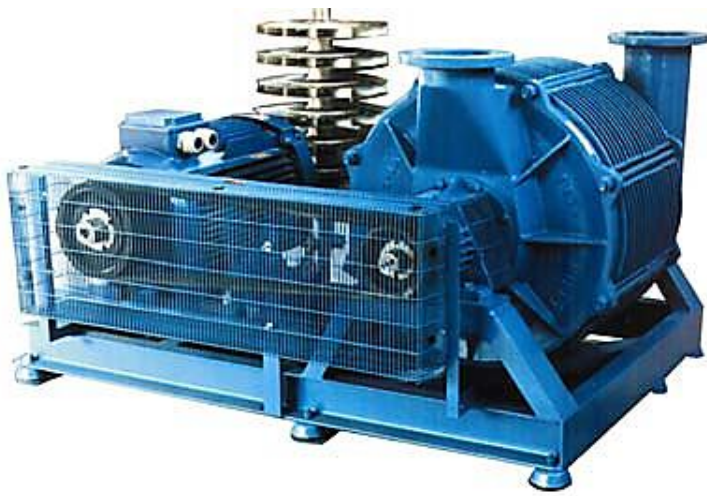


THEREC CORPORATION LTD.

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



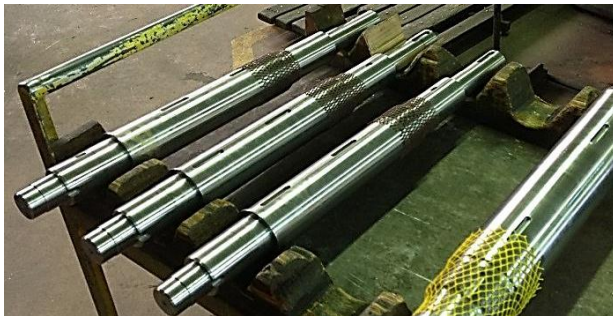
Multi Stage Centrifugal Type Blower



SAVIO s.r.l.
AIR TECHNOLOGY



ATEX



Stainless Steel Shaft in ATEX version



Therec's In house package assemble



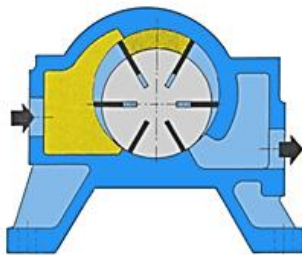
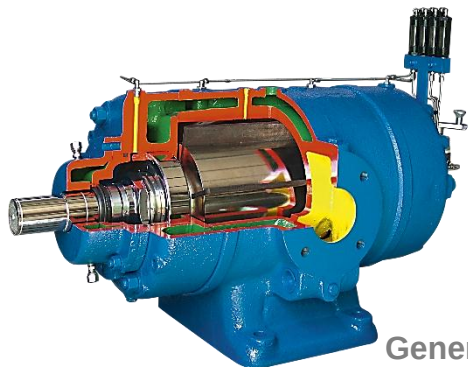
SAVIO s.r.l.
TECNOLOGIA DELL'ARIA

Via Reggio Calabria,13 – Cascine Vica Rivoli (TO) Italia
Tel: (+39) 011. 959.16.01 Fax: (+39) 011. 959.29.62
E-mail : savio@savioclima.it http:// www.savioclima.it

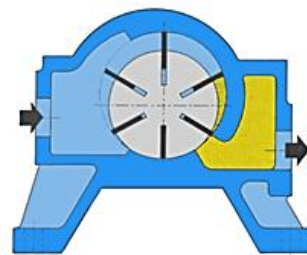
Thai Eakarot Biogas Plant / Kampangpetch

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Rotary Vane Gas Compressor

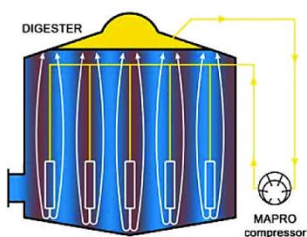


MAXIMUM VOLUME



MINIMUM VOLUME

General Function Description of Rotary Vane Gas Compressor



Standard Direct Couple Package for Biogas Digester Tank Stirring

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

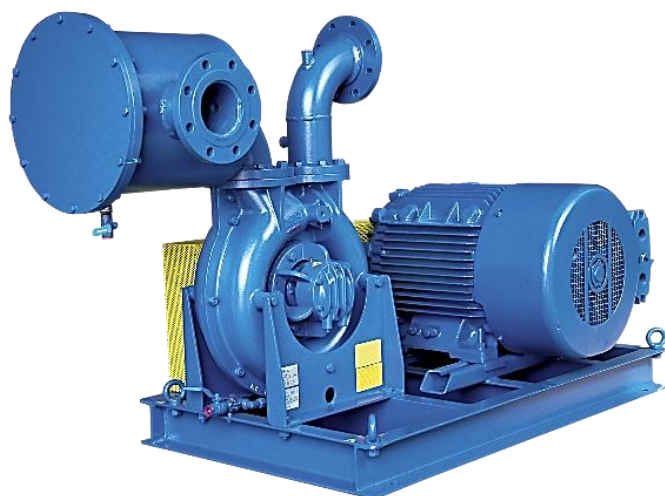


Special Direct Couple
Package for Chemical
Process Line



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

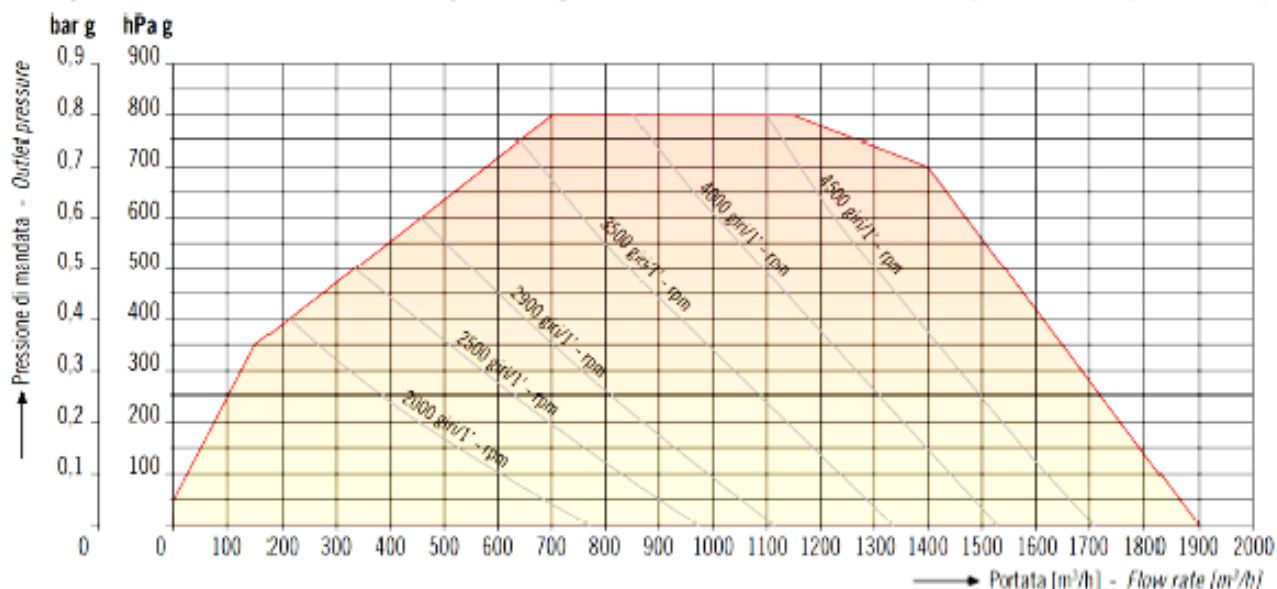


Belt Drive Upside Down to avoid the water trap in biogas plant **Engineering Package design for bio gas processing line**

Turbotron Standard Belt Drive Package

Campo di utilizzo Turbotron® per biogas

Turbotron® for biogas – Range of duty



Supper 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



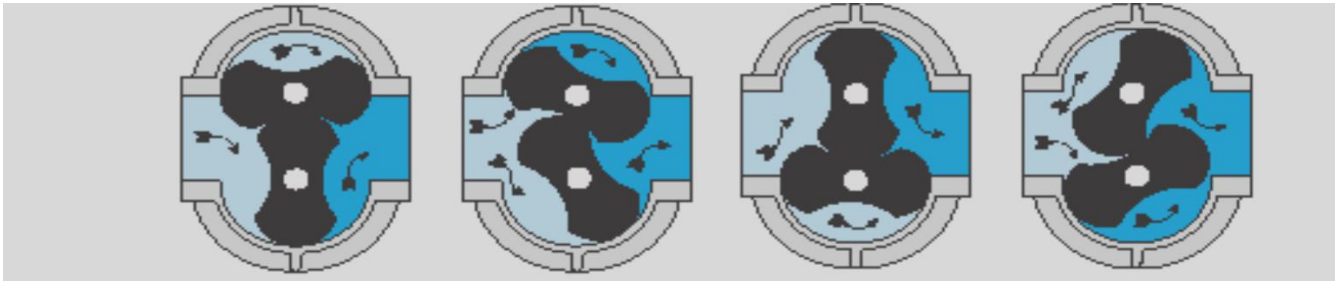
URAI-G small gas blower



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.™

Roots

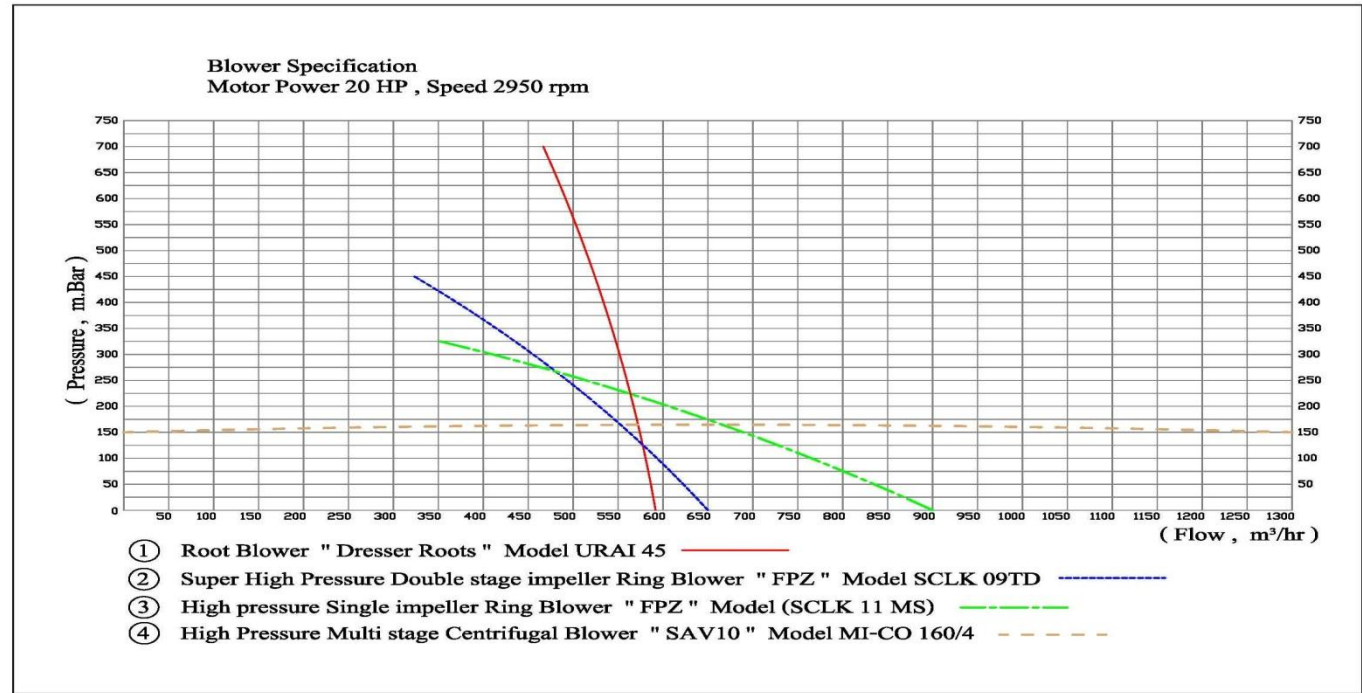
GE Energy

Houston, Texas Headquarters | U.S. Toll Free Phone: 1 877-363-ROOT(S) (7668) | Direct Phone: +1 832-590-2600

Connersville, Indiana Operations | Direct Phone: +1 765-827-9200

Waukesha, Wisconsin Operations | Direct Phone: +1 262-650-5965

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 & FrequencyInverter	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 asuumed from the common available items in market.

*Please check wit your supplier before making any decision.

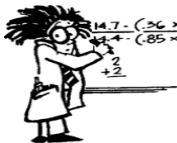
Volume & Pressure Convection table

Volume (rate of flow)			Gas condition			
m³/hr x 0.5886 = cfm	x 1.699 = m³/hr			sing	Temp	Pressure
m³/hr x 35.31 = cfm	x 0.0283 = m³/min		Standard	S	68 F	14.7 PSI
l/min x 0.06 = m³/hr x 16.67 = l/min			Normal	N	0 °C	1013 mbar
l/min x 0.03532 = cfm	x 28.31 = l/min		Actual	A	Ambient	Ambient

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

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)

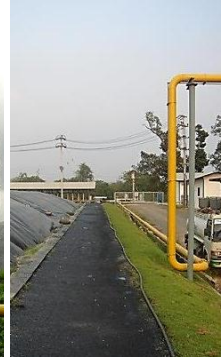
*See Chart on page 12



$$Nm³/hr = SCFM \times 1.583$$

Pressure (static)								
	psi	In. Hg	In.H2O	Kgf/cm³	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/cm³	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

Engineering Work

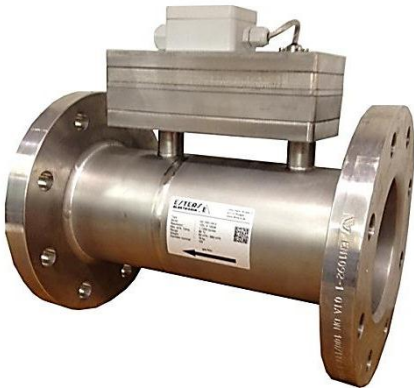


Installation & Piping Work



Electrical control work / PLC / SCADA system

Oscillating Biogas Flow Meter



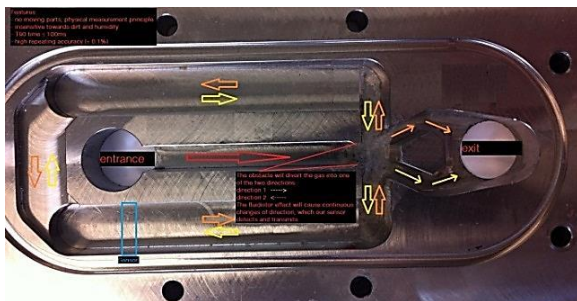
Stainless Steel Oscillating Gas Flow Meter



Intelligent Flow Computer Module



Gas Validation Flow Meter



Oscillating Principle of Measurement



Esters Elektronik GmbH

Otto-Hahn-Str. 2 D-63110 Rodgau

Phone: +49 (6106) 3040

Telefax: +49 (6106) 1 81 92

e-Mail: vertrieb@esters.de

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Membrane Air & Gas Diffuser

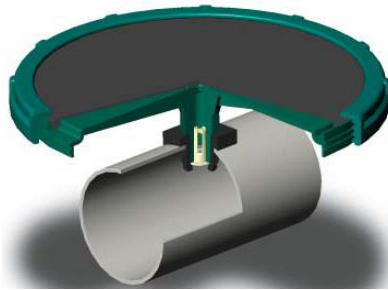


Membranes are not just rubber parts

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

Test every production lot



JetFlex Disc Diffuser - HD 270

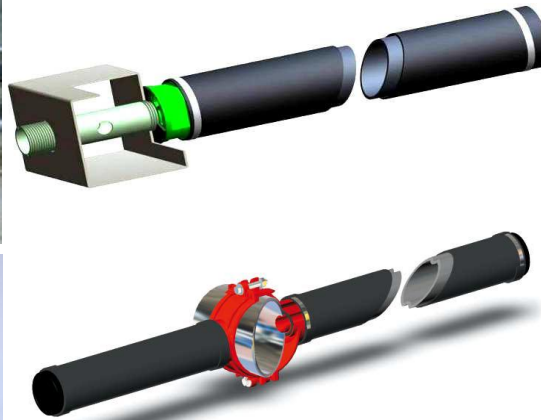
FO53 J27

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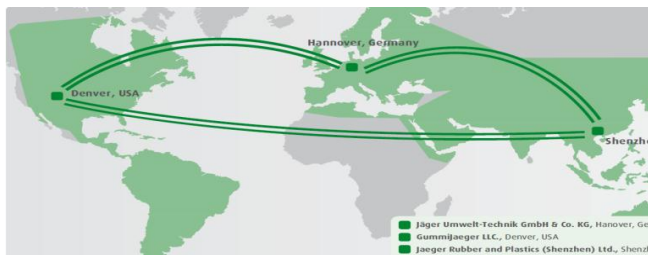
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Umwelt-Technik

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JetFlex Tube Diffuser - TD 63

EPDM performance J34



Choices of connections

Three Manufacturing bases



Therec Corporation Ltd. <http://www.thereccorp.com>

Tel : (662) 893 9003-4

Fax : (662) 893 9005, 893 9178

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Thailand

General product TRS 01 / 2016