Rate Control: vApply HD

20/20 SeedSense

Start Here

System Requirements
RED requirements must be met before the system will command a rate to the vApply HD Modules.
BLUE requirements MUST BE MET before the system will STOP commanding at least the minimum rate set by the Pump Calibration to the vApply Module (System Pump)

System Rate Parameters
This includes Min/Max Duty Cycle and Pump Cal information

User Inputs
These inputs affect the resulting GPA and System Rate

Commanded Rate (GPA)
This is from either a manual set-point or Prescription Value

Speed Inputs
- GPS
- Radar

Must be >0

Master Plant Switch:
ON/OFF

Section Plant Switches:
OFF

Planter Lowered:
Lift Switch = LOWERED

Product Enabled

Rate >0 GPA

Planter Settings
- Effective Row Spacing
- Target Rate
- Pump Min/Max Pressure

Calibrations & Configurations
- Radar Calibration
- GPS Configuration
- PDM Orientation
- Gyro Zeroing
- Pump Calibration

Speed Inputs (Constantly Variable)
- GPS
- Radar
- Accelerometer
- Gyro

Physical Components that can cause poor vApply HD performance
- Supply Voltage
- Physical Obstruction to Flow Meter
- CAN errors
- Excessive Drop in Pressure from vApply Module to vApply HD Module
- Undersized pump (needs to be sized 110% of maximum desired rate)
- Undersized hose
- Obstruction in hose
- Plugged Filter
- Relief Valve pressure set incorrectly

PDM

Relays System Rate Parameters

SRM

Individual Row

Calculates Row Speed
Converts GPA to GPM

vApply HD Module

Receives Commanded GPM

vApply Module

Calculates/Executes: System Rate

Actual Pressure is reported by the Pressure Sensor to the vApply Module at 100hz

Receives Range of current & next HD Module flow rates, and calculates pump control to accommodate target rates

vApply Module Commands Pump to achieve target at 10hz

NOTE: If the pump is uncontrolled, the vApply Module is still necessary to calculate system values at pump

vApply HD

Executes: Actual GPM

Actual Flow Rate is reported by the Flow Meters

vApply HD Module incrementally opens or close ball valve position to change actual GPM to achieve target GPM

vApply HD Module monitors pressure and ball valve position

Recommended Hose size

	0 - 15 GPA	15 + GPA
Hose Size Recommendations	Low Flow	High Flow
Pump Outlet	1"	1-1/2"
Section Supply	3/4"	1"
Boom	1/2"	3/4"
Pressure Relief	1"	1"