

# ALCO CONTROLS™

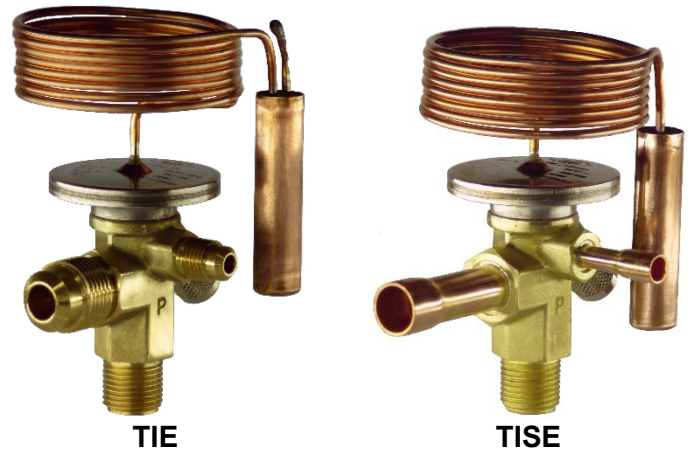
## TI - Thermo™-Expansion Valve Series

Technical Bulletin

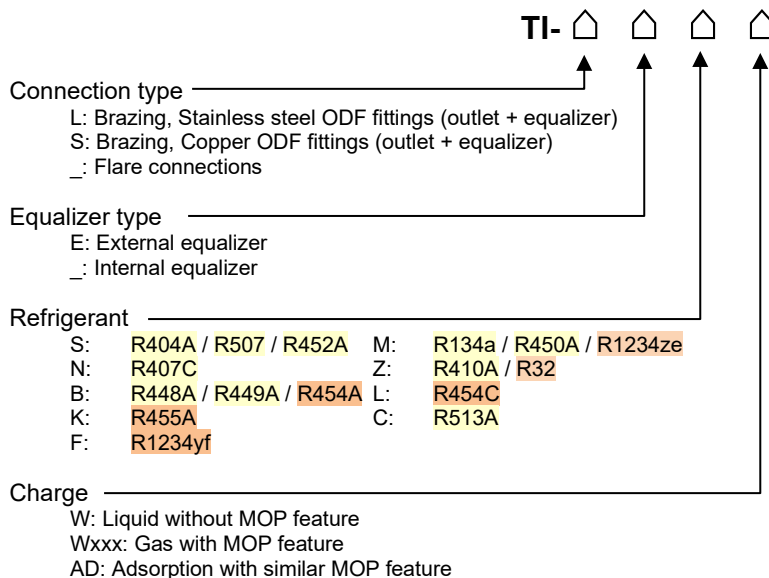
TI series of Thermo™-Expansion Valves with interchangeable orifices are designed for refrigeration applications such as display cases in supermarkets, walk-in/reach-in coolers, freezers, soft ice cream/ice maker machines, milk tank coolers, transport refrigeration as well as for air conditioning and heat pump systems. TI provides flexibility in selection of capacity and is ideal for those applications requiring compact size with stable and accurate control over wide load and evaporating range.

### Features

- Eight interchangeable orifice assemblies provide a large capacity range
- 45 bar maximum working pressure allows the use of high-pressure refrigerants
- Three styles of connections:
  - **TILE**: Stainless steel brazed fittings
  - **TIS(E)**: Copper brazed fittings
  - **TI(E)**: Flare connections
- Constant superheat across a wide application range
- Large diaphragm provides smoother and consistent valve control
- Laser welded stainless steel power element
- Internal or external equalizer
- Inlet brazing adapter available
- External superheat adjustment




### Type Designation Valve Body



# TI - Thermo™-Expansion Valve Series

Selection table - Orifices

		Orifice type Part No.	Nominal capacity (kW)							
			TIO-00X	TIO-000	TIO-001	TIO-002	TIO-003	TIO-004	TIO-005	TIO-006
			800532	800533	800534	800535	800536	800537	800538	800539
Refrigerant	A1	R134a	0.3	0.8	1.9	3.1	5	8.3	10.1	11.7
		R404A/R507	0.4	1	2.3	3.9	6.2	10.1	12.3	14.2
		R407C	0.5	1.4	3.5	5.7	9.2	15	18.3	21.1
		R410A	0.6	1.5	3.7	6.2	9.9	16.2	19.7	22.8
		R448A	0.5	1.3	3.2	5.3	8.5	13.9	16.9	19.4
		R449A	0.5	1.3	3.1	5.2	8.3	13.5	16.5	19.0
		R513A/R450A	0.3	0.7	1.7	2.8	4.5	7.5	9.1	10.6
	R452A	0.4	1	2.4	4	6.4	10.5	12.8	14.8	
	A2L	R1234ze	0.2	0.6	1.5	2.4	3.9	6.5	7.9	9.1
		R455A	0.5	1.2	3.0	5.0	8.1	13.2	16.0	18.5
		R454C	0.4	1.1	2.6	4.3	7.0	11.4	13.8	16.0
		R1234yf	0.2	0.6	1.4	2.2	3.6	6.0	7.3	8.4
		R32	0.9	2.3	5.6	9.2	14.8	24.1	29.3	33.9

Note: Evaporating Temperature +4°C (dew point), Condensing Temperature +38°C (bubble point), Subcooling 1 K  
 For other operating conditions use the quick selection tables in this document or the "Controls Navigator 4.1" selection tool.

Selection Table - Valve

Refrigerant		Outlet/Equalizer Connection	Type	Part No.	Type	Part No.	MOP(°C)	Evaporating Temp. Range
A1	A2L		External Equalizer		Internal Equalizer			
R404A / R507 R452A*		Brazing Stainless Steel Fittings **	TILE-SW (12mm)	802465			-	-45...+20°C
			TILE-SW (1/2")	802466			-	-45...+20°C
		Brazing Copper Fittings ***	TISE-SW (12mm)	802462	TIS-SW(12mm)	802461	-	-45...+20°C
			TISE-SW (1/2")	802464	TIS-SW(1/2")	802463	-	-45...+20°C
			TISE-SAD10 (1/2")	802479	TIS-SAD10(1/2")	802478	+10°C	-45...0°C
			TISE-SW75 (12mm)	802471			0°C	-45...-3°C
			TISE-SW75 (1/2")	802472			0°C	-45...-3°C
			TISE-SAD-20 (12mm)	802474			-20°C	-45...-27°C
			TISE-SAD-20 (1/2")	802475			-20°C	-45...-27°C
		Flare Fittings	TIE-SW	802460	TI-SW	802459	-	-45...+20°C
			TIE-SAD10	802477	TI-SAD10	802476	+10°C	-45...0°C
			TIE-SW75	802470	TI-SW75	802469	0°C	-45...-3°C
			TIE-SAD-20	802473			-20°C	-45...-27°C
R134a R450A*	R1234ze*	Brazing Stainless Steel Fittings**	TILE-MW (12mm)	802451			-	-45...+20°C
			TILE-MW (1/2")	802452			-	-45...+20°C
		Brazing Copper Fittings***	TISE-MW (12mm)	802448	TIS-MW(12mm)	802447	-	-45...+20°C
			TISE-MW (1/2")	802450	TIS-MW(1/2")	802449	-	-45...+20°C
			TISE-MW55 (12mm)	802457			+14°C	-45...+11°C
		Flare Fittings	TISE-MW55 (1/2")	802458			+14°C	-45...+11°C
			TIE-MW	802446	TI-MW	802445	-	-45...+20°C
		TIE-MW55	802456	TI-MW55	802455	+14°C	-45...+11°C	

Note: \*) Superheat readjustment required - see Operating Instruction

\*\*\*) TISE Brazing with wet rag

\*\*) TILE Brazing without wet rag

# TI - Thermo™-Expansion Valve Series

Selection Table – TI Valve (continued)


Refrigerant		Outlet/Equalizer Connection	Type	Part No.	Type	Part No.	MOP(°C)	Evaporating Temp. Range
A1	A2L		External Equalizer		Internal Equalizer			
R407C		Brazing Stainless Steel Fittings**	TILE-NW (12mm)	802486			-	-45...+20°C
			TILE-NW (1/2")	802485			-	-45...+20°C
		Brazing Copper Fittings***	TISE-NW (12mm)	802438	TIS-NW(12mm)	802437	-	-45...+20°C
			TISE-NW (1/2")	802440	TIS-NW(1/2")	802439	-	-45...+20°C
Flare Fittings	TIE-NW	802436	TI-NW	802435	-	-45...+20°C		
R410A	R32*	Brazing Stainless Steel Fittings**	TILE-ZW (12mm)	802488			-	-35...+20°C
			TILE-ZW (1/2")	802489			-	-35...+20°C
		Brazing Copper Fittings***	TILE-ZW175 (12mm)	802490			+16.4°C	-35...+15°C
			TILE-ZW175 (1/2")	802491			+16.4°C	-35...+15°C
R448A / R449A	R454A*	Brazing Stainless Steel Fittings**	TILE-BW (12mm)	802418			-	-45...+20°C
			TILE-BW (1/2")	802419			-	-45...+20°C
		Brazing Copper Fittings***	TISE-BW (12mm)	802416	TIS-BW(12mm)	802414	-	-45...+20°C
			TISE-BW (1/2")	802417	TIS-BW(1/2")	802415	-	-45...+20°C
			TISE-BW30 (12mm)	802494			-15°C	-45...-18°C
		TISE-BW30 (1/2")	802495			-15°C	-45...-18°C	
Flare Fittings	TIE-BW	802413	TI-BW	802412	-	-45...+20°C		
R513A		Brazing Stainless Steel Fittings**	TILE-CW (12mm)	802166			-	-30...+20°C
			TILE-CW (1/2")	802167			-	-30...+20°C
		Brazing Copper Fittings***	TISE-CW (12mm)	802168	TIS-CW (12mm)	802170	-	-30...+20°C
			TISE-CW (1/2")	802169	TIS-CW (1/2")	802171	-	-30...+20°C
Flare Fittings	TIE-CW	802172	TI-CW	802173	-	-30...+20°C		
	R454C	Brazing Stainless Steel Fittings**	TILE-LW (12mm)	802150			-	-35...+20°C
			TILE-LW (1/2")	802151			-	-35...+20°C
		Brazing Copper Fittings***	TISE-LW (12mm)	802152	TIS-LW (12mm)	802154	-	-35...+20°C
			TISE-LW (1/2")	802153	TIS-LW (1/2")	802155	-	-35...+20°C
Flare Fittings	TIE-LW	802156	TI-LW	802157	-	-35...+20°C		
	R455A	Brazing Stainless Steel Fittings**	TILE-KW (12mm)	802158			-	-35...+20°C
			TILE-KW (1/2")	802159			-	-35...+20°C
		Brazing Copper Fittings***	TISE-KW (12mm)	802160	TIS-KW (12mm)	802162	-	-35...+20°C
			TISE-KW (1/2")	802161	TIS-KW (1/2")	802163	-	-35...+20°C
Flare Fittings	TIE-KW	802164	TI-KW	802165	-	-35...+20°C		
	R1234yf	Brazing Stainless Steel Fittings**	TILE-FW (12mm)	802174			-	-35...+20°C
			TILE-FW (1/2")	802175			-	-35...+20°C
		Brazing Copper Fittings***	TISE-FW (12mm)	802176	TIS-FW (12mm)	802178	-	-35...+20°C
			TISE-FW (1/2")	802177	TIS-FW (1/2")	802179	-	-35...+20°C
Flare Fittings	TIE-FW	802180	TI-FW	802181	-	-35...+20°C		

Note: \*) Superheat readjustment required - see Operating Instruction

\*\*\*) TISE Brazing with wet rag

\*\*\*) TISE Brazing with wet rag

## Accessories

Type	Part No.	Connection size	
TIA-M06	802500	6 mm	
TIA-M10	802501	10 mm	
TIA-014	802502	1/4"	
TIA-038	802503	3/8"	

Brazing adapter

# TI - Thermo™-Expansion Valve Series

## Superheat

The factory setting of TI is made with the valve pin just starting to move away from seat. The superheat increments necessary to get the pin ready to move is called static superheat (SS). A superheat increments over and beyond the static superheat (factory setting) is necessary for the valve pin to open to its rated capacity. This additional superheat is known as gradient or opening superheat (OS).

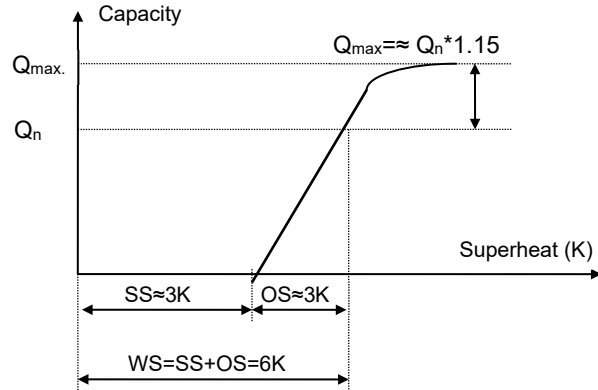
The working superheat, which can be measured in field, is the sum of static superheat and opening superheat (WS).

The opening superheat of TXV varies if the selected valve operates at higher or lower capacities than rated capacity. It is highly recommended to select the valve according to the rated capacity. Using reserve capacity leads to larger opening superheat and longer pull-down time during start-up or after defrosting.

Selecting a larger valve than required in system may lead to smaller opening superheat and/or hunting of TXV.

## Static superheat setting

Thermo®-Expansion Valves are factory preset for optimum superheat settings. This setting should be modified only if absolutely necessary. The readjustment should be at the lowest expected evaporating temperature.



Q<sub>n</sub> = Nominal capacity

SS: Static superheat at rated nominal operating condition

OS: Opening superheat at rated nominal capacity

WS: Working superheat

## Charges and standard superheat setting

Refrigerant	Charge code	Charge type	MOP		Evaporating temperature range	Max. Bulb Temp.	Nominal static superheat (SS) Factory setting	Opening superheat (OS*)
			(bar)*	(°C)				
R404A/ R507	SW	Liquid	-	-	-45...+20°C	85°C	3K	3K
	SW75	MOP	5.2	0	-45...-3°C	175°C		
	SAD10	Adsorption	-	+10	-45...0°C	130°C		
	SAD-20	Adsorption	-	-20	-45...-27°C	130°C		
R134a	MW	Liquid	-	-	-45...+20°C	100°C		
	MW55	MOP	3.8	+14	-45...+11°C	175°C		
R407C	NW	Liquid	-	-	-45...+20°C	85°C		
R410A	ZW	Liquid	-	-	-35...+20°C	60°C		
	ZW175	MOP	12	+16.4	-35...+15°C	175°C		
R448A	BW	Liquid	-	-	-35...+20°C	85°C		
R449A	BW30	MOP	2.1	-14	-45...-17°C	175°C		
R513A	CW	Liquid	-	-	-35...+20°C	90°C		
R454C	LW	Liquid	-	-	-35...+20°C	85°C		
R455A	KW	Liquid	-	-	-35...+20°C	85°C		
R1234yf	FW	Liquid	-	-	-35...+20°C	90°C		

Note: \*) Pressures are gauge pressures

# TI - Thermo™-Expansion Valve Series

Quick selection table A1 refrigerants (included 1.5 bar pressure drop for liquid line components and distributor)

(°C)*	R134a Capacity (kW) TI...-M...							R134a Orifice type
	Evaporating temperature (°C)							
	40	20	10	0	-10	-20	-30	
50	0.14	0.27	0.29	0.3	0.3	0.23	0.16	TIO-00X
	0.39	0.71	0.77	0.79	0.79	0.6	0.43	TIO-000
	0.92	1.7	1.83	1.89	1.89	1.43	1.03	TIO-001
	1.5	2.77	2.99	3.08	3.08	2.33	1.68	TIO-002
	2.41	4.47	4.82	4.96	4.97	3.76	2.71	TIO-003
	4.01	7.41	8	8.24	8.25	6.24	4.5	TIO-004
	4.88	9.02	9.73	10.02	10.03	7.59	5.48	TIO-005
5.65	10.45	11.27	11.61	11.62	8.8	6.34	TIO-006	
45	-	0.25	0.27	0.29	0.29	0.22	0.16	TIO-00X
	-	0.65	0.73	0.77	0.78	0.6	0.43	TIO-000
	-	1.55	1.74	1.83	1.86	1.42	1.03	TIO-001
	-	2.53	2.84	2.99	3.03	2.31	1.68	TIO-002
	-	4.09	4.58	4.82	4.89	3.73	2.71	TIO-003
	-	6.78	7.6	8	8.11	6.2	4.5	TIO-004
	-	8.25	9.25	9.73	9.87	7.54	5.48	TIO-005
-	9.56	10.72	11.27	11.43	8.74	6.35	TIO-006	
40	-	0.21	0.25	0.28	0.28	0.22	0.16	TIO-00X
	-	0.57	0.68	0.74	0.76	0.59	0.43	TIO-000
	-	1.35	1.61	1.75	1.8	1.39	1.02	TIO-001
	-	2.21	2.63	2.85	2.94	2.27	1.66	TIO-002
	-	3.56	4.25	4.6	4.74	3.66	2.68	TIO-003
	-	5.91	7.05	7.63	7.87	6.08	4.46	TIO-004
	-	7.19	8.58	9.28	9.58	7.4	5.42	TIO-005
-	8.33	9.94	10.76	11.09	8.57	6.28	TIO-006	
35	-	0.17	0.23	0.26	0.27	0.21	0.16	TIO-00X
	-	0.45	0.61	0.69	0.72	0.57	0.42	TIO-000
	-	1.07	1.45	1.63	1.72	1.35	1	TIO-001
	-	1.75	2.36	2.66	2.81	2.2	1.63	TIO-002
	-	2.82	3.8	4.3	4.53	3.55	2.62	TIO-003
	-	4.68	6.31	7.13	7.52	5.89	4.36	TIO-004
	-	5.7	7.68	8.68	9.15	7.17	5.3	TIO-005
-	6.6	8.9	10.05	10.6	8.3	6.14	TIO-006	
30	-	0.1	0.19	0.23	0.25	0.2	0.15	TIO-00X
	-	0.26	0.51	0.62	0.68	0.54	0.41	TIO-000
	-	0.61	1.22	1.48	1.61	1.29	0.96	TIO-001
	-	1	1.99	2.42	2.63	2.1	1.57	TIO-002
	-	1.61	3.21	3.9	4.25	3.39	2.53	TIO-003
	-	2.67	5.33	6.48	7.05	5.62	4.21	TIO-004
	-	3.25	6.48	7.89	8.58	6.84	5.12	TIO-005
-	3.77	7.51	9.14	9.94	7.93	5.93	TIO-006	
25	-	-	0.14	0.2	0.23	0.19	0.14	TIO-00X
	-	-	0.38	0.54	0.62	0.51	0.39	TIO-000
	-	-	0.9	1.29	1.48	1.21	0.92	TIO-001
	-	-	1.47	2.11	2.41	1.97	1.5	TIO-002
	-	-	2.37	3.4	3.89	3.18	2.41	TIO-003
	-	-	3.93	5.64	6.46	5.28	4	TIO-004
	-	-	4.78	6.86	7.86	6.42	4.87	TIO-005
-	-	5.54	7.95	9.1	7.44	5.64	TIO-006	
20	-	-	0.04	0.16	0.21	0.17	0.14	TIO-00X
	-	-	0.11	0.44	0.55	0.47	0.36	TIO-000
	-	-	0.25	1.03	1.31	1.11	0.86	TIO-001
	-	-	0.41	1.69	2.13	1.81	1.4	TIO-002
	-	-	0.66	2.72	3.44	2.92	2.26	TIO-003
	-	-	1.09	4.51	5.7	4.84	3.75	TIO-004
	-	-	1.33	5.49	6.94	5.89	4.56	TIO-005
-	-	1.54	6.36	8.04	6.82	5.28	TIO-006	

Note: \*) Condensing temperature - bubble point

(°C)*	R404A Capacity (kW) R507 TI...-S...							R404A R507 Orifice type
	Evaporating temperature (°C)							
	40	20	10	0	-10	-20	-30	
50	-	0.34	0.36	0.37	0.36	0.27	0.19	TIO-00X
	-	0.84	0.9	0.92	0.91	0.68	0.47	TIO-000
	-	1.93	2.06	2.11	2.08	1.57	1.09	TIO-001
	-	3.28	3.5	3.57	3.53	2.66	1.85	TIO-002
	-	5.21	5.56	5.68	5.62	4.23	2.94	TIO-003
	-	8.49	9.06	9.25	9.15	6.89	4.79	TIO-004
	-	10.33	11.04	11.26	11.14	8.39	5.83	TIO-005
-	11.93	12.74	13	12.86	9.68	6.73	TIO-006	
45	-	0.33	0.36	0.38	0.38	0.29	0.2	TIO-00X
	-	0.82	0.91	0.95	0.95	0.72	0.51	TIO-000
	-	1.89	2.09	2.17	2.19	1.67	1.17	TIO-001
	-	3.21	3.54	3.69	3.71	2.83	1.99	TIO-002
	-	5.1	5.63	5.86	5.89	4.49	3.17	TIO-003
	-	8.3	9.17	9.55	9.6	7.32	5.16	TIO-004
	-	10.11	11.17	11.63	11.69	8.92	6.28	TIO-005
-	11.67	12.89	13.43	13.49	10.29	7.25	TIO-006	
40	-	0.31	0.36	0.38	0.39	0.3	0.21	TIO-00X
	-	0.77	0.89	0.95	0.97	0.75	0.54	TIO-000
	-	1.77	2.05	2.19	2.24	1.73	1.23	TIO-001
	-	3	3.48	3.72	3.8	2.94	2.09	TIO-002
	-	4.77	5.53	5.91	6.04	4.67	3.32	TIO-003
	-	7.77	9	9.62	9.83	7.6	5.41	TIO-004
	-	9.46	10.97	11.72	11.98	9.26	6.59	TIO-005
-	10.92	12.66	13.53	13.83	10.69	7.61	TIO-006	
35	-	0.27	0.34	0.37	0.39	0.31	0.22	TIO-00X
	-	0.67	0.85	0.94	0.98	0.77	0.55	TIO-000
	-	1.55	1.95	2.16	2.25	1.76	1.27	TIO-001
	-	2.63	3.31	3.66	3.81	2.99	2.15	TIO-002
	-	4.18	5.26	5.81	6.06	4.75	3.42	TIO-003
	-	6.81	8.56	9.47	9.87	7.74	5.58	TIO-004
	-	8.29	10.43	11.53	12.02	9.43	6.79	TIO-005
-	9.58	12.04	13.31	13.88	10.88	7.84	TIO-006	
30	-	0.21	0.31	0.36	0.39	0.31	0.22	TIO-00X
	-	0.52	0.77	0.9	0.96	0.77	0.56	TIO-000
	-	1.19	1.78	2.07	2.21	1.76	1.29	TIO-001
	-	2.02	3.01	3.51	3.75	2.99	2.18	TIO-002
	-	3.21	4.79	5.58	5.97	4.76	3.47	TIO-003
	-	5.23	7.8	9.09	9.72	7.75	5.65	TIO-004
	-	6.37	9.5	11.07	11.84	9.43	6.88	TIO-005
-	7.35	10.97	12.78	13.67	10.89	7.94	TIO-006	
25	-	-	0.26	0.33	0.37	0.3	0.22	TIO-00X
	-	-	0.66	0.84	0.93	0.75	0.56	TIO-000
	-	-	1.51	1.93	2.14	1.74	1.28	TIO-001
	-	-	2.56	3.26	3.62	2.94	2.18	TIO-002
	-	-	4.07	5.19	5.76	4.68	3.46	TIO-003
	-	-	6.64	8.45	9.38	7.62	5.63	TIO-004
	-	-	8.08	10.3	11.42	9.29	6.86	TIO-005
-	-	9.33	11.89	13.19	10.72	7.92	TIO-006	
20	-	-	0.19	0.3	0.35	0.29	0.22	TIO-00X
	-	-	0.47	0.74	0.87	0.73	0.55	TIO-000
	-	-	1.09	1.71	2.01	1.68	1.26	TIO-001
	-	-	1.85	2.9	3.41	2.85	2.14	TIO-002
	-	-	2.94	4.62	5.42	4.53	3.4	TIO-003
	-	-	4.8	7.52	8.83	7.37	5.54	TIO-004
	-	-	5.84	9.16	10.75	8.98	6.74	TIO-005
-	-	6.74	10.57	12.41	10.37	7.78	TIO-006	

Note: \*) Condensing temperature - bubble point

# TI - Thermo™-Expansion Valve Series

Quick selection table A1 refrigerants (included 1.5 bar pressure drop for liquid line components and distributor)

(°C)*	Capacity (kW) TI...N...							Orifice type
	R407C							
	Evaporating temperature (°C)							
	40	20	10	0	-10	-20	-30	
50/54	-	0.45	0.48	0.49	0.49	0.36	-	TIO-00X
	-	1.27	1.34	1.36	1.37	1	-	TIO-000
	-	3.16	3.35	3.41	3.42	2.5	-	TIO-001
	-	5.15	5.45	5.55	5.56	4.07	-	TIO-002
	-	8.32	8.79	8.96	8.98	6.56	-	TIO-003
	-	13.56	14.34	14.61	14.64	10.7	-	TIO-004
	-	16.54	17.49	17.83	17.87	13.05	-	TIO-005
-	19.07	20.17	20.56	20.6	15.05	-	TIO-006	
45/50	-	0.43	0.47	0.49	0.49	0.36	-	TIO-00X
	-	1.21	1.32	1.37	1.38	1.02	-	TIO-000
	-	3.03	3.3	3.42	3.44	2.54	-	TIO-001
	-	4.94	5.37	5.57	5.6	4.13	-	TIO-002
	-	7.97	8.67	8.99	9.04	6.67	-	TIO-003
	-	13	14.14	14.66	14.74	10.88	-	TIO-004
	-	15.86	17.25	17.88	17.99	13.27	-	TIO-005
-	18.29	19.88	20.62	20.74	15.31	-	TIO-006	
40/45	-	0.41	0.45	0.48	0.49	0.36	-	TIO-00X
	-	1.14	1.27	1.35	1.38	1.02	-	TIO-000
	-	2.84	3.17	3.37	3.44	2.54	-	TIO-001
	-	4.62	5.17	5.48	5.6	4.14	-	TIO-002
	-	7.46	8.34	8.85	9.04	6.68	-	TIO-003
	-	12.16	13.6	14.43	14.74	10.89	-	TIO-004
	-	14.84	16.6	17.61	17.98	13.29	-	TIO-005
-	17.11	19.14	20.3	20.73	15.32	-	TIO-006	
35/40	-	0.37	0.43	0.46	0.48	0.36	-	TIO-00X
	-	1.02	1.21	1.29	1.35	1.01	-	TIO-000
	-	2.56	3.02	3.24	3.37	2.53	-	TIO-001
	-	4.17	4.92	5.27	5.49	4.12	-	TIO-002
	-	6.72	7.95	8.51	8.86	6.65	-	TIO-003
	-	10.96	12.96	13.87	14.44	10.84	-	TIO-004
	-	13.37	15.81	16.93	17.62	13.23	-	TIO-005
-	15.42	18.23	19.52	20.32	15.25	-	TIO-006	
30/35	-	0.31	0.4	0.44	0.47	0.35	-	TIO-00X
	-	0.86	1.11	1.23	1.3	0.99	-	TIO-000
	-	2.16	2.77	3.09	3.26	2.48	-	TIO-001
	-	3.52	4.51	5.03	5.31	4.04	-	TIO-002
	-	5.68	7.28	8.11	8.57	6.52	-	TIO-003
	-	9.26	11.87	13.23	13.97	10.63	-	TIO-004
	-	11.29	14.48	16.13	17.04	12.97	-	TIO-005
-	13.02	16.69	18.6	19.64	14.95	-	TIO-006	
25/30	-	0.23	0.35	0.41	0.44	0.34	-	TIO-00X
	-	0.64	0.98	1.15	1.24	0.95	-	TIO-000
	-	1.6	2.45	2.87	3.1	2.39	-	TIO-001
	-	2.6	4	4.68	5.04	3.89	-	TIO-002
	-	4.19	6.45	7.55	8.14	6.27	-	TIO-003
	-	6.84	10.52	12.31	13.27	10.23	-	TIO-004
	-	8.34	12.84	15.01	16.19	12.48	-	TIO-005
-	9.62	14.8	17.31	18.66	14.39	-	TIO-006	
20/26	-	0.05	0.29	0.37	0.42	0.33	-	TIO-00X
	-	0.13	0.81	1.05	1.16	0.91	-	TIO-000
	-	0.33	2.02	2.61	2.91	2.28	-	TIO-001
	-	0.53	3.29	4.26	4.74	3.72	-	TIO-002
	-	0.86	5.3	6.87	7.65	6	-	TIO-003
	-	1.4	8.65	11.2	12.47	9.78	-	TIO-004
	-	1.71	10.55	13.67	15.21	11.93	-	TIO-005
-	1.98	12.16	15.76	17.54	13.76	-	TIO-006	

Note: \*) Condensing temperature: bubble point/ dew point

(°C)*	Capacity (kW) TI...Z...							Orifice type
	R410A							
	Evaporating temperature (°C)							
	40	20	10	0	-10	-20	-30	
60	0.38	0.51	0.54	0.56	0.56	0.43	0.3	TIO-00X
	0.96	1.28	1.35	1.39	1.41	1.08	0.76	TIO-000
	2.37	3.15	3.34	3.44	3.47	2.65	1.88	TIO-001
	3.98	5.28	5.6	5.76	5.81	4.44	3.14	TIO-002
	6.35	8.43	8.94	9.2	9.27	7.1	5.02	TIO-003
	10.39	13.8	14.63	15.06	15.18	11.61	8.22	TIO-004
	12.64	16.78	17.79	18.31	18.46	14.12	9.99	TIO-005
14.63	19.42	20.58	21.19	21.36	16.34	11.57	TIO-006	
55	0.36	0.52	0.56	0.59	0.6	0.46	0.33	TIO-00X
	0.9	1.31	1.41	1.47	1.49	1.15	0.82	TIO-000
	2.22	3.23	3.48	3.62	3.68	2.84	2.02	TIO-001
	3.72	5.41	5.83	6.07	6.17	4.75	3.39	TIO-002
	5.94	8.64	9.3	9.69	9.85	7.59	5.41	TIO-003
	9.72	14.13	15.22	15.85	16.11	12.42	8.85	TIO-004
	11.82	17.19	18.51	19.27	19.59	15.1	10.76	TIO-005
13.68	19.89	21.43	22.31	22.68	17.48	12.45	TIO-006	
50	0.3	0.52	0.57	0.6	0.62	0.48	0.34	TIO-00X
	0.76	1.3	1.42	1.5	1.54	1.2	0.86	TIO-000
	1.86	3.2	3.51	3.71	3.8	2.95	2.12	TIO-001
	3.12	5.35	5.89	6.21	6.37	4.95	3.55	TIO-002
	4.99	8.55	9.4	9.92	10.17	7.9	5.66	TIO-003
	8.16	13.99	15.39	16.23	16.65	12.93	9.27	TIO-004
	9.93	17.01	18.71	19.73	20.25	15.72	11.27	TIO-005
11.49	19.69	21.65	22.84	23.43	18.19	13.04	TIO-006	
45	-	0.5	0.56	0.6	0.62	0.49	0.35	TIO-00X
	-	1.24	1.41	1.51	1.56	1.22	0.88	TIO-000
	-	3.06	3.47	3.72	3.85	3.02	2.18	TIO-001
	-	5.13	5.81	6.23	6.46	5.05	3.65	TIO-002
	-	8.19	9.28	9.94	10.31	8.07	5.82	TIO-003
	-	13.41	15.18	16.27	16.87	13.2	9.53	TIO-004
	-	16.3	18.46	19.78	20.52	16.06	11.58	TIO-005
-	18.87	21.36	22.9	23.75	18.58	13.41	TIO-006	
40	-	0.46	0.54	0.59	0.62	0.49	0.36	TIO-00X
	-	1.15	1.35	1.48	1.56	1.23	0.89	TIO-000
	-	2.83	3.34	3.66	3.84	3.03	2.2	TIO-001
	-	4.73	5.6	6.13	6.44	5.08	3.69	TIO-002
	-	7.56	8.94	9.79	10.28	8.12	5.9	TIO-003
	-	12.37	14.62	16.01	16.83	13.28	9.65	TIO-004
	-	15.04	17.78	19.47	20.46	16.15	11.73	TIO-005
-	17.41	20.58	22.54	23.68	18.69	13.58	TIO-006	
35	-	0.4	0.51	0.57	0.61	0.49	0.36	TIO-00X
	-	1	1.27	1.43	1.53	1.22	0.89	TIO-000
	-	2.46	3.13	3.53	3.77	3.01	2.2	TIO-001
	-	4.13	5.25	5.92	6.32	5.05	3.69	TIO-002
	-	6.6	8.38	9.45	10.1	8.06	5.9	TIO-003
	-	10.79	13.71	15.47	16.53	13.18	9.65	TIO-004
	-	13.12	16.67	18.81	20.1	16.03	11.73	TIO-005
-	15.19	19.29	21.77	23.26	18.56	13.58	TIO-006	
30	-	0.31	0.46	0.54	0.59	0.48	0.35	TIO-00X
	-	0.78	1.15	1.36	1.48	1.2	0.88	TIO-000
	-	1.92	2.83	3.34	3.65	2.95	2.18	TIO-001
	-	3.22	4.74	5.6	6.12	4.95	3.65	TIO-002
	-	5.15	7.57	8.94	9.77	7.90	5.83	TIO-003
	-	8.42	12.39	14.64	15.99	12.92	9.54	TIO-004
	-	10.24	15.07	17.8	19.44	15.71	11.6	TIO-005
-	11.85	17.44	20.6	22.5	18.19	13.42	TIO-006	

Note: \*) Condensing temperature: bubble point













# TI - Thermo™-Expansion Valve Series

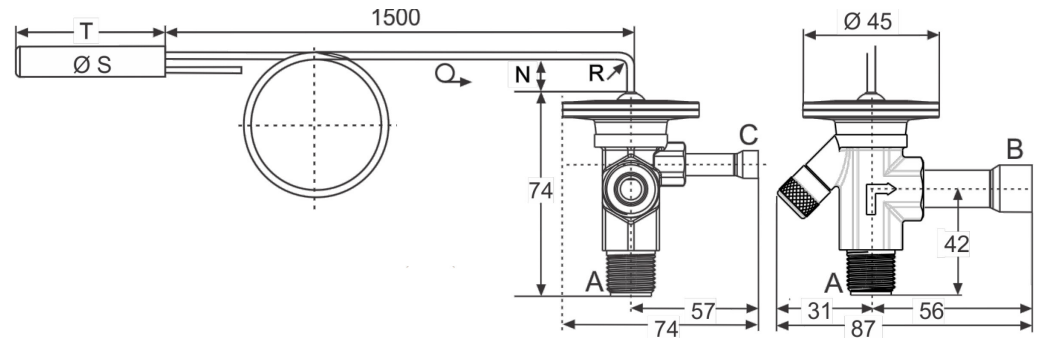
## Technical Data

Maximum working pressure PS	45 bar
Factory test pressure PT	49.5 bar
Medium temperature range TS	-45...+70°C
Fluid Group	I + II
Hazard Category	SEP (PED 14/68/EU)

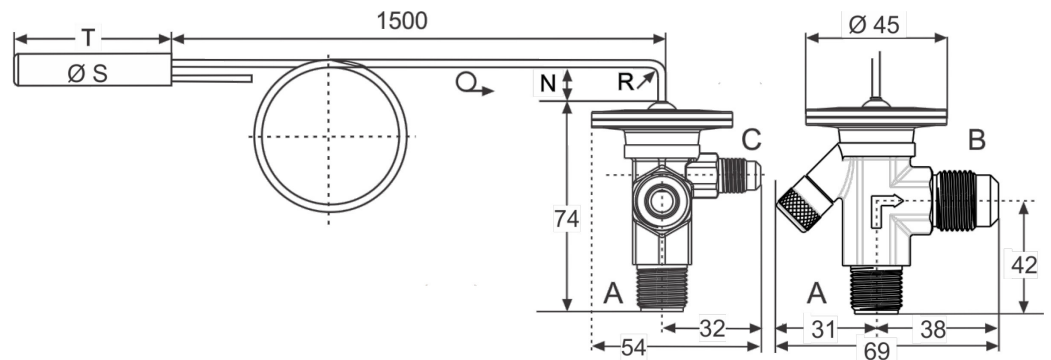
Connections	TIL / TILE TIS / TISE TI / TIE	Stainless steel ODF Copper ODF Brass flare
Protection		Salt spray test
Weight		approx. 0.4 kg
Markings		CE not allowed EAC

## Dimensions (mm)

TILE / TISE



TI(E)



## Valve Body Connections:

Type	Inlet A	ODF	
		Outlet B	External Equalizer C
TIE	5/8"-18UNF	3/4"-16UNF	7/16"-20UNF
TI	5/8"-18UNF	3/4"-16UNF	-
TILE / TISE	5/8"-18UNF*	12 mm	6 mm
		1/2"	1/4"
TIS	5/8"-18UNF*	12 mm	-
		1/2"	-

Note: \*) optional use of braze adapter

## Optional Braze Adapter for Inlet connection A:

Type	ODF	
	Type	ODF
TIA-M06		6 mm
TIA-M10		10 mm
TIA-014		1/4"
TIA-038		3/8"

## Bulb:

Charge	N	Bending radius R	Ø S	T	Capillary tube length
SWxx / SADxx / MWxx / ZWxx / BWxx	10 mm	5 mm	12.6 mm	53 mm	1.5 m
SW / MW / NW / ZW / BW / CW / LW / KW / FW	10 mm	5 mm	15.9 mm	53 mm	1.5 m

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