

CUMSA

VACUUM 抽真空使用手册



抽真空机构

VJ

VG

VM

NEW

SV

NEW

VB

抽气阀组件
顶管 - 活塞

PT

PA

VV

VT

密封组件

VD

NEW

LV

JV

CV

TV

English

Español

Deutsch

Italiano

Portugues

Česky

中國

English

Español

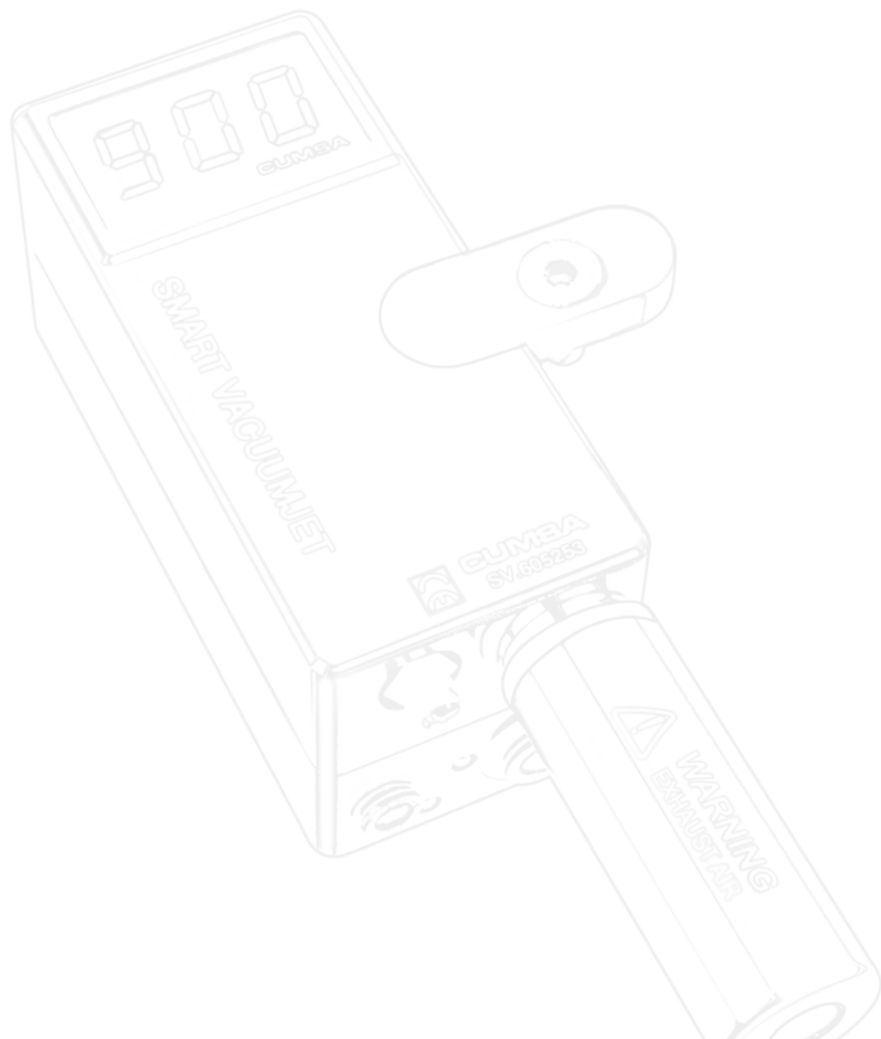
Deutsch

Italiano

Portugues

Česky

中國



CUMSA

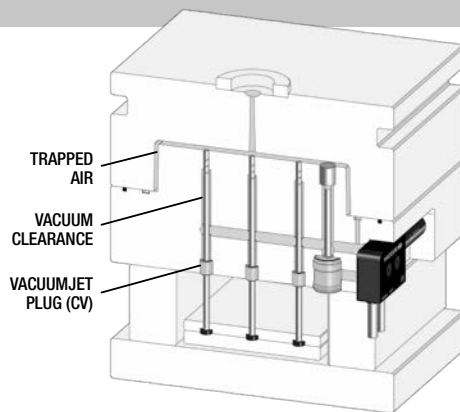
索引

A.	抽真空机构操作步骤	4
B.	安装	6
	I. 抽真空机构: VJ, VG, VM, SV, VB	6
	II. 抽气阀组件 - 顶管 - 活塞: PT, PA, VV, VT	8
	III. 密封组件: JV, CV, TV, GV, LV	10
C.	工作	13
D.	维护	47
E.	技术参数	48

A. 抽真空机构操作步骤

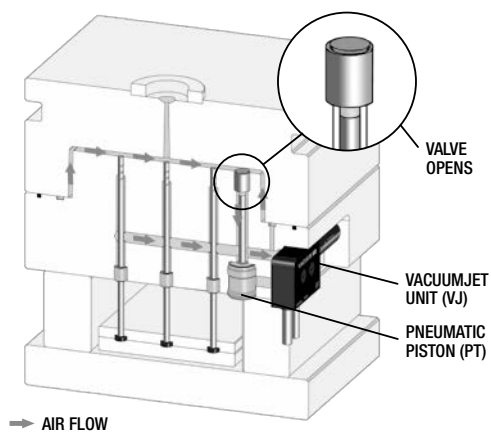
1_合模

当合模后，空气会密封在模腔内。开始注塑后，空气将会被塑胶挤压，升温，开始注塑后，空气将会被塑胶挤压，升温，从而影响产品质量。我们必须创造一个真空模腔！



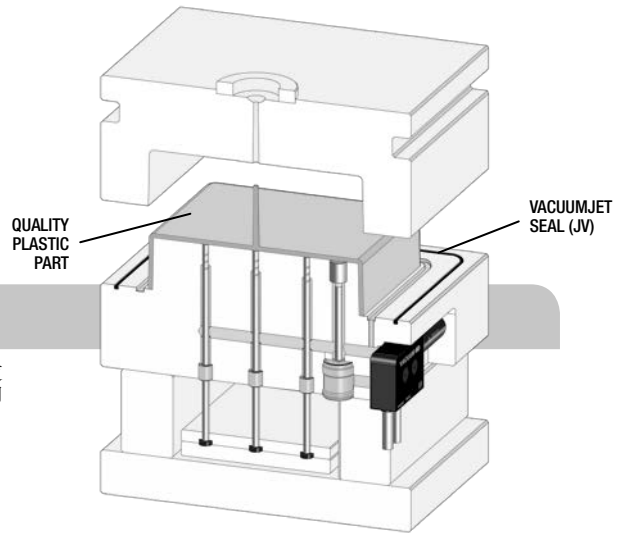
2_模腔内生产真空

为优化注塑生产我们必须排出模腔内的空气。有几个方法可以实现，但都是靠塑胶把空气排挤出去的。然而抽真空机构不一样，在注塑之前气阀就已经排出空气，产生一个真空状态的模腔以供注塑。



3_ 开始注塑

在注塑期间抽真空机构继续吸取空气，最大限度地加大塑料的流动性，从而减少注塑时所需压力。



4_ 注塑过程

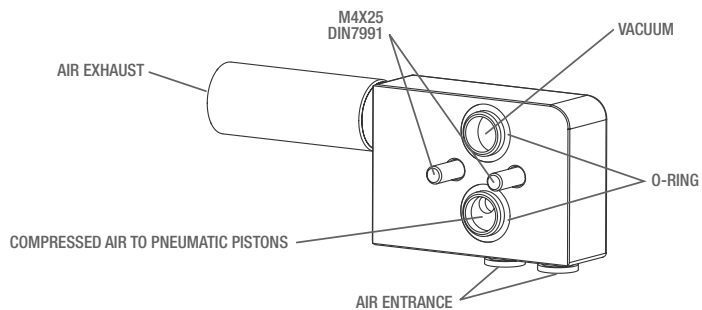
当注塑完成，抽真空机构停止，注塑产品冷却然后顶出。即使没有更快捷，在没有变更任何参数的情况下，使用抽真空机构，至少在相同的时间内我们可以获得质量更好的产品。

B. 安装

I. 抽真空机构

VJ VG VM SV VB

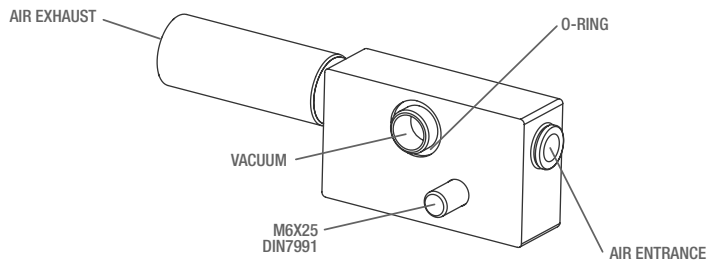
VJ



Important!

通道一定要干净以避免杂质进入抽真空机构。胶圈完全压到位以保证密封效果。

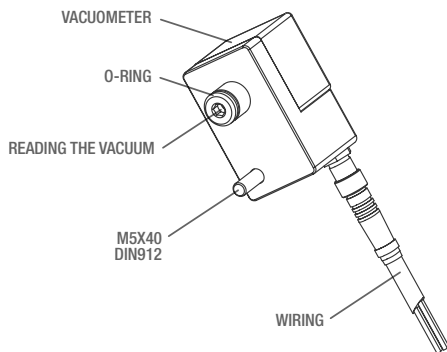
VG



Important!

通道一定要干净以避免杂质进入抽真空机构。胶圈完全压到位以保证密封效果。

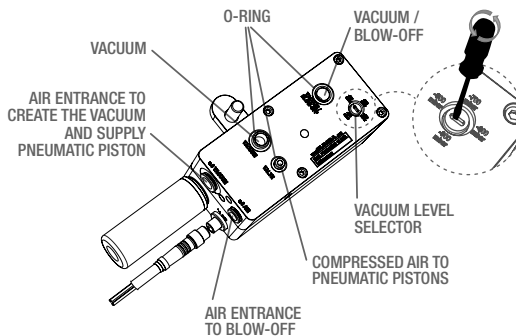
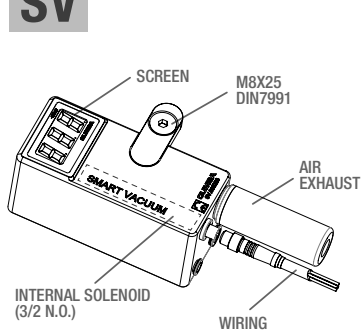
VM



Important!

胶圈完全压到位以保证密封效果。

SV



Important!

通道一定要干净以避免杂质进入抽真空机构。胶圈完全压到位以保证密封效果。

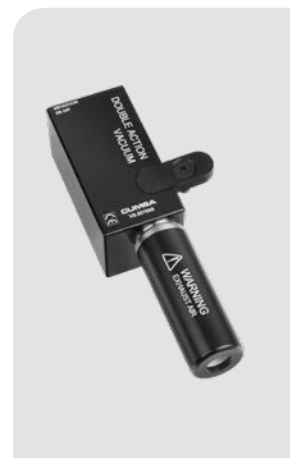
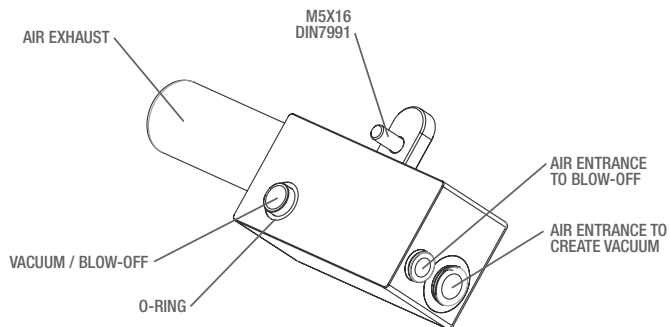
I. 抽真空机构

II. VACUUM INSERTS

VJ VG VM SV **VB**

PT PA VV VT VD LV

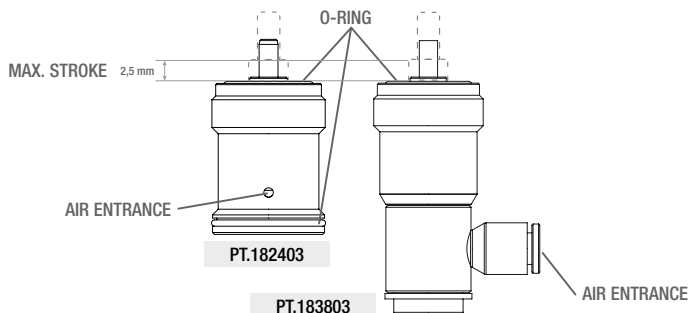
VB



Important!

通道一定要干净以避免杂质进入抽真空机构。胶圈完全压到位以保证密封效果。

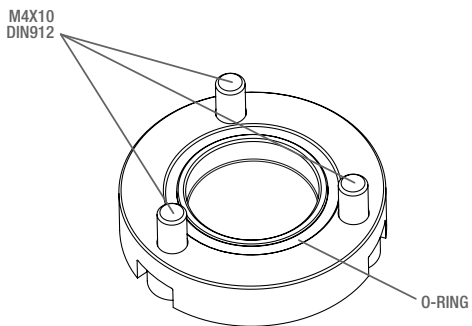
PT



Important!

胶圈完全压到位以保证密封效果。气动活塞总是打开2.5mm. 气阀由气动活塞推动。

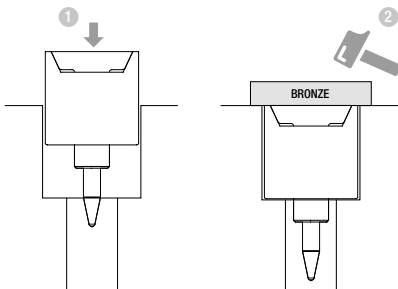
PA



Important!

胶圈完全压到位以保证密封效果。

VV



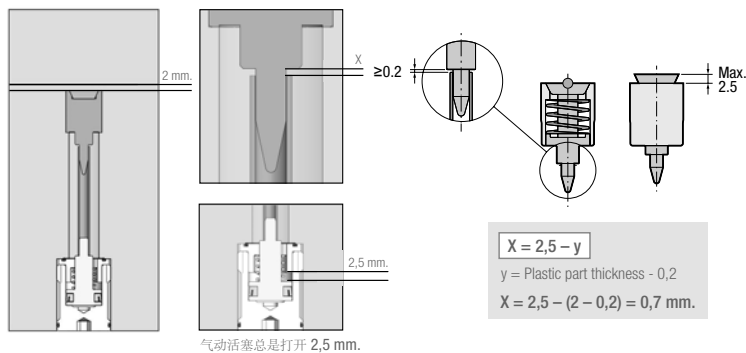
Important!

气阀由气动活塞推动。抽气阀是紧配安装。我们需要切短顶管来限制抽气阀的打开行程。

II. VACUUM INSERTS

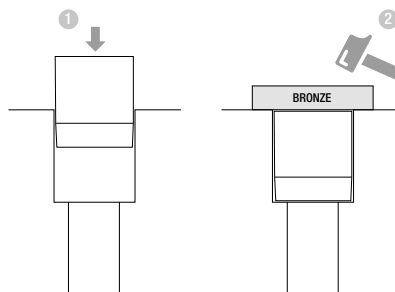
PT PA VV VT VD LV

VT

**Important!**

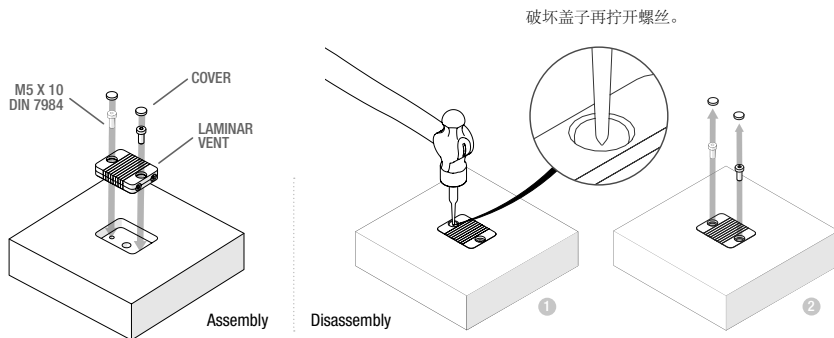
我们需要切短顶管来限制抽气阀的打开行程。我们建议使用EDM或者车床来准确切削顶管长度。

VD

**Important!**

VD 是紧配固定。排气槽允许双向吹气。

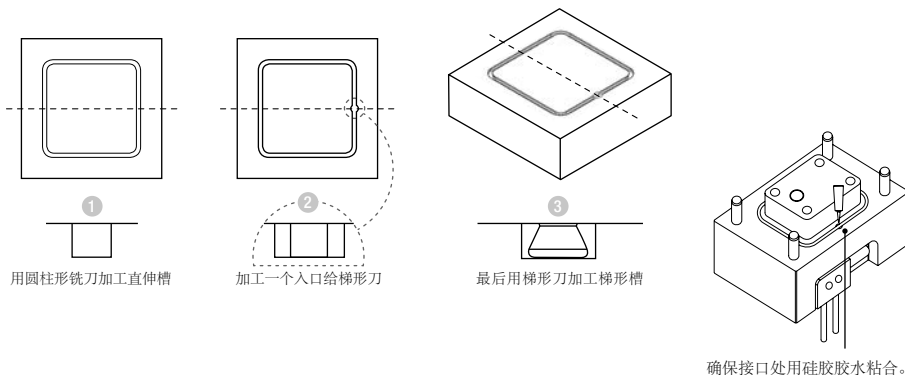
LV



Important!

LV在模具上用两个螺丝固定。螺丝可以用盖子隐藏，保证表面平整。

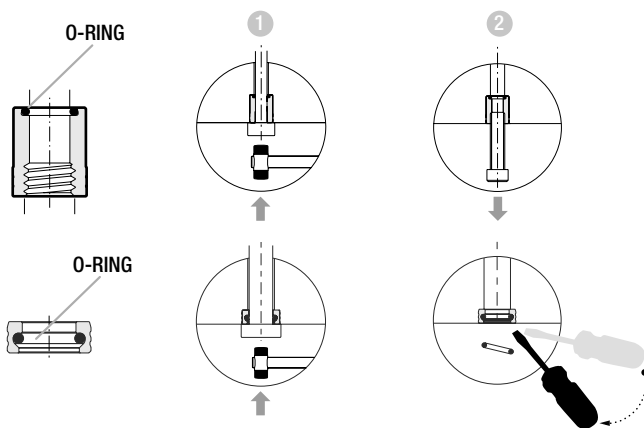
JV



III. 密封组件

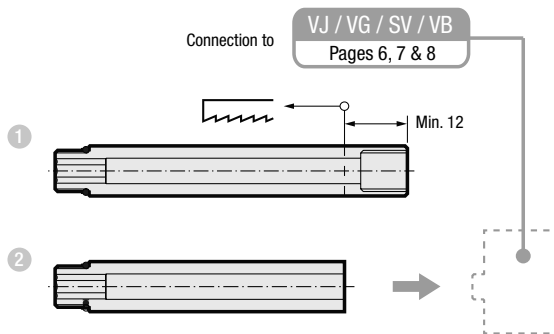
JV CV TV

CV

**Important!**

胶圈完全压到位以保证密封效果。顶针密封铜套是紧配安装。

TV

**Important!**

胶圈完全压到位以保证密封效果。

C. 工作

测试抽真空系统

首先你需要了解，你正在运用一个不同的概念。
 图解进程和工作原理都和常规的模具完全不一样。
 通常每穴安装一个抽气阀。
 当模具合模后，气阀打开开始抽气。
 注塑信号必须要在气阀关闭后发出，否则就可能跑胶进去。
 我们如何知道型腔内已经形成真空？通过真空传感器。
 真空传感器负责发送注塑信号。

选择你的选项

我是否需要控制抽真空程度？

✓

✗

我是否有空间安装抽气阀？

✓

✗

✓

✗

我需要背面吹气吗？

✓

✗

✓

✗

✓

✗

✓

✗

我需要几个电磁阀？

2

2

2

1

3

2

2

1



SV



VM + VJ



VM + VB



VM + VG



VJ + VB



VJ



VB



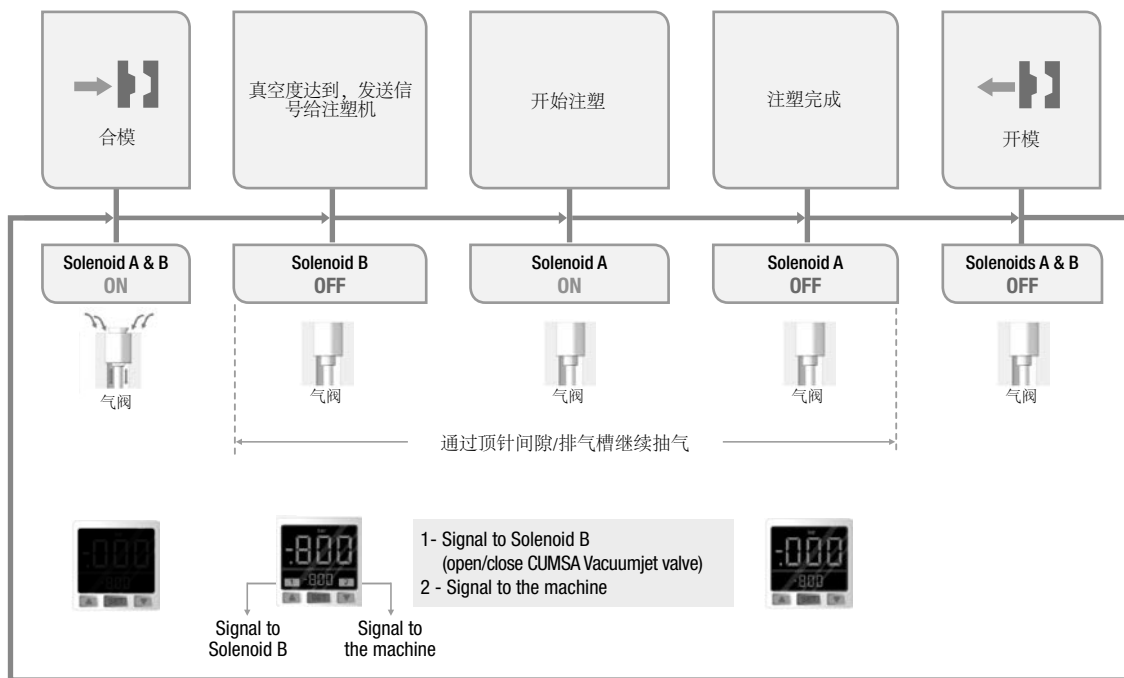
VG

VG机构可以增加任何抽真空组合来增加功率，每一个VG机构都需要独立的空气回路来保证至少有6BARS的气压。

The use of Spiral Ejector or Spiral Sleeve (VP & VS) is mandatory when not using a valve. However, it is also recommended when using a valve to maintain the vacuum achieved throughout the rest of the process.

VACUUMJET SYSTEM

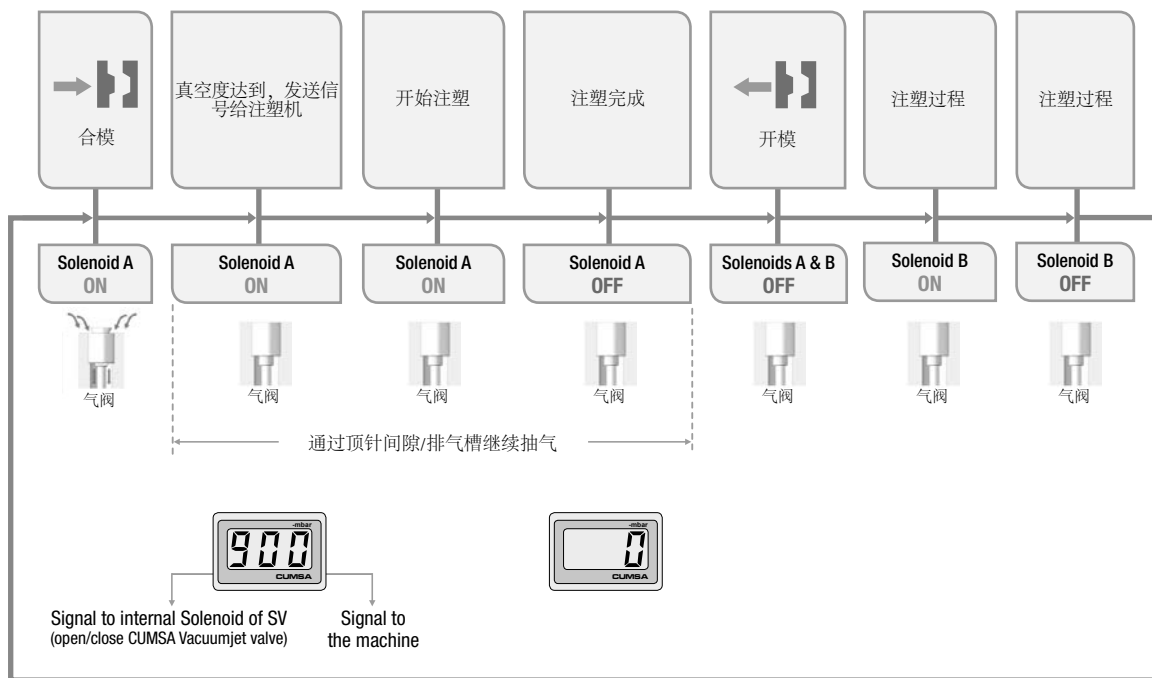
VJ + VM



2 external solenoids are needed: { Solenoid A – Vacuum **OPEN/CLOSE** air circuit to activate Venturi (Vacuum ON / Vacuum OFF)
Solenoid B – Valve **OPEN/CLOSE** air circuit to supply the pneumatic pistons

VACUUMJET SYSTEM

SV

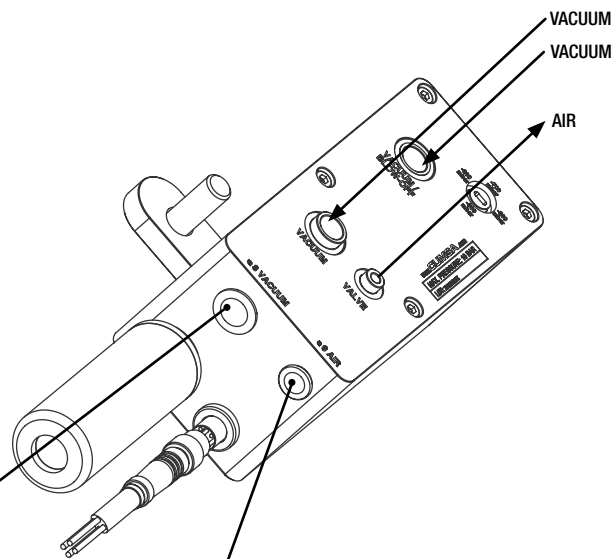


2 external solenoids are needed: { Solenoid A – Vacuum **OPEN/CLOSE** air circuit to activate Venturi and supply the pneumatic pistons
Solenoid B – Blow-off **OPEN/CLOSE** air circuit to blow-off through the gas vent insert/vents

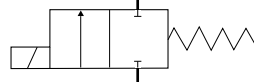
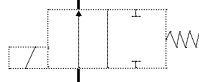
VACUUMJET SYSTEM

SV

Example

Solenoid A
ON

24vac

Solenoid B
OFF

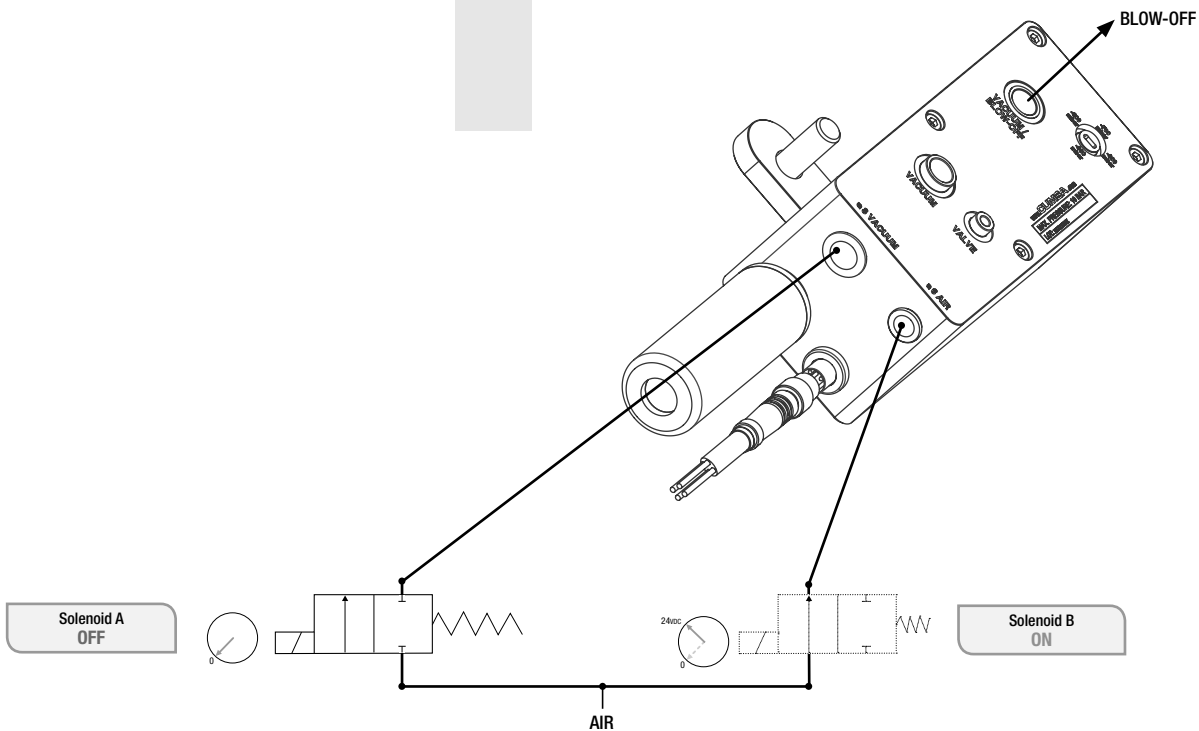
AIR

VACUUMJET SYSTEM

SV

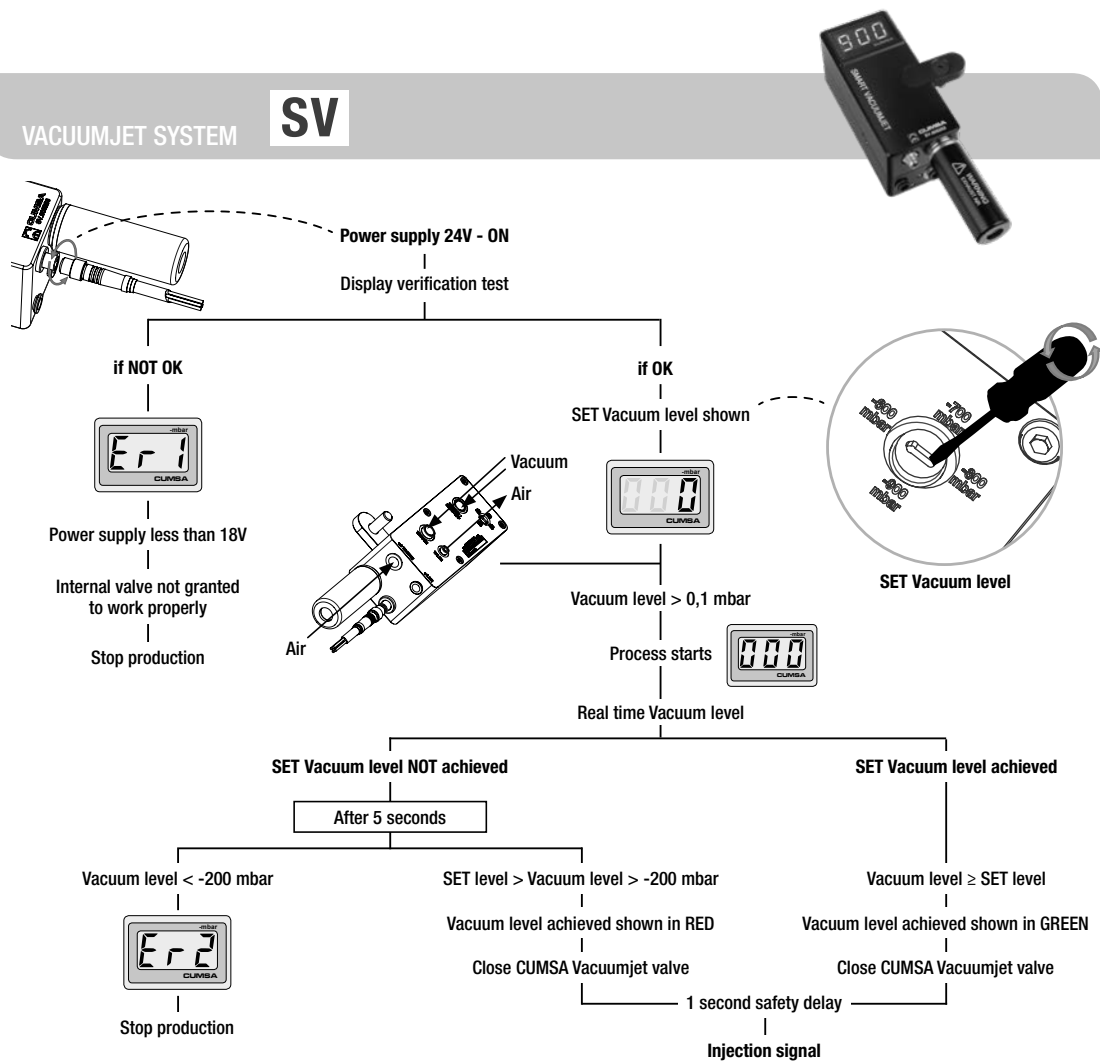


Example



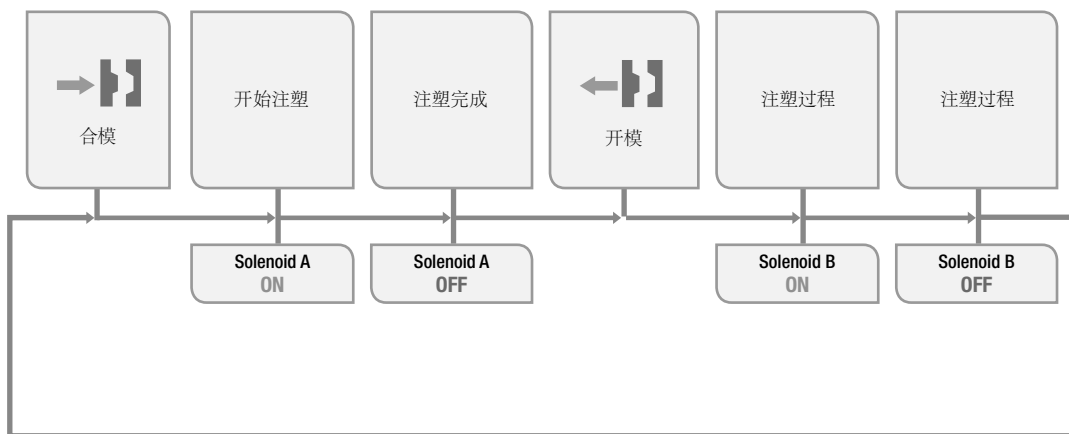
VACUUMJET SYSTEM

SV



VACUUMJET SYSTEM

VB



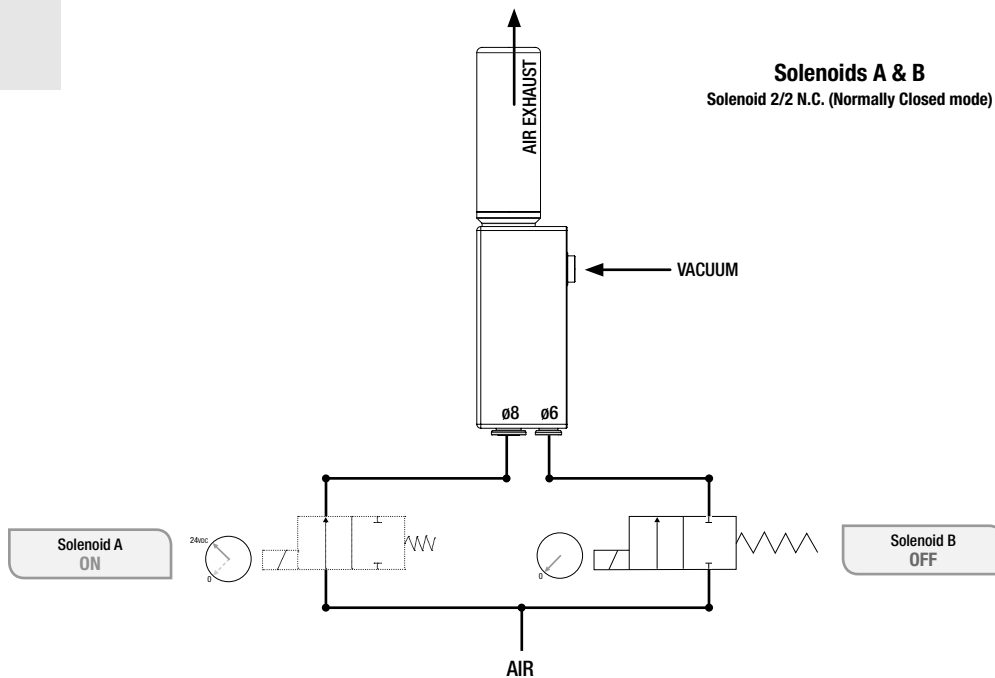
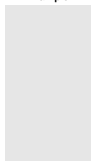
2 external solenoids are needed: { Solenoid A – Vacuum **OPEN/CLOSE** air circuit to activate Venturi (Vacuum ON / Vacuum OFF)
 Solenoid B – Blow-off **OPEN/CLOSE** air circuit to blow-off through the gas vent insert/vents

VACUUMJET SYSTEM

VB



Example



Solenoids A & B
Solenoid 2/2 N.C. (Normally Closed mode)

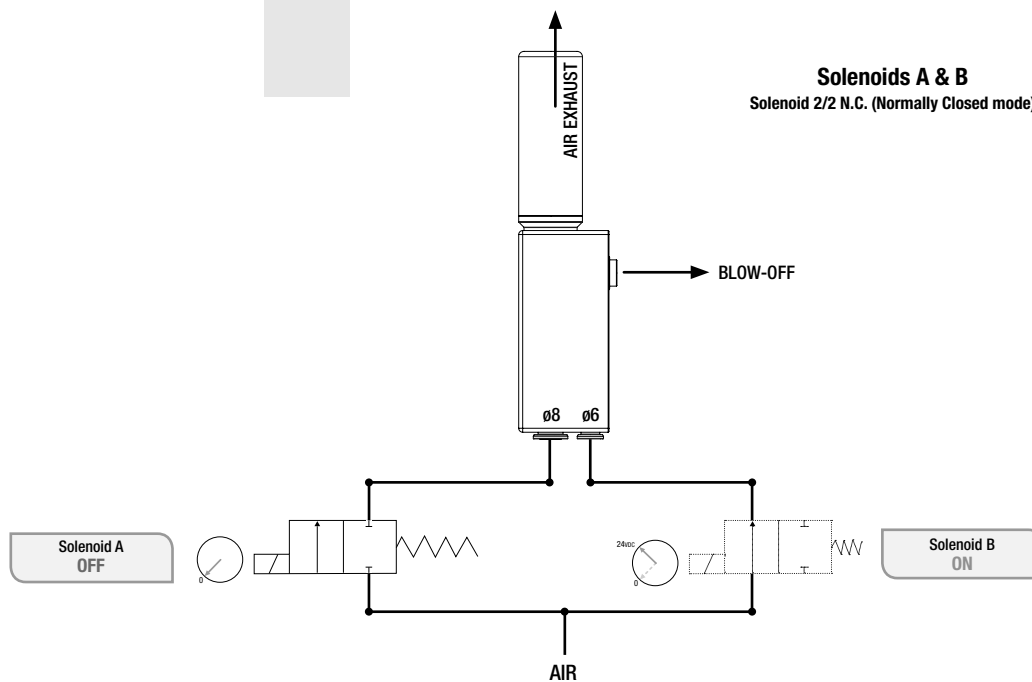
2 external solenoids are needed: { Solenoid A – Vacuum **OPEN/CLOSE** air circuit to activate Venturi (Vacuum ON / Vacuum OFF)
Solenoid B – Blow-off **OPEN/CLOSE** air circuit to blow-off through the gas vent insert/vents

VACUUMJET SYSTEM

VB



Example

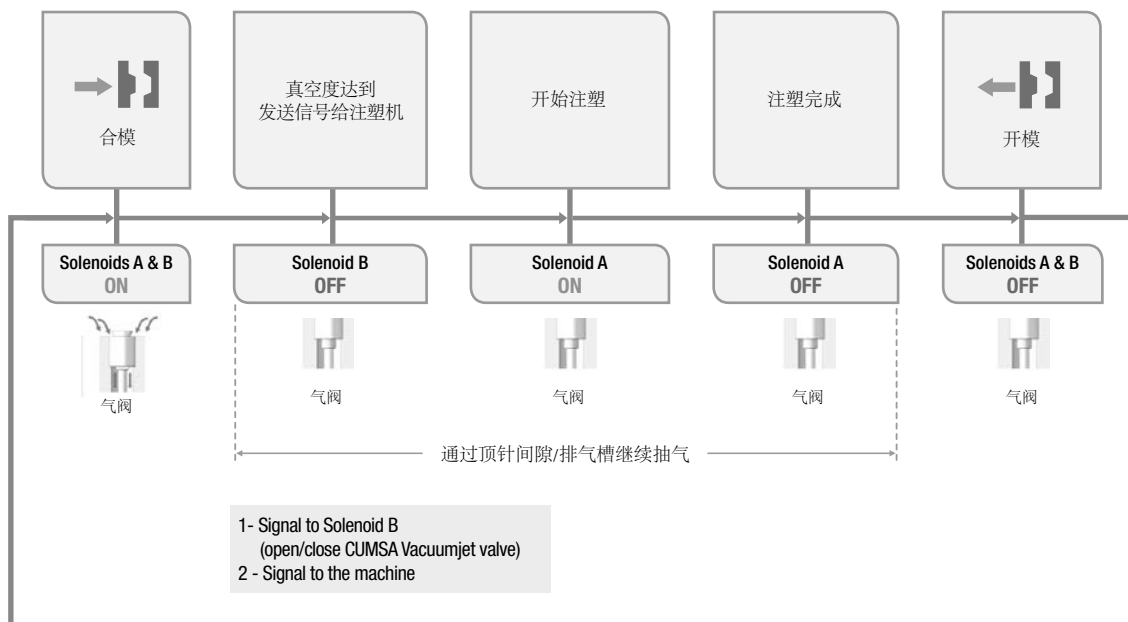
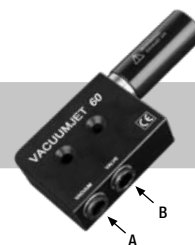


Solenoids A & B
Solenoid 2/2 N.C. (Normally Closed mode)

2 external solenoids are needed: { Solenoid A – Vacuum **OPEN/CLOSE** air circuit to activate Venturi (Vacuum ON / Vacuum OFF)
Solenoid B – Blow-off **OPEN/CLOSE** air circuit to blow-off through the gas vent insert/vents

VACUUMJET SYSTEM

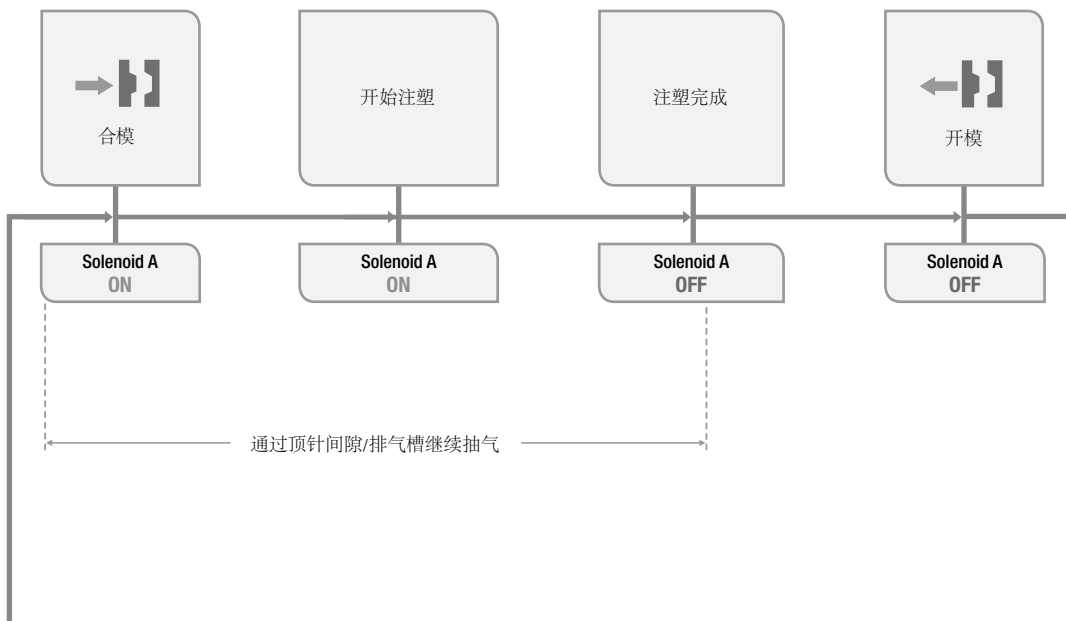
VJ



2 external solenoids are needed: { Solenoid A – Vacuum **OPEN/CLOSE** air circuit to activate Venturi (Vacuum ON / Vacuum OFF)
Solenoid B – Valve **OPEN/CLOSE** air circuit to blow-off through the gas vent insert/vents

VACUUMJET SYSTEM

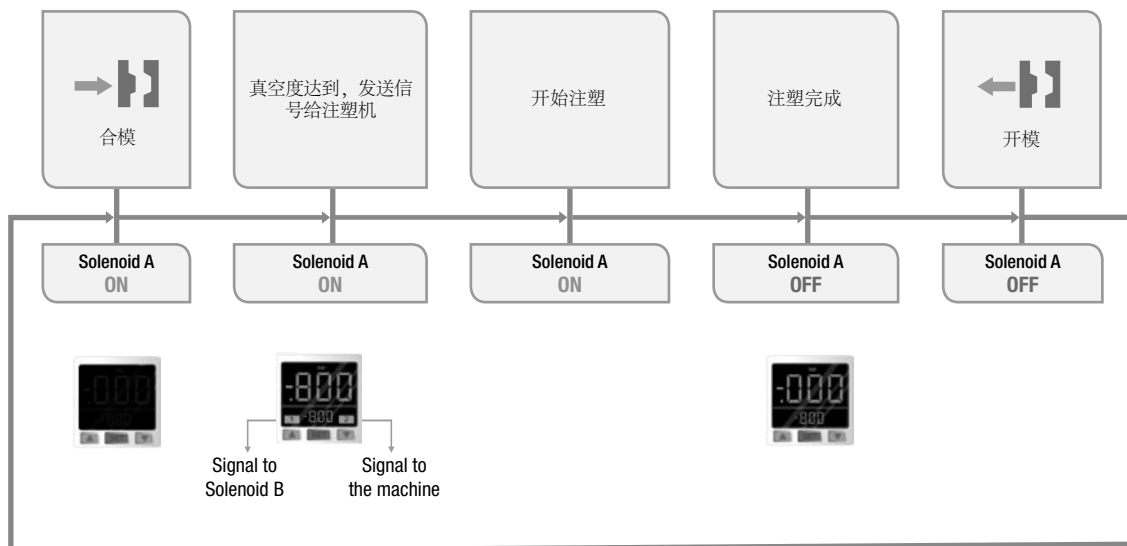
VG



1 external solenoid is needed: Solenoid A – Vacuum - **OPEN/CLOSE** air circuit to activate Venturi

VACUUMJET SYSTEM

VG + VM

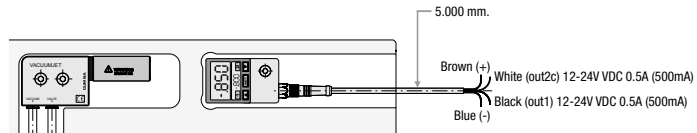
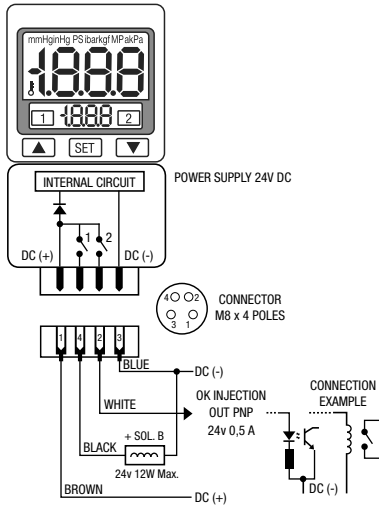


1 external solenoid is needed: Solenoid A – Vacuum - **OPEN/CLOSE** air circuit to activate Venturi (Vacuum ON / Vacuum OFF)

WIRING

VJ + VM

Model: VM.503032



Model: VM.503032

Switch output:

Output PNP open collector

Max. load: 500mA

Max. supply voltage: 24VDC ±10%

24V 电源连接到 VM.503032:

蓝色线 (-): 负极电源信号.

棕色线(+): 正极电源信号.

信号线, 发送注塑信号

白色线(+), 输出 PNP 电板开路

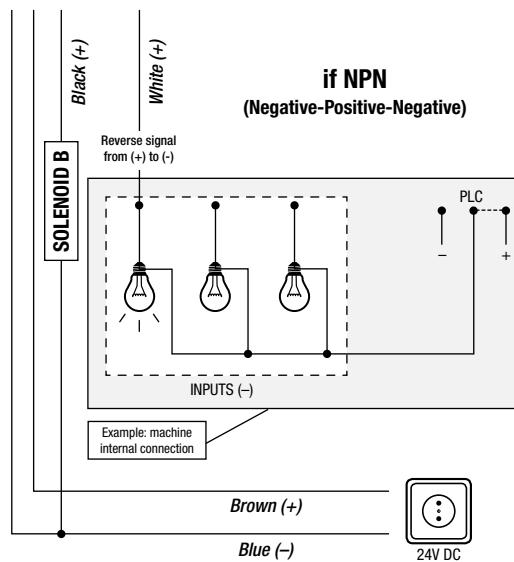
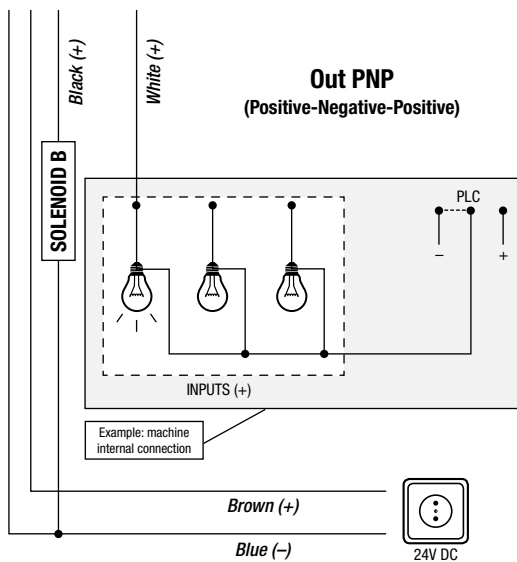
信号线, 控制外部电磁阀**B**.

黑色线 (+): 用于连接电磁阀正极, 最大24VDC, 12W.

那么蓝色线则连接电磁阀的负极.

ELECTRICAL WIRING SIMULATION

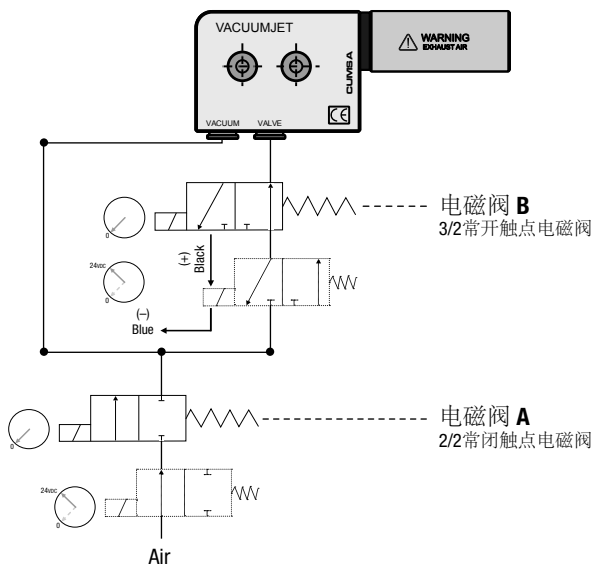
VJ + VM



电磁阀

VJ + VM

请注意 VM.503032 没有任何电磁阀



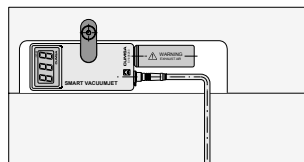
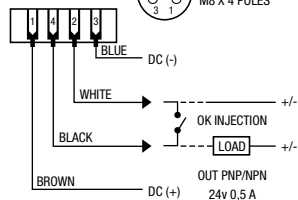
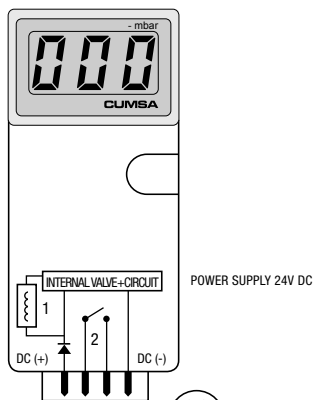
2 external solenoids are needed: { Solenoid A – Vacuum **OPEN/CLOSE** air circuit to activate Venturi (Vacuum ON / Vacuum OFF)
Solenoid B – Valve **OPEN/CLOSE** air circuit to supply the pneumatic pistons (Valve opened/Valve closed)

接线

SV

接线

SV



5,000 mm. → Brown (+) White (in/out) 12-24V VDC 0.5A (500mA)
Blue (-) White (in/out) 12-24V VDC 0.5A (500mA)

24V电源连接到 SV.605253:

蓝色线 (-): 负极电源信号.

棕色线(+): 正极电源信号.

信号线, 发送注塑信号:

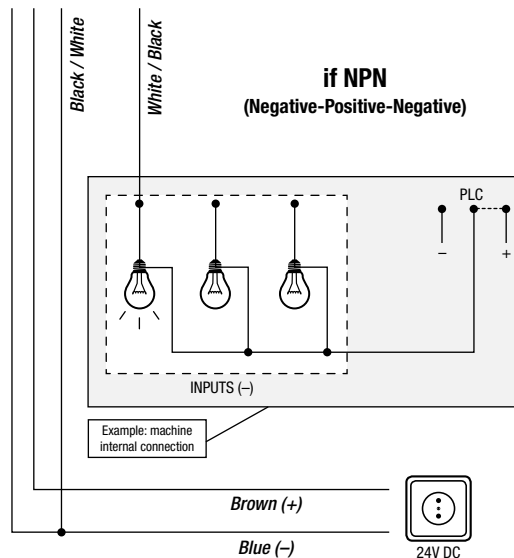
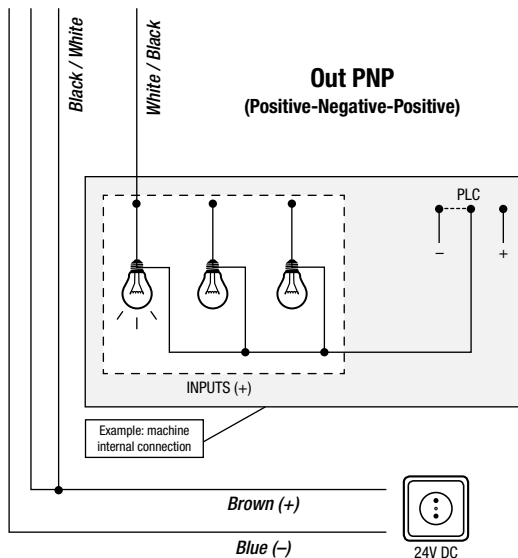
白色 (+/-).

黑色 (+/-)

这些电线都是信号接点,PNP型(正-负-正)或NPN型(负-正-负)将给注塑机发送注塑信号。这些线必须连接到注射机的PLC上,这将命令注塑。每个注射机的连接点都有所不同。

电路图示例

SV



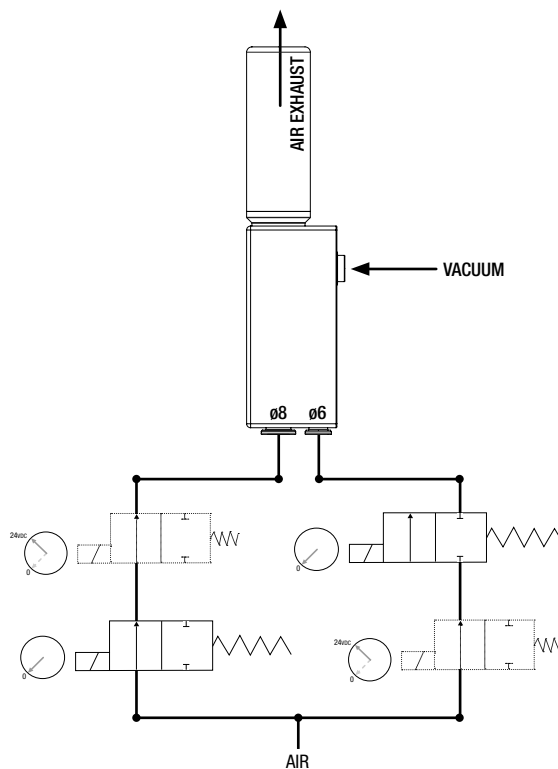
电磁阀

VB



电磁阀 A
2/2常闭触点电磁阀

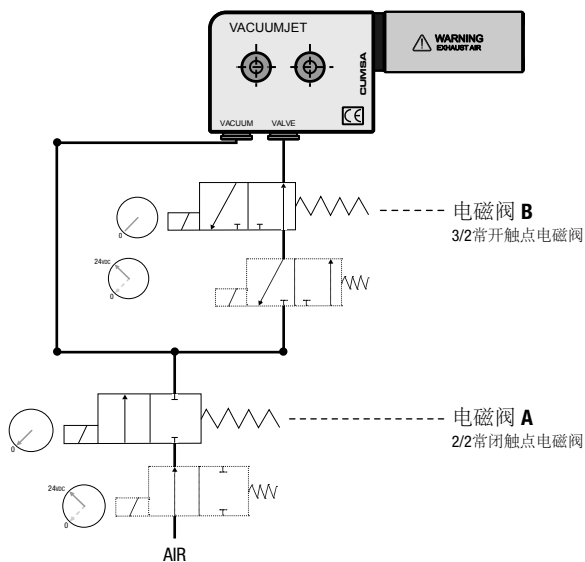
电磁阀 B
2/2常闭触点电磁阀



2 external solenoids are needed: { Solenoid A – Vacuum **OPEN/CLOSE** air circuit to activate Venturi
Solenoid B – Blow-off **OPEN/CLOSE** air circuit to blow-off through the gas vent insert/vents

电磁阀

VJ



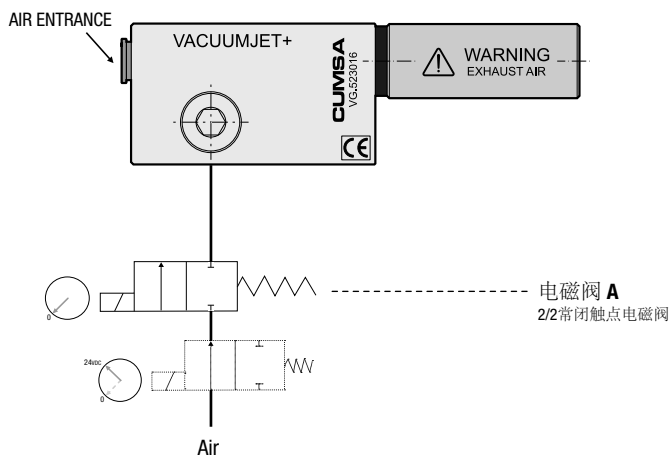
2 external solenoids are needed: { Solenoid A – Vacuum **OPEN/CLOSE** air circuit to activate Venturi
Solenoid B – Valve **OPEN/CLOSE** air circuit to activate the pneumatic piston (valve open/valve closed)

电磁阀

VG

电磁阀

VG

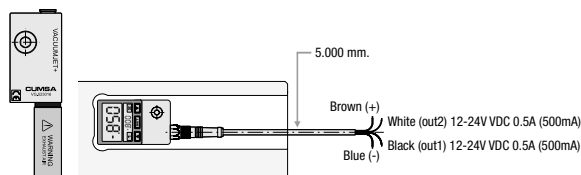
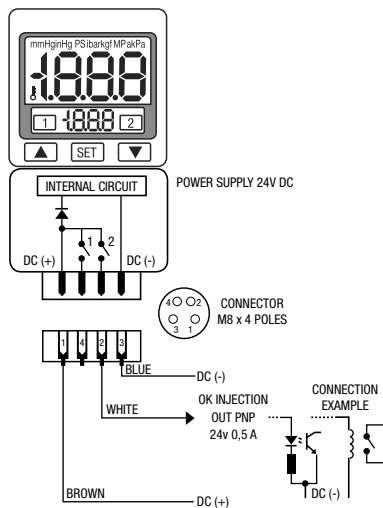


1 external solenoid is needed: Solenoid A - **OPEN/CLOSE** air circuit to activate Venturi (Vacuum ON / Vacuum OFF)

接线

VG + VM

Model: VM.503032



Model: VM.503032

Switch output:

Output PNP open collector

Max. load: 500mA

Max. supply voltage: 24VDC \pm 10%**24V电源连接到 VM.503032:**

蓝色线 (-): 负极电源信号。

棕色线 (+): 正极电源信号

信号线, 发送注塑信号:

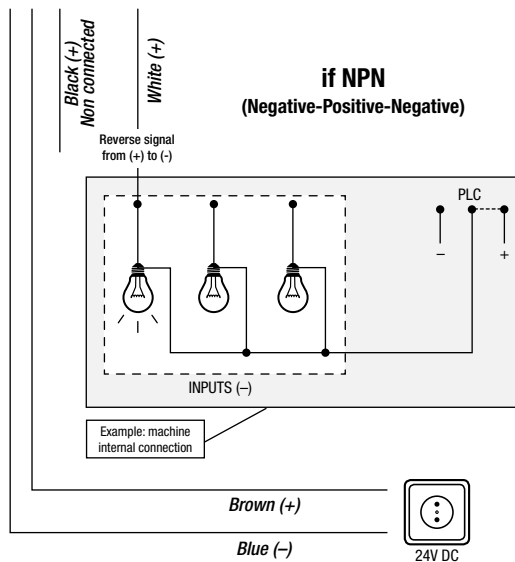
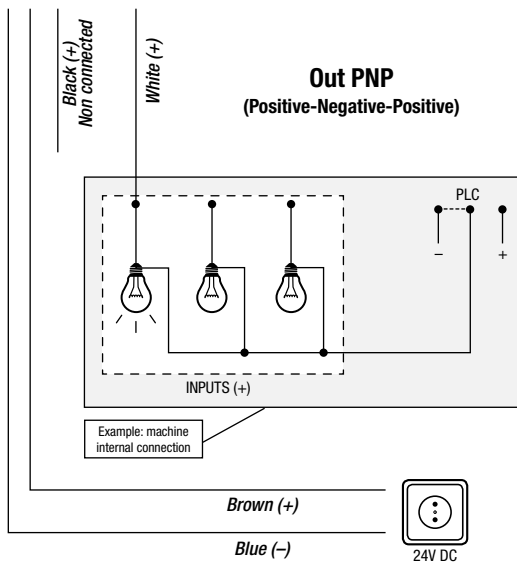
白色线 (+): 输出 PNP 电极开路。如果PLC 注塑机 NPN, 必须调转信号从(+)到(-)

信号线, 指挥外置电磁阀B:

黑色线 (+): 不连接

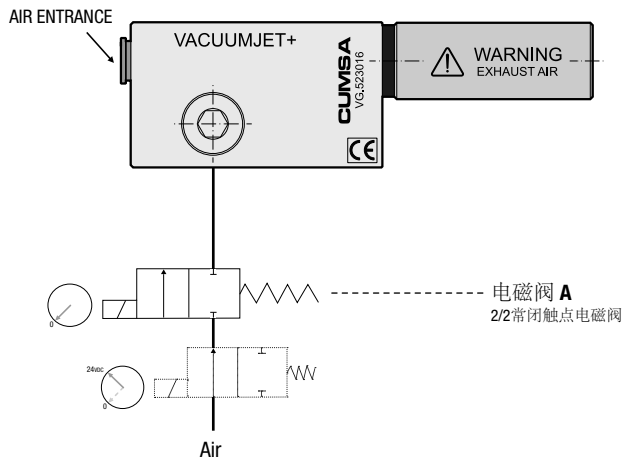
电路图示例

VG + VM



电磁阀

VG + VM



1 external solenoid is needed: Solenoid A - **OPEN/CLOSE** air circuit to activate Venturi

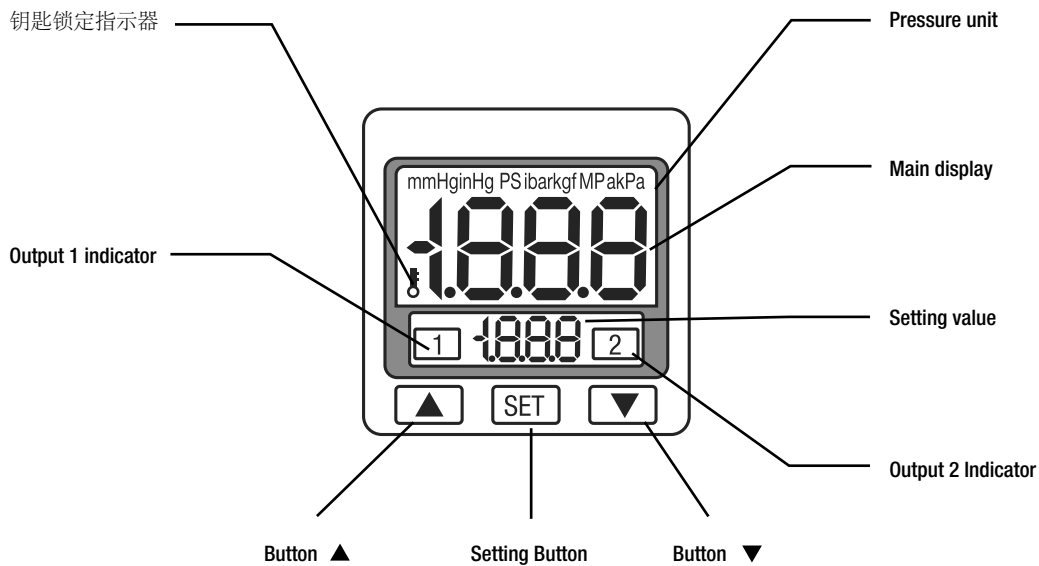
C. 工作

真空指示器

传感器的设定

真空指示器

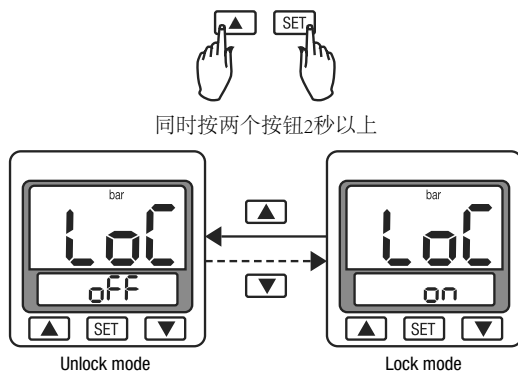
控制器的主要部分:




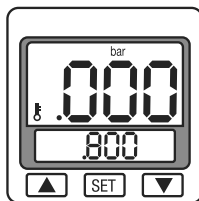
A. 锁定 - 解锁模式

A. 锁定 - 解锁模式

此机构总是提供锁定模式以防止未经授权的或意外的篡改出厂设置。
如果你需要修改归零设置,你需要先解锁。
我们强烈推荐再次锁定,系统只会在初始设置模式下进行抽真空工作。



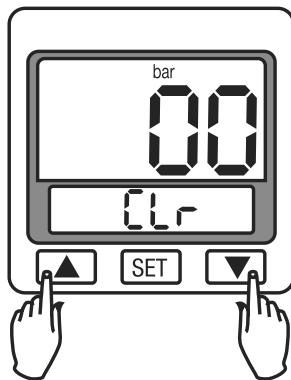
锁定时 **SET** 仪表上应显示“”。



B. 归零设置

B. 归零设置

系统接上电源后,如果显示屏不显示000,系统必须重新设置为适当的值。
设置时,同时按下 ▲+▼ 按钮,直到“00”显示。
松开按钮结束归零设置。



C. 设置真空水平

C. 设置真空水平

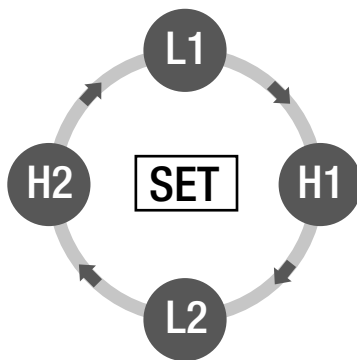
The vacuum is factory defined as an 80%, which is the recommended level. In case the user wants to modify this value.

First, refer to the Lock/Unlock mode section to be able to modify this.

Press **[SET]** button to start configuration, and to switch between L-1, H-1, L2 and H-2 options.

Press **[▲]** and **[▼]** to increase or decrease values, and press **[SET]** again to define values.

* The L-1, H-1, L2 and H-2 options and the Values, are shown in the secondary display.



IMPORTANT!

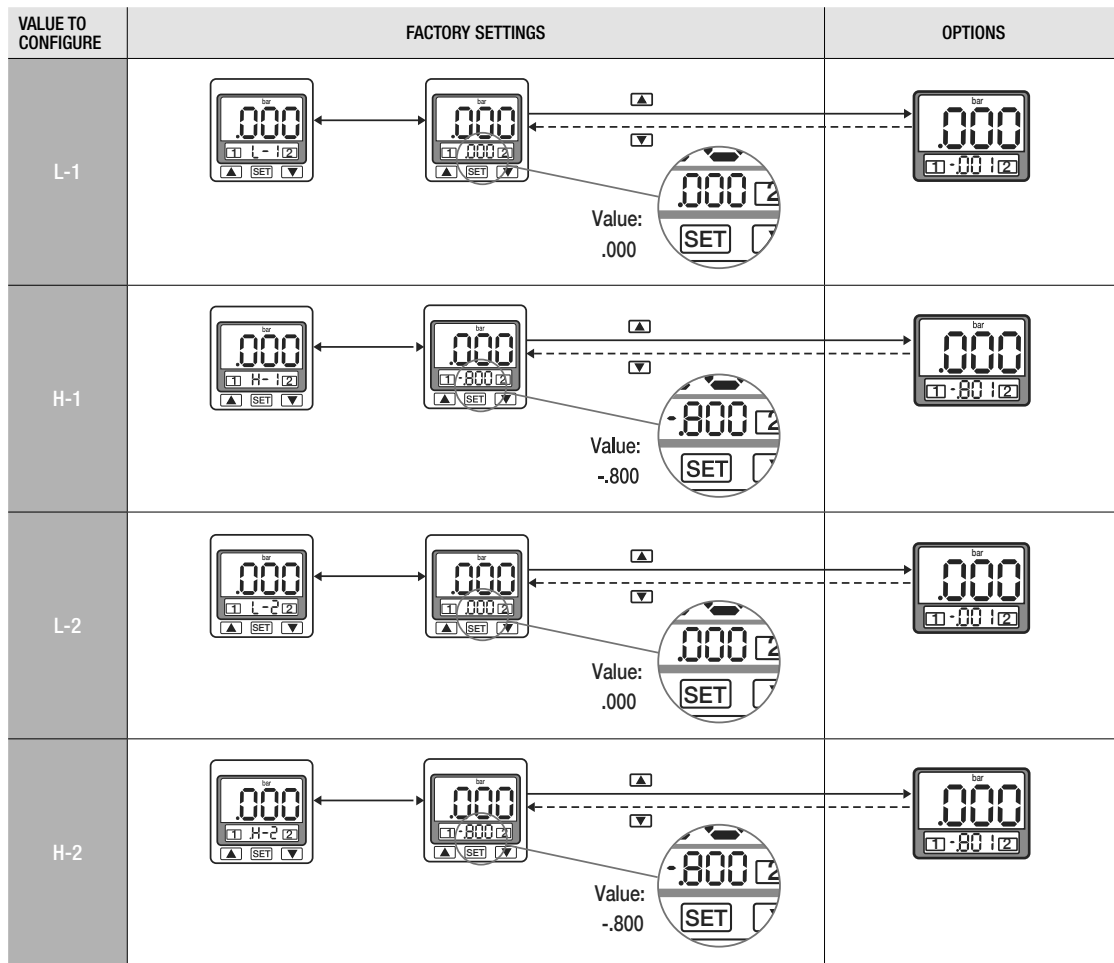
建议遵循出厂设置.

IMPORTANT!

L1=L2=0
H1=H2=-0.800

L1= 信号1 低水平
H1= 信号1 高水平
L2= 信号2 低水平
H2= 信号2 高水平













C. 设置真空水平



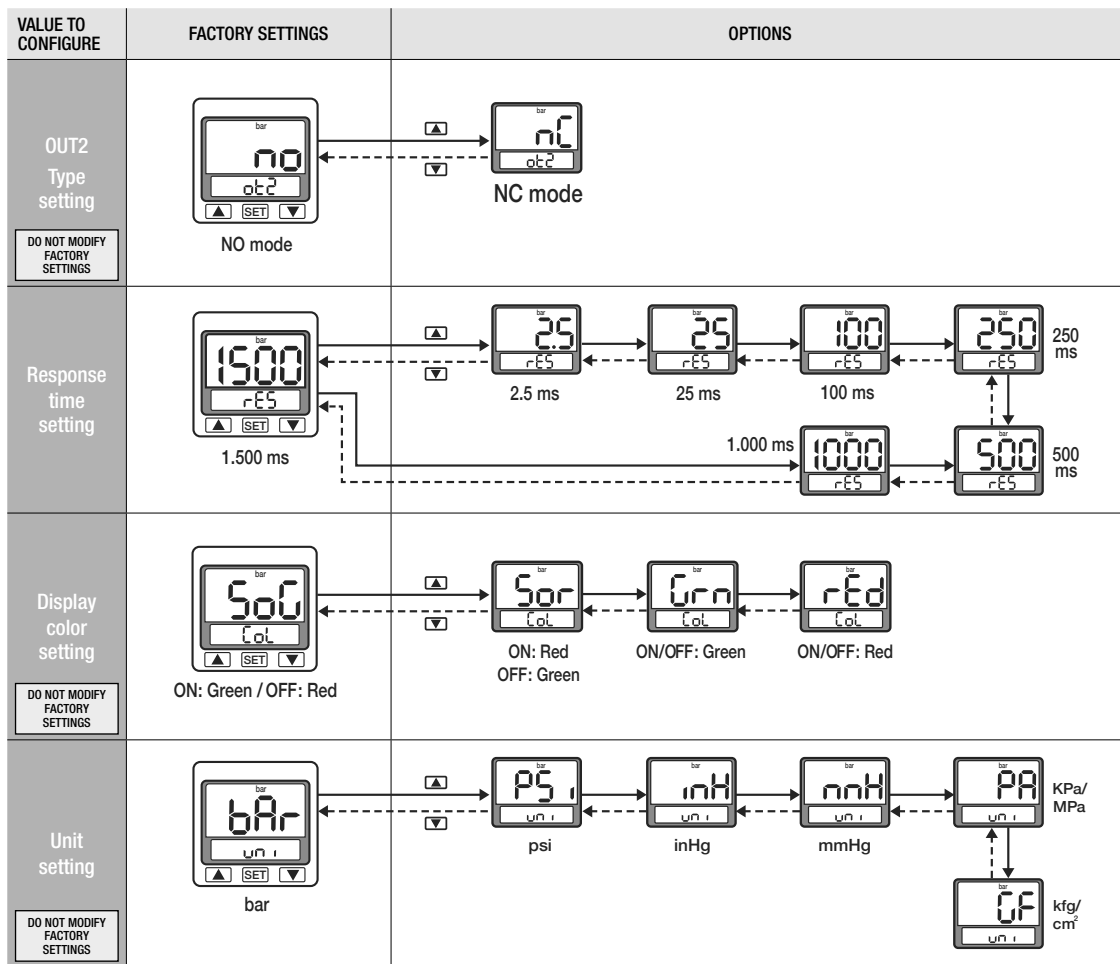
D. INITIAL SETTING MODE

Press **[SET]** button between 3 to 5 seconds to start configuration.

Press **[▲]** and **[▼]** to switch between options and press **[SET]** again to set the desired option.

VALUE TO CONFIGURE	FACTORY SETTINGS	OPTIONS		
OUT1 Operating mode setting DO NOT MODIFY FACTORY SETTINGS	 Hysteresis mode	  Windows comparator	 One point set	
OUT1 Type setting DO NOT MODIFY FACTORY SETTINGS	 NO mode	  NC mode		
OUT2 Operating mode setting DO NOT MODIFY FACTORY SETTINGS	 Hysteresis mode	  Windows comparator	 OFF mode	 One point set

D. INITIAL SETTING MODE



E. ERROR CODE INSTRUCTIONS

TYPE	CODE	CONDITION	TROUBLESHOOTING
RESIDUAL PRESSURE ERROR	ER3	During zero reset, ambient pressure is over $\pm 3\%$ F.S.	Change input pressure to ambient pressure and perform zero reset again.
APPLIED PRESSURE ERROR	HHH	Supplied pressure exceeds the upper limit of pressure setting.	Adjust the pressure within operating pressure range.
APPLIED PRESSURE ERROR	LLL	Supplied pressure exceeds the lower limit of pressure setting.	Adjust the pressure within operating pressure range.
SYSTEM ERROR	ER4	Internal system error.	Turn power off, and then restart. If error condition remains, please return to factory for inspection.
	ER5		
	ER6	Internal data error.	
	ER7		

C. 工作

开始测试

- a) 检查清单。
- b) 打开吹气，查看模具可以达到的抽真空最高值。请注意不要打开注塑。
- c) 当抽真空值稳定后，把数值记录下来，这个将会是模具能够达到的抽真空最高值。

现在已经准备好注塑了。

最重要一点是要确保传感器是指令注塑过程。

D. 保养

检查清单

- 模具加压
- 图表正确跟踪
- 布线正确
- 归零设置
- $L1=L2=0$
- $H1=H2=-0.980^*$
- 传感器锁定
- 射嘴就位

**In order to test the vacuum level we recommend to set H1/H2 at -0.980. This guarantees that we will never reach it, as the maximum venturi level is -0.940. By following this procedure we can avoid sending the signal to the injection machine.*

保养

- 确保压缩空气是干的及过滤的。
- 确保压缩空气在5~8 bar。
- 确保抽气通道完全干净。
- 确保所有的顶针铜套，导套及密封胶圈保持密封状态。
- 确保螺纹顶针没有杂质。
- 确保抽真空机构的消声器保持清洁。
- 确保文丘里管里（抽真空机构）没有杂质。
- 确保抽真空机构在生产过程中保持锁定状态。

E. 技术参数

VACUUMJET

TYPE		SPECIFICATIONS	
Rated pressure range		0.0 ~ / -101.3kPa	
Withstand pressure		300kPa	
Fluid		Air, non/corrosive gases, incombustible gases	
Set pressure resolution	kPa	0.1	
	Mpa	-	
	kgf/cm ²	0.001	
	bar	0.001	
	psi	0.01	
	InHg	0.1	
	mmHg	1	
Power supply voltage		12 to 24 VDC \pm 10%, Ripple (P-P) 10% or less	
Current consumption		\leq 40mA (With no load)	
Switch output	Model: SV.605253		Model: VM.503032
	Output PNP/NPN (DC/AC) Max. load: 500mA Max. supply voltage: 24VDC \pm 10%		Output PNP open collector Max. load: 500mA Max. supply voltage: 24VDC \pm 10%

VACUUMJET

TYPE		SPECIFICATIONS
Repeatability (Switch output)		$\leq \pm 0.2\%$ F.S. ± 1 digit
Response time		≤ 2.5 ms (chattering-proof function 25ms to 1500ms selections)
Output short circuit protection		Yes
7 segment LCD display		Three color (Red/Green/Orange) (Sampling rate > 5 times/sec.)
Indicator accuracy		$\leq \pm 2\%$ F.S. ± 1 digit (ambient temperature: $25 \pm 3^\circ\text{C}$)
Switch ON indicator		Orange 1 & 2 Indicator
Environment	Enclosure	IP 40
	Ambient temp. range	Operation: $0 \sim 50^\circ\text{C}$, Storage: $-10 \sim 60^\circ\text{C}$ (no condensation or freezing)
	Ambient humidity range	Operation/Storage: 35~85% RH (no condensation)
	Withstand voltage	1000VAC in 1-min (between case and lead wire)
	Insulation resistance	50Mohm min. (at 500VDC, between case and lead wire)
	Vibration	Total amplitude 1.5mm or 10G, 10Hz-150Hz-10Hz scan for 1 minute, two hours each direction of X, Y and Z
	Shock	100m/s (10G), 3 times each direction of X, Y and Z
Temperature characteristic		$\leq \pm 2\%$ F.S. of detected pressure (25°C) at temp. range of $0 \sim 50^\circ\text{C}$

CUMSA

CUMSA

INNOVATIVE SOLUTIONS
FOR YOUR MOLDS

www.CUMSA.com