Exterran’s C150 Cryogenic Processing System removes condensed ethane and other NGLs from natural gas. Image includes optional equipment.

Key Benefits

**Speed Your Time to Plant Startup**
- Start operations faster with the optional Exterran Quick-Start® program. This unique program includes onsite engineering expertise, inventory planning and materials and management of systems components shipped separately
- Reduced manufacturing times with Exterran’s key component inventory
- Control your project schedule with Exterran’s turnkey project capabilities such as design, manufacturing, installation, startup, commissioning and plant operation

**Performance Delivers Value**
- We tune our engineered designs to optimize natural gas liquid yield and back our plants with a process guarantee
- We use only high-quality components such as Orbit® switching valves, Fisher® control valves, Rosemount® transmitters and Chart® heat exchangers

**Increase Confidence with Years of Engineering Experience**
- Proven standard designs or custom-engineered plants
- Combined 2,000+ years of engineering experience
- 300+ completed gas processing plants

**OVERVIEW**

Designed for nominal gas flow rates up to 150MMscfd, the Exterran Processing Solutions™ C150 Cryogenic Processing System uses the reflux demethanizer Gas Subcooled Process (GSP) to recover natural gas liquids (NGLs). These facilities typically consist of a molecular sieve dehydration, optional mechanical refrigeration, turbo expander/compressor and demethanizer to drop the temperature of the gas and remove condensed ethane and other natural gas liquids.

Exterran is the first choice for gas processing plants. We quickly deliver reliable plants designed and manufactured in-house to maximize your control over project schedules. Our plants are backed by a combined 2,000+ years of industry-leading design and application engineering experience. We have more than 300 completed gas processing plants designed for rich inlet gas.
PROCESS DESCRIPTION

The standard C150 system can be operated in either ethane recovery or rejection modes. In ethane recovery mode the system can recover in excess of 90% of the ethane from natural gas streams, or, as much as 90% propane, while rejecting 90% of the ethane. All heat exchangers, air coolers, and centrifugal pumps are designed with at least a 10% capacity margin.

The standard cryogenic system is comprised of two main sections, the mol sieve and the turbo expander. Wet natural gas first enters the mol sieve section, passes through the inlet gas separator to remove any free liquids and then onto the inlet gas filter/coalescer to remove contaminants. The filtered wet gas then flows to the mol sieve dehydration beds where water is removed by adsorption. The dry gas passes through a dust filter to remove dust and other particles.

The regeneration process begins with a small stream of dry gas diverted from the outlet stream. The dry stream is compressed and heated to regenerate the mol sieve bed. The wet gas exiting the mol sieve bed passes through a regenerator gas cooler and regenerator gas separator to capture the steam and condense it back to water. The regenerator gas is then routed back to the inlet gas filter/coalescer.

The mol sieve absorption stage is typically configured in parallel to alternately allow for both adsorption and regeneration of the mol sieve beds.

Dry gas exits the mol sieve section and is cooled by a gas/gas exchanger and demethanizer reboiler, after which it flows to a cold separator. Liquid from the lower section of the cold separator feeds midway into the demethanizer tower, which separates the methane from the liquids. For rich gas compositions, supplemental mechanical propane refrigeration can be added to the system to maximize NGL recovery.

High pressure cold vapor from the cold separator flows to the turbo expander and subcooler. The cooled gas and condensed liquid flow into the demethanizer tower where the gas rises and the liquid descends. The liquid product exits the bottom of the tower to be further processed as required. The cold residual gas exits the top of the tower and flows through the subcooler and into the gas/gas heat exchanger. Warm gas exiting the gas/gas exchanger flows to the suction side of the booster compressor and then to residue compression for pipeline delivery.

PROCESS DIAGRAM

The hot residue gas is used for the trim reboiler, minimizing utility costs.
## C150 Standard Specifications

<table>
<thead>
<tr>
<th>Module / Component</th>
<th>Length (ft–in)</th>
<th>Width (ft–in)</th>
<th>Weight (lbs)</th>
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<tbody>
<tr>
<td>Upper Demethanizer Skid Module</td>
<td>50 - 10</td>
<td>14 - 0</td>
<td>88,901</td>
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<td>Lower Demethanizer Skid Module</td>
<td>61 - 0</td>
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<td>97,882</td>
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<td>Upper Dehydration/Regeneration Skid Module</td>
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<td>Upper Hot Oil Skid Module</td>
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<td>14 - 5</td>
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<td>Lower Hot Oil Skid Module</td>
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<td>14 - 0</td>
<td>31,500</td>
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<tr>
<td>Turbo Expander / Compressor Skid</td>
<td>23 - 0</td>
<td>8 - 4</td>
<td>25,000</td>
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<tr>
<td>Turbo Expander / Compressor Discharge Cooler</td>
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<td>13 - 9</td>
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<td>Demethanizer Product Cooler</td>
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<tr>
<th>Component</th>
<th>ID (in)</th>
<th>Overall Height</th>
<th>Weight</th>
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<tr>
<td>Dehydration Absorber (3)</td>
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<td>33 - 6</td>
<td>122,985</td>
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<tr>
<td>Demethanizer Tower / Cold Separator</td>
<td>78 X 54/109</td>
<td>144 - 0</td>
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<table>
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<th>Component</th>
<th>ID (in)</th>
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<td>Demethanizer Surge Tank</td>
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<td>40 - 0</td>
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<tr>
<td>Inlet Gas Separator</td>
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<td>16 - 0</td>
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<table>
<thead>
<tr>
<th>Power Requirement</th>
<th>HP</th>
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</thead>
<tbody>
<tr>
<td>Connected/Operating Horsepower</td>
<td>452/322</td>
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</tbody>
</table>

*Excluding Booster or Product Pumps

## Standard Product Features

- Gas Subcooled Process (GSP) design
- 90%+ ethane recovery for typical NGL streams
- Full ethane rejection mode
- Product booster pumps
- Manual ethane recovery/rejection switching
- Three-bed molecular sieve gas dehydration
- Skid edge junction box compatible with any control system
- Control system includes Allen-Bradley® ControlLogix® Programmable Logic Controller (PLC) and Wonderware® Human Machine Interface (HMI) workstations
- Custom design expander/compressor wheel for optimized conditions
- Hot oil heater

## DIMENSIONS

*Dimensions shown here are approximate and may vary. Images include optional equipment.*

**Side View**

**Top View**

**200 ft**

**144 ft**

**300 ft**
C150 CRYOGENIC GAS PROCESSING SYSTEM

Sizing and Options Form
Contact your local Exterran representative to submit sizing and options.

Cryogenic System Design and Sizing Requirements
- Elevation (ft)
- Ambient Temperature - Min/Max (°F)
- Barometric Pressure (psia)
- Maximum Wind Speed (mph)
- Seismic Zone
- Soil Bearing Allowable (psf)

Inlet Gas Flow
- Pressure (psig)
- Temperature (°F)
- Water Content (lbs/MMscfd)
- Rate Min-Max (MMscfd)
- Specific Gravity
- \( \text{H}_2\text{S} \) Hydrogen Sulfide (ppm)
- \( \text{CO}_2 \) Carbon Dioxide (mol%)
- \( \text{N}_2 \) Nitrogen (mol%)
- \( \text{C}_1 \) Methane (mol%)
- \( \text{C}_2 \) Ethane (mol%)
- \( \text{C}_3 \) Propane (mol%)
- \( \text{iC}_4 \) iso-Butane (mol%)
- \( \text{nC}_4 \) n-Butane (mol%)
- \( \text{iC}_5 \) iso-Pentane (mol%)
- \( \text{nC}_5 \) n-Pentane (mol%)
- \( \text{C}_6+ \) Hexanes Plus (mol%)
- TOTAL mol% 100%

Residue Gas
- Heating (BTU/scf)
- Pressure (psig)

Liquid Product Requirement
- Ethane (mol%)
- Propane (mol%)
- Product Pipeline Pressure

Standard Modules
- Demethanizer/Expander Valve Module
- Molecular Sieve
- Dehydration/Regeneration Module
- Regeneration Gas Heater Exchanger
- Turbo Expander/Compressor Module
- Hot Oil Pump Skid
- Hot Oil Heater

Options Checklist
- Closed-loop propane refrigeration system
- Product treating
- Inlet treating
- Horizontal or vertical product pipeline pumps
- Inlet/residue gas meters
- Fuel gas meter
- Mercury removal bed
- Fuel gas skid
- Condensate stabilizer
- Fractionation
- Power Distribution Center (PDC)
- Black start option
- Ultra low NOx heater emissions
- Exterran QuickStart

Notes

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