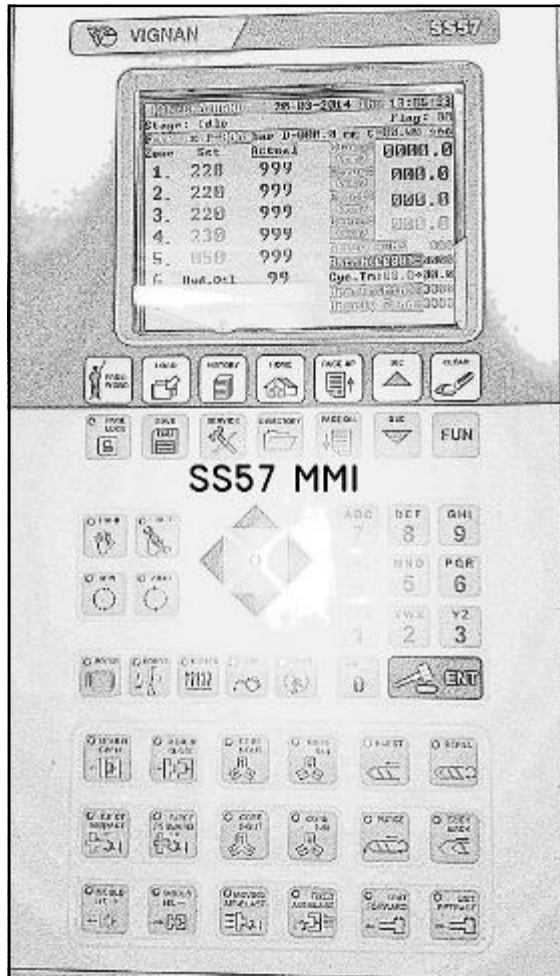
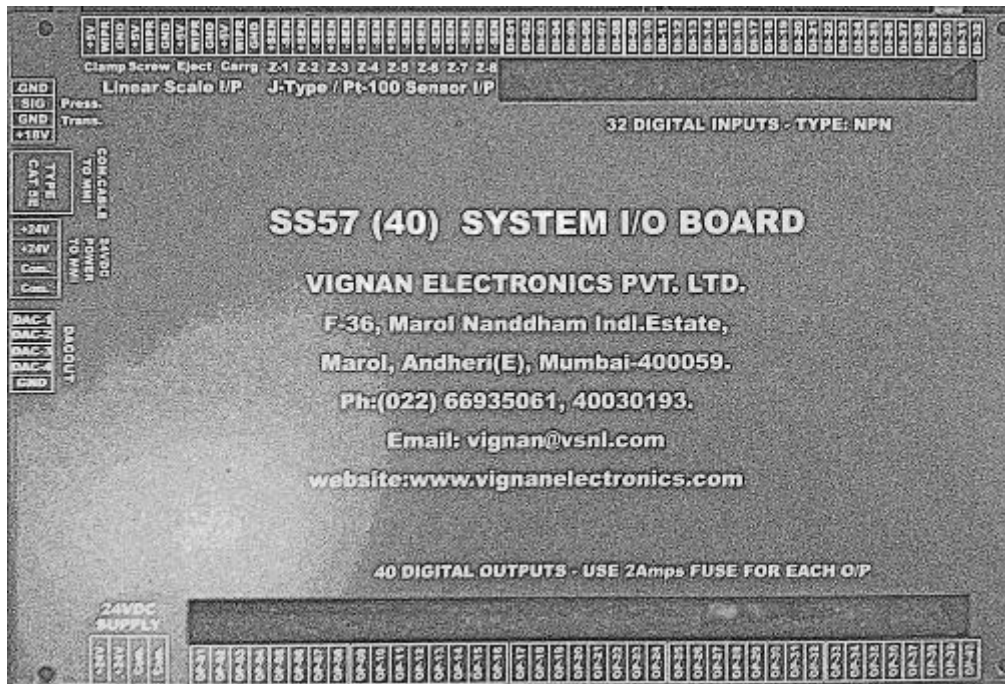


VIGNAN SS57-40



OPERATING MANUAL FOR **DIRECT LOCKING/RAM** **INJECTION MOLDING M/C** **V1.0**



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PLC SPECIFICATIONS

SS57 COLOR

For Injection Molding Machine



- HMI with 5.7" TFT 16 million colors, 640*480 resolution 140 pixels/inch clarity.
- USB port for remote reprogramming, data transfer, machine calibration etc.
- Dual-processor hardware system based on **ARM® & PIC®** technology.
- Seamless integration with all servo drives, variable volume pumps & proportional.
- Programmable on-field digital & proportional outputs for each machine execution stage.
- SD card storage facility for last **10-year** machine shots data, set data changes & errors.

TECHNICAL SPECIFICATIONS

System Configuration	Highly Integrated 4-piece system
MMI CPU	32-Bit ARM-7 Embedded Processor @72MHz
LCD Backlit	LED Type with Digitally adjustable Contrast
No. of Keys	55-with LED indication for direct fn. call keys
Machine Scan Time	2500 microsec (400 times/sec)
MMI Scan Time	1000 microsec (1000times/sec)
No. of Mould Programs	120
History Database Memory	2GB, data retention for machine lifetime
Communication Channels	USB(front) @48MHz & RS232 @9600baud
I/O Board CPU	16-Bit Microchip DSP Processor @40MHz
No. of Digital Inputs	32 (Type NPN-NO, Max.Source Current 5ma)
No. of Digital Outputs	40 (Max. current output of 2A for each o/p)
Digital Outputs Feature	Onsite programmable (Delays & Switching)
No. of Analog Inputs	5 (4 Linear Pot. +1 Pressure Transducer)
No. of Temp. Sensors	8 (Type: RTD Pt-100 Isolated) and J-type Thermocouple
Analog Input Resolution	12-bit
Temp. Control Accuracy	+1 to -2 °C of set value
Type of Temp. Control	Advanced Adaptive PID control
No. of PWM Outputs	4 Nos. digitally user calibrated
PWM O/P Voltage Range	-10 to +10volts with 16-bit resolution
Power consumption	6.25W max.(standby)
Max. Operating Temperature	60 °C

SALIENT FEATURES















- Dual-processor hardware system based on 32-bit ARM® & 16-bit PIC® technology.
- Cylinder speeds can be controlled upto 2000 mm/sec with excellent repeatability.
- Programmable on-field digital & proportional outputs for each machine execution stage.
- Integrated control for handling pick & place robot.
- Special functions include: 2 Cores with 6-modes, Intrugen, Thin-wall injection, Adaptive mold-locking correction, Mold-opening correction, Online power calculations.
- Advanced Adaptive PID control for closed-loop heating with high/low alarms.
- Built-in Interface for Pressure Transducer, Blowers, Encoder & Energymeter.
- SD card storage facility for last 10-year machine shots data, set data changes & errors.
- USB port for on-site reprogramming, data transfer, machine calibration etc.





DISPLAY FUNCTIONS

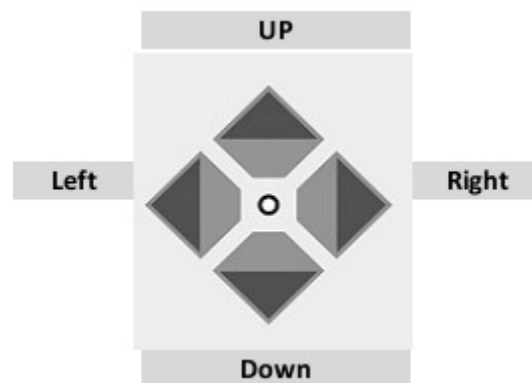
- ▲ Real-Time Temperature, Scale readings, Cycle times, Machine operational stage & Batch counters displayed on Homescreen.
- ▲ Dynamic coloring for machine variables as per real-time status.
- ▲ Displays valid maximum/minimum data limits during data entry.
- ▲ Color trends for individual stage timings, Mould Open/Close, Injection/Refill speeds profiles & Zone Temperatures profiles.
- ▲ Hourly & Shift production for the last 30 days.
- ▲ Displays all machine timings in fractional of seconds resolution & cylinder speeds in mm/sec.
- ▲ Displays online power calculations for each hour of the day, average units/last 10 shots, units/job work & total overall consumed units by machine.
- ▲ In-depth details of any machine shot from the past 10 years can be retrieved & displayed.
- ▲ Displays the log for the last 128 Errors & Alarms.
- ▲ Displays the updated PLC runtime hours in each operating mode.



MMI KEYS DESCRIPTION












General Function keys	Key Function
	Password
	Load Program
	History Menu
	Home Screen
	Page Up/Previous
	Increment
	Clear/Backspace
	Page Lock
	Save Program
	Service Menu
	Mold Directory
	Page Down/Next
	Decrement
	Function













Mode Keys	Mode
	Hand/Manual
	Setting
	Semi Auto Cycle
	Fully Auto Cycle



Alphanumeric Keys for Data Entry



M/C Operation keys	Hand Function
	Motor ON/OFF Manual Switch ON/OFF Motor
	Robot ON/OFF
	Heater ON/OFF
	Lub. Pump ON/OFF
	Start Cycle
	Mould Open start
	Mould Close start
	Core-1 Out start
	Core-1 IN start
	Injection start
	Refill start

M/C Operation keys	Hand Function
	Hyd. Ejector Retract start
	Hyd. Ejector Forward start
	Core-2 OUT start
	Core-2 IN start
	Purge start
	Suckback start
	Mould Height+ start
	Mold Height- start
	Moving Air Blast start
	Fixed Air Blast start
	Unit/Carriage Forward start
	Unit/Carriage Retract start

GENERAL OPERATING INSTRUCTIONS

1. To change any program data currently operating
 - Go to the required screen by using **<PAGE UP>**, **<PAGE DN>** keys, by using data screen symbols or by using hand mode keys (You must disable page lock).
 - Go to the required data parameter using up, down, left & right arrow keys.
 - Enter data using **<0 to 9>** keys (Either numeric 0-9 or Alphanumeric A-Z).
 - Press **<ENTER>** key to start to operate with new changed data.
 - If no data change is accepted, then the password access level for that page may be low. Change password level and retry the same.
2. To save entered data into backup memory.
 - Change data as per requirement
 - Press **<ENTER>** key
 - Unlock page lock status (Page lock led must not glow)
 - Press **<SAVE>** key to save in the memory.
3. To load new program data (Mould data – Only in **SET** Mode)
 - Press **<Directory>** key and directory for first 30 mould programs are displayed.
 - Use **<INC>** & **<DEC>** to go to directory page of any of 120 mould programs.
 - Use **Up(↑)**, **Down(↓)**, **Left(←)** & **Right(→)** arrow keys to move the cursor on to the desired mould data name.
 - Press **<Load>** key to load data for new job.
 - Before running the machine please Check the data for its correctness.
 - Now select required mode to operate machine.
4. To copy mould data from Prog.No.xx to Prog.No.yy (Only in **SET** Mode)

Press **<Directory>** key and the first 30 mould programs are displayed.

Go to last line on the screen using arrow keys.

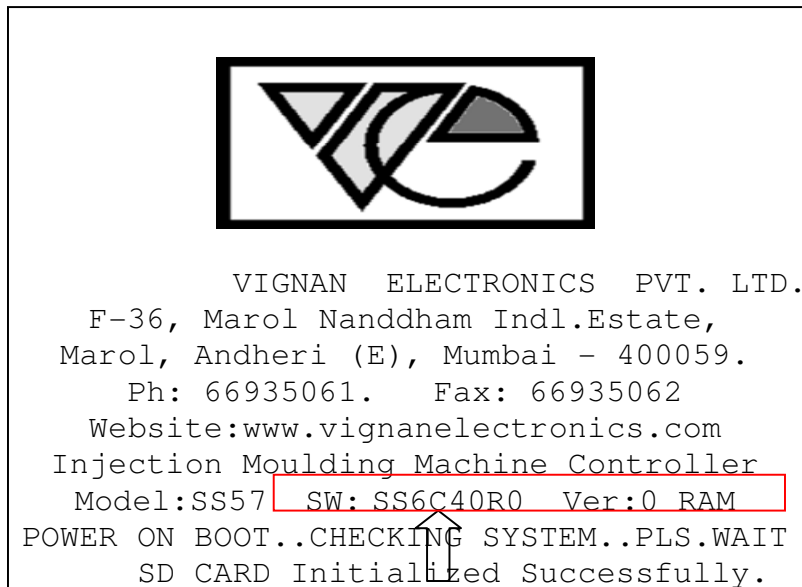
Enter Original Program no. (xx) And Destination program no. (yy). (Both xx and yy must be within 01 to 30)

Press **<FUN>** key to copy complete mould data from xx to yy.

A message "Data Copied...OK" will be displayed, if copy is successful.

Now load the new mould data as explained in Step: 3 for execution.
5. When PLC is repowered, the last selected (running) mould data is automatically loaded for execution.
6. The top line on every screen denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
7. The second line on every screen denotes the present stage in machine operation with its corresponding stage number.
8. The third line on every screen denotes the present stage's set Flow, Pressure, Position & Time(if operating in timer mode).
9. The last line denotes any machine error condition detected by the PLC.
10. If no key is pressed for 120 seconds, the LCD backlit goes off to increase the life span of LCD and it comes on when any key is pressed.
11. To increase/decrease the screen backlight press **<INC>**/**<DEC>** keys on Homepage.
12. To enter new data on any screen corresponding level of password must be entered. The present password level automatically reduces by level 1 after each 15 minutes interval.
13. Reset password as soon as you complete data entry to avoid unauthorized or wrong data entry.
14. When page lock led is off you can go to the required page directly by using hand mode keys and data can be saved in backup memory.
15. If at any time data is saved in the backup memory the page lock led comes on to avoid resaving.
16. If no RTD is connected or sensor is open, that zone temp. displays 999 so that corresponding contactor goes off.
17. To execute either semi auto or full auto cycle, the heaters must be put on.

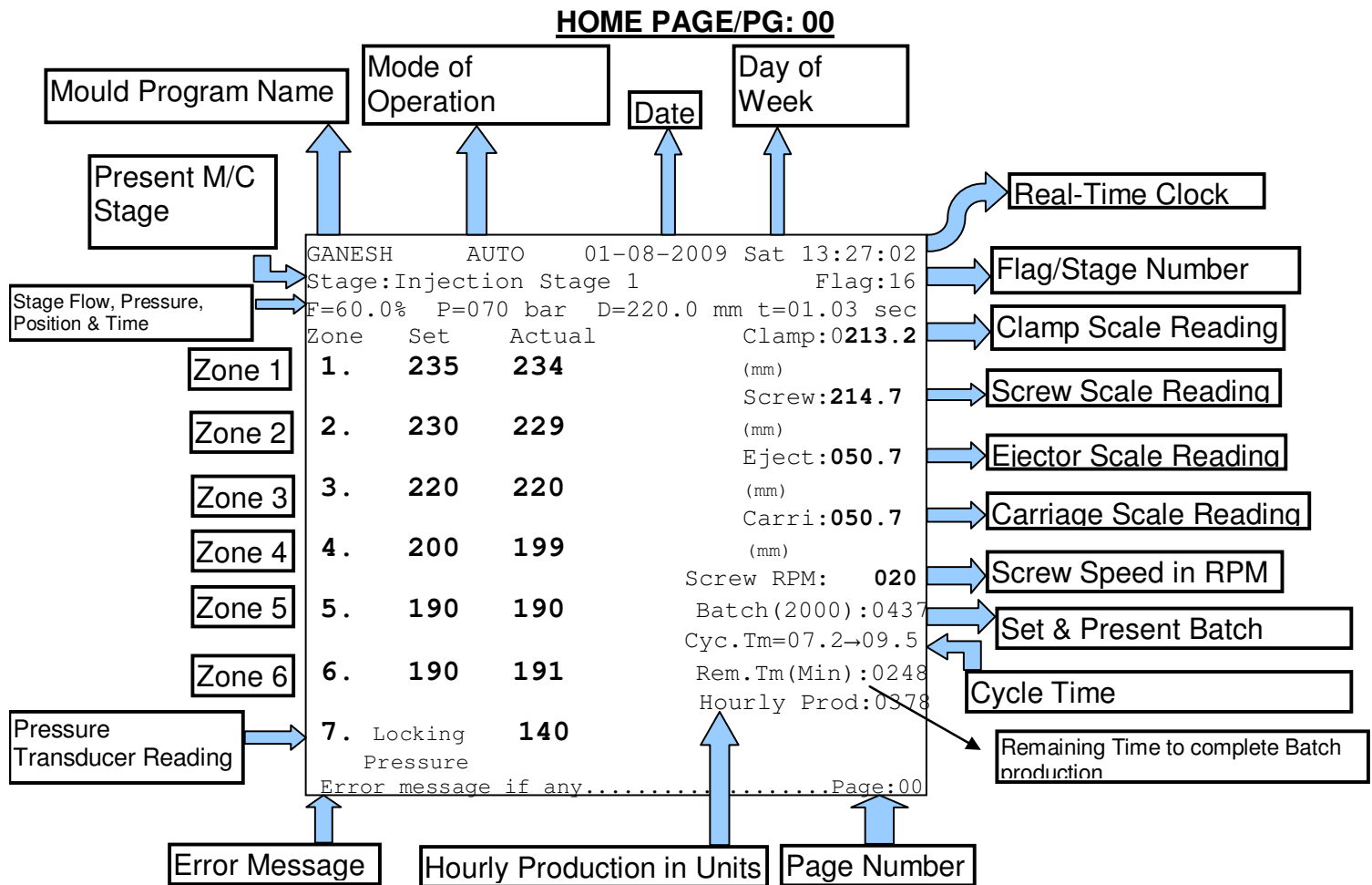
18. Whenever a new mould program is loaded, heaters are put off automatically.
19. Whenever machine stops at any stage, check flag no., operating message and error message on the screen and rectify the problem accordingly.
20. All zone set temperatures must be above minimum temperature set in machine parameter screen.
21. No machine operation can be done during Motor transition delay/Motor ON delay.

STARTUP SCREEN**SOFTWARE NAME**

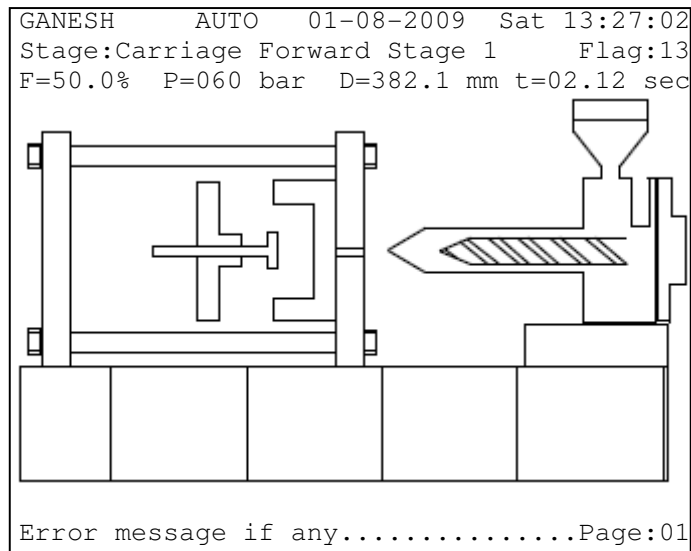
- 1) The above screen is “**STARTUP SCREEN**” visible for only 5 seconds every time the PLC power cycles.
- 2) This screen displays VIGNAN logo & contact details along with the PLC model: **SS57**
- 3) On the seventh line of this screen, PLC displays the software name installed in it. Here for a toggle machine SW name: **SS6C40R0 Ver:0**.

Screen Related Messages:

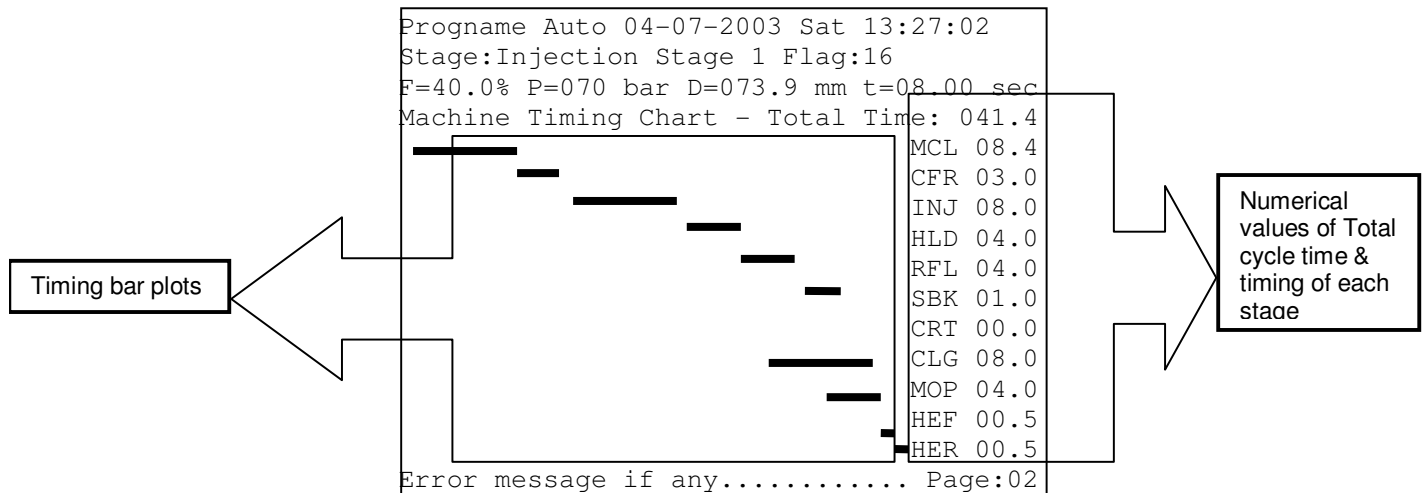
- 4) “**SD Card Initialized Successfully**” message indicates that PLC has detected the SDCARD inserted & is ready for recording/logging all history parameters.
- 5) “**SD Card Faulty & Not Initialized**” message indicates that PLC has not detected the SDCARD inserted or not properly initialized or damaged and hence is not ready for recording/logging all history parameters.
- 6) “**VIGNAN PLC Reprogrammed Successfully.**” Message indicates that PLC program has been updated successfully through an USB drive.
- 7) “**Er:Battery LOW.Replace with New Battery**” message indicates that the BIOS battery voltage is below critical level. Call VIGNAN service centre & replace the battery at the earliest for proper operation of PLC.
- 8) “**System Fail Detected...Call Service Engg**” message indicates that something abnormal has occurred on PLC.Call nearest VIGNAN service centre at the earliest for proper operation of PLC.



- 1) The above screen is “**HOME PAGE**” or **PG:00**, accessible by pressing <HOME> on keypad
- 2) Password Level Required to **Access=0**. No values are settable/configurable on this screen.
- 3) This is the main observation screen during machine operation indicating all real-time values of temperature zones, scales, screw speed & production counters details.
- 4) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time. This line is shown on all screens.
- 5) The second line denotes the present stage in machine operation with its corresponding stage number.
- 6) The third line denotes the present machine operation stage’s set Flow, Pressure, Position & Time (if operating in timer mode).

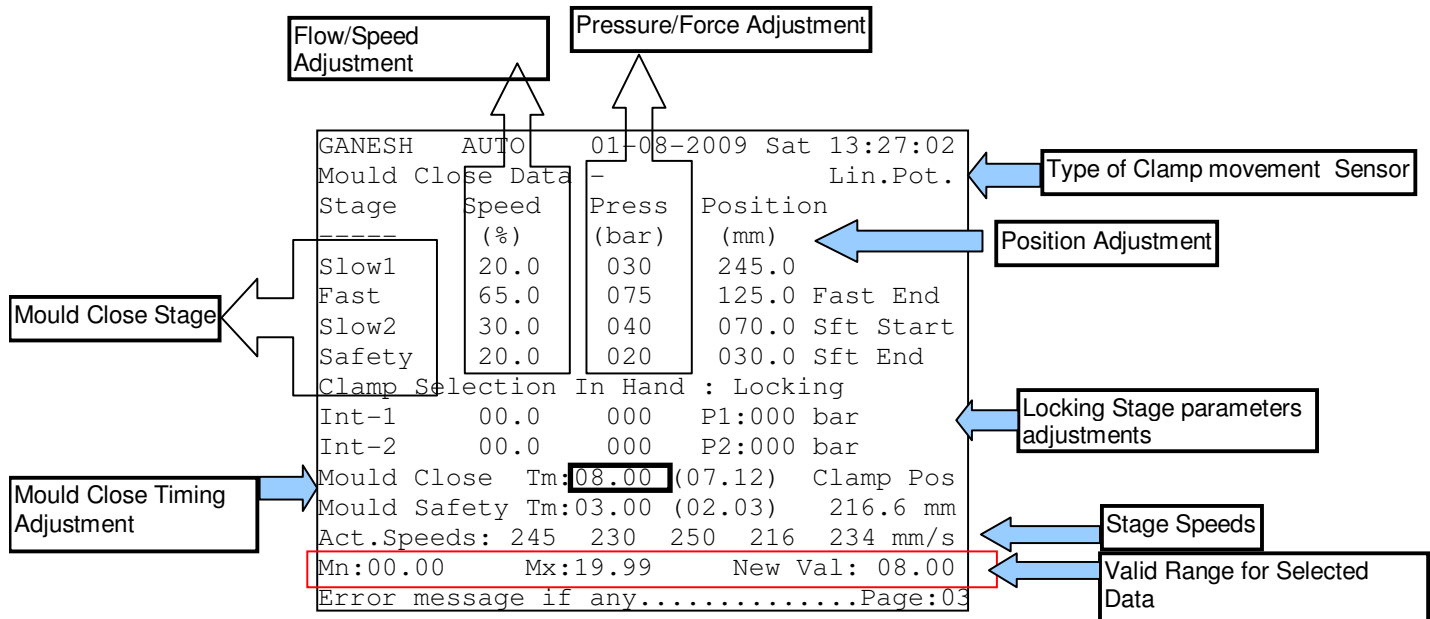
GRAPHICAL MACHINE MOTION PAGE/PG: 01

- 1)The above screen is **PG:01**, accessible by pressing **<HOME>** and then **<PAGE DN.>** key on keypad.
- 2)Password Level Required to **Access=0**.No values are settable/configurable on this screen.
- 3)This is a graphical screen showing real-time machine motion as per the present stage of operation.
- 4)The graphics indicates Screw, Carriage, Ejector & Mould Clamp motion.
- 5)Linear Scales for Clamp, Screw, Ejector & Carriage should be installed for graphics.
- 6) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 7)The second line denotes the present stage in machine operation with its corresponding stage number.
- 8)The third line denotes the present stage's set Flow, Pressure, Position & Time(if operating in timer mode).
- 9)The last line denotes any machine error condition detected by the PLC.

GRAPHICAL TIMING PAGE/PG: 02

- 1) The above screen is **PG:02**, accessible by pressing **<HOME>** & then **<PAGE DN.>** key twice on the keypad.
- 2) Password Level Required to **Access=0**. No values are settable/configurable on this screen.
- 3) This is a graphical screen showing time bar graphs of different operation during a machine cycle.
- 4) The horizontal bar graph indicates the length of the time in seconds.
- 5) Numerical values of operation timing for each stage are also represented along with the total cycle time.
- 6) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 7) The second line denotes the present stage in machine operation with its corresponding stage number.
- 8) The third line denotes the present stage's set Flow, Pressure, Position & Time (if operating in timer mode).
- 9) The last line denotes any machine error condition detected by the PLC.

MOULD CLOSE PAGE/PG: 03



1) The above screen is **PG:03**, accessible by pressing **<MOULD CLOSE>** key on keypad.

2) Password Level Required to **Access=01**. All Mould Close setting are settable/configurable on this screen.

3) On this screen flow, pressure, position & times are configurable for each stage of mould closing operation. The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.

4) Mold Locking/Unlocking can be based on Limit **switches/Pressure Transducer/Timers**. Appropriate sensor can be selected from **PG: 36**.

5) **Intensification 1 & 2** locking stages flow/pressure/locking pressure values can be adjusted on this page.

6) **Interlock:** Position of Slow1>Fast>Slow2>Safety>Locking

7) **Interlock:** Intensification-1 Pressure< Intensification-2 Pressure

8) The maximum values of each settable parameter can be adjusted from **PG:33**

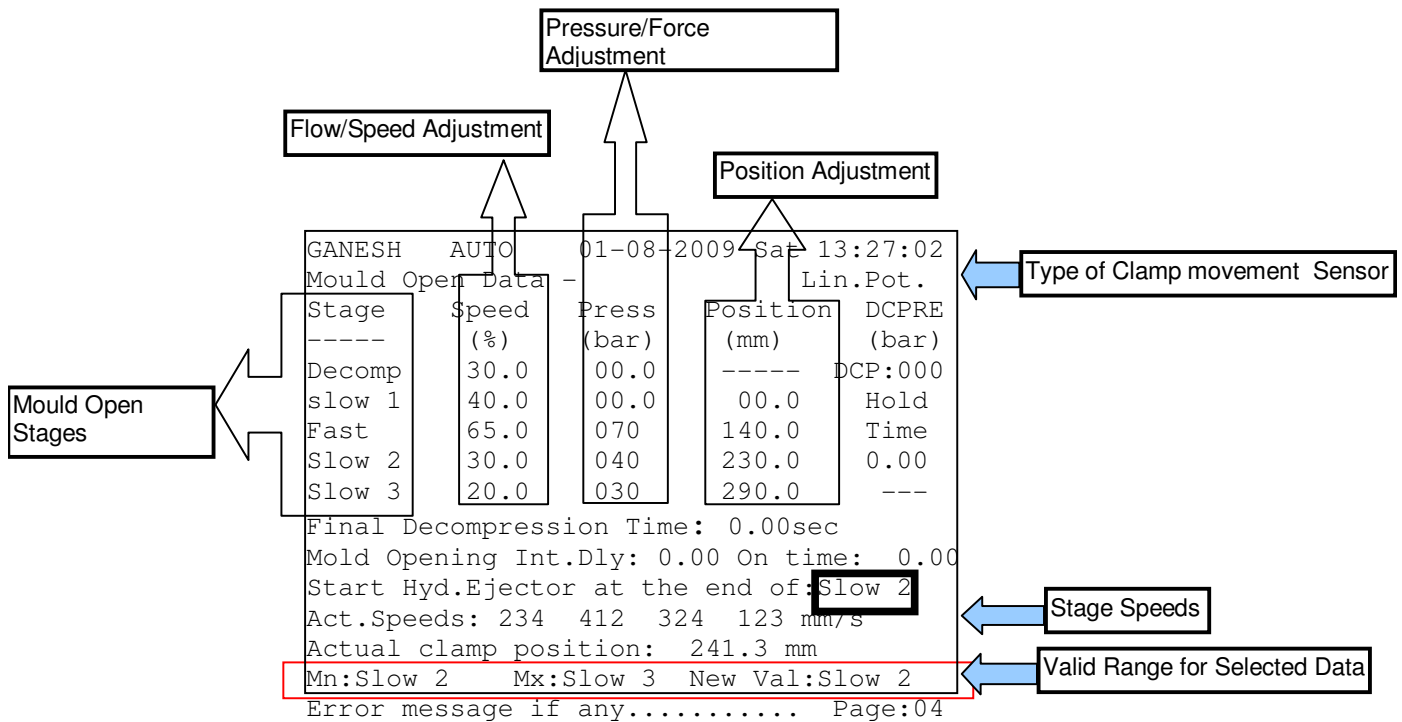
9) The maximum value of clamp scale can be adjusted from **PG:29**

10) The type of **Clamp sensor** ("**Linear Potentiometer**" / "**Limit switch**") is machine manufacturer settable from **PG: 36**. This is indicated on the second line of the screen.

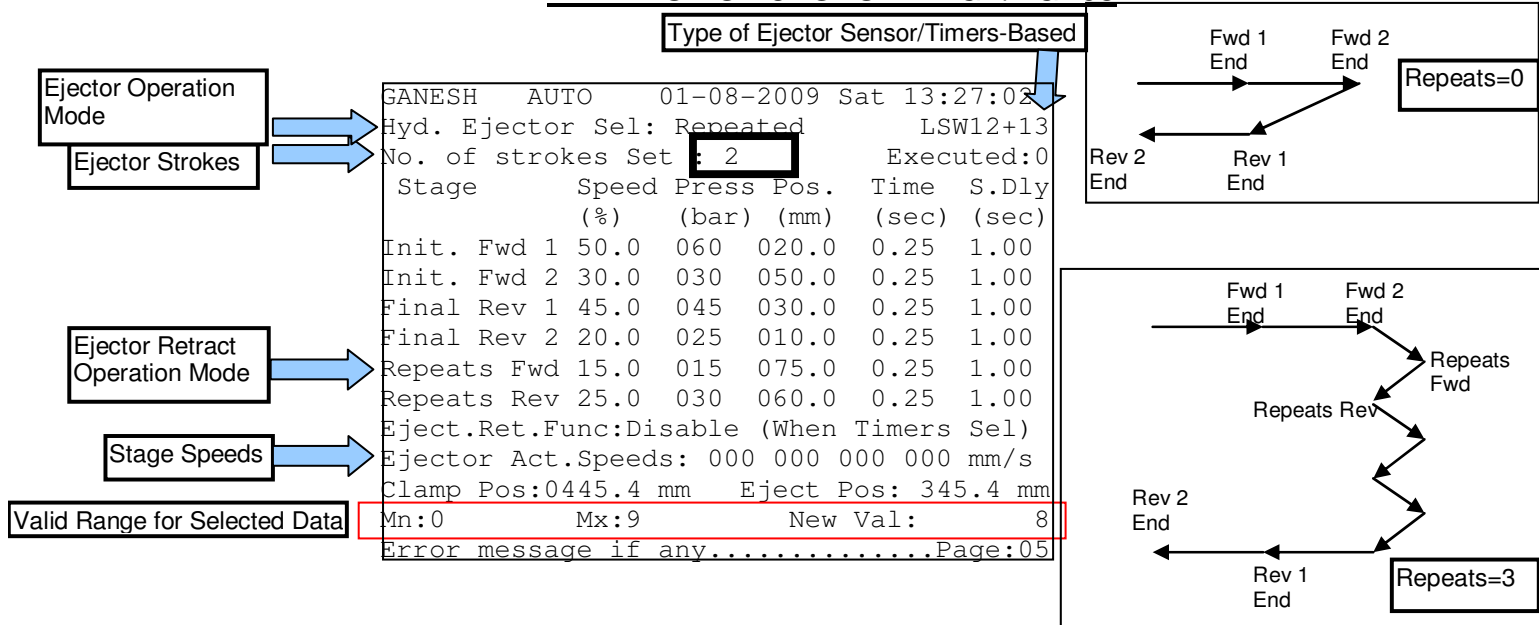
11) **Clamp Selection in Hand (Mode)** is settable between "**Locking**" or "**No Locking**". If Clamp Selection=Locking then Mould Locks after closing for locking time specified.

12) Actual Speeds for all stages of Mould Closing operation are indicated in terms of mm/s

13) Actual real-time Mould Close Position & timings are also indicated.

MOLD OPEN PAGE/PG: 04

- 1) The above screen is **PG:04**, accessible by pressing <**MOULD OPEN**> key on keypad
- 2) Password Level Required to Access=**01**.All Mould Open setting are settable/configurable on this screen.
- 3) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 4) On this screen flow, pressure, position & times are configurable for each stage of mould opening operation.
- 5) **Interlock**: Position of Slow1<Fast<Slow2<Slow3
- 6) Mold Locking/Unlocking can be based on Limit **switches/Pressure Transducer/Timers**. Appropriate sensor can be selected from **PG: 36**.
- 7) When Pressure Locking selected for locking, **DCPRE=decompression pressure** should be set for unlocking; i.e. 1st stage of unlocking. **Interlock**: DCPRE < P1 pressure.
- 8) When Timer selected for locking, **final decompression time** should be set for unlocking;i.e. 1st stage of unlocking.
- 9) Mold Opening Intensification valve if available, delay can be set on this page.
- 10)The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter.
Eg: Mn=Minimum=slow 2 & Mx=Maximum=Slow 3 for -Start Hyd. Ejector at the end of .
- 11) The type of **Clamp sensor** ("Linear Potentiometer"/"Limit switch") is machine manufacturer settable from **PG: 36**. This is indicated on the second line of the screen.
- 12) **Start Hyd. Ejector at the end of-** is settable between "**Slow2**" or "**Slow3**".If Slow 2 is selected then ejector operates at the end of Slow 2 Set Position. If Slow 3 is selected then ejector operates at the end of Slow 3 Set Position.
- 13) The maximum values for clamp scale can be settable from **PG:29**
- 14) The maximum values for flow, pressure and times can be settable from **PG:33**
- 15) Actual Real-time Speeds for all stages of Mould Opening operation are indicated in terms of mm/s
- 16) Actual Real-time Mould Open Position & Hold times are also indicated.
- 17) The last line denotes any machine error condition detected by the PLC.

HYDRAULIC EJECTOR PAGE/PG: 05

- 1) The above screen is **PG:05**, accessible by pressing **<EJECT RETRACT>** or **<EJECT FORWARD>** key on keypad
- 2) Password Level Required to **Access=01**. All Hydraulic Ejector settings are settable/configurable on this screen.
- 3) On this screen flow, pressure, position & times are configurable for each stage of hydraulic ejector operation. **S.Dly**= Start Delay in seconds
- 4) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter.
 Eg: Mn=Minimum=0 & Mx=Maximum=9 for -No. of strokes Set.
- 5) The type of **Ejector Sensor** ("**Linear Potentiometer**" / "**Limit switch**") or **Timer-based function** is machine manufacturer settable from **PG: 36**. This is indicated on the top left of the screen.
- 6) The mode of **Ejector Selection** is selectable between **Inactive/Repeated/Stay Forward**.
- 7) **Inactive**=Ejector Movement Disabled; **Repeated**=Multiple Ejector strokes, **Stay Forward**= At the End of ejection, Hydraulic ejector stays forward.
- 8) **No. of Strokes Set** is between **0-9**. 0= Repeats Disable , >0=Repeats Enable
- 9) **Position Interlock**: Fwd2>Fwd1, Rev2<Rev1, RepeatsFwd>Fwd2, Repeats Rev>Rev1
- 10) The **Ejector Retract Function** can be **Enabled/Disabled** when Hydraulic Ejector is functioning on Timers.
- 11) The maximum value of ejector scale can be adjusted from **PG:29**
- 12) The maximum values for flow & pressure can be settable from **PG:33**
- 13) Actual Real-time Speeds for all stages of Hydraulic Ejector operation are indicated in terms of mm/s.
- 14) Actual Strokes executed & Present Stage of Hydraulic Ejector is indicated.
- 15) Actual Real-time Clamp & Ejector Position are also indicated.

CORE 1/2 SETTING PAGE/PG: 06

GANESH AUTO 01-08-2009 Sat 13:27:02						
Core Present Stage: Core 1=0 Core 2=0						Core 1 & Core 2 Sequence Status
Core 1 Seq.No.: 4 (1 to 6 or 0-Off)						Core 1 Sequence Number Setting
Stage Speed Press Posit. Time Limit						
(%) (bar) (mm) (sec) Switch						
Core In 50.0 060 102.0 01.00 LS25						
Core Out 50.0 075 270.0 01.00 LS26						Core 2 Sequence Number Setting
Core 2 Seq.No.: 2 (1 to 6 or 0-Off)						
Core In 50.0 065 150.0 01.00 LS27						Core IN/OUT Priority Setting
Core Out 55.0 075 070.0 01.00 LS28						
Core In/Out Priority Selection:						
First Core 0 In, Confirm, then Other Core						
First Core 0 Out, Confirm, then Other Core						
Actual Clamp Position: 216.3 mm						
Mn:0 Mx:6 New Val: 2						Valid Range for Selected Data
Error message if any.....Page:06						

1) The above screen is **PG:06**, accessible by pressing **<CORE 1 IN>** or **<CORE 1 OUT>** or **<CORE 2 IN>** or **<CORE 2 OUT>** keys on keypad

2) Password Level Required to **Access=01**. All CORE 1/2 settings are settable/configurable on this screen.

3) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter. Eg: Mn=Minimum=0 & Mx=Maximum=6 for - CORE 1 Sequence Number

Sequence No.	Operation	Operation
0	Disabled	Disabled
1	CORE-IN	MOLD CLOSE
	MOLD OPEN	CORE-OUT
2	MOLD CLOSE	CORE-IN
	CORE-OUT	MOLD OPEN
3	CORE-IN	MOLD CLOSE
	CORE-OUT	MOLD OPEN
4	MOLD CLOSE	CORE-IN
	MOLD OPEN	CORE-OUT
5	MOLD CLOSE TO SET POSITION & STOPS	MOLD CLOSE
	MOLD OPEN	MOLD OPEN TO SET POSITION & STOPS
6	MOLD CLOSE TO SET POSITION, PARALLELY	MOLD CLOSE
	MOLD OPEN	MOLD OPEN TO SET POSITION, PARALLELY

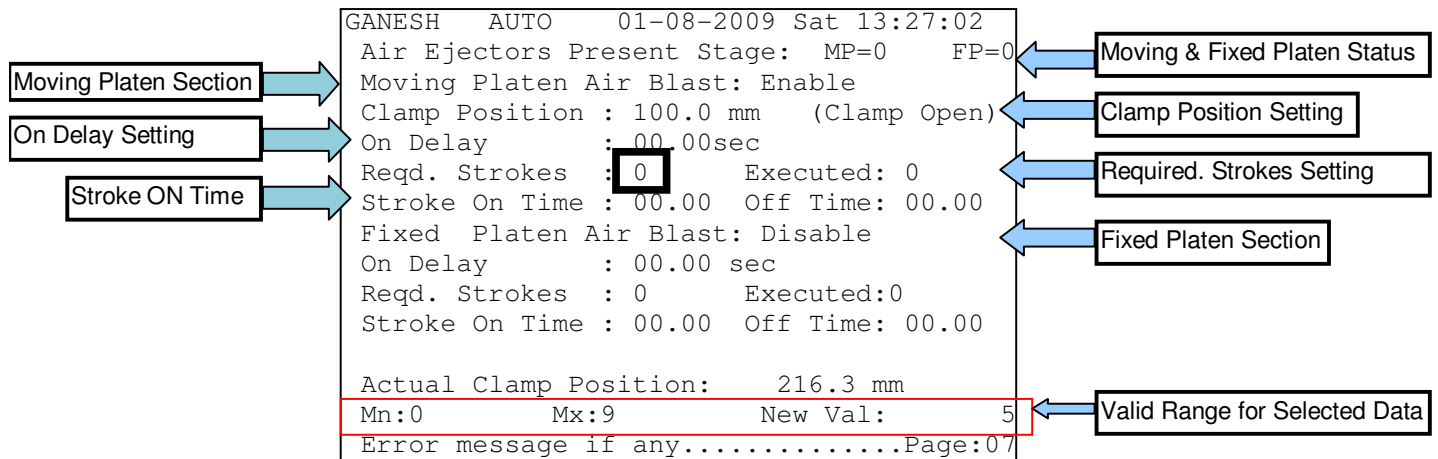
4) When both Core 1 & Core 2 are in operation, priority can be configurable where which CORE get IN first & which CORE gets OUT first.

5) **CORE 1 IN** is sensed by **LSW 25**, **CORE 1 OUT** is sensed by **LSW 26**.

6) **CORE 2 IN** is sensed by **LSW 27**, **CORE 2 OUT** is sensed by **LSW 28**.

7) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter. Eg: Mn=Minimum=0 & Mx=Maximum=6 for - Core Present Stage.

8) Actual Set CORE 1 & CORE 2 sequence are indicated.

AIR EJECTORS SETTINGS PAGE/PG: 07

- 1) The above screen is **PG:07**, accessible by pressing **<MOVING AIR BLAST>** or **<FIXED AIR BLAST>** keys on keypad
- 2) Password Level Required to **Access=01.MOVING/FIXED AIR EJECTOR** settings are settable/configurable on this screen.
- 3) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter.Eg: Mn=Minimum=0 & Mx=Maximum=9 for -Air Blast Required Strokes.
- 4) The two air ejectors, **Moving Platen Air Blast/Fixed Platen Air Blast** can be set **“Enable”/ “Disable”**.
- 5) **ON DELAY**, i.e. Total Time to keep the air ejector operation ON can be configurable in seconds.
- 6) **REQUIRED STROKES**, i.e. Number of times the air ejector blows air can be configurable.
- 7) **STROKE ON TIME**, i.e. Time to keep the air blast ON can be configurable in seconds.
- 8) **STROKE OFF TIME**, i.e. Time to keep the air blast OFF can be configurable in seconds.
- 9) Whether the Moving Platen Air Ejectors/Fixed Platen Air Ejectors are Enabled (MP=1, FP=1)/Disabled (MP=0, FP=0) is indicated on the second line.
- 10) Actual Clamp Position is also indicated in mm.

Injection Mode Selection

GANESH AUTO 01-08-2009 Sat 13:27:02

Intrugen & Injection Profile Data-

Injection Mode : Position Lin.Pot.

Total Inj.Time : 005.00 sec

Total Injection Time Setting

Intrugen Setting

Stage	Speed (%)	Press (bar)	Position (mm)	Time (sec)
Intrugen	50.0	065	----	01.00
Injection1	60.0	070	130.0	01.00
Injection2	75.0	070	080.0	01.00
Injection3	60.0	065	040.0	01.00
Injection4	60.0	065	000.0	01.00
Injection5	60.0	065	000.0	01.00

Time settings for each stage during Time Mode

Act.Speeds: 320 234 530 454 354 mm/s

Actual Screw Position : 232.0 mm

Mn:Position Mx:Time New Val:Position

Valid Range for Selected Data

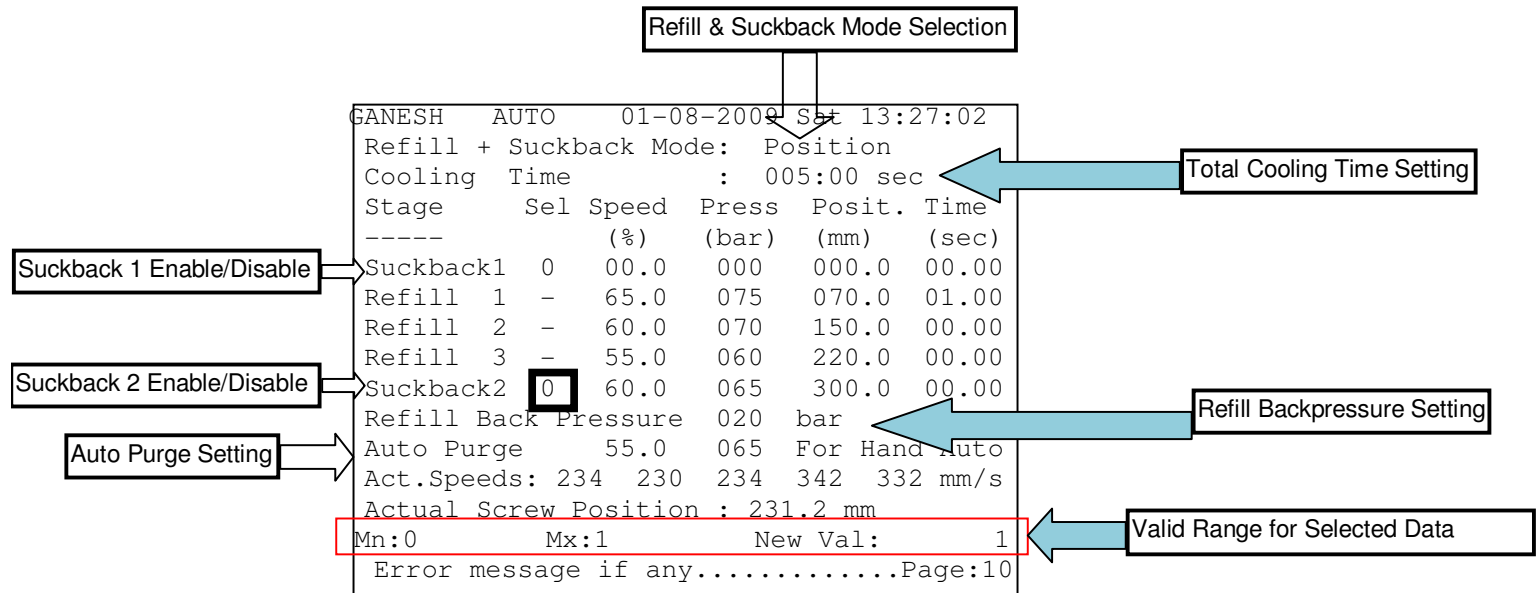
Error message if any.....Page:08

- 1) The above screen is **PG:08**, accessible by pressing **<INJECT>** key on keypad
- 2) Password Level Required to **Access=01**. All Injection Operation settings are settable/configurable on this screen.
- 3) On this screen flow, pressure, position & times are configurable for each stage of Injection operation.
- 4) The **Injection Operation** can be settable to operate in **Position** or **Time Mode**.
- 5) **Position Mode**: Injection operates as per the set position for each stage. Total Injection Time acts as master.
Interlock: In Position mode, Total injection cycle should take place within total time set.
- 6) **Time Mode**: Injection operates as per the set time for each stage.
Interlock: Total sum of times of all injection stages \leq Total injection time.
- 7) The total maximum Injection Time can be settable for Time Mode in terms of seconds.
- 8) The type of **Injection Position Sensor** ("**Linear Potentiometer**" / "**Limit switch**") is machine manufacturer settable from **PG: 36**. This is indicated on the third line of the screen.
- 9) The maximum value of injection scale can be adjusted from **PG:29**
- 10) The maximum values for flow & pressure can be settable from **PG:33**
- 11) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter. Eg: Mn=Minimum=Position & Mx=Maximum=Time for –Injection Mode .
- 12) Actual Speeds for all stages of Injection operation are indicated in terms of mm/s
- 13) Actual Screw Position is also indicated in mm.

HOLD ON SETTINGS PAGE/PG: 09

Special Injection Functions	GANESH	AUTO	01-08-2009 Sat	13:27:02	
	Hold On (RIP)	Speed	Pressure	Time	
		(%)	(bar)	(sec)	
	Hold On-1	40.0	050	00.50	
	Hold On-2	----	040	00.50	Hold ON Timing Setting
	Hold On-3	----	030	00.50	
	Hold On-4	----	020	00.50	
	Init Decom	00.0	000	00.50	Initial Decompression Setting
	Injection Switch Over Posn: 123.5 mm				
	Injection Cushion Position: 005.0 mm				
	Actual Hold On Time	:	00.00 sec.		Actual Hold ON Time Selection
	Act.Speeds:	000 000 000 000	mm/s		
	Actual Screw Position	:	000.0 mm		
	Error message if any.....Page:09				

- 1) The above screen is **PG: 09**, accessible by pressing **<INJECT>** & then **<PAGE DN>** key on keypad.
- 2) Password Level Required to **Access=01**. All Hold On, Initial Decompression & Special Injection Function settings like Switchover & Cushion positions are settable/configurable on this screen.
- 3) On this screen flow, pressure, & times are configurable for each stage of Hold ON & Initial Decompression operation.
- 4) To Enable Initial Decompression operation during Mould Opening corresponding Speed, Pressure & Time is to be set.
- 5) **Injection Switch Over Position**: When Injection process in timer mode, feed position here to allow switchover from injection to hold-on stage. Basically, End of Injection stage.
- 6) **Injection Cushion Position**: When Injection process in timer mode, feed this position to allow minimum amount of material to left at the tip of the injection screw. . Basically, End of Hold-ON stage.
- 7) Actual Speeds for all stages of Hold ON operation are indicated in terms of mm/s
- 8) Actual Hold ON Time is indicated in terms of seconds.
- 9) Actual Screw Position is also indicated in mm.

REFILL SETTING PAGE/PG: 10

- 1) The above screen is **PG:10**, accessible by pressing **<REFILL>** or **<PURGE>** or **<SUCK BACK>** keys on keypad
- 2) Password Level Required to **Access=01**. All Refill, Purge & Suckback 1 /2 Operation settings are settable/configurable on this screen.
- 3) On this screen flow, pressure, position & times are configurable for each stage of Refill, Suckback & backpressure operations.
- 4) For Backpressure to be output on a particular DAC channel, "**B**" should be programmed in DAC piping on **PG: 32**.
- 5) On this screen, Flow & Pressure are configurable for Auto Purge operation.
- 6) **Suckback 1 /2** can be enabled or disabled by setting corresponding parameter **1** or **0**.
- 7) The **Refill & Suckback** Operations can be settable to operate in **Position** or **Time** Mode.
- 8) **Position Mode**: Refill operates as per the set position for each stage.
- 9) **Time Mode**: Refill operates as per the set time for each stage.
- 10) The maximum value of screw scale can be adjusted from **PG:29**
- 11) The maximum values for flow & pressure can be settable from **PG:33**
- 12) The total maximum Cooling Time can be settable here in terms of seconds. This parameter can also be settable from Timers page **PG:34**
- 13) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter. Eg: Mn=Minimum=0 & Mx=Maximum=1 for - SuckBack1.
- 14) Actual Speeds for all stages of Refill operation are indicated in terms of mm/s
- 15) Actual Screw Position is also indicated in mm.

CARRIAGE PAGE SETTING/PG: 11

The screenshot shows the 'Carriage (Unit) Setting Data - Limit Sw' screen. It displays various parameters for carriage movement, including speed, pressure, position, and time. Annotations with arrows point to specific fields:

- Carriage Movement Sensor:** Points to the 'Limit Sw' field.
- Carriage Mode Selection:** Points to the 'Carriage Mode Select' field, which is currently set to 'Fixed'.
- Carriage Move Selection:** Points to the 'Carriage Move Select' field, which is currently set to 'After Refill'.
- Carriage Forward Enable/Disable:** Points to the 'Car. Fwd During Injection/RIP' and 'Car. Fwd During Refil/Suckback' fields, both currently set to 'Disable'.
- Carriage Actual Position:** Points to the 'Carr.Act.Position' field, which is currently set to '171.0 mm'.
- Valid Range for Selected Data:** Points to the line 'Mn:Fixed Mx:Moving New Val: Fixed', which indicates the valid range for the selected parameter.

The screen also displays the following data:

Speed (%)	Press (bar)	Posit. (mm)	Time (sec)
Fast Forward 40.0	050	150.0	2.00
Slow Forward 30.0	040	005.0	----
Fast Retract 40.0	050	150.0	2.00
Slow Retract 40.0	040	300.0	1.00

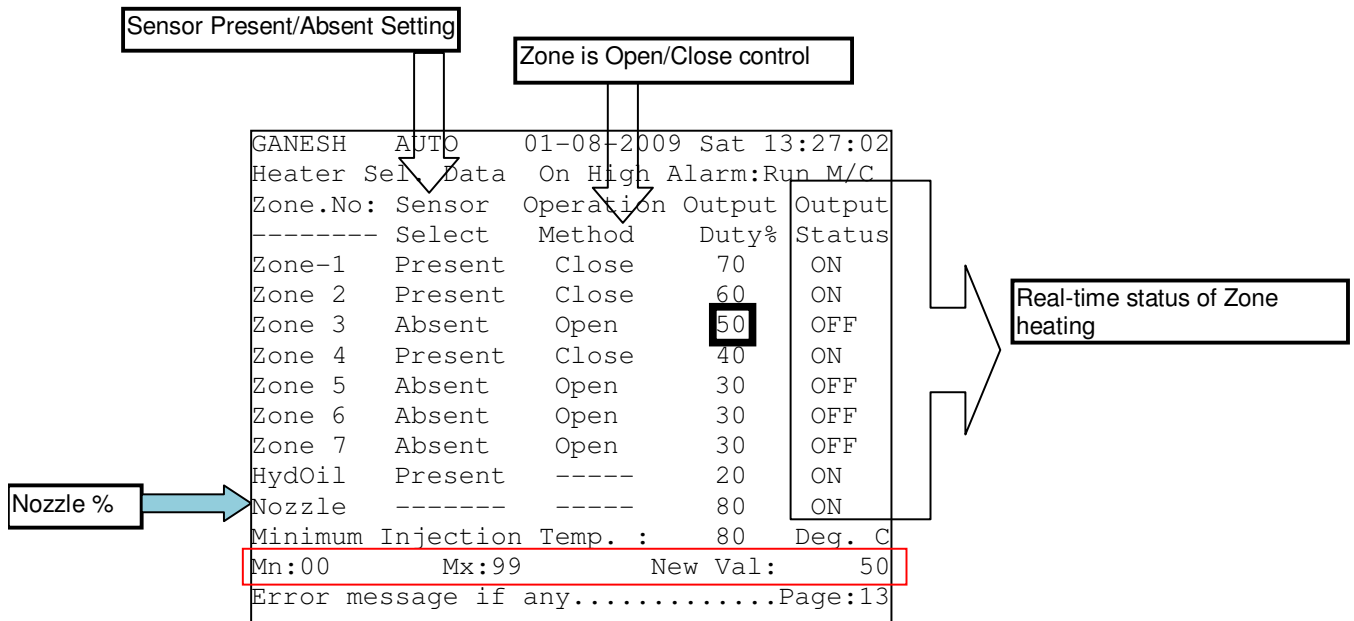
At the bottom, it shows 'Error message if any.....Page:11'.

- 1) The above screen is **PG:11**, accessible by pressing **<UNIT FORWARD>** or **<UNIT RETRACT>** key on keypad
- 2) Password Level Required to **Access=01**. All Carriage Movement Operation settings are settable/configurable on this screen.
- 3) On this screen flow, pressure, position & times are configurable for each stage of Carriage operation.
- 4) The **Carriage Operation** can be settable to operate in **Position** or **Time Mode**.
- 5) **Position Mode**: Carriage/Unit operates as per the set position for each stage.
- 6) **Time Mode**: Carriage/Unit operates as per the set time for each stage.
- 7) The type of **Carriage Position Sensor** ("Linear Potentiometer"/"Limit switch") is machine manufacturer settable from **PG: 36**. This is indicated on the second line of the screen.
- 8) The maximum value of screw scale can be adjusted from **PG:29**
- 9) The maximum values for flow & pressure can be settable from **PG:33**
- 10) The **Carriage Movement Function** can be enabled/disabled by setting Carriage Mode Select to **Moving/Fixed** respectively.
- 11) The time point of Refill function when the Carriage movement operates is set by Carriage Move Select.
- 12) The **Carriage Forward function** during Injection/RIP can be **Enabled/Disabled**
- 13) The **Carriage Forward function** during Refill/suckback can be **Enabled/Disabled**.
- 14) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter. Eg: Mn=Minimum=Fixed & Mx=Maximum=Moving for - Carriage Movement Function.
- 15) Actual Speeds for all stages of Carriage operation are indicated in terms of mm/s
- 16) Actual Carriage Position is also indicated in mm.

HEATERS SETTING PAGE/PG: 12

GANESH AUTO 01-08-2009 Sat 13:27:02						
Heaters Setting:-						
Zone No.	Set Temp	Duty %	Low Alarm	High Alarm	Act. Temp	
Zone 1	160	00	-20 <	+10	000	Actual Zone Temperatures
Zone 2	160	00	-20 <	+10	000	
Zone 3	160	00	-20 <	+10	000	
Zone 4	160	00	-20 <	+10	000	
Zone 5	160	00	-20 <	+10	000	
Zone 6	160	00	-20 <	+10	000	
Zone 7	160	00	-20 <	+10	000	
Hyd.Oil	--	---	--	---	55	
Hydraulic Oil Preheating: Disable						
Nozzle Heater Duty Cycle: 60%						
Mn:Enable Mx:Disable New Val: Enable						
Error message if any.....Page:12						

- 1) The above screen is **PG:12**, accessible by pressing **<HEATER>** key on keypad
- 2) Password Level Required to **Access=01**. All Heater Zones, Nozzle & Hydraulic Oil Temperature settings are settable/configurable on this screen.
- 3) PLC **Outputs 32-40** are assigned to **Nozzle, Zone1-Zone7 & Hydraulic Oil** Heating zones.
- 4) All Zones can also be operated either in Duty Cycle % mode i.e. Timing or a Closed Loop i.e. Sensor feedback. This mode can be set from **PG: 13**.
- 5) Duty Cycle % can be configurable for each zone & Nozzle from 00 to 99%.
- 6) The calibration for each Zone can be configured from **PG: 30**.
- 7) Low & High Alarms Limits can be set with respect to Set Temperature.
- 8) Hydraulic Oil Preheating can be Enabled/Disabled here.
- 9) Only High Alarms Limit can be set for Hydraulic Oil in this screen.
- 10) Only Duty Cycle can be configurable for Nozzle. Duty Cycle for Nozzle can also be set on **PG: 16**. For **Nozzle** heating usage, **Output 32** should be used.
- 11) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter.
Eg: Min=Minimum=Enable & Mx=Maximum=Disable for - Hydraulic Oil Preheating.
- 12) Actual Temperatures for all Heating Zones are indicated in terms of Degree Celsius.

HEATER SELECTION PAGE/PG: 13

- 1) The above screen is **PG:13**, accessible by pressing **<HEATER>** & then **<PAGE DN.>** key on keypad.
- 2) Password Level Required to **Access=02**. All Heater Zones, Nozzle & Hydraulic Oil Temperature Sensors & Duty cycle are settable/configurable on this screen.
- 3) PLC Outputs 32-40 are assigned to Nozzle, Zone1-Zone6 & Hydraulic Oil Heating zones.
- 4) All Zones can also be operated either in Duty Cycle % mode i.e. Timing or a Closed Loop i.e. with Sensor feedback. This can be configured by setting the Sensor Select for each zone.
- 5) To operate heater/s in **Closed loop mode** i.e. with sensor, set **Sensor Select=Present & Operation Method= Close**.
- 6) To operate heater/s in **Open loop mode** i.e. without sensor, set **Sensor Select=Absent & Operation Method= Open & set corresponding Duty cycle %**.
- 7) Duty Cycle % can be configurable for each zone & Nozzle from 00 to 99%. Only Duty Cycle can be configurable for Nozzle. Duty Cycle for Nozzle also is set from **PG:12**. For Nozzle heating usage, Output 32 should be used.
- 8) The minimum injection temperature limit can be set on this page. Default=100C.
- 9) The calibration for each Zone can be configured from **PG: 30**.
- 10) Here, It can be configured to make the machine **STOP** or **RUN** when any zone actual temperature is above or equal to the **Zone SET temperature+ High Alarm Limit**(From PG:12).
- 11) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter.
Eg: Mn=Minimum=00 & Mx=Maximum=99 for – Output Duty %.

BLOWERS SETTINGS PAGE/PG: 14

Zone No.				
GANESH	AUTO	01-08-2009 Sat 13:27:02		
Blower Setting Data:-				
Blower	Control	Sw.OFF	Sw.ON	Output
No.	Zone	Temp	Temp	No.
1.	1	-01	+01	00
2.	2	-01	+01	00
3.	3	-01	+01	00
4.	4	-01	+01	00
Special Operations:-				
Bad Piece Rejection :		Enable		
Thin Wall Inject.Cycle:		Disable		
Full Auto Cycle Select:		Enable		
Error message if any.....Page:14				


 PLC output No.

- 1)The above screen is **PG:14**, accessible by pressing **<HEATER>** & then **<PAGE DN.>** twice key on keypad.
- 2) Password Level Required to **Access=02**. Upto two blowers are settable/configurable on this PLC screen.
- 3) **Control Zone=** The heating zone that has to be cooled down by blower on temperature rise.
- 4) **Switch OFF Temp=** Zone Temperature – this value is when the blower goes OFF.
- 5) **Switch ON Temp=** Zone Temperature + this value is when the blower goes ON.
- 6) **Output No=** Any PLC Spare Outputs can be assigned for blower control.
- 7)**Bad Piece Rejection** during any of production mode can be settable to “Enable”/“Disable”.
- 8)**Thin Wall Injection Cycle** can be settable to “Enable”/“Disable”. Enabling this function will initiate Thin Wall Injection Sequence.
- 9)**Full Auto Cycle Select** can be settable to “Enable”/“Disable”. Enabling this function under supervisor password level will disallow Auto Cycle to protect Mould Die life.

TIMERS SETTINGS PAGE/PG: 15

Set Timing for each stage

GAMESH		AUTO		01-08-2008 Sat 13:27:02	
Timers (Seconds) -		Set	Actual		
1.Car. Forward	Delay:	0.10	0.10		
2 Injection	Delay:	0.10	0.11		
3.Total Inject.	Time :	005.00	005.00		
4.Car. Retract	Delay:	0.10	0.10		
5.Refill/Dosing	Delay:	0.10	0.10		
6.Cooling	Time :	005.00	005.00		
7.Ejector Start	Delay:	0.10	0.10		
8.Cycle	Delay Time :	01.00	1.02		
9.Total	Cycle Time :	100.00	11.53		
Mn:000.00		Mx:999.9	New Val: 100.00		
Error message if any.....Page:15					

Actual Timing

Valid Range for Selected Data

1) The above screen is **PG:15**, accessible by pressing **<SERVICE>** & then **<PAGE UP.>** key on keypad.

2) Password Level Required to **Access=01**.All Stage Operation & Cycle Timings (Delays) are settable/configurable on this screen.

3) All timings & delays are specified in terms of seconds.

4) The maximum values for times/delays can be settable from **PG:34**

5) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter.

Eg: Mn=Minimum=000.00 & Mx=Maximum=999.99 for – Total Cycle time.

SERVICE MENU PAGE/PG: 18

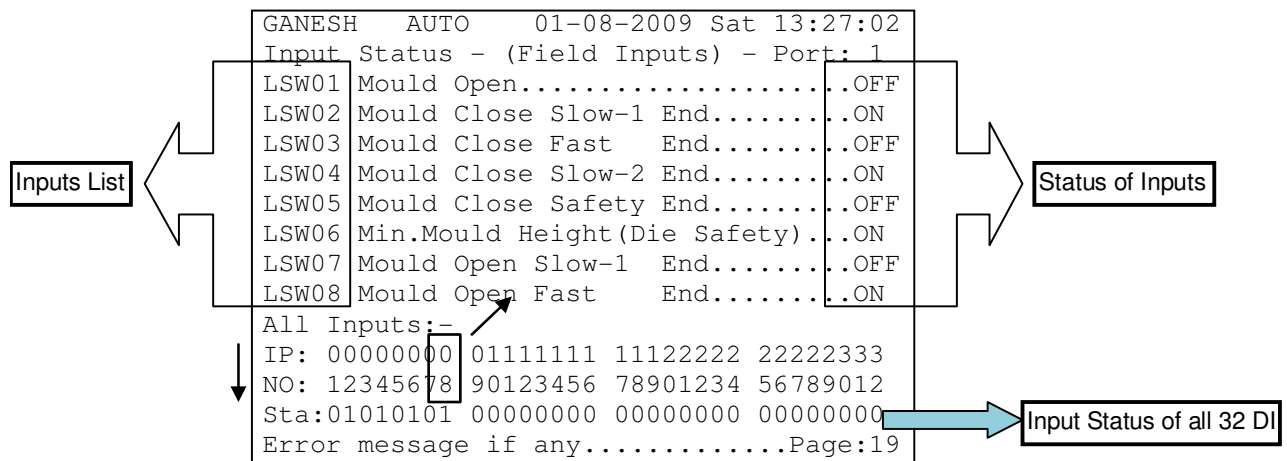
```

GANESH  AUTO    01-08-2009 Sat 13:27:02
Service Menu Selection - ?

1. Digital Input  Status
2. Digital Output Status
3. 3.Lin.Transducer & RTD Calibration
4. Speed & Pressure Calibration
5. Maximum Values
6. Real Time Clock Settings
7. Manufacture Settings
8. Machine Configuration
9. Transferring & Checking of Outputs
Mn:1           Mx:9           New Val: 5
Error message if any.....Page:18

```

- 1) The above screen is **PG:18**, accessible by pressing **<SERVICE>** key on keypad.
 - 2) Password Level Required to **Access=02**.All service oriented items like PLC Inputs/Outputs Status, Sensor calibration, Real Time clock, Machine Settings, Maximum values of all variables can be selected from this page.
 - 3) As per the required item choice from the menu list, one has to enter values between 1-9.
 - 4) The user will be redirected automatically to the page of valid choice entered.
 - 5) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter.
- Eg: Mn=Minimum=1 & Mx=Maximum=9 for – Service Menu Selection.

INPUTS PORT-1 STATUS PAGE/PG: 19

- 1) The above screen is **PG:19**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 1**.
- 2) Password Level Required to Access=**02**. All Inputs from **Port:1** i.e. Digital Inputs **01-08** status can be viewed from this page.
- 3) An "ON" Status indicates PLC is sensing the corresponding signal at the instant.
- 4) An "OFF" Status indicates PLC is not sensing the corresponding signal at the instant.
- 5) All Digital Inputs 01-32 status can also be viewed at the bottom of the screen by vertically reading the Input number and checking whether it is '0' or '1'.
- 6) A '0' indicates that Input is OFF while a '1' indicates Input is ON.
- 7) No values are settable / configurable on this screen.
- 8) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 9) The last line denotes any machine error condition detected by the PLC.

INPUTS PORT-2 STATUS PAGE/PG: 20

GANESH AUTO 01-08-2009 Sat 13:27:02

Input Status - (Field Inputs) - Port: 2

LSW09	Intensification	Pre.Sw.(PS1)	...	OFF
LSW10	Intensification	Pre.Sw.(PS2)	...	ON
LSW11	Mold Decompress	Pre.Sw.(PS3)	...	ON
LSW12	Hyd.Ejector	Farward	.....	OFF
LSW13	Hyd.Ejector	Retract	.....	ON
LSW14	Front Safety Guard	.....	.....	ON
LSW15	Rear Safety Guard	.....	.....	OFF
LSW16	Drop Detector	.....	.....	OFF

Status of Inputs

All Inputs:-

IP:	00000000	01111111	11122222	22222333
NO:	12345678	90123456	78901234	56789012
Sta:	01010101	00000000	00000000	00000000

Input Status of all 32 DI

Error message if any.....Page:20

- 1) The above screen is **PG:20**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 1** & then **<PAGE DN.>**
- 2) Password Level Required to **Access=02**. All Inputs from **Port:2** i.e.Digital Inputs **09-16** status can be viewed from this page.
- 3) An "ON" Status indicates PLC is sensing the corresponding signal at the instant.
- 4) An "OFF" Status indicates PLC is not sensing the corresponding signal at the instant.
- 5) All Digital Inputs 01-32 status can also be viewed at the bottom of the screen by vertically reading the Input number and checking whether it is '0' or '1'.
- 6) A '0' indicates that Input is OFF while a '1' indicates Input is ON.
- 7) No values are settable/configurable on this screen.
- 8) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 9) The last line denotes any machine error condition detected by the PLC.


INPUTS PORT-3 STATUS PAGE/PG: 21

```

GANESH  AUTO  01-08-2009 Sat 13:27:02
Input status- (Field Inputs) - Port: 3
LSW17 Carriage Forward.....OFF
LSW18 Carriage Retract.....ON
LSW19 Injection End & RIP start.....OFF
LSW20 Refill/Dosing End.....ON
LSW21 Post Suckback End.....OFF
LSW22 Kilo Watthour Meter Input.....ON
LSW23 Moving Platen Air Blast Start...OFF
LSW24 Fixed Platen Air Blast Start...ON

All Inputs:-
IP: 00000000 01111111 11122222 22222333
NO: 12345678 90123456 78901234 56789012
Sta:01010101 00000000 00000000 00000000
Error message if any.....Page:21

```


 Input Status of all 32 DI

- 1) The above screen is **PG:21**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 1** & then **<PAGE DN.>** twice.
- 2) Password Level Required to **Access=02**. All Inputs from **Port: 3** i.e. Digital Inputs **17-24** status can be viewed from this page.
- 3) An "ON" Status indicates PLC is sensing the corresponding signal at the instant.
- 4) An "OFF" Status indicates PLC is not sensing the corresponding signal at the instant.
- 5) All Digital Inputs 01-32 status can also be viewed at the bottom of the screen by vertically reading the Input number and checking whether it is '0' or '1'.
- 6) A '0' indicates that Input is OFF while a '1' indicates Input is ON.
- 7) No values are settable / configurable on this screen.
- 8) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 9) The last line denotes any machine error condition detected by the PLC.

INPUTS PORT-4 STATUS PAGE/PG: 22

```

GANESH    AUTO    01-08-2009 Sat 13:27:02
Input Status - (Field Inputs) - Port: 4
LSW25 Core 1 In .....OFF
LSW26 Core 1 Out.....OFF
LSW27 Core 2 In /Robo Ready.....OFF
LSW28 Core 2 Out/Robo Cycle Compltd...OFF
LSW29 Hopper Empty Sensor (NC).....ON
LSW30 Speed Proximity (Screw RPM).....ON
LSW31 Electric Motor On/Off Status....ON
LSW32 Emergency Push Button (NC).....ON
All Inputs:-
↓ IP: 00000000 01111111 11122222 22222333
  NO: 12345678 90123456 78901234 56789012
  Sta:01010101 00000000 00000000 00000000
Error message if any.....Page:22

```

Input Status of all 32 DI

- 1) The above screen is **PG:22**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 1** & then **<PAGE DN.>** thrice.
- 2) Password Level Required to Access=**02**.All Inputs from **Port: 4** i.e. Digital Inputs **25-32** status can be viewed from this page.
- 3) An “ON” Status indicates PLC is sensing the corresponding signal at the instant.
- 4) An “OFF” Status indicates PLC is not sensing the corresponding signal at the instant.
- 5) All Digital Inputs 01-32 status can also be viewed at the bottom of the screen by vertically reading the Input number and checking whether it is '0' or '1'.
- 6) A '0' indicates that Input is OFF while a '1' indicates Input is ON.
- 7) No values are settable / configurable on this screen.
- 8) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 9) The last line denotes any machine error condition detected by the PLC.

KEYPAD CHECK PAGE/PG: 23

```

GANESH  AUTO    01-08-2009 Sat 13:27:02
Input Status-(Bits for keyboard keys)

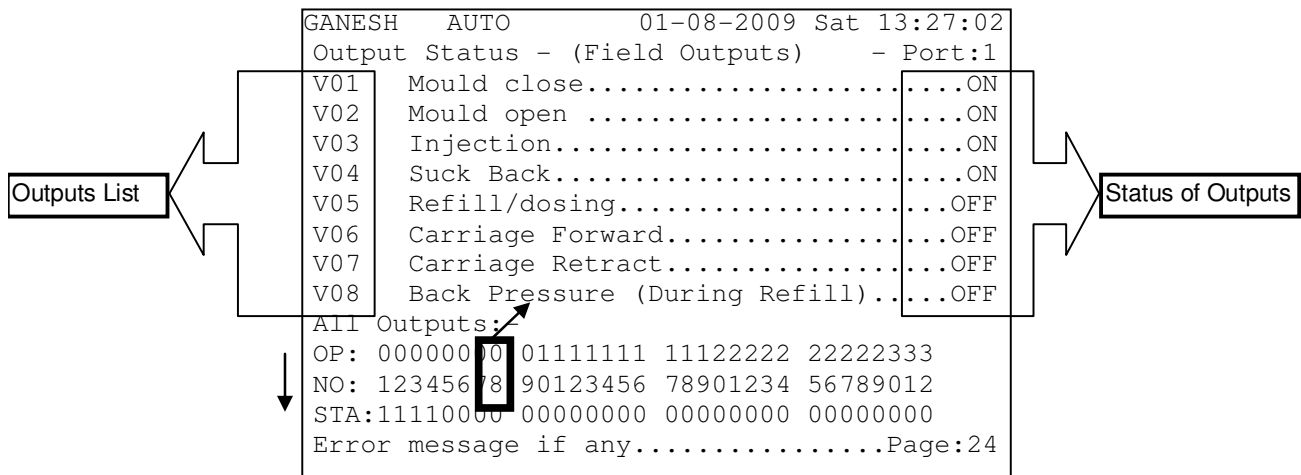
Dig0 Dig8 STAR CLR  FUN  RFL  SKBK IURE
Dig1 Dig9 LUB. INC  DEC  INJE PURG IUFA
Dig2 ENTR HTRS PGUP PGDN C1IN C2IN FPAB
Dig3 ---- ROBO HOME DIR  C1OU C2OU MPAB
Dig4 LEFT SET  HIST SERV MCLO HEFA MHT-
Dig5 RIGH HAND LOAD SAVE MOPN HERE MHT+
Dig6 DOWN SEMI PSWD LOCK MOTR ---- ----
Dig7  UP  AUTO ---- ---- ---- ---- ----

Press <HOME+ENTER> to change this page

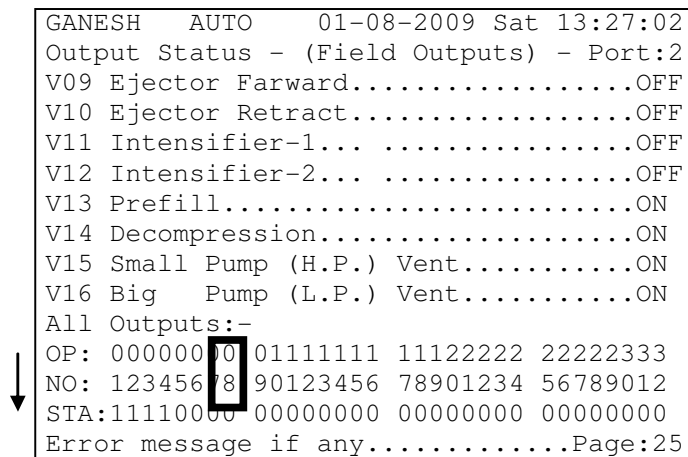
Error message if any.....Page:23

```

- 1) The above screen is **PG:23**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 2** & then **<PAGE UP>**
- 2) Password Level Required to **Access=02**. All MMI keys can be checked for proper functionality from this page.
- 3) When a key is pressed/hit, the corresponding key text is highlighted & flashed along with a buzzer tone; indicating the key pressed is properly functioning.
- 4) No values are settable / configurable on this screen.
- 5) To exit this page & return to home screen, one has to press **<HOME>** & **<ENTER>** keys together.
- 6) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 7) The last line denotes any machine error condition detected by the PLC.

OUTPUTS PORT-1 STATUS PAGE//PG: 24

- 1) The above screen is **PG:24**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 2**.
- 2) Password Level Required to Access=**02**.All Outputs from **Port:1** i.e. Digital **Outputs 01-08** status can be viewed from this page.
- 3) An “ON” Status indicates PLC is outputting the corresponding signal at the instant.
- 4) An “OFF” Status indicates PLC is not outputting the corresponding signal at the instant.
- 5) All Digital Outputs **01-32** status can also be viewed at the bottom of the screen by vertically reading the Input number and checking whether it is '0' or '1'.
- 6) A '0' indicates that Output is OFF while a '1' indicates Output is ON.
- 7) No values are settable / configurable on this screen.
- 8) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 9) The last line denotes any machine error condition detected by the PLC.

OUTPUTS PORT-2 STATUS PAGE/PG: 25


```

GANESH  AUTO    01-08-2009 Sat 13:27:02
Output Status - (Field Outputs) - Port:2
V09 Ejector Farward.....OFF
V10 Ejector Retract.....OFF
V11 Intensifier-1... ..OFF
V12 Intensifier-2... ..OFF
V13 Prefill.....ON
V14 Decompression.....ON
V15 Small Pump (H.P.) Vent.....ON
V16 Big Pump (L.P.) Vent.....ON
All Outputs:-
OP: 000000 0 01111111 11122222 22222333
NO: 123456 8 90123456 78901234 56789012
STA: 11110000 00000000 00000000 00000000
Error message if any.....Page:25

```

- 1) The above screen is **PG:25**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 2** & then **<PAGE DN>**.
- 2) Password Level Required to **Access=02**. All Outputs from **Port:2** i.e. Digital Outputs **09-16** status can be viewed from this page.
- 3) An "ON" Status indicates PLC is outputting the corresponding signal at the instant.
- 4) An "OFF" Status indicates PLC is not outputting the corresponding signal at the instant.
- 5) All Digital Outputs **01-32** status can also be viewed at the bottom of the screen by vertically reading the Input number and checking whether it is '0' or '1'.
- 6) A '0' indicates that Input is OFF while a '1' indicates Input is ON.
- 7) No values are settable / configurable on this screen.
- 8) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 9) The last line denotes any machine error condition detected by the PLC.

OUTPUTS PORT-3 STATUS PAGE/PG: 26

```

GANESH  AUTO    01-08-2009 Sat 13:27:02
Output Status - (Field Outputs) - Port:3
V17  Moving Platen air blast.....OFF
V18  Fixed  Platen air blast.....OFF
V19  Core 1 In  (Farward).....OFF
V20  Core 1 Out (Retract).....OFF
V21  Core 2 In  /Robo Enable.....OFF
V22  Core 2 Out/Robo Cycle Start.....OFF
V23  Spare (User Defined).....OFF
V24  Hooter.....OFF
All Outputs:-
OP: 00000000 01111111 11122222 22222333
NO: 12345678 90123456 78901234 56789012
STA:11110000 00000000 00000000 00000000
Error message if any.....Page:26

```

- 1) The above screen is **PG:26**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 2** & then **<PAGE DN.>** key twice.
- 2) Password Level Required to Access=**02**.All Outputs from **Port:3** i.e. Digital Outputs **17-24** status can be viewed from this page.
- 3) An “ON” Status indicates PLC is outputting the corresponding signal at the instant.
- 4) An “OFF” Status indicates PLC is not outputting the corresponding signal at the instant.
- 5) All Digital Outputs **01-32** status can also be viewed at the bottom of the screen by vertically reading the Input number and checking whether it is '0' or '1'.
- 6) A '0' indicates that Input is OFF while a '1' indicates Input is ON.
- 7) No values are settable / configurable on this screen.
- 8) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 9) The last line denotes any machine error condition detected by the PLC.

OUTPUTS PORT-4 STATUS PAGE/PG: 27

```

GANESH  AUTO  01-08-2009 Sat 13:27:02
Output Status - (Field Outputs) - Port:4
V25 Spare    (User Defined).....ON
V26 Spare    (User Defined).....ON
V27 Spare    (User Defined).....ON
V28 Spare    (User Defined).....ON
V29 Motor Starter Contactor K1.....ON
V30 Motor Starter Contactor K2.....ON
V31 Motor Starter Contactor K3.....ON
V32 Nozzle Heater Contactor.....ON
All Outputs:-
OP: 00000000 01111111 11122222 22222333
NO: 12345678 90123456 78901234 56789012
STA:11110000 00000000 00000000 00000000
Error message if any.....Page 27

```

- 1) The above screen is **PG:27**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 2** & then **<PAGE DN.>** key thrice.
- 2) Password Level Required to **Access=02**. All Outputs from **Port:4** i.e. Digital **Outputs 25-32** status can be viewed from this page.
- 3) An "ON" Status indicates PLC is outputting the corresponding signal at the instant.
- 4) An "OFF" Status indicates PLC is not outputting the corresponding signal at the instant.
- 5) All Digital Outputs **01-36** status can also be viewed at the bottom of the screen by vertically reading the Input number and checking whether it is '0' or '1'.
- 6) A '0' indicates that Input is OFF while a '1' indicates Input is ON.
- 7) No values are settable/configurable on this screen.
- 8) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 9) The last line denotes any machine error condition detected by the PLC.

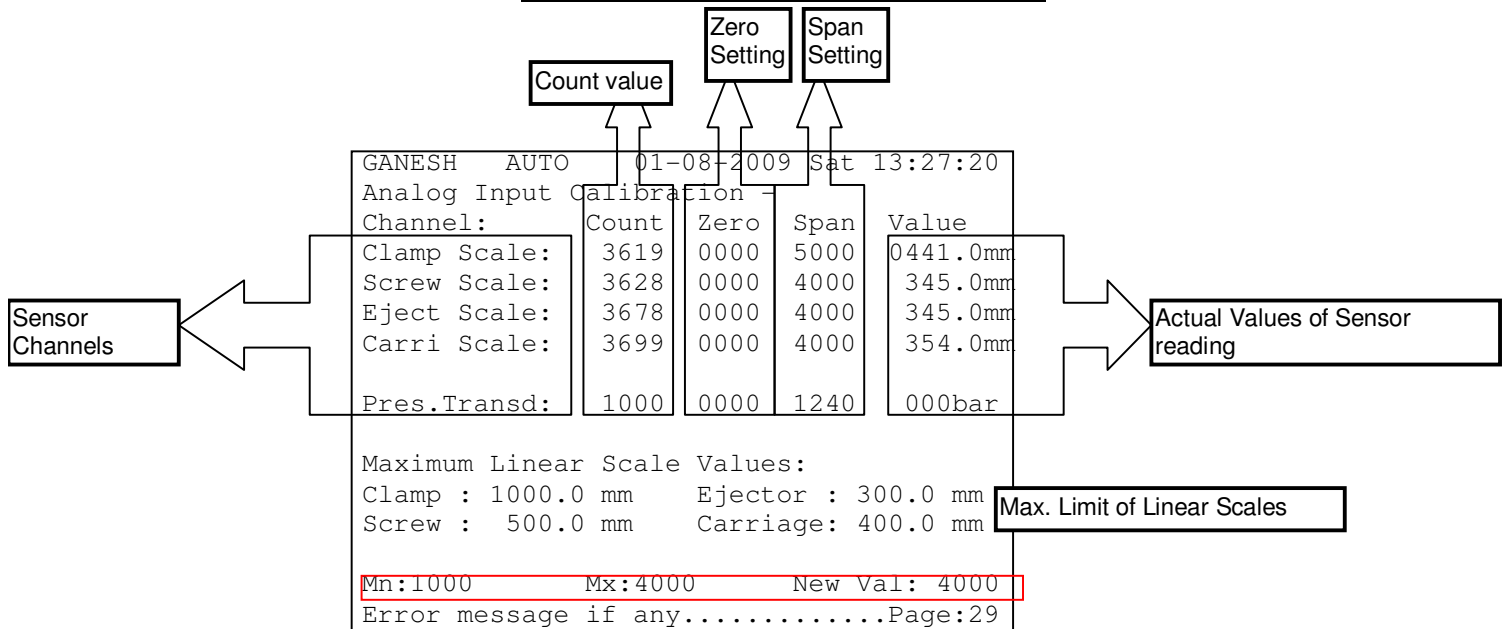
OUTPUTS PORT-5 STATUS PAGE/PG: 28

```

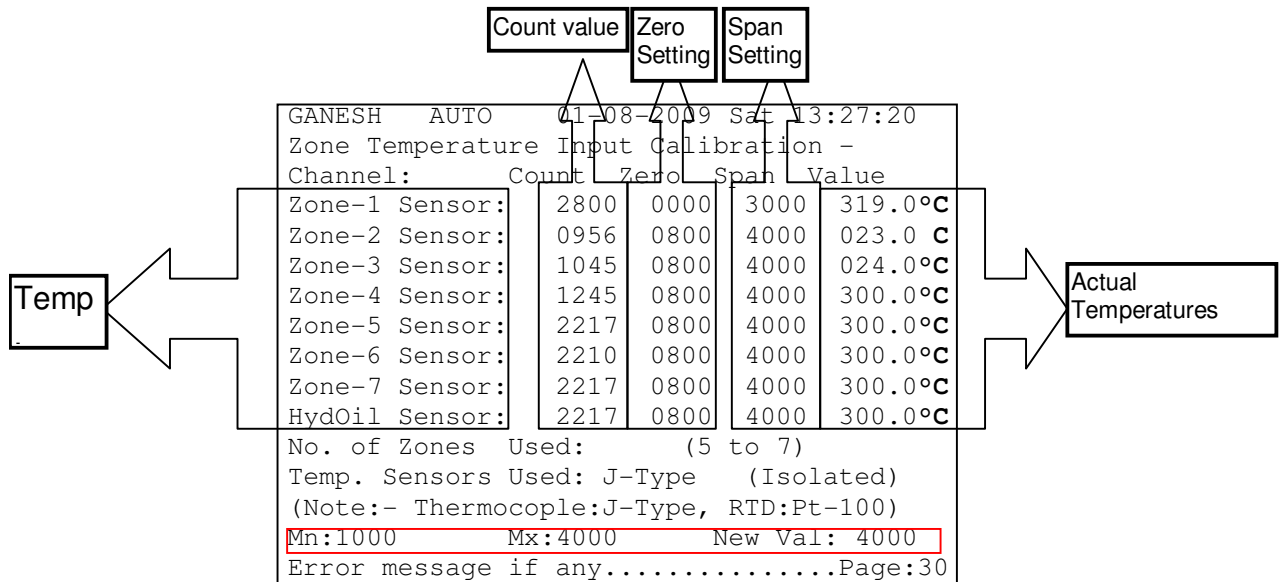
GANESH  AUTO  01-08-2009 Sat 13:27:02
Output Status - (Field Outputs) - Port:5
V33 Zone-1  Temperature Contactor.....OFF
V34 Zone-2  Temperature Contactor.....ON
V35 Zone-3  Temperature Contactor.....OFF
V36 Zone-4  Temperature Contactor.....OFF
V37 Zone-5  Temperature Contactor.....OFF
V38 Zone-6  Temperature Contactor.....ON
V39 Zone-7  Temperature Contactor.....OFF
V40 Hyd.Oil Heating      Contactor.....OFF
All Outputs:-
00000000 01111111 11122222 22222333
12345678 90123456 78901234 56789012
00000000 00000000 00000000 11111111
Error message if any.....Page 28

```

- 1) The above screen is **PG:28**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 3** & then **<PAGE UP>** key.
- 2) Password Level Required to **Access=02**. All Outputs from **Port:5** i.e. Digital Outputs **32-36** status can be viewed from this page.
- 3) An "ON" Status indicates PLC is outputting the corresponding signal at the instant.
- 4) An "OFF" Status indicates PLC is not outputting the corresponding signal at the instant.
- 5) All Digital Outputs 01-32 status can also be viewed at the bottom of the screen by vertically reading the Input number and checking whether it is '0' or '1'.
- 6) A '0' indicates that Input is OFF while a '1' indicates Input is ON.
- 7) No values are settable/configurable on this screen.
- 8) The top line denotes Mould Program Name, Mode of machine operation i.e. Hand/Semi/Auto, Present Date, Day & Time.
- 9) The last line denotes any machine error condition detected by the PLC.

SENSOR CALIBRATION PAGE/PG: 29

- 1) The above screen is **PG:29**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 3**.
- 2) Password Level Required to **Access=02**. All Linear Potentiometer Scales & Pressure Transducer connected to the PLC are calibrated from this page.
- 3) The four columns i.e. Count, Zero, Span & Value against each sensor form the basis of calibration.
- 4) **Only Zero & Span columns are settable/configurable**. Count & Actual Values columns are for monitoring purposes.
- 5) To calibrate any sensor for the first time:
 - i. Make the sensor reading minimum, ideally to zero (check from Actual Value column)
 - ii. Now observe the Count value from the Count column against the sensor, & enter the 4-digit count number into Zero column against the sensor.
 - iii. Now make the sensor reading maximum as per the required application (check from Actual Value column)
 - iv. Now observe the Count value against the sensor from the Count column, & enter the 4-digit count number into Span column against the sensor.
 - v. Now, turn back the sensor to its minimum reading, ideally to zero (check from Actual Value column) & check whether the actual value reflects the minimum value (Zero). If not redo Step (b)
 - vi. Now, turn back the sensor to maximum reading as per the required application (check from Actual Value column) & check whether the actual value reflects the maximum value. If not redo Step (d).
- 6) The maximum permissible values for data entry of linear scales can be set on this page. This in result becomes the maximum position values of respective scales.

SENSOR CALIBRATION PAGE/PG: 30

- 1) The above screen is **PG:30**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 3** & then **<PAGE DN>** key
- 2) Password Level Required to **Access=02**. All Temperature sensors connected to the PLC are calibrated from this page.
- 3) The type of temperature sensor used for measuring actual zone temperature has to be selected i.e. **PT-100 RTD/J-type** thermocouple before calibration procedure.
- 4) The four columns i.e. Count, Zero, Span & Value against each sensor form the basis of calibration.
- 5) **Only Zero & Span columns are settable/configurable**. Count & Actual Values columns are for monitoring purposes.
- 6) Total No. Of Temperature Zones used on the machine can be set here on this page. i.e. **5/6/7**. As per selection, Zones display on home page changes.
- 7) The maximum possible Temperature zones including Hydraulic Oil = **8**
- 8) If **J-type thermocouple** is selected it should be **Isolated-type**.
- 9) Generally the temperature channels are factory-calibrated first-time. Though to calibrate any temperature sensor:

Zero Adjustment:

Thermocouple> Short zone \pm terminals & adjust zero count such that it displays ambient temperature in actual reading.

PT-100> Fix **110 Ω** to zone \pm terminals & adjust zero count such that it displays **26 °C** in actual reading.

Span Adjustment:

Thermocouple> Provide **21.848mv** to zone \pm terminals & adjust span count such that it displays **400 °C+ambient temperature** in actual zone reading.

PT-100> Fix **220 Ω** to zone \pm terminals & adjust zero count such that it displays **323 °C** in actual reading.

ANALOG OUTPUT CALIBRATION SETTING PAGE/PG: 31

Default=Flow Default=Pressure

GANESH AUTO 01-08-2009 Sat 13:27:02

Linearise DAC 1 & 2 Outputs:- Curve Fit)

Volt	DAC1	DAC2	Volt	DAC1	DAC2
0.00	00.00	01.00	6.00	06.00	06.00
1.00	01.00	02.00	7.00	07.00	07.00
2.00	02.00	03.00	8.00	08.00	08.00
3.00	03.00	04.00	9.00	09.00	09.00
4.00	04.00	05.00	10.00	09.99	09.99
5.00	05.00	06.00			

Final Dac Offsets (Volts): 0.50 0.40

Flag:00 Idle

DAC Piping: +0+0+0+0 (Set Sign & Value)

P:Stg Pres, S:Stg Flow, 0-9:0-90%, F:Full

Act. O/P: 05.50 09.50 05.50 09.50

Error message if any.....Page:31

- 1) Above screen = **PG:31**, Keys= **<SERVICE> + Option 4**. Password Level = **02**.
- 2) This page displays 2 analog outputs, assigned as **DAC1-DAC2** respectively; to be calibrated by the machine manufacturer.
- 3) Each analog output gives out a voltage output in range of **-10 to +10 VDC**.
- 4) Each DAC can be calibrated using **10 points** using curve fit method.
- 5) Any of the DAC1-DAC2 can be configured to correspond to Flow/Speed or Pressure output for the machine. This is done by configuring the DAC Piping for each stage/flag accordingly.
- 6) A Flag represents the operational stage number during machine running.
- 7) E.g.: To assign DAC1=Pressure, DAC2=Flow, for Flag/Stage=15;
 - a) Enter 15 into Flag Number input.
 - b) Then set the DAC Piping as +P+S+S+P
 - c) Press Save key, & update the Flag=0
- 8) In DAC Piping, a "+" at any DAC channel configures a positive analog voltage output from 0 to +10VDC. A "-" at any DAC channel configures a negative analog voltage output from 0 to -10VDC.

DAC PIPING	OUTPUT
S	SET FLOW
P	SET PRESSURE
B	SET BACK PRESSURE
F	FULL VALUE=100% OF DAC CHANNEL MAX. CALIBRATED VALUE
1-9	1-10%, 2-20%, 3-30%, 4-40%, 5-50%, 6-60%, 7-70%, 8-80%, 9-90% OF DAC CHANNEL MAX. CALIBRATED VALUE

9) E.g. A number “7” correlates to 70% of 10V i.e. constant 7V at the corresponding DAC channel.

10) E.g.: To get constant outputs at DAC1=+5V, DAC2=+10V, DAC3=-9V & DAC4=0 for Flag/Stage=15;

- a) Enter 15 into Flag Number input.
- b) Then set the DAC Piping as +5+F-9+0
- c) Press Save key, & update the Flag=00
- d) Restart the PLC

11) By default, **DAC1 & DAC3** channels corresponds to required **Flow output** while **DAC2 & DAC4** channels corresponds to required **Pressure output** during each stage of machine operation.

12) By default, all DAC channels are linearly calibrated.

Voltage	DAC for 5V max	Voltage	DAC for 2.5V max	Voltage	DAC for 10V max
0.0	0.00	0.0	0.00	0.0	0.00
1.0	0.50	1.0	0.25	1.0	1.00
2.0	1.00	2.0	0.50	2.0	2.00
3.0	1.50	3.0	0.75	3.0	3.00
4.0	2.00	4.0	1.00	4.0	4.00
5.0	2.50	5.0	1.25	5.0	5.00
6.0	3.00	6.0	1.50	6.0	6.00
7.0	3.50	7.0	1.75	7.0	7.00
8.0	4.00	8.0	2.00	8.0	8.00
9.0	4.50	9.0	2.25	9.0	9.00
10.0	5.00	10.0	2.50	10.0	10.00

13) The actual voltages generated & outputted at the DAC channels outputs is shown at the end of the calibration table.

14) To fine tune or allow correction margin on the end output voltage one can set the Offset value for the required DAC channel.

15) To offset or zero any voltage presence on any of the DAC channel during idle conditions, reset the DAC channel by using passwords as stated below on the password page **Pg.48** . Eg: If voltage measured=0.567V on all channels then;

DAC Channel	Password
DAC1	DAC1-567
DAC2	DAC2-567
DAC3	DAC3-567
DAC4	DAC4-567

16) The **gains** of any of the **DAC channels** can be set digitally using the following passwords. **Gain value range =000-999**. This feature can be used to integrate with servodrives. Eg: To set a gain of 500 to DAC 2; following password to be entered in the password page **Pg. 48**.

DAC Channel	Password
DAC2	DAC2G500

ANALOG OUTPUT CALIBRATION SETTING PAGE/PG: 32

Default=Flow Default=Pressure

GANESH AUTO 01-08-2009 Sat 13:27:02

Linearise DAC 3 & 4 Outputs:- Curve Fit)

Volt	DAC3	DAC4	Volt	DAC3	DAC4
0.00	00.00	01.00	6.00	06.00	06.00
1.00	01.00	02.00	7.00	07.00	07.00
2.00	02.00	03.00	8.00	08.00	08.00
3.00	03.00	04.00	9.00	09.00	09.00
4.00	04.00	05.00	10.00	09.99	09.99
5.00	05.00	06.00			

Final Dac Offsets (Volts): 0.50 0.40

Flag:00 Idle

DAC Piping: +0+0+0+0 (Set Sign & Value)

P:Stg Pres, S:Stg Flow, 0-9:0-90%, F:Full

Act. O/P: 05.50 09.50 05.50 09.50

Error message if any.....Page:32

Annotations:

- Flag/Stage Number → Flag:00 Idle
- Offset correction/fine tuning → 0.40
- DAC Piping Setting → +0+0+0+0
- Actual Analog Output → Act. O/P: 05.50 09.50 05.50 09.50

- 1) Above screen =PG:32, Keys= <SERVICE> + Option 4 + <PGDN>. Password Level =02.
- 2) This page displays 2 analog outputs, assigned as **DAC3-DAC4** respectively; to be calibrated by the machine manufacturer.
- 3) Each analog output gives out a voltage output in range of **-10 to +10 VDC**.
- 4) Each DAC can be calibrated using **10 points** using curve fit method.
- 5) Any of the DAC3-DAC4 can be configured to correspond to Flow/Speed or Pressure output for the machine. This is done by configuring the DAC Piping for each stage/flag accordingly.
- 6) A Flag represents the operational stage number during machine running.
- 7) E.g.: To assign DAC3=Pressure, DAC4=Flow, for Flag/Stage=15;
 - a) Enter 15 into Flag Number input.
 - b) Then set the DAC Piping as +P+S+S+P
 - c) Press Save key, & update the Flag=0
- 8) In DAC Piping, a "+" at any DAC channel configures a positive analog voltage output from 0 to +10VDC. A "-" at any DAC channel configures a negative analog voltage output from 0 to -10VDC.

DAC PIPING	OUTPUT
S	SET FLOW
P	SET PRESSURE
B	SET BACK PRESSURE
F	FULL VALUE=100% OF DAC CHANNEL MAX. CALIBRATED VALUE
1-9	1-10%, 2-20%, 3-30%, 4-40%, 5-50%, 6-60%, 7-70%, 8-80%, 9-90% OF DAC CHANNEL MAX. CALIBRATED VALUE

9) E.g. A number “7” correlates to 70% of 10V i.e. constant 7V at the corresponding DAC channel.

10) E.g.: To get constant outputs at DAC1=+5V, DAC2=+10V, DAC3=-9V & DAC4=0 for Flag/Stage=15;

- a) Enter 15 into Flag Number input.
- b) Then set the DAC Piping as +5+F-9+0
- c) Press Save key, & update the Flag=00
- d) Restart the PLC

11) By default, **DAC1 & DAC3** channels corresponds to required **Flow output** while **DAC2 & DAC4** channels corresponds to required **Pressure output** during each stage of machine operation.

12) By default, all DAC channels are linearly calibrated.

DAC for 5V		DAC for 2.5V		DAC for 10V	
Voltage	max	Voltage	max	Voltage	max
0.0	0.00	0.0	0.00	0.0	0.00
1.0	0.50	1.0	0.25	1.0	1.00
2.0	1.00	2.0	0.50	2.0	2.00
3.0	1.50	3.0	0.75	3.0	3.00
4.0	2.00	4.0	1.00	4.0	4.00
5.0	2.50	5.0	1.25	5.0	5.00
6.0	3.00	6.0	1.50	6.0	6.00
7.0	3.50	7.0	1.75	7.0	7.00
8.0	4.00	8.0	2.00	8.0	8.00
9.0	4.50	9.0	2.25	9.0	9.00
10.0	5.00	10.0	2.50	10.0	10.00

13) The actual voltages generated & outputted at the DAC channels outputs is shown at the end of the calibration table.

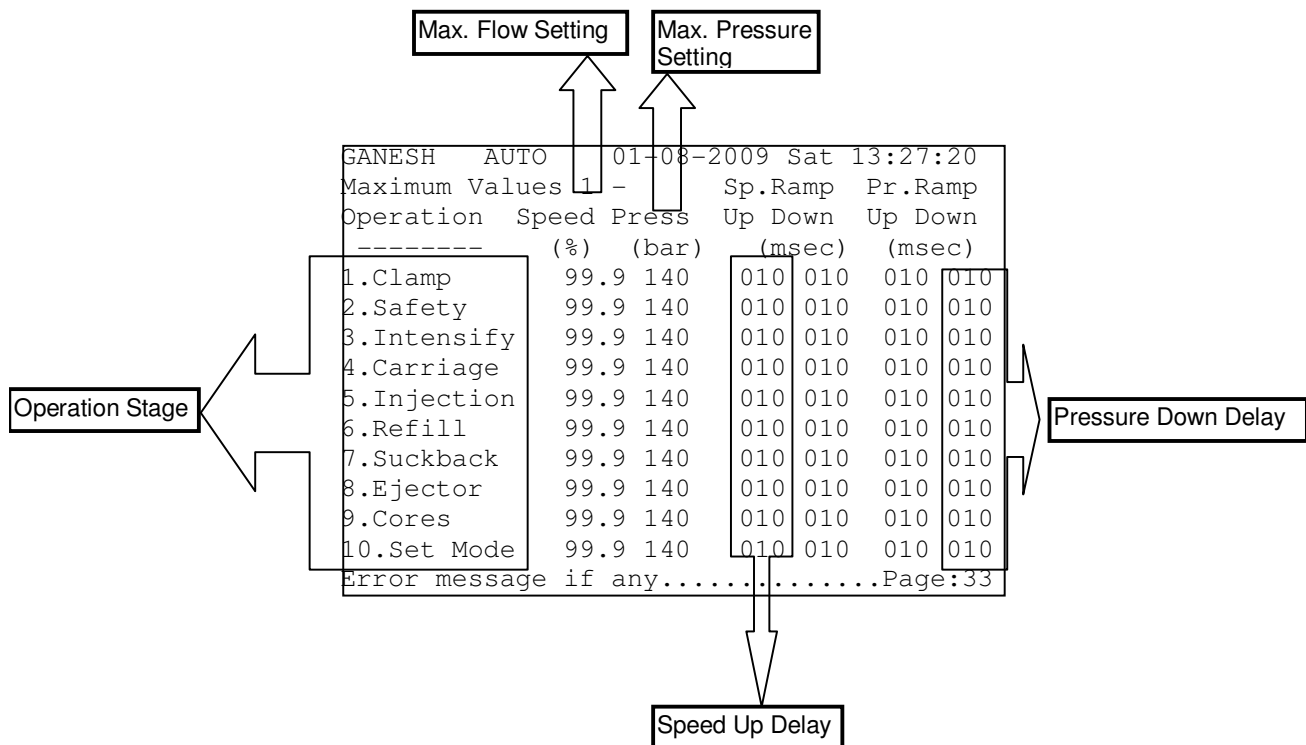
14) To fine tune or allow correction margin on the end output voltage one can set the Offset value for the required DAC channel.

15) To offset or zero any voltage presence on any of the DAC channel during idle conditions, reset the DAC channel by using passwords as stated below on the password page **Pg.48** . Eg: If voltage measured=0.567V on all channels then;

DAC Channel	Password
DAC1	DAC1-567
DAC2	DAC2-567
DAC3	DAC3-567
DAC4	DAC4-567

16) The **gains** of any of the **DAC channels** can be set digitally using the following passwords. **Gain value range =000-999**. This feature can be used to integrate with servodrives. Eg: To set a gain of 500 to DAC 2; following password to be entered in the password page **Pg. 48**.

DAC Channel	Password
DAC2	DAC2G500

MAXIMUM VALUES 1 SETTING PAGE/PG: 33

- 1) The above screen is **PG:33**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 5**.
- 2) Password Level Required to **Access=03**.
- 3) All maximum values/upper limit for flow & pressure for each stage of machine operation can be set from this page only by the machine manufacturer.
- 4) The maximum possible limit for pressure is prefixed by the machine manufacturer on **PG:36/Manufacturer Settings**.
- 5) Up Ramping/Acceleration: How fast in time a parameter(Flow/Pressure) reaches its set point from zero.
- 6) Down Ramping/Deceleration: How fast in time a parameter(Flow/Pressure) reaches zero from its setpoint.
- 7) The Up & Down Ramping times for each stage of machine operation can be set from this page only by the machine manufacturer.
- 8) The Up & Down Ramping times can be set in range of **010** to **999** milliseconds.

MAXIMUM VALUES 2 SETTING PAGE/PG:34

```

GANESH  AUTO   01-08-2009 Sat 13:27:20
Max. Values 2 -
1.Cooling      Time : 005.00 sec
2.Total Injec. Time : 300.00 sec
3.Hold on      Time : 99.99 sec
4.Cycle        Time : 100.00 sec
5.Cycle Delay Time : 05.00 sec

Electric Motor Setting:-
Motor Switched On By: Cntrl
Motor Starter Type : STRDLT
Star-Delta Delay   : 05 sec
Motor On Delay     : 10 sec

Mn:000.00      Mx:600.00      New Val: 5.00
Error message if any.....Page:34

```

- 1) The above screen is **PG:34**, accessible by pressing **<SERVICE>** key on keypad & selection **Option 5** & then **<Page Dn.>** key.
- 2) Password Level Required to **Access=03**.
- 3) All maximum values/upper limit for times/delays for different stage of machine operation can be set from this page.
- 4) Total Cooling Time & Injection Time can be set from **PG:8** & **PG:10** respectively.
- 5) All times/delays are set in terms of seconds.
- 6) Main Motor switching operations can be set on this page.

Parameter	Options	Description
Motor Switched ON by	Manual/CTRL	Manual:No PLC Control CTRL:Thru PLC Control
Motor Startor type	DOL/STRDLT	DOL:Direct ON Line single motor DO STRDLT:Star-Delta 3 motor DOs
Star-Delta Delay		Delay in seconds of switchover from Star-Delta phase of motor
Motor On Delay		Delay in seconds the motor gets ON after the key is pressed. Minimum=01 sec

REAL TIME CLOCK SETTING PAGE/PG: 35

```

GANESH  AUTO   01-08-2009 Sat 13:27:20
Real Time Clock Setting:-

Time : Hours   Minutes   Seconds
      13       27        20

Date : Date    Month     Year
      01       08        2009

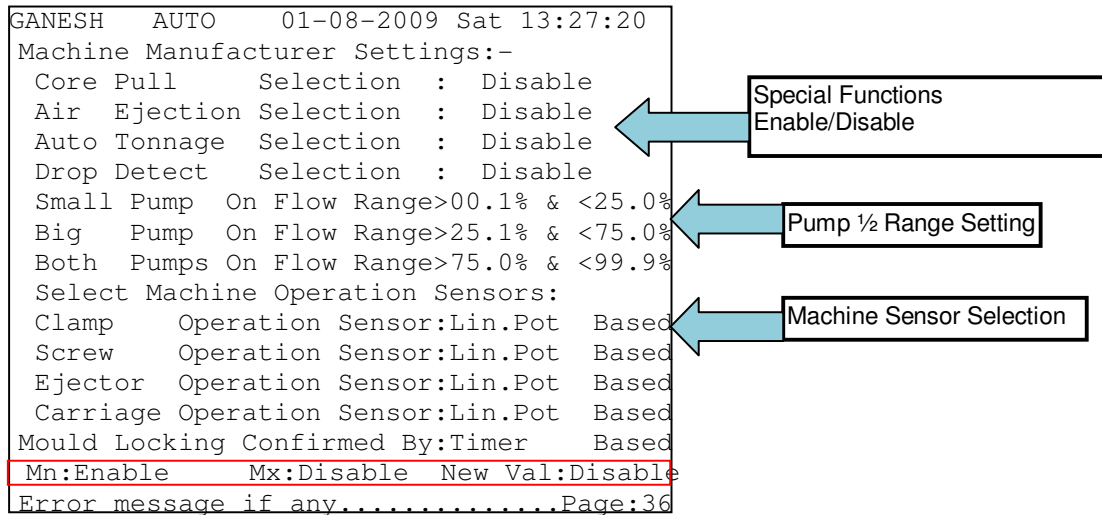
Day   : Saturday

Press <FUN> Key to set New Time.

Battery Voltage   : 3.28 Volts   (099%)
Battery Life Left: 3024 Days
Mn:00             Mx:23         New Val: 13
Error message if any.....Page:35

```

- 1) The above screen is **PG:35**, accessible by pressing **<SERVICE>** key on keypad & selecting **Option 6**.
- 2) Password Level Required to **Access=03**. Time, Date & Day of the Week can be set on this page.
- 3) Time & Date can be set by changing the value, press **<ENTER>** Key & arrow keys on the keypad.
- 4) Time is to be set in 24 hour format while Date is to be set in DD-MM-YYYY format
- 5) Day of Week can be changed by using **<INC>** & **<DEC>** keys of the keypad & then pressing **<ENTER>** key.
- 6) To put the new time into effect, press **<FUN>** key on the keypad.
- 7) The status of the RTC battery is also displayed on this page. Battery Actual Voltage, % of charge left & days of battery life are all indicated for better diagnostics.

MANUFACTURER SETTING PAGE/PG: 36

1) The above screen is **PG:36**, accessible by pressing **<SERVICE>** key on keypad & selecting **Option 7**.

2) Password Level Required to **Access=03**. All machine parameters like Special Functions, Pumps configuration, Sensors type selection, Maximum Pump PQ Limit & Maximum System Pressure can be set on this page by the machine manufacturer.

3) Special Functions like Core 1/2 Operation, Air Ejectors Operation, Auto Tonnage Feature & Drop Detect Logic can be Enabled /Disabled by selecting the required function & using **<INC>** & **<DEC>** keys on the keypad.

4) By default, when machine uses a single pump for all operations it is termed to be a using a Small(Single) Pump. In this case, On Flow Range can be set from minimum(0%) to maximum(99.9%) i.e. all flowrates are delivered by this pump only.

5) In a case when a machine uses two pumps of same/different capacities to share the designed delivered flow rate the two pumps are termed as Small & Big pumps that are to be configured as needed.

6) E.g.: Pump1=0 to 125 lpm(Small Capacity), Pump2=0 to 175 lpm(Big Capacity). In this scenario, to deliver a maximum of 300lpm On Flow Ranges can be configured as follows:

Small Pump On Flow Range>00.1% & <41.6% (Upto 125lpm)

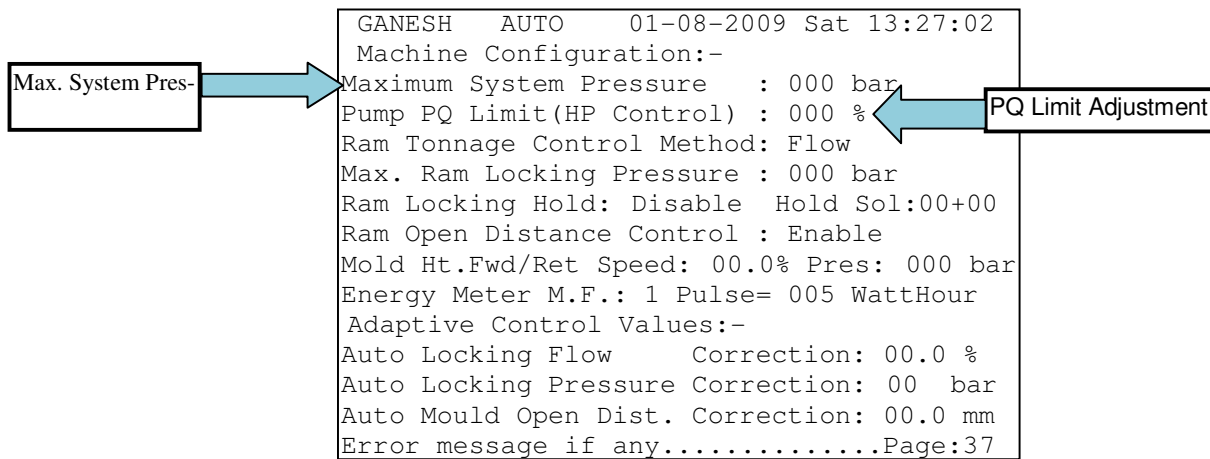
Big Pump On Flow Range>41.7% & <58.3% (Upto 175lpm)

Both Pumps On Flow Range>58.4% & <99.9% (Upto 300lpm)

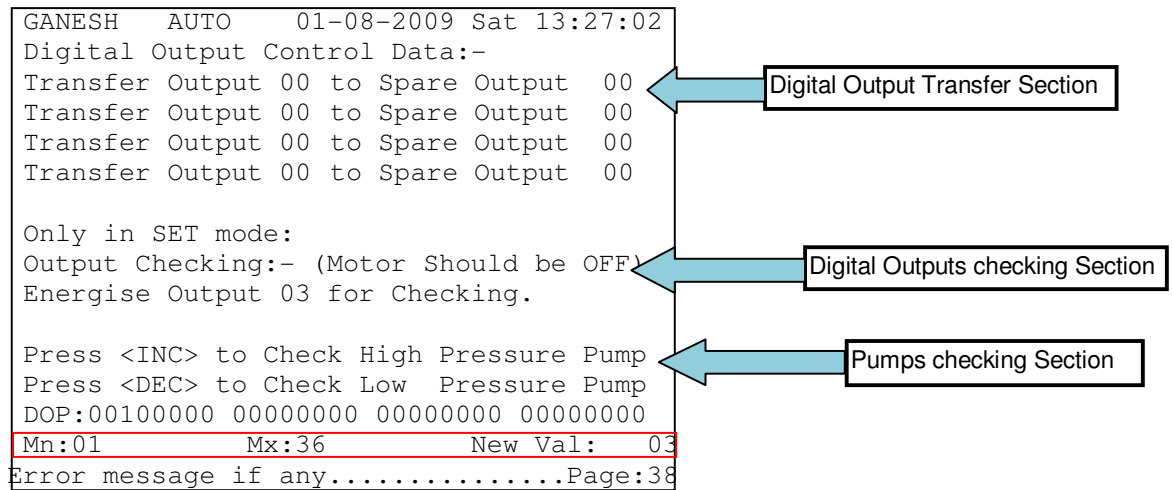
7) The type of sensor based on which the Clamp, Screw, Ejector & Carriage parts are sensed for operation can be selected between Linear Potentiometer/Limit Switch/Timer. This selection can be done by selecting the appropriate part & using the **<INC>** & **<DEC>** keys on the keypad

8) The maximum allowable working pressure of the machine can be configured in the Maximum System Pressure entry. The **Max PQ Limit** can be set in the range of **00-99%**.

9) To avoid overloading the delivering pump one can restrict the maximum PQ

MACHINE CONFIGURATION SETTING PAGE/PG: 37

- 1) The above screen is **PG:37**, accessible by pressing **<SERVICE>** key on keypad & selecting **Option 8**.
- 2) Password Level Required to **Access=03**.
- 3) The maximum allowable working pressure of the machine can be configured in the **Maximum System Pressure** entry. Maximum value= 200bar
- 4) To avoid overloading the delivering pump one can restrict the maximum PQ delivered to the machine system. This can be controlled by setting the **Max. PQ Limit** which controls the set flow rate while delivering the set pressure.
- 5) The **Max PQ Limit** can be set in the range of **00-99%**.
- 6) The **Tonnage control** methodology can be selected between **Pressure/Flow Adaptive**.
- 7) The maximum locking pressure of the machine can be configure in the **Max.RAM Locking pressure** entry.
- 8) **RAM Locking Hold Function** can be **Enabled/Disabled** on this screen. This function is required on certain machines with peculiar hydraulic circuit where particular **digital solenoids** are **ON** during **Mold closing/Locking to prevent Mold opening**.
- 9) The screen also shows the **Mould Open Correction** done automatically by the PLC over 10 continuous auto cycle shots/upto 25.0mm.
- 10) The mould open correction is done to prevent moving Mould slip beyond the final opening position. This mould opening correction is expressed in millimetres.
- 11) Energy meter connected to PLC on Digital Input has to be calibrated from this page.
- 12) Pulses/Wh number is indicated by the energy meter manufacturer.
- 13) The last line denotes any machine error condition detected by the PLC.

DIGITAL OUTPUTS CONTROL PAGE/PG: 38

- 1) The above screen is **PG:38**, accessible by pressing **<SERVICE>** key on keypad & selecting **Option 9**.
- 2) Password Level Required to **Access=03**. All digital output related control operations like Output checking, Output transferring & Pump Energisation can be done from this page.
- 3) The PLC has to be put in **SET** mode for all output control operations.
- 4) By default, All Spare Digital Outputs and can be used to take up a new function or take up the function of an existing digital output.
- 5) To take up the function of an existing digital output, the latter has to be transferred to the spare output. Please check the Digital output list for spare outputs available.
- 6) This transfer can be done by setting the appropriate numbers in Transfer to Spare output.
- 7) To test the functionality of any digital output, enter the Output number in the Check Select Output section.
- 8) To test the functionality of low pressure pump, Press **<DEC>** key & check whether the pump is energised.
- 9) To test the functionality of High pressure pump, Press **<INC>** key & check whether the pump is energised.
- 10) The string of '1's & '0's shows the real-time status of the **01-32** Digital Outputs.

Program Directory Status

- 48

ROBOT INTERFACE PAGE/PG: 41

```

GANESH  AUTO      01-08-2009 Sat 13:27:20
ROBOT Data:-                      Robot Stage:0

Robot Selection Enable
Robot Start Pos: MoldOpen
Robot Type(Mfg): Shini

Notes:
Core-2 Inputs/Outputs are Used for ROBOT.
ROBOT will Operate only and when Core-2
is Not Selected and Robot is Selected.
When both are selected then Core-2 works
and Robot does not work.
Mn:Enable      Mx:Disable      New Val: Enable

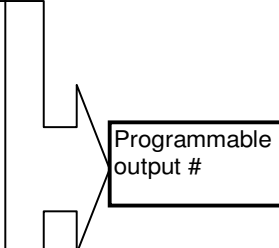
```

- 1) The above screen is **PG:41**, accessible by pressing <**ROBOT**> key on keypad.
- 2) Password Level Required to **Access=03**. Integration & control of a **pick-and-place Robot** with the this PLC can be configured from this page.
- 3) The PLC's **Core-2 Inputs/Outputs** are used for Robot integration. Hence **Core-2 should be disabled for Robot to work**.
- 4) The PLC can be readily integrated to and work with Robot of **SHINI & WETEC** make.
- 5) Firstly, the Robot selection should be **Enabled**.
- 6) Then the position where the Robot starts its functions during the cycle should be set. **Start Position** can be at **Mold Open**, **Core-1 Out** or at **Ejector forward**.

Robot Sequence for Shini	
Digital Inputs(PLC-Robot)	Operation Event
Robot Ready	Continuously ON, when Robot is powered ON
Robot Cycle Completed	High Pulse, when Robot finished its sequence
Digital (Robot-PLC)	
Robot Enable	ON when Robot is Enabled & front safety guard is closed
Robot Cycle Start	ON until Robot completes its cycle sequence

Robot Sequence for Wetec	
Digital Inputs(PLC-Robot)	Operation Event
Robot Ready	Continuously ON, when Robot is powered ON
Robot Cycle Completed	ON, when Robot finished its sequence
Digital (Robot-PLC)	
Robot Enable	ON when Robot is Enabled & front safety guard is closed
Robot Cycle Start	ON until Robot completes its cycle sequence

PROGRAMMABLE DIGITAL OUTPUTS/PG: 42

GANESH	AUTO	01-08-2009 Sat 13:27:02	
Programable Digital Outputs:-			
Mold Close Fast.....		00	
Mold Close Safety Pressure.....		00	
Mold Opening Intensifier.....		00	
Mold Open Fast.....		00	
Injection Boost.....		00	
Injection Pressure.....		00	
Zero Injection Pressure.....		00	
Reduced Injection Pressure.....		00	
Hydraulic Ejector Pressure.....		00	
Core pressure.....		00	
Pump-3 Vent(Add in Solenoid Chart).		00	
Lubrication Contactor.....		00	
Error message if any.....		Page:42	

- 1) The above screen is **PG:42**, accessible by pressing **<HISTORY>** key on keypad & selection & then **<PAGE UP.>**
- 2) Password Level Required to **Access=03**.
- 3) RAM machine having special valves on Closing/Opening/Injection/Ejector/Core can be enabled by programming the digital output number hard-wired to.
- 4) Corresponding output shall be switched ON during the appropriate machine operational stages.
- 5) Pump-3 & Lubrication pump contactor also be programmed from this page.

HISTORY MENU PAGE/PG: 43

```

GANESH  AUTO    01-08-2009 Sat 13:27:20
HISTORY MENU SELECTION ?

0.Hour Meters / Production Counters
1.Production History for last 30 days
2.Last 10 cycles timing History
3.Selected Shot Details
4.Power Consumption Details
5.Transfer Data from SDCARD to USB
6.Display Error Details
7.Clamp Speed Graphs
8.Injection, Suckback & Refill Graph
9.Temperature Control Graph
Mn:0           Mx:9           New Val: 4
Error message if any.....Page:43

```

- 1) The above screen is **PG:43**, accessible by pressing **<HISTORY>** key on keypad.
 - 2) Password Level Required to **Access=02**.All history oriented items like Production counters, Past Timings, Any shot history, real-time power consumption details, Data transfer to USB, Past Errors & Parameter graphs can be selected from this page.
 - 3) As per the required item choice from the menu list, one has to enter values **between 0-9**.
 - 4) The user will be redirected automatically to the page of valid choice entered.
 - 5) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter.
- Eg: Mn=Minimum=0 & Mx=Maximum=9 for – History Menu Selection.

PRODUCTION COUNTERS PAGE/PG: 44

GANESH	AUTO	01-08-2009	Sat	13:27:02	
Batches Completed:	0237	Set:	2000	To Reset	
Pres. Batch Count:	0100	Set:	0054	CLR	
Time Left to Complete Pre.Batch:	0000	Min			
Total Shots (Resettable)		:	000000,000		
Total Shots (Non Resettable):		:	000000,000		
Hour Meters Data-	Hours		Min.		
Controller On :	005,040		04		
Main Motor On :	004,033		40		
Manual :	000,003		35		
Semi Auto :	000,000		26		
Hand :	004,004		21		
Mn:0000	Mx:9999	New Val:	2000		
Error message if any.....Page:44					

- 1) The above screen is **PG:44**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 0**.
- 2) Password Level Required to **Access=03**. All production oriented items like Production batch counters can be set & viewed from this page.
- 3) The number of batches to be produced or completed on the machine before the machine stops for the next programmed batch can be set on the first line of this page.
- 4) The present running Batch count number & the time to finish the present set batches are also displayed on the second & third lines of the page.
- 5) To reset the batch counter at any given time **<CLR>** key is to be pressed for two seconds.
- 6) Also the page also displays the total number of shots executed by the machine since the PLC has been commissioned on the machine.
- 7) The total number of hours the PLC was ON is displayed under the Hour Meters Data section.
- 8) The PLC hours of operation in various modes of Manual, Semi auto & full Auto are individually displayed in terms of hours & minutes.
- 9) The total number of shots(non-resettable) & hours meter data are non-resettable.

MONTHLY PRODUCTION PAGE/PG: 45

GANESH AUTO 01-08-2009 Sat 13:27:02					
Monthly Production Data For 03-07-2009					Production Date
00-01	AM	0344	12-01	PM	0532
01-02	AM	0425	01-02	PM	0533
02-03	AM	0470	02-03	PM	0935
03-04	AM	0560	03-04	PM	0247
04-05	AM	0065	04-05	PM	0325
05-06	AM	0654	05-06	PM	0342
06-07	AM	0342	06-07	PM	0233
07-08	AM	0324	07-08	PM	0324
08-09	AM	0520	08-09	PM	0024
09-10	AM	0234	09-10	PM	0640
10-11	AM	0665	10-11	PM	0534
11-12	AM	0332	11-12	PM	0430
Error message if any.....Page:45					

- 1) The above screen is **PG:45**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 1**.
- 2) Password Level Required to **Access=02**.The hourly production units during a 24-hour/day are displayed on this page. No settings are done on this page.
- 3) The user can select a day in the last 31 days to view the hourly production output of the machine on an hourly basis.
- 4) The user can go to the required day within the last 31 days by using the **<INC>** & **<DEC>** keys on the keypad.
- 5) The production output of the machine is expressed in terms of units of maximum size=9999.
- 6) To reset the month long production counters at any given time, goto Password Page & enter respective password as described.

LAST 10 CYCLE TIMINGS PAGE/PG: 46

Cycle operation Stages

GANESH AUTO 01-08-2009 Sat 13:27:02							
Cycles Details History for Last 10 shots							
SNO	MCTM	INJTM	INJFP	RFTM	SBTM	MOTM	TCTM
01.	4.32	06.08	307.2	05.6	8.64	2.96	038.0
02.	4.52	06.30	308.2	05.3	8.63	2.97	035.0
03.	4.44	06.05	303.0	05.4	8.60	2.94	033.0
04.	4.34	06.55	303.0	05.5	8.66	2.94	033.0
05.	4.54	06.05	300.0	05.5	8.65	2.93	033.0
06.	4.45	06.04	303.0	05.4	8.64	2.94	039.0
07.	4.55	06.40	330.0	05.5	8.63	2.98	038.0
08.	4.53	06.04	330.0	05.3	8.65	2.90	036.0
09.	4.33	06.04	330.0	05.5	8.65	2.97	037.0
10.	4.55	06.05	330.0	05.4	8.65	2.99	037.0

Last 10 Total Cycle Times

Latest Cycle Timings

Error message if any.....Page:46

- 1) The above screen is **PG:46**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 2**.
- 2) Password Level Required to **Access=02**.The cycle timing details for the last 10 shots are displayed on this page. No settings are done on this page.
- 3) The **latest cycle timing** details are shown on **SNO#10** while the past cycle timing details are pushed up.
- 4) The first column indicated the serial number of the 10 production cycles in analysis.
- 5) Each production cycle details is further split into Total Mould Closing Time(Column 2), Total Injection Time(Column 3), Injection Final Position(Column 4), Total Refill Time(Column 5), Total Suckback Time(Column 6) & Total Mould Opening Time(Column 7)
- 6) The last column(Column 8) reflects the total time the production cycle took in terms of seconds.

PRODUCTION SHOT DETAILS PAGE/PG: 47

Diagram illustrating the Production Shot Details page (PG: 47) with annotations:

- Shot# Entry**: Points to the first line of the data.
- Shot # Upper Block**: Points to the first line of the data.
- Shot # Lower Block**: Points to the first line of the data.
- Shot Specific Details**: Points to the 'Production Shot Details' line.

Production Shot Details : 00001250

Prod.No:000 Mode hh:mm:ss dd-mm-20yy

Mould Cls Tm: 00.00 System Press :000

Mould Sft Tm: 00.00 Intrug End Pos:000.0

Injectin Tm:000.00 Inject End Pos:000.0

Hold On Tm:000.00 HoldOn End Pos:000.0

Refill Tm:000.00 Refill End Pos:000.0

Suckback Tm: 00.00 Suckbk End Pos:000.0

MoldOpen Tm: 00.00 Total Cyc. Tm:000.00

Prod.Quality:Good Screw Max. RPM:000

Zone Temp: Z1:000 Z2:000 Z3:000

Z4:000 Z5:000 Z6:000

Total Power Consumed : 0000000.000 Units

Mn:0000 Mx:9999 New Val: 1250

Error message if any.....Page:47

- 1) The above screen is **PG:47**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 3**.
- 2) Password Level Required to **Access=02**. This page is a further extension of production shot history from **PG:46**.
- 3) The PLC stores/records actual parameter details of each shot the machine executes upto a maximum of **26000000 machine shots** equivalent to almost **10 years** of machine running.
- 4) The user can retrieve this record for any shot through its serial number, provided the serial number of the shot is less than the total executed shots executed by the machine to date.
- 5) The total executed shots executed by the machine to date is displayed on **PG:44**
- 6) To retrieve the records of any executed past shot, user needs to enter the shot serial number.
- 7) The last four digits of the serial number are entered on the left side of the input entry box (Lower block) displayed on the first line of the page.
- 8) The upper four digits of the serial number are entered on the right side of the input entry (Upper block) box displayed on the first line of the page.
- 9) The general details shown for each shot are the date, time, program number & mode

POWER CONSUMPTION DETAILS/PG: 48

Last 24 th Hour Units	GANESH AUTO 01-08-2009 Sat 13:27:02 Power Consumption for The Present Job:- Job Name Tot.Shots Tot.Units Per Shot GANESH 1234 01234.567 1.000 Power Consumed For Last 10 Shots= 10.000 Power Consumption Rate(Units/Hr)= 10.000 Last 24 Hour Power Consumption (Units) 00.00← 00.00← 00.00← 00.00← 00.00← 00.00 00.00← 00.00← 00.00← 00.00← 00.00← 00.00 00.00← 00.00← 00.00← 00.00← 00.00← 00.00 00.00← 00.00← 00.00← 00.00← 00.00← 00.00 Press <FUN> & <CLR> Keys To Reset Units Total Units Consumed By Machine: 0000000 Mn:00 Mx:999 New Val: 50 Error message if any.....Page:48	Average Consumption Details
		Present Hour Units

1) The above screen is **PG:48**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 4**.

2) Password Level Required to **Access=02**.

3) All power calculations are automatically calculated & displayed on this screen when a power meter is connected to the machine's main 3-Φ supply & integrated with the PLC **Digital Input=22**.

4) This page displays Total shots, Total units consumed, average power consumption for each shot by the present job as well as , Hourly Power consumption rate and last 24 hours Units consumed by the Machine & its auxiliaries.

5) The hourly power consumption for the last 24-hour is expressed in terms of 00.00 units for each hour in the Last 24 Hour Power Consumption section.

6) The present hour power consumption unit reading is displayed at the end of the 4th line & the previous 24th hour unit reading is displayed at the beginning of the 1st line.

7) On every new hour the readings get shifted left by one place.

8) All power values on this page can be reset by pressing **<FUN>** & **<CLR>** keys together on the keypad.

HISTORY TRANSFER TO USB PAGE/PG: 49

```

GANESH  AUTO    01-08-2009 Sat 13:27:
Transfer Logged Data into USB Device:-
Prerequisites:-
-----
Put in SET mode & Page Lock Mode(LED ON)
Insert FAT32 USB into USB slot and then
Press <History> & <INC> Keys Together to
Start Data Transfer from SDCARD to USB.

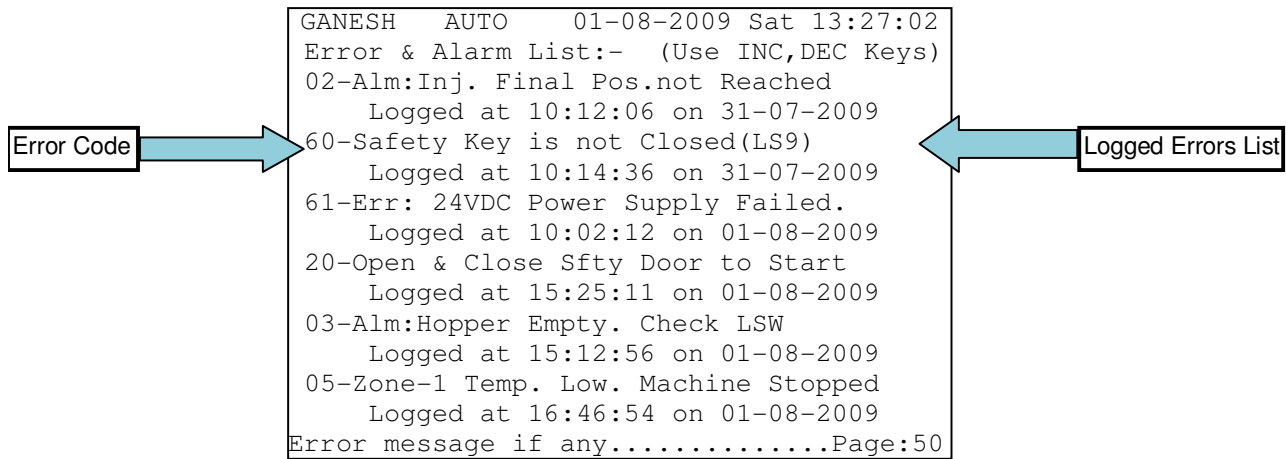
Shot Starting No. : 00001250

Wait for 1-2 minutes until Transfer
Completion Message
Mn:0000      Mx:9999      New Val: 1250
Error message if any.....Page:49

```

Shot Beginning No.

- 1) The above screen is **PG:49**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 5**.
- 2) Password Level Required to **Access=02**.
- 3) The PLC keeps records of last **26000000 shot data** (i.e. parameter values of each executed shot as per **PG:44**, **65536 mould data changes** done by operator and **65536 displayed Error messages**.
- 4) These stored data can be downloaded from PLC to USB device by authorised person. After download into an USB device this data can be analysed in a standard PC as per customer requirement.
- 5) To download the data, the following conditions should be met
 - a. The PLC should be in **SET** mode.
 - b. Press the **<Page Lock>** key & Page lock LED must be ON
 - c. Insert an USB which has been formatted for **FAT32** operation.
 - d. Enter the starting Shot No. (should be < 26000000)
- 6) Now Press **<HISTORY>** & **<INC>** keys together to download 65536 shots data beginning from the entered Starting shot No, All 65536 Mould data changes and All 65536 Error messages.
- 7) This data download operation takes about 1-2 minutes time. When the message "Data Transfer Complete" appears on the screen the USB can be removed and machine can be operated as usual.

MACHINE ERROR HISTORY PAGE/PG: 50

- 1) The above screen is **PG:50**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 6**.
- 2) Password Level Required to **Access=01**. This page displays the last **50** Machine Errors in a chronological order.
- 3) The machine errors can be scrolled UP & DOWN using the **<INC>** & **<DEC>** keys respectively.
- 4) Each machine error is displayed with the Error number, Name of the Error, Time & Date of occurrence.

MOULD SPEED PROFILE PAGE/PG: 51

GANESH AUTO 01-08-2009 Sat 13:27:02 MOULD CLOSE SPEED PROFILE
MOULD OPEN SPEED PROFILE
Error message if any.....Page:51

- 1) The above screen is **PG:51**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 7**.
- 2) Password Level Required to **Access=01**. This page displays the speed profiles or continuous smooth plots of **Mould Closing & Opening Operation**.
- 3) The upper section plots the Mould Close speed profile w.r.t time. The x-axis is time & y-axis is the amplitude of the speed.
- 4) Mould close speed profile is plotted after every Mould Close operation during Hand, Semiauto & Auto PLC modes.
- 5) The lower section plots the Mould Open speed profile w.r.t time. The x-axis is time & y-axis is the amplitude of the speed.
- 6) Mould Open speed profile is plotted after every Mould Open operation during Hand, Semiauto & Auto PLC modes.

SCREW SPEED PROFILE PAGE/PG: 52

GANESH AUTO 01-08-2009 Sat 13:27:02 INJECTION SPEED PROFILE
REFILL & SUCKBACK SPEED PROFILE
Error message if any.....Page:52

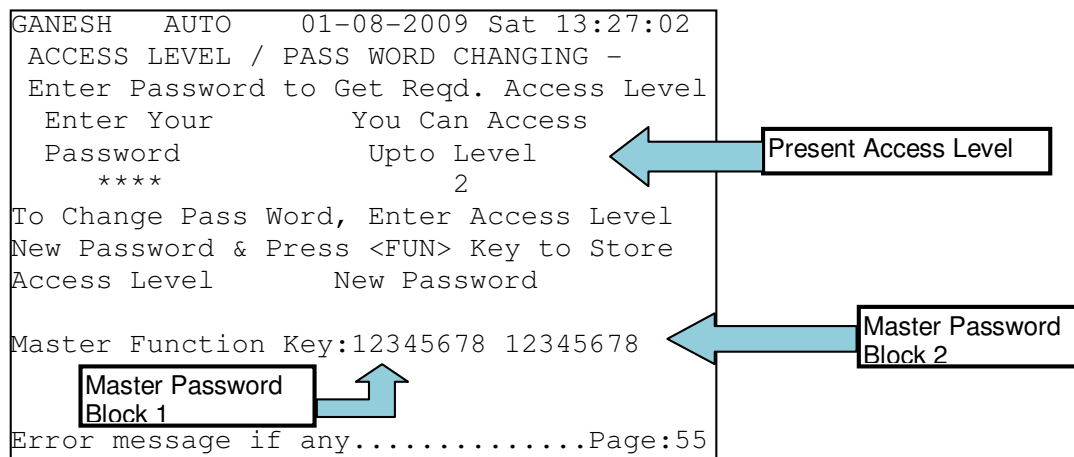
- 1) The above screen is **PG:52**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 8**.
- 2) Password Level Required to **Access=01**. This page displays the speed profiles or continuous smooth plots of **Injection & Refill Operation**.
- 3) The upper section plots the Screw forward i.e. Injection speed profile w.r.t time. The x-axis is time & y-axis is the amplitude of the speed.
- 4) Injection speed profile is plotted after every Injection operation during Hand, Semiauto & Auto PLC modes.
- 5) The lower section plots the Screw backward i.e., Refill & Suckback speed profile w.r.t time. The x-axis is time & y-axis is the amplitude of the speed.
- 6) Refill & Suckback speed profile is plotted after every Refill & Suckback(if enabled) operation during Hand, Semiauto & Auto PLC modes.

ZONE TEMPERATURE PROFILE PAGE/PG: 53

GANESH	AUTO	01-08-2009 Sat 13:27:02
ZONE TEMPERATURE PROFILES- PID CONTROL		
Z1		
Z2		
Z3		
Z4		
Z5		
Z6		
Error message if any.....Page:53		

- 1) The above screen is **PG:53**, accessible by pressing **<HISTORY>** key on keypad & selecting **Option 9**.
- 2) Password Level Required to **Access=01**. This page displays the temperature profiles or bar plots of present zone temperatures w.r.t. the set zone temperatures for all the 6 zones.
- 3) The profiles are plotted in terms of bar thickness w.r.t the set point line.
- 4) The thicker the bar plot indicates the farther the present temperature of the zone w.r.t its respective set point.
- 5) The thinner the bar plot indicates the nearer the present temperature of the zone w.r.t its respective set point.
- 6) A straight line or no bar plot present indicated the present temperature of the zone equals its respective set point.

PASSWORD PAGE/PG: 55



- 1) The above screen is **PG:55**, accessible by pressing **<PASSWORD>** key on keypad
- 2) Password Level Required to **Access=00**. This page is used for accessing various functions of the PLC locked at various access levels.
- 3) By default, the hierarchy of password levels is as follows:

On powerup password level=0.

Password Levels 1 & 2=For machine operator & maintenance personnel

Password Level 3 = Machine floor supervisor

Password Level 4= Machine Original manufacturer

Password Level 5= PLC(VIGNAN) Manufacturer

- 4) One has to enter the appropriate password to get access to the required level. **default, the passwords for each level are:**

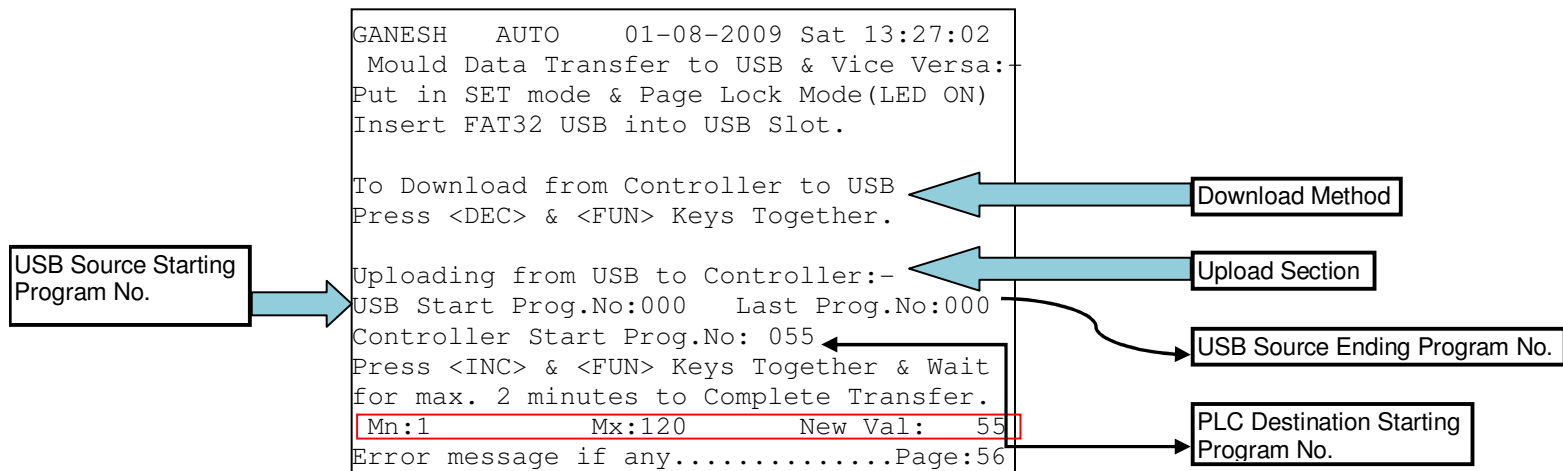
Password for Level 1=1234, Level 2=2345, Level 3=3456, Level 4=4567

- 5) The default password for a particular level can be changed at any given time provided present password has been entered for the level in context.
- 6) The new password will be registered on entering the new 4-digit password & pressing **<FUN>** key on the keypad.
- 7) A confirmation message will be played whether the new password has been registered or not by displaying messages "O.K. - New Password Accepted" or "Sorry- New Password Rejected" in the latter case.
- 8) A special password called the Master Function key is provided for special usages.
- 9) The Master Function key is made up of 2 blocks of 8 alphanumeric password which tallies the Master Function key to 16 alphanumeric key.
- 10) Master Function key for special usages are:

Block 1	Block 2	Usage
CLRHRSPR		Clear Hourly Production Data
SETDFTOP		Set Default Outputs(DO & PWM)
RSTUSRPW		Reset Passwords of Level 1,2,3 to default

- 11) Original Machine Manufacturer can contact Vignan Electronics Pvt. Ltd. For

MOULD DATA TRANSFER TO USB PAGE/PG: 56



1) The above screen is **PG:56**, accessible by pressing **<DIRECTORY>** key on keypad & then **<PAGE UP>** key.

2) Password Level Required to **Access=02**. This page is used for transferring program directory(120 mould programs) from one machine(1st machine) to another machine(2nd machine) having **SS57 PLC**.

3) To initiate download/upload of Mould Data to/from USB the following steps are to be followed:

- i. Put the PLC in SET mode by pressing the **<SET>** key on the keypad.
- ii. Press the **<Page Lock>** key on the keypad & make sure its LED is ON
- iii. Insert a **FAT32 USB** drive into the front USB slot

4) To download the entire directory of 120 mould programs, press **<DEC>** & **<FUN>** keys together on the keypad.

5) A download progress message **"Data Transfer to USB in progress....."** is displayed indicating the download process.

6) A download complete message **"Data Transfer to USB complete."** Is displayed indicating the end of the download process.

7) A file named **VIGNANPD.bin** will be created on the USB drive consisting of all 120 mould programs.

8) To upload a single or a range of mould programs the bottom uploading section is to be used.

9) The starting program number present in the USB source is to be entered in the USB Start Prog. No input

10) The last program number of the range to be copied/uploaded present in the USB source is to be entered in the Last Prog.No input.

11) The destination program number in the PLC directory at which the program range to be copied/uploaded from the USB is entered in the Controller Start Prog.No input.

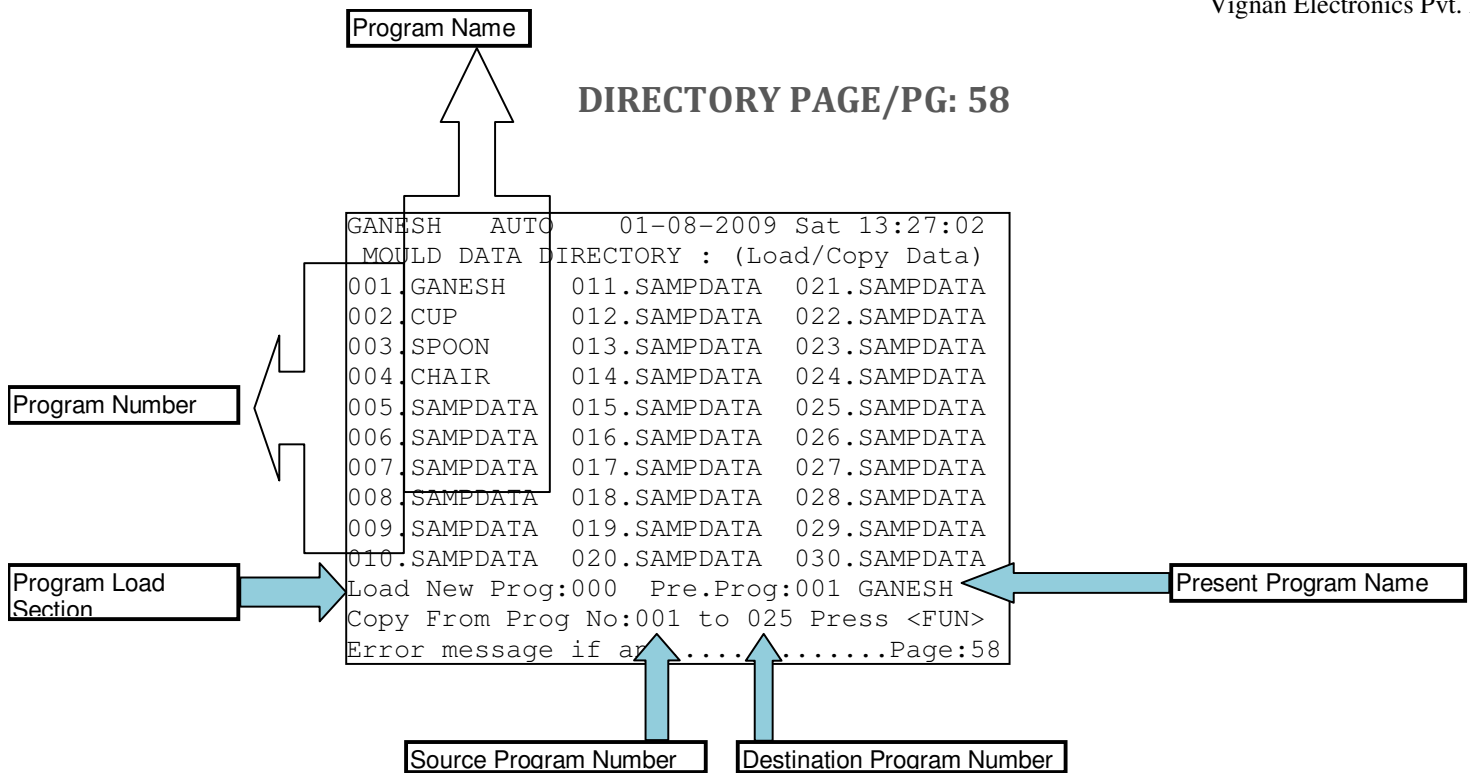
12) Ex: To copy/upload Programs 1 to 10 from the USB drive(1st machine) into the PLC directory(2nd machine) Program slots 20 to 30, Enter:

```

USB Start Prog.No: 001
Last Prog.No: 011
Controller Start Prog.No: 020
  
```

13) To initiate the upload process press **<INC>** & **<FUN>** keys together on the keypad.

14) An upload complete message **"Data Transfer to EERAM complete."** Is displayed indicating the end of the upload process.

DIRECTORY PAGE/PG: 58

- 1) The above screen is **PG:58**, accessible by pressing **<DIRECTORY>** key on keypad.
- 2) Password Level Required to **Access=02**. This page shows the entire directory of **120** mould programs available on the PLC.
- 3) Upto 30 programs are visible on each directory screen. To scroll up or down the directory of 120 programs **<INC>** or **<DEC>** keys are to be pressed respectively on the keypad.
- 4) The present program loaded is indicated by number in the Pre. Prog. Text.
- 5) To load a new program, put the PLC in SET mode & enter the new program number in the Load New Prog input entry & press **<LOAD>** key on the keypad.
- 6) To rename a program name, the program has to be loaded first & then a new name for the program can be entered at the input entry besides the Present Program Number.
- 7) Once a new name has been entered for the program in context **<SAVE>** key has to be pressed to update the new name.
- 8) To copy one program to another program slot, the Copy from section has to be used.
- 9) To copy, the PLC has to be in SET mode, the FROM & TO program numbers are to be entered.
- 10) The program number should be in the range of 01 to 120.
- 11) **<FUN>** key on the keypad is to be pressed to imitate the copy process.
- 12) The message "Data Copied...OK" will be displayed indicating the end of copy process.

DIGITAL VALVES DELAY PAGE/PG: 59

ON

OFF

Valve Number

Valve

On

Off

Valve

On

Off

V01

0.00

0.00

V09

0.00

0.00

V02

0.00

0.00

V10

0.00

0.00

V03

0.00

0.00

V11

0.00

0.00

V04

0.00

0.00

V12

0.00

0.00

V05

0.00

0.00

V13

0.00

0.00

V06

0.00

0.00

V14

0.00

0.00

V07

0.00

0.00

V15

0.00

0.00

V08

0.00

0.00

V16

0.00

0.00

Mn:0.00

Mx:9.99

New Val: 0.00

Error message if any.....Page:59

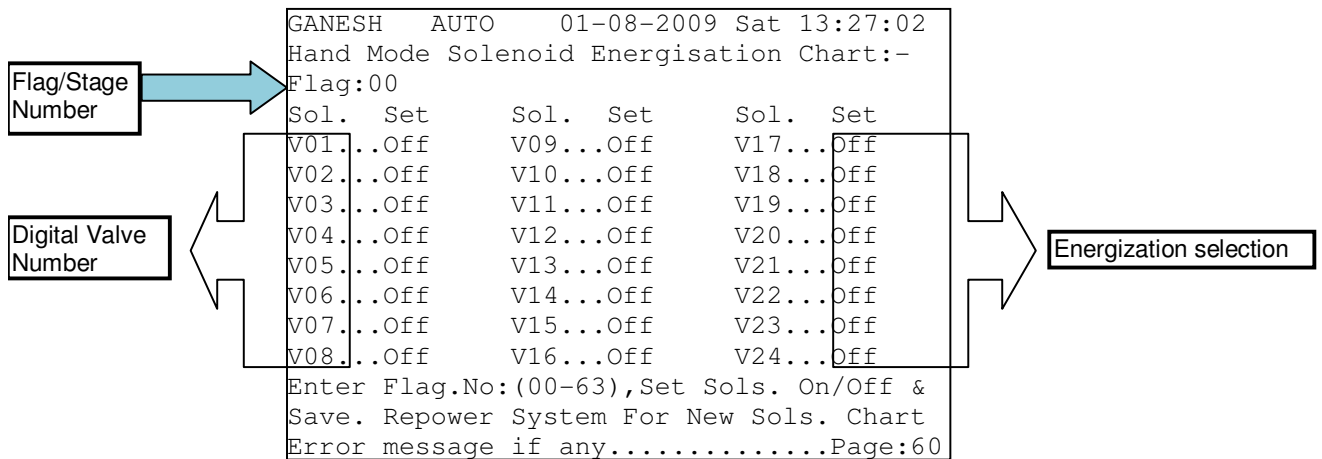
1) The above screen is **PG:59**, accessible by pressing **<DIRECTORY>** key on keypad & then **<PAGE DN>** key.

2) Password Level Required to Access=**03**. This page is used to introduce ON/OFF delays for the digital valves connected to the PLC digital outputs.

3) All delays are in terms of seconds. A maximum of **9.99** seconds can be set as delay for ON/OFF operation of the maximum 16 digital valves.

4) The line above the last line indicates the valid range of values acceptable for the selected particular settable parameter.

Eg: Mn=Minimum=00.00 & Mx=Maximum=9.99 for Mould Close time.

HAND MODE SOLENOID ENERGISATION PAGE/PG: 60

- 1) The above screen is **PG:60**, accessible by pressing **<DIRECTORY>** key on keypad & then **<PAGE DN.>** key twice.
- 2) Password Level Required to Access=**03**. This page is used to energize/de-energize(ON/OFF) digital valves as per the requirement for any operational stage in **HAND mode** only.
- 3) The setting on this page is to be done by the machine manufacturer or under the supervision of the authorized personnel.
- 4) Using the chart on this page the user can enter the flag/stage number in the Flag entry to reprogram the digital valves. Valid Flag No: 0-63
- 5) The required digital valves can be Energized/ON or De-energized/OFF by using the **<INC>** & **<DEC>** keys on the keypad.
- 6) Once the required valves are programmed i.e. set ON/OFF as per requirements, press **<SAVE>** key to update the Hand Solenoid Energization Chart.
- 7) The **PLC** also has to be **repowered** for the updated chart to come into effect.
- 8) The default HAND mode energization chart is shown next.

DEFAULT HAND MODE SOLENOID ENERGIZATION

		PORT 1	PORT 2	PORT 3	PORT 4
Flag-00	Idle				
Flag-01	Cycle Start Delay				
Flag-02	Core 1 or 2 IN				
Flag-03	Mould Close Slow 1	OV01	OV13		
Flag-04	Mould Close Fast 2	OV01	OV13		
Flag-05	Mould Close Slow 3	OV01	OV13		
Flag-06	Ejector Retract stage 4 (safety)		OV10		
Flag-07	Mould Close Stage 5 (low safety)	OV01	OV13		
Flag-08	mould close stage 5 (high safety)		OV11+OV13		
Flag-09	Core 1 or 2 IN				
Flag-10	Intensification-1	OV01	OV11		
Flag-11	Intensification-2		OV12		
Flag-12	Carriage Forward Delay				
Flag-13	Carriage Forward Stage 1	OV06			
Flag-14	Carriage Forward Stage 2	OV06			
Flag-15	Intrugen Stage				
Flag-16	Injection Stage 1	OV03			
Flag-17	Injection Stage 2	OV03			
Flag-18	Injection Stage 3	OV03			
Flag-19	Injection Stage 4	OV03			
Flag-20	Injection Stage 5	OV03			
Flag-21	Hold ON Stage 1	OV03			
Flag-22	Hold ON Stage 2	OV03			
Flag-23	Hold ON Stage 3	OV03			
Flag-24	Hold ON Stage 4	OV03			
Flag-25	Pre suckback Stage				
Flag-26	Carriage Retract Delay				
Flag-27	Carriage Retract Stage 1	OV07			
Flag-28	Carriage Retract Stage 2	OV07			
Flag-29	Refill Delay				
Flag-30	Refill Stage 1	OV05+OV08			
Flag-31	Refill Stage 2	OV05+OV08			
Flag-32	Refill Stage 3	OV05+OV08			
Flag-33	Post Suckback Stage	OV04			
Flag-34	Initial Decompression Stage		OV14		
Flag-35	Carriage Retract Delay				
Flag-36	Carriage Retract Stage 1	OV07			
Flag-37	Carriage Retract Stage 2	OV07			
Flag-38	Cooling				
Flag-39	Final Decompression		OV14		
Flag-40	Core 1 or 2 OUT				
Flag-41	Mould Open Stage 1	OV02			
Flag-42	Mould Open Stage 2	OV02			
Flag-43	Mould Open Stage 3	OV02			
Flag-44	Core OUT & Ejector operation				

DEFAULT HAND MODE SOLENOID ENERGIZATION

Flag-46	Core 1 or 2 OUT				
Flag-47	Cycle Delay				
Flag-48	Cycle Completed				
Flag-49	Start Next Cycle				
Flag-50	Ejector Forward		OV09		
Flag-51	Ejector Retract		OV10		
Flag-52	Core 1 IN			OV19	
Flag-53	Core 1 OUT			OV20	
Flag-54	Core 2 IN			OV21	
Flag-55	Core 2 OUT			OV22	
Flag-56	Moving Platen Air Blast			OV17	
Flag-57	Fixed Platen Air Blast			OV18	
Flag-58	Mould Height -		OV12		
Flag-59	Mould Height +		OV11		
Flag-60	Purge (Injection)	OV03			
Flag-61	Purge (Refill)	OV05			
Flag-62	Small pump (H.P) system pressure check		OV15		
Flag-63	Big Pump (L.P) system pressure check		OV16		

AUTO MODE SOLENOID ENERGISATION PAGE/PG: 61

```

GANESH  AUTO    01-08-2009 Sat 13:27:02
Auto Mode Solenoid Energisation Chart:-
Flag:00
Sol.  Set      Sol.  Set      Sol.  Set
V01...Off      V09...Off      V17...Off
V02...Off      V10...Off      V18...Off
V03...Off      V11...Off      V19...Off
V04...Off      V12...Off      V20...Off
V05...Off      V13...Off      V21...Off
V06...Off      V14...Off      V22...Off
V07...Off      V15...Off      V23...Off
V08...Off      V16...Off      V24   Off
Enter Flag.No:(00-63),Set Sols. On/Off &
Save. Repower System For New Sols. Chart
Error message if any.....Page:61

```

- 1) The above screen is **PG:61**, accessible by pressing **<DIRECTORY>** key on keypad & then **<PAGE DN.>** key thrice.
- 2) Password Level Required to **Access=03**. This page is used to energize/de-energize(ON/OFF) digital valves as per the requirement for any operational stage in **AUTO mode** only.
- 3) The setting on this page is to be done by the machine manufacturer or under the supervision of the authorized personnel.
- 4) Using the chart on this page the user can enter the flag/stage number in the Flag entry to reprogram the digital valves. Valid Flag No: 0-63
- 5) The required digital valves can be Energized/ON or De-energized/OFF by using the **<INC>** & **<DEC>** keys on the keypad.
- 6) Once the required valves are programmed i.e. set ON/OFF as per requirements, press SAVE key to update the Hand Solenoid Energization Chart.
- 7) The PLC also has to be repowered for the updated chart to come into effect.

DEFAULT AUTO MODE SOLENOID ENERGIZATION

		PORT 1	PORT 2	PORT 3	PORT 4
Flag-00	Idle				
Flag-01	Cycle Start Delay				
Flag-02	Core 1 or 2 IN				
Flag-03	Mould Close Slow 1	OV01	OV13		
Flag-04	Mould Close Fast 2	OV01	OV13		
Flag-05	Mould Close Slow 3	OV01	OV13		
Flag-06	Ejector Retract stage 4 (safety)	OV01	OV10		
Flag-07	Mould Close Stage 4 (low pressure safety)	OV01	OV13		
Flag-08	Mould Close Stage 4 (high pressure safety)		OV11		
Flag-09	Core 1 or 2 IN				
Flag-10	Intensification-1	OV01	OV11		
Flag-11	Intensification-2	OV01	OV12		
Flag-12	Carriage Forward Delay				
Flag-13	Carriage Forward Stage 1	OV06			
Flag-14	Carriage Forward Stage 2	OV06			
Flag-15	Intrugen Stage	OV05+OV08			
Flag-16	Injection Stage 1	OV03			
Flag-17	Injection Stage 2	OV03			
Flag-18	Injection Stage 3	OV03			
Flag-19	Injection Stage 4	OV03			
Flag-20	Injection Stage 5	OV03			
Flag-21	Hold ON Stage 1	OV03			
Flag-22	Hold ON Stage 2	OV03			
Flag-23	Hold ON Stage 3	OV03			
Flag-24	Hold ON Stage 4	OV03			
Flag-25	Pre suckback Stage	OV04			
Flag-26	Carriage Retract Delay				
Flag-27	Carriage Retract Stage 1	OV07			
Flag-28	Carriage Retract Stage 2	OV07			
Flag-29	Refill Delay				
Flag-30	Refill Stage 1	OV05+OV08			
Flag-31	Refill Stage 2	OV05+OV08			
Flag-32	Refill Stage 3	OV05+OV08			
Flag-33	Post Suckback Stage	OV04			
Flag-34	Initial Decompression Stage		OV14		
Flag-35	Carriage Retract Delay				
Flag-36	Carriage Retract Stage 1	OV07			
Flag-37	Carriage Retract Stage 2	OV07			
Flag-38	Cooling				
Flag-39	Final Decompression		OV14		
Flag-40	Core 1 or 2 OUT				
Flag-41	Mould Open Stage 1	OV02			
Flag-42	Mould Open Stage 2	OV02			
Flag-43	Mould Open Stage 3	OV02			
Flag-44	Core OUT & Ejector operation				
Flag-45	Mould Open Stage 4	OV02			
Flag-46	Core 1 or 2 OUT				
Flag-47	Cycle Delay				

DEFAULT AUTO MODE SOLENOID ENERGIZATION

Flag-48	Cycle Completed				
Flag-49	Start Next Cycle				
Flag-50	Ejector Forward				
Flag-51	Ejector Retract				
Flag-52	Core 1 IN				
Flag-53	Core 1 OUT				
Flag-54	Core 2 IN				
Flag-55	Core 2 OUT				
Flag-56	Moving Platen Air Blast				
Flag-57	Fixed Platen Air Blast				
Flag-58	Mould Height -				
Flag-59	Mould Height +				
Flag-60	Purge (Injection)				
Flag-61	Purge (Refill)				
Flag-62	Small pump (H.P) system pressure check				
Flag-63	Big Pump (L.P) system pressure check				

ONSITE RE-PROGRAMMING OF SS57 PLC

NOTE: USB MUST BE OF FAT32 TYPE

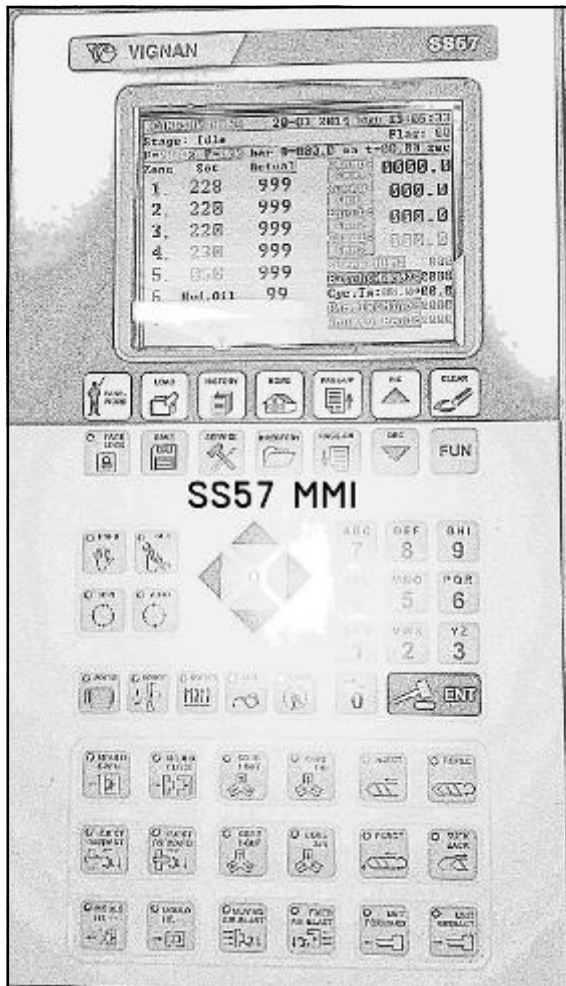
1. Copy and Download the new software file VIGNANUP.bin from PC onto a FAT16 USB Drive.
2. Make sure the PLC is in power **OFF** State.
3. Insert the USB drive in its slot which is located on the right side of the MMI designated by the USB symbol.
4. Press the keys **<LOAD>** and **<CLEAR>** keys simultaneously.
5. Power **ON** the PLC with the keys pressed.
6. Make sure to continue pressing both the keys until the **STARTUP** screen appears.
7. During reprogramming phase, a white screen will appear for 2- 3 seconds & USB drive LED should be blinking indicating progress.
8. The PLC shall auto-restart itself once reprogramming is finished.
9. A confirmation message "**VIGNAN PLC Reprogrammed Successfully.**" Shall be displayed on restart momentarily at the bottom of the HOMEPAGE indicating that the PLC has been reprogrammed.

CONVERTING FILES OF SS57 PLC INTO EXCEL FILES

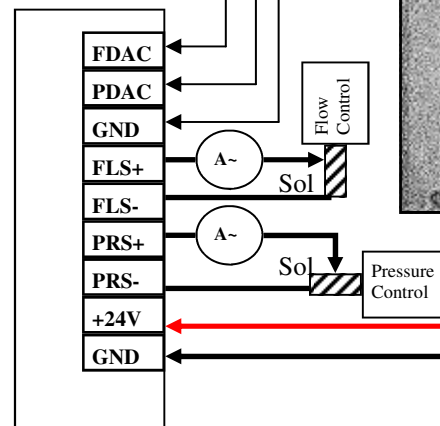
NOTE: USB MUST BE OF FAT32 TYPE

Instructions:

1. Create a new folder on the computer drive where you want to store the data.
2. Download the utility program named: "**Convert.exe**" (from www.vignanelectronics.com/email) in that folder.
3. Place all the data files from the USB downloaded from the PLC in the same folder. Files are **VIGNANS**D, **VIGNAN**DC, **VIGNAN**ED
4. Double click the Convert.exe
5. Text Files will be created in the same folder.
6. To view them, open each view with MS Excel.
7. VIGNANS D = Shot Database File
8. VIGNAN DC = PLC Data Change Database File
9. VIGNAN ED = PLC Error Database File

GENERAL/OVERVIEW WIRING SCHEMATICMMI<IOBOARD>PQ AMPLIFIER<SMPS>FILTER

USB Comm.Cable

MMI
Power
CableData
Comm.
CablePQ AmplifierInput: 230VAC, 1 ϕ

EARTH

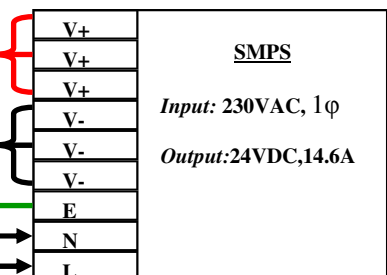
Line

Line Filter

3A

Neutral

Line

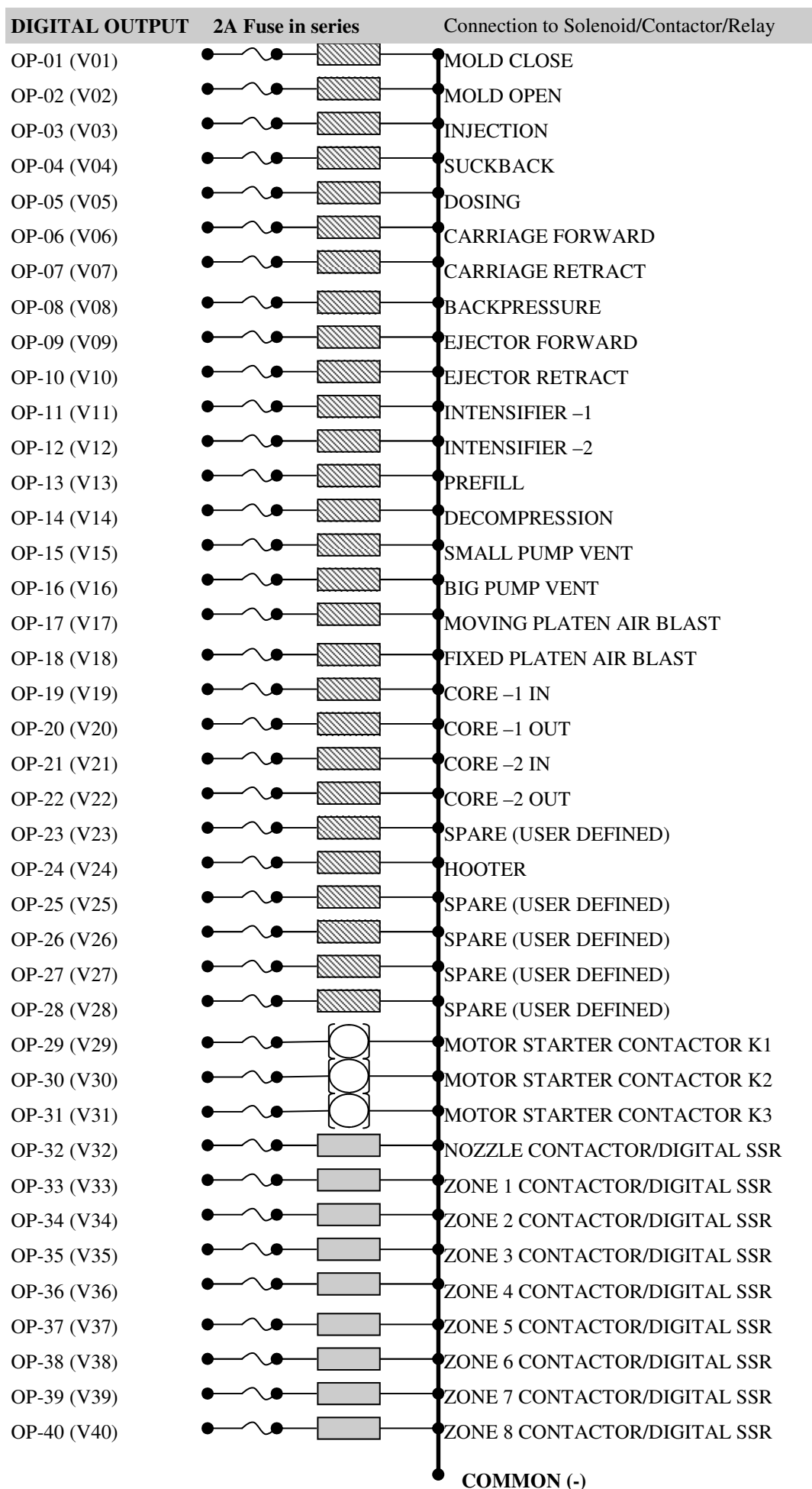
SMPSInput: 230VAC, 1 ϕ

Output: 24VDC, 14.6A

COMMON/RETURN WIRE FROM LSW/SENSORS/MODULES SHOULD BE CONNECTED TO DIGITAL INPUTS

DIGITAL INPUT	CONNECTION TO
DI-01 (LSW01)	MOLD OPEN
DI-02 (LSW02)	MOLD CLOSE SLOW - 1 END (START FAST)
DI-03 (LSW03)	MOLD CLOSE FAST END (START SLOW-2)
DI-04 (LSW04)	MOLD CLOSE SAFETY START
DI-05 (LSW05)	MOLD CLOSE SAFETY END (LOCKING START)
DI-06 (LSW06)	MINIMUM MOLD HEIGHT SAFETY
DI-07 (LSW07)	MOLD OPEN SLOW-1
DI-08 (LSW08)	MOLD OPEN SLOW-2
DI-09 (LSW09)	MOLD LOCKING STAGE –1 (PS1)
DI-10 (LSW10)	MOLD LOCKING STAGE –2 (PS2)
DI-11 (LSW11)	MOLD LOCKING STAGE –3 (PS3)
DI-12 (LSW12)	EJECTOR FORWARD POSITION
DI-13 (LSW13)	EJECTOR RETRACT POSITION
DI-14 (LSW14)	FRONT SAFETY GUARD + SEMI AUTO START
DI-15 (LSW15)	REAR SAFETY GUARD
DI-16 (LSW16)	DROP DETECT
DI-17 (LSW17)	CARRIAGE FORWARD POSITION
DI-18 (LSW18)	CARRIAGE RETRACT POSITION
DI-19 (LSW19)	RIP START
DI-20 (LSW20)	DOSING END (SUCKBACK START)
DI-21 (LSW21)	SUCKBACK END
DI-22 (LSW22)	ENERGY METER PULSE INPUT
DI-23 (LSW23)	MOVING PLATEN AIR EJECTOR
DI-24 (LSW24)	FIXED PLATEN AIR EJECTOR
DI-25 (LSW25)	CORE-1 IN
DI-26 (LSW26)	CORE-1 OUT
DI-27 (LSW27)	CORE-2 IN
DI-28 (LSW28)	CORE-2 OUT
DI-29 (LSW29)	HOPPER EMPTY
DI-30 (LSW30)	SCREW SPEED PROXY SENSOR
DI-31 (LSW31)	HYDRAULIC MOTOR ON INPUT
DI-32 (LSW32)	EMERGENCY INPUT(NC)

32 DIGITAL INPUTS :TYPE NPN
DIGITAL INPUTS (1-32) WIRING SCHEMATIC

**DIGITAL OUTPUTS (1-40) WIRING SCHEMATIC**



DAC OUTPUT (-10 TO +10VDC)	CONNECTION TO
DAC-1 →	FLOW CONTROL ELEMENT (DEFAULT)
DAC-2 →	PRESSURE CONTROL ELEMENT (DEFAULT)
DAC-3 →	FLOW CONTROL ELEMENT (DEFAULT)
DAC-4 →	PRESSURE CONTROL ELEMENT (DEFAULT)
GND →	TO COMMON OF AMPLIFIER CARD/SERVO DRIVE/AC DRIVE

ALL DAC CHANNELS ARE PROGRAMMABLE/USER DEFINED ON MMI TO OUTPUT EITHER OF THE FOLLOWING:

DAC PIPING	OUTPUT
S	SET FLOW
P	SET PRESSURE
B	SET BACK PRESSURE
F	FULL VALUE=100% OF DAC CHANNEL MAX. CALIBRATED VALUE
1-9	1-10%, 2-20%, 3-30%, 4-40%, 5-50%, 6-60%, 7-70%, 8-80%, 9-90% OF DAC CHANNEL MAX. CALIBRATED VALUE

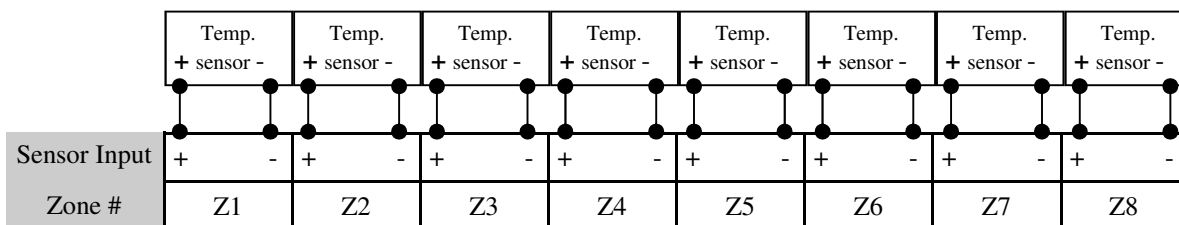
> For Backpressure proportional valve connect DAC-3/4 output to an *extra amplifier card* & set the **Auto Solenoid energization tables on MMI accordingly.**

AMPLIFIER CARD NOTES:

BY DEFAULT AMPLIFIER CARD DRIVES VALVE SOLENOIDS RATED UPTO 24VDC, 1.6A

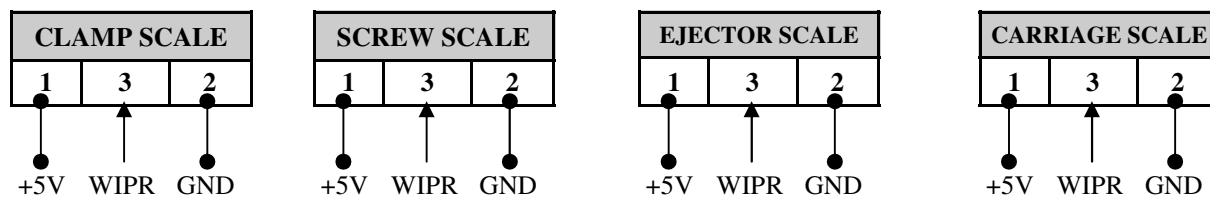
ANY ABOVE VOLTAGE REQUIREMENTS >24VDC, RECONNECT JUMPERS J1, J2 TO HV.

ANY ABOVE CURRENT REQUIREMENTS >1.6A, REPLACE 20E RESISTORS

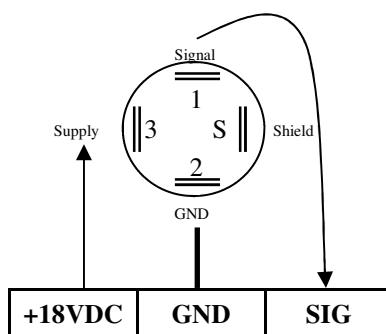


Temperature Sensor= J-type Thermocouple (Isolated)/ Pt-100 RTD

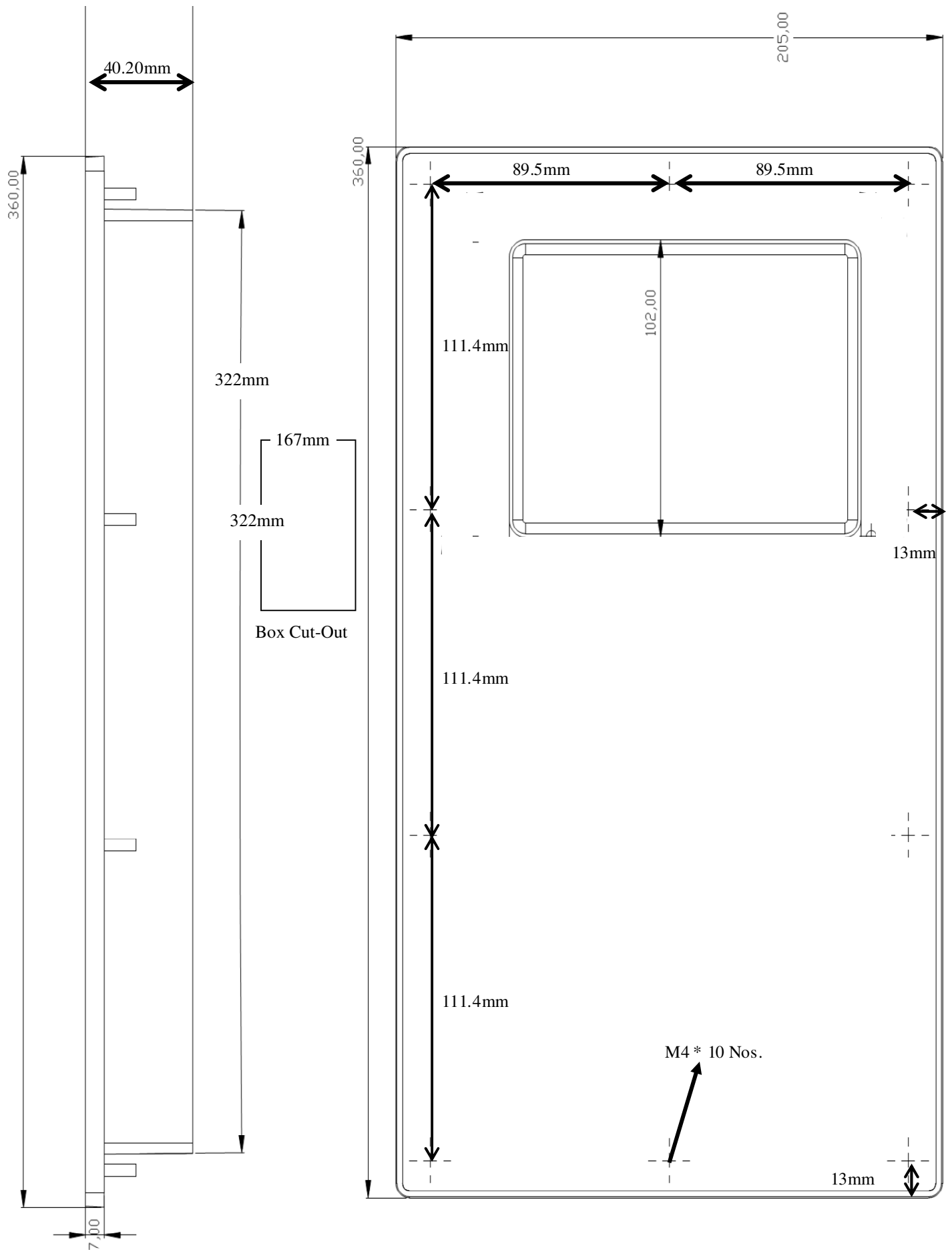
Temperature Sensor Wiring Schematic



Linear Potentiometers/Scales Wiring Schematic



Pressure Transducer Input Wiring Schematic

**SS57 Frame Mounting Dimensions**

TROUBLESHOOTING PROCEDURE FOR SS57 SYSTEM

NATURE OF FAULT & POSSIBLE RECTIFICATIONS

+24VDC POWER SUPPLY FAILED

- ✓ Check the 24VDC supply module.
- ✓ Check the MCB of the supply. If the MCB tripped then switch ON the MCB.
- ✓ If again MCB is tripping then disconnect the output wire of the supply then switch on the MCB.
- ✓ If now the MCB is not tripping then check if any output valve or proximity switch has got shorted.
- ✓ Find the faulty output Valve or proximity switch by disconnecting, all outputs.
- ✓ Then connect the outputs and proximity switches one by one to find the fault.
- ✓ If after disconnecting the outputs, MCB is still tripping then power supply rectifier has shorted, it has to be replaced.

A

ALL THE ZONE TEMPERATURES ARE OVER-SHOOTING

- ✓ Check the heater selection data on screen(Pg 13).
- ✓ If operating in open loop then reduce the Duty cycle %.
- ✓ Observe that the digital output LEDs of the temperature zones should go OFF when they reach the set temp.
- ✓ Make sure that any unused Zones are looped between Z+ & Z-
- ✓ Check the wiring in the RTD section.
- ✓ Check the EARTHING of the machine.

ALL THE ZONE TEMPERATURES ARE DISPLAYING 999

- ✓ Check the communication cable between MMI-I/O Board.
- ✓ Check the resistance of the PT-100. It should be more than 120E and less than 250E.
- ✓ If the resistance is more than 250E then replace Pt-100.
- ✓ If the resistance is less than 100E then either it is a thermocouple or it is a faulty PT-100 sensor.

B

BATTERY LOW.REPLACE WITH NEW BATTERY

- ✓ Press <START> key to skip the error & enter the PLC Homepage.
- ✓ Check the voltage on Pg.35. Battery Voltage should be greater than 2.7V
- ✓ Check the Battery Life Left. If less than 10 days please replace battery immediately.
- ✓ If this error persists on PLC startup, call service engineer & replace the internal battery.

BAD PIECE DETECTED. PLS. REMOVE.

- ✓ Make sure that Bad Piece Detect feature is Enabled on Pg. 14.
- ✓ A bad piece (cut piece) has been detected by PLC.

Please remove the piece after the mould opens and press any key to restart next cycle.

C

CHECK CORE IN/OUT & AIR EJECT POSIT

- ✓ Check the positions set in Pg. 06
- ✓ Check the positions set in Pg. 07
- ✓ The above positions should be less than or equal to the final Mold opening position on Pg. 04.

CORE-2 SELECTED. ROBOT NOT POSSIBLE

- ✓ Robot Selection and Core-2 are enabled together.
- ✓ Robot cannot be started with Core-2 in operation or enabled.
- ✓ Robot operations & Core-2 use the same set of Digital Inputs/Outputs of the PLC.

- ✓ Disable Core-2 from Pg. 36 & then Enable Robot from Pg. 41.

CLOSE SAFETY GUARD TO START CYCLE

- ✓ Close the Safety guard door to start the PLC in Full Auto run mode.

CARRIAGE FORWARD LSW ALREADY CUT

- ✓ Check the Digital input #17(on 40 output card) status on screen(Pg 21).
- ✓ Check the Digital input #14(on 32 output card) status on screen(Pg 20).
- ✓ Digital Input #17/#14 LED should be in OFF state.
- ✓ If it is ON then check the carriage forward limit switch position condition.
- ✓ If scale is used, check the forward position set on Pg.11.
- ✓ Check the carriage scale reading for stability.

CARRIAGE RET LIMIT SWITCH ALREADY CUT

- ✓ Check the Digital input #18(on 40 output card) status on screen(Pg 21).
- ✓ Check the Digital input #15(on 32 output card) status on screen(Pg 20).
- ✓ Digital Input #18/#15 LED should be in OFF state.
- ✓ If it is ON then check the carriage forward limit switch position condition.

CORE-1 IN LSW-xx NOT CUT

- ✓ Check the Digital input status #25(40 Digital output board) on Pg 22.
- ✓ Check the Digital input status #17(32 Digital output board) on Pg 21.
- ✓ Check the Digital Input #25/#17 LED, it should be ON.
- ✓ If the #25/#17 is OFF then check the position of the physical Limit Switch.

CORE-1 OUT LSW-xx NOT CUT

- ✓ Check the Digital input status #26(40 Digital output board) on Pg 22.
- ✓ Check the Digital input status #18(32 Digital output board) on Pg 21.
- ✓ Check the Digital Input #26/#18 LED, it should be ON.
- ✓ If the #26/#18 is OFF then check the position of the physical Limit Switch.

CORE-2 IN LSW-xx NOT CUT

- ✓ Check the Digital input status #27(40 Digital output board) on Pg 22.
- ✓ Check the Digital input status #19(32 Digital output board) on Pg 21.
- ✓ Check the Digital Input #27/#19 LED, it should be ON.
- ✓ If the #27/#19 is OFF then check the position of the physical Limit Switch.

CORE-2 OUT LSW-xx NOT CUT

- ✓ Check the Digital input status #28(40 Digital output board) on Pg 22.
- ✓ Check the Digital input status #20(32 Digital output board) on Pg 21.
- ✓ Check the Digital Input #28/#20 LED, it should be ON.
- ✓ If the #28/#20 is OFF then check the position of the physical Limit Switch.

CARRIAGE NOT MOVING FORWARD

- ✓ Check for any error message at the bottom of screen.
- ✓ Check the sensor selected for Carriage on Pg. 36.
- ✓ Check the corresponding Digital O/P Valves V06.
- ✓ Check the O/P voltage on the V06 it should be 24VDC
- ✓ Check carriage forward Limit switch(LSW#17),it should be OFF(Pg 21) on SS57- 40.
- ✓ Check carriage forward Limit switch(LSW#14),it should be OFF(Pg 20) on SS57- 32.
- ✓ If carriage is functioning of linear scale, check the scale functioning.
- ✓ Check the flow/pressure and time on screen (Pg 11).
- ✓ Check the carriage forward delay time(Pg 15).

CARRIAGE NOT MOVING REVERSE

- ✓ Check for any error message at the bottom of screen.
- ✓ Check the sensor selected for Carriage on Pg. 36.
- ✓ Check the corresponding Digital O/P Valves V07.
- ✓ Check the O/P voltage on the V07 it should be 24VDC

- ✓ Check carriage retract Limit switch(LSW#18),it should be OFF(Pg 21) on SS57- 40.
- ✓ Check carriage retract Limit switch(LSW#15),it should be OFF(Pg 20) on SS57- 32.
- ✓ If carriage is functioning of linear scale, check the scale functioning.
- ✓ Check the flow/pressure and time on screen (Pg 11).
- ✓ Check the carriage retract delay time(Pg 15).

CONTINUOUS +24VDC ON THE DIGITAL OUTPUT

- ✓ Check the digital output LED which is giving continuous +24VDC output supply.
- ✓ If the supply is present at the output when the LED is off then output transistor may have failed.
- ✓ In such case, transfer at fault digital output number to a spare output (Pg 38) and reconnect the output wire of the faulty digital output to the spare output terminal.

D

DATA VALUE (LOW) NOT ACCEPTED

- ✓ Data entered is less than the minimum acceptable limit.
- ✓ Check the minimum limit at the bottom of the screen during data entry.

DATA VALUE (HIGH) NOT ACCEPTED

- ✓ Data entered is more than the maximum acceptable limit.
- ✓ Check the maximum limit at the bottom of the screen during data entry.
- ✓ Check the maximum value setting on Pg 33 & 34.
- ✓ If you want to set more than the maximum value, then first increase the maximum limit/s

E

EMERGENCY PUSH BUTTON PRESSED

- ✓ Check whether the physical Emergency Push Button is released.
- ✓ Check the Digital input #32(on 40 output card) status on screen(Pg 22).
- ✓ Check the Digital input #24(on 32 output card) status on screen(Pg 21).
- ✓ Check the Digital input #24/#32 Red LED. It should be ON.
- ✓ Short both wires of the emergency Push Button. If error goes off then Emergency Push Button is faulty. Replace it.

ELECTRIC MOTOR OFF

- ✓ Check the Digital input #31(on 40 output card) status on screen(Pg 22).
- ✓ Check the Digital input #23(on 32 output card) status on screen(Pg 21).
- ✓ Check the Digital Input #23/#31 LED, it should be ON.
- ✓ If it is OFF then check the wiring, common wire of the 24VDC should be connected to the input serial #23/#31 in series with NO contact of the electric motor contactor.

EJECTOR NOT AT RETRACT POSITION

EJECTOR NOT RETRACTED, MOULD OPENING

- ✓ For mould closing the ejector should be in retract position.
- ✓ Check the Digital input #13(on 40 output card) status on screen(Pg 20).
- ✓ Check the Digital input #10(on 32 output card) status on screen(Pg 20).
- ✓ Check the Digital Input #10/#13 LED, it should be ON.
- ✓ If the digital input #10/#13 is OFF then check the position of the retract limit switch.
- ✓ If ejector scale is used please check the ejector retract position(mm) set.
- ✓ Check the status of ejector scale functionality.
- ✓ If timer mode is selected keep the ejector in retract position for mold closing

EJECTOR NOT MOVING FORWARD

- ✓ Check for any error message at the bottom of screen.
- ✓ Check the corresponding Digital O/P Valves V09.

- ✓ Check the Digital output #09 status on screen(Pg 25).
- ✓ Check the O/P voltage on the V09, it should be 24VDC
- ✓ Check the Digital input #12(on 40 output card) status on screen(Pg 20).
- ✓ Check the Digital input #09(on 32 output card) status on screen(Pg 20).
- ✓ The digital inputs #12/#09 should be OFF.
- ✓ Check the flow/pressure and time on screen (Pg 05).

EJECTOR NOT MOVING REVERSE

- ✓ Check for any error message at the bottom of screen.
- ✓ Check the corresponding Digital O/P Valves V10.
- ✓ Check the Digital output #09 status on screen(Pg 25).
- ✓ Check the O/P voltage on the V10 it should be 24VDC
- ✓ Check Limit switch(LSW#10),it should be OFF on screen(Pg 20).
- ✓ Check the flow/pressure and time on screen (Pg 05).

F

FRONT SAFETY GUARD IS NOT CLOSE

- ✓ Fully close the front safety guard.
- ✓ This signal should be **continuously ON** for machine operation.
- ✓ Check the Digital input #14(on 40 output card) status on screen(Pg 20).
- ✓ Check the Digital input #11(on 32 output card) status on screen(Pg 20).
- ✓ If it is OFF then check the Limit Switch.Short both the terminals of the Limit Switch.If the Input LED lits then the Limit Switch is faulty.
- ✓ Open and Close the rear guard & observe the LED serial No.14/11. If it is OFF when the gate is close and it is ON when gate is open then change both the wire from NC to NO contact.

FINAL INJECTION POSITION ALREADY REACHED

- ✓ When time option is selected then injection stage is controlled by stage time set on Pg 8.
- ✓ When position is selected then injection stage is controlled by set position, if final position is reached then the above message will appear.
- ✓ Check the set final injection position on the screen 8.
- ✓ Check the cushion position – End of of hold on.
- ✓ Cushion position should be less than or equal to final injection position.
- ✓ Check the screw scale reading for stability.

FLOW/PRESSURE CURRENT METER NOT INDICATING

- ✓ Check for any error message at the bottom of the screen.
- ✓ Check the voltage at the Flow/Pressure terminals of the PLC.
- ✓ Does the voltage correspond to the entered Flow/Pressure?
- ✓ Check the polarity of the respective current meter connected.
- ✓ Operate machine in HAND mode & observe whether the ammeter pointer moves or not.
- ✓ If the current meter remains inactive & operation is in place then the meter is faulty.

G

H

HOPPER EMPTY

- ✓ Check the powder content in the hopper.
- ✓ This signal should be **continuously ON** for machine operation.
- ✓ Check the Digital input #29(on 40 output card) status on screen(Pg 22).
- ✓ Check the Digital input #21(on 32 output card) status on screen(Pg 21).
- ✓ Check whether the powder sensor is functioning.

HEATERS NOT PUT ON

- ✓ Heaters must be put ON for PLC to run in Auto/Semi mode.
- ✓ Press <Heater> key for at least 2 sec until the LED of heater key is ON.

HYD.OIL TEMP.LOW-START MOTOR TO HEAT

- ✓ Check the Heater setting data of the Hydraulic Oil Zone on (Pg 12)
- ✓ Check the Heater selection data of the Zone on (Pg 13).
- ✓ If open loop is selected then increase the duty %
- ✓ The oil temp. is low because of non circulation in the system. Start Hydraulic motor to circulate hydraulic oil thereby increasing the temperature of oil.
- ✓ Check the heater resistance of that Zone.
- ✓ Check the coil resistance of the contactor.
- ✓ Check any loose connection of the wiring to the contactor.
- ✓ Check the PT-100 sensor of that Zone.
- ✓ Check the ammeter reading of the Zone.

HYD.OIL TEMP.HIGH. CHECK COOLING SYSTEM

- ✓ Check that the Digital O/P of the zone should be OFF when actual temp is more than the set temp.
- ✓ Check the contactor coil supply voltage. Check that the contactor spring is not stuck.
- ✓ Check the output voltage of the Digital O/P should be zero when LED is OFF, If it is not zero when the LED is OFF then transfer the same O/P to the spare Digital output output and connect the trouble zone.
- ✓ If all above conditions are OK then check the zone sensor PT-100. Is it faulty?
- ✓ Check the Heater selection data on Pg 13, if it is open loop then reduce the Duty %.
- ✓ Check if the hydraulic oil is choking in the hydraulic system causing an increase in temperature.

HYDRAULIC EJECTOR FORWARD LSW CUT

- ✓ The hydraulic ejector is in forward position.
- ✓ Check the Digital input #12(on 40 output card) status on screen(Pg 20).
- ✓ Check the Digital input #09(on 32 output card) status on screen(Pg 20).
- ✓ The digital inputs #12/#09 should be ON.
- ✓ Check the physical state of the Forward Limit Switch.

HYDRAULIC EJECTOR REVERSE LSW CUT

- ✓ The hydraulic ejector is in retract position.
- ✓ Check the Digital input #13(on 40 output card) status on screen(Pg 20).
- ✓ Check the Digital input #10(on 32 output card) status on screen(Pg 20).
- ✓ The digital inputs #13/#10 should be ON.
- ✓ Check the physical state of the Forward Limit Switch.

HEATERS ARE OFF EVEN TEMPS ARE INCREASING

- ✓ Check the contactor O/P supply to the heaters.
- ✓ If any contactor is ON then check the coil supply to the contactor.
- ✓ If the supply is present then check the O/P voltage on the PLC.
- ✓ If 24VDC supply is present at the o/p terminal of the corresponding output is shorted.
- ✓ Then transfer that zone to the spare digital output.

HEATERS NOT SWITCHING ON

- ✓ Check for any error message
- ✓ Press the heater on key for at least 2 sec & see whether heaters key LED is ON.
- ✓ Check heater settings on Pg 12,13;whether all the zones are enabled.

HEATERS ON, BUT TEMPERATURES NOT INCREASING

- ✓ Check the set temp on Pg 12,it should be more than the actual temp.
- ✓ Check the heater selection data on the (Pg 13),it should be PRE/CLS if operating in close loop.
- ✓ It should be OPN/ABS if operating in open loop.In this case Duty % should not be zero.

- ✓ Check the 24VDC power supply.
- ✓ Check the respective Digital O/P LED on the back of PLC, it should be turned ON.
- ✓ Check the coil voltage of the respective contactor.
- ✓ Check the O/P AC voltage of the contactor, if the voltage is present then switch off the main supply and check the resistance of the heater.
- ✓ If it is open then replace the heater.

I

INJECTION FINAL POSITION NOT REACHED

- ✓ Check the Total injection time. It may be very less time to achieve the set position(Pg 08).
- ✓ Check the final injection setting position.
- ✓ Check the injection pressure/flow setting it may be less to achieve injection within the set time.

INVALID USB OR CONTROLLER PROG.NOS.

- ✓ On Pg.56, invalid entries have been input on either the USB source Starting No., Last Program No. or Destination PLC Program No.
- ✓ USB Start Prog. No should be between 1 & 120
- ✓ Last Prog. No should be more than or equal to USB Start Prog. No & less than 120
- ✓ Controller Start Prog.No should be 120-(USB Start Prog. No+ Last Prog.No)

J

K

L

LUBRICATION OIL LEVEL LOW.M/C STOPED

- ✓ Check whether the Lub Oil Level signal is high(**NC**).
- ✓ This signal should be **continuously ON** for machine operation.
- ✓ Check the Digital input #08(on 40 output card) status on screen(Pg 19).
- ✓ Check the Digital input #03(on 32 output card) status on screen(Pg 19).
- ✓ Check whether the Lub Oil system functioning.

LSW03/LSW04 CUT BEFORE LSW02

- ✓ Valid for **ONLY** 40 output card
- ✓ During Mold closing, the PLC has detected Mold Close End/Safety End signal before Mold Close Fast End.
- ✓ Actual cut sequence = LSW02>>LSW03>>LSW04
- ✓ Check Digital Input (LSW#02) LED during closing, it should be ON after Mold Fast End.
- ✓ If the LSW#02 is OFF after Fast End then check the status of the Limit Switch.
- ✓ Also check Digital Input(LSW#03/LSW#04) during closing. Should ON as per their respective limit switch status and mold closing stages.

LSW04 CUT BEFORE LSW03

- ✓ Valid for **ONLY** 40 output card
- ✓ During Mold closing, the PLC has detected Mold Locking End signal before Mold Close Safety end End signal.
- ✓ Actual sequence = LSW03>>LSW04
- ✓ Check Digital Input (LSW#03) LED during closing, it should be ON after Mold Safety End.
- ✓ If the LSW#03 is OFF after Safety End then check the status of the Limit Switch.
- ✓ Also check Digital Input(LSW#03/LSW#04) during closing. Should ON as per their respective limit switch status and mold closing stages.

M**MOULD NOT AT OPENING POSITION**

- ✓ To start Auto/Semi mode, mould should be fully open.
- ✓ Check the mould open data setting flow/press/position (Pg 04).
- ✓ Check any wiring issues of the linear scale.
- ✓ If operated on Limit switches, Make sure Digital Input LSW#01 is cut(PG 19).

MOULD CLOSE TIME OVER, MOULD OPENING

- ✓ Mould close time entered might be too small to complete the mold closing stage
- ✓ Increase the mould close time on Pg 03.
- ✓ Check the flow/pressure in all stages of the mould closing. It may be not sufficient to close the mould. Change the settings

MINIMUM MOULD HEIGHT-LSW05 CUT

- ✓ During the Die height setting operating, LSW05 is cut
- ✓ Check the Digital input #05(on 40 output card) status on screen(Pg 19).
- ✓ Check the Digital input #02(on 32 output card) status on screen(Pg 19).
- ✓ Check the Digital Input #5/#2 LED, it should be ON.
- ✓ If the Die height is not physically cut, please check the Limit Switch.

MOULD SAFETY TIME OVER

- ✓ Check the mould safety time on Pg 03.
- ✓ If the safety time is too less to achieve the set position then increase the safety time.
- ✓ If the time is sufficient then increase slow-2 stage flow/pressure.
- ✓ Check the safety position reading/Limit switch(LSW03) (on 40 output card) .

MOULD CLOSE SAFETY LSW03 CUT

- ✓ Mould safety Limit switch is cut please check the die and set the safety Limit Switch appropriately.

MOULD ALREADY IN CLOSED POSITION

- ✓ Check the mould close position and actual position, If both are same then the above message will be displayed.
- ✓ If you further want to close the mould then reduce the setting of the mould close position on Pg 03 when Linear scale mode is selected.
- ✓ On 40 Digital Output card, make sure Digital input LSW04 is not cut, when operating in Limit switch mode.

MOULD ALREADY OPENED

- ✓ Check the mould open limit switch(LSW#01) on 40 Digital Output board.
- ✓ It should be OFF on Pg 19.
- ✓ If opening is scale-based then check the Slow-3 stage position.
- ✓ It should be more than the actual clamp position on page 03.
- ✓ Check the clamp scale reading for stability.

MOULD NOT CLOSING

- ✓ Check for any error message at the bottom of screen.
- ✓ Check the Clamp scale reading on Homescreen. It should be steady & accurate.
- ✓ Check Rear/Front safety guard Limit switches(LSW #15/#14) on SS57-40, both should be ON under Digital I/P status(Page 20).
- ✓ Check the Digital Inputs #14/#15 Red LED on SS57-40 Input/Output board of the PLC. Both should be ON.
- ✓ Check Rear/Front safety guard Limit switches(LSW #12/#11) on SS57-32, both should be ON under Digital I/P status(Page 20).
- ✓ Check the Digital Inputs #11/#12 Red LED on SS57-32 Input/Output board of the PLC. Both should be ON.
- ✓ Check the Ejector Retract Limit LSW #13 should be ON and LSW #12 on SS57-40

should be OFF under Digital I/P status(Page 20).

- ✓ Check the Ejector Retract Limit LSW #10 should be ON and LSW #09 on SS57-32 should be OFF under Digital I/P status(Page 20).
- ✓ Check the mould closing data setting pressure and flow(Page 03).
- ✓ If it is low then increase the flow & pressure setting.
- ✓ Check the output Valves for mould close(V01),is it connected to DO#1 of PLC.

MOULD NOT OPENING

- ✓ Check for any error message at the bottom of screen.
- ✓ Check the Clamp scale reading on Homescreen. It should be steady & accurate.
- ✓ Check the mould opening data settings for pressure and flow(Page 04).
- ✓ Check the mould open Limit switch(LSW#01),it should not cut (i.e. it should be in OFF state on(PG 19) on SS57-40.
- ✓ On SS57-32, check the clamp scale reading & functionality.
- ✓ Check the output Valves for mould open(V02),is it connected to DO#2 of PLC.

MCB OF THE POWER SUPPLY IS TRIPPING

- ✓ Disconnect the output of the power supply unit.
- ✓ Check the fuse of the SMPS module.
- ✓ Check for shorting in the PLC.

N

NO DISPLAY

- ✓ Check the Power ON LED Indicator on the center of the key MMI.
- ✓ If centre LED is ON, increase LCD contrast by pressing <INC> key.
- ✓ If still the LCD brightness doesn't increase call VIGNAN service engineer.
- ✓ IF centre LED is OFF, Check the +24VDC MMI supply cable from I/O Board connection.
- ✓ Check Main +24VDC SMPS supply.

NO ANY HAND OPERATION

- ✓ Check the selection of the PLC mode. It should be in "Hand" mode only.
- ✓ Check for any error message at the bottom of screen.
- ✓ Check the Emergency push button Digital Input #32(on 40 Digital Output Board).
- ✓ Check the Emergency push button Digital Input #24(on 32 Digital Output Board).
- ✓ Digital Inputs #32/#24 should be ON under Digital I/P status(Page 22/21).
- ✓ Check the Digital Input #32/#24 Red LED on Input/Output board of the PLC. It should be ON.
- ✓ Check the Motor ON Digital Input #31(on 40 Digital Output Board).
- ✓ Check the Motor ON Digital Input #23(on 32 Digital Output Board).
- ✓ Digital Inputs #31/#23 should be ON under Digital I/P status(Page 22/21).
- ✓ Check the Digital Input #31/#23 Red LED on on Input/Output board of the PLC. It should be ON.
- ✓ Check the 24VDC supply & common wiring.

NO INJECTION

- ✓ Check for any error message at the bottom of screen.
- ✓ Heaters should be put ON.
- ✓ Hydraulic motor should be ON.
- ✓ Injection temperature should be less than actual
- ✓ All the zone temperature should be more than minimum injection temperature(Pg 13).
- ✓ Check the O/P V03 (Injection) should be ON(Pg 24).
- ✓ Check the Screw scale reading on Homescreen. It should be steady & accurate.
- ✓ Check the O/P voltage on the V03 it should be 24VDC
- ✓ Check powder in the Hopper.
- ✓ Check the Nozzle. Is it choked?

NO REFILLING

- ✓ Check for any error message at the bottom of screen.
- ✓ Check the powder in the hopper.
- ✓ On SS57-32, Check the screw scale for proper functionality.
- ✓ On SS57-40, Check the input Limit switch(LSW#20 (on Pg 21)),it should not ON.
- ✓ Check pressure/flow of the refilling stages(Pg 10).
- ✓ Depending on the selection, check the Time/Position of the refilling stages on page 10.
- ✓ Check the Screw scale reading on Homescreeen.It should be steady & accurate.
- ✓ Check the corresponding Digital O/P Valves V05.
- ✓ Check the O/P voltage on the V05 it should be 24VDC

NO 24VDC POWER SUPPLY

- ✓ Check the AC supply input to the DC-DC power supply module.
- ✓ If AC supply is present then disconnect the output of SMPS and check the output voltage
- ✓ It should measure between 23-26VDC.
- ✓ Now connect the SMPS to PLC & recheck the output voltage of the power module.It should not go below 24VDC.If it drops below 24VDC then there is short circuit in the SMPS module/PLC.

O**OPEN AND CLOSE SAFETY DOOR TO START**

- ✓ In Semi Auto mode after completing one cycle, Open and Close the front safety guard to start next cycle.

P**PLEASE SET TEMPERATURE ABOVE MINIMUM VALUE**

- ✓ All the Zone Set temperatures should be more than minimum injection temperature.
- ✓ Check the minimum injection temperature (Pg 13).

Q**R****REAR SAFETY GUARD IS NOT CLOSE**

- ✓ Fully close the rear safety guard.
- ✓ This signal should be **continuously ON** for machine operation.
- ✓ Check the Digital input #15(on 40 output card) status on screen(Pg 20).
- ✓ Check the Digital input #12(on 32 output card) status on screen(Pg 20).
- ✓ Check the Digital Input LED, it should be ON.
- ✓ If it is OFF then check the Limit Switch. Short both the terminals of the Limit Switch.If the Input LED lits then the Limit Switch is faulty.
- ✓ Open and Close the rear guard & observe the LED serial No.15/12. If it is OFF when the gate is close and it is ON when gate is open then change both the wire from NC to NO contact.

REFILL NOT ACHIEVED. CHECK HOPPER

- ✓ Check the powder in the hopper.
- ✓ Check the refill time it may be very small on Pg 10.
- ✓ Check the refilling position.

REFILL/DOSING POSITION ALREADY REACHED

- ✓ When time option is selected then refilling is controlled by stage time set on Pg 08.
- ✓ When position is selected then refilling stage is controlled by set position, if final position is reached then the above message will appear.

- ✓ Check the refilling set position on the Pg 10
- ✓ Check the Stage 3 position of the refilling.
- ✓ Check the screw scale reading for stability.

REQD BATCH PRODUCTION COMPLETED

- ✓ Set amount of production batches completed in full Auto/Semi Auto cycle.
- ✓ Check the value set on Pg 44.

ROBOT FAULT DETECTED,MACHINE STOPPED

- ✓ When Robot is enabled, PLC has detected a failure of Robot.
- ✓ Check whether Robot is giving out required signals to the PLC.
- ✓ Check the Digital input status #27,#28 (on 40 output card) on Pg 22.
- ✓ Check the Digital input status #19,#20 (on 32 output card) on Pg 221.
- ✓ Check the Digital Inputs LED, it should be ON.
- ✓ If the Robot interface Digital Inputs are OFF then check the status of Robot
- ✓ Restart the Robot.

ROBOT NOT SELECTED.

- ✓ Robot operation is being initiated without the Robot function being enabled on Pg. 41.
- ✓ Enable the Robot Selection to start Robot operations.

ROBOT IS NOT READY

- ✓ When Robot is Enabled,the PLC fails to detect the Robot Ready Digital Input.
- ✓ Check the Digital input #14(on 40 output card) status on screen(Pg 20).
- ✓ Check the Digital input #11(on 32 output card) status on screen(Pg 20).
- ✓ Check whether the Robot is sending the Ready signal to PLC.

S

SYSTEM FAIL DETECTED...CALL SERVICE ENGG

- ✓ Call VIGNAN Representative immediately on the numbers provided on startup screen.

SAFETY GATE OPEN, MOULD OPENING

SAFETY GATE OPENED, MACHINE STOPPED

- ✓ Either front or rear safety gate is opened during Auto running of the machine.
- ✓ During running in Full Auto mode, if this error comes then check the Front/Rear safety gate Limit Switch.
- ✓ Check the Digital input #14(on 40 output card) status on screen(Pg 20).
- ✓ Check the Digital input #11(on 32 output card) status on screen(Pg 20).
- ✓ Check the Digital input #15(on 40 output card) status on screen(Pg 20).
- ✓ Check the Digital input #12(on 32 output card) status on screen(Pg 20).
- ✓ All the Digital Input LED should be ON.
- ✓ Check whether the gate is properly closed or there is loose contact in the safety door limit switch.

SAFETY TIME IS OVER MOULD OPENING

- ✓ Check mould safety time it may be very small on Pg 04.
- ✓ Increase the mould safety time on Pg 03.
- ✓ Check the mould safety pressure/flow it may be very low. If it is so then increase the settings.

SAFETY ATTEMPS EXCEEDED,M/C STOPPED

- ✓ Mold closing in safety stage is not achieved. Please check for any obstruction.
- ✓ Check the mould safety time on Pg 03.
- ✓ If the safety time is too less to achieve the set position then increase the safety time.
- ✓ If the time is sufficient then increase slow-2 stage flow/pressure.
- ✓ Check the safety position reading/Limit switch(LSW03) on 40 Digital Output card.

SCREW NOT AT REFILL FINAL POSITION.

- ✓ Check if Refill is selected on Timer/Position.
- ✓ If timer is selected ,screw refill to the final position is not completing in the time set. Increase the refill time or retune the final refill position.
- ✓ If position is selected, readjust the final refill position.
- ✓ Check the screw scale reading for stability.

SET CYCLE TIME OVER. MACHINE STOPPED

- ✓ The machine can't finish the entire shot cycle in the set Total cycle time.
- ✓ On Pg. 15, check the actual time taken by the cycle to complete & increase the Total cycle time parameter.

SUCK BACK POSITION ALREADY REACHED

- ✓ Suck back can be selected either Pre-suckback or Post-suckback or both.
- ✓ Check the selection of the suck back on the Pg 10.
- ✓ Check the Pre-suckback/Post-suckback position on Pg 10.
- ✓ Check the screw scale reading for stability.

SUCK BACK NOT WORKING

- ✓ Check for any error message at the bottom of screen.
- ✓ Check the sensor selected for Screw on Pg. 36.
- ✓ Check the Screw scale reading on Homescreeen.It should be steady & accurate
- ✓ Check the corresponding Digital O/P Valves V04.
- ✓ Check the O/P voltage on the V4 it should be 24VDC
- ✓ Check the suck back flow/pressure(Pg 10)
- ✓ Check time, if time mode selected else check position settings (Pg 10).

SDCARD INITIALIZATION FAILED.

- ✓ PLC has failed to detect the SDCard inserted.
- ✓ SDCard is corrupted.
- ✓ SD Card Socket is damaged.

SDCARD BUSY,RETRY.

- ✓ On Pg.47, try entering the shot number again
- ✓ or Try entering a different shot number.

SCALE READINGS NOT STEADY

- ✓ Check the communication cable between MMI-I/O Board.
- ✓ Check the reading on the screen, Is it changing without any movement of the scale? If it is changing then check the scale.
- ✓ Remove the terminals of the scale, measure the resistance between terminal 1 & 3,then check the resistance between 1 & 2 terminal, then move the scale very slowly by hand, the resistance on resistance meter should increase or decrease linearly.
- ✓ If the resistance is not changing linearly then the scale is faulty.
- ✓ Check the AC voltage at the terminal of the scale.
- ✓ If AC voltage is present then properly EARTH the machine.

SOLENOID FUSE BLOWING

- ✓ Check the resistance of the solenoid. It should not be zero.

T**TEMPERATURE OVER-SHOOTING OF ANY ONE ZONE**

- ✓ Observe the Digital O/P LED of the corresponding zone.
- ✓ Check the contactor coil supply voltage. Check that the contactor spring is not stuck.
- ✓ Check the output voltage of the Digital O/P should be zero when LED is OFF, If it is not zero when the LED is OFF then transfer the same O/P to the spare Digital O/P output and connect the trouble zone.

- ✓ If all above conditions are OK then check the zone sensor PT-100. Is it faulty?

U**USB/SDCARD NOT FOUND/NON-FAT32 DISK**

- ✓ USB drive inserted is not FAT/FAT32 formatted.
- ✓ SDCard is not available in the PLC or not functioning for data transfer.
- ✓ USB drive is corrupted.
- ✓ Check the USB cable for proper connection.

V**W****WAITING FOR ROBOT SEQUENCE COMPLETION**

- ✓ When Robot is Enabled, the PLC fails to detect the Robot cycle finished digital signal.
- ✓ Check the Digital input #28(on 40 output card) status on screen(Pg 22).
- ✓ Check the Digital input #20(on 32 output card) status on screen(Pg 21).
- ✓ Check the Digital Inputs LED, it should be ON.
- ✓ If the LSW#28 is OFF then check the status of Robot system.
- ✓ Check whether the Robot is sending the Sequence complete signal to PLC.

X**Y****Z****ZONE X...TEMP LOW MACHINE STOPPED**

- ✓ Check the Heater setting data of the Zone on (Pg 12)
- ✓ Check the Heater selection data of the Zone on (Pg 13).
- ✓ If open loop is selected then increase the duty %
- ✓ Check the heater resistance of that Zone.
- ✓ Check the coil resistance of the contactor.
- ✓ Check any loose connection of the wiring to the contactor.
- ✓ Check the PT-100 sensor of that Zone.
- ✓ Check the ammeter reading of the Zone.

ZONE X...TEMP HIGH MACHINE STOPPED

- ✓ Check that the Digital O/P of the zone should be OFF when actual temp is more than the set temp.
- ✓ Check the contactor coil supply voltage. Check that the contactor spring is not stuck.
- ✓ Check the output voltage of the Digital O/P should be zero when LED is OFF, If it is not zero when the LED is OFF then transfer the same O/P to the spare Digital output and connect the trouble zone.
- ✓ If all above conditions are OK then check the zone sensor PT-100. Is it faulty?
- ✓ Check the Heater selection data on Pg 13, if it is open loop then reduce the Duty %.

ZONE TEMP. LOW, INJ+REFIL+SKBK PUT OFF.

- ✓ One of the active temperature zones is below the set temperature-low alarm value.
- ✓ Readjust the set temperature of the low zone.
- ✓ Check the sensor of the low temperature reading zone.
- ✓ Check the minimum injection temperature on Pg. 13.
- ✓ All zone set temperatures should be above minimum injection temperature.

ZONE TEMPERATURES ARE NOT STEADY

- ✓ Check the communication cable between MMI-I/O Board.
- ✓ Check for any loose contacts in the PT-100 wiring.
- ✓ Check the 5VDC supply on the analog input card where PT-100 connection is done.
- ✓ Check the isolation of the PT-100 with the body.
- ✓ Check the AC voltage at the PT-100 input terminal, there should not be any AC voltage.
- ✓ Make sure that any unused Zones are looped between Z+ & Z-
- ✓ If any AC voltage is present there, then EARTH the machine with thick wire.