INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Ref. PR No. 1000051915 **RFx. No. 6100002700**

1. **Item Description: DC power supplies – 12kW, 300V (Qty 1)**

Sr. No	Parameter	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	Rated output	Max. Voltage: ≥300V, Max. Current: ≥(-150A to +150A) Max. Power: ≥(-12KW to + 12KW), Resistance: 0 to 1Ω		
2.	Line Regulation	Voltage: ≤0.01%F S, Current: ≤0.05%FS		
3.	Load Regulation	Voltage: <0.02%FS, Current: <0.05%FS		
4.	Setup and Readback Resolution	Voltage: ≤0.1V, Current: ≤0.01A, Power: ≤0.001kW, Resistance: ≤0.001Ω		
5.	Setting and Readback Accuracy within 12 months 25°±5° ± (%of Output +Offset)	Voltage: ≤0.02% + 0.02%FS, Current: ≤0.1% + 0.1%FS Power: ≤0.5% + 0.5%FS Resistance: ≤1% + 1%FS		
6.	Ripple (20Hz -20MHz)	Voltage: ≤120mVpp (MAX:≤600mVpp) Current: ≤0.1%FS RMS		
7.	Rising Time (Voltage)	No load condition: ≤15ms Full Load Condition: ≤30ms		
8.	Falling Time (Voltage)	No load condition: ≤30ms Full Load Condition: ≤15ms		
9.	Transient Response Time	Voltage: ≤2ms		
10.	Remote Sense Compensation Voltage	≤5V		
11.	Instruments Criteria	Should have Bi-directional source and regenerative sink function up to the specified ratings		
		Built-in function generator, support arbitrary waveform Generating,		
		Adjustable output impedance		
		Should Support CC/CV priority mode, LIST mode,		
		Should Support multiple working modes, adjustable rising and falling time		
		Strong dynamic driving profile simulation function, up to 10,000,000 points		
12.	Communication Interfaces	Standard Built-in USB/CAN/LAN/digital IO interface, Front panel USB host port for quick data import/export of List files and Data logging. Instrument should provide with std. PC software to control the instrument functions from PC. Command Response Time : 2ms		
13.	Trigger System	Selectable Trigger function as Immediate, Manual, Bus, External		
14.	AC Input	Input Voltage: Three phases: 342V~528V (3P 4W)		
		Max. Input current 34A or less. Frequency: 47Hz~63Hz		

15.	Efficiency	Regenerative efficiency ≥ 92%, Should Support energy feedback onto Grid,		
16.	Protective and safe operation features	OVP, +/- OCP, +/-OPP, OTP, power down protection, anti-islanding protection Local/Remote/Lockout key selector on front panel;		
		Lockout must mechanically/electrically inhibit output and configuration changes.		
		Dual-channel STO (Safe Torque Off) / output inhibit inputs meeting PL d / SIL 2 or better; dry-contact loop for external E-Stop chain.		
		Door interlock input (dry contact): opening any safety door shall drop output contactor and engage bleeder discharge.		
		Pre-charge & soft start with output contactor; automatic discharge to <60 V within 1 s after output off/fault.		
		Galvanic isolation statement for input-to-output and chassis (state test voltage).		
		Remote interlock status & Ready/Fault relays on digital I/O for PLC/BMS integration		
17.	Built-in Waveform Function	Built-in voltage curves complied with LV 123		
18.	Paralleling	The unit should support paralleling function with Optical fibre transfer between master and slave, without any degradation in performance and operating functions and without needing of Calibration after Paralleling. Should be able to make parallel of minimum 8 unit or more unit		
19.	Compliance and safety std.	EMC std.: IEC 61326-1:2012/ EN 61326-1:2013		
		CISPR 11:2015+A1:2016 Ed 6.1.		
		Safety Std.: IEC 61010-1:2010+A1:2016		
		Pollution degree 2 or Equivalent		
20.	operating temperature	0°C to 50°C		
21.	Instruments Dimension	Each unit should be 3U or less		
22.	Warranty	Minimum 3 years on main unit		
23.	Delivery	With-in 70 days after receipt of PO		
24.	After sale Service / Support	Vendor should have complete setup and Technically Qualified manpower in INDIA to provide onsite service / support. A written confirmation OEM for the above on OEM letter head needs to be submit with the technical compliance document.		
25.	Minimum Distribution Requirement	A supplier should have supplied minimum of 7 such units of same Make/OEM/Family in academic institutions or to government organization.		
26.	Demonstration	Product may be call for demonstration		
27.	Requirement Datasheet	Mere declaration of compliance is not acceptable. Vendors must submit complete datasheets explicitly mentioning all required technical specifications, values, Make and Model.		

2. Item Description: DC power supplies – 12kW, 800V (Qty 1)

Sr. No	Parameter	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	Rated output Value	Max. Voltage: ≥800V, Max. Current: ≥ (-50A to +50A) Max. Power: ≥(-12KW to + 12KW), Resistance: 0 to 1Ω		
2.	Line Regulation	Voltage: ≤0.01%F S, Current: ≤0.05%FS		
3.	Load Regulation	Voltage: <0.02%FS, Current: <0.05%FS		
4.	Setup and Readback Resolution	Voltage: ≤0.01V, Current: ≤0.01A, Power: ≤0.001kW, Resistance: ≤0.001Ω		
5.	Setting and Readback Accuracy within 12 months 25°±5° ±(%of Output +Offset)	Voltage: ≤0.02% + 0.02%FS, Current: ≤0.1% + 0.1%FS Power: ≤0.5% + 0.5%FS Resistance: ≤1% + 1%FS		
6.	Ripple (20Hz -20MHz)	Voltage: ≤800mVpp (MAX: ≤1.2Vpp) Current: ≤0.1%FS RMS		
7.	Rising Time (Voltage)	No load condition: ≤15ms Full Load Condition: ≤30ms		
8.	Falling Time (Voltage)	No load condition: ≤30ms, Full Load Condition: ≤15ms		
9.	Transient Response Time	Voltage: ≤2ms		
10.	Remote Sense Compensation Voltage	≤8V		
11.	Instruments Criteria	Should have Bi-directional source and regenerative sink function up to the specified ratings		
		Built-in function generator, support arbitrary waveform Generating,		
		Adjustable output impedance		
		Should Support CC/CV priority mode, LIST mode,		
		Should Support multiple working modes, adjustable rising and falling time		
		Strong dynamic driving profile simulation function, up to 10,000,000 points		
12.	Communication Interfaces	Standard Built-in USB/CAN/LAN/digital IO interface, Front panel USB host port for quick data import/export of List files and Data logging. Instrument should provide with std. PC software to control the instrument functions from PC. Command Response Time : 2ms		
13.	Trigger System	Selectable Trigger function as Immediate, Manual, Bus, External		
14.	AC Input	Input Voltage: Three phases: 342V~528V (3P 4W)		
		Max. Input current 34A or less. Frequency: 47Hz~63Hz		
15.	Efficiency	Regenerative efficiency ≥ 92%, Should Support energy feedback onto Grid,		
16.	Protective and safe operation features	OVP, +/- OCP, +/-OPP, OTP, power down protection, anti-islanding protection Local/Remote/Lockout key selector on front panel;		
		Lockout must mechanically/electrically inhibit output and configuration changes.		

		Dual-channel STO (Safe Torque Off) / output inhibit inputs meeting PL d / SIL 2 or better; dry-contact loop for external E-Stop chain.		
		Door interlock input (dry contact): opening any safety door shall drop output contactor and engage bleeder discharge.		
		Pre-charge & soft start with output contactor; automatic discharge to <60 V within 1 s after output off/fault.		
		Galvanic isolation statement for input-to-output and chassis (state test voltage).		
		Remote interlock status & Ready/Fault relays on digital I/O for PLC/BMS integration		
17.	Built-in Waveform Function	Built-in voltage curves complied with LV 123		
18.	Paralleling	The unit should support paralleling function with Optical fibre transfer between master and slave, without any degradation in performance and operating functions and without needing of Calibration after Paralleling. Should be able to make parallel of minimum 8 unit or more unit		
19.	Compliance and safety std.	EMC std.: IEC 61326-1:2012/ EN 61326-1:2013		
		CISPR 11:2015+A1:2016 Ed 6.1.		
		Safety Std.: IEC 61010-1:2010+A1:2016		
		Pollution degree 2 or Equivalent		
20.	operating temperature	0°C to 50°C		
21.	Instruments Dimension	Each unit should be 3U or less		
22.	Warranty	Minimum 3 years on main unit		
23.	Delivery	With-in 70 days after receipt of PO		
24.	After sale Service / Support	Vendor should have complete setup and Technically Qualified manpower in INDIA to provide onsite service / support. A written confirmation OEM for the above on OEM letter head needs to be submit with the technical compliance document.		
25.	Minimum Distribution Requirement	A supplier should have supplied minimum of 7 such units of same Make/OEM/Family in academic institutions or to government organization.		
26.	Demonstration	Product may be call for demonstration		
27.	Requirement Datasheet	Mere declaration of compliance is not acceptable. Vendors must submit complete datasheets explicitly mentioning all required technical specifications, values, Make and Model.		

3. Item Description: High Voltage High Power supply – 54 kW, 300 V (Qty 1)

Sr. No	Parameter	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	Rated output	Max. Voltage ≥ 300 V, Max. Current: ≥(-675 A to +675 A) Max. Power: ≥(-54 kW to + 54kW), Resistance: 0 to 1Ω		
2.	Line Regulation	Voltage: ≤0.01% FS, Current: ≤0.05%FS		
3.	Load Regulation	Voltage: <0.02%FS, Current: <0.05%FS		
4.	Setup and Readback Resolution	Voltage: ≤0.01V, Current: ≤0.01A, Power: ≤0.001kW, Resistance: ≤0.001Ω		
5.	Setting and Readback Accuracy within 12 months 25°±5° ±(%of Output +Offset)	Voltage: ≤0.02% + 0.02%FS, Current: ≤0.1% + 0.1%FS Power: ≤0.5% + 0.5%FS Resistance: ≤1% + 1%FS		
6.	Ripple (20Hz -20MHz)	Voltage: ≤120mVpp (MAX: ≤300mVpp) Current: ≤0.1% FS RMS		
7.	Rising Time (Voltage) Rising Time (Voltage)	No load condition: ≤15ms Full Load Condition: ≤30ms		
8.	Falling Time (Voltage) Falling Time (Voltage)	No load condition: ≤30ms Full Load Condition: ≤15ms		
9.	Transient Response Time	Voltage: ≤2ms		
10.	Remote Sense Compensation Voltage	≤5V		
11.	Instruments Criteria	Should have Bi-directional source and regenerative sink function up to the specified ratings		
		Built-in function generator, support arbitrary waveform Generating,		
		Adjustable output impedance		
		Should Support CC/CV priority mode, LIST mode,		
		Should Support multiple working modes, adjustable rising and falling time		
		Strong dynamic driving profile simulation function, up to 10,000,000 points		
12.	Communication Interfaces	Standard Built-in USB/CAN/LAN/digital IO interface, Front panel USB host port for quick data import/export of List files and Data logging. Instrument should provide with std. PC software to control the instrument functions from PC. Command Response Time : 2ms		
13.	Trigger System	Selectable Trigger function as Immediate, Manual, Bus, External		
14.	AC Input	Input Voltage: Three phases: 342V~528V (3P 4W)		
		Max. Input current 34A or less. Frequency: 47Hz~63Hz		
15.	Efficiency	Regenerative efficiency ≥ 92%, Should Support energy feedback onto Grid,		
16.	Protective and safe operation features	OVP, +/- OCP, +/-OPP, OTP, power down protection, anti-islanding protection Local/Remote/Lockout key selector on front panel;		

		Lockout must mechanically/electrically inhibit output and configuration changes.		
		Dual-channel STO (Safe Torque Off) / output inhibit inputs meeting PL d / SIL 2 or better; dry-contact loop for external E-Stop chain.		
		Door interlock input (dry contact): opening any safety door shall drop output contactor and engage bleeder discharge.		
		Pre-charge & soft start with output contactor; automatic discharge to <60 V within 1 s after output off/fault.		
		Galvanic isolation statement for input-to-output and chassis (state test voltage).		
		Remote interlock status & Ready/Fault relays on digital I/O for PLC/BMS integration		
17.	Built-in Waveform Function	Built-in voltage curves complied with LV 123		
18.	Paralleling	The unit should be Modular and support paralleling function with Optical fibre transfer between master and slave, without any degradation in performance and operating functions and without needing of Calibration after Paralleling. Should be able to make parallel of minimum 3 or more unit Input voltage ≥80 V, should supports power levels ≥ 54kW		
19.	Compliance and safety std.	EMC std.: IEC 61326-1:2012/ EN 61326-1:2013		
		CISPR 11:2015+A1:2016 Ed 6.1.		
		Safety Std.: IEC 61010-1:2010+A1:2016		
		Pollution degree 2 or Equivalent		
20.	operating temperature	0°C to 50°C		
21.	Instruments Dimension	The power supply system shall be of modular construction, with individual plug-in modules having a maximum height of 3U.		
22.	Warranty	Minimum 3 years on main unit		
23.	Delivery	With-in 70 days after receipt of PO		
24.	After sale Service / Support	Vendor should have complete setup and Technically Qualified manpower in INDIA to provide onsite service / support. A written confirmation OEM for the above on OEM letter head needs to be submit with the technical compliance document.		
25.	Minimum Distribution Requirement	A supplier should have supplied minimum of 7 such units of same Make/OEM/Family in academic institutions or to government organization.		
26.	Demonstration	Product may be call for demonstration		
27.	Requirement Datasheet	Mere declaration of compliance is not acceptable. Vendors must submit complete datasheets explicitly mentioning all required technical specifications, values, Make and Model.		

4. Item Description: DC power supply – 18kW, 2250V (Qty 1)

Sr. No	Parameter	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	Rated output	Max. Voltage: ≥2250V, Max. Current: ≥(-25A to +25A) Max. Power: ≥(-18KW to + 18KW), Resistance: 0 to 1Ω		
2.	Line Regulation	Voltage: ≤0.01%F S, Current: ≤0.05%FS		
3.	Load Regulation	Voltage: <0.02%FS, Current: <0.05%FS		
4.	Setup and Readback Resolution	Voltage: ≤0.1V, Current: ≤0.001A, Power: ≤0.001kW, Resistance: ≤0.001Ω		
5.	Setting and Readback Accuracy within 12 months 25°±5° ±(%of Output +Offset)	Voltage: ≤0.02% + 0.02%FS, Current: ≤0.1% + 0.1%FS Power: ≤0.5% + 0.5%FS Resistance: ≤1% + 1%FS		
6.	Ripple (20Hz -20MHz)	Voltage: ≤900mVpp (MAX: ≤2250mVpp) Current: ≤0.1%FS RMS		
7.	Rising Time (Voltage) Rising Time (Voltage)	No load condition: ≤15ms Full Load Condition: ≤30ms		
8.	Falling Time (Voltage) Falling Time (Voltage)	No load condition: ≤30ms Full Load Condition: ≤15ms		
9.	Transient Response Time	Voltage: ≤2ms		
10.	Remote Sense Compensation Voltage	≤22.5V		
11.	Accessories	Parallel kit:4 And Trolley: Five unit each size less than 10U		
12.	Instruments Criteria	Should have a Bi-directional source and regenerative sink function up to the specified ratings		
		Built-in function generator, support arbitrary waveform Generating,		
		Adjustable output impedance		
		Should Support CC/CV priority mode, LIST mode,		
		Should Support multiple working modes, adjustable rising and falling time		
		Strong dynamic driving profile simulation function, up to 10,000,000 points		
13.	Communication Interfaces	Standard Built-in USB/CAN/LAN/digital IO interface, Front panel USB host port for quick data import/export of List files and Data logging. Instrument should provide with std. PC software to control the instrument functions from PC. Command Response Time : 2ms		
14.	Trigger System	Selectable Trigger function as Immediate, Manual, Bus, External		
15.	AC Input	Input Voltage: Three phases: 342V~528V (3P 4W)		
		Max. Input current 34A or less. Frequency: 47Hz~63Hz		
16.	Efficiency	Regenerative efficiency ≥ 92%, Should Support energy feedback onto Grid,		
17.	Protective and safe operation features	OVP, +/- OCP, +/-OPP, OTP, power down protection, anti-islanding protection Local/Remote/Lockout key selector on front panel;		

		Lockout must mechanically/electrically inhibit output and configuration changes.		
		Dual-channel STO (Safe Torque Off) / output inhibit inputs meeting PL d / SIL 2 or better; dry-contact loop for external E-Stop chain.		
		Door interlock input (dry contact): opening any safety door shall drop output contactor and engage bleeder discharge.		
		Pre-charge & soft start with output contactor; automatic discharge to <60 V within 1 s after output off/fault.		
		Galvanic isolation statement for input-to-output and chassis (state test voltage).		
		Remote interlock status & Ready/Fault relays on digital I/O for PLC/BMS integration		
18.	Built-in Waveform Function	Built-in voltage curves complied with LV 123		
19.	Paralleling	the unit should support paralleling function with Optical fibre transfer between master and slave, without any degradation in performance and operating functions and without needing of Calibration after Paralleling. Should be able to make parallel of minimum 8 unit or more unit		
20.	Compliance and safety std.	EMC std.: IEC 61326-1:2012/ EN 61326-1:2013		
		CISPR 11:2015+A1:2016 Ed 6.1.		
		Safety Std.: IEC 61010-1:2010+A1:2016		
		Pollution degree 2 or Equivalent		
21.	operating temperature	0°C to 50°C		
22.	Instruments Dimension	Each unit should be 3U or less		
23.	Warranty	Minimum 3 years on main unit		
24.	Delivery	With-in 70 days after receipt of PO		
25.	After sale Service / Support	Vendor should have complete setup and Technically Qualified manpower in INDIA to provide onsite service / support. A written confirmation OEM for the above on OEM letter head needs to be submit with the technical compliance document.		
26.	Minimum Distribution Requirement	A supplier should have supplied minimum of 7 such units of same Make/OEM/Family in academic institutions or to government organization.		
27.	Demonstration	Product may be call for demonstration		
28.	Requirement Datasheet	Mere declaration of compliance is not acceptable. Vendors must submit complete datasheets explicitly mentioning all required technical specifications, values, Make and Model.		

5. Item Description: DC power supplies – 18kW, 1500V (Qty 1)

Sr. No	Parameter	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	Rated output	Max. Voltage: ≥(0-1500V), Max. Current: ≥(-40A to +40A) Max. Power: ≥(-18KW to + 18KW), Resistance: 0 to 1Ω		
2.	Line Regulation	Voltage: ≤0.01%F S, Current: ≤0.05%FS		
3.	Load Regulation	Voltage: <0.02%FS, Current: <0.05%FS		
4.	Setup and Readback Resolution	Voltage: ≤0.01V, Current: ≤0.001A, Power: ≤0.001kW, Resistance: ≤ 0.001Ω		
5.	Setting and Readback Accuracy within 12 months 25°±5° ±(%of Output +Offset)	Voltage: ≤0.02% + 0.02%FS, Current: ≤0.1% + 0.1%FS Power: ≤0.5% + 0.5%FS Resistance: ≤1% + 1%FS		
6.	Ripple (20Hz -20MHz)	Voltage: ≤600mVpp (MAX: ≤1500mVpp) Current: ≤0.1%FS RMS		
7.	Rising Time (Voltage) Rising Time (Voltage)	No load condition: ≤15ms Full Load Condition: ≤30ms		
8.	Falling Time (Voltage) Falling Time (Voltage)	No load condition: ≤30ms Full Load Condition: ≤15ms		
9.	Transient Response Time	Voltage: ≤2ms		
10.	Remote Sense Compensation Voltage	≤ 15V		
11.	Instruments Criteria	Should have Bi-directional source and regenerative sink function up to the specified ratings		
		Built-in function generator, support arbitrary waveform Generating,		
		Adjustable output impedance		
		Should Support CC/CV priority mode, LIST mode,		
		Should Support multiple working modes, adjustable rising and falling time		
		Strong dynamic driving profile simulation function, up to 10,000,000 points		
12.	Communication Interfaces	Standard Built-in USB/CAN/LAN/digital IO interface, Front panel USB host port for quick data import/export of List files and Data logging. Instrument should provide with std. PC software to control the instrument functions from PC. Command Response Time : 2ms		
13.	Trigger System	Selectable Trigger function as Immediate, Manual, Bus, External		
14.	AC Input	Input Voltage: Three phases: 342V~528V (3P 4W)		
		Max. Input current 34A or less. Frequency: 47Hz~63Hz		
15.	Efficiency	Regenerative efficiency ≥ 92%, Should Support energy feedback onto Grid,		
16.	Protective and safe operation features	OVP, +/- OCP, +/-OPP, OTP, power down protection, anti-islanding protection Local/Remote/Lockout key selector on front panel;		
		Lockout must mechanically/electrically inhibit output and configuration changes.		
		Dual-channel STO (Safe Torque Off) / output inhibit inputs meeting PL d / SIL 2 or better; dry-contact loop for external E-Stop chain.		

		Door interlock input (dry contact): opening any safety door shall drop output contactor and engage bleeder discharge.		
		Pre-charge & soft start with output contactor; automatic discharge to <60 V within 1 s after output off/fault.		
		Galvanic isolation statement for input-to-output and chassis (state test voltage).		
		Remote interlock status & Ready/Fault relays on digital I/O for PLC/BMS integration		
17.	Built-in Waveform Function	Built-in voltage curves complied with LV 123		
18.	Paralleling	the unit should support paralleling function with Optical fibre transfer between master and slave, without any degradation in performance and operating functions and without needing of Calibration after Paralleling. Should be able to make parallel of minimum 8 unit or more unit		
19.	Compliance and safety std.	EMC std.: IEC 61326-1:2012/ EN 61326-1:2013		
		CISPR 11:2015+A1:2016 Ed 6.1.		
		Safety Std.: IEC 61010-1:2010+A1:2016		
		Pollution degree 2 or Equivalent		
20.	operating temperature	0°C to 50°C		
21.	Instruments Dimension	Each unit should be 3U or less		
22.	Warranty	Minimum 3 years on main unit		
23.	Delivery	With-in 70 days after receipt of PO		
24.	After sale Service / Support	Vendor should have complete setup and Technically Qualified manpower in INDIA to provide onsite service / support. A written confirmation OEM for the above on OEM letter head needs to be submit with the technical compliance document.		
25.	Minimum Distribution Requirement	A supplier should have supplied minimum of 7 such units of same Make/OEM/Family in academic institutions or to government organization.		
26.	Demonstration	Product may be call for demonstration		
27.	Requirement Datasheet	Mere declaration of compliance is not acceptable. Vendors must submit complete datasheets explicitly mentioning all required technical specifications, values, Make and Model.		