Your partner in gas detection and gas analysis since 2003

SAFETY – PROCESS

INDUSTRY

LABORATORY & RESEARCH

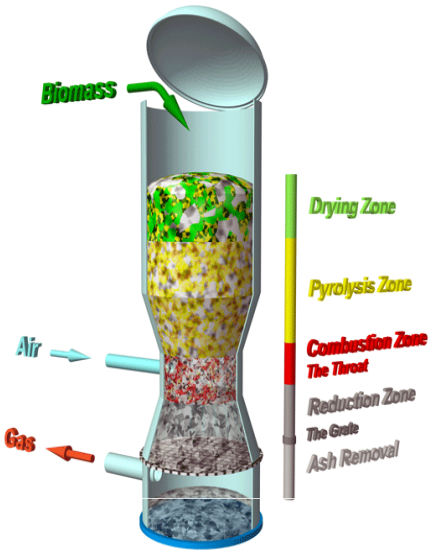
Gasification

What is Biomass Gasification?

Basic Process Chemistry

- Conversion of solid fuels into combustible gas mixture called producer gas (CO + H_2 + CH_4)
- Involves partial combustion of biomass
- Four distinct process in the gasifier viz.
  - Drying
  - Pyrolysis
  - Combustion
  - Reduction

Gasification – Basic Process Chemistry Schematic



Producer Gas - Composition?

Particulars	Rice Husk	Woody Biomass
CO	15-20%	15-20%
H_2	10-15%	15-20%
CH4	Upto 4%	Upto 3%
N2	45-55%	45-50%
CO2	8-12%	8-12%
Gas C.V. (kcal/Nm3)	Above 1050	Above 1100
Gas generated in Nm3/kg of biomass	2	2.5

Portable GAS3100P Syngas Analyser

O_2% + CO% + CO_2% + CH_4% + C_nH_m% + H_2% + Gas calorific value calculation

Applications

- ❑Coal chemical process
- ❑Steel making process as
  - Blast furnace top gas
  - Converter
  - Coking
  - Direct iron ore smelting reduction processes
- ❑Coal or Biomass gasification
- ❑Others

Syngas (from synthesis gas)

is the name given to a gas mixture that contains varying amounts of carbon monoxide (CO) and hydrogen (H_2).

Syngas production methods include steam reforming of natural gas or liquid hydrocarbons to produce hydrogen, the gasification of coal, biomass or Plasma gasification process (produces rich syngas including H_2 and CO)

Standard measuring ranges*

GAS 3100 Syngas	GAS 3100 Syngas
CO: 0-100%	CO: 0-100%
CO_2: 0-50%	CO_2: 0-50%
CH_4: 0-10%	CH_4: 0-10%
H_2: 0-50%	C_nH_m: 0-10%
O_2: 0-25%	H_2: 0-50%
	O_2: 0-25%

* Other range available on request

SPECIFICATIONS

Measurement	CO, CO_2, CH_4, C_nH_m, O_2, H_2 + BTU index (gas calorific value)
Technology	CO, CO_2, CH_4, C_nH_m : proprietary dual beam NDIR detectors O_2 : industrial electrochemical cell H_2 : proprietary thermal conductivity detector
Ranges	CO: 0-100%, CO_2: 0-50%, CH_4 : 0-10%, C_nH_m : 0-10%, O_2: 0-25%, H_2: 0-50% Other ranges customizable on request without price increase
Resolution	0,01%
Accuracy	≤ ± 2% FS
Repeatability	≤ 2%
Zero	Auto-zeroing function via keyboard interface
Flow	0,7 to 1,2L/min, internal gas sampling pump
Inlet pressure	2 to 50 kPa
Gas conditions	No dust, no water vapour, no tar
Operating conditions	Tamb : 0-50° C / Pamb : 86 to 108 kPa / RH : 0-95% non condensing
Response time (T90)	≤ 15 sec
Warm-up time	15 min
Communication interface	RS232 (real time and memory data download software included)
Power supply	External 220 VAC-50Hz
	Internal with battery and charger; Autonomy of > 4h with pump in operation
Data logging	Up to 1500 sets of 7 data Possibility to identify 10 different sites and up to 100 measuring points Logging rate adjustable from 1 to 99 sec
Display	LCD 320 x 240 display with back-lit function Simultaneous indication of the 7 measures and units
Casing	Robust casing in aluminium with cover and shoulder trap
Dimensions and weight	380 × 140 × 255 mm / 5 kg max

No effect of CH_4 on C_nH_m detector: Band width is relatively huge if it applies non-traditional filter & monitor approach. So it is difficult to be spread among CH_4, C_2H_6, C_3H_8, C_4H_{10}. In addition, C_2H_6 exerts a significant influence on CH_4. Cross-interferences on CH_4 can be avoided with our proprietary infrared technology. Moreover, we can add a C_nH_m sensor to directly measure other hydrocarbons than CH_4.

No effect of CO, CO_2, CH_4, C_nH_m on H_2 detector: CO_2 can reduce H_2 measurement reading while CH_4 can increase H_2 measurement reading. As syngas contains CO_2 and CH_4, we need measure and compensate the effects of CO_2 and CH_4 on H_2 in order to get an accurate measure of H_2. Both CO_2 and CH_4 detectors are specifically calibrated in factory according to these parameters.

No effect of gasflow variation on H_2 detector: we adopt a patented thermal conductive sensor technology (ZL 2006 20098453.3) on which gas flow variation has negligible effects on H_2 measurement.

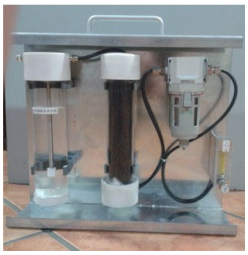
Accessories

- **Standard accessories**

Battery charger ,RS232 cable

Optional accessories

:



The sample gas must be free from particles, oil traces and its moisture content ,we can provide portable gas conditioning device to remove all of it

Optional software for reading data on the computer

Connect RS232 cable with PC and analyzer ,install real time datalogging software ,you can read real time data and storage data on the PC

Application Picture