

Power Amplifiers For 40Ω Series Flow Control Valves

These power amplifiers are used to drive the 40Ω series proportional electro-hydraulic flow control valves.

Model Number Designation

AME	-D	-40	-100	-40
Series Number	Type of Function	Coil Resistance of Valve	Power Supply	Design Number
AME	D: DC Input Type	40: 40 Ω	100: 100 V AC 200: 200 V AC	40

AME	-DF	-S	-100	-22
Series Number	Type of Function	Type of Mounting	Power Supply	Design Number
AME	DF: DC Input Feedback Type	S: Panel Mounting Type	100: 100 V AC	22
	T: Slow Up Down Type		200: 200/220 V AC	22



Applicable to Valve

Name of Valve	Model Numbers
40 Ω Series Flow Control Valves	EFG -02 (31 Design) EFCG
	EFG -03 (26 Design) EFCG
	EFG -06 (22 Design) EFCG
	EFG -10 (11 Design) EFCG

Specifications

Model No.	AME-D-40-* -40	AME-DF-S-* -22	AME-T-S-* -22
Description			
Type of Function	DC Input Type	DC Input Feedback Type	Slow Up Down Type
Max. Output Current	0.8 A (40 Ω Solenoid)	0.8 A (40 Ω Solenoid)	0.8 A (40 Ω Solenoid)
Max. Input Voltage	+ 10 V DC	+ 10 V DC	—
Feedback Voltage	—	0 to -10 V	—
Input Impedance	10 kΩ	50 kΩ	—
Slow Up Down Range	—	—	0.05 – 1 s/100 mA
Max. Gain	0.8 A / 5 V	0.8 A / 5 V	—
Dither	Fix	Fix	Fix
Temperature Drift (Max.)	0.2 mA /°C	0.2 mA /°C	0.2 mA /°C
Power Supply	100 V AC, 200/220 V AC ±10% (50/60 Hz)		
Power Input (Max.)	70 VA	90 VA	90 VA
Ambient Temperature	0–50°C (32–122°F)	0 – 50°C (32 – 122°F)	0 – 50°C (32 – 122°F)
External Setting Resistance	1 kΩ	1 kΩ	—
Approx. Mass	2.8 kg (6.2 lbs.)	4.5 kg (9.9 lbs.)	4.5 kg (9.9 lbs.)

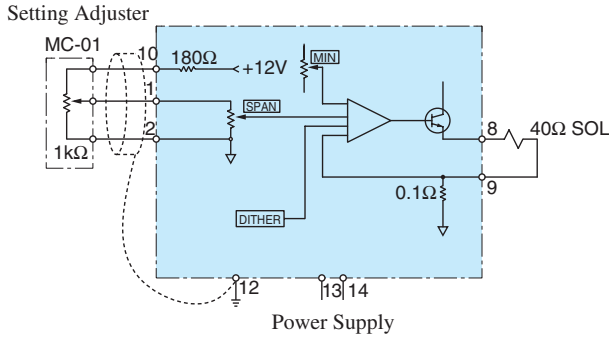
Instructions

Power supply of the outside setting adjuster

When DC input type (AME-D-40) or DC input-feedback type (AME-DF-S) power amplifier is used, power supply for the setting adjuster can be provided from this power amplifier, but for only one. However, please use the variable resistor or potentiometre of which impedance is 1 kΩ for the setting adjuster.

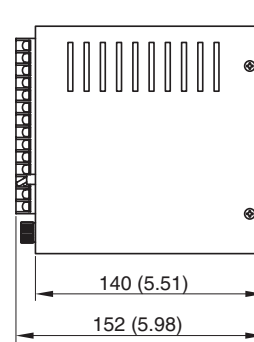
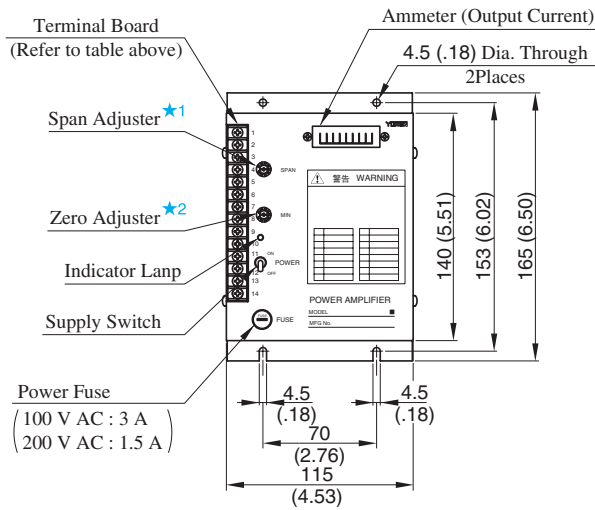
AME-D-40- *-40

[Example Diagram]



● Detail of Terminal Board

Terminal Number	Name	
1	Input Signal	IN
2	Input Signal	COM
3		—
4		—
5	Internal Power Supply	-5V
6	Feedback Signal	MFB
7	Feedback Signal	COM
8	Output to Valve Solenoid	SOL
9		—
10	Internal Power Supply	+12V
11		—
12	Frame Ground	FG
13	Power Supply	VAC
14	Power Supply	VAC

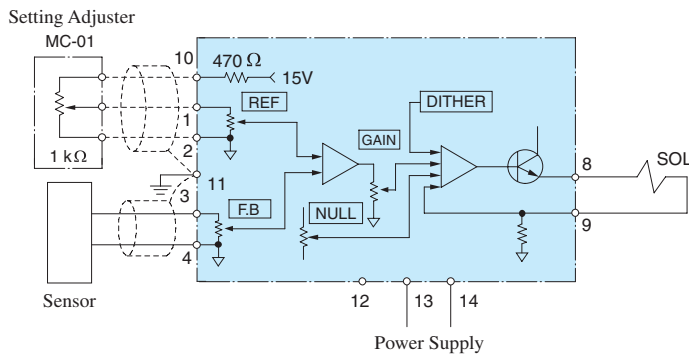


- ★1. Adjustment of upper limit of usable range
- ★2. Adjustment of lower limit of usable range

DIMENSIONS IN
MILLIMETRES (INCHES)

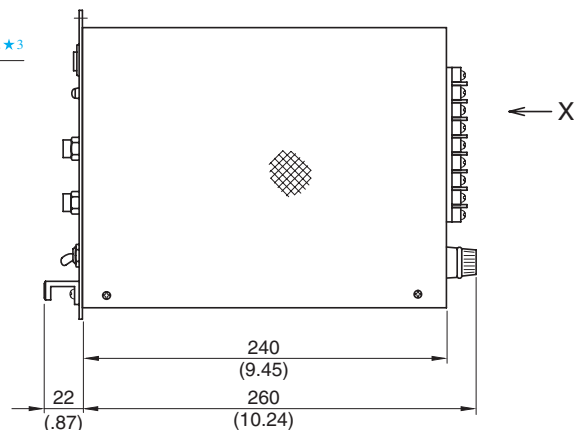
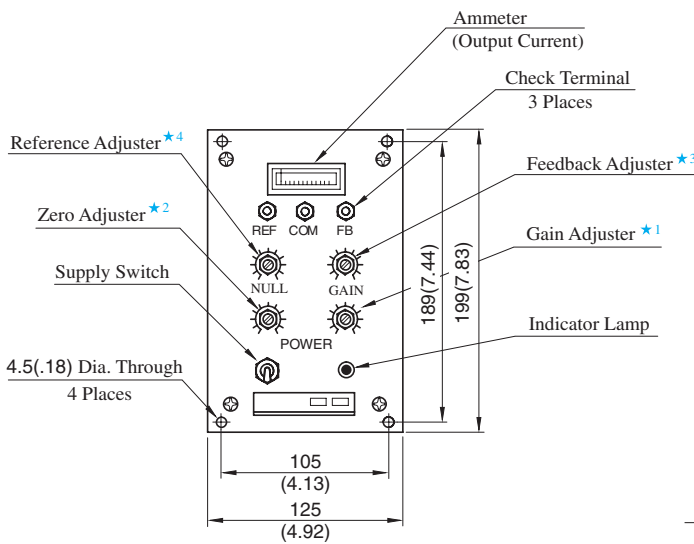
AME-DF-S-*-22

[Example Diagram]



● Detail of Terminal Board

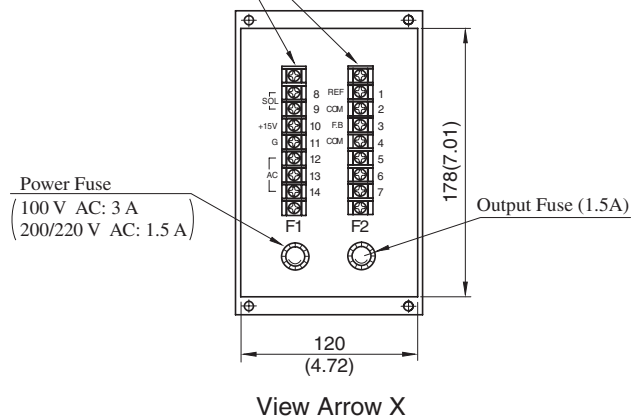
Terminal Number	Name	
1	Input Signal REF	
2	Input Signal COM	
3	Feedback Signal F.B	
4	Feedback Signal COM	
5	—	
6	—	
7	—	
8	Output to Valve Solenoid SOL	
9		
10	Power Supply for Setting Adjuster (10 V at 1 kΩ) +15 V	
11	Ground G	
12	Power Supply	
13		100 V AC, 200 V AC: 13, 14
14		220 V AC: 12, 14



- ★ 1. Adjustment of upper limit of usable range
- ★ 2. Adjustment of lower limit of usable range
- ★ 3. Adjustment of feedback voltage ratio
- ★ 4. Adjustment of input voltage ratio

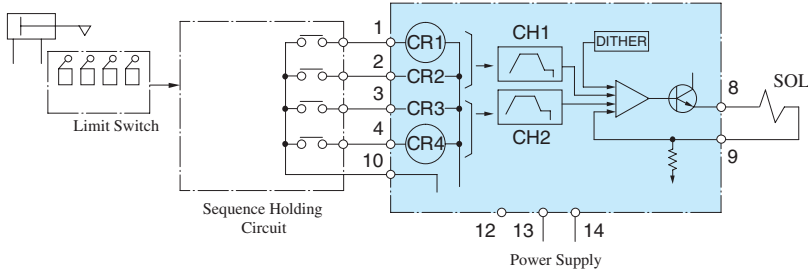
DIMENSIONS IN MILLIMETRES (INCHES)

Terminal Board (Refer to table above)



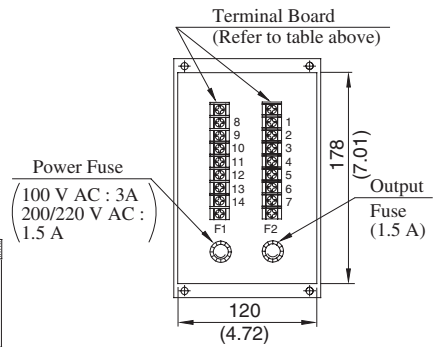
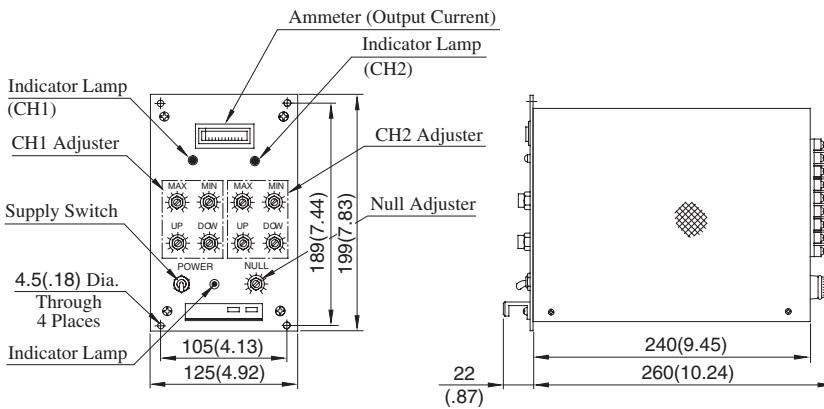
AME-T-S-*-22

[Example Diagram]

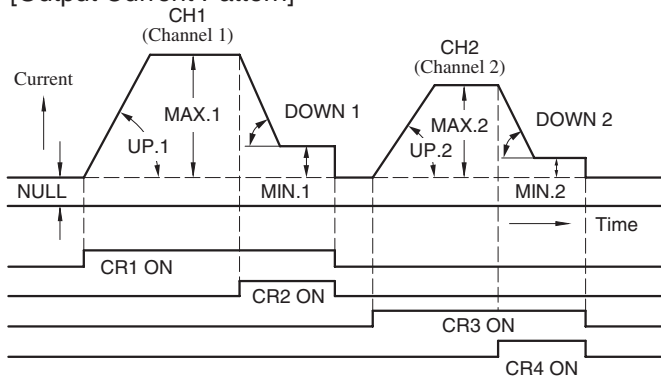


● Detail of Terminal Board

Terminal Number	Name	
1	Input Command	CR1
2	Input Command	CR2
3	Input Command	CR3
4	Input Command	CR4
5	—	
6	—	
7	—	
8	—	
9	Output to Valve Solenoid	SOL
10	Input Command	CR.COM
11	Ground	G
12	Power Supply	
13		100 V AC, 200 V AC: 13, 14
14		220 V AC: 12, 14



[Output Current Pattern]



DIMENSIONS IN MILLIMETRES (INCHES)

Terminal
 1 & 10 in Short-Circuit
 2 & 10 in Short-Circuit
 3 & 10 in Short-Circuit
 4 & 10 in Short-Circuit

- Note: 1. CR1 to CR4: Relays in the power amplifier.
 The output patterns CH1 and CH2 can not be obtained simultaneously nor can they be transmitted halfway to another pattern.
 2. The words such as MAX, MIN, UP and DOWN show the volume adjustment of the power amplifier.

How to Calculate Accelerating and Decelerating Time (Example)

Question: Wish to accelerate and decelerate the actuator in between 5 L/min (1.32 U.S. GPM) and 25 L/min (6.6 U.S. GPM) in the use of proportional flow control valve model EFG-02-30-31*.
In such case, what are the manimum and minimun time adjustable for the acceleration and deceleration?

Answer: The input current for EFG-02-30-31* at the flow rate of 5 L/min (1.32 U.S. GPM) and 25 L/min (6.6 U.S. GPM) can be obtained respectively from the chart below. The chart shows:

Input current at 5 L/min (1.32 U.S. GPM) 300 mA
Input current at 25 L/min (6.6 U.S. GPM) 520 mA

Then, the difference between the above two can be obtained with the following formula:

$$520 \text{ mA} - 300 \text{ mA} = 220 \text{ mA}$$

While, the specification for the model AME-T-S shows the amplifier's gradient for acceleration or deceleration as being between 0.05 s/100 mA and 1.0 s/100 mA (which means that the minimum time is 0.05 second and the maximum time is 1.0 second for every 100 mA variation).

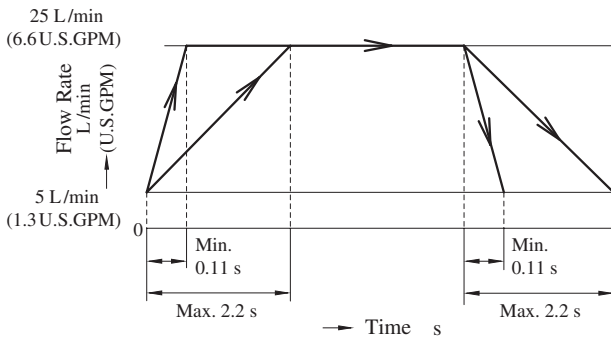
Therefore, the minimum and maximum adjustable time can be obtained as follows:

$$\frac{220 \text{ mA}}{100 \text{ mA}} \times 0.05 \text{ second} = 0.11 \text{ second (Minimum)}$$

$$\frac{220 \text{ mA}}{100 \text{ mA}} \times 1.0 \text{ second} = 2.2 \text{ second (Maximum)}$$

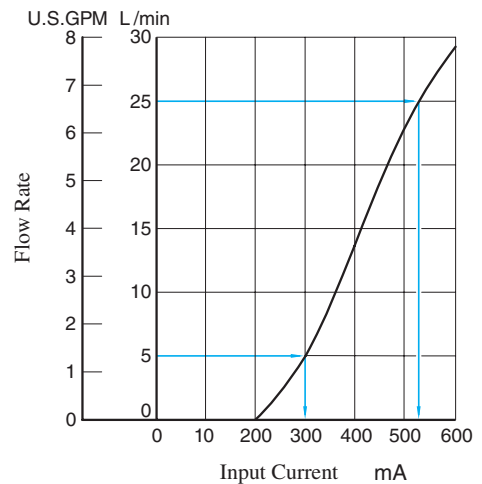
The result above are as illustrated on the below.

[Flow Pattern]



[Input Current vs. Flow]

EFG-02



Interchangeability in Installation Current and New Design

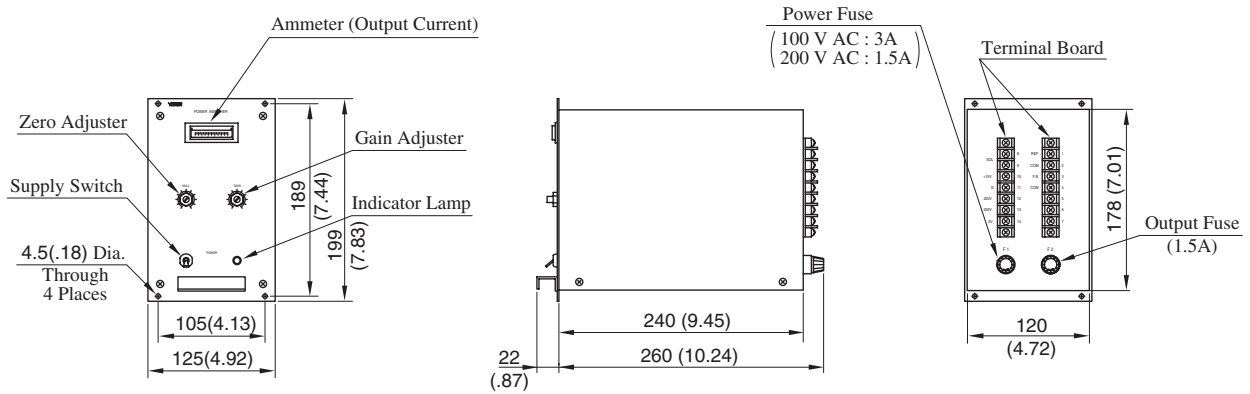
Specification

Electricity consumption is different by Current and New Design.
The other specifications remain unchanged.

Electricity Consumption	
Current : 32 Design	New : 40 Design
90 VA	70 VA

Installation Interchangeability : None

AME-D-S-* -32



DIMENSIONS IN MILLIMETRES (INCHES)

AME-D-40-* -40

