



کنترل کننده خودکار حرارت

Self-Operated temperature Controller

Type 1

کاربرد :

این دستگاه با قابلیت تنظیم از 10°C تا 150°C ، سایز ولو از DN15 تا DN100 و با فشار نامی PN16 تا PN40 تا دمای 350°C ، جهت کنترل خودکار حرارت در سیستمهای حرارتی قابل استفاده می باشد. ولو در حالت نرمال باز بوده و با افزایش میزان دما به تدریج بسته می شود. دستگاه با دو نوع سنسور حرارتی تیپ ۲۲۳۱ و ۲۲۴۱ قابل استفاده می باشد. کنترل کننده خودکار حرارت تیپ ۱ از دو قسمت اصلی ولو و ترموستات تشکیل شده است که شرح قطعات مختلف آنها در شکل ۱ آمده است.

Application :

This device with adjustment capability from -10°C to 150°C , valve size from DN15 to DN100 and by nominal pressure from PN16 to PN40 up to temperature 350°C is usable for heating installation. Valve is open in normal condition and closes gradually when temperature rises. The device is usable by two sensor types 2231 and 2241. The type 1 automat temperature controller is made of two main sections valve and thermostat that the part description of them is came in fig 1.

ویژگی ها :

- ۱- دارای مکانیزم ایمنی در مقابل افزایش بیش از حد دما می باشد.
- ۲- خودکار بوده و به هیچ نیروی کمکی دیگری جهت کنترل حرارت نیاز ندارد.
- ۳- به نگهداری و تعمیرات زیادی نیاز ندارد.
- ۴- دارای آب بندی کامل بوده و برای انواع سیستم های انتقال حرارت بسیار مناسب می باشد.
- ۵- بدنه آن از جنس چدن ، کربن استیل و یا استینلس استیل می باشند.

Traits :

- 1- Has the excess temperature safety mechanism.
- 2- Self operated and don't need any auxiliary force to temperature controlling.
- 3- Don't need a lot maintenance and service.
- 4- Thoroughly sealed and most suitable for any kind of heat transfer systems.
- 5- It's body material is cast iron, carbon steel or stainless steel.

قطعات :

مجموعه ولو :

- | | | |
|-------------|--------------|----------------|
| ۱- بدنه ولو | ۲- سیت | ۳- پلاگ |
| ۴- فنر | ۵- میله پلاگ | ۶- درپوش فلنجی |

ترموستات :

- | | |
|------------------------|-------------------------|
| ۷- مهره کوپلینگ ولو | ۸- المان عمل کننده |
| ۹- پین المان عمل کننده | ۱۰- قطعه فلزی آکاردئونی |
| ۱۱- لوله موئین | ۱۲- ولوم تنظیم کننده |
| ۱۳- پلاک درجه بندی شده | ۱۴- مهره کوپلینگ |
| ۱۵- تبدیل | ۱۶- پیستون |
| ۱۷- سنسور حرارت | |

Parts :

Valve collection:

- | | | |
|---------------|--------------|-----------------|
| 1- Valve body | 2- Seat | 3- Plug |
| 4- Spring | 5- Plug stem | 6- Flange cover |

Thermostat:

- | | |
|---------------------------|---------------------------|
| 7- Coupling nut for valve | 8- Operator element |
| 9- Operator element pin | 10- Accordion metal piece |
| 11- Capillary tube | 12- Regulator volume |
| 13- Scaled plate | 14- Coupling nut |
| 15- Reduction | 16- piston |
| 17- Temperature sensor | |

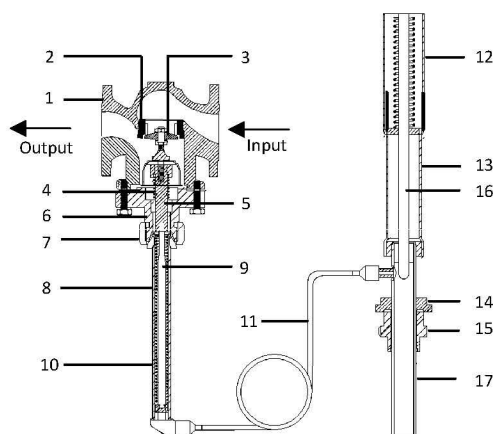


Fig 1

Type 1

Technical specification :

مشخصات فنی :

100	80	65	50	40	32	25	20	15	Size DN	سایز DN		
125	80	50	32	20	12.5	8	5	3.2	Fix flow rate (kvs)	دبی ثابت (kvs)		
PN 16/40									Working pressure	فشار کاری (bar)		
0.75	1.25	2.5	4	6	12	14	25	25	Differential pressure Δp	اختلاف فشار Δp (bar)		
$\leq 0.05\%$ of KVS valve									Leakage rate	مقدار نشتی		
100	80	65	50	40	32	25	15...25			Specific sizes DN	سایزهای خاص DN	
12.5				5			0.16;0.4;1;2.5;3.2				Fix flow rate (kvs)	دبی ثابت (kvs)
12			14		25					Differential pressure Δp	اختلاف فشار Δp	
Permissible temperature of the valve : See Pressure-Temperature diagram									دمای مجاز ولو: به دیاگرام فشار- حرارت مراجعه شود.			
Type 2231 \rightarrow 332mm ; Type 2241 \rightarrow 312mm									Sensor type and entering rate in the pod.		نوع سنسور و مقدار داخل شدن در غلاف	
Screwed 1"				دنده ای 1"					Size & connection type of pod		سایز و نوع اتصال غلاف	
-10...+90°C , 20...120°C , 50...150°C									Regulatable temperature range		محدوده دمای قابل تنظیم	
-40 to +80°C									Allowable ambient temperature of adjustment volume		دمای مجاز اطراف ولوم تنظیم	
50 °C above the actual set point				5 °C بالاتر از مقدار تنظیمی					Permissible excess temperature of the sensor		افزایش دمای مجاز سنسور	
PN40									Permissible pressure of the sensor		فشار مجاز سنسور (bar)	
3m				3...15m					Length of capillary tube (Standard) (Custom)			طول لوله موئین (استاندارد) (سفارشی)

1) The purpose of differential pressure is valve's input pressure for steam and pump's output pressure for water.

1) منظور از اختلاف فشار، فشار ورودی شیر در مورد بخار و فشار ابتدای پمپ در مورد آب می باشد.

Material:

متریال :

DN15 to DN100			Nominal size	سایز نامی
PN16	PN25/40		Nominal pressure	فشار نامی
GG-25 WN 0.6025	Cast steel GS-C25 WN 1.0619	Stainless steel WN 1.4301	Valve & flange body	بدنه ولو و فلنج
SS410 (WN 1.4006)	Standard	استاندارد	Seat & plug	سیت و پلاگ
SS304 / 316	Custom	سفارشی		
SS304 (WN1.4301)			Plug steam / Spring	میل پلاگ/فنر
Graphite on metal core		گرافیت با هسته فلزی	Body gasket	واشر بدنه
Thermostat type 2241 or 2231		ترموستات تیپ ۲۲۴۱ یا ۲۲۳۱		
Brass with nickel plated		برنج با روکش نیکل	Operator element & Sensor	المان عمل کننده و سنسور
Copper		مس	Capillary tube	لوله موئین
Brass with nickel plated (stainless steel if necessary)		برنج با روکش نیکل (در صورت لزوم استنلیس استیل)	Thermo well with treaded nipple	غلاف با مغزی دنده ای

Self-operated Temperature Regulators

Temperature Regulator Type 1

with unbalanced single-seated globe valve · Flanges



Application

Temperature regulators for heating installations with control thermostats for set points from -10 to $+250$ °C · Nominal sizes **DN 15** to **DN 50** · Nominal pressure **PN 16** to **PN 40** · Suitable for temperatures up to **350** °C

The valve closes when the temperature rises.

Note

Typetested temperature regulators (TR), temperature limiters (TL), safety temperature monitors (STM), and safety temperature limiters (STL) are available.



The regulators consist of an unbalanced valve and a control thermostat, comprising a temperature sensor, a set point adjuster with an excess temperature safety device, a capillary tube and an operating element.

Special features

- Low-maintenance P regulators requiring no auxiliary energy
- Wide set point range and convenient set point adjustment indicated on a dial
- Unbalanced single-seated globe valves for use in applications with liquids, gases and vapors, especially for the heat transfer fluids such as water, oil or steam
- Valve body optionally made of cast iron, spheroidal graphite iron, cast steel or stainless cast steel
- Versions with double adapter available for attachment of a temperature limiter or a second control thermostat. See Data Sheet T 2036 EN for details.

Versions

Temperature Regulators with Type 1 Globe Valve

Nominal sizes DN 15 to 25 · PN 25 to 40 · DN 32 to 50 · PN 16 to 40 · Types 2231 to 2235 Control Thermostats

For details on the application of the control thermostats, refer to Information Sheet T 2010 EN.

Type 2111/2231 (Fig. 1.1) · With Type 2111 Valve and Type 2231 Control Thermostat for liquids · Set points from -10 to $+150$ °C · Set point adjustment at the sensor

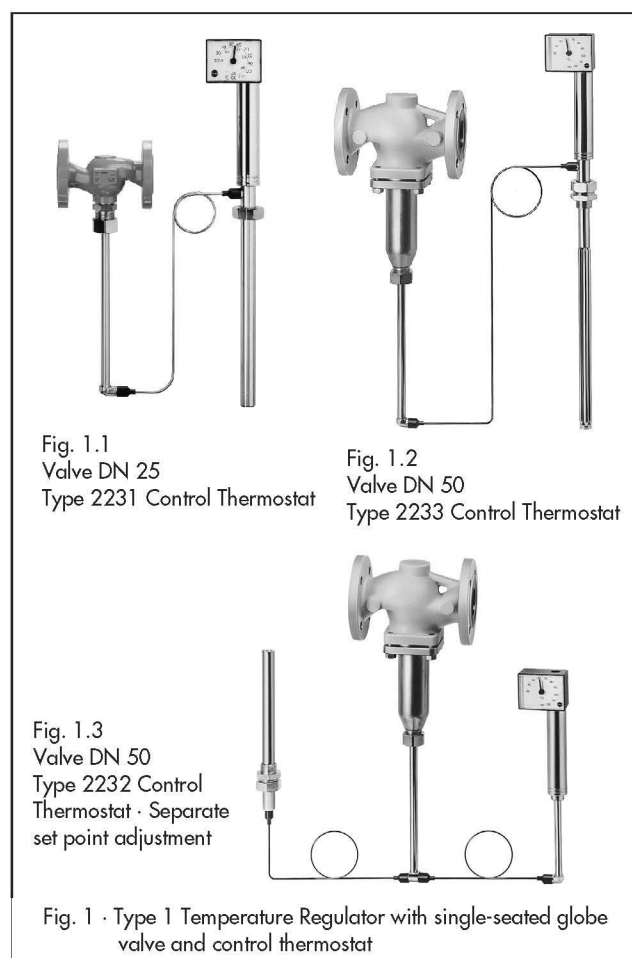
Type 2111/2232 (Fig. 1.3) · With Type 2111 Valve and Type 2232 Control Thermostat for liquids and steam · Set points from -10 to $+250$ °C · Separate set point adjustment

Type 2111/2233 (Fig. 1.2) · With Type 2111 Valve and Type 2233 Control Thermostat for liquids, air and other gases · Set points from -10 to $+150$ °C · Set point adjustment at the sensor

Type 2111/2234 · With Type 2111 Valve and Type 2234 Control Thermostat for liquids, steam, air, and other gases · Set points from -10 to $+250$ °C · Separate set point adjustment

Type 2111/2235 · With Type 2111 Valve and Type 2235 Control Thermostat for air-heated storerooms, drying, climatic and heating cabinets · Set points from -10 to $+250$ °C · Separate set point adjustment and capillary tube installed on site

Versions with screwed ends **G ½** to **G1** female thread can be found in Data Sheet T 2112 EN



Special version

- Capillary tube 5 m, 10 m, 15 m
- Sensor made of CrNiMo steel
- Capillary tube made of CrNiMo steel or plastic-coated Cu
- Valve free of non-ferrous metal
- Valve in corrosion-resistant version
- Valve with flow divider I for noise reduction when controlling steam and non-flammable gases (only 1.0619 and stainless cast steel 1.4581)
- Dimensions and materials in accordance with ANSI (see Data Sheet T 2115 EN)

Table 1 · Technical data · All pressures in bar (gauge).

The specified permissible pressures and differential pressures are limited by the values given in the pressure-temperature diagram and the nominal pressure ratings (acc. to DIN EN 12516-1).

Type 2111 Valve							
Nominal pressure		PN 16 to PN 40					
K _{Vs} , leakage rate, and max. permissible differential pressures $\Delta p^{1)}$ in bar							
Standard version	Connection DN	15	20	25	32	40	50
K _{Vs}		4 ²⁾	6.3 ²⁾	8	16	20	32
Differential pressure	Δp_{max}	25	16	14	6	6	4
Leakage rate		$\leq 0.05\%$ of K _{Vs}					
Special version	Connection DN	15	20	25	32	40	50
K _{Vs}		2.5 · 1 · 0.4 · 0.1		4 ²⁾ · 1 · 0.4 · 0.1		6.3 ²⁾	8
Diff. pressure	Δp_{max}	25			16	14	6
Permissible valve temperature		See pressure-temperature diagram					
Types 2231 to 2235 Thermostats							
Size 150							
Set point range (set point span 100 K)		-10 to +90 °C, 20 to 120 °C, or 50 to 150 °C For Types 2232, 2234, 2235 also 100 to 200 °C, 150 to 250 °C					
Permissible ambient temperature at the set point adjustment head		-40 to +80 °C					
Permissible temperature at the sensor		100 K above the adjusted set point					
Permissible pressure at the sensor		Without thermowell: PN 40 · With thermowell: PN 40 or PN 100 With thermowell with flange: PN 40/DN 32 or PN 100/DN 40					
Type 2231/2232		Without thermowell: PN 40 · With flange PN 6 (external \varnothing 140) or PN 40/DN 32					
Type 2233/2234		Without thermowell: PN 40 · With flange PN 6 (external \varnothing 140) or PN 40/DN 32					
Length of the capillary tube		3 m (special version: 5 m, 10 m, or 15 m)					

¹⁾ The differential pressure corresponds to the pressure head of the pump for liquids

²⁾ For spheroidal graphite iron and for K_{Vs} 4 and 6.3: $\Delta p_{max} = 14$ bar

Table 2 · Materials · Material numbers according to DIN EN

Type 2111 Valve				
Nominal size	DN 32 to DN 50	DN 15 to DN 50		
Nominal pressure	PN 16	PN 25	PN 40	
Body	Cast iron EN-JL1040 (GG-25)	Spheroidal graphite iron EN-JS1049 (GGG-40.3)	Cast steel 1.0619 (GS-C 25)	Stainless cast steel 1.4581
Seat and plug	1.4305			Stainless steel 1.4571
Plug stem/spring	Steel 1.4301/1.4310			
Lower part	1.0425 (St 35.8) ¹⁾			Stainless steel 1.4571
Body gasket	Graphite on metal core			
Extension piece/ distance piece	Brass (special version: stainless steel 1.4301)			Stainless steel 1.4301
Types 2231, 2232, 2233, 2234, and 2235 Thermostats²⁾				
	Standard version	Special version		
Operating element	Brass, nickel-plated			
Type 2231/2232	Bronze, nickel-plated			Stainless steel 1.4571
Sensor Type 2233/2234	Copper, nickel-plated	-		
Type 2235	Copper			
Capillary tube	Copper, nickel-plated	Plastic-coated copper		
Thermowell with threaded connection				
Immersion tube	Bronze, nickel-plated	Copper		Stainless steel 1.4571
Threaded nipple	Brass, nickel-plated			
... with flange				
Immersion tube	Steel	Plastic-coated steel or PTFE ³⁾		Stainless steel 1.4571
Flange				

¹⁾ EN-JL 1040 and EN-JS 1049 with brass bushing · ²⁾ Type 2235 not available in corrosion-resistant version

³⁾ Plastic coating (for temperatures up to 80 °C) · PVC or PPH coating. PTFE version · Immersion tube: PTFE · Flange: steel with PTFE sleeve