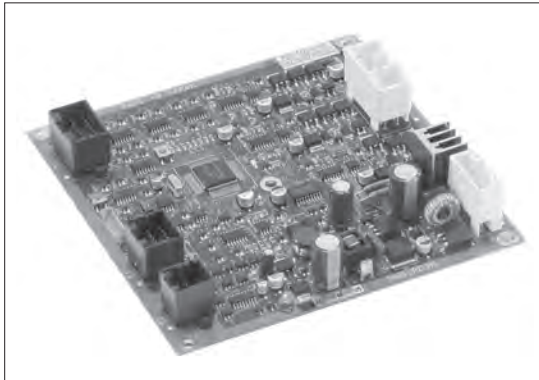# COMNICA valve controller PD3

These proportional digital controllers are used for construction machinery and vehicles. They can control triple COMNICA valves using contact input or joystick input or both. Using specially designed PC software (adjustment tool), the input/output curve for acceleration/deceleration which are essential for shockless operation, dither frequency and other characteristics can be adjusted. In terms of the power supply, two types—the G type for DC 12V and the H type for DC 24V—are available.

Features

1. Circuit board unit configuration (size: 150 x 152.5)
2. Adjustment of the input/output curves using software specially designed for the PC
   (For details, refer to the function column of the adjustment tool specifications.)

3. Excellent vibration resistance characteristics (JIS automobile standard satisfied).
4. Excellent resistance to power surge voltages specific to vehicles.

Model Code

PD3-***-*-10

| 1 | 2 | 3 | 4 |

1 Series: PD3
2 Specifications no.: 100

3 Power supply
   G: Used with DC 12 V (on-vehicle use)
   H: Used with DC 24 V (on-vehicle use)
4 Design no.

Specifications

PD3-100-G-10

Environmental conditions	Storage temperature: –30 to +70ºC
	Operating temperature: –20 to +60ºC
	Humidity:
	    Less than 90% RH (no formation of condensation)
	Resistance to vibration:
	    JIS D 1601-1995 Class 3 B
	    Vibration frequency range category 200
	    Vibration acceleration step category 45

Power input	Supply voltage: DC 9V to 15V Current consumption under no-load conditions: less than 0.2A (Voltage range: 9V to 15V)
Contact inputs	Selector, all activation stop, output stop, high-speed switching Input current: More than 5mA but under 10mA (9V to 15V) Threshold voltage: 2.5V to ±0.3V
Joystick input	Resolution: 10 bit Reference voltage: 4.8V to 5.2V (less than 10mA) Current limiting resistor: 220Ω±1% (Both + side and ground) Input voltage range: 0V to 5V

Proportional solenoid valve drive output	Maximum output current:
	    More than 1500mA (with 12V supply voltage)
	Degree of fluctuation for setting:
	    Power supply = 12V to 15V, less than ±5% over entire
	    temperature range
	Output shorting time:
	    Less than 0.5Ω load resistance at room temperature
	    Within 1 minute

Note: However, it is Tokyo Keiki's COMNICA valves (models with no installed amp, lead wire type and 12V specifications) which guarantee the performance aspects given above. Furthermore, when the supply voltage falls below 12V, there may be a reduction in the output current.

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Specifications

PD3-100-H-10

Environmental conditions	Storage temperature: −30 to +70°C Operating temperature: −20 to +60°C Humidity: 　Less than 90% RH (no formation of condensation) Resistance to vibration: JIS D 1601-1995 Class 3B 　Vibration frequency range category 200 　Vibration acceleration step category 45
Power input	Supply voltage: DC 18V to 30V Current consumption under no-load conditions: 　less than 0.2A (Voltage range: 18V to 30V)
Contact inputs	Selector, all activation stop, output stop, high-speed switching Input current: 5mA to 10mA (18V to 30V) Threshold voltage: 8V to ±1V
Joystick input	Resolution: 10 bit Reference voltage: 4.8V to 5.2V (less than 10mA) Current limiting resistor: 　220Ω±1% (Both + side and ground) Input voltage range: 0V to 5V
Proportional solenoid valve drive output	Maximum output current: 　More than 1500mA (with 24V supply voltage) Degree of fluctuation for setting: 　Power supply = 24V to 30V, less than ±5% over entire 　temperature range Output shorting time: 　Less than 0.5Ω load resistance at room temperature 　Within 1 minute

Note: However, it is Tokyo Keiki's COMNICA valves (models with no installed amp, lead wire type and 24V specifications) which guarantee the performance aspects given above. Furthermore, when the supply voltage falls below 24V, there may be a reduction in the output current.
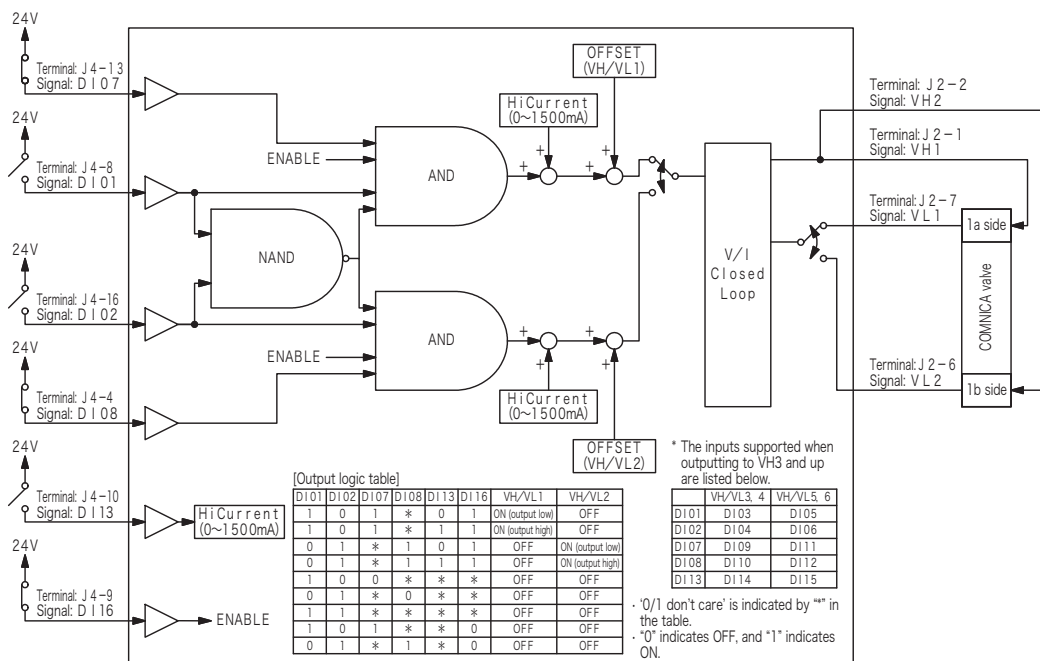
Description of pin functions

Signal	Function
DI01~06	VH/VL1 to VL6 output command inputs DI01 corresponds to VH/VL1 … DI06 corresponds to VH/VL6.
DI07~12	VH/VL1 to VL6 output prohibit inputs DI07 corresponds to VH/VL1 … DI12 corresponds to VH/VL6.
DI13~15	VH/VL1 to VL6 output current high/low switching inputs DI13 corresponds to VH/VL1&2 … DI15 corresponds to VH/VL5&6.
DI16	Enabled with all output enable signals and 24V input
AI1~3	Joystick (potentiometer) inputs AI1 corresponds to VH/VL1&2 … AI3 corresponds to VH/VL5&6.

Adjustment tool

Operating environment	• Operating system supported 　Windows95/98 • PC 　DOS/V compatible machine compliant with OADG 　CPU Intel MMX 　Pentium 166 MHz or faster • Memory 　64 MBytes or more
Function — (1) Setting functions	• Output gain and offset settings It is possible to set the output current offset and output current slope (output gain) that match the output current range in which the proportional control valves operate. • Dither frequency setting It is possible to set the dither frequency common to all the channels. • Setting of output current control range at the joystick input amount It is possible to set the output current that matches the input range of the joystick.
Function — (2) Remote output function	Regardless of the contact inputs or joystick inputs, the output current can be set directly from the PC, and the proportional control valves can be activated experimentally even when there is no input device.
Function — (3) Monitor function	The contact inputs, joystick inputs, supply voltage status, output current settings, etc. can be displayed to support debugging work in the system.

Note: The serial communication port (RS-232C) is used for the adjustment tool so provide a PC which is equipped with this kind of port.
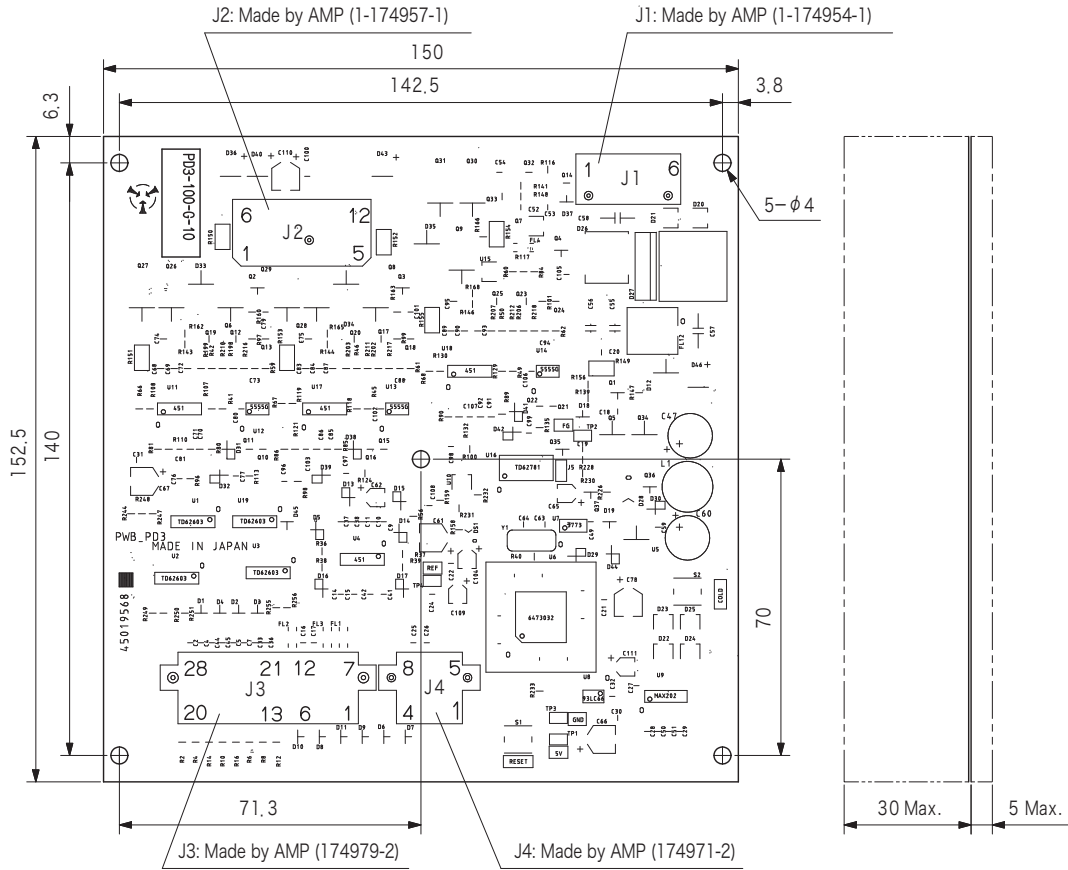
Block diagram of switch mode operations (PD3-100-H-10)

[Output logic table]

DI01	DI02	DI07	DI08	DI13	DI16	VH/VL1	VH/VL2
1	0	1	*	0	1	ON (output low)	OFF
1	0	1	*	1	1	ON (output high)	OFF
0	1	*	1	0	1	OFF	ON (output low)
0	1	*	1	1	1	OFF	ON (output high)
1	0	0	*	*	*	OFF	OFF
0	1	*	0	*	*	OFF	OFF
1	1	*	*	*	*	OFF	OFF
1	0	1	*	*	0	OFF	OFF
0	1	*	1	*	0	OFF	OFF

* The inputs supported when outputting to VH3 and up are listed below.

	VH/VL3, 4	VH/VL5, 6
	DI01	DI03	DI05
	DI02	DI04	DI06
	DI07	DI09	DI11
	DI08	DI10	DI12
	DI13	DI14	DI15

· '0/1 don't care' is indicated by "*" in the table.
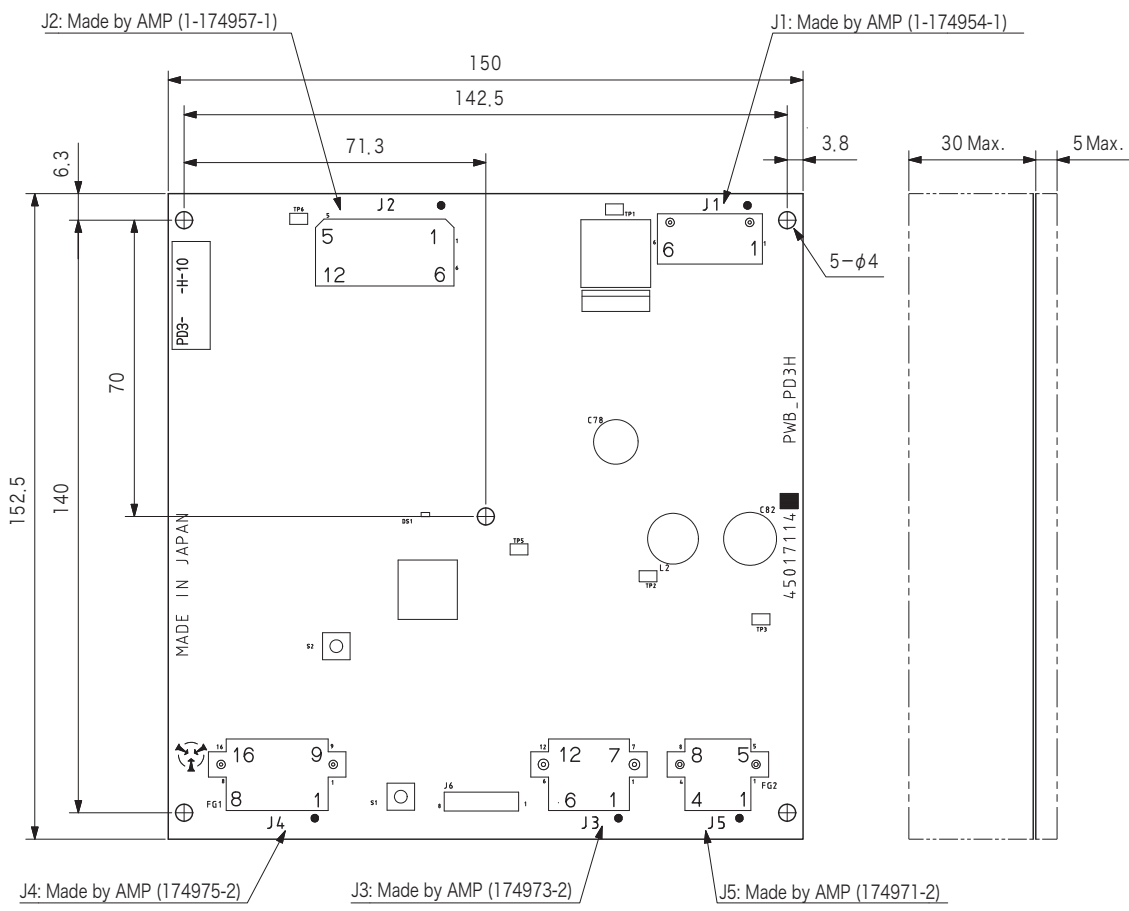· "0" indicates OFF, and "1" indicates ON.

Note: • The block diagram presented above is a reference example for the H type.
　　　• There is no compatibility in the signals between the G type and H type so do not use the connections shown above for the G type.

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PD3-100-G-10

J2: Made by AMP (1-174957-1) J1: Made by AMP (1-174954-1)

150
142.5
3.8
6.3
152.5
140
70
5-φ4
PD3-100-G-10
J2
J1
6 12
1 5
1 6
PWB_PD3
MADE IN JAPAN
45019568
28 21 12 7   8   5
J3   J4
20   13 6 1   4   1
71.3
30 Max.
5 Max.

J3: Made by AMP (174979-2)   J4: Made by AMP (174971-2)

PD3-100-H-10

J2: Made by AMP (1-174957-1) J1: Made by AMP (1-174954-1)

150
142.5
71.3
3.8
30 Max.
5 Max.
6.3
70
152.5
140
5-φ4
PD3-H-10
J2
5   1
12   6
J1
6   1
PWB_PD3H
MADE IN JAPAN
45017114
16   9   12 7   8   5
8   1   6 1   4   1
FG1   J4   J3   J5   FG2

J4: Made by AMP (174975-2)   J3: Made by AMP (174973-2)   J5: Made by AMP (174971-2)

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