Small Type Multi-function Power Amplifier

Features

This compact, multi-function power amplifier uses advanced hybrid integrated circuits (HIC).

- Compact design — Less than half the size of previous models
- High reliability — Circuit board configuration eliminates the need for wiring.
- Multi-function
  - · Simultaneous driving of two valves
  - · Controller with built-in amplifier (EDC-PC6-AWZ-D2-20)
  - · Dither frequency selection function (From Designs 11, 20)

Specifications

Item \ Model No.	EDA-PD1-NWZ-D2-11	EDC-PC6-AWZ-D2-20
Function	Amp Type	Amp/Controller Type
Input type	1 DC inputs	Contacts, 6 inputs, DC 2 inputs
Maximum Output Current	900mA (20Ω solenoid)	900mA (20Ω solenoid)
Input voltage	–10 to + 10VDC	0 to + 10VDC
Input Impedance	50kΩ	50kΩ
Externally Set Variable Resistance	10kΩ	10kΩ
Drive Solenoid	SOL a, SOL b	SOL 1, SOL 2
Zero Adjust (NULL)	0 to 900mA	0 to 900mA
Gain Adjust (GAIN)	0 to $\frac{900mA}{2.5V}$	0 to $\frac{900mA}{2.5V}$
External power supply	+ 5VDC (5mA) - 5VDC (5mA)	+ 5VDC (10mA)
Time Lag (LAG)	0 to 2sec	0 to 2sec
Dither Frequency (DITHER)	80 to 250Hz	80 to 250Hz
Power Supply Voltage	DC24V (DC22 to 30V)	DC24V (DC22 to 30V)
Power Consumption	30VA	60VA
Allowable Ambient Temperature	0 to 50°C	0 to 50°C
Temperature Drift	0.2mA/°C max.	0.2mA/°C max.
Weight	0.3kg	0.4kg
Driven Valve	Pressure, flow, direction control valves	Pressure, flow, direction control valves

●Handling

1 When selecting a location, avoid areas subject to high temperatures and high humidity, and select an area where there is little vibration and dust.

2 Use shielded wire for the analog signal and valve output signal wires. See page I-33 for general precautions.

3 The brightness of the LED changes in accordance with the size of the output current.

Explanation of model No.

(1) Amp Type

ED A – P D 1 – N W Z – (□) – D2 – 11

- 11: Design number
- D2: Voltage symbol D2 : DC24V
- (□): Auxiliary symbol

None	1-rotation adjustor knob
D	3-rotation adjustor knob (1-rotation trimmer for dither)

- Z: With case
- W: 4-direction valve drive possible
- N: Standard type
- 1: Number of inputs 1: 1 input
- D: Amp DC input
- P: Panel type
- A: Amp type
- ED: Small type, multi-function power amp

(2) Amp/Controller Type

ED C – P C 6 – A W Z – (□□□) – D2 – 20

- 20: Design number
- D2: Voltage symbol D2 : DC24V
- (□□□): Auxiliary symbol (Up to four characters can be combined in alphabetic sequence.)

None	1-rotation adjustor knob Variable TIMER Range: 0.1 to 2 seconds
D	3-rotation trimmer for controller block LEVEL, TIME, TOFF only
E	3-rotation for amp block GAIN, NULL, OFFSET, LAG only
F	3-rotation trimmer for controller/amp block LEVEL, TIME, TOFF, GAIN, NULL, OFFSET, LAG
T5	Variable TIMER Range: 0.5 to 5 seconds
T10	Variable TIMER Range: 1 to 10 seconds.

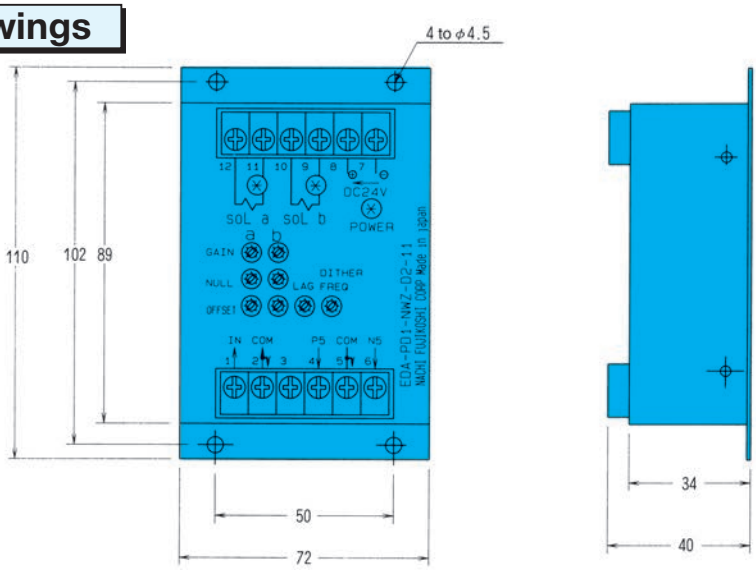
Note) D, E, F designs all have 1-rotation trimmer.

- Z: With case
- W: 4-direction valve drive possible
- A: With acceleration timer
- 6: Number of inputs 6: 6 input
- C: Controller type contact input
- P: Panel type
- C: Controller type
- ED: Small type, multi-function power amp

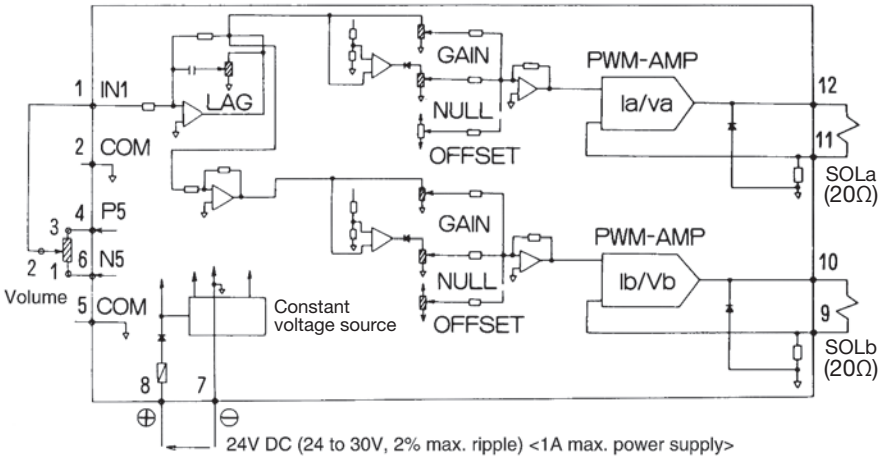
Installation Dimension Drawings

EDA-PD1-NWZ-D2-11

No.	Name	No.	Name
1	Input signal terminal IN1	7	- DC24V
2	Input signal terminal COM	8	+ DC24V
3		9	Output terminal to valve
4	External power supply P5	10	SOL b
5	Input signal terminal COM	11	Output terminal to valve
6	External power supply N5	12	SOL a



Block Diagram



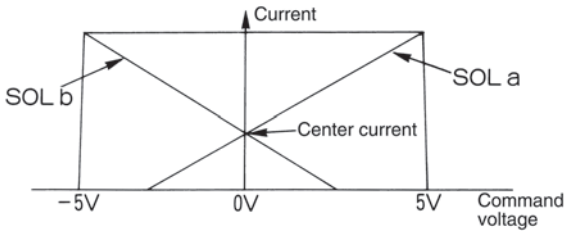
- Current is supplied to SOL a when input signal voltage polarity is positive, and to SOL b when negative. Either SOL a or SOL b can be driven at any one time.
- Push-pull drive is also supported.
- To measure current, measure the voltage at SOL a terminal 11 and SOL b terminal 9, using terminal 5 as reference. The voltage across the 0.5Ω current detection resistor at 1A is 0.5V. Use a measurement device with an input impedance of at least 1MΩ.
- To use SOL a only, connect terminal 1 of the knob to amp terminal 2, use an input voltage range of 0 to 5V. (ER, ES only)

Application Examples

1 Adjusting Push-pull Drive for a Special Proportional Valve (Special Specification Direction Control Valve)

a) Overlap Type Proportional Valve ESD-G01-C5$^{10}_{20}$-6333D…300mA(Center Current)

b) Zero-Lap Type Proportional Valve ESD-G01-C5$^{10}_{20}$-6586C…200mA(Center Current)



As shown in the figure to the left, push-pull control aims at increasing response at the zero point by simultaneously energizing both solenoids.

Adjustment Procedure

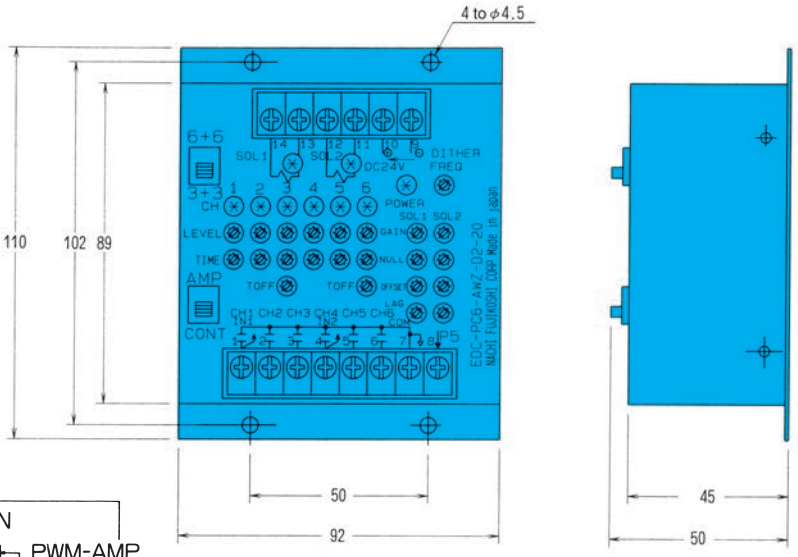
1) NULL, GAIN, OFFSET, LAG
   Rotate all seven knobs counterclockwise as far as they will go.
2) Without any connection between terminals ① and ②, use the OFFSET knob to simultaneously energize SOL a and SOL b as follows.
   SOL a 300mA (200mA)
   SOL b 300mA (200mA)
3) Next, apply +5V to terminal ① (connecting ① and ④), and set the SOL a GAIN knob to the following.
   SOL a 850mA
   SOL b 300mA
   For the SOL b current here, SOL b GAIN should be fully rotated counterclockwise, and its setting should not be changed.
4) Apply −5V to terminal ① (connecting ① and ⑥), and set the SOL b GAIN knob for the following.
   SOL a 0mA
   SOL b 850mA

This completes the setting procedure.

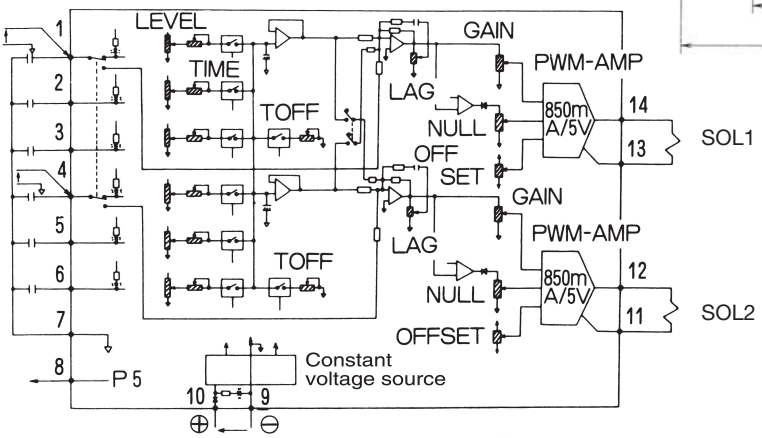
- The three LAG and NULL knobs should be left rotated fully counterclockwise. There is no need to change their settings.
- EDA-PD1-NWZ-D2-11 is configured with a feedback system, so it does not have a feedback gain adjustment function. In this case, use EDA-PD1-NWZ-D2-11 in combination with the EA-PD4-D10-*-10 NACHI servo amp.

EDC-PC6-AWZ-D2-20

No.	Name	No.	Name
1	CH1 select terminal / Input signal terminal	7	COM
		8	External power supply P5
2	CH2 select terminal	9	- DC24V
3	CH3 select terminal	10	+ DC24V
4	CH4 select terminal / Input signal terminal	11	Output terminal to valve SOL 2
		12	
5	CH5 select terminal	13	Output terminal to valve SOL 1
6	CH6 select terminal	14	



Block Diagram

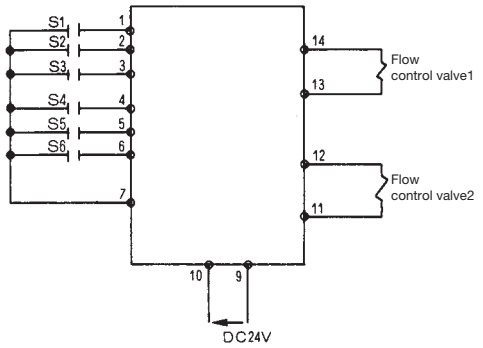


24V DC (24 to 30V, 2% max. ripple) <2A max. power supply>

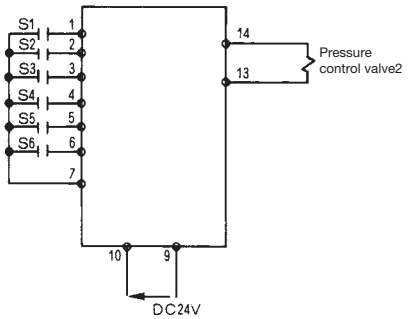
- Dual simultaneous output to SOL 1 and SOL 2 is supported.
- To measure current, measure the voltage at SOL a terminal 13 and SOL b terminal 1, using terminal 7 as reference. The voltage across the 0.5Ω current detection resistor at 1A is 0.5V. Use a measurement device with an input impedance of at least 1MΩ.

Application Examples

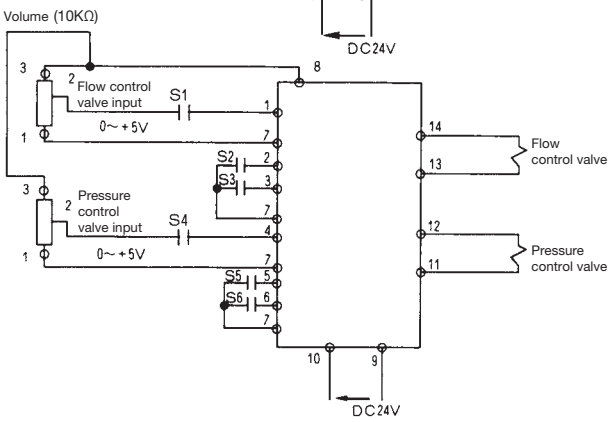
1) Switch Position
- CONT
- 3+3



2) Switch Position
- CONT
- 6+6



3) Switch Position
- AMP
- 3+3



- Simultaneous control using two flow control valves (3-speed)

  As shown in the diagram to the left, flow control 1 speed is controlled with CH1 LEVEL when CH1 and CH2 are turned on at the same time.

  Next, flow control valve 2 speed is controlled by CH4 LEVEL, and simultaneous control is possible by adjusting flow control valve 1 speed in the same way. 3-speed synchronous control is possible by grouping CH1 through CH3 and CH4 thorough CH6.
- Pressure control valve 6-pressure control

  As shown in the diagram to the left, this amplifier can be use as a 6-channel controller for a single pressure control valve.

  Minimum pressure at this time is in accordance with the setting of the OFFSET knob. The NULL knob cannot be used to configure settings unless a channel is selected.
- 2-output amplifier for simultaneous control of load-sensitive system pressure and flow rate

  As shown in the diagram to the left, 0 to +5V input and channel CH2 or CH3 input are added together and output to the flow control valve.

  Likewise, 0 to +5V and CH5 or CH6 input is added together and output to the pressure control valve.