



DOSATRON[®]

An Ingersoll Rand Business



Car Wash **CHEMICAL DELIVERY SYSTEM GUIDE**

How to choose the right chemical blending
method for your business

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code for more
information on
Vehicle Wash.

1 Introduction

Imagine golfing with bent clubs and expecting to make a hole in one. Or, trying fly fishing with an old cane pole and expecting to catch salmon. You wouldn't. Then why do we continue to use old, outdated chemical dilution equipment, expecting to deliver consistently clean and shiny cars?



On the surface, carwash chemical dilution, or blending, seems like a simple thing. But without the right equipment, you won't achieve the precision blending that is needed to provide your customers with the results they expect. Your chemical usage becomes ineffective, your water is being wasted, and you quickly become frustrated with the time and money it costs you.

Imagine, on the one hand, blending a capful of detergent or polish with a gallon of water and, at the same time, dumping a capful on the ground. Sounds crazy, doesn't it?

But, this is essentially what's happening if your dosing equipment does not provide repeatable results. In this case, more is not better. Overdosing chemicals will not only increase your budget, but using too much can also affect how other chemicals perform further down the conveyor, often costing additional labor to compensate. If your delivery system isn't providing accurate and consistent dosage, your cost-per-car could end up being twice as much as it should be.

On the other hand, if you are only adding half a capful of chemical to each gallon of water when it really should be one capful, do you really think your cars are going to come out clean, dry and shiny? Probably not.

Accurate, repeatable and reliable chemical blending is the key to keeping the lowest cost-per-car possible and providing your customers with the brilliant wash they are expecting. Let's take a look at what your options are in chemical delivery.

2 Four Ways to Blend

There are four primary ways of blending chemicals with water before applying to a vehicle.



Hand-Mixing

You can hand mix products with water and then spray them onto the car. The issue with this method is that each person involved may mix your chemical at varying concentrations and apply a different amount each time.

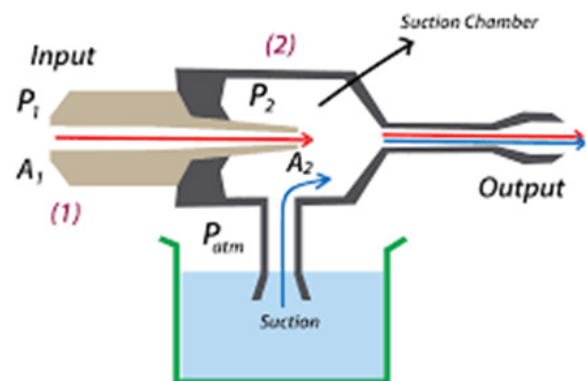
Choosing this method provides an inconsistent application and is generally the least efficient way to use your chemistry.





Venturi

One of the most common yet antiquated methods to blend water and concentrate is the Venturi principle. The Venturi effect is the reduction in fluid pressure that results when a fluid flows through a constricted section (or choke) of a pipe. Although new to some, the Venturi principle was actually discovered by Giovanni Venturi in 1797. Not much has changed in over two centuries.



Today, this method uses a set screw, or orifice tip, that interferes with the vacuum of a jet-like Venturi injector. The jet squeezes the water and creates the vacuum to draw chemical from the concentrate tank. Variations in city water pressure feeding the Venturi will affect the amount of vacuum created and lead to non-repeatable or unpredictable chemical dilution. A booster pump is required to stabilize the pressure and variations of the city water as well as to improve performance.

Since a Venturi system often fills a reservoir with the mixed solution, a repressurization pump (most often an air diaphragm pump) is used downstream to transfer the ready-to-use product to the applicator in the wash. If the pump malfunctions, in either case, chemicals can't make it to the car, and you have an unhappy customer. And, with today's chemistry getting more and more concentrated, the orifice tips used to control the dilution rate are much smaller in diameter. Those small-diameter tips naturally become very prone to clogs, potentially cutting off any concentrate from being drawn, creating another headache for operators.



Water-Powered Proportional Injector

One more method that's been on the market for about 25 years is the water-powered proportional injector. It works by using the same water you are using to mix your concentrated chemical. The water acts as the energy source, driving a piston in a vertical stroke inside the injector body. As the piston moves, a plunger attached to the bottom of the piston also moves, causing a syringe-like action that creates a predictable vacuum and displacement of chemical into the water flow.

This technology is not affected by water pressure fluctuations. It remains proportional even if the water flow through the injector varies - the frequency of the piston stroke increases or decreases to maintain a proportional mixture of water to concentrate.

On the lower portion of the injector, a threaded collar with an engraved scale in both ratio and percent allows you to dial-in the desired dilution rate. It is not limited by orifice tip size, making it infinitely adjustable.

The injectors may require a very simple seal kit change every year or so, depending on usage. The models today give you the ability to blend chemical as low as 3,000-to-1 for concentrates to 10-to-1 for most wheel and tire applications.



Electric Diaphragm Metering Pump

The last option is the predictable blending method of the electric diaphragm metering pump. This low-energy pump can be configured as a direct injection method into the water stream before flowing to the applicator. The electric-powered pump injects concentrate into a water line that could feed a foamer, spray arch or rain bar.

It is also configurable with an ultrasonic flow meter to proportionally inject the chemical into the water stream. The flow meter senses variations in water volume and speeds up or slows down with the pump-action, causing it to perform like the water-driven proportional injector. The electric diaphragm metering pumps require very little maintenance and can blend as low as 5,000-to-1.



3 Bottom Line

After reviewing the four primary options of blending chemicals with water, you now have the knowledge to make an informed decision on the right method and equipment for your wash. Remember to look for a chemical delivery system that provides your carwash with the best-blended solution possible, giving your customers the wash they are expecting that will keep them coming back time after time as well as keeping your overall chemical costs down.

Learn More ►

Learn more about the right Chemical Delivery System for your business by connecting with Car Wash experts at Dosatron.



4 Water-Powered Chemical Proportioners

Dosatron chemical proportioners compensate for flow and pressure changes providing consistent, repeatable results, and because they are water-powered there is no need for electricity or air. You can still wash cars even if your water booster pump fails!

- No Venturi Tips - No Clogs
- Metal-Free Piston
- Space-Saving Design
- Direct On-Demand Mixing

Here's How It Works ►

Mixing the Water and Chemical is as easy as 1, 2, 3!

1

When water enters the proportioner, it triggers the hydraulic piston, which begins moving up and down inside the body of the unit.

2

As it strokes, the Dosatron draws fluid up from the concentrate tank in an action similar to a hypodermic syringe.

3

The concentrate is then displaced into the mixing chamber, where it is mixed with the water flowing through the unit.



Scan the QR code to see how it works

Helpful Suggestions



Decreasing Cost-Per-Car

With the ball valve installed on the water supply side of the Dosatron, open the ball valve wide open and observe the coverage of the mixed chemical on the car.

If the coverage is adequate, close the ball valve slightly and check the coverage again. Continue this procedure until you see sufficient coverage on the car without “flooding” the surface and using unnecessary water and chemical.

For example: if you are diluting drying agent through a Dosatron and you find the best “break” on the car’s surface is at 400:1, lock the adjustment there.

If, with the ball valve wide open, the drying agent arch is flowing at 3 GPM, and you are able to reduce the flow to 1.5 GPM by closing the ball valve and you are still getting sufficient coverage on the car, you have effectively reduced the amount of chemical and water used on each car by half!

Foaming Chemicals

Dosatron offers consistent dilution, regardless of variations in pressure and flow, but as the unregulated water pressure varies, the air to chemical pressure ratio at the foam generator will also vary, causing the foam “density” to change from wet to dry and back again.

When operating your Dosatron directly from city water pressure, installing the water pressure regulator and setting it at 3 - 4 PSI below the lowest, your water pressure drops will allow for an unvarying air-to-chemical pressure ratio at the foam generator.

This will also allow you to control the “density” of the foam and eliminate “spitting” at the arch by a simple adjustment of the air pressure to the foamer.



Doing this gives you **REAL** water and chemical savings you can measure and see!

Remember, your Dosatron will provide consistently mixed chemical regardless of the flow.

Recommended Proportioners

Dosatrons are a perfect fit for presoaks, detergents, and acidic products. The water-powered Dosatron provides accurate car wash chemical dispensing while cutting your cost-per-car.

Dosatron Chemical Proportioners accurately inject:

Presoaks • Detergents • Polishes/Waxes • Bug Remover • Drying Agents

For Car Wash

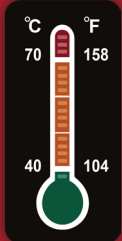
PROPORTIONERS				
MODEL	D14MZ2VFDII	D14MZ5AFDII	D14MZ10AFDII	D14MZ3000VFDII
FLOW RANGE	0.05 - 14 GPM	0.05 - 14 GPM	0.05 - 14 GPM	0.05 - 14 GPM
DILUTION RANGE	500:1 - 50:1	200:1 - 20:1	100:1 - 10:1	3000:1 - 333:1
PRESSURE RANGE	4.3 - 85 PSI	4.3 - 85 PSI	7 - 85 PSI	4.3 - 85 PSI
CONNECTIONS	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT

For Truck Wash or Large Vehicles

PROPORTIONERS			
MODEL	D40MZ2VFII	D40MZ5AFII	D40MZ3000VFII
FLOW RANGE	2.2 - 40 GPM	2.2 - 40 GPM	2.2 - 40 GPM
DILUTION RANGE	500:1 - 50:1	100:1 - 20:1	3000:1 - 500:1
PRESSURE RANGE	4.3 - 116 PSI	7.2 - 116 PSI	4.3 - 116 PSI
CONNECTIONS	1 1/2" NPT	1 1/2" NPT	1 1/2" NPT

All units include: mounting bracket, suction hose, weighted strainer, and quick start guide. Maximum temperature: 104°F

Hot-Water Dosatron Proportioners

			
MODEL	D14TMZ5	D14TMZ10	D14TMZ3000
TEMPERATURE	158 °F (70 °C)	158 °F (70 °C)	158 °F (70 °C)
DILUTION RANGE	200:1 - 20:1	100:1 - 10:1	3000:1 - 333:1
PRESSURE RANGE	4.3 - 85 PSI	7 - 85 PSI	4.3 - 85 PSI

All units include: mounting bracket, suction hose, weighted strainer, and quick start guide. Maximum temperature: 158 °F (70 °C).

Pre-Plumbed Systems

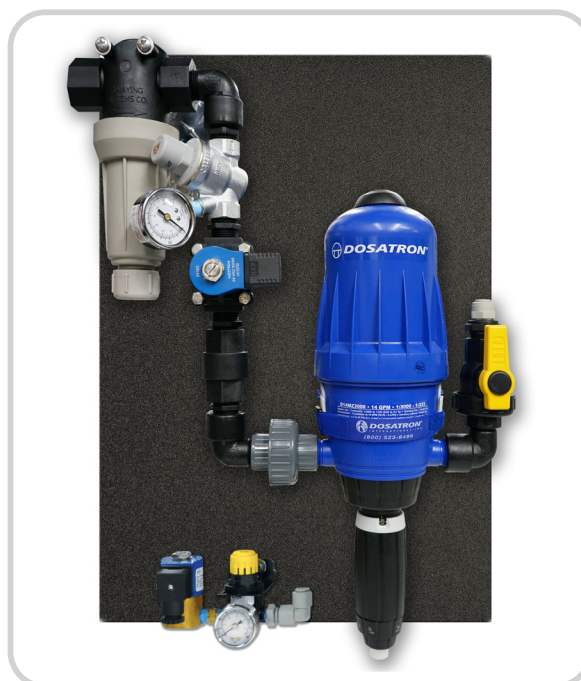
Simplify your installation with Dosatron's custom panel systems. Our pre-plumbed systems include all the necessary accessories mounted on either aluminum diamond plate or black polypropylene panels.

SINGLE PANEL SYSTEM ▶

- 1 Dosatron Proportioner Unit
- Water & Air Solenoid Valves
- Water & Air Pressure Regulators & Gauges
- Filter

Part #: PS1A138
(using D14MZ2VFDII)

Call for a quote
1-800-451-6628
www.dilutionsolutions.com





▶ HIGH- AND LOW-PRESSURE MODULAR SELF SERVICE SYSTEM

- 6 Bay with Air Version shown
- 1 Dosatron Proportioner Unit
- Chemical & Air Solenoid Valve Manifolds
- Water & Air Pressure Regulators & Gauges
- Filter

Part #: Call 1-800-523-8499 for specific part #.

TRIPLE PANEL SYSTEM

- 3 Dosatron Proportioner Units
- Filter
- Water & Air Solenoid Valves
- Water & Air Pressure Regulators & Gauges

Part #: PSD5J138-138-138
(using 3-D14MZ2VFDII)



Please contact us to discuss your Custom Panel System Configurations!

Proportioner Venturi

Venturi proportioners, under constant pressure and flow conditions, provide an economical means of accurately diluting and dispensing chemicals.

Features

- 12 large, easy-to-change, color-coded tips
- Chemical resistant construction
- Built-in check valve
- Backflush valve
- Suction valve and strainer
- A simple turn of the bypass handle changes function from dosing to rinsing

Benefits

- The tips allow for injection rates from 1:100 to 1:2.3
- Flushes water through, for easy cleaning after each use
- Can handle hot water up to 160 °F



Part #: DSA-VENTURI

LOW COST - COMPACT PROPORTIONER
with broad injection range!

Specifications

- 3/4" Polypropylene proportioner
- 3" W x 5" H x 2" D
- Injection Rate 1:100 to 1:2.3
- Flow Rate:
 - 2 GPM at 58 PSI (in Dosing Mode)
 - 13 GPM at 58 PSI (in Rinse Mode)

VBV Vacuum Breaker Valve Kit

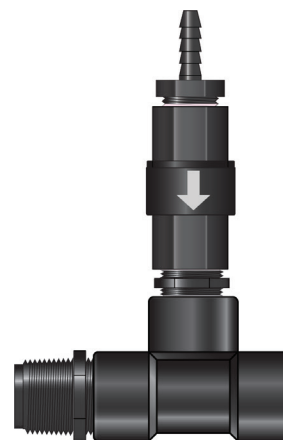
This simple **Vacuum Breaker Valve Assembly** when placed downstream from the injector, helps prevent chemical from being siphoned into the line.

If a vacuum occurs in the line, the check valve opens to allow air to enter the pipe and break the siphon.

As part of a regular system maintenance, it is recommended to verify the operation of the check valve by inserting a thin rod through the barb, then push down and release. Liquid may come out so be sure to wear the proper personal protective equipment such as gloves and goggles when performing this task.



Please meet all state and local requirements
for back flow prevention.



Part #: VBV34

5 Electric Metering Pumps

Along with being easy to use, highly reliable, and compact in size, Etatron pumps provide constant dosing, save energy, and the low operating temperatures result in reduced mechanical stress.

Etatron Pumps **Operation** is **NOT Affected** by Water Quality!

PKX Series

The PKX Solenoid Metering Pump is simple to use, highly reliable, and provides a compact design. Long-lasting, unique one-piece Teflon® diaphragm design. Works with reclaimed water!

Etatron PKX Pumps accurately inject:

- Presoaks
- Detergents
- Chlorine
- Waxes
- Drying Agents



PKX STANDARD FEATURES	
Manual air bleed pump head for fast priming	Wall or foot mounting options
24 or 120V - 50/60 Hz	Polypropylene solenoid head for chemical resistance
Flashing LED indicates pump is operating	Manual control adjustable from 0 to 100%
Suction stops immediately when power is off	Hot water applications up to 140°F
Adjustable while running	IP65 acid resistant housing

PKX Specifications Chart

VERSION	FLOW RATE	PRESSURE
NUMBER	Oz/Minute	PSI
0105	0.6	72
0206	1.1	87
0303	1.7	43
0505	2.8	72
0702	3.9	29
	5.6	14

eOne Series

The eOne Electric Metering Pump provides consistent dosing, energy savings, and low operating temperatures resulting in reduced mechanical stress. Long-lasting, unique one-piece Teflon® diaphragm design. Works with reclaimed water!



Etatron eOne Pumps accurately inject:

- Presoaks
- Waxes
- Detergents
- Drying Agents

eOne STANDARD FEATURES	
Manual air bleed pump head for fast priming	Wall mounting options
Long-lasting, unique one-piece Teflon® diaphragm	Standard PVDF solenoid head
Proportional dosing with a 4-20 mA signal	120V or 230V - 50/60 Hz
Alarm to detect suction or discharge interruption	Reduced operating temperature to increase reliability
Digital control	Hot water applications up to 140°F
Level control alarm	IP65 acid resistant housing

eOne Specifications Chart

VERSION	FLOW RATE	PRESSURE
NUMBER	Oz/Minute	PSI
0110	0.6	145
0216	1.1	232
0420	2.2	290
0607	3.4	101
0710	4.0	145
1012	5.6	174
1505	8.4	72
2007	11.3	101
3005	16.9	72

Pre-Plumbed Systems

Make your installation easy with Etatron's custom panel installations. Our pre-plumbed systems include all the necessary accessories mounted on either aluminum diamond plate or black polypropylene panels.

SIMPLE DIRECT FEED PANEL SYSTEM

Call for a quote
1-800-451-6628
www.dilutionsolutions.com

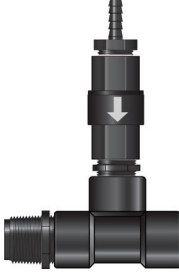


4 - 20 mA PROPORTIONAL FEED PANEL SYSTEM

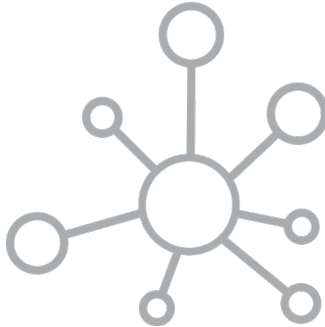


6 Recommended Accessories

These are the recommended accessories for your Water-Powered Proportioners and Electric Metering Pumps. Please note, for installation on all water systems, you must conform to all state, local, and federal laws concerning the use of chemical injection devices for backflow prevention.

PRODUCT	IMAGE	DESCRIPTION	PART #
FILTER		T-Type, 200 Mesh/80 Micron filter, 3/4" FNPT, polypropylene, industrial grade. Includes a cleanable, permanent, stainless steel cartridge.	AKF5AP11T
CHECK VALVE		3/4" check valve allows flow to go in one direction. Polypropylene & hastelloy.	CV34-PH
SOLENOID VALVE		3/4" chemical resistant solenoid valve. Polypropylene. 24 V or 120 V.	SV034P-24-G SV034P-110-G
PRESSURE REGULATOR		3/4" NPT pressure regulator with 2" stainless steel gauge. Includes a tamper-resistant cap.	PR34-NPT
Vacuum Breaker Valve Kit (VBV)		This simple Vacuum Breaker Valve Assembly, when placed downstream from the injector pump, helps prevent stock solution from being siphoned into the line.	VBV34 & VBV100

PRODUCT	IMAGE	DESCRIPTION	PART #
LOCKING DEVICE FOR DOSATRON PROPORTIONER		Protects unauthorized access to your Dosatron settings. Includes lock and key set. Made of high impact strength polypropylene. Dosatron unit sold separately.	DOSA-LOCK
PRO HM DIGITAL TDS METER		Easily measures conductivity, TDS, and temperature of water.	COM-100
TDS CALIBRATION SOLUTION		Ready-to-use, individual liquid packets for optimized calibration.	CP-1000
PRO HM DIGITAL pH METER		Easily measures pH and temperature of water.	PH-200
pH CALIBRATION SOLUTION		Makes calibration easy with ready-to-use pH liquid packets.	PH-P7
pH STORAGE SOLUTION		Keeps probe hydrated, contains fungicide and helps probe last longer.	PH-STOR



CONNECT



1-800-523-8499

Give us a call, and we will be glad to answer any of your questions or take your order.



CHAT

CHAT with us at www.dosatron.com. Just enter your question and we will be glad to assist.

For **Technical Advice** Contact Our **Vehicle Wash Experts**



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