



Reciprocating
Engines on
Digester Gas

2007

Who's Who

This information is for discussion purposes, and is not meant to be a conclusive review.

The family of engines under discussion, are lean burn, 35-42% efficiency, individual heads per cylinder

- Caterpillar, Lafayette, Indiana
- Deutz Corp, Atlanta, Georgia
- Deutz Power Systems, Germany
- Guascor, Spain
- Jenbacher, Austria
- MAN, Germany
- Tedom, Czech Republic
- Waukesha, Wisconsin

What's What

This is for discussion purposes, and is not meant to be all inclusive information. Ekw listed below is the “practical” rating on ~600btu gas
The family of engines under discussion, are lean burn, 35-42% efficiency, individual heads per cylinder, 50 to 2,000 ekW.

- Caterpillar, ~400 to 1,600 ekw
- Deutz Corp, ~ 150 to 230 ekw
- Deutz Power Systems
- Guascor, ~180 to 1,000 ekw
- Jenbacher, ~ 300 to 2,300 ekw
- MAN, ~70 to 360 ekw
- Tedom, ~100 ekw to 180 ekw
- Waukesha, ~180 to 700 ekw

Where's What

New designs in 2006 and 2007

ekW

1,200 Bio-Gas 2 x **Guascor** SFGLD-480 Dairy Complex
Washington, Lean Burn, first of this type we installed.

1,200 Bio-Gas 2 x **Guascor** SFGLD-480 Dairy Complex
Wisconsin, Lean Burn, First in WI

600 Bio-Gas 2 x **Guascor** SFGLD-240 Dairy Complex
Vermont, Lean Burn, first in VT

180 Bio-Gas 1 x **MAN** 6 cyl, 150 cow Family Farm
Ontario, Lean Burn, European digester

100 Bio-Gas 1 x **MAN** 6 cyl, 100 cow Family Farm
Ontario, Lean Burn, European digester

What's Going On

■ More Data

Reason	Date	Time	RPM	Fwr	G	PF	LCkr	Qtrq	Vgt	Vg2	Vg3	Vg12	Vg23	Vg31	igt	ig2	ig3	Mtrq	Vn1	Vn2	Vn3	Vn12	Vn
0. Password set	11/20/2007	9:34:35.7	U=0000;T=UART1																				
-1. Terminal	11/20/2007	9:34:02.8	UART1 Connected																				
-2. Ready	11/20/2007	9:33:55.1	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	277	276	277	0
-3. MP L31 under	11/20/2007	9:33:45.2	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	276	275	276	0
-4. MP L23 under	11/20/2007	9:33:45.2	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	276	275	276	0
-5. MP L12 under	11/20/2007	9:33:45.2	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	276	275	276	0
-6. Fls UnivState 1	11/20/2007	9:33:42.9	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	278	276	276	0
-7. Hit MCB feedback	11/20/2007	9:33:40.8	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	278	277	277	0
-8. Not ready	11/20/2007	9:33:40.1	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	277	277	276	0
-9. Terminal	11/20/2007	9:33:39.6	Or1 Connected																				
-10. Switched On	11/20/2007	9:33:38.8	System started																				
-11. Ready	11/20/2007	7:40:54.8	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	277	276	276	0
-12. MP L31 under	11/20/2007	7:40:44.7	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	277	276	276	0
-13. MP L23 under	11/20/2007	7:40:44.7	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	277	276	276	0
-14. MP L12 under	11/20/2007	7:40:44.7	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	277	276	276	0
-15. Fls UnivState 1	11/20/2007	7:40:42.5	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	277	276	276	0
-16. Hit MCB feedback	11/20/2007	7:40:40.3	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	278	277	277	0
-17. Not ready	11/20/2007	7:40:39.6	0	0	0	0.00		0.0	0	0	0	0	0	0	0	0	0	0	60.0	278	277	277	0

- New Bio-gas systems have 1,000 lines of event log stamps standard, to 1/10th of a second resolution.
- Provides system status on every stamp; generator output info, engine gauges and digester pressure.
- Allows for a complete system overview.
- Standard system allows for over 100 analogue and digital inputs.

What did we Learn

Help yourself - it's hard to count on anyone else.

Lean Burn engines are very sensitive to gas changes.

Lean Burn engines require frequent plug changes on Bio-gas.

We aren't done learning!