

## **Application**

Temperature control in heating and cooling processes in industrial plants, for h.v.a.c services and marine engineering. For liquids, gases, vapours.

### Design

The self-acting temperature controller consists of a valve featuring a thermostat and a sensor. According to the service conditions the controller is optionally equipped with a cooling unit or a sensor pocket.

The temperature sensed by the sensor changes the volume of the measuring liquid in the capillary tube. The resulting pressure acts directly on the actuating piston which, in turn, operates the valve spindle. As the temperature rises, the regulating valve is held in closed positon (heating process) or open position (cooling process) until the pre-set release temperature is reached.

When the temperature drops again, a builtin return spring resets the valve to original position. Two-way valves, with single seat or pressure-balanced single/double seat. Double-seated, two-way reverse-acting valves or three-way valves for diverting and mixing applications. Valve components made of gunmetal, cast iron, nodular cast iron or cast steel, with flanged or screwed connections.

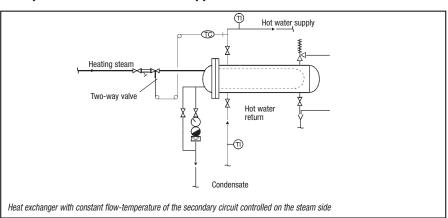
#### **Thermostat**

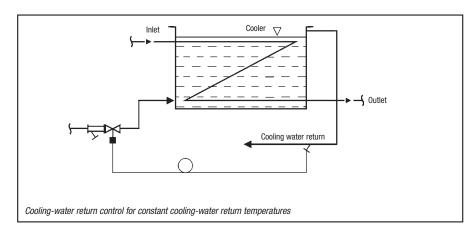
The thermostat is firmly attached to the sensor capillary tube. The rod-, spiral- or airduct-type sensors are made of copper or high-alloy stainless steel.

The capillary tube is available in different lengths, made of copper or high-alloy stainless steel.

#### **Valves**

## **Examples of Industrial Process Applications**







<b>Dimensions</b> Imi	n] and Weights [kg	i for Valves and	<b>Thermostats</b>

Valve ty	pe		DN	15	20	25	32	40	50	65	80	100	125	150
			G	1/2	3/4	1	11/4	1½	2					
M1F			L	130	150	160	180	200	230					
G1F			H <sub>1</sub>	80	85	95	105	110	125					
H1F			$H_2$	60	65	70	75	85	95					
		M1F/G1F	kg	3.1	4.2	5.5	8.1	9.7	14.7					
	G1	H1F	kg	3.4	4.6	6.1	9.0	10.8	15.5					
M1FBN	L		L	130	150	160	180	200	230	290	310			
G1FBN			Н	101	107	112	122	125	140	154	164			
H1FBN			H <sub>1</sub>	80	85	70	75	85	95	110	115			
	" <b>\</b>	M1FBN	kg	4	5	6.0	9.0	13.0	16.0	23.0	38.0			
		G1FBN	kg	4	5	6.0	9.0	13.0	16.0	23.0	38.0			
	G1	H1FBN	kg	4	5	6.0	9.0	13.0	16.0	23.0	38.0			
L1S	<u> </u>		L	85	95									
=			Н	65	67									
=			H <sub>1</sub>	20	32									
			kg	0.7	0.8									
L 2 S			L					129	153					
	┢┤┟╣╌		Н					118	122					
	₽		H <sub>1</sub>					68	71					
			kg					2.9	3.8					
L2SR	L		L					129	153					
			Н					65	70					
			H <sub>1</sub>					90	94					
	G1 G1		kg					3.0	4.0					
M2FR	G1		L		150	160	180	200	230	290	310	350	400	400
G2FR	╟┸┸┦┋╸		H <sub>1</sub>		63	70	75	85	95	110	155	145	160	180
H2FR			$H_2$		112	117	151	155	163	180	195	240	260	293
			kg		5.0	6.5	9.0	11.0	16.0	21.0	35.0	39.0	75.0	77.0

Thermostats		Type \	/ 2.05	Type \	/ 4.03	Type \	<b>/</b> 4.05	Type \	<b>/</b> 4.10	Type \	V 8.09	Type \	/ 8.18
K = sensor of copper N = sensor of high alloy S.S.		К	N	K	N	K	N	K	N	К	N	К	N
Adjusting cylinder	Α	305	305	385	385	385	385	385	385	560	560		560
	В	405	405	525	525	525	525	525	525	740	740		740
Rod- and spiral-type	С	210	190	210	190	390	380	490	515	710	745		800
sensor with BSP connection	D	235	170	235	170	235	250	325	325	425	435		810
→ 30 ← → E ← → F ←	Е	22	22	22	22	22	22	28	25	28	25		34
	F	49	49	49	49	49	49	49	49	49	49		49
	G	3/4	3/4	1	1	1	1	1	1	2	2		2
	Н	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"		2"
	kg	1.8	1.8	2.4	2.4	2.6	2.6	3.3	3.3	6.3	6.3		7.3
4 4	kg	2.3	2.3	2.9	2.9	3.1	3.1	3.8	3.8	6.3	6.3		7.3



# **Closing Pressure Ratings for Valves and Sensors**

Other transfer of the state of	and the second s	L. A	
Single-seated requiating	y valves with flanged ends and ro	1-type copper sensor with	copper capillary tupe (3 m)

Single-seated regulating valves	with nangeu	enus an	u rou-ty									
	DN [mm]	15/6	15/9	15/12	15	20	25	32	40	50	65	80
	k <sub>vs</sub> value	0.45	0.95	1.7	2.75	5	7.5	12.5	20	30	50	80
∆p <sub>max</sub> for sensor type	2.05	20	13	9.3	5.3	1.9	0.9	-	-	_		
Fluid: saturated steam	4.05	40	38	24	15	6.7	-	-	_	_		
Type M1F, G1F, H1F	4.10	-	-	-	-	-	4.1	1.9	0.8	_		
	8.09	-	-	-	-	16	10	5.8	3.3	2.3		
Balanced, single-seated regulating	valves with fla	naed en	ds and ro	d-type co	nner ser	sor with	conner	canillar	v tube (	3 m)		
	DN			,,,,	15	20	25	32	40	50	65	80
	k <sub>vs</sub> value				4	6.3	10	16	25	35	58	80
$\Delta$ p <sub>max</sub> for sensor type	4.05				16	16	16	16	9	8	6	4
Fluid: saturated steam	4.10				16	16	16	16	9	8	6	4
Type M1FBN, G1FBN, H1FBN	8.09				16	16	16	16	16	16	16	16
7,6	8.18				16	16	16	16	16	16	16	16
Cinale control annulation values												1 .0
Single-seated regulating valves	BSP	1/ <sub>2</sub> / 6	1/ <sub>2</sub> / 9	1/ <sub>2</sub> / 12			nsor ca <sub>l</sub>	Jiliary	tube (3	m)		T
		_			1/2	3/4						
	k <sub>vs</sub> value	0.45	0.95	1.7	2.75	5						
	0.05			_	6	2.9						
Δp <sub>max</sub> for sensor type	2.05	16	16			_				I	- 1	
Fluid: saturated steam	4.05	16	16	-	16	9						
******				-	16 16	9						
Fluid: saturated steam	4.05 4.10	16 16	16 16	-	16	9	opper ca	pillary t	tube (3 r	n)		
Fluid: saturated steam Type L 1S	4.05 4.10	16 16	16 16	-	16	9	opper ca	pillary t		<del>-</del>		
Fluid: saturated steam Type L 1S	4.05 4.10	16 16 nnection	16 16 <b>and rod</b> -	- type copp	16 Der senso	9 or with co		_	11/2	<del>-</del>		
Fluid: saturated steam Type L 1S	4.05 4.10 <b>th screwed co</b>	16 16 <b>nnection</b>	16 16 and rod-	- type copp	16 <b>Der sensc</b>	9 or with co	1	11/4	11/2	2		
Fluid: saturated steam  Type L 1S  Double-seated regulating valves with	4.05 4.10 th screwed co BSP k <sub>vs</sub> value 2.05	16 16 <b>nnection</b> 1/ <sub>2</sub> / 6 0.45	16 16 <b>and rod-</b> 1/ <sub>2</sub> /9 0.95	- type copp	16 per senso 1/ <sub>2</sub> 2.75	9 or with co	7.5	1 <sup>1</sup> / <sub>4</sub> 12.5	11/2	2 30		
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L 2	4.05 4.10  th screwed co  BSP  k <sub>vs</sub> value  2.05 4.10	16 16 <b>nnection</b> 1/ <sub>2</sub> / 6 0.45 -	16 16 <b>and rod-</b> 1/ <sub>2</sub> /9 0.95 - -	- type copp 1/ <sub>2</sub> / 12 1.7 - -	16 per senso 1/ <sub>2</sub> 2.75 –	9 or with co 3/ <sub>4</sub> 5 -	7.5 -	1 <sup>1</sup> / <sub>4</sub> 12.5  -	1 <sup>1</sup> / <sub>2</sub> 20 - 21	2 30 - 14		
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi $\Delta p_{max}$ for sensor type  Fluid: water < 120 °C  Type L 2	4.05 4.10  th screwed co  BSP  k <sub>vs</sub> value  2.05 4.10	16 16 nnection 1/ <sub>2</sub> / 6 0.45 - - connect	16 16 <b>and rod-</b> 1/ <sub>2</sub> /9 0.95 - -	- type copp 1/2 / 12 1.7 od-type c	16 per senso 1/ <sub>2</sub> 2.75 –	9 or with co 3/ <sub>4</sub> 5 -	7.5 -	11/ <sub>4</sub> 12.5	1 <sup>1</sup> / <sub>2</sub> 20 - 21	2 30		2
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi $\Delta p_{max}$ for sensor type  Fluid: water < 120 °C  Type L 2	4.05 4.10  th screwed co  BSP  k <sub>vs</sub> value 2.05 8 4.10  with screwed BSP	16 16 <b>nnection</b> 1/ <sub>2</sub> / 6 0.45 -	16 16 and rod- 1/2/9 0.95 - -	- type copp 1/ <sub>2</sub> / 12 1.7 - -	16 per senso 1/ <sub>2</sub> 2.75 –	9 or with co 3/4 5 nsor wit	7.5 -	1 <sup>1</sup> / <sub>4</sub> 12.5  -	1 <sup>1</sup> / <sub>2</sub> 20 - 21	2 30 - 14		2 30
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi  \[ \Delta p_{max} \text{ for sensor type} \]  Fluid: water < 120 °C  Type L 2  Double-seated reverse-acting valve	4.05 4.10  th screwed co  BSP  k <sub>vs</sub> value  2.05 4.10  with screwed	16 16 nnection 1/2 / 6 0.45 connect 1/2	16 16 and rod- 1/2/9 0.95 - -	- type copp  1/2 / 12  1.7   cod-type c  3/4	16 per senso 1/ <sub>2</sub> 2.75 –	9 or with co  3/4 5 nsor with	7.5 -	11/ <sub>4</sub> 12.5	1 <sup>1</sup> / <sub>2</sub> 20 - 21	2 2 30 - 14 (3 m) 11/ <sub>2</sub>		
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi  \[ \Delta p_{max} \text{ for sensor type} \]  Fluid: water < 120 °C  Type L 2  Double-seated reverse-acting valve	4.05 4.10  th screwed col  BSP  k <sub>vs</sub> value 2.05 4.10  with screwed  BSP  k <sub>vs</sub> value	16 16 nnection 1/2/6 0.45 - connect 1/2 2.75	16 16 and rod- 1/2/9 0.95 - -	- type copp  1/2 / 12  1.7	16 per senso 1/ <sub>2</sub> 2.75 –	9 or with co  3/4 5 nsor with	7.5 -	11/ <sub>4</sub> 12.5  -  capilla  11/ <sub>4</sub> 12.5	1 <sup>1</sup> / <sub>2</sub> 20 - 21	2 2 30 - 14 (3 m) 11/ <sub>2</sub> 20		
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L 2  Double-seated reverse-acting valve $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C	4.05 4.10  th screwed co  BSP  k <sub>vs</sub> value 2.05 4.10  with screwed  BSP  k <sub>vs</sub> value 2.05 4.05	16 16 nnection 1/2 / 6 0.45 connect 1/2 2.75	16 16 and rod- 1/2/9 0.95 - -	-  type copp  1/2 / 12  1.7   od-type c  3/4  5  -	16 per senso 1/ <sub>2</sub> 2.75 –	9 or with co  3/4 5 nsor with	7.5 -	11/ <sub>4</sub> 12.5  -  capilla  11/ <sub>4</sub> 12.5	1 <sup>1</sup> / <sub>2</sub> 20 - 21	2 30 - 14 (3 m) 11/ <sub>2</sub> 20		30 - -
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L 2  Double-seated reverse-acting valve $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L2SR	4.05 4.10  th screwed co  BSP  k <sub>vs</sub> value 2.05 4.10  with screwed  BSP  k <sub>vs</sub> value 2.05 4.10  4.10	16 16 nnection 1/2 / 6 0.45 connect 1/2 2.75	16 16 and rod- 1/2/9 0.95 - - ion and r	-  type copp  1/2 / 12  1.7   cod-type c  3/4  5	16  ner sensc  1/2  2.75  -  -  opper se	9 or with co	1 7.5	11/ <sub>4</sub> 12.5	11/ <sub>2</sub> 20 - 21 ary tube	2 2 30 - 14 (3 m) 11/ <sub>2</sub> 20 - 2.7		
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L 2  Double-seated reverse-acting valve $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L2SR	4.05 4.10  th screwed column screwed column screwed column screwed column screwed column screwed screwed screwed screwed screwed screwed column screwed colu	16 16 nnection 1/2/6 0.45 - connect 1/2 2.75 ed ends a	16 16 and rod- 1/2/9 0.95 ion and rod-	- type copp  1/2 / 12  1.7	16  ver senso  1/2 2.75  opper se	9 or with co 3/4 5 nsor with 1 7.5 or with or	1 7.5 — — — — h copper	11/ <sub>4</sub> 12.5  - capilla 11/ <sub>4</sub> 12.5  capillar	11/ <sub>2</sub> 20 21 21 21 21 21 21 21 21 21 21	2 30 - 14 (3 m) 11/ <sub>2</sub> 20 - 2.7 3 m)		30 - - 1.8
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L 2  Double-seated reverse-acting valve $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L2SR	4.05 4.10  th screwed co  BSP  k <sub>vs</sub> value 2.05 4.10  with screwed BSP  k <sub>vs</sub> value 2.05 4.10  ve with flange DN [mm]	16 16 nnection 1/2 / 6 0.45 connect 1/2 2.75 cd ends a	16 16 and rod- 1/2 / 9 0.95 ion and rod- 25	- type copp    1/2 / 12     1.7     -     -     od-type c   3/4     5     -     -     -     type copp   32	16    1/2   2.75   -	9 or with co	1 7.5 — — — — — — — — — — — — — — — — — — —	11/ <sub>4</sub> 12.5	11/ <sub>2</sub> 20 - 21 ary tube	2 2 30 - 14 (3 m) 11/ <sub>2</sub> 20 - 2.7	125	30 - -
Fluid: saturated steam  Type L 1S  Double-seated regulating valves with the property of the pr	4.05 4.10  th screwed co  BSP  k <sub>vs</sub> value 2.05 4.10  with screwed  BSP  k <sub>vs</sub> value 2.05 4.10  ve with flange  DN [mm]  k <sub>vs</sub> value	16 16 17 17 17 17 17 17 17 17 17 17 17 17 17	16 16 and rod- 1/2/9 0.95 ion and rod- 25 7.5	- type copp  1/2 / 12  1.7	16  ver senso  1/2 2.75  opper se  per senso  40 20	9 or with co 3/4 5 nsor with 1 7.5 or with o	1 7.5 — — — — — — — — — — — — — — — — — — —	11/ <sub>4</sub> 12.5  - capilla 11/ <sub>4</sub> 12.5  capillar 65	11/ <sub>2</sub> 20 21  ry tube ( 80 80	2 30 - 14 (3 m) 11/ <sub>2</sub> 20 - 2.7 3 m) 100 125	125 215	30 - - 1.8
Fluid: saturated steam  Type L 1S  Double-seated regulating valves with the property of the pr	4.05 4.10  th screwed column in the screwed	16 16 nnection 1/2/6 0.45 - connect 1/2 2.78 ed ends a 20 5 8.3	16 16 and rod- 1/2/9 0.95 ion and rod- 25 7.5 8	- type copp  1/2 / 12  1.7	16    1/2   2.75   -	9 or with co 3/4 5 nsor with 1 7.5 or with 6	1 7.5 — — — — — — — — — — — — — — — — — — —	11/ <sub>4</sub> 12.5	11/ <sub>2</sub> 20 21 21 21 21 21 21 21 21 21 21 21 21 21	2 2 30 14 (3 m) 11/ <sub>2</sub> 20 - 2.7 3 m) 100	125	30 - - 1.8
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L 2  Double-seated reverse-acting valve $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L2SR  Double-seated reverse-acting valve $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C	4.05 4.10  th screwed co  BSP  k <sub>vs</sub> value 2.05 4.10  with screwed  BSP  k <sub>vs</sub> value 2.05 4.05 4.10  ve with flange DN [mm]  k <sub>vs</sub> value 2.05 4.05	16 16 17 17 17 17 17 17 17 17 17 17 17 17 17	16 16 and rod- 1/2/9 0.95 ion and rod- 25 7.5	- type copp  1/2 / 12  1.7	16  ver senso  1/2  2.75   copper se  40  20	9 or with co 3/4 5 nsor with 1 7.5 or with 6 30	1 7.5 — — — — — — — — — — — — — — — — — — —	11/ <sub>4</sub> 12.5	11/ <sub>2</sub> 20 - 21  ary tube ( 80 80	2 2 30 14 (3 m) 11/ <sub>2</sub> 20 - 2.7 3 m) 100 125 -	125 215 –	30 - - 1.8
Fluid: saturated steam  Type L 1S  Double-seated regulating valves wi $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L 2  Double-seated reverse-acting valve $\Delta p_{max} \text{ for sensor type}$ Fluid: water < 120 °C  Type L2SR  Double-seated reverse-acting valve	4.05 4.10  th screwed column in the screwed	16 16 nnection 1/2/6 0.45 - connect 1/2 2.78 ed ends a 20 5 8.3	16 16 and rod- 1/2/9 0.95 ion and rod- 25 7.5 8	- type copp  1/2 / 12  1.7	16    1/2   2.75   -	9 or with co 3/4 5 nsor with 1 7.5 or with 0 50 30 -	1 7.5 — — — — — — — — — — — — — — — — — — —	11/ <sub>4</sub> 12.5	11/ <sub>2</sub> 20 21 21 21 21 21 21 21 21 21 21 21 21 21	2 2 30 14 (3 m) 11/ <sub>2</sub> 20 - 2.7 3 m) 100 125 -	125 215 –	30 - - 1.8

