These power amplifiers are used to drive the 10Ω series proportional electro-hydraulic pressure and flow control valves.

Model Number Designation

AME	-D	-10	-100	-20
Series Number	Type of Function	Coil Resistance of Valve	Power Supply	Design Number
AME	**D :** DC Input Type	**10 :** 10 Ω	**100 :** 100 V AC **200 :** 200 V AC	**20**

SK1022	-A	-100	-11
Series Number	Type of Function	Power Supply	Design Number
SK1022 : DC Input-Feedback Type	**A :** Polarity of Feedback Voltage...(-) **B :** Polarity of Feedback Voltage...(+)	**100 :** 100 V AC **200 :** 200/220 V AC	**11**
SK1015 : DC Input Type for DC Power Supply	———	———★	**11**

★ Use with 24 V DC since this is for a battery power supply.

Applicable to Valve

Name of Valve	Model Numbers
Pilot Relief Valves	EDG-01∗
Relief Valves	EBG-03 EBG-06 EBG-10
Reducing and Relieving Valves	ERBG-06 ERBG-10
10Ω Series Flow Control Valves	EFG - 03 EFCG - 06
10Ω-10Ω Series High Flow Series Flow Control and Relief Valves	EFBG-03 EFBG-06 EFBG-10

H

Specifications

Description \ Model No.	AME-D-10-∗-20	SK1022-A-∗-11	SK1022-B-∗-11	SK1015-11
Type of Fuction	DC Input Type	DC Input Feedback Type	DC Input Feedback Type	DC Input Type
Max. Output Current	1 A (10Ω Solenoid)	1 A (10Ω Solenoid)	1 A (10Ω Solenoid)	0.9 A (10Ω Solenoid)
Max. Input Voltage	+ 10 V DC	+ 10 V DC	+ 10 V DC	+ 10 V DC
Feedback Voltage	—	0 to -10V	0 to +10V	—
Input Impedance	10 kΩ	50 kΩ	50 kΩ	50 kΩ
Max. Gain	1 A / 5 V	1 A / 0.5 V	1 A / 0.5 V	0.9 A / 5 V
Dither	Variable	Fix	Fix	Fix
Temperature Drift (Max.)	0.2 mA /°C	0.2 mA /°C	0.2 mA /°C	1 mA /°C
Power Supply	100 V AC, 200 V AC (50/60 Hz)★	100 V AC, 200/220 V AC ±10% (50/60 Hz)		22-30 V DC
Power Input (Max.)	55 VA	45 VA	45 VA	25 VA
Ambient Temperature	0-50°C (32-122°F)	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	1 kΩ	10 kΩ
Approx. Mass	2.1 kg (4.6 lbs.)	4.5 kg (9.9 lbs.)	4.5 kg (9.9 lbs.)	0.4 kg (.88 lbs.)

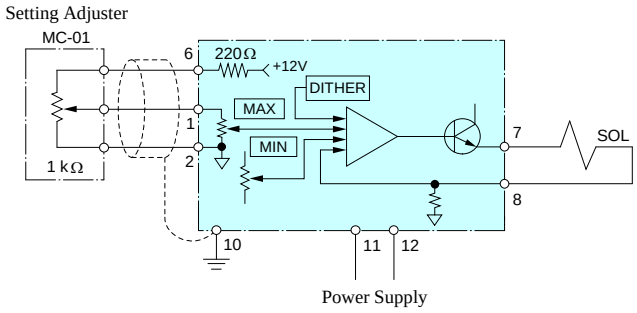
★ Serviceable Range; 100 V AC can be used from 90 to 132 V AC, 200 V AC can be used from 180 to 264 V AC.

Instructions

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 (in case of model SK1015, use 10 kΩ) for the setting adjuster.

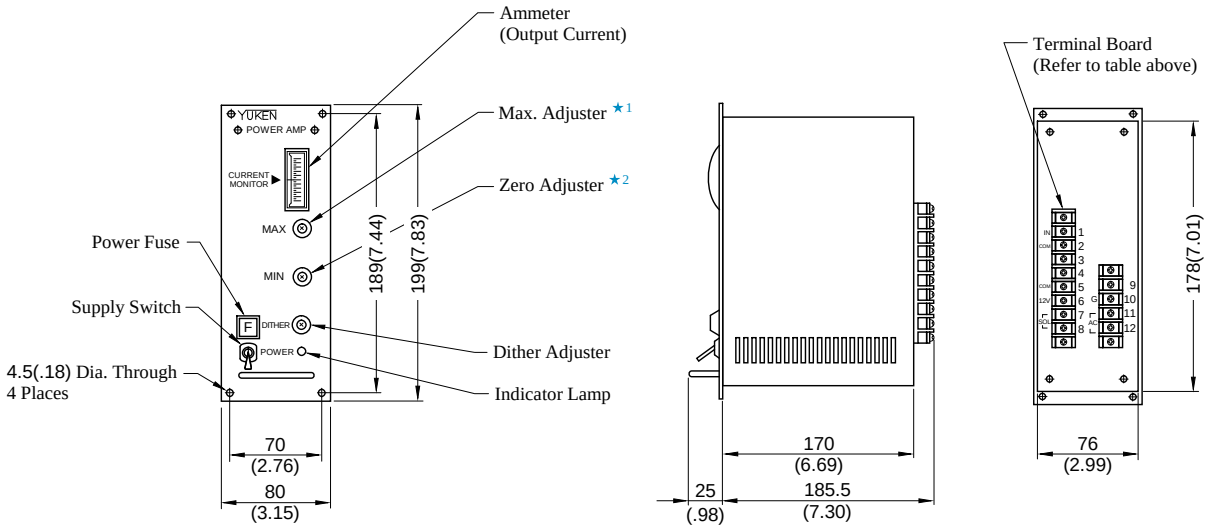
AME-D-10-∗-20

[Example Diagram]



Terminal Board

Terminal Number	Name	
1	Input Signal	IN
2	Input Signal	COM
3	—	
4	—	
5	Input Signal	COM
6	Internal Power Supply (10 V at 1 kΩ)	+12 V
7	Output to Valve Solenoid	SOL
8		
9	—	
10	Ground	G
11	Power Supply 100/200 V AC	
12		

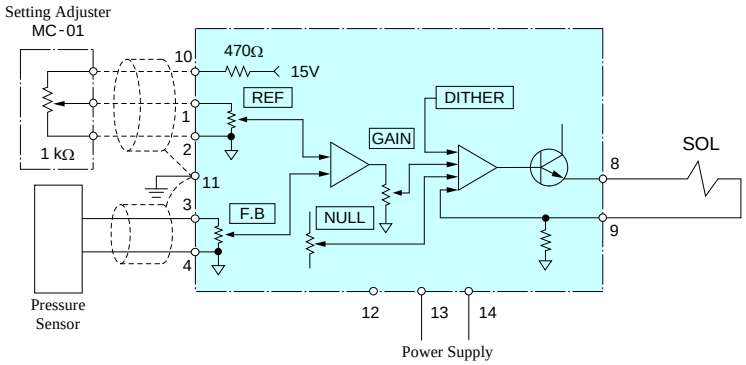


★1. Adjustment of upper limit of usable range
★2. Adjustment of lower limit of usable range

DIMENSIONS IN MILLIMETRES (INCHES)

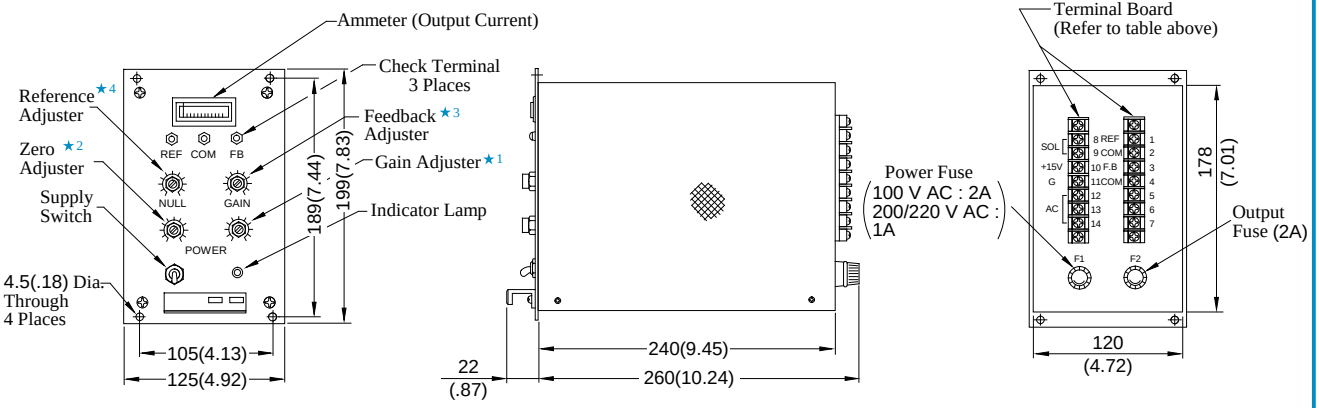
SK1022-$\frac{A}{B}$-∗-11

[Example Diagram]



● 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)	+15V
11	Ground	G
12	Power Supply 100 V AC, 200V AC : 13, 14 220 V AC : 12, 14	
13		
14		

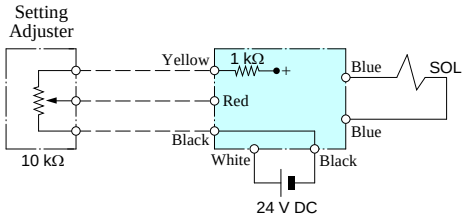


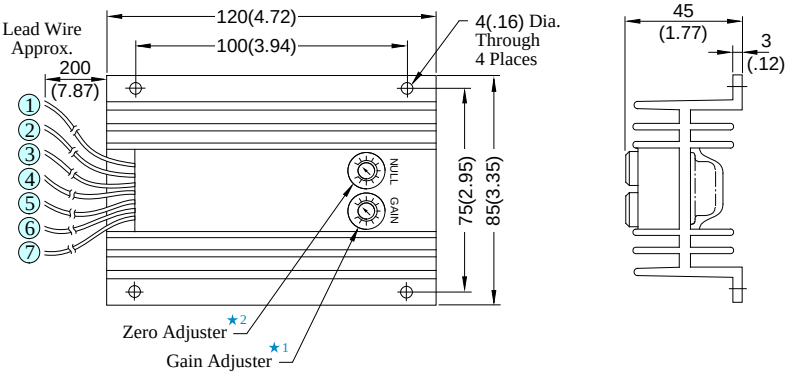
★1. Adjustment of upper limit of usable range
★2. Adjustment of lower limit of usable range
★3. Adjustment of feedback voltage ratio
★4. Adjustment of input voltage ratio

DIMENSIONS IN MILLIMETRES (INCHES)

SK1015-11

[Example Diagram]





● Lead Wire Detail

① White.....Plus of 24 V DC
② Black.....Zero of 24 V DC
③ Blue.....
④ Blue..... } Output to Valve Solenoid
⑤ Yellow.....15 V Power Supply for Setting Adjuster (10 V at 10 kΩ)
⑥ Red.....Input Signal
⑦ Black.....Zero of Input Signal

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

H

Compact power amplifiers for 10Ω proportional solenoids. The power supply is 24 V DC. It uses a new circuitry to be slow to heat.

Model Number Designation

AMN	-D	-10
Series Number	Type of Function	Design Number
AMN	D : DC Input Type	10

Specifications

Model No. / Description	AMN-D-10
Type of Function	DC Input Type
Max. Output Current	1 A (10Ω Solenoid)
Power Input (Max.)	+ 10 V DC
Input Impedance	10 kΩ
Max. Gain	1 A / 5 V
Dither	Variable
Temperature Drift (Max.)	0.2 mA /°C
Power Supply	24 V DC (20 - 30 V DC)
Max. Input Power	25 W
Ambient Temperature	0 - 50°C (32 - 122°F)
External Setting Resistance	1 kΩ
Approx. Mass	0.2 kg (.44 lbs.)

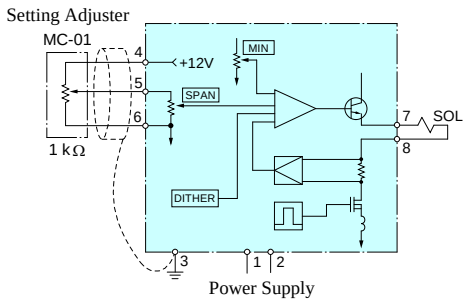
Applicable to Valve

Name of Valve	Model Numbers
Pilot Relief Valves	EDG-01∗
Relief Valves	EBG-03 EBG-06 EBG-10
Reducing and Relieving Valves	ERBG-06 ERBG-10
10Ω Series Flow Control Valves	EFG - 03 EFCG - 06
10Ω-10Ω Series High Flow Series Flow Control and Relief Valves	EFBG-03 EFBG-06 EFBG-10

AMN-D-10

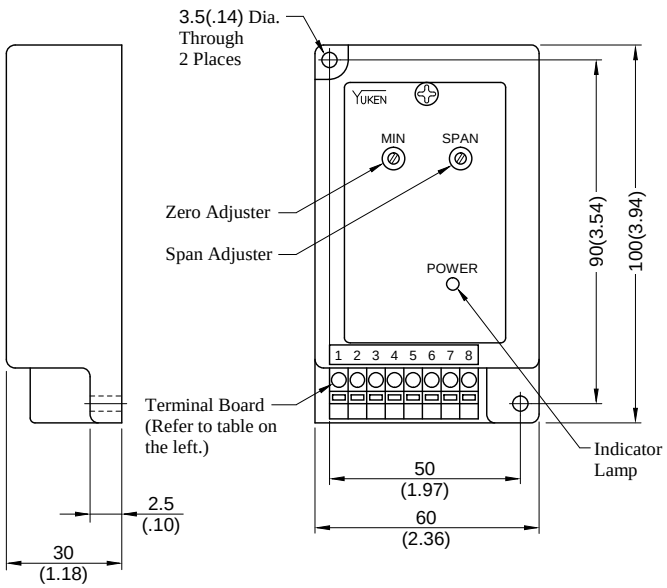
DIMENSIONS IN MILLIMETRES (INCHES)

[Example Diagram]



Terminal Board

Terminal Number	Name	
1	Power Supply	+24 V
2	Power Supply	0 V
3	Ground	G
4	Internal Power Supply	+12 V
5	Input Signal	IN
6	Input Signal	COM
7	Output to Valve Solenoid	SOL
8		



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

Model Number Designation

AME	-D	-S	-100	-32
Series Number	Type of Function	Type of Mounting	Power Supply	Design Number
AME	**D :** DC Input Type	**S :** Panel Mounting Type	**100 :** 100 V AC **200 :** 200/220 V AC	**32**
	DF : DC Input Feedback Type			**22**
	T : Slow Up Down Type			**22**

Applicable to Valve

Name of Valve	Model Numbers
40Ω Series Flow Control Valve	EFG EFCG -02/03/06/10
40Ω-10Ω Series Flow Control and Relief Valve	EFBG-03/06/10

Specifications

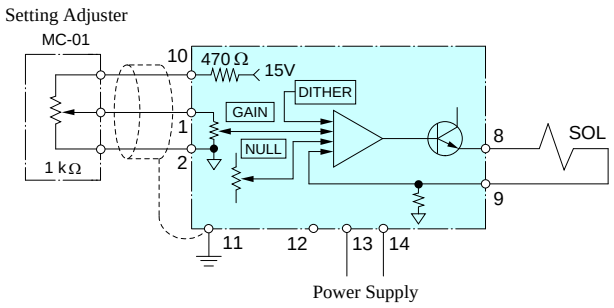
Model No. / Description	AME-D-S-∗-32	AME-DF-S-∗-22	AME-T-S-∗-22
Type of Function	DC Input Type	DC Input Feedback Type	Slow Up Down Type
Max. Output Current	0.8 A (40Ω Solenoid)	0.8 A (40Ω Solenoid)	0.8 A (40Ω Solenoid)
Max. Input Voltage	+ 10 V DC	+ 10 V DC	—
Feedback Voltage	—	0 to -10 V	—
Input Impedance	10 kΩ	50 kΩ	—
Slow Up Down Range	—	—	0.05 to 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.)	90 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	4.5 kg (9.9 lbs.)	4.5 kg (9.9 lbs.)	4.5 kg (9.9 lbs.)

Instructions

When DC input type (AME-D-S) 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.

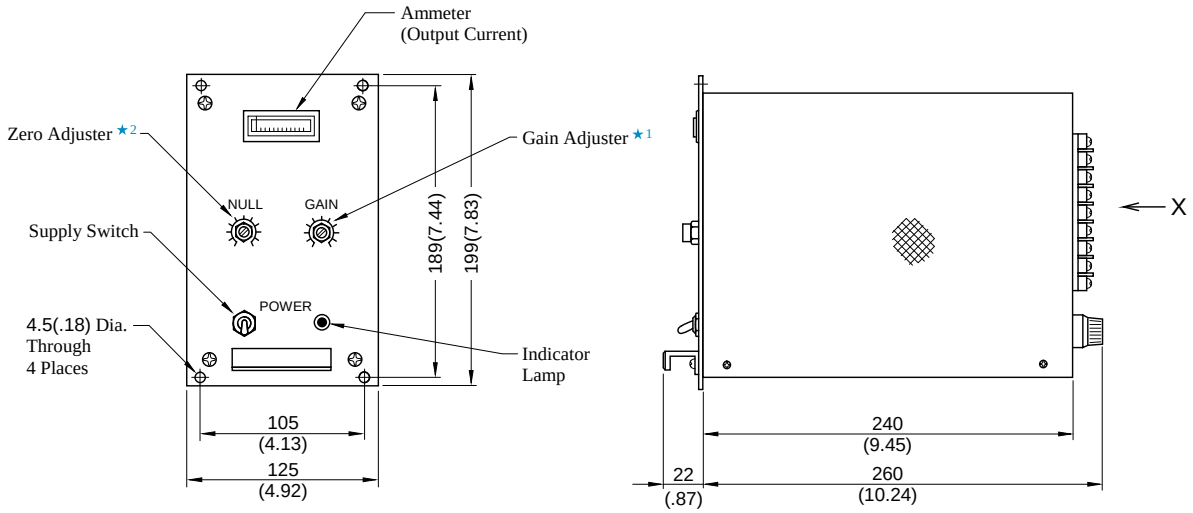
AME-D-S-∗-32

[Example Diagram]



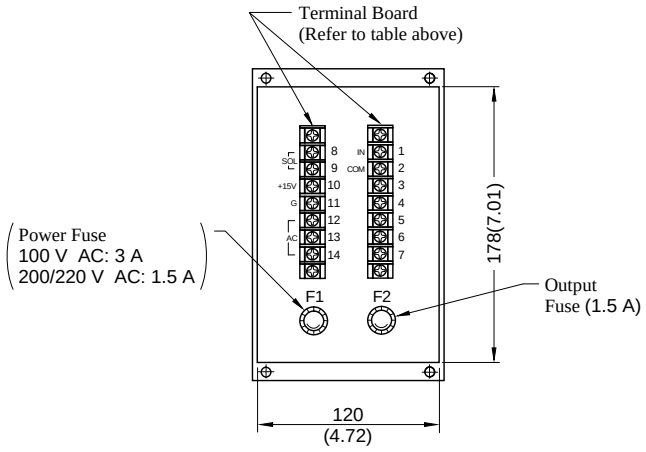
● Terminal Board

Terminal Number	Name	
1	Input Signal	IN
2	Input Signal	COM
3	—	
4	—	
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 100 V AC, 200 V AC: 13, 14 220 V AC: 12, 14	
13		
14		



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

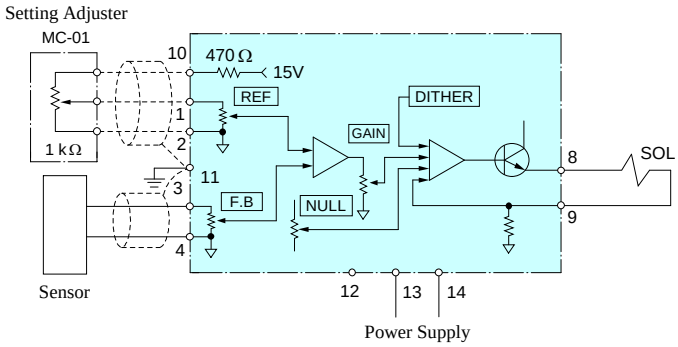
DIMENSIONS IN MILLIMETRES (INCHES)



View Arrow X

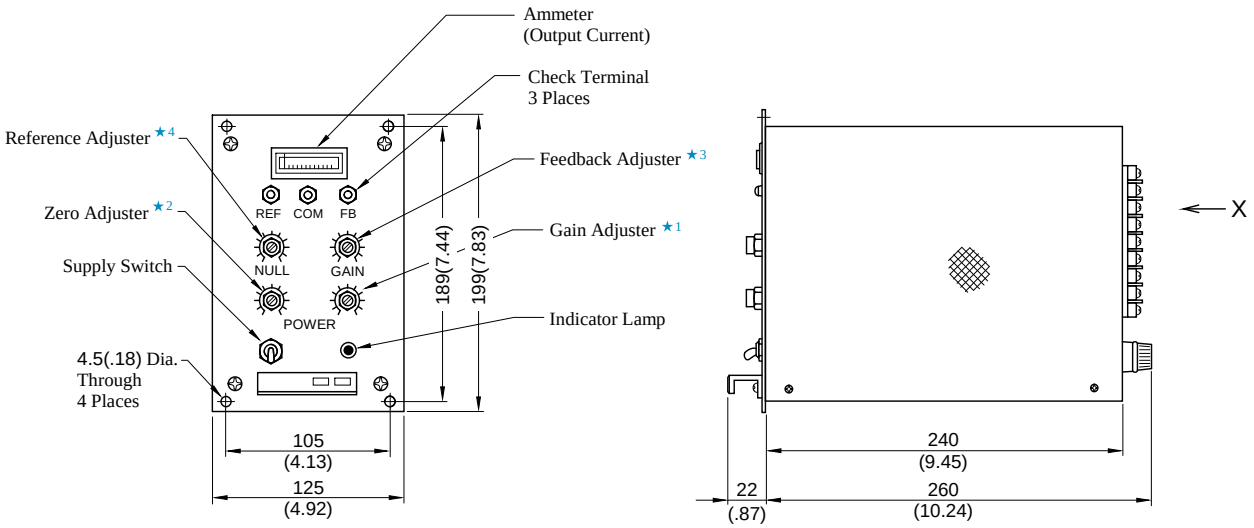
AME-DF-S-∗-22

[Example Diagram]



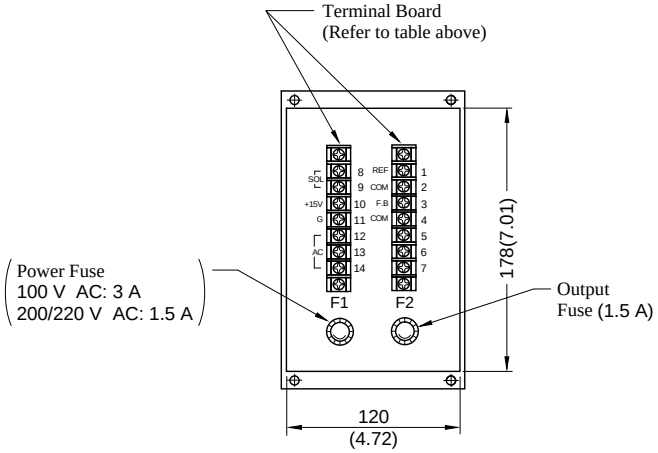
● Terminal Board

Terminal Number	Name	
1	Input Signal	IN
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 100 V AC, 200 V AC: 13, 14 220 V AC: 12, 14	
13		
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)

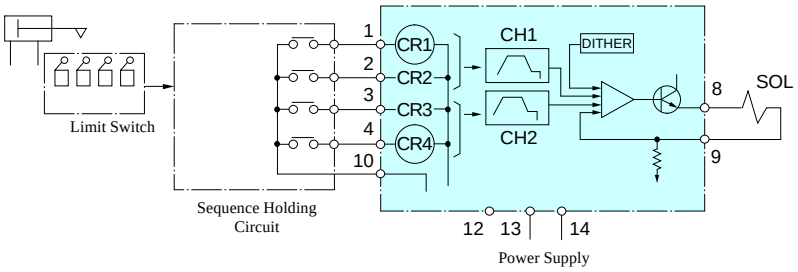


View Arrow X

H

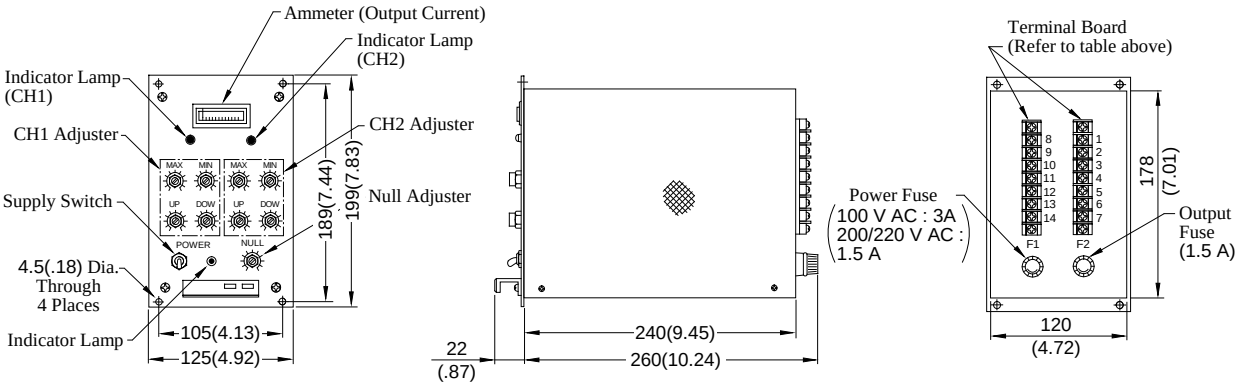
AME-T-S-∗-22

[Example Diagram]

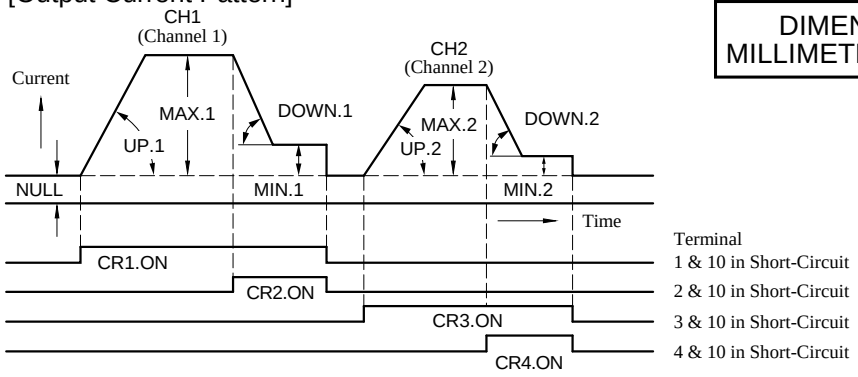


● Terminal Board

Trminal Number	Name	
1	Input Command	CR1
2	Input Command	CR2
3	Input Command	CR3
4	Input Command	CR4
5	—	
6	—	
7	—	
8	Output to Valve Solenoid	SOL
9		
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)

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.
In such case, what are the maximum and minimum time adjustable for the acceleration and deceleration?

Answer: The input current for EFG-02-30 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 mA-300 mA=220 mA

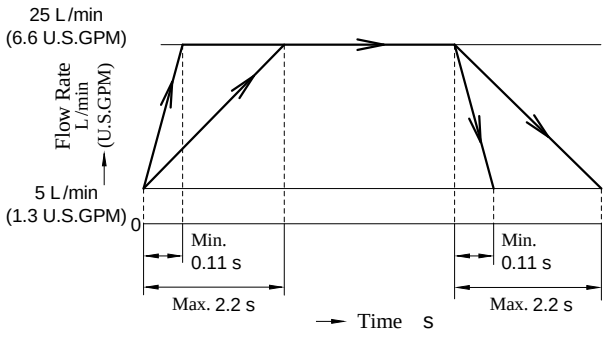
While, the specification for the model AME-T-S shows the amplifier's gradient for acceleration or deceleration as being between 0.05 s/100 mA and 1.0 s/100 mA (which means that the minimum time is 0.05 second and the maximum time is 1.0 second for every 100 mA variation).
Therefore, the minimum and maximum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

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

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

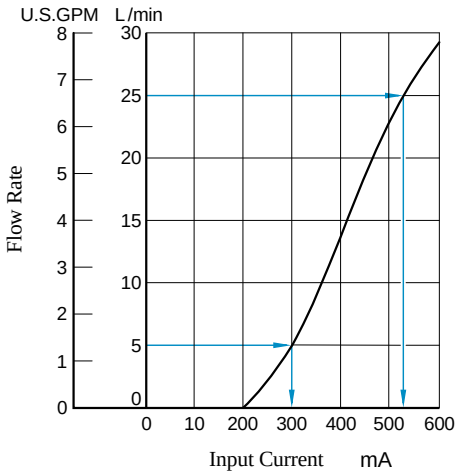
The result above are as illustrated on the below.

[Flow Pattern]



[Input Current vs. Flow]

EFG-02



H

These power amplifiers are specially designed to combine and incorporate the functions of pressure control (10 Ω solenoid) and flow control (40 Ω solenoid) into one and can be used for the proportional electro-hydraulic flow control and relief valves of which model numbers are as shown below.

Model Number Designation

AME	-D2	-H1	-100	-12
Series Number	Type of Function	Type of Mounting	Power Supply	Design Number
AME	**D2:** DC Input Type	**H1:** Wall Tapestry Type	**100:** 100 V AC **200:** 200/220 V AC	**12**

Applicable to Valve

Name of Valve	Model Numbers
40Ω- 10Ω Series Flow Control and Relief Valve	03-125 EFBG-06-250-C/H 10-500

Specifications

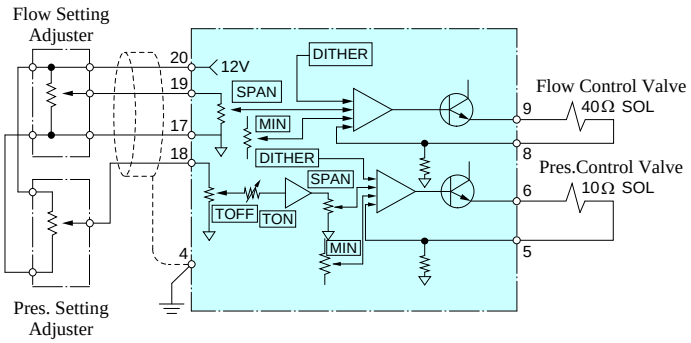
Model No. / Description	AME-D2-H1-∗-12	
	Flow Controls (40Ω Solenoid)	Pressure Controls (10Ω Solenoid)
Type of Function	DC Input Type	DC Input Type
Max. Output Current	0.8 A (40Ω Solenoid)	1 A (10Ω Solenoid)
Max. Input Voltage	+10 V DC	+10 V DC
Input Impedance	10 kΩ	10 kΩ
Max. Gain	0.8 A / 5 V	1 A / 5 V
Dither	Fix	Fix
Temperature Drift (Max.)	0.2 mA /°C	0.2 mA /°C
Power Supply	100 V AC, 200/220 V AC ± 10% (50/60 Hz)	
Power Input (Max.)	130 VA	
Ambient Temperature	0-50°C (32-122°F)	
External Setting Resistance	1 kΩ	1 kΩ
Approx. Mass	5.6 kg (12.3 lbs.)	

Instructions

Power supply for the setting adjuster up to 2 set can be provided from this power amplifier. However, please use the variable resistor or potentiometre of which impedance is 1 kΩ for the setting adjuster.

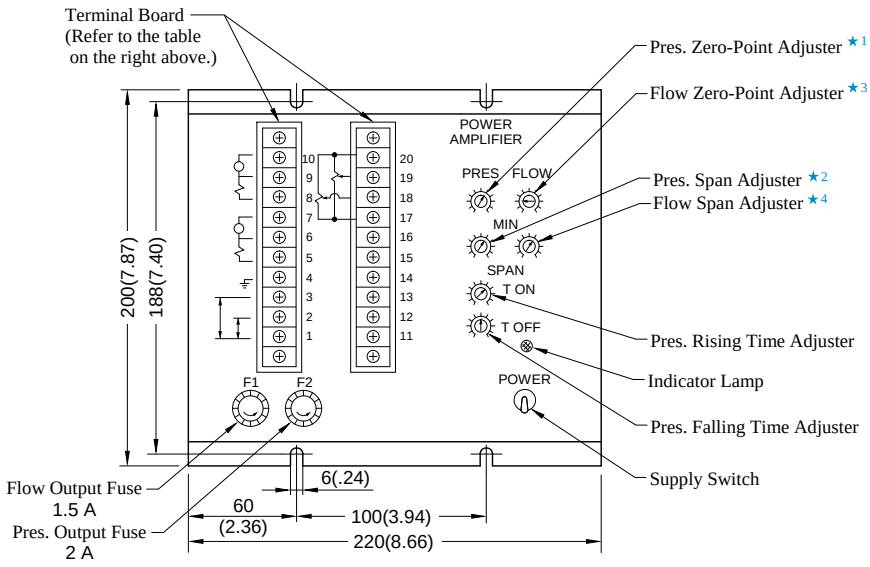
AME-D2-H1-∗-12

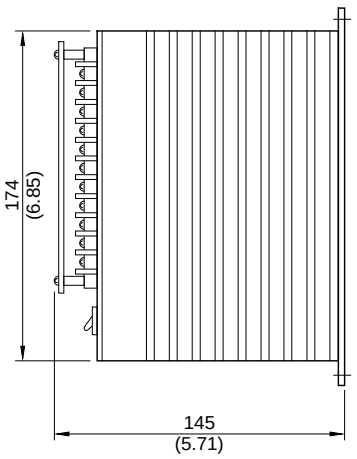
[Example Diagram]



● Terminal Board

Terminal Number	Name	
1	Power Supply 100 V AC, 200 V AC: 1, 2 220 V AC: 1, 3	
2		
3		
4	Ground	G
5	Output to Pressure Control Valve (10Ω) Solenoid	PR. SOL
6		
7	Ammeter	
8	Output to Flow Control Valve (40Ω) Solenoid	FL. SOL
9		
10	Ammeter	
11	Common	COM
12	—	
13	—	
14	-12 V OUT	-12 V
15	Common	COM
16	+12 V OUT	+12 V
17	Common	COM
18	Input Signal for PRES.	PR.IN
19	Input Signal for FLOW	FL.IN
20	+12 V OUT	+12 V





★1. Minimum Pressure Setting
★2. Variable Pressure Range Setting
★3. Minimum Flow Setting
★4. Variable Flow Range Setting

DIMENSIONS IN MILLIMETRES (INCHES)

H

These power amplifiers can drive two solenoid of 10Ω load simultaneously or separately, and the control can be done in the same way even though the object is separated by pressure system and flow rate system. Although the display of control unit on the front panel is PRESS and FLOW, they are exactly the same circuit, so there is no distinction between the two system when used.

Model Number Designation

AME	-D2	-1010	-100	-10
Series Number	Type of Function	Coil Resistance of Valve	Power Supply	Design Number
AME	**D2:** DC Input Type	**1010:** 10 Ω × 2	**100:** 100 V AC **200:** 200/220 V AC	**10**

Specifications

Model No. / Description	AME-D2-1010-∗-10
Type of Function	DC Input Type
Max. Output Current	1 A (10Ω Solenoid)
Max. Input Voltage	+ 10 V DC
Input Impedance	10 kΩ
Max. Gain	1 A / 5 V
Dither	Variable 100-300 mA
Temperature Drift (Max.)	0.2 mA /°C
Power Supply	100 V AC, 200/220 V AC ±10% (50/60 Hz)
Power Input (Max.)	120 VA
Ambient Temperature	0-50°C (32-122°F)
External Setting Resistance	1 kΩ
Approx. Mass	4.3 kg (9.5 lbs.)

Applicable to Valve

Name of Valve	Model Numbers
Pilot Relief Valves	EDG-01∗
Relief Valves	EBG-03 EBG-06 EBG-10
Reducing and Relieving Valves	ERBG-06 ERBG-10
10Ω Series Flow Control Valves	EFG - 03 EFCG - 06
10Ω-10Ω Series High Flow Series Flow Control and Relief Valves	EFBG-03 EFBG-06 EFBG-10

Applicable to Piston Pump

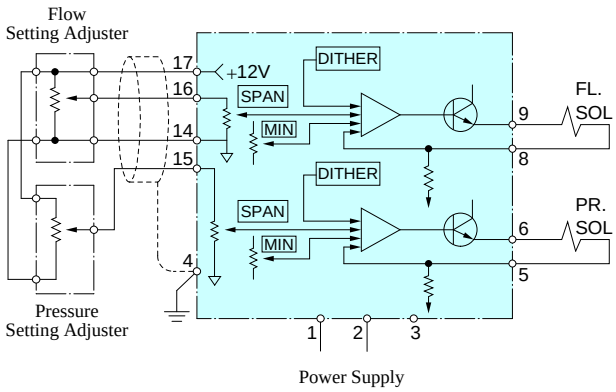
Name of Pump	Model Numbers
"A" Series Variable Displacement Piston Pump (Proportional Electro-Hydraulic Load Sensing Type)	A16 A22 A37 -∗-R-04 A56 A70 A90 -∗-R-04 A145 Also, double pumps combined with the models listed above and fixed displace-ment vane pumps.

Instructions

Power supply for the setting adjuster up to 2 set can be provided from this power amplifier. However, please use the variable resistor or potentiometre of which impedance is 1 kΩ for the setting adjuster.

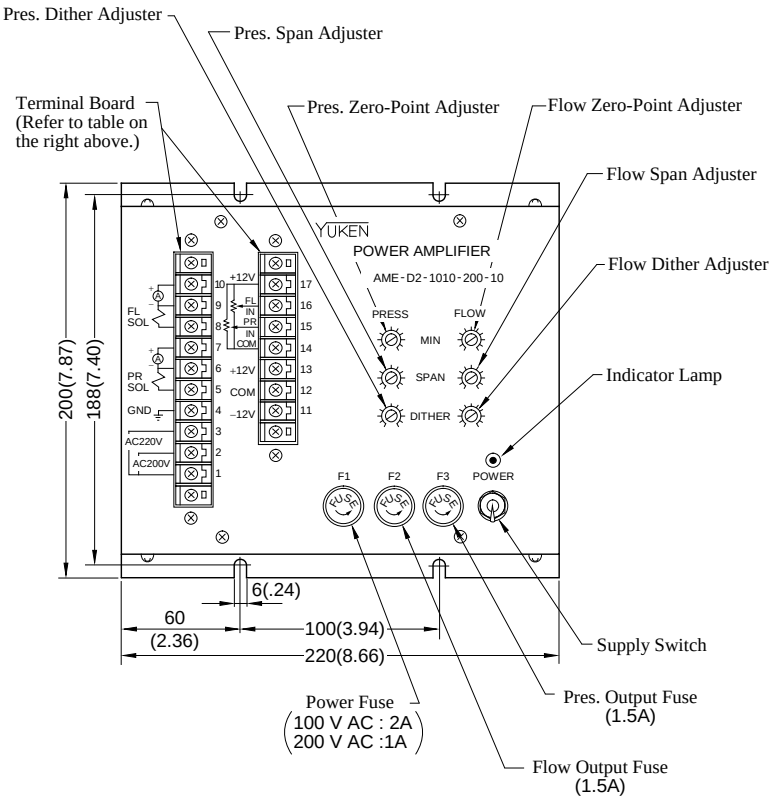
AME-D2-1010-∗-10

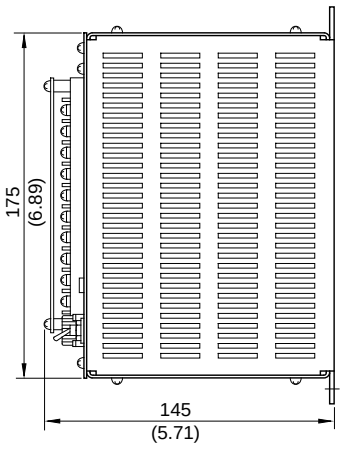
[Example Diagram]



● Terminal Board

Terminal Number	Name	
1	Power Supply	
2	100 V AC, 200 V AC: 1, 2	
3	220 V AC: 1, 3	
4	Ground	G
5	Output to Pressure Control	
6	Valve Solenoid	PR.SOL
7	Ammeter	
8	Output to Flow Control	
9	Valve Solenoid	FL.SOL
10	Ammeter	
11	–12 V OUT	–12 V
12	Common	COM
13	+12V OUT	+12 V
14	Common	COM
15	Input Signal for PRES.	PR. IN
16	Input Signal for FLOW	FL. IN
17	+12V OUT	+12 V





DIMENSIONS IN MILLIMETRES (INCHES)

H

Model Number Designation

SK1091	-D24	-10
Series Number	Power Supply	Design Number
SK1091	**D24:** 24 V DC	**10**

Applicable to Valve

Name of Valve	Model Numbers
Directional and Flow Control Valve	03 EDFHG-04 06

Specifications

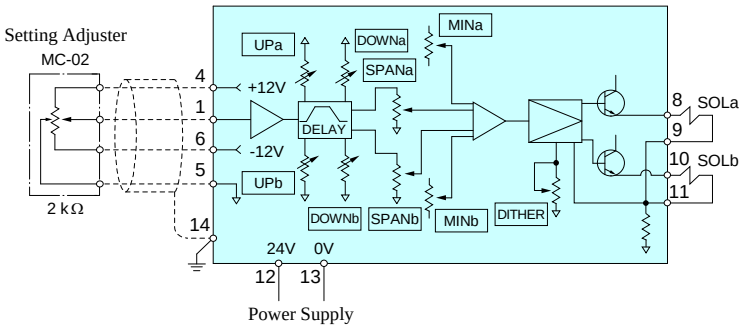
Model No. / Description	SK1091-D24-10
Max. Output Current	1 A (10Ω Solenoid)
Max. Input Voltage	-10 V DC for SOL a +10 V DC for SOL b
Input Impedance	10 kΩ
Max. Gain	1 A / ±5 V
Dither	Variable
Delay Time Adjustment Range	0.15-3 s
Temperature Drift (Max.)	0.2 mA /°C
Power Supply	24 V DC (21-28 V Included Ripple)
Required Current	More than 1.5 A
Power Input (Max.)	25 W
Ambient Temperature	0-50°C (32-122°F)
Ambient Humidity	Less than 90%RH
External Setting Resistance	2 kΩ
Approx. Mass	1.0 kg (2.2 lbs.)

Instructions

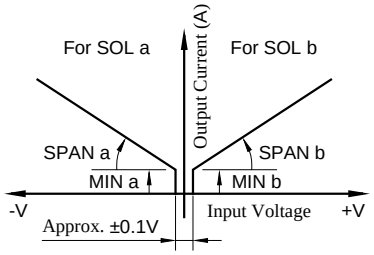
- **Power Supply for the Setting Adjuster**
  Power supply for the setting adjuster can be provided from this power amplifier, but for only one. However, please use the variable resistor or potentiometre of which impedance is 2 kΩ for the setting adjuster.
- **Power Switch**
  The power amplifier has no power supply switch. As soon as it is connected to a power supply , it comes to be alive. Provide a power switch externally.

SK1091-D24-10

[Example Diagram]



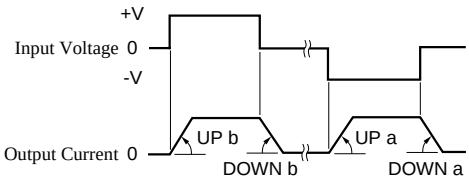
[Input-Output Characteristics]



Terminal Board

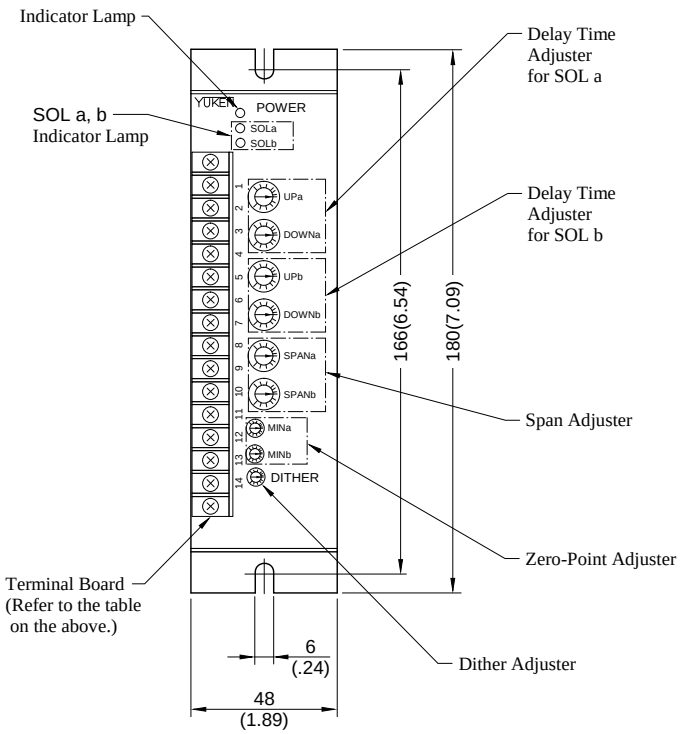
Terminal Number	Name	
1	Input Signal	IN
2	Input Signal	COM
3	—	
4	Power Supply for Setting Adjuster	+12V
5	Power Supply for Setting Adjuster	COM
6	Power Supply for Setting Adjuster	-12V
7	—	
8	Output to Valve Solenoid	SOL a
9		
10	Output to Valve Solenoid	SOL b
11		
12	Power Supply	24 V
13	Power Supply	0 V
14	Ground	FG

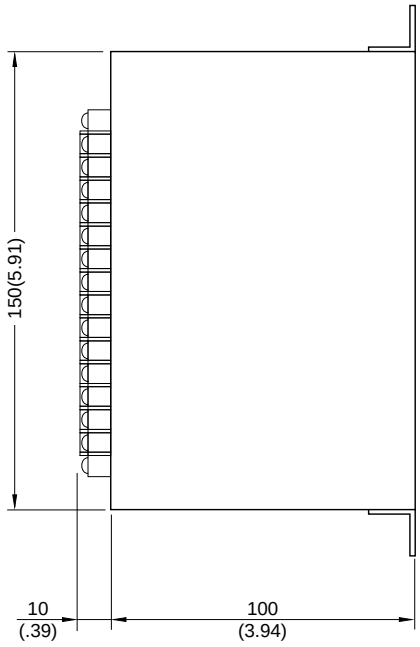
[Delay Function]



H

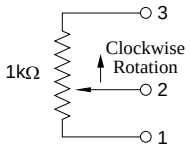
DIMENSIONS IN MILLIMETRES (INCHES)



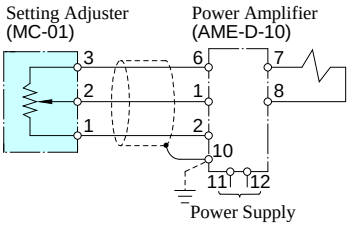


MC-01

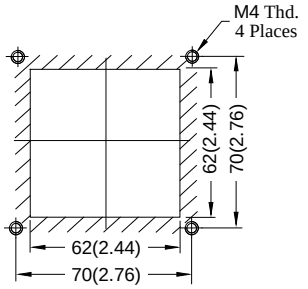
[Electric Circuit]

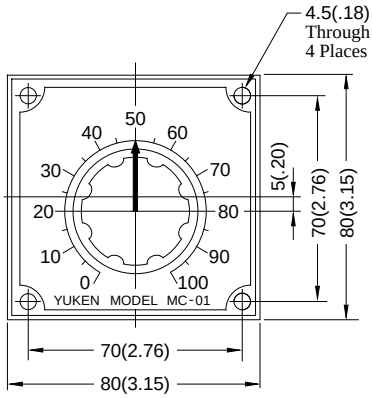


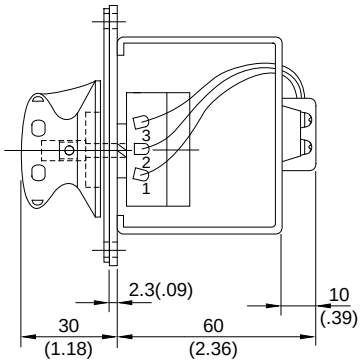
[Example Diagram]

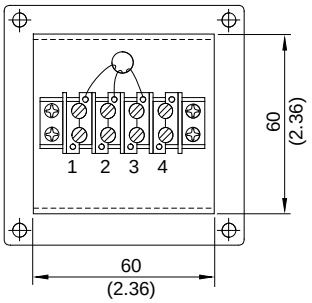


[Mounting Panel]









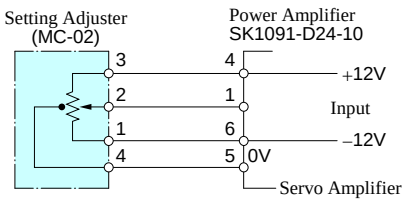
DIMENSIONS IN MILLIMETRES (INCHES)

MC-02

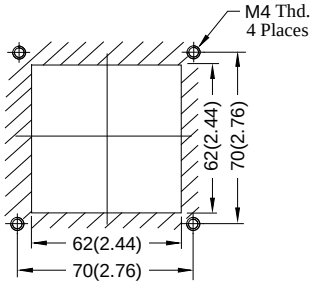
[How to Use]

This setting adjuster is for using positive and negative voltages to the right and left of the zero point. Most suitable for servo systems.
Please contact us for usage details.

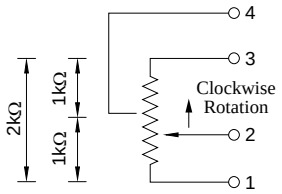
[Example Diagram]

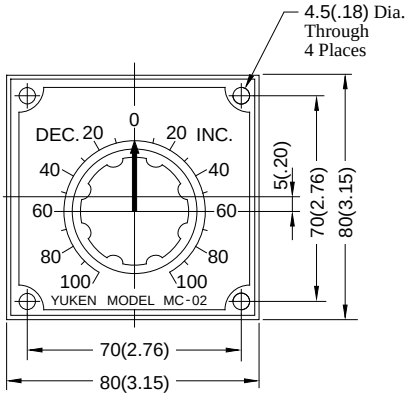


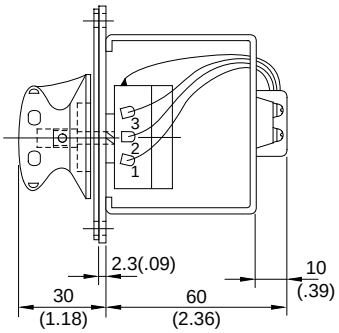
[Mounting Panel]

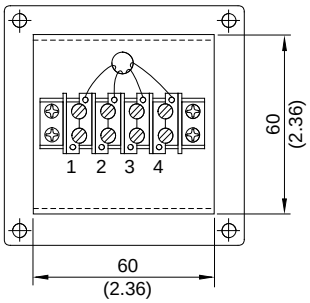


[Electric Circuit]





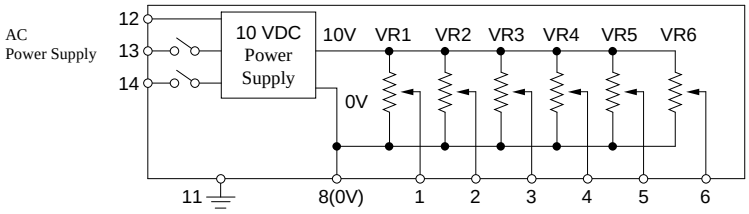




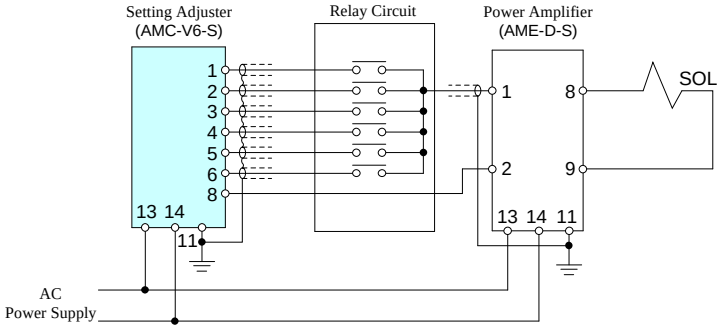
AMC-V6-S-∗-10

Power Supply
100.....100 V AC
200.....200 V AC
220.....220 V AC

[Electric Circuit]

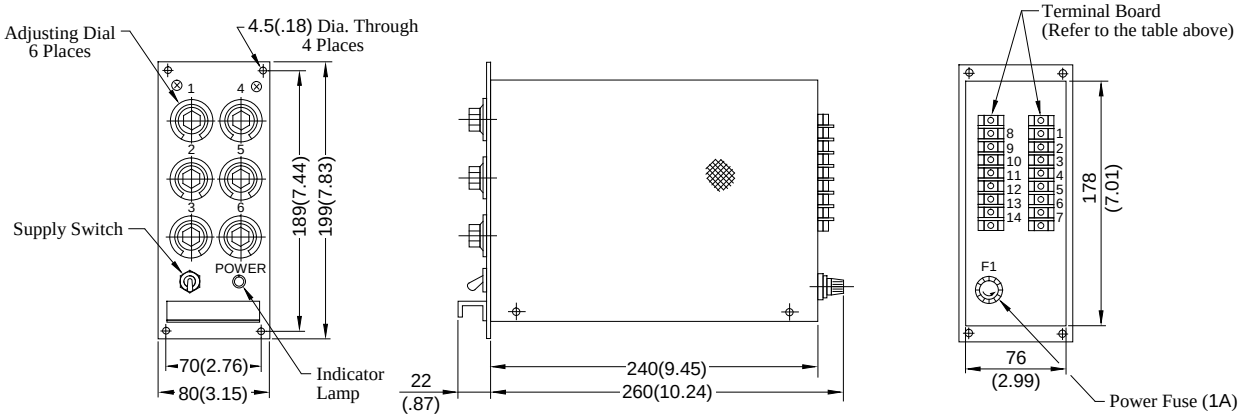


[Example Diagram]



● Terminal Board

Terminal Number	Name
1	1 OUT (VR1)
2	2 OUT (VR2)
3	3 OUT (VR3)
4	4 OUT (VR4)
5	5 OUT (VR5)
6	6 OUT (VR6)
7	—
8	0V COM
9	—
10	—
11	Ground G
12	—
13	Power Supply
14	85-265 V AC



DIMENSIONS IN MILLIMETRES (INCHES)

H