

# Extended Water Injection Regulation Module (TRGV-X)

## Modular Array of Extended-Range Regulators with Multiple Reducers for Water Injection Control in Selective Strings with Mandrels

The TRGV-X (Tandem Regulator Injection Valve eXtended) module for water injection regulation in secondary recovery fields with multiple reservoir zones that use regulating valves and mandrels was developed and patented by Ecopetrol and JPT.

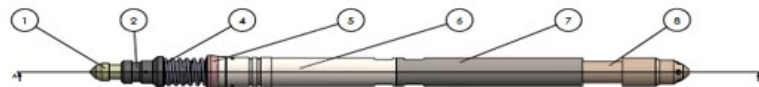
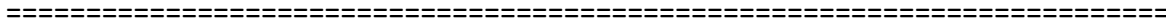
This module is designed for the valve, providing greater length and diameter, thereby extending system life and increasing injection capacity up to 4500 BWPD per zone.

The modular system enables stabilization, optimization, and improved efficiency of water injection in mature and secondary recovery fields.

The device regulates water injection through multiple fixed-orifice tandem regulators, including a damper (expansion element).

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

The system is modular and serves as a direct replacement for conventional field variable regulators, optimizing investment and service/operational costs.



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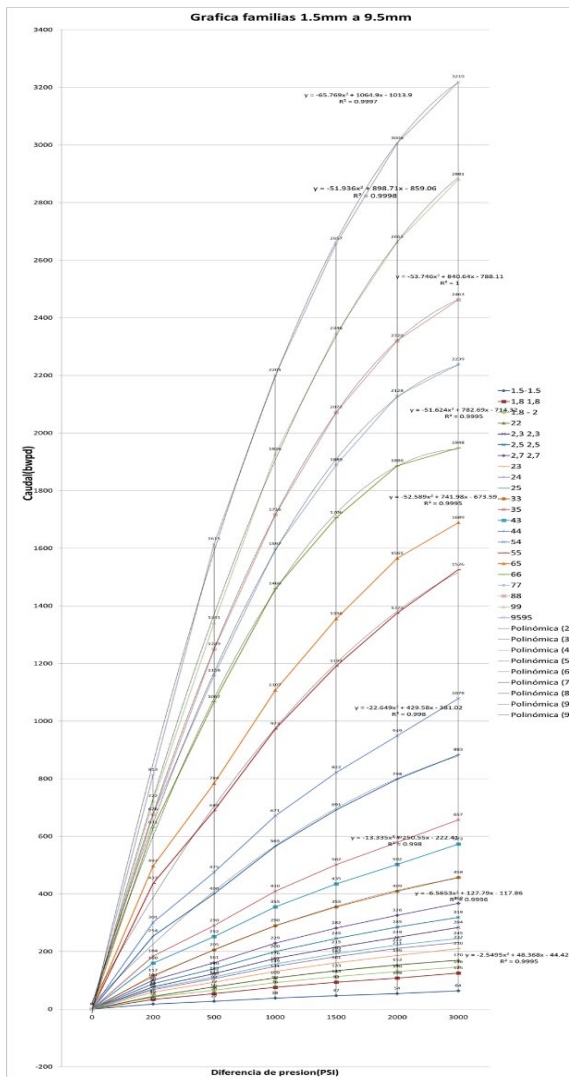
## Applications

- Control and regulation of water injection in mature fields with multiple reservoirs.
- Stabilization of injection in each zone and throughout the well, reducing energy consumption.
- Longer and larger-diameter reducers for controlling higher flow rates.

## Advantages and Benefits

- Improved efficiency and injection stability, achieving maximum stable injection volume per zone.
- Modular design allows upgrading, optimization, and replacement of reducers as needed.
- Proprietary technology with local technical support.

## Technical Specifications



Especificaciones Técnicas Generales TRGV-X	
Parámetro	Especificaciones y comentarios
Diámetro Valvula	1.675 in valvula OD / TRGV-S: L-9in; OD-1.3in
Material	SST ANSI 316
Máx. Temp. Operación	400dF - determinada por O'ring
Maximo Caudal	3300 BWPd por cada zona/mandril
Rango de Presión	0 psi hasta 10.000 psi
Desgaste Maximo	1% por 10.000 horas a 1000 BWPd
Orificios Reductores	1.5, 1.8, 2.0, 2.3, 2.5, 2.7, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 9.5
Seguridad	Intrínsecamente Segura

