Consultant specification: Powerduct Busway

1. Manufacturer

1.1 All low voltage busbar trunking systems (busways) shall be Powerduct Series manufactured by Power Plug Busduct for IPD.

2. Product

2.1 General

2.1.1 The busbar trunking system (400A and above), both feeder and plug-in, shall be of low impedance and sandwich construction, with no air gaps between busbars except at joints and plug-in openings.

2.1.2 All busbar trunking and accessories (straight lengths, flanged ends, end feed units, elbows, offsets, tees, plug-in boxes, etc.) shall comply with AS/NZS 61439.6:2016 and be from the same manufacturer.

2.1.3 Rated operating voltage of the busbar trunking system shall be ≤1000V.

2.1.4 Busbar trunking system should be 3-Phase, 4 or 5 wire with continual integral (housing) or internal earthing busbar. External bolt-on earthing busbars shall not be accepted.

2.1.5 The neutral busbar shall have an equal or greater cross-sectional area than the phase conductors.

2.1.6 For indoor applications, the busbar trunking system must have a minimum ingress protection rating of IP54, when completely installed.

2.1.7 For outdoor applications the busbar trunking systems must have a minimum ingress protection of IP66, when completely installed.

2.1.8 The busbar, of full range and current rating, should pass full type tests specified in AS/NZS 61439.6: 2016.The certificate of compliance shall be issued by an internationally recognised, independent testing authority (e.g. KEMA, DEKRA, etc.)

2.1.9 A product safety mark (e.g. KEMA-KEUR) should be on each length of busbar trunking to provide visible assurance that the product has been deemed to meet all quality and safety standards.

2.1.10 The whole busbar trunking system shall have a nominal insulation voltage of 1000V.

2.1.11 The minimum short circuit ratings of the busbar trunking system shall be as follows.

Aluminium conductors

Rating (A)	Icw (kA)	Ipk (kA)
400	20	40
600	20	40
800	20	40
1000	20	40
1200	50	105
1350	60	132
1600	60	132
2000	90	198
2500	80	176
3200	100	220
4000	128	282
5000	128	282

Copper conductors

Rating (A)	Icw (kA)	Ipk (kA)
400	15	30
600	20	40
800	40	34
1000	50	105
1200	70	154
1350	80	176
1600	80	176
2000	95	212
2500	95	212
3200	83	183
4000	150	330
5000	180	396
6300	150	330

2.2 Housing

2.2.1 The busbar trunking housing shall be constructed from 2mm total extruded aluminium with anodised finish.

2.2.2 The busbar trunking housing shall be totally enclosed and non-ventilated to protect against mechanical damage and dust accumulation.

2.2.3 The busbar trunking housing shall be manufactured by the busbar trunking manufacturer. Any modifications to the busbar trunking housing by others will void the manufacturer's warranty, without written consent from the manufacturer.

2.3 Busbars

2.3.1 Busbars shall be aluminium with conductivity in excess of 60% IACS, or copper with conductivity in excess of 99% IACS.

2.3.2 All contact surfaces of the busbars shall be fully electroplated with nickel tin or silver to ensure a firm connection is made at joints and plug-in points.

2.3.3 All busbars shall be insulated with a non-hygroscopic, self-extinguishing epoxy powder coat and then wrapped in Mylar® to provide sufficient protection against the ingress of dust and water. Insulation shall be minimum Class B 130°C.

2.3.4 All insulation processes of the busbar shall be completed by the manufacturer and not by others.

2.3.5 The temperature rise at any point of the busbar shall not exceed 55°C above ambient temperature when at full load.

2.4 Joint

2.4.1 The busbar trunking joints shall be of bridge / mono-block design to allow for electrical isolation of busbar trunking system without needing to remove adjacent sections of busbar trunking lengths.

2.4.2 The joining bolt shall be double-headed and designed to shear off automatically when the correct torque is applied.

2.4.3 Belleville spring washers shall be used to ensure the original contact pressure is maintained across the joint and provide a secure and reliable connection.

2.4.4 Removal side covers shall be provided to maintain the ingress protection of the busbar trunking system and allow for visual inspection of joint during routine maintenance.

2.5 Tap-off Box

2.5.1 The tap-off box shall be of plug-in type for up to 800A.

2.5.2 The tap-off box shall be of bolt-on type for 800A and above.

2.5.3 The tap-off box shall come with Interlocking door to prevent the tap-off box enclosure from being opened when the switchgear is in the 'ON' position.

2.5.4 The tap-off box shall come with Mechanical Interlocking that prevents the tap-off box from being removed from the busbar trunking when the switchgear is in the 'ON' position.

2.5.5 The earthing contact of the tap-off box shall always be made before the live conductors during installation and the last to break during removal.

2.6 Supports

2.6.1 Hanger spacing shall be noted on layout drawings and shall not exceed the manufacturer's recommendations.

2.6.2 Hold down brackets are to be used every 2.5 metres to minimise vibrations and prevent movement of the busbar trunking system when energised.

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