

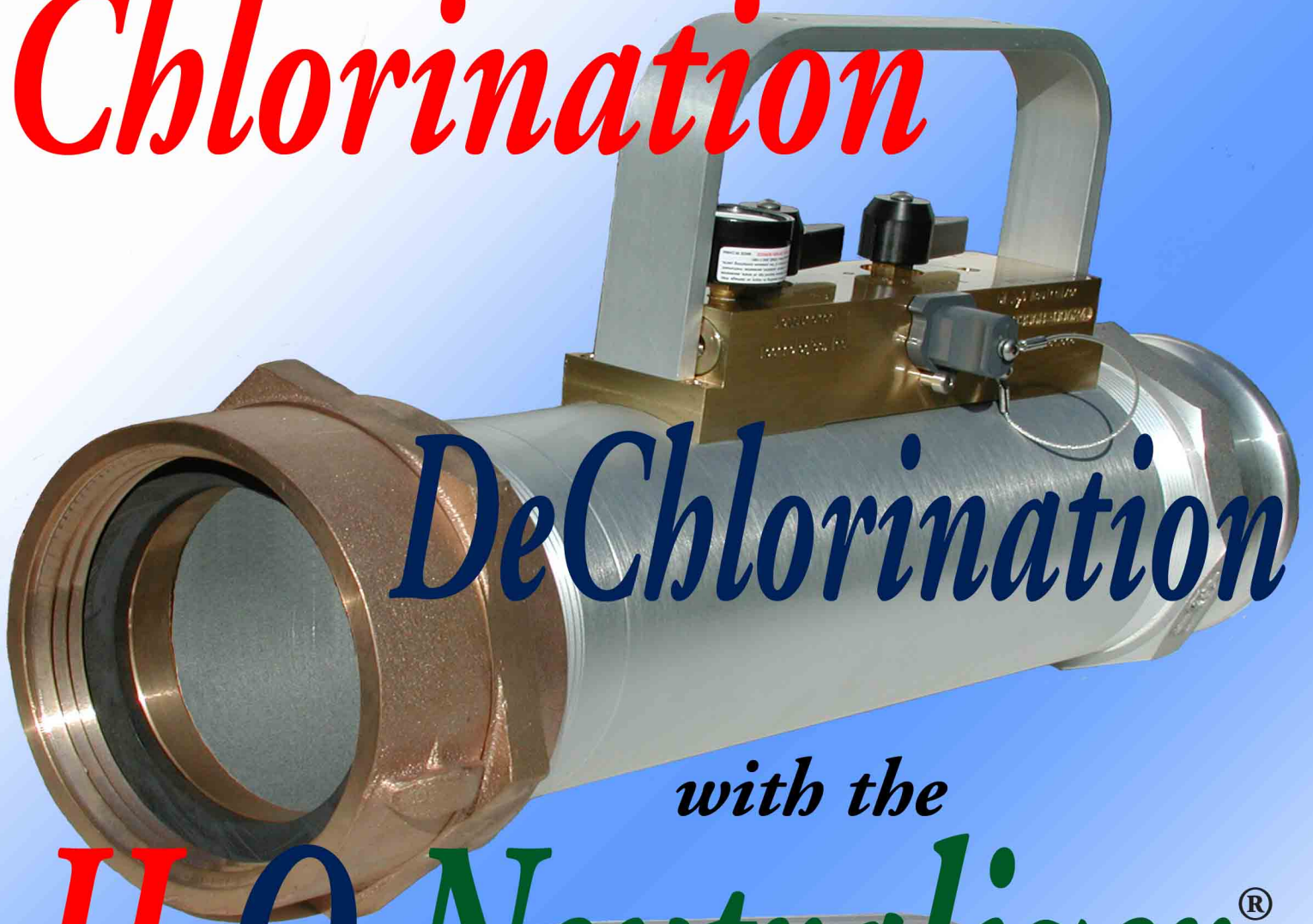
Chlorination

DeChlorination

with the

H₂O Neutralizer[®]

Flows from
5 - 4,000+ GPM



U.S. Patent# 6,264,846

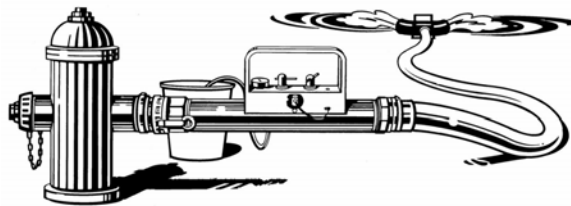
Measurement Technologies, Inc.



Measurement Technologies began producing the H₂O Neutralizer® in 1999. The first model was 3" in size and only designed for dechlorination. The 5" device was later introduced in the fall of 2000. It did not take long to realize that the device could also be used for chlorination, which made the device dual purpose and answered the problems of field chlorination. Both utilities and contractors have faced the problem of super chlorinating lines unevenly, causing failed purity tests. The H₂O Neutralizer® injects chlorine into every gallon of water that is entering the new system. For dechlorination, the H₂O Neutralizer® design allows the operator complete control of the feed solution entering the venturi, allowing the proper balance between the chlorine residual level and the amount of dechlorination solution required.

The quest for environmentally sound means of dechlorination started in the 1990's. First, a local kidney dialysis doctor in Mount Vernon, Washington, enlightened Public Utility District No. 1 of Skagit County as to the benefits of ascorbic acid, Vitamin C, to remove chlorine from our drinking water. Ascorbic acid has been recommended as the dechlorinating agent of choice for VOC's (EPA QA Newsletter, January, 1988), as well as being the choice of many owners of exotic fish to dechlorinate their tank water. Ascorbic acid is an additive in fish food to improve their immune systems. It is also an additive in food production for human consumption. When weighing the benefits of ascorbic acid to the conventional sulfur-based dechlorination chemicals, Skagit County quickly made the change to ascorbic acid. It made good environmental sense. The first few years the utility used the ascorbic acid for dechlorination with conventional methods that had been used over the years with sulfur-based chemicals. The methods that were being used were different configurations of drip systems as well as simply broadcasting the ascorbic over open water. Results were not impressive, especially with the higher cost of ascorbic acid. I, Tony Smith, then Water Superintendent for the P.U.D., decided that it was time to design a device that would work under all field conditions and make the most economical use of ascorbic acid. The H₂O Neutralizer® was born out of two principles. It has a mainline orifice with additional (easy to install) orifice inserts to control flow rates and differential pressure, and a lateral by-pass venturi to create a full vacuum at low flows that will maintain throughout the entire performance range of the device. My combination worked and I now hold the first patent issued for a dechlorination device. My design allows the device to reach 29 inches of vacuum with as little as 5 psi and approximately 6-8 gpm of flow. The H₂O Neutralizer® is available in two different models. The 3M is designed to be used on connections up to 3" in size, and the 5M is designed to be used on connections up to 6". We offer units that are designed for both DeChlorination AND Chlorination.

Tony Smith
Inventor

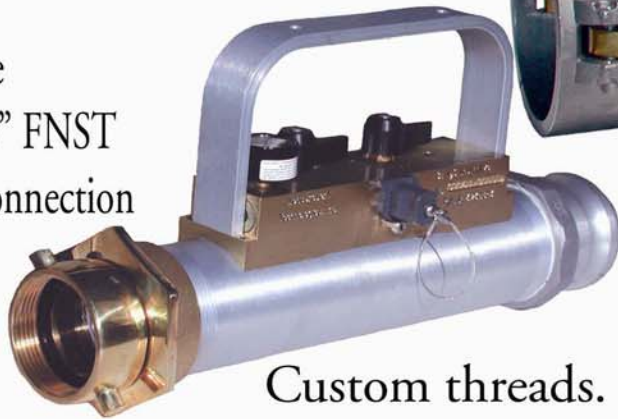


Chlorination / DeChlorination

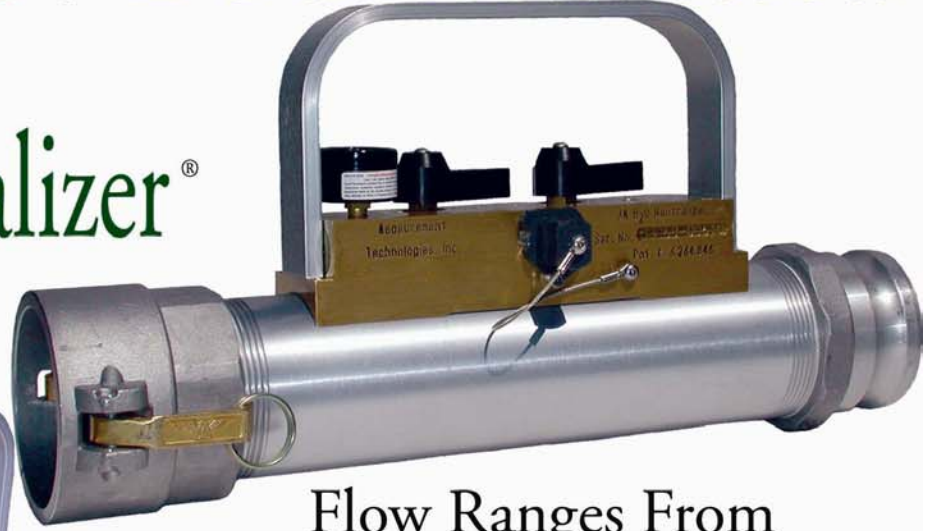
with the

3M H₂O Neutralizer[®]

Available
with 2½" FNST
swivel connection
and



Custom threads.



Flow Ranges From
5 - 1,200+ GPM

The H₂O Neutralizer[®] features a lateral by-pass venturi design which achieves a full vacuum at pressures as low as 20 psi and maintains a constant feed solution flow of one gallon per minute throughout the entire flow range.



Available in two packages:

3M-SC Package

- OR -

3M-TSP Total Solution Package including:

3" x 20'-0" Nitrile Rubber Discharge Hose

3" Full Flow Diffuser

3" Dust Cap

U.S. Patent # 6,264,846

*The H₂O Neutralizer[®]
is the original
Chlorination / DeChlorination Device
using Vitamin "C"...*



Measurement Technologies, Inc.

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Redmond, WA 98073-2195

425.836.8683

Toll Free: 877.889.8482

Fax: 425.868.5982

www.H2ONeutralizer.com

3M-SC Package includes:

3M H₂O Neutralizer®



Nominal Size:	3"
Overall Length:	20"
Overall Height:	10.0"
Approximate weight:	18 lbs.
Power requirements:	None
Flow rate:	5 - 1,200+ GPM
Feed Solution rate:	65 GPH
Orifice Inserts:	1.5", 1.0", & 0.75"
Tubing:	(2) 3/8" x 5'-0"
Storage Case:	Blow molded with custom foam cutout
Inlet Side Adapter:	2½" FNST x 3" male cam adapter
Discharge Side Adapter:	2½" FNST x 3" female cam adapter



3M-TSP Package includes:

3M-SC Package (above)

3" x 20'-0" Nitrile Rubber Discharge Hose

3" Full Flow™ Diffuser

3" Dust Cap



3M-TSP

The dechlorination/chlorination device will have a 3" nominal diameter with Cam & Groove fittings for connecting to fire hydrant, blow-off assemblies and discharge hoses. The device will have one fixed orifice with three (3) additional orifices, which can be placed in the fixed orifice to reduce the orifice opening to allow control of the water flow based on the by-pass pressure coming into the device. The device will have a flow range of 5 to 1,200+ gpm with no change in the feed solution rate (65 gallons per hour) of the reagent solution entering the waterway. The device must have a make-up water control valve, which will allow the user to make additional batches of feed solution while dechlorinating through the feed solution valve. The make-up water control valve must also allow the user to determine what the incoming chlorine levels are by drawing water samples from this outlet. The device must be able to dechlorinate up to 300 ppm of chlorinated water using ascorbic acid. The device will also work with any common dechlorinating reagents. The device will have a feed solution control valve equipped so that it will allow the user to balance the amount of reagent entering the water. This will allow the user to conserve on the amount of reagent products that are introduced into the waterway and add only the proper amount of reagent to remove the chlorine. The feed solution will also allow chlorinating of the system by introducing the chlorine solution through the feed solution control valve and this control valve will also act as the controlling valve to balance the chlorine to the desired residual level. The unit will work with water pressure only; no outside power will be required. The water pressure will create a vacuum that will induce the feed solution into the waterway. The vacuum will only work in one direction. Once the flow has stopped, the vacuum will cease. No backflow or reverse flow will occur with the reagent solution. This device is for dechlorination and chlorination. The device is furnished with a custom storage case, including vinyl tubing and hose adapter. Included with this package; one-3"x20'-0" discharge hose made from Nitrile rubber with cam loc connections, one - 3" Full Flow Diffuser™, one - 3" dust cap and 2 - 2.0kg No-Chlor™ ascorbic acid. Dechlorination/Chlorination device shall be equal to the H₂O Neutralizer®, Model 3M-TSP, as manufactured by Measurement Technologies, Inc. of Redmond, Washington or prior approved equal.

3M-SC (ONLY)

For 3M-SC specifications, remove the following sentence from above:

Included with this package; one-3"x20'-0" discharge hose made from Nitrile rubber with cam loc connections, one - 3" Full Flow Diffuser™, one - 3" dust cap and 2 - 2.0kg No-Chlor™ ascorbic acid.

3M H₂O Neutralizer®

The 3M H₂O Neutralizer® is designed for DeChlorinating Potable and Super Chlorinated water AND chlorinating your systems. The H₂O Neutralizer® works with a mainline orifice (three additional orifices included for controllability) and a lateral by-pass venturi. This combination allows the H₂O Neutralizer® to reach 29 inches of vacuum at only 5-psi of by-pass pressure.

The 3M H₂O Neutralizer® is the most efficient dechlorinating device in the industry. Due to its patented design, the H₂O Neutralizer® is the most economical device for dechlorination when using ascorbic acid. Using No-Chlor™ Ascorbic Acid and the H₂O Neutralizer® equals the most environmentally friendly combination.

Chlorination / DeChlorination

5M H₂O Neutralizer®

U.S. Patent # 6,264,846



4 1/2" FNST
swivel connection

Custom threads
available at an
additional cost

Flow Ranges From
500 - 4,000+ GPM

The H₂O Neutralizer® features a lateral by-pass venturi design which achieves a full vacuum at pressures as low as 20 psi and maintains a constant feed solution flow of 1 gallon per minute throughout the entire flow range.



Photo courtesy of San Francisco Water Department - San Francisco, California

Available in two packages:

5M-SC Package

- OR -

5M-TSP Total Solution Package including:

5" x 20'-0" Nitrile Rubber Discharge Hose

5" Full Flow Diffuser

5" Dust Cap

Measurement Technologies, Inc.

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*The H₂O Neutralizer®
is the original
Chlorination / DeChlorination Device
using Vitamin "C"...*



Tacoma Water - Tacoma, Washington



5M-SC Package includes:

5M H₂O Neutralizer®

Nominal Size:	5"
Overall Length:	23"
Overall Height:	11.25"
Approximate weight:	33 lbs.
Flow rate:	450 - 5,000 GPM
Feed Solution rate:	65 GPH
Power requirements:	None
Orifice Inserts:	3.5", 3.0", & 2.5"
Tubing:	(2) 3/8" x 5'-0"
Storage Case:	Blow molded with custom foam cutout



5M H₂O Neutralizer®

The 5M H₂O Neutralizer® is designed primarily for high volume flushing of potable drinking water; however, it can also be used to DeChlorinate **Super** Chlorinated water and to **super chlorinate**. The high limit of the residual level of **Super** chlorinated water to be dechlorinated is determined by the discharge rate. **Super** chlorinated water with a residual level in the 50 ppm range can be discharged in the 1,500 - 1,800 GPM flow range. As the residual level drops, the discharge rate can be increased. Down stream conditions must be considered when flushing at high volumes. In low pressure conditions, or when discharge rates are low, the 3M H₂O Neutralizer® may need to be used. If flows over 5,000 gpm are required, multiple devices can be installed on a header.

5M-TSP Package includes:

5M-SC Package (above)

5' x 20'-0" Nitrile Rubber Discharge Hose

5" Full Flow™ Diffuser

5" Dust Cap



5M-TSP

The dechlorination device will have a 5" nominal diameter with a 4½" FNST swivel inlet with male Cam Lock outlet, for connecting to fire hydrants, blow-off assemblies and discharge hoses. The device will have one fixed orifice with three (3) additional orifices, which can be placed in the fixed orifice to reduce the orifice opening to allow control of the water flow based on the by-pass pressure coming into the device. The device will have a flow range of 450 to 5,000 gpm with no change in the feed solution rate (65 gallons per hour) entering the lateral by-pass venturi. The device must have a make-up water control valve, which will allow the user to make additional batches of feed solution while dechlorinating through the feed solution valve. This make-up water control valve must also allow the user to determine what the incoming chlorine levels are by drawing water samples from this outlet. The device must be able to use any of the common reagents including ascorbic acid to dechlorinate up to 4 ppm of chlorinated water. Dechlorination of super chlorinated water can be achieved up to 50 ppm with discharge rates to 1,500 gpm. The device will have a feed solution control valve equipped so that it will allow the user to balance the amount of reagent entering the water. This will allow the user to conserve on the amount of reagent products that are introduced into the waterway, and add only the proper amount of reagent to remove the chlorine. The unit will work with water pressure only; no outside power will be required. The water pressure will create a vacuum that will induce the feed solution into the waterway. The vacuum will only work in one direction. Once the flow has stopped, the vacuum will cease. No backflow or reverse flow will occur with the reagent solution. The device is furnished with a custom storage case, including vinyl tubing and hose adapter. Included with this package: one-5"x20'-0" discharge hose made from Nitrile rubber with Cam Lock connections, one - 5" Full Flow Diffuser™, one - 5" dust cap and one - 2.0kg No-Chlor™ ascorbic acid. Dechlorination device shall be equal to the H₂O Neutralizer®, Model 5M-SC, as manufactured by Measurement Technologies, Inc. of Redmond, Washington or prior approved equal.

5M-SC (ONLY)

For 5M-SC specifications, remove the following sentence from above:

Included with this package; one-5"x20'-0" discharge hose made from Nitrile rubber with Cam Lock connections, one - 5" Full Flow Diffuser™, one - 5" dust cap and 1 - 2.0kg No-Chlor™ ascorbic acid dechlorination grade.

How does the H₂O Neutralizer[®] work?

The H₂O Neutralizer[®] is a patented design combining two principles into one device. By utilizing a mainline orifice ring with a lateral bypass venturi the user is able to control discharge rates and control the amount of solution entering the device. The permanent mainline orifice ring is 2" for the 3M or 4" for the 5M with three additional orifice rings that can be inserted into the 2" or 4" ring. The different orifice openings will either allow the user to control the discharge rate or allow the user to create a full vacuum at very low flows and pressure. When the water is passing through the orifice it will create differential pressure causing part of the water flow to enter the lateral bypass. The modified venturi will create a vacuum of 29 inches which draws in one gallon per minute of feed solution with the control valve in the full open position. The control valve allows the user to control the amount of feed solution from zero to one gallon per minute. After the venturi mixes the solution with the bypass water, it will reintroduce that fluid back into the main flow of water causing either the neutralizing reaction to the chlorine or the mixture of chlorine with the water to create chlorinated water of any strength.

Operational Features:

One device may be used for either chlorinating or dechlorinating, and there are two sizes to choose from: the original 3" model that will chlorinate and dechlorinate standard drinking water and super chlorinated water, and the 5" model which is designed to chlorinate and dechlorinate standard drinking water. The 3M H₂O Neutralizer[®] is designed to be connected to pipe sizes 1" and larger, and the 5M H₂O Neutralizer[®] is designed for 4" and larger connections with minimum flows of 600 gpm and 20-psi. Choose the proper adapter which will connect the 3M H₂O Neutralizer[®] to the filling point of the new system or the discharge point of the system that needs to be dechlorinated. The 3" model comes with two special adapters so that the H₂O Neutralizer[®] can be installed in either direction. Due to the many different ways that the 5" model can be connected it is only furnished with a female swivel inlet and a type 'A' cam lock adapter outlet. Different end connections can be furnished.

Both the 3M and 5M H₂O Neutralizer[®] are equipped with a lateral by-pass pressure gauge which will give the operator an approximate flow rate when compared to the orifice size being used, and a make-up water valve. The make-up water valve will allow the user to draw incoming water to make feed solution and to test the incoming chlorine residual level during dechlorinating operations.

The 3M H₂O Neutralizer[®] can achieve a full vacuum with as little as 5 psi and 5 gpm of flow by blocking the opening in the ¾" orifice and inserting it into the device. Once both devices reach a full vacuum it insures the ability to deliver one gallon per minute of feed solution to the modified venturi. The bypass solution being reintroduced into the main flow will enter on the back side of the differential ring which has a lower pressure than the front side of the orifice ring and the lateral bypass.

Both models have an optional discharge hose and diffuser. The discharge hoses are made from Nitrile rubber, which features good abrasion resistance, and no special drying requirements. The hoses are twenty feet in length, as that is the longest hose that can be installed on the discharge side of the device. Our Full Flow Diffusers are designed to allow the user to position the discharge at up to 90° from the device in either direction.

Email:
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Fax: 425-868-5982



Why Dechlorinate?

The EPA is mandating that the discharge of chlorinated water to the environment be eliminated. This is to protect aquatic life and other animals. Utilities, contractors, fire departments, and all others that must discharge chlorinated water into the environment must remove the chlorine to allowable discharge levels. All states have adopted discharge requirements with some states enacting requirements that go beyond the EPA requirements.

Dechlorination Chemicals:

To insure the proper supply of ascorbic acid for dechlorination, Measurement Technologies has developed **No-Chlor™** ascorbic acid dechlorination grade. When using the **H₂O Neutralizer®** with **No-Chlor™** ascorbic acid dechlorination grade, Measurement Technologies will guarantee the neutralization of chlorine or chloramine water to EPA discharge requirements with residual levels as high as 300+ ppm. The **H₂O Neutralizer®** can be used with other dechlorination chemicals, however the user should be aware of the negative side effects that sulfur-based chemicals can have on the environment. Unlike ascorbic acid which reacts immediately to neutralize chlorine or chloramine water, sulfur-based chemicals require contact and reaction time. And if your system is protected with chloramine water the reaction time is even longer. When flushing water there is **no reaction time or contact time.**

Product Information for **No-Chlor™** Ascorbic acid DeChlorination Grade

Product name: No-Chlor™

Chemical Formula: C₆H₈O₆

Formula Weight: 176.13

Chemical Family: Organic acid

Product numbers:

8 oz. Sample: AA-SM

2.0kg Poly bottle: AA-2.0

25.0 kg Bag in a box: AA-25.0

Components

Ascorbic acid CAS # 00050-81-7 >95%

Physical Data

Specific gravity: 1.65 Water = 1

Solubility: 33 g/100 ml water @ 25°C

Melting point: 192° C

Acidity (pH): 2.2 – 2.5

Assay: 99.0 – 100.5%

Characteristics: Crystalline powder

Organic volatile impurities: Meets USP 24 stipulation

Protective Equipment

Ventilation: Use adequate general or local exhaust ventilation.

Respiratory Protection: None needed unless use generates annoying or irritating dust, mist or vapors. Use a dust/mist respirator mask if necessary.

Skin & Eye Protective Equipment: Safety glasses. Use good chemical handling practices.

3x2 Chlorinating Adapter



- Chlorinating through a 2" service connection or blow-off can easily be done by using the Chlorinating Adapter.
- The Chlorinating Adapter attaches to a female 2 inch threaded connection.
- The adapter comes with a brass test port to give the operator immediate chlorine residual test capabilities.
- The test port allows the operator to comply with the specified chlorine residual level at the point of entry into the system.

The H₂O Neutralizer® Feed Solution Control Valve insures that the operator will be able to chlorinate the system to whatever the specifications calls for, with the Chlorinating Adapter.

The H₂O Neutralizer® insertable orifice rings gives the ability to even reduce down to ¾ inch connections and have full performance.



Special inlet adapters are available for connections down to ¾ inch.

3x2 Chlorinating Adapter

Part #: 3220

\$129.95



Measurement Technologies, Inc

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CHLOROMETER DUO1000

Palintest[®]
Leading the way in water analysis

Precision hand-held multi-purpose chlorine meter

The Palintest Chlorometer Duo provides a convenient, accurate and easy-to-use photometer capable of providing on-the-spot confirmation of both disinfectant and residual protection chlorine levels.

The Palintest **CHLOROMETER DUO 1000** offers water utilities a new dimension in chlorine testing. Used in conjunction with the Palintest DPD Chlorine method, it provides a simple means of accurately measuring chlorine residuals. It can also be used with Palintest high range Chlorine HR test to provide a fast check on disinfection and sterilization levels in pipework.

CHLOROMETER DUO 1000 - SPECIFICATIONS

- PULSED LED COLORIMETER PRE-PROGRAMMED FOR DIRECT READING OF CHLORINE
- DUAL RANGES: 0.00 - 5.00 mg/l (Chlorine DPD)
0-200mg/l (Chlorine HR)
- RESOLUTION 0-5mg/l RANGE 0.01 mg/l Cl
0-200mg/l RANGE 1 mg/l Cl
- EASY READ 10 mm LCD DISPLAY
- TWO BUTTON OPERATION FOR EASY USE
- AUTOMATIC BLANK RECOGNITION
- RANGE SETTING MEMORY
- FACTORY SET MULTIPOINT CALIBRATIONS
- SPLASH PROOF CASE WITH FULLY SEALED CELL HOLDER
- POWER MANAGEMENT SYSTEM WITH AUTO SWITCH OFF GIVES APPROX 20,000 READINGS FROM 2 x 1.5v BATTERIES

PRODUCT ORDERING INFORMATION

PT227	Chlorometer Duo supplied in soft carry pouch
PT238	Optional hard carry case
PT233/M2	Check standard with test certificate
AP031	DPD No. 1 & 3 tablets (pack of 250)
AP162	Chlorine High range (pack of 250) test

3x2 Type 'A' Adapter

The 3x2 adapter is all you need, If your requirements call for connections less than 2 ½" NST.



3x2 Type 'A' Adapter with customer furnished bushing and valve connection.



Special Type 'A' adapter with 2 inch female threads