ABB MEASUREMENT & ANALYTICS | APPLICATION NOTE

PUV3402 LED and PIR3502 Multiwave photometers

Industry applications for PUV3402 LED and PIR3502 measurements.

Measurement made easy

Applications

Introduction
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 Multiwave photometer 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 PUV3402LED and PIR3502 applications

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

### PUV3402 and PIR3502

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<td>Styrene 0 to 100 ppm,</td>
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<td>Maleic anhydride</td>
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<td>0 to 0.5 %, and maleic anhydride 0 to 2 %</td>
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<td></td>
<td>Vinyl chloride 0 to 200 ppm, 0 to 2 % in HCl</td>
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</table>

### IR absorbing compounds

#### Potential measurements – partial list

- Butadiene (1,3)
- Butane (n)
- Carbon dioxide
- Carbon monoxide
- Carbon tetrachloride
- Chloroform
- Cyanogen
- Cyclopropane
- Diazomethane
- Dichloroethylene (1,1 and 1,2)
- Dichloromethane
- Dimethyl amine
- Dimethyl ether
- Dimethyl hydrazine
- Ethane
- Ethyl alcohol
- Ethyl chloride
- Freon-13B
- Freon-14
- Freon-318
- Hydrazone
- 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
- Propylene
- Trimethylhydrazine
- Vinly 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
- Oxygen
- 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 measurements
0 to 1.2 % toluene; 0 to 2 % tetrahydrofuran and 0 to 100 % LEL of gas mix (3 components)
0 to 20 % CO; 0 to 20 % CO₂; and 0 to 5 % CH₄ (3 components)
0 to 55 % propane and 0 to 20 % propylene (2 components)
0 to 1000 ppm CH₄ and 0 to 250 ppm ethane in ethylene @ 100 psig (2 components)
0 to 100 ppm CO and 0 to 100 ppm CO₂ in H₂ @ 200 psig (2 components)
0 to 5 % CO₂; 0 to 5 % CO; 0 to 1 % toluene and 0 to 1 % benzene in air oxidation vent (4 components)
0 to 50 ppm acrylonitrile and 0 to 50 ppm styrene in air (2 components)
0 to 50 ppm ethylene oxide and 0 to 50 ppm propylene oxide in air (2 components)
0 to 70 % methyl chloride and 30 to 55 % methylene chloride (2 components)
0 to 5000 ppm SO₂; 0 to 2000 ppm NO; 0 to 2000 ppm NO₂ and 0 to 2000 ppm NOx (4 components)
0 to 5000 ppm ethane; 0 to 5000 ppm ethylene and 0 to 80 % methane (3 components)
0 to 40 % CO₂; 0 to 40 % CO and 0 to 25 % water vapor in air (3 components)
0 to 80 % ethylene and 0 to 15 % CO₂ in mixed HC stream as a vapor (2 components)
0 to 100 % CO; 0 to 60 % ethylene; 0 to 20 % CO₂; and 0 to 5 % ethyl chloride @ 70 psig (4 components)
0 to 1000 ppm water and 0 to 5 % DMSO in monochlorobenzene (2 components)
0 to 100 % ethylene; 0 to 10 % EDC; 0 to 50 % HCl; and 0 to 20 % ethyl chloride (4 components)
0 to 20 % propadiene; 0 to 40 % methyl acrylate and 0 to 60 % MAPD (3 components)

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

Various single component measurements
1.3 butadiene 0 to 50 %; in isobutene
1.3 butadiene 0 to 70 %
Acetic Acid 0 to 2 %; in acetic anhydride
Acetylene 0 to 1 %; in methane; ethane and ethylene acetylene 0 to 1.5 %
Ammonia 0 to 250 ppm; in air
cis-2-butene 0 to 10 %; in butadiene
CO 0 to 1 %; in CH₄ and C₂H₆
CO 0 to 1 %; in ethane
CO 0 to 5000 ppm; in ethane
CO 0 to 5000 ppm; in propane
Cyclohexane 0 to 30 %; in cyclohexanol
Cyclohexanone 0 to 500 ppm; in cyclohexane
Ethane 0 to 10 %; in methane and propane
Ethylene 0 to 2 %; in ethane
H₂S 0 to 15 %; in sour fuel gas
Hexamethylene imine 0 to 400 ppm
Hydrogen cyanide 0 to 1 %
MEOH 0 to 20 %; in MTBE/TAME
Methane 0 to 6 %; in H₂ and water vapor
Methanol 0 to 40 %; in MTBE
Methyl bromide 0 to 100 ppm in air
Propane 0 to 6 %; in propylene propylene 80 to 100%
Total hydrocarbons 0 to 10 %; in propylene
Total hydrocarbons 0 to 300 ppm; as butene-1 vinyl acetate 0 to 10 %; in ethylene
Vinyl acetate 0 to 10 %; in ethylene
UV field-proven applications
APHA color 0 to 50
ASTM color 0 to 8 ASTM units benzene
0 to 100 ppm; in water Bisphenol A 0 to 25 ppm and 0 to 100 ppm; in water
Chlorine 0 to 30 %; in propane
Chlorine 0 to 10 %; in NaOH+H₂O
Chlorine 0 to 2 %; in HCl
Chlorine 0 to 200 ppm; SO₂ 0 to 200 ppm; in vent gas (2 components)
Chlorine 0 to 30 %; in propylene
Dimethyl aniline 0 to 2000 ppm; in N₂ saturated with water
DMAC 0 to 1000 ppm; in air (2 components)
0 to 50 ppm acrylonitrile and 0 to 50 ppm styrene in air (2 components)
0 to 5000 ppm CH₄ and 0 to 250 ppm ethane in ethylene @ 100 psig (2 components)
0 to 100 ppm CO and 0 to 100 ppm CO₂ in H₂ @ 200 psig (2 components)
0 to 5 % CO₂; 0 to 5 % CO; 0 to 1 % toluene and 0 to 1 % benzene in air oxidation vent (4 components)
0 to 40 % CO₂; 0 to 40 % CO and 0 to 25 % water vapor in air (3 components)
0 to 80 % ethylene and 0 to 15 % CO₂ in mixed HC stream as a vapor (2 components)
0 to 100 % CO; 0 to 60 % ethylene; 0 to 20 % CO₂; and 0 to 5 % ethyl chloride @ 70 psig (4 components)
0 to 1000 ppm water and 0 to 5 % DMSO in monochlorobenzene (2 components)
0 to 100 % ethylene; 0 to 10 % EDC; 0 to 50 % HCl; and 0 to 20 % ethyl chloride (4 components)
0 to 20 % propadiene; 0 to 40 % methyl acrylate and 0 to 60 % MAPD (3 components)

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0 to 500 ppm water in dimethylacetamide
0 to 200 ppm water in allyl chloride
0 to 0.5 % water in acetone
0 to 1500 ppm water in methanol
0 to 100 ppm water in benzene
0 to 300 ppm water in toluene diamine
0 to 1000 ppm water in MEK & alcohols