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# GPR200



**Gas Pressure Regulator**

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# 1 introduction

## 1.1 general product description

The GPR200 is designed to manually set and adjust gas pressures between atmosphere and 20 MPa in high line applications. For this the GPR200 has an integrated variable volume. GPR200 is designed as the standard pressure control component for working with the DGS001 high line deadweight tester. The universal character makes it wide applicable.

## 1.2 specifications

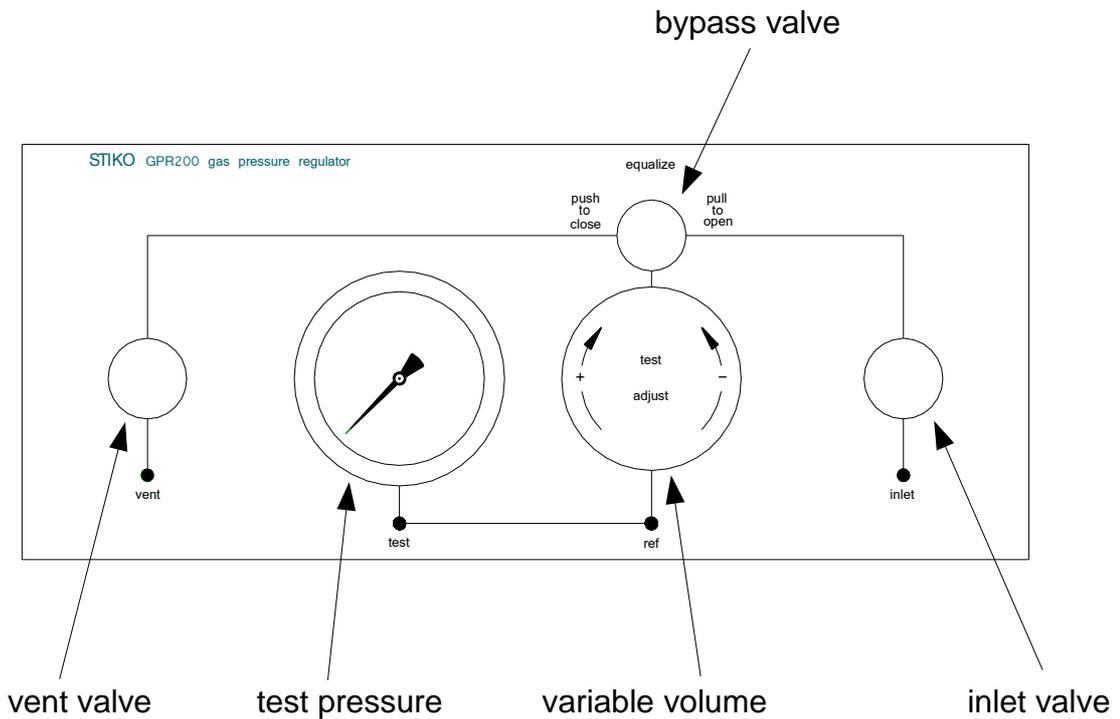
|                        |                            |       |
|------------------------|----------------------------|-------|
| pressure range         | 0 .. 20                    | MPa g |
| max. supply pressure   | 20                         | MPa g |
| pressure connections   | ¼" BSP female <sup>1</sup> |       |
| enclosure              | painting aluminium RAL7035 |       |
| width x height x depth | 345 x 135 x 440            | mm    |
| weight                 | 6                          | kg    |

 GPR200 is equipped with equalization variable volumes which automatically equalize when the differential pressure exceeds 0.5 MPa d

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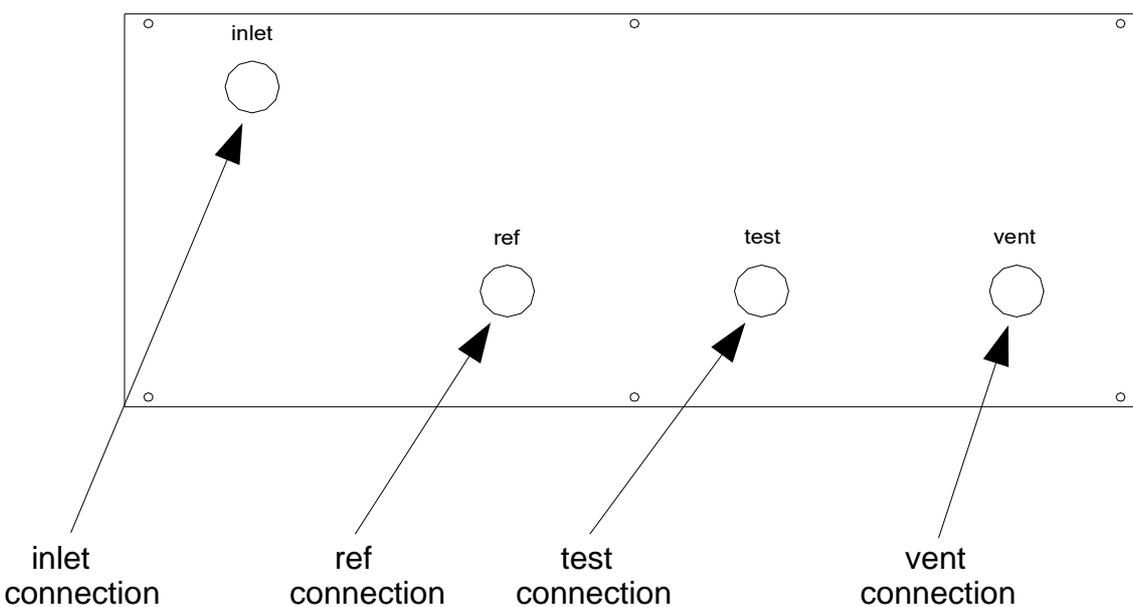
<sup>1</sup> on request Minimes quick connectors can be supplied

### 1.3 front panel



**!** GPR200 is either configured with test ports on the front - or on the back panel, this should be defined on purchase order description.

### 1.4 rear panel



## 2 installation

### 2.1 as received

The GPR200 is sealed in plastic and packed in an export quality carton box. When opening the box, check the contents against the scope of delivery.

### 2.2 site requirements

The GPR200 should be placed as close as possible to the pressure reference (like the DGS001) and the DUT<sup>2</sup>. A separate interconnection hardware kit for connecting the controller to other systems is available.

Preferable pressure source is a Nitrogen class 5.0 bottle.

### 2.3 setup

All GPR200 pressure connections are 1/4" BSP female. Therefore, a 1/4" BSP male adaptor is needed to make each of the connections. BSP connections can either be sealed with a metal ring or elastomere manchette ring.

If the interconnection hardware kit was purchased with the GPR200, use it to make the connections to DUT and pressure reference.

- Connect the INLET port to a suitable source of clean nitrogen
- Connect the REF port to the reference device. For example the deadweight tester DGS001.
- Connect the TEST port to the device under test.
- The VENT port may be connected to a tube with internal diameter > 4 mm connected to atmosphere outside the direct working environment, but in normal operation this is not obligatory due to the small amount of nitrogen consumption.

**!** do not plug or shut off the VENT port.  
minimess adapters are normaly automatically shut off.

## 3 operating GPR200

### 3.1 operating principle

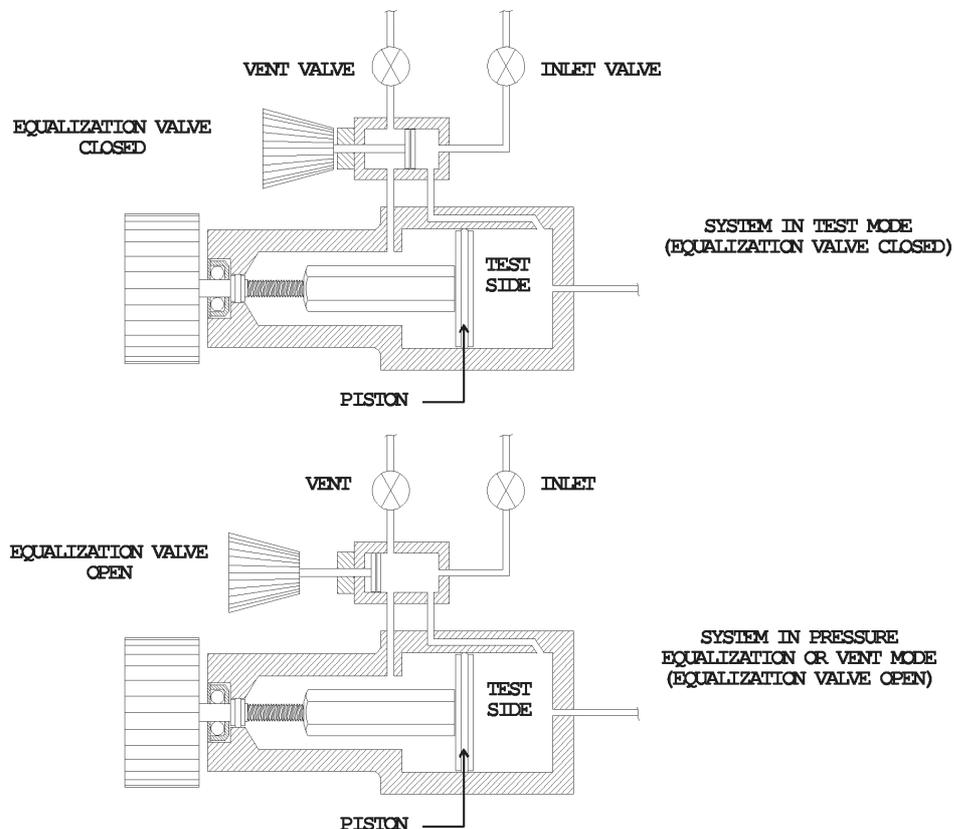
GPR200 manually controls line pressure from atmosphere to 20 MPa through the use of a pressure reducer, two valves, a variable volume (VV) pump and pressure gauges. Fittings for an outside source of pressure, connections to reference, and test devices and a vent port are located on the rear and/or front panel.

**!** The test inlet valve is connected directly to the reference and test connection and the high pressure chamber of the variable volume. Opening this valve will result in an increase of pressure in the test system when pressure is applied to the valve.

### 3.2 sub assemblies

#### 3.2.1 variable volume

A variable volume volume is used in the GPR200. The variable volume (VV) is a cylinder whose volume distribution is adjusted by rotating a knob that moves an internal piston. Attached to the top of the VV is a push/pull equalization valve that is designed to isolate the low side from the high side of the piston as well as provide protection to the unit itself in certain situations.



The VV is used to adjust the pressure (and/or piston position when used with a deadweight tester) by rotating the knob to change the TEST side volume with the equalization valve closed. Before operating the INLET or VENT valve, always open the equalization valve to avoid causing excessive differential pressure across the VV piston. To open the equalization valve, pull it outward; to close, push it inward.

**!** The equalization valve stem is relatively fragile, so make sure to operate the valve gently.

When using the VV, it is useful to put its piston in the optimum position based on the intent of use. Under most operating conditions, the piston is placed in its mid-stroke position (about 30 rotations). This will allow for equal movement, forward and backward, of the piston.

When a maximum increase or decrease of pressure is required, especially at low pressures, place the VV knob at the stop limit (either clockwise for maximum decrease in pressure or counter-clockwise for maximum pressure increase).

The VV is designed to operate with a maximum differential pressure of 0.5 MPa (75psi) across the piston. When the differential pressure across the piston exceeds 0.5 MPa (75psi) positive on the TEST side, the equalization valve will automatically open reducing the differential pressure to zero. This is a safety feature intended to prevent damage to the VV. The value of 0.5 MPa (75psi) factory set and cannot be changed. The variable volume is not internally protected against differential overpressure positive on the back (KNOB) side of the piston. Never vent pressure externally of the GPR200 or operate the VENT valve without opening the VV equalization valves.

### 3.2.2 valves

Two needle valves are used in the GPR200. They are used to control large changes between pressures.

- Operating the INLET or VENT valve may change the system pressure quickly by an amount that is largely relative to the required pressure setting.
- !** ● Operate the INLET and/or VENT valve very carefully when the BYPASS valve is closed.
- Be sure to open the BYPASS valve before using the SUPPLY or VENT valve to adjust the line pressure.

### 3.2.3 analogue pressure gauge

A pressure gauges are mounted. The gauge has a dual function :

- As a safety device since it is important for the operator to know the value of system pressure at all times.
- As a means to assist the operator in setting pressure.

### 3.3 setting an elevated pressure

The pressure gauge shows the test pressure.

1. close the VENT valve
2. open the variable volume equalization valves (pull knob outward)
3. carefully operate the INLET valve to admit pressure until the approximate desired pressure is reached
4. place the VV piston at appropriate position and close its equalization valve (push knob inward)
5. adjust VV knob until desired pressure is obtained (or until the piston floats when connected to a deadweight tester)

Opening the equalization valve may result in a sudden change in the test pressure. Ensure conditions are such that either this does not happen or its effects are inconsequential.



Maximum differential pressure across the VV piston is 0.5 MPa (75psi). Differential pressures above 0.5 MPa (75psi) will automatically open the equalization valve.

### 3.4 decrease pressure or vent the GPR200

The INLET valve is closed.

- open the VV pressure equalization valve (pull knob outward).
- open the VENT valve.

Opening the equalization valve may result in a sudden change in the test pressure.



Ensure conditions are such that either this does not happen or its effects are inconsequential.

## 4 maintenance

GPR200 is configured from standard components which are maintenance free. In case of failure of one of the sub-assemblies please contact the manufacturer for repair instructions.