

HYPRO® Duo React

Compact and Economical Twin Pneumatic Valve Nozzle Body and Control System

Features & Benefits

- Increase productivity by allowing operator to increase speed range while maintaining droplet spectrum by automatically switching nozzles based on pressure and droplet size
 - Utilize pre-selected nozzle pairs for contact or systemic chemistries
 - Program to automatically switch at pressures specified on the chemical label to increase speed range
- Increase efficiency by not having to leave the cab to switch nozzles when changing application rate or nozzle types (herbicide vs fertilizer, drift reducing vs standard, etc)
- Easy to install system that requires only a speed input
- Works side-by-side with rate controller without having to communicate with the controller
- Electro-pneumatic nozzle body replaces section control valve and provides fast on/off control (0.3 second) of sprays with manual or automatic nozzle selection control



Electro-Pneumatic
(Leader)

Pneumatic
(Follower)



Duo React
Console



Quickly and easily switch to a drift reducing nozzle alongside field boundaries or between liquid fertilizer and other nozzles from the cab.



Simple console allows for automatic or manual switching between Nozzle A, Nozzle B or Nozzles A + B



Apply variable rate liquid fertilizer by selecting the nozzle size combination that offers your desired application.

HYPRO® DUO REACT

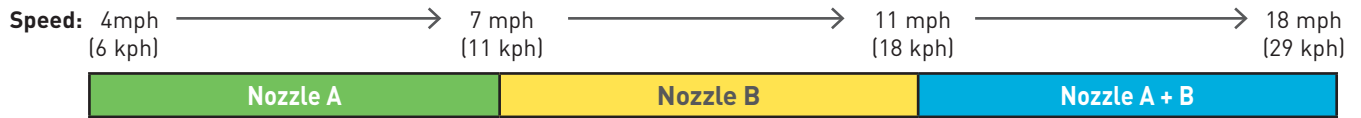
Application Options

The Duo React's unique dual port design allows for a variety of application options:



Nozzle B Nozzle A

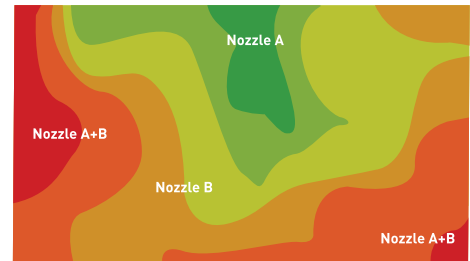
- Flexibility of Speeds:** With proper nozzle selection, you can drive at the speed you want and maintain application rate and spray quality desired by switching between two different nozzle sizes.



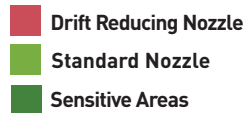
Field Examples: Turning corners or traveling up hill

Flat, open field (top speeds)

- Variable Rate Applications:** Apply variable rate liquid fertilizer by selecting the nozzle size combination that offers your desired application range.

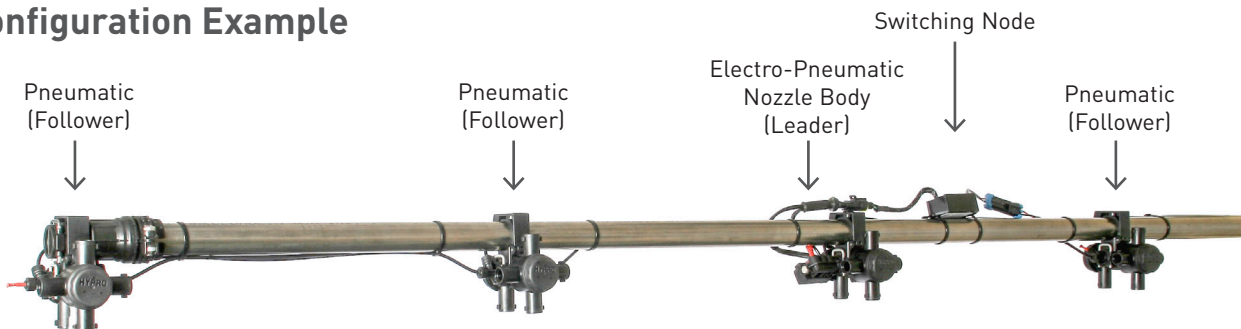


- Boundary Spraying:** Utilize a drift reduction nozzle around the boundary of your field or other obstacles including grass waterways, hedges, drainage tile inlets and ditches. Then switch to a standard nozzle for the rest of the field.



- Convenience:** Save time in changing over nozzles by making an alternative nozzle readily available and easily selected for a variety of application options. For example, you could place a liquid fertilizer nozzle on the single position and a plant health or herbicide nozzle on the turret position.

Boom Configuration Example



- Electro-pneumatic (leader) nozzle body can be used in place of a section control valve
- Sections can be set without changing pipe layout

HYPRO® DUO REACT NOZZLE BODIES

Twin Pneumatic Valve Nozzle Bodies

Features & Benefits

- A single and 4-way turret nozzle body incorporated into one compact unit
 - Eliminates the need for twin lines or “back to back” configurations
 - Simple operation, twin valves allow either or both nozzles to spray
- Pneumatic actuated valves are integrated into the nozzle body for a compact design and provides air-to-open fail safe actuation
- Integrated push-to-connect air porting is easy, secure and rugged while allowing for simple daisy chain connections

Clamp Size	Electro-Pneumatic Part Number	Pneumatic Part Number
1/2"	4214-2502V	4214-1502V
3/4"	4214-2503V	4214-1503V
1"	4214-2504V	4214-1504V
20mm	4214-2507V	4214-1507V
25mm	4214-2508V	4214-1508V

General Specification

- Operating Temperature range 32°F – 122°F (0-50°C)
- Industry standard male bayonet connection
- Inlet to fluid pipe 3/8"
- Max pressure drop 5psi for 1.7 gpm (0.35 bar for 6.4 l/min flow)
- Waterproof to BSEN60529 (IP65)
- Tolerant to UV, dust, vibration and impact likely to be encountered in an agricultural spraying environment
- Viton elastomers for chemical resistance

Spares and Tools	Part Number
O-ring and piston sub-assembly kit	3430-0840V
Cap removal service wrench	3021-0006

Duo React Electro-Pneumatic (Leader)



- Flow to each nozzle individually controlled by 12 VDC signal
- Surge protected, range tolerated 9-16 VDC
- Max current draw 0.25 amps for each solenoid
- Pneumatic actuation of valves at 40-100 psi (3-7 bar)
- Can be used as a section control valve, actuating multiple pneumatic followers
- Response time when controlling 7 pneumatic followers 0.1 seconds (open) 0.3 seconds (close) using 4mm diameter 600mm hose and 40-60psi (3-4 bar)
- Wet gross weight including caps and nozzles 13oz (364g)
- Tyco AMP Superseal connector
- Push fit air connectors: 6mm inlet, 4mm outlet

Duo React Pneumatic (Follower)



- Air actuated 40-115psi (3-8 bar), normally closed
- Nozzle valve selection response time 0.1 seconds
- Wet gross weight including caps and nozzles 8oz (225g)
- 4mm push fit air inlet and outlet connectors

Dimensions

	Leader		Follower	
	In	mm	In	mm
Height	3.27	83	3.27	83
Width	5.47	139	3.66	93
Depth	4.37	111	4.37	111

HYPRO® DUO REACT CONSOLE

Simple Control from the Cab

- Program console to manage droplet size by switching between nozzle sizes
- Choose from automatic or manual nozzle switching
- Stores up to four configurations for repeated use
- Monitor nozzle output status from the cab
- Allows user to set deadband to control hysteresis
- US or Metric unit setting



Console

Part Number	Description
2850-0028	Duo React Console (includes power cable and mounting hardware)



Switching Nodes

Part Number	Description
2510-0064	Duo React switching note Node AmpSeal-16, 4 position
2510-0065	Duo React switching note Node Weather Pack Shroud 3 pin



AmpSeal-16



Weather Pack

Cables

Part Number	Description
2520-0223	Y-Cable
2520-0224	15' 4-pin Amp Superseal Extension Cable (node to leader)
2520-0225	5' 2-pin M/P150 Extension Cable (node to node)
2520-0226	10' 2-pin M/P150 Extension Cable (node to node)
2520-0227	15' 2-pin M/P150 Extension Cable (node to node)
2520-0228	20' 2-pin M/P150 Extension Cable (node to node)
2520-0229	25' 2-pin M/P150 Extension Cable (node to node)
2520-0231	5' 3-pin W/P150 Extension Cable (node to node)
2520-0232	10' 3-pin W/P150 Extension Cable (node to node)
2520-0233	15' 3-pin W/P150 Extension Cable (node to node)
2520-0234	20' 3-pin W/P150 Extension Cable (node to node)
2520-0235	25' 3-pin W/P150 Extension Cable (node to node)

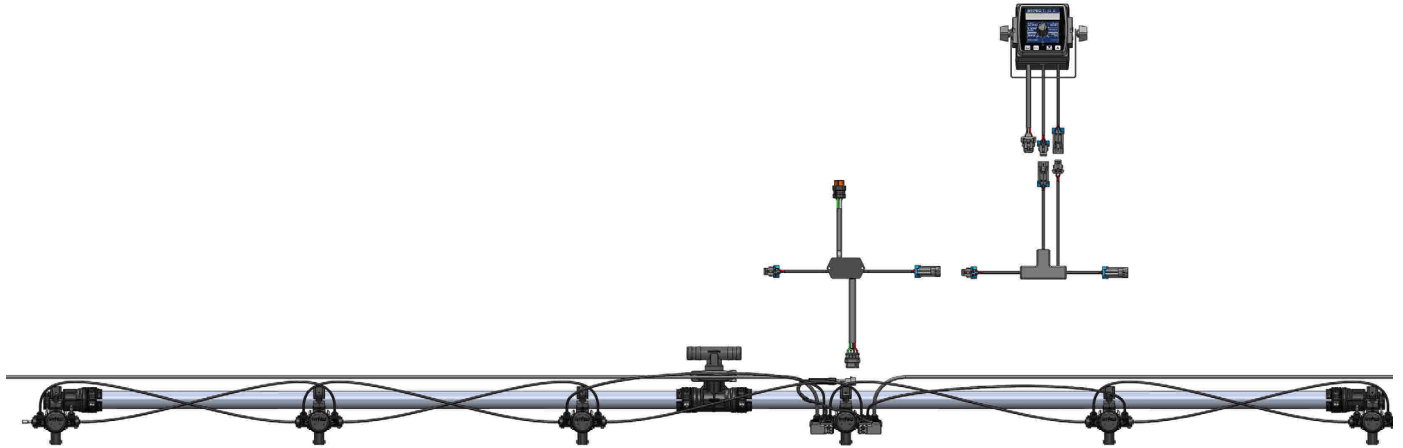


Kits

Part Number	Description
3430-0940	Air Supply Parts Kit (4&6mm tubing, termination plugs, fittings)

HYPRO® DUO REACT CONSOLE

Setting Up the System



Electrical Connections

- A typical Duo React system uses a switching node at each section valve location to actuate the leader nozzle body.
- The on/off control signal from the existing section control valve drives the leader nozzle body.
- Nozzle port control from Duo React Console located in the cab links to each node by a 2 wire extension cable.

Air Line Connections

- All fittings and tubing needed comes in the Air Supply Parts Kit to complete the air supply connections.
- A 6mm diameter tubing is run from the air supply on the sprayer back to the boom, through a tee fitting and then is daisy chained through push-to-connect (PTC) porting at each Duo React leader nozzle body.
- A 4mm diameter tubing is supplied to complete daisy chain connection from leader to follower nozzle bodies using push-to-connect porting (shown above).
- Air system requirement is very low, at just 0.16 liter (0.006 SCF) per 8 nozzle body configuration.





Solution Line Connections

- On an existing sprayer the solution lines can stay connected with section control valves inline (open state) with on/off control provided at the Duo React leader integrated pneumatic air stop.
- Alternatively, with Duo React leader nozzle body controlling flow, section control valves can be eliminated with a single feed line running down the entire length of the boom to feed the individual boom pipe sections.
- With Duo React the number of nozzle bodies per section can be rebalanced by simply connecting airline independent of what pipe they are mounted on.

Nozzle Selection and Control Point Setup

Find your closest application rate in the column headers. Scan down the column until you find the min and max speed range that suits your needs. Select the nozzles to the left and enter the setpoints as pre-selected in the chart below. Contact and Systemic charts will follow in this brochure.

SAMPLE





		Application Rate (gpa)				
Nozzle B	Nozzle A	Setpoints (mph)	5	7.5	10	12.5
 FC-ULD120-025	 FC-ULD120-015	Min Speed	6.3	4.2	3.2	2.5
		Max Speed	29.1	19.4	14.5	11.6
		Setpoint 1 (A to B)	10.9	7.3	5.5	4.4
		Setpoint 2 (B to A+B)	18.2	12.1	9.1	7.3
 FC-ULD120-03	 FC-ULD120-02	Min Speed	8.4	5.6	4.2	3.4
		Max Speed	36.4	24.2	18.2	14.5
		Setpoint 1 (A to B)	14.5	9.7	7.3	5.8
		Setpoint 2 (B to A+B)	21.8	14.5	10.9	8.7

HYPRO® DUO REACT NOZZLE SELECTION

Systemic Nozzle Pairs - 20" Spacing

Droplets: C or Greater





Pressure Range: 20 to 60 psi

Nozzle B	Nozzle A	Setpoints (mph)	Application Rate (gpa)												
			5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35
 FC-ULD120-025 FC-ULD120-015	Min Speed	6.3	4.2	3.2	2.5	2.1	1.8	1.6	1.4	1.3	1.1	1.1	1.0	0.9	
	Max Speed	29.1	19.4	14.5	11.6	9.7	8.3	7.3	6.5	5.8	5.3	4.8	4.5	4.2	
	Setpoint 1 (A to B)	10.9	7.3	5.5	4.4	3.6	3.1	2.7	2.4	2.2	2.0	1.8	1.7	1.6	
	Setpoint 2 (B to A+B)	18.2	12.1	9.1	7.3	6.1	5.2	4.5	4.0	3.6	3.3	3.0	2.8	2.6	
 FC-ULD120-03 FC-ULD120-02	Min Speed	8.4	5.6	4.2	3.4	2.8	2.4	2.1	1.9	1.7	1.5	1.4	1.3	1.2	
	Max Speed	36.4	24.2	18.2	14.5	12.1	10.4	9.1	8.1	7.3	6.6	6.1	5.6	5.2	
	Setpoint 1 (A to B)	14.5	9.7	7.3	5.8	4.8	4.2	3.6	3.2	2.9	2.6	2.4	2.2	2.1	
	Setpoint 2 (B to A+B)	21.8	14.5	10.9	8.7	7.3	6.2	5.5	4.8	4.4	4.0	3.6	3.4	3.1	
 FC-ULD120-04 FC-ULD120-03	Min Speed	12.6	8.4	6.3	5.0	4.2	3.6	3.2	2.8	2.5	2.3	2.1	1.9	1.8	
	Max Speed	50.9	33.9	25.5	20.4	17.0	14.5	12.7	11.3	10.2	9.3	8.5	7.8	7.3	
	Setpoint 1 (A to B)	21.8	14.5	10.9	8.7	7.3	6.2	5.5	4.8	4.4	4.0	3.6	3.4	3.1	
	Setpoint 2 (B to A+B)	29.1	19.4	14.5	11.6	9.7	8.3	7.3	6.5	5.8	5.3	4.8	4.5	4.2	
 FC-ULD120-05 FC-ULD120-04	Min Speed	16.8	11.2	8.4	6.7	5.6	4.8	4.2	3.7	3.4	3.1	2.8	2.6	2.4	
	Max Speed	65.5	43.6	32.7	26.2	21.8	18.7	16.4	14.5	13.1	11.9	10.9	10.1	9.4	
	Setpoint 1 (A to B)	29.1	19.4	14.5	11.6	9.7	8.3	7.3	6.5	5.8	5.3	4.8	4.5	4.2	
	Setpoint 2 (B to A+B)	36.4	24.2	18.2	14.5	12.1	10.4	9.1	8.1	7.3	6.6	6.1	5.6	5.2	

Systemic Nozzle Pairs - 15" Spacing

Droplets: C or Greater

Pressure Range: 20 to 60 psi








Nozzle B	Nozzle A	Setpoints (mph)	Application Rate (gpa)												
			5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35
 FC-ULD120-025 FC-ULD120-015	Min Speed	8.4	5.6	4.2	3.4	2.8	2.4	2.1	1.9	1.7	1.5	1.4	1.3	1.2	
	Max Speed	38.8	25.9	19.4	15.5	12.9	11.1	9.7	8.6	7.8	7.1	6.5	6.0	5.5	
	Setpoint 1 (A to B)	14.5	9.7	7.3	5.8	4.8	4.2	3.6	3.2	2.9	2.6	2.4	2.2	2.1	
	Setpoint 2 (B to A+B)	24.2	16.2	12.1	9.7	8.1	6.9	6.1	5.4	4.8	4.4	4.0	3.7	3.5	
 FC-ULD120-03 FC-ULD120-02	Min Speed	11.2	7.5	5.6	4.5	3.7	3.2	2.8	2.5	2.2	2.0	1.9	1.7	1.6	
	Max Speed	48.5	32.3	24.2	19.4	16.2	13.9	12.1	10.8	9.7	8.8	8.1	7.5	6.9	
	Setpoint 1 (A to B)	19.4	12.9	9.7	7.8	6.5	5.5	4.8	4.3	3.9	3.5	3.2	3.0	2.8	
	Setpoint 2 (B to A+B)	29.1	19.4	14.5	11.6	9.7	8.3	7.3	6.5	5.8	5.3	4.8	4.5	4.2	
 FC-ULD120-04 FC-ULD120-03	Min Speed	16.8	11.2	8.4	6.7	5.6	4.8	4.2	3.7	3.4	3.1	2.8	2.6	2.4	
	Max Speed	67.9	45.3	33.9	27.2	22.6	19.4	17.0	15.1	13.6	12.3	11.3	10.4	9.7	
	Setpoint 1 (A to B)	29.1	19.4	14.5	11.6	9.7	8.3	7.3	6.5	5.8	5.3	4.8	4.5	4.2	
	Setpoint 2 (B to A+B)	38.8	25.9	19.4	15.5	12.9	11.1	9.7	8.6	7.8	7.1	6.5	6.0	5.5	
 FC-ULD120-05 FC-ULD120-04	Min Speed	22.4	14.9	11.2	9.0	7.5	6.4	5.6	5.0	4.5	4.1	3.7	3.4	3.2	
	Max Speed	87.3	58.2	43.6	34.9	29.1	24.9	21.8	19.4	17.5	15.9	14.5	13.4	12.5	
	Setpoint 1 (A to B)	38.8	25.9	19.4	15.5	12.9	11.1	9.7	8.6	7.8	7.1	6.5	6.0	5.5	
	Setpoint 2 (B to A+B)	48.5	32.3	24.2	19.4	16.2	13.9	12.1	10.8	9.7	8.8	8.1	7.5	6.9	

HYPRO® DUO REACT NOZZLE SELECTION

Contact Nozzle Pairs - 20" Spacing

Droplets: M to C




Pressure Range: 40 to 90 psi

Nozzle B	Nozzle A	Setpoints (mph)	Application Rate (gpa)												
			5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35
 FC-GA110-025	 FC-GA110-015	Min Speed	8.9	5.9	4.5	3.6	3.0	2.5	2.2	2.0	1.8	1.6	1.5	1.4	1.3
		Max Speed	35.6	23.8	17.8	14.3	11.9	10.2	8.9	7.9	7.1	6.5	5.9	5.5	5.1
		Setpoint 1 (A to B)	13.4	8.9	6.7	5.3	4.5	3.8	3.3	3.0	2.7	2.4	2.2	2.1	1.9
		Setpoint 2 (B to A+B)	22.3	14.9	11.1	8.9	7.4	6.4	5.6	5.0	4.5	4.1	3.7	3.4	3.2
 FC-GA110-03	 FC-GA110-02	Min Speed	11.9	7.9	5.9	4.8	4.0	3.4	3.0	2.6	2.4	2.2	2.0	1.8	1.7
		Max Speed	44.6	29.7	22.3	17.8	14.9	12.7	11.1	9.9	8.9	8.1	7.4	6.9	6.4
		Setpoint 1 (A to B)	14.5	9.7	7.3	5.8	4.8	4.2	3.6	3.2	2.9	2.6	2.4	2.2	2.1
		Setpoint 2 (B to A+B)	21.8	14.5	10.9	8.7	7.3	6.2	5.5	4.8	4.4	4.0	3.6	3.4	3.1
 FC-GA110-04	 FC-GA110-03	Min Speed	17.8	11.9	8.9	7.1	5.9	5.1	4.5	4.0	3.6	3.2	3.0	2.7	2.5
		Max Speed	62.4	41.6	31.2	24.9	20.8	17.8	15.6	13.9	12.5	11.3	10.4	9.6	8.9
		Setpoint 1 (A to B)	26.7	17.8	13.4	10.7	8.9	7.6	6.7	5.9	5.3	4.9	4.5	4.1	3.8
		Setpoint 2 (B to A+B)	35.6	23.8	17.8	14.3	11.9	10.2	8.9	7.9	7.1	6.5	5.9	5.5	5.1
 FC-GA110-05	 FC-GA110-04	Min Speed	23.8	15.8	11.9	9.5	7.9	6.8	5.9	5.3	4.8	4.3	4.0	3.7	3.4
		Max Speed	80.2	53.5	40.1	32.1	26.7	22.9	20.0	17.8	16.0	14.6	13.4	12.3	11.5
		Setpoint 1 (A to B)	35.6	23.8	17.8	14.3	11.9	10.2	8.9	7.9	7.1	6.5	5.9	5.5	5.1
		Setpoint 2 (B to A+B)	44.6	29.7	22.3	17.8	14.9	12.7	11.1	9.9	8.9	8.1	7.4	6.9	6.4

Contact Nozzle Pairs - 15" Spacing

Droplets: M to C



Pressure Range: 40 to 90 psi

Nozzle B	Nozzle A	Setpoints (mph)	Application Rate (gpa)												
			5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35
 FC-GA110-025	 FC-GA110-015	Min Speed	11.9	7.9	5.9	4.8	4.0	3.4	3.0	2.6	2.4	2.2	2.0	1.8	1.7
		Max Speed	47.5	31.7	23.8	19.0	15.8	13.6	11.9	10.6	9.5	8.6	7.9	7.3	6.8
		Setpoint 1 (A to B)	17.8	11.9	8.9	7.1	5.9	5.1	4.5	4.0	3.6	3.2	3.0	2.7	2.5
		Setpoint 2 (B to A+B)	29.7	19.8	14.9	11.9	9.9	8.5	7.4	6.6	5.9	5.4	5.0	4.6	4.2
 FC-GA110-03	 FC-GA110-02	Min Speed	15.8	10.6	7.9	6.3	5.3	4.5	4.0	3.5	3.2	2.9	2.6	2.4	2.3
		Max Speed	59.4	39.6	29.7	23.8	19.8	17.0	14.9	13.2	11.9	10.8	9.9	9.1	8.5
		Setpoint 1 (A to B)	23.8	15.8	11.9	9.5	7.9	6.8	5.9	5.3	4.8	4.3	4.0	3.7	3.4
		Setpoint 2 (B to A+B)	35.6	23.8	17.8	14.3	11.9	10.2	8.9	7.9	7.1	6.5	5.9	5.5	5.1
 FC-GA110-04	 FC-GA110-03	Min Speed	23.8	15.8	11.9	9.5	7.9	6.8	5.9	5.3	4.8	4.3	4.0	3.7	3.4
		Max Speed	83.2	55.4	41.6	33.3	27.7	23.8	20.8	18.5	16.6	15.1	13.9	12.8	11.9
		Setpoint 1 (A to B)	35.6	23.8	17.8	14.3	11.9	10.2	8.9	7.9	7.1	6.5	5.9	5.5	5.1
		Setpoint 2 (B to A+B)	47.5	31.7	23.8	19.0	15.8	13.6	11.9	10.6	9.5	8.6	7.9	7.3	6.8
 FC-GA110-05	 FC-GA110-04	Min Speed	31.7	21.1	15.8	12.7	10.6	9.1	7.9	7.0	6.3	5.8	5.3	4.9	4.5
		Max Speed	106.9	71.3	53.5	42.8	35.6	30.5	26.7	23.8	21.4	19.4	17.8	16.4	15.3
		Setpoint 1 (A to B)	47.5	31.7	23.8	19.0	15.8	13.6	11.9	10.6	9.5	8.6	7.9	7.3	6.8
		Setpoint 2 (B to A+B)	59.4	39.6	29.7	23.8	19.8	17.0	14.9	13.2	11.9	10.8	9.9	9.1	8.5

HYPRO® DUO REACT NOZZLE SELECTION

Enlist Duo Nozzle Pairs - 20" Spacing



Droplets: C or Greater

Nozzle B	Nozzle A	Setpoints (mph)	Application Rate (gpa)												
			5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35
 FC-ULD120-04	 FC-ULD120-06	Min Speed	16.8	11.2	8.4	6.7	5.6	4.8	4.2	3.7	3.4	3.1	2.8	2.6	2.4
		Max Speed	66.4	44.3	33.2	26.6	22.1	19.0	16.6	14.8	13.3	12.1	11.1	10.2	9.5
		Setpoint 1 (A to B)	31.4	21.0	15.7	12.6	10.5	9.0	7.9	7.0	6.3	5.7	5.2	4.8	4.5
		Setpoint 2 (B to A+B)	42.0	28.0	21.0	16.8	14.0	12.0	10.5	9.3	8.4	7.6	7.0	6.5	6.0

Speeds apply to pressures stated on label (04 = 20-70psi, 06=20-50psi)

Enlist Duo Nozzle Pairs - 15" Spacing

Droplets: C or Greater

Nozzle B	Nozzle A	Setpoints (mph)	Application Rate (gpa)												
			5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35
 FC-ULD120-04	 FC-ULD120-06	Min Speed	22.4	14.9	11.2	9.0	7.5	6.4	5.6	5.0	4.5	4.1	3.7	3.4	3.2
		Max Speed	88.5	59.0	44.3	35.4	29.5	25.3	22.1	19.7	17.7	16.1	14.8	13.6	12.6
		Setpoint 1 (A to B)	41.9	27.9	21.0	16.8	14.0	12.0	10.5	9.3	8.4	7.6	7.0	6.4	6.0
		Setpoint 2 (B to A+B)	56.0	37.3	28.0	22.4	18.7	16.0	14.0	12.4	11.2	10.2	9.3	8.6	8.0

Speeds apply to pressures stated on label (04 = 20-70psi, 06=20-50psi)



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