

Penny + Giles announces the release of a new single axis joystick controller design that enables use in heavy duty applications without compromising on smooth proportional control. The **JC1500** joystick utilises contactless rotary position sensor technology combined with a rugged, low profile design.

The joystick provides reliable and accurate output signals - and includes a second output to enable error checking of the system integrity. The **JC1500** is intended for use in the off-highway specialist vehicles market - particularly where reliability and strength are paramount e.g. Aerial Work Platforms.

The **JC1500** joystick complements the existing range of JC150 potentiometer track joysticks and has the same panel mounting details – allowing replacement or upgrade with no panel modifications. The new joystick is designed to share the same range of handles and grips used in the JC150 and JC6000 models.



Key Features

- Contactless – Hall effect technology
- Single axis control with spring to center or friction hold lever action
- Lock and detent features
- Choice of handles and grips
- 5Vdc or 9-30Vdc supply
- Dual channel output with optional ramp directions
- Analog (Vdc) or Digital (PWM) outputs
- Extremely low signal noise – less than 1mV_{rms}
- Operating temperature -40 to +85°C
- Environmental protection to IP69K above the panel
- 53mm under-panel depth
- Electrically interchangeable with potentiometers

JC1500 SINGLE AXIS CONTACTLESS JOYSTICK

www.pennyandgiles.com

Penny & Giles Controls Ltd
15 Airfield Road
Christchurch
Dorset BH23 3TG
United Kingdom
+44 (0) 1202 409409
+44 (0) 1202 409475 Fax
sales@pennyandgiles.com

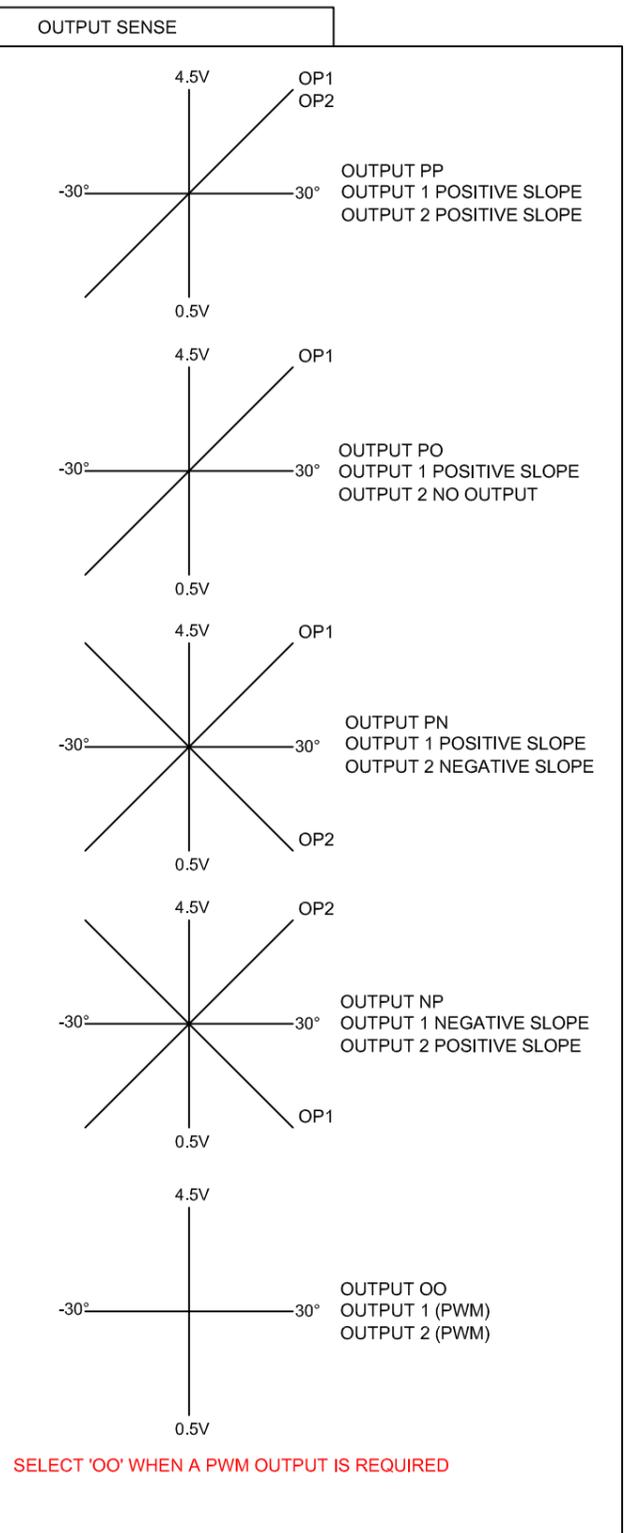
Penny & Giles Controls Inc
5875 Obispo Avenue
Long Beach
CA 90805
USA
+1 562 531 6500
+1 562 531 4020 Fax
us.sales@pennyandgiles.com

www.penny-giles.de

Penny & Giles GmbH
Straussenlettenstr. 7b
85053
Ingolstadt
Germany
+49 (0) 841 61000
+49 (0) 841 61300 Fax
info@penny-giles.de

1		2					3					4			5				6								
RANGE		AXIS	OUTPUT		OUTPUT SENSE			OPERATION		SPRING			FEATURES			DETENT		HANDLE		GAITER OPTION		INTERFACE					
JC1500		Y	*		**			*		*			**			***		***		***		***					
			A	P	PP	PO	PN	NP	OO	S	F	L	M	N	NL	CL	EL	D00	D01	NH	NHF	HKN	HB	R	S	STN	STA

ELECTRICAL DATA	
Insulation Resistance @50V DC; Between isolated pins	50 MΩ
Maximum Current consumption	12.5mA per Channel
Supply Voltage	5Vdc +/-0.5Vdc Regulated and 9V to 30Vdc Unregulated
Supply Current	≤25mA (12.5mA per Channel)
Supply reverse polarity protection	Yes
Short circuit protection output to GND	Yes
Short circuit protection output to supply	In 5V regulated mode only
Over voltage protection	up to 40V (-40 to +60°C)
Power on settlement	<1s
Resolution	12 Bit (0.025% of measurement range)
Non-linearity	<+/-0.4%
Temperature coefficient	<+/-30ppm/°C in 5V regulated supply mode <+/-90ppm/°C in 9-30V supply mode
OUTPUT (A or P)	
Options	Analogue or Digital PWM
ANALOGUE OUTPUT OPTION (A)	
Voltage output range (9-30V Supply)	Absolute voltage from 0.5V to 4.5V over measurement range (+/-3%)
Voltage output range (5V Supply)	Ratiometric output voltage from 10% to 90% (+/-1%) 10% to 90% over measurement range
Monotonic range	0.25V (5%) and 4.75 (95%) nominal
Load Resistance	10 Kohms minimum (resistive to ground)
Output noise	≤1mVrms
Input/Output delay	2.5ms
DIGITAL PWM OUTPUT OPTION (P)	
PWM frequency	244Hz +/-20% over temperature range
PWM levels (9-30V supply)	0V and 5V nominal (+/-3%)
PWM levels (5V supply)	0v and Vsupply (+/-1%)
Duty cycle	10% to 90% over measurement range
Monotonic range	5% and 95% nominal
Load Resistance	10 Kohms minimum (resistive to ground)
Rise/Fall time	<20 μs typical



SELECT 'OO' WHEN A PWM OUTPUT IS REQUIRED

EC	FL	RL												
FC	RC													

A3		Penny + Giles		METRIC		ALL SCREW THREADS TO BS 3643 PT. 2 EXTERNAL CLASS: 6g INTERNAL CLASS: 6H TOLERANCES IN LINE WITH PENNY & GILES STANDARDS 56-301		RoHS COMPLIANCE		TITLE		SPECIFICATION NUMBER	
ACAD		© COPYRIGHT RESERVED.		NOT TO SCALE; DO NOT SCALE. IF IN DOUBT, ASK.		THIRD ANGLE PROJECTION TO BS 8888		YES		SINGLE AXIS JOYSTICK		JC1500-GEN-****	
SHT 1 OF		THIS DOCUMENT CONTAINS CONFIDENTIAL AND/OR PROPRIETARY INFORMATION AND MAY NOT BE REPRODUCED IN ANY FORM WHATSOEVER, NOR MAY ITS CONTENTS BE DIVULGED TO THIRD PARTIES WITHOUT THE WRITTEN PERMISSION OF THE OWNER. ALL RIGHTS RESERVED.		CHANGES TO THIS BORDER MUST BE ACTIONED ON SK309927		LINEAR (MACHINING) 0.0 mm +/- 0.5mm 0.0 mm +/- 0.2mm 0.0 mm +/- 0.1mm 0.000 mm +/- 0.01mm		ANGULAR +/-1° UNLESS OTHERWISE STATED		NO		NEW DRAWING	
3 SHTS								10/04/10		JD		CHANGES	
								DATE		DRAWN		ENG' APPROVAL	
								ISSUE		QUAL' APPROVAL			

1		2		3		4		5		6	
MECHANICAL DATA											
OPERATION (S or F)											
SPRING RETURN		S		FRICTION		F					
SPRING (L, M OR N)											
LIGHT	L	MEDIUM	M	NO SPRING	N						
Breakout force	8N	Breakout force	11N	Breakout force	1.5Nm						
Operating force	15N	Operating force	20N	Operating force	1.5Nm						

NO SPRING OPTION AVAILABLE ON FRICTION JOYSTICKS ONLY	
Maximum Overload on Axis	80Nm
Maximum Overload off Axis	80Nm
Maximum Downward Load	1000N
Mechanical Life (Centre & End Lock, Friction)	10 Million (500,000, TBD)

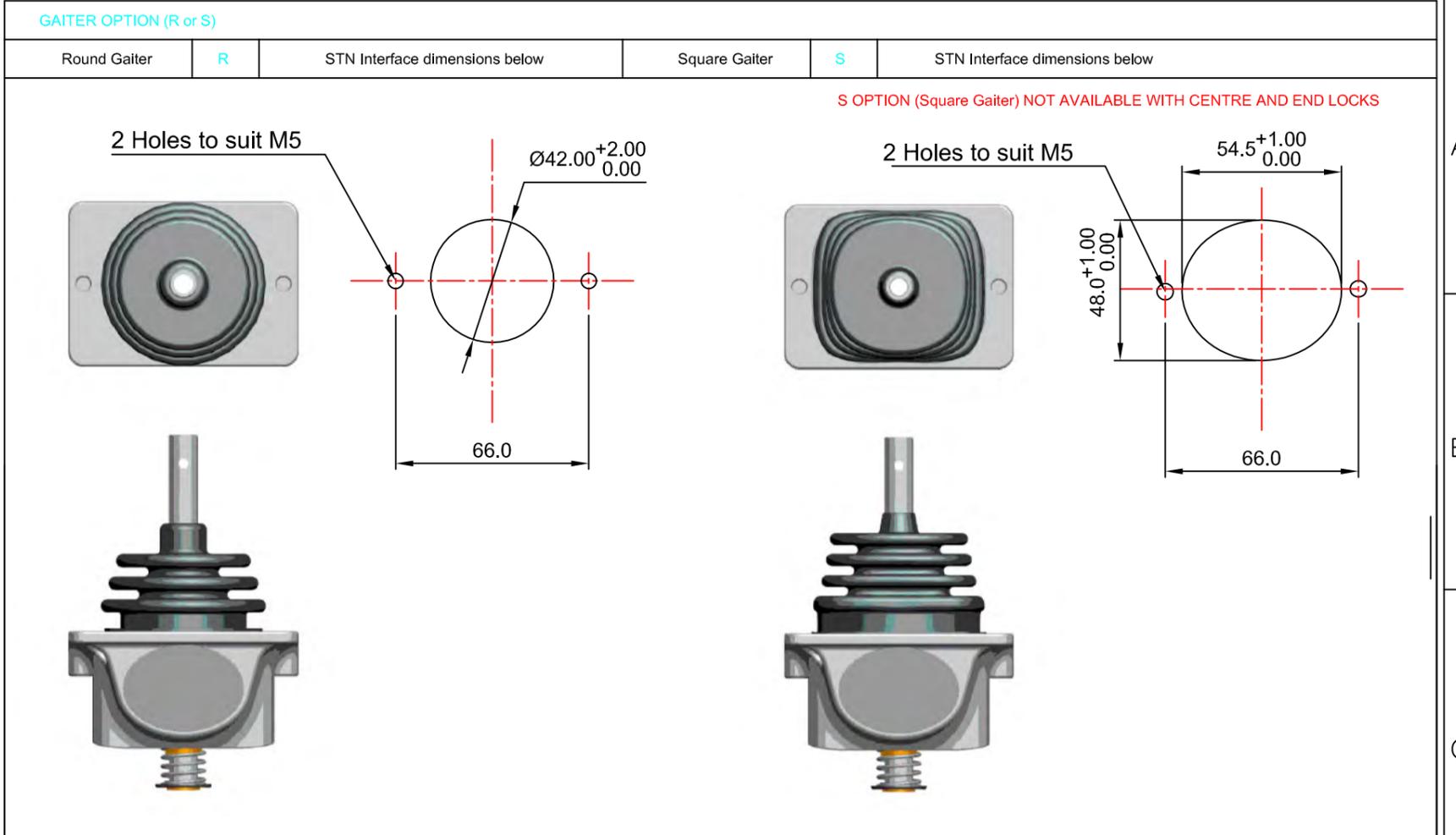
The loads required to deflect the joystick are measured 100mm from the joystick mounting surface perpendicular to the operating rod, throughout the operating angle. (With no handle fitted). The operating force will be affected by the handle length & type. One cycle is defined as operation from the centre to one extreme and back to centre. The mechanical life is based on a test frequency of 1 Hertz.

FEATURES (NL, CL, EL, EC, FL, RL, FC, RC)		
NO LOCK	NL	Spring Return
CENTRE LOCK	CL	Mechanical Lock at Centre
END LOCK	EL	Mechanical Lock at both Ends
END LOCK WITH CENTRE LOCK	EC	Mechanical Lock at centre and both Ends
FORWARD END LOCK	FL	Mechanical Lock in forward direction
REVERSE END LOCK	RL	Mechanical Lock in reverse direction
CENTRE AND FORWARD END LOCK	FC	Mechanical Lock at centre and forward direction
CENTRE AND REVERSE END LOCK	RC	Mechanical Lock at centre and reverse direction

FOR LONGER OPERATING ROD VERSIONS OF THE ABOVE ADD 1 TO THE CODE
EXAMPLE. CENTRE LOCK WITH LONGER OPERATING ROD = CL1
 End lock Joysticks are limited to +/-25° travel

DETENTS (D00 or D01)		
NO DETENT	D00	Used for 0° to 60° travel option (end to end)
CENTRE	D01	Mechanical Detent at Centre

HANDLE (NH, NHF, HKN, HB, AMF, MGMF, CL)	CODE	MOUNTING DETAIL
NO HANDLE FITTED	NH	MK1 or MK2 option
NO HANDLE FITTED (wires through operating lever)	NHF	MK1 or MK2 option
HKN HANDLE FITTED	HKN	MK1 or MK2 option
HB HANDLE RANGE FITTED	HB*	MK1 or MK2 option
Refer to HB handle specification for details		
AMF HANDLE RANGE FITTED	A****	MK1 or MK2 option
Refer to AMF handle specification for details		STA Interface required
MGMF HANDLE RANGE FITTED	MG**	MK1 or MK2 option
Refer to MGMF handle specification for details		
PULL COLLAR HANDLE FITTED	CL	MK1 option

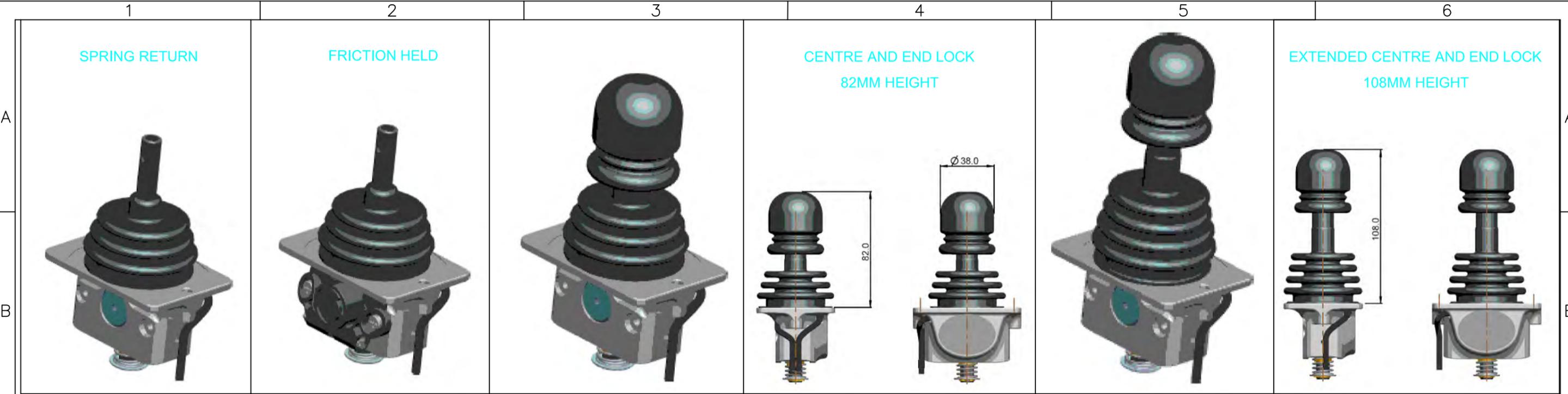


Mounting Screws	M5 x 12mm Tri-Tap Countersunk Head (Supplied)
Mounting Torque	3.5Nm Maximum
Panel Thickness	3.5mm to 6mm
Round Gaiter (R). The joystick is designed to be fitted from below the mounting panel, through a 42 - 44mm diameter hole.	
Square Gaiter (S). The joystick is designed to be fitted from below the mounting panel, through a 48 by 54.5mm elliptical hole.	
It is the responsibility of the customer to ensure that the joystick mounting screws are torqued correctly and that the mounting panel is of a sufficient design to ensure a seal is formed on joystick installation.	

LABELLING DETAIL		LABEL TO CONTAIN	
P&G CONTROLS Ltd. U.K			
Specification Number	JC1500-GEN-****		
	JC1500 JOYSTICK		
Serial Number	*****		
Reference	*****MMYYYY		
Reference Description			
Job Number	E.g 62854		
Month	MM		
Year	YYYY		

WIRING DETAILS (dual output, single supply)		
WIRE	COLOUR	FUNCTION
1	RED	5V Supply
2	BLACK	Ground
3	YELLOW	Joystick Output 1
4	WHITE	Joystick Output 2
Sensor wiring looms from Joystick will be 240mm in length		
Handle wiring looms from Joystick will be 240mm in length		

A3	Penny + Giles	METRIC	ALL SCREW THREADS TO BS 3643 PT. 2	RoHS COMPLIANCE	TITLE	SPECIFICATION NUMBER
ACAD	©COPYRIGHT RESERVED.	NOT TO SCALE: DO NOT SCALE. IF IN DOUBT, ASK.	EXTERNAL CLASS: 6g INTERNAL CLASS: 6H	YES	SINGLE AXIS JOYSTICK	JC1500-GEN-****
SHT 2 OF 3 SHTS	THIS DOCUMENT CONTAINS CONFIDENTIAL AND/OR PROPRIETARY INFORMATION AND MAY NOT BE REPRODUCED IN ANY FORM WHATSOEVER, NOR MAY ITS CONTENTS BE DIVULGED TO THIRD PARTIES WITHOUT THE WRITTEN PERMISSION OF THE OWNER. ALL RIGHTS RESERVED.	THIRD ANGLE PROJECTION TO BS 8888	PENNY & GILES STANDARDS 56-301	NO	NEW DRAWING	
	CHANGES TO THIS BORDER MUST BE ACTIONED ON SK309927		LINEAR (MACHINING) 0. mm +/- 0.5mm 0.0 mm +/- 0.2mm 0.00 mm +/- 0.1mm 0.000 mm +/- 0.01mm	C 10/04/10	CHANGES	
			ANGULAR +/-1° UNLESS OTHERWISE STATED	JD		
				ISSUE DATE DRAWN	ENG' APPROVAL QUAL' APPROVAL	



ENVIRONMENTAL DATA	
CRITERIA	TESTING STANDARD
Sealing (above mounting panel)	BS-EN 60529 rating IP69K
Sealing (below mounting panel)	BS-EN 60529 rating IP40
Sealing (electronics)	BS-EN 60529 rating IP69K
Operating Temperature range	BS EN 60068-2-14 (-40°C to +85°C)
Storage Temperature range	BS EN 60068-2-14 (-50°C to +85°C)
Temperature \ Humidity	BS EN 60068-2-38
Vibration (Random)	BS EN 60068-2-6
Vibration (Sinusoidal)	BS EN 60068-2-64
Vibration (Shock)	BS EN 60068-2-29
Vibration (Bump)	BS EN 60068-2-27
Salt Spray	BS EN 60068-2-11
Drop Test	BS EN 60068-2-31
Radiated Susceptibility	BS EN 61000-4-3

STA INTERFACE OPTION
 JC1500 Adaptor plate P48692, This is needed when an AMF handle is fitted.
 Plate thickness 2.90/3.35mm.
 Finished in black eggshell epoxy (all surfaces).
 Note: Joystick assembly is mounted from the top of the panel when adapter plate is fitted

A3	Penny + Giles ©COPYRIGHT RESERVED.	METRIC NOT TO SCALE: DO NOT SCALE. IF IN DOUBT, ASK.	ALL SCREW THREADS TO BS 3643 PT. 2 EXTERNAL CLASS: 6g INTERNAL CLASS: 6H TOLERANCES IN LINE WITH PENNY & GILES STANDARDS 56-301	RoHS COMPLIANCE YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		TITLE SINGLE AXIS JOYSTICK	SPECIFICATION NUMBER JC1500-GEN-****
ACAD	THIS DOCUMENT CONTAINS CONFIDENTIAL AND/OR PROPRIETARY INFORMATION AND MAY NOT BE REPRODUCED IN ANY FORM WHATSOEVER, NOR MAY ITS CONTENTS BE DIVULGED TO THIRD PARTIES WITHOUT THE WRITTEN PERMISSION OF THE OWNER. ALL RIGHTS RESERVED.	THIRD ANGLE PROJECTION TO BS 8888 CHANGES TO THIS BORDER MUST BE ACTIONED ON SK309927	LINEAR (MACHINING) 0. mm +/- 0.5mm 0.0 mm +/- 0.2mm 0.00 mm +/- 0.1mm 0.000 mm +/- 0.01mm	ANGULAR +/-1° UNLESS OTHERWISE STATED	C 10/04/10 JD	NEW DRAWING	
SHT 3 OF 3 SHTS					ISSUE DATE DRAWN	ENG' APPROVAL QUAL' APPROVAL	CHANGES