◆ HOW TO ORDER 編號說明

1		2		3
AMP	—	V		02

1 VALVE SERIES 系列名稱
AMP= Proportional Electronic Controller
比例電子控制器

2 OUTPUT SIGNAL 輸出信號
A：4 - 20mA
V：0 - 10V

3 DESIGN NO 設計編號

◆ DESCRIPTION 說 明

These switch mode units provide stepless control for proportional solenoids. Start current (offset) and full load current (FLC) can be individually preset. The current in the solenoid is substantially independent of changes in solenoid resistance and supply voltage variation. The inherent dither, due to switch-mode operation helps to overcome friction effects in the solenoid. Ramp controls are fitted to give up to 10 seconds for the current in the solenoid to build up to its full load value, or to return to the offset point.

此切換模式提供分配閥的連續控制．啓動電流支流和滿載電流都是可以單獨預設．在閥裡的電流大致上是不受到固有的抖動變化和伏特變化．因為這個切換模式有助於克服在電磁閥裡的衝突作用.斜坡控制允許電流調整約10秒直到最大值或預設位置.

◆ GENERAL PRECAUTIONS 一般注意事項

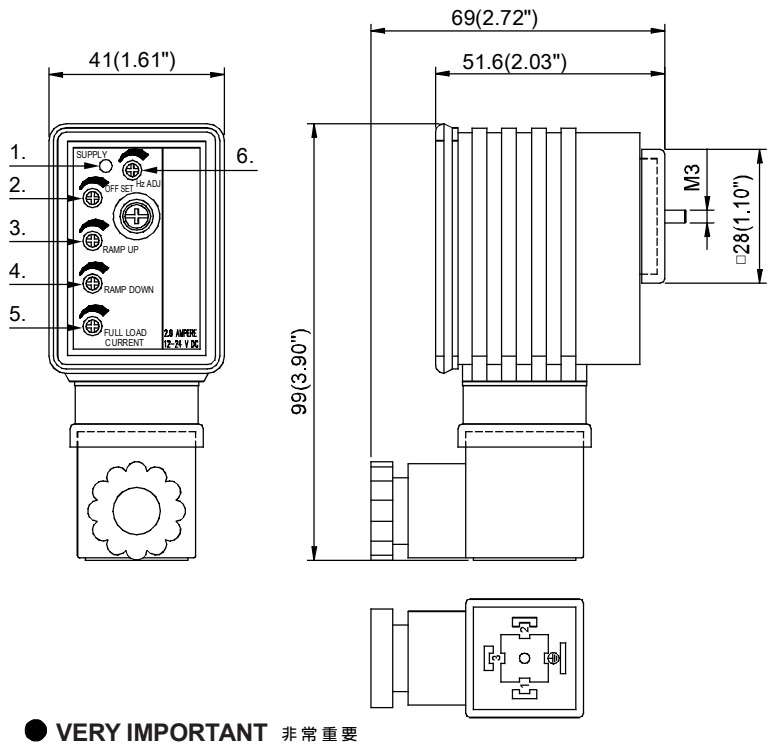
For connection between the amp/controller and solenoid coil, use a 2-con-ductor shielded wire with a conductor nominal cross-section area of 2.0mm². Type VCTF (Rated Voltage: 300V vinyl cab tire cord. Wiring between the command voltage generator and amplifier should be VCTF 0.75mm² 3-conductor wire.
Class 3 grounding. If the ground line is unstable, do not connect the shield to anything.

放大器、控制器和電磁線圈之間的連接，請使用導體通用橫斷面積為2.0㎜²、線心數為2的屏蔽線，其型號為VCTF（額定電壓300V乙烯橡膠絕緣軟線）．指令電壓發生器和放大器之間的結線，請使用0.75㎜²、線心數為3的VCTF型號．屏蔽線使用第3種接地方式．但是在地線不穩定的情況下，不要連接到任何線上.

◆ TECHNICAL DATA 技術資料

Supply voltage 電源電壓 (V DC)		10 ~ 30	**Ramp adjustment up/down** 向上/向下斜坡調整 (s)	0 ~ 10
Control signal 控制信號 (V DC)		0 ~ 7.5	**Frequency adjustment (PWM)** 頻率調整 (Hz)	100 ~ 500
Maximum output current 12 and 24 V DC 最大輸出電流 (mA)		2000	**Ambient operating temperature** 工作環境溫度 (˚C)	-5 ~ 60 (-41 ~ 140°F)
Minimum output current 最小輸出電流 (mA)	12V	0~900	**Protection rating** 保護等級	IP 65
	24V	0~600	**IP 65** Only with protection seals properly mounted. 只有在正確地安裝了保護密封的情況下.	
Weight 重量 (Kg)		0.15 (0.26 lbs)		

◆ DIMENSIONS 外型尺寸圖



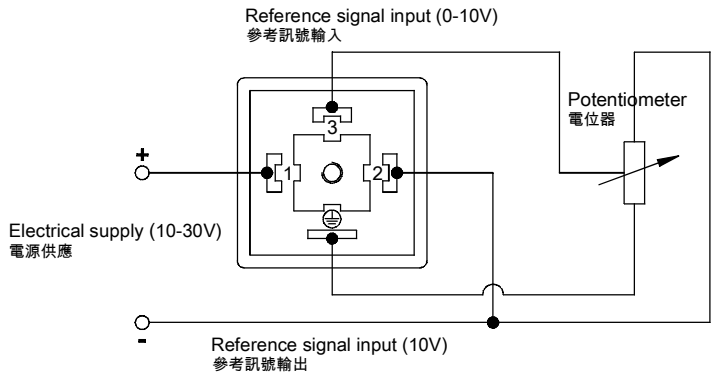
● **VERY IMPORTANT** 非常重要
Do not remove the amplifier from the coil while the power is on. This will cause a failure in the internal circuits of the amplifier, resulting in loss of output to the coil.
當通電時，請不要從線圈上去除放大器．這樣會引起放大器內部電路故障,導致線圈輸出損失.

◆ INSTRUCTIONS FOR SETTING 設置說明

1. **SUPPLY** 電源
   LED
2. **OFF SET** 開始電流
   Minimum current adjustment. Adjust solenoid current so that the desired minimum value is obtained. Clockwise rotation increases current. (Factory setting is at zero.)
   最小電流調整. 調整電磁閥電流, 以便得到想要的最小值. 順時針增加電流. (出廠調整都是歸零狀態.)
3. **RAMP UP** 斜坡向上
   Ramping up time adjustment. 斜坡向上時間調整.
   (Factory setting is at zero.) (出廠調整都是歸零狀態.)
4. **RAMP DW** 斜坡向下
   Ramping down time adjustment. 斜坡向下時間調整.
   For long ramping times, turn potentiometers clockwise, for short ramping times, turn potentiometers counter clockwise.
   (Factory setting is at zero.)
   要更長的斜坡時間,請順時針旋轉電位器, 要更短的斜坡時間, 請逆時針旋轉電位器. (出廠調整都是歸零狀態.)
5. **FULL LOAD C** 滿載電流
   Maximum current adjustment. Adjust solenoid current so that the desired maximum value is obtained (up to 2A). Clockwise rotation increases current. (Factory setting is at zero.)
   最大電流調整. 調整電磁閥電流, 以便得到想要的最大值(達到2A). 順時針增加電流. (出廠調整都是歸零狀態.)
6. **FREQUENCY ADJ.** 頻率調整
   Adjusting this internal potentiometer (after removing the external plastic cover), it is possible to set the PWM frequency obtaining the desired control sensitivity. Clockwise rotation increases frequency from 100 to 500 Hz max. (Set frequency at 150 Hz when goods finished)
   調整該內部電位器(除去外部塑料套後), 能夠進行PWM頻率設置, 得到想要的控制靈敏度. 順時針轉動, 把頻率從100 Hz增加到最大值500 Hz. (出廠頻率設定為150 Hz)

◆ CONNECTION EXAMPLE 連接範例

With external potentiometer 有外部電位器



Pin 1 : V Batt 電壓端
Pin 2 : GND Batt 接地端
Pin 3 : Input control signal 輸入控制訊號
Pin GND : Control signal ground 控制訊號接地

FULL LOAD CURRENT 滿載電流
1.Turn the pin to half way under load current ⇧.
負載電流先調置一半 ⇧
2.Maximum current adjustment by turning the signal to 10V.
將電訊號調整10V時,再修正其最大線圈電流即可
3.For potentiometer resistance volume : 10KΩ
電位器電阻值使用：10KΩ

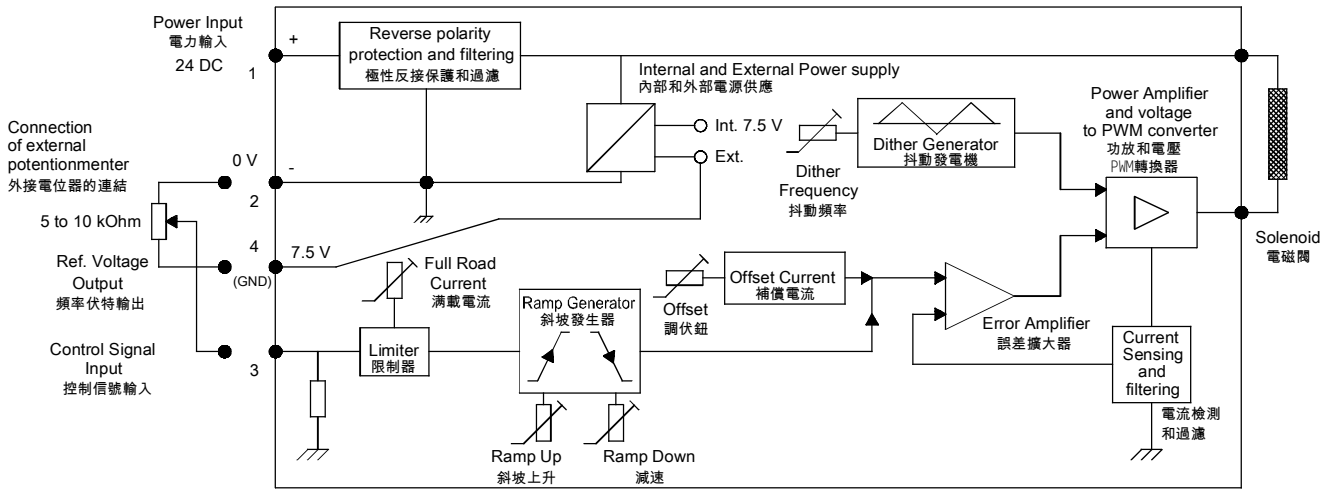
Max. current adjustment test :Turn the POT to 270° (mechanical full angle 300°), and tarn "FULL LOAD CURRENT" to semi fixed current so as to reach its max. current.
最大電流調試: 將電位器旋轉至約270°（機械全角度300°），再調整 FULL LOAD CURRENT 半固定電阻，使其設備電流最大。

Min. current adjustment test :Turning POT to 50° , adjust the "OFF SET" to semi fixed current so that it reaches the min. Initial current (initial offset aka sensitivity adjustment).
最低啓動電流調試：再將電位器旋轉約50°，調整OFF SET半固定電阻，使其設備為最低起動電流(啟動偏移量，亦稱靈敏度調整)。

● NOTES 注意

Electrical supply voltage ranges between 10 and 30 V DC. A power supply with rectified and filtered current is required. Use of a 4700 µF - 35V electrolytic capacitor is recommended. The regulator is suitable for driving 12 or 24 V DC solenoid valves. In order to ensure the coil's maximum rated operating current, the controller supply voltage must be at least 1.5v higher than the coil's nominal voltage rating.
供電電壓範圍：10至30V DC, 需要電源供應器(整流與濾波電流) , 建議使用4700µF-35V電解電容器. 調控器適用於驅動12或24V Dc電磁閥, 為了確保線圈的最大額定工作電流, 控制器電壓必須高於線圈的名目電壓額定值至少1.5V.

◆ CONTROL PORT(S) 動作形式



◆ HOW TO ORDER 編號說明

1		2		3		4
AMP	—	V		02B	—	**

1 VALVE SERIES 系列名稱

AMP= Proportional Electronic Controller
比例電子控制器

2 OUTPUT SIGNAL 輸出信號

A：4 - 20mA
V：0 - 10V

3 DESIGN NO 設計編號

4 MAXIMUM OUTPUT CURRENT 最大輸出電流

Non : 1 (A) (Standard) 無記號：1 (A)(標準型)
18 : 1. 8 (A)

◆ DESCRIPTION 說 明

Power amplifiers for proportional valves.
比例閥用功率放大器.

◆ GENERAL PRECAUTIONS 一般注意事項

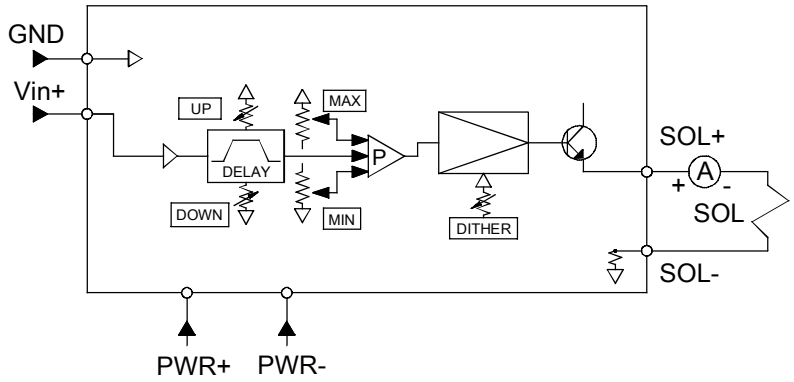
For connection between the amp/controller and solenoid coil, use a 2-conductor shielded wire with a conductor nominal cross-section area of 2.0mm². Type VCTF (Rated Voltage: 300V vinyl cab tire cord. Wiring between the command voltage generator and amplifier should be VCTF 0.75mm² 3-conductor wire. Class 3 grounding. If the ground line is unstable, do not connect the shield to anything.

放大器、控制器和電磁線圈之間的連接，請使用導體通用橫斷面積為2.0㎜²、線心數為2的屏蔽線，其型號為VCTF(額定電壓300V乙烯橡膠絕緣軟線)．指令電壓發生器和放大器之間的結線，請使用0.75㎜²、線心數為3的VCTF型號．屏蔽線使用第3種接地方式．但是在地線不穩定的情況下，不要連接到任何線上.

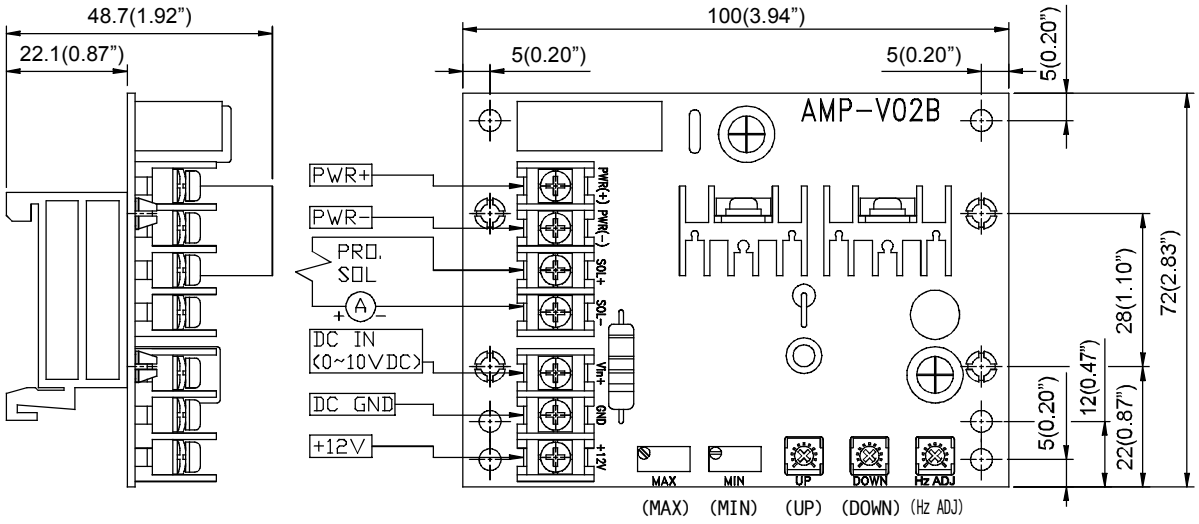
◆ TECHNICAL DATA 技術資料

Voltage type 功能型式	DC Input 輸入	**Dither frequency (DITHER)** 高頻脈動頻率 (Hz)		50 ~ 300
DC Power Input DC電源輸入 (V DC)	24	**Input control volt.** 控制訊號輸入	**(mA)**	4 ~ 20
			(V DC)	0 ~ 10
Maximum power 最大輸出功率 (W)	30	**FUSE (A)**		2
Valve coil restance 負載組抗 (R)	10	**Operation temperature** 環境溫度 (˚C)		0 ~ 65(32 ~ 149°F)
Maximum output current 最大輸出電流 (A)	1	**Temperature drift (max.)** 溫度轉移(最大)		0.3mA/˚C
	1. 8	**Storage temperature** 儲藏溫度 (˚C)		-10 ~ 75(14 ~ 167°F)

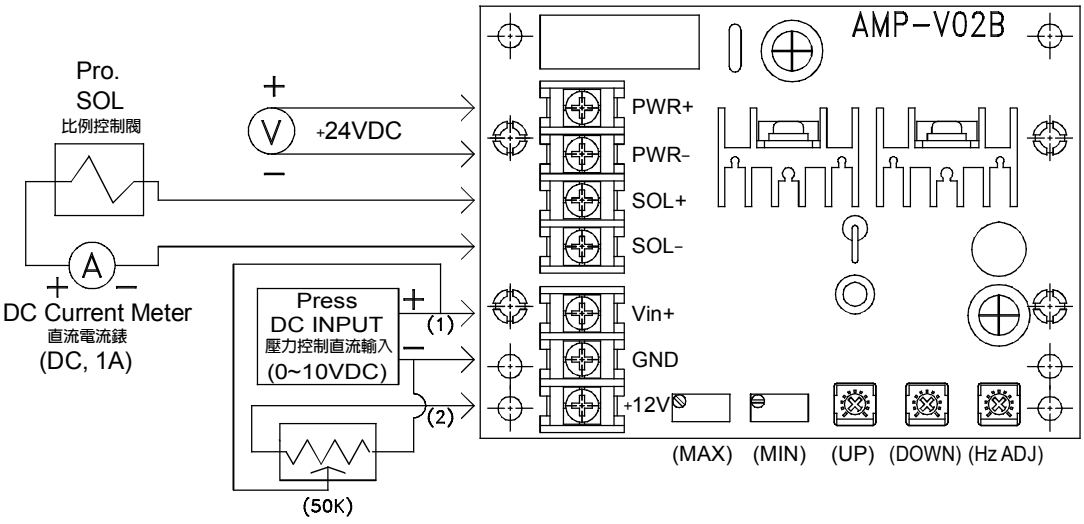
◆ CONTROL PORT(S) 動作形式



◆ DIMENSIONS 外型尺寸圖



◆ ADJUSTMENT 配線調整



● CONTROL METHODS 控制方法

(1) Controller D/A Output. 控制器D/A輸出控制
(2) Potential Meter (50K) for Manual. Adj. 手動調整的電位電錶(50K)

● WIRING 配線方式

1) Wiring following diagram as above. Please use DC 1A Current Meter. If without designing in current meter, please adjust according to hydraulic pressure indicator for pressure adjustment.
電流錶配線如上圖例,選擇1安培直流電流錶(1A,DC).壓力若不裝電流錶,則以壓力錶作為調整的依據.
2) List two control methods for just one using at a time:
列出兩種控制方式,僅能選擇其中一種方式做控制:
(1) Controller D/A output DC 0~10V
控制器輸出 D/A DC 0~10V
(2) Potential Meter (50K) for Manual adjustment which using +12VDC on board.
手動調整的電流錶(50K)是用12VDC.

● ADJUSTMENT STEPS 調整步驟

1) MIN ADJ. 最小值調整
When control signal output is 0V , adjust MIN VR to the setting value of DC current (with current meter) or pressure (with pressure indicator) . (clockwise for increasing value)
當輸出控制信號是0V.調整最小值來設定DC(用電流錶)的電流或壓力(用壓力計).(順時針時增加)
2) MAX ADJ. 最大值調整
When control signal output is 10V (for D/A output) or maximum voltage (for potential meter) , adjust MAX VR to the setting value of DC current (with current meter) or pressure (with pressure indicator) . (clockwise for increasing value. For potential meter, input voltage can up to 12V with no damage)
當D/A輸出控制信號是10V或最大值伏特(電位電錶),調整最大VR來設定DC電流值(用電流錶)或壓力(用壓力計).(順時針增加電位電錶的話最大可以到12V)
3) Ramp (UP) 上升斜率調整
Clockwise adjustment rising time shorter reaction speed faster.
Counter clockwise adjustment rising time longer reaction speed slower.
順時針調整,上升時間短,反應速度快.
逆時針調整,上升時間長,反應速度慢.
4) Ramp (DOWN) 下降斜率調整
Clockwise adjustment decline time shorter reaction speed faster.
Counter clockwise adjustment decline time longer reaction speed slower.
順時針調整,下降時間短,反應速度快.
逆時針調整,下降時間長,反應速度慢.
5) FREQUENCY ADJ. (Hz ADJ) 頻率調整
Adjusting potentiometer, it is possible to set the PWM frequency obtaining the desired control sensitivity. Clockwise rotation increases frequency from 50 to 300 Hz max. (Set frequency at 150 Hz when goods finished)
調整該內部電位器, 能夠進行PWM頻率設置,得到想要的控制靈敏度. 順時針轉動, 把頻率從50 Hz增加到最大值300 Hz. (出廠頻率設定為150 Hz)

Plan & Memo

Date/
Member/
Subject: Place/