

AG series

Agricultural grips

Distinctive features and specifications



- Hall effect sensing
- Ergonomic design
- Multiple faceplate configurations
- CAN bus J1939, CANopen & analog output options

MECHANICAL (FOR X AND Y AXIS)

- Break Out Force: 7.6N (1.70lbf)
- Operating Force: 13.8N (3.10lbf)
- Maximum Applied Force: 1000.8N (225.00lbf)
- Mechanical Angle of Movement: 38°
- Expected Life: 1 million cycles
- Lever Action (Centering): Spring centering
- Material: Glass reinforced nylon

ENVIRONMENTAL

- Operating Temperature: -25°C to 70°C (-13°F to 158°F)
- Storage Temperature: -40°C to 70°C (-40°F to 158°F)
- Sealing: Up to IP63 (dependent on configuration)
- EMC Immunity Level (V/M): IEC 61000-4-8:2009
- EMC Emissions Level: IEC 61000-4-3:2006
- ESD: IEC 61000-4-2:2008

SENSOR SPECIFICATIONS

- Sensor: Hall effect
- Resolution: 1.22mV
- Supply Voltage Range: 5.00V±0.01V
- Reverse Polarity Max: -10V
- Transient Overvoltage Max: 16V
- Output Impedance: 2Ω
- Return to Center Voltage Tolerance: ±200mV initial
- Supply Current: 13mA per sensor

CAN bus OUTPUT VERSION

- Supply Voltage Range: 6V to 35V
- CAN bus Version: J1939, CANopen

STANDARD PUSHBUTTON SWITCH CHARACTERISTICS/RATINGS

- Max Current / Voltage Rating with Resistive Load: 400mA 32VAC - 100mA 50VDC - 125mA 125VAC
- Low Level: 10mA @ 30mV
- Electrical Life at Full Load: 500,000 cycles
- Mechanical Life: 1 million cycles
- Environmental Seal: IP67
- Action: Momentary, pushbutton
- Operating Force: 7N±3N (1.57lbf±0.67lbf)
- Total Travel: 1.9mm (0.07 inches)±0.3mm (0.01 inches)

INDEX TRIGGER SWITCH CHARACTERISTICS/RATINGS

- Electrical Resistive Load: 5A (depending on the chosen switch)
- Electrical Inductive Load: 3A (depending on the chosen switch)
- Low Level: 10mA @ 30mV (depending on the chosen switch)
- Electrical Life: 1 million cycles 5A @ 28 VDC resistive snap-action (depending on the chosen switch)
- Mechanical Life: 25,000 cycles
- Environmental Seal: IP67
- Action: Momentary, snap-action
- Operating Force: 7.5N±2.0N (1.69lbf±0.45lbf)
- Total Travel: 0.080 inches max
- Over Travel: 0.010 inches min

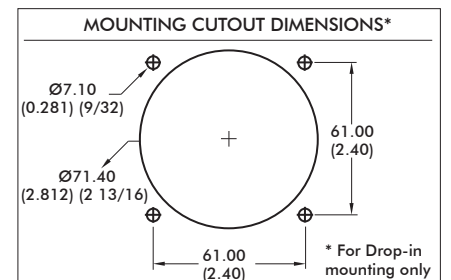
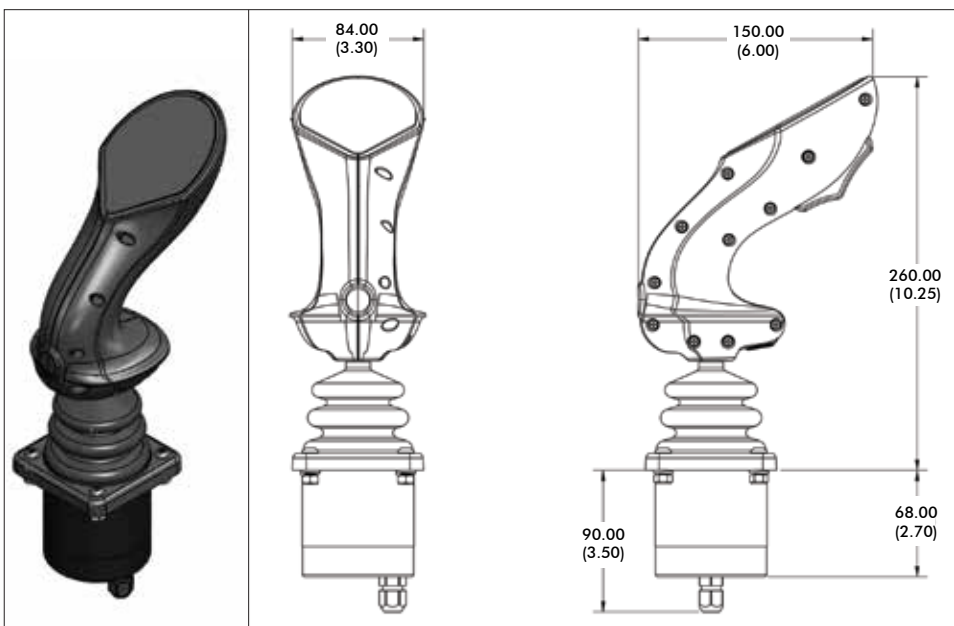
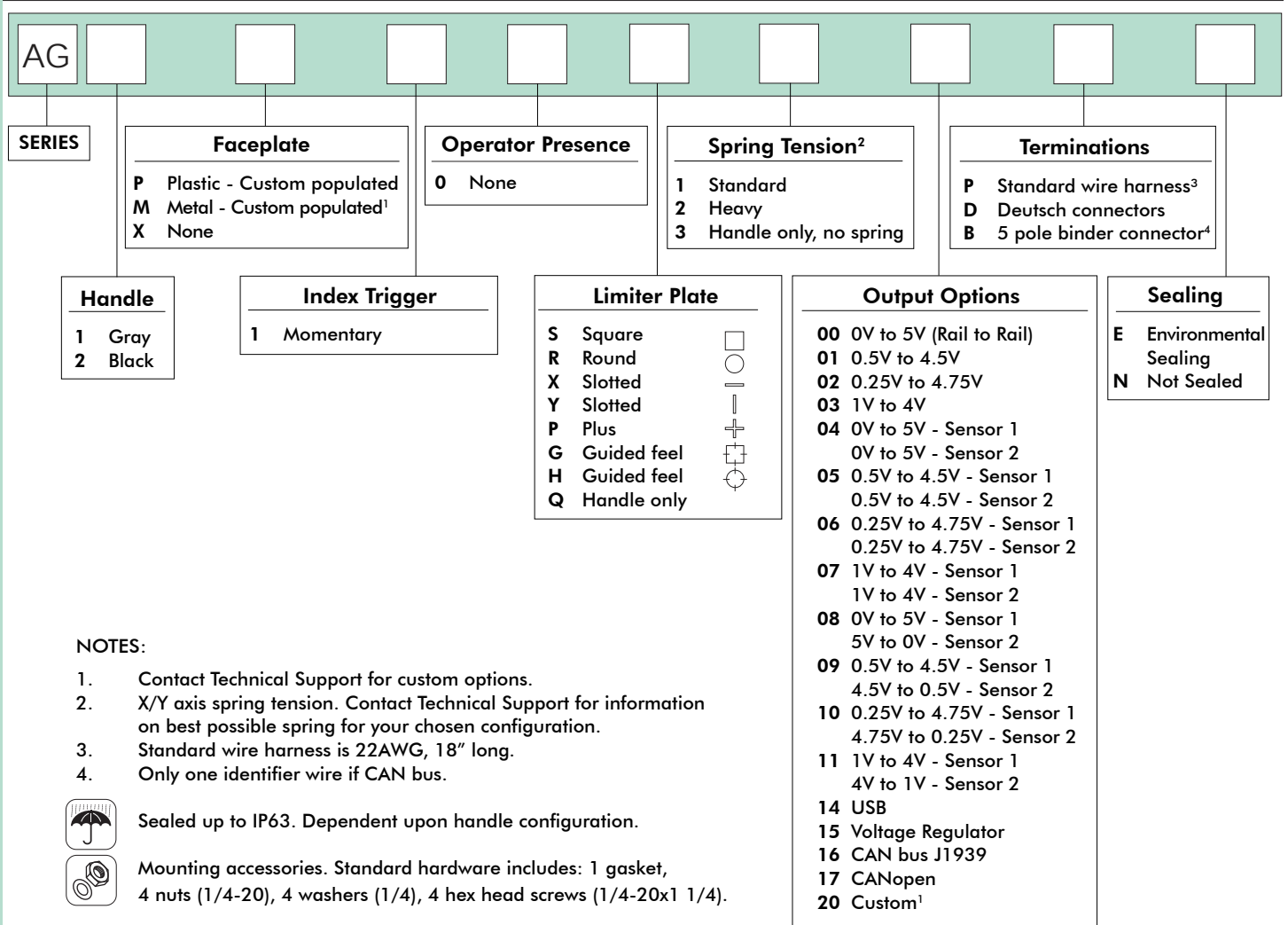
NOTES:

All values are nominal.
Exact specifications may be subject to configuration.
Contact Technical Support for the performance of your specific configuration.

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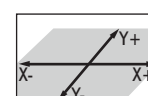
Agricultural grips

Overview



NOTES:

- Dimensions are in mm/(inch).
- Actual strain relief position may vary.
- For below panel lower profile housings, the strain relief [20.30/(0.80)] can be replaced with a rubber grommet [1.27/(0.05)], and the standard housing cap [18.54/(0.73)] can be replaced with a short cap [11.94/(0.47)]. These options are available only for joysticks without additional boards, except USB.
- Axis orientation:



Note: The company reserves the right to change specifications without notice.

AG series

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Overview

FACEPLATE OPTIONS

The AG series may be configured with a black anodized aluminum or a plastic faceplate, providing a near limitless combination of pushbutton and linear device configuration options. Faceplate configuration options include proportional Hall effect pushbuttons, latching LED pushbuttons, LED indicators, and proportional miniature joysticks.



JOYSTICK AND GRIP OPTIONS

The AG series handle can be fitted onto a one or two axis Hall effect joystick mechanism or it can be supplied as just a Fixed Grip™.



INDEX TRIGGER

The AG series handle is available with a normally open momentary index trigger.

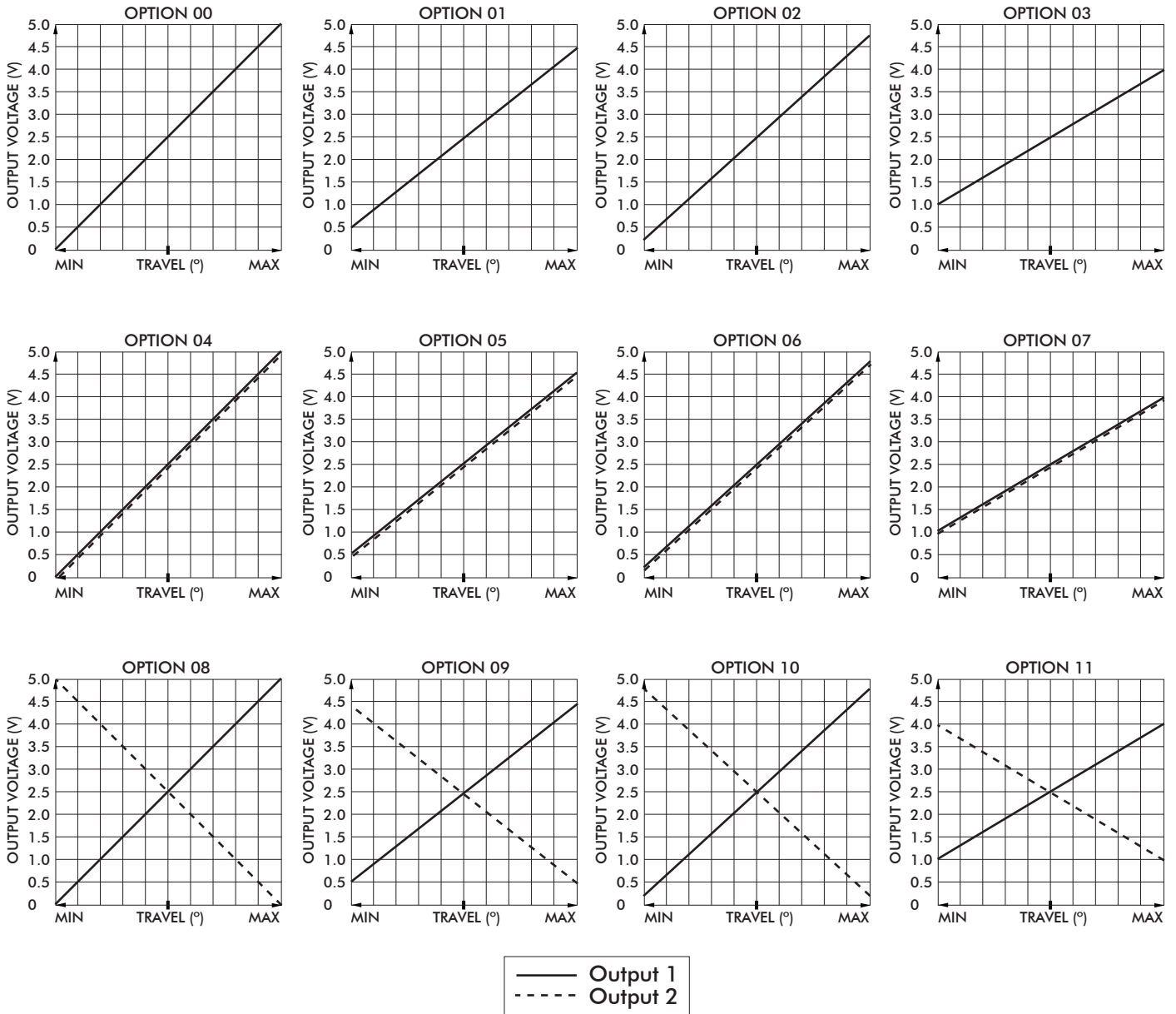


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VOLTAGE OUTPUT OPTIONS



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Overview

USB

USB

Featuring USB 1.1 HID compliant interface, APEM's USB joysticks are recognized as standard HID "game controller" devices. Adhering to the HID specification, APEM's USB joysticks are plug-and-play with most versions of Windows. Joystick button and axis assignments are dependent upon the controlled application.

FEATURES

- USB 1.1 HID compliant "game controller" device
- Easy to install and operate
- Functions determined by controlled application

SUPPLIED WIRING

USB: USB Male Type A Connector with overmolded cable

CURSOR EMULATION

The Cursor Emulation option converts multi-axis joystick output into a mouse, trackball, or cursor control device. The joystick's internal microprocessor converts absolute axis position into a cursor velocity, which is translated as a relative trackball or mouse position.

APPLICATIONS

The Cursor Emulation option is ideal for vehicle applications subjected to dirt and high vibration which makes operating a traditional cursor control device difficult. The Cursor Emulation option is widely used in shipboard and military applications.

FEATURES

- HID compliant "pointing device"
- Plug-and-play with USB option

SUPPLIED WIRING

USB: USB Male Type A Connector with overmolded cable



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CAN BUS

CAN bus J1939

APEM's CAN bus joysticks conform to the SAE J1939 serial bus specification used for communications between electronic control units and vehicle components. The AG CAN bus option provides I/O extension for up to eight digital and 4 analog inputs, or four digital inputs and a switch matrix of 4 x 6 for up to 24 switches.

| ELECTRICAL SPECIFICATIONS | |
|---------------------------|--|
| • Supply Voltage: | 6VDC to 35 VDC |
| • Supply Current: | 15mA min, +5mA per LED, +10mA per axis |

| WIRING SPECIFICATION | |
|----------------------|-----------------------|
| • Red Wire: | Supply Power |
| • Black Wire: | Ground |
| • Green Wire: | CAN high data |
| • White Wire: | CAN low data |
| • Blue Wire: | Identifier Select LSB |
| • Orange Wire: | Identifier Select MSB |

| ENVIRONMENTAL | |
|--------------------------|----------------------------------|
| • Operating temperature: | -25°C to +70°C (-13°F to +158°F) |
| • Storage temperature: | -40°C to +70°C (-40°F to +158°F) |

CONNECTOR OPTIONS:

- Cable assembly with Deutsch DT04 style plugs

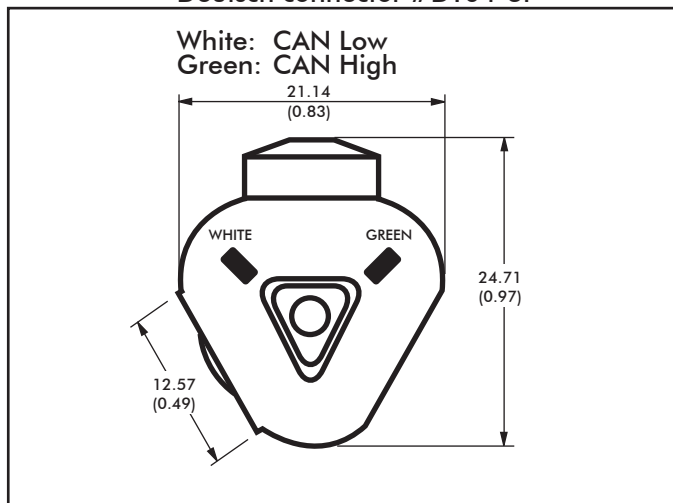
CAN bus CONFIGURATION

- Contact Technical Support for assistance.

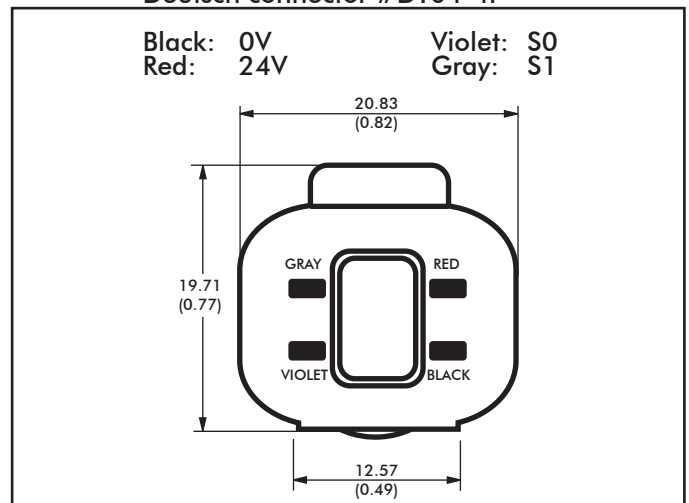
PINOUT INFORMATION

The CAN bus AG series joystick is available with industry standard Deutsch connectors #DT04-3P and #DT04-4P for easy installation. The pinouts are listed below.

Deutsch connector #DT04-3P



Deutsch connector #DT04-4P



NOTES:

1. Dimensions are in mm/(inch).
2. Standard cable harness is 450mm (18inch) long, 22AWG, with flying leads.

CANopen

- Contact Technical Support for assistance with CANopen configuration.

Note: The company reserves the right to change specifications without notice.

ADDITIONAL OUTPUT OPTIONS

VOLTAGE REGULATOR

The Voltage Regulator is a multi-wired analog option used to mate to a variety of industrial control voltages. The Voltage Regulator may be used when the supply or output voltage is greater than 5V or when bipolar output is required.

User Specified Output Voltage:

- 0-5VDC
- 0-10VDC
- ± 5 VDC
- ± 10 VDC

| ELECTRICAL SPECIFICATIONS |
|---|
| <ul style="list-style-type: none">• Supply Voltage: (Output Voltage + 1VDC) to 30VDC• Supply Current: 90mA max |