DATA SHEET

T 7506 EN

Type 3421 Pneumatic Compact Controller

Series 420

Application

For panel mounting (front frame 72x144 mm)

Compact controller for automation of industrial and process plants · PI controller · Fixed set point, follow-up or cascade control

The compact controller is designed for input and output signals from 0.2 to 1.0 bar and for a supply pressure of 1.4 bar. The controller meets special requirements of the processing industry.

Special features

- Compact controller with a mounting depth of 320 mm (400 mm installation depth)
- Set point, controlled variable and system deviation are easy to read off the vertical 100 mm-long flat scale
- Adjusters, switches and displays can be operated from the front
- Universal version, with standard selector switch w_{int}/w_{ext}
- PI controller
- Use in hazardous areas

Fig. 1: *Type 3421 Compact Controller, front view*

Fig. 2: *Type 3421 Compact Controller with Type 3422-1 Controller Station*

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Design and principle of operation

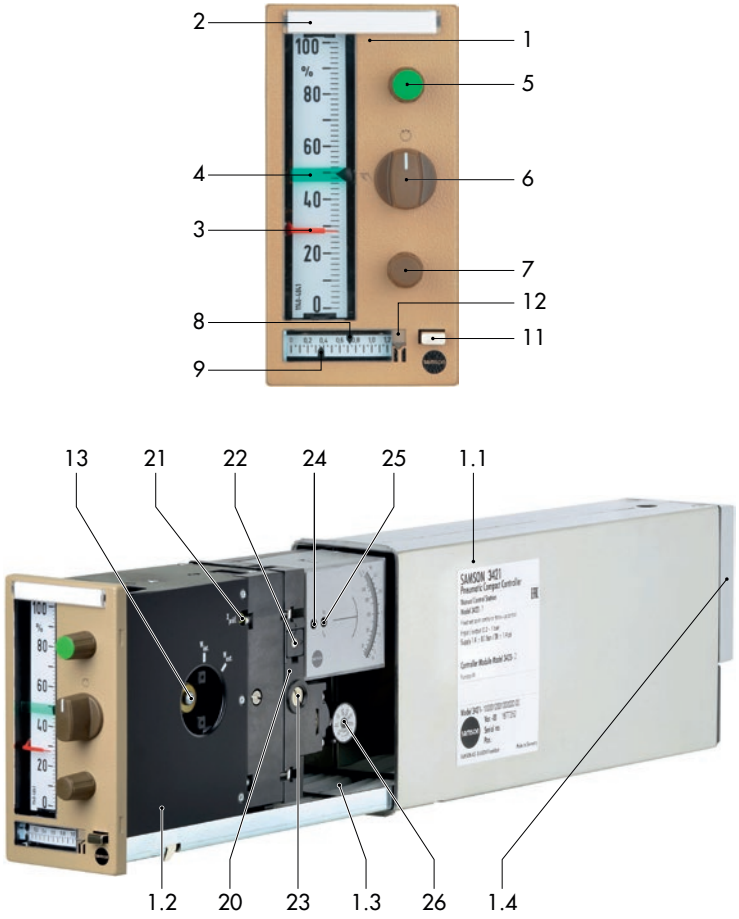
The Type 3421 Compact Controller consists of the Type 3422-1 Controller Station and Type 3423-2 PI Controller Module. The Type 3422-1 Controller Station consists of a housing, plug-in unit with displays and operating controls as well as a flexible hose harness, which connects the plug-in unit to the connecting plate. The plug-in unit, which can be released at the lock and pulled out, is fitted with plug-on connections to accommodate the controller module. These pneumatic connections are self-sealing when the controller module is pulled out.

- Fig. 3 shows the displays and operating controls.
- Fig. 4 shows the functional diagram with the pneumatic circuit.
- Fig. 5 shows the pneumatic connection.

The internal set point is adjusted at the set point adjuster (5). The external set point (with an input signal of 0.2 to 1 bar) is fixed and input at connection w_{ext}. The selector switch w_{int}/w_{ext} (13) is used to select the internal or external set point. The internal set point w_{int} is selected in the delivered state. The selector switch w_{int}/w_{ext} (13) is accessible after releasing the lock (11) and pulling the plug-in unit (1.2) out of the housing (1.1). The set point can be read at the set point display (4). The controlled variable is supplied as a 0.2 to 1 bar input signal at the connection x and displayed at the controlled variable display (3). Set point and controlled variable are displayed on a scale with 0 to 100 % range or with a physical measuring range. The manual/automatic switchover (6) is used to select the manual or automatic mode. The manual output pressure (y_H) is set at the adjuster (7) and displayed at the display (9). The automatic output pressure (y_A) is shown at the display (8). Both output pressures are shown on a scale ranging between 0 and 1.2 bar. The signal pressure is issued at the connection y. The arrow symbol (12) is used to indicate the OPEN or CLOSED valve position at 100 % signal pressure.

After releasing the lock (11) and pulling the plug-in unit (1.2) out of the housing (1.1), the selector switch w_{int}/w_{ext} (13) can be operated and the direction of action can be changed at the turnboard A (22) and the proportional-action coefficient Kp (25), reset time Tn (26) and controller zero (24) can be set at the corresponding adjusters.

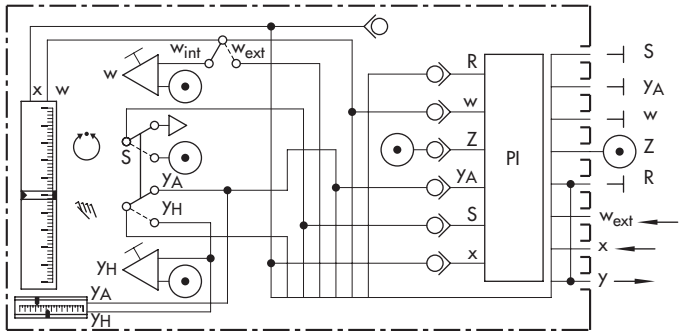
The device is supplied with a supply pressure of 1.4 bar at connection Z. After pulling out the plug-in unit, the supply pressure can be tested at the test connection X_{test} (21) using the yellow test connector included in the scope of delivery to connect a pressure gauge using a hose with 2 mm inside diameter.



1	Type 3422-1 Controller Station
1.1	Housing
1.2	Plug-in unit
1.3	Hose harness
1.4	Connecting plate
2	Label
3	Controlled variable display (x)
4	Set point display (w)
5	Set point adjuster
6	Manual/automatic switch
7	Adjuster for manual mode
8	Automatic output pressure (yA) display
9	Manual output pressure (yH) display
11	Lock
12	Arrow symbol to indicate the OPEN or CLOSED valve position at 100 % signal pressure
13	w_{int}/w_{ext} selector switch
20	Type 3423-2 Controller Module
21	Test connection for supply pressure
22	Turnboard A for direction of action
23	Restriction with filter
24	Adjuster for controller zero
25	Adjuster for proportional-action coefficient Kp
26	Adjuster for reset time Tn

Fig. 3: *Type 3421 Compact Controller, with the plug-in unit pulled out of the housing*

Type 3421 Compact Controller

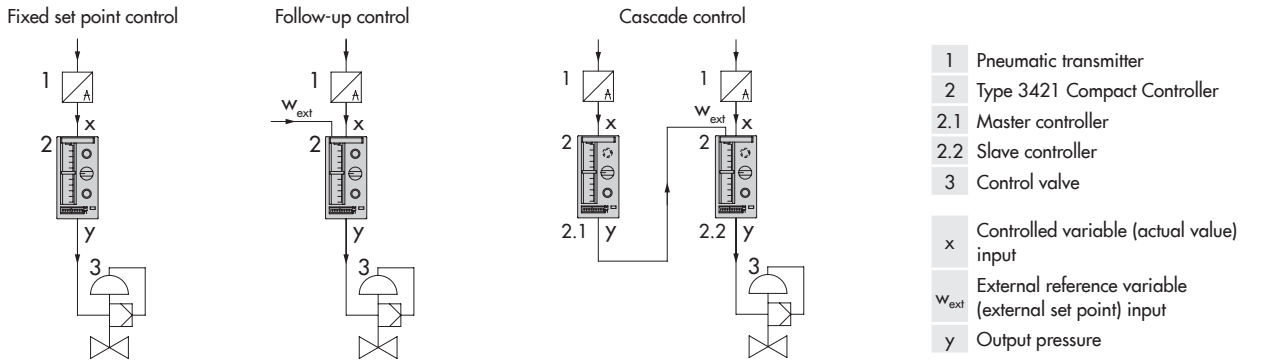


Design and use of Type 3422 Controller Station

Type 3422-1 Controller Station
With Type 3423-2 Controller Module
For fixed set point and follow-up control
Can be used as master or slave controller in cascade control

Symbols for schematic diagram

Control circuits with Type 3421 Compact Controller (schematics)



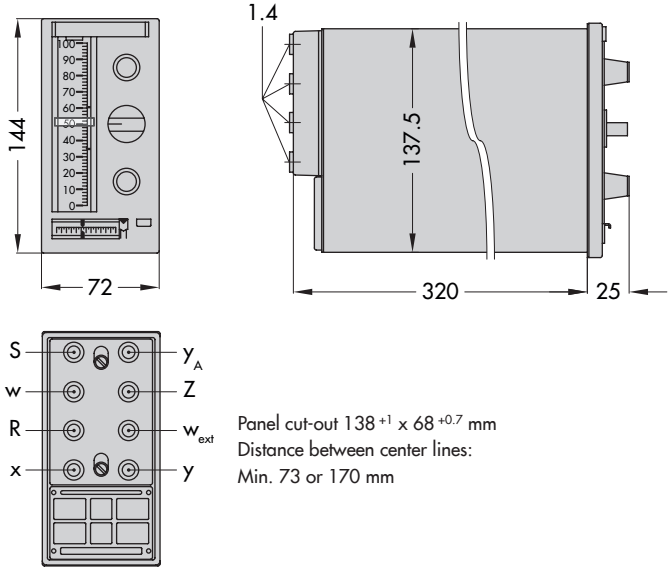
1	Pneumatic transmitter
2	Type 3421 Compact Controller
2.1	Master controller
2.2	Slave controller
3	Control valve
x	Controlled variable (actual value) input
w_{ext}	External reference variable (external set point) input
y	Output pressure

Fig. 4: *Control applications*

Installation and connections

Two rails are used to fasten the controller in the control panel. Pneumatic line connections: threaded holes ⅛ NPT in the connecting plate

Type 3421 Compact Controller



Panel cut-out 138 $^{+1}$ x 68 $^{+0.7}$ mm
Distance between center lines:
Min. 73 or 170 mm

Connections:	
S	Binary output manual/automatic mode
w	Reference variable (set point) output
R	Feedback
x	Controlled variable (actual value) input
y_A	Automatic output pressure
C	Supply
w_{ext}	External reference variable (external set point) input
y	Output pressure
1.4	Connecting plate for pneumatic connections

Seal unused connections with the threaded plugs included in the scope of delivery.

Fig. 5: *Dimensions in mm and connections*

Technical data · Type 3421 Compact Controller

Type 3421 Compact Controller		
Controller station		3422-1
Set point/controlled variable display		2 metal bellows pressure gauge, upright · Signal range: 0.2 to 1 bar · Accuracy class 1 (synchronism 0.6) Scale inscription: 0 to 100 % or special inscription with physical measuring range; length: 100 mm
Output display		2 bourdon tube pressure gauges, horizontal · Signal range: 0 to 1.2 bar · Accuracy class 2.5 Scale inscription: 0 to 1.2 bar; length: 36 mm
Adjuster for manual output pressure		Output signal 0.2 to 1 bar · Max. 0.02 to 1.35 bar Max. air delivery >1.5 m_n^3/h · Air consumption depending on adjuster: 0.1 m_n^3/h
Controller module	Type	3423-2
	Controller action	PI
	Control parameters	Proportional-action coefficient Kp = 0.2 to 20 · Reset time T_n = 0.03 to 50 min.
	Input signal	0.2 to 1 bar
	Output signal	0.2 to 1 bar · Max. 0.02 to 1.35 bar
Supply air		Supply air 1.4 ±0.1 bar · Air consumption per unit <0.15 m_n^3/h
Air quality acc. to ISO 8573-1		Maximum particle size and density: Class 3 · Oil content: Class 2 Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected
Permissible ambient temperature		–20 to +60 °C
Pressure Equipment Directive		2014/68/EU, Article 4.3 (sound engineering practice)
Compliance		EAC
Weight		Approx. 3.2 kg

Use in hazardous areas

The Type 3421 Compact Controller is suitable for use in hazardous areas of Zone 1 and 2 without its own EU-type examination certificate. A EU-type examination certificate according to 2014/34/EU (ATEX Directive) is not required.

Ordering text

– Type 3421 Compact Controller
  With Type 3422-1 Controller Station for 0.2 to 1 bar
  With Type 3423-2 PI Controller Module
  Scale inscription: specify range and unit.