

Control and Load Switch Specifications

Bulletin Number 194E, 194L

Topic	Page
Product Line Overview	2
194E General Specifications	3
194E Approximate Dimensions	5
194L Circuit Diagrams	13
194L General Specifications	17
Approximate Dimensions	20

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.

			
	Bulletin 194E	Bulletin 194L	
Product Type	Inductive load-rated load switch		Inductive load-rated control/load switch
Current Range	16...100 A		12...40 A
Main Applications	UL, CSA ratings "suitable as at-motor disconnect"		UL, CSA ratings "suitable as at-motor disconnect"
Functionality	3- or 6-pole switch configurations for OFF-ON or changeover applications (16...100 A switches)		1- to 6-pole multifunction switch control configurations for OFF-ON, changeover, Star-Delta (Wye-Delta), reversing, ammeter, voltmeter, and step switch applications - Also available in custom control configurations up to 16 circuits for any unique control switching application.
Mounting Styles	Front/door or base/DIN Rail mounting		Front/door or base/DIN Rail mounting
Handles	- Handle colors in grey/black and red/yellow and padlockable versions - Legend plates available in 0-I international markings and text styles		- Uniformly styled handles: selector knob, disk style, rectangular style, and key-operated versions (Type 1/12, IP66) - Handle colors in grey/black and red/yellow and padlockable versions - Legend plates available in 0-I international markings and text styles
Open Switch or Enclosed	- Open switch (large frame Bul. 194E — open style only) - Enclosed: IP66 thermoplastic enclosure or UL/CSA rated enclosure		Open switch
UL/CSA Electrical Ratings: Rated Voltage U_e	600V AC		600V AC
Rated Current I_e	16...100 A @ 600V		12...40 A @ 600V
Rated Power P_e [FLA]	Varies w/ 1- or 3-phase switch, voltage		Varies w/ 1- or 3-phase switch, voltage
Short-Circuit Ratings	5 kA		5 kA
Switching Rate [ops/h]	120		120
Mechanical Life [ops]	0.2 million (16...100 A switches)		1 million
IEC Rated Current I_e			
AC-1	16...100 A @ 600V		12...40 A @ 600V
AC-21A	16...100 A @ 600V		12...40 A @ 600V
AC-22A	16...100 A @ 600V		12...40 A @ 600V
Ambient Operational Temp.	-25...+60 °C (-13...+140 °F)		-25...+60 °C (-13...+140 °F)
Ambient Enclosed Temp.	-20...+60 °C (-4...+140 °F)		-20...+60 °C (-4...+140 °F)
Ambient Storage Temp.	-40...+80 °C (-40...+176 °F)		-40...+80 °C (-40...+176 °F)
Protection class per IEC 529	Switch bodies: IP2		Switch bodies: IP2
Optional Accessories	- IP66 handles - Multi-length shafts and shaft extension kits - Terminal covers		- Multi-length shafts and shaft extension kits - Terminal covers
Standards/Certifications	- UL 508 - CSA C22.2, No. 14 - IEC 60947-3 Low Voltage Switchgear and Controlgear part 3 - CE		- UL 508 - CSA C22.2, No. 14 - IEC 60947-3 Low Voltage Switchgear and Controlgear part 3 - CE

Electrical Ratings

Performance Data				16 A	25 A	32 A	40 A	63 A	80 A	100 A	Aux. Contacts	
IEC Applications												
Rated operational voltage (U_0): IEC★				[V]	690	690	690	690	690	690	690	
Rated operational voltage (U_0): UL, CSA				[V]	600	600	600	600	600	600	600	
Rated isolation voltage (U_i): IEC/UL, CSA				[V]	690/600	690/600	690/600	690/600	690/600	690/600	690/600	
Rated impulse voltage (U_{imp}): UL, CSA				[kV]	8	8	8	8	8	8	8	
Test voltage, (U_i) 1 minute				[kV]	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lost power per pole				[W]	0.58	1.0	1.5	1.6	2.4	3.6	5.5	
Rated frequency				[Hz]	50/60	50/60	50/60	50/60	50/60	50/60	50/60	
Conventional free air thermal current I_{th} ★				[A]	25	40	50	63	75	100	120	
Conventional enclosed thermal current I_e ★				[A]	20	32	40	50	63	80	100	
Rated current I_e ★												
AC-1/	Non-inductive or only slightly inductive loads			[A]	16	25	32	40	63	80	100	
AC-21A	Switching of resistive loads with slight overload											
Rated power P_e												
AC-23A	Occasional switching of 3Ø motors and other highly inductive loads (criterion for selecting main switches)	230V	[kW]	5.5	7.5	7.5	15	18.5	22	30	—	
		400V	[kW]	7.5	11	15	22	30	37	55	—	
		690V	[kW]	7.5	11	15	18.5	22	37	45	—	
AC-3	Squirrel-cage motors; starting and stopping of running motors	230V	[kW]	4	5.5	7.5	11	15	18.5	22	—	
		400V	[kW]	5.5	7.5	11	15	18.5	30	37	—	
		690V	[kW]	5.5	7.5	11	15	18.5	30	22	—	
Short circuit current (co-ordination type 2) Rated conditional short-circuit current Maximum fuse rating of circuit (type g,G) Rated short-time current I_{cw} (1 s)			[kA]	20	20	15	20	15	30	25	—	
		400/415V	[A]	20	25	35	50	63	80	100	—	
			[A]	800	900	900	1300	1300	2500	2500	—	
Rated breaking capacity AC23A (cosφ 0.45)		230V	[A]	156	296	296	484	484	780	780	—	
		400V	[A]	120	256	256	504	504	800	800	—	
		690V	[A]	70	136	136	196	196	376	376	—	
DC switching capacity		1 pole	24/48V	[A]	20	25	32	40	63	80	100	—
Rated current I_e	110V		[A]	5	5	6	8	10	16	20		
	220V		[A]	1	1	1	1.5	15	3	3		
	440V		[A]	0.5	0.5	0.5	0.6	0.6	0.7	0.7		
	2 poles in series		96V	[A]	20	25	32	40	63	80	100	—
110V		[A]	20	23	25	32	50	70	80			
220V		[A]	5	5	6	8	10	16	20			
440V		[A]	1	1	1	1.5	1.5	3	3			
600V		[A]	0.6	0.6	0.6	0.8	0.8	1	1			
DC-21A	For resistive loads, $T \leq 1$ ms U_e max = 660V	3 poles in series	110V	[A]	20	25	32	40	63	80	100	—
			220V	[A]	13	13	15	20	28	50	63	
			440V	[A]	2.2	2.2	2.2	3.6	3.6	6.5	6.5	
			600V	[A]	1.3	1.5	1.5	2	2	3	3	
			Rated power P_e		3 poles in series	90V	[kW]	1	1.3	1.5	2.9	
DC-23A, DC-3, DC-5	For inductive loads, $T \leq 15$ ms	110V	[kW]	1		1.1	1.3	2.2	3.3	5.5	7	
		220V	[kW]	0.8		0.9	1.1	1.7	2	3.5	4.4	
		440V	[kW]	0.6		0.6	0.6	0.9	0.9	1.1	1.1	
		600V	[kW]	0.4		0.4	0.4	0.5	0.5	0.9	0.9	

★ See standards compliance listed on <http://ab.rockwellautomation.com/Circuit-and-Load-Protection/Disconnect-Switches/Non-Visible-Blade/194R-Fused-Non-Fused-Disconnect-Switches#specifications>

Electrical Ratings, Continued

Performance Data		16 A	25 A	32 A	40 A	63 A	80 A	100 A	Aux. Contacts			
UL/CSA Applications												
Continuous current		[A]	16	25	32	40	63	80	100	—		
Heavy Pilot Duty		[AC]	A600	A600	A600	—	—	—	—	A600		
Standard Duty		[DC]	—	—	—	—	—	—	—	Q600		
Single-phase (2 poles)	Motor rating 60 Hz	120V, 1P	[FLA]	16	16	16	24	34	56	80	—	
			[Hp]	1	1	1	2	3	5	7.5		
	240V, 1P	[FLA]	12	12	17	17	28	50	68			
		[Hp]	2	2	3	3	5	10	15			
	480V, 1P	[FLA]	8.5	8.5	14	21	26	34	68			
		[Hp]	3	3	5	7.5	10	15	30			
	600V, 1P	[FLA]	11.2	11.2	11.2	16	20	27	44			
		[Hp]	5	5	5	7.5	10	15	25			
	Three-phase	120V, 3P	[FLA]	13.6	13.6	19.2	30.4	40	56	84		—
			[Hp]	2	2	3	5	7.5	10	15		
		240V, 3P	[FLA]	9.6	15.2	22	28	42	68	80		
			[Hp]	3	5	7.5	10	15	25	30		
480V, 3P		[FLA]	11	14	21	27	34	52	65			
		[Hp]	7.5	10	15	20	25	40	50			
600V, 3P		[FLA]	11	11	17	22	27	52	52			
		[Hp]	10	10	15	20	25	50	50			

Mechanical Data

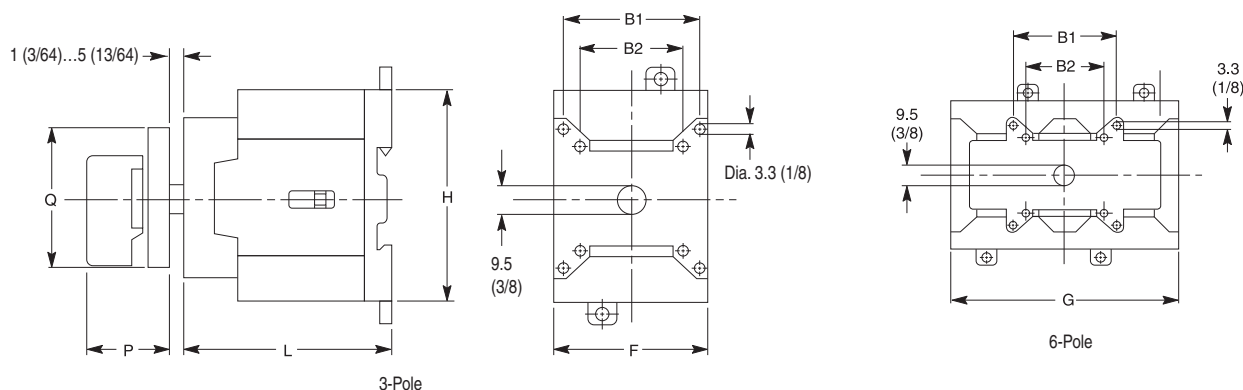
Performance Data		16 A	25...32 A	40...63 A	80...100 A	Aux. Contacts
Protection class according to IEC 529						
Motor rating 60 Hz						
handles		IP66	IP66	IP66	IP66	IP66
switch bodies		IP20	IP20	IP20	IP20	IP20
Mechanical life	[million operations]	0.2	0.2	0.2	0.2	0.2
Max wire gauges						
Terminal size per IEC 947-1		A4	A6	A7	A9	2xA2
rigid wire	[AWG]	16...10	14...8	12...4	10...1	18...14
	[mm ²]	1...10	1.5...16	2.5...25	4...50	0.75...2.5
fine strands	[AWG]	16...8	14...8	12...4	10...1	18...14
	[mm ²]	1.5...6	1.5...10	2.5...16	4...35	0.5...2.5
Tightening torque	[N•m]/[lb•in]	1.4/12.2	1.4/12.2	2.8/24.5	5.6/50	1/8.8

Environmental Data

Storage	-40...+80 °C (-40...+176 °F)
Operation	-25...+60 °C (-13...+140 °F)

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

Front Installation Cat. No. 194E-E...



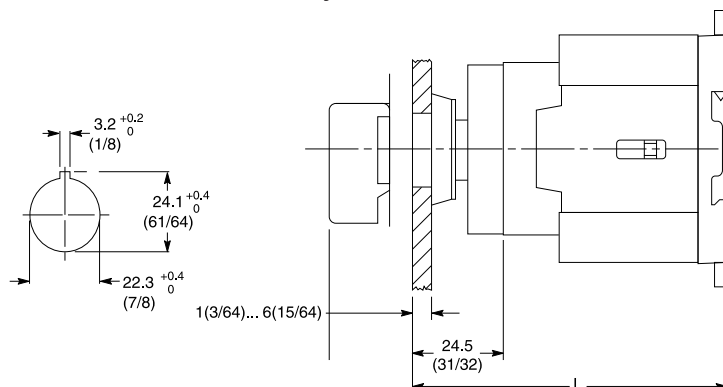
Handles		
Cat. No.	P	Q
194L-HE4A	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4I	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194E-HE4N	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194E-HE4G	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194L-HE6A	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6I	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6N	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)
194L-HE6G	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)

Switch Body						
Use with Cat. No.	B1 ★	B2	F	H	L ‡	G
194E-E16	28 (1-7/64)	N/A	36 (1-37/64)	63 (2-31/64)	51 (2)	90 (3-35/64)
194E-E25/32	36 (1-27/64)	N/A	45 (1-25/32)	64 (2-33/64)	60 (2-3/8)	90 (3-1/2)
194E-E40/63	48 (1-57/64)	36 (1-27/64)	54 (2-1/8)	72 (2-27/32)	74 (2-29/32)	108 (4-1/4)
194E-E80/100	48 (1-57/64)	36 (1-27/64)	72 (2-27/32)	90 (3-35/64)	90 (3-35/64)	144 (5-11/16)

★ Does not apply to 194E-40/63A, 6-Pole Switches. Use B2 dimensions for 6-pole devices.

‡ For 6-pole switches, add 1 in. to the "L" dimension.

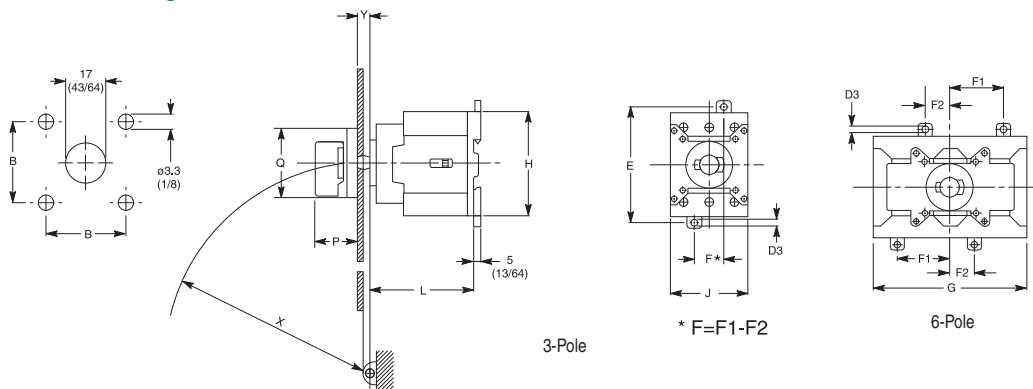
Cat. No. 194E-E Switch Body with Cat. No. 194L-HC4A Handle for 22.5 mm Hole Mounting Style



Type	L
194E-E16	76 (3)
194E-E25/32	84.5 (3-21/64)
194E-E40/63	98.5 (3-7/8)
194E-E80/100	114.5 (4-33/64)

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

Base Mounting Cat. No. 194E-A...



Handles

Cat. No.	P	Q
194L-HE4A	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4I	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4S	28 (1-7/64)	48 x 62 (1-57/64 x 2-7/16)
194E-HE4N	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194E-HE4G	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194L-HE6A	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6I	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6S	28 (1-7/64)	64 x 78 (2-33/64 x 3-5/64)
194L-HE6N	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)
194L-HE6G	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)

Cover Requirements

For Use With	Y min.	X ≥	Y max.	X ≥
194E-A16	5 (13/64)	142 (5-19/32)	9.5 (3/8)	90 (3-35/64)
194E-A25/32	5 (13/64)	142 (5-19/32)	9.5 (3/8)	90 (3-35/64)
194E-A40/63	2.5 (7/64)	150 (5-29/32)	9.5 (3/8)	90 (3-35/64)
194E-A80/100	2.5 (7/64)	150 (5-29/32)	9.5 (3/8)	90 (3-35/64)

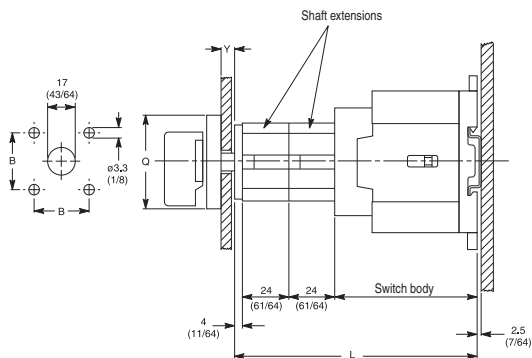
Switch Body

Use With Cat. No.	D3	E	F1	F2	G	H	L†	J
194E-A16	4.5 (3/16)	70 (2-49/64)	12.5 (31/64)	23.5 (59/64)	90 (3-35/64)	63 (2-31/64)	80 (3-5/32)	36 (1-27/64)
194E-A25/32	4.5 (3/16)	70 (2-49/64)	30 (1-3/16)	15 (19/32)	90 (3-1/2)	64 (2-33/64)	59 (2-5/16)	45 (1-25/32)
194E-A40/63	4.5 (3/16)	80 (3-5/32)	37 (1-15/32)	17 (43/64)	108 (4-1/4)	72 (2-27/32)	73 (2-55/64)	54 (2-1/8)
194E-A80/100	5.6 (7/32)	95 (3-3/4)	48.5 (1-29/32)	23.5 (59/64)	144 (5-11/16)	90 (3-35/64)	89 (3-1/2)	72 (2-27/32)

† For 6-pole switches, add 1 in. to the "L" dimension.

Base Mounting Cat. No. 194E-A...

Cat. No. 194E-A... Switch Body with Cat. No. 194L-G2853 Shaft Extension



Switch Body

L ★	Cat. No.			
	194E-A 16	194E-A 25/32	194E-A 40/63	194E-A 80/100
With 1 shaft extension	79 (3-7/64)	88 (3-15/32)	102 (4-1/32)	118 (4-21/32)
With 2 shaft extensions	103 (4-37/64)	112 (4-27/64)	126 (4-31/32)	142 (5-19/32)
With 3 shaft extensions	127 (5)	136 (5-23/64)	150 (5-29/32)	166 (6-35/64)
With 4 shaft extensions	151 (6-61/64)	160 (6-5/16)	174 (6-55/64)	190 (7-31/64)
With 5 shaft extensions	175 (7-57/64)	184 (7-1/4)	198 (7-51/64)	214 (8-7/16)
With 6 shaft extensions	199 (8-27/32)	208 (8-13/64)	222 (8-3/4)	238 (9-3/8)

★ For 6-pole switches, add 1 in. to the "L" dimension.

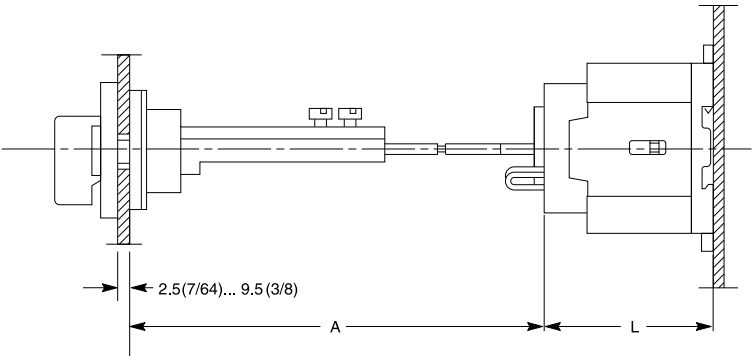
Shaft	Y
194L-G2830	2.5...9.5 (7/64...3/8)
194L-G3194	9...18 (23/64...23/32)
194L-G3195	14...23 (9/16)...(29/32)

Type	Handles		
	B	Q	P
194L-HE4A	36 (1-27/64)	48 x 48 (1-57/64 x 1-57/64)	28 (1-7/64)
194L-HE4I	36 (1-27/64)	48 x 48 (1-57/64 x 1-57/64)	28 (1-7/64)
194E-HE4G	28 (1-7/64)	54 x 54 (2-1/8 x 2-1/8)	34 (1-11/32)
194E-HE4N	28 (1-7/64)	54 x 54 (2-1/8 x 2-1/8)	34 (1-11/32)
194L-HE6A	48 (1-57/64)	64 x 64 (2-33/64 x 2-33/64)	28 (1-7/64)
194L-HE6I	48 (1-57/64)	64 x 64 (2-33/64 x 2-33/64)	28 (1-7/64)
194L-HE6N	48 (1-57/64)	67 x 67 (2-41/64 x 2-41/64)	34 (1-11/32)
194L-HE6G	48 (1-57/64)	67 x 67 (2-41/64 x 2-41/64)	34 (1-11/32)

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

Base Installation Cat. No. 194E-A...

Cat. No. 194E-A Switch Body with Metal Shaft Extension



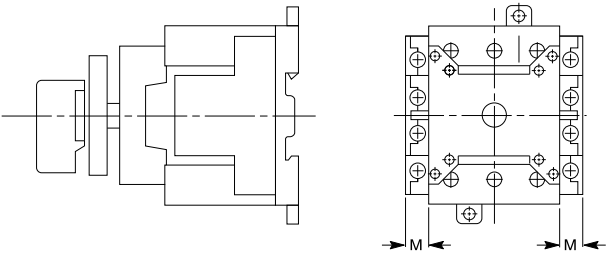
Cat. No.	A
194L-G3393	110...235 (4-11/32...9-1/4)
194L-G3394	230...350 (9-1/16...13-25/32)

Cat. No.	L ★
194E-A16	51 (2)
194E-A25/32	60 (2-3/8)
194E-A40/63	74 (2-59/64)
194E-A80/100	90 (3-35/64)

★ For 6-pole switches, add 1 in. to the "L" dimension.

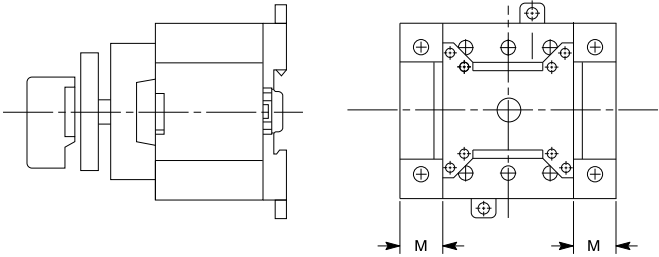
Base and Front Installation

Cat. No. 194E... with Auxiliary Contact Block Installed



Contacts	M
1 N.O. + 1 N.C.	9 (23/64)
2 N.O. + 2 N.C.	18 (23/32)

Cat. No. 194E... with 4-Pole, Ground and Neutral Terminals

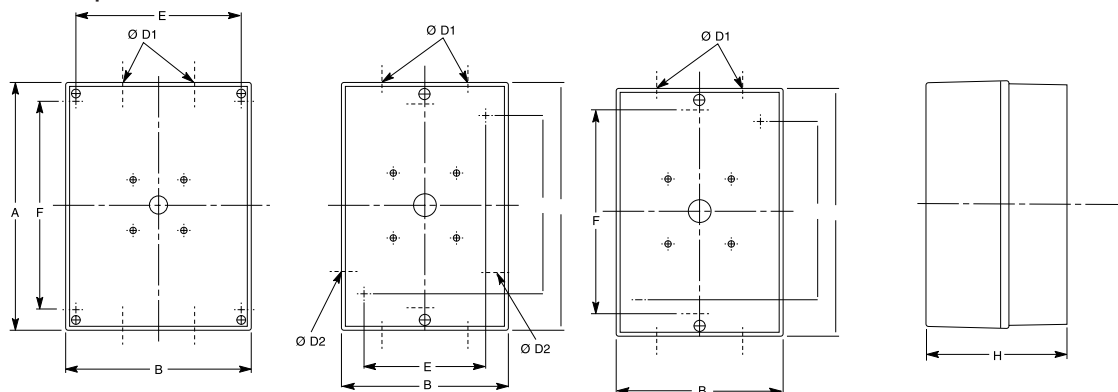


Cat. No.	M
194E-16	12.5 (31/64)
194E-25/32	14 (9/16)
194E-40/63	17.5 (11/16)
194E-80/100	22 (7/8)

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

Base Mounting Cat. No. 194E-A...

Thermoplastic Enclosures



Cat. No. 194L-3665		Cat. No. 194L-3572		Cat. No. 194L-3563		Enclosure Base View				
Complete Switches		Enclosures		Height A	Width B	Knockouts† ØD1		Mounting Holes§		Depth H
Cat. No.	Poles	ABS	Noryl					E	F	
		Cat. No.								
194E-Y16	3 and 4	★	★	120 (4-23/32)	70 (2-3/4)	M16/M20 16/20 mm	PG11/PG16 18.5/22.5 mm	50 (1-31/32)	105 (4-9/64)	70 (2-49/65)
	6	194E-G3663	194E-G3664	180 (7-3/32)	125 (4-59/64)	M25/M30 25/30 mm	PG21/PG29 28.5/37.5 mm	On Center	145 (5-23/32)	105 (4-1/8)
194E-Y25/32	3 and 4	194L-G3572	194L-G3576	150 (5-29/32)	95 (3-3/4)	PG16/PG21 22.5/28.5 mm		60 (2-3/8)	115 (4-17/32)	86 (3-3/8)
	6	194E-G3663	194E-G3664	180 (7-3/32)	125 (4-59/64)	PG21/PG29 28.5/37.5 mm		On Center	145 (5-23/32)	105 (4-1/8)
194E-Y40/63	3 and 4	194E-G3663	194E-G3664	180 (7-3/32)	125 (4-59/64)	PG21/PG29 28.5/37.5 mm		On Center	145 (5-23/32)	105 (4-1/8)
	6	194E-G3665	194E-G3666	230 (9-1/16)	175 (6-57/64)	PG29/PG36 37.5/47.5 mm		155 (6-3/32)	195 (7-43/64)	120 (4-47/64)
194E-Y80/100	3 and 4	194E-G3665	194E-G3666	230 (9-1/16)	175 (6-57/64)	PG29/PG36 37.5/47.5 mm		155 (6-3/32)	195 (7-43/64)	120 (4-47/64)

★ Empty enclosures not available for purchase.

† Cat. No. 194E-A16 units have 1 knockout on each end. all others have 2 knockouts on each end. A letter "M" in the catalog number indicates metric knockouts; the unit is otherwise supplied with PG knockouts.

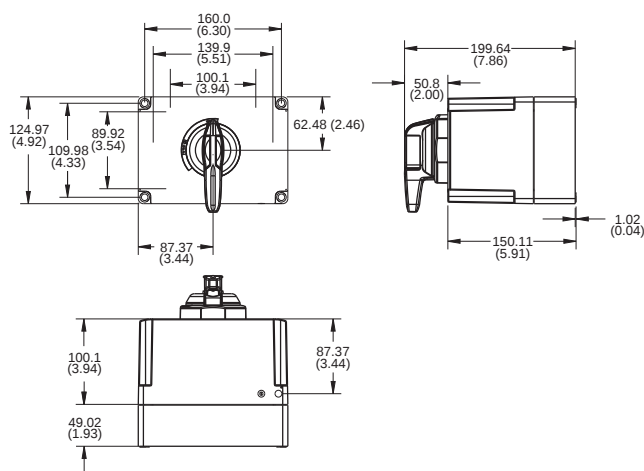
§ All mounting holes have a 4.2 mm (5/32 in.) diameter.

No. of Extensions	Cat. No. 194E-A 20/32...	Cat. No. 194E-A 40/63...	Cat. No. 194E-A 80/00...
With 1 extension	96 (3-25/32)	107 (4-7/32)	114 (4-31/64)
With 2 extensions	120 (4-23/32)	131 (5-5/32)	138 (5-7/16)
With 3 extensions	144 (5-43/64)	155 (6-7/64)	162 (6-3/8)
With 4♣ extensions	168 (6-39/64)	179 (7-3/64)	186 (7-21/64)
With 5♣ extensions	192 (7-9/16)	203 (8)	210 (8-17/64)
With 6♣ extensions	216 (8-1/2)	227 (8-15/16)	234 (9-7/32)

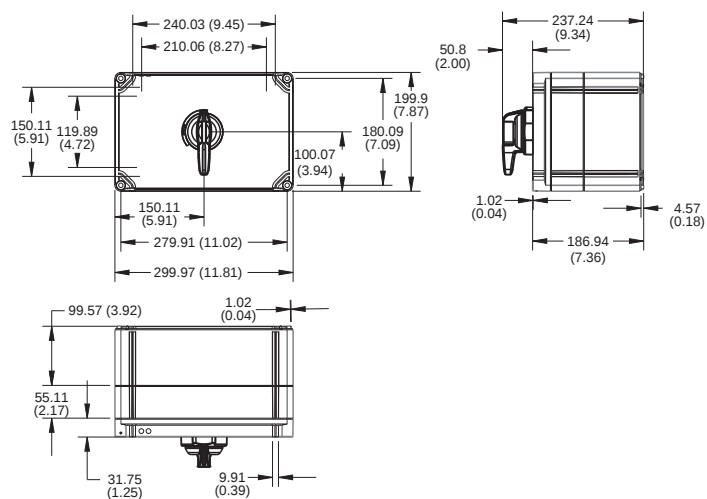
♣ When more than four modules are used, attach the first one to the switch body using the screws supplied with the extension (Cat. No. 194L-G2853).

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

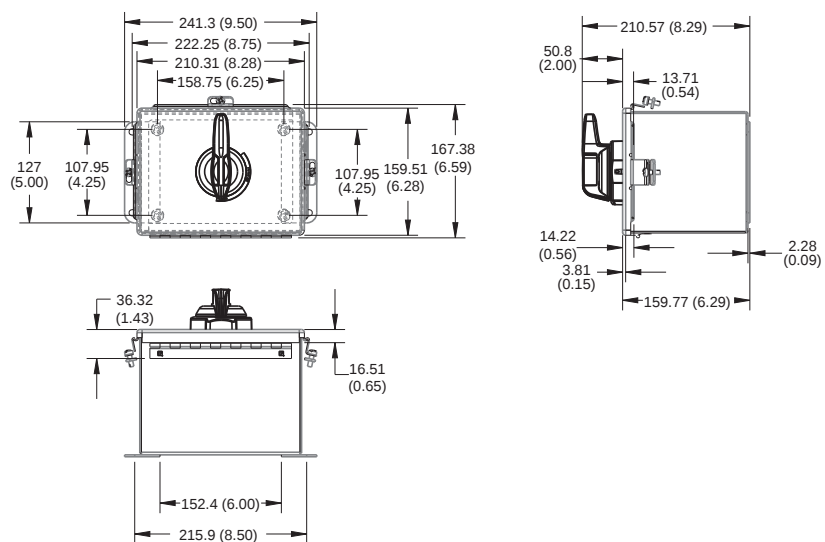
194E Enclosed Switches with 194R Handles

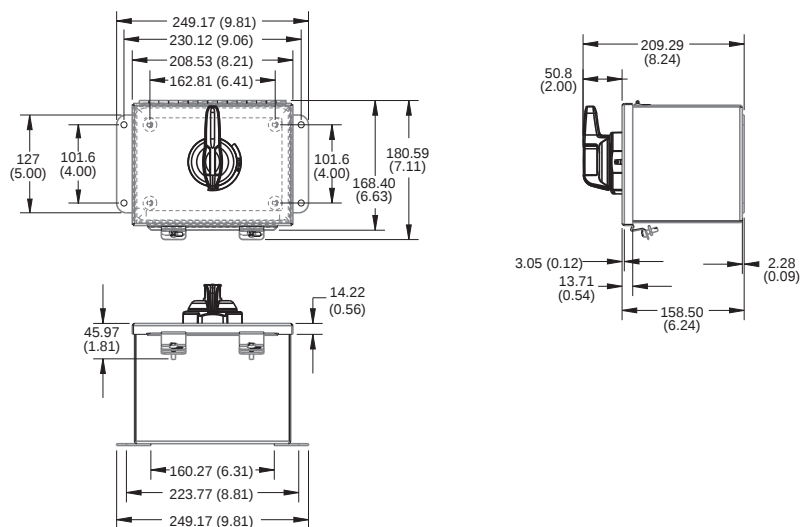


Cat. Nos. 194E-KA-16..63

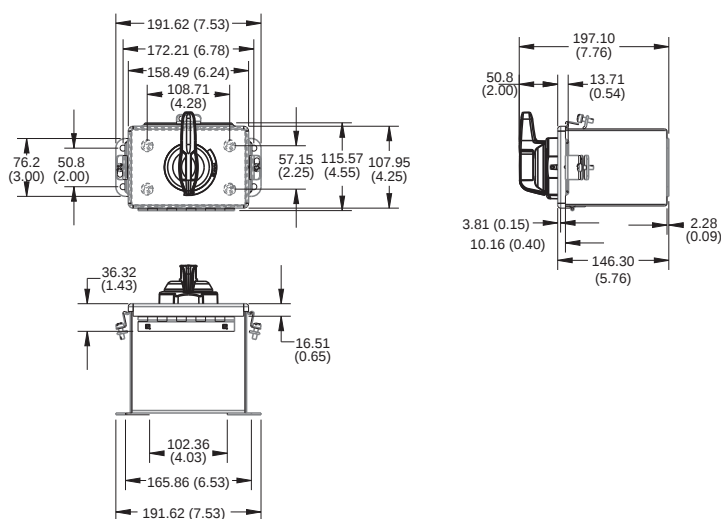


Cat. Nos. 194E-KA-16X...63X, 194E-KA-80...00

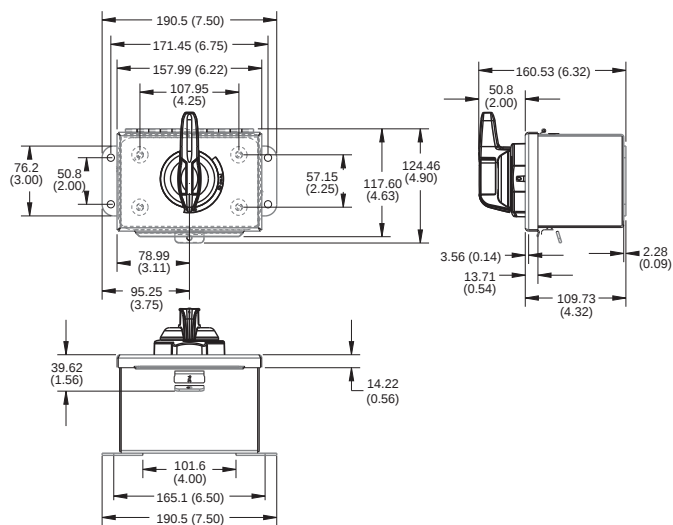
Cat. Nos. 194E-AA-16X...63X, 194E-AA-80...00,
194E-FA-16X...63X, 194E-FA-80...00



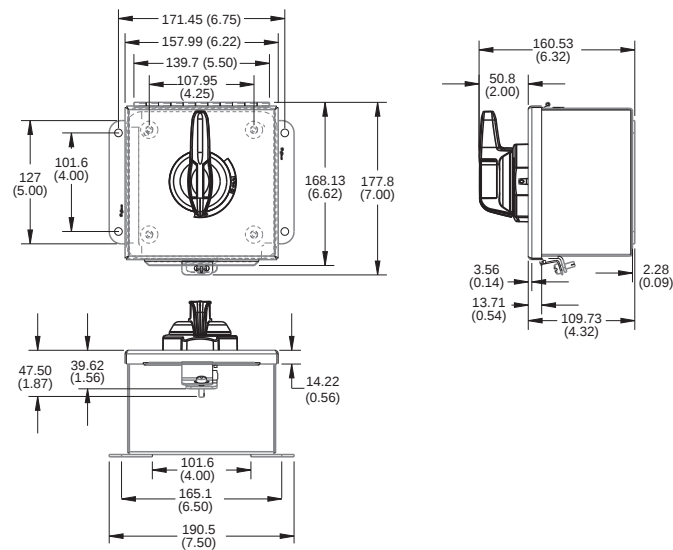
Cat. Nos. 194E-CA-16X...63X, 194E-CA-80...00



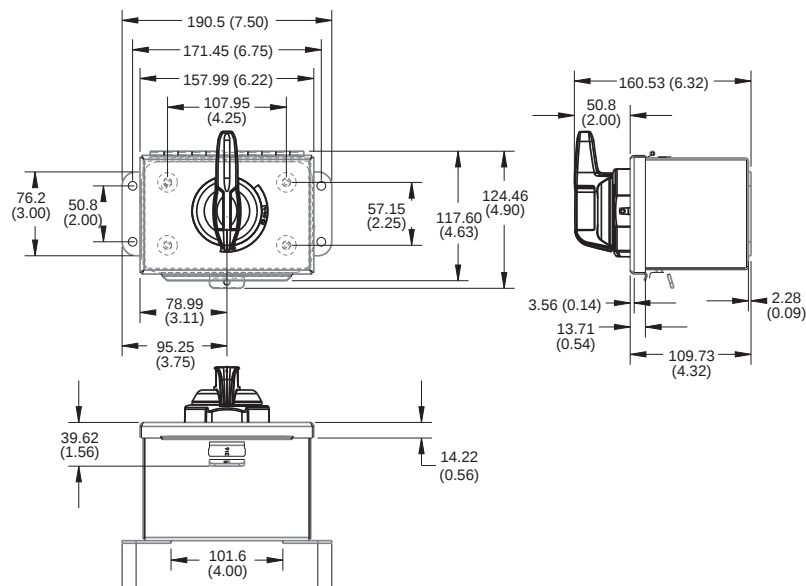
Cat. Nos. 194E-AA-16...63, 194E-FA-16...63



Cat. Nos. 194E-CA-16...63



Cat. Nos. 194E-DA-16...63

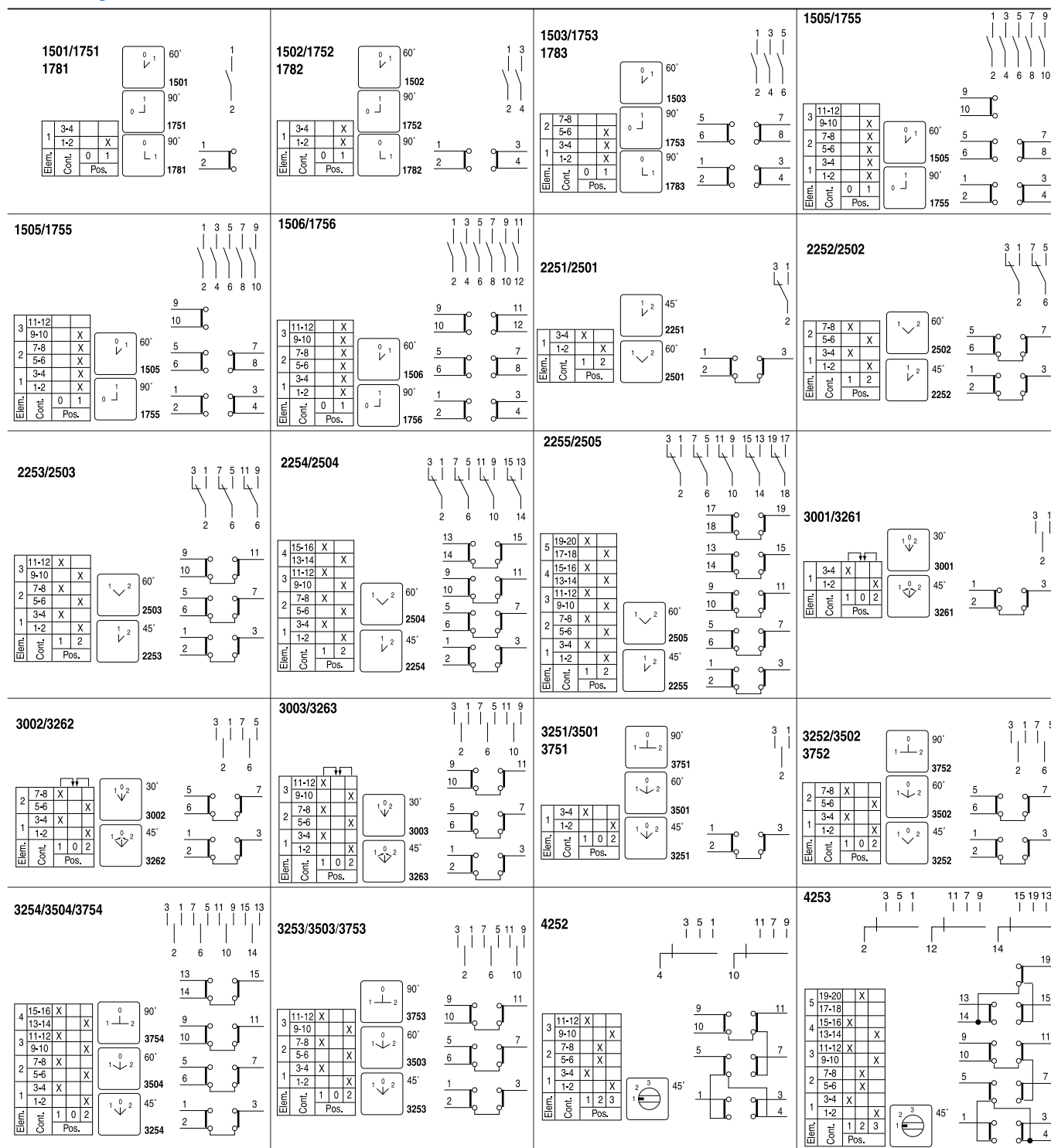


Cat. Nos. 194E-GA-16...63

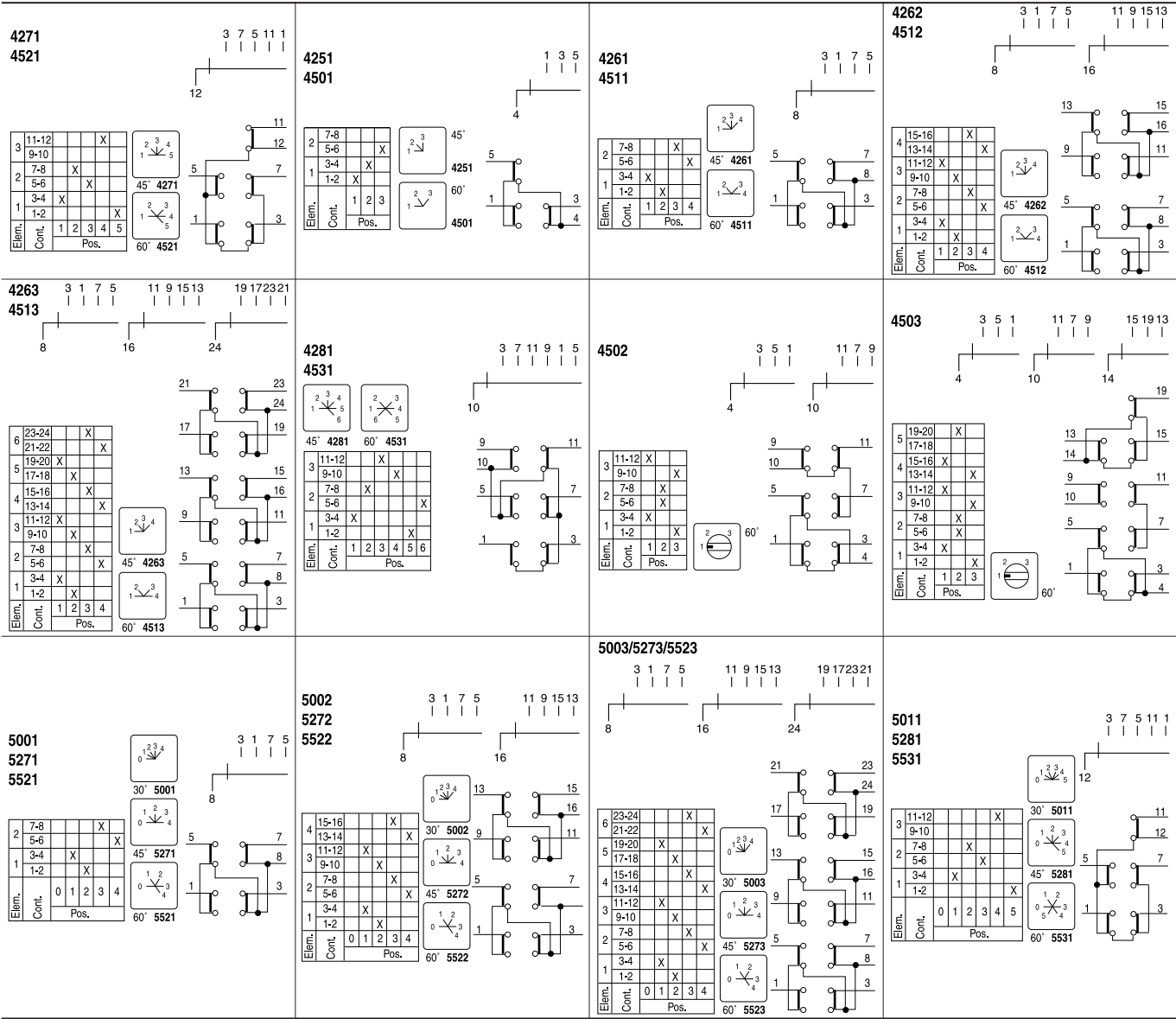
Switching Diagrams

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

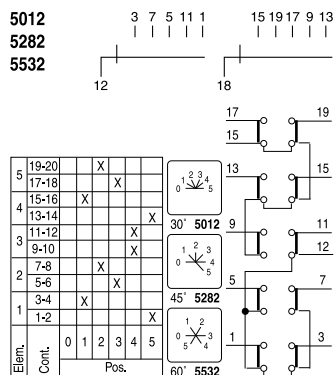
Circuit Diagram Nos. 1501...4253



Circuit Diagram Nos. 4271...5531



5012
5282
5532



3 7 5 1 1 15 19 17 9 13 23 27 25 29 21

8 18 30

29
30

25 27

21 23

17 19

18 15

13 11

9 12

5 7

1 3

31-32
29-30
27-28
25-26
23-24
21-20
19-20
17-18
15-16
13-14
11-12
9-10
7-8
5-6
3-4
1-2

0 1 2 3 4 5

30' 5013

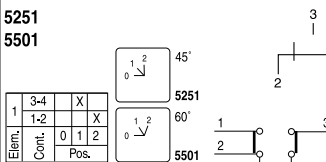
0 1 2 3 4 5

45' 5283

0 1 2 3 4 5

6N' 5533

Elem.
Cont.
Pos.

5251
5501

5252
5502

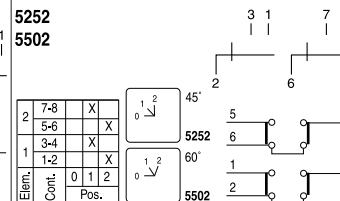
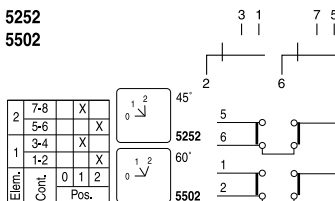
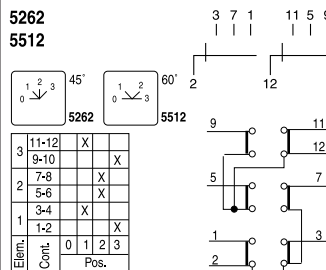
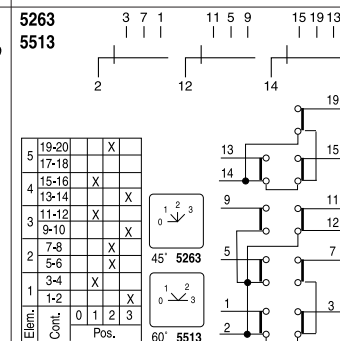
5252
5502

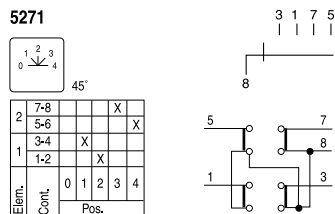
Figure 1(a) shows two examples of the proposed notation. The first example shows a 45-degree angle with a 1/2 slope, labeled with the slope value 5261. The second example shows a 60-degree angle with a 1/3 slope, labeled with the slope value 5511. Figure 1(b) shows a schematic diagram of a multi-stage interconnection network. It has 5 inputs and 4 outputs. The inputs are labeled 1, 2, 3, 4, and 5. The outputs are labeled 1, 2, 3, and 4. The diagram shows a complex routing path connecting the inputs to the outputs.

5262
5512

	5263
	5513



5271






45°

4	15-16 13-14			X	
3	11-12 9-10		X		X
2	7-8 5-6			X	
1	3-4 1-2		X		X

Elem. Cont. 0 1 2 3 4 Pos.

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	690
Isolating conditions acc. to VDE fulfilled up to rated impulse voltage U_{imp}										[kV]	6	6	6	6	8	8
Thermal rated current I_{th} ★ 40 °C			IEC-947							[A]	16	20	25	30	32	45
Thermal rated current I_{the} 60 °C			IEC-947							[A]	12	16	20	25	32	45
Rated current I_e ★																
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 690V							[A] [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 380...415V 500V							[A] [A] [A]	5 3 2	6 4 2.5	7 5 3	8 6 4	—	—
DC switching capacity			Contacts in series													
Rated current I_e																
DC-21A	Rated Voltage [V]	1	2	3	4	5	6	8								
		24	48	72	96	120	144	192	[A]	12	16	20	22	—	—	
	For resistive loads, T ≤ 1ms	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	
		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_e max = 600V		440	—	—	—	—	—	[A]	0.4	0.4	0.5	0.5	—	—
		Rated making/breaking capacity (= 1.5 x I_e)														
	1.05 x Rated voltage [V]	25.2	50.4	75.6	100.8	126	151.2	201.6	[A]	18	24	30	33	—	—	
		50.4	100.8	151.2	201.6	252	302.4	403.2	[A]	15	21	24	27	—	—	
For resistive loads, T I_{th} 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_e 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_e																
DC-21A	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 x I_e)																
DC-21A	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_e 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
Rated power P_e			Contacts in series													
Rated voltage [V] DC-23A, DC-3, DC-5 For inductive loads, T ≤1 ms																

★ See standards compliance listed on <http://ab.rockwellautomation.com/Circuit-and-Load-Protection/Disconnect-Switches/Non-Visible-Blade/194R-Fused-Non-Fused-Disconnect-Switches#specifications>

Performance Data, Continued						12 A	16 A	20 A	25 A	32 A	40 A
IEC Applications, Continued											
Rated making/breaking capacity ($= 4 \times I_n$)		Contacts in series									
DC-23A, DC-3, DC-5 For inductive loads, $T \leq 7.5$ ms	Rated Voltage [V]	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	—	—	
Rated breaking capacity		231	4	[A]	6.7	9.1	13.6	18.2	—	—	
		231	6	[A]	18.1	21.8	25.2	27.2	—	—	
			at 220V	[A]	72	96	128	176	296	296	
			0.45 [cos ϕ]	[A]	72	96	128	176	280	336	
Rated power P_e ★	AC-2 Slip-ring motors: starting, reversing and electric braking; star/delta starting	IEC-947									
			240V	[kW]	3	4	5.5	5.5	—	—	
			380V	[kW]	5.5	7.5	9	13	—	—	
		3-phase	415V	[kW]	5.5	7.5	9	13	—	—	
		3-pole	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		IEC-947									
			220...240V	[kW]	2.2	3	4.5	5.5	7.5	7.5	
		3-phase	380...440V	[kW]	4	5.5	7.5	11	15	18.5	
		3-pole	500V	[kW]	5.5	7.5	10	13	—	—	
			660V	[kW]	5.5	7.5	8	11	18.5	18.5	
		1-phase	110V	[kW]	0.75	1.1	1.2	1.6	—	—	
		2-pole	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		IEC-947									
			220...240V	[kW]	0.75	1.5	3	4	5.5	5.5	
		3-phase	380...415V	[kW]	1.5	2.2	3.7	5.5	7.5	7.5	
		3-pole	440...550V	[kW]	1.5	2.2	3.7	5.5	7.5	11	
		1-phase	110V	[kW]	0.18	0.37	0.55	0.75	—	—	
		2-pole	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 <http://ab.rockwellautomation.com/Circuit-and-Load-Protection/Disconnect-Switches/Non-Visible-Blade/194R-Fused-Non-Fused-Disconnect-Switches#specifications>

Specifications

194L Control and Load Switches

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 3-phase 3-pole	220...240V	[kW]	2.2	3	4.5	5.5	11	11
			380...440V	[kW]	4	5.5	7.5	11	18.5	22
			500V	[kW]	5.5	7.5	10	13	—	—
			660V	[kW]	5.5	7.5	8	11	22	22
	1-phase 2-pole		110V	[kW]	0.75	1.1	1.2	1.6	—	—
			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		(gL characteristic)		[kA _{rms}]	0.48	0.48	0.6	0.75	0.8	0.8
Rated short-time current (1s)				[A]	20★	20★	20★	25★	35	40
Strongest series fuse, not in enclosure										
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‡			12	16	20	25	32	40
Rated power P _e §		UL (CSA)			(FLA)	(FLA)	(FLA)	(FLA)		
Standard motor DOL rating (similar to AC-3)		3-phase 3-pole	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)
		1-phase 2-pole	120V	[Hp]	0.5 (9.8)	.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)		3-phase 3-pole	120V 240V	[Hp] [Hp]	— —	— —	— —	— —	— —	— —
Max. back-up fuse		(gG characteristic)		[A]	35	55	60	80		
Short Circuit Ratings	Maximum Short Circuit Prospective Fault Current Maximum Fuse Size			[kA]	5	5	5	5		
				[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		IP66	IP66	IP66
	Switch Bodies		IP20	IP20	IP20
Mechanical Endurance		[mil.ops]	1	1	1
Switching rate	mechanical	[ops/h]	1200	1200	1200
Maximum Wire Gauges					
	rigid wire	AWG	(2)18...12	(2)16...10	(2)12...8
		[mm ²]	(2)1...2.5	(2)1.5...6	(2)4...10
	fine strands	AWG	(2)18...12	(2)16...10	(2)14...10
		[mm ²]	(2)1...2.5	(2)1.5...4	(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)

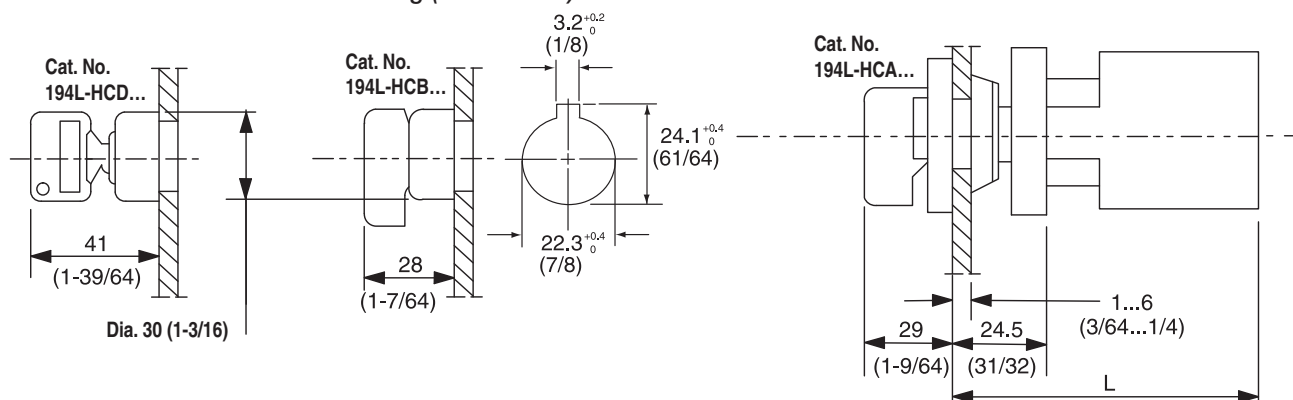
★ Does not apply to switches in enclosure.

‡ Suitable for switching off-load (AC-20) above 660V, but only up to 660V for switches with screws at the rear.

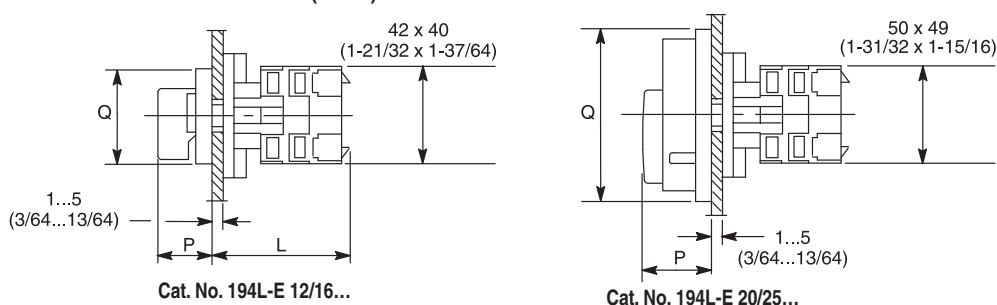
§ See standards compliance listed on <http://ab.rockwellautomation.com/Circuit-and-Load-Protection/Disconnect-Switches/Non-Visible-Blade/194R-Fused-Non-Fused-Disconnect-Switches#specifications>

Approximate Dimensions

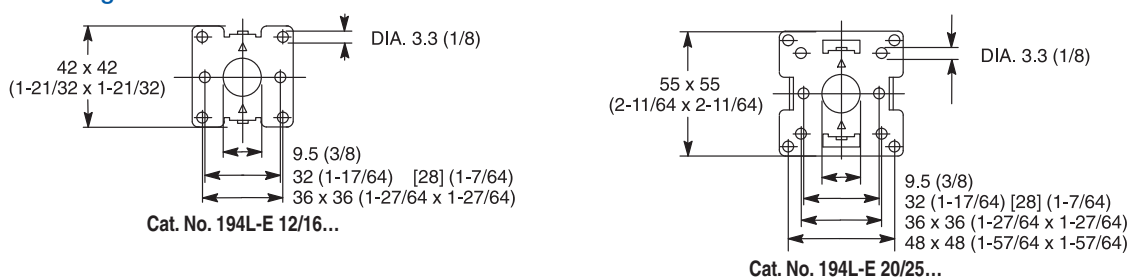
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

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

Cat. No.	L				
	No. of Contacts				
	1...2	3...4	5...6	7...8	9...10
194L-C32/40...	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



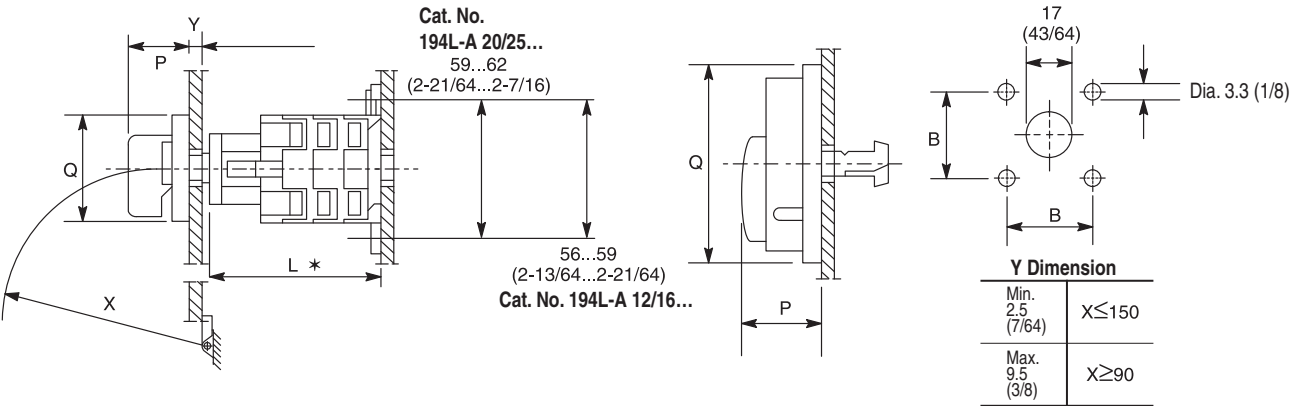
Cat. No.	L				
	No. of Contacts				
	1...2	3...4	5...6	7...8	9...10
194L-E12/16...	44 (1-47/64)	54 (2-1/8)	64 (2-33/64)	74 (2-29/32)	84 (3-5/16)
194L-E20/25...	44.5 (1-3/4)	57 (2-1/4)	69.5 (2-3/4)	82 (3-15/64)	94.5 (3-23/32)
194L-E32/40...	43 (1-11/16)	58.5 (2-5/16)	76 (2-63/64)	93.5 (3-11/16)	111 (4-3/8)

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-HE6I...		67 (2-41/64) x 67 (2-41/64)
194L-HE6S...		
194L-HE6N...	34 (1-11/32)	
194L-HE6G...		

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)

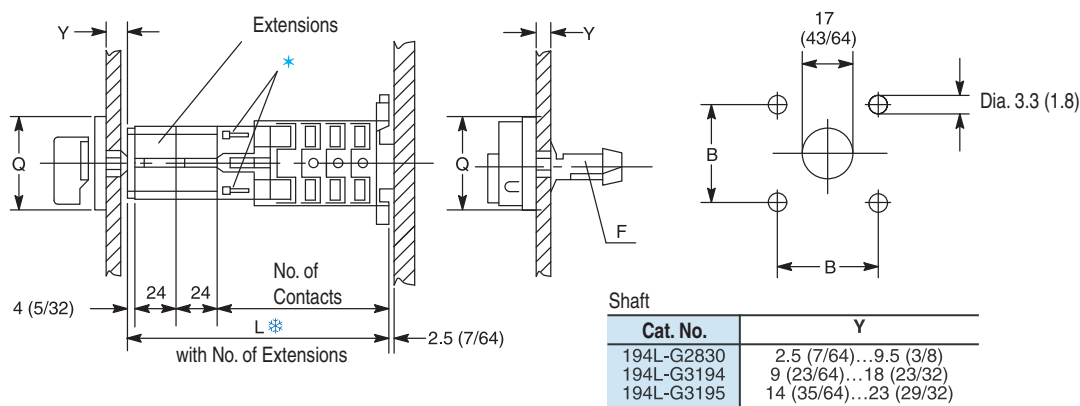
Control Knob

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...		48 (1-57/64)	64 (2-33/64) x 64 (2-33/64)	
194L-HE6A...			64 (2-33/64) x 78 (3-5/64)	
194L-HE6I...			34 (1-11/32)	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)

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



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

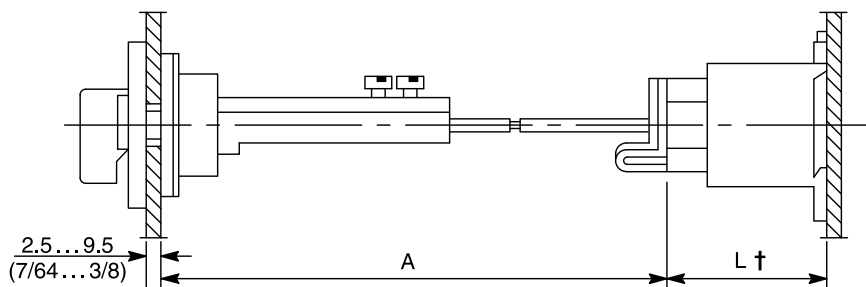
Cat. No.	Q	B
194L-HE4A...	48 (1-57/64) x 48 (1-57/64)	36 (1-27/64)
194L-HE4I...		
194L-HE6A...	64 (2-33/64) x 64 (2-33/64)	48 (1-57/64)
194L-HE6I...		
194L-HE6N...	67 (2-41/64) x 67 (2-41/64)	
194L-HE6G...		

★ When more than four 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)

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**).

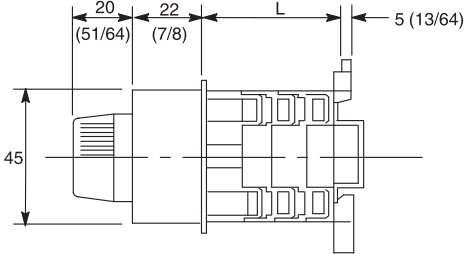
§ For DIN Rail-mounted devices, remember to deduct the offset distance provided by the rail. For example, deduct 2.5 mm (7/64 in.) from the mounting depth for Bulletin 194L switch body mounted on DIN 46277 rail.

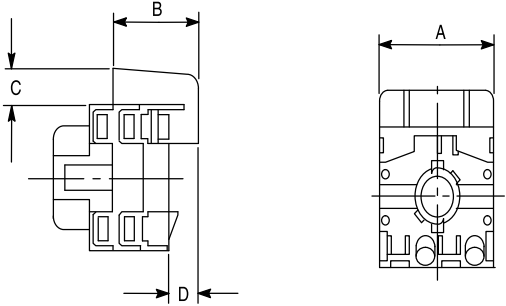
★ One 44 mm (1-47/64 in) end shaft is supplied with all Bulletin 194L Switch Bodies.

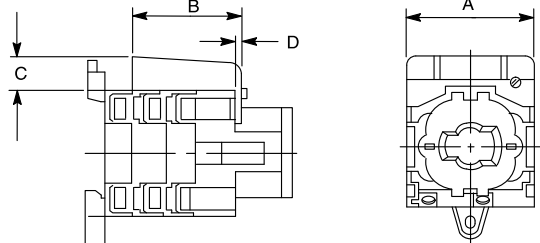
Modular Shaft Extensions (Cat. No. 194L-G2853)

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

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

Cat. No. 194L-A... With Cat. No. 194L-HE4P-... Installation on DIN 46277 (35 mm) Rails + 2.5 mm (7/64 in.)		L			
	Cat. No.	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)

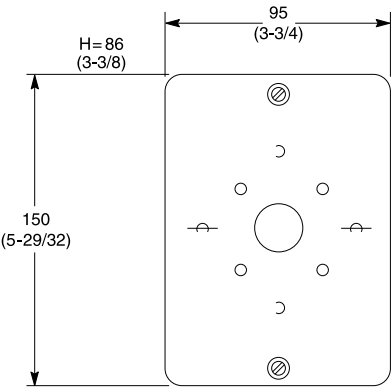
Cat. No. 194L-E... With Terminal Cover		Cat. No.	A	B	C	D
		194L-E12/16...	40 (1-37/64)	42.5 (1-43/64)	12 (15/32)	2.5 (7/64)
		194L-E20/25...	49 (1-15/16)	37.5 (1-31/64)	12 (15/32)	2.5 (7/64)
		194L-E32/40...	59 (2-21/64)	50 (1-31/32)	15 (19/32)	2.5 (7/64)

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)

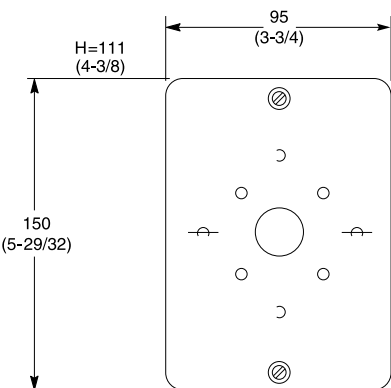
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Enclosure

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



Cat. No. 194L-G3572/G3576
G3574/G3578



Cat. No. 194L-G3573/G3577
G3575/G3579

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.

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