



SKILL 19

CIRCUIT DESIGN AND/OR MODIFICATION

NOTE:

1. Open the template "WSC2016_TP19_Module_Circuit_Design_template.ct" on your computer.
2. Save the template with your **province** and your **name**. (Example: **province_name**.ct)
3. Use only the newly saved template to design the electrical circuit in FluidSIM!

COMPETITOR:

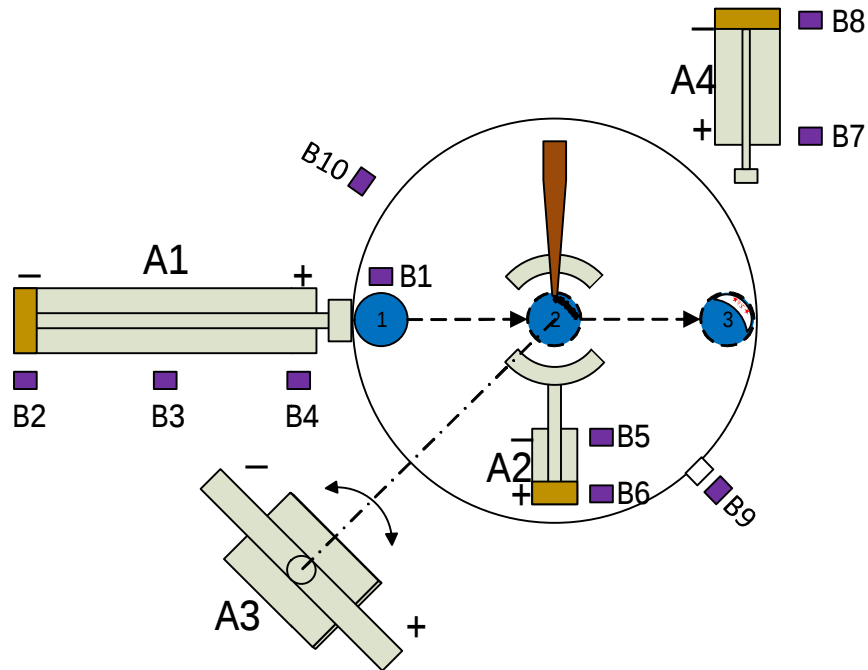
NAME: _____

PROVINCE: _____

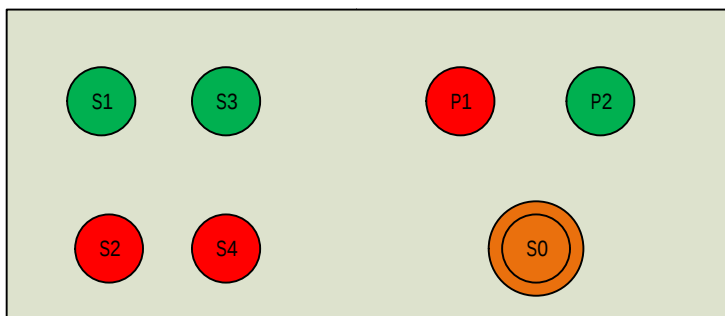
BOOTH NR: _____



REPRESENTATION OF SYSTEM:



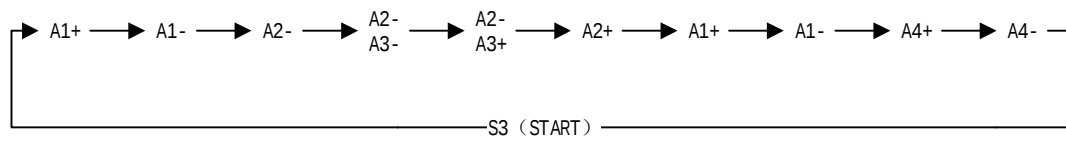
PRODUCT: BUTTON



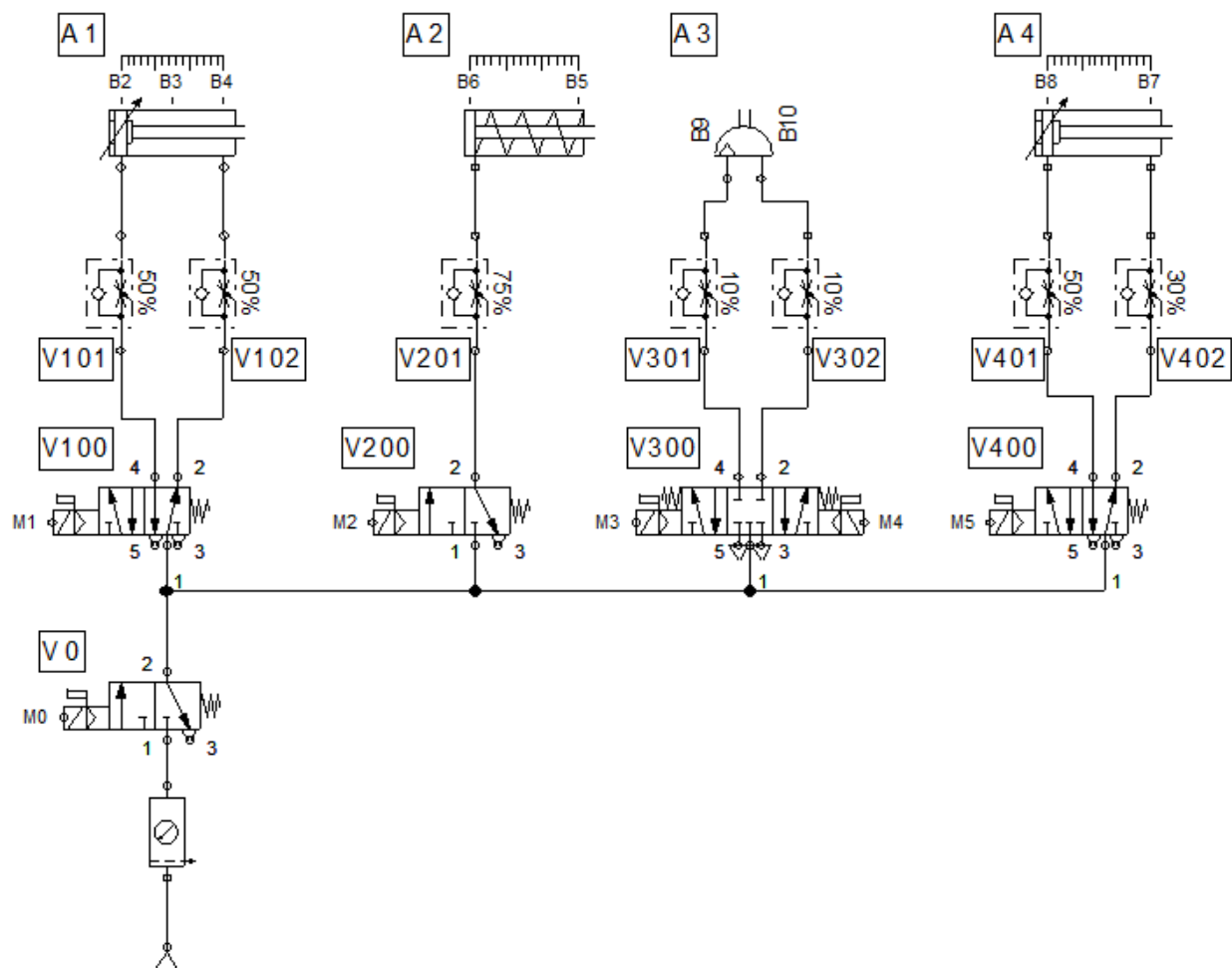
- S0 紧急停止按钮
- S1 气源接通按钮
- S2 气源断开按钮
- S3 加工启动按钮
- S4 加工停止按钮
- P1 红色指示灯
- P2 绿色指示灯



SEQUENCE OF MOVEMENT (CYCLE)

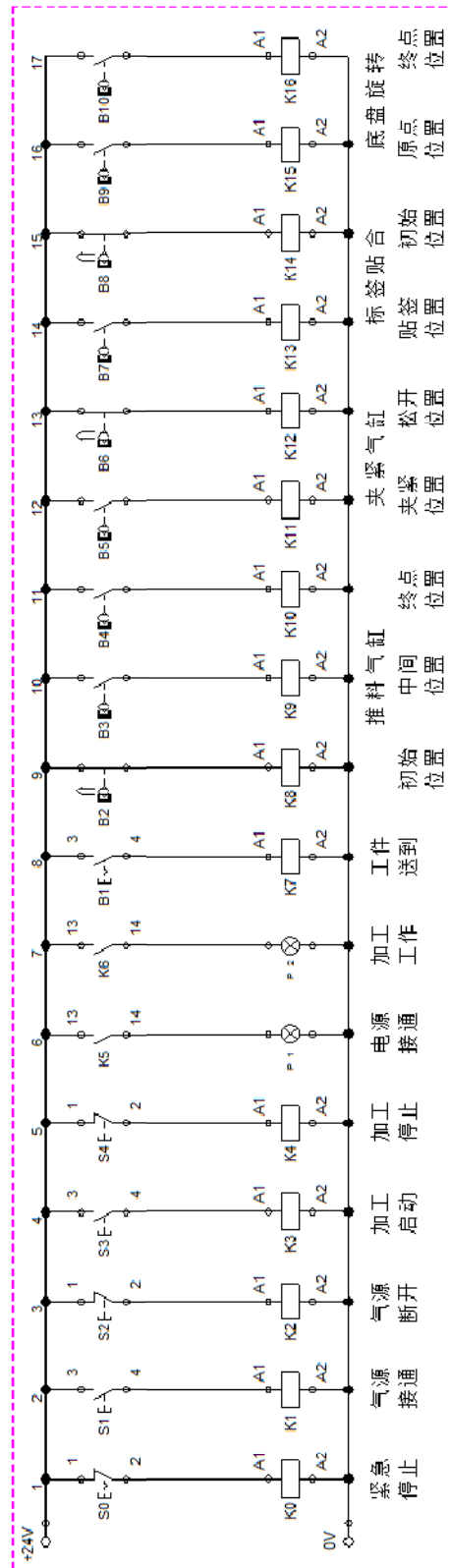


PNEUMATIC DIAGRAM



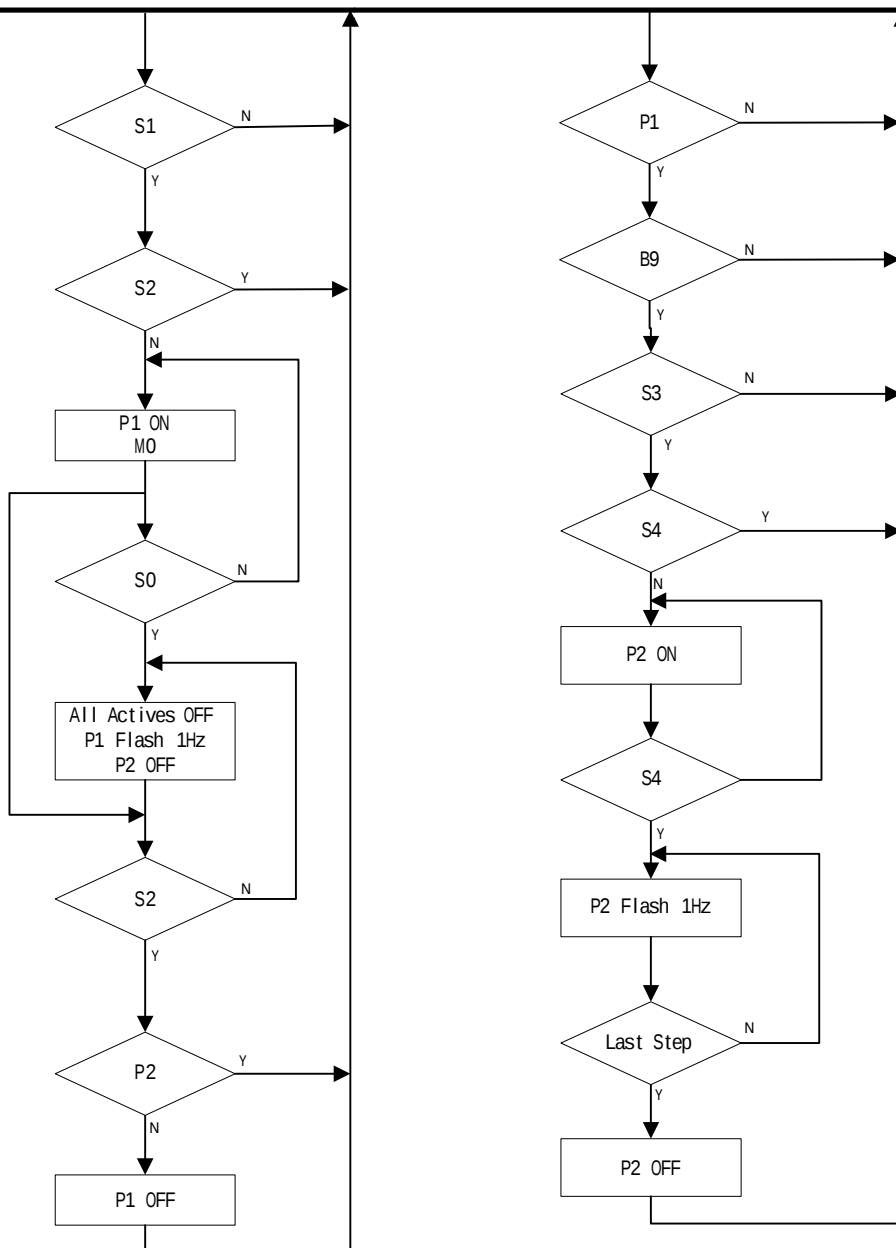


ALREADY WIRED CONTROL PANEL AND FIELD SENSORS

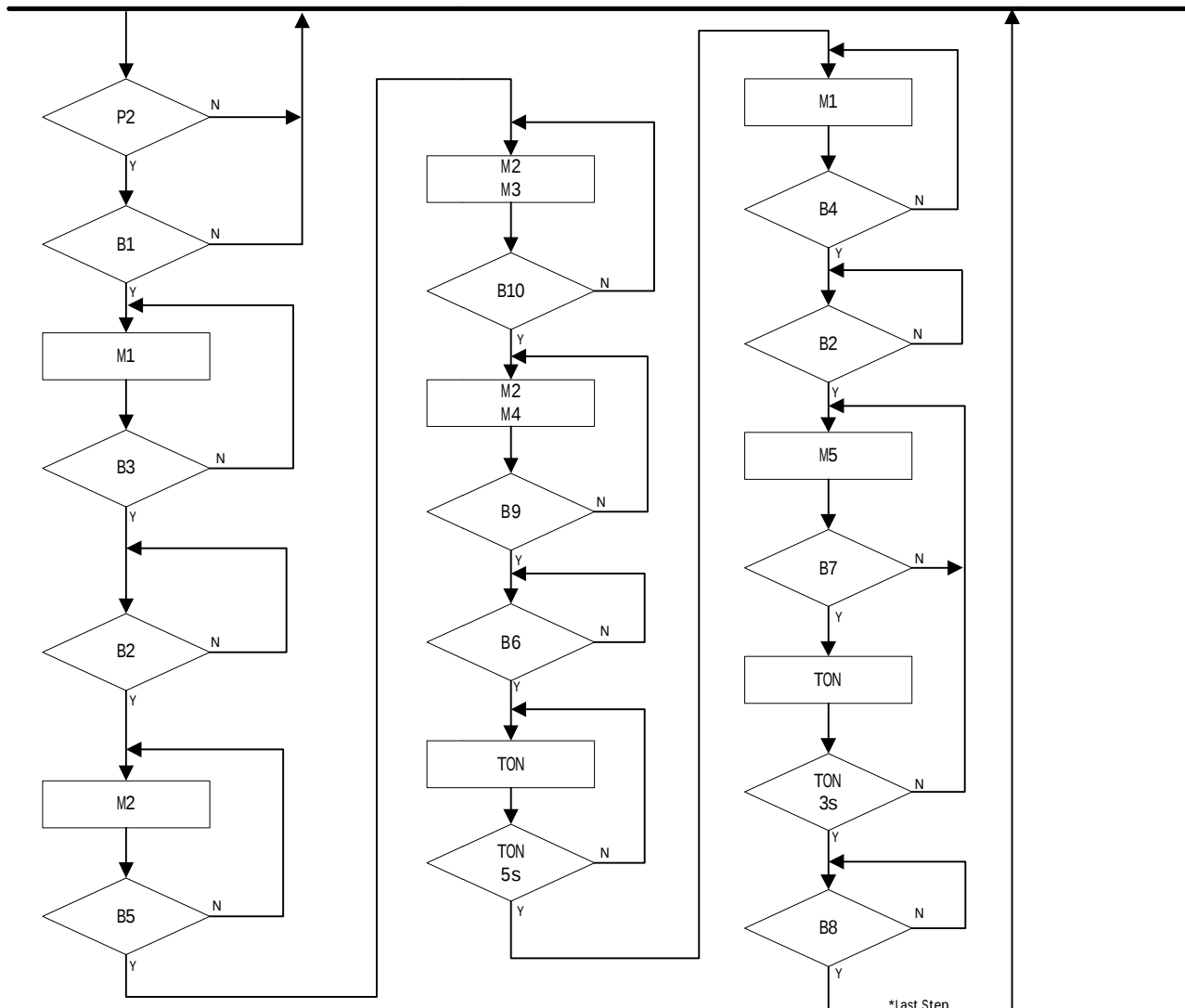




FUNCTION DESCRIPTION



Note: N = not actuated Y = actuated



Note: N = not actuated Y = actuated



SKILL 19

MODULE “FAULT FINDING HARDWARE”

COMPETITOR:

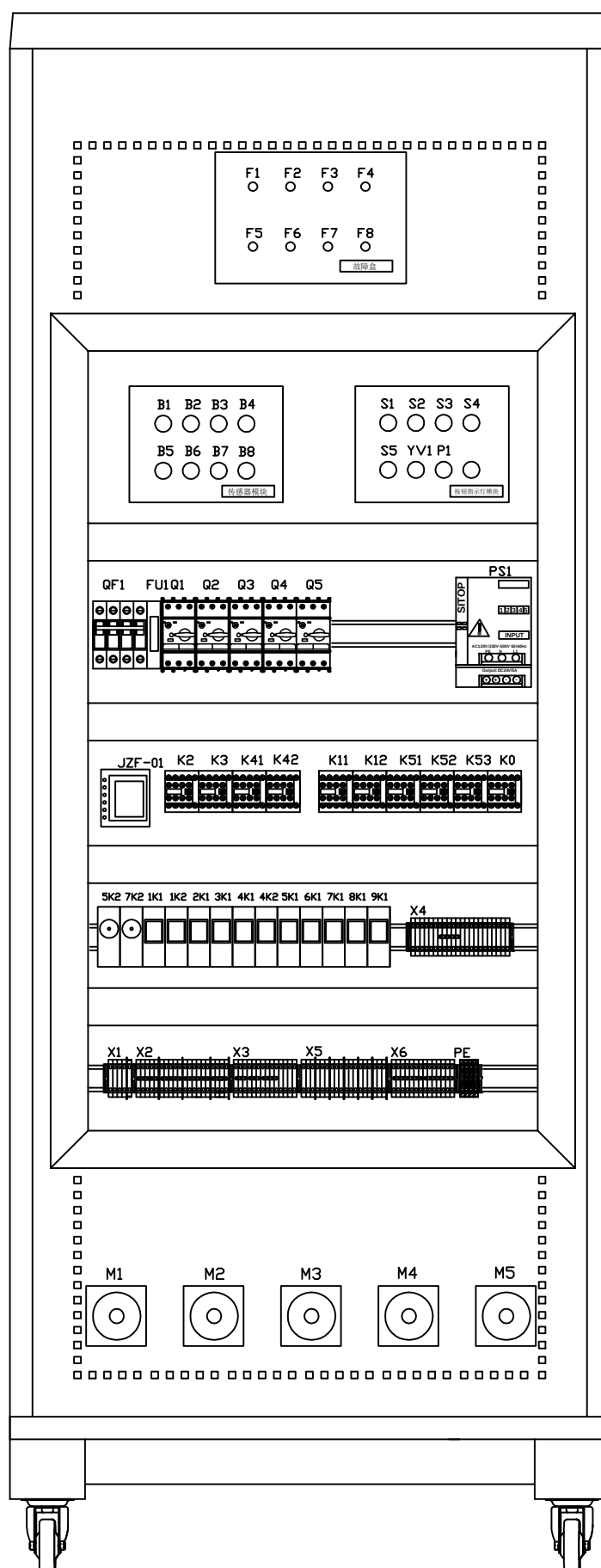
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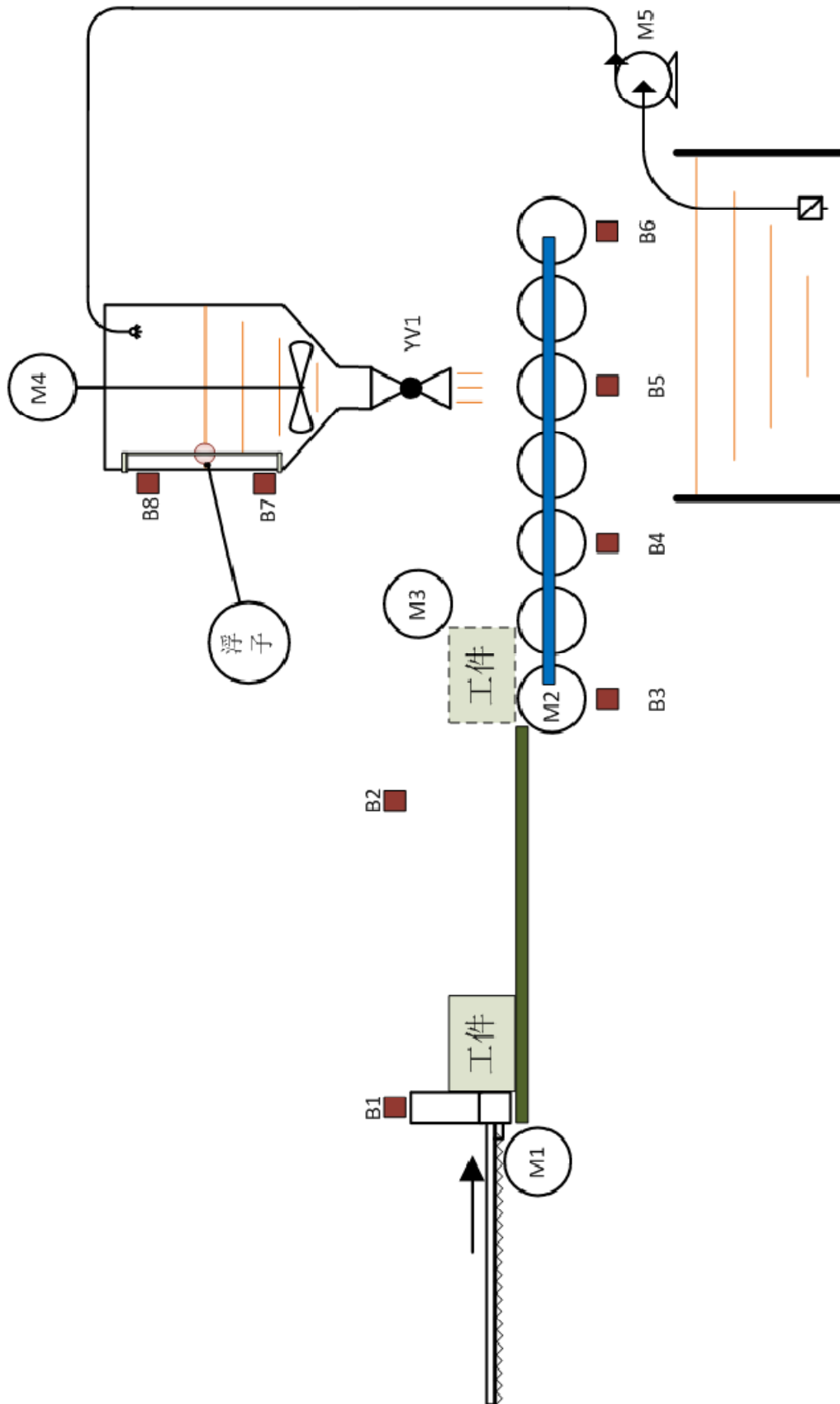
PROVINCE: _____

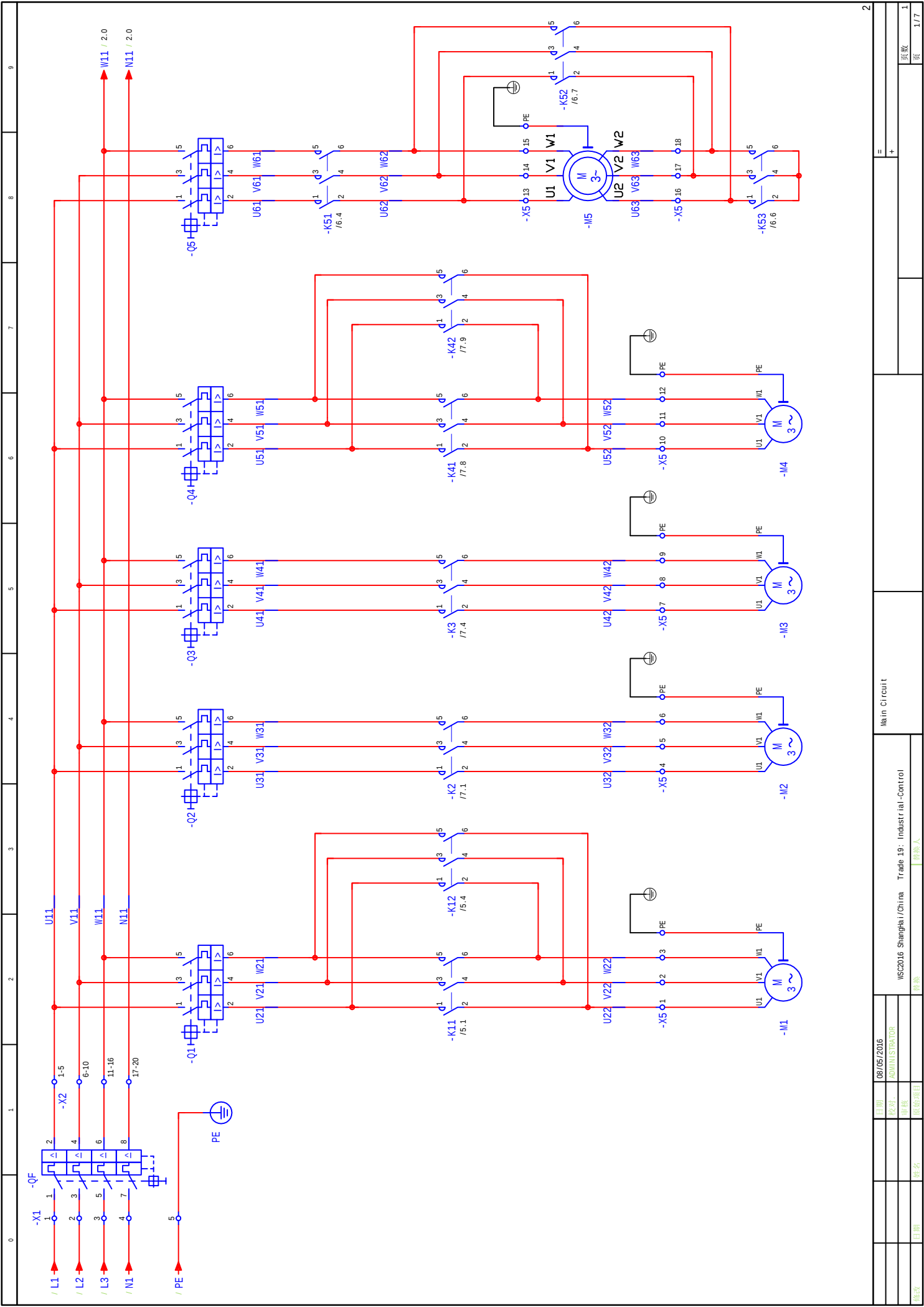
BOOTH NR: _____

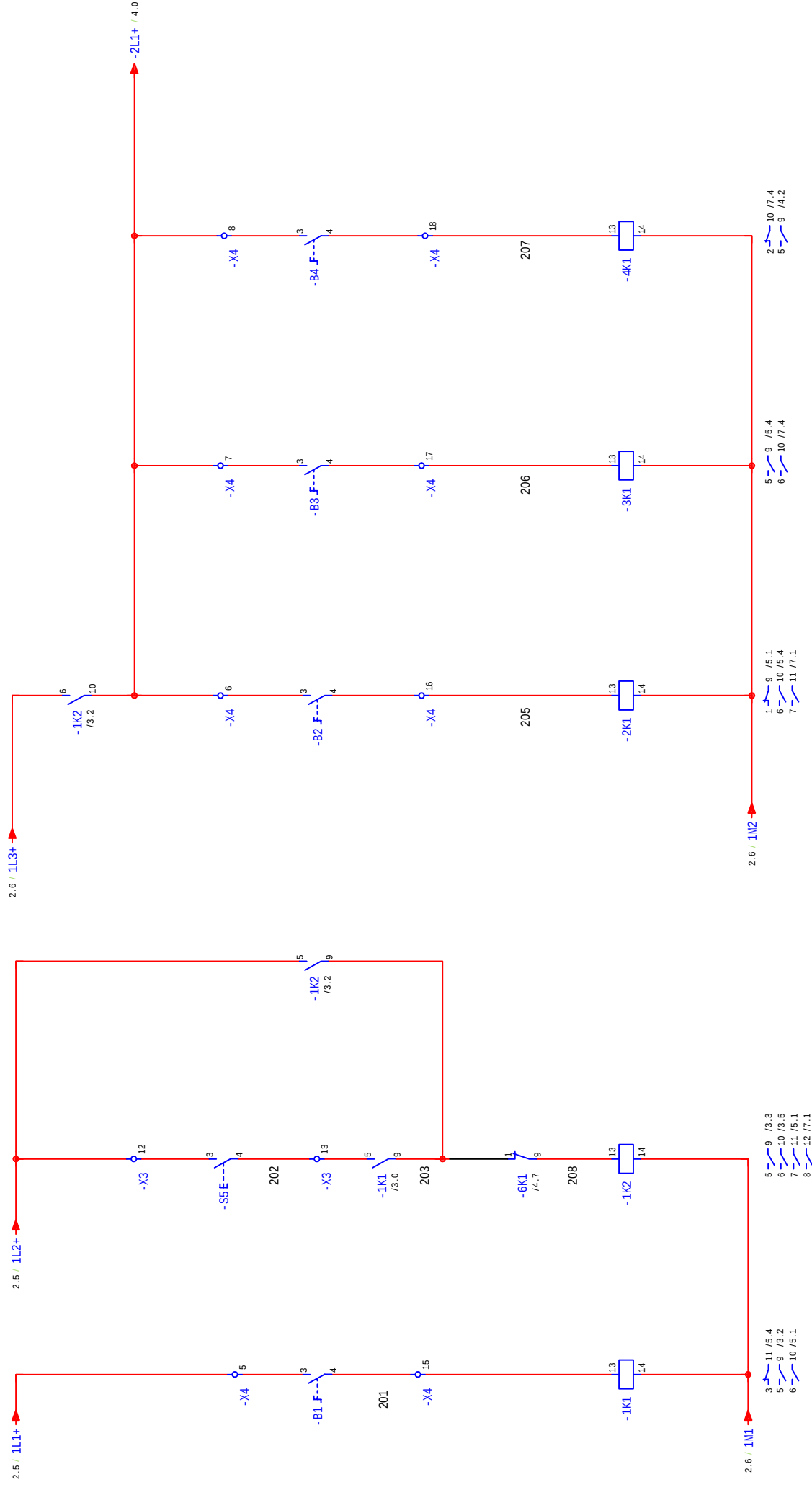


正面











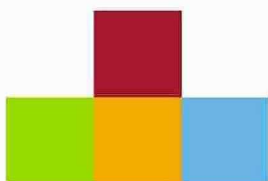
TEST PROJECT INDUSTRIAL CONTROL

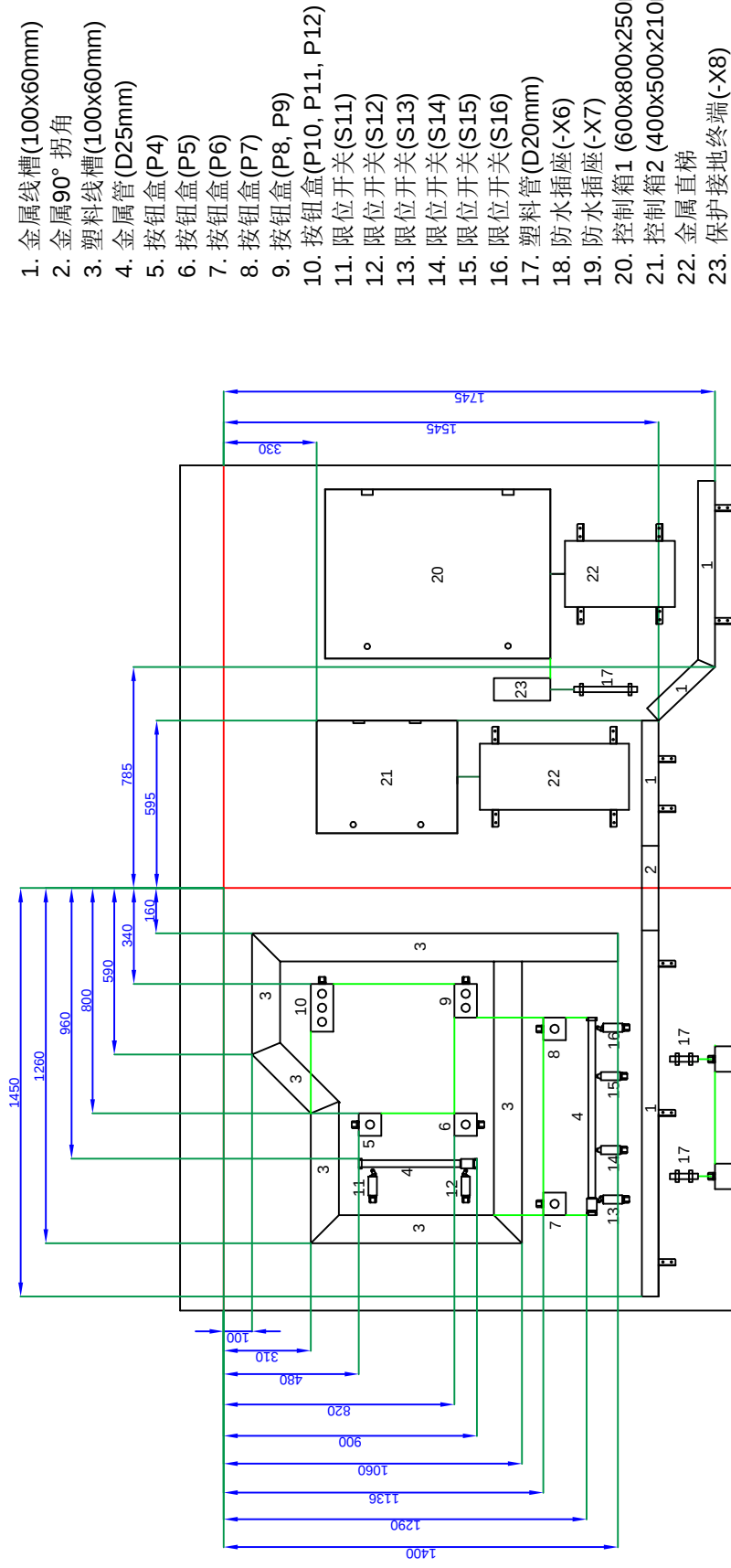
Submitted by: Yuan Hairong
Member country/region: China

Name of the Competitor: _____

Province: _____

BOOTH NR: _____





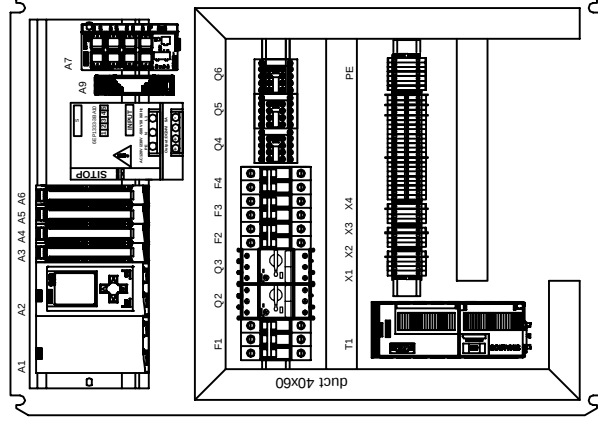
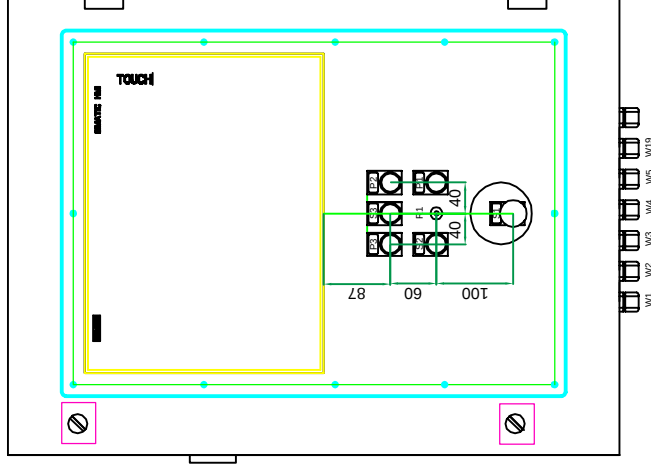
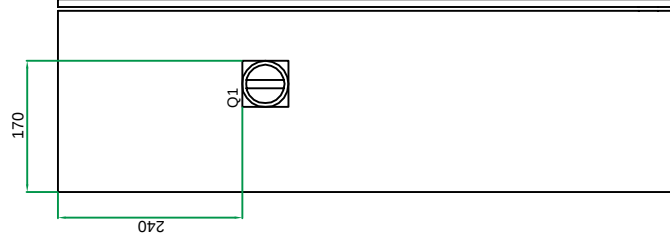
WALL INSTALLATION NOT IN SCALE

- * All measurements from a horizontal line ap 150 - 300mm from the end of the booth,
- All measurements from a vertical line ap 10 - 30mm from the end of the booth.
- All devices, which are not in the mesuarements, the mounting is up to the competitor



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Skill: Skillname and No		Paper: A3	
Scale: X:Y	Date: 07.2016		
Drawn / Design by:		Drawing No:	
Description:		Rev: 01	Page:
		Appd:	Sign:



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Skill: Skillname and No

Scale: X:Y Date: 07.2016

Paper: A3

Drawn / Design by:

Drawing No:

Description:

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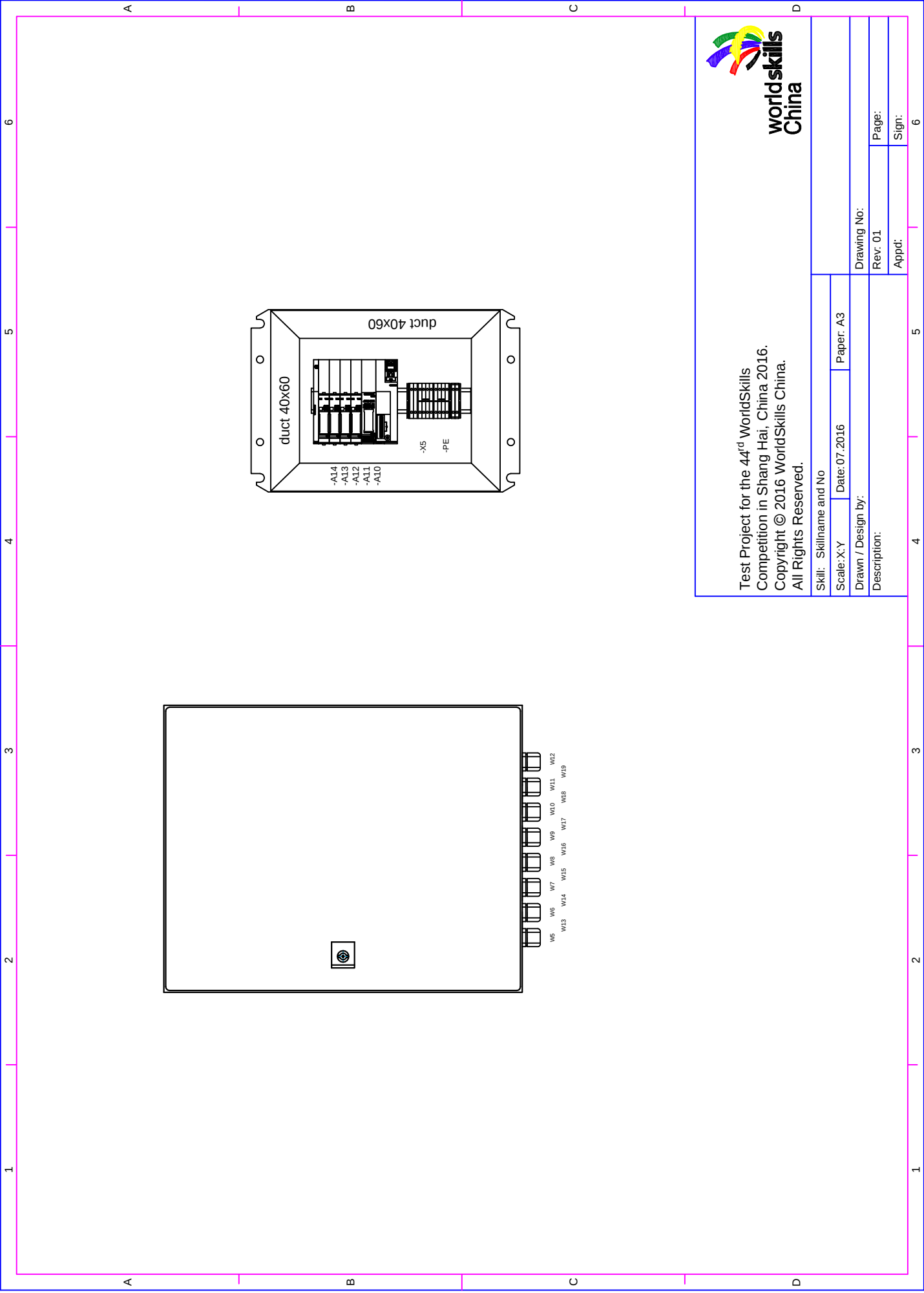
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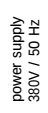
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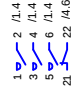
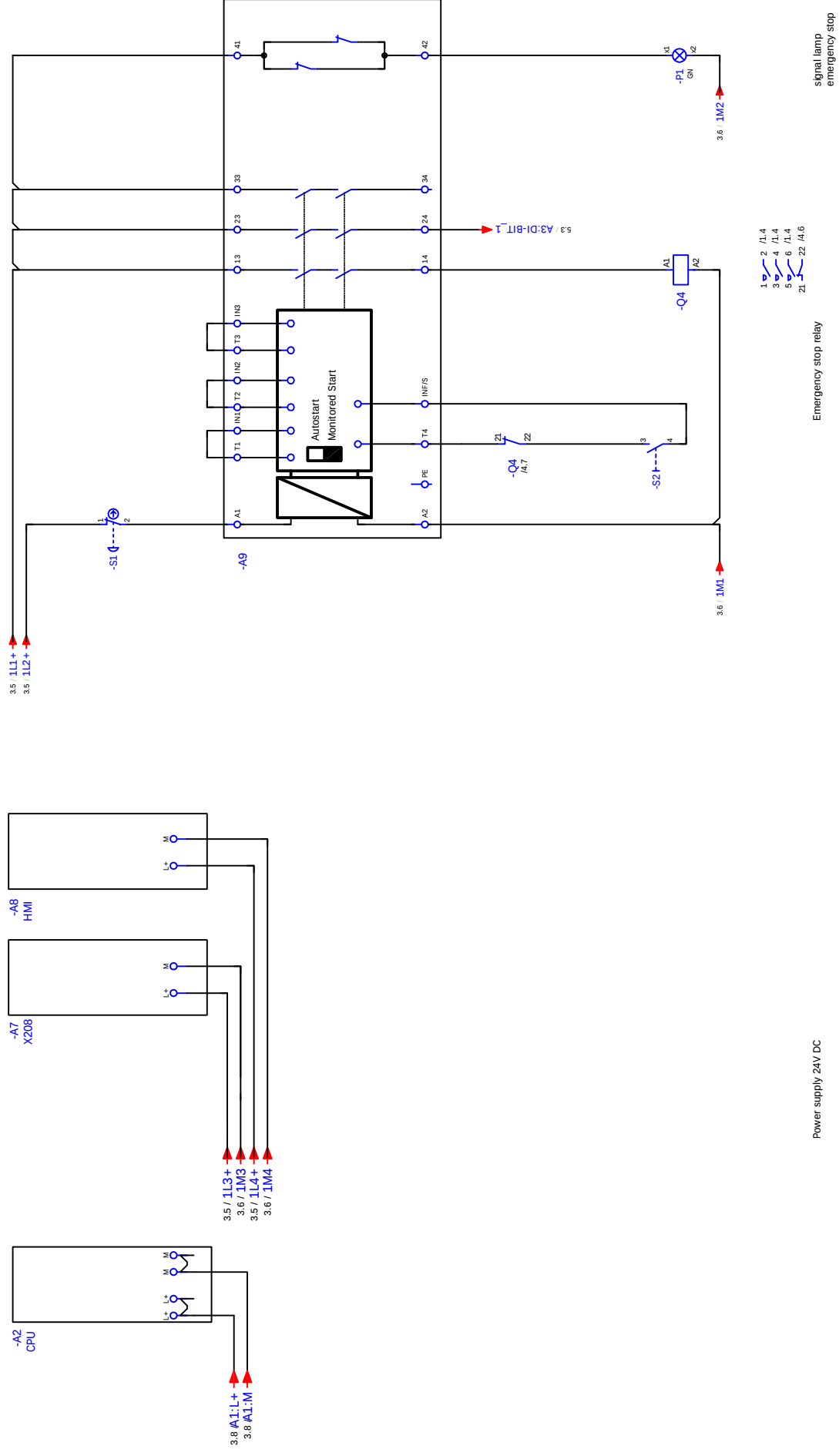
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Competition in Shang Hai, China 2016.
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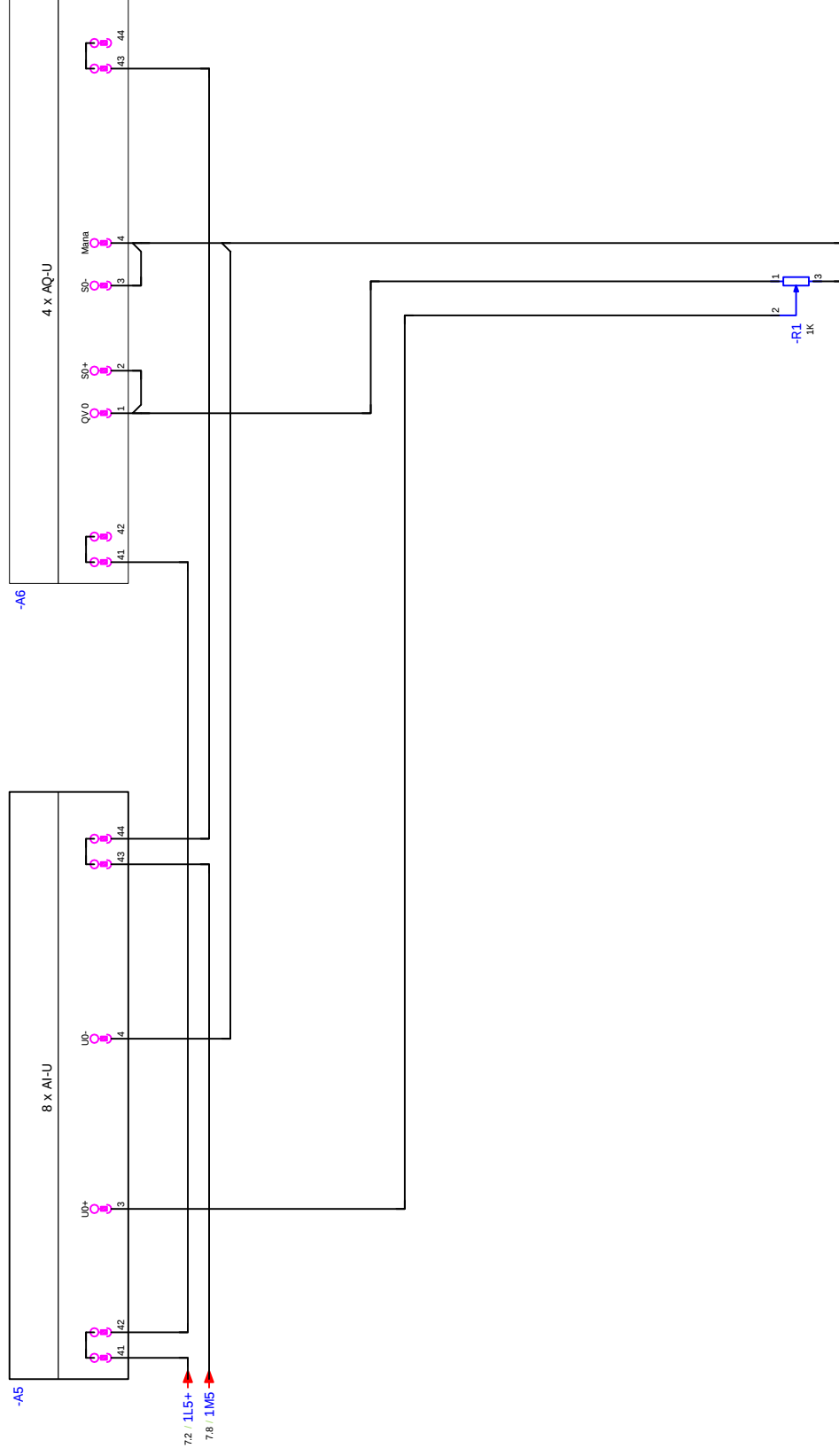


Power supply 24V DC

Emergency stop relay

signal lamp
emergency stop

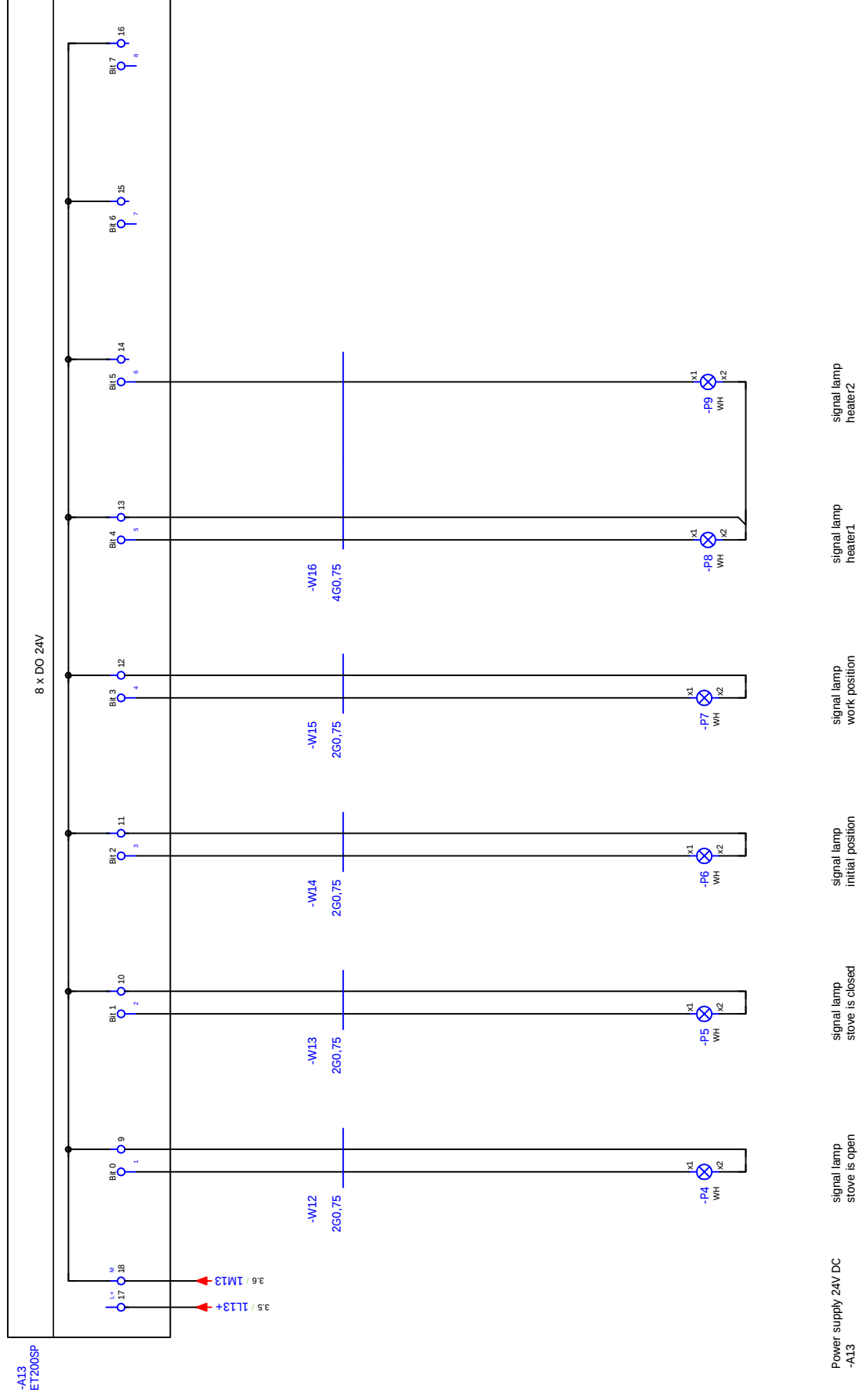
[illegible]



Temperature

0	1	2	3	4	5	6	7	8	9
-A12 ET200SP 8 x DI 24V 17 18 17 18 3.5 / 1L12+ 3.6 / 1M12 control box 2 - panel control box 2 - wall control box 2 - door -PE -W18 2.5 -X8 /3.1 PE protective conductor connection									
9									11
Datum		07/2016		WS2016 Shang Hai/China		Skill 19: Industrial-Control		Control Circuit	
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Datum								Blatt	
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0	1	2	3	4	5	6	7	8	9
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[illegible]

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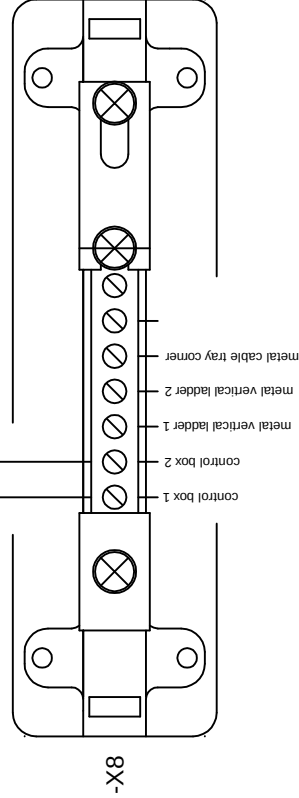
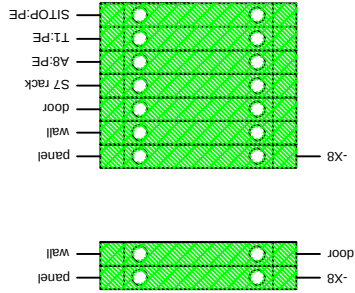
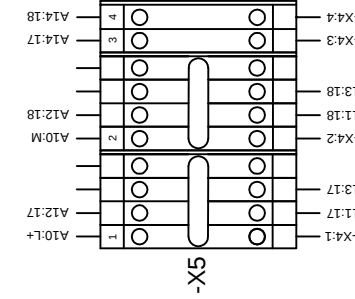
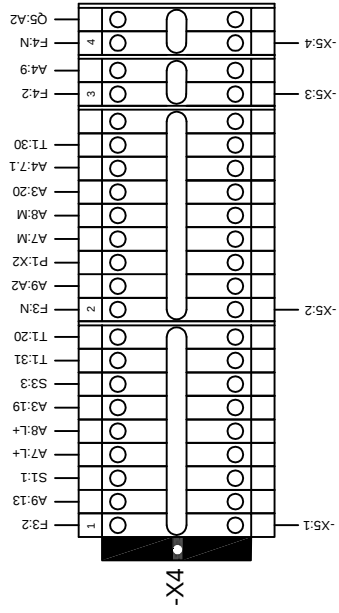
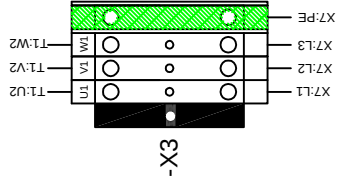
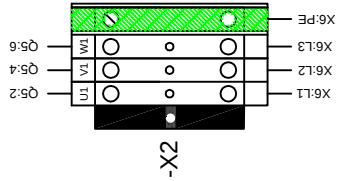
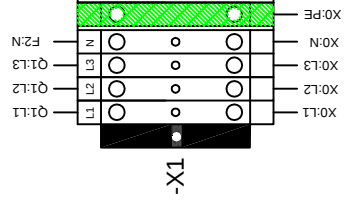
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A

B

C

D



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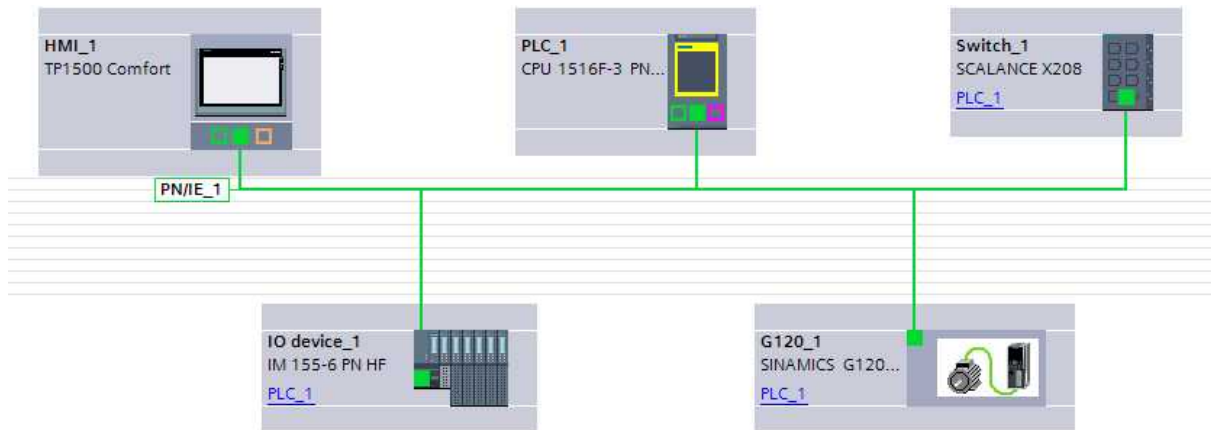
CABLE LIST

Nr.	Cable type	intern		extern	Description
W1	RVV-5G2,5	X1	----->	X0	Power Supply 3x400V+N+PE
W2	RVV-4G1,5	X2	----->	X6	CEE socket 400V (MA1)
W3	RVV-4G1,5	X3	----->	X7	CEE socket 400V (MA2)
W4	RV-2.5	PE	----->	X8	protective earth terminal
W5	RVV-4G0,75	X4	----->	X5	Power Supply 24V/DC control box 2
W6	RVV-2G0,75	ET200SP	----->	S11,	Limit switch
W7	RVV-2G0,75	ET200SP	----->	S12	Limit switch
W8	RVV-2G0,75	ET200SP	----->	S13	Limit switch
W9	RVV-2G0,75	ET200SP	----->	S14	Limit switch
W10	RVV-2G0,75	ET200SP	----->	S15,	Limit switch
W11	RVV-2G0,75	ET200SP	----->	S16	Limit switch
W12	RVV-2G0,75	ET200SP	----->	P4	Signal lamp
W13	RVV-2G0,75	ET200SP	----->	P5	Signal lamp
W14	RVV-2G0,75	ET200SP	----->	P6	Signal lamp
W15	RVV-2G0,75	ET200SP	----->	P7	Signal lamp
W16	RVV-4G0,75	ET200SP	----->	P8,P9	Heater
W17	RVV-4G0,75	ET200SP	----->	P10.P11.P12	Temperature
W18	RV-2.5	X5 PE	----->	X8	protective earth terminal
W19	IE-cable	A7	----->	A10	Profinet cable to ET200 SP

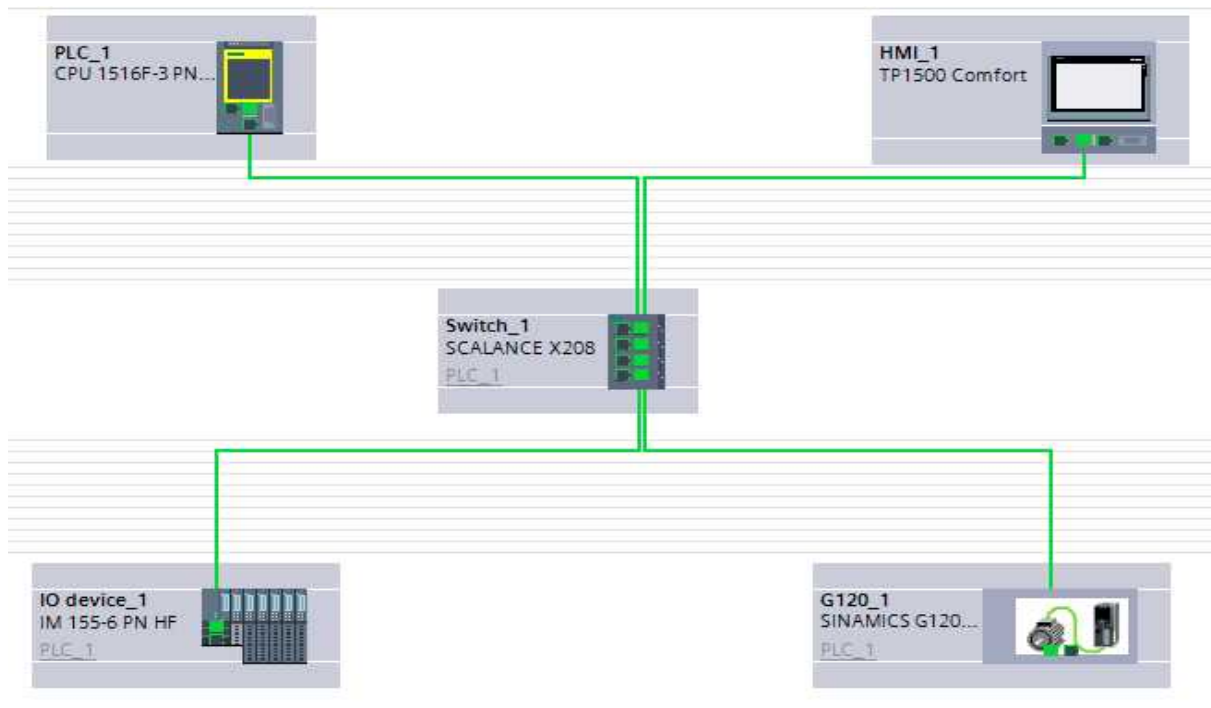


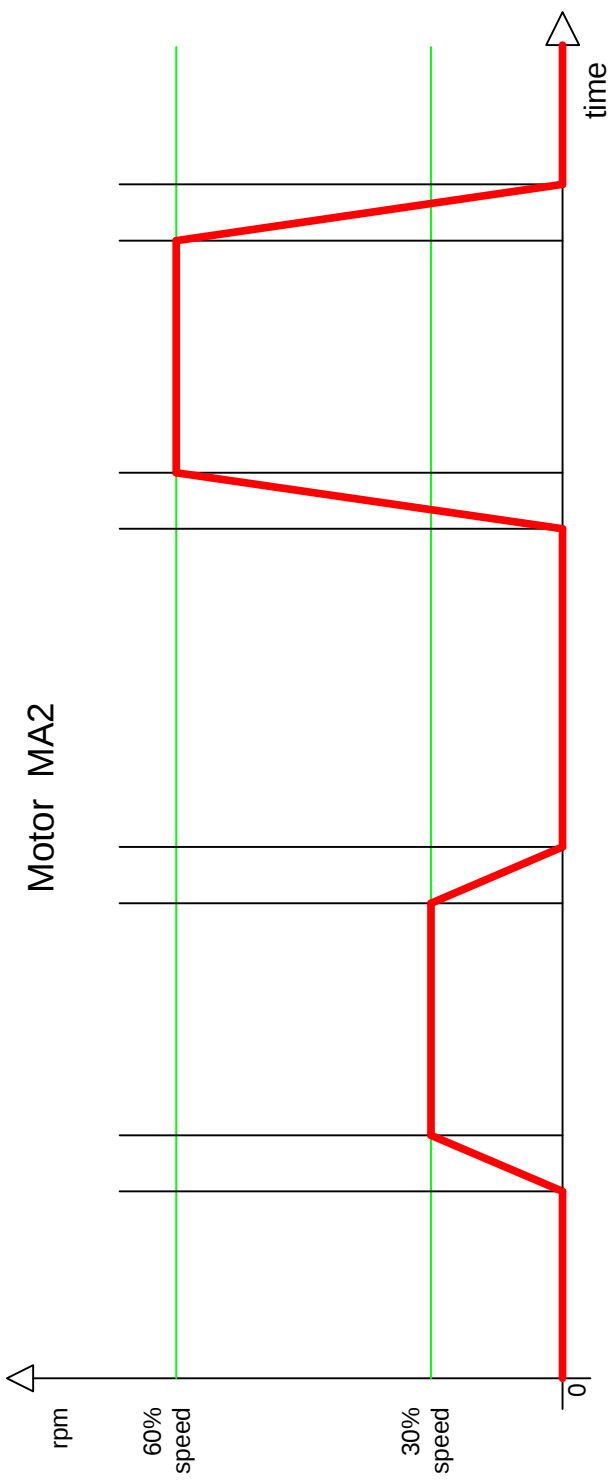
PROFINET CONNECTIONS

OVERVIEW TECHNOLOGY



OVERVIEW TOPOLOGY





The changes in speed and the 0-speed will be reached in 3 seconds. The ramps must be programmed in the frequency converter.



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SAFETY REPORT – COMMISSIONING

Competitor

Name, Province /

Booth No.:

1. VISUAL INSPECTION:

The visual inspection includes:

☐ Control box 1 ☐ Control box 2 ☐ Protective earth terminal ☐ Plant installation

2. MEASUREMENT:

2.1 LOW IMPEDANCE TESTING:

Control box 1:

CEE- plug	---	X1/PE	 Ω
PE	---	Sitop	 Ω
PE	---	panel	 Ω
PE	---	side wall	 Ω
PE	---	door	 Ω
PE	---	S7-rack	 Ω
PE	---	T1/PE	 Ω
PE	---	A8/PE (HMI)	 Ω
PE	---	X8	 Ω
X2/PE	---	X6/PE(CEE socket)	 Ω
X3/PE	---	X7/PE (CEE socket)	 Ω

Control box 2:

PE	---	X8	 Ω
PE	---	panel	 Ω
PE	---	side wall	 Ω
PE	---	door	 Ω

Wall Installation:

X8	---	vertical ladder 1	 Ω
X8	---	vertical ladder 2	 Ω
X8	---	cable tray right side	 Ω
X8	---	cable tray corner	 Ω
X8	---	cable tray left side	 Ω



2.2. ISOLATION MEASUREMENT:

Main circuit X1 – Power supply:

X1/PE	---	L1, L2, L3	 MΩ
X1/L1, L2, L3,	---	L1, L2, L3	 MΩ

Main circuit X2 –CEE socket X6:

X2/PE	---	X2/ L1, L2, L3	 MΩ
X2/L1, L2, L3	---	X2/ L1, L2, L3	 MΩ

Main circuit X3– CEE socket X7:

X3/PE	---	X3/ L1, L2, L3	 MΩ
X3/L1, L2, L3	---	X3/ L1, L2, L3	 MΩ



2016年中国技能大赛—工业控制项目材料设施清单（清单部分）

序号	名称	数量	单位	生产商	尺寸
1	大控制箱	1	个	威图	W 600 x H 800 x D 250 mm
2	PLC-SCE 培训包	1	套	西门子	1个S7-1500 CPU 1516F-3 PN/DP , 1 MB / 5 MB; 1个数字量输入模块, 32 DI; 1个数字量输出模块, 32 DO; 1个模拟量输入模块, 8 AI; 1个模拟量输出模块, 4 AO; 1个MMC存储卡, 24 MB; 4个40针前连接器; 1根以太网电缆, 长6米; 1根导轨, 长482mm; 1个电源模块, 24V/8A。
3	HMI-SCE 培训包 TP1500 舒适型	1	套	西门子	15 " SIMATIC HMI TP1500 COMFORT 精智面板
4	SCE 培训包工业路由器 X208	1	套	西门子	
5	VSD-SCE 培训包 FU-G120	1	套	西门子	1、SINAMICS G120 控制单元 CU250-2 PN, 内置ProfiNET通讯口, 支持矢量控制, 可通过 EPos 功能执行定位任务, 4个可组态的IO点, 6 DI(可作3 F-DI), 5 DI, 3 DO(可作1 F-DO), 2 AI, 2 AO 安全集成 STO, SBC、SS1 安全功能可通过安全授权扩展, 编码器: D - CLIQ + HTL/TTL/SSI, 旋转变压器/HTL 通过端子接入保护等级 IP20, 提供USB 及SD/MMC 接口; 2、SINAMICS SD卡 512 MB ; 3、SINAMICS G120 智能操作面板; 4、SINAMICS G120 0.75KW 功率单元 PM240-2 带制动斩波器, 3AC 380-480V, +10%/-10% 47-63 Hz
6	电源模块24V稳压电源	1	个	西门子	电源模块24V稳压电源, 10A
7	安全继电器	1	个	西门子	安全型继电器
8	电机保护断路器	2	个	西门子	断路器, SZ S00 1.8~2.5A
9	3联断路器	1	个	西门子	断路器, 6KA 3POL C13
10	2联断路器	3	个	西门子	断路器, 6KA 1+N-P B6
11	接触器	3	个	西门子	接触器, 24V直流线圈、380V主触点、1NO+1NC
12	完整指示灯（红）	1	个	西门子	带光滑镜片、集成的LED（UC 24V）、螺钉端子
13	完整指示灯（黄）	1	个	西门子	带光滑镜片、集成的LED（UC 24V）、螺钉端子

14	完整指示灯（绿）	1	个	西门子	带光滑镜片、集成的LED（UC 24V）、螺钉端子
15	旋转开关	1	个	西门子	0-1自锁触头：1NO x 1NC
16	按钮	1	个	西门子	1NO+1NC
17	急停按钮	1	个	西门子	旋转式开关装置，红色，1NO+1NC
18	铭牌架	5	个	西门子	
19	Fluidsim-P V3.6	1	套	Festo	Fluidsim-P V3.6
20	PLC编程软件	1	套	西门子	TIA Portal V13 SP1
21	HMI编程软件	1	套	西门子	WinCC Advanced V13
22	VSD编程软件	1	套	西门子	SINAMICS Startdrive V13 SP1 TIA PORTAL
23	STEP 7 Safety Advanced V13 SP1	1	套	西门子	STEP 7 Safety Advanced V13 SP1 TIA PORTAL
24	CEE插座-5极	1	个	国产	
25	导轨	1	根	WAGO万可	TS35 x 7.5 x 2000mm
26	小控制箱	1	个	威图	W 400 x H 500 x D 210 mm
27	无螺纹金属管	1	根	国产	VR25 2000mm
28	塑料管	1	根	国产	VR20 2000mm
29	电机	2	个	西门子	
30	多股软电线	1	盘		RV 0.75 mm ²
31	多股软电线	1	盘		RV 1.5 mm ²
32	多股软电线	1	盘		RV 2.5 mm ²
33	多股软地线（黄绿双色）	1	盘		RV 1.5 mm ²
34	多股软地线（黄绿双色）	1	盘		RV 2.5 mm ²
35	电缆	1	盘		0.75 mm ² x2
36	塑料槽	3	根		W100xH60xL2000 mm
37	线槽	3	根		W40xH60xL2000mm
38	电缆槽	2	根		W100xH60xL2000mm
39	金属直梯	2	根		50x50x1000mm
40	金属直梯	1	根		35x15x1000mm
41	端子插入式跳线	24	个	西门子	2.5
42	导体端子块 2.5	44	个	西门子	2.5
43	导体接地端子块 2.5	12	个	西门子	2.5
44	末端和中间板块 2.5	12	个	西门子	2.5
45	固定件	11	个	西门子	
46	电缆密封套及螺母	2	个	国产	M16x1,5
47	电缆密封套及螺母	34	个	国产	M20x1,5
48	分布式I/O- SCE 培训包 SIMATIC ET 200SP IO-LINK	1	套	西门子	1个接口模块 IM155-6PN; 1个底板模块，带两个RJ45接口; 2个DI模块，8*24VDC/0.5A HF; 2个DQ模块，8*24VDC/0.5A HF; 4个底座
49	电位器	1	个	国产	1K 5% 2W
50	电位器旋钮	1	个	国产	

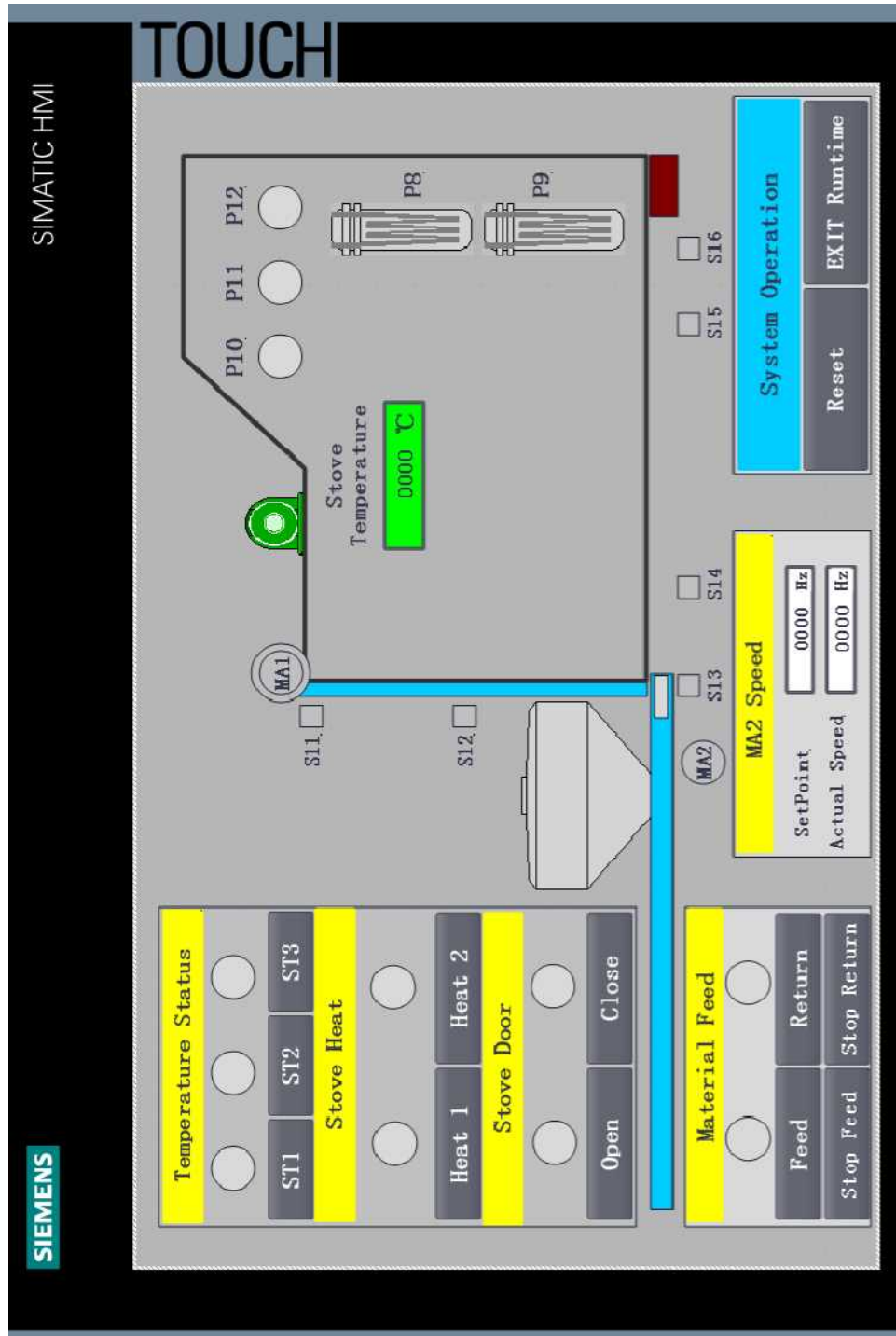
51	保护导体端子	1	个	国产	
52	塑料管夹	4	个	国产	VR25
53	电缆密封套及螺母	1	个	国产	M25x1,5
54	塑料管夹	6	个	国产	VR20
55	塑料滑块	2	个	国产	VR25.5 B35xH50mm
56	限位开关	4	个	西门子	SIRIUS 行程开关,1NO/1NC 缓动触头
57	限位开关	2	个	西门子	SIRIUS 行程开关,1NO/1NC 快速触头
58	1孔塑料防护外壳	4	个	西门子	1孔
59	2孔塑料防护外壳	1	个	西门子	2孔
60	3孔塑料防护外壳	1	个	西门子	3孔
61	指示灯（白）	6	个	西门子	
62	LED灯座（白）	6	个	西门子	
63	指示灯（黄）	1	个	西门子	
64	LED灯座（黄）	1	个	西门子	
65	指示灯（红）	1	个	西门子	
66	LED灯座（红）	1	个	西门子	
67	指示灯（绿）	1	个	西门子	
68	LED灯座（绿）	1	个	西门子	
69	CEE插座-4极	2	个	国产	
70	CEE插头-4极	2	个	国产	
71	CEE插头-5极	1	个	国产	
72	急停开关	1	个	西门子	电压为400V时功率为7.5KW;
73	工业以太网IE电缆	25	米	西门子	
74	180°网线头	14	个	西门子	
75	粘块	30	个		20x20mm
76	尼龙扎带	500	根		100x2,5mm
77	尼龙扎带	500	根		200x4mm
78	热缩管	1	米		Φ 2.5mm
79	绕线管	2	米		Φ 4mm
80	螺丝	50	个		M4x10mm
81	螺丝	50	个		M5x10mm
82	螺母	50	个		M4
83	螺母	50	个		M5
84	圆形预绝缘端头（O型线鼻）	50	个		1,5mm ² ;M6
85	圆形预绝缘端头（O型线鼻）	50	个		1,5mm ² ;M5
86	圆形预绝缘端头（O型线鼻）	50	个		1,5mm ² ;M4
87	圆形预绝缘端头（O型线鼻）	50	个		2.5mm ² ;M8
88	圆形预绝缘端头（O型线鼻）	50	个		2.5mm ² ;M6
89	圆形预绝缘端头（O型线鼻）	50	个		2.5mm ² ;M5
90	圆形预绝缘端头（O型线鼻）	50	个		2.5mm ² ;M4

91	欧式管型接线端子（针型线鼻）	1000	个		0,75mm ²
92	欧式管型接线端子（针型线鼻）	100	个		0,75mm ²
93	欧式管型接线端子（针型线鼻）	1000	个		1,5 mm ²
94	欧式管型接线端子（针型线鼻）	100	个		1,5 mm ²
95	欧式管型接线端子（针型线鼻）	100	个		2,5 mm ²
96	欧式管型接线端子（针型线鼻）	50	个		2,5 mm ²
97	自攻螺丝	200	个		3,5 x 20mm
98	自攻螺丝	100	个		3,5 x 45mm
99	燕尾丝	100	个		4x16mm
100	垫片	100	个		M4x15mm
101	垫片	50	个		M5x20mm
102	电缆	1	盘		0.75 mm ² x4
103	电缆	1	盘		1.5 mm ² x4
104	电缆	1	盘		2.5 mm ² x5
105	U型夹	10	个		12-16mm
106	U型夹	10	个		16-22mm
107	口取纸	2	张		每张64片
108	配M5×30，自攻蘑菇头，M5垫片	10	只		固定控制柜2
109	电缆槽90°弯头	1	个		H:60 mm
110	电缆槽保护边	2	米		
111	墙面支架	16	个		100mm
112	圆头螺钉和螺母	80	套		M6x16mm



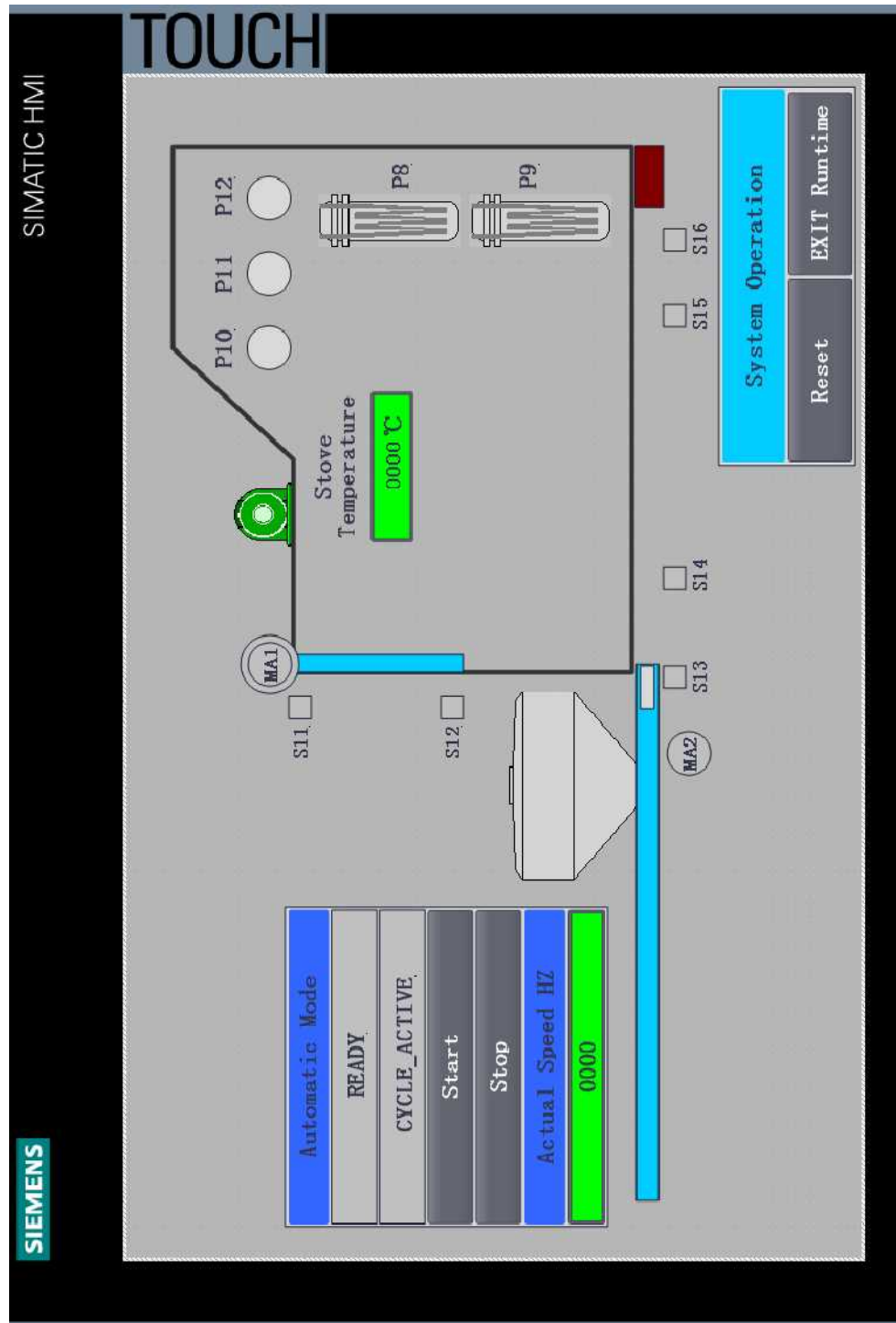
HMI - CONFIGURATION

SCREEN OVERVIEW(MANUAL MODE)





SCREEN OVERVIEW(AUTOMATIC MODE)





HMI VARIABLES

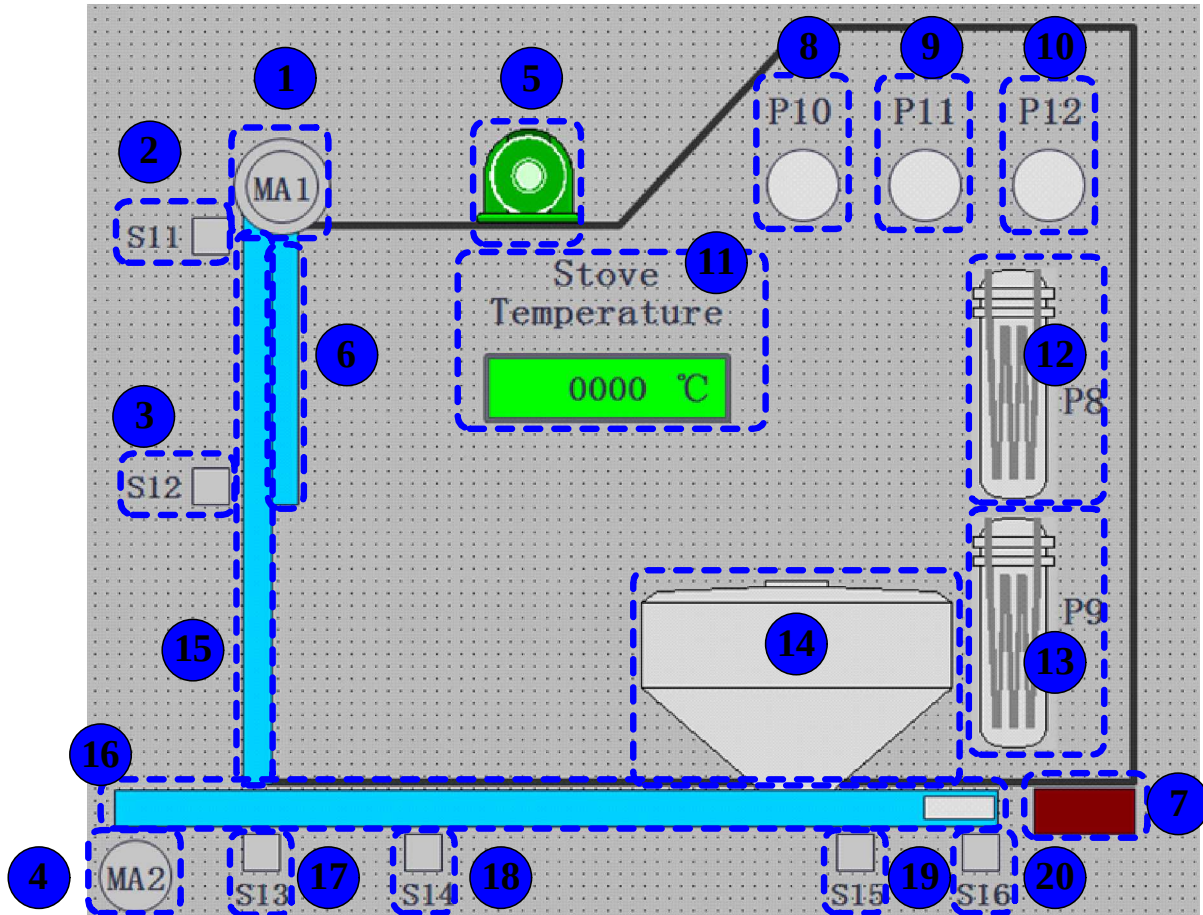
SYMBOL	TYPE	COMMENT	IN USE
S11	BOOL	PLC-Input	Read
S12	BOOL	PLC-Input	Read
S13	BOOL	PLC-Input	Read
S14	BOOL	PLC-Input	Read
S15	BOOL	PLC-Input	Read
S16	BOOL	PLC-Input	Read
P4	BOOL	PLC-Output	Read
P5	BOOL	PLC-Output	Read
P6	BOOL	PLC-Output	Read
P7	BOOL	PLC-Output	Read
P8	BOOL	PLC-Output	Read
P9	BOOL	PLC-Output	Read
P10	BOOL	PLC-Output	Read
P11	BOOL	PLC-Output	Read
P12	BOOL	PLC-Output	Read
Open_stove_door	BOOL	PLC-Variable	Write
Close_stove_door	BOOL	PLC-Variable	Write
Material_feed	BOOL	PLC-Variable	Write
Stop_Material_feed	BOOL	PLC-Variable	Write
Material_return	BOOL	PLC-Variable	Write
Stop_Material_return	BOOL	PLC-Variable	Write
Start_heat_1	BOOL	PLC-Variable	Write
Start_heat_2	BOOL	PLC-Variable	Write
Turn_on_p10	BOOL	PLC-Variable	Write



Turn_on_p11	BOOL	PLC-Variable	Write
Turn_on_p12	BOOL	PLC-Variable	Write
MA1_CW_on	BOOL	PLC-Variable	Read
MA1_CCW_on	BOOL	PLC-Variable	Read
MA1_is_ON	BOOL	PLC-Variable	Read
MA2_Setpoint	DINT	PLC-Variable	Read/Write
MA2_actual_Speed	DINT	PLC-Variable	Read
MA2_CW_on	BOOL	PLC-Variable	Read
MA2_CCW_on	BOOL	PLC-Variable	Read
MA2_is_ON	BOOL	PLC-Variable	Read
Automatic_start	BOOL	PLC-Variable	Write
Automatic_stop	BOOL	PLC-Variable	Write
ERROR	BOOL	PLC-Variable	Read
Error_Reset	BOOL	PLC-Variable	Write
Stove_temperature_DINT	DINT	PLC-Variable	Read
Automatic_ready_on	BOOL	PLC-Variable	Read
Cycle_Active	BOOL	PLC-Variable	Read



DETAILS: STOVE



DESCRIPTION	SYMBOL LIBRARY	SYMBOL LIBRARY ITEM
Stove	User-defined	User-defined
S11-S16	User-defined	User-defined
P10-P12	User-defined	User-defined
MA1-MA2	User-defined	User-defined
Material	Material handling	Element #108
Heating element P8-P9	Process heating	Element #23
Alarm light	Operator interface	Element #26

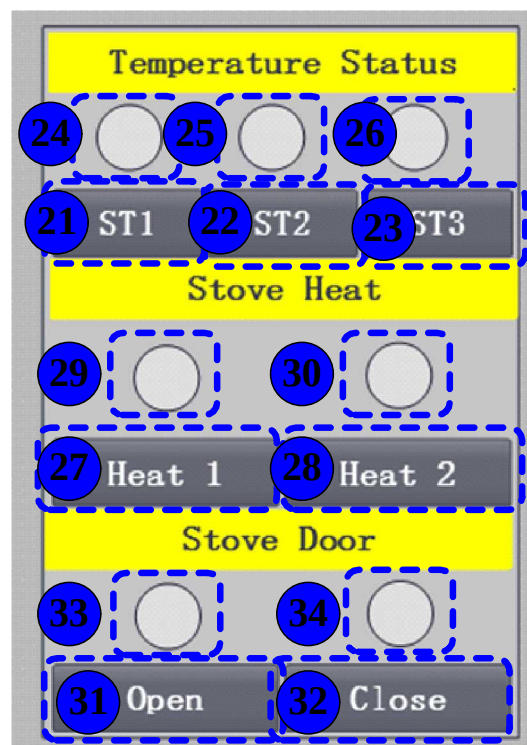


POSITION	VARIABLE	ACTION	COMMENT	
1	MA1_is_ON	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
2	S11	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
3	S12	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
4	MA2_is_ON	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
5	ERROR	Background Control Colour	not actuated actuated	colour = GREEN colour = RED
6	S11	Visibility dynamic	not actuated actuated	visible = FALSE visible = TRUE
7	NO	NO		
8	P10	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
9	P11	Background Control Colour	not actuated actuated	colour = GRAY colour =YELLOW
10	P12	Background Control Colour	not actuated actuated	colour = GRAY colour = RED
11	Stove_temperature_DINT	output field	Value: 0 to 1200	
12	P8	Foreground Control Colour	Fill style: shaded not actuated actuated	colour = GRAY colour =RED
13	P9	Foreground Control Colour	Fill style: shaded not actuated actuated	colour = GRAY colour =RED
14	S16	Visibility dynamic	not actuated actuated	visible = FALSE visible = TRUE
15	S12	Visibility dynamic	not actuated actuated	visible = FALSE visible = TRUE
16	S16	Visibility dynamic	not actuated actuated	visible = FALSE visible = TRUE
17	S13	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
18	S14	Background Control Colour	not actuated	colour = GRAY



			actuated	colour = GREEN
19	S15	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
20	S16	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN

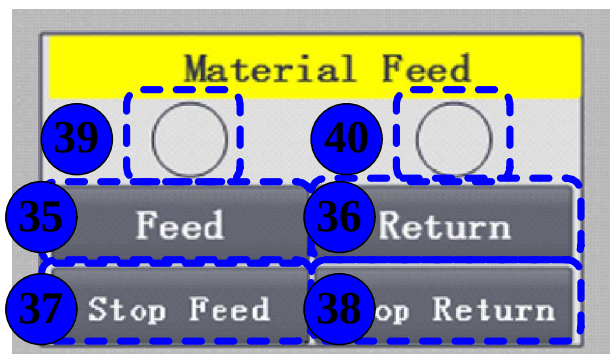
DETAILS:OTHER



POSITION	VARIABLE	ACTION	COMMENT	
21	Turn_on_p10	Button control	“InvertBit” while button is pressed	
22	Turn_on_p11	Button control	“InvertBit” while button is pressed	
23	Turn_on_p12	Button control	“InvertBit” while button is pressed	
24	P10	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
25	P11	Background Control Colour	not actuated actuated	colour = GRAY colour =YELLOW



26	P12	Background Control Colour	not actuated actuated	colour = GRAY colour = RED
27	Start_heat_1	Button control	"InvertBit" while button is pressed	
28	Start_heat_2	Button control	"InvertBit" while button is pressed	
29	P8	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
30	P9	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
31	Open_stove_door	Button control	"State 1" while button is pressed	
32	Close_stove_door	Button control	"State 1" while button is pressed	
33	MA1_CW_on	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
34	MA1_CCW_on	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN



POSITION	VARIABLE	ACTION	COMMENT	
35	Material_feed	Button control	"State 1" while button is pressed	
36	Stop_Material_feed	Button control	"State 1" while button is pressed	
37	Material_return	Button control	"State 1" while button is pressed	
38	Stop_Material_return	Button control	"State 1" while button is pressed	
39	MA2_CW_on	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN
40	MA2_CCW_on	Background Control Colour	not actuated actuated	colour = GRAY colour = GREEN



MA2 Speed

SetPoint 0000 Hz 42

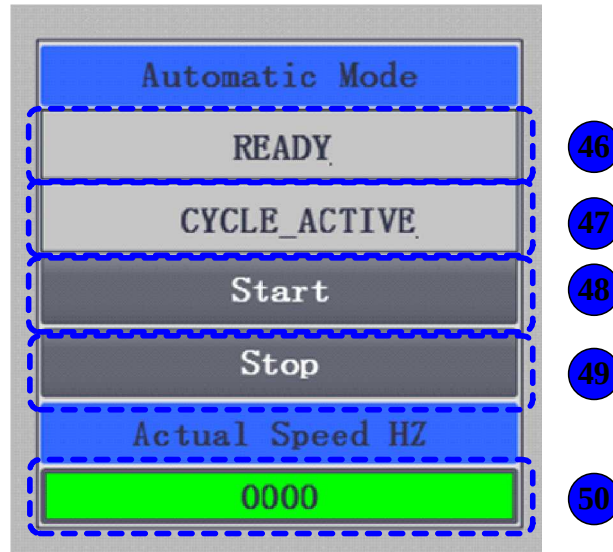
Actual Speed 0000 Hz 43

POSITION	VARIABLE	ACTION	COMMENT
41	NO	NO	
42	MA2_Setpoint	Input/output field	Value: 0 to 50
43	MA2_actual_Speed	output field	Value: 0 to 50

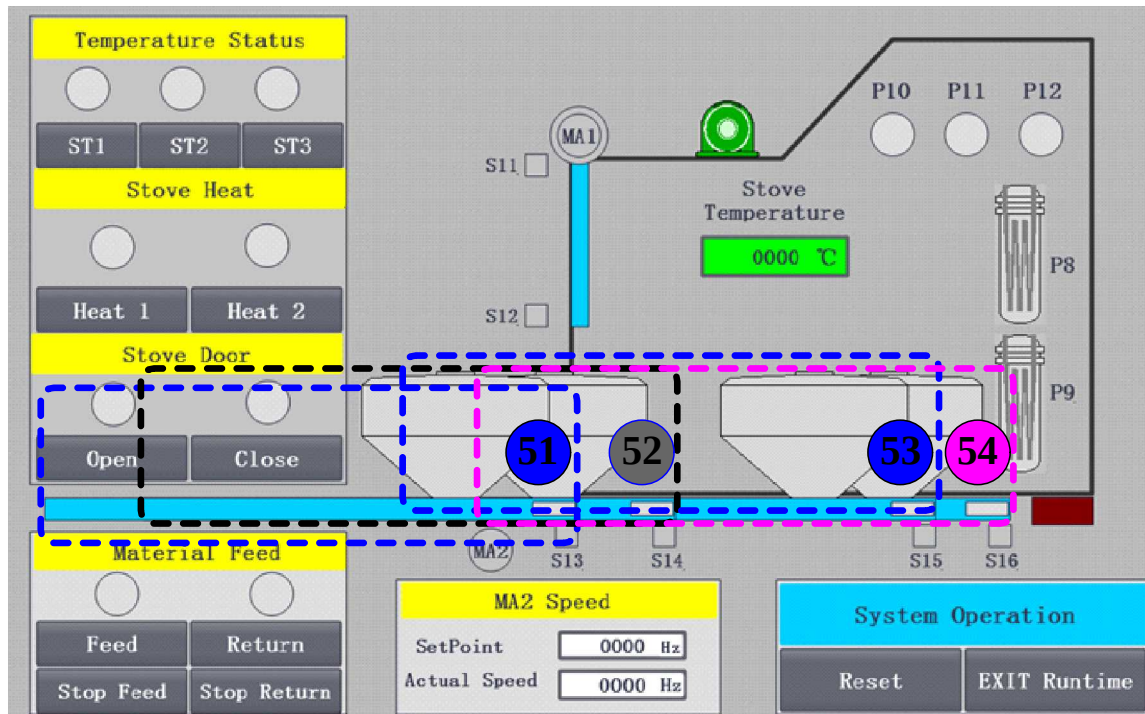
System Operation

44 Reset EXIT Runtime 45

POSITION	VARIABLE	ACTION	COMMENT
44	Error_Reset	Button control	"State 1" while button is pressed
45		System function	"Stop runtime" while button is pressed



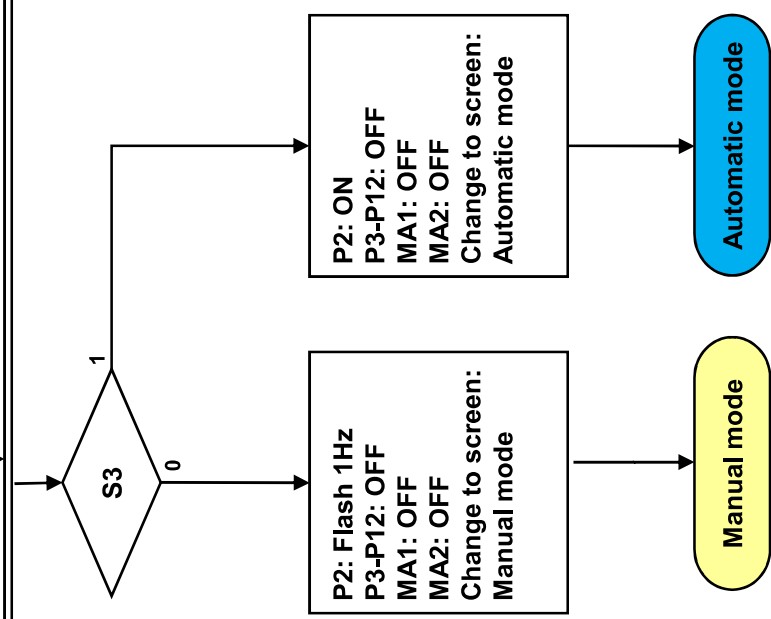
POSITION	VARIABLE	ACTION	COMMENT
46	Automatic_ready_on	Background Control Colour	not actuated colour = GRAY actuated colour = GREEN
47	Cycle_Active	Background Control Colour	not actuated colour = GRAY actuated colour = GREEN
48	Automatic_start	Button control	"State 1" while button is pressed
49	Automatic_stop	Button control	"State 1" while button is pressed
50	MA2_actual_Speed	output field	Value: 0 to 50



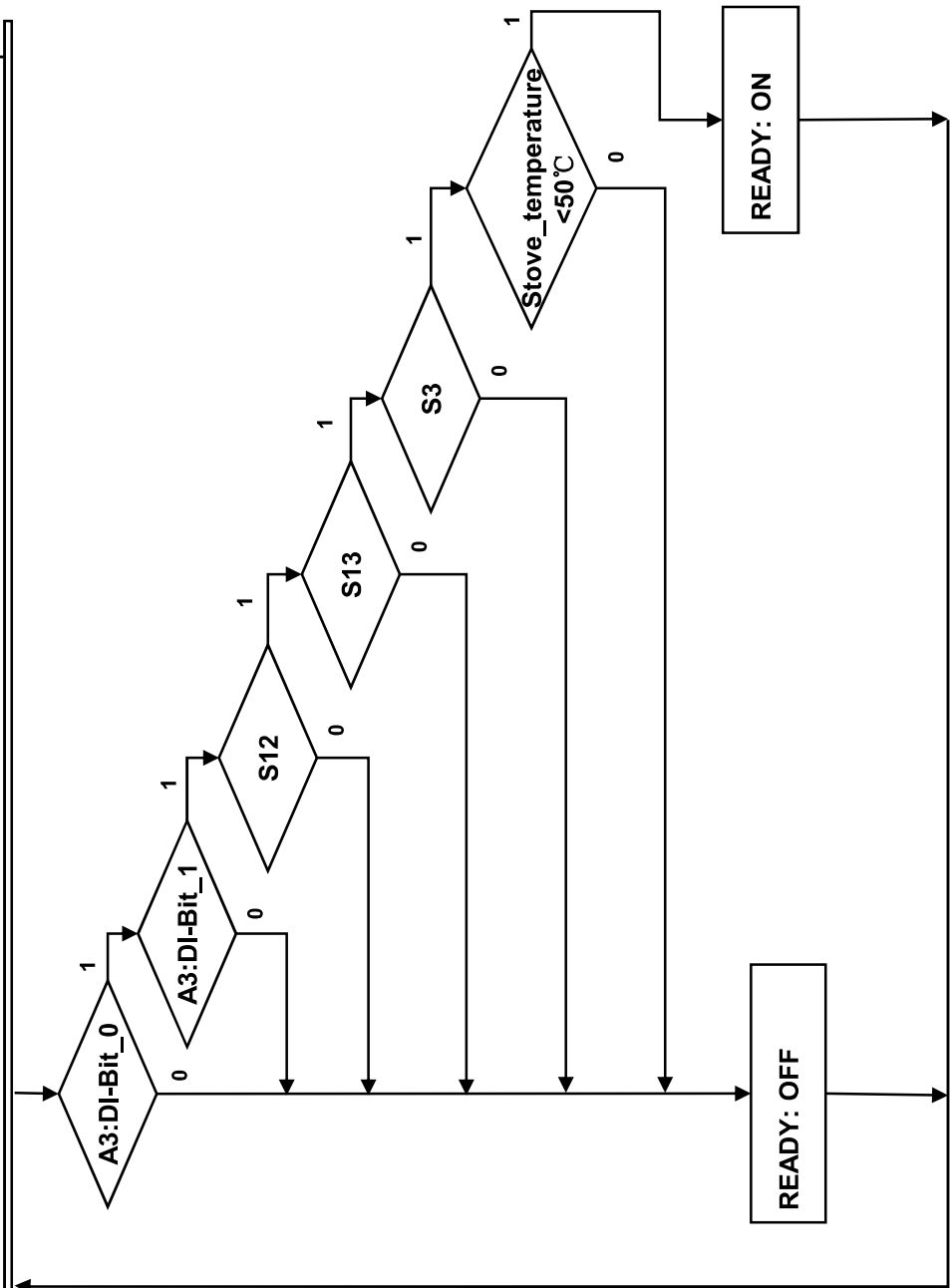
POSITION	VARIABLE	ACTION	COMMENT	
51	S13	Visibility dynamic	not actuated actuated	visible = FALSE visible = TRUE
52	S14	Visibility dynamic	not actuated actuated	visible = FALSE visible = TRUE
53	S15	Visibility dynamic	not actuated actuated	visible = FALSE visible = TRUE
54	S16	Visibility dynamic	not actuated actuated	visible = FALSE visible = TRUE

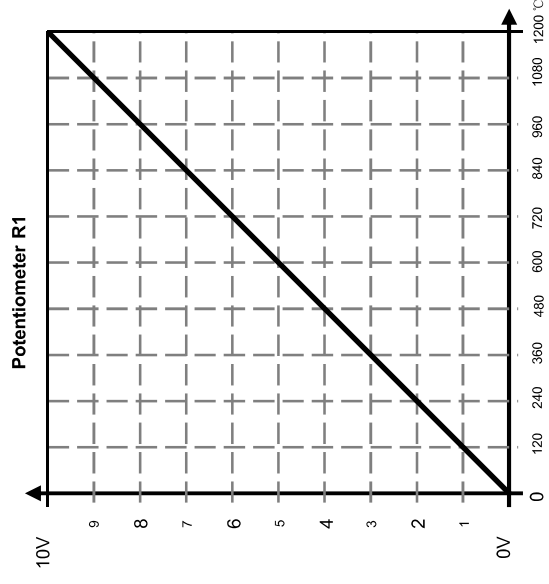
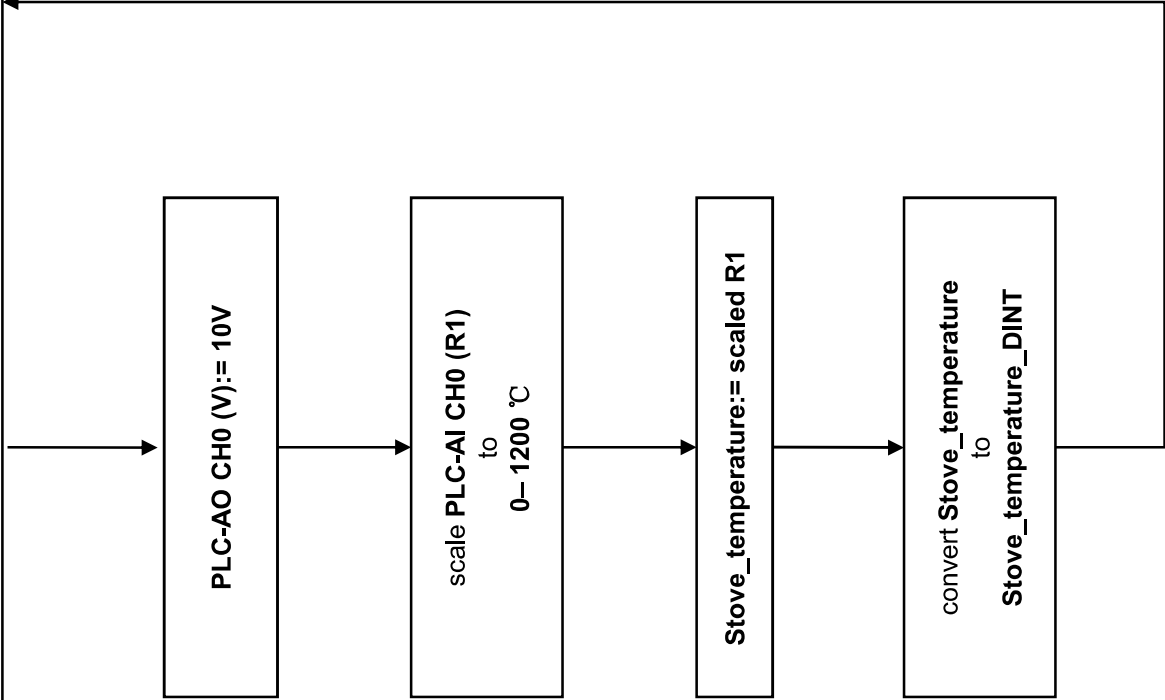
Power On

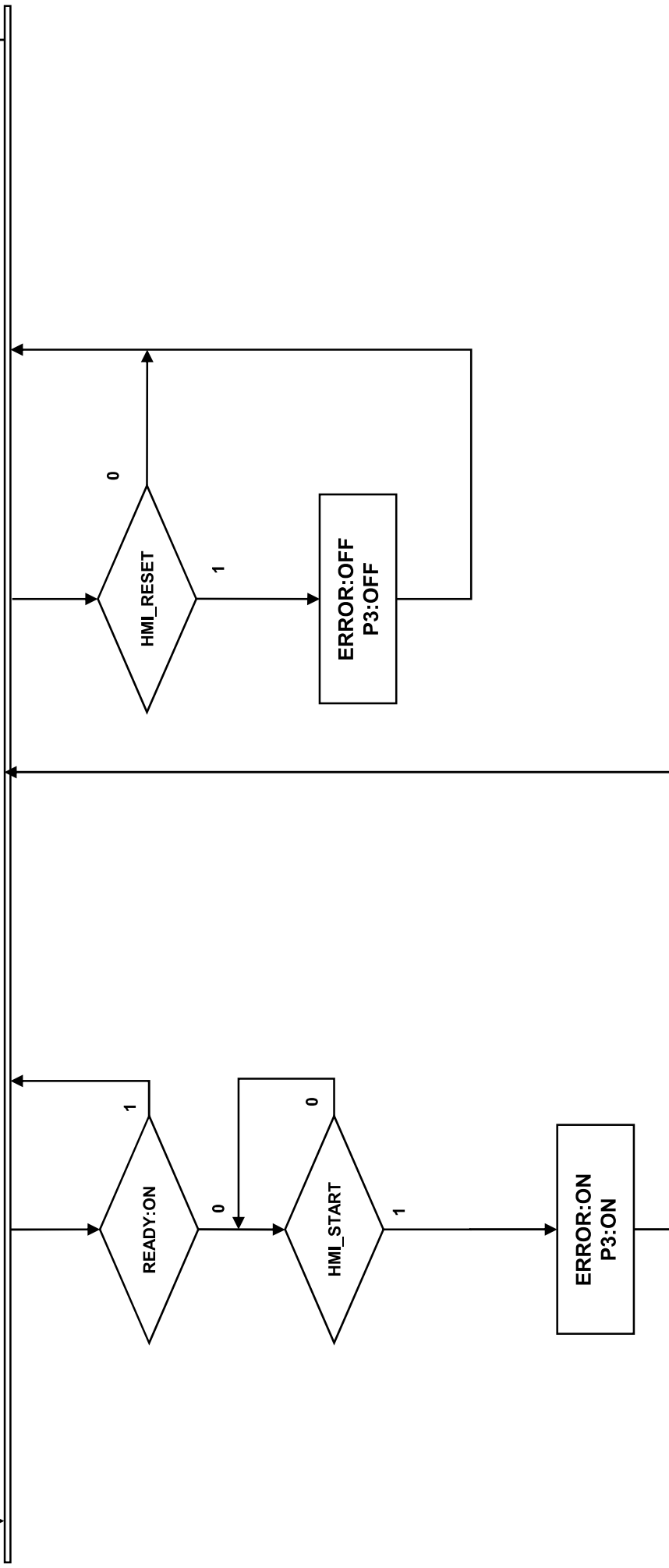
all actors: OFF



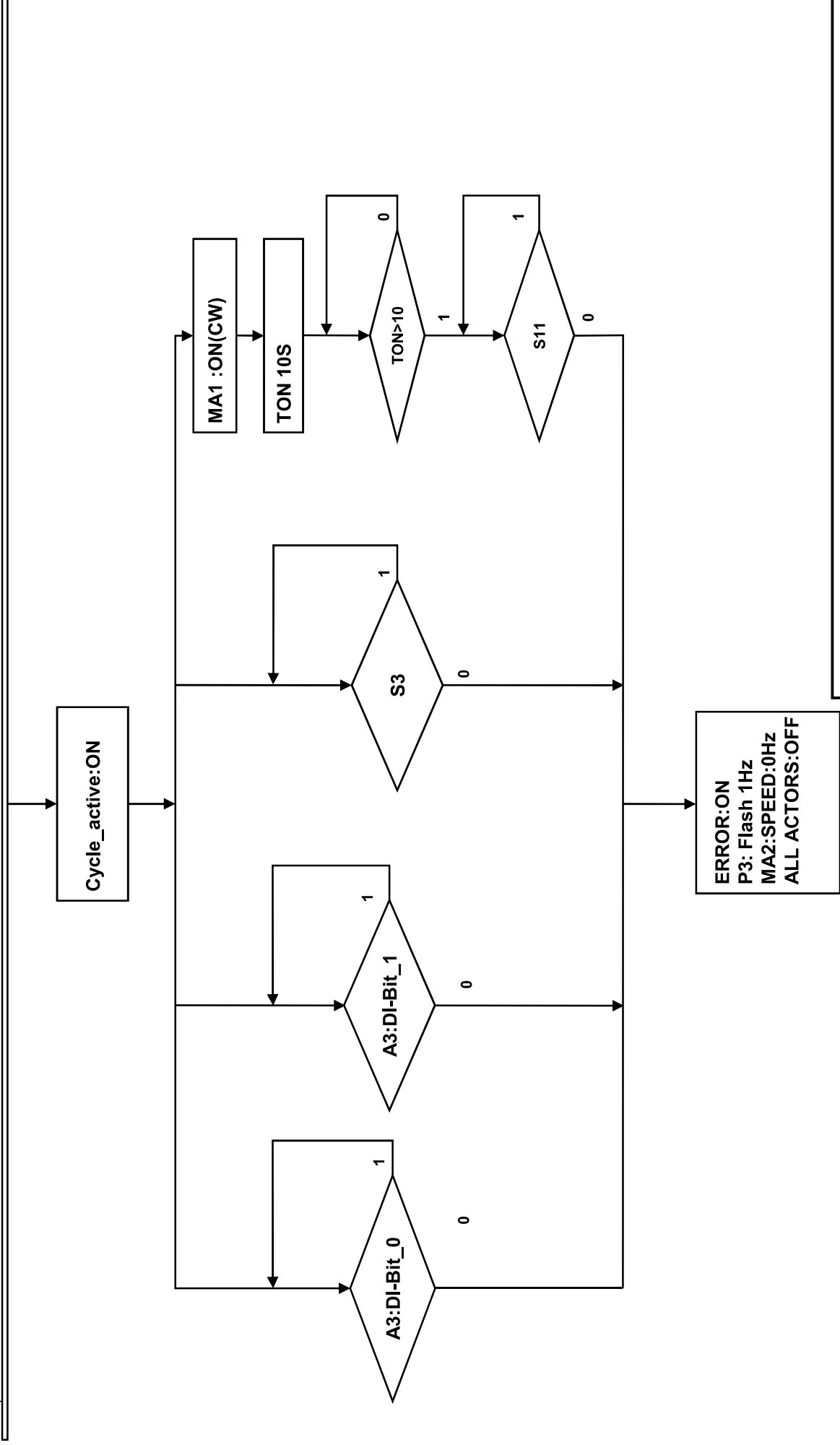
Note:
switches, push buttons or other devices **actuated / true = state "1"** on the function diaPram
switches, push buttons or other devices **not actuated / not true = state "0"** on the function diaPram







WSC2016_TP19		Trade 19	
INDUSTRIAL - CONTROL		PLC- Function Description	PAPE 14



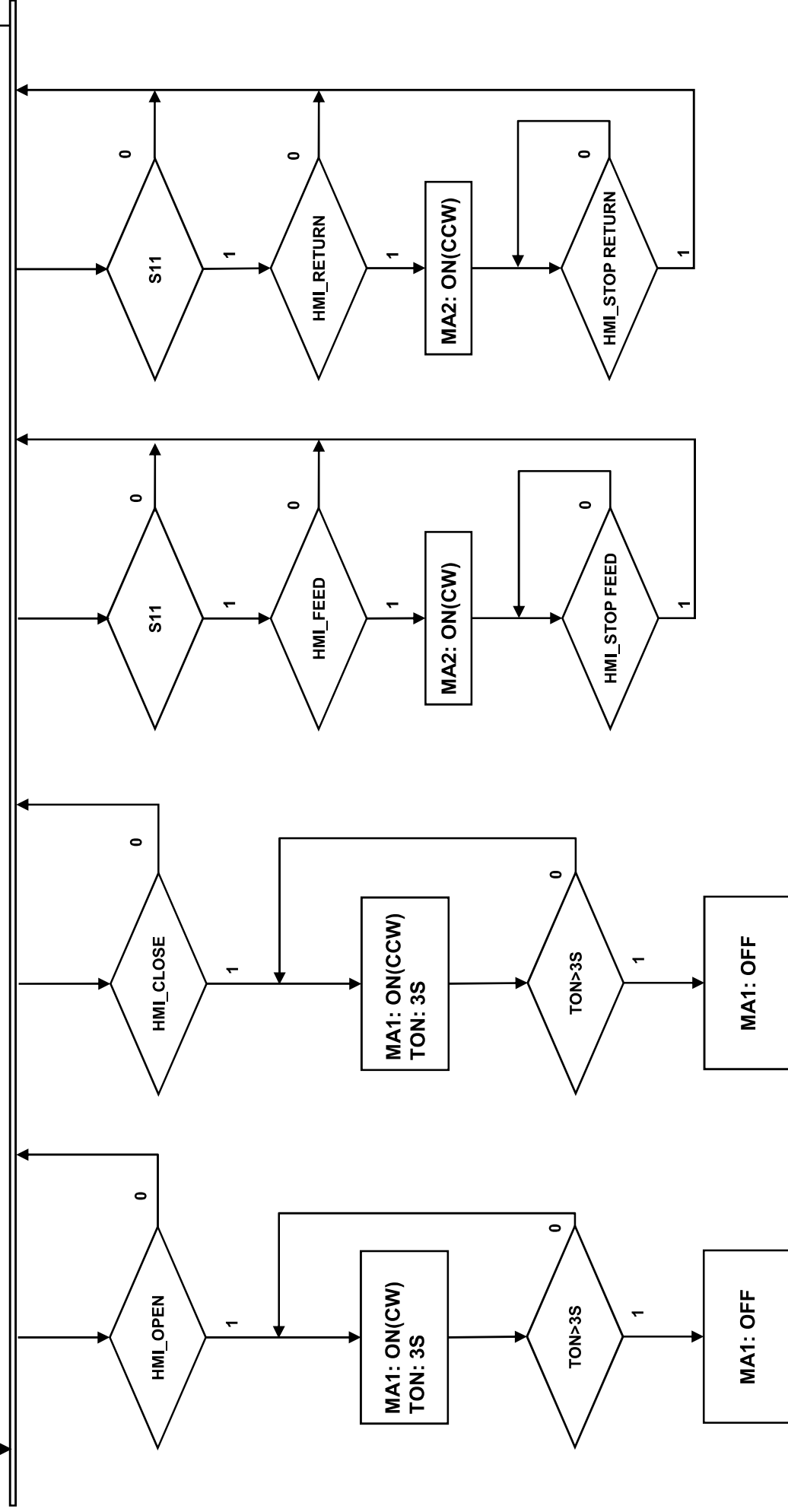
WSC2016_TP19

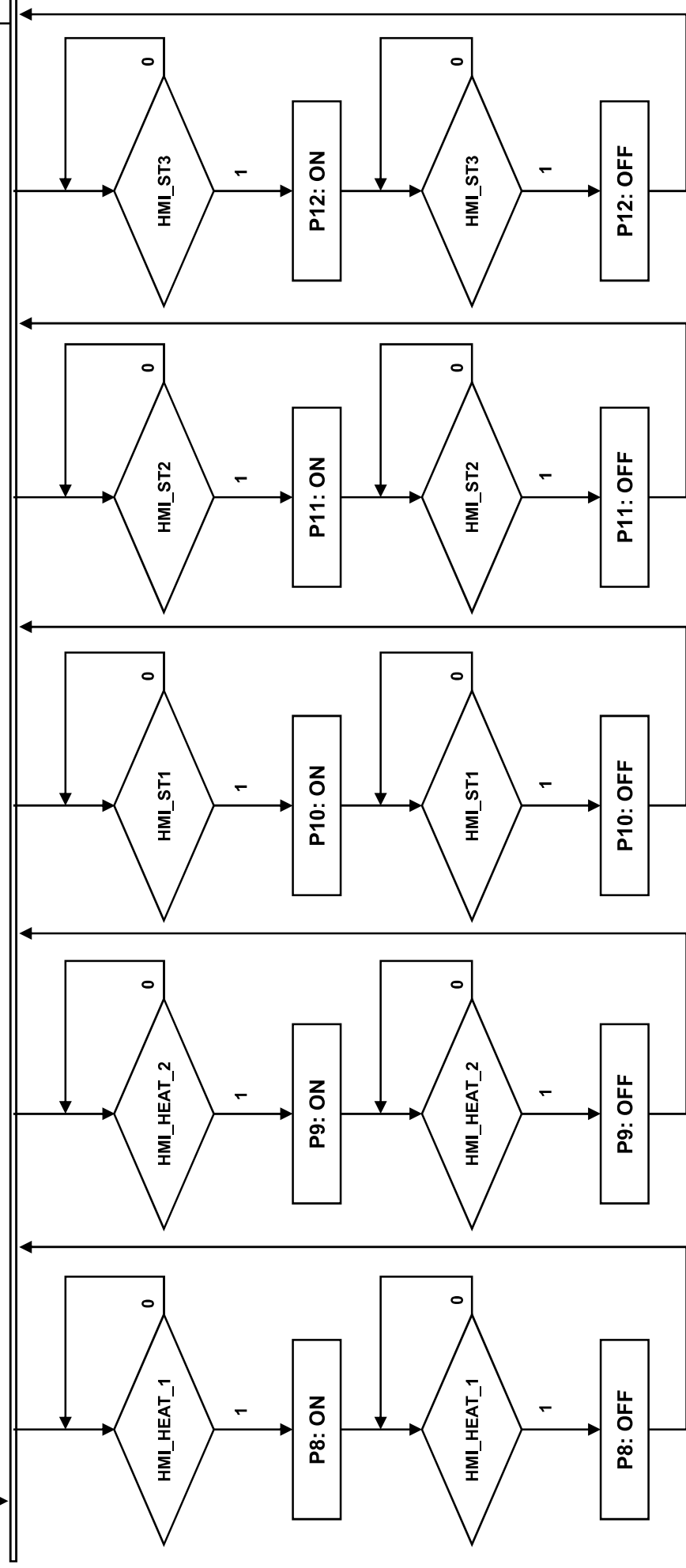
Trade 19

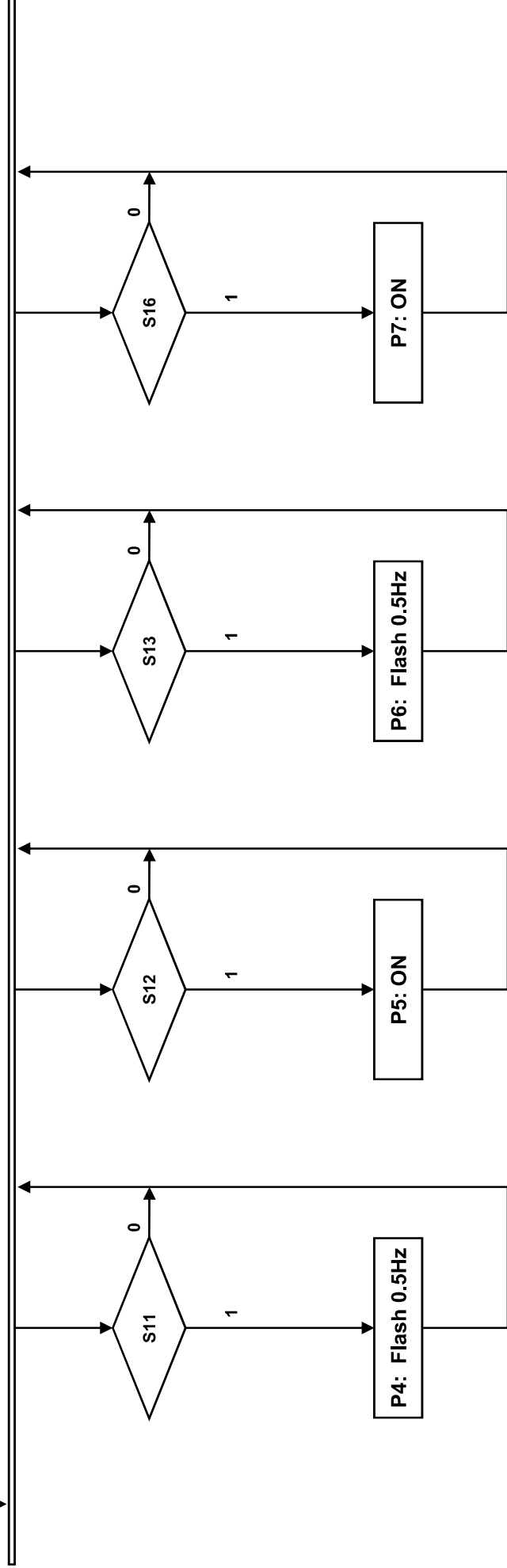
PLC- Function Description

PAPE
15

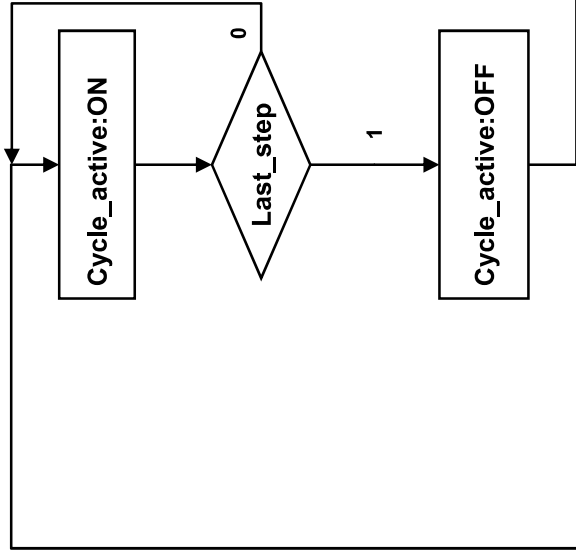
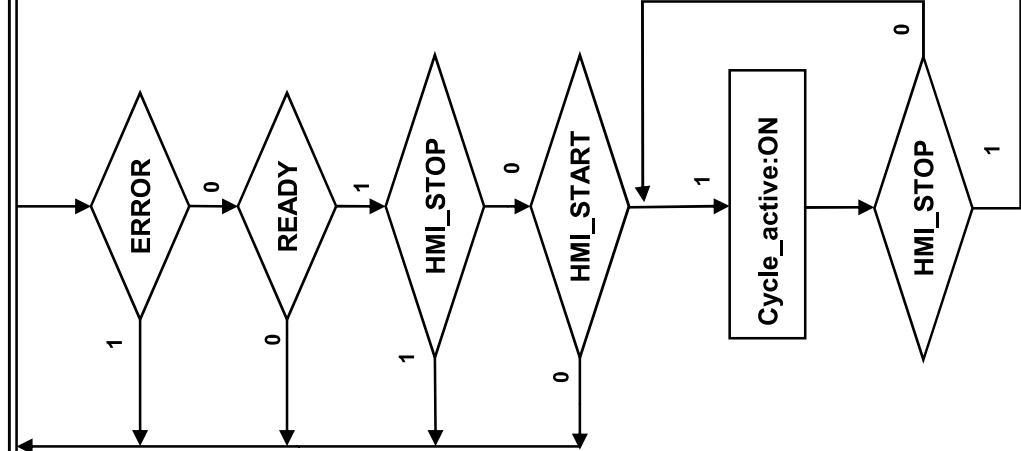
INDUSTRIAL - CONTROL

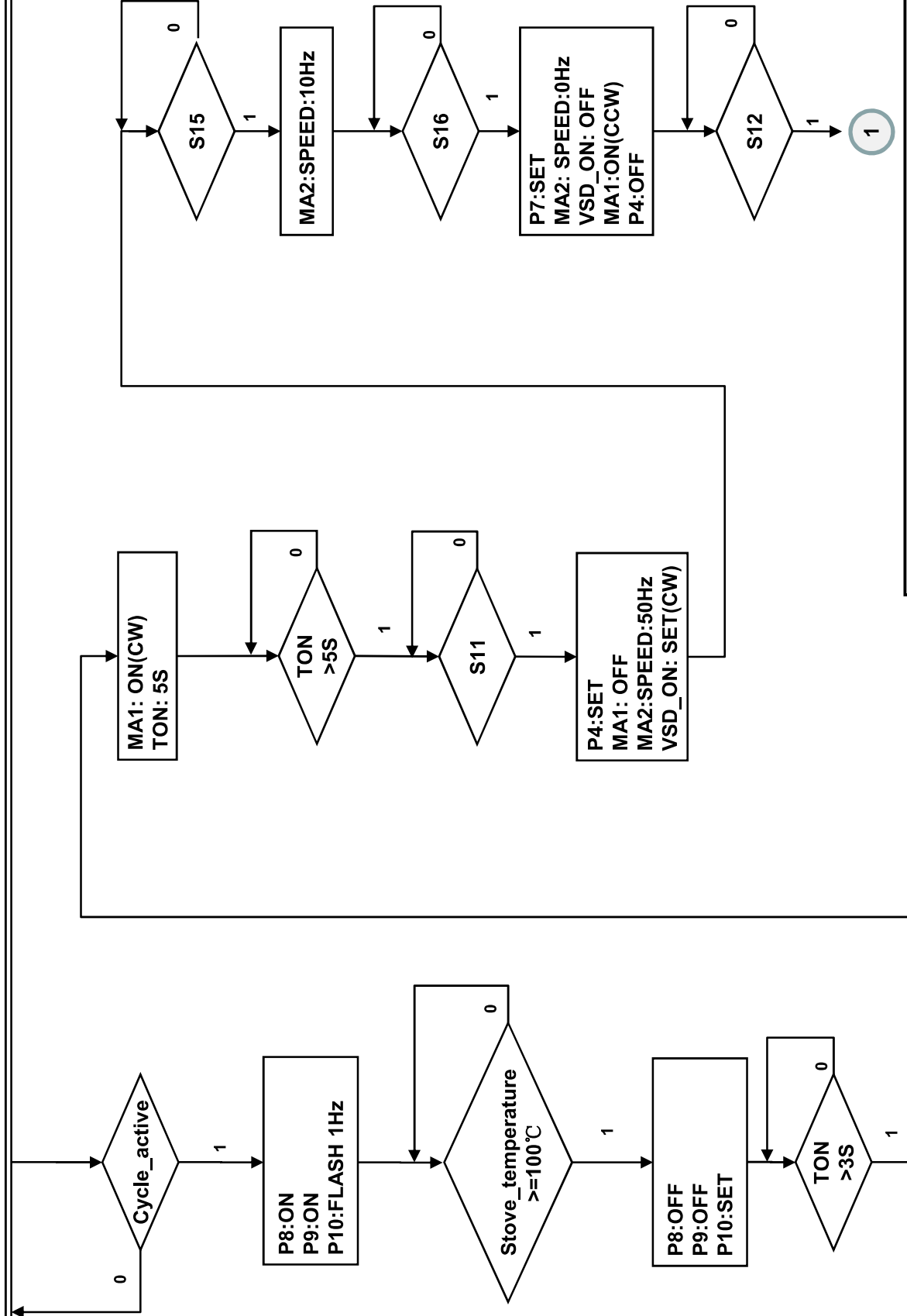


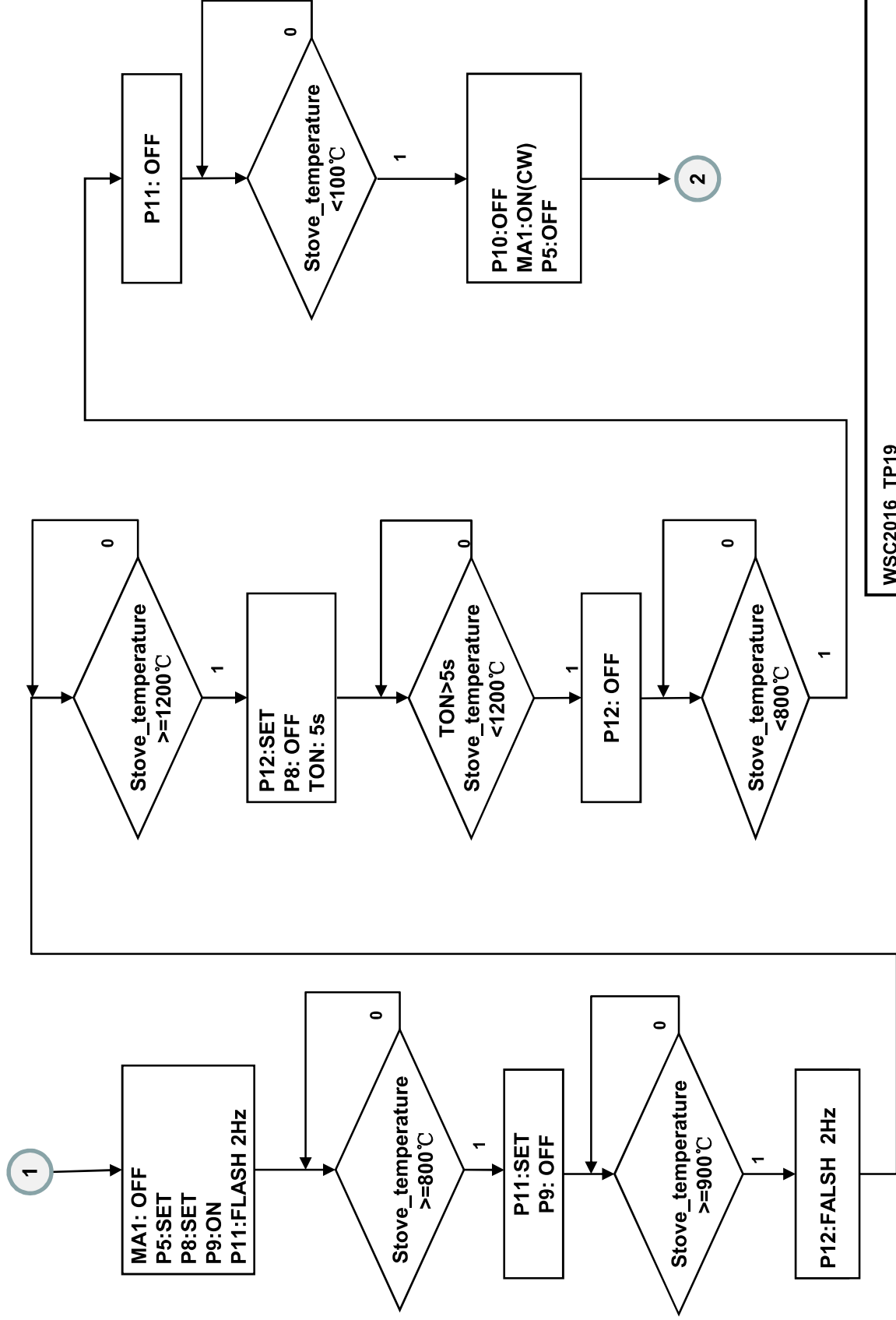




WSC2016_TP19		Trade 19	
INDUSTRIAL - CONTROL		PLC- Function Description	PAPE 18







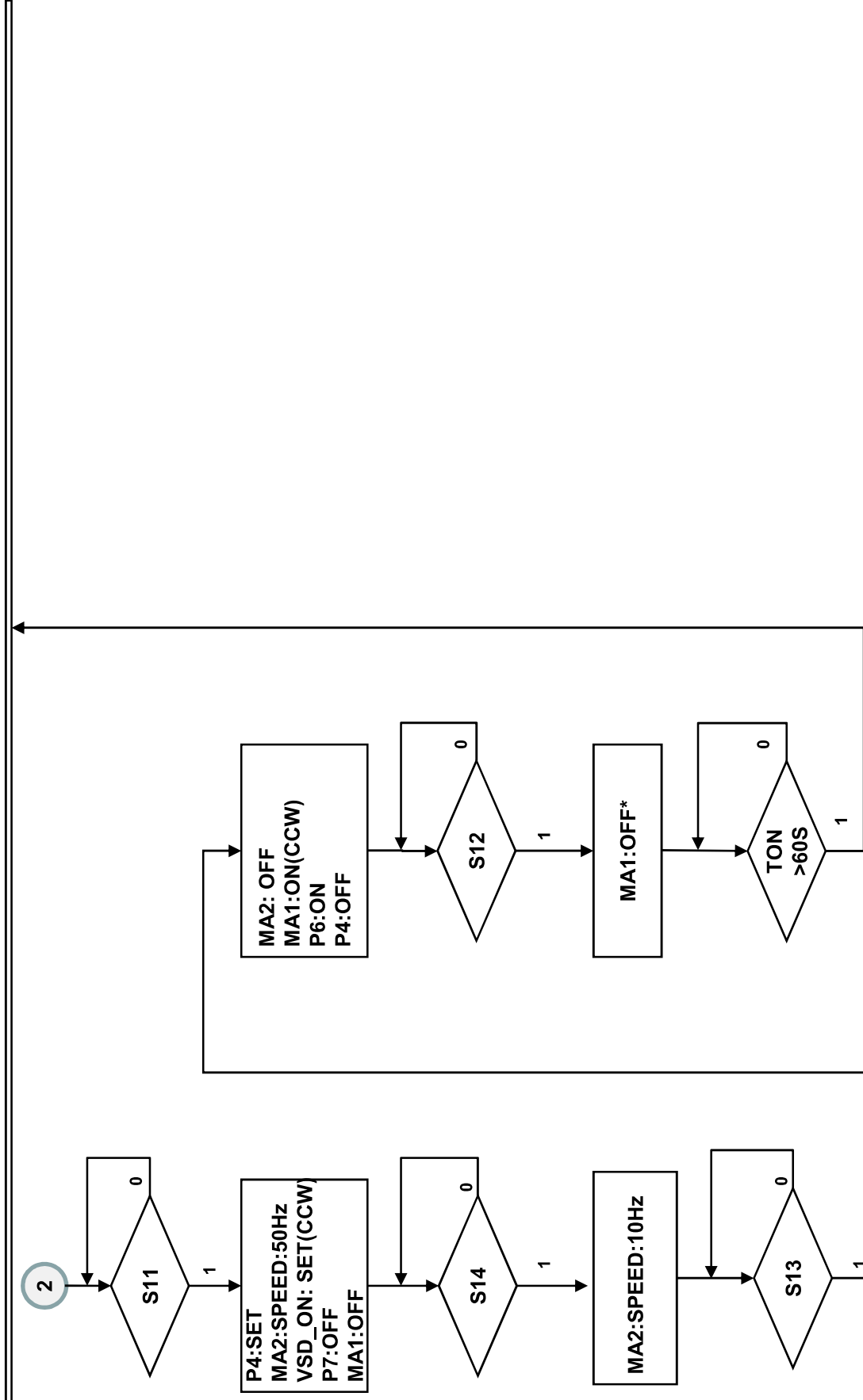
WSC2016_TP19

Trade 19

PLC- Function Description

PAPE
21

INDUSTRIAL - CONTROL



*Last_step

WSC2016_TP19		Trade 19	
INDUSTRIAL - CONTROL		PLC- Function Description	PAPE 22