

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, Analog + Relay 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

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

ENVIRONMENTAL SPECIFICATIONS

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

ELECTRICAL SPECIFICATIONS

Analog Version

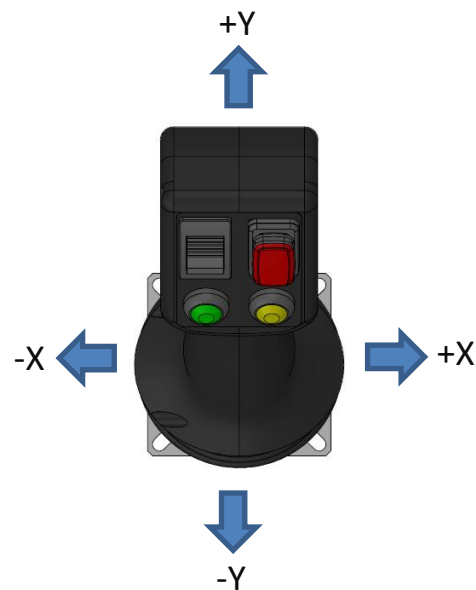
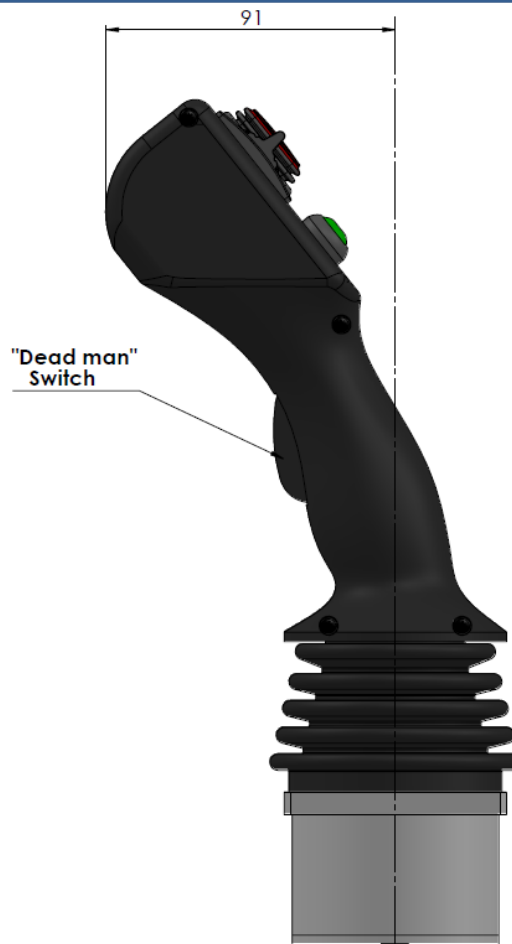
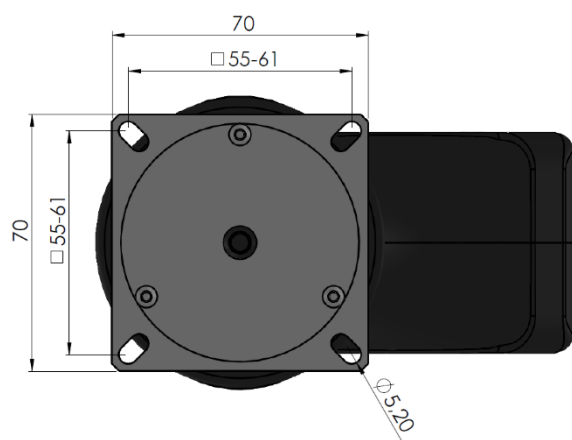
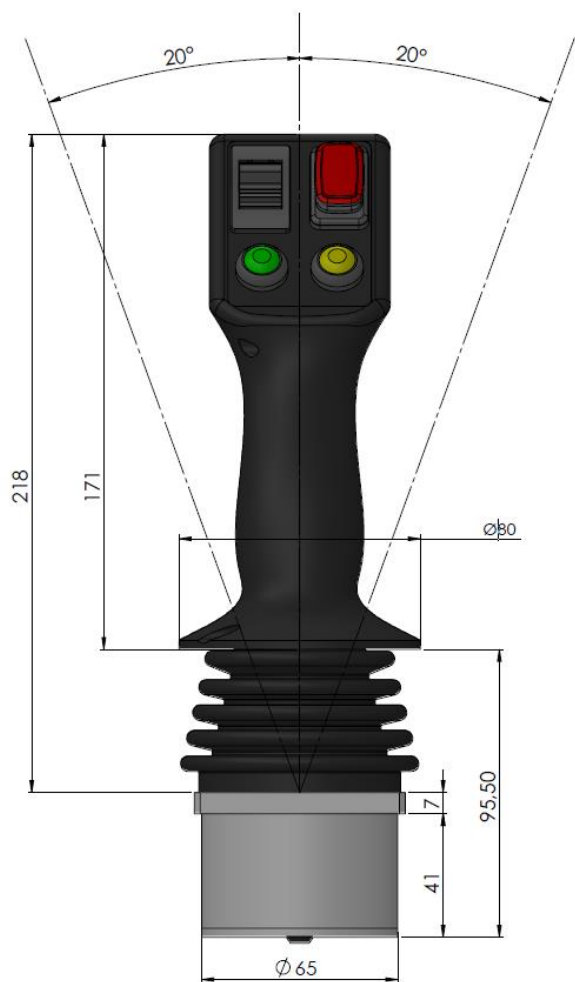
Sensor Type	Hall-effect, 2axis
Resolution	11 bit
Supply Voltage	15 ... 30 VDC
Supply Current	≤40 mA (per axis)
Reverse Polarity Protection	Yes (supply)
Short-Circuit Protection	Yes
Overvoltage Protection	Up to 33V
Electrical Interface	4-20 mA, 0-20 mA, 0-10V, 0-5V, 0.5-4.5V
Return to Center Accuracy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

Relay Version

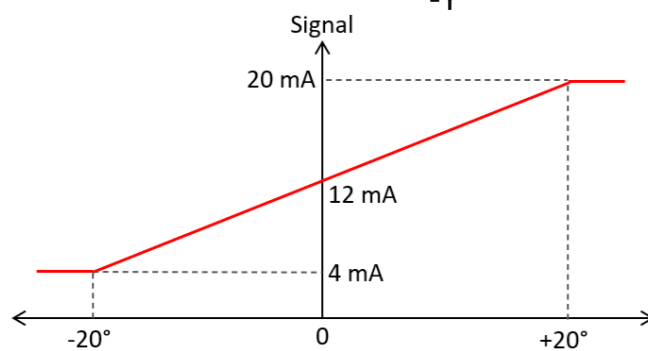
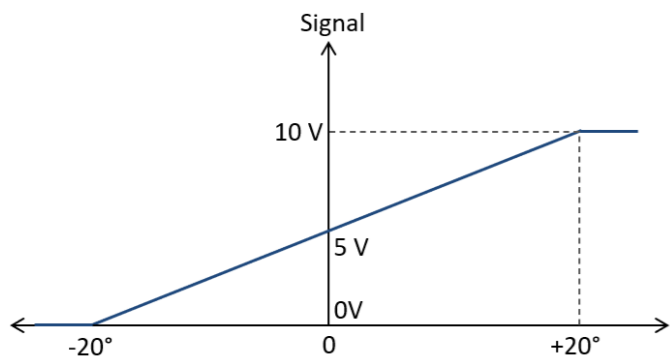
Contact Form	SPDT (1 Form C)
Rated Contact Current	1A
Maximum Contact Current	3A
Maximum Contact Voltage	120 VAC/24 VDC

CANopen Version

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



Joystick Output Signal



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 mΩ (1 A 12 V DC)
Insulation resistance	> 100 MΩ (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



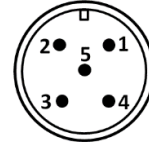
Mounting diameter	12mm
Terminal	2 pin
Current/voltage	3A / 220VAC
Protection class	IP65

ELECTRICAL CONNECTIONS

Analog

WITHOUT BUTTON

Signal	Cable
+V	RED
-V	BLACK
Analog X	YELLOW
Analog Y	GREEN
N/C	PINK



WITH BUTTON

JA1		JA2		JA3		JA4	
+V	RED	+V	RED	+V	RED	+V	RED
-V	BLACK	-V	BLACK	-V	BLACK	-V	BLACK
Analog X	YELLOW	Analog X	YELLOW	Analog X	YELLOW	Analog X	YELLOW
Analog Y	GREEN	Analog Y	GREEN	Analog Y	GREEN	Analog Y	GREEN
P.Comm	BLUE	P.Comm	BLUE	P.Comm	BLUE	P.Comm	BLUE
P1	WHITE	P1	WHITE	P1	WHITE	P1	WHITE
		P2	GREY	P2	GREY	P2	GREY
				P3	BROWN	P3	BROWN
						P4	PINK

JB1		JB2		JB3		JB4	
+V	RED	+V	RED	+V	RED	+V	RED
-V	BLACK	-V	BLACK	-V	BLACK	-V	BLACK
Analog X	YELLOW	Analog X	YELLOW	Analog X	YELLOW	Analog X	YELLOW
Analog Y	GREEN	Analog Y	GREEN	Analog Y	GREEN	Analog Y	GREEN
P.Comm	BLUE	P.Comm	BLUE	P.Comm	BLUE	P.Comm	BLUE
P1	WHITE	P1	WHITE	P1	WHITE	P1	WHITE
R.Comm	BLACK-WHITE	R.Comm	BLACK-WHITE	P2	GREY	P2	GREY
R.up	GREEN-WHITE	R1.up	GREEN-WHITE	R.Comm	BLACK-WHITE	R.Comm	BLACK-WHITE
R.down	YELLOW-WHITE	R1.down	YELLOW-WHITE	R.up	GREEN-WHITE	R1.up	GREEN-WHITE
		R2.up	GREEN-BROWN	R.down	YELLOW-WHITE	R1.down	YELLOW-WHITE
		R2.down	YELLOW-BROWN			R2.up	GREEN-BROWN
						R2.down	YELLOW-BROWN

JC1		JC2		JC3		JC4	
+V	RED	+V	RED	+V	RED	+V	RED
-V	BLACK	-V	BLACK	-V	BLACK	-V	BLACK
Analog X	YELLOW	Analog X	YELLOW	Analog X	YELLOW	Analog X	YELLOW
Analog Y	GREEN	Analog Y	GREEN	Analog Y	GREEN	Analog Y	GREEN
P.Comm	BLUE	P.Comm	BLUE	P.Comm	BLUE	P.Comm	BLUE
P1	WHITE	P1	WHITE	P1	WHITE	P1	WHITE
T.out	RED-BLUE	T1.out	RED-BLUE	P2	GREY	P2	GREY
		T2.out	PINK-GREY	T.out	RED-BLUE	T1.out	RED-BLUE
						T2.out	PINK-GREY

JD1		JD2		JD3	
+V	RED	+V	RED	+V	RED
-V	BLACK	-V	BLACK	-V	BLACK
Analog X	YELLOW	Analog X	YELLOW	Analog X	YELLOW
Analog Y	GREEN	Analog Y	GREEN	Analog Y	GREEN
J.up	PINK	P.Comm	BLUE	P.Comm	BLUE
J.down	PINK-BROWN	P1	WHITE	P1	WHITE
J.right	RED-BLUE	J.up	PINK	P2	GREY
J.left	GREY-PINK	J.down	PINK-BROWN	J.up	PINK
		J.right	RED-BLUE	J.down	PINK-BROWN
		J.left	GREY-PINK	J.right	RED-BLUE
				J.left	GREY-PINK

JE1		JE2		JE3		JE4	
+V	RED	+V	RED	+V	RED	+V	RED
-V	BLACK	-V	BLACK	-V	BLACK	-V	BLACK
Analog X	YELLOW	Analog X	YELLOW	Analog X	YELLOW	Analog X	YELLOW
Analog Y	GREEN	Analog Y	GREEN	Analog Y	GREEN	Analog Y	GREEN
T.out	RED-BLUE	R.Comm	BLACK-WHITE	R.Comm	BLACK-WHITE	R.Comm	BLACK-WHITE
		R.up	GREEN-WHITE	R.up	GREEN-WHITE	R.up	GREEN-WHITE
		R.down	YELLOW-WHITE	R.down	YELLOW-WHITE	R.down	YELLOW-WHITE
		T.out	RED-BLUE	T.out	RED-BLUE	T.out	RED-BLUE
				P.Comm	BLUE	P.Comm	BLUE
				P1	WHITE	P1	WHITE
						P2	GREY

JF1		JF2	
+V	RED	+V	RED
-V	BLACK	-V	BLACK
Analog X	YELLOW	Analog X	YELLOW
Analog Y	GREEN	Analog Y	GREEN
R.Comm	BLACK-WHITE	R.Comm	BLACK-WHITE
R.up	GREEN-WHITE	R.up	GREEN-WHITE
R.down	YELLOW-WHITE	R.down	YELLOW-WHITE
		J.up	PINK
		J.down	PINK-BROWN
		J.right	RED-BLUE
		J.left	GREY-PINK

E274-AXIS SWITCH	
SWITCH X+	RED-BLUE
SWITCH X-	PINK-GREY
SWITCH Y+	GREEN-BROWN
SWITCH Y-	YELLOW-BROWN
SWITCH Comm	GREY
DEADMAN	WHITE
DEADMAN Comm	BLUE
P1	RED
P2	YELLOW
P3	GREEN
P4	PINK
P.Comm	BLACK

RELAY + ANALOG	
+V	RED
GND	BLACK
AX	YELLOW
AY	GREEN
+XCom	BLUE
+XNC	RED-BLUE
+XNO	PINK-GREY
-XCOM	GREY
-XNC	GREEN-WHITE
-XNO	YELLOW-WHITE
+YCOM	WHITE
+YNC	GREEN-BROWN
+YNO	YELLOW-BROWN
-YCOM	PURPLE
-YNC	BLACK-WHITE
-YNO	GREY-BROWN
P.COM	PINK
P1	BROWN

* When the Relay + Analog version is selected, only the **JA1** front panel variation can be chosen.

CANopen

CAN CONNECTION

Signal	Cable
CAN_SHIELD	SHIELD
V+ (8...30VDC)	RED
GND (0V)	BLACK
CAN_H	YELLOW
CAN_L	GREEN

CAN + EXTERNAL BUTTON CONNECTION

Signal	Cable
CAN_SHIELD	SHIELD
V+ (8...30VDC)	RED
GND (0V)	BLACK
CAN_H	YELLOW
CAN_L	GREEN
Comm.	BLUE
Buton1	WHITE
Buton2	GREY

ORDER CODING

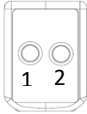
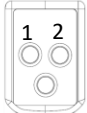
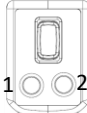
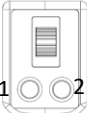
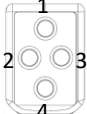
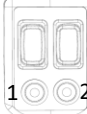
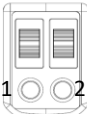
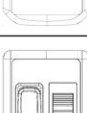
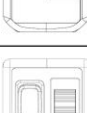
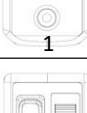
BASE SELECTION

Model	Axis	Output Signal	Relay	Cable Length
AJS 600 (Hall effect)	Diagonal X: 1 axis/X axis Y: 1 axis/Y axis XY: 2 axis Linear 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: 0.5-4.5V A: 4-20mA A0: 0-20mA	R0: Without Relay R1: With Relay	1M: 1m cable (std) *Optional others

GRIP AND BUTTON SELECTION

Rear Panel Button Variations	Front Panel Button Variations	Push Button Color and LED Selection	Thumbwheel Button Output Signal	Rocker- Thumbwheel Button Placement Angle
0: No deadman switch 1: Button deadman 2: capacitive deadman 3: capacitive+button deadman	0: No button JA1, JA2, JA3, JA4 JB1, JB2, JB3, JB4 JC1, JC2, JC3, JC4 JD1, JD2, JD3 JE1, JE2, JE3, JE4 See button configurations	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...)	V8 : 0.5...4.5V V9 : 0...5V	V : Vertical (std) H : Horizontal

BUTTON CONFIGURATIONS

JA: Push button(P)		JB: Push button(P) + Rocker button(R)		JC: Push button(P) + Thumbwheel button(T)	
JA1 P1		JB1 P1+ R1		JC1 P1+T1	
JA2 P2		JB2 P1+ R2		JC2 P1+T2	
JA3 P3		JB3 P2+R1		JC3 P2+T1	
JA4 P4		JB4 P2+ R2		JC4 P2+T2	
JD: Push button(P) + Micro joystick(J)		JE: Rocker button(R)+ thumbwheel button(T) + push button(P)		JF: Rocker buton (R) + Micro joystick (J)	
JD1 J1		JE1 T1		JF1 R1	
JD2 P1+J1		JE2 R1+T1		JF2 R1+J1	
JD3 P2+J1		JE3 R1+T1+P1			
		JE4 R1+T1+P2			

SAMPLE ORDER CODE:

BASE SELECTION					GRIP SELECTION				
Model	Axis	Output Signal	Cable Length	Relay	Rear panel button	Front panel button	Push Button Color Selection	Thumbwheel Output Signal	Rocker-Thumbwheel button angle
AJS 600	XY	V	1M	R0	1	JB3	1SL-2B	V8	V
	2 axis	0-10V	1 meters	Without Relay	Button deadman	P2+R1	Buton1: Black with led Buton2: Blue without	0.5...4.5V	Vertical