Allen-Bradley

Solid-State Overload Relay Specifications

Bulletin Number 193-EF

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Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

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193 – EF   1   A   KP – R F L
       a *b* *c* *d*   *e*

a

Model	
Code	**Description**
EF	Bulletin 193-EF solid-state overload relay

b

Version	
Code	**Description**
Basic	1
Advanced	2

c

Adjustment Range [A]	
Code	**Description**
A‡	20…180
B§	160…400
C§	160…630

‡ Pass-thru mounting style
§ Direct (to contactor) mount style

d

Voltage	
Code	**Description**
KJ	24V AC
KV	36V AC
KY	48V AC
KD	110V AC
KP	120V AC
KF	230V AC
KA	240V AC
KN	400V AC
KG	415V AC
KB	440V AC
ZJ	24V DC
ZY	48V DC

e

Factory Modifications	
Code	**Description**
R	Automatic reset
F	Remote reset
L	External indication

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Supply Voltage Failure
In the event of a supply voltage failure, the output relay resets and the stand-by indicator goes out. The actual status is stored for 30 minutes. When the supply voltage is restored, the output relay reverts to its original state.

Reset — Manual
The reset button resets all protection functions. Resetting from any location is possible with the 193-RB1 remote reset module.

Reset — Automatic
Automatic resetting of thermal overload and thermistor overtemperature functions is an optional feature. All other protection functions must be reset manually.

Test Button for Thermal Overload Protection
Pressing the test button will verify thermal tripping operation time at $6x/_e$ without the motor being connected. The test button must be held for longer than the set trip time $t_{6x/e}$.

Device Installation and Commissioning
The operating instructions enclosed with the device provide all of the information necessary to set and commission it.

Surface Mounting
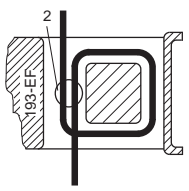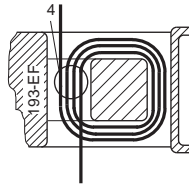193-EF_A Snap-on fixing to standard DIN Rail or screw fixing
193-EF_B Screw fixing
193-EF_C Screw fixing
Mounting position: optional

Setting the Rated Current (0.5…20 A) (193-EF1A and 193-EF2A Requires 193-HD)

The motor supply cables are looped through the current transformer twice, thereby doubling the rated motor current. The setting on the Bulletin 193-EF overload relay is the product of:

I_e [A] x…number of loops

Motor supply wire looped twice   *Motor supply wire looped 4 times*

Recommended for I_e [A]	Motor Supply Cables	Cable Cross Section (Flexible Strand)	
		IEC [mm^2]	CSA, UL (AWG No.)
20…180	fed straight through	4…95	10…10 000
10…20	looped twice	2.5…25	14…10
5…10	looped 4 times	1…6	14
2.5…5	looped 8 times	0.75…2.5	14
0.5…2.5	looped 40 times	0.5…0.75	‡

‡ CSA, UL: for I_e = 0.5…2.5 A, only factory-assembled wound devices should be installed

Rated Voltage Motor Circuit (primary circuit of current measuring device)							
IEC 947, EN 60947	[V]	1000					
CSA, UL	[V]	600					
Control Circuit							
IEC 947, EN 60947	[V]	440					
CSA, UL	[V]	240					
Rated Control Voltage U_S							
AC 50/60 Hz	[V]	24, 36, 48, 110, 120, 230, 240, 400, 415, 440, $(0.8…1.1U_S)$					
DC	[V]	24, 48 $(0.9…1.2\ U_S)$					
Terminal Cross-section							
Control circuit	[mm^2]	2 x 2.5					
Device Protection Fuse		10 A Type gG or 16 A Type gG					
Output Relay Contact Information							
Contact assembly		1 N.O. and 1 N.C., galvanically separated					
Rated operating voltage per UL/CSA: pilot duty 240V	[V]	24	110…125			220…250	380…440
Continuous Thermal current	[A]	4					
Rated AC operating current AC-15	[A]	3				3	1.2
Max. permissible switching current (cos = 0.3) AC-15	[A]	30				30	12
Rated DC operating current (L/R = 300 ms), no protective circuit needed DC-13	[A]	2	0.3			0.2	—
Max. rated back-up fuse current		10 A, 500V AC Type gG					
Ambient temperature Operation Storage Transport		-5…+60 °C -50…+60 °C -50…+85 °C					

Sensor Measurement Circuit			
Measurement circuit Cross section	[mm^2]	0.5	1.5
Max. lead length‡	[m]	200	600
Max. cold resistance of PTC sensor chain	kΩ	1.5	
Max. number of PTC sensors per IEC 34-11-2		6	
Weights			
Overload Relay			
193-EF1A	[g]	1 070	
193-EF2A	[g]	1 090	
193-EF1B	[g]	2 510	
193-EF2B	[g]	2 530	
193-EF2C	[g]	5 550	
193-LB1 indication module	[g]	160	
193-RB1 Remote reset module	[g]	160	
196-MTM Adapter	[g]	5	
193-PA Front cover	[g]	3	
193-HD Terminal lug	[g]	40	
Bus bars			
825-MVM	[g]	230	
825-MVM2	[g]	290	
825-MVS	[g]	280	
825-MVS2	[g]	350	
Approvals			
CE, UL Listed, CSA, Bureau Veritas, Lloyd's Register of Shipping, Maritime Register of Shipping, RINA			

‡ Type of wiring: insulated control leads, screened > 200 m (shield connected with 1T1)

Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes.

Cat. Nos. 193-EF1A, 193-EF2A
(shown with cat. no. 825-MVM bus bar kit)

Cat. Nos. 193-EF1B, 193-EF2B

Cat. No. 193-EF2C

Cat. No. 193-LB1
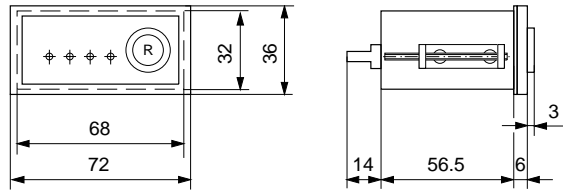
Dimensions	193-EF1A 193-EF2A	193-EF1B 193-EF2B	193-EF2C
A	120	140	155
a1	105	—	—
b	100	142	143
b‡	100	—	—
b▽	117	—	—
b1	73	—	—
φd	5.4	5.8	6.5
d1	55…60	75	90…93
d2	100	125	135
φe	M8 x 12	M10 x 25	M10 x 25
φe1	—	M10 x 35	M10 x 25
e2	38.5	48	48
e3‡	16	25	25
e3▽	20	25	25
e4	82	117	118
e4‡	82	—	—
e4▽	97	—	—
c	143	148	178
c1	72	117	118
c2	93.5	—	—
c3	53.5	—	—

♠ Terminal cover
‡ Universally applicable busbars (Cat. No. 825-MVM)
§ Feed-through openings 19 x 19 mm
♣ With 193-LB1 indication module: c = c + 29 mm
Δ Can be mounted to DIN Rail EN 50 022-35
▽ Universally applicable busbars (Cat. No. 825-MVM2)

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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