TAMCO 33kV METALCLAD
WITHDRAWABLE SWITCHGEAR: SCHEDULE OF TECHNICAL DATA

Item no.	Description Ratings & Electrical Requirements	Unit	Performance Data *
1	**General Details**		
	Manufacturer's Name		TAMCO
	Typical Layout and sectional Drg of Switchgear supplied to Australian environment		REFER DRG NO CC/33AIS/08/2008
	Switchgear Model No		VH3
	Type		METAL CLAD
2	**Applicable Standards**		IEC 62271:200
	Enclosure		IEC 62271:200
	Circuit Breaker		IEC 62271:100
	Current Transformers		AS 60044.2
	Voltage Transformers		AS 60044.2
3	**General Performance**		
	Rated Frequency	Hz	50
	Rated Voltage	kV (RMS)	33
	Highest Voltage	kV	36
	Rated Insulation Level:		
	4.1 One minute power frequency withstand voltage	kV (RMS)	70
	4.2 Impulse withstand	kV (Peak)	185
	Rated Short Time Current	kA	UP TO 31.5
	Rated Duration of Short Circuit time	Sec	3
	Internal Arc Fault Performance	kA	25
	Time	Sec	0.1
	Standard		IEC 62271:200
	Rated Fifteen-Minute DC Withstand Voltage of Parts Directly Connected to Power Cables:		
	7.1 Between Phases	kV DC	66
	7.2 Between All Phases and Earth	kV DC	66
	Operating Cycle		0-0.3s -CO-3 Min-CO
	Critical Corona Voltage (Phase to Earth)	kV (RMS)	23
	Voltage Drop Across Terminal of a Pole at Rated Normal Current	Milli-Volts	34 (for 1250A) 42 (for 2000A)
	Length of Each Break	mm	23
4	**Earthing Devices**		
	Rated Short Circuit Making Current	kA (Peak)	79

5	**Busbars and Connectors**		
	Rated Normal Current Main Busbar Circuit Connectors		 2,000 1,250 / 2000
	Resistance of Main Contacts for VCB Truck	Micro-Ohms	22

6	**Cubicle**	**Behind Closed Door Operation**	
	Whether separate metal compartments are provided for circuit breakers, fuse switches, busbars, current transformers, voltage transformers, cable boxes, i.e. whether switchgear is metalclad in accordance with BS 5227		SEPARATE METAL COMPARTMENTS ARE PROVIDED FOR CIRCUIT BREAKER, BUSBAR AND CABLE CHAMBER
	Whether switchgear is extensible		YES
	Degree of Protection		IP42
	Whether Space Heater is provided in the Switchgear		YES
7	**Circuit Breakers**		
	Type of Circuit Breaker (i.e. whether Vacuum of SF6)		VACUUM
	Vacuum Interrupter (Manufacture/Country of Origin)		EATON or Equivalent
	Number of Breaks per Pole		SINGLE BREAK PER POLE
	Length of Each Break	mm	23
	Material Of Current Carrying Conductors		COPPER
	Type of Main Current Contact/Material		BUTT./CU-CR Spiral
	Type of Arching Contacts/Material		N/A
	Type of Arc Control Devices		VACUUM
	Thickness of Vacuum Circuit Breakers Shell Circuit Breaker Pole Chamber	mm	7.2
	Whether any separate Switch Trucks or Handles required for Circuit Breaker Transfer		NOT NECESSARY
	Method of Isolation (i.e. whether Circuit Breaker is horizontally isolated)		HORIZONTALLY ISOLATED
	Type of Isolating Contacts On Circuit Breaker On Fixed Portion Material of Contacts		 TULIP CONTACT ROD FOR TULIP CONTACT COPPER
	Whether any Seal provided for the Orifice		SHUTTER
	Whether it is possible to locate the Circuit Breaker in the following position: Service position Disconnected position		 YES YES

	Test position		YES
	Removed position (Maintenance position)		YES
	Circuit Earth position		N/A
	Rated Transient Recovery Voltage (in accordance with IEC62271:200):		
	TRV Peak Value for Terminal Faults at Rated Short Circuit Breaking Current (u_c)	kV	61.5
	Time Co-ordinate (t_3)	µs	10.7
	Time Delay (t_d)	µs	16.2
	Voltage Co-ordinate (u^1)	kV	20.8
	Time Co-ordinate (t^1)	µs	51
	Rate of Rise (u_c/t_3)	kV/µs	0.57
	First-Pole-to-Clear Factor		1.5
	Rated Power Frequency Recovery Voltage	kV (RMS	36
	Small Inductive Breaking Current:		
	16.1 Rated Small Induction Breaking Current	A (RMS)	20
	16.2 Maximum Instantaneous Value of Current chopped by Circuit Breakers when breaking Small Inductive Currents	A (RMS)	3
	Cable-Charging Breaking Current:		
	Rated Cable-Charging Breaking Current	A (RMS)	50
	Maximum Instantaneous Value of Current chopped by Circuit Breakers when breaking Cable Charging Currents	A (RMS)	3
	Maximum TRV when Breaking Cable-Charging Current up to rated Value:		
	On Supply Side of Circuit Breaker	kV (Peak)	36
	On Load Side of Circuit Breaker		64
	Opening Time	ms	25
	Whether Circuit Breaker can be Closed whilst the Closing Spring is being charged		NO
	Whether Closing Spring can be Charged with the Circuit Breaker in the Closed Position		YES
	Whether Locking Facilities are provided for the Manual Tripping of the Circuit Breaker		YES
	Whether the following Position Indicators are provided:		
	For Circuit Breaker		
	Spring Charged Spring Free		YES
	"ON" "OFF"		YES
	Earth "ON" Earth "OFF"		YES

8	**Insulation**		
	Minimum Clearance of any Live Parts		
	For VCB		
	Between Phases	mm	205
	Between Phases	mm	255
	Live Part to Earth	mm	260
	Type of Solid Insulating Material for:		
	Busbars		EPOXY
	Busbars to Circuit Breaker		POLYURETHANE (P.U.)
	Circuit Breaker Isolating Contact Orifices		N.A (PLUG-IN CONTACT)
	Circuit Breaker to Cable Box Connectors		POLYURETHANE (P.U.)
	Circuit Breaker Contact Arms		
	Current Transformers		PLUG-IN CONTACT
	Voltage Transformers		RING TYPE CT - PVC TAPE WOUND TYPE CT - EPOXY
			EPOXY RESIN
9	**Busbar and Connectors**		
	Material of Busbar and Connector		COPPER
	Cross-sectional Area of Busbars and Connector Conductors:		
	Main Busbar		1 -10 X 150 (2000A) (TINNED COPPER)
	Connectors		3 -10 X 75 (2000A) (TINNED COPPER)
	Type of Busbar and Connector Insulating Materials and whether Condenser Bushings used		
10	**Dimensions and Weights**		
	Width	mm	FEEDER & INCOMER 1,200 BUS SECTION 2,400
	Depth	mm	SINGLE BUS 3,080 (typical) DOUBLE BUS 3,200 (typical)
	Height	mm	SINGLE BUS 2,300 (typical) DOUBLE BUS 2,400 (typical)
			SINGLE BUS 1,350 (typical) DOUBLE BUS 1,650 (typical)
	Cubicle Weight w/o VT	Kg	1,850
	Typical Weight of VT	Kg	300
	Total Weight of panel + VT	Kg	2,150

11	**Cable Termination**		
	Type of Cable Termination		HEAT SHRINK OR EQUIVALENT
	Cable Gland Plates Provided		YES
	Whether 3 Phase or Single Phase VTS employed		SINGLE
	Highest Working Voltage	kV	1.2 TIMES
	Whether Primary of VTS are Protected with Fuse Links		YES
	Rated Voltage Factor/Duration		1.9 FOR 10 SECONDS
	Whether VTS are installed on Load Side of Circuit Breaker		YES
	Type of Core Material		SILICON STEEL
	Whether it is Withdrawable Type		NO: FUSES ARE ISOLATABLE
12	**Neon Indication**		
	Type of Neon Potential Indicators		VOLTAGE TAPED FROM BUSHING ON WHICH RING CT's ARE MOUNTED
13	**Switchgear Metal Enclosures**		
	Thickness of Enclosure Metal Panels	mm	2.5mm
14	**Earthing Bars**		
	Cross Sectional Area of Copper Main Earth Bar for Switchboard	mm	180
	Cross Sectional Area of Copper Subsidiary	mm	180
15	**Locks and Locking Facilities**		
	Whether Locking Facilities are Provided for: Shutter on the Busbar Orifice Shutter on the Circuit Orifice Circuit Breaker in its Service Position Circuit Breaker in its Earth Position		 YES YES YES N/A AS THE EARTHING IS VIA INTEGRAL EARTHING SWITCHES AND IS PADLOCKABLE