

PRONTO

Individual room controllers for fan-coil units

PRFA.../A

without bus communications



The PRFA/A, PRFA-C/A and PRFA-V/A controllers are used for temperature control in individual rooms.

- For 2-pipe or 4-pipe fan-coil systems, with or without change-over
- PID control action
- Stand-alone operation, without bus communications
- Control of AC 24 V PWM ¹⁾ thermic valve actuators or AC 24 V 3-position damper actuators
- Operating voltage AC 230 V

1) PWM = pulse-width modulated

Use

The PRFA.../A controllers can be used in the following types of fan-coil systems:

- ON/OFF systems (electric heating coil or on/off cooling)
- 2-pipe systems with or without change-over
- 2-pipe systems with electric heating coil or on/off cooling
- 4-pipe systems with or without electric reheater
- Fan-coil systems with air-side control

The controllers are programmed for the required application by setting the DIP switches accordingly (see "Commissioning notes", page 4).

The "System examples" manual, reference CA2A3539, contains a selection of standard applications with equipment configurations and wiring diagrams.

Functions

- Built-in AC 230 V / AC 24 V mains transformer with self-resetting primary fuse
- Control of thermic valve actuators (AC 24 V PWM), electric heating coils or on/off cooling (AC 24 V) or 3-position damper actuators (AC 24 V)
- Volt-free relay outputs for fan speed control and for control of an electric reheater
- Built-in setpoint potentiometer
- A selection of room operating units
- External switch contact for change of operating mode (day or night mode)
- Summer/winter compensation
- Control signal for master/slave circuits
- Additional valves or actuators can be connected by use of power amplifiers
- Valve exercising feature
- Option of operation with T1 or T28 temperature sensor

- Selection of eight different types of control

For a detailed description of functions see the “Engineering and commissioning” manual, reference CA2G3539.

Type summary

The controllers are available in three versions, distinguished by the number of outputs available.

Controller	Outputs	Signal
PRFA-C/A	Y1	AC 24 V, can be configured for: <ul style="list-style-type: none"> – Proportional control of thermic valve actuators with a PWM (pulse-width modulation) algorithm, heating or cooling (change-over) – Control of contactors for electric heating coil or on/off cooling
PRFA/A	Y1, Y2	AC 24 V, can be configured for: <ul style="list-style-type: none"> – Proportional control of thermic valve actuators with a PWM (pulse-width modulation) algorithm, heating and cooling – Control of contactors for electric heating coils or on/off cooling – Control of 3-position damper actuators
PRFA-V/A	Y1, Y2 Y3, Y4, Y5	AC 24 V, can be configured for: <ul style="list-style-type: none"> – Proportional control of thermic valve actuators with a PWM (pulse-width modulation) algorithm, heating and cooling – Control of contactors for electric heating coils or on/off cooling – Control of 3-position damper actuators Volt-free relay contacts, AC 230 V, 4 A for: <ul style="list-style-type: none"> – Automatic control of 3-speed fan control – Automatic control of 2-speed fan and electric reheater

Ordering

Please state the quantity, product description and type code when ordering.

Example:

15 Individual room controllers for fan-coil units PRFA-C/A

Equipment combinations

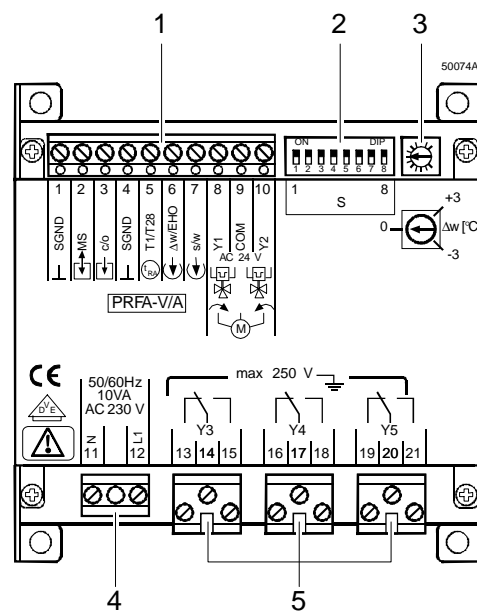
The following peripheral devices can be used with the PRFA.../A controllers:

Type	Description	Data sheet
FB-T28	Unit-mounted temperature sensor	1835
FR-T1/A	Room temperature sensor	1736
FR-A180	Occupancy detector with daylight sensor (wall type)	5488
FR-A360	Occupancy detector with daylight sensor (ceiling type)	5488
BSG-U1	Universal setpoint adjuster, for adjustments of ± 3.0 K	1987
Z182	Change-over thermostat	–
WSK4	Reset transmitter for summer/winter compensation	A1-02.45
FK-T30	Duct temperature sensor (for WSK4)	S1-02.27
PBA	Room operating unit with: <ul style="list-style-type: none"> – T1 temperature sensor – Setpoint adjuster ± 3.0 K 	1651
PBC	Room operating unit: as PBA, with additional room temperature display	1655

PBAS	Room operating unit: as PBA, with additional step controller for 3-speed fan	1652
PBAS/C1	Room operating unit: as PBA, with additional switch for day/night mode or single-speed fan	1653
GHD131.2E	Linear actuator for modulating damper control	4689
T3W..., T4W...	Valves with pre-mounted thermic actuators, comprising STE72 actuator and type ...W... valve body	4829
STE71.1	Thermic actuators for valve types 2T.../A	4874, 4848
UA1T	Power amplifier for thermic valve actuators	3591
UA2T	Power amplifier for thermic valve actuators or damper actuators	3592

Mechanical design

The PRFA.../A controllers comprise a sheet-steel housing and the PCB. The latter accommodates the connection terminals, switches and potentiometers.



- 1 Connection terminals 1 ... 10
- 2 DIP switches S1 ... S8
- 3 Setpoint adjuster ± 3 K
- 4 AC 230 V power supply
- 5 AC 230 V relay terminals

Engineering notes

To ensure that the controllers operate correctly from the outset, careful planning in respect of the electromagnetic compatibility of the system is essential.

AC 230 V primary power supply cables

The controllers are operated with an AC 230 V power supply. The dimensions of the primary supply cables are determined by the total load and by local regulations. The primary power supply cables should be connected to the controllers or transformers by as direct a route as possible, and should not be routed parallel to other cables.

AC 24 V signal and supply voltage cables

Signal cables are low-power cables. In the context of the PRFA.../A controllers, these include cables for devices such as temperature sensors, window switches, setpoint adjusters etc.

The AC 24 V supply voltage cables provide the supply voltage for the controllers, valves and power amplifiers.

Attention should be paid to the following:

- Avoid routing in the vicinity of primary power supply cables
- Use twisted-pair or concentrically stranded cables with at least 10 twists per metre (recommended type: LiYYF in accordance with VDE/DIN standard)

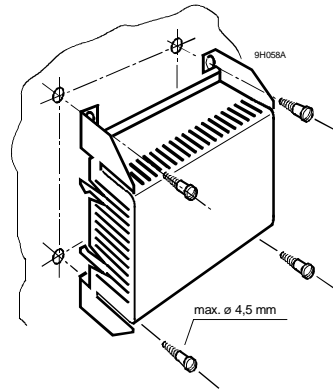
See the “Engineering and Commissioning” manual, reference CA2G3539, for further information on engineering and cable dimensions.

Mounting notes

The controllers can be snap-mounted on DIN rails or screwed directly to a flat surface. The controllers can be mounted in any orientation.

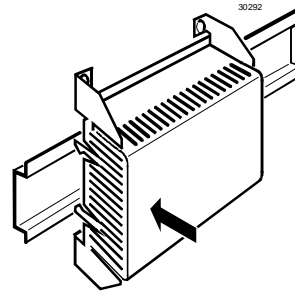
When mounting, account should be taken of the following:

- Install only in a protected environment (e.g. in control panels, behind covers or above suspended ceilings)
- Ensure adequate air circulation to permit dissipation of the heat generated during operation
- For service purposes, ensure that the connection terminals are freely accessible.
- Local installation regulations must be observed.



Surface mounting

Four drilled holes are provided for surface mounting with screws.



Rail mounting

The housing is designed for snap-mounting on DIN/EN rails.
Rail type: EN50022-35 x 7.5

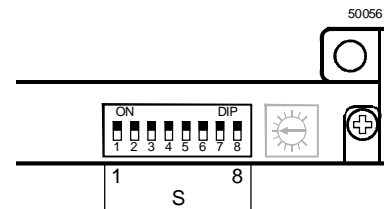
Commissioning notes

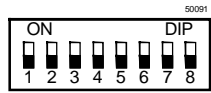
Commissioning involves setting the DIP switches in accordance with the plant configuration and adjusting the internal setpoint.

Details of the relevant settings will be found in the "Engineering and commissioning" manual, reference CA2G3539.

DIP-switch settings

Set DIP-switches S1 ... S8 in accordance with the required control type and the type of sensor used.





S8: Relay sequence (PRFA-V/A only)

OFF = Relay sequence A (fan-speed 3 controlled by relay Y5)
 ON = Relay sequence B (electric heating coil controlled by relay Y5)

S7: Temperature sensor and relay Y3

OFF = - T28 return air sensor
 - Fan continuous ON at lowest speed
 ON = - T1 room temperature sensor
 - Fan-speed 1 (Y3) switched as a function of control deviation

S5, S6: Zero-energy zone

S5	S6	Zero-energy zone X_T
OFF	OFF	1.0 K
ON	OFF	2.0 K
OFF	ON	4.0 K
ON	ON	6.0 K

S2, S3, S4: Control type

(see table below)

S1: Master or slave controller

OFF = Master
 ON = Slave

Note

On delivery, all switches are factory-set to OFF.

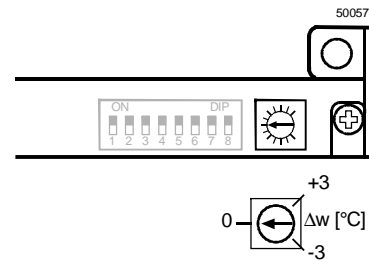
Programming the control types

Sequence diagram	Output Y1	Output Y2 *	Control Type	S2	S3	S4
50133A	Proportional (PID)	Proportional (PID)	0	OFF	OFF	OFF
50133B	Proportional (PID)	On/Off $x_D = 1.5 \text{ K}$	1	ON	OFF	OFF
50133C	Proportional (PID)	On/Off $x_D = 1.5 \text{ K}$	2	OFF	ON	OFF
	Proportional (PID)	On/Off $x_D = 1.0 \text{ K}$	3	ON	ON	OFF
50133D	On/Off $x_D = 1.5 \text{ K}$	On/Off $x_D = 1.5 \text{ K}$	4	OFF	OFF	ON
	On/Off $x_D = 1.0 \text{ K}$	On/Off $x_D = 1.0 \text{ K}$	5	ON	OFF	ON
50133E	3-position without synchronisation		6 *	OFF	ON	ON
	3-position with synchronisation (for parallel operation of several damper actuators)		7 *	ON	ON	ON

* Control types 6 and 7 and output Y2 are not available with type PRFA-C/A controllers.

Setpoint adjustment

The basic setpoint, w , is 22 °C. This value can be adjusted by ± 3 K on the internal potentiometer Δw (Factory-setting: 0 K). When an external setpoint adjuster is connected, its value is added to the internal setpoint.



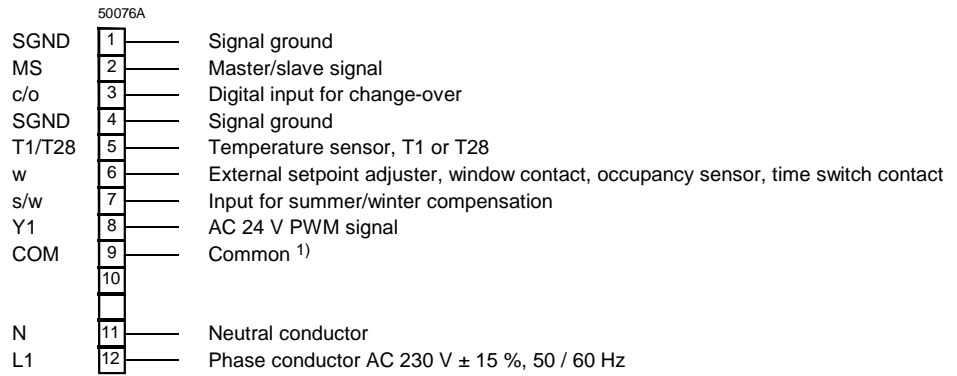
Technical data

Power supply	
Nominal voltage	AC 230 V, 50/60 Hz
– Admissible voltage tolerance	+10 / –15 %
Power consumption	
with output peripheral devices connected	Max. 10 VA
Primary fuse	Electronic, self-resetting
Inputs	
T1 sensor	Effective measuring range 9 ... 41 °C
T28 sensor	Effective measuring range 9 ... 41 °C
Internal setpoint adjuster	± 3 °C
External setpoint adjuster	Max. ± 3 °C
Change-over contact	Contact closed = Change-over
Master/slave configuration	Max. 3 slaves
Summer/winter compensation	DC 0 ... 25 V = 0 ... 10 K DC 0 ... 10 V = 0 ... 4 K
Local contacts for operating mode change-over, e.g. window contact	Contact closed = Night mode
Outputs Y1 and Y2	
Thermic valve actuators	AC 24 V modulating (PWM), max. 2 T3W..., T4W... or STE71.1 valves, or max. 5 VA per output ^{1) 2)}
Damper actuators	AC 24 V 3-position (PWM), run-time max. 7 mins., max. 3 GHD131.2E actuators or 5 VA AC 24 V, on/off, max. 5 VA per output ¹⁾
Contactors	
Relay outputs Y3, Y4, Y5	
Contact rating	Max. AC 250 V / 4 A / $\cos \varphi = 0.6$ DC 30 V / 4 A
Switching capacity	Max. AC 1000 VA, max. DC 120 W
Min. admissible load	10 mA at DC 5 V
Switching voltage against earth	Max. 250 V
Switching differential x_D	Can be selected, see "Programming the control types"
Zero-energy zone X_T	Can be selected in the range 1.0 ... 6.0 K, see "DIP switch settings"
Setpoint in "Night" operating mode	$w_H = 15$ °C, $w_K = 33$ °C
Weight including packaging	0.6 kg
Dimensions (W x H x D)	108 x 52 x 118 mm
Connection terminals for signals	Screw terminals with text socket, for 1 x 4 mm ² wire
Product safety	
Overvoltage category	II Up to 2500 V transient power surges
Contamination level	2 Normal non-conductive contamination
Electrical safety	PELV
General ambient conditions	
Conditions of use	– For indoor use (control panels) – To maximum height of 2500 m
Operating temperature	0 ... 50 °C
Storage temperature	–25 ... 70 °C
Ambient humidity	Max. 65 %rh average over year, non-condensing
Conformity	Meets the requirements for CE marking

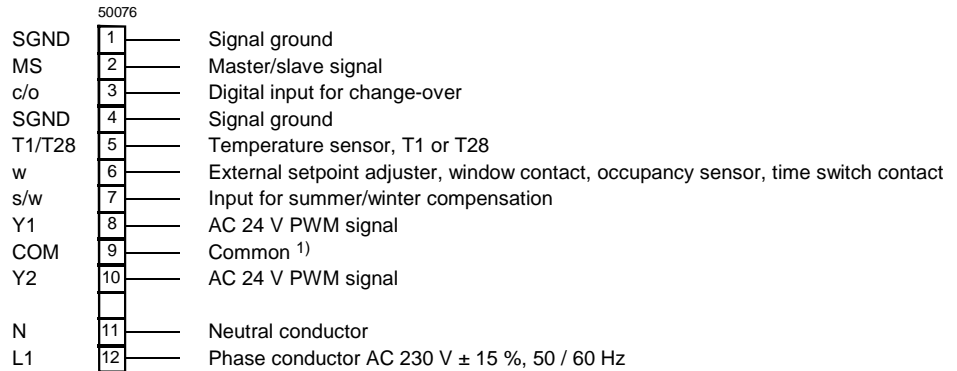
- 1) With control types 2 and 3, max. total 5 VA for both outputs together.
- 2) The modulating control of thermic valve actuators is achieved by use of a pulse-width-modulated control signal. This may result in a longer positioning time than the time specified in the actuator data sheet.

Connection terminals

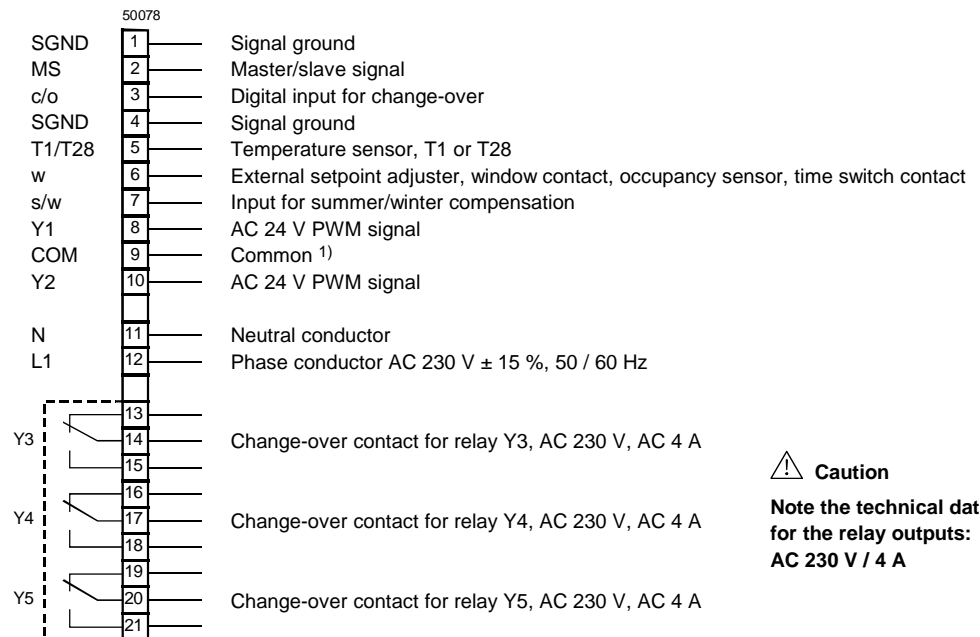
PRFA-C/A



PRFA/A



PRFA-V/A



Caution
Note the technical data
for the relay outputs:
AC 230 V / 4 A

1) Common and SGND have reverse polarity – Do not interconnect.

Important

Local installation regulations must be observed

Connection diagrams

See the “Engineering and Commissioning” manual, document reference CA2G3539, for PRFA.../A connection diagrams.

Application examples

Examples of applications of the PRFA.../A controller will be found in the “System examples” manual, document reference CA2A3539.

Dimensions

All dimensions in mm

