

ASSEMBLING THE DISCHARGE TEMPERATURE CONTROL VALVE FOR SEMI-HERMETIC R22 LOW TEMPERATURE APPLICATIONS

1 The Discharge Temperature Control Valve (DTC)

The Discharge Temperature Control valve liquid injection system is a low cost and reliable solution for the D3SC-750/X, D3SS-1000/X, D4SL/T, D6SL/T and D6SU compressors to obtain lower evaporating temperatures within an extended operating envelope.

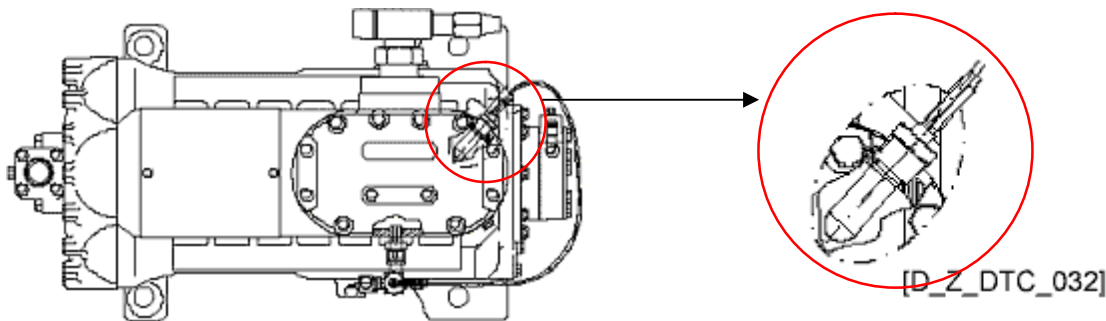
The afore mentioned compressors are equipped with a plugged injection port on the side of the compressor wall close to the base of the cylinder block. The injection port can be retro-fitted with the DTC valve. The temperature sensing element with 12" NPT thread fits on the D4SL/T, D6SL/T and D6SU compressor body close to the discharge shut-off valve.

Note:

- The valve can be obtained as an optional extra.
- It is recommended to use an additional fan with the DTC valve for performance values as shown in Select
- The D4SL/T, D6SL/T and D6SU compressors with DTC valve and fan operate with a voltage tolerance of $\pm 5\%$ over the complete operating envelope.

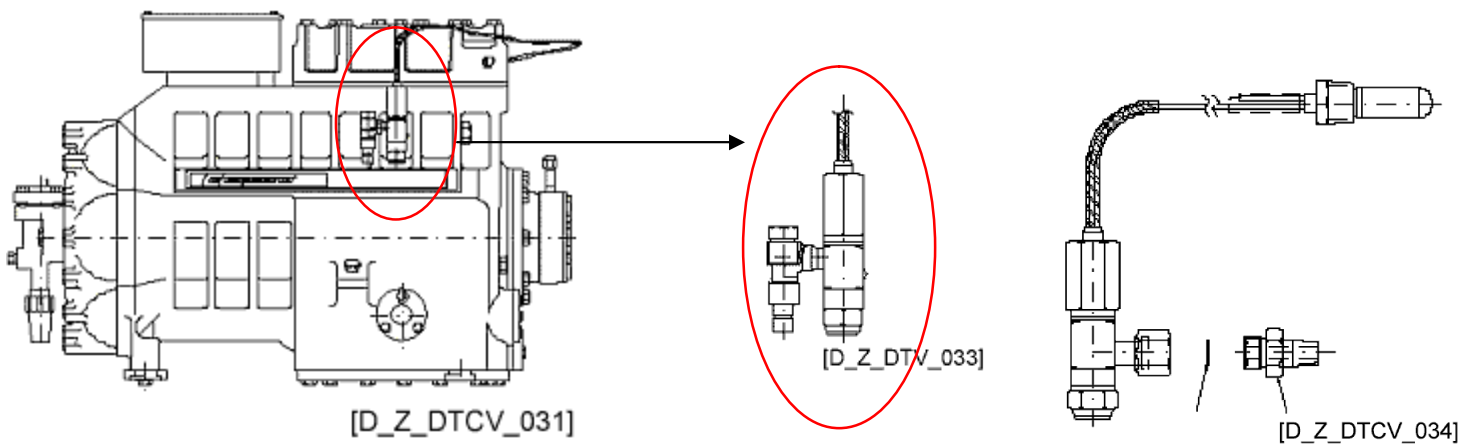
2 D3SC-750/X, D3SS-1000/X Compressors

2.1 General view of D3S with DTC valve



Location and Fitting of the DTC valve

DTC - Discharge Temperature Control Valve

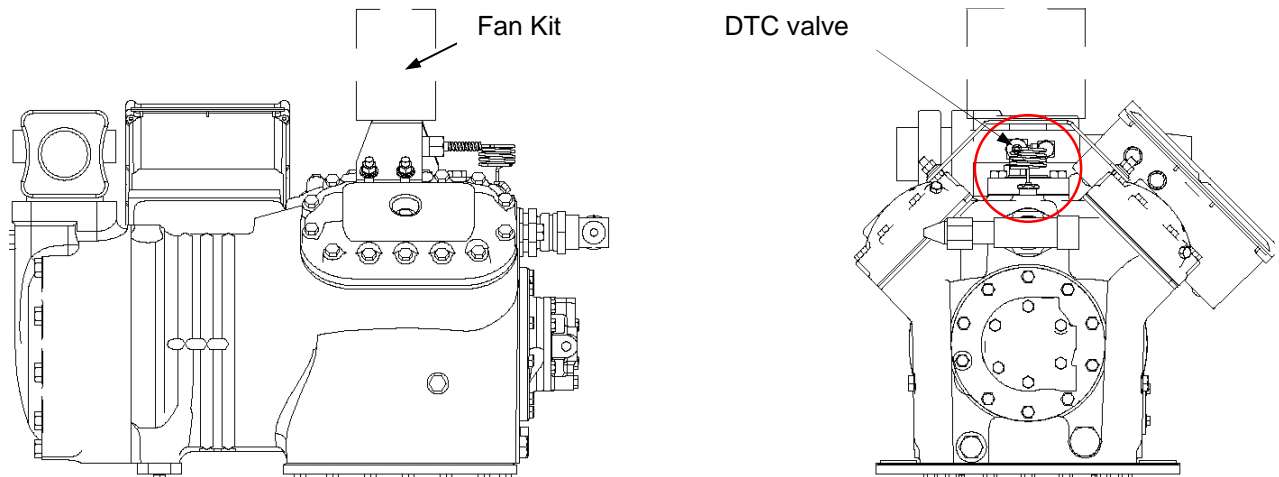


2.2 To fit the DTC valve

- Pump down then isolate the compressor from the refrigerant system by closing the suction and discharge service valves. Reclaim refrigerant from the compressor using manifold and gauges to ensure there is no pressure (positive or negative) in the compressor.
- Remove 1/2" NPT plug from the cylinder head at the location shown.
- Rotating the entire DTC valve, thread the sensing DTC bulb into the hole where the plug was (use thread sealant) and torque bulb to 57 – 67 Nm.
- Remove 1/8" NPT plug from the cylinder body at the location shown.
- Install injection fitting (use thread sealant) and torque fitting to 27 – 34 Nm.
- Attach the DTC valve to the injection fitting making sure the O-ring is used between the two parts and torque to 24 – 27 Nm.
- Ensure liquid refrigerant is available in the line feeding the DTC valve prior to starting the compressor. Failure to do this will result in damage to the valve and compressor.

3 D4SL & D4ST Compressors

3.1 General view of D4SL/T with DTC valve, Injection piping system and Head Fan kit after assembly



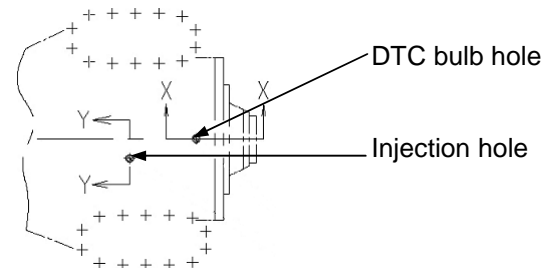
3.2 To fit the DTC valve

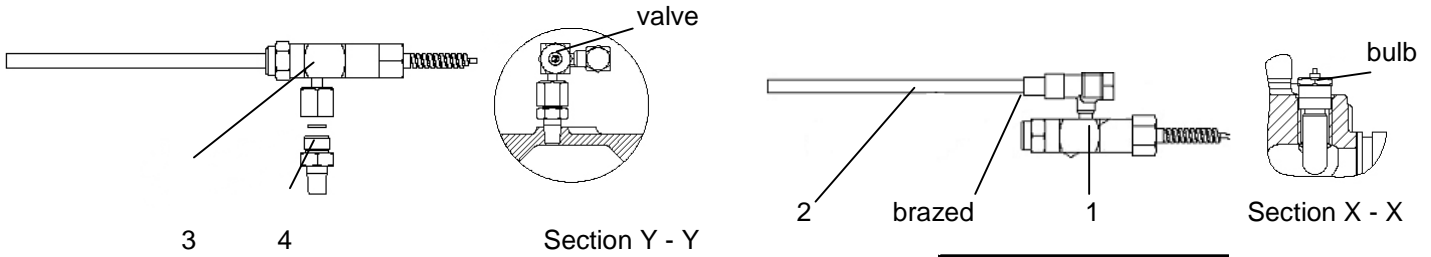
3.2.1 Assemble DTC Valve Kit

- Braze DTC valve and tube inlet:
Wrap a damp cloth around the body of the DTC valve before brazing and keep the flame away from valve.

- Mounting DTC valve temperature sensing element:
Remove plug from compressor body. Apply Loctite to the thread of the bulb and screw in to plug orifice.

- Assemble DTC valve and injection nozzle:
Remove plug from compressor body. Apply Loctite to the thread of the injection nozzle and screw into plug orifice. Mount DTC valve onto the nozzle.





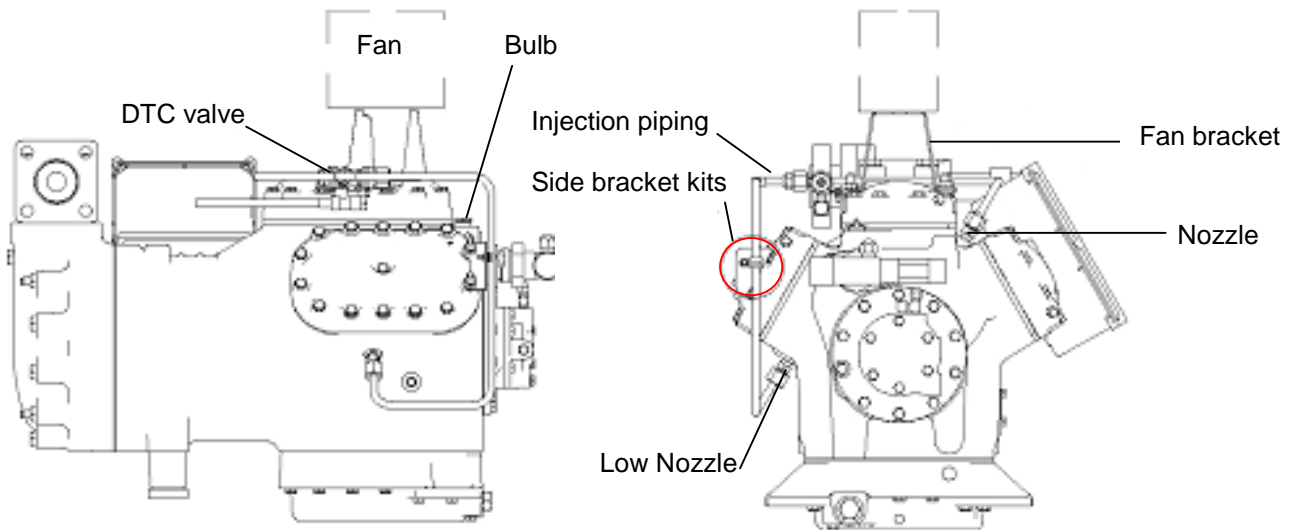
Bill Of Material	
1	DTC valve
2	Tube inlet
3	Gasket O ring
4	Nozzle (27-24 Nm)

NOTE!

D4SL/D4ST low temperature models require DTC valve and head fan. Assemble DTC valve first then head fan kit. The head fan is assembled as shown on the instructions supplied with the fan kit.

4 D6SL/D6ST Compressors

4.1 General view of D6SL/T with DTC valve, Injection piping system and Head Fan kit after assembly

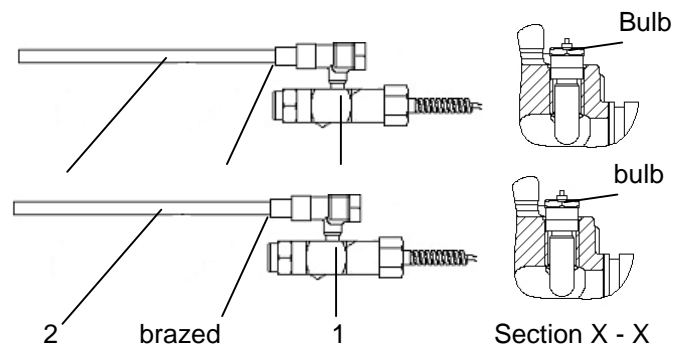


4.2 To fit the DTC valve

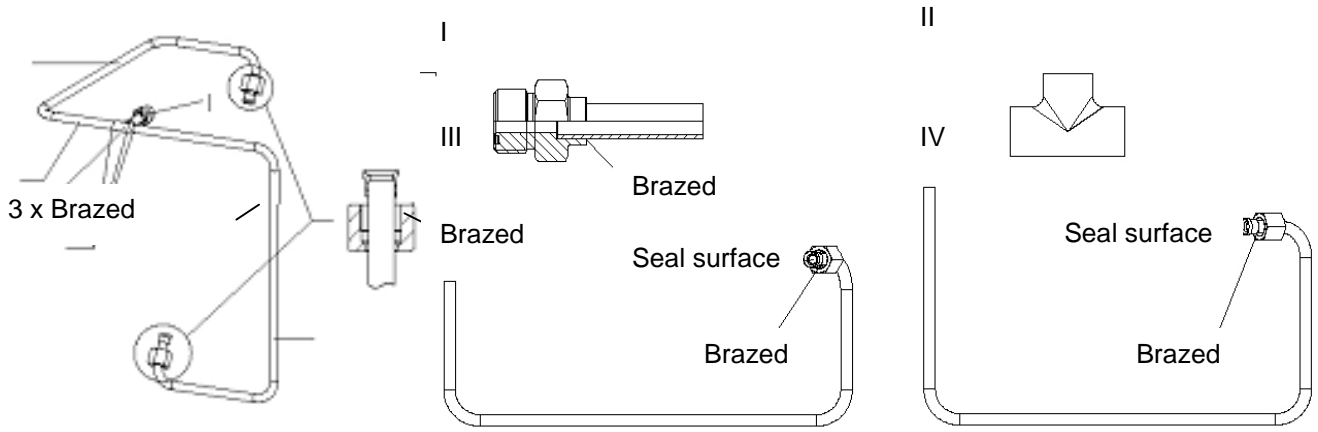
4.2.1 Assemble DTC Valve Kit

1 Braze DTC valve and tube inlet:
Wrap a damp cloth around the body of the DTC valve before brazing and keep the flame away from valve.

2 Mounting DTC valve temperature sensing element:
Remove plug from compressor body. Apply Loctite to the thread of the bulb and screw into plug orifice.



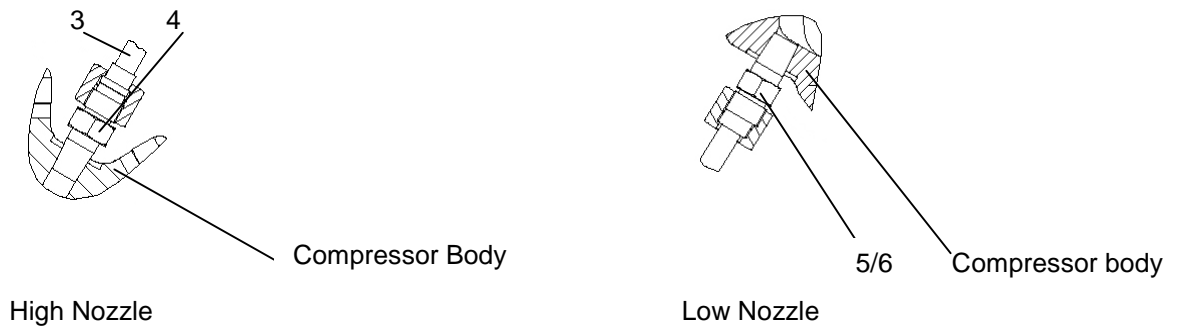
4.2.2 Injection Piping Assembly: Sub Assembly of Piping



I. Tube outlet assembly II. Fitting III. Tube top assembly IV. Tube side assembly

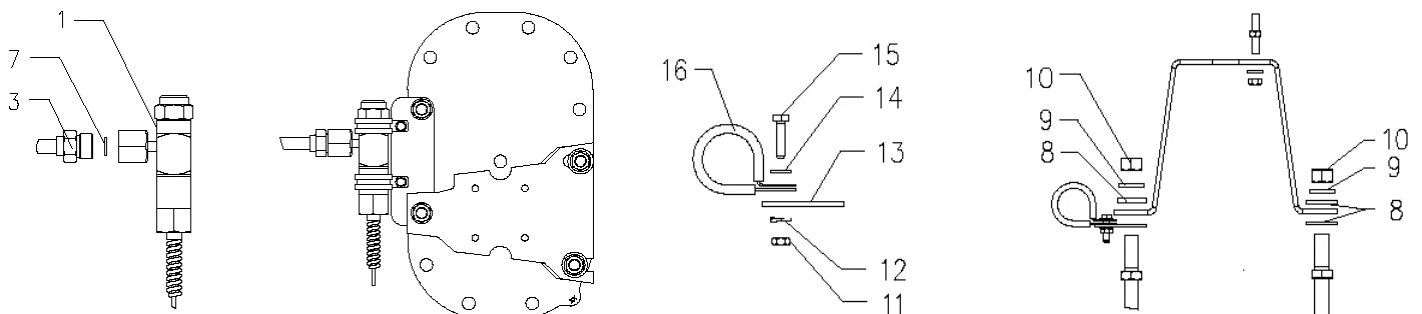
NOTE! :
Clean tube joint areas before assembly. All brazed joints must be gas tight.

4.2.3 Assemble Injection Nozzles and Piping:



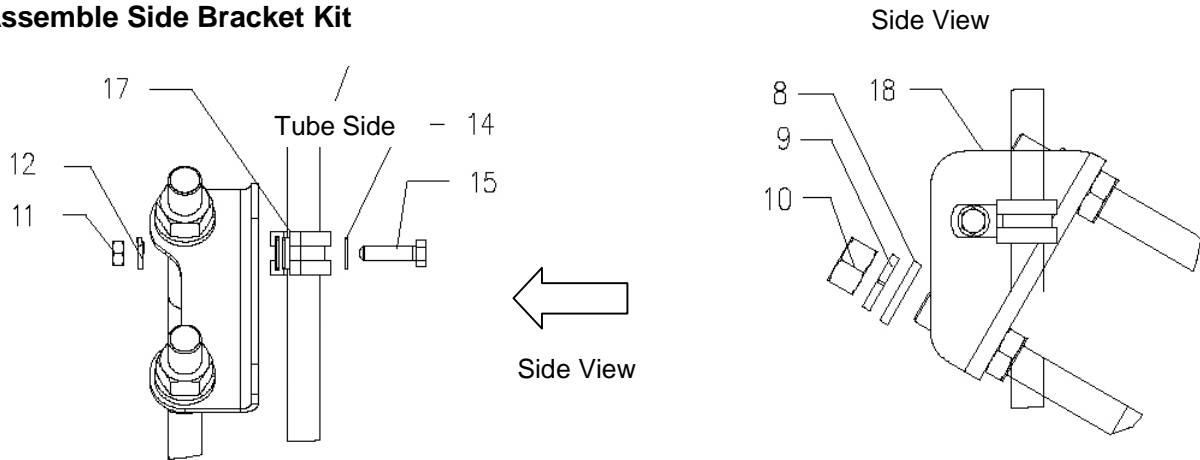
Remove plugs from compressor body. Apply Loctite to the thread of the injection nozzles and screw into plug orifice.

4.2.4 Clamping DTC Valve, Assembling Piping and Head Fan Kit

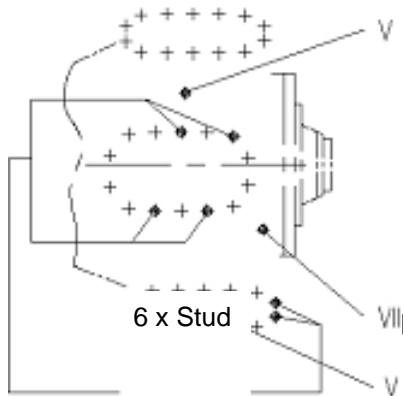


Note! The text side of bracket No.13 must be facing upwards

4.2.5 Assemble Side Bracket Kit



4.2.6 Location of DTC Valve Injection and Sensor Ports



- V Upper injection port
- VI Lower injection port (under cylinder deck)
- VII DTC temperature sensor port

4.2.7 D6SL & D6ST DTC Valve Kits

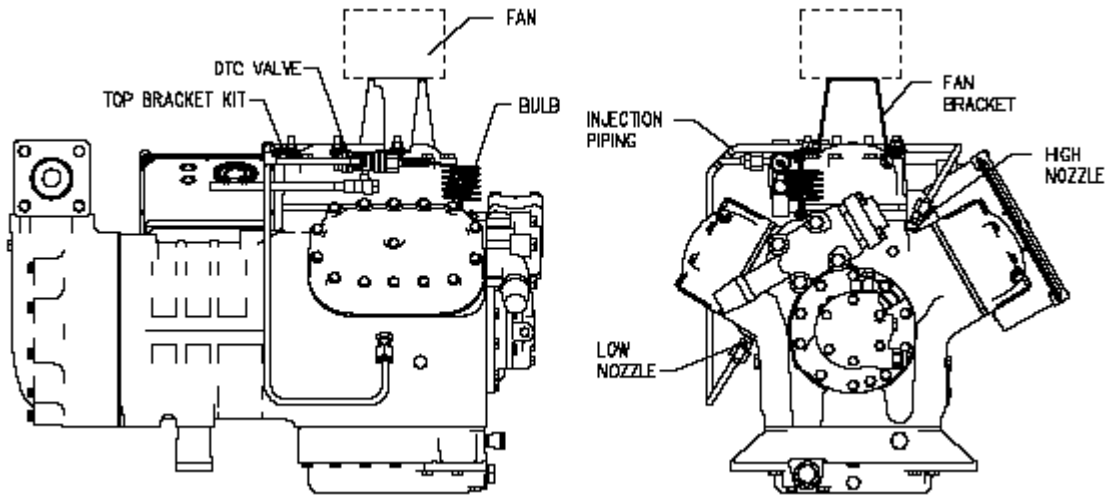
Bill Of Material		D6SL	D6ST	Bill Of Material		D6SL	D6ST
1	DTC valve - Nut 24-27 Nm, Bulb 57-67 Nm	1	1	7	O Ring Gasket	1	1
2	Tube Inlet	1	1	8	Washer 10	4	4
3	Tubing Assembly	1	1	9	Lock Washer	4	4
	Tee Fitting	1	1	10	Nut 3/8" 40 - 48 Nm	4	4
	Top Tube	1	1	11	Nut M4 1.2 - 5.0 Nm	3	3
	Side Tube	1	1	12	Lock Washer 4	3	3
	Tube Outlet	1	1	13	Valve Bracket	1	1
	Nut 24-27 Nm	2	2	14	Washer 4	3	3
	Solder Sleeve	2	2	15	Bolt M4 x 16	3	3
	Fitting	1	1	16	Clamp 7/8"	2	2
4	Nozzle - 3/8" (40-48 Nm)	1	1	17	Clamp 3/8"	1	1
5	Nozzle - 1/4" (27-34 Nm) 2.7 mm Orifice	1		18	Side Bracket	1	1
6	Nozzle - 1/4" (27-34 Nm) 3.5 mm Orifice		1				

D6SL & D6ST low temperature models require head fan as used with DTC applications. Assemble head fan kit as described.

If the DTC and the fan kits are assembled there will be some parts left over.

5 D6SU Compressor

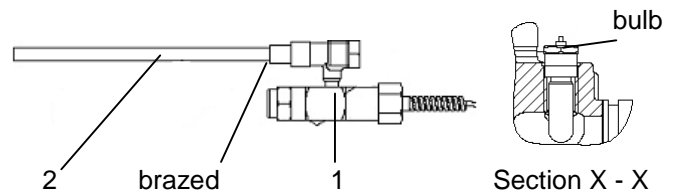
5.1 General view of D6SU with DTC valve, Injection piping system and Head Fan kit after assembly



5.2 To fit the DTC valve

5.2.1 Assemble DTC Valve Kit

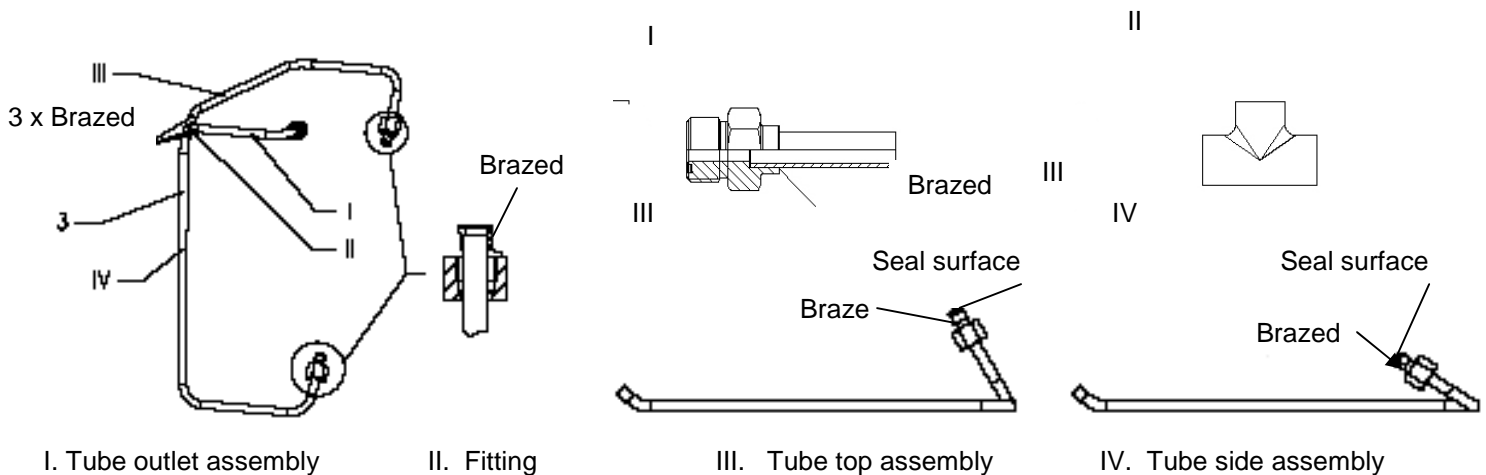
1 Braze DTC valve and tube inlet:
Wrap a damp cloth around the body of the DTC valve before brazing and keep the flame away from valve.



2 Mounting DTC valve temperature sensing element:
Remove plug from compressor body. Apply Loctite to the thread of the bulb and screw in to plug orifice.

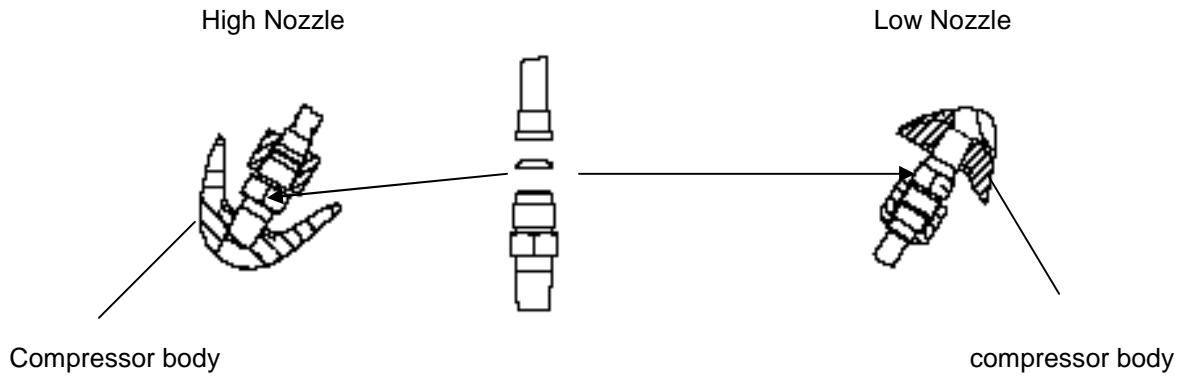
5.2.2 Injection Piping Assembly:

Sub Assembly of Piping



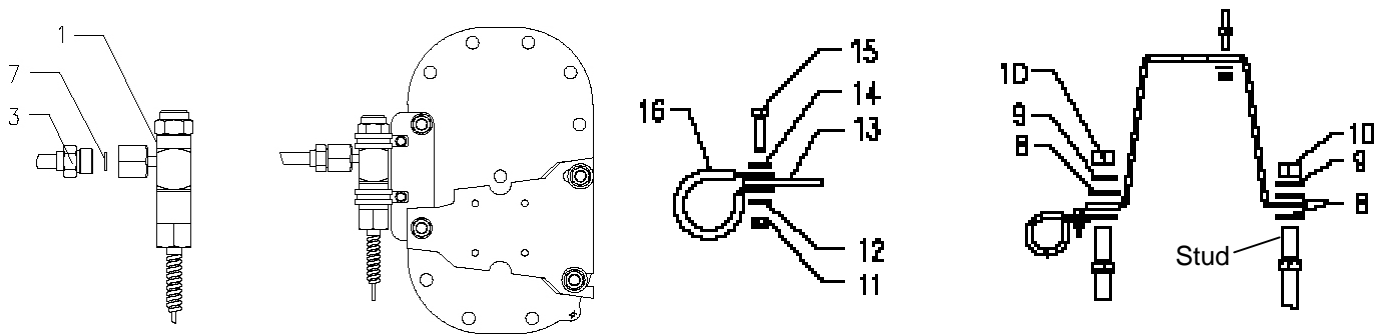
NOTE! : Clean tube joint areas before assembly. All brazed joints must be gas tight.

5.2.3 Assemble Injection Nozzles and Piping:



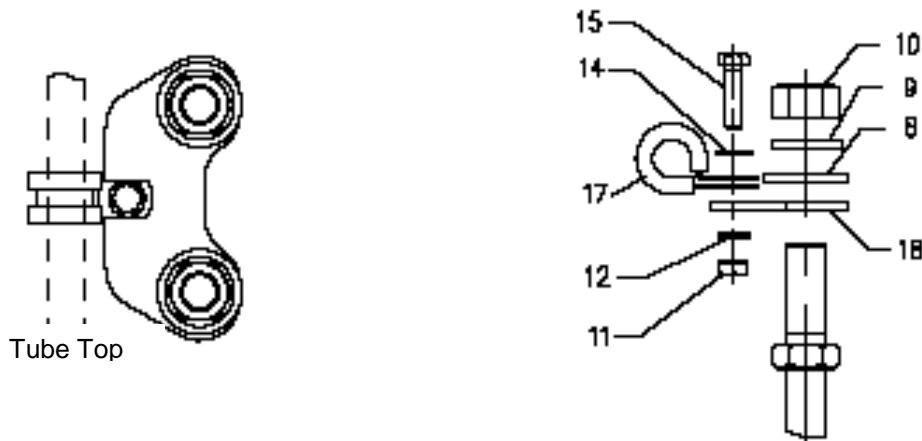
Remove plugs from compressor body. Apply Loctite to the thread of the injection nozzles and screw into plug orifice.

5.2.4 Clamping DTC Valve, Assembling Piping and Head Fan Kit

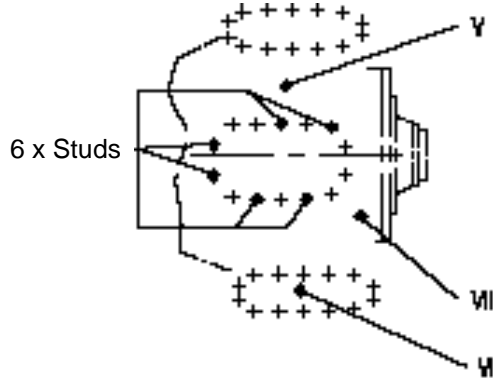


Note! The text side of bracket No.13 must be facing upwards

5.2.5 Assemble Top Bracket Kit



5.2.6 Location of DTC Valve Injection and Sensor Ports



- V Upper injection port
- VI Lower injection port (under cylinder deck)
- VII DTC temperature sensor port

5.2.7 D6SU DTC Valve Kit

Bill Of Material		D6SU	Bill Of Material		D6SU
1	DTC valve - Nut 24-27 Nm, Bulb 57-67 Nm	1	7	O Ring Gasket	1
2	Tube Inlet ID 3.50mm	1	8	Washer 10	4
3	Tubing Assembly	1	9	Lock Washer	4
	Tee Fitting	1	10	Nut 3/8" 40 - 48 Nm	4
	Top Tube	1	11	Nut M4 1.2 - 5.0 Nm	3
	Side Tube	1	12	Lock Washer 4	3
	Tube Outlet	1	13	Valve Bracket	1
	Nut 24-27 Nm	2	14	Washer 4	3
	Solder Sleeve	2	15	Bolt M4 x 16	3
	Fitting	1	16	Clamp 7/8"	2
4	Nozzle - 3/8" (40-48 Nm)	1	17	Clamp 3/8"	1
5	Nozzle - 1/4" (27-34 Nm) 2.7 mm Orifice	1	18	Top Bracket	1
6	Gasket	2			

D6SU low temperature models require head fan as used with DTC applications. Assemble head fan kit as described. If the DTC and the fan kits are assembled there will be some parts left over.