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Scientific and Manufacturing
Enterprise

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Integrated Systems and Package
Equipment for Oilfield and
Gas Fields Construction

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Integrated Systems and Package Equipment for Oilfield and Gas Fields Construction

SME Tomsk Electronic Company offers package supply of integrated systems and modular equipment for oil and gas fields construction.

Company develops its products basing on Customer's requirements and operation conditions. Basic options for design and components serve as a basic, then they are adjusted by specialists of the Company. High quality of products is provided by employing highly qualified and experienced specialists and state-of-art production technologies.

Company has been certified as per ISO 9001:2008 Quality Management System, it possesses all relevant certificates for designing, construction, installation and commissioning, it is a member of Oil and Gas Equipment Producers, it has all necessary resources including designing departments, modern mechanical and electronic production, certified welding technique, assembly and installation shops, certified NDT laboratory, metrological service, quality assurance department, commissioning and service department.

List of Manufactured Equipment

■ Integrated Systems for Metering and Recording

- Commercial Oil Metering Systems (SIKN)
- Crude Oil Metering Systems (SIKNS)
- Metering System for Oil Products
- Metering Units for Natural and Associated Gas (UUG, SIKG)
- Metering Units for Stripped Gas and Gas Condensates
- Formation Water Metering Skids (UUV)
- Metering Units for Material Flows
- Mobile Calibration Units (PPU)

■ Pumping Stations

- Package station for water pumping
- Package station for oil pumping
- Fire fighting pump stations
- Package station for LPG pumping

■ Oil, Gas and Water Treatment Equipment

- Automated Gas Distribution Stations (AGDS)
- Gas Treatment Units (GTU)
- Gas Reduction Units (GRU)

■ Equipment for Formation Pressure Maintenance

- Package pad pump stations (BKNS)
- Inlet line block (BVN)
- Manifolds

■ Administration and On-Site Facilities

- Prefabricated control rooms
- Prefabricated buildings for location of electrical equipment

Integrated Systems for Metering and Recording

Metering Systems for Crude and Commercial Oil and Oil Products



2010 - SIKN for Crude Oil Acceptance and Delivery Station of Oil Refinery in the village of Semiluzhki, Tomsk Oblast, OOO Tomskneftepererabotka. Block of Metering Lines



2010 - SIKN for Crude Oil Acceptance and Delivery Station of Oil Refinery in the village of Semiluzhki, Tomsk Oblast, OOO Tomskneftepererabotka. General View



2010 - SIKN for Crude Oil Acceptance and Delivery Station of Oil Refinery in the village of Semiluzhki, Tomsk Oblast, OOO Tomskneftepererabotka. SIKN prefabricated building, outside view

Purpose

Metering systems are aimed for automated metering of crude and commercial oil and oil products by indirect volume-weight method or direct weight dynamic method as per Recommendations for Oil Weight Metering with Use of SIKN, approved by Edict №69 dated 31.03.2005, GOST P 8.595, MI 2825, GOST P 8.615, MI 2693.

Functions

- Automatic metering oil gross weight, density, water cut, temperature, pressure, pressure drop by filters
- Automatic calculation of oil net weight
- Automatic and manual oil sampling
- Remote and local pressure metering
- Remote and local temperature metering
- Control of metrological parameters and flow transducers calibration by checking line or calibration unit
- Automated (remote and local) or manual control of stop valves
- Automated oil pressure control at the SIKN outlet manifold

Equipment Location

- in one block, which dimensions allow it to be transported by railroad, motor or water transport
- at open platforms, allowing it to be transported by railroad, motor or water transport
- in prefabricated buildings installed at the operation site

System Components

Metering systems for oil and oil products include the following functional elements, hereinafter blocks:

- Filtering Block (BF)
- Block of Metering Lines (BIL)
- Block for Quality Parameters Metering (BIK)
- Calibration Unit (BPU)
- Reference Instruments Block (BSE)
- Flow and Pressure Control Units
- Data Processing System (SOI)
- Power System



2009 - SIKNS for Odoptu-more oilfield, OOO RN-Sakhalinmorneftegas, OAO NK Rosneft. General View



2009 - SIKN for Odoptu-more oilfield, OOO RN-Sakhalinmorneftegas, OAO NK Rosneft. SOI IVK MikroTEK with hot backup



2009 - SIKN Katangli oilfield, OOO RN-Sakhalinmorneftegas, OAO NK Rosneft. General View

Metrological Assurance

Systems are equipped by the measuring devices entered into the State Register and possessing certificates on type approval.

SME TEC Ltd. performs metrological scrutiny for system design by the accredited State Research Metrological Centre (SRMX) with the consequent issue of the conclusion.

Measuring technique is developed, agreed and approved with the consequent issue of the certificate on measuring technique approval.

When the systems are being introduced, their type is tested with the consequent enter into Metering Devices State Register and certificate issue on the type approval.



2009 - SIKN for Katangli oilfield, OOO RN-Sakhalinmorneftegas, OAO NK Rosneft. SIKN prefabricated building, outside view

Brief Technical Parameters

Operation medium	commercial oil as per GOST P 51858, crude oil as per GOST P 8.615
Water cut, %	up to 1 (commercial oil), up to 85 (crude oil)
Temperature, °C	from 0 to +65
Flow rate, t/h	individually as per design
Pressure, MPa	up to 10
Operation mode	intermittent / continuous
Control mode for cut off and control valves	manual / automatic
Calibration technique for flow meters	by stationary CU / by mobile CU
MPM technique for flow meters	by monitored line / by monitored standby line
Components of data processing system	it is recommended to use data processing system basing on IVK MicroTEK

Water Metering Skids



2010 - UUV of Talinskoye pad of Krasnoleninskoye oil and gas field, OAO TNK-Nyagan, OAO TNK BP. General View



2010 - UUV of Talinskoye pad of Krasnoleninskoye oil and gas field, OAO TNK-Nyagan, OAO TNK BP. View from main entrance



2010 - UUV of Talinskoye pad of Krasnoleninskoye oil and gas field, OAO TNK-Nyagan, OAO TNK BP. Shipment of products

Brief Technical Parameters

Operation medium	formation water
Capacity, t/h	200...2000*
Operating pressure, MPa	up to 10
Temperature, °C	As per design
Components of data processing system	it is recommended to use data processing system basing on IVK MicroTEK

* Should the Customer require the ranges can be expanded.

Purpose

They are aimed for automatic metering of formation water.

Functions

- Automatic metering of water volume during routine operation by vortex, ultrasound, turbine and differential pressure techniques
- Automatic calculation of water volume and weight and standard operation conditions
- Remote and local pressure metering
- Remote and local temperature metering
- Monitoring of metrological parameters of the operating flow meter against the reference one
- Monitoring of metrological parameters and calibration of operating and reference flow meters by the calibration unit
- Automated (remote and local) or manual control of stop valves.

Components

- Process equipment
- Data processing system (SOI)
- Power supply system

Equipment Location

- in one block which dimensions allow it to be transported by railroad, motor or water transport
- at the open platforms which dimensions allow it to be transported by railroad, motor or water transport
- in prefabricated buildings erected on site

Pumping Stations



2010 - BPS for liquified petroleum gas of Kazanskoye oil and gas field OAO Vostokgasprom, OAO Gazprom. General View



2010 - BPS for liquified petroleum gas of Kazanskoye oil and gas field OAO Vostokgasprom, OAO Gazprom. Customer's acceptance at the facilities of SME TEC Ltd.



2009 - BPS for oil pumping at Katangli of OOO RN-Sakhalinmorneftegas, NK Rosneft. Pump

Purpose

MPS is aimed for transfer of oil, oil products, natural and associated petroleum gas, liquefied gas, gas condensate, water, chemicals and automated supporting of the preset outlet pressure.

Functions

Provision of preset capacity and supporting outlet pressure.

Components

- Process units (KT)
- Power units
- PCS

Equipment Location

- in one block, which dimensions allow it to be transported by railroad, motor or water transport
- at open platforms, allowing it to be transported by railroad, motor or water transport
- in prefabricated buildings installed at the operation site



2009 - BPS for oil pumping at Katangli of OOO RN-Sakhalinmorneftegas, NK Rosneft. BPS prefabricated building, outside view

Brief Technical Parameters

Operation medium	oil, oil products, natural and associated petroleum gas, liquefied gas, gas condensate, water, chemicals
Flow rate capacity, m ³ /day	as per Customer's requirement
Inlet pressure, MPa	from 0.1
Outlet pressure, MPa	as per Customer's requirement

Equipment for gas, oil and water treatment

Automated Gas Distribution Stations of Tom



Purpose

Automatic gas distribution stations (AGRS) of Tom are aimed to decrease high pressure of natural gas to reach the preset out pressure and maintain it with the preset accuracy, as well as metering gas flow and its odorizing before supplying to consumers.

Features

- Reduction of capital and operation costs due to the following:
 - Reduction of service by 40% related to stop valves and process pipelines due to using built-in functional diagnostic system, including monitoring of resources and leaks in pipelines and valves (stationary and mobile design).
 - No need for service of odorization unit due to original system of batching and built-in adaptive system of automatic adjustment, providing accurate batching of odorizer proportionally to gas flow rate at GRU outlet with wide production ranges (starting practically from zero).
 - Increase of inter-calibration period for gas flow metering devices up to 8-12 years due to using ISA 1932 orifice, thus the gas metering accuracy is provided in the wide dynamic ranges complying with MI 3082 requirements.
 - Reduction of gas tapped off for internal needs due to using vortex technologies for gas heating and reduction.
 - Up to 70% of scope of work for AGRS is performed by SME TEC, mostly Russian components are used.

- Transfer to unmanned operation is possible.
- Enhancement of operation reliability and service life of AGRS due to using modern materials and equipment, process solutions, functional diagnostic system and AGDS TOM ESD.
- Integrated factory testing of TOM AGDS before shipment to the Customer at the site of SME TEC in Tomsk with drawing up of diagnostic data sheet for process equipment of TOMAGDS.
- Performing complete scope of work, including: Designing, development of design documents and software, manufacturing, testing, installation and commissioning on site, guarantee and post guarantee service by SME TEC personnel with drawing up of diagnostic data sheet for process equipment of AGDS.

Brief Technical Parameters

Operation medium	Natural gas
Inlet pressure, MPa	1,2...10
Outlet pressure, MPa	0,3...1,2
Capacity, cu, nm/h	1 000 - 100 000
Number of outlets, ea.	Upon Customer's requirements (standard design includes 1-3 outlets)
Inlet gas temperature, °C	-10...+20
Ambient temperature, °C	Standard design -50...+50 (customized design - 60...+50)

Units for gas treatment, reduction and distribution



2010 - Gas reduction unit at Boatasino pad of OOO RN-Sakhalinmorneftegas, NK Rosneft. General View



2010 - Gas reduction unit at Boatasino pad of OOO RN-Sakhalinmorneftegas, NK Rosneft. Control room of gas reduction unit



2010 - Gas reduction unit at Boatasino pad of OOO RN-Sakhalinmorneftegas, NK Rosneft. Installation of products at site

Brief Technical Parameters

Operation medium	natural and associated petroleum gas, liquefied gas, gas condensate
Capacity, nm ³ /hour	50 ... 50000
Pressure, MPa	0,12...15
Outlet pressure, MPa	0,02...3,2
Inlet gas temperature, °C	as per Customer's requirements
Outlet gas temperature, °C	as per Customer's requirements

Purpose

Units are aimed for treatment of fuel gas for gas piston and gas turbine drives of compressor stations, power stations and other consumers.

Functions

Gas separation, heating, metering, reduction, compression, drying.

Components

Units can include the following blocks and systems:

- separation block
- heating block
- metering block
- reduction block
- dehydration block
- gas compression block
- fire alarm system
- fire fighting system
- monitoring system for gas contamination
- heating, lighting and ventilation system
- PCS

Equipment Location

- in one block, which dimensions allow it to be transported by railroad, motor or water transport
- at open platforms, allowing it to be transported by railroad, motor or water transport
- in prefabricated buildings installed at the operation site

Equipment for Formation Pressure Maintenance

Well piping units

Purpose

Units are aimed for collection and distribution of oil, oil products, natural and associated petroleum gas, liquefied gas, gas condensate, water for various process needs (gas lift, transportation, formation pressure maintenance etc).

Functions

Startup and continuous fail free operation of oil and gas wells.

Components

- Process units (KT)
- PCS

Equipment Location

- in one block, which dimensions allow it to be transported by railroad, motor or water transport
- at open platforms, allowing it to be transported by railroad, motor or water transport
- in prefabricated buildings installed at the operation site



2010 - Block of inlet lines at Yarakinskoye oil and gas field OOO Irkutsk Oil Company. General View



2010 - Block of inlet lines at Yarakinskoye oil and gas field OOO Irkutsk Oil Company. Part of process pad

Brief Technical Parameters

Operation medium	oil, oil products, natural and associated petroleum gas, liquefied gas, gas condensate, water
Capacity, nm ³ /hour	10 000 ... 150 000
Inlet pressure, MPa	11 ... 30
Inlet gas temperature, °C	as per design

Administrative and On-Site Facilities



2010 - Administrative and on-site quarters for Crude Oil Acceptance and Delivery Station of Oil Refinery in the village of Semiluzhki, Tomsk Oblast, OOO Tomskneftepererabotka



2010 - Prefabricated building of SIKN for Crude Oil Acceptance and Delivery Station of Oil Refinery in the village of Semiluzhki, Tomsk Oblast, OOO Tomskneftepererabotka



2009 - Prefabricated building for SIKN at Katangli oilfield OOO RN-Sakhalinmorneftegas, OAO NK Rosneft



2009 - Prefabricated building for control room of MPS at Katangli oilfield OOO RN-Sakhalinmorneftegas, OAO NK Rosneft



2010 - Prefabricated building for UUV at Talinskoye pad, Krasnoleninskoye oil and gas field OAO TNK-Nagryan, OAO TNK-BP



2009 - Prefabricated building for control room of MPS at Katangli oilfield OOO RN-Sakhalinmorneftegas, OAO NK Rosneft. Inside view



2010 - Administrative and on-site quarters for Crude Oil Acceptance and Delivery Station of Oil Refinery in the village of Semiluzhki, Tomsk Oblast, OOO Tomskneftepererabotka. MCC room



2010 - Control room for Gas reduction unit at Boatasino pad, OOO RN-Sakhalinmorneftegas, NK Rosneft. Inside view

Integrated Approach

Supplying its products, SME TEC Ltd. provides the complete scope of services (on turn key basis), including:

- Pre-design examination, development and approval of the technical assignment
- Metrological scrutiny of technical assignment
- Development, issue and approval of detail design
- Metrological scrutiny of detail design with the consequent issue of conclusion
- Development, agreement and approval of measuring techniques with consequent issue of MT appraisal certificate
- Industrial safety check of detail design
- State approval of detail design
- Obtaining Rostechnadzor permits for production and using of products at hazardous facilities

- Development design documents
- Development of operation documents
- Manufacturing at own production facilities
- Integrating factory testing
- Delivery of products to Customer's site
- Installation and installation supervision
- Setup and commissioning
- Training and advising to Customer's personnel
- Commissioning for pilot operation
- Testing in order to approve the MD type in the accredited metrological center entered into the State Register of Measuring Devices
- Putting into commercial operation
- Service



Quality Assurance

Our Company has been certified as per ISO 9001:2008 Quality Management System. In order to confirm compliance with requirements of international the quality management system of SME TEC has been certified by Lloyd's Register Quality Assurance (United Kingdom) - one of the internationally acknowledged leaders in the field of standardization, certification and surveillance. SME TEC Ltd take every effort to assure quality at the every stage of production, including:

- inspection of incoming materials and components
- thorough quality control between production stages

- visual and instrumental weld examination
- X-ray quality check of piping welds as per formal requirements
- hydraulic testing of process pipelines
- preliminary testing
- acceptance testing
- initial calibration of measuring devices by TCSM (IVK MicroTEK and GSM gas detectors)
- acceptance testing of products in compliance with the program and technique agreed by the Customer in the workshop of SME TEC Ltd or at the Customer's site.