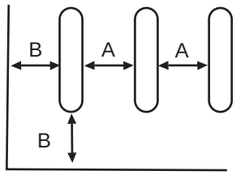
ANSI Specification Typical “Indoor” Clearance for Rectangular Bars

These spacings should not be adopted without actual testing by the user. Sharp electrodes and unusual geometries will require wider spacing.

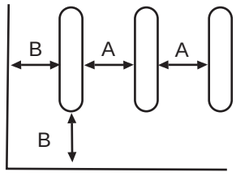


System Voltage	BIL	Uninsulated		BPTM		BBIT	
KV	**KV**	**A***	**B****	**A***	**B****	**A***	**B****
15	95	7.5“	5“	3.4“	4.2“	2.2“	2.6“
25	125	10.5“	7.5“	4.5“	6.0“	2.8“	4.0“
35	150	2.5“	9.5“	6.5“	8.0“	5.6“	7.5“

*phase to phase **phase to ground

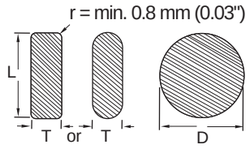
IEC Specification Typical "indoor" clearance for rectangular bars

These spacings should not be adopted without actual testing by the user. Sharp electrodes and unusual geometries will require wider spacing.

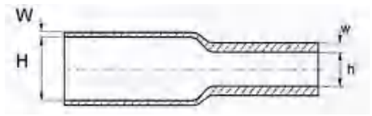


System Voltage	BIL	Uninsulated Clearance-Indoor		BPTM Clearance-Indoor		BBIT Clearance-Indoor	
KV	**KV**	**A***	**B****	**A***	**B****	**A***	**B****
12	75	120	120	65	75	2.2“	2.6“
24	125	220	220	115	150	2.8“	4.0“
36	170	320	320	200	285	5.6“	7.5“

*phase to phase **phase to ground

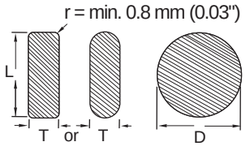


L refers to the width and
T refers to the thickness

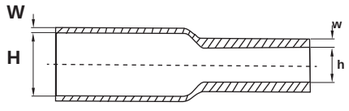


W and **H** refer to the wall thickness and internal diameter as supplied
w and **h** refer to the wall thickness and internal diameter after free recovery

Product Description	Rectangular bars L + T mm (in)		Round bars D mm (in)		Inside diameter mm (in)		Wall thickness mm (in)	
	min.	max.	min.	max.	H min.	h max.	W min.	W max.
BPTM-15/6-A/U	12 (0.47)	18 (0.71)	6.5 (0.25)	12 (0.47)	15 (0.59)	6 (0.24)	1.1 (0.04)	1.90 (0.07)
BPTM-30/12-A/U	22 (0.87)	38 (1.50)	13.5 (0.53	25 (0.98)	30 (1.18)	12 (0.47)	1.1 (0.04)	2.20 (0.09)
BPTM-50/20-A/U	36 (1.42)	65 (2.56)	22 (0.87)	43 (1.69)	50 (1.97)	20 (0.79)	1.1 (0.04)	2.35 (0.09)
BPTM-75/30-A/U	55 (2.17)	95 (3.74)	33 (1.30)	63 (2.48)	75 (2.95)	30 (1.18)	1.1 (0.04)	2.35 (0.09)
BPTM-100/40-A/U	70 (2.76)	130 (5.12)	44 (1.73)	86 (3.39)	100 (3.94)	40 (1.57)	1.1 (0.04)	2.35 (0.09)
BPTM-120/50-A/U	90 (3.44)	165 (6.50)	55 (2.17)	105 (4.13)	120 (4.72)	50 (1.97)	1.3 (0.05)	2.80 (0.11)
BPTM-175/70-A/U	125 (4.92)	235 (9.25)	80 (3.15)	150 (5.91)	170 (6.69)	70 (2.76)	1.3 (0.05)	2.80 (0.11)
BPTM-205/110-A/U	200 (7.87)	276 (10.87)	127 (5.00)	190 (7.48)	205 (8.07)	110 (4.33)	1.3.(0.05)	2.80 (0.11)
BPTM-235/130-A/U	235 (9.25)	315 (12.40)	150 (5.91)	220 (8.66)	235 (9.25)	130 (5.12)	1.5 (0.06)	3.10 (0.12)



L refers to the width and
T refers to the thickness



W and **H** refer to the wall thickness and internal diameter as supplied
w and **h** refer to the wall thickness and internal diameter after free recovery

Product Description	Rectangular bars L + T mm (in)		Round bars D mm (in)		Inside diameter mm (in)		Wall thickness mm (in)	
	min.	max.	min.	max.	H min.	h max.	W min.	W max.
BBIT-25/10-A/U	17 (0.67)	28 (1.10)	11 (0.43)	20 (0.79)	25 (0.98)	10 (0.39)	1.6 (0.06)	3.6 (0.14)
BBIT-40/16-A/U	28(1.10)	45 (1.77)	18 (0.71)	32 (1.26)	40 (1.57)	16 (0.63)	1.6 (0.06)	3.6 (0.14)
BBIT-65/25-A/U	44 (1.73)	69 (2.72)	28 (1.10)	47 (1.85)	65 (2.56)	25 (0.98)	1.6 (0.06)	3.6 (0.14)
BBIT-100/40-A/U	69 (2.72)	102 (402)	44 (1.73)	72 (2.83)	100 (3.94)	40 (1.57)	1.6 (0.06)	3.6 (0.14)
BBIT-150/60-A/U	102 (4.02)	148 (5.83)	65 (2.56)	105 (4.13)	150 (5.91)	60 (2.36)	1.6 (0.06)	3.6 (0.14)
BBIT-175/80-A/U	133 (5.24)	196 (7.72)	85 (3.35)	125 (4.92)	175 (6.89)	80 (3.15)	1.6 (0.06)	3.6 (0.14)

INSTALLATION INSTRUCTIONS

EPP-3264-12/18

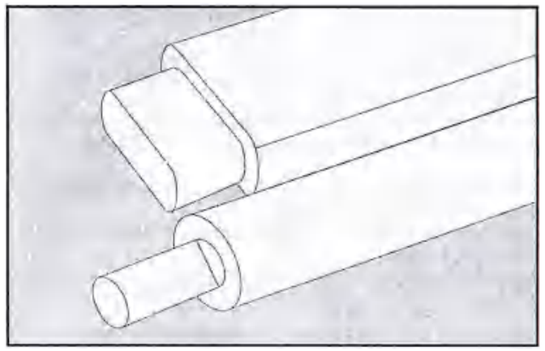
Insulation Enhancement Heat Shrink Tubing for Busbars

BPTM Busbar Insulation Tubing For 25 kV Flashover Protection

BBIT Busbar Insulation Tubing For 36 kV Flashover Protection

TE Connectivity
Wildlife and Asset Protection

BPTM / BBIT



Before Starting

- Check to ensure that the kit you are going to use fits the cable.
- Refer to the kit label and the title of the installation instructions.
- Components or working steps may have been modified since you last installed this product.
- Carefully read and follow the steps in the installation instructions.

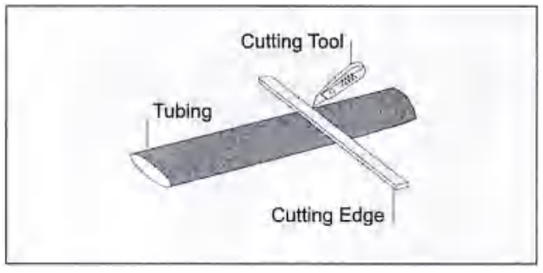
General Instructions

- Use a propane (preferred) or butane gas torch.
- Ensure the torch is always used in a well-ventilated environment.
- Adjust the torch to obtain a soft blue flame with a yellow tip.
- Pencil-like blue flames should be avoided.
- Keep the torch aimed in the shrink direction to preheat the material.
- Keep the flame moving continuously to avoid scorching the material.
- Clean and degrease all parts that will come into contact with adhesive.
- If a solvent is used follow the manufacturer's handling instructions.
- Start shrinking the tubing at the position recommended in the instruction.
- Ensure that the tubing is shrunk smoothly all around before continuing along the cable.
- Tubing should be smooth and wrinkle free with inner components clearly defined.

Cutting Length & Technique

Care should be taken when cutting tubings to ensure that the cut edge is clean (no jagged edges). A cutting tool (utility knife) or a guillotine with a suitably sharp blade and the facility for clamping the tubing during cutting is recommended. A paper cutter with a curved blade has been used successfully (one stroke only).

When measuring tubings for long lengths, about 5 - 10% extra length should be added to take account of longitudinal shrinkage.



For more information: te.com/energy

Please dispose of all waste according to environmental regulations.

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Installation Instructions-Straight Busbar

Remove any sharp edges from the busbar by filing smooth.
Clean and degrease the busbar.
Preheat the busbar until it is hot to the touch.
Note: To prevent possible damage to the inside of the tubing when positioning tubing over the busbar, apply 4-5 wraps of PVC tape over the end of the busbar as shown in the inset drawing.

Environmental Seal Option

If an environmental seal is required, apply sealing mastic S1085 (50% overlap, 50mm wide) to the busbar before installing the tube.
Slide tubing over the busbar to the required position.Remove any protection tape from the ends of the busbar.
BPTM/BBIT is a fast shrinking tubing. To avoid wrinkling or overlapping, apply slight tension to the tubing by pulling in the direction shown in the drawing.
Shrink tubing, starting from one end, moving the flame continuously while moving the gas torch towards the other end of the busbar.

Note: Inspect the tubing surface. Any flat spots or wrinkles should be reheated until the surface is smooth.
During reheating the torch should be moved continuously to avoid scorching the material.
Note: After installation the tubing may require trimming back to allow bolted connections to be made. Wait until tubing has cooled and mark trim lines on the tubing.
Using a sharp knife and a straight edge cut around trim lines. The end of the tubing should be smooth and free of any nicks.

Installation on straight busber completed.

Installation Bent Busbar

Remove any sharp edges from the busbar by filing smooth.
Clean and degrease the busbar.
Using a gloved hand apply a thin layer of high temperature grease (eg. EPPA 212) to the busbar (inner and outer surfaces) at the position shown in the drawing.
The grease will help the tubing slide around the bent busbar during shrinking

Preheat the busbar until it is hot to the touch.
Note: To prevent possible damage to the inside of the tubing when positioning tubing over the busbar, apply 4-5 wraps of PVC tape over the end of the busbar as shown in the inset drawing
Tape should be removed before shrinking the tubing

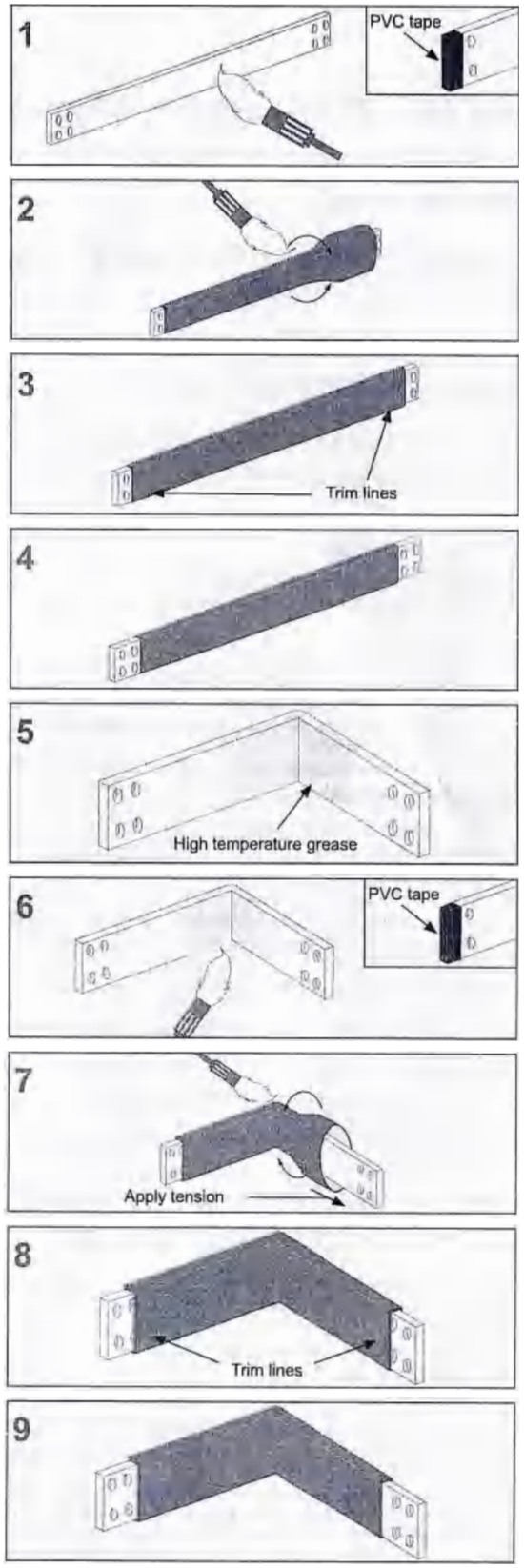
Environmental Ses Option

If an environmental seal is required, apply sealing mastic S1085 to the busbar before installing the tube.
Slide tubing over the busbar to the required position.
Remove any protection tape from the ends of the busbar.
BPTM/BBIT is a fast shrinking tubing. To avoid wrinkling or overlapping, apply slight tension to the tubing by pulling in the direction shown in the drawing.
Shrink tubing, starting from one end, moving the flame continuously while moving the gas torch towards the other end of the busbar.

Note: Inspect the tubing surface. Any flat spots or wrinkles should be reheated until the surface is smooth to the touch.
During reheating the torch should be moved continuously to avoid scorching the material.

Note: After installation the tubing may require trimming back to allow bolted connections to be made.
Wait until tubing has cooled and mark the trim lines on tubing.
Using a sharp knife and a straight edge cut around trim lines. The end of the tubing should be smooth and free of any nicks.

Installation on bent busbar complete

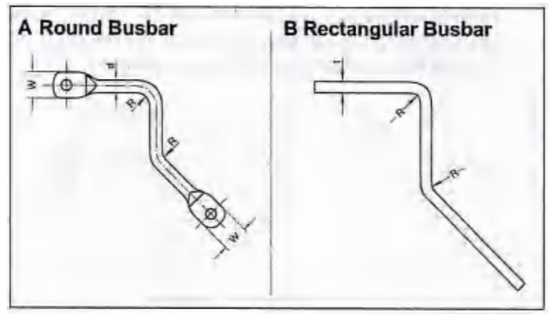


Busbar Configuration

The width **W** of the terminals should not exceed 1.25 times supplied tubing diameter (Drawing A).
Burrs should be removed to avoid damage to the tubing.
The bending radius R should not be less than:

round busbar R = 2 x d (Drawing A)
rectangular busbar R = 3 x t (Drawing B)

d = Overall diameter
w = Width of terminal
t= Thickness of the busbar

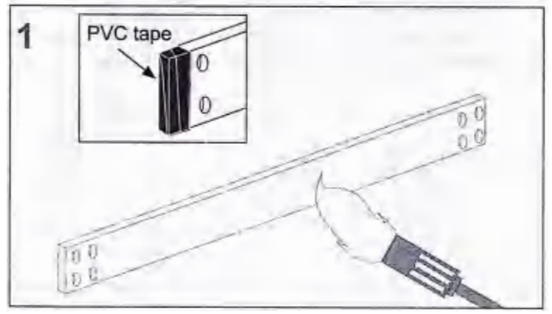


Remove any sharp edges from the busbar by filing smooth.

Clean and degrease the busbar.

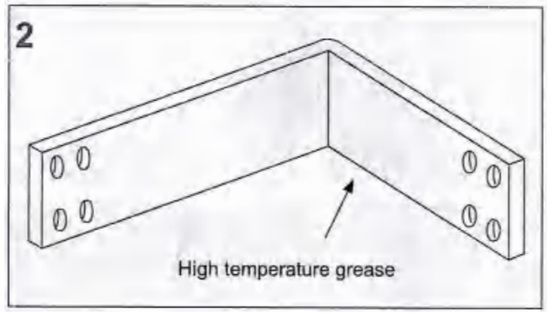
To prevent possible damage to the inside of the tubing when positioning tubing over the busbar, apply 4-5 wraps of PVC tape over the end of the busbar as shown in the inset drawing.

Note: Remove any PVC tape before starting the recovery procedure.



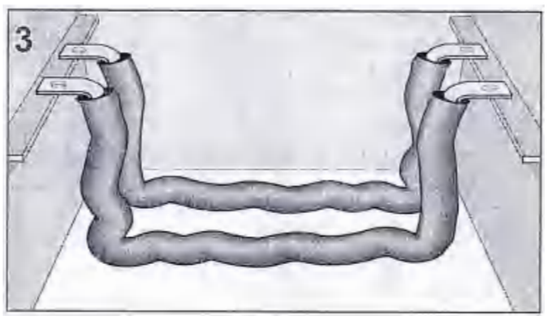
Lubricate bent busbars by applying a thin film of grease with a melting temperature above intended shrink temperature (e.g. silicone grease such as EPPA 212).
Straight busbars do not need to be lubricated. Slide the tubing over the busbar.

Note: Bent busbars and especially U-shaped busbars may cause a certain longitudinal shrinkage of the tubing. To achieve full coverage of the bar up to the terminals, apply the tubing in folds evenly over the total length. For bars with several bends it is recommended to determine the exact length with a trial run.



Tubing Recovery Procedure

For industrial production an oven with air circulation is recommended with a minimum temperature of 135°C.
Place the bars with tubing in the prewarmed oven.
Suspend or support the bars at the terminals as shown to allow unrestricted recovery.
The shrinking temperature should not exceed 180°C.



Installation Inspection and Finishing

A correctly installed tube will be smooth and conform to the contour of the busbar, free of creases and folds.
Allow the insulated busbar to cool to room temperature before beginning any trimming of the ends to the required length and/or punching of any holes in the tube.
Note: Cold spots (or dimpling) may be present if the oven temperature was too low or if the bars did not remain in the oven long enough. To prevent dents in the tubing, avoid resting bars against any hard surface while cooling. Cold spots andd ents may be eliminated by returning the bars to the oven..