1.0.0 **Purpose :**
The system is required for automatic protection of machines during testing of Compressors & Drive Turbines by online monitoring of critical parameters and by tripping the drivers automatically in case of emergency.

2.0.0 **Specification:**
The details of the system required are as follows:

2.1.0 **General :**
The system shall essentially consist of the following:-
a) Local automation module
b) Configuration and acquisition software
c) Accessories and Spares.

Various instruments and sensors required for monitoring critical parameters shall be connected to the Local Module.The local module shall be compact , light weight portable unit capable of signal conditioning , excitation , multiplexing , and providing trip signals to driver equipment like Electric Motoror or Steam turbine , incase of any parameter touches danger limit. .

2.3.0 **Local Automation Module:**
Local module shall be compact , ruggedised , portable unit to be kept in the Test Bed.The various instruments and sensors shall be terminated in the local module.It shall be intelligent unit built on **PXI** (The PCI Extensions for Instrumentation) and **SCXI**(Signal Conditioning extensions for Instrumentation) platform.
The module must have following salient features:

a) Excitation for the pressure transmitters , preamplifiers and other instrument devices.
b) Signal conditioning the input signal as per the system requirement
c) Multiplexing , scanning better than 100 channels per seconds.
d) Inbuilt processor module capable of processing the input signals based on the down loaded configuration of channels and their set values. Should have provision for down loading software from CD ROM and USB pen drive
e) Should have Ethernet Communication interface through LAN . Fully configurable from PC through LAN.

f)   Programming,parameter display and diagnostic facility through a detachable local monitor.

g)   Operating Condition : 5 to 55 deg C , Shopfloor   environment..This modules shall be placed near rotating equipment .They may be subjected to vibration and shock.

h)   The teminal connectors shall be highly ruggedised as they may be subjected to frequent   connection / disconnection.

i)   The local module enclosure should be waterproof and should safeguard it from water or oil spillage.

J)   Capable of Capturing and processing live non contact type vibration signals of rotating   equipments along with other process parameters.

h)   Data update rate for total number of configured channels (20 maximum) shall not be more than 100 mili seconds

i)   Relay module with 10 independent relays,, fully software programmable, , rated for 230 VAC/230 V DC and 12A .

2.3.1 **Instruments and Measuring channel accuracies :**

The following type of instruments shall be connected to local   modules :

	Descriptio	**Measuring channel Accuracy**
a)	4 wire resistance temperature detectors (Pt100).	+/-0.25 degC
c)	Pressure transmitters : two wire type , 4 - 20 mA with 4-20mA or 0 - 5 volts output with 24 volts DC excitation.	+/-0.1%
e)	Analog inputs : 4-20 mA, 0 to +/-5 volts or 0 to +/-10 volts process variable signals from vibration monitors and other control system	+/- 0. 1 %

2.3.2 **Local Module Configuration:**

List of Devices to be terminated in the local module

Devices	Number Of Channels
Resistance Temperature Detectors	05
Pressure Transmitters	05
Speed	04
Analog Input(Vibrations)	04
Axial shift	04

2.4.0 **Data acquisition and Presentation software:**

The Software shall cater to Data acquisition , control , alarm   management, communication , graphics and other   requirements. It   shall have the following features:

a)   Windows –XP based software

b)   Caters to analog , digital , frequency , RTDs etc.

c)   Real time graphical displays and tables.

e)   Selectable Triggering of trip circuit - automatic , based on time , speed , other parameter or manual.

g) Selectable data storage modes -delta speed , delta time ,

Facilities shall be provided to store/print or cancell the displayed data as per the operator's choice. Point no. shall be autometically incremented by 1 for each set of stored readings.

h) Scaling in engineering units & selectable gain/ offset setting for each channel in $Y= mX + C$ form.

i) Selectable alarm and danger set points, real time alarm display ,anunciation, print out , acknowledge/reset facilities. Alarm status screen at the click of mouse or press of a key

j) User programmable channel configuration screen .

n) Provision to verify instrument connections with a user friendly screen with OK / NOT OK information .

o) Data shall be stored in a database format (ODBC) , easily accessible through Micro soft -Access or any other DATA BASE software

p) After testing , data shall be retrieved and printed in the specific format .

q) Pass word administration for security.

r) Provision for software modification for future improvement .

s) Provision for Trend plot of real as well as stored data

2.6.0 **Accessories and spares :**

    a)   Backup of all software shall be provided on CD

    f)   Interconnecting , power , communication and interface cables for all peripherals and modules .

    g)   3 sets of operation , maintenance and software manuals and other documents for data acquisition   system and software.

2.8.0 **General Requirements :**

    a)   The installation and commissioning of the system shall be in the scope of the supplier . After successful installation and commissioning the supplier shall provide   training to the operating personnel . Easy to   understand course material shall be provided.

    b)   The system shall be guaranteed for a period of 18 months from the date of commissioning at our works against any design defficiency, manufacturing for software programming deffects 18 months on site comprehesive warranty shall be provided by the supplier for the whole system .

    c)   Vendor shall indicate their service agents , stationed at Hyderabad for the equipment offered .

    d)   Necessary detailed technical literature , catalogues , write ups , references etc. shall be furnished with   the offer .