

ANNEXURE -A

SPECIFICATIONS FOR PLC AND HMI BASED CONTROL PANEL FOR UPGRADATION OF STRESS RELIEVING FURNACE.

The SR furnace of Fabrication department is used for Stress relieving of LOCO Bogies.
The existing Control Panel is to be upgraded with latest PLC and HMI based system.

Scope of Supply:

1. PLC system with 16 Digital inputs, 16 digital outputs, 12 Analog inputs, 12 analog outputs.
2. A 10" touch screen HMI for Entering the Job heating Profile parameters, selecting recipes for control for the SR Operation as per user requirements.
3. Control panel with minimum 1500mm x 1000mm x 400mm size (RITTAL /BCH/ABB make) comprising above with suitable no. of Push buttons, toggle switches, LED indications, Emergency Pushbutton, heater and fan on off push buttons for all the 3 heating zones, OLRs, MCBs, contactors, SSR relay, control relays, Fuse TBs, control wiring etc. as per requirement for Automatic & manual control of furnace.
4. Control wire min 200m length for panel wiring.
5. 3 wire shielded cable for giving reference to the existing Eurotherm drives.
6. 8 "K type" thermocouple sensors of suitable probe length with min 40m cable each, for sensing and display of Job temp and furnace Zone temperatures.
7. 24VDC 10A SMPS supply for PLC and HMI control.
8. 24VDC 10A SMPS supply for Other electrical controls.
9. A Main switch of suitable capacity for input Supply of complete control panel.
10. Other miscellaneous items not mentioned above but required in new panel shall be under the scope of supplier.

Scope of Work:

1. Uninstallation of existing Control panel from the site.
2. Installation of new control panel with supplied electrical items in place of old panel.
3. Complete Control wiring of new panel for automatic and manual control of SR Furnace through HMI and Push buttons.
4. Installation and commissioning of Existing Process control instruments for displaying the temperature of three zones of furnace.
5. Installation and commissioning of existing Lumel chartless recorder for display and recording of individual Job temperature process values.
6. Laying reference cable from new control panel to the existing Eurotherm drive panel to give reference signal.
7. Installation of supplied 8 "K type" thermocouple sensors in furnace and cable laying upto control panel.
8. All the control wiring should have proper tagging & ferrules, Legends for different electrical items like MCB contactors and relays etc. with proper references in electrical drawing.
9. Development of PLC and HMI program for automatic control of furnace heating as per receipe through existing heaters and Eurotherm drives by continuous control of reference to these drives and Thermocouple feedbacks as per BHEL job requirement.

10. The control supply shall be 24VDC should be used for all relay and contactors.
11. Installation commissioning and prove-out of complete system through new control panel.
12. Miscellaneous work not specifically mentioned but required for achieving the process control shall also be considered by the supplier.

Acceptable makes:

1. PLC and HMI: Siemens /Allen Bradley/ABB/ Schneider only.
Note: Offered PLC and HMI must be of Same make.
2. Switchgears: Siemens /ABB/L&T/Schneider/Omron/Legrand only
3. K Type thermocouple: JUMO/RADIX/HONEYWELL/EMERSON/YOKOGAWA only

Documentation:

1. Complete manual of system containing detailed electrical drawing of system as commissioned, PLC ladder diagram with comments, HMI program, Operation manual with stepwise details for automatic and manual control of furnace, Service manual for control panel maintenance shall be provided in soft and hard bind 3 sets.
2. Soft copies of PLC & HMI backup file with comments in English is to be provided. PDF copy of PLC Ladder and screens of HMI all in one 16GB Pen drive.

Guarantee/Warranty:

1. All the supplied items and complete panel shall be under warranty for one year from date of commissioning at BHEL. If any problem is reported to party within this one year, the party shall rectify the same to the satisfaction of BHEL.