MOOG



DESCRIPTION

The Moog G122-828B017 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

Rev C of this data sheet changes the model number to B017 and adds a power supply fuse. The B017 is functionally identical to the A017.

The A017 and B017 models differ from the -017 model in that the valve drive during back pressure is limited to +5 V maximum in the A017 and B017 models. The -017 model allowed full +10 V valve drive.

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:

S-act+ 0 to +10 V S-act - 0 to -10 V P-act 0 to +10 V 0 to +10 V V-act

2mA max, short circuit and over-voltage protected

Front panel test points:

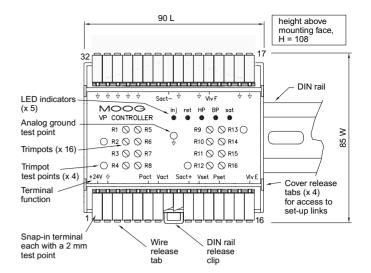
Wipers of R2, 4,12 & 13 and 0 V reference

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 sens R2 actual pressu R3 actual pressu R4 hold pressur R5 hold pressur R6 voltage distr R7 voltage distr R8 hold pressur	ire zero ire sensitivity e zero e balance ibutor P gain ibutor I 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:	Rin = 100 kOh	m	
Pin 13	Vin = 0 to + 10	V	
V-set signal input: Pin 11	Rin = 10 kOhm Vin = 0 to +10		
P-act signal input: Pin 4	Rin = 15 kOhm Vin = 0 to +100 mV		
S-act signal input: Pin 8, voltage			
V-act signal input: Pin 8, frequency	J421 made full scale = 1.8 mark space rat	21 made II scale = 1.8 kHz ark space ratio = 50%	
S-act signal input:	Rin = 2 kOhm	pull up to +15 V	
Pin 9	Rin = 100 kOh Vin = –10 to 0		
Pressure transducer: supply, Pin 3	+5 V ± 0.25 V 0	@ 50 mA max	
Valve supply: Pin 20	Internally supp 300 mA max o	olied from pin 1 utput	
Supply:	24V nominal, 2 130 mA @ 24 V Fuse 250 mA T complient to I	/, sat LED on	
Mounting:	DIN rail to EN5 Housing IP40 Terminal block		
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.

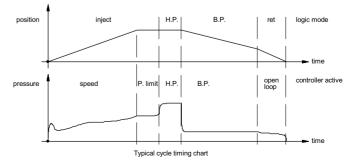
Back Pressure: This part of the cycle maintains a constant pressure in the rear of the injection actuator to ensure even plasticising.

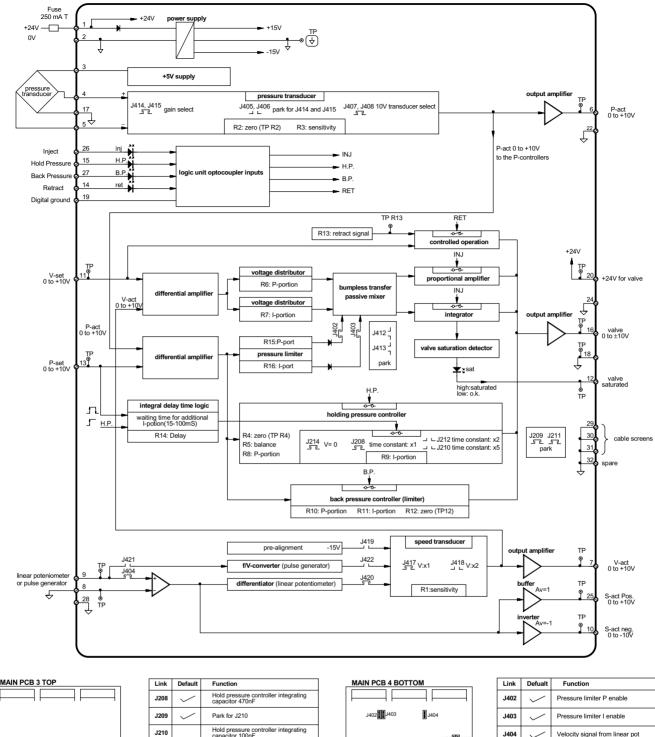
The machine PLC removes the HOLD PRESSURE logic signal and sets the BACK PRESSURE logic signal true. It adjusts the P-set analog signal to the required pressure and the closed loop holds the oil pressure at that value as the screw rotates and forces the inject actuator back.

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 pressurises 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





C70349 REV A J214 Default link loaded.

Hold pressure controller integrating capacitor 100nF J211 Park for J212 Hold pressure controller integrating capacitor 220nF J212 J214 Hold pressure controlle integrator dissable

MAIN PCB 4 BOTTOM	
J402	1404
도 [] 이 J413	J405 * * J406 J407 II J408 J414 II J415
C70365 REV A 4444848	

LINK ACCESS

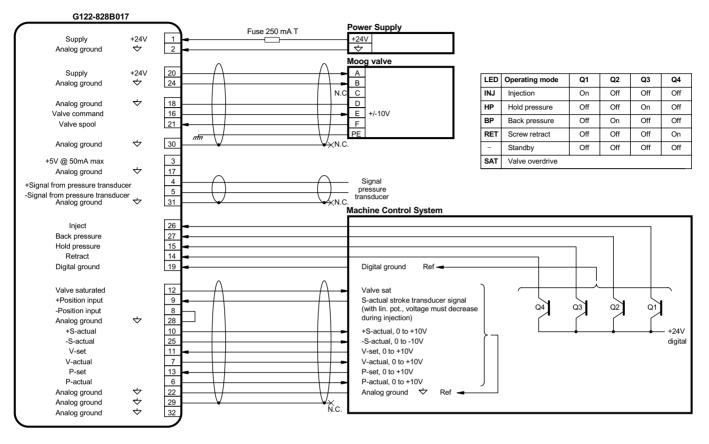
Access to the internal circuit boards, so the links can be set, is achieved by the following:

- 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 two tabs on the other side.
- Withdraw the electronics assembly and identify the circuit boards by their part numbers C70349 and C70365.

Link	Defualt	Function	
LINK	Deiuait	Function	
J402	$\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{$	Pressure limiter P enable	
J403	\checkmark	Pressure limiter I enable	
J404	\checkmark	Velocity signal from linear pot	
J405		Park for J414	
J406		Park for J415	
J407	\checkmark	Pressure measuring amp 10V transducer	
J408	\checkmark	Pressure measuring amp 10V transducer	
J412		Park for J402	
J413		Park for J403	
J414	$\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{$	Pressure measuring amp gain select	
J415	$\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{$	Pressure measuring amp gain select	
J417	$\left<\right>$	Velocity measuring amp low gain Vx1	
J418		Velocity measuring amp high gain Vx2	
J419		Velocity signal offset	
J420	\checkmark	Velocity signal from linear pot	
J421		Velocity signal from pulse pick up	
J422		Velocity signal from pulse pick up	

G122-828

INTERCONNECT DIAGRAM



FRONT PANEL TEST POINTS

Location	Name	Description
R2	_	Actual pressure zero
R4	-	Hold pressure command zero
R12	-	Back pressure command zero
R14	-	Retract speed trim
Terminal 6	Pact	Actual inject pressure. 0 to +10V
Terminal 7	Vact	Actual inject velocity. 0 to +10V
Terminal 10	Sact+	Actual inject position. 0 to +10V
Terminal 11	Vset	Command (set) inject velocity
Terminal 13	Pset	Command (set) inject pressure
Terminal 16	Vlv E	Servo valve drive signal. 0 to ±10V
Terminal 21	Vlv F	Servo valve spool signal. Varies with valve model.
Terminal 25	Sact-	Actual inject position. 0 to -10V
Various	4	Signal 0V reference (ground)

ORDERING INFORMATION

G122-828B017 VP Controller

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INTERNET DATA

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

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