

March 2014

# Types 98L and 98H Backpressure Regulators and Relief Valves

## WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion, fire and/or chemical contamination causing property damage and personal injury or death.

Fisher® backpressure regulators and relief valves must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations, and Emerson Process Management Regulator Technologies, Inc. instructions.

If a leak develops or if the outlet continually vents gas, service to the unit may be required. Failure to correct trouble could result in a hazardous condition. Only a qualified person must install or service the unit.

Installation, operation and maintenance procedures performed by unqualified personnel may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Use qualified personnel when installing, operating and maintaining the Types 98L and 98H backpressure regulators and relief valves.

## Introduction

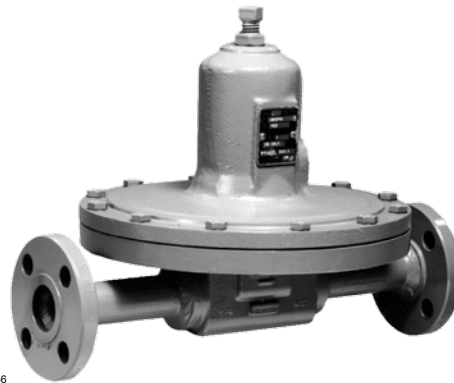
### Scope of the Manual

This manual provides instructions for the installation, adjustment, maintenance and parts ordering information of Types 98L and 98H Backpressure Regulators and Relief Valves. Instructions and parts lists for other equipment mentioned in this instruction manual are found in separate manuals.



W6155

TYPE 98H OR 98HM



W6156

TYPE 98L

Figure 1. Types 98L and 98H Backpressure Regulators and Relief Valves

## Description

Types 98L and 98H are direct-operated, spring-loaded backpressure regulators or relief valves. Typical applications include use in wash tanks, small heaters, fuel and oil lines, air supply systems, test fixtures and sterilizers. Relief pressure ranges are 2 to 38 psig / 0.14 to 2.6 bar, in four ranges, for Type 98L and 15 to 200 psig / 1.0 to 13.8 bar, in four ranges for each sizes, for Type 98H. Type 98L is available on body sizes NPS 1/4, 1/2, 3/4 and 1 / DN 15, 20 and 25 and Type 98H on body sizes NPS 1/4, 1/2, 3/4, 1, 1-1/2 and 2 / DN 15, 20, 25, 40 and 50.



# Types 98L and 98H

## Specifications

### Available Constructions

**Type 98L:** Direct-operated low-pressure backpressure regulator/relief valve with internal pressure registration and standard adjusting screw for 2 to 38 psig / 0.14 to 2.6 bar set pressure range

**Type 98H:** Direct-operated high-pressure backpressure regulator/relief valve with internal pressure registration and standard adjusting screw for 5 to 200 psig / 0.34 to 13.8 bar set pressure range

**Type 98HM:** Direct-operated high-pressure backpressure regulator/relief valve with external pressure registration and standard adjusting screw for 5 to 275 psig / 0.34 to 19.0 bar set pressure range

### Body Sizes and End Connection Styles

TYPE	BODY MATERIAL	
	Cast Iron	WCC Steel, CF8M Stainless steel
98L	1/4, 1/2, 3/4, 1 NPT	1/4 through 1 NPT, NPS 1/2 through 1 / DN 15 through 25, SWE, CL150 RF, CL300 RF, PN16/25/40 RF
98H	1/4, 1/2, 3/4, 1, 1-1/2, 2 NPT	1/4 through 2 NPT, NPS 1/2 through 2 / DN 15 through 50, SWE, CL150 RF, CL300 RF, PN 16/25/40 RF
98HM	----	1/2, 3/4, 1, 1-1/2, 2 NPT

### Maximum Cold Working Pressures of Body Size and Materials<sup>(1)(2)</sup>

REGULATOR	BODY SIZE	BODY AND SPRING CASE MATERIALS	MAXIMUM INLET PRESSURE <sup>(3)</sup>	
			psig	bar
Type 98L	All Sizes	Cast Iron	60	4.1
		Steel	125	8.6
		Stainless Steel	125	8.6
Type 98H	All Sizes	Cast Iron	300	20.7
		Steel	300	20.7
		Stainless Steel	300	20.7
Type 98HM	All Sizes	Steel	300	20.7
		Stainless Steel	300	20.7

### Flow Coefficient

$C_v$ : 35

### IEC Sizing Coefficients

BODY SIZE		$X_T$	$F_D$	$F_L$	$K_m$
NPS	DN				
1/4	----	0.78	0.50	0.91	0.83
1/2	15			0.83	0.69
3/4 and 1	20 and 25			0.88	0.77
1-1/2 and 2	40 and 50			0.92	0.85

### Relief Pressure Ranges

See Tables 1 and 2

### Shutoff Classification Per ANSI/FCI 70-3-2004

**Metal Seats:** Class IV

**Polytetrafluoroethylene (PTFE):** Class IV

**Elastomer Seats:** Class VI

### Temperature Capabilities for Elastomer Parts<sup>(1)(4)</sup>

MATERIAL	TEMPERATURE RANGE
Nitrile (NBR)	-40 to 180°F / -40 to 82°C
Neoprene (CR)	-40 to 180°F / -40 to 82°C
Fluorocarbon (FKM) <sup>(5)</sup>	0 to 300°F / -18 to 149°C Limited to 200°F / 93°C for hot water
Ethylenepropylene (EPDM) <sup>(5)</sup>	-40 to 275°F / -40 to 135°C
Perfluoroelastomer (FFKM) <sup>(5)</sup>	0 to 425°F / -18 to 218°C
PTFE Diaphragm protector	-40 to 400°F / -40 to 207°C

### Temperature Capabilities for Metal Parts<sup>(1)(4)</sup>

MATERIAL	TEMPERATURE RANGE
Cast iron <sup>(6)</sup>	-40 to 406°F / -40 to 207°C
WCC Steel	-20 to 450°F / -29 to 232°C
CF8M Stainless steel	-40 to 450°F / -40 to 232°C

### Type 98HM Sensing Line Connection

**NPS 1/2, 1-1/2 or 2 / DN 15, 40 or 50 Body:** 1/8 NPT

**NPS 3/4 or 1 / DN 20 or 25 Body:** 1/4 NPT

### Pressure Registration

**Types 98L and 98H:** Internal

**Type 98HM:** External

### Options

- Handwheel or tee handle for Types 98L and 98H
- Tapped spring case vent for Types 98L, 98H and 98HM
- Seal washer to permit spring case pressure loading for Types 98L, 98H and 98HM

### Approximate Weights

#### Type 98L

**NPS 1/4 Body:** 6 pounds / 3 kg

**NPS 1/2 / DN 15 Body:** 13 pounds / 6 kg

**NPS 3/4 / DN 20 Body:** 30 pounds / 14 kg

**NPS 1 / DN 25 Body:** 30 pounds / 14 kg

#### Type 98H

**NPS 1/4 Body:** 7 pounds / 4 kg

**NPS 1/2 / DN 15 Body:** 7 pounds / 2 kg

**NPS 3/4 / DN 20 Body:** 16 pounds / 7 kg

**NPS 1 / DN 25 Body:** 16 pounds / 7 kg

**NPS 1-1/2 / DN 40 Body:** 55 pounds / 25 kg

**NPS 2 / DN 50 Body:** 55 pounds / 25 kg

#### Type 98HM

**NPS 1/2 / DN 15 Body:** 8 pounds / 4 kg

**NPS 3/4 or 1 / DN 20 or 25 Body:** 20 pounds / 9 kg

**NPS 1-1/2 or 2 / DN 40 or 50 Body:** 73 pounds / 33 kg

1. The pressure/temperature limits in this instruction manual or any applicable standard limitation should not be exceeded.

2. Temperature and/or the body end connection may decrease these maximum pressures.

3. Maximum inlet pressure equals set pressure plus buildup.

4. Pressure and/or the body end connection may decrease these maximum temperatures.

5. Not for use on steam service.

6. Not available for Type 98HM.

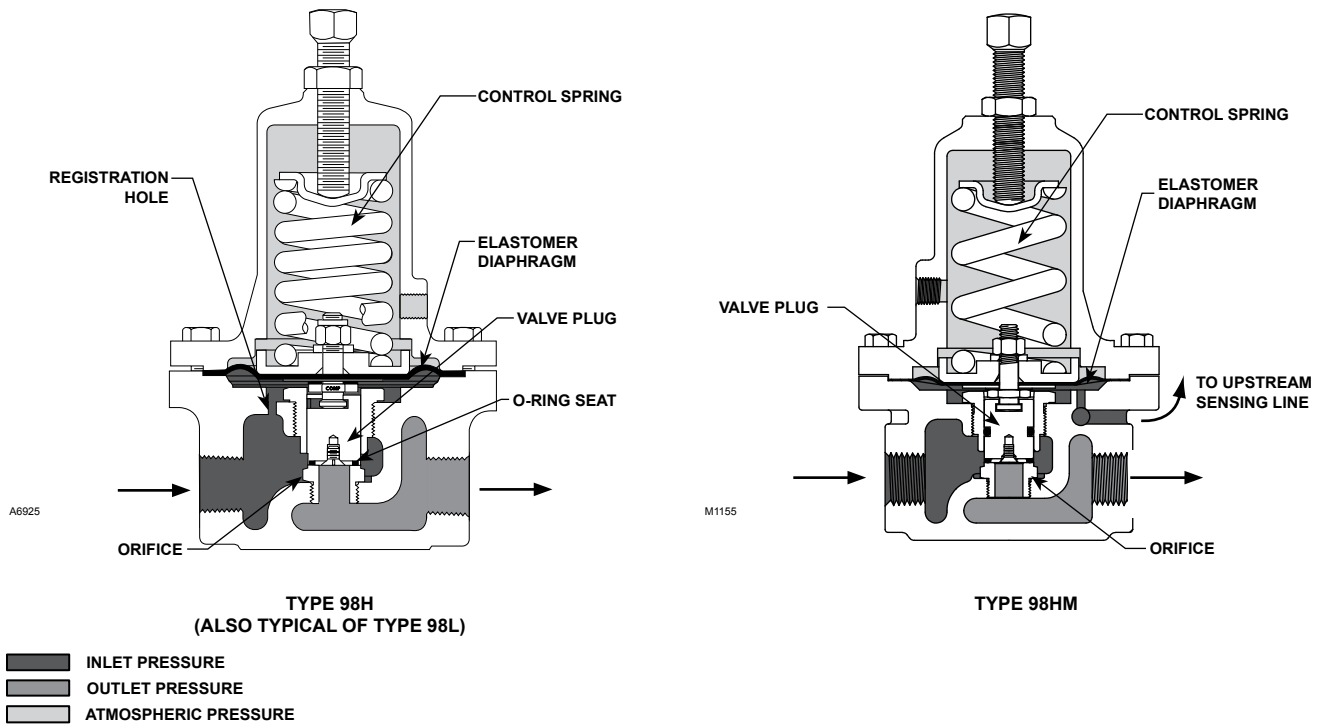


Figure 2. 98 Series Operational Schematics

The Type 98HM can be used for backpressure or relief applications in liquid, gas or steam service. The Type 98HM features a sensing line connection for sensing pressure externally from the regulator. The Type 98HM is a direct-operated, spring-to-close regulator and requires no external power to operate. A seal washer for the set screw can be included when applications require pressure loading of the spring case (not available on NPS 1-1/2 and 2 / DN 40 and 50 bodies).

#### Note

Using a Type 98HM as a relief valve does not exclude the installation of an ASME certified full flow relief valve as specified by local codes and regulations or system design.

## Principle of Operation

Relief or backpressure valves respond to changes in upstream pressure. Pressure changes register under the diaphragm (see Figure 2) through a registration hole in the valve body (through upstream sensing line connection for Type 98HM). When the pressure increases beyond the spring setting, the diaphragm pressure overcomes the spring compression. This causes the valve plug to move away from the orifice. The flow line through the valve is open and excess

pressure is vented. When upstream pressure drops back to normal, the valve resumes its closed position.

## Installation

### WARNING

Personal injury or system damage may result if this relief valve/backpressure regulator is installed where service conditions could exceed the limits given on the Specifications section or regulator nameplate. Installations should be adequately protected from physical damage.

Overpressuring any portion of this equipment may cause equipment damage, leaks in the relief valve/backpressure regulator, or personal injury due to bursting of pressure-containing parts. System operation within the limits shown in the Specifications section (page 2) does not eliminate the possibility of damage from external sources or debris in the pipeline. The relief valve/backpressure regulator should be inspected for damage regularly and after any overpressure condition.

# Types 98L and 98H

**Table 1. Types 98L and 98H Relief Set Pressure Ranges**

BODY SIZES		TYPE 98L RELIEF SET PRESSURE RANGE <sup>(1)</sup>		TYPE 98H RELIEF SET PRESSURE RANGE <sup>(1)</sup>		SPRING COLOR	SPRING PART NUMBER	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
NPS	DN	psig	bar	psig	bar			Inch	mm	Inch	mm
1/4	----	2 to 7	0.14 to 0.48	15 to 35	1.0 to 2.4	Yellow	1E392527022	0.148	3.76	2.00	50.8
		6 to 14	0.41 to 0.97	25 to 75	1.7 to 5.2	Green	1E392627012	0.170	4.32	2.00	50.8
		12 to 25	0.83 to 1.7	70 to 140	4.8 to 9.6	Red	1E392727142	0.207	5.26	1.93	49.0
		20 to 38	1.4 to 2.6	130 to 200	9.0 to 13.8	Blue	1L346127142	0.225	5.72	2.08	52.8
1/2	15	2 to 7	0.14 to 0.48	15 to 35	1.0 to 2.4	Yellow	1E395627022	0.207	5.26	2.50	63.5
		6 to 14	0.41 to 0.97	25 to 75	1.7 to 5.2	Green	1D7455T0012	0.234	5.94	1.02	25.9
		12 to 25	0.83 to 1.7	70 to 140	4.8 to 9.6	Red	1E395727192	0.281	7.14	2.44	62.0
		20 to 38	1.4 to 2.6	130 to 200	9.0 to 13.8	Blue	1L380027142	0.331	8.41	2.25	57.2
3/4 and 1	20 and 25	2 to 7	0.14 to 0.48	15 to 35	1.0 to 2.4	Yellow	1E398927022	0.306	7.77	4.00	102
		6 to 14	0.41 to 0.97	25 to 75	1.7 to 5.2	Green	1E399027142	0.343	8.71	4.00	102
		12 to 25	0.83 to 1.7	70 to 140	4.8 to 9.6	Red	1E399127162	0.406	10.3	4.00	102
		20 to 38	1.4 to 2.6	130 to 200	9.0 to 13.8	Blue	1L380127082	0.468	11.9	3.75	95.3
1-1/2 and 2	40 and 50	----	----	5 to 35	0.3 to 2.4	Dark Gray	1E792327092	0.468	11.9	6.56	167
		----	----	20 to 65	1.4 to 4.5	Light Blue	1E795327082	0.531	13.5	6.56	167
		----	----	50 to 100	3.5 to 6.9	Light Gray	1E795427082	0.562	14.2	6.56	167
		----	----	80 to 170	5.5 to 11.7	Black	1P788827082	0.625	15.9	6.56	167

1. All springs may be backed off to 0 psig / 0 bar. However, highest capacities and best performances are obtained by using these springs in their recommended ranges.

**Table 2. Type 98HM Relief Set Pressure Ranges**

SPRING MATERIAL	BODY SIZES		SPRING RANGE <sup>(1)</sup>		SPRING COLOR	SPRING PART NUMBER	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
	NPS	DN	psig	bar			Inch	mm	Inch	mm
Steel	1/2	15	15 to 35	1.0 to 2.4	Yellow	1E395627022	0.207	5.26	2.50	63.5
			25 to 75	1.7 to 5.2	Green	1D7455T0012	0.234	5.94	2.62	66.5
			70 to 140	4.8 to 9.6	Red	1E395727192	0.281	7.14	2.44	62.0
			130 to 200	9.0 to 13.8	Blue	1L380027142	0.331	8.41	2.25	57.2
	3/4 and 1	20 and 25	15 to 35	1.0 to 2.4	Yellow	1E398927022	0.306	7.77	4.00	102
			25 to 75	1.7 to 5.2	Green	1E399027142	0.343	8.71	4.00	102
			70 to 140	4.8 to 9.6	Red	1E399127162	0.406	10.3	4.00	102
			130 to 200	9.0 to 13.8	Blue	1L380127082	0.468	11.9	3.75	95.3
	1-1/2 and 2	40 and 50	5 to 35	0.34 to 2.4	Dark Gray	1E792327092	0.469	11.9	6.50	165
20 to 65			1.4 to 4.5	Light Blue	1E795327082	0.531	13.5	6.50	165	
50 to 100			3.5 to 6.9	Light Gray	1E795427082	0.563	14.3	6.50	165	
80 to 170			5.5 to 11.7	Black	1P788827082	0.656	16.7	6.50	165	
Stainless steel	1/2	15	15 to 100	1.0 to 6.9	Unpainted	14B9943X012	0.282	7.16	2.50	63.5
			100 to 275	6.9 to 19.0	Unpainted	14B9942X022	0.375	9.53	2.50	63.5
	3/4 and 1	20 and 25	15 to 100	1.0 to 6.9	Unpainted	14B9944X022	0.432	11.0	4.03	102
			100 to 275	6.9 to 19.0	Unpainted	14B9945X022	0.562	14.2	4.03	102

1. All springs may be backed off to 0 psig / 0 bar. However, highest capacities and best performances are obtained by using these springs in their recommended ranges.

**Table 3. Torque Specifications**

BODY SIZES		SPRING CASE		ORIFICE	
NPS	DN	FOOT-POUNDS	N•m	FOOT-POUNDS	N•m
1/4	----	4.5 to 5.0	6.1 to 6.8	8 to 12	11 to 16
1/2	15	10 to 13	14 to 18	29 to 35	39 to 47
3/4, 1	20, 25	24 to 30	33 to 41	33 to 42	45 to 57
1-1/2, 2	40, 50	40 to 50	54 to 68	140 to 170	190 to 230

Unbox and inspect the valve. Remove pipe scale and other foreign material from the connecting pipeline. Apply a suitable pipe compound to the external threads. The relief valve can be installed in any position as long as the flow is in the direction indicated by the arrow cast on the body.

**backpressure regulator, or personal injury due to bursting of pressure-containing parts. The system should be inspected after any overpressure condition.**

Relief or backpressure ranges are from 2 to 200 psig / 0.14 to 13.8 bar. The individual spring range of your relief valve is stamped on the nameplate.

Maximum inlet pressures depend upon body materials and temperatures. See the Specifications section for the maximum inlet pressure of the valve. The valve should be inspected for damage after any overpressure condition.

## Overpressure Protection



**Overpressuring any portion of this equipment may result in equipment damage, leaks in the relief valve /**

## Vents



### WARNING

**If using a Type 98L, 98H or 98HM Backpressure Regulator or Relief Valve on hazardous or flammable gas service, personal injury and property damage could occur due to fire or explosion of vented gas that may have accumulated.**

**To prevent such injury or damage, provide piping or tubing to vent the gas to a safe, well-ventilated area. Also, when venting a hazardous gas, the piping or tubing should be located far enough away from any buildings or windows so to not create a further hazard, and the vent opening should be protected against anything that could clog it.**

If remote venting is necessary, an optional tapped vent in the spring case is available. Install remote vent lines in the spring case and outlet openings. The vent lines must have the largest practical diameter and be as short as possible with a minimum number of bends or elbows.

## Startup

Key numbers are shown in Figures 3 through 5. With proper installation completed and system equipment properly adjusted, close any vent valves, and slowly open the upstream shutoff valve while using pressure gauges to monitor pressure.

If set pressure adjustment is necessary, monitor the inlet pressure with a gauge during the adjustment procedure.

## Adjustment

Each unit is factory set for the pressure specified on your order. The allowable spring range is stamped on the nameplate. If a pressure setting beyond the indicated range is required, replace with the appropriate spring. Be sure to label the valve to indicate the new pressure range.

Always use a pressure gauge to monitor pressure when making adjustments.

All regulator springs can be backed off to 0 psig / 0 bar. Recommended set pressure ranges available, maximum inlet pressures and temperatures, and color codes of the respective springs are shown in the Specifications section and Tables 1 and 2.

Loosen the jam nut (key 17). To increase the setting, turn the adjusting screw (key 15) clockwise. Turn the adjusting screw counterclockwise to decrease the setting. Tighten the jam nut.

## Shutdown

Close the upstream shutoff valve, and release all pressure from the backpressure regulator/relief valve.

## Maintenance



### WARNING

**To avoid personal injury and equipment damage, isolate the valve from all pressure. Cautiously release pressure from the valve before attempting disassembly.**

Due to normal wear and damage that may occur from external sources, relief valve parts such as the O-rings, gaskets, diaphragm, orifice and valve plug should be inspected periodically and replaced as necessary. The frequency of inspection and replacement depends upon the severity of service conditions or the requirements of state and federal laws.

Instructions are given below for disassembly of the Types 98L and 98H backpressure regulators/relief valves. These valves do not have to be removed from the pipeline to inspect internal parts. Suitable lubricants are indicated on the assembly drawings. Apply the lubricants as the relief valve is being reassembled. Refer to Figures 3, 4 and 5 while servicing the relief valve.



### CAUTION

**Metal diaphragms have thin sharp edges. To avoid hand cuts, use caution when handling the diaphragm and particularly the diaphragm edge.**

Type 98 relief valves contain or may contain a thin metal diaphragm. Use care when handling the metal diaphragms to prevent hand injuries or damage to the diaphragm.

1. Relieve the spring tension by loosening the jam nut (key 17) and turning the adjusting screw (key 15) counterclockwise. Remove the cap screws (key 16). Lift off the spring case (key 2), upper spring seat (key 9) and spring (key 11).
2. Lift out the diaphragm unit which includes the pusher post (key 6), lower spring seat (key 8), diaphragm

# Types 98L and 98H

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head (key 25, Type 98L), washer (key 7), valve plug (key 4) and diaphragm (key 12).

There will be two diaphragms if the diaphragm material is metal or fluorocarbon (FKM) except for Type 98L, NPS 1/4, 2 to 7 psi / 0.14 to 0.48 bar range which uses only one metal diaphragm.

For Type 98HM, two diaphragms are also required if material used is Ethylenepropylene (EPDM) except for NPS 3/4 or 1 / DN 20 or 25 which uses only one Ethylenepropylene (EPDM) diaphragm.

Refer to Figures 3, 4 and 5 for the diaphragm and gasket assembly.

3. Check the orifice (key 3). If it needs replacing or repairing, unscrew the valve plug guide (key 5) and then the orifice. The valve plug can be removed by sliding it off of the pusher post (key 6).

## Note

**If damage to elastomer or metal seating surfaces is severe, replace the orifice (key 3) and valve plug O-ring (key 22) with new parts. However, by following the lapping procedure below, it is possible to repair metal seating surfaces if they are only slightly worn or scratched.**

4. Lapping procedure:
  - a. Place a small amount of 500-grit silicon carbide or aluminum oxide lapping compound on a flat surface such as a piece of heavy plate glass.
  - b. Take the valve plug (key 4) or orifice (key 3) and move it in a figure 8 motion on the lapping compound. Do not allow the part to tip or rock since this would round the corners.
  - c. Repeat step b for each part, using an 800-grit or 1000-grit silicon carbide or aluminum oxide lapping compound.
  - d. Wash away all traces of the lapping compound. To help prevent scratching the seating surfaces, a light coat of oil may be applied before returning the valve plug and orifice to the body (key 1). See Table 3 for torque specifications.
5. Return the orifice and valve plug guide (key 5) to the body.
6. Place a small amount of sealant on the threads before installing the valve plug guide and the orifice. See Table 3 for torque specifications.
7. To replace the valve plug O-ring (key 22), remove the screw (key 24) and O-ring retainer (key 21) from the plug. Remove and replace the O-ring.

8. Separate the remainder of the diaphragm unit parts. Take the locknut (key 26) off of the pusher post (key 6). Slide off the lock washer (key 23), lower spring seat, diaphragm head (Type 98L), diaphragm, washer (key 7) and gasket (key 10).
9. Slip the plug (key 4) onto the pusher post. Place a gasket (key 10) on the shaft of the pusher post (key 6) over the threaded portion until it rests on the base of the post. If elastomer diaphragm is used, place a metal washer (key 7) on top of the gasket. For Type 98H, NPS 1-1/2 to 2 / DN 40 to 50) with metal diaphragm, place another gasket on the shaft of the pusher post until it rests on the bottom diaphragm head (key 25), see Figure 4. Refer to Figures 3 to 5.

## Note

**If a metal diaphragm is to be replaced by an elastomer diaphragm or an elastomer diaphragm by a metal diaphragm, a new pusher post is required. Each diaphragm material requires a different pusher post length and make sure the proper number of metal or elastomer diaphragm that will be used is followed. Refer to the Parts List section for the correct number of diaphragm to be used.**

10. For the metal diaphragms, replace the large diaphragm gasket (key 19) on the surface of the body (key 1) that will support the diaphragms. There will be two diaphragms used per regulator, except for Type 98L, NPS 1/4 with 2 to 7 psi / 0.14 to 0.48 bar set pressure range which uses only one metal diaphragm. The raised surfaces of the metal diaphragms should be placed in the unit so that they are facing toward the assembler (toward the spring) except only when one diaphragm is being used then the raised surface should be facing down (towards the body). See Figures 3 to 5 as references.
11. Slip the lower spring seat (key 8) and lock washer (key 23) back onto the pusher post. Screw on the locknut (key 26) and return the diaphragm unit to the body (key 1).
12. Set the spring (key 11) in the lower spring seat and place the upper spring seat (key 9) on the spring.
13. Put the spring case (key 2) over the spring and onto the body. Tighten the cap screws (key 16) finger tight only.
14. To ensure proper slack in the diaphragm, apply some spring compression by turning the adjusting screw clockwise. Finish tightening the cap screws.

# Types 98L and 98H

## Parts Ordering

When corresponding with your local Sales Office about this equipment, always reference the equipment serial number stamped on the nameplate.

When ordering replacement parts, specify the complete 11-character part number of each required part as found in the following parts list. Separate kits containing all recommended spare parts are available.

## Parts List

### Note

**In this parts list, parts marked NACE are intended for corrosion-resistant service as detailed in the NACE International standard MR0175-2003.**

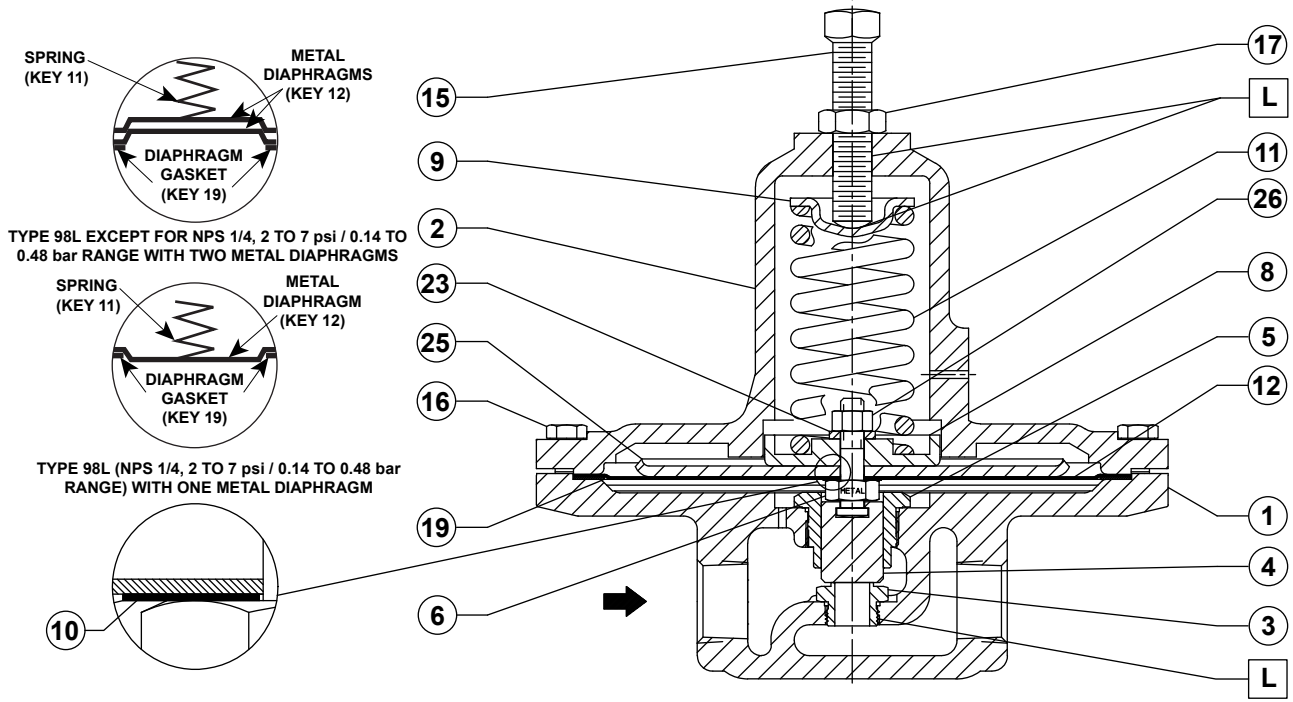
## Types 98L, 98H and 98HM (Figures 3, 4 and 5)

Key	Description	Part Number
	Type 98L	
	Parts Kits	
	Elastomer Trim (include keys 3, 4, 10, 12, 21, 22 and 24)	
	NPS 1/4	R98LX000012
	NPS 1/2 / DN 15 body	R98LX000022
	NPS 3/4 and 1 / DN 20 and 25 bodies	R98LX000032
	Metal Trim (include keys 3, 4, 10, 12 and 19)	
	NPS 1/4	R98LX000042
	NPS 1/2 / DN 15 body	R98LX000052
	NPS 3/4 and 1 / DN 20 and 25 bodies	R98LX000062
	Type 98H	
	Parts kit	
	Elastomer Trim (include keys 3, 4, 10, 12 and 14 (for NPS 1-1/2 and 2 / DN 40 and 50 only), 21, 22 and 24)	
	NPS 1/4 body	R98HX000012
	NPS 1/2 / DN 15 body	R98HX000022
	NPS 3/4 and 1 / DN 20 and 25 bodies	R98HX000032
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	R98HX000072
	Metal Trim (include keys 3, 4, 10, 12 and 19)	
	NPS 1/4 body	R98HX000042
	NPS 1/2 / DN 15 body	R98HX000052
	NPS 3/4 and 1 / DN 20 and 25 bodies	R98HX000062
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	R98HX000082
	Type 98HM	
	Parts Kits (include keys 3, 4, 10, 12, 19, 21, 22, 24 and 53)	
	416 Stainless steel trim	
	With Fluorocarbon (FKM) O-rings	R98HMX00012
	With Ethylenepropylene (EPDM) O-rings	R98HMXEPR12
	316 Stainless steel	
	With Fluorocarbon (FKM) O-rings	R98HMX00022
	With Ethylenepropylene (EPDM) O-rings	R98HMXEPR22
1	Body	See following table
2	Spring Case	
	Type 98H	
	Cast iron	
	Standard	
	NPS 1/4 body	2E391219012
	NPS 1/2 / DN 15 body	2J496219012
	NPS 3/4 and 1 / DN 20 and 25 bodies	3E397819012
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	-----

Key	Description	Part Number
2	Spring Case (continued)	
	Type 98H (continued)	
	Cast iron (continued)	
	Tapped	
	NPS 1/4 body	2L442919012
	NPS 1/2 / DN 15 body	-----
	NPS 3/4 and 1 / DN 20 and 25 bodies	3L460819012
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	4P784019012
	Steel	
	Standard	
	NPS 1/4 body	2J127522012
	NPS 1/2 / DN 15 body	2L416322012
	NPS 3/4 and 1 / DN 20 and 25 bodies	3E408722012
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	-----
	Tapped	
	NPS 1/4 body	2L443022012
	NPS 1/2 / DN 15 body	2L442022012
	NPS 3/4 and 1 / DN 20 and 25 bodies	3L460722012
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	3P790422012
	316 Stainless steel	
	Standard	
	NPS 1/4 body	2J1275X0012
	NPS 1/2 / DN 15 body	2L416333092
	NPS 3/4 and 1 / DN 20 and 25 bodies	3E4087X0012
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	-----
	Tapped	
	NPS 1/4 body	2L4430X0012
	NPS 1/2 / DN 15 body	2L4420X0012
	NPS 3/4 and 1 / DN 20 and 25 bodies	3L4607X0022
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	3P7904X0012
	Type 98L	
	Cast iron	
	Standard	
	NPS 1/4 body	2E391319012
	NPS 1/2 / DN 15 body	3J496319012
	NPS 3/4 and 1 / DN 20 and 25 bodies	4E397919012
	Tapped	
	NPS 1/4 body	-----
	NPS 1/2 / DN 15 body	3L442119012
	NPS 3/4 and 1 / DN 20 and 25 bodies	4L461019012
	Steel	
	Standard	
	NPS 1/4 body	2J127922012
	NPS 1/2 / DN 15 body	3L416122012
	NPS 3/4 and 1 / DN 20 and 25 bodies	4E592922012
	Tapped	
	NPS 1/4 body	-----
	NPS 1/2 / DN 15 body	3L442222012
	NPS 3/4 and 1 / DN 20 and 25 bodies	4L460922012
	316 Stainless steel	
	Standard	
	NPS 1/4 body	2J1279X0022
	NPS 1/2 / DN 15 body	3L4161X0022
	NPS 3/4 and 1 / DN 20 and 25 bodies	4E592933092
	Tapped	
	NPS 1/4 body	2L4428X0012
	NPS 1/2 / DN 15 body	3L4422X0012
	NPS 3/4 and 1 / DN 20 and 25 bodies	4L4609X0032
	Type 98HM	
	Steel	
	NPS 1/2 / DN 15 body	2L442022012
	NPS 3/4 and 1 / DN 20 and 25 bodies	3L460722012
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	3P790422012
	Stainless Steel	
	NPS 1/2 / DN 15 body	2L4420X0012
	NPS 3/4 and 1 / DN 20 and 25 bodies	3L4607X0022
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	3P7904X0012

\*Recommended spare part.

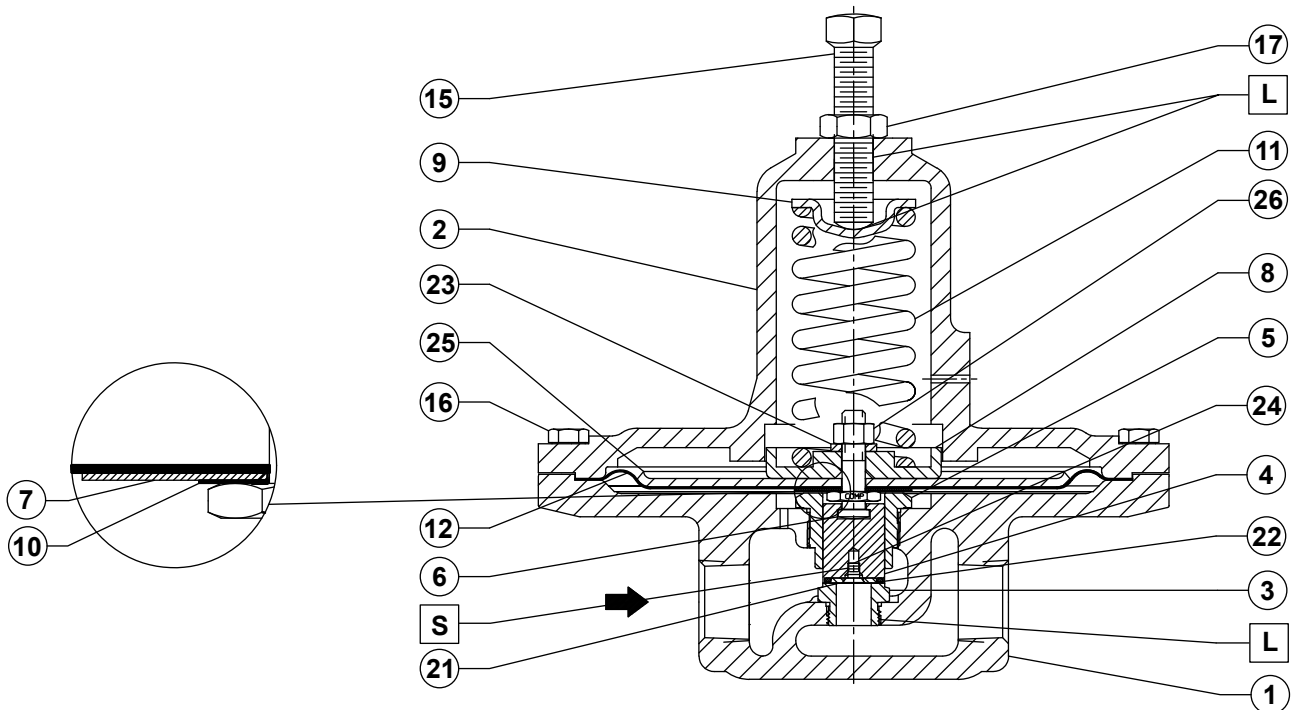
# Types 98L and 98H



30A7027

□ - APPLY LUBRICANT<sup>(1)</sup>  
L = ANTI-SEIZE COMPOUND

1. Lubricants must be selected such that they meet the temperature requirements.



30A7028

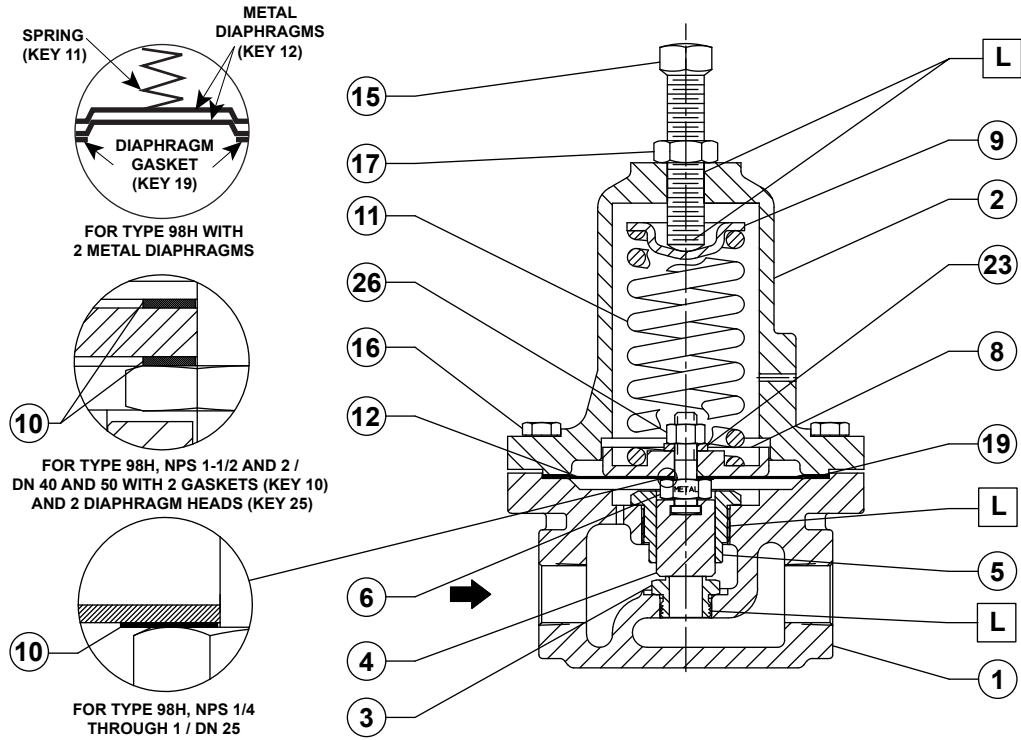
□ - APPLY LUBRICANT OR SEALANT<sup>(1)</sup>  
L = ANTI-SEIZE COMPOUND  
S = MULTI-PURPOSE PTFE THREAD SEALANT

1. Lubricants and sealants must be selected such that they meet the temperature requirements.

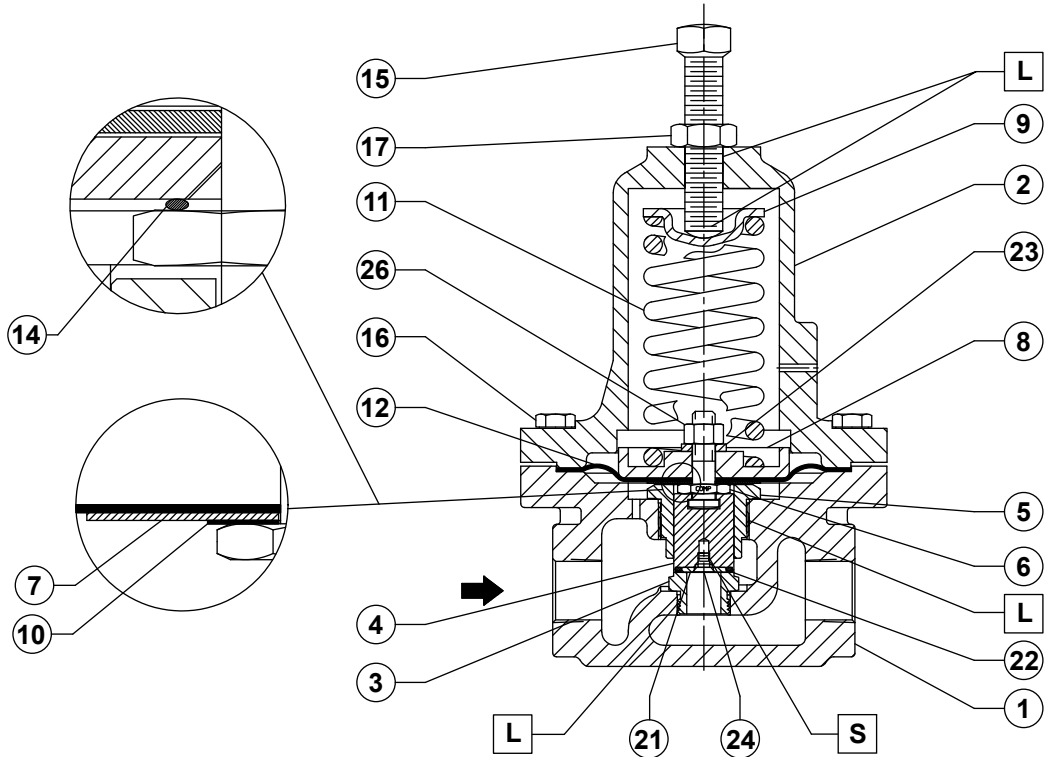
Figure 3. Type 98L Relief Valve Assemblies



# Types 98L and 98H



TYPE 98H ASSEMBLY WITH METAL DIAPHRAGM



TYPE 98H ASSEMBLY WITH ELASTOMER DIAPHRAGM

30A7030

□ - APPLY LUBRICANT OR SEALANT<sup>(1)</sup>

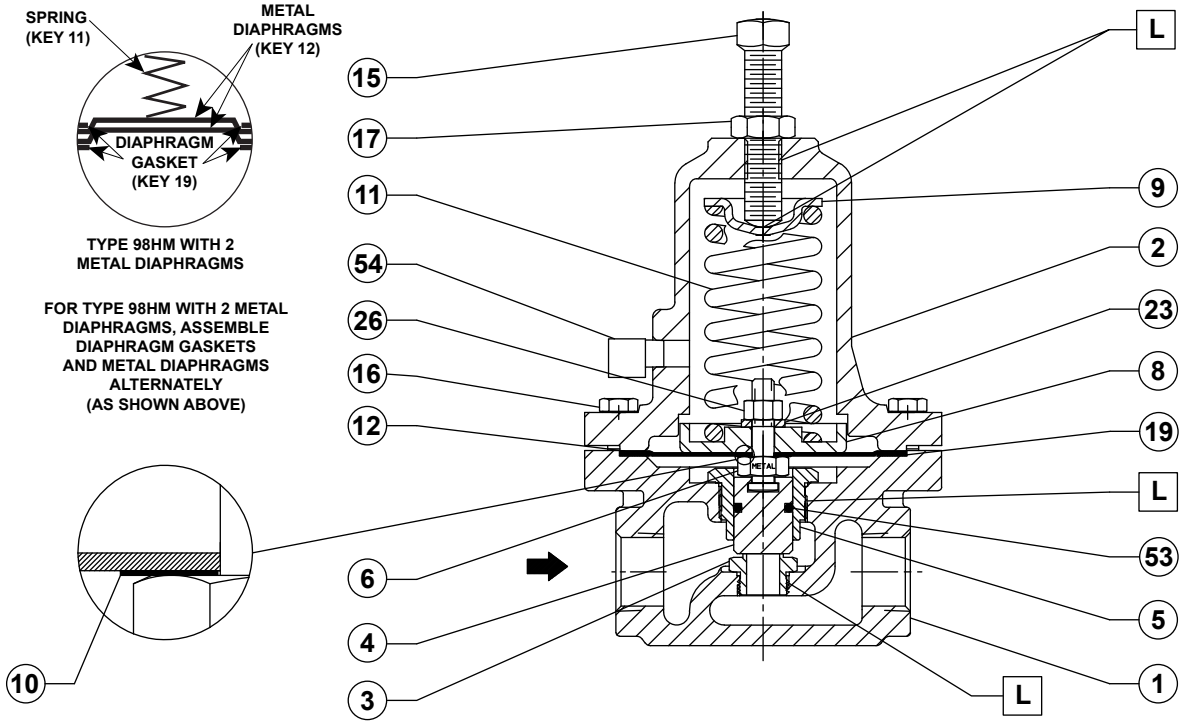
L = ANTI-SEIZE COMPOUND

S = MULTI-PURPOSE PTFE THREAD SEALANT

1. Lubricants and sealants must be selected such that they meet the temperature requirements.

Figure 4. Type 98H Relief Valve Assemblies

# Types 98L and 98H



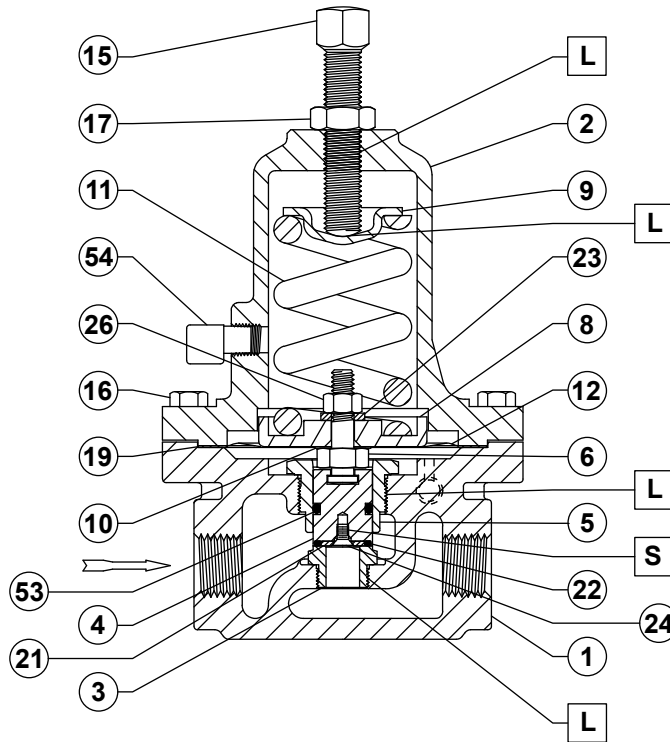
TYPE 98HM ASSEMBLY WITH METAL SEAT AND DIAPHRAGM

37B4753

□ - APPLY LUBRICANT<sup>(1)</sup>

L = ANTI-SEIZE COMPOUND

1. Lubricants must be selected such that they meet the temperature requirements.



TYPE 98HM ASSEMBLY WITH ELASTOMER SEAT AND METAL DIAPHRAGM

37B4754

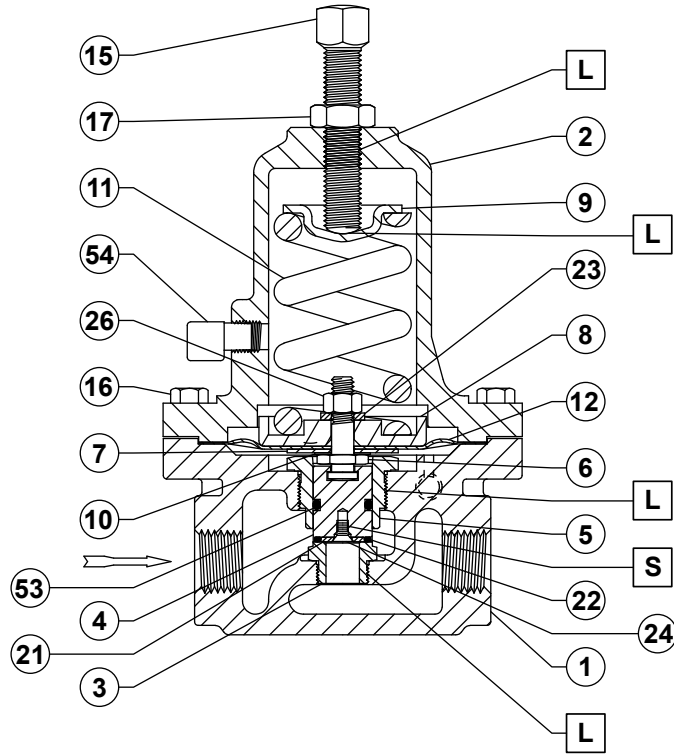
□ - APPLY LUBRICANT OR SEALANT<sup>(1)</sup>

L = ANTI-SEIZE COMPOUND

S = MULTI-PURPOSE PTFE THREAD SEALANT

1. Lubricants and sealants must be selected such that they meet the temperature requirements.

Figure 5. Type 98HM Relief Valve Assemblies



**TYPE 98HM WITH ELASTOMER SEAT AND DIAPHRAGM**

39B3360

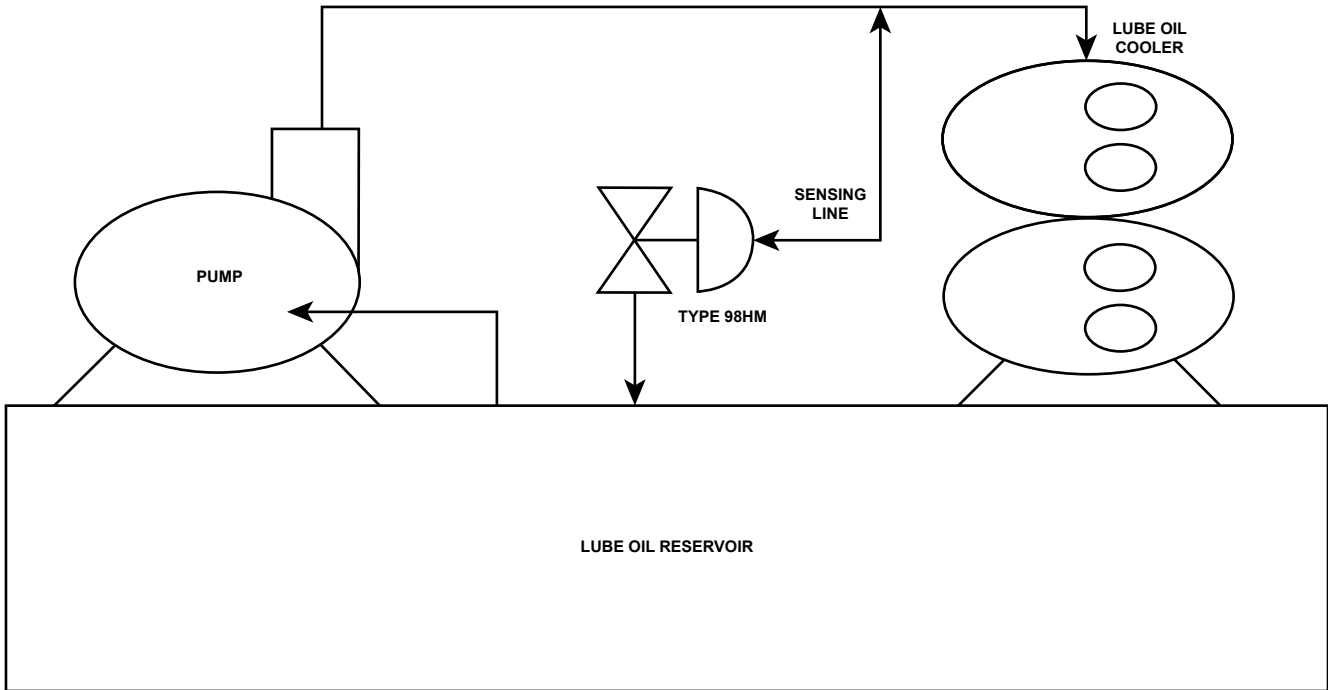
□ - APPLY LUBRICANT OR SEALANT<sup>(1)</sup>

L = ANTI-SEIZE COMPOUND

S = MULTI-PURPOSE PTFE THREAD SEALANT

1. Lubricants and sealants must be selected such that they meet the temperature requirements.

**Figure 5. Type 98HM Relief Valve Assemblies (continued)**



**Figure 6. Type 98HM Used in a Typical Bypass Application**

# Types 98L and 98H

Key	Description	Part Number	Key	Description	Part Number
3*	Orifice	See following table	10*	Gasket (continued)	
4*	Valve Plug	See following table		Type 98HM	
5	Valve Plug Guide			Graphite	
	Types 98L and 98H			NPS 1/2 / DN 15 body	1L3411X0012
	416 Stainless steel			NPS 3/4 and 1 / DN 20 and 25 bodies	1L3434X0032
	NPS 1/4 body	1L345835132		Composition	
	NPS 1/2 / DN 15 body	1L341635132		NPS 1/2 / DN 15 body	1L341104022
	NPS 3/4 and 1 / DN 20 and 25 bodies	1L342935132		NPS 3/4 and 1 / DN 20 and 25 bodies	1L343404022
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	1P788535132		NPS 1-1/2 and 2 / DN 40 and 50	1P788004022
	316 Stainless steel		11	Relief Valve Spring	See Tables 1 and 2
	NPS 1/4 body, NACE	1L345835072	12*	Diaphragm	See following table
	NPS 1/2 / DN 15 body, NACE	1L3416X0102	13	Nameplate, (not shown)	-----
	NPS 3/4 and 1 / DN 20 and 25 bodies, NACE	1L342935072	14*	O-ring, Type 98H only, NPS 1-1/2 and 2 / DN 40 and 50 bodies, Elastomer seat only	
	NPS 1-1/2 and 2 / DN 40 and 50 bodies, NACE	1P788535072		Nitrile (NBR)	1C782206992
	Type 98HM			Fluorocarbon (FKM)	1K756106382
	NPS 1/2 / DN 15 body			Fluorocarbon, NACE	1K756135072
	Metal Seat and Metal Diaphragm		15	Adjusting Screw, Steel plated	
	416 Stainless steel	1L341635132		NPS 1/4 body, <b>(standard)</b>	1C216032992
	316 Stainless steel	1L3416X0102		NPS 1/2 / DN 15 body, <b>(standard)</b>	1D995448702
	Elastomer Seat and Metal Diaphragm			NPS 1/2 / DN 15 body, For Handwheel	1J496428982
	416 Stainless steel	1L341635132		NPS 1/2 / DN 15 body, Type 98HM only (SST Spring)	1D9954X0032
	316 Stainless steel	1L3416X0102		NPS 3/4 and 1 / DN 20 and 25 bodies, <b>(standard)</b>	1A330828982
	Elastomer Seat and Elastomer Diaphragm			NPS 3/4 and 1 / DN 20 and 25 bodies, Type 98HM only (SST Spring)	1A3308X0092
	416 Stainless steel	1L341635032		NPS 1-1/2 and 2 / DN 40 and 50 bodies, <b>(standard)</b>	1A680128992
	316 Stainless steel	1L3416X0102	16	Cap Screw	
	NPS 3/4 and 1 / DN 20 and 25 bodies			Zinc-plated steel	
	416 Stainless steel	18B5256X012		Type 98L	
	316 Stainless steel	18B5256X022		NPS 1/4 body (10 required)	1A407824052
	NPS 1-1/2 and 2 / DN 40 and 50 bodies			NPS 1/2 / DN 15 body (10 required)	1A381624052
	416 Stainless steel	18B3529X012		NPS 3/4 and 1 / DN 20 and 25 bodies (12 required)	1A336924052
	316 Stainless steel	18B3529X022		Types 98H and 98HM	
6	Pusher Post	See following table		NPS 1/4 body	
7	Washer (Elastomer diaphragm only)			(not available to Type 98HM) (6 required)	1A391724052
	416 Stainless steel trim			NPS 1/2 / DN 15 body (8 required)	1A352624052
	NPS 1/4 body	1L344736012		NPS 3/4 and 1 / DN 20 and 25 bodies (8 required)	1A341824052
	NPS 1/2 / DN 15 body	1L339836012		NPS 1-1/2 and 2 / DN 40 and 50 bodies (8 required)	1K568428982
	NPS 3/4 and 1 / DN 20 and 25 bodies	1L342836012	16	Cap Screw (continued)	
	316 Stainless steel trim			Stainless alloy	
	NPS 1/4 body, Standard	1L344736142		Type 98L	
	NPS 1/4 body, NACE	1L3447X0012		NPS 1/4 body (10 required)	1A4078X0102
	NPS 1/2 / DN 15 body, Standard	1L339835072		NPS 1/2 / DN 15 body (10 required)	1A3816X0152
	NPS 1/2 / DN 15 body, NACE	1L339840032		NPS 3/4 and 1 / DN 20 and 25 bodies (12 required)	1A3369X0112
	NPS 3/4 and 1 / DN 20 and 25 bodies, Standard	1L342836142		Type 98H	
	NPS 3/4 and 1 / DN 20 and 25 bodies, NACE	1L3428X0022		NPS 1/4 body (6 required)	1A3917X0062
8	Lower Spring Seat			NPS 1/2 / DN 15 body (8 required)	1A3526X0142
	NPS 1/4 body, Aluminum	1L344609012		NPS 3/4 and 1 / DN 20 and 25 bodies (8 required)	1A3418X0332
	NPS 1/2 / DN 15 body, Aluminum	1L339708012		NPS 1-1/2 and 2 / DN 40 and 50 bodies (8 required)	1K5684X0032
	NPS 1/2 / DN 15 body, Plated Steel			Type 98HM	
	(For Type 98HM only with Stainless steel Spring)	17B4480X012		For Steel Springs	
	NPS 3/4 and 1 / DN 20 and 25 bodies, Aluminum	1L342708012		NPS 1/2 / DN 15 body (8 required)	1A352624052
	NPS 3/4 and 1 / DN 20 and 25 bodies, Plated Steel			NPS 3/4 and 1 / DN 20 and 25 (8 required) bodies	1A341824052
	(For Type 98HM only with Stainless steel Spring)	17B3088X022		NPS 1-1/2 and 2 / DN 40 and 50 (8 required) bodies	1K568428982
	NPS 1-1/2 and 2 / DN 40 and 50 bodies, Steel plated	1P787724152		For Stainless Springs	
9	Upper Spring Seat, Steel plated			NPS 1/2 / DN 15 body (8 required)	1A3526X0142
	NPS 1/4 body	1B798525062		NPS 3/4 and 1 / DN 20 and 25 (8 required) bodies	1A3418X0332
	NPS 1/2 / DN 15 body	1D667125072		NPS 1-1/2 and 2 / DN 40 and 50 (8 required) bodies	1K568428982
	NPS 1/2 / DN 15 body (For Type 98HM only with SST Spring)	14B9951X012		For Steel Springs	
	NPS 3/4 and 1 / DN 20 and 25 bodies	1E398725072		NPS 1/2 / DN 15 body (8 required)	1A3526X0142
	NPS 3/4 and 1 / DN 20 and 25 bodies (For Type 98HM only with SST Spring)	14B9952X012		NPS 3/4 and 1 / DN 20 and 25 (8 required) bodies	1A3418X0332
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	1P787624092		NPS 1-1/2 and 2 / DN 40 and 50 bodies (8 required) bodies	1A3418X0332
10*	Gasket		17	Jam Nut, Zinc-plated steel	
	Types 95L and 95H, Composition			NPS 1/4 body	1A352224122
	NPS 1/4 body	1L344804022		NPS 1/2 / DN 15 body	1A353724122
	NPS 1/2 / DN 15 body	1L341104022		NPS 1/2 / DN 15 body, (For Type 98HM only with SST Spring)	T1208635442
	NPS 3/4 and 1 / DN 20 and 25 bodies	1L343404022		NPS 3/4 and 1 / DN 20 and 25 bodies	1A319224122
	NPS 1-1/2 and 2 / DN 40 and 50 bodies (2 required, for Type 98H only)	1P788004022		NPS 3/4 and 1 / DN 20 and 25 bodies, (For Type 98HM only with SST Spring)	1A3192K0012
				NPS 1-1/2 and 2 / DN 40 and 50 bodies	1A368124112

\*Recommended spare part.

# Types 98L and 98H

Key	Description	Part Number	Key	Description	Part Number
18	Drive Screw (not shown) (2 required)	1A368228982	22*	O-ring (continued)	
19*	Diaphragm Gasket, Composition (use with 302 Stainless steel diaphragm)			Type 98HM, Elastomer Seat Only (continued)	
	Type 98H			NPS 1-1/2 and 2 / DN 40 and 50 bodies	
	NPS 1/4 body	1E393104022		Nitrile (NBR)	1P787403202
	NPS 1/2 / DN 15 body	1E396104022		Fluorocarbon (FKM)	1P787406382
	NPS 3/4 and 1 / DN 20 and 25 bodies	1E399304022		Ethylene propylene (EPDM)	1P7874X0032
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	1P787904022		Perfluoroelastomer (FFKM)	1P7874X0022
	Type 98L		22	L-ring, Type 98H only, Elastomer seat only,	
	NPS 1/4 body	1E394004022		NPS 1-1/2 and 2 / DN 40 and 50 bodies	
	NPS 1/2 / DN 15 body	1E397004022		Nitrile (NBR)	1P787403202
	NPS 3/4 and 1 / DN 20 and 25 bodies	1E390404022		Fluorocarbon (FKM)	1P787406382
	Type 98HM		23	Lock Washer, Steel	
	Composition (2 required)			NPS 1/4 and 1/2 / DN 15 bodies	1C225628982
	NPS 1/2 / DN 15 body	1E396104022		NPS 3/4 and 1 / DN 20 and 25 bodies	1H624328992
	NPS 3/4 and 1 / DN 20 and 25 bodies	1E399304022		NPS 1-1/2 and 2 / DN 40 and 50 bodies	1A487828992
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	1P787904022	24	Machine Screw, Stainless steel,	
	Graphite (2 required)			Elastomer seat only	
	NPS 1/2 / DN 15 body	1E3961X0012		NPS 1/4 body, NACE	1L346238992
	NPS 3/4 and 1 / DN 20 and 25 bodies	1E3993X0012		NPS 1/2 / DN 15 body, NACE	1J4159X0012
20	Diaphragm Protector, PTFE (not shown)			NPS 3/4 and 1 / DN 20 and 25 bodies	1L343538992
	Type 98L			NPS 3/4 and 1 / DN 20 and 25 bodies, NACE	1L3435X0012
	NPS 1/4 body	11A5132X012		NPS 1-1/2 and 2 / DN 40 and 50 bodies, NACE	1P788638992
	NPS 1/2 / DN 15 body	11A5133X012	25	Diaphragm Head	
	NPS 3/4 and 1 / DN 20 and 25 bodies	11A5134X012		Type 98L, Steel plated	
	Type 98H			NPS 1/4 body	1L345525072
	NPS 1/4 body	11A5135X012		NPS 1/2 / DN 15 body	1L339625072
	NPS 1/2 / DN 15 body	11A5136X012		NPS 3/4 and 1 / DN 20 and 25 bodies	1L342125072
	NPS 3/4 and 1 / DN 20 and 25 bodies	11A5137X012		Type 98H, NPS 1-1/2 and 2 / DN 40 and 50 bodies	
	NPS 1-1/2 to 2 / DN 40 and 50 bodies	11A5527X012		Metal Seat with	
	Type 98HM			416 Stainless steel Trim,	
	NPS 1/2 / DN 15 body	11A5136X012		Steel/316 Stainless steel	
	NPS 3/4 and 1 / DN 20 and 25 bodies	11A5137X012		(1 of each required)	1P788225012/1P788235072
21	O-ring Retainer (Elastomer seat only)			316 Stainless steel Trim,	
	NPS 1/4 body			316 Stainless steel (2 required)	1P788235072
	416 Stainless steel	1L346035132		Steel/316 Stainless steel	
	316 Stainless steel, NACE	1L346035072		(1 of each required)	1P788225012/1P788235072
	NPS 1/2 (DN 15) body			Elastomer Seat with	
	416 Stainless steel	1L341535232		416 Stainless steel Trim, Steel (2 required)	1P788225012
	316 Stainless steel, NACE	1L341535072		316 Stainless steel Trim,	
	NPS 3/4 and 1 (DN 20 and 25) bodies			316 Stainless steel (2 required)	1P788235072
	416 Stainless steel	1L343035132		Type 98HM, NPS 1-1/2 and 2 /	
	316 Stainless steel, NACE	1L343035072		DN 40 and 50 bodies (2 required)	1P788235072
	NPS 1-1/2 and 2 (DN 40 and 50) bodies		26	Locknut, Steel plated	
	416 Stainless steel	1P787535132		NPS 1/4 and 1/2 / DN 15 bodies	1L872324122
	316 Stainless steel, NACE	1P787535072		NPS 3/4 and 1 / DN 20 and 25 bodies	1L872224122
22*	O-ring			NPS 1-1/2 and 2 / DN 40 and 50 bodies	1P788724122
	Types 98L and 98H, Elastomer seat only		27	Tee Handle Assembly (not shown),	
	NPS 1/4 body			Types 98L and 98H only	
	Nitrile (NBR)	1C853806992		NPS 1/4	1F2236000A2
	Fluorocarbon (FKM)	1C8538X0052		NPS 3/4 and 1 / DN 20 and 25	1F2238000A2
	NPS 1/2 / DN 15 body		28	Handwheel (not shown), Zinc, NPS 1/2 / DN 15	
	Nitrile (NBR)	1D288806992		Types 98L and 98H bodies only	1J496144012
	Fluorocarbon (FKM)	1N530106382	29	Machine Screw (not shown), Steel plated,	
	Ethylene propylene (EPDM)	1D2888X0042		NPS 1/2 / DN 15 body (with handwheel only)	16A5763X012
	NPS 3/4 and 1 / DN 20 and 25 bodies		30	Lockwasher (not shown), Steel,	
	Nitrile (NBR)	1C782106992		NPS 1/2 / DN 15 body (with handwheel only)	1A352332992
	Fluorocarbon (FKM)	1C7821X0072	45*	O-ring (not shown)	
22*	O-ring			Types 98L and 98H	
	Type 98HM, Elastomer Seat Only			(with sealed adjusting screw only)	1E547706992
	NPS 1/2 / DN 15 body		50	Sealing Washer (not shown)	
	Nitrile (NBR)	1D288806992		Types 98L and 98H	
	Fluorocarbon (FKM)	1N530106382		NPS 1/2 / DN 15	1V205699012
	Ethylene propylene (EPDM)	1N5301X0022		NPS 3/4 and 1 / DN 20 and 25	11A9681X012
	Perfluoroelastomer (FFKM)	1N5301X0012		Type 98HM	
	Type 98HM, Elastomer Seat Only			NPS 1/2 / DN 15	1V2056X0022
	NPS 3/4 and 1 / DN 20 and 25 bodies			NPS 3/4 and 1 / DN 20 and 25	11A9681X022
	Nitrile (NBR)	1C7821X0062			
	Fluorocarbon (FKM)	1C7821X0072			
	Ethylene propylene (EPDM)	1C7821X0032			
	Perfluoroelastomer (FFKM)	1C7821X0052			

\*Recommended spare part.

# Types 98L and 98H

Key 1 Types 98L and 98H Regulator Body, NPT

BODY SIZE		TYPE 98H			TYPE 98L		
NPS	DN	Cast Iron	Steel	316 Stainless Steel	Cast Iron	Steel	316 Stainless Steel
1/4	----	1L346419012	1L372122012	1L372133092	1L346519012	1L372322012	1L372333092
1/2	15	2L339519012	2L368722012	2L368733092	2L339219012	2L368922012	2L368933092
3/4	20	2L342519012	2L373422012	2L373433092	2L341919012	2L318222012	2L318233092
1	25	2L342619012	2L373522012	2L373533092	2L342019012	2L318322012	2L318333092
1-1/2	40	3P786819012	3P786822012	3P786833092	----	----	----
2	50	3P786719012	3P786722012	3P786733092	----	----	----

Key 1 Type 98HM Regulator Body, NPT

BODY SIZE		TYPE 98HM	
NPS	DN	Steel	316 Stainless Steel
1/2	15	37B3472X012	37B3472X022
3/4	20	48B5252X012	48B5252X022
1	25	48B6241X012	48B6241X022
1-1/2	40	38B3526X012	38B3526X022
2	50	38B3526X032	38B3526X042

Key 1 Types 98L and 98H Regulator Body, CL150 and CL300 RF Flanges

BODY SIZE		TYPE 98H BODY MATERIAL				TYPE 98L BODY MATERIAL			
		Steel		Stainless Steel		Steel		Stainless Steel	
NPS	DN	CL150 RF	CL300 RF	CL150 RF	CL300 RF	CL150 RF	CL300 RF	CL150 RF	CL300 RF
1/2	15	1V5178X0012	20A4987X0A2	1V5178X0022	20A4987X012	25A9930X022	20A4701X012	25A9930X012	20A4701X022
3/4	20	15A6098X022	23B9543X022	15A6098X012	23B9543X012	2V4264X0022	14B2317X012	2V4264X0012	14B2317X022
1	25	2V3805X0012	2U8048X0012	2V3805X00B2	2U8048X0022	2V3641X0022	2U8047X0012	2V3641X0012	2U8047X0062
1-1/2	40	21B0804X012	1V4541X0012	21B0804X022	1V4541X0022	----	----	----	----
2	50	10A0192X012	10A4986X012	10A0192X022	10A4986X052	----	----	----	----

Key 1 Types 98L and 98H Regulator Body, Socket Weld

BODY SIZE		TYPE 98H BODY MATERIAL		TYPE 98L BODY MATERIAL	
NPS	DN	Steel	Stainless Steel	Steel	Stainless Steel
1/2	15	2L9673X0022	2L9673X0012	2U8059X0012	2U8059X0022
3/4	20	2N443922012	2N4439X0012	2N4463X0012	2N4463X0022
1	25	2N414422012	2N4144X0012	2N445222012	2N4452X0012
1-1/2	40	3V4542X0012	3V4542X0022	----	----
2	50	30A0191X012	30A0191X032	----	----

Key 1 Types 98L and 98H Regulator Body, PN 16/25/40 RF Flanged Bodies

BODY SIZE		TYPE 98H BODY MATERIAL		TYPE 98L BODY MATERIAL	
NPS	DN	Steel	316 Stainless Steel	Steel	316 Stainless Steel
1/2	15	14B2236X012	14B2236X022	24B1959X012	24B1959X022
3/4	20	14B2236X032	14B2236X042	14B2237X012	14B2237X022
1	25	14B2236X052	14B2236X062	14B2237X032	14B2237X042
1-1/2	40	14B2236X072	14B2236X082	----	----
2	50	14B1513X012	14B1513X022	----	----

\*Recommended spare part.

# Types 98L and 98H

## Key 3\* Orifice

BODY SIZE		METAL TO METAL SEAT		ELASTOMER SEAT		
NPS	DN	416 Stainless Steel	316 Stainless Steel	Standard Applications		NACE Applications
				416 Stainless Steel	316 Stainless Steel	
1/4	----	1E391646172	1E391635072	1L345935132	1L345935072	1L345935072
1/2	15	1E395046172	1E395035072	1L341735132	1L341735072	1L341735072
3/4, 1	20, 25	1E398046172	1E398035072	1L343135132	1L343135072	1L343135072
1-1/2, 2	40, 50	2P787046172	2P787035072	1P787135132	1P787135072	1P787135072

## Key 4\* Types 98L and 98H Valve Plug

BODY SIZES		METAL TO METAL SEAT		ELASTOMER SEAT		
NPS	DN	416 Stainless Steel	316 Stainless Steel	Standard Applications		NACE Applications
				416 Stainless Steel	316 Stainless Steel	
1/4	----	1L345246172	1L345235072	1L345135132	1L345135072	1L345135072
1/2	15	1L344146172	1L344135162	1L344335132	1L344335072	1L344335072
3/4, 1	20, 25	1L343746172	1L343735162	1L343635132	1L343635072	1L343635072
1-1/2, 2	40, 50	1P787246172	1P787235072	1P787346172	1P787335072	1P787335072

## Key 4\* Type 98HM Valve Plug

BODY SIZE		METAL SEAT AND METAL DIAPHRAGM		ELASTOMER SEAT AND METAL DIAPHRAGM		ELASTOMER SEAT AND ELASTOMER DIAPHRAGM	
NPS	DN	416 Stainless Steel	316 Stainless Steel	416 Stainless Steel	316 Stainless Steel	416 Stainless steel	316 Stainless Steel
1/2	15	17B3475X012	17B3475X022	17B3474X032	17B3474X012	17B3474X032	17B3474X012
3/4, 1	20, 25	18B5255X012	18B5255X022	18B5254X012	18B5254X022	18B5254X012	18B5254X022
1/2, 2	40, 50	18B3528X012	18B3528X022	18B3530X012	18B3530X022	18B3530X012	18B3530X022

## Key 6 Pusher Post

BODY SIZE		METAL TO METAL SEAT		ELASTOMER SEAT		
NPS	DN	416 Stainless Steel	316 Stainless Steel	Standard Applications		NACE Applications
				416 Stainless Steel	316 Stainless Steel	
1/4	----	1L345735132	1L345735072	1L345635132	1L345635072	1L345635072
1/2	15	1L344535132	1L344535072	1L344235132	1L344235072	1L344235072
3/4, 1	20, 25	1L343935132	1L343935072	1L343835132	1L343835072	1L343835072
1-1/2, 2	40, 50	1P788335132	1P788335072	1P788435132	1P788435072	1P788435072

## Key 12\* Diaphragm

TYPE	BODY SIZES		DIAPHRAGM MATERIAL				
	NPS	DN	Neoprene (CR)	Neoprene (CR) with PTFE Protector	Fluorocarbon (FKM) (2 required)	Ethylenepropylene (EPDM) <sup>(3)</sup>	302 Stainless Steel (2 required)
98L	1/4	----	1L345302112	----	1L345302402	----	1L345436012 <sup>(4)</sup>
	1/2	15	1L341302112	----	1L341302402	----	1L341436012
	3/4, 1	20, 25	1L342302112	----	1L342302402	----	1L342236012
98H	1/4	----	1L344902112	1K344902112	1L344902402	----	1L345036012
	1/2	15	1L341202112	----	1L341202402	1L3412X0032 <sup>(1)</sup>	1L339936012
98H and 98HM	3/4, 1	20, 25	1L343302112	----	1L3433X0032	1L3433X0062	1L343236012
	1-1/2, 2	40, 50	1P788102192	----	11A1347X012	1P7881X0022 <sup>(2)</sup>	1P787836012

1. 1 required for Type 98H and 2 for Type 98HM.

2. 2 required.

3. Available to NPS 1/2 / DN 15 Type 98H and all sizes Type 98HM. Please consult your local Sales Office for Ethylenepropylene (EPDM) option on other sizes.

4. Only 1 metal diaphragm is required for Type 98L, NPS 1/4, 2 to 7 psi / 0.14 to 0.48 bar; 2 metal diaphragms for other ranges.

\*Recommended spare part.

# Types 98L and 98H

Key	Description	Part Number	Key	Description	Part Number
51	NACE Tag (not shown)	-----	53	O-ring (for Type 98HM only) (continued)	
52	Tag Wire (not shown), NACE	-----		Fluorocarbon (FKM)	
53	O-ring (for Type 98HM only)			NPS 1/2 / DN 15 body	1R620106382
	Nitrile (NBR)			NPS 3/4 and 1 / DN 20 and 25 bodies	1D237506382
	(not available with Metal Diaphragms)			NPS 1-1/2 and 2 / DN 40 and 50 bodies	1D2620X0032
	NPS 1/2 / DN 15 body	1H292406992		Perfluoroelastomer (FFKM)	
	NPS 3/4 and 1 / DN 20 and 25 bodies	1D2375X0022		(not available with Composition Diaphragms)	
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	1D262006992		NPS 1/2 / DN 15 body	1V8029X0022
	Ethylene Propylene (EPDM)			NPS 3/4 and 1 / DN 20 and 25 bodies	1D2375X0052
	NPS 1/2 / DN 15 body	1V8029X0012		NPS 1-1/2 and 2 / DN 40 and 50 bodies	1D2620X0082
	NPS 3/4 and 1 / DN 20 and 25 bodies	1D2375X0042	54	Type Y602-12 (shown in the	
	NPS 1-1/2 and 2 / DN 40 and 50 bodies	1D2620X0052		98HM Series assemblies)	27A5516X012

\*Recommended spare part.

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