

<b>Project</b>	<b>750T Coining Press Machine</b>
<b>Work Order No.</b>	<b>W/FA1/P2147</b>
<b>Customer</b>	<b>Mahindra CIE</b>
<b>End User</b>	<b>Mahindra CIE</b>
<b>DAP Date</b>	<b>11.01.2021</b>
<b>Place</b>	<b>Chakan, Pune</b>
<b>Attended by (Cubix)</b>	<ol style="list-style-type: none"> <li>1. Siddhant Kamble</li> <li>2. Furquan Sayyed</li> <li>3.</li> </ol>
<b>Attended by (Customer)</b>	<ol style="list-style-type: none"> <li>1. Santosh Aru</li> <li>2. Anand Patil</li> <li>3.</li> </ol>

## INDEX

SR.NO.	CONTENTS	PAGE NO.	APPROVAL	REMARK
1	<b>System Layout</b>			
	1.1 – Total System Layout	3		
	1.2 – PLC Layout	4		
2	<b>IO List</b>	5		
3	<b>Operation Sequence</b>	8		
	3.1 – Manual Mode Sequence			
	3.2 – Auto Mode Sequence	9		
4	<b>Interlocks</b>			
	4.1 - Hardwired Interlock	11		
	4.2 – Software Interlock	12		
5	<b>Electrical Drawing</b>			
	5.1 – Panel GA	13		
	5.2 – Base Plate GA	14		
	5.3 – Electrical Drawing	15		
6	<b>Bill of Material</b>			
	6.1 – FA BOM	39		
	6.2 – Panel BOM	40		
7	<b>HMI Screens</b>	41		
8	<b>SCADA Screens</b>			
	8.1 – Screens	49		
	8.2 – Reports	50		
	8.3 – Hard Key Details	51		
	8.4 – PC/IPC Details.	52		
9	<b>Scope of Supply</b>	53		

## 1 – System Layout

### 1.1 – Total System Layout

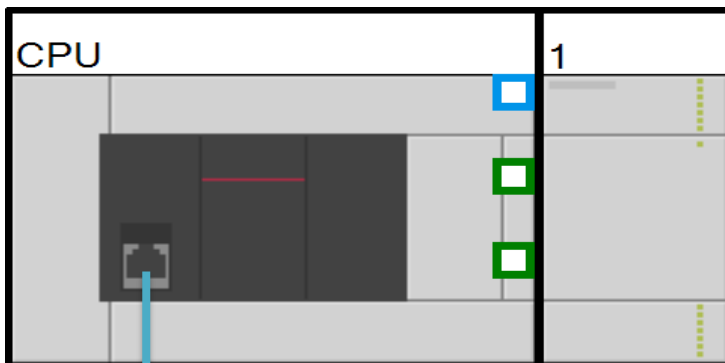
NA

## 1.2 – PLC Layout

**PLC**

**FX5U-64MR/ES**

**FX5-16EX/ES**



**HMI**



**GS2107-WTBD**

**Ethernet Cable**

## 2 – IO List

### 750T HYD. COINING PRESS INPUT LIST

Date- 09.12.2020 Rev. 1.0

SR NO	PLC ADD.	DISCRIPTION	TYPE	COLOUR CODE	LOCATION
Main PLC FX5U-64MR/ES					
1	X00	SINGLE STROKE SELECTOR (AUTO)	SSW		
2	X01	INCHING STROKE SELECTOR (MANUAL)	SSW		
3	X02	RAM LOCK/UNLOCK SELCTOR	SSW		
4	X03	SAFTY HAND PB 1	PB		
5	X04	SAFTY HAND PB 2	PB		
6	X05	MAIN HYD MOTOR ON PBL	ILPB		
7	X06	MAIN HYD MOTOR OFF PBL	ILPB		
8	X07	HYD COOLING MOTR ON PBL	ILPB		
9	X10	HYD COOLING MOTOR OFF PBL	ILPB		
10	X11	RAM UP PBL	ILPB		
11	X12	RAM DN PBL	ILPB		
12	X13	FAULT RESET PB	PB		
13	X14	MAIN HYD MOTOR OL TRIP(MPD)	MPCB F/B		
14	X15	PILOT PUMP OL TRIP (MPD)	MPCB F/B		
15	X16	HYD COOLING MTR OL TRIP (MPD)	MPCB F/B		
16	X17	MAIN HYD MOTOR ON F/B.	CONT. FB		
17	X20	PILOT PUMP ON F/B	CONT. FB		
18	X21	HYD COOLING MTR F/B	CONT. FB		
19	X22	RAM AT TDC L/S (HOME)	LSW		
20	X23	RAM AT BDC L/S	LSW		
21	X24	RAM OVER RUN TDC L/S	LSW		
22	X25	RAM UNDER RUN BDC L/S	LSW		
23	X26	RAM LOCK L/S	LSW		
24	X27	RAM UNLOCK L/S	LSW		
25	X30	AIR MECHANISUM L/S	LSW		
26	X31	COUNTER BALANCER PSR SW RIGHT			
27	X32	COUNTER BALANCER PSR SW LEFT			
28	X33	RAM DOWN PRESSURE SW(PRESSING COMPLETE)	PRESSURE SWITCH		
29	X34	AIR PRESSURE SW (PS4)	PRESSURE SWITCH		
30	X35	PILOT PRESSURE SW	PRESSURE SWITCH		
31	X36	RAM UP E.STOP	MUSHROOM PB		
32	X37	MAIN HYD OIL LEVEL SW	LEVEL SW		

## Input Exp. Card FX5-16EX/ES

33	X40	HYD OIL TEMP. HIGH			
34	X41	SAFETY CURTAIN SENSOR	SAFTEY I/P		
35	X42	SPARE	SPARE I/P		
36	X43	SPARE	SPARE I/P		
37	X44	SPARE	SPARE I/P		
38	X45	SPARE	SPARE I/P		
39	X46	SPARE	SPARE I/P		
40	X47	SPARE	SPARE I/P		
41	X50	SPARE	SPARE I/P		
42	X51	SPARE	SPARE I/P		
43	X52	SPARE	SPARE I/P		
44	X53	SPARE	SPARE I/P		
45	X54	SPARE	SPARE I/P		
46	X55	SPARE	SPARE I/P		
47	X56	SPARE	SPARE I/P		
48	X57	SPARE	SPARE I/P		

## 750T HYD. COINING PRESS OUTPUT LIST

Date- 09.12.2020 Rev. 1.0

SR. NO.	PLC ADD	DISCRIPTION	TYPE	COLOUR CODE	LOCATION	RELAY BOARD
Main PLC FX5U-64MR/ES						
1	Y00	MAIN HYD MOTOR ON				
2	Y01	PILOT PRESSURE MOTOR ON				
3	Y02	HYD COOLING MOTOR ON				
4	Y03	RAM DOWN SV (V3-A)				
5	Y04	RAM UPSV (V3-B)				
6	Y05	PILOT PRESSURE SV (V7)				
7	Y06	DECOMPRESSION SV (V6)				
8	Y07	RAM LOCK /UNLOCK				
9	Y10	STROKE READY				
10	Y11	STROKE COUNTER				
11	Y12	FAULT 1				
12	Y13	FAULT 2				
13	Y14	FAULT 4				
14	Y15	FAULT 8				
15	Y16	FAULT 16				
16	Y17	SPARE				
17	Y20	SPARE				
18	Y21	SPARE				
19	Y22	SPARE				
20	Y23	SPARE				
21	Y24	SPARE				

# DESIGN APPROVAL

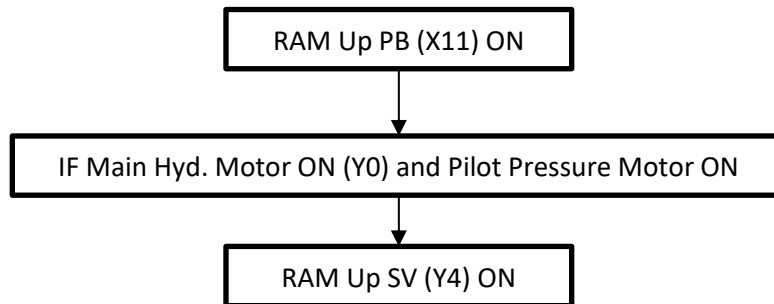
Doc. No: CAPL/PROJ/002  
Rev. No: 00  
Date : 06-10-2020

22	Y25	SPARE				
23	Y26	SPARE				
24	Y27	SPARE				
25	Y30	SPARE				
26	Y31	SPARE				
27	Y32	SPARE				
28	Y33	SPARE				
29	Y34	SPARE				
30	Y35	SPARE				
31	Y36	SPARE				
32	Y37	SPARE				

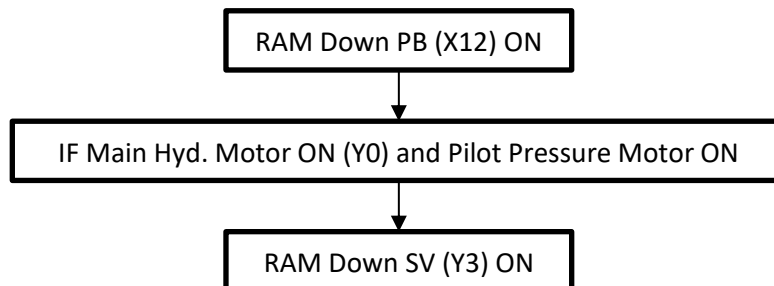
## 3 – Operation Sequence

### 3.1– Manual Mode Sequence

#### RAM Up SV Operation



#### RAM Down SV Operation



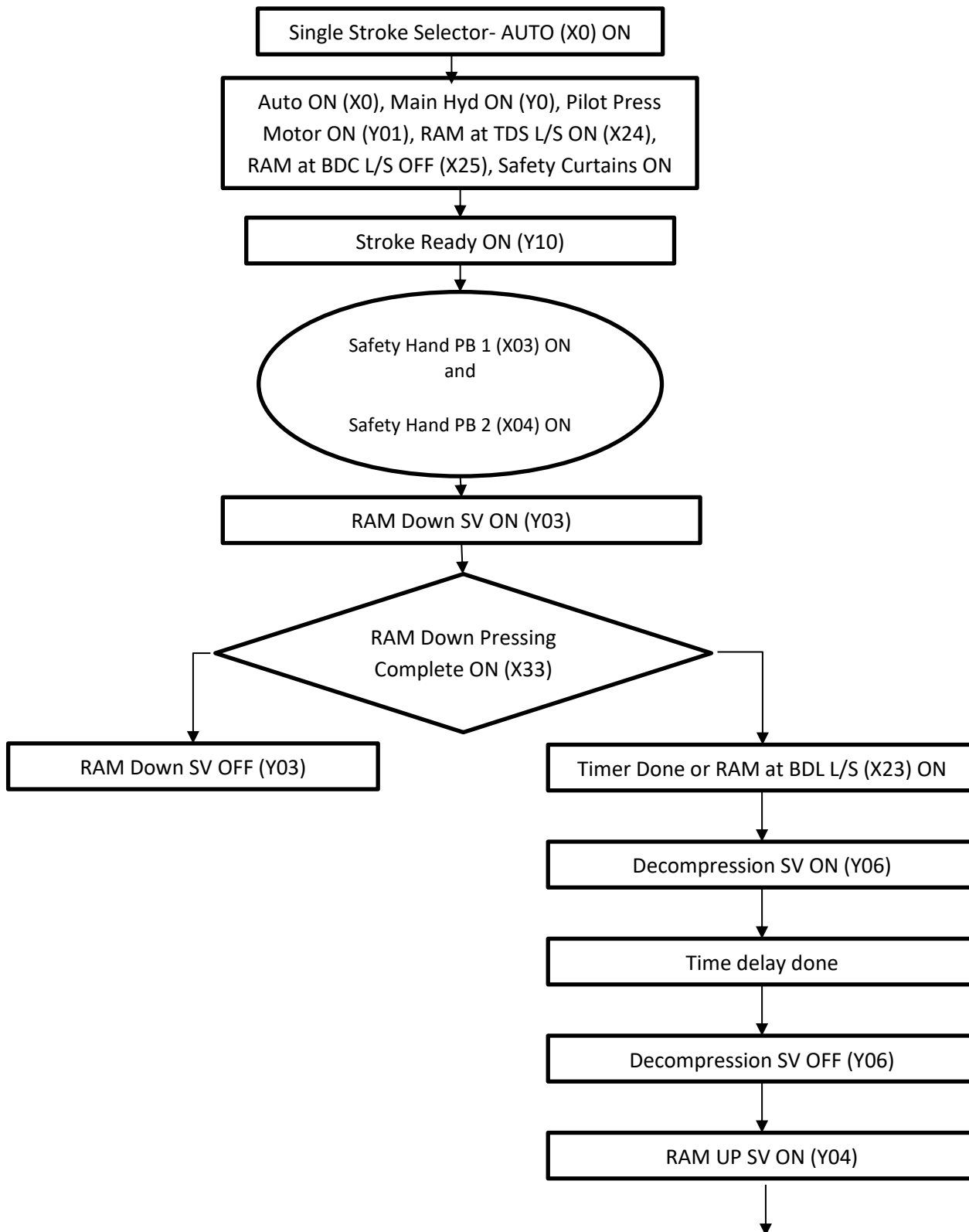
**Main Hyd. Motor** – The motor will ON from Operator Box PB manually.

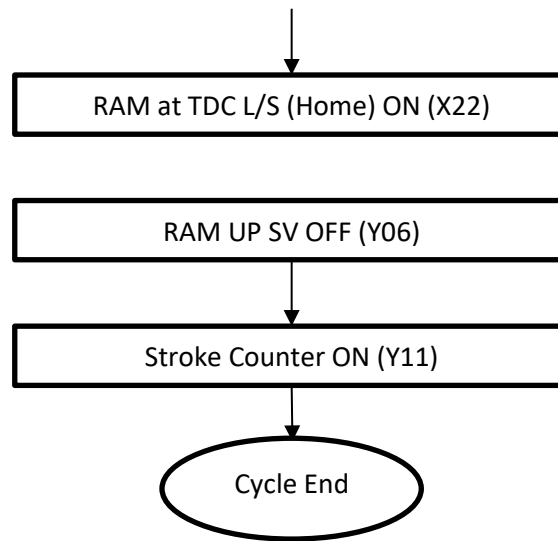
**Pilot Pressure Motor** – The motor will ON from Operator Box PB manually.

**Hyd. Cooling Motor** – The motor will ON from Operator Box PB manually.



## 3.2– Auto Mode Sequence





## 4 – Interlocks

### 4.1 – Hardwired Interlock

1. Safety Light curtains are interlock for RAM unit pressing operation.
2. Emergency Stop PB 1 on Operator Box and Emergency Stop PB 2 on Main Panel is interlock for Control circuit OFF during operation.
3. MPDs are used for each Motor protection and Healthy F/B given to PLC input.

## 4.2 – Software Interlock

1. RAM Emergency Stop PB is used for interrupt press operation and move RAM unit up direction.
2. Air Pressure SW F/B input given to PLC for interlock.
3. Pilot Pressure SW F/B input given to PLC for interlock.
4. Hyd. Oil temp F/B input given to PLC for interlock.
5. Main Hyd. Oil Level SW F/B input given to PLC for interlock.

### 5.1 – Panel GA



This drawing is property of Cubix Automation Pvt Ltd. & must not be passed to any unauthorized person or body without prior written permission

**CUBIX AUTOMATION PVT. LTD**  
S.No.25/5A,Nanded Phatda  
Near Savali Dhaba  
PUNE-411 041  
MAHARASHTRA, INDIA

This Document is sole Property of Cubix Automation pvt ltd . It should not be copied or communicated to any person without written approval of Application Center India

## 6 – Bill of Material

### 6.1 – FA BOM

PLC HARDWARE			
SR. NO.	DESCRIPTION	ITEM	QTY.
1	PLC 32 DIGITAL INPUT, 32 DIGITAL OUTPUT	FX5U-64MR/ES	1
2	16 Digital Input	FX5-16EX/ES	1
3	7" HMI	GS2107-WTBD	1
4	MEMORY CARD FOR HMI 8GB	STD	1
5	PLC TO HMI COMMUNICATION CABLE (5 MTR.)	CABETHR-ST-IN	1

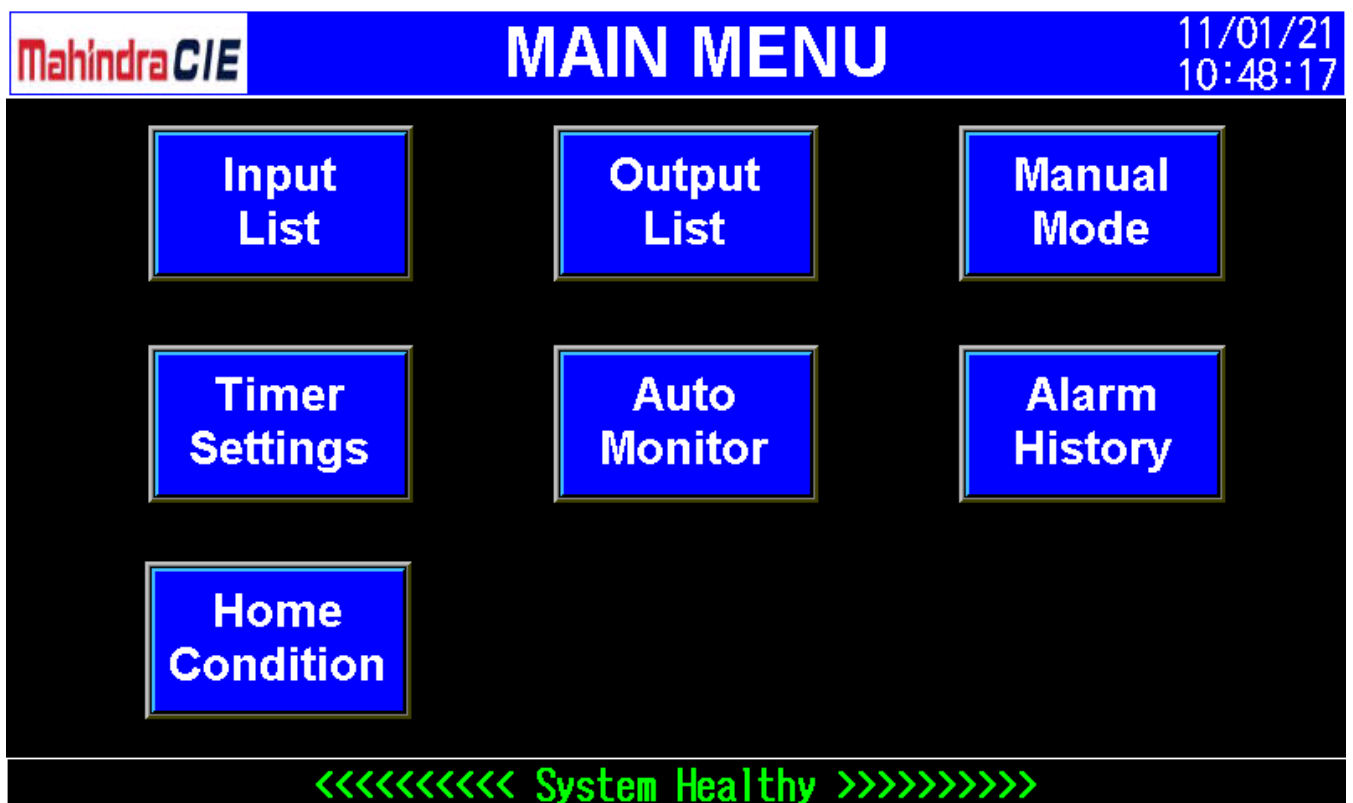
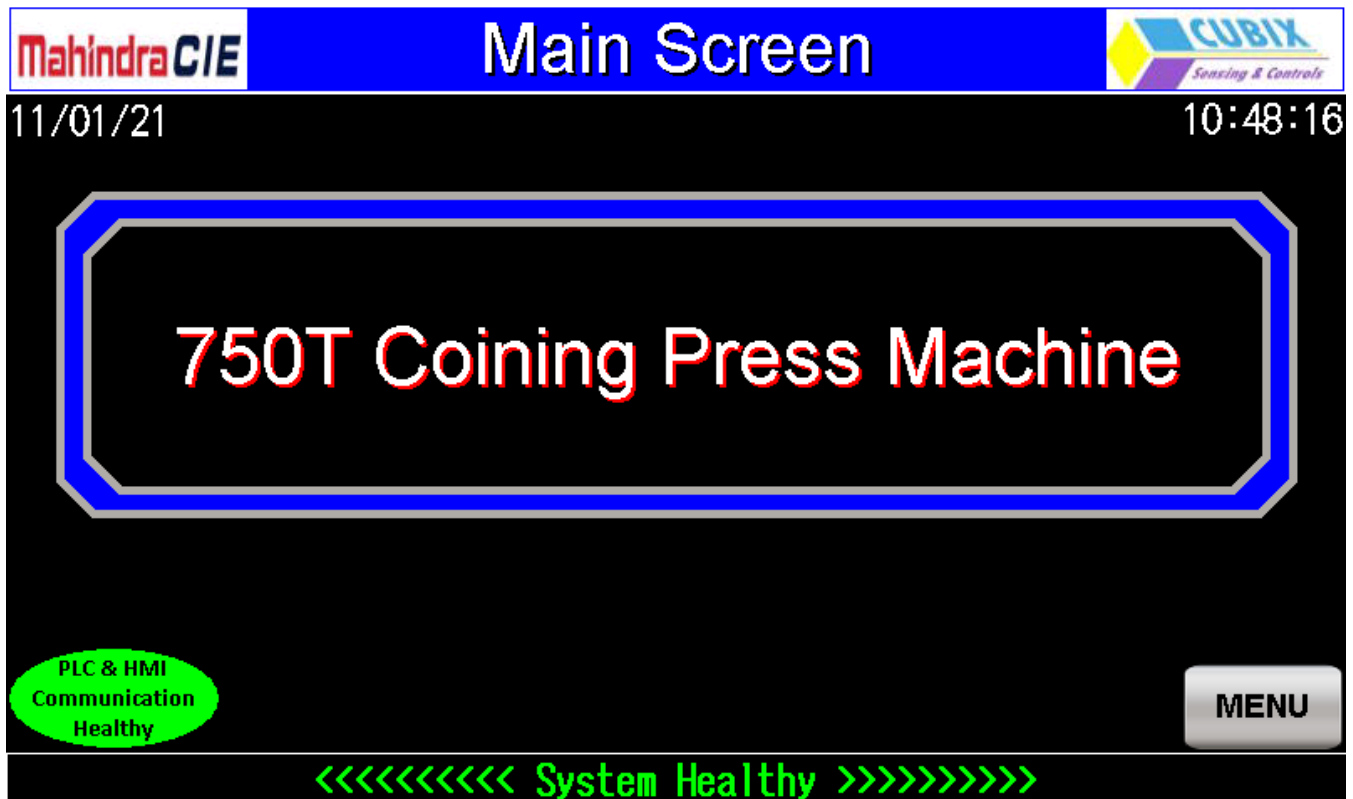


## 6.2 – Panel BOM

Sr. No.	Description	Make	Qty.
1	Mains ON/OFF Switch 3Pole 160A	L&T	1
2	Mains ON/OFF Switch Handle + Rod	L&T	1
3	R, Y, B Ind Lamp SET	Teknic/Autonics	1
4	Earthing Bus Bar	Std	1
5	Aux Contactor 9A Ac Coil	L&T	1
6	MCB for TXR, I/P 2 Pole 4 Amp	L&T	2
7	MCB for SMPS O/P 2 Pole 20 Amp	L&T	1
8	MCB for PLC, 2 Pole 2 Amp	L&T	1
9	MCB 2 Pole for Fan/Tube and Control 10 Amp	L&T	2
10	MCB 2Pole 6A For SMPS Supply	L&T	1
11	MCCB 3 pole 45 Kw motor 125 Amp fix type	L&T	1
12	Main Delta Contactor Ac Coil 93A	L&T	2
13	Star Contactor Ac Coil 40A	L&T	1
14	MPD 34-50 Amp	STD	1
15	Star Delta Timer	Omron	1
16	MPCB HYD motor Cooling	L&T	1
17	Contactor for Hyd. Cooling Motor 9 A Ac Coil	L&T	1
18	MPD 1-10A For Contactor for Hyd. Cooling	STD	1
19	MPCB PILOT pressure	L&T	1
20	Contactor for Pilot pressure Motor 9A Ac Coil	L&T	1
21	MPD 7-10 HYD. Motor	STD	1
22	safety Light curtain 400 mm	Aditiy Make	1
23	SSR Board 3 AMP AC output with cable	Aditiy Make	1
24	SSR Board 3 AMP DC output with cable	Aditiy Make	3
25	CT 150 / 5 Amp	Rishabh	3
26	SMPS 24V DC 5A	Omron	1
27	Control Terminal UK2.5B-E	Phoenix	90
28	Power Terminal UK 6N-E	Phoenix	9
29	Earthing Terminal USLKG 5	Phoenix	4
30	Earthing Terminal USLKG 16	Phoenix	1
31	Incoming Terminal UIK 16	Phoenix	10
32	End Plate D-UK 2.5-E	Phoenix	12
33	End Plate D-UK 16	Phoenix	4
34	End Block E/UK (with 3 Screws)	Phoenix	10
35	Push Button (22.5 mm) Yellow	Autonics	1
36	IL Push Button (22.5 mm) Green	Autonics	4
37	E STOP/40mm Dia. / Short Head	Autonics	1
38	KEY Selector Switch / 2 Position Maintained (22.5 mm)	Autonics	2
39	Selector Switch / 2 Position Maintained (22.5 mm)	Autonics	2
40	Relay Board (8 CH) Single Change Over 24V DC	TTPL	3
41	PVC Channel (40*80)	TTPL	7

42	PVC Channel (25*60)	TTPL	1
43	PVC Channel (25*80)	TTPL	4
44	Din Rail	TTPL	4
45	Desk type Control Panel with HMI	Std	1
46	2 Hand safety Panel Box (Length 1000 mm * Hight 50 mm) with Stand	Std	1
47	Push Button (22.5 mm)	Teknic/Autonics	15
48	IL Push Button (22.5 mm)	Teknic/Autonics	10
49	Selector switch	Teknic/Autonics	5
50	EMG Button	Teknic/Autonics	3
51	Operator BOX	Std	1
52	Energy meter -	Schinder	1
53	Mounting Brackets	Std	1
54	Transformer 100VA (Pri-0,415,440, Sec-0, 110, 180, 220)	Chintamani	1
55	Utility Socket	Anchor	1
56	Tube Light 5 Watt	Hawells/Philips	1
57	Door Switch	Std	1
58	4 Fan with Grill	Super flex	2
59	Ferrule	Indomax	150
60	Drawing and documentation	Cubix	1
61	Panel Specification Plate	Std	1
62	Control Cable for Inside Panel Wiring	Std	1

## 7 – HMI Screens



**MahindraCIE**

## INPUT LIST 1

GO TO  
SCREEN

11/01/21  
10:48:17

ADD	INPUT DESCRIPTION	STATUS	ADD	INPUT DESCRIPTION	STATUS
X00	SINGLE STROKE (AUTO)	OFF	X10	HYD. COOLING MOTOR OFF PB	OFF
X01	INCHING STROKE (MANUAL)	OFF	X11	RAM UP PB	OFF
X02	RAM LOCK/UNLOCK SELECTOR	OFF	X12	RAM DOWN PB	OFF
X03	SAFETY HAND PB 1	OFF	X13	FAULT RESET PB	OFF
X04	SAFETY HAND PB 2	OFF	X14	MAIN HYD MOTOR OL TRIP (MPD 1)	OFF
X05	MAIN HYD. MOTOR ON PB	OFF	X15	PILOT PUMP OL TRIP (MPD 2)	OFF
X06	MAIN HYD. MOTOR OFF PB	OFF	X16	HYD COOLING MTR OL TRIP (MPD 3)	OFF
X07	HYD. COOLING MOTR ON PB	OFF	X17	MAIN HYD MOTOR ON F/B	OFF

OUTPUT LIST



<<<<<<<<< System Healthy >>>>>>>>

**MahindraCIE**

## INPUT LIST 2

GO TO  
SCREEN

11/01/21  
10:48:17

ADD	INPUT DESCRIPTION	STATUS	ADD	INPUT DESCRIPTION	STATUS
X20	PILOT PUMP ON F/B	OFF	X30	AIR MECHANISUM L/S	OFF
X21	HYD COOLING MTR ON F/B	OFF	X31	COUNTER BALANCER PSR SW RIGHT	OFF
X22	RAM AT TDC L/S (HOME)	OFF	X32	COUNTER BALANCER PSR SW LEFT	OFF
X23	RAM AT BDC L/S	OFF	X33	RAM DOWN PRESSURE SW (PRESSING COMPLETE)	OFF
X24	RAM OVER RUN TDC L/S	OFF	X34	AIR PRESSURE SW	OFF
X25	RAM UNDER RUN BDC L/S	OFF	X35	PILOT PRESSURE SW	OFF
X26	RAM LOCK L/S	OFF	X36	RAM UP EMG. STOP	OFF
X27	RAM UNLOCK L/S	OFF	X37	MAIN HYD OIL LEVEL SW	OFF



<<<<<<<<< System Healthy >>>>>>>>

**MahindraCIE**

## INPUT LIST 3

GO TO  
SCREEN

11/01/21  
10:48:17

ADD	INPUT DESCRIPTION	STATUS	ADD	INPUT DESCRIPTION	STATUS
X40	HYD OIL TEMP. HIGH	OFF	X50	SPARE I/P	OFF
X41	SAFETY CURTAIN SENSOR	OFF	X51	SPARE I/P	OFF
X42	PILOT PRESSURE MOTOR ON PB	OFF	X52	SPARE I/P	OFF
X43	PILOT PRESSURE MOTOR OFF PB	OFF	X53	SPARE I/P	OFF
X44	DOOR L/S 1	OFF	X54	SPARE I/P	OFF
X45	DOOR L/S 2	OFF	X55	SPARE I/P	OFF
X46	SPARE I/P	OFF	X56	SPARE I/P	OFF
X47	SPARE I/P	OFF	X57	SPARE I/P	OFF



OUTPUT LIST

<<<<<<<<< System Healthy >>>>>>>>>

**MahindraCIE**

## OUTPUT LIST 1

GO TO  
SCREEN

11/01/21  
10:48:17

ADD	OUTPUT DESCRIPTION	STATUS	ADD	OUTPUT DESCRIPTION	STATUS
Y00	MAIN HYD MOTOR ON	OFF	Y10	STROKE READY LAMP	OFF
Y01	PILOT PRESSURE MOTOR ON	OFF	Y11	STROKE COUNTER	OFF
Y02	HYD COOLING MOTOR ON	OFF	Y12	FAULT 1 LAMP	OFF
Y03	RAM DOWN SV (V3-A)	OFF	Y13	FAULT 2 LAMP	OFF
Y04	RAM UP SV (V3-B)	OFF	Y14	FAULT 4 LAMP	OFF
Y05	PILOT PRESSURE SV (V7)	OFF	Y15	FAULT 8 LAMP	OFF
Y06	DECOMPRESSION SV (V6)	OFF	Y16	FAULT 16 LAMP	OFF
Y07	RAM LOCK /UNLOCK SV	OFF	Y17	RAM UP LAMP	OFF

INPUT LIST



<<<<<<<<< System Healthy >>>>>>>>>

## MahindraCIE OUTPUT LIST 2

GO TO  
SCREEN

11/01/21  
10:48:18

ADD	OUTPUT DESCRIPTION	STATUS	ADD	OUTPUT DESCRIPTION	STATUS
Y20	RAM DOWN LAMP	OFF	Y30	SPARE O/P	OFF
Y21	SPARE O/P	OFF	Y31	SPARE O/P	OFF
Y22	SPARE O/P	OFF	Y32	SPARE O/P	OFF
Y23	SPARE O/P	OFF	Y33	SPARE O/P	OFF
Y24	SPARE O/P	OFF	Y34	SPARE O/P	OFF
Y25	SPARE O/P	OFF	Y35	SPARE O/P	OFF
Y26	SPARE O/P	OFF	Y36	SPARE O/P	OFF
Y27	SPARE O/P	OFF	Y37	SPARE O/P	OFF



INPUT LIST

<<<<<<<<< System Healthy >>>>>>>>

## MahindraCIE MANUAL MODE

GO TO  
SCREEN

11/01/21  
10:48:19

PILOT PRESSURE  
SV OFF

DECOMPRESSION  
SV OFF

STROKE READY  
LAMP OFF

<<<<<<<<< System Healthy >>>>>>>>

**MahindraCIE**

## ALARM HISTORY

GO TO  
SCREEN

11/01/21  
10:48:19

OCCURRED	COMMENT	RES
11/01/2021 10:48	Main Hyd. Motor Trip (X14)	10:48
11/01/2021 10:48	Pilot Pump Trip (X15)	10:48
11/01/2021 10:48	Hyd. Cooling Motor Trip (X16)	10:48
11/01/2021 10:48	Air Preesure Low (X34)	10:48
11/01/2021 10:48	Main Hyd. Oil Level Low (X37)	10:48
11/01/2021 10:48	Hyd. Oil Temp High (X40)	10:48
11/01/2021 10:48		10:48
11/01/2021 10:48		10:48
11/01/2021 10:48		10:48
11/01/2021 10:48		10:48
11/01/2021 10:48		10:48

Cursor  
ON

Up

Check

Delete

Save

Cursor  
OFF

Down

Check  
all

Delete  
all

Reset

**MahindraCIE**

## TIMER SETTING

GO TO  
SCREEN

11/01/21  
10:48:19

Main Hyd. Motor Full ON Time **456** Sec.

RAM Pressing Hold Time **456** Sec.

Decompression Time **456** Sec.

<<<<<<<<< System Healthy >>>>>>>>

**MahindraCIE**

## HOME CONDITION

GO TO  
SCREEN

11/01/21  
10:48:20

Sr No.	Description	Status
1.	Auto Mode ON (X0)	Not OK
2.	Main Hyd. Motor ON (X17)	Not OK
3.	Pilot Pressure Motor ON (X20)	Not OK
4.	RAM at TDC L/S (X22)	Not OK
5.	Safety Light Curtains (X41)	Not OK

**MahindraCIE**

## AUTO MODE

GO TO  
SCREEN

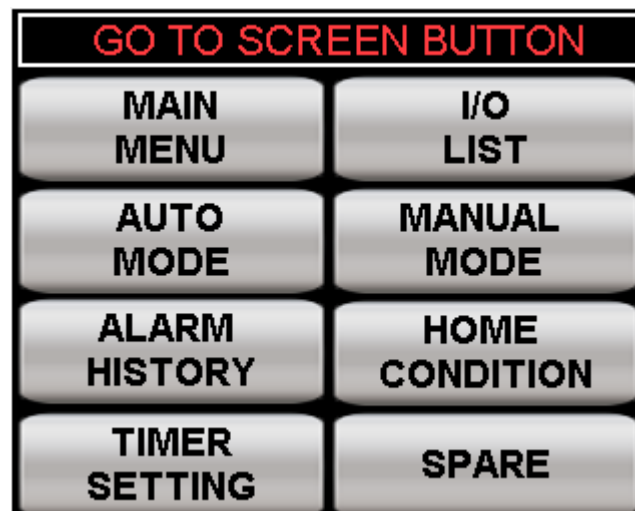
11/01/21  
10:48:20

Stroke Counter :- 1234567

Counter  
Reset

<<<<<<<< System Healthy >>>>>>>>





**Main Hyd. Oil  
Low Level**

Please check I/P (X37)

**RESET**

**Pilot Pressure Low**

Please check I/P (X35)

**RESET**

**Air Pressure Low**

Please check I/P (X34)

**RESET**

**Hyd. Cooling Motor  
Trip**

Please check I/P (X16)

**RESET**

## Pilot Pressure Motor Trip

Please check I/P (X15)

**RESET**

## Main Hyd. Motor Trip

Please check I/P (X14)

**RESET**

## Safety Light Curtains

Curtains disturbed during cycle

**RESET**

## 8 – SCADA Screens

### 8.1 – Screens

NA

## 8.2 – Reports

**NA**

## 8.3 – Hard Key Details

**NA**

## 8.4 – PC/IPC Details

**NA**

## 9 – Scope of Supply

SR.NO.	ACTIVITY DESCRIPTION	SCOPE UNDER	REMARK
1	FA hardware	Cubix	
2	PLC program	Cubix	
3	HMI program	Cubix	
4	SCADA development	NA	
5	Control panel	Cubix	
6	Packing Charges Scope and Type	Cubix	
7	Forwarding Charges Scope	Cubix	
8	Freight Scope	Cubix	
9	Transit Insurance Scope	Cubix	
10	Loading Scope	Cubix	
11	Unloading Scope	MCIE	
12	Electrical drawing	Cubix	
13	Field wiring materials	Cubix	
14	Field wiring labour/work	Cubix	
15	Field instruments	NA	
16	Removal of old panel		
17	Removal of old field wiring		
18	Installation & commissioning	Cubix	
19	Operator Training	Cubix	
20	Panel Shifting		
21	Mechanical work	MCIE	
22	Civil work	MCIE	
23	Lodging facility scope	NA	
24	Boarding scope	NA	
25	Travelling (To & Fro) scope	Cubix	
26	Meal Arrangements at site-Scope	Cubix	
27	Customer Scope Instruments	Safety Relays	
28			
29			
30			
31			
32			
33			
34			
35			

