CASH VALVES TYPE G-60 PRESSURE REGULATORS

A self-contained, self-actuated high capacity all purpose regulator designed to operate within close limits.

FEATURES

- Broad choice of body and internal materials for a wide range of applications.
- Wide variety of inlet pressure ranges and operating temperatures, depending on construction.
- Balanced piston design provides close control despite wide in inlet pressure variations for water, air, oil and gas services.
- Flat seal ring for excellent shut-off, high capacity and easy maintenance.
- All internal parts guided to ensure proper seating.
- Large diaphragm and long pressure spring provide for a wide range of adjustment and give exceptional sensitivity of control.
- Hex head adjusting screw and lock nut as standard. Optional T-bar available to special order.
- Optional stainless steel internal trim suitable for regulating steam, air, water, oil, gases, chemicals and other fluids.
- Optional construction for cryogenic service.
- Modified version available for constant differential control or dome-loaded valve.

GENERAL APPLICATION

The G-60 is designed for use with steam, water, air, oil, gases, chemicals or other fluids in dryers, steam atomized oil burners, plastic molding, cookers, degreasers and sterilizers. Also available for cryogenic service.

TECHNICAL DATA

Materials:	Iron, bronze, carbon steel, stainless steel
Sizes:	¼" through 1½" (7 to 38 mm)
Connections:	Threaded NPTF
Inlet pressure ranges	
Water/air:	250 to 700 psig (17.2 to 48.3 barg)
Steam:	250 to 400 psig (17.2 to 27.6 barg)
Reduced pressure range:	1 to 250 psig (0.07 to 17.2 barg)
Temperature range:	-320 to 750°F (-195 to 399°C)

OPERATION

The Type G-60 design is totally different from the majority of self-acting pressure reducing regulators. Note the cross section below. Five pressure chambers play a part in producing its high capacity and exceptional performance.

Flow from inlet chamber (A) goes through the seat orifice to intermediate chamber (B), then into the outlet line (F) through nozzle chamber (C). Control chamber (D) communicates with outlet line (F) through chamber (E). In operation, assuming the valve closed, a drop in pressure in line (F) caused by demand downstream, drops the pressure in chambers (E) and (D) simultaneously. As this produces some valve opening, pressure in chamber (B) will elevate the velocity of flow through nozzle (C) considerably. This increased velocity through the nozzle (jet action) drops the pressure in control chamber (D). The valve is opened wide to satisfy the demand and the delivery pressure is maintained within narrow limits.

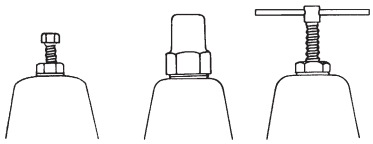
CONSTRUCTION

Body: iron, bronze, carbon steel or 316 stainless steel.
Trim (pusher post button, pusher post orifice, nozzle, bottom cap and piston): bronze or stainless steel.
Guide bushing: stainless steel.
Piston and seat ring: stainless steel - for steam and other fluids requiring metal-to-metal seats.
Bronze piston with NBR seat disc and stainless steel seat ring - for air, cold water and other fluids where tight shut-off is desired, stainless steel pistons are optional.
Diaphragm: phosphor bronze, stainless steel, NBR, FKM.
Diaphragm gasket (used only with metal diaphragms)**:** aramid fiber (PTFE to special order).
Bottom cap gasket: aramid fiber (PTFE to special order).
Adjusting screw cap (when furnished)**:** brass (stainless steel to special order).

FEATURES

Adjusting screw
A hex head adjusting screw and hex lock nut are standard. An optional T-bar is available to special order.

OPTIONS

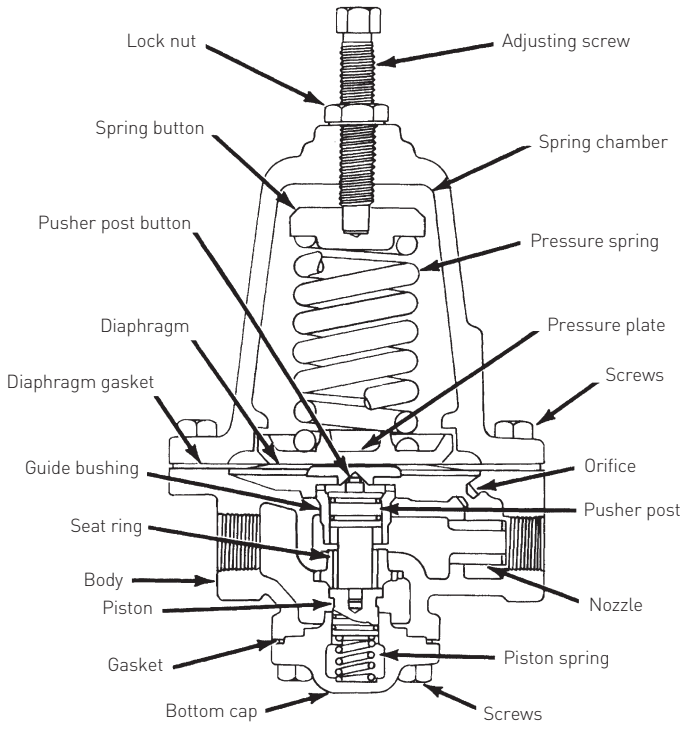


Standard adjusting screw | Adjusting screw cap | T-Handle

Optional cryogenic service
Approved construction is offered for handling cold fluids, e.g. pressure building regulators on liquid to gas oxygen and nitrogen converters. Special stainless steel pressure springs for higher ranges than those shown in the spring range table are available for this service. See datasheet VCTDS-00514 for more information.

Internal design features
1. Except for the steam valves, the valve piston is fully balanced against inlet and outlet pressures. This provides close control despite wide inlet pressure variations.
2. A flat seat ring rather than a beveled seat is employed for better shut-off, higher capacity and easier maintenance.
3. The internal parts are well guided to assure proper seating.
4. The Type G-60 has a large diaphragm and long pressure spring which, in combination, provide for a wide range of adjustment and give exceptional sensitivity of control.

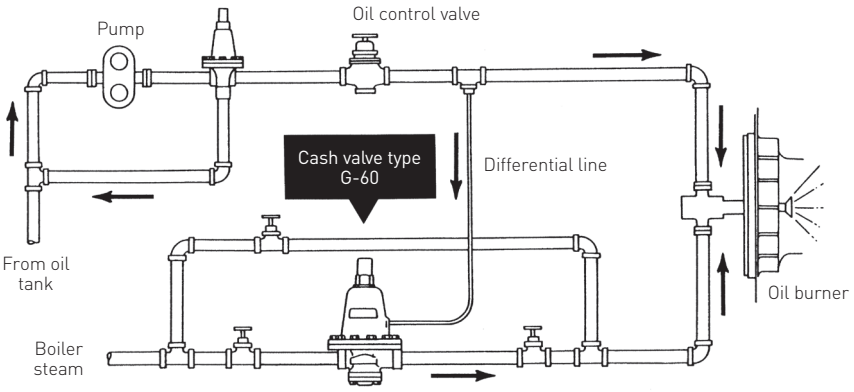
TYPE G-60 INTERIOR STEAM REGULATOR



Optional differential pressure control
The Type G-60 can serve as a constant-differential valve through a slight modification of the standard valve design. This is accomplished by incorporating a ¼" (7 mm) side tap in the spring housing. In a typical steam/oil atomizing installation (below), loading pressure is introduced above the G-60 diaphragm and steam is delivered through the valve at a regulated pressure higher than the loading pressure, with the pressure difference being determined by the diaphragm spring setting. The outlet steam pressure is maintained automatically to provide a constant, fixed pressure differential between the steam pressure and oil pressure. Variations in the loading pressure are reflected in a pound-for-pound change in the discharge pressure.

Valves equipped with the optional differential pressure control are fitted with a pressure-tight closing cap over the pressure adjusting screw, a gasket above the diaphragm and a gasket seal to the closing cap.

STEAM/OIL ATOMIZING CONTROL

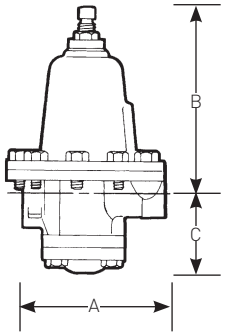


SPECIFICATIONS

TYPE G-60 WITH THREADED CONNECTIONS

Description		Dimensions				Shipping weight (lbs.)	
			B				
Type	Pipe size	A	With cap	W/O cap	C	Iron	Bronze
G-60	¼"	4"	6⅝"	6¼"	2 3/16"	8	9
	⅜"	4"	6⅝"	6¼"	2 3/16"	8	9
	½"	4¾"	7⅝"	7⅛"	2 5/16"	15	16
	¾"	5⅝"	10"	9½"	2⅝"	22	24
	1"	6½"	10¾"	9⅞"	2⅞"	32	35
	1¼"	8"	12⅜"	11 13/16"	3½"	58	62½
	1½"	8"	12⅜"	11 13/16"	3½"	58	62½

TYPE G-60
Threaded connections



PRESSURE AND TEMPERATURE RATINGS

Body	Trim	Seat ring	Diaphragm	Media	Max. initial pressure (psi)	Max. temp. ranges (°F)
Iron	Bronze	Stainless steel	NBR	Water/air steam	400	-20 to 180
		Stainless steel	Phosphor bronze		250	-50 to 410
	Stainless steel	Stainless steel	Stainless steel	Steam	250	-50 to 410
Bronze	Bronze	Stainless steel	NBR	Water/air steam	400	-20 to 180
		Stainless steel	Phosphor bronze		300	-50 to 410
	Stainless steel	Stainless steel	Stainless steel	Steam	300	-50 to 500
Carbon steel or stainless steel	Stainless steel	Stainless steel	Stainless steel	Water/air steam	700	-20 to 180
					400	-50 to 700

Bronze and stainless steel valves are also available for service to -320°F with cryogenic modification

SPECIFICATIONS (CONTINUED)

The amount of air or fluid any regulator will pass is governed by two factors:

1. Pressure differential, or the difference between the inlet and outlet pressure.
2. A characteristic known as fall-off or droop, by which the outlet pressure drops slightly as flow starts through the valve and drops off even more as increased demand requires increased flow.

The rates of flow stated on the following charts are based on maximum fall-off or droop of 20% from set pressure.

TYPE G-60 AIR CAPACITY INFORMATION

Inlet pressure (psig)	Outlet pressure (psig)	Air capacity In SCFM by size						
		¼"	⅜"	½"	¾"	1"	1¼"	1½"
25	15	11	19	30	55	88	127	160
	10	13	23	36	65	104	150	189
50	40	12	21	33	60	96	138	174
	25	20	35	55	100	160	230	290
	10	21	37	58	105	168	242	305
75	65	15	26	41	75	120	173	218
	50	26	46	72	130	208	299	377
	25	29	51	80	145	232	334	421
	10	29	51	80	145	232	334	421
100	90	17	30	47	85	136	196	247
	75	27	47	74	135	216	311	392
	50	34	60	94	170	272	391	493
	25	36	63	99	180	288	414	522
125	100	28	49	77	140	224	322	406
	75	36	63	99	180	288	414	522
	50	42	74	116	210	336	483	609
	25	50	88	138	250	400	575	725
150	140	21	37	58	105	168	242	305
	100	38	66	105	190	304	437	551
	75	44	77	121	220	352	506	638
	50	52	91	143	260	416	598	754
	25	54	95	149	270	432	621	783
200	150	45	79	124	225	360	450	653
	100	52	91	143	260	416	598	754
	75	54	95	149	270	432	621	783
	50	56	98	154	280	448	644	812
	25	56	98	154	280	448	644	812
250	150	55	96	151	275	440	633	798
	100	57	100	157	285	456	656	827
	75	65	114	179	325	520	748	943
	50	68	119	187	340	544	782	986
	25	69	121	190	345	552	794	1001
300/400	150	59	103	162	295	472	679	856
	100	68	119	187	340	544	782	986
	75	70	123	193	350	560	805	1015
	50	71	124	195	355	568	817	1030

Capacities are based on a 20% fall-off

SPECIFICATIONS (CONTINUED)

TYPE G-60 STEAM CAPACITY INFORMATION

Inlet pressure (psig)	Outlet pressure (psig)	Steam (lbs.) per hour by size						
		¼"	⅜"	½"	¾"	1"	1¼"	1½"
25	15	36	48	72	120	192	264	324
	10	50	66	100	150	240	330	405
50	40	49	65	98	145	238	327	401
	25	72	96	144	240	384	528	648
	10	75	100	150	250	400	550	675
75	65	53	71	105	157	252	345	425
	50	90	120	180	300	480	660	810
	25	105	140	210	350	560	770	945
	10	105	140	210	350	560	770	945
100	90	70	78	117	195	313	430	528
	75	113	150	225	375	600	825	1013
	50	134	178	267	445	712	979	1202
	25	135	180	270	450	720	990	1215
125	100	105	140	210	350	560	770	945
	75	158	210	315	525	840	1155	1418
	50	165	220	330	550	880	1210	1485
	25	168	224	336	560	896	1232	1512
150	140	57	76	125	210	340	420	580
	100	165	220	330	550	880	1210	1485
	75	188	250	375	625	1000	1375	1688
	50	195	260	390	650	1040	1430	1755
	25	197	262	393	655	1048	1441	1769
200	150	198	264	396	660	1056	1452	1782
	100	263	350	525	875	1400	1925	2363
	75	278	370	555	925	1480	2035	2498
	50	275	372	558	930	1488	2046	2511
	25	275	372	558	930	1488	2046	2511
250	150	266	354	531	885	1416	1947	2390
	100	324	432	648	1080	1728	2376	2916
	75	338	450	675	1125	1800	2475	3038
	50	345	460	690	1150	1840	2530	3105
	25	345	460	690	1150	1840	2530	3105
300/400	150	330	440	660	1100	1760	2420	2970
	100	387	516	774	1290	2064	2838	3483
	75	390	520	780	1300	2000	2860	3510
	50	390	520	780	1300	2000	2860	3510

Capacities are based on a 20% fall-off

SPECIFICATIONS (CONTINUED)

TYPE G-60 WATER CAPACITY INFORMATION

Inlet pressure (psig)	Outlet pressure (psig)	Gallons per minute by size						
		¼"	⅜"	½"	¾"	1"	1¼"	1½"
25	15	2.2	3.9	6.0	11.0	17.6	24.2	29.7
	10	2.4	4.2	6.6	12.0	19.2	26.4	32.4
50	40	2.4	4.2	6.6	12.0	19.2	26.4	32.4
	25	3.4	6.0	9.4	17.0	27.2	37.4	45.9
	10	4.0	7.0	11.0	20.0	32.0	44.0	54.0
75	65	2.4	4.2	6.6	12.0	19.2	26.4	32.4
	50	3.2	5.6	8.8	16.0	25.6	35.2	43.2
	25	5.0	8.8	13.8	25.0	40.0	55.0	67.5
	10	5.2	9.1	14.3	26.0	41.6	57.2	70.2
100	90	2.6	4.6	7.2	13.0	20.8	28.6	35.1
	75	3.6	6.3	9.9	18.0	28.8	39.6	48.6
	50	4.6	8.0	12.7	23.0	36.8	50.6	62.1
	25	5.8	10.2	16.0	29.0	46.4	63.8	78.3
125	100	3.8	6.7	10.5	19.0	30.4	41.8	51.3
	75	4.8	8.4	13.2	24.0	38.4	52.8	64.8
	50	5.4	9.5	14.9	27.0	43.2	59.4	72.9
	25	6.4	11.2	17.6	32.0	51.2	70.4	86.4
150	140	3.0	5.3	8.3	15.0	24.0	33.0	40.5
	100	5.2	9.1	14.3	26.0	41.6	57.2	70.2
	75	6.2	10.9	17.1	31.0	49.6	68.2	83.7
	50	6.8	11.9	18.7	34.0	54.4	74.8	91.8
	25	7.0	12.3	19.3	35.0	56.0	77.0	94.5
200	150	5.4	9.5	14.9	27.0	43.2	59.4	72.9
	100	7.0	12.3	19.3	35.0	56.0	77.0	94.5
	75	7.2	12.6	19.8	36.0	57.6	79.2	97.2
	50	7.8	13.7	21.5	39.0	62.4	85.8	105.3
	25	8.0	14.0	22.0	40.0	64.0	88.0	108.0
250	150	7.0	12.3	19.3	35.0	56.0	77.0	94.5
	100	7.8	13.7	21.5	39.0	62.4	85.8	105.3
	75	8.0	14.0	22.0	40.0	64.0	88.0	108.0
	50	8.4	14.7	23.1	42.0	67.2	92.4	113.4
	25	8.6	15.1	23.7	43.0	68.8	94.6	116.1
300/400	150	7.8	13.7	21.5	39.0	62.4	85.8	105.3
	100	8.4	14.7	23.1	42.0	67.2	92.4	113.4
	75	8.8	15.4	24.2	44.0	70.4	96.8	118.8
	50	9.0	15.8	24.8	45.0	72.0	99.0	121.5

Capacities are based on a 20% fall-off

SELECTION GUIDE

Example:	G60Z	A	W	S	S	Z	Z	B	S	01	-	D	1

Model

G60Z G60 w/bronze body
G60F G60 w/iron body
G60D G60 w/carbon steel body
G60G G60 w/316 stainless steel body

Valve size

A	¼"	**E**	1"
B	⅜"	**F**	1¼"
C	½"	**G**	1½"
D	¾"		

Service

W	Water/air service	**S**	Steam service

Body/connection style

S Side inlet/side outlet - straight through w/NPT connections

Spring chamber style

S	Standard	**D**	w/pressure screw cap and differential connection

Spring chamber material

Z	Bronze	**D**	Carbon steel
F	Iron	**G**	Stainless steel

Diaphragm material

B	Buna-N	**V**	Viton® (water/air)
Z	Bronze (all)	**L**	Buna-N w/Teflon diaphragm liner (water/air)
G	316 stainless steel (all)		

Seat material

B	Buna-N (water/air)	**R**	EPR (water/air)
T	Teflon (water/air)	**E**	303 Stainless steel (steam)
V	Viton® (water/air)		

Pressure screw style

S	Standard	**T**	T-handle

Variation

01 Standard (303 stainless steel trim) (303 SST seat ring, 303 SST pusher post button, 303 SST pusher post, 303 SST guide bushing, 303 SST piston orifice, 303 SST nozzle and 316 SST bottom cap)
02 303 Stainless steel trim with Teflon gasketing (303 SST seat ring, 303 SST pusher post button, 303 SST pusher post, 303 SST guide bushing, 303 SST piston orifice, 303 SST nozzle and 316 SST bottom cap)
11 316 Stainless steel trim (316 SST seat ring, 316 SST pusher post button, 316 SST pusher post, 316 SST guide bushing, 316 SST piston orifice, 316 SST nozzle and 316 SST bottom cap)
12 316 Stainless steel trim with Teflon gasketing (316 SST seat ring, 316 SST pusher post button, 316 SST pusher post, 316 SST guide bushing, 316 SST piston orifice, 316 SST nozzle and 316 SST bottom cap)
21 Monel® trim (¼" and ⅜" water/air service only) (Monel® pusher post button, Monel® pusher post, Monel® guide bushing, Monel® piston orifice, Monel nozzle and Monel bottom cap)
31 Brass trim (303 SST seat ring, brass pusher post button, brass pusher post, 303 SST guide bushing, brass piston orifice, brass nozzle and bronze bottom cap)
33 Brass trim with SST bottom cap (303 SST seat ring, brass pusher post button, brass pusher post, 303 SST guide bushing, brass piston orifice, brass nozzle and 316 SST bottom cap)

Design revision

(-) Indicates original design

Spring material

D	Carbon steel (water/air, steam service only)	**E**	Stainless steel

Spring range

Refer to table below

STANDARD SPRING RANGES (PSIG)

Spring material	Size	1	2	3	4	5	6	7
Steel	¼", ⅜"	1-15	5-40	20-90	30-125	75-250	--	--
	½"	0-7	5-15	10-50	30-75	50-120	75-150	--
	¾"	5-15	10-50	30-75	50-120	75-150	--	--
	1"	2-10	5-25	10-50	30-100	50-130	75-150	100-250
SST	¼", ⅜"	5-30	15-65	30-110	75-200	100-400	100-600	--
	½"	0-7	5-70	50-150	50-250	100-400	200-500	--
	¾"	0-10	5-75	50-200	100-400	100-600	--	--
	1"	10-50	50-200	100-400	100-600	--	--	--
	1¼", 1½"	5-15	10-50	30-75	50-120	75-120	100-400	--

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