

January 2021

M Series Pressure Regulators

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INTRODUCTION

Scope of Manual

This manual provides instructions for installation, startup, maintenance and spare parts ordering for the M Series spring loaded regulators.

Product Description

The M Series regulators are fail open, differential strength, spring loaded with counterbalanced shutter. They can be provided with slam-shut controller for minimum pressure, maximum pressure or minimum and maximum downstream pressure.

The regulators of the M Series due to their operating specifications are mainly used in those system where sudden capacity variations are required, or else, where the cut-off of the gas distribution is controlled by solenoid valve, such as for the feeding of burners.

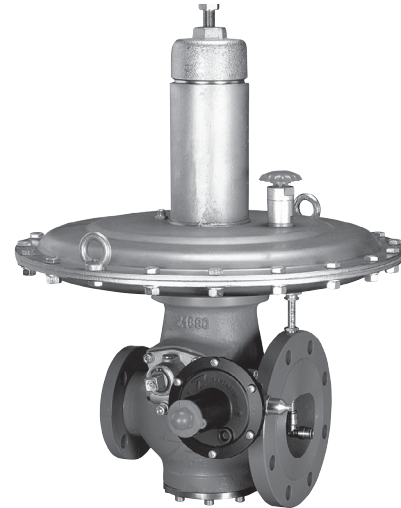


Figure 1. Regulator Type MBN

This product has been designed to be used with fuel gases of 1st and 2nd family according to EN 437, and with other non aggressive and non fuel gases. For any other gases, other than natural gas, please contact your local sales agent.

The following versions are available:

MN • MF: Regulator (pressure accessories)

MBN • MBF: Regulator with slam-shut (safety accessories)

MBN-M • MBF-M: Monitor with slam-shut (safety accessories)

MN, MF, MBN and MBF Series with SR silencer are also available.

The standard gas pressure devices (regulators and safety shut-off devices) are those used in the assemblies dealt with into EN 12186 and EN 12279 and their use has to be under the provisions into ENs 12186 and 12279.

If additional pressure accessories (e.g. slam shut controller) are needed, it is recommended to use Emerson Process Management Regulator Technologies, Inc. (Emerson) products.

Emerson will not be responsible for any possible inefficiency due to installation of non-Emerson production additional pressure accessories (e.g. slam-shut controller).

When pressure containing parts of possible built-in safety shut-off device (SSD) valve and pilot have different maximum allowable pressures, the SSD is the differential strength type.

Type M

PED CATEGORIES AND FLUID GROUP

Fail open stand-alone M Series regulators cannot be used as a safety accessory according Pressure Equipment Directive PED 2014/68/UE to protect downstream pressure equipment.

According to EN 14382, only in integral strength type and Class A configuration (when both over and under pressure protections are set up), the possible built-in safety shut-off device can be classified like a safety accessory according to Pressure Equipment Directive PED 2014/68/UE.

The minimum PS between SSD valve and slam-shut controller shall be the PS of the safety accessory to comply the provisions of EN 14382 about integral strength type.

Downstream equipment, protected by possible built-in safety shut-off device (in its Class A and integral strength configuration) of this product, shall have technical features such as to be category per table below according to Pressure Equipment Directive PED 2014/68/UE.

Table 1. M Series Regulators PED Category

PRODUCT SIZE	CATEGORY	FLUID GROUP
DN 25	SEP	1
DN 40 TO DN 50	I	
DN 65 TO DN 100	II	
ALL SIZES WITH SLAM-SHUT	IV	

The regulator size DN 25 and possible built-in pressure accessories (e.g. slam-shut controller Type OS/66) installed in all the available sizes of M Series regulators, are conform to Pressure Equipment Directive PED 2014/68/UE Article 4 Section 3 and were designed and manufactured in accordance with sound engineering practice (SEP).

Per Article 4 Section 3, these "SEP" products must not bear the CE marking.

CHARACTERISTICS

Body Sizes and End Connection Styles

MN • MBN • MBN-M (widened outlet)

DN 25x65, 40x80, 50x100, 65x100, 80x150, 100x200
PN 16, ANSI 150

MF • MBF • MBF-M (Same Size Inlet/Outlet)

DN 25, 40, 50, 80, 100
PN 16, ANSI 150



WARNING

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

Maximum Operating Inlet Pressure

MN • MBN • MBN-M DN 25-40-50: 10 bar **

MN • MBN • MBN-M DN 65-80: 6 bar **

MN • MBN • MBN-M DN 100: 5 bar **

MF • MBF • MBF-M DN 25-40-50: 10 bar **

MF • MBF • MBF-M DN 80: 6 bar **

MF • MBF • MBF-M DN 100: 5 bar **

MN-PST • MBN-PST • MBN-M-PST: 19.6 bar *

MF-PST • MBF-PST • MBF-M-PST: 19.6 bar *

MN-AP • MBN-AP • MBN-M-AP: 19.6 bar *

MF-AP • MBF-AP • MBF-M-AP: 19.6 bar *

MN-APA • MBN-APA • MBN-M-APA: 19.6 bar *

MF-APA • MBF-APA • MBF-M-APA: 19.6 bar *

* At average ambient temperature.

** PST version is available on request to allow a Maximum Operating Inlet Pressure = 19.6 bar at average ambient temperature.

Outlet Set Pressure Ranges

MN • MF: 10 to 500 mbar *

MN-PST • MF-PST: 0.2 to 0.5 bar

MN-AP • MF-AP: 0.5 to 1 bar

MN-APA • MF-APA: 1 to 3 bar

* For DN 80 and 100 the operating outlet set pressure range 0.01 to 0.08 bar is allowable with M...-BP version.

Minimum/Maximum Allowable Temperature (TS)

See label.

Functional Features

Accuracy class AC : up to ± 5%

Lock-up pressure class SG : up to +10%

Class of lock-up pressure zone SZ : up to 10%

Slam-Shut Controller

Accuracy class AG : ± 5%

Response time t_a : ≤ 1 s

Temperature

Standard version: Working -10° +60°C

Low temperature version: Working -20° +60°C

Materials

Flanges and covers: Steel

Diaphragm: Fabric NBR+PVC/Nitrile rubber

Pads: Nitrile (NBR) rubber

LABELLING

BIOLOGNA ITALY TARTARINI		CE	Notified body xxxx	APPARECCHIO TIPO / DEVICE TYPE
				Note 1
MATRICOLA / ANNO SERIAL Nr. / YEAR	/ Note 2		DN1	
REAZIONE FAIL SAFE MODE	FAIL OPEN <input checked="" type="checkbox"/>	FAIL CLOSE <input type="checkbox"/>	DN2	
NORME ARMONIZ. HARMONIZED STD.	EN		Wds	bar
CLASSE DI PERDITA LEAKAGE CLASS		TIPO TYPE	Wdso	bar
CLASSE FUNZIONALE FUNCTIONAL CLASS		Cg	Wdsu	bar
FLUIDO GRUPPO FLUID GROUP	1	pmax	bar	DN seat
TS	Note 3	°C	PS	Note 4
			PSD	Note 5
			Bar	PT= 1.5
			x PS	bar

Figure 2. Label for M Series Regulators

Note 1: See “Characteristics”

Note 2: Year of manufacture

Note 3: Class 1: -10/+60 °C
Class 2: -20/+60 °C

Note 4: PN 16 PS = 16 bar
ANSI 150 PS = 19.3 bar

Note 5: 1.5 bar M...N-BP/80-100
4 bar all other types

OVERPRESSURE PROTECTION

The recommended maximum allowable pressures are stamped on the regulator nameplate. If actual version does not have a built-in safety shut-off device, some type of overpressure protection is needed if the actual outlet pressure exceeds the actual maximum operating outlet pressure rating. Overpressure protection should also be provided if the regulator inlet pressure is greater than the maximum operating inlet pressure. Downstream side pressure after possible built-in SSD’s intervention shall stay within the actual maximum operating set-up range to avoid anomalous back pressures that can damage the SSD’s slam-shut controller. Downstream overpressure protection shall also be provided if the SSD outlet pressure can be greater than the PS of the SSD slam-shut controller (differential strength type). 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.

TRANSPORT AND HANDLING

Established transport and handling procedures shall be followed to avoid any damage on the pressure containing parts by shocks or anomalous stresses. Eyebolts are designed just for handling of equipment weight. Built-up sensing lines and pressure accessories (e.g. slam-shut controller) shall be protected by shocks or anomalous stresses.

ATEX REQUIREMENTS

Application of ATEX Product Directive:

Table 2. Overview

TYPE	CLASSIFICATION	ATEX ASSEMBLIES	ATEX LABELLING
Regulator/SSD	Non-electrical equipment	Not falling under the 2014/34/EU Directive	No
Regulator/SSD + electrical device	Non-electric equipment equipped with an electrical device falling under the scope of the ATEX Directive 2014/34/EU	Constitutes an assembly according to the 2014/34/EU Directive	CE Ex II 2 GT



WARNING

Usage of an “ATEX Assembly” in an explosive atmosphere.

A non-electrical equipment incorporating an electrical device (proximity, microswitch...) is an “ATEX Assembly”, and in the scope of the ATEX Directive 2014/34/EU.

When such equipment(s) is used in a natural gas pressure control and/or measuring station in compliance with the following European standards: EN12186, EN12279 and EN 1776, can be installed in any type of classified zones according to the Directive 1999/92/EC dated 16 December 1999, in the following conditions:

- the equipment(s)/electrical circuit is connected to a suitable and certified intrinsically safe apparatus (suitable zener barrier)
- the equipment(s)/electrical circuit is used according to this instruction manual issued by the manufacturer and/or available on our website

ATEX Labelling

The nameplate will be installed on the ATEX assembly.

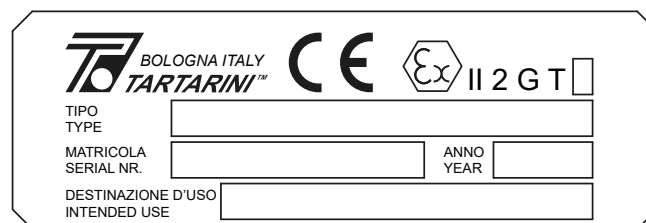


Figure 3. Label for ATEX Assembly

Where:

- Manufacturer:** Name and address and/or logo of the manufacturer
- CE:** Conformity marking to European Directive
- Type:** Description of the ATEX Assembly
- Serial Number and Year of Construction**
- Ex:** Specific marking of explosion protection
- II:** Equipment group
- 2:** Equipment Category/level of protection 2 = suitable for zone 1
- G:** For gases, vapour or mists
- T:** Temperature Class (i.e.: T6 > 85 ... ≤ 100 °C)

Intended Use: Natural Gas infrastructures.

Type M

SLAM-SHUT CONTROLLER

The following controllers are used with M Series regulator with built-in slam-shut:

- OS/66 Series spring loaded controllers



Figure 4. Type OS/66 Slam-Shut Controller

Table 3. Type OS/66 Characteristics

MODEL	BODY RESISTANCE bar	OVERPRESSURE SET RANGE W_{do} bar		UNDERPRESSURE SET RANGE W_{du} bar	
		Min.	Max.	Min.	Max.
OS/66	6	0.022	0.6	0.007	0.45
OS/66-AP	6	0.2	5	0.1	2.5

Threaded 1/4" NPT female impulse connections.

Materials

Body and Cover: Aluminum

Diaphragm: NBR rubber

For further informations please see the Instruction Manual D103657X012.

DIMENSIONS AND WEIGHTS

Table 4. Dimensions (mm) and Weights (kg) Types MN, MBN and MBN-M Regulators

MN • MBN • MBN-M									
DN	I	A		H	H1	H2 MONITOR VERSION	WEIGHT		
		STD	AP APA				MN	MBN	MBN-M
25x65	184	380		500	95	140	31	33	37
40x80	222	500	380	580	100	160	53	55	59
50x100	254			600	120	170	59	62	67
65x100	276			620	132	200	62	66	72
80x150	298	500	380	650	145	215	80	84	90
		620*							
100x200	352	500	500	660	180	265	125	130	140
		620*							

(*) BP Version

(**) For models with internal impulse connection only (DN 25, 40, 50, 65)

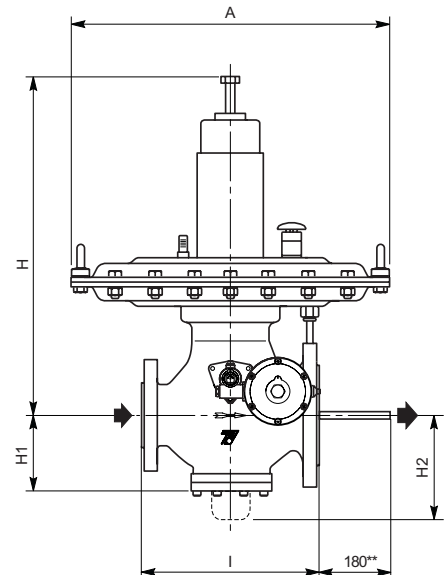


Table 5. Dimensions (mm) and Weights (kg) Types MF, MBF and MBF-M Regulators

MF • MBF • MBF-M									
DN	I	A		H	H1	H2 MONITOR VERSION	WEIGHT		
		STD	AP APA				MF	MBF	MBF-M
25	184	380		500	95	140	27	29	33
40	222	500	380	580	100	160	50	52	56
50	254			600	120	180	55	59	64
80	298	500	380	650	145	215	73	77	83
		620*							
100	352	500	500	660	180	265	110	115	125
		620*							

(*) BP Version

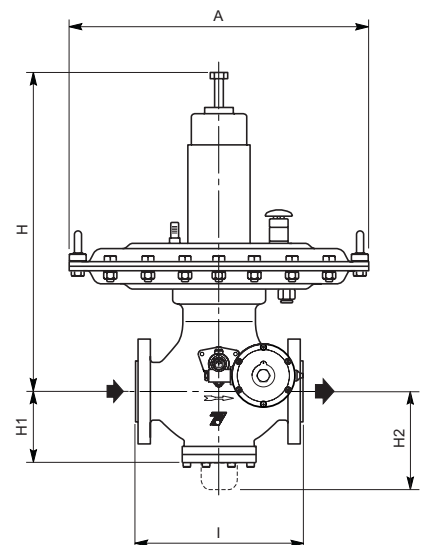


Figure 5. M Series Dimensions

OPERATION

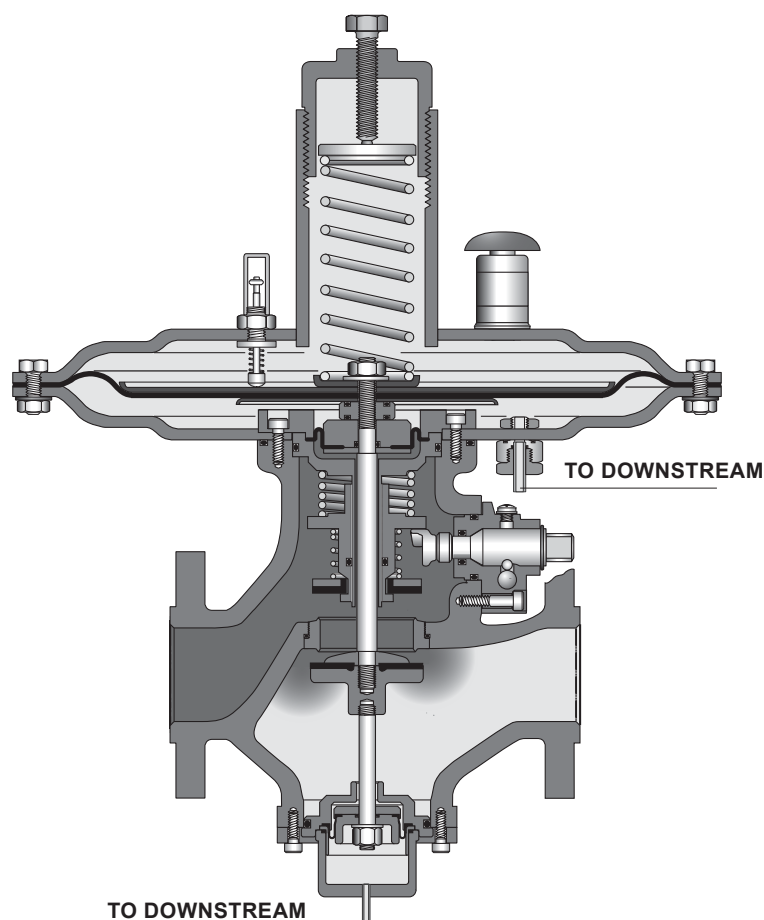


Figure 6. MBF-M Series Operational Schematic

How the Regulator Works

The range of position of control member depends from actuator assembly (spring-stem-diaphragm) movements.

The Diaphragm divides the Regulator control head into two chambers. The lower chamber is connected to regulated pressure P_d , and the other, where the spring regulator is located, is connected to atmospheric pressure.

When the contrasting actions of the spring and outlet pressure coincide, the mobile diaphragm-stem-valve assembly remains motionless, and outlet pressure matches spring set point.

An increase in capacity demand will cause a decrease in outlet pressure. This means that the spring's action will prevail over outlet pressure's action, and the valve will open until set point pressure is again reached at outlet.

The opposite occurs whenever outlet pressure increases.

Precision perfect balancing of control member is assured under all operating conditions by the inlet pressure which operates in the counterbalancing chamber.

How the Monitor Works

The monitor or emergency regulator is used as a safety device in gas pressure reduction systems. The purpose of this device is to protect the system against possible overpressure, while keeping the reduction line in service.

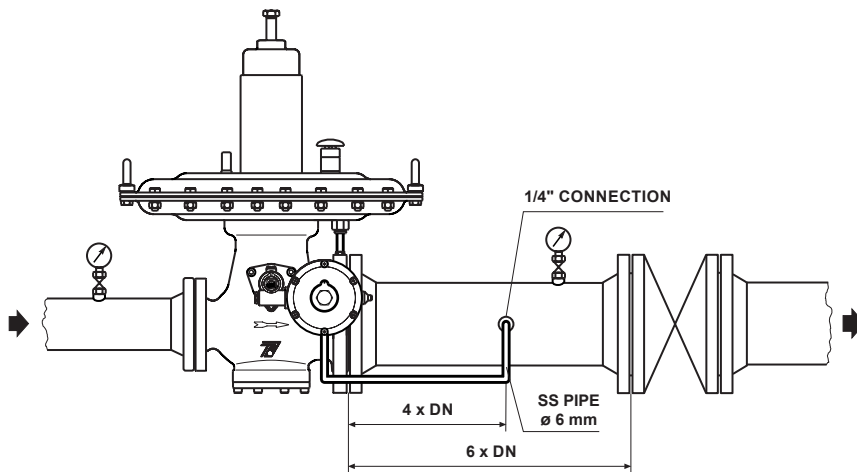
The monitor controls downstream pressure at the same point as the main regulator and is set a little higher than the latter.

Under normal duty, the monitor is fully open as it detects a pressure value lower than its set value. If, due to any regulator fault, downstream pressure increases, when it exceeds the tolerated level, the monitor comes into operation and adjusts pressure to its own set value.

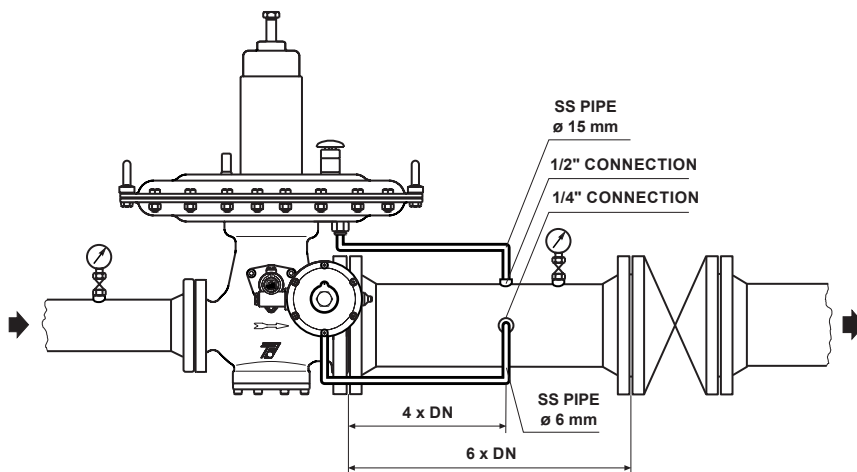
For the Type OS/66 slam-shut controller operation please see the D103657X012 instruction manual.

Type M

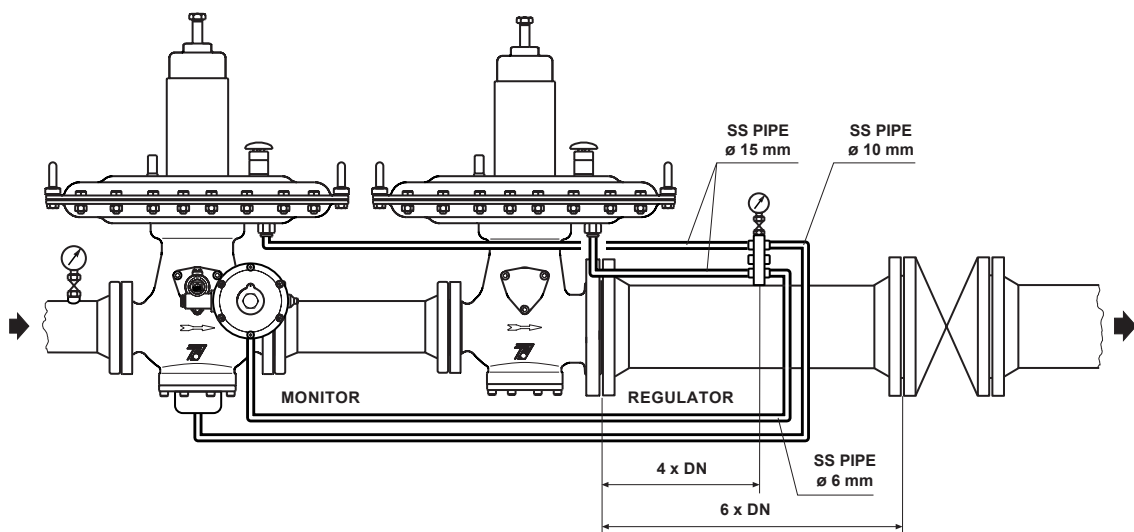
INSTALLATION



REGULATOR TYPE MBN DN 25 TO DN 65 WITH INTERNAL IMPULSE CONNECTION



REGULATOR TYPE MBN DN 80 TO DN 100 WITH EXTERNAL IMPULSE CONNECTION



MONITOR TYPE MBF-M AND REGULATOR TYPE MN WITH EXTERNAL IMPULSE CONNECTIONS

Figure 7. Connection Schematics

- Ensure that the data found on the regulator plate are compatible with usage requirements.
- Ensure that the regulator is mounted in accordance with the direction of flow indicated by the arrow.
- Make the connections as indicated in Figure 7.



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. If the regulator vents fluid or a leak develops in the system, it indicates that servicing 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 over pressured or is installed where service conditions could exceed the limits given in the “Characteristics” 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.

Before installation, check if service conditions are consistent with usage limitations and if pilot set-up or possible built-in safety slam-shut device, is in accordance with service conditions of protected equipment.

All means for venting must be provided in assemblies where the pressure equipment is installed (ENs 12186 and 12279).

All means for draining must be provided for any equipment installed before regulators and slam-shut devices (ENs 12186 and 12279).

According to EN 12186 and 12279, where this product is used:

- Provide a cathodic protection and electrical isolation to avoid any corrosion;
- In accordance with relevant clauses of aforesaid standards, the gas shall be cleaned by proper filters / separators / scrubbers to avoid any technical and

reasonable hazard of erosion or abrasion for pressure containing parts.

All pressure equipment should be installed in a non-seismic area and should not undergo fire and thunderbolt action.

All pipelines should be cleaned before installation of the regulator and checked that the regulator has not been damaged or contains foreign material after shipment.

Use suitable line gaskets and approved piping and bolting practices.

Install the regulator in a horizontal position, and check that flow through the body is in the direction indicated by the arrow on the body. Installation must be performed avoiding to create pressure force on the body and using suitable joint means according to equipment dimensions and service conditions.

The user should check and carry out any protection suitable for assembly’s specific environment.

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.

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 obtain desired results.

With proper installation completed:

- Slightly and very slowly open the outlet cut-off valve.
- In case of models fitted with slam-shut valve, relatch the valve by first loosening cap (C) and then screwing it onto the stem, after which pull cap outwards.
- By means of the appropriate wrench, hold stem pulled and slowly turn shaft (key 86) counterclockwise until balls (keys 97 and 99) are felt to be clearly engaged, after which release wrench.
- Wait for outlet pressure to stabilize.
- Release the cap nut and remount it in original position.
- Finally, slowly open inlet and outlet cut-off valves fully.

Type M

ADJUSTMENT

To change the outlet pressure turn the adjusting screw (key. 1) clockwise to increase outlet pressure or counter clockwise to decrease pressure.

Monitor the outlet pressure with a test gauge during the adjustment.

SHUTDOWN



WARNING

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

In case of disassembly of main pressure retaining parts for checks and maintenance procedures, external and internal tightness tests have to be done according applicable codes.

PERIODICAL CHECKS



CAUTION

It is recommended that checks be made periodically on the efficiency of the regulator.

Regulator Checking

Slowly close the outlet cut-off valve and check pressure in the length of pipe between the regulator and the valve.

If the system is functioning properly, an increase in outlet pressure will be noticed due to lock-up pressure, after which pressure will stabilize.

If, on the contrary, outlet pressure continues increasing, the system is not functioning properly due to improper valve disc tightness. In this case, close the valve located upstream of regulator and carry out maintenance procedures.

Slam-Shut Controller Checking (if installed)

See the Instruction Manual D103657X012.

MAINTENANCE (SEE FIGURE 8)



WARNING

All maintenance procedures must be carried out only by qualified personnel. If necessary, contact our technical support representatives or our authorized dealers.

The regulator and its pressure accessories are subject to normal wear and must be inspected periodically and replaced if necessary.

The frequency of inspection/checks and replacement depends upon the severity of service conditions and according to applicable National or Industry codes, standards and regulations/recommendations.

In accordance with applicable National or Industry codes, standards and regulations/recommendations, all hazards covered by specific tests after final assembling before applying the CE marking, shall be covered also after every subsequent reassembly at installation site, in order to ensure that the equipment will be safe throughout its intended life.

Before proceeding with any maintenance work, shutoff the gas upstream and downstream from the regulator, also ensure that there is no gas under pressure inside the body by loosening the upstream and downstream connections.

Servicing does not require removal of valve from the line.

Replacing Seal Pad

- Unscrew the adjusting screw (key 1), unscrew the tube (key 3) and slide out the spring (key 66); unscrew the screws (key 29) and dismount the cap (key 28) or (key 126) for the monitor versions.
- Lock the stem (key 32) by inserting a suitable wrench in the appropriate slots (see letter **A** in Figure 8).
- Hold the stem locked and unscrew the pad holder (key 31).



CAUTION

This operation must be carried out with extreme care in order to avoid damage to the diaphragms.

Only for the monitor version before to dismount the pad holder (key 31) it is necessary to dismount the counterbalancing system:

Lock the monitor stem (key 130) by inserting a suitable wrench in the appropriate slots (see letter **B** in Figure 8) and dismount the nut (key 65). Disassemble all the parts of the counterbalancing system.

Check the shaped diaphragm (key 9), or the O-ring (key 7, 120 and 123 for the AP and APA versions). Hold the stem (key 32) locked and unscrew the monitor stem (key 130). Dismount the pad holder (key 31).

- Replace the pad (key 34). During this phase, the seat (key 35) and the O-ring (key 36) can be checked and replaced, if required. In order to do this, open slam-shut valve shutter and keep it open while unscrewing the seat with the appropriate wrench.

With the slam-shut valve shutter still kept open, mount a new seat.

- e. Reassemble the various parts by reversing the steps laid out above.

Reset Unit Maintenance

- a. Trip the slam-shut controller Type OS/66 and remove impulse connection. Then loosen and remove the screws (keys 93 and 98) and take off the combined reset and controller unit.
- b. Loosen the dowels (G) and slide out the slam-shut controller from the reset unit.
- c. Unscrew the plug (key 104).
- d. Unscrew the stem (key 102) and remove the shaft (key 91), the spring (key 103), the slam-shut spring holder (key 105) and the O-Ring (key 106).
- e. Unscrew the plug (key 96) and remove the spring (key 94) and the balls (keys 97 and 99).
- f. Remove the elastic pin (key 78), unscrew the dowel (key 89) and then slide out the shaft (key 85). Check the antifriction rings (keys 76 and 80) and the O-ring (key 79); replace if required.
- g. Clean and check all components and replace if worn.
- h. Lubricate moving parts and reassemble by reversing the steps set out above. When reassembling the reset unit, make sure that cam (key 75) is to the right of the operator.

Upon completion of maintenance procedure, check opening of the slam-shut pad (key 39) by rotating the shaft (key 85) anticlockwise.

General Maintenance

- a. Remove the seal pad (key 34) as described in the previous paragraph.
- b. For the versions with slam-shut unscrew the screws (keys 93 and 98) and remove the reset unit and the slam-shut controller Type OS/66 (key 134).
- c. Unscrew the screws (key 22) and the eyebolt (Key 48) and dismount the upper cover unit (key 61).
- d. Lock the stem (key 32) by inserting a suitable wrench in the appropriate slots (see letter **A** in Figure 8) and unscrew the nut (key 66).
- e. Dismount the plates (keys 63, 62 and 17), dismount and check the diaphragm (key 21) and replace it if is worn.
- f. Unscrew the screws (key 14), slide out the plate (key 12) and the diaphragm tube (key 10).
- g. Dismount the assembly composed by the stem (key 32) and the shaped diaphragm (key 9); unscrew the spacer (key 6) and disassemble the various parts, check the shaped diaphragm (key 9) and the O-ring (key 5 and 7).

Only for the AP, APA and PST version slide out the piston (key 122) and the stem (key 32), check the O-ring (key 123) and the guide bush (key 121).

- h. Unscrew the screw (key 51), dismount the lower cover (key 25) and the cup unit (key 44).



For the versions with slam-shut, keep attention to progressively unload the slam shut spring (key 26).

In case of the cup unit (key 44) being clogged due to oxidation or dust, remove it by inserting a puller in the appropriate threaded holes.

- i. Check the O-ring (key 15) and the antifriction rings (key 37).
- j. For the versions with slam-shut dismount the elastic ring (key 46) and disassemble the slam-shut parts; check the pad (key 39), the O-ring (key 41) and the antifriction ring (key 45), replace if required.
- k. Unscrew the seat (key 35) with the appropriate wrench and check the O-ring (key 36).
- l. Clean the various metallic parts with petrol and with compressed air. Replace worn parts.

For the Type OS/66 slam-shut controller maintenance please see the D103657X012 instruction manual.

Reassembling

Reassemble the various parts by reversing the steps laid out above. Attention should be made that each reassembled part moves freely and without friction.

In addition, care should be taken with regards to:

- a. Lubricating all moving parts and seals with MOLYKOTE 55 M grease or equivalent, and making sure that are not damaged during reassembly.
- b. Progressively and uniformly tightening all the screws so as to guarantee maximum seal.
- c. Setting the slam-shut valve and checking reset mode at end of reassembly.
- d. Checking for any leaks by using soapy water.

SPARE PARTS

Spare parts storage shall be done by proper procedures according to national standard/rules to avoid over aging or any damage.

Type M

TROUBLESHOOTING

Table 6. M Series General Troubleshooting

SYMPTOMS	CAUSE	ACTIONS
The regulator does not open	Lack of incoming gas	Check the station feeding
	The slam-shut controller has not been reset	Manually reset the slam-shut controller
Drop in pressure downstream from the regulator	Insufficient upstream pressure	Check the station feeding
	Flow requirements higher than the flow that the regulator can supply	Check the regulator sizing
	Filter upstream is obstructed	Clean or replace the filter
	Broken spring	Replace the spring
Increase in pressure downstream from the regulator or safety devices being activated (slam-shut valve)	Tight shutoff gaskets are worn	Replace gaskets
	Deposits of grime on the tight shutoff pad are obstructing proper positioning of the shutter	Clean or replace the pad
	Diaphragm damaged	Replace the diaphragm
Slam-shut device does not execute tight shutoff procedure	O-ring and/or slam-shut pad worn	Replace the O-ring or/and the slam-shut pad
	Slam-shut seat damaged	Replace the slam-shut seat

PARTS LIST

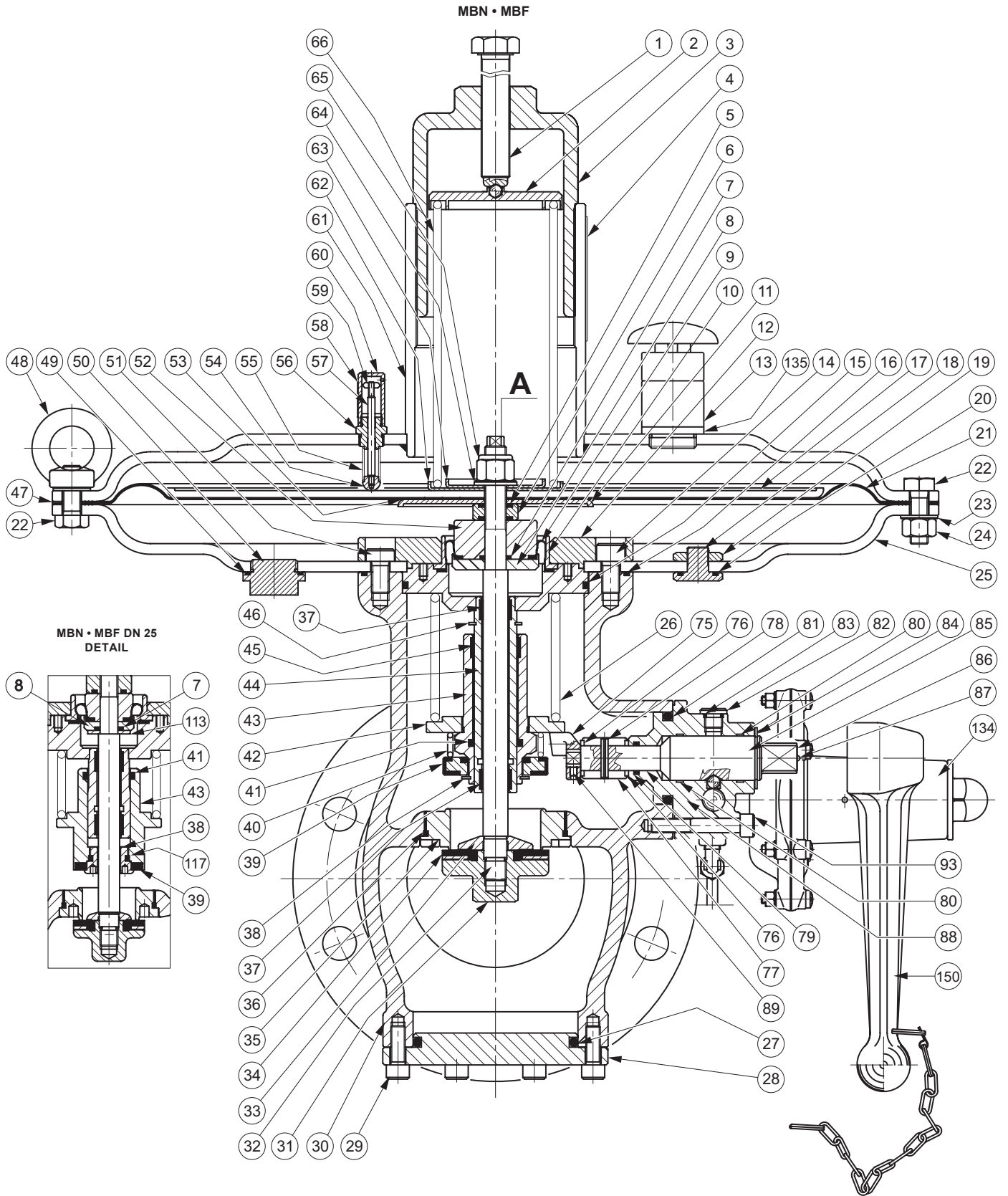
Key Description

1	Adjusting Screw	46	Elastic ring	93	Screw
2	Upper spring holder	47*	Gasket	94	Spring
3	Tube	48	Eyebolt	95*	Gasket
4	Label	49*	O-ring	96	Plug
5*	O-ring	50	Plug	97	Ball
6	Spacer	51	Screw	98	Screw
7*	O-ring	52	Diaphragm hub	99	Ball
8	Plate	53	Diaphragm	100	Screw
9*	Shaped Diaphragm	54	Pawl	101*	O-ring
10	Diaphragm tube	55	Spring	102	Stem
11	Plate	56	Bush	103	Spring
12	Plate	57	Travel indicator	104	Plug
13	Vibrations dumper	58	Label	105	Slam-shut spring holder
14	Screw	59	Label	106*	O-ring
15*	O-ring	60	Sheath	107	Screw
16*	O-ring	61	Upper cover unit	108	Plug
17	Plate	62	Spring holder plate	109	Plug
18	Plug	63	Spring holder plate	110	Connection
19	Special nut	64	Washer	113	Special washer
20*	O-ring	65	Autolocking nut	117*	O-ring
21*	Diaphragm	66	Spring	118*	O-ring
22	Screw	67	Connection	119	Plug
23	Washer	68*	O-ring	120*	O-ring
24	Nut	69	Impulse pipe connection	121	Guide bush
25	Lower cover	70	Extension	122	Piston
26	Spring	71	Impulse pipe	123*	O-ring
27*	O-ring	72	Connection	124	Plate
28	Cap	75	Cam	125	Connection
29	Screw	76*	Antifriction ring	126	Monitor cap
30	Body	77	Bush	127	Monitor plate
31	Pad holder	78	Elastic pin	128*	O-ring
32	Stem	79*	O-ring	129	Monitor cup
33	Pad retainer	80*	Antifriction ring	130	Monitor stem
34*	Pad unit	81*	O-ring	132	Disco
35	Seat	82	Plug	133	SR silencer
36*	O-ring	83*	O-ring	134	Type OS/66 Slam-shut controller
37*	Antifriction ring	84	Elastic ring	135	Washer
38	Pad holder	85	Shaft	150	Reset lever unit
39*	Pad	86	Label		
40	Spring	87	Rivet		
41*	O-ring	88	Hub		
42	Slam-shut spring holder	89	Screw		
43	Slam-shut shutter	90*	O-ring		
44	Cup unit	91	Shaft		
45	Connection	92*	O-ring		

Rubber parts marked with (*) are supplied in the "spare parts kit", recommended as stock.

To order the kit it is necessary to communicate to us the type of the regulator and its serial number.

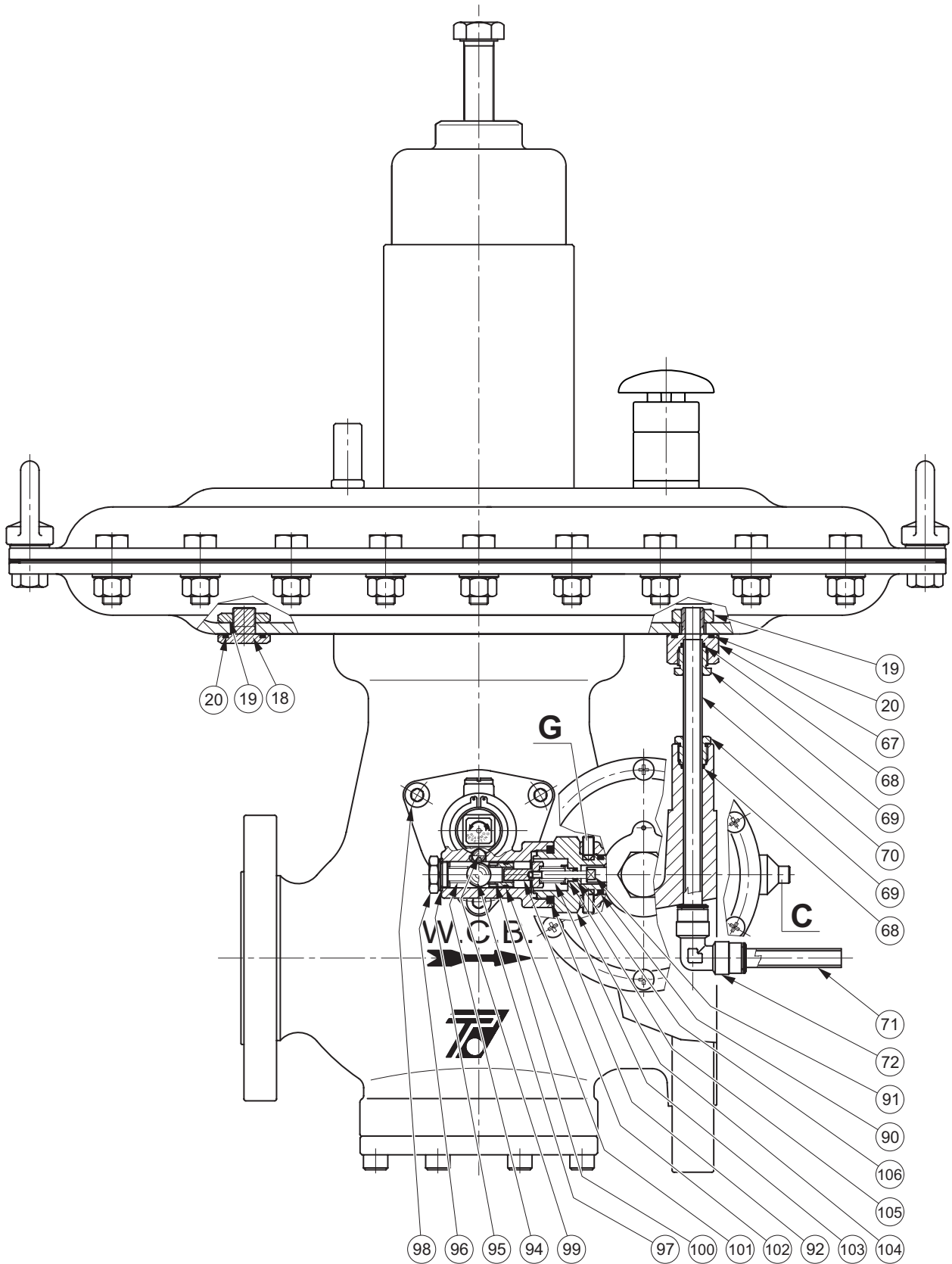
SCHEMATIC ASSEMBLIES



LM/1392

Figure 8. M Series Regulator Assembly

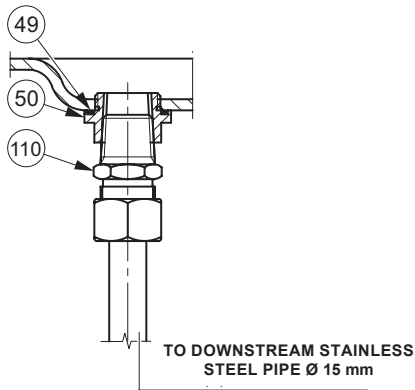
Type M



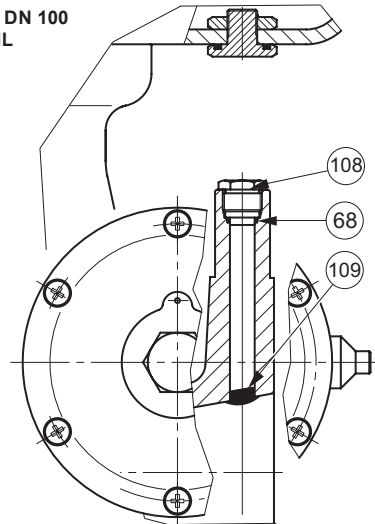
LM1392

Figure 8. M Series Regulator Assembly (continued)

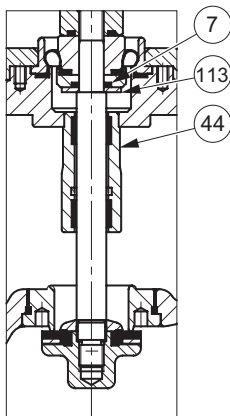
**EXTERNAL IMPULSE
LINE DETAIL**



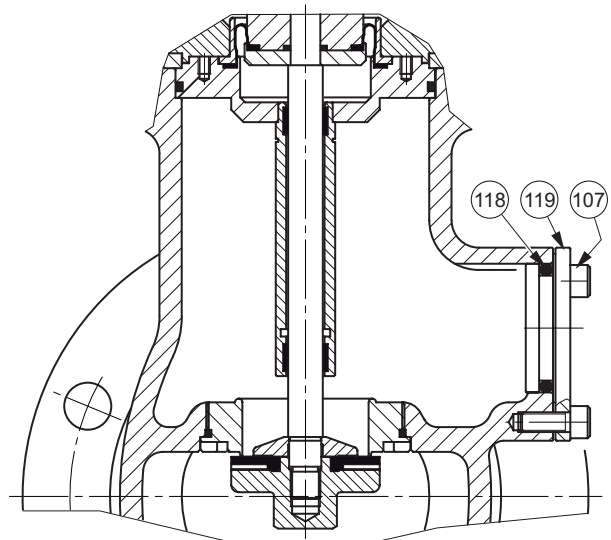
**MN • MBN DN 80 TO DN 100
MBN-M DETAIL**



**MN • MF DN 25
DETAIL**



**MN • MF DN 40 TO DN 100
DETAIL**



**DN 25 TO DN 100
AP, APA AND PST VERSION**

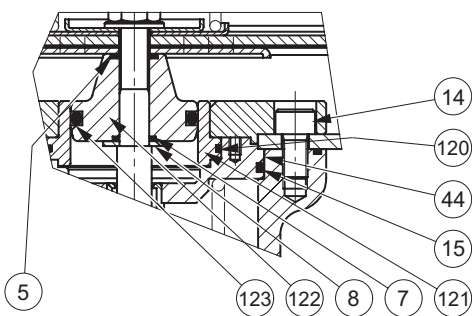


Figure 8. M Series Regulator Assembly (continued)

Type M

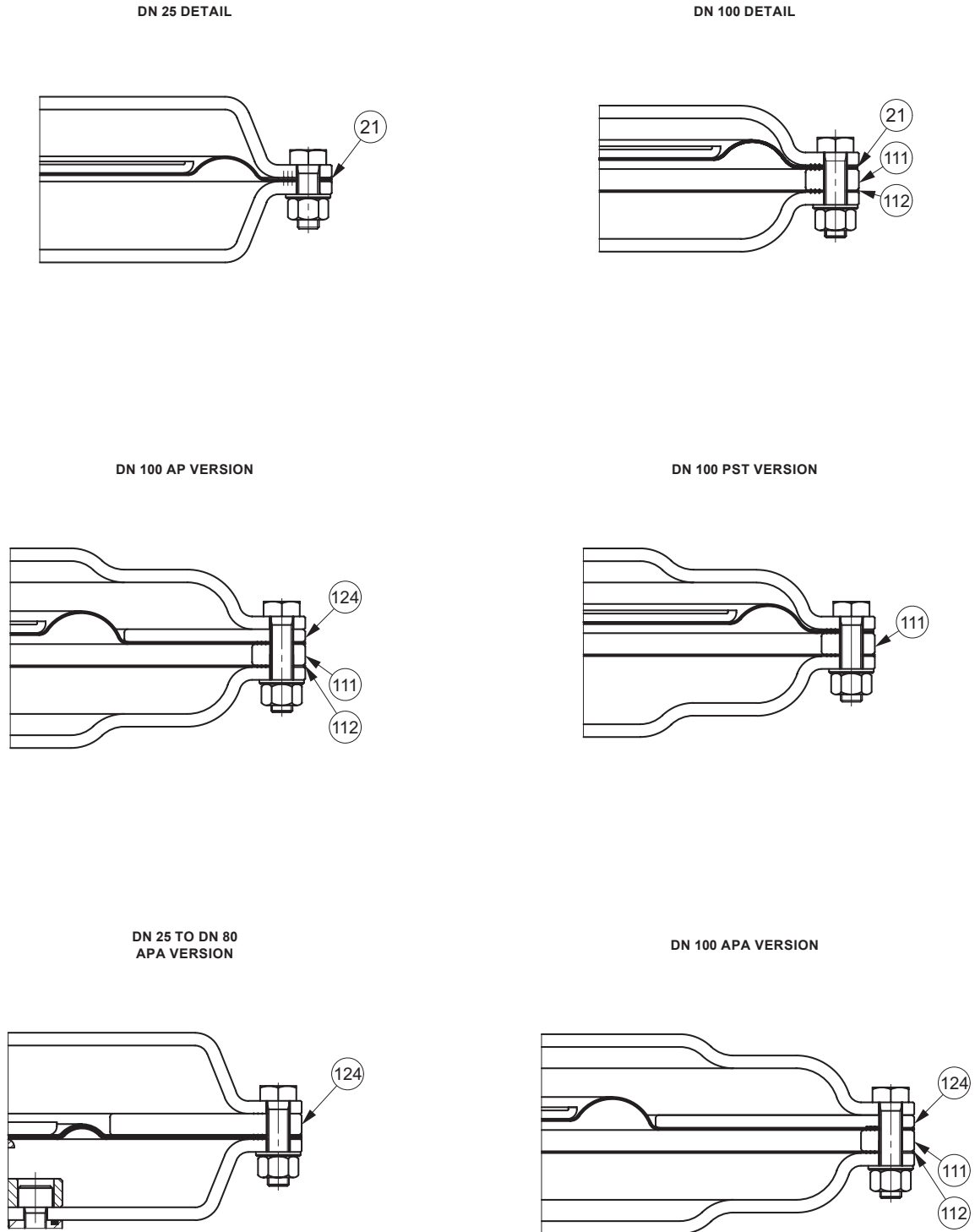
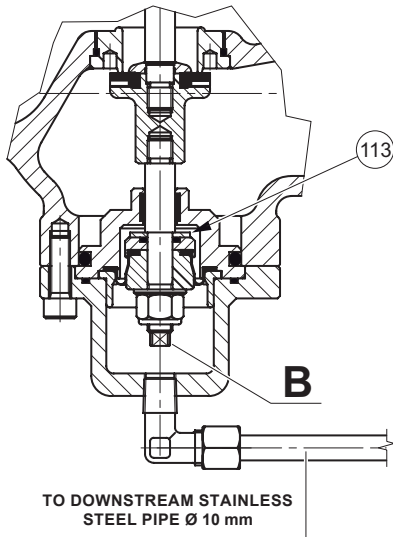
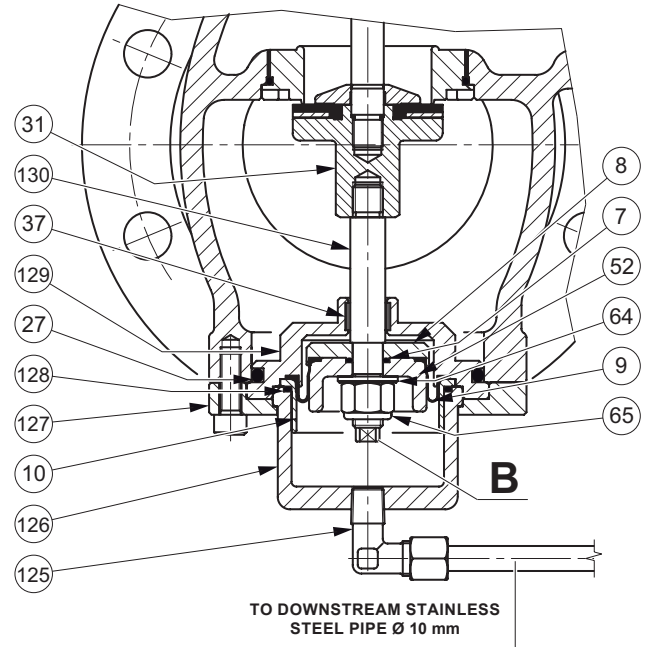


Figure 8. M Series Regulator Assembly (continued)

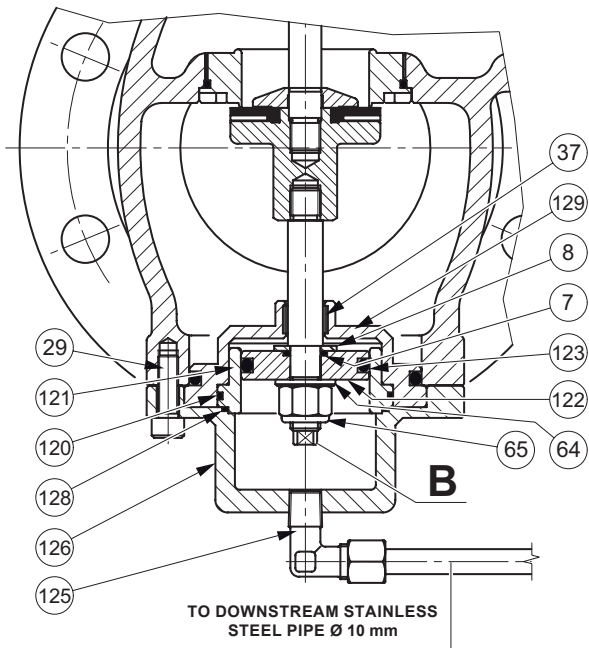
DN 25 MONITOR VERSION



DN 40 TO DN 100
MONITOR VERSION



AP AND APA MONITOR VERSION



SR SILENCED VERSION DETAIL

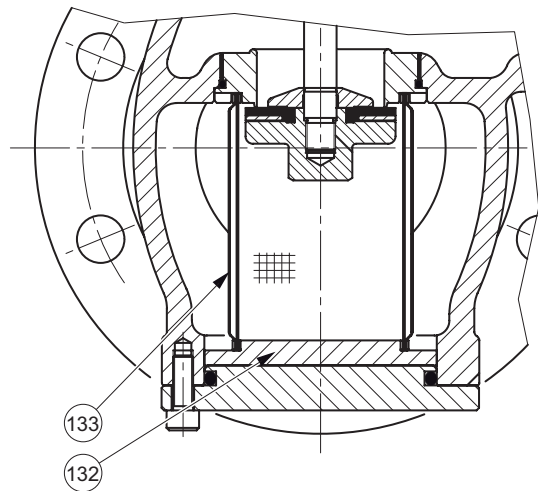


Figure 8. M Series Regulator Assembly (continued)

Type M

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