

- **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 and 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.



## CONTENTS

<b>Contents</b> .....	<b>2</b>
<b>Configuration &amp; Ordering Codes</b> .....	<b>3</b>
Output.....	3
Output Sense.....	4
Spring Return Position .....	5
Paddle Insert Color.....	5
End of travel feature .....	5
available configurations .....	5
OPERATING FORCE characteristics – No feature.....	6
OPERATING FORCE characteristics – Overpress .....	7
OPERATING FORCE characteristics – lock .....	8
OPERATING FORCE characteristics – Overpress and lock.....	9
<b>Installation</b> .....	<b>10</b>
Mechanical.....	10
Dimensions – Molex Connector.....	10
Dimensions - Flying lead with Molex connector.....	11
Dimensions - Header connector .....	12
Panel cut-out/Mounting Details.....	13
Panel Mounting Details - standard.....	14
Panel Mounting Details - Non-Standard.....	15
Electrical Connections .....	16
<b>Specifications</b> .....	<b>18</b>
Electrical.....	18
Mechanical.....	18
Environmental .....	19

© 2017 Curtiss-Wright. All rights reserved.

Curtiss-Wright accepts no responsibility for possible errors in catalogs, brochures and other printed material. Curtiss-Wright reserves the right to alter its products without prior notice. This also applies to products already ordered provided that such alterations can be made without affecting agreed specifications. All trademarks in this material are properties of their respective owners.



## CONFIGURATION & ORDERING CODES

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

Type	Output	Output Sense	Spring Return Position	Paddle Insert	Forward Latch Option	Forward Overpress Option	Backward Overpress Option	Backward Latch Option	Interface Option
JC1210-GEN	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-GEN-X-XX-X-XX-XXXX-XX

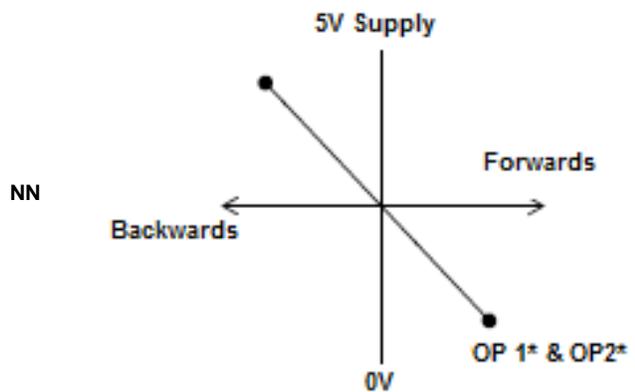
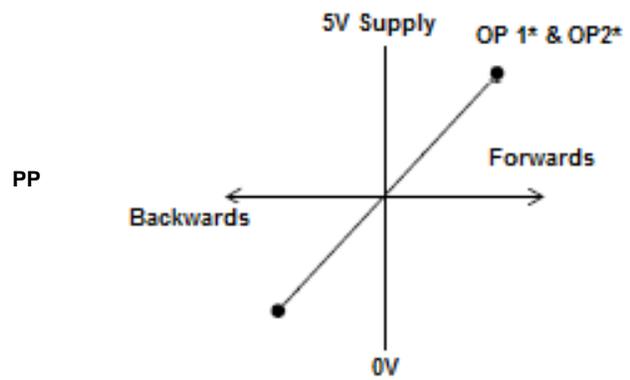
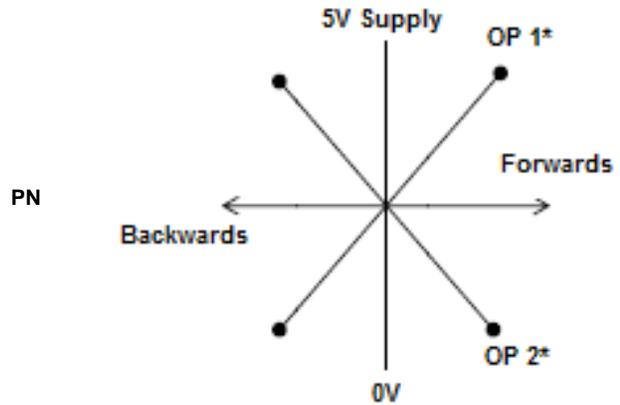
Code	Description
A	10-90% of 5V supply (0.5-4.5V nominal)
B	20-80% of 5V supply (0.1-4.0V nominal)



### OUTPUT SENSE

JC1210-GEN-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



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



**SPRING RETURN POSITION**

JC1210-GEN-X-XX-~~X~~-XX-XXXX-XX

Code	Description
C	Center

**PADDLE INSERT COLOR**

JC1210-GEN-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-GEN-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	Overpress Backward

**AVAILABLE CONFIGURATIONS**

The following feature configurations are available as standard:

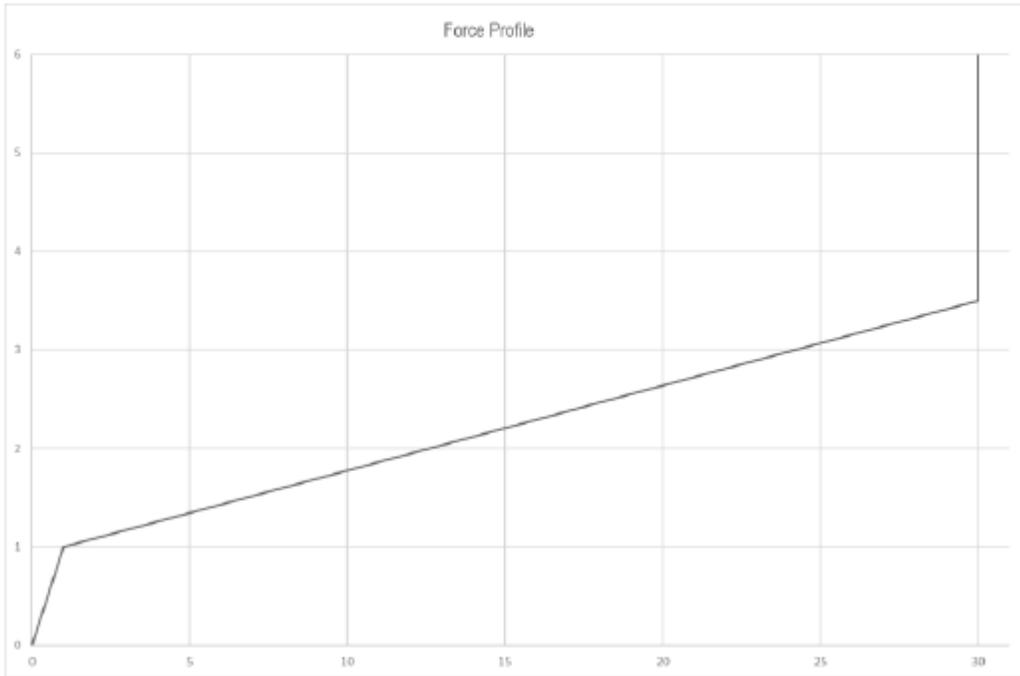
Code	Function
NNNN	No lock or overpress forward; no lock or overpress backward
NOON	No lock forward; overpress forward and backward; no lock backward
LNNL	Lock forward, no overpress forward or backward; lock backward
LOOL	Lock and overpress forward; lock and overpress backward

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**

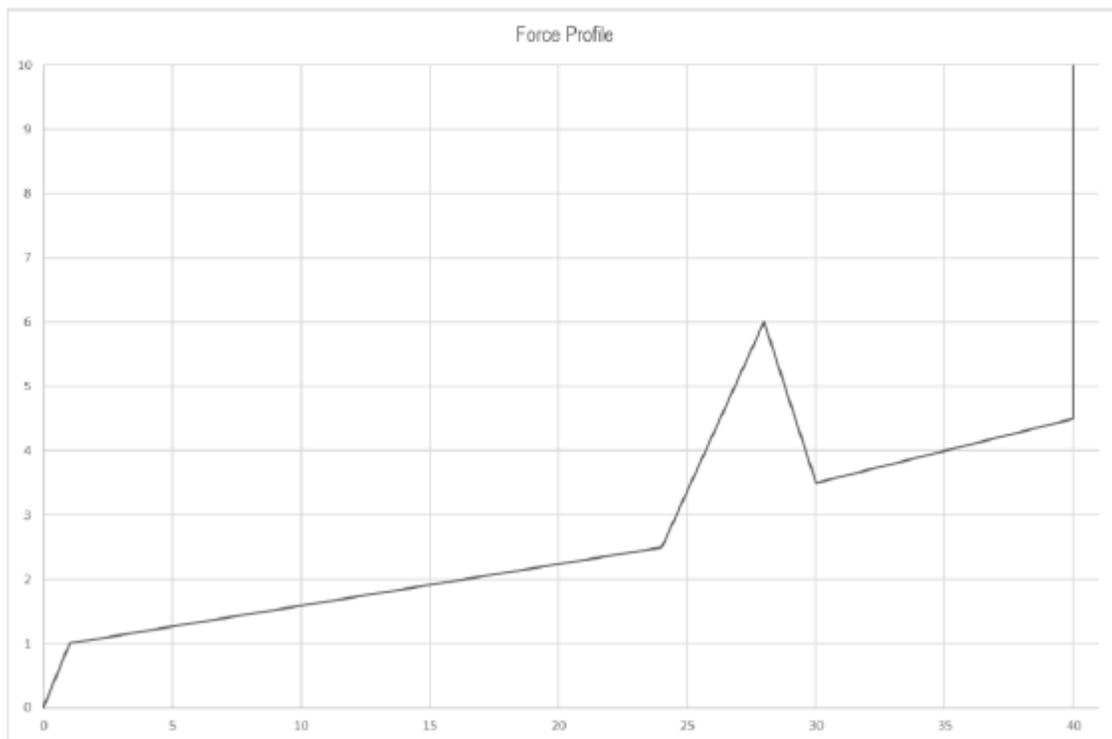
<b>Breakout Force</b>	<b>1N</b>
<b>Maximum Operating Force</b>	<b>3.5N</b>
<b>Mechanical Angle (Full travel)</b>	<b>±30°</b>





**OPERATING FORCE CHARACTERISTICS – OVERPRESS**

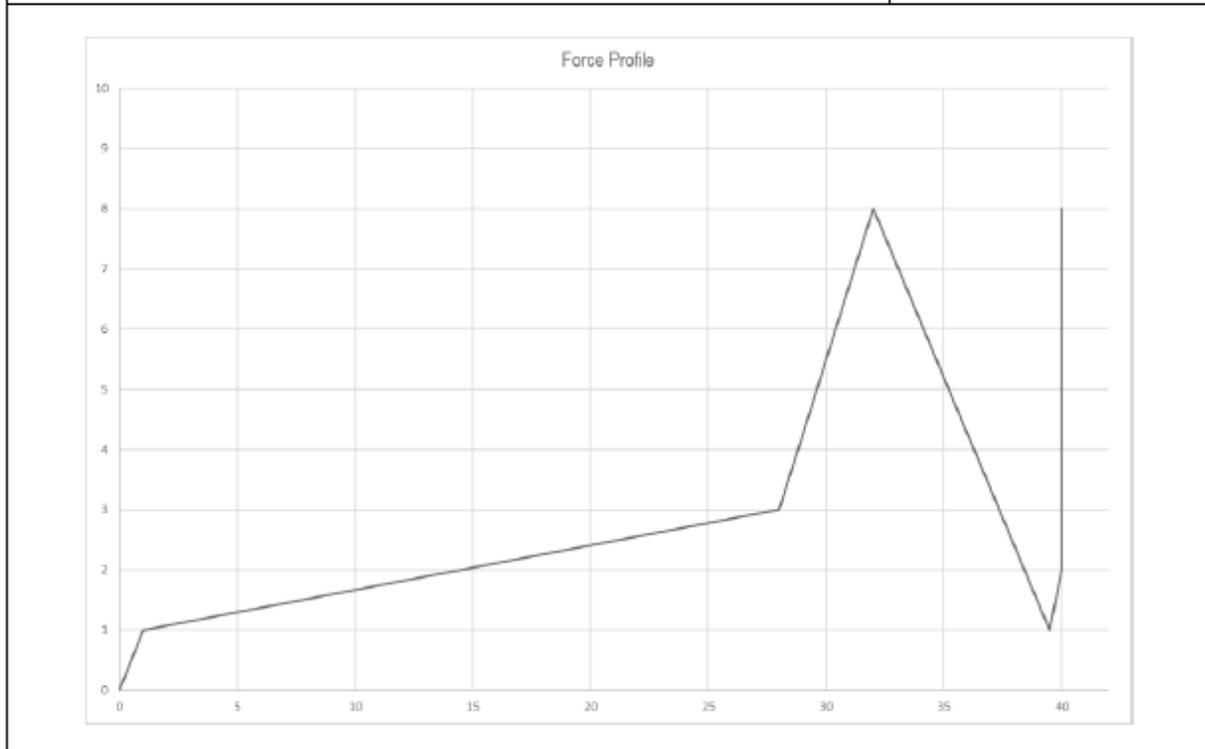
<b>Breakout Force</b>	<b>1N</b>
<b>Maximum Operating Force</b>	<b>4.5N</b>
<b>Overpress Force</b>	<b>6N</b>
<b>Overpress Angle</b>	<b>28°</b>
<b>Mechanical Angle (Full travel)</b>	<b>±40°</b>





**OPERATING FORCE CHARACTERISTICS – LOCK**

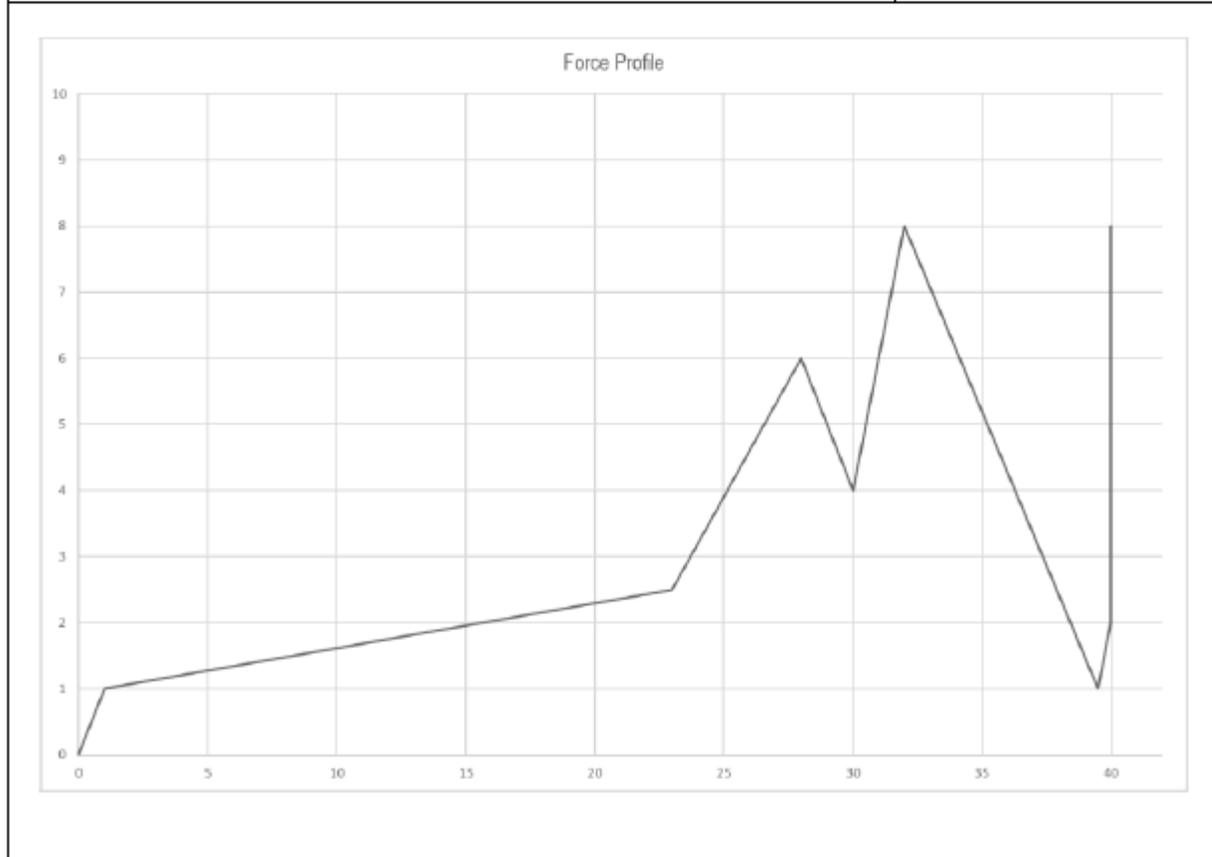
<b>Breakout Force</b>	<b>1N</b>
<b>Maximum Operating Force</b>	<b>4.5N</b>
<b>Lock Force</b>	<b>8N</b>
<b>Lock Angle</b>	<b>32°</b>
<b>Mechanical Angle (Full travel)</b>	<b>±40°</b>





**OPERATING FORCE CHARACTERISTICS – OVERPRESS AND LOCK**

<b>Breakout Force</b>	<b>1N</b>
<b>Maximum Operating Force</b>	<b>4.5N</b>
<b>Overpress Force</b>	<b>6N</b>
<b>Overpress Angle</b>	<b>28°</b>
<b>Lock Force</b>	<b>8N</b>
<b>Lock Angle</b>	<b>32°</b>
<b>Mechanical Angle (Full travel)</b>	<b>±40°</b>

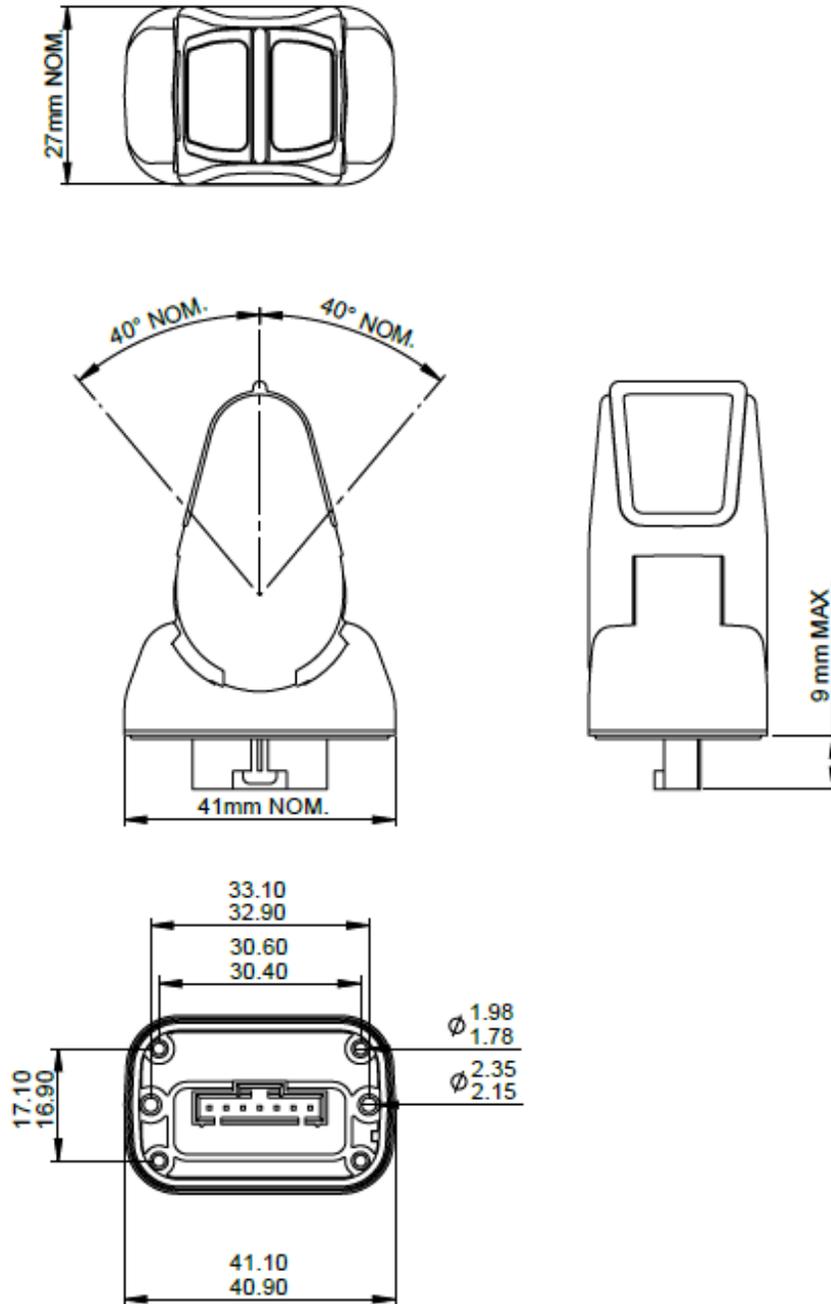




## INSTALLATION

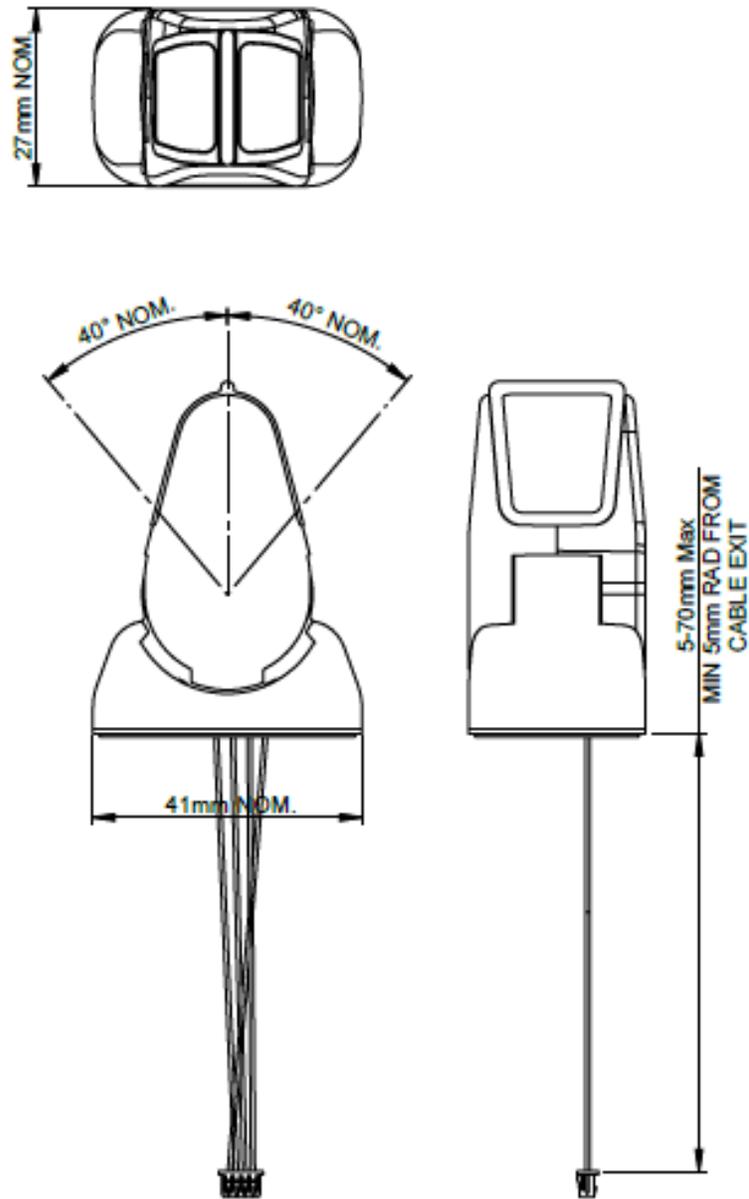
## MECHANICAL

### Dimensions – Molex Connector



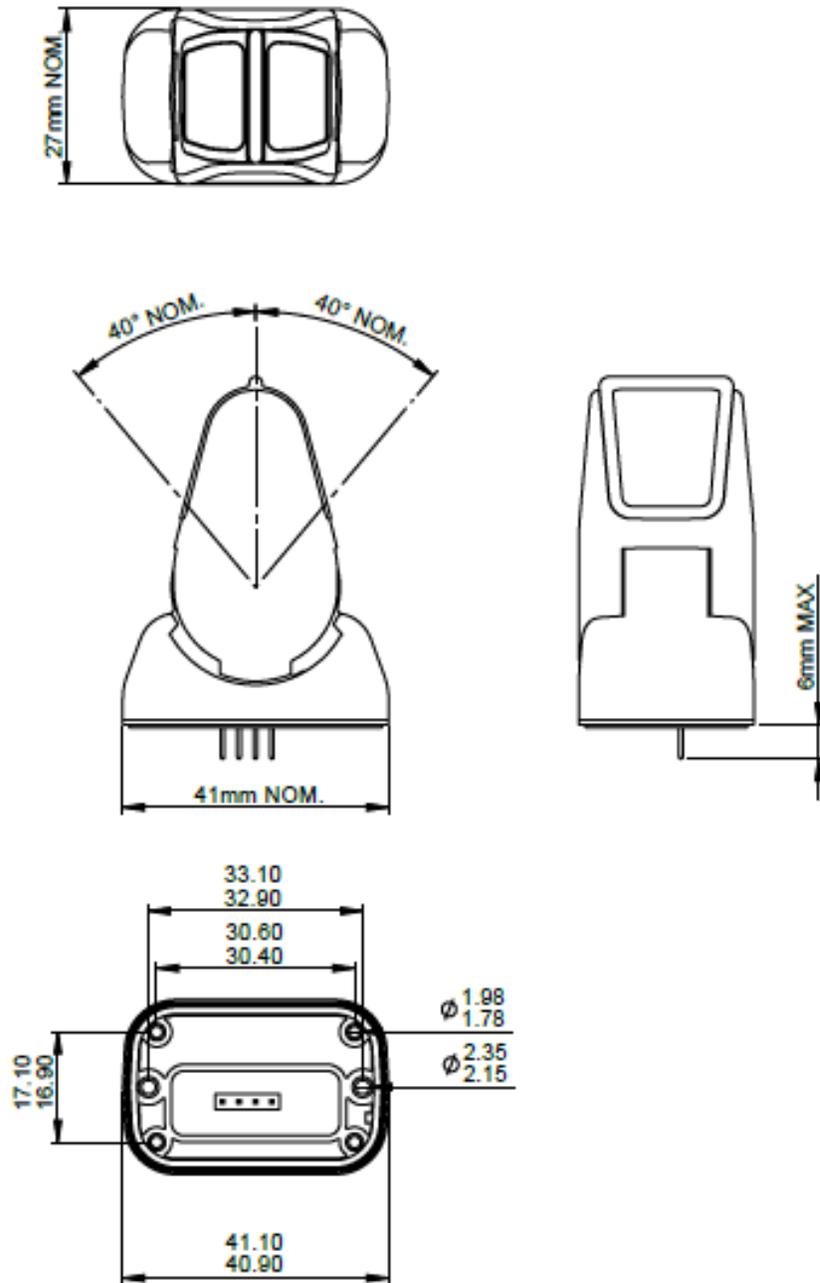


Dimensions - Flying lead with Molex connector





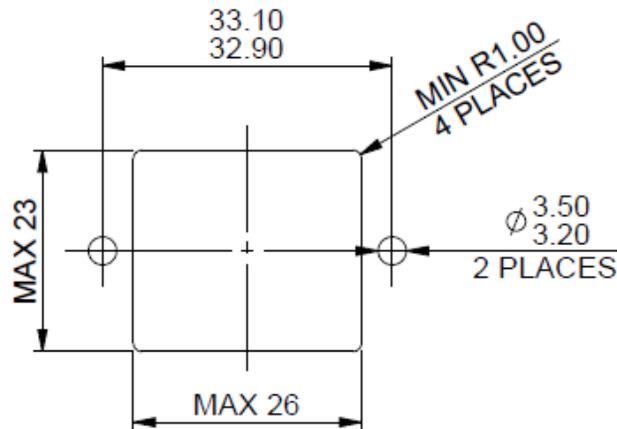
Dimensions - Header connector



**Panel cut-out/Mounting Details**

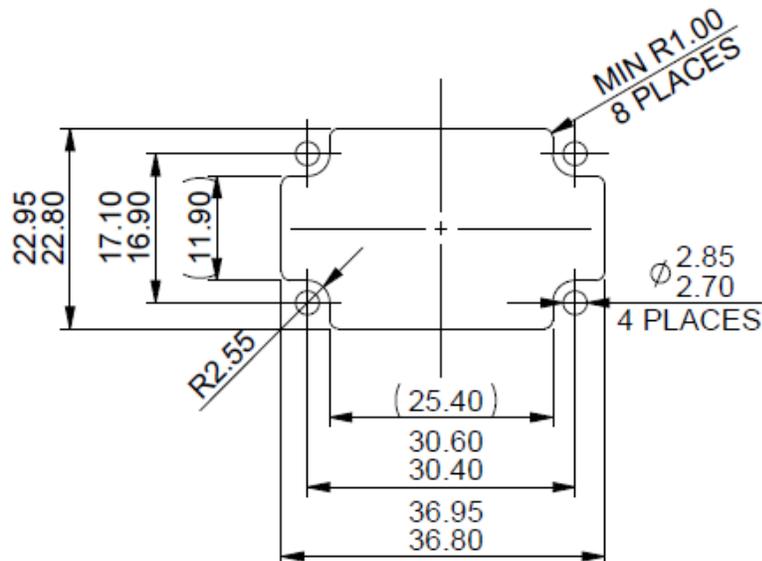
The following cut-out details show the largest hole that can be cut and still have an effective seal to the panel.

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

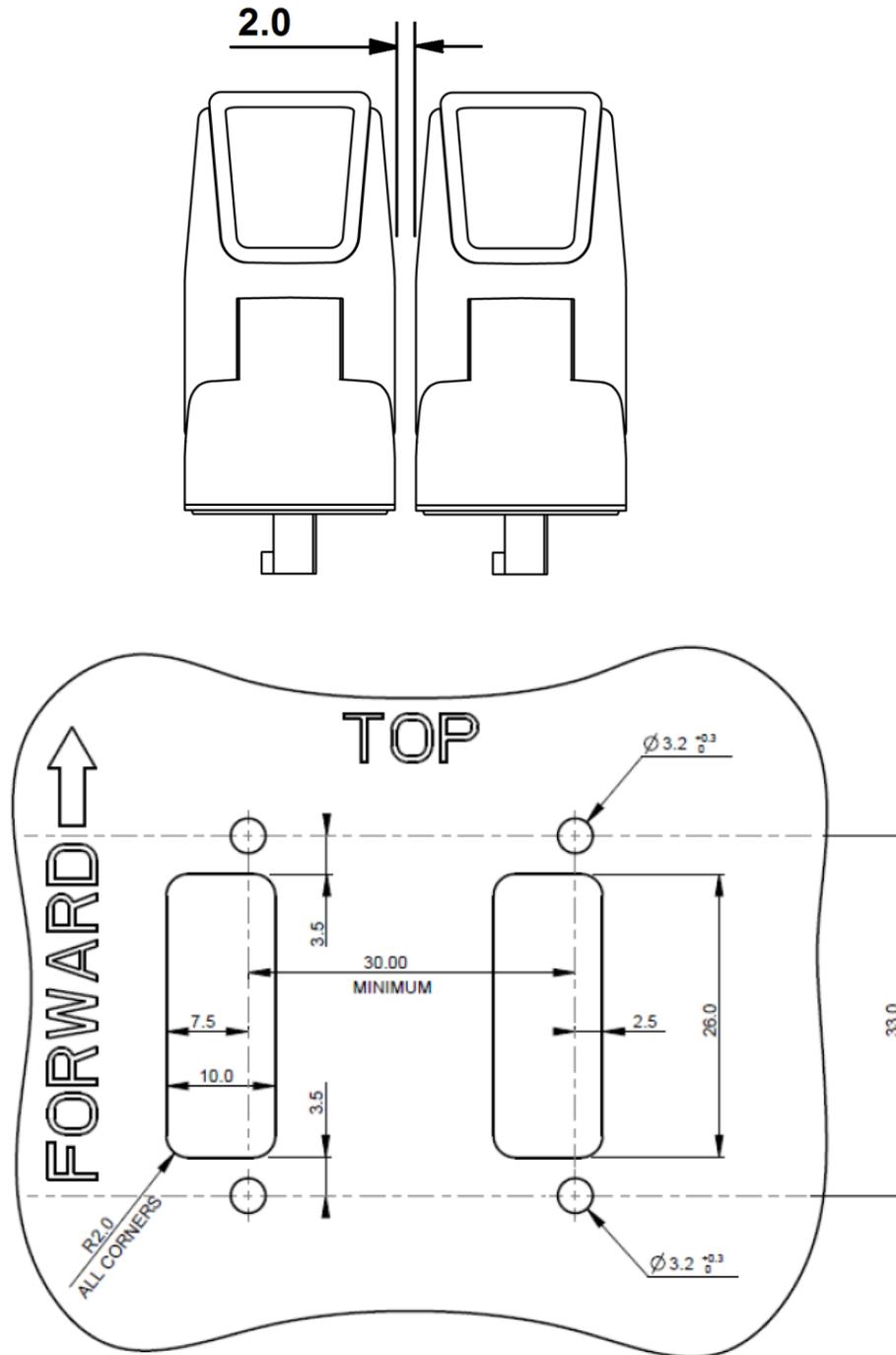


Curtiss Wright recommend the use of 4 x EJOT WN1451-K25-12 screws when utilising the 4 corner screw mounting points. The screws should be tightened to 0.3Nm with a minimum panel thickness of 3 mm. For thicker panels the screw length should be increased to suit.



### Panel Mounting Details - standard

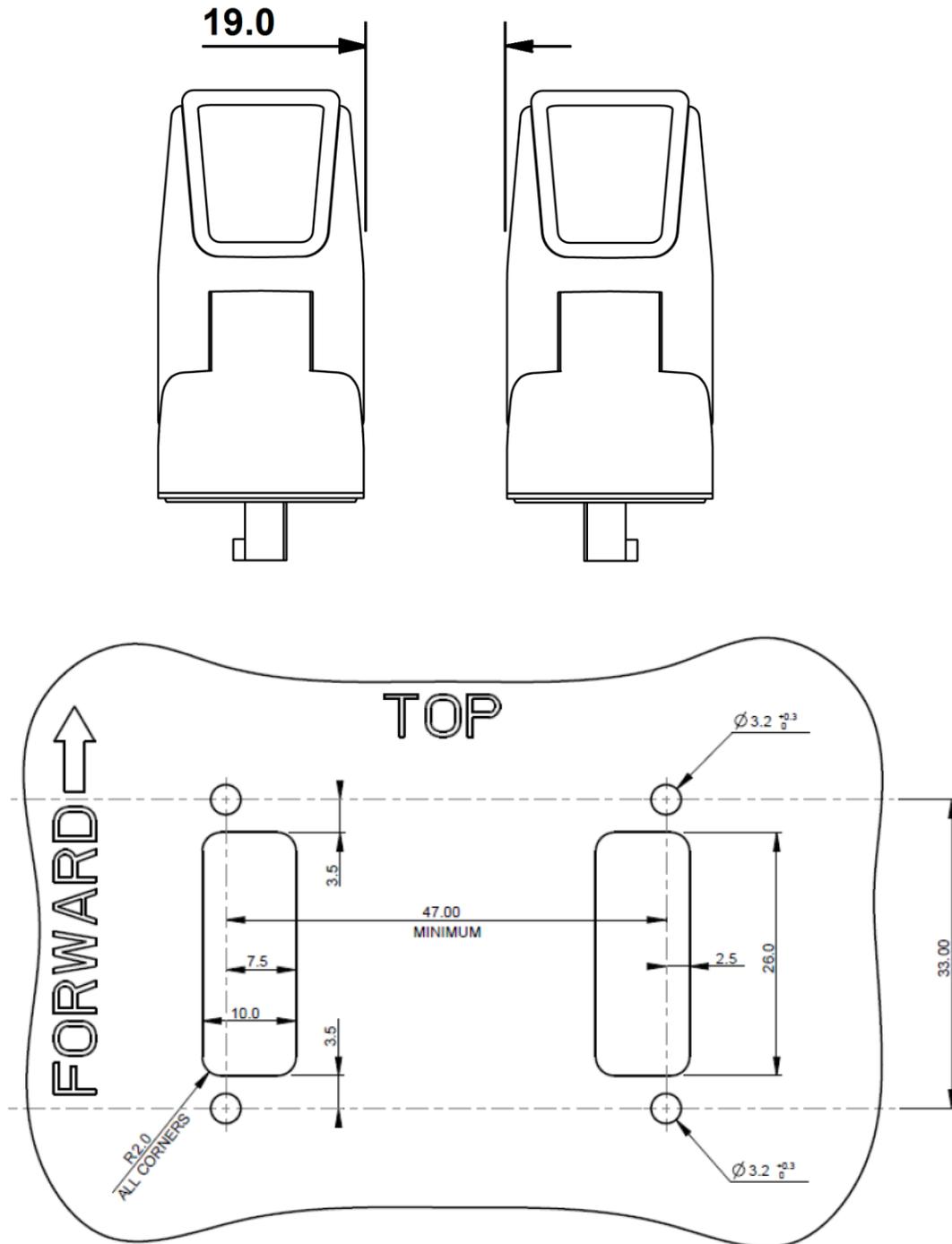
There is a minimal spacing between two JC1200 paddle joysticks to ensure there isn't any influence on one paddle's output from the other paddles magnet. In a standard mounting configuration the gap is:





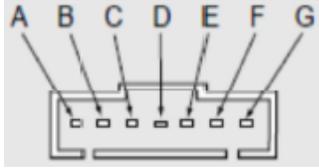
### Panel Mounting Details - Non-Standard

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**

**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.

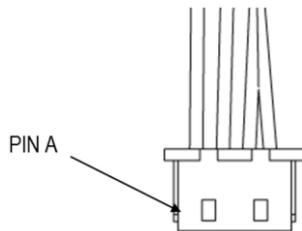
**Note:** the mating connector must be fitted with gold-plated pins to ensure stable output from the joystick

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

**4-pin in-line Molex connector**



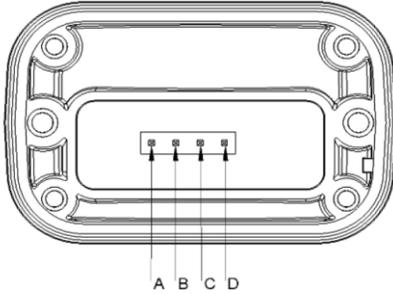
Molex 51021-0400 4-pin connector with gold-plated 50058-8000 pins

**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



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 $\pm$ 0.5Vdc
SUPPLY CURRENT	$\leq$ 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	< $\pm$ 3%
TEMPERATURE COEFFICIENT	$\leq$ $\pm$ 30 ppm/°C
TRACKING ERROR	$\pm$ 2%
OUTPUT CLAMPING	Yes (1% above and below the Maximum and Minimum end voltage values) <b>Note:</b> Clamping limits still apply to output voltage after life
OUTPUT TYPE	Dual analogue ratiometric (crossed or parallel)
OUTPUT RANGE: AS SUPPLIED	10-90% $\pm$ 2% of supply voltage (0.5-4.5V nominal) – see after life note below 20-80% $\pm$ 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: $\pm$ 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 $\pm$ 30° of full travel
OPERATING FORCE AT HANDLE TIP	4.5N with overpress and/or latch at $\pm$ 40° of full travel
OPERATING FORCE TO OPERATE OVERPRESS	6 N
OPERATING FORCE TO ENGAGE LATCH	8N
MECHANICAL ANGLE	$\pm$ 30° without overpress/latch; $\pm$ 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
MTTFd	> 200 years
WEIGHT	$\leq$ 40g

---



**ENVIRONMENTAL**

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

**IMPORTANT INFORMATION**

Whilst Curtiss-Wright Industrial Group - 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.

Continual research and development may require change to products and specification without prior notification. All trademarks acknowledged.

