Data sheet DS/PUV3402LED/PIR3502 Applications-EN

PUV3402 LED and PIR3502 - Applications
Multiwave Photometers

Measurement made easy

ABB PUV3402 LED, PIR3502, PFO3372 process photometers provide on-line measurements of gas or liquid components, in simple or complex process streams for:

– Process Efficiency
– Catalyst Protection
– Product Quality
– Environmental Concerns
– Safety
– Process Control

ABB process photometers provide reliable performance in the petrochemical, chemical, refining, gas processing and product pipeline industries.

These lists provide a general reference for determining potential IR and UV applications. Other considerations will be the remaining stream matrix, stream temperature, stream pressure, and stream phase. The sample must be homogeneous, single phase in order to apply the method. Please provide the detailed information on your application to our ABB sales group so that application engineers can determine the feasibility of your application.

Field proven PUV3402 and PIR3502 applications

This chart is a partial listing of field-proven applications. These applications are grouped by process. Measured components and key benefits are indexed by each applications.

Process	Measurement	Benefits	IR/UV
Acid Gas Scrubbers	Sodium Hydroxide 0 –15 %	Improved scrubber efficiency and reduced cost	IR
Acetic Acid	CO 80 –100% in Reactor Feed	Maximize process yield	IR
	Water 0 –20% in Reactor Outlet	Distillation tower control	IR
		2nd half of distillation tower control and determining expected life of drying column	IR
	Water 0 –1500 ppm in Drying Column Outlet	Drying column efficiency	IR
	*Methyl Iodide 0 –1000 ppm	Scrubber efficiency and safety	UV
Ammonia	CO 0 –500ppm	Catalyst protection	IR
	CH4 0–0.5%	Safety	IR
Area Monitoring	Ethyl Benzene 0 –200 ppm,	Safety, leak detection	IR
	Styrene 0 –100 ppm,		IR
	Isooctane 0 –2500 ppm,		IR
	Divinylbenzene 0 –300 ppm		IR
Crude Unit	ASTM color 0 – 8	Product quality	IR
Ethylene	Acetylene 0 –2%	Hydrogenation reactor inlet continuous control	IR
	Acetylene 0 – 0.5%	Hydrogenation reactor mid-bed continuous control	IR
Ethylene Dichloride	CO 0 –10%, CO2 0–5%, and Ethylene 0 –5%	Process efficiency and safety	IR
	*Chlorine 0 –2000 ppm in EDC with Sparger System	Process efficiency	UV
Maleic Anhydride	CO 0 –2.5%, CO2 0–2.5%, Butane 0 –0.5%, and Maleic Anhydride 0 –2%	Reactor outlet – process efficiency	IR
	Butane 0 –2% and Water Vapor 0 –5%	Reactor inlet – LEL control	IR
Phosgene	CO 0 –2.5%, CO2 0–2.5%, Butane CO 0 –10%	Process control	IR
	*Chlorine 0 –200 ppm	Process control	UV
	Phosgene 0 –100 ppm	Safety	IR
Product Pipeline	CO2 0–1000 ppm	Prevent freezing of natural gas lines	IR
Sulfur Recovery	H2S 0 –100%, CO2 0–100%,	Acid gas feed Forward control	IR
	H2S 0 –100%, NH3 0–50%,	Sour gas feed	IR
Vinyl Chloride	Water 0 –50 ppm in EDC	Catalyst protection, corrosion protection of reactors	IR
	Vinyl chloride 0 –200 ppm, 0 –2% in HCl	Condenser efficiency	IR

IR absorbing compounds (potential measurements) - partial list

Butadiene (1,3)
Butane (n)
Carbon dioxide
Carbon monoxide
Carbon tetrachloride
Chloroform
Cyanogen
Cyclopropane
Diazomethane
Dichloroethane (1,1 and 1,2)
Dichloromethane
Dimethyl amine
Dimethyl ether
Dimethyl hydrazine
Ethane
Ethyl alcohol
Ethyl chloride
Freon-13B
Freon-14
Freon-C-318
Hydrazine
Hydrogen bromide
Hydrogen chloride
Hydrogen cyanide
Hydrogen sulfide
Isobutane
Methane
Methyl alcohol
Methyl azide
Methyl chloride
Methyl mercaptan
Nitric Acid
Nitric oxide
Nitroethane
Nitrogen dioxide
Nitrogen pentoxide
Nitromethane
Nitropropane (1&2)
Nitrosyl chloride
Nitrous Oxide
Phosgene
Propane
Propylene
Trimethylhydrazine
Trimethylamine
Vinyl chloride
Water

UV absorbing compounds (potential measurements) - partial list

Acetic acid
Acetone
Ammonia
Aniline
Anthracene
Benzene
Bromine
Carbon disulfide
Carbon tetrachloride
Chlorine
Chlorine dioxide
Chlorophenol (o,m,p)
Dioxane
Ethylbenzene
Ferric chloride
Fluorine
Hydrogen sulfide
Iodine
Mercury
Methyl mercaptan
Naphthalene
Nickel carbonyl
Nitrobenzene
Ozone
Perchloroethane
Phenol
Phosgene
Pyridine
Sodium sulfide
Styrene
Sulfur
Sulfur dioxide
Furfural
Toluene
Hydrogen peroxide
Xylene (o, m, p)
Hydrogen sulfide
Toluene
Iodine
Xylene (o, m, p)

Field-proven multicomponent applications

Multicomponent measurements

0–1.2% toluene; 0 –2% tetrahydrofuran and 0 –100% LEL of gas mix (3 components)
0–20% CO; 0 –20% CO2; and 0 –5% CH4 (3 components)
0–55% propane and 0 –20% propylene (2 components)
0–1000 ppm CH4 and 0 –250 ppm ethane in ethylene @ 100 psig (2 components)
0–100 ppm CO and 0 –100 ppm CO2 in H2 @ 200 psig (2 components)
0–5% CO2; 0 –5% CO; 0 –1% toluene and 0 –1% benzene in air oxidation vent (4 components)
0–50 ppm acrylonitrile and 0 –50 ppm styrene in air (2 components)
0–50 ppm ethylene oxide and 0 –50 ppm propylene oxide in air (2 components) 0–70% methyl chloride and 30 –55% methylene chloride (2 components)
0–5000 ppm SO2; 0 –2000 ppm NO; 0 –2000 ppm NO2 and 0 –2000 ppm NOx (4 components)
0–5000 ppm ethane; 0 –5000 ppm ethylene and 0 – 80% methane (3 components)
0–40% CO2; 0 – 40% CO and 0 –25% water vapor in air (3 components)
0–80% ethylene and 0 –15% CO2 in mixed HC stream as a vapor (2 components)
0–100% CO; 0 – 60% ethylene; 0 –20% CO2; and 0 –5% ethyl chloride @ 70 psig (4 components)
0–1000 ppm water and 0 –5% DMSO in monochlorobenzene (2 components)
0–100% ethylene; 0 –10% EDC; 0 –50% HCl; and 0 –20% ethyl chloride (4 components)
0–20% propadiene; 0 – 40% methyl acetylene and 0 – 60% MAPD (3 components)

Water measurements

0–2% water in phenol
0–500 ppm water in monochlorobenzene
0–50 ppm water in ethylene dichloride
0–250 ppm water in chlorine @ 75psig (vapor)
0–0.5% water in ethylene diamine
0–100 ppm water in vinylidene chloride
0-500 ppm water in propylene glycol
0–200 ppm water in methyl ethyl ketone (MEK)
0–500 ppm water in dimethylacetamide
0–200 ppm water in allyl chloride
0–0.5% water in acetone
0–1500 ppm water in methanol
0–100 ppm water in benzene
0–300 ppm water in toluene diamine
0–1000 ppm water in MEK & alcohols

Various single component measurements

1,3 butadiene 0 – 50%; in isobutene
1,3 butadiene 0 –70%
acetic acid 0 –2%; in acetic anhydride
acetylene 0 –1%; in methane; ethane and ethylene acetylene 0 –1.5%
ammonia 0 –250 ppm; in air
cis-2-butene 0 –10%; in butadiene
CO2 0–1%; in CH4 and C2H6
CO2 0–1%; in ethane
CO2 0–5000 ppm; in ethane
CO2 0–5000 ppm; in propane
cyclohexane 0 –30%; in cyclohexanol
cyclohexanone 0 – 500 ppm; in cyclohexane
ethane 0 –10%; in methane and propane
ethylene 0 –2%; in ethane
H2S 0 –15%; in sour fuel gas
hexamethylene imine 0 – 400 ppm
hydrogen cyanide 0 –1%
MEOH 0–20%; in MTBE/TAME
methane 0–6%; in H2 and water vapor
methanol 0 – 40%; in MTBE
methyl bromide 0 –100 ppm in air
propane 0–6%; in propylene propylene 80 –100%
total hydrocarbons 0 –10%; in propylene
total hydrocarbons 0 –300 ppm; as butene-1 vinyl acetate 0 –10%; in ethylene
vinyl acetate 0 –10%; in ethylene
vinyl acetate 0 –20%; in ethylene

UV field-proven applications

APHA color 0 – 50
ASTM color 0 – 8 ASTM units benzene 0 –100 ppm; in water
Bisphenol A 0 –25 ppm and 0 - 100 ppm; in water
chlorine 0 –30%; in propane
chlorine 0 –10%; in NaOH+H20
chlorine 0 –2%; in HCl
chlorine 0 –200 ppm; SO2 0–200 ppm; in vent gas (2 components)
chlorine 0 –30%; in propylene
dimethyl aniline 0–2000 ppm; in N2 saturated with water DMAC 0–1000 ppm; in water
H2S 0 –10%; in H2
H2S 0 – 4%; in N2
Saybolt color -30 to +15
SO2 0–500 ppm
SO2 0–5000 ppm; in stack gas
styrene 0 –20 ppm; butadiene in water total aminobenzenes as aniline 0 – 50 ppm
total phenols as 2-chlorophenol 0 –25 ppm; in 33% HCl in H20

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