

- **Robust design for arduous applications**
- **Options for Overpress and Latch at ends of travel**
- **Soft Touch sections of the ‘Tab’**
- **Under-panel depth minimized to 9 mm – Molex connector**
- **Three electrical termination options**
- **Rated for 5 million cycles up to start of overpress**
- **Hall-effect sensor technology**
- **Dual outputs with sense and voltage span options**
- **IP67 sealing above panel**
- **Two mounting panel fixing options in the one body design**
- **Color-coded ‘Tab’ options**



The JC1210 builds on the success of the JC1200, incorporates the same robust design with exceptional life, and now offers the option of overpress and latch features at the ends of travel. This new joystick utilizes non-contacting, Hall-effect sensing technology for long-life integrity of the output signal. Operating feel has been an important part of this new development to make this unit as smooth and easy to operate as possible throughout a 5 million cycle life to the start of overpress

Hall-effect sensing eliminates contact wear and provides safety functionality via dual outputs, which can be set to positive or negative ramps, or a combination of both. Electronic robustness is assured with sealing of the internal PCB to a rating

of IP67, while a joystick to panel rating of IP67 can be achieved.

The joystick is available with Overpress and Latch options at the ends of travel, which can be combined to meet your system needs to hold functions at full speed/float.

There are three options for electrical termination – integrated Molex connector, flying lead with Molex connector or header pins.

A soft-touch colored insert area of the paddle – which has a choice of nine colors – increases operator comfort and decreases the likelihood of finger-slip during operation.



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CONFIGURATION & ORDERING CODES

JC1210-X-XX-X-XX-XXXX-XX

| Type | Output | Output Sense | Spring Return Position | Paddle Insert Color | Forward Latch Option | Forward Overpress Option | Backward Overpress Option | Backward Latch Option | Interface Option |
|---------|--------|--------------|------------------------|---------------------|----------------------|--------------------------|---------------------------|-----------------------|------------------|
| JC1210- | X | XX | X | XX | X | X | X | X | XX |
| | A | PN | C | 01 | N | N | N | N | C1 |
| | B | PP | | 02 | L | O | O | L | F1 |
| | | NN | | 03 | | | | | P1 |
| | | | | 04 | | | | | |
| | | | | 05 | | | | | |
| | | | | 06 | | | | | |
| | | | | 07 | | | | | |
| | | | | 08 | | | | | |
| | | | | 09 | | | | | |

OUTPUT

JC1210-X-XX-X-XX-XXXX-XX

| Code | Description |
|------|--|
| A | 10-90% of 5V supply (0.5-4.5V nominal) |
| B | 20-80% of 5V supply (0.1-4.0V nominal) |

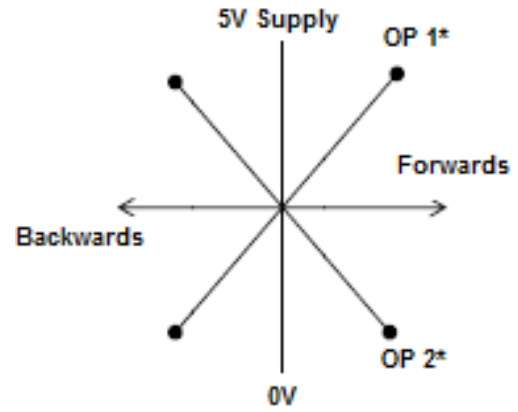


OUTPUT SENSE

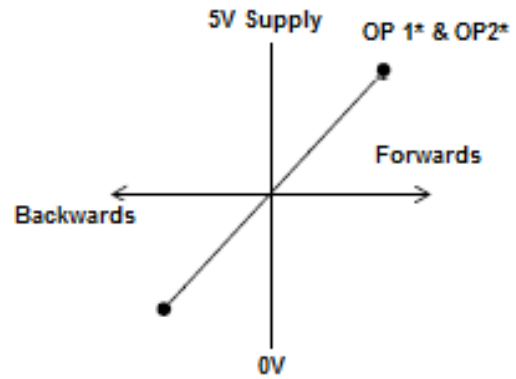
JC1210-X-XX-X-XX-XXXX-XX

| Code | Description |
|------|---|
| PN | Output 1: Positive slope Output 2: Negative slope |
| PP | Output 1: Positive slope Output 2: Positive slope |
| NN | Output 1: Negative slope Output 2: Negative slope |

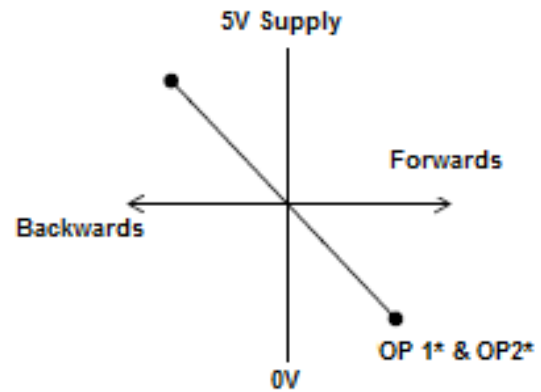
PN



PP



NN



* 10-90% or 20-80% of 5V supply












SPRING RETURN POSITION

JC1210-X-XX-X-XX-XXXX-XX

| Code | Description |
|------|-------------|
| C | Center |

PADDLE INSERT COLOR

JC1210-X-XX-X-XX-XXXX-XX

| Code | Color Description | Applicable RAL Number |
|------|--|-----------------------|
| 01 |  Black | RAL 9005 |
| 02 |  Grey | RAL 7042 |
| 03 |  White | RAL 9003 |
| 04 |  Yellow | RAL 1023 |
| 05 |  Orange | RAL 2007 |
| 06 |  Red | RAL 3028 |
| 07 |  Purple | RAL 4006 |
| 08 |  Blue | RAL 5010 |
| 09 |  Green | RAL 6038 |

END OF TRAVEL FEATURE

JC1210-X-XX-X-XX-XXXX-XX

| Code | Function |
|------|---|
| NXXX | No Lock Forward – Note the angle of operation is 30° |
| LXXX | Lock Forward |
| XNXX | No Overpress Forward |
| XOXX | Overpress Forward |
| XXNX | No Overpress Backward |
| XXOX | Overpress Backward |
| XXXN | No Lock Backward – Note the angle of operation is 30° |
| XXXL | Lock Backward |

INTERFACE OPTIONS

JC1210-X-XX-X-XX-XXXX-XX

| Code | Function |
|------|----------------------------------|
| C1 | Integrated Molex Connector |
| F1 | Flying Lead with Molex connector |
| P1 | Header Connector |



AVAILABLE CONFIGURATIONS

The following feature configurations are available as standard:

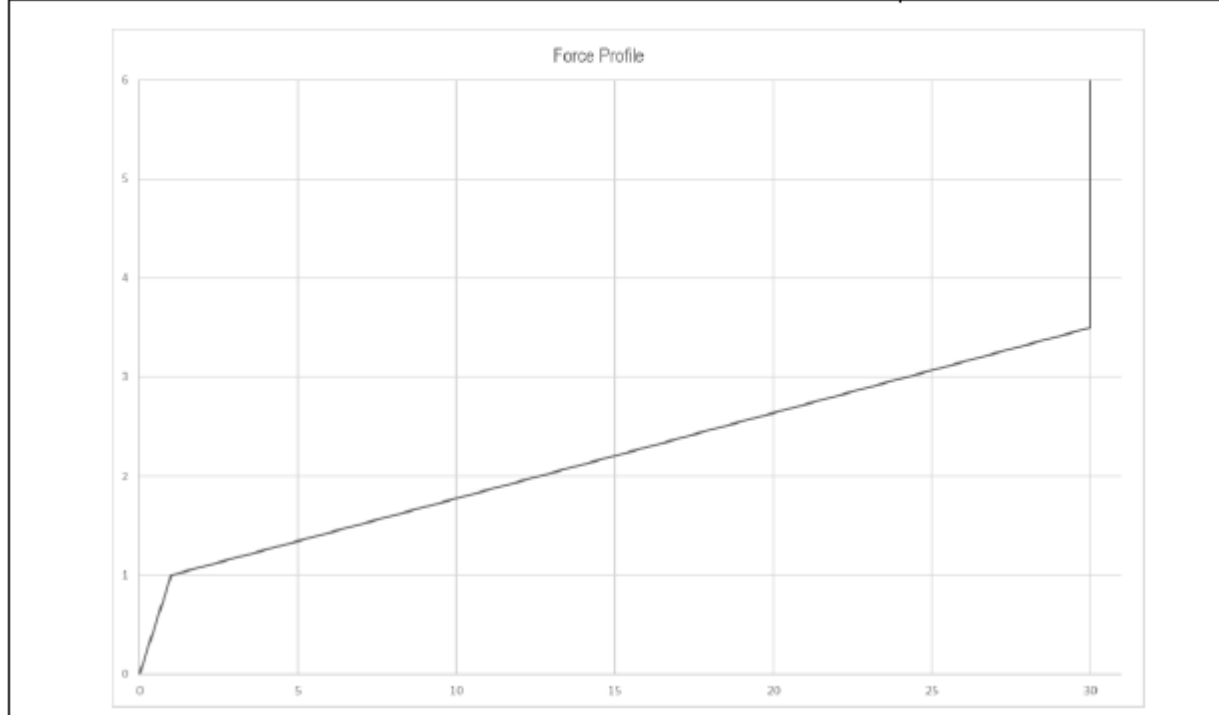
| Code | Function |
|-------------|---|
| NNNN | No lock or overpress forward; no lock or overpress backward |
| NOON | No lock forward; overpress forward and backward; no lock backward |
| LNNL | Lock forward, no overpress forward or backward; lock backward |
| LOOL | Lock and overpress forward; overpress and lock backward |
| LOON | Lock and overpress forward; overpress backward but no lock backward |

Other feature configurations will be available in the future and please refer to the Curtiss Wright sales team for the latest availability status:



OPERATING FORCE CHARACTERISTICS – NO FEATURE

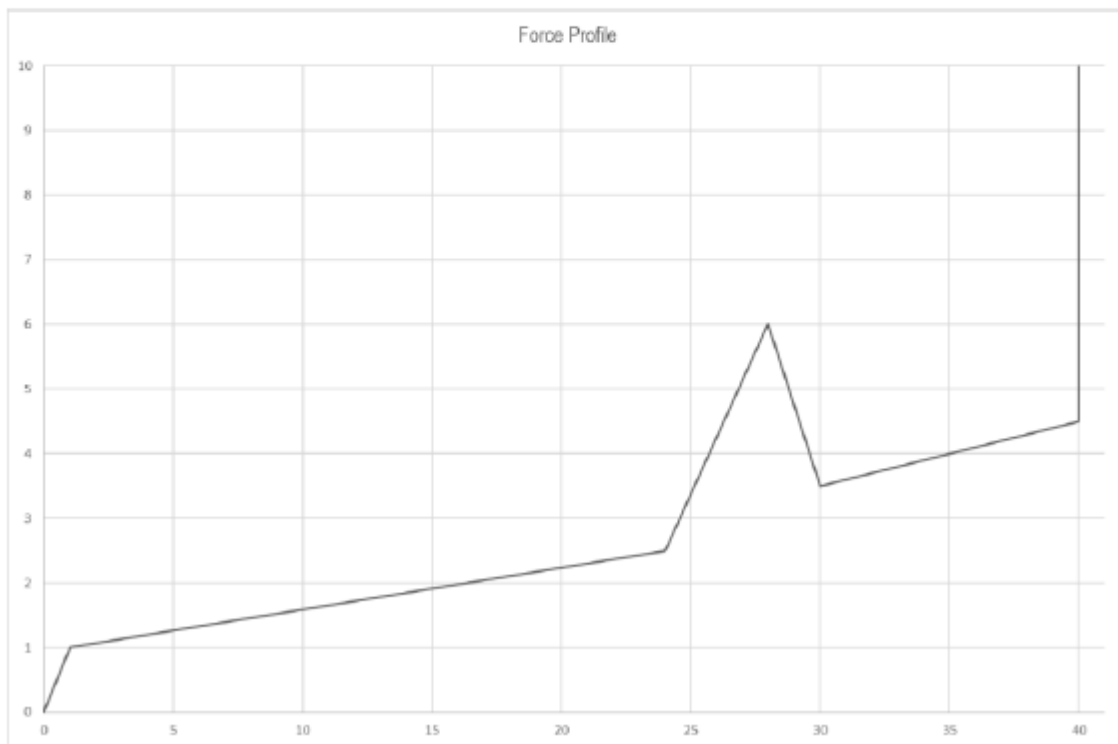
| | |
|---------------------------------------|-------------|
| Breakout Force | 1N |
| Maximum Operating Force | 3.5N |
| Mechanical Angle (Full travel) | ±30° |





OPERATING FORCE CHARACTERISTICS – OVERPRESS

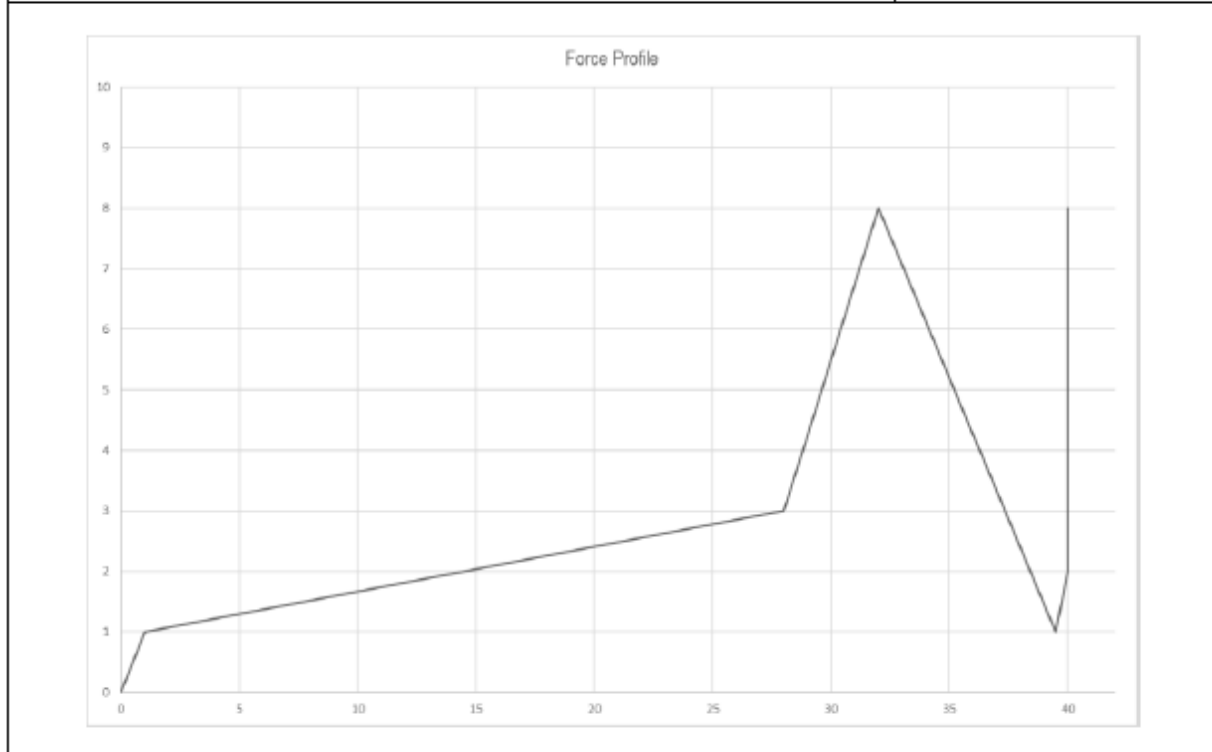
| | |
|---------------------------------------|-------------|
| Breakout Force | 1N |
| Maximum Operating Force | 4.5N |
| Overpress Force | 6N |
| Overpress Angle | 28° |
| Mechanical Angle (Full travel) | ±40° |





OPERATING FORCE CHARACTERISTICS – LOCK

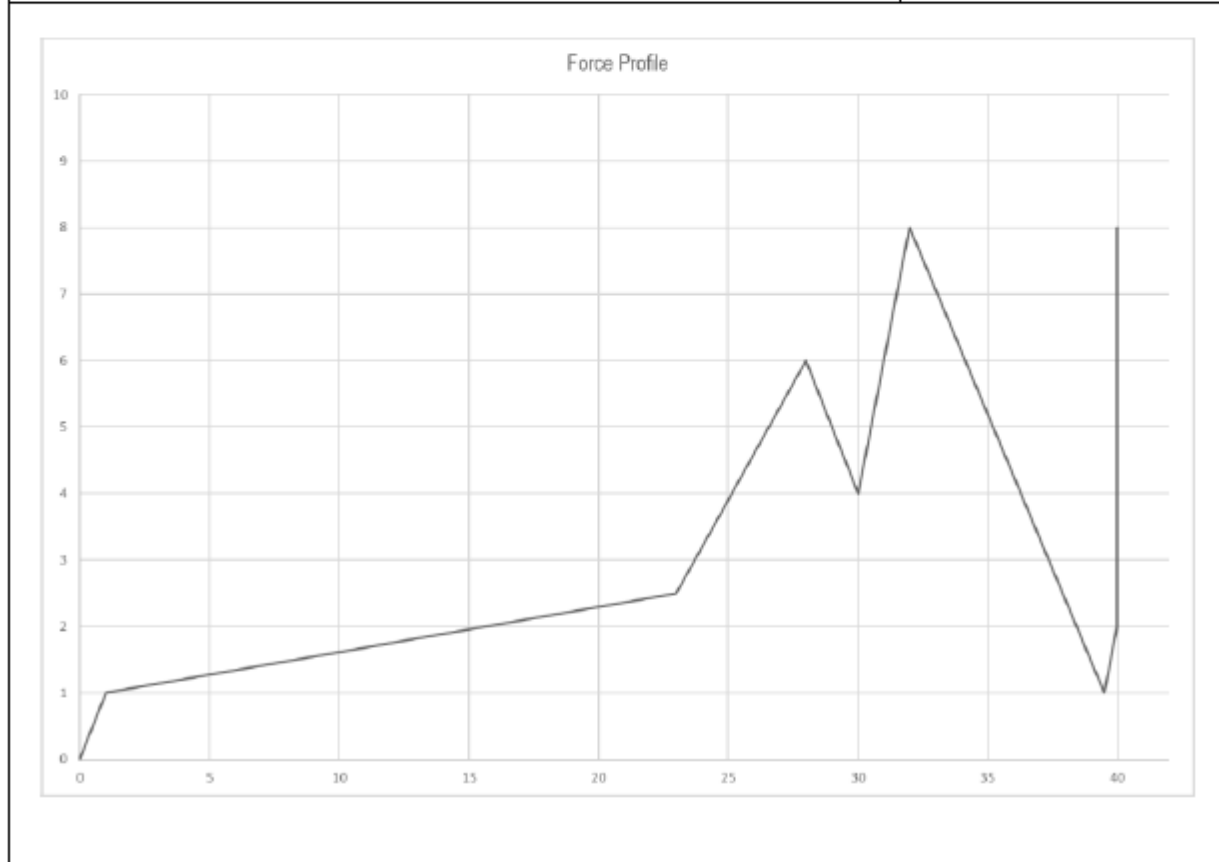
| | |
|---------------------------------------|-------------|
| Breakout Force | 1N |
| Maximum Operating Force | 4.5N |
| Lock Force | 8N |
| Lock Angle | 32° |
| Mechanical Angle (Full travel) | ±40° |





OPERATING FORCE CHARACTERISTICS – OVERPRESS AND LOCK

| | |
|---------------------------------------|-------------|
| Breakout Force | 1N |
| Maximum Operating Force | 4.5N |
| Overpress Force | 6N |
| Overpress Angle | 28° |
| Lock Force | 8N |
| Lock Angle | 32° |
| Mechanical Angle (Full travel) | ±40° |

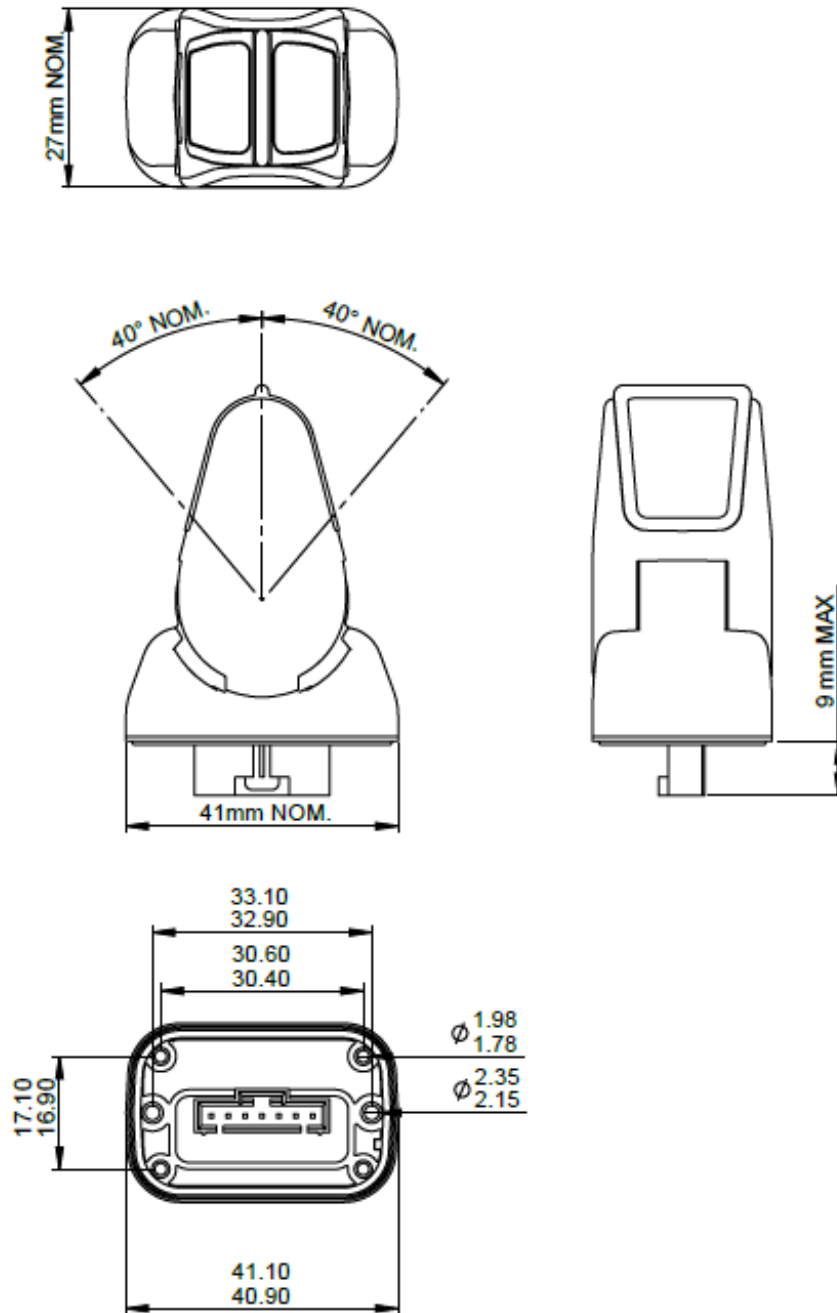




INSTALLATION

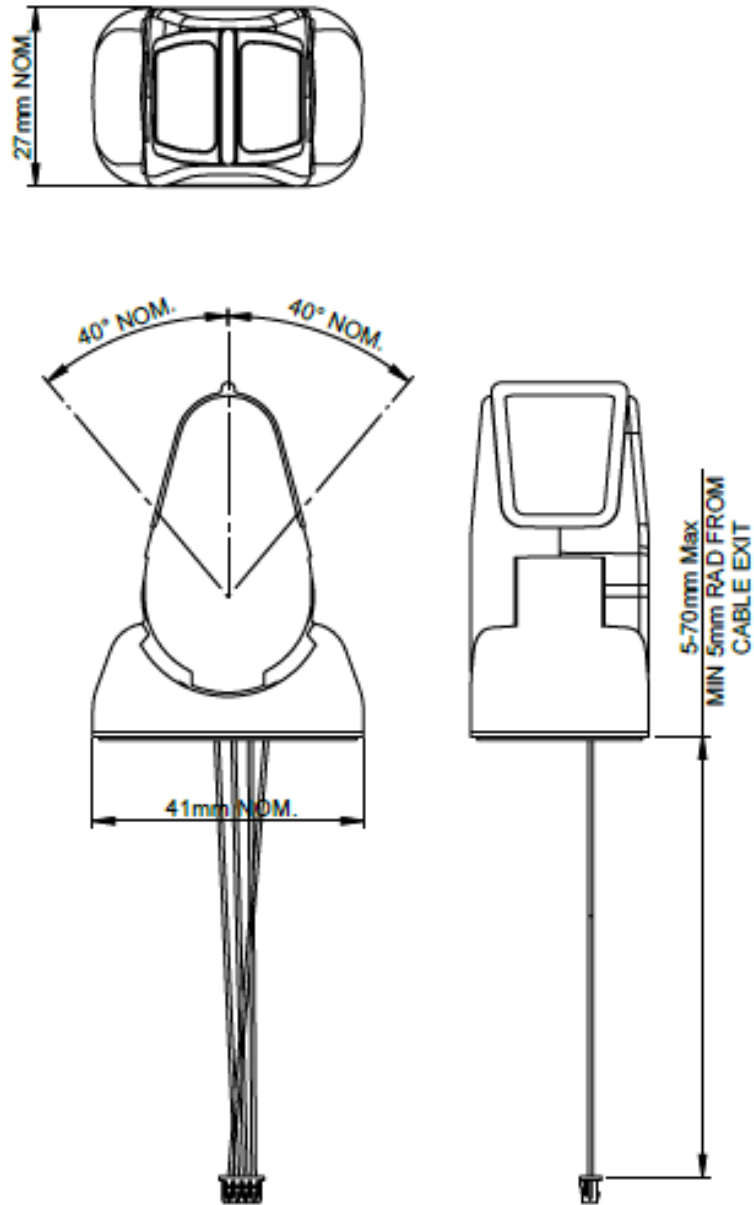
MECHANICAL

Dimensions – Molex Connector – C1



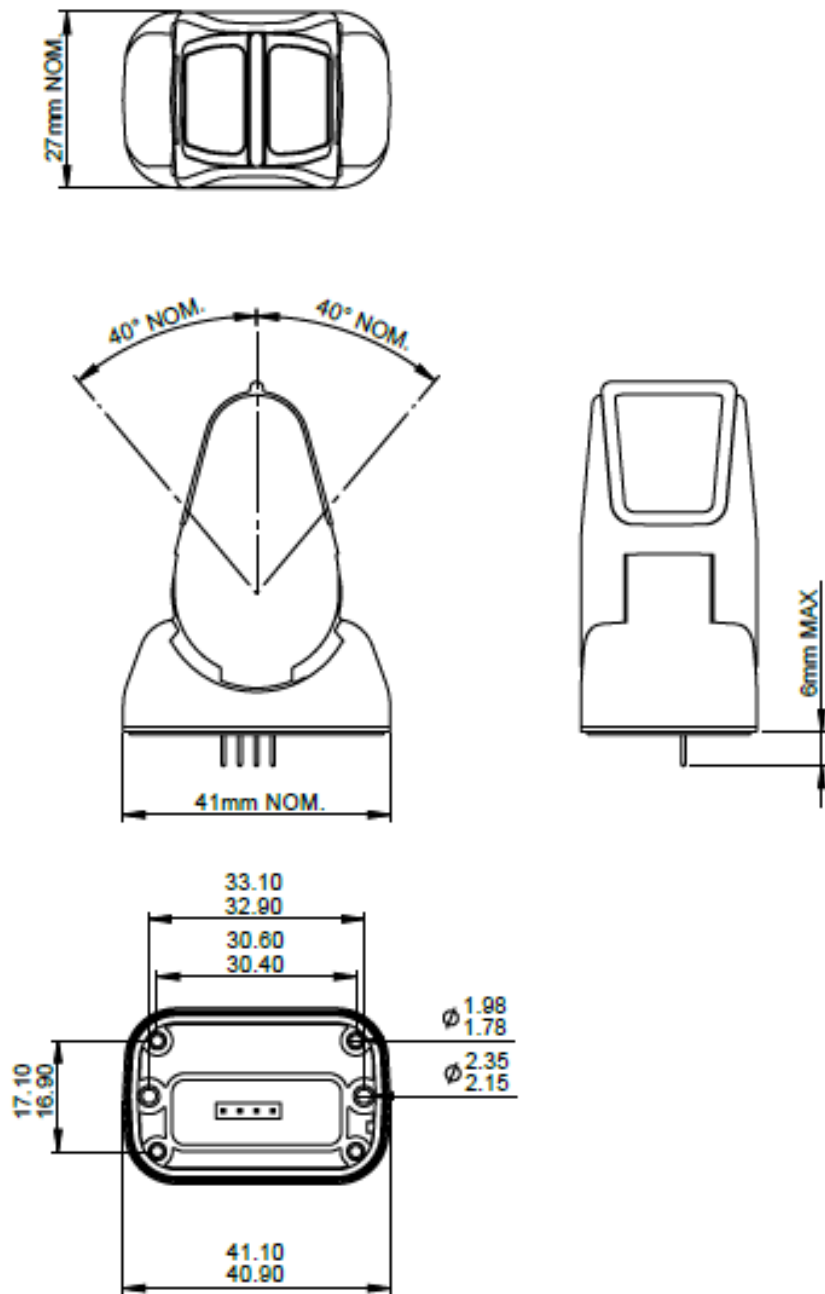


Dimensions - Flying lead with Molex connector – F1





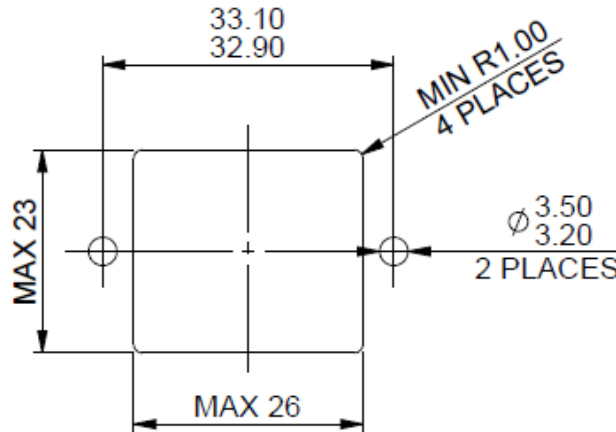
Dimensions - Header connector - P1



Panel cut-out/Mounting Details

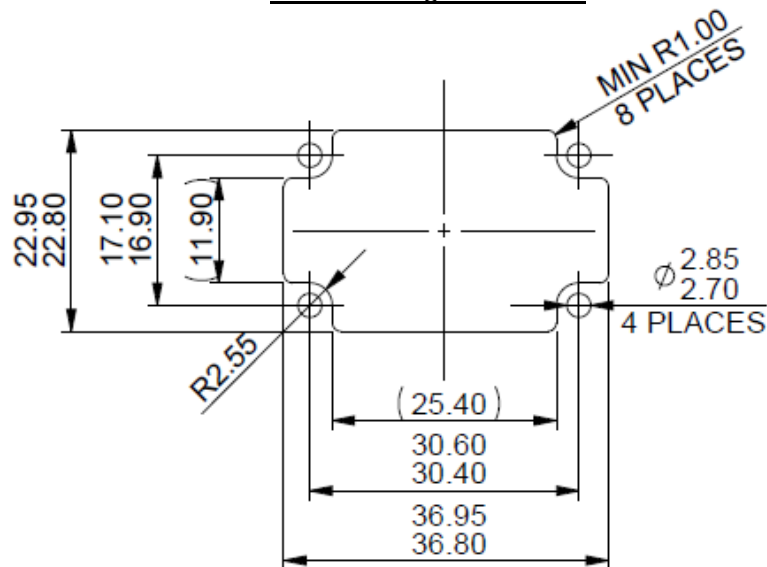
The following cut-out details show the largest hole that can be cut and still have an effective seal to the panel.

2 screw fitting - on centre line



Curtiss-Wright recommend the use of 2 x EJOT WN1451-K30-8 screws when utilising the 2 screw mounting points on the centre line. The screws should be tightened to 0.55Nm with a minimum panel thickness of 3 mm. For thicker panels the screw length should be increased to suit.

4 screw fitting – in corners

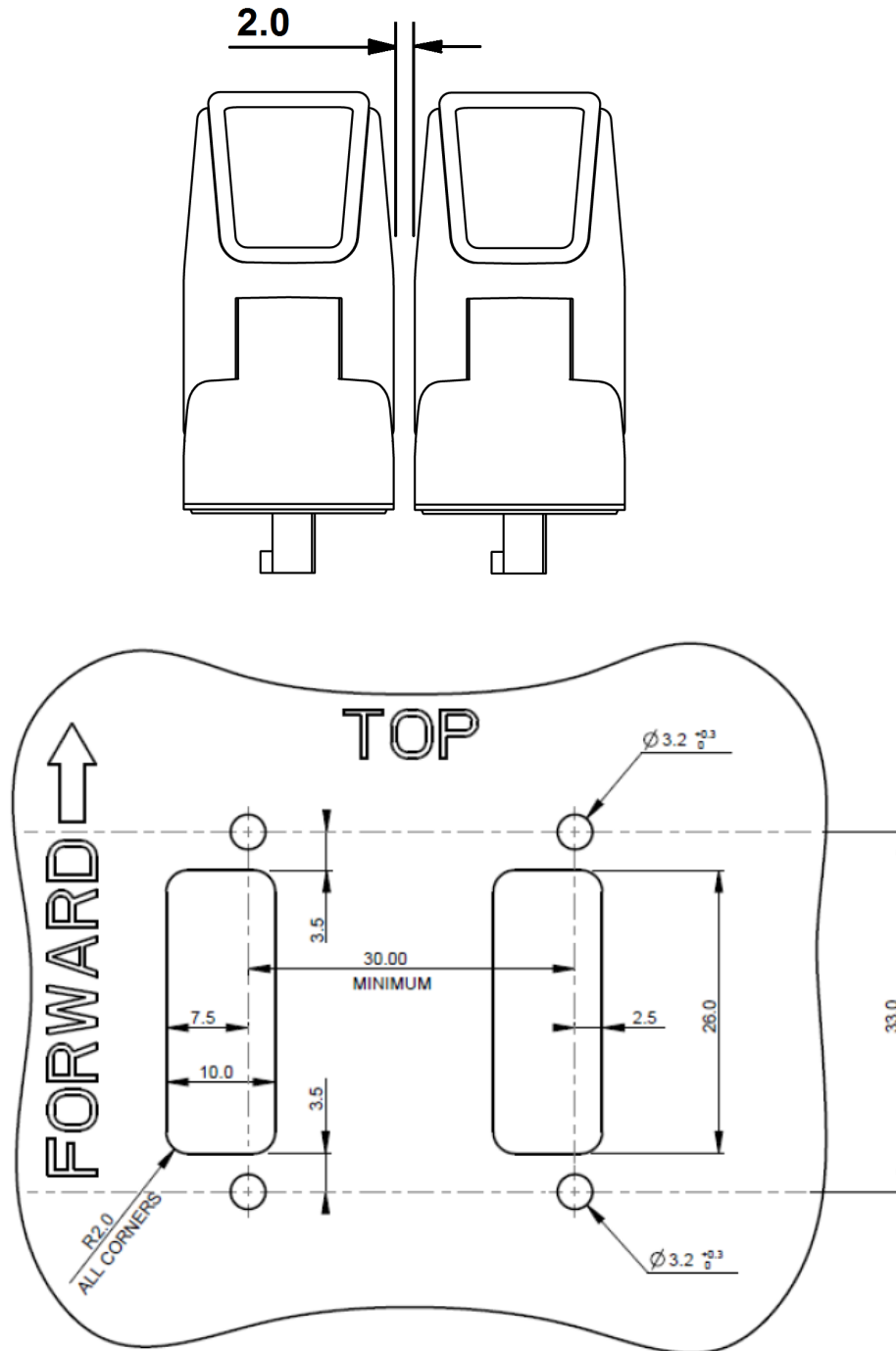


Curtiss-Wright recommend the use of 4 x EJOT WN1451-K25-12 screws when utilising the 4 corner screw mounting points. The screws should be tightened to 0.3Nm with a minimum panel thickness of 3 mm. For thicker panels the screw length should be increased to suit.



Panel Mounting Details - standard

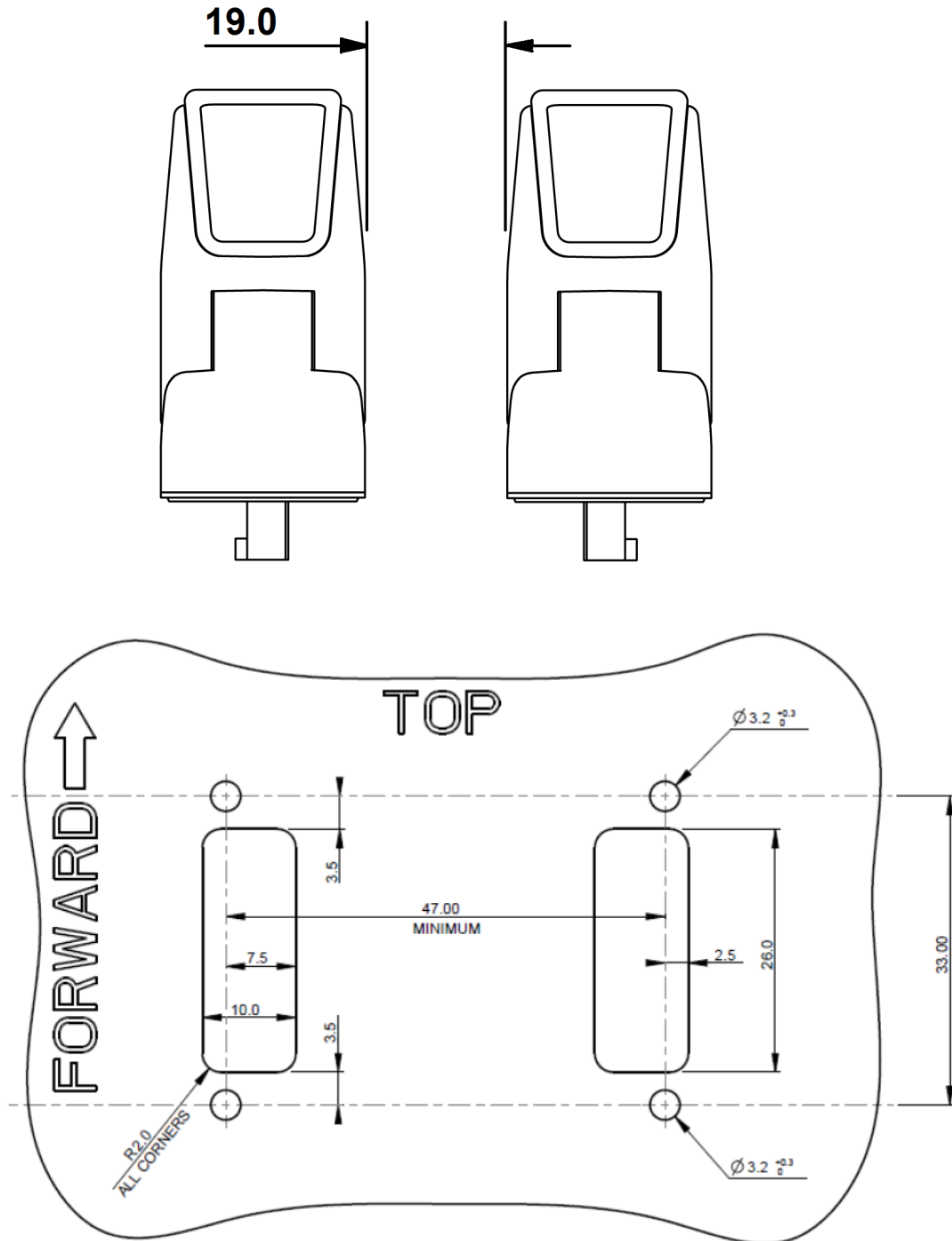
There is a minimal spacing between two JC1210 paddle joysticks to ensure there isn't any influence on one paddle's output from the other paddles magnet. In a standard mounting configuration the gap is:





Panel Mounting Details - Non-Standard

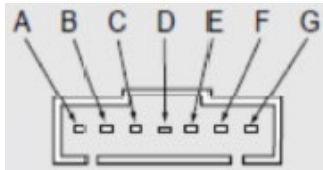
There is a minimal spacing between two JC1210 paddle joysticks to ensure there isn't any influence on one paddle's output from the other paddles magnet. In a non-standard mounting configuration where one of the paddles has been mounted in the opposite direction the gap is:



ELECTRICAL CONNECTIONS

C1 option

7-pin integral Molex connector



Molex 70553-0006 7-pin connector with gold-plated pins

Recommended mating connector either:
 Molex 70400 14-56-2074 (connector and pin kit)
 or Molex 70066 50-57-9407 connector body plus 7 pins to the Molex number
 70058 16-02-0082.

Note: the mating connector must be fitted with gold-plated pins to ensure stable output from the joystick

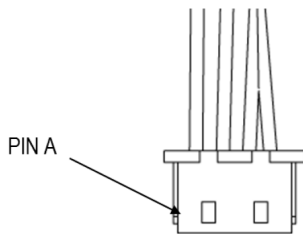
Standard Cables with a connector fitted are available from Curtiss Wright as follows:

CW part number SA301649 – cable length 500 mm
 CW part number SA308599 – cable length 1,000 mm

| Pin | Function |
|-----|---------------|
| A | Not connected |
| B | 5V supply |
| C | Output 1 |
| D | 0V supply |
| E | Output 2 |
| F | Not connected |
| G | Not connected |

F1 Option

4-pin in-line Molex connector



Molex 51021-0400 4-pin connector with gold-plated 50058-8000 pins

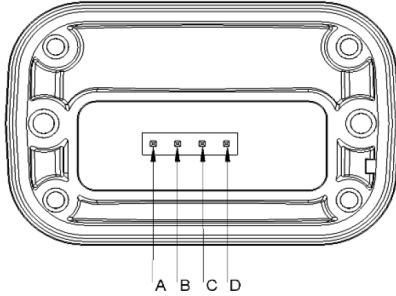
Note: the mating connector must be fitted with gold-plated pins to ensure stable output from the joystick

| Pin | Wire Color | Function |
|-----|------------|-----------|
| A | Black | 0V supply |
| B | Red | 5V supply |
| C | Yellow | Output 1 |
| D | Blue | Output 2 |



P1 option

4-pin in-line Molex connector



4-way gold plated header pins at 2.54 mm pitch

Note: the mating connector must be fitted with gold-plated pins to ensure stable output from the joystick

| Pin | Function |
|------------|-----------------|
| A | 5V supply |
| B | Output 1 |
| C | 0V supply |
| D | Output 2 |



SPECIFICATIONS

ELECTRICAL

| | |
|--|--|
| SUPPLY VOLTAGE | 5Vdc ±0.5Vdc |
| SUPPLY CURRENT | ≤ 25mA (12.5mA max. per channel) |
| OVER-VOLTAGE PROTECTION | Up to 10Vdc (-40°C to 85°C) |
| SHORT-CIRCUIT PROTECTION TO GND | Yes |
| SHORT-CIRCUIT PROTECTION TO SUPPLY | Yes |
| REVERSE POLARITY PROTECTION | 10Vdc continuous |
| POWER-ON SETTLEMENT | < 1s |
| RESOLUTION | 12-bit (0.025% of measurement range) |
| NON-LINEARITY | < ± 3% |
| TEMPERATURE COEFFICIENT | ≤ ± 30 ppm/°C |
| TRACKING ERROR | ± 2% |
| OUTPUT CLAMPING | Yes (1% above and below the Maximum and Minimum end voltage values) Note: Clamping limits still apply to output voltage after life |
| OUTPUT TYPE | Dual analogue ratiometric (crossed or parallel) |
| OUTPUT RANGE: AS SUPPLIED | 10-90% ±2% of supply voltage (0.5-4.5V nominal) – see after life note below 20-80% ±2% of supply voltage (1.0-4.0V nominal) – see after life note below |
| CENTER VOLTAGE: AS SUPPLIED | 48% to 52% of supply voltage – see after life note below |
| TOLERANCE OF OUTPUT VOLTAGE AT ENDS OF TRAVEL AND CENTER POSITION AFTER LIFE | After 5 million cycles: ± 3% |

MECHANICAL

| | |
|--|--|
| BREAKOUT FORCE AT JOYSTICK TIP | 1.0N |
| OPERATIVE FORCE AT END OF TRAVEL AT JOYSTICK TIP | 3.5N without overpress or latch at ±30° of full travel |
| OPERATING FORCE AT HANDLE TIP | 4.5N with overpress and/or latch at ±40° of full travel |
| OPERATING FORCE TO OPERATE OVERPRESS | 6 N |
| OPERATING FORCE TO ENGAGE LATCH | 8N |
| MAXIMUM ON AXIS FORCE (END OF TRAVEL) | 50N |
| MECHANICAL ANGLE | ±30° without overpress/latch; ±40° with overpress/latch |
| MECHANICAL FEATURES | Overpress or Latch or Overpress and Latch at both ends of travel |
| GATE | Single axis |
| MECHANICAL LIFE | Linear section >5 million cycles Overpress >200,000 operations/overpress Latch >150,000 operations/latch |
| WEIGHT | ≤ 40g |



ENVIRONMENTAL AND LEGISLATIVE

| | | |
|----------------------------|------------------------------------|---|
| OPERATING TEMPERATURE | -40°C to 85°C | Operational Temperature per IEC 60068-2-1: (-40°C {Cabin}; 96 hours; powered) Operational Temperature per IEC 60068-2-2: (+85°C {Cabin}; 96 hours; powered) Temperature cycle per IEC 60068-2-14: (10 cycles, -40°C to +85°C) Thermal shock to IEC 60068-2-14: (100 cycles, -40°C to +85°C) Temperature and humidity to IEC 60068-2-78: (85°C; 85% rH; 21 days) |
| STORAGE TEMPERATURE | -40°C to 85°C | IEC 60068-2-1: (-40°C; 3 hours; non-powered) IEC 60068-2-2: (+85°C; 3 hours; non-powered) |
| ENVIRONMENTAL PROTECTION | IEC 60529 | IP67 above panel, IP67 electronics and customer responsibility to seal the connector IP55 below panel, including connector |
| SALT MIST | IEC 60068-2-11 | 96 hours |
| ALTITUDE | IEC 60068-2-13 | Down to 18.6 kPa; 1 hour |
| CHEMICAL RESISTANCE | ISO 15003 | Section 5.10 |
| EMC IMMUNITY LEVEL | ISO 11452-2 | 150V/m, 20MHz-1GHz |
| EMC EMISSIONS LEVEL | ISO 14982 or CISPR 25 ed.3 class 3 | 30MHz to 1GHz |
| ESD IMMUNITY LEVEL | ISO 10605 | ±8KV contact (including connector pins); ±15kV air discharge |
| AC MAGNETIC FIELD IMMUNITY | MIL-STD-461F | Method RS101 |
| VIBRATION SINUSOIDAL | ISO 15003 | Level 2 in 3 axes |
| VIBRATION - RANDOM | ISO 15003 | random, Level 1 in 3 axes |
| FREE FALL DROP | IEC 60068-2-31 | 1.0m on all edges and faces |
| SHOCK | IEC 60068-2-27 | 40g, 6ms, Half Sine, 100 shocks in each of 3 directions |
| MTTFd | > 200 years | |

IMPORTANT INFORMATION

Whilst Curtiss-Wright Industrial Division - Penny & Giles has designed this joystick to meet a range of applications it is the responsibility of the customer to ensure it meets their specific requirement.

Penny & Giles Controls Ltd makes no warranty or representation in respect of product fitness or suitability for any particular design application, environment, or otherwise, except as may subsequently be agreed in contract for the sale and purchase of products. Customers should therefore satisfy themselves of the actual performance requirements and subsequently the product's suitability for any particular design application and the environment in which the product is to be used.

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