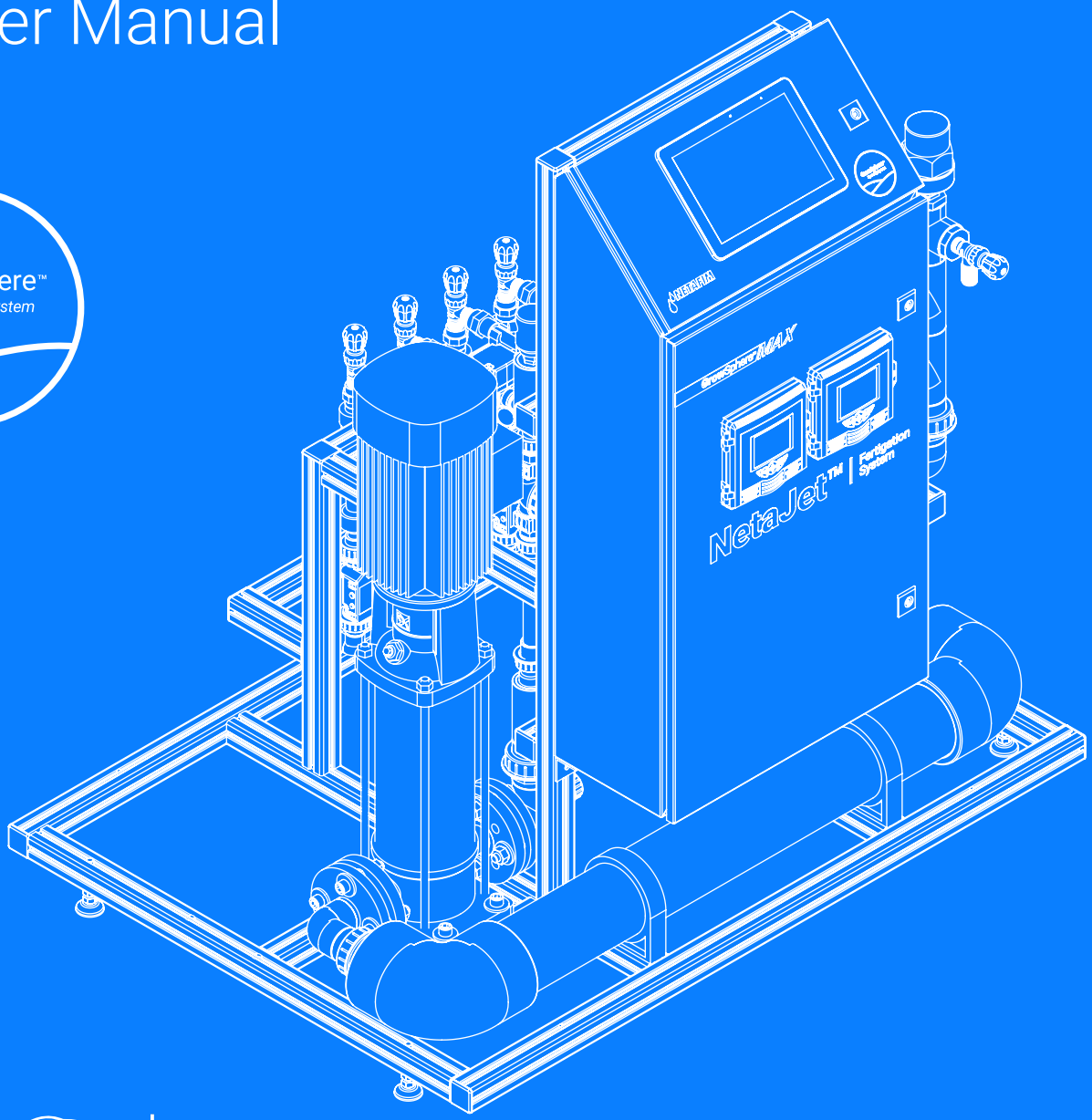
NetaJet™ 5G with GrowSphere™ Max Controller

User Manual

GrowSphere™ Operating System



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NETAFIM™

→ The Symbols Used in This Document Refer to the Following:

WARNING
Contains instructions aimed at preventing bodily injury or direct damage to the crops, the NetBeat™ system and/or the infrastructure.

CAUTION
Contains instructions aimed at preventing unwanted system operation, installation or conditions that, if not followed, might void the warranty.

ATTENTION
Contains instructions aimed at enhancing the efficiency of usage of the instructions in the manual.

NOTE
Contains instructions aimed at emphasizing certain aspect of the operation of the system or installation.

ACID HAZARD
Contains instructions aimed at preventing bodily injury or direct damage to the crops and/or the irrigation system in the presence of acid.

PROTECTIVE EQUIPMENT
Contains instructions aimed at preventing damage to health or bodily injury in the presence of nutrients, acid or chemicals.

FOREIGN LANGUAGES
In the event that you are reading this manual in a language other than the English language, you acknowledge and agree that the English language version shall prevail in case of inconsistency or contradiction in interpretation or translation.

Contents

Safety

CAUTION
Read the Safety instructions chapter before using, maintaining or troubleshooting the NetaJet™ 5G.

→ SAFETY INSTRUCTIONS

- **All safety regulations must be applied.**
- Ensure that the installation is carried out in a manner that prevents leaks from the NetaJet™, the fertilizer/acid tanks and lines, the peripherals and the accessories (contaminating the environment, soil or ambient area).
- Electrical installation should be performed by an authorized electrician only.
- The electrical installation must comply with the local safety standards and regulations.
- Installation should be performed by authorized technicians only.
- Protection provided by the equipment can be impaired if the equipment is used in a manner other than that specified by the manufacturer.

WARNING
In agricultural environments - always wear protective footwear.

PROTECTIVE EQUIPMENT
Always use protective equipment, gloves and goggles when handling fertilizers, acid and other chemicals!

WARNING
Measures must be taken to prevent fertilizer infiltration of the water source, to avoid water pollution.

CAUTION
When opening or closing any manual valve, always do so gradually, to prevent damage to the system by water hammer.

NOTE
- The maximum sound level produced by the equipment does not exceed 70dB.
- Overvoltage category: II
- Pollution degree: II
- Manufacturer´s declaration, Hi-Pot: 2100VDC, GND Bond

→ Safety Instructions when Using Acid/Chemicals

ACID HAZARD

When using acid - always observe the acid manufacturer's safety instructions.

CAUTION

Always use protective equipment, gloves and goggles when handling fertilizers, acid and other chemicals!

CAUTION

There are fertilizer combinations that at high concentration might induce crystallization in the NetaJet's lower manifold and cause clogging of the pipes.

Fertilizer combinations prone to induce crystallization:

Calcium Nitrate	+	Ammonium Sulfate	=>	Calcium Sulfate
Calcium Nitrate	+	Potassium Sulfate	=>	Calcium Sulfate
MKP	+	Calcium Nitrate	=>	Calcium Phosphate
MAP	+	Calcium Nitrate	=>	Calcium Phosphate
Phosphoric acid	+	Calcium Nitrate	=>	Calcium Phosphate

When injecting these fertilizer combinations:

- Make sure to dilute each fertilizers to the allowed concentration in the fertilizer tank prior to injection through the NetaJet™
- Imediately after each injection of any of the fertilizer combination above, flush the NetaJet™ with clean water for at least 2 minutes.

In case of doubt regarding the use of any combination of fertilizers, contact your Netafim™ local representative.

ATTENTION

When dosing acid, use a dosing channel fitted with the appropriate components according to the type and concentration of acid used*:

		For pH correction					For maintenance of drippers		
Type of dosing channel	Diaphragm and O-rings	Nitric acid (HNO_3)	Phosphoric acid (H_3PO_4)	Sulfuric acid (H_2SO_4)	Potassium hydroxide (KOH)	Acetic acid (CH_3COOH)	Hydrochloric (HCl)	Hydrogen peroxide (H_2O_2)	Chlorine (as hypochloride)
For diluted acid	EPDM	<3%	<85%	<30%	<35%	<30%	<10%	<30%	<1%
For concentrated acid	Viton	<40%	<85%	<90%	<10%	<5%	<33%	<50%	<10%

% is by weight at 21°C (70°F)

*The table indicates the resistance of the dosing channel components to acid, and is not a recommendation to use the acids mentioned.

WARNING

- Exceeding the recommended acid concentrations will damage the dosing channels.
- Substances such as chemicals for pest/disease control might be corrosive and damage the NetaJet™ 5G. When using any substance other than fertilizers or acids not exceeding the concentrations in the table above, always observe the manufacturer's instructions for corrosivity.

In case of any doubt, contact your Netafim™ local representative.

Description

→ Features

- The NetaJet™ 5G realizes Netafim's "grow more with less" concept. Based on Netafim's unique Nutrigation™ technology, it controls the amount of water and fertilizers used, optimizing resource utilization for each specific crop and soil/substrate type.
- The NetaJet™ 5G is extremely accurate and reliable, preventing water and fertilizer waste while reducing environmental pollution.
- The NetaJet™ 5G ensures very precise and homogeneous nutrient dosing for greenhouse crops.
- The NetaJet™ 5G is a modular CE-compliant dosing system that easily integrates with multiple Netafim™ and third-party control and monitoring systems.
- The NetaJet™ 5G always injects a uniform quantity of nutrients while performing perfect EC and pH control.
- The NetaJet™ 5G can accommodate a wide variety of dosing channels for fertilizer and concentrated/diluted acid.
- The NetaJet™ 5G accommodates a wide variety of system pumps, peripherals and accessories to meet a vast range of applications and infrastructure constraints.

→ Highlights

- Equipped with Netafim's unique innovative analog dosing channels for very accurate and reliable EC/pH control.
- Provides fast and accurate fertilizer and acid control.
- State-of-the-art technology with unique static mixing chamber
- Short control cycle
- Efficient water, fertilizer and energy consumption
- Guaranteed EC and pH control
- Almost completely maintenance-free Venturi operations – no moving parts
- Highly accurate dosing channels
- Fast and efficient Nutrigation™ recipe adjustments
- Multi-lingual capabilities
- Made by Netafim™

→ Advantages

- Easy system installation and maintenance
- In-house developed offering
- Versatile flow capacity
- Covers all applications ranging from greenhouse in soil, to very intensive soilless media
- Requires minimal investment with rapid ROI

→ Operating Principle

The NetaJet™ 5G doses the various fertilizers and acids into a homogeneous solution in its unique HidroMix static mixing chamber and injects it into the irrigation water main line.

The suction of the fertilizers and acid in the dosing channels is based on the Venturi principle. This requires a pressure differentiation - available on the main line or supplied by the main line pump or the NetaJet's dosing booster.

→ Main Components

- HydroMix static mixing chamber
- A compensation channel with a pressure regulator
- Factory-installed PRV at the inlet and a PSV at the outlet
- Selectable analog dosing channels
- Dual EC/pH monitoring and control
- Quick-action dosing valves
- Ultrasonic Fertilzer flow meter
- Wide range of integrated accessories and peripherals
- High-quality components and PVC piping
- Aluminum, corrosion-resistant frame with adjustable legs

→ Analog Dosing Channel

The NetaJet™ 5G is the first fertilizer-dosing system equipped with Netafim's unique innovative analog dosing channel.

The analog dosing channel is the long-awaited solution for very accurate and reliable EC/pH control for Nutrigation™ of high-value greenhouse crops.

The analog dosing channel is equipped with a servo motor capable of continuous variable opening from 0 to 100%. This unique feature allows unprecedented precise and seamless Nutrigation™.

Advantages

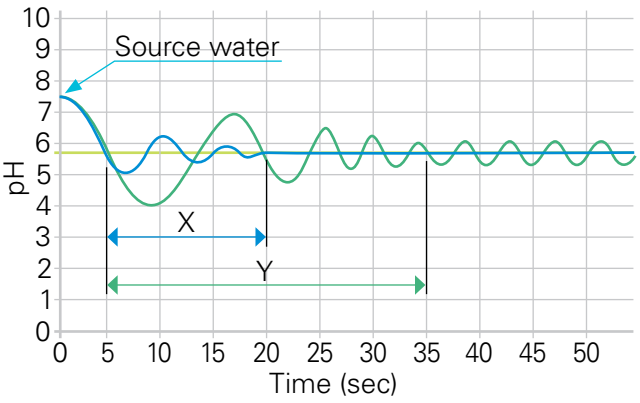
- Ultra-high precision
- Smooth and stable hydraulic operation
- No fluctuations
- Fast EC/pH set-point reaching
- Short stabilization time
- Enables short Nutrigation™ cycles
- No risk of cavitation damage to the booster

Stabilization time

The analog dosing channel offers the benefit of a significantly shorter stabilization time compared with the digital (pulsating) dosing channel (up to 50%). This is particularly beneficial when performing short Nutrigation™ cycles typical of greenhouse crops.

- X = Analog (continuous-variable) dosing channel
- Y = Digital (pulsating) dosing channel

Digital (ON/OFF) vs. analog dosing channel performances



— Analog (continuous-variable) dosing channel
— Digital (pulsating) dosing channel
— pH set point

CAUTION

Using an analog dosing channel featuring an ultrasonic fertilizer meter. **Make sure there are no air bubbles in the water.** If there are air bubbles visible in the rotameter:

1. Check all the connectors along the dosing pipe, from the fertilizer tank to the dosing channel, and tighten where necessary.
2. Make sure the fertilizer tank is at least 25% full.
3. In the rare case a fertilizer by itself creates air bubbles, consult Netafim's product manager.

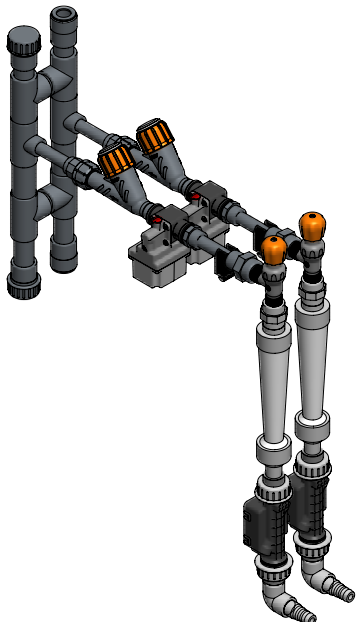
→ Dual Dosing Channel

The NetaJet™ 5G Octa mode (8 dosing channels) includes 3 dual dosing channel.

The dual dosing channel is applicable with 50 l/h (13 GPH) and 600 l/h (158 GPH) Venturis.

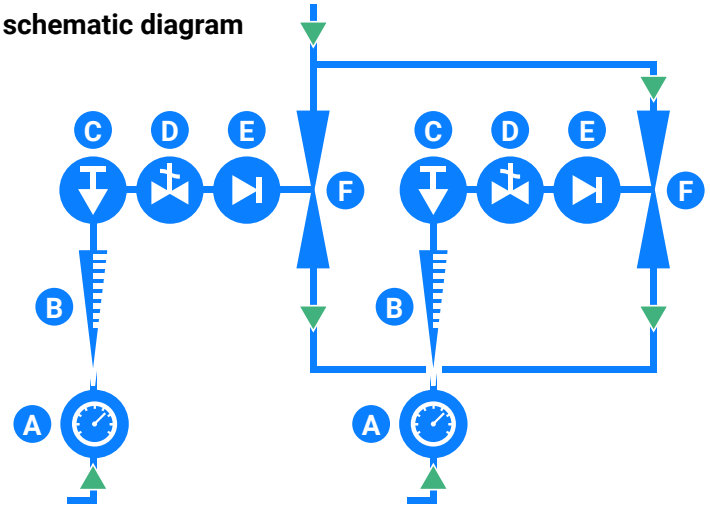
CAUTION

There are fertilizer combinations that should never be used in any concentration in the dual dosing channel! (see CAUTION, page 5)



Dual dosing channel schematic diagram

- A Fertilizer meter
- B Rotameter
- C Needle valve
- D Dosing valve
- E Check valve
- F Venturi



→ Capabilities

NetaJet™ 5G modes fed by a pressurised main line are suitable for a vast range of main line pressures

- Standard: 2.5 - 5.8 bar (36.5 - 84.0 PSI)
- High pressure: 5.8 - 7.5 bar (84.0 - 108.5 PSI)

For main line pressures lower than 2.5 bar (36.5 PSI), consult Netafim™.

NetaJet™ 5G modes fed by a storage tank

The water level in the storage tank should not be higher than 5 meters (16.4 feet) above the NetaJet™ 5G inlet.

Various dosing channel configuration options

- Most modes: Up to 5 highly accurate dosing channels of various types, from 50 l/hr (13 GPH) up to 600 l/hr (158 GPH) each.
- Octa mode: Up to 8 highly accurate dosing channels of various types, from 50 l/hr (13 GPH) up to 600 l/hr (158 GPH) each.
- High-flow mode: Up to 5 highly accurate dosing channels of various types, from 50 l/hr (13 GPH) up to 1000 l/hr (264 GPH) each.

→ Service

The NetaJet™ 5G utilizes modular construction, making servicing a simple and quick process. The dealer keeps a small quantity of interchangeable components on hand, for replacement on site within a few minutes.

→ Maintenance

To prevent failures and extend the life cycle of the NetaJet™ 5G, regular maintenance must be carried out by the user, such as periodic rinsing of filters and calibration of the EC and pH sensors.
Regular maintenance of the NetaJet™ 5G is a time- and cost-efficient process requiring no special tools or skills.

→ Add-Ons

You can extend the functionality of your NetaJet™ 5G by means of the the wide variety of useful add-ons. All the add-ons are easy to connect to the NetaJet™ 5G - here are a few examples:

Fertilizer meter with electric output

Enables continuous reading of fertilizer dosing. Allows a broader indication of fertilizer flow in addition to the EC and pH readings. Controlled and monitored by the NetaJet™ 5G GrowSphere™ MAX controller.

Stock selection

Enables the dosing of multiple fertilizers through a single dosing channel (in cases where simultaneous dosing is not required). Available in a wide variety of configurations, from a single channel with 2 fertilizers to as many channels and fertilizers as required. Installed externally, controlled and monitored by the NetaJet™ 5G GrowSphere™ MAX controller.

For further information on the NetaJet™ 5G add-ons, consult Netafim™.

→ Modes

- **BP PL**: Bypass system for pressurized-line water source; 5 dosing channels (see page 10)
- **BP ST**: Bypass system for storage-tank water source; 5 dosing channels (see page 12)
- **IL PL**: Inline system for pressurized-line water source; 5 dosing channels (see page 14)
- **IL ST**: Inline system for storage-tank water source; 5 dosing channels (see page 16)
- **High-flow**: High-flow bypass system for pressurized-line water source; 5 dosing channels (see page 18)
- **Octa - 8-channel**: Bypass system for pressurized-line water source; 6-8 dosing channels (see page 20)

Legend:

BP	Bypass
IL	Inline
PL	Pressurized line
ST	Storage tank

→ Main Parts of the Netajet™ 5G and its Infrastructure

The list below presents the main parts of the NetaJet™ 5G and the parts of the infrastructure required for the operation of the NetaJet™ 5G various modes.

1. Dosing channel + Venturi
2. Dual dosing channel + Venturis
3. Inlet pressure gauge
4. Outlet pressure gauge
5. Lower manifold pressure gauge
6. Main line pressure gauge
7. Sampling outlet
8. Controller
9. EC/pH transducer
10. Dosing booster switchbox
11. pH sensor
12. EC sensor
13. Dosing booster
14. Check valve
15. Pressure switch
16. Pressure sustaining valve (PSV)
17. Pressure reducing valve (PRV)
18. Air release valve
19. Mixing chamber
20. Compensation channel
21. Onboard main line pump
22. Upper manifold filter
23. Main line pump
24. Main line filter
25. Main line water meter
26. Main line pressure sustaining valve (PSV)
27. Manual valve (isolation)
28. Irrigation valve
29. Fertilizer/acid filter
30. Manual valve (fertilizer)
31. Fertilizer/acid stock tank

Legend:

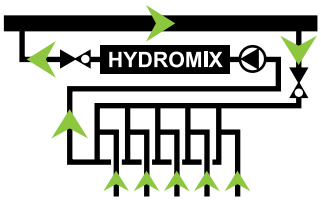
- Supplied (part of the NetaJet™ 5G)
- Not supplied (part of infrastructure)

Select your NetaJet™ 5G according to the required flow rate of the largest irrigation shift.

ATTENTION
Make sure that the selected system pump fits the electricity voltage, phases and frequency on site.

ATTENTION
Calculations are either in metric or in US units - consistency in the type of units used is essential.

→ BP PL mode



Bypass system for pressurized-line water source.

Operating principle:
The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster pump integrated in the NetaJet™ 5G. This mode of operation, where the lower manifold is under low pressure (around 0 bar/PSI), permits the use of high-efficiency Venturis with high suction capacity and low motive flow consumption.

Suitable for main line flow rate:
20-120 m³/h (90-500 GPM)
Flow limitation depends on the fertilizer injection rate and the size of the Venturis.

Suitable for main line pressure:
Standard: 2.5-5.8 bar (36.5-84.0 PSI)
High pressure: 5.8-7.5 bar (84.0-108.5 PSI)
For main line pressures lower than 2.5 bar (36.5 PSI), consult Netafim™.

Dosing channels:
Accommodates a wide variety of highly accurate analog or digital dosing channels for fertilizer and concentrated/diluted acid:

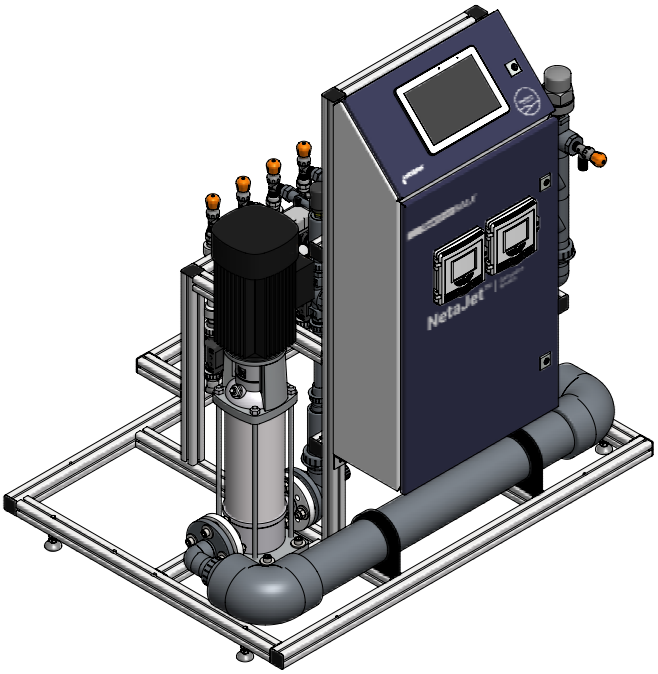
- Up to 5 dosing channels of various types, from 50 l/hr (13 GPH) up to 600 l/hr (158 GPH) each.
- Optional - Concentrated acid channel, 50 l/h (13 GPH).

Total fertilizer/acid suction capacity - up to 3000 l/h (792 GPH).

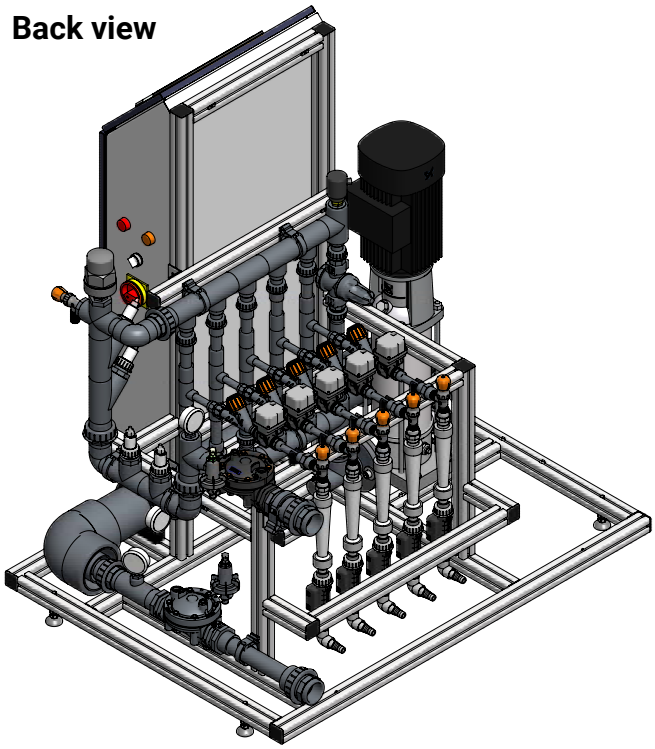
Controller:
GrowSphere™ MAX (Operation with third-party controllers is optional. Consult Netafim™.)

EC/pH:
Precise single or dual monitoring and control - selectable by customer.

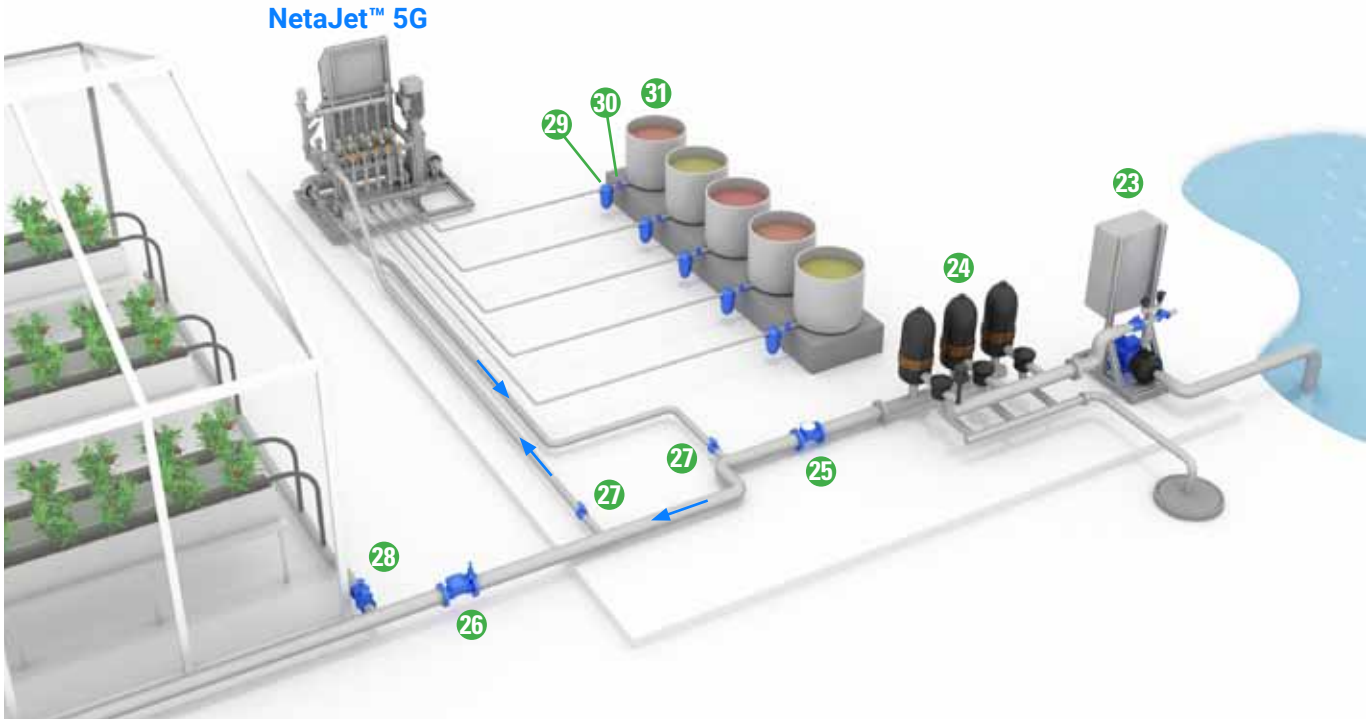
Front view



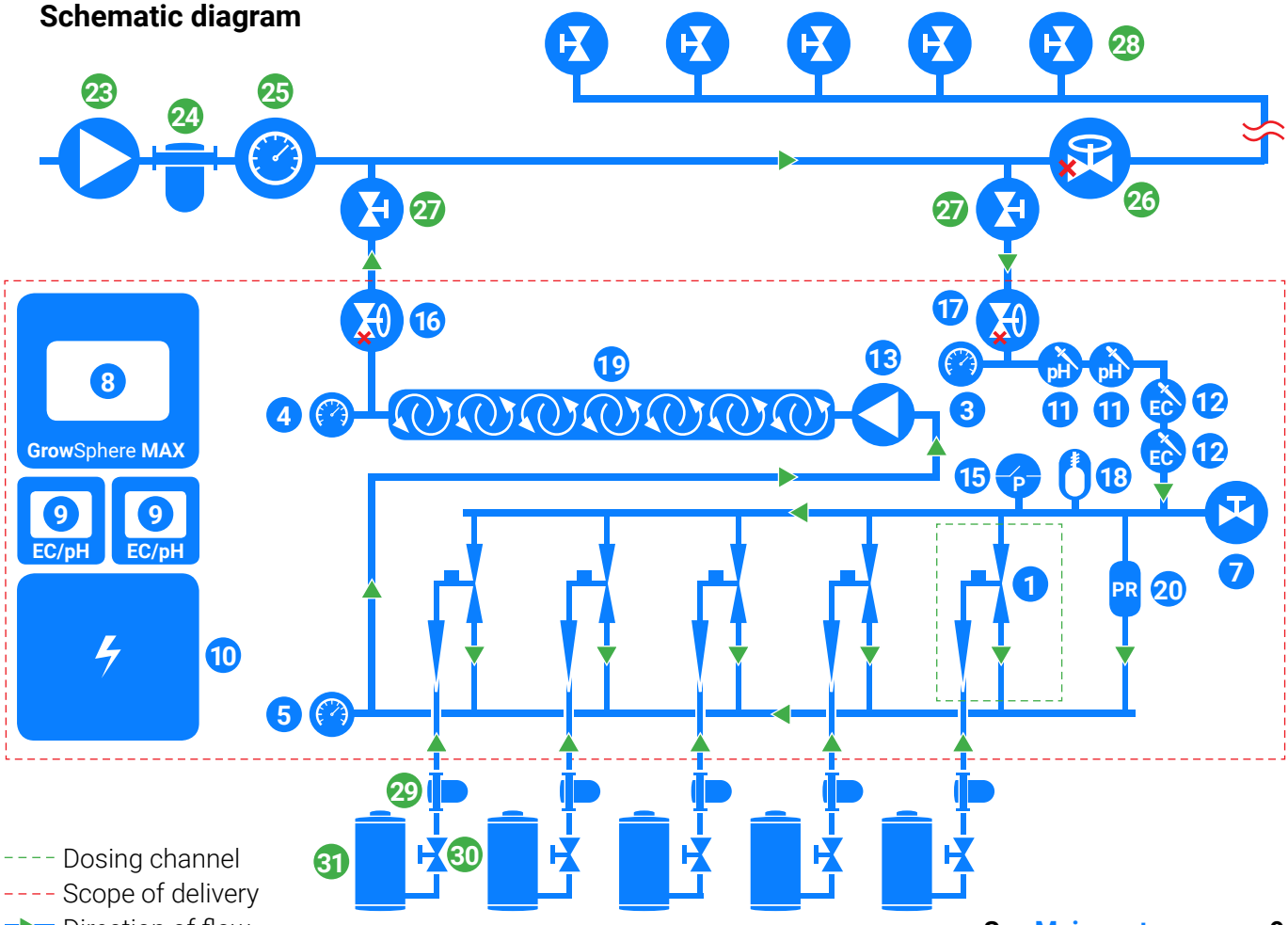
Back view



BP PL mode - typical setup

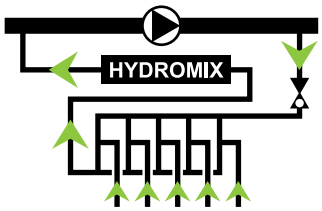


Schematic diagram



See Main parts on page 9

→ BP ST mode



Bypass system for storage-tank water source.

Operating principle:
For systems operating at low pressure - from an on-ground reservoir or a storage tank [max. height: 6 meters (20 feet)].
The main line pump also serves as dosing booster pump.

Suitable for main line flow rate:
15-100 m³/h (66-440 GPM)
Flow limitation depends on the fertilizer injection rate and the size of the Venturis.

Suitable for main line pressure:
The water level in the storage tank should not be higher than 5 meters (16.4 feet) above the NetaJet™ 5G inlet.

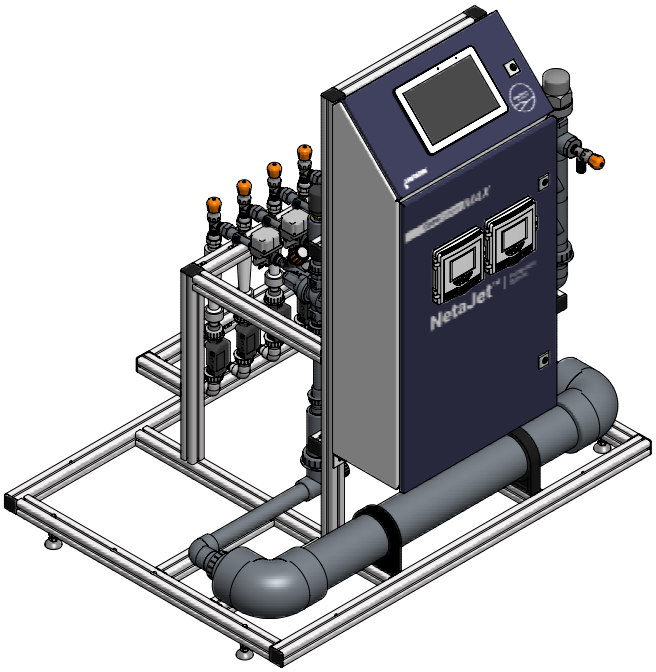
Dosing channels:
Accommodates a wide variety of highly accurate analog or digital dosing channels for fertilizer and concentrated/diluted acid:
- Up to 5 x 50-600 l/hr (13-158 GPH)
- Optional - Concentrated acid channel, 50 l/h (13 GPH).

Total fertilizer/acid suction capacity - up to 3000 l/h (792 GPH).

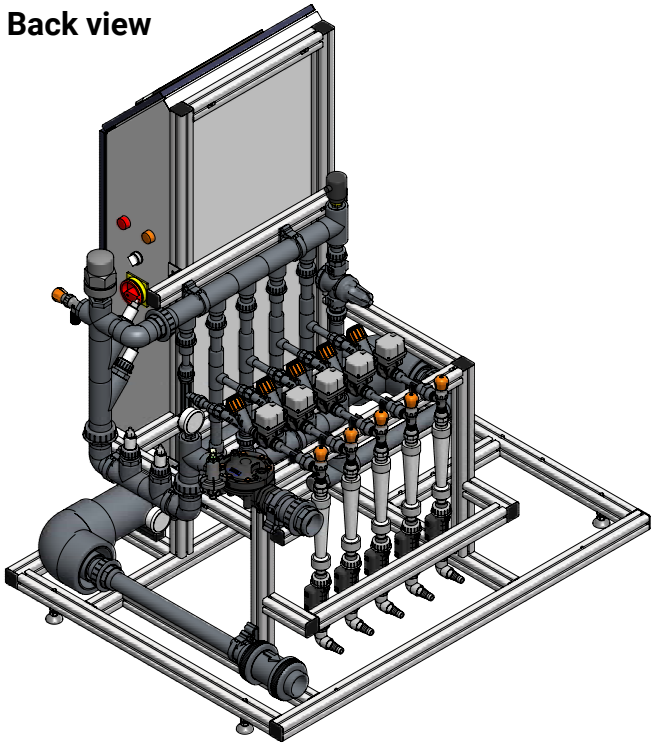
Controller:
GrowSphere™ MAX (Operation with third-party controllers is optional. Consult Netafim™.)

EC/pH:
Precise single or dual monitoring and control - selectable by customer.

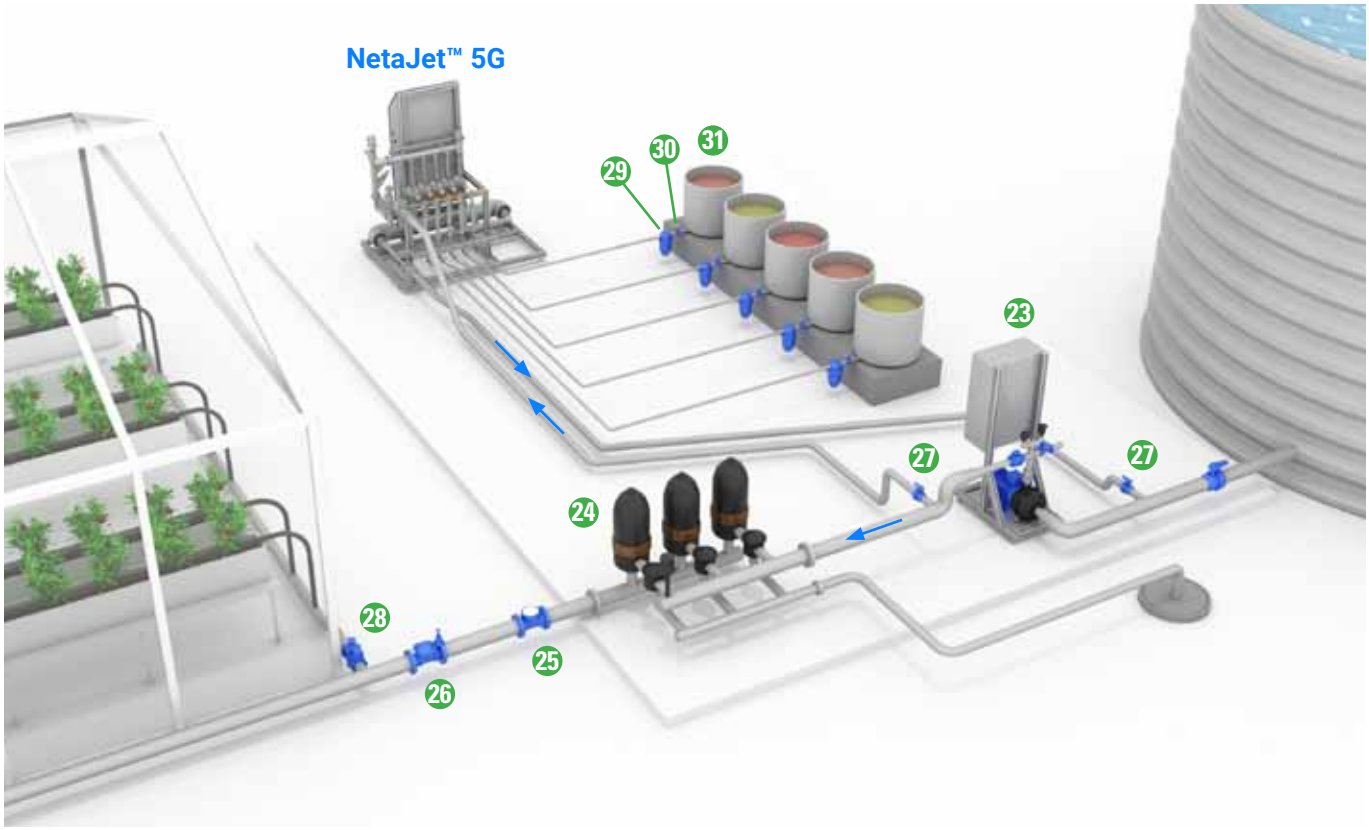
Front view



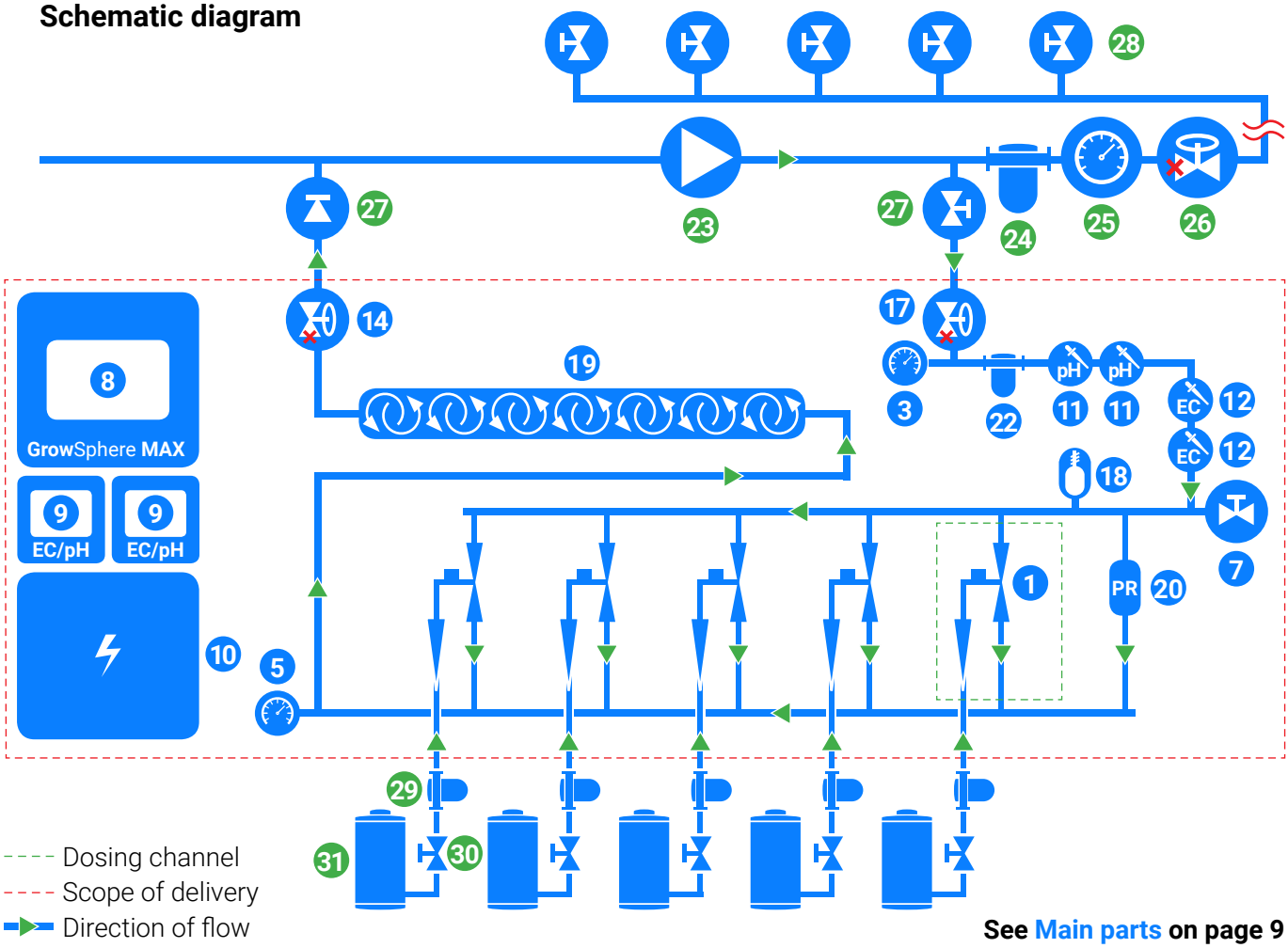
Back view



BP ST mode - typical setup

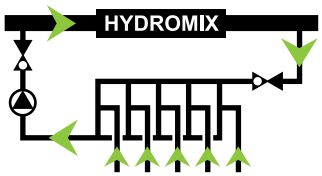


Schematic diagram



See Main parts on page 9

→ IL PL mode



Inline system for pressurized line water source.

Operating principle:
The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster pump integrated in the NetaJet™ 5G. This mode of operation, where the lower manifold is at low pressure (around 0 bar/psi), allows the use of high-efficiency Venturis with high suction capacity and low motive flow consumption.
Since all the main line water flows through the system, slight pressure losses at the NetaJet™ 5G outlet should be considered (see the table below).

Suitable for main line flow rate:
Up to 20 m³/h (90 GPM)

Suitable for main line pressure:
Standard: 2.5-5.8 bar (36.5-84.0 PSI)
High pressure: 5.8-7.5 bar (84.0-108.5 PSI)

pressure losses

Flow rate m³/h (GPM)	Pressure loss bar (PSI)
5 (22)	0.3 (4.35)
10 -20 (44-88)	0.4 (5.8)

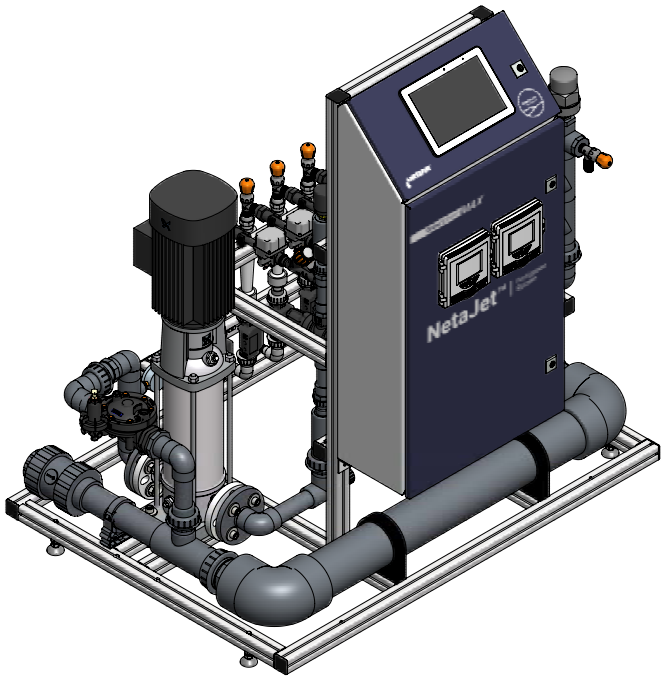
Dosing channels:
Accommodates a wide variety of highly accurate analog or digital dosing channels for fertilizer and concentrated/diluted acid:
- Up to 5 dosing channels of various types, 50-400 l/hr (13-105.5 GPH) each.
- Optional - Concentrated acid channel, 50 l/h (13 GPH).

Total fertilizer/acid suction capacity - up to 2000 l/h (528 GPH).

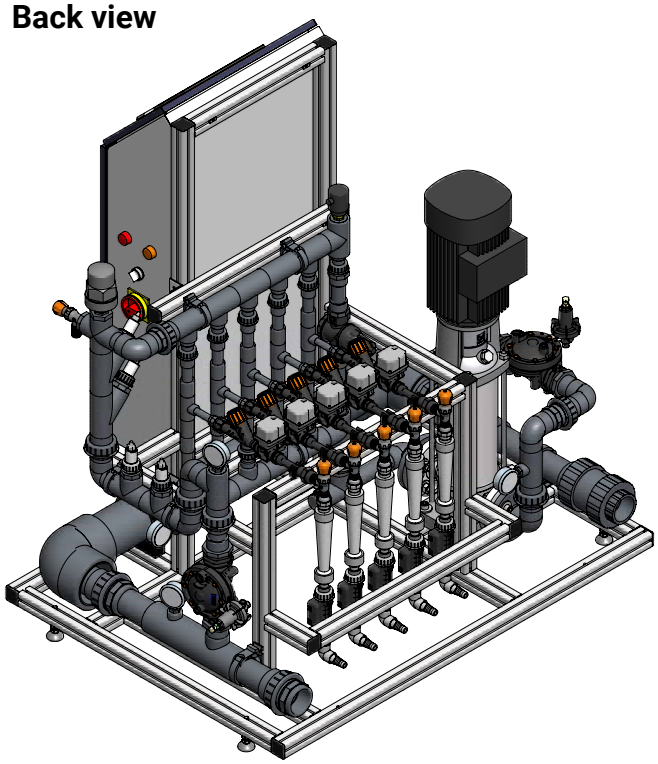
Controller:
GrowSphere™ MAX (Operation with third-party controllers is optional. Consult Netafim™.)

EC/pH:
Precise single or dual monitoring and control - selectable by customer.

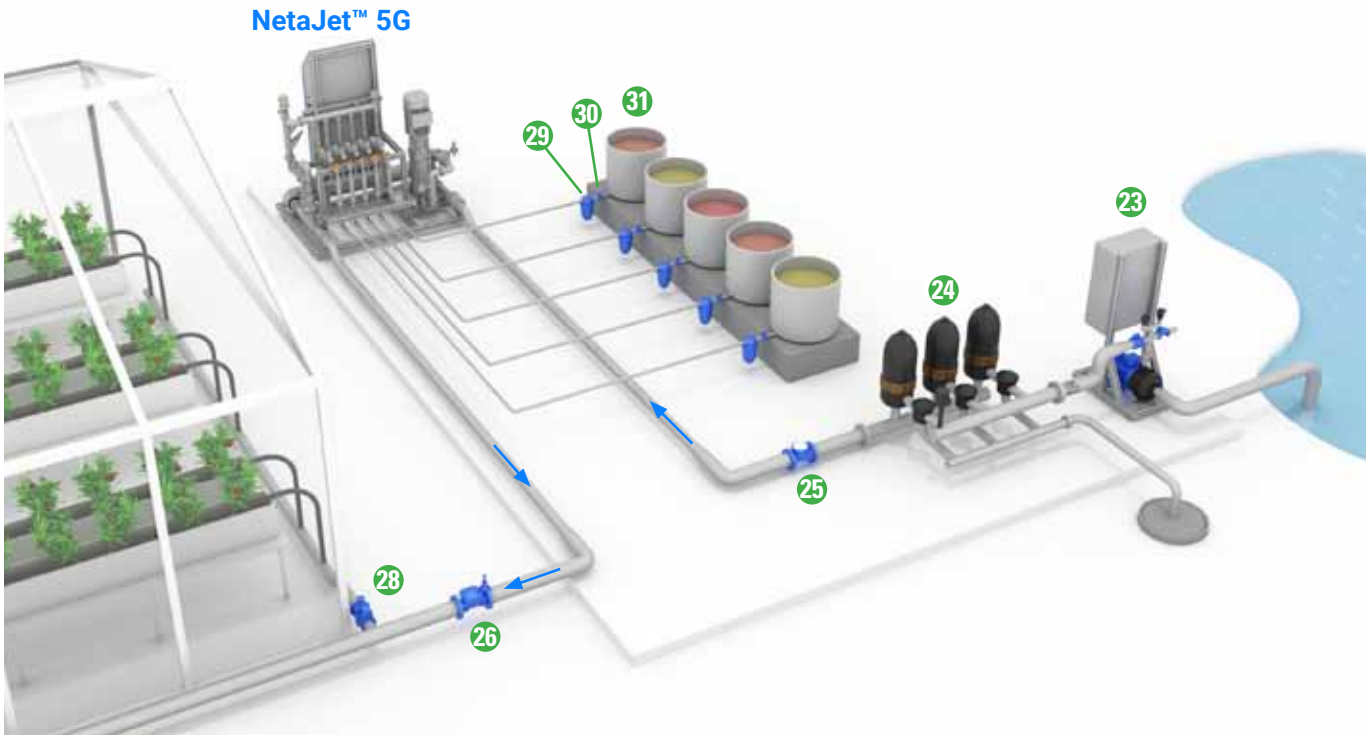
Front view



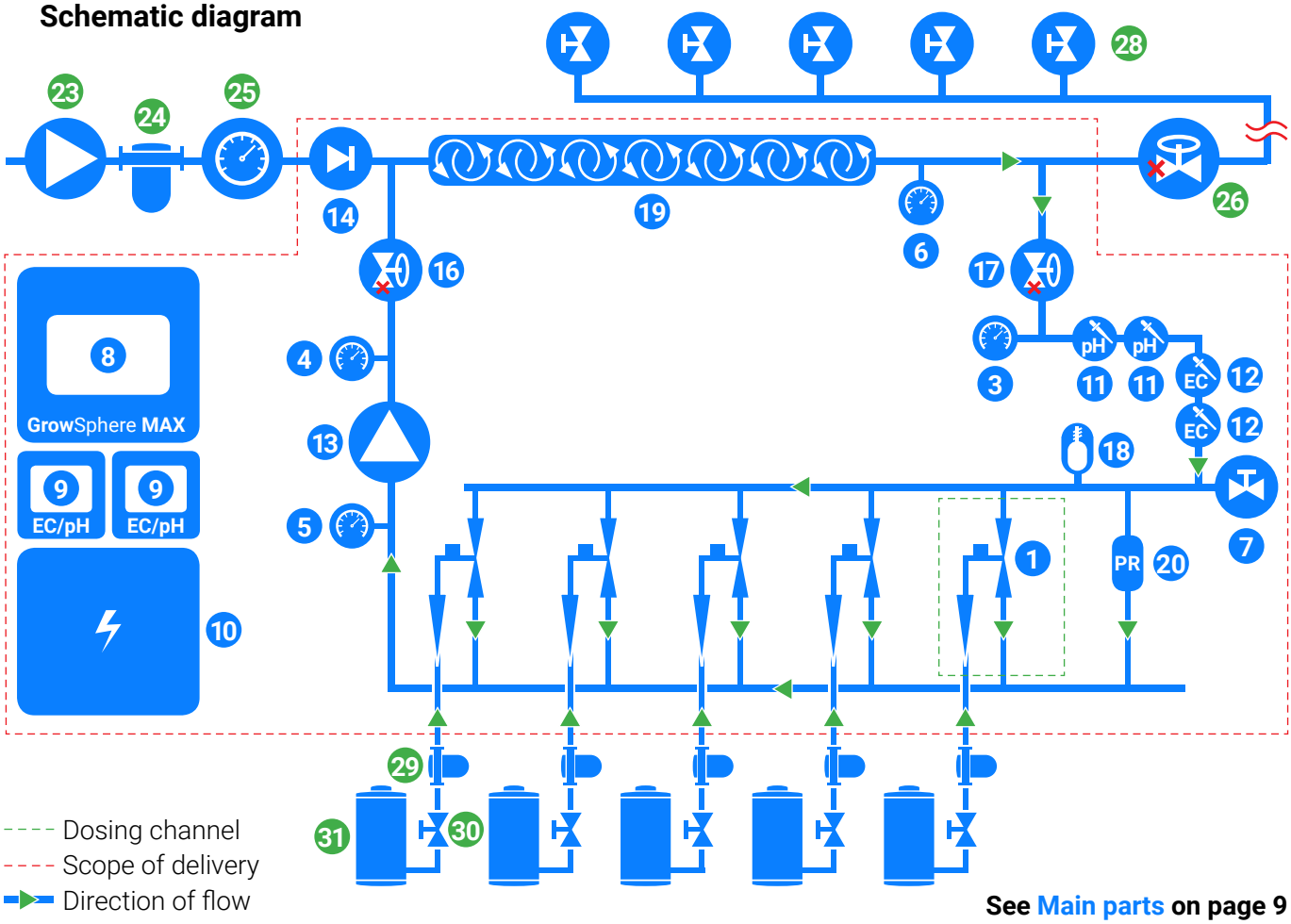
Back view



IL PL mode - typical setup

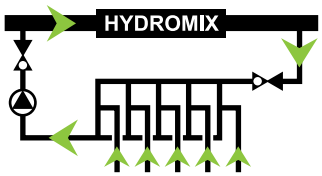


Schematic diagram



See Main parts on page 9

→ IL ST mode



Inline system for storage-tank water source.

Operating principle:
The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster pump integrated in the NetaJet™ 5G. This mode of operation, where the lower manifold is at low pressure (around 0 bar/psi), allows the use of high-efficiency Venturis with high suction capacity and low motive flow consumption.
Since all the main line water flows through the system, slight pressure losses at the NetaJet™ 5G outlet should be considered (see the table below).

Suitable for main line flow rate:
Up to 20 m³/h (90 GPM)

Suitable for main line pressure:
The water level in the storage tank should not be higher than 5 meters (16.4 feet) above the NetaJet™ 5G inlet.

pressure losses

Flow rate m³/h (GPM)	Pressure loss bar (PSI)
5 (22)	0.8 (11.6)
10 (44)	0.9 (13.05)
15-20 (66-88)	1.0 (14.5)

Dosing channels:
Accommodates a wide variety of highly accurate analog or digital dosing channels for fertilizer and concentrated/diluted acid:

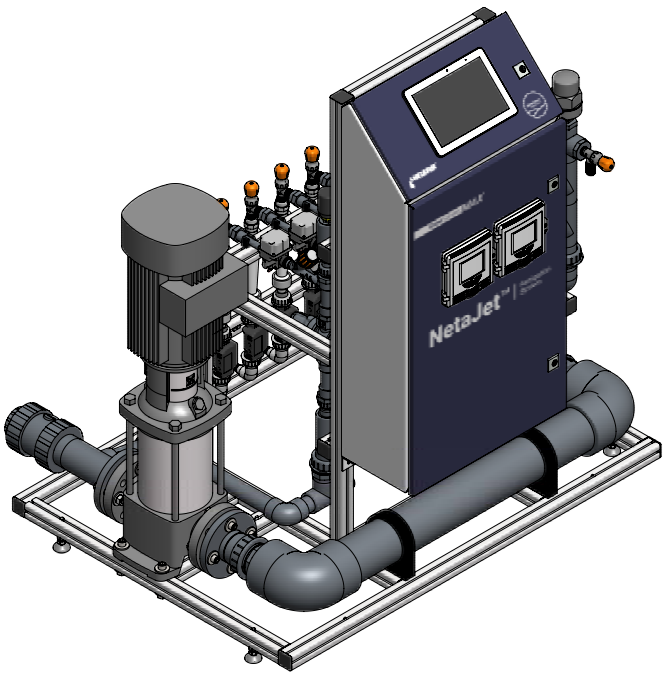
- Up to 5 dosing channels of various types, 50-400 l/hr (13-105.5 GPH) each.
- Optional - Concentrated acid channel, 50 l/h (13 GPH).

Total fertilizer/acid suction capacity - up to 2000 l/h (528 GPH).

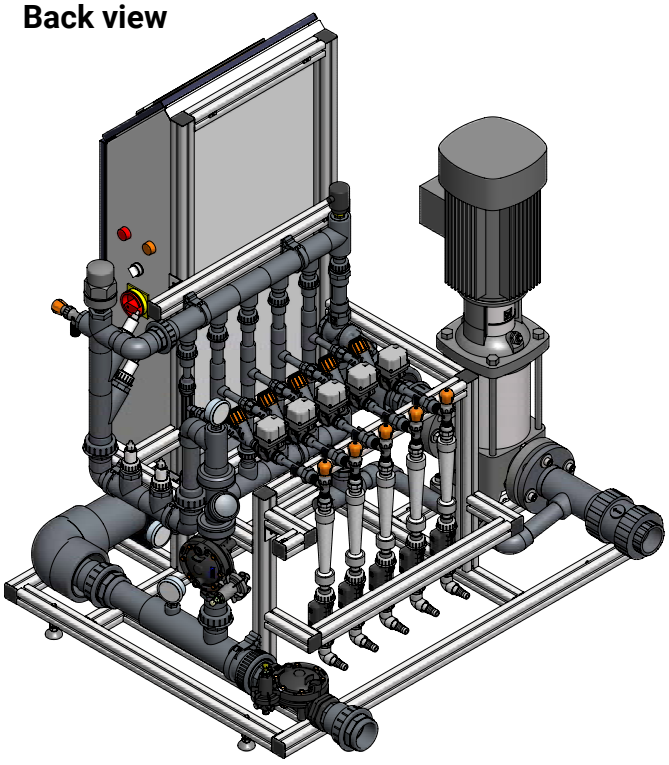
Controller:
GrowSphere™ MAX (Operation with third-party controllers is optional. Consult Netafim™.)

EC/pH:
Precise single or dual monitoring and control - selectable by customer.

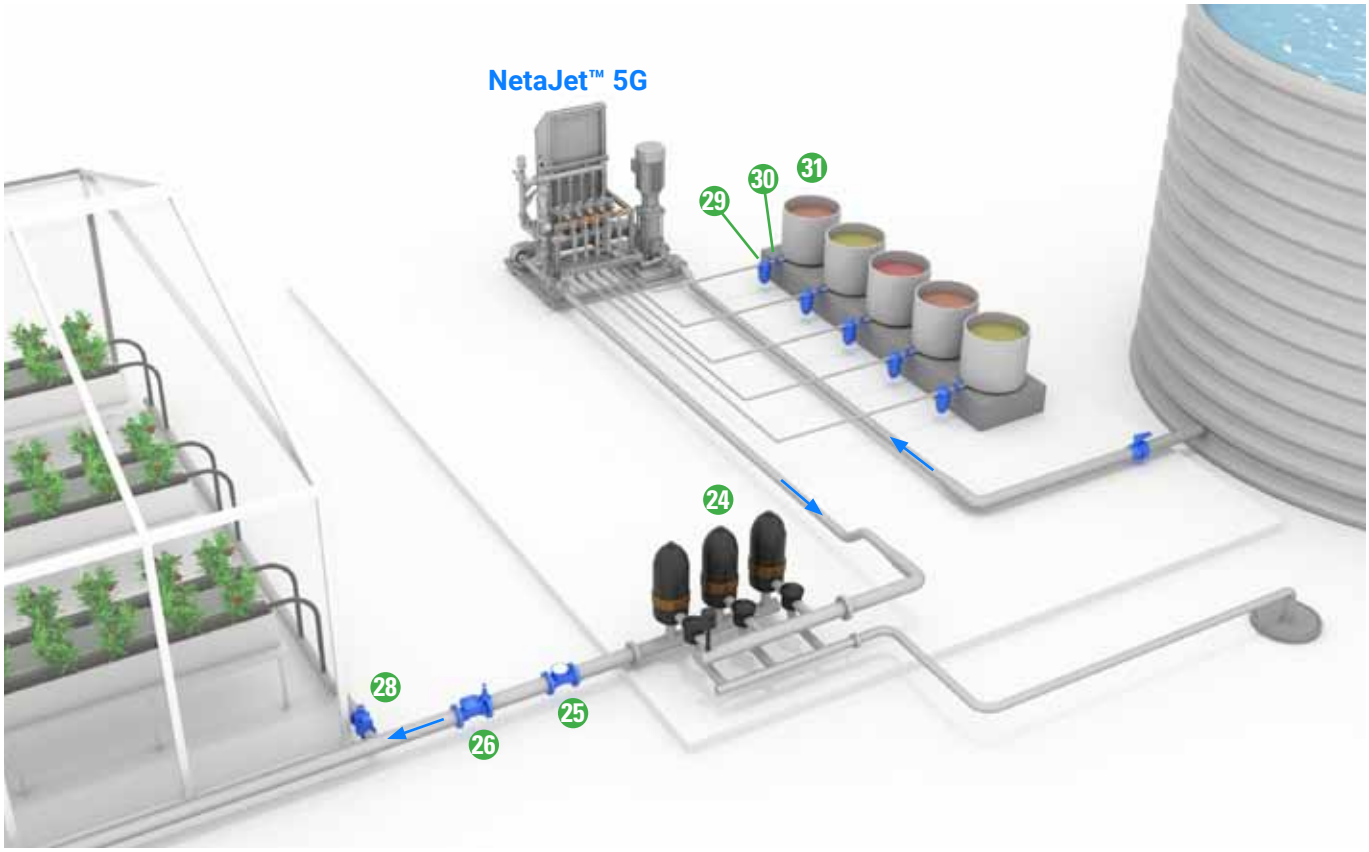
Front view



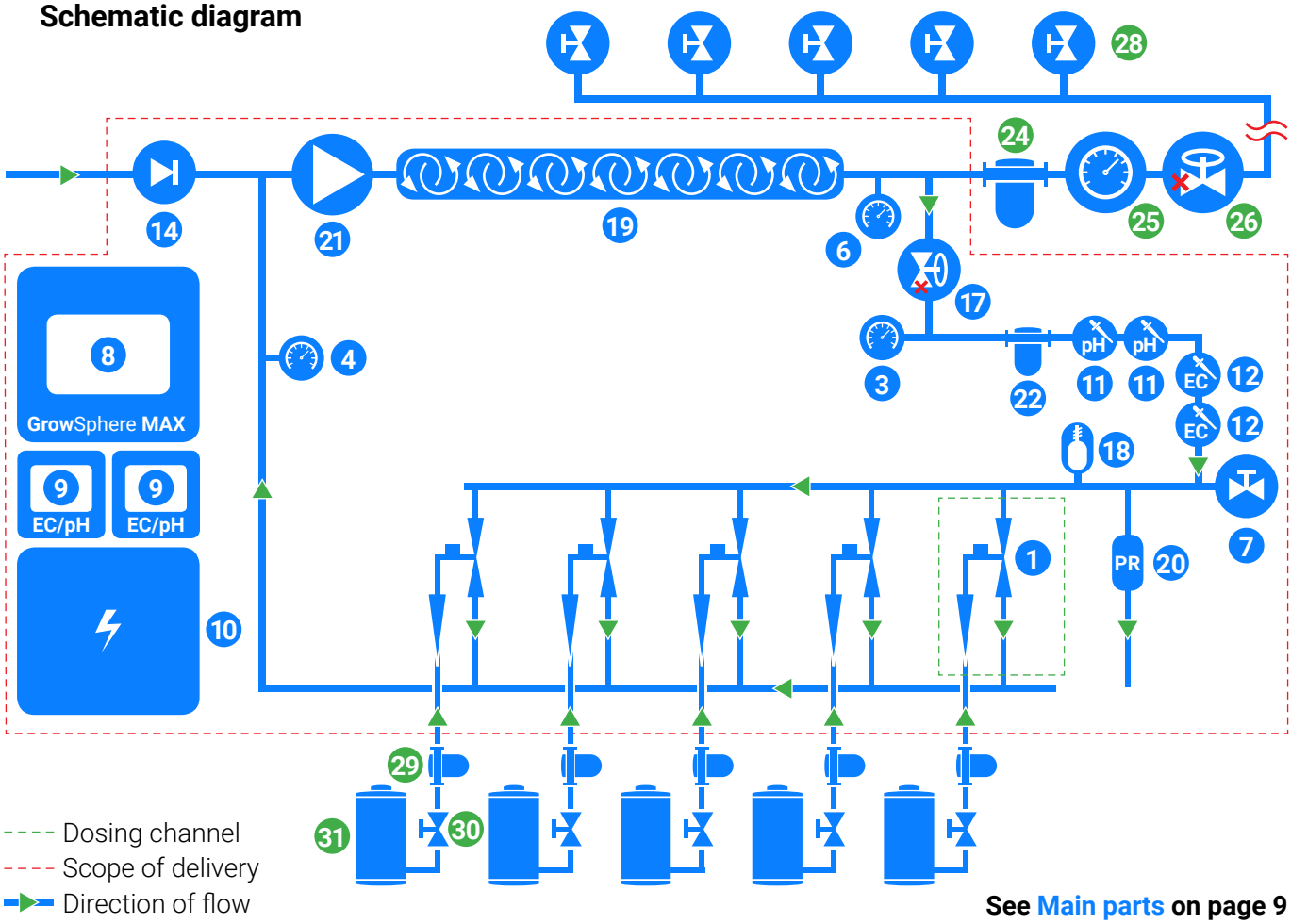
Back view



IL ST mode - typical setup

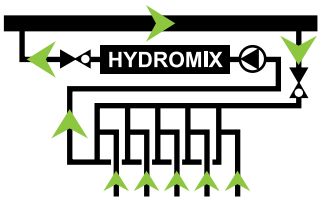


Schematic diagram



See Main parts on page 9

→ High-Flow Mode



High-flow bypass system for pressurized-line water source.

Operating principle:
The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster pump integrated in the NetaJet™ 5G. This mode of operation, where the lower manifold is under low pressure (around 0 bar/PSI), permits the use of high-efficiency Venturis with high suction capacity and low motive flow consumption.

Suitable for main line flow rate:
80-400 m³/h (350-1760 GPM)
Flow limitation depends on the fertilizer injection rate and the size of the Venturis.

Suitable for main line pressure:
Standard: 2.5-5.8 bar (36.5-84.0 PSI)
High pressure: 5.8-7.5 bar (84.0-108.5 PSI)

Dosing channels:
Accommodates a wide variety of highly accurate digital dosing channels for fertilizer and concentrated/diluted acid:

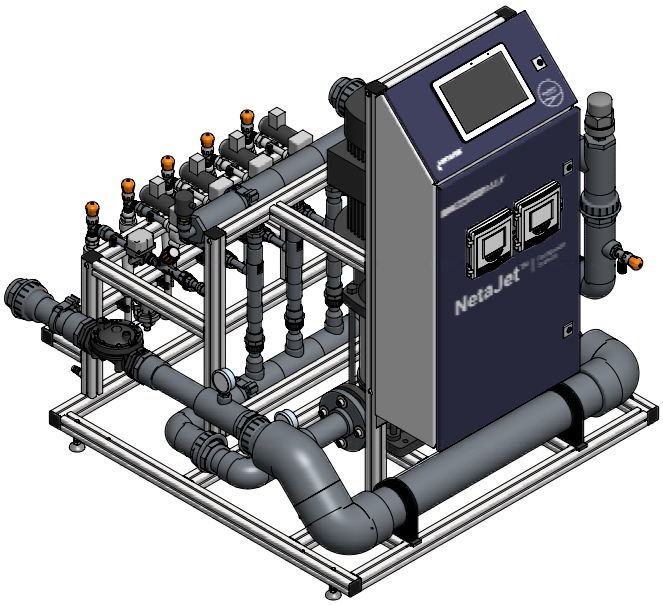
- Up to 5 x 50-1000 l/h (13-265 GPH)
- Optional - Concentrated acid channel, 50 l/h (13 GPH).

Total fertilizer/acid suction capacity - up to 5000 l/h (1320 GPH).

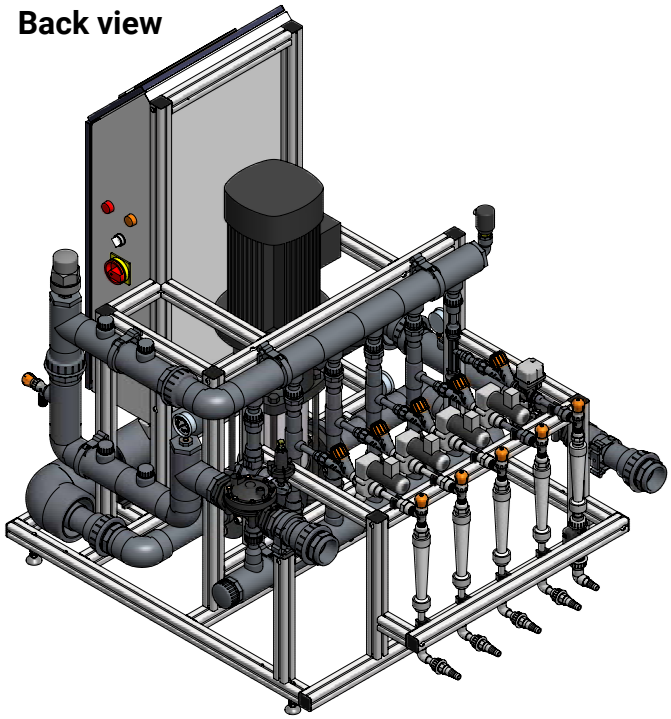
Controller:
GrowSphere™ MAX (Operation with third-party controllers is optional. Consult Netafim™.)

EC/pH:
Precise single or dual monitoring and control - selectable by customer.

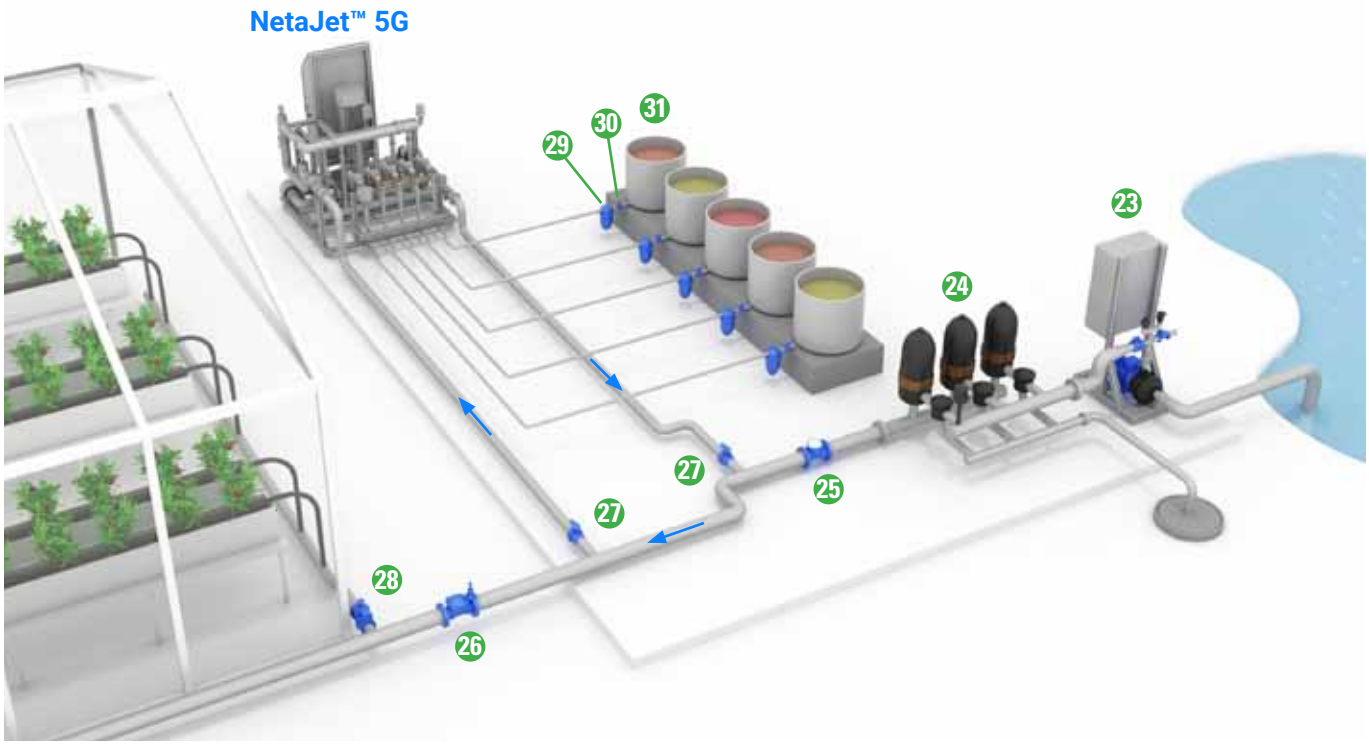
Front view



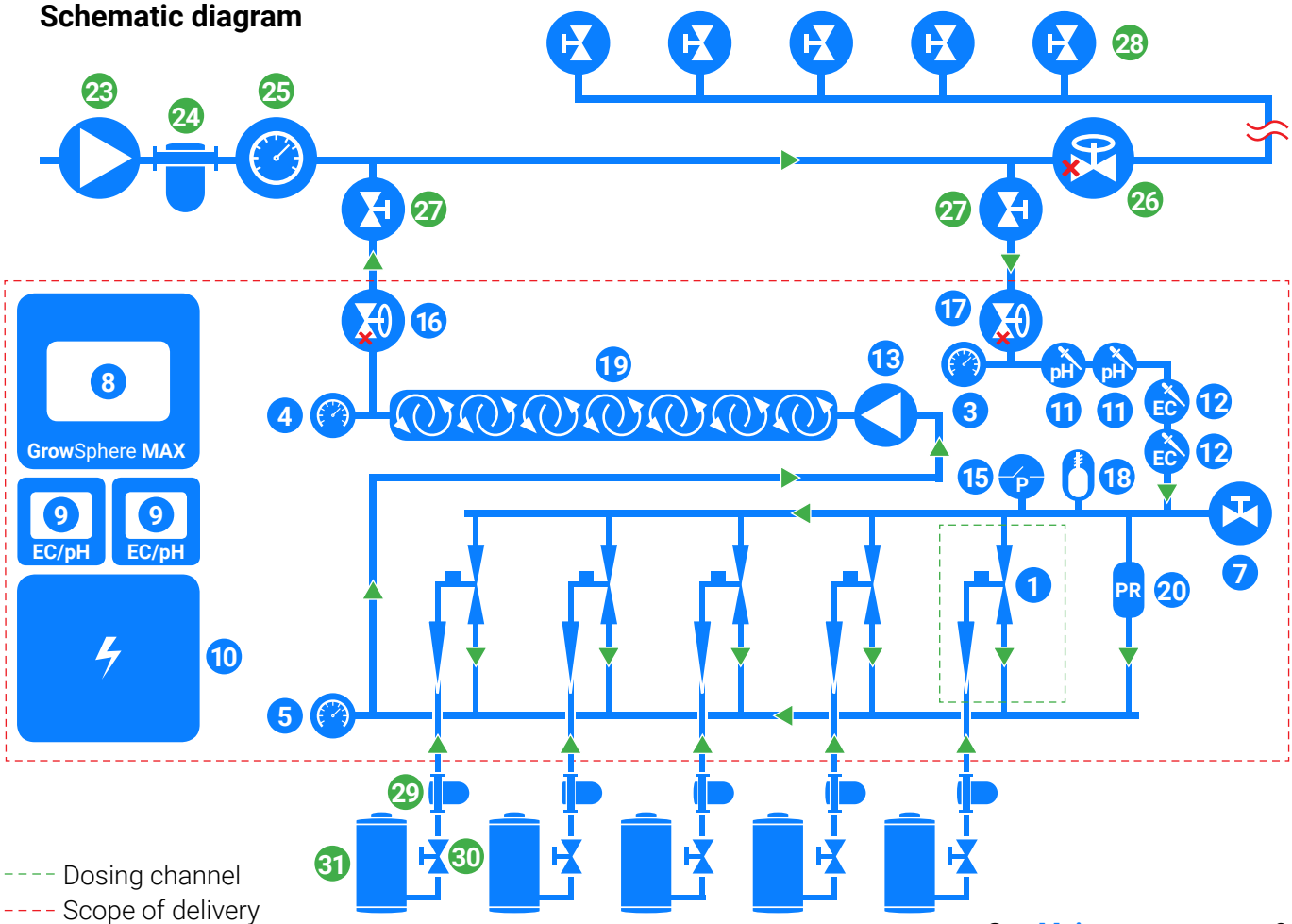
Back view



High-flow mode - typical setup

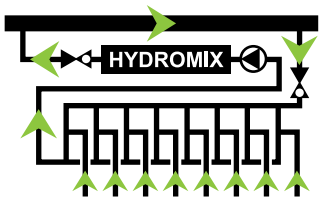


Schematic diagram



See Main parts on page 9

→ OCTA - 8-Channel Mode



Bypass system for pressurized-line water source, with 8 dosing channels.

Operating principle:
The pressure differential required to generate fertilizer suction via the Venturis is produced by a booster pump integrated in the NetaJet™ 5G. This mode of operation, where the lower manifold is under low pressure (around 0 bar/PSI), permits the use of high-efficiency Venturis with high suction capacity and low motive flow consumption.

Suitable for main line flow rate:
20-120 m³/h (90-500 GPM).
Flow limitation depends on the fertilizer injection rate and the size of the Venturis.

Suitable for main line pressure:
Standard: 2.5-5.8 bar (36.5-84.0 PSI)
High pressure: 5.8-7.5 bar (84.0-108.5 PSI)

Dosing channels:
Accommodates a wide variety of highly accurate analog or digital dosing channels for fertilizer and concentrated/diluted acid:

- Up to 8 x 50-600 l/h (13-158 GPH)
- Optional - Concentrated acid channel, 50 l/h (13 GPH).

Total fertilizer/acid suction capacity - up to 4800 l/h (1268 GPH).

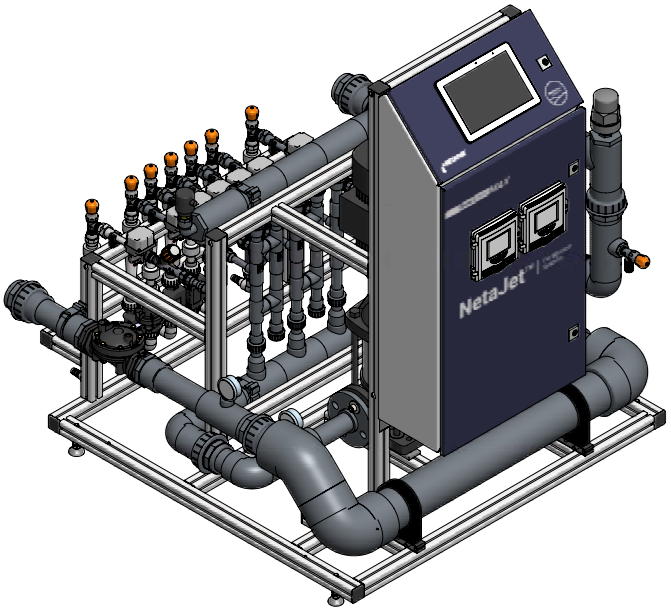
CAUTION

The Octa mode (8 dosing channels) includes 3 dual dosing channels. There are fertilizer combinations that should never be used in any concentration in the dual dosing channel! (see CAUTION, page 8)

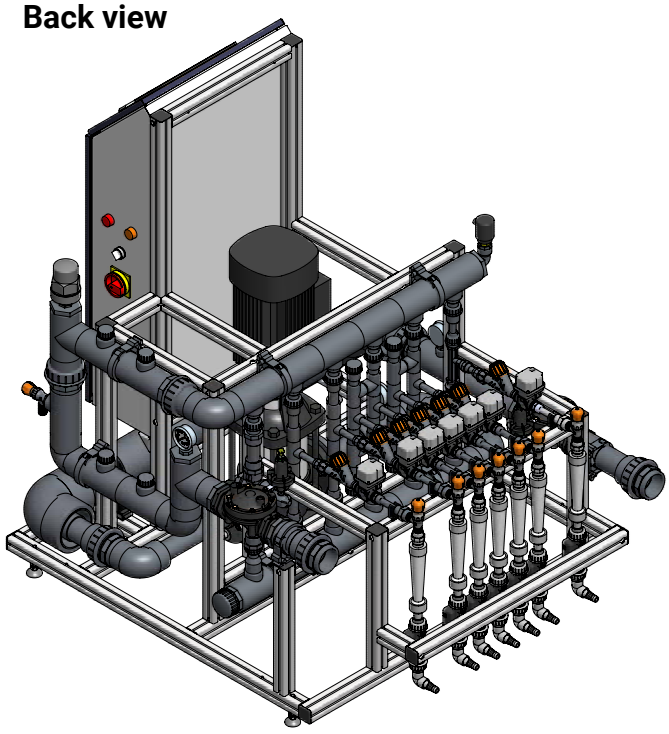
Controller:
GrowSphere™ MAX (Operation with third-party controllers is optional. Consult Netafim™.)

EC/pH:
Precise single or dual monitoring and control - selectable by customer.

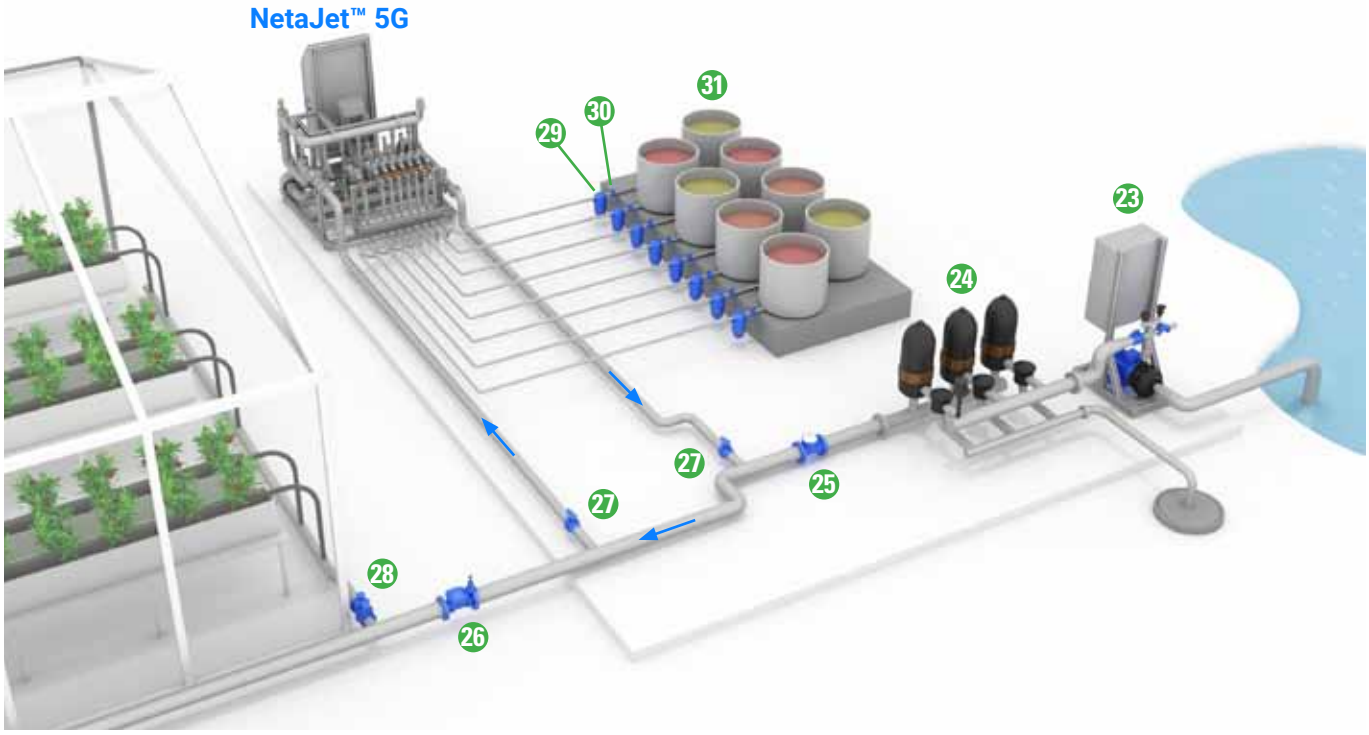
Front view



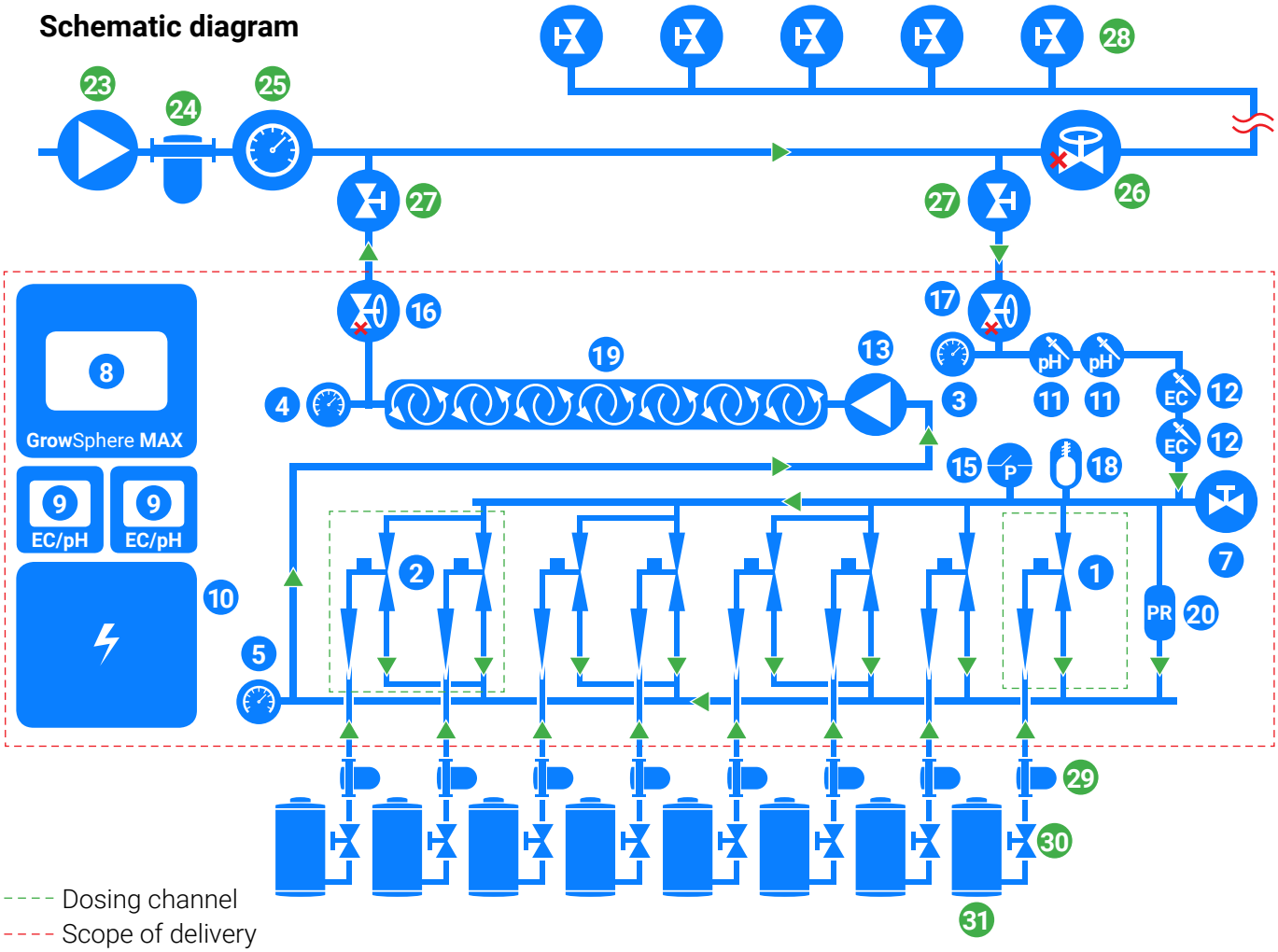
Back view



Octa - 8-channel mode - typical setup



Schematic diagram



Dosing channel
Scope of delivery
Direction of flow

See Main parts on page 9

Operation and Maintenance

→ Operation

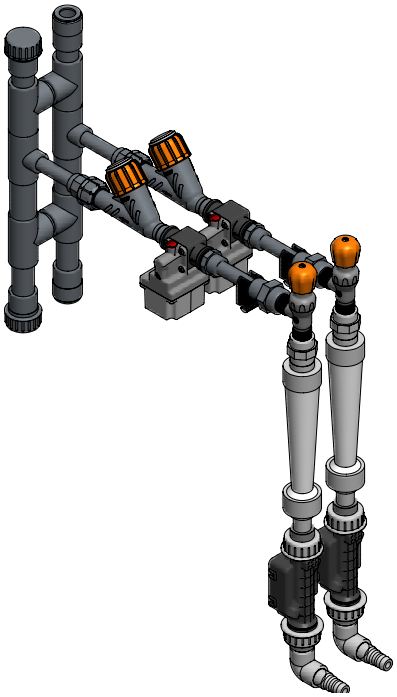
The routine operation of the NetaJet™ is almost totally automatic, controlled by the controller (for the operation of the controller, see the Controller Manual).

All you need is to make sure that:

- Electricity is supplied to the NetaJet™.
- Adequate quality water at the appropriate flow rate and pressure is supplied at the inlet of the NetaJet™ (see the NetaJet™ Hydraulic Conditions Checklist, page 47).
- Properly dissolved fertilizers, according to the agronomist's instructions, are constantly present in the stock tanks.
- If acid is used - it is constantly present in the acid stock tank and does not exceed the recommended concentration (see ATTENTION, page 5).

Dual dosing channel

- The NetaJet™ 5G Octa mode (8 dosing channels) includes 3 dual dosing channels.
- The dual dosing channels are applicable with 50 l/h (13 GPH) and 600 l/h (158 GPH) Venturis.



→ Maintenance

WARNING

Never perform maintenance/repair of the NetaJet™ 5G when the system is under pressure.

- Before performing maintenance/repair of the NetaJet™ 5G, always set the active mainlines to PAUSE **(GrowSphere™ MAX -)**.
- After completing the maintenance/repair activity set the paused mainlines back to their previous setting.

CAUTION

When opening or closing any manual valve, always do it gradually, to prevent damage to the system by water hammer.

To prevent failures and extend the life cycle of the NetaJet™, the user must carry out regular maintenance.

- Keep the NetaJet™ dosing unit and its immediate environment clean and dry.

CAUTION

Before calibrating the EC and pH sensors, gradually close the isolation valves and open the sampling valve until the pressure in the system is released.

- The NetaJet™ dosing unit and the supply water and irrigation system must be inspected regularly.

Regular inspection

Description	How often	Instructions
Rinsing of fertilizer filters*	Once a day	
Rinsing of supply water filters*	Once a day	
Water and fertilizer leak inspection	Once a week	Visual inspection
Calibration of the pH sensor	Every 2-4 weeks	See the enclosed EC/pH Transmitter Manual
Calibration of the EC sensor	Every 4 weeks	

* Manual filters only.

Check the NetaJet™ hydraulic conditions every 4 weeks

Consult the main line flow meter and pressure gauge, the upper manifold and lower manifold pressure gauges and the Rotameters of the dosing channels, fill in the data on the NetaJet™ Hydraulic Conditions Checklist on page 47 and make sure that all the hydraulic conditions match the reference data.

When verifying the flow rate for each dosing channel, make sure the cursors on all the Rotameters are adjusted.

NOTE

The Rotameter's scale is calibrated by the manufacturer for measurement of the flow rate of water (H_2O). Certain inacuracies may be observed when the flow rate of liquids with different densities, such as fertilizers and acids, is measured.

ATTENTION

Once a month, read the measured flow rates of the dosing channels and compare them with the flow rates defined in the controller, to check whether any changes have occurred.

→ Winterization

CAUTION

When opening or closing any manual valve, always do it gradually, to prevent damage to the system by water hammer.

If the system is not required for irrigation during the winter (mainly in open field applications) perform the following procedure to avoid damage caused by freezing when the NetaJet™ is idle for the winter period:

At the beginning of winter:

- Gradually close the isolation valves and open the sampling valve until the pressure in the system is released.
- Remove EC and pH sensors and store the pH sensor immersed in KCL solution (supplied with the sensor) or in calibration buffer 4 at temperature 18-25°C (64-77°F). The pH sensor must never be dry (see the enclosed EC/pH Transmitter User Manual).
- Empty the NetaJet™ of water.

At the end of winter:

- Reinstall the EC and pH sensors and calibrate them (see the enclosed EC/pH Transmitter User Manual).
- Gradually open the isolation valves until the pressure in the system is restored.

Troubleshooting

This chapter is a systematic guide to the actions to be taken in the case of a malfunction of the NetaJet™.

WARNING
Never perform maintenance/repair of the NetaJet™ 5G when the system is under pressure.

- Before performing maintenance/repair of the NetaJet™ 5G, always set the active mainlines to PAUSE **(GrowSphere™ MAX -)**.
- After completing the maintenance/repair activity set the paused mainlines back to their previous setting.

ATTENTION
Before proceeding to troubleshoot any malfunction, make sure that:
- The controller settings regarding the dosing channels are correct and match the dosing channels of the NetaJet™ (see the Controller Manual).
- The controller settings regarding the field valves are correct (see the enclosed Controller User Manual).

- Perform the actions in their order of appearance until the malfunction is fixed.
  If you identify faulty parts - consult your Netafim™ representative.

WARNING
Only qualified electricians are permitted to perform electrical installations and repairs!

CAUTION
If isolation valves have been installed on the system, ensure that they are in closed position before troubleshooting any hydraulic malfunction.

ATTENTION
If fertilizers from a different manufacturer have been recently in use and changes in EC and pH are recorded, perform calibration of the system before assuming a malfunction of the NetaJet™ (see Calibration, page 31).

→ Symptoms Regarding More Than One Single Dosing Channel

If one or more of the following symptoms occur regarding more than one single dosing channel, perform the actions listed bellow:

Controller warnings
- Low EC
- High pH
- Low fertilizer/acid flow rate

Rotameter reading
- Low fertilizer/acid flow rate

Action
1. For controller warnings only - check and calibrate the EC and pH sensors (see the enclosed EC/pH Transmitter User Manual).
2. Have a qualified electrician check that electricity is being supplied to the NetaJet™ and that all the electrical components are properly connected (see the enclosed Switchboard electrical diagram).

3. Check that the hydraulic conditions comply with the reference data in the NetaJet™ Hydraulic Conditions Checklist on page 47.

   If NO, restore the original hydraulic conditions according to the reference data in the NetaJet™ Hydraulic Conditions Checklist on page 47.

   If YES or if the malfunction is still not fixed after restoring the original hydraulic conditions, in PL or PB mode - have a qualified electrician check the dosing booster:
   Does it function? Does it rotate in the correct direction?
   If not - the electrician should swap between phases L1 and L3 (see the enclosed Dosing Booster Manual).

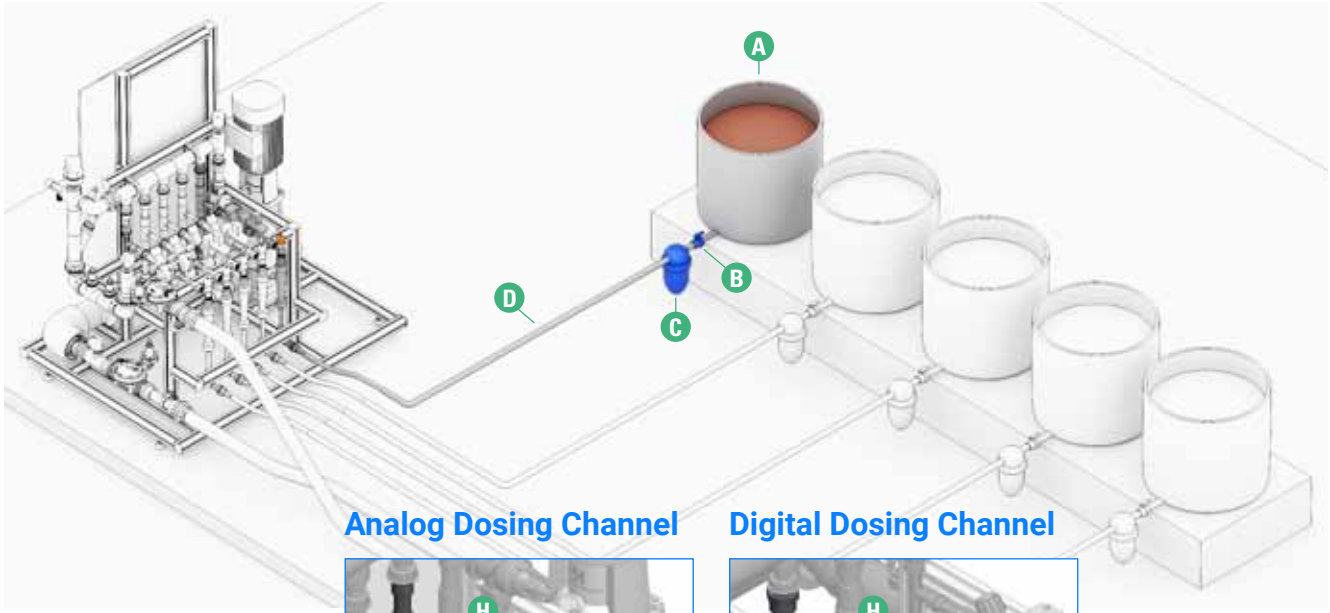
4. Check for an air pocket in the dosing booster impeller chamber (see the enclosed Dosing Booster Manual): Open the NetaJet™ sampling valve until a stable flow, free of air-bubbles, is obtained.

5. If the original hydraulic conditions are still not restored - loosen the dosing booster's bleeding screw and wait until a stable flow, free of air-bubbles, is obtained, then retighten the bleeding screw (see the enclosed Dosing Booster Manual).

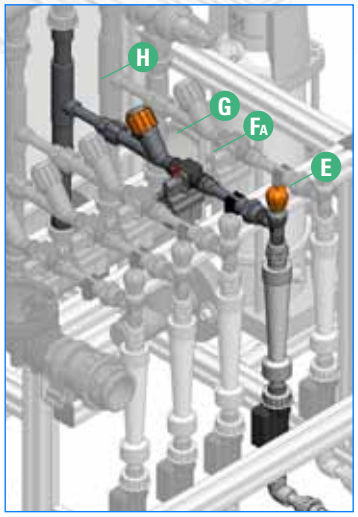
6. Check the dosing booster's impeller chamber for clogging:
   If it is clogged - it should be dismantled and thoroughly cleaned (see the enclosed Dosing Booster Manual).

If after implementing all the above steps the malfunction is still not fixed - consult your Netafim™ representative.

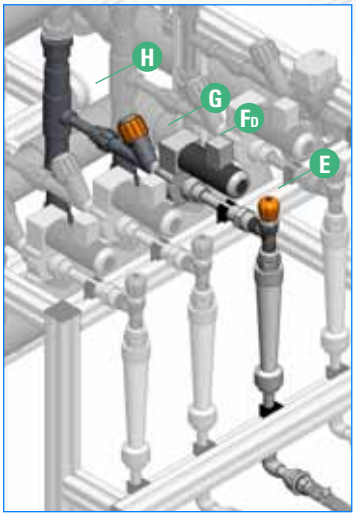
→ Symptoms Regarding a Single Dosing Channel



Analog Dosing Channel



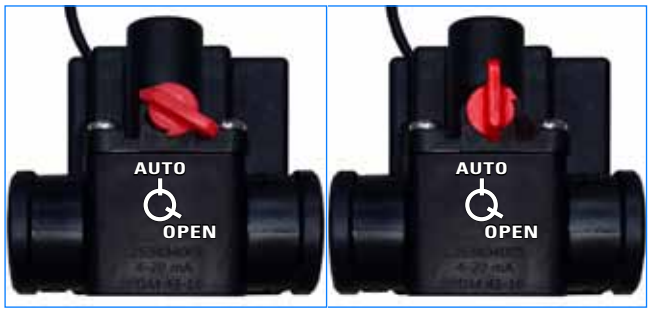
Digital Dosing Channel



Analog Dosing Valve

OPEN
Manual operation

AUTO
Controlled operation



Digital Dosing Valve

OPEN
Manual operation

CLOSE
Controlled operation

If one or more of the following symptoms occur regarding a single dosing channel, perform the actions listed bellow:

Controller warnings

- Low EC
- High pH
- Low fertilizer/acid flow rate

Rotameter reading

- Low fertilizer/acid flow rate

Action

1. Check that there is fertilizer/acid solution in the stock tank (A).

2. Check that the stock tank manual valve (B) is in the OPEN position.

3. Check that the fertilizer/acid filter (C) is clean - If not, it should be dismantled and thoroughly cleaned.

4. Check the fertilizer/acid line (D) (from the stock tank to the dosing channel) for leaks and breaches and make sure all the connectors are tightened.

5. Make sure the dosing channel's needle valve (E) is open according to the reference data in the NetaJet™ Hydraulic Conditions Checklist on page 47.

6. Visually check the needle valve (E) for chemical damage (internal deformation).
If internal deformation is present - replace the needle valve.

7. Visually check the needle valve (E) for clogging.
If clogging is present - thoroughly clean the needle valve.

8. Check that the dosing valve (F) is functioning:

With the controller in MANUAL mode, set the dosing valve (F) to ON (see the enclosed Controller Manual). The LED on the dosing valve should be lit.

If it is not - have a qualified electrician check the dosing valve's cable for electrical continuity.

If the cable is in working order - check the controller (see the enclosed Controller Manual).

If the controller and the cable are in working order - toggle the dosing valve (F) to OFF and again to ON in the controller (see the enclosed Controller Manual). A "Click" should be heard from the dosing valve with each toggle - If a "Click" is not heard, replace the dosing valve (consult your Netafim™ representative).

If a "Click" is heard and the dosing valve (F) still does not open - disconnect the dosing valve from the dosing channel and with the dosing valve set to ON in the controller (see the enclosed Controller Manual), check for clogging by injecting water at low pressure through the dosing valve.

If there is clogging - thoroughly clean the dosing valve F with running water.

If there is no clogging and the dosing valve F still does not open - replace it (consult your Netafim™ representative).

9. Visually check the non-return valve G for any internal deformation or damage to its flat ring gasket. If present - replace the non-return valve (consult your Netafim™ representative).

10. Check the non-return valve G for clogging by injecting water at low pressure through it (make sure to respect the direction of flow).

If there is clogging - thoroughly clean the non-return valve G with running water.

11. Disconnect the Venturi H from the manifolds and from the dosing channel and check it for clogging, visually and by injecting water at low pressure through it.

If there is clogging - thoroughly clean the Venturi H with running water.

12. Visually check the Venturi H for chemical damage (internal deformation). If internal deformation is present - replace the Venturi (consult your Netafim™ representative).

If after implementing all the above steps the malfunction is still not fixed - consult your Netafim™ representative.

→ Symptoms While Idle

If the following symptoms occur while the NetaJet™ is idle, perform the actions listed bellow:

Controller warnings

- Low EC
- High pH
- While idle - Uncontrolled fertilizer/acid flow rate or a fertilizer/acid leak or breach

Action

NOTE

- When using an analog dosing valve, make sure the dosing valve selector is in the AUTO position.
- When using a digital dosing valve (S22), make sure the dosing valve selector is in the CLOSED position.

Check if the dosing valves leak when closed:

1. Close all the manual valves B for fertilizers and acid.

2. Make sure the level of the solution in all the the stock tanks is higher than the dosing valves.

3. With the controller in MANUAL mode, set all the dosing valves to OFF (see the enclosed Controller Manual).

4. Disconect one of the the dosing valves from the non-return valve (downstream from the dosing valve).

5. Open the fertilizer manual valve B.
If a leak from the dosing valve is visible - disconect the dosing valve from the dosing channel.

6. With the controller in MANUAL mode, set the dosing valve to ON (see the enclosed Controller Manual).

7. Thoroughly clean the dosing valve with running water.

8. Repeat steps 4-7 for each fertilizer and acid dosing channel.

9. After completing the procedure, open all the manual valves **B** for fertilizers and acid.

10. If the malfunction is still not fixed - replace the dosing valve.

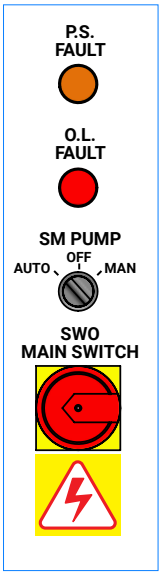
If after implementing all the above steps the malfunction is still not fixed - consult your Netafim™ representative.

→ Switchboard Warning

If the following symptom occurs during operation, perform the actions listed bellow:

Switchboard warning lights

- The P.S. fault light (Yellow) is on.



Action

Check if the pressure on the main line is low compared with the reference data on the NetaJet™ Hydraulic Conditions Checklist on page 47:

If YES, restore the original main line pressure (see the enclosed Switchboard Manual).

- The O.L. fault light (Red) is on.

Action

Check if the overload protection breaker is ON (see the enclosed Switchboard Manual). Toggle it OFF and ON again.

If the switchboard warning light is still on or the overload protection breaker trips (turns to OFF) again, and have a qualified electrician check if the dosing booster is in working order (see the enclosed Dosing Booster Manual) and check if there are irregularities in the electricity voltage supplied to the NetaJet™.

If after implementing all the above steps the malfunction is still not fixed - consult your Netafim™ representative.

→ The Netajet™ 5G Does Not Function at All

WARNING

Only qualified electricians are permitted to perform electrical installations and repairs!

If the following symptom occurs during operation, perform the actions listed bellow:

Symptom

The NetaJet™ 5G does not function.

Action

1. Have a qualified electrician check the overload protection breaker:

If it is not in the ON position, turn it to ON.

If it is in the ON position, toggle it once to OFF and to ON again.

(do not repeat this action).

2. If the overload protection breaker trips (turns to OFF or to TRIP) again, the electrician will check whether the system pump is in working order (see the system pump manual) and check for irregularities in the electricity voltage supplied to the NetaJet™ 5G.

If after implementing all the above steps the malfunction is still not fixed - consult your Netafim™ representative.

→ System Vibrations

If the following symptom occurs during operation, perform the actions listed bellow:

Symptom

The NetaJet™ 5G vibrates during operation.

Cause

The main line pressure is out of the NetaJet™ 5G working range (higher or lower).

Action

1. Restore the main line pressure to the original value according to the reference data in the NetaJet™ Hydraulic Conditions Checklist, page 47:

   If the main line pressure is restored and the vibrations persist - consult your Netafim™ representative.

2. If it is impossible to restore the main line pressure according to the reference data - alter the system calibration according to the actual main line pressure - consult your Netafim™ representative.

Dosing Calibration

The process of calibrating the NetaJet™ is carried out in three stages:

→ 1. Calculation of Dosing Channels Opening Percentage

To finely calibrate the NetaJet™ in order to achieve homogeneous and stable dosing, perform the following calculation for each dosing channel (fertilizers and acid) to determine the amount of suction reduction needed to attain the required fertilizer/acid flow rate.

Metric units

			EXAMPLE	
Flow rate of the largest irrigation shift		m^3/h	120	m^3/h
	X		X	
Dosing ratio of a single fertilizer/acid		l/m^3	3	l/m^3
	=		=	
Result: a single fertilizer flow rate		l/h	360	l/h
	X 1.25 =		X 1.25 =	
Result: target Rotameter reading		l/h	450	l/h

Definition

Dosing ratio = $\frac{\text{The quantity of fertilizer/acid (l)}}{\text{1 } m^3 \text{ irrigation water}}$

US units

			EXAMPLE	
Flow rate of the largest irrigation shift		GPM	500	GPM
	X		X	
Dosing ratio of a single fertilizer/acid		US gal/1000 US gal	15	US gal/1000 US gal
	X 0.06 =		X 0.06 =	
Result: a single fertilizer flow rate		GPH	450	GPH
	X 1.25 =		X 1.25 =	
Result: target Rotameter reading		GPH	560	GPH

Definition

Dosing ratio = $\frac{\text{The quantity of fertilizer/acid (US gal)}}{\text{1 THG (1000 US gal) irrigation water}}$

NOTE

The Rotameter's scale is calibrated by the manufacturer for measurement of the flow rate of water (H_2O). Certain inacuracies may be observed when the flow rate of liquids with different densities, such as fertilizers and acids, is measured.

→ 2. Simulation Test with a 10 Liter (2 US Gal) Bucket of Water

Instruments needed

- Good-quality portable EC and pH sensors, finely calibrated
- Calibration solutions for EC and pH
- Bucket with a scale for up to 10 liters (2 US gallons)
- Measuring tube or syringe with a scale for up to 100 cc (1 oz)
- Clean (preferably distilled) water for cleaning sensors during calibration
- Blotting paper for cleaning and drying

- The client prepares the fertilizer solutions and the acid solution (if required) in the stock tanks according to the recipe advised by the agronomist/consultant.

ATTENTION

Restore the settings of all the alarms back to the state where adequate protection to the system and the crop is provided (see the enclosed Controller Manual).

- Note the required dosing ratio of each fertilizer solution and the dosing ratio of the acid solution (if used).
- Fill a bucket with 10 liters (2 US gallons) of the client's supply water (without fertilizer or acid).
- Measure the EC and the pH levels of the water in the bucket using calibrated portable sensors.

EXAMPLE

	EC	pH
Supply water (without fertilizer or acid)	0.3	7.8

- Using a measuring tube or a syringe, take a dose from each fertilizer solution and from the acid solution (if used) according to the proportions determined by the dosing ratio (see example below) and mix thoroughly with the water in the bucket.

Metric units

For a fertilizers dosing ratio of 5 l/m³ each and an acid dosing ratio of 2 l/m³, the quantities for 10 liters of water in the Bucket-simulation-test will be 50 cc of each fertilizer solution and 20 cc of the acid solution.

US units

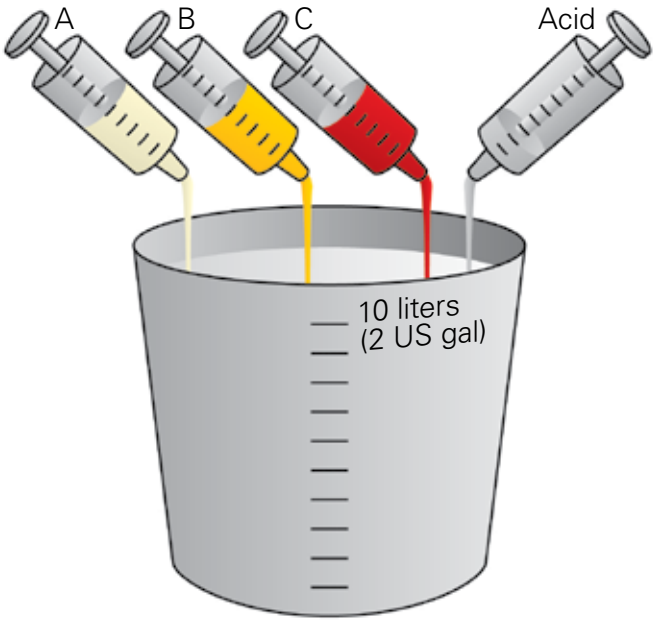
For a fertilizers dosing ratio of 1.5 US gal/THG each and an acid dosing ratio of 1.1 US gal/THG the quantities for 2 US gallons of water in the Bucket-simulation-test will be 0.38 oz* of each fertilizer solution and 0.28 oz** of the acid solution.

Definition

1 US gal = 128 oz*

* $\frac{1.5 \times 2}{1000}$ = 0.003 US gal = 0.384 oz

** $\frac{1.1 \times 2}{1000}$ = 0.0022 US gal = 0.28 oz



- Measure the EC and the pH levels of the mixture in the bucket using calibrated portable sensors.
- Compare the measured EC and pH values to the target values set by the agronomist/consultant.

	EC	pH
After adding the fertilizers and acid	1.6	5.5
Target values	1.8	5.8
Deviation from target value	11%	5%

- With the controller set to operate according to EC/pH values - if the EC and pH values measured in the bucket are within a range of ±30% deviation from the target values, the system will be able to correct them automatically.
- If the values are out of the ±30% range, check the data and consult the agronomist/consultant.

→ 3. Calibration of the Netajet™ While Irrigating

WARNING

Extreme EC or pH values may damage the crop.

Perform the following procedure only after completing stage 2 above (Simulation test with a 10 liter or 2 US gallon bucket of water) with satisfactory results.

NOTE

The NetaJet™ 5G is supplied with its EC/pH transmeter/s factory caibrated and does not require user intervention.

NOTE

The NetaJet™ 5G contains a single or 2 EC/pH transmeters.
If 2 EC/pH transmeters are installed:

- The left transmeter (No. 1) is for control
- The right transmeter (No. 2) is for monitoring

For further instructions see the enclosed EC/pH transmeter Manual.

NOTE

Before calibration:

- Confirm that the EC and the pH sensors of the NetaJet™ have been calibrated according to the instructions in the enclosed EC/pH transmeter Manual.
- Make sure that each ferilizer tank is filled with a suitable quantity of properly diluted fertilizer.
- Make sure that a field valve is open, preferably of an unplanted plot to avoid damaging the crop in case of out-of-range EC/pH values.

The following steps explain the operations to be performed, regardless of the type of controller used.
For the operation of your controller's interface (see the Controller user manual).
However, since the GrowSphere™ MAX controller is widely used - its interface screens for the execution of each step are noted. If the GrowSphere™ MAX is your controller, perform the calibration process with the enclosed controller user manual in hand.

For digital dosing channels:

- Set the dosing mode to 1/1000 **(GrowSphere™ MAX -** NPK **)**.
- Enter the dosing ratio for each dosing channel **(GrowSphere™ MAX -** NPK **)**.
- Enter the EC and pH target values **(GrowSphere™ MAX -** NPK **)**.
- Assign the dosing recipe to the irrigation program **(GrowSphere™ MAX -** 💧 **)**.
- Complete defining the program **(GrowSphere™ MAX -** 💧 **)**.
- Run the irrigation program **(GrowSphere™ MAX -** 💧 **)**.
- Allow a few minutes for the pipes to fill up and the flow rate to stabilize.
- Reduce the suction of the dosing channels by adjusting the manual needle valve of each dosing channel until the "target Rotameter reading" calculated in stage 1 (page 31) is attained.

NOTE

The Rotameter's scale is calibrated by the manufacturer for measurement of the flow rate of water (H_2O). Certain inacuracies may be observed when the flow rate of liquids with different densities, such as fertilizers and acids, is measured.

- Check the appropriate controller screen for the measured EC and pH values **(GrowSphere™ MAX -** 🏠 **)**.
  If the desired values have been reached, check opening percentages of the dosing valves.
- The EC and pH target values should be attained with the dosing valves opened to 50% - 80% of their capacity.
- If the EC and pH target values are attained with the dosing valves opened less than 50%, reduce the dosing channel suction rate, until the EC and pH target values are reached.

NOTE

Every change in the flow rate of the needle valve must be updated afterwards in the controller **(GrowSphere™ MAX -** NPK **)**.

- If the EC and pH target values cannot be attained, and the dosing valves are opened more than 85%, measures should be taken to increase the dosing ratio - if feasible, slightly increase the concentration of the fertilizer solution and/or reduce the water flow rate to the field during irrigation.
  If not - consult Netafim™ CMT support.
- In a field where the flow rate changes significantly from one irrigation shift to the next, try to be at a minimum of 50% dosing valve opening for the low flow rate shift, and a maximum of 80% for the high flow rate shift.
- In the EC and pH alarm definitions, define the EC and pH deviation from the target values that, if attained, will trigger the alarm and set the EC and pH alarm to the ON position (activated) **(GrowSphere™ MAX -** ⚠ **)**.

NOTE

EC and pH values must not exceed a ±30% deviation from the target values.

For analog dosing channels:

NOTE

Analog dosing channel operation is a unique solution available only with the GrowSphere™ MAX controller.

- Allocate Sub-Station to Controller's Mainline **(GrowSphere™ MAX - ⚙)**
- Check in "remote IO" screen that all devices are allocated **(GrowSphere™ MAX - ⚙)**

If the process was successful:

- Select the desired dosing channels to be use **(GrowSphere™ MAX - NPK)**
- Set Fertigation Method to 1/1000 **(GrowSphere™ MAX - NPK)**
- Manually start the mainline pump, main valve, and shift valve from the controller **(GrowSphere™ MAX -)**
- Manually start the dosing booster pump from the controller **(GrowSphere™ MAX -)**
- Adjust dosing channel needle valve to Maximum and make sure that all channels will be in the same flow **(GrowSphere™ MAX - NPK)**.
- Move the Dosing channels from Manual to Automat **(GrowSphere™ MAX -)**

If the process was not successful:

- Check Lan/Switch/Modem cable, and try to connect again
- Run "Autotune" and wait until the automatic process is complete **(GrowSphere™ MAX - NPK)**.

If the process was successful:

- Check Dosing channel Nominal flow **(GrowSphere™ MAX - NPK)**.
- Set the proportional ratio value for each channel **(GrowSphere™ MAX - NPK)**.
- Define dosing recipe by adding EC and pH values according to the Bucket test results **(GrowSphere™ MAX - NPK)**.
- Deactivate EC/pH control **(GrowSphere™ MAX - NPK)**.
- Run the irrigation program, by using dosing recipe including "water before"
  a. Measure EC/pH cycle time **(GrowSphere™ MAX -)**.
  b. Check EC/pH values align with the Targets

If the process was not successful:

- Check the dosing channel for hydraulic and mechanical malfunctions, from the fertilizer tank up to the NetaJet's manifolds.
- Check the mainline valve and pump functionality

If the process was successful:

- Assign EC/pH control **(GrowSphere™ MAX - NPK)**.

If the process was not successful:

- Change the dosing recipe to meet the desired targets **(GrowSphere™ MAX - NPK)**.
- If still not successful - consult Netafim™ CMT support.

After completion of the calibration process:

- See the EC and pH actual values displayed by the controller **(GrowSphere™ MAX -)**, and compare them with the values displayed by the EC/pH transmeter/s.
- Fill out the NetaJet™ Hydraulic Conditions Checklist, page 47) in three copies. Make sure to fill out all the boxes of the reference row.

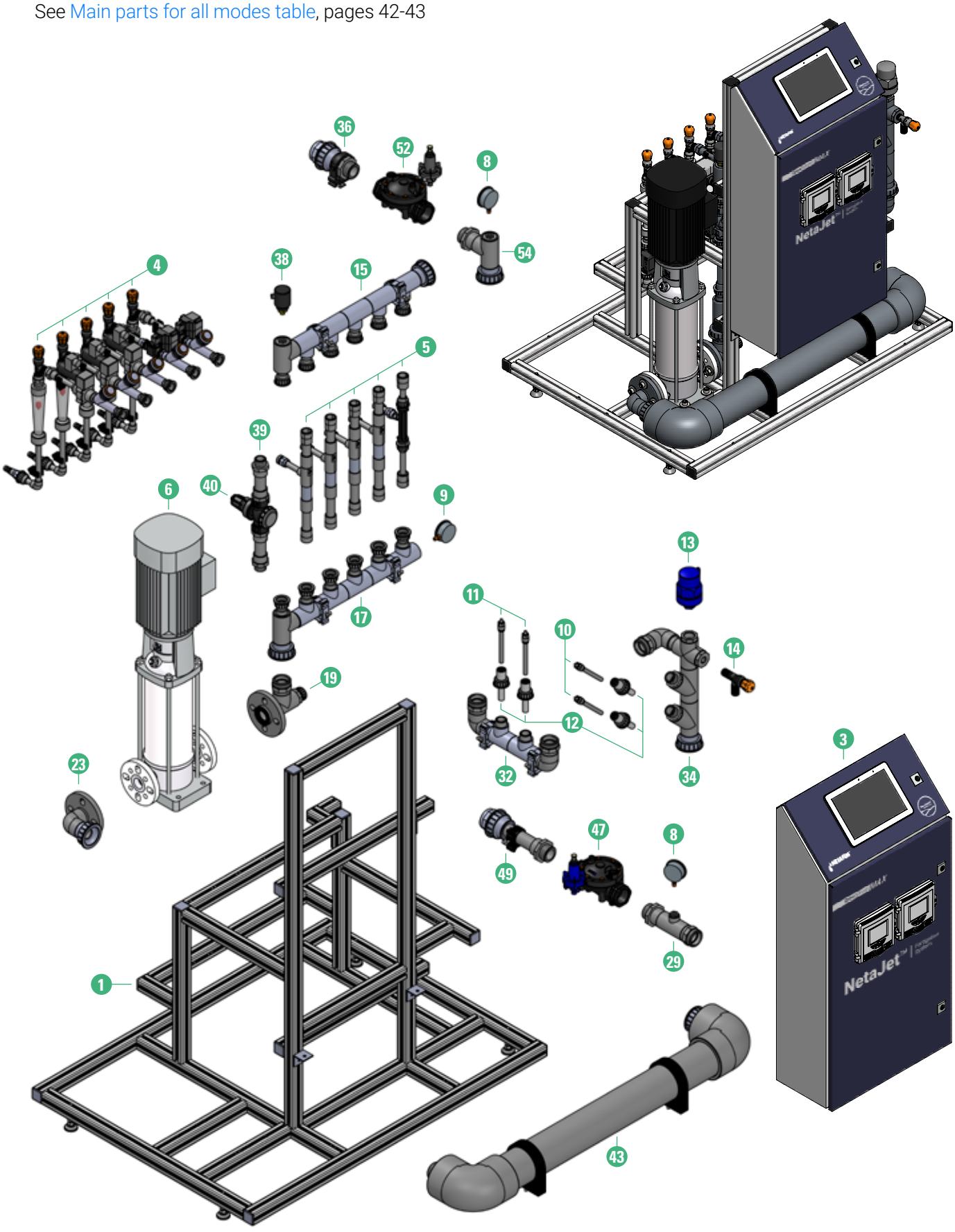
ATTENTION

Once a month, read the measured flow rates of the dosing channels and compare them with the flow rates defined in the controller, in order to check whether changes have occurred **(GrowSphere™ MAX - NPK)**.

List of Parts

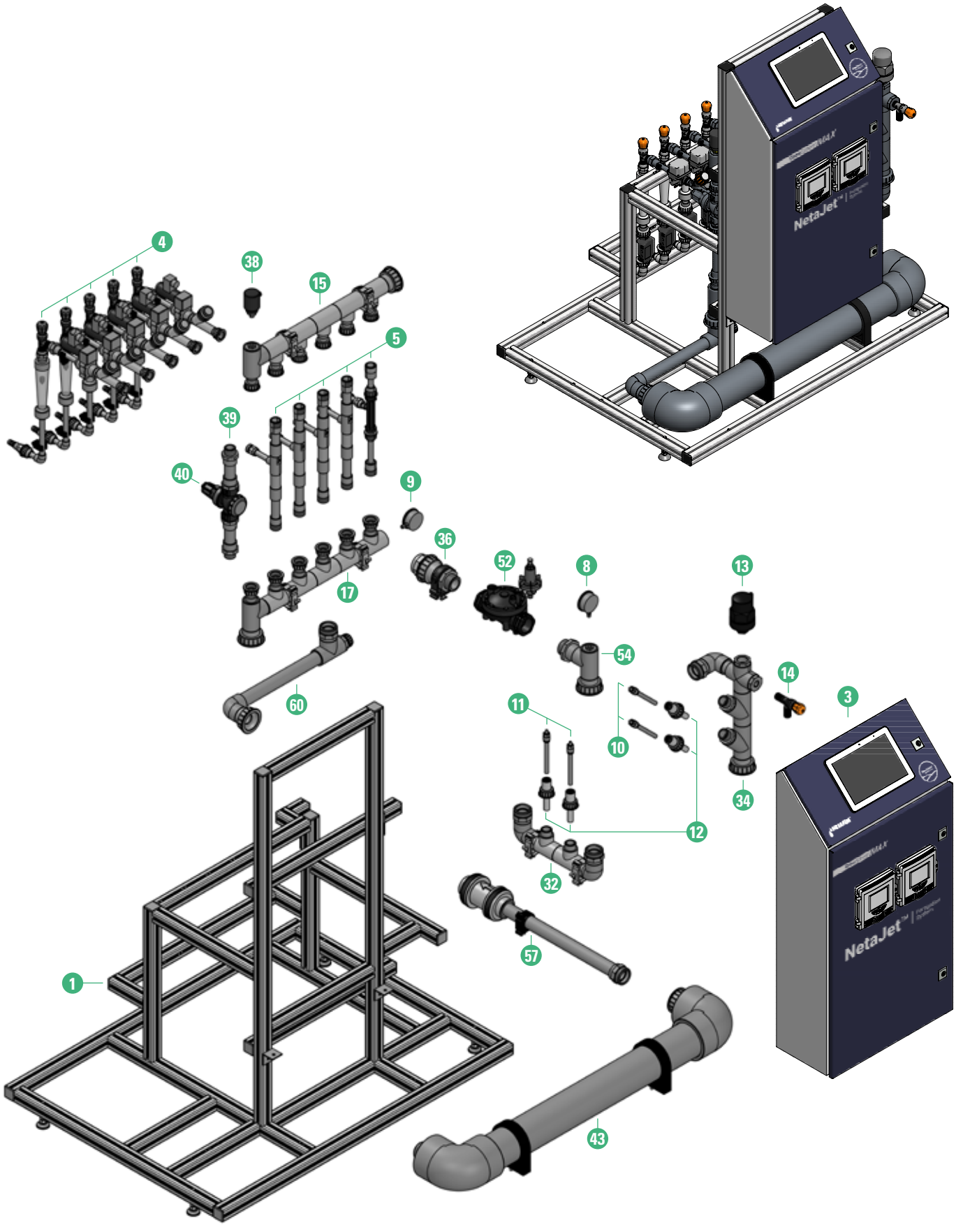
→ BP PL mode

See Main parts for all modes table, pages 42-43



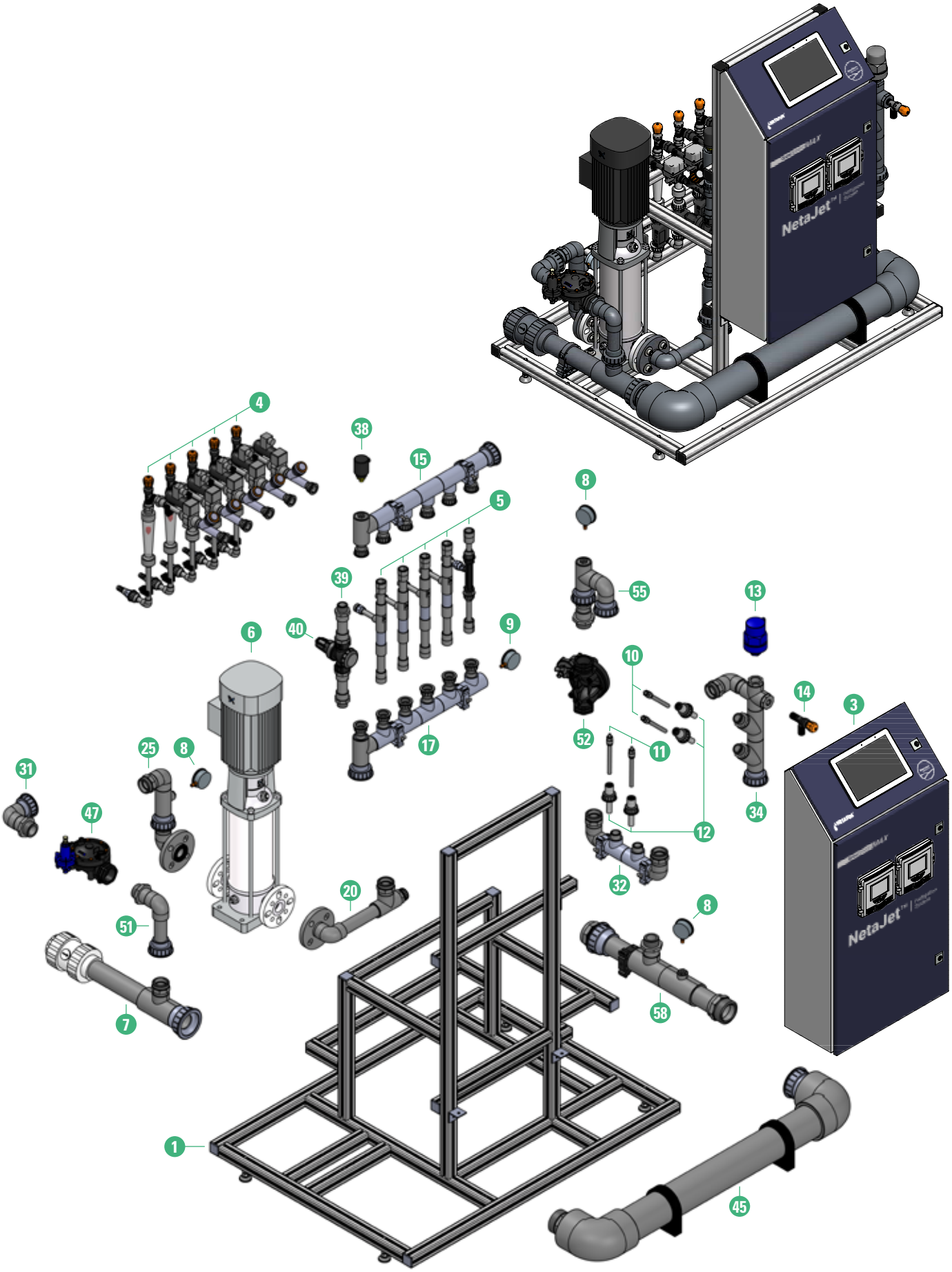
→ BP ST mode

See Main parts for all modes table, pages 42-43



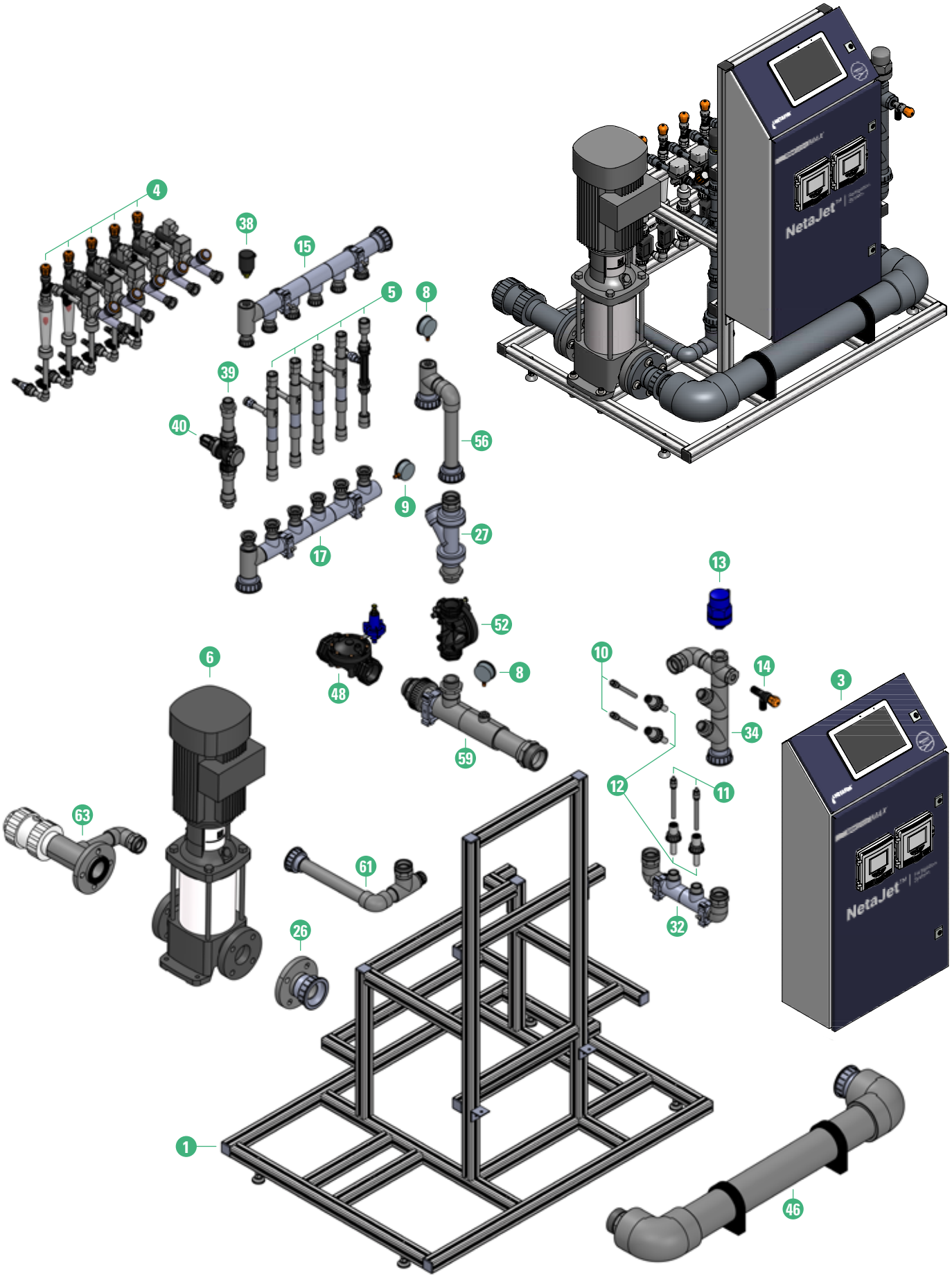
→ IL PL mode

See Main parts for all modes table, pages 42-43



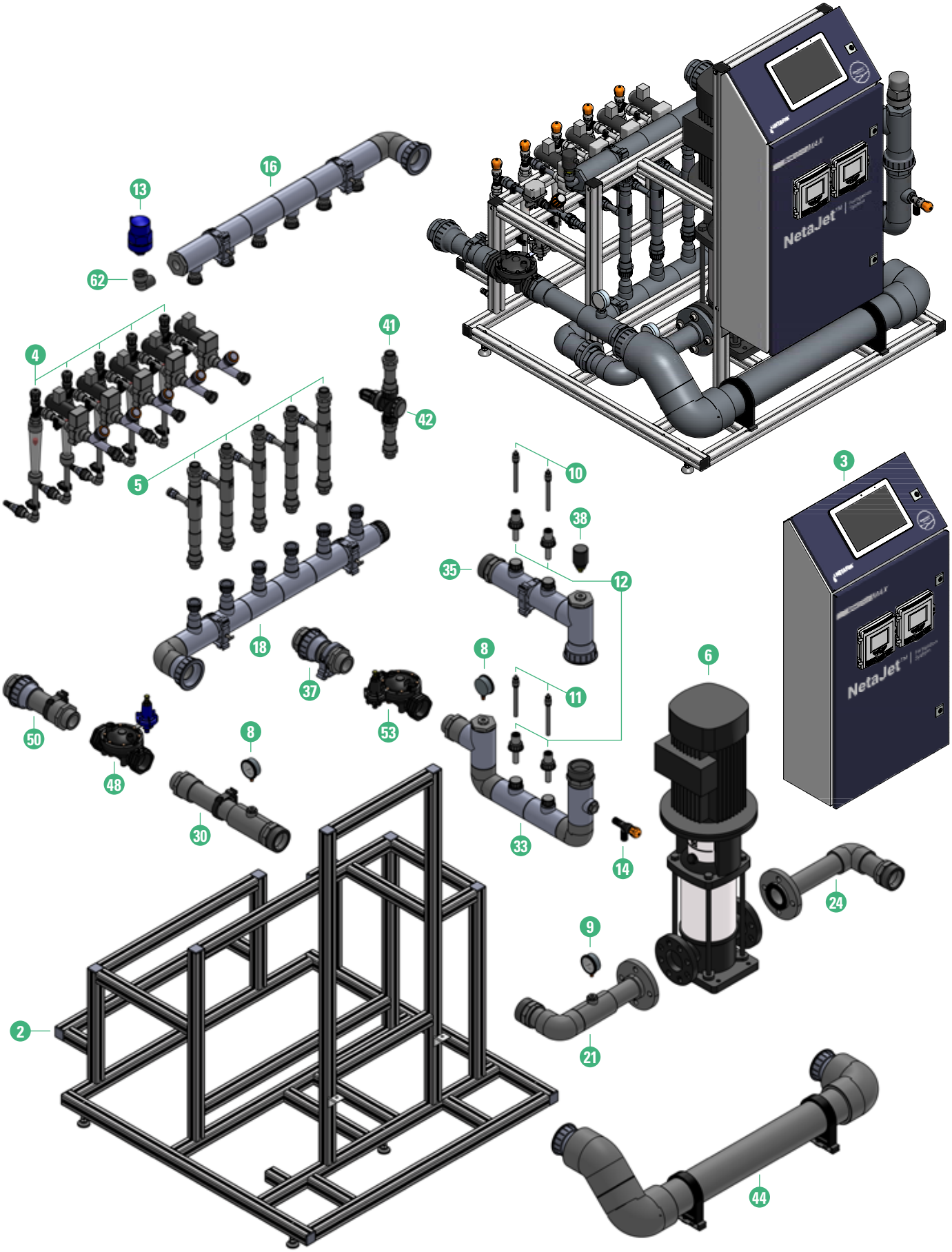
→ IL ST mode

See Main parts for all modes table, pages 42-43



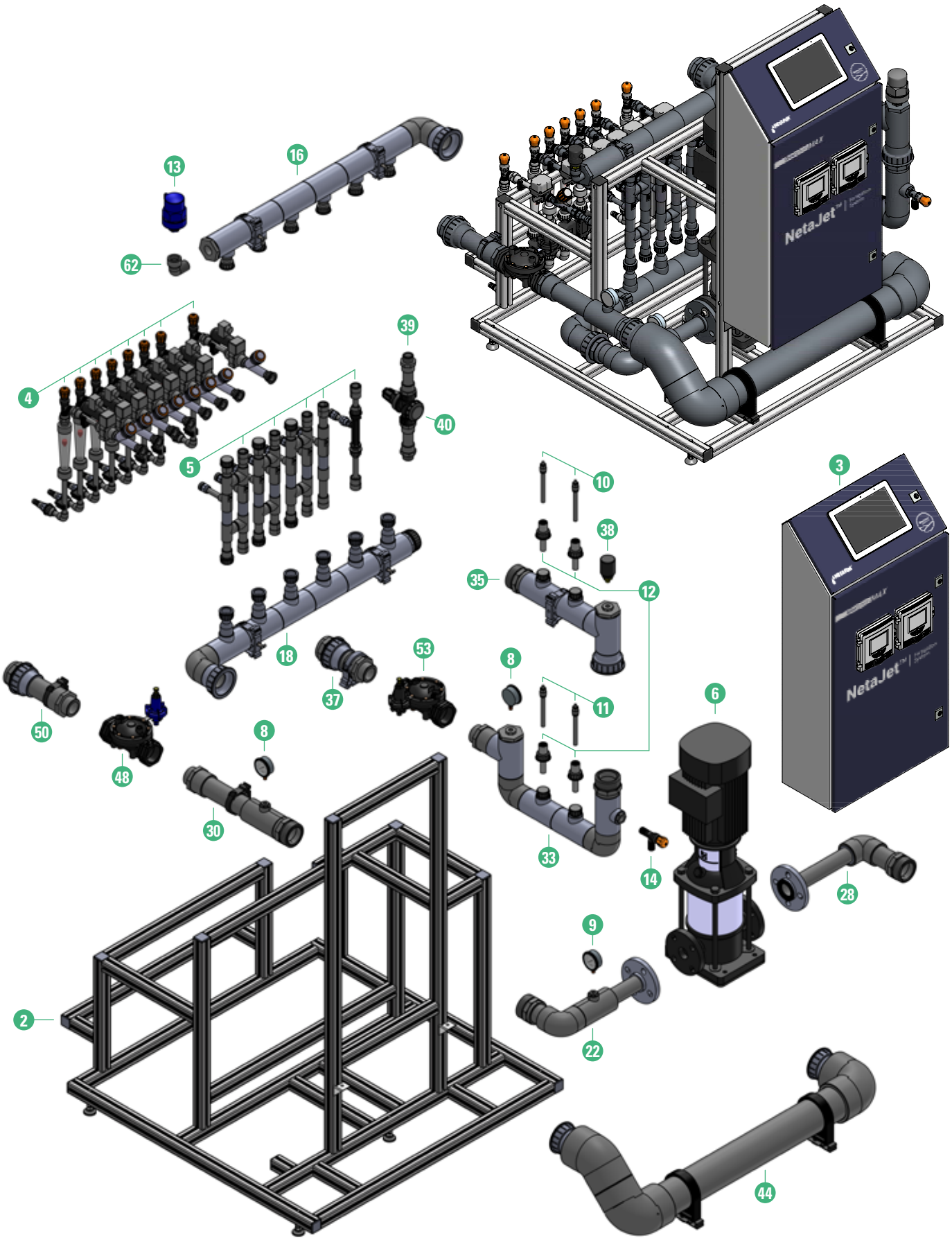
→ High-Flow Mode

See Main parts for all modes table, pages 42-43



→ OCTA - 8-Channel Mode

See Main parts for all modes table, pages 42-43



→ Main Parts for All Modes

Part	Description	Cat. No.
1	Aluminum frame for BP PL, BP ST, IL PL, IL ST	Not availabe as spare part
2	Aluminum frame for High-flow, Octa	Not availabe as spare part
3	Control unit	Per NetaJet™ 5G serial number*
4	Dosing channels	See Dosing channels, page 44
5	Venturis	See Venturis, page 45
6	Dosing booster	See Dosing boosters, page 46
7	Inlet for IL PL	33152-002010
8	Pressure gauge, 250 GLZ 8 bar ¼" BSP	77540-003350
9	Vacuum gauge, model 250-1-9 ATM ¼" BSP	77540-004151
10	EC sensor, for ABB	74360-000005
11	pH sensor, for ABB	74360-000004
12	Union adaptor set for ABB EC/pH sensor	74520-008500
13	Barak plastic air valve ¾" BSP (DG-010)	70500-000540
14	Needle valve, ½"	76400-011375
15	Upper manifold for BP PL, BP ST, IL PL, IL ST	33152-001520
16	Upper manifold for High-flow, Octa	33152-001070
17	Lower manifold for BP PL, BP ST, IL PL, IL ST	33152-001530
18	Lower manifold for High-flow, Octa	33152-001000
19	Pump inlet for BP PL	33152-001600
20	Pump inlet for IL PL	33152-002020
21	Pump inlet for High-flow	33152-001200
22	Pump inlet for Octa	33152-001300
23	Pump outlet for BP PL	33152-001610
24	Pump outlet for High-flow	33152-001210
25	Pump outlet for IL PL	33152-002030
26	Pump outlet, 50 mm for IL ST with CRI 10 pump	33152-002270
	Pump outlet, 63 mm for IL ST with CRI 15 / CRI 20 pump	33152-002260
27	Strainer for IL ST	33152-002280
28	Pump outlet for Octa	33152-001310
29	PSV inlet for BP PL	33152-001630
30	PSV inlet for High-flow, Octa	33152-001040
31	PSV inlet for IL PL	33152-002040
32	PH manifold for BP PL, BP ST, IL PL, IL ST	33152-001510
33	PH manifold for High-flow, Octa	33152-001060
34	EC manifold for BP PL, BP ST, IL PL, IL ST	33152-001500
35	EC manifold for High-flow, Octa	33152-001010
36	PRV inlet for BP PL, BP ST	33152-001400
37	PRV inlet for High-flow, Octa	33152-001050
38	Pressure switch 1-3 bar 0.3 bar diff. ¼"	77800-002180

Continued on the next page

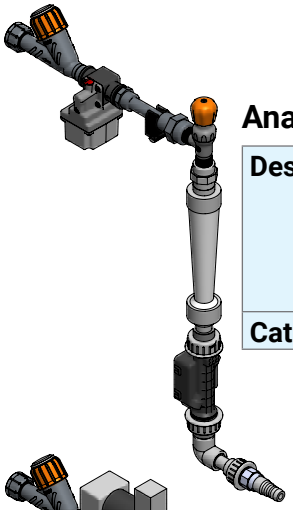
Main parts for all modes (continued)

Part	Description	Cat. No.
39	Low-flow compensation channel set	33240-007000
40	Low-flow 1" PRV P-BSP-FF-A Dir. Act., Yellow cap	71000-016380
41	High-flow compensation channel set	33152-001080
42	High-flow 1" PRV P-SP-FF-B Dir. Act., White cap	71000-016100
43	Mixing chamber for BP PL, BP ST	33152-001700
44	Mixing chamber for High-flow, Octa	33152-001020
45	Mixing chamber for IL PL	33152-002060
46	Mixing chamber for IL ST	33152-002230
47	PSV, 1½" for for BP PL, IL PL	71600-001912
48	PSV, 2" for High-flow, Octa, IL ST	71600-010611
49	PSV outlet for BP PL	33152-001620
50	PSV outlet for High-flow, Octa	33152-001030
51	PSV outlet for IL PL	33152-002050
52	PRV, 1½" for BP PL, BP ST, IL PL, IL ST	71600-001913
53	PRV, 2" for High-flow, Octa	71600-010612
54	PRV outlet for BP PL, BP ST	33152-001410
55	PRV to PH manifold for IL PL	33152-002000
56	PRV to PH manifold for IL ST	33152-002250
57	Outlet for BP ST	33152-001810
58	Outlet for IL PL	33152-002070
59	Outlet for IL ST	33152-002240
60	Outlet from lower manifold for BP ST	33152-001800
61	Outlet from lower manifold for IL ST	33152-002200
	Elbow, 90 deg. 3/4" F x 3/4" M	77300-011400
62	Inlet flange, 50 mm for IL ST with CRI 10 pump	33152-002220
	Inlet flange, 63 mm for IL ST with CRI 15 / CRI 20 pump	33152-002210

* To order spare parts, call your Netafim™ local representative with the serial number of your NetaJet™ 5G at hand. **Only with this number we can supply the correct part for your specific NetaJet™ 5G.** The serial number is inscribed on the side of the switchbox (3530-_____).

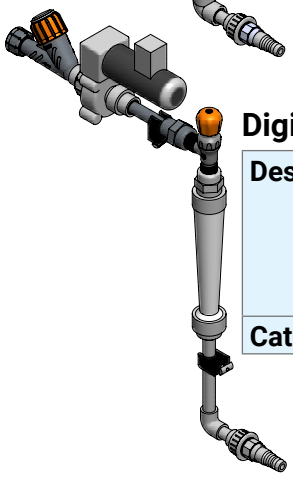
→ Dosing Channels

To accommodate a variety of installations, flow rates and Nutrigation™ needs, the NetaJet™ 5G offers a wide range of dosing channels for fertilizer and acid. Some of them are listed below.
For a full overview go to the online configurator at https://cmtconfig.netafim.com.



Analog dosing channels

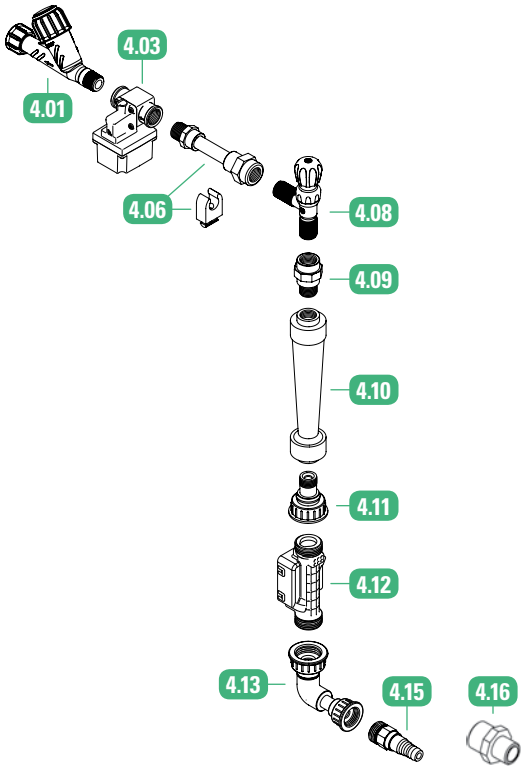
Description	Up to 50 l/hr (13 GPH), Viton, with manual override	Up to 150 l/hr (39.5 GPH), EPDM, with manual override	Up to 400 l/hr (105 GPH), EPDM, with manual override	Up to 600 l/hr (158.5GPH), EPDM, with manual override
Cat. No.	Contact Netafim™	74520-000301	74520-000302	74520-000303



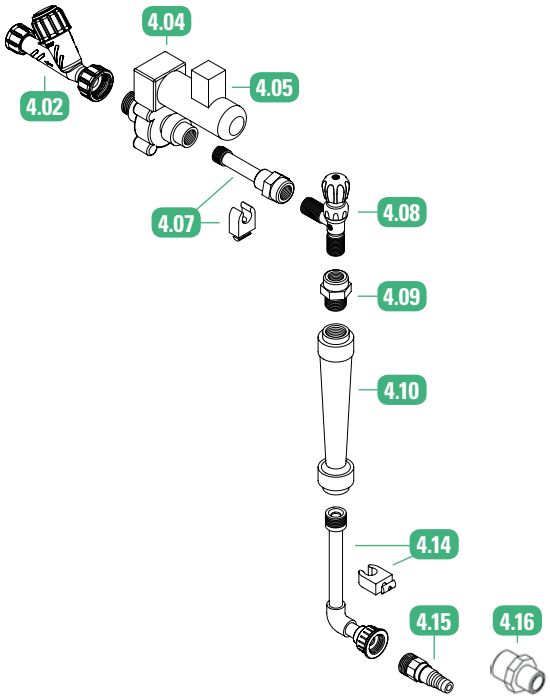
Digital dosing channels

Description	Up to 50 l/hr (13 GPH), Viton, with manual override	Up to 150 l/hr (39.5 GPH), EPDM, with manual override	Up to 400 l/hr (105 GPH), EPDM, with manual override	Up to 600 l/h (158 GPH), EPDM, with manual override	Up to 1000 l/h (264 GPH)
Cat. No.	33230-001955	33200-000368	33230-001595	33230-001194	33230-001860

Analog dosing channel



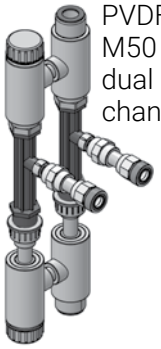
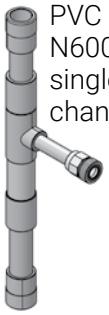
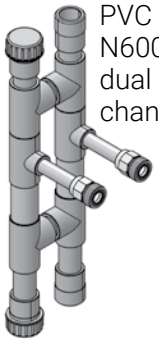
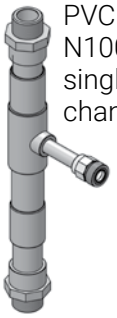
Digital dosing channel



→ Dosing Channel Parts

Part	Description	Cat. No.
4.01	Check valve, connecting between analog EPDM dosing valve and Venturi with EPDM	76420-007965
	Check valve, connecting between analog Viton dosing valve and Venturi with Viton	76420-007960
4.02	Check valve, connecting between S22 digital dosing valve and Venturi with EPDM ISO	76420-007950
4.03	Analog EPDM dosing valve (PWM)	70800-000026
	Analog Viton dosing valve	70800-001796
4.04	Digital dosing valve, S12 24VAC 50/60 Hz Viton	77540-008480
	Digital dosing valve, S22 24VAC 50/60 Hz Viton	77540-008500
4.05	Connector and cable for S22 24VAC valve	77540-008520
4.06	Connection between needle valve and analog dosing valve	33240-004650
4.07	Connection between needle valve and S22 ISO dosing valve 1000 l/h (264 GPH)	33240-004450
4.08	Needle valve, ½" for 50, 150 and 400 l/h (13, 39.5 and 105.5 GPH) Rotameter	76400-011375
	Needle valve, ½" for 600 and 1000 l/h (158.5 and 264 GPH) Rotameter	76400-011376
4.09	Connection between needle valve and DFM170 ISO Rotameter, 50, 150 and 400 l/h (13, 39.5 and 105.5 GPH)	33240-004350
	Connection between needle valve and DFM185 ISO Rotameter, 600 and 1000 l/h (158.5 and 264 GPH)	33240-004400
4.10	Rotameter, DFM170 5-50 l/hr (1.3 - 13 GPH)	77540-007560
	Rotameter, DFM170 15-150 l/hr (4 - 40 GPH)	77540-007575
	Rotameter, DFM170 40-400 l/hr (10.6 - 106 GPH)	77540-007570
	Rotameter, DFM185 60-600 l/hr (15.8 - 158 GPH)	77540-007577
	Rotameter, DFM185 100-1000 l/hr (26.5 - 265 GPH)	77540-007580
4.11	Connection between Rotameter and fertmeter 50-400 l/hr (13.3 - 106 GPH)	77520-000001
	Connection between Rotameter and fertmeter 600-1000 l/hr (158 - 265 GPH)	77520-000003
4.12	Fertmeter DN20 1" 5000/L	45000-000022
4.13	Connection between hoze nozzle and fertmeter	74520-000002
4.14	Connection between hoze nozzle and DFM170 ISO Rotameter, 50, 150 and 400 l/h (13, 39.5 and 105.5 GPH)	33240-004250
	Connection between hoze nozzle and DFM185 ISO Rotameter, 600 and 1000 l/h (158.5 and 264 GPH)	33240-004300
4.15	Hoze nozzle for dosing channel	33240-004200
4.16	Nipple, ¾"-½"	77300-010470

→ Venturis

Part	5.01	5.02	5.03	5.04	5.05
Description	 PVDF M50 single channel	 PVDF M50 dual channel	 PVC N600 single channel	 PVC N600 dual channel	 PVC N1000 single channel
Cat. No.	33240-003200	33152-001315	33240-002370	33152-001320	33240-002390

→ Dosing Boosters

For 50 Hz installations

Pump	Mode	Mains/ rated voltage (V)	Rated power (kW)	NetaJet™ 5G total rated power (kW)	Rated current (A)	Cat. No.
CRI 5-12	BP/IL PL	3 x 220-240 or 3 x 380-415	2.2	2.35	7.70/4.45	77800-003000
CRI 5-18	BP/IL PL		3	3.15	11.0/6.30	77800-003081
CRI 10-8	Octa / IL ST		3	3.15	11,0/6,30	77800-027410
CRI 10-10	Octa, high pressure		4	4.15	13,6/7,90	77800-000063
CRI 20-5	High-flow		5.5	5.5	19,0/11,0	77800-003090
CRI 20-7	High-flow (high P)		7.5	7.65	25.0-24.2/14.4-14.0	77800-003093

For 60 Hz installations

Pump	Mode	Mains/ rated voltage (V)	Rated power (kW)	NetaJet™ 5G total rated power (kW)	Rated current (A)	Cat. No.
CRI 5-7	BP/IL PL	3 x 220-277 or 3 x 380-480	2.2	2.35	7,70-6,35/4,45-3,70	77800-003050
CRI 5-11	BP/IL PL		3	3.15	10,8-9,35/6,20-5,40	Call Netafim™
CRI 10-5	Octa / IL ST		3	3.15	10,8-9,35/6,20-5,40	77800-027420
CRI 10-6	Octa, high pressure		4	4.15	13,6-11,8/7,80-6,80	77800-027405
CRI 20-3	High-flow		5.5	5.5	18,4-16,2/10,6-9,30	77800-003095
CRI 20-4	High-flow (high P)		7.5	7.65	24,6-20,8/14,2-12,0	77800-003097

Hydraulic Condition Checklist

Check the inlet, lower manifold, outlet and main line pressure gauges and the main line flow meter and make sure all the hydraulic conditions are in range according to the following table.

Serial number	
Project name	
Technician name	
Installation date	
Notes	

Mode	Inlet PRV pressure bar (PSI)	Lower manifold pressure bar (PSI)	Outlet PSV pressure bar (PSI)	Main line pressure bar (PSI)	Main line flow m^3/h (GPM)
BP PL	3.5-4.0 (50.7-58.0)	0-+0.5 (0-7.2)	4.0 (58.0)	Standard: 2.5-5.8 (36.5-84.0) High pressure: 5.8-7.5 (84.0-108.5)	20-120 (90-500)*
Octa					
IL PL					Up to 20 (90)
High-flow					80-400 (350-1760)*
BP ST				0-+0.5 (0-7.2)	15-100 (66-440)*
IL ST					Up to 20 (90)

*In all bypass modes flow limitation depends on the fertilizer injection rate and the size of the venturis.

Testing date	Inlet PRV pressure bar / PSI	Lower manifold pressure bar / PSI	Outlet PSV pressure bar / PSI	Main line pressure bar / PSI	Main line flow m^3/h / GPM	Q_suction l/h / GPM								Source water EC	Source water pH	Dripline water EC	Dripline water pH
						Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8				
Reference data																	

Warranty

Netafim™ warrants all the components of the NetaJet™ 5G to be free of defects in material and workmanship for 1 (one) year from the date of installation, provided the installation has been reported to Netafim™ within 30 days of installation.

If the installation was not reported or was reported later than 30 days from the date of installation, Netafim™ will warrant the NetaJet™ 5G for a period of 18 months from the date of production, according to its serial number.

If a defect is discovered during the applicable warranty period, Netafim™ will repair or replace, at its discretion, the product or the defective part.

The above does not apply to EC and pH sensors, since they are wearable. Netafim™ will warrant these items to be free of defects in material and workmanship for 3 months from the date of installation, provided the installation has been reported to Netafim™ within 30 days, or 6 months from date of production if installation was not reported or was reported later than 30 days from the date of installation.

NOTE

When not installed, the pH sensor must be immersed in KCL solution (supplied with the sensor) or in calibration buffer 4 at a temperature of 18-25˚C (64-77˚F), protected from freezing and not be exposed to pressure greater than 6 bars (87 PSI).
Damage due to these causes is not covered by the warranty.

This warranty does not extend to repairs, adjustments or replacements of a NetaJet™ 5G or part that results from misuse, negligence, alteration, force majeure, lightning, power surge, improper installation or improper maintenance.

If a defect arises in your Netafim™ product during the warranty period, contact your Netafim™ supplier.

Limited Warranty

This warranty is subject to the conditions in Netafim's official warranty statement.
(For the full text of Netafim's official warranty statemen, contact your Netafim™ local representative).

Appendix

→ Dosing Ratio Estimates

WARNING

These are only estimates - for the exact fertilizer dosing ratio in a given project, consult an agronomist.

Irrigation according to the water consumption of the crop

Protected Crops (greenhouse)	**Dosing ratio per channel** (l/m³) (US gal/1000 US gal)
Vegetable in soil (A+B+acid)	5
Flowers in soil (A+B+acid)	5
Vegetable in soil (A+B+C+D+acid)	3.5
Flowers in soil (A+B+C+D+acid)	3.5
Vegetable in substrate	5
Flowers in substrate	5
Vegetable in substrate (High-Tech greenhouse - Multi-pulse**)	10
Flowers in substrate (High-Tech greenhouse - Multi-pulse**)	10

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