

# P99 Pressure Reducing Regulator

The P99 gas regulators provide a broad range for controlled pressure ranges and capacities in a wide variety of distribution, industrial, and commercial applications.

## Features

- **Wide Variety of Applications** — Natural gas distribution systems, gas supply to industrial boilers, furnaces, ovens, mixers, plant air service, oxygen and ammonia service, and large commercial establishments such as shopping centers and schools.
- **High Accuracy** — Keeps constant inlet pressures to downstream equipment by accurately controlling distribution system pressures at widely varying flow rates and supply pressures for maximum efficiency and best operation, or by eliminating the need for pressure-compensating meters by holding a steady pressure to the meter inlet.
- **No Atmospheric Bleed** — Loading pressure bleeds downstream through pilot via downstream control line. No bleed occurs when regulator is shut off.
- **Easy to Maintain**— Valve disk and orifice can be inspected without removing body from pipeline. Union nut connection permits quick removal of actuator and pilot from body.
- **Tight Shutoff** — Heavy mainspring working through a lever provides a high seat loading force for tight shutoff



## P99 Specifications

P99 Output Ranges		
Ranges	0.25 to 2 PSIG	0.017 to 0.13 BAR
	2 to 10 PSIG	0.13 to 0.69 BAR
	10 to 65 PSIG	0.69 to 4.5 BAR
Pilot Versions	L	
	LD	
	LE	
	H	
Maximum Pilot Supply Pressures	400 PSIG with L Pilot and H Pilot	
	160 PSIG with LD Pilot	
	400 PSIG with LE Pilot	
Temperature Range	-20° to 180° F	(-29° to 82° C)
Weight Approximate		
2" NPT	115 lbs.	52.2 kg

## P99 Materials of Construction

P99 Main Regulator	
Body	Cast Iron
Spring Case	Cast Iron
Upper and Lower Casing	Cast Iron
Main Spring	Steel
Diaphragm	Nitrile
Diaphragm Plate	Steel
P99 Pilot Regulator	
Body	Cast Iron
Spring Case	Cast Iron
Casings	Cast Iron
Diaphragms	Nitrile
Orifices	Stainless Steel
Springs	Steel
Bleed Valve	Stainless Steel
Tubing	Copper
Fittings	Brass

## P99 Regulator Rebuild Kits

	Kit Includes	Part Number
<b>P99 Nitrile Low Pressure Pilot 7/8" Orifice</b>	Kit Includes: Diaphragm, Pusher post gasket, Body gasket, Nitrile disk assembly, Orifice, Spring case gasket. <b>Pilot parts included are:</b> Upper relay diaphragm, O-ring seal, Relay orifice, Lower relay diaphragm, relay disk, Bleed valve spring, Bleed valve, Bleed orifice, Closing cap gasket, Filter element	971-P99-000
<b>P99 Nitrile Low Pressure Pilot 1-1/8" Orifice</b>	Kit Includes: Diaphragm, Pusher post gasket, Body gasket, Nitrile disk assembly, Orifice, Spring case gasket. <b>Pilot parts included are:</b> Upper relay diaphragm, O-ring seal, Relay orifice, Lower relay diaphragm, relay disk, Bleed valve spring, Bleed valve, Bleed orifice, Closing cap gasket, Filter element	971-P99-001

	Kit Includes	Part Number
<b>P99 Nitrile High Pressure Pilot 7/8" Orifice</b>	Kit Includes: Diaphragm, Pusher post gasket, Body gasket, Nitrile disk assembly, Orifice, Spring case gasket. <b>Pilot parts included are:</b> Upper relay diaphragm, O-ring seal, Relay orifice, Lower relay diaphragm, relay disk, Bleed valve spring, Bleed valve, Bleed orifice, Closing cap gasket, Filter element	971-P99-002
<b>P99 Nitrile High Pressure Pilot 1-1/8" Orifice</b>	Kit Includes: Diaphragm, Pusher post gasket, Body gasket, Nitrile disk assembly, Orifice, Spring case gasket. <b>Pilot parts included are:</b> Upper relay diaphragm, O-ring seal, Relay orifice, Lower relay diaphragm, relay disk, Bleed valve spring, Bleed valve, Bleed orifice, Closing cap gasket, Filter element	971-P99-003



## P99 Outlet Pressure Ranges

Pilot Type	Maximum Pilot Supply Pressure		Outlet (Control) Pressure Ranges		Pilot Control Spring					
					Part Number	Color Code	Wire Diameter		Free Length	
	PSIG	BAR	PSIG	BAR			Inches	mm	Inches	mm
L LD LE	400	27.6	2 to 4 inches WC <sup>(1)</sup>	5 to 10 mbar <sup>(1)</sup>		Orange	0.072	1.83	3.78	96.0
			3 to 12 inches WC <sup>(1)</sup>	7 to 30 mbar <sup>(1)</sup>		Unpainted	0.080	2.03	3.00	76.2
	160	11.0	0.25 to 2	0.02 to 0.14	655-734-002	Red	0.109	2.77	2.75	69.9
			1 to 5	0.07 to 0.35	655-734-007	Yellow	0.142	3.61	2.75	69.9
			2 to 10	0.14 to 0.69	655-734-003	Blue	0.172	4.37	2.88	73.2
	400	27.6	5 to 15	0.35 to 1.0	655-734-008	Brown	0.187	4.75	3.03	77.0
10 to 20			0.69 to 1.4	655-734-009	Green	0.207	5.26	3.13	79.5	
H	400	27.6	10 to 65	0.69 to 4.5	655-659-003	Green stripe	0.363	9.22	6.00	152
HP	600	41.4	35 to 100	2.4 to 6.9		Blue	0.200	5.08	1.69	42.9

1. Type LD pilot only.

## P99 Approximate Proportional Bands

Pilot Type	Pilot Control Spring						Proportional Bands	
	Part Number	Color Code	Wire Diameter		Free Length		Inches WC	mbar
			Inches	mm	Inches	mm		
LD		Orange	0.075	1.91	4.13	105	0.1 to 0.5	0.25 to 1
		Unpainted	0.080	2.03	3.25	82.6		
L	655-734-002	Red	0.109	2.77	2.75	69.9	1 to 2	2 to 5
LD		Red	0.109	2.77	2.75	69.9	0.25 to 1	0.62 to 2
LE		Red	0.109	2.77	2.75	69.9	5 to 8	12 to 20
L, LD, and LE		655-734-007	Yellow	0.142	3.61	2.75	69.9	0.1 to 0.3 psi
	655-734-003	Blue	0.172	4.37	2.88	73.2		
	655-734-008	Brown	0.187	4.75	2.88	73.2		
	655-734-009	Green	0.207	5.26	3.13	79.5		
H	655-659-003	Green Stripe	0.363	9.22	6.00	152.4	0.1 to 0.3 psi	6.9 to 21
HP		Blue	0.200	5.08	1.69	42.9	1 to 2 psi	6.9 to 21

## P99 Orifice Sizes and Flow and Sizing Coefficients

Trim Construction	Orifice Size		FOR RELIEF SIZING WIDE-OPEN C <sub>g</sub>	REGULATING C <sub>g</sub>	C <sub>1</sub>	K <sub>m</sub>	IEC Sizing Coefficients		
	Inches	mm					X <sub>T</sub>	F <sub>D</sub>	F <sub>L</sub>
Restricted capacity trim, Straight bore — Elastomer disk seat only	1/2	3	200	155	35	0.79	0.78	0.50	0.89
	5/8	16	300	216					
	3/4	19	425	330					
Restricted capacity trim, Stepped bore — Elastomer disk seat only	7/8 x 3/8	22 x 9.5	115	110	35	0.79	0.78	0.50	0.89
	7/8 x 1/2	22 x 13	200	190					
	7/8 x 5/8	22 x 16	300	280					
Full capacity trim, Elastomer disk, or O-ring seats	7/8	22	550	408	35	0.79	0.78	0.50	0.89
	1-1/8	29	850	680					



# P99 Capacities of Type 99 Regulators (Full Capacity)



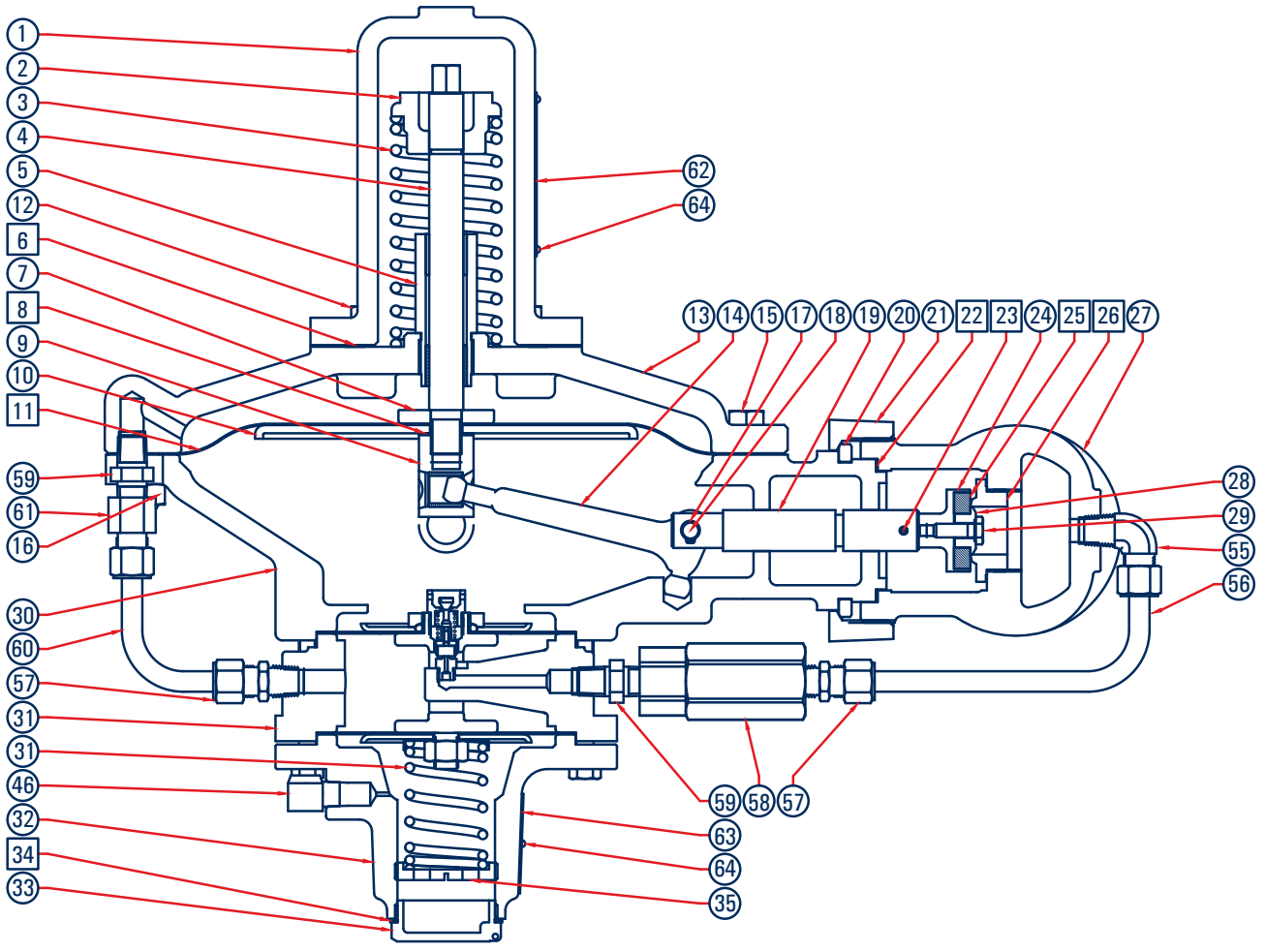
Orifice Size		Inlet Pressure		Capacities in Thousands of SCFH / Nm³/h of 0.6 Specific Gravity Natural Gas <sup>(2)</sup>																									
				Outlet Pressure, PSIG (BAR)																									
Inches	mm	PSIG	BAR	15 (1.0)		20 (1.4)		25 (1.7)		30 (2.1)		35 (2.4)		40 (2.8)		45 (3.1)		50 (3.5)		60 (4.1)		75 (5.2)		100 (6.9)					
				SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h		
7/8	22	20	1.4	10.8	0.3																								
		25	1.7	16.2	0.4	12	0.3																						
		30	2.1	20	0.5	17	0.5	12.5	0.3																				
		35	2.4	24	0.6	21	0.6	18	0.5	13	0.3																		
		40	2.8	28	0.8	26	0.7	23	0.6	19	0.5	14.4	0.4																
		50	3.4	34	0.9	34	0.9	31	0.8	28	0.8	25	0.7	21	0.6	15.5	0.4												
		60	4.1	42	1.1	42	1.1	42	1.1	37	1.0	35	0.9	30	0.8	27	0.7	23	0.6										
		75	5.2	47	1.3	47	1.3	47	1.3	47	1.3	47	1.3	45	1.2	41	1.1	37	1.0	30	0.8								
		100	6.9	59	1.6	59	1.6	59	1.6	59	1.6	59	1.6	59	1.6	59	1.6	59	1.6	53	1.4	44	1.2						
		125	8.6	73	2.0	73	2.0	73	2.0	73	2.0	73	2.0	73	2.0	73	2.0	73	2.0	73	2.0	66	1.8	48	1.3				
		150	10.3	86	2.3	86	2.3	86	2.3	86	2.3	86	2.3	86	2.3	86	2.3	86	2.3	86	2.3	86	2.3	86	2.3	72	1.9		
		175	12.1	96	2.6	96	2.6	96	2.6	96	2.6	96	2.6	96	2.6	96	2.6	96	2.6	96	2.6	96	2.6	96	2.6	93	2.5		
		200	13.8	108	2.9	108	2.9	108	2.9	108	2.9	108	2.9	108	2.9	108	2.9	108	2.9	108	2.9	108	2.9	108	2.9	108	2.9	108	2.9
		225	15.5	123	3.3	123	3.3	123	3.3	123	3.3	123	3.3	123	3.3	123	3.3	123	3.3	123	3.3	123	3.3	123	3.3	123	3.3	123	3.3
		250	17.2	132	3.5	132	3.5	132	3.5	132	3.5	132	3.5	132	3.5	132	3.5	132	3.5	132	3.5	132	3.5	132	3.5	132	3.5	132	3.5
		300	20.7	162	4.3	162	4.3	162	4.3	162	4.3	162	4.3	162	4.3	162	4.3	162	4.3	162	4.3	162	4.3	162	4.3	162	4.3	162	4.3
350	24.1	188	5.0	188	5.0	188	5.0	188	5.0	188	5.0	188	5.0	188	5.0	188	5.0	188	5.0	188	5.0	188	5.0	188	5.0	188	5.0		
400	27.6	215	5.8	215	5.8	215	5.8	215	5.8	215	5.8	215	5.8	215	5.8	215	5.8	215	5.8	215	5.8	215	5.8	215	5.8	215	5.8		
1-1/8	29	20	1.4	18	0.5																								
		25	1.7	27	0.7	20	0.5																						
		30	2.1	34	0.9	28	0.8	21	0.6																				
		35	2.4	40	1.1	35	0.9	30	0.8	22	0.6																		
		40	2.8	47	1.3	43	1.2	38	1.0	32	0.9	24	0.6																
		50	3.4	57	1.5	57	1.5	52	1.4	47	1.3	42	1.1	35	0.9	26	0.7												
		60	4.2	65	1.7	65	1.7	65	1.7	62	1.7	58	1.6	50	1.3	45	1.2	38	1.0										
		75	5.2	78	2.1	78	2.1	78	2.1	78	2.1	78	2.1	74	2.0	68	1.8	50	1.3										
		100	6.9	99	2.7	99	2.7	99	2.7	99	2.7	99	2.7	99	2.7	99	2.7	99	2.7	99	2.7	99	2.7	88	2.4				
		125	8.6	122	3.3	122	3.3	122	3.3	122	3.3	122	3.3	122	3.3	122	3.3	122	3.3	122	3.3	122	3.3	122	3.3	80	2.1		
		150	10.3	143	3.8	143	3.8	143	3.8	143	3.8	143	3.8	143	3.8	143	3.8	143	3.8	143	3.8	143	3.8	143	3.8	120	3.2		
175	12.1	160	4.3	160	4.3	160	4.3	160	4.3	160	4.3	160	4.3	160	4.3	160	4.3	160	4.3	160	4.3	160	4.3	155	4.2				
200	13.8	180	4.8	180	4.8	180	4.8	180	4.8	180	4.8	180	4.8	180	4.8	180	4.8	180	4.8	180	4.8	180	4.8	180	4.8	180	4.8		
225	15.5	205	5.5	205	5.5	205	5.5	205	5.5	205	5.5	205	5.5	205	5.5	205	5.5	205	5.5	205	5.5	205	5.5	205	5.5	205	5.5		
250	17.2	220	5.9	220	5.9	220	5.9	220	5.9	220	5.9	220	5.9	220	5.9	220	5.9	220	5.9	220	5.9	220	5.9	220	5.9	220	5.9		
300	20.7	265	7.1	265	7.1	265	7.1	265	7.1	265	7.1	265	7.1	265	7.1	265	7.1	265	7.1	265	7.1	265	7.1	265	7.1	265	7.1		
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1. When sizing a regulator, always use the lowest inlet pressure, the highest outlet pressure, and the maximum capacity desired.  
 2. Requires 0.75 PSIG / 0.05 bar minimum differential pressure construction.  
 — Shaded areas indicate no capacity due to differential pressure requirement.

## P99 Parts

Item	Description	Qty.	Part Number
1	Spring Case - Cast Iron	1	604-260-000
2	Main Spring Seat	1	626-109-000
	Main Spring Seat - 1000 PSIG	1	626-109-001
3	<b>Main Springs</b>		
	25 PSIG Drop	1	655-734-006
	50 PSIG Drop	1	655-734-005
	250 PSIG Drop	1	655-734-004
	1,000 PSIG Drop	1	655-659-001
4	SS Diaphragm Rod	1	646-548-000
5	Brass Diaphragm Rod Guide Assembly	1	626-111-001
6	Spring Case Gasket	1	624-081-000
7	Brass Collar		612-012-001
8	Pusher Post Gasket		624-079-000
9	Brass Pusher Post Assembly		637-332-001
10	Diaphragm Plate - Steel		638-075-000
11	<b>Diaphragms</b>		
	Main Regulator Diaphragm -Nitrile	1	618-097-000
12	Cap Screw	4	648-467-003
13	Upper Casing - Cast Iron	1	604-261-000
14	Lever - Steel	1	703-010-000
15	Casing Cap Screw	12	648-467-004
16	Casing Hex Nut	12	634-199-000
17	Retaining Ring for Brass Trim	2	693-026-000
18	Lever Pin	1	635-073-000
19	Valve Carrier - Brass	1	651-102-001
20	Body Snap Ring	2	644-060-000
21	Union Nut	1	634-198-000
22	Body Gasket	1	624-080-000
23	Cotter Pin	1	635-000-042
24	Disk Seat Holder - Brass	1	650-174-001
25	<b>Seat Disks</b>		
	250 PSIG Drop - Nitrile	1	619-066-000
	250 PSIG Drop - Neoprene	1	619-066-001
26	<b>Orifices</b>		
	Brass - 7/8"	1	688-057-001
	Brass - 1-1/8"	1	688-058-001
27	<b>Bodies</b>		
	2" NPT Iron	1	664-379-000
28	<b>Retainers</b>		
	7/8" Orifice	1	643-205-002
	1-1/8" Orifice	1	643-205-003
29	Cap Screw	1	648-466-000
30	Lower Casing - Cast Iron	1	629-236-000
31	Relay Valve Body	1	664-380-000
32	<b>Pilot Spring Case - Cast Iron</b>		
	L, LE, LD Spring Case	1	604-262-000
	H Spring Case	1	604-263-000
33	Closing Cap - L, LE and LD	1	610-056-000
34	Gasket	1	624-069-000
35	<b>Pilot Adjustment Screw</b>		
	L, LE and LD Screw	1	648-499-000
	H Screw	1	648-462-000

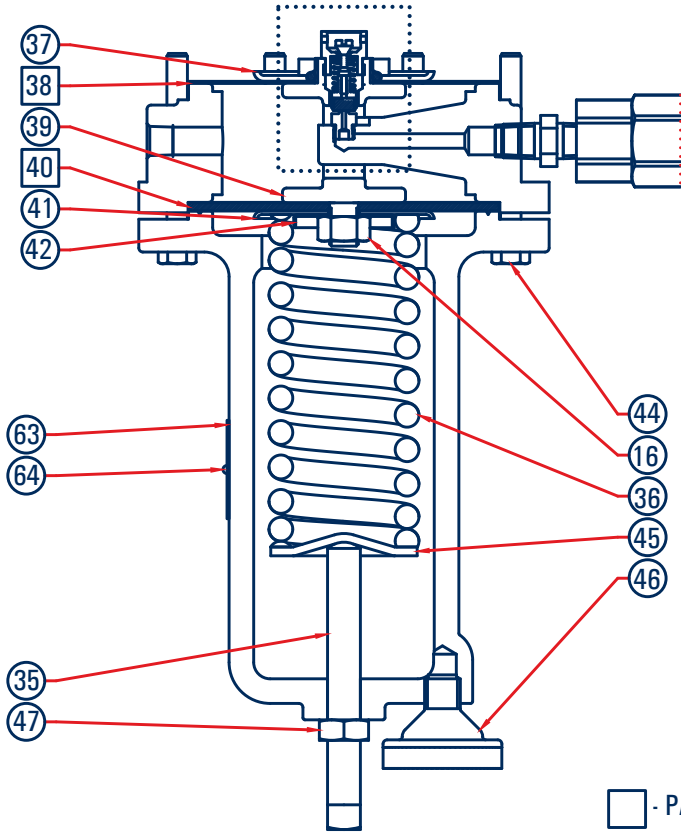
Item	Description	Qty.	Part Number
36	<b>Pilot Control Springs</b>		
	0.25 to 2 PSIG - Red	1	655-734-002
	1 to 5 PSIG - Yellow	1	655-734-007
	2 to 10 PSIG - Blue	1	655-734-003
	.5 to 15 PSIG - Brown	1	655-734-008
	10 to 20 PSIG - Green	1	655-734-009
	10 to 65 PSIG - Green stripe	1	655-659-003
37	<b>Pilot Upper Relay Diaphragm Head</b>		
	L and LD Diaphragm Head	1	638-076-000
	LE and H Diaphragm Head	1	638-077-000
38	Upper Relay Diaphragm	1	618-098-000
39	Relay Yoke Assembly	1	670-035-000
40	<b>Pilot Lower Relay Diaphragms</b>		
	L, LE and LD Diaphragm - Nitrile	1	618-099-000
	H Diaphragm - Nitrile	1	618-100-000
41	<b>Pilot Lower Relay Diaphragm Head</b>		
	L, LE and LD Diaphragm Head	1	638-076-001
	H Diaphragm Head	1	638-078-000
42	<b>Pilot Spring Seats</b>		
	L, LE and LD Seat	1	650-175-000
	H Seat	1	650-173-000
43	Pipe Plug - (not shown)	1	639-119-000
44	Cap Screw	8	648-467-004
45	Spring Seat H Only	1	626-077-000
46	<b>Pilot Vent Assemblies</b>		
	L, LE and LD Vents	1	836-004-000
	H Vents	1	836-008-000
47	Pilot Adjustment Screw Nut	1	634-000-056
48	Bleed Orifice - Stainless	1	688-056-000U
49	Diaphragm Nut - Brass	1	634-200-001
50	O-ring Seal - Nitrile	1	649-309-002
51	<b>Relay Orifices</b>		
	For 25 PSIG Drop	1	688-055-001U
	For greater than 25 PSIG Drop	1	688-055-000U
52	<b>Bleed Valve - Stainless</b>		
	L, LE and LD Valves	1	636-058-000
	H Valves	1	636-058-001
53	<b>Bleed Valve Spring</b>		
	LD Valves	1	655-734-010
	L and LE Valves	1	655-734-000
	H Valves		655-734-001
54	Relay Disk Assembly - Nitrile	1	822-042-002
55	Elbow Compression Fitting - Brass	1	622-061-000
56	Pilot Supply Tubing - Horizontal	1	660-081-001
	Pilot Supply Tubing - Vertical	1	660-081-002
57	Male Compression Fitting - Brass	2	662-062-000
58	P590 Brass Line Filter - Brass	1	P590
	P590 Filter Element - Brass	1	677-052-000
59	Pipe Nipple - Steel - SS	2	633-022-000
60	Loading Tubing - Copper	1	660-081-000
61	Female Compression Fitting - Brass	1	662-063-000
62	Nameplate	1	632-546-000
63	Pilot Nameplate	1	632-547-000
64	Drive Screw	4	648-464-000



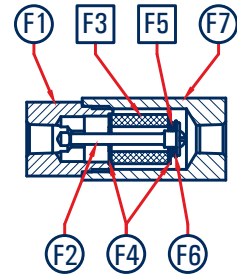
- PARTS INCLUDED IN REPAIR KITS 971-P99-XXX

# P99 Regulator with H Series Pilot Parts List

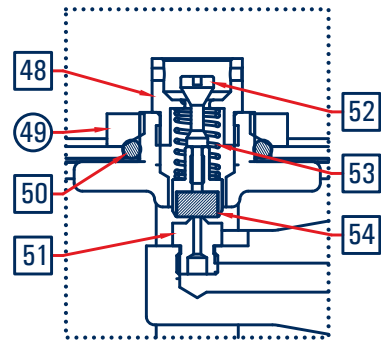
H SERIES PILOT



P590 SERIES FILTER



P61 SERIES BLEED VALVE ASSEMBLY



- PARTS INCLUDED IN REPAIR KITS 971-P99-XXX