UTM
PTE LTD

FM-400
FILTER MAKING MACHINE

PREFACE

Notes About Documents

This description is intended only for use by trained specialists in the field of control and automation engineering who understand the applicable national standards. The following documents, notes, and explanations must be followed when installing and operating components. It is the duty of technical personnel to use the documents issued at the time of each installation and commissioning.

Responsible staff must ensure that the application or use of the described product meets all safety requirements, including all relevant laws, regulations, guidelines and standards.

Statement

This document has been carefully prepared. However, the described product is still being developed. We reserve the right to revise and amend this document at any time and without prior notice. Claims for product modifications that have been provided should not be made based on the data, diagrams and descriptions in this document.

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SUMMARY

Figure 0.1 FM-400 Filter Making Machine

FM-400 cigarette filter making machine is a special equipment for the tobacco industry, designed for the automatic production of cigarette filters. With the ability to adjust the filter diameter and length according to specifications, as well as accurate control using PLC and servo systems, this machine ensures precision and quality in filter manufacturing. With high production capacity up to 400 meters per minute, the machine is suitable for mass production with high efficiency.

Equipped with FM-400 Filter Maker and F80 Auto Tray Filler units, as well as a total power of 40KW for FM-400 and 15KW for F80, this machine is ideal for large-scale production. With a total weight of approximately 6,500 Kg, this machine offers stability and reliability in industrial environments. FM-400 cigarette filter rod making machine is also known as the best choice for small and medium-sized cigarette factories, with its stable operation and ability to produce high-quality filter rods with a maximum speed of 400m per minute.

PANEL CONTROL

The FM-400 and F80 control panels are equipped with various buttons and selectors which are one of the key elements in engine operation, designed to give the operator the ability to manage and control various aspects of engine performance. With these buttons, the operator can easily make adjustments to the parameters, depending on the complexity and function of the machine.

1. PANEL FM-400

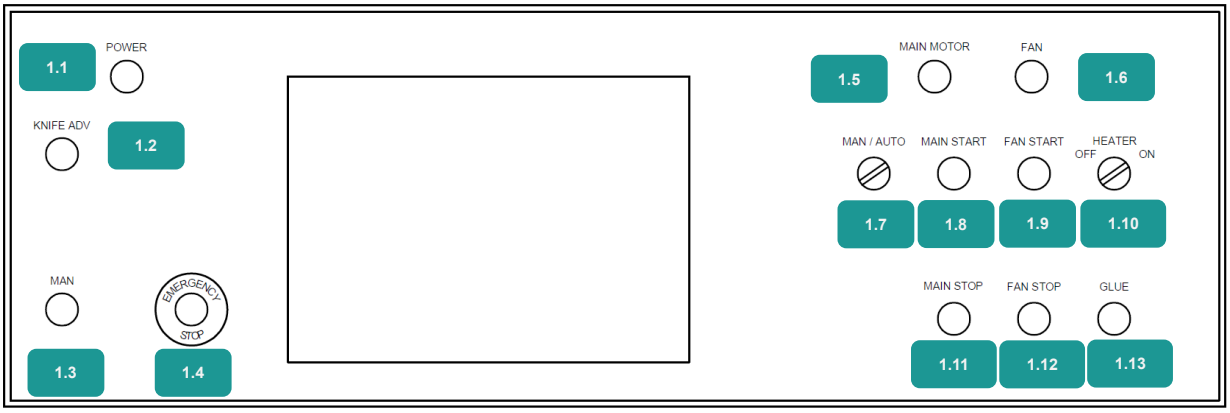

Figure 1.1 Panel FM-400

Position Function	Description
1.1	Indicator lights that indicate the state / power status of the engine.
1.2	Indicator light that indicates the state / status of the knife adv when activated manually.
1.3	The button that serves to activate the adv knife manually.
1.4	The button that serves to disable the FM-400 engine in an emergency.
1.5	Indicator lights that indicate the state / status of the main motorcycle.
1.6	Indicator lights that indicate the state / status of the fan.
1.7	Selector that functions to select Man/Auto mode when the machine is activated.
1.8	The button that functions to activate the main motor on the engine.
1.9	The button that serves to activate the fan on the machine.

1.10	Selector that functions to select On/Off mode in the heater settings.
1.11	The button that functions to disable the main motor on the engine.
1.12	The button that serves to disable the fan on the machine.
1.13	The button that serves to activate the glue on the machine.

2. PANEL F80

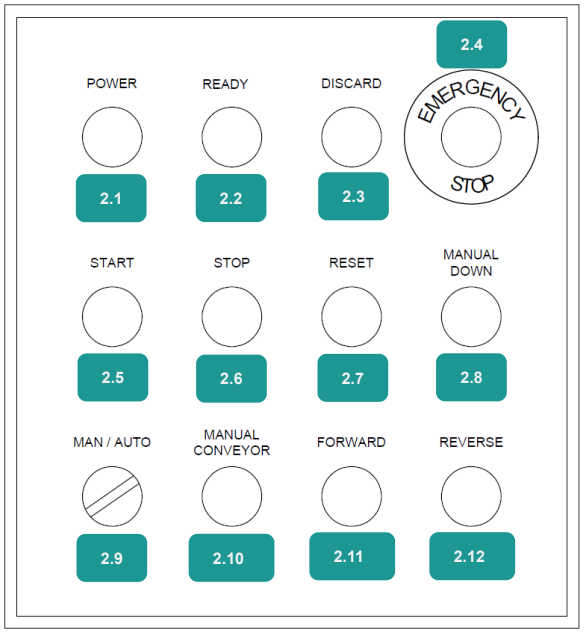

Figure 1.2 Panel F-80

Position Function	Description
2.1	Indicator light that indicates if the engine power is on.
2.2	Indicator lights indicating when the F-80 engine is ready.
2.3	Indicator light that indicates when there is a cigarette entering.
2.4	Emergency Switch.
2.5	The button that serves to start the machine.
2.6	The button that serves to stop the running of the engine.
2.7	The button that serves to reset data on the F-80 engine.

2.8	The button that serves to lower the tray manually. Only when manual mode.
2.9	Selector that functions to select manual/auto mode of running F-80 engines.
2.10	The button that functions to activate the cigarette conveyor when the machine is running manually.
2.11	The button that functions to run the forward conveyor tray manually. Only when manual mode.
2.12	The button that functions to manually run the reverse conveyor tray. Only when manual mode.

HOME SCREEN

1. MAIN SCREEN

When the device is turned on, the screen will display the FM-400 main screen and a number of interactive menus. Users can also easily view production statistics, including information on Tray Product, Knife Advance, Rod Speed, Meter/min, Speed of Servo Roll 1, Servo Roll 2, and Servo Roll 3. By presenting a detailed menu, the system gives the user the ability to control specific FM-400 operations and monitor engine performance.

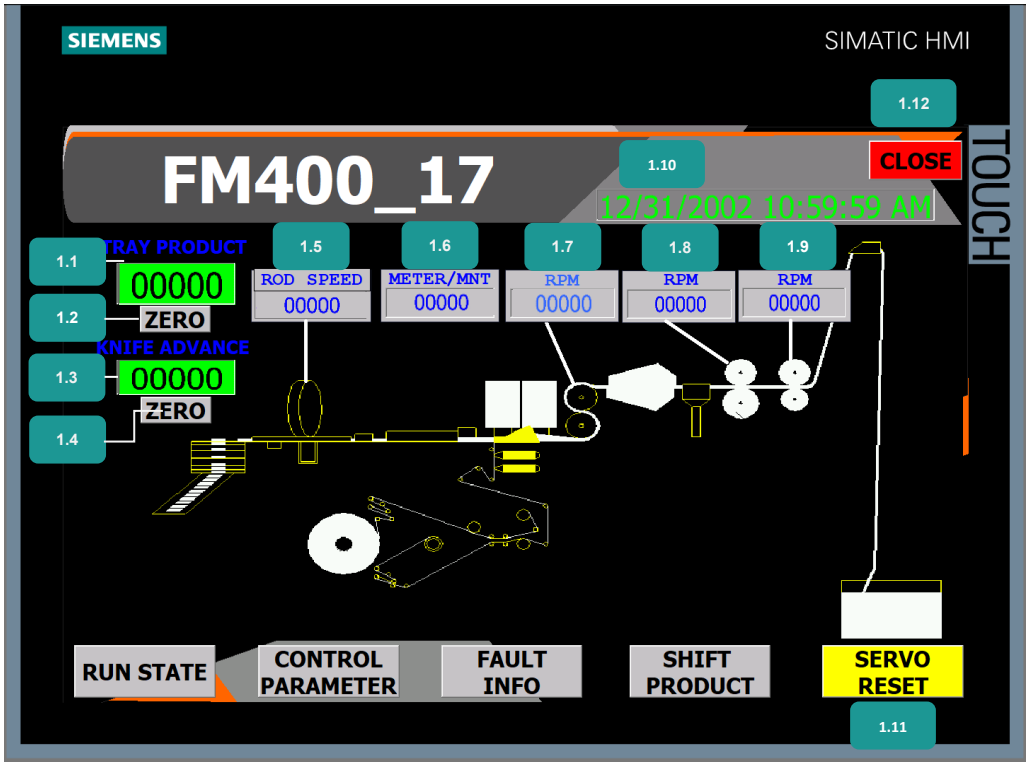

Figure 2.1 FM-400 Main Screen

Position Function	Description
1.1	Displays the number of trays produced out of the F80.
1.2	The button that serves to reset the number of trays that come out.
1.3	Displays the calculation (counter) of the number of knives advanced sharpening that occurs on the blade.
1.4	The button that serves to reset the number of adv knives.

1.5	Displays the production speed of the rod machine.
1.6	Displays the production speed of the machine Meters/Minute.
1.7	Displays the speed of Servo Roll 1.
1.8	Displays the speed of Servo Roll 2.
1.9	Displays the speed of Servo Roll 3.
1.10	Displays the date and time.
1.11	The button that functions to reset the entire Servo Roll.
1.12	The button that serves to close or turn off the HMI screen.

On the FM-400 engine screen there are 5 main menus, users can navigate the menu to access various features and functions, such as Run State, Control Parameter, Fault Info, Shift Product, and Main Screen.

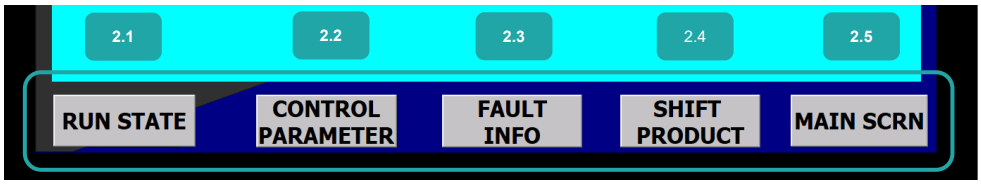

Figure 2.2 Home Screen Menu

Fungsi Posisi	Description
2.1	The button that serves to direct the screen to the Run State view.
2.2	The button that serves directs to the Control Parameter display screen.
2.3	The button that serves directs to the Fault Info display screen.
2.4	The button that serves directs to the Shift Product display screen.
2.5	The button that serves to direct to the Main Screen display screen.

2. RUN STATE

By pressing the menu button ”Run State”, The screen will switch to view Menu Run State on the FM-400 machine, there are a number of sub menus such as, KDF2, AF2, I/O State, Shift Time Set.

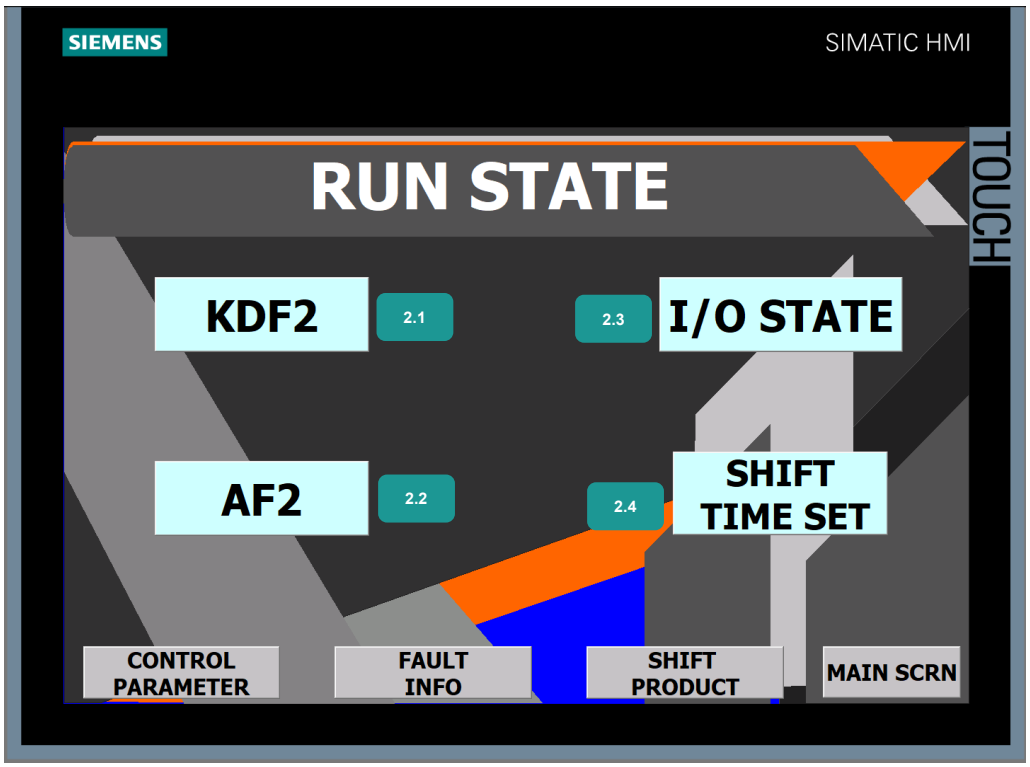

Figure 2.3 Run State Display

Position Function	Description
2.1	The button that serves directs to the KDF2 display.
2.2	The button directs to the AF2 display.
2.3	The button that serves to point to the I/O State view.
2.4	The button that serves directs to the Shift Time Set display.

On the KDF2 & AF2 screen displayed, there is a visualization that shows the position of each sensor installed on the machine, allowing users to easily track and monitor the location and condition of each sensor installed in the machine.

2.1 KDF2

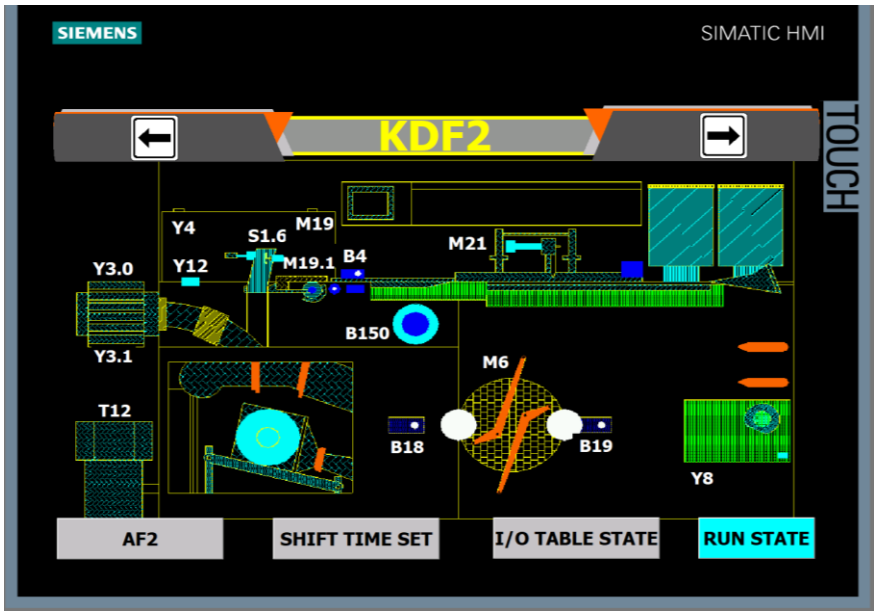

Figure 2.4 KDF2 Display

2.2 AF2

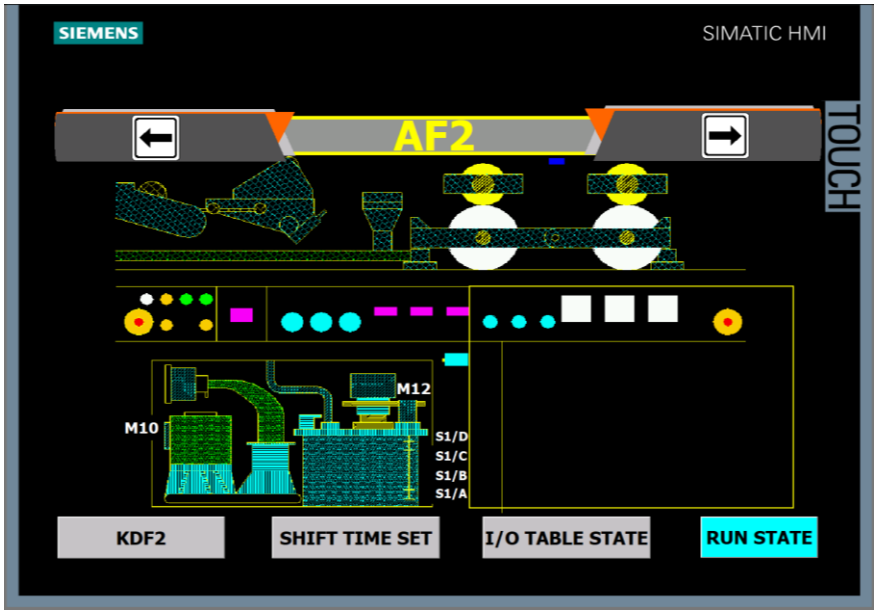

Figure 2.5 AF2 Display

2.3 I/O TABLE STATE

The I/O Table State displays the addresses of the inputs (I0.0 – I7.7) and outputs (Q0.0 – Q7.7). A green indicator on the address indicates an active address, while a red indicator on the address indicates an inactive address.

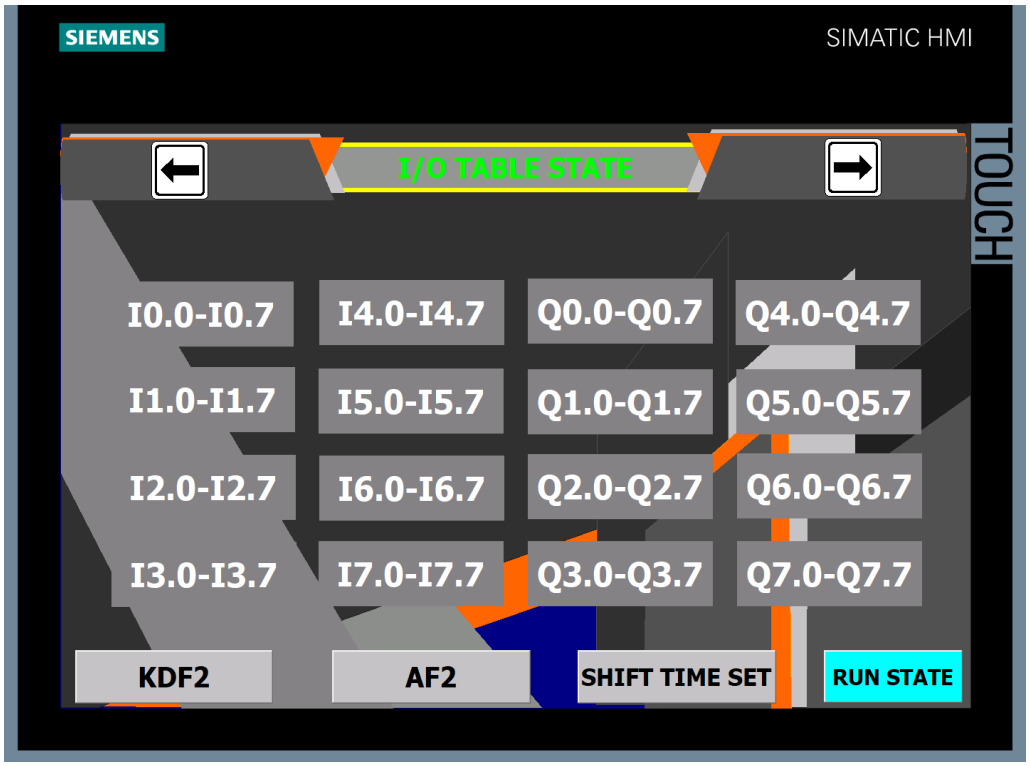

Figure 2.6 Table I/O State Display

2.3.1 Display I0.0-I1.7

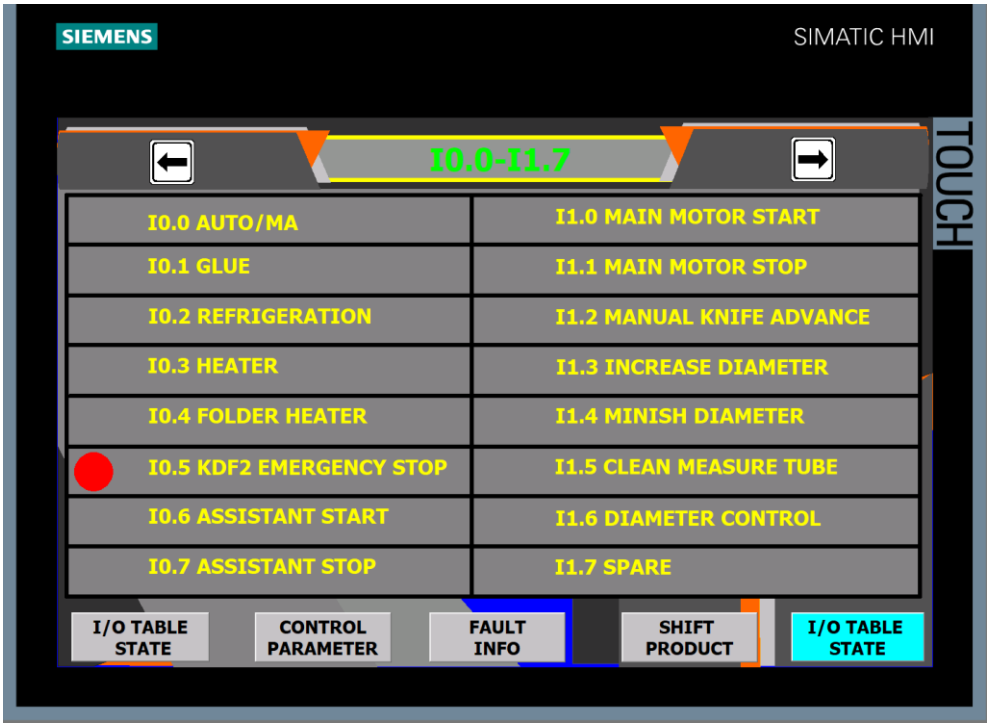

Figure 2.7 I0.0-I1.7 Display

2.3.2 Display I2.0-I3.7

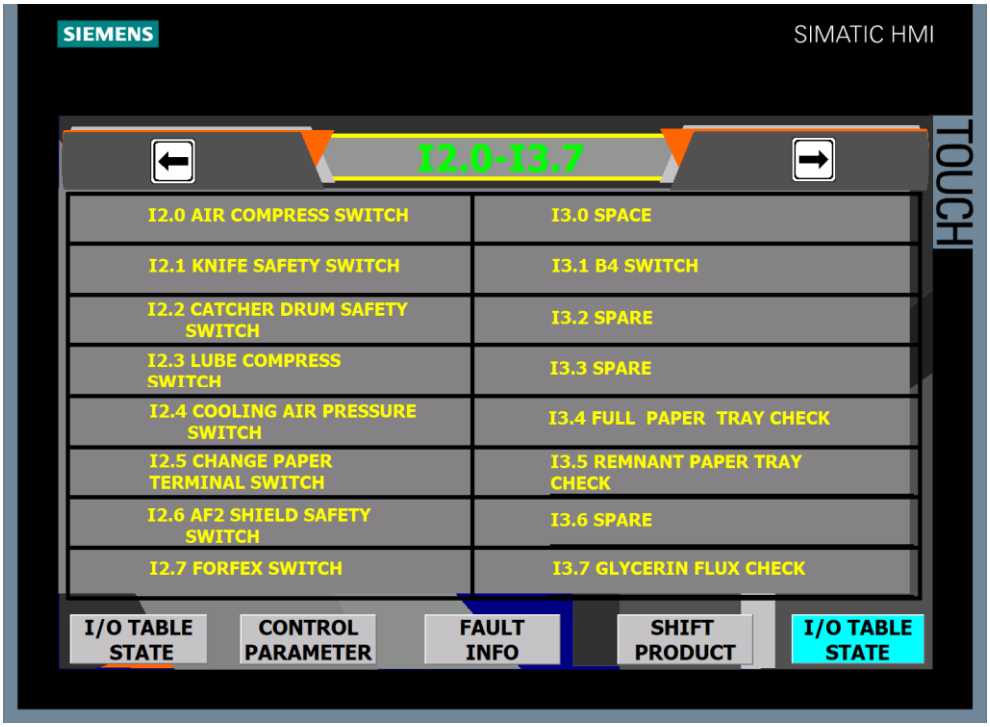

Figure 2.8 I2.0-I3. Display

2.3.3 Display I4.0-15.7

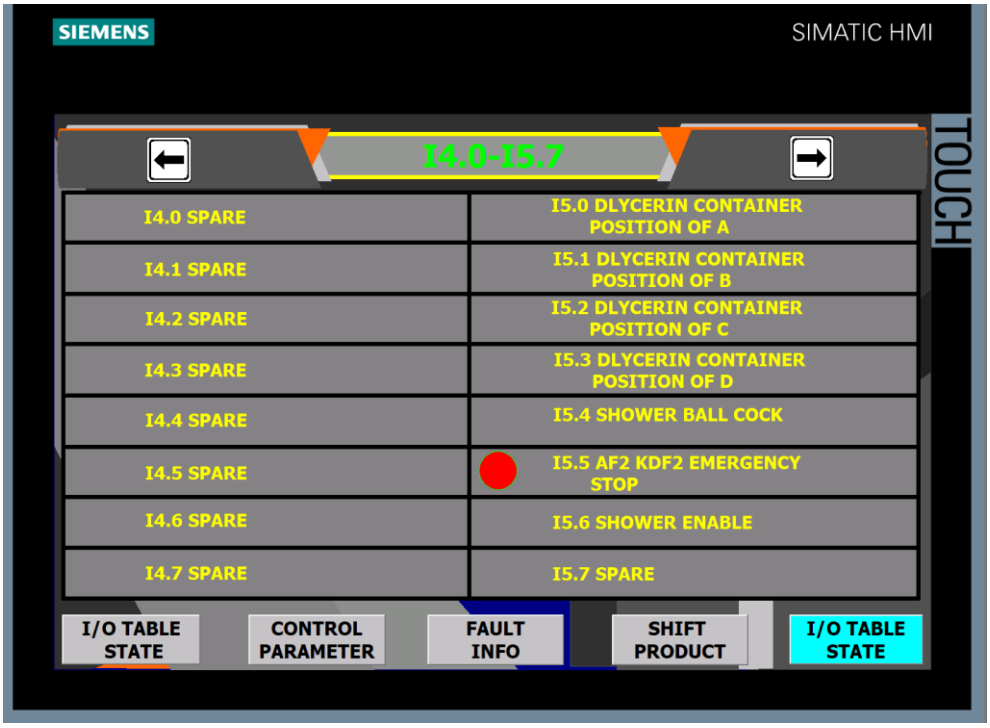

Figure 2.9 I4.0-I5.7 Display

2.3.4 Display I6.0-17.7

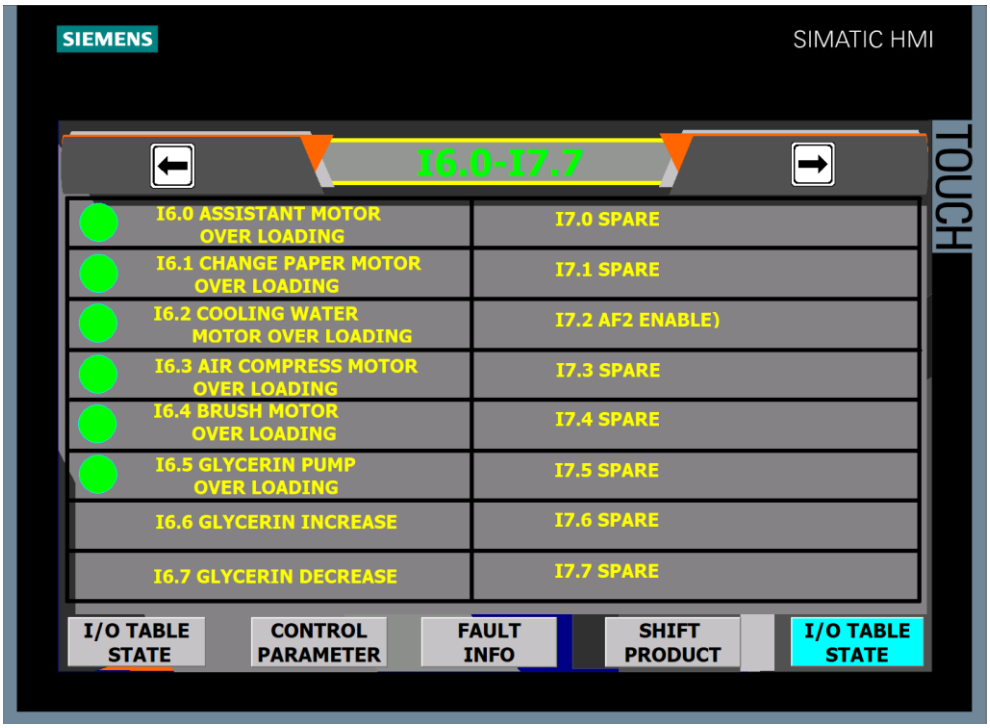

Figure 2.10 I6.0-I7.7 Display

2.3.9 Display Q0.0-Q1.7

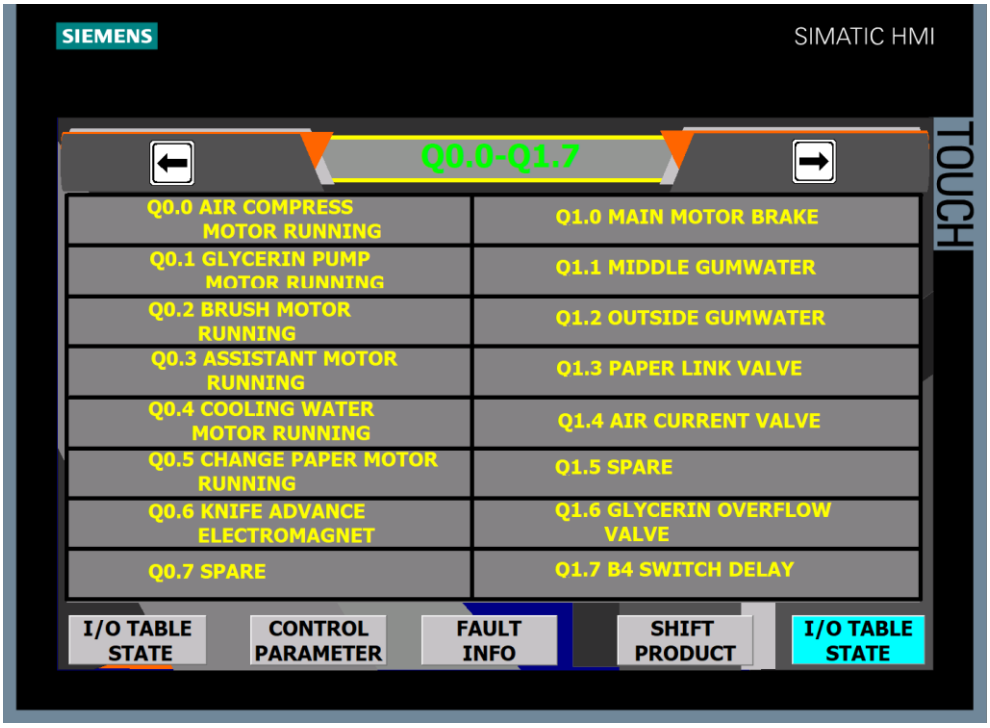

Figure 2.11 Q0.0-Q1.7 Display

2.3.10 Display Q2.0-Q3.7

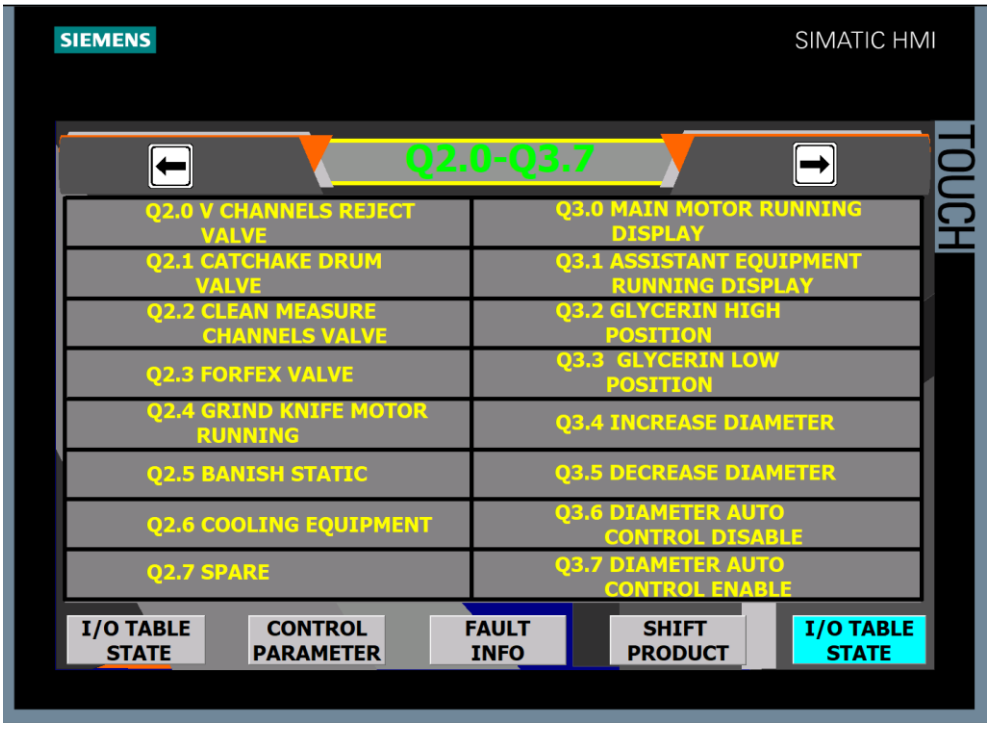

Figure 2.12 Q2.0-Q3.7 Display

2.3.11 Display Q4.0-Q5.7

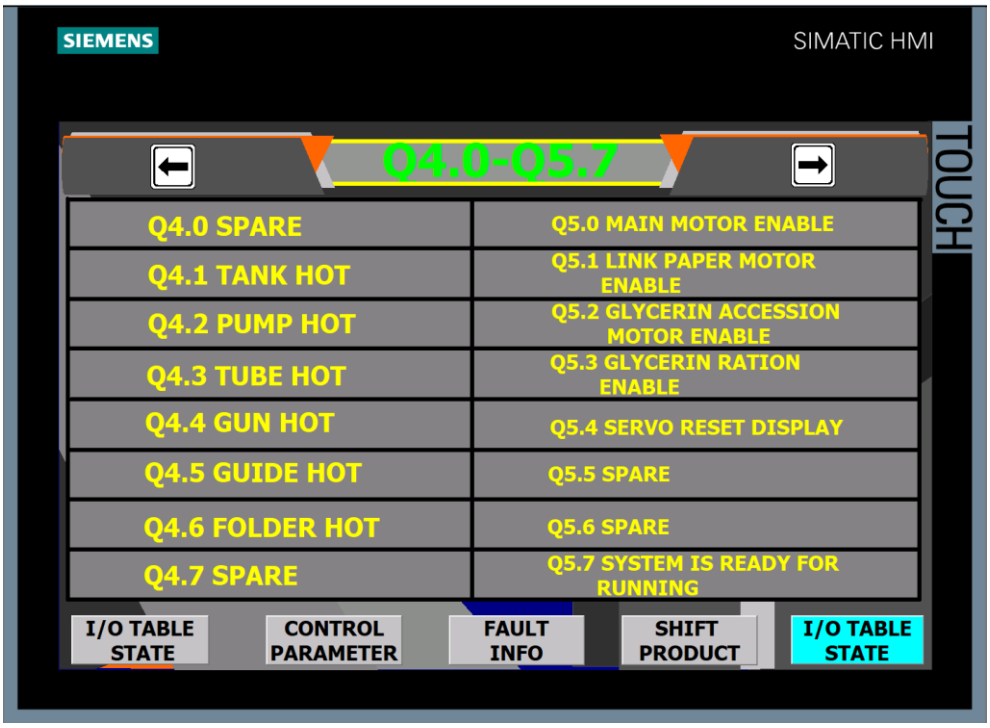

Figure 2.13 Q4.0-Q5.7 Display

2.3.12 Display Q6.0-Q7.7

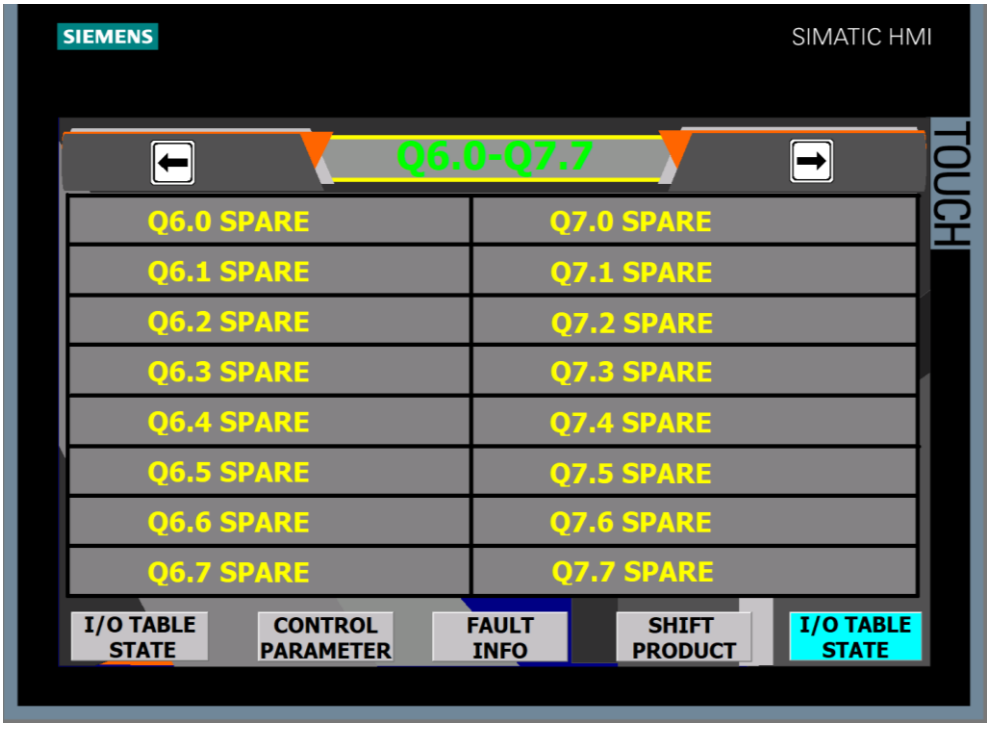

Figure 2.14 Q6.0-Q7.7 Display

2.4 SHIFT TIME SET

This screen displays the start and end times for FM-400 machines according to their respective shifts, such as Shifts A, B, C, this helps ensure the availability of manpower in a timely manner, and maximizes efficiency in the work process in the factory.

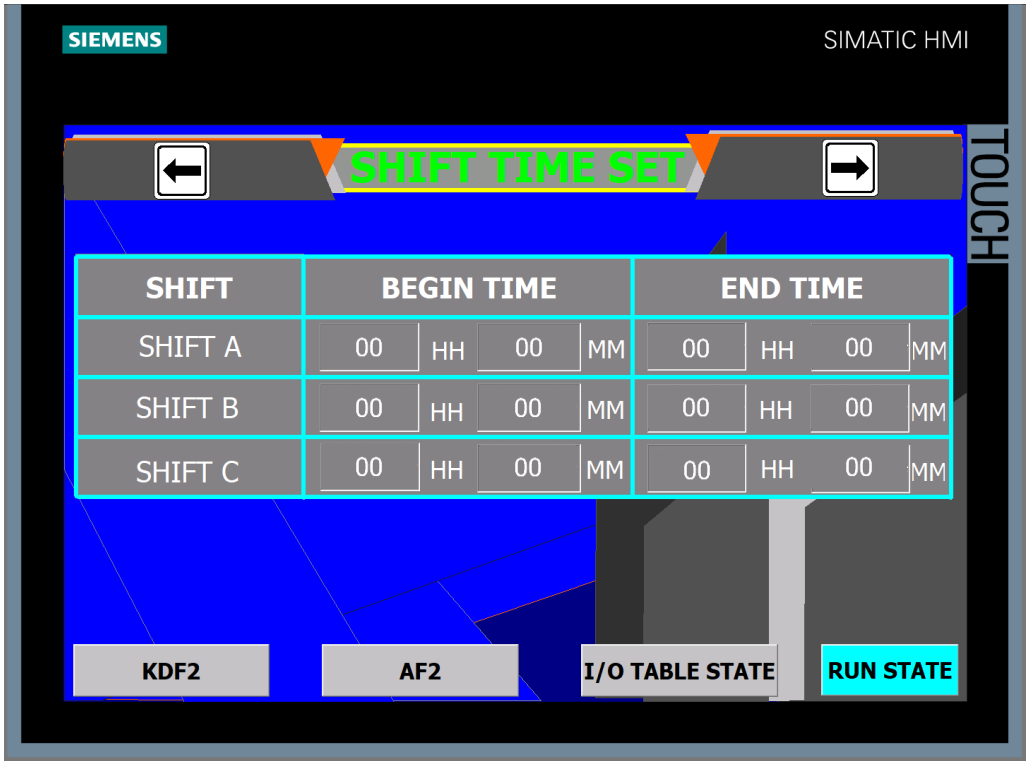

Figure 2.15 Shift Time Set Display

3. CONTROL PARAMETER

The parameter control menu displays options such as Main Speed Set, Timer Set, Twin Speedup Wheel Data & Glue Speed, and Temperature Display & Set, allowing users to adjust system settings as needed.

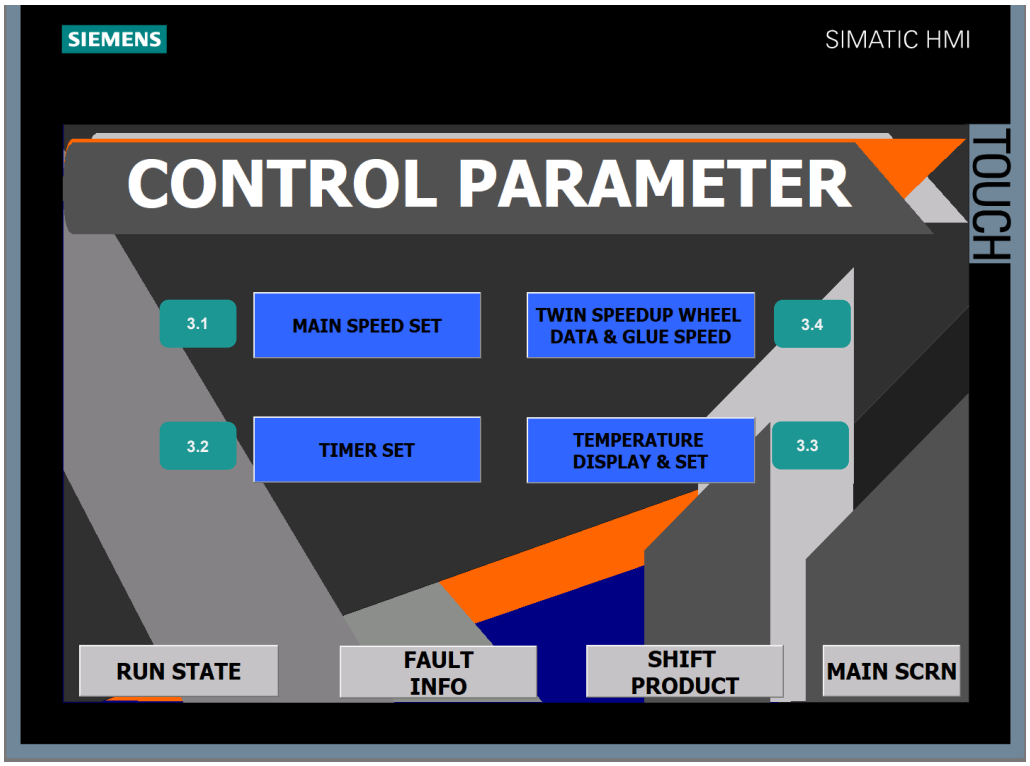

Figure 2.16 Control Parameter Display

Position Function	Description
3.1	The button that serves directs to the Main Speed Test display.
3.2	The button that serves directs to the Timer Set view.
3.3	The button that serves directs to the Temperature Display &; Set display.
3.4	The button that functions directs to the Twin Speedup Wheel Data &; Glue Speed display.

3.1 MAIN SPEED SET

The Main Speed Set menu displays settings for Splice Speed, Start Speed, and Working Speed which are useful for determining the desired speed in various engine functions.

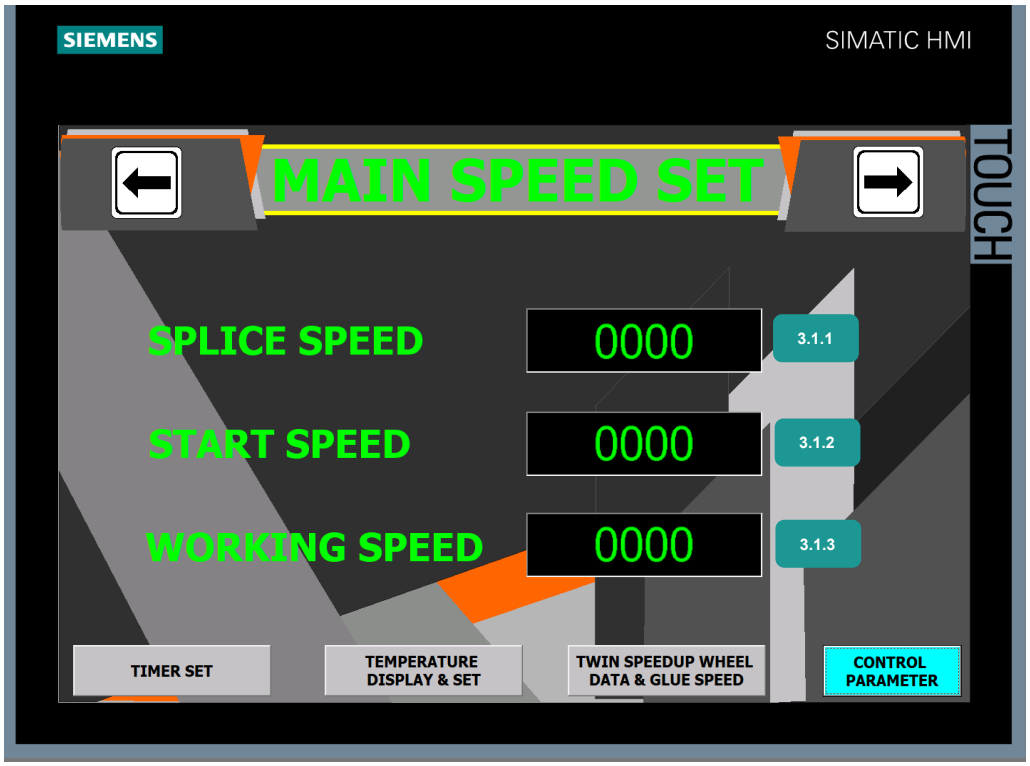

Figure 2.17 Main Speed Set Display

Position Function	Description
3.1.1	Setting the speed of the machine at the time of splicing paper. When the diameter of the paper has reached the specified limit, then from the maximum speed position, the speed will decrease according to the predetermined number.
3.1.2	Setting the engine speed at the time of the inch button and engine speed start working. This condition occurs when the cover cut off has been closed.
3.1.3	Speed regulation on the machine in the engine position runs automatically.

3.2 TIMER SET

On the Timer Set screen display, there is information that shows the settings on the machine, including time settings and other parameters related to the timer function in the operation of the machine.

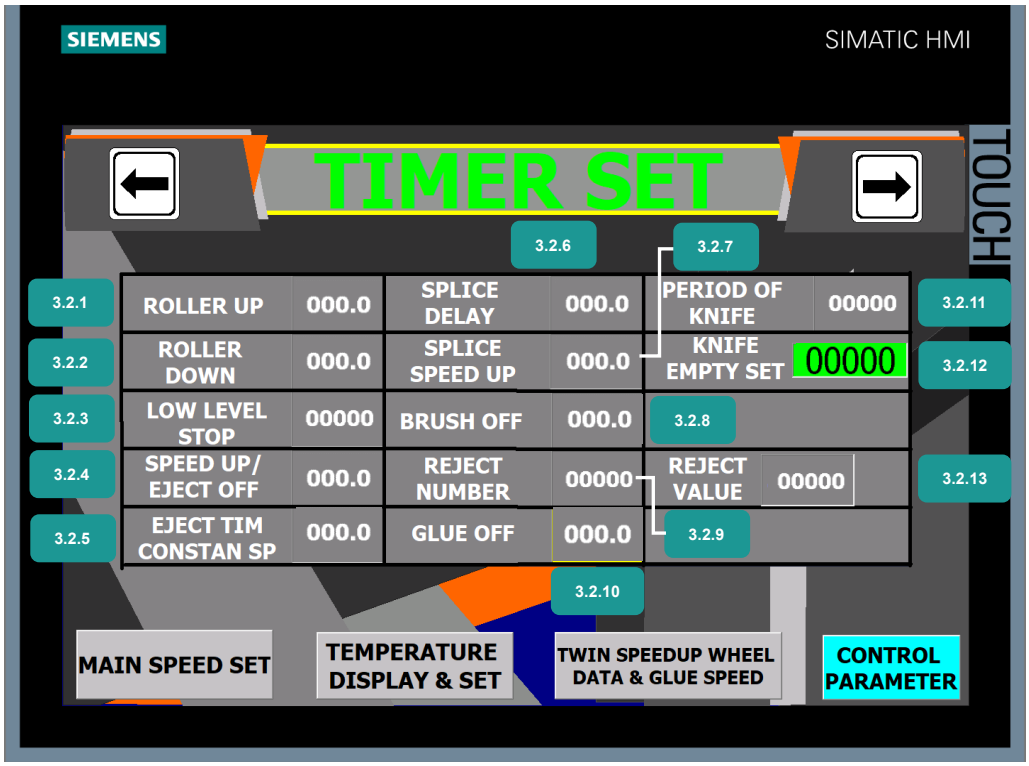

Figure 2.18 Timer Set Display

Position Function	Description
3.2.1	The timing for the Roller rises at the time the engine is activated.
3.2.2	The timing for the Roller drops at the time the engine is turned off.
3.2.3	Not used.
3.2.4	Machine speed regulation, when the sensor detects the reject product, the reject product will be wasted continuously before the engine speed matches the set setting.
3.2.5	Machine speed regulation, when the sensor detects the reject product, the reject product will be wasted continuously before the engine speed matches the set setting.
3.2.6	Timing at the time of connecting the paper.

3.2.7	Setting the speed of the machine at the time of splicing paper.
3.2.8	The timing for the Brush stops at the moment the machine is turned off.
3.2.9	Calculation settings for reject products after paper connection.
3.2.10	The timing for Lem stops at the moment the machine is turned off.
3.2.11	Displays the calculation (counter) of the number of knives advanced sharpening that occurs on the blade.
3.2.12	Setting to stop the machine when the blades have reached their maximum limit for advancing and sharpening. (When the knife has reached a predetermined number, the machine will stop and send an alarm for the technician to change the blade)
3.2.13	Setting for the number of reject products to be removed from the machine after splicing paper.

3.3 TEMPERATURE DISPLAY & SET

On the Temperature Display & Set screen, the information presented includes the designation PV (Point Value) which is the actual value of the measured temperature, while SP (Set Point) indicates the value that has been set as the desired temperature target for the setting.

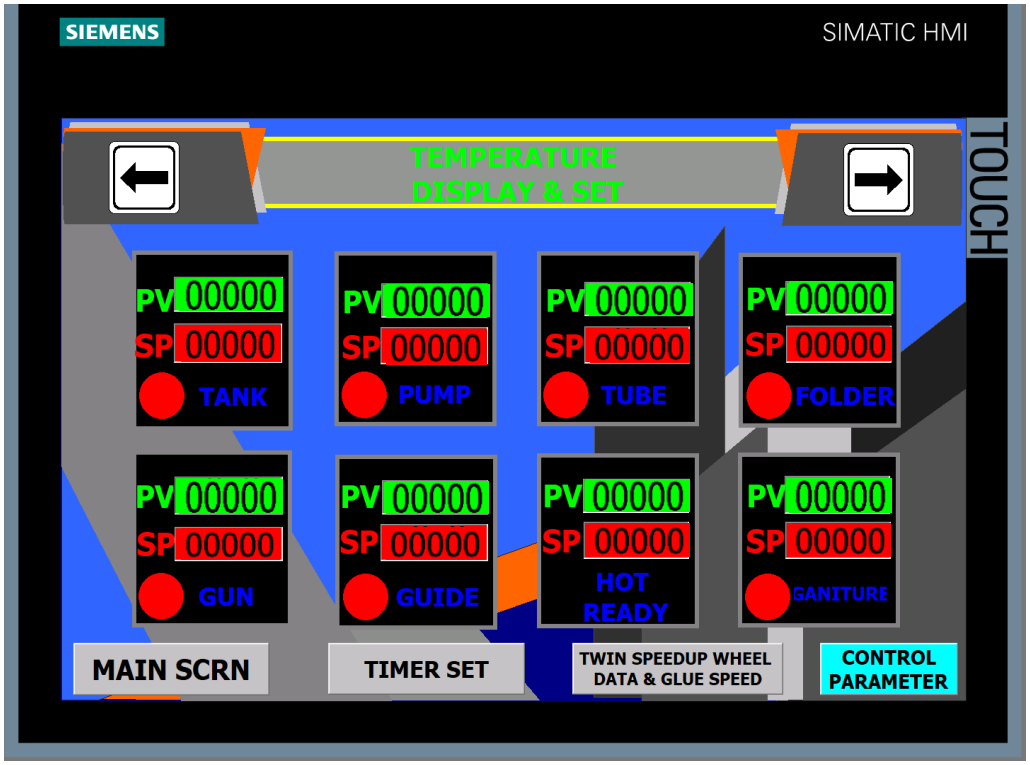

Figure 2.19 Temperature Display & Set Display

3.4 TWIN SPEEDUP WHEEL DATA & GLUE SPEED

This screen displays various settings related to Twin Speedup Wheel Data and Glue Speed. In addition, this screen also displays options to adjust the Main Motor Gear, Long Rod Filter, as well as several other settings related to the process being carried out.

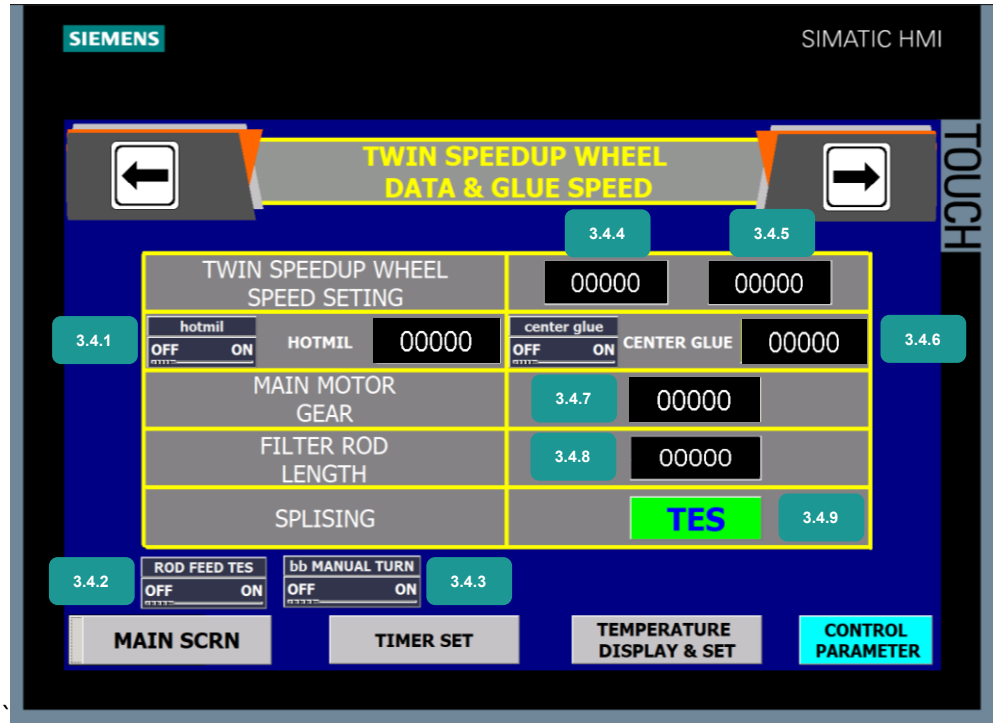

Figure 2.20 Twin Speedup Wheel Data & Glue Speed Display

Position Function	Description
3.4.1	Settings to enable/disable the Hotmil function, and display the speed ratio of the Hotmil function .
3.4.2	Settings to enable/disable the functions of the Test Feed Rod.
3.4.3	Settings to enable/disable functions of the Bobbin Manual Turn.
3.4.4	Settings to set the speed of Twin Speedup Wheel Data.
3.4.5	Displays the actual speed of Twin Speedup Wheel Data.
3.4.6	Settings to enable/disable the Center Glue function, and display the ratio speed of the Center Glue function.

3.4.7	Settings on the installed Main Motor Gear (the larger the gear size, the faster the speed).
3.4.8	Settings to determine the length of the filter to be produced.
3.4.9	Button to do splicing manually.

4. FAULT INFO

On the Fault Info screen display, there is detailed information about the fault that occurred in the machine. This view is designed to provide a comprehensive overview of the types of errors that may occur and additional information that helps in the identification of problem solving.

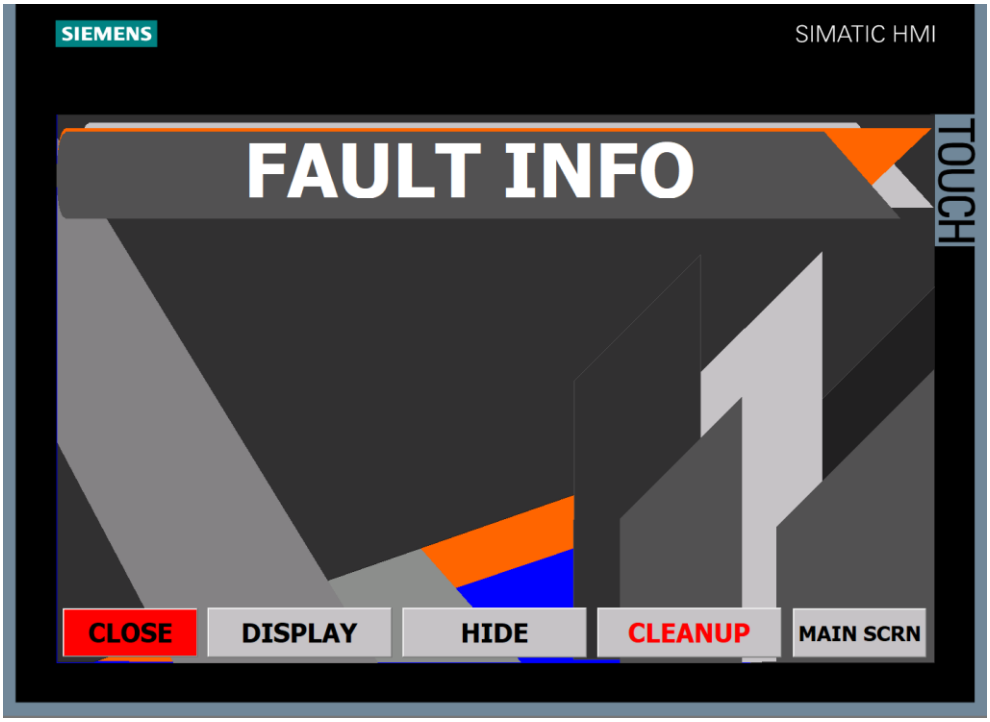

Figure 2.21 Fault Info Display

To identify the location of the error in the FM-400 engine, the first step is to track down the critical components that interact in the operation of the machine, this will help to identify exactly the location of the source of the problem.

4.1 KNIFE SHIELD OPENING

Figure 2.22 Error Knife Shield Opening

4.2 KNIFE EMPTY SET

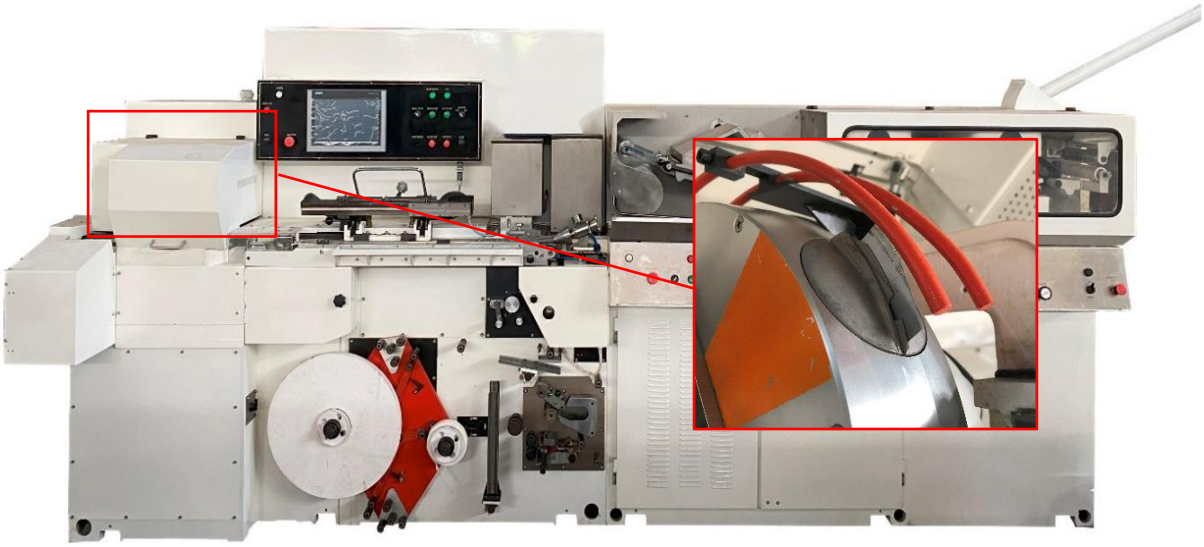

Figure 2.23 Error Knife Empty Set

4.3 RBO

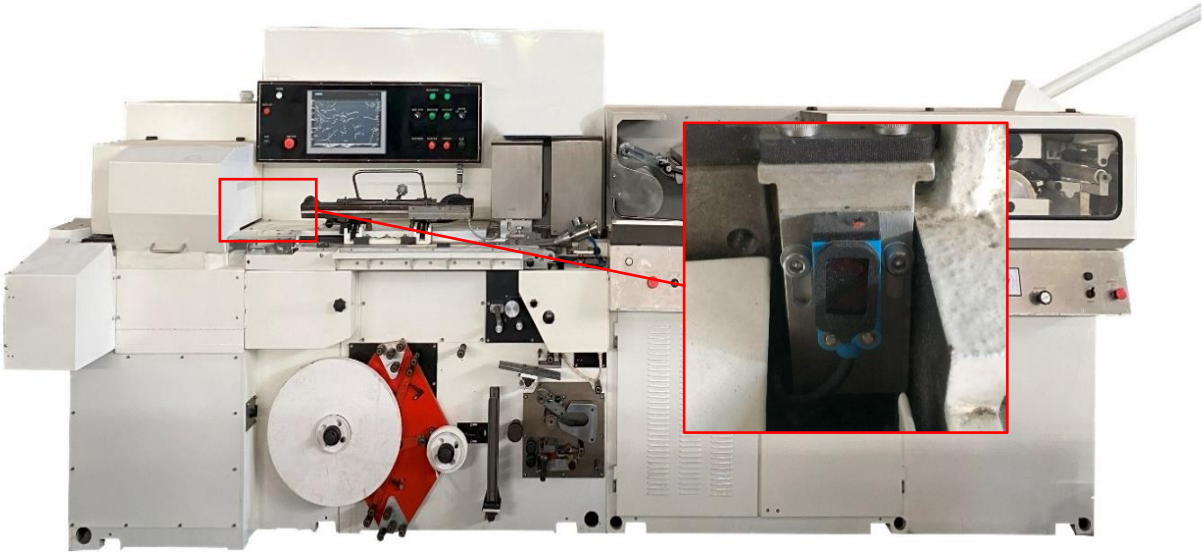

Figure 2.24 Error RBO

4.4 KDF2 EMERGENCY STOP

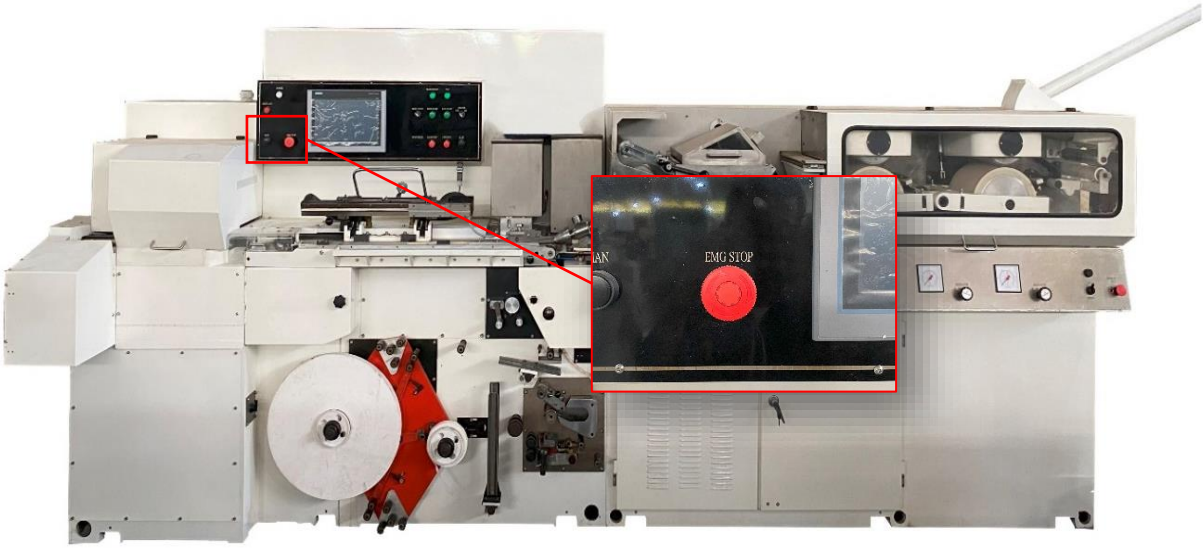

Figure 2.25 Error KDF2 Emergency Stop

4.5 TEMPERATURE IS NOT IN AREA

Figure 2.26 Error Temperature is not In Area

4.6 AF2 SHIELD IS OPENING

Figure 2.27 Error AF2 Shield is Opening

4.7 AF2 EMERGENCY STOP

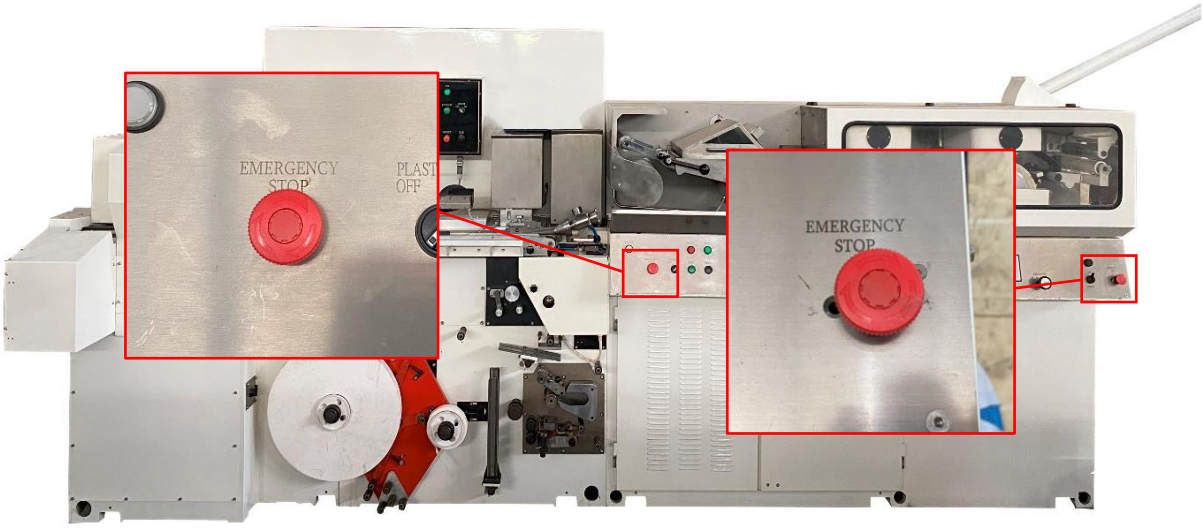

Figure 2.28 Error AF2 Emergency Stop

4.8 HCF EMERGENCY STOP

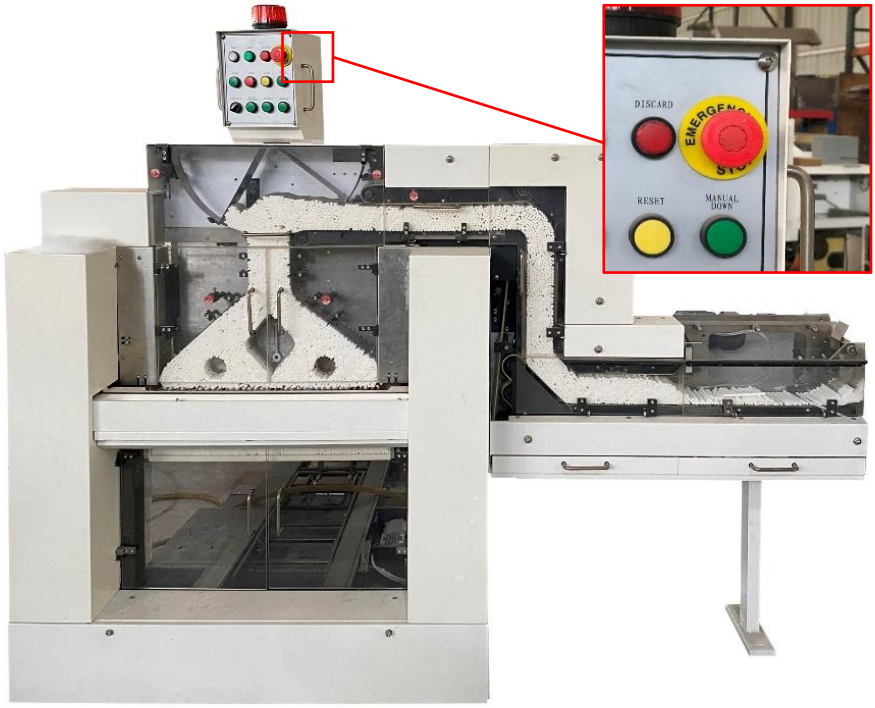

Figure 2.29 Error HCF Emergency Stop

4.9 HCF FAULT

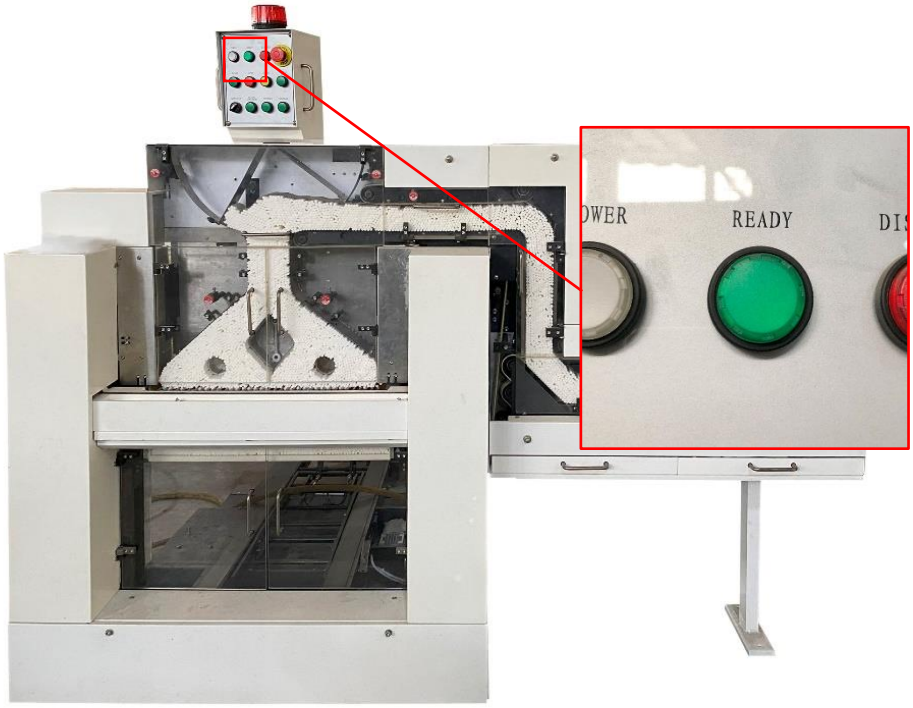

Figure 2.30 Error HCF Fault

4.10 OIL PRESSURE IS LOW

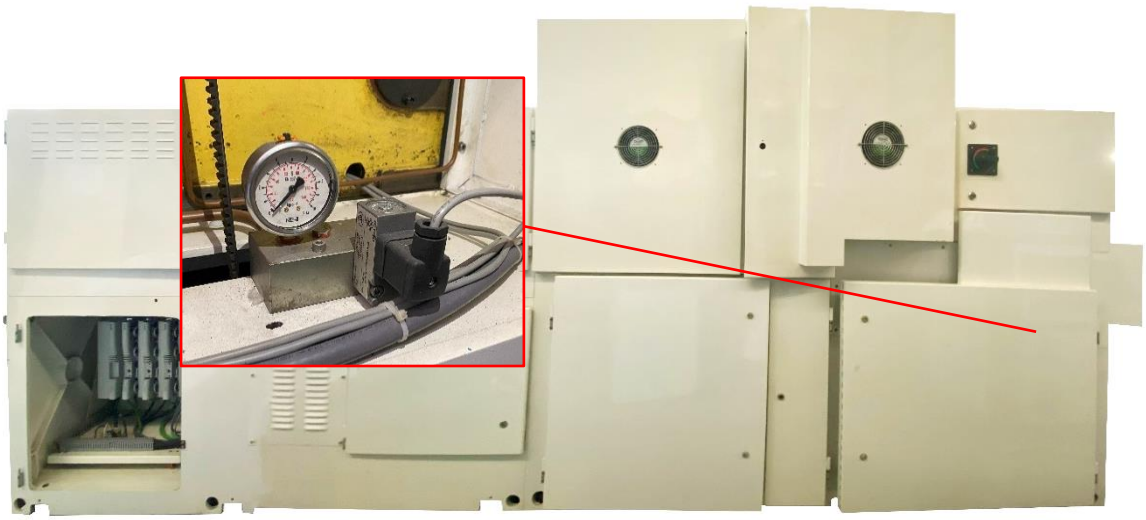

Figure 2.31 Error Oil Pressure is Low

4.11 AIR COMPRESSURE IS LOW

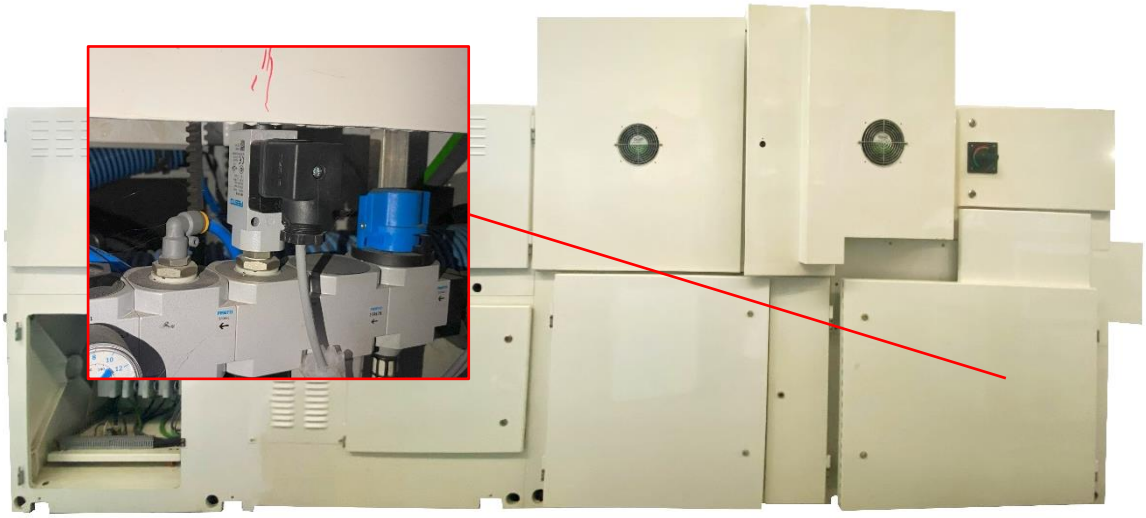

Figure 2.32 Error Air Compressure is Low

4.12 BOBBIN TURN MOTOR IS OVERLOAD & OIL PUMP MOTOR IS OVERLOAD

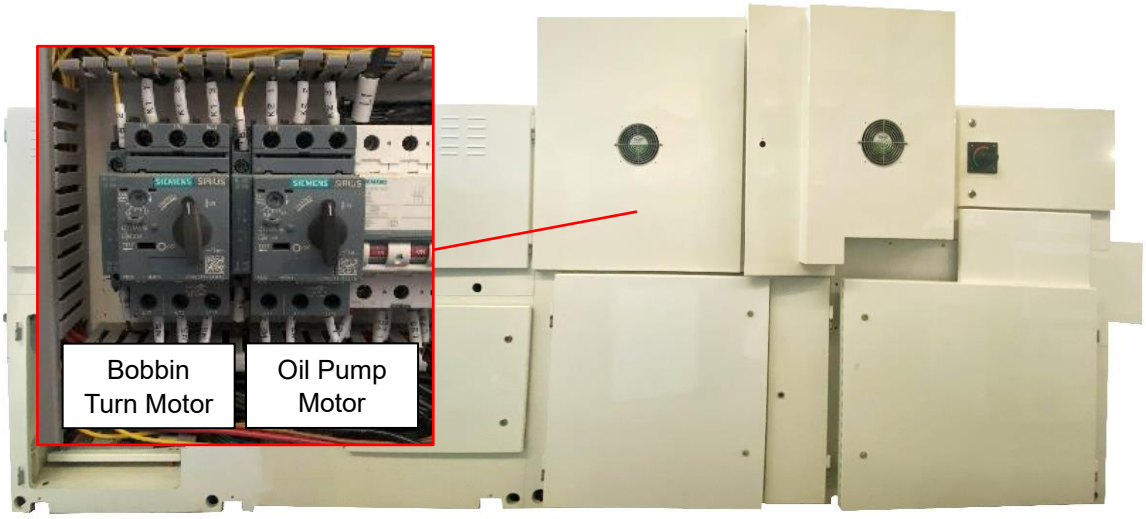

Figure 2.33 Error Bobbin Turn Motor is Overload & Oil Pump Motor is Overload

4.13 BRUSH MOTOR IS OVERLOAD

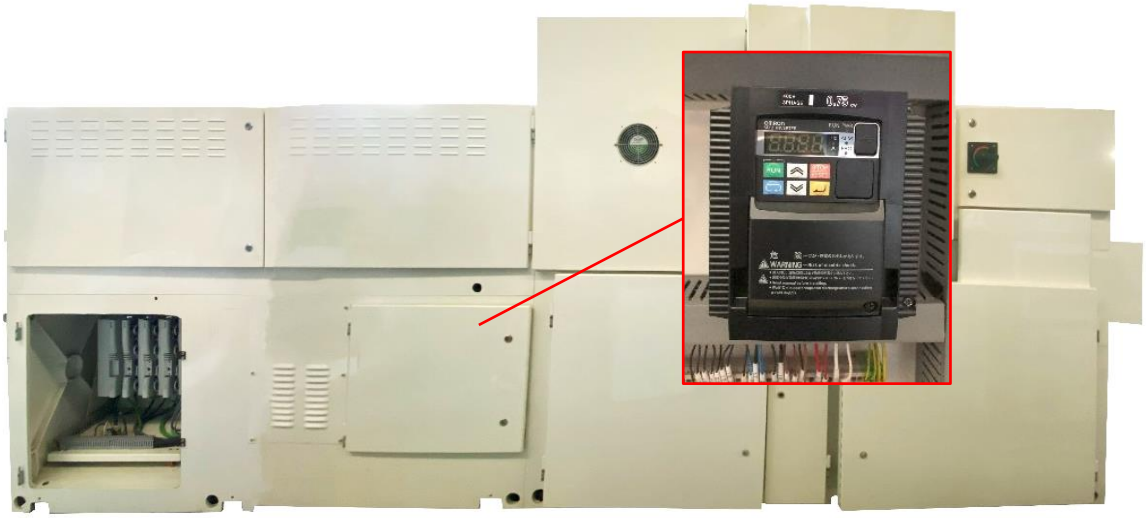

Figure 2.34 Error Brush Motor is Overload

4.14 KDF FAN MOTOR IS OVERLOAD

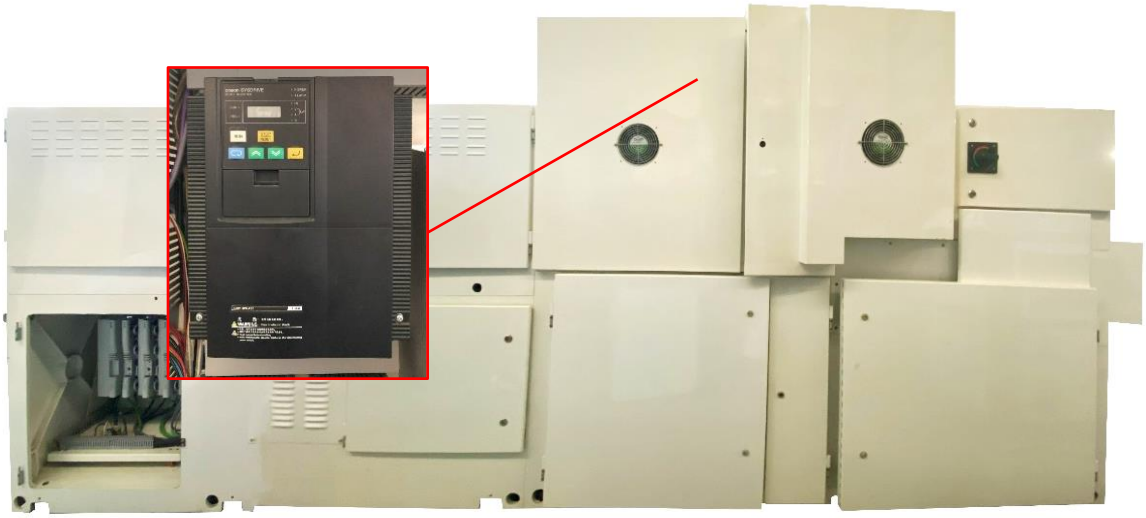

Figure 2.35 Error KDF Fan Motor is Overload

5. SHIFT PRODUCT

On the Shift Product screen, there is a display that describes the division of shifts into shifts A, B, and C. The information presented for each shift includes the start and end time of each shift, the number of machine stops during the shift duration, and the number of products that have been produced during the shift period.

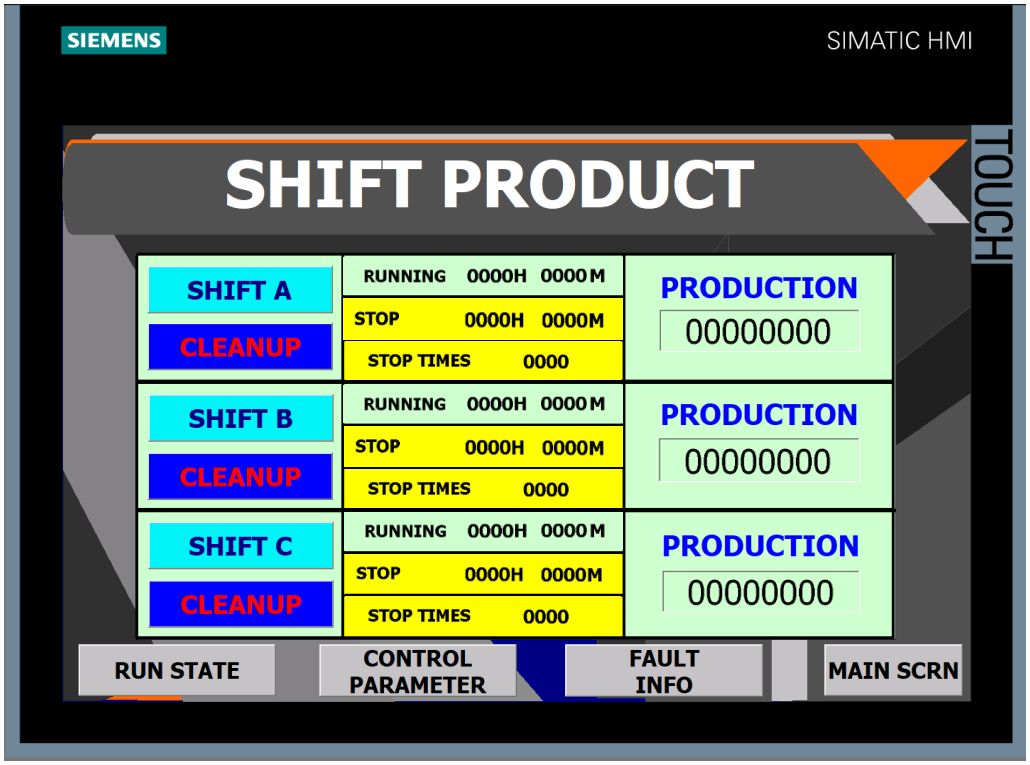

Figure 2.36 Shift Product Display

1. SECOND SCREEN

The AF2 screen displays settings related to three different rolls, namely Roll 1, Roll 2, and Roll 3. Each of these settings is stored separately in memory, allowing users to access and modify the configuration of each roll as needed.

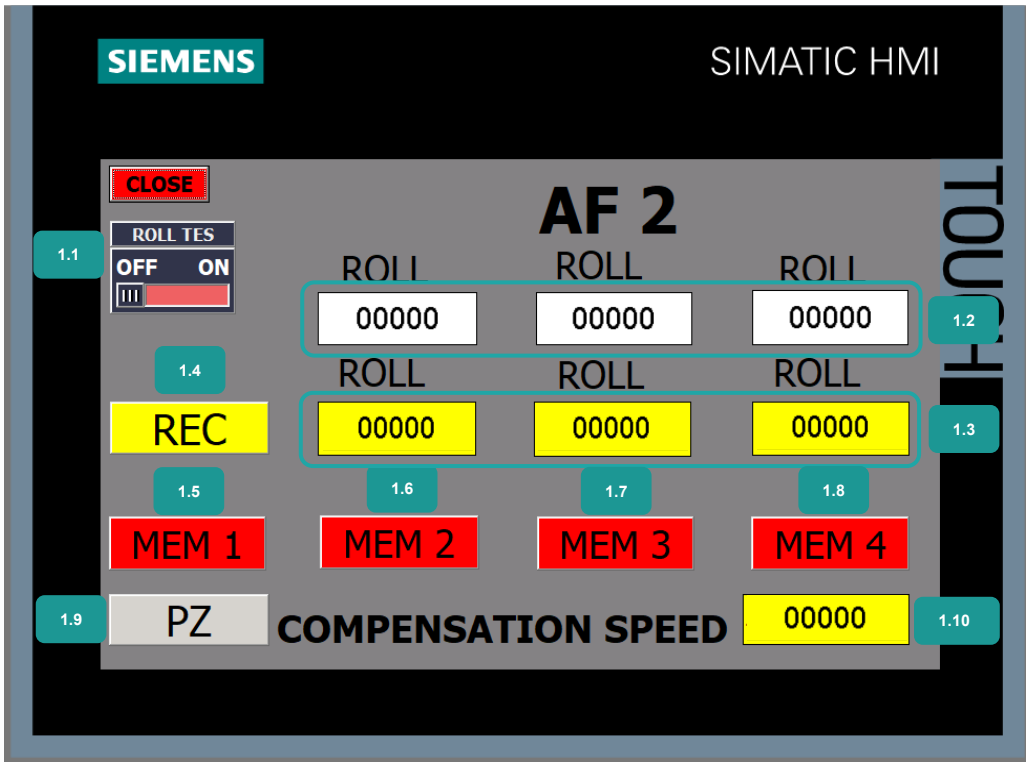

Figure 3.1 AF2 Second Screen

Position Function	Description
1.1	Settings to enable/disable the function of Test Roll.
1.2	Displays the Point Value (actual value) of Roll 1, Roll 2, and Roll 3.
1.3	Setting Set Value or predefined values as desired targets of Roll 1, Roll 2 and Roll 3.
1.4	Button to save the Set Value settings on each memory.
1.5	Button to access memory settings 1.
1.6	Button to access memory settings 2.

1.7	Button to access memory settings 3.
1.8	Button to access memory settings 4.
1.9	The button that serves directs to the display screen of Plasticizer Motor Speed.
1.10	Displays the minimum speed of the Motor Speed Plasticizer.

2. PLASTICIZER MOTOR SPEED

This screen displays various settings related to maximum and minimum speeds, as well as actual readings from the plasticizer motor speed. All these settings can be adjusted as needed and then stored in the available memory.

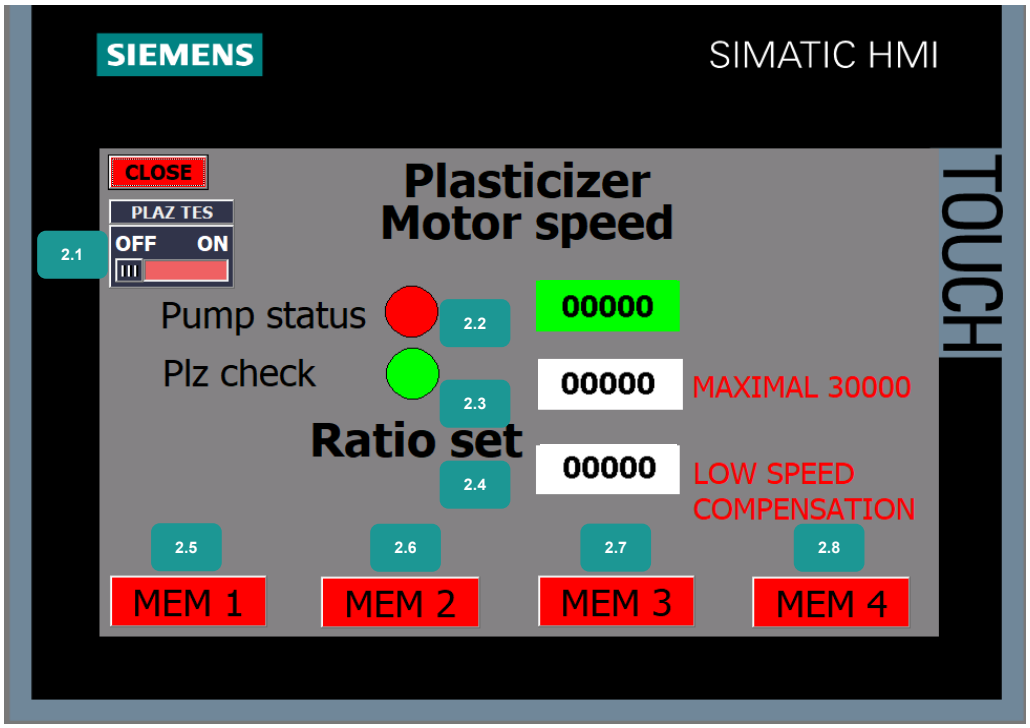

Figure 3.2 Display of Speed Motor Plastizer

Position Function	Description
2.1	Settings to enable/disable the function of the Test Plasticizer.
2.2	Displays the actual speed of the Motor Speed Plasticizer.
2.3	High speed regulation of Plasticizer Motor Speed (Maximal 3000).
2.4	Low speed regulation of Plasticizer Motor Speed.
2.5	Button to access memory settings 1.
2.6	Button to access memory settings 2.
2.7	Button to access memory settings 3.
2.8	Button to access memory settings 4.

CLOSING

We have completed the Manual Book for FM-400 Filter Making Machine as a complete source of information, to ensure efficient operations and optimal production results. We hope that this Manual Book can provide users with a clear and deep understanding, so that they can manage this filter engine well.

If you have any further questions or need technical assistance, please feel free to contact our customer service team. We thank you for your trust in choosing our products, and hopefully this FM-400 Filter Making Machine can make a positive contribution to the smooth running of your business.