

## AJS 600 Series

“Dual Axis, Non-Contact Hall-effect Technology”



- Non contact – Hall effect measurement technology
- Dual axis
- Special design for mobile machines
- Robust structure, long service life
- Configurable button and grip options
- Optional Dead man switch
- 5 million cycles mechanical life
- Resistant to electromagnetic field
- 0-10V, 0-5V, 0.5-4.5V, 0-20mA, 4-20mA or CANopen output options
- IP67 protection class

AJS 600 series joysticks have a mechanical structure similar to hydraulic joysticks. However, it has more precise measurement, high performance and long operating life with non-contact hall-effect technology. With its robust structure, it is suitable for use in mobile vehicles operating in the field. Analog and CANopen interface options are available for easy integration.

AJS 600 series joysticks offer easy installation and use with its precise control and ergonomic structure. In addition, thanks to its maintenance-free structure and high protection class, it works perfectly in harsh ambient conditions.

## MECHANICAL SPECIFICATIONS

<b>Angle of movement</b>	±20° (from center) ±1 tolerance
<b>Operating force (X, Y axis)</b>	6N±1N
<b>Life</b>	5 million life cycle
<b>Material</b>	Shaft: Stainless steel
	Boot: NBR
	Handle: Delrin® POM-C EN 10204
	Housing: Zamak

## ENVIRONMENTAL SPECIFICATIONS

<b>Protection Class</b>	IP67
<b>Operating Temperature</b>	-40°C...+85°C
<b>Storage Temperature</b>	-40°C...+85°C
<b>Relative Humidity</b>	%10...%90 RH

## ELECTRICAL SPECIFICATIONS

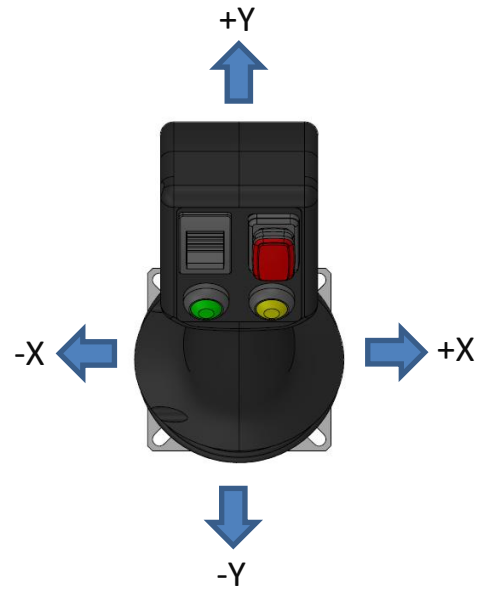
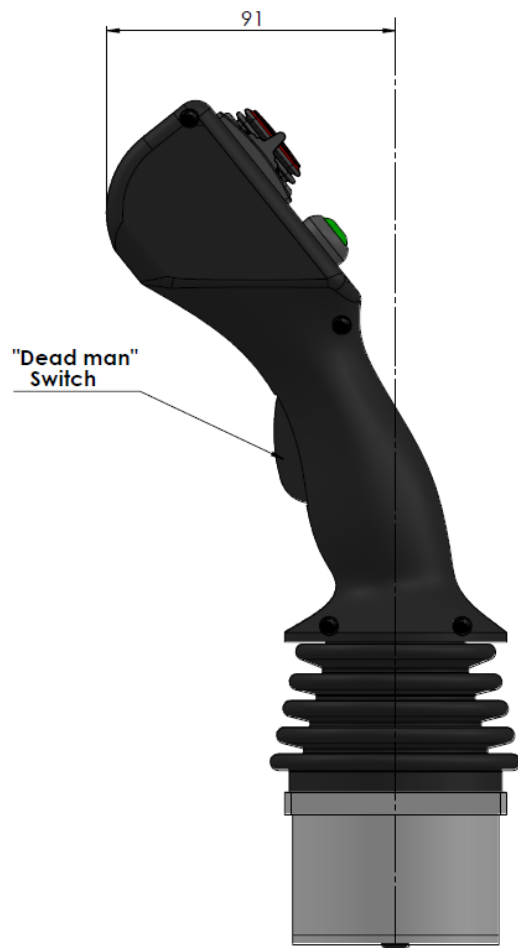
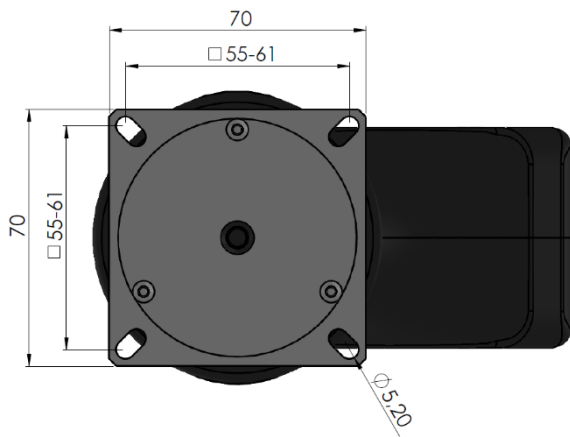
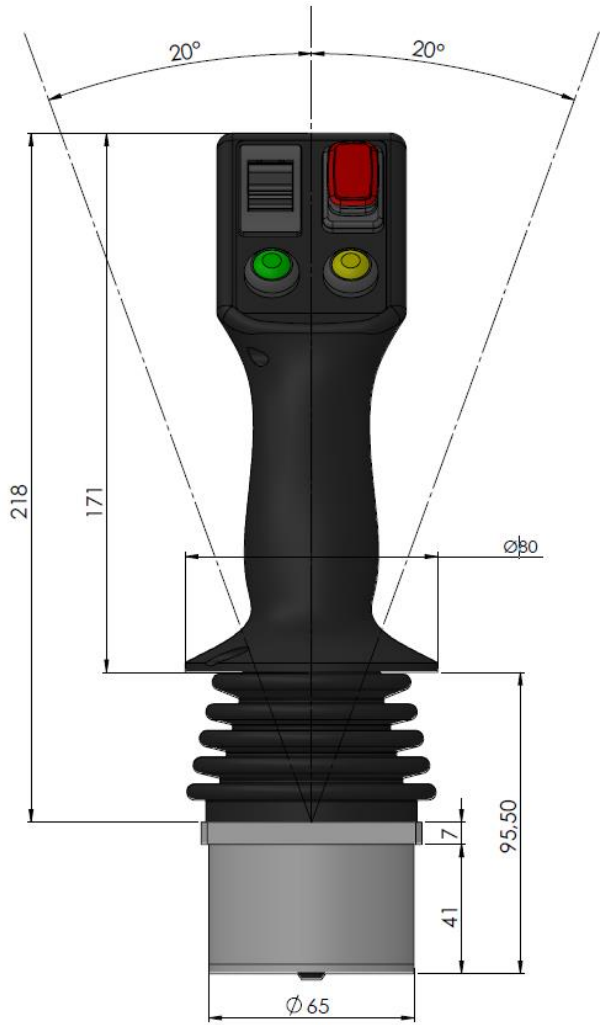
### Analog Version

<b>Sensor Type</b>	Hall-effect, 2axis
<b>Resolution</b>	11 bit
<b>Supply Voltage</b>	15 ... 30 VDC
<b>Supply Current</b>	≤40 mA (per axis)
<b>Reverse Polarity Protection</b>	Yes (supply)
<b>Short-Circuit Protection</b>	Yes
<b>Overvoltage Protection</b>	Up to 33V
<b>Electrical Interface</b>	4-20 mA, 0-20 mA, 0-10V, 0-5V, 0.5-4.5V
<b>Return to Center Accuracy</b>	±%2
<b>Load Resistance</b>	For current output; min 250 Ω For voltage output; min 1 KΩ

### CANopen Version

<b>Sensor Type</b>	Hall-effect, 2 axis
<b>Resolution</b>	11 bit
<b>Supply Voltage</b>	8 ... 30 VDC
<b>Supply Current</b>	≤40 mA (per axis)
<b>Reverse Polarity Protection</b>	Yes (supply)
<b>Short-Circuit Protection</b>	Yes
<b>Overvoltage Protection</b>	Up to 33V
<b>Protocol</b>	CANopen protocol: CiA DS-301 V4.02 Device profile: DS-401 V3.0
<b>Node ID</b>	Can be set from 1 to 127 with LSS or SDO Default Node ID:1
<b>Baud Rate</b>	10 kBit/s, 20 kBit/s, 50 kBit/s, 100 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 Mbit/s
<b>PDO Data Rate</b>	100 ms
<b>Error Check</b>	Heartbeat, Emergency Message
<b>PDO</b>	3 Tx PDO
<b>PDO Modes</b>	Event/Time triggered, Synch/Asynch
<b>SDO</b>	1 server
<b>Position Data</b>	Object Dictionary 0x6020
<b>Terminating Resistor</b>	Optional

# MECHANICAL DIMENSIONS (mm)



## BUTTON OPTIONS AND TECHNICAL SPECIFICATIONS

### Thumbwheel Button



#### Mechanical Data

Travel angle	±42°
Operating type	Spring return
Breakout force	2N
Operating force	11N
Max. force	100N
Expecting life	>100,000 cycles

#### Electrical Data

Operating type	Hall-effect
Supply voltage	5.0±0.5Vdc
Output signal	0.5...4.5V / 0...5V
Supply current	10mA
Max. overload voltage	30Vdc
Max. reverse voltage	-15Vdc
Output linearity tolerance	<±0.2V

#### Environmental Data

Operating temp.	-30°C ~ +70°C
Storage temp.	-40°C ~ +85°C
Protection class	IP67 (only electronic parts)

### Micro Joystick



#### Mechanical Data

Travel angle	6° (3° each direction)
Switch mechanism	Tactile
Life cycles	100K minimum
Max. vertical load	60 lbf
Max. horizontal load	40 lbf

#### Electrical Data

Min. contact rating	10µA @ 1V DC
Max. contact rating	50mA @ 24V DC
Initial contact resistance	100mΩ max.
Insulation resistance	100MΩ min. @ 100V DC
Dielectric strength	500V AC / minute
Thermal shock	PER EIA-364-32C

#### Environmental Data

Operating temp.	-35°C ~ +85°C
Storage temp.	-35°C ~ +85°C
Protection class	IP67

### Rocker Button



#### Mechanical Data

Plug force of terminals	≤ 80 N
Material	Actuator: PA / PC Housing: PA Terminals: silver plated

#### Electrical Data

Inrush current (capacitive)	120 A / 50 A
Contact resistance	< 100 mOhm (1 A 12 V DC)
Insulation resistance	> 100 MOhm (500 V DC)

#### Environmental Data

Operating temp.	Terminal: -20 °C ~ +105 °C Actuator: -20 °C ~ +55 °C
Glow wire test temperature	850 °C
Flammability	UL 94 V-2
Protection class	IP67

### Push Button



Mounting diameter	12mm
Terminal	2 pin
Current/voltage	1A / 250VAC

### Push Button with LED



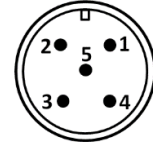
Mounting diameter	12mm
Terminal	2 pin
Current/voltage	3A / 220VAC
Protection class	IP65

## ELECTRICAL CONNECTIONS

### Analog

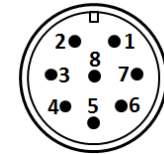
#### WITHOUT BUTTON

Signal	M12 / 5 Pin Male Connector	Cable
V+ (15...30VDC)	Pin 1	Red
GND (0V)	Pin 2	Black
Analog Out 1 (X axis)	Pin 3	Yellow
Analog Out 2 (Y axis)	Pin 4	Green
Deadman Switch	Pin 5	Pink



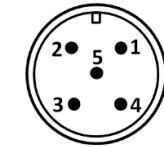
#### WITH BUTTON

Signal	M12 / 8 Pin Male Connector	Cable
V+ (15...30VDC)	Pin 1	Red
GND (0V)	Pin 2	Black
Analog Out 1 (X axis)	Pin 3	Yellow
Analog Out 2 (Y axis)	Pin 4	Green
Comm.	Pin 5	Blue
Button 1	Pin 6	White
Button 2	Pin 7	Grey
Deadman Switch	Pin 8	Pink



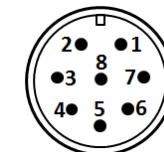
#### CAN CONNECTION

Signal	M12 / 5 Pin Male Connector	Cable
CAN_SHIELD	Pin 1	Shield
V+ (8...30VDC)	Pin 2	Red
GND (0V)	Pin 3	Black
CAN_H	Pin 4	Yellow
CAN_L	Pin 5	Green



#### CAN + EXTERNAL BUTTON CONNECTION

Signal	M12 / 8 Pin Male Connector	Cable
CAN_SHIELD	Pin 1	Shield
V+ (8...30VDC)	Pin 2	Red
GND (0V)	Pin 3	Black
CAN_H	Pin 4	Yellow
CAN_L	Pin 5	Green
Comm.	Pin 6	Blue
Button 1	Pin 7	White
Button 2	Pin 8	Grey



# ORDER CODING


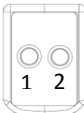
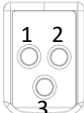
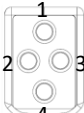
## BASE SELECTION



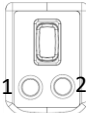
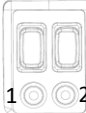
Model	Axis	Output Signal	Cable Length	Connector Type
AJS 600 (Hall effect)	<b>Diagonal</b> X: 1 axis/X axis Y: 1 axis/Y axis XY: 2 axis <b>Linear</b> XL: 1 axis /X axis YL: 1 axis /Y axis XYL: 2 axis *See page 3 for axis	C: CANopen V:0-10V V1:0-5V V3:.4-4.5V A:4-20mA A0: 0-20mA	1M:1m cable (std) *Optional others	No code: No connector S13M: M12 5 pin male conn. S14M: M12 8 pin male conn. *Optional others



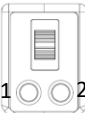
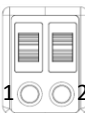
## GRIP AND BUTTON SELECTION




Rear Panel Button Variations	Front Panel Button Variations	Thumbwheel Button Output Signal	Push Button Color and LED Selection	Rocker- Thumbwheel Button Placement Angle
0: No deadman switch 1: Button deadman 2: capacitive deadman 3: capacitive+button deadman	No code: No button JA1, JA2, JA3, JA4 JB1, JB2, JB3, JB4 JC1, JC2, JC3, JC4 JD1, JD2, JD3 JE1, JE2, JE3, JE4 See button configurations	V8 : 0.5...4.5V V9 : 0...5V	G: Green R: Red B :Blue S : Black The number of each button is written next to it, when choosing a color, the number of the relevant button should also be added. If LED is desired on the button, "L" code should be added after color selection. (like 1SL, 2B...)	H : Horizontal (std) V : Vertical


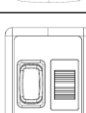

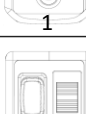
## BUTTON CONFIGURATIONS

JA: Push button(P)	
JA1 P1	
JA2 P2	
JA3 P3	
JA4 P4	

JB: Push button(P) + Rocker button(R)	
JB1 P1+ R1	
JB2 P1+ R2	
JB3 P2+R1	
JB4 P2+ R2	

JC: Push button(P) + Thumbwheel button(T)	
JC1 P1+T1	
JC2 P1+T2	
JC3 P2+T1	
JC4 P2+T2	

JD: Push button(P) + Micro joystick(J)	
JD1 J1	
JD2 P1+J1	
JD3 P2+J1	

JE: Rocker button(R)+ thumbwheel button(T) + push button(P)	
JE1 T1	
JE2 R1+T1	
JE3 R1+T1+P1	
JE4 R1+T1+P2	

**SAMPLE ORDER CODE:**

BASE SELECTION					GRIP SELECTION				
Model	Axis	Output Signal	Cable Length	Connector Type	Rear panel button	Front panel button	Thumbwheel Output Signal	Push Button Color Selection	Rocker-Thumbwheel button angle
AJS 600	2	V	1M	S14M	1	JB3	V8	1SL-2B	V
	2 axis	0-10V	1 meters	M12 8 pin male conn.	Button deadman	P2+R1	0.5...4.5V	Buton1: Black, with LED Buton2: Blue, without LED	Vertical