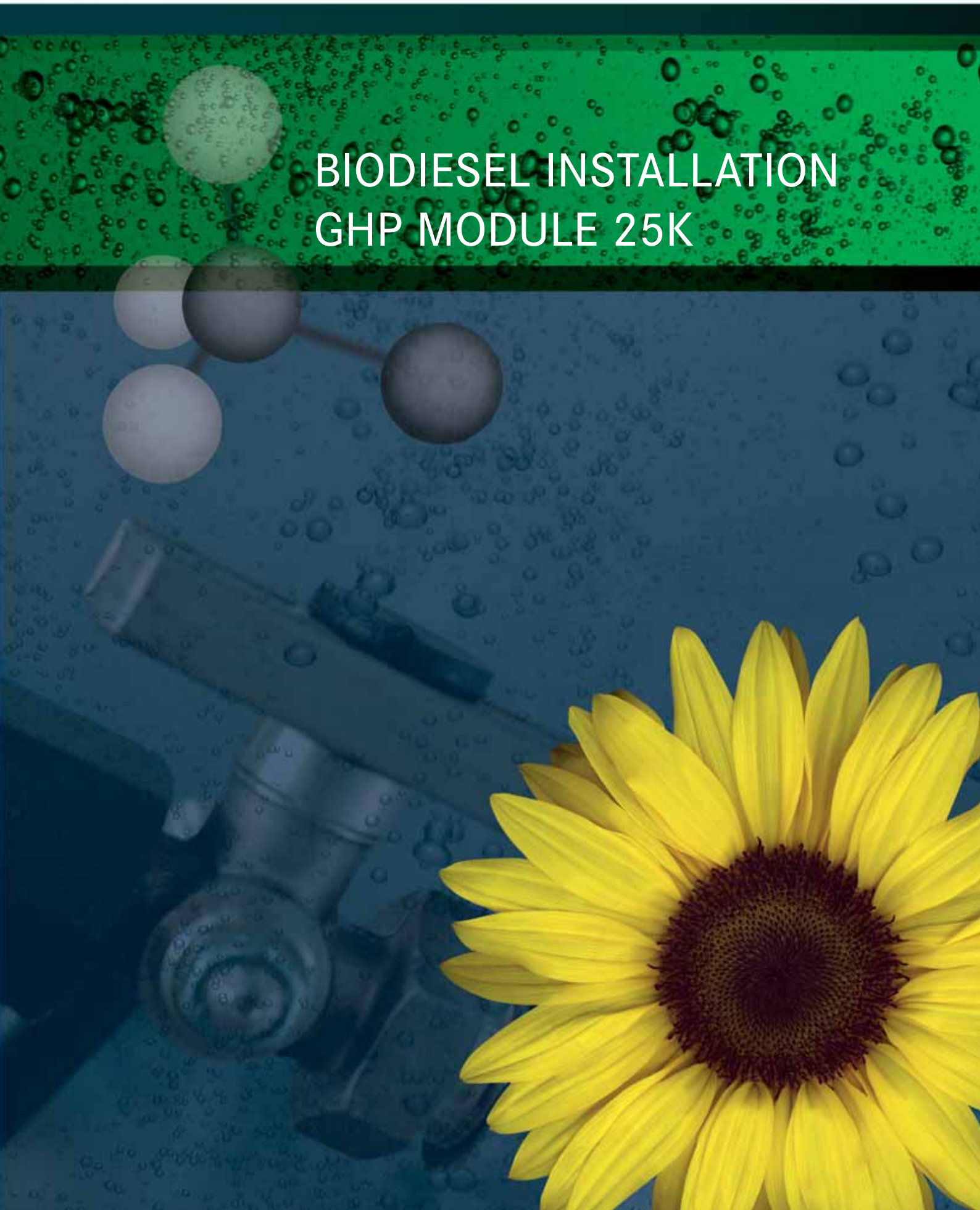


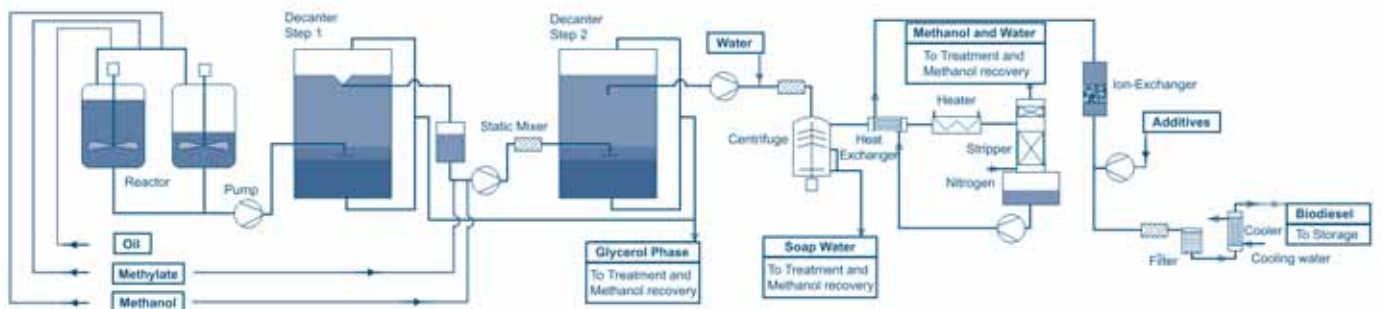
GHP = BIODIESEL

BIODIESEL INSTALLATION
GHP MODULE 25K



GHP – OUR TECHNOLOGY – YOUR ADVANTAGE!

PROCESS DIAGRAMM



Our proven technology is based on a transesterification process in an alkaline environment!

- Transesterification is based on the catalysed chemical reaction of triacylglycerol (TAG) with methanol forming fatty acid methylester (FAME) and glycerine.
- 2 stage transesterification improves the yield of the process.
- Reaction and separation are optimized to ensure maximum performance.
- Continuous separation of the phases by gravity.
- Washing followed by centrifugation separates efficiently residual soap, catalyst, glycerine and methanol.
- Vacuum-stripping of the Biodiesel with nitrogen removes last traces of methanol and water.
- Ion-exchanger – adsorbs ionic impurities, e.g. alkali, earth-alkali, to keep them well under the limits stipulated by the ASTM/EN Standards for Biodiesel.
- This process technology dominates the market for medium capacity, offering high yields, almost complete transesterification at very low operating costs.



KEY ADVANTAGES OF GHP PROCESS!

OUR PROCESS	YOUR ADVANTAGE
Simple, robust and flexible technology	Best economics at reasonable investment
25.000 tons p.a. (contractually guaranteed)/ 30.000 tons p.a. (design capacity) in a modular configuration.	Offers best economics for mid sized investors; allows easy multiplication of the capacity
Modular, containerized equipment	Easy setup reduces installation costs; highest flexibility to relocate equipment if required
Multifeed – works with vegetable oils, used cooking oil or animal fats	Highest flexibility in operation guarantees best economics
Reaction takes place at atmospheric pressure and ambient temperature	Limits initial investment; eases permit procedure
Very limited manpower required for plant operation: 3 operators to run 24 hours/7 days	Limits variable costs of the process
Semi-continuous transesterification process	Safeguards consistency of process parameters even with changing feedstocks
Can be operated effluent-free if linked to biogas plant	Keeps daily operations simple and focussed on the core process
State-of-the-art online Process Management System	Allows to run with lowest possible manpower
Glycerine phase upgrading and methanol recovery on request	Designed to the local market requirements

GHP – BECAUSE WE WALK THE TALK!

Since January 2005 we have operated our own facilities and know what we are talking about from daily experience!

Our technology has been continuously updated, driven by our in-depth understanding of what is needed for simple, robust operation and a most effective cost structure.

We established a 365/ 24/ 7 operation

- With only 3 operators,
- which operates effluent free,
- which is truly multifeed,
- which has proven to offer the highest flexibility in a rapidly changing environment!

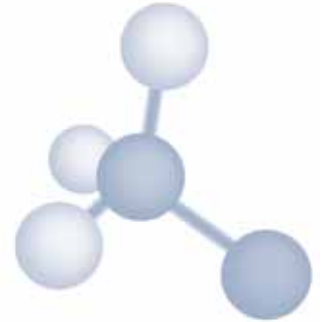


SPECIFICATIONS

FEEDSTOCK SPECIFICATION:

Following specification – based on rapeseed – are recommended for optimal yield. Other feedstock can be processed as well, however lower yields might be achieved (specifications upon request).

- FFA content: max. 0,1 %
- Water content: max. 0,1 %
- Unsaponifiables: max. 0.8 %
- Phosphorus content: max.10 ppm



YIELDS

1000 kg of dried, degummed and deacidified rapeseed-, soybean- or sunflower oil result in

- Biodiesel: approx. 1000 kg in line with European specification EN 14214
- Crude Glycerine phase: 180 - 190 kg

CORRESPONDING CONSUMPTION DATA AT STEADY CONTINUOUS OPERATION

PER TON/ BIODIESEL

ALL VALUES APPROXIMATIONS

Methanol (without methanol recovery)	118 kg
Catalyst (30% potassium methylate)	60 kg
Electrical energy (excl. heating of hall, tanks, ventilation system)	40 kWh
Washing Water	0,1 m ³
Cooling water (Delta t= 5 °C)	2,5 m ³
Compressed air	20 Nm ³ /h



WE STAND FOR A SUCCESSFUL BIODIESEL BUSINESS!



⦿ GHPS HISTORY SPANS THE EARLY YEARS OF THE - STILL YOUNG - BIO-DIESEL INDUSTRY:

- ⦿ GHP was founded in 2002 in Germany.
- ⦿ For many years we were active as a producer of bio-diesel in the highly competitive German market.
- ⦿ GHP continuously expanded and evolved its technology, based on our daily experience of what it takes to be successful in the bio-diesel industry.

⦿ OUR PHILOSOPHY IS TO MAKE YOUR BUSINESS SUCCESSFUL!

- ⦿ Offer reasonable investment cost.
- ⦿ Ensure our technology allows to run with slimmest operating cost.
- ⦿ Benefit from economies of scale through standardization of our technology.
- ⦿ Grow with the market in a step-by-step process.

⦿ GHP TECHNOLOGY IS DESIGNED TO

- ⦿ Run 24/7.
- ⦿ Ensure minimal labour-cost.
- ⦿ Allow highest feedstock flexibility.
- ⦿ Minimize set-up costs.



GHP = BIODIESEL

CONTACT US



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