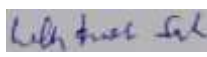


		 A4-10	BHEL ELECTRONICS DIVISION PES-TRACTION ENGG DC-DC POWER SUPPLY		PS4452709																																												
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			1. General Instructions: 1.1 The supplier shall submit the offer / bids in two parts: Part 1: Techno-commercial bid (without pricing). Unpriced price bid to be enclosed in the technical bid. List of type tests shall be clearly indicated in the technical bid. The type tests are to be performed in any NABL certified laboratories. Part 2: Price bid with price of 1 set (02 nos) of DC-DC power supply 2. Introduction 2.1 General description and Scope of supply: The scope of this specification covers Design, manufacture, testing at supplier's works, supply and commissioning of DC-DC Power supplies for Traction Applications. Every basic unit uses two DC-DC power supplies to supply 24V DC to indication lights and control electronics. The supplier shall supply two identical DC-DC power supplies to be used in parallel.	

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COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		3. Technical Specification of Power Supply i. Input voltage range : Continuous 77V - 143V DC Dynamic 66V - 154V DC ii. No-load current/sleep mode : To be specified by supplier along with quotation iii. Output voltage : 24V DC±2%, iv. Response time : < 5mS v. Nominal power : 200-300W vi. Efficiency : ≥ 90% at 110V-Full load vii. Output current (max) : 15A viii. Converter principle : Buck + Push-pull or any better ix. Ambient temperature : -40°C to +85°C x. Build in position : Vertical, Free air convection xi. Storage temperature : Electrolytic Capacitors, -40°C to +50°C /short term 85°C xii. Isolation test voltage : 1500VAC /50Hz 1 min, Input – PE 1500VAC /50Hz 1 min, Output – PE 1500VAC /50Hz 1 min, Input – Output xiii. Fuse (Internal) : Shall be intimated by supplier xiv. Input polarity protection : Active Diode xv. Connectors : Suitable for Traction application. xvi. Supplier required to explain the circuit operation xvii. Cooling : Inbuilt - xviii. Potential free contacts : One c/o contact to indicate healthiness status of output xix. Mounting arrangement : DIN rail mounted, Supplier to provide dimensional drawing and 3D model (STEP format) to check for dimensional compatibility with BHEL make traction converter cubicle. xx. Indicator/Alarms : Defined below xxi. Supplier shall submit MTBF of the DC power supply xxii. Dimensions : Supplier to provide the dimensions. Should be as compact as possible to fit in BHEL make cubicle. Maximum dimensions (l x b x h): 220x100x40mm.		

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4. Input voltage and output monitoring

4.1 Under voltage fault logic shall be as follows:

4.1.1	Input Voltage less than 62Volts	Shutdown all the outputs with an UV Fault LED Indication.
	Input Voltage reaches 76 to 77V after UV fault	Automatic resumption of all the outputs.
4.1.2	Output voltages less than specified range as per clause No. 3	Shutdown all the outputs with an UV Fault LED Indication. Automatic resumption of all the outputs when these output voltage reaches with in tolerance limits

4.2 Over voltage fault logic shall be as follows:

4.2.1	Input Voltage more than 154 Volts:	Shutdown all the outputs with an OV Fault LED Indication.
	Input Voltage reaches 143V after over voltage fault	Automatic resumption of all the outputs.
4.2.2	Output voltages more than specified range as per clause No. 3	Shutdown all the outputs with an OV Fault LED Indication. Automatic resumption of all the outputs when these output voltage reaches with in tolerance limits.

5. Output Currents are to be monitored. If output current exceeds the rated values, shutdown the output and indicator should be provided.

6. List of tests to be conducted

6.1 Routine Tests

6.1.1	Visual inspection
6.1.2	Line regulation
6.1.3	Load Regulation
6.1.4	Output ripple measurement at different load conditions
6.1.5	Input under Voltage/Over Voltage, Output Fault
6.1.6	LED indication-input, output, fault

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