

Portable Cavity and Hydraulic Pressure Monitor and Controller



- COMPACT AND SELF CONTAINED
- PROVIDES DIGITAL DISPLAY READOUT OF HYDRAULIC AND CAVITY PRESSURES
- PROVIDES AMPLIFIED OUTPUT OF PRESSURE SIGNAL
- 1 AMP RELAY OUTPUT FOR CONTROL OF BOOSTER PUMP CUTOFF
- PROVIDES EASY CALIBRATION OF D-M-E CONSTANT CALIBRATION SENSORS

The IPC-01-01 Injection Process Controller is a portable device that provides an inexpensive means of controlling peak plastics pressure in the mould. Peak pressure control is accomplished using a mould pressure sensor and a single setpoint to control filling and packing of the mould. By closely monitoring and controlling cavity pressure the user will reduce cycle time, reject rates and plastics usage. The controller operates the booster pump for the absolute minimum time required to fill and pack the cavities, significantly reducing electrical power consumption.

The IPC-01-01 controller uses a technique known as Dynamic Pressure Control (DPC). DPC maintains a more constant peak cavity pressure than machine timers and limit switches, regardless of plastic viscosity changes. This is accomplished by switching from High Volume (Fill) to Low Volume (Hold) injection at a predetermined cavity pressure.

Because of a direct correlation between peak cavity pressure and part weight (and therefore part size), accurate control of peak cavity pressure means more consistent part production.

Because part weight range can be reduced by using DPC, the average part weight can be reduced without occurrences of short shots. This translates into potential reduction in material usage. Increased repeatability in part weight also means less scrap as a result of short shots, over packed and flashed parts. Reducing these occurrences can also reduce associated wear and damage to tooling.

The IPC offers the three most requested features in a pressure monitor/controller:

1. Display of the pressure reading, including the peak pressure that occurred.
2. Amplification of the pressure signal for use by other equipment.
3. A relay contact set for direct control of the moulding machine's booster pump cutoff function.

The IPC uses an injection signal or other switch closure to arm the holding of the peak pressure that occurred during the shot. The peak pressure reading is held until the end of the injection sequence.

A connector on the rear of the IPC provides the amplified pressure signal. A zero to 1, 2, 5, or 10 VDC (or 4 to 20 mA DC) signal directly corresponds to a zero to 20,000 PSI pressure. This signal can be routed to strip chart recorders, plant wide

monitors or other equipment. The signal can also be input into moulding machines offering closed loop pressure control but that lack the necessary amplifiers for the sensing equipment.

The IPC offers a one amp, form C (normally open, normally closed) relay contact set for direct control of the machine's booster cutout function. The relay contacts are also gold plated for switching of low level signals such as the potentiometers used to set the machine's injection velocity. Many control relays are not capable of switching such sensitive signals. The relay contacts carry a voltage rating of up to 120 VAC.

The IPC is designed for use with DME's Constant Calibration sensors but can be used with other manufacturers strain gage based sensors as well.

FRONT PANEL CONTROLS AND INDICATORS

The IPC offers quick easy calibration of pressure sensors via front panel adjustments. Calibration is quickly performed by pressing a push button and then adjusting the calibration setting.

A rotary switch allows for rapid selection of the pressure sensor and ejector pin size. A second rotary switch allows for selecting what is displayed: The pressure signal with peak hold, the pressure signal without peak hold or the DPC pressure setpoint.

A DPC light illuminates when the mould (or hydraulic) pressure reaches setpoint. This is an indication that the IPC's control relay has activated.

A toggle switch allows the user to override the control function while allowing for continued monitoring of pressures. A high accuracy ten-turn potentiometer allows for input of the pressure setpoint for booster cutoff.

A three and one-half digit display allows for direct readout of pressures up to 19,990 PSI. This is displayed as pressure (times 10) for mould pressure.

A UL, CSA, VDE approved power switch allows the user to turn the IPC on and off from the front panel. Internal fuses (not shown) protect the unit from both sides of the AC line voltage. While the standard unit (IPC-01-01) is constructed for 120 VAC use, an optional IPC-01-02 is available. The unit is easily converted between 120 and 240 VAC operation. The 120 VAC unit comes with a standard wall outlet plug.

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OPERATION

The user plugs the IPC into a standard wall outlet. If machine control or automatic hold of the peak pressure signal is desired, a normally open relay contact is attached via the rear panel connector. If control of the machine is desired, the IPC's control relay is wired back to the machine via the same connector. A DME pressure sensor is then attached via the rear panel and the unit is set to the appropriate pin size calibration. The pressure offset value is adjusted to zero with the front panel ZERO adjustment. The CAL push-button is pressed in and the CAL adjustment is then set for 8900 PSI. The user then sets IPC to the actual pin size being used and the IPC is ready to run. With the IPC set to MONITOR, the user notes and records the peak pressure obtained during acceptable part production. The SETPOINT is adjusted to 50 to 80% of the recorded peak. The user then places the IPC into the CONTROL mode and adjusts the SETPOINT until the desired peak pressure is achieved. It will be necessary to add time or distance to the machine's booster setting for the IPC to take control. The amplified signal output can be connected to process recording equipment or a moulding machine's pressure signal input.

REAR PANEL (LEFT TO RIGHT)

Analog Output: is a standard 1/4 inch stereo headphone jack that outputs an amplified pressure signal of zero to 1, 2, 5 or 10 VDC (or 4 to 20 mA DC) corresponding to zero to 20,000 PSI.

DME Sensor: accepts a D-M-E slide, or button sensor or related extension cable. Also accepts other sensors via a conversion cable.

Machine Interface: provides the injection forward and booster cutout wiring connections to the moulding machine.

Power Input: provides 120 VAC (standard) or 240 VAC (optional) power for operation.



IPC-01-01 SPECIFICATIONS:

Accuracy:	Analog output and digital display: +/-1% full scale Setpoint: 0.8% of full scale
Repeatability:	Analog output and digital display: +/-0.5% full scale Setpoint: 0-25% of full scale
Recorder Output:	Proportional to cavity pressure. Zero to 1, 2, 5 or 10 VDC (or 4 to 20 mA DC) corresponds to zero to 20,000 PSI
Control Span Range:	Zero to 20,000 PSI
Temperature Range:	50° to 130°F
Power Required:	115 VAC (105-125), 50-60Hz
Zero Drift, Analog Out:	Long Term: 0.1%/month, with temperature 0.1%/°F
Control Relay:	1 amp, form C, 0-120 VAC, VDC
Injection Forward In:	normally open contact closure, less than 10 milliamps
Dimensions:	7.2" wide, 2.7" high, 8.6" deep

ORDERING INFORMATION

CONTROLLER

Includes 19 foot integral power cable, mating control and analog output connectors and two spare fuses. Pressure sensors and extension cables must be ordered separately.

Catalog Numbers: **IPC-01-01** (120 VAC standard)
IPC-01-02 (240 VAC optional)
Fuse Requirement: (2) **ABC-1** fuses

SLIDE Mould PRESSURE SENSORS

Catalog Numbers: **SS-405C** (500 pound)*
SS-406C (2000 pound)*

BUTTON Mould PRESSURE SENSORS

Catalog Numbers: **BS-411C** (125 pound)
BS-412C (500 pound)*
BS-413C (2000 pound)*
Requires Extension: **BSC-10** (10 foot cable)

EXTENSION CABLES

Catalog Numbers: **SSC-10** works with all sensors, 10' one req'd for button sensor
BSC-10 JIG box with 15' cable, works with all sensors.
SI-900

***NOTE:** 500 pound sensors are recommended for use with ejector pins from 1/16 to 3/16 inch diameters. 2000 pound sensors are recommended for use with ejector pins from 3/16 to 1/2 inch diameters. The 125 pound Sensor is recommended for 1/16 inch or less diameter pins.