

## Introduction

This installation guide provides instructions for installation, startup and adjustment. To receive a copy of the instruction manual, contact your local Sales Office or view a copy at [www.fisher.com](http://www.fisher.com). For further information refer to: 133 Series Instruction Manual, D100270X012.

## PED/PE(S)R Categories

This product may be used as a safety accessory with pressure equipment in the following categories. It may also be used outside of these Directives using Sound Engineering Practice (SEP) per table below. For information on the current PED/PE(S)R revision, see Bulletin: [D103053X012](#).

PRODUCT SIZE	CATEGORIES	FLUID TYPE
DN 50 / NPS 2	1	1

## Specifications

### Available Constructions

**Type 133H:** High pressure construction for outlet pressure range of 0.10 to 0.69 bar / 1.5 to 10 psig. The Type 133H can also use the 5 mbar to 0.14 bar / 2 in. w.c. to 2 psig springs of the Type 133L. The maximum operating inlet pressure is 4.1 bar / 60 psig with a maximum emergency inlet pressure of 8.6 bar / 125 psig.

**Type 133HP:** Extra high pressure construction for outlet pressure range of 0.14 to 4.1 bar / 2 to 60 psig. The maximum operating inlet pressure rating of 10.3 bar / 150 psig with a maximum emergency inlet pressure of 10.3 bar / 150 psig.

**Type 133L:** Low pressure construction for outlet pressure range of 5 mbar to 0.14 bar / 2 in. w.c. to 2 psig. The maximum operating inlet pressure is 4.1 bar / 60 psig with a maximum emergency inlet pressure of 8.6 bar / 125 psig.

**Type 133Z:** Zero gravity governor construction for outlet pressure range of -2 to 10 mbar / -1 to 4 in. w.c. The maximum operating inlet pressure is 1.4 bar / 20 psig with a maximum emergency inlet pressure of 8.6 bar / 125 psig.

### Body Size and End Connection Styles

BODY SIZE		BODY MATERIAL	
DN	In.	Cast Iron Body	WCC Steel Body
50	2	NPT or CL125 FF Flanged	NPT or CL150 RF Flanged

### Outlet Pressure Ranges<sup>(1)</sup>

See Table 1

### Maximum Inlet and Outlet Pressures<sup>(1)</sup>

See Table 2

### Proof Test Pressure

All Pressure Retaining Components have been proof tested per Directive

### Temperature Capabilities<sup>(1)</sup>

-29 to 66°C / -20 to 150°F

### Control Line Connection

**Types 133H, 133L and 133Z:** 3/4 NPT (internal) connection will be positioned directly over body outlet (standard position) or 90 degrees right or left of standard position if specified

**Type 133HP:** 1/4 NPT (internal) connection positioned directly over body outlet

## Installation

### WARNING

**Only qualified personnel should install or service a regulator. Regulators should be installed, operated and maintained in accordance with international and applicable codes and regulations and Emerson Process Management Regulator Technologies, Inc. instructions.**

**If the regulator vents fluid or a leak develops in the system, it indicates that service is required. Failure to take the regulator out of service immediately may create a hazardous condition.**

**Personal injury, equipment damage or leakage due to escaping fluid or bursting of pressure-containing parts may result if this regulator is overpressured or is installed where service conditions could exceed the limits given in the Specifications section or where conditions exceed any ratings of the adjacent piping or piping connections.**

**To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices (as required by the appropriate code, regulation or standard) to prevent service conditions from exceeding limits.**

**Additionally, physical damage to the regulator could result in personal injury and property damage due to escaping fluid. To avoid such injury and damage, install the regulator in a safe location.**

Clean out all pipelines before installation of the regulator and check to be sure the regulator has not been damaged or has collected foreign material during shipping. For NPT bodies, apply pipe compound to the external pipe threads. For flanged bodies, use suitable line gaskets and approved piping and bolting practices. Install the regulator in any position desired, unless otherwise specified, but be sure flow through the body is in the direction indicated by the arrow on the body.

1. The pressure/temperature limits in this installation guide and any applicable standard or code limitation should not be exceeded.

# 133 Series

**Table 1. 133 Series Outlet Pressure Ranges**

TYPE	OUTLET PRESSURE RANGE	
	bar	psig
133H <sup>(1)</sup>	0.10 to 0.21 0.14 to 0.34 0.34 to 0.69	1.5 to 3 2 to 5 5 to 10
133HP <sup>(1)</sup>	0.14 to 0.34 0.31 to 0.69 0.41 to 1.4 1.1 to 2.1 1.8 to 2.8 2.5 to 3.4 3.1 to 4.1	2 to 5 4.5 to 10 6 to 20 16 to 30 26 to 40 36 to 50 45 to 60
133L <sup>(1)</sup> and 133H <sup>(2)</sup>	5 to 10 mbar 9 to 15 mbar 12 to 22 mbar 21 to 45 mbar 35 to 70 mbar 0.05 to 0.14	2 to 4 in. w.c. 3.5 to 6 in. w.c. 5 to 9 in. w.c. 8.5 to 18 in. w.c. 14 to 28 in. w.c. 0.75 to 2
133Z <sup>(1)</sup>	-3 to 3 mbar	-1 to 1 in. w.c.
	0 to 10 mbar	0 to 4 in. w.c.

1. Pressure ranges shown are correct if the regulator is installed with the actuator portion above the body portion. If the regulator is installed with the actuator portion below the body, the pressure ranges will be lowered by approximately 5 mbar / 2 in. w.c. for the Type 133L and by approximately 7 mbar / 3 in. w.c. for the Types 133H and 133Z.

2. If the 5 mbar to 0.14 bar / 2 in. w.c. to 2 psig springs (all 6 ranges) are used in the Type 133H, the pressure ranges will increase by approximately 2 mbar / 1 in. w.c. due to the weight of the Type 133H parts (assuming that the actuator is installed above the body).

**Note**

It is important that the regulator be installed so that the vent hole in the spring case is unobstructed at all times. For outdoor installations, the regulator should be located away from vehicular traffic and positioned so that water, ice and other foreign materials cannot enter the spring case through the vent. Avoid placing the regulator beneath eaves or downspouts and be sure it is above the probable snow level.

must be taken when placing the 133 Series in service. The outlet of the regulator must never be subjected to pressures higher than the inlet pressure or the balancing diaphragm may be damaged. Also, the control line pressure must never exceed the set point dictated by the spring setting by more than 0.21 bar / 3 psig or the valve seat or diaphragm plates can be damaged.

The regulator is factory set at approximately the midpoint of the spring range or the pressure requested, so an initial adjustment may be required to give the desired results. With proper installation completed and relief valves properly adjusted, slowly open the upstream and downstream shutoff valves.

**Overpressure Protection**

The recommended pressure limitations are stamped on the regulator nameplate. Some type of overpressure protection is needed if the actual inlet pressure exceeds the maximum operating outlet pressure rating. Overpressure protection should also be provided if the regulator inlet pressure is greater than the safe working pressure of the downstream equipment.

Regulator operation below the maximum pressure limitations does not preclude the possibility of damage from external sources or debris in the line. The regulator should be inspected for damage after any overpressure condition.

**Adjustment**

To change the outlet pressure, remove the closing cap or loosen the locknut and turn the adjusting screw clockwise to increase outlet pressure or counterclockwise to decrease pressure. Monitor the outlet pressure with a test gauge during the adjustment. Replace the closing cap or tighten the locknut to maintain the desired setting.

**Taking Out of Service (Shutdown)**

**Startup**



If the downstream system is already pressured by another regulator or by a manual bypass, then extra precautions



To avoid personal injury resulting from sudden release of pressure, isolate the regulator from all pressure before attempting disassembly.

Table 2. Maximum Inlet and Outlet Pressures

PRESSURES	TYPE NUMBER							
	133H		133HP		133L		133Z	
	bar	psig	bar	psig	bar	psig	bar	psig
Maximum Operating Inlet Pressure	4.1	60	10.5	150	4.1	60	1.4	20
Maximum Emergency Inlet Pressure	8.6	125			8.6	125	8.6	125
Maximum Operating Outlet Pressure <sup>(1)</sup>	0.69	10	Setpoint plus 2.8	Setpoint plus 40	0.14	2	10 mbar	4 in. w.c.
Maximum Outlet Pressure Over Outlet Pressure Setting	0.21	3			0.21	3	0.21	3
Maximum Emergency Outlet (Casing) Pressure	1.0	15	10.5	150	1.0	15	1.0	15

1. With highest spring range available only.

## Parts List

### Types 133H, 133L and 133Z

#### Key Description

1	Body
2*	Orifice, Aluminum
3	Belleville Spring Washer, 17-4PH Stainless steel
4*	O-ring
5*	Cage/Pin Assembly, Aluminum/Steel
6*	Bearing, Nylon (PA)
7	Lower Casing
8	Spring Case
8A	Spring Case, Aluminum
8B	Stabilizer Stem, 302 Stainless steel
8C	Lower Stabilizer, Nylon (PA)
8D	Upper Stabilizer, Polyethylene
8E	Orifice, Stainless steel
8F	Screw, Steel (3 required)
8G	Spring, 302 Stainless steel (2 required)
8H	Screen, Stainless steel
8J	Snap Ring, 302 Stainless steel
9	Closing Cap
10*	Closing Cap Gasket
11	Adjusting Screw
12	Spring Steel
13	Spring Seat, Plated steel
14	Diaphragm Plate, Steel
15*	Diaphragm, Nitrile (NBR) and Nylon (PA)
16	Sealing Diaphragm Plate, Zinc-plated steel
17*	Sealing Washer, Zinc-plated steel
18	Stem, Stainless steel
19*	O-ring
20	Hex Nut
21	Diaphragm Plate, Plated steel
22*	Diaphragm
23	Washer, Steel (2 required)
24*	Guide Bushing, Nylon (PA)
25	Stem Sleeve, 303 Stainless steel
26	E-ring, Plated steel
27	Roll Pin, 420 Stainless steel
28*	Valve Disk Assembly
29	Registration Disk, Nylon (PA)
30	Washer, Zinc-plated steel
31	Hex Nut, Zinc-plated steel

#### Key Description

32*	O-ring
33	Stud, Alloy steel (4 required)
34	Locknut, Plated alloy steel (4 required)
35	Cap Screw, Zinc-plated steel
36	Hex Nut, Zinc-plated steel
37	Nameplate (for Types 133L, 133H and 133Z only) (not shown)
38	Nameplate (for Types 133L, 133H and 133Z only) (not shown)
39	Set Screw, Alloy steel (2 required)
40*	Thrust Washer, Nylon (PA) (Type 133H only)
41	Upper Spring Seat
42	Spring Retainer, Brass (Type 133Z only)
43	Ball, 440C Stainless steel (Type 133Z only) (10 required)
44	Extension Spring, Zinc-plated steel (Type 133Z only, Unpainted)
45	Retaining Ring, Plated steel (Type 133Z only)
46	Restriction Collar, Aluminum
47	Set Screw, Steel
50	Flow Arrow, 18-8 Stainless steel
51	Drive Screw, 18-8 Stainless steel (2 required)

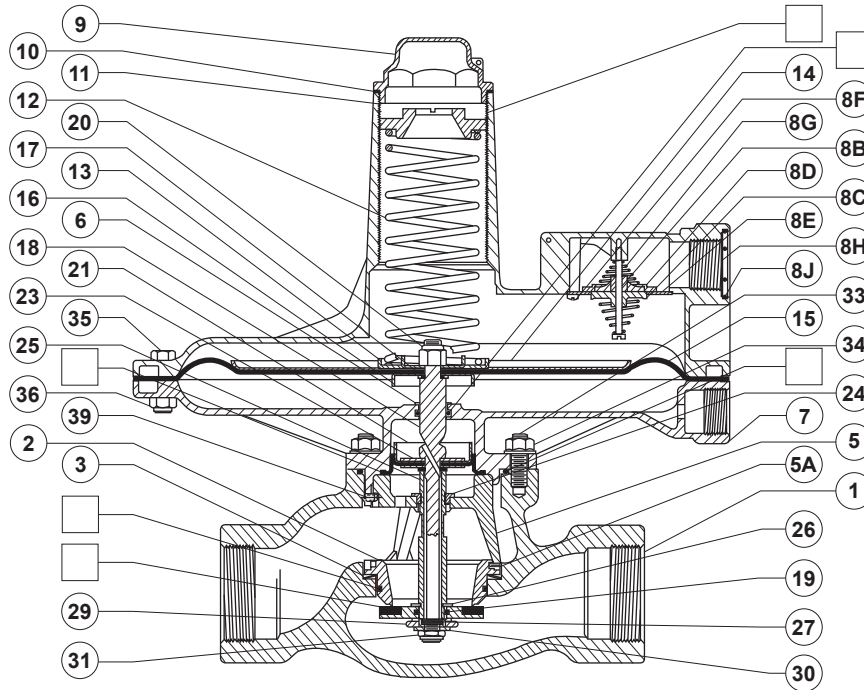
### Type 133HP only

#### Key Description

49	Pipe Nipple, Zinc-plated steel
50	Vent Assembly
51	Street Elbow, Malleable iron
52	Upper Diaphragm Casing, Steel
53	Cap Screw, Zinc-plated steel (4 required)
54*	Adaptor O-ring, Nitrile (NBR)
55	Cap Screw, Zinc-plated steel (6 required)
56	Mounting Bracket, Steel
57*	Mounting Bracket Gasket, Neoprene (CR) (2 required)
58	Lock Washer, Steel
59	Hex Jam Nut, Zinc-plated steel
60	Casing Adaptor, Steel
61*	Diaphragm Washer O-ring, Nitrile (NBR)
62	Cap Screw, Zinc-plated steel (6 required)
63	Nameplate
64	Drive Screw

\*Recommended spare parts.

# 133 Series

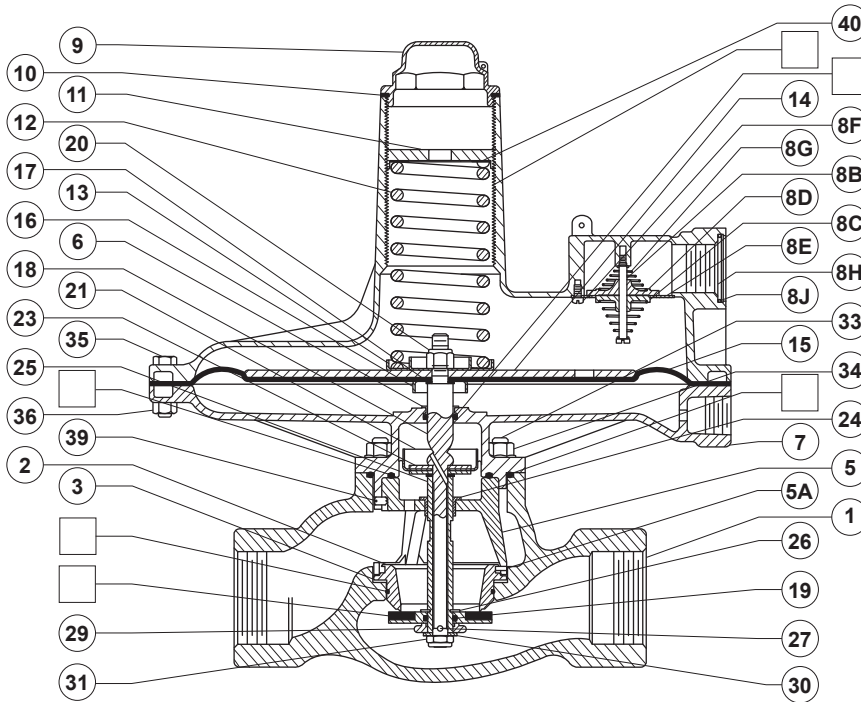


40A3066

APPLY LUBRICANT (L) OR SEALANT (S)<sup>(1)</sup>

1. Lubricant and sealant must be selected such that they meet the temperature requirements.

Figure 1. Type 133L Assembly

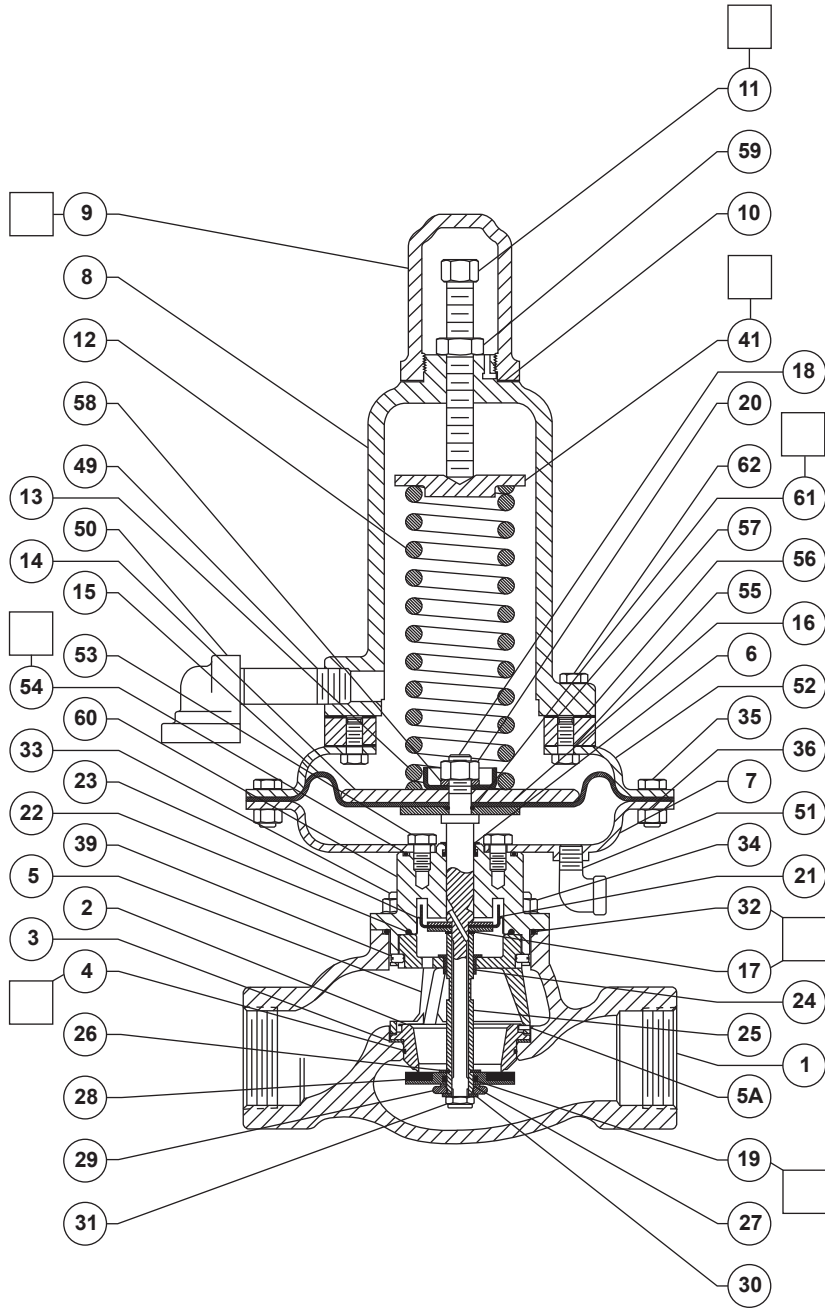


40A3070

APPLY LUBRICANT (L) OR SEALANT (S)<sup>(1)</sup>

1. Lubricant and sealant must be selected such that they meet the temperature requirements.

Figure 2. Type 133H Assembly



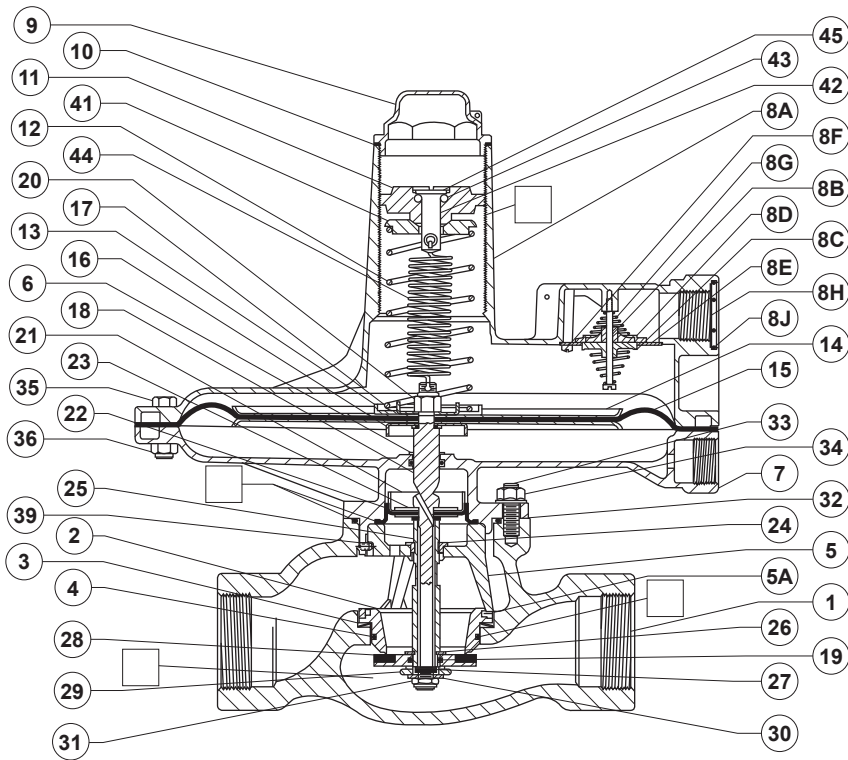
A7011/L

APPLY LUBRICANT (L)<sup>(1)</sup>

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

**Figure 3. Type 133HP Assembly**

# 133 Series



40A3071

**APPLY LUBRICANT (L)<sup>(1)</sup>**

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

**Figure 4. Type 133Z Assembly**

 [Webadmin.Regulators@emerson.com](mailto:Webadmin.Regulators@emerson.com)

 [Fisher.com](http://Fisher.com)

 [Facebook.com/EmersonAutomationSolutions](https://Facebook.com/EmersonAutomationSolutions)

 [LinkedIn.com/company/emerson-automation-solutions](https://LinkedIn.com/company/emerson-automation-solutions)

 [Twitter.com/emr\\_automation](https://Twitter.com/emr_automation)

## Emerson Automation Solutions

### Americas

McKinney, Texas 75070 USA  
T +1 800 558 5853  
+1 972 548 3574

### Europe

Bologna 40013, Italy  
T +39 051 419 0611

### Asia Pacific

Singapore 128461, Singapore  
T +65 6777 8211

### Middle East and Africa

Dubai, United Arab Emirates  
T +971 4 811 8100

D100270X014 © 2004, 2019 Emerson Process Management Regulator Technologies, Inc. All rights reserved. 01/19.

The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are the property of their prospective owners. Fisher™ is a mark owned by Fisher Controls International LLC, a business of Emerson Automation Solutions.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.

Emerson Process Management Regulator Technologies, Inc does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Emerson Process Management Regulator Technologies, Inc. product remains solely with the purchaser.



For further information on the current PED/PE(S)R revision see Bulletin: [D103053X012](#) or scan the QR code.

