

TECHNICAL SPECIFICATION

Name of Work : Provision of quick watering arrangement at station yard of JSG.

The details of work to be executed is given below:

1. Specifications

A. Electrical Motor

Description	Technical Specifications
Make	KBL/ABB/Siemens
Type	3-phase TEFC SCR Induction Motor, High efficiency
Voltage	415V ($\pm 10\%$)
Type	Squirrel cage(SER)
Frequency	50 $\pm 5\%$ Hz.
Combined Variation	$\pm 10\%$ (Absolute SUM)
Rating	Continuous.
Insulation	Class "F" with class "B" Tem rise.
Degree of Protection	IP 55
FL RP	1475/2900
Efficiency	FL - 92 / $\frac{3}{4}$ Load - 92 / $\frac{1}{2}$ Load - 90
Power factor	FL - 0.89 / $\frac{3}{4}$ Load - 0.86 / $\frac{1}{2}$ Load - 0.78
Motor Protection Circuit Breaker	Yes (if not inbuilt, to be provided externally and integrated with the SCADA system)
Dry running protection	Yes (if not inbuilt, to be provided externally and integrated with the SCADA system)

B. Specification of SCADA system

Section	Specification	
1. System Overview	SCADA system for quick watering system at Jharsuguda Railway Station	
2. Key Features & Data Points Watering System Monitoring		
Flow Meter Data	Track volume of water dispensed across watering points.	
Solenoid Valve Control	Track open/close status of solenoid valves, indicating hydrant position where water is directed.	
Pressure Monitoring	Monitor water pressure in suction and delivery manifolds, with alarms for sudden pressure changes.	
Watering Details	Manual entry of train number and coach numbers attended, stored for future analysis.	
Pump Usage & Maintenance		
Pump Usage Hours	Track total hours of usage for each pump to ensure equal usage.	
Pump Status	Monitor ON/OFF status of pumps.	
Pump selection	Using VFD, pump sets will be alternately used to ensure required pressure with optimum use of energy	
Power Supply Monitoring		
Power Supply Status	Monitor voltage, current, and power status for each pump/system.	
Power Failure Log	Keep a log of power failures with timestamps and recovery data.	
Alarm & Notification System		
Pressure Drop Alarm	Alarm functionality when there is a sudden fall in pressure.	
Pump Usage Alarms	Alerts when one pump is overused compared to others.	
Log Management & Data Storage		
Operational Log	Log watering data, pump usage, pressure readings, solenoid valve status, and train/coach details for future analysis.	
Power Failures Log	Log instances of power interruptions and recovery events.	
User Interface (UI)		
User Data Entry Interface	Provide interface for manual entry of watering details.	

Report Generation	Automated reports on water usage, pump activity, and operational logs.	
System Expansion & Integration		
Future Data Points	Capability to add new data points and sensors in future.	
System Components		
SCADA Server	Centralized server for managing and storing data.	
RTUs (Remote Terminal Units)	For data acquisition from flow meters, pressure sensors, and solenoid valves.	
HMIs (Human Machine Interface)	User-friendly interface for monitoring and control.	
PLCs (Programmable Logic Controllers)	For controlling pumps, valves, and other actuators based on SCADA commands.	
Sensors	Flow meters, pressure sensors, and solenoid valves.	
UPS/Backup Power	Backup power systems to ensure continuous operation.	
Software & Integration		
Data Acquisition Software	Software to collect data from RTUs, sensors, and PLCs.	
Alarm Management	For real-time alerts based on pressure drop or system failure.	
Reporting & Analytics Software	For generating performance and maintenance reports.	
System Integration	Full TCP/IP support should be inbuilt into the system to facilitate smooth integration into all existing railway data networks.	
Database Management	Store historical data for analysis (watering logs, pump hours, power failures).	
UI Specifications		
Interactive Dashboards	Display real-time data for water flow, pressure, pump status, and alarms.	
Data Entry Fields	Interface for entering train numbers, coach numbers, and watering times.	
Alarm Notifications	Visual and audible alerts for pressure drop or pump failure.	
Log Viewing	Display historical logs for water usage, pump hours, power supply status, etc.	
Scalability & Future Expansion		
System Expansion	Design the system to allow easy addition of sensors and functionality in the future.	
Future Integration with CMM	Ensure the system supports future integration with CMM for data transmission and analysis.	
Training & Support		
Operator Training	Provide training for station personnel on system operation and maintenance.	
Maintenance Support	Offer ongoing technical support for troubleshooting and system updates.	

C. Control Panel

Control panel for the system should have following features:-

- CRC sheet fabricated weather proof powder coated from outside.
- 3 numbers Star delta starters for 40 HP
- PLC for smart controller. Power saving and proper utilization of all four pump sets
- VFD for speed control & energy saving
- Protections-Protections like Single phasing, Under voltage, Over voltage, Earth leakage, Over load protection
- Indications: - Phase indication, voltage, Current, status On/OFF, fault indication.
- Cable Entry provision in bottom
- Dry running protection for pumps
- Integrated with Smart Control feature to operate system through mobile communication via GSM Network including SMPS power supply.

2. **Inspection:**

- 1 The vendor must provide the GC & TC of all supplied materials before installation.
2. The vendor must provide inspection certificate issued from M/S RITES Ltd. for the item of Control Panel for pumps, SCADA Inspection charges shall be borne by the vendor at his / her own cost.
3. After commissioning of each pump house & also after successful running of quick watering system in any line individual commissioning certificate for both pump house & hydrant line will be prepared jointly by MTPL representative & authorized Railway representative, vendor and the same will be countersigned by nominated Railway officer.

3. **Warranty:** The contractor shall provide comprehensive warranty for the item Control Panel for pumps, SCADA for a period of 24 months from the date of commissioning of the said item. In case of failure of said items supplied by the Vendor for the instant tender the same shall be made functional within 24 hrs after receiving the intimation from authorized railway representative/MTPL failing which penalty shall be imposed as per penalty clause.