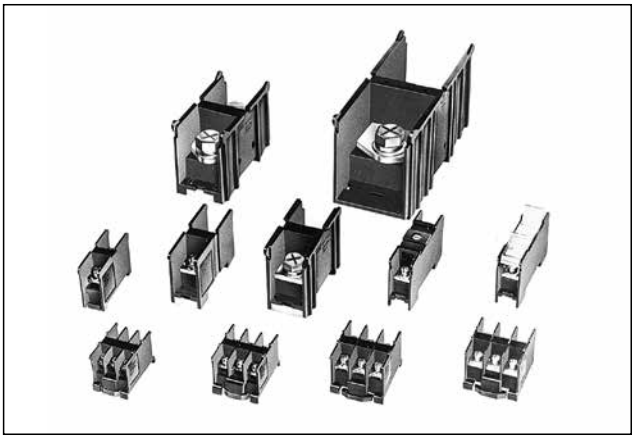
BA Series Terminal Blocks

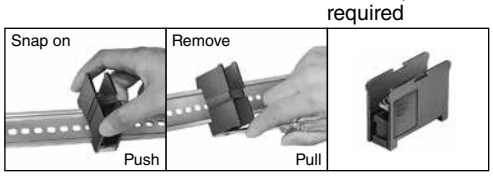
Quick-mount terminal blocks for mounting on 35-mm-wide DIN rails. Current capacities from 16A to 370V (1250V).



- Snaps on to 35-mm-wide DIN rails.
- Wide range of current capacities from 16A to 370A. Insulation voltage is 1250V.
- No end plates are required.
- 3-pole units, fuse blocks with blown fuse indicators available.
- Large capacity types (BA811S, BA911S) can be mounted directly to panels.
- Material: PPE (black)
- Complies with JIS C 2811.
- UL recognized and CSA certified. (BA111T, BA211T, BA311T, BA411S, BAF111SU, BAF111SNU)

Applicable Standards	Mark	Certification Organization/ File No.
UL1059		UL recognized File No. E78117
CSA 22.2 No. 158		CSA (File No. LR64803)

Quick-mount Unlatch No end plates required



General Ratings

Dielectric Strength	2500V AC, 1 minute
Insulation Resistance	100MΩ minimum
Operating Temperature	–25 to +55°C (no freezing)
Storage Temperature	–25 to 70°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)

Terminal Blocks

Style		Part No.	Ordering No.	UL/CSA		JIS			Terminal Screw	Tightening Torque (N·m)	Package Quantity
				Voltage/ Current	Wire Size (AWG)	Voltage	Current	Wire Size (mm^2)			
3-pole	Self-Lifting	**BA111T**	**BA111TPN20**	300V/15A	22-14	630V	16A	1.25 mm^2	M3	0.6 to 1.0	20
							21A	2 mm^2			
		BA211T	**BA211TPN20**	300V/20A	22-12	630V	21A	2 mm^2 (3.5 mm^2)	M3.5	1.0 to 1.3	20
		BA311T	**BA311TPN20**	150V/30A	18-10	630V	40A	5.5 mm^2	M4	1.4 to 2.0	20
1-pole	Self-Lifting	**BA411S**	**BA411SPN50**	600V/40A	16-6	630V	70A	14 mm^2	M5	2.6 to 3.7	50
		BA611S	**BA611SPN10**	—	—	1000V	94A	22 mm^2	M6	3.9 to 5.4	10
	Large Capacity	**BA711S**	**BA711SPN06**	—	—	1000V	132A	38 mm^2	M8	10 to 13.5	6
		BA811S	**BA811SPN06**	—	—	1250V	240A	100 mm^2	M10	21 to 28	6
		BA911S	**BA911SPN06**	—	—	1250V	370A	200 mm^2 (200 mm^2 2 wires) (325 mm^2 1 wire)	M12	38 to 49	6
	Fuse	**BAF111S-□**	**BAF111S-□PN20**	—	—	1000V	10A	5.5 mm^2	M4	1.4 to 2.0	20
	Fuse with Lamp	**BAF111SN-□**	**BAF111SN-□PN20**	—	—	1000V	10A	5.5 mm^2	M4	1.4 to 2.0	20
	Without Fuse	**BAF111SU**	**BAF111SUPN20**	600V/10A	18-10	1000V	10A	5.5 mm^2	M4	1.4 to 2.0	20
	WIthout Fuse/ With Lamp	**BAF111SNU**	**BAF111SNUPN20**	300V/10A	18-10	1000V	10A	5.5 mm^2	M4	1.4 to 2.0	20
	With Disconnecting Switch	**BAT20**	**BAT20PN20**	—	—	1000V	20A	5.5 mm^2	M4	1.4 to 2.0	20

1. Specify fuse ratings 1A, 3A, or 5A in place of □ in the Part No.
2. The wire size in ( ) does not comply with JIS standards.
3. The voltage/current differ according to operating conditions. See "Selecting Terminal Blocks by Current According to JIS Standards" on page 4.
4. Use a socket wrench or screwdriver for tightening screws.

○: Order when a marking strip or a dust cover is needed.
▲: Used for surface mounting
∗ : Dust cover with fuse holder

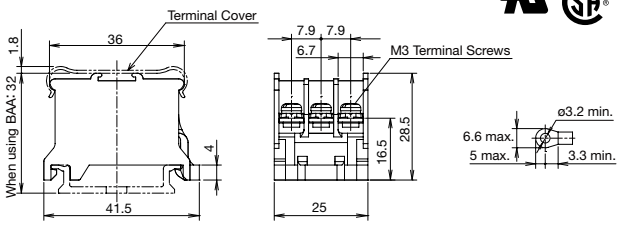
Part No.	Accessories (× Necessary)						
	DIN Rail	End Clip	Marking Strip	Dust Cover	Connecting Rod	Connecting Nut	Surface Mounting Clip
BA111T, BA411S, BAT20, BA211T, BA611S, BA711S, BA311T	×	×	○	○	—	—	—
BA811S, BA911S	×	×	○	○	×	×	▲
BAF111S□, BAF111SN□, BAF111SU, BAF111SNU	×	×	○	∗	—	—	—

Material

Parts Name	Material
Housing	Polyamide
Bus Bar	Brass (nickel-plated)
Terminal Screw	Steel (zinc chrome-plated)

BA Series Terminal Blocks

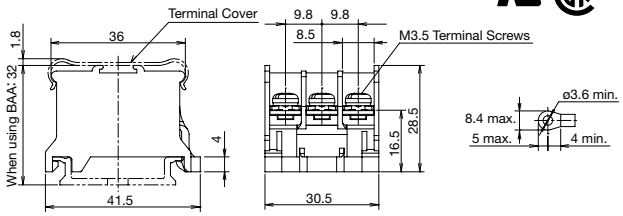
BA111T (3 Pole) 16A M3



Weight: Approx. 18.8g

Standards		UL/CSA	JIS
Insulation Voltage		300V	630V
Rated Current ∗2		15A max.	16A/21A
Dielectric Strength		2,500V AC, 1 minute	
Insulation Resistance		100 MΩ minimum	
Wire Size ∗1		22-14 AWG	1.25 mm² / 2 mm²
Accessories	Marking Strip Width	9.5 mm (BNM7, BNM9, BNM725, BNM725-TK1700)	
	Dust Cover	BNC220	
	Rail	BAA1000	
	See page	31	

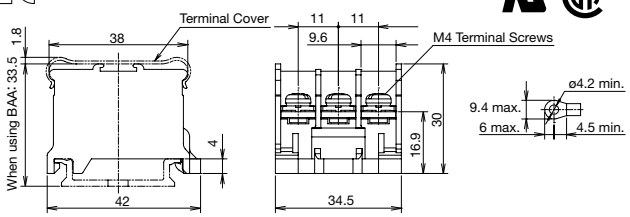
BA211T (3 Pole) 21A M3.5



Weight: Approx. 25.3g

Standards		UL/CSA	JIS
Insulation Voltage		300V	630V
Rated Current ∗2		20A max.	21A
Dielectric Strength		2,500V AC, 1 minute	
Insulation Resistance		100 MΩ minimum	
Wire Size ∗1		22-12 AWG	2 mm² (3.5 mm²)
Accessories	Marking Strip Width	9.5 mm (BNM7, BNM9, BNM725, BNM725-TK1700)	
	Dust Cover	BNC220	
	Rail	BAA1000	
	See page	31	

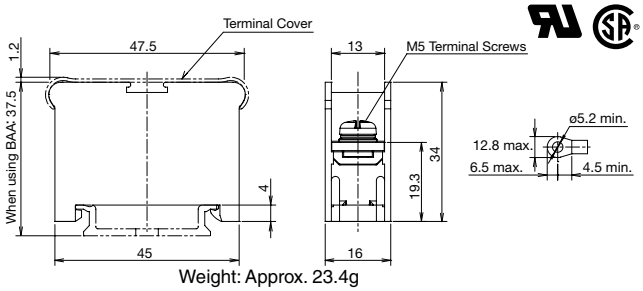
BA311T (3 Pole) 40A M4



Weight: Approx. 40.0g

Standards		UL/CSA	JIS
Insulation Voltage		150V	630V
Rated Current ∗2		30A max.	40A
Dielectric Strength		2,500V AC, 1 minute	
Insulation Resistance		100 MΩ minimum	
Wire Size ∗1		18-10 AWG	5.5 mm²
Accessories	Marking Strip Width	9.5 mm (BNM7, BNM9, BNM725, BNM725-TK1700)	
	Dust Cover	BNC230	
	Rail	BAA1000	
	See page	31	

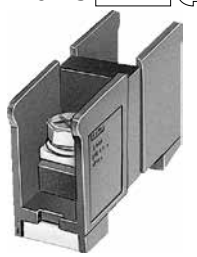
BA411S 70A M5

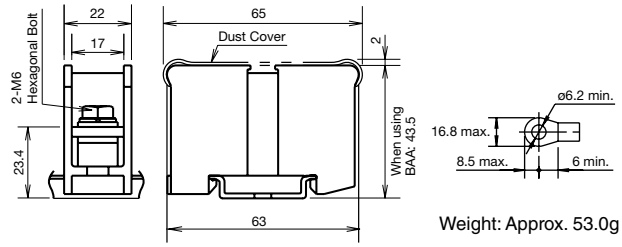


Weight: Approx. 23.4g

Standards		UL/CSA	JIS
Insulation Voltage		600V	630V
Rated Current ∗2		40A max.	70A
Dielectric Strength		2,500V AC, 1 minute	
Insulation Resistance		100 MΩ minimum	
Wire Size ∗1		16-6 AWG	14 mm²
Accessories	Marking Strip Width	9.5 mm (BNM7, BNM9, BNM725, BNM725-TK1700)	
	Dust Cover	BNC320	
	Rail	BAA1000	
	See page	31	

BA611S 94A M6



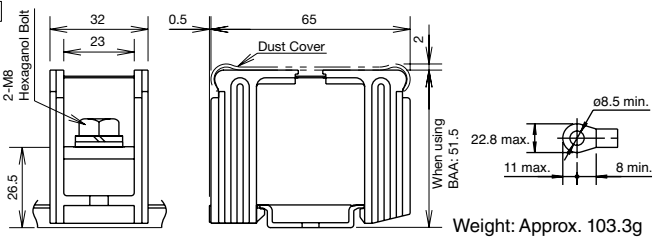


Weight: Approx. 53.0g

Socket wrench: 12.7 mm square drive hexagonal socket 10 ∗3

Insulation Voltage		1000V
Rated Current ∗2		94A max.
Dielectric Strength		2,500V AC, 1 minute
Insulation Resistance		100 MΩ minimum
Wire Size		22 mm²
Accessories	Marking Strip Width	9.5 mm (BNM7, BNM9, BNM725, BNM725-TK1700)
	Dust Cover	BNC520
	Rail	BAA1000
	See page	31

BA711S 132A M8



Weight: Approx. 103.3g

Socket wrench: 12.7 mm square drive hexagonal socket 13 ∗3

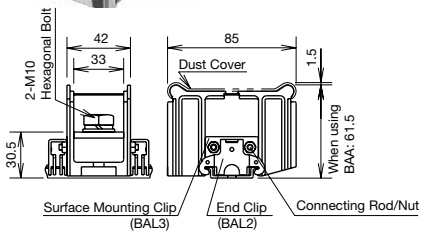
Insulation Voltage		1000V
Rated Current ∗2		132A max.
Dielectric Strength		2,500V AC, 1 minute
Insulation Resistance		100 MΩ minimum
Wire Size		38 mm²
Accessories	Marking Strip Width	9.5 mm (BNM7, BNM9, BNM725, BNM725-TK1700)
	Dust Cover	BNC520
	Rail	BAA1000
	See page	31

∗1: The wire size in ( ) does not comply with JIS standards.
∗2: The voltage/current differ according to operating conditions. See “Selecting Terminal Blocks by Current According to JIS Standards” on page 4.
∗3: Screws can be tightened with a socket wrench.
∗4: The grooves on the head of the hex bolt are for temporary tightening. For proper tightening, use an applicable socket wrench and tighten within the range of the recommended tightening torque.

BA811S 240A M10

Socket wrench: 12.7 mm square drive hexagonal socket 17

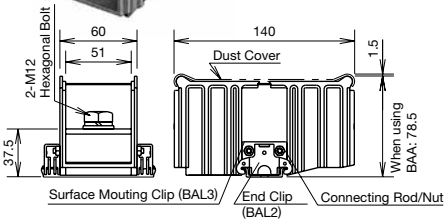
Weight: Approx. 185.0g



BA911S 370A M12

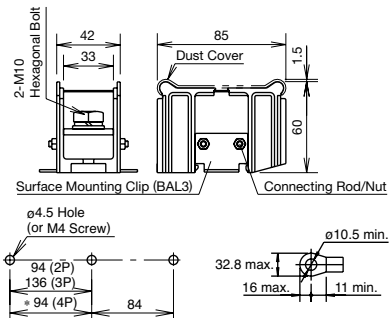
Socket wrench: 12.7 mm square drive hexagonal socket 19

Weight: Approx. 406.3g



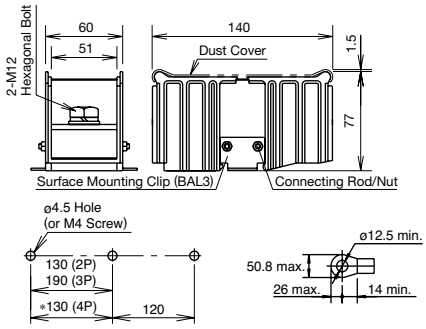
Part No.		BA811S	BA911S
Insulation Voltage		1250V	
Rated Current ∗2		240A	370 (400A)
Dielectric Strength		2,500V AC, 1 minute	
Insulation Resistance		100MΩ minimum	
Wire Size		100 mm²	200 mm² ∗1 (200 mm² 2 wires) (325 mm² 1 wire)
Terminal Screw		M10	M12
Accessories	Connecting Rod	BNR1, BNR2, BNL8	
	Connecting Nut	BAN1	
	End Clip/ Surface Mounting Clip	BAL2, BAL3	
	Marking Strip Width	9.5 mm (BNM7, BNM9, BNM725, BNM725-TK1700)	
	Dust Cover	BAC820	BNC92
	Rail	BAA1000	
	See page	31	

Surface Mounting



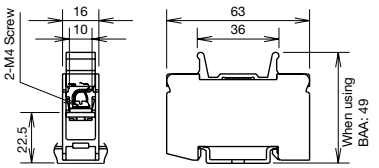
∗Use 3 surface mounting clips (BAL3) for 4-pole mounting

Surface Mounting



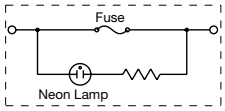
∗Use 3 surface mounting clips (BAL3) for 4-pole mounting

BAF111S□□□ (Fuse) 10A M4



- Neon lamp turns on when the fuse blows.
- For the neon lamp to turn on, the voltages must be from 100 to 250V AC.

- Internal Connection



BAF111S (with fuse)/BAF111SN (with fuse/lamp)

Insulation Voltage		1000V
Rated Current		10A max. (depends on fuse rating)
Dielectric Strength		2,500V AC, 1 minute
Insulation Resistance		100MΩ minimum
Wire Size		5.5 mm²
Terminal Screw		M4
Accessories	Marking Strip Width	9.5mm (BNM7, BNM9, BNM725, BNM725-TK1700)
	Dust Cover	—
	Rail	BAA1000
	See page	31

- Fuse ratings
  Rated voltage: 250V
  Rated current: 1, 3, 5A
  Cartridge fuse: JIS C6575-2
  6.35×31.8 mm

Part No.
BAF111S-1A
BAF111S-3A
BAF111S-5A
BAF111SN-1A
BAF111SN-3A
BAF111SN-5A

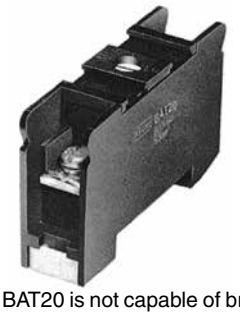
[UL/CSA approved]
BAF111S (with fuse)/BAF111SN (without fuse/with lamp)

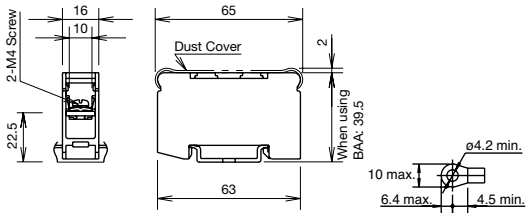
Insulation Voltage (UL/CSA)		BAF111SU: 600V BAF111SNU: 300V
Rated Current		10A max. (depends on fuse rating)
Dielectric Strength		2,500V AC, 1 minute
Insulation Resistance		100 MΩ minimum
Wire Size		18-10 AWG
Terminal Screw		M4
Accessories	Marking Strip Width	9.5 mm (BNM7, BNM9, BNM725, BNM725-TK1700)
	Dust Cover	—
	Rail	BAA1000
	See page	31

UL File No.: E78117
CSA File No.: LR64803

- UL/CSA approved products are not supplied with fuses.
- When UL/CSA approval is required for fuse terminal blocks, use UL/CSA-rated fuses (10A maximum).
- Fuse size
  6.35×31.8 mm
  6.40×30 mm

BAT20 (With Disconnecting Switch) 20A M4





Insulation Voltage		1000V
Rated Current		20A
Dielectric Strength		2,500V AC, 1 minute
Insulation Resistance		100 MΩ minimum
Wire Size		5.5 mm² max.
Terminal Screw		M4
Accessories	Marking Strip Width	9.5 mm (BNM7, BNM9, BNM725-TK1700)
	Dust Cover	BNC520
	Rail	BAA1000
	See page	31

BAT20 is not capable of breaking circuits. Do not apply voltage when opening or closing the circuit. Turn the slot using a screwdriver.

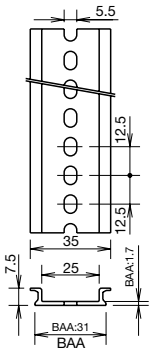
∗1: The wire size in ( ) does not comply with JIS standards.
∗2: The rated current differs according to operating conditions. See “Selecting Terminal Blocks by Current According to JIS Standards” on page 4.
∗3: The grooves on the head of the hex bolt are for temporary tightening. For proper tightening, use an applicable socket wrench and tighten within the range of the recommended tightening torque.

Accessories

Rails

DIN Rail 35-mm-wide

BAA



Length	Part No.	Ordering No.	Material	Weight (Approx.)	Package Quantity
1000 mm	**BAA1000** (Note)	**BAA1000PN10**	Aluminum	200g	10

Note: 2000 mm is also available. Contact IDEC.

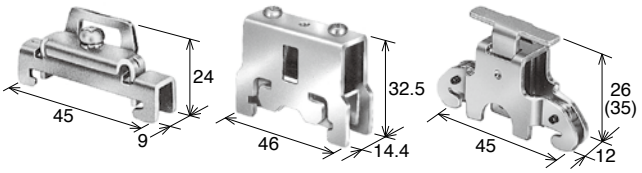
Marking Strip (BNM)

Part No.	Ordering No.	Package Quantity	Dimensions	Material
BNM7	**BNM7PN10**	10	9.5 × 0.5t × 1m	PVC (glossy surface)
BNM9	**BNM9PN10**	10	9.5 × 0.5t × 1m	Fiber Glass (matte surface)
BNM725-TK1700	**BNM725-TK1700**	1	9.5 × 0.5t × 25m	PVC (glossy surface)
BNM725	**BNM725**	1	9.5 × 0.5t × 25m	PVC (glossy surface)

Note: BNM7, BNM725-TK1700 (slick surface) recommended when printing using printers.

End Clip

Used on the ends of a group of terminal blocks to secure and prevent sliding along the rails.



BNL6 (M4 Screw) (Tightening torque: 1.1 N·m)

BNL8 (M4 Screw)

BAL2 (Weight: Approx. 25.2g)

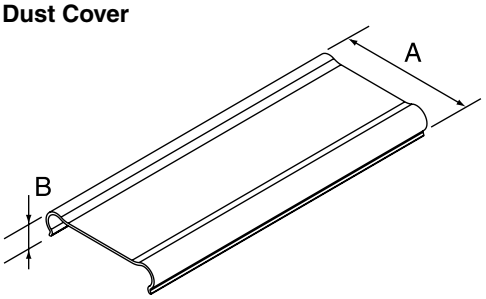
Material: Steel (zinc chrome-plated)

Part No.	Ordering No.	Package Quantity
BNL6	**BNL6PN10**	10
BNL8	**BNL8PN10**	10
BAL2	**BAL2PN10**	10

Notes on Selecting End Clips

- When using BA611S, use BAL2 or BNL8. Also, when using BA711S, BA811S, BA911S of 100A or larger, use BAL2 or BNL8.
- When mounting rails vertically, use BAL2 or BNL8.

Dust Cover



Material: Polycarbonate

Item	Part No.	Ordering No.	Size (mm)		Terminal Block	Package Quantity
			A	B		
Dust Cover (1m)	**BNC220**	**BNC220PN10**	37.6	8.5	BA111T, BA211T	10
	BNC230	**BNC230PN10**	39.6	8.5	BA311T	10
	BNC320	**BNC320PN10**	49.6	8.5	BA411S	10
	BNC520	**BNC520PN10**	65.0	9.0	BA611S, BA711S, BAT20	10
	BAC820	**BAC820PN10**	85.0	10.6	BA811S	10
Dust Cover (500 mm)	**BNC92**	**BNC92PN10**	140.5	9.8	BA911S	10

Connecting Rod/Connecting Nut (For BA811S, BA911S)

BNR1: M4 × 0.7 L = 265 (21.0g)
BNR2: M4 × 0.7 L = 500 (43.0g)

BAN1: M4 × 0.7 (2.5g)

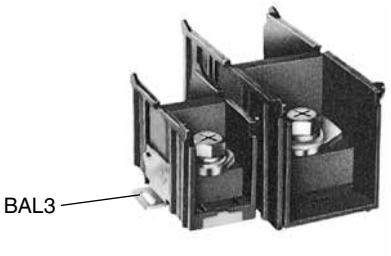
Item	Part No.	Ordering No.	Weight (Approx.)	Package Quantity	Remarks
Connecting Rod (265 mm)	**BNR1**	**BNR1PN10**	2.6g	10	M4 × 0.7
Connecting Rod (500 mm)	**BNR2**	**BNR2PN10**	43g	10	M4 × 0.7
Connecting Nut (4 pcs/set)	**BAN1**	**BAN1PN10**	2.5g	10	M4 × 0.7

Surface Mounting Clip (For BA811S and BA911S Only)

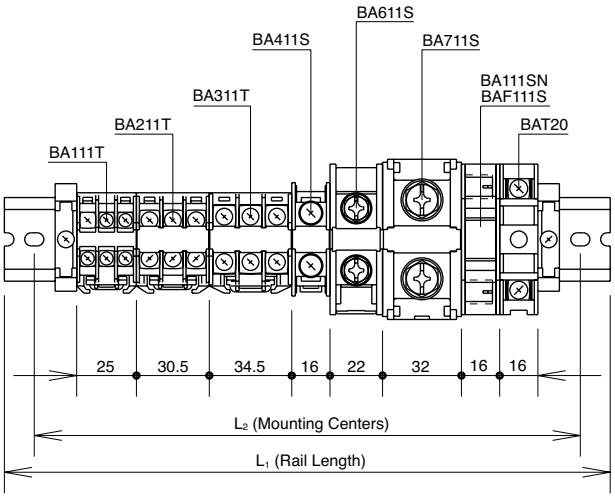
Used on the ends of groups of terminal blocks for direct mounting to panels.

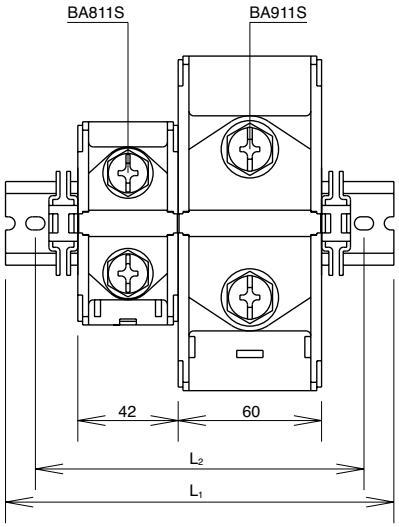
Material: Steel (zinc-chrome plated)

Part No.	Ordering No.	Weight (approx.)	Package Quantity
BAL3	**BAL3PN10**	12.4g	10



Calculating Rail / Connecting Rod Length





Calculating Rail Length

For BAA rails
$L_1 = 12.5 \times N$
$L_2 = L_1 - 25$
A: Total thickness of each terminal block
B: Tolerance of stacking thickness
0.1 mm per block
C: End Clip
When using 2 pieces of BNL6 or BAL2 = 62.5
N: Rounded up numerical number from the calculated value of M.
(Example: N for 19.1 is 20)

$$M = \frac{A + B + C}{12.5}$$

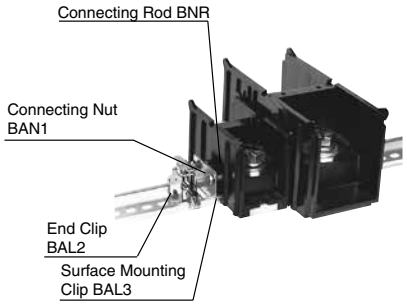
Note: This formula is for calculating the maximum rail length including tolerance. The rail length may be shorter than the calculated value, depending on how the terminal blocks are combined.

Calculating Connecting Rod Length

$L = 42 \times n_1 + 60 \times n_2 + 10.2$
n_1: BA811S
n_2: BA911S
n: The number of terminal blocks

Instructions

Installation of BA811S and BA911S



Rail Mount

1. Mount the terminal block on DIN rail.
2. Mount the surface mounting clips (BAL3) on both ends and slide 2 connecting rods (BNR) through the holes in the terminal blocks.
3. Tighten both ends of the connecting rod with a connecting nut (BAN1).
4. Secure the terminal blocks with end clips (BAL2).

Surface Mount

1. Mount the terminal block to the panel.
2. Mount the surface mounting clips (BAL3) on both ends and slide 2 connecting rods (BNR) through the holes in the terminal blocks.
3. Tighten both ends of the connecting rod with connecting nuts (BAN1).
4. Secure the terminal blocks to the panel.

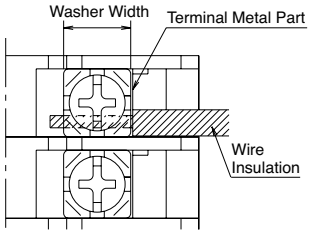
Notes on Wiring

Crimping Terminals

- When using crimping terminals, be sure to use insulated terminals to prevent electric shocks.

Without Crimping Terminals

- Insert the wire until the insulation comes into contact with the terminal metal part.
- Strip the insulation so that the wire is longer than the width of the wire clamp.
- When connecting two wires, use wires of the same size.

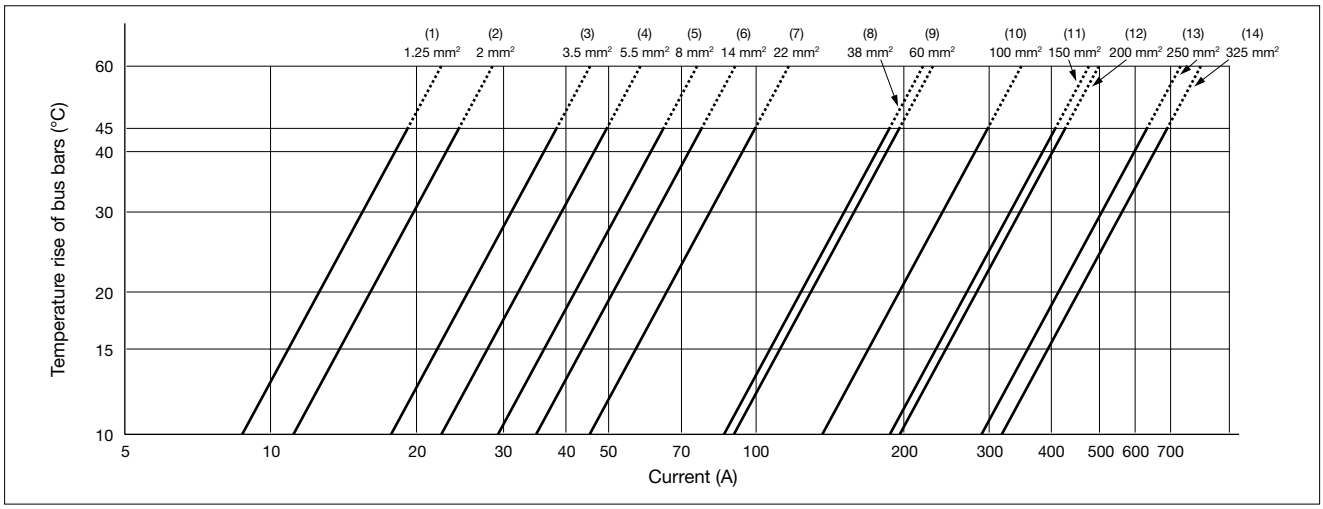


Selecting Terminal Blocks by Current According to JIS Standards

IDEC's terminal blocks are compliant with JIS C 8201-7-1. The current varies depending on the operationg conditions (wire type, number of budle wire, operating temperature, etc.). See the table below for choosing the terminal block.
When using the terminal blocks as UL, CSA, and TÜV approved products, refer to UL, CSA, and TÜV ratings.

Applicable Wire (mm^2)		1.25	2	3.5	5.5	8	14	22	38	60	100	150	200	240	325
Current (A)		16	21	30	40	50	70	94	132	175	240	310	370	430	520
Current vs. Temperature Rise at Bus Bars		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Applicable IDEC Terminal Block	BN-W BNH-W Series	BN10W BNH10W BN15MW BNH15MW BND15W BNDH15W	BN15LW BNH15LW BN15MWT BNH15MWT BND15LW BNDH15LW BND15WT BNDH15WT	BN15LWT BNH15LWT	BN30W BNH30W	BN40W BNH40W	BN50W BNH50W	BN75W	BN100W	BN150W BN150NW	BN200BW BN200NW	BN300BW BN300NW	BN400BW BN400NW	BN500BW BN500NW	BN600NW
	BA Series	BA111T	BA111T BA211T	—	BA311T	—	BA411S	BA611S	BA711S	—	BA811S	—	BA911S	—	
	BTB BTBH Series	BTB15C BTBH15C	BTB15LC BTBH15LC	—	BTB30C BTBH30C	—	BTB50C BTBH50C	—							
	BD Series	BD8 BD8S	—												

Current vs. Temperature Rise at Bus Bars



How to read the graph

When using IDEC terminal blocks, make sure that the operating temperature and the temperature of the bus bars do not exceed 100°C. However, the upper limit of the temperature rise is limited to 45°C by JIS C 8201-7-1.

Operating temperature + Temperature rise at bus bars ≤ 100°C

Note: Select wires according to the allowable temperature, operating temperature, and temperature rise of bus bars.

About SCCR of Terminal Block

When exporting machine or systems to the USA, the smallest short-circuit current rating of the control board's main circuit must be displayed as SCCR (short-circuit current rating) value. SCCR is specified by UL508A-2001, Supplement SB, Table SB4.1. The value is 10kA for terminal block.