

The image shows an industrial facility with several tall, dark metal chimneys or towers. Each tower has a conical, perforated metal top. The facility is filled with various pipes, valves, and machinery. A white plastic jerrycan is visible in the foreground. A red diagonal graphic element is on the left side, and a white diagonal graphic element is on the right side. The background is a clear blue sky.

INDUSTRY LEADING DESIGN

CIMARRON
ENERGY

SEPARATION
GAS PRODUCTION UNITS



Introduction

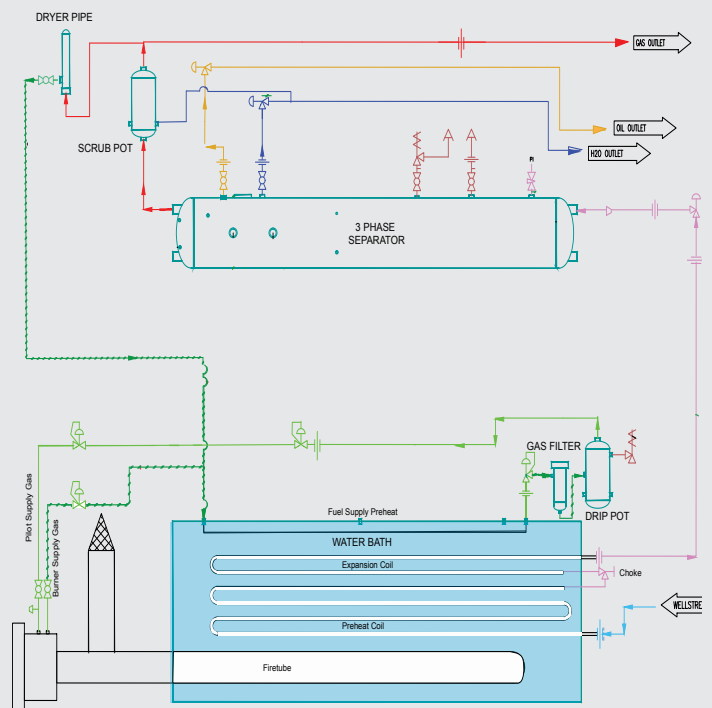
Cimarron's separators and gas production equipment have become an industry standard for wellhead consolidation, pad footprint and flow-line reduction, installation and production efficiency, and lower capital investment.

- Multiple-well designs
- Reduced footprint & installation costs
- Skid-limit design
- Pressures to 1440 PSIG
- Two and three phase
- Separators are typically 20" to 42" OD
- Optional enclosed cabinet for challenging operating environments
- Optional integrated sand separators and line heaters

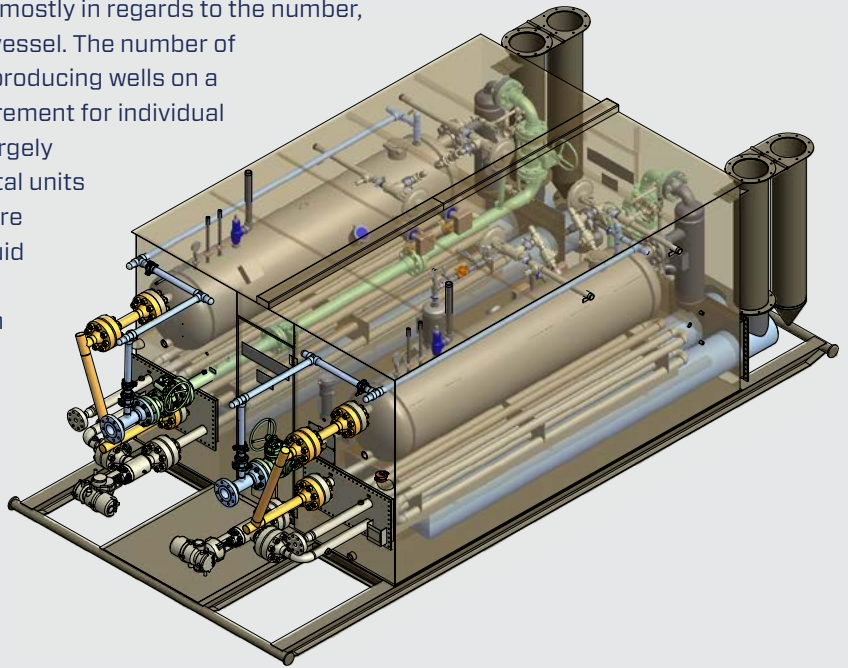


Operation

A Gas Production Unit (GPU) is comprised of a split-pass coil indirect heater containing a gas-fired natural draft burner, a pre-heat and expansion coil bundle, followed by a two-phase or three-phase separator typically operating above pipeline pressure. The process heat reduces the risk of gas hydrate formation associated with large pressure drops and ensures effective separation through the control of pressure and temperature. The equipment is enclosed within a skid-mounted cabinet, allowing for ease of installation and operation while minimizing the equipment footprint and space requirements. The indirect heater is designed in accordance with API 12K standards, while the separator design is based on recommendations of the Gas Processors Suppliers Association (GPSA).



Production units have many variations, mostly in regards to the number, size, and positioning of the separation vessel. The number of separators is related to the number of producing wells on a multi-well pad (allowing volume measurement for individual wellstreams), while the positioning is largely dependent on the gas-oil ratio. Horizontal units are common while vertical separators are utilized when there is relatively little liquid in the wellstream. Cimarron has designed and manufactured production units capable of processing up to five separate wellstreams, although two to four are more common.



Cimarron also offers a large number of sand separators extending the life of the GPU. We highly recommend that an operator include a sand separator prior to the inlet of the production unit to remove as many solids and contaminants as possible. Solids and well debris, particularly where shale fracturing is employed, can reduce processing capacity and has a particularly erosive effect on the production choke.

The preheat coil, choke, and expansion coil vary with well conditions and are carefully sized in the design phase. Typical coil ratings are 5000 PSIG, but this figure has increased in recent years with the advent of deeper drilling and the extension of laterals. Cimarron now frequently manufactures coil bundles with ratings of 10,000 PSIG. The number of passes for the preheat and expansion coils are determined using actual well conditions and process simulation to provide the appropriate surface area for heat transfer. Maximum allowable working pressure of the separator vessel is typically 1440 PSIG.

ESTIMATED SEPARATOR CAPACITIES

Typical Separator Sizes (inches)	Vessel 50% Liquid Filled		
	Liquid Capacity* (Bbl/d)	Gas Capacity @ 600 PSIG (MMCF/d)	Gas Capacity @ 300 PSIG (MMCF/d)
20 OD x 90	380	6.2	4.4
24 OD x 120	740	10.4	7.2
30 OD x 120	1160	15.2	10.4
36 OD x 120	1700	22.4	16.0
42 OD x 120	2020	32.0	22.0

* Assumes 5 minute liquid retention time

Features & Accessories

Standard Features

- Indirect Heater — API 12k with removable firetube
- Natural draft burner with flame arrestor
- Hinged stack for transport with bird screen
- Removable split-pass coil bundle with choke
- Supply gas system with gas preheat coil, supply gas scrubber, burner and pilot controls and emergency shut-off
- Two or Three Phase Separator, with drain, pressure relief, rupture disk, level controllers, dump valves and high/low shutdown
- Separator internals — weir bucket or interfacing style with mist extractor & baffles
- Shut down pressure control assembly
- Meter tube with junior or senior orifice fittings
- Integral skid and walk-through cabinet
- Cimarron ARC ignition system
- Pressure relief, temperature and level gauges, and other necessary instrumentation

Options and Accessories

- Sales line scrubber pot
- Fire retardation system
- Outside access cabinet for smaller footprint
- Customer specified burner management system
- Additional flash separator
- Motor actuated chokes
- Custom features as required
- Vane Packs
- Sand Removal Manifold and sand separators

For More Information

We would be glad to discuss all of your separation needs. Please contact us at your convenience at **405-928-7373** or visit our website at **CimarronEnergy.com**, where you will find a design input sheet if you would like us to address your specific requirements.

