

## TRGV – Tandem Regulating Injection Valves Standard Injection Module (TRGV-S)

### Multiple Regulator Array for Water Injection Control in Tandem in Selective Strings with Mandrels

The TRGV – Tandem Regulator Injection Valve system is designed for water injection control in secondary recovery fields with multiple reservoir zones that use regulating valves and mandrels.

It was developed and as a direct replacement for existing regulators, enabling stabilization, optimization, and higher efficiency in water injection operations within mature or secondary recovery fields.

The device controls water injection through multiple tandem regulators, including a damper (expansion element).

It allows control of the maximum injected water volume per zone based on the specific pressure differential, using selection tables derived from laboratory tests and advanced modeling.

The reducer assembly is encapsulated and compatible with most existing valves used in injection mandrels, and can be installed or retrieved using wireline tools.

The system's modular design makes it a direct replacement for field-deployed variable regulators, optimizing investment and service/operation costs.

This is national technology, used by Ecopetrol, with ongoing support from JPT Consulting and Services.

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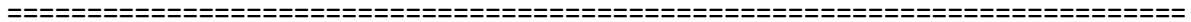
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## Applications

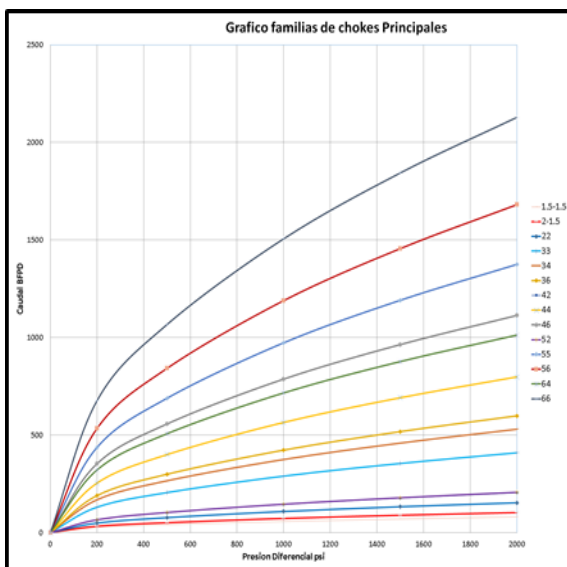
- Control and regulation of water injection in mature fields with multiple reservoirs.
- Stabilization of injection in each zone and the entire well, reducing energy consumption.
- Direct replacement for conventional regulating valves used in standard mandrel systems for selective injection strings.
- Reduction of surface pressure fluctuations and increased operational reliability.
- Reducer selection based on required injection rate and pressure differential per zone, using tested and modeled tables covering a wide range of field needs.
- Stainless-steel construction for harsh conditions and long service life.

## Advantages and Benefits

- Improved efficiency and injection stability, achieving maximum stable volume per zone, which translates into long-term production increases.
- Stabilized injection process for each well with lower energy consumption.
- Reduced operating costs due to extended service life — up to several times longer than conventional variable-regulation systems (average replacement interval: 12 months).
- Modular design allows upgrading, optimization, and replacement of parts as spares in existing valves, optimizing capital and operational expenses.
- Simple system, easy regulator selection, and straightforward installation and use in the field.
- Proprietary technology with local technical support.



## Technical Specifications



Especificaciones Técnicas Generales	
Parámetro	Especificaciones y comentarios
Diámetro Valvula	1.675in valvula OD / TRGV: L-6in; OD-1in
Material	St Stl ANSI 316
Máx. Temp. Operación	400dF - determinada por O'ring
Maximo Caudal	2500 BWPD por cada zona/mandril
Rango de Presión	0 psi hasta 20.000 psi
Desgaste Maximo	1% por 10.000 horas a 1000 BWPD
Seguridad	Intrinsecamente Segura

