

# HANSEN TECHNOLOGIES CORPORATION



RT125H: 1 1/4" Globe Expansion Valve

**Specifications, Applications,  
Service Instructions & Parts**

**EXPANSION VALVES  
(REGULATORS)**

**3/8" thru 1 1/4" Threaded  
1/2" thru 4" Welding  
Globe or Angle  
for refrigerants**

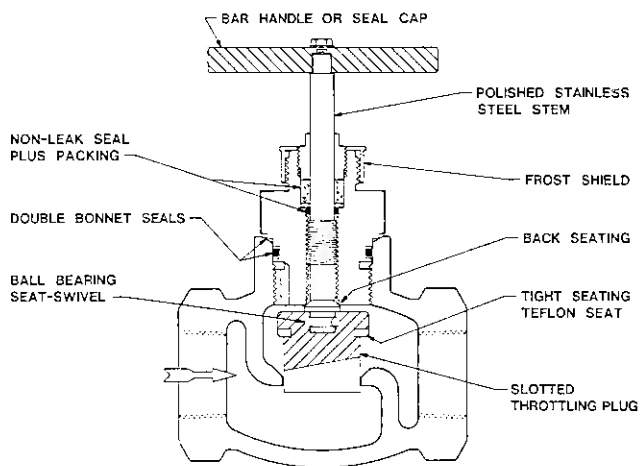
## KEY FEATURES

### INTRODUCTION

These precision-calibrated, adjustable, slotted plug flow regulating valves (expansion valves) are ideal for metering or flashing expansion of liquid refrigerants. Their slotted plugs are more tolerant of dirt particles than are tapered plug expansion valves. Valves 2 1/2" and larger have characterized plug. All valves are teflon tight seating and have near linear flow characteristics per turn open. Bar handle or yellow seal caps distinguish them from shut-off valves. Suitable for Ammonia or fluorocarbons.

### APPLICATIONS

- Liquid feed or circulating liquid overfeed evaporators
- High pressure or intermediate pressure liquid feed to accumulators, intercoolers, or recirculators
- Defrost condensate relief
- Hot gas feed to evaporators
- Equalize evaporator to suction pressure after defrost



### CAPACITIES (tons of refrigeration)

REFRIG.	APPLICATION	3/8"		1/2"		3/4"		1"		1 1/2"		1 3/4"		2"		2 1/2"		3"		4"	
		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
R717	Circulating (4:1)	1.5	12	1.5	16.7	1.5	37	1.5	62	1.5	110	9.1	151	18.2	253	65	407	98	632	152	847
	Liquid Make Up	7.4	36	7.4	60	7.4	111	7.4	185	7.4	330	44	454	89	759	319	1219	482	1896	742	2539
R22	Circulating (2:1)	.7	5.7	.7	8	.7	18	.7	29	.7	52	4.4	72	8.7	121	31	194	47	301	72	404
	Liquid Make Up	1.6	7.5	1.6	12.5	1.6	23	1.6	38	1.6	68	9.8	94	19.7	157	70	253	106	393	164	526

See page 2 for additional sizing information

## MATERIAL SPECIFICATIONS

Body: THREADED 3/8" thru 1 1/4" ductile iron  
 ASTM A-536  
 Body: WELDING 1/2" and 3/4" ASTM A-108  
 (connections ASTM A-513)  
 1" thru 4" cast steel, ASTM A-352 Grade LCB  
 Bonnet: 3/8" thru 1 1/4" steel, zinc chromate plated  
 1 1/2" thru 4" ductile iron ASTM A-536  
 Stem: stainless steel  
 Throttling plug: 3/8" thru 1 1/4" stainless steel  
 1 1/2" thru 4" steel, zinc chromate plated  
 Seat disc: PTFE teflon  
 Ball bearings: stainless steel  
 Stem packing: graphite composite plus  
 neoprene O-ring  
 Packing nut: steel, zinc chromate plated  
 Bonnet seal: 3/8" thru 1 1/4" neoprene O-ring,  
 steel knife edge  
 1 1/2" thru 4" flat composite gasket  
 Safe Working Pressure: 400 psig

## ADVANTAGES

Compared to tapered plug valves, Hansen expansion valves are less affected by dirt, less susceptible to wire drawing and are tight-closing. These valves have stainless steel stems and dual stem seal design with back seating for seal replacement. The patented O-ring stem seal design permits low torque operation to adjust the valve because the packing nut does not require much tightening.

## VALVE SIZING

The CAPACITIES table (page 1) is based upon a velocity limiting factor of 7 feet/second for ammonia and 5 feet/second for R22. The circulating capacities assume 0°F evaporator temperature liquid with 10 psi pressure drop across the expansion valve. Liquid make up capacities are based on 86°F condensing to 0°F evaporation temperature. Maximum capacities are possible with appropriate line sizing. For liquid feed to an accumulator, valve should be sized for intermittent, float switch operated flow (i.e., a valve open 50% of time feeding a 100 ton accumulator should be sized for 200 tons). For liquid make up, when required valve size is greater than 1 1/2", two expansion valves and solenoid valves staged in parallel should be used to help reduce the potential of "water hammer".

Valve sizing may also be calculated by using the VALVE SETTING section of this bulletin. In general, valve size should be based upon valve adjusted to about 1/2 open (see Cv PER TURNS OPEN table).

## CONNECTION DIMENSIONS

THREADED 3/8" thru 1 1/4": Internal NPT  
 (USA Standard Taper Pipe Thread)  
 WELDING 1/2" thru 1 1/2": Schedule 80 steel  
 2" thru 4": Schedule 40 steel

## INSTALLATION

Valves should be located with stem horizontal or upright. For Liquid make up, valves should be located within two feet of upstream solenoid valve. The available pressure drop should occur across the expansion valve, not through the control valve. As always, proper pipe sizing is essential for optimal control.

## VALVE SETTING

In order to properly set expansion valves the following factors should be known: refrigerant, refrigerant temperature, estimated pressure drop through the expansion valve (not system), evaporator tonnage and circulating rate, or desired tons of liquid make up.

**For circulating liquid overfeed:** The steps below determine the flow (Cv) requirement and required turns open. For special sizing assistance, contact factory.

1. Evaporator tonnage multiplied by circulating rate = **ton equivalent** = \_\_\_\_\_
2. See table below - **tons per Cv** = \_\_\_\_\_
3. **Ton equivalent** divided by **tons per Cv** = **Cv requirement** = \_\_\_\_\_
4. See Cv PER TURNS OPEN table, valve size versus **Cv requirement** = **turns open** = \_\_\_\_\_

## TONS PER Cv (circulating liquid overfeed)

REFRIG.	TEMP. °F	PRESSURE DROP ( Δ P)*				
		5	10	15	20	30
R717	0	43.0	60.8	74.5	86.1	105.5
R22	0	10.0	14.5	17.5	20.2	24.8

\*Pressure drop across expansion valve

For other evaporator temperatures these values will change only slightly due to density and latent heat variations.

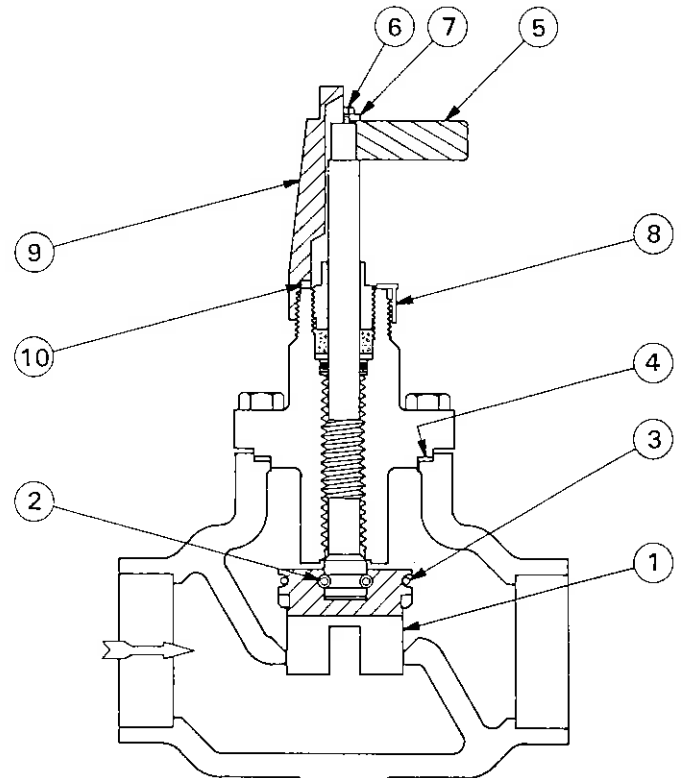
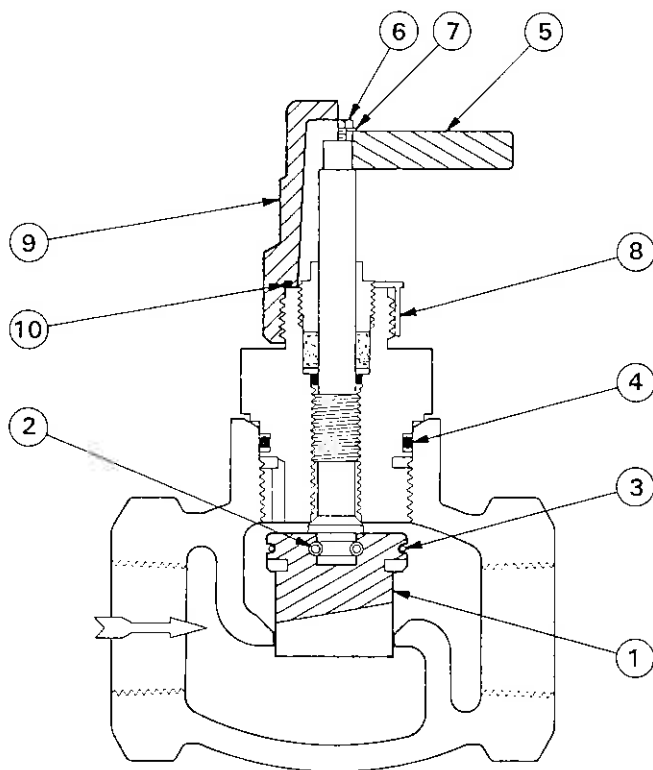
**For liquid make up:** To determine flow (Cv) requirement, estimate approximate tons of liquid make up desired and divide by 74.2 tons per Cv for ammonia or 16.4 tons per Cv for R22. These ratings are based upon 86°F saturated liquid with 50 psi pressure drop across valve and 0°F evaporating temperature. Refer to Cv PER TURNS OPEN table for appropriate valve setting.

## Cv PER TURNS OPEN

SIZE		TURNS OPEN							
		1	2	3	4	5	6	7	7 1/2
T H R E A D E D	3/8"	.1	.2	.4	.6	.8	—	—	—
	1/2"	.1	.3	.6	.9	1.1	—	—	—
	3/4"	.1	.8	1.5	2.2	2.9	—	—	—
	1"	.1	.3	.6	1.2	2.2	3.3	4.2	4.5
	1 1/4"	.1	.3	.9	2.0	4.0	5.8	7.0	7.4
W E L D I N G	1/2"	.1	.2	.3	.4	.6	.8	.9	1.1
	3/4"	.1	.2	.5	.9	1.4	2.0	2.6	2.9
	1"	.1	.3	.6	1.2	2.2	3.3	4.2	4.5
	1 1/4"	.1	.3	.9	2.0	4.0	5.8	7.0	7.4
	1 1/2"	.6	1.5	4.5	7.0	10.0	13.5	15.0	—
	2"	1.2	4.0	7.5	11.0	14.5	18.0	22.0	—
	2 1/2"	4.3	8.7	15.2	21.7	28	35	43.3	—
	3"	6.5	13	23	33	42	52	65	—
	4"	10	20	35	50	65	80	100	—

3/8" to 1 1/4" VALVES

1 1/2" to 4" VALVES



See page 4 for valve catalog numbers.

**PARTS LIST**

ITEM	DESCRIPTION
	<b>Throttling Plug Kit:</b>
1	Throttling Plug
2	Ball Bearings
3	Ball Retainer
4a	Bonnet O-ring
4b	Bonnet Gasket
	<b>Bar Handle Kit:</b>
5	Bar Handle
6	Screw
7	Washer
8	Bonnet Thread Cap
	<b>Seal Cap Kit:</b>
9	Seal Cap (yellow)
10a	Seal Cap O-ring
10b	Seal Cap Gasket

**THREADED**

DESCRIPTION	SIZE				
	3/8"	1/2"	3/4"	1"	1 1/4"
THROTTLING PLUG KIT	50-1060	50-1061	50-1062	50-1015	50-1016
BAR HANDLE KIT	50-1012	50-1012	50-1012	50-1012	50-1012
SEAL CAP KIT	50-1049	50-1049	50-1049	50-1049	50-1049
GASKET KIT	50-1040	50-1040	50-1040	50-1020	50-1020

**SOCKET WELD**

DESCRIPTION	SIZE					
	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
THROTTLING PLUG KIT	50-1053	50-1054	50-1015	50-1016	50-1046	50-1047
BAR HANDLE KIT	50-1012	50-1012	50-1012	50-1012	50-1039	50-1039
SEAL CAP KIT	50-1049	50-1049	50-1049	50-1049	50-1048	50-1048
GASKET KIT	50-1040	50-1040	50-1020	50-1020	50-1023	50-1023

Note: Gasket kit consists of the valve stem O-ring, stem washers, graphite packing material, packing nut, and gaskets or O-rings for the bonnet and seal cap.

**BUTT WELD**

DESCRIPTION	SIZE			
	2"	2 1/2"	3"	4"
THROTTLING PLUG KIT	50-1047	50-1059	50-1058	50-1063
BAR HANDLE KIT	50-1039	50-1051	50-1051	50-1051
SEAL CAP KIT	50-1048	50-1050	50-1050	50-1050
GASKET KIT	50-1023	50-1043	50-1043	50-1065

## SERVICE AND MAINTENANCE

Hansen expansion valves require minimum service or maintenance. Stem leakage is virtually eliminated by the combination of polished stainless stems and reliable, conventional, adjustable packing supplementing fluid-tight O-ring stem seals. For optimum maintenance, occasional cleaning of the valve stem with a soft rag containing refrigerant oil is helpful.

## VALVE SEAT

To inspect or replace 3/8" thru 1 1/4" valve throttling plug an 18" wrench is required. Isolate the valve from the system and safely pump out refrigerant; with stem open at least one turn, carefully remove bonnet assembly. If conical seat surface in body is marred, remove marks with emery paper by hand or power drill. If valve throttling plug is damaged, replace entire throttling plug by first removing ball retainer ring and ball bearings. Install new throttling plug assembly including new bearings and retainer ring. Install new stem packing, stem O-ring and bonnet O-ring if necessary. Reassemble bonnet into valve body with stem still open at least several turns and tighten threaded bonnet to minimum torque of 75 foot pounds. Test valve for leaks before returning to service. 1 1/2" thru 4" valve bonnets are bolted instead of screwed. Bonnet bolts require 40 foot pounds of torque.

Whenever servicing these valves, refer to the current editions of the following Hansen bulletins:

G109 - Threaded Shut-off Valves

G209 - Socket Weld Shut-off Valves

G359 - Butt Weld Shut-off Valves

SP - Safety Precautions Sheet

## SAFE OPERATION

Hansen valves are only for refrigeration systems. Read these instructions completely before selecting, using or servicing these valves. Only knowledgeable, trained refrigeration mechanics should install, operate or service these valves. Stated temperature and pressure limits must not be exceeded. Bonnets should not be removed from valves unless system has been evacuated to zero pressure. See also Safety Precautions in current List Price Bulletin and Safety Precautions Sheet supplied with product.

## WARRANTY

Hansen valves are guaranteed against defective materials or workmanship for one year F.O.B. our factory. No consequential damages or field labor is included.

## TYPICAL SPECIFICATIONS

"Refrigerant expansion (flow regulating) valves shall have slotted or characterized throttling plugs, tight-closing teflon seats, stainless steel stems, back-seating design for packing replacement, exterior bonnet threads for installation of stem seal caps on any valve, and be suitable for a working pressure of at least 400 PSIG, as manufactured by Hansen Technologies Corporation or approved equal."

## ORDERING INFORMATION, Expansion Valves

SIZE	DESCRIPTION	CAT. NO.
3/8"	Globe, Threaded, Bar Handle	RT038H
	Globe, Threaded, Seal Cap	RT038C
	Angle, Threaded, Bar Handle	VT038H
	Angle, Threaded, Seal Cap	VT038C
1/2"	Globe, Threaded, Bar Handle	RT051H
	Globe, Threaded, Seal Cap	RT051C
	Globe, Socket Weld, Bar Handle	RS051H
	Globe, Socket Weld, Seal Cap	RS051C
	Angle, Threaded, Bar Handle	VT051H
	Angle, Threaded, Seal Cap	VT051C
	Angle, Socket Weld, Bar Handle	VS051H
	Angle, Socket Weld, Seal Cap	VS051C
3/4"	Globe, Threaded, Bar Handle	RT076H
	Globe, Threaded, Seal Cap	RT076C
	Globe, Socket Weld, Bar Handle	RS076H
	Globe, Socket Weld, Seal Cap	RS076C
	Angle, Threaded, Bar Handle	VT076H
	Angle, Threaded, Seal Cap	VT076C
	Angle, Socket Weld, Bar Handle	VS076H
	Angle, Socket Weld, Seal Cap	VS076C
1"	Globe, Threaded, Bar Handle	RT100H
	Globe, Threaded, Seal Cap	RT100C
	Globe, Socket Weld, Bar Handle	RS100H
	Globe, Socket Weld, Seal Cap	RS100C
	Angle, Threaded, Bar Handle	VT100H
	Angle, Threaded, Seal Cap	VT100C
	Angle, Socket Weld, Bar Handle	VS100H
	Angle, Socket Weld, Seal Cap	VS100C
1 1/4"	Globe, Threaded, Bar Handle	RT125H
	Globe, Threaded, Seal Cap	RT125C
	Globe, Socket Weld, Bar Handle	RS125H
	Globe, Socket Weld, Seal Cap	RS125C
	Angle, Threaded, Bar Handle	VT125H
	Angle, Threaded, Seal Cap	VT125C
	Angle, Socket Weld, Bar Handle	VS125H
	Angle, Socket Weld, Seal Cap	VS125C
1 1/2"	Globe, Socket Weld, Bar Handle	RS150H
	Globe, Socket Weld, Seal Cap	RS150C
	Angle, Socket Weld, Bar Handle	VS150H
	Angle, Socket Weld, Seal Cap	VS150C
2"	Globe, Socket Weld, Bar Handle	RS200H
	Globe, Socket Weld, Seal Cap	RS200C
	Globe, Butt Weld, Bar Handle	RW201H
	Globe, Butt Weld, Seal Cap	RW201C
	Angle, Socket Weld, Bar Handle	VS200H
	Angle, Socket Weld, Seal Cap	VS200C
	Angle, Butt Weld, Bar Handle	VW201H
	Angle, Butt Weld, Seal Cap	VW201C
2 1/2"	Globe, Butt Weld, Bar Handle	RW251H
	Globe, Butt Weld, Seal Cap	RW251C
	Angle, Butt Weld, Bar Handle	VW251H
	Angle, Butt Weld, Seal Cap	VW251C
3"	Globe, Butt Weld, Bar Handle	RW301H
	Globe, Butt Weld, Seal Cap	RW301C
	Angle, Butt Weld, Bar Handle	VW301H
	Angle, Butt Weld, Seal Cap	VW301C
4"	Globe, Butt Weld, Bar Handle	RW401H
	Globe, Butt Weld, Seal Cap	RW401C
	Angle, Butt Weld, Bar Handle	VW401H
	Angle, Butt Weld, Seal Cap	VW401C

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