

DYNAJET® FLEX

INSTALLATION, SETUP AND USER GUIDE

Software version 1.02
with optional high flow option



TeeJet®
TECHNOLOGIES

A Subsidiary of  Spraying Systems Co.®

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DYNAJET® FLEX OVERVIEW

The DynaJet Flex controller works in conjunction with an existing rate controller that regulates flow via a control valve or pump regulation to achieve a target application rate while maintaining target droplet size(s) when a speed change occurs. This system only works with automatic rate controllers that use flow based monitoring systems and not pressure based monitoring systems. Automatic rate controllers equipped for both flow and pressure based control should have the pressure-based system disabled to work in conjunction with DynaJet Flex.

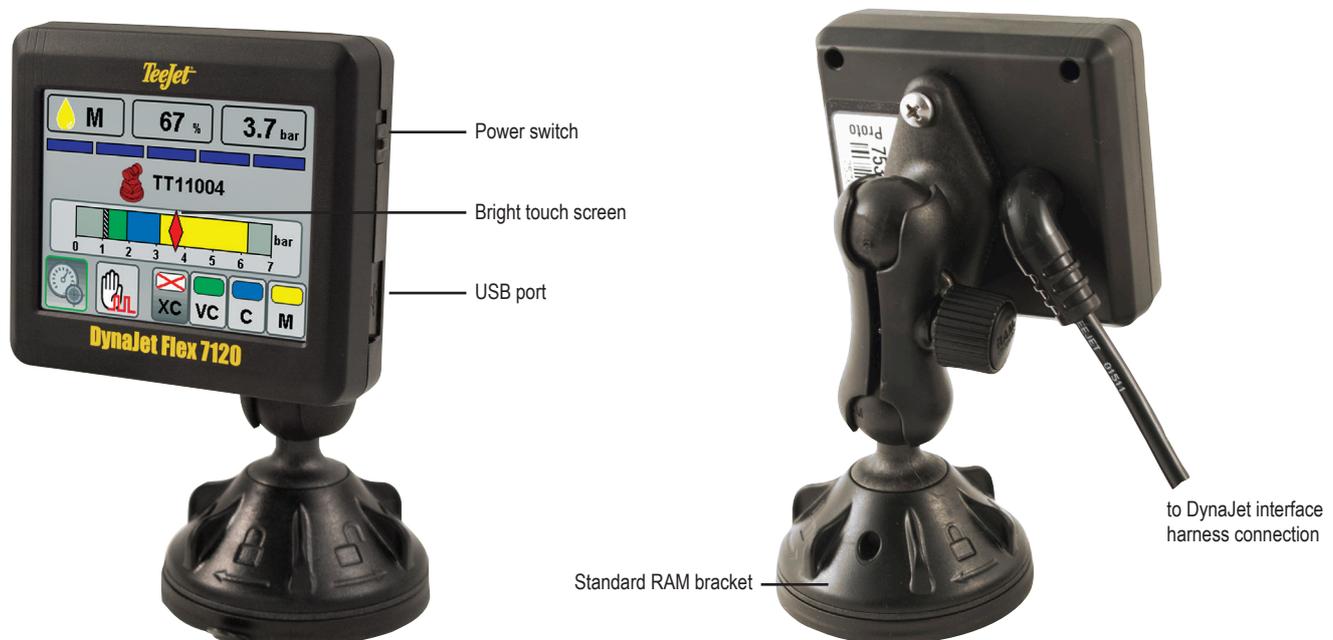
The independent automatic rate controller loop performs the same as it would if the DynaJet controller were not present. The DynaJet Flex controller changes flow output to each individual nozzle based upon input provided from the operator about the optimum droplet size (pressure) for the application.

INSTALLATION

CONSOLE

The DynaJet Flex console is designed to provide years of service under typical agricultural and turf operating conditions. A tight fitting enclosure means that typical dusty environments will not cause operational problems. While occasional splashing of water will not damage the unit, the DynaJet Flex console is not designed for direct exposure to rain. Take care not to operate the DynaJet Flex console in wet conditions.

Figure 1: DynaJet Flex 7120 console front and back



Safety information

TeeJet Technologies is not responsible for damage or physical harm caused by failure to adhere to the following safety requirements.

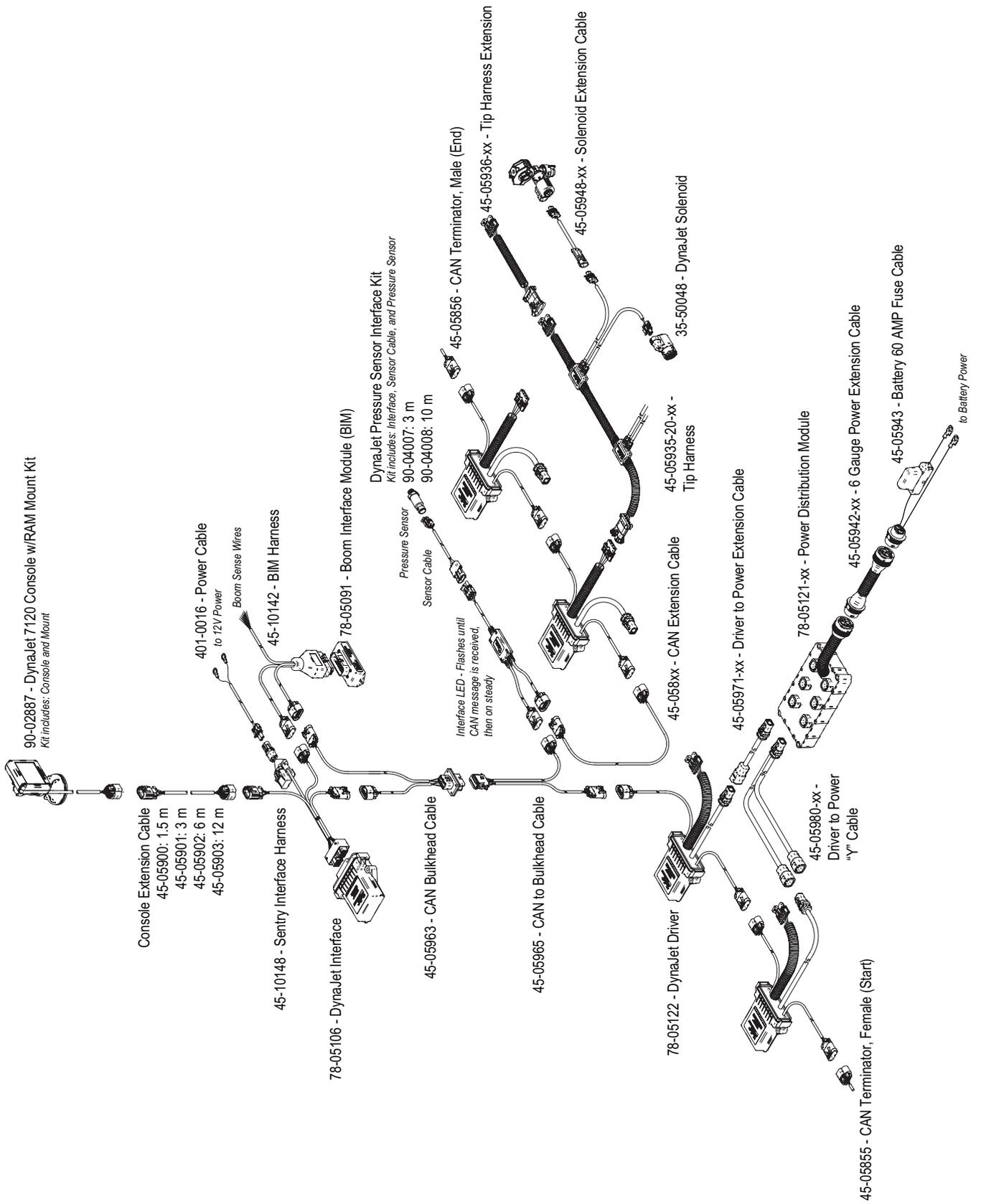
As the operator of the vehicle, you are responsible for its safe operation.

The DynaJet Flex is not designed to replace the vehicle's operator.

Be sure that the area around the vehicle is clear of people and obstacles before and during engagement.

The DynaJet Flex is designed to support and improve efficiency while working in the field. The driver has full responsibility for the quality and work related results.

Figure 3: System diagram - standard mode



INSTALLATION – STANDARD MODE

DynaJet® drivers

There will be one DynaJet driver 78-05122 per boom section with a limit of 20 nozzles per section.

- Mount them so they are at the end of each section that is closest to the middle of the boom.

Power

Power will be sourced from the battery using the 60 amp fused cable 45-05943.

Power from the battery will be routed to the boom using the 6 gauge power cables 45-05942-xx

The power distribution modules 78-05121-xx will connect to the 45-05942-xx cables.

Power will then route from 78-05121-xx to each DynaJet driver 78-05122 using cables 45-05971-xx.

Figure 2: Installation diagram - standard mode

Nozzle harnesses

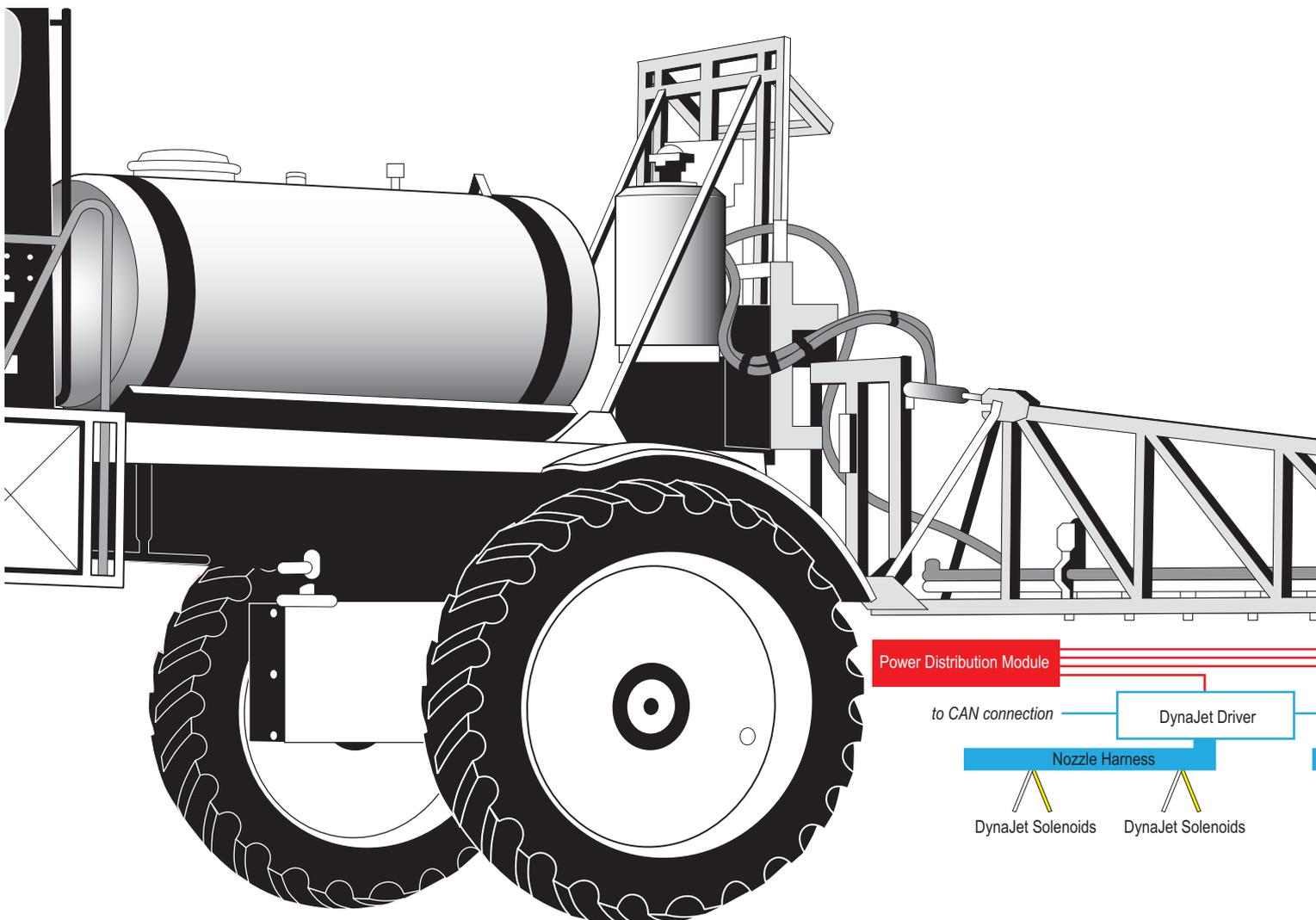
When installing nozzle harnesses 45-05935-xx-xx always start with section 1 and continue to the last section.

Each section will require nozzle harnesses designed for your specific nozzle spacing and number of nozzles.

- Nozzle harnesses are built with an even number of outputs.
- Some sections will use more than one harness to equal the number of nozzles in that section.

The yellow and white solenoid cables on the nozzle harnesses must alternate across the entire boom. When sections have odd numbers of nozzles then accounting for the altering can be accomplished one of two ways:

- A. By crossing the two solenoid cables
- B. By installing nozzle harness reversing adapters 45-05952



Pressure sensor interface kit

The DynaJet system requires pressure sensor interface kit 90-04007 or 98-04008 to be installed.

- The pressure sensor interface kit should be mounted close to the boom manifold.

Boom interface module (BIM)

The boom interface module (BIM) 78-05091 is used by the DynaJet system for boom sense.

The BIM harness connects between the BIM and the can.

On the BIM harness 45-10142, the boom sense wires (or flying leads) are supplied to tie into existing machine boom section 12V on/0V off outputs.

If not using 45-10142, some machine specific harnesses are available.

The BIM can be mounted in the cab or outside depending upon your installation.

DynaJet® interface

The DynaJet interface 78-05106 connects to the Sentry interface harness 45-10148:

The Sentry interface harness connects to

- The console 75-30119 (extension cable may be used)
- Power 12V for powering the CAN
- CAN

The DynaJet interface can be mounted in the cab or outside depending upon your installation.

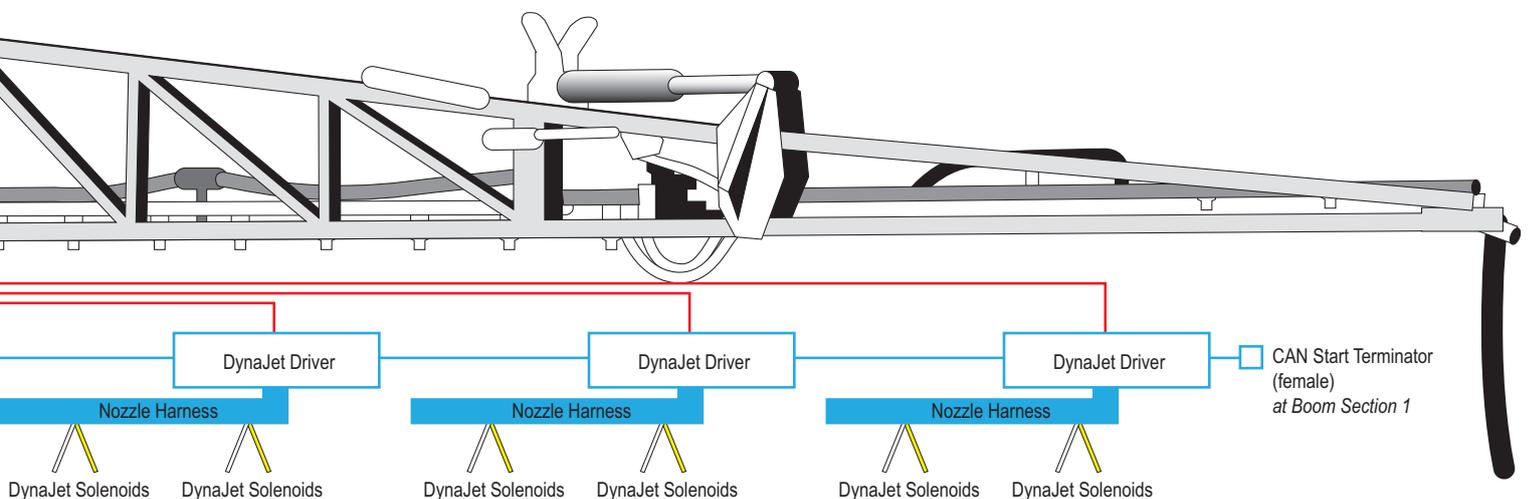
CAN cables and terminators

The start terminator 45-05855 must be connected to the DynaJet driver 78-05122 for section 1.

Can cables must be connected in series:

- To each DynaJet driver 78-05122
- To the boom interface module 78-05091 (via BIM harness 45-10142)
- To the DynaJet interface 78-05106 (via sentry interface harness 45-10148)
- To the pressure sensor interface kit (via pressure interface 78-05110)

The end terminator 45-05856 must be connected to the driver module 78-05122 for the last section.



INSTALLATION – HIGH FLOW MODE



The following illustration and steps are only a guideline of an installation based on a specific vehicle configuration. Installations on other vehicles may vary. If there are questions concerning the installation of the DynaJet Flex system on this vehicle, or due to the changes in component specifications the parts supplied in the kit are not exactly as presented in this document, please contact your dealer or TeeJet customer service representative for clarification before installation. TeeJet technologies is not responsible for misuse or incorrect installation of the system.

DynaJet® interface and drivers

Step 1a – mount the **(F)** DynaJet HF drivers 78-05124 onto brackets, one for each boom section.

Step 1b – mount the **(D)** DynaJet HF interface 78-05123, connecting to the **(C)** DynaJet interface harness 45-10177, and **(H)** boom harness 45-10178.

Connect terminators

Step 2a – connect the **(I)** start terminator 45-05855 to **(K)** 4 nozzle harness (1-4) 45-10174, first section.

Step 2b – connect the **(J)** end terminator 45-05856 to **(M)** 4 nozzle harness (9-12) 45-10176, last section.

Nozzle harnesses

Step 3 – install nozzle harness **(K)** 4 nozzle harness (1-4) 45-10174, **(L)** 4 nozzle harness (5-8) 45-10175, and **(M)** 4 nozzle harness (9-12) 45-10176. Each harness features two solenoid connections per nozzle body, supporting (4) nozzle bodies in total.

Note: specific section breakdown may vary by installation

Connect can cables to drivers

Step 4 – using the **(E)** can extension cables, connect the **(I)** DynaJet HF drivers 45-05124 to the **(D)** DynaJet HF interface 78-05123.

Driver battery cables

Step 5 – connect the battery cable 45-05987 to the three (3) **(F)** DynaJet HF drivers 78-05124, and to the battery.

Boom harnesses

Step 6 – install the **(H)** boom harnesses 45-10178, 45-10179, or 45-10181 connecting to the **(D)** DynaJet HF interface 78-05123.

Pressure sensor

Step 7 – connect the boom pressure sensor 0-10 bar to the **(C)** DynaJet HF interface harness 45-10177. The pressure sensor interface kit should be mounted close to the boom manifold

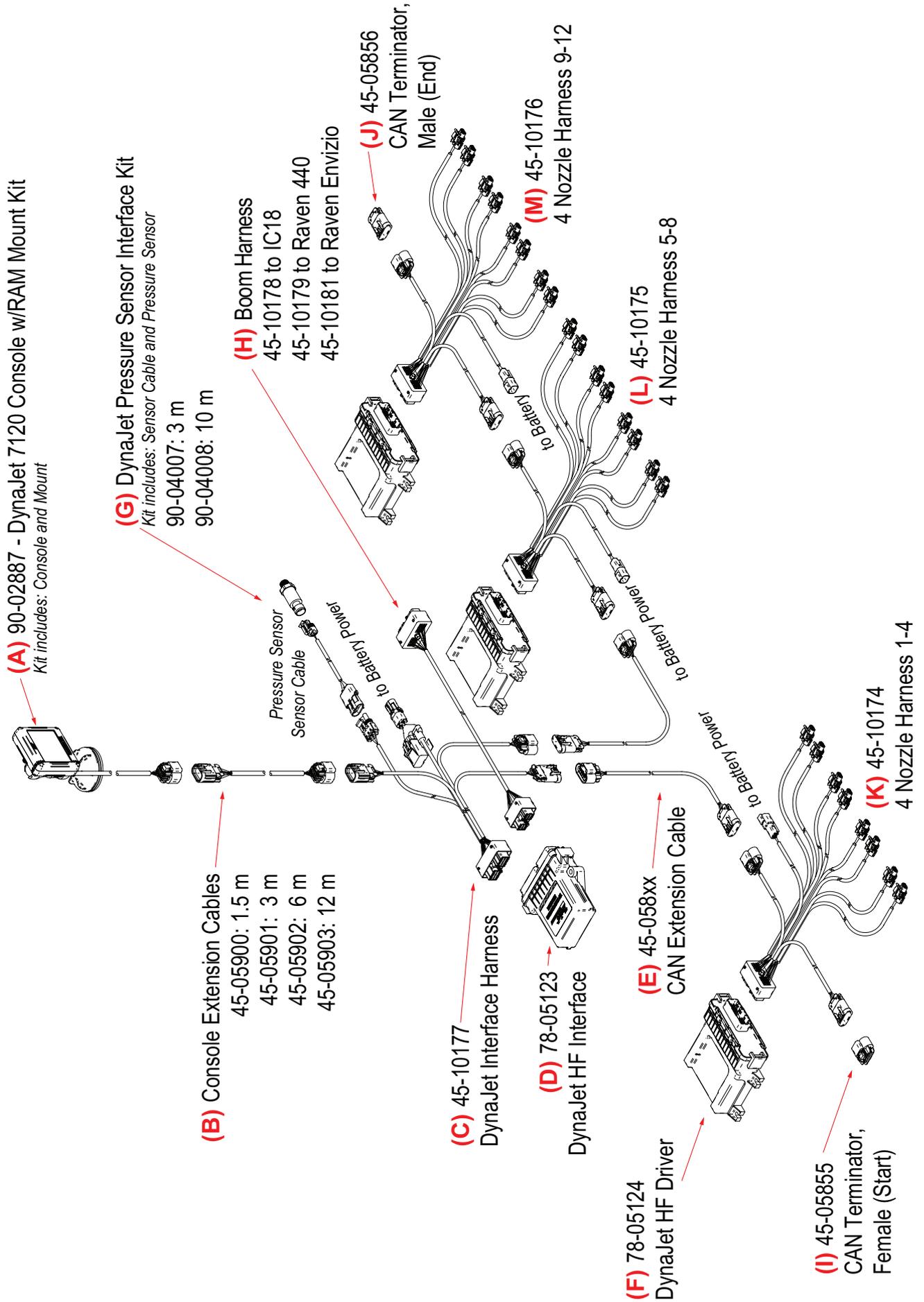
DynaJet® 7120 console

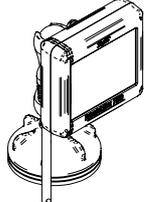
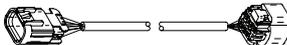
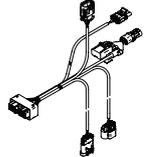
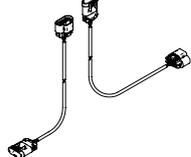
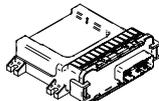
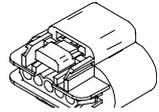
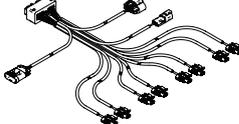
Step 8 – connect the **(A)** DynaJet 7120 console 90-02887 to the **(C)** DynaJet HF interface harness 45-10177 via console extension cables.

Other battery cable

Step 9 – connect 401-0012 to the battery and route leads as needed.

Figure 4: System diagram - high flow mode



Item	Part #	Description	Illustration
A	90-02887	DynaJet 7120 console	
B	45-05900: 1.5 m 45-05901: 3 m 45-05902: 6 m 45-05903: 12 m	Console extension cable	
C	45-10177	DynaJet interface harness	
D	78-05123	DynaJet HF interface	
E	45-05857: 1 m 45-05858: 2 m 45-05859: 4 m 45-05864: 10.5 m	CAN extension cable	
F	78-05124	DynaJet HF driver	
G	90-04007: 3 m 90-04008: 10 m	DynaJet pressure sensor interface kit	
H	45-10178 to IC18 45-10179 to Raven 440 45-10181 to Raven Envizio	Boom harness	
I	45-05855	CAN terminator, female (start)	
J	45-05856	CAN terminator, male (end)	
K	45-10174	4 Nozzle harness 1-4	
L	45-10175	4 Nozzle harness 5-8	
M	45-10176	4 Nozzle harness 9-12	

INITIAL STARTUP

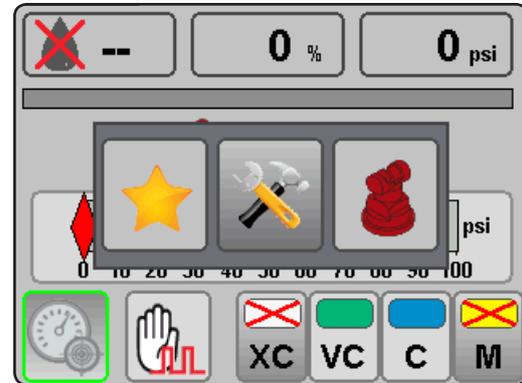
This section will explain basic setup of the values required for first-time setup of a DynaJet Flex system.

When these settings are completed, initial operation and fine-tuning should be possible.

To access setup menu from the work screen, touch center of the screen.

- Select from:
 - ▶ Favorites – the FAVORITE icon ★ represents favorite spray nozzles. This function automatically stores the most recent five (5) nozzles chosen. Use this to quickly access your most frequently used spray nozzles.
 - ▶ Setup – the SETUP icon 🛠️ is used to access settings. This will enter the configuration menu.
 - ▶ Nozzle selection – the SPRAY NOZZLE icon 📌 is used to select the spray nozzle style and capacity. Once chosen here, the spray nozzle style and capacity is automatically added to the favorites list.
- Press HOME icon 🏠 to return to the main work screen.

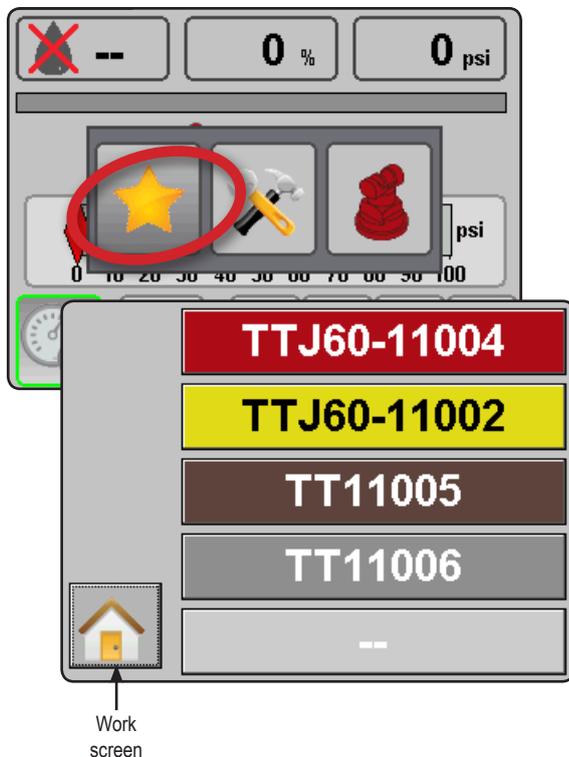
Figure 5: Options menu



Favorites

★ The favorite icon represents favorite spray nozzles. This function automatically stores the most recent five (5) nozzles chosen. Use this to quickly access your most frequently used spray nozzles.

Figure 6: Favorites

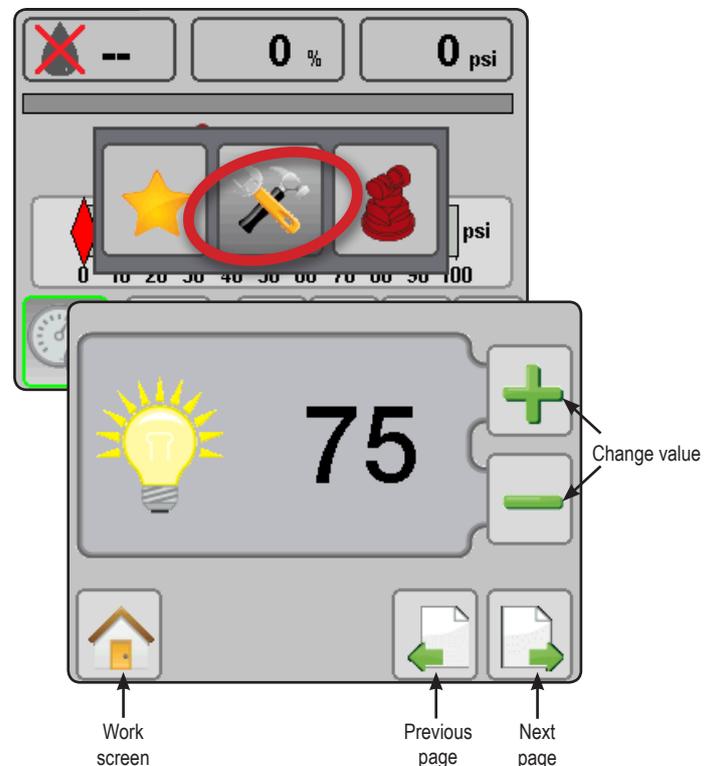


Setup

🛠️ The setup icon is used to access settings. This will enter the configuration menu. Selections are automatically saved when adjusted.

Note: Not all settings are listed below. See "User settings" section of this guide for additional settings and details.

Figure 7: Setup



Units

Sets the units to us (PSI) or metric (bar)

Figure 8: Units



Number of sections

Set the number of boom sections. This should match the number of sections used on the spray controller. Range is 1 to 15.

Figure 9: Number of sections



Maximum pressure sensor value

Verify this value by looking at the pressure sensor description. Values will be either 10 bar or 25 bar.

If pressure value displayed on the DynaJet Flex console are not accurate compared to a mechanical gauge, adjust this value until there is a match.

- ▶ Increasing the value will reduce the pressure value displayed during operation
- ▶ Decreasing this value will increase the pressure value displayed during operation

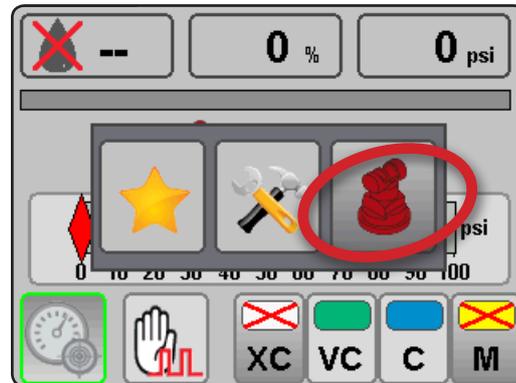
Figure 10: Maximum pressure sensor value



Nozzle selection

Accesses the nozzle selection process to select which nozzle is to be used. At this time only TeeJet nozzles are supported.

Figure 11: Nozzle selection



Select nozzle series

Use the green up and down arrows to highlight the correct spray nozzle series/family.

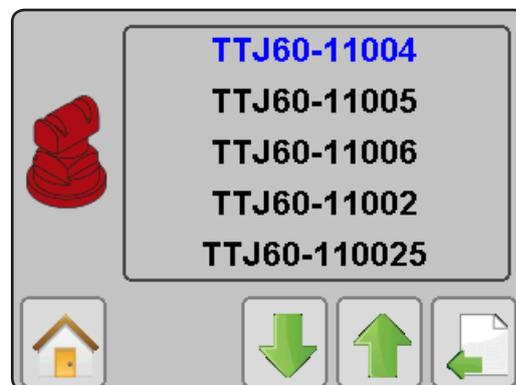
Figure 12: Select nozzle series



Select nozzle capacity

With the correct nozzle capacity highlighted, select the HOME icon  to return to operating mode. The selected nozzle will be active and will automatically be added to the favorites list.

Figure 13: Select nozzle capacity



Ready to pressure test the system

1. Ensure that current rate control system is operating at the optimum level. Set DynaJet operating mode to manual and set PWM duty cycle at 100%. This will make the system operate as if DynaJet was not present. Use this configuration to verify the rate control system is operating normally.
2. Keep DynaJet operating mode on manual and change PWM duty cycle to 50%. Use this configuration to verify the rate control system is operating normally.
3. Confirm boom section functionality by observing the row of rectangles below the on the operating display.
4. Switch the master switch ON (on rate control or other boom section control switches) and individual sections one at a time. Make sure each section appropriately changes colour to blue. With the master switch off, all active sections will be grey again.
5. Start pump and ensure no leaks.
6. Verify pressure on mechanical gauge matches the digital pressure display within reason. If not, adjust maximum pressure sensor value as previously described.
7. Configure in PWM mode DynaJet at duty cycle of 50%. Confirm each e-ChemSaver (ECS) is pulsating.

At this point the system is functioning. Further details for fine-tuning the system are available in the user settings section of this guide.

Work screen

On screen indicators

Current droplet size – displays the current droplet size using both the appropriate colour droplet icon and size letter code.

PWM duty cycle – displays the current PWM duty cycle as a percentage.

Active solenoid (high flow mode only) – displays if one or both sets of solenoid are active.

Actual pressure – displays the actual pressure.

Current nozzle selection – displays the current selected nozzle.

Boom status

- ▶ Blue – turned on (standard mode or high flow mode single solenoid active)
- ▶ Green – turned on (high flow mode both solenoids active)
- ▶ Empty – turned off

Pressure gauge

- ▶ Red diamond – actual pressure
- ▶ Colors – droplet size,

Operation modes

- ▶ Nozzle mode (pressure) – when the user changes the desired drop sizes choices (via the droplet size selectors checkboxes) the system will recalculate the desired pressure. It will then adjust the PWM duty cycle to attempt to attain the desired pressure in the system.
- ▶ Manual mode (PWM) – the user can manually adjust the PWM duty cycle to attempt to attain the desired pressure in the system.

Droplet size selectors

- ▶ Red X and greyed out – not selected

High flow mode

- ▶ Single – one set of solenoids active
- ▶ Dual – both sets of solenoids active

Droplet size chart

When choosing a spray nozzle that produces droplet sizes in one of the eight droplet size classification categories, it is important to remember that a single nozzle can produce different droplet size classifications at different pressures. A nozzle might produce medium droplets at low pressures, while producing fine droplets as pressure is increased.

Category	Symbol	Color code
Extremely fine	XF	Violet
Very fine	VF	Red
Fine	F	Orange
Medium	M	Yellow
Coarse	C	Blue
Very coarse	VC	Green
Extremely coarse	XC	White
Ultra coarse	UC	Black

Figure 14: Work screen - standard mode

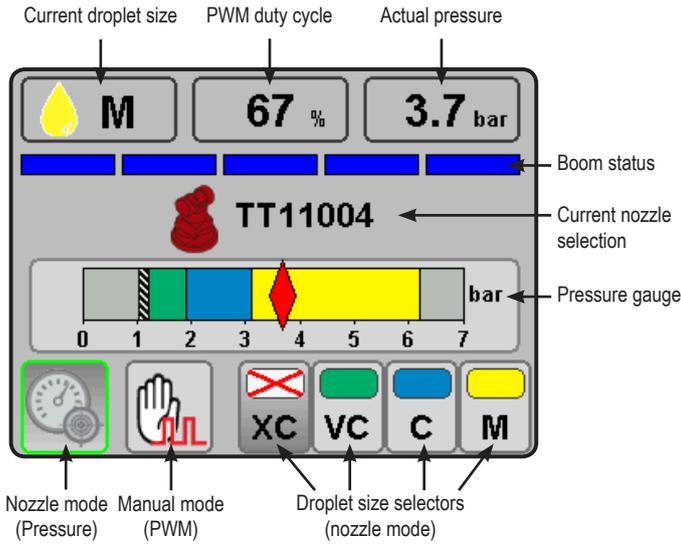


Figure 15: Work screen - high flow mode single

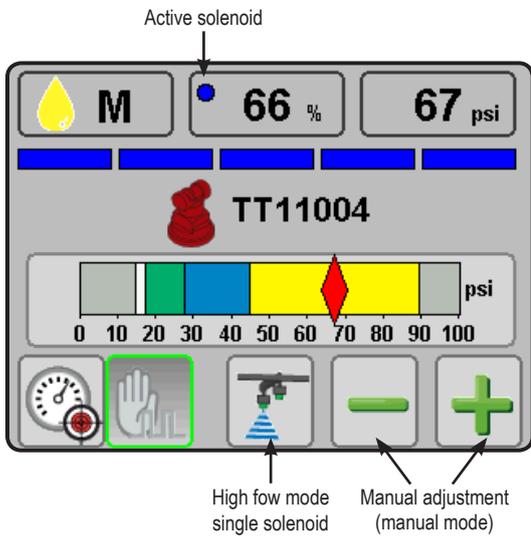
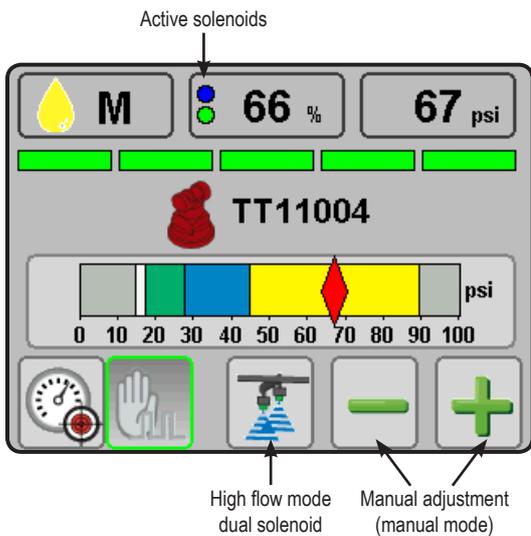


Figure 16: Work screen - high flow mode dual



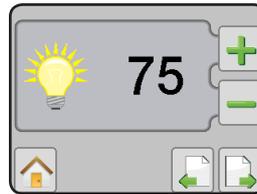
USER SETTINGS

If there are questions concerning the setup of the DynaJet Flex, please contact your dealer or TeeJet customer service representative for clarification before operation. TeeJet technologies is not responsible for misuse or incorrect operation of the system.

Setup is used to configure units, display brightness, number of sections, boom section on/off beep, maximum pressure sensor value, minimum duty cycle, control hold delay, fine gain, coarse gain, and coarse gain on/off.

Display brightness

Sets the brightness level of the display. Range is 5% to 100% in 5% increments.



Units

Sets the units to us (PSI) or metric (bar).



Key beep

Enable/disable all beeping from console.



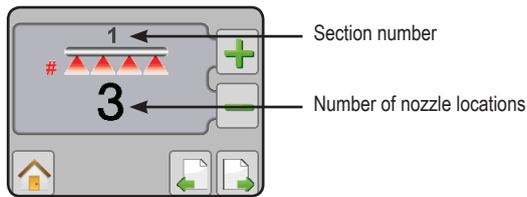
Number of sections

Set the number of boom sections. Range is 1 to 15.



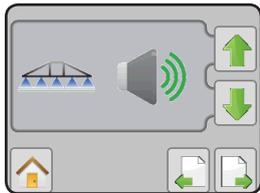
Number of nozzles (high flow mode only)

Set the number of nozzle locations for each boom section.
Range is 1 to 120.



Boom section on/off beep

Enable/disable beep when a boom section is turned on or off.



Maximum pressure sensor

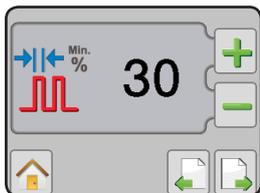
Sets the value from the pressure sensor description. Either 10 bar or 25 bar.



Minimum duty cycle

Sets the minimum duty cycle to which the DynaJet will control.
Default is 30%, minimum is 20%.

Higher values reduce the overall control range of the system.



Control hold delay

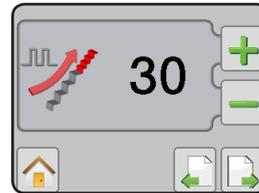
When any boom switch changes state, DynaJet Flex will not make control adjustments for the specified time period. Range is 0.0 to 10.0 seconds. Default is 1.0 second.



Fine gain

Allows the control system to make minor adjustments when close to the target, with the goal of stable pressures and minimal overshoot of target. Range is 0 to 100. Default is 30.

Fine gain settings are 1/10 as powerful gain as coarse gain settings.



Coarse gain

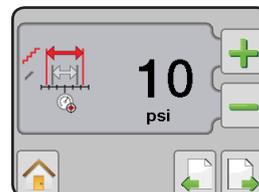
This is the more aggressive gain setting and will have the largest impact on the stability and function of the DynaJet Flex system. Coarse gain makes major adjustments to duty cycle to attempt to bring actual pressure back to the target. A coarse gain setting that is too high will result in pressure oscillation. Range is 1 to 100. Default is 5.



Coarse gain on

This setting determines the threshold at which coarse gain becomes active. Value is shown in the pressure units previously chosen. Range is 0.07 To 1.38 bar.

For example, if operating in bar units with a setting of 0.48; coarse gain becomes active when actual pressure is 0.48 or more bar away from the target value. Increasing this value makes the coarse setting in effect less of the time (higher value means higher tolerance between actual pressure and target pressure). Decreasing this value means coarse regulation is active more frequently. Setting coarse gain on too high would disable the feature. Decreasing this value too much will result in pressure oscillations.



Coarse gain off

This setting determines the threshold at which coarse regulation is switched off and fine regulation takes over. Value is shown in the pressure units previously chosen. Range is 0.07 to 1.38 bar.

This value must be lower than coarse gain on. For example, if operating in bar units and with a setting of 0.28; coarse regulation will be switched off (and fine gain becomes active) when the difference between target and actual pressure is 0.28 bar or less. Regulation will remain in fine until the error reaches the coarse gain on value described above.



OEM settings

The settings described below are engineering and development values used in development of the DynaJet Flex system. Do not alter these settings unless directed by TeeJet Technologies support personnel.

Setting Description	Default Value
PWM frequency	10 Hz
On pulse duration	38
Hold current frequency	10 counts
Hold current duty cycle	5 counts
Phase offset	128 counts
Jump point	0.35 bar.
Maximum duty cycle	80% (all ON above this value)
PWM off time	0 counts

Enable/disable options

To enter the OEM setup:

1. Press the TeeJet logo 3 times within the first three seconds of the splash screen being displayed. The console will beep to acknowledge the OEM option has been activated.

Figure 17: OEM setup



TUNING DYNAJET®

1. Identify the speed range, rate range and system pressures for the application. Ensure the operating conditions are compatible with the nozzle capacity, speeds and duty cycles shown in the TeeJet PWM nozzle selection guide.
2. Using the identified speed range based on nozzle selection use the rate controllers test speed or simulated speed to target a desired application rate and droplet size.
3. Fine tune the regulation performance of the rate control system and the DynaJet system.
 - a. Typical settings used for DynaJet fine-tuning include fine gain, coarse gain, coarse gain on and coarse gain off.
 - b. Coarse gain on must be a higher value than coarse gain off. A good starting point for coarse gain on is a pressure value that is about 35-40% of the target pressure.
 - c. Coarse gain off value is typically is about 25% of the target pressure, or 0.3 - 0.6 bar lower than coarse gain on.
 - d. Coarse gain on and coarse gain % are used to make major adjustments to pressure regulation. Once coarse gain has brought pressure near target; coarse gain off and fine gain will influence the smaller adjustments.
 - e. Coarse gain should be increased if large pressure adjustments need to be made more quickly.
 - f. Fine gain should be decreased if actual pressure constantly moves across the target pressure.

DynaJet and the existing rate controller are two control systems that must coexist. Because DynaJet is a second control device that is installed on the same liquid system, users should be prepared to adjust the rate controller regulation settings to harmonize the two system. For example, if subtle changes in duty cycle on DynaJet induce noticeable rate or pressure oscillations, the rate control regulation gain settings may need to be reduced. Placing the rate control system in manual regulation mode during the tuning process will help determine if oscillations are being caused by the DynaJet or by the rate controller.

TeeJet control systems like 844E, 854 or Radion will typically perform better with DynaJet when their coarse and fine regulating speeds are reduced by 2-3 units.

General rule of thumb under normal operating conditions for flow rate changes; DynaJet in combination with the rate controller should have rate/pressure stabilized in ~ 2-3 seconds.

DYNAJET® NOZZLE SELECTION

Selection of the proper spray nozzle for use with the DynaJet system is much like selecting the spray nozzle for a traditional spraying operation. Along with the extra application flexibility, DynaJet brings a few other nozzle-related considerations that will be summarized below.

1. Duty cycle

- a. DynaJet Flex controls nozzle flow rate by varying the portion of time that each nozzle is 'on' vs. 'off'. The on time is referred to as duty cycle. The range of duty cycle available is typically 30% to 100%, meaning that the nozzles on the machine will have approximately 30% to 100% of their rated flow capacity.
- b. With the DynaJet system:
 - Standard mode $\text{Spray Nozzle Flow Capacity} = \text{Spray Nozzle Size} \times \text{Duty Cycle}$
 - High flow mode $\text{Spray Nozzle Flow Capacity} = \text{Spray Nozzle Size} \times \text{Duty Cycle} \times 2$
- c. By varying the duty cycle, the DynaJet Flex is essentially varying spray nozzle capacity on the fly. When more pressure is required, the nozzle capacity (duty cycle) is reduced. When higher nozzle capacity is required, the duty cycle is increased.
- d. Although the operator has a much more flexible and forgiving application system with DynaJet, care should be taken to select spray nozzles that give the best possible results.
- e. When selecting a spray nozzle, review the DynaJet nozzle selection charts and select a spray nozzle capacity that produces the target application rate at a duty cycle of about 70% when running at expected travel speeds. In other words, choose nozzle capacity and desired pressure/droplet size closer to the high end of the speed (or rate) range than to the lower end. This will provide plenty of adjustment range for DynaJet to reduce duty cycle when travel speed slows, while also providing additional capacity if travel speed increases above the planned speed.
 - The default setting for minimum duty cycle is 30%. This means the system will not adjust the duty cycle below 30% 'on'. While this setting can be set as low as 20% by the operator, the higher default value provides a more uniform application at lower speeds.

2. Spray nozzle selection

- a. The DynaJet system is not compatible with air inducted spray nozzles. Be sure to select a conventional spray nozzle for use with the system. The recommended options are XR TeeJet, DG TeeJet, Turbo TwinJet and Turbo TeeJet.
- b. Different nozzle styles have different droplet size characteristics across the range of operating pressures. The spray nozzle style should be selected based on the desired droplet size at the pressures expected to be in use for your application.
- c. Always use spray nozzles with 110° (or wider) spray pattern. These spray nozzle part numbers will typically include the 110 in their name – for example TT11006vp or XR11006-VS. 80° spray nozzles are not recommended with DynaJet.

3. Spray height

- a. In order to achieve the best possible spray coverage, make sure to keep spray height at or above 20" from the nozzle to the target.

Nozzle selection example

These columns show flow rates at various pressures. The Delta P represents pressure loss through the DynaJet solenoid valve, and the resulting Nozzle bar and Flow show actual values at the spray nozzle.

These columns show droplet sizes for different styles of spray nozzle at given pressures. Use these columns to choose the best nozzle style for your application.

Just like a normal nozzle chart, these columns show rates available at given speeds. The only difference is the range of values that corresponds to the range of flows available with DynaJet Flex.

Nozzle number	Gauge pressure (bar)	Rated l/min	Δ P	Nozzle		Minimum duty cycle 30%		Nozzle spacing 50 cm			
				Pressure (bar)	Flow (l/min)	TT	TTJ60	6 km/h	8 km/h	10 km/h	12 km/h
								l/ha	l/ha	l/ha	l/ha
11006 TT TJ60 TTJ60 XR XRC (50)	1.5	1.68	0.2	1.3	1.54	VC	XC	92 to 308	69 to 231	55 to 185	46 to 154
	2	1.94	0.3	1.7	1.80	VC	XC	108 to 360	81 to 270	65 to 216	54 to 180
	3	2.37	0.4	2.6	2.21	VC	C	133 to 442	99 to 332	80 to 265	66 to 221
	4	2.74	0.5	3.5	2.57	C	C	154 to 514	116 to 386	93 to 308	77 to 257
	5	3.06	0.6	4.4	2.88	C	C	173 to 576	130 to 432	104 to 346	86 to 288
	6	3.35	0.7	5.3	3.16	M	C	190 to 632	142 to 474	114 to 379	95 to 316
	7	3.62	0.8	6.2	3.42	M	C	205 to 684	154 to 513	123 to 410	103 to 342

If the operator wants to apply 120 l/ha at 10 km/h, he would look in the 10 km/h column, and find the row that shows 120 l/ha with room above and below to compensate for higher and lower speeds that may be experienced in the field. In this case a TT11006 at 3-4 bar will work very well.

Nozzle number	Gauge pressure (bar)	Rated l/min	Δ P	Nozzle		Minimum duty cycle 30%		Nozzle spacing 50 cm			
				Pressure (bar)	Flow (l/min)	TT	TTJ60	6 km/h	8 km/h	10 km/h	12 km/h
								l/ha	l/ha	l/ha	l/ha
11006 TT TJ60 TTJ60 XR XRC (50)	1.5	1.68	0.2	1.3	1.54	VC	XC	92 to 308	69 to 231	55 to 185	46 to 154
	2	1.94	0.3	1.7	1.80	VC	XC	108 to 360	81 to 270	65 to 216	54 to 180
	3	2.37	0.4	2.6	2.21	VC	C	133 to 442	99 to 332	80 to 265	66 to 221
	4	2.74	0.5	3.5	2.57	C	C	154 to 514	116 to 386	93 to 308	77 to 257
	5	3.06	0.6	4.4	2.88	C	C	173 to 576	130 to 432	104 to 346	86 to 288
	6	3.35	0.7	5.3	3.16	M	C	190 to 632	142 to 474	114 to 379	95 to 316
	7	3.62	0.8	6.2	3.42	M	C	205 to 684	154 to 513	123 to 410	103 to 342

The next consideration is droplet size. The chart shows that a Turbo TeeJet (TT) nozzle will give Very Coarse (VC) droplets in this pressure range, and a Turbo TwinJet (TTJ60) will give Coarse (C) droplets. The benefit of the TT is that the operator could select droplets from VC to M all at the same rate and speed.

Nozzle number	Gauge pressure (bar)	Rated l/min	Δ P	Nozzle		Minimum duty cycle 30%		Nozzle spacing 50 cm			
				Pressure (bar)	Flow (l/min)	TT	TTJ60	6 km/h	8 km/h	10 km/h	12 km/h
								l/ha	l/ha	l/ha	l/ha
11006 TT TJ60 TTJ60 XR XRC (50)	1.5	1.68	0.2	1.3	1.54	VC	XC	92 to 308	69 to 231	55 to 185	46 to 154
	2	1.94	0.3	1.7	1.80	VC	XC	108 to 360	81 to 270	65 to 216	54 to 180
	3	2.37	0.4	2.6	2.21	VC	C	133 to 442	99 to 332	80 to 265	66 to 221
	4	2.74	0.5	3.5	2.57	C	C	154 to 514	116 to 386	93 to 308	77 to 257
	5	3.06	0.6	4.4	2.88	C	C	173 to 576	130 to 432	104 to 346	86 to 288
	6	3.35	0.7	5.3	3.16	M	C	190 to 632	142 to 474	114 to 379	95 to 316
	7	3.62	0.8	6.2	3.42	M	C	205 to 684	154 to 513	123 to 410	103 to 342

55295 E-CHEMSAVER® MAINTENANCE INSTRUCTIONS

The 55295 e-ChemSaver is a solenoid-actuated shutoff compatible with a wide range of TeeJet nozzle bodies equipped with a diaphragm check valve. It can be used for end-of-boom nozzles as well as individual nozzle shutoff and PWM controls.

The valve is normally closed and opens when the solenoid is energized. The 55295 has a 2-pin MetriPack connector molded into the body for a clean, weather-tight electrical connection.

General disassembly and reassembly

Note: O-rings (8, 9, 10) should be handled with care as they can be damaged/deformed

- Loosen and remove the nylon nut (4) and stainless steel washer (5)
- Separate the coil assembly (1) from the rest of the tube/plunger assembly (2, 3, 6-11)
- Remove the locking ring (11)
- Using pliers to grip the stainless steel interface cap (7), loosen the tube sub-assembly (2) using a 14 mm or adjustable wrench. Note a low-profile 14 mm wrench is available from TeeJet using part number 97-00067.

All repairable parts should be accessible at this point. The plunger sub-assembly (3), stainless steel spring (6), and O-rings (8, 9, 10) can be replaced without further disassembly

- During reassembly, place the plunger sub-assembly (3) and stainless steel spring (6) in the tube sub-assembly (2)

NOTE: the plunger sub-assembly (3) should be oriented with the black insert facing outward (visible) when placed in the tube sub-assembly (2)
- While compressing the spring (6), thread the tube/plunger assembly (2, 3, 6-11) to the stainless steel interface cap (7) and tighten using a wrench and pliers

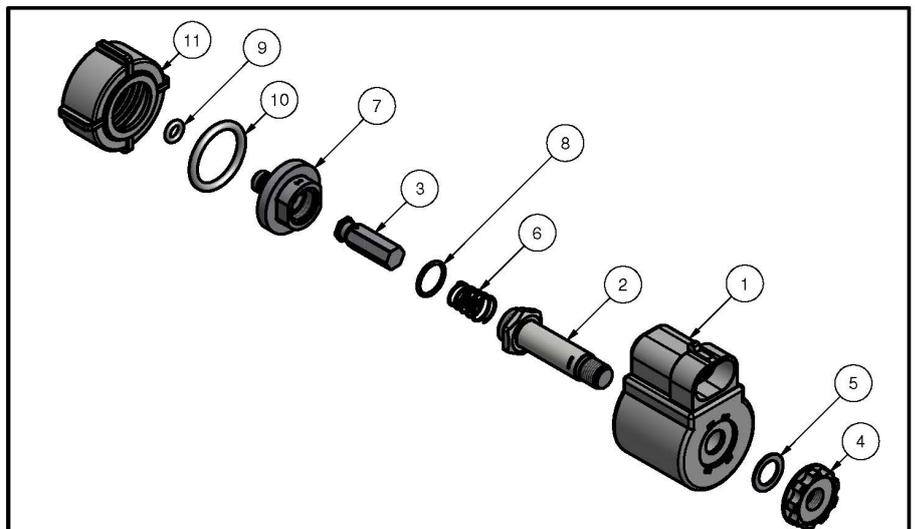
Optional: apply 1 drop of Loctite Blue 243 to the threads of the interface cap (7) and tube sub-assembly (2)

Torque specifications: tighten interface cap (7) and tube sub-assembly (2) to 12 in-lbs (1.36 N-m)

- Return the locking ring (11) to its original position and slide the tube/plunger assembly (2, 3, 6-11) through the coil assembly (1)

NOTE: the coil assembly (1) should be oriented with the MetriPack connectors facing away from the interface cap (7)

- Place the stainless steel washer (5) above the coil assembly (1) and tighten the nylon nut (4) to the tube/plunger assembly (2, 3, 6-11)



ITEM	PART NUMBER	DESCRIPTION
1	CP55296-12	12 VOLT COIL ASSEMBLY (55295-1-12, 55295-2-12, & 55295-4-12)
1A	CP55296-24	24 VOLT COIL ASSEMBLY (55295-1-24, 55295-2-24, & 55295-4-24)
2	N/A	TUBE SUB ASSEMBLY
3	N/A	PLUNGER SUB-ASSEMBLY
4	N/A	NUT, NYLON-BLACK
5	N/A	WASHER, 303 STAINLESS STEEL
6	N/A	SPRING, 302 STAINLESS STEEL
7	N/A	INTERFACE CAP, 303 STAINLESS STEEL (55295-1-12 & 55295-4-12)
7A	N/A	INTERFACE CAP, 303 STAINLESS STEEL (55295-2-12)
8	N/A	O-RING, VITON
9	N/A	O-RING, VITON (55295-1-12 & 55295-4-12)
9A	N/A	O-RING, VITON (55295-2-12)
10	N/A	O-RING, VITON (55295-1-12 & 55295-2-12)
10A	N/A	GASKET, VITON (55295-4-12)
11	N/A	LOCKING RING, NYLON-BLACK
AB55295-1-KIT, SPARE PARTS KIT (INCLUDES 3, 6, 8, 9, 10)		
AB55295-2-KIT, SPARE PARTS KIT (INCLUDES 3, 6, 8, 9A, 10)		
AB55295-4-KIT, SPARE PARTS KIT (INCLUDES 3, 6, 8, 9, 10A)		

DESCRIPTION:

55295-1-12, 55295-2-12, 55295-4-12,
55295-1-24, 55295-2-24, 55295-4-24
e-CHEMSAVER® SOLENOID OPERATED
ELECTRIC SHUT-OFF VALVE



Spraying Systems Co.®

Spray Nozzles and Accessories
P.O. Box 7900 - Wheaton, IL 60189-7900

REVISION NO.

REFERENCE:

PARTS LIST

PL55295

SHEET:

DWG SIZE:

A

©Spraying Systems Co.

APPLICATION RATES AT GIVEN SPEED

Figure 18: Metric - standard mode

Nozzle number	Gauge pressure (bar)	Rated l/min	ΔP	Nozzle		Minimum duty cycle		Nozzle spacing 50 cm												
				Pressure (bar)	Flow (l/min)	XR/XRC	TT	TJ60	TTJ60	DG	5 km/h	6 km/h	8 km/h	10 km/h	12 km/h	14 km/h	16 km/h	18 km/h	20 km/h	
11004 DG TT TJ60 XR XRC (50)	1.5	1.12	0.1	1.4	1.07	M	VC	-	VC	-	-	77 to 257	64 to 214	48 to 161	39 to 128	32 to 107	28 to 92	24 to 80	21 to 71	19 to 64
	2	1.29	0.2	1.8	1.24	M	C	F	C	C	C	89 to 298	94 to 248	56 to 186	45 to 149	37 to 124	32 to 106	28 to 93	25 to 83	22 to 74
	3	1.58	0.2	2.8	1.52	F	C	F	M	M	M	109 to 365	91 to 304	68 to 228	55 to 182	46 to 152	39 to 130	34 to 114	30 to 101	27 to 91
	4	1.82	0.3	3.7	1.76	F	M	F	C	C	C	127 to 422	106 to 352	79 to 264	63 to 211	53 to 176	45 to 151	40 to 132	35 to 117	32 to 106
	5	2.04	0.3	4.7	1.98	-	M	-	-	C	C	143 to 475	119 to 396	89 to 297	71 to 238	59 to 198	51 to 170	45 to 149	40 to 132	36 to 119
	6	2.23	0.3	5.7	2.16	-	M	-	-	C	C	156 to 518	130 to 432	97 to 324	78 to 259	65 to 216	56 to 185	49 to 162	43 to 144	39 to 130
	7	2.41	0.4	6.6	2.34	-	-	-	-	C	C	168 to 562	140 to 468	105 to 351	84 to 281	70 to 234	60 to 201	53 to 176	47 to 156	42 to 140
11005 DG TT TJ60 XR XRC (50)	1.5	1.39	0.2	1.3	1.30	M	VC	-	VC	-	-	94 to 312	78 to 260	59 to 195	47 to 156	39 to 130	33 to 111	29 to 98	26 to 87	23 to 78
	2	1.61	0.2	1.8	1.52	M	VC	M	C	C	109 to 365	91 to 304	68 to 228	55 to 182	46 to 152	39 to 130	34 to 114	30 to 101	27 to 91	
	3	1.97	0.3	2.7	1.87	M	C	M	C	C	135 to 449	112 to 374	84 to 281	67 to 224	56 to 187	48 to 160	42 to 140	37 to 125	34 to 112	
	4	2.27	0.4	3.6	2.17	F	C	F	C	C	156 to 521	130 to 434	98 to 326	78 to 260	65 to 217	56 to 186	49 to 163	43 to 145	39 to 130	
	5	2.54	0.4	4.6	2.43	-	M	-	-	C	C	175 to 583	146 to 486	109 to 365	87 to 292	73 to 243	62 to 208	55 to 182	49 to 162	44 to 146
	6	2.79	0.5	5.5	2.67	-	M	-	-	C	C	192 to 641	160 to 534	120 to 401	96 to 320	80 to 267	69 to 229	60 to 200	53 to 178	48 to 160
	7	3.01	0.6	6.4	2.89	-	M	-	-	C	C	208 to 694	173 to 578	130 to 434	104 to 347	87 to 289	74 to 248	65 to 217	58 to 193	52 to 173
11006 TT TJ60 XR XRC (50)	1.5	1.68	0.2	1.3	1.54	M	VC	-	VC	-	-	111 to 370	92 to 308	69 to 231	55 to 185	46 to 154	40 to 132	35 to 116	31 to 103	28 to 92
	2	1.94	0.3	1.7	1.80	M	VC	M	C	C	130 to 432	108 to 360	81 to 270	65 to 216	54 to 180	46 to 154	41 to 135	36 to 120	32 to 108	
	3	2.37	0.4	2.6	2.21	M	VC	M	C	C	159 to 530	133 to 442	99 to 332	80 to 265	66 to 221	57 to 189	50 to 166	44 to 147	40 to 133	
	4	2.74	0.5	3.5	2.57	M	C	F	C	C	185 to 617	154 to 514	116 to 386	93 to 308	77 to 257	66 to 220	58 to 193	51 to 171	46 to 154	
	5	3.06	0.6	4.4	2.88	F	C	F	C	C	207 to 691	173 to 576	130 to 432	104 to 346	86 to 288	74 to 247	65 to 216	58 to 192	52 to 173	
	6	3.35	0.7	5.3	3.16	-	M	-	-	C	C	228 to 758	190 to 632	142 to 474	114 to 379	95 to 316	81 to 271	71 to 237	63 to 211	57 to 190
	7	3.62	0.8	6.2	3.42	-	M	-	-	C	C	246 to 821	205 to 684	154 to 513	123 to 410	103 to 342	88 to 293	77 to 257	68 to 228	62 to 205
11008 TT TJ60 XR XRC (50)	1.5	1.82	0.3	1.2	1.66	C	VC	-	VC	-	-	160 to 398	100 to 332	75 to 249	60 to 199	50 to 166	43 to 142	37 to 125	33 to 111	30 to 100
	2	2.58	0.4	1.6	2.28	C	VC	M	VC	-	-	124 to 547	137 to 456	103 to 342	82 to 274	68 to 228	59 to 195	51 to 171	46 to 152	41 to 137
	3	3.16	0.6	2.4	2.82	M	VC	M	VC	-	-	203 to 677	169 to 564	127 to 423	102 to 338	85 to 282	73 to 242	63 to 212	56 to 188	51 to 169
	4	3.65	0.8	3.2	3.27	M	C	M	VC	-	-	235 to 785	196 to 654	147 to 491	118 to 392	98 to 327	84 to 280	74 to 245	65 to 218	59 to 196
	5	4.08	1.0	4.0	3.67	M	C	M	C	-	-	264 to 881	220 to 734	165 to 551	132 to 440	110 to 367	94 to 315	83 to 275	73 to 245	66 to 220
	6	4.47	1.2	4.8	4.02	-	M	-	-	C	-	289 to 965	241 to 804	181 to 603	145 to 482	121 to 402	103 to 345	90 to 302	80 to 268	72 to 241
	7	4.83	1.3	5.7	4.34	-	M	-	-	C	-	312 to 1042	260 to 868	195 to 651	156 to 521	130 to 434	112 to 372	98 to 326	87 to 289	78 to 260
11010 TJ60 TTJ60 XR XRC (50)	1.5	2.79	0.5	1.0	2.29	VC	VC	-	VC	-	-	165 to 550	137 to 458	103 to 344	82 to 275	69 to 229	59 to 196	52 to 172	46 to 153	41 to 137
	2	3.23	0.6	1.4	2.67	C	VC	-	VC	-	-	192 to 641	160 to 534	120 to 401	96 to 320	80 to 267	69 to 229	60 to 200	53 to 178	48 to 160
	3	3.95	0.9	2.1	3.30	C	VC	-	VC	-	-	238 to 792	198 to 660	149 to 495	119 to 396	99 to 330	85 to 283	74 to 248	66 to 220	59 to 198
	4	4.56	1.2	2.8	3.82	M	VC	-	VC	-	-	275 to 917	226 to 764	172 to 573	138 to 458	115 to 382	98 to 327	86 to 287	76 to 255	69 to 229
	5	5.10	1.5	3.5	4.26	M	VC	-	VC	-	-	307 to 1022	256 to 852	192 to 639	153 to 511	128 to 426	110 to 365	96 to 320	85 to 284	77 to 256
	6	5.59	1.8	4.2	4.66	M	VC	-	VC	-	-	336 to 1118	280 to 932	210 to 699	168 to 559	140 to 466	120 to 399	105 to 350	93 to 311	84 to 280
	7	6.03	2.2	4.8	5.01	-	VC	-	VC	-	-	361 to 1202	301 to 1002	225 to 752	180 to 601	150 to 501	129 to 429	113 to 376	100 to 334	90 to 301

Figure 19: Metric - high flow mode

Nozzle number	Gauge pressure (bar)	Rated l/min	ΔP	Nozzle		Minimum duty cycle				30%		Nozzle spacing 50 cm									
				Pressure (bar)	Flow (l/min)	XR/XRC	TT	TJ60	TTJ60	DG	50 l/ha	75 l/ha	100 l/ha	125 l/ha	150 l/ha	200 l/ha	225 l/ha	250 l/ha	300 l/ha		
																				VC	C
11004 DG TT TJ60 TTJ60 XR XRC (50)	1.5	1.12	0.1	1.4	1.07	M	VC	-	VC	-	-	7.7 to 26	5.1 to 17	3.9 to 13	3.1 to 10	2.6 to 8.6	1.9 to 6.4	1.7 to 5.7	1.5 to 5.1	1.3 to 4.3	
	2	1.29	0.2	1.8	1.24	M	C	F	C	C	C	8.9 to 30	6.0 to 20	4.5 to 15	3.6 to 12	3.0 to 9.9	2.2 to 7.4	2.0 to 6.6	1.8 to 6.0		
	3	1.58	0.2	2.8	1.52	F	C	F	C	M	M	11 to 36	7.3 to 24	5.5 to 18	4.4 to 15	3.6 to 12	2.7 to 9.1	2.4 to 8.1	2.2 to 7.3		
	4	1.82	0.3	3.7	1.76	F	M	-	C	M	M	13 to 42	8.4 to 28	6.3 to 21	5.1 to 17	4.2 to 14	3.2 to 11	2.8 to 9.4	2.5 to 8.4		
	5	2.04	0.3	4.7	1.98	-	M	-	C	-	-	14 to 48	9.5 to 32	7.1 to 24	5.7 to 19	4.8 to 16	3.6 to 12	3.2 to 11	2.9 to 9.5		
	6	2.23	0.3	5.7	2.16	-	M	-	C	-	-	16 to 52	10 to 35	7.8 to 26	6.2 to 21	5.2 to 17	3.9 to 13	3.5 to 12	3.1 to 10		
	7	2.41	0.4	6.6	2.34	-	M	-	C	-	-	17 to 56	11 to 37	8.4 to 28	6.7 to 22	5.6 to 19	4.2 to 14	3.7 to 12	3.4 to 11		
11005 DG TT TJ60 TTJ60 XR XRC (50)	1.5	1.39	0.2	1.3	1.30	M	VC	-	VC	-	-	9.4 to 31	6.2 to 21	4.7 to 16	3.7 to 12	3.1 to 10	2.3 to 7.8	2.1 to 6.9	1.9 to 6.2		
	2	1.61	0.2	1.8	1.52	M	VC	M	C	C	C	11 to 36	7.3 to 24	5.5 to 18	4.4 to 15	3.6 to 12	2.7 to 9.1	2.4 to 8.1	2.2 to 7.3		
	3	1.97	0.3	2.7	1.87	M	C	M	C	C	C	13 to 45	9.0 to 30	6.7 to 22	5.4 to 18	4.5 to 15	3.4 to 11	3.0 to 10.0	2.7 to 9.0		
	4	2.27	0.4	3.6	2.17	F	C	F	C	M	M	16 to 52	10 to 35	7.8 to 26	6.2 to 21	5.2 to 17	3.9 to 13	3.5 to 12	3.1 to 10		
	5	2.54	0.4	4.6	2.43	-	M	-	C	-	-	17 to 58	12 to 39	8.7 to 29	7.0 to 23	5.8 to 19	4.4 to 15	3.9 to 13	3.5 to 12		
	6	2.79	0.5	5.5	2.67	-	M	-	C	-	-	19 to 64	13 to 43	9.6 to 32	7.7 to 26	6.4 to 21	4.8 to 16	4.3 to 14	3.8 to 13		
	7	3.01	0.6	6.4	2.89	-	M	-	C	-	-	21 to 69	14 to 46	10 to 35	8.3 to 28	6.9 to 23	5.2 to 17	4.6 to 15	4.2 to 14		
11006 TT TJ60 TTJ60 XR XRC (50)	1.5	1.68	0.2	1.3	1.54	M	VC	-	VC	-	-	11 to 37	7.4 to 25	5.5 to 18	4.4 to 15	3.7 to 12	2.8 to 9.2	2.5 to 8.2	2.2 to 7.4		
	2	1.94	0.3	1.7	1.80	M	VC	M	C	C	C	13 to 43	8.6 to 29	6.5 to 22	5.2 to 17	4.3 to 14	3.2 to 11	2.9 to 9.6	2.6 to 8.6		
	3	2.37	0.4	2.6	2.21	M	VC	M	C	C	C	16 to 53	11 to 35	8.0 to 27	6.4 to 21	5.3 to 18	4.0 to 13	3.5 to 12	3.2 to 11		
	4	2.74	0.5	3.5	2.57	M	C	F	C	C	C	19 to 62	12 to 41	9.3 to 31	7.4 to 25	6.2 to 21	4.6 to 15	4.1 to 14	3.7 to 12		
	5	3.06	0.6	4.4	2.88	F	C	F	C	C	C	21 to 69	14 to 46	10 to 35	8.3 to 28	6.9 to 23	5.2 to 17	4.6 to 15	4.1 to 14		
	6	3.35	0.7	5.3	3.16	-	M	-	C	-	-	23 to 76	15 to 51	11 to 38	9.1 to 30	7.6 to 25	5.7 to 19	5.1 to 17	4.6 to 15		
	7	3.62	0.8	6.2	3.42	-	M	-	C	-	-	25 to 82	16 to 55	12 to 41	9.8 to 33	8.2 to 27	6.2 to 21	5.5 to 18	4.9 to 16		
11008 TT TJ60 TTJ60 XR XRC (50)	1.5	2.23	0.3	1.2	1.96	C	VC	-	VC	-	-	14 to 47	9.4 to 31	7.1 to 24	5.6 to 19	4.7 to 16	3.5 to 12	3.1 to 10	2.8 to 9.4		
	2	2.58	0.4	1.6	2.28	C	VC	M	C	C	C	16 to 55	11 to 36	8.2 to 27	6.6 to 22	5.5 to 18	4.1 to 14	3.6 to 12	3.3 to 11		
	3	3.16	0.6	2.4	2.82	M	VC	M	C	C	C	20 to 68	14 to 45	10 to 34	8.1 to 27	6.8 to 23	5.1 to 17	4.5 to 15	4.1 to 14		
	4	3.65	0.8	3.2	3.27	M	C	M	VC	C	C	24 to 78	16 to 52	12 to 39	9.4 to 31	7.8 to 26	5.9 to 20	5.2 to 17	4.7 to 16		
	5	4.08	1.0	4.0	3.67	M	C	M	C	C	C	26 to 88	18 to 59	13 to 44	11 to 35	8.8 to 29	6.6 to 22	5.9 to 20	5.3 to 18		
	6	4.47	1.2	4.8	4.02	-	M	-	C	-	-	29 to 96	19 to 64	14 to 48	12 to 39	9.6 to 32	7.2 to 24	6.4 to 21	5.8 to 19		
	7	4.83	1.3	5.7	4.34	-	M	-	C	-	-	31 to 104	21 to 69	16 to 52	12 to 42	10 to 35	7.8 to 26	6.9 to 23	6.2 to 21		
11010 TJ60 TTJ60 XR XRC (50)	1.5	2.79	0.5	1.0	2.29	VC	-	-	-	-	-	16 to 55	11 to 37	8.2 to 27	6.6 to 22	5.5 to 18	4.1 to 14	3.7 to 12	3.3 to 11		
	2	3.23	0.6	1.4	2.67	C	-	-	XC	C	C	19 to 64	13 to 43	9.6 to 32	7.7 to 26	6.4 to 21	4.8 to 16	4.3 to 14	3.8 to 13		
	3	3.95	0.9	2.1	3.30	C	-	M	VC	C	C	24 to 79	16 to 53	12 to 40	9.5 to 32	7.9 to 26	5.9 to 20	5.3 to 18	4.8 to 16		
	4	4.56	1.2	2.8	3.82	M	-	M	C	C	C	28 to 92	18 to 61	14 to 46	11 to 37	9.2 to 31	6.9 to 23	6.1 to 20	5.5 to 18		
	5	5.10	1.5	3.5	4.26	M	-	M	C	C	C	31 to 102	20 to 68	15 to 51	12 to 41	10 to 34	7.7 to 26	6.8 to 23	6.1 to 20		
	6	5.59	1.8	4.2	4.66	M	-	M	C	C	C	34 to 112	22 to 75	17 to 56	13 to 45	11 to 37	8.4 to 28	7.5 to 25	6.7 to 22		
	7	6.03	2.2	4.8	5.01	-	-	-	C	C	C	36 to 120	24 to 80	18 to 60	14 to 48	12 to 40	9.0 to 30	8.0 to 27	7.2 to 24		

Figure 20: US Turf - high flow mode

Tip No.	Gauge Pressure psi	Rated GPM	Δ P	Tip		Minimum Duty Cycle 30%		Tip Spacing 20 inches						
				PSI	Flow	XR/XRC	TT	MPH						
								1.0 Gal/1000ft²	1.5 Gal/1000ft²	2.0 Gal/1000ft²	2.5 Gal/1000ft²	3.0 Gal/1000ft²	4.0 Gal/1000ft²	
11006 TT XR XRC (50)	20	0.42	4	16	0.37	C	XC	1.2 to 5.0	0.8 to 3.4	0.6 to 2.5	0.5 to 2.0	0.4 to 1.7	0.3 to 1.3	
	30	0.52	5	25	0.48	M	VC	1.5 to 6.5	1.0 to 4.4	0.7 to 3.3	0.6 to 2.6	0.5 to 2.2	0.4 to 1.6	
	40	0.60	5	35	0.56	M	VC	1.7 to 7.6	1.1 to 5.1	0.8 to 3.8	0.7 to 3.0	0.6 to 2.5	0.4 to 1.9	
	50	0.67	6	44	0.63	M	VC	1.9 to 8.6	1.2 to 5.7	0.9 to 4.3	0.7 to 3.4	0.6 to 2.9	0.5 to 2.1	
	60	0.73	6	54	0.69	M	C	2.0 to 9.4	1.3 to 6.3	1.0 to 4.7	0.8 to 3.8	0.7 to 3.1	0.5 to 2.3	
	70	0.79	7	63	0.75	F	C	2.1 to 10.2	1.4 to 6.8	1.1 to 5.1	0.8 to 4.1	0.7 to 3.4	0.5 to 2.6	
	80	0.85	8	72	0.81	-	C	2.2 to 11.0	1.5 to 7.3	1.1 to 5.5	0.9 to 4.4	0.7 to 3.7	0.6 to 2.8	
	90	0.90	9	81	0.86	-	M	2.3 to 11.7	1.5 to 7.8	1.1 to 5.8	0.9 to 4.7	0.8 to 3.9	0.6 to 2.9	
	11008 TT XR XRC (50)	20	0.57	5	15	0.49	C	XC	1.5 to 6.7	1.0 to 4.4	0.7 to 3.3	0.6 to 2.7	0.5 to 2.2	0.4 to 1.7
30		0.69	6	24	0.62	C	VC	1.8 to 8.4	1.2 to 5.6	0.9 to 4.2	0.7 to 3.4	0.6 to 2.8	0.4 to 2.1	
40		0.80	7	33	0.72	M	VC	2.0 to 9.8	1.4 to 6.5	1.0 to 4.9	0.8 to 3.9	0.7 to 3.3	0.5 to 2.4	
50		0.89	9	41	0.81	M	C	2.1 to 11.0	1.4 to 7.3	1.1 to 5.5	0.8 to 4.4	0.7 to 3.7	0.5 to 2.8	
60		0.98	10	50	0.89	M	C	2.4 to 12.1	1.6 to 8.1	1.2 to 6.1	0.9 to 4.8	0.8 to 4.0	0.6 to 3.0	
70		1.06	12	58	0.97	M	C	2.5 to 13.2	1.7 to 8.8	1.2 to 6.6	1.0 to 5.3	0.8 to 4.4	0.6 to 3.3	
80		1.13	13	67	1.03	-	C	2.6 to 14.0	1.7 to 9.3	1.3 to 7.0	1.0 to 5.6	0.9 to 4.7	0.6 to 3.5	
90		1.20	15	75	1.09	-	C	2.6 to 14.8	1.7 to 9.9	1.3 to 7.4	1.0 to 5.9	0.9 to 4.9	0.6 to 3.7	
11010 XR XRC (50)		30	0.87	8	22	0.74	C	-	2.1 to 10.1	1.4 to 6.7	1.0 to 5.0	0.8 to 4.0	0.7 to 3.4	0.5 to 2.5
	40	1.00	11	29	0.86	C	-	2.4 to 11.7	1.6 to 7.8	1.2 to 5.8	1.0 to 4.7	0.8 to 3.9	0.6 to 2.9	
	50	1.12	13	37	0.96	C	-	2.6 to 13.1	1.8 to 8.7	1.3 to 6.5	1.1 to 5.2	0.9 to 4.4	0.7 to 3.3	
	60	1.22	16	44	1.05	M	-	2.8 to 14.3	1.9 to 9.5	1.4 to 7.1	1.1 to 5.7	0.9 to 4.8	0.7 to 3.6	
	70	1.32	19	51	1.13	M	-	2.9 to 15.4	1.9 to 10.2	1.5 to 7.7	1.2 to 6.1	1.0 to 5.1	0.7 to 3.8	
80	1.41	22	58	1.20	M	-	3.0 to 16.3	2.0 to 10.9	1.5 to 8.2	1.2 to 6.5	1.0 to 5.4	0.7 to 4.1		

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98-05334-EN-A4 R2 English
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