SERIES 60AR

Rugged and Sealed Joystick

FEATURES

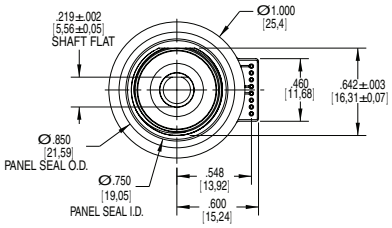
- Three-in-One Joystick, Optical Encoder and Pushbutton
- Shaft and panel sealed to IP67 against liquids and particulates
- Choices of knobs, cable length and termination
- Customized solutions available

APPLICATIONS

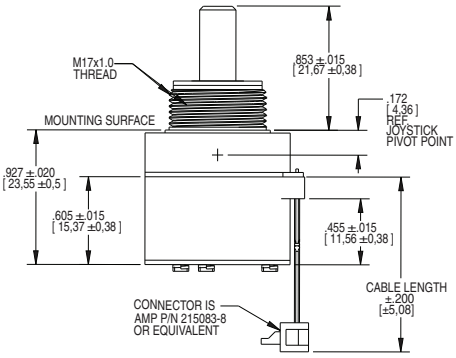
- Aerospace
- Military vehicles and devices
- Mobile electronics for outdoor use

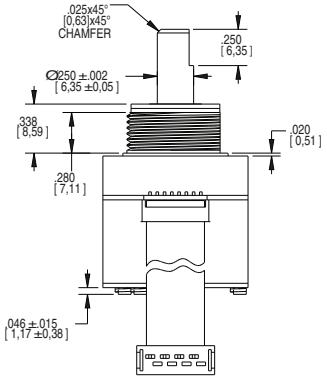
DIMENSIONS in inches (and millimeters)

Unless otherwise specified, standard tolerance are:
Linear ± .025
Diameter ± .010
Angle ± 2.0°



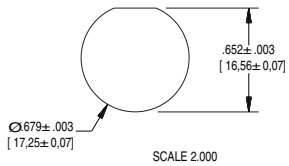
Cable Connector Version



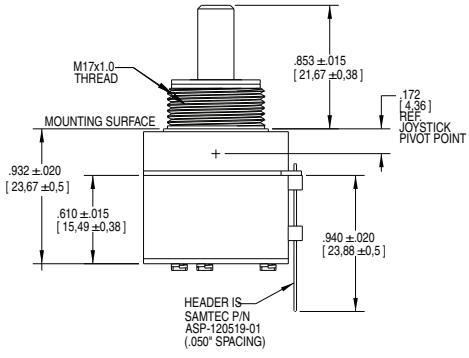


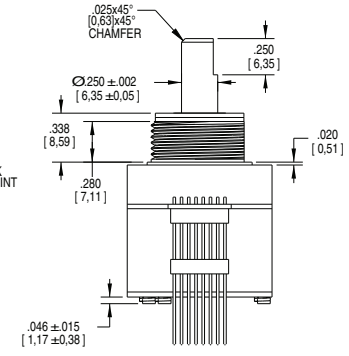
PANEL SEAL GASKET NOT SHOWN TO ILLUSTRATE MOUNTING SURFACE

Recommended Panel Cut Out



Pin Version





PANEL SEAL GASKET NOT SHOWN IN LOWER VIEWS TO ILLUSTRATE MOUNTING SURFACE

ORDERING INFORMATION

60AR18-4-060S

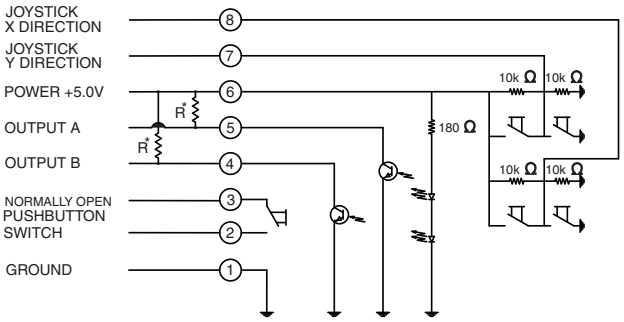
Angle of Throw: 18= 18° or 20 positions, 08= Non-detent or 20 positions, 00= Non-turn
Joystick: 4= Four contacts & four directions; 8= Four contacts & eight directions

Termination: 0.050" center P= pin header; C= connector; S= stripped cable
Cable Length: 020 thru 250 in 1/2 inch increments, 060= 6.0 inch cable, leave blank if pinned

For prices and custom configurations, contact a local sales office, an authorized distributor, or Grayhill's sales department.

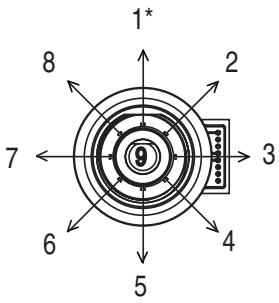
JOYSTICK OPERATION + ENCODER WAVEFORM AND TRUTH TABLE Standard Quadrature 2-Bit Code

SWITCH SCHEMATIC

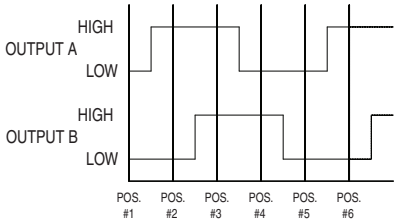


*EXTERNAL PULL-UP RESISTORS REQUIRED FOR OPERATION (2.2k Ω).

JOYSTICK POSITION DIAGRAM
* INDICATES DIRECTION OF D-FLAT ON BUSHING



ENCODER WAVEFORM (C.W. ROTATION)



ENCODER TRUTH TABLE (C.W. ROTATION)

POSITION	OUTPUT A	OUTPUT B
#1	○	○
#2	◯	○
#3	◯	◯
#4	○	◯

◯ INDICATES LOGIC-HIGH
○ INDICATES LOGIC-LOW
CODE REPEATS EVERY FOUR POSITIONS

JOYSTICK TRUTH TABLE

POSITION	X OUTPUT	Y OUTPUT
1	2.5	HIGH
2	HIGH	HIGH
3	HIGH	2.5
4	HIGH	LOW
5	2.5	LOW
6	LOW	LOW
7	LOW	2.5
8	LOW	HIGH
9	2.5	2.5

SPECIFICATIONS

Environmental Specifications

Operating Temperature Range: -40°C to 85°C
Storage Temperature Range: -40°C to 100°C
Humidity: 96 hours at 90-95% humidity at 40°C
Mechanical Vibration: Harmonic motion with amplitude of 15g, within a varied 10 to 2000 Hz frequency for 12 hours
Mechanical shock:
Test 1: 100g for 6Ms half sine wave with velocity change of 12.3 ft/s.
Test 2: 100g for 6 Ms sawtooth wave with velocity change of 9.7 ft/s.
Shaft and panel Seal: IP67, 1 meter submersion for 30 minutes

Joystick Electrical & Mechanical Specifications

Supply Current: 5 Ma, maxium
Output Code: 2-bit
Logic Output Characteristics: Neutral Position: 2.5±0.5 Vdc, High-state Position: >4.5 Vdc, Low-state Position: <0.5 Vdc
Mechanical Life (Joystick): 500k actuations, minimum in each direction
Actuation Force (Joystick): 1500±300g (X&Y directions only)
Angle of Throw: 3.5°+2/1° (X&Y directions only, at electrical contact)

Pushbutton Electrical & Mechanical Specifications

Rating: 10 Ma at 5 Vdc, resistive
Contact Resistance: Less than 10 Ω
Contact Bounce: <4 Ms make, <10 Ms break
Mechanical Life (Pushbutton): 1 million actuations, minimum
Actuation Force (Pushbutton): 1600±400g
Pushbutton Travel: .015±.005 in

Rotary Electrical & Mechanical Specifications

Operating Voltage: 5.00±25 Vdc
Supply Current: 20 Ma, maximum at 5 Vdc
Minimum Sink Current: 2.0 Ma for 5 Vdc
Output: Open collector phototransister, external pull-up resistors are required
Output Code: 2-bit quadrature, channel "A" leads channel "B" by 90° electrically during clockwise rotation of the shaft
Logic Output Characteristics: Logic-high shall be no less than 3.5 Vdc, Logic-low shall be no greater than 1.0 Vdc
Optical Rise Time: 30 µs, maximum
Optical Fall Time: 30 µs, maximum
Mechanical Life (Rotational): 1 million cycles, minimum (1 cycle is a rotation through all positions and a full return)
Average Rotational Torque: 8.0±30% in-oz, initial
Shaft Push-out Force: 60 lbs, minimum before failure
Shaft Side-load Force: 25 lbs, minimum before failure
Terminal Strength: 15 lbs pull-out force, minimum for cable or header termination
Solderability: 95% free of pin holes or voids
Maximum Rotational Speed: 100 Rpm
Mounting Torque: 15 in-lbs maximum

Specifications are subject to change

LifeElectronics
Живое партнерство

ООО «ЛайфЭлектроникс» **“LifeElectronics” LLC**

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- *Конкурентоспособные цены и скидки постоянным клиентам.*
- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
- *Формирование склада под заказчика.*

- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

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