Offsets Joule-Thomson cooling, prevents regulator “freeze up”, and provides stable output pressure even through large swings in inlet pressure!

The Genie® Joule-Thomson Heated Regulator Model JTR-H™ is a four stage pressure regulator with a self-limiting block heater designed to prevent condensation from occurring during pressure regulation of high pressure gas sources and natural gas having a high moisture or hydrocarbon dew point. Unlike traditional single stage heated regulators, the JTR-H™ has the ability to autocorrect the outlet pressure during inlet pressure swings up to 5700 PSI. Inlet pressure swings commonly occur at natural gas storage facilities and during the use of calibration gas cylinders, making the JTR-H™ the regulator of choice for these applications.

When dropping the pressure of a natural gas stream whose operating pressure is higher and operating temperature is at, near or below its cricondenhthem temperature (highest dew point temperature on the natural gas phase diagram), it sometimes becomes necessary to use multi-stage pressure regulation to prevent the sample from condensing during the pressure reduction process. If the gas composition is very rich (high BTU) or wet (high moisture), the ambient temperature is low, or the pressure is high enough to where there will be substantial Joule-Thomson cooling then it may be required to provide additional heat even when reducing the pressure in multiple stages to ensure that there will be sufficient heat transfer during the pressure reduction process to prevent condensation from occurring.

The need for this type of regulator is best illustrated by referencing a natural gas phase diagram (see below). For this particular gas composition, it can be observed that the only regulator that is able to maintain the sample in a vapor state AND comply with the requirement from API 14.1 of maintaining the sample 30°F above the hydrocarbon dew point at all times is this four stage heated regulator.

Note: Although the example above was specific to natural gas, this regulator can be used with other types of gases. For assistance in determining heating and pressure regulation requirements, please contact A+ Corporation or your local A+ distributor.

---

**Natural Gas Phase Diagram**

**Legend**
- Critical Point
- Source Conditions
- Probe Regulator JT
- 1 Stage Heated Regulator JT
- 4 Stage Heated Regulator JT

**Composition**

<table>
<thead>
<tr>
<th>Component</th>
<th>Mole %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Dioxide</td>
<td>2.0971</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>1.9315</td>
</tr>
<tr>
<td>Methane</td>
<td>77.7296</td>
</tr>
<tr>
<td>Ethane</td>
<td>11.1812</td>
</tr>
<tr>
<td>Propane</td>
<td>5.3681</td>
</tr>
<tr>
<td>n-Butane</td>
<td>0.2092</td>
</tr>
<tr>
<td>Isobutane</td>
<td>0.8487</td>
</tr>
<tr>
<td>n-Pentane</td>
<td>0.1344</td>
</tr>
<tr>
<td>Isopentane</td>
<td>0.1359</td>
</tr>
<tr>
<td>Hexane</td>
<td>0.2872</td>
</tr>
</tbody>
</table>

---

**Product Brief**

**Applications**
- Heated, multi-stage pressure regulation for gas analytical systems in any process industry:
  - High pressure sources
  - Natural gas having a high hydrocarbon or moisture dewpoint
  - Natural gas storage facilities
  - Calibration gas cylinders

**Benefits**
- Provides a steady output pressure, even when its inlet supply pressure changes over time
- No need to constantly adjust set pressure for each stage
- Prevents condensation during pressure reduction—reducing regulator freeze ups, preserving sample integrity, and minimizing analyzer down time and maintenance cost
- Eliminates the need for multiple regulators in series reducing cost, space, and set up time
- Auto-corrects outlet pressure during inlet pressure swings of up to 5700 PSI
- Easy to mount in small enclosures or densely populated cabinets

**Features**
- Four (4) stages of pressure regulation in one stainless steel housing
- First three pressure stages are ratio controlled
- User-adjustable fourth stage
- Piston pressure sensing elements
- Self-limiting heater prevents temperature overload
- Heater can be supplied to meet:
  - American NEC standard (CSA/NRTL/FM/UL)
  - IEC, ATEX and GOST standard
**Technical Specifications**

- **Temperature range**: 
  - Wetted materials: 
    - -15ºF (-26 ºC) to 300 ºF (149 ºC)
  - Machined parts: 316 stainless steel / NACE compliant
  - All other metal parts: stainless steel / NACE compliant
  - Regulator seat material: Teflon® PFA
  - Seals: Teflon®/Viton® (other materials available upon request)

- **Operating pressure range**: 
  - 300 PSIG (21 bar) to 6,000 psig (414 bar)

- **Outlet pressure range**: 
  - 0-10 psig (0-0.7 bar), 0-25 psig (0-1.7 bar), 0-50 psig (0-3.4 bar), 0-100 psig (0-6.9 bar), 0-250 psig (0-17.2 bar), 0-500 psig (34.5 bar)

- **Port sizes**: 
  - 1/4" female NPT

- **Heater block electrical approval**: 
  - 1/4" female NPT

- **Electrical approval**: 
  - C = CSA/NRTL (Cl. 1, Div. 1, Grp ABCD) 
  - A = ATEX/IECEEx (II 2 G Ex d IIC T4 bzw. T3) (other electrical approvals available upon request)

- **Heater replacement kit**: 
  - JTR

- **Sealing material**: 
  - 0 = Fluoroelastomer 
  - JW = James Walker® Elast-O-Lion® 101 (other materials available upon request)

- **Supply voltage**: 
  - 1 = 110 To 265 VAC, 80W 
  - 2 = 24VDC,30W

- **Conduit connection**: 
  - 110 to 265 VAC, 80W 
  - 24 VDC, 30W

- **Power requirements**: 
  - American NEC Standard (CSA/NRTL): File # 1655545 (LR43674)
  - Protection Type: Class 1, Division 1, Groups ABCD
  - ATEX/IECEEx Standard: EC Examination Certificate - PTB 02 ATEX 1116 X
  - IEC Scheme Certificate - IECEx PTB 07.0055X
  - Protection Type: II 2 G Ex d IIC T4 bzw. T3

- **Spare Parts & Accessories**: 
  - Kozy Insulated Cover - Part # KZ-10-L (when not mounted in enclosure/sample cabinet)

- **Dimensions**

  **Side View**

  - 6.1" W x 3.5" H x 3.5" D
  - Inlet Port: 1/4-18 NPT
  - Outlet Port: 1/4-18 NPT
  - Pressure Adjustment Screw

  **Top View**

  - 3.5" W x 2.5" H x 1.9" D
  - Conduit Connection: 1/4" NPT
  - 1/4-20 Screws MOUNTING HOLES
  - 10-32 UNF - 2B 2X

A+ Corporation is the leader in Analytically Correct™ Sample Extraction and Conditioning Systems.

Contact us for expert product application assistance.

sales@geniefilters.com > 225.644.5255 > Fax 225.644.3975

41041 Black Bayou Road, Gonzales, LA 70737  An ISO 9001:2008 Certified Company

We cannot recommend specific sealing materials due to the complex nature of sample stream compositions. Temperature and pressure also may be factors. Unless specified otherwise, the product will ship with our standard sealing materials and materials of construction stated in the technical specifications section of the corresponding Product Sheet. Please refer to www.dupontelastomers.com for sealing material recommendations and advice. It is the user’s responsibility to specify the sealing materials of construction for their application.