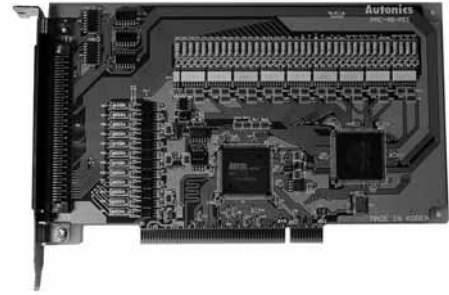


# 4-Axis Motion Controller

## 4-Axis board type programmable motion controller

### ■ Features

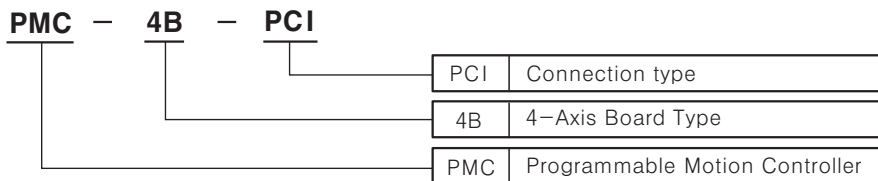
- Available to control 4-axis independent AC servo motor and stepping motor
- PC-PCI Card
- Auto home search and synchronous operation
- Interpolation on circular/linear, Bit pattern/continuous/ ac • deceleration drive
- 2/3-Axis constant linear velocity.
- Compatible with Windows 98, NT, 2000, XP
- Apply the library which can be operated in C++



**!** Please read "Caution for your safety" in operation manual before using.



### ■ Ordering information



### ■ Specifications

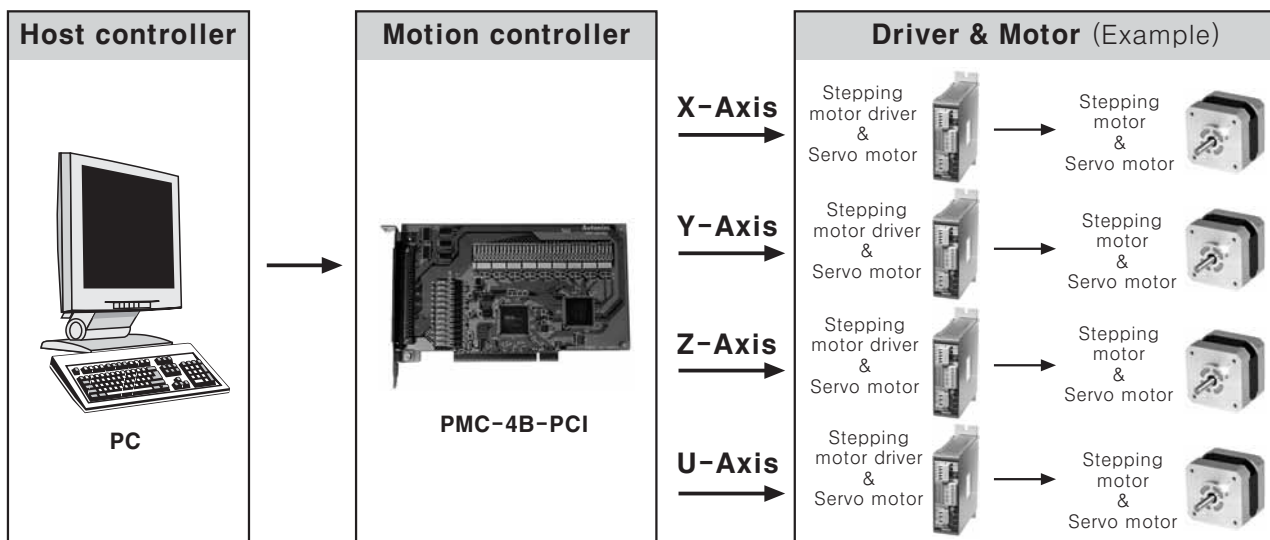
Model		PMC-4B-PCI
Control axis		4-Axis
CPU Data bus		8/16 Bit selectable
2/3-Axis linear shortcut	Shortcut range	Axis -2,147,483,646 ~ +2,147,483,646
	Shortcut speed	1pps ~ 4 Mpps
	Shortcut position accuracy	Max. $\pm 0.5$ LSB(Within shortcut range)
Circular shortcut	Shortcut range	Axis -2,147,483,646 ~ +2,147,483,646
	Shortcut speed	1pps ~ 4 Mpps
	Shortcut position accuracy	Max. $\pm 1$ LSB(Within shortcut range)
2/3-Axis bit pattern shortcut		1~4MPPS(Dependent only on CPU data setup)
Other interpolation function		Selectable axis, Linear speed, Continual shortcut, Transmit shortcut STEP(Command, External signal)
Driver pulse output (X, Y common specifications) (CLK=16MHz)		Output speed range : 1 pps ~ 4 Mpps
		Output speed accuracy : Max $\pm 0.1\%$ (For setting value)
		Speed rate : 1 ~ 500
		S type Ac.acceleration rate : $954 \sim 62.5 \times 10^6$ PPS/SEC <sup>2</sup> (At rate=1) (Rate of increase) $477 \times 10^3 \sim 31.25 \times 10^6$ PPS/SEC <sup>2</sup> (At rate=500)
		Ac.deceleration : $125 \sim 1 \times 10^6$ PPS/SEC <sup>2</sup> (At rate=1) $62.5 \times 10^3 \sim 500 \times 10^6$ PPS/SEC <sup>2</sup> (At rate=500)
		Super high speed : 1 ~ 8,000PPS (At rate=1) $500 \sim 4 \times 10^6$ PPS/SEC <sup>2</sup> (At rate=500)
		Drive speed : 1 ~ 8,000PPS (At rate=1) $500 \sim 4 \times 10^6$ PPS/SEC <sup>2</sup> (At rate=500)
		Output pulse : 0 ~ 4,294,967,295(Fixed quantity pulse drive)
		Speed curve : Fixed / Linear ac.deceleration / Parabola S type Ac.acceleration drive
		Deceleration mode of fixed pulse drive(Available asymmetry linear ac.deceleration speed) / Manual deceleration
		Output pulse on Driving, Available to change drive speed
		Selectable dependent 2pulse / 1pulse direction type
		Selectable logic level, Changeable output terminal
Encoder input pulse		2-Phase pulse / Up down pulse input, 2-Phase pulse 1, 2, 4 magnifying selectable

# PMC-4B-PCI

## Specifications

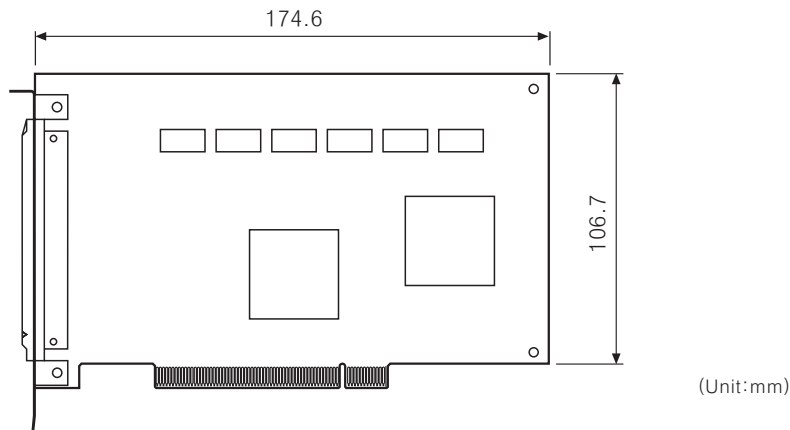
Position Counter	Logic position counter (For output pulse) count range : -2,147,483,648 ~ +2,147,483,647 Real position counter (For input pulse) count range : -2,147,483,648 ~ +2,147,483,647
Compare register	COMP+ register position compare range : -2,147,483,648 ~ +2,147,483,647
	COMP- register position compare range : -2,147,483,648 ~ +2,147,483,647
	Status output and signal output the magnitude with position counter
	Available operating as a software limit
Auto home search	Step 1 (High speed near home search) → Step 2 (Low speed near home search) → Step 3 (Low speed encoder nearby search) → Step 4 (Selectable enable/disable, detection direction for each step)
Interrupt function (Except for interpolation)	<ul style="list-style-type: none"> <li>• 1 drive pulse output</li> <li>• On changing position counter ≥ COMP-</li> <li>• On changing position counter &lt; COMP-</li> <li>• Starting fixed speed on ac.deceleration drive</li> <li>• On changing position counter ≥ COMP+</li> <li>• On changing position counter &lt; COMP+</li> <li>• Completing fixed speed on ac.deceleration drive</li> <li>• On drive ending</li> </ul>
Drive shortcut by external signal	Able to drive fixed quantity • continual speed of +/- direction by EXPP, EXPM signal
	2-Phase encoder signal mode (Encoder input) drive
E decelerate stop / Immediate stop signal	INO ~ 3 axis 4 points
	Selectable enable/disable signal and detection of direction, able to use as a common input
Input signal for servo motor	Selectable enable/disable signal and detection direction
Output signal for common	OUT4 ~ 7 square axis 4 points (Multiple 4 combines MULT CHIP shortcut signal and terminal)
Signal output on drive	ASND (Ascend speed), DSND (Descend speed)
	CMPP (Position ≥ COMP+), CPM (Position < COMP-)
	DRIVE (Driver pulse output), Read at status register
Overrun limit signal input	Direction +, - each one, Selectable logic level
	Selectable emergency stop/deceleration stop for active
Emergency stop signal input	EMG 1 point in all axis, make drive pulse of all axis immediately stop
Integral type filter built-in	Built-in integration filter on each input terminal, selectable passing time (8 hours)
Etc.	Selectable axis, Constant linear speed, Continuous interpolation, Interpolation step transmission (Command, External signal)
Power supply	5VDC (Using PC inner power)
External power supply	12-24VDC
Allowable voltage fluctuation range	90~100% of power supply
Operation temp. range	0°C ~ +45°C (at non-dew or non-freezing status)
Storage temperature	-10°C ~ +55°C (at non-dew or non-freezing status)
Ambient humidity	35 ~ 85%RH

## System



# 4-Axis Motion Controller

## ■ Dimensions

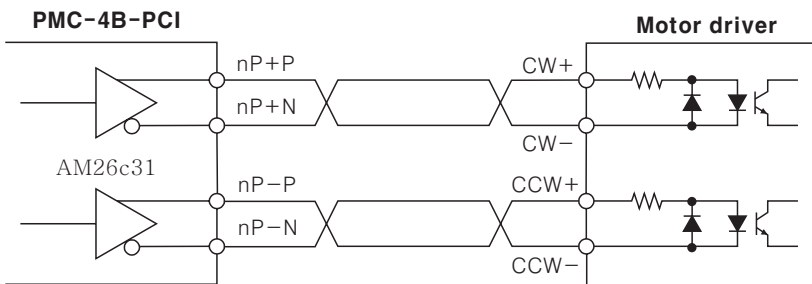


## ■ Connections

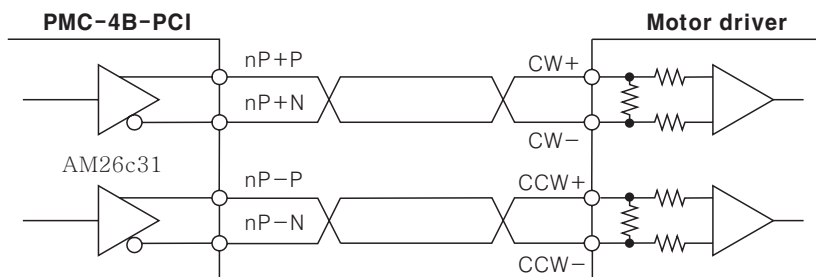
### ◎ Connection of pulse output signal for operating driver

PMC-4B-PCI outputs pulse for operating driver as +/- of CW/CCW output using Line driver (AM26c31) and refer to the follows connections of motor driver with photocoupler and line driver input.

#### ● Connection to motor driver with photocoupler



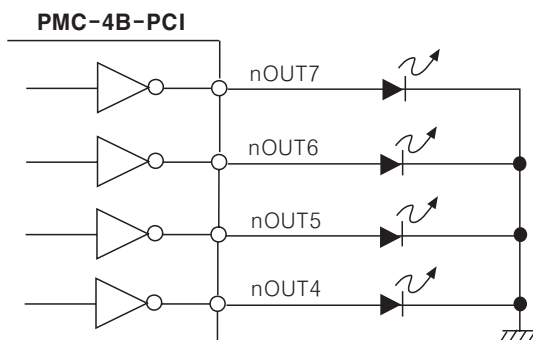
#### ● Connection to motor driver with line driver



※It is recommended to use twisted pair shield wire for pulse output signal of driver operation regarding EMC.

### ◎ Connection of common output signal (nOUT4~7)

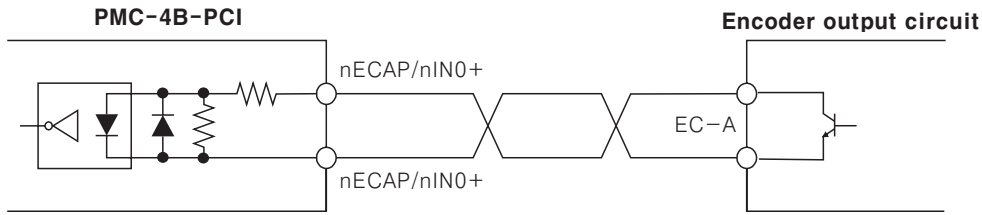
Output signal is outputted by buffer(74LS06), and all outputs are OFF after reset.



# PMC-4B-PCI

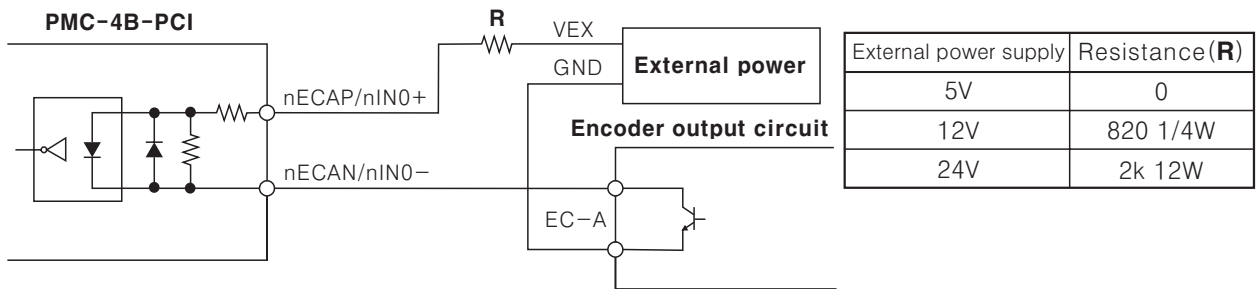
## ◎ Connection of encoder input signal (nECAP/N, nECBP/N) and nINO+/- signal

### ● Connection of encoder input signal and auto output line driver



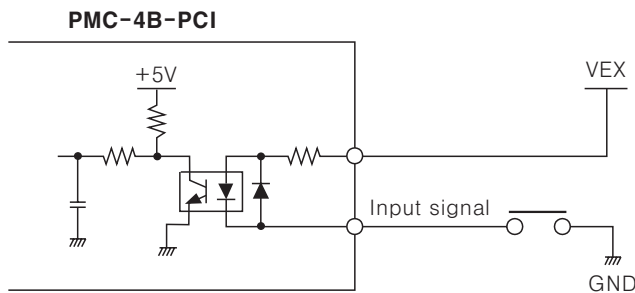
※All A, B, Z-phases are having same connections.

## ◎ Example for the connection of encoder input signal and NPN open collector output encoder



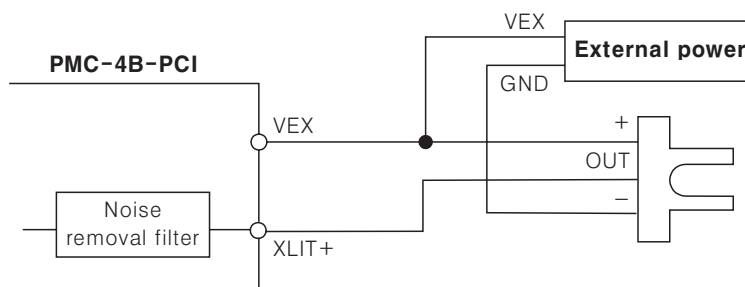
※All A, B, Z-phases are having same connections.

## ◎ Connection of input signal (nIN1~3, nINPOS, nALRAM, nEXP+/-, EMG)



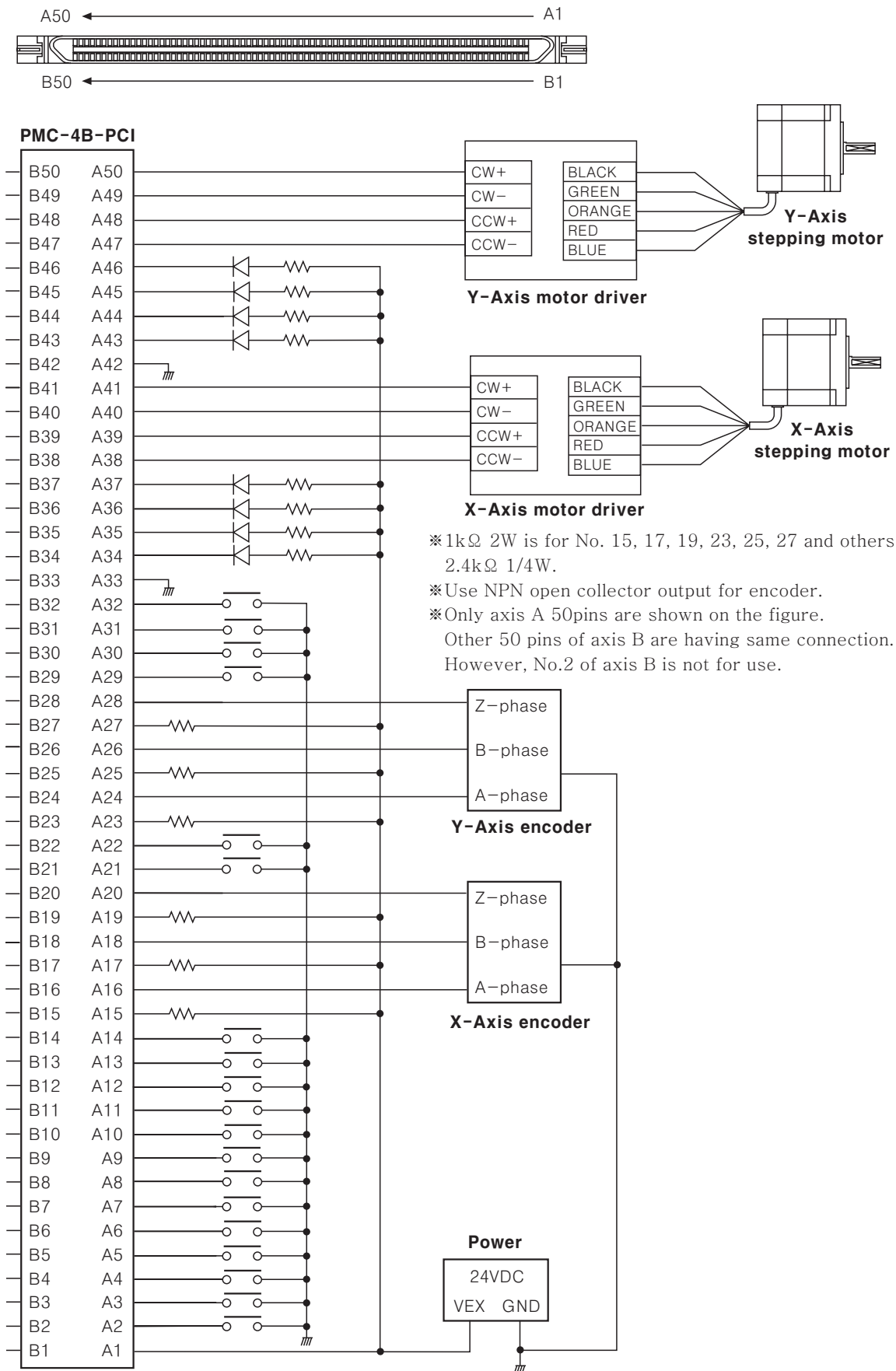
## ◎ Connection of limit input signal (nLMIT+/-)

The outgoing cable of limit signal can be affected by noise, it can not be removed only with photocoupler, so, the filter circuit is built in and set enough passing time. (FL=2,3)



# 4-Axis Motion Controller

## Entire I/O connections



# PMC-4B-PCI

## ■ I/O Specifications

Pin No.	Signal	Description	Pin No.	Signal	Description
A1	VEX	12-24VDC	B1	VEX	12-24VDC
A2	EMG	Emergency stop (4-axis stop)	B2	-	Non-using
A3	XLIMIT+	Axis X +limit	B3	ZLIMIT+	Axis Z +limit
A4	XLIMIT-	Axis X -limit	B4	ZLIMIT-	Axis Z -limit
A5	XIN1	Axis X input signal(home)	B5	ZIN1	Axis Z input signal(home)
A6	XIN2	Axis X input signal (encoder Z phase signal)	B6	ZIN2	Axis Z input signal (encoder Z phase signal)
A7	XIN3	Axis X input signal	B7	ZIN3	Axis Z input signal
A8	YLIMIT+	Axis Y +limit	B8	ULIMIT+	Axis U +limit
A9	YLIMIT-	Axis Y -limit	B9	ULIMIT-	Axis U -limit
A10	YIN1	Axis Y input signal(home)	B10	UIN1	Axis U input signal(home)
A11	YIN2	Axis Y input signal (encoder Z phase signal)	B11	UIN2	Axis U input signal (encoder Z phase signal)
A12	YIN3	Axis Y input signal	B12	UIN3	Axis U input signal
A13	XINPOS	Axis X input inposition	B13	ZINPOS	Axis Z input inposition
A14	XALARM	Axis X alarm input	B14	ZALARM	Axis Z alarm input
A15	XECAP	Axis X Encoder phase A+	B15	ZECAP	Axis Z Encoder phase A+
A16	XECAN	Axis X Encoder phase A-	B16	ZECAN	Axis Z Encoder phase A-
A17	XECBP	Axis X Encoder phase B+	B17	ZECBP	Axis Z Encoder phase B+
A18	XECBN	Axis X Encoder phase B-	B18	ZECBN	Axis Z Encoder phase B-
A19	XIN0+	Axis X near home	B19	ZIN0+	Axis Z near home
A20	XIN0-	Axis X near home	B20	ZIN0-	Axis Z near home
A21	YINPOS	Axis Y input inposition	B21	UINPOS	Axis U input inposition
A22	YALARM	Axis Y alarm input	B22	UALARM	Axis U alarm input
A23	YECAP	Axis Y Encoder phase A+	B23	UECAP	Axis U Encoder phase A+
A24	YECAN	Axis Y Encoder phase A-	B24	UECAN	Axis U Encoder phase A-
A25	YECBP	Axis Y Encoder phase B+	B25	UECBP	Axis U Encoder phase B+
A26	YECBN	Axis Y Encoder phase B-	B26	UECBN	Axis U Encoder phase B-
A27	YIN0+	Axis Y near home	B27	UIN0+	Axis U near home
A28	YIN0-	Axis Y near home	B28	UIN0-	Axis U near home
A29	XEXP+	Axis X manual +drive	B29	ZEXP+	Axis Z manual +drive
A30	XEXP-	Axis X manual -drive	B30	ZEXP-	Axis Z manual -drive
A31	YEXP+	Axis Y manual +drive	B31	UEXP+	Axis U manual +drive
A32	YEXP-	Axis Y manual -drive	B32	UEXP-	Axis U manual -drive
A33	GND	GND	B33	GND	GND
A34	XOUT4/CMPP	Axis X common output	B34	ZOUT4/CMPP	Axis Z common output
A35	XOUT5/CMPM	Axis X common output	B35	ZOUT5/CMPM	Axis Z common output
A36	XOUT6/ASND	Axis X common output	B36	ZOUT6/ASND	Axis Z common output
A37	XOUT7/DSND	Axis X common output	B37	ZOUT7/DSND	Axis Z common output
A38	XP+P	Axis X +CW drive signal output	B38	ZP+P	Axis Z +CW drive signal output
A39	XP+N	Axis X -CW drive signal output	B39	ZP+N	Axis Z -CW drive signal output
A40	XP-P	Axis X +CCW drive signal output	B40	ZP-P	Axis Z +CCW drive signal output
A41	XP-N	Axis X -CCW drive signal output	B41	ZP-N	Axis Z -CCW drive signal output
A42	GND	GND	B42	GND	GND
A43	YOUT4/CMPP	Axis Y common output	B43	UOUT4/CMPP	Axis U common output
A44	YOUT5/CMPM	Axis Y common output	B44	UOUT5/CMPM	Axis U common output
A45	YOUT6/ASND	Axis Y common output	B45	UOUT6/ASND	Axis U common output
A46	YOUT7/DSND	Axis Y common output	B46	UOUT7/DSND	Axis U common output
A47	YP+P	Axis Y +CW drive signal output	B47	UP+P	Axis U +CW drive signal output
A48	YP+N	Axis Y -CW drive signal output	B48	UP+N	Axis U -CW drive signal output
A49	YP-P	Axis Y +CCW drive signal output	B49	UP-P	Axis U +CCW drive signal output
A50	YP-N	Axis Y -CCW drive signal output	B50	UP-N	Axis U -CCW drive signal output