



NAXYS A10/A10E – SUBSEA LEAK DETECTOR AND CONDITION MONITORING SYSTEM

The Naxys A10/A10E utilizes acoustic and electric sensors arrays for non-intrusive monitoring of the entire subsea installation. Applications for the Naxys A10/A10E range from acoustic leak detection to advanced acoustic and electric monitoring of subsea machinery and processes.



MACHINE MONITORING

- Continuous monitoring and early detection of changes/faults
- Acoustic and electric monitoring
- Compressor, pump, transformer

LEAK DETECTION

- Early detection
- Wide area coverage
- Directional
- High sensitivity

VIBRATION DETECTION

- Early detection
- Structural, flow lines, riser

General	
Type:	Subsea Leak Detector and Condition Performance Monitoring System
Name:	Naxys A10 / Naxys A10E
Manufacturer:	GE Measurement & Control – Naxys
Operating temperature range:	-5°C to +40°C
Operating pressure:	Max. 300 bar
Test pressure:	Max. 330 bar
Mounting:	Subsea by ROV or topside before subsea deployment
Weight:	Approximately 250 kg in air
Dimensions (HxØ):	1750x1000 mm
Qualifications:	ISO 13628-6 :2006, Statoil TR1233
ESS testing:	Optional as agreed: ISO 13628-6 :2006, Statoil TR1233
Design Life:	30 years

Leakage Detector	
Sensitivity:	- Signal to Noise Ratio > 6 dB at sensor location - Depends on differential pressure across leakage, Gas Oil Ratio, distance to leakage, water depth, obstructions and background noise.
Coverage:	- Wide area coverage. - Typical detection threshold for wide area coverage is subsea installation and surrounding infrastructure. Demonstrated detection up to 500 m range.
Response time:	Continuous monitoring, alarm response time configured by user – typically 2 minutes
Frequency range:	Band of leakage noise
Accuracy:	Indication of leakage flow rate by trending the leakage over time
Redundancy:	Yes (sensor, electronics, power and communication)
Directivity pattern:	Directional estimation, approximately a few degrees accuracy
Features:	

Vibration Detector	
Frequency range:	5-5000 Hz
Response time:	Real time
Directivity pattern:	Directional estimation to vibration
Redundancy:	Yes
Features:	Wide area vibration detection (entire installation and surrounding infrastructure)

Pump and Compressor Monitoring	
Frequency range:	5-400,000 Hz (acoustic), 5-5000 Hz (electric)
Response time:	Real time
Directivity pattern:	Direction estimation to pump
Redundancy:	Yes
Features:	- Speed tracking/pump RPM (acoustic) - VSD frequency monitoring (electric) - Slip ratio estimation - Monitoring of harmonics - Resonant frequencies detection - Vibration levels trending - Pump imbalance detection - Electrical ground faults - Electrical failure - Verification of pump operation - Early detection of changes and failures

Valve and Choke Detection	
Frequency range:	5-5000 Hz
Response time:	Real time
Directivity pattern:	Direction estimation to valve/choke
Redundancy:	Yes
Features:	- Event tracing - Acoustic signature - Verification of valve/choke operation - Early detection of changes and failures

Housing	
Material frame:	Titanium grade 2
Material electronics canister:	Titanium grade 2
Material penetrators:	Titanium grade 23

Acoustic Sensor	
Naxys Acoustic Sensor	Piezo element

Electric Sensor	
Naxys Electric Sensor	Carbon fiber

Termination	
Connector type:	Pigtail or stab-plate subsea ROV wet-mateable connector
Connector manufacturer:	Tronic/ODI
Model:	Digitron/Nautilus

Signal and Power	
Signal output:	- SIIS Level 3 Ethernet Modbus/TCP - Modbus RTU over RS485
Bandwidth:	- Leakage Detection (full subsea processing): - 16 bit alarm register updated every 15s = approx 1 bit/s ec recommended polling interval of 15s - Condition Monitoring (partial subsea processing): - 2 to 10 Mbits/se
Electrical power supply:	24V DC nominal (18 to 34V DC)
Power consumption:	25 W
Current drain:	1.05 A @ 24V DC
Inrush current:	Initial cold start inrush current: <5 A for <1 ms. Thereafter maximum inrush current: 120% of rated steady state current for <500 ms. Time averaging of the inrush current can be performed
IP address:	DHCP

Installation	
Method:	ROV installable/retrievable
Mounting support:	Subsea docking station / Guide funnels / Mud-mat