

# THEREC CORPORATION LTD.

Total Solution for Biogas Blower and Compressor  
Process & Equipment for Biogas Boosting & Aeration System



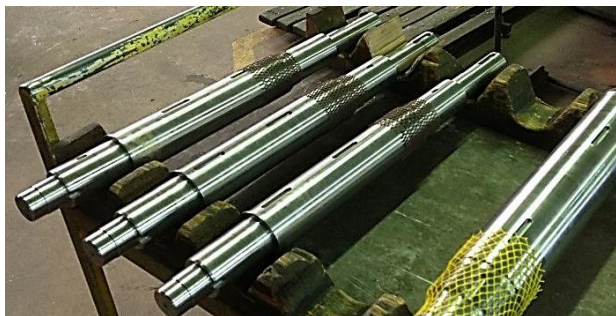
**Multi Stage Centrifugal Type Blower**



**SAVIO** s.r.l.  
AIR TECHNOLOGY



**ATEX**



**Stainless Steel Shaft in ATEX version**



**Therec's In house package assemble**



**SAVIO** s.r.l.  
TECNOLOGIA DELL'ARIA

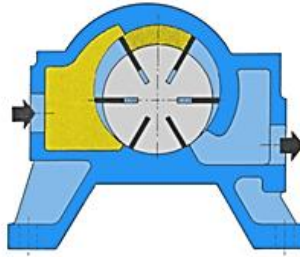
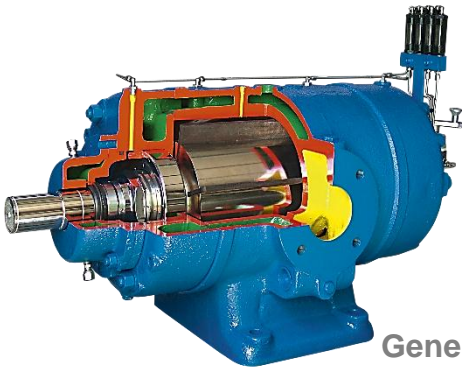
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Tel: (+39) 011. 959.16.01 Fax: (+39) 011. 959.29.62  
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**Thai Eakarot Biogas Plant / Kampangpetch**

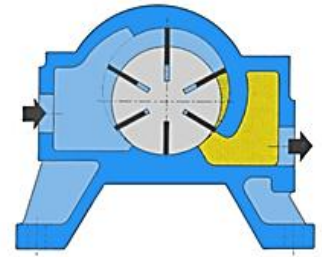
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# Rotary Vane Gas Compressor

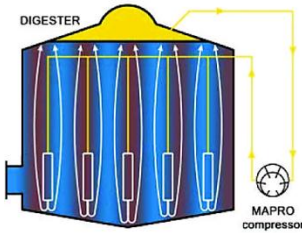


MAXIMUM VOLUME



MINIMUM VOLUME

General Function Description of Rotary Vane Gas Compressor



Standard Direct Couple Package for Biogas Digester Tank Stirring

INTERNATIONAL

## Conformity with 94/9/EC Directive (ATEX)

All MAPRO® biogas compressors are designed in accordance with the 94/9/EC Directive, Equipment-Group II, Category 2, for use in hazardous places, classified as Zone 1, where an explosive atmosphere, consisting of a mixture of air and flammable gases, is likely to occur.



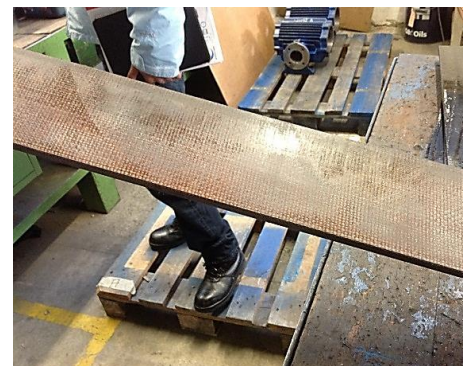
**MAPRO BioGas**  
Technology



First "Mapro" Rotary vane Gas Compressor In Thailand for Palm Oil Bio-gas Plant



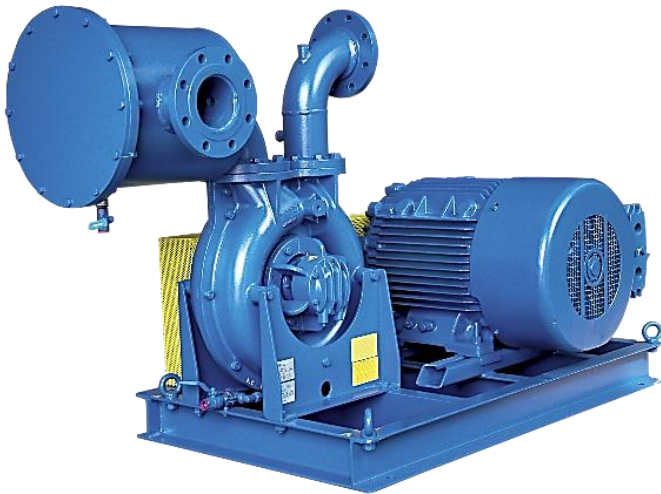
Special Direct Couple Package for Chemical Process Line



Special Material , Rotary Vane Gas Compressor Blade for Corrosion Resistant



# The Peripheral Toroidal Chanel Blower



**Turbotron Blower**



Very Special Designed of both Rotor & Housing

**SOFFIANTE TURBOTRON® per BIOGAS e GAS NATURALE**  
**TURBOTRON® BLOWER for BIOGAS and NATURAL GAS**

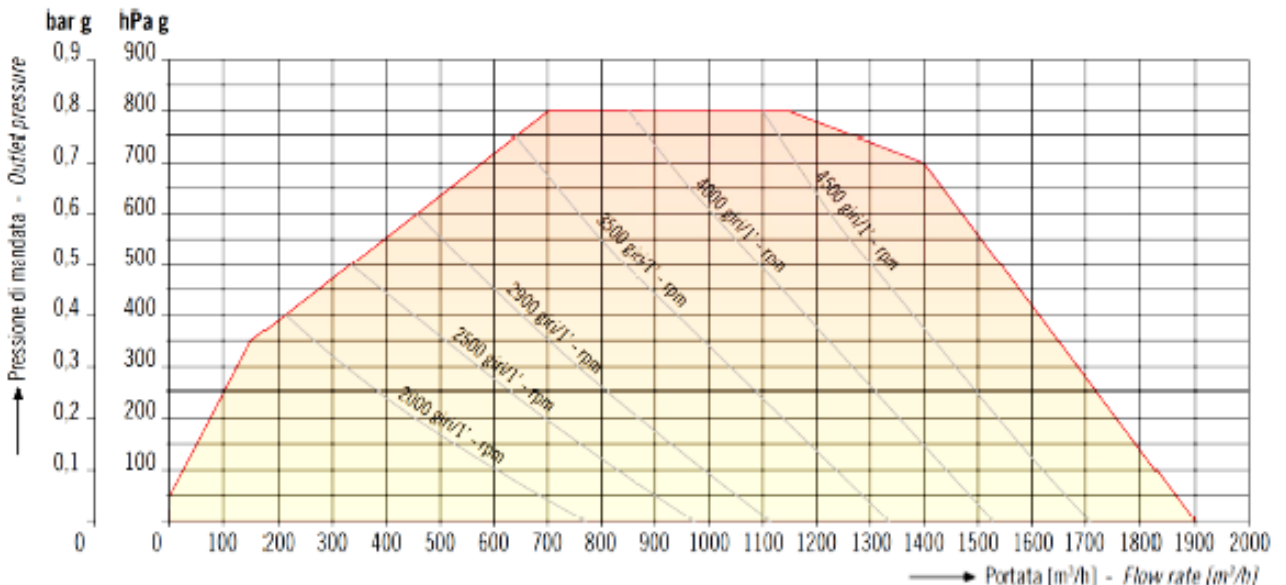


Belt Drive Upside Down to avoid the water trap in biogas plant  
 Engineering Package design for bio gas processing line

Turbotron Standard Belt Drive Package

**Campo di utilizzo Turbotron® per biogas**

*Turbotron® for biogas – Range of duty*



Super High Pressure Ring blower with full information in biogas performance

# Cast Aluminum Centrifugal Fan

Belt Drive Version / Up to 5800 rpm



**MAPROBioGas**  
Technology



Direct Drive Version / Up to 3500 rpm

La marcatura ATEX del ventilatore centrifugo MCF 500 per biogas o gas naturale  
*The ATEX marking of MCF 500 centrifugal fan for biogas or natural gas*

## Side Chanel / Ring Blower



Premier Energy's Biogas Plant /  
Pimai Nakornrachasima

**SOFFIANTI A CANALE LATERALE per BIOGAS e GAS NATURALE**  
**SIDE CHANNEL BLOWERS for BIOGAS and NATURAL GAS**



Bio gas and Natural gas  
extraction package, from  
the pipeline or system



Ring Blower for Landfill  
Biogas Package



Ring Blower with  
Pressure Control by  
pass Valve

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# Roots / Positive Displacement (PD) / Rotary Type Blower



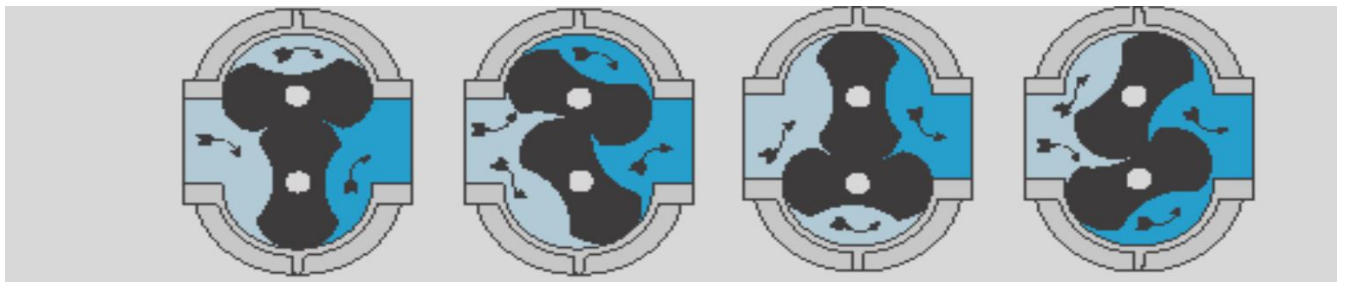
URAI-G small gas blower



RAMG-J medium size gas Blower



RGS-J Large size gas blower



## Rotary Positive Blower Principle of Operation

Two figure-eight lobe impellers mounted on parallel shafts rotate in opposite directions. without

As each impeller passes the blower inlet, it traps a finite volume of air and carries it around the case to the blower outlet, where

the air is discharged. With constant speed operation the displaced volume is essentially

the same regardless of pressure, temperature or barometric pressure. Timing gears control the relative position of the impellers to each

other and maintain small, but defined, clearances. This allows operation

lubrication being required inside the air casing.



Belt Drive Package Gas Blower



Direct Couple Package Gas Blower

**The original ROOTS blower still leads the way.™**



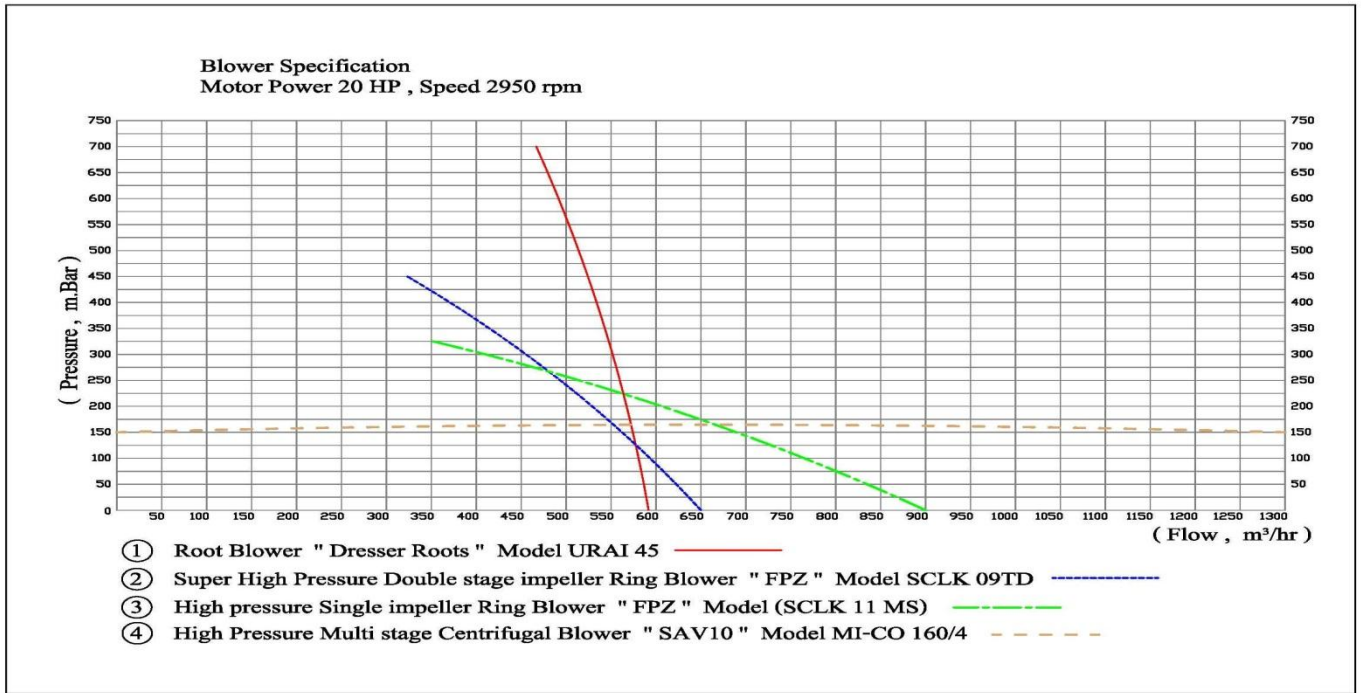
GE Energy

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# The Comparison Characteristic Graph between 3 Types of Blower



## Guide line table for air & gas compression machine selection

Aircompressionmachine (เครื่องอัดลม)	Compressed method	Max Pressure (mm.H2O)	Max.speed (rpm)	Flow control equipment	Zero Flow operating
High press. centrifugal	Centrifuse	+1000	4000	Valve	Allow
Extra high press. centrifugal	Centrifuse	+15000(1.5 bar)	10000	Valve	Allow
Multi-stage centrifugal	Centrifuse	+20000(2 bar)	5000	Valve	Allow
Ring (Side chanel)	Regenerative	+8000	5000	Valve & Frequency Inverter	Not allow
Roots (Rotary)	Positive Displacement	+20000(2 bar) (10 bar)	5000	Frequency Inverter	Not allow/ Very dangerous
Rotary Vane	Positive Displacement		3000	Frequency Inverter	Not allow/ Very dangerous

\*Max values in this table are asumed from the common available items in market.

\*Please check wit your supplier before making any decision.

### Volume & Pressure Convection table

Volume (rate of flow)	Gas condition		
	sing	Temp	Pressure
m <sup>3</sup> /hr x 0.5886 = cfm x 1.699 = m <sup>3</sup> /hr	Standard	68 F	14.7 PSI
m <sup>3</sup> /hr x 35.31 = cfm x 0.0283 = m <sup>3</sup> /min	Normal	0 °C	1013 mbar
l/min x 0.06 = m <sup>3</sup> /hr x 16.67 = l/min	Actual	Ambient	Ambient
l/min x 0.03532 = cfm x 28.31 = l/min			

$$ACFM = SCFM \times \frac{Ps - (RHs \times PVs)}{Pb - (RHa \times PVa)} \times \frac{Ta}{Ts} \times \frac{Pb}{Pa}$$

Where

Ps = Standard pressure (PSIA)

Pb = Atmospheric pressure – barometer (PSIA)

Pa = Actual pressure (PSIA)

RHs = Standard relative humidity

RHa = Actual relative humidity

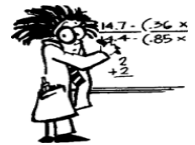
PVs = Saturated vapor pressure of water at standard temperature (PSI)\*

PVa = Saturated vapor pressure of water at actual temperature (PSI)\*

Ts = Standard temperature (°R) NOTE: °R = °F+460

Ta = Actual temperature (R)

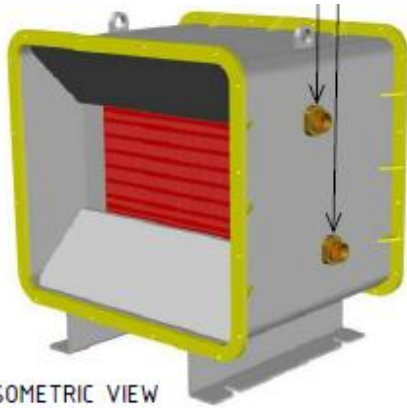
\*See Chart on page 12



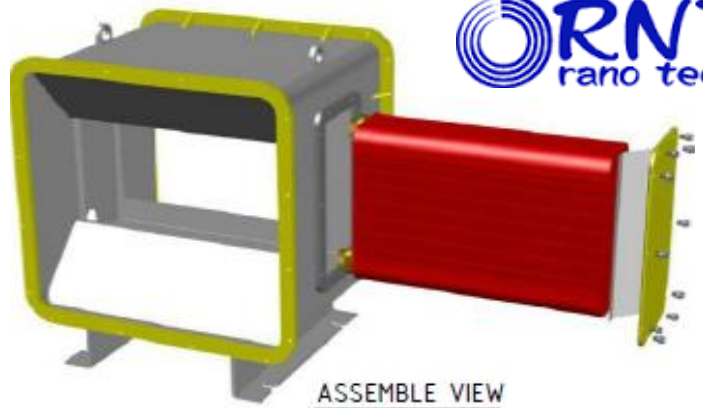
$$Nm^3/hr = SCFM \times 1.583$$

	Pressure (static)							
	psi	In. Hg	In.H2O	Kgf/cm <sup>3</sup>	mbar	kPa	mm.Hg	mmH2O
psi	1	2.036	27.68	0.07	68.95	6.895	51.71	703.1
In.Hg	0.4911	1	13.6	0.035	33.86	3.386	25.4	345.3
In.H2O	0.03613	.07356	1	0.003	2.491	0.2491	1.868	25.4
Kgf/cm <sup>3</sup>	14.22	28.96	393.7	1	980.7	98.07	735.6	10000
mbar	0.0145	0.02953	0.4015	0.001	1	0.1	0.7501	10.2
kPa	0.145	0.2953	4.015	0.01	10	1	7.501	102
mm.Hg	0.01934	0.03937	0.5352	0.001	1.333	0.1333	1	13.6
mm.H2O	0.001422	0.02896	0.0394	1E-04	0.9807	0.00981	0.7356	1





ISOMETRIC VIEW



ASSEMBLE VIEW

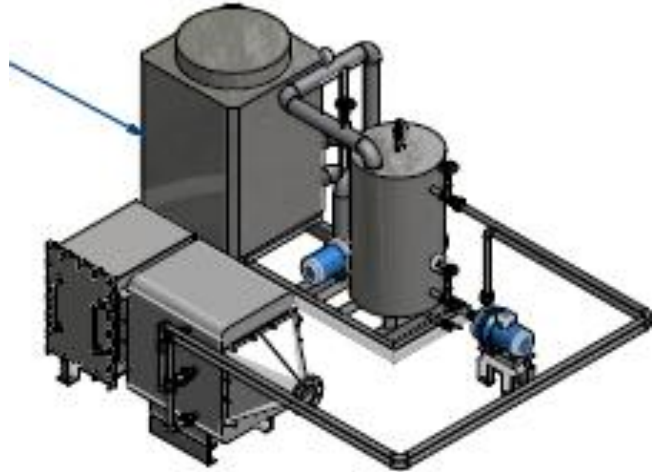
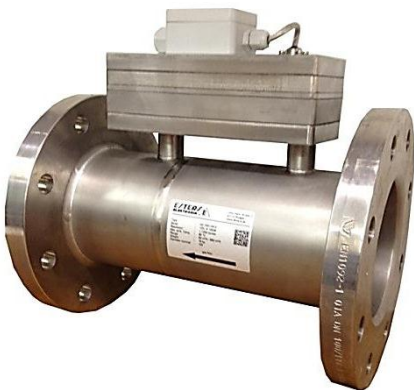


Plate type Air and Gas Dryer and Cooler

Lower Pressure loss, Longer Heat Exchanger Life time than the conventional Fin & Tube type

## Oscillating Biogas Flow Meter



Stainless Steel Oscillating Gas Flow Meter



Intelligent Flow Computer Module



Gas Validation Flow Meter



Oscillating Principle of Measurement



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# Membrane Air & Gas Diffuser

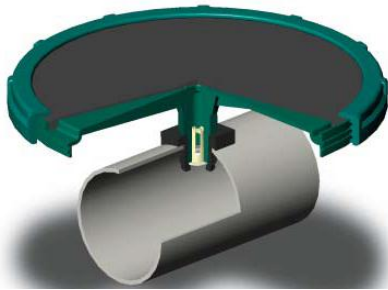


## Membranes are not just rubber parts

Using his experience based on Automotive and Machine Tool industry he engineered custom designed disc and tube type diffusers for almost every German and US OEM waste water company.

Since 1975 Gummi-Jaeger sold more than 10 Million membranes and diffuser assemblies. As pioneer in the industry Arnold Jaeger innovated the diffused air wastewater treatment and created more than 30 diffuser related patents.

Test every production lot



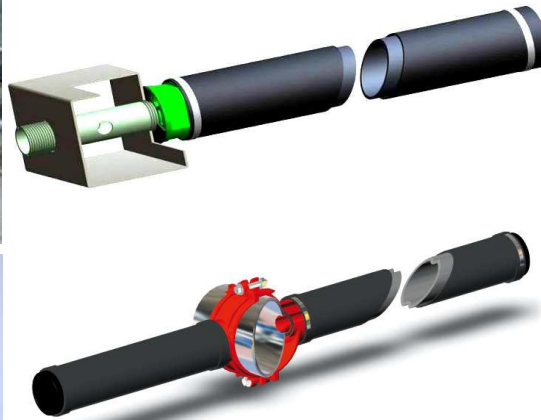
JetFlex Disc Diffuser - HD 270

FO53 J27

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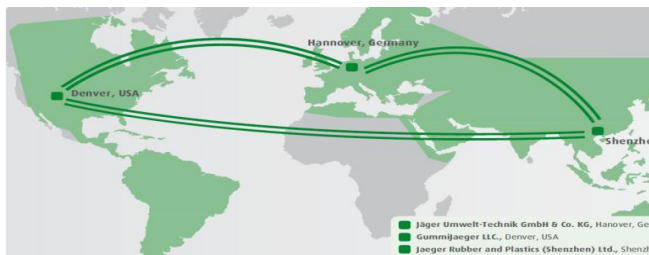


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JetFlex Tube Diffuser - TD 63

EPDM performance J34



Choices of connections

Three Manufacturing bases



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General product TRS 01 / 2016