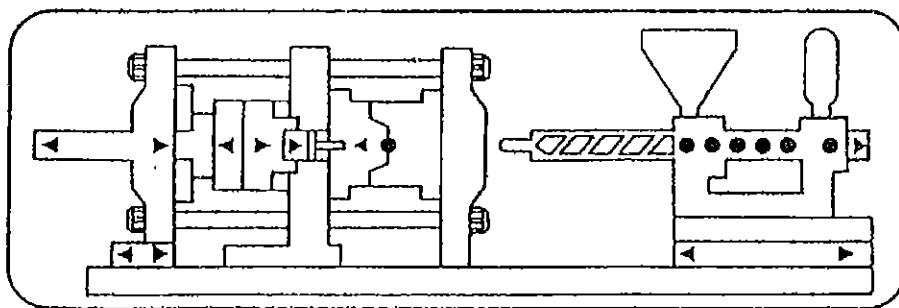


PROGRAMMABLE CONTROLLER

MODEL CH-2PC

OPERATION MANUAL



CHEN HSONG MACHINERY CO. LTD.

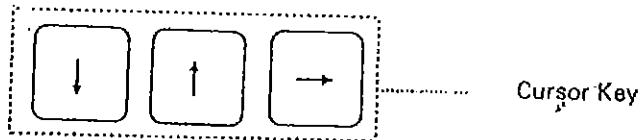
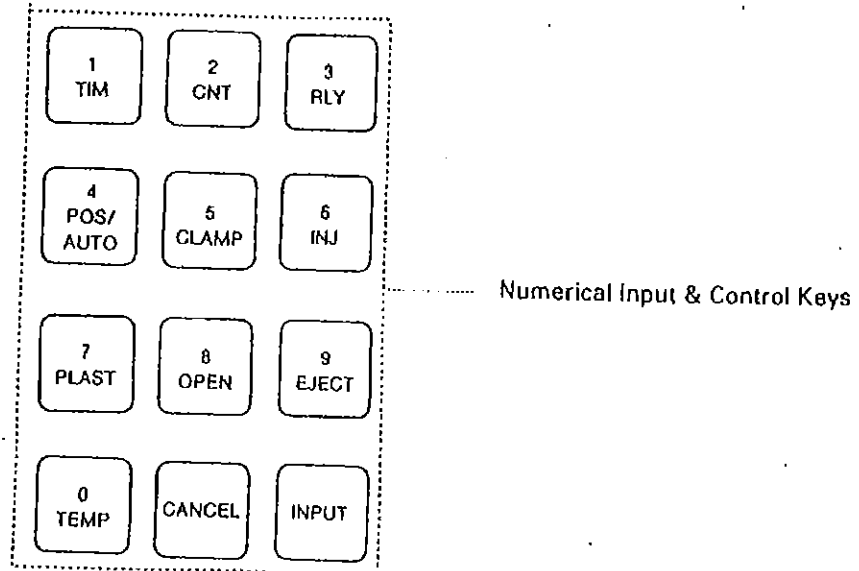
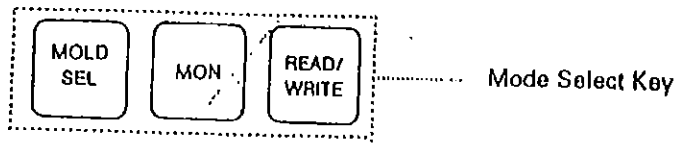
This Operation Manual describes how to handle Data Setting Keys for monitoring, setting and reading of various data in operating Programmable Controller Model CH-1PC.

For operation of Injection Molding Machine, please refer to Operation Manual of the machine.

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1. Data Setting Block Key Layout



2. State When Power Supply is ON

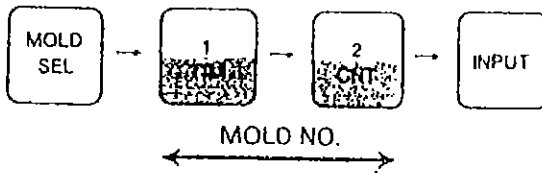
Controller will be in "initialized" state immediately after Power Supply Switch is ON. LCD display at this moment will be as follows;

C	H	E	N		H	S	O	N	G						
M	A	C	H	I	N	E	R	Y		C	O	.	L	T	D.

3. Mold (Number) Select

To designate Mold Number (for Mold Select), the following Key Operation will be made. (Mold Number is settable from 0 to 99)

"KEY OPERATION"



"DISPLAY"

M	O	L	D		N	O	.		=					1	2

Display 1

Note: Mold Number and Mold Data will be retained even after Power Supply Switch is OFF. Therefore, it is not necessary to input Mold Number and Mold Data.

4. Read/Write

Read/Write of Mold Data, Timer, Counter and (Temperature *1) can be made.

(1) Read/Write of Mold Data

① To read Mold Data — pick up a specific sequential process for reading.

"KEY OPERATION"



"DISPLAY"

L	P		C	L	A	M	P					1	2		
P	0	0	0	0			S	0	0			P	R	0	0

Display 2

Note: Any of the following Keys can be pressed for reading.

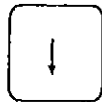


*1

*1: When Temperature controller (Optional) is installed.

② To read the next sequential process

"KEY OPERATION"



"DISPLAY"

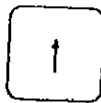
Display 2, when the Key indicated above is pressed, will shift to Display 3.

H	P		C	L	A	M	P					1	2		
P	0	0	0	0			S	0	0			P	R	0	0

Display 3

③ To read Data of the previous process

"KEY OPERATION"



"DISPLAY"

Display 3, when the Key indicated above is pressed, will shift to Display 4.

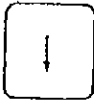
L	P		C	L	A	M	P					1	2		
P	0	0	0	0			S	0	0			P	R	0	0

Display 4

Note: Cursor will shift to the position of P, when reading of Data of the next or the previous process is made.



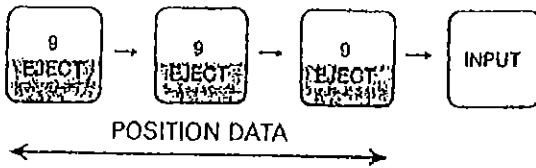
The repeated pressing of this Key will exhibit the Data of Mold Data Table(in Page 14)in sequence.



This Key is similar to the Key above.

④ -1 To write Mold Data — Rewriting of Position

"KEY OPERATION" (Make sure Cursor is positioned at the place of P)



"DISPLAY"

Display 4, when Input Key is pressed as illustrated above, will shift to Display 5. And Cursor will automatically shift to the position of S.

L	P		C	L	A	M	P							1	2
P	0	9	9	9			S	0	0			P	R	0	0

Cursor

Display 5

To rewrite or change Position Data, through this Key.

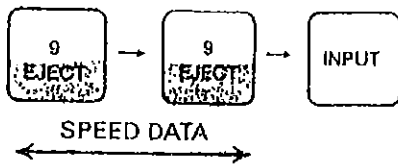


shift Cursor to the position of P and Input position Data. Position Data is settable in the range from 0 to 9999 mm.

999 and 0999 are practically identical.

④ -2 To write Mold Data — Rewriting of Speed.

"KEY OPERATION"



"DISPLAY"

Display 5, when keys are input as illustrated above, will shift to Display 6.

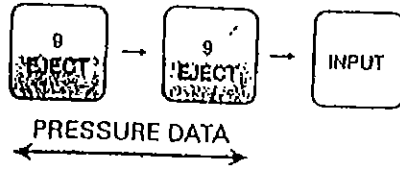
L	P		C	L	A	M	P							1	2
P	0	9	9	9			S	9	9			P	R	0	0

Display 6

Note: To rewrite or change Speed Data, shift the position of Cursor to S and input the Data. Speed Data is settable from 0 to 99%. When it is set, Cursor will automatically shift to the position of PR.

④ -3 To write Mold Data — Rewriting of Pressure.

"KEY OPERATION"



"DISPLAY"

Display 6, when Input Key is pressed as illustrated above, will shift to Display 7.

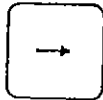
L	P		C	L	A	M	P					1	2		
P	0	9	9	9			S	9	9			P	R	9	9

Display 7

Note: To rewrite or change Pressure Data, shift Cursor to the position of PR and input the Data. Pressure Data is settable from 0 to 99%. When it is set, Cursor will automatically shift to the position of P.

④ -4 To shift Cursor

"KEY OPERATION"



"DISPLAY"

Display 7, when the Key indicated above is input, will shift to Display 8.

L	P		C	L	A	M	P					1	2		
P	0	9	9	9			<u>S</u>	9	9			P	R	9	9

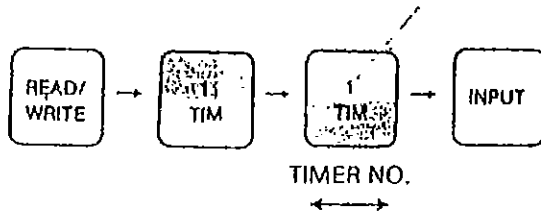
Display 8

Note: Cursor will shift to right from the present position. Cursor positioned at PR will come back to the position of P.

(2) Read/Write of Timer data

① To read Timer Data

"KEY OPERATION"



"DISPLAY"

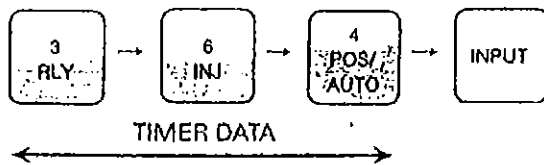
T	I	M		N	O	.	=		1				1	2
							0	.	0					

Display 9

Note: Timer Number is settable from 0 to 10.

② To write Timer Data

"KEY OPERATION"



"DISPLAY"

Display 9, when Input Key is pressed as illustrated above, will shift to Display 10.

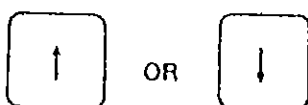
T	I	M		N	O	.	=		1				1	2
							3	6	.	4				

Display 10

Note: Timer Data is settable from 0 to 9999.

③ To display the next Timer

"KEY OPERATION"

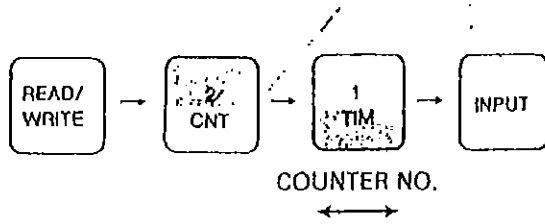


Through this Key operation as illustrated above, reading of the next Timer will be made.

(3) Read/Write of Counter Data

① To read Counter Data

"KEY OPERATION"



"DISPLAY"

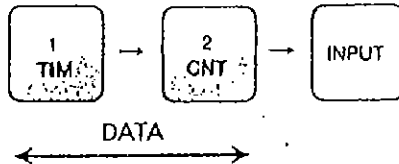
C	N	T		N	O	.	=	1				1	2
								0					

Display 11

Note: Counter Number is settable from 0 to 5.

② To write Counter Data

"KEY OPERATION"



"DISPLAY"

Display 11, when Input Key is pressed as illustrated above, will shift to Display 12.

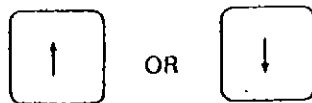
C	N	T		N	O	.	=	1				1	2
								1	2				

Display 12

Note: Counter Data is settable from 0 to 9999.

③ To display the Next Counter

"KEY OPERATION"



Through this Key operation, reading of the next counter will be made.

5. Monitoring

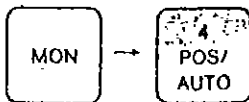
Monitoring for Timer, Counter, Relay, (Temperature) and Position can be made.

(1) Automatic monitoring

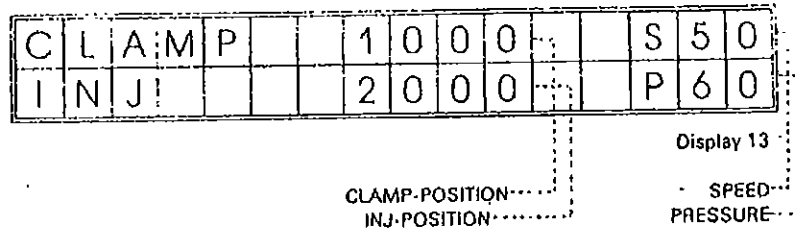
① Automatic monitoring for Position, Speed and Pressure.

Position Data detected by Clamping (side) encoder and Injection (side) encoder, Speed and Pressure values either in Clamping or Injection process will be displayed.

"KEY OPERATION"



"DISPLAY"



② Automatic monitoring for Timer and Counter

Timer 0 to 2 and Counter 0 to 1 will be automatically displayed.

"KEY OPERATION"



Note: To enter this mode, press.



and



or



"DISPLAY"

T	I	M	N	O	.	=	1				1	2
S	T	A	T	E			3	6	.	0		

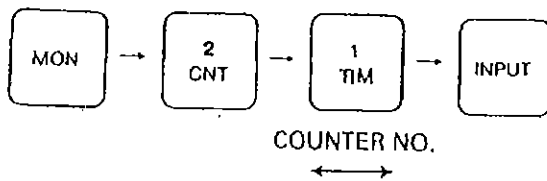
Display 19

Note: Timer Number is settable from 0 to 30.

(3) Counter Monitoring

Monitors the current value of the designated Counter.

"KEY OPERATION"



"DISPLAY"

C	N	T	N	O	.	=	1				1	2
S	T	A	T	E			1	0				

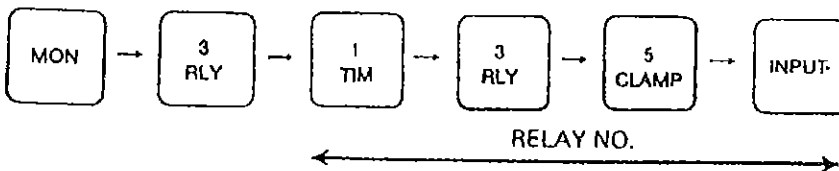
Display 20

Note: Counter Number is settable from 0 to 5.

(4) Relay Monitoring

Monitors the current state of the designated Relay.

"KEY OPERATION"



"DISPLAY"

R	L	Y		N	O	.	=	1	3	5		1	2
S	T	A	T	E			=	1					

Display 21

Note: Relay Number is settable from 0 to 50, from 100 to 159 and from 200 to 399.
State 1 is ON and State 0 is OFF.

6. Cancel Key

It is used when a wrong key was input mistakenly. When Cancel Key is input, Controller will be in the same state as Power Supply is ON.

"KEY OPERATION"



"DISPLAY"

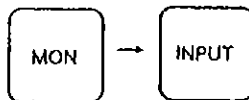
R	E	A	D	Y									1	2

Display 22

7. Testing Mode

It is to test if Sequence Ladder Program is set in the normal state.

"KEY OPERATION"



"DISPLAY"

Display in the normal state.

P	R	O	G		T	E	S	T					1	2
					"	P	A	S	S	E	D	"		

Display 23

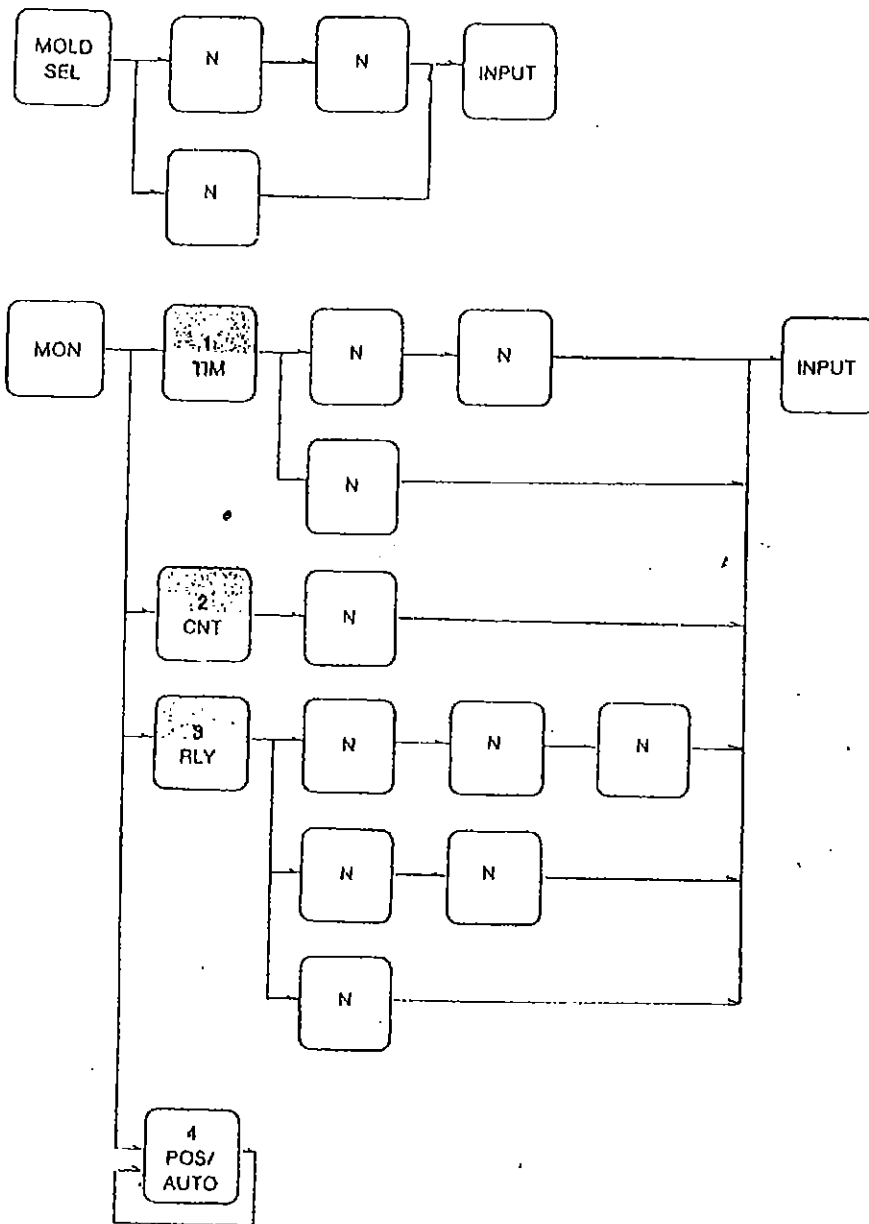
Display in the abnormal state.

P	R	O	G		T	E	S	T				1	2
					"	F	A	I	L	E	D	"	

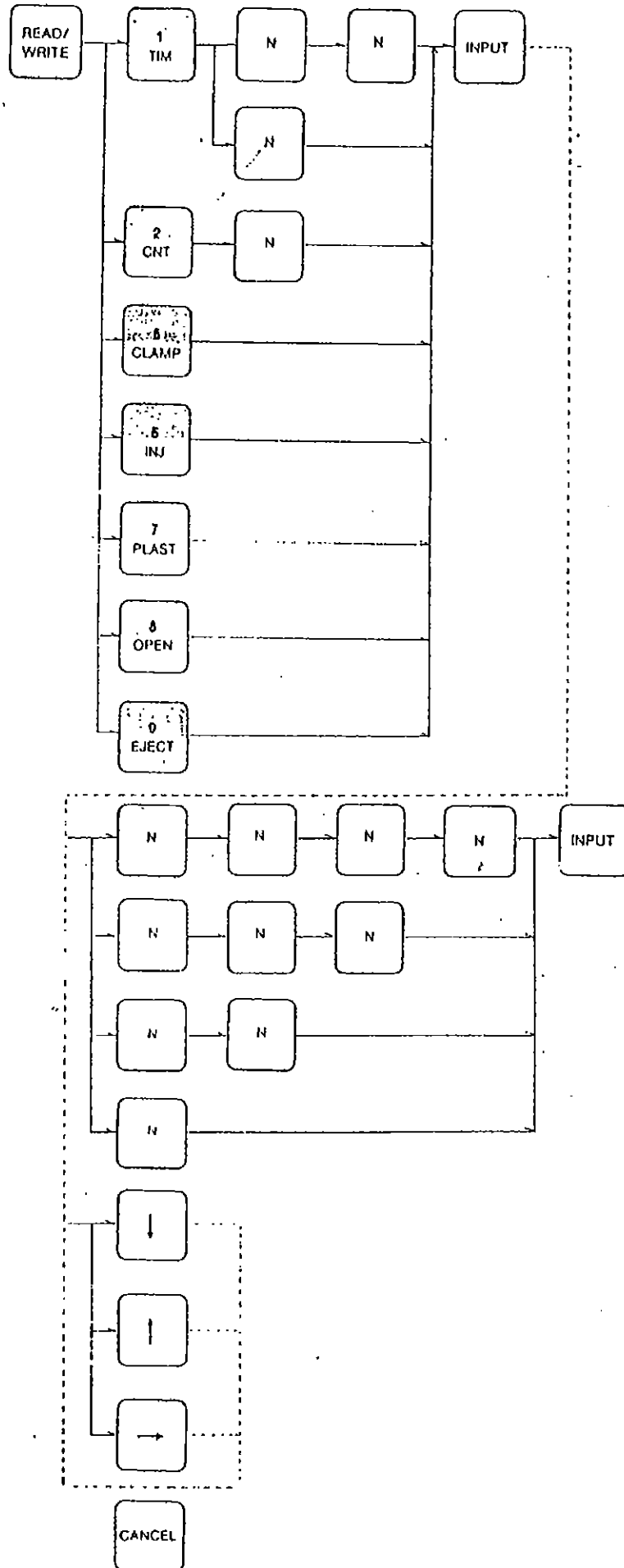
Display 24

If Sequence Ladder Program is broken, Display 24 will be exhibited.

8. Sequence of Key Operation. (Summary)



N: Numeric



9. MOLD DATA TABLE

NO.	DATA NAME	POSITION	SPEED	PRESSURE
1	LOW PRESSURE CLAMP	0 ~ 9999	0 ~ 97	0 ~ 99
2	HIGH PRESSURE CLAMP	0 ~ 9999	0 ~ 99	0 ~ 99
3	CLAMPING FORCE	0 ~ 9999	0 ~ 99	0 ~ 99
4	CORE IN START	0 ~ 9999	0 ~ 99	0 ~ 99
5	CLAMPING END	(0 ~ 9999)	(0 ~ 99)	(0 ~ 99)
6	CARRIAGE FORWARD	NIL	(0 ~ 99)	(0 ~ 99)
7	INJECTION I-II	0 ~ 9999	0 ~ 99	0 ~ 99
8	INJECTION II-III	0 ~ 9999	0 ~ 99	0 ~ 99
9	INJECTION III-IV	0 ~ 9999	0 ~ 99	0 ~ 99
10	INJECTION TERMINATION	0 ~ 9999	0 ~ 99	0 ~ 99
11	COMPENSATED PRESSURE	NIL	NIL	0 ~ 99
12	PLASTICIZATION	0 ~ 9999	0 ~ 99	(0 ~ 99)*
13	MELT DECOMPRESSION	0 ~ 9999	(0 ~ 99)	(0 ~ 99)
14	CARRIAGE BACKWARD	NIL	(0 ~ 99)	(0 ~ 99)
15	OPEN SLOW TO FAST	0 ~ 9999	0 ~ 99	(0 ~ 99)
16	OPEN FAST TO SLOW	0 ~ 9999	0 ~ 99	(~ 99)
17	OPEN END	0 ~ 9999	0 ~ 99	(0 ~ 99)
18	CORE OUT	0 ~ 9999	0 ~ 99	0 ~ 99
19	EJECTOR FORWARD	NIL	0 ~ 99	0 ~ 99
20	EJECTOR BACKWARD	NIL	0 ~ 99	0 ~ 99
21	SHOT SIZE TOLERANCE	0 ~ 99	NIL	NIL
22	CLAMPING ZERO PT.	NIL	(0 ~ 99)	(0 ~ 99)
23	INJECTION ZERO PT.	NIL	(0 ~ 99)	(0 ~ 99)
24	AUTO MOLD ADJUSTMENT	NIL	(0 ~ 99)	(0 ~ 99)
25	INJECTION SHOT NG COUNT	(0 ~ 99)	NIL	NIL
26	TIMER 0	0 ~ 9999		
27	TIMER 1	0 ~ 9999		
28	TIMER 2	0 ~ 9999		
29	TIMER 3	0 ~ 9999		
30	COUNTER 0	0 ~ 9999		
31	COUNTER 1	0 ~ 9999		
32	TIMER 4	0 ~ 9999		
33	TIMER 5	0 ~ 9999		
34	TIMER 6	0 ~ 9999		
35	TIMER 7	0 ~ 9999		
36	TIMER 8	0 ~ 9999		
37	TIMER 9	0 ~ 9999		
38	TIMER 10	0 ~ 9999		
39	COUNTER 2	0 ~ 9999		
40	COUNTER 3	0 ~ 9999		
41	COUNTER 4	0 ~ 9999		
42	COUNTER 5	0 ~ 9999		

The number in parenthesis is ROM Data.
 Reading of ROM Data is possible similarly RAM Data.
 (Writing of ROM Data cannot be made)
 *For MARK III RAM Data is stored.

10. Mold Data Display Format at the time of Read/Write.

(1) LOW PRESSURE CLAMP

L	P		C	L	A	M	P					1	2
P	0	0	0	0		S	0	0		P	R	0	0

(2) HIGH PRESSURE CLAMP

H	P		C	L	A	M	P					1	2
P	0	0	0	0		S	0	0		P	R	0	0

(3) CLAMPING FORCE

C	L	A	M	P		F	O	R	C	E			1	2
P	0	0	0	0		S	0	0		P	R	0	0	

(4) CORE IN START

C	O	R	E		I	N							1	2
P	0	0	0	0		S	0	0		P	R	0	0	

(5) CLAMPING END

C	L	A	M	P		E	N	D					1	2
P	0	0	0	0		S	0	0		P	R	0	0	

(6) CARRIAGE FORWARD

C	A	R	R	I	A	G	E		F	O	R			1	2
						S	0	0		P	R	0	0		

(7) INJECTION I-II

I	N	J	E	C	T	I	O	N		1				1	2
P	0	0	0	0		S	0	0		P	R	0	0		

(8) INJECTION II-III

I	N	J	E	C	T	I	O	N		2				1	2
P	0	0	0	0		S	0	0		P	R	0	0		

(9) INJECTION III-IV

I	N	J	E	C	T	I	O	N	3			1	2	
P	0	0	0	0		S	0	0			P	R	0	0

(10) INJECTION TERMINATION

I	N	J		T	E	R	M					1	2	
P	0	0	0	0		S	0	0			P	R	0	0

(11) COMPENSATED PRESSURE

C	O	M	P		P	R						1	2	
											P	R	0	0

(12) PLASTICIZATION

P	L	A	S	T								1	2	
P	0	0	0	0		S	0	0			P	R	0	0

(13) MELT DECOMPRESSION

M	E	L	T		D	E	C	O	M	P		1	2
P	0	0	0	0		S	0	0		P	R	0	0

(14) CARRIAGE BACKWARD

C	A	R	R	I	A	G	E		B	A	C	K	1	2
						S	0	0			P	R	0	0

(15) OPEN SLOW TO FAST

O	P	E	N		S		T	O		F		1	2
P	0	0	0	0		S	0	0		P	R	0	0

(16) OPEN FAST TO SLOW

O	P	E	N		F		T	O		S		1	2
P	0	0	0	0		S	0	0		P	R	0	0

(17) OPEN END

O	P	E	N		E	N	D					1	2
P	0	0	0	0		S	0	0		P	R	0	0

(18) CORE OUT

C	O	R	E		O	U	T					1	2	
P	0	0	0	0		S	0	0			P	R	0	0

(19) EJECTOR FORWARD

E	J	E	C	T	O	R		F	O	R			1	2
						S	0	0			P	R	0	0

(20) EJECTOR BACKWARD

E	J	E	C	T	O	R		B	A	C	K		1	2
						S	0	0			P	R	0	0

(21) SHOT SIZE TOLERANCE

S	H	O	T		S	I	Z	E		T	O	L		1	2
P	0	0	0	0											

(22) CLAMPING ZERO PT.

C	L	A	M	P		Z	E	R	O		P	T		1	2
						S	0	0			P	R	0	0	

(23) INJECTION ZERO PT.

I	N	J		Z	E	R	O		P	T				1	2
						S	0	0			P	R	0	0	

(24) AUTO MOLD ADJUSTMENT

A	U	T	O		M	O	L	D		A	D	J		1	2
						S	0	0			P	R	0	0	

(25) INJECTION SHOT NG COUNT

S	H	O	T		N	G		C	O	U	N	T		1	2
C	0	0													

11. ERROR MESSAGE

The following messages will be displayed when Controller runs into the abnormal state and Alarm buzzer will be ON.

(1) CHANGE BATTERY

C	H	A	N	G	E		B	A	T	T	E	R	Y		

(2) ADD MATERIAL

A	D	D		M	A	T	E	R	I	A	L				

(3) PARTS NOT DROP

P	A	R	T	S		N	O	T		D	R	O	P		

(4) CLEAN PHOTO CELL

C	L	E	A	N		P	H	O	T	O		C	E	L	L

(5) MOLD PROTECTION ALARM

M	O	L	D		P	R	O	T	E	C	T	I	O	N	
A	L	A	R	M											

(6) CYCLE COMPLETED

C	Y	C	L	E		C	O	M	P	L	E	T	E	D	

(7) CYCLE TIME ERROR

C	Y	C	L	E		T	I	M	E		E	R	R	O	R

(8) AUTO MOLD ADJUST

A	U	T	O		M	O	L	D		A	D	J	U	S	T

(9) PUMP OVER LOAD

P	U	M	P		O	V	E	R		L	O	A	D		

(10) DOOR NOT CLOSE

D	O	O	R		N	O	T		C	L	O	S	E		

If Cancel Key or other Keys are pressed, Error Messages will disappear

(11) WDT ERROR

W	D	T		E	R	R	O	R							

The watch dog timer is a timer inside the PC that measures the "scan time". The scan time is the total time required for the PC to perform all the operations. If the scan time exceeds 100ms, a circuit with the 0.1 second clock pulse may malfunction and the scan time alarm will turn ON. LCD will display "W.D.R. error" and then the CH-2PC immediately stop. Generally, this alarm can be resetted by turning power off. If this alarm cannot be eliminated, please consulted with the service centre.

12. Remarks

Writing of Data can be made only at Manual mode. Writing cannot be made at Auto-mode, Semi-Auto-mode. (Reading of Data can be made in any mode of Manual-mode, Auto-mode, Semi-Auto-mode)

13. Precautions for Operation

Please do not push the part of LCD on the Panel and do not give strong impact on it.
(LCD might be broken).

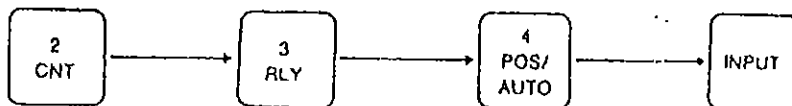
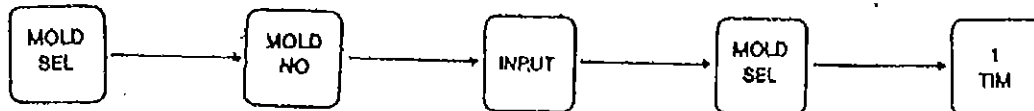
Do not give strong impact on Switches and the part of LCD display on the Panel

In operating Controller, please provide Frame Grounding prior to operation.

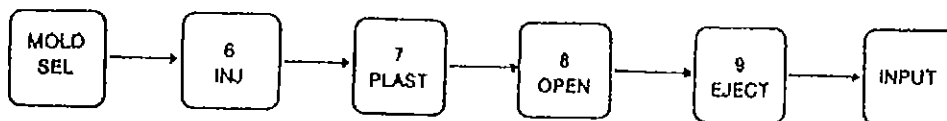
SUPPLEMENTARY INFORMATION

PROTECTION OF MOLD SELECTION

If you want to lock up the mold number, the improved program of the computer can provide this function. If you press



then the mark of "#" will be displayed in front of mold number on the screen and no one can change the mold number unless you press



the mark of "#" in front of mold number will be disappeared on the screen, and you can select another mold number.

(1) Restriction of maximum mold open stroke

When the position data of mold open and mold clamp are input, the data must fall within the maximum mold open stroke which is pre-set in the programmable controller.

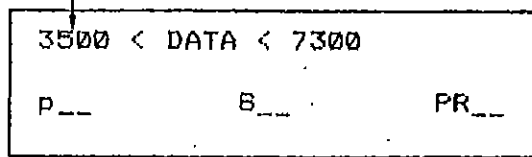
For Jm12 MkIIc, the value of maximum mold open stroke is 7300.

For Jm4 MkIIc, the value of maximum mold open stroke is 5800.

If the input data is greater than the maximum value, the input of this data will not be accepted. The display of the programmable controller will show:

The assumed position of mold open from fast to slow

OPEN END



The new input data must be less than the maximum value.

(2) Restriction of maximum injection stroke

When the position data of injection, plasticization and melt decompression, the data must fall within the maximum injection stroke. The programmable controller will not accept the input of the data until the following condition is satisfied.

For Jm12 MkIIc, the value of maximum injection stroke is 3600.

For Jm4 MkIIc, the value of maximum injection stroke is 2500.

(3) Operation of monitoring

I. Operation of relay monitoring

Relay no.

- | | |
|-----------|--|
| 0 - 57 | represent the sequence input signal relay |
| 100 - 137 | represent the sequence → process output signal relay |
| 138 - 165 | represent the machine output signal relay |
| 200 - 299 | represent the internal relay |
| 300 - 399 | represent the keep relay |

Example:-

When the position data of injection are input, if there are two groups of data.

GROUP	MAXIMUM INJ. STROKE	INJECTION I-II	INJECTION II-III	INJECTION III-IV	INJECTION TERMINATION
A	2500	1600	900	600	200
B	2500	2400	2000	1000	300

The condition of setting the position data is:-
 maximum injection stroke > injection I-II >
 injection II-III > injection III-IV > injection termination

Both groups of data in above satisfy the condition. However, if the order of input of position data is inappropriate, the data stored in the controller cannot be changed.

Incorrect input order correct input order

To change from group B to group A

Start from injection I-II

Start from injection termination

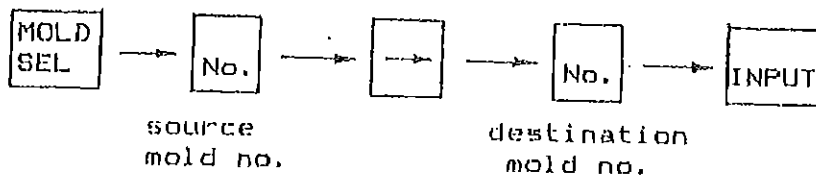
To change from group A to group B

Start from injection termination

Start from injection I-II

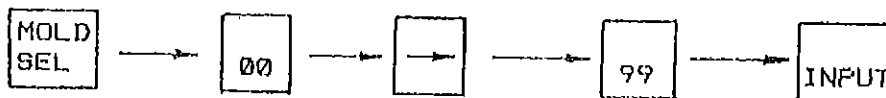
(5) Mold data copy

This is to copy mold data, preparing mold data of the designated mold number by copying the designated source mold number. The key operations are as follows:-

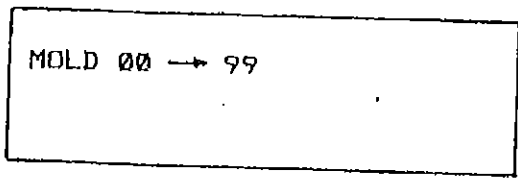


Example:-

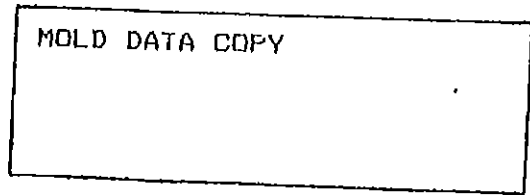
To copy the data of mold no. 00 to mold no. 99.



DISPLAY



Display after the completion of mold copy.



(6) Error message preservation

If an error message is displayed on the LCD of the controller, this error message will be preserved until the error is corrected. Before this is done, the error message on the LCD cannot be cancelled even the 'cancel' key is pressed.

(7) Standard mold data copy

There is a standard mode data stored in the programmable controller. When a new set of data is needed for a particular mould, this set of standard data can be transferred to a new mold no. and changed part of the data if necessary. This provides a convenient and quick way in setting the processing parameters.

The key operations are as follows:-

