

Penny + Giles' new single axis joystick controller 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

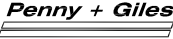
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	1							2							3							4							5							6						
A	AXIS		OUTPUT		OUTPUT SENSE			OPERATION			SPRING			FEATURES			DETENT		HANDLE			ROCKER OUTPUT		ROCKER PROFILE		GAITER			INTERFACE		A											
	Y		*		**			*			*			***			**		****			*		*		*			***													
		A	P	PP	PO	PN	NP	OO	S	F	L	M	N	NL	CL, CL1	EL, EL1	D0	D1	NH	NHF	HKN	HB	E	N	Q	R	S	V	R	S	L	STN	STA									
	ELECTRICAL DATA							OUTPUT SENSE							EC, EC1 FC, FC1							FL, FL1 RL, RL1																				
	Insulation Resistance @50V DC; All sensor wires to main body							50 MΩ																																		
	Maximum Current consumption							12.5mA per Channel																																		
	Supply Voltage							5Vdc +/-0.5Vdc Regulated and 9V to 30Vdc Unregulated																																		
B	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																																		
	Tracking Error							+/-2%																																		
	Output Clamping							Yes																																		
	OUTPUT (A or P)																																									
	Options							Analogue or Digital PWM																																		
	ANALOGUE OUTPUT OPTION (A)																																									
D	Voltage output range (9-30V Supply)							Absolute voltage from 0.5V to 4.5V over measurement range (±150mV, 3%)																																		
	Voltage output range (5V Supply)							Ratio-metric output voltage from 10% to 90% over measurement range (±50mV, 1%)																																		
	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 agd 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 us typical																																		

1		2				3			4			5			6		
A	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	0.75Nm	Breakout force	1.15Nm	Breakout force		1.50Nm										
	Operating force	1.25Nm	Operating force	1.85Nm	Operating force		1.50Nm										
	NO SPRING OPTION AVAILABLE ON FRICTION JOYSTICKS ONLY																
	Maximum Overload on Axis				110Nm												
	Maximum Overload off Axis				70Nm												
B	Maximum Downward Load				1000N												
	Maximum Torque				25Nm												
	Mechanical Life (Centre & End Lock, Friction)				10 Million (1 Million)												
	The loads required to deflect the joystick are measured 80mm from the joystick pivot point 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)																
C	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													
D	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													
	FRICTION HELD ONLY AVAILABLE WITH NO CENTRE DETENT																
	HANDLE (NH, NHF, HKN, HB, AMF, MGMF, CL)		CODE	HANDLE WIRES		GAITER OPTION											
	NO HANDLE FITTED		NH	No Wires		R or S option											
	NO HANDLE FITTED (wires through operating lever)		NHF	28 AWG		R or S option											
E	HKN HANDLE FITTED		HKN	No Wires		R or S option											
	HB HANDLE RANGE FITTED		HB*	26 AWG		R or S option											
	Refer to HB handle specification for details																
	AMF HANDLE RANGE FITTED		A****	28 AWG		R option											
	Refer to AMF handle specification for details																
	MGMF HANDLE RANGE FITTED		MG**	26 AWG		R or S option											
	Refer to MGMF handle specification for details																
	PULL COLLAR HANDLE FITTED		CL	No Wires		R option											
	CL HANDLE ONLY AVAILABLE WHEN LOCKS HAVE BEEN CHOSEN																
	F	A3				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		TITLE		SPECIFICATION NUMBER	
ACAD		©COPYRIGHT RESERVED.								YES		NO		SINGLE AXIS JOYSTICK			
SHT 2		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		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		3			
OF										06/10/11		GC		RD			
3 SHTS										ISSUE		DATE		DRAWN			
												ENG' APPROVAL		QUAL' APPROVAL			
														ECR 14734			
														CHANGES			

ROCKER OPTION (E, N, Q, R)

CODE

0% - 100% OUTPUT

E

4.0 - 6.0 kΩ Resistance

0% - 100% OUTPUT

N

1.4- 2.2 kΩ Resistance

25% - 75% OUTPUT

Q

2.2 - 3.6 kΩ Resistance

10% - 90% OUTPUT

R

1.6 - 2.4 kΩ Resistance

ROCKER PROFILE (S OR V)

CODE

Standard Rocker Profile

S

V - Rocker Profile

V

ROCKERS ARE ONLY AVAILABLE ON AMF HANDLE OPTIONS

REFER TO AMF HANDLE SPECIFICATION FOR DETAILS

GAITER OPTION (R or S or L)

Round Gaiter

R

STN Interface dimensions below

Square Gaiter

S

Lock Gaiter

L

STN Interface dimensions below

S OPTION (Square Gaiter) NOT AVAILABLE WITH CENTRE AND END LOCKS

2 Holes to suit M5

Ø42.00^{+2.00}_{0.00}

66.0

2 Holes to suit M5

54.5^{+1.00}_{0.00}

48.0^{+1.00}_{0.00}

66.0

Mounting Screws

M5 x 12mm Tri-Tap Countersunk Head (Supplied)

Mounting Torque

3.5Nm Maximum

Panel Thickness

3.0mm 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.

3

06/10/11

GC

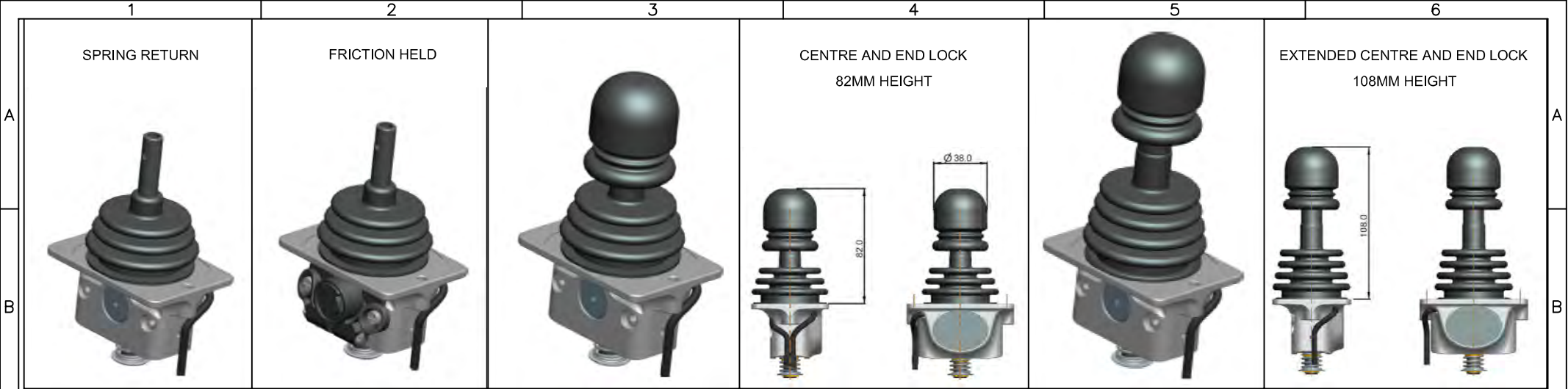
RD

DA

ECR 14734

CHANGES

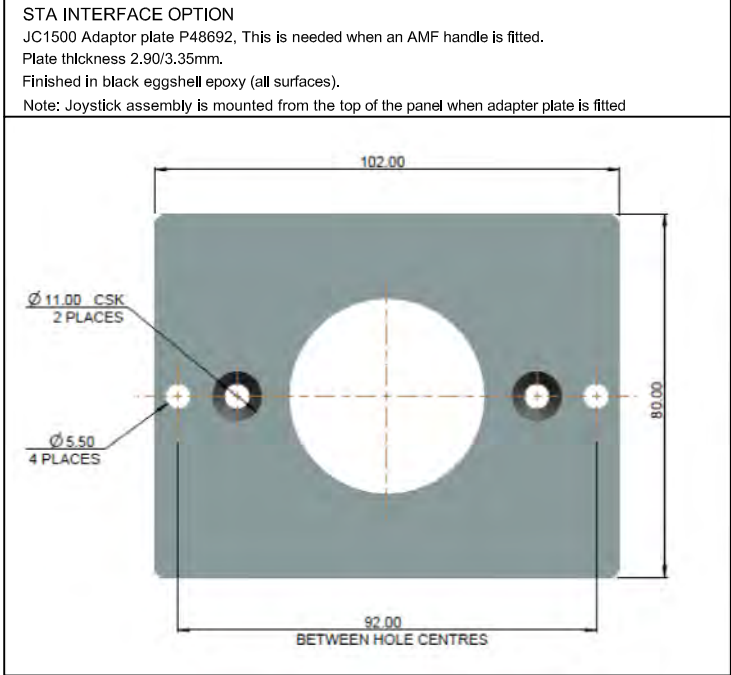
JC1500-GEN-****



ENVIRONMENTAL DATA	
CRITERIA	TESTING STANDARD
Sealing (above mounting panel)	DIN 40050-9 rating IP69K
Sealing (below mounting panel)	Not Sealed Mechanically Under Panel
Sealing (electronics)	DIN 40050-9 rating IP69K
Operating Temperature range	BS EN 60068-2-14 (-40°C to +85°C)
Storage Temperature range	BS EN 60068-2-1 (-50°C)
Storage Temperature range	BS EN 60068-2-2 (+85°C)
Temperature \ Humidity	BS EN 60068-2-38
Vibration (Random)	BS EN 60068-2-64
Vibration (Sinusoidal)	BS EN 60068-2-6
Vibration (Shock)	BS EN 60068-2-27
Vibration (Bump)	BS EN 60068-2-29
Salt Spray	BS EN 60068-2-11
Drop Test	BS EN 60068-2-31
ESD	BS EN 61000-4-2
RFI	BS EN 61000-4-3
Fast Transients	BS EN 61000-4-4
Conducted RFI	BS EN 61000-4-6
Power Frequency Magnetic Immunity	BS EN 61000-4-8
Radiated Emissions	BS EN 55022 Class A

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 220mm ±10mm Sensor loom is extruded 4 core spec, 55A 24 AWG wires		
Handle wiring looms from Joystick will be 220mm ±10mm See handle options on page 2 for specific wire diameters		

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	



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