# MR95 Series

## 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.fisherregulators.com. For further information refer to MR95 Series Industrial Pressure Regulators Instruction Manual, D103587X012.

## P.E.D. Category

This product may be used as a safety accessory with pressure equipment in the following Pressure Equipment Directive 97/23/EC categories. It may also be used outside of the Pressure Equipment Directive using Sound Engineering Practice (SEP) per table below.

| TYPE | PRODUCT SIZE | BODY MATERIAL | CATEGORY |
|---|---|---|---|
| MR95L/ MR95LD | 1/4 NPT, DN 15 to 25 / 1/2 to 1 in. | All | SEP |
| MR95H/ MR95HD | 1/4 NPT, DN 15 to 25 / 1/2 to 1 in. | All | SEP |
| | DN 40 and 50 / 1-1/2 and 2 in. | Cast iron | I |
| | | Steel and Stainless steel | II |
| MR95HP/ MR95HT | 1/4 NPT, DN 15 to 25 / 1/2 to 1 in. | All | SEP |
| | DN 40 and 50 / 1-1/2 and 2 in. | Steel and Stainless steel | II |

## Specifications

**Available Constructions**

**Type MR95L:** Low pressure regulator for 0.14 to 2.1 bar / 2 to 30 psig outlet pressures

**Type MR95H:** High pressure regulator for 0.34 to 10.3 bar / 5 to 150 psig outlet pressures

**Type MR95HP:** High pressure regulator for 1.0 to 27.6 bar / 15 to 400 psig outlet pressures (soft-seated)

**Type MR95HT:** High pressure/high temperature regulator for 1.0 to 20.7 bar / 15 to 300 psig outlet pressures (metal seat) and up to 343°C / 650°F

**Type MR95LD:** Low pressure differential regulator for 0.14 to 2.1 bar / 2 to 30 psi differential pressures with handwheel and packing box

**Type MR95HD:** High pressure differential regulator for 0.34 to 10.3 bar / 5 to 150 psi differential pressures with handwheel and packing box

**Body and Orifice Sizes**

**1/4 NPT body:** 7.22 mm / 0.284 in. orifice

**DN 15 / 1/2 in. body:** 10.56 mm / 0.416 in. orifice

**DN 20 and 25 / 3/4 and 1 in. bodies:** 16.02 mm / 0.631 in. orifice

**DN 40 and 50 / 1-1/2 and 2 in. bodies (not available for Types MR95L and MR95LD):** 29 mm / 1.142 in. orifice

**End Connection Styles**

NPT, SWE and Welded and Integral CL150 RF, CL300 RF, CL600 RF and PN 16/25/40 RF; all sizes are fabricated with slip-on flanges (for welded end connections) and are EN flanged 356-mm face-to-face (14 in. face-to-face)

**Maximum Cold Working Pressures of Body Size and Materials(1)(2)**

See Table 2

**Outlet and Differential Pressure Ranges(1)**

See Table 1

**Temperature Capabilities(1)**

**Diaphragm and Seat Materials:**

*Nitrile (NBR) and Neoprene (CR):* -40 to 82°C / -40 to 180°F

*Fluorocarbon (FKM)(3):* -18 to 149°C / 0 to 300°F

*Ethylenepropylene (EPDM):* -7 to 135°C / 20 to 275°F

*Perfluoroelastomer (FFKM):* -18 to 218°C / 0 to 425°F

*Polytetrafluoroethylene (PTFE):* -40 to 204°C / -40 to 400°F

*Stainless Steel (SST):* -40 to 343°C / -40 to 650°F

**Body Materials:**

*Gray Cast Iron:* -29 to 208°C / -20 to 406°F

*WCC Steel(4):* -29 to 343°C / -20 to 650°F

*LCC Steel(4):* -40 to 343°C / -40 to 650°F

*Stainless Steel(4), Monel® and Hastelloy® C:* -40 to 288°C / -40 to 550°F

*Aluminum-Bronze:* -40 to 260°C / -40 to 500°F

**Pressure Registration**

Internal or External

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

**Metal Seats:** Class IV

**PTFE:** Class IV

**Elastomer Seats:** Class VI or better

## Installation

**WARNING**

**Only qualified personnel shall 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.

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1. The pressure/temperature limits in this Installation Guide and any applicable standard or code limitation should not be exceeded.
2. The pressure limits given are based on the body size and body materials only. Actual pressure limits of the assembled regulator may decrease and vary depending on the temperature, body end connection, diaphragm, seat and/or trim material of the regulator.
3. Fluorocarbon (FKM) is limited to 93°C / 200°F hot water.
4. Meets API 614 requirements (with stainless steel trim).

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***Table 1.*** *Outlet and Differential Pressure Ranges*

| TYPE | BODY SIZE | | OUTLET OR DIFFERENTIAL PRESSURE RANGE(1) | |
|---|---|---|---|---|
| | DN | In. | bar | psi/psig |
| MR95L and MR95LD | 15, 20 and 25 | 1/4 NPT, 1/2, 3/4 and 1 | 0.14 to 0.41 | 2 to 6 |
| | | | 0.34 to 1.0 | 5 to 15 |
| | | | 0.90 to 2.1 | 13 to 30 |
| MR95H and MR95HD | 15, 20 and 25 | 1/4 NPT, 1/2, 3/4 and 1 | 1.0 to 2.1 | 15 to 30 |
| | | | 1.7 to 5.2 | 25 to 75 |
| | | | 4.8 to 10.3 | 70 to 150 |
| | 40 and 50 | 1-1/2 and 2 | 0.34 to 5.5 | 5 to 80 |
| | | | 4.1 to 8.3 | 60 to 120 |
| | | | 6.9 to 9.7 | 100 to 140 |
| | | | 8.3 to 10.3 | 120 to 150 |
| MR95HT | 15, 20 and 25 | 1/4 NPT, 1/2, 3/4 and 1 | 1.0 to 6.9 | 15 to 100 |
| | | | 5.5 to 20.7 | 80 to 300 |
| | 40 and 50 | 1-1/2 and 2 | 1.0 to 6.9 | 15 to 100 |
| | | | 4.1 to 17.9 | 60 to 260 |
| MR95HP | 15, 20 and 25 | 1/4 NPT, 1/2, 3/4 and 1 | 1.0 to 6.9 | 15 to 100 |
| | | | 5.5 to 27.6 | 80 to 400 |
| | 40 and 50 | 1-1/2 and 2 | 1.0 to 6.9 | 15 to 100 |
| | | | 4.1 to 20.7 | 60 to 300 |

1. For Types MR95LD and MR95HD regulators, the pressure ranges indicate the differential pressure that can be obtained with the indicated spring. The differential pressure (spring setting) is added to the spring case loading pressure to determine the actual outlet pressure.

***Table 2.*** *Maximum Cold Working Pressures of Body Size and Material(1)(2)*

| TYPE | BODY SIZE | BODY MATERIALS | MAXIMUM INLET PRESSURE | | MAXIMUM OUTLET PRESSURE | | MAXIMUM SPRING CASE PRESSURE | |
|---|---|---|---|---|---|---|---|---|
| | | | bar | psig | bar | psig | bar | psig |
| MR95L/ MR95LD | All available sizes | Gray Cast Iron | 17.2 | 250 | 3.4 | 50 | 3.4 | 50 |
| | | WCC/LCC Steel; CF8M/CF3M Stainless Steel; Monel®(3); Hastelloy® C(3) | 20.7 | 300 | 8.6 | 125 | 8.6 | 125 |
| MR95H/ MR95HD | All available sizes | Gray Cast Iron | 17.2 | 250 | 17.2 | 250 | 17.2 | 250 |
| | | WCC/LCC Steel; CF8M/CF3M Stainless Steel; Monel®(3); Hastelloy® C(3); Aluminum-Bronze(3) | 20.7 | 300 | 20.7 | 300 | 20.7 | 300 |
| MR95HP | All available sizes | WCC/LCC Steel | 68.9 | 1000 | 41.4 | 600 | 20.7 | 300 |
| | | CF8M/CF3M Stainless Steel; Monel®(3); Hastelloy® C(3); Aluminum-Bronze(3) | 68.9 | 1000 | 37.9 | 550 | 20.7 | 300 |
| MR95HT | 1/4 NPT and DN 15 to 25 / 1/2 to 1 in. | WCC/LCC Steel | 41.4 | 600 | 41.4 | 600 | 20.7 | 300 |
| | | CF8M/CF3M Stainless Steel; Monel®(3); Hastelloy® C(3); Aluminum-Bronze(3) | 41.4 | 600 | 37.9 | 550 | 20.7 | 300 |
| | DN 40 and 50 / 1-1/2 and 2 in. | WCC/LCC Steel; CF8M/CF3M Stainless Steel; Monel®; Hastelloy® C; Aluminum-Bronze | 41.4 | 600 | 31.0 | 450 | 20.7 | 300 |

1. The pressure/temperature limits in this Installation Guide and any applicable standard or code limitation should not be exceeded.
2. The pressure limits given are based on the body size and body materials only. Actual pressure limits of the assembled regulator may decrease and vary depending on the temperature, body end connection, diaphragm, seat and/or trim material of the regulator.
3. Not available for 1/4 NPT body size.

**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.**

## 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.

## Startup

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.

## Adjustment

To change the outlet pressure, loosen the jam nut and turn the adjusting screw clockwise to increase outlet pressure or counterclockwise to decrease it. Monitor the outlet pressure with a test gauge during the adjustment. Tighten the jam nut to maintain the desired setting.

## Taking Out of Service (Shutdown)

**WARNING**

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

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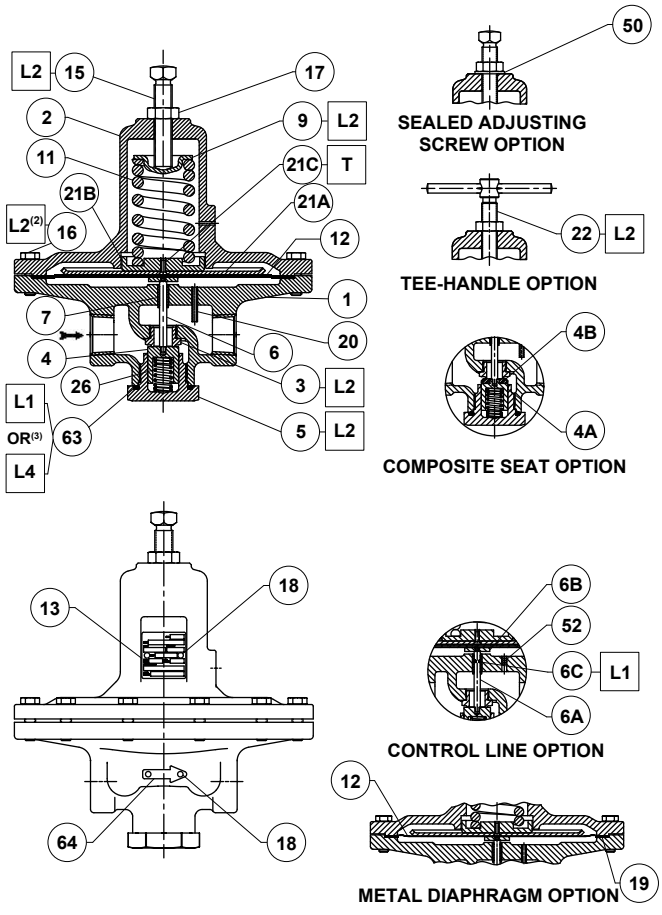


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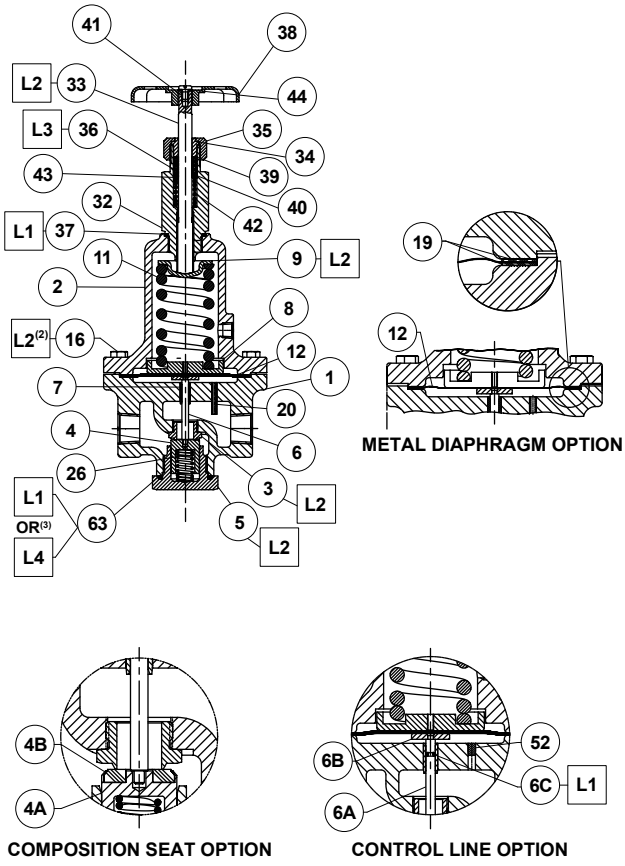
☐ **APPLY LUBRICANT OR SEALANT(1):**
**T = THREAD LOCKER**
**L1 = GENERAL PURPOSE PTFE OR LITHIUM GREASE**
**L2 = ANTI-SEIZE COMPOUND**
**L4 = GRAPHITE SEALANT**

***Figure 1.*** *Type MR95L, 1/4 NPT and DN 15 to 25 / 1/2 to 1 In. Body Sizes Assembly*

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☐ **APPLY LUBRICANT(1):**
**L1 = GENERAL PURPOSE PTFE OR LITHIUM GREASE**
**L2 = ANTI-SEIZE COMPOUND**
**L4 = GRAPHITE SEALANT**

***Figure 2.*** *Type MR95HD, 1/4 NPT and DN 15 to 50 / 1/2 to 2 In. Body Sizes Assembly*

## Parts List

| Key | Description |
|---|---|
| 1 | Body |
| 2 | Spring Case |
| 3* | Orifice |
| 4* | Valve Plug, Metal seat |
| 4* | Disk Holder Assembly, Composition seat |
| 4a | Disk Holder |
| 4b | Disk |
| 4c | O-ring (not shown) |
| 5 | Valve Plug Guide |
| 6 | Stem/Stem Assembly |
| 6a | Stem |
| 6b | Pusher Plate |
| 6b | O-ring |
| 6c | O-ring |
| 7 | Stem Guide Bushing |
| 8 | Lower Spring Seat |
| 9 | Upper Spring Seat |
| 10 | Pusher Post, (not shown) |
| 11 | Control Spring |
| 12* | Diaphragm (2 required for metal, FKM and EPDM diaphragms)(4) |
| 13 | Nameplate |

| Key | Description |
|---|---|
| 14* | Diaphragm Protector (not shown) |
| 15 | Adjusting Screw |
| 16 | Cap Screw<br>Types MR95L and MR95LD<br>DN 15 / 1/4 NPT and 1/2 in. bodies - 10 required<br>DN 20 and 25 / 3/4 and 1 in. bodies - 12 required<br>Types MR95H and MR95HD<br>1/4 NPT Body - 6 required<br>DN 15 to 50 / 1/2 to 2 in. bodies - 8 required<br>Types MR95HP and MR95HT<br>1/4 NPT Body - 6 required<br>DN 15 to 50 / 1/2 to 2 in. bodies - 8 required |
| 17 | Jam Nut |
| 18 | Nameplate Drive Screw (4 required) |
| 19* | Diaphragm Gasket (2 required for pressure loaded spring case) |
| 20 | Pitot Tube (for constructions without control line) |
| 21 | Diaphragm Head Assembly (not shown) |
| 21a | Diaphragm Head |
| 21b | Lower Spring Seat |
| 21c | Screw |
| 21 | Diaphragm Head (2 required) (not shown) |

*Recommended Spare Part
1. Lubricants and sealants must be selected such that they meet the temperature requirements.
2. Apply L2 (anti-seize compound) on key 16 for Stainless steel bolts.
3. Apply L4 (graphite sealant) instead of L1 (general purpose PTFE or lithium grease) on key 63 for graphite ring.
4. Only one metal diaphragm is needed for Types MR95L and MR95LD with 1/4 NPT body size and 0.14 to 0.41 bar / 2 to 6 psi spring range.

## Parts List (continued)

| Key | Description |
|---|---|
| 22 | Adjusting Screw Assembly (Tee Handle Adjustment) |
| 23 | Handwheel (not shown) |
| 26 | Inner Valve Spring |
| 27 | Inner Valve Base (not shown) |
| 27 | Inner Valve Base Assembly (not shown) |
| 29* | Gasket (2 required) (not shown) |
| 31 | Locknut (not shown) |
| 32 | Stuffing Box |
| 33 | Adjusting Screw |
| 34 | Packing Follower |
| 35 | Stuffing Box Nut |
| 36 | Packing (3 required) |
| 37* | Stuff Box Gasket |
| 38 | Handwheel/Handle |
| 39 | Internal Adaptor |
| 40 | External Adaptor |
| 41 | Machine Screw |
| 41 | Jam Nut |
| 42 | Spring |
| 43 | Washer |
| 44 | Washer |
| 45* | O-ring (2 required for Type MR95HD only) (not shown) |
| 47 | NACE Tag (not shown) |
| 48 | Tag Wire (not shown) |
| 49 | Lockwasher (not shown) |
| 50* | Sealing Washer |
| 51 | Vent, Type Y602-12 (not shown) |
| 52 | Plug |
| 62 | Adaptor (Types MR95L and MR95LD: 2 gauges - 2 required; 1 gauge - 1 required) (not shown) |
| 63* | Bottom Plug Seal |
| 64 | Flow Arrow |
| 65 | Pipe Plug (not shown) |
| 66 | Inlet Pressure Gauge (not shown) |
| 67 | Outlet Pressure Gauge (not shown) |
| 69 | ATEX Tag (not shown) |
| 70 | PED Tag (not shown) |

*Recommended Spare Part

**Industrial Regulators**

**Emerson Process Management**
**Regulator Technologies, Inc.**

USA - Headquarters
McKinney, Texas 75070 USA
Tel: +1 800 558 5853
Outside U.S. +1 972 548 3574

Asia-Pacific
Shanghai 201206, China
Tel: +86 21 2892 9000

Europe
Bologna 40013, Italy
Tel: +39 051 419 0611

Middle East and Africa
Dubai, United Arab Emirates
Tel: +971 4811 8100

**Natural Gas Technologies**

**Emerson Process Management**
**Regulator Technologies, Inc.**

USA - Headquarters
McKinney, Texas 75070 USA
Tel: +1 800 558 5853
Outside U.S. +1 972 548 3574

Asia-Pacific
Singapore 128461, Singapore
Tel: +65 6770 8337

Europe
Bologna 40013, Italy
Tel: +39 051 419 0611
Chartres 28008, France
Tel: +33 2 37 33 47 00

Middle East and Africa
Dubai, United Arab Emirates
Tel: +971 4811 8100

**TESCOM**

**Emerson Process Management**
**Tescom Corporation**

USA - Headquarters
Elk River, Minnesota 55330-2445, USA
Tels: +1 763 241 3238
+1 800 447 1250

Europe
Selmsdorf 23923, Germany
Tel: +49 38823 31 287

Asia-Pacific
Shanghai 201206, China
Tel: +86 21 2892 9499

The distinctive diamond shape cast into every spring case uniquely identifies the regulator as part of the Fisher® brand and assures you of the highest-quality engineering, durability, performance, and support.

For further information visit www.fisherregulators.com