Penny+Giles

A Curtiss-Wright Company

JC6000 MULTI AXIS JOYSTICK CONTROLLER

GS GLOBAL RESOURCES

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INNOVATION IN MOTION

The JC6000 rugged joystick controller is designed for demanding operator control applications in off-highway vehicles and other man-machine interfaces, where strength, reliability, and handle functionality are important. Available in one or two axis configurations, this joystick can be supplied with non-contact Hall effect sensors or long life potentiometer tracks. The JC6000's compact size, high lever strength and superb proportional control are ideal for applications which include operator controls on a wide range of off-highway vehicles, including cranes, loaders, excavators, access platforms, tractors and harvesters.

Handles and grips

The JC6000 can be specified with a choice of handles and grips to increase the functionality of the operator controls. With a choice of push buttons, trigger grips, proportional and switched rockers in a variety of different configurations, users can match their handle selection to suit their unique application.

Innovative design

With a choice of Hall effect sensors or potentiometer tracks to provide the analogue signals proportional to lever movement, the JC6000 can be configured to provide a range of output signals, directional and center switching functions, lever forces, and handle styles. CAN output can also be specified on the Hall sensor version for digital communication with vehicle systems.

Features

- **Hall effect or potentiometric sensing**
- **Single or dual axis control**
- **High strength lever with superb proportional control**
- **Sealed above the panel to IP66**
- **Choice of outputs and switches**
- **Choice of handles/grips with or without switches**
- **AMP 040 series multi-lock connectors**
- **Interchangeable with Penny + Giles' JC600 model**

Benefits

- **Long life and maintenance-free operation**
- **Suited to a range of operator control functions**
- **Rugged and smooth lever movement**
- **Operation in hostile environments**
- **Enables user configuration for system safety**
- **Additional operator control functions**
- **Simple installation**
- **Improved performance within the same footprint**

Quality Assurance
Penny + Giles are accredited to BS EN ISO9001:2000
Quality is at the heart of all our systems ensuring the reliability of our products from initial design to final

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JC6000 MULTI-AXIS JOYSTICK CONTROLLER

Total reliability

The JC6000 includes lever mechanics designed to give smooth proportional control, with Hall effect sensors that provide contactless, long life operation up to 15 million operations. Alternative potentiometer tracks featuring multi-fingered precious metal wipers give low electrical noise and a long life of greater than 5 million operations.

Safety

The JC6000 with the Hall sensors option has dual outputs fitted as standard, allowing the signals to be monitored and compared for failure detection in safety critical applications. Additional independent switch functions can be specified for directional and center position indication - vital for vehicle system start-up safety. These switch functions are also available with the potentiometer tracks, which can also be specified with padding resistors to limit the output signals to 10-90% or 25-75%, allowing comparison and error detection.

Custom design

Penny+Giles offer an extensive range of fingertip and hand operated joysticks in standard modular configurations, designed to meet the majority of individual customer needs, but we can customise our designs for OEMs who require something more specialised to their application. Please talk to our technical sales team about your requirements.

Cell manufactured

The modular design of the JC6000 joystick is designed to provide the user with a wide choice of options, but allows efficient build and despatch using cell manufacturing principles. Contact your nearest sales office for the latest information on availability.

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JC6000 JOYSTICK CONTROLLER

PERFORMANCE

MECHANICAL

Lever operating force		
breakout*	**N**	7 or 16
operating*	**N**	19 or 39 (full deflection)
maximum allowable**	**N**	390 (490 overload)
Lever mechanical angle		
single axis only	**°**	±20 forward/reverse
square gate	**°**	±20 in X and Y directions
Seat		preferred bias on axis
Expected life		15 million operations (5 million for potentiometer track version)
Weight	**g**	750 without handle fitted

* Measured at 55mm above upper flange face ** Measured 130mm above upper flange face

ENVIRONMENTAL

Operating temperature	**°C**	-25 to +80 (-25 to +80 with microswitches)
Storage temperature	**°C**	-25 to +85 (-25 to +85 with microswitches)
Environmental protection (above the flange)		IP66 IEC 60529 (fitted with HKN handle)
Vibration		Level±3g,10Hz to 200Hz (random) @ 3.6g(rms)
Shock		20g, 6mS, half sine profile
EMC immunity level		100V/m, 30MHz to 1GHz, 1KHz 80% sine wave modulation, EN50082-2 (1995)
EMC emissions level		Complies with EN50081-2 (1993), 150kHz to 30MHz, level B
ESD immunity level		IEC61000-4-2 level 4 8kV contact discharge, 15kV air discharge

ELECTRICAL - HALL EFFECT SENSOR

Resolution		Infinite
Supply voltage range	**Vdc**	5 ±0.5 regulated transient free
Over voltage (maximum)	**Vdc**	15 continuous
Reverse polarity (maximum)	**Vdc**	14.5
Output voltage span - options	**Vdc**	±25% span - nominal 1.1 to 3.9
		±30% span - nominal 1.0 to 4.0
		±40% span - nominal 0.5 to 4.5
Load impedance (minimum)	**kΩ**	5
Center voltage (no load)	**%**	48 - 52 of supply voltage
Current consumption	**mA**	13 per axis (6.5 per sensor)
Insulation resistance		Greater than 50MΩ at 50Vdc
Output sense		The dual outputs rise together in the same direction, increasing with lever forward (and right), decreasing with lever backward (and left)
Output matching		See maximum output difference diagram below

ELECTRICAL CONNECTIONS

All Hall sensor connections terminate in a 12-way AMP 040 series multi-lock connector in the joystick base. See page 8 for pin identities

Mating 12 way connector and pins	SA48061 (AMP 040 12 way connector 174045-2; pins 175062-1)
Mating 12 way harness	P49779 (connector, pins and 380mm long cable)

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ELECTRICAL - POTENTIOMETER TRACK

Resolution		Virtually infinite
Track resistance ±20%	**kΩ**	1.8, 2, 2.9, 5
Track operating angle	**°**	±18
Output voltage range	**%**	0-100, 10-90, 25-75 of input
Center tap voltage	**%**	48 - 52 of applied voltage
Center tap angle	**°**	±2.5
Center tap to switch alignment	**°**	Within 0.5
Supply voltage maximum	**Vdc**	32
Wiper circuit impedance	**MΩ**	1 minimum recommended*
Power dissipation @ 25°C	**W**	0.25
Insulation resistance		Greater than 15MΩ at 50Vdc

* The long life resistive elements require a high impedance load in the wiper circuit to minimise the current flowing through the wiper for optimum life conditions

ELECTRICAL - DIRECTIONAL OR CENTER SWITCH (LOW CURRENT)

Not available with CANbus output

Switch operating angle	**°**	1.5 or 5 either side of center
Supply voltage maximum	**Vdc**	35
Load current maximum	**mA**	200 resistive

ELECTRICAL CONNECTIONS

All primary potentiometer track and directional/center switch connections terminate in a 16-way AMP 040 series multi-lock connector in the joystick base. Secondary potentiometer track connections terminate in an 8-way AMP 040 series multi-lock connector. See page 8 for pin identities

Mating 16 way connector and pins	SA47931 (AMP 040 16 way connector 174046-2; Pins 175062-1)
Mating 16 way harness	P49780 (connector, pins and 380mm long cable)
Mating 8 way connector and pins	SA304522 (AMP 040 8 way connector 174044-2; pins 175062-1)
Mating 8 way harness	P303083 (connector, pins and 380mm long cable)

ELECTRICAL - MICROSWITCH

Not available with CANbus output

Switch configuration		Two switches per axis. Normally open at lever center position
Switch operating angle	**°**	2 to 5 either side of center
Contact rating		3A @125Vac, 2A @ 30Vdc
Switch life minimum		100,000 cycles, cycled at 1Hz, 1A and 12Vdc
Operating temperature	**°C**	-25 to +85

ELECTRICAL CONNECTIONS

Microswitch connections in the potentiometer joystick will replace the low current directional/center switches in the 16-way AMP 040 series multi-lock connector in the joystick base. In the Hall sensor joystick, switches terminate in the 8-way connector. See Electrical Connections on page 8 for pin identities

CAN OUTPUT VERSION

JC6000 with Hall sensing option can also be supplied with an integrated CANBUS output offering the J1939 protocol. This CANBUS interface meets the requirements of IEC61508 SIL level 1

Supply voltage range	**Vdc**	9 to 36
CAN version		CAN 2.0b
Protocol		J1939
Under-panel sealing		IP66 IEC60529

ELECTRICAL CONNECTIONS

All connections terminate in the 6-way Deutsch DTM04-6P integrated connector

Mating connector and pins	P304844 (includes 390mm flying leads)

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JC6000 JOYSTICK CONTROLLER
HOW TO SPECIFY

PERFORMANCE OPTIONS			CODE
AXES		Single	**NY**
		Dual	**XY**
SENSING		**Potentiometer Px** or **Pxx** selected from below	**P**
	Output	5k 0-100%, ±5° directional switch	**E**
		1.8k 0-100%, ±5° directional switch	**N**
		2.9k 25-75%, ±1.5° directional switch	**Q**
		2k 10-90%, ±1.5° directional switch	**R**
		2k 10-90%, ±5° directional switch	**S**
		2.9k 25-75%, ±5° directional switch	**T**
		Dual outputs per axis, 2k 10-90%, ±1.5° directional switch	**U**
		Dual Hall Effect sensors each axis **Hxx** with output selected from below	**H**
		Dual Hall Effect sensors each axis and ±1.5° directional switch **Bxx** with output selected from below	**B**
	Output	1.1Vdc to 3.9Vdc	**K**
		1.0Vdc to 4.0Vdc	**L**
		0.5Vdc to 4.5Vdc	**M**
		CANbus Output	**HC**
		Single Axis/Dual Axis	**1 or 2**
		Note: Directional track switches not currently available with CANbus output.	
LEVER SPRING FORCE		Heavy duty, 16N breakout, 39N full deflection	**H**
		Medium duty, 7N breakout,19N full deflection	**M**
GATE		Square ±20° mechanical angle in X and Y directions	**S**
MECHANICAL FEATURES		No lock or detents fitted	**NL**
MICROSWITCH		No switch fitted	**N**
		High current microswitches, 2A @ 30Vdc (Not available with CANbus output)	**Y**
INTERFACE		Standard interface (no electronics)	**STN**
		CANbus output, SAE J1939 protocol, 1000 CAN counts — Source Address 33 (HEX)	**JR1**
		Source Address 34	**JL1**
		Source Address 35	**JC1**
		Source Address 36	**JA1**
HANDLE/GRIP STYLE **See pages 9-15**		Standard knob, no functions	**HKN**
		Hand grip with options for buttons or rocker	**HB**
		Ergonomic grip with multiple buttons and proportional rockers	**A**
		Trigger grip with optional rocker switching	**MG**
		No handle	**NH**
		No handle, flying leads fitted (allows customer to fit own handle.)	**NHF**

EXAMPLE ORDER CODE **JC6000 - XY- PRR - H - S - NL - N - STN - HKN**

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JC6000 JOYSTICK CONTROLLER

DIMENSIONS

Note: drawings not to scale

INSTALLATION

The joystick is designed to be fitted from below the mounting panel, through a 70mm diameter hole. The effectiveness of the joystick flange sealing is dependent on the panel mounting surface being sufficiently rigid to compress the sealing gaiter. The surface finish of the mounting panel is critical to achieving an adequate seal and rough surface finishes, paint chips, deep scratches, etc. should be avoided.

Recommended panel thickness

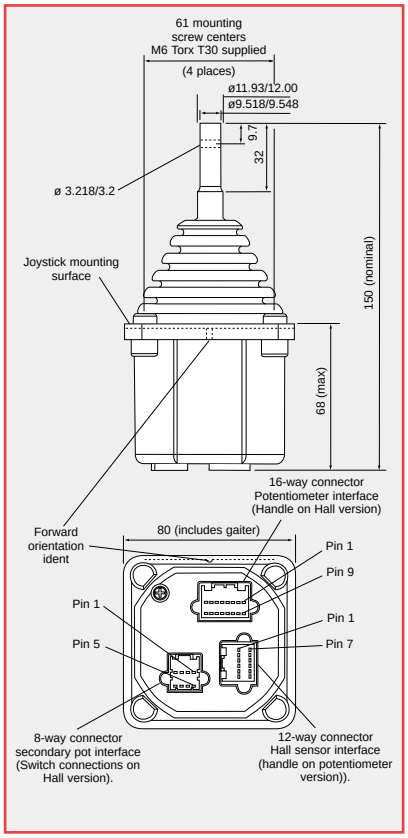
3.5 to 6mm

Recommended screw torque

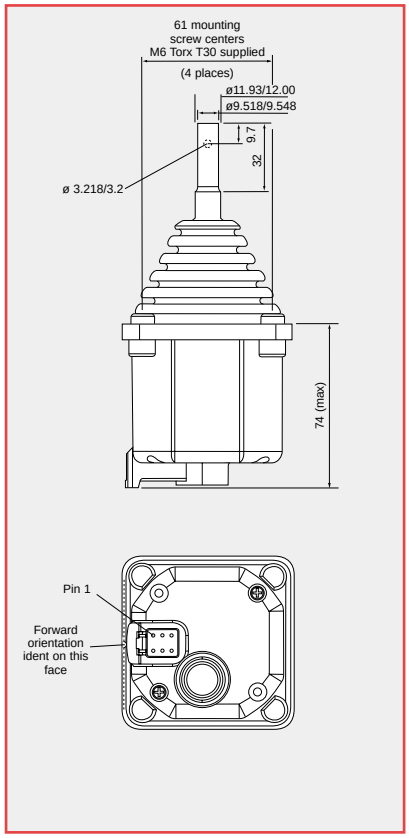
Fixing screws can be driven to a maximum torque of 5Nm when clamped against a 3.5mm thick panel.

The mounting hole depth is 12.6mm. For through-hole installation, the screws can be driven at a torque of 3.5Nm directly through the blind cast holes to remove the cast covers. The joystick mounting flange should be connected to the vehicle chassis or reference plane (normally zero volts).

POTENTIOMETER AND HALL EFFECT CONTROLLER



CAN OUTPUT CONTROLLER



CAN OUTPUT OPTIONS

The sealing of the lower cover meets the requirements of IP66 (IEC 60529) and uses an integrated Deutsch DTM04-6P 6 pin connector with the cover. The use of a suitable sealed mating connector will enable a full IP66 connection to be made. The cover also includes an integrated breather system to ensure pressure regulation under all barometric pressure and temperature conditions without moisture ingress into the joystick.

See next page for electrical connections

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JC6000 JOYSTICK CONTROLLER

ELECTRICAL CONNECTIONS

	Pin number	Potentiometer tracks	Hall effect sensors
16-way primary connector	1	Y switch track N/O (lever forward +Y)	Pins 1 to 12 used for handle connections
	2	X switch track center on	See chosen handle style for details
	3	X pot track left	-
	4	X pot track wiper signal	-
	5	X pot track right	-
	6	X pot track center tap	-
	7	X switch track common	-
	8	X switch track N/O (lever left -X)	-
	9	Y pot track backward	-
	10	Y pot track wiper signal	-
	11	Y pot track forward	-
	12	Y pot track center tap	-
	13	Y switch track common	Not connected
	14	Y switch track N/O (lever backward -Y)	Not connected
	15	X switch track N/O (lever right +X)	Not connected
	16	Y switch track center on	Not connected
8-way secondary connector (where fitted)	1	Secondary Y pot track backward	Forward (directional or micro) switch common
	2	Secondary Y pot track center tap	Forward switch output
	3	Secondary Y pot track wiper signal	Backward switch output
	4	Secondary Y pot track forward	Backward switch common
	5	Secondary X pot track right	Left switch common
	6	Secondary X pot track wiper signal	Left switch output
	7	Secondary X pot track center tap	Right switch output
	8	Secondary X pot track left	Right switch common
12-way connector	1	Pins 1 to 12 used for handle connections	+5V supply - sensors 3 and 4
	2	See chosen handle style for connection details	0V supply - sensors 3 and 4
	3	-	+5V supply - sensors 1 and 2
	4	-	0V supply - sensors 1 and 2
	5	-	Forward/backward output - sensor 3
	6	-	Left/right output - sensor 2
	7	-	Left/right output - sensor 4
	8	-	Forward/backward output - sensor 1
	9	-	Not connected
	10	-	Not connected
	11	-	Not connected
	12	-	Not connected
6 pin Deutsch connector CAN output	1	Not available	Ground
	2	Not available	Power
	3	Not available	CAN high
	4	Not available	CAN low
	5	Not available	CAN shield
	6	Not available	Not connected

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JC6000 JOYSTICK CONTROLLER HANDLE OPTIONS

HKN

The HKN handle is the simplest option available for the JC6000. This handle does not include any additional functionality, but is designed to allow the joystick to be controlled by the operator gripping the handle palm downwards.

NH or NHF

These options are selected when no handle is required to be fitted. NHF option has wires fitted to the joystick connector on the base, through the operating lever.

HB

Developed to replicate the functionality of the traditional mechanical handle, the HB range of hand grips can be specified with either a button or rocker switch, mounted into the top of the handle, within easy reach of the operator's thumb. These can be configured as a 'Person Present' feature or, for example, the steer signal for an access platform.

A RANGE

Designed to meet the demands for more complex control systems in off-highway applications, the 'A' range of ergonomic hand grips can be fitted with a combination of analogue outputs, push button and 'Person Present' switches. The handle can be specified with two independent analogue outputs generated by proportional rockers which, in turn, provide auxiliary directional switching in addition to the potentiometric output. When coupled with the two axis JC6000 base joystick this unit can provide a four-axis controller.

This handle can also be purchased separately, for fitting to customer levers or assemblies. Ask our sales team for more details on this option.

MG

Designed to provide a simple approach to a 'Person Present' handle whilst offering the flexibility of switch options in the top of the handle. The profile of the MG handle ensures the operator's fingers are permanently close to the buttons, minimising operator fatigue and maximising functional control. The handle can be supplied with or without a hand rest and can be configured with a combination of trigger lever, single or dual switches.

This handle can also be purchased separately, for fitting to customer levers or assemblies. Ask our sales team for more details on this option.

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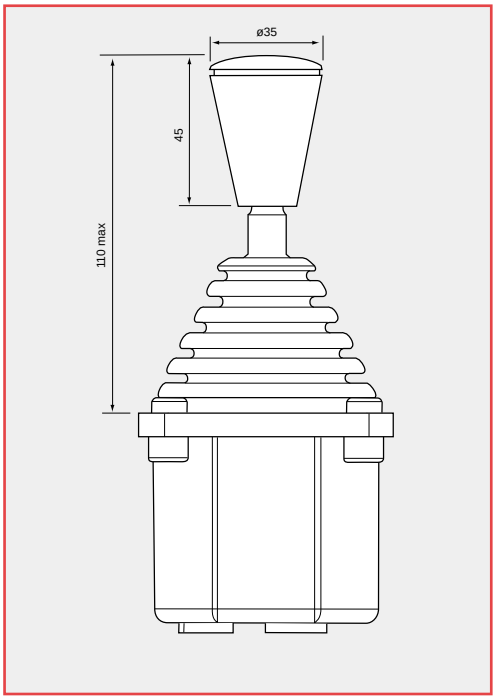
HKN HANDLE OPTION

DIMENSIONS

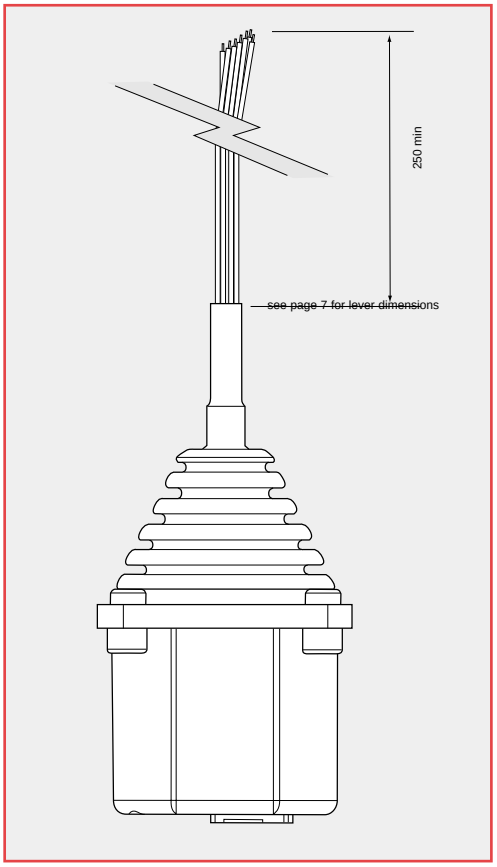


NH OR NHF HANDLE OPTIONS

ELECTRICAL CONNECTIONS

Wire size 28AWG

Wire current 1.4A



NH option has no wires fitted.

NHF option allows customer to fit own handle style to joystick operating lever.

Pin	*Wire color*
1	Grey
2	Yellow
3	Red
4	Orange
5	Brown
6	Black
7	Green
8	White
9	Blue
10	Violet
11	Pink
12	Red/Yellow
13	Not connected
14	Not connected
15	Not connected
16	Not connected

NHF handle option note: Wires terminate on the 12-way connector (Potentiometer version), or the 16-way connector (Hall sensor version).

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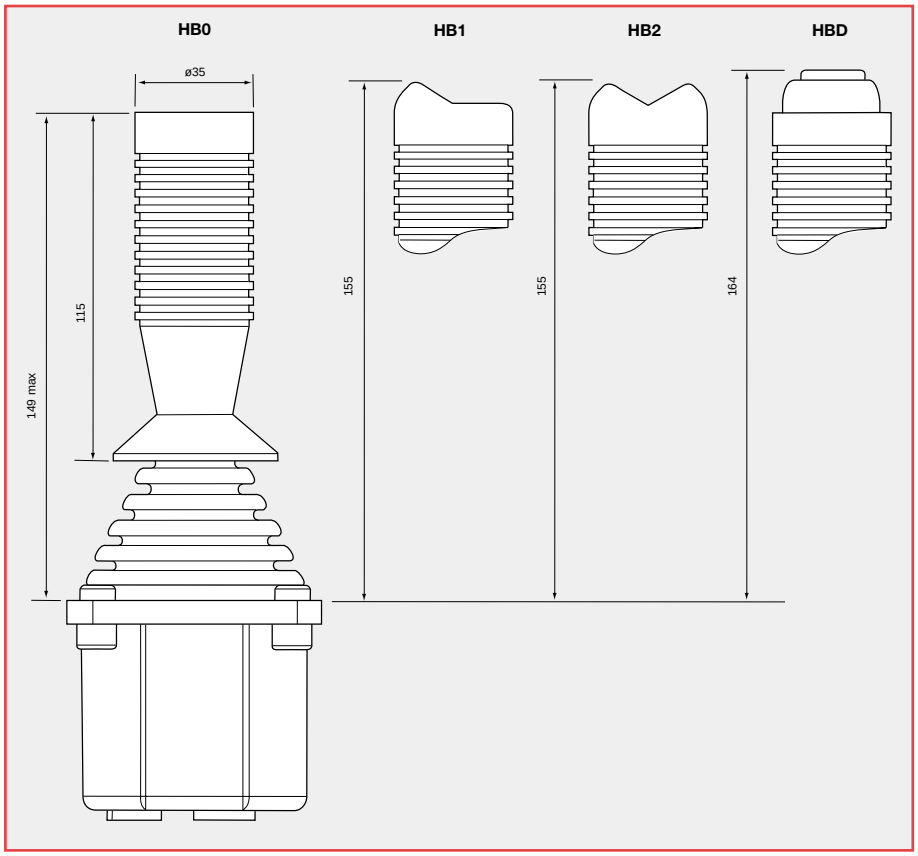
HB HANDLE OPTIONS

DIMENSIONS



SPECIFICATION		HBO	HB1	HB2	HBD
Maximum height above flange	**mm**	149	155	155	164
Maximum grip diameter	**mm**	35	35	35	35
Environmental sealing (IEC 60529)		IP65	IP65	IP65	IP65
Number of switches		0	1	2	1
Action			Momentary rocker	Momentary rocker	Momentary button
Switch operating force	**N**	-	-	-	7
Maximum current @ 30Vdc	**A**	-	2.5	2.5	5
Expected life (operations)		100,000	100,000	100,000	100,000

ELECTRICAL CONNECTIONS

Common terminal	11	11	11
N/O contact switch 1	4	4	1
N/C contact switch 1	1		
N/O contact switch 2		1	

Note: Signals terminate on the 12 way connector (potentiometer version) or the 16 way connector (Hall sensor version)

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A RANGE HANDLE OPTIONS

SPECIFICATION

Maximum height above flange	**mm**	166
Maximum grip diameter	**mm**	61
Environmental sealing (IEC 60529)		IP65
Number of switches		1 to 6 in the top plate
Action		Momentary button
Switch operating force	**N**	3
Maximum current @ 50Vdc	**mA**	200
Expected life (operations)		1 million
Weight	**g**	170 - A2LD option
Operating temperature	**°C**	-40 to +70
Storage temperature	**°C**	-40 to +80

ROCKER

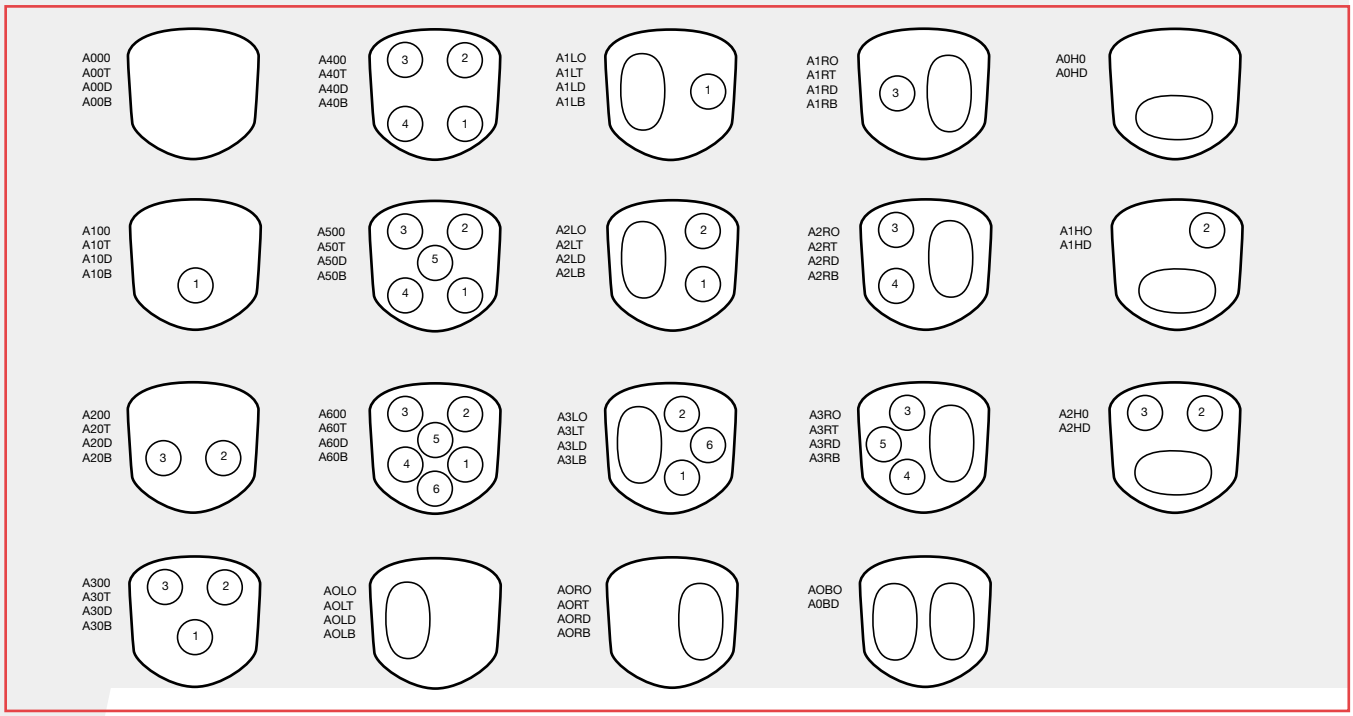
Rocker profile		Standard (S) or V profile (V)
Breakout force	**N**	5 at the end of the rocker
Operating force	**N**	15 at the end of the rocker
Mechanical movement	**°**	±10 (±1°)
Electrical movement	**°**	±9 (±1°)
Expected life (operations)		5 million
Load current (maximum)	**mA**	200 (see note on page 5)
Power dissipation @ 25°C	**W**	0.25
Track resistance		Will match JC6000 Y axis resistance †
Output voltage		Will match JC6000 Y axis output †
Center tap angle	**°**	±1.5
Directional or center off switch		Standard
Switch gap	**°**	2.5 either side of center
Switch supply voltage	**Vdc**	35

† unless requested otherwise

FUNCTIONALITY

	SWITCHES								ROCKERS		
	1	2	3	4	5	6	TOP	Person Present	LEFT	RIGHT	HORIZONTAL
SWITCH 1		✔	✔	✔	✔	✔	✔	✔	✔		
SWITCH 2	✔		✔	✔	✔	✔	✔	✔	✔		✔
SWITCH 3	✔	✔		✔	✔	✔	✔	✔		✔	✔
SWITCH 4	✔	✔	✔		✔	✔	✔	✔		✔	
SWITCH 5	✔	✔	✔	✔		✔	✔	✔		✔	
SWITCH 6	✔	✔	✔	✔	✔		✔	✔	✔		
TOP SWITCH	✔	✔	✔	✔	✔	✔		✔	✔	✔	
PERSON PRESENT	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔
LEFT ROCKER	✔	✔				✔	✔	✔		✔	
RIGHT ROCKER			✔	✔	✔		✔	✔	✔		
HORIZONTAL		✔	✔					✔			

SWITCH AND ROCKER OPTIONS



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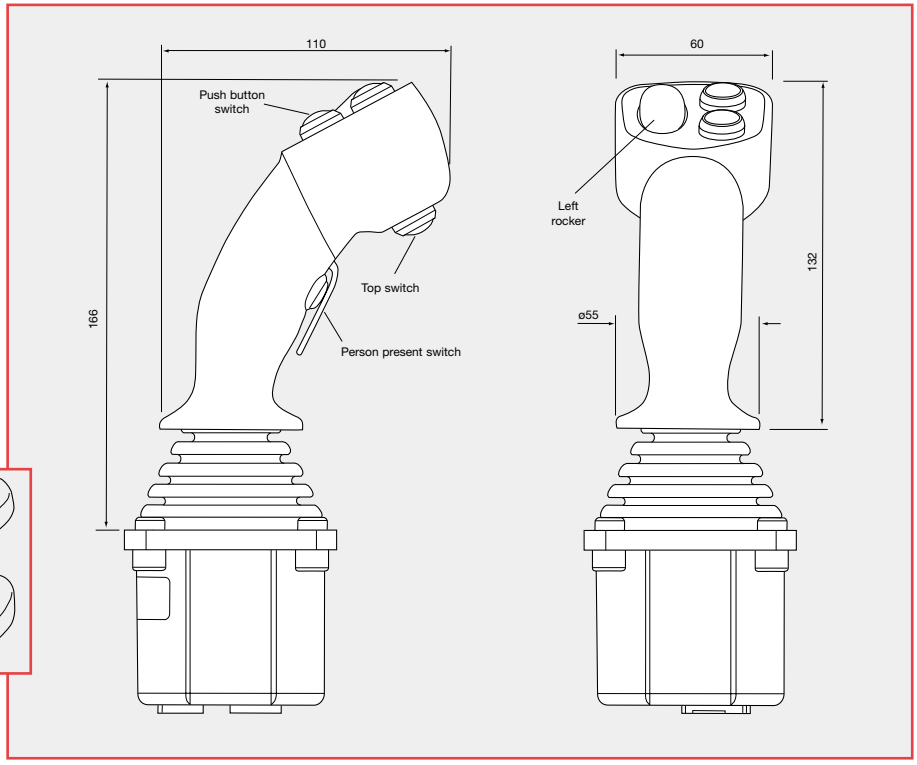
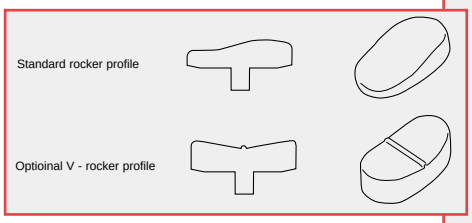
DIMENSIONS





ELECTRICAL CONNECTIONS

	Pin	Wire color		Pin	Wire color
Common terminal (for all switches)	11	Black	**Rocker center tap**	6	Yellow/Red*
Switch 1	4	Blue	**Rocker zero or negative supply (L, R or H)**	10	Pink/Grey
Switch 2	3	Yellow	**Rocker output signal (L or H only)**	5	Pink
Switch 3	2	Blue/White	**Rocker output signal (R)**	9	White
Switch 4	1	White/Green	**Rocker switch common**	11	Black
Switch 5	†	Red	**Rocker switch (L forward)**	2	Blue/Orange
Switch 6	†	Violet	**Rocker switch (L backward)**	1	Green
Top switch	†	Pink with marker	**Rocker switch (R forward)**	3	Yellow
Person present switch	12	Red/Green	**Rocker switch (R backward)**	4	Blue
Person present switch	8	Black/White	**Rocker switch (H left)**	4	Blue/Orange
Rocker positive supply (L, R or H)	7	White/Red	**Rocker switch (H right)**	1	Green

† depends on other options selected

*Center tap not connected on A3LB and A3RB handles

Note: Signals terminate on the 12-way connector (Potentiometer version), or the 16-way connector (Hall sensor version)

ORDERING CODES

A - 2 - L - D - R - S

Push button
select 1 to 6 in the top plate

Rocker position
O = None
L = Left
R = Right
B = Both
H = Horizontal

Rocker profile
S = Standard
V = V profile

Rocker resistance code
(See page 6 for codes)

Additional switches
O = None
T = Top
D = Person Present (Deadmans)
B = Both

Note: When ordering a handle fitted with a rocker, two profiles can be supplied (S = standard profile; V = v profile) please specify style when ordering.

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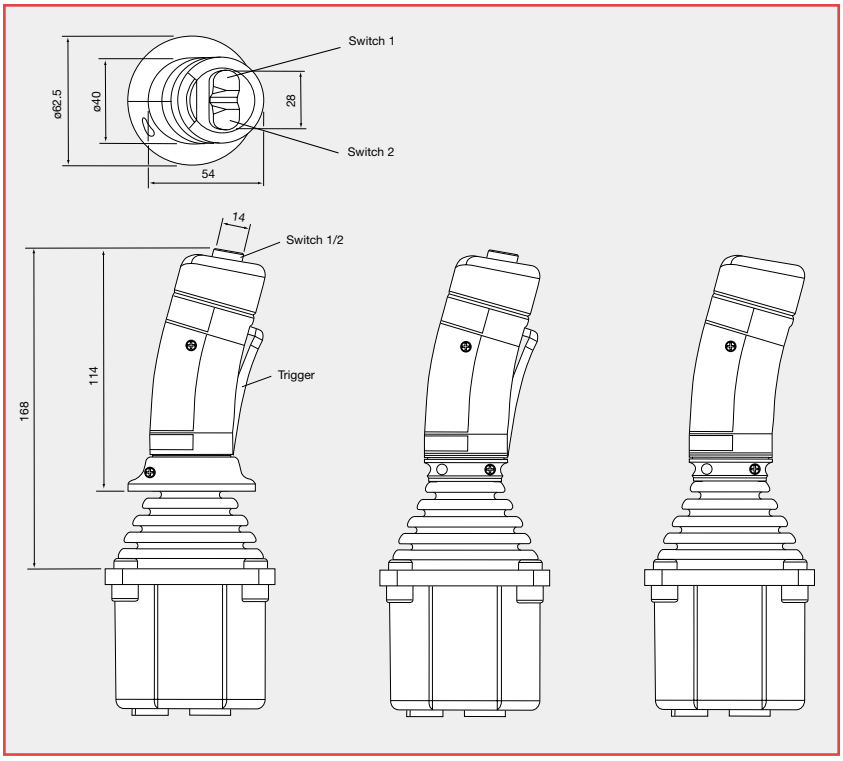
MG HANDLE OPTIONS

DIMENSIONS



SPECIFICATION

Maximum height above flange	**mm**	168
Maximum grip diameter	**mm**	40
Environmental sealing (IEC 60529)		IP67 (IP66 with trigger switch)
Number of switches		0 to 3
Action		Momentary Button, Rocker or Trigger
Switch operating force		
Trigger	**N**	5
Switch 1 or 2	**N**	7
Maximum current @ 30Vdc	**mA**	100
Expected life (operations)		1 million
Operating temperature	**°C**	-25 to +75
Storage temperature	**°C**	-30 to +80

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HANDLE CODE	*Top switch position*	*Trigger switch*	*Hand rest*
MG00	None	No	No
MG01	1	No	No
MG02	1 & 2	No	No
MG03	1 & 2	Yes	No
MG04	1 & 2	Yes	Yes
MG05	1	Yes	Yes
MG06	1 & 2	No	Yes
MG07	1	No	Yes
MG08	1	Yes	No
MG09	None	Yes	Yes
MG10	None	None	Yes
MG11	None	Yes	No

See Electrical Connections for wire color codes.

ELECTRICAL CONNECTIONS	*Pin number*	*Wire color*
Common terminal (for top switches)	12	Black
Switch 1- Left	6	Blue
Switch 2 - Right	3	Green
Trigger switch	4	Blue/Orange
Trigger switch	5	Yellow

Note: Signals terminate on the 12-way connector (Potentiometer version), or the 16-way connector (Hall sensor version)

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Penny+Giles
A Curtiss-Wright Company

Doc Ref: JC6000 10/08

www.pennyandgiles.com

Penny & Giles
Position sensors and joysticks for commercial and industrial applications.

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

36 Nine Mile Point Industrial Estate
Cwmfelinfach
Gwent NP11 7HZ
United Kingdom
+44 (0) 1495 202000
+44 (0) 1495 202006 Fax
sales@pennyandgiles.com

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

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

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CURTISS WRIGHT Controls

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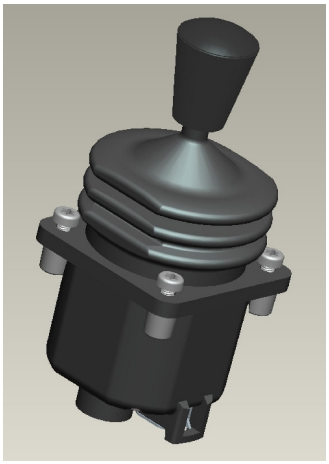
JC6000 Joystick Option

with friction hold and centre detent



This JC6000 option is available in a single (Y) axis configuration.

The joystick handle position will remain in the position set by the operator and will not automatically return to centre. Centre location is maintained by a detent mechanism that provides feedback to the operator as to when the joystick exits and returns to the centre position.

Three alternatives of friction torque and breakout torque from centre position are available.

The joystick can be ordered with all standard interfaces and handle options or customer specific handle designs.

The joystick includes a heavy duty robust design suitable for off-road applications such as road construction vehicles.

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JC6000 Option with friction hold and centre detent

HOW TO SPECIFY

		CODE
PERFORMANCE		
AXES:	Single	**NY**
SENSING:	**Potentiometer Px** or **Pxx** selected from below	**P**
Output	5k 0-100%, ± 5° directional switch	E
	1.8k 0-100%, ± 5° directional switch	N
	2.9k 25-75%, ± 1.5° directional switch	Q
	2k 10-90%, ± 1.5° directional switch	R
	2k 10-90%, ± 5° directional switch	S
	2.9k 25-75%, ± 5° directional switch	T
	Dual output per axis, 2k 10-90%, ± 1.5° directional switch	U
SENSING:	**Dual Hall Effect** sensors each axis **Hxx** selected below	**H**
	Hall Effect sensors each axis and ± 1.5° directional switch **Bxx** selected below	**B**
Output	1.1 Vdc to 3.9Vdc	K
	1.0 Vdc to 4.0 Vdc	L
	0.5Vdc to 4.5 Vdc	M
	CANbus digital output	C
FRICTION HOLD	Friction hold torque 1.25 Nm, centre detent breakout torque 2.25 Nm	FB
	Friction hold torque 1.25 Nm, centre detent breakout torque 3.25 Nm	FC
	Friction hold torque 2.25 Nm, centre detent breakout torque 4.00 Nm	HC
MICROSWITCH	No switch fitted	N
	High current microswitches, 2A@ 30Vdc (Not available with CANbus output)	Y
INTERFACE	Standard interface (no electronics)	STN
	CAN bus output, SAE J1939 protocol, RH source address	JR1
	LH source address	JL2
	Centre source address	JC1
	Auxilary source address	JA1
HANDLE/GRIPP STYLE	Standard knob, no function	HKN
	Hand grip with options for buttons or rocker	HB
	Ergonomic grip with multiple buttons and proportional rocker	A
	Trigger grip with optional rocker switching	MG
	No handle	NH

EXAMPLE ORDER CODE: JC6000 – NY – HM – / – / – FC – N – STN – HKN

FURTHER PERFORMANCE

Operating angle:	± 20°
Operating angle to breakout of detent:	± 5°
Centre hysteresis:	± 1°
Expected operating life:	1 million cycles

For further information covering JC6000 including technical data, interface details and handle option etc please refer to brochure JC6000 multi axis joystick controllers

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
36 Nine Mile Point Industrial Estate
Cwmfelinfach
Gwent NP11 7HZ
United Kingdom
+44 (0) 1495 202000
+44 (0) 1495 202006 Fax
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

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Penny+Giles
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JC6000 – Single axis

HIGH STRENGTH JOYSTICK RANGE

Penny + Giles has expanded its JC6000 options with the addition of the new High Strength single axis spring return to centre joystick.

Penny & Giles have responded to customer requests for a **higher strength** single axis spring return to centre joystick for use in the most **arduous of applications** particularly where there are high **"Across Axis"** loads.

The **increase in strength** has been achieved by the design and manufacture of a **new body** casting dedicated to the single axis design and has increased the across axis fatigue life by a factor of 5.

The improvement in the fatigue performance is such that this new option will replace the existing single axis spring return joystick in any new applications so that all customers can benefit from this improvement but Joysticks manufactured with the existing lower strength mechanism will still be available to support customer needs for continuity of systems and spares.

The new joystick has the **same panel mounting** detail as the existing JC6000 joystick but does have a new gaiter designed specifically for the extra strength body casting.

Applications for this new High Strength JC6000 include Wheel Loaders where the joystick can be used in the X axis (Left/Right) as a steering function and the design will withstand the **"Across Axis"** fatigue loads applied by the operator as they use the machine.

This new joystick option is available with the entire Penny & Giles output and handle options and has the new **"SY"** designation in the joystick code.

- Available with all of the standard JC6000 handles
- Available with Potentiometer, Hall sensor, Can (J1939) and Can-Extended Input interfaces.

For further information please contact the Penny & Giles Sales team

High Strength JC6000 single axis joystick with CAN output

www.pennyandgiles.com

Penny & Giles Controls Ltd
36 Nine Mile Point Ind. Est.
Cwmfelinfach
Gwent NP11 7HZ
United Kingdom
+44 (0) 1495 202000
+44 (0) 1495 202006 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

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