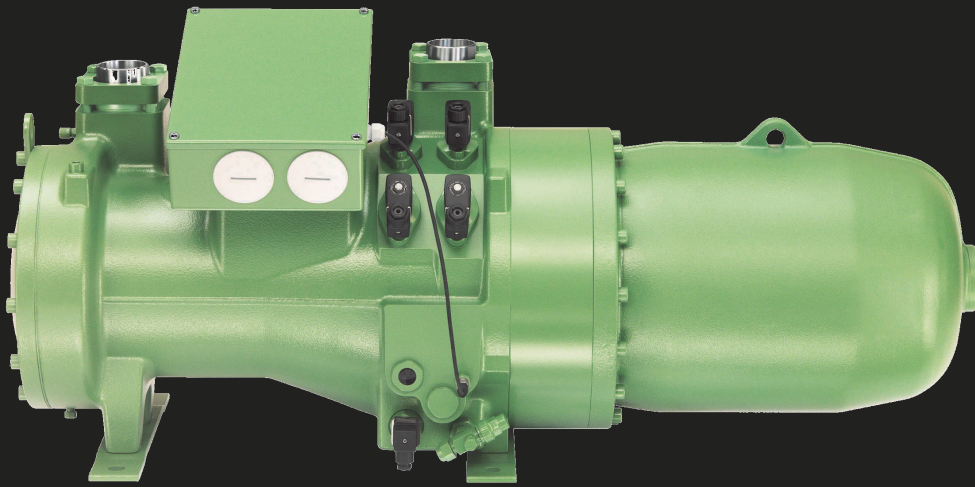




BITZER CONVERSION GUIDELINES

For HSKC to CSH Series Screw Compressors



Conversion Guidelines – HSKC to CSH Screw Compressors

Conversion guidelines for removing the original two step capacity control HSKC screw compressor and installing the four step / infinite capacity control CSH screw compressor.

The overall dimensions of the CSH screw compressor are different than the HSKC compressor that is being replaced. There are differences with the suction and discharge connections. The application remains the same but with upgraded function and operation. The CSH models have enhanced capacity control. Some accessories and items require replacement and improvement.

Unloader/Loader Solenoid Coil

The conversion to the CSH screw compressor requires the installation of the solenoid coils. The original HSKC required two solenoid coils for the operation of the two step capacity control (50%, 100%), while the new compressor requires four solenoid coils for a four step capacity control set up (25%, 50%, 75%, 100%) or two coils for infinite capacity control. Charts A, B and C below demonstrate the controls for infinite capacity control.

Infinite capacity control in the range of 100% .. 25%

CR	1	2	3	4
Start / Stop	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
CAP ↑	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
CAP ↓	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
CAP ↔	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

CAP Cooling capacity

- CAP ↑ Increasing capacity
- CAP ↔ Constant capacity
- CAP ↓ Decreasing capacity

CAP 25%* CSH6561/7571/8571: 25%
 CSH6551/7561/8561: 30%
 CSH7551/8551: 35%

- Solenoid valve de-energized
- Solenoid valve energized
- Solenoid valve pulsing
- Solenoid valve intermittent (10 s on /10 s aus)

Infinite capacity control in the range of 100% .. 50%

Start / Stop	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
CAP ↑	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
CAP min 50% ↓	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
CAP ↔	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



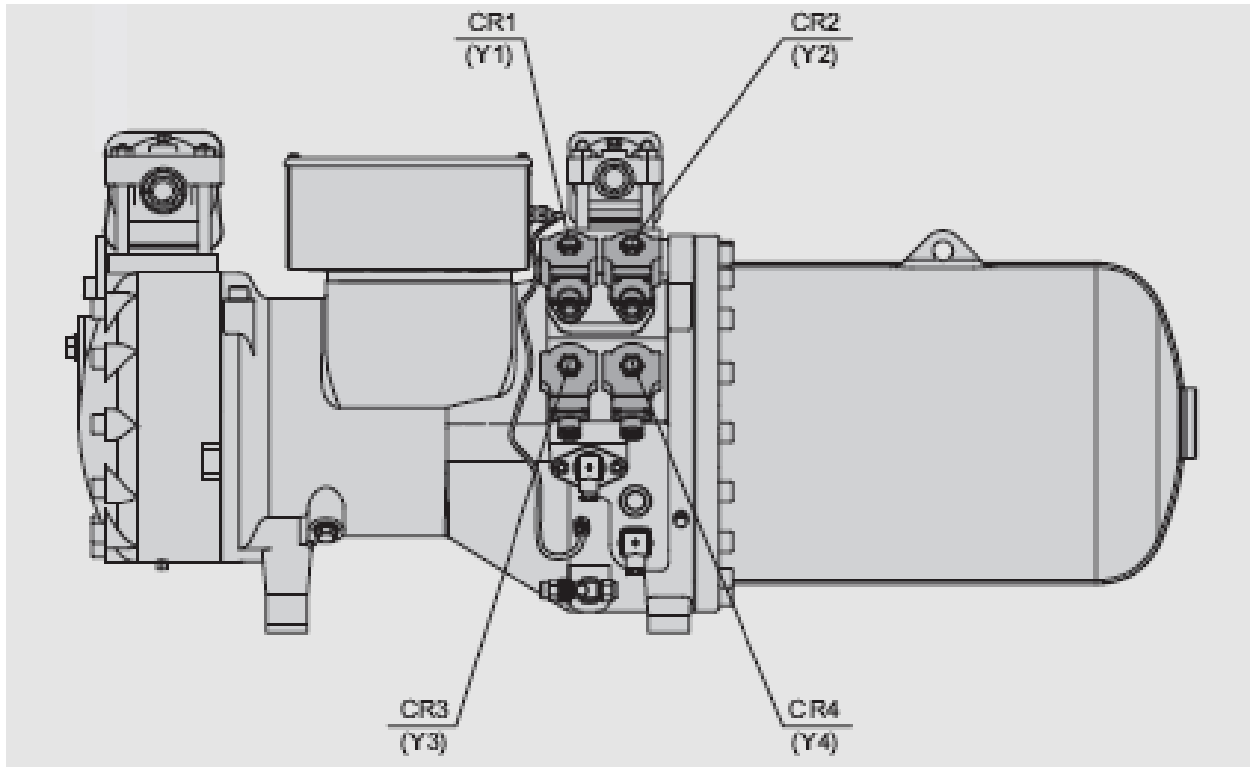
Attention!

The application ranges with capacity control are restricted!
 See SH-170 or BITZER software.

4-Step capacity control

CR	1	2	3	4
Start / Stop	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
CAP 25%*	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
CAP 50%	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
CAP 75%	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CAP 100%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Location of Four Step / Infinite Capacity Solenoid Coils

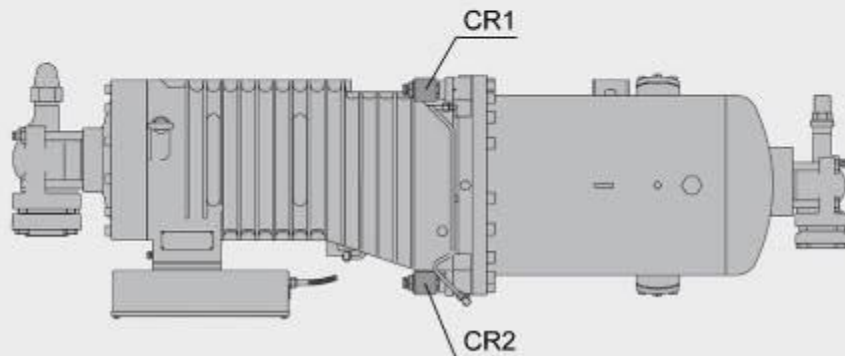


Location of Two Step Capacity Solenoid Coils

Types	Capacity control: ①	Full load (100%)	1. Step (approx. 75%)	2. Step (approx. 50%)	Start unloading
HSKC 64		CR1 = ● CR2 = ●	CR1 = ○ CR2 = ●	CR1 = ○ CR2 = ○	CR1 = ○ CR2 = ○
HSKC 74		CR1 = ● CR2 = ●	CR1 = ● CR2 = ○	CR1 = ○ CR2 = ○	CR1 = ○ CR2 = ○

- ① Effective capacity stages are dependent upon operating conditions
- Solenoid coil de-energized
- Solenoid coil energized

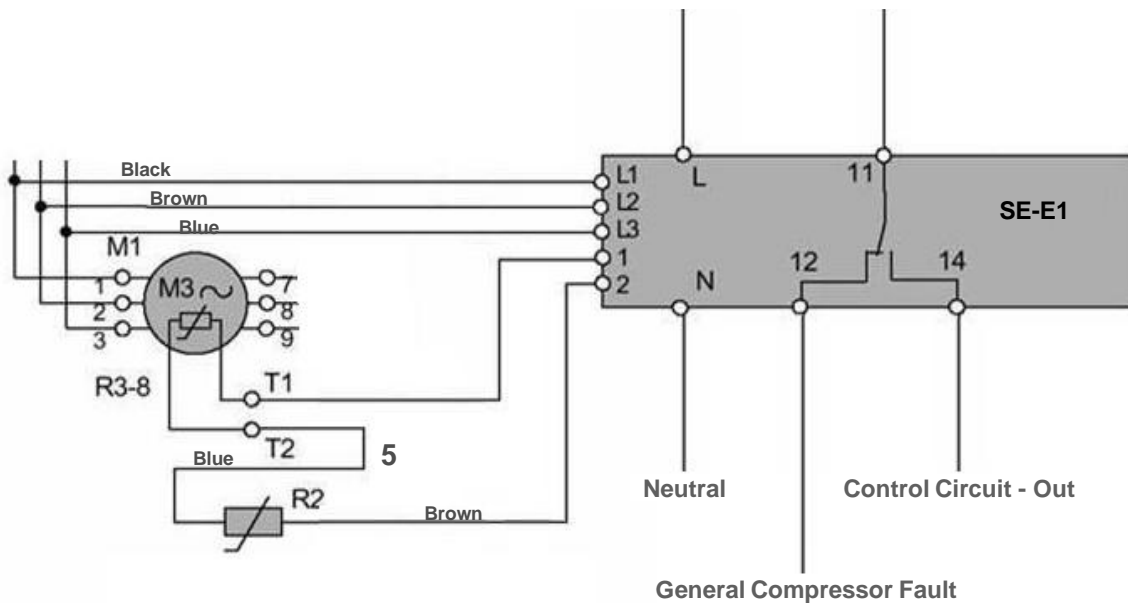
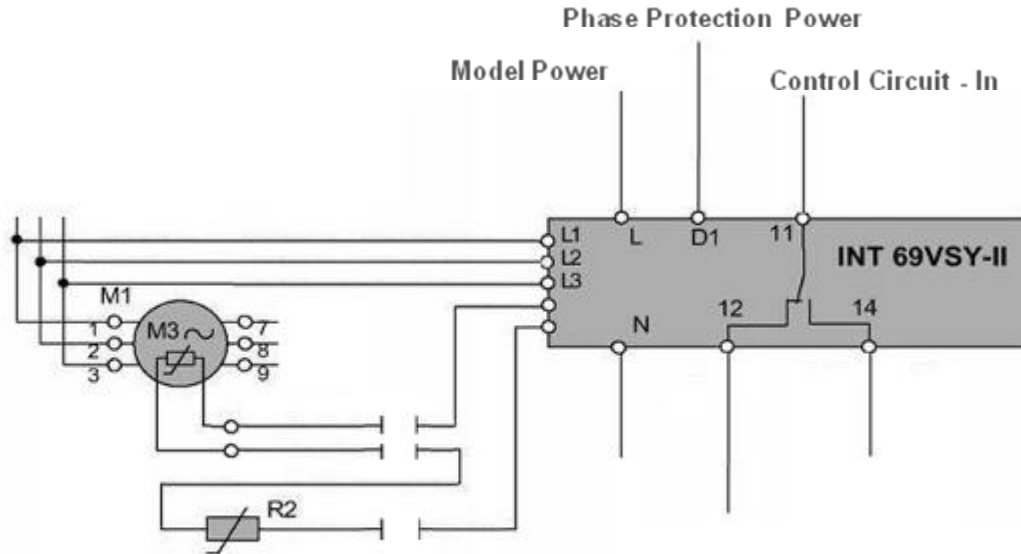
HSKC 64 / HSKC 74



Arrangement of solenoid valves

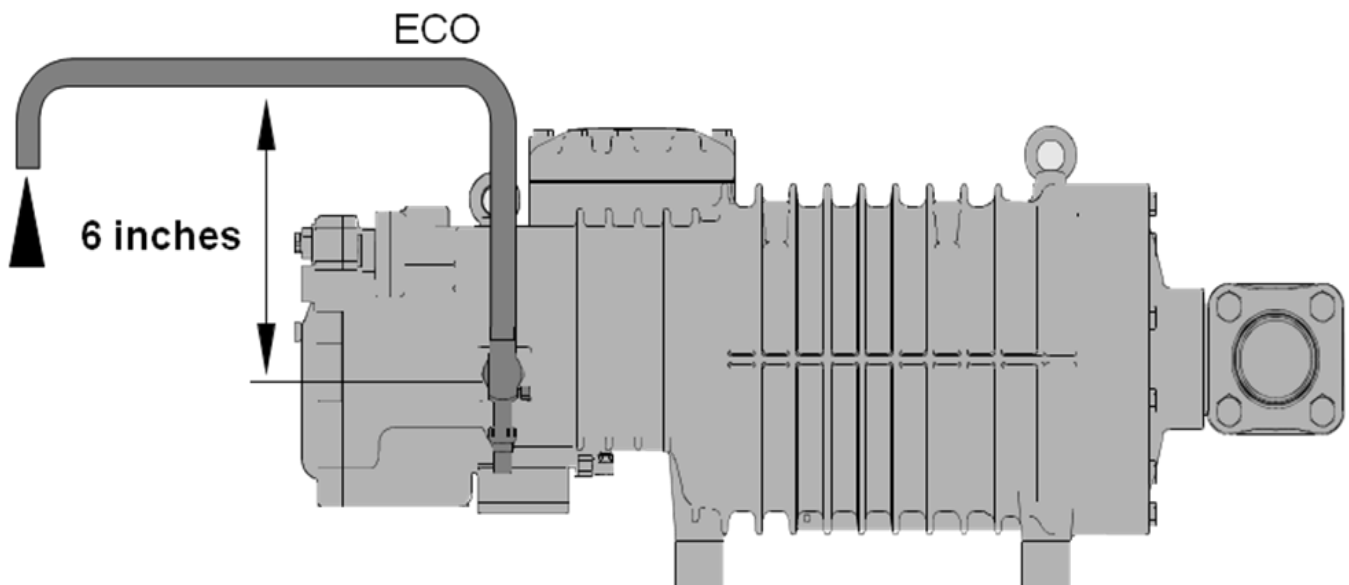
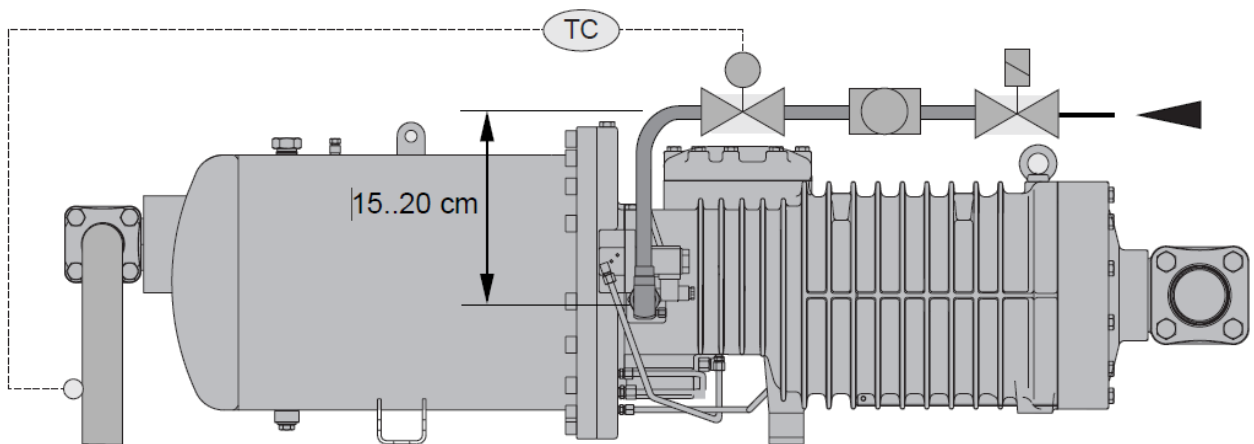
Electronic Protection Module – INT69VSY-II/ SE-E1

The CSH screw compressor comes with the standard SE-E1 electronic protection module. The HSKC used the INT69VSY-II. Replacement of the module is simplified by removing the terminal D-1, which was used by the INT69VSY-II module for phase protection. This connection was connected to an "N.O." auxiliary relay to sense voltage fluctuation imbalance in the system. The SE-E1 phase power protection is embedded in the module so that if any malfunction, voltage fluctuation or imbalance in the system is sensed, the module will shut the unit off.



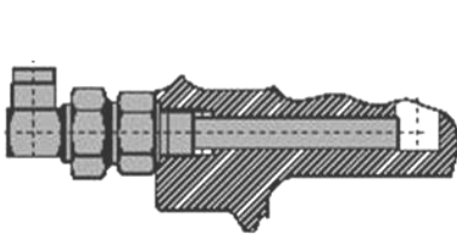
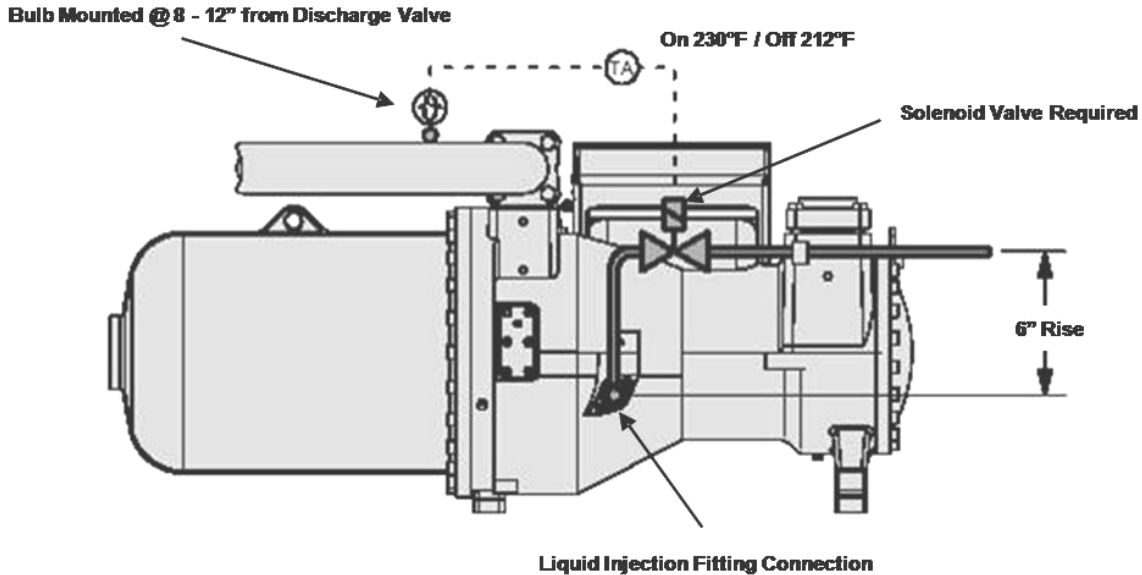
Economizer/Liquid Injection Port Connection - HSKC Screw Compressor

If the original screw compressor utilized the ECO / LI connection, the original piping will have to be reconfigured for the new screw compressor ECO / LI ports. The original connection on the HSKC connected on the side of the compressor body with a M26 x 1-1/4"-12 UNF rotolock connection. Some of the original piping to the ECO / LI ports may also be used; however, every installation may differ in the condition of the piping once the retrofit is completed.

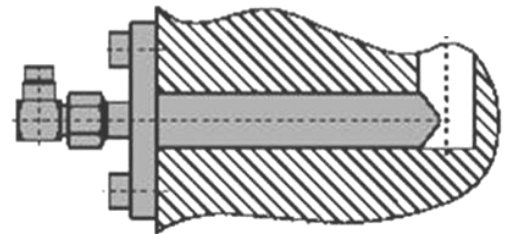


Economizer/Liquid Injection Port Connection - CSH Screw Compressor

The replacement CSH screw compressor has an ECO / LI ports connection which is located on the side of the compressor and labeled ECO. This connection requires the use of an external fitting. The pipe plug on the side of the compressor should be removed, and an M22 x 1-1/4"-12 UNF fitting should be installed. Each fitting comes with an M22 aluminum washer and a 1-1/4"-12 Teflon O-ring. After the fitting is installed, the original pipeline can be modified for installation as shown in the figure below. The CSH utilizes a M22 x 1-1/4"-12 UNF rotolock fitting. The diagram below shows an optional liquid injection oil cooling kit which utilizes a nozzle.



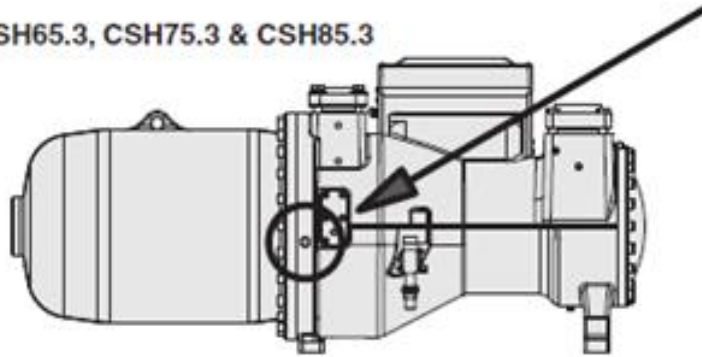
CSH-Y 35,40,50,60,70
CSH 50,60,70,80,90



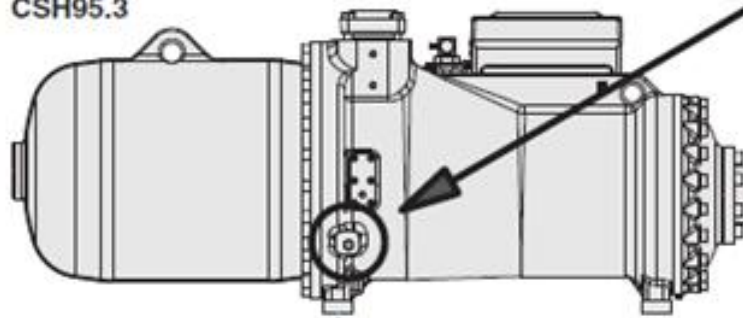
CSH-Y 80,90,110,125,140,160,180,210,240
CSH 110,125,140,180,210,240,280,300

Liquid Injection Nozzle and Fitting – Fixed L.I. Port
CSH.3 Series Compressors

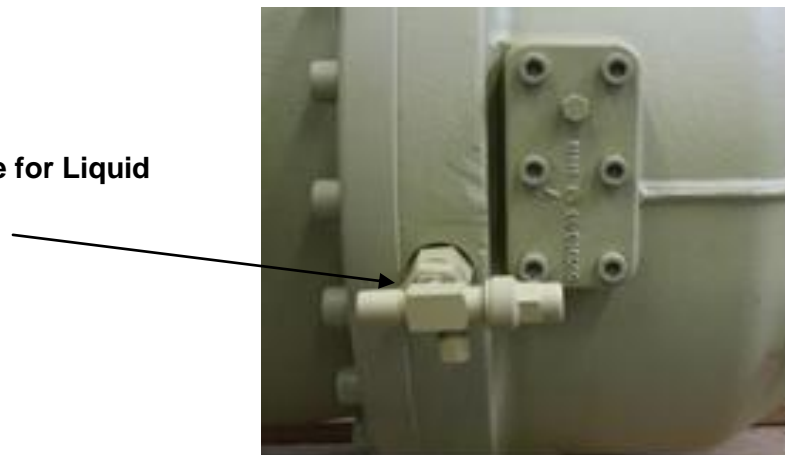
CSH65.3, CSH75.3 & CSH85.3



CSH95.3



Shut-off valve for Liquid Injection



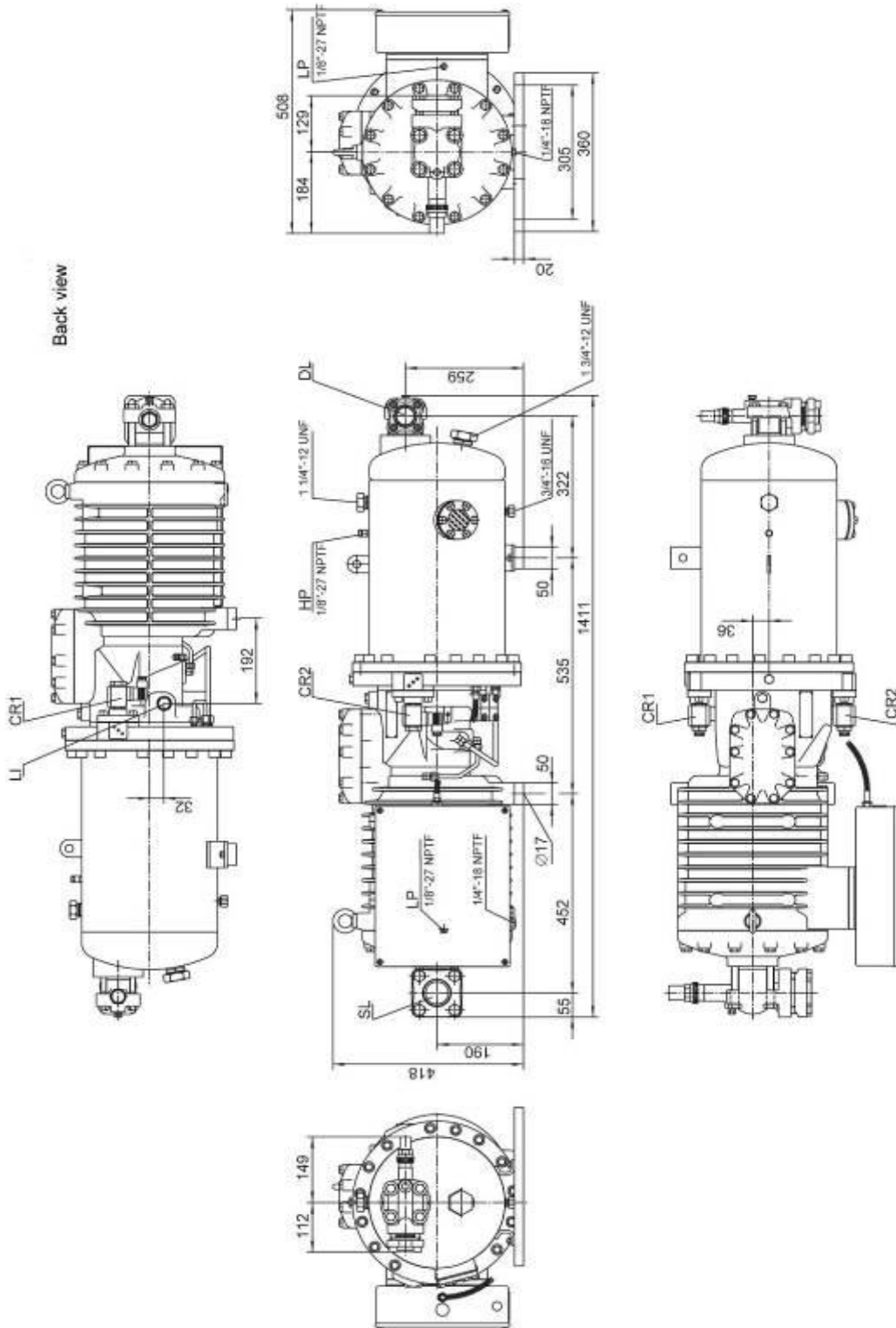
Unit Dimension

Although the application is the same, the dimensions of the CSH are different than the HSKC model. The suction and discharge valves are mounted on top of the CSH compressors as opposed to each end of the HSKC models. The terminal box position on the HSKC model is located on the side, while the terminal box on the CSH model is located on the top or a slight 45° (depending on frame size). The mounting dimensions are different between the two models which may require additional bracing depending on the original mounting of the HSKC. Dimensional drawings for each of the models are provided for your reference.

CS Models		Overall Dimensions			Mounting Dimensions		Service Valve Dimensions	
CSH1	CSH3	L	W	H	L	W	Disch.	Suct
CSH6551-50	CSH6553-50	43.57	22.13	22.44	18	12	1 5/8	2 1/8
CSH6561-60	CSH6563-60	43.57	22.13	22.44	18	12	1 5/8	2 1/8
CSH7551-70	CSH7553-70	52.94	22.25	24.19	17.94	12	2 1/8	3 1/8
CSH7561-80	CSH7563-80	52.94	22.25	24.19	17.94	12	2 1/8	3 1/8
CSH7571-90	CSH7573-90	52.94	22.25	24.19	17.94	12	2 1/8	3 1/8
HSKC Models		Overall Dimensions			Mounting Dimensions		Service Valve Dimensions	
HSKC 6451-50		55.65	19.83	16.92	21.07	12	1 5/8	2 1/8
HSKC 6461-60		55.65	19.83	16.92	21.07	12	1 5/8	2 1/8
HSKC 7451-70		64.61	20.72	18.28	21.06	12	2 1/8	3 1/8
HSKC 7461-80		64.61	20.72	18.28	21.06	12	2 1/8	3 1/8
HSKC 7471-90		67.45	20.72	18.28	21.94	12	2 1/8	3 1/8
Please Note - All measurements listed above are provided in inches.								

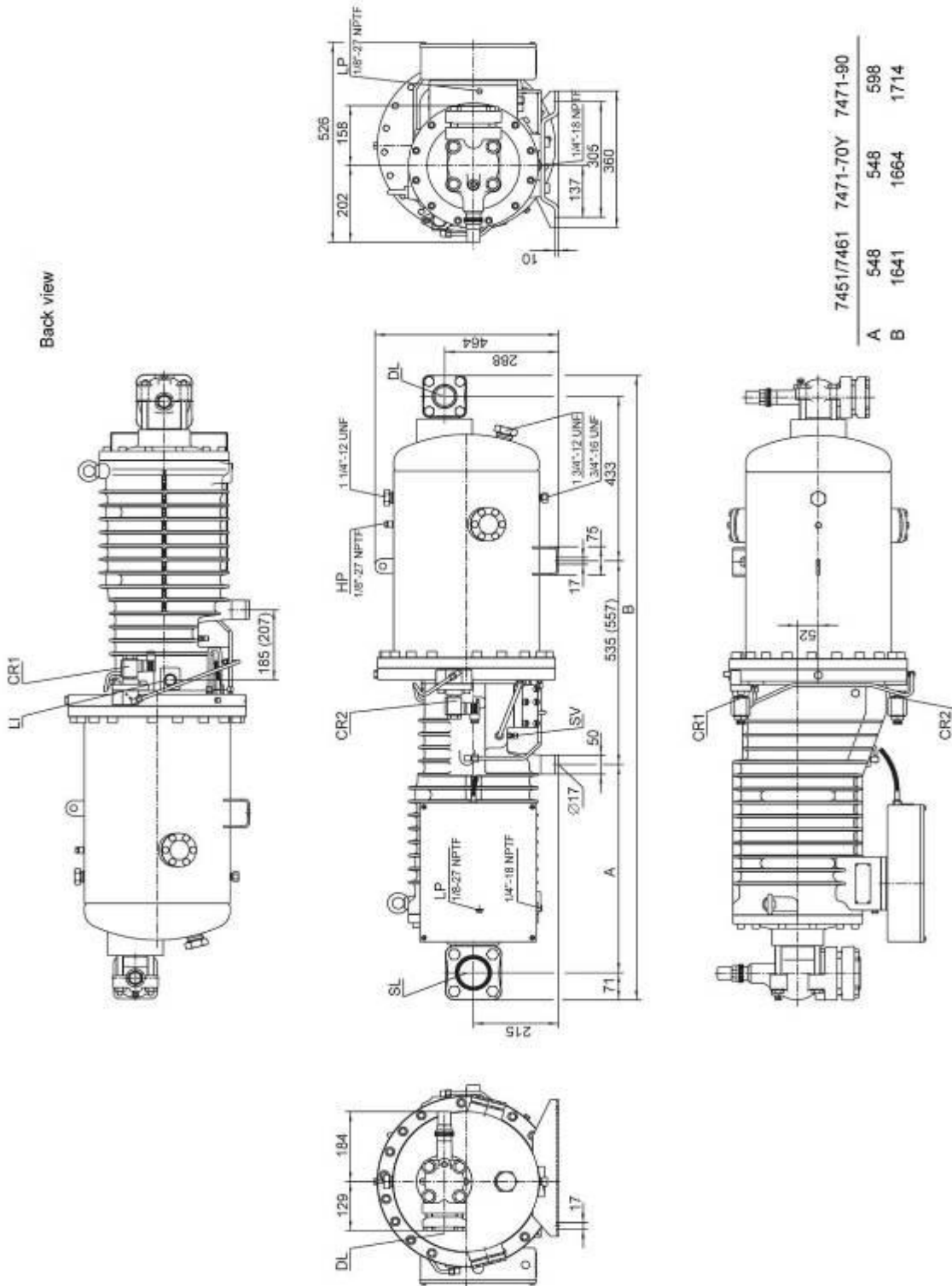
Unit Dimensions - HSKC 64 Compressors

Please note – Dimensions are listed in millimeters



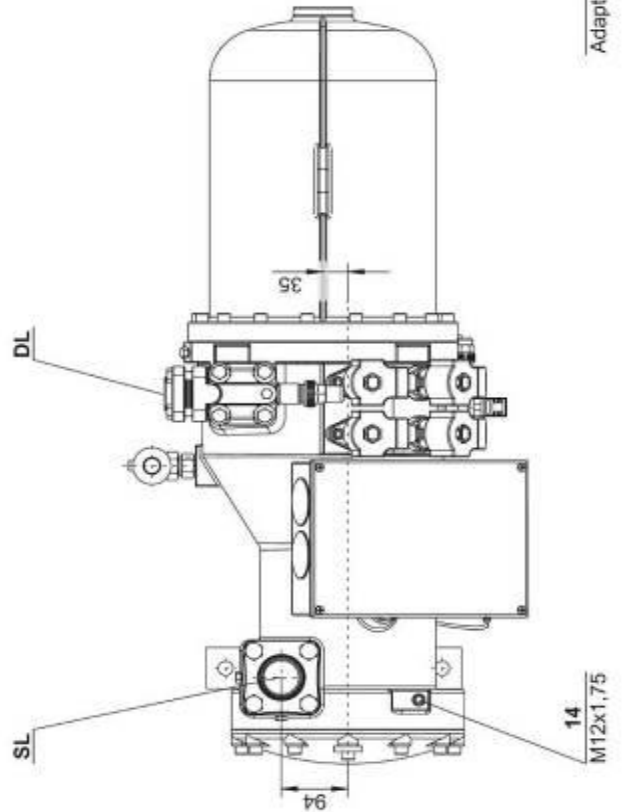
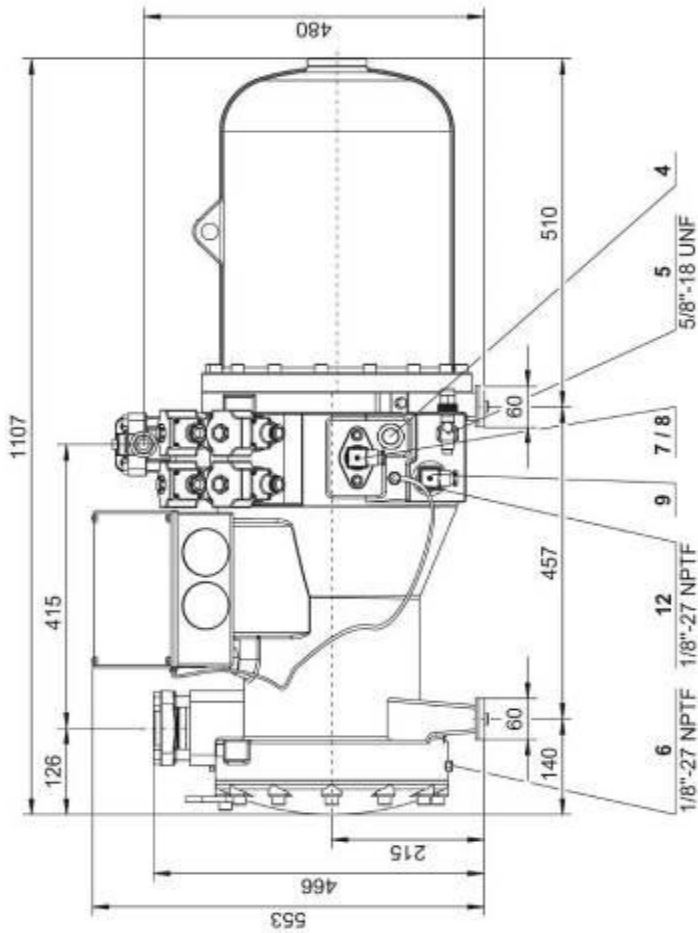
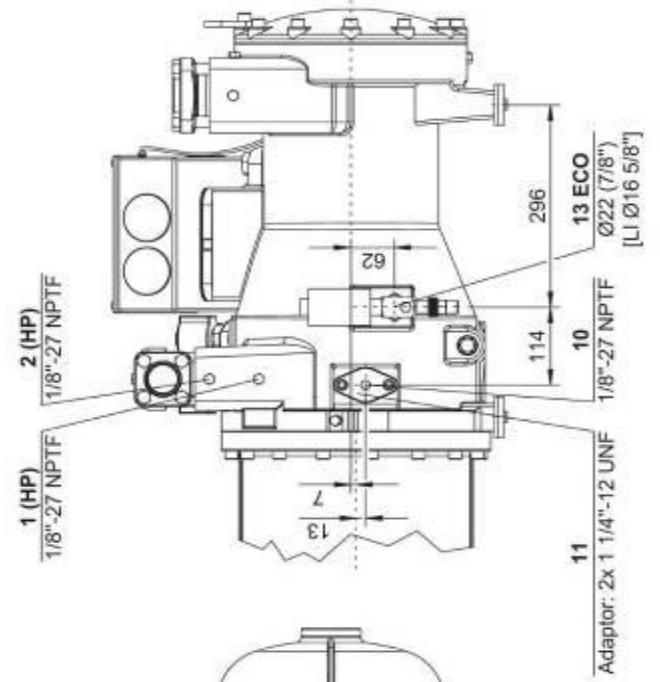
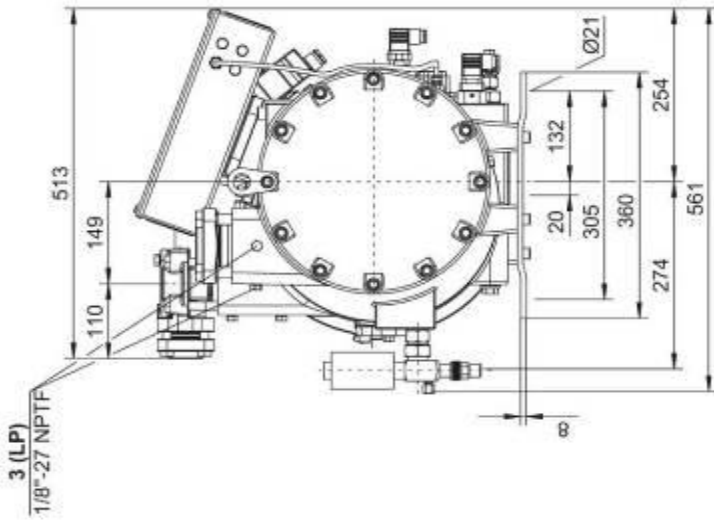
Unit Dimensions - HSKC 74 Compressors

Please note – Dimensions are listed in millimeters



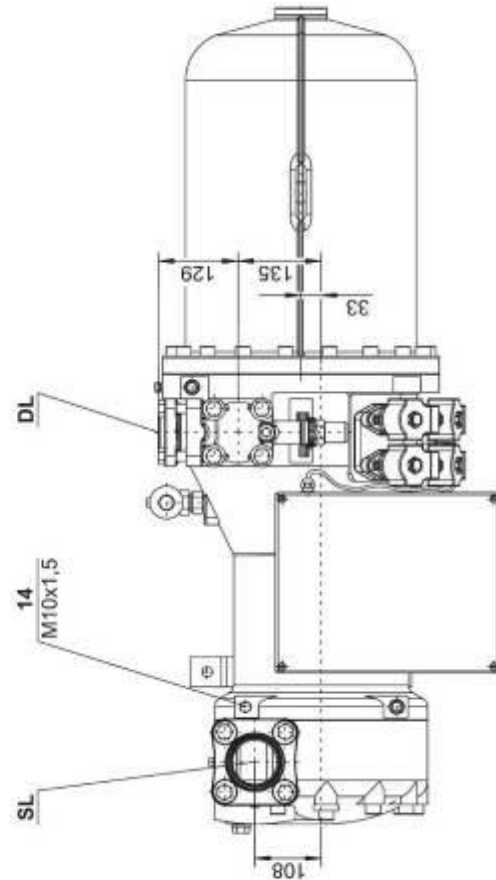
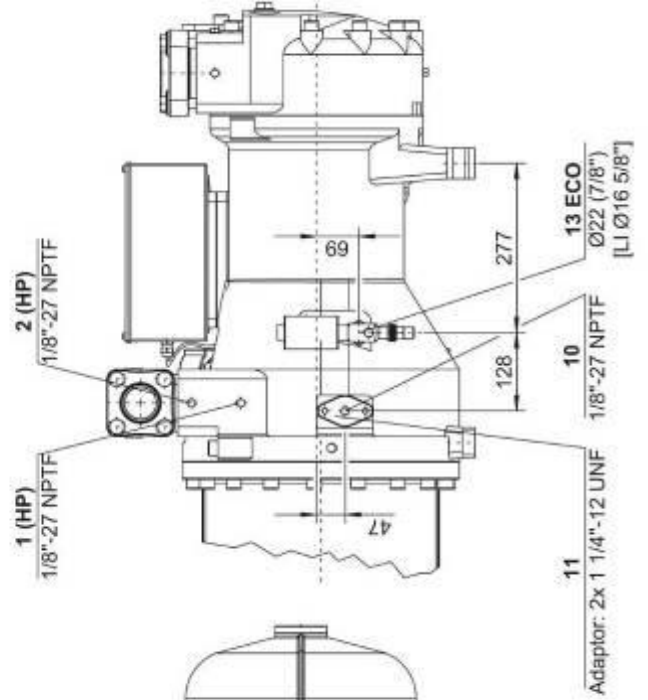
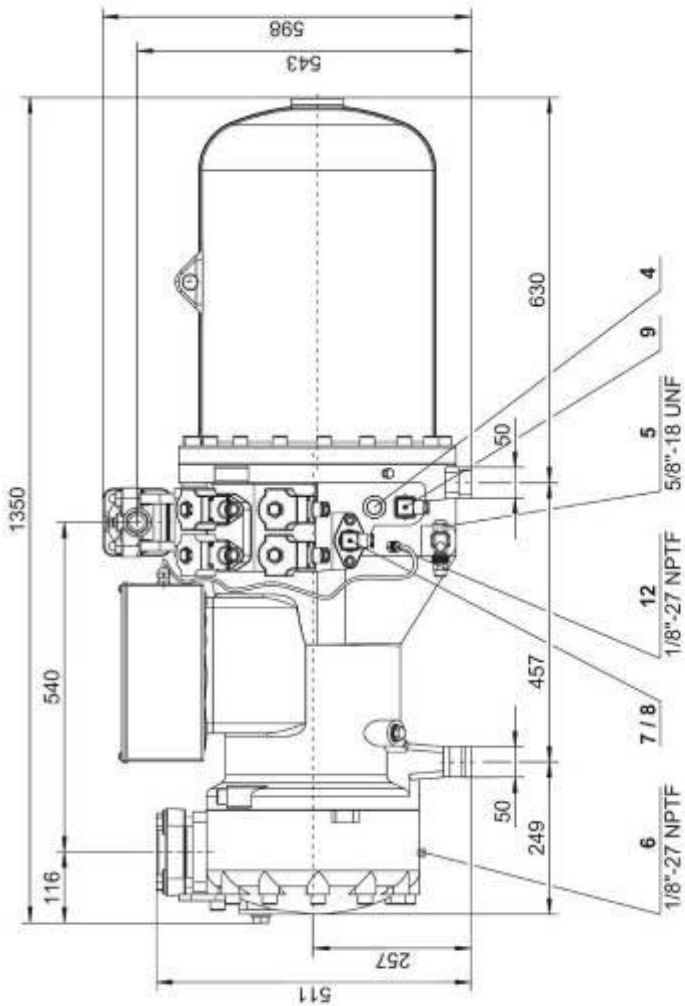
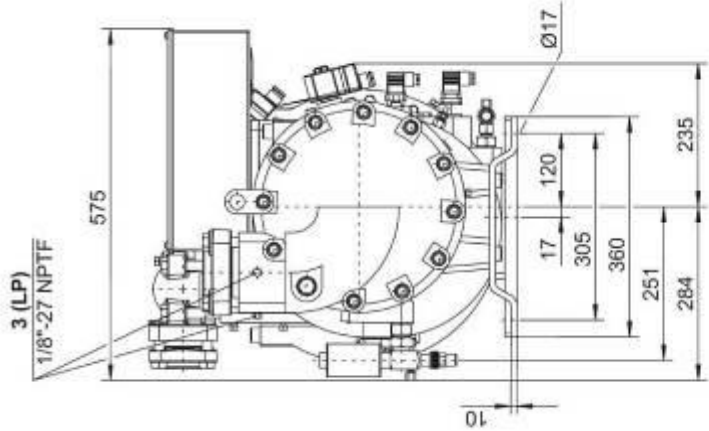
Unit Dimensions – CSH 65.1 Compressors

Please note – Dimensions are listed in millimeters



Unit Dimensions – CSH 75.1 Compressors

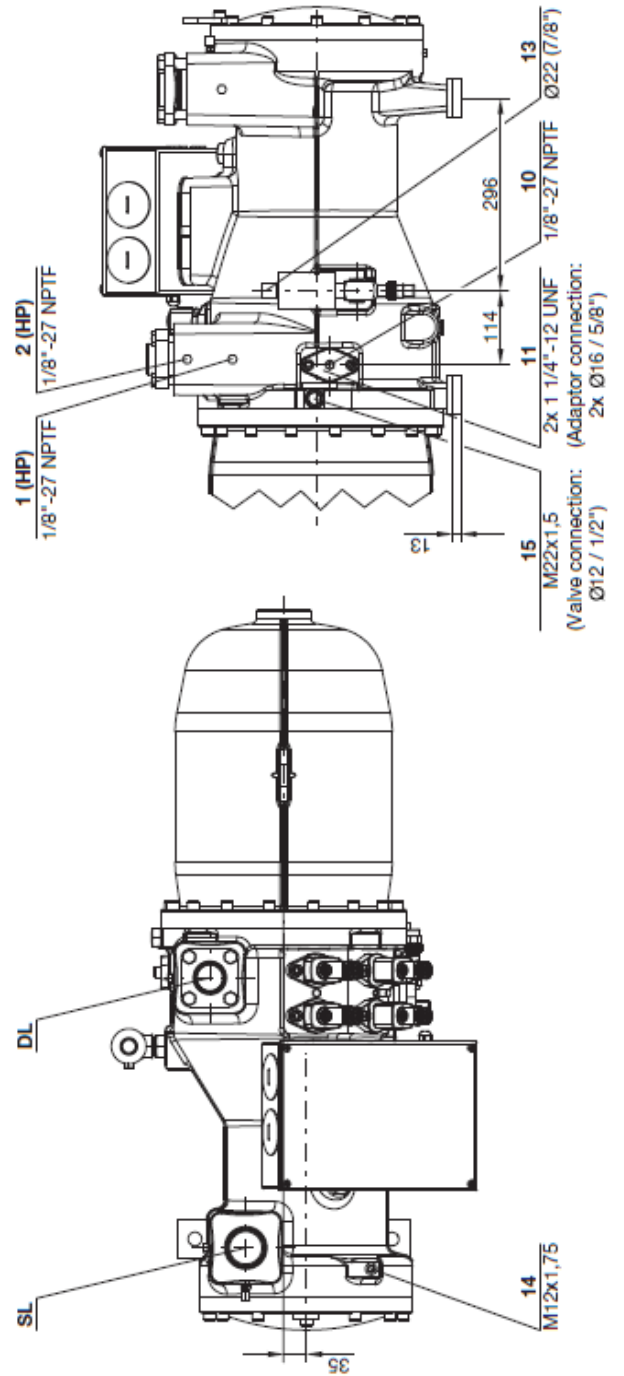
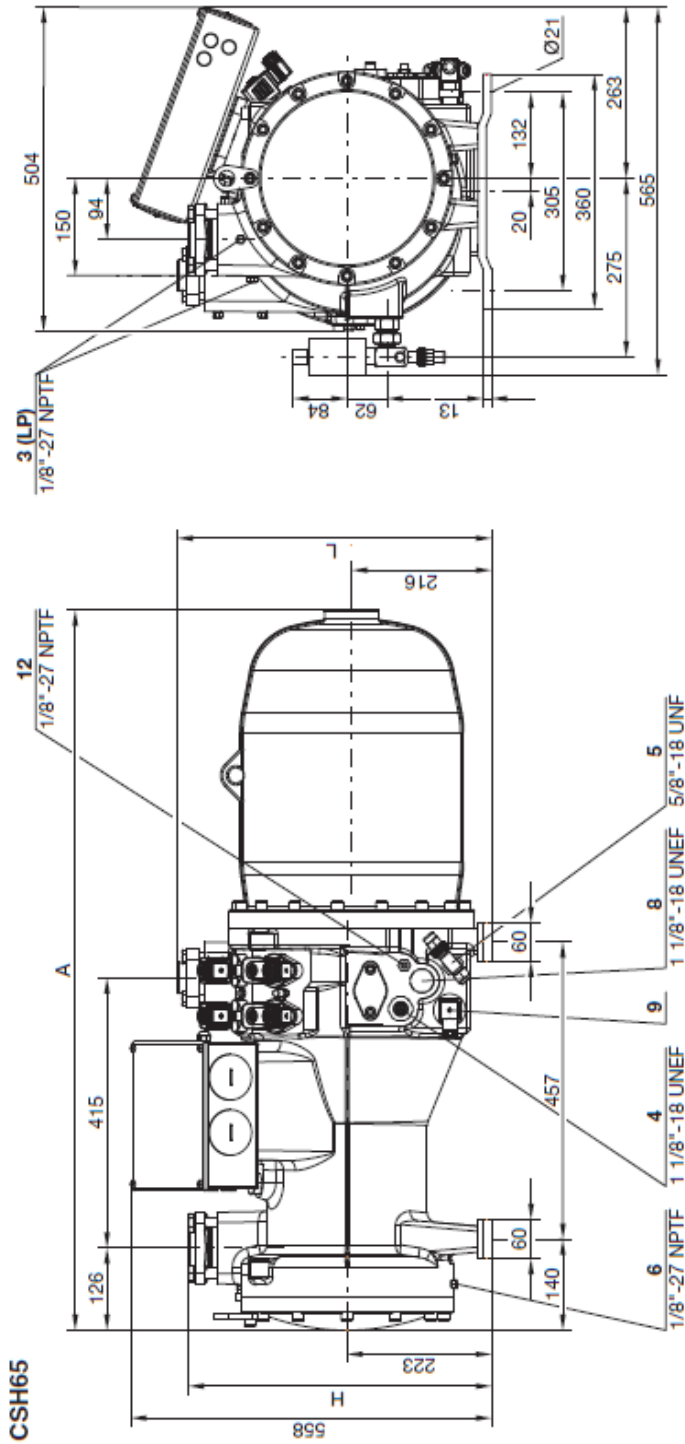
Please note – Dimensions are listed in millimeters



Unit Dimensions – CSH 65.3 Compressors

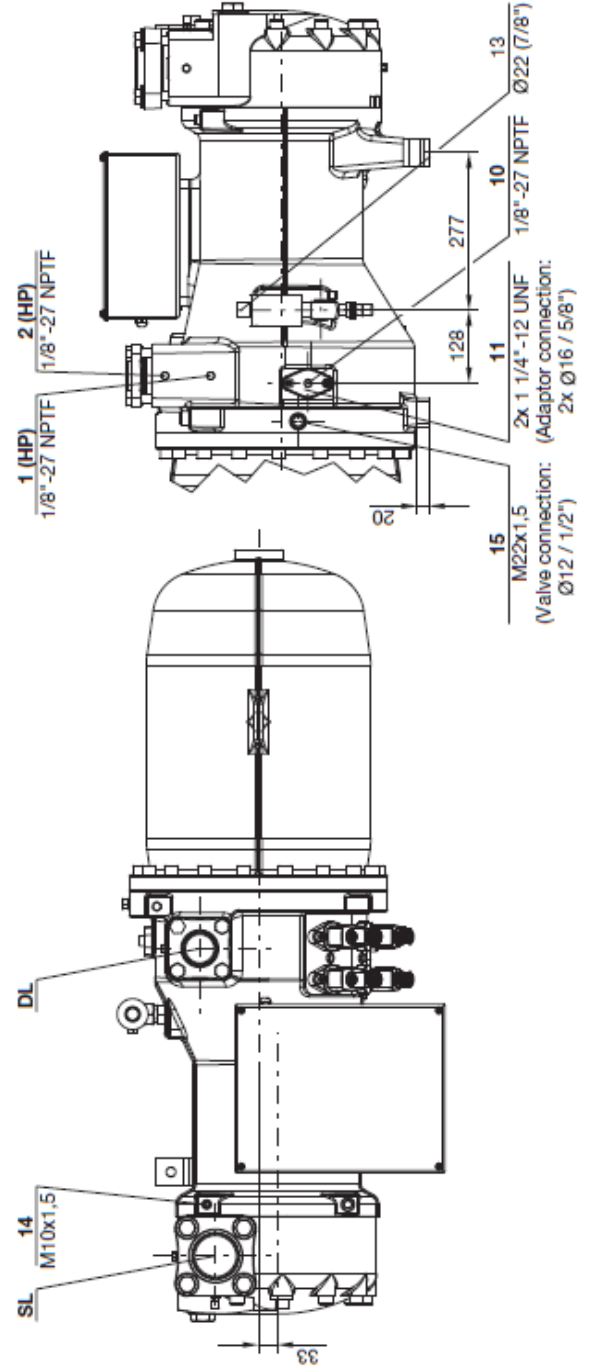
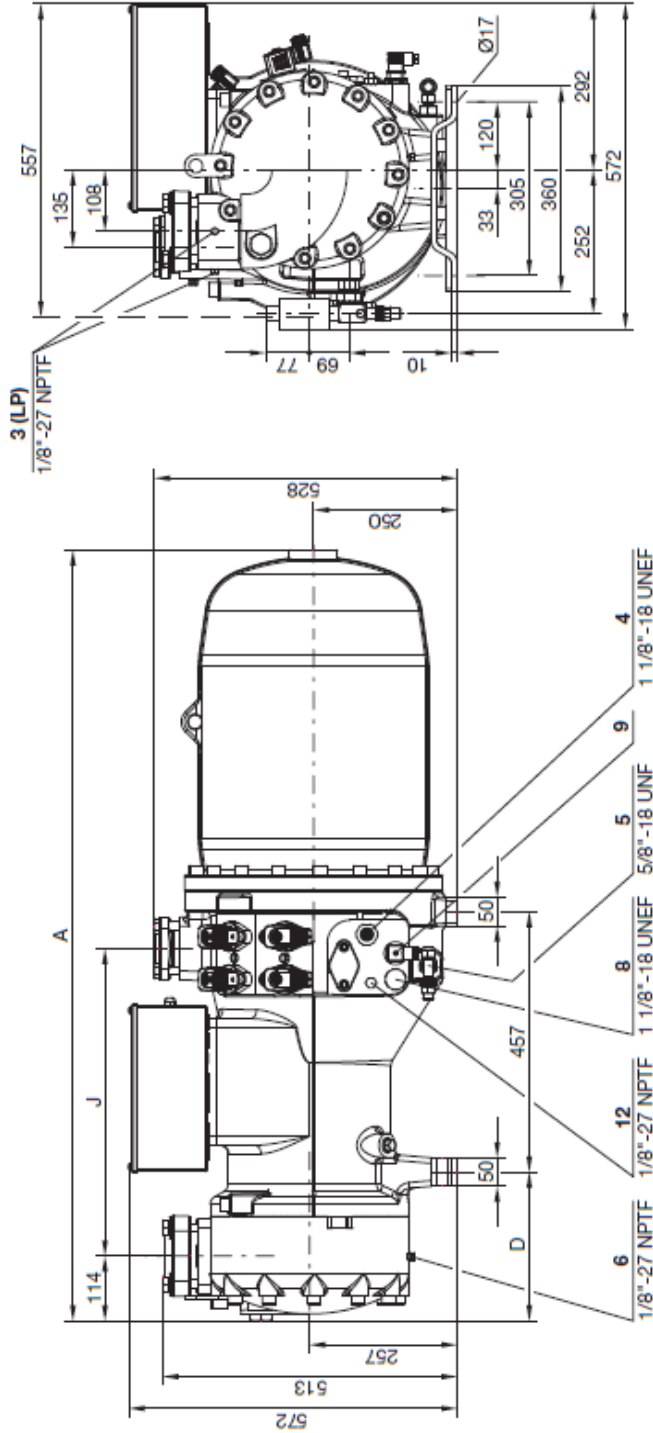
Please note – Dimensions are listed in millimeters

	A mm	H mm	L mm
CSH6553	1107	468	486
CSH6563			
CSH6583	1207	478	490
CSH6593			



Unit Dimensions – CSH 75.3 Compressors

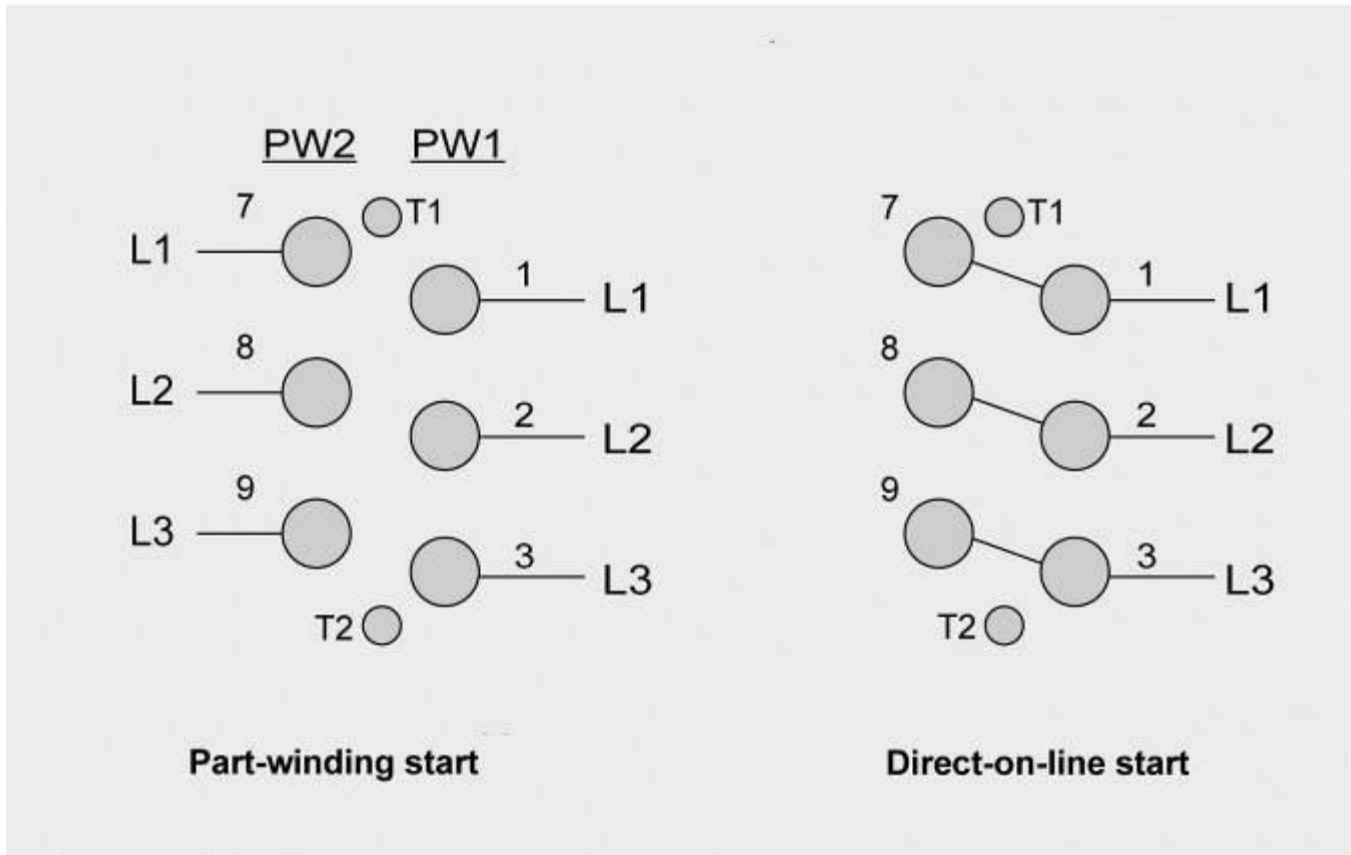
Please note – Dimensions are listed in millimeters



	A mm	D mm	J mm
CSH7553 / CSH7563 / CSH7573 CSH7583-80Y / CSH7593-90Y	1353	261	540
CSH7583-100(Y) CSH7593-110(Y)	1383	291	570

Electrical

The motor horsepower, voltage, phase and frequency of the HSKC compressors are equal to their CSH counterparts. Both series can utilize either part-winding (PWS) or direct on line (DOL) starting methods. The contactors are similar depending on the brand being used. The accessories are also similar depending on the control system design and protection. Electrical specifications, uses and functions are similar, but will depend on the electrical system design.



Additional Publications

For additional compressor information, please refer to compressor Application Manuals SH-170-4 (CSH) or SH-150-2 (HSKC) and compressor Operating Instruction Manuals SB-170-6 (CSH) or SB-150-1 (HSKC).

Additional publications can be viewed on www.bitzerus.com in the documentation section.



Notes



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