January 2015 - Rev. 00

Type PS/79-1 and PS/79-2 Pilots

SUMMARY

Figure 1. *Type PS/79-1 or PS/79-2 Pilots*

INTRODUCTION

Scope of Manual

This manual provides installation, startup, maintenance, troubleshooting, and spare parts for the pilot series PS/79-1 and PS/79-2.

Product Description

Designed for pressure regulators control, the following types are available:

- **PS/79-1 - RE/79-1 - PSO/79-1 - REOPS/79-1**
- **PS/79-2 - RE/79-2 - PSO/79-2 - REO/79-2**

Tightness cover version available on request (e.g. Types PS/79-1-D and PS/79-2-D).

The full range of PS pilots can be installed in the following pressure regulators:

FL Series - Cronos Series

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.

CHARACTERISTICS

Table 1. *Technical Features*

APPLICATION Regulator or Monitor	ALLOWABLE PRESSURE PS (bar)	SET RANGE W_d (bar)	BODY AND COVERS MATERIAL
PS/79-1	25	0.01 - 0.5	Aluminum
PS/79-2		0.5 - 3	

1/4-inch NPT female threaded connections.

All PS/ series pilots are supplied with a filter (5µ filtering degree) and built-in pressure stabilizer, with the exception of Type PSO/79-1 and PSO/79-2 pilots (supplied without stabilizer).

LABELLING

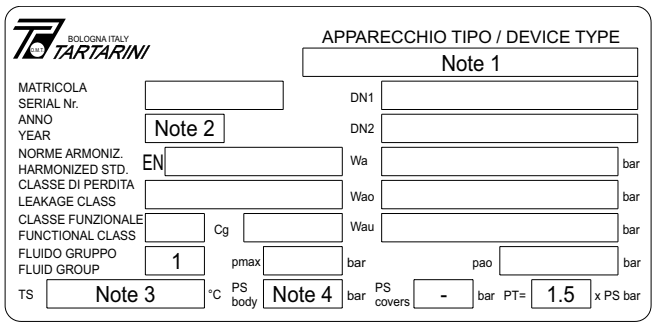


Figure 2. *Label for PS/79-1 and PS/79-2 Pilots*

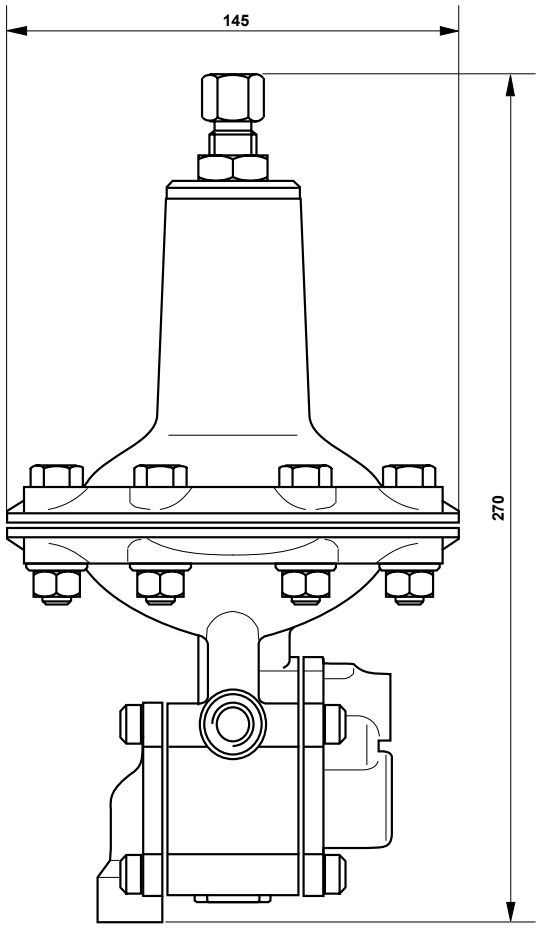
Note 1: See "**Characteristics**"

Note 2: Year of Manufacture

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

Note 4: See **"Characteristics"**

DIMENSIONS AND WEIGHT



TYPE PS/79-1 AND PS/79-2 FULL RANGE WEIGHT: 2.5 kg

Figure 3. *Type PS/79-1 and PS/79-2 Pilots Dimensions (mm)*

INSTALLATION

a. Check that data on the pilot's plate are compatible with actual working conditions.

b. Install in accordance with regulator instruction manual.

STARTUP

See the set-up and pilot adjustment instructions applying to the equipment where the pilot is fitted.

PERIODIC CHECKS

Slowly close the outlet slam-shut and check line pressure between it and regulator. A slight increase in pressure should be detected: this results from overload due to closing, and is followed by pressure stabilization. If, however, outlet pressure continues to rise, then seal is defective. Check if leak is coming from regulator or pilot, and service.

SEP STATEMENT

Emerson Process declares this product conforms to Pressure Equipment Directive (PED) 97/23/EC.

Article 3 section 3 and was designed and manufactured in accordance with sound engineering practice (SEP).

Per Article 3 section 3, this "SEP" product must not bear the CE marking.

ATEX REQUIREMENTS

WARNING

If the provisions of EN 12186 & EN 12279, national regulations, if any, and specific manufacturer recommendations are not put into practice before installation and if purge by inert gas is not carried out before equipment's start-up and shut-down operations, a potential external and internal explosive atmosphere can be present in equipment & gas pressure regulating/ measuring stations/installations.

If a presence of foreign material in the pipelines is foreseen and purge by inert gas is not carried out, the following procedure is recommended to avoid any possible external ignition source inside the equipment due to mechanical generated sparks:

- drainage to safe area via drain lines of foreign materials, if any, by inflow of fuel gas with low velocity in the pipe-work (5m/sec)

In any case,

- provisions of Directive 1999/92/EC and 89/655/EC shall be enforced by gas pressure regulating/measuring station/ installation's end user
- with a view to preventing and providing protection against explosions, technical and/or organizational measures appropriate to the nature of the operation shall be taken (e.g. : filling/exhausting of fuel gas of internal volume of the isolated part/entire installation with vent lines to safe area - 7.5.2 of EN 12186 & 7.4 of EN 12279 ; monitoring of settings with further exhaust of fuel gas to safe area ; connection of isolated part/entire installation to downstream pipeline; ….)
- provision in 9.3 of EN 12186 & 12279 shall be enforced by pressure regulating/measuring station/installation's end user
- external tightness test shall be carried out after each reassembly at installation site using testing pressure in accordance with national rules
- periodical check/maintenance for surveillance shall be carried out complying with national regulations, if any, and specific manufacturer recommendations.

MAINTENANCE

CAUTION

Servicing should be carried out by qualified, skilled personnel only.

For further information, please contact our Technical Support Representatives or our authorized dealers.

Before servicing, cut off regulator inlet and outlet and release any trapped pressurized gas. Use suds to check that there are no leaks.

Replacing Filter

a. Remove screws (key 54), cover (key 58), and replace felt (key 41). Reassemble by reversing the above sequence.

Replacing Stabilizer Diaphragm and Seal Pad

b. Remove screws (key 54), cover (key 55), spring (key 52) and diaphragm assembly (key 53, 51, 50, 49, 48, and 47). Replace diaphragm if necessary.

c. Unscrew seat (key 44) and replace pad holder (key 45).

d. Reassemble by reversing the above sequence.

Replacing Valve Seal Pads

e. Remove plug (key 23) and seat (key 25). Slide out spring (key 27), pad holder unit (key 29) and forked stem (key 31).

f. Replace pad holder (key 29) and O-ring (key 32).

g. Reassemble by reversing above sequence.

General Maintenance

h. Proceed as directed in the replacement of filter, stabilizer diaphragm and seal pad, and valve seal pads.

i. Completely release spring (key 5) by turning the adjusting screw (key 1) counterclockwise.

j. Remove screws (key 10) and cover (key 6).

k. Keep plate (key 8) blocked with a box wrench, unscrew nut (key 7).

CAUTION

This must be done exactly as described to prevent damage to or breaking of drilled needle valve (key 17).

l. Unscrew plate (key 8) from stem (key 12) and slide off split pin (key 35).

m. In Types RE/79-1 and -2, remove locknut (key 15) by means of an appropriate wrench and slide out parts (key 62, 63, 16, and 17), make sure that the surface of seat (key 61) is intact.

n. Replace any worn seals.

Reassembly

Lubricate the static O-rings with a thin layer of Molykote 55 M, be very careful not to damage the O-rings when reassembling. No other pilot parts are to be lubricated.

Reassemble parts by reversing the above steps. As you proceed, make sure that parts move freely and without friction.

In addition:

o. Once lever (key 36) and stem (key 12) have been mounted, check that, with stem (key 12) against body (key 19), clearance between forked stem (key 31) and register (A) of lever (key 36) is 0.2 to 0.3 mm If not, use register to correct.

CAUTION

The above clearance can be checked by gently pulling the stem (key 12) upward. Use the proper tool to make sure that support of diaphragm (key 9) on the stem (key 12) is on the same plane as that supporting the diaphragm (key 9) in the body (key 19).

p. Mount diaphragm (key 9) and screw on plate (key 8), first by hand then with box wrench, always keep diaphragm (key 9) firmly in place to avoid damage to stem (key 12) and underlying levers.

q. Holding plate (key 8) firmly in place with box wrench, tighten nut (key 7).

r. Before remounting cover (key 6), center diaphragm as follows: mark a reference point (with pencil) on the diaphragm; turn it to the right without forcing and mark another reference on body. Now turn diaphragm to the left and mark a further reference. Position the diaphragm mark midway between the two marks on the body.

s. Tighten all screws uniformly to ensure proper sealing.

CAUTION

The pilot has a wide range of self-adjustment values. However, given actual operating conditions, it may be necessary to assist it at times by finding the best setting of pin screw/register (key 24) or the most suitable

TROUBLESHOOTING

Table 2. *Troubleshooting for Type PS/79-1, PS/79-2, RE/79-1, and RE/79-2 Pilots*

SYMPTOMS	CAUSE	ACTIONS
Desired set point is not reached	Calibration spring (key 5) is too weak	Check the springs catalog and replace it with a stronger one
	Leaks from pilot connections	Check pilot feed connections and proper gas flow feeding
Outlet pressure drops well below set point	Filter (key 41) is clogged preventing proper through-flow of gas	Clean or replace filter
	Pad holder (key 45) is swollen preventing proper feed flow	Replace pad holder
	Pad holder (key 29) is swollen preventing proper feed flow	Replace pad holder
Outlet pressure increases over set point	Faulty sealing of pad holder (key 45)	Replace pad holder
	Faulty sealing of pad holder (key 29)	Replace pad holder
Slow response to changes in gas demand	Insufficient flow rate of valve seat (key 25)	Increase flow by means of register/pin screw (key 24)
	Over large calibration jet (key 18) (only for Types PS/79-1 and PS/79-2)	Replace calibration jet with a smaller one
Overly rapid response to changes in gas demand, i.e. Hunting	Excessive flow rate of valve seat (key 25)	Reduce flow by means of a pin screw (key 24)
	Calibration jet (key 18) is too small (only for Types PS/79-1 and PS/79-2)	Replace calibration jet with a larger one
	Incorrect internal parts assembly	Check clearance between lever (key 36) and valve seat (key 25)
Gas continually escaping from relief (S)	Defective seal of pad (key 59) (only for Types PS/79-1 and PS/79-2)	Replace pad

PARTS LISTS

Type PS/79-1, PS/79-2, RE/79-1 and RE/79-2 Pilots (See Figure 4)

Item	Description
1	Adjusting screw
2	Nut
3	Cap
4	Spring holder
5	Spring
6	Cover
7	Nut
8	Plate
9*	Diaphragm
10	Screw
11*	Gasket (for Types PS/79-1 and RE/79-1 only)
12	Stem
13	Washer
14	Nut
15	Locking nut
16	Spring
17	Drilled needle valve
18	Jet
19	Body
20*	O-ring
21	Plug
22*	O-ring
23	Plug
24	Pin screw
25	Seat
26*	O-ring
27	Spring
29*	Pad holder unit
30	Spacer
31	Forked stem
32*	O-ring
33*	O-ring
34	Screw
35	Split pin
36	Lever unit
37	Data plate
38	Pin
39	Elastic ring
40*	O-ring
41*	Felt
42	Filter net
43	Spring
44	Seat
45*	Pad holder unit
46*	O-ring
47	Screw unit
48*	Diaphragm
49	Plate
50	Washer
51	Washer
52	Spring
53	Autolocking nut
54	Screw
55	Cover
56	Plug
57*	O-ring
58	Filter cover

Type RE/79-1 and RE/79-2 Pilots Only

Item	Description
17	Safety Valve
59*	Pad
60*	O-ring
61	Seat
62	Thrust bearing
63*	“GACO” Ring

Type PS/79-1-D, PS/79-2-D,RE/79-1-D and RE/79-2-D Pilots (See Figure 4)

Item	Description
69*	O-ring
70	Elastic ring
71*	O-ring

Type REOPS/79-1 Pilot (See Figure 4)

Item	Description
77	Body

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 pilot and its serial number.

SCHEMATIC ASSEMBLIES

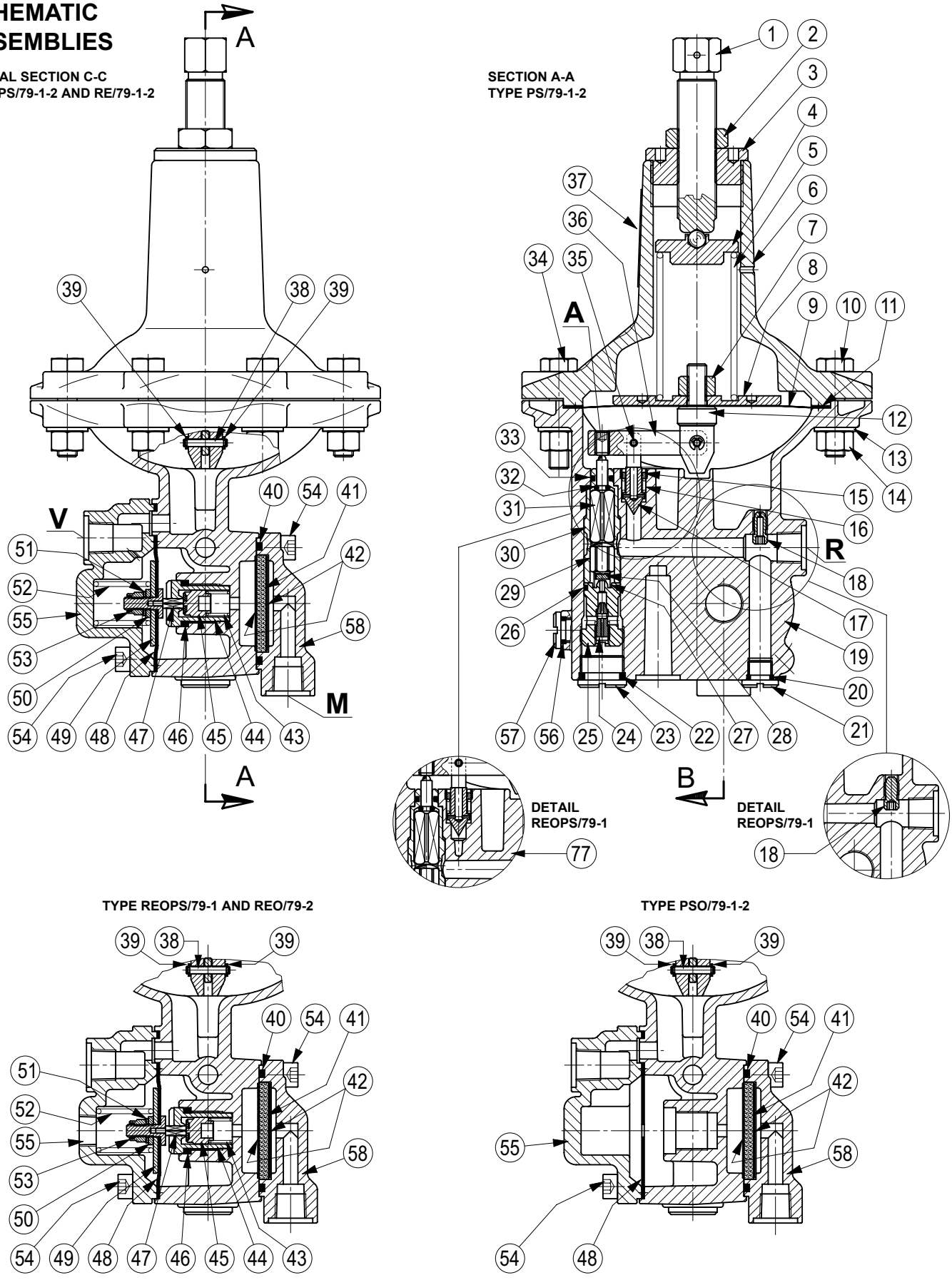
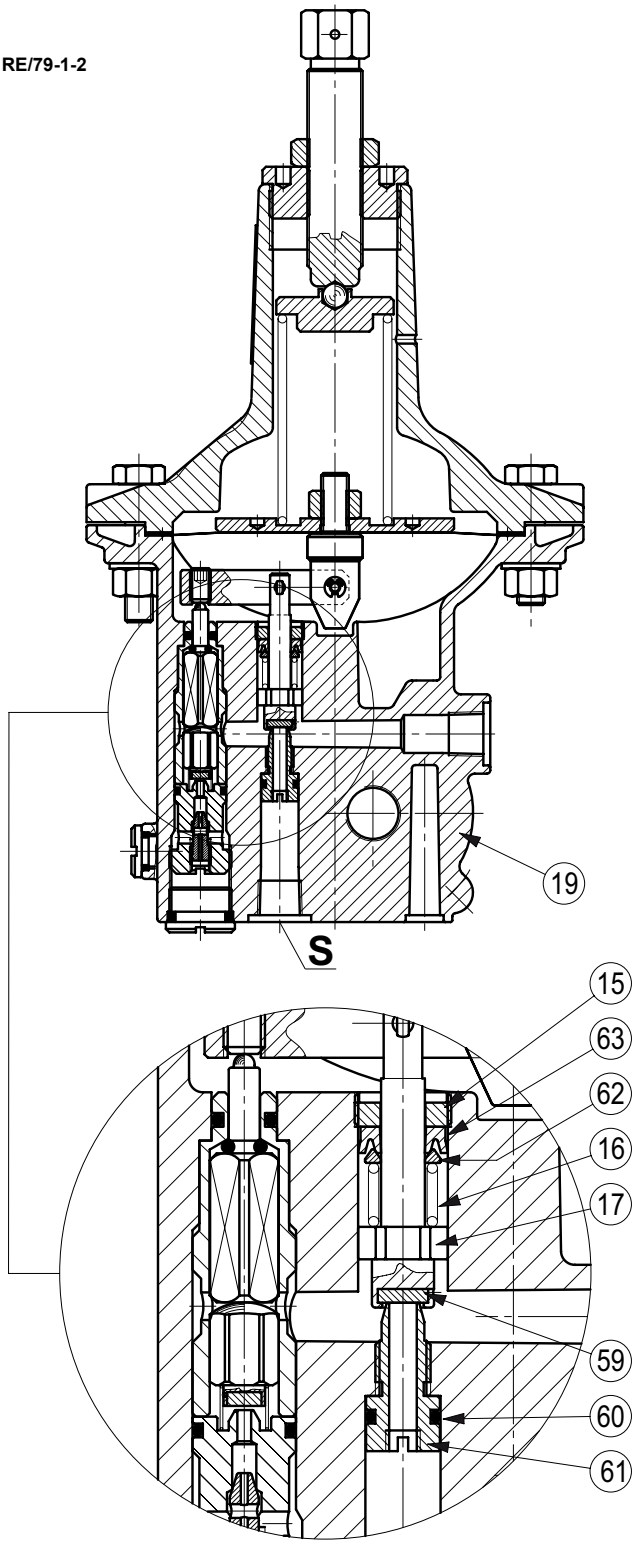


Figure 4. *Type PS/79-1, PS/79-2, and RE/79-2 Pilots Assemblies*

TYPE RE/79-1-2



TYPE
PS/79-1-D
RE/79-1-D
PS/79-2-D
RE/79-2-D

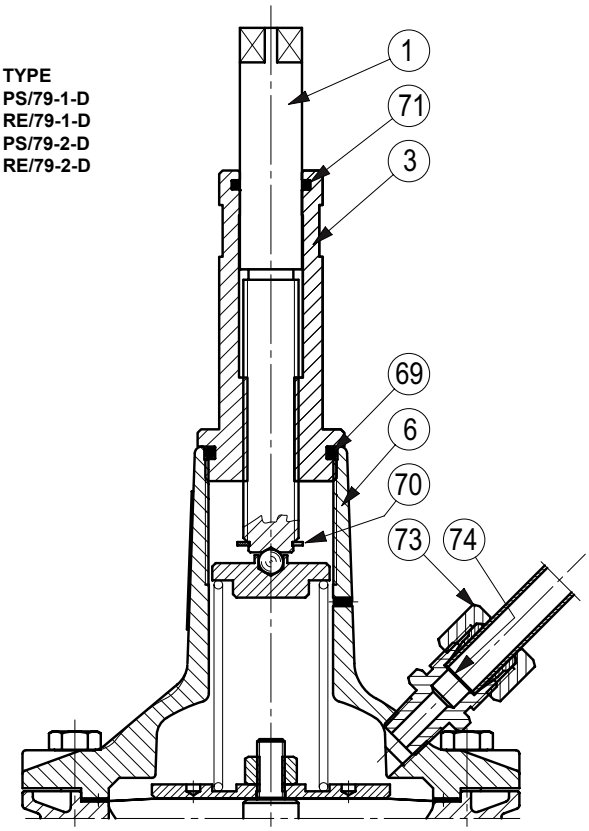


Table 3. *Type PS/79-1 and PS/79-2 Pilot Connections*

CODE	CONECTIONS
M	Upstream of the regulator
R	To the regulator (loading pressure)
S	Downstream or safe area
V	Downstream of the regulator

Figure 4. *Type PS/79-1, PS/79-2, and RE/79-2 Pilots Assemblies (continued)*

Type PS/79-1 and PS/79-2

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