

Bharat Heavy Electricals Limited TIRUCHIRAPPALLI/MM/Services/CP&SP

SUPPLY OF VVVF DRIVES FOR HOIST APPLICATION IN CRANES

A. COMMON SPECIFICATION FOR ITEM No. 10 TO ITEM No. 40

Application: Crane Hoist Control.

Detailed Technical Specifications:

- 1.0 The VVVF Drive should be dedicated for hoist application.
- 2.0 The rated output current of the drive should be at 45 deg. C ambient Temperature and maximum operating temperature shall be 55 deg. C.
- 3.0 Duration on any account {Viz} temperature / carrier frequency should not exceed 15% of rated output current of inverter offered.
- 4.0 Inverter offered should be provided with accurate brake co-ordination signals.
- 5.0 Vibration: The drive must be Compliant with JIS C60068-2-6 or IEC 60068-2-6
- 6.0 In addition to the above crane specific features the inverter shall offer the Following features:
 - 6.01 Rated input voltage & Frequency: 3 Phase, 380-460V, 50/60 Hz.
 - 6.02 Allowable Voltage Fluctuation: +10% to -15%.
 - 6.03 Allowable frequency Fluctuation: +5% to -5%.
 - 6.04 Overload Tolerance: 150% of rated output current for 60s
 - 6.05 Multi-Function Digital Inputs: Minimum 8 multifunction digital inputs. (4 inputs shall be dedicated for 4 speed selection).
 - 6.06 Multi-Function Relay Output: Minimum 2 multifunction relay outputs (110V)
 - 6.07 Max. Output Voltage: 3 phase, 380-460V {Proportion to Input Voltage}
 - 6.08 Max. Output frequency: 400Hz {Programmable}
 - 6.09 Control method: High carrier frequency {low noise} sine wave PWM Technique.
 - 6.10 Control Supply: 110V AC.
 - 6.11 Starting Torque: 200% / 0.3Hz (Open Loop Vector Control)
 - 6.12 Speed Control Range: 1:200 (Open Loop Vector Control)
 - 6.13 Torque limit: Settable through program {Parameter}

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6.14 Output frequency Resolution: 0.01 Hz. / 0.02

6.15 Frequency setting signal Acceleration/Deceleration Time: 0.01 to 60 sec.

6.16 Braking Torque: Approx. 20% {approx. 125% when using braking Resistor}.

6.17 MAIN CONTROL FUNCTIONS:

- a) Auto tuning
- b) Momentary loss restart
- c) PID control
- d) Drop control
- e) DC injection braking
- f) Slip compensation
- g) Speed search
- h) Excess torque detection and Torque limit
- i) Multi step speed operation
- j) Accl./Decel. Time change over operation.
- k) 3 Wire sequence
- l) Operation Fault log
- m) Built in Crane Algorithm / brake control logic.

6.18 PROTECTIVE FUNCTIONS:

- a) Motor overload trip
- b) Instantaneous over current trip
- c) DC bus protection
- d) Input supply Over / Under voltage trip
- e) Power loss ride through.
- f) Heat sink overheat detection & tripping (both Drive, DBU, DBR)
- g) Output Short circuit protection
- h) Input / Output open circuit protection
- i) Stall prevention

7.0 Keypad of the drive shall be LCD

8.0 The keypad of the VVVF drive shall be panel mounted with necessary extension wire from the drive.

9.0 DBU of Drive shall be of same manufacturer.

10.0 DBR shall be supplied with thermal overload protection, so that on excessive temperature the signal shall be sent to drive and the drive will trip.

11.0 When DBU Power transistor gets shorted then drive needs to be tripped for that necessary provision must be present.

12.0 Drives shall have protective PCB coating (Conformal coating)

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Scope of Supply:

- 1.0 Each VVVF Drive unit should be supplied with Suitable Hoist Dynamic Braking Unit and Dynamic Braking Resistor (at least 50% of motor KW).
- 2.0 The VVVF Drive unit should be loaded with software needed for Hoist applications in cranes.
- 3.0 For Every VVFD drive instruction manual, User manual, starting guide, necessary parameter catalogues shall be supplied in Hardcopy manner.
- 4.0 DBR shall be 50% of the motor KW. Resistance calculation value shall be given by supplier. DBR make shall be either by OEM or OEM recommended.
- 5.0 Only YASKAWA, MITSUBHISHI, FUJI, TOSHIBA make of VVVF Drives are acceptable. Other makes are liable for rejection.

Note:

- i. Prospective tenderers have to compulsorily submit detailed catalogue indicating the model number recommended against this specification.
- ii. Drive shall have warranty period of one year from the date of receipt at BHEL.

B. PRE QUALIFYING CRITERIA

The BIDDER / VENDOR has to compulsorily meet all the following requirements to get qualified for consideration of the technical offer for the SUPPLY OF VVVF DRIVES FOR HOIST APPLICATIONS. If the vendor does not qualify as per PRE- QUALIFICATION CRITERIA, the technical offer of such BIDDER(s) / VENDOR(s) offer will not be evaluated.

- 1.0 The BIDDER(s) / VENDOR(s) shall be a Manufacturer or an Authorised Channel partners having scope with the OEM to carry out supply and provide field services during the warranty period of the VVVF DRIVES. The authorisation by the OEM shall be valid at least three months from the date of tender opening.
- 2.0 Any Deviations in technical specification may lead to rejection of the offer.

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