2009 XT Purge Control
APP– 032

Theory

This application note will describe each of the seven purge cycles of the XT-70 panel.

0 = No Purge cycles
1 = Time Purge, no ARL or CO2
2 = ARL (Ambient Reverse Loading), no CO2 or Time Purge
3 = ARL & CO2, no Time Purge
4 = ERV (Energy Recovery Ventilation) no CO2
5 = ERV with CO2
6 = Time Purge / Cooling Purge with CO2 sensor

Application:

Purge_cnfg = 0

No Purge: Fresh air doors only open in the Cooling Mode to control temperature.

To use this configuration, set the following E2 parameters:

Purge_Cnfg = 0

Purge_cnfg = 1

Timed Purge: The Time Purge cycle is used when a CO2 sensor is not available for purge initiation.

Four parameters must be set to initiate the time purge. In the above example if the outside air is less than 40 degrees initiate a purge cycle for 15 minutes every 6 hours and set the fans

at 85%. Once the purge is over the fans will go to the previous setting.

If the XT panel is in Refrigeration or a Timed run the XT would pulse the fresh air doors open to the Max Door setting for the length of the purge.

If the XT panel is in Cooling and the Heat Switch is in Auto, the XT panel will turn the Return air heaters on for the duration of the purge.

To use this configuration, set the following E2 parameters:

Purge_Cnfg = 1

Purge_cnfg = 2

ARL: (Ambient Reverse Loading) This purge cycle uses the fresh air doors to false load the refrigeration when you have minimum loading and the refrigeration wants to cycle on and off. When the Refrigeration output drops below the minimum Refrig_Level setting, the XT panel will slowly pulse the Fresh Air doors in a Heat PID mode to bring in warm fresh air to keep the Refrigeration system running. The Refrigeration system will run at the minimum setting and the doors will modulate in a heat mode to control temperature. The doors can only open to the Max Door Setting. The ARL mode will not only keep the refrigeration running, but will purge the storage by bringing in fresh air after long runs of refrigeration. The ARL function is primarily used in the spring when the refrigeration load is light.

The Outside air temperature must be above the start temperature for the ARL to become active. Under some conditions it may be necessary to raise the start temperature to ensure the outside air is warm enough. This can be done using the OSA Diff setting. To protect against the OSA not being warm enough, the parameter LC (low cutout) is used. This is in 1/10ths of a degree and would have a default of 5.

To use this configuration, set the following E2 parameters:

Purge_Cnfg = 2

Ref_Level (ROL) *default setting = 30%*

ROL_Diff *default setting = 5%*

Low_Cutout *default setting = 5 tenths of a degree*

Max_Door *default setting = 20%*

ROL_Start_Dly default setting = 10 minutes

Set the following Main Flash parameters:

OSA DIFF this parameter is used to adjust the Start Temp. A suggested value for running ARL would be +5 degrees.

Purge_cnfg = 3

ARL / CO2: (Ambient Reverse Loading with a CO2 Sensor)

This configuration uses the same logic as the ARL purge_cnfg = 2. In addition to the ARL, this configuration uses a CO2 sensor to trigger a purge and monitor the CO2 levels during the ARL cycle. The ARL is active only during the Refrigeration cycle, but the CO2 purge can take place either in Cooling or Refrigeration. For the CO2 purge to become active, the CO2 must be greater than the CO2 SP. If the system is in Cooling and the Heat Switch is in Auto, then the Return air heater will turn on and force the fresh air doors open to purge the system. The heaters must be sized as to not raise the return air more than 3 degrees. The doors should open somewhere between 20 to 30%.
If the system is running in Refrigeration, the CO2 purge will become active when the CO2 level is greater than the CO2 SP. When this happens the doors will slowly open and the Refrigeration will continue to maintain temperature. Once the CO2 level has dropped below the Setpoint minus the CO2_Diff, the doors will slowly close.

To use this configuration, set the following E2 parameters:

Purge_Cnfg = 3

Ref_Level (ROL) default setting = 30 %

ROL_Diff default setting = 5 %

Low_Cutout default setting = 5 tenths of a degree

Max_Door default setting = 20 %

ROL_Start_Dly default setting = 10 minutes

CO2_Diff default setting = 200 ppm

CO2_RAS default setting = 5 tenths of a degree

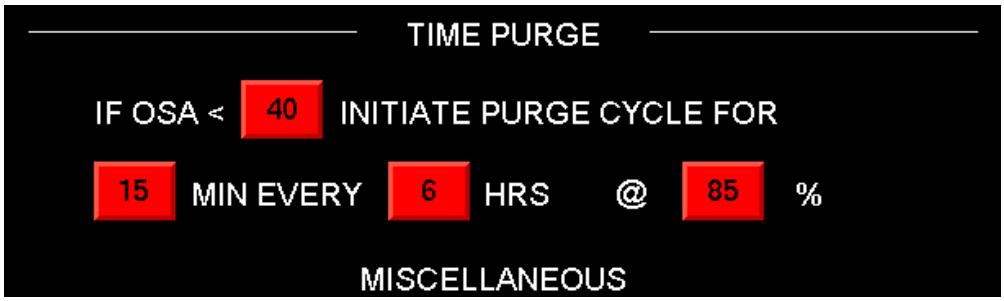
Set the following Main Flash parameters:

OSA DIFF *this parameter is used to adjust the Start Temp. A suggested value for running ARL would be +5 degrees.*

CO2 SP *this is the CO2 Setpoint. A suggested value would be 2000 ppm.*

Purge_cnfg = 4

ERV: (Energy Recovery Ventilator) The ERV purge uses a ventilator that will bring in fresh air. This configuration operates without a CO2 sensor, so it must trigger strictly on Time. The Aux 1 switch must be set to control the ventilator and must be in Auto. Four parameters must be set to initiate the ERV purge.



Example: ***(Buttons are main flash parameter that need to be set)***

If the outside air is less than 40 degrees, initiate a purge cycle for 15 minutes every 6 hours with fans at 85%. The fans will return to previous setting after purge.

If the XT panel is in Refrigeration or a Timed Run, the XT will turn the ventilator on. This purge does not activate if the panel is in Cooling.

To use this configuration, set the following E2 parameters:

Purge_Cnfg = 4

Aux 1_Config = 1

Purge_cnfg = 5

ERV / CO2: (Energy Recovery Ventilator with CO2 Sensor) The ERV purge uses a ventilator

that will bring in fresh air. This configuration operates with a CO2 sensor. This purge will work in either a Time or Refrigeration mode. The Aux 1 switch must be configured to control the ventilator and be set to Auto. If the CO2 level is greater than the CO2 SP, then the ventilator will be turned on. The ventilator will turn off when the CO2 level is below the CO2 SP - CO2 Diff.

To use this configuration, set the following E2 parameters:

Purge_Cnfg = 5

Aux 1_Config = 1

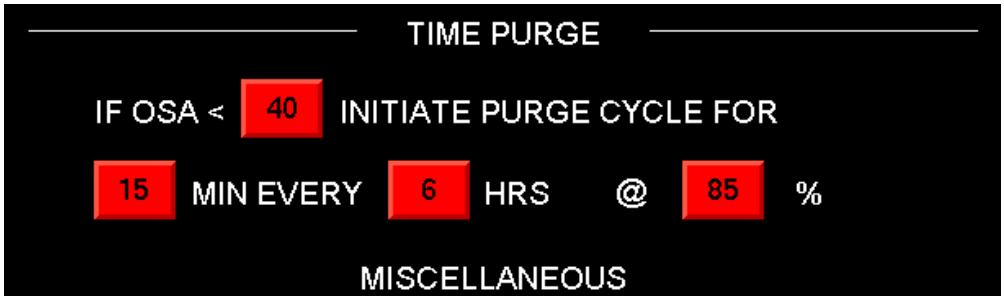
CO2_Diff *default setting = 200 ppm*

Set the following Main Flash parameters:

CO2 SP *this is the CO2 Setpoint. A suggested value would be 2000 ppm.*

Purge_cnfg = 6

Timed / CO2 Purge: This parameter is used when you do not have refrigeration but desire to recirculate the air when there is no cooling air available. A CO2 sensor is required and will be used to trigger the purge cycle. If you are in Cooling mode and the CO2 level is greater than the CO2 SP, the purge cycle will be activated. The Heat switch must be in Auto and the Return air heaters will then be turned on. The heaters must be sized as to not raise the return air more than 3 degrees. The doors should open somewhere between 20 to 30 %.
If the system is running in Timed Run mode, then the purge will be triggered by both time and CO2.



Example: ***(Buttons are main flash parameter that need to be set)***

If outside air is less than 40 degrees, initiate a purge cycle for 15 minutes every 6 hours and run the fans at 85%. If the XT panel is in cooling, the return air heaters will be turned on for

the duration of the purge cycle. In a Timed Run the fresh air doors would be open to the Max Door setting.

To use this configuration, set the following E2 parameters:

Purge_Cnfg = 6

Max_Door default setting = 20 %

Set the following Main flash parameters:

CO2 SP this is the CO2 Setpoint. A suggested value would be 2000 ppm.