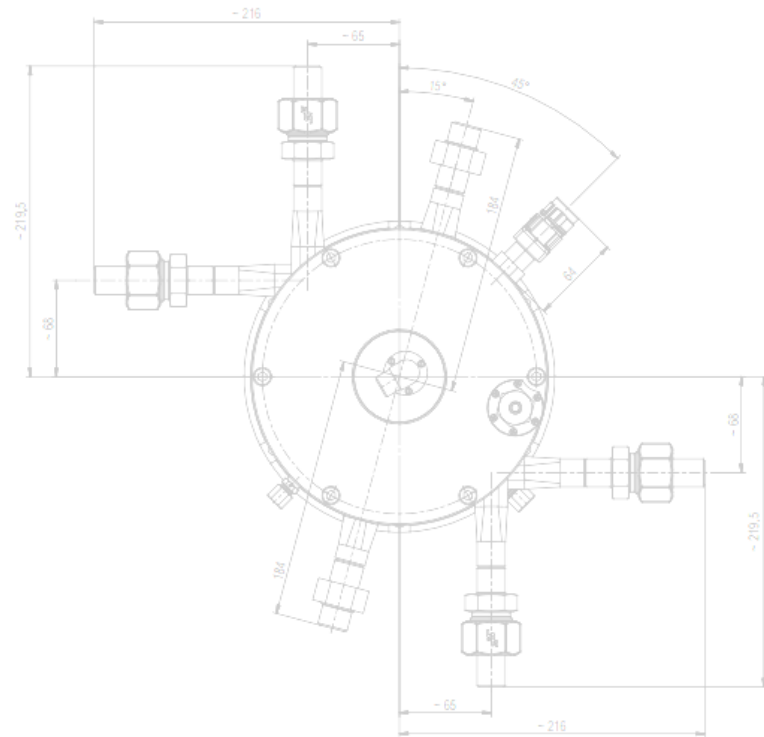


ATEKO a.s.

1949 – 2020

Gas Drying Technology



Gas Drying Technology – Technological Options

Absorption technology

- Humidity absorption into liquid triethylene glycol (TEG)
- The process is held in absorption column
- Continuous TEG regeneration by distillation of water in regenerator (up to 200°C)

Adsorption technology

- Humidity absorption on solid adsorbent – silicagel, alumina or molecular sieve
- The process is held in periodically working adsorbers – cycle phases adsorption, heating, regeneration and cooling
- Adsorbent regeneration is done by heated gas (min 150°C)

Low-temperature separation

- Humidity condensation by low-temperature and subsequent separation on gas-liquid mixture
- Convenient use of „jet-effect“, ie. temperature decline due to expansion
- Methanol, DEG injection – protection against hydrate formation
- Cold regeneration

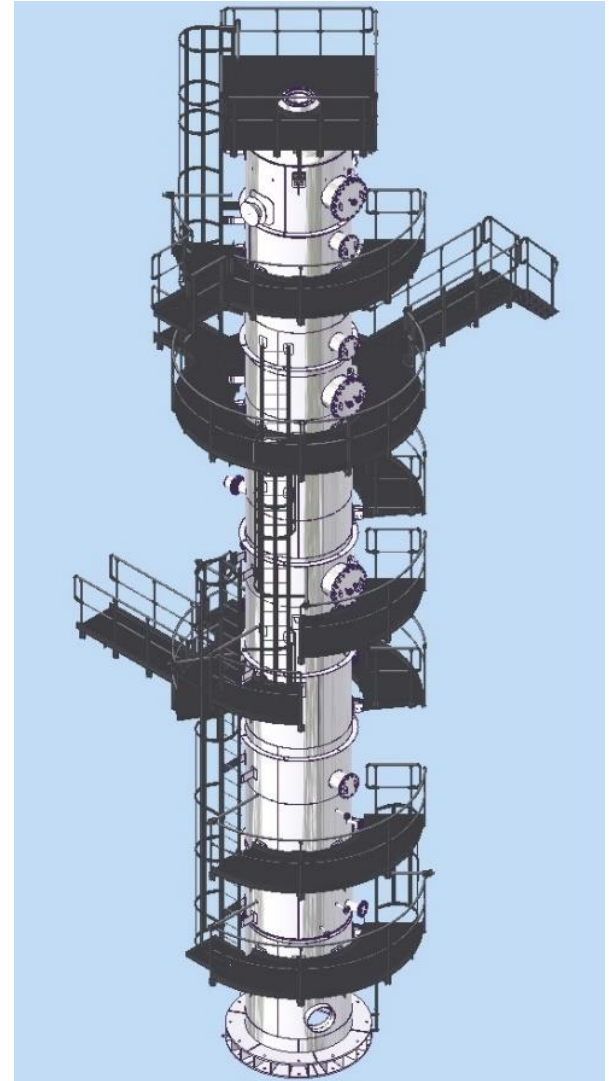
Gas Drying Technology – General Data

Typical Operating Data:	Filtration:	Drying:
Capacity:	100 000 – 300 000 Nm ³ / hour	100 000 – 300 000 Nm ³ / hour
Pressure:	7 – 20 MPa	6 – 10 MPa
Temperature:	+3 °C – +40 °C	+15 °C – +25 °C
Filtration Efficiency:	20 micro meters	
Dew Point:		-7 °C at 4 MPa as minimal

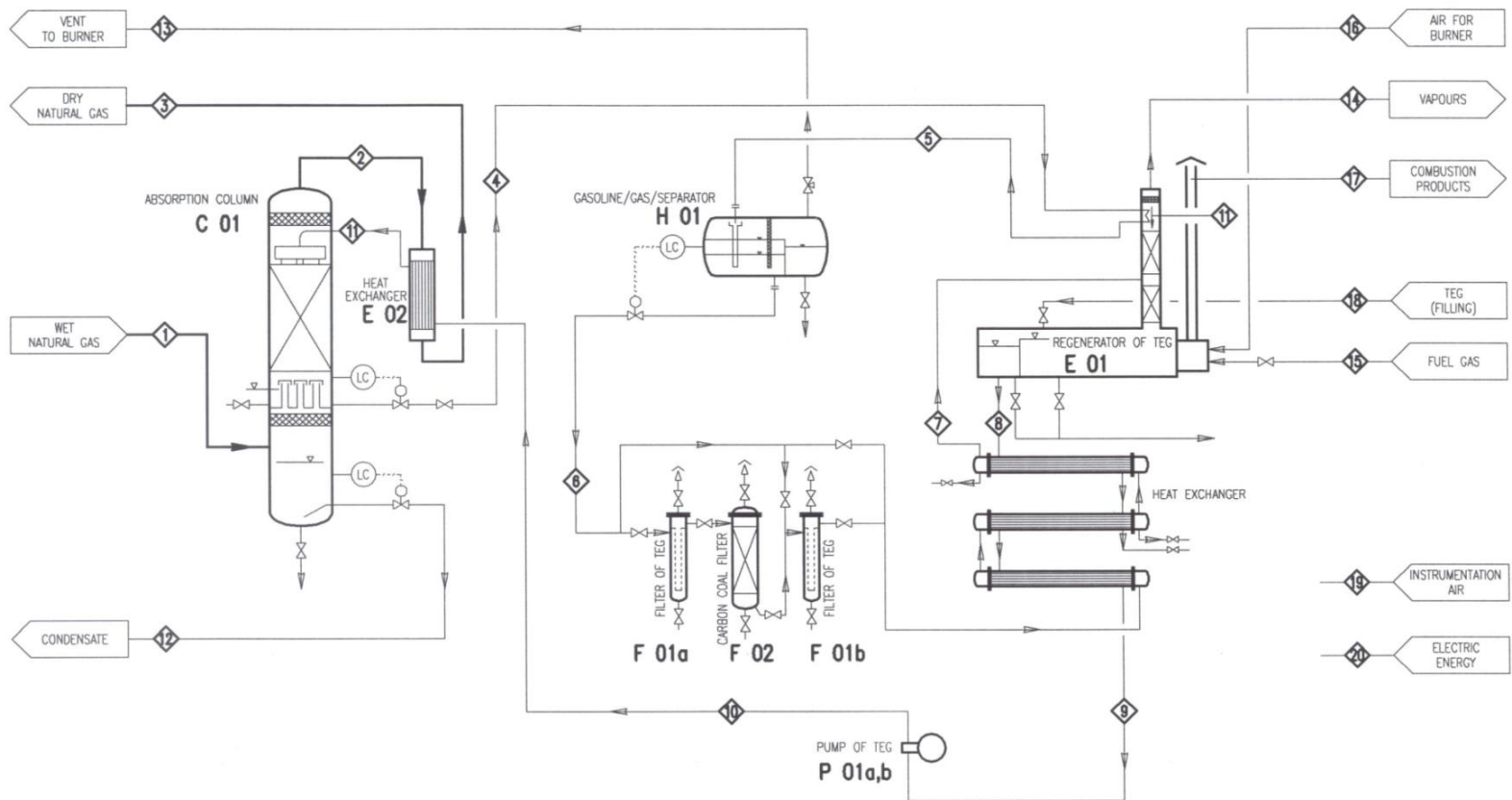
Gas Drying Technology - Deliveries

ATEKO Capabilities:

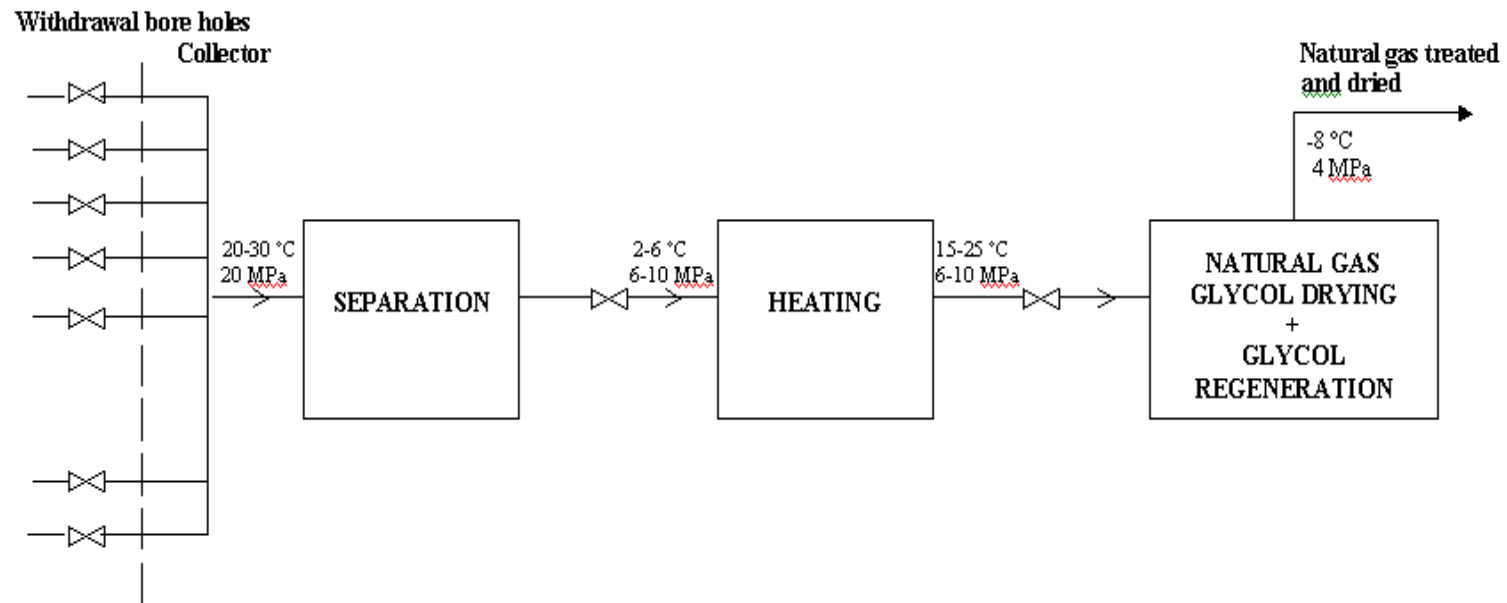
- Turn-key Solutions
- Plant Projects
- Technology Design
- Individual Apparatuses
 - *both of design and manufacture*
 - *Separators*
 - *Absorption Columns*
 - *Heat Exchangers*
 - *Regeneration Units*
 - *Filters incl. filter elements*
 - *On-site supervision*
- Accessories delivery



Gas Drying Technology – TEG Operating Scheme (1)



Gas Drying Technology – TEG Operating Scheme (2)



Gas Drying Technology – References 2019

innogy Gas Storage, UGS Tvrdonice, CZ – Gas Drying Equipment refurbishment (Gas drying columns, TEG Regeneration Unit, Breed Vapours Combustion Unit)

Design and manufacture phase (assembly and commissioning expected in 2020)



Gas Drying Technology – References 2018

innogy Gas Storage, UGS Štramberk, CZ – Gas Drying Equipment (Gas drying columns, TEG Regeneration Unit, Breed Vapours Combustion Unit)



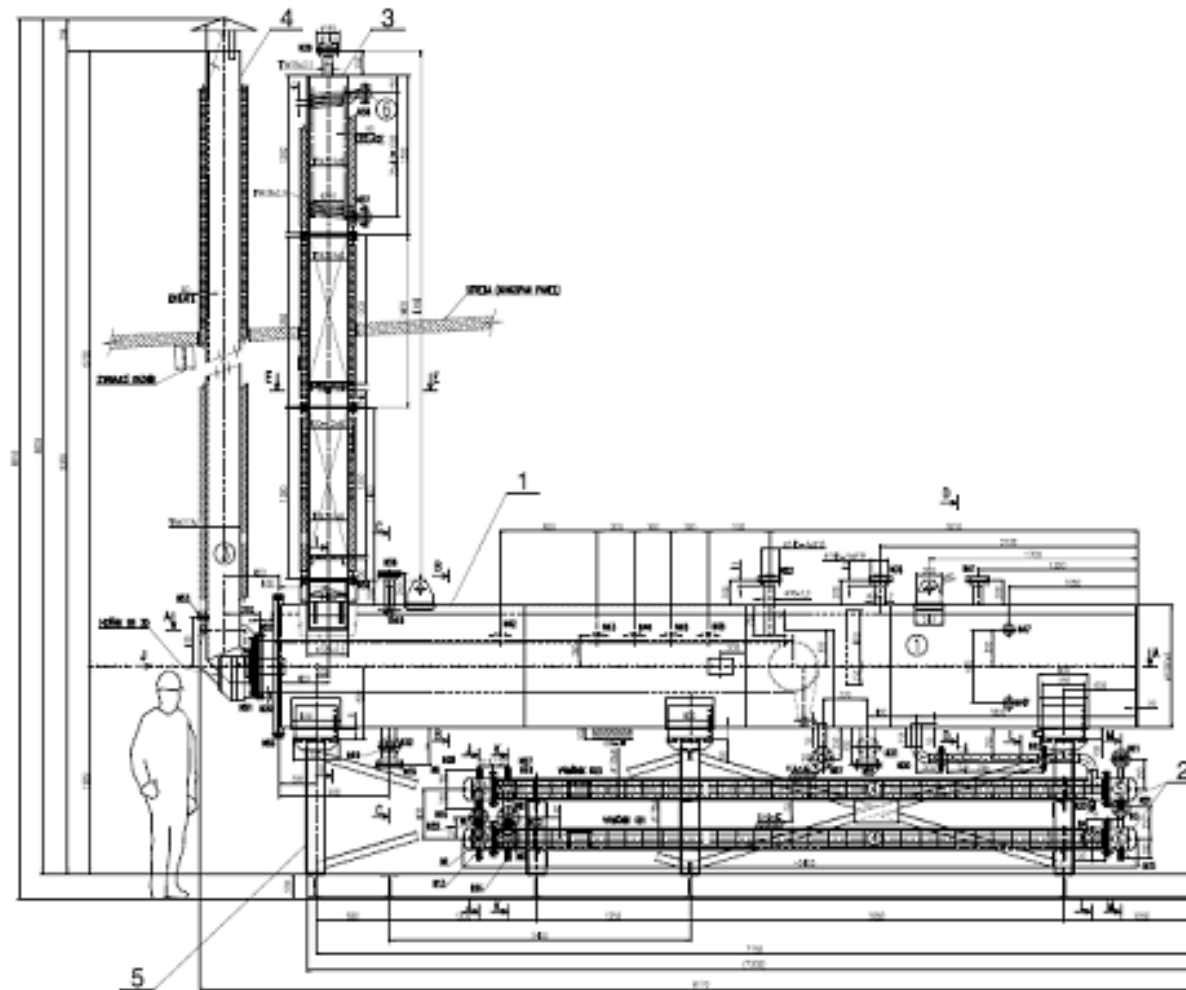
Gas Drying Technology – References 2018

innogy Gas Storage, UGS Štramberk, CZ - under development, a complete technology to be delivered



Gas Drying Technology – References 2017

innogy Gas Storage, UGS Háj, CZ – Emission Limits and TEG Regeneration



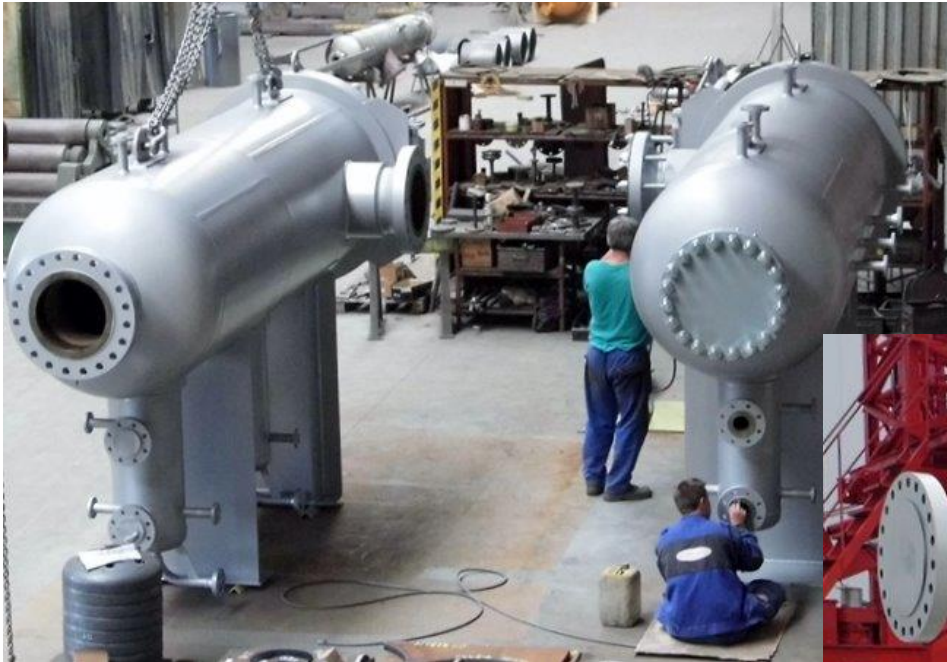
Gas Drying Technology – References 2016

RWE Gas Storage, UGS Třanovice, CZ, Low Pressure Gas Drying



Gas Drying Technology – References 2015

RWE Gas Storage, UGS Dolní Dunajovice, Filterseparators for Natural Gas



Gas Drying Technology – References 2014

NAFTA, UGS Gajáry, SK, Enerflex Separator Overhaul, A New Gas Heater



Gas Drying Technology – References 2013

RWE Gas Storage, UGS Háje, CZ, Technology Repair and Refurbishment



Gas Drying Technology – References 2012

Plynostav, Powerplant Počerady, CZ, Filterseparators, Filters, Special Heaters



Gas Drying Technology – References 2011

RusGasEngineering Company, Russia, UGS Uhřice, CZ, Audit of the project implementation documentation

Assessment of the project and realization documentation for the construction of a new unit of the natural gas low temperature drying for underground storage NG Uhřice

Gas Drying Technology - References 2010

Plynostav, CZ, UGS Wierzchowice, PL, Design, manufacture, delivery of gas filterseparator with quick-closure, 13 pcs


Design of UGS Wierzchowice,

- main stage $3,5 \cdot 10^9$. Nm³,
- sub-stage $1,2 \cdot 10^9$. Nm³



Gas Drying Technology - References

***A deep history because of
many projects since 1976 ...***



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