C4 4-Channel SCR Power Controller with Independent PID Control Quick Start Manual 0037-75569 (PK541)

This manual is intended to be a quick reference guide for basic installation requirements and an overview of the connections, wiring considerations, and general specifications for the C4 4-Channel SCR Power Controller with Independent PID control. For complete installation and operation, refer to the PK544 C4 Hardware Instruction Manual. For complete configuration and programming refer to the PK548 C4 Configuration and Programming Manual. The most current revisions may be found on the Chromalox website: www.chromalox.com

1. IMPORTANT SAFEGUARDS

⚠WARNING

ELECTRIC SHOCK HAZARD: Read and understand all instructions before installing, servicing or operating this controller. Failure to do so could result in equipment or property damage as well as personal injury and even death.

⚠WARNING

HIGH VOLTAGE is used in the operation of this equipment. DEATH ON CONTACT may result if personnel fail to observe safety precautions. Learn the areas containing high-voltage connections when installing or operating this equipment.

⚠WARNING

Be careful not to contact high-voltage connections when installing or operating this equipment. Before working inside the equipment, turn power off and ground all points of high voltage potential before touching.

⚠WARNING

ELECTRIC SHOCK HAZARD. Any installation involving control equipment must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

⚠CAUTION

The Owner/Installer must provide all necessary safety and protection devices and follow all current electrical wiring standards and regulations. Failure to do so may compromise the integrity of the controller and/or cause product failure resulting in a safety risk to operational service and personnel.

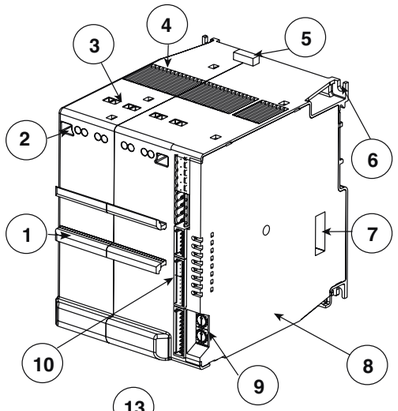
⚠CAUTION

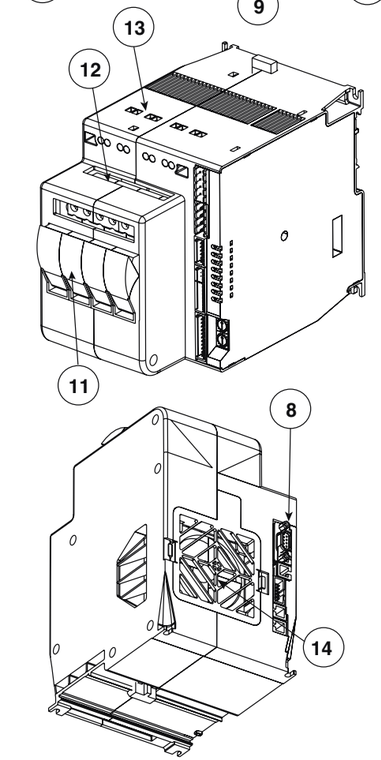
This controller utilizes a heat sink which is designed to cool the unit during operation. Under no circumstance should air flow around the controller be compromised in any way. Failure to do so may result in the overheating of the controller, product failure, product temperatures and even fire.

⚠WARNING

During continuous operation, the heat sink can reach a very high temperatures, and keeps a high temperature even after the unit is turned off due to its high thermal inertia.

2. OVERVIEW & LAYOUT





Item	Description
1.	Front DIN Rail Mount For C4-OP
2.	Power terminal: screws
3.	Power terminal
4.	Ventilation screen (DO NOT Obstruct)
5.	Spring clamp release for rear DIN rail
6.	Screw holes for additional mounting
7.	DIP switch for configuration
8.	Communication Port
9.	Rotary switch for addressing
10.	Connectors J1, J2, J3, J4
11.	Fuse holder (only for 30KW and 60KW models)
12.	Fuse holder terminals (F1, F2, F3, F4/N)
13.	Power terminals (U1, U2, U3, U4)
14.	Ventilation screen (DO NOT Obstruct)

Installation Wiring Note:

Use the extra rapid fuses as indicated in the C4 Hardware Instruction Manual PKXXX, according to the wiring schematic examples and controller rating. Additionally, the applications with solid state units require safety automatic switch to disengage the load power line during certain alarm events.

CHROMALOX
Advanced Thermal Technologies

PK541
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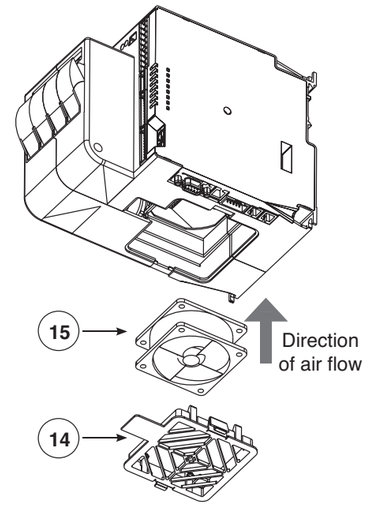
⚠WARNING

Before and during the inspection/ maintenance cut power to the fan controller and verify that the system is isolated for operator safety.



14.	Support Grill
15.	Fan

COOLING FAN CARE

Periodic Cleaning

Every 6-12 months (depending on the dust level of the installation) blow a compressed air jet downward through the upper rectangular cooling grilles (on the side opposite the fan). This will clean the internal heat dissipater and the cooling fan.

In Case of Overheat Alarm

If periodic cleaning does not eliminate the problem, do as follows:

a. Remove the fan support grille by detaching the two support tabs
b. Disconnect fan connector from board
c. Check the condition of the fan
d. Clean or replace the fan (*)
e. Insert the connector into the board
f. Insert fan support grille until it attaches
g. Power up the device and check fan rotation when at least one load is on

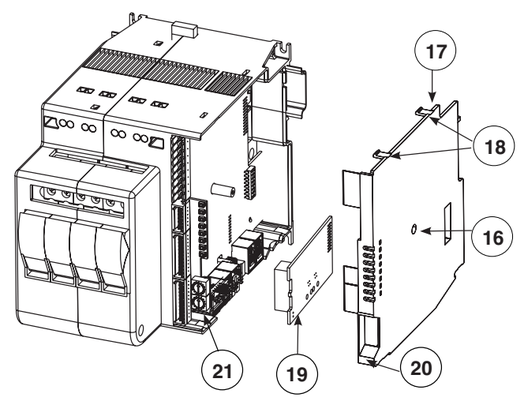
⚠WARNING

Before attempting board replacement, ensure that power to the controller has been cut and verify that the system is isolated for operator safety.

INSERTING A NEW FIELD BUS INTERFACE CARD

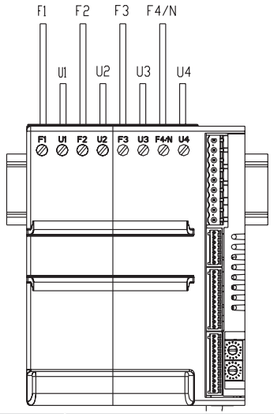
To insert a communication module, the Field Bus Interface Board compartment must be accessed. Follow these steps:

1. Remove the Fieldbus compartment cover screw 16
2. With a flat screwdriver, gently apply pressure at 18
3. Remove compartment cover 17
4. Insert Fieldbus card 19 into the proper connector 21
5. Remove applicable communication port tab 20 on cover 17
6. Carefully replace compartment cover 17
7. Tighten compartment cover screw 16



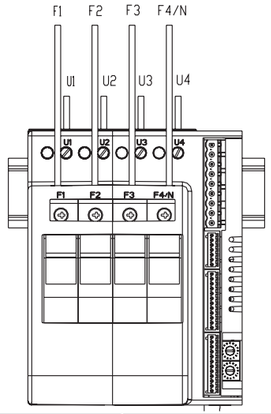
3. WIRING

Model without fuse holder



F1,F2,F3,F4/N	Line Connection Terminals
U1,U2,U3,U4	Load Connection Terminals

Model with fuse holder



F1,F2,F3,F4/N	Line Connection Terminals
U1,U2,U3,U4	Load Connection Terminals

Power Wiring Considerations

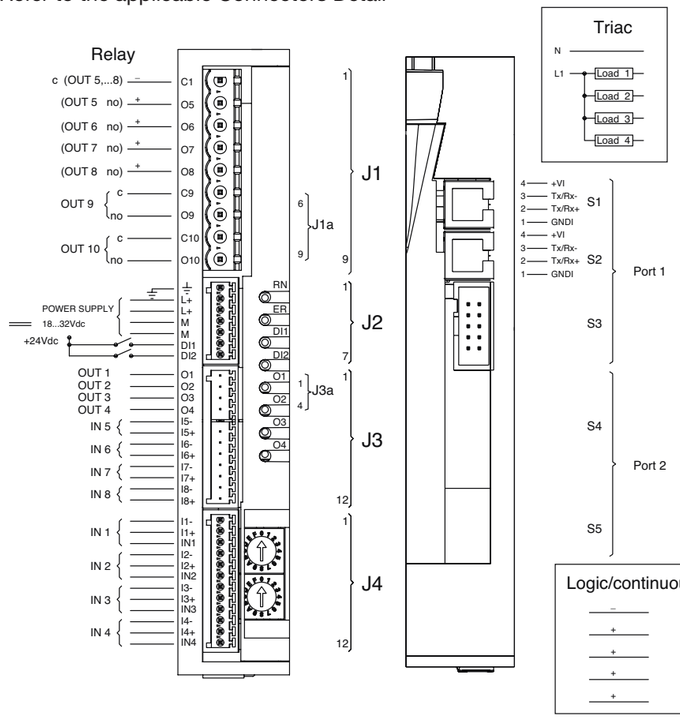
Model	30 kW		60 kW		80 kW	
Item	16A		30A		40A	
rigid	0.2-6mm²	24-10 AWG	0.2-6mm²	24-10 AWG	0.5-16mm²	20-6 AWG
flexible	0.2-4mm²	24-10 AWG	0.2-4mm²	24-10 AWG	0.5-10mm²	20-7 AWG
	0.25-4mm²	23-10 AWG	0.25-4mm²	23-10 AWG	0.5-10mm²	20-7 AWG
	0.25-4mm²	23-10 AWG	0.25-4mm²	23-10 AWG	0.5-10mm²	20-7 AWG
	0.5-0.6 Nm	4.4-5.3 In-Lb	0.5-0.6 Nm	4.4-5.3 In-Lb	1.2-1.5 Nm	10.6-13.3 In-Lb

Voltage/Current Considerations

C4	Current (Amp)	Voltage (Vac)			Power (kW)	
	Max Per Channel	Range	Nominal	Working	Per Channel	Controller Total
164 (4x16A)	16	24-530	480	120	1.9	7.7
				208	3.3	13.3
				240	3.8	15.4
				277	4.4	17.7
				400	6.4	25.6
				480	7.7	30.7
304 (4x30A)	30	24-530	480	120	3.6	14.4
				208	6.2	25.0
				240	7.2	28.8
				277	8.3	33.2
				400	12.0	48.0
				480	14.4	57.6
404 (4x40A)	40	24-530	480	120	4.8	19.2
				208	8.3	33.3
				240	9.6	38.4
				277	11.1	44.3
				400	16.0	64.0
				480	19.2	76.8

4. OPTIONS, INPUTS AND OUTPUTS CONNECTIONS

- Use adequately compensated cable for thermocouple inputs. Maintain polarity by avoiding junctions on the cables
- If using a grounded thermocouple, the connection must be at a single point
- For RTD inputs, use copper extension cables and avoid junctions on the cables. Resistance must not exceed 20 Ohm
- For 2-wire RTD's, make the connection indicated instead of the third wire
- Refer to the applicable Connectors Detail



5. DIP SWITCH CONFIGURATION

Dip Switch Legend		
Dip Switch	Function	Description
1	Load Connection	See Load Configuration Table Below
2		
3		
4	No Function	
5	Frequency	ON: 60 Hz OFF: 50 Hz
6	Factory Default	ON: Resets Controller to Factory Settings
7	Simulation	ON: Simulation Mode
8	RS-485 Communications	ON: When the device is the ONLY RS485 Device or when it is the LAST RS485 Device

Load Configuration Table			
Dip Switch			Load Connection Type
1	2	3	
OFF	OFF	OFF	4 Independent zones (4 single-phase loads)
ON	OFF	OFF	Zone 1: 3-phase load, star (wye) connection, with neutral
OFF	ON	OFF	Zone 1: 3-phase load, open delta connection
ON	ON	OFF	Zone 1 & 3: Two 3-phase loads, star (wye) connection, without neutral
OFF	OFF	ON	Zone 1 & 3: Two 3-phase loads, closed delta connection
ON	OFF	ON	No Function
OFF	ON	ON	No Function
ON	ON	ON	No Function

6. GENERAL DATA

General Data			
Power Supply	24 VDC +/-25%, max 8VA		
Indicators	Eight LEDS: RN CPU in run state , ER Fault Signal DI1, DI2 state of digital inputs O1,...O4 state of outputs		
Protection	IP20		
Work/Storage Temperature	0 - 50°C (see dissipation curves) / -20°C...70°C		
Relative Humidity	20 - 85% RH non-condensing		
Ambient Work Conditions	Indoor use, altitude up to 2000m		
Installation	DIN RAIL EN50022 or panel using screws		
Installation Instructions	Installation category II, Pollution level 2, double isolation Max surrounding air temp. 50°C (for UL) Open type equipment		
Weight **Models 30kW, 60kW, 80kW**	1200g		
Models 30kW, 60kW, w/fuse holder	1600g		
Power (Solid State Power Units, 4 Units)			
Rated Voltage	480 Vac		
Work Voltage Range	24....530 Vac		
Non-Repetitive Voltage	1200 Vp		
Zero Switching Voltage	<20 V		
Rated Frequency	50/60 Hz Self Testing		
Rated Current AC51	30 kW 4x16A	60 kW 4x30	80 kW 4x40A
Non-repetitive Overcurrent (t=1....10msec)	400A 600A	1150A	
I²T Fusion (t=1....10msec)	645A²S 1010A²S	6600A²S	
Critical Dv/dt with Output Deactivated	1000 V/Sec		
Rated Isolation Voltage	4000 V		

Minimum Clearance Considerations

Attention: Respect the min. distances shown in figure to provide adequate air circulation.