OPERATING MANUAL FOR CONTROL SYSTEM OF INJECTION MOLDING MACHINE
Streamline Controls Pvt. Ltd. (SCPL) is in the business of providing electronic & computerized automation solution for different industries so as to enhance the quality and productivity. Our motto is to provide indigenous, reliable and proven products & hence to ensure consistent performance. Our concept of value to the customers is to supply indigenous control systems designed with latest technology, developed through extensive R & D, incorporating state of art technology (world technology trend), manufactured under strictest quality control system and duly tested, at competitive prices, delivered in time and supported by service teams.

We feel it to be our responsibility to ensure that our business operates at a reasonable profit, as profit provides opportunity for R&D, growth and job security. Therefore we are dedicated to profitable growth - growth as a company and growth as an individual.

For detailed inquiry and trouble shooting contact:

STREAMLINE CONTROLS PVT.LTD.
401/402,"meghansh"complex, opp. Oxford tower,
Gurukul road, Memnagar, Ahmedabad-380 052.
Gujrat,India.

Phone. - (079) 27411463(O)

E-mail -
customercare@Streamlinecontrols.com

Web - www.streamlinecontrols.com
PREFACE

INJkon is a multi-functional controller incorporating microcontroller, making it a versatile and cost-effective solution optimally designed to best suit the automation needs of injection molding machines.

For the usage and maintenance of the control system, a detailed study of this operating manual will be helpful.

We would be glad to assist your queries.

Specifications are subject to change without prior notice.
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(A) SPECIFICATIONS:

Input

<table>
<thead>
<tr>
<th>Power:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>230vac ± 10%vac</td>
</tr>
<tr>
<td>Frequency</td>
<td>49-50 Hz</td>
</tr>
<tr>
<td>Consumption</td>
<td>30VA Max.</td>
</tr>
</tbody>
</table>

Control:

<table>
<thead>
<tr>
<th>Thermocouple</th>
<th>J/K type - Isolated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximity</td>
<td>NPN (NO type)</td>
</tr>
<tr>
<td>Limit switches</td>
<td>10-30 Vdc - 50 mA Max.</td>
</tr>
</tbody>
</table>

Output

<table>
<thead>
<tr>
<th>For Solenoids</th>
<th>For 230VAC, 2 Amp. Max. - SSR Output OR For 24VDC - 2 Amp. Max. – MOSFET Driver Output</th>
</tr>
</thead>
</table>

Environment

<table>
<thead>
<tr>
<th>Temperature</th>
<th>0ºC to 55ºC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity</td>
<td>5 to 95% RH non-condensing</td>
</tr>
</tbody>
</table>

MECHANICAL DIMENSIONS (All are in MM)

Operating Box Depth X Width X Height

| 95 mm          | 133 mm     | 280 mm    |

(B) INTRODUCTION

INJkon is a complete proven & reliable control system for Injection Molding Machine. System consists of two units:

1. MMI unit
2. C.V.T. (Optional)/Transformer

(1) Operating Panel:
This is a small lightweight Display unit with soft touch keypad & LCD display, digital input, digital output and temperature section.

This package has some obvious advantages over existing conventional Electrical Systems. This occupies lesser space than conventional system. The simplicity of wiring from solenoids to systems or limit switches to system and from Thermocouples to system makes it easier and less time consuming for commissioning. This system has no moving parts, so periodical maintenance is drastically reduced and there for reliability is definitely improved. Function like suck back ON-OFF, Heating ON-OFF and Cycle Time Interlock makes this system much more superior than the conventional system.

(C) FEATURES

- Inherently reliable high speed Micro controller based technology C8051F120 CPU.
- Offers up to 16 digital inputs, Up to 16digital outputs, 8-zone Proportional controlled Temperature Controllers, timers, Extensive feather touch membrane keypad for user interface for manual/Semi auto/fully auto functions of the machine.
- Latest E2PROM Technology ensures security of programmed parameters.
- User friendly programming through an extensive membrane keypad for easy operator interface (Details of manual mode operations available is appended on separate sheet)
- Six digits shot counter to count Number of Pieces.
- Facility for counting cycle time helpful in production analysis.
- Three different programs for Ejector operations provide to suit the operational needs with various molds.
- Thermocouple "Open" & "Reverse" conditions are self detected and are displayed as "Opn" and "rev" respectively.
- Programmable High & Low limits for all temperature zones.
- Automatic cold junction compensation for Thermocouple inputs.
- Mold Safety interlock provided in case of abnormal pressure rise while the mold is getting closed (For that pressure switch input has to be provided.)
- Inbuilt interlocks for Low & High temperature, Front and/or Back guards, Maximum Cycle Time, Emergency stop.
- Built in 25 sets of mold memory.
- Operating Input/Output diagnosis.
- Central lubrication control with precisely On/Off timer.

(D) SCOPE OF SUPPLY
Streamline Controls To provide:
1. Hand Panel.

(E) PROGRAMMING OF THE SYSTEM
The system will be programmed to suit your application by us.
(F) OPERATING PANEL DESCRIPTION

Front Key Board Sticker
KEY'S DESCRIPTION

1. CURSOR KEY

- Push this key to move cursor from left to right direction for parameter setting in any menu.
- With help of this key you should toggle your screen from shot counter to proportional or proportional to shot counter.
- To increase parameter value in any menu.
- Also use for function on/Off.
- Rolls up temperature channel display in temperature channel freeze status.
- To decrease parameter value in any menu.
- Also use for function on/Off.
- Push this key to show percentage output in normal temperature display.
- For Data input confirmation & shift to next parameter.
- Toggle the screen from normal display to Digital input or Digital output display.
- For shift to previous parameter.
- Alarm reset for all mode.
- Freezes to scroll temperature channel display at current channel.

2. MENU SELECTOR

- Set temperature key for set all zones set point.
- Set timer key for set all function's timer.
- Set misc key to do set On/ Off for selectable function.

3. OPERATING MODE SELECTOR

- Push this key to start or stop the heating.
- Machine operating at fully automatic production mode. Restarted by cycle delay timer.
- Operate machine in semi-auto recycling and re-started by front safety door open and close again.
- Operating machine by manual key.

4. Manual Operation Key

- Mold Open Key: Push for activate of mold opening action manually.
- Mold Close Key: Push for activate of mold clamping action manually.
- Carriage Forward Key: Push for activate of Carriage Forward action manually.
- Carriage Backward Key: Push for activate of Carriage Backward action manually.
- Injection Key: Push for activate of Injection action manually.
- (Disable by any zone of barrel temperature is lower than alarm low setting)
- Refill Key: Push for activate of Refill action manually.
- (Disable by any zone of barrel temperature is lower than alarm low setting)
- Ejector Forward Key: Push for activate of Ejector Forward action manually.
- Ejector Backward Key: Push for activate of Ejector Backward action manually.
- Suck Back Key: Push for activate of Suck Back action manually.
- (Disable by any zone of barrel temperature is lower than alarm low setting)
(G) MANUAL MODE OF OPERATIONS

1. Mold Close
2. Carriage forward
3. Injection
4. Ejector forward
5. Suck Back
6. Motor off
7. Mold Open
8. Carriage backward
9. Refill
10. Ejector backward
11. Motor on

(G) PRECAUTIONS

To prevent damage from human and machine, please obey the following safety caution.

- Equipment must be operating under correct power. (Install a voltage stabilizer while need)
- Earth terminal must be connected to qualified terminal.
- All electrical elements with EARTH terminal, it is necessary for users to connect with the EARTH terminal.
- The high power cables should be separated from the low power cables to avoid interferes.
- To prevent fire or hazard shock, do not expose the unit to rain or moistly place.
- Please understand the operating process before use.
- When system shut down, wait 10seconds for re-start.
- Thermocouples used for this system must be isolated (ungrounded) Fe/k,j, type.
- The wiring of each zone starting from thermocouple of heater must be verified.
- For ex: first zone thermocouple must be connected to first channel of the system and heater of first zone must be connected to heater 1of the system.
- The limit switch and solenoids wiring must be done as per given wiring diagram.
- If the proximity switches are used then use only NPN-NO type proximity switches.

(I) SETTING PROCEDURES

(1) TEMPERATURE CONTROLLERS:

Here two different levels of programming is provided
1. Operator Level.
2. Engineers Level.

In case of operator level only set value of temperature can be changed where as in case of other level all other parameters can be changed.

Set Temperature

In case of operator level

Press SET TEMP. key.
First line of LCD shows TEMPERATURE C
Second line of LCD shows zone number & set temperature.
Select require zone using NEXT/ PREV key.
Set require temperature using INC, DEC and SHIFT key.
On pressing NEXT key the set value will be saved and display will show the next function.

List of temperature parameters are given below.

<table>
<thead>
<tr>
<th>Zone No.</th>
<th>Message In First Line</th>
<th>Message In Second Line</th>
<th>Description</th>
<th>Range</th>
<th>Default Value</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Temperature C Zone 1</td>
<td>Zone 1 set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>User</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Temperature C Zone 2</td>
<td>Zone 2 set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>User</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Temperature C Zone 3</td>
<td>Zone 3 set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>User</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Temperature C Zone 4</td>
<td>Zone 4 set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>User</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Temperature C Zone 5</td>
<td>Zone 5 set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>User</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Temperature C Zone 6</td>
<td>Zone 6 set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>User</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Temperature C Zone 7</td>
<td>Zone 7 set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>User</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Temperature C Zone 8</td>
<td>Zone 8 set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>User</td>
<td></td>
</tr>
</tbody>
</table>

In case of Engineer level

Press SET TEMP key and keep it pressed for at least ten seconds.
First line of LCD shows parameter name.
Second line of LCD shows zone number & parameter value.
Select require parameter using NEXT/ PREV key.
Set require value using INC, DEC and SHIFT key.
On pressing NEXT key the set value will be saved and display will show the next function.
On pressing set temp key the zone number can be changed. Again pressing the NEXT key the different parameter of the same zone can be checked.

List of temperature parameters are given below.
<table>
<thead>
<tr>
<th>ZoneNo.</th>
<th>Message In First Line</th>
<th>Message In Second Line</th>
<th>Description</th>
<th>Range</th>
<th>Default Value</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Temperature C Zone 1</td>
<td>Set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prop. Band C Zone 1</td>
<td>Proportional band</td>
<td>0-100 C</td>
<td>030 C</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Integr. Time Sec Zone 1</td>
<td>Integral time</td>
<td>0-999 Sec</td>
<td>900 Sec</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Derivt. Time Sec Zone 1</td>
<td>Derivative time</td>
<td>0-999 Sec</td>
<td>000 Sec</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cycle Time Sec Zone 1</td>
<td>Cycle time</td>
<td>0-200 Sec</td>
<td>15 Sec</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alarm Low C Zone 1</td>
<td>Alarm low</td>
<td>0-200 C</td>
<td>025 C</td>
<td>Engineer</td>
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</tr>
<tr>
<td></td>
<td>Alarm High C Zone 1</td>
<td>Alarm High</td>
<td>0-999 C</td>
<td>025 C</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blower Point C Zone 1</td>
<td>Blower Operating Point</td>
<td>0-999 C</td>
<td>005 C</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Temperature C Zone 2</td>
<td>Set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
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</tr>
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<tr>
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<td>Blower Point C Zone 2</td>
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<td>0-999 C</td>
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<tr>
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</tr>
<tr>
<td>4</td>
<td>Temperature C Zone 4</td>
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<td>200 C</td>
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</tr>
<tr>
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<td>Proportional band</td>
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<td>030 C</td>
<td>Engineer</td>
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<tr>
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<td>Integr. Time Sec Zone 6</td>
<td>Integral time</td>
<td>0-999 Sec</td>
<td>900 Sec</td>
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<td>Derivt. Time Sec Zone 6</td>
<td>Derivative time</td>
<td>0-999 Sec</td>
<td>000 Sec</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cycle Time Sec Zone 6</td>
<td>Cycle time</td>
<td>0-200 Sec</td>
<td>15 Sec</td>
<td>Engineer</td>
<td></td>
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<td></td>
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<td>0-200 C</td>
<td>025 C</td>
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<tr>
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<td>Alarm High C Zone 6</td>
<td>Alarm High</td>
<td>0-999 C</td>
<td>025 C</td>
<td>Engineer</td>
<td></td>
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<tr>
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<td>Blower Point C Zone 6</td>
<td>Blower Operating Point</td>
<td>0-999 C</td>
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<td>Engineer</td>
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<tr>
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<td>Temperature C Zone 7</td>
<td>Set temperature</td>
<td>0-500 C</td>
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<tr>
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<td>Prop. Band C Zone 7</td>
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<td>0-999 Sec</td>
<td>000 Sec</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cycle Time Sec Zone 7</td>
<td>Cycle time</td>
<td>0-200 Sec</td>
<td>15 Sec</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alarm Low C Zone 7</td>
<td>Alarm low</td>
<td>0-200 C</td>
<td>025 C</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alarm High C Zone 7</td>
<td>Alarm High</td>
<td>0-999 C</td>
<td>025 C</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blower Point C Zone 7</td>
<td>Blower Operating Point</td>
<td>0-999 C</td>
<td>005 C</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Temperature C Zone 8</td>
<td>Set temperature</td>
<td>0-500 C</td>
<td>200 C</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prop. Band C Zone 8</td>
<td>Proportional band</td>
<td>0-100 C</td>
<td>030 C</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Integr. Time Sec Zone 8</td>
<td>Integral time</td>
<td>0-999 Sec</td>
<td>900 Sec</td>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Derivt. Time Sec Zone 8</td>
<td>Derivative time</td>
<td>0-999 Sec</td>
<td>000 Sec</td>
<td>Engineer</td>
<td></td>
</tr>
</tbody>
</table>
Cycle Time Sec Zone 8 Cycle time 0-200 Sec 15 Sec Engineer
Alarm Low C Zone 8 Alarm low 0-200 C 025 C Engineer
Alarm High C Zone 8 Alarm High 0-999 C 025 C Engineer
Blower Point C Zone 8 Blower Operating Point 0-999C 005 C Engineer

Set Miscellaneous
Press set MISC key.
Third line of LCD show function’s name and it’s value/status.
Select require function using NEXT/ PREV key.
Set require value/ status using INC, DEC and SHIFT key.
On pressing NEXT key the set value will be saved and display will show the next function.
List of miscellaneous parameters are given below.

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Description</th>
<th>Range</th>
<th>Default Value</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Suckback</td>
<td>Suck Back On/Off</td>
<td>On/Off</td>
<td>On</td>
<td>Supervisor</td>
</tr>
<tr>
<td>2</td>
<td>Ejct Prog</td>
<td>Ejector Operating Program</td>
<td>0-2</td>
<td>0002</td>
<td>Supervisor</td>
</tr>
<tr>
<td>3</td>
<td>Ejct Shot</td>
<td>Ejector Shot</td>
<td>0-5</td>
<td>0001</td>
<td>User</td>
</tr>
<tr>
<td>4</td>
<td>% Heat Zn1</td>
<td>Set Temperature of % Heating Zone 1</td>
<td>0-100%</td>
<td>0050</td>
<td>User</td>
</tr>
<tr>
<td>5</td>
<td>% Zn1 CyTm</td>
<td>Cycle time of % Heating Zone 1</td>
<td>0-100Sec</td>
<td>0010</td>
<td>User</td>
</tr>
<tr>
<td>6</td>
<td>TestIn/Out</td>
<td>Test Mode On/Off</td>
<td>On/Off</td>
<td>Off</td>
<td>Supervisor</td>
</tr>
<tr>
<td>7</td>
<td>Count Rst</td>
<td>Reset the Shot Counter</td>
<td>On/Off</td>
<td>Off</td>
<td>User</td>
</tr>
<tr>
<td>8</td>
<td>Mold Memry</td>
<td>Mold Memory Selection</td>
<td>0-25</td>
<td>0000</td>
<td>Supervisor</td>
</tr>
<tr>
<td>9</td>
<td>Fast Appro</td>
<td>Fast Approach</td>
<td>On/Off</td>
<td>On</td>
<td>Supervisor</td>
</tr>
</tbody>
</table>

STANDARD EJECTOR PROGRAM:
1. Program 00: Ejector disable.
2. Program 01: Ejector Forward only after mold gets fully open.
3. Program 02: Ejector Forward/Hold/Backward
   i.e. Full Shot after mold gets fully open.
   No of shots is programmable.

Set Timer
Press set TIMER key.
Third line of LCD show function’s name and it’s value.
Select require function using NEXT/ PREV key.
Set require time using INC, DEC and SHIFT key.
On pressing NEXT key the set value will be saved and display will show the next function.
List of timer parameters are given below.

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Description</th>
<th>Range</th>
<th>Default Value</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inject Dely</td>
<td>Injection delay</td>
<td>0-999.9 Sec</td>
<td>000.2</td>
<td>User</td>
</tr>
<tr>
<td>2</td>
<td>Inject 1</td>
<td>Injection 1 time</td>
<td>0-999.9 Sec</td>
<td>003.0</td>
<td>User</td>
</tr>
<tr>
<td>3</td>
<td>Inject Hold</td>
<td>Injection Hold time</td>
<td>0-999.9 Sec</td>
<td>000.1</td>
<td>User</td>
</tr>
<tr>
<td>4</td>
<td>Refil Dely</td>
<td>Refill delay</td>
<td>0-999.9 Sec</td>
<td>000.1</td>
<td>User</td>
</tr>
<tr>
<td>5</td>
<td>Suckb2 Dly</td>
<td>Suck back 2 Delay</td>
<td>0-999.9 Sec</td>
<td>000.1</td>
<td>User</td>
</tr>
<tr>
<td>6</td>
<td>Suckb Time</td>
<td>Suck back time</td>
<td>0-999.9 Sec</td>
<td>010.0</td>
<td>User</td>
</tr>
<tr>
<td>7</td>
<td>Cool Time</td>
<td>Cool time</td>
<td>0-999.9 Sec</td>
<td>004.0</td>
<td>User</td>
</tr>
<tr>
<td>8</td>
<td>Ejct Dely</td>
<td>Ejector delay</td>
<td>0-999.9 Sec</td>
<td>000.1</td>
<td>User</td>
</tr>
<tr>
<td>9</td>
<td>Ejct Forwd</td>
<td>Ejector Forward time</td>
<td>0-999.9 Sec</td>
<td>000.5</td>
<td>User</td>
</tr>
<tr>
<td>10</td>
<td>Ejct Hold</td>
<td>Ejector Hold time</td>
<td>0-999.9 Sec</td>
<td>000.0</td>
<td>User</td>
</tr>
<tr>
<td>11</td>
<td>Ejct Bakwd</td>
<td>Ejector Backward time</td>
<td>0-999.9 Sec</td>
<td>000.5</td>
<td>User</td>
</tr>
<tr>
<td>12</td>
<td>Cycle Dely</td>
<td>Cycle delay</td>
<td>0-999.9 Sec</td>
<td>001.0</td>
<td>User</td>
</tr>
<tr>
<td>13</td>
<td>Cycle Time</td>
<td>Cycle time</td>
<td>0-999.9 Sec</td>
<td>999.9</td>
<td>Supervisor</td>
</tr>
<tr>
<td>14</td>
<td>Tot Inj Tim</td>
<td>Total Injection time</td>
<td>0-999.9 Sec</td>
<td>010.0</td>
<td>User</td>
</tr>
<tr>
<td>15</td>
<td>EjBak@MCls</td>
<td>Set Ejector Backward time before mold close function</td>
<td>0-999.9 Sec</td>
<td>000.2</td>
<td>User</td>
</tr>
</tbody>
</table>

(J) DESCRIPTION OF TEST MODES

1. INPUT TEST MODE:
   - This mode is useful for testing of each input. (Limit switch Or proximity switch or push button)
   - This mode is enabled when Test In/out is ON (GO to SET MISC and then on the test in/out mode)
   - First two line of LCD display shows the input, which is being tested.
   - When input is sensed LCD display shows its particular count on LCD.
   - For Ex: When we apply first input on input card LCD display will show 0(Zero). i.e. every input has it's own count. Please refer list of inputs & outputs for more information. Every input is provided with particular count.
   - Changes in the input status as per sensing of input indicates that the wiring and electronic path of that input is functioning correctly.
   - During this mode no other cycle function can operate.
   - To disable the test mode made off the test In/Out in set misc menu.
(2) OUTPUT TEST MODE:

- This mode is useful for testing each output of the system.
- This mode is enabled when Test In/Out is ON (GO TO SET MISC menu and then ON the test in/out mode.) first line of LCD shows output being checked. When any output is activated, its particular count is shown on LCD. Please refer list of inputs & outputs for more information. Every output is provided with particular count.
- The output can be made ON or OFF using SHIFT key.
- The O/P under test can be changed using INC/DEC key.
- If the O/P goes ON and OFF as per the status show on the display, we can say that the wiring & electronic path of the system for that O/P is correct.
- During this mode all other functions are disabled.
- To disable the test mode made off the test In/Out in set misc menu.

(K) FUNCTIONAL DESCRIPTIONS

(1) MOLD SAFETY:
This feature is enabled when Mold Safety in set misc. menu is switched ON
At the time of mold closing if the delay between mold safety start switch & mold safety end switch is more then the set value of mould safety timer the cycle brakes here mold gets opened and machine comes into hand mode.

(2) Heat off function:
Heating off function can be enabled or disabled using HEAT OFF. key. When heating off is active HOFF indicate in second line of display. And all output of heater goes OFF. When heating is ON PV indicate in second line of display. And all heater outputs operate as per control action of temp. Controller.

(4) HAND:
System (after power on) starts in HAND MODE. In this mode all the functions (like mold open, mold close, unit forward etc) can be done using different function keys.
For ex. : Mold can be opened using mold open key. When any interlock appears during cycle the machine transferred in to hand mode.

(5) SEMI AUTO:
On pressing SEMI AUTO key cycle starts. Cycle stops after completion of one cycle. Here cycle can be restarted by opening and closing of front guard.

(6) FULLY AUTO:
On pressing AUTO key the auto cycle starts. Here after completion of one cycle, cycle delay timer starts after completion of cycle delay cycle restarts.

(L) INTERLOCKS

It is a one type of alarm system which activate when cycle or any other function does not operate properly because of those abnormal condition it indicate INTERLOCK
Following are the different interlock messages:

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Operation</th>
<th>Interlocks Messages On Screen</th>
<th>Description Of Messages</th>
<th>Type Of Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mold Open</td>
<td>IL Mold Open End</td>
<td>Mold fully open end</td>
<td>Hand Semi Auto Fully Auto</td>
</tr>
<tr>
<td>2</td>
<td>Mold Close</td>
<td>IL Mold Open/Clos On</td>
<td>Mold open close limits on</td>
<td>y y y</td>
</tr>
<tr>
<td>3</td>
<td>Carriage Forward</td>
<td>IL Carriage For End</td>
<td>Carriage Forward End</td>
<td>y y y</td>
</tr>
<tr>
<td>4</td>
<td>Carriage Backward</td>
<td>IL Carriage Back End</td>
<td>Carriage Backward End</td>
<td>y y y</td>
</tr>
<tr>
<td>5</td>
<td>Injection</td>
<td>IL Temperature Low</td>
<td>Temperature is low</td>
<td>y y y</td>
</tr>
<tr>
<td>6</td>
<td>Refill</td>
<td>IL Refill End</td>
<td>Refill End</td>
<td>y y y</td>
</tr>
<tr>
<td>7</td>
<td>Suck Back</td>
<td>IL Temperature Low</td>
<td>Temperature is low</td>
<td>y y y</td>
</tr>
<tr>
<td>8</td>
<td>Ejector Forward</td>
<td>IL Eje Forward End</td>
<td>Ejector Forward end</td>
<td>y y y</td>
</tr>
<tr>
<td>9</td>
<td>Ejector Backward</td>
<td>IL Eje Backward End</td>
<td>Ejector Backward end</td>
<td>y y y</td>
</tr>
<tr>
<td>10</td>
<td>Temperature</td>
<td>IL Temperature Low</td>
<td>Temperature is low</td>
<td>y y y</td>
</tr>
<tr>
<td>11</td>
<td>Common</td>
<td>IL Front Guard Open</td>
<td>Front door open</td>
<td>y y y</td>
</tr>
</tbody>
</table>
N) Wiring Diagram (IN case of 230vac output)
IN case of 24vdc output
OUR PRODUCT RANGE

• Dedicated Controller for Plastic Injection/Blow molding Machines
• DC Stepper Drives
• PID Temperature Controllers - 6 CH/1CH
• Profile Generator
• Pre Programmable Logic Controllers - PPLCs
• Digital Timers & Counters
• Dedicated Controller for Plastic Bag /Pouch Making Machines
• Dedicated Controller for Food / Pharma labeling Machines
• Dedicated Controller for Grinding Machines
• 2/3/4 Axes Motion Controller (Using DC Stepper / AC Servo Drives)

AUTOMATION... PRODUCTIVITY THROUGH TECHNOLOGY.