Series A28
Two stage Thermostats

Introduction

These thermostats are designed for various types of heating, cooling, ventilation, or air-conditioning applications. All models have two SPDT switches providing the following control possibilities:
- *2 stage heating*
- *2 stage cooling*
- *heating/cooling with automatic changeover*

Models are provided with a standard IP30 case or splashproof, dust-tight IP65 plastic case

Description

Controls are compact with fixed differential per stage and (on most models) adjustable differential between stages. Liquid filled element provides wide range, constant differential over whole range and no influence from barometric pressure. Since the bulb contains the major portion of the total fill the thermostat may by considered as cross-ambient, capillary and cup temperature variations affect the operating point only slightly due to the small amount of fill they contain.

For quantity orders it is possible to have the below stated optional constructions
- Without case and cover for panelmounting
- Close differential per stage
- Different capillary lengths

All standard IP30 enclosure models have a universal way of adjustment. For this purpose a knob and sealing cap are enclosed.

A28QA
splashproof dust-tight thermostat with 2m capillary and style 1b bulb (left).

A28AA
thermostat with style 3 element (right).

Feature and Benefits	
❑ **Liquid filled sensing element**	No cross ambient temperature problems
	Constant differential over the whole range
❑ **Dust tight Penn switch**	Prevents pollution of the contacts by electrostatic influences.
❑ **IP65 protection class models available**	Suitable for outdoor applications
❑ **Front adjustment**	Less mounting space required

Note

These controls are designed for use only as operating controls. Where an operating control failure would result in personal injury or loss of property it is the responsibility of the installer to add devices or systems that protect against, or warn of, control failure.

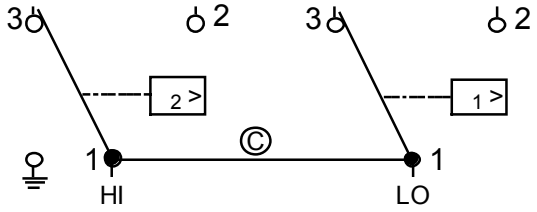
Adjustment

Models "set low" (see also cover label):
The dial indicates the switch point "SP1" (see switching diagram).

Models "set high" (see also cover label):
The dial indicates the switch point "SP2" (see switching diagram)

For IP30 models the standard screwdriver adjustment can be converted easily in the field to knob adjustment. Also concealing of adjustment is possible after installation.

Contact function



$\theta_1 < \theta_2$

Fig. 1
1-2 closes on temperature increase.
C Removable jumper.

Switching diagram (Heating Mode)

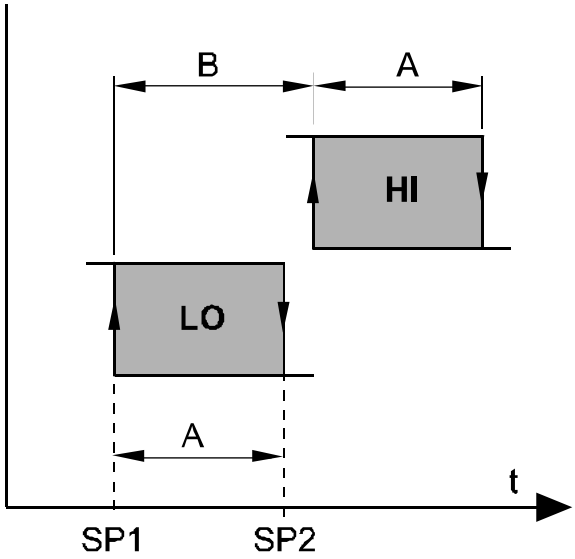


Fig.2

A Differential per stage.
B Differential between the stages.
SP1 Dial setting (for exceptions see 'SP2').
SP2 Dial setting (range 0 to 43°C and 1 to 60°C).
t Temperature increase.
LO Low stage.
HI High stage.

Repair and Replacement

Repair is not possible. In case of an improperly functioning control, please check with your nearest supplier. When contacting the supplier for a replacement you should state the type/model number of the control. This number can be found on the data plate or cover label.

Type number selection table:

Range (°C)	Diff. per stage (K)	Diff. between stages (K)	Element style (cap. length)	Bulb size (mm)	Element finish	Setting (see page 2 adjustment)	Max. bulb temp (°C)	Bulb well (optional)	Order number
Type A28AA Capillary Thermostats, General Purpose IP30									
-35 to +10	2	1 to 4	1b(2m)	9.5 x 110	Tin-plated	set low	60	WEL14A602R	**A28AA-9006**
-5 to +28	1.5	1 to 4	1b(2m)	9.5 x 135	Tin-plated	set low	60	WEL14A603R	**A28AA-9007**
-5 to +28	1.5	1 to 4	1b(5m)	9.5 x 135	Tin-plated	set low	60	WEL14A603R	**A28AA-9106**
1 to 60	2	1 to 4	1b(3m)	9.5 x 115	-	set high	85	WEL14A602R	**A28AA-9118**
Type A28AA Space thermostat									
0 to +43	1.5	1 to 4	3	-	St. Steel	set high	60	-	**A28AA-9113**
Type A28QA Capillary Thermostats, Splashproof IP65 , Dust-tight Case									
-35 to +10	2	1 to 4	1b(2m)	9.5 x 110	Tin-plated	set low	60	WEL14A602R	**A28QA-9110**
-5 to +28	1.5	1 to 4	1b(2m)	9.5 x 135	Tin-plated	set low	60	WEL14A603R	**A28QA-9111**
-35 to +40	2	1 to 4	1b(3.5m)	9.5 x 110	Tin-plated	set low	60	WEL14A602R	**A28QA-9114**
1 to 60	2	1 to 4	1b(3m)	9.5 x 115	-	set high	60	WEL14A602R	**A28QA-9115**
Type A28QA Space Thermostats, Splashproof IP65, Dust-tight Case									
0 to +43	1.5	1 to 4	3	-	St. Steel	set high	60	-	**A28QA-9113**
Type A28QA Capillary Thermostats, Splashproof IP65, Dust-tight Case, Concealed adjustment. For use on cooling-towers evaporative condensers, or air cooled condensers									
5 to 50	2	4	1b(2m)	9.5 x 110	Tin-plated	set low	100	WEL14A602R	**A28QA-9101**
Type A28QJ Capillary Thermostats, Splashproof IP65, Dust-tight Case For use on heat pumps and heat recovery units									
10 to 95	1.5	1 to 4	1b(3m)	9.5 x 100	-	set low	115	WEL14A602R	**A28QJ-9100**

Note: If what you need is not in the specific type numbering selection table then please contact your representative.

Sensor styles

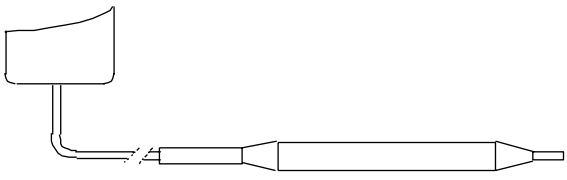


Fig. 3
Style 1b
swaged bulb, can be used with closed-tank connector **FTG13A-600**

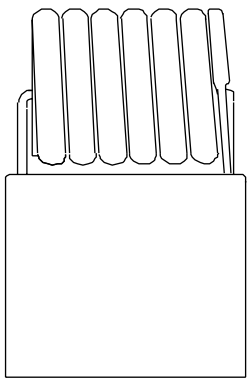
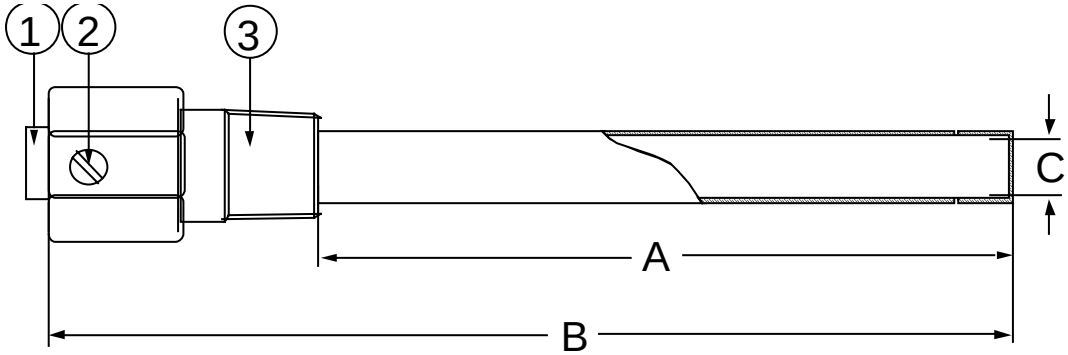


Fig. 4
Style 3 (coil)

Accessories (optional)



Order no.	Dimension A	Dimension B	Dimension C Internal
WEL14A602R	125 mm	171 mm	9.8 mm
WEL14A603R	147 mm	193 mm	9.8 mm

1. Bushing
2. Set screw
3. Adapter, 1/2"-14 NPT
Bulb well (brass, copper pipe)

Fig. 5

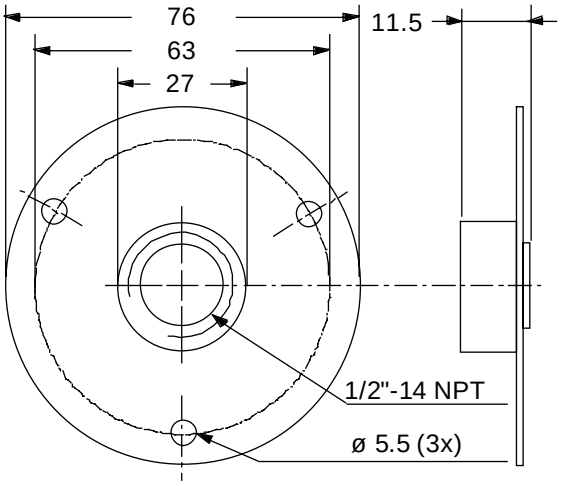
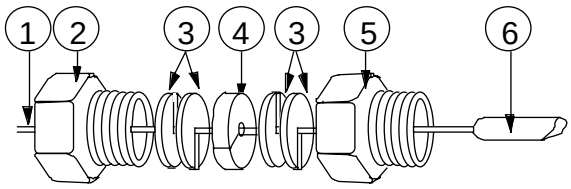


Fig. 6
Duct flange to be used with closed-tank connector FTG13A-600R.
Order number **T-752-1001**



1. Style 1b bulb support tube
2. Packing nut
3. Washer
4. Packing
5. Adapter, 1/2"-14 NPT
6 . Bulb

Fig. 7
Closed-tank connector
Order number **FTG13A-600R**

Dimensions (mm)

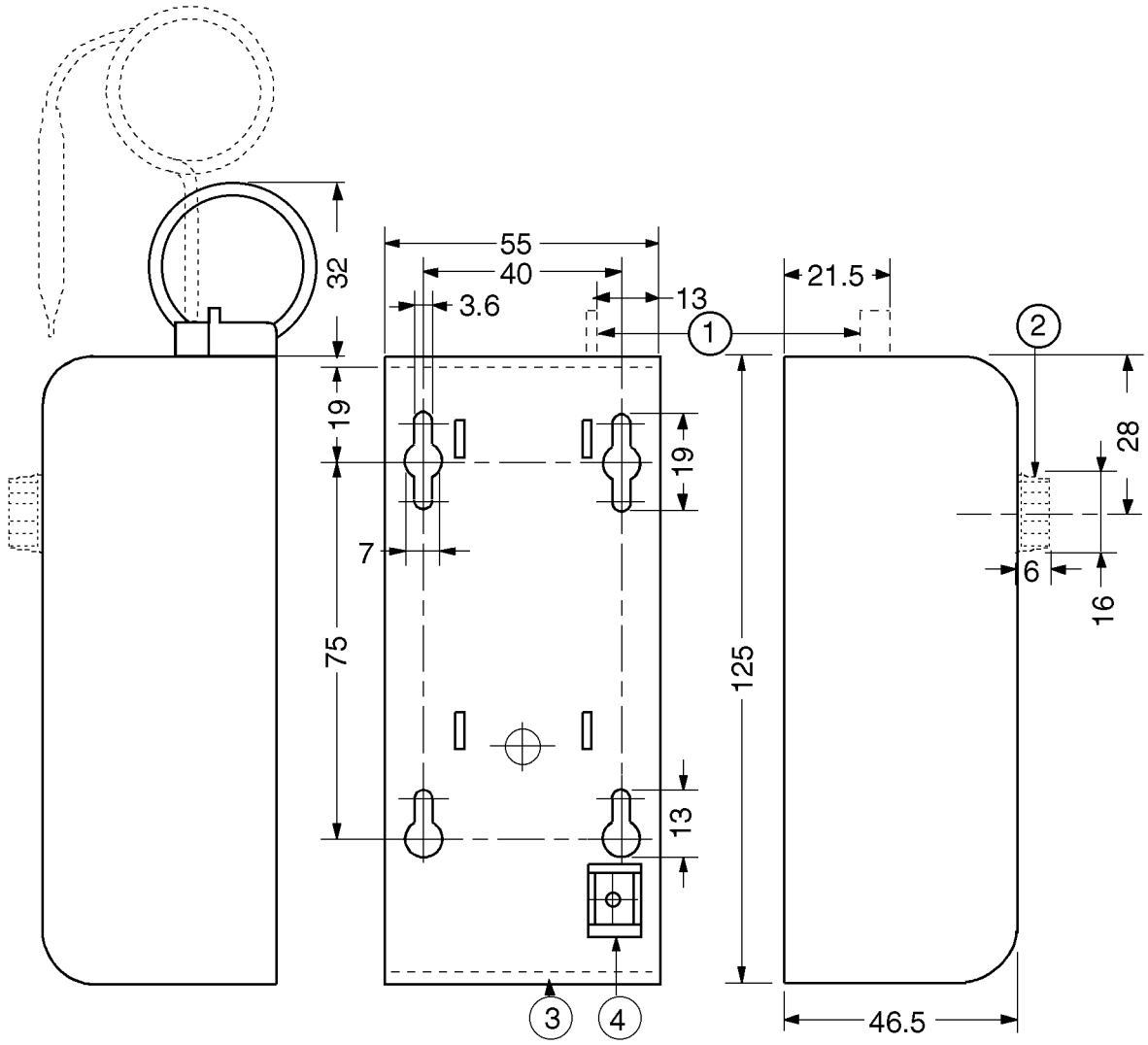


Fig. 8
A28AA (standard IP30 enclosure)

1 Reset lever
2 Knob packed separately with the control
3 22.3 mm dia. cable inlet hole for PG-16
4 Earth screw

Dimensions (mm)

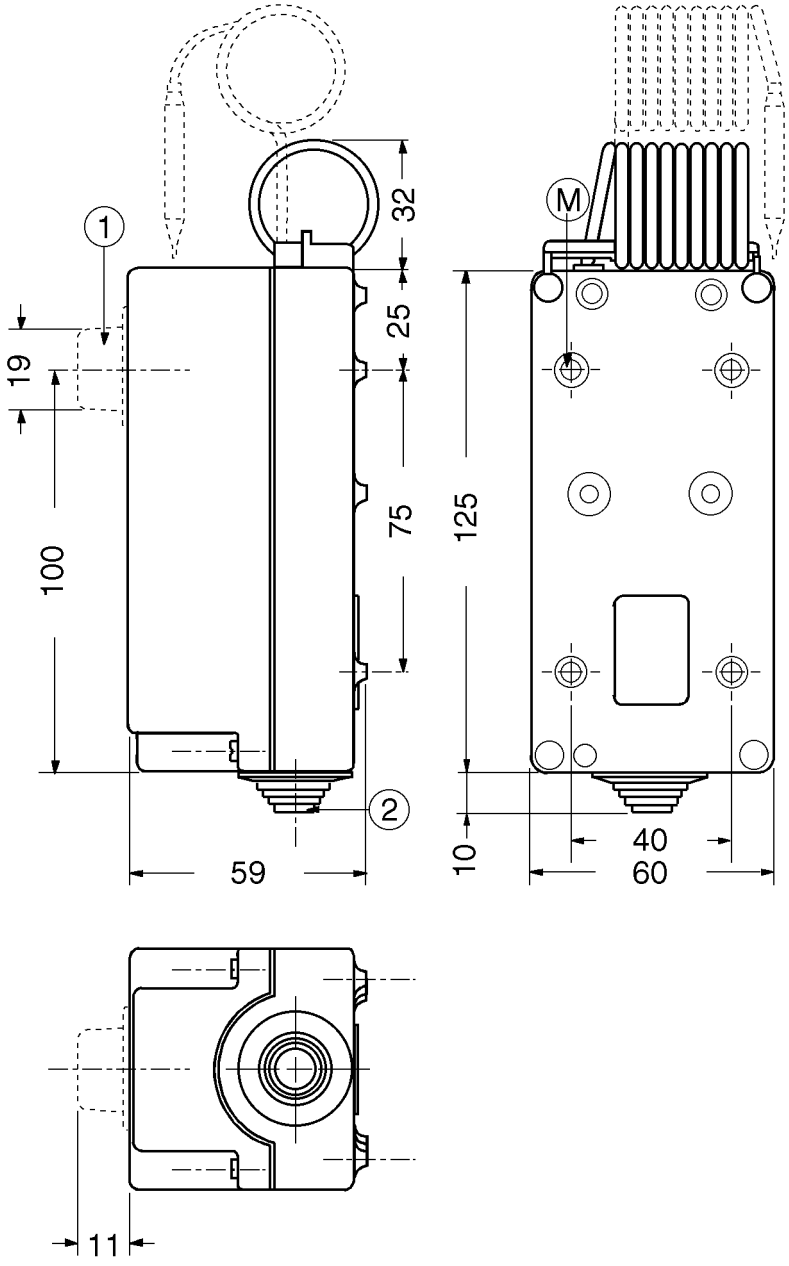


Fig. 9
A28QA/QJ (splash-proof IP65, dust-tight enclosure)

1 Knob (knob models only)
2 Cable grommet Ø 5 to Ø 13 mm
M Mounting holes Ø 4.5 mm use upper 2 holes only

Notes

Specifications

Type number	A28AA (standard IP30 enclosure)		A28QA/QJ (splashproof, dust-tight IP65 enclosure)	
Element style	Style 1b bulb element	Style 3	Style 1b bulb element	Style 3
Application	General purpose -	Space -	General purpose Cooling towers and air-cooled condensers	Space (out-door and agriculture) -
Operating ranges	See type number selection table			
Differentials	See type number selection table			
Adjustment	Universal	-	External knob (general purpose) Concealed under cover (cooling-tower and air-cooled condensers)	
	Controls with adjustable differential between stages have an adjustment lever under the cover			
Material Case Cover	1.75 mm cold-rolled zinc plated steel 1.5 mm ABS plastic		Polycarbonate Blue-colour finish Polycarbonate Blue-colour finish	
Conduit opening	22.3 mm dia. hole for PG16		Cable grommet. Conduit opening also applicable for PG16 connector	
Amb. temp. limits	-35 to +55°C		-35 to +55°C	
CE Conformity	According to low voltage directive and EMC directive			
Electrical ratings	~15(5)A 230V		~15(5)A 230V (A28QJ: ~15(3)A) 230V)	
Enclosure	IP30		IP65	
Shipping weight ind. pack overpack	0.4 kg 10 kg (24 pcs.)		0.5 kg 12 kg (24 pcs.)	

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office or representative. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

JOHNSON CONTROLS

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