DESCRIPTION

The Moog G122-828-019 VP Controller, combined with a Moog servo valve, a position or velocity transducer and a pressure transducer, will provide closed loop control of the injection cycle of a plastic injection molding machine. The functions controlled during the cycle are:

• Injection speed
• Injection pressure limiting
• Hold pressure during setting
• Back pressure during plasticising

Retract speed during decompression is controlled open loop.

Closed loop control of the critical injection speed and pressures ensures precise repeatability of mold fill and so consistent and high quality machine output. Variations in material characteristics, machine hydraulic pressure, mold temperature, screw clearances, etc, do not result in the normally observed variations is part quality. Consistent and repeatable inject speed, hold pressure and back pressure dramatically reduce the influence of these variables.

The VP Controller is housed in a compact DIN rail mounting enclosure and requires a 24V DC supply.

FEATURES

• Improved yield
• Higher quality parts
• Set once, no further adjustments needed
• Low cost
• Moog quality and reliability
• Compact DIN rail housing
• Convenient front panel controls, test points and indicators
**SPECIFICATIONS**

**Logic inputs:** Inject, hold pressure, back pressure and retract
- On at 10 V
- Off at 5 V
- Max 28 V
- 5.1 mA @ 24 V

**Valve output:** 0 to ± 10 V @ ± 2 mA max
- Short circuit and over-voltage protected

**Monitor signal outputs:**
- P-act 0 to +10 V
- V-act 0 to +10 V
- 2mA max, short circuit and over-voltage protected

**Front panel test points:**
- Wipers of R2, 4,12 & 13 and 0 V reference

**Front panel indicators:**
- inj (inject) – green
- HP (hold pressure) – green
- BP (back pressure) – green
- ret (retract) – green
- sat (valve saturated) – yellow

**Front panel trimpots:**
- R1 velocity sensitivity
- R2 actual pressure zero
- R3 actual pressure sensitivity
- R4 hold pressure zero
- R5 hold pressure balance
- R6 voltage distributor P gain
- R7 voltage distributor I gain
- R8 hold pressure P gain
- R9 hold pressure I gain
- R10 back pressure P gain
- R11 back pressure I gain
- R12 back pressure zero
- R13 retract adjust
- R14 integral delay time
- R15 pressure limiter P gain
- R16 pressure limiter I gain

**P-set signal input:**
- Pin 13
  - Rin = 100 kOhm
  - Vin = 0 to +10 V

**V-set signal input:**
- Pin 11
  - Rin = 10 kOhm
  - Vin = 0 to +10 V

**P-act signal input:**
- Pin 4
  - Rin = 500 Ohm
  - Iin = 0 to +20 mA

**S-act signal input:**
- J404 made
- Pin 8, voltage
  - Rin = 100 kOhm
  - Vin = +10 to 0 V
  - Vin must decrease during injection

**S-act signal input:**
- Pin 9
  - Rin = 100 kOhm
  - Vin = -10 to 0 V

**Pressure transducer:** +5 V ± 0.25 V @ 50 mA max

**Valve supply:**
- Internally supplied from pin 1

**Pin 20**
- 300 mA max output

**Supply:**
- 24V nominal, 22 to 28 V
- 130 mA @ 24 V, sat LED on

**Recommended supply protection:**
- M205, 250mA T (slow blow) fuse
- compliant with IEC 127-2 sheet 3

**Mounting:**
- DIN rail to EN50002
- Housing IP40
- Terminal block IP20

**Temperature:**
- 0 to +40°C

**Dimensions:**
- 90 L x 85 W x 108 H

**Weight:**
- 316 gm

---

**CYCLE DESCRIPTION**

Refer to the timing diagram below and the Operating detail drawings on page 4.

**Inject:** At the start of the cycle the machine PLC sets the INJECT logic input true and outputs an analog voltage V-set, to set the inject speed. It also outputs an analog voltage P-set, which sets the upper limit of the inject pressure. As soon as the actual inject pressure reaches the P-set value, the speed control is suppressed by the pressure control and the rest of the inject part of the cycle is at constant pressure. The pressure will normally rise to this limit when the mold is full and the inject actuator can no longer move forward.

**Hold Pressure:** This part of the cycle maintains a constant pressure on the part, setting in the mold. The machine PLC now removes the INJECT logic input and sets HOLD PRESSURE true. At the same time it adjusts the P-set analog value to the required hold pressure.

**Back Pressure:** This part of the cycle maintains a constant pressure in the rear of the injection actuator to ensure even plasticising.

The machine PLC removes the HOLD PRESSURE logic signal and sets the BACK PRESSURE logic signal true. It adjusts the P-set analog signal to the required pressure and the closed loop holds the oil pressure at that value as the screw rotates and forces the inject actuator back.

**Retract:** After plasticising, the screw is pulled back to stop inject nozzle drool.

The machine PLC removes the BACK PRESSURE logic signal and sets the RETRACT logic signal true. The machine also pressure the front of the inject actuator to pull back the screw. Oil flow out of the back of the actuator is controlled open loop by the servo valve. The command to the servo valve can come from V-set, or R13 on the VP Controller, or both.

---

**CYCLE TIMING DIAGRAM**

![Cycle Timing Diagram](image)
**LINK ACCESS**

Access to the internal circuit boards, so the links can be set, is achieved by the following:

- Remove both electrical connectors.
- Using a medium sized, flat blade screw driver, push in one side tab while pulling the cover away from the base. The cover will click over the tab.
- Repeat for the other tab on that side.
- After the two tabs on one side are released, release the tabs on the other.
- Withdraw the electronics assembly and identify the circuit boards by their part numbers C70349 and C70365.

**MAIN PCB 3 TOP**

```
J208  ✓  Hold pressure controller integrating capacitor 8.10mF
J209  ✓  Spare
J210  ✓  Hold pressure controller integrating capacitor 10mF
J211  ✓  Spare
J212  ✓  Hold pressure controller integrating capacitor 20mF
J214  ✓  Hold pressure controller integrator disable
```

**MAIN PCB 4 BOTTOM**

```
J401  ✓  Pressure measuring amp Dynisco
J402  ✓  Pressure measuring amp 210 bar
J403  ✓  Pressure measuring amp 210 bar
J404  ✓  Pressure measuring amp Dynisco
J405  ✓  Pressure measuring amp 350 bar
J406  ✓  Velocity signal from linear pot
J407  ✓  Pressure measuring amp 350 bar
J408  ✓  Pressure measuring amp 350 bar
J409  ✓  Velocity signal from linear pot
```

**C70349 REV A**

- Default link loaded.
INTERCONNECT DIAGRAM

ORDERING INFORMATION
G122-828-019  VP Controller

INTERNET DATA
For the latest version of this Data Sheet please refer to the Moog website www.moog.com/dinmodules

Moog Australia Pty. Ltd.  14 Miles Street, Mulgrave, Victoria 3170, Australia. Telephone: 03 9561 6044.  Fax: 03 9562 0246.
For the location nearest you, contact: www.moog.com/worldwide.
Moog pursues a policy of continuous development and reserves the right to alter designs and specifications without prior notice. Information contained herein is for guidance only and does not form part of a contract.

Moog Australia Pty. Ltd.  14 Miles Street, Mulgrave, Victoria 3170, Australia. Telephone: 03 9561 6044.  Fax: 03 9562 0246.
For the location nearest you, contact: www.moog.com/worldwide.

Moog pursues a policy of continuous development and reserves the right to alter designs and specifications without prior notice. Information contained herein is for guidance only and does not form part of a contract.