

Thermo™-expansion valve series T with exchangeable power assemblies and orifices

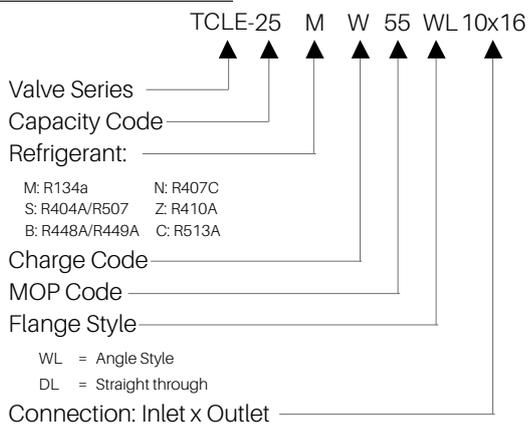
Features

- 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. allowable 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

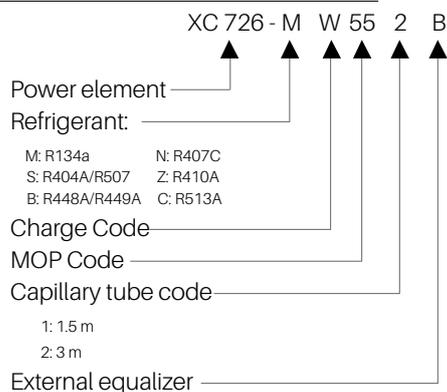


TCLE

Type code valve



Type code power element



Nominal capacities for orifices

Valve Series	Type	Nominal Capacity (kW)					Type	Nominal Capacity (kW)		Orifice Type	Power Element Type
		R134a	R513A*	R450A*	R1234yf*	R1234ze*		R404A / R507	R452A*		
TCLE-	25MW	1.5	1.3	1.3	1.1	1.1	25SW	1.3	1.4	X22440-B1B	XB1019 ...1B
	75MW	2.9	2.6	2.5	2.1	2.2	75SW	2.6	2.8	X22440-B2B	
	150MW	6.1	5.5	5.4	4.4	4.8	150SW	5.6	6.0	X22440-B3B	
	200MW	9.3	8.3	8.1	6.6	7.2	200SW	8.4	9.0	X22440-B3,5B	
	250MW	13.5	12.1	11.8	9.6	10.5	250SW	12.2	13.1	X22440-B4B	
	350MW	17.3	15.5	15.1	12.4	13.4	400SW	15.7	16.8	X22440-B5B	
	550MW	23.6	21.2	20.7	17.0	18.4	600SW	21.5	23.0	X22440-B6B	
	750MW	32.0	28.7	28.0	22.9	24.8	850SW	29.0	31.1	X22440-B7B	
	900MW	37.2	33.4	32.6	26.7	28.9	1000SW	33.8	36.2	X22440-B8B	
TJRE-	11MW	45.0	40.5	39.6	32.3	35.1	12SW	40.0	43.9	X11873-B4B	XB1019 ...1B
	13MW	57.0	51.7	50.5	41.3	44.7	14SW	51.0	56.0	X11873-B5B	
TERE-	16MW	71.0	63.5	62.1	50.7	55.0	18SW	63.0	68.9	X9117-B6B	XC726...2B
	19MW	81.0	72.6	70.9	58.0	62.9	20SW	72.0	78.7	X9117-B7B	
	25MW	112.0	99.8	97.5	79.7	86.4	27SW	99.0	108.3	X9117-B8B	
	31MW	135.0	121.5	118.7	97.0	105.2	34SW	120.0	131.7	X9117-B9B	
TIRE-	45MW	174.0	155.7	152.1	124.3	134.8	47SW	154.0	168.8	X9166-B10B	XC726...2B
THRE-	55MW	197.0	176.6	172.5	141.1	152.9	61SW	174.0	191.5	X9144-B11B	
	68MW	236.0	210.8	205.9	168.4	182.5	77SW	209.0	228.6	X9144-B13B	

Valve Series	Type	Nominal Capacity (kW)			Type	Nominal Capacity (kW)		Type	Nominal Capacity (kW)		Orifice Type	Power Element Type
		R448A	R449A	R454A*		R407C	R454C		R410A	R32		
TCLE-	55BW	1.9	1.9	1.8	50NW	2.1	1.6	50ZW	2.2	3.3	X22440-B1B	XB1019 ...1B
	100BW	3.7	3.6	3.5	100NW	4.0	3.0	100ZW	4.3	6.4	X22440-B2B	
	250BW	7.9	7.8	7.5	200NW	8.5	6.5	250ZW	9.2	13.7	X22440-B3B	
	350BW	11.9	11.7	11.3	300NW	12.9	9.7	400ZW	13.9	20.7	X22440-B3,5B	
	500BW	17.3	17.0	16.4	400NW	18.7	14.2	600ZW	20.2	30.0	X22440-B4B	
	650BW	22.1	21.8	21.0	550NW	24.0	18.2	750ZW	25.9	38.5	X22440-B5B	
	850BW	30.3	29.9	28.8	750NW	32.9	24.9	1000ZW	35.5	52.8	X22440-B6B	
	1150BW	41.0	40.4	38.9	1000NW	44.4	33.6	1400ZW	48	71.4	X22440-B7B	
	1350BW	47.7	47.0	45.3	1150NW	51.7	39.1	1600ZW	55.8	83.0	X22440-B8B	
TJRE-	17BW	57.8	57.0	54.9	14NW	62.0	47.4	19ZW	67.7	100.7	X11873-B4B	XB1019 ...1B
	21BW	73.8	72.8	70.1	17NW	80.0	60.5	25ZW	86.4	128.5	X11873-B5B	
TERE-	26BW	90.7	89.5	86.2	21NW	99.0	74.4	-	-	-	X9117-B6B	XC726...2B
	30BW	103.7	102.3	98.5	25NW	112.0	85.1	-	-	-	X9117-B7B	
	41BW	142.6	140.6	135.4	33NW	155.0	117.0	-	-	-	X9117-B8B	
	50BW	173.5	171.1	164.8	42NW	188.0	142.3	-	-	-	X9117-B9B	
TIRE-	64BW	222.4	219.3	211.2	52NW	241.0	182.4	-	-	-	X9166-B10B	XC726...2B
THRE-	72BW	252.3	248.8	239.6	71NW	273.0	207.0	-	-	-	X9144-B11B	
	86BW	301.1	297.0	286.0	94NW	327.0	247.0	-	-	-	X9144-B13B	

Note 1: Nominal conditions: Evaporating Temperature +4°C (dew point), Condensing Temperature +38°C (bubble point), Subcooling 1 K

Note 2: *) Superheat readjustment required - see Operating Instruction

Note 3: For selection of other operation conditions, please use the "Select" tool.

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	
TCLE	X22440-B1B / B2B/ B3B / B3.5B / B4B	C501-5	9761-3	-	3/8" x 5/8" ODF	XB1019...2B
		C501-5mm	9761-3mm	10 x 16 mm ODF	-	
	X22440-B5B / B6B	C501-7	9761-4	-	1/2" x 5/8" ODF	
		C501-7mm	9761-4mm	12 x 16 mm ODF	-	
	X22440-B7B / B8B	-	6346-17	16 x 22 mm ODF	5/8" x 7/8" ODF	
		A576	-	-	5/8" x 7/8" ODF 7/8" x 1-1/8" ODM	
A576-mm		-	16 x 22 mm ODF 22 x 28 mm ODM	-		
TJRE	X11873-B4B / B5B	10331	10332	22 x 22 mm ODF	7/8" x 7/8" ODF 1-1/8" x 1-1/8" ODM	
TERE	X9117-B6B / B7B / B8B / B9B	9153 9153-mm	9152 9152-mm	22 x 22 mm ODF 22 x 28 mm ODM	7/8" x 7/8" ODF 1-1/8" x 1-1/8" ODM	XC726...2B
TIRE						
THRE	X9144-B11B / B13B	9149	9148	22 x 22 mm ODF	7/8" x 7/8" ODF 1-1/8" x 1-1/8" ODM	

MOP charges T-series

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

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
Bulb clamp for XB1019	XA 1728-4	803260
Bulb clamp for XC726	XA 1728-5	803261

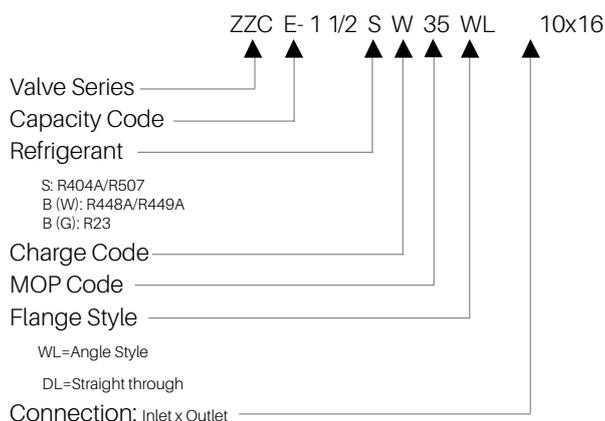
Thermo™ - expansion valve series ZZ for low evaporating temperatures between -45 and -100°C

Features

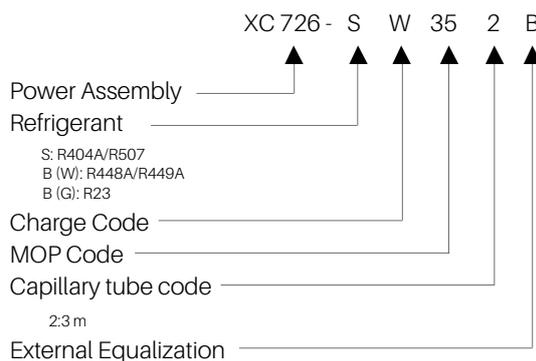
- Modular design for economical logistics and easy assembly and servicing
- Very good stability due to large diaphragm diameter
- High-quality materials and processes for high reliability and long lifetime
- To withstand stress at extremely low temperatures, ZZ-Series valves feature bronze bolts.
- Max.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



Type code valve



Type code power element



Selection table

Valve Series	Type	Nominal Capacity (kW)	Type	Nominal Capacity (kW)		Type	Nominal Capacity (kW)			Orifice	Power Assembly
		R23		R404A / R507	R452A		R448A / R449A	R454A	R455A		
ZZCE	2BG	1.9	2/4SW	1.2	1.3	1BW	1.7	1.7	1.6	X10-B01	XC726...2B
	6BG	4.0	1-1/2SW	2.6	2.8	2BW	3.7	3.7	3.4	X10-B02	
	8BG	6.8	2-1/2SW	4.4	4.6	3BW	6.2	6.2	5.7	X10-B03	
	12BG	10.8	3-1/2SW	7.0	7.4	5BW	9.8	9.8	9.1	X10-B04	
	17BG	16.3	5SW	10.6	11.1	6BW	14.8	14.8	13.7	X10-B05	
	25BG	21.7	8SW	14.1	14.8	10BW	19.8	19.8	18.2	X10-B06	
	31BG	27.1	9SW	17.6	18.5	12BW	24.7	24.7	22.8	X10-B07	

Note 1: Nominal conditions:

R23: Evaporating Temperature -60°C, Condensing Temperature -25°C, Subcooling 1 K

Other refrigerants: Evaporating Temperature -40°C (dew point), Condensing Temperature 25°C (bubble point), Subcooling 1 K"

Note 2: Attention - To withstand stress at extremely low temperatures, ZZ-Series valves feature bronze bolts. Please order separately Screw BZ 32 Part No. 803575

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" x 5/8" ODF -	
	X 10-B04/ B05	A 576 mm		16x22 mm ODF		
			A 576	22x28 mm ODM	5/8" x 7/8" ODF	

MOP charges ZZ-Series

MOP Code	MOP		Evaporating Temperature Range		
	bar	T _{max}	R23	R404A/R507/R452A	R448A/ R449A/R545A/R455A
20	1.4	-66°C	-100 ... -71°C		
35	2.1	-14°C			-75 ... -18°C
40	2.8	-14°C		-75 ... -18°C	
55	3.8	-7°C		-75 ... -10°C	
60	4.1	-48°C	-100 ... -51°C		
125	8.6	-32°C	-100 ... -35°C		

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
Bulb clamp for XC726	XA 1728-5	803261

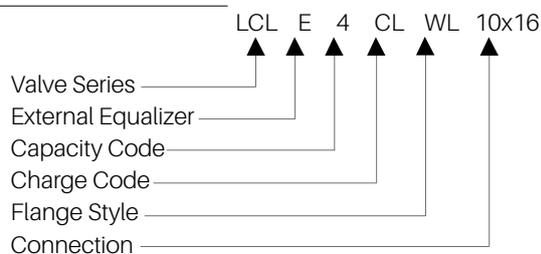
Thermo™-expansion valves L-series with exchangeable power assemblies and orifices

Features

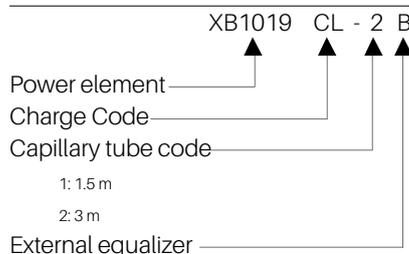
- Applications for series L valves include superheat control (desuperheating of suction gas i.e., in hotgas bypass systems and interstage cooling in multiple stage compressors)
- Modular design for economical logistics and easy assembly and servicing
- Very good stability is attained because of the large 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. allowable 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	R404A/R507	R407C	R450A	R613A	R448A	R449A	R410A	R32	R454A	R454C	R1234yf	R1234ze	R455A		
LCLE	1 *	1.5	1.3	2.1	1.3	1.3	1.9	1.9	2.2	3.3	1.9	1.6	1.1	1.1	1.8	X 22440-B1B	XB1019 ...2B
	2 *	2.9	2.6	4.0	2.5	2.6	3.7	3.6	4.3	6.4	3.6	3.0	2.1	2.2	3.5	X 22440-B2B	
	3 *	6.1	5.6	8.5	5.4	5.5	7.9	7.7	9.2	13.7	7.8	6.5	4.4	4.8	7.5	X 22440-B3B	
	3.5 *	9.3	8.4	12.9	8.1	8.3	11.9	11.6	13.9	20.7	11.7	9.7	6.6	7.2	11.3	X 22440-B3.5B	
	4 *	13.5	12.2	18.7	11.8	12.1	17.3	16.9	20.2	30.0	17.0	14.2	9.6	10.5	16.4	X 22440-B4B	
	6 *	17.3	15.7	24.0	15.1	15.5	22.1	21.6	25.9	38.5	21.8	18.2	12.4	13.4	21.0	X 22440-B5B	
	7 *	23.6	21.5	32.9	20.7	21.2	30.3	29.6	35.5	52.8	29.9	24.9	17.0	18.4	28.8	X 22440-B6B	
	10 *	37.2	33.8	51.7	32.6	33.4	47.7	46.6	55.8	83.0	47.0	39.1	26.7	28.9	45.3	X 22440-B8B	
LJRE	11 *	45.0	40.0	62.0	40.0	40.0	57.8	56.5	67.7	100.7	57.0	47.4	32.3	35.1	54.9	X 11873-B4B	XB1019 ...2B
	12 *	57.0	51.0	80.0	50.0	52.0	73.8	72.1	86.4	128.5	72.8	60.5	41.3	44.7	70.1	X 11873-B5B	
LERE	13 *	71.0	63.0	99.0	62.0	64.0	90.7	88.6	-	-	89.5	74.4	50.7	55.0	86.2	X 9117-B6B	XC726...2B
	14 *	81.0	72.0	112.0	71.0	73.0	103.7	101.3	-	-	102.3	85.1	58.0	62.9	98.5	X 9117-B7B	
	15 *	112.0	99.0	155.0	98.0	100.0	142.6	139.3	-	-	140.6	117.0	79.7	86.4	135.4	X 9117-B8B	
LIRE-	16 *	135.0	120.0	188.0	119.0	121.0	173.5	169.5	-	-	171.1	142.3	97.0	105.2	164.8	X 9117-B9B	XC726...2B
	17 *	174.0	154.0	241.0	152.0	156.0	222.4	217.2	-	-	219.3	182.4	124.3	134.8	211.2	X 9166-B10B	

Note 1: Nominal conditions: Evaporating Temperature +4°C (dew point), Condensing Temperature +38°C (bubble point), Subcooling 1 K

Note 2: For selection of other operating conditions, please use "Select" software.

Note 3: *) Please indicate designation character for desired superheat.

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" x 5/8" ODF	XB1019...2B
		C501-5mm		10x16 mm ODF		
	X22440-B5B / B6B		C501-7		1/2" x 5/8" ODF	
		C501-7mm		12x16 mm ODF		
			A576		5/8" x 7/8" ODF 7/8" x 1 1/8" ODF	
A576-mm		16x22 mm ODF 22x28 mm ODM	-			
LJRE	X11873-B4B / B5B	10331	10331	22x22 mm ODF	7/8" x 7/8" ODF 1 1/8" x 1 1/8" ODM	XC726...2B
LERE/ LIRE	X9117-B6B / B7B / B8B / B9B / B10B		9153	-	7/8" x 7/8" ODF 1 1/8" x 1 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	R454A	R454C	R1234yf	R1234ze	R32	R455A
CL	-	22K	13K	30K	17K	-	-	19K	13K	-	-	31K	15K
GL	14K	-	25K	-	30K	10K	17K	32K	27K	16K	-	-	28K
UL	30K	-	-	-	-	26K	-	-	-	-	22K	-	-

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
Bulb clamp for XB1019	XA 1728-4	803260
Bulb clamp for XC726	XA 1728-5	803261

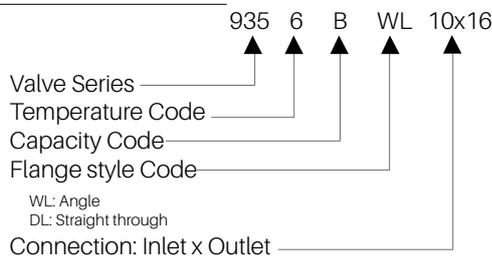
Liquid injection valves series 935 with exchangeable power assemblies and orifices

Features

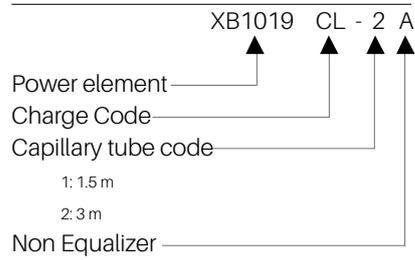
- Modular design for economical logistics and easy assembly and servicing
- Very good stability is attained because of the large forces generated by the large diaphragm diameter
- High-quality materials and processes for high reliability and long lifetime
- Combinations of different charges with various orifice springs cover a very large application range
- Max. allowable pressure PS:
 - 46 bar with XB 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	R32	R404A/R507	R407C	R410A	R448A/R449A	R450A	R454A	R454C	R455A	R513A	R452a	R1234yf	R1234ze		
935- * -	A	4.0	9.0	3.8	5.6	6.1	5.2	3.5	5.1	4.3	4.9	3.6	3.9	2.9	3.1	X10-**-01	XB1019-***-2A
	B	7.8	17.5	7.4	10.9	11.8	10.1	6.9	9.9	8.3	9.6	7.1	7.6	5.6	6.1	X10-**-02	
	C	11.1	24.7	10.3	15.4	16.6	14.2	9.7	14.0	11.6	13.4	9.9	10.8	7.9	8.6	X10-**-03	
	D	16.3	36.6	15.6	22.8	24.6	21.0	14.4	20.7	17.3	20	14.7	16.0	11.8	12.8	X10-**-04	
	E	22.5	50.2	21.0	31.2	33.7	28.8	19.7	28.4	23.6	27.4	20.2	21.9	16.1	17.5	X10-**-05	
	G	32.0	71.5	29.9	44.5	48.1	41.1	28.1	40.5	33.7	39.0	28.8	31.2	23.0	24.9	X10-**-06	
	X	46.6	104.2	43.5	64.9	70.0	59.8	40.9	59.0	49.1	56.8	41.9	45.4	33.5	36.3	X10-**-07	

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

Note: Nominal conditions: Evaporating Temperature +4°C (dew point), Condensing Temperature +38°C (bubble point), Subcooling 1 K
For selection of other operating conditions, please use "Select" program.

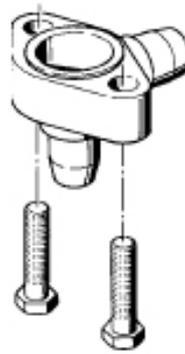
Selection table power assembly and recommended flanges

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		12 x 16 mm ODF		
			C501-7		1/2" x 5/8" ODF -	
	X 10-*06/ *07	A 576 mm		16 x 22 mm ODF 22 x 28 mm ODM		
			A 576		5/8" x 7/8" ODF 7/8" x 1-1/8" ODM	

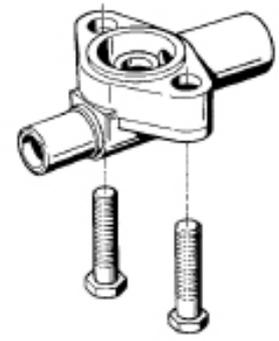
Accessories and spare parts

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

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	10x16 mm ODF	
	X22440-B5B / B6B	C501-7	803234	9761-4	803350		1/2"x5/8" ODF
		C501-7mm	803235	9761-4mm	803243	12x16 mm ODF	-
	X22440-B7B / B8B	-	-	6346-17	803330	16x22 mm ODF	5/8"x7/8" ODF
		A576	803238	-	-	-	5/8"x7/8" ODF
		A576-mm	803239	-	-	16x22 mm ODF	7/8"x1-1/8" ODM
						22x28 mm ODM	-
TJRE / LJRE	X11873-B4B / B5B	10331	803338	10332	803324	22x22 mm ODF	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM
TERE / TIRE LERE / LIRE	X9117-B6B / B7B / B8B / B9B / X9166-B10B	9153	803244	9152	803286	-	7/8"x7/8" ODF 1-1/8"x1-1/8" ODM
		9153-mm	803245	9152-mm	803287	22x22 mm ODF 28x28 mm ODM	
THRE	X9144-B11B / B13B	9149	803284	9148	803283	22x22 mm 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	10x16 mm ODF	
	X10-*04 / *05	C501-7	803234	9761-4	803350		1/2"x5/8" ODF
		C501-7mm	803235	9761-4mm	803243	12x16 mm ODF	-
	X10-*06 / *07			6346-17	803330	16x22 mm ODF	5/8"x7/8" ODF
		A576	803238	-	-	-	5/8"x7/8" ODF
		A576-mm	803239	-	-	16x22 mm ODF	7/8"x1-1/8" ODM
						22x28 mm ODM	-