

## Gas dehydration with TEG



## **1. General**

HEAT Gas dehydration systems with absorption technology by using of TEG are customized solutions for the gas industry. The units are designed for the specific requirements of gas production facilities, gas compressor stations or underground gas storage systems.

Depending on the specific design data, gas consumption, flow range, dew point, operating pressure and operating temperature range several executions and options will apply.

## **2. Absorber**

The absorber is designed as a vertical column with inlet gas scrubber section to separate free water and liquids efficiently. After the separation section the gas enters the dehydration section upwards while the TEG flows down through the packages or trays and absorbs the water.

Different types of trays or structural packages are used. The designs are developed in cooperation with nameable process companies. In the gas outlet section a demister for the removal of droplets is situated to avoid glycol losses in the absorber.

The absorber will be equipped with all necessary instruments for monitoring and control to ensure a undisturbed operating and all necessary platforms for maintenance and service.

## **3. TEG Cooler (Gas-TEG Heat Exchanger)**

Depending on the gas operating temperatures in the absorber and the operation method a gas-TEG heat exchanger is situated in the outlet gas line from the absorber to cool the TEG to the necessary inlet temperature before entering the absorber.

## **4. Flash separator**

The TEG is drained from the absorber and expanded in a two or three phase separator. Dissolved hydrocarbons in the TEG (Flash gas) will be used as strip gas and will be recycled as fuel gas for the burner or will be depolluted in the incinerator.

If heavy hydrocarbons are dissolved in the TEG a three phase separator has to be used. In the three phase separator the flash gases are separated from the liquid flow in the first step and the hydrocarbons are separated from the TEG/water mixture by gravity in a second step.

The design ensures an adjustable separation layer level, excellent visual level indication of the two liquid phases and two well design storage drums for hydrocarbons and TEG.

## **5. Regeneration**

The TEG is leaded from the separator via filters to the TEG-TEG Heat Exchanger, is pre heated and enters the distillation column. In the reboiler the TEG is heated up to the operating temperature and the water evaporates at low operating pressure. The lean TEG is cooled down in TEG-TEG Heat exchanger.

The standard design includes a heat exchanger coil in the surge drum, situated direct under the reboiler. Different designs for the TEG reservoir and external plate heat exchanger configurations can be apply. The lean TEG is transferred direct by high pressure pumps to the absorber, or at first by booster pumps to the TEG-Air Cooler and from the cooler by high pressure pumps to the absorber.

In the standard design the reboiler is heated by direct firing with a forced draft burner. The firebox and the heat exchanger are well designed with a low specific heat input rate to avoid hot spots and to ensure a long life time of the TEG filling without reservation. If no condensate may be produced an incinerator is used to depollute all water and hydrocarbons, generated in the process. The hot exhaust gases of the incinerator are used for the heating of the reboiler.

## **6. Safety and control**

All safety valves, shut down valves for a safe operation and emergency shutdown are included in the design of HEAT TEG-dehydration units.

All necessary level, temperature and pressure gauges with local indication and/or transmittal of the signals to the control system are included and will be designed according to customer's specification and request.

The complete system is standardized controlled by a Siemens S7 control system and separate burner management system. Other control systems or an integration into local customer control system can be implemented.

## **7. Layout and installation of the equipment**

The complete scope is prefabricated in transportable units. All equipment within the units are completely assembled and tested in our work shop. At site connecting piping and connecting cabling can to be performed by the client or will be performed by HEAT on request.

## **8. Site erection by client / Exclusions**

The prefabricated and tested equipment will be transported to site and has to be erected by client. Supervision or erection can be quoted optional on request.

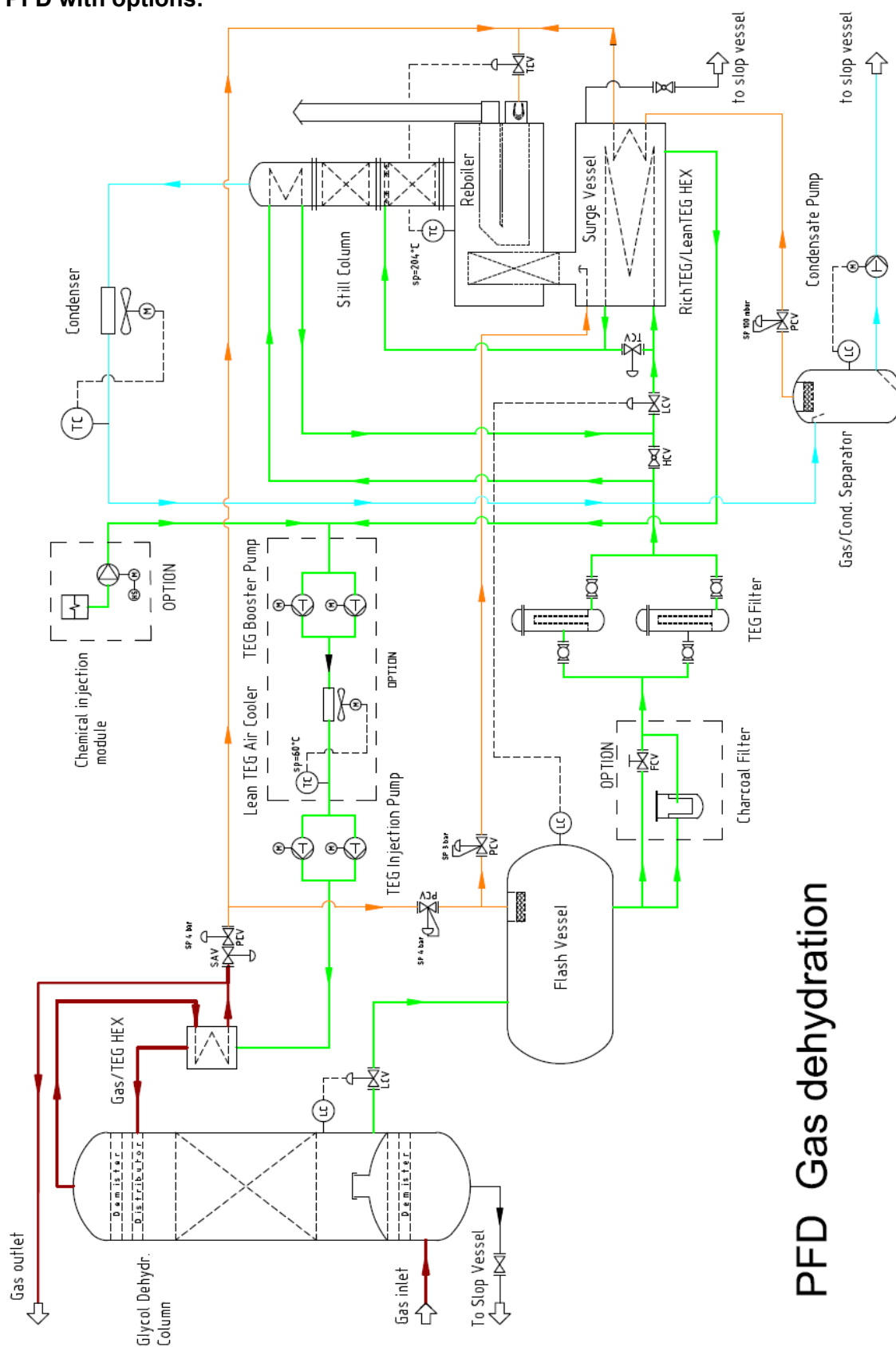
- All foundations and civil works
- Transport, unloading, erection of the units
- Interconnecting piping between the units
- Interconnecting cabling between the units
- Connection to all terminal points
- Power supply
- Local approvals

## **9. Options:**

Every dehydration unit will be designed in coordination with client's specification. Following options can be integrated in the standard design.

- Charcoal filter for hydro carbon absorption
- Booster pumps and TEG – Air cooler for high gas temperatures
- Three phase separator for hydro carbon – TEG separation
- Heat tracing for stand by operation
- NACE design for sour gas

## Standard PFD with options:



## PFD Gas dehydration



## 10. Reference projects:



Gas production facility with two production lines, each 1.000.000 nm<sup>3</sup>/d



Reboiler 350 kW with burner and surge drum



Condensate separator with drain pump





**Reboiler for 6.500 kg TEG/h and horizontal incinerator 900 kW**



**Absorber 400.000 nm<sup>3</sup>/h    Vertical incinerator 1000 kW**





**Gas dehydration for 5.000.000 Sm<sup>3</sup>/d and  
TEG flow of 8.000 kg/h**



**TEG regeneration 5.000 kg/h**

