



VÁLVULAS DE CONTROL ELECTRO-HIDRÁULICAS

H3

AMPLIFICADORES DE POTENCIA



油研工業株式会社



Power Amplifiers For 10Ω Series Control Valves

These power amplifiers are used to drive the 10Ω series proportional electro-hydraulic pressure or 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
Relieving and Reducing Valves	ERBG-06 ERBG-10
10 Ω Series Flow Control Valves	EFG-03/06 EFCG-03/06 (51 Design)
Flow Control and Relief Valves	EFBG-03 EFBG-06 EFBG-10

Specifications

Model No.	AME-D-10-*-20	SK1022-A-*-11	SK1022-B-*-11	SK1015-11
Description	AME-D-10-*-20	SK1022-A-*-11	SK1022-B-*-11	SK1015-11
Type of Function	DC Input Type	DC Input Feedback Type	DC Input Feedback Type	DC Input Type
Max. Output Current	1 A (10 Ω Solenoid)	1 A (10 Ω Solenoid)	1 A (10 Ω Solenoid)	0.9 A (10 Ω 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
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 VAC can be used from 90 to 132 VAC, 200 VAC can be used from 180 to 264 VAC.

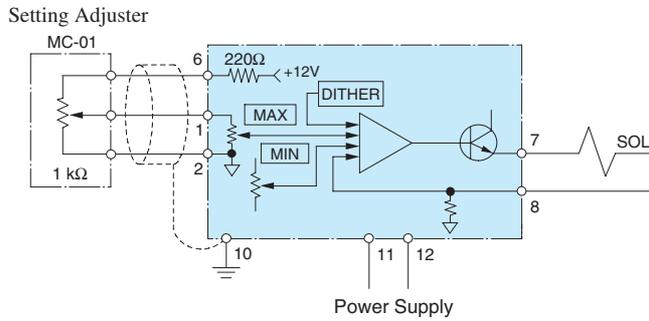
Instructions

Power supply for the setting adjuster can be provided from this power amplifier, but for only one.

However, please use the variable resistor or potentiometer of which impedance is 1 kΩ (in case of model SK1015, use 10 kΩ) for the setting adjuster.

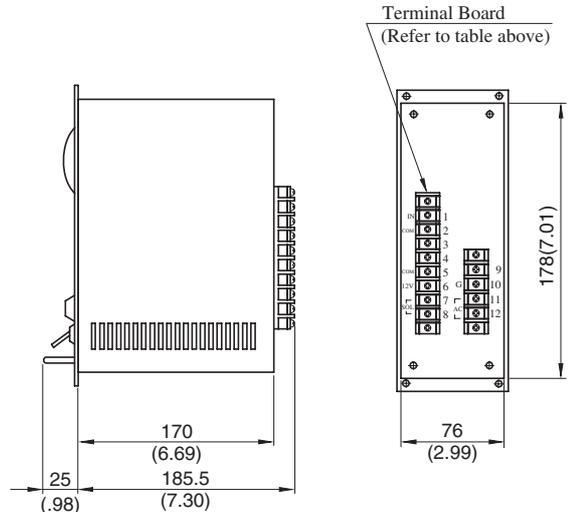
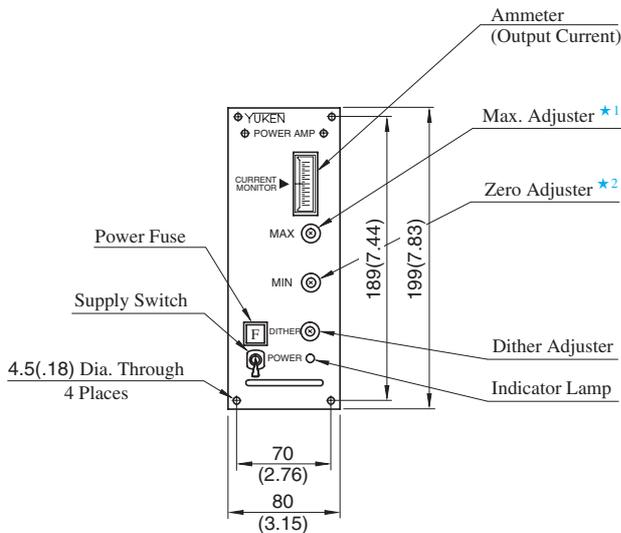
AME-D-10-*-20

[Example Diagram]



● Detail of Terminal Board

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

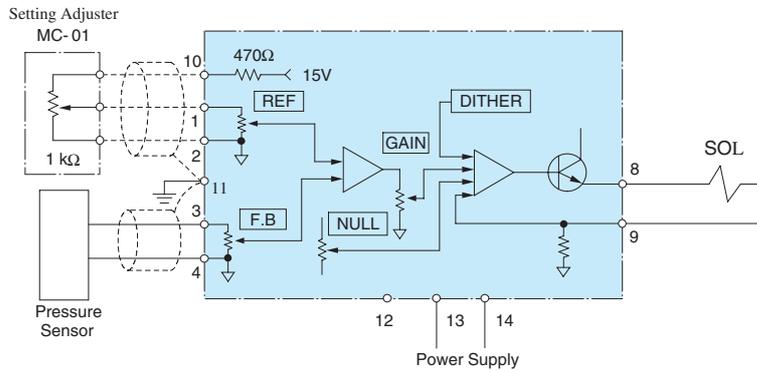


- ★1. Adjustment of upper limit of usable range
- ★2. Adjustment of lower limit of usable range

DIMENSIONS IN
MILLIMETRES (INCHES)

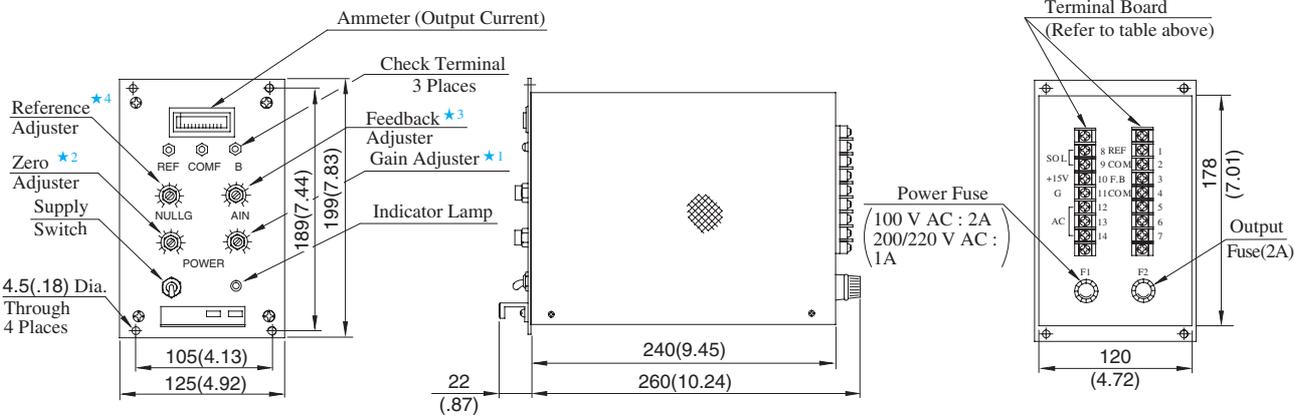
SK1022-A/B-*-11

[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	+15V (10 V at 1 kΩ)
11	Ground	G
12	Power Supply	100 V AC, 200V AC : 13, 14 220 V AC : 12, 14
13		
14		

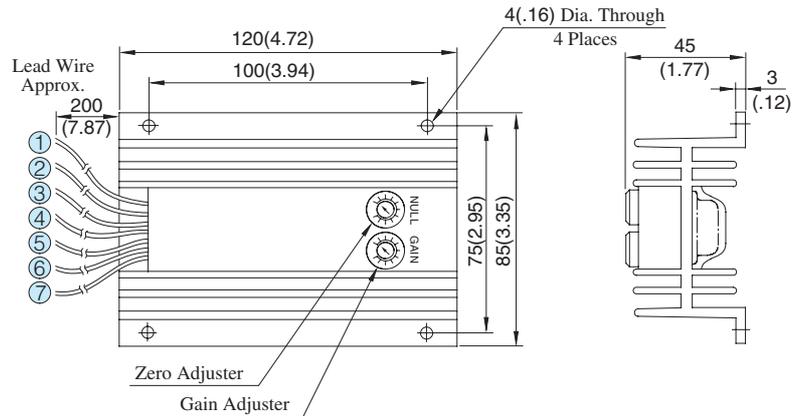
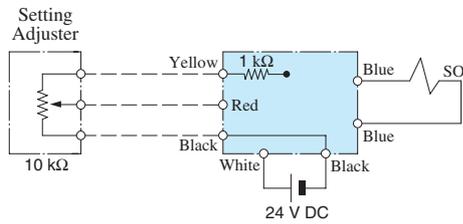


- ★ 1. Adjustment of upper limit of usable range
- ★ 2. Adjustment of lower limit of usable range
- ★ 3. Adjustment of feedback voltage ratio
- ★ 4. Adjustment of input voltage ratio

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

**DIMENSIONS IN
MILLIMETRES (INCHES)**

■ **Instructions**

● **Supply 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.

■ Compact Power Amplifiers For 10Ω Series Control Valves

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.	AMN-D-10
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
Relieving and Reducing Valves	ERBG-06 ERBG-10
10Ω Series Flow Control Valves	EFG-03/06 EFCG-03/06 (51 Design)
10Ω-10Ω Series High Flow Series Flow Control and Relief Valves	EFBG-03 EFBG-06 EFBG-10

AMN-D-10

[Example Diagram]

Setting Adjuster
MC-01
+12V
MIN
SPAN
DITHER
Power Supply
SOL

DIMENSIONS IN MILLIMETRES (INCHES)

3.5(.14) Dia. Through 2 Places

Zero Adjuster

Span Adjuster

Terminal Board (Refer to table on the left.)

Indicator Lamp

90(3.54)
100(3.94)

50 (1.97)
60 (2.36)

2.5 (.10)
30 (1.18)

● Detail of 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	SOL
8	Solenoid	SOL

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

Description	Model No. AME-D-40-*-40	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 (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.)

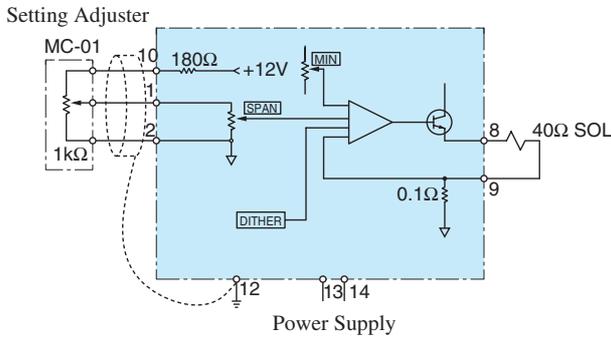
Instructions

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.

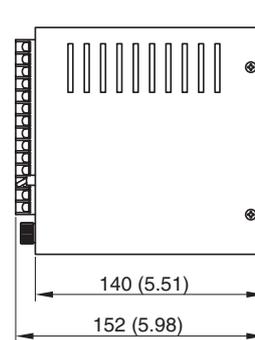
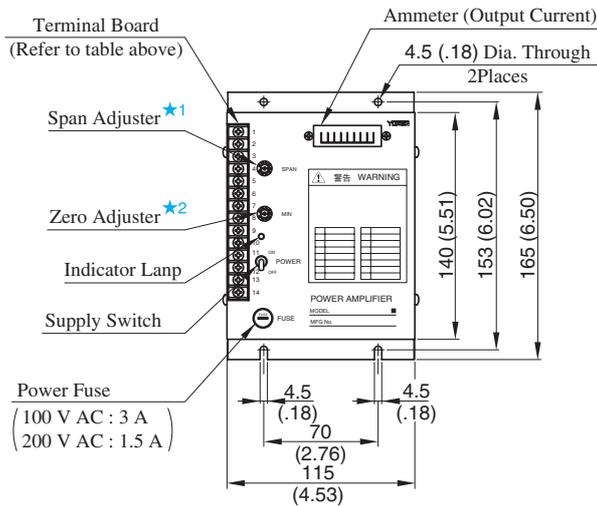
AME-D-40- *-40

[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

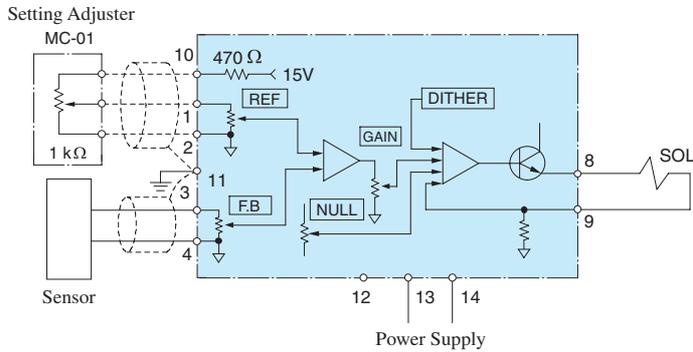


- ★1. Adjustment of upper limit of usable range
- ★2. Adjustment of lower limit of usable range

DIMENSIONS IN MILLIMETRES (INCHES)

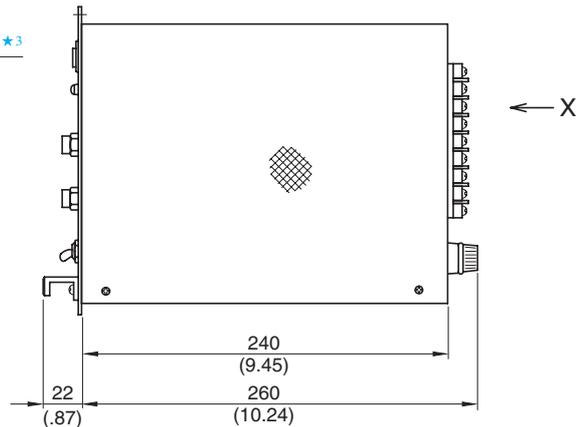
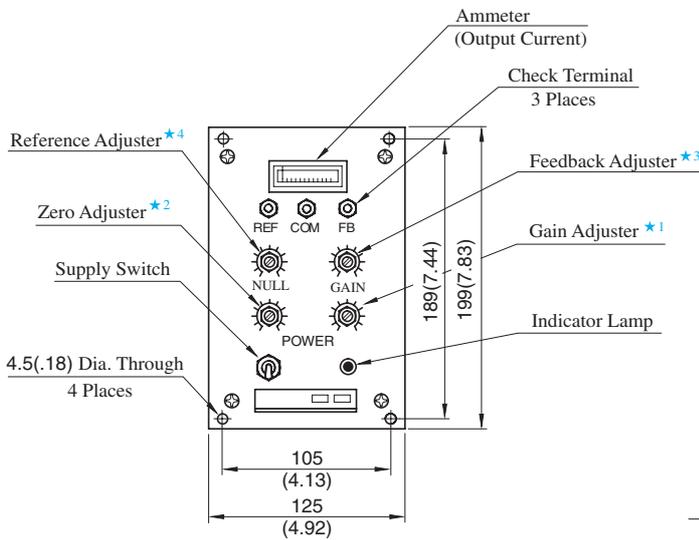
AME-DF-S-*22

[Example Diagram]



● Detail of Terminal Board

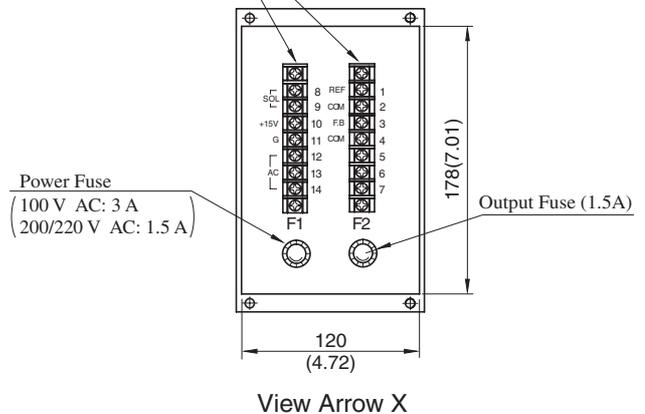
Terminal Number	Name	
1	Input Signal REF	
2	Input Signal COM	
3	Feedback Signal F.B	
4	Feedback Signal COM	
5	—	
6	—	
7	—	
8	Output to Valve Solenoid SOL	
9	—	
10	Power Supply for Setting Adjuster (10 V at 1 kΩ) +15 V	
11	Ground G	
12	Power Supply	
13		100 V AC, 200 V AC: 13, 14
14		220 V AC: 12, 14



- ★ 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

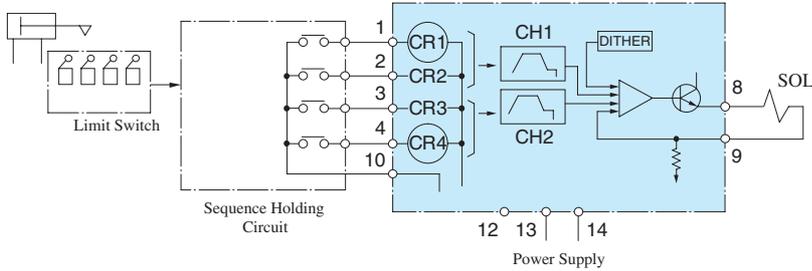
DIMENSIONS IN MILLIMETRES (INCHES)

Terminal Board (Refer to table above)



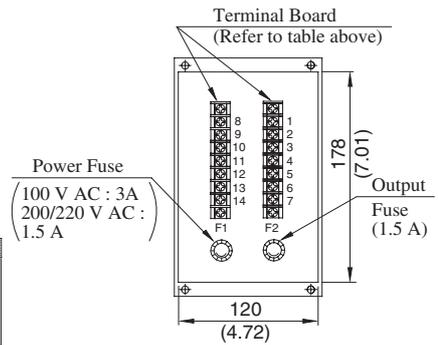
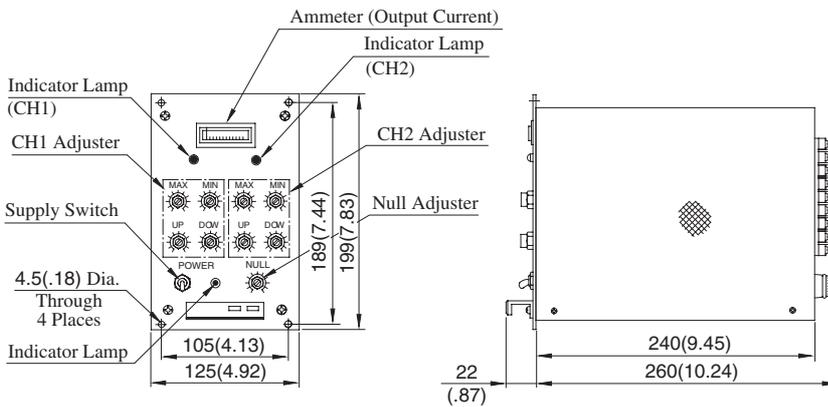
AME-T-S-*-22

[Example Diagram]

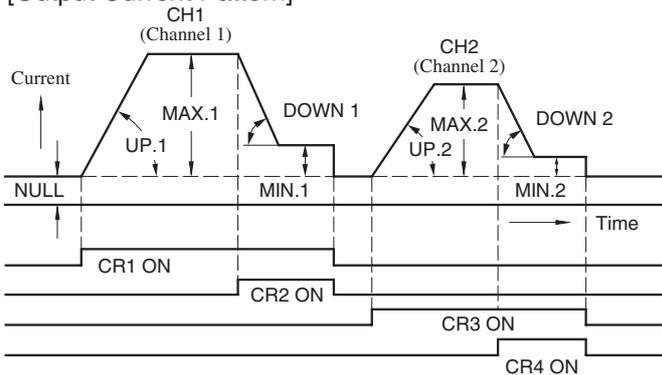


● Detail of Terminal Board

Terminal Number	Name		
1	Input Command	CR1	
2	Input Command	CR2	
3	Input Command	CR3	
4	Input Command	CR4	
5	—		
6	—		
7	—		
8	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)

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).

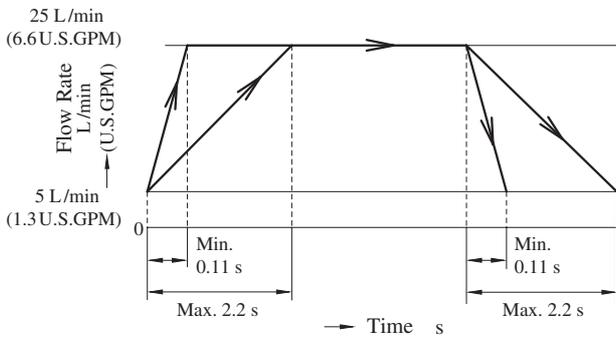
Therefore, the minimum and maximum adjustable time can be obtained as follows:

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

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

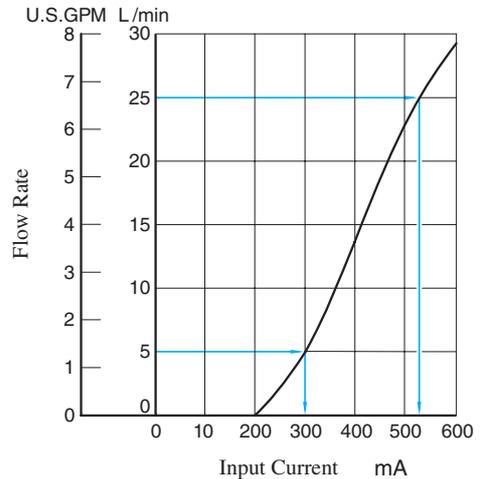
The result above are as illustrated on the below.

[Flow Pattern]



[Input Current vs. Flow]

EFG-02



Interchangeability in Installation Current and New Design

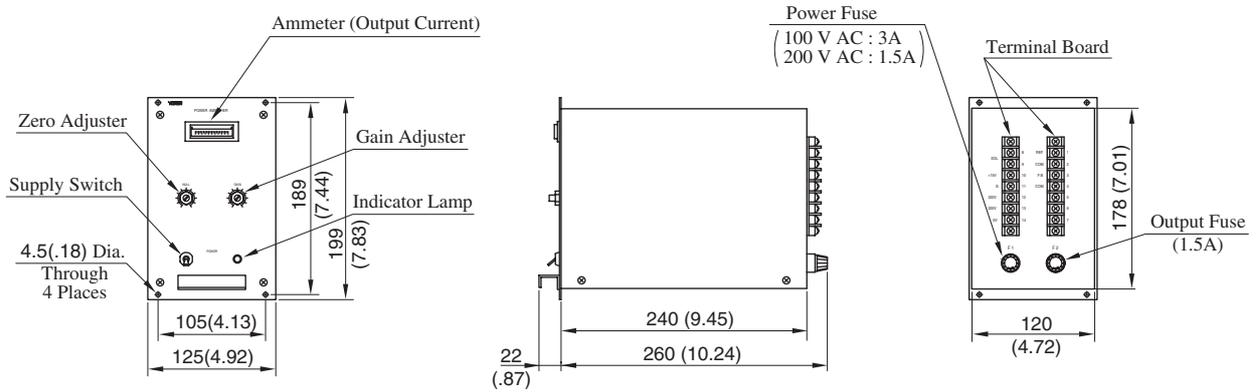
Specification

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

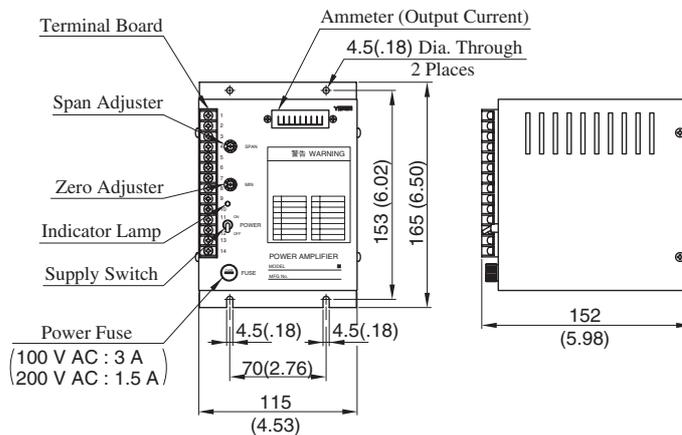
Installation Interchangeability : None

AME-D-S-* -32



DIMENSIONS IN MILLIMETRES (INCHES)

AME-D-40-* -40



■ Power Amplifiers For 40Ω - 10Ω Series Control Valves

These power amplifiers are specially designed to combine and incorporate the functions of pressure control (10Ω solenoid) and flow control (40Ω 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	EFBG-03-125-C/H-17* EFBG-06-250-C/H-17* EFBG-10-500-C/H-17*

■ Specifications

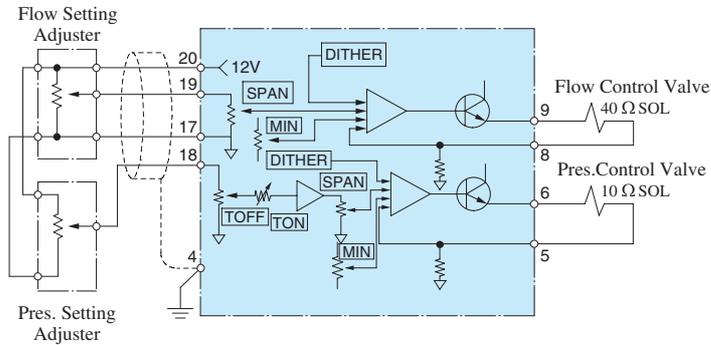
Description	Model No. AME-D2-H1-*-12	
	Flow Controls (40Ω Solenoid)	Pressure Controls (10Ω Solenoid)
Type of Function	DC Input Type	DC Input Type
Max. Output Current	0.8 A (40Ω Solenoid)	1 A (10Ω Solenoid)
Max. Input Voltage	+10 V DC	+10 V DC
Input Impedance	10 kΩ	10 kΩ
Max. Gain	0.8 A / 5 V	1 A / 5 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 two 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

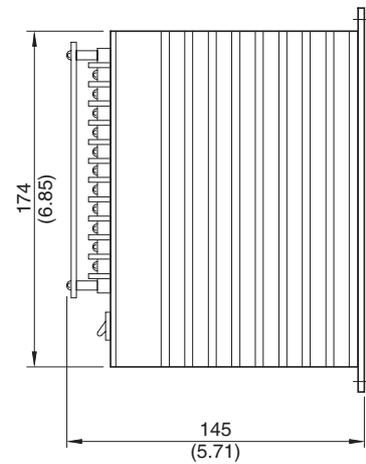
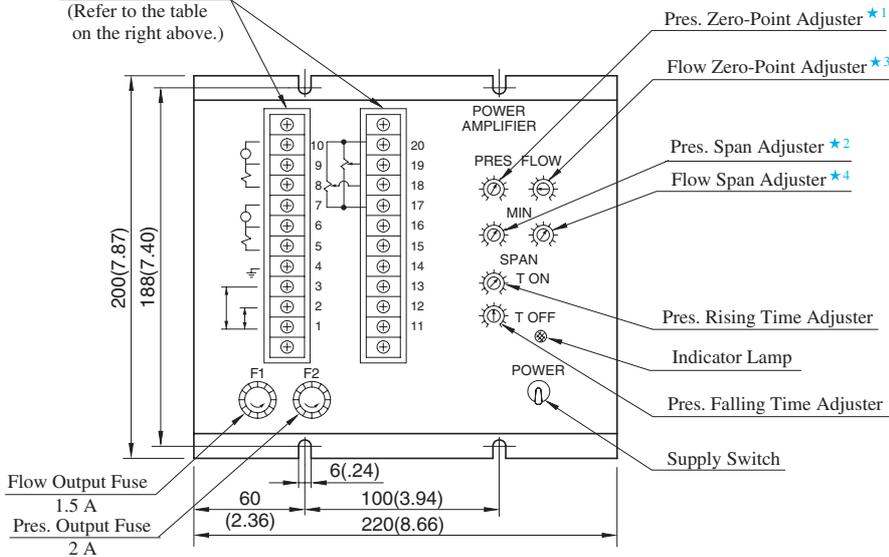
[Example Diagram]



● Detail of 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
6	Valve (10 Ω) Solenoid PR. SOL
7	Ammeter
8	Output to Flow Control
9	Valve (40 Ω) Solenoid FL. SOL
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

Terminal Board
(Refer to the table on the right above.)



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

DIMENSIONS IN MILLIMETRES (INCHES)

Power Amplifiers For 10Ω - 10Ω Series Control Valves

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	-11
Series Number	Type of Function	Coil Resistance of Valve	Design Number
AME	D2: DC Input Type	1010: 10 Ω × 2	11

Specifications

Description	Model No.	AME-D2-1010-11
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		85 - 264 VAC
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
Relieving and Reducing Valves	ERBG-06 ERBG-10
10 Ω Series Flow Control Valves	EFG-03/06 EFCG-03/06
10 Ω-10 Ω Series High Flow Series Flow Control and Relief Valves	EFBG-03 EFBG-06 EFBG-10

Applicable to Piston Pump

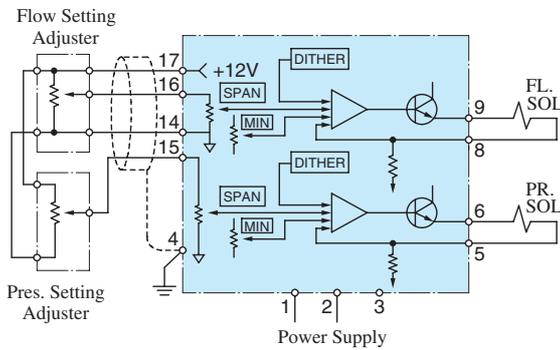
Name of Pump	Model Numbers
"A" Series Variable Displacement Piston Pump	A16- *-R-04 A22- *-R-04 A37- *-R-04 A56- *-R-04 A70- *R04 A90- *R04 A145- *R04
(Proportional Electro-Hydraulic Load Sensing Type)	Also, double pumps combined with the models listed above and fixed displacement vane pumps.

Instructions

Power supply for the setting adjuster up to two 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.

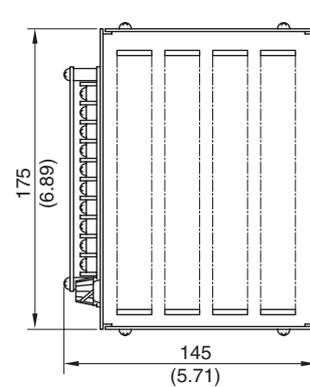
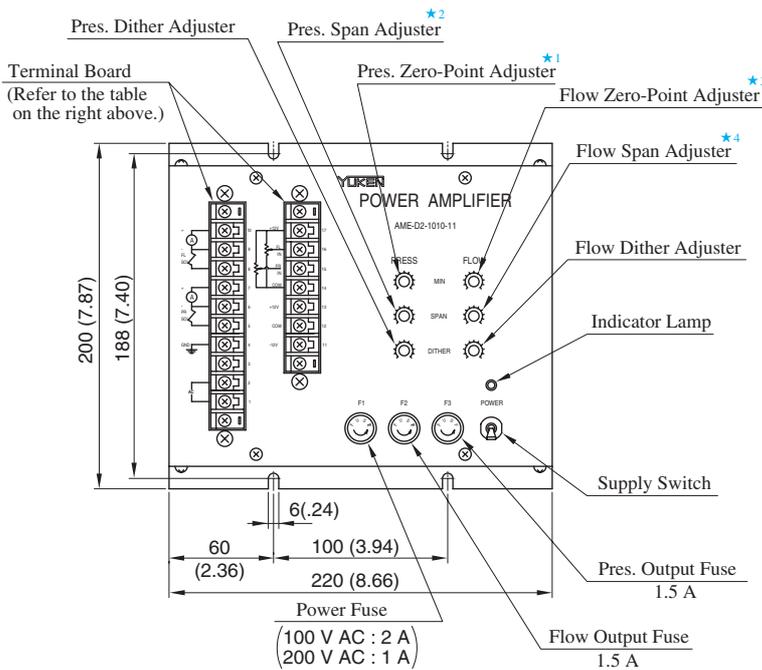
AME-D2-1010-11

[Example Diagram]



● Detail of Terminal Board

Terminal Number	Name
1	Power Supply 85 - 264 VAC
2	
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	+12 V OUT +12 V
14	Common COM
15	Input Signal for PRES. PR.IN
16	Input Signal for FLOW FL.IN
17	+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)

■ Power Amplifiers For Shockless Type Directional and Flow Control Valves

These power amplifiers are used to drive the shockless type proportional and flow control valves.

■ Model Number Designation

AMN	-G	-10
Series Number	Type of Function	Design Number
AMN	G: Shockless Directional and Flow Control Type	10
	W: DC Input Type	10



■ Applicable to Valve

Name of Valve	Model Numbers
Shockless Type Proportional Directional and flow Control Valves	EDFG-01

■ Specifications

Model Numbers		AMN-G-10	AMN-W-10
Description			
Max. Output Current		1.3 A (10 Ω Solenoid)	
Setting Resolution		0 – 99 % (1 % Units)	—
Number of Preselection Pattern		SOLa : 3 Patterns SOLb : 3 Patterns	—
Sequence Input	Input Current	10 mA/24 V	—
	Voltage Range	10 – 28 V	—
Maximum Input Voltage		—	-10 V DC : SOLa +10 V DC : SOLb
Input Impedance		—	10 kΩ
Maximum Gain		—	1.3 A/-5 V : SOLa 1.3 A/+5 V : SOLb
Dither		Variable (Internal)	
Slope Adjustment Range		0 – 99 %/Max. slope time	—
Maximum Slope Time		1 – 99 s	—
Delay Time Adjustment Range		—	0.1 – 3 s
Temperature Drift		0.2 mA /°C	
Power Supply		24 V DC (Power Supply Range : 20 – 30 V)	
Power Input		25 W	
Ambient Temperature		0 – 50°C (32 – 122°F)	
Ambient Humidity		90 % RH or less	
Approx. Mass		0.2 kg (.4 lbs.)	

■ Instructions

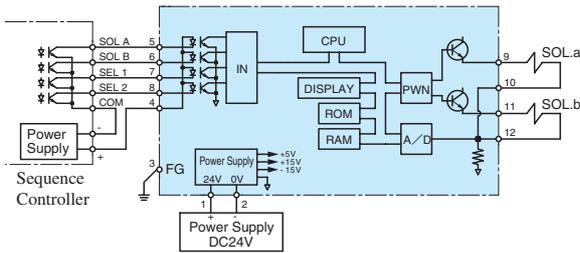
● Power supply of the outside setting adjuster

When DC input type (AMN-W) 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.

● Supply Switch

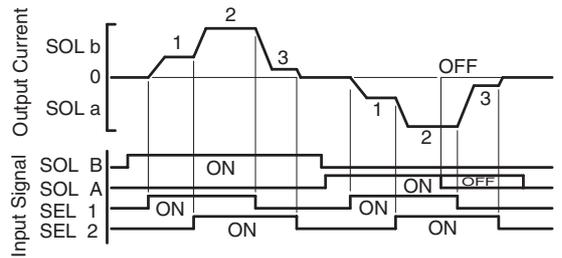
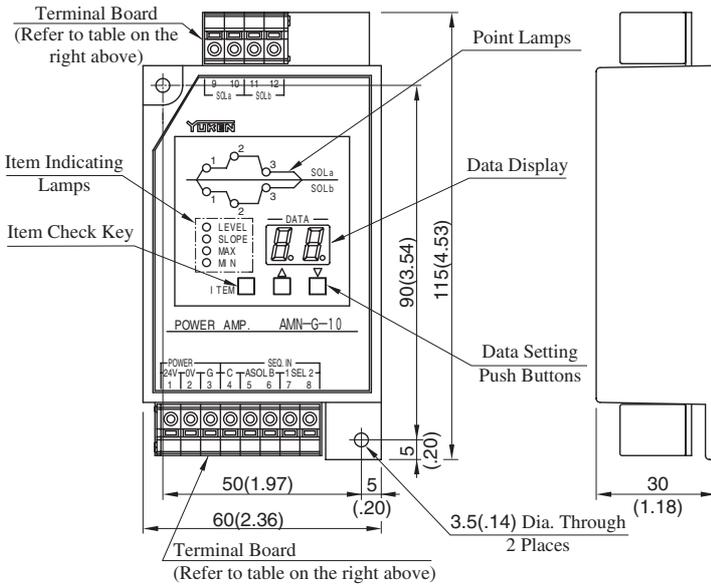
The power amplifier has no power supply switch. As soon as it is connected to a power supply, it comes to be alive. Provide a power switch externally.

AMN-G-10 [Example Diagram]



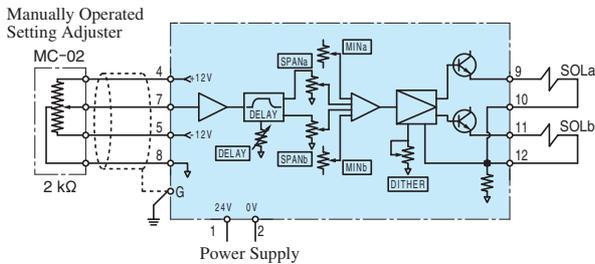
● Detail of Terminal Board

Terminal Number	Name	Terminal Number	Name
1	Power Supply +24V	7	Sequence Input SEL 1
2	Power Supply 0V	8	Sequence Input SEL 2
3	Ground G	9	Output to Valve Solenoid SOL a
4	Sequence Input IN COM	10	Output to Valve Solenoid SOL b
5	Sequence Input SOL A	11	
6	Sequence Input SOL B	12	



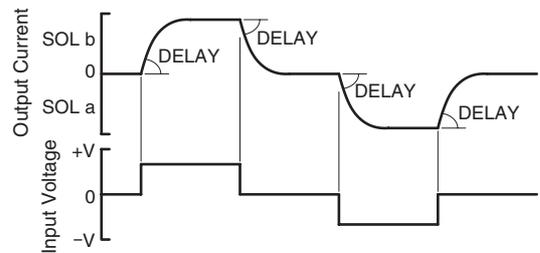
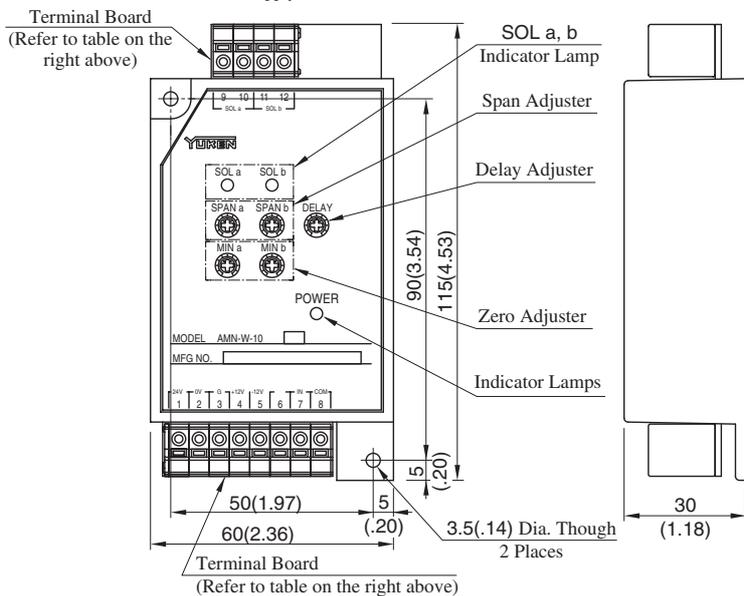
DIMENSIONS IN MILLIMETRES (INCHES)

AMN-W-10 [Example Diagram]



● Detail of Terminal Board

Terminal Number	Name	Terminal Number	Name
1	Power Supply +24V	7	Input Signal IN
2	Power Supply 0V	8	Input Signal COM
3	Ground G	9	Output to Valve Solenoid SOL a
4	Internal Power Supply +12V	10	Output to Valve Solenoid SOL b
5	Internal Power Supply -12V	11	
6		12	



DIMENSIONS IN MILLIMETRES (INCHES)

■ Power Amplifiers For Directional and Flow Control Valves

These power amplifiers are used to drive the proportional electro-hydraulic directional and flow control valves.

■ 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.	SK1091-D24-10
Description	
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	1.5 A or more
Power Input (Max.)	25 W
Ambient Temperature	0-50°C (32-122°F)
Ambient Humidity	90%RH or less
External Setting Resistance	2 kΩ
Approx. Mass	1.0 kg (2.2 lbs.)

■ Instructions

● Power Supply for the Setting Adjuster

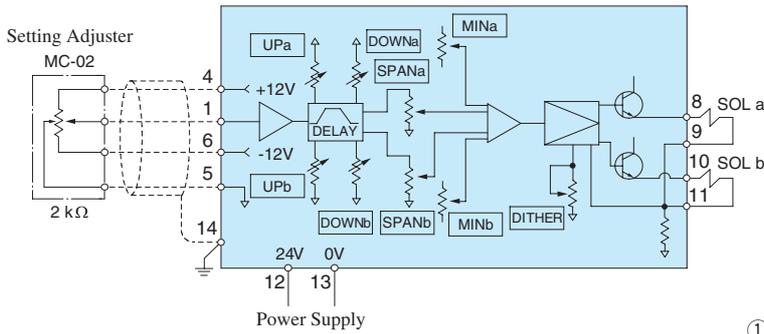
Power supply for the setting adjuster can be provided from this power amplifier, but for only one. However, please use the variable resistor or potentiometre of which impedance is 2 kΩ for the setting adjuster.

● Power Switch

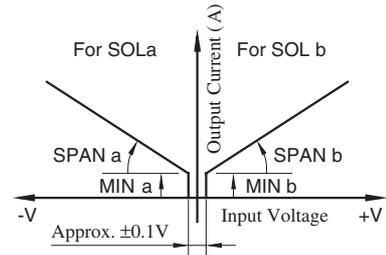
The power amplifier has no power supply switch. As soon as it is connected to a power supply, it comes to be alive. Provide a power switch externally.

SK1091-D24-10

[Example Diagram]

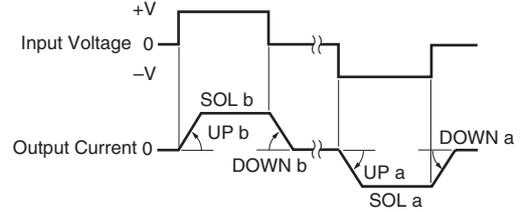


[Input-Output Characteristics]

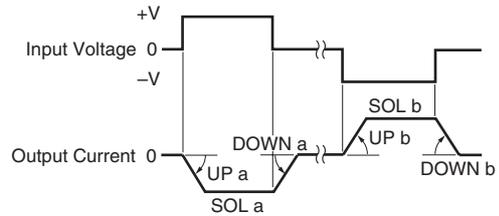


[Delay Function]

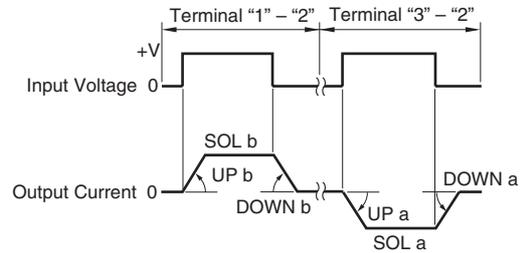
① In case "1" and "2" Input signal terminals are used.



② In case "3" and "2" Input signal terminals are used.



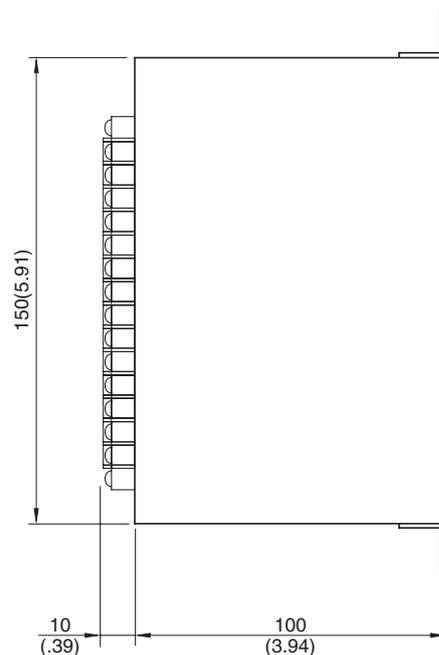
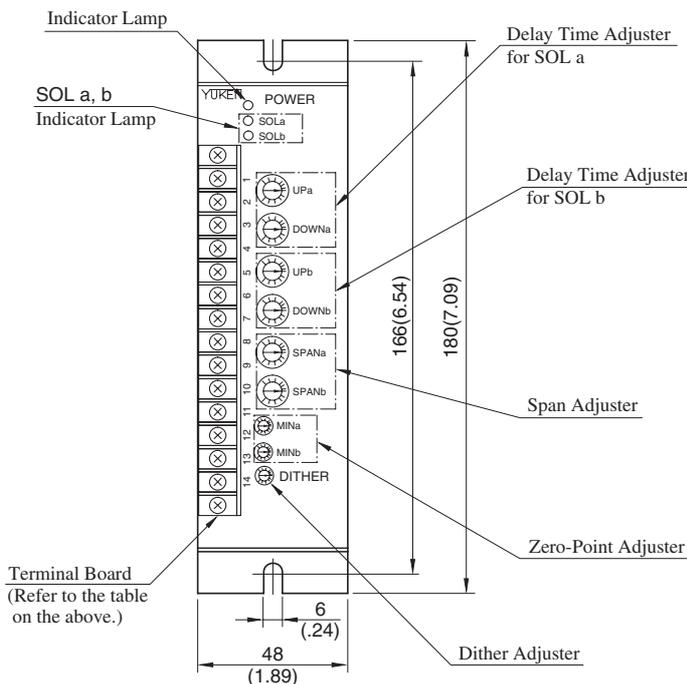
③ In case "1", "2" and "3" Input signal terminals are used.



● Detail of Terminal Board

Terminal Number	Name
1	Input Signal IN *
2	Input Signal COM
3	Input Signal IN *
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	Output to Valve Solenoid SOL a
10	Output to Valve Solenoid SOL b
11	Output to Valve Solenoid SOL b
12	Power Supply 24 V
13	Power Supply 0 V
14	Frame Ground FG

★ Three (3) usages are available as shown ① to ③ of "Delay Function" at right hand side for Input signal terminal (IN).

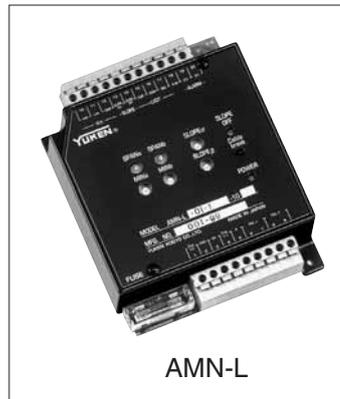


Power Amplifiers For High Response Type Directional and Flow Control Valves

These power amplifiers are used to drive the high response type proportional electro-hydraulic directional and flow control valves.

A compact AMN-L model and a euro card type AMB-EL model are available.

The single height [3U: 100 × 160 mm (3.94 × 6.30 in.)] is employed for the euro card size of the AMB-EL model.



AMN-L



AMB-EL

Model Number Designation

● AMN-L

AMN	-L	-01	-3	-2P	-10
Series Number	Type of Function	Size of Applicable Valve	Compensation	Applicable Spool Type	Design Number
AMN	L: DC Input Type Directional and Flow Control with Miner feedback	01: 01 Size	1: Type 1 3: Type 3	None: 3C2, 3C40 2P: 3C2P	10

● AMB-EL

AMB	-EL	-03	-2P	-1	-10
Series Number	Type of Function	Size of Applicable Valve	Applicable Spool Type	Compensation	Design Number
AMB	EL: DC Input Type Directional and Flow Control with Miner feedback	01: 01 Size 03: 03 Size 04: 04 Size 06: 06 Size	None: 3C2, 3C40 2P: 3C2P	★1 1: For flow rate 40/80 L/min (10.6/21.1 U.S.GPM) 2: For flow rate 280 L/min (74.0 U.S.GPM) 3: For flow rate 350 L/min(92.5 U.S.GPM) 4: For flow rate 500 L/min(132 U.S.GPM)	10

Please refer to us for ★1.

Specifications

Description	Model Numbers					
	AMN-L-01-1	AMN-L-01-3-2P	AMB-EL-01	AMB-EL-03	AMB-EL-04	AMB-EL-06
Max. Output Current	2.5 A (3.9 Ω Solenoid)		2.5 A (3.9 Ω Solenoid)	3.0 A (3 Ω Solenoid)	2.5 A (3.9 Ω Solenoid)	
Max. Input Voltage	+10 V DC: P→B→A→T -10 V DC: P→A→B→T		±10 V / ±5 V			
Input Impedance	10 kΩ or more		100 kΩ (50 kΩ in single-end mode)			
Slope-off input	Terminal Number 13-14 Short	—	4 – 28 V			
Slope Adjust Time	0.03 – 5 s	—	0.05 – 5 s (Slope Adjustment function is not available with “AMB-EL-*-2P”)			
Monitor Voltage	±1.5 V / ±3 mm st.		±10 V / rated st.			
Alarm	Open Collector (30 V DC, 10 mA Max.)		Open Collector (30 V DC, 10 mA Max.)			
Supply Voltage Range	24 V DC (20 – 30 V DC)		24 V DC (21 – 28 V DC)			
Power Input	75 W		30 W	40 W	30 W	
Ambient Temperature	0 – 50 °C (32 – 122 °F)		0 – 50 °C (32 – 122 °F)			
Ambient Humidity	90 % RH or less		85 % RH or less			
Connector	—		DIN 41612 – F32			
Approx. Mass	0.3 kg (.66 lbs.)		0.28 kg (.62 lbs.)		0.34 kg (.75 lbs.)	

Applicable to Valve

Power Amplifiers Model Numbers	Valve Model Numbers
AMN-L	ELDFG-01
AMB-EL	ELDFG-01/03 ELDFHG-04/06

Instructions

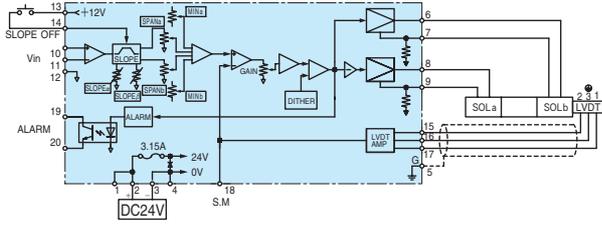
● Power Switch

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.

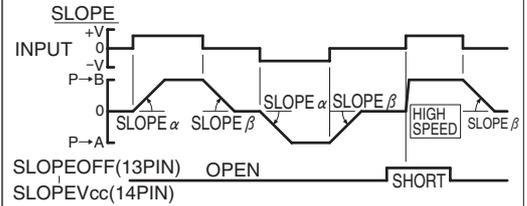
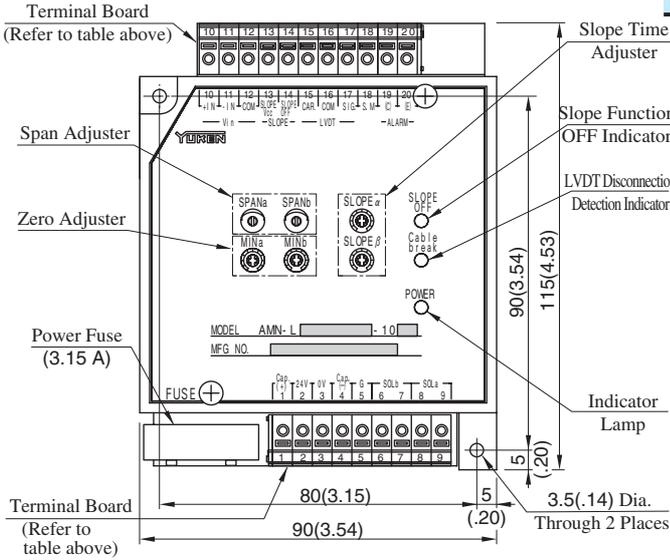
AMN-L-01-1-10

[Example Diagram]



● Detail of Terminal Board

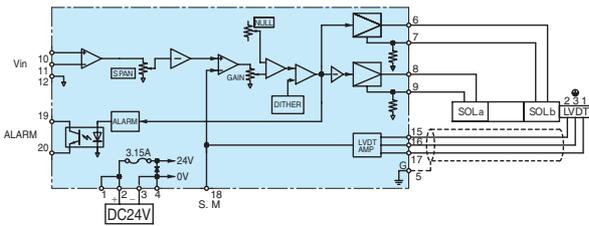
Terminal Number	Name	Terminal Number	Name
1	Power Supply CAPACITOR(+)	11	Input Signal -IN
2	Power Supply +24V	12	Input Signal COM
3	Power Supply 0V	13	Slope Control ON/OFF Terminal SLOPE Vcc
4	Power Supply CAPACITOR(-)	14	Slope Control ON/OFF Terminal SLOPE OFF
5	Frame Ground G	15	LVDT Terminal CAR.
6	Output to Valve Solenoid SOL b	16	LVDT Terminal COM
7	Output to Valve Solenoid SOL a	17	LVDT Terminal SIG.
8	Output to Valve Solenoid SOL a	18	Sensor Monitor Output S.M
9	Output to Valve Solenoid SOL a	19	Alarm Output ALM(C)
10	Input Signal +IN	20	Alarm Output ALM(E)



DIMENSIONS IN MILLIMETRES (INCHES)

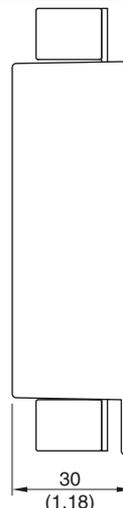
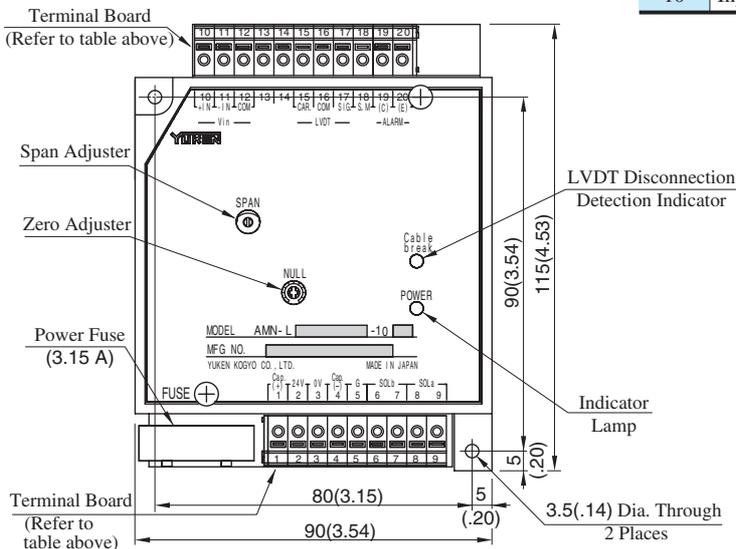
AMN-L-01-3-2P-10

[Example Diagram]



● Detail of Terminal Board

Terminal Number	Name	Terminal Number	Name
1	Power Supply CAPACITOR(+)	11	Input Signal -IN
2	Power Supply +24V	12	Input Signal COM
3	Power Supply 0V	13	
4	Power Supply CAPACITOR(-)	14	
5	Frame Ground G	15	LVDT Terminal CAR.
6	Output to Valve Solenoid SOL b	16	LVDT Terminal COM
7	Output to Valve Solenoid SOL b	17	LVDT Terminal SIG.
8	Output to Valve Solenoid SOL a	18	Sensor Monitor Output S.M
9	Output to Valve Solenoid SOL a	19	Alarm Output ALM(C)
10	Input Signal +IN	20	Alarm Output ALM(E)



DIMENSIONS IN MILLIMETRES (INCHES)

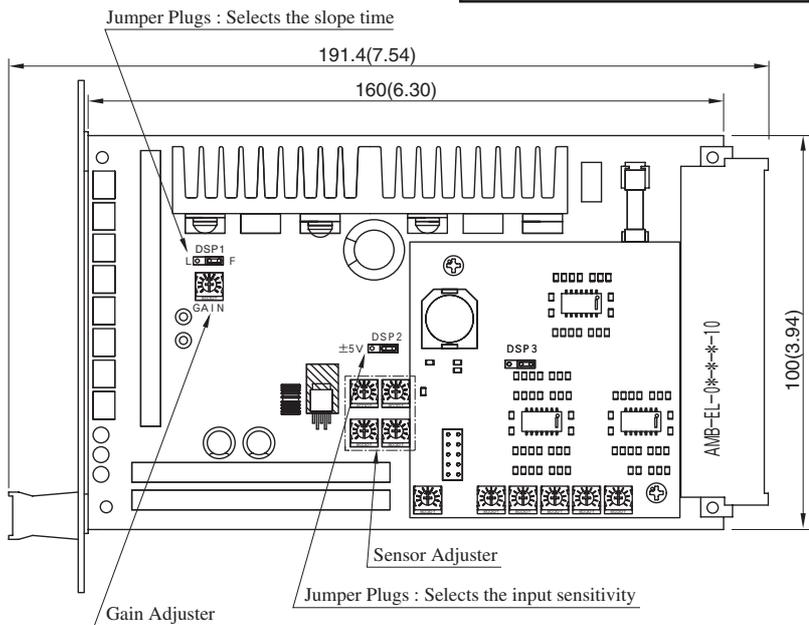
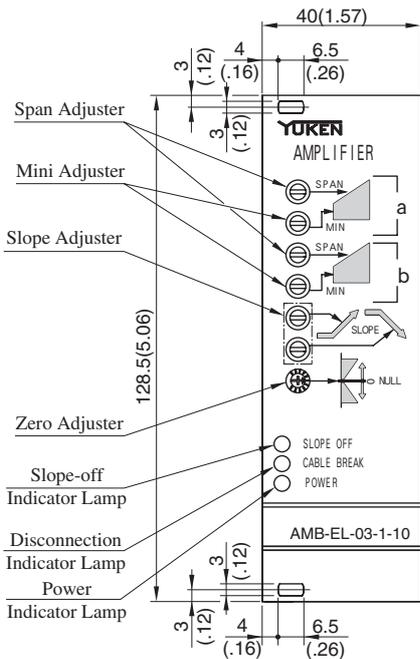
AMB-EL-*-10**

● Pin Connections and Functions

Pin Number	Name	Pin Number	Name	
b02	Power Supply	0V	z02	sol a(+)
b04	Power Supply	0V	z04	sol a(-)
b06			z06	
b08			z08	
b10			z10	Command Input (+)
b12			z12	Command Input (-)
b14			z14	
b16	Power Supply	+24V	z16	COM (No.2)
b18	Power Supply	+24V	z18	Carrier (No.3)
b20	Slope Off		z20	Signal (No.1)
b22	COM (No.3)	Connected to pilot valve sensor.	z22	
b24	Signal (No.1)	See "Snsor Connecton"	z24	Alarm Output (-)
b26	Carrier (No.2)		z26	Alarm Output (+)
b28	Output	24V	z28	Stroke Monitor Signal (P)
b30	Output	24V	z30	Stroke Monitor Signal (S)
b32			z32	

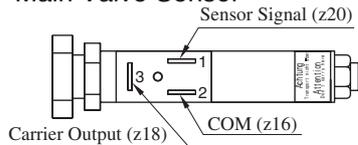
This power amplifier requires connector cards for connection. A connector card attached model is also available. Please ask for details if interested.

DIMENSIONS IN MILLIMETRES (INCHES)

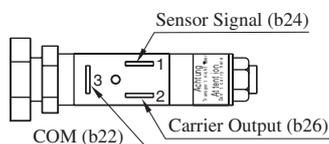


■ Sensor Connection

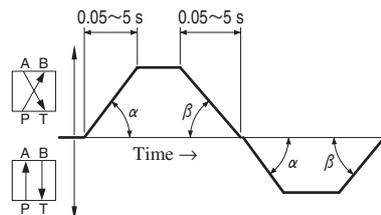
● Main Valve Sensor



● Pilot Valve Sensor



■ Lamp Pattern





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Elements for Manufacturing Processes

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