Fixed multi-component gas analyzer for process/ecological monitoring AHKAT-410

Designed for automatic process monitoring and measurement of environment polluting emissions, also for operation in monitoring distributed systems.

Application

Fuel combustion and process facilities of power, metallurgy, glass, chemical and petrochemical industries, constructional materials manufacturing plants, rail transport.

Principle of measurement - electrochemical (on CO_2, ΣCH channels – optical absorption). Operation mode – continuous or cyclic.

Basic technical characteristics

Measured component	Measuring (indicating) range	Least significant digit	Part of measuring range where error is rated	Limits of intrinsic absolute error	Readings setting time, s
O_2	(0-21) vol.%	0,1 vol.%	(0-5) vol.% (5-21) vol.%	± 0,2 vol.%. ± 0,4 vol.%	30 30
CO	(0-200) ppm	1,0 ppm	(0-20) ppm (20-200) ppm	± 5,0 ppm ± (5+0,06(C_{in}-20)) ppm	60 60
CO	(0-2 000) ppm ((0-4 000) ppm)	1,0 ppm	(0-2 000) ppm	± 10 ppm or ± 5 % (relative)*	60 60
CO	(0-0,5) vol.%	0,001 vol.%	(0-0,5) vol.%	± 5 % (fiducial)	60
NO	(0-200) ppm	1,0 ppm	(0-50) ppm (50-200) ppm	± 5,0 ppm ± (5+0,1(C_{in}-50)) ppm	60 60
NO	(0-2000) ppm	1,0 ppm	(0-100) ppm (100-200) ppm	± 10 ppm ± (10+0,1(C_{in}-100)) ppm	60 60
NO	(0-0,4) vol.%	0,001 vol.%	(0-0,4) vol.%	± 10 % (fiducial)	60
NO_2	(0-140) ppm	1,0 ppm	(0-140) ppm	± 15 % (fiducial)	90
SO_2	(0-200) ppm	1,0 ppm	(0-50) ppm (50-200) ppm	± 10 ppm ± (10+0,1(C_{in}-50)) ppm	60 60
SO_2	(0-3 000) ppm	10 ppm	(0-3000) ppm	± 20 ppm or ± 10 % (relative)*	60
H_2S	(0-40) mg/m^3 ((0-150) mg/m^3)	0,1 mg/m^3	(0-40) mg/m^3	± 2 mg/m^3 or ± 25 % (relative)*	60
HCl	(5-30) mg/m^3 ((0-150) mg/m^3)	0,1 mg/m^3	(5-30) mg/m^3	± 25 % (relative)	180
NH_3	(0-150) mg/m^3	1 mg/m^3	(0-20) mg/m^3 (20-150) mg/m^3	± 5 mg/m^3 ± (5+0,25(C_{in}-20)) mg/m^3	180 180
NH_3	(0-2 000) mg/m^3	10 mg/m^3	(0-2000) mg/m^3	± 50 mg/m^3 or ± 25 % (relative)*	180
Cl_2	(0-25) mg/m^3	0,01 mg/m^3	(0-25) mg/m^3	± 0,25 mg/m^3 or ± 25 % (relative)*	120
CO_2	(0-30) vol.%	0,1 vol.%	(0-30) vol.%	± 5 % (fiducial)	90
ΣCH	(0-0,05) vol.%	0,0001 vol.%	(0-0,05) vol.%	± 5 % (fiducial)	60

C_{in} – analyte content at gas analyzer inlet, vol.fraction, % (vol. fraction, ppm, mg/m^3).
* - the greater value of intrinsic error is taken of the two calculated ones.

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Range of calculated values

Calculation channel	Range	Remarks
CO_2	(0-25) vol.%	if gas analyzer has no CO_2 measuring channel
NO_x	(0-100) ppm (100-3 000) ppm	
excess air factor λ	0,5-9,99	
CO	(0-6,25) g/N•m^3	for gas analyzer AHKAT-410-16
NO_x	(0-0,29) g/N•m^3	for gas analyzer AHKAT-410-16
ΣCH	(0-0,98) g/N•m^3	for gas analyzer AHKAT-410-16

Procedure of industrial emissions monitoring with the use of AHKAT-410 has been agreed in FSUE "SRI Atmosphere". AHKAT-410-16 is approved for diesel locomotive and diesel train emission monitoring at environment monitoring stations in accordance with СТ СС ФЖТ ЦТ 09-98 and СТ СС ФЖТ ЦТ 07-99 of FSUE "FSUE "All-Russian Research and Technology Institute of Railway System of Ministry of Transportation of Russia".

Gas analyzer versions

Versions	Designation	Configuration
AHKAT-410-01	ИБЯЛ.413252.001	2 measuring channels with ECHC (single set), without IRS
AHKAT-410-02	-01	3 measuring channels with ECHC (single set), without IRS
AHKAT-410-03	-02	4 measuring channels with ECHC (single set), without IRS
AHKAT-410-04	-03	5 measuring channels with ECHC (single set), without IRS
AHKAT-410-05	-04	6 measuring channels with ECHC (single set), without IRS
AHKAT-410-06	-05	2 measuring channels with ECHC (single set), measuring channel with IRS
AHKAT-410-07	-06	3 measuring channels with ECHC (single set), measuring channel with IRS
AHKAT-410-08	-07	4 measuring channels with ECHC (single set), measuring channel with IRS
AHKAT-410-09	-08	5 measuring channels with ECHC (single set), measuring channel with IRS
AHKAT-410-10	-09	6 measuring channels with ECHC (single set), measuring channel with IRS
AHKAT-410-11	-10	2 measuring channels with ECHC (dual redundant set), measuring channel without IRS
AHKAT-410-12	-11	3 measuring channels with ECHC (dual redundant set), measuring channel without IRS
AHKAT-410-13	-12	2 measuring channels with ECHC (dual redundant set), measuring channel with IRS
AHKAT-410-14	-13	3 measuring channels with ECHC (dual redundant set), measuring channel with IRS
AHKAT-410-15	-14	2 measuring channels with ECHC (dual redundant set) for Cl_2, HCl
AHKAT-410-16	-15	3 measuring channels with ECHC: for CO (0 – 0,5) %, volume fraction, for NO (0 – 0,4) %, volume fraction, for NO_2 (0 – 0,014) %, volume fraction; measuring channel with IRS: for ΣCH (0 – 0,05) %, volume fraction

Gas analyzers AHKAT-410 are produced in 16 versions that differ in the list of measured components and calculation channels, and also by quantity of ECHC used.

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Basic technical characteristics

Characteristics	Values	Remarks
Warm-up time, minutes	60	
Period of gas analyzer operation without adjustment, months, at least	6	
Unified output signals: - current output, mA - digital output	(0-5) or (4-20) RS 232 and RS 485	selected via software MODBUS RTU Protocol
Relay output	6 relays for alarms "Threshold1" and "Threshold2" actuation	selected via software, voltage and relay switching current – 220V, 2,5 A
Ambient temperature,°C	+ 5 / +45	
Supply voltage, V	~ 220	50 Hz
Consumed power, VA, at most	40	
Overall dimensions, mm, LxWxH	485x215x285	weight 15 kg

Standard equipment

> Gas analyzer AHKAT-410;
> SPTA set;
> CD with software;
> Documentation.

Optional items can be ordered

> Cylinders with TGM-SSS;
> Cylinder with air cl.1;
> Adjustable flow rate indicator ИБЯЛ.418621.002-04 (or analogous one);
> Electrochemical cells (to replace worked-out ones);
> Flow rate pump ПЗ АПИ5.883.070-04;
> Remote control console ИБЯЛ.442411.005;
> Fine adjustment valve ВТР ИБЯЛ.306577.002-03.

Sampling probe

Heat-resistant gas sampling probe is designed for extraction and prefiltration of sample with an option of back-purging. Can be furnished with Pitot tube for measurement of flow velocity.

Cabinets

Cabinet is designed for protection of gas analyzer against environment climatic aspects, for delivery, dehydration, treatment and discharge of analyzable gas mixture, for purging of sensors with external air, for condensate drainage. Cabinets provide heated sample transportation line with AC of 220 V, 50 Hz and automatic protection.

Sample transportation line

The line has two modifications: heat-insulated and heated-up ones. Line material – fluoroplastic tube Ж6х1. Connection to sampling probe and cabinet – with nipples. Maximum length of heated-up transportation line is defined by pneumatic resistance with regard to characteristics of flow rate pump built in the cabinet.

Other technical characteristics

Characteristics	Design description	Protection degree	Overall dimensions LxWxH	Weight, kg	Versions of gas analyzers AHKAT-410
ИБЯЛ.422419.009	non-heated, for indoor installation	IP 40	360x630x650	40	AHKAT-410, -01...-10, -16
ИБЯЛ.422419.009-01	heated-up, for installation on open platforms	IP 65	360x740x810	45	AHKAT-410, -01...-10, -16
ИБЯЛ.422419.009-02	for indoor content change	IP 40	360x630x650	40	AHKAT-410-11...-14, -15
ИБЯЛ.422419.009-03	for content change on open platforms	IP 65	360x740x810	45	AHKAT-410-11...-14, -15

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