

Glycol Dehydration Systems

Efficient removal of water, BTEX, and VOCs from natural gas streams

APPLICATIONS

- Removal of water; benzene, toluene, ethylbenzene, and xylene (BTEX); and other volatile organic compounds (VOCs) from natural gas streams
- Natural gas dehydration

BENEFITS

- Enhances operational versatility
- Lower operating costs compared with conventional desiccants
- Lower capex compared with solid bed systems
- Reduced manufacturing and commissioning times through standardized unit offering (customized units also available)
- Streamlined packaging of hybrid systems

CONTACTOR FEATURES

- Diameters from 8½ in to 15 ft
- Design pressures from 230 to 2,160 psi
- Flow rate capacities from 100 to 200,000 MMcf/d
- ASME Code, National Board, or British Standard stamped
- Corrosion allowance with ASME code inspection openings
- Internal or external glycol-gas heat exchangers or air coolers
- Integral inlet scrubber
- 3 to 15 trays or packed columns
- 18-, 24-, or 30-in tray spacing
- Carbon steel or stainless steel trays and bubble caps
- Tray drains
- Tray inspection openings
- External or internal tray walkways
- Gas piping and valves
- Instrumentation and alarm systems
- Safety-caged ladders and platforms
- Carbon steel, 304- or 316-L stainless-steel, 316-L stainless-steel-clad, or 316-L stainless-steel overlay construction



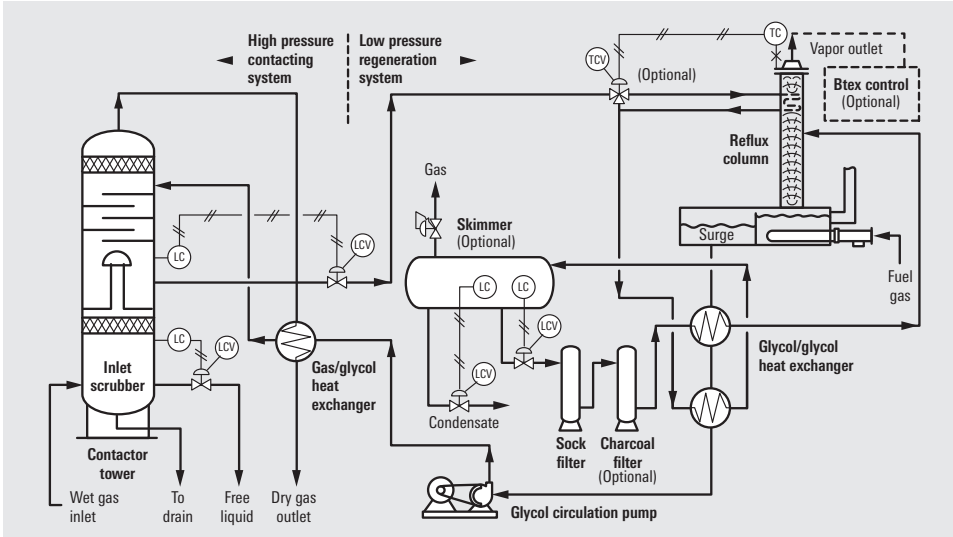
Schlumberger glycol dehydration processes remove water vapor from natural gas, which helps prevent hydrate formation and corrosion and maximizes pipeline efficiency.

Schlumberger engineers fabricate and install complete dehydration systems, including custom and standard dehydration systems, glycol purification modules, glycol injection units, and stripping gas recovery systems.

A complete program of support services is also available to satisfy every aspect of your dehydration problems.

How it works

The dehydration process is simple—wet gas contacts dry glycol, and the glycol absorbs water from the gas. Wet gas enters the tower at the bottom. Dry glycol flows down the tower from the top, from tray to tray or through packing material.



Flow diagram of a typical Schlumberger glycol dehydration unit.

Glycol Dehydration Systems

RECONCENTRATOR FEATURES

- Glycol purity to 99.3% (available to 99.97% with stripping gas columns)
- Heat duty from 75,000 to 8,000,000 Btu/h
- Heat sources can be direct fired, steam, hot oil, electric, or natural gas
- ASME Code TEMA C or R design heat exchanger
- ASME Code or National Board Stamped
- Pulsation dampeners
- Flame arrestors
- Internal or external glycol-glycol heat exchangers or air coolers
- Glycol flash drums or hydrocarbon skimmers
- Glycol sock or charcoal filters with standby
- Electric-, gas-, or glycol-powered glycol pumps with standby or automatic switching
- Automatic reflux and overhead temperature control
- Temperature or filter differential pressure recorders
- Instrumentation and alarm systems
- High-level, low-level, and high-temperature alarms
- Automatic shutdown panels
- Automatic pilot relight systems
- Moisture analyzer
- Carbon steel, alloy, or carbon steel with alloy clad or WOL construction
- Special coatings
- Galvanized skids, ladders, and access platforms
- Fiberglass cold-weather housings
- Modular design
- Stripping gas recovery system
- Combustion air controller or firetube turbulator for increased fuel efficiency

The special bubble cap configuration maximizes gas/glycol contact, removing water to levels below 5 lbm/MMcf. Systems can be designed to achieve levels down to less than 1 lbm/MMcf.

The dehydrated gas leaves the tower at the top and returns to the pipeline or goes to other processing units. The water-rich glycol leaves the tower at the bottom and goes to the reconcentration system. In the reconcentration system, the wet glycol is filtered of impurities and heated to 400 degF [204 degC]. Water escapes as steam, and the purified glycol returns to the tower where it contacts wet gas again.

The entire system operates reliably unattended. Controllers monitor pressures, temperatures, and other aspects of the system to ensure efficient operation.



Glycol dehydration system bubble cap.

Glycol Contactor and Integral Inlet Scrubber Nominal Gas Capacity, MMcf/d

Vessel Size OD, in	Design Pressure, psi					
	230	500	600	1,000	1,200	1,440
12¾	1.4	1.9	2.2	2.6	3.0	3.1
16	2.1	3.2	3.5	4.2	4.7	4.8
20	3.4	5.0	5.5	7.0	7.3	7.5
24	4.9	7.2	7.5	10.5	10.6	12.5
30	7.5	11.3	12.5	17.0	18.0	21.0
36	11	16.5	20	25	27	31.7
42	17	25.5	27.5	34.5	38.0	41.0
48	22.0	33.0	37.0	46.0	50.0	54.0
54	28.0	42.0	46.0	58.0	63.0	68.0
60	34.5	52.0	57.0	72.0	78.0	84.0
66	41.5	64.5	70.0	87.0	94.0	102.0
72	50.0	75.0	82.0	100.0	110.0	123.0

Note: Nominal gas capacity (MMcf/d) at design pressure 0.7 relative density and 100 degF [38 degC] inlet gas temperature, with bubble cap trays.

Maximum Capacity of Water Removed from Glycol Reconcentrator (with Glycol Powered Pumps), lbm/d

Reconcentrator Duty Duty, Btu/h	Pump, galUS/h	Glycol Circulation Rates Capacity (Glycol or Pounds of Water Removed), galUS				
		2.0	2.5	3.0	3.5	4.0
75,000	40	393	343	304	268	233
150,000	40	480	384	320	274	240
250,000	90	1,080	864	720	617	540
375,000	210	1,680	1,344	1,120	960	840
550,000	210	2,520	2,016	1,680	1,440	1,260
750,000	450	4,112	3,446	2,966	2,604	2,320
1,000,000	660	5,482	4,595	3,955	3,472	3,100
1,500,000	900	8,223	6,893	5,934	5,208	4,641

Note: Maximum capacity of reconcentrator in pounds of water per day removed, when limited by firebox capacity or pump capacity.

Glycol Dehydration Systems

Schlumberger provides glycol dehydration systems in standard and custom sizes. Standard units are available, some with immediate delivery for certain applications. Systems for large gas flow rates or for meeting other specified conditions are custom engineered.

Specifications are computer analyzed, and many variations and combinations of equipment are examined. All systems optimize efficiency, capital investment, and operating costs.

Standard systems

Schlumberger offers a series of contactor towers and reconcentrator packages, including a low-profile unit, that are ready for immediate delivery. These systems come with accessories and controls.

Contactor towers are available with packed or trayed columns:

- Packed columns: 8⁵/₈- to 10³/₄-in OD with working pressure to 1,440 psi
- Trayed columns: 12³/₄- to 36-in OD with working pressure to 1,440 psi

These are available with six or eight trays and integral inlet scrubber.

Reconcentrator systems are available with

- heat duty from 75,000 to 1,500,000 Btu/h
- glycol-powered pump with rates from 13 to 450 galUS/h
- glycol pumping hookup kits for use with 12-, 16-, 20-, and 24-in six-tray absorbers along with 75,000-, 150,000-, and 250,000-Btu/h reconcentrators

Support services

- A 24-hour support service program from more than 30 service centers helps maintain efficiency and minimize downtime. Schlumberger expertise ensures system performance to its strict design specifications.
- Scheduled maintenance is delivered by trained technicians for maximized performance.
- Laboratory analysis of field glycol samples are performed to detect problems earlier.
- Equipment undergoes chemical cleaning to remove scale and contaminants. The specially blended chemicals we use increase system efficiency, reduce corrosion, and minimize downtime.
- High-quality glycols are available in bulk and in drums.

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