



Most Frequently Asked Questions

Q I know that cross-connection control is important on industrial and commercial facilities, but is it necessary on residential connections? Is there really a risk?

A Cross-connection control is important no matter what type of service is involved. Industrial cross-connection control programs have been used for years. Historically, water purveyors have recognized the potential risk of health hazard industrial connections in their systems and have taken an active roll in protecting the public water supply (primary system) from them. The potential risk from residential connections has been, for the most part, overlooked, even though some of the most serious cases of backflow originated at a residence. Chlordane was siphoned through a hose at a residence in Roanoke, Virginia, contaminating the water supply of an entire neighborhood. The cost to the water purveyor to replace water mains, valves, meters, service lines, water heaters, ice makers, and other plumbing was about \$200,000. In addition, lawsuits totalling several million dollars were filed. Since these suits were settled out of court by the water purveyor and the exterminator, no records are available on the actual amount paid, but it was probably considerable.

Q What do you mean by "second line of defense?"

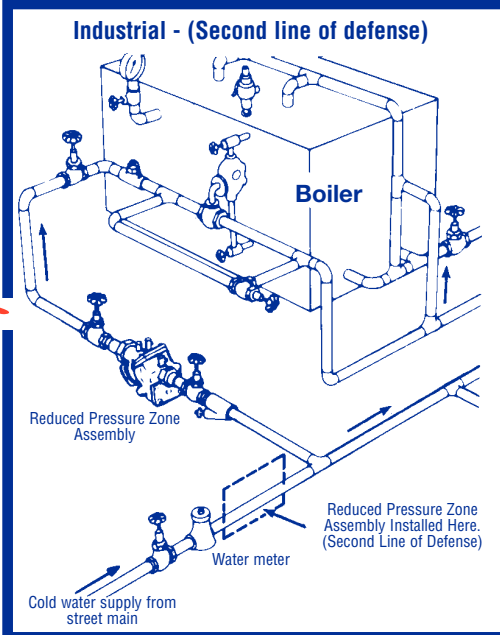
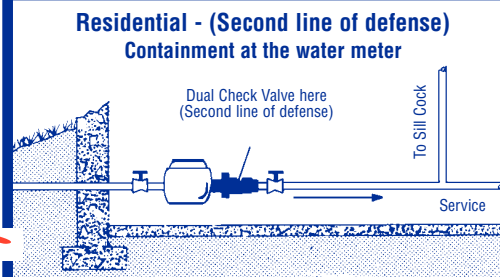
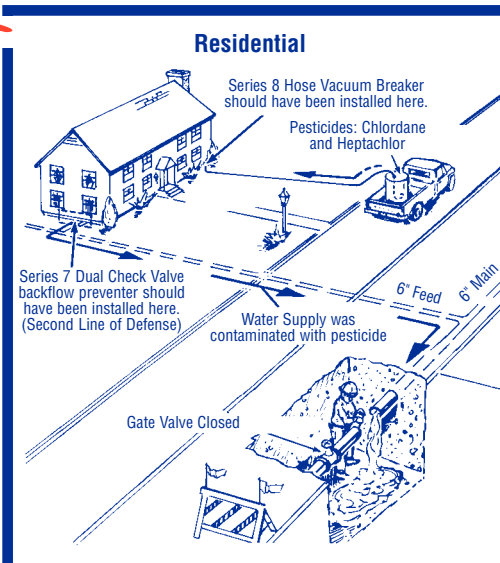
A We call this program of containment at the service connection with a Dual Check Valve backflow preventer the "second line of defense" because it is intended as a backup to the plumbing cross-connection control program which controls backflow at the cross-connection itself. It might be compared to the safety latch on an automobile door where both would have to fail simultaneously before the door could open unintentionally.

Q Is the second line of defense concept limited to residential systems?

A No, the principle must be applied to all systems, although the backup for health hazard facilities would require the use of an assembly that was designed for such installations, such as the Reduced Pressure Zone Assembly backflow preventer. The Dual Check Valve backflow preventer simply was not developed for use in health hazard industrial applications. You wouldn't put a residential deadbolt on the door to the bank vault, would you?

Residential Backflow Prevention

The combined efforts of cross-connection control (first line of defense) and containment (second line of defense).



Q If plumbing codes require backflow protection at the cross-connection, why is a second line of defense needed?

A There are several reasons: The first is that plumbing codes, like other rules and regulations, are not always adequately enforced. The second, and by far the most compelling reason, is that the day after the certificate of occupancy is issued, plumbing becomes subject to unauthorized changes. Economic factors motivate homeowners to do-it-yourself plumbing. The bottom line is the cost of a competent plumber versus the savings when the homeowner does it himself. Generally, the homeowner is not only ignorant of the plumbing code requirements, he is totally unaware of the dangers of cross-connection and backflow. Finally, the installation of a Dual Check Valve backflow preventer at the service connection divorces the public water supply from the domestic water supply and establishes jurisdictional authority and responsibility between the public water supply and domestic water system.

Q What types of water system protection are required in a residence?

A Plumbing codes are very specific here. They require backflow protection by cross-connection control and many important safety devices as follows:

1. Air gaps built into sink, tub, and basin faucets
2. Anti-siphon type ballcocks in water closets (toilets)
3. Vacuum breakers on hose bibbs and sill cocks
4. Backflow preventers or vacuum breakers on lawn sprinklers
5. Backflow preventers on supply lines to boilers or other equipment containing non-potable fluids and cross-connected to the potable water system

Because some local authorities modify existing national codes, certain areas require backflow protection on the following as well:

1. Residential swimming pools, hot tubs, and spas
2. Residential solar heating systems
3. Private wells and other auxiliary water supplies

Most homeowners do not know they alone are responsible for the safety of domestic water system. It is up to the water purveyor to inform him.

Q Is the water purveyor responsible for enforcing the plumbing code?

A No, but the water purveyor is responsible for protecting the public water supply. That responsibility may include taking secondary measures beyond the plumbing code requirements, such as installing a backflow prevention assembly at residential connections to ensure that contaminated water does not enter the distribution system at one point, only to be served to another consumer down the line. Generally, the water purveyor's responsibility ends at the service-connection to the consumer's water system. However, since the need for this added protection is relatively new (past 15 years) many premises exist that must be retrofit or brought up to today's standard. Therefore, the water purveyor must require the owner to provide proof of compliance with the current plumbing code and install a containment control device at each service or meter. The minimum standard of performance must be met before being tied into the system.

Q If you are going to install a Dual Check Valve at the service connection, why not go ahead and install a more stringent device, such as the intermediate atmospheric vent backflow preventer or the Reduced Pressure Zone Assembly?

A If that idea had merit, the water industry would already have adopted it. The fact is, the industry made repeated requests to backflow preventer manufacturers to produce a compact, economical product that could be installed in the meter box as a second line of defense for the community water system. The Dual Check Valve is a direct result of those requests. It is the only practical device for large-scale residential programs and it is designed to be installed with the meter, including in the meter box, for new or retrofit installations. One could equate the use of a Dual Check Valve to the installation of a dead-bolt on the front door: it provides better protection than a single lock in the handle, but it certainly doesn't provide the protection of a full-scale electronic security system—nor does it cost as much to install and maintain.

Q Even so, suppose I decided to use the intermediate atmospheric vent backflow preventer or a Reduced Pressure Zone Assembly at the meter as the second line of defense, could it be installed in the box with the meter?

A Positively not, because meter boxes are subject to flooding. Each of these items have an air-intake valve that would create a cross-connection the instant it became submerged. You could be creating a more dangerous situation than having no protection at all. The air-intake valves must be installed above ground, and they must be protected from freezing and vandalism. While these products meet specific needs in the industry, they simply aren't practical for meter box installation.

Q I understand the Dual Check Valve is limited by national standards to one-inch size. Suppose a residence had a service connection larger than one inch—what type of device would be practical?

A This would be an unusual situation, but a larger size Double Check Valve Assembly could be installed in lieu of the Dual Check Valve.

Q Speaking of national standards, what standards does the dual check meet?

A The Dual Check Valve meets the ANSI/ASSE Standard 1024. Generally speaking, most standards address the performance and construction requirements including the quality of materials and workmanship and the quality of the bronze, stainless steel, plastic and rubber parts, and the spring tension, tolerance and tightness.

Q Do standards ensure reliability?

A No, all water works equipment requires a maintenance program. The more sophisticated assemblies, such as the Reduced Pressure Zone Assembly, the Double Check Valve Assembly, and the Pressure Vacuum Breakers all have something in common with the Dual Check Valve. We know that after we test a sophisticated assembly, a year will generally go by before we test it again.

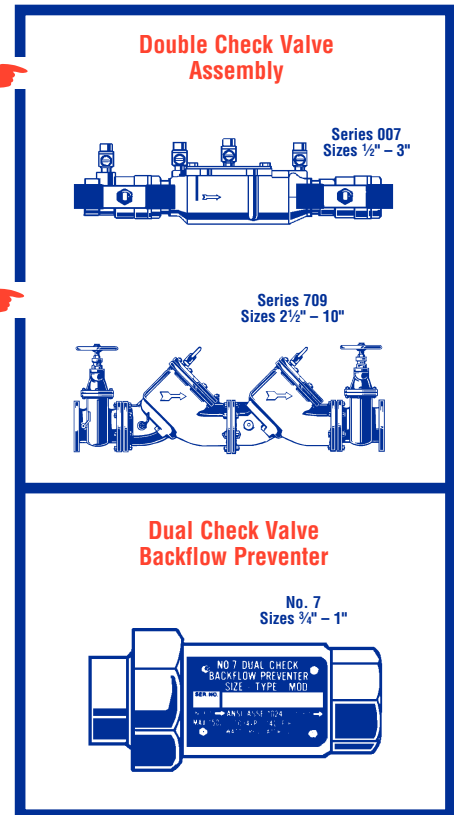
During that time, we trust we are protected. This trust is being hedged, however, with the knowledge that the assembly is manufactured to national standards and will, in all probability, prevent anyone from getting hurt. The story is the same with the Dual Check Valve. The most significant difference here is that we know the Dual Check Valve is not installed as a primary device, but as a backup, a sort of insurance policy against a residence not being or not becoming in full compliance with the plumbing code.

Q You mentioned testing. What are the major utilities doing about testing the Dual Check Valve?

A For the most part, they are using selective spot-testing; but a few are using 100 percent annual testing. All are testing at the time the meter is serviced or upon change of ownership.

Q How can a water purveyor gain confidence in a Dual Check valve that is designed for selective spot-testing?

A By experience. All backflow preventers, like other mechanical devices, are depended upon to work for a reasonable period of time after installation. Assuming the water purveyor removes a certain percentage of the assemblies on a selected grid of his distribution system, he will be able to determine if the assemblies are performing as intended and are suitable for extended service, or if his water conditions dictate the need for extensive maintenance or replacement. He can then make adjustments to his spot-testing procedures to ensure even higher reliability.



Q Is spot-testing adequate?

A Selective spot-testing is the mainstay method of quality control used in every industry in the world today, including the potable water supply industry. Clearly, spot-testing is nothing new to the water industry. It is used regularly to test meter accuracy, flow rates, and system pressure. In fact, spot-testing is used to ensure that the water is within the bacteriological and chemical limits established by EPA. The Safe Drinking Water Act requires that random samples of water be sent to certified labs. Using this method to test Dual Checks Valves not only makes good economic sense, it can often provide additional valuable information to the water purveyor regarding the overall condition of his distribution system.

Q If spot-testing is adequate, why are all Reduced Pressure Zone Assemblies tested annually?

A Unlike the Dual Check Valve, RPZs are intended for use in health hazard installations and are considered the first line of defense. Interestingly, the air gap, purported to be the ultimate in cross-connection control, is assumed to remain in place and function indefinitely, since no periodic reports on inspections are maintained on these installations, even though defeating an air gap by adding an extension is a very simple and commonplace procedure. The selection, maintenance, and testing of every backflow prevention assembly demands the use of sound judgement, based on a reasonable assessment of the risk involved versus the cost of protection.

Q Regarding risks, is there a potential for liability from backflow into the mains when the source is beyond the jurisdictional authority of the water purveyor?

A Most definitely. All purveyors connect the public water supply of the utility to the domestic water systems of the consumer. Purveyors must require domestic water systems to comply with state and local plumbing codes (the first line of defense), but experience teaches that this is not always the case. Accordingly, we have a bonafide risk of contamination. The concern over potential liability is intensified by the Insurance Crisis in America and the fact that most utilities can no longer purchase liability insurance. Because we can not assume that 100 percent of the consumers will comply with the plumbing code, there is no alternative but to take additional measures to protect the public water supply. **That's where the Dual Check Valve comes in, as a second line of defense and establishes jurisdictional authority.** It is economical, dependable, suitable for installation in the meter box, and a lot better than the millions of unprotected services in the country today!

Q Is there a possibility the utility would be held liable for an incident that occurred in spite of an active second line of defense program?

A That's highly unlikely. Certainly not if the contamination was contained in the domestic water system and highly unlikely if some of it got into the public water supply. There would be a legal defense for an on-going backup program, even if it failed. There would be no defense for a nonexistent program.

Q What about thermal expansion? Doesn't the Dual Check Valve create a closed system?

A A backflow preventer, like any other checking device installed at the service connection, creates a closed domestic water system. The water purveyor has the right and duty to contain all domestic water systems that, in his judgement, represent a threat—or a potential threat—to his public water supply. Prior to closing the domestic water system by installing a Dual Check Valve backflow preventer, however, the purveyor has a responsibility to notify the consumer and the plumbing official, in writing, of his intent to do so. The consumer must then make provisions for any resulting thermal expansion through the installation of a Watts Gov. 80 antisiphon ball cock and relief valve, auxiliary pressure relief valve, or a thermal expansion tank.

Q Could the water purveyor make his own provision for thermal expansion?

A No. The control of thermal expansion is plumbing by nature. All domestic water systems that are in compliance with the plumbing code would have provisions built in. It makes more sense for water

purveyors to get on with protection of the public water supply and advise the owner or his designated agent to comply with the plumbing code.

Q Is the residential containment method of water system protection being favorably accepted, and can you elaborate on the actual operations in some of the major cities' programs?

A Yes. "Containment" or the "second line of defense" has been very favorably accepted in the U.S.A. and Canada. Recently, major cities have reported very successful operations of their backflow programs. Since these communities are extending backflow prevention to include residential homes, the water supply is now safe. The actual operations or mechanics of backflow prevention is based on the following:

1. A valve is required on all new residential homes located at the meter
2. Existing homes are retrofit during meter change out programs or at the time of change of ownership
3. All customers are required to provide a certificate of compliance with the plumbing code. Residential homeowners utilize a short, simple, self certification form.

Rather than specifically calling for compliance with cross-connection control, the form is designed to cover water system safety in homes.

Included is a check off for the T&P valves on water heaters, anti-siphon ball cocks, thermal expansion relief devices, etc.

The plumbing code is clear that the owner or his agent is responsible for safety of his plumbing system. It would not be prudent for the public water supplier to require anything less than the minimum legal requirements. No reasonable person would conclude otherwise.

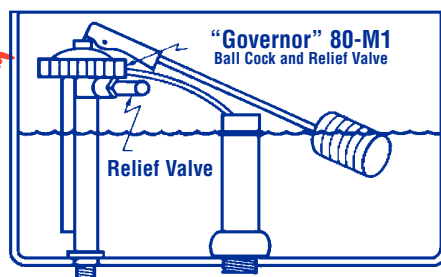
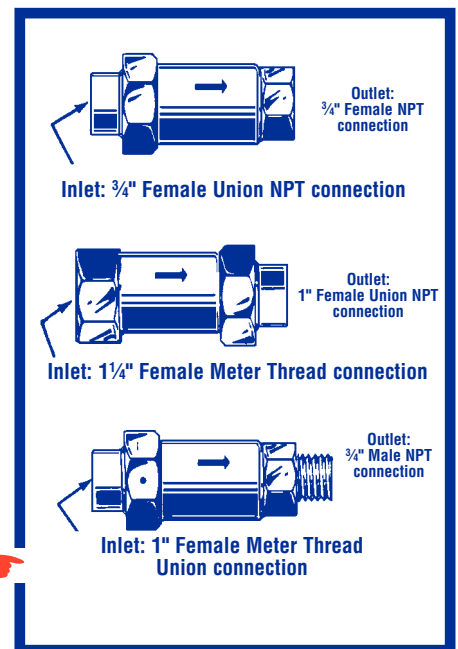
Q Can the Dual Check Valve be adapted to existing meter installations?

A Yes, Watts offers models with meter threads, pipe threads, male or female threads, or combinations on one or both ends. Unions are also available on one or both ends.

Q How much does it cost to establish a "second line of defense" program utilizing Dual Check Valve backflow preventers?

A The cost, of course, will vary depending on the type of installation. However, compared to the cost of serious backflow incident, a second line of defense program is relatively inexpensive. In addition to the cost of replacement or repair when a public water supply is contaminated, courts may impose judgements in favor of injured parties and the cost can skyrocket—along with bad publicity. How can a utility afford NOT to take extra precautions to protect the public water system, its customers, and its good reputation?

Send for our folder F-BDL that explains the importance of jurisdictional authority, total containment, and several other important subjects that every individual in the water industry should be informed about.



TYPICAL WATER CLOSET

Send for S-Gov80

For Technical Assistance Call Your Authorized Watts Agent.

			Telephone #	Fax #
	HEADQUARTERS: Watts Regulator Company	815 Chestnut St., North Andover, MA 01845-6098 U.S.A.	978 688-1811	978 794-1848
North East	Vernon Bitzer Associates, Inc.	980 Thomas Drive, Warminster, PA 18974	215 443-7500	215 443-7573
	Edwards, Platt & Deely, Inc.	271 Royal Ave., Hawthorne, NJ 07506	973 427-2898	973 427-4246
	Edwards, Platt & Deely, Inc.	368 Wyandanch Ave., North Babylon, NY 11703	631 253-0600	631 253-0303
	J. B. O'Connor Company, Inc.	P.O. Box 12927, Pittsburgh, PA 15241	724 745-5300	724 745-7420
	The Joyce Agency, Inc.	8442 Alban Rd., Springfield, VA 22150	703 866-3111	703 866-2332
	W. P. Haney Co., Inc.	51 Norfolk Ave., South Easton, MA 02375	508 238-2030	508 238-8353
	WMS Sales, Inc. (Main office)	9580 County Rd., Clarence Center, NY 14032	716 741-9575	716 741-4810
South East	Billingsley & Associates, Inc.	2728 Crestview Ave., Kenner, LA 70062-4829	504 602-8100	504 602-8106
	Billingsley & Associates, Inc.	478 Cheyenne Lane, Madison, MS 39110	601 856-7565	601 856-8390
	Francisco J. Ortiz & Co., Inc.	Charlyn Industrial Pk., Road 190 KM1.9 - Lot #8, Carolina, Puerto Rico 00983	787 769-0085	787 750-5120
	Mid-America Marketing, Inc.	2776 B.M. Montgomery St., Birmingham, AL 35209	205 879-3469	205 870-5027
	Mid-America Marketing, Inc.	1364 Foster Avenue, Nashville, TN 37210	615 259-9944	615 259-5111
	Mid-America Marketing, Inc.	5466 Old Hwy. 78, Memphis, TN 38118	901 795-0045	901 795-0394
	RMI	Glenfield Bus. Ctr., 2535 Mechanicsville Tpk., Richmond, VA 23223	804 643-7355	804 643-7380
	Smith & Stevenson Co., Inc.	4935 Chastain Ave., Charlotte, NC 28217	704 525-3388	704 525-6749
	Spotswood Associates, Inc.	6235 Atlantic Blvd., Norcross, GA 30071	770 447-1227	770 263-6899
		Target Marketing Enterprises, Inc.	118 West Grant St., Building M, Orlando, FL 32806	407 245-7838
South Central	Hugh M. Cunningham, Inc.	13755 Benchmark, Dallas, TX 75234	972 888-3808	972 888-3838
	Mack McClain & Associates	11132 South Towne Square, Suite 202, St. Louis, MO 63123	314 894-8188	314 894-8388
	Mack McClain & Associates, Inc.	1450 NE 69th Place, Ste. 56 Ankeny, IA 50021	515 288-0184	515 288-5049
	Mack McClain & Associates, Inc.	15090 West 116th St., Olathe, KS 66062	913 339-6677	913 339-9518
	Pro-Spec, Inc.	P.O. Box 472226, Tulsa, OK 74147-2226	918 461-0066	918 461-0105
North Central	Aspinall Associates, Inc.	6840 Hillsdale Court, Indianapolis, IN 46250	317 849-5757	317 845-7967
	Associated Independent Marketing	1606 Commerce Dr., Sun Prairie, WI 53590	608 837-5005	608 837-2368
	Dave Watson Associates	1325 West Beecher, Adrian, MI 49221	517 263-8988	517 263-2328
	Disney-McLane-Woodcock, Inc.	428 McGregor Ave., Cincinnati, OH 45206	800 542-1682	877 476-1682
	Disney-McLane-Woodcock, Inc.	17610 S. Waterloo Rd., Cleveland, OH 44119	216 486-1010	216 486-2860
	Mid-Continent Marketing Services Ltd.	1724 Armitage Ct., Addison, IL 60101	630 953-1211	630 953-1067
South West	Delco Sales, Inc.	1930 Raymer Ave., Fullerton, CA 92833	714 888-2444	714 888-2448
	Phoenix Marketing, Ltd.	2416 Candelaria N.E., Albuquerque, NM 87107	505 883-7100	505 883-7101
	P I R Sales, Inc.	3050 North San Marcos Place, Chandler, AZ 85225	480 892-6000	480 892-6096
	Preferred Sales	31177 Wiegman Road, Hayward, CA 94544	510 487-9755	510 476-1595
North West	Delco Sales, Inc.	111 Sand Island Access Rd., Unit I-10, Honolulu, HI 96819	808 842-7900	808 842-9625
	Fanning & Associates, Inc.	6765 Franklin St., Denver, CO 80229-7111	303 289-4191	303 286-9069
	Hollabaugh Brothers & Associates	6915 South 194th St., Kent, WA 98032	253 867-5040	253 867-5055
	Hollabaugh Brothers & Associates	3028 S.E. 17th Ave., Portland, OR 97202	503 238-0313	503 235-2824
	R. E. Fitzpatrick Sales, Inc.	4109 West Nike Dr. (8250 South), West Jordan, UT 84088	801 282-0700	801 282-0600
	Soderholm & Associates, Inc.	7150 143rd Ave. N.W., Anoka, MN 55303	763 427-9635	763 427-5665
CANADA	Watts Industries (Canada) Inc. (Watts Regulator Co. Division)	5435 North Service Road, Burlington, Ontario L7L 5H7	905 332-4090	905 332-7068
	GTA Sales Team.	Greater Toronto Area	888 208-8927	888 479-2887
	Hydro-Mechanical Sales, Ltd.	3700 Joseph Howe Dr., Ste. 1 Halifax, Nova Scotia B3L 4H7	902 443-2274	902 443-2275
	Hydro-Mechanical Sales, Ltd.	297 Collishaw St., Ste. 7 (shipping) Moncton, New Brunswick E1C 9R2	506 859-1107	506 859-2424
	Hydro-Mechanical Sales, Ltd.	85 Tolt Rd., St. Phillips, Newfoundland A1B 3M7	709 895-0090	709 895-0091
	Le Groupe B.G.T., Inc.	2800 Rue Dalton Ste. 3, Ste-Foy, Quebec G1P 3S4	418 657-2800	418 657-2700
	Le Groupe B.G.T., Inc.	140 Rue Merizzi, Ville St. Laurent, Quebec H4T 1S4	514 341-9010	514 341-4464
	Walmar Mechanical Sales	24 Gurdwara Rd., Nepean, Ontario K2E 8B5	613 225-9774	613 225-0673
	Mar-Win Agencies, Ltd.	1123 Empress St., Winnipeg, Manitoba R3E 3H1	204 775-8194	204 786-8016
	Palser Enterprises, Ltd.	1885 Blue Heron Dr., #4, London, Ontario N6H 5L9	519 471-9382	519 471-1049
	Northern Mechanical Sales	P.O. Box 280 (mailing) 163 Pine St. (shipping), Garson, Ontario P3L 1S6	705 693-2715	705 693-4394
	RAM Mechanical Marketing	1301 Winnipeg St., Regina, Saskatchewan S4R 1K2	306 525-1986	306 525-0809
	RAM Mechanical Marketing	2615-B Wentz Avenue, Saskatoon, Saskatchewan S7K 5J1	306 244-6622	306 244-0807
	Con-Cur West Marketing, Inc.	#109-42 Fawcett Rd., Coquitlam, British Columbia V3K 6X9	604 540-5088	604 540-5084
	D.C. Sales, Ltd.	10-6130 4th St. S.E., Calgary, Alberta T2H 2A6	403 253-6808	403 259-8331
D.C. Sales, Ltd.	11420 142 Street, Edmonton, Alberta T5M 1V1	780 496-9495	780 496-9621	
0315	EXPORT Hdqtrs.: Watts Regulator Co.	815 Chestnut St., North Andover, MA 01845-6098 U.S.A.	978 688-1811	978 794-1848



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