

OPERATING MANUAL FOR CONTROL SYSTEM OF PET STRETCHBLOW MOLDING MACHINE

FIRMWARE VERSION 1.2

PETkon



Business Mission

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.

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PREFACE

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

For better usage and maintenance of control system, detail study of this operating manual will be helpful.

We would be glad to assist your queries.

Features & Specifications are subject to change without prior notice.



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1. Introduction

This document discusses the operation of controller for Pet stretch blow molding Machine. Use in making plastic bottles.

2. Basic Specification

Power Supply: 24V DC

Display: 20x4 Small LCD

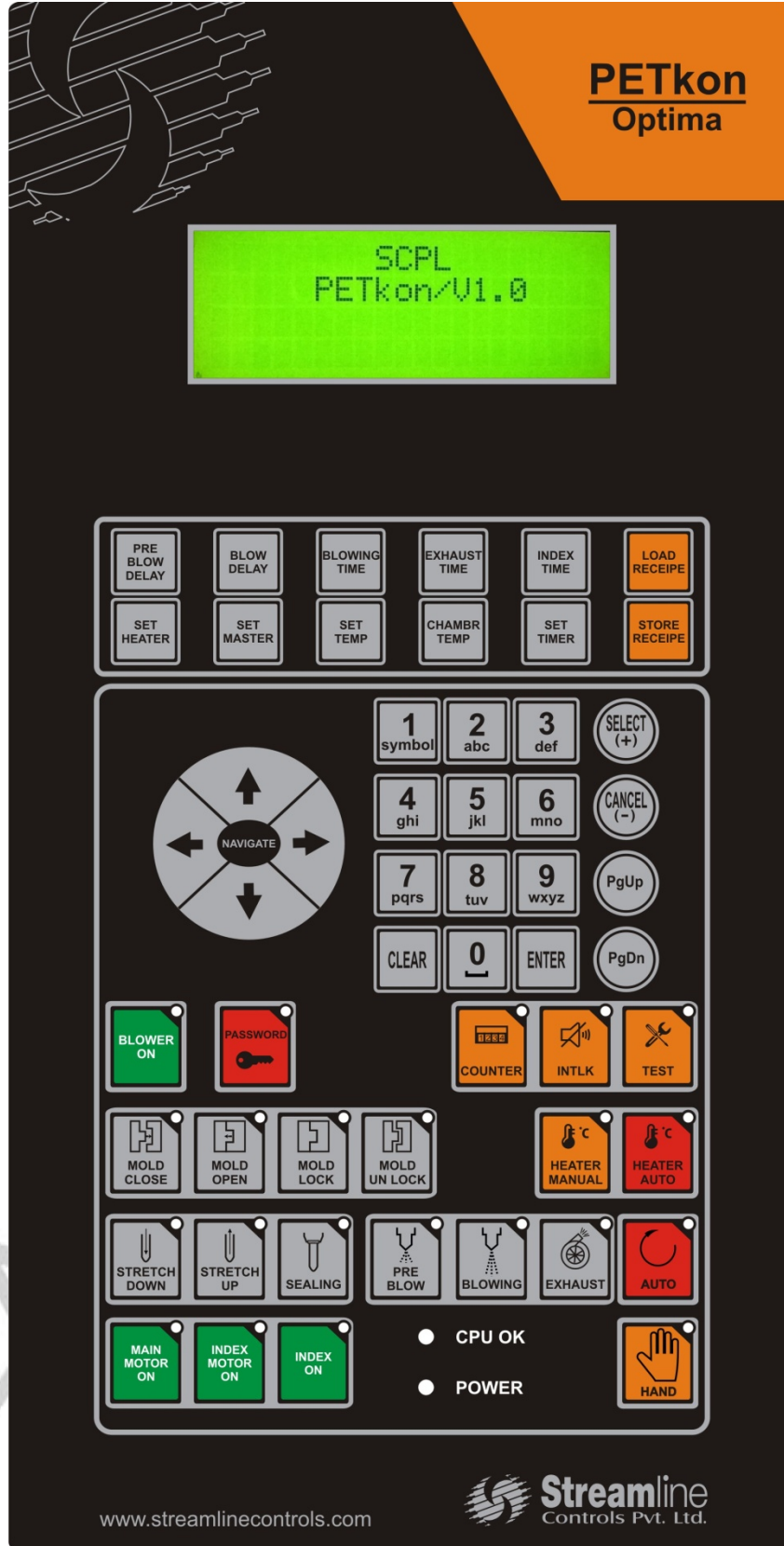
Keyboard: 55 Keys

Digital Input: 11 Digital Inputs

Digital Output: 20 Digital outputs

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3. Keyboard Description



1. **Pre Blow Delay** : Use to set the pre blow delay time parameter directly from set timers page.
2. **Blow Delay** : Use to set the Blow delay time parameter directly from set timers page.
3. **Blowing Time** : Use to set the Blowing Time parameter directly from set timers page.
4. **Index Time** : Use to set the Conveyor delay time parameter directly from set timers page.
5. **Set Heater** : Use to set the R1 SET(%) parameter directly from set temperature page.
6. **Set Master** : Use to set the Set Master parameter directly from set temperature page.
7. **Set Temp** : Use to set the temperature related all parameters.
8. **Chamber Temp** : Use to set the Set temperature parameter in set temperature page.
9. **Set Timers** : Use to set the timers related all parameters.
10. **Numeric Keys** : all the numeric keys 1,2,3,4,5,6,7,8,9,0,Clear,Enter use to set the value of parameters.
11. **Enter** : Use to save the parameter value after changes in programming mode and use to change to status of output in test mode.
12. **Select** : Use to change the value of character type parameter (i.e. on /off) in programming mode. And also use to save/load the recipe. And in calibration mode it will increment the value of offset/gain.
13. **Cancel** : Use to change the value of character type parameter (i.e. on /off) in programming mode. And in calibration mode it will decrement the value of offset/gain.
14. **Page Up** : Use to scroll up the parameter list.
15. **Page Down** : Use to Scroll down the parameter list.
16. **Up Arrow** : Use to scroll up the pages in out of programming mode.
17. **Down Arrow** : Use to scroll down the pages in out of programming mode.
18. **Left Arrow** : By long pressing it, it will clear the heater running hour counter. And in calibration mode use to change selection between offset and gain.
19. **Right Arrow** : Use to shift the character in save recipe page. And use to change the output number in test mode. And in calibration mode use to change the selection between offset and gain.
20. **Counter** : By long pressing it, it will reset the value of totalizer.
21. **Interlock** : Use to acknowledge the interlock.
22. **Test** : Use to go into test mode page to test the outputs.

- 23. **Heater Manual** : Use to set the master output by calculating the actual value of temperature with comparing the value of Proportional band, Integral time, Derivative Time etc.
- 24. **Heater Auto** : Use to set the master output automatically by comparing the set value with actual value of temperature.
- 25. **Mold Close** : Use for mold close function manually.
- 26. **Mold Open** : Use for mold open function manually.
- 27. **Mold Lock** : Use for mold lock function manually.
- 28. **Mold Unlock** : Use for mold unlock function manually.
- 29. **Index On** : Use to run the conveyor Function.
- 30. **Stretch Down** : Use for Stretch down function manually.
- 31. **Stretch Up** : Use for stretch up function manually.
- 32. **Sealing** : Use for Sealing Up function manually.
- 33. **Main Motor On** : Use to on/off the output of hydraulic motor.
- 34. **Index Motor On** : Use for on/off the output of index motor.
- 35. **Blower On** : Use for blower on/off output.
- 36. **Auto** : Use to run auto cycle.
- 37. **Pre Blow** : Use for pre blow function manually.
- 38. **Blowing** : Use for blowing function manually.
- 39. **Exhaust** : Use for Exhaust function manually.
- 40. **Hand** : Use for transfer cycle from auto mode to manual mode.

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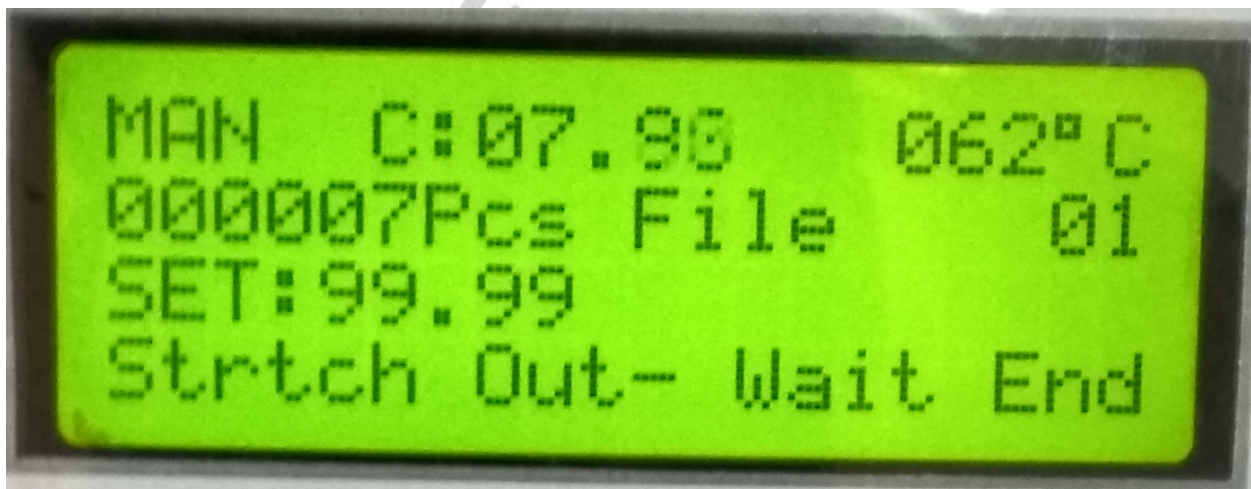
4 Page Description

- **Power on Page**



At power on, there is a name of the plc as well as the current programmed version will be display on screen.

- **Main Page**



At main page, in first line there will be the current mode of machine. If machine will be in manual mode, it will display MAN, and if machine will be in auto mode it will display AUTO. Than after it will display the cycle time and current temperature.

In second line, there will be a display of total pieces and current recipe name.

In third line, there will be a display of set value of the timer of that function as well as the actual value of the timer.

In fourth line it will display the message/interlock, if any.

- *View Page*



At view page, there will be a display of current input and output status. If the input/output will be on, the number of that input/output will display on screen.

- *Temperature Page*

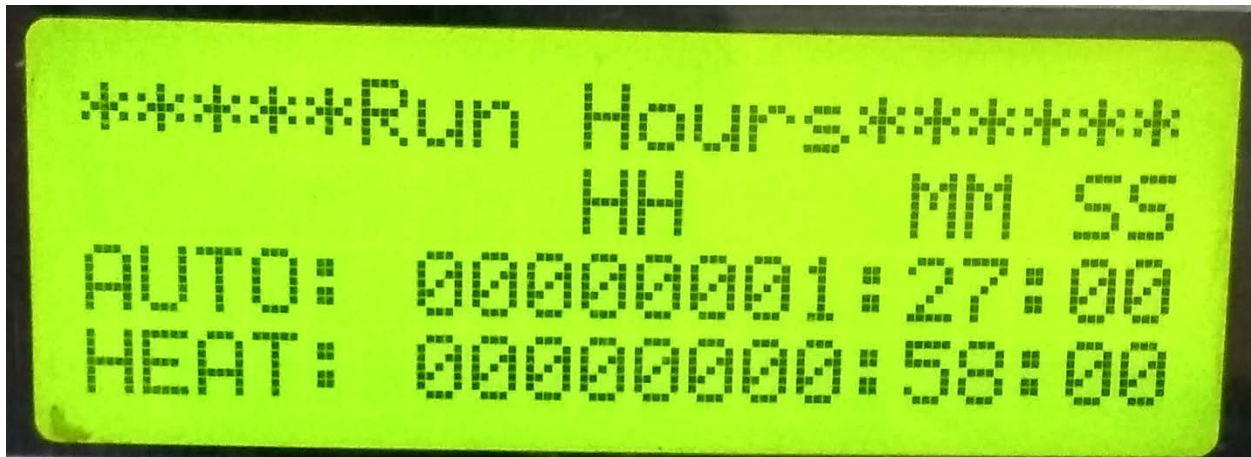


At temperature page, in second line it will display the set temperature.

In third line it will display the master output value. Set value as well as actual value.

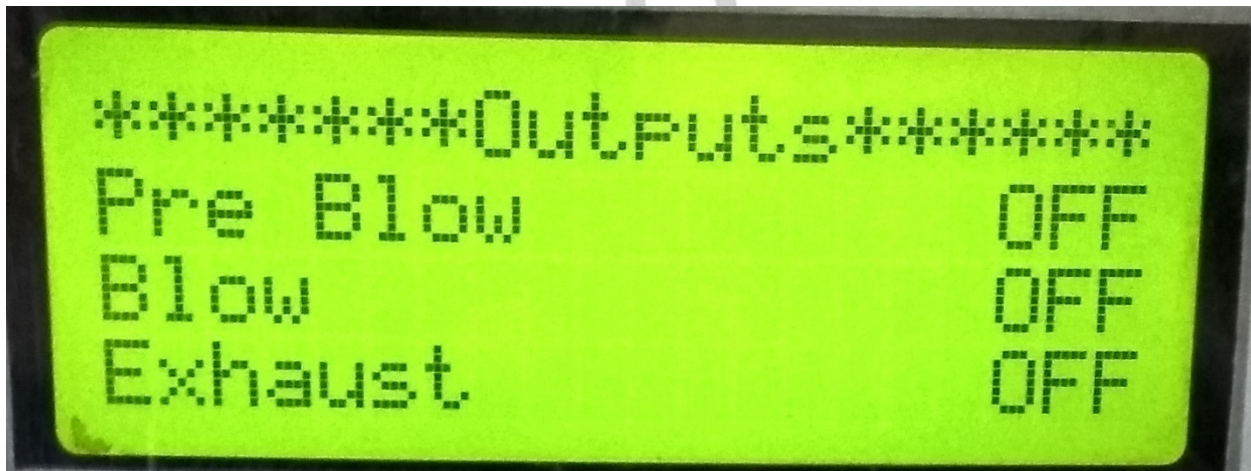
In fourth line it will display the total estimated value of production of bottles per hour.

- *Run Hours Page*



At run hour page, it will display the total run hours of auto cycle, and total heater run hours also.

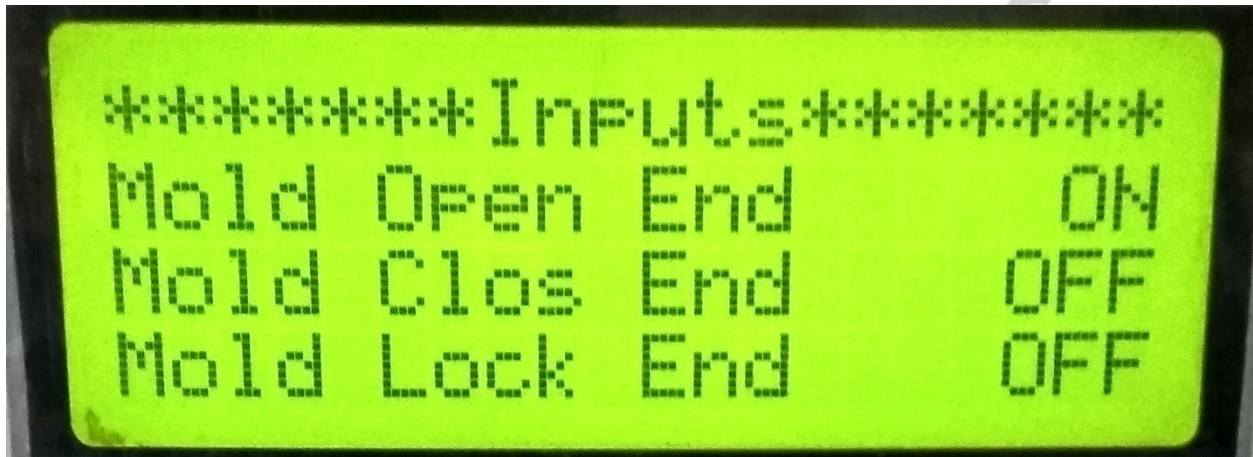
- *Outputs Page*



This page will display the current status of all outputs.

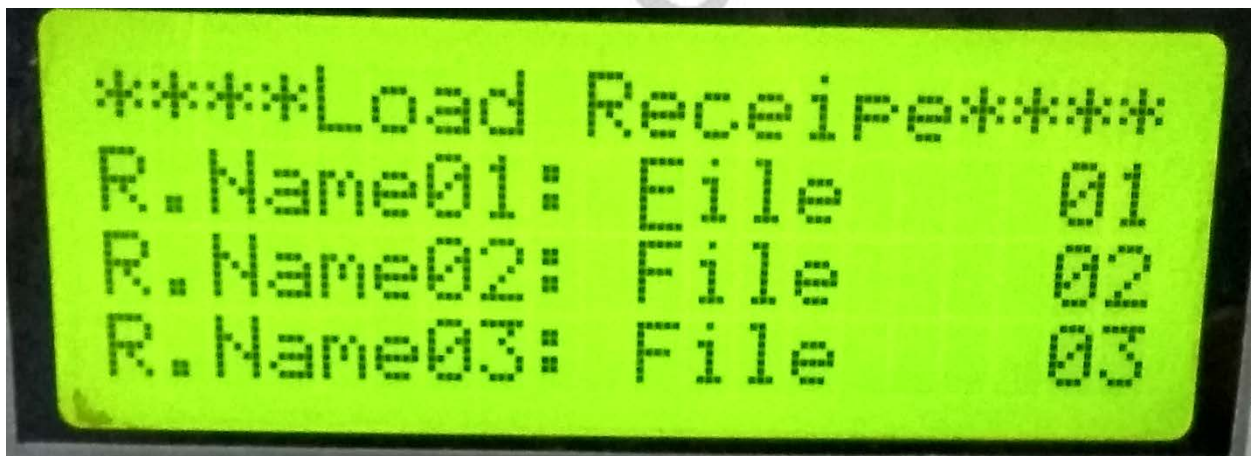
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- *Inputs Page*



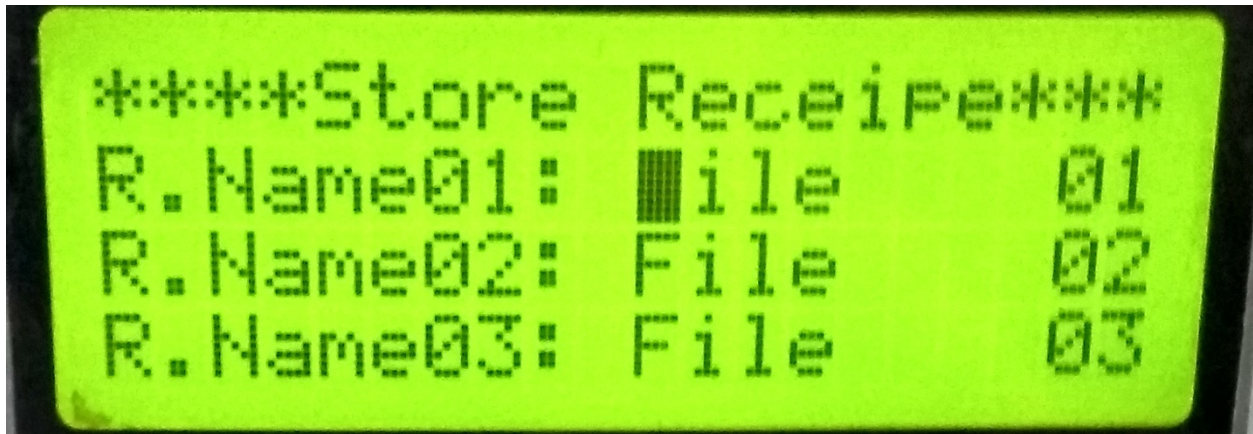
This page will display the input status of all inputs.

- *Load Recipe Page*



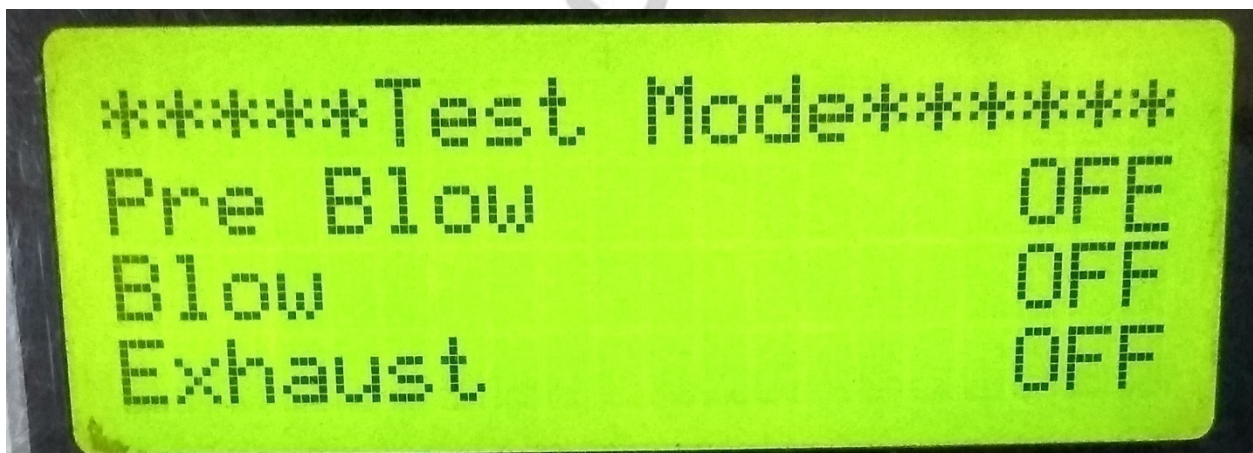
At load recipe page, it will display all recipe names. If you want to change the current recipe, first of all take the cursor at required recipe by using page up/down key. And then press SELECT button.

- *Store recipe Page*



At store recipe page, it will display the name of all recipes as well as you can change the name of recipe by using numeric keys. To store the value of recipe, first of all select the recipe at by using page up/down key. And then press SELECT key to store the recipe.

- *Test Mode Page*



At test mode page, you will change the status of outputs when machine is in manual mode. By pressing the enter key you can change the status of output.

4. Sequence of Operation

By pressing Auto key, you can go into Auto mode. The sequence will be run as per following steps.

Step 1: Wait for cycle start push button.

Step 2: with pressing cycle start push button mold close function will start up to mold close end. Do not release the cycle start push button up to mold will not reach mold close end, otherwise cycle will be stop and mold will be open.

Step 3: Mold lock function will be run up to mold lock end.

Step 4: Seal Down and stretch in function will be on.

Step 5: Pre blow delay will on than after pre blow output will be on.

Step 6: Blow delay will be run and after blow delay blow output will be on up to blowing time.

Step 7: Pre blow and Blow output will be off and Exhaust output will be on up to Exhaust time.

Step 8: Stretch in will be off, Stretch out will be on, Seal function will be off and Unlocking function will run up to unlock end.

Step 9: Mold will be open up to Mold open end stretch out will be off.

Step 10: Jump back to step 1.

5. Parameter Description

- [Set Temperature Page](#)

Parameter	Description	Parameter Description		
		Range	Unit	Default
Master Output	This parameter use to set the scale of all heater zones maximum output %.	000-100	%	5
Zone 1 SET	It will set the output % of zone R1	000-100	%	5
Zone 2 SET	It will set the output % of zone Y1	000-100	%	5
Zone 3 SET	It will set the output % of zone B1	000-100	%	5
Zone 4 SET	It will set the output % of zone R2	000-100	%	5
Zone 5 SET	It will set the output % of zone Y1	000-100	%	5
Zone 6 SET	It will set the output % of zone B1	000-100	%	5
Set Temp	Set the required Temperature.	000-999	°C	5

Prop Band	Setting the proportional band.	000-999	°C	5
Intg Time	Setting the integral time	000-999	Sec	5
Deriv Time	Setting the Derivative Time	000-999	Sec	5
Cycle Time	Setting the temperature PID calculation cycle time.	000-999	Sec	5
Al low	To set the lower value of temperature after which alarm will on.	000-999	°C	5
Al High	To set the higher value of temperature after which alarm will on.	000-999	°C	5

- *Set timer Page*

Parameter	Description	Parameter Description		
		Range	Unit	Default
Pre Blow Delay	Delay before pre blow output	00.00-99.99	Sec	00.05
Blow delay	Delay before blow output will on.	00.00-99.99	Sec	00.05
Blowing Time	Time up to which blowing function will on	00.00-99.99	Sec	00.05
Exhaust Time	Time up to which exhaust function will on	00.00-99.99	Sec	00.05
Conveyor delay	Delay before conveyor on	00.00-99.99	Sec	00.05
Strtch out dly	Delay before stretch out will on	00.00-99.99	Sec	00.05
Cycle Time	Total cycle time after which cycle time over interlock condition occur	00.00-99.99	s	00.05

6. Input Output List

INPUTS	
Input No.	Description
Input 1	Mold Open end
Input 2	Mold Close end
Input 3	Mold lock end

OUTPUTS	
Output No.	Description
Output 1	Pre Blow
Output 2	Blow
Output 3	Exhaust

Input 4	Mold unlock end
Input 5	Conveyor
Input 6	Cycle Start
Input 7	Emergency Stop
Input 8	Hydraulic motor OLR
Input 9	Index motor OLR
Input 10	Phase R input
Input 11	Phase Y input
Input 12	Phase B input

Output 4	Mold open
Output 5	Mold close
Output 6	Mold lock
Output 7	Mold unlock
Output 8	Sealing
Output 9	Stretching down
Output 10	Stretching up
Output 11	Hydraulic motor
Output 12	Index motor
Output 13	Conveyor
Output 14	Blower
Output 15	R1
Output 16	Y1
Output 17	B1
Output 18	R2
Output 19	Y2
Output 20	B2

7. Interlocks

INTERLOCKS	
Name	Description
IL Emergency Press	When Emergency push button press this interlocks will come.
IL Hyd Motor OLR	When Hydraulic motor output on but Hydraulic motor OLR input absent.
IL Index motor OLR	When Index motor output on but index motor OLR input absent.
IL Mold not closed	When mold is open and you are trying to run functions like mold lock, stretch down etc.
IL mold open/close on	When mold open and close input comes together
IL Lock/Unlock 1 on	When mold lock and unlock input comes together
IL Mold not open	At auto cycle when cycle start push button pressed but mold is not at open end.

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OUR PRODUCT RANGE

- Dedicated Controller for Plastic Injection molding Machines
- Dedicated Controller For Blow Molding Machine
- Dedicated Controller For Pet Stretch Molding Machine
- Dedicated Controller For Hopper Loader
- AC Servo Motor Drive
- DC Stepper Drive
- Dedicated Controller For Bag Making Machine
- Dedicated Controller For Sticker Labeling Machine
- Dedicated Controller For Grinding Machine
- Dedicated Controller For Dozing Application
- Dedicated Controller For Pad Printing Machine
- Dedicated Controller For Jet Dyeing Machine
- Application Specific Packages
- All Servo Pick & Place Robot For IMM
- Time/Temperature Based Profile Generator
- Multi Channel Temperature Controller
- 2/3/4 Axes Motion Controllers (Using DC stepper / AC Servo Drives).

AUTOMATION... PRODUCTIVITY THROUGH TECHNOLOGY