Gas-Dilution Unit DIL-1/(H)

Special Features

- Proven M&C-dilution technique
- Operation at ambient temperature
- Optionally heated to 180 °C (356 °F) or 320 °C (608 °F)
- Integrated dilution preheater
- No dew point problems
- Dilution factor from 10:1 to 500:1
- With test gas connection
- Independent of the ambient temperature
- Easy maintenance and operation

Application

The non-heated or electrically heated M&C dilution unit DIL-1 /H is used in analysis technique to dilute the sample gas or components in the sample for example in case of toxic gases, moisture measurement or emission measurement.

The M&C dilution unit is based on the functional dilution technique which is proved since years in the M&C gas sample probe SP2000-H/DIL.

Description

The M&C dilution units DIL-... are mounted on a plate for wall mounting. The version DIL-1 is not heated and works at ambient temperature. The version DIL-1/H is electrically heated up to 180 °C (356 °F). It is additionally equipped with a lagged cover (version for 320 °C (608 °F) on request).

A capillary thermostat controls the temperature, adjustable from 0-180 °C (32 °F to 356 °F). A high temperature limiter and a low temperature alarm is included.

The connection of the heated lines is made without cold bridges in the heated part. Before the dilution gas enters the dilution unit, it is heated up to operating temperature via a gas pre-heater. In order to protect the dilution part against contaminations, internal protective filters are installed for the sample gas and the dilution gas stream. Calibration gas can be fed via the integrated connection.

A precision pressure controller with pressure gauge is used for adjustment of the necessary admission pressure of the dilution gas. Via a vacuum pressure gauge, the function of the dilution injector is controlled.

Both, pressure controller and pressure gauges have to be ordered separately. Two versions are available: Set -A (-A1) is mounted directly on the mounting plate and control panel type -S (-S1) is suitable for external 19» rack mounting. A shut off valve and a flowmeter for adjustment of the calibration gas are included in the version -S (-S1).
Dimensions

Electrically heated Gas-Dilution Unit DIL-1/H with control panel -S (S.1)

DIL-1 with control panel -S (S.1)

Gas-Dilution Unit DIL-1 with mounting set -A (-A1)

Electrically heated Gas-Dilution Unit DIL-1/H with mounting set -A (-A1)

# Gas connections for tube 6 x 1 mm
## Gas connections for tube 8 x 1 mm

Dimensions in mm (inches)
Connections in inches on request
### Technical Data

<table>
<thead>
<tr>
<th>Dilution rates with the critical orifices ‘a’ - ‘g’</th>
<th>a = 500</th>
<th>b = 200</th>
<th>c = 100</th>
<th>d = 50</th>
<th>e = 30*</th>
<th>f = 20</th>
<th>g = 10</th>
<th>: 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample flow rate depending on the critical orifices ‘a’ - ‘g’</td>
<td>a = 4</td>
<td>b = 2.7</td>
<td>c = 5.5</td>
<td>d = 11</td>
<td>e = 19*</td>
<td>f = 28</td>
<td>g = 55</td>
<td>l/hr</td>
</tr>
</tbody>
</table>

Possibility to adapt the dilution factor: with dilution gas pressure-adjustment -5 % bis +30 %

Dilution gas flow rate with injectors I or II: I: 480 - 600 Nl/hr, optional II: 1800 – 3000 Nl/hr

Dilution gas pressure on inlet of pressure controller: min. 4.5 bar g, max. 16 bar g

Bypass injector / 8 sample gas flow rate:

- Pressure / gas flow rate approx. 2 bar
- Injector gas approx. 300 l/hr sample gas approx. 150 l/hr

Process pressure: 0.9 to 2 bar abs.

Fault caused by process temperature variations: operation independent of process temperature

Fault caused by process low- or overpressure: no fault as long as the differential pressure \( \Delta P \) at the dilution unit is > 0.5 bar g and test gas is given to the probe under process conditions

Fault caused by atmospheric pressure variations: < 1 % with a variation of 50 mbar

Materials in contact with the sample gas: stainless steel 316 / 316Ti, quartz glass, FPM, graphite

Power supply for DIL-1/H: 230 V 50 Hz, 800 W

Temperature controller for DIL-1/H: capillary thermostat adjustable 0-180 °C (32 °F to 356 °F), with high temperature limiter and low temperature alarm as changeover contact, voltage free alarm point \( \Delta T \) 30 °C to Tset, contact rating max. 250 V 3 A= 0.25 A =

Weight: approx. 8 kg (17.64 lbs)

---

* Standard, others to be indicated along with order, intermediate values possible.
1) approx. at 3 bar dilution gas.
2) -5 % not possible for orifice ‘g’.

---

### Part-No. | Type | M&C-Dilution Unit DIL-1/ (H) with orifice ‘e’ for dilution ratio 30 : 1 standard
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20 S 4900</td>
<td>DIL-1</td>
<td>Dilution unit non heated</td>
</tr>
<tr>
<td>20 S 4905</td>
<td>DIL-1/H (a)</td>
<td>Dilution unit electrically heated to 180 °C (356 °F), (a) to be added to the Part-No. for power 115 V 60 Hz</td>
</tr>
<tr>
<td>20 S 4925</td>
<td>Option I</td>
<td>Bypass injector - B</td>
</tr>
<tr>
<td>20 S 4930</td>
<td>Option II</td>
<td>Additional sample gas outlet undiluted</td>
</tr>
<tr>
<td>20 S 4205</td>
<td>DIL-1/A</td>
<td>option: 1 pressure controller, 2 gauges, mounting set for dilution unit</td>
</tr>
<tr>
<td>20 S 4215</td>
<td>DIL-1/A1</td>
<td>option: 2 pressure controllers, 3 gauges, mounting set incl. connector set for dilution unit with by-pass</td>
</tr>
<tr>
<td>20 S 4250</td>
<td>DIL-1/S</td>
<td>option: mounting set with 1 pressure controller, 2 gauges, flowmeter, 2 ball valves</td>
</tr>
<tr>
<td>20 S 4260</td>
<td>DIL-1/S1</td>
<td>option: mounting set with 2 pressure controllers, 3 gauges, flowmeter, 2 ball valve</td>
</tr>
</tbody>
</table>

Other executions on request.