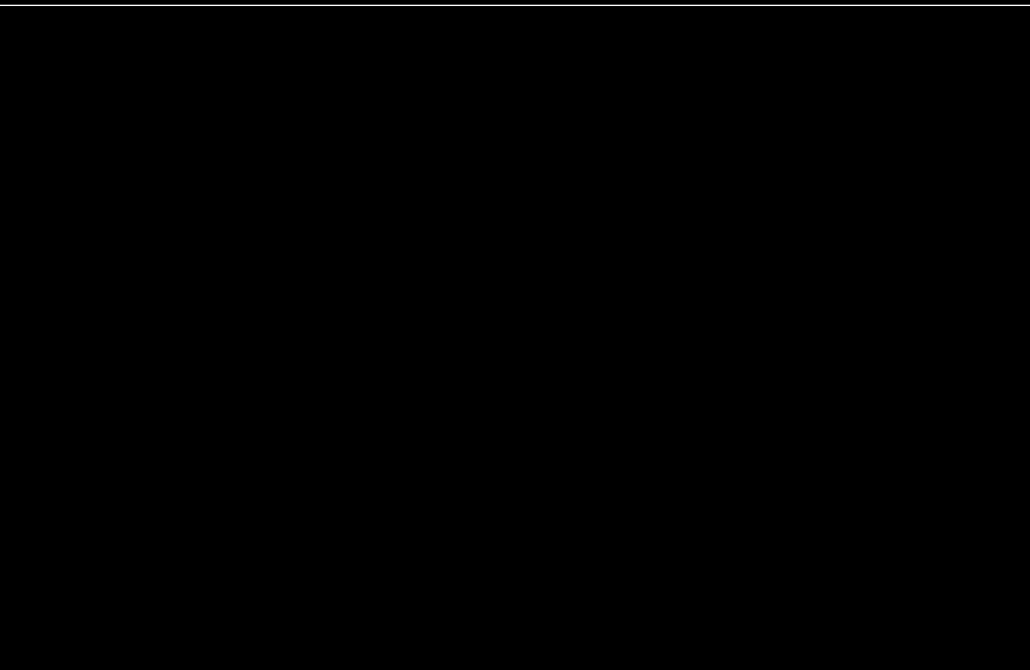# Steam Products

WWATTS®

Introduction

Watts has been a leader in steam management technology and products since 1874. Steam products perform under severe conditions requiring high quality performance and quick in-line maintenance. We recognize the importance and value of designing high quality, longer service life features for these types of products. All our steam products are engineered to exceed established standards. This brochure describes the full line of Watts steam products designed to provide cost effective, efficient steam system solutions.

Table of Contents

Steam Traps

Watts manufactures a variety of steam traps. To determine which trap is best for your application it is helpful to understand how each style of steam trap works. Below is a brief description of the operating principal of Thermostatic, Float & Thermostatic, Open Float & Thermostatic, Inverted Bucket, and Thermodynamic steam traps.

Thermostatic Radiator Traps

The thermostatic element in a radiator trap responds to temperature to open or close. At start-up when air and condensate are cooler the thermostatic element (diaphragm) contracts pulling the valve head off of the valve seat. The trap then opens and discharges air and cool condensate. As the condensate gets hotter the element expands driving the valve head into the valve seat closing the trap. The trap will stay closed until the condensate cools enough to contract the element and open the trap.

- These traps are recommended for radiators and convectors.

Float & Thermostatic Traps

Float & Thermostatic steam traps contain a sealed stainless steel thermostatic air vent and stainless steel ball float. The thermostatic air vent is open at start-up to discharge large volumes of air to the condensate return. As steam enters the trap body the air vent closes. The float is closed at start-up and stays in the closed position while steam is in the trap body. When the steam condenses, the hot condensate lifts the float moving the valve head off the seat opening the trap to discharge condensate. As condensate discharges steam enters the trap body, the float falls and drives the valve head into the valve seat closing the trap.

- These traps are designed to continuously discharge condensate in modulating conditions. Perfect for heat exchangers, air handling coils and steam main drip stations.

Open Float & Thermostatic Traps

Open Float & Thermostatic traps are designed to provide continuous air venting and condensate drainage using an open float, fail-safe design. In case of float failure, the trap will discharge condensate and air. The trap is designed with straight thru piping for easy installation.

Condensate fills the trap until it overflows into float. When the weight of the condensate overcomes the buoyancy of the float, the float begins to drop independent of the float valve head. The float continues to drop until the collar at the bottom of the valve stem engages the internal stop. At this impact point, the float falls to the bottom of the trap snapping the valve open. Condensate travels up the discharge tube, through the orifice and out the outlet port. The float will remain at the bottom with valve fully open so long as there is sufficient condensate entering the trap. As the discharge drains the float, buoyancy returns and the float begins to rise. The valve head is snapped closed into the valve seat by the velocity of the discharging condensate.

- These traps are ideal for low to medium pressure main drip applications as well as heat exchangers, air handling coils and other process applications.

Inverted Bucket Traps

Inverted Bucket Traps must be manually primed at start-up to create the water seal around the inverted bucket which allows the trap to operate. At start-up the trap is open and air and condensate enters the trap body. Air is discharged through a small vent on the top of the inverted bucket while condensate fills the trap body and is discharged through the valve seat located on the top of the trap body. When steam enters the trap body it collects in the inverted bucket. The buoyancy of the steam raises the inverted bucket which pushes the valve head into the valve seat, closing the trap. When the steam condenses the bucket is no longer buoyant causing the bucket to drop, opening the valve seat and allowing condensate to discharge to the condensate return line.

- These traps are ideal for use as main drip traps up to 250psi and on some steam equipment where minimal air venting capability is acceptable.
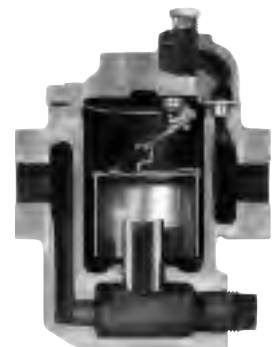
Thermodynamic Traps

At start-up, air and condensate under pressure raise the disc off of the valve seat opening the trap allowing discharge into the condensate return line. Hot condensate flashes to steam as it goes through the trap body. The velocity of the flash steam creates a lower pressure area under the disc causing the disc to seat. The pressure of the flash steam in the cap keeps the disc on the valve seat, closing the trap. The trap remains closed until the flash steam condenses allowing system pressure to raise the disc off of the valve seat.

- These traps are ideal for use as high pressure main distribution line traps from 75-600psi.

Steam Trap Selection Guide

Main Drip Applications

A main drip trap should be used every 100-150 feet of straight piping run. Traps should be used at each change of piping elevation and at risers as well as in front of expansion loops. The condensate load in a typical main drip application is small. It is unusual for main drip steam traps to be larger than ¾" (20mm).

PSI Range	Applicable Products
0-75psi	WFT, WIB
76-125psi	WTD 600, WFT, WIB
126-250psi	WTD 600, WIB
251-600psi	WTD 600

Typical Steam Main Drip Station
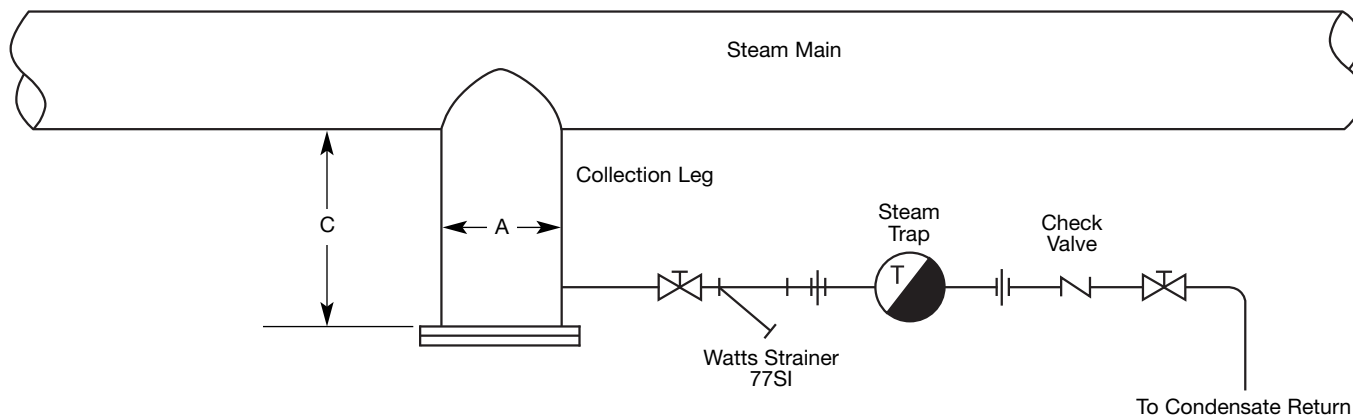
Size of Steam Main	Collection Leg Diameter A
½" to 4" (13 to 102mm)	Same as main
5" (127mm) & larger	2 to 3 pipe sizes smaller than main, but never smaller than 4" (102mm)

Length C of collection leg
Automatic Start Up: Length to be 28" (711mm) or more
Supervised Start Up: Length to be 1½ times steam main diameter, but never shorter than 8" (203mm).

Process Applications

Process Applications include the following: heat exchangers, air handling coils, pre or reheat coils, unit heaters, cooking kettles and absorption chillers. Use WFT traps, sized at full load at ¼ psi differential.

You Need to Know the Following to Properly Size a Process Trap:
- Steam load in #/hr
- Maximum system pressure
- Application (back pressure, lift to overhead returns or vacuum)

Jacketed Steam Kettle

Pressure Reducing Applications

Pressure Reducing Valve Station

A Guide to Steam Loss

Faulty Steam Traps Are Leaking Money

The constant drive for energy conservation combined with the continual rise in energy costs has motivated colleges, universities, hospitals and other large facilities throughout the U.S. to become more aware of energy waste. In spite of this, institutions often overlook one particular area: the steam system. This is because steam systems appear to be functioning well.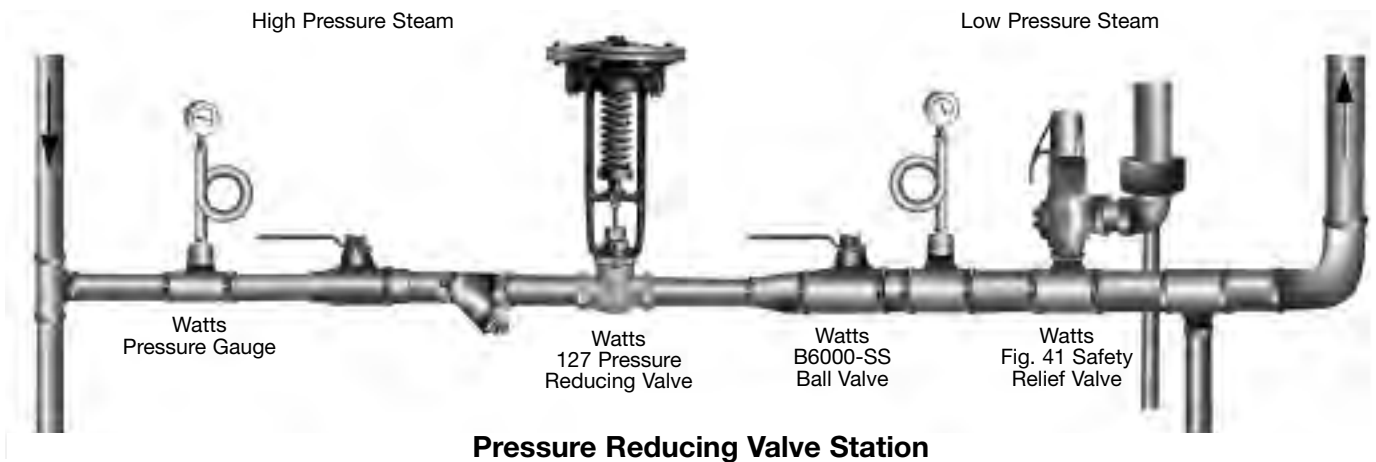 This perception may be misleading because the steam system may still be wasting significant amounts of energy and money. The problem — a well designed and properly installed steam system is inherently efficient and forgiving of bad maintenance practices. Thus, small defects can go unnoticed, while efficiency gradually degrades. Meanwhile, the accompanying increase in operating cost is easily lost in the overall costs of operating a facility.

Looking For The Sources of Leakage

Steam traps are perhaps the single major source of steam loss. This is because there are so many of them on a system and because they connect directly to the condensate return system. In large systems, individual traps may fail with little significant impact. But the collective waste of several faulty traps can push the cost of energy out of sight.

Problems with Vacuum Return Systems

In the condensate return system, steam injected by a leaking steam trap can cause severe operational problems by raising the temperature and the pressure of the return system. This can be particularly troublesome if a vacuum return system is used because it is virtually impossible to maintain a vacuum with steam leaking into the return lines. Proper steam and condensate circulation through the entire system is hampered or prevented. Operators try to restore the proper circulation by raising the pressure in the boiler, consuming more energy and driving up operating costs. So, if your system shows a loss of vacuum or pressure at the vacuum pump, it is a signal that steam is coming directly from the supply section into the return section.

Using a Condensate Pump

In systems using a condensate pump only, steam escaping into the condensate return line raises the condensate temperature to a point where it cannot be handled by the centrifugal condensate pump. Cavitation, noise and pump seal leaks are imminent if condensate temperatures are not brought to a reasonable level. In such cases, the pump simply cannot return the condensate to the boiler. Excessive temperatures at the condensate pump can be detected by noting the character of the discharge at the pump vent. With temperatures in the proper operating range (less than 190°F), there should be no noticeable discharge from the vent. An occasional wisp of vapor is acceptable.

Figuring Loss in Dollars and Cents

How much can leaking traps cost in wasted energy? It depends on the system's steam pressure (psi), the cost of the steam, and the number of traps involved. The example illustrated on the graph on page 5 indicates that one ¼" orifice on a 2psi system could cost the owner $478.80/trap every year. An older steam system used on a large campus could easily incorporate a hundred or more such traps.

STEAM LOSS THROUGH TRAP ORIFICES AT VARIOUS STEAM PRESSURES
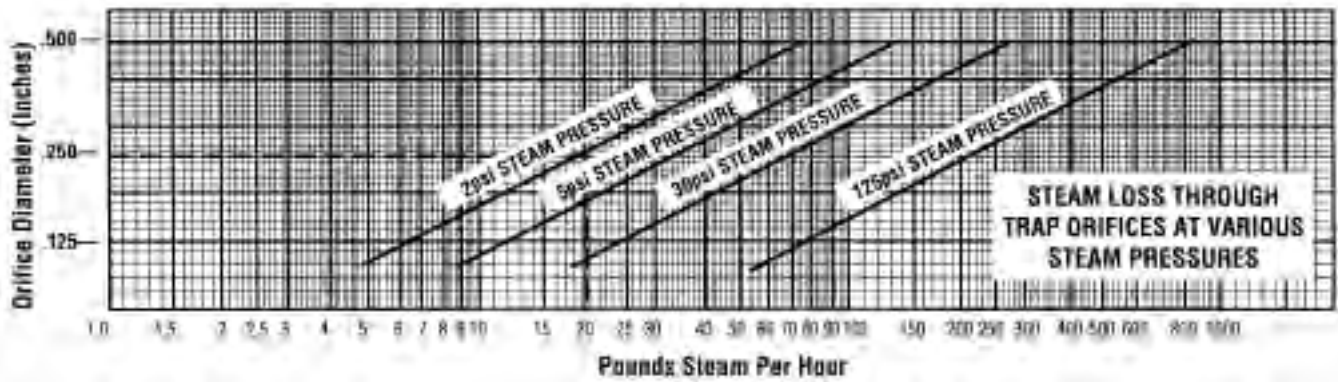
Steam Loss through Trap Orifices at Various Steam Pressures

If you know the size of the orifice that is leaking steam and your particular system's pressure (psi), you can determine what the leak is costing you in wasted energy by using the graph above. For example, take a ¼" (0.250 in.) orifice on a 2psi system. Find 0.250 on the vertical axis labeled Orifice Diameter (inches). Read horizontally to the 2psi steam pressure line. Then read vertically downward to "steam loss rate line" and determine steam loss rate at 19 lbs./hour. Steam costs approximately $5.00/ per 1,000 lbs for steam generated in a highly efficient boiler plant to $15.00 per 1,000 lbs. for purchased district steam. For the example cited, let's assume the steam cost at $5.00/1,000 lbs. Also assume an operating period of 24 hours per day, 7 days a week, through a 7-month heating season (approximately 30 weeks.)

Total Operating Hours = 24 hours x 7 days/week x 30 weeks/year = 5,040 hours.

Now, Total Steam Loss = 5,040 hours x 19 lbs./hour = 95,760 lbs. of steam.

Thus, the Total Annual Cost = 95,670 lbs. x $5.00 / 1,000 lbs. = $478.80/year.

So, if: 1) your system pressure is greater than 2psi; 2) the orifice used on your system is larger than the ¼" cited above; 3) there is more than one trap on the system; and, 4) you are paying more than $5.00/1,000 lbs of steam— it's costing you real money to neglect your steam system, thus it is important to properly maintain your steam system.

*This information is based on an article written for the publication, American School & University, 6/92.

Series G, GH, MG, MGH

Thermostatic Radiator Steam Traps
For operating pressures up to 65psi (4.5 bar)
Sizes: ½" – 1" (15 – 25mm)

Series G, GH, MG, MGH Thermostatic Radiator Steam Traps are designed to remove condensate, air and non-condensable gases from heating systems. The balanced pressure duplex phosphor bronze diaphragm is a highly sensitive modulating unit thermally programmed to provide accurate steam conserving operation. Available in a choice of various body patterns including angle, straightway, left hand corner, right hand corner, vertical and vertical double union.

Features

- Rugged brass construction with union inlet. Duplex phosphor bronze diaphragm sensitive within 3°F
- Hardened stainless steel valve
- Stainless steel valve seat
- Diaphragm and seat both replaceable
- Uniform operation within pressure range
- Superior operation under highest vacuum
- Each trap factory tested
- Standard patterns in ½", ¾", and 1" (15, 20, 25mm)

For additional information, request literature ES-G/GH/MG/MGH.

Applications

Models G and GH – 25" HG vacuum to 25psi (172 kPa)

- Low pressure and vacuum heating
- Convectors
- Unit Ventilators
- Radiators
- Fin pipes
- Drip points
- Air vents

Models MG and MGH – 25" HG vacuum to 65psi (448 kPa)

- Medium pressure heating equipment
- Process equipment
- Sterilizers
- Autoclaves
- Tracer lines
- Cooking equipment

Angle Pattern
1GAP, 3GHAP, 5MGHAP

Straightway Pattern
1GHSW, 3GHSW

- - - LEFT HAND   —— RIGHT HAND

Corner Pattern
1GLHC, 1GRHC

Vertical Pattern
Double Union
1 VGDU

Vertical Pattern
Single Union
1VG

MODEL	PATTERNS	TAPPING				Male Tailpiece A		B		C		D		E		F		G		WEIGHT	
		Inlet		Outlet																	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kgs.
1GAP-1MGAP	Angle	½	15	½	15	2⅞	73	1⅛	29	1³⁄₁₆	35	1⅜	35	–	–	–	–	–	–	1.2	.54
1GRHC-1GLHC	Corner	½	15	½	15	2⅞	73	–	–	1³⁄₁₆	35	1⅜	35	⁹⁄₁₆	14	2⅝	67	1⅝	41	1.4	.64
1GSW-1MGSW	Straightway	½	15	½	15	2⅞	73	–	–	1³⁄₁₆	35	1⅜	35	⁹⁄₁₆	14	2⅝	67	1⅝	41	1.2	.54
1VG	Vert. S.U.	½	15	½	15	–	–	1⅛	29	1³⁄₁₆	35	1⅜	35	1⅞	48	4	102	2⅝	67	1.4	.64
1VGDU	Vert. D.U.	½	15	½	15	–	–	2⁹⁄₁₆	65	1³⁄₁₆	35	1⅜	35	1⅞	48	5⅜	137	2¾	70	1.7	.77
3GH-3MGH	Angle	¾	20	¾	20	3⅛	79	1⅜	35	1³⁄₁₆	35	1⅝	41	–	–	–	–	–	–	1.5	.68
3GH-3MGH	Straight	¾	20	¾	20	3⅛	79	–	–	1³⁄₁₆	35	1⁹⁄₁₆	40	⅜	10	2¾	70	1⅞	48	1.5	.68
5MGH	Angle	1	25	1	25	3⅝	92	1½	38	1½	38	1¹¹⁄₁₆	43	–	–	–	–	–	–	2.5	1.13

Series QF
Quick-Fix™ Radiator Steam Trap Replacement Kits

Series QF Quick-Fix™ Radiator Steam Trap Replacement Kits are used to repair old or obsolete radiator steam traps without the cost of replacing the steam trap body or expensive repiping. The stainless steel capsule and valve seat are designed as original equipment parts for many hard to find or obsolete radiator steam traps.

Remove the cover of the old steam trap and take out any remaining trap parts. Install the stainless steel Quick-Fix™ seat and snap the stainless steel capsule onto the new seat. Replace the cover and the radiator steam trap has been repaired.

Contact Watts for any model radiator traps not listed below.

Traps with Replaceable Seats

Model No.	Manufacturer	½" Traps	¾" Traps
QF-1	Warren Webster	02H, 02V, 502, 502V-1 702, 702V-1, 712, 902V	503, 703, 713
QF-2	Warren Webster	512, 512H-1, 512G-1 522, 522H, 522HB 712HB, 722HB	513, 533 523A, 523H-1**, 5236-1** 713HB, 733, 733HB 723A
QF-3	Warren Webster	902H	
QF-4	Warren Webster		913A, 913H
QF-5	Sarco	E, H, S65,	E, H, S65
	TB25, TS25	TB25, TS25	
	T65	T65	
	Erwel	R30	
	Illinois	1G	3GH
	Trane	B1*	
	Marsh	1	
	Monash-Younker	30	
QF-6	Hoffman	17C	8C
QF-14	Marsh		2-4, 2-7
QF-15	Sterling	7-50A	
QF-16	Trane		B3
Dunham-Bush		TH2A	

Traps with Integral Seats

QF-7	Dunham-Bush	1B, 1C, 1R, V18	
	Trane	B2	
	Sarco		T25
QF-8	Sarco	T25	
	Hoffman	8	
QF-9	Illinois	1T, 2T	
QF-10	Barnes & Jones	122A, 122S, 3045	
QF-11	Barnes & Jones		134A, 134S
QF-12	Trane	B1*	
QF-13	Trane		B3

Replacement Air Vents for F&T Traps (15 and 30psi)

QF-25	Sarco		Series FT ¾" - 2"
QF-26	Trane		686/55AL ¾" - 1"

Replacement Thermal Capsule Only

QFC-10	ALL	ALL	ALL

* Except vertical models

** Old style omits "-1" from symbol. For traps built since 1931 only.

For additional information, request literature ES-QF.

Quick, Easy installation

1.

Remove cover of trap and old trap parts.

2.

Install seat adapter, then snap capsule onto it.

3.

Replace original cover.

Once the Quick-Fix™ kits are installed, most subsequent trap repairs require only replacement of the capsule, which is the same for all trap kits.

Series WFT

Float & Thermostatic Steam Traps

For operating pressures up to 125psi (8.6 bar)
Sizes: ¾" – 2" (20 – 50mm)

Series WFT Float & Thermostatic Steam Traps are designed to provide continuous air venting and separate condensate draining with maximum efficiency and service. The "H" pattern body on all ¾", 1" (15, 30, 75, 125psi) and 1¼" (15, 30psi) has been designed to offer maximum installation flexibility. Four possible hookup combinations, combined with similar piping dimensions to other major manufacturers, make this the "universal" replacement trap. For larger sized traps, 1½", 2" (15, 30, 75, 125psi) and 1¼" (75, 125psi), the inlet and outlet taps are located in the cover. This design allowing for the larger capacities needed. Series WFT traps can also be serviced without disturbing system piping.
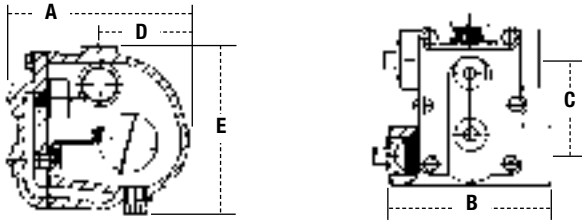
Features:

- Universal 4-port design
- All stainless steel internal components protect against erosion and corrosion
- Balanced pressure thermostatic element
- Extra-long life and dependable service
- Water hammer resistant
- Can be serviced without disturbing system piping

Applications:

- Unit heaters and other space heating equipment
- Heat exchangers/reboilers
- Air heating coils
- Steam main drips
- Process equipment

All ¾", 1" WFT, 1¼" WFT–15, WFT–30

All 1½", 2" WFT, 1¼" WFT-75, WFT-125

MODEL	SIZE (DN)		DIMENSIONS														WEIGHT	
			A		B		C		D		E		E1					
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kgs.
WFT-15	¾	20	6¼	159	5½	140	3⁵⁄₁₆	84	3	76	5¾	146	–	–	9	4.1
WFT-15	1	25	6¼	159	5½	140	3⁵⁄₁₆	84	3	76	5¾	146	–	–	9	4.1
WFT-15	1¼	32	6¼	159	5¾	146	3⁵⁄₁₆	84	3	76	5¾	146	–	–	9.5	4.3
WFT-15	1½	40	8½	216	4¼	108	3	76	11⁄₁₆	17	–	–	8⅜	213	18	8.2
WFT-15	2	50	9¹³⁄₁₆	249	4¹⁵⁄₁₆	125	4¹⁵⁄₁₆	125	⅛	3	9⅛	231	–	–	26	11.8
WFT-30	¾	20	6¼	159	5½	140	3⁵⁄₁₆	84	3	76	5¾	146	–	–	9	4.1
WFT-30	1	25	6¼	159	5½	140	3⁵⁄₁₆	84	3	76	5¾	146	–	–	9	4.1
WFT-30	1¼	32	6¼	159	5¾	146	3⁵⁄₁₆	84	3	76	5¾	146	–	-	9.5	4.3
WFT-30	1½	40	8½	216	4¼	108	3	76	11⁄₁₆	17	–	–	8⅜	213	18	8.2
WFT-30	2	50	9¹³⁄₁₆	249	4¹⁵⁄₁₆	125	4¹⁵⁄₁₆	125	⅛	3	9⅛	231	–	–	26	11.8
WFT-75	¾	20	6¼	159	5½	140	3⁵⁄₁₆	84	3	76	5¾	146	–	–	9	4.1
WFT-75	1	25	6¼	159	5½	140	3⁵⁄₁₆	84	3	76	5¾	146	–	–	9	4.1
WFT-75	1¼	32	8½	216	4¼	108	3	76	11⁄₁₆	17	–	–	8⅜	213	18	8.2
WFT-75	1½	40	8½	216	4¼	108	3	76	11⁄₁₆	17	–	–	8⅜	213	18	8.2
WFT-75	2	50	9¹³⁄₁₆	249	4¹⁵⁄₁₆	125	4¹⁵⁄₁₆	125	⅛	3	9⅛	231	–	–	26	11.8
WFT-125	¾	20	6¼	159	5½	140	3⁵⁄₁₆	84	3	76	5¾	146	–	–	9	4.1
WFT-125	1	25	6¼	159	5½	140	3⁵⁄₁₆	84	3	76	5¾	146	–	–	9	4.1
WFT-125	1¼	32	8½	216	4¼	108	3	76	11⁄₁₆	17	–	–	8⅜	213	18	8.2
WFT-125	1½	40	8½	216	4¼	108	3	76	11⁄₁₆	17	–	–	8⅜	213	18	8.2
WFT-125	2	50	9¹³⁄₁₆	249	4¹⁵⁄₁₆	125	4¹⁵⁄₁₆	125	⅛	3	9⅛	231	–	–	26	11.8

Series WFT Float & Thermostatic Steam Trap Capacities
Hot Condensate (lbs. per hr.)

Model	Size NPT in	mm	PSIG Orifice	¼	½	1	2	5	10	15	20	25	30	40	50	75	100	125
WFT-15	¾"	20	.218	279	369	489	650	785	1000	1075								
WFT-15	1"	25	.218	279	369	489	650	785	1000	1075								
WFT-15	1¼"	32	.312	600	770	980	1240	1640	2000	2340								
WFT-15	1½"	40	.500	1100	1700	2400	3300	5000	6600	7600								
WFT-15	2"	50	.625	2300	2800	3600	4650	6900	9000	10900								
WFT-30	¾"	20	.218	279	369	489	650	785	1000	1075	1210	1300	1370					
WFT-30	1"	25	.218	279	369	489	650	785	1000	1075	1210	1300	1370					
WFT-30	1¼"	32	.228	375	500	690	910	1200	1500	1680	1800	1900	2000					
WFT-30	1½"	40	.390	1000	1300	1700	2300	3400	4600	5500	6000	6600	7000					
WFT-30	2"	50	.500	1300	1800	2500	3400	5200	6800	7800	8600	9300	10000					
WFT-75	¾"	20	.166	160	213	280	365	520	700	795	875	930	970	1120	1230	1450		
WFT-75	1"	25	.166	160	213	280	365	520	700	795	875	930	970	1120	1230	1450		
WFT-75	1¼"	32	.312	550	725	960	1300	1900	2650	3050	3400	3700	4000	4400	4750	5400		
WFT-75	1½"	40	.312	550	725	960	1300	1900	2650	3050	3400	3700	4000	4400	4750	5400		
WFT-75	2"	50	.421	850	1100	1500	2000	3100	4150	4750	5200	5500	5800	6400	6800	7700		
WFT-125	¾"	20	.125	100	135	175	230	330	415	500	585	620	685	750	830	970	1110	1190
WFT-125	1"	25	.125	100	135	175	230	330	415	500	585	620	685	750	830	970	1110	1190
WFT-125	1¼"	32	.246	400	520	680	890	1300	1700	2050	2300	2500	2700	3000	3200	3800	4200	4500
WFT-125	1½"	40	.246	400	520	680	890	1300	1700	2050	2300	2500	2700	3000	3200	3800	4200	4500
WFT-125	2"	50	.332	550	675	880	1225	1950	2600	3000	3250	3500	3800	4200	4600	5500	6100	6600

For additional information, request literature ES-WFT.

Series WFTC, WFTK

Float & Thermostatic Steam Trap Cover Assemblies and Repair kits

Sizes: ¾" – 2" (20 – 50mm)

Series WFTC, WFTK Float & Thermostatic Steam Trap Cover Assemblies & Repair Kits are designed for use on Watts and select Spirax-Sarco F&T steam traps.
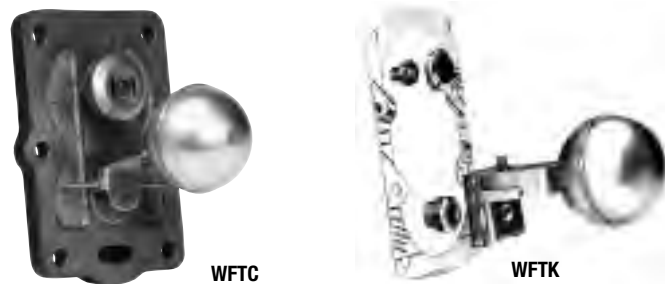
Features
• Quick, easy and economical
• Simplifies and standardizes inventory
• All stainless steel corrosion resistant internal parts

Models
WFTC Cover assembly consists of a complete factory assembled unit which simply bolts on for ease of repair. No pipe connections need to be broken. There will be no reduction in the original trap's capacity.

WFTK Designed for large traps that have piping connections into the cover plate. To avoid the "breaking" of piping connections, these kits are installed by removing the trap body. Each complete kit contains the thermostatic air vent, float, linkage, valve, seat and body gasket. These kits were designed to ensure ease of installation

WFTC

WFTK

WFTC
Series WFTC cover assemblies include the cast iron cover, condensate valve assembly, float and linkage, thermostatic vent in one factory assembled unit (A) and cover gasket (B).

WFTK
Series WFTK Repair Kits include condensate valve assembly - float and linkage (A), thermostatic vent and seat (B), and cover gasket (C).

Dimensions – Weights

MODEL	MANUFACTURERS Model	Trap	LINE SIZE in.	mm	WEIGHT lbs.	kgs.
¾-WFTC-15	Spirax-Sarco	FT-15	¾	20	3.0	6.6
¾-WFTC-30	Spirax-Sarco	FT-30	¾	20	3.0	6.6
1-WFTC-15	Spirax-Sarco	FT-15	1	25	3.0	6.6
1-WFTC-30	Spirax-Sarco	FT-30	1	25	3.0	6.6
1¼-WFTC-15	Spirax-Sarco	FT-15	1¼	32	3.0	6.6
1¼-WFTC-30	Spirax-Sarco	FT-30	1¼	32	3.0	6.6
1½-WFTK-15	Spirax-Sarco	FT-15	1½	40	1.5	3.3
1½-WFTK-30	Spirax-Sarco	FT-30	1½	40	1.5	3.3
2-WFTK-15	Spirax-Sarco	FT-15	2	50	1.5	3.3
2-WFTK-30	Spirax-Sarco	FT-30	2	50	1.5	3.3

For models of 75 or 125psi, please contact your Watts Representative for ordering information.

For additional information, request literature ES-WFTC/WFTK.

Series G, MG

Float & Thermostatic Steam Traps

For operating pressures up to 50psi (345 kPa)
Sizes: ¾" – 2" (20 – 50mm)

Series G, MG Float & Thermostatic Steam Traps are designed for use on modulating process equipment and as main distribution line drip traps. Series G Float & Thermostatic steam traps feature a straight through design for fast simple installation. Stainless steel valve head and seats provide long service life.

G, MG series steam traps have excellent air venting capability and discharge condensate at near to steam temperature so the steam space remains free of condensate providing improved steam system efficiency.

Features

- Fail safe – In case of float failure, trap will discharge condensate and air; no unit freeze-up
- Air vent parts – accessible without disturbing piping
- Inlet baffle – breaks up water hammer; prevents damage to parts
- Snap action valve – no wire-drawing or valve chatter
- Two moving parts – no levers, hinges or pins to corrode or jam
- Straight-through connections – saves installation time, labor, space, headroom
- Stainless valves and valve seats
- Seamless copper float – no seams to develop leaks
- Uniform operations – not affected by changes in load or pressures
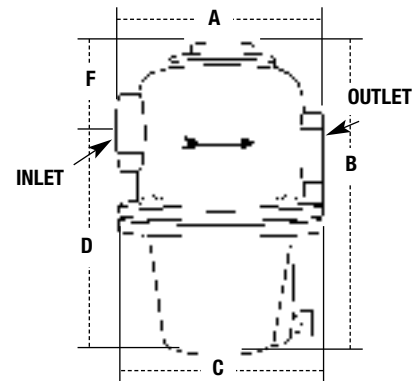- Condensate valve rotates – ensures even wear, longer valve and seat life

Applications

- Steam coils
- Unit heaters
- Drip points
- Heat exchangers
- Water heaters
- Absorption machines
- Unit ventilators
- Air handlers
- Make-up air coils
- Re-heat coils
- Jacketed kettles

Models

G-15 — 25" Hg to 15psi (103 kPa)
MG-30 — 25" Hg to 30psi (207 kPa)
MG-50 — 25" Hg to 50psi (345 kPa)

| MODEL | TAPPING (NPT) | | DIMENSIONS | | | | | | | | | | | WEIGHT | |
| | | | A | | B | | C | | D | | F | | | | |
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	n.	mm		lbs.	kgs.
6G-15	¾	20	4½	114	6½	165	4½	114	4¹⁵⁄₁₆	125	1⅞	48		6	152
7G-15	1	25	5½	140	7½	191	5½	140	5⅝	143	2¹⁄₁₆	52		9	229
8G-15	1¼	32	5½	140	8	203	6	152	5½	140	2	51		12	305
91G-15	1½	40	7⅝	194	11¾	298	8⁹⁄₁₆	217	9¹⁄₁₆	230	2³⁄₁₆	71		39	991
101G-15	2	50	9⁵⁄₁₆	237	13¹³⁄₁₆	351	10⅜	263	10¹⁵⁄₁₆	278	2⅜	60		59	1499
111G-15	2	50	10⅜	264	15¼	387	11⅝	295	11⅞	302	2¾	70		85	2159
7MG-30	1	25	5½	140	7½	191	5½	140	5⅝	143	2¹⁄₁₆	52		9	229
8MG-30	1¼	32	5½	140	8	203	6	152	5½	140	2	51		12	305
91MG-30	1½	40	7⅝	194	11¾	298	8⁹⁄₁₆	217	9¹⁄₁₆	230	2³⁄₁₆	71		39	991
101MG-30	2	50	9⁵⁄₁₆	237	13¹³⁄₁₆	351	10⅜	263	10¹⁵⁄₁₆	278	2⅜	60		59	1499
111MG-30	2	50	10⅜	264	15¼	387	11⅝	295	11⅞	302	2¾	70		85	2159
6MG-50	¾	20	4½	114	6½	165	4½	114	4¹⁵⁄₁₆	125	1⅞	48		6	152
7MG-50	1	25	5½	140	7½	191	5½	140	5⅝	143	2¹⁄₁₆	52		9	229
8MG-50	1¼	32	5½	140	8	203	6	152	5½	140	2	51		12	305
91MG-50	1½	40	7⅝	194	11¾	298	8⁹⁄₁₆	217	9¹⁄₁₆	230	2³⁄₁₆	71		39	991
101MG-50	2	50	9⁵⁄₁₆	237	13¹³⁄₁₆	351	10⅜	263	10¹⁵⁄₁₆	278	2⅜	60		59	1499
111MG-50	2	50	10⅜	264	15¼	387	11⅝	295	11⅞	302	2¾	70		85	2159

Maximum Trap Capacities

Pounds Condensate Per Hour, MBH, and Square Feet EDR

Model	Valve Seat Orifice Diameter	Pressure Differential Lat. Ht. Value	¼ 969.8	½ 969.3	1 968	2 966	5 961	10 952	15 945	20 939	30 929	50 912	75 895	100 881	125 868	150 857	175 847
¾-6G-15		Lbs. Cond./Hr.	70	100	140	200	210	220	230								
		MBH	68	97	136	193	202	209	217								
		EDR	282	404	566	804	841	870	904								
1-7G-15		Lbs. Cond./Hr.	175	250	350	500	525	550	575								
		MBH	170	242	339	483	505	524	543								
		EDR	708	1008	1413	2012	2104	2183	2263								
1¼-8G-15		Lbs. Cond./Hr.	425	600	850	1200	1260	1320	1280								
		MBH	412	582	823	1159	1211	1257	1304								
		EDR	1717	2423	3428	4830	5045	5236	5434								
1½-91G-15		Lbs. Cond./Hr.	850	1200	1700	2400	2520	2640	2760								
		MBH	824	1163	1646	2318	2422	2513	2608								
		EDR	3435	4847	6857	9660	10091	10472	10868								
2-101G-15		Lbs. Cond./Hr.	1775	2500	3550	5000	5250	5500	5750								
		MBH	1721	2423	3436	4830	5045	5236	5434								
		EDR	7172	10096	14318	20125	21021	21817	22641								
2-111MG-15	²¹⁄₃₂	Lbs. Cond./Hr.	2200	2900	3920	5200	7600	10100	12000								
		MBH	2133	2811	3795	5023	7304	9615	11340								
¾-30-30*	⁵⁄₃₂	Lbs. Cond./Hr.	175	235	315	420	570	670	825	935	1160						
		MBH	170	228	305	406	548	638	780	878	1078						
1-7MG-30	⅛	Lbs. Cond./Hr.	95	127	170	228	335	445	530	600	700						
		MBH	92	123	165	220	322	424	501	563	650						
1¼-8MG-30	⁵⁄₃₂	Lbs. Cond./Hr.	156	210	280	375	550	740	870	980	1160						
		MBH	151	204	271	362	529	704	822	920	1078						
1½-91MG-30	¹⁹⁄₆₄	Lbs. Cond./Hr.	525	700	940	1250	1850	2450	2930	3300	3900						
		MBH	509	679	910	1208	1778	2332	2769	3099	3623						
2-101MG-30	¹¹⁄₃₂	Lbs. Cond./Hr.	670	890	1180	1580	2340	3120	3700	4150	4900						
		MBH	650	863	1142	1526	2249	2970	3497	3897	4552						
2-111MG-30	¹⁵⁄₃₂	Lbs. Cond./Hr.	1300	1750	2340	3120	4600	6100	7200	8200	9700						
		MBH	1261	1696	2265	3014	4421	5807	6804	7700	9011						
¾-6MG-50	³⁄₃₂	Lbs. Cond./Hr.	52	69	92	122	180	240	285	320	380	470					
		MBH	50	67	89	118	173	228	269	300	353	429					
1-7MG-50	⁷⁄₆₄	Lbs. Cond./Hr.	81	108	143	190	280	375	440	500	590	730					
		MBH	79	105	138	184	269	357	416	470	548	666					
1¼-8MG-50	⅛	Lbs. Cond./Hr.	102	138	182	245	355	475	565	630	750	920					
		MBH	99	134	176	237	341	452	534	591	697	839					
1½-91MG-50	¹⁵⁄₆₄	Lbs. Cond./Hr.	360	480	640	860	1260	1680	2000	2250	2670	3300					
		MBH	349	465	620	831	1211	1599	1890	2113	2480	3010					
2-101MG-50	⁹⁄₃₂	Lbs. Cond./Hr.	460	610	820	1100	1600	2140	2520	2841	3350	4150					
		MBH	446	591	794	1063	1538	2037	2381	2667	3112	3785					
2-111MG-50	²¹⁄₆₄	Lbs. Cond./Hr.	630	850	1140	1520	2220	2950	3500	3950	4700	5800					
		MBH	611	824	1104	1468	2133	2808	3308	3709	4366	5290					

**Capacities According to Recommended Shema Standards

The basic capacity ratings are expressed in pounds condensate per hour at various pressure differentials.

For ease of trap selection the tables also give the heating value in MBH of the steam condensed. This is arrived at by multiplying the condensate rating by the appropriate Latent Heat Value and dividing by 1,000 to determine MBH.

For low pressure heating service traps the capacities are also expressed in square feet Equivalent Direct Radiation. This is determined by dividing the heating capacity in BTU/Hr. (MBH x 1,000) by 240 BTU/Hr./Square Foot Equivalent Direct Radiation.

Example:

Select a trap for a Unit Heater with a heating capacity of 170 MBH operating on a 5psi line. A 2 to 1 capacity factor is desired.

MBH rating for selection purposes = 2 x 170 = 340 MBH. Read down 5psi column and select the smallest trap whose MBH rating exceeds 340 MBH. A 1-7G actual capacity 505, MBH, 525 pounds condensate per hour on 2,012 square feet Equivalent Direct Radiation would be the correct trap.

*Also available in ½" (15mm) pipe size

Note: The condensate capacities for GF or MGF traps are the same as shown for G or MG float and thermostatic traps and selection should be made in the same manner.

**Ratings are in accordance with the recommended standards adopted by the Steam Heating Equipment Manufacturers Association. Select trap directly from table for the lowest differential that may exist in the system. Traps may be applied directly and no safety factor need be applied.

For additional information, request literature ES-G/MG.

Series WIB

Inverted Bucket Steam Traps

For operating pressures up to 250psi (17 bar)
Sizes: ½" – 1" (15 – 25mm)

Series WIB Inverted Bucket Steam Traps are designed for reliable condensate removal on steam main line drips for system pressure up to 250psi. Series WIB Inverted Bucket Traps have an excellent reputation as a long lasting, rugged steam trap, naturally resistant to water hammer.

Features

- In-line connections
- Hardened stainless steel valve and seat
- Cast iron body construction; Class 250
- Stainless steel bucket
- Test plug
- Drain plug

Models

WIB 80 – ½" – ¾" (15–20mm) for operating pressures up to 150psi (10 bar)

WIB 81 – ½" – 1" (15–25mm) for operating pressures up to 250psi (17 bar)

Pressure — Temperature

WIB 80

Maximum Allowable Pressure: 150psi (10 bar)
Maximum Allowable Temperature: 406°F (208°C)
Maximum Operating Pressure: 150psi (10 bar)

WIB 81

Maximum Allowable Pressure: 250psi (17 bar)
Maximum Allowable Temperature: 406°F (208°C)
Maximum Operating Pressure: 250psi (17 bar)

Applications

- Steam main drips
- Process applications requiring minimal air venting

WIB 80

WIB 81

SIZE (DN) NPT		DIMENSIONS						WEIGHT	
		A		B		C			
in.	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs.*	*kgs.*
WIB 80									
½	15	5	127	8⅛	206	3¼	83	5.5	2.5
¾	20	5	127	8⅛	206	3¼	83	5.5	2.5
WIB 81									
½	15	5	127	7⅝	194	3¼	83	6	2.7
¾	20	5	127	7⅝	194	3¼	83	6	2.7
1	25	5	127	7⅝	194	3¼	83	6	2.7

Steam Traps

Maximum Trap Capacities - WIB 80

| DIFFERENTIAL Pressure | | ORIFICE Size | | Model |
psi	bar	in.	mm	80
¼	.02	³⁄₁₆"	5	139
½	.03	³⁄₁₆"	5	200
¾	.05	³⁄₁₆"	5	240
1	.07	³⁄₁₆"	5	270
2	.14	³⁄₁₆"	5	340
3	.21	³⁄₁₆"	5	390
4	.28	³⁄₁₆"	5	425
5	.35	³⁄₁₆"	5	450
10	.69	³⁄₁₆"	5	560
15	1	³⁄₁₆"	5	640
20	1	³⁄₁₆"	5	690
25	2	⅛"	3	460
30	2	⅛"	3	500
40	3	⅛"	3	550
50	3	⅛"	3	580
60	4	⅛"	3	635
70	5	⅛"	3	660
80	6	⅛"	3	690
100	7	#38	–	860
125	9	#38	–	950
130	9	#38	–	550
150	10	#38	–	570
180	12	#38	–	—
200	14	#38	–	—
225	16	#38	–	—
250	17	#38	–	—

Maximum Trap Capacities - WIB 81

| DIFFERENTIAL Pressure | | Orifice | | Model |
psi	bar	In.	mm	81
¼	.02	¼	8	191
½	.03	¼	8	300
¾	.05	¼	8	395
1	.07	¼	8	450
2	.14	¼	8	590
3	.21	¼	8	680
4	.28	¼	8	750
5	.35	¼	8	830
10	.69	¼	8	950
15	1	¼	8	1,060
20	1	³⁄₁₆--	5	880
25	2	³⁄₁₆	5	950
30	2	³⁄₁₆	5	1,000
40	3	⁵⁄₃₂	4	770
50	3	⁵⁄₃₂	4	840
60	4	⁵⁄₃₂	4	900
70	5	⁵⁄₃₂	4	950
80	6	⅛	3	800
100	7	⅛	3	860
125	9	⅛	3	950
130	9	⁷⁄₆₄	2.7	780
150	10	⁷⁄₆₄	2.7	810
180	12	⁷⁄₆₄	2.7	850
200	14	⁷⁄₆₄	2.7	860
225	16	#38	–	730
250	17	#38	–	760

Note: Capacities given are continuous discharge capacities in pounds of hot condensate per hour at differential indicated.

For additional information, request literature ES-WIB.

Series WTD 600

Thermodynamic Steam Traps

For operating pressures up to 600psi (41 bar)
Sizes: ⅜" – 1" (10 – 25mm)

Series WTD 600 Thermodynamic Steam Traps are economical and compact, designed to efficiently drain steam mains, steam tracing lines, and small process equipment. The WTD 600 Steam Trap discharges condensate at near to steam temperatures, so the steam space remains free of condensate. Their tight shut-off feature ensures that valuable steam energy is not wasted. The WTD 600's hardened disc is the only moving part, assuring a long service life, easy low cost maintainability, and improved steam system efficiency.

Features

- Inexpensive: low initial purchase price and lower maintenance costs than traps requiring expensive repair kits
- Compact design; light weight and easy to install. Provides longer service life with simple maintainability. The only moving part is the hardened stainless steel disc
- Rugged all stainless steel: resistant to water hammer, freezing, superheat and corrosion for extra long service life
- Audible discharge cycle: checking trap operation is simple and does not require any special devices
- Blast discharge of condensate: eliminates dirt build up and provides a tight shutoff, saving valuable steam energy
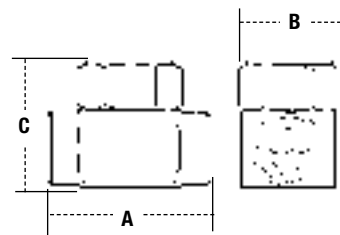
Applications

- Steam main drainage
- Superheat steam applications
- Steam tracing lines
- Freeze protection for outside applications
- Small process equipment

Pressure – Temperature

Maximum Operating Pressure: 600psi (42 bar)

Maximum Operating Temperature: 800°F (427°C)

Maximum Allowable Pressure: 600psi (42 bar)

Maximum Allowable Temperature: 800°F (427°C)

SIZE (DN)		DIMENSIONS						WEIGHT	
		A		B		C			
in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg.
⅜	10	2	51	1¾	45	1¾	45	.8	.36
½	15	2¹¹⁄₁₆	68	1¾	45	2"	51	1.2	.54
¾	20	2¹³⁄₁₆	71	2⁵⁄₁₆	59	2⁷⁄₁₆	62	1.8	.82
1	25	3⁵⁄₁₆	84	2½	64	2⅞	73	3.1	1.41

Maximum Capacity – Lbs./Hr. at Saturation Steam Temperature

NPT CONNECTION		PSIG (BAR)													
in.	mm	3.5 (0.24)	5 (0.34)	10 (0.7)	20 (1.4)	30 (2.1)	50 (3.4)	75 (5.2)	100 (6.9)	150 (10.3)	200 (13.8)	300 (20.7)	400 (27.6)	500 (34.5)	600 (41.8)
⅜"	10	180	185	190	200	215	245	305	370	500	610	790	960	1100	1250
½"	15	300	310	345	410	465	575	700	810	1000	1140	1410	1630	1830	2000
¾"	20	405	420	470	550	640	810	1000	1160	1450	1670	2100	2430	2750	3050
1"	25	640	670	725	865	980	1200	1470	1750	2200	2600	3250	3780	4250	4700

For Kg./Hr. multiply by .454

For additional information, request literature ES-WTD.

Figure 31, 41, 41A

Bronze and Cast Iron Safety Relief Valves

Models

Figure 31 – ASME Section I

Figure 31 is a top guided, high capacity, full nozzle safety relief valve available in bronze or cast iron for over pressure protection of steam boilers with operating pressure from 5 to 250psi (.35 to 17 bar).

Figure 41 – ASME Section VIII

Figure 41 is a top guided, high capacity, full nozzle relief valve for over-pressure protection on unfired pressure vessels, steam pressure reducing valve stations and other steam service applications with operating pressure from 5 to 250psi (.35 to 17 bar).

Figure 41A – ASME Section VIII

Figure 41A is a heavy duty, high capacity safety relief valve for compressors, intercoolers, aftercoolers and receivers, air makeup units, gas burners, pneumatic conveying/elevating equipment, dryers and other pressure vessels and piping, handling air, gases and vapors to 250psi (17 bar) with temperature to 406°F (208°C)

Features

- Unitized bonnet/base design
- Rugged construction and 2-ring control
- Single Unit Cap and lifting lever

Figure 31, 41, 41A Bronze Safety Valves

Inlet		VALVE SIZE Orifice	Outlet		NPT X Outlet
in	mm		in	mm	
½	15	D	¾	20	NPT x NPT
¾	20	D	¾	20	NPT x NPT
¾	20	E	1	25	NPT x NPT
1	25	E	1	25	NPT x NPT
1	25	F	1¼	32	NPT x NPT
1¼	32	F	1¼	32	NPT x NPT
1¼	32	G	1½	40	NPT x NPT
1½	40	G	1½	40	NPT x NPT
1½	40	H	2	50	NPT x NPT
2	50	H	2	50	NPT x NPT
2	50	J	2½	65	NPT x NPT
2½	65	J	2½	65	NPT x NPT

Figure 31, 41, 41A Cast Iron Safety Valves

Inlet		Orifice	Outlet		NPT X Outlet
1½	40	J	2½	65	250 FLG x NPT
1½	40	J	2½	65	NPT x NPT
2	50	J	3	80	250 FLG x NPT
2	50	K	3	80	250 FLG x NPT
2	50	K	3	80	NPT x NPT
2½	65	K	3	80	250 FLG x NPT
2½	65	L	4	100	250 FLG x NPT
2½	65	L	4	100	NPT x NPT
3	80	K	3	80	250 FLG x NPT
3	80	L	4	100	250 FLG x NPT
3	80	M	4	100	250 FLG x NPT
3	80	M	4	100	NPT x NPT
4	100	N	6	150	250 FLG/125 FLG
4	100	P	6	150	250 FLG/125 FLG
6	152	Q	8	200	250 FLG/125 FLG
6	152	R	8	200	250 FLG/125 FLG

How to Order Watts Safety Relief Valves

You must consider five parameters in order to select the correct valve for your application.

1) What is the valve size needed?
   - Nominal pipe size (Inlet x Outlet)

2) What is the application?
   - ASME Section IV for Low-Pressure Steam Service and Equipment up to 15psi. Use Series 315/415 or Figure 10. (See page 20 for more information.)
   - ASME Section I for Steam Boilers up to 250psi (17 bar). Use Figure 31.
   - ASME Section VIII for Steam Service and Equipment up to 250psi. Use Figure 41.
   - ASME Section VIII for air, gas, and vapors up to 250psi (17 bar). Use Figure 41A.

3) What is the set pressure in psi?
   - Confirm set pressure with project engineer or boiler plant personnel.
   - Watts valves perform in the 5-250psi (.35-17 bar) range.

4) What lbs/hr capacity must the valve relieve?
   - Set pressure and orifice size determine valve capacity.
   - Orifice size is designated by the letter D through R and is determined by ASME standards.

5) What end connections are required?
   - NPT x NPT
   - Flange x NPT
   - Flange x Flange

For additional information, request literature PG-SSRV.

Series 315 & 415

Steam Safety Valves

For steam heating boilers with operating pressures up to 15psi (103 kPa)

Series 315, 415 ASME Section IV Rated Steam Safety Relief Valves have been developed to provide high quality dependable low cost protection for any low pressure steam heating equipment operating up to 15psi (103 kPa). This series features a bronze body and stainless steel spring. A top guided stem and a non-shock Teflon® disc-to-metal seat ensures positive shutoff.
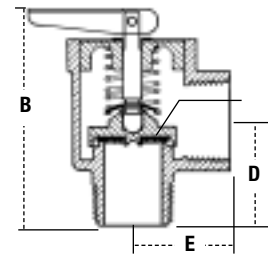
Features

- High capacity
- Positive shut off
- Non-sticking Teflon® disc
- Seat located above drain
- NPT threaded male inlet x threaded female outlet (drain) connection

Models

L – Low pressure setting
SC – Satin chrome finish

MODEL	SIZE		ASME STEAM Discharge Capacity	DIMENSIONS						WEIGHT	
				B		D		E			
	in.	mm	lbs./hr. @ 15psi	in.	mm	in.	mm	in.	mm	lbs.	kg.
315-M1	¾ x ¾	20 x 20	375	2¹¹⁄₁₆	68	1⅜	35	1¼	32	.55	.24
415-M1	¾ x ¾	20 x 20	450	2¹³⁄₁₆	71	1⁵⁄₁₆	33	1¼	32	.70	.31
415-M1	1 x 1	25 x 25	643	3⅛	78	1¹¹⁄₁₆	43	1⅝	41	.91	.41
415	1¼ x 1½	32 x 40	1230	4¾	121	2⅜	60	2⅛	54	2.00	.91
415	1½ x 2	40 x 50	1860	5⁷⁄₁₆	138	2⅝	67	2⁵⁄₁₆	59	3.00	1.36

For additional information, request literature ES-315 or ES-415.

Series 127

Process Steam Pressure Regulators

Sizes: ½" – 4" (15 – 100mm)

Series 127 Process Steam Pressure Regulators are single seated, remote control, diaphragm type regulators, ideal for institutional, industrial and commercial applications. These valves feature stainless steel and nickel alloy seats and trim for either superheated or saturated steam service as well as outstanding maintenance features that make spring and diaphragm chamber assembly changes and adjustments a snap.

Features
- Stainless steel and nickel alloy seats and trim
- Outstanding maintenance features

Applications
- Main line and high capacity process regulation service
- Heating applications
- Dead-end service

Models

127SC - ½" – 1¼" (15 – 32mm), bonze body with composition disc for initial pressure up to 150 lbs.

127SS - ½" – 3" (15 – 80mm), bonze body with stainless steel disc for initial pressure up to 250 lbs.

F127 - 3" – 4" (80 – 100mm), iron body with Flanged connections for initial pressure up to 125 lbs.

Typical Installation

Series 127 may be installed with the diaphragm above or below the line. It may also be installed in a vertical line. Pressure connections must always have a water seal.

Series 127

High Pressure

Reduced Pressure
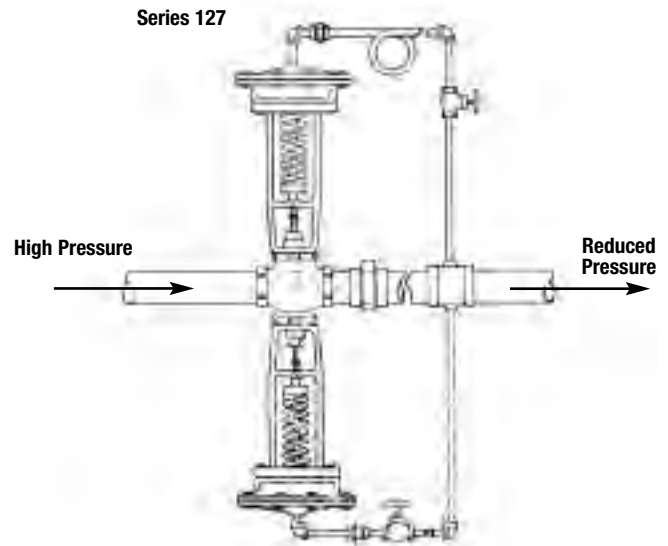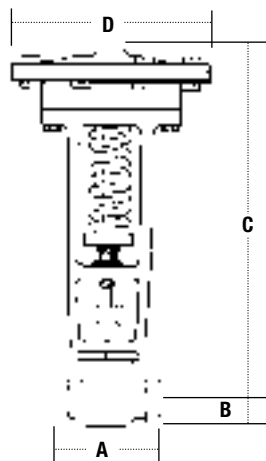
MODEL	SIZE (DN)		DIMENSIONS						WEIGHT	
			A		B		C			
	in	mm	in	mm	in	mm	in	mm	lbs.	kgs.
127	½	15	4	102	1	25	15	381	22.5	10.2
127	¾	20	4	102	1	25	15	381	23	10.4
127	1	25	4¼	108	1⅛	29	15	381	23.5	10.7
127	1¼	32	4½	114	1¼	32	15⅛	384	24	10.9
127	1½	40	5¼	133	1½	38	15¼	387	28	12.7
127	2	50	6	152	1¾	44	15⅜	391	32	14.5
127	2½	65	7¼	184	2⅛	54	15¾	400	34	15.4
127	3	80	8	203	2⅜	60	16⅛	410	40	18.1
F127*	3	80	8	203	3¾	95	16¾	425	42	19.0
F127*	4	100	12⅛	308	4½	114	16¾	425	84	38.1

*Iron body, flanged connections
Dimension "D" is 6", 8" or 10" (152, 203 or 254mm) depending upon reduced pressure range.

For additional information, request literature F-127.

Series 152A, 252A
Process Steam Pressure Reducing Valves

Sizes: ½" – 2" (15 – 50mm)

Series 152A, 252A Process Steam Pressure Reducing Valves are used to reduce steam pressure to the lowest possible steam pressure that provides the required temperature for each application. This series is a self contained, spring actuated, pressure reducing valve designed for all process pressure reducing applications.

Features
- Serviceable in line
- Standard sensitivity adjuster

Models

152A – Iron body for pressures up to 200psi (14 bar)

252A – Bronze body for pressures up to 300psi (21 bar)

152A–T or 252A–T – With Teflon® valve disc operating temperatures are 300℉ at 300psi (140℃ at 21 bar) and 400℉ at 200psi (204℃ at 14 bar).

152SS – Stainless steel body for pressures up to 300psi (21 bar)

152SST – Stainless steel body, tight seating model for dead end service for pressures up to 300psi (21 bar)

Adjusting Springs for reduced pressure ranges between 3 and 140psi (.21 and 9.8 bars)

Laminated Metal Diaphragm

Stainless Steel Disc and Stem Guide

Replaceable Stainless Steel Seat and Valve Disc.**

Stainless Steel Strainer Screen

Sensitivity Adjuster
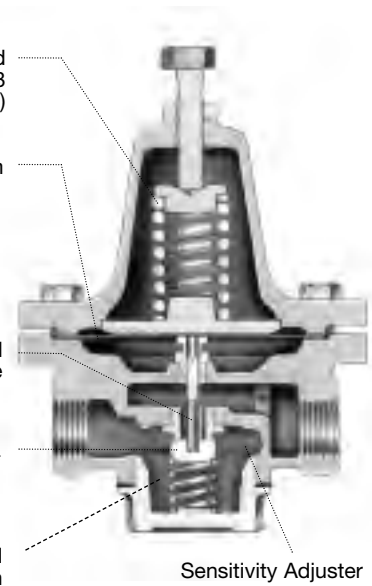
**When utilizing a Teflon® valve disc in the 152AT, the maximum operating temperature are 300°F at 300psi (149°C at 21 bar) and 400°F at 200psi (204°C at 14 bar).

SIZE (DN)		DIMENSIONS							WEIGHT	
		A		C		D				
in.	mm	in.	mm	in.	mm	in.	mm		lbs.	kg.
½	15	6	152	7	178	1¹⁵⁄₁₆	49		11	4.99
¾	20	6	152	7	178	1¹⁵⁄₁₆	49		11	4.99
1	25	7½	191	7½	191	2³⁄₁₆	56		20	9.07
1¼	32	7½	191	7½	191	2³⁄₁₆	56		20	9.07
1½	40	9	229	11¼	286	2¾	70		40	18.14
2	50	9	229	11¼	286	2¾	70		40	18.14

For additional information, request literature ES-152A, ES-152SS or ES-252A.
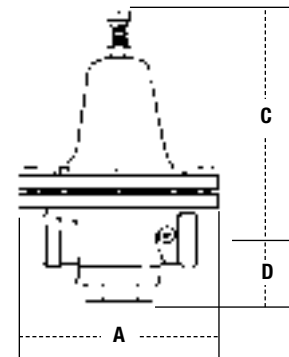
Series 127, 152A and 252A

Process Steam Pressure Regulators
Sizing and Capacity Information

To provide the most efficient and economical steam service it is critical to properly size the pressure reducing valve. Do not size pressure reducing valves based on piping line size. Instead size the valve based on the required steam load, inlet pressure, and the desired reduced pressure. The smallest sized valve that will satisfy the peak demand of a specific application is the correct size. If the regulator is too large the seat and disc will get wire drawn, the reduced pressure will not maintain set point and will be uneven resulting in poor control, short valve service life, and excessive maintenance. If the valve is too small it will not provide enough steam to satisfy the application.
Use the sizing charts below to choose the correct sized pressure reducing valve for your application.

How to Use Steam Capacity Charts

1. To find correct valve size when initial and reduced pressure and amount of steam (pounds per hour) are known.

In Chart 1 under the known initial pressure and opposite the required reduced pressure select the figure shown. Divide the amount of steam required by the figure. The quotient thus obtained is the valve coefficient. Select a valve size whose co-efficient is equal to or next larger than this figure.

Example:

Initial pressure is	100 lbs.
Amount of steam	275 lbs. per hour
Reduced pressure is	45 lbs.

Under 100 and opposite 45 is the figure 5059

Co-efficient is $\dfrac{275}{5950}$ equals .046

For Type 127 the nearest valve co-efficient in Table A is .065, which corresponds to a ½" valve. For Type 152A the nearest valve co-efficient in Table A is .085, which corresponds to a ¾" valve.

2. To determine the valve size when the amount of radiation, initial and reduced pressure are given. Convert the radiation to pounds of steam by dividing the sq. ft. of radiation by 4. Then proceed as in 1.

3. To determine size of valve necessary for steam coil heater in water storage tank when initial and reduced pressure are given and heater recovery capacity in gal. per hour is known.

Multiply cap. gal. per hr. by .93 for 80° rise per hr.
Multiply cap. gal. per hr. by 1.16 for 100° rise per hr.
Multiply cap. gal. per hr. by 1.62 for 140° rise per hr.
Multiply cap. gal. per hr. by 1.74 for 150° rise per hr.

The resulting figure is pounds of steam, required. Determined valve size as shown in 1.

4. To determine the capacity of a valve when the initial and reduced pressures are known.

In chart 1 under the known initial pressure and opposite the known reduced pressure select the figure shown. Multiply this by the co-efficient for the size of the valve. The result is the cap. in lbs. steam per hr.

Table A – Valve Co–Efficients for Steam

TYPE	½"	¾"	1"	1¼"	1½"	2"	2½"	3"
127	.065	.147	.262	.409	.589	1.05	1.64	2.36
152A-252A	.024	.085	.120	.132	.187	.216	–	–

Chart 1 — Steam Capacity Chart

INITIAL PRESSURE

REDUCED PRESSURE	10.64	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
0	1360																								
5	1110	1830																							
10		1670	2250	2790																					
15					3350	3890																			
20			1980				4430	4850																	
25			1500	2590					5390																
30				2250	3180					5950	6480														
35				1670	2900	3740						7020	7560												
40					2480	3510	4300							8110	8540										
45					1830	3180	4100									9080	9620								
50						2700	3820	4680										10150	10720	11240	11780	12130	12820	13360	13860
55						1980	3430	4430	5240																
60							2900	4100	5020	5800															
65							2120	3670	4730	5600	6360														
70								3090	4360	5350	6180	6910													
75								2250	3890	5020	5950	6740	7460												
80									3260	4620	5660	6520	7300	8070											
85									2370	4100	5300	6270	7110	7860											
90										3430	4850	5950	6860	7680	8410										
95										2480	4300	5550	6570	7460	8240	8950									
100											3590	5070	6220	7180	8030	8800	9500								

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Series 127 Standard
Reduced Pressure Range Chart

The table below shows minimum and maximum reduced pressure ranges obtainable with various selections of chamber diameters and adjusting spring, depending on supply pressures.

Size	Model	INITIAL PRESSURE																		
		25		50		75		100		125		150		175		200		225		250	
Size	Model	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
	206	14	25	19	50	20	75	21	100	22	104	23	105	24	106	25	107	26	108	27	109
	208	10	25	10	50	11	50	11	51	12	51	12	52	13	52	13	53	14	53	14	54
½"	108	3	17	3	17	4	18	4	18	5	19	5	19	6	20	6	20	7	21	7	21
	110	2	9	2	9	3	9	3	10	3	10	3	10	4	10	4	11	4	11	4	11
	206	13	25	20	50	22	75	24	100	26	108	28	110	30	112	32	114	34	116	36	118
	208	10	25	11	50	12	51	13	52	14	53	15	54	16	55	17	56	18	57	19	58
¾"	108	2	17	3	18	4	19	4	20	6	21	7	22	8	23	9	24	10	25	11	26
	110	2	9	2	9	3	10	3	10	4	11	4	11	5	12	5	12	6	13	6	13
	206	13	25	–	50	24	75	26	100	29	108	31	110	34	113	36	115	39	118	41	120
	208	10	25	11	50	12	51	13	52	14	53	15	54	16	55	17	56	18	57	19	58
1"	108	3	17	4	18	5	19	6	20	7	21	8	22	9	23	10	24	11	25	12	26
	110	2	9	2	9	3	10	3	10	4	11	4	11	5	12	5	12	6	13	6	13
	206	13	25	23	50	26	75	29	100	32	112	35	115	38	118	41	121	44	124	47	127
	208	14	25	15	50	16	55	17	56	18	57	19	58	20	59	21	60	22	61	23	62
1¼"	108	4	24	5	25	6	26	7	27	8	28	9	29	10	30	11	31	12	32	13	33
	110	1	9	2	10	3	11	4	12	4	12	5	13	6	14	7	15	7	15	8	16
	206	15	25	24	50	28	75	31	100	35	117	38	120	42	124	45	127	49	130	52	134
	208	11	25	13	50	15	52	17	54	19	56	21	58	23	60	25	62	27	64	29	66
1½"	210	7	25	8	30	9	31	10	32	11	33	12	34	13	35	14	36	15	37	16	38
	110	3	10	4	11	5	12	6	13	7	14	8	15	9	16	10	17	11	18	12	19
	206	16	25	25	50	31	75	36	100	42	115	47	120	53	126	58	133	64	137	69	142
	208	9	25	12	50	15	53	18	56	21	59	24	62	27	65	30	68	33	71	36	74
2"	210	6	29	7	30	9	32	10	33	12	35	13	36	15	38	16	39	18	41	19	42
	110	4	9	5	10	7	12	8	13	10	15	11	16	13	18	14	19	16	21	17	22
	206	11	25	27	50	35	75	42	100	50	118	57	125	65	133	72	140	80	148	87	155
	208	11	25	15	50	19	54	23	58	27	62	31	66	35	70	39	74	43	78	47	82
2½"	210	7	25	9	30	12	33	14	35	17	38	19	40	22	43	24	45	27	48	29	50
	110	4	10	6	12	9	15	11	17	14	20	16	22	19	25	21	27	24	30	26	32
	206	18	25	30	50	40	75	50	100	60	120	70	130	80	140	90	150	100	160	110	170
	208	12	25	18	50	24	56	30	62	36	68	42	74	48	80	54	86	60	92	66	98
3" – 4"	210	8	25	11	32	15	36	18	39	22	43	25	46	29	50	32	53	36	57	39	60
	110	5	11	8	14	12	18	15	21	16	28	20	31	26	32	29	35	33	39	36	42

Note: Consult factory for special ranges below those shown, providing initial pressure, reduced pressure and valve size.

Quick Reference Capacity Chart for Average Conditions

Model	Size		INITIAL PRESSURE / REDUCED PRESSURE								
	in	mm	FROM 50 UP TO 20	FROM 75 UP TO 35	FROM 100 UP TO 50	FROM 125 UP TO 60	FROM 150 UP TO 70	FROM 175 UP TO 80	FROM 200 UP TO 90	FROM 225 UP TO 100	FROM 250 UP TO 125
			MAXIMUM CAPACITIES IN LBS. OF STEAM PER HOUR								
127	½	15	218	302	387	474	555	643	731	811	900
127	¾	20	492	682	875	1072	1255	1454	1653	1834	2037
127	1"	25	878	1216	1560	1911	2237	2591	2946	3268	3631
127	1¼	32	1370	1898	2436	2984	3493	4045	4599	5102	5668
127	1½	40	1973	2733	3508	4297	5030	5825	6623	7348	8163
127	2"	50	3518	4872	6253	7660	8967	10385	11807	13099	14553
127	2½	65	5494	7610	9766	11964	14006	16220	18442	20459	22730
127	3"	80	7906	10950	14054	17216	20154	23440	26538	29441	32709
127	4"	100	8301	11497	14756	18076	–	–	–	–	–
252A-152A	½	15	80	111	143	175	205	237	270	299	332
252A-152A	¾	20	285	394	506	620	726	841	956	1060	1178
252A-152A	1"	25	402	557	715	875	1025	1186	1349	1497	1663
152A	1¼	32	442	613	786	962	1127	1305	1484	1646	1830
152A	1½	40	665	870	1120	1355	1600	1950	2230	2460	2725
152A	2"	50	765	1000	1285	1490	1840	2242	2564	2829	3134

Example; Initial pressure is 100 lbs. reduced pressure is 50 lbs. and capacity required is 1500 lbs. of steam per hour. By referring to the proper initial reduce pressure column (100 to 50) 1560 lbs. per hour is closest to Required Capacity and corresponds to a Type 127 Valve, Size 1".

Note: For reduced pressures above those shown for each initial pressure column, refer to Detailed Capacity Table.

Series 142

Process Boiler Water Feeders
with direct feed through float chamber

Series 142 Process Boiler Water Feeders are for use on pressing machines and other small process boilers when feed through float chamber is permissible. This series comes standard with direct feed through float chamber.

Series 144

Process Boiler Water Feeders
with external water feed connectors

Series 144 Process Boiler Water Feeders are for use on pressing machines and other small process boilers. Water is fed automatically as needed to maintain the correct operating level in the boiler. The simple construction of the feed valve permits quick and easy cleaning should it become fouled by dirt in the water supply. This series comes standard with external water feed connections.

Pressure Ratings

WSP: 100psi (7 bar)

WOG: 125psi (8.75 bar)

Steam Pressure: Max. 100psi (7 bar)

Water Pressure: Max. 125psi (8.75 bar)

Water pressure must be at least 10psi (69 kPa) higher than steam pressure

WATTS®

ISO 9001-2008
CERTIFIED