



For more than 25 years Ortloff Engineers, Ltd. has developed extensive experience successfully retrofitting NGL/LPG recovery plants to more efficient gas processing technologies. A plant retrofit offers the owner/operator one or more of the following benefits: improved ethane and propane recovery, additional gas processing throughput, and/or increased plant flexibility while operating in either ethane recovery or full ethane rejection. Ortloff's Retro-Flex™ is a unique gas processing technology developed for *Retrofitting* existing Gas Subcooled Process (GSP) plants to enhance *Flexibility*. With only a few tie-ins and minimal downtime during installation, Retro-Flex™ makes it possible for an existing GSP plant to operate from ethane recovery to full ethane rejection without losing any propane.

APPLICATIONS

The Retro-Flex™ process was developed to increase recoveries of propane and heavier components (C₃₊) from GSP plants in both ethane recovery and ethane rejection modes of operation – without the need for additional power.

Invented by Ortloff in 1976, GSP is limited in propane recovery mainly by economics. In ethane rejection operation, GSP plant designs typically require excessive residue compression power to achieve propane recoveries above 93%. The Retro-Flex™ process was developed to overcome this limitation, and improves the recovery of C₃₊ components in both modes of operation. Its most significant improvement is the increase in recovery of C₃₊ components while in ethane rejection mode.

As part of Ortloff's proven *Gas Plant in a Bottle*® (GPB™) product line, Retro-Flex™ utilizes a standalone heat and mass transfer device, referred to as the Cold Refluxing Module (CRM), which sits adjacent to the Demethanizer / Deethanizer column. The CRM provides additional fractionation and cooling to capture the unrecovered C₃₊ components which would otherwise exit the top of the GSP column.

RETRO-FLEX™

Typical applications for the Retro-Flex™ process include:

- Existing GSP plants capable of operating in both ethane recovery and ethane rejection modes, which would economically benefit from ultra-high C₃₊ recoveries.
- Existing GSP plants where economic conditions may favor a more flexible design, with the ability to operate in high ethane recovery and full ethane rejection modes while maintaining ultra-high C₃₊ recovery. The amount of ethane the Deethanizer is capable of rejecting depends on column size and reboiling requirements for meeting the liquid product specifications.
- New GSP plants that are about to be moved out of storage and placed into service. For a relatively small incremental investment, new plant owners can upgrade their "recovery-limited" GSP plant with the value enhancing Retro-Flex™ technology.

BENEFITS

Retro-Flex™ offers the following benefits when installed as part of an existing GSP plant:

- Significantly higher C₃₊ recovery in ethane rejection operation using no additional compression. Retro-Flex™ is capable of achieving greater than 99% propane recovery even when rejecting all the ethane, while GSP is typically limited to 85% - 93% propane recovery.
- Improved C₃₊ recovery in ethane recovery mode while achieving similar ethane recoveries using no additional compression. Retro-Flex™ typically achieves nearly 100% propane recovery in ethane recovery mode, while GSP is limited to less than 99% C₃ recovery.
- Same operation and controllability as GSP means very little operator training is required prior to start-up.
- Simple operation and controls making it easy to startup and operate.

BENEFITS (CONT.)

- A compact design with few equipment items required. Retro-Flex™ equipment can be installed while the plant is operating and then tied into the existing equipment at the first opportunity.
- Very few tie-ins are required for installation, and all tie-ins take place in the existing piping, rather than on the pressure-containing Demethanizer / Deethanizer column.

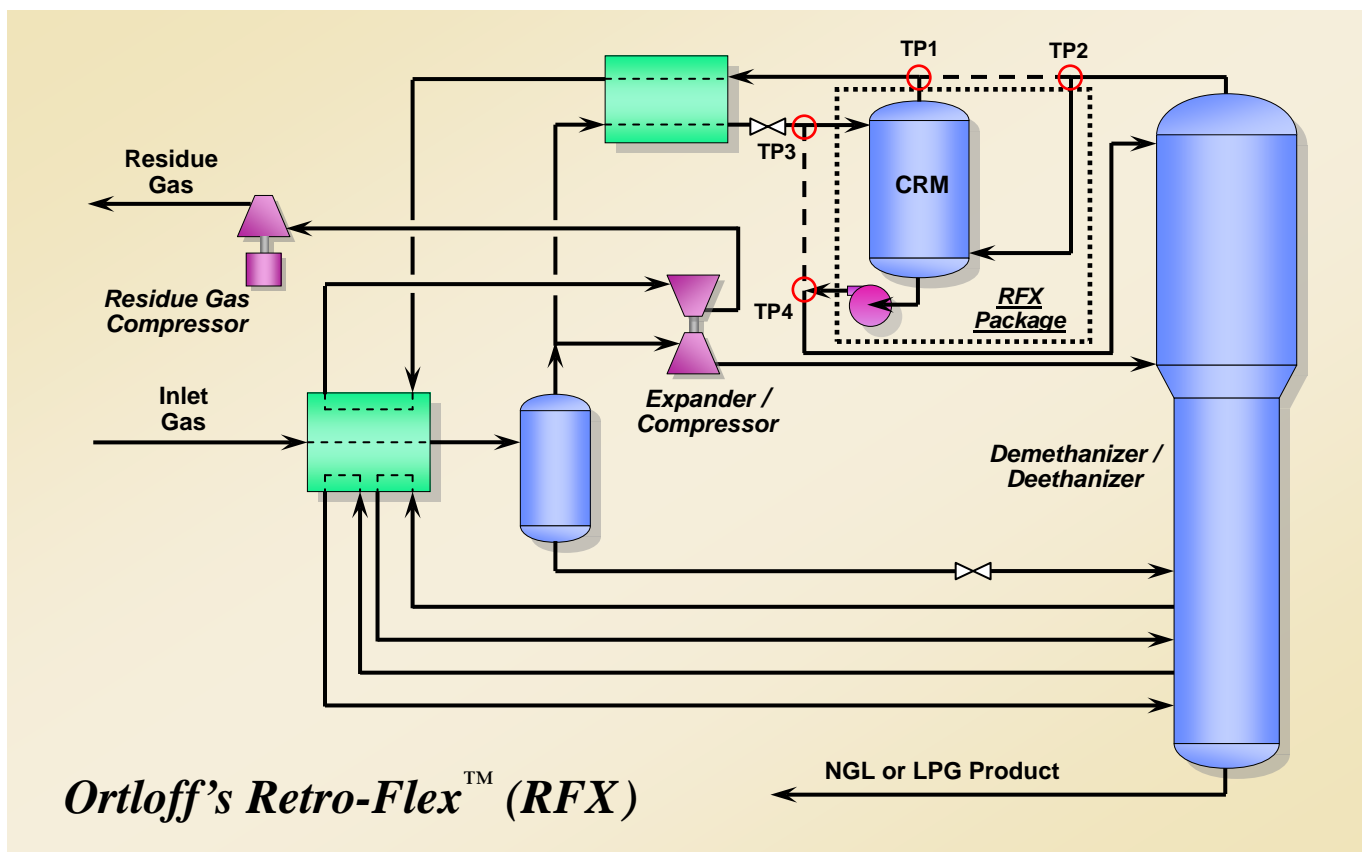
EQUIPMENT PACKAGE

Retro-Flex™ standard skid-mounted packages in sizes of 40, 80, 125, and 200 MMSCFD are under

development through a third party contractor. Custom packages are available. Packages include the CRM, pumps, instrumentation, and additional reboiling equipment, if required, for ethane rejection operation.

EXPERIENCE

For over 40 years customers have benefitted from Ortloff's gas processing technology innovations. Retro-Flex™ is one of Ortloff's newest inventions and is based on proven process and equipment design concepts. Several retrofit process designs using Retro-Flex™ are currently being considered by customers who have significant experience with GSP.



FOR MORE INFORMATION

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