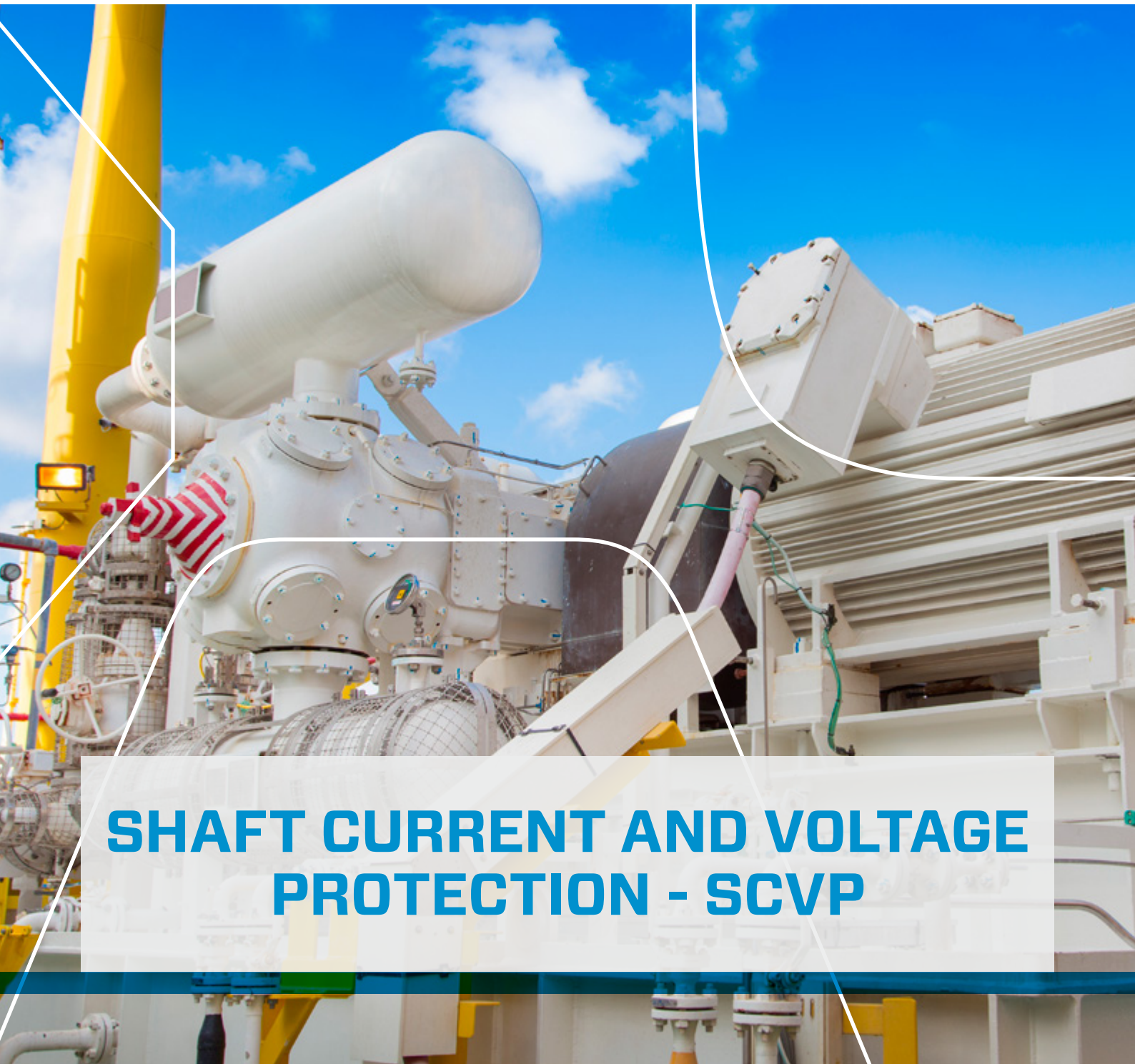
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SHAFT CURRENT AND VOLTAGE PROTECTION - SCVP









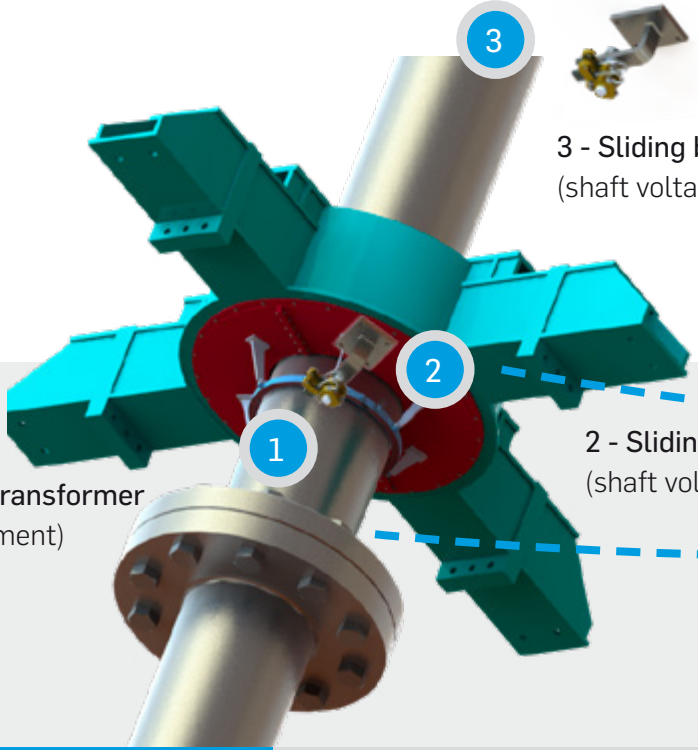

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Shaft Current and Voltage Protection - SCVP

Due to magnetic field asymmetry in the machine, a voltage in the shaft can be induced, which, depending on the type of machine, its size and load, varies in amplitude and frequency composition. Low circuit impedance consisting of shaft, bearing, oil film and other structural components, can cause shaft current flow which leads to bearing destruction.

Shaft Current and Voltage Protection Relay (SCVP) is used to measure/analyze shaft voltage and current that may damage the generator bearing.



3 - Sliding brush
(shaft voltage measurement)

2 - Sliding brush
(shaft voltage/current measurement)

1- current transducer/transformer
(shaft current measurement)

SCVP Features

- On-line analysis
- Protection relay configuration based on harmonic composition
- Data base (trends, waveforms, alarms ...)
- Local/remote HMI

Operator panel - HMI
(real time data, trends, spectrum, alarms, setup...)



SCVP – Processing/protection unit
(real time processing, database, web server, HMI, voltage and current input, relay outputs ...)



Analog signals

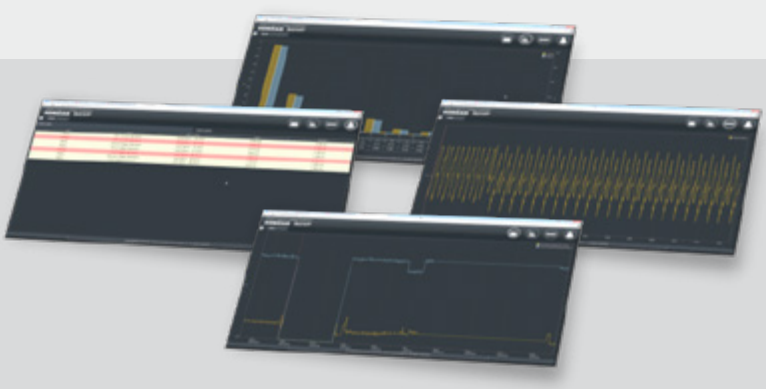
Ethernet



Ethernet

Remote user
(computer, smartphone, tablet ...)

Web HMI
(real time data, trends, spectrum, alarms)





SCVP specification



Architecture:

- Two channel acquisition unit with real time controller

Current input:

- Measuring range: 0 to ± 50 A (input for either or current transducer)
- Frequency range: up the 10 kHz
- Test voltage: 4 kV
- Rated isolation voltage: 300 V overload (category III) by EN 50178
- Surge withstand: 4 kV (50Hz, 1min)

Voltage input:

- Measuring range: 0 to ± 100 V
- Frequency range: up the 10 kHz
- Test voltage: 4 kV
- Rated isolation voltage: 300 V overload (category II) by EN 50178
- Surge withstand: 2,5 kV

Digital/relay outputs:

- Number of outputs: 2 to 8
- Continuous current: 6 A
- Maximum switching power: 1500 VA
- Maximum switching voltage: 250 VAC/DC
- Surge withstand: 2,5 kV

Communication:

- Ethernet 10/100 Mbit/s
- Supported protocols: Modbus TCP, FTP server (other on request - IEC 60870-104, Modbus RTU, Profibus,...)

Power supply:

- 110 V to 240 V AC/DC, frequency 45 to 66 Hz
- Integrated 1 second UPS
- Test voltage: 3 kV (2 kV against ground)

Temperature range:

- Operational temperature range: -20°C to +70°C / -0°C to +55°C (for SCVP variant with touch screen)
- Storage temperature range: -40° to +85°C

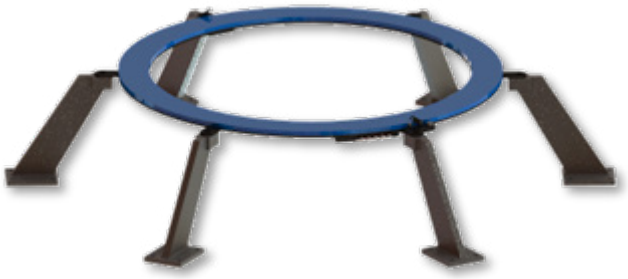
Dimensions:

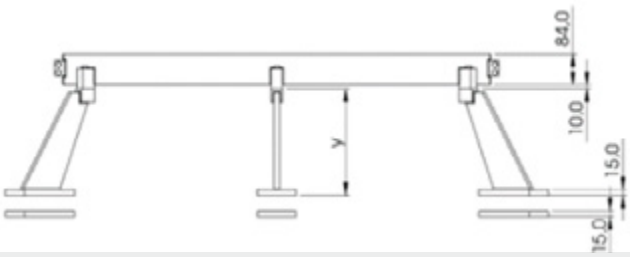
- 19" installation – WHD: 482,5x177,5x250 mm
- Cabinet IP 54 (IP 66 on request) – WHD: 300x300x200 mm

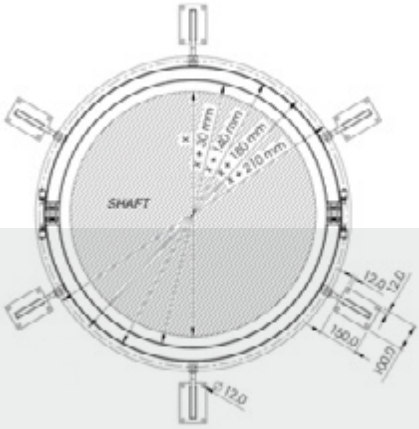
Measuring sensors

Current transducer CT-AE79:

- Based on Rogowski coil
- Linear on the whole measurement range
- Sensitivity: 200mV/A
- Dimension: On request
- Test winding: no
- Frequency: 50 Hz, 60 Hz
- 4xthinner, 5x lighter than standard CT







Sliding brush and small CT (current and voltage measurement):

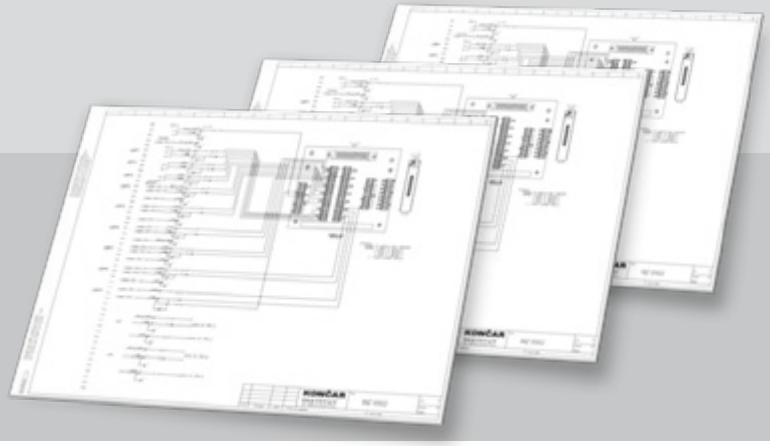
- CT – typically 100 mA, 1A, 5 A and 10 A
- Low resistance, silver sliding brushes



Documentation

Complete documentation required for system installation, maintenance and usage of the SCVP system. Usual scope of the documentation:

- Electrical documentation
- User instructions
- Test reports...



Software

Depending on the selected SCVP type, users can get insight into measuring data through local touch display (local HMI) and through web server (web application).

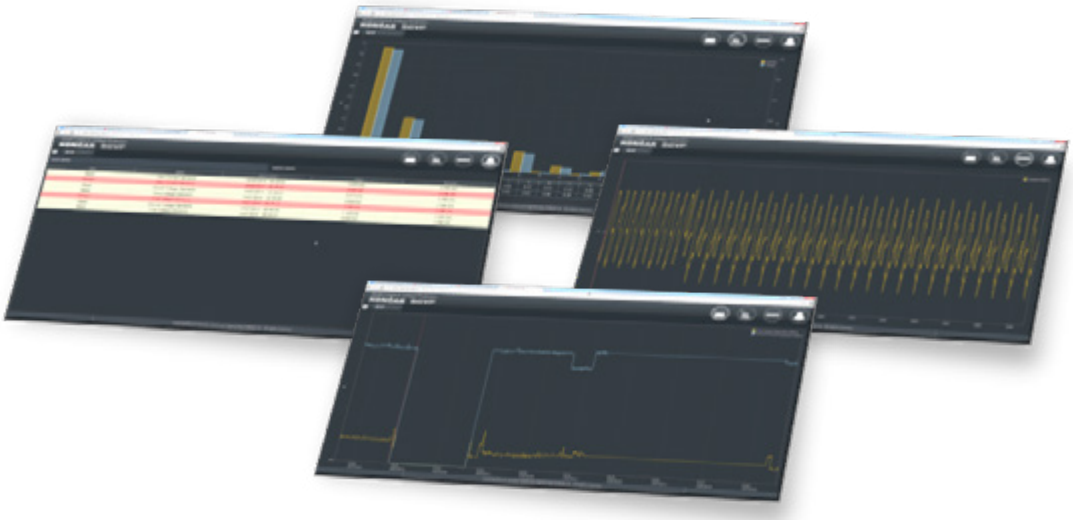
Local visualization enables insight into real-time data (waveform and spectrum) and setup. All screens can be modified according to the Customer's requests which includes native language.



Local HMI

The SCVP system is equipped with a multiuser web server which enables remote access and overview of all system data through standard web browser. This web server provides access to the SCVP system from any desktop or a laptop computer (with Windows or iOS operating system), tablet (with iOS, Android OS...) or smartphone (with iOS, Android OS...).

System access is provided without the need to install any additional software, using a standard web browser (Google Chrome, Internet Explorer, Mozilla Firefox, Safari ...). Web server enables insight into real-time data (spectrum), alarms and for SCVP variant with data base trends and waveforms are on the Customers disposal.



Remote web application (HMI)

SCVP benefits

INSTALLATION



- Installation without machine interruption and integration with other systems (e.g. SCADA)
- Web integration into a single access point which supervises critical equipment in multiple power plants

CONNECTIVITY



- Integration of multiple user accounts into one user application
- Innovative technology which connects local HMI, database for long term archive and web server for a compact product

USER FRIENDLY



- Intuitive data presentation and remote access using standard Internet browsers
- Automated report generation with all relevant information on machine status
- Online analysis and real trending for reliable form of predictive monitoring

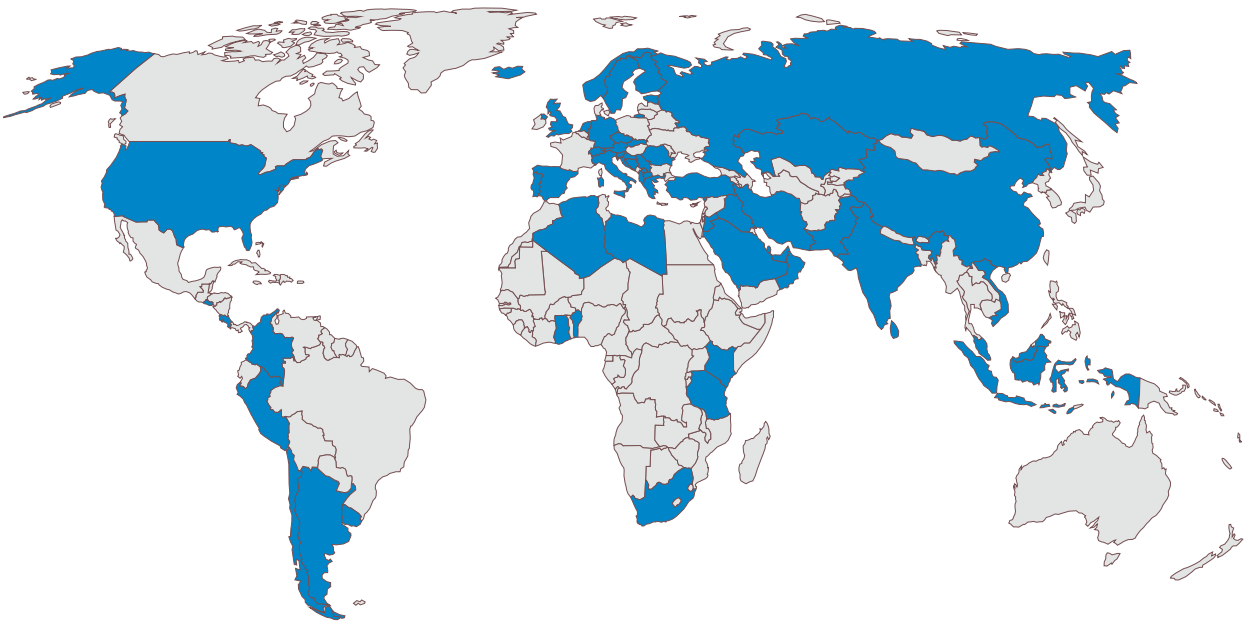
PROTECTION

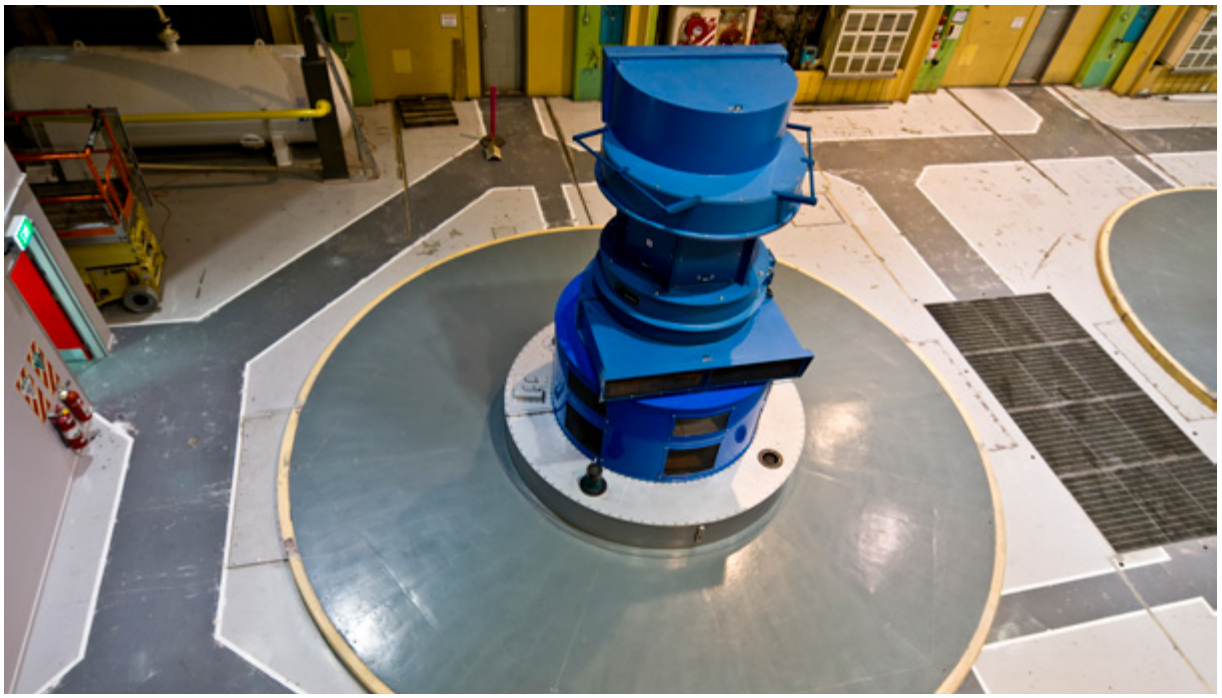


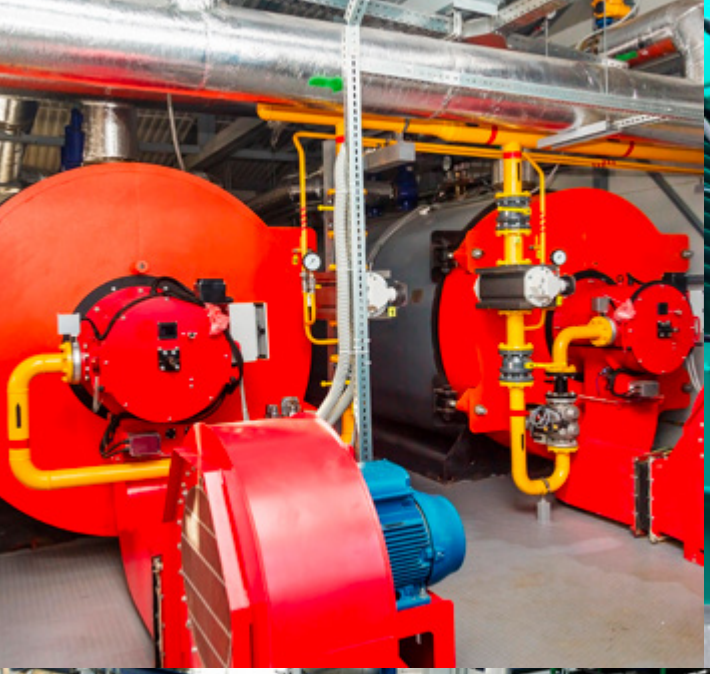
- The system performs spectral analysis (FFT) using instrument transformer/transducer which can be used to set custom alarms for critical values
- Long term archive of data and historical values stored for detailed analyses and trends

Worldwide recognized and implemented

SCVP has found its place on many hydro and turbo generators around the globe. Our customers recognize its value and the importance of monitoring one of the biggest issues that arise during the generator usage.



















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