

Temperature regulator
DN 15 - 100

ARI-TEMPTRÖL®
Thermal closing valve
straight through with flanges

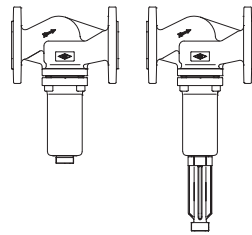


Fig. 771 Fig. 772 Page 2

ARI-TEMPTRÖL® LCG
Thermal closing valve
straight through with screwed sockets
without balanced bellow

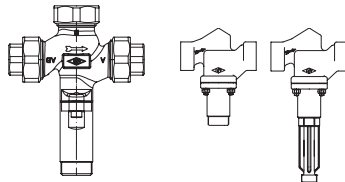


Fig. 771...2.1 Fig. 771/772...2.1
SA105 Page 4

ARI-TEMPTRÖL®
Thermal opening valve
straight through with flanges

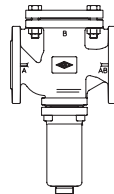


Fig. 775 Page 6

ARI-TEMPTRÖL® LCG
Thermal opening valve
straight through with screwed sockets
without balanced bellow

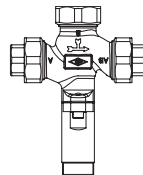


Fig. 775...2.1 Page 8

ARI-TEMPTRÖL®
Thermal mixing/diverting valve
3-way form with flanges

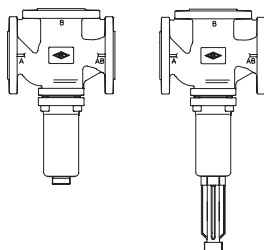


Fig. 773 Fig. 774 Page 10

ARI-TEMPTRÖL® LCG
Thermal mixing/diverting valve
3-way form with screwed sockets without
balanced bellow

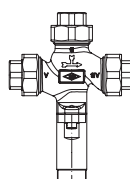


Fig. 773...2.1 Page 12



Fig. 771



Fig. 775



Fig. 773

• TÜV-approval acc. to DIN EN 14597 / Reg.-No. TR910/TW911
• Approved through Germanischen Lloyd

Features:

- Self-operating (no auxiliary power required)
- Reliable, low maintenance operation
- Over-temperature safety device
- Valves pressure balanced with stainless steel bellows
- 3 thermal controller sizes for optimal selection of proportional range
- Thermal sensors with different time constants
- Exact and easy adjustment
- Setting range is adjustable
- Sensor pocket
- Manual control device

Thermal closing valve straight through with flanges

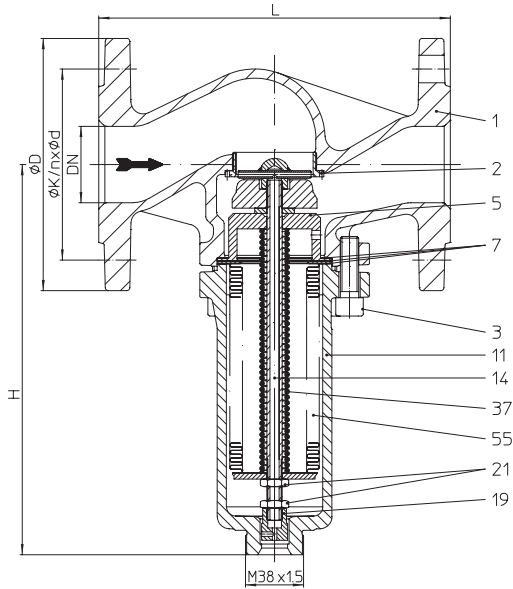


Fig. ...771 max. 150°C

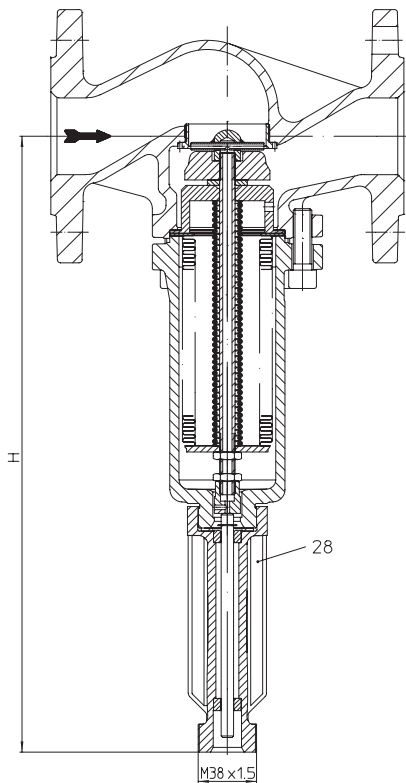


Fig. ...772 with cooling spacer max. 300°C

Figure	Nominal pressure	Material	Nominal diameter
12.771 / 12.772	PN16	EN-JL1040	DN15-100
22.771 / 22.772	PN16	EN-JS1049	DN15-100
23.771 / 23.772	PN25	EN-JS1049	DN15-100
35.771 / 35.772	PN40	1.0619+N	DN15-100
55.771 / 55.772	PN40	1.4408	DN15-100

Selection of possible applications

Industrial heating and ventilation systems, residential applications, marked-warehouses, ship building, cooling systems, etc..
(other applications on request)

Selection of possible flow media

Fluids, air and steam
(other flow media on request)

Construction LC without balanced below

Figure	Nominal pressure	Material	Nominal diameter
12.771....1..1	PN16	EN-JL1040	DN15-50
12.772....1..1			

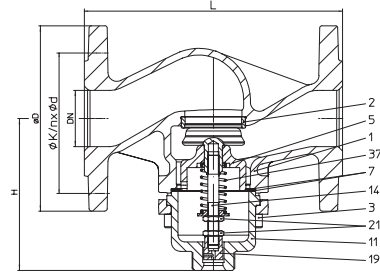


Fig. 12.771....1..1 max. 130°C

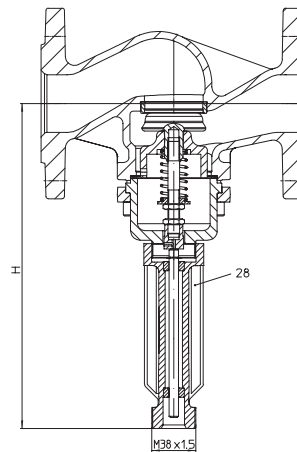


Fig. 12.772....1..1 with cooling spacer max. 250°C

Dimensions and weights

DN			15	20	25	32	40	50	65	80	100
L		(mm)	130	150	160	180	200	230	290	310	350
Fig. 771	H	(mm)	160	160	195	195	215	255	260	320	340
	Weight	(kg)	3,3	4,3	6	7,1	9,8	12,2	23	29	38
Fig. 772	H	(mm)	305	305	340	340	360	400	405	455	485
	Weight	(kg)	4,3	5,3	7	8,1	10,8	13,2	24	30	39
Fig. 771...1..1 (LC)	H	(mm)	125	125	125	125	130	135	--	--	--
	Weight	(kg)	2,5	3,5	5	6	8	10	--	--	--
Fig. 772...1..1 (LC)	H	(mm)	270	270	270	270	275	280	--	--	--
	Weight	(kg)	3,5	4,5	6	7	9	11	--	--	--

Standard-flange dimensions refer to page 15.

Face-to-face dimension FTF series 1 according to DIN EN 558

Kvs-value

DN			15	20	25	32	40	50	65	80	100
Standard Kvs-values		(m³/h)	4,0	6,3	10,0	16,0	22,0	32,0	50,0	70,0	80,0
Travel		(mm)	7,5	7,5	8	9,5	9,5	11,5	14	15	15
Reduced Kvs-values		(m³/h)	0,4	1,0	--	--	--	--	--	--	--
Travel		(mm)	5	5	--	--	--	--	--	--	--
Leakage rate		IV acc. to DIN EN 1349 (≤ 0,01% from the nominal flow)									

Max. differential pressure drop Δp

DN			15	20	25	32	40	50	65	80	100
Fig. 771 Fig. 772	Straight through	(bar)	16	16	16	16	12	9	9	9	9
Fig. 771...1..1 (LC) Fig. 772...1..1 (LC)	Straight through	(bar)	9,3	9,3	5,6	4,1	2,3	1,5	--	--	--

Pressure balancing of the actuator needed: P1 > Δp (e.g. P1=12 bar, Δp=9 bar). For pressure balancing use manual control device (Type 9900390011).

Parts

Pos.	Description	Fig. 12.771 Fig. 12.772	Fig. 22./23.771 Fig. 22./23.772	Fig. 35.771 Fig. 35.772	Fig. 55.771 Fig. 55.772	
1	Body	EN-JL1040, EN-GJL-250	EN-JS1049, EN-GJS-400-18U-LT	GP240GH+N, 1.0619+N	GX5CrNiMo19-11-2, 1.4408	
2	Seat	X6CrNiTi18-10, 1.4541				
3	Cylinder screw	A2-70				
5	Guide bushing	X6CrNiTi18-10, 1.4541				
7	Gasket *	Graphite				
11	Hood	EN-JS1049, EN-GJS-400-18U-LT			X6CrNiMoTi17-12-2, 1.4571	
14	Spindle unit *	X6CrNiTi18-10, 1.4541				
19	Pressure piece	X6CrNiTi18-10, 1.4541				
21	Hexagon nut	A2-70				
28	Cooling spacer	EN-JS1049, EN-GJS-400-18U-LT			X6CrNiTi18-10, 1.4541	
37	Spring *	X12CrNi17-7, 1.4310				
55	Balanced bellow *	X6CrNiTi18-10, 1.4541				

* Spare part

Information / restriction of technical rules need to be observed!

Operating instructions can be ordered by phone +49 (0)5207 / 994-0 or fax +49 (0)5207 / 994-158 or -159.

ARI-Valves of EN-JL1040 are not allowed to be operated in systems acc. to TRD 110.

A production allowance acc. to TRB 801 No. 45 exists (acc. to TRB 801 No. 45 EN-JL1040 is not allowed.)

The engineer, designing a system or a plant, is responsible for the selection of the correct valve.

Thermal closing valve straight through with screwed sockets without balanced bellows

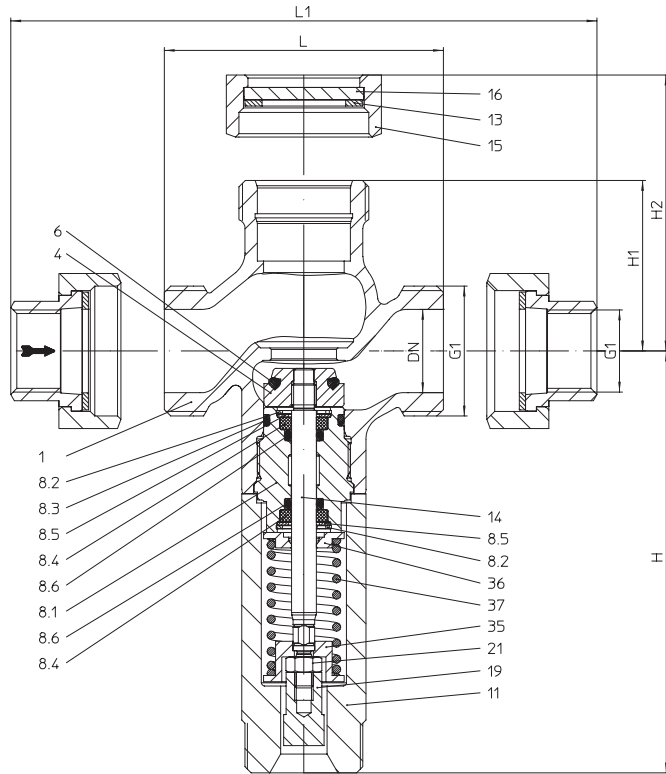


Figure	Nominal pressure	Material	Nominal diameter
72.771....2..1	PN16	CC491K	G1/2" - G1"

Selection of possible applications

Industrial heating and ventilation systems, residential applications, marked-warehouses, ship building, cooling systems, etc..
(other applications on request)

Selection of possible flow media

Liquids and Luft
(other flow media on request)

Figure	Nominal pressure	Material	Nominal diameter
45.771....2..1	PN40	SA105	G1/2" - G2"
45.772....2..1			

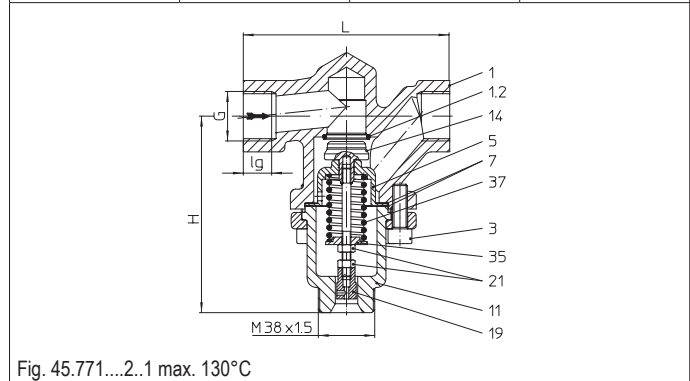


Fig. 45.771....2..1 max. 130°C

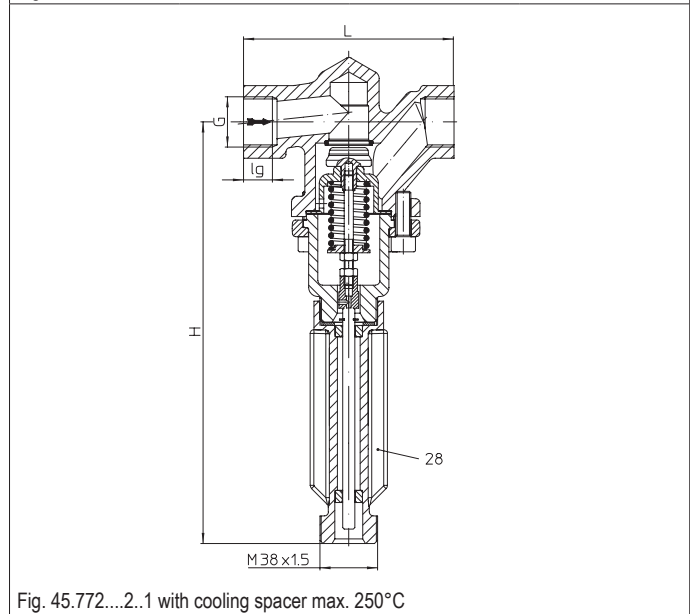


Fig. 45.772....2..1 with cooling spacer max. 250°C

Fig. 72.771....2..1 max. 130°C

Dimensions and weights

DN		15	20	25	32	40	50
Ø G1		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Ø G2		1 1/8"	1 1/4"	1 1/2"	2"	2 1/4"	2 3/4"
L	(mm)	80	90	110	120	130	150
L1	(mm)	128	138	166	--	--	--
Fig. 771....2..1	H	(mm)	283	283	289	--	--
	H1	(mm)	55	55	55	--	--
	H3	(mm)	65	65	66	--	--
	Weight	(kg)	2,9	3,1	3,7	--	--
Fig. 45.771....2..1	H	(mm)	127	127	131	138	138
	Weight	(kg)	2,5	3,5	5	6	8
Fig. 45.772....2..1	H	(mm)	272	272	276	283	283
	Weight	(kg)	3,5	4,5	6	7	9

Face-to-face dimension FTF series 1 according to DIN EN 558

Kvs-value

DN		15	20	25	32	40	50
Ø G1		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Fig. 72.771....2..1	Kvs-value	(m³/h)	4,0	6,3	10,0	--	--
	Travel	(mm)	7,5	7,5	8	--	--
Fig. 45.771....2..1	Kvs-value	(m³/h)	3,1	5,5	8,6	12,8	20
Fig. 45.772....2..1	Travel	(mm)	7,5	7,5	8	9,5	11,5
Leakage rate		IV acc. to DIN EN 1349 (≤ 0,01% from the nominal flow)					

Max. differential pressure drop Δp

DN		15	20	25	32	40	50
Ø G1		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Fig. 72.771....2..1	Straight through	(bar)	9,3	9,3	5,6	--	--
Fig. 45.771....2..1 Fig. 45.772....2..1	Straight through	(bar)	9,3	9,3	5,6	4,1	2,3
Pressure balancing of the actuator needed: P1 > Δp (e.g. P1=12 bar, Δp=9,3 bar). For pressure balancing use manual control device (Type 9900390011).							

Parts

Pos.	Description	Fig. 72.771....2..1	Fig. 45.771....2..1 / Fig. 45.772....2..1
1	Body	CuSn5Zn5Pb5-C, CC491K	SA105
1.2	Seat	--	X6CrNiTi18-10, 1.4541
3	Cylinder screw	A4-70	A2-70
4	Plug *	CuZn39Pb3, CW614N	--
5	Guide bushing	--	X6CrNiTi18-10, 1.4541
6	O-ring *	EPDM	--
7	Gasket *	--	Graphite
8.1	Screw joint	CuZn39Pb3, CW614N	--
8.2	Retaining ring	CuSn8, CW453K	--
8.3	O-ring *	EPDM	--
8.4	Bushing	PTFE	--
8.5	Washer	CuZn37, CW508L	--
8.6	O-ring *	EPDM	--
11	Hood	CuZn39Pb3, CW614N	EN-JS1049, EN-GJS-400-18U-LT
13	Sealing ring	Centellen	--
14	Stem / Spindle unit *	X6CrNiMoTi17-12-2, 1.4571	X6CrNiTi18-10, 1.4541
15	Sleeve nut	TMP / chrom.	--
16	Blind plate	S235JR, 1.0037	--
19	Pressure piece	X6CrNiTi18-10, 1.4541	--
21	Hexagon nut	A2	A2-70
28	Cooling spacer	--	EN-JS1049, EN-GJS-400-18U-LT
35	Spring plate	X6CrNiTi18-10, 1.4541	--
36	Spring plate	X6CrNiMoTi17-12-2, 1.4571	--
37	Spring *	X10CrNi18-8, 1.4310	--

* Spare parts

Information / restriction of technical rules need to be observed!

A production allowance acc. to TRB 801 No. 45 exists.

The engineer, designing a system or a plant, is responsible for the selection of the correct valve.

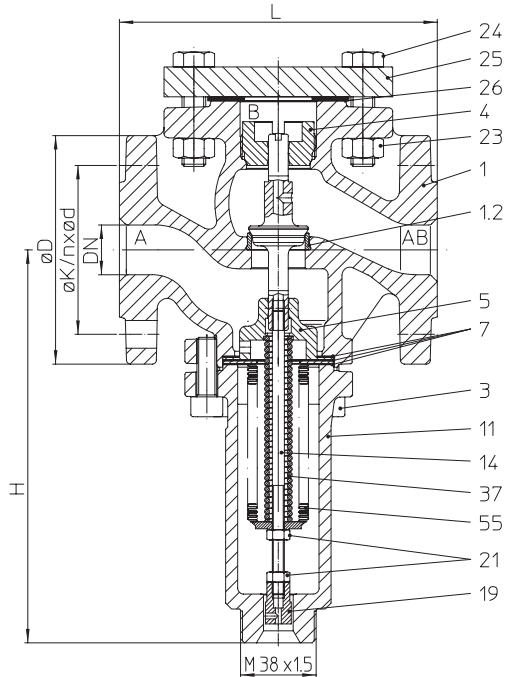
Thermal opening valve straight through with flanges


Fig. ...775 max. 150°C (> 150°C on request)

Figure	Nominal pressure	Material	Nominal diameter
12.775	PN16	EN-JL1040	DN15-100
22.775	PN16	EN-JS1049	DN15-100
23.775	PN25	EN-JS1049	DN15-100
35.775	PN40	1.0619+N	DN15-100
55.775	PN40	1.4408	DN15-100

Selection of possible applications

Industrial heating and ventilation systems, residential applications, marked-warehouses, ship building, cooling systems, etc..
 (other applications on request)

Selection of possible flow media

Fluids, air and steam
 (other flow media on request)

Construction LC without balanced bellows

Figure	Nominal pressure	Material	Nominal diameter
12.775...1..1	PN16	EN-JL1040	DN15-50

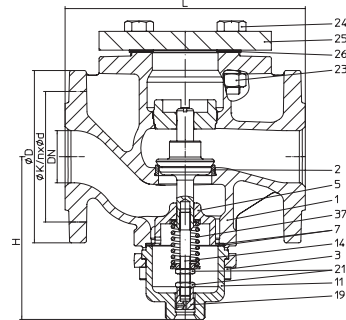


Fig. 12.775...1..1 max. 130°C (> 130°C on request)

Dimensions and weights

DN			15	20	25	32	40	50	65	80	100
L		(mm)	130	150	160	180	200	230	290	310	350
Fig. 775	H	(mm)	195	195	200	225	245	280	300	365	385
	Weight	(kg)	5,4	6,8	9,1	11,9	17	19,5	30	37	46
Fig. 775....1..1 (LC)	H	(mm)	125	125	130	155	160	160	--	--	--
	Weight	(kg)	4,5	6	8	10,5	15	17	--	--	--

Standard-flange dimensions refer to page 15.

Face-to-face dimension FTF series 1 according to DIN EN 558

Kvs-value

DN			15	20	25	32	40	50	65	80	100
Standard Kvs-values		(m³/h)	4,0	6,3	10,0	16,0	22,0	32,0	50,0	70,0	80,0
Travel		(mm)	7,5	7,5	8	9,5	9,5	11,5	14	15	15
Reduced Kvs-values		(m³/h)	1,0	--	--	--	--	--	--	--	--
Travel		(mm)	5	--	--	--	--	--	--	--	--
Leakage rate			IV acc. to DIN EN 1349 (≤ 0,01% from the nominal flow)								

Max. differential pressure drop Δp

DN			15	20	25	32	40	50	65	80	100
Fig. 775	A ⇌ AB	(bar)	12	4	4	4	4	4	4	4	4
	Straight through										
Fig. 775....1..1 (LC)	A ⇌ AB	(bar)	3	3	2,5	1,5	1	0,5	--	--	--
	Straight through										

Pressure balancing of the actuator needed: P1 > Δp (e.g. P1=14 bar, Δp=12 bar). For pressure balancing use manual control device (Type 9900390011).

Parts

Pos.	Description	Fig. 12.775	Fig. 22./23.775	Fig. 35.775	Fig. 55.775
1	Body	EN-JL1040, EN-GJL-250	EN-JS1049, EN-GJS-400-18U-LT	GP240GH+N, 1.0619+N	GX5CrNiMo19-11-2, 1.4408
1.2	Seat	X20Cr13+QT, 1.4021+QT			X6CrNiMoTi17-12-2, 1.4571
3	Cylinder screw	A2-70			
4	Plug guiding	X20Cr13+QT, 1.4021+QT			X6CrNiTi18-10, 1.4541
5	Guide bushing	X20Cr13+QT, 1.4021+QT			X6CrNiTi18-10, 1.4541
7	Gasket *	Graphite			
11	Hood	EN-JS1049, EN-GJS-400-18U-LT			X6CrNiMoTi17-12-2, 1.4571
14	Spindle unit *	X20Cr13+QT, 1.4021+QT / X6CrNiTi18-10, 1.4541			X6CrNiTi18-10, 1.4541
19	Pressure piece	X6CrNiTi18-10, 1.4541			
21	Hexagon nut	A2-70			
23	Hexagon nut	C35E, 1.1181 -A2B			A4-70
24	Hexagon screw	5.6-A2B			A4-70
25	Flange	S235JR, 1.0037			X6CrNiTi18-10, 1.4541
26	Gasket *	Graphite (with CrNi-Streckmetalleinlage)			
28	Cooling spacer	EN-JS1049, EN-GJS-400-18U-LT			X6CrNiTi18-10, 1.4541
37	Spring *	X12CrNi17-7, 1.4310			
55	Balanced bellow *	X6CrNiTi18-10, 1.4541			

* Spare part

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ARI-Valves of EN-JL1040 are not allowed to be operated in systems acc. to TRD 110.

A production allowance acc. to TRB 801 No. 45 exists (acc. to TRB 801 No. 45 EN-JL1040 is not allowed.)

The engineer, designing a system or a plant, is responsible for the selection of the correct valve.

Thermal opening valve straight through with screwed sockets without balanced bellow

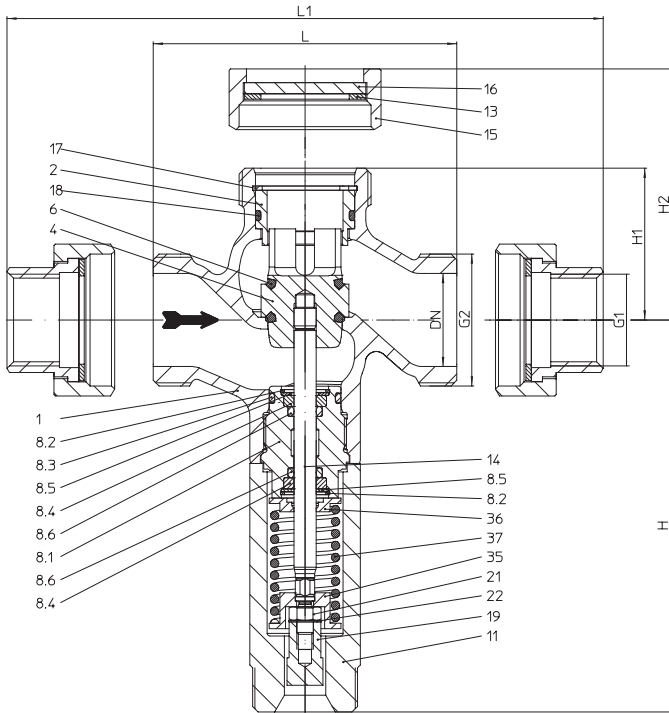


Figure	Nominal pressure	Material	Nominal diameter
72.775....2..1	PN16	CC491K	G1/2" - G2"

Selection of possible applications

Industrial heating and ventilation systems, residential applications, marked-warehouses, ship building, cooling systems, etc..
(other applications on request)

Selection of possible flow media

Fluids, air and steam
(other flow media on request)

Fig. 72.775....2..1 max. 130°C

Dimensions and weights

DN		15	20	25	32	40	50
Ø G1		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Ø G2		1 1/8"	1 1/4"	1 1/2"	2"	2 1/4"	2 3/4"
L	(mm)	80	90	110	120	130	150
L1	(mm)	128	138	166	186	199	223
Fig. 775....2..1	H	(mm)	283	283	289	293	302
	H1	(mm)	55	55	55	55	60
	H2	(mm)	79	79	83	88	95
	Weight	(kg)					

Face-to-face dimension FTF series 1 according to DIN EN 558

Kvs-value

DN		15	20	25	32	40	50
Ø G1		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Kvs-value	(m³/h)	4,0	6,3	10,0	16,0	25,0	40,0
Travel	(mm)	14	14	14	14	14	14
Leakage rate		IV acc. to DIN EN 1349 (≤ 0,01% from the nominal flow)					

Max. differential pressure drop Δp

DN		15	20	25	32	40	50
Ø G1		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
A → AB	(bar)	3	3	2,5	1,5	1	0,5
Straight through							

Parts

Pos.	Description	Fig. 72.775
1	Body	CuSn5Zn5Pb5-C, CC491K
2	Seat ring	X20Cr13+QT, 1.4021+QT
3	Cylinder screw	A4-70
4	Plug *	CuZn39Pb3, CW614N
6	O-ring *	EPDM
8.1	Screw joint	CuZn39Pb3, CW614N
8.2	Retaining ring	CuSn8, CW453K
8.3	O-ring *	EPDM
8.4	Bushing	PTFE
8.5	Washer	CuZn37, CW508L
8.6	O-ring *	EPDM
11	Hood	CuZn39Pb3, CW614N
13	Sealing ring	Centellen
14	Stem *	X6CrNiMoTi17-12-2, 1.4571
15	Sleeve nut	TMP / chrom.
16	Blind plate	S235JR, 1.0037
17	Retaining ring	FSt
18	O-ring *	EPDM
19	Pressure piece	X6CrNiTi18-10, 1.4541
21	Hexagon nut	A2
22	Washer	A2
35	Spring plate	X6CrNiTi18-10, 1.4541
36	Spring plate	X6CrNiMoTi17-12-2, 1.4571
37	Spring *	X10CrNi18-8, 1.4310

* Spare parts

Information / restriction of technical rules need to be observed!

A production allowance acc. to TRB 801 No. 45 exists.

The engineer, designing a system or a plant, is responsible for the selection of the correct valve.

Thermal mixing/diverting valve in 3-way form with flanges

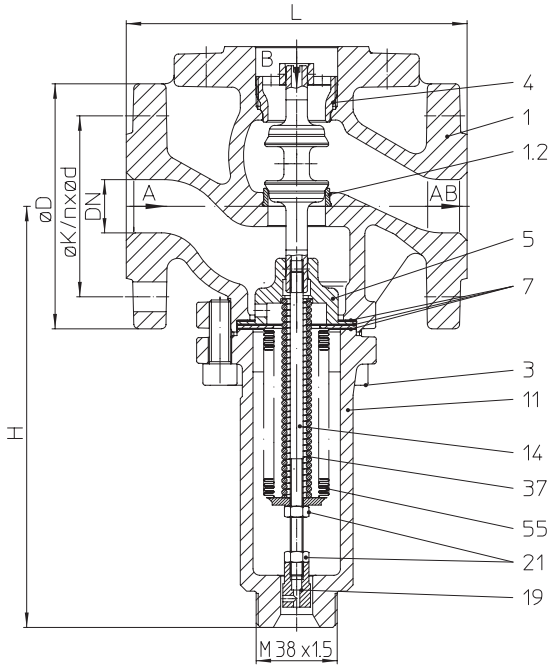


Fig. ...773 max. 150°C

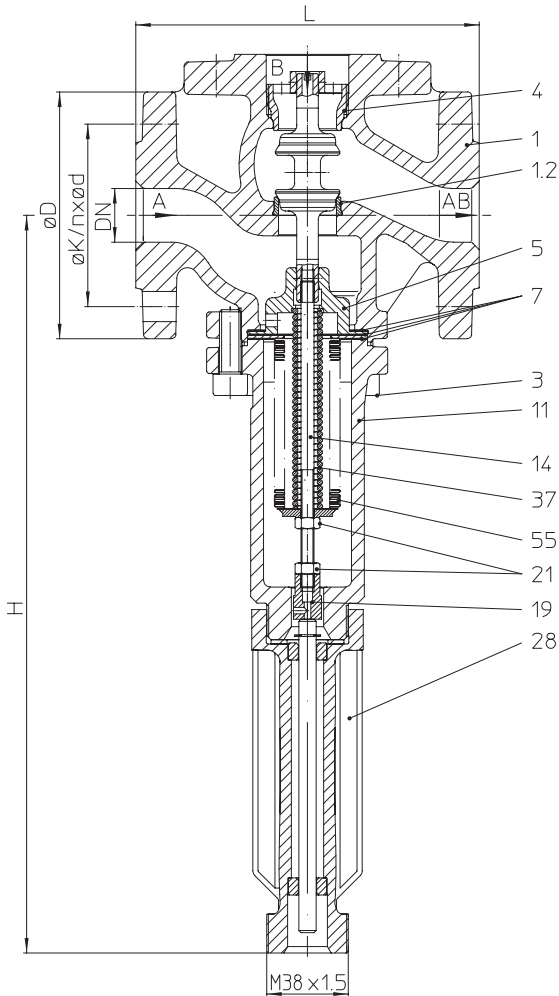


Fig. ...774 with cooling spacer max. 300°C

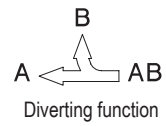
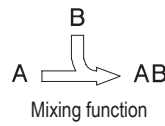
Figure	Nominal pressure	Material	Nominal diameter
12.773 / 12.774	PN16	EN-JL1040	DN15-100
22.773 / 22.774	PN16	EN-JS1049	DN15-100
23.773 / 23.774	PN25	EN-JS1049	DN15-100
35.773 / 35.774	PN40	1.0619+N	DN15-100
55.773 / 55.774	PN40	1.4408	DN15-100

Selection of possible applications

Industrial heating and ventilation systems, residential applications, marked-warehouses, ship building, cooling systems, etc.. (other applications on request)

Selection of possible flow media

Fluids, air and steam (other flow media on request)



Construction LC without balanced bellow

Figure	Nominal pressure	Material	Nominal diameter
12.773....1..1	PN16	EN-JL1040	DN15-50
12.774....1..1			

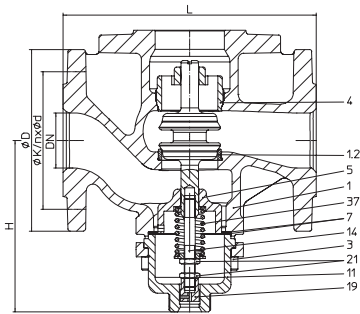


Fig. 12.773....1..1 max. 150°C

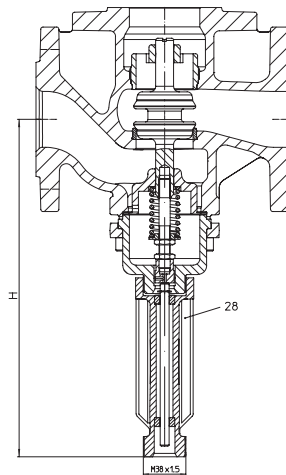


Fig. 12.774....1..1 with cooling spacer max. 300°C

Dimensions and weights

DN		15	20	25	32	40	50	65	80	100	
L	(mm)	130	150	160	180	200	230	290	310	350	
Fig. 773	H	(mm)	195	195	200	225	245	280	300	365	385
	Weight	(kg)	4,4	5,8	7,6	9,9	14,5	16,5	25	31	38
Fig. 774	H	(mm)	340	340	345	370	390	425	445	510	530
	Weight	(kg)	5,4	6,8	8,6	10,9	15,5	17,5	26	32	39
Fig. 773....1.1 (LC)	H	(mm)	125	125	130	155	160	160	--	--	--
	Weight	(kg)	3,5	5	6,5	8,5	12,5	14	--	--	--
Fig. 774....1.1 (LC)	H	(mm)	270	270	275	300	305	305	--	--	--
	Weight	(kg)	4,5	6	7,5	9,5	13,5	15	--	--	--

Standard-flange dimensions refer to page 15.

Face-to-face dimension FTF series 1 according to DIN EN 558

Kvs-value

DN		15	20	25	32	40	50	65	80	100
Standard Kvs-values	(m³/h)	4,0	6,3	10,0	16,0	22,0	32,0	50,0	70,0	80,0
Travel	(mm)	7,5	7,5	8	9,5	9,5	11,5	14	15	15
Reduced Kvs-values	(m³/h)	1,0	--	--	--	--	--	--	--	--
Travel	(mm)	5	--	--	--	--	--	--	--	--

Leakage rate

 IV acc. to DIN EN 1349 ($\leq 0,01\%$ from the nominal flow)

Max. differential pressure Δp

DN		15	20	25	32	40	50	65	80	100	
Fig. 773 Fig. 774	 Mixing function	$p_B > p_A$ ($\Delta p = p_B - p_A$) (bar)	12	16	16	16	12	9	9	9	9
		$p_A > p_B$ ($\Delta p = p_A - p_B$) (bar)	12	4	4	4	4	4	4	4	4
Fig. 773....1.1 (LC) Fig. 774....1.1 (LC)	 Diverting function	$p_{AB} > p_B$ $p_{AB} > p_A$ (bar)	12	4	4	4	3	1,5	0,7	0,25	0,15
	 Mixing function	$p_{AB} > p_B$ $p_{AB} > p_A$ (bar)	3	3	2,5	1,5	1	0,5	--	--	--
Fig. 773....1.1 (LC) Fig. 774....1.1 (LC)	 Diverting function	(bar)	3	3	2,5	1,5	1	0,5	--	--	--
		(bar)	3	3	2,5	1,5	1	0,5	--	--	--

 Pressure balancing of the actuator needed: $P_1 > \Delta p$ (e.g. $P_1=14$ bar, $\Delta p=12$ bar). For pressure balancing use manual control device (Type 9900390011).

Parts

Pos.	Description	Fig. 12.773 Fig. 12.774	Fig. 22./23.773 Fig. 22./23.774	Fig. 35.773 Fig. 35.774	Fig. 55.773 Fig. 55.774
1	Body	EN-JL1040, EN-GJL-250	EN-JS1049, EN-GJS-400-18U-LT	GP240GH+N, 1.0619+N	GX5CrNiMo19-11-2, 1.4408
1.2	Seat	X20Cr13+QT, 1.4021+QT			X6CrNiMoTi17-12-2, 1.4571
3	Cylinder screw	A2-70			
4	Plug guiding	X20Cr13+QT, 1.4021+QT			X6CrNiTi18-10, 1.4541
5	Guide bushing	X20Cr13+QT, 1.4021+QT			X6CrNiTi18-10, 1.4541
7	Gasket *	Graphite			
11	Hood	EN-JS1049, EN-GJS-400-18U-LT			X6CrNiMoTi17-12-2, 1.4571
14	Spindle unit *	X20Cr13+QT, 1.4021+QT / X6CrNiTi18-10, 1.4541			X6CrNiTi18-10, 1.4541
19	Pressure piece	X6CrNiTi18-10, 1.4541			
21	Hexagon nut	A2-70			
28	Cooling spacer	EN-JS1049, EN-GJS-400-18U-LT			X6CrNiTi18-10, 1.4541
37	Spring *	X12CrNi17-7, 1.4310			
55	Balanced bellow *	X6CrNiTi18-10, 1.4541			

* Spare part

Information / restriction of technical rules need to be observed!

Operating instructions can be ordered by phone +49 (0)5207 / 994-0 or fax +49 (0)5207 / 994-158 or -159.

ARI-Valves of EN-JL1040 are not allowed to be operated in systems acc. to TRD 110.

A production allowance acc. to TRB 801 No. 45 exists (acc. to TRB 801 No. 45 EN-JL1040 is not allowed.)

The engineer, designing a system or a plant, is responsible for the selection of the correct valve.

Thermal mixing/diverting valve in 3-way form with screwed sockets without balanced bellow

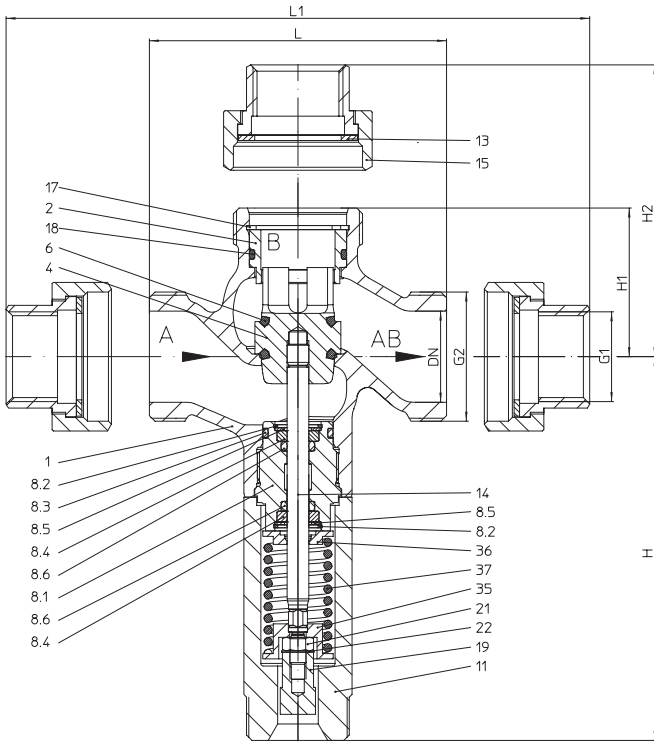


Figure	Nominal pressure	Material	Nominal diameter
72.773....2..1	PN16	CC491K	G1/2" - G2"

Selection of possible applications

Industrial heating and ventilation systems, residential applications, marked-warehouses, ship building, cooling systems, etc..
(other applications on request)

Selection of possible flow media

Fluids, air and steam
(other flow media on request)

Fig. 72.773....2..1 max. 130°C

Dimensions and weights

DN		15	20	25	32	40	50
Ø G1		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Ø G2		1 1/8"	1 1/4"	1 1/2"	2"	2 1/4"	2 3/4"
L	(mm)	80	90	110	120	130	150
L1	(mm)	128	138	166	186	199	223
Fig. 773	H	(mm)	136	136	142	146	155
	H1	(mm)	55	55	55	55	60
	H2	(mm)	79	79	83	88	95
	Weight	(kg)	2,4	2,6	3,2	4,1	4,7

Face-to-face dimension FTF series 1 according to DIN EN 558

Kvs-value

DN		15	20	25	32	40	50
Ø G1		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Standard Kvs-values	(m³/h)	4,0	6,3	10,0	16,0	25,0	40,0
Travel	(mm)	14	14	14	14	14	14
Leakage rate		IV acc. to DIN EN 1349 (≤ 0,01% from the nominal flow)					

Max. differential pressure drop Δp

DN		15	20	25	32	40	50
Ø G1		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
 Mixing function	(bar)	3	3	2,5	1,5	1	0,5
 Diverting function	(bar)	3	3	2,5	1,5	1	0,5

Parts

Pos.	Description	Fig. 72.773
1	Body	CuSn5Zn5Pb5-C, CC491K
2	Seat ring	X20Cr13+QT, 1.4021+QT
4	Plug	CuZn39Pb3, CW614N
6	O-ring *	EPDM
8.1	Screw joint	CuZn39Pb3, CW614N
8.2	Retaining ring	CuSn8, CW453K
8.3	O-ring *	EPDM
8.4	Bushing	PTFE
8.5	Washer	CuZn37, CW508L
8.6	O-ring *	EPDM
11	Hood	CuZn39Pb3, CW614N
13	Sealing ring	Centellen
14	Stem *	X6CrNiMoTi17-12-2, 1.4571
15	Sleeve nut	TMP / chrom.
17	Retaining ring	FSt
18	O-ring *	EPDM
19	Pressure piece	X6CrNiTi18-10, 1.4541
21	Hexagon nut	A2
22	Washer	A2
35	Spring plate	X6CrNiTi18-10, 1.4541
36	Spring plate	X6CrNiMoTi17-12-2, 1.4571
37	Spring *	X10CrNi18-8, 1.4310

* Spare parts

Information / restriction of technical rules need to be observed!

A production allowance acc. to TRB 801 No. 45 exists.

The engineer, designing a system or a plant, is responsible for the selection of the correct valve.

Application / Operating principle

Thermal control devices are used to regulate temperature of fluids, air and steam. You will find them in industrial heating and ventilation systems, in residential applications, in marked-warehouses, ship building and also in cooling systems.

The ARI-Temperature Regulator (TEMPTRÖL) works on the principle of thermal expansion. For operation no extra energy is needed, self acting. Changes in temperature lead to changes in fluid volume in the capillary tube, which means a certain stroke in the actuator onto the valve spindle. The excess temperature protector prevents an unnecessary load on the controller when the temperature is too high on the thermal sensor. The setting range can be adjusted precisely with the adjusting knob to the required temperature value. If a manual control device is fitted, the stroke position is shown and the valve can be operated manually. With thermal detectors acc. to DIN EN 14597, the intended value can only be adjusted with tools.

Ambient temperature: max. 70°C for indicator unit (DIN EN 14597 T70)

Operating principle:

Thermal closing valve:	- closes with rising temperature
Thermal opening valve:	- opens with rising temperature
Thermo-3-way mixing valve:	- reduces or closes inlet B with rising temperature (at mixing function, the warmer medium must be put into inlet B)
Thermo-3-way diverting valve:	- reduces resp. closes output B with rising temperature

Selecting the valve

To select the nominal diameter it is necessary to know the Kvs-value.

This can be done using the calculation program „MyValve“ (Module „ARI-Temperature regulator TEMPTRÖL-Calculation“).

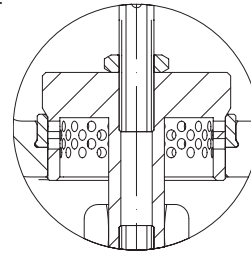
The following data is needed

- Medium
- Temperature
- Flow capacity (Q)
- Upstream pressure (p1)
- Downstream pressure (p2)

Then the thermal controller with the next highest Kvs-value is selected (see table). With „MyValve“ you can also calculate the velocities in the piping, before and behind the valve, and if necessary select the right piping size.

For selecting a valve, the pressure-temperature-ratings must be observed (see page 15), also the corrosive aspect.

If at thermal opening valves and at thermal mixing/diverting valves $\Delta p > \frac{P_1}{2}$, then a perforated plug is recommended.



Selecting the controller

The following must be observed:

- Type selecting acc. to the used medium
(rod sensor, spiral sensor for gas, spiral sensor for liquids, with thread or flange).
- The temperature range.
- Installation place of thermal sensor, set point adjusting unit and valve (length of capillary tubes)..

Then the thermal controller is selected using the recommended proportional range (see page 17).

The proportional range shows by which temperature alteration on the thermal sensor, the valve needs from open to closed position. Preferably use the range between 10 and 15 K. It is also possible to use the other ranges, if the calculation of the control loop finds this necessary. We strongly advise that you check the systems transient response.

Standard-flange dimensions

Flanges acc. to DIN EN 1092-2 (Flange holes / -thickness tolerances acc. to DIN)

DN		(mm)	15	20	25	32	40	50	65	80	100
PN16	ØD	(mm)	95	105	115	140	150	165	185	200	220
PN16	ØK	(mm)	65	75	85	100	110	125	145	160	180
PN16	n x Ød	(mm)	4x14	4x14	4x14	4x18	4x18	4x18	4x18	8x18	8x18
PN25	ØD	(mm)	95	105	115	140	150	165	185	200	235
PN25	ØK	(mm)	65	75	85	100	110	125	145	160	190
PN25	n x Ød	(mm)	4x14	4x14	4x14	4x18	4x18	4x18	8x18	8x18	8x22
PN40	ØD	(mm)	95	105	115	140	150	165	185	200	235
PN40	ØK	(mm)	65	75	85	100	110	125	145	160	190
PN40	n x Ød	(mm)	4x14	4x14	4x14	4x18	4x18	4x18	8x18	8x18	8x22

Pressure-temperature-ratings acc. to DIN EN 1092-2

Material			-60°C to <-10°C*	-10°C to 120°C	150°C	200°C	250°C	300°C
EN-JL1040	16	(bar)	--	16	14,4	12,8	11,2	9,6
EN-JS1049	16	(bar)	on request	16	15,5	14,7	13,9	12,8
EN-JS1049	25	(bar)	on request	25	24,3	23	21,8	20

Pressure-temperature-ratings acc. to manufacturers standard

Material			-60°C to <-10°C*	-10°C bis 120°C	150°C	200°C	250°C	300°C
1.0619+N	40	(bar)	30	40	38,1	35	32	28
SA105	40	(bar)	30	40	38,1	35	32	28
DN100 max. 26 bar								

Pressure-temperature-ratings acc. to DIN EN 1092-1

Material			-60°C to <-10°C*	-10°C to 100°C	150°C	200°C	250°C	300°C
1.4408	40	(bar)	40	40	36,3	33,7	31,8	29,7
DN100 max. 26 bar								

Pressure-temperature-ratings acc. to DIN EN 1092-3

Material			-10°C to 20°C	100°C	130°C
CC491K	16	(bar)	16	16	16

Intermediate values for max. permissible operational pressures can be determined by linear interpolation of the given temperature / pressure chart.

* Studs and nuts made of A4-70 (at temperatures below -10°C)

Please indicate when ordering:

- Figure-No. - Kvs-value
- Nominal diameter - ΔP
- Nominal pressure - Medium
- Body material Ordering data for controller: refer to Seite 16.

Example:

Figure 22.772; Nominal diameter DN25; Nominal pressure PN16; Body material EN-JS1049; Kvs 10, ΔP 3 bar, Water.

 Dimensions in mm
 Weights in kg
 Pressures in barg (gauge)
 1 bar ≙ 10⁵ Pa ≙ 0,1 MPa
 Kvs in m³/h

	Type		Size	Pressure range	Time constant without sensor pocket	Temperature sensor version
	Thermal controller	Thermal detector				
	9900386011	9900387611	I	-20 ... +50°C 0 ... +70°C +30 ... +100°C +60 ... +130°C	75 s ²⁾ measured with water (flow rate 0,2 - 0,3 m/s)	Temperature sensor and setpoint adjusting knob in one unit. Stainless steel 1.4541 (optional sensor pocket)
	9900386021	9900387621	II			
	9900386031	9900387631	III			
	9900386041	9900387641	I			rod sensor, nickel-plated brass (optional sensor pocket)
	9900386051	9900387651	II			
	9900386061	9900387661	III			
	9900386071	9900387671	I			Spiral sensor for gas, Copper blank with flange
	9900386081	9900387681	II			
	9900386091	9900387691	III			
	9900386101	9900387701	I	-20 ... +50°C 0 ... +70°C +30 ... +100°C +60 ... +130°C +130 ... +200°C	80 s measured with air (flow rate 3m/s)	Spiral sensor for gas Copper blank with bracket
	9900386111	9900387711	II			
	9900386121	9900387721	III			
	9900386131	9900387731	I		80 s ²⁾ measured with water (flow rate 0,2 - 0,3 m/s)	Rod sensor, Stainless steel 1.4541 (optional sensor pocket)
	9900386141	9900387741	II			
	9900386151	9900387751	III			
	9900386311	9900387911	I			Spiral sensor for liquids, nickel-plated copper
	9900386321	9900387921	II			
	9900386331	9900387931	III			
	9900386341	9900387941	I	-20 ... +50°C 0 ... +70°C +30 ... +100°C +60 ... +130°C	15 s measured with water (flow rate 0,2 - 0,3 m/s)	Spiral sensor for liquids, Stainless steel 1.4541
	9900386351	9900387951	II			
	9900386361	9900387961	III			
	9900387461		I	+35 ... +105°C trend scale	75 s ³⁾ Flow temperature sensor measured with water (flow rate 0,2 - 0,3 m/s)	rod sensor, nickel-plated brass (optional sensor pocket) outdoor rod sensor, stainl. st. 1.4541 (with bracket)
	9900387471		I			
	9900387481		III			
V1 : V2 = 1 : 2,5 ¹⁾						
	9900387491		I	+10 ... +50°C trend scale	80 s Air intake temperature sensor measured with air (flow rate 3m/s)	Spiral sensor for gas, Copper blank with flange outdoor rod sensor, stainl. st. 1.4541 (with bracket)
	9900387501		II			
	9900387511		III			
V1 : V2 = 1,8 : 1 ¹⁾						
	9900387581		I	+25 ... +95°C trend scale	75 s ³⁾ Flow temperature sensor measured with water (flow rate 0,2 - 0,3 m/s)	rod sensor, nickel-plated brass (optional sensor pocket) outdoor rod sensor, stainl. st. 1.4541 (with bracket)
	9900387591		II			
	9900387601		III			
V1 : V2 = 1 : 1,9 ¹⁾						
1) V1 = Volume of controlled volume sensor V2 = Volume of outside temperature sensor		2) with brass sensor pocket: 100 s with stainless steel sensor pocket: 115 s		3) with brass sensor pocket: 125 s with stainless steel sensor pocket: 145 s		

Proportional range (Combination controller with valve in Kelvin) ¹⁾

DN	15		20	25	32	40	50	65	80	100	
Controller size I	10	10	15	15	17	20	20	24	37	39	39
Controller size II	7,5	7,5	10	10	12	13	13	16	27	29	29
Controller size III	5	5	6,5	6,5	7,5	8,5	8,5	10	20	21	21

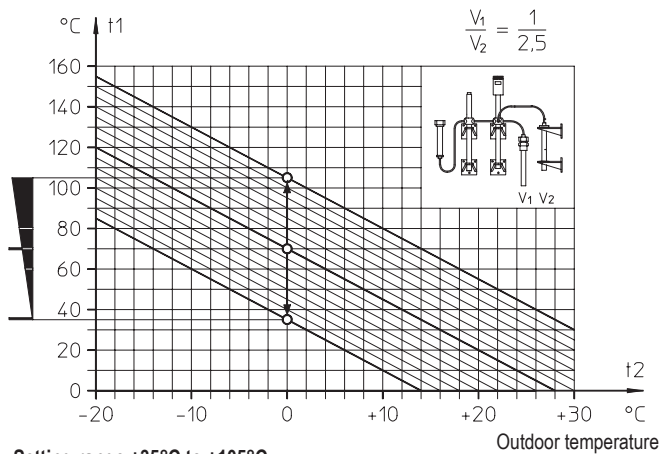
Proportional range Fig. 773 LCG Thermal mixing valve / Fig. 775 LCG Thermal opening valve (Combination controller with valve in Kelvin) ¹⁾

DN	15	20	25	32	40	50
G1	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
G2	1 1/8"	1 1/4"	1 1/2"	2"	2 1/4"	2 3/4"
Controller size I	29	29	29	29	29	29
Controller size II	19	19	19	19	19	19
Controller size III	12	12	12	12	12	12

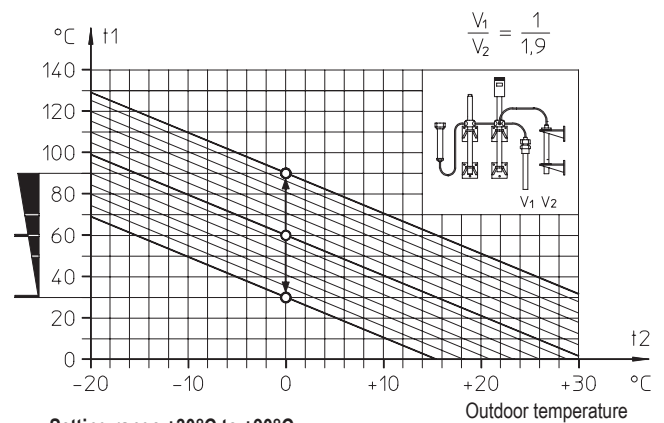
 = recommended combinations

¹⁾ The proportional range determines at what change in sensor temperature the valve will move from totally open to totally closed.

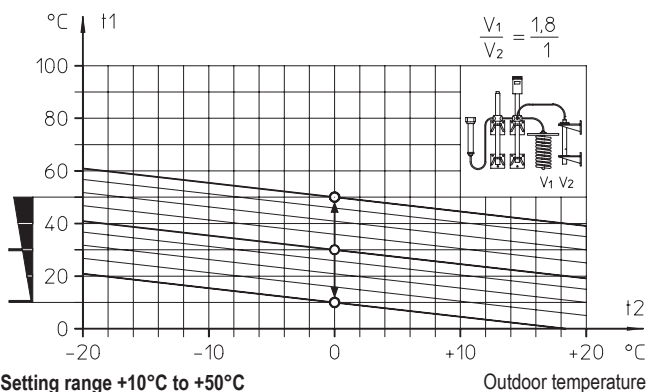
Setting diagrams
(only for temperature regulators with two temperature sensors and trend scale)



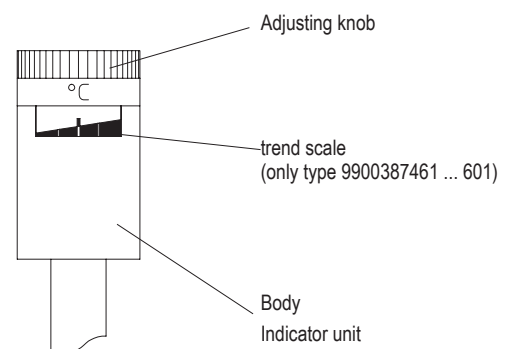
Setting range +35°C to +105°C
Type 9900387461 ... 481



Setting range +30°C to +90°C
Type 9900387581 ... 601



Setting range +10°C to +50°C
Type 9900387491 ... 511

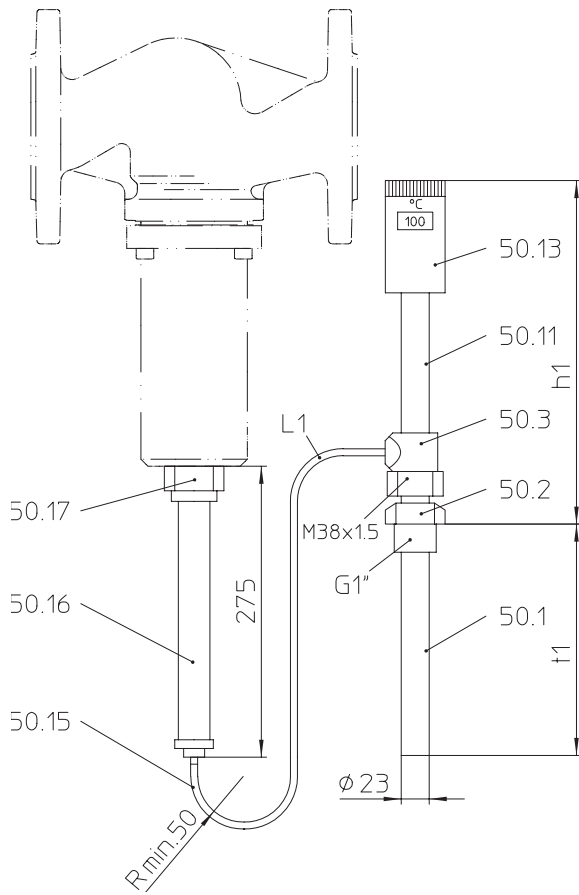


Please indicate when ordering:

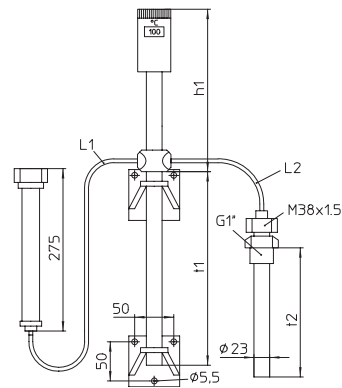
- Thermal controller / detector (Type-No.)
- Temperature range
- Length of capillary tube (refer to page 19: L1 ... L4)
- Top mounted handwheel
- Sensor pocket

Example:

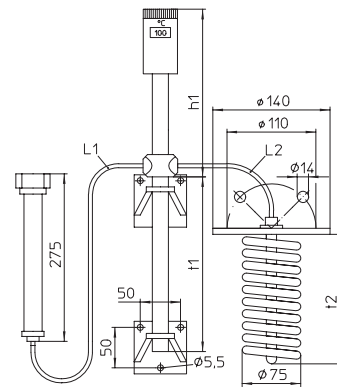
Type 9900386041; temperature range 0...70°C; length of capillary pipe 4m + 4m., Top mounted handwheel, Sensor pocket 990038600Z31



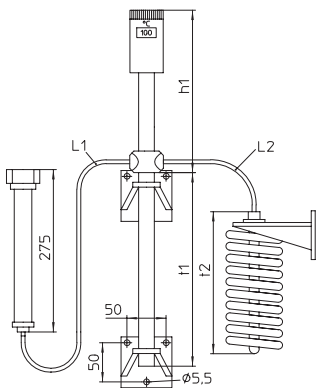
Type 9900386011 ... 031
Type 9900387611 ... 631



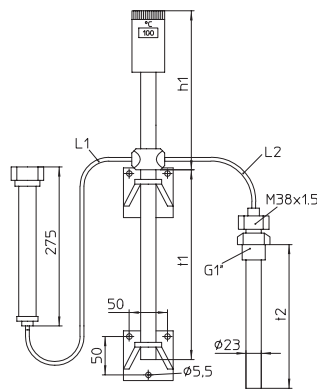
Type 9900386041 ... 061
Type 9900387641 ... 661



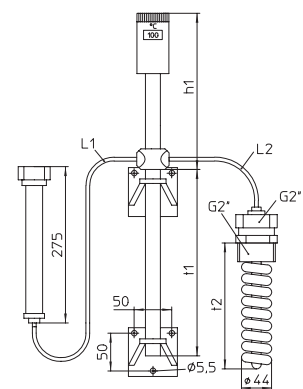
Type 9900386071 ... 091
Type 9900387671 ... 691



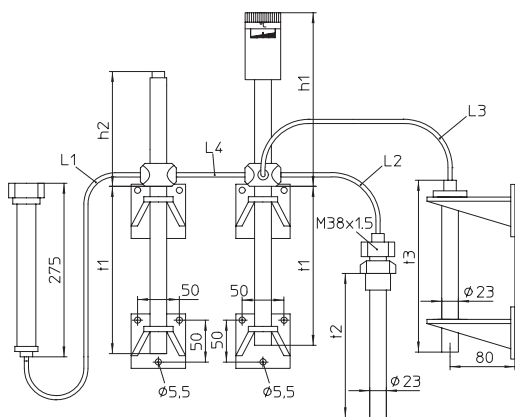
Type 9900386101 ... 121
Type 9900387701 ... 721



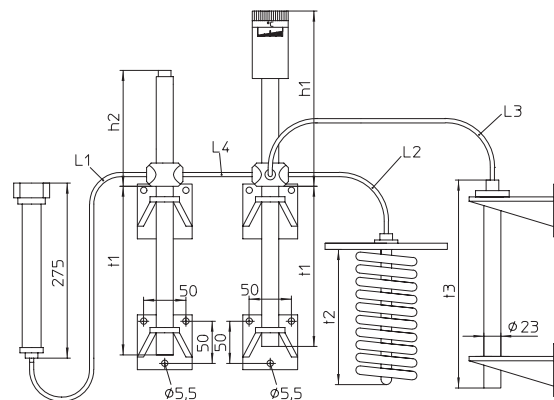
Type 9900386131 ... 151
Type 9900387731 ... 751



Type 9900386311 ... 361
Type 9900387911 ... 961



Type 9900387461 ... 481
Type 9900387581 ... 601



Type 9900387491 ... 511

Dimensions and weights

Type		h1	h2	t1	t2	t3	L1	L2	L3	L4	Weight			
Thermal controller	Thermal detector	(mm)	(mm)	(mm)	(mm)	(mm)	(m)	(m)	(m)	(m)	(kg)			
9900386011	9900387611	269		339			2,4,8,16				1,8			
9900386021	9900387621	347		557							3			
9900386031	9900387631	347		857							3,3			
9900386041	9900387641	240		239	256		2,4,8,16 ¹⁾	2,4,8,16 ¹⁾			3,2			
9900386051	9900387651	318		389	390							3,5		
9900386061	9900387661	318		559	600							4		
9900386071	9900387671	240		239	151							3,2		
9900386081	9900387681	318		389	207							4,2		
9900386091	9900387691	318		559	305							4,5		
9900386101	9900387701	240		239	184							3		
9900386111	9900387711	318		389	240							4		
9900386121	9900387721	318		559	338							4,2		
9900386131	9900387731	240		239	256							3,2		
9900386141	9900387741	318		389	390							3,5		
9900386151	9900387751	318		559	600							4		
9900386311	9900387911	240		239	266							3,5		
9900386321	9900387921	318		389	394							4,5		
9900386331	9900387931	318		559	598							5		
9900386341	9900387941	240		239	266							3,5		
9900386351	9900387951	318		389	394							4,5		
9900386361	9900387961	318		559	598							5		
9900387461		240	201	239	257	708			2,4,8,16 ¹⁾	2,4,8,16 ¹⁾	2,4,8,16 ¹⁾	0,8	4,4	
9900387471		318	201	389	391	1078								
9900387481		318	477	559	601	839								7
9900387491		240	201	239	207	257								5
9900387501		318	201	389	305	384								5,8
9900387511		318	477	559	477	585								7,3
9900387581		240	201	239	257	542								4,2
9900387591		318	201	389	391	824								4,8
9900387601		318	477	559	601	642								6,5

¹⁾ max. permissible length (L1+L2+...) = 24 m

Parts

Pos.	Description *	
50.1	Thermal sensor	Constructions refer to page16
50.2	Screw joint	CuZn39Pb3, CW614N (nickel plated)
50.3	Sleeve nut	St Fe/Zn 12C
50.11	Pipe	Al (painted)
50.13	Indicator unit	ABS (Plastic)
50.15	Capillary tube	Cu (tin plated)
50.16	Actuator	CuZn37, CW508L (nickel plated)
50.17	Sleeve nut	CuZn39Pb3, CW614N (nickel plated)

* Spare part (cpl. unit)

Manual control device Type 9900390011

- Installed as an accessory between controller and valve.
- Allows valve to be operated independently of the controller.
- Valve position indicator (pin) plus two movable wire set rings mark the max. positions (totally open and totally closed) (Pos. 60.3).
- Enables a pressure relief of the actuator.

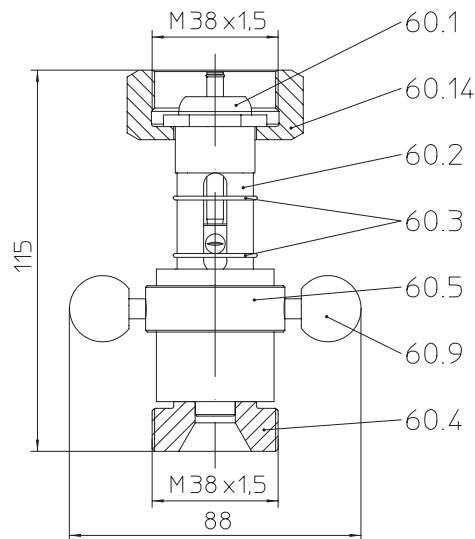
Function:

The spindle of the manual control device transfers the travel of the actuator onto the valve.
The valve and manual control device is sealed metal to metal.
The spindle is sealed with an o-ring and PTFE-strip band.

Parts

Pos.	Description *	Type 9900390011
60.1	Sealing unit	CuZn39Pb3, CW614
60.2	Position tube	11SMn30+C, 1.0715+C
60.3	Retaining ring (Travel indicator)	X12CrNi17-7, 1.4310
60.4	Ground unit	CuZn39Pb3, CW614N
60.5	Adjusting ring	CuZn39Pb3, CW614N
60.9	Ball grip	Plastic
60.14	Sleeve nut	St Fe/Zn 12C

* Spare part (cpl. unit)


Sensor pocket

A sensor pocket eliminates the need to empty the system when replacing the temperature sensor.

Technical data

Construction	Brass	Stainless steel
Material	CW508L, CuZn37	X6CrNiTi18-10, 1.4541
max. pressure (bar)	25	40
max. Temperature (°C)	130	250

Dimensions and weights

Type				L (mm)	Weight (kg)
Thermal controller	Thermal detector	Sensor pocket Brass	Sensor pocket Stainless steel		
9900386011	9900387611	990038600Z22	990038600Z32	344	0,5
9900386021	9900387621	990038600Z24	990038600Z34	562	0,7
9900386031	9900387631	990038600Z26	990038600Z36	862	1,0
9900386041	9900387641	990038600Z21	990038600Z31	262	0,4
9900386051	9900387651	990038600Z23	990038600Z33	396	0,6
9900386061	9900387661	990038600Z25	990038600Z35	606	0,8
9900386131	9900387731	990038600Z21	990038600Z31	262	0,4
9900386141	9900387741	990038600Z23	990038600Z33	396	0,6
9900386151	9900387751	990038600Z25	990038600Z35	606	0,8

