RCP 20, 21: P-controller

How energy efficiency is improved
Enables the implementation of individually optimised controls for maximum efficiency in pneumatic installations.

Areas of application
Pneumatic control in ventilation and air-conditioning equipment of temperature, pressure, pressure differential, humidity and flow rate in combination with appropriate transducers.

Features
- P fixed-value controller
- P fixed-value/schedule controller
- Controllers can be used universally for the most varied of applications
- Housing, rack and front doors made of thermoplastic
- Suitable for wall or panel mounting
- Functional description and commissioning help inserted in front door
- Front panel with adjusters and 3 covered recesses for plug-in pressure gauge (XMP) making commissioning easier
- Setpoint adjuster XS adjustable manually with scales for all Centair measuring ranges
- All settings very easy to make with a coin and % scale
- M4 measuring connections, control action adjustable (delivered with control action B)
- Compressed-air connections Rp ¼” female thread
- Complies with directive 97/23/EC Art. 3.3 on pressure equipment

Technical description
- Supply pressure 1.3 bar ± 0.1
- Easily accessible adjusters for XS (setpoint), Xp4 (P range), Trn (reset time), E (influence) and FF (schedule start point)
- Inputs for:
  - remote setpoint adjustment
  - controlled variable
  - command variable
- Outputs for:
  - output pressure for dampers or actuator

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Air capacity 1)</th>
<th>Air consumption 2)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP 20 F001</td>
<td>fixed-value P-controller, min. limiter</td>
<td>400</td>
<td>40</td>
<td>0,7</td>
</tr>
<tr>
<td>RCP 21 F001</td>
<td>fixed-value + schedule P-controller</td>
<td>400</td>
<td>60</td>
<td>0,7</td>
</tr>
</tbody>
</table>

RCP 20:
- Setpoint XS: 0...100%
- Remote adjust. of setpoint: 0...100%
- P-band Xp3: 0...100%
- Zero point: 0...100%
- Limiter B: 0...100%

RCP 21:
- Setpoint XS: 0...100%
- Remote adjustment of setpoint: 0...100%
- P-band Xp3: 0...100%
- Zero point: 0...100%
- Shift starting point FF: 0...100%
- Influence E: 0.25...3

Supply pressure 3)
- 1,3 bar ± 0,1

Input pressures
- 0.2...1,0 bar

Output pressures
- 0.2...1,0 bar

Permissible amb. temp.
- 0...55 °C

Accessories
0297103 000 Additional bag of scales with 8 different scales according to the transducer used.
0297133 000 Universal scales for setpoint adjuster XS; gradation 120, 80/160, 50/100, 30/60

1) 200 l/h for RCP 20 with limiter B activated.
2) Without transducer; air consumption for transducer connection 3 is 33 l/h more.
3) See Section 60 on regulations concerning the quality of supply air, especially at low ambient temperatures.
**Operation**

**RCP 20 and RCP 21**

The transducer at connection 3 converts the control variable into the pneumatic standard signal 0,2...1,0 bar (equivalent to 0...100%) within its measuring range. This actual-value signal $x_3$ is compared with the fixed setpoint $X_S$. If there is control deviation, the output pressure changes depending on the set P-band $X_{P3}$ (P-control). When the actual value is equal to the setpoint ($x_3 = X_S$), the output pressure always assumes the value zero (0,6 bar).

By including the limiter B, the RCP 20 allows the output pressure $y$ to be limited to a (variable) minimum value.

With a pressure of 0,2...1,0 bar at input 6, the setpoint can be set remotely from 0...100%. The internal setpoint setting then functions as a minimum limitation.

A restrictor ($\Omega$ 0,2 mm) for supplying the transducer is fitted at connection 3. The signals from the transducer and the output pressure can be checked via the M4 measuring connection or shown via the manometer.

**RCP 21: additional functions**

The transducer at connection 5 converts the command variable (e.g. outside temperature) into the pneumatic standard signal 0,2...1,0 bar (equivalent to 0...100%). This signal ($x_5$) is fed to the command circuit which, together with the setting parameters FF and E, creates a program for the setpoint shift of the following P-controller. The characteristic for the influence E can be placed in any of the four quadrants.

Because the outside temperature is often fed to more than one controller, the transducer at connection

**Additional details**

RCP 20: Front plate with adjusters for setpoint, P-band, zero and minimum limiter of $y$.

RCP 21: Front plate with adjusters for setpoint, P-band, zero, influence and shift starting point.

**Additional information on accessories**

0297103 000  Additional bag of eight alternative scales

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Relative Humidity</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>5...35 °C</td>
<td>20...90 %rh</td>
<td>0...5 mbar</td>
</tr>
<tr>
<td>-20...40 °C</td>
<td>0...5 mbar</td>
<td>5...10 mbar</td>
</tr>
<tr>
<td>0...120 °C</td>
<td></td>
<td>10...15 mbar</td>
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<tr>
<td>80...200 °C</td>
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</table>

**Technical information**

Technical manual: centair system 304991 003

5 must be supplied by a separate ($\Omega$ 0,2 mm) restrictor.

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**Connection diagrams**

**Dimension drawing**

**RCP 20**

**RCP 21**

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Supply pressure</td>
<td>$X_S$</td>
</tr>
<tr>
<td>2</td>
<td>Output pressure</td>
<td>$X_{P3}$</td>
</tr>
<tr>
<td>4</td>
<td>Actual value for P-controller</td>
<td>zero</td>
</tr>
<tr>
<td>5</td>
<td>Command variable for fixed-value + schedule</td>
<td>FF</td>
</tr>
<tr>
<td>6</td>
<td>Remote setpoint adjustment</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
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</tbody>
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Example: Room-temperature control

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Sauter Components
Dimension drawing

Rp1/8
(ISO 7/1)

5x22

100

144

13

45

109

min. 155

DIN 43700

138 (+1/-0)

max. 5

16

93

DIN 43700 M297100

N.B.: A comma between cardinal numbers denotes a decimal point

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