

Dimensions

Single compressors LLZ013-015-018

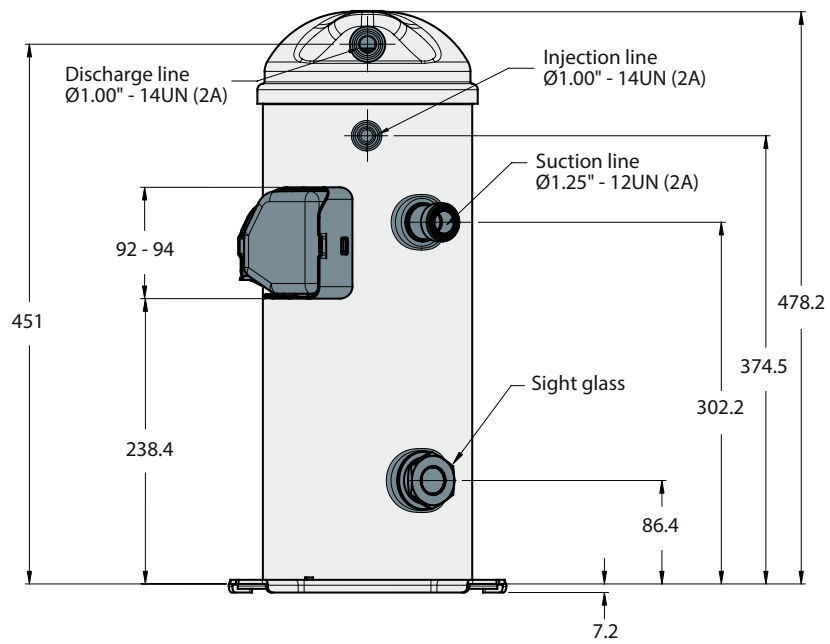
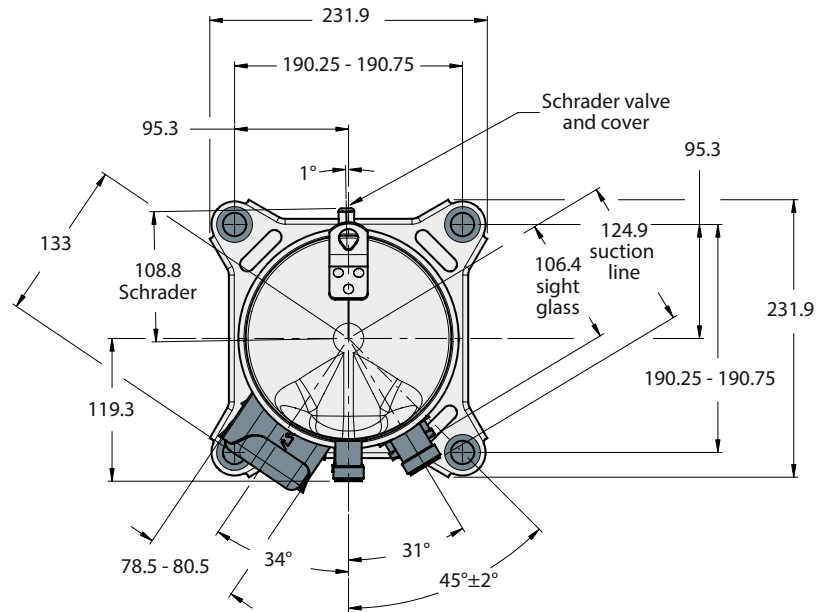
GENERAL INFORMATION

PRODUCT INFORMATION

SYSTEM DESIGN

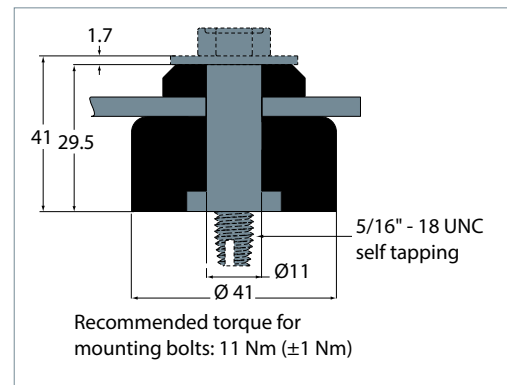
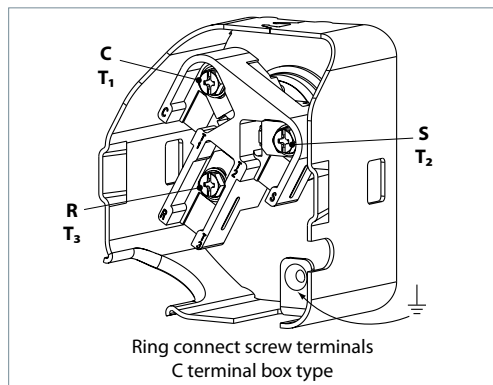
INTEGRATION INTO SYSTEM

ORDERING INFORMATION



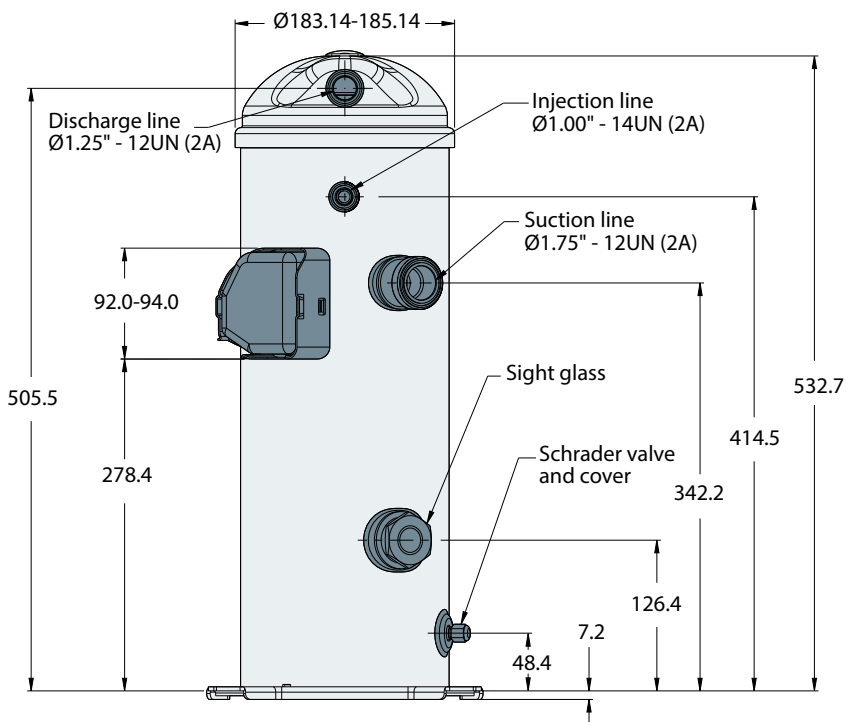
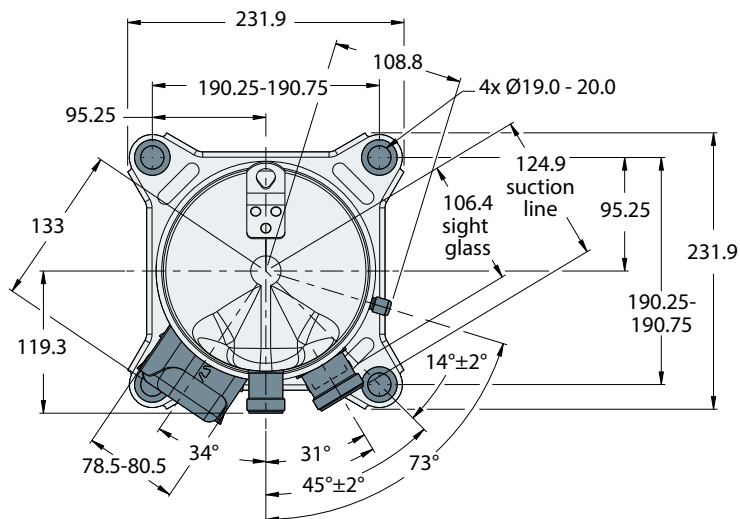
Terminal box

Mounting grommet

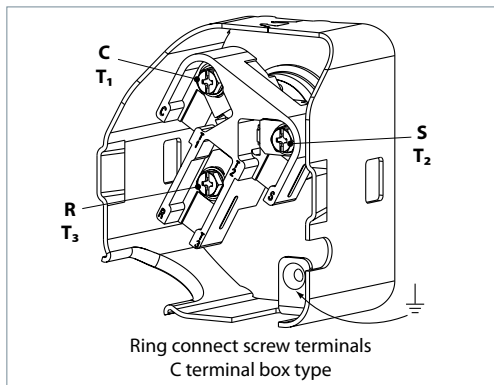


Dimensions

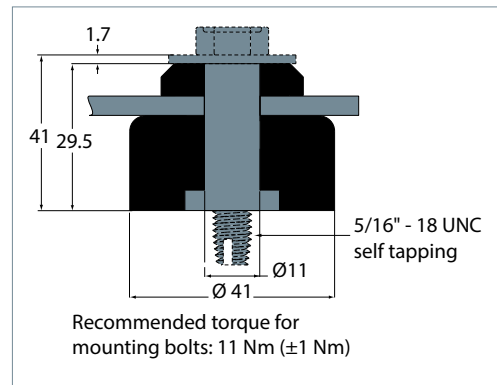
Single compressors LLZ024



Terminal box



Mounting grommet



GENERAL INFORMATION

PRODUCT INFORMATION

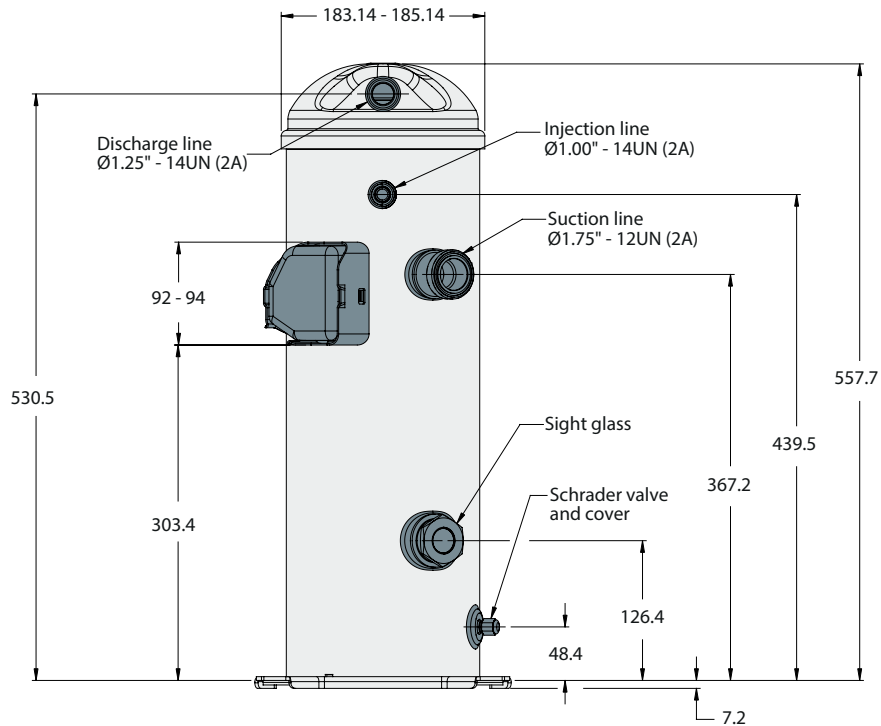
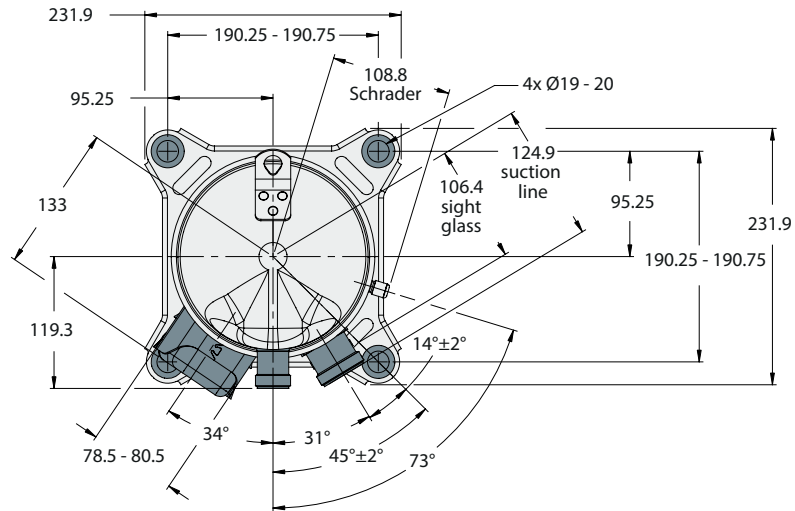
SYSTEM DESIGN

INTEGRATION INTO SYSTEM

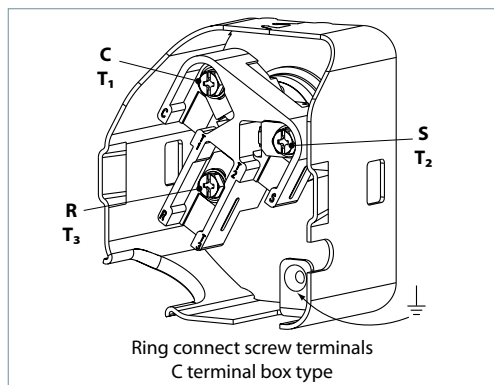
ORDERING INFORMATION

Dimensions

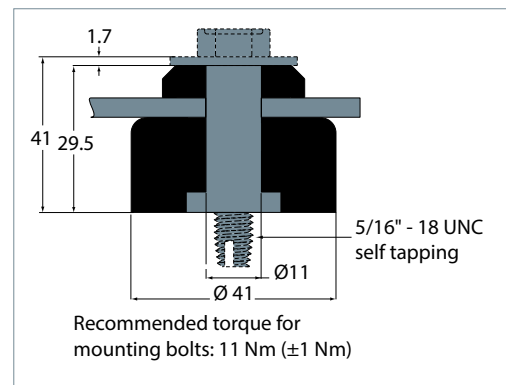
Single compressors LLZ034



Terminal box



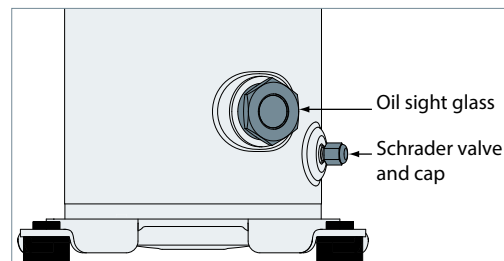
Mounting grommet



Dimensions

Oil sight glass

LLZ scroll compressors come equipped with a threaded oil sight glass with 1"1/8 - 18 UNEF connection. It can be used for a visual check of the oil amount and condition or it may be replaced by an accessory oil management device. The oil level must be visible in the sight glass during operation.



Schrader

The oil fill and drain connection and gauge port is a 1/4" male flare connector incorporating a schrader valve.

Suction and discharge connections

LLZ scroll compressors are factory delivered with rotolock connections only.

Compressor Models	Rotolock Sizes		
	Suction Fitting (in)	Discharge Fitting (in)	Injection Fitting (in)
LZL013	1"1/4	1"	1"
LLZ015	1"1/4	1"	1"
LLZ018	1"1/4	1"	1"
LLZ024	1"3/4	1"1/4	1"
LLZ034	1"3/4	1"1/4	1"

Motor voltage

Danfoss scroll compressors LLZ are available in 3 different motor voltages as listed below.

Motor voltage code		Code 2	Code 4	Code 9
50 Hz	Nominal voltage	200-220V-3 ph	380-415V - 3 ph	-
	Voltage range	180-242V*	342-457 V	
60 Hz	Nominal voltage	208-230V-3 ph	460V - 3 ph	380V -3 ph
	Voltage range	187-253V*	414-506 V	342-418V

The maximum allowable voltage imbalance is 2%. Voltage imbalance causes high amperage over one or several phases, which in turn leads to

overheating and possible motor damage. Voltage imbalance is given by the formula:

$$\% \text{ voltage imbalance} = \frac{|V_{\text{avg}} - V_{1-2}| + |V_{\text{avg}} - V_{1-3}| + |V_{\text{avg}} - V_{2-3}|}{2 \times V_{\text{avg}}} \times 100$$

Vavg = Mean voltage of phases 1, 2, 3.

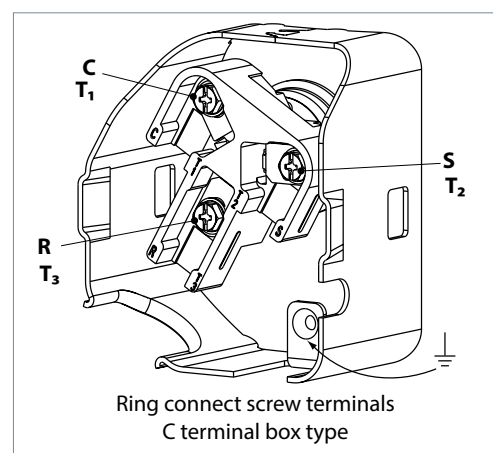
V1-3 = Voltage between phases 1 and 3.

V1-2 = Voltage between phases 1 and 2.

V2-3 = Voltage between phases 2 and 3.

Wiring connections

Danfoss scroll compressors LLZ will only compress gas while rotating counter-clockwise (when viewed from the compressor top). Three-phase motors will start and run in either direction, depending on the phase angles of the supplied power. Care must be taken during installation to ensure that the compressor operates in the correct direction (see "Phase sequence and reverse rotation protection").

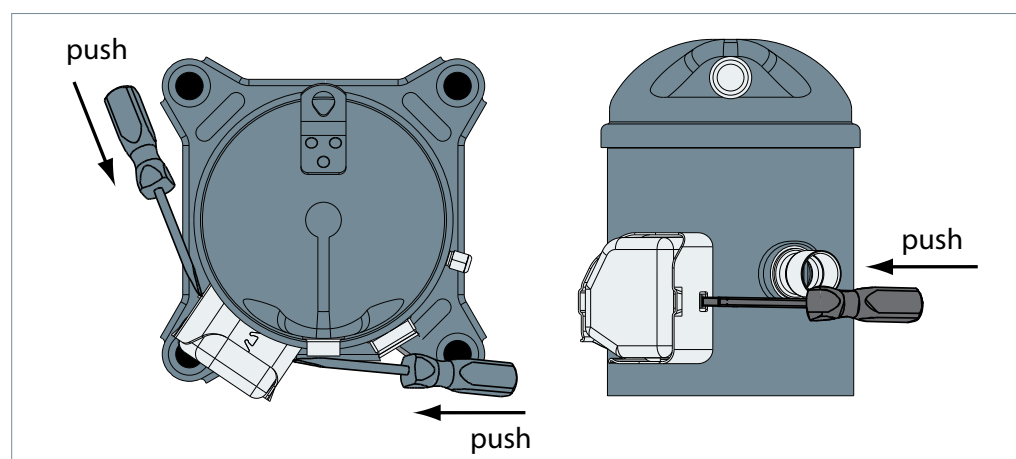


The drawings hereafter show electrical terminal labelling and should be used as a reference when wiring the compressor. For three phase applications, the terminals are labelled T1, T2, and T3. For single-phase applications the terminals are labelled C (common), S (start), and R (run).

Terminal cover mounting

The terminal cover and gasket should be installed prior to operation of the compressor. Respect the "up" marking on gasket and cover and ensure

that the two outside tabs of the cover engage the terminal box.

Terminal cover removal


Electrical data, connections and wiring

IP rating

The compressor terminal box IP rating according to CEI 529 is IP22 for all models. IP ratings is only valid when correctly sized cable glands of the IP rating is applied.

First numeral, level of protection against contact and foreign objects

2 - Protection against object size over 12.5 mm (fingers of similar)

Second numeral, level of protection against water

2 - Protection against dripping water when tilted up to 15°

The IP rating can be upgraded to IP54 with an accessory kit (see section "Accessories").

Three phase electrical characteristics

Compressor model		LRA	MCC	Max. operating current	Max. operating current with economizer	Winding resistance
		A	A	A	A	Ω
Motor voltage code 2 200-220 V / 3 / 50Hz 208-230 V / 3 / 60Hz	LLZ013	123.0	25.0	16.4	20.0	0.60
	LLZ015	180.0	29.0	18.9	23.0	0.50
	LLZ018	184.0	31.0	24.1	29.4	0.43
	LLZ024	190.0	40.0	28.4	34.7	0.37
	LLZ034	250.0	50.0	42.4	44.7	0.29
Motor voltage code 4 380-415/3ph/50Hz 460V/3ph/60Hz	LLZ013	62.0	12.0	8.0	9.8	2.30
	LLZ015	88.5	15.0	9.8	12.0	1.69
	LLZ018	90.0	15.0	11.8	14.4	1.61
	LLZ024	95.0	21.0	15.0	18.3	1.48
	LLZ034	150.0	26.0	19.1	22.7	0.84
Motor voltage code 9 380V/3ph/60Hz	LLZ013	81.0	14.0	9.4	11.8	1.49
	LLZ015	81.0	17.0	11.3	14.2	1.49
	LLZ018	106.0	20.0	13.7	16.5	1.13
	LLZ024	135.0	21.0	17.1	19.4	0.93
	LLZ034	155.0	29.6	22.9	25.5	0.63

Electrical data, connections and wiring

GENERAL INFORMATION

LRA (Locked Rotor Amp) Locked Rotor Amp value is the higher average current as measured on mechanically blocked compressor tested under nominal voltage. The LRA value can be used as rough estimation for the starting current. However in most cases, the real starting current will be lower. A soft starter can be applied to reduce starting current.

MCC (Maximum Continuous Current) The MCC is the current at which the motor protection trips under maximum load and low voltage conditions. This MCC value is the maximum at which the compressor can be operated in transient conditions and out of the application envelope. Above this value, the overload or external electronic module will cut-out the compressor to protect the motor.

Max. operating Current The max. operating current is the current when the compressors operate at maximum load conditions and 10% below nominal voltage (+15°C evaporating temperature and +68°C condensing temperature). Max Oper. A can be used to select cables and contactors. In normal operation, the compressor current consumption is always less than the Max Oper. A. value.

PRODUCT INFORMATION

Winding resistance Winding resistance is the resistance between phases at 25°C (resistance value +/- 7%). Winding resistance is generally low and it requires adapted tools for precise measurement. Use a digital ohm-meter, a "4 wires" method and measure under stabilised ambient temperature. Winding resistance varies strongly with winding temperature. If the compressor is stabilised at a different value than 25°C, the measured resistance must be corrected using the following formula:

$$R_{t_{amb}} = R_{25^{\circ}\text{C}} \frac{a + t_{amb}}{a + t_{25^{\circ}\text{C}}}$$

$t_{25^{\circ}\text{C}}$: reference temperature = 25°C
 t_{amb} : temperature during measurement (°C)
 $R_{25^{\circ}\text{C}}$: winding resistance at 25°C
 R_{amb} : winding resistance at t_{amb}
 Coefficient $a = 234.5$

SYSTEM DESIGN

Motor protection Danfoss scroll compressors LLZ are equipped with an internal line break protector mounted on the motor windings. The protector is an automatic reset device, containing a snap action bimetal switch.

Motor current under a variety of fault conditions, such as failure to start, running overload, and fan failure.

Internal protectors respond to over-current and overheating. They are designed to interrupt

If the internal overload protector trips out, it must cool down to about 60°C to reset. Depending on ambient temperature, this may take up to several hours.

INTEGRATION INTO SYSTEM

Phase sequence and reverse rotation protection The compressor will only operate properly in a single direction. Use a phase meter to establish the phase orders and connect line phases L1, L2 and L3 to terminals T1, T2 and T3, respectively. For three-phase compressors, the motor will run equally well in both directions. Reverse rotation results in excessive noise; no pressure differential between suction and discharge; and suction line warming rather than immediate cooling. A service technician should be present at initial start-up to verify that supply power is properly phased and that compressor and auxiliaries are rotating in the correct direction.

Phase monitors are required for LLZ compressors. The selected phase monitor should lock out the compressor from operation in reverse.

ORDERING INFORMATION