

Bulletin 194L IEC Control and Load Switches

- 12, 16, 20, 25, 32, and 40 A inductive load-rated switch
- IP66 water spray and dustproof handles
- IP20 finger-safe terminals
- Switches available for OFF-ON, changeover, star-delta (wye-delta), reversing, ammeter, voltmeter and step switch configurations
- 1...6-Pole versions
- Front/door- or base/ DIN Rail-mounting configurations
- Thermoplastic enclosures IP66
- Suitable as motor disconnect (UL 508)

Bulletin 194L control and load switches are flexible, adaptable, time- and space-saving devices. Switches are available as front/door- or Base/DIN rail-mounting versions. Uniformly styled handles, featuring marked legend plates, are available in Selector-Knob, Disk-Style, Rectangular-Style and Key-Operated versions. Selector-Knob versions are available in three sizes. Most handles are available in Grey/Black or Red/Yellow and have padlockable versions.

A new thermoplastic enclosure features constructions of impact-resistant ABS or corrosion resistant NORYL materials. Both shallow and deep versions include 35 mm DIN mounting rail, grounding and neutral terminals, and captive cover screws. Enclosures may be ordered with or without cover openings for handle mounting. Enclosures are rated for use in IP66 (UL Type 1, 3, 3R, 12) environments.

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Standards Compliance

IEC 60947-3 Low-voltage switchgear and control gear part 3
 UL 508
 CSA: C22.2 No. 14

Certifications

UL Listed (File No. E14841 NLRV)
 CSA Certified (LR 13908)
 Meets IEC, VDE and BS Standard requirements
 CE

Product Overview



OFF-ON Switch

OFF-ON Switch

Two-position switch used to connect or disconnect a variety of inductive loads including: solenoids, handles, valves, magnetic starters and relays.



Star-Delta (Wye-Delta) Switch

Star-Delta (Wye-Delta) Switch

Three-position (Off-Wye-Delta) switch used to manually control reduced-voltage motor starting. Operating the switch manually changes the wiring configuration of the motor from a star configuration to delta configuration after the controller operator has determined that the motor is up to operating speed.



Ammeter Switch

Ammeter Switch

Multi-position switch used to connect one or more phases of an electrical supply to an ammeter, so that the current in each phase can be displayed on one ammeter.



Step Switch

Step Switch

Multi-position switch used to connect a variety of loads to an electrical supply in a pre-determined logical sequence. A typical application would be temperature control of a heating oven or furnace.



Changeover Switch

Changeover Switch

Two-position switch used in control applications to change between alternate power supplies. This device can typically be used to manually switch power supplies from a primary source to a stand-by/emergency supply in the event of a power outage.



Reversing Switch

Reversing Switch

Three-phase, three-position (Forward-Off-Reverse) switch used to manually control a motor's direction of rotation. Operating the switch changes the wiring configuration of the motor to operate in the forward or reverse direction.








Voltmeter Switch

Voltmeter Switch

Multi-position switch used to connect two lines of the electrical supply system to a voltmeter so that the voltage between the lines (phase-to-phase or phase-to-neutral) can be displayed on one voltmeter.

Bulletin 194L Control and Load Switches

Base/DIN Rail Mounting	Front/Door Mounting	Base/DIN Rail Mounting	Front/Door Mounting	Front/Door Mounting
				
12...25 A Base Mount	12...25 A Front Mount	32 A and 40 A Base Mount	32 A and 40 A Front Mount	32 A and 40 A Front Mount, for use with 22.5 mm mounting hole style handle

Cat. No. Explanation

194L - A 16 - 175 3
 a b c d

a

Installation Type	
Code	Description
A	Base/DIN Mounting
E	Front/Door Mounting
C	Front/Door Mounting (For use with 32 A and 40 A switches only. Use when selecting 22.5 mm hole-mounting style handle.)

b

Load Size			
Code	Description	Code	Description
12	12 A	25	25 A
16	16 A	32	32 A
20	20 A	40	40 A

c

Code	Function	Configuration	Use with Switch Style*:	Circuit Diagram Ref. No.	
150	On/Off	2-Position (60 degrees)	194L-E, 12...40 A, 1...6 poles	1501...1506	
175		2-Position (90 degrees)	194L-E or 194L-A, 12...40 A, 1...6 poles	1751...1756	
178		2-Position (90 degrees-inverted)	194L-E or 194L-A, 12...40 A, 1...4 poles	1781...1784	
225	Change-Over	1-2 (without 0, 45 degrees)	194L-E, 12...40 A, 1...5 poles or 194L-A, 12...40 A, 1...2 poles	2251...2255	
250		1-2 (without 0, 60 degrees)	194L-E, 12...40 A, 1...5 poles	2501...2505	
300		1-0-2 (with 0, 30 degrees, spring return)	194L-E, 12 A, 1...3 poles	3001...3003	
325		1-0-2 (with 0, 45 degrees)	194L-E or 194L-A, 12...40 A, 1...4 poles	3251...3254	
326		1-0-2 (with 0, 45 degrees, spring return)	194L-E, 12 A, 1...3 poles	3261...3263	
350		1-0-2 (with 0, 60 degrees)		3501...3504	
375		1-0-2 (with 0, 90 degrees)	194L-E, 12...40 A, 1...4 poles	3751...3754	
425	Step Switch	1-2-3 (45 degrees)	194L-E or 194L-A, 12...40 A, 1 pole 194L-E, 12...40 A, 2...3 poles	4251...4253	
426		1-2-3-4 (45 degrees)	194L-E, 12...40 A, 1...3 poles 194L-A, 12...40 A, 2 poles	4261...4263	
427		1-2-3-4-5 (45 degrees)		4271	
428		1-2-3-4-5-6 (45 degrees)	194L-E or 194L-A, 12...40 A, 1 pole	4281	
450		1-2-3 (60 degrees)		4501...4503	
451		1-2-3-4 (60 degrees)	194L-E, 12...40 A, 1...3 poles	4511...4513	
452		1-2-3-4-5 (60 degrees)		4521	
453		1-2-3-4-5-6 (60 degrees)	194L-E, 12...40 A, 1 pole	4531	
500		Star-Delta (Wye-Delta)	0-1-2-3-4 (30 degrees)		5001...5003
501			0-1-2-3-4-5 (30 degrees)	194L-E, 12...40 A, 1...3 poles	5011...5013
525			0-1-2 (45 degrees)		5251...5253
526			0-1-2-3 (45 degrees)		5261...5263
527			0-1-2-3-4 (45 degrees)	194L-E or 194L-A, 12...40 A, 1 pole	5271...5273
528			0-1-2-3-4-5 (45 degrees)	194L-E, 12...40 A, 2...3 poles	5281...5283
550			0-1-2 (60 degrees)		5501...5503
551			0-1-2-3 (60 degrees)		5511...5513
552			0-1-2-3-4 (60 degrees)	194L-E, 12...40 A, 1...3 poles	5521...5523
553			0-1-2-3-4-5 (60 degrees)		5531...5533
725		Reversing	0-Y-Δ (45/90 degrees)	194L-E or 194L-A, 12...40 A, 3 poles	7253
732			0-Y-Δ (45/90 degrees)		7323
750	Voltmeter	0-Y-Δ (60 degrees)	194L-E, 12...40 A, 3 poles	7503	
730		1-0-2 (45 degrees)	194L-E or 194L-A, 12...40 A, 3 poles	7303	
754	Ammeter	1-0-2 (60 degrees)	194L-E, 12...40 A, 3 poles	7543	
825		0-RN-SN-TN-TR-ST-RS (45 degrees)		8251	
827		0-RS-ST-TR (45 degrees)		8271	
875		0-1-2-3 (90 degrees)	194L-E or 194L-A, 12 A, 1 pole	8751	
876		0-1-2-3-4 (90 degrees)		8761	
877		0-1 (90 degrees inverted)		8771	

d

No. of Poles	
Code	Description
1	1 Pole
2	2 Poles
3	3 Poles
4	4 Poles
5	5 Poles
6	6 Poles


* Not all possible configurations are available as standard. Some configurations are custom orders with longer delivery times.
 * When choosing front mount style 194L-E for 32 A or 40 A, use the 194L-C code.


IEC Control and Load Switches

Product Selection, Continued

Frequently Ordered 194L Switches — Base/Front-Mounted Switches (Switch Handles listed on page 2-389)







2

ON-OFF Switch Body (Includes Shaft)	No. of Poles	Contact Target Configuration X = Contact Closed O = Contact Open			Rated Current [A]	Mounting Type	Cat. No.
		No. of Circuits	Control Knob Position				
			OFF/0	ON/1			
	1	1	O	X	20	Front/Door	194L-E20-1751
					25	Base/DIN	194L-A25-1751
2-Circuit ON-OFF Switch	2	1 2	O O	X X	12	Base/DIN	194L-A12-1752
						Front/Door	194L-E12-1752
					16	Front/Door	194L-E16-1752
					20	Base/DIN	194L-A20-1752
						Front/Door	194L-E20-1752
					25	Front/Door	194L-E25-1752
3-Circuit ON-OFF Switch	3	1 2 3	O O O	X X X	12	Base/DIN	194L-A12-1753
						Front/Door	194L-E12-1753
					16	Base/DIN	194L-A16-1753
						Front/Door	194L-E16-1753
					20	Base/DIN	194L-A20-1753
						Front/Door	194L-E20-1753
					25	Base/DIN	194L-A25-1753
						Front/Door	194L-E25-1753
4-Circuit ON-OFF Switch	4	1 2 3 4	O O O O	X X X X	12	Base/DIN	194L-A12-1754
						Base/DIN	194L-A20-1754
					20	Front/Door	194L-E20-1754
						Base/DIN	194L-A25-1754
					25	Front/Door	194L-E25-1754
6-Circuit ON-OFF Switch	6	1 2 3 4 5 6	O O O O O O	X X X X X X	16	Front/Door	194L-E16-1756
						Base/DIN	194L-A20-1756
					20	Front/Door	194L-E20-1756
						Base/DIN	194L-A25-1756
					25	Base/DIN	194L-A25-1756
						Front/Door	194L-E25-1756

Reversing Switch Body (Includes Shaft)	No. of Poles	Contact Target Configuration X = Contact Closed O = Contact Open			Rated Current [A]	Mounting Type	Cat. No.	
		No. of Circuits	Control Knob Position					
			1	0				2
	3	1 2 3 4 5	O X X O X	O O O O O	X O O X X	25	Front/Door	194L-E25-7543



Bulletin 194L Handles (for use with Bulletin 194L Switches)

Color	Handles (Includes Legend Plate and Control Knob)			
Red/Yellow (Emergency Stop colors)	 <i>Type I</i>	 <i>Type L</i> With Locking For One Padlock (Padlock Not Included)	 <i>Type N</i>	Bulletin 194L handles are available in both screw fixing and 22.5 mm mounting hole style. IP66, UL Type 3/3R/12 for all 194L Handles
Black/Grey (Standard Operation colors)	 <i>Type A</i>	 <i>Type E</i> With Locking For One Padlock (Padlock Not Included)	 <i>Type G</i>	



Cat. No. Explanation

194L - **HE** **6** **N** - **175**
 a **b** **c** **d**

a

Code	Installation Type
HC	22.5 mm Mounting Hole Style Handle (for use with front-mounted switches)
HE	Screw-Mounting Handle (for use with front- and base-mounted switches)

b

Code	Use with Handle Type	Handle Legend Plate Size	Use With 194L Switch Size
4	A, E, I, L	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-A12...A25 194L-E12...E25 194L-C32...C40
	S	48 mm x 62 mm (1-57/64 in. x 2-7/16 in.)	
6	A, E, I, L	64 mm x 64 mm (2-33/64 in. x 2-33/64 in.)	194L-A12...40 A 194L-E12...40 A
	G, N*	67 mm x 67 mm (2-41/64 in. x 2-41/64 in.)	
	S	64 mm x 78 mm (2-33/64 in. x 3-5/64 in.)	

* Use Type G and N with ON-OFF function only (selection "d").

c

Code	Legend Plate Type	Color
A	Square	Grey/Black
I	Square	Red/Yellow
E	Square/Lockable	Grey/Black
L	Square/Lockable	Red/Yellow
G	Disc/Lockable (up to 3 locks)	Grey/Black
N	Disc/Lockable (up to 3 locks)	Red/Yellow
S	Large Square with extra legend area	Grey/Black

d

See Table on the next page.

d


2

Code	Description	Legend Marking	Code	Description	Legend Marking	Code	Description	Legend Marking
150	O-I		426	1-2-3-4 (45° Step Switch)		551	0-1-2-3 (60° Step Switch)	
150I	OFF-ON		427	1-2-3-4-5 (45° Step Switch)		552	0-1-2-3-4 (60° Step Switch)	
175	O-I		428	1-2-3-4-5-6 (45° Step Switch)		553	0-1-2-3-4-5 (60° Step Switch)	
175I	OFF-ON		450	1-2-3 (60° Step Switch)		725	0-Y-Δ (45°/90° Star-Delta Switch)	
178	O-I		451	1-2-3-4 (60° Step Switch)		732	0-Y-Δ (45°/90° Star-Delta Switch)	
178I	OFF-ON		452	1-2-3-4-5 (60° Step Switch)		750	0-Y-Δ (60° Star-Delta Switch)	
225	1-2 (45° Changeover without O)		453	1-2-3-4-5-6 (60° Step Switch)		754	Same as Code 350. Use order code 350.	
250	1-2 (60° Changeover without O)		500	0-1-2-3-4 (30° Step Switch)		825	0-RN-SN-TN-TR-ST-RS (45° Voltmeter Switch)	
300	1-0-2 (30° Changeover with spring return)		501	0-1-2-3-4-5 (30° Step Switch)		827	0-RS-ST-TR (45° Voltmeter Switch)	
325	1-0-2 (45° Changeover with O)		525	0-1-2 (45° Step Switch)		875	0-1-2-3 (90° Ammeter Switch — 3 c.t.'s)	
326	Same as Code 325. Use order code 325.		526	0-1-2-3 (45° Step Switch)		876	1-2-3-4 (90° Ammeter Switch — 4 c.t.'s)	
350	1-0-2 (Reversing 45° Changeover with O)		527	0-1-2-3-4 (45° Step Switch)		877	0-1 (90° Ammeter Switch — 1 c.t.)	
375	1-0-2 (90° Changeover with O)		528	0-1-2-3-4-5 (45° Step Switch)				
425	1-2-3 (45° Step Switch)		550	0-1-2 (60° Step Switch)				



Frequently Ordered 194L Handles — Base/Front-Mounted Switch Handles
 (Switch Body listed on page 2-387)

Handle Type	Degree of Protection	Handle Color	Legend Plate Size	For Use With	Legend Plate Marking	Cat. No.*
A	IP66	Black/Grey	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-E12...40 A, -7543	1-0-2	194L-HC4A-350
			48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-E12...40 A, -7543 194L-A12...40 A, -7543		194L-HE4A-350
			64 mm x 64 mm (2-33/64 in. x 2-33/64 in.)	194L-E12...40 A, -7543 194L-A12...40 A, -7543		194L-HE6A-350
E		Black/Grey	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194E-16...63 A 194L-E12...40 A, -1753 194L-A12...40 A, -1753	0-1 OFF-ON	194L-HE4E-175 194L-HE4E-175I
L		Red/Yellow	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194E-16...63 A 194L-E12...40 A, -1753 194L-A12...40 A, -1753	0-1 OFF-ON	194L-HE4L-175 194L-HE4L-175I
G		IP66 (UL Type 3/3R/12)	Black/Grey	67 mm x 67 mm (2-41/64 in. x 2-41/64 in.)	194E-25...100 A 194L-E12...40 A, -1753 194L-A12...40 A, -1753	0-1 OFF-ON
N	Red/Yellow		67 mm x 67 mm (2-41/64 in. x 2-41/64 in.)	194E-25...100 A 194L-E12...40 A, -1753 194L-A12...40 A, -1753	0-1 OFF-ON	194L-HE6N-175
L	IP66 (UL Type 3/3R/12)	Red/Yellow	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-E12...40 A, -1753	0-1 OFF-ON	194L-HC4L-175 194L-HC4L-175I

* For 22.5 mm mounting hole style (code HC), select either handle type A, E, I, or L with 48 x 48 mm legend plate size (code 4) only or handle type G or N with 64 x 64 mm legend plate size (code 6) only.


Rectangular Knob Handle (Includes Legend Plate and Control Knob)	Color	Locking Provision	Legend Plate Size	For Use With	Fixing	Legend Marking	Cat. No.
	Black/Grey	None	48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)	194L-A 12...40 A switches ONLY	Screw	0-1	194L-HE4P-175
						OFF-ON	194L-HE4P-175I

22.5 mm Mounting Hole Style Knob and Keyed Type Handles

	Description	Fixing	Pkg. Qty.	Cat. No.
 Type B	22.5 mm Mounting Hole Style Handles (IP65) Handle Style: Knob Lever with Latch (For Use With 194E-E25...100 A, -1753) or 194L-E12...40 A	22.5 mm Mounting Hole Style	1	194L-HCB-001
 Type D	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A, - 1753	22.5 mm Mounting Hole Style	1	194L-HCDC-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A, - 1753			194L-HCDD-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A, - 1753			194L-HCDG-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12...40 A, 194E-E16...63 A - 1753			194L-HCDH-001

2

Accessories


		Description	Pkg. Qty.	Cat. No.
 Standard Black Control Knob	 Rectangular Front Frame	Control Knob, Black, L = 37.5 mm (1-31/64 in.)	5	194L-G3154N
		Control Knob, Black, L = 48 mm (1-57/64 in.)	5	194L-G3155N
		Control Knob, Red, L = 37.5 mm (1-31/64 in.)	5	194L-G3154R
		Control Knob, Red, L = 48 mm (1-57/64 in.)	5	194L-G3155R
		Rectangular front frame with blank nameplate L = 48 mm x 62 mm (1-57/64 in. x 2-7/16 in.)	10	194L-G3196
	Rectangular front frame with blank nameplate L = 64 mm x 78 mm (2-33/64 in. x 3-5/64 in.)	10	194L-G3197	
 Control Knob, With Locking Facility		Control Knob, Black, with Locking Facility (Use 1/4 in. max. hasp lock.) (Locks in 0°, 90°, 180°, and 270° positions)	10	194L-G2864N
		Control Knob, Red, with Locking Facility (Use 1/4 in. max. hasp lock)		194L-G2864R
 Control Knob, Type P Control Knob, Black, 31 mm (1-7/32 in.) Diameter Control Knobs, Type P Control Knob, Red, 31 mm (1-7/32 in.) Diameter			5	194L-G2888N 194L-G2888R
	 Large Control Knob, 41 mm (1-5/8 in.) Diameter; IP40, Black		5	194L-G2851N
	 Control Knob, 41 mm (1-5/8 in.) Diameter; IP65, Black		5	194L-G2854N
 Use Bulletin 800F Legend Frames and Inserts			—	—
 Blank Legend Plate, 48 mm x 48 mm (1-57/64 in. x 1-57/64 in.)			10	194L-B4
 Blank Legend Plate, 64 mm x 64 mm (2-33/64 in. x 2-33/64 in.)				194L-B6
 Locking Ring Wrench For 22.5 mm Mounting Hole Style Handles (For use with front-mounted switches)			1	800E-AW2
 Terminal Cover — Base/DIN For Cat. No. 194L-A12...16 Terminal Cover — Front (Door) For Cat. No. 194L-E12...16 Terminal Cover — Base/DIN For Cat. No. 194L-A20...25 Terminal Cover — Front (Door) For Cat. No. 194L-E20...25			10	194L-A12-C34 194L-E12-C34
			10	194L-A20-C34 194L-E20-C34

2

IEC Control and Load Switches

Accessories, Continued






2

	Use With Switch	Number of Contacts*	ABS		Required Shaft	Noryl Material	Required Shaft
			Cat. No.	Cat. No.	Cat. No.	Cat. No.	
	194L-A12/16	1...2	194L-G3572	194L-G3195	194L-G3576	194L-G3195	
		3...4	194L-G3572	194L-G2830	194L-G3576	194L-G2830	
		5...6	194L-G3573	194L-G3195	194L-G3577	194L-G3195	
	194L-A20/25	1...2	194L-G3572	194L-G3194	194L-G3576	194L-G3194	
		3...4	194L-G3572	194L-G2830	194L-G3576	194L-G2830	
		5...6	194L-G3573	194L-G3194	194L-G3577	194L-G3194	
	194L-E12/16	1...4	* 194L-G3574	194L-G3380	194L-G3578*	194L-G3380	
		5...8	* 194L-G3575	194L-G3380	194L-G3579*	194L-G3380	
	194L-E20/25	1...4	* 194L-G3574	194L-G3380	194L-G3578*	194L-G3380	
		5...8	* 194L-G3575	194L-G3380	194L-G3579*	194L-G3380	

Use With Size 6 Handles

* Covers must be drilled for operating handle by user. Does not include earth/ground — neutral terminal.

* Refer to the switching diagrams that follow to determine the number of switch contacts.

	Description	Pkg. Qty.	Cat. No.
	Metal Shaft Extension with Padlock Provision ON Switch in OFF Position L = 110 mm...235 mm (4-21/64 in....9-1/4 in.)	1	194L-G3393
	Metal Shaft Extension with Padlock Provision ON Switch in OFF Position L = 230 mm...350 mm (9-3/64 in....13-51/64 in.)	1	194L-G3394
	Metal Shaft Extension For modification of Cat. No. 194L-G3393/ G3394 when used with any switches other than 2-position, 90° rotation.	10	194L-G3399
	Standard Interlock Shaft For Use With 194L-A12...40 = 44 mm (1-47/64 in.)	5	194L-G2830*
	Interlock Shaft For Use With 194L-A12...40 = 52 mm (2-3/64 in.)		194L-G3194*
	Interlock Shaft For Use With 194L-A12...40 = 57 mm (2-15/64 in.)		194L-G3195*
	Shaft Extension Including Coupling For Use With 194L-A12...40 = 24 mm (15/16 in.)	10	194L-G2853
	Standard Shaft For Use With 194L-E12...40 = 34 mm (1-11/32 in.)	5	194L-G3380

* For Use With **194L-A...** Base-Mounted switches only.

Contact target tables: X = Contact Closed
 [Blank] = Contact Open

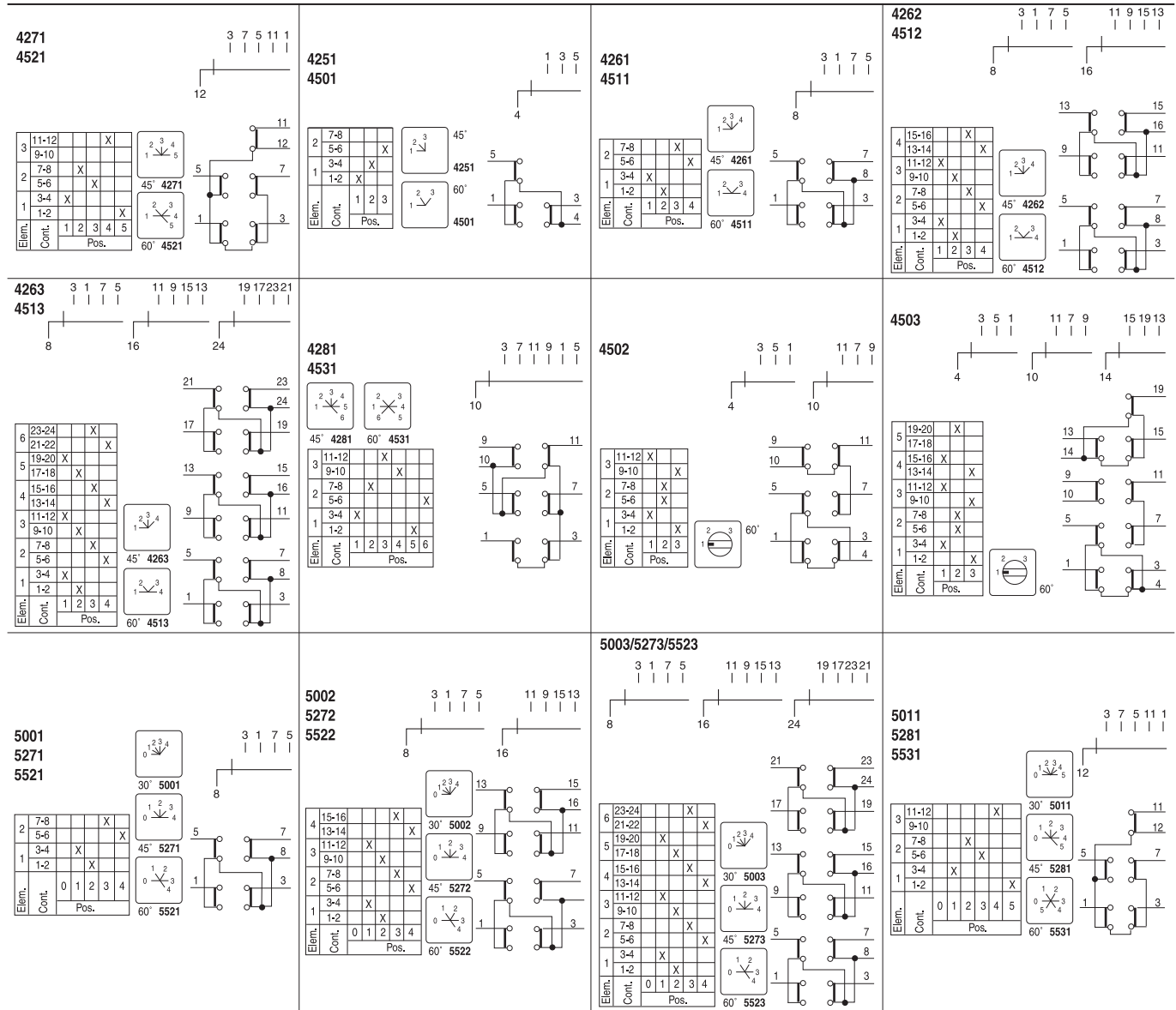
Circuit Diagram Nos. 1501...4253

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Circuit Diagram Nos. 4271...5531

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Electrical Ratings

Performance Data		12 A	16 A	20 A	25 A	32 A	40 A								
IEC Applications															
Rated voltage U_e *	IEC-947	[V]	690	690	690	690	690								
Isolating conditions acc. to VDE fulfilled up to rated impulse voltage U_{imp}		[kV]	6	6	6	8	8								
Thermal rated current I_{th}^* 40 °C	IEC-947	[A]	16	20	25	30	45								
Thermal rated current I_{the} 60 °C	IEC-947	[A]	12	16	20	25	32								
Rated current I_g^*															
AC-1/ AC-21A	Non-inductive or slightly inductive loads/ switching of resistive loads with slight overload	IEC-947	690V [A]	12	16	20	25	32	40						
AC-1	Non-inductive or slightly inductive loads	SEV	660V [A]	12	16	20	25	32	40						
AC22A	Switching of mixed resistive and inductive loads with slight overload	IEC-947	220...500V [A] 690V [A]	12 12	16 16	20 20	25 25	32 32	40 40						
AC-15	Switching of inductive drives, motors, valves, and electromagnets.	IEC-947	220...240V [A] 380...415V [A] 500V [A]	5 3 2	6 4 2.5	7 5 3	8 6 4	—	—						
DC switching capacity	Contacts in series														
Rated current I_g															
Rated Voltage [V]	1	2	3	4	5	6	8								
	24	48	72	96	120	144	192	[A]	12	16	20	22	—	—	
	48	96	144	192	240	288	384	[A]	10	12	16	18	—	—	
	60	120	180	240	300	360	450	[A]	8	10	12	14	32	40	
DC-21A	For resistive loads, $T \leq 1ms$	110	220	330	440	550	660	—	[A]	2	2.5	4	5	—	—
		220	440	660	—	—	—	—	[A]	0.5	0.6	0.7	0.8	—	—
	U_g max = 600V	440	—	—	—	—	—	—	[A]	0.4	0.4	0.5	0.5	—	—
Rated making/breaking capacity (= $1.5 \times I_g$)															
		25.2	50.4	75.6	100.8	126	151.2	201.6	[A]	18	24	30	33	—	—
	1.05 x Rated voltage [V]	50.4	100.8	151.2	201.6	252	302.4	403.2	[A]	15	21	24	27	—	—
	For resistive loads, $T = 1ms$	63	126	189	252	315	378	504	[A]	12	18	18	21	48	60
		115.5	231	346.5	462	577.5	—	—	[A]	3	4.5	6	7.5	—	—
	U_g max = 600V	231	462	—	—	—	—	—	[A]	0.75	1.12	1.05	1.2	—	—
		462	—	—	—	—	—	—	[A]	0.52	0.78	0.47	0.75	—	—
Rated current I_g															
Rated voltage [V]		24	48	72	96	120	144	192	[A]	8	10	12	14	16	16
		30	60	90	120	150	180	240	[A]	4.5	5.5	7	8	—	—
	For inductive loads $T = 50 ms$	48	96	144	192	240	288	384	[A]	1.5	2	2.5	3	8	8
	Rated voltage [V]	60	120	180	240	300	360	450	[A]	1	1.2	1.5	1.8	4.8	4.8
		110	220	330	440	550	660	—	[A]	0.4	0.5	0.6	0.7	2	2
		220	—	—	—	—	—	—	[A]	—	—	—	—	0.6	0.6
Rated making/breaking capacity (= $1.1 \times I_g$)															
	1.1 x Rated voltage [V]	26.4	52.8	79.2	105.6	132	158.4	184.8	[A]	8.8	11	13.2	1.54	—	17.6
		33	66	99	132	165	198	231	[A]	4.95	6.05	7.7	8.8	—	—
	For inductive loads $T = 50 ms$	52.8	105.6	158.4	211.2	264	316.8	369.6	[A]	1.65	2.2	2.75	3.3	8.8	8.8
	U_g max = 600V	66	132	198	264	330	396	462	[A]	1.1	1.32	1.65	1.98	5.28	5.28
		121	242	363	484	605	—	—	[A]	4.95	6.05	7.7	8.8	2.2	2.2
Power Lost									[W]	0.3	0.5	0.6	0.9	0.8	1.4
Rated power P_g	Contacts in series														
		24				1			[kW]	0.12	0.15	0.20	0.25	0.30	0.30
		24				2			[kW]	0.20	0.25	0.30	0.37	—	—
		48				2			[kW]	0.25	0.30	0.37	0.50	0.50	0.50
		48				3			[kW]	0.30	0.37	0.50	0.75	—	—
	Rated voltage [V]	60				2			[kW]	0.25	0.30	0.37	0.50	1.00	1.00
	DC-23A, DC-3, DC-5	60				4			[kW]	0.37	0.50	0.75	1.00	—	—
	For inductive loads, $T \leq 1 ms$	110				4			[kW]	0.50	0.75	1.00	1.20	—	—
		110				6			[kW]	1.00	1.20	1.40	1.60	—	—
		220				4			[kW]	0.37	0.50	0.75	1.00	—	—
		220				6			[kW]	1.00	1.20	1.40	1.50	—	—

* See standards compliance listed on page page 2-386.

⊛ 32 and 40 A data for one contact in series.

Bulletin 194L
IEC Control and Load Switches
 Specifications, Continued

2

Performance Data, Continued				12 A	16 A	20 A	25 A	32 A	40 A	
IEC Applications, Continued										
Rated making/breaking capacity (= 4 x I _g)		Contacts in series								
	Rated Voltage [V]			[A]						
DC-23A, DC-3, DC-5 For inductive loads, T ≤ 7.5 ms	25.2	1	[A]	20.0	25.0	33.3	41.6	50.0	50.0	
	25.2	2	[A]	33.3	41.6	50.0	61.6	—	—	
	50.4	2	[A]	21.0	25.0	30.8	41.6	41.6	41.6	
	50.4	3	[A]	25.0	30.8	42.0	62.4	—	—	
	63	2	[A]	16.6	20.0	24.6	33.2	66.6	66.6	
	63	4	[A]	24.6	33.3	50.0	66.4	—	—	
	115.5	4	[A]	18.1	27.2	36.4	44.0	—	—	
	115.5	6	[A]	36.4	43.6	51.0	58.2	—	—	
231	4	[A]	6.7	9.1	13.6	18.2	—	—		
231	6	[A]	18.1	21.8	25.2	27.2	—	—		
Rated breaking capacity		at 220V	[A]	72	96	128	176	296	296	
		0.45 [cos φ]	[A]	72	96	128	176	280	336	
		at 660V	[A]	53	72	86	112	196	196	
		0.45[cos φ]								
Rated power P _e *		IEC-947								
AC-2	Slip-ring motors: starting, reversing and electric braking; star/delta starting	3 Ø 3-pole	240V	[kW]	3	4	5.5	5.5	—	—
			380V	[kW]	5.5	7.5	9	13	—	—
			415V	[kW]	5.5	7.5	9	13	—	—
			440V	[kW]	5.5	7.5	9	13	—	—
			500V	[kW]	7.5	10	11	15	—	—
			660V	[kW]	7.5	10	11	15	—	—
AC-3	Squirrel-cage motors: starting and stopping of running motors	3 Ø 3-pole	220...240V	[kW]	2.2	3	4.5	5.5	7.5	7.5
			380...440V	[kW]	4	5.5	7.5	11	15	18.5
			500V	[kW]	5.5	7.5	10	13	—	—
			660V	[kW]	5.5	7.5	8	11	18.5	18.5
		1 Ø 2-pole	110V	[kW]	0.75	1.1	1.2	1.6	—	—
			220...240V	[kW]	1.3	2.2	2.5	3.2	4	4
			380...440V	[kW]	2.2	3.7	4.5	5.5	8	16
AC-4	Squirrel-cage motors: starting, reversing, electric braking, inching	3 Ø 3-pole	220...240V	[kW]	0.75	1.5	3	4	5.5	5.5
			380...415V	[kW]	1.5	2.2	3.7	5.5	7.5	7.5
			440...550V	[kW]	1.5	2.2	3.7	5.5	7.5	11
		1 Ø 2-pole	110V	[kW]	0.18	0.37	0.55	0.75	—	—
			240V	[kW]	0.37	0.75	1.5	2.2	—	—
			380V	[kW]	0.75	1.1	1.8	3	—	—
			440V	[kW]	0.75	1.1	1.8	3	—	—

* See standards compliance listed on page page 2-386.

Performance Data, Continued				12 A	16 A	20 A	25 A	32 A	40 A	
IEC Applications, Continued										
AC-23A	Occasional switching of motors and other highly inductive loads (criterion for selecting main switches)	IEC-947	220...240V [kW]	2.2	3	4.5	5.5	11	11	
		3Ø	380...440V [kW]	4	5.5	7.5	11	18.5	22	
		3-pole	500V [kW]	5.5	7.5	10	13	—	—	
			660V [kW]	5.5	7.5	8	11	22	22	
1Ø	110V [kW]	0.75	1.1	1.2	1.6	—	—			
2-pole	220...240V [kW]	1.3	2.2	2.5	3.2	5.5	5.5			
	380...440V [kW]	2.2	3.7	4.5	5.5	11	11			
Short-circuit ratings										
	Rated short-time current (1s)		[kA _{rms}]	0.48	0.48	0.6	0.75	0.8	0.8	
	Strongest series fuse, not in enclosure	(gL characteristic)	[A]	20*	20*	20*	25*	35	40	
	Conditional rated short-circuit		[kA]	6	6	5	5	5	5	
Switch Rate		electrical	[ops/h]	120	120	120	120	120	120	
CSA and UL Applications										
Rated Voltage U _e			[V AC]	600	600	600	600	600	600	
Ampere Rating	Pilot Duty	Contact class	[A]	A600	A600	—	—	—	—	
	General Use	Non-inductive or slightly inductive load*	[A]	12	16	20	25	32	40	
Rated power P _e ‡			UL (CSA)	(FLA)	(FLA)	(FLA)	(FLA)			
Standard motor DOL rating (similar to AC-3)	3Ø	120V [Hp]		1 (7.2)	1.5 (12)	2 (13.6)	3 (19.2)	5 (30.4)	5 (30.4)	
		240V [Hp]		2 (6.8)	3 (9.6)	4 (12.4)	6 (18)	7.5 (22)	10 (28)	
		480V [Hp]		5 (7.6)	7.5 (11)	8 (11.6)	12 (17)	20 (27)	25 (34)	
		600V [Hp]		5 (6.1)	7.5 (9)	10 (11)	15 (17)	20 (22)	25 (27)	
	1Ø	2-pole	120V [Hp]		0.5 (9.8)	0.75 (13.8)	1 (16)	1.5 (20)	2 (24)	2 (24)
			240V [Hp]		1 (8.0)	1.5 (10.0)	2 (12)	3 (17)	5 (28)	5 (28)
			480V [Hp]		2 (6.0)	3 (8.5)	4 (11.2)	6 (17)	7.5 (21)	10 (26)
			600V [Hp]		3 (6.8)	3 (6.8)	5 (11.2)	7.5 (16)	10 (20)	15 (27)
Heavy motor load, reversing Rating (similar to AC-4)	3Ø	120V [Hp]		—	—	—	—			
		240V [Hp]		—	—	—	—			
Max. back-up fuse		3-pole	(gG characteristic)	[A]	35	55	60	80		
Short Circuit Ratings	Maximum Short Circuit Prospective Fault Current		[kA]	5	5	5	5			
	Maximum Fuse Size		[A]	35	55	60	80			
Switching Rate		electrical	[ops/h]	120	120	120	120	120	120	

Mechanical Data

Performance Data			12/16 A	20/25 A	32/40 A
Protection class acc. to IEC 529	Handles Switch Bodies		IP66 IP20	IP66 IP20	IP66 IP20
Mechanical Endurance		[mil.ops]	1	1	1
Switching rate	mechanical	[ops/h]	1200	1200	1200
Maximum Wire Gauges					
	rigid wire	AWG [mm ²]	(2)18...12 (2)1...2.5	(2)16...10 (2)1.5...6	(2)12...8 (2)4...10
	fine strands	AWG [mm ²]	(2)18...12 (2)1...2.5	(2)16...10 (2)1.5...4	(2)14...10 (2)2.5...6

Environmental Data

Performance Data		12/16/20/25 A	32/40 A
Ambient temperature			
	Operation	-25...+60 °C (-13...+140 °F)	-25...+60 °C (-13...+140 °F)
	Storage	-40...+80 °C (-40...+176 °F)	-40...+80 °C (-40...+176 °F)

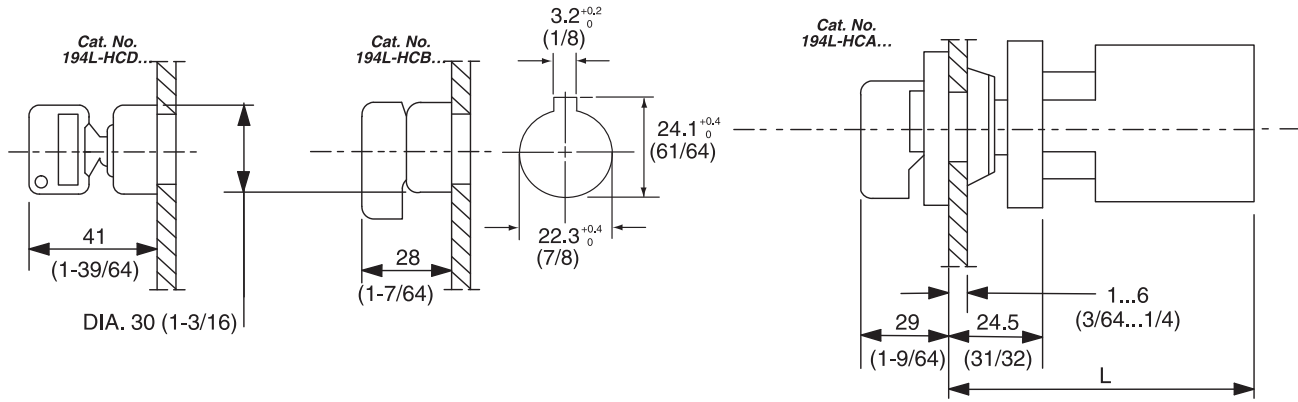
* Does not apply to switches in enclosure.
 † Suitable for switching off-load (AC-20) above 660V, but only up to 660V for switches with screws at the rear.
 ‡ See standards compliance listed on page page 2-386.

IEC Control and Load Switches

Approximate Dimensions

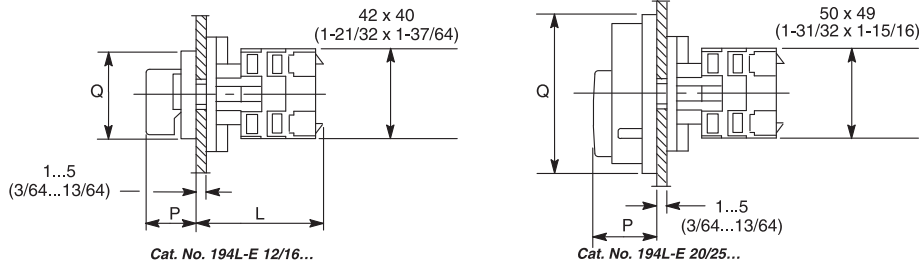
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Cat. No. 194L-E... for Central Fixing (194L-HC...)

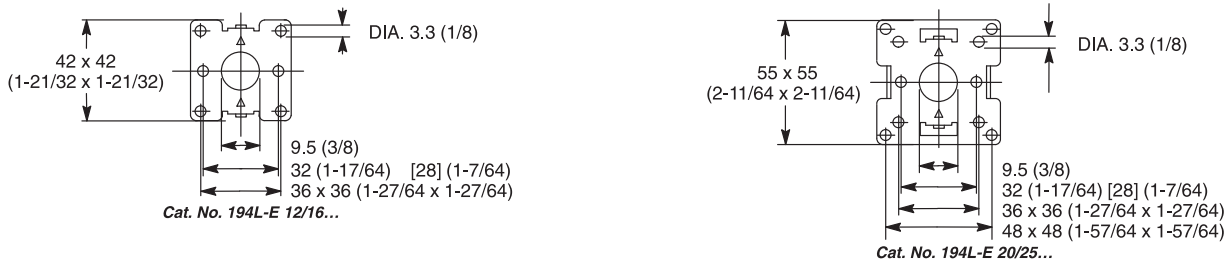


Cat. No.	L				
	No. of Contacts				
	1...2	3...4	5...6	7...8	9...10
194L-E12/16...	67.5 (2-21/32)	77.5 (3-3/64)	87.5 (3-7/16)	97.5 (3-27/32)	107.5 (4-15/64)
194L-E20/25...	69 (2-23/32)	81.5 (3-7/32)	94 (3-45/64)	106.5 (4-3/16)	119 (4-11/16)
194L-E32/40...	86 (3-25/64)	103.5 (4-5/64)	121 (4-49/64)	138.5 (5-29/64)	156 (6-9/64)

Cat. No. 194L... for Front (Door) Installation



Mounting Dimensions



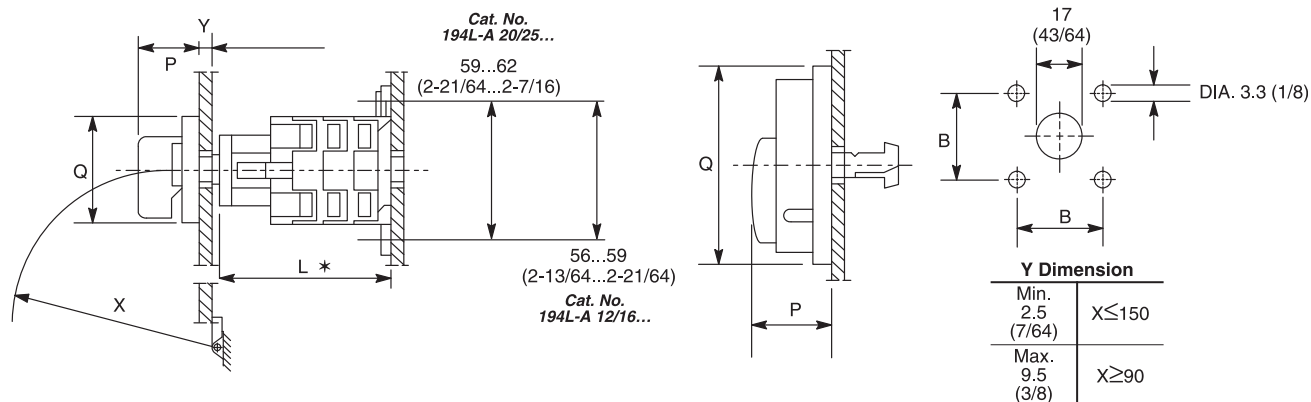
Cat. No.	L				
	No. of Contacts				
	1...2	3...4	5...6	7...8	9...10
194L-E12/16...	44 (1-47/64)	54 (2-1/8)	64 (2-33/64)	74 (2-29/32)	84 (3-5/16)
194L-E20/25...	44.5 (1-3/4)	57 (2-1/4)	69.5 (2-3/4)	82 (3-15/64)	94.5 (3-23/32)
194L-E32/40...	43 (1-11/16)	58.5 (2-5/16)	76 (2-63/64)	93.5 (3-11/16)	111 (4-3/8)

Control Knob

Cat. No.	P	Q
194L-HE4A...	28 (1-7/64)	48 (1-57/64) x 48 (1-57/64)
194L-HE4I...		48 (1-57/64) x 62 (2-7/16)
194L-HE4S...		64 (2-33/64) x 64 (2-33/64)
194L-HE6A...		64 (2-33/64) x 78 (3-5/64)
194L-HE6S...		67 (2-41/64) x 67 (2-41/64)
194L-HE6N...		
194L-HE6G...	34 (1-11/32)	

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Cat. No. 194L-A... for Base/DIN Rail Installation



Cat. No.	L *			
	No. of Contacts			
	1...2	3...4	5...6	7...8
194L-A12/16...	58 (2-9/32)	68 (2-11/16)	78 (3-5/64)	88 (3-15/32)
194L-A20/25...	58 (2-9/32)	71.5 (2-13/16)	84 (3-5/16)	96.5 (3-51/64)
194L-A32/40...	67.5 (2-21/32)	85 (3-11/32)	102.5 (4-1/32)	120 (4-47/64)

Control Knob

Cat. No.	P	B	Q
194L-HE4A...	28 (1-7/64)	36 (1-27/64)	48 (1-57/64) x 48 (1-57/64)
194L-HE4I...			48 (1-57/64) x 62 (2-7/16)
194L-HE4S...		34 (1-11/32)	48 (1-57/64)
194L-HE6A...	64 (2-33/64) x 78 (3-5/64)		
194L-HE6I...	67 (2-41/64) x 67 (2-41/64)		
194L-HE6S...			
194L-HE6N...			
194L-HE6G...			

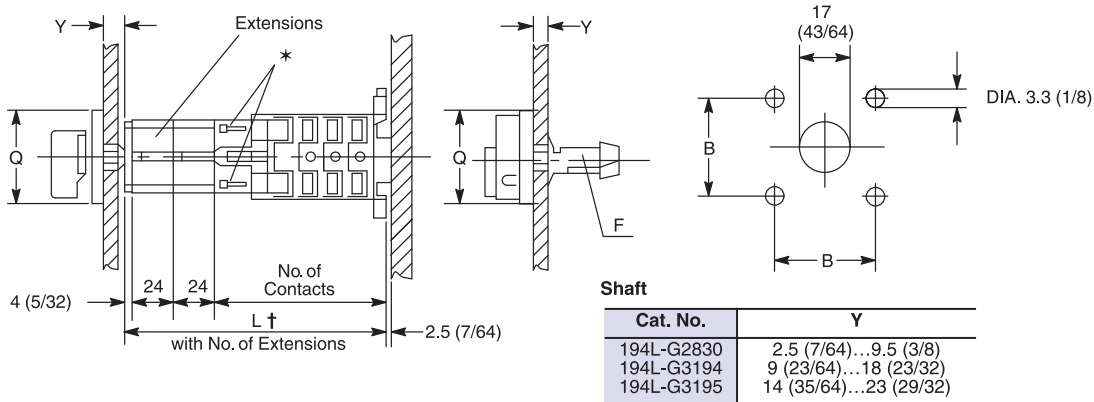
* With DIN 46 277 (35) Rail + 2.5 mm (7/64)

IEC Control and Load Switches

Approximate Dimensions, Continued

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Cat. No. 194L-A... With Shaft Extension **Cat. No. 194L-G2853**



2

No. of Extensions	Cat. No. 194L-A12/16... 10mm (0.39)				Cat. No. 194L-A20/25... 12.5mm (0.49)				Cat. No. 194L-A32/40			
	L											
	No. of Contacts											
	1...2	3...4	5...6	7...8	1...2	3...4	5...6	7...8	1...2	3...4	5...6	7...8
With 1 extension	82 (3-15/64)	92 (3-5/8)	102 (4-1/64)	112 (4-13/32)	83 (3-17/64)	95.5 (3-49/64)	108 (4-1/4)	120.5 (4-3/4)	91.5 (3-15/64)	108 (4-1/4)	126.5 (5-63/64)	144 (6-43/64)
With 2 extensions	106 (4-11/64)	116 (4-37/64)	126 (4-31/32)	136 (5-23/64)	107 (4-7/32)	119.5 (4-45/64)	132 (5-13/64)	144.5 (5-11/16)	115.5 (5-35/64)	133 (5-15/64)	150.5 (6-5/16)	168 (7-5/8)
With 3 extensions	130 (5-1/8)	140 (5-33/64)	150 (5-29/32)	160 (6-19/64)	131 (5-5/32)	143.5 (5-21/32)	156 (6-9/64)	168.5 (6-5/8)	135.5 (5-11/32)	157 (6-3/16)	174.5 (7-7/8)	182 (8-9/16)
With 4 * extensions	154 (6-1/16)	164 (6-15/32)	174 (6-55/64)	184 (7-15/64)	155 (6-7/64)	167.5 (6-19/32)	180 (7-3/32)	192.5 (7-37/64)	163.5 (6-7/16)	181 (7-1/8)	198.5 (8-53/64)	216 (9-33/64)
With 5 * extensions	178 (7-1/64)	188 (7-13/32)	198 (7-51/64)	208 (8-3/16)	179 (7-3/64)	191.5 (7-35/64)	204 (8-1/32)	216.5 (8-33/64)	187.5 (7-3/8)	205 (8-5/64)	222.5 (9-49/64)	240 (9-29/64)
With 6 * extensions	202 (7-61/64)	212 (8-23/64)	222 (8-3/4)	232 (9-1/8)	203 (7-63/64)	215.5 (8-31/64)	228 (8-63/64)	240.5 (9-15/32)	211.5 (8-21/64)	229 (12)	246.5 (10-23/32)	264 (10-13/32)

Control Knob

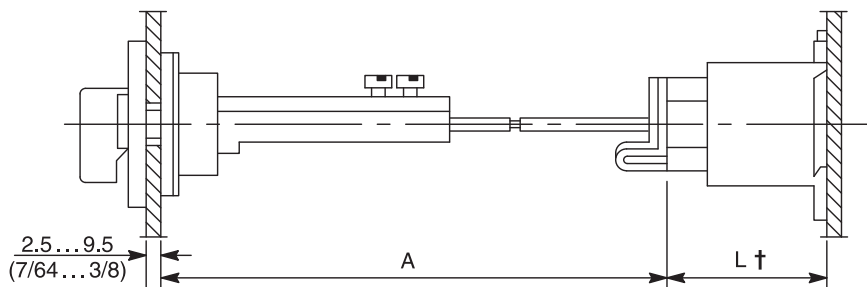
Cat. No.	Q	B
194L-HE4A...	48 (1-57/64) x 48 (1-57/64)	36 (1-27/64)
194L-HE4I...		
194L-HE6A...	64 (2-33/64) x 64 (2-33/64)	48 (1-57/64)
194L-HE6I...		
194L-HE6N...	67 (2-41/64) x 67 (2-41/64)	
194L-HE6G...		

* When more than 4 modules are used, attach the first one to the switch body using the screws supplied with the extension (**Cat. No. 194L-G2853**).

* Mounting on DIN 46 277 (35) Rails.

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Cat. No. 194L-A... With Metal Shafts



Cat. No.	A
194L-G3393...	110 (4-21/64)...235(9-1/4)
194L-G3394...	230 (9-1/16)...350 (13-25/32)



Cat. No.	L*			
	No. of Contacts			
	1...2	3...4	5...6	7...8
194L-A12/16...	54 (2-1/8)	64 (2-33/64)	74 (2-29/32)	84 (3-5/16)
194L-A20/25...	55 (2-11/64)	67.5 (2-21/32)	80 (3-5/32)	92.5 (3-41/64)
194L-A32/40...	63.5 (2-31/64)	81 (3-3/16)	88.5 (3-7/8)	116 (4-9/16)

Modular Shaft Extensions (Cat. No. 194L-G2853)

Select No. of Extension Modules and Shaft for use with enclosures.

No. of Extension Modules	Required End Shaft	Enclosure Mounting Depth‡	
		Cat. No. 194L-A12/16...	Cat. No. 194L-A20/25...
0	44 (1-47/64) §	71.5...77.5 (2-13/16...3-1/16)	75...80.5 (2-61/64...3-11/64)
	52 (2-3/64)	77...87 (3-1/32...3-27/64)	80...90 (3-5/32...3-35/64)
	57 (2-1/4)	82...92 (3-15/64...3-5/8)	85...95 (3-11/32...3-3/4)
1	44 (1-47/64) §	95.5...101.5 (3-49/64...4)	99...105 (3-29/32...4-9/64)
	52 (2-3/64)	97.5...111 (3-27/32...4-3/8)	101...114.5 (3-63/64...4-33/64)
	57 (2-1/4)	102.5...116 (4-3/64...4-37/64)	106...119.5 (4-11/64...4-45/64)
2	44 (1-47/64) §	119.5...125.5 (4-45/64...4-61/64)	123...129 (4-27/32...5-5/64)
	52 (2-3/64)	121.5...135 (4-51/64...5-5/16)	125...138.5 (4-59/64...5-29/64)
	57 (2-1/4)	126.5...140 (4-63/64...5-33/64)	130...143.5 (5-1/8...5-21/32)
3	44 (1-47/64) §	143.5...149.5 (5-21/32...5-57/64)	147...153 (5-51/64...6-1/32)
	52 (2-3/64)	145.5...159 (5-47/64...6-17/64)	149...162.5 (5-7/8...6-13/32)
	57 (2-1/4)	150.5...164 (5-15/16...6-15/32)	154...167.5 (6-1/16...6-19/32)
4	44 (1-47/64) §	167.5...173.5 (6-19/32...6-27/32)	171...177 (6-47/64...6-31/32)
	52 (2-3/64)	169.5...183 (6-43/64...7-13/64)	173...186.5 (6-13/16...7-11/32)
	57 (2-1/4)	174.5...188 (6-7/8...7-13/32)	178...191.5 (7-1/64...7-35/64)
5	44 (1-47/64) §	191.5...197.5 (7-35/64...7-25/32)	195...201 (7-43/64...7-59/64)
	52 (2-3/64)	193.5...207 (7-5/8...8-5/32)	197...210.5 (7-49/64...8-19/64)
	57 (2-1/4)	198.5...212 (7-53/64...8-23/64)	202...215.5 (7-61/64...8-31/64)
6	44 (1-47/64) §	215.5...221.5 (8-31/64...8-23/32)	219...225 (8-5/8...8-55/64)
	52 (2-3/64)	217.5...231 (8-37/64...9-3/32)	221...234.5 (8-45/64...9-15/64)
	57 (2-1/4)	222.5...236 (8-49/64...9-19/64)	226...239.5 (8-29/32...9-7/16)

* When more than 4 modules are used, attach the first one to the switch body using the screws supplied with the extension (**Cat. No. 194L-G2853**).
 † With DIN 46 277 (35) Rail + 2.5 mm (7/64)
 ‡ For DIN Rail-mounted devices, remember to deduct the offset distance provided by the rail. For example, deduct 2.5 mm (7/64 in.) from the mounting depth for Bulletin 194L switch body mounted on DIN 46277 rail.
 § One 44 mm (1-47/64 in) end shaft is supplied with all Bulletin 194L Switch Bodies.

IEC Control and Load Switches

Approximate Dimensions, Continued

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

2

Cat. No. 194L-A... With Cat. No. 194L-HE4P-... Installation on DIN 46277 (35) Rails + 2.5 mm (7/64)	Cat. No.	L			
		No. of Contacts			
		1...2	3...4	5...6	7...8
	194L-A12/16...	35 (1-3/8)	45 (1-49/64)	55 (2-11/64)	65 (2-9/16)
	194L-A20/25...	33.5 (1-21/64)	48 (1-57/64)	60.5 (2-3/8)	73 (2-7/8)
	194L-A32/40...	43 (1-11/16)	61 (2-13/32)	79 (3-7/64)	97 (3-53/64)

Cat. No. 194L-E... With Terminal Cover	Cat. No.	A	B	C	D
	194L-E12/16...	40 (1-37/64)	42.5 (1-43/64)	12 (15/32)	2.5 (7/64)
	194L-E20/25...	49 (1-15/16)	37.5 (1-31/64)	12 (15/32)	2.5 (7/64)
	194L-E32/40...	59 (2-21/64)	50 (1-31/32)	15 (19/32)	2.5 (7/64)

Cat. No. 194L-A... With Terminal Cover	Cat. No.	A	B	C	D
	194L-A12/16...	40 (1-37/64)	42.5 (1-43/64)	12 (15/32)	2.5 (7/64)
	194L-A20/25...	49 (1-15/16)	37.5 (1-31/64)	12 (15/32)	2.5 (7/64)
	194L-A32/40...	63.5 (2-1/2)	49 (1-53/64)	12 (15/32)	2 (5/64)

Enclosure

Cat. No. 194L-G3572...Cat. No. 194L-G3579

