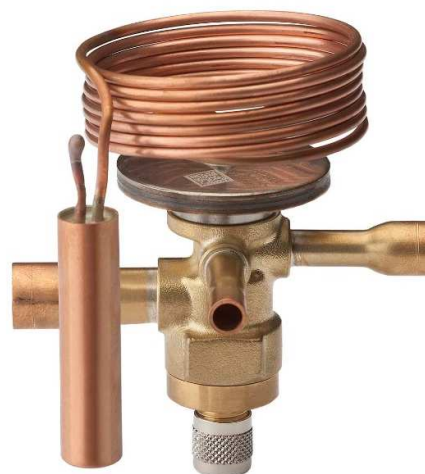


Thermo™-Expansion Valves Series TIH-...FLR

TIH-...FLR series of Thermo™-Expansion Valves are designed for air conditioning, heat pumps and commercial refrigeration applications. The TIH-...FLR is ideal for those applications requiring hermetic/ compact size combined with stable and accurate control over wide load and evaporating temperature ranges.

Features

- Compact size and hermetic design
- up to 29.4 kW for R290
- Balanced port design
- Brazing connections (imperial and metric) with straight through configuration
- Stainless steel power element resists corrosion
- Large diaphragm provides smoother and consistent valve control
- Internal or external equalizer
- External superheat adjustment
- Standard with integrated 100 mesh size strainer at inlet of valve
- Packaging with 20 pieces necked including bulb fastening accessories and single operating instruction
- Sample as single package



TIH-P24-FLR

Options

- Special setting or bleed hole function on request: Minimum order quantity 100 pieces per batch, type and order
- Valve without internal strainer on request: Minimum order quantity 100 pieces per batch, type and order

Selection Table R290 (20 pieces)

Capacity (kW) R290	Metric connection				Imperial connection				Connection		
	without MOP		with MOP		without MOP		with MOP		Inlet	Outlet	Equalizer
Type	Part No.	Type	Part No.	Type	Part No.	Type	Part No.				
3.2	TIH-P02 M FLR	802650M							6 mm	10 mm	internal
3.2					TIH-P02 FLR	802664M			1/4"	3/8"	internal
5.3	TIH-P03 M FLR	802651M							6 mm	10 mm	internal
5.3					TIH-P03 FLR	802665M			1/4"	3/8"	internal
7.5	TIH-P04 M FLR	802652M							10 mm	12 mm	internal
7.5					TIH-P04 FLR	802666M			3/8"	1/2"	internal
3.2	TIH-P22 M FLR	802653M							6 mm	10 mm	6 mm
3.2					TIH-P22 FLR	802667M			1/4"	3/8"	1/4"
5.3	TIH-P23 M FLR	802654M							6 mm	10 mm	6 mm
5.3					TIH-P23 FLR	802668M			1/4"	3/8"	1/4"
7.5	TIH-P24 M FLR	802655M							10 mm	12 mm	6 mm
7.5					TIH-P24 FLR	802669M			3/8"	1/2"	1/4"
11.0	TIH-P25 M FLR	802656M							10 mm	12 mm	6 mm
11.0					TIH-P25 FLR	802670M			3/8"	1/2"	1/4"
12.9	TIH-P26 M FLR	802657M							10 mm	12 mm	6 mm
12.9					TIH-P26 FLR	802671M			3/8"	1/2"	1/4"
18.4	TIH-P27 M FLR	802658M							12 mm	16 mm	6 mm
18.4					TIH-P27 FLR	802672M			1/2"	5/8"	1/4"
20.5	TIH-P28 M FLR	802659M							12 mm	16 mm	6 mm
20.5					TIH-P28 FLR	802673M			1/2"	5/8"	1/4"
23.6	TIH-P29 M FLR	802660M							12 mm	16 mm	6 mm
23.6					TIH-P29 FLR	802674M			1/2"	5/8"	1/4"
29.4	TIH-P2A M FLR	802661M							12 mm	16 mm	6 mm
29.4					TIH-P2A FLR	802675M			1/2"	5/8"	1/4"

Note1: The nominal capacities are based +4°C evaporating temperature, +38°C condensing temperature and 1 K subcooling. For other operating conditions use the quick selection in this document.

Note2: When selecting also observe the information in the operating instructions. Available on EMERSON website www.climate.emerson.com/en-gb.

Superheat

The factory setting of TIH-...FLR 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).

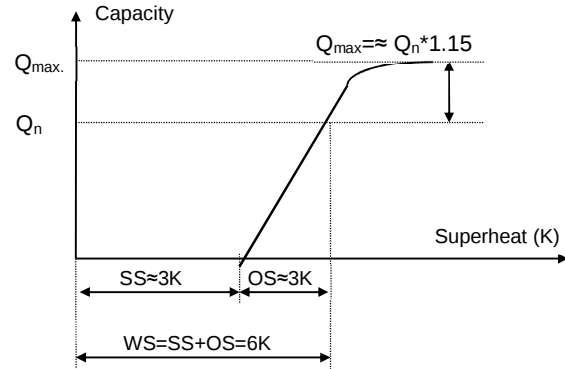
The working superheat, which can be measured in field, is the sum of static superheat and opening superheat (WS).

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_n = Nominal capacity

SS: Static superheat at rated nominal operating condition

OS: Opening superheat at rated nominal capacity

Heat Pump Application

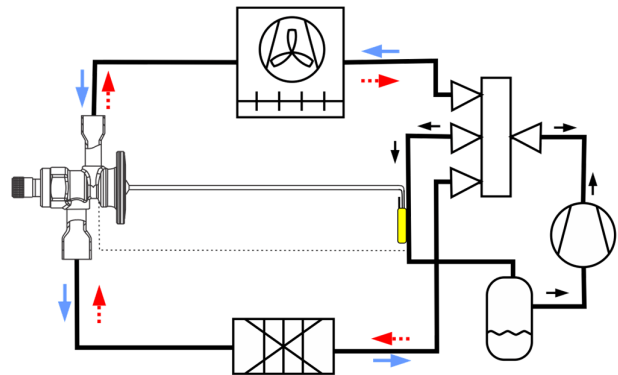
There are several ways to apply an expansion valve in a heat pump. The following figure is showing the most popular application:

Bi-flow application

For application of TIH-...FLR in Bi-flow as single expansion valve in heat pumps, the following subjects need to be considered:

- TIH-...FLR is balanced port only in normal flow direction but not in reverse flow direction.
- Inlet pressure in reverse flow act on valve pin as closing force. This effect is more significant at higher inlet pressure and lower evaporating temperature.
- This effect will prevent the valve from desired opening percentage in reverse flow depends on port size of valve, inlet pressure and evaporating temperature.

Based on the above facts, it is necessary to evaluate the selection of TIH-...FLR in Bi-flow application.



System with single Bi-flow expansion valve and EMERSON suction filter dryer ASD.

TIH: Quick Selection (included 1.5 bar pressure drop for liquid line components and distributor)

Condensing temperature (°C)	Capacity (kW)												Valve type
	Evaporating temperature (°C)												
	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	--40	
70	3.0	3.0	3.0	2.9	2.9	2.8	2.5	2.1	1.7	1.4	1.1	0.9	TIH-P...2
	5.0	5.0	4.9	4.9	4.8	4.7	4.1	3.5	2.8	2.3	1.8	1.4	TIH-P...3
	7.0	7.0	6.9	6.9	6.8	6.6	5.8	4.9	4.0	3.2	2.5	2.0	TIH-P...4
	10.3	10.2	10.2	10.1	9.9	9.7	8.5	7.1	5.8	4.7	3.7	3.0	TIH-P...5
	12.1	12.1	12.0	11.9	11.7	11.5	10.1	8.4	6.9	5.5	4.4	3.5	TIH-P...6
	17.2	17.2	17.1	16.9	16.7	16.4	14.3	12.0	9.8	7.8	6.2	5.0	TIH-P...7
	19.2	19.2	19.1	18.9	18.6	18.3	16.0	13.4	10.9	8.7	7.0	5.6	TIH-P...8
	22.1	22.1	21.9	21.7	21.4	21.0	18.4	15.4	12.5	10.0	8.0	6.4	TIH-P...9
27.5	27.5	27.3	27.0	26.6	26.1	22.9	19.2	15.6	12.5	10.0	8.0	TIH-P...A	
65	3.1	3.1	3.1	3.1	3.0	3.0	2.6	2.2	1.8	1.5	1.2	0.9	TIH-P...2
	5.1	5.1	5.1	5.1	5.1	5.0	4.4	3.7	3.0	2.4	2.0	1.6	TIH-P...3
	7.2	7.2	7.2	7.2	7.1	7.0	6.2	5.2	4.2	3.4	2.7	2.2	TIH-P...4
	10.5	10.6	10.6	10.5	10.4	10.3	9.1	7.6	6.2	5.0	4.0	3.2	TIH-P...5
	12.4	12.5	12.5	12.4	12.3	12.1	10.7	9.0	7.4	5.9	4.8	3.8	TIH-P...6
	17.7	17.8	17.8	17.7	17.5	17.3	15.2	12.8	10.5	8.4	6.8	5.4	TIH-P...7
	19.7	19.8	19.8	19.7	19.6	19.3	17.0	14.3	11.7	9.4	7.6	6.1	TIH-P...8
	22.7	22.8	22.8	22.7	22.4	22.1	19.5	16.4	13.4	10.8	8.7	7.0	TIH-P...9
28.2	28.4	28.4	28.2	28.0	27.6	24.3	20.5	16.7	13.5	10.8	8.7	TIH-P...A	
60	3.1	3.1	3.2	3.2	3.1	3.1	2.8	2.3	1.9	1.5	1.2	1.0	TIH-P...2
	5.1	5.2	5.3	5.3	5.2	5.2	4.6	3.9	3.2	2.6	2.1	1.7	TIH-P...3
	7.2	7.3	7.4	7.4	7.3	7.3	6.4	5.4	4.5	3.6	2.9	2.4	TIH-P...4
	10.6	10.7	10.8	10.8	10.8	10.7	9.4	8.0	6.6	5.3	4.3	3.5	TIH-P...5
	12.5	12.7	12.8	12.8	12.7	12.6	11.1	9.4	7.7	6.3	5.1	4.1	TIH-P...6
	17.8	18.0	18.2	18.2	18.1	17.9	15.9	13.4	11.0	8.9	7.2	5.8	TIH-P...7
	19.9	20.1	20.3	20.3	20.2	20.0	17.7	15.0	12.3	10.0	8.0	6.5	TIH-P...8
	22.8	23.1	23.3	23.3	23.2	23.0	20.3	17.2	14.1	11.4	9.2	7.4	TIH-P...9
28.4	28.8	29.0	29.0	28.9	28.6	25.3	21.4	17.6	14.2	11.5	9.3	TIH-P...A	
55	3.1	3.1	3.2	3.2	3.2	3.2	2.8	2.4	2.0	1.6	1.3	1.1	TIH-P...2
	5.1	5.2	5.3	5.3	5.3	5.3	4.7	4.0	3.3	2.7	2.2	1.8	TIH-P...3
	7.1	7.3	7.4	7.4	7.4	7.4	6.6	5.6	4.6	3.8	3.0	2.5	TIH-P...4
	10.5	10.7	10.9	10.9	10.9	10.9	9.7	8.2	6.8	5.5	4.5	3.6	TIH-P...5
	12.4	12.6	12.8	12.9	12.9	12.9	11.4	9.7	8.0	6.5	5.3	4.3	TIH-P...6
	17.6	18.0	18.2	18.4	18.4	18.3	16.3	13.8	11.4	9.3	7.5	6.1	TIH-P...7
	19.6	20.1	20.4	20.5	20.5	20.4	18.2	15.4	12.7	10.3	8.4	6.8	TIH-P...8
	22.5	23.1	23.4	23.5	23.6	23.5	20.9	17.7	14.6	11.9	9.6	7.8	TIH-P...9
28.1	28.7	29.1	29.3	29.3	29.2	26.0	22.1	18.2	14.8	12.0	9.7	TIH-P...A	
50	3.0	3.1	3.1	3.2	3.2	3.2	2.9	2.4	2.0	1.6	1.3	1.1	TIH-P...2
	4.9	5.1	5.2	5.3	5.3	5.3	4.8	4.1	3.4	2.7	2.2	1.8	TIH-P...3
	6.9	7.1	7.3	7.4	7.5	7.5	6.7	5.7	4.7	3.8	3.1	2.5	TIH-P...4
	10.2	10.5	10.7	10.9	11.0	11.0	9.8	8.4	6.9	5.7	4.6	3.7	TIH-P...5
	12.0	12.4	12.7	12.9	12.9	13.0	11.6	9.9	8.2	6.7	5.4	4.4	TIH-P...6
	17.1	17.6	18.0	18.3	18.4	18.5	16.5	14.1	11.7	9.5	7.7	6.3	TIH-P...7
	19.0	19.7	20.1	20.4	20.6	20.6	18.4	15.7	13.0	10.6	8.6	7.0	TIH-P...8
	21.9	22.6	23.1	23.4	23.6	23.6	21.1	18.0	14.9	12.2	9.9	8.0	TIH-P...9
27.2	28.1	28.8	29.2	29.4	29.4	26.3	22.4	18.6	15.2	12.3	10.0	TIH-P...A	
40	2.3	2.6	2.8	2.9	3.0	3.1	3.1	2.8	2.4	2.0	1.7	1.4	TIH-P...2
	3.9	4.3	4.6	4.9	5.0	5.1	5.2	4.7	4.1	3.4	2.8	2.3	TIH-P...3
	5.4	6.0	6.5	6.8	7.0	7.2	7.3	6.6	5.7	4.7	3.9	3.2	TIH-P...4
	8.0	8.9	9.5	10.0	10.3	10.6	10.7	9.7	8.4	7.0	5.7	4.7	TIH-P...5
	9.4	10.5	11.2	11.8	12.2	12.5	12.7	11.4	9.9	8.2	6.8	5.5	TIH-P...6
	13.4	14.9	16.0	16.8	17.4	17.8	18.0	16.3	14.0	11.7	9.6	7.9	TIH-P...7
	15.0	16.6	17.8	18.7	19.4	19.8	20.1	18.2	15.7	13.1	10.8	8.8	TIH-P...8
	17.2	19.1	20.5	21.5	22.2	22.8	23.1	20.9	18.0	15.0	12.3	10.1	TIH-P...9
21.4	23.7	25.5	26.8	27.7	28.3	28.8	26.0	22.4	18.7	15.4	12.6	TIH-P...A	
30	1.3	1.8	2.2	2.5	2.6	2.8	2.9	2.7	2.3	2.0	1.6	1.3	TIH-P...2
	2.1	3.1	3.7	4.1	4.4	4.6	4.8	4.4	3.9	3.3	2.7	2.2	TIH-P...3
	3.0	4.3	5.1	5.7	6.2	6.5	6.7	6.2	5.4	4.6	3.8	3.1	TIH-P...4
	4.4	6.3	7.5	8.4	9.1	9.6	9.9	9.1	7.9	6.7	5.6	4.6	TIH-P...5
	5.2	7.4	8.9	10.0	10.7	11.3	11.7	10.7	9.4	7.9	6.6	5.4	TIH-P...6
	7.4	10.6	12.7	14.2	15.3	16.1	16.6	15.3	13.3	11.3	9.4	7.7	TIH-P...7
	8.2	11.8	14.1	15.8	17.0	17.9	18.6	17.1	14.9	12.6	10.4	8.6	TIH-P...8
	9.4	13.6	16.2	18.1	19.5	20.6	21.3	19.6	17.1	14.4	12.0	9.9	TIH-P...9
11.8	16.9	20.2	22.6	24.3	25.6	26.6	24.4	21.3	18.0	14.9	12.3	TIH-P...A	

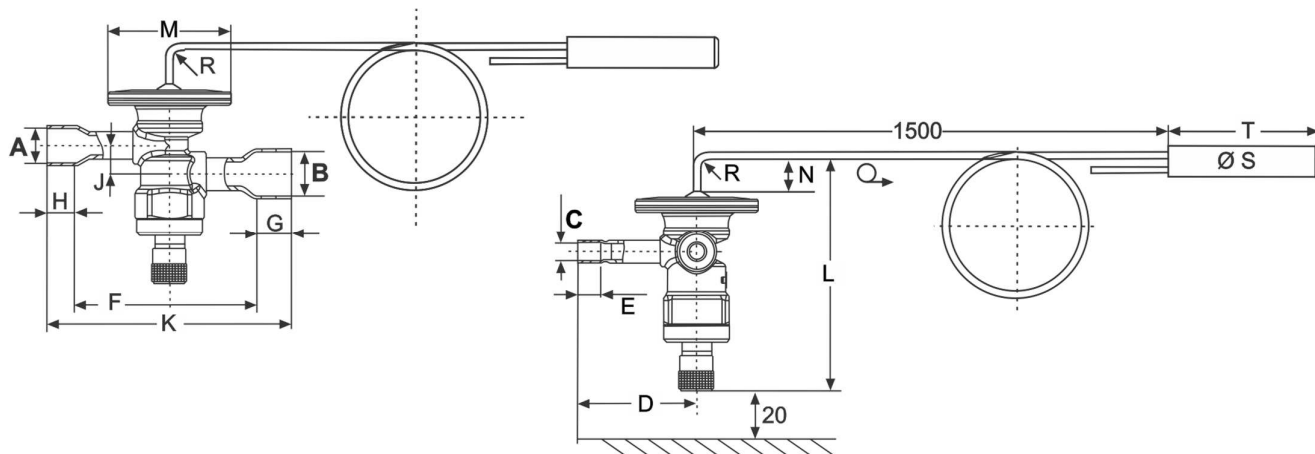
Thermo™-Expansion Valves Series TIH-FLR

Technical data

Maximum working pressure PS	35 bar
Factory test pressure PT	38.5 bar
Medium temperature range TS	-40...+70°C
Power element	Stainless steel. Laser welded

Connections	Copper ODF
Gross weight	270-305 g (depend on the valve size)
Label	Laser printing

Dimensions (mm)



Body:

Type	ODF (mm) / (inch)			(mm)															
	A	B	C	D	E	F	G	H	J	K	L	M							
TIH-...2-FLR	6 / 1/4"	10 / 3/8"	internal equalizer	-	-	70.7	8.4	8.4	10.3	87.5	83.2	45							
TIH-...3-FLR			6 / 1/4"	43.5	8.4														
TIH-...2-FLR																			
TIH-...3-FLR	6 / 1/4"	10 / 3/8"	6 / 1/4"	43.5	8.4	70.7	8.4	8.4											
TIH-...4-FLR			10 / 3/8"	12 / 1/2"	internal equalizer								-	-	68.7	10.4	8.4		
TIH-...4-FLR																			
TIH-...5-FLR	10 / 3/8"	12 / 1/2"			6 / 1/4"	43.5	8.4	68.7					10.4	8.4					
TIH-...6-FLR																			
TIH-...7-FLR			12 / 1/2"	16 / 5/8"	6 / 1/4"										43.5	8.4	64	13.1	10.4
TIH-...8-FLR																			
TIH-...9-FLR																			
TIH-...A-FLR																			

Bulb:

Charge	Refrigerant	N	Bending radius R	Ø S	T	Capillary tube length
P0/P2	R290	10 mm	5 mm	13 mm	78 mm	1.5 m