

## RCP 30 & 31: P+PI cascade controller

For universal use as a P+PI cascade controller in ventilation and air-conditioning systems, e.g. room-temperature control (P) with supply-air temperature as an auxiliary control loop (PI). Used in conjunction with the relevant transducers for controlling temperature, humidity, pressure and flow. Conforms to the regulations on pressure equipment (97/23/EG Art. 3.3).

Housing and insert of thermoplastic; front door of thermoplastic; front plate with the setting knobs and three covered openings for plug-in manometers (XMP); setpoint adjuster  $X_S$  can be set manually, with scales for all *centair* measuring ranges; all other settings are made using a coin and the %-scale; measuring connections M4; control action can be changed (factory setting is B); suitable for wall or panel mounting; compressed-air connections Rp  $\frac{1}{8}$  female thread; includes a bag of scales (297103).

Type	Description	Air capacity	Air consumption <sup>1)</sup>	Weight kg
<b>RCP 30 F001</b>	fixed-value controller, P+PI	400 l <sub>n</sub> /h	70 l <sub>n</sub> /h	0.7
<b>RCP 31 F001</b>	fixed-value + schedule controller, P+PI	400 l <sub>n</sub> /h	90 l <sub>n</sub> /h	0.7

<b>RCP 30:</b>		<b>RCP 31:</b>	
Setpoint $X_S$	0...100%	Setpoint $X_S$	0...100%
Remote adjust. of setpoint	0...100%	Remote adjustment of setpoint	0...100%
P-band $X_{P3}$ , $X_{P4}$	0...100%	P-band $X_{P3}$ , $X_{P4}$	0...100%
Reset time $T_n$	1...15 min	Reset time $T_n$	1...15 min
Zero point	0...100%	Zero point	0...100%
Limiter B	0...100%	Limiter B	0...100%
		Shift starting point FF	0...100%
		Influence E	0.25...3

Supply pressure <sup>2)</sup>	1.3 bar $\pm$ 0,1	Connection diagram, RCP 30	<a href="#">A02688</a>
Input pressures	0.2...1.0 bar	Connection diagram, RCP 31	<a href="#">A02689</a>
Output pressures	0.2...1.0 bar	Dimension drawing	<a href="#">M297100</a>
Permissible amb. temp.	0...55 °C	Fitting instructions	MV 3246

### Accessories

**0297103 000** Additional bag of scales with 8 different scales according to the transducer used.

**0297133 000** Universal scales for setpoint adjuster  $X_S$ ; gradation 120, 80/160, 50/100, 30/60

1) Without transducer; air consumption for transducer connections 3 and 4 is 33 l<sub>n</sub>/h more in each case.

2) See Section 60 on regulations concerning the quality of supply air, especially at low ambient temperatures.

### Operation

#### RCP 30 and RCP 31

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  $x_{i3}$  is compared with the fixed setpoint  $X_S$ .

Depending on the P-band  $X_{P3}$ , the control deviation is amplified by a P-controller (master), limited by limiter B to a (variable) minimum value, and then fed as the command variable to a PI-controller (slave). When the actual value is equal to the setpoint ( $x_{i3} = X_S$ ), the PI-controller controls to the value zero = 50%, i.e. to a value that is 50% of the transducer range at connection 4.

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 ( $\varnothing$  0.2 mm) for supplying the transducer is fitted at connections 3 and 4. The signals from the transducer and the output pressure can be checked via the M4 measuring connection or shown via the manometer.

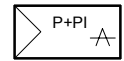
#### RCP 31: additional functions

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 ( $x_{i5}$ ) 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 (master). The characteristic for the influence E can be placed in any of the four quadrants.

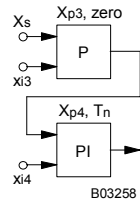
Because the outside temperature is often fed to more than one controller, the transducer at connection 5 must be supplied by a separate ( $\varnothing$  0.2 mm) restrictor.



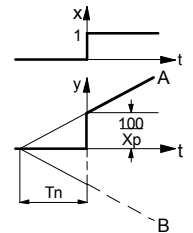
T03053



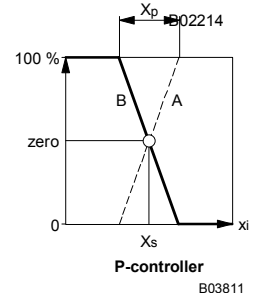
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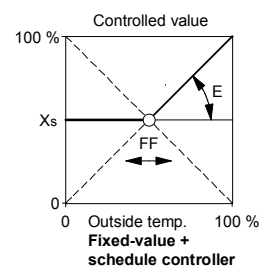


PI-controller



P-controller

B03811



B03257

Additional details

RCP 30: Front plate with adjusters for setpoint ( $X_s$ ), P-bands ( $X_{P3}$ ,  $X_{P4}$ ), zero, reset time ( $T_n$ ) and minimum limitation (B).

RCP 31: Front plate with adjusters for setpoint, P-bands, ( $X_{P3}$ ,  $X_{P4}$ ), zero, reset time, minimum limitation, influence (E) and shift starting point (FF).

Additional information on accessories

0297103 000 Additional bag of eight alternative scales

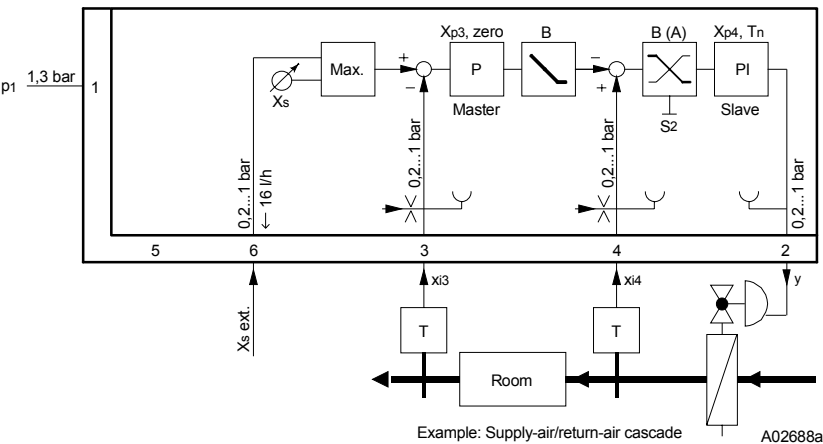
5...35 °C	20...90 %rh
-20...40 °C	0...5 mbar
0...120 °C	5...10 mbar
80...200 °C	10...15 mbar

Technical information

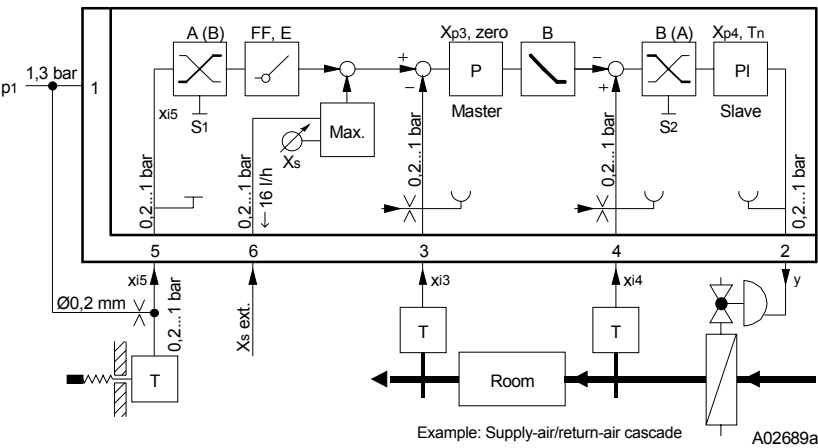
Technical manual: centair system 304991 003

Connection diagrams

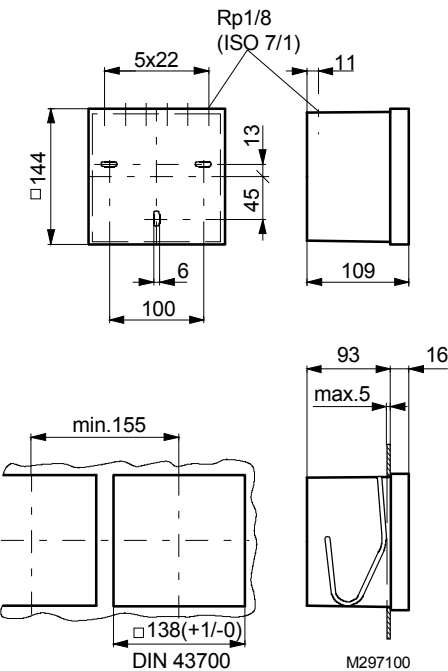
RCP 30



RCP 31



Dimension drawing



1	Supply pressure	$T_n$	Reset time	B	Limiter
2	Output pressure	$X_s$	Variable setpoint	$x_{i3}$	Main control variable
3	Actual value for P-controller	$X_{P3}$	P-band for P-controller	$x_{i4}$	Secondary control variable
4	Actual value for PI-controller	$X_{P4}$	P-band for PI-controller	$x_{i5}$	Command variable
5	Command variable for fixed-value + schedule	zero	zero point	y	Output pressure
6	Remote setpoint adjustment	FF	Shift starting point for fixed-value + schedule	S1	Control action for fixed-value + schedule
		E	Influence	S2	Control action for controller