Tag/Name	Type	Description
DI0	Digital Input	Emergency Stop Circuit (NC)
DI1	Digital Input	Safety Interlock 1 (Door)
DI2	Digital Input	Safety Interlock 2 (Guard)
DI3	Digital Input	Safety Curtain 1 OSSD
DI4	Digital Input	Safety Curtain 2 OSSD
DI5	Digital Input	Safety Relay Feedback
DI6	Digital Input	Z-axis home proximity switch
DI7	Digital Input	X-axis home proximity switch
DI8	Digital Input	Z-axis overtravel limit
DI9	Digital Input	X-axis overtravel limit
DI10	Digital Input	Part/Ring present sensor
DI11	Digital Input	Reset Button
DI15	Digital Input	Feeder fully retracted limit switch
DO1	Digital Output	Machine Enable
DO2	Digital Output	Hydraulic/Pneumatic Enable
DO3	Digital Output	Heaters Enable
DO4	Digital Output	Press Solenoid (Down/Up select)
DO5	Digital Output	Alarm/Buzzer Output
DO6	Digital Output	Cooling Valve/Fan Enable
DO7	Digital Output	Unused / Spare
DO8	Digital Output	Unused / Spare
DO9	Digital Output	
DO10	Digital Output	
ANA0	Analog Input	Temp Zone 1 (after amplifier)
ANA1	Analog Input	Temp Zone 2
ANA2	Analog Input	Temp Zone 3
ANA3	Analog Input	Temp Zone 4
ANA4	Analog Input	Pressure Transducer
HMI_COMM	Comm	HMI Panel Ethernet (Modbus/Trio)

Channel	Terminal (Controller)	Signal Range	Normal State	Wire Color
%I0.0	IN0			
%I0.1	IN1	0V/24V	24V (safe)	Blue
%I0.2	IN2	0V/24V	24V (safe)	Blue
%I0.3	IN3	0V/24V	24V (safe)	Blue
%I0.4	IN4	0V/24V	24V (safe)	Blue
%I0.5	IN5	0V/24V	24V (safe)	Blue
%I0.6	IN6	0V/24V	24V (safe)	Blue
%I0.7	IN7	0V/24V	0V (idle)	Green
%I0.8	IN8	0V/24V	0V (idle)	Red
%I0.9	IN9	0V/24V	--	Gray
%I0.10	IN10	0V/24V	--	Gray
%I0.11	IN11	0V/24V	0V (idle)	Yellow
%I0.15	IN15	0V/24V		
%Q0.0	OUT1	0V/24V	0V (off)	Black
%Q0.1	OUT2	0V/24V	0V (off)	Orange
%Q0.2	OUT3	0V/24V	0V (off)	Violet
%Q0.3	OUT4	0V/24V	0V (idle)	Brown
%Q0.4	OUT5	0V/24V	0V (off)	Pink
%Q0.5	OUT6	0V/24V	0V (off)	Light Blue
%Q0.6	OUT7	0V/24V	--	Gray
%Q0.7	OUT8	0V/24V	--	Gray
%Q0.8	OUT9	0V/24V		
%Q0.9	OUT10	0V/24V		
%AI0.0	ANA0	0-10V or 4-20mA	--	White
%AI0.1	ANA1	0-10V or 4-20mA	--	White
%AI0.2	ANA2	0-10V or 4-20mA	--	White
%AI0.3	ANA3	0-10V or 4-20mA	--	White
	ANA4	0-10V or 4-20mA	--	Blue/White
	RJ45/Ethernet	TCP/IP	--	Cat5e Blue

Variable Name(s)	Notes/Function		
IN[DI0]			
IN[DI1]	N.C. contact	opens if unsafe	
IN[DI2]	N.C. contact		
IN[DI3]	Dual channel	N.C.	
IN[DI4]	Dual channel	N.C.	
IN[DI5]	Contact from safety relay		
IN[DI6]	N.C. or N.O. as per device		
IN[DI7]	N.O. pushbutton		
IN[DI8]	N.C. pushbutton		
IN[DI9]	For future expansion		
IN[DI10]	For future expansion		
IN[DI11]	N.O. momentary		
OUT[DO1]	Enables main logic/cycle		
OUT[DO2]	Enables hydraulic/pneumatic valves		
OUT[DO3]	Enables all heater contactors/SSRs		
OUT[DO4]	Drives press actuator		
OUT[DO5]	Activates alarm on fault		
OUT[DO6]	Turns on cooling system as needed		
OUT[DO7]	For future expansion		
OUT[DO8]	For future expansion		
ANA[0]	Type K thermocouple (via amp)		
ANA[1]	Type K thermocouple (via amp)		
ANA[2]	Type K thermocouple (via amp)		
ANA[3]	Type K thermocouple (via amp)		
ANA[4]	Pressure	e.g.	0-100 bar
HMI_COMM	Operator interface (UNIPLAY)		

Tag/Name	Type	Description	Channel
DI0	Digital Input	Emergency Stop Circuit (NC)	%I0.0
DI1	Digital Input	Safety Interlock 1 (Door)	%I0.1
DI2	Digital Input	Safety Interlock 2 (Guard)	%I0.2
DI3	Digital Input	Safety Curtain 1 OSSD	%I0.3
DI4	Digital Input	Safety Curtain 2 OSSD	%I0.4
DI5	Digital Input	Safety Relay Feedback	%I0.5
DI6	Digital Input	Z-axis home proximity switch	%I0.6
DI7	Digital Input	X-axis home proximity switch	%I0.7
DI8	Digital Input	Z-axis overtravel limit	%I0.8
DI9	Digital Input	X-axis overtravel limit	%I0.9
DI10	Digital Input	Part/Ring present sensor	%I0.10
DI11	Digital Input	Reset Button	%I0.11
DI15	Digital Input	Feeder fully retracted limit switch	%I0.15
DO1	Digital Output	Machine Enable	%Q0.0
DO2	Digital Output	Hydraulic/Pneumatic Enable	%Q0.1
DO3	Digital Output	Heaters Enable	%Q0.2
DO4	Digital Output	Press Solenoid (Down/Up select)	%Q0.3
DO5	Digital Output	Alarm/Buzzer Output	%Q0.4
DO6	Digital Output	Cooling Valve/Fan Enable	%Q0.5
DO7	Digital Output	Unused / Spare	%Q0.6
DO8	Digital Output	Unused / Spare	%Q0.7
DO9	Digital Output	Unused / Spare	%Q0.8
DO10	Digital Output	Unused / Spare	%Q0.9
ANA0	Analog Input	Temp Zone 1 (after amplifier)	%AI0.0
ANA1	Analog Input	Temp Zone 2	%AI0.1
ANA2	Analog Input	Temp Zone 3	%AI0.2
ANA3	Analog Input	Temp Zone 4	%AI0.3
ANA4	Analog Input	Pressure Transducer	%AI0.4
HMI_COMM	Comm	HMI Panel Ethernet (Modbus/Trio)	

Terminal (Controller)	Signal Range	Normal State	Wire Color	Variable Name(s)
IN0	0V/24V	24V (safe)	Blue	IN[DI0]
IN1	0V/24V	24V (safe)	Blue	IN[DI1]
IN2	0V/24V	24V (safe)	Blue	IN[DI2]
IN3	0V/24V	24V (safe)	Blue	IN[DI3]
IN4	0V/24V	24V (safe)	Blue	IN[DI4]
IN5	0V/24V	24V (safe)	Blue	IN[DI5]
IN6	0V/24V	24V (safe)	Blue	IN[DI6]
IN7	0V/24V	0V (idle)	Green	IN[DI7]
IN8	0V/24V	0V (idle)	Red	IN[DI8]
IN9	0V/24V	--	Gray	IN[DI9]
IN10	0V/24V	--	Gray	IN[DI10]
IN11	0V/24V	0V (idle)	Yellow	IN[DI11]
IN15	0V/24V	--	Gray	IN[DI15]
OUT1	0V/24V	0V (off)	Black	OUT[DO1]
OUT2	0V/24V	0V (off)	Orange	OUT[DO2]
OUT3	0V/24V	0V (off)	Violet	OUT[DO3]
OUT4	0V/24V	0V (idle)	Brown	OUT[DO4]
OUT5	0V/24V	0V (off)	Pink	OUT[DO5]
OUT6	0V/24V	0V (off)	Light Blue	OUT[DO6]
OUT7	0V/24V	--	Gray	OUT[DO7]
OUT8	0V/24V	--	Gray	OUT[DO8]
OUT9	0V/24V	--	Gray	OUT[DO9]
OUT10	0V/24V	--	Gray	OUT[DO10]
ANA0	0-10V or 4-20mA	--	White	ANA[0]
ANA1	0-10V or 4-20mA	--	White	ANA[1]
ANA2	0-10V or 4-20mA	--	White	ANA[2]
ANA3	0-10V or 4-20mA	--	White	ANA[3]
ANA4	0-10V or 4-20mA	--	Blue/White	ANA[4]
RJ45/Ethernet	TCP/IP	--	Cat5e Blue	HMI_COMM

Notes/Function
N.C. conta opens if unsafe
N.C. contact
N.C. contact
Dual chanr N.C.
Dual chanr N.C.
Contact from safety relay
N.C. or N.O. as per device
N.O. pushbutton
N.C. pushbutton
For future expansion
For future expansion
N.O. momentary
For future expansion
Enables main logic/cycle
Enables hydraulic/pneumatic valves
Enables all heater contactors/SSRs
Drives press actuator
Activates alarm on fault
Turns on cooling system as needed
For future expansion
For future expansion
For future expansion
For future expansion
Type K thermocouple (via amp)
Type K thermocouple (via amp)
Type K thermocouple (via amp)
Type K thermocouple (via amp)
Pressure (e.g. 0-100 bar)
Operator interface (UNIPLAY)

Tag/Name	Type	Description	Channel	Terminal (Controller)
DI0	Digital Input	Emergency Stop Circuit (NC)	%I0.0	IN0
DI1	Digital Input	Door Interlock Switch	%I0.1	IN1
DI2	Digital Input	Safety Curtain 1 OSSD	%I0.2	IN2
DI3	Digital Input	Safety Curtain 2 OSSD	%I0.3	IN3
DI4	Digital Input	Safety Relay Status	%I0.4	IN4
DI5	Digital Input	Z-axis Overtravel Limit	%I0.5	IN5
DI6	Digital Input	Z-axis Home Sensor	%I0.6	IN6
DI7	Digital Input	X-axis Home Sensor	%I0.7	IN7
DI8	Digital Input	X-axis Overtravel Limit	%I0.8	IN8
DI9	Digital Input	Ring Present Sensor	%I0.9	IN9
DI10	Digital Input	Feeder Fully Extended	%I0.10	IN10
DI11	Digital Input	Feeder Fully Retracted	%I0.11	IN11
DI12	Digital Input	Spare	%I0.12	IN12
DI13	Digital Input	Spare	%I0.13	IN13
DI14	Digital Input	Spare	%I0.14	IN14
DI15	Digital Input	Fault Reset Button	%I0.15	IN15
DO0	Digital Output	Heater Zone 1 Contactor	%Q0.0	OUT0
DO1	Digital Output	Heater Zone 2 Contactor	%Q0.1	OUT1
DO2	Digital Output	Heater Zone 3 Contactor	%Q0.2	OUT2
DO3	Digital Output	Heater Zone 4 Contactor	%Q0.3	OUT3
DO4	Digital Output	Z-axis Brake Release	%Q0.4	OUT4
DO5	Digital Output	X-axis Brake Release	%Q0.5	OUT5
DO6	Digital Output	Alarm Buzzer	%Q0.6	OUT6
DO7	Digital Output	HMI "Ready" Status LED	%Q0.7	OUT7
DO8	Digital Output	HMI "Fault" Status LED	%Q0.8	OUT8
DO9	Digital Output	Timer Trigger	%Q0.9	OUT9
DO10	Digital Output	Cooling System Enable	%Q0.10	OUT10
DO11	Digital Output	Spare	%Q0.11	OUT11
DO12	Digital Output	Spare	%Q0.12	OUT12
ANA0	Analog Input	Temperature Zone 1	%AI0.0	THC0
ANA1	Analog Input	Temperature Zone 2	%AI0.1	THC1
ANA2	Analog Input	Temperature Zone 3	%AI0.2	THC2
ANA3	Analog Input	Temperature Zone 4	%AI0.3	THC3
ANA4	Analog Input	Pressure Transducer	%AI0.4	ANA4
HMI_COMM	Ethernet	HMI Interface	-	RJ45

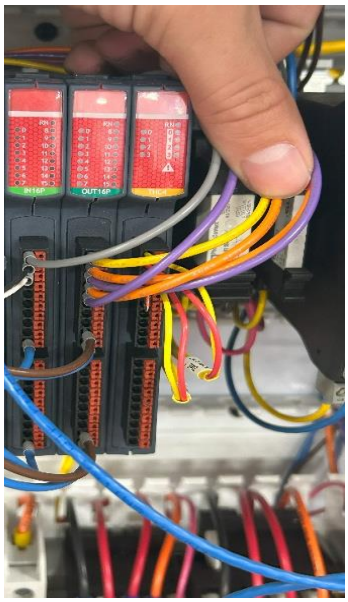
Signal Range	Normal State	Wire Color	Variable Name(s)
0V/24V	24V (safe)		E_Stop_In
0V/24V	24V (safe)	Blue	Door_Sw_In
0V/24V	24V (safe)	Blue	Curtain1_OSSD
0V/24V	24V (safe)	Blue	Curtain2_OSSD
0V/24V	24V (safe)	Blue	SafetyRelay_OK
0V/24V	0V (idle)	Red	LimitZ_Overtravel
0V/24V	24V (safe)	Blue	HomeZ_Sensor
0V/24V	0V (idle)	Green	HomeX_Sensor
0V/24V	-	Gray	LimitX_Overtravel
0V/24V	-	Gray	PartPresent_Sensor
0V/24V	-		FeederExtend_Sensor
0V/24V	0V (idle)	Yellow	FeederRetract_Sensor
-	-		
-	-		
-	-		
0V/24V	0V (idle)		FaultReset_Button
0V/24V	0V (off)	Black	Heater1_Coil
0V/24V	0V (off)	Orange	Heater2_Coil
0V/24V	0V (off)	Violet	Heater3_Coil
0V/24V	0V (off)	Brown	Heater4_Coil
0V/24V	0V (off)		Z_BrakeRelease
0V/24V	0V (off)	Pink	X_BrakeRelease
0V/24V	0V (off)	Light Blue	Buzzer_Alarm
0V/24V	0V (off)		HMI_Ready_LED
0V/24V	0V (off)		HMI_Alarming_LED
0V/24V	0V (off)		Timer_Trigger
0V/24V	0V (off)		Cooling_Enable
-	-	Gray	
-	-	Gray	
0-10V	-	White	Temp_Zone1
0-10V	-	White	Temp_Zone2
0-10V	-	White	Temp_Zone3
0-10V	-	White	Temp_Zone4
0-10V	-	Blue/White	Pressure_Transducer
TCP/IP	-	Cat5e Blue	HMI_Comm

Notes/Function	
NC contact	opens when triggered
XCK-J115	NC contact
Leuze MLC	dual-channel NC
Leuze MLC	dual-channel NC
Schmersal SRB 206SQ (pins 13-14)	
NC switch	
Proximity sensor (NPN/PNP configurable)	
Proximity sensor (NPN/PNP configurable)	
NC switch	
Photoelectric/inductive sensor	
Limit switch	
Limit switch (NC)	
Reserved	
Reserved	
Reserved	
NO momentary pushbutton	
Controls DILMP20 contactor	
Controls DILMP20 contactor	
Controls DILM32 contactor	
Controls DILM32 contactor	
Releases servo brake	
Releases servo brake	
Audible alarm during faults	
Green indicator	
Red indicator	
Omron K8AK-TH11 timer control	
Fans/coolant valves	
Reserved	
Reserved	
Type K thermocouple (scaled to °C)	
Type K thermocouple	
Type K thermocouple	
Type K thermocouple	
0-100 bar (via amplifier)	
Uniplay HMI (Modbus/Trio protocol)	

IN16P	Wire Color
DI0	Grey
DI1	Black
DI2	White
DI3	
DI4	
DI5	
DI6	
DI7	Blue
DI8	
DI9	
DI10	
DI11	
DI12	
DI13	
DI14	
DI15	Blue

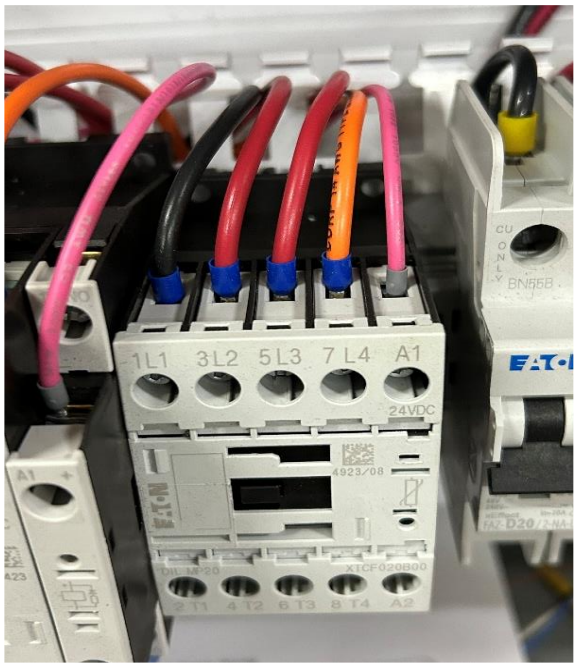
OUT16P	Wire Color
DO0	Yellow
DO1	Orange
DO2	Purple
DO3	Orange
DO4	Purple
DO5	
DO6	Brown
DO7	Blue
DO8	
DO9	
DO10	
DO11	
DO12	
DO13	
DO14	Brown
DO15	Blue

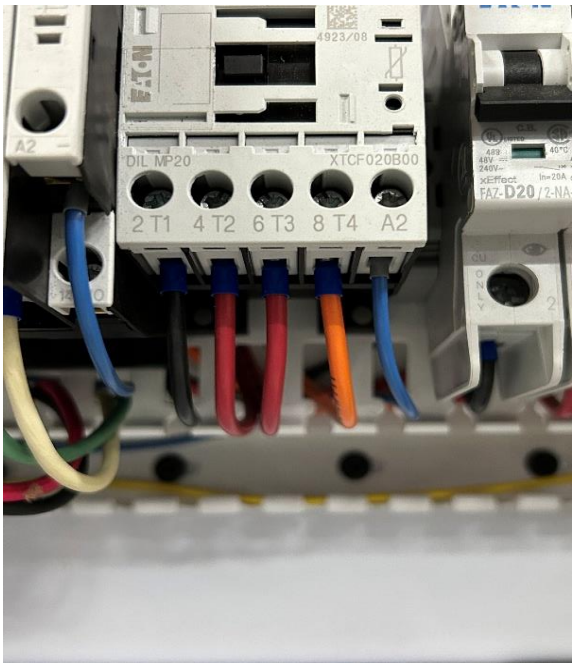
THC4	Wire Color
THC0	Yellow
THC1	Red
THC2	Yellow
THC3	Red


IN16P
OUT16P

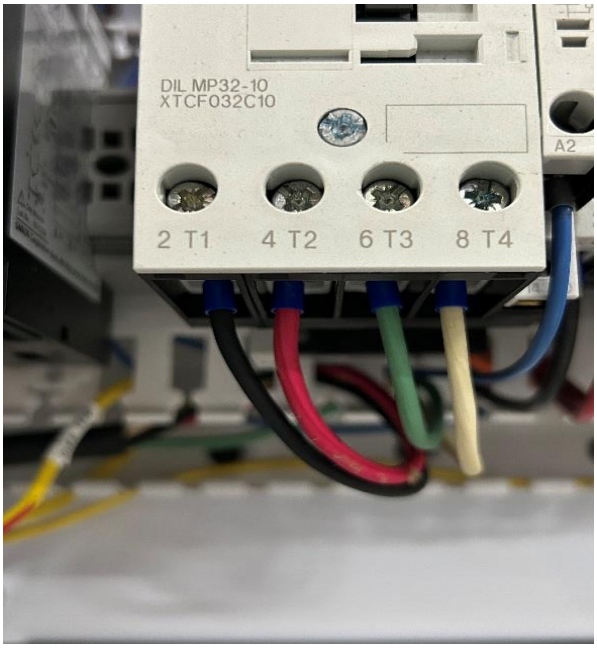
Terminal	Wire Color
L	Orange
N	Black
PE (earth)	Green
V+	Brown
V-	Blue

Terminal	Wire Color	Destination/Source	Description/Source
1L1	Black	Line (from breaker)	Phase 1 incoming
3L2	Red	Line (from breaker)	Phase 2 incoming
5L3	Red	Line (from breaker)	Phase 3 incoming
7L4	Orange	Line (from breaker/aux)	Auxiliary/4th pole
2T1	Black	Out to Load (heater/motor)	Phase 1 to device
4T2	Red	Out to Load (heater/motor)	Phase 2 to device
6T3	Red	Out to Load (heater/motor)	Phase 3 to device
8T4	Orange	Out to Load (aux circuit)	4th pole
A1	Pink	PLC/Control OUT (24VDC)	Contactor coil + (energize to close)
A2	Blue	OVDC Control Common	Contactor coil -





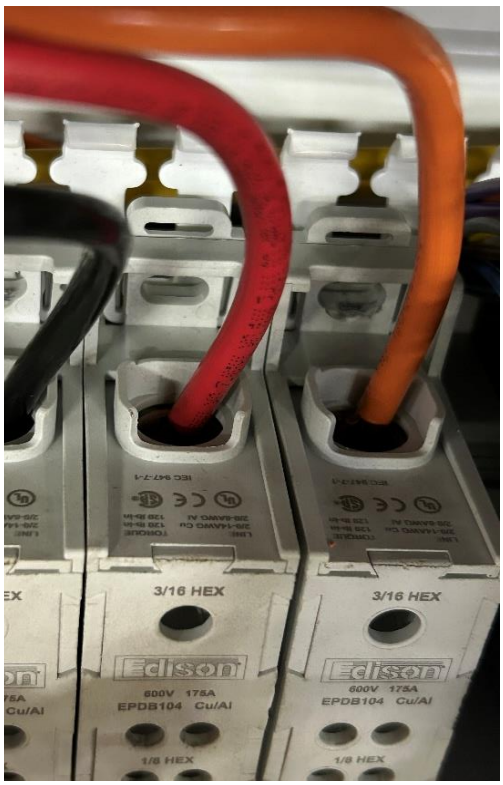
Terminal	Wire Color	Destination/Source	Description/Source
1L1	Black	Line (from breaker)	Phase 1 incoming
3L2	Red	Line (from breaker)	Phase 2 incoming
5L3	Red	Line (from breaker)	Phase 3 incoming
7L4	Orange	Line (from breaker/aux)	Auxiliary/4th pole
2T1	Black	Out to Load (heater/motor)	Phase 1 to device
4T2	Red	Out to Load (heater/motor)	Phase 2 to device
6T3	Green	Out to Load (heater/motor)	Phase 3 to device
8T4	White	Out to Load (aux circuit)	4th pole
A1	Pink	PLC/Control OUT (24VDC)	Contactor coil + (energize to close)
A2	Blue	OVDC Control Common	Contactor coil -



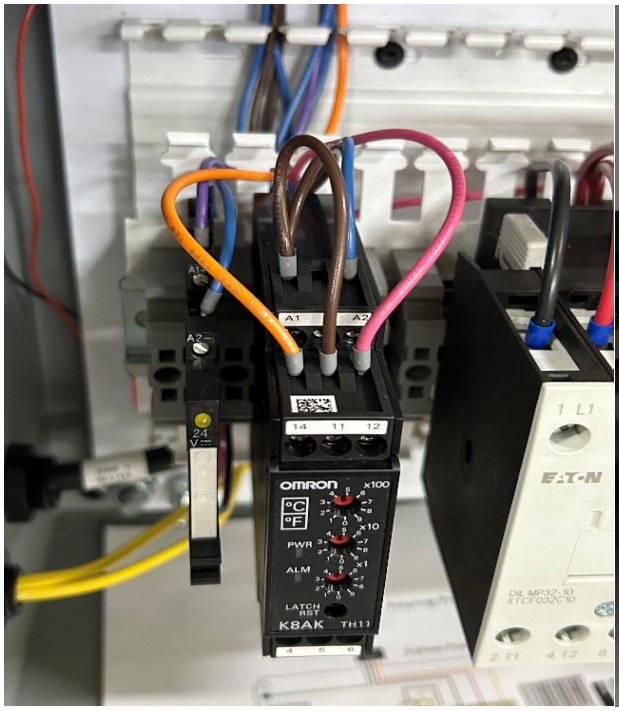
Function/Tag	Terminal Location	Wire Color
Main Power IN Ll	Top/Side (3/16" HEX)	Black
Main Power IN L2	Top/Side (3/16" HEX)	Red
Main Power IN L3	Top/Side (3/16" HEX)	Orange
Power OUT Ll	Front/Bottom (1/8" HEX)	Black
Power OUT Q	Front/Bottom (1/8" HEX)	Red
Power OUT B	Front/Bottom (1/8" HEX)	Orange

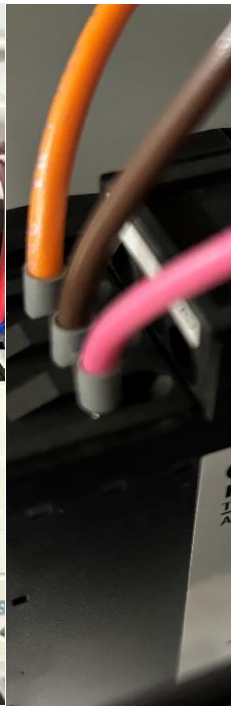
Description / 10 Role

Incoming power from main disconnect or feed
Incoming power from main disconnect or feed
Incoming power from main disconnect or feed
Distribution to breakers, contactors, loads
Distribution to breakers, contactors, loads
Distribution to breakers, contactors, loads



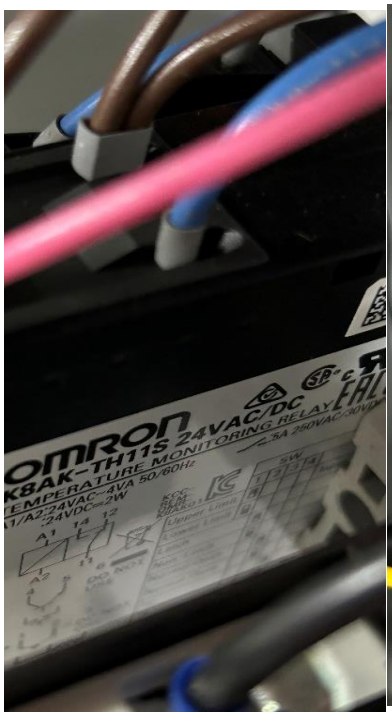
Function/Tag	Type	Terminal		Wire Color`
24V Power In (+)	Power Input	A1		Brown
OV Power In (-)	Power Input	A2		Blue
Relay Common	Relay Output		11	Brown
Relay NC Output	Relay Output		12	Pink
Relay NO Output	Relay Output		14	Orange
Sensor Input	Sensor Input		1	Yellow
Sensor Input	Sensor Input		2	Red

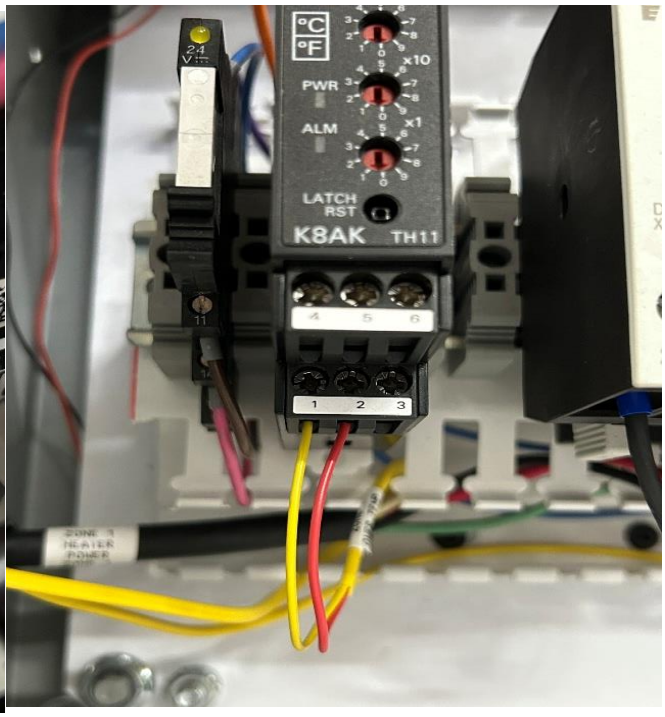




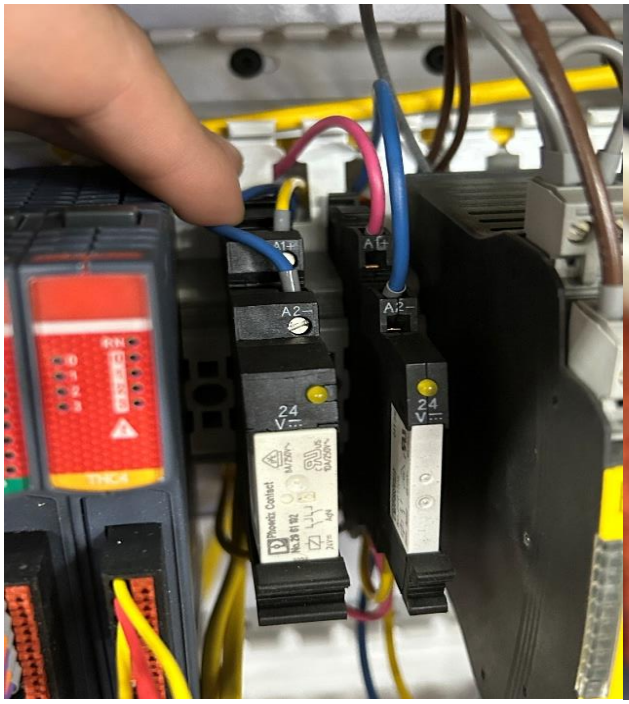
Description/IO Role

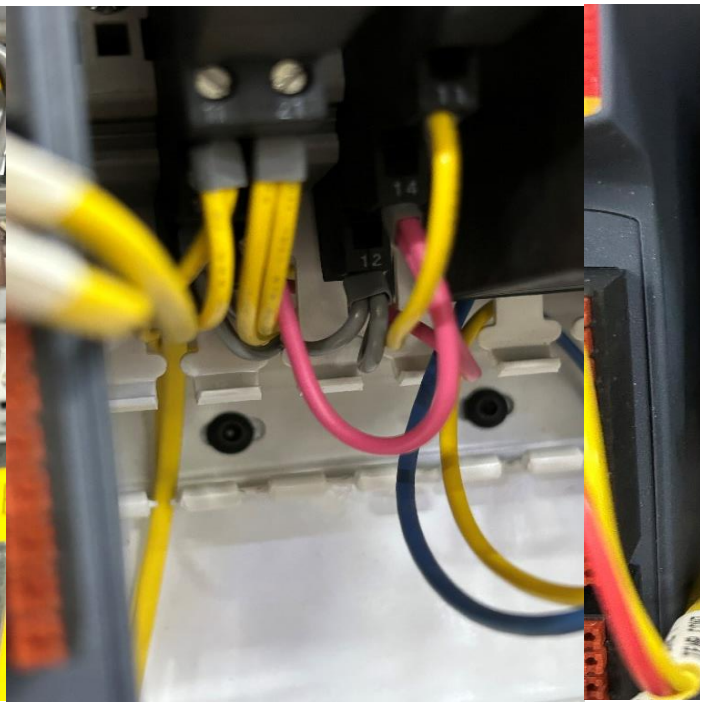
Supply voltage for relay module
Supply common
Common terminal for alarm/control switching
Normally closed contact output
Normally open contact output
Temperature probe input (wiring not visible)





Function/Tag	Type	Terminal	Wire Color	Descripiton/IO Role
Relay Coil +	Control In	A1	Yellow	24VDC PLC output energizes relay
Relay Coil -	Control In	A2	Blue	OVDC/common
Relay Common	Power/Signal	11	Yellow	Switched common terminal
Relay NC Output	Power/Signal	12	Grey	Normally closed contact (not always used)
Relay NO Output	Power/Signal	14	Pink	Normally open contact (switched output)

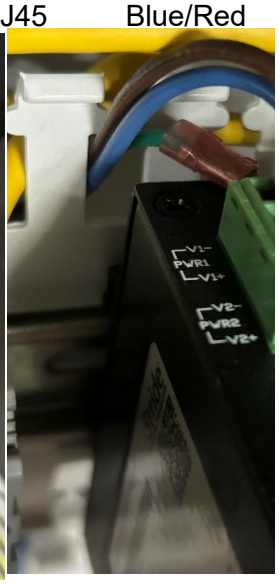


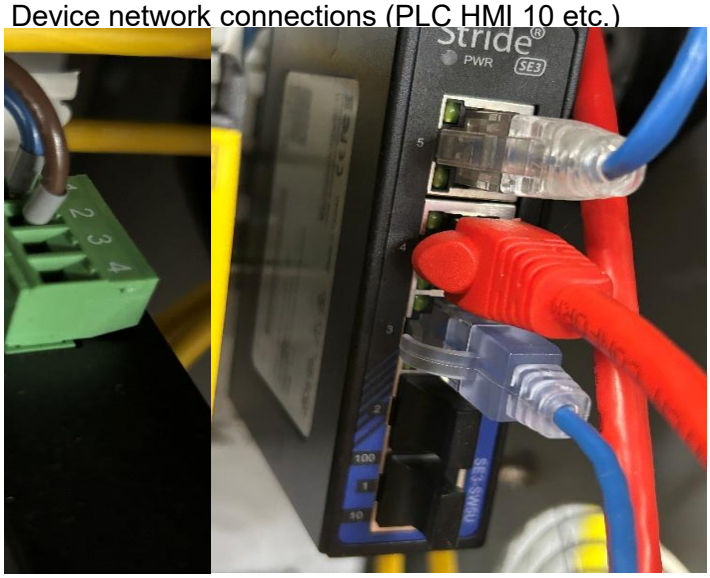


A2–
24
V
Phoenix Contact
No. 29 61 192
A2–
24
V

Function/Tag	Type	Terminal	Wire Color	Description/IO Role
+24VDC Power In	Power Input	A1	Brown	Module power supply
OVDC Power In	Power Input	A2	Blue	Module power supply
Safety Channel 1	Input	13	Grey	E-stop/safety device loop
Safety Channel 2	Input	23	Grey	E-stop/safety device loop
Reset/Feedback	Control	X2/X3	Grey	Reset or feedback loop
Aux/Status Outputs	Terminal	14	Yellow	PLC status/diagnostics

Function/Tag	Type	Terminal	Wire Color
Power1 V1-	Power Input	1	Blue
Power1 V1+	Power Input	2	Brown
Power2 V2-	Power Input	3	Unused
Power2 V2+	Power Input	4	Unused
Ethemet Ports 1—5	Network	RJ45	Blue/Red



Description/IO Role

DC negative G) main supply
DC positive (+) main supply
Optional redundant DC negative (-)
Optional redundant DC positive (+)
Device network connections (PLC HMI 10 etc.)