Compressor - Loss of oil, Loss of oil pressure, or Cuts off on oil pressure control.

- Compressor short cycling.
- Insufficient oil in the system.
- Oil trapping in the system. Probably in the evaporator.
- Excessively low suction pressure.
- Excessive liquid refrigerant returning to the compressor (flood back).
- Defective oil pump or the oil pump inlet screen is restricted.
- Crankcase heater not installed or defective (migration).
- System is low on refrigerant.
- No traps or insufficient traps in the suction riser.
- Suction riser too large.
- Lack of an oil separator on freezer systems.
- Liquid refrigerant feeding through the oil separator.
- Iced up evaporator coil.
- Evaporator fan motor(s) not working.
- Expansion valve or metering device too large.
- Ruptured suction line to the liquid line heat exchanger.
- Worn bearings, cylinder walls and piston rings in the compressor.
- Defective compressor overload which will cause the lube oil control to time out and shut the system down.
- Oil pressure control defective or improperly wired.
- Control voltage too high, causing premature trip out.

Compressor runs continuously - Existing on a system that previously worked properly.

- The load is too high. Has there been a recent addition to the design load? Product, people, heat producing equipment in the refrigerated or air condition space etc.
- Has the refrigerated space been increased in size?
- Ask questions about past changes. Rerun the load calculations.
- Low refrigerant charge.
- Low suction pressure due to a liquid line restriction.
- Expansion valve out of adjustment.
- The evaporator is iced or dirty.
- Evaporator fan motor(s) not working.
- Dirty condenser.
- Dirty filters.
- Poor insulation, doors left open, or defrost heaters running continuously.
- Faulty low pressure control, temperature control, hot gas bypass valve or capacity control valve.
- Ruptured suction line to the liquid line heat exchanger.
- Evaporator pressure regulator(EPR) valve faulty.
- Incorrect refrigerant in the system.

- Compressor malfunctioning, possibly leaking valve. Check amp draw verses suction pressure verses condensing temperature using performance chart.
- Check defrost system if applicable.

Compressor runs continuously - New installation.

- System undersized. Excessive load on the evaporator above the design conditions. Rerun the load calculation.
- System undersized. Suction pressure high - High superheat at evaporator outlet.
- Other component malfunction.

Compressor starts but cycles off on overload protector.

- Excessive suction pressure beyond the limits of the compressors ability to start and run. Check the performance charts of the compressor for the maximum suction pressure. The use of a Crankcase Pressure Regulator (CPR) or pressure limited TXV (MOP) may be required.
- Excessive discharge pressure.
- Low supply voltage.
- Improperly wired (very common mistake).
- Defective run or start capacitor.
- Defective start relay.
- Defective overload protector.
- Shorted or grounded motor windings.
- Tight bearings or mechanical damage in the compressor.

Compressor starts but short cycles.

- Pressure or temperature control differential too small.
- Shortage of refrigerant.
- Discharge pressure too high.
- Dirty condenser causing high pressure cut out.
- Condenser discharge air re-circulating.
- Excessive refrigerant on non receiver system.
- Compressor valve leaking.
- High suction pressure.
- High / low voltage, high amperage on 3 phase supply, voltage out of balance.
- Incorrect refrigerant.
- Low refrigerant flow, high superheat.
- Low air flow thru the evaporator.
- Low outside air temperature on an air cooled system. Check the low ambient control.
- Evaporator discharge air re-circulating.
- Liquid line solenoid valve leaking during the off cycle.

- Undercharged system.
- Partial load, low humidity, etc, without capacity control.
- Un-insulated receiver exposed to low ambient.

Compressor will not start, but hums.

- Improperly wired (very common mistake).
- Low supply voltage.
- Defective run or start capacitor.
- Defective start relay.
- Un-equalized pressures on a PSC motor.
- Shorted or grounded motor windings.
- Tight bearings or mechanical damage in the compressor.

Compressor will not start, no hum.

- Improperly wired (very common mistake).
- Blown fuse or tripped circuit breaker.
- Motor protector open.
- Defective temperature or pressure control.
- Manual reset low or high pressure control lockout.
- Lube oil control lockout.
- Burned motor windings - open circuit.
- Loose wire.

Compressor pull high amps.

- Excessive suction pressure beyond the limits of the compressors ability to run. Check the performance charts of the compressor for the maximum suction pressure. The use of a Crankcase Pressure Regulator (CPR) or pressure limited TXV (MOP) may be required.
- Excessive system load.
- Improperly wired (very common mistake).
- Defective run or start capacitor.
- High or low voltage.
- Excessive discharge pressure.
- Incorrect refrigerant.
- Tight bearings or mechanical damage in the compressor.
- Burned contacts.
- Supply wire too small of gauge.
- Voltage out of balance on 3 phase systems.
- Sticking start relay.

Discharge pressure high.

- Air in the system. If so, then check the low side for a leak.
- Dirty condenser.
- Re-circulating of condenser air. This is a common occurrence when an oversized outdoor weather hood has been installed.
- Air flow is restricted thru the condenser.
- The ambient temperature surrounding the condenser is too warm. This is common on walk in coolers and freezers when the condensing unit is mounted on the box and closed off by a drop ceiling.
- Refrigerant overcharge.
- Liquid refrigerant backed up in the receiver.
- Restriction in the discharge line due to physical damage or an internal restriction.
- Incorrect air flow thru the condenser. Has someone previously installed a new fan motor or blade? Check the rotation, horsepower and blade size, compared to the specifications of the unit.
- Fan motor malfunctioning.
- Fan cycle control out of calibration.
- Flooded head pressure control: Receiver too small for summer application.
- Flooded head pressure control: Pressure drop thru the condenser exceeds 20 psi, forcing the bypass port to partially open.
- Flooded head pressure control: Bypass port wedged open due to a foreign material lodged in it, or the port is worn.
- Flooded head pressure control: Incorrect control, check the pressure dome settings.
- Flooded head pressure control: Field adjustable controls are set incorrectly.
- Water cooled: Restricted water flow, water too warm, condenser tubes restricted or defective water regulating valve.

Discharge pressure low.

- Ambient air too cold. Check operation of the low ambient controls or install if there not existing.
- Refrigerant shortage or lacking a winter charge.
- Damaged valves or rods in the compressor.
- Uninsulated receiver in a cold ambient acting as a condenser.
- Fan cycle control out of calibration.
- Flooded head pressure control: Power head has lost its charge.
- Flooded head pressure control: Field adjustable controls are set incorrectly.
- Flooded head pressure control: Hot gas bypass line is restricted or shut off.
- Flooded head pressure control: Bypass condenser port wedged open due to a foreign material lodged in it.
- Flooded head pressure control: Incorrect control, check the pressure dome settings.
- Water cooled: Water too cold or defective water regulating valve.

Discharge pressure fluctuating.

- Insufficient refrigerant charge, usually accompanied with corresponding fluctuating in the suction pressure.
- Fan cycle control out of calibration.
- Fan cycle control: This is normal if this type of control is based on pressure. If the fluctuating pressure is not acceptable, change to a control based on ambient air temperature, variable speed motor or a flooded head pressure control system.
- Condenser fan motor running erratically.
- Existing low ambient controls out of adjustment or defective.
- Water cooled: Water is inadequate and the temperature is inconsistent.
- Water cooled: Defective water regulating valve.
- Water cooled: The cooling tower is cycling due to defective or dirty components.

Liquid line flash gas.

- Usually corresponds with high superheat at the evaporator outlet.
- Insufficient refrigerant charge.
- Excessive pressure drop in the liquid line due to an undersized liquid line or excessive vertical lift.
- Fan cycle control: This is normal if this type of control is based on pressure. If the flash gas is not acceptable, change to a control based on ambient air temperature, variable speed motor or a flooded head pressure control system.
- Lack of positive head pressure control.
- Loss of subcooling due to liquid line running thru a hot area, an attic or drop ceiling for example.

Run capacitor burned out.

- Excessively high supply voltage.
- High supply voltage, light compressor load.
- Incorrect capacitor, capacitor voltage rating too low.

Start capacitor burned out.

- Compressor short cycling.
- Relay contacts sticking. Does the start capacitor have a bleed resistor?
- Incorrect capacitor.
- Start winding staying in the circuit too long.

Start relay contacts stick.

- Compressor has a short running cycle.
- No bleed resistor on the start capacitor.

Start relay burned out.

- Compressor short cycling.
- Low or high supply voltage.
- Improper mounting of the relay. Check the arrow on the side of the relay, it should be pointing up.
- Incorrect start or run capacitor.
- Incorrect starting relay. Check the specifications with the compressor manufacturer.

Suction pressure high - High superheat at evaporator outlet.

- Unbalanced system, load in excess of the design conditions.
- Compressor discharge valve leaking.
- Leaking hot gas defrost solenoid or hot gas bypass valve.
- Hot gas bypass regulator piped direct to the suction line without a liquid injection valve.
- Incorrect expansion valve installed.

Suction pressure high - Low superheat at evaporator outlet.

- Oversized expansion valve.
- External equalizer on the expansion valve plugged or capped.
- Expansion valve defective or held open by a foreign material causing liquid flood back.
- Moisture in the system causing the expansion valve to freeze in the open position.
- Expansion valve superheat set too low.
- Ruptured suction line to the liquid line heat exchanger.
- The unit is coming out of defrost (normal).
- The overfeeding of expansion valve on a multi evaporator system where all the EPR valves are wide open.

Suction pressure low - High superheat at evaporator outlet.

- Starving evaporator.

Suction pressure low - Low superheat at evaporator outlet.

- Light load conditions.
- Compressor oversized and the evaporator is undersized.
- Evaporator coil is icing.

- Poor distribution of refrigerant thru the evaporator nozzle and circuits. Usually the bottom rows of the evaporator will freeze up when this occurs. There should be no more than 5 degrees F difference in the superheat between any two circuits as they enter the header.
- Uneven or inadequate evaporator loading due to poor air distribution.
- Excessive accumulation of oil in the evaporator. Check the defrost controls for proper operation and add more defrost cycles. A minimum of four should be used.
- Chiller systems; frozen or slushed or low water flow.

Suction pressure - Fluctuating

- Incorrect superheat setting.
- Expansion valve bulb not mounted properly.
- Restricted external equalizer line.
- Fan cycle control: This is normal if this type of control is based on pressure. If the fluctuating pressure is not acceptable, change to a control based on ambient air temperature, variable speed motor or a flooded head pressure control system.
- Oversized expansion valve.
- Flood back due to poor distribution of refrigerant thru the evaporator nozzle and circuits. Usually the bottom rows of the evaporator will freeze up when this occurs. There should be no more than 5 degrees F difference in the superheat between any two circuits as they enter the header.
- Defective of faulty EPR valve.
- External equalizer lines tapped at a common point although there is more than one expansion valve on the same system.
- Water cooled: Restricted water flow, water too warm, condenser tubes restricted or defective water regulating valve.
- Normal compressor cycling on a rack system.

Superheat at evaporator too high.

- Flash gas in the liquid line.
- Insufficient refrigerant charge.
- Excessive pressure drop in the liquid line due to an undersized liquid line or excessive vertical lift.
- Liquid line restrictions.
- Improper piping design.
- Inadequate subcooling.
- Low head pressure.
- Expansion valve distributor or cap tube restricted.
- Excessive load on the evaporator above the design conditions.
- System contamination, probably moisture or rarely, wax.
- Undersize expansion valve.

- Internally equalized expansion valve used on a system with too much pressure drop thru the evaporator or used with a refrigerant distributor.
- Expansion valve power element has failed or lost its charge.
- Incorrect expansion valve power head charge.
- Oversized evaporator or undersized compressor.
- Superheat setting on expansion valve too high.

Superheat at evaporator too low.

- Overcharge of refrigerant or oil.
- Compressor is oversized.
- Uneven or inadequate evaporator loading, probably caused by poor air distribution.
- Excessive accumulation of oil in the evaporator. Check the defrost controls for proper operation and add more defrost cycles. A minimum of four should be used.
- Expansion valve bulb and / or equalizer tube located improperly on the system.
- External equalizer line plugged or capped.
- Expansion valve defective or held open by a foreign material causing liquid flood back.
- Moisture in the system causing the expansion valve to freeze in the open position.
- Evaporator fan blades are on backwards.
- Oversized condenser.
- Excessive subcooling.
- Poor distribution of refrigerant thru the evaporator nozzle and circuits. Usually the bottom rows of the evaporator will freeze up when this occurs. There should be no more than 5 degrees F difference in the superheat between any two circuits as they enter the header.
- Expansion valve defective or has the incorrect power element charge.
- Interrupted pump down which will leave refrigerant in the low side. This creates the possibility of flooding on start up.
- Oversized expansion valve.
- Liquid migration on the off cycle. Install pump down controls and a crankcase heater.
- The expansion valve, solenoid valve or the compressor discharge valve leaks. This will leave refrigerant in the low side which creates the possibility of flooding on start up.
- Excessive evaporator coil icing.
- Superheat setting on expansion valve too low.