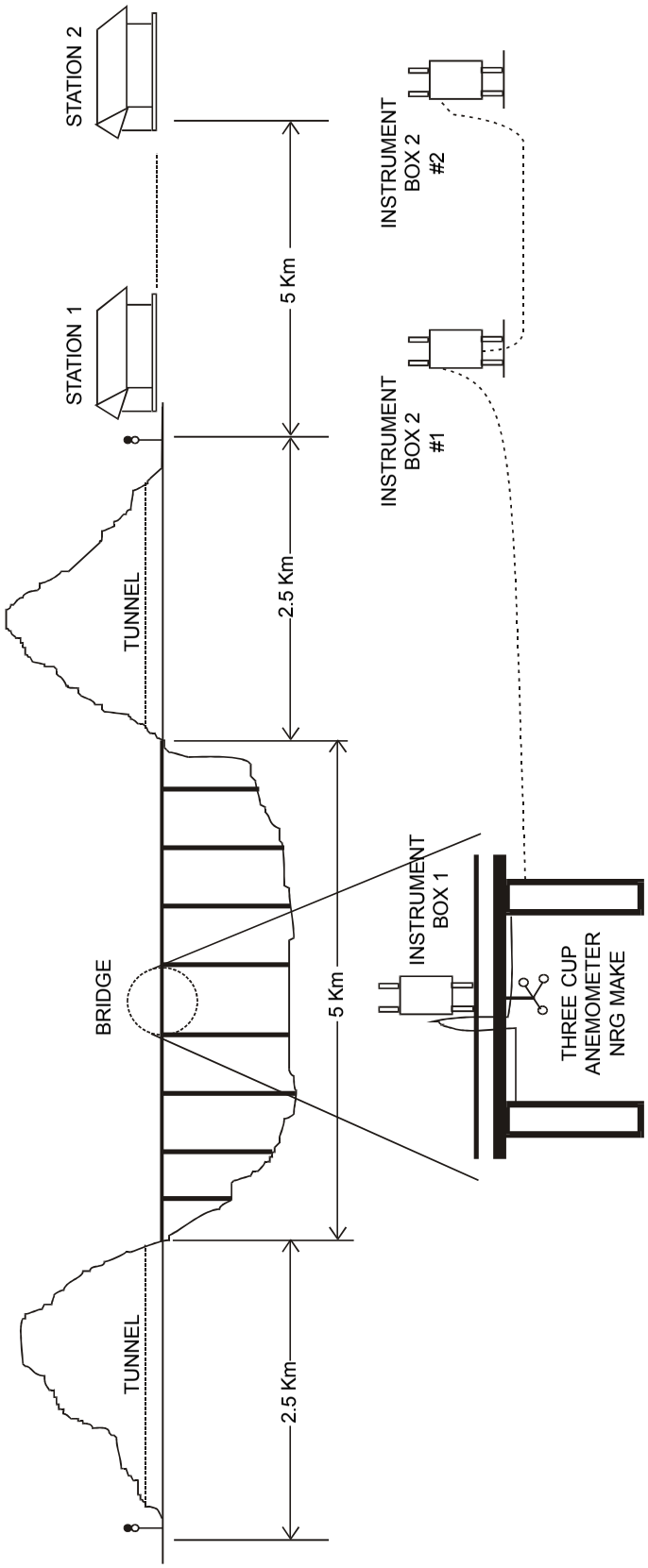
Core Technologies

Wind Alarm Control System

WACS-100

For Surveillence of
Railway Bridges,
Jettys,
Tall Structures,
Off Shore Installations, etc.



Railway Bridge Surveillance and Safety

Core Technologies

Wind Alarm Control System
WACS-100

A reliable and trustworthy Sentinel to guard your valuable Property and invaluable Life

Wind at low speeds like a soft breeze, is pleasant. Continuous wind at speeds higher than 25 Kmph, is uncomfortable though not hazardous. At about 50 Kmph, wind is considered unsafe for small fishing boats to venture out at sea. Wind speed above 70 Kmph, certainly is a stormy condition, to be taken seriously and is usually accompanied by thunder lightning and rains. Beyond 100 Kmph the weatherman declares cyclonic conditions calling for mobilisation of emergency measures. Core Technologies' **Wind Alarm Control System WACS-100** is a surveillance aid of immense value in stormy and emergency conditions. Especially developed for keeping watch over remote and un-manned sites for excessive wind speed conditions and to generate appropriate alarms with mandatory operator involvement ensuring total safety of property and life, WACS-100 is the result of intensive R&D at Core Technologies and a product of 100% indigeneous design and concept.

WACS-100 uses a three cup magnetically coupled anemometer. WACS-100 is immune to gust or lull from affecting the alarm annunciation. Simple and easy controls and an ergonomic design makes WACS-100 a fool proof and dependable instrument system.

WACS-100 is essential where life and property are at risk. and is ideally recommended for Railway Bridges, Railway Tunnel entry and exits, Tall buildings, Suspension bridge Towers, Jetties projecting into sea, Air Ports, Dam sites, Tall Chimneys, Light Houses etc.

1. All weather operation:

WACS-100 is packaged in IP66 enclosure and uses components rated to work upto 65°C. It can withstand water submergence upto 3 m. and is resistant to corrosion.

2. Maximum reliability:

WACS-100 processes wind speed pulses through two independent paths; analog and digital, giving 100% redundancy. In addition it has facility to check and cross refer sensor calibration built in the system. The main principle of the system, is based on the proven technology of data transmission over industrial 4-20mA current loop. This also enables installation of the sensor in the remote field and allows data transmission over just one pair of wires upto distances in excess of 5 Km. With the facility of loop repeater, WACS-100 can be used for retransmission of data repeatedly for further distances in multiples of 5 Km, with no loss of accuracy.

Loop powered operation isolates the system from dependence on mains supply, usually the first casualty in a thunder storm. The instrument operates from a 24 volt battery and is isolated from the battery upto 500V AC. All other schemes of data transmission like modem, or UHF / VHF communication cannot ensure data reliability in stormy conditions, besides needing power source at the remote site of the sensor.

The 4-20 mA loop has inherent quality of detecting open or shorted loop conditions. In addition, WACS-100 has in built protection and filters for

lightening and lightning induced spikes as well as from accidental 230V AC line leakage. Sensor, Electro-nics hardware and the 24 Volt battery supply are totally isolated from each other.

3. Designed for utility:

Simplicity of operation, provision of minimum important functions and ease of installation have been the key design criteria. WACS-100 provides potential free NC/NO contacts for interlocking with the external track signalling system. In addition the system, provides for foolproof alarm acknowledge, both in NORMAL to ALARM and ALARM to NORMAL transitions. This feature, for example, will ensure that trains will not be allowed to proceed over the bridge when the wind speed condition is abnormal.

Functional Description

- Wind Alarm Control System WACS-100 is a surveillance system, which keeps watch over Railway Bridges for excessively high wind speed conditions and generates warning alarms when the wind speed exceeds a user defined limit.
- These alarms can be interfaced with Railway Track Signalling System to automatically prevent passage of trains over the bridge, whenever alarm conditions occur.
- The system has facility to mute the alarm, at the discretion of supervisor or through automatic interlock with the track signalling system. This feature is useful since the sensor is likely to be mounted on the bridge not very far from the railway track. Trains moving at high speed on the track can cause false alarms as a result of the "wake" wind. This facility helps to ignore such false alarms.
- The system is capable of re-transmitting wind speed analog data over a secondary loop interfaced with yet another IB-2. With this cascading facility, the wind speed information can be transmitted, repeatedly over longer distances, with virtually no limit and negligible loss of accuracy and with facility for alarm annunciation and interlock at each node.
- In fact, applications of WACS-100 are numerous and varied. WACS-100 can be used on tall towers, Skyscrapers, Jetties, Airfields, Dam sites, Suspension Rope Bridge towers, Wind Farms and many more.

4. The Topologies:

The basic system WACS-100 caters to one sensor with SCTR-100 on the bridge one loop receiver alarm generator LARM-100 at up or down station. This is Topology-1. This system can be further expanded by cascading any number of loops in a given direction, say "up". This is achieved by simply locating one LARM-100 at each of the stations in that direction. This is topology-2. In topology-3 the Signal conditioner and transmitter SCTR-101 is a modified version of SCTR-100, to include an extra loop transmitter to cater to data transmission in both up and down directions with supervisory logic to operate from either of the two loops. Basic specifications of all three topologies are same as WACS-100.

SPECIFICATIONS

The Wind Alarm Control System WACS-100 specifications given below are valid for use only with 4 pole Magnetic pickup Anemometer #40 manufactured by NRG Inc. USA having specified sensitivity of 73.17 Hz at 200 Kmph.

A. Absolute Maximum specifications:

1.	Operating Temperature	:	-10°C to +60°C.
2.	Relative Humidity	:	10 to 95% non condensing.
3.	Supply Voltage	:	22 to 28 Volts DC, 0.5 A.
4.	Maximum loop resistance	:	600 ohms.
5.	Maximum wind speed	:	200 Kmph.
6.	Alarm Relay contacts	:	230 VAC, 1.0 A continuous.
7.	Sensor Cable	:	7/32, Teflon Shielded twisted pair 3 meter supplied with IB-1.
8.	Loop Cable	:	14/36 SWG, 105°C Industrial PVC, 3 meter supplied with IB-1 and 2 each.
9.	Sensor to IB-1 distance	:	1.0 Km max.
10.	IB-1 to IB-2 distance	:	5.0 Km subject to (4) above.
11.	IB-2 to Track Signalling Equipment Distance	:	Up to 100m. max.
12.	IB-2 to Track Signalling Equipment Cable	:	14/36 SWG 105°C twisted pair PVC

Please Note: The WACS-100 supply includes a set of cables with Shell type connectors with cable length of 3 m. from IB-1 or IB-2 to Junction Boxes at respective sites. These Junction Boxes are to be provided by the user. Cables from Junction Box to the sensor and to the other Junction Box are to be provided by the user.

B. Protections:

1. With proper earth pit and Lightning arrester provided, WACS-100 is protected from secondary effects of Lightning. Lightning arrester and earth pit is to be provided by the user.
2. Provision of secure shelter protecting IB-1 and IB-2 from rain and direct sunlight, from theft, pilferage and vandalism, is the responsibility of the user. Core Technologies has incorporated protections described below as additional measures to ensure reliable operation under the conditions stated at 1 and 2 above.

1.	Sensor isolation from IB-1	:	750 Vrms continuous.
2.	Lightning/spark protection	:	14 Kv spark to sensor cable Shield.
3.	EMI/RFI protection	:	1 Kv spikes Common mode.
4.	Loop protection	:	110 VAC continuous.
5.	Loop short circuit	:	Continuous Protection with indication on IB-1 and IB-2.
6.	Battery to IB-2 isolation	:	500 Meg Ohm, @ 500 VDC / 230 Volts AC continuous.
7.	Track signalling system to WACS-100 isolation.	:	500V AC or 750 VDC continuous.

Operating Specifications :

Operating specifications given below are based on the sensor specifications claimed by NRG Inc. of 73.48 Hz for 200 Kmph.

All values below refer to percentage of full scale reading.

IB-1

1.	Wind speed accuracy Analog Display	:	± 2.0%
2.	Wind speed accuracy Digital Display	:	± 2.0% ± 1Kmph
3.	Self test Accuracy	:	± 1.0% ± display accuracy.
4.	Response Time	:	5 Sec.

IB-2

1.	Wind speed accuracy Analog Display	:	± 3.0%
2.	Wind speed accuracy Digital Display	:	± 3.0% ± 1Kmph
3.	Self test Accuracy	:	± 3.0% ± display accuracy.
4.	Alarm setting accuracy	:	± 2.5%
5.	Alarm hysteresis	:	± 1.5%.
6.	Leakage alarm sensitivity	:	± 1.0%
7.	Gust/Lull latency	:	15 Sec.

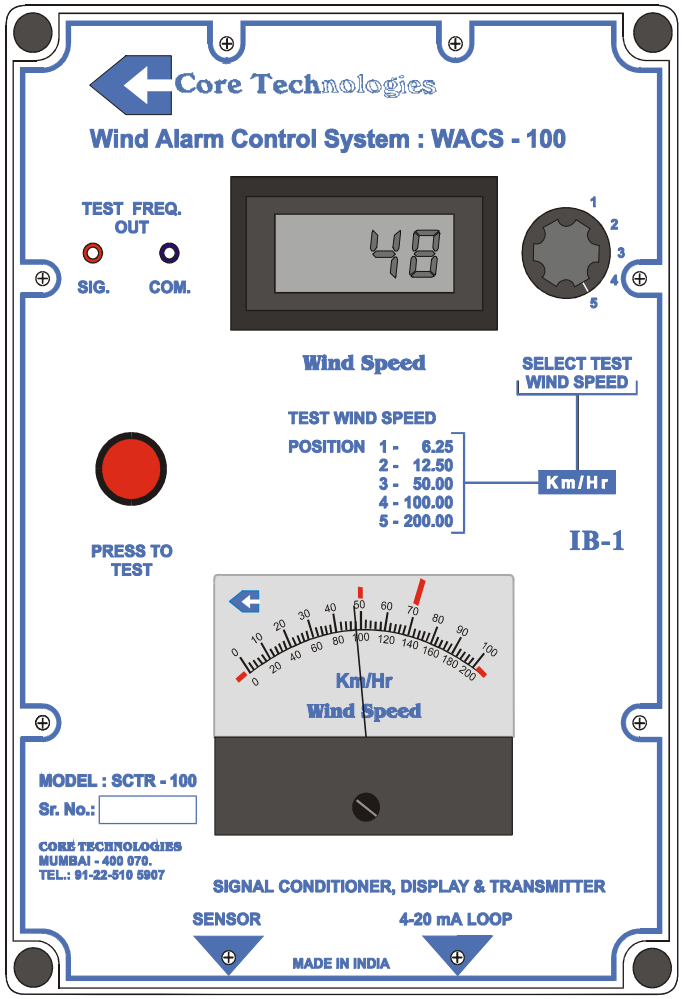
Physical Specifications :

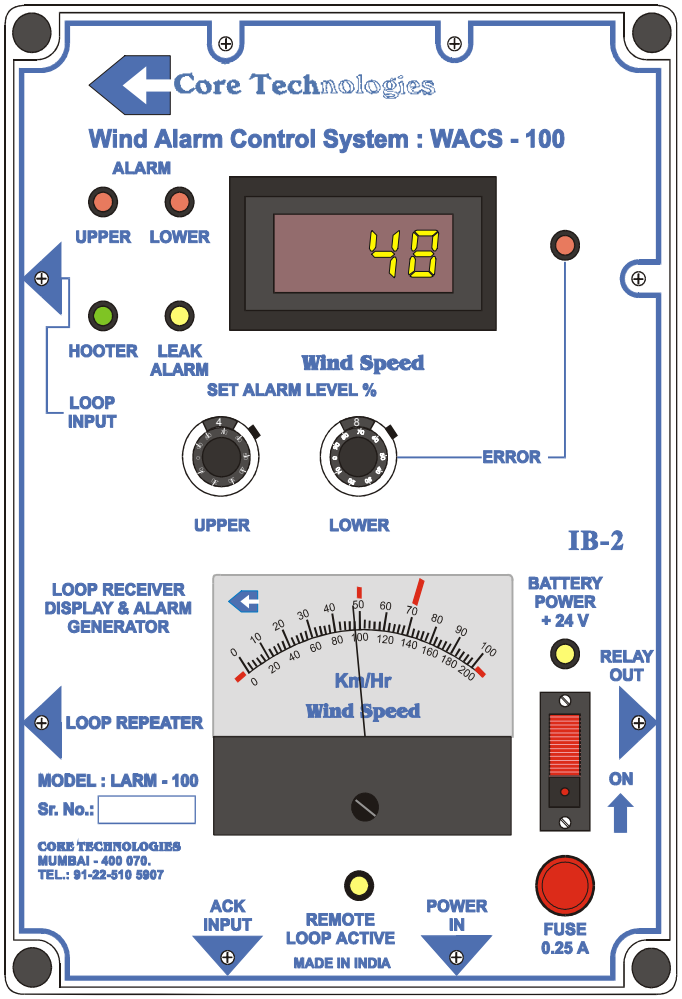
IB-1

1.	Dimensions	:	20cm x 27cm x 9cm	2.	Weight	:	3.0 Kg.

IB-2

1.	Dimensions	:	20cm x 27cm x 11cm	2.	Weight	:	3.5 Kg.





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ABOUT CORE TECHNOLOGIES

A company dedicated to self-reliance in high technology development, Core Technologies, is committed to excellence in Electronics and Instrumentation. Core Tech, as is popularly known, and now well established as company providing original R&D solutions to the Industry and Government organisations, was founded by M.G.Phadnis, well known for his pioneering work at Bhabha Atomic Research Centre as a Senior Research Scientist, in the year 1988. Core Technologies had in the short span of its first two years, developed full range of Data Acquisition, Measurement and Logging Systems based on advanced circuit technology and Software Algorithms. The company has won several prestigious awards and citations for its contributions to indigeneous research in private sector.

Equipped with a strong manufacturing base and a no compromise policy on Quality Control, Core Tech specialises in Precision, High speed dynamic weighing machine controllers with Micro-Processor intelligence, Advanced Weather Monitoring Data Loggers and related Software, Loop powered Industrial Transmitters, Strain Gauge Instrumentation, Automated Test Equipment for engineering test rigs and custom projects.

Other products from Core Technologies

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Automated Weather Monitoring Systems,
Micro-processor based Bagging Machine Controllers,
Data Acquisition Systems,
Automated Test Rigs,
Loop Powered Transmitters,
Plant Performance Monitoring with interface to Management Information System,
Custom Design and Development,
Turnkey R&D Projects for Govenment and Industry

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Manufactured by

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