



Thermo™ - Expansion Valves

Basic Terms and Technical Information

Operating Principles

Alco Thermo-Expansion valves control the superheat of refrigerant vapor at the outlet of the evaporator. They act as a throttle device between the high pressure and the low pressure sides of refrigeration systems and ensure that the rate of refrigerant flow into the evaporator exactly matches the rate of evaporation of liquid refrigerant in the evaporator. Thus the evaporator is fully utilized and no liquid refrigerant may reach the compressor.

Description of Bulb Charges

The application ranges of Thermo-Expansion valves are heavily influenced by the charge selected.

Liquid Charges

The behaviour of Thermo-Expansion valves with liquid charges is exclusively determined by temperature changes at the bulb and not subject to any cross-ambient interference. They feature a fast response time and thus react quickly in the control circuit. Liquid charges cannot incorporate MOP functions. Maximum bulb temperatures shall not exceed 75°C.

Gas Charges

The behaviour of Thermo-Expansion valves with gas charges will be determined by the lowest temperature at any part of the expansion valve (power assembly, capillary tube or bulb). If any parts other than the bulb are subject to the lowest temperature, malfunction of the expansion valve may occur (i.e., erratic low pressure or excessive superheat). Alco Thermo-Expansion valves with gas charges always feature MOP functions and include ballasted bulbs. Ballast in the bulb leads to slow opening and fast closure of the valve. Maximum bulb temperature is 120°C.

Adsorption Charges

These charges feature control characteristics much like MOP charges but avoid the difficulties of cross-ambient interference. Response time is slow but perfectly suitable for common refrigeration systems. Maximum bulb temperature is 130°C.

MOP (Maximum Operating Pressure)

MOP functionality is somewhat similar to the application of a crankcase pressure regulator. Evaporator pressures are limited to a maximum value to protect compressor from overload conditions. MOP selection should be within maximum allowed low pressure rating of the compressor and should be at approximately 3K above evaporating temperatures.

Practical hint: Superheat adjustments influence the MOP:

Increase of superheat:	Decrease of MOP
Decrease of superheat:	Increase of MOP

Static Superheat

Alco 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.



Subcooling

Subcooling generally increases the capacity of the refrigeration system and may be accounted for when dimensioning an expansion valve by applying the correction factor K_c . The capacity corrections for evaporating temperature, condensing temperature and subcooling are all incorporated in K_c . These are, in particular the liquid density upstream from the expansion valve, the different enthalpies of liquid and vapor phase refrigerants, as well as certain parts of flash gas after expansion. The percentage of flash gas differs with various refrigerants and depends on system conditions.

Heavy subcooling results in very small flash gas amounts and therefore increases expansion valve capacities. These conditions are not covered by K_c . Likewise, small flash gas amounts lead to reduced evaporator capacities and may result in substantial discrepancies between the capacities of the Thermo-expansion valve and the evaporator. These effects have been integrated in selection program "Controls Navigator".

Dimensioning

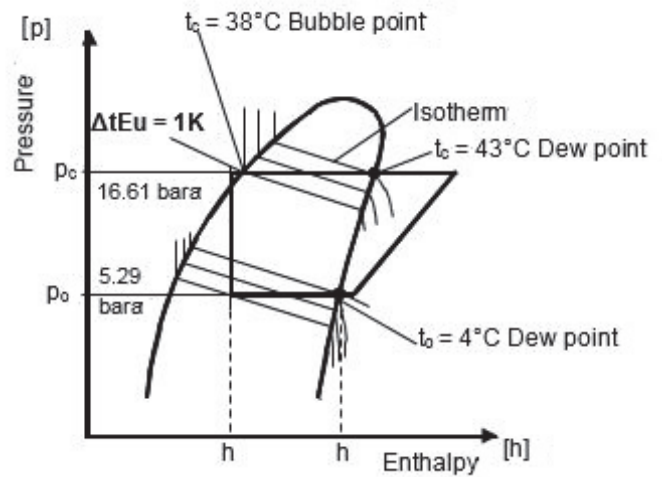
To facilitate valve dimensioning for other than standard conditions, Emerson Climate Technologies offers the "Controls Navigator" selection tool which can be downloaded from www.emersonclimate.eu

See www.emersonclimate.eu for contact addresses, email, phone numbers or downloads.

Dimensioning of Thermo™ - Expansion Valves for Systems With Refrigerant Having Temperature Glide

As opposed to single substances (e.g. R 134a) where the phase change takes place at a constant temperature/pressure the evaporation and condensation of zeotropic blends are in a "gliding" form (e.g. at a constant pressure the temperature varies within a certain range) through evaporators and condensers. HFO blends R448A and R449A are zeotropic blends.

The condensing /evaporating pressure must be determined at saturated temperatures (bubble for liquid / dew points for vapor) for dimensioning of the expansion valves, solenoid valves etc. The corresponding dew point for liquid pressures is provided in case of compressor selection based on dew point of liquid pressure.



Selection Guide for Expansion Valves

Series	Selection Criteria			
	Capacity Range R448A (kW)	Evaporating Temp. Range (°C)	Main Application	Features
TI	0.5...19.4	+20...-45	Refrig./Air Cond. Heat Pumps	Exchangeable Orifices
TX3	0.8...15.0	+20...-45	Refrig./Air Cond. Heat Pumps	Hermetic, Superheat Adjustable, Optional with Check Valve
TX7	32...183 (R401A)	+20...-45	Air-Cond. Heat Pumps	Hermetic, Superheat Adjustable
T	1.9.. 301	+30...-45	Refrig./Air Cond. Heat Pumps	Exchangeable Orifices, Power-Assembly and Flange
ZZ	1.7...24.7	-45...-120	Low Temperature Application	Exchangeable Orifices, Power-Assembly and Flange
L	1.9...222	+30...-50	Liquid Injection Superheat Control	Exchangeable Orifices, Power-Assembly and Flange
935	5.2...59.8	+30...-45	Liquid Injection Temperature Control	Exchangeable Orifices, Power-Assembly and Flange

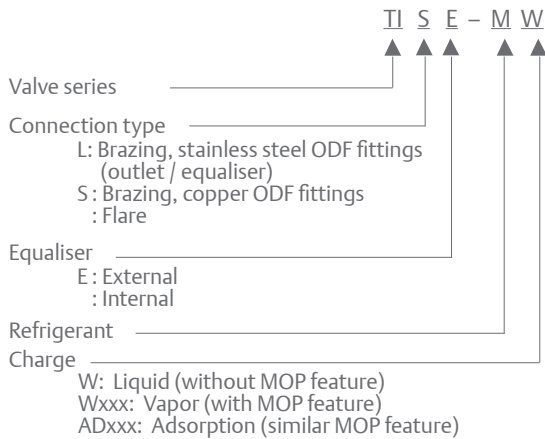
Thermo™ - Expansion Valves Series TI

Exchangeable Orifices

Features

- Laser-welded diaphragm / power element with large diameter for high reliability and maximum lifetime
- Constant superheat across wide application ranges
- Easy and precise superheat setting by internal fine threads
- Three styles of connections:
 - TILE: Stainless steel brazed fittings eliminate the need of wet rags during brazing
 - TIS(E): Copper brazed fittings (valve requires wet rag during brazing)
 - TI(E): Flare
- With capacities between 0.5kw and 19.4 kW (R448A) ideally suited for service work
- Internal or external equaliser
- Cleanable / exchangeable inlet strainer in orifice assembly
- Inlet brazing adapter
- Capillary tube length 1.5 m
- Max. working pressure PS: 45 bar
- Temperature range TS: -45...+75°C
- PS: 45 bar. TS: -45 ... +75°C
- CE Marking acc. PED not required

Type Code



TILE



TIE

Selection Table for Orifice Assembly With Strainer for Inlet Connection

Type	Nominal Capacity* (kW)							
	TIO-00X	TIO-000	TIO-001	TIO-002	TIO-003	TIO-004	TIO-005	TIO-006
Part No.	800 532	800 533	800 534	800 535	800 536	800 537	800 538	800 539
R134a	0.3	0.8	1.9	3.1	5.0	8.3	10.1	11.7
R22	0.5	1.3	3.2	5.3	8.5	13.9	16.9	19.5
R404A / R507	0.4	1.0	2.3	3.9	6.2	10.1	12.3	14.2
R407C	0.5	1.4	3.5	5.7	9.2	15.0	18.3	21.1
R410A	0.6	1.5	3.7	6.2	9.9	16.2	19.7	22.8
R407A	0.5	1.3	3.2	5.2	8.4	13.7	16.6	19.2
R407F	0.6	1.5	3.6	5.9	9.5	15.5	18.9	21.8
R448A	0.5	1.3	3.19	5.28	8.48	13.86	16.85	19.44
R449A	0.49	1.27	3.12	5.16	8.28	13.54	16.46	19
R450A	0.2	0.55	1.3	2.11	3.41	5.66	6.89	7.98
R513A	0.21	0.56	1.33	2.16	3.49	5.79	7.05	8.17
R1234ze	0.23	0.63	1.49	2.42	3.91	6.49	7.9	9.15
R452A	0.4	1.0	2.4	4.0	6.4	10.5	12.8	14.8

Brazing Adapter for TILE and TIS(E)

Type	Part No.	Connection, ODF	
		(mm)	(inch)
TIA-M06	802 500	6.0	-
TIA-M10	802 501	10.0	-
TIA-014	802 502	-	1/4"
TIA-038	802 503	-	3/8"
Gasket Set	803 780	100 pieces	



*Nominal capacity is based on the following conditions:

Refrigerant	Evaporating Temperature	Condensing Temperature	Sub-cooling
R407C, R407F	+4°C +4°C dew point	+38°C bubble p. +42.9°C dew point	1K
R513A, R1234ze		+38°C bubble/ +38°C dew point	
R22, R134a, R404A, R410A, R507		+38°C bubble/ +38°C dew point	
R450A		+38°C bubble/ +38.6°C dew point	
R448A, R449A		+38°C bubble/ +42.6°C dew point	
R452A		+38°C bubble / +41.6°C dew point	

These effects have been integrated in selection program "Controls Navigator".

TI Valve Bodies Without Orifice and Nut

Refrigerant	Outlet/Equalizer Connection	Type	Part No.	Type	Part No.	MOP (°C)	Evaporating Temperature Range (°C)
		External Equalizer		Internal Equalizer			
R404A / R507	Brazing Stainless Steel Fittings *	TILE-SW (12mm)	802465			-	-45 ... +20
		TILE-SW (1/2")	802466			-	-45 ... +20
	Brazing Copper Fittings **	TISE-SW (12mm)	802462	TIS-SW (12mm)	802461	-	-45 ... +20
		TISE-SW (1/2")	802464	TIS-SW (1/2")	802463	-	-45 ... +20
		TISE-SAD10 (1/2")	802479	TIS-SAD10 (1/2")	802478	+10	-45 ... 0
		TISE-SW75 (12mm)	802471			0	-45 ... -3
		TISE-SW75 (1/2")	802472			0	-45 ... -3
		TISE-SAD-20 (12mm)	802474			-20	-45 ... -27
		TISE-SAD-20 (1/2")	802475			-20	-45 ... -27
	Flare Fittings	TIE-SW	802460	TI-SW	802459	-	-45 ... +20
		TIE-SAD10	802477	TI-SAD10	802476	+10	-45 ... 0
		TIE-SW75	802470	TI-SW75	802469	0	-45 ... -3
		TIE-SAD-20	802473			-20	-45 ... -27
	R134a	Brazing Stainless Steel Fittings *	TILE-MW (12mm)	802451			-
TILE-MW (1/2")			802452			-	-45 ... +20
Brazing Copper Fittings **		TISE-MW (12 mm)	802448	TIS-MW (12 mm)	802447	-	-45 ... +20
		TISE-MW (1/2")	802450	TIS-MW (1/2")	802449	-	-45 ... +20
		TISE-MW55 (12mm)	802457			+14	-45 ... +11
		TISE-MW55 (1/2")	802458			+14	-45 ... +11
Flare Fittings		TIE-MW	802446	TI-MW	802445	-	-45 ... +20
		TIE-MW55	802456	TI-MW55	802455	+14	-45 ... +11
R407C	Brazing Stainless Steel Fittings *	TILE-NW (12mm)	802486			-	-45 ... +20
		TILE-NW (1/2")	802485			-	-45 ... +20
	Brazing Copper Fittings **	TISE-NW (12mm)	802438	TIS-NW (12mm)	802437	-	-45 ... +20
		TISE-NW (1/2")	802440	TIS-NW (1/2")	802439	-	-45 ... +20
	Flare Fittings	TIE-NW	802436	TI-NW	802435	-	-45 ... +20
R407A/ R407F	Brazing Stainless Steel Fittings *	TILE-NW (12mm)	802486			-	-45 ... 0
		TILE-NW (1/2")	802485			-	-45 ... 0
	Brazing Copper Fittings **	TISE-NW (12mm)	802438	TIS-NW (12mm)	802437	-	-45 ... 0
		TISE-NW (1/2")	802440	TIS-NW (1/2")	802439	-	-45 ... 0
	Flare Fittings	TIE-NW	802436	TI-NW	802435	-	-45 ... 0
	Brazing Copper Fittings **	TISE-SAD-20 (12mm)	802474			-20	-45 ... -27
		TISE-SAD-20 (1/2")	802475			-20	-45 ... -27
R22	Brazing Stainless Steel Fittings *	TILE-HW (12mm)	802426			-	-45 ... +20
		TILE-HW (1/2")	802427			-	-45 ... +20
	Brazing Copper Fittings **	TISE-HW (12mm)	802423	TIS-HW (12mm)	802422	-	-45 ... +20
		TISE-HW (1/2")	802425	TIS-HW (1/2")	802424	-	-45 ... +20
		TISE-HW100 (12mm)	802431			+15	-45 ... +13
		TISE-HW100 (1/2")	802432			+15	-45 ... +13
	Flare Fittings	TIE-HW	802421	TI-HW	802420	-	-45 ... +20
R410A	Brazing Stainless Steel Fittings *	TILE-ZW (12mm)	802488			-	-35 ... +20
		TILE-ZW (1/2")	802489			-	-35 ... +20
		TILE-ZW175 (12mm)	802490			+16.4	-35 ... +15
		TILE-ZW175(1/2")	802491			+16.4	-35 ... +15

Note: *) TILE Brazing without wet rag **) TISE Brazing with wet rag

TI Valve Bodies Without Orifice and Nuts in Single Packaging

Refrigerant	Connection	Valves With Factory Setting and/or New Charges					Valve for Field Setting		
		Type	ad Part No.	Equalizer	Charge	MOP	Type	Part No.	
R448A/ R449A/ R452A	Brazeing Stainless Steel Fittings *	TILE-BW (12mm)	802418	External	Liquid	No	TILE-SW (12 mm)	802 465	
		TILE-BW (1/2")	802419		Liquid	No	TILE-SW (1/2")	802 466	
	Brazeing Copper Fittings **	TISE-BW (12 mm)	802416		Liquid	No	TISE-SW (12 mm)	802 462	
		TISE-BW (1/2")	802417		Liquid	No	TISE-SW (1/2")	802 464	
		TISE-BW30 (1/2")	802495		Vapor	Yes		-	
		TISE-BW30 (12mm)	802494						
		TISE-BW70 (1/2")	-		Vapor	Yes	TISE-SW75 (1/2")	802 472	
		TIS-BW (12 mm)	802414		Internal	Liquid	No	TIS-SW (12 mm)	802 461
	TIS-BW (1/2")	802415	Liquid			No	TIS-SW (1/2")	802 463	
	Flare Fittings	TIE-BW	802413		External	Liquid	No	TIE-SW	802 460
			-			Vapor	Yes	TIE-SW75	802 470
		TI-BW	802412		Internal	Liquid	No	TI-SW	802 459
R450A	Brazeing Stainless Steel Fittings *	TILE-DW (12 mm)	-	External	Liquid	No	TILE-MW (12 mm)	802 451	
		TILE-DW (1/2")	-		Liquid	No	TILE-MW (1/2")	802 452	
	Brazeing Copper Fittings **	TISE-DW (12 mm)	-		Liquid	No	TISE-MW (12 mm)	802 448	
		TISE-DW (1/2")	-		Liquid	No	TISE-MW (1/2")	802 450	
		TISE-DW55 (12 mm)	-		Vapor	Yes	TISE-MW55 (12 mm)	802 457	
		TISE-DW55 (1/2")	-		Vapor	Yes	TISE-MW55 (1/2")	802 458	
		TIS-DW (12 mm)	-		Internal	Liquid	No	TIS-MW (12 mm)	802 447
		TIS-DW (1/2")	-			Liquid	No	TIS-MW (1/2")	802 449
	Flare Fittings	TIE-DW	-		External	Liquid	No	TIE-MW	802 446
		TI-DW	-		Internal	Liquid	No	TI-MW	802 445
R513A	Brazeing Stainless Steel Fittings *	TILE-CW (12 mm)	-	External	Liquid	No	TILE-MW (12 mm)	802 451	
		TILE-CW (1/2")	-		Liquid	No	TILE-MW (1/2")	802 452	
	Brazeing Copper Fittings **	TISE-CW (12 mm)	-		Liquid	No	TISE-MW (12 mm)	802 448	
		TISE-CW (1/2")	-		Liquid	No	TISE-MW (1/2")	802 450	
		TISE-CW55 (12 mm)	-		Vapor	Yes	TISE-MW55 (12 mm)	802 457	
		TISE-CW55 (1/2")	-		Vapor	Yes	TISE-MW55 (1/2")	802 458	
		TIS-CW (12 mm)	-		Internal	Liquid	No	TIS-MW (12 mm)	802 447
		TIS-CW (1/2")	-			Liquid	No	TIS-MW (1/2")	802 449
	Flare Fittings	TIE-CW	-		External	Liquid	No	TIE-MW	802 446
		TI-CW	-		Internal	Liquid	No	TI-MW	802 445
R1234ze	Brazeing Copper Fittings **	TISE-EW (12 mm)	-	External	Liquid	No	TISE-MW (12 mm)	802 448	
		TISE-EW (1/2")	-		Liquid	No	TISE-MW (1/2")	802 450	
		TISE-EW55 (12 mm)	-		Vapor	Yes	TISE-MW55 (12 mm)	802 457	
		TISE-EW55 (1/2")	-		Vapor	Yes	TISE-MW55 (1/2")	802 458	
		TIS-EW (12 mm)	-		Liquid	No	TIS-MW (12 mm)	802 447	
		TIS-EW (1/2")	-		Liquid	No	TIS-MW (1/2")	802 449	
	Flare Fittings	TIE-EW	-		Internal	Liquid	No	TIE-MW	802 446
		TI-EW	-			Liquid	No	TI-MW	802 445

Note: *) TILE Brazeing without wet rag**) TISE Brazeing with wet rag

Connections

Body	Inlet connection		Outlet	External equalizer*
	Brazeing with adapter	Flare		
TI(E) Flare connections	-	5/8"-18UNF Flare suitable for 6 mm, 8 mm, 10 mm, 1/4", 5/16", 3/8" tubes	3/4" - 16UNF Flare: for 12 mm, 1/2" tubes	7/16" - 20UNF Flare: for 6 mm, 1/4" tubes
TIS(E) / TILE Braze connections	TIA - M06 (6 mm ODF) TIA - M10 (10 mm ODF)		12 mm ODF	6 mm ODF
	TIA - 014 (1/4" ODF) TIA - 038 (3/8" ODF)		1/2 ODF	1/4" ODF

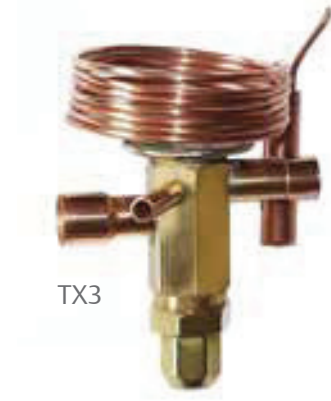
Note: *) TI and TIS with internal equalizer

Thermo™- Expansion Valves Series TX3

For OEM use, hermetic design

Features

- Hermetic design with brazing and straight through configuration
- Internal or external equalizer
- External superheat adjustment
- Large diaphragm eliminates disturbances to the valve and provides smoother valve control
- Very compact size
- Version with internal check valve eliminates external check valve for heat pump applications
- Capillary tube length 1.5m
- Max. Working Pressure PS: 45 bar
Medium Temperature Range TS: -45 ... +120°C
- Packaging units with 24 pieces, no single packs



MOP

MOP (bar)	Upper limit of Evaporating Temperature Range		
	R134A	R407C	R410A
3.3	+11°C		
6.4		+14.5°C	
12.9			+17°C

Note: Pressures are given in gauge pressure.

Selection Tables

R134A

Nominal Capacity (kw)	less MOP		with Standard-MOP		Equalizer	Inlet x Outlet / ODF
	Type	Part No.	Type	Part No.		
1.8	TX3-M02	801766M	TX3-M12	801778M	internal	1/4" x 3/8"
2.8	TX3-M03	801767M			internal	1/4" x 3/8"
4.0	TX3-M04	801768M			internal	3/8" x 1/2"
2.8	TX3-M023	801770M	TX3-M33	801782M	Ext. 1/4"	1/4" x 3/8"
4.0	TX3-M024	801771M	TX3-M34	801783M	Ext. 1/4"	3/8" x 1/2"
6.1	TX3-M025	801772M	TX3-M35	801784M	Ext. 1/4"	3/8" x 1/2"
8.3	TX3-M026	801773M	TX3-M36	801785M	Ext. 1/4"	3/8" x 1/2"
10.2	TX3-M027	801774M	TX3-M37	801786M	Ext. 1/4"	1/2" x 5/8"
12.1	TX3-M028	801775M	TX3-M38	801787M	Ext. 1/4"	1/2" x 5/8"
16.5	TX3-M029	801776M	TX3-M39	801788M	Ext. 1/4"	1/2" x 5/8"

R410A

Nominal Capacity (kw)	less MOP		with Standard-MOP		Equalizer	Inlet x Outlet / ODF
	Type	Part No.	Type	Part No.		
6.3			TX3-Z34	801944M	Ext. 1/4"	3/8" x 1/2"
9.4			TX3-Z35	801945M	Ext. 1/4"	3/8" x 1/2"
12.9			TX3-Z36	801946M	Ext. 1/4"	3/8" x 1/2"
15.8			TX3-Z37	801947M	Ext. 1/4"	1/2" x 5/8"
18.8			TX3-Z38	801948M	Ext. 1/4"	1/2" x 5/8"

R407C

Nominal Capacity (kw)	less MOP		with Standard-MOP		Equalizer	Inlet x Outlet / ODF
	Type	Part No.	Type	Part No.		
0.9	TX3-N01	801813M			internal	1/4" x 3/8"
3.9			TX3-N13	801828M	internal	1/4" x 3/8"
2.5	TX3-N22	801818M			Ext. 1/4"	1/4" x 3/8"
3.9	TX3-N23	801819M	TX3-M33	801832M	Ext. 1/4"	1/4" x 3/8"
5.6	TX3-N24	801820M	TX3-M34	801833M	Ext. 1/4"	3/8" x 1/2"
8.4	TX3-N25	801821M	TX3-M35	801834M	Ext. 1/4"	3/8" x 1/2"
11.6	TX3-N26	801822M	TX3-M36	801835M	Ext. 1/4"	3/8" x 1/2"
14.2	TX3-N27	801823M	TX3-M37	801836M	Ext. 1/4"	1/2" x 5/8"
16.9	TX3-N28	801824M	TX3-M38	801837M	Ext. 1/4"	1/2" x 5/8"
23.0			TX3-M39	801838M	Ext. 1/4"	1/2" x 5/8"

R407C for heat pump applications

Nominal Capacity (kw)	less MOP		with Standard-MOP		Equalizer	Inlet x Outlet / ODF
	Type	Part No.	Type	Part No.		
3.9	TX3-N63	806801M	Adjustable with internal check valve and special liquid charge for heat pump applications		Ext. 1/4"	1/4" x 3/8"
8.4	TX3-N65	806803M			Ext. 1/4"	3/8" x 1/2"
11.6	TX3-N66	806804M			Ext. 1/4"	3/8" x 1/2"
14.2	TX3-N67	806805M			Ext. 1/4"	1/2" x 5/8"
16.9	TX3-N68	806806M			Ext. 1/4"	1/2" x 5/8"
23	TX3-N69	806807M			Ext. 1/4"	1/2" x 5/8"

Nominal capacity (Q_n) is based on the following conditions:

Refrigerant	Evaporating temperature	Condensing temperature	Subcooling
R407C	+4°C dew point	+38°C bubble p.	1K
8.4	+4°C		1K

Thermo™-Expansion Valves Series TX7

TX7 series of Thermo™-Expansion Valves are designed predominantly for AC, heat pumps, close control and industrial process cooling applications. The TX7 is ideal for those applications requiring hermetic / compact size combined with stable and accurate control over wide load and evaporating temperature ranges.

Features

- Monoblock, hermetic valve with brazing connections
- 7 sizes up to 180 kW (R410A)
- Maximum working pressure: PS 46 bar
- Factory test pressure: PT 50.6 bar
- Bi-Flow application
 - Balanced port in normal and reverse flow directions eliminates disturbance forces resulting from condensing pressure
 - Optimum static superheat in normal and reverse flow
 - Capacities performance in normal and reverse flow correlates to capacity of heat pumps in cooling and heating mode
- Power Element with 65 mm diameter enables low partial load (20-25%) performance at stable superheat
- Applicable in systems with digital scroll, step less screw compressors and variable speed compressors
- Floating superheat in reverse flow (heating mode) supports evaporator efficiency during low ambient operating conditions in air cooled reversible chillers
- Laser welded stainless steel power element with a special diaphragm profile provides life expectancy against high pressure during reversed flow via external equalizer.
- Single diaphragm with negligible hysteresis withstands against higher pressure
- Fine tuning by external superheat adjusting mechanism
- Special factory setting upon request. Minimum order quantity 60 pieces



TX7-Z13

R410A / R32 Selection Table

Capacity, R410A [kW]		Capacity, R32 [kW]		With MOP		Connection	
Normal Flow	Reverse Flow	Normal Flow	Reverse Flow	Type	Part No.	Inlet x Outlet	Equalizer
32.1	31.7	47.7	46.9	TX7-Z13 m	806 811	12 mm x 16 mm	6 mm
32.1	31.7	47.7	46.9	TX7-Z13	806 810	1/2" x 5/8"	1/4"
39.9	39.1	59.3	57.8	TX7-Z14 m	806 813	16 mm x 22 mm	6 mm
39.9	39.1	59.3	57.8	TX7-Z14	806 812	5/8" x 7/8"	1/4"
48.9	47.4	72.7	70.1	TX7-Z15 m	806 815	16 mm x 22 mm	6 mm
48.9	47.4	72.7	70.1	TX7-Z15	806 814	5/8" x 7/8"	1/4"
80.7	67.7	120	100.2	TX7-Z16 m	806 817	22 mm x 28 mm	6 mm
80.7	67.7	120	100.2	TX7-Z16	806 816	7/8" x 1-1/8"	1/4"
99.4	81.5	147.9	120.5	TX7-Z17 m	806 819	22 mm x 28 mm	6 mm
99.4	81.5	147.9	120.5	TX7-Z17	806 818	7/8" x 1-1/8"	1/4"
130.9	113.9	194.7	168.4	TX7-Z18 m	806 821	22 mm x 28 mm	6 mm
130.9	113.9	194.7	168.4	TX7-Z18	806 820	7/8" x 1-1/8"	1/4"
183.4	165.1	272.9	244.1	TX7-Z19 m	806 823	22 mm x 28 mm	6 mm
183.4	165.1	272.9	244.1	TX7-Z19	806 822	7/8" x 1-1/8"	1/4"

R134a Selection Table

Capacity, R134a [Kw]		With MOP		Without MOP		Connection	
Normal Flow	Reverse Flow	Type	Part No.	Type	Part No.	Inlet x Outlet	Equalizer
18.1	17.9	TX7-M13 m	806 839	TX7-M03 m	806 825	12 mm x 16 mm	6 mm
18.1	17.9	TX7-M13	806 838	TX7-M03	806 824	1/2" x 5/8"	1/4"
22.5	22	TX7-M14 m	806 841	TX7-M04 m	806 827	16 mm x 22 mm	6 mm
22.5	22	TX7-M14	806 840	TX7-M04	806 826	5/8" x 7/8"	1/4"
27.5	26.7	TX7-M15 m	806 843	TX7-M05 m	806 829	16 mm x 22 mm	6 mm
27.5	26.7	TX7-M15	806842	TX7-M05	806 828	5/8" x 7/8"	1/4"
45.4	38.2	TX7-M16 m	806 845	TX7-M06 m	806 831	22 mm x 28 mm	6 mm
45.4	38.2	TX7-M16	806844	TX7-M06	806 830	7/8" x 1-1/8"	1/4"
56.0	45.9	TX7-M17 m	806 847	TX7-M07 m	806 833	22 mm x 28 mm	6 mm
56.0	45.9	TX7-M17	806846	TX7-M07	806 832	7/8" x 1-1/8"	1/4"
73.7	64.1	TX7-M18 m	806 849	TX7-M08 m	806 835	22 mm x 28 mm	6 mm
73.7	64.1	TX7-M18	806848	TX7-M08	806 834	7/8" x 1-1/8"	1/4"
103.3	93	TX7-M19 m	806 851	TX7-M09 m	806 837	22 mm x 28 mm	6 mm
103.3	93	TX7-M19	806850	TX7-M09	806 836	7/8" x 1-1/8"	1/4"

R407C Selection Table

Capacity, R407C [kw]		With MOP		Without MOP		Connection	
Normal Flow	Reverse Flow	Type	Part No.	Type	Part No.	Inlet x Outlet	Equalizer
28.9	28.6	TX7-N13 m	806 868	TX7-N03 m	806 853	12 mm x 16 mm	6 mm
28.9	28.6	TX7-N13	806 867	TX7-N03	806 852	1/2" x 5/8"	1/4"
36.0	35.2	TX7-N14 m	806 870	TX7-N04 m	806 855	16 mm x 22 mm	6 mm
36.0	35.2	TX7-N14	806 869	TX7-N04	806 854	5/8" x 7/8"	1/4"
44.1	42.7	TX7-N15 m	806 872	TX7-N05 m	806 857	16 mm x 22 mm	6 mm
44.1	42.7	TX7-N15	806 871	TX7-N05	806 856	5/8" x 7/8"	1/4"
72.7	61.1	TX7-N16 m	806 874	TX7-N06 m	806 859	22 mm x 28 mm	6 mm
72.7	61.1	TX7-N16	806 873	TX7-N06	806 858	7/8" x 1-1/8"	1/4"
89.7	73.5	TX7-N17 m	806 876	TX7-N07 m	806 861	22 mm x 28 mm	6 mm
89.7	73.5	TX7-N17	806 875	TX7-N07	806 860	7/8" x 1-1/8"	1/4"
118.1	102.7	TX7-N18 m	806 878	TX7-N08 m	806 863	22 mm x 28 mm	6 mm
118.1	102.7	TX7-N18	806 877	TX7-N08	806 862	7/8" x 1-1/8"	1/4"
165.4	148.9	TX7-N19 m	806 880	TX7-N09 m	806 865	22 mm x 28 mm	6 mm
165.4	148.9	TX7-N19	806 879	TX7-N09	806 864	7/8" x 1-1/8"	1/4"

R450A / R513A Selection Table

Capacity, R450A [kW]	Capacity, R513A [kW]	With MOP		Without MOP		Connection	
		Type	Part No.	Type	Part No.	Inlet x Outlet	Equalizer
15.9	16.3	TX7-M13 m	806 839	TX7-M03 m	806 825	12 mm x 16 mm	6 mm
15.9	16.3	TX7-M13	806 840	TX7-M03	806 824	1/2" x 5/8"	1/4"
19.8	20.3	TX7-M14 m	806 841	TX7-M04 m	806 827	16 mm x 22 mm	6 mm
19.8	20.3	TX7-M14	806 842	TX7-M04	806 826	5/8" x 7/8"	1/4"
24.3	24.8	TX7-M15 m	806 843	TX7-M05 m	806 829	16 mm x 22 mm	6 mm
24.3	24.8	TX7-M15	806 844	TX7-M05	806 828	5/8" x 7/8"	1/4"
40.1	41.0	TX7-M16 m	806 845	TX7-M06 m	806 831	22 mm x 28 mm	6 mm
40.1	41.0	TX7-M16	806 846	TX7-M06	806 830	7/8" x 1-1/8"	1/4"
49.4	50.6	TX7-M17 m	806 847	TX7-M07 m	806 833	22 mm x 28 mm	6 mm
49.4	50.6	TX7-M17	806 848	TX7-M07	806 832	7/8" x 1-1/8"	1/4"
65.0	66.6	TX7-M18 m	806 849	TX7-M08 m	806 835	22 mm x 28 mm	6 mm
65.0	66.6	TX7-M18	806 850	TX7-M08	806 834	7/8" x 1-1/8"	1/4"
91.1	93.3	TX7-M19 m	806 851	TX7-M09 m	806 837	22 mm x 28 mm	6 mm
91.1	93.3	TX7-M19	806 852	TX7-M09	806 836	7/8" x 1-1/8"	1/4"

The TX7-xxx with standard charges can be used with systems having R450A, R513a, and R32 considering the readjustment of factory setting. The readjusting depends to designed evaporating temperature. For more details see operating instructions.

The nominal capacity (Q_n) is based on the following conditions:

Refrigerant	Evaporating temperature [°C]	Condensing temperature [°C]	Subcooling
R134A, R22	+4 °C	+38°C	1K
R407C,	+4 °C	+38°C bubble point/ +43 °C dew point	1K
R440A, R513A	+4 °C	+38°C	1K
R410A, R32	+4 °C	+38°C	1K

Charge	Refrigerant	Recommended Evaporating Temperature Range [°C]	Maximum Bulb Temperature [°C]
M0	R134a	-25...+30	88
N0	R407C	-25...+20	71
M1 MOP 3.8 Bar	R134a	-25...+10	120
N1 MOP 6.9 Bar	R407C	-25...+14	120
Z1 MOP 12.1 Bar	R410A/ R32	-25...+14	120

Thermo™-Expansion Valve Series T Exchangeable Power Assemblies and Orifices

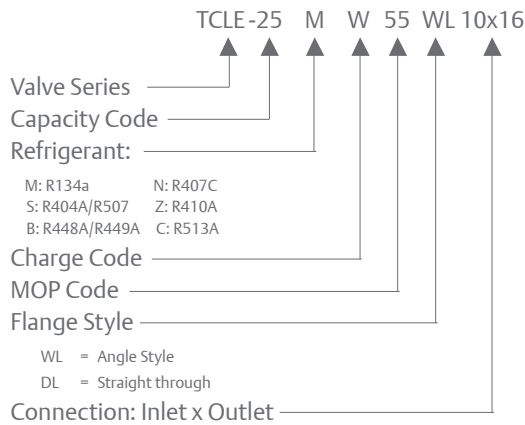
Features

- Modular design for economical logistics and easy assembly and servicing
- Very good stability due to large diaphragm diameter
- Constant superheat across a wide application range
- Superior partial load performance due to double seat orifice design (TJRE, TERE, TIRE & THRE)
- Bi-flow capability for applications in heat pumps
- Capillary tube length 1.5 m (TCLE, TJRE) and 3m (TERE, TIRE & THRE)
- Max. working pressure PS:
 - 46 bar with XB power assembly
 - 31 bar with XC power assembly
- Medium Temperature range TS: -45...+75°C
- Flanges: brazing ODF/ODM connection

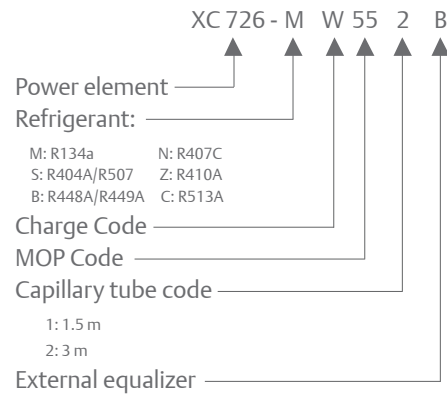


TCLE

Type Code Valve



Type Code Power Element



Nominal Capacities for Orifices

Valve Series	R134a/R513A/R450A			R404A/R507 R452A			R448A/ R449A		R407C		Orifice Type	Power Element Type
	Type	R134a (kW)	R513A/ R450A (kW)	Type	R404A/ R507 (kW)	R452A (kW)	Type	R448A/ R449A (kW)	Type	R407C (kW)		
TCLF-	25 MW	1.5	1.3	25 SW	1.3	1.4	25 BW	1.9	50 NW	2.1	X 22440-B1B	XB1019...1B
	75 MW	2.9	2.6	75 SW	2.6	2.8	100 BW	3.7	100 NW	4.0	X 22440-B2B	
	150 MW	6.1	5.6	150 SW	5.5	6.0	200 BW	7.9	200 NW	8.5	X 22440-B3B	
	200 MW	9.3	8.4	200 SW	8.3	9.0	250 BW	11.9	300 NW	12.9	X 22440-B3.5B	
	250 MW	13.5	12.2	250 SW	12.1	13.1	300 BW	17.3	400 NW	18.7	X 22440-B4B	
	350 MW	17.3	15.7	400 SW	15.5	16.8	500 BW	22.1	550 NW	24.0	X 22440-B5B	
	550 MW	23.6	21.5	600 SW	21.2	23.0	800 BW	30.3	750 NW	32.9	X 22440-B6B	
	750 MW	32.0	29.0	850 SW	28.7	31.1	1100 BW	41.0	1000 NW	44.4	X 22440-B7B	
	900 MW	37.2	33.8	1000 SW	33.4	36.2	1300 BW	47.7	1150 NW	51.7	X 22440-B8B	
TJRE-	11 MW	45	40	12 SW	40	43.9	15 BW	58	14 NW	62	X 11873-B4B	XC726...2B
	13 MW	57	52	14 SW	51	56	18 BW	74	17 NW	80	X 11873-B5B	
TERE-	16 MW	71	64	18 SW	63	69	23 BW	91	21 NW	99	X 91117-B6B	
	19 MW	81	73	20 SW	72	79	26 BW	104	25 NW	112	X 91117-B7B	
	25 MW	112	100	27 SW	99	108	35 BW	143	33 NW	155	X 91117-B8B	
	31 MW	135	121	34 SW	120	132	44 BW	174	42 NW	188	X 91117-B9B	
TIRE-	45 MW	174	156	47 SW	154	169	60 BW	222	52 NW	241	X 9166-B10B	
THRE-	55 MW	197	177	61 SW	174	192	78 BW	252	71 NW	273	X 9144-B11B	
	68 MW	236	211	77 SW	209	229	98 BW	301	94 NW	327	X 9144-B13B	

Note 1: R450A, R513A can be used with MW charge. For valve readjustment see HFO/HFO blends Product Guide.

Note 2: R452A can be used with SW charge. For valve readjustment see R452A Product Guide.

Note 3: R410A available with Power element XB1019-ZW175-1B. Nominal capacity range 2.2...86.4 kW.

Note 4: R407A/ R407F can be used with NW/ SW40 charges and readjustment of valve. Nominal capacity range ≈ 2...338 kW.

The Nominal Capacity is Based on the Following Conditions:

Refrigerant	Evaporating temperature	Condensing temperature	Subcooling
R134a, R404A, R507, R513A, R1234ze, R410A	+4°C dew point	+38°C bubble/ +38°C dew point	1K
R407F, R407A		38°C bubble / +42.4°C dew point	
R450A		+38°C bubble/ +38.6°C dew point	
R448A, R449A,		+38°C bubble/ +42.6°C dew point	
R407C		+38°C bubble/ +42.9°C dew point	
R452A		+38°C bubble/ +41.6°C dew point	

For selection of other operating conditions, please use „Controls Navigator“ selection program.

Selection Table Power Element and Recommended Flanges

Valve series	Orifice type	Angle style type	Straight through type	Connection (inlet x outlet)		Power Element Type
				Metric	Imperial	
TCLC	X22440-B1B / B2B / B3B / B3.5B / B4B	C501-5	9761-3	-	3/8"x5/8" ODF	XB1019...1B
		C501-5mm	9761-3mm	10x16 mm ODF	-	
	X22440-B5B / B6B	C501-7	9761-4	-	1/2"x5/8" ODF	
		C501-7mm	9761-4mm	12x16 mm ODF	-	
	X22440-B7B / B8B	-	6346-17	16x22 mm ODF	5/8"x7/8" ODF	
		A576	-	-	5/8"x7/8" ODF 7/8"x1-1/8" ODM	
A576-mm		-	16x22 mm ODF 22x28 mm ODM	-		
TJRE	X11873-B4B / B5B	10331	10332	22x22 mm ODF	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM	
TERE	X9117-B6B / B7B / B8B / B9B	9153 9153-mm	9152 9152-mm	22x22 mm ODF 22x28 mm ODM	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM	XC726...2B
TIRE	X9166 - B10B					
THRE	X9144-B11B / B13B	9149	9148	22x22 mm ODF	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM	

MOP Charges T-Series

MOP		Evaporating Temperature Range °C				
Code	Bar	R134a MW	R404A/ R507 SW	R407C NW	R410A ZW	R448A/ R449A BW
15	1.0	-45... -16				
30	2.1					-45...-18
35	2.4	-45...0				
40	2.8		-45...-18			
55	3.8	-45...+11	-45...-10			
75	5.2		-45...-2			
80	5.5		-45...0			
100	6.9			-45...+14		
175	12.1				-45...+16	

Accessories and Spare Parts

Description	Type	Part No.
Service Tool for T, ZZ, L and 935 Series valves	X 99999	800005
Gasket sets for T, ZZ, L and 935 Series valves	X 13455-1	027579
Steel Screws for flange types: C501, 9761, 6346, A576	Screw ST 32	803573
Steel Screws for flange types: 9148, 9149, 9152, 9153, 10331, 10332	Screw ST 48	803574

Thermo™ - Expansion Valve Series ZZ

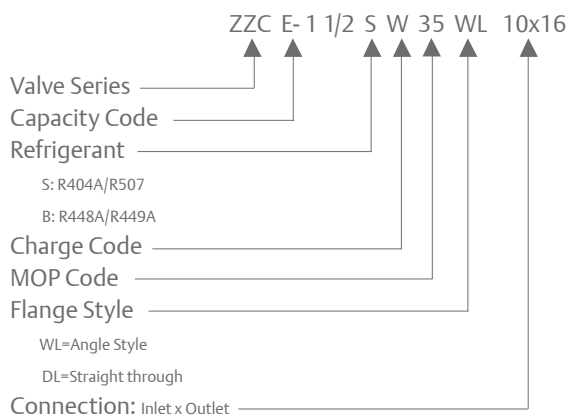
for Low Evaporating Temperatures Between -45 and -100°C

Features

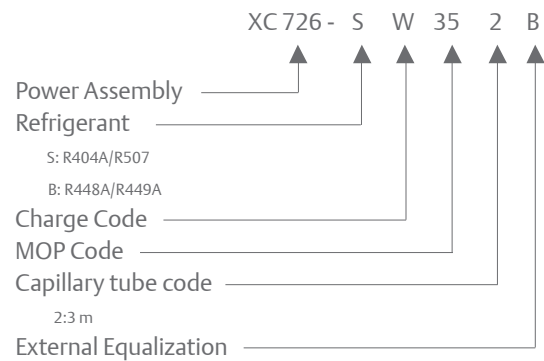
- Modular design for economical logistics and easy assembly and servicing
- Very good stability due to large diaphragm diameter
- High-quality materials and processes for high reliability and long lifetime
- To withstand stress at extremely low temperatures, ZZ-Series valves feature bronze bolts.
- Max. working pressure PS:
- 31 bar with XC power assembly



Type Code Valve



Type Code Power Element



Selection table and Nominal Capacities

Valve Series	R23		R404A / R507		R448A/ R449A		Orifice	Power Assembly
	Type	Nominal Capacity (kW)	Type	Nominal Capacity (kW)	Type	Nominal Capacity (kW)		
ZZCE	2 BG	1.9	2/4 SW	1.2	1BW	1.7	X 10-B01	XC726 ... 2B
	6 BG	4.0	1 1/2 SW	2.6	2BW	3.7	X 10-B02	
	8 BG	6.8	2 1/2 SW	4.4	3BW	6.2	X 10-B03	
	12 BG	10.8	3 1/2 SW	7.0	5BW	9.8	X 10-B04	
	17 BG	16.3	5 SW	10.6	6BW	14.8	X 10-B05	
	25 BG	21.7	8 SW	14.1	10BW	19.8	X 10-B06	
	31 BG	27.1	9 SW	17.6	12BW	24.7	X 10-B07	

Note: Attention - To withstand stress at extremely low temperatures, ZZ-Series valves feature bronze bolts. Please order separately Screw BZ 32 Part No. 803575, Screw BZ 48 Part No. 803576

Nominal capacity (Q_n) is based on the following conditions:

Refrigerant	Evaporating temperature	Condensing temperature	Subcooling
R23	-60°C	-25°C	1K
R448A, R449A	-40°C	25°C bubble / 30,1°C dew point	
R404A, R507	-40°C	25°C	

For selection of other operating conditions, please use „Controls Navigator“ selection program.

Selection table Power Element and Recommended Flanges

Valve Series	Orifice type	Connection Standard Flange, Angle Style		Connection (inlet x outlet)		Power Element Type
		Type	Type	Metric	Imperial	
ZZCE	X 10-B01/ B02/ B03	C501-5mm		10 X 16 mm ODF		XC726 ... 2B
			C501-5		3/8" X 5/8 ODF	
	X 10-B04/ B05	C501-7 mm		12x16 mm ODF		
			C501-7		1/2"x5/8" ODF -	
	X 10-B04/ B05	A 576 mm		16x22 mm ODF		
			A 576	22x28 mm ODM	5/8"x7/8" ODF	

MOP Charges ZZ-Series

MOP Code	MOP		Evaporating Temperature Range °C		
	bar	Tmax	R23	R404A/R507	R448A/ R449A
20	1.4	-66°C	-100 ... -71		
35	2.1	-14°C			-75 ... -18
40	2.8	-14°C		-75 ... -18	
55	3.8	-7°C		-75 ... -10	
60	4.1	-48°C	-100 ... -51		
125	8.6	-32°C	-100 ... -35		

Accessories and Spare Parts

Description	Type	Part No.
Service Tool for T, ZZ, L and 935 Series valves	X 99999	800005
Gasket sets for T, ZZ, L and 935 Series valves	X 13455-1	027579
Bronze screw for Flange types: C500, C501, 9761, X6346, X6669, A576	Screw BZ 32	803575

Thermo™-Expansion Valves L-Series

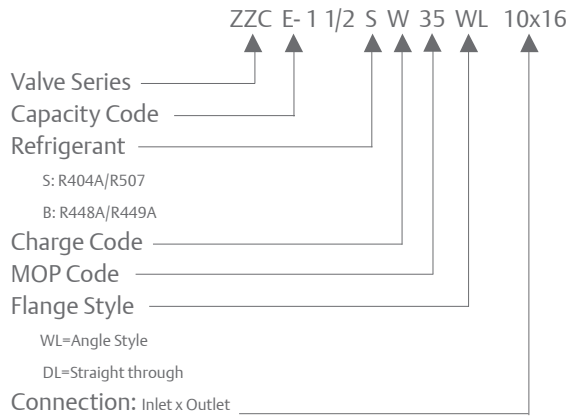
Exchangeable Power Assemblies and Orifices

Features

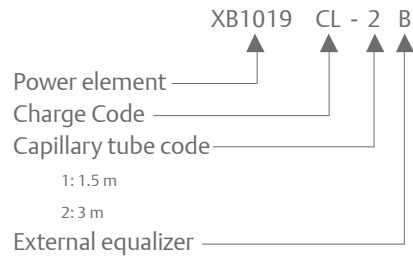
- Applications for Series L valves include superheat control (desuperheating of suction gas i.e., in hotgas bypass systems and interstage cooling in multiple stage compressors)
- Modular design for economical logistics and easy assembly and servicing
- Very good stability is attained because of the large forces generated by the large diaphragm diameter
- High-quality materials and processes for high reliability and long lifetime
- Superior partial load performance due to seat orifice design (LJRE, LERE & LIRE)
- Max. working pressure PS
 - 46 bar with XB power assembly
 - 31 bar with XC power assembly.
- Medium Temperature Range TS: -45...+65°C



Type Code Valve



Type Code Power Assembly



Nominal Capacities for Cages

Valve Series	Capacity code *	Nominal Capacity Q _n kW								Orifice Type	Power Assembly Type
		R134a (kW)	R404A/R507 (kW)	R407C (kW)	R407A (kW)	R4071F (kW)	R448A/R449A (kW)	R450A	R513A		
LCLE	1 *	1.5	1.3	2.1	1,9	2,1	1.9	1.3	1.3	X 22440-B1B	XB1019...2B
	2 *	2.9	2.6	4.0	3,6	4,1	3.7	2.5	2.6	X 22440-B2B	
	3 *	6.1	5.6	8.5	7,8	8,8	7.9	5.4	5.5	X 22440-B3B	
	3.5 *	9.3	8.4	12.9	21,9	13,3	11.9	8.1	8.3	X 22440-B3.5B	
	4 *	13.5	12.2	18.7	17,0	19,3	17.3	11.8	12.1	X 22440-B4B	
	6 *	17.3	15.7	24.0	11,7	24,8	22.1	15.1	15.5	X 22440-B5B	
	7 *	23.6	21.5	32.9	29,9	34,0	30.3	20.7	21.2	X 22440-B6B	
	9 *	32.0	29.0	44.4	40,5	45,9	41.0	28.0	28.7	X 22440-B7B	
LJRE-	10 *	37.2	33.8	51.7	47	53	47.7	32.6	33.4	X 22440-B8B	XC726...2B
	11 *	45	40	62	57	65	58	40	40	X 11873-B4B	
LERE	12 *	57	51	80	73	83	74	50	52	X 11873-B5B	XC726...2B
	13 *	71	63	99	90	102	91	62	64	X 91117-B6B	
	14 *	81	72	112	102	116	104	71	73	X 91117-B7B	
LIRE-	15 *	112	99	155	141	160	143	98	100	X 91117-B8B	XC726...2B
	16 *	135	120	188	171	194	174	119	121	X 91117-B9B	
LIRE-	17 *	174	154	241	219	249	222	152	156	X 9166-B10B	

Note: *) Please indicate designation character for desired superheat.

The nominal capacity is based on the following conditions:

Refrigerant	Evaporating temperature [°C]	Condensing temperature [°C]	Subcooling
R134a, R22, R513A, R404A, R507	+4°C Dew Point	+38°C bubble/ +38°C dew point	1K
R448A, R449A		+38°C bubble/ +42.6°C dew point	
R450A		+38°C bubble / +38.6°C dew point	
R407C		+38°C bubble/ +42.9°C dew point	
R407A, R407A		+38°C bubble/ +42.4°C dew point	

For selection of other operating conditions, please use „Controls Navigator“ selection program.

Selection Table Power Assembly and Recommended Flanges

Valve Series	Orifice Type	Connection Standard Flange, Angle Style		Connection (inlet x outlet)		Power Element Type
		Type	Type	Metric	Imperial	
LCLE	X22440-B1B / B2B / B3B / B3.5B / B4B		C501-5	-	3/8"x5/8" ODF	XB1019...1B
		C501-5mm		10x16 mm ODF		
	X22440-B5B / B6B		C501-7		1/2"x5/8" ODF	
		C501-7mm		12x16 mm ODF		
		A576		5/8"x7/8" ODF 7/8"x1-1/8" ODF		
	A576-mm		16x22 mm ODF 22x28 mm ODM	-		
LJRE	X11873-B4B / B5B	10331	10331	22x22 mm ODF	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM	XC726...2B
LERE/ LIRE	X9117-B6B / B7B / B8B / B9B / B10B		9153	-	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM	
		9153-mm		22x22 mm ODF 22x28 mm ODM		

Suction Gas Superheat Selection:

* Charge Code	Refrigerant							
	R134a	R404A/R507	R407C	R410A	R448A/R449A	R450A	R513A	R407A/R407F
CL		22 K	13 K	30 K	16K	-	-	22 K
GL	15 K	35 K	25 K	33	27K	9K	-	35 K
UL	30 K		40 K	47	-	16K	24 K	-

Note: *) Please Indicate Designation Character for Desired Superheat.

Accessories and Spare Parts

Description	Type	Part No.
Service Tool for T, ZZ, L and 935 Series valves	X 99999	027 579
Gasket sets for T, ZZ, L and 935 Series valves	X 13455 -1	800 005
Gasket sets for T, ZZ, L and 935 Series valves Steel Screws for flange types: C500, C501, 9761, X6346, X6669, A576	Screw ST 32	803 573
Steel Screws for flange types: 9148, 9149, 9152, 9153, 10331, 10332	Screw ST 48	803 574

Liquid Injection Valves Series 935

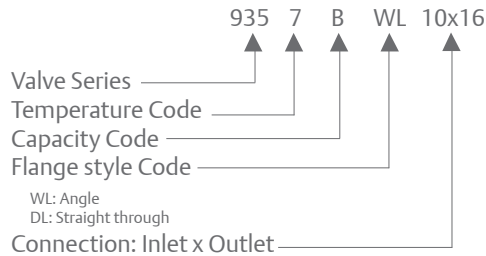
Exchangeable Power Assemblies and Orifices

Features

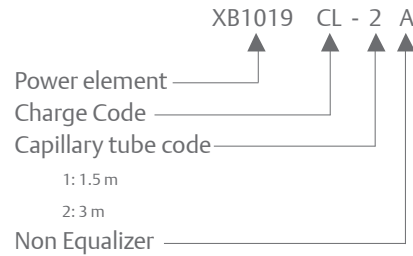
- Modular design for economical logistics and easy assembly and servicing
- Very good stability is attained because of the large forces generated by the large diaphragm diameter
- High-quality materials and processes for high reliability and long lifetime
- Combinations of different charges with various orifice springs cover a very large application range
- Max. working pressure PS:
 - 46 bar with XB power assembly
 - 31 bar with XC power assembly.
- Medium Temperature Range TS: -45...+65°C



Type Code Valve



Type Code Power Assembly



Nominal Capacities for Cages

Valve Series	Capacity code*	Nominal Capacity Q _n kW									Orifice Type	Power Element Type
		R134a (kW)	R404A/R507 (kW)	R407C	R407F	R407A	R448A/R449A	R450A	R513A	R1234ze		
935- *-	A	4.0	3.8	5.6	5.8	5.1	5.2	3.5	3.6	3.1	X10-**-01	XB1019 - ** - 2A
	B	7.8	7.4	10.9	11.3	9.9	10.1	6.9	7.1	6.1	X10-**-02	
	C	11.1	10.3	15.4	15.9	14.0	14.2	9.7	9.9	8.6	X10-**-03	
	D	16.3	15.6	22.8	23.6	20.7	21.0	14.4	14.7	12.8	X10-**-04	
	E	22.5	21.0	31.2	32.3	28.4	28.8	19.7	20.2	17.5	X10-**-05	
	G	32.0	29.9	44.5	46.1	40.5	41.1	28.1	28.8	24.9	X10-**-06	
	X	46.6	43.5	64.9	67.1	58.9	59.8	40.9	41.9	36.3	X10-**-07	

*) Temperature Code	Temperature Range °C	**) Spring code	***) Charge code
3	-1 ... +17	B	UL
6	+14 ... +38	C	KL
105	+44 ... +70	C	YL
106	+66 ... +94	C	JL
100	+94 ... +121	C	LL

The nominal capacity is based on the following conditions:

Refrigerant	Evaporating temperature [°C]	Condensing temperature [°C]	Subcooling
R134a, R513A, R404A, R507, R1234ze,	+4°C dew Point	+38°C bubble/ +38°C dew point	1K
R448A, R449A		+38°C bubble/ +42.6°C dew point	
R450A		+38°C bubble / +38.6°C dew point	
R407C		+38°C bubble/ +42.9°C dew point	
R407F, R407A		+38°C bubble/ +42.4°C dew point	

For selection of other operating conditions, please use „Controls Navigator“ selection program.

Selection Table Power Assembly and Recommended Flanges

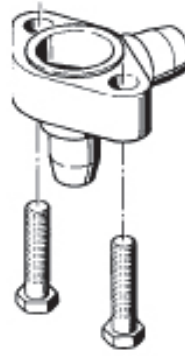
Valve Series	Orifice Type	Connection Standard Flange, Angle Style		Connection (inlet x outlet)		Power Element Type
		Type	Type	Metric	Imperial	
935	X 10- [*] 01/ [*] 02/ [*] 03	C501-5 mm		10 X 16 mm ODF		XB1019- [*] [*] [*] -2A
			C501-5		3/8" X 5/8 ODF	
	X 10- [*] 04/ [*] 05	C501-7 mm		12x16 mm ODF		
			C501-7		1/2"x5/8" ODF -	
	X 10- [*] 06/ [*] 07	A 576 mm		16x22 mm ODF 22x28 mm ODM		
			A 576		5/8"x7/8" ODF 7/8"x1-1/8" ODM	

Accessories and Spare Parts

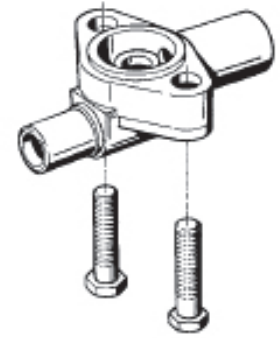
Description	Type	Part No.
Service Tool for T, ZZ, L and 935 Series valves	X 99999	800005
Gasket sets for T, ZZ, L and 935 Series valves	X 13455-1	027579
Steel Screws for flange types: C500, C501, 9761, X6346, X6669, A576	Screw ST 32	803573
Bulb clamp for XB1019	XA 1728-4	803260

Note: See "Controls Navigator" for More Information on Selection and Adjustment Guidelines.

Overview Flange for Take Apart Valves



Angle Style Flange
(WL)



Straight Through Flange
(DL)

Flanges: T- / L-Series								
Valve Series	Orifice Type	Angle Style		Straight Through		Connection (Inlet x Outlet)		
		Type	Part No.	Type	Part No.	Metric	Imperial	
TCLE / LCLE	X22440-B1B / B2B/ B3B / B3.5B / B4B	C501-5	803232	9761-3	803240	-	3/8"x5/8" ODF	
		C501-5mm	803233	9761-3mm	803241	10x16mm ODF		
	X22440-B5B / B6B	C501-7	803234	9761-4	803350		1/2"x5/8" ODF	
		C501-7mm	803235	9761-4mm	803243	12x16mm ODF	-	
	X22440-B7B / B8B	-	-	-	6346-17	803330	16x22mm ODF	5/8"x7/8" ODF
		A576	803238	-	-	-	-	5/8"x7/8" ODF 7/8"x1-1/8" ODM
A576-mm		803239	-	-	-	16x22mm ODF 22x28mm ODM	-	
TJRE / LJRE	X11873-B4B / B5B	10331	803338	10332	803324	22x22mm ODF	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM	
TERE/ TIRE	X9117-B6B / B7B / B8B / B9B / X9166-B10B	9153	803244	9152	803286	-	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM	
LERE/ LIRE		9153-mm	803245	9152-mm	803287	22x22mm ODF 28x28mm ODM		
THRE	X9144-B11B / B13B	9149	803284	9148	803283	22x22mm ODF	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM	

Flanges: 935- / ZZ-Series								
Valve Series	Orifice Type	Angle Style		Straight Through		Connection (Inlet x Outlet)		
		Type	Part No.	Type	Part No.	Metric	Imperial	
935 / ZZ	X10-*01 / *02 / *03	C501-5	803232	9761-3	803240	-	3/8"x5/8" ODF	
		C501-5mm	803233	9761-3mm	803241	10x16mm ODF		
	X10-*04 / *05	C501-7	803234	9761-4	803350		1/2"x5/8" ODF	
		C501-7mm	803235	9761-4mm	803243	12x16mm ODF	-	
	X10-*06 / *07	-	-	-	6346-17	803330	16x22mm ODF	5/8"x7/8" ODF
		A576	803238	-	-	-	-	5/8"x7/8" ODF 7/8"x1-1/8" ODM
A576-mm		803239	-	-	-	16x22mm ODF 22x28mm ODM	-	