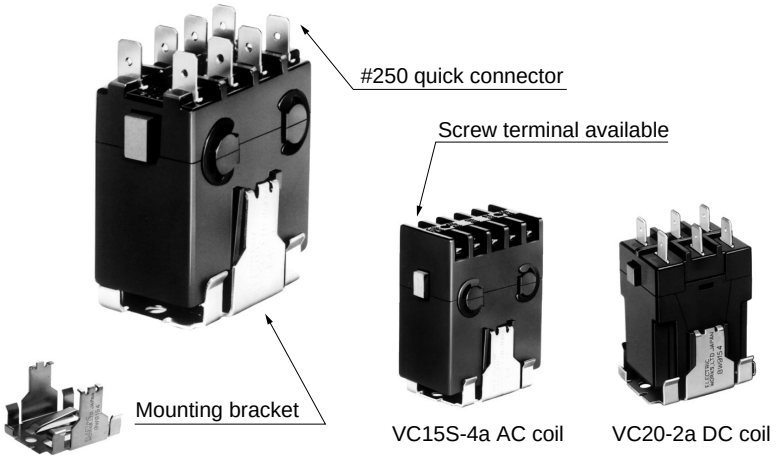
NAiS

HEAVY DUTY POWER RELAYS VC-RELAYS

COMPACT SIZE AND EASY MAINTENANCE

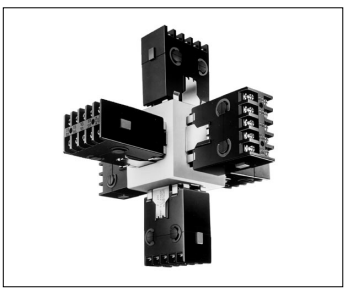


UL File No.: E43028
CSA File No.: LR26550

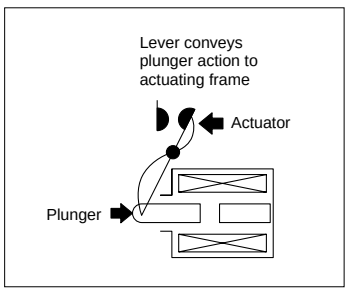
- **Large capacity with Form X contacts**
  — 1.5 kW 1 phase through 3.7 kW 3 phase 240 V AC motor
- **Wide range of types for various applications**

FEATURES ON CONSTRUCTION

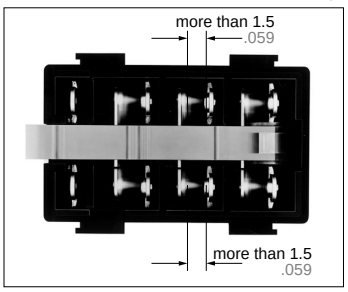
1. Multipositional snap-mounting



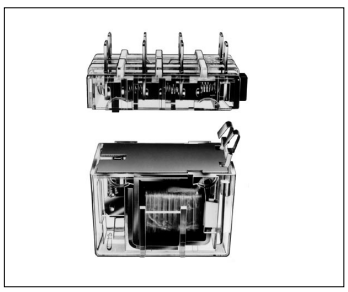
2. Lever action mechanism provides heavy-duty switching



3. Wide, 3.0 mm contact-gap with 2-point contacts



4. Separate blocks for contacts and coils provides high insulation



TYPICAL APPLICATIONS

VC Power relays are specially designed for control of heavy duty loads. You can be assured of a minimum of 250,000 faultless operations of this unit. It also ensures the lowest total cost with highest quality for applications such as:

Home appliances: Air conditioners, blowers, electronic ranges....
Office equipment: Copiers, time recorders, shredders....
Power devices: Pumps, fans, motor drives....
Automatic vending machines: Food and cigarette venders....
Electrical heating equipment: Dryers, heaters, molding machines....

ORDERING INFORMATION

Ex. VC 15 (20) [S] — [4a] — [AC240V] — [K]

Terminal type
Nil: Quick connection
S: Screw terminal (only for 4a or 3a1b)

Contact arrangement*
4a: 4 Form X
3a1b: 3 Form X 1 Form Y
2a2b: 2 Form X 2 Form Y
3a: 3 Form X
2a1b: 2 Form X 1 Form Y
2a: 2 Form X
1a1b: 1 Form X 1 From Y
1a: 1 Form X

Coil voltage*	
AC 24 V	DC 12 V
AC 48 V	DC 24 V
AC 110 V	DC 48 V
AC 120 V	
AC 220 V	
AC 240 V	

Suffix “K” follows some type numbers with AC coil type. For detail, refer to the TYPES in Page 359.

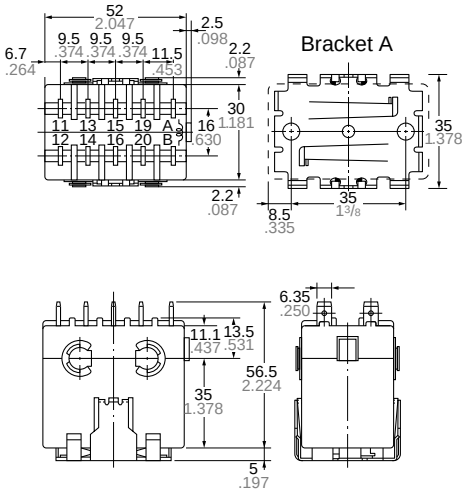
(Note) 1. For UL/CSA recognized types, add suffix UL/CSA.
2. Standard packing
Case: 50 pcs.

*As to combination availability of contact arrangement and coil voltage, refer to TYPES in Page 360 and 361.

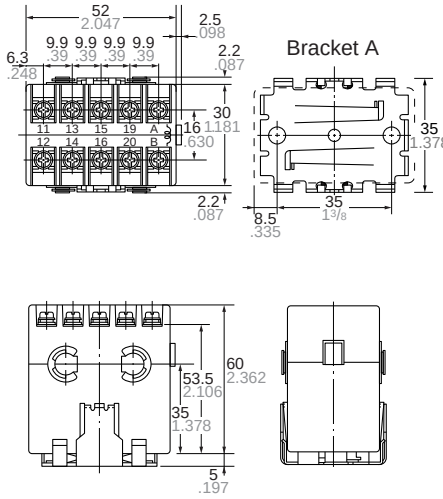
DIMENSIONS

mm inch

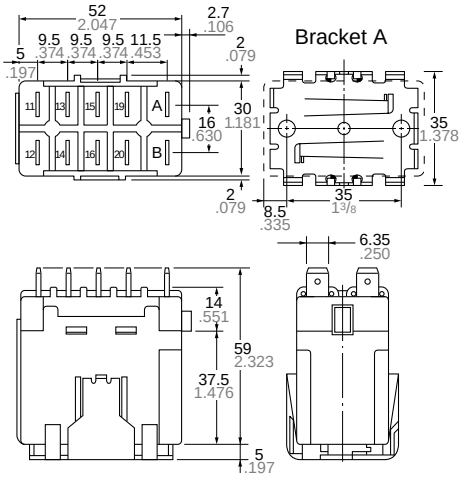
VC15 (4a, 3a1b, 2a2b)-AC-K



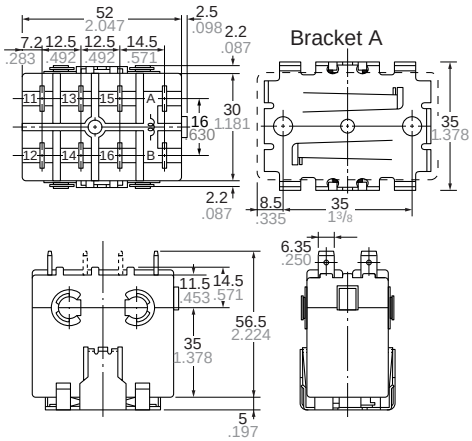
VC15S-AC-K



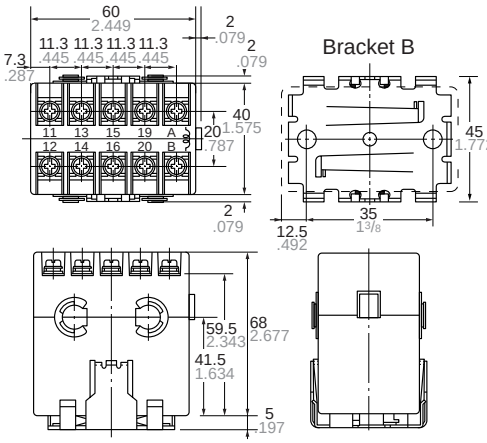
VC15 (4a, 3a1b)-DC



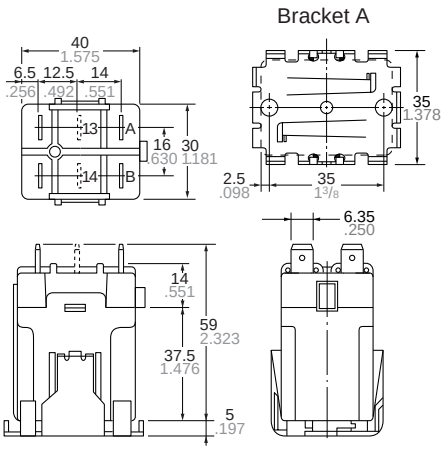
VC15 (3a, 2a1b, 2a)-AC-K
VC20 (3a, 2a1b, 2a, 1a1b, 1a)-AC-K



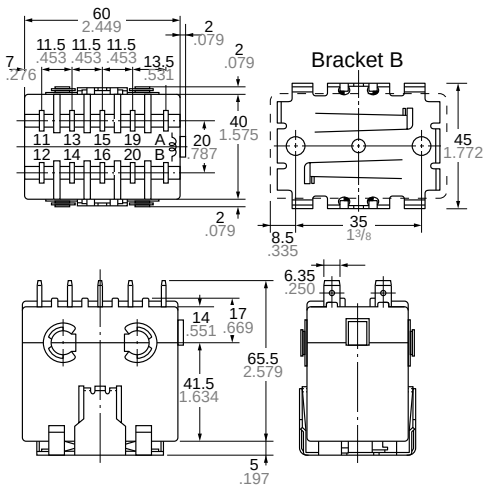
VC20S-AC



VC15 (2a, 1a1b, 1a)-DC
VC20 (2a, 1a1b, 1a)-DC



VC20 (4a, 3a1b)-AC



SPECIFICATIONS (AC type)

Coil input			AC						
Types			VC15		VC15S	VC20		VC20S	Remarks
Contact arrangement			1a, 3a1b, 2a2b	3a, 2a1b, 2a	4a, 3a1b	4a, 3a1b	3a, 2a1b, 2a, 1a1b, 1a	4a, 3a1b	
Terminals			# 250 quick connector		3.5 mm dia. screw	# 250 quick connector		4 mm dia. screw	
Acceptable wire size		Single wire	1.6 mm (AWG14)			2.0 mm (AWG12)			
		Stranded wire	2.0 mm^2 (AWG14)			3.5 mm^2 (AWG12)			
Motor loads		1 phase, 120 V	1/3 HP			1 HP			
		1 phase, 240 V	1 HP			2 HP			
		3 phase, 240 V	2 HP		2 HP	5 HP			
		3 phase, 380 V	(2 HP)			(5 HP)			(IEC)
Resistive loads		1 phase, 120 V	15 A			20 A			
		1 phase, 240 V	15 A		15 A	20 A			
		3 phase, 240 V	15 A		15 A	20 A			
Tungsten, lamp loads		1 phase, 240 V	6 A			12 A			
Maximum contact current		“b” contact (p.f. = 1)	3 A			3 A			
Max. operating voltage			IEC 380 V AC			UL, CSA 300 V AC			
Breaking capacity (“a” contact)		3 phase, 240 V (p.f. = 0.4)	80 A			160 A			IEC AC3
		3 phase, 380 V (p.f. = 0.4)	40 A			80 A			
Making capacity (“a” contact)		3 phase, 240 V (p.f. = 0.4)	80 A			160 A			IEC AC3
		3 phase, 380 V (p.f. = 0.4)	40 A			80 A			
Expected life	Electrical (max. rated current)		250,000 operations*						
	Mechanical		1,000,000 operations						
Unit weight (with bracket)			190 g	180 g	210 g	270 g	190 g	320 g	

Note: * In the case of 12 A lamp loads, the expected life is 100,000 operations.

TYPES

• AC coils

Contact arrangement \ Types	VC15	VC15S	VC20	VC20S
4 Form X	VC15-4a-AC✱✱✱V-K	VC15S-4a-AC✱✱✱V-K	VC20-4a-AC✱✱✱V	VC20S-4a-AC✱✱✱V
3 Form X 1 Form Y	VC15-3a1b-AC✱✱✱V-K	VC15S-3a1b-AC✱✱✱V-K	VC20-3a1b-AC✱✱✱V	VC20S-3a1b-AC✱✱✱V
2 Form X 2 Form Y	VC15-2a2b-AC✱✱✱V-K	—	—	—
3 Form X	VC15-3a-AC✱✱✱V-K	—	VC20-3a-AC✱✱✱V-K	—
2 Form X 1 Form Y	VC15-2a1b-AC✱✱✱V-K	—	VC20-2a1b-AC✱✱✱V-K	—
2 Form X	VC15-2a-AC✱✱✱V-K	—	VC20-2a-AC✱✱✱V-K	—
1 Form X 1 Form Y	—	—	VC20-1a1b-AC✱✱✱V-K	—
1 Form X	—	—	VC20-1a-AC✱✱✱V-K	—

COIL DATA at 20°C 68°F

• AC coils (120 V AC)

Types			VC15 (3a, 2a1b, 2a) VC20 (2a, 1a1b, 1a)		VC15 (4a, 3a1b, 2a2b) VC15S, VC20 (3a, 2a1b)		VC20 (4a, 3a1b) VC20S	
Nominal coil voltage			120 V AC		120 V AC		120 V AC	
Frequency, Hz			60	50	60	50	60	50
Coil input	Inrush	mA (max.)	135	162	175	209	267	292
		VA (max.)	16.2	19.4	21	25	32	35
	Sealed	mA (max.)	45	54	50	60	65	77
		VA (max.)	5.4	6.4	6.0	7.2	7.8	9.2
Pick-up voltage, V AC (max.)			96	96	96	96	96	96
Drop-out voltage, V AC (min.)			24	24	24	24	24	24

SPECIFICATIONS (DC type)

Coil input		DC			
Types		VC15		VC20	Remarks
Contact arrangement		4a, 3a1b	2a, 1a1b, 1a	2a, 1a1b, 1a	
Terminals		# 250 quick connector			
Acceptable wire size	Single wire	1.6 mm (AWG 14)		2.0 mm (AWG 12)	
	Stranded wire	2.0 mm² (AWG 14)		3.5 mm² (AWG 12)	
Motor loads	1 phase, 120 V	1/3 HP		1 HP	
	1 phase, 240 V	1 HP		2 HP	
	3 phase, 240 V	2 HP		—	
	3 phase, 380 V	(2 HP)		—	(IEC)
Resistive loads	1 phase, 120 V	15 A		20 A	
	1 phase, 240 V	15 A		20 A	
	3 phase, 240 V	15 A		—	
Tungsten, lamp loads	1 phase, 240 V	6 A		12 A	
Maximum contact current	"b" contact (p.f. = 1)	3 A		3 A	
Max. operating voltage		IEC 380 V AC		UL, CSA 300 V AC	
Breaking capacity ("a" contact)	3 phase, 240 V (p.f. = 0.4)	80 A		—	IEC AC3
	3 phase, 380 V (p.f. = 0.4)	40 A		—	
Making capacity ("a" contact)	3 phase, 240 V (p.f. = 0.4)	80 A		—	IEC AC3
	3 phase, 380 V (p.f. = 0.4)	40 A		—	
Expected life	Electrical (max. rated current)	250,000 operations*			
	Mechanical	1,000,000 operations			
Unit weight (with bracket)		190 g	150 g	150 g	

Note: * In the case of 12 A lamp loads, the expected life is 100,000 operations.

TYPES

• DC coils

Contact arrangement \ Types	VC15	VC20
4 Form X	VC15-4a-DC**V	—
3 Form X 1 Form Y	VC15-3a1b-DC**V	—
2 Form X	VC15-2a-DC**V	VC20-2a-DC**V
1 Form X 1 Form Y	VC15-1a1b-DC**V	VC20-1a1b-DC**V
1 Form X	VC15-1a-DC**V	VC20-1a-DC**V

COIL DATA at 20°C 68°F

• DC coils (24 V DC)

Types	VC15 (4a, 3a1b)	VC15 (2a, 1a1b, 1a) VC20 (2a 1a1b, 1a)
Nominal coil voltage	24 V DC	24 V DC
Coil resistance (±10%)	163 Ω	174 Ω
Pick-up voltage, V DC (max.)	20.4	20.4
Drop-out voltage, V DC (min.)	2.4	2.4

Note: Above values are average under hot condition, when horizontally mounted.

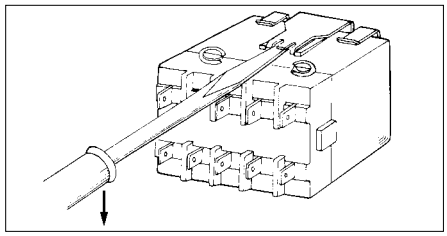
Characteristics (AC, DC common)

Max. operate time		25 ms*
Max. release time		25 ms
Contact bounce time		5 ms
Dielectric strength (Initial)	Between open contacts (inc. coil terminal)	2,500 Vrms
	Between load & source with open contacts	2,500 Vrms
Insulation resistance	Between open contacts (inc. coil terminal)	Over 100 MΩ (initial) at 500 V DC
	Between load & source with open contacts	Over 100 MΩ (initial) at 500 V DC
Switching speed	Electrical	1,200 times/hour
	Mechanical	14,400 times/hour
Ambient temp. (max. humidity)		–10°C to +40°C 14°F to +104°F (max. 85% R.H.) 40°C to +55°C 104°F to 131°F (max. 75% R.H.)

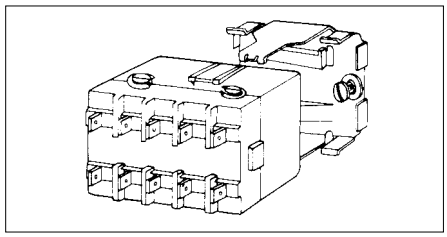
*VC15(DC) : 30ms

MOUNTING

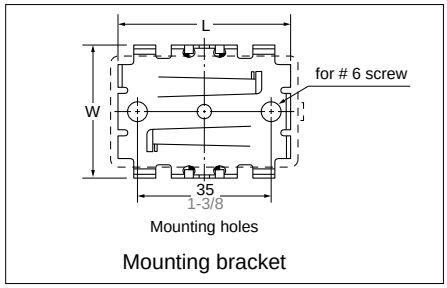
Gentle lifting of the bracket clamp with the tip of a screwdriver permits easy removal.



The mounting bracket is simply screwed in the desired location and the relay firmly snapped into the bracket.



mm inch



Mounting bracket

	L	W
Bracket A	45 1.772	35 1.378
Bracket B	50 1.969	45 1.772

• Bracket B is for VC-20-4a, 3a1b and VC20S-4a, 3a1b types.
• Mounting bracket is provided with each model.

For Cautions for Use, see Relay Technical Information.