

CR-110 VSC (VFD & SCREW) Profiles and Settings
APP- 040

Application:

This application note will explain the different profiles and PID modes for the VSC CR-110 software.

Profile:

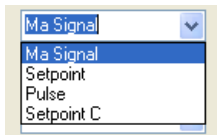


None - this profile is not used.

Basic Screw - this profile is for a normal Screw compressor without a VFD. The 0-20ma or 0-10vdc output is not used.

VFD Screw - this profile is for using a VFD on a Screw compressor. The 0-20ma or 0-10vdc output is used to stage the VFD.

VFD Compressor - this profile is for using a VFD on a reciprocating type compressor. The 0-20ma or 0-10vdc output is used to stage the VFD.



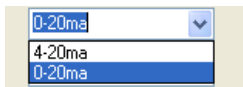
Input Mode:

Ma Signal - this mode uses a 0-20 or 4-20ma signal from an external source. This will determine the refrigeration demand.

Setpoint - this mode uses a Setpoint and a temperature sensor on input 5 to control temperature. The PID loop will generate the refrigeration demand signal based on the difference between the Setpoint and the room sensor. This requires the PID mode to be set to Setpoint.

Pulse - this uses a open and close pulse from a IVI panel to produce the refrigeration demand signal.

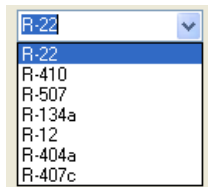
Setpoint C - this is the same as the Setpoint mode except that the room temperature and Setpoint are in centigrade.



Signal:

This is the type of input signal to the CR card. 4-20ma will span 0% at 4ma and 100% at 20ma.

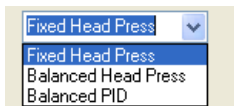
0-20ma will span 0% at 0ma and 100% at 20ma.



Gas Type:

Currently the following gas types are available.

- R-22
- R-410a
- R-507
- R-134a
- R-12
- R-404a
- R-407c

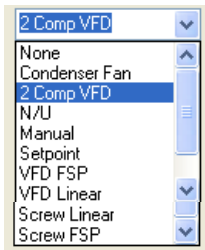


Condenser Mode:

Fixed Head Pressure - uses the Control Point setting and Cond Fan Diff to cycle the condenser fans off and on.

Balanced Head Pressure - control will float the head pressure depending on the ambient air conditions. The lowest pressure that the system will float to is the System Drop plus the suction pressure.

Balanced PID pressure - control will produce a 4-20ma signal for a VFD drive on the condenser fans. The Set-point would be the System Drop plus the Suction pressure. With this selected the PID mode should be set to none.



PID Mode:

None - no PID loop is used.

Condenser Fan - The PID loop is used to control the speed of the condenser fan using a VFD. If the condenser mode is set to Fixed Head Pressure it will control to the condenser fan SP. If the condenser mode is set to balanced head press or balanced PID it will control to the condenser fan SP plus the system drop.

2 Comp VFD - This mode is used when there is two compressors both with VFD's. It will stage the two compressors up and down to match the load exactly according to the input signal.

Manual - will output a 4-20ma signal equal to the man out setting.

Setpoint - will use the PID loop to control the temperature to the SP using input 5 as the room sensor.

VFD FSP - VFD Floating Setpoint. The VFD output will be based off of the FSP calculation. The FSP is determined from refrigeration demand, Suction Setpoint and the range. See app note 19 for more detail.

VFD Linear - produces a linear output based on refrigeration demand. The Span L and Span U and min output is used in the calculation.

$$\text{Percent Output to the VFD} = ((Rd - SL) / (SH - SL)) * (100 - \text{Min}) + \text{Min}$$

The operation of the VFD will be from Min to 100 percent. Using the Span L and Span U the VFD can be setup to operate any where in the 0-100% refrigeration demand.

Screw Linear - The output of the PID to the VFD is equal to the refrigeration demand.

Screw FSP - Screw Floating Setpoint. The load and unload pulses to the screw will be based off of the FSP calculation. See app note 19 for more detail.