

E.W. Howell Co., LLC

113 Crossways Park Drive

Woodbury, NY 11797

Phone: 516-921-7100

Fax: 516-921-7920

REQUEST FOR INFORMATION**No. 00039****TITLE:** Orifice Unions in Tunnel**DATE:** 2/22/2010**PROJECT:** BNL CCWF-II**JOB:**

TO: Attn: Alan Raphael
 Brookhaven National Laboratory
 Brookhaven Sciences Associates, LLC
 Project Modernization Office
 Upton, NY 11973-5000
 Phone: 631-344-5854

STARTED:**COMPLETED:****REQUIRED:** 3/1/2010**WORK****IMPACT:** Unknown**SCHEDULE****IMPACT:** Unknown**COST****IMPACT:** Unknown**QUESTION:**

2/22/2010

Orifice Unions in Tunnel

In order to properly size the orifice unions in the tunnel, we require the pressure and temperature in each of the headers involved. The headers are:

42" CWS
 24" CWS
 30" CWR
 36" CHS
 36" CHR
 24" CHS

Also, we assume the pressures in the headers will determine the pressure differential across the orifice.

CC: Bill Harrison, George Santorilla, File

PROPOSED SOLUTION:**ANSWER:**

*PLEASE SEE THE ATTACHED RESPONSE AND REFERENCED ATTACHMENTS.
 W. HARRISON, GIFFELS/ISI GROUP 4-9-10*

Requested By: E.W. Howell Co., LLC**Date:** _____**Signed:** _____

Hans Laros

The chilled water supply pressure varies while the return pressure remains essentially constant. Similarly, the delta-p between the condenser water pump discharge and the cooling water supply and return headers will vary depending on the number of cells operating.

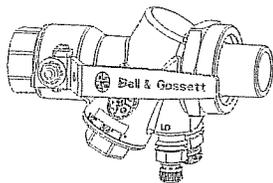
A union orifice, as shown on the drawings, will result in variable flow as the system pressures vary. Therefore, provide a constant flow control valve instead of the union orifice.

Attached for reference is product literature for the B&G and Griswold constant flow control valves. The B&G Circuit Sentry valve control range is 2 psi to 60 psi. The equivalent Griswold valve has a 4 psi to 57 psi range. The B&G valve is preferred due to the wider control range.

Either the B&G 1.5" Circuit Sentry, Model AC at 26 gpm or the Griswold 1.5" Isolator "R", Model IR24 at 25.33 gpm will suit our application. Both valves are rated for 400 psi service. We do not need a read out kit to see how close we are to the 25 gpm flow.

The valves are fitted at the factory with a flow control cartridge based on the desired constant flow rate. The valve will maintain the selected constant flow rate over the operating pressure range of the valve. The attached Griswold product information includes a graph that illustrates what happens to the flow rate outside of the pressure control range.

JOB:	REPRESENTATIVE:	
UNIT TAG:	ORDER NO.	DATE:
ENGINEER:	SUBMITTED BY:	DATE:
CONTRACTOR:	APPROVED BY:	DATE:



Circuit Sentry™

Model AC

Combination Commissioning Valve
& Automatic Flow Limiting Valve

DESCRIPTION

The Bell & Gossett Circuit Sentry™ is a combination automatic flow limiting valve, commissioning valve, and shut-off valve for use in HVAC systems. Valves are furnished with a removable flow limiting diaphragm cartridge to allow easy access for inspection, cleaning or flow rate changes without disturbing the piping. Two 1" pressure / temperature ports and a hanging ID tag for commissioning are standard. A variety of end connections are available on both the fixed and union ends.

CONSTRUCTION

Body: Brass C37710
 Ball: Chrome Plated Brass C37710
 Ball Seal: PTFE
 Stem: Blow-out Proof
 O-Rings: EPDM
 Cartridge: Brass C36000
 Diaphragm: Reinforced EPDM
 Spring: Stainless Steel

MAXIMUM WORKING PRESSURE

400 psig (2,758 kPa)

TEMPERATURE RANGE

-4°F (-20°C) to 250°F (121°C)

CONTROL RANGE

2 psi (14kPa) to 60 psi (414 kPa)

Accuracy

+/- 5%

*See Instruction Sheet V50844

SCHEDULE

VALVE SIZE FIXED END	TAGGING INFORMATION	QUANTITY
½" Sweat Female		
½" NPT Female		
¾" Sweat Female		
¾" NPT Female		
1" Sweat Female		
1" NPT Female		
1L" Sweat Female		
1L" NPT Female		
1½" Sweat Female		
1½" NPT Female		
1½" Sweat Female		
1½" NPT Female		
2" R Sweat Female		
2" R NPT Female		
LARGE BODY		
1½" L Sweat Female		
1½" L NPT Female		
2" Sweat Female		
2" NPT Female		
2½" Sweat Female		
2½" NPT Female		

FLOW RATES

Fixed End Size In. (mm)	FLOW RATES* (GPM)																										
½" (15)	0.33	0.5	1	1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	9	10	11						
¾" (20)	0.33	0.5	1	1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	9	10	11						
1" (25)	0.33	0.5	1	1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	9	10	11						
1"L (25L)	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	32	34	36	38	40	42
1¼" (32)	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	32	34	36	38	40	42
1½" (40)	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	32	34	36	38	40	42
2"R (40)	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	32	34	36	38	40	42

*B&G recommends following ASHARAE's design criteria for hydronic system piping, flow rates, and friction loss.

Fixed End Size In. (mm)	FLOW RATES* (LPS)																										
½" (15)	0.02	0.03	0.06	0.09	0.11	0.13	0.16	0.19	0.22	0.25	0.28	0.32	0.35	0.38	0.41	0.44	0.47	0.50	0.57	0.63	0.69						
¾" (20)	0.02	0.03	0.06	0.09	0.11	0.13	0.16	0.19	0.22	0.25	0.28	0.32	0.35	0.38	0.41	0.44	0.47	0.50	0.57	0.63	0.69						
1" (25)	0.02	0.03	0.06	0.09	0.11	0.13	0.16	0.19	0.22	0.25	0.28	0.32	0.35	0.38	0.41	0.44	0.47	0.50	0.57	0.63	0.69						
1"L (25L)	0.32	0.38	0.44	0.50	0.57	0.63	0.69	0.76	0.82	0.88	0.95	1.01	1.07	1.14	1.20	1.26	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40	2.52	2.65
1¼" (32)	0.32	0.38	0.44	0.50	0.57	0.63	0.69	0.76	0.82	0.88	0.95	1.01	1.07	1.14	1.20	1.26	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40	2.52	2.65
1½" (40)	0.32	0.38	0.44	0.50	0.57	0.63	0.69	0.76	0.82	0.88	0.95	1.01	1.07	1.14	1.20	1.26	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40	2.52	2.65
2"R (40)	0.32	0.38	0.44	0.50	0.57	0.63	0.69	0.76	0.82	0.88	0.95	1.01	1.07	1.14	1.20	1.26	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40	2.52	2.65

*B&G recommends following ASHARAE's design criteria for hydronic system piping, flow rates, and friction loss.

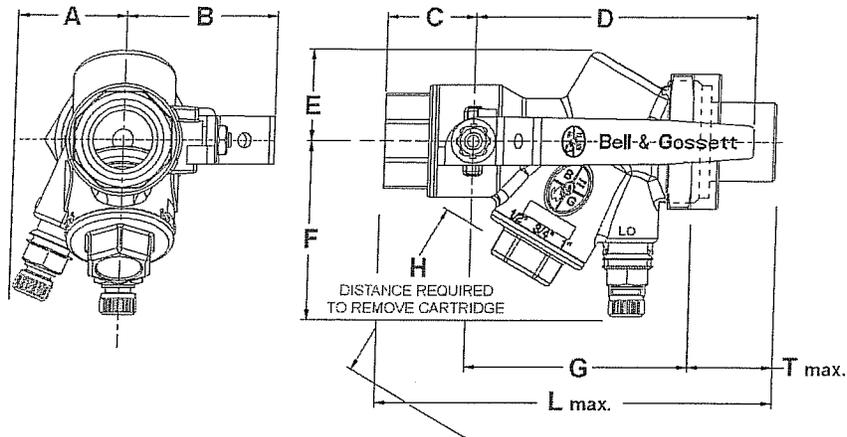
FLOW RATES - LARGE BODY

Fixed End Size In. (mm)	FLOW RATES* (GPM)																						
1½"L (40L)	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	110	120	130	140	150
2" (50)	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	110	120	130	140	150
2½" (65)	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	110	120	130	140	150

*B&G recommends following ASHARAE's design criteria for hydronic system piping, flow rates, and friction loss.

Fixed End Size In. (mm)	FLOW RATES* (LPS)																						
1½"L (40L)	0.95	1.26	1.58	1.89	2.21	2.52	2.84	3.15	3.47	3.79	4.10	4.42	4.73	5.05	5.36	5.68	5.99	6.31	6.94	7.57	8.20	8.83	9.46
2" (50)	0.95	1.26	1.58	1.89	2.21	2.52	2.84	3.15	3.47	3.79	4.10	4.42	4.73	5.05	5.36	5.68	5.99	6.31	6.94	7.57	8.20	8.83	9.46
2½" (65)	0.95	1.26	1.58	1.89	2.21	2.52	2.84	3.15	3.47	3.79	4.10	4.42	4.73	5.05	5.36	5.68	5.99	6.31	6.94	7.57	8.20	8.83	9.46

*B&G recommends following ASHARAE's design criteria for hydronic system piping, flow rates, and friction loss.



Valve Size Fixed End	Connection Fixed End	DIMENSIONS* INCH (mm)										Approx. Weight Lbs.(kg)
		A	B	C	D	E	F	G	H	T (Max)	L (Max)	
½"	Sweat Female	1.42 (36)	1.93 (49)	1.26 (32)	3.74 (95)	1.18 (30)	2.36 (60)	3.03 (77)	1.77 (45)	0.98 (25)	5.27 (134)	2.4 (1.1)
½"	NPT Female	1.42 (36)	1.93 (49)	1.18 (30)	3.74 (95)	1.18 (30)	2.36 (60)	3.03 (77)	1.77 (45)	0.98 (25)	5.19 (132)	2.4 (1.1)
¾"	Sweat Female	1.42 (36)	1.93 (49)	1.38 (35)	3.74 (95)	1.18 (30)	2.36 (60)	3.03 (77)	1.77 (45)	0.98 (25)	5.39 (137)	2.4 (1.1)
¾"	NPT Female	1.42 (36)	1.93 (49)	1.18 (30)	3.74 (95)	1.18 (30)	2.36 (60)	3.03 (77)	1.77 (45)	0.98 (25)	5.19 (132)	2.5 (1.1)
1"	Sweat Female	1.42 (36)	1.93 (49)	1.46 (37)	3.74 (95)	1.18 (30)	2.36 (60)	3.03 (77)	1.77 (45)	1.69 (43)	6.18 (157)	2.6 (1.2)
1"	NPT Female	1.42 (36)	1.93 (49)	1.38 (35)	3.74 (95)	1.18 (30)	2.36 (60)	3.03 (77)	1.77 (45)	1.69 (43)	6.10 (155)	2.6 (1.2)
1L"	Sweat Female	1.65 (42)	2.87 (73)	1.85 (47)	5.2 (132)	1.89 (48)	2.95 (75)	4.67 (118.5)	2.46 (62.5)	1.93 (49)	8.45 (214.5)	7.1 (3.2)
1L"	NPT Female	1.65 (42)	2.87 (73)	1.67 (42.5)	5.2 (132)	1.89 (48)	2.95 (75)	4.67 (118.5)	2.46 (62.5)	1.93 (49)	8.27 (210)	7.1 (3.2)
1¼"	Sweat Female	1.65 (42)	2.87 (73)	1.89 (48)	5.2 (132)	1.89 (48)	2.95 (75)	4.67 (118.5)	2.46 (62.5)	2.09 (53)	8.65 (219.5)	7.1 (3.2)
1¼"	NPT Female	1.65 (42)	2.87 (73)	1.65 (42)	5.2 (132)	1.89 (48)	2.95 (75)	4.67 (118.5)	2.46 (62.5)	2.09 (53)	8.41 (213.5)	7.2 (3.3)
1½"	Sweat Female	1.65 (42)	2.87 (73)	2.01 (51)	5.2 (132)	1.89 (48)	2.95 (75)	4.67 (118.5)	2.46 (62.5)	2.09 (53)	8.77 (222.5)	7.1 (3.2)
1½"	NPT Female	1.65 (42)	2.87 (73)	1.73 (44)	5.2 (132)	1.89 (48)	2.95 (75)	4.67 (118.5)	2.46 (62.5)	2.09 (53)	8.49 (215.5)	7.1 (3.2)
2" R **	Sweat Female	1.65 (42)	2.87 (73)	5.04 (128)	5.2 (132)	1.89 (48)	2.95 (75)	4.67 (118.5)	2.46 (62.5)	2.09 (53)	11.8 (299.5)	9.8 (4.4)
2" R **	NPT Female	1.65 (42)	2.87 (73)	3.36 (85)	5.2 (132)	1.89 (48)	2.95 (75)	4.67 (118.5)	2.46 (62.5)	2.09 (53)	10.12 (256.5)	9.0 (4.1)

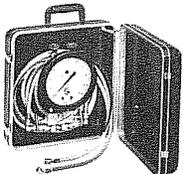
*All dimensions +/- 0.125" (3.2 mm) tolerance. Dimensions are subject to change. Not to be used for construction purposes unless certified.

** 2" Reduced Port

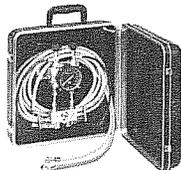
BELL & GOSSETT

SUBMITTAL

A-552B

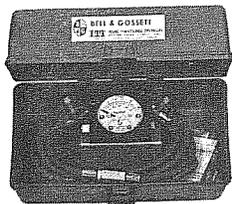


RO-2



RO-3

RO-4



RO-5

Engineered Products Read Out Kits

JOB _____	B & G REPRESENTATIVE _____
UNIT TAG NO. _____	ORDER NO. _____ DATE _____
ENGINEER _____	SUBMITTED BY _____ DATE _____
CONTRACTOR _____	APPROVED BY _____ DATE _____

DESCRIPTION

B&G Readout Kits are designed for use with B&G Circuit Setter Balance Valves, Circuit Sensor Flow Meters and Triple Duty Valves. They may also be used to check differential pressures across other system components

including B&G pumps, Suction Diffusers, strainers, coils, etc. All readout kits feature full overrange protection and are equipped with hoses, readout probes, carrying case and Circuit Setter Balance Valve calculator.

MODEL NO.	SCALE			HOSE LENGTH FEET	TAGGING INFORMATION	QUANTITY
	RANGE*	INCREMENTS	ACCURACY** ±%			
RO-2	0-100	0.5	.5	10		
RO-3	0-16	1.0	1.0			
RO-4	0-35					
RO-5†	0-25	0-5 FT. @ 1.25 FT. 5-25 FT. @ 1.0 FT.	3.0	5		
	0-0.7 kg/cm	0.05 kg/cm				

*Contact your local Bell & Gossett Representative for the availability of Readout Kits with scales other than shown.

**Full Scale

†Dual Scale 0-25 ft of water and 0-0.7kg/cm²

MAXIMUM OPERATING TEMPERATURE

All Models: 235°F Liquids and Gasses compatible with Nylon, Viton, Buna N. Brass, Aluminum and 316 Stainless Steel

MAXIMUM OPERATING PRESSURE

All Models: 250 PSIG

MODEL NO.	LENGTH	WIDTH	HEIGHT
RO-2, RO-3, RO-4	12"	7½"	12¾"
RO-5	12¼"	6¾"	6"

TYPICAL SPECIFICATION

Provide a portable Readout Meter with provision for hanging, capable of indicating pressure differential across a system component. Unit to be complete with all

necessary hoses, shut-off and vent valves, and carrying case. Reading range to be _____. Readout Kits to be ITT Bell & Gossett Model # _____.

For further information, contact ITT Bell & Gossett, 8200 N. Austin Avenue, Morton Grove, IL 60053, Phone: (708) 966-3700 — Telex 4949943 — Facsimile (708) 966-9052.

A One-Of-A-Kind Solution To Automatic Flow Control.

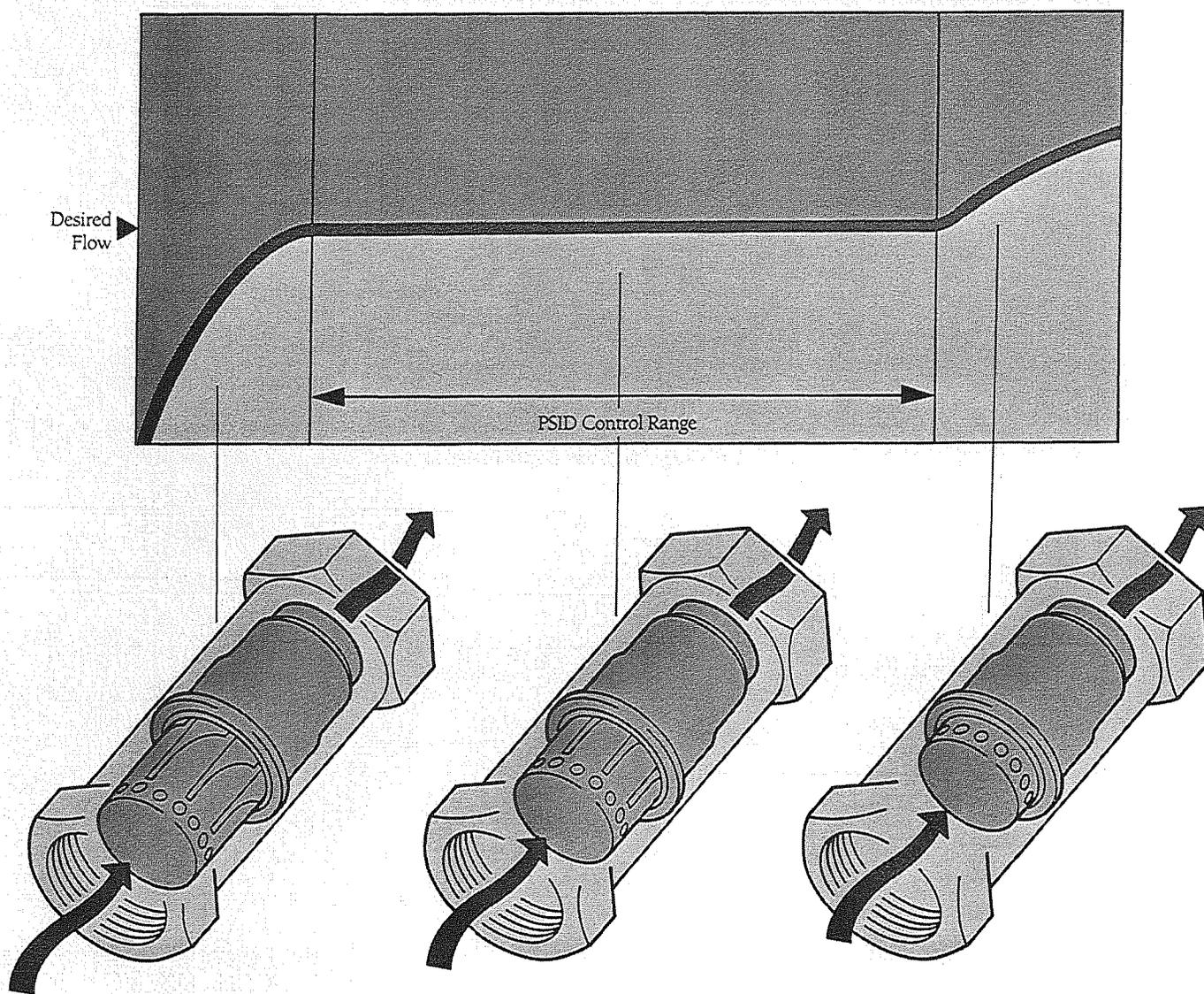
The Griswold flow-control cartridge takes the guesswork and uncertainties out of fluid system design. Whether you are balancing multiple flows, limiting the flow through a system or assuring a minimum safe flow, you can specify exactly the rate you want within a broad pressure-differential range and know that the specified flow rate, within $\pm 5\%$, will be maintained.

The Griswold cartridge is totally contained within the process stream. It cannot be tampered with or second-guessed by well-meaning but misguided operators. Yet, if at any time you need to change the factory-set flow, you can simply replace the cartridge with a different flow-rate unit.

Moreover, the precision engineered and manufactured cartridges, individually tested and calibrated, are highly

resistant to corrosion, clogging or any other type of problem that might interfere with their flow-control function. The stainless steel perforated cup, the only moving part, wipes itself clean every time the cartridge operates.

Griswold guarantees the flow-control cartridge for five years. In thousands of installations around the world, Griswold flow controls are functioning flawlessly after decades of continuous service.



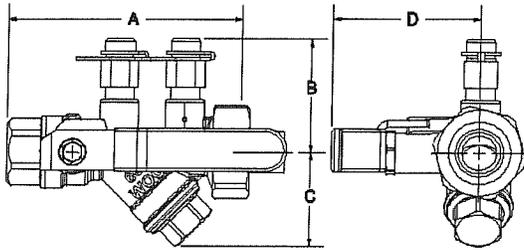
Below the control range, the cartridge acts as a variable flow device allowing flow to vary below the rated amount.

Within the wide control range, the cartridge modulates in response to pressure differential changes to maintain a fixed flow rate within $\pm 5\%$ accuracy.

Above the control range, the cartridge is fully compressed, allowing flow to increase as the pressure differential rises.

ACCESSIBLE CARTRIDGE

1/2" & 3/4" Housing



SPECIFICATIONS:

PSI/Temperature Rating: 1/2"-1-1/2": 400 PSI / 250° F
 1-1/2"L-3": 275 PSI / 250° F

Cartridge: AISI Type 304 stainless steel
 AISI Type 17-7 PH stainless steel spring

Body Material: 1/2"-1-1/2": Forged brass ASTM B283-06
 1-1/2"L-3": Cast brass

End Connections: Brass – NPT or Sweat

Ball Valve Seals: Teflon

Union Seal: EPDM O-Ring

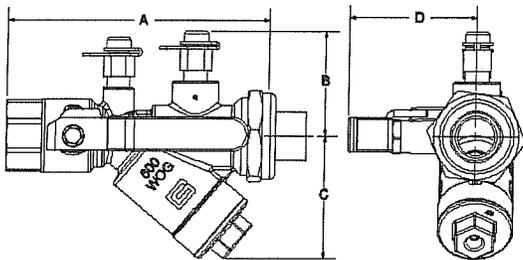
Body Tappings¹: Two Combination P/T Test Valve and Manual Air Vent (CPTA)

Ball Valve: Nickel-plated brass ball
 Optional: Stainless Steel ball

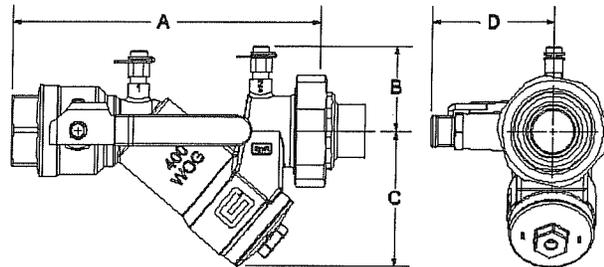
Field Repairable Stem: Dual Teflon seals and EPDM O-ring

Assembly: Valve comes fully assembled

1/2"L – 1-1/2" Housing



1-1/2"L – 3" Housing



DIMENSIONS & WEIGHTS (NOMINAL)

SIZE	A - FIXED END CONNECTION		UNION END CONNECTION ²						B	C	D	Cv ³	WEIGHT (LBS.)		
	FNPT	SWT	FNPT		MNPT		SWT								
1/2"	3.9	3.8	1/2":1.0	3/4":N/A ⁴	1/2":1.0	3/4":1.2	3/8",1/2":0.8	3/4":1.1	1.9	2.9	2.5	2.3	1.0		
3/4"	3.9	4.0													
1/2"L	5.3	5.5													
3/4"L	5.4	5.4	1/2",3/4":1.0	1":N/A ⁴	1/2"-3/4":1.0	1":1.4	3/8",3/4":1.0	1/2":0.7	1":1.3	2.2	3.6	2.6	10.9	2.3	
1"	5.4	5.6													
1"L	8.0	8.2													
1-1/4"	7.6	7.7	1",1-1/4",1-1/2":1.7		1",1-1/4",1-1/2":1.7 ⁵		1",1-1/4":1.7		1-1/2":1.4		2.5	3.1	3.1	28.5	5.0
1-1/2"	7.5	7.9													
1-1/2"L	9.4	9.6	1-1/4",	2": N/A ⁴	1",1-1/4":1.8	1-1/2", 2":1.6	1-1/4",2":1.6		1-1/2":1.7		2.6	3.7	3.7	40	8.8
2"	9.3	9.8	1-1/2":1.6												
2"L	10.9	11.2													
2-1/2"	11.1	N/A	N/A ⁶						2.9	4.0	4.0	75	13.6		
3"	11.3	N/A	N/A ⁶												

NOTES

- ¹ Body Tappings for accessories are a leak proof metal to metal seal and do not require pipe dope or tape. Tape or dope should not be used.
- ² For overall length, add union end connection length to body length.
- ³ Cv's are based on housing without cartridge.
- ⁴ Tailpiece is not available for this size. Male tailpiece used with coupling.
- ⁵ 1-1/4"-1-1/2" valves can also take 1/2"-3/4" MNPT tailpieces.
- ⁶ 2-1/2" and 3" Valves are fixed end by fixed end connection. Union connection is not available.

Replaces form F-4078E

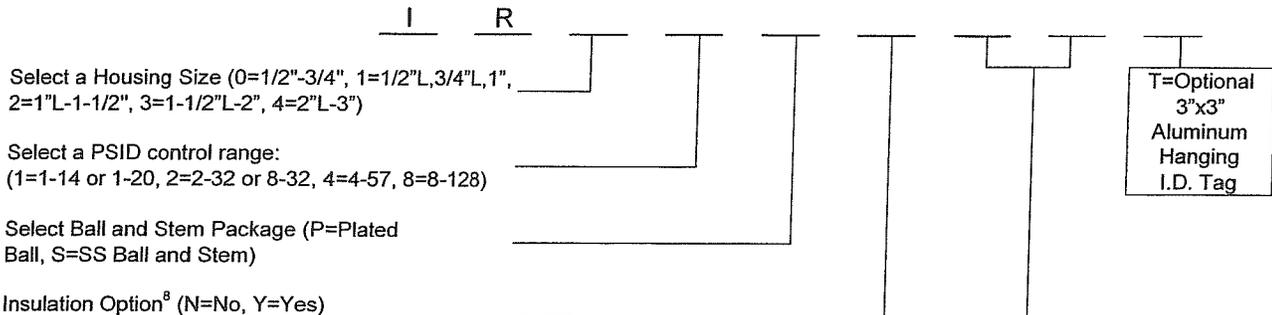
This specification © 2007 Griswold Controls

10/07
 F-5386A

2803 Barranca Parkway, Irvine, CA 92606
 (949) 559-6000 Fax (949) 559-6088
 www.GriswoldControls.com



MODEL NUMBER SELECTION⁷



Valve	FIXED END OR UNION END ⁹ (No Union Tailpiece=Z)		UNION END ONLY ⁹
	Female Threaded	Female Sweat	Male Threaded
IR0	1/2"=E, 3/4"=F ¹⁰	3/8"=K ¹¹ , 1/2"=L, 3/4"=M	1/2"=H, 3/4"=I
IR1	1/2"=E, 3/4"=F, 1"=G ¹⁰	3/8"=K ¹¹ , 1/2"=L, 3/4"=M, 1"=N	1/2"=H, 3/4"=I, 1"=J
IR2	1"=G, 1-1/4"=P, 1-1/2"=Q	1"=N, 1-1/4"=K, 1-1/2"=W	1/2"=H, 3/4"=I, 1"=J, 1-1/4"=S, 1-1/2"=T
IR3	1-1/4"=P ¹¹ , 1-1/2"=Q, 2"=R ¹⁰	1-1/4"=K ¹¹ , 1-1/2"=W, 2"=Y	1-1/4"=S, 1-1/2"=T, 2"=U
IR4 ¹² (Fixed End)	2"=L, 2-1/2"=M, 3"=N	N/A	N/A

FLOW RATES (+/-5%)

SIZE	MODEL NO.	HEAD LOSS IN FEET ¹³	PSID RANGE	GPM					
				MIN.	INCREMENT	MAX.			
1/2", 3/4"	IR02	7.4	2-32	0.25, 0.33, 0.50, 1.00, 1.50, 2.00, 2.50, 3.00					
1/2"L, 3/4"L, 1"	IR11	3.5	1-14	0.33, 0.50, 0.67, 1.00, 1.33, 1.67, 2.00, 2.33, 2.67, 3.33, 4.00, 4.67, 5.00					
	IR12	7.4	2-32	0.55, 0.75, 1.00, 1.50, 2.00, 2.50, 3.00, 3.50, 4.00, 5.00, 6.00, 7.00, 8.00					
	IR14	13.4	4-57	0.75, 1.00, 1.33, 2.00, 2.67, 3.33, 4.00, 4.67, 5.33, 6.67, 8.00, 9.33, 10.00					
	IR18	30.0	8-128	1.10, 1.50, 2.00, 3.00, 4.00, 5.00, 6.00, 7.00, 8.00, 10.0, 12.0, 14.0, 16.0					
1"L, 1-1/4", 1-1/2"	IR21	3.5	1-14	5.33, 6.00, 6.67, 7.33, 8.00, 8.67, 9.33, 10.00, 10.67, 11.33, 12.00, 12.67, 13.33, 14.00, 14.67					
	IR22	7.4	2-32	8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0, 21.0, 22.0					
	IR24	13.4	4-57	10.67, 12.00, 13.33, 14.67, 16.00, 17.33, 18.67, 20.00, 21.33, 22.67, 24.00, 25.33, 26.67, 28.00, 29.33					
	IR28	30.0	8-128	16.0, 18.0, 20.0, 22.0, 24.0, 26.0, 28.0, 30.0, 32.0, 34.0, 36.0, 38.0, 40.0, 42.0, 44.0					
1-1/2"L - 2"	IR31	3.5	1-14	12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38					
	IR32	7.4	2-32	18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57					
	IR34	13.4	4-57	24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76					
	IR38	30.0	8-128	36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114					
SIZE	MODEL NO.	HEAD LOSS IN FEET ¹³	PSID RANGE	GPM			HEAD LOSS IN FEET ¹³	PSID RANGE	HIGHER FLOW RATES/ NO INCREMENTS
				MIN.	INCREMENT	MAX.			
2"L, 2-1/2", 3"	IR41	3.5	1-20	14.0	2.0	60	9.2	4-20	90, 110, 130
	IR42	7.4	2-32	17.5	2.5	75	18.4	8-32	110, 135, 160
	IR44	13.4	4-57	23.33	3.33	100	NONE		
	IR48	30.0	8-128	35.0	5.0	150	NONE		

NOTES

- ⁷ Model no. and flow rate are indicated on label affixed to body.
- ⁸ Insulation Option includes handle cover and Accessory extensions.
- ⁹ Select the Fixed End First and the Union End Second. For 2-1/2" and 3" size select a 2nd fixed end instead of a union end.
- ¹⁰ Tailpiece is not available for this size. Male tailpiece used with coupling.
- ¹¹ Fixed end not available for this size. Union tailpiece only.
- ¹² 2-1/2" and 3" IR4 valve is only available with fixed end by fixed end option. Tailpieces aren't available.
- ¹³ Head Loss in Feet is provided for pump head calculations. (1 PSI = 2.307 Feet of Water)

Replaces form F-4078E

This specification © 2007 Griswold Controls

2803 Barranca Parkway, Irvine, CA 92606
(949) 559-6000 Fax (949) 559-6088
www.GriswoldControls.com



10/07
F-5386A