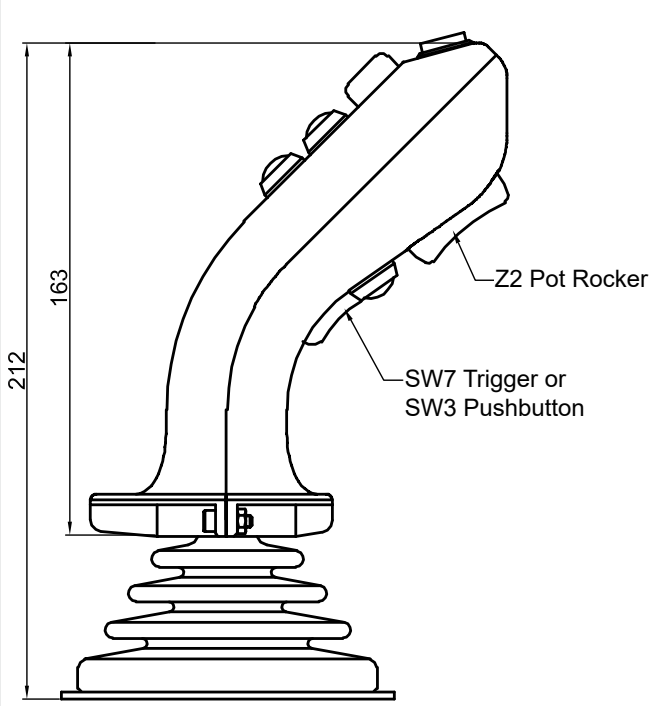
Wires AWG27

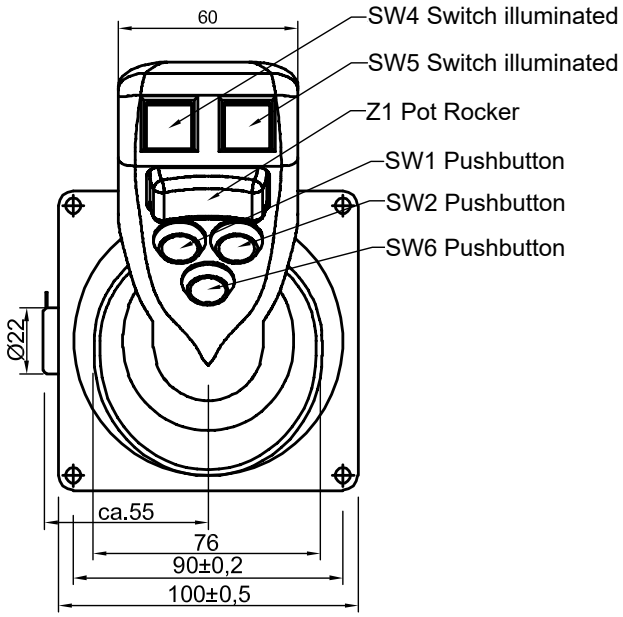


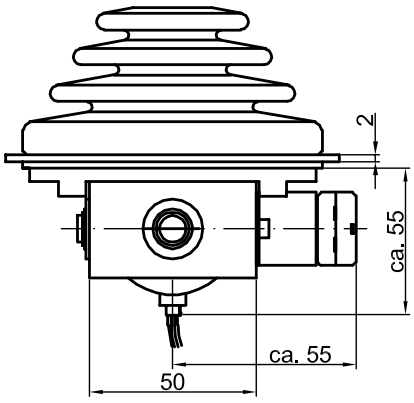
Wires AWG27

Hand Joystick — Series 891

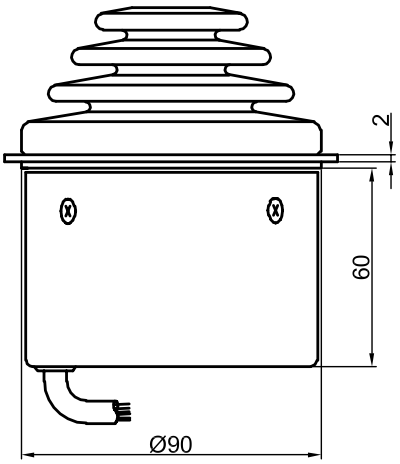
Technical Drawings







Without Housing



With Housing

All Dimensions in mm