

TK . P 80 & TK . P 81: Pneumatic duct-temperature controllers

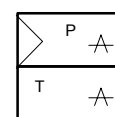
For continuous control (P-controller) of temperature in air ducts of air-conditioning systems, for residential and business premises. Especially suitable for activating VAV controllers or small valves. Used in conjunction with an RXP 81 scheduling relay, it forms a centrally-controlled individual-room control system.

Housing 72 × 72 mm of pure-white (RAL 9010; baseplate of black, glass-fibre-reinforced thermoplastic; oil-filled expansion sensor comprising copper cartridge, 1.5 m of capillary tubing and membrane box; force-balance nozzle-ball system; compressed-air connection Rp 1/8 with female thread.

Standard version: thermoplastic housing with adjuster knob and variable stops for setpoint limitation; +/- scale.



T05032

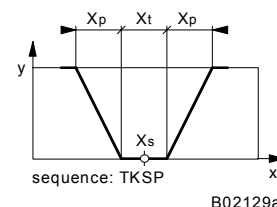
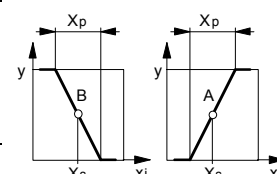


Y02128

Type	Control function ¹⁾	Control action	Air capacity I _n /h	Setpoint range °C	Weight kg
TKP 80A F117	fixed-value	A	33	17...27	0.17
TKP 80B F117	fixed-value	B	33	17...27	0.17
TKP 81A F117	fixed-value	A	200	17...27	0.17
TKP 81B F117	fixed-value	B	200	17...27	0.17
TKFP 81A F117	fixed/schedule	A	200	17...27	0.17
TKFP 81B F117	fixed/schedule	B	200	17...27	0.17
TKSP 80 F117	sequence	A and B	2 × 33	17...27	0.17

	TKP 80	TKP 81, TKFP 81	TKSP
Air consumption I _n /h	33	20	66
Air exhaust capacity I _n /h ²⁾	50	34	50
External restrictor required	1 pc	—	2 pcs
Dead zone X _t (sequence)	—	—	2 K
Connection diagram	A02048	A02049	A02051
Fitting instructions	MV 23177	MV 23187/23188	MV 23201

Supply pressure ⁴⁾	1.3 bar ± 0.1	Permissible amb. temp	0...55 °C
Output pressure	0.2...1.0 bar	Dimension drawing	M297351
P-band X _p	approx. 2 K	Connection diagram and MV	see table
Linearity	2%		
Time constants (0.5 m/s)	approx. 2.5 min		



B02129a

Accessories

- 0296724 000*** Sensor holder for wall mounting
- 0303212 000*** Sensor holder for duct mounting
- 0297302 000*** Fixing bracket for the controller
- 0228234 001*** Setpoint adjustment knob in pure white, with raised bridge
- 0297354 000*** Short screw-in nipple R 1/8 for soft plastic tubing of 4 mm internal diameter
- 0297416 001** Housing cover in pure white, screw-type, without setpoint adjuster ³⁾
- 0297418 032** Housing cover in pure white, screw-type, with setpoint adjuster, scale 17...27 °C ³⁾
- 0297419 001** Housing cover in pure white, of light metal, screw-type, without setpoint adjuster, without airing louvres ³⁾
- 0297760 001** Temperature other than 22 °C for middle of scale (span ± 5 K)
- 0297760 002** Setpoint shift other than ± 6 K or 1 K per 0.1 bar (for TKFP 81)

^{*}) Dimension drawing or wiring diagram are available under the same number

- 1) 'Fixed/schedule' requires an external command signal of 0...1.2 bar (e.g RXP 81). Setpoint shift ± 6 K. Setpoint increase: 0.6...1.2 bar = 0...+6 K. Setpoint decrease: 0.6...0 bar = 0...-6 K.
- 2) Due to the blow-off noise produced, this value should not be exceeded.
- 3) For orders with controller, the housing will be replaced in the factory.
- 4) See Section 60 on regulations concerning the quality of supply air, especially at low ambient temperatures.

Operation

Fixed-value' basic function: TKP 80 & TKP 81

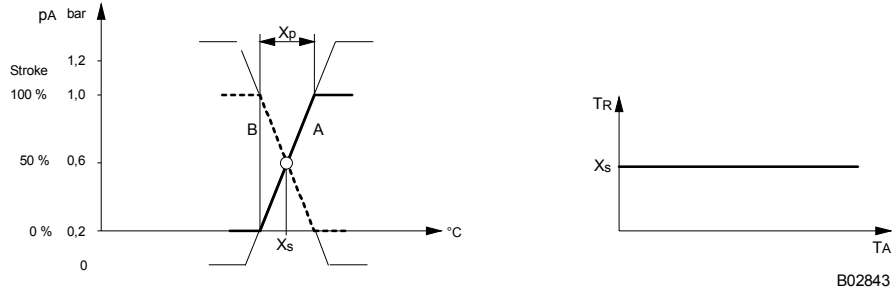
The bimetal sensor, which works on the bleed-off force-balance principle, converts the temperature within its P-band into a pneumatic standard signal of 0.2 to 1.0 bar.

Direction of operation A: the output pressure increases as the temperature rises.

Direction of operation B: the output pressure decreases as the temperature rises.

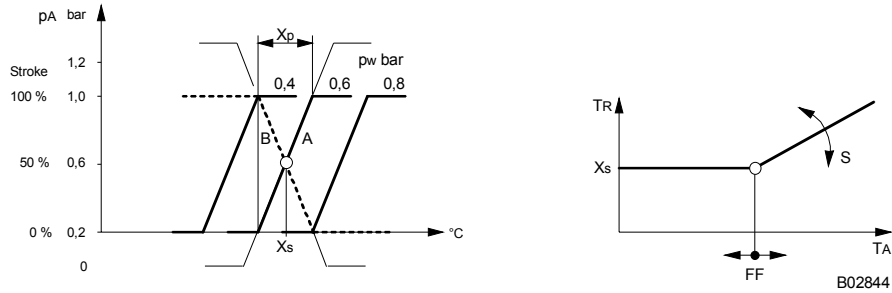
When the temperature is rising, the oil-filled sensor bends and, via the force-balance lever, exerts a force on the nozzle-ball system. An output pressure – proportional to the force of the lever – builds up between the external pre-valve and the nozzle-ball system. On the model with direction of operation B, the nozzle-ball system is on the other side of the lever.

Instead of the external pre-valve, the models with type number 81 have an integrated pre-amplifier for systems with long lines or for drives with short running times; these require a connection for supply pressure.



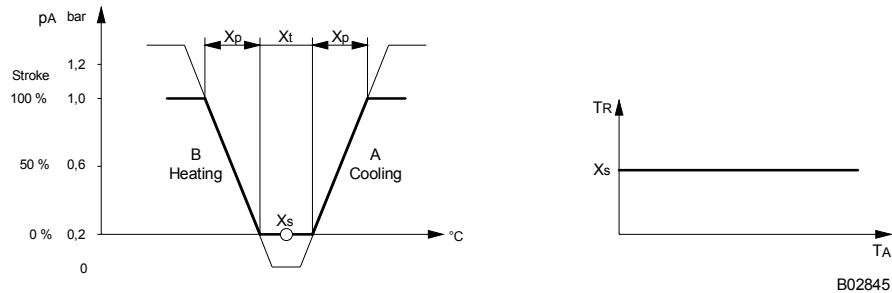
Fixed-value + schedule' extra function: TKFP 81

On this model is a membrane cell below the force-balance lever. When this is pressurised by an external command signal, the setpoint X_s can be shifted. When the command signal is 0.6 bar, then control is performed exactly to the pre-set setpoint. The setpoint elevation works on a command signal of 0.6 to 1.2 bar = 0 to +6 K; while the setpoint setback works between 0.6 and 0 bar = 0 to -6 K. Models with this setpoint shift have an 'F' in the model code and require a connection for command pressure.



Sequence' extra function: TKSP 80 & TKSP 81

This model has a nozzle-ball system on both sides of the force-balance lever. It requires two external pre-valves and has two outputs: one each for both directions of operation (A and B). This provides a sequence curve with the setpoint in the middle of the neutral zone X_t . Models with the sequence function have an additional 'S' in the model code.



Key

- | | | | |
|-------|--|-------|--------------------|
| S | = slope, setpoint shift | T_R | = room temperature |
| FF | = shift starting point, setpoint of the scheduling relay | X_p | = P-band |
| X_s | = setpoint | X_t | = dead zone |
| T_A | = outside temperature | p_A | = output pressure |
| | | p_W | = command pressure |

Engineering notes

In order to prevent excess noise, the air recovery should be kept to 50 l_n/h for the TK . P 80 and 34 l_n/h for the TK . P 81. This means that the maximum number of RLP units that can be connected to each controller is as follows:-

TK . P 80: either three RLP 10 or 20, or three RLP 100 or 200;

TK . P 81: either two RLP 10 or 20, or two RLP 100 or 200.

On installations with a re-heater that have been equipped with a sequence relay or sequence-reversing relay (air supplied by the RLP), the air emitted at terminal 6 of the RLP is bled off by the sequence relay or sequence-reversing relay so that no such noise is caused by the TK . P unit itself.

The maximum air recovery of a sequence relay or sequence-reversing relay is 50 l_n/h. For this reason, no more than three RLP units may be connected to such a relay. If more are connected (to either a sequence relay or sequence-reversing relay or a TK . P unit), an interface relay XRP 101 must be used.

Additional details on accessories

0297760 001 Setting limits: middle of scale 15 - 40 °C; end of scale 10 - 45 °C.

Only whole °C values can be used for the special settings.

0297760 002 The command pressure can be set between 0 and 1.2 bar. The variable setpoint shift is either 0.5 °C or 0.75 °C per 0.1 bar.

Additional details on models

Housing cover of plastic or metal (see Accessories). Internal setpoint adjustment with end stops and '+' -' scale.

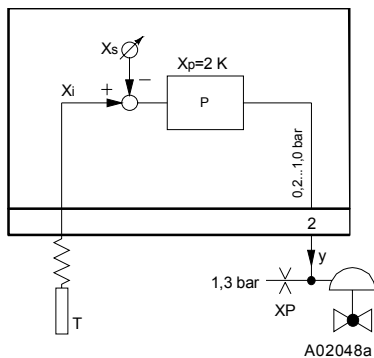
Base plate for snap-on or screw-on housing cover with two Allen-type grub screws (1.5 mm).

Types TKP 81 and TKFP 81 have quantity amplification.

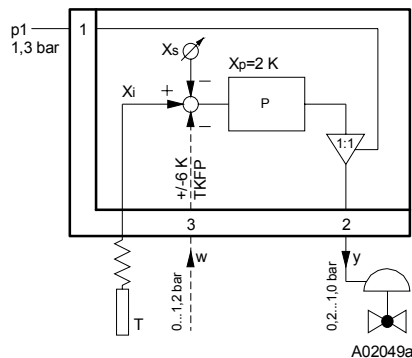
Types TKFP 81 have a connection piece with a membrane for the setpoint shift. Measurement connection for tube of Ø 1.8 × 3.5 mm.

Connection diagrams

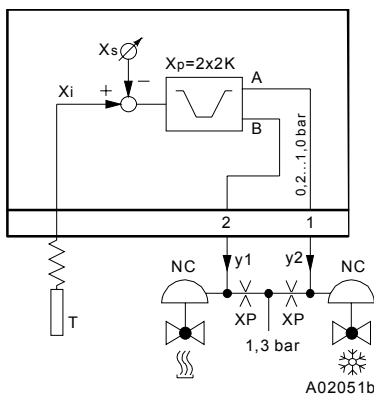
TKP 80



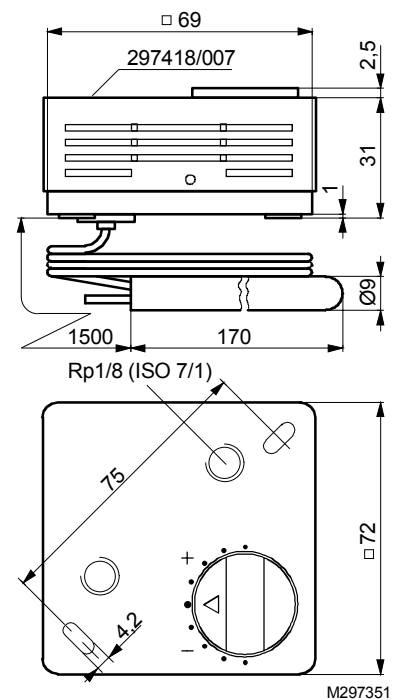
TKP 81, TKFP 81



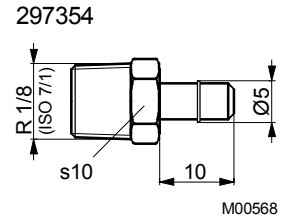
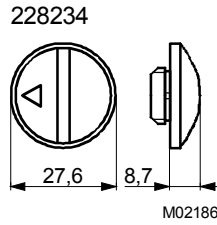
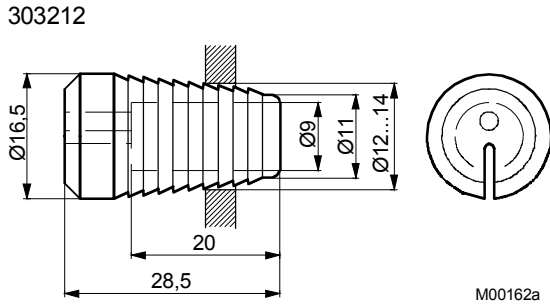
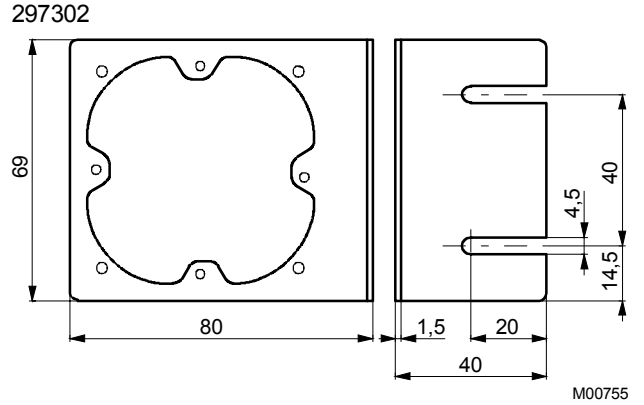
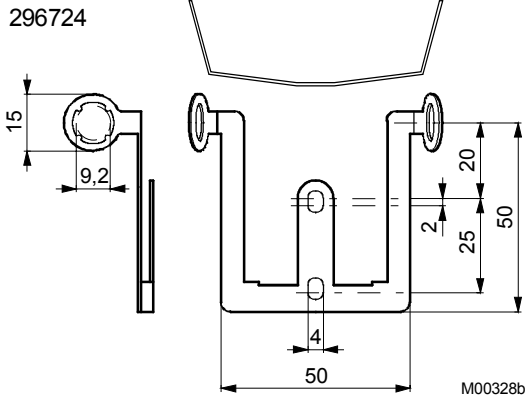
TKSP 80



For heating and cooling: use NC valves (normally closed) (e.g. VK18P or BK18P)

Dimension drawing

Accessories



Examples of use

- Addition of a command variable (outside temperature) to several TKFP 81 duct-temperature controllers

