

RCP 30, 31: P+PI cascade controller

How energy efficiency is improved

Enables the implementation of individually optimised controls for maximum efficiency in pneumatic installations.

Areas of application

Room-temperature control (P) with supply-air temperature as auxiliary control loop (PI) in ventilation and air-conditioning equipment. Pneumatic control of temperature, pressure, differential pressure, humidity and flow rate in combination with appropriate transducers.

Features

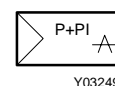
- P+PI cascade controller
- P+PI cascade schedule controller
- Controllers can be used universally for the most varied of applications
- Housing, rack and front doors made of thermoplastic
- Suitable for wall or panel mounting
- Functional description and commissioning help inserted in front door
- Front panel with adjusters and 3 covered recesses for plug-in pressure gauge (XMP) making commissioning easier
- Setpoint adjuster X_S 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 R_p 1/8" female thread
- Complies with directive 97/23/EC Art. 3.3 on pressure equipment

Technical description

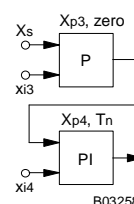
- Supply pressure 1.3 bar ± 0.1
- Easily accessible adjusters for X_S (setpoint), X_{P4} (P range), T_n (reset time), E (influence) and FF (schedule start point)
- Inputs for:
 - remote setpoint adjustment
 - main controlled variable
 - auxiliary controlled variable
 - command variable
- Outputs for:
 - output pressure for dampers or actuator



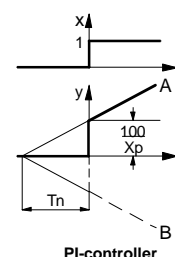
T03053



Y03249



B03258



PI-controller

B02214

Type	Description	Air		Weight
		capacity l _n /h	consumption ¹⁾ l _n /h	
RCP 30 F001	fixed-value controller, P+PI	400	70	0,7
RCP 31 F001	fixed-value + schedule controller, P+PI	400	90	0,7
RCP 30:		RCP 31:		
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%	
Limiting B	0...100%	Limiting B	0...100%	
		Shift starting point FF	0...100%	
		Influence E	0,25...3	
Supply pressure ²⁾	1,3 bar ± 0,1	Connection diagram, RCP 30	A02688	
Input pressures	0,2...1,0 bar	Connection diagram, RCP 31	A02689	
Output pressures	0,2...1,0 bar	Dimension drawing	M297100	
Permissible amb. temp.	0...55 °C	Fitting instructions	MV 3246	

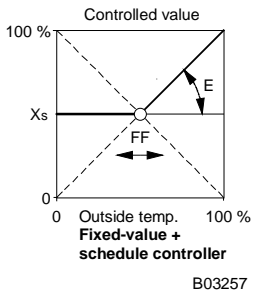
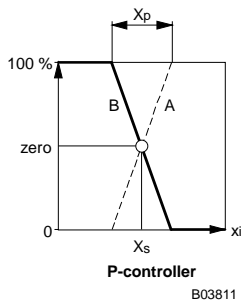
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Operation

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.

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

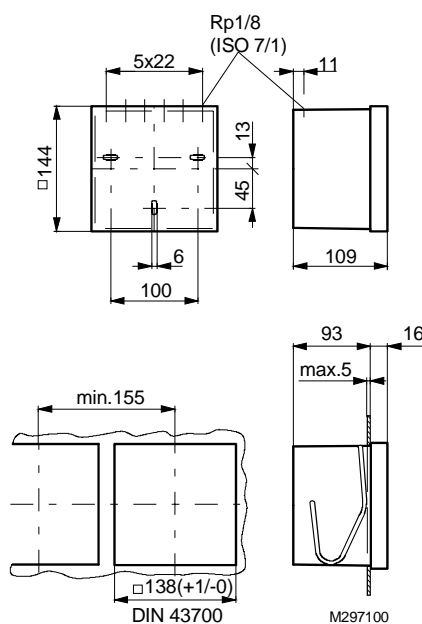
0297103 000 Additional bag of eight alternative scales

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

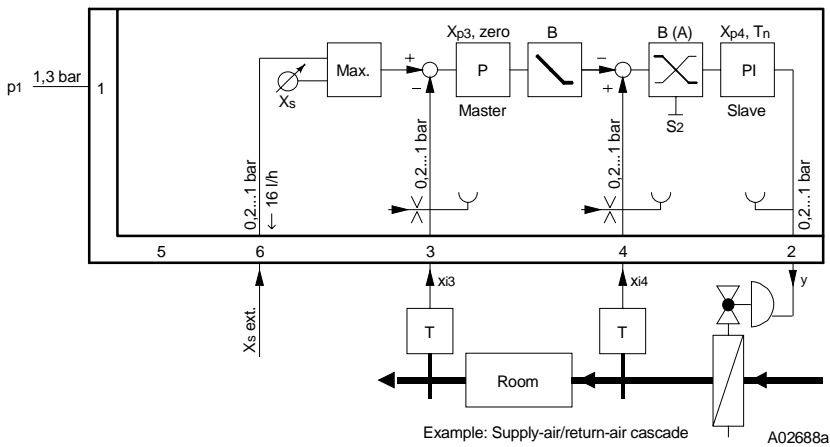
Technical manual: *centair* system 304991 003

Dimension drawing

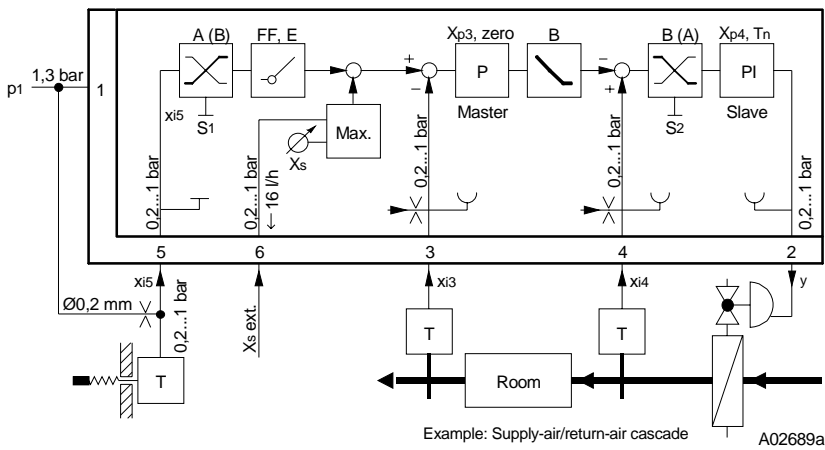


Connection diagrams

RCP 30



RCP 31



- 1 Supply pressure
- 2 Output pressure
- 3 Actual value for P-controller
- 4 Actual value for PI-controller
- 5 Command variable for fixed-value + schedule
- 6 Remote setpoint adjustment

- T_n Reset time
- X_S Variable setpoint
- X_{P3} P-band for P-controller
- X_{P4} P-band for PI-controller
- zero zero point
- FF Shift starting point for fixed-value + schedule
- E Influence

- B Limiter
- x_{i3} Main control variable
- x_{i4} Secondary control variable
- x_{i5} Command variable
- y Output pressure
- S1 Control action for fixed-value + schedule
- S2 Control action for controller

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