

Data Sheet for Joysticks

Finger Joystick

Series 826



- Outstanding quality of mechanics and sensors
- 1 to 2 axes
- For demanding applications
- Conductive plastic potentiometer on the outside of the housing
- Diverse configuration options for switches, latching positions, etc.
- Protection class up to IP65 above panel on request
- Optionally redundant (dual-ganged potentiometers)
- Optionally with USB or CANopen interface

The 826 series joysticks show their strengths in demanding applications of up to 2 axes, where quality, durability and reliability are paramount and the sensor technology must meet special requirements.

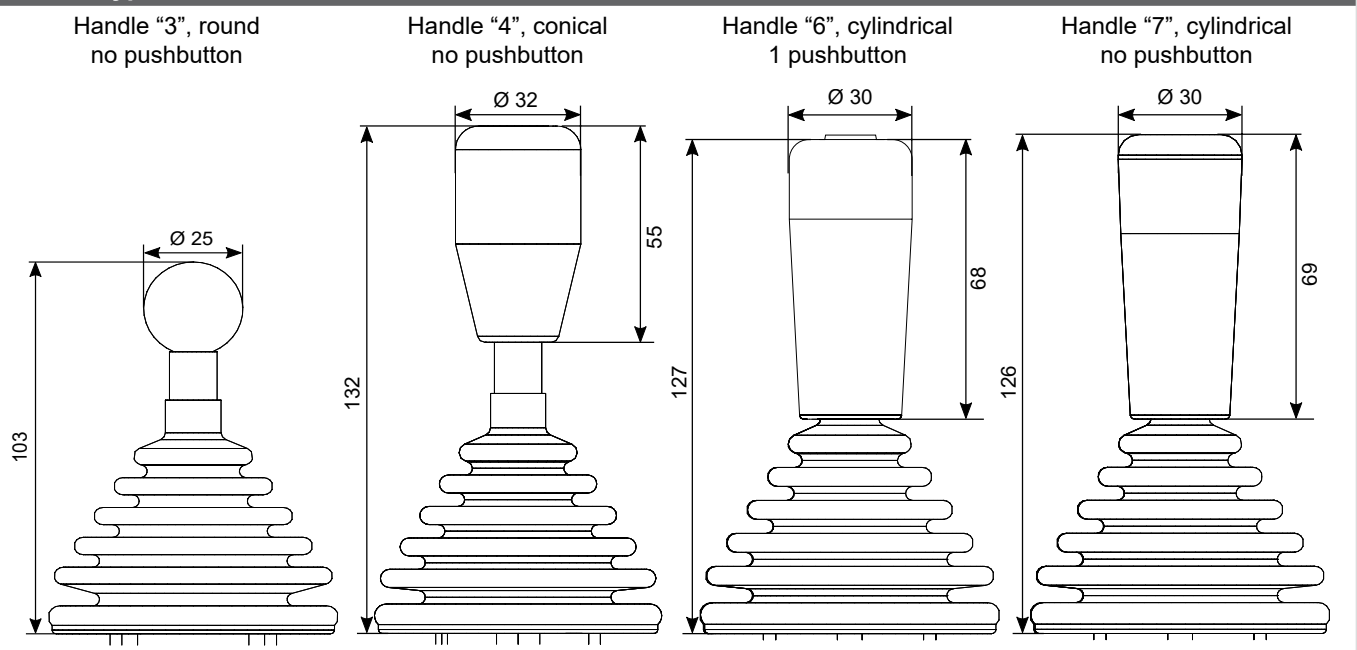
The mechanically separate shafts for both axes allow for special adaptations to be made: For example, detent points can be realized, and a friction brake can be installed. In addition, up to 6 microswitches can be mounted on the outside of the housing.

Technical Data Joystick

Angle of Movement X+Y Axis	±30° to ±35°
Return to Center Accuracy X+Y Axis	±1°
Operating Force X+Y Axis	3 to 15 N
Lifetime	typ. 5 million cycles
Vibration 10 bis 55 Hz, 1 min.	10 G (MIL-STD-202F-204)*
Shock	30 G (MIL-STD-202F-213)*
Protection Grade (above panel)	IP54, IP65 if sealed mounting plate is selected
Operating Temperature	-20°C to +65°C
Weight	ca. 350 g*
Panel Thickness	max. 3.2 mm

* only valid for potentiometer version without USB/CAN

Handle types



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

Order Code

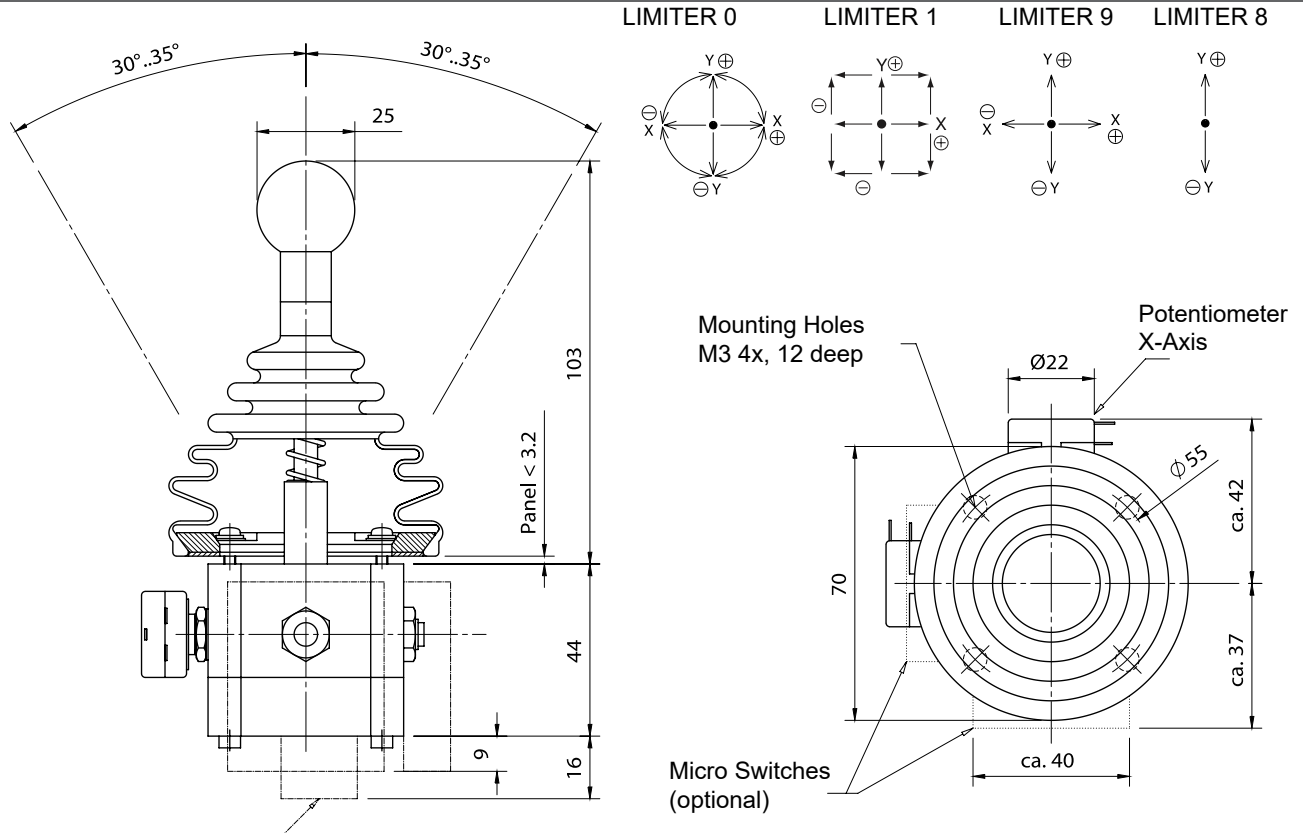
Description	Selection: standard= black/bold , possible options= <i>grey/italics</i>									
Series	826									
Axes:										
1 Axis		1								
2 Axes		2								
2 Axes with pushbutton		3								
1 Axis with pushbutton		6								
Sealing:										
Rubber boot			5							
Return Mechanism:										
Spring return					1					
No spring return					2					
Friction clutch, with detent in center position					5					
Friction clutch, w/o detent					6					
Handle versions:										
Ball-Tip, Ø25 mm						3				
Cylindrical handle, with pushbutton, Ø30 mm						6				
Cylindrical handle, without pushbutton, Ø30 mm						7				
Conical handle, Ø32 mm						4				
Trim function:										
w/o trim							1			
with trim function ⁽¹⁾							3			
Sensor type/output interface:										
Potentiometer type F / unwired								4		
Potentiometer type F / USB HID-compliant game controller								5		
Potentiometer type F / USB HID-compliant mouse emulation								6		
Potentiometer type F / CANopen								8		
Hall sensors, voltage output 0.5-4.5 V, supply 5 VDC / unwired								H0505		
Hall sensors, voltage output 0.5-4.5 V, supply 24 VDC / unwired								H2405		
Hall sensors, current output 4-20 mA, supply 24 VDC / unwired ⁽²⁾								H2442		
Limiters:										
Round									0	
Square									1	
Single axis Y									8	
X-/Y-Axis plus, "+"									9	
Micro switches:										
none										0
Common center detect switch X-/Y-Axis ⁽³⁾										1
Separate center detect switches (for 2 axes)										2
Switches ON @ ±3°, X-/Y-Axis										4
Switches ON @ ±3°, center detect, X-/Y-Axis										5
Switches ON @ ±5°, 1 or 2 axis										6
Switches ON @ ±5°, center detect, X-/Y-Axis										7
Additional options:										
Mounting plate										M
Mounting plate sealed to IP65 (glued rubber boot)										MIP
Potentiometer with center tap ⁽⁴⁾										CT

⁽¹⁾ Only possible if potentiometers are selected as sensors
⁽²⁾ The output must be connected with a load resistance of 500 Ohms
⁽³⁾ Code also applies to 1-axis variant
⁽⁴⁾ Not available for versions with current output, USB and CAN

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

- For example:
- Combinations of micro switches
 - Customer-specific cable

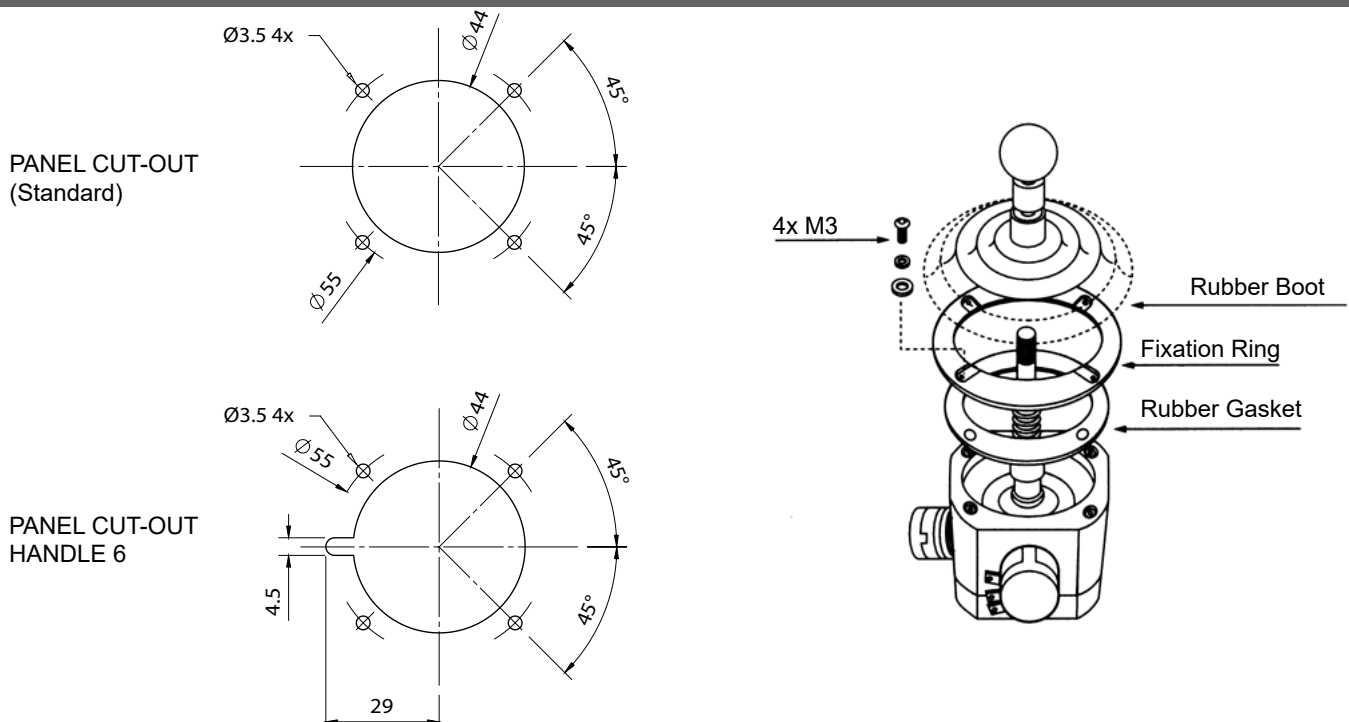
Drawing



Center Detect (optional) - in the presence of handle "6" two microswitches will be attached to the housing instead of a single center detecting switch.

Dimensions in mm

Installation



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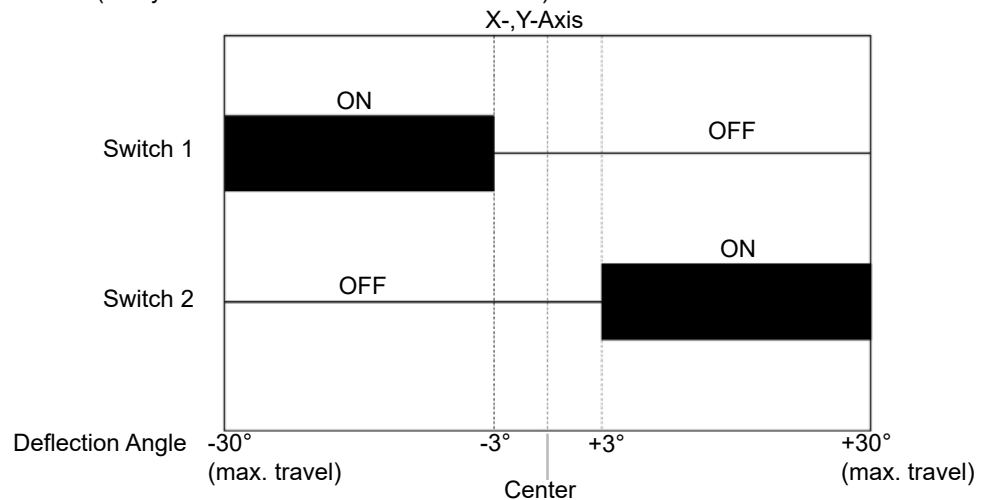
Pushbutton & Micro Switches

The joystick series 826 offers the option to integrate micro switches for deflection-dependent switch actuation. Three different angles per axis can be defined, e.g. one switch to detect the center position of the joystick handle plus one switch at $+10^\circ$ and -10° each. Due to the large number of different combination we cannot give a complete list of order codes. We recommend to contact us personally to identify the optimal solution for your needs.

Technical Data	Pushbutton (handle 6)	Micro Switch	Center Detect
Voltage / Current (max.)	50 VAC / 6 A	50 VAC / 5 A	30 VDC / 100 mA
Lifetime (typ.)	25000	200000	100000

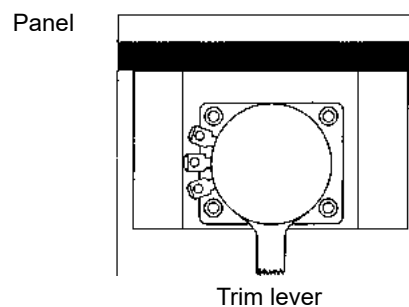
SCHEME (Standard) of deflection-dependent switch actuation

e.g. "Switches ON @ $\pm 3^\circ$, X-/Y-Axis" (many other combinations can be realized).



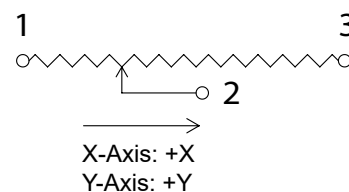
Trim Option „3“

Using the Trim function, potentiometers can repeatedly be adjusted ("trimmed") to an individual zero position.



Technical Data Potentiometer Type F

Technology	Conductive plastic
Nominal Total Resistance	10 kOhm
Resistance Tolerance	$\pm 15\%$
Independent Linearity	$\pm 3\%$
Power Rating @ 40°C	0.15 W
Effective Electrical Angle of Rotation	60°
max. Wiper Current	1 mA



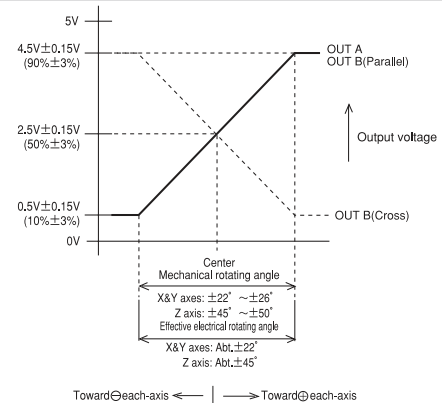
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Technical data Hall sensor option H0505

Supply voltage	5 VDC $\pm 10\%$
Current consumption	ca. 6 mA
Output signal	0.5 to 4.5 V
Load resistance	> 10 kOhm
Independent linearity	$\pm 3\%$
Temperature drift output	$< \pm 2,5\% U_{Out} *FS$
Temperature drift center pos.	$< 0,5\% U_{Out} *FS$
Insulation voltage	1 Minute at 250 VAC
Insulation resistance	> 100 MOhms at 250 VAC



Technical data Hall sensor option H2405

Supply voltage	24.0 ± 0.5 V
Current consumption	ca. 16 mA
Output signal	0.5 to 4.5 V
Load resistance	≥ 10 kOhm
Independent linearity	$\pm 3\%$
Insulation voltage	± 8 kV (contact), ± 16 kV (air) (IEC 61000-4-2)
Insulation resistance	> 1000 MOhm at 500 VDC

Technical data Hall sensor option H2442

Supply voltage	24.0 ± 0.5 V
Output signal	4 to 20 mA
Load resistance	≤ 500 Ohm
Independent linearity	$\pm 3\%$
Insulation voltage	± 8 kV (Kontakt), ± 16 kV (Luft) (IEC 61000-4-2)
Insulation resistance	> 1000 MOhm at 500 VDC

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USB specifications (sensor/output options 5 and 6)

Supply voltage	5 V (via USB type A connector)
USB version:	2.0
Operating systems:	Windows 7, Windows 8.1, Windows 10, Linux depending on kernel configuration
Cable (included)	USB cable (length approx. 198 cm) with USB type A plug
<p>The PCB for the USB interface is attached to the joystick housing. There is no IP protection for the PCB. The joystick is powered via the interface cable. Most Windows and Linux versions recognize the device without additional drivers. There are two different configurations of the joystick available according to the data sheet:</p>	
<p>USB HID-compliant game controller (option 5) The device identifies itself on the USB bus as a USB 2.0 HID-compliant game controller, i.e. as a joystick. The axis resolution is 10 bits.</p>	
<p>USB HID-compliant mouse emulation (USB joystick as a mouse replacement, option 6) Optionally, the joystick can also be operated as a mouse replacement. In this case, the device identifies itself on the USB bus as a USB 2.0 HID-compliant mouse. The X and Y axes are converted in the movement of the mouse pointer on the screen. Button 1 is a left mouse button.</p>	

CANopen specifications (output option 8) - General

<p>The board for the CANopen interface is attached to the joystick housing. There is no IP protection for the circuit board. The potentiometers are supplied with voltage by the CANopen board. CAN is not galvanically insulated.</p>	
Supply voltage	+24 VDC
Baud rate	up to 1 MBit/s, selected by DIP switch (see below)
Terminating resistor	on/off selected by DIP switch (siehe unten)
Bus connection	Transceiver TJA1050
CAN Bus norm	ISO11898
CiA draft standards	DS301, DS401
Terminating connector	JST B4B-XH-A
Operating temperature	-20 to +65°C (limited by joystick)
Node id	1..63, per Dipschalter selektierbar (siehe unten)
Available functions	4 transmit and 4 receive PDOs, dynamic PDO mapping, variable PDO identifiers, node guarding, lifeguarding and heart beat, emergency messages
PDO-Übertragungsmodi	synchronous, asynchronous, event-driven, cyclic, acyclic and RTR
Timer	Event timer and inhibit timer for all transmit PDOs
PDO layout (axis data)	Please contact us

Pin assignment at connector JST B4B-XH-A

Pin No.	Name	Function
1	PWR	+24 VDC
2	GND	ground
3	CANH	CAN high
4	CANL	CAN low

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CANopen specifications (output option 8) - CAN states and signal LED

LED	Colour	Function
RUN-LED	green	off no supply or faulty flickering CAN not started flashing Stopped blinking Pre-operational on Operational
ERR-LED	red	off no error 1x flashing CAN module in Error Warning State 2x flashing Node guarding error on Bus off

CANopen specifications (output option 8) - Configuration DIP switches

Switch Number										Description
4-DIP				6-DIP						
4	3	2	1	6	5	4	3	2	1	
RT										RT Termination CAN-Bus
	BD0	BD1	BD2							BDx Baud rate CAN-Bus
				ID5	ID4	ID3	ID2	ID1	ID0	IDx Select Node-ID
ON										CAN-Termination on (120 Ohm)
OFF										CAN-Termination off
	OFF	OFF	OFF							1 MBit/ s
	ON	OFF	OFF							800 kBit/ s
	OFF	ON	OFF							500 kBit/ s
	ON	ON	OFF							250 kBit/ s
	OFF	OFF	ON							125 kBit/ s
	ON	OFF	ON							50 kBit/ s
	OFF	ON	ON							20 kBit/ s
	ON	ON	ON							Reserved
				OFF	OFF	OFF	OFF	OFF	OFF	Setting of Node-ID and CAN baud rate using object 3000
				OFF	OFF	OFF	OFF	OFF	ON	Node-ID = 1
				OFF	OFF	OFF	OFF	ON	OFF	Node-ID = 2
				OFF	OFF	OFF	OFF	ON	ON	Node-ID = 3
			
				ON	ON	ON	ON	OFF	OFF	Node-ID = 60
				ON	ON	ON	ON	OFF	ON	Node-ID = 61
				ON	ON	ON	ON	ON	OFF	Node-ID = 62
				ON	ON	ON	ON	ON	ON	Node-ID = 63