

CS3 Three Phase SSR Quick Start Manual

0037-75554 (PK528)

This manual is intended to provide only the basic installation and operation instructions for the CS3 Three Phase Solid State Relay. Please refer to manual PK522, for complete installation & operation details. The most current revision of PK522 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.

Higher voltages may be present. DO NOT work on the power section without first disconnecting electrical power to the panel. Failure to do so could result in serious injury or death.

2. INSTALLATION - MECHANICAL

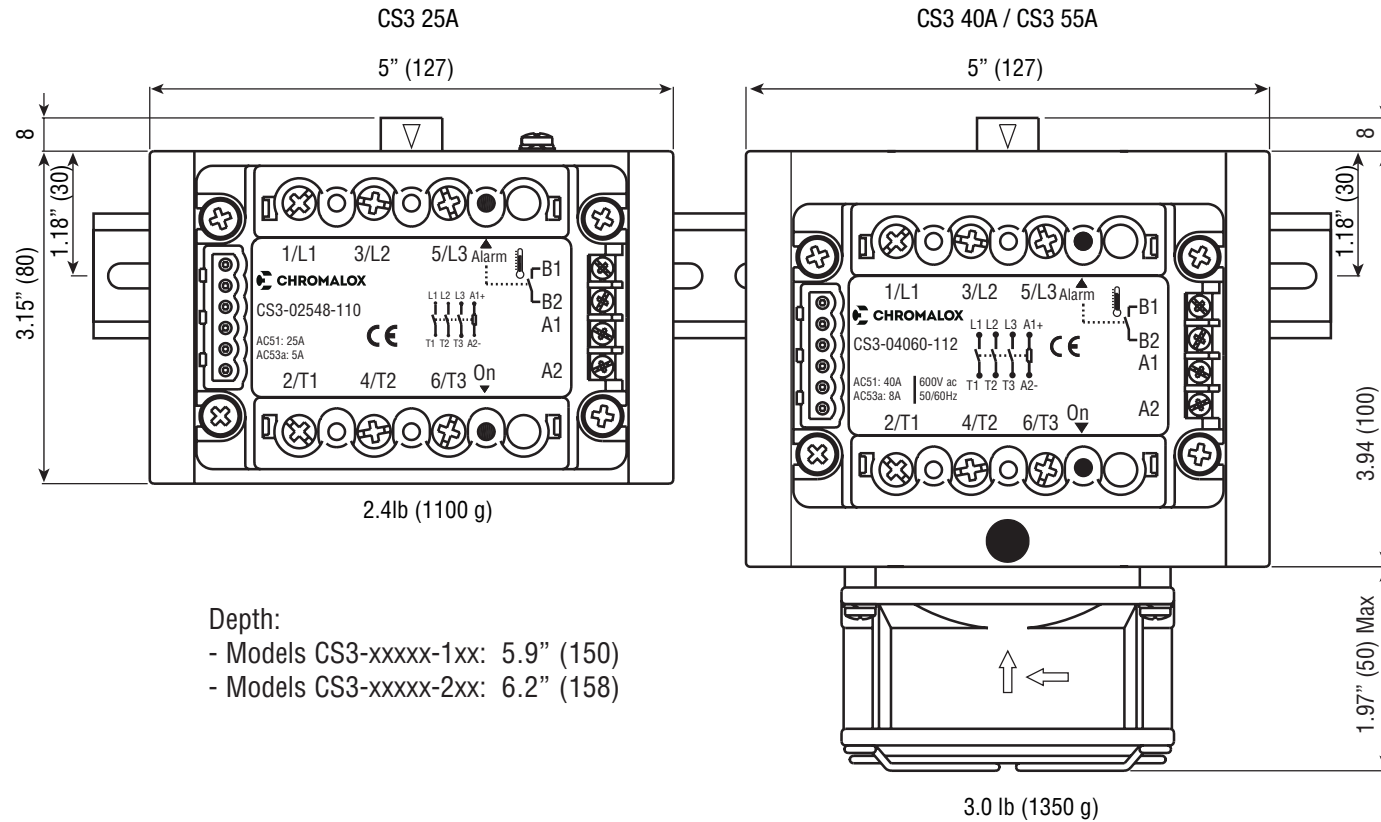
To ensure proper performance, maximum safety and reliability, it is essential to install the unit correctly. This includes proper mounting, spacing, hardware and wiring. See below:

- Maximum surrounding air temperature is 40°C in "Open Type Equipment" which is suitable for use in pollution degree 2.
- Install the unit vertically (max 10° inclination from vertical axis).

3. Spacing:

- Min. vertical distance between unit and panel wall: 3.9" (100 mm)
- Min. horizontal distance between unit and panel wall: 0.8" (20 mm)
- Min. vertical distance between adjacent power control units: 11.8" (300 mm)
- Min. horizontal distance between adjacent power control units: 0.8" (20 mm)

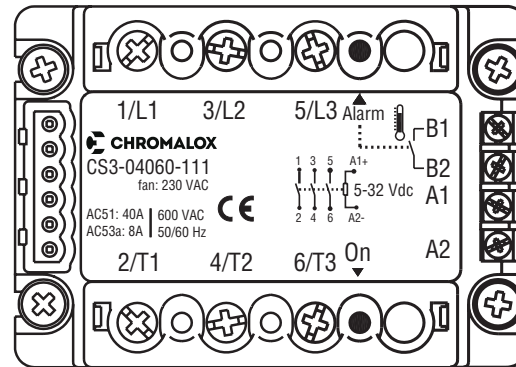
Dimensions & Weights



- Depth:
- Models CS3-xxxxx-1xx: 5.9" (150)
 - Models CS3-xxxxx-2xx: 6.2" (158)

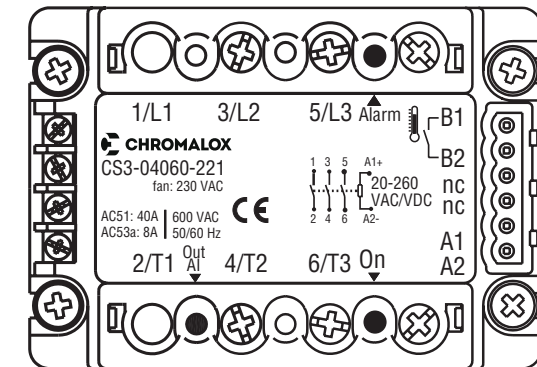
3. INSTALLATION - ELECTRICAL CONTROL, LOAD & LINE CONNECTIONS & LED INDICATION

CS3 with VDC Control Signal Input



Label	Connection/Indication	Label	Connection/Indication
L1, L2, L3	Line 1, Line 2, Line 3 VAC Input	B2	Alarm Output (Option)
T1, T2, T3	Load 1, Load 2, Load 3 VAC Input	ON	Red LED - Command Signal Indication
A1	(+) VDC Control Signal Input	Alarm	Yellow LED - Over Temp. Indication
A2	(-) VDC Control Signal Input	GND	Earth Ground (Not shown, varies by model)
B1	Alarm Output (Option)		

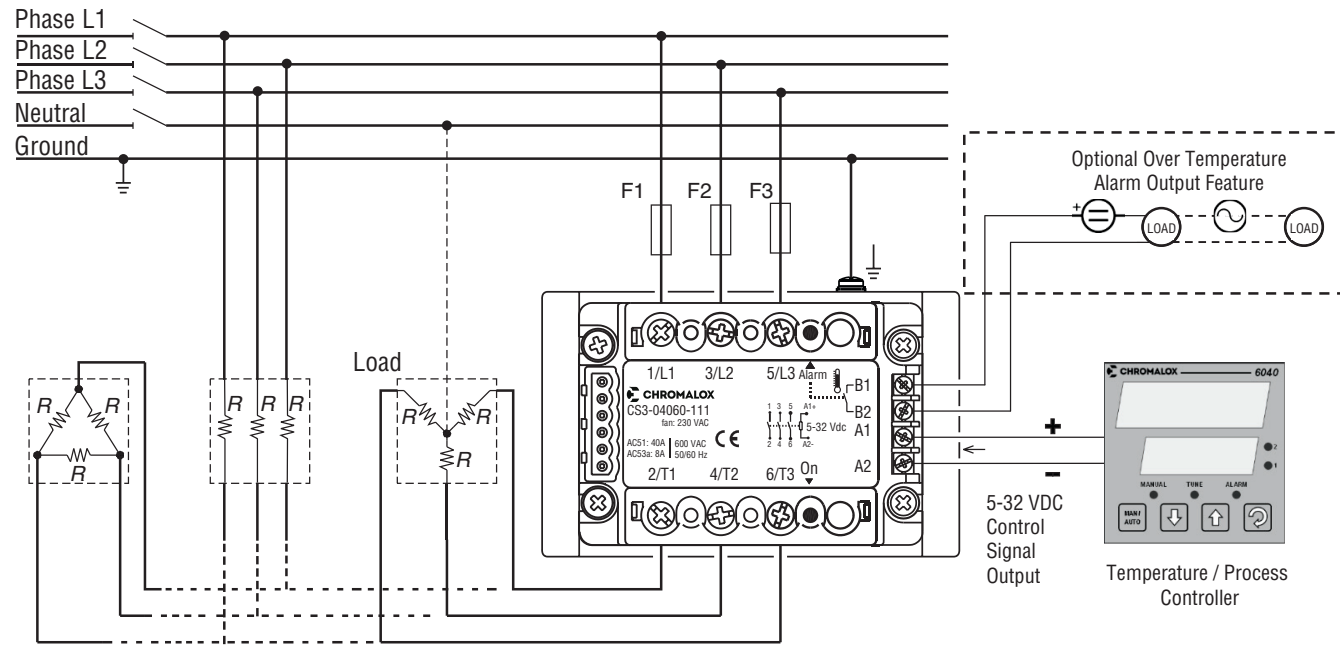
CS3 with VAC Control Signal Input



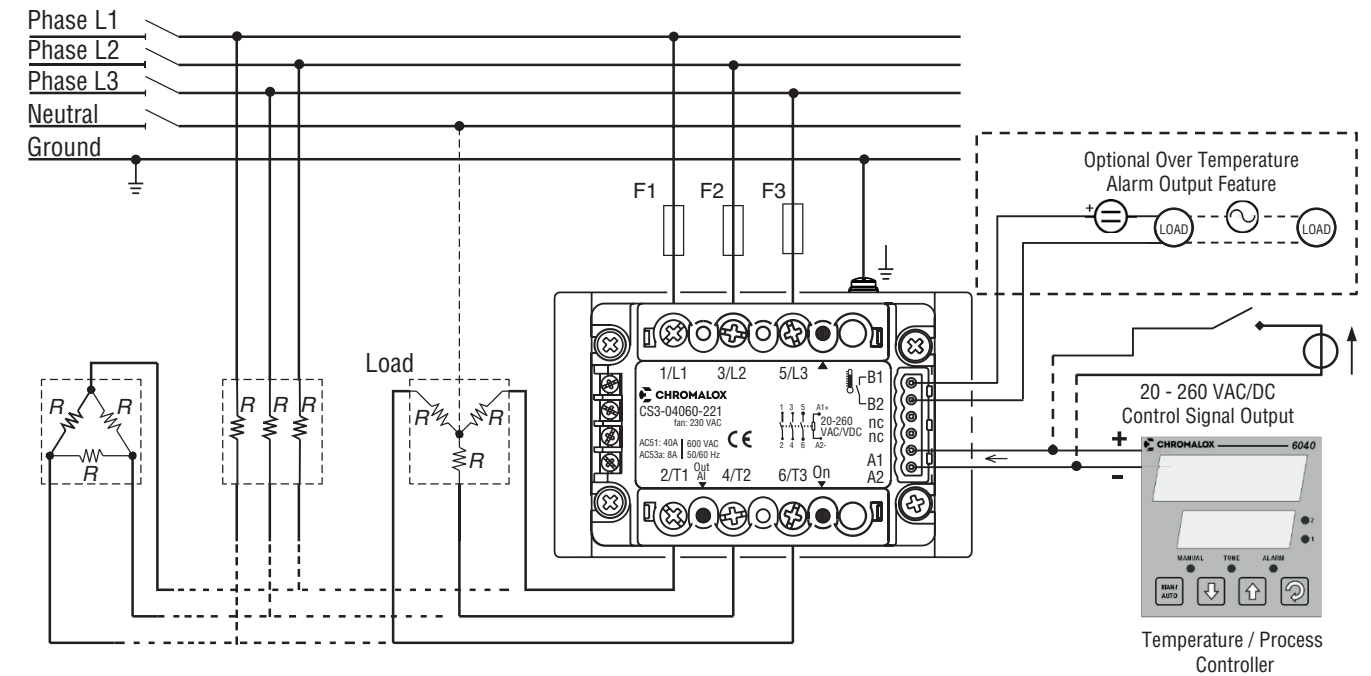
Label	Connection/Indication	Label	Connection/Indication
L1, L2, L3	Line 1, Line 2, Line 3 VAC Input	ON	Red LED - Command Signal Indication
T1, T2, T3	Load 1, Load 2, Load 3 VAC Input	Alarm	Yellow LED - Over Temp. Indication
A1, A2	AC Control Signal Input	OUT-AL	Red - LED Load/Line Interrupt Alarm (Alarm Code 2 Only)
B1	Alarm Output (Option)	GND	Earth Ground (Not shown, varies by model)
B2	Alarm Output (Option)		

4. WIRING - LOAD, LINE, INPUT SIGNAL AND OPTIONAL ALARM

CS3 Wiring with VDC Control Signal Input



CS3 Wiring with VAC/VDC Control Signal Input (Code 2)



5. SPECIFICATIONS

General

Category of use:	AC51, AC53a
Switching Mode:	Zero Cross
Input/Output Isolation Voltage:	4,000 VAC RMS
Operational Voltage Range	
• 480 VAC models:	24 - 530 VAC
• 600 VAC models:	24 - 660 VAC
Nominal Frequency:	50 - 60 Hz
Non-repetitive peak voltage	
• 480 VAC models:	1200 Vp
• 600 VAC models:	1200 Vp
Zero Voltage Turn-on:	≤ 20V
Activation time:	1/2 cycle
Deactivation time:	1/2 cycle
Potential drop at rated current:	< 1.4 Vrms
Power factor:	1
Protection:	IP20

Inputs

VDC Input (Type "1")

Control voltage:	5 - 32 VDC
Maximum input:	< 18 mA @5 VDC to 22 mA @ 32 V
Maximum reverse voltage:	36 VDC
Activation voltage:	> 4.5 VDC
Deactivation voltage:	< 3 VDC VAC

Input (Type "2")

Control voltage:	20 - 260 VAC/DC
Activation voltage:	> 15 VAC/DC
Deactivation voltage:	< 6 VAC/DC
Current draw:	≤ 8 mAac/dc @ 260 VAC/DC

Integrated Thermal Protection

The SSR temperature is constantly monitored. If the maximum temperature limit (230°F/110°C) is exceeded, current to the load is interrupted and the YELLOW over-temperature condition LED illuminates.

Outputs

Specification	CS3-025		CS3-040		CS3-055	
	AC51	AC53	AC51	AC53	AC51	AC53
Rated Current (@ 40°C continuous service)	3 X 25A	3 X 5A	3 X 40A	3 X 8A	3 X 55A	3 X 15A
Maximum Surge Current (t=20 ms)	400 A		600 A		1,150 A	
Maximum I ² t for fusing (blowout)	645 A ² s		1,010 A ² s		6,600 A ² s	
Critical dV/dt Off-state (minimum)	1,000 V/μs					
Off-state Leakage Current (@ Rated Voltage)	< 3 mA					

Alarm Output Option

The Alarm Output is a solid state switch which actuates a wired device during an alarm event, such as a horn or light. This output alarm requires an external 24 VAC/DC power supply.

Alarm Output Ratings:	I _{max}	150 mA
	V _{max}	32 VAC/DC
	Z close (impedance)	< 15 Ω

For Models with 24 VDC Input Control Signal

The alarm output function closes the isolated solid state output switch when it detects the following fault condition:

The control signal is active, but:

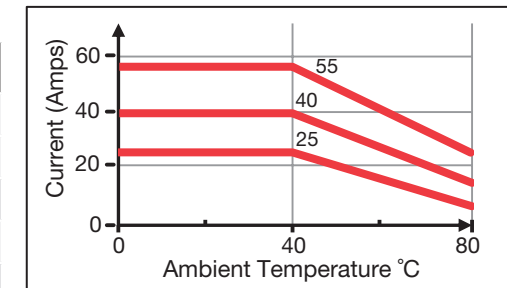
- The internal temperature limit of the SSR has been exceeded (Code 1)

For Models with 20 - 260 VAC/DC Input Control Signal

The alarm output function closes the isolated solid state output switch when it detects any of the following fault conditions:

The control signal is active, but:

- The internal temperature limit of the SSR has been exceeded (Code 1)
- There is no current on the load (Alarm Option Code 2)
- There is no line voltage power supply (Alarm Option Code 2)



CS3-025, CS3-040 & CS3-055 Derating Curves

Rated Current versus Ambient Temperature
Note: Models as tested with approved heat sinks and fans, if applicable.

Environment Conditions

Operating Temperature Range:	-20°C to 80°C
Max. Relative Humidity:	50% @ 40°C
Max. Installation Altitude:	2000m above sea level
Pollution Level:	2
Storage Temperature:	-20°C to 85°C
Junction Temperature:	125°C

This device conforms to ECC 2004/108/CE and 2006/95/CE and subsequent modifications including with reference to product standard EN 60947-4-3 (Low-voltage switchgear and control gear – AC contactors and semiconductor motor starters). The product is designed for type A environments. Use of the product in type B environments may cause undesired electromagnetic noise. In this case, the user should take appropriate steps for improvement.