niyama
Power of Discipline

Environment Monitoring & HVAC Controlling System

Monitor | Alarm | Log | Report | Control

Technology Beyond Imagination

About Us

Shree Aerodynamic Products, SAP is a multifaceted electronic engineering corporation in the making, inheriting a sterling tradition of electronic excellence of Indian technocrats. True to its tradition, SAP endeavours to provide innovative engineering products and technical solutions – be it from a standard range or customized designs in Clean Room Industries. All **SAP** products offer the distinct technology and quality edge that is today the mark of our industry. This is backed by focused customer centricity, consistent service reliability and optimal time consciousness from conception through design, installation, commissioning, validation and sign off.

The Accolades

Like true character, true quality also gets appreciation everywhere. NIF Presidential Award confirmed by former President of India, Dr. A. P. J. Abdul Kalam on 5th Jan, 2005 for innovative design & development of Acryl Butadiene Styrene Plastic Blower at National Innovation Foundation underscores this fact.

About Niyama

Shree Aerodynamic Products are Introducing **NIYAMA** Relative Humidity, Temperature, Differential Pressure, Absolute Pressure transmitter Modules equipped with **NIYAMA** Intranet software ...The beginning of a new era of HVAC Monitoring.

In collaboration with Arvonix Inc. USA, **NIYAMA**, a clean room monitoring system is designed especially for today's industrial environment monitoring requirements. Precision is the word that best describes **'NIYAMA'** for the measurement of Temperature, Humidity and Differential pressure, and Absolute Pressure that forms the basis of HVAC for the Pharmaceutical industry.

Pharma HVAC System

Pharmaceuticals industries require an effective ventilation system with appropriate filtration, to ensure that there is no risk of cross-contamination. It is not possible without effective ventilation system, to consider a predefined filtration facility. Thus Pharmaceutical manufacturers need an appropriately-designed HVAC system. The design of the AHU should ensure that appropriate components are selected and installed for temperature, relative humidity and pressure, with consideration classification of filtration, to ensure effective ventilation that will prevent cross contamination. Pressure cascades and appropriate air flow direction play an important role in containment. Therefore pressure cascades and air flow direction should be maintained as designed conditions.

NIYAMA Hybrid System Transmitter Module

NIYAMA systems with in house designed and developed hardware and software supports – hardware with inbuilt Digital sensors to read and store Temperature, Relative Humidity and Differential Pressure and display , alarm alerts. **NIYAMA** transmitters supports Blue tooth, Wi-Fi, Radio transmitters for communication. Niyama Transmitter stand alone data logger to log data and display localy. **NIYAMA** Serial /RF transmitters for monitoring and recording on remote PC by support of **NIYAMA** software ..Unique feature is all NIYAMA Transmitters dedicated to display for single parameter to multiple parameters in One module with satable scroll time to display multiple parameters in one display. **Niyama** Transmitter used factory calibrated digital out put sensors with internatiol standards . **Niyama** transmitter with it innovative technology to plug and play for easy maintains ,up gradation or migration from one parameter transmitter to any other or all multiple parameters display in one transmitter. The digital NIYAMA Transmitter gives analogue control signals to AHU control devices, to control analogue systems such as the VFD, Actuators damper, etc. As the AHU has both digital and analogue components, it is a hybrid system.

How does it work?

Simply place NIYAMA wire and wireless transmitter module inside in the production area. You can easily connect the NIYAMA module to NIYAMA PC Software and Smart mobile applications. NIYAMA software collects the data from NIYAMA transmitters with their unique ID, for accurate and secure communication on intranet-based software. The dual display communication option feature for both side display transmitters is a unique feature of the wide range NIYAMA series.

About NIYAMA Monitoring Protocol

NIYAMA transmitters are designed and developed to meet most critical parameters to monitor preventive action. **NIYAMA** systems come with synchronized communication protocol and local alarm system to manage critical parameter information and communication on the PC, where its data is stored for audit purposes.

NIYAMA Environmental Monitoring system is a proactive system to ensure that the controlled environment of the production facility is maintained. It collects the data information from different areas to monitor for preventive action, and stores data information with alert information, to generate user-friendly reports from square data storage. All these activities are documented and reviewed for audit. The main highlight of **NIYAMA** Monitoring System is its support with in-public announcement for remote alert alarm information.

NIYAMA Monitoring system designe for audits, system validations, audit trails, electronic signatures, and documentation for software and systems involved in processing the electronic data that should comply with CFR 21part 11.

NIYAMA Monitoring Operation

- local display with alert.
- Local alert information.
- Send all data information central server for monitoring .
- Secure data store local and remode Storage for backup support.
- Process value and audit trail.
- Multiple pop up on alert.
- Generate user friendly customize Reports .

21 CFR Part 11 Audit Trail capabilities and Security Manager for electronic signaturesto comply CFR 21 part 11 .

RF Mesh Network

The Base receiver can be connected to NIYAMA modules wirelessly. **Shree Aerodynamic Products**, India's RF mesh networking technology is proven with ease of implementation of NIYAMA product line modules, that can be add upto 100 or more nodes, to be connected in a flawless, consistent and self-forming mesh network. The mesh technology permits modules to communicate with the central base receiver and each other, allowing for weak RF links, and by design, automatically adjusting to provide the best performance in a harsh environment. In this way, our mesh technology has the capability to perform in many harsh environment applications.

Mesh Network – established through powered transmitters. This enables the system to utomatically adjust to any changes in the environment, rerouting signals as required to ensure that the data is always returned to the Gateway.

RF Specification

RF 2.1 GHz Smart RF Mesh Technology

Max number of wireless nodes : 65536

Range : approx 300 ft (100m) from one node to another node, can act as a repeater in RF Mesh Network, every node (Module) can find its neighbours, evaluate RF signal strength, obtain synchronization and frequency hop information, and set up the best paths to link with neighbours. In this way, our RF Mesh Technology uses a frequency hopping method to counter the problem of both frequency selective fading and interference effects, and operates in combination with automatic re-transmission requests (ARQ).

The network provides an accurate time reference for the whole network, ensuring that all modules and the base receiver are time-synchronized correctly. Each data sample is synchronized with this network time.

NIYAMA Software for monitoring on PC and Smart Mobile

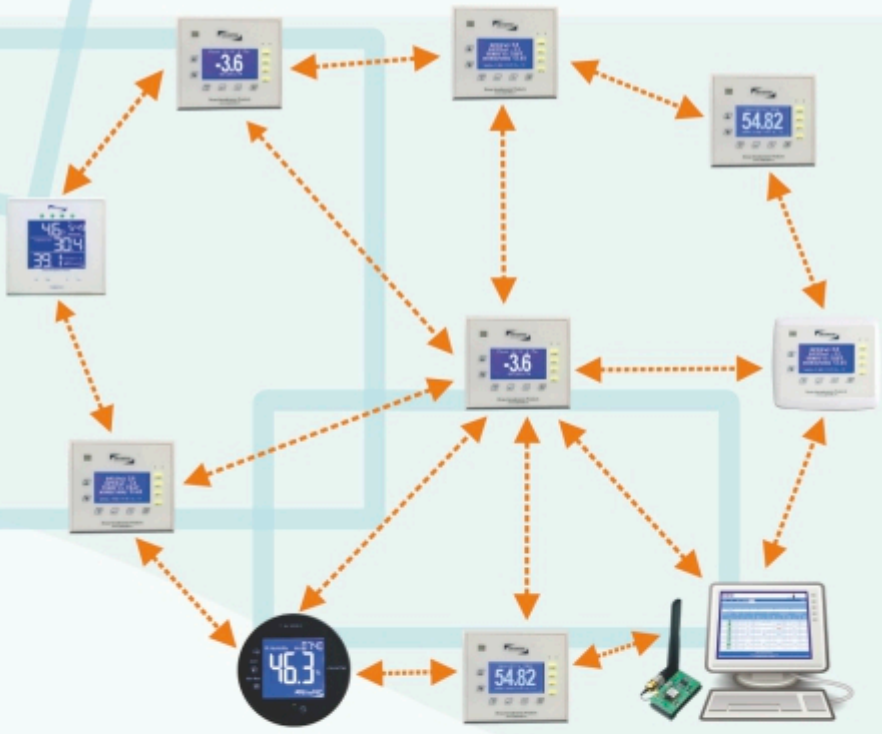
The NIYAMA Series is the online Monitoring system with software support, which uses the very latest technology to fully automate temperature, Relative Humidity Differential Pressure and Absolute pressure monitoring and recording 24 x7, providing effective control over temperature-sensitive products.

This enables **Shree Aerodynamic Products** to offer innovative, customized and user-friendly solutions to ensure central monitoring of various systems like chiller, energy meter, water treatment system, etc., as our software and hardware support various kinds of communication protocol. Our expertise with in-house design and development helps us meet upgrading regulatory demands. We do not limit our software or hardware to NIYAMA Products, but make it compatible to communicate with multiple communication protocol for centralized monitoring and data logging, to generate user-friendly reports, trend-charts and Graph-mimics, for various kinds of facilities under one server for central surveillance.

All data is automatically collected through the base receiver, and passed to a comprehensive software database for storage and retrieval, simplifying record-keeping for audit purposes. The software is easy to use and enables real time display Mimics, immediate visual display of data (current and historical) in graphical form.

Ideal for monitoring

- Clean room monitoring.
- AHU monitoring.
- Fridges and freezers.
- Coolers, chillers and cold stores.
- Warehousing, distribution and transport.
- Storage areas for drugs or vaccines.
- Incubators and test chambers.
- Perishable goods such as blood products and costly test reagents.



Practical functionality allows you to

- Stop and start logging.
- View or program tasks.
- View data as graphs or tables and toggle between the two.
- View events for a selected day.
- Super User function allows multi-Gateway visibility from one screen.

Niyama software access is achieved via a PC from any location. Multi-user access can be controlled via built-in safeguards configured to ensure that staff only have access to information relevant to their needs and can only make changes deemed appropriate by the system administrator. There are no hidden charges for licences and there is no limit on the number of users – you dictate how many or how few people have access with access right like view ,print or updates .With a full audit trail, electronic signatures and data protection to meet the requirements of 21CFR Part 11.

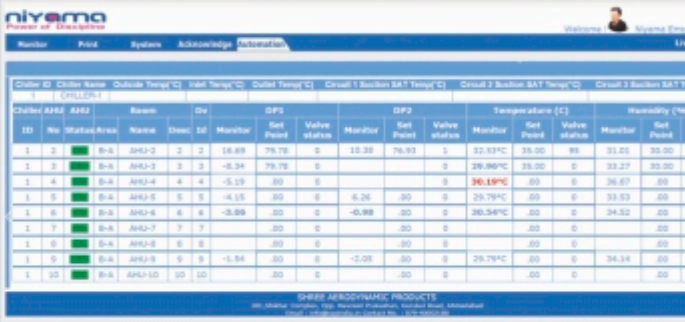
Salient Features

- Remote monitoring, logging and notification, using the central base Server support software, to generate LOG, Repot, Chart, Graph, Mimic.
- Accessible for monitoring from any computer using a web browser connected By internet .
- Controlled access to NIYAMA software, based on allocated user privileges.
- Display current, minimum and maximum limits and activates a settable.
- Internet- and web-enabled remote diagnostics and maintenance.
- High/low alarm for all four readings.
- Alarm notification through email or SMS – on the user's mobile phone, pop ups and Hooter Alert.
- Absolute control of networked modules, together with module parameter reading and writing.
- Provides password-protected access for security purpose.
- Remote display consol.
- Remote data back UP.
- Smart mobile application support for real time view and user friendly configuration by Blue tooth / Wifi support
- Hard-wired or wireless module connections to the central computer system.
- Reliable Ethernet /RS-485 connection for faster data transmission between networked modules and central computer system.
- Compatible with PLC, SCADA and other substation automation platforms.

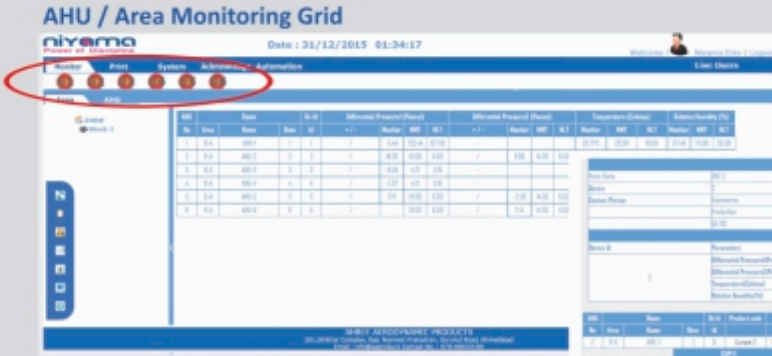
Alarms include

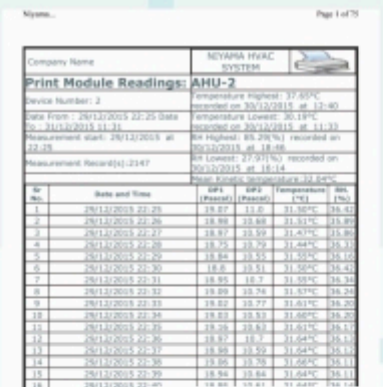
- Notification via screens, email, SMS* or voice, with the ability to select which personnel are notified in line with work rotas.
- Alarm delay option – system will not indicate out of range status until the parameters has been out of range for a set period of time, ideal for defrost cycles and restocking.
- Dynamic alarms selectable by time, allowing more than one alarm level for asingle sensor.

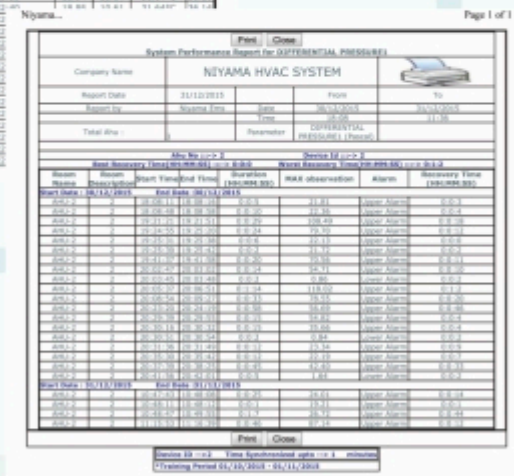
AHU Monitoring / Controlling Grid



AHU / Area Monitoring Grid







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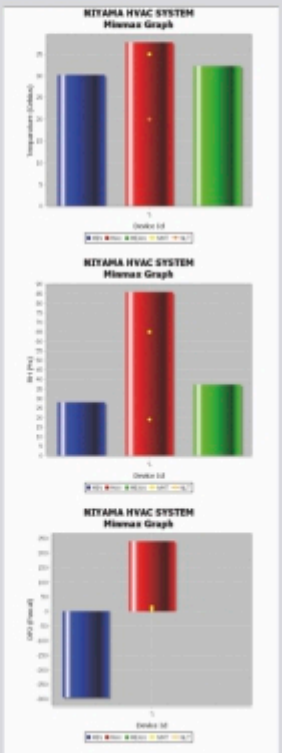
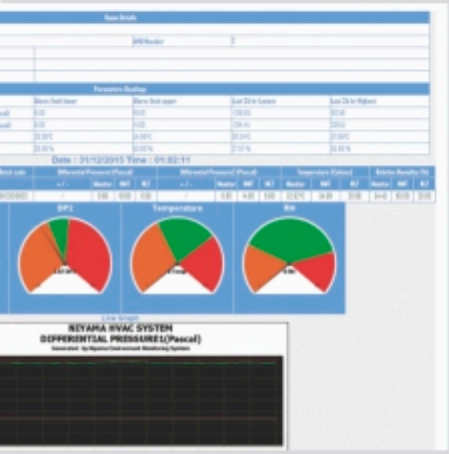
Live Grid

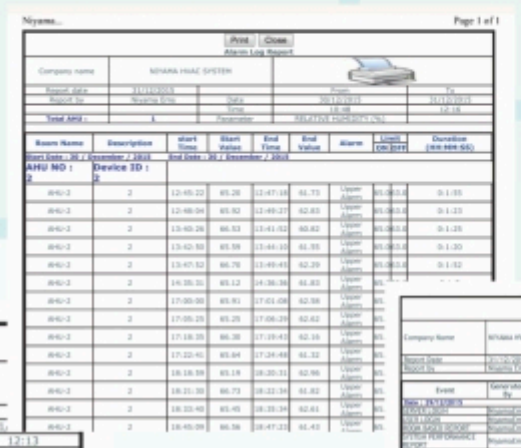
Live Graf



Live Mimic

Live Grid





Niyama...

Print Close

Alarm Log Report

Company name	NIYAMA HVAC SYSTEM		
Report date	31/12/2015		From
Report by	Niyama Ems	Date	30/12/2015
		Time	14:05
Total AHU :	**1**	Parameter	DIFFERENTIAL PRESSURE1 (Pascal)

Room Name	Description	start Time	Start Value	End Time	End Value	Alarm	Limit ON	Limit OFF	Duration (HH:MM:SS)
Start Date : 30 / December / 2015		**End Date : 30 / December / 2015**							
AHU NO : 2	**Device ID : 2**								
AHU-2	2	14:39:55	25.67	14:40:59	18.88	Upper Alarm	21.99	18.99	0:1:3
AHU-2	2	17:13:48	23.42	17:40:32	13.85	Upper Alarm	21.99	18.99	0:26:43
AHU-2	2	18:03:15	28.82	18:04:27	18.39	Upper Alarm	21.99	18.99	0:1:11
AHU-2	2	20:05:37	38.15	20:06:52	18.91	Upper Alarm	21.99	18.99	0:1:14
Start Date : 31 / December / 2015		**End Date : 31 / December / 2015**							
AHU-2	2	10:47:43	20.64	11:16:39	18.01	Upper Alarm	20.00	19.00	0:28:55
AHU-2	2	11:51:44	20.64	11:53:05	18.43	Upper Alarm	20.00	19.00	0:1:21

Room Name	Device ID	User Name	Narration	Date and Time
AHU-2	2	niyamaems	acknowledge	31-12-2015 11:12:00

Print Close

*Training Period 01/10/2015 - 01/11/2015

Device ID -->2 Time Synchronized upto --> 1 minutes

PID Control Mode

A Proportional Integral Derivative (PID) controller is a control loop feedback controller for AHU automation control systems. A PID controller continuously calculates an error value as the difference between a measured process variable and a desired set point. The Niyama controller attempts to minimize the error over time, by adjustment of a control variable, such as the position of a control valve, a damper, or the power supplied to a heating element.

PID controllers have three control modes :

- Proportional Control
- Integral Control
- Derivative Control

Each of the three modes reacts differently to the error. The amount of response produced by each control mode, is adjustable by changing the controller's tuning settings.

AHU Monitoring / Controlling Device

Intelligent PID Hydro Control Mode

The standard PID control is sometimes not very efficient in achieving the desired Hydro condition, especially in uncontrolled conditions. Temperature and humidity both are somewhat dependent on each other, and are controlled differently. Different control methods could also adversely affect each parameter. If the control does not have enough margins, then it may either result in a lock-up condition, or take a long time to achieve a stable condition.

In Intelligent Hydro Control mode, when a parameter (temperature or humidity) control is unable to bring the parameter under control using full control capacity, the standard PID control goes beyond its regular control, introducing the required influence on other parameters' control. These just needed control adjustments help bring an unstable condition to a stable condition faster, and also avoid control lock-ups. As soon as the desired parameter comes under normal control, the influenced parameter control starts coming to a normal condition, maintaining the desired parameter under control. This also provides smooth and unnoticeable transition between the standard PID control and Hydro control modes.

NIYAMA provides ability to select influence conditions and program influence direction and sensitivity, giving ability to tune the hydro control influence for maximum performance.

Basic Utilities

- Clean room Facility Monitoring System
- AHU monitoring System
- Alert information
- Remote AHU monitoring
- Stand-alone AHU controlling

Optional

- Stand-alone with Alert for area
- Stand-alone for AHU with Tower LED Hooter
- Master and slave module for both site monitoring
- RF communication
- Wi-Fi Blue Tooth Communication
- Remote Display panel for AHU monitoring
- Stand-alone with Inbuilt Analogue PID
- CASCADE control for AHU Room

Niyama Hybrid AHU Control System

Digital signals propagate more efficiently than analogue signals, largely because digital impulses, which are well-defined and orderly. The Temperature, Relative Humidity and Differential Pressure sensors data transmission are in digital values, so the NIYAMA AHU System can monitor them. The digital NIYAMA Transmitter gives analogue control signals to AHU control devices, to control analogue systems such as the VFD, Actuators damper, etc. As the AHU has both digital and analogue components, it is a hybrid system.

Optional Features

- Stand-alone Alert Display Transmitter
- For the parameters like Temperature, Relative Humidity and Differential Pressure
- Stand-alone Display with Tower LED Alert and Communication Transmitter for real time monitoring of AHU and production facility.
- Stand-alone Alert Display and Communication Transmitter for real time monitoring and controlling

Differential Pressure Display Module

NIYAMA Differential Pressure Indicator is a versatile solution for zero-defect differential pressure indication with high and low differential pressure alarms, for clean room application in the pharmaceutical industry only. This is designed with a view to indicate and prevent overshoot and undershoot of Differential Pressure. It replaces conventional analogue gauges, which are prone to human error, and adds aesthetic value in this digital era of environmental monitoring systems.

It is a pre-programmed device with factory calibrated Digital differential pressure sensors , and hence there's no need of user intervention. The wall-mounted design of **NIYAMA** differential pressure indicator is without edges, which reduces particle count. A large graphical LCD display with backlight and readings in desired units, makes the product more user-friendly. This differential pressure indicator uses factory - calibrated semiconductor monolithic miniature digital accurate low differential pressure sensor with bi-directional readings.

- Nominal Pressure range : 0 to 25 bar
- Linearity & Hysteresis : ±0.05 (normal) to ±0.15 (max.)
- Long Term Stability : ±0.1
- Burst Pressure : 35 bar
- Response Time : 0.6 to 20 ms

Salient Features

- Zero and Span Calibrated
- All necessary filter components on board
- Fast response 0.56 ms to 20 ms factory selectable
  Wide Supply Voltage range 2.7 to 40V
- Temperature Compensated -40 ... 125 C
- Amplified Output O ... 3V I 0...3 MW 0.
  5V1 0...1 OV Differential, Gauge and Absolute Pressure
- 16-bit resolution digital output
- Small outline, easy to assemble

Optional Features

- Display big Blue and White fonds with back light
- Single and double Differential Pressure sensor in one module .
- In built memory.
- Remote display with Radio frequency , Blue tooth and Wife support for communication.
- Stand alone Relay out put module with Tower LED.
- Stand alone AHU controller for VFD.
- Analog put with precise control out put range.
- In built Analog / PID controller for stand alone control.
- Wide range display module enclosure for various applications.

Digital Temperature/ Relative Humidity transmiters

NIYAMA uses Sensirion's family of relative humidity and temperature sensors .by useing CMOSens® Technology NIYAMA transmiters established high performance and integration in a miniature format transmiters. The capacitive humidity and temperature sensors provide digital and fully calibrated output which allows for easy integration without the need for additional calibration. The excellent long term stability has been very well perceived and the cutting edge low energy consumption is unrivalled and makes them the right choice for any remote application.

NIYAMA Temperature Indicator is a versatile solution for zero-defect temperature indication, with high/low and on/off temperature alarms settings for clean room application in the Pharmaceutical industry. This is designed to indicate and prevent overshoot and undershoot of temperature. This data also supports the analysis of HVAC system performance, providing analogue and pulse-modulating outputs.

Salient Features

- Avoids user intervention
- Wall-mounted design of **NIYAMA** temperature and relative humidity indicator, without edges
- Large graphical LCD display with back light and readings in desired units, making the product more user-friendly.
- Uses factory-calibrated semiconductor monolithic miniature feature of temperature sensor.

Optional Features

- Display big Blue and White fonds with back light.
- In built memory [data logger]
- Remote display with Radio frequency, Blue tooth and Wifi support for communication.
- Stand alone Relay out put module with Tower LED.
- Stand alone AHU controller for VFD.
- Analog put with precise control out put range .
- In built Analog / PID controller for stand alone control .
- Wide range display module enclosure for various applications.

Technical Specifications

Reading temperature range	: 20°C to 100°C
Resolution	: 0.05°C
Conditioner accuracy	: ±2°C
Accuracy at different RH	: 2% RH, RH range 10 to 90 % 3.5 % RH, RH range 0 to 10 % 3.5 % RH, RH range : 90 to 100 %
Material Enclosure	: ABS Plastid, SS 304, edgeless
Display	: 128 x 64 /LCD display (blue) 14 mm fonts or 75 x 75 63 mm fonts
Communication protocols	: RS-485 , RF ,blue tooth and wifi communication (optional)
Analogue outputs	: 5 V and 10 V (optional)
Power supply	: 5 V DC, 1 A
Installation	: standard wall-mount flush

An ISO 9001:2008 Certified Company
D&B Certified Company
CE Certified Products

Our Valuable Clients

Airport Authority of India
Alembic Ltd.
Blue Star Ltd.
Cadila Healthcare Ltd.
Cadila Pharmaceuticals Ltd.
Gujarat Glass Ltd.
Intas Pharmaceuticals Ltd.
Karnavati Engineers Ltd.
Kusum Healthcare Ltd.
Lupin Laboratories Ltd.
Marck Bioscience Ltd.
Nirlife Healthcare (Nirma Ltd.)
Nitin Lifesciences Ltd.
Ranbaxy Laboratories Ltd.
Torrent Pharmaceuticals Ltd.
Unichem Laboratories Ltd.
Voltas Ltd.
Wockhardt Ltd.
Zydus Cadilla
...and the list is still growing.

Our International representation in

Germany, Italy, Turkey, Brazil, Nigeria, Kenya, Ghana, Egypt, Uzbekistan, Ethiopia, Shri Lanka, Bangladesh, Syria, Middle East, Nepal etc.

Shree Aerodynamic Products

201, Sikhar Complex, Opp. Navneet Prakashan,
Gurukul, Ahmedabad 380 052. GUJARAT. INDIA.
E-Mail : info@sapindia.in I info@niyama.in
Phone : +91 79 4005 2100, 4005 5100
URL : www.sapindia.in I www.niyama.in

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