

RB 4700



Commercial & Industrial Regulator

The RB 4700 regulator is designed for use in industrial and distribution applications such as district station and heating plants, and for industrial customers.

Description

The RB 4700 is a pilot-operated regulator with an optional integrated safety shut-off device. Its pilot system provides a fast and accurate response to flow rate variation. Pilot supply is protected by an integrated filter. The optional built-in shut-off valve offers protection against overpressure or over- and under-pressure. It is considered a “normally closed” valve and will fail to the closed position in the event of loss of supply pressure to pilot or rupture of the main actuator diaphragm.

Advantages

- » High flow capacity
- » Accurate control
- » Easy maintenance
- » Top entry design
- » Low noise
- » Travel indicator
- » High turn down
- » Bubble-tight true lock up

Technical Features

Inlet pressure	Up to 360 psi
Outlet pressure	.75 psi - 190 psi
Differential pressure	4 psi minimum
Accuracy	Up to AC1 / SG 2,5
Acceptable gases	Natural gas, town gas, propane, butane, air, nitrogen or any non-corrosive gas
Safety devices	Optional built-in safety shut-off valve Overpressure shut-off (OPSO) and under-pressure shut-off (UPSO)

Materials

Body	Standard: Spheroidal graphite cast iron Special Order: Steel body
Head	Pressed steel / UNI EN10025
Internal parts & pilot	Steel, stainless steel, brass and aluminium
Seals	Nitrile rubber
Diaphragm	Synthetic rubber with fabric reinforcement

Construction

- » Dresser Actaris takes pride in delivering products with the utmost concern for safety, quality, and customer satisfaction.

Operating Temperature

- » -4°F to 140°F

	Metric	Imperial
Regulator Sensing Line Connection	RP1/4 - w/compression fitting for 12mm pipe	1/4" NPT w/compression fitting for 3/8" pipe
Pilot Sensing Line connection	RP1/4 - w/compression fitting for 10mm pipe	1/4" NPT w/compression fitting for 3/8" pipe
Regulator Sense line	RP3/8 - w/compression fitting for 10mm pipe	3/8" NPT w/compression fitting for 3/8" pipe
SSV 8600 Sensing line	RP1/4 - w/compression fitting for 10mm pipe	1/4" NPT w/compression fitting for 3/8" pipe
SSV 8600 Vent line	RP1/4	1/4" NPT
SSV 8500 Sensing line	RP1/4 - w/compression fitting for 10mm pipe	1/4" NPT w/compression fitting for 3/8" pipe
SSV 8500 Vent line	RP1/8	1/8" NPT
Maximum Operating Inlet Pressure	360 PSIG	
Available Options	Seal wire to indicate unapproved tampering Special Order: Internal Silencer	

VALVE BODY SIZE (INCHES)

Inlet	Outlet	ANSI 150 Flanged	Orifice Diameter	Wide Open Flow Coefficient (KG-Factor)
2"	2"	X	2"	KG 1750
3"	3"	X	3"	KG 3700
4"	4"	X	4"	KG 6000

*Note ANSI 300 Flanges available as special order.

MODEL DESIGNATIONS

R	B	E	4	7	X	X	Size	X	X	Options
					1					Pilot TF 511
					2					Pilot TF 512
					3					Pilot TF 513
						0				Without safety device
						1				Over-pressure shut-off
						2				Over & Under pressure shut-off
								2"		2" Orifice
								3"		3" Orifice
								4"		4" Orifice
									S	With Built-in Silencer

CORRECTION FACTORS FOR NON-NATURAL GAS APPLICATIONS

The RB4700 may be used to control gases other than natural gas. To determine the capacity for gases other than natural gas, multiply the values within the capacity tables by a correction factor. The table below lists the correction factors for some of the more common gases:

Gas Type	Specific Gravity	Correction Factor (CF)
Air	1.00	0.77
Butane	2.01	0.55
Carbon Dioxide (Dry)	1.52	0.63
Carbon Monoxide (Dry)	0.97	0.79
Natural Gas	0.60	1.00
Nitrogen	0.97	0.79
Propane	1.53	0.63
Propane-Air-Mix	1.20	0.71

*Note The RB4700 is suitable for 100% Hydrogen gas up to 60psi inlet pressure. All pressures above 60psi the RB4700 can handle a 20% hydrogen blend.

To calculate the correction factor for gases not listed in the table above, use the gases' specific gravity and insert it in the formula listed below:

$$\text{Correction Factor (CF)} = \sqrt{\frac{SG_1}{SG_2}}$$

Where:

SG_1 = Specific gravity of the gas in which the capacity is published.

SG_2 = Specific gravity of the gas to be controlled.

Wide Open Flow Calculations

For wide-open orifice flow calculations use the following equations:

$$\text{For } \frac{P_1}{P_2} < 1.89 \quad \text{use: } Q = K\sqrt{P_2(P_1 - P_2)} \quad \text{For } \frac{P_1}{P_2} > 1.89 \quad \text{use: } Q = \frac{KP_1}{2}$$

Where:

P_1 = Absolute Inlet Pressure (PSIA)

Q = Flow Rate (SCFH)

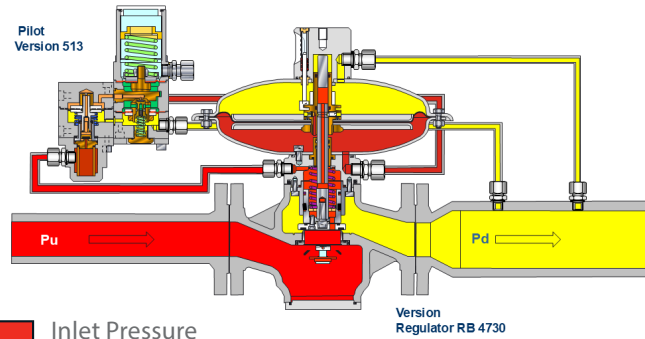
P_2 = Absolute Outlet Pressure (PSIA)

K = Orifice Coefficient (SCFH/PSI)

PILOT SYSTEM

RB 4700 regulators are equipped with a TF 500 series pilot system, as follows:

TF5	1	X	Options
		1	Low pressure .07-4psi
		2	Medium pressure 1.45-14.5psi
		3	High pressure 3.5-189psi



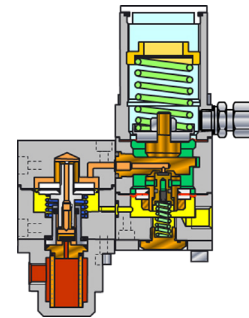
- Inlet Pressure
- Outlet Pressure
- Medium Pressure
- Motorization Pressure
- Atmosphere

Spring characteristics:

d: wire diameter Lo: height
De: external diameter

Pilot Outlet Pressure Range

Pilot Type	Spring #	D (mm)	De (in)	Lo (in)	Spring Range
TF 511	20565125	2.5	1.4"	6	2" – 10" w.c.
TF 511	20565126	3	1.4"	6	8" – 1psi
TF 511	20565127	3.5	1.4"	6	16" – 2.0psi
TF 511	20565128	4	1.4"	6	1psi – 4psi
TF 512	20565128	4	1.4"	6	1.4psi – 8.5psi
TF 512	20565129	4.5	1.4"	6	3psi – 14.5psi
TF 513	20565132	3.5	1.4"	6.5	3.5psi 18.5psi-
TF 513	20565133	4	1.4"	6.5	7psi – 36psi
TF 513	20565131	5	1.4"	6.5	22psi – 80psi
TF 513	20565134	6	1.4"	6.5	58psi – 189psi

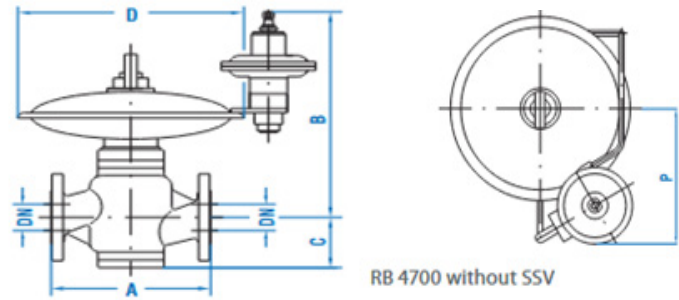


- Inlet Pressure
- Outlet Pressure
- Feeding Pressure (from pre-pilot)
- Motorization Pressure

The TF 500 series pilot system includes a built-in pre-regulator which is loaded by the outlet pressure to provide the pilot with a feeding pressure 7.25psi above outlet pressure. The pre-regulator is fitted with a separate filter.

RB4700 OVERALL DIMENSIONS (INCHES)

Size	Actuator	A	B	C	D	P	Weight (lbs)
2"		10"	15"	4"	14"	10.5"	70.5
3"	TF511	12"	17"	5"	19"	13"	136.5
	TF512 or TF513				14"	10.5"	136.5
4"		14"	18"	5.5"	14"	13"	192



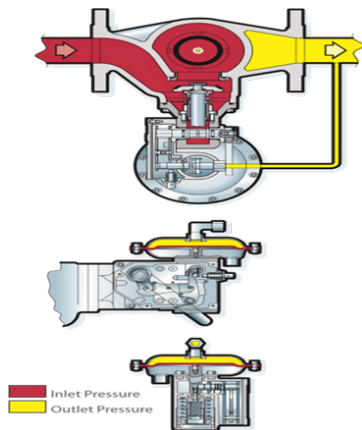
The RB4700 series regulators can be fitted with the SSV 8600 safety shut-off valve for overpressure (opso) or combined under-and-over pressure (Opco/Upso) protection.

The SSV trip pressure can easily be adjusted independently of regulator set point. The following accessories make the SSV 8600 easier to use:

- » Manual shut-off button for emergency losing
- » Easily accessible lever for relatching the valve
- » Built-in bypass for balancing pressure before relatching the safety shut-off valve. Use the relatching lever to operate the bypass

OPERATIONAL DIAGRAM

SSV 8600 SAFETY SHUT-OFF VALVE



Type Designation and Options

SSV 86	X	X	Versions
	1		∅ 150
	2		∅ 150/TR
	3		∅ 90
	4		∅ 90/TR
		1	OPSO
		2	OPSO + UPSO

Minimum difference between regulator and SSV settings (ΔP_w):

- » 15%, with a minimum difference of 4iwc for UPSO and 8iwc for OPSO.

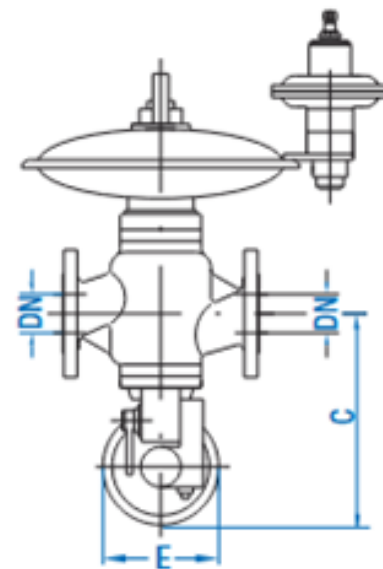
SAFETY SHUT-OFF VALVE - OVERALL DIMENSIONS (INCHES)

SSV 8600

Valve Body Size	E	C	E	C	Additional Weight (lbs)
Actuator	∅ 150		∅ 90		
2"	6"	11"	3.5"	10"	15.5 lbs
3"	6"	13"	3.5"	12"	20 lbs
4"	6"	13"	3.5"	12"	22 lbs

SSV 8500

Valve Body Size	E	Additional Weight (lbs)
2"	10.5"	11 lbs
3"	10.5"	11 lbs



SSV 8600 Over Pressure Shut-off Set Ranges

Part #	Spring Characteristic				Color	8611/12 (150)	8621/ 22 (150TR)	8631/32 (90)	8641 /42 (90TR)
	d (in)	De (in)	Lo (in)	Lt		(psi)	(psi)	(psi)	(psi)
20565233	.087"	1.4"	2.35"	7	Yellow	11" – 26"	-	-	-
20565234	.09"	1.4"	2.35"	7	Red	.65 – 1.45#	-	-	-
20565330	.11"	1.4"	2.35"	7	White	1.15 -2.0#	-	-	-
20565331	.12"	1.4"	2.35"	7	Blue	1.45 – 3.5#	-	8.5 – 13#	-
20565332	.14"	1.4"	2.35"	7	Orange	2.75 – 5.0#	8 – 13#	13 - 20#	-
20565333	.16"	1.4"	2.35"	7	Brown	5.0 – 10#	13 – 25#	20 – 35#	33 – 60#
20565334	.16"	1.4"	2.35"	7	Green	6.5 – 11.5#	22 – 29#	29 – 45#	45 – 72#
20565430	.18"	1.4"	2.35"	7	Black	8.5 – 14.5#	25 – 33#	36 – 56#	55 – 87#
20565431	.18"	1.4"	2.35"	7	Grey	13.5 – 19#	33 – 44#	56 – 67#	83 – 109#
20565432	.21"	1.4"	2.35"	7	Yellow	-	-	67 – 91#	109 – 145#
20565134	.24"	1.4"	2.35"	7	Red	-	-	91 – 156#	145 – 290#

Spring characteristics:

d: wire diameter Lo: height
De: external diameter Lt: no. of spires

Under Pressure Shut-off Springs (UPS0)

Part #	Spring Characteristic				Color	8611/12 (150)	8621/ 22 (150TR)	8631/32 (90)	8641/ 42 (90TR)
	d (in)	De (in)	Lo (in)	Lt		(psi)	(psi)	(psi)	(psi)
20561124	.05"	.6"	1.5"	10	White	2 – 7iwc	-	-	-
20561221	.06"	.6"	1.5"	10	Blue	4 – 22iwc	-	-	-
20561222	.07"	.6"	1.5"	10	Orange	.4 -1#	1.5 – 4#	3.3 – 5.3#	4.5 – 9#
20561223	.08"	.6"	1.5"	10	Brown	.8 – 2#	2.3 – 7#	3.5 – 9.5#	6 – 16#
20561224	.10"	.6"	1.5"	10	Green	1.45 – 3.5#	3 – 10.5#	4.5 – 14.5#	8.5 – 32#

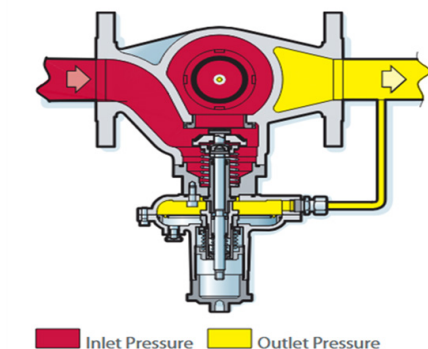
The RB 4700 Series regulators can be fitted with the SSV 8500 safety shut-off valve for overpressure (OPSO) or combined under-and-over pressure (UPS0/OPSO) protection. The SSV trip pressure can easily be adjusted independently of the regulator set point. The closing plug of the SSV controller is used as pulling tool to relatch the valve. A built-in bypass, for balancing pressure before relatching the safety shut-off valve, is operated by pulling the valve stem.

Minimum difference between regulator and SSV settings (ΔP_w):

Regulator set point (SP)	OPCO set point	UPS0 set point
4iwc - 12iwc	SP + 8iwc	SP - 4iwc
13iwc - 1.5psi	SP + 8iwc	SP - 8iwc
1.6psi - 4psi	SP + 14iwc	SP - 14iwc
4.1psi - 190psi	120% SP	80% SP

SP: Set point outlet pressure
OPSO: Over-pressure shut off
UPS0: Under-pressure shut off

Operational Diagram



Type Designation and Options

SSV 85	X	X	Versions
	1		∅ 150
	2		∅ 90
	3		∅ 90/TR
		1	OPSO
		2	OPSO + UPS0

Maximum Inlet Pressure

For higher inlet pressure, the SSV 8500 is fitted with heavier closing spring which gives a positive lock-up even in case of high-pressure differential across the valve. The following table indicates the maximum inlet pressure for both options.

Size	2"	3"
Standard	85 psi	85 psi
Heavy Duty	230 psi	85 psi

SSV 8500 Over Pressure Shut-off Set Ranges

Part #	Spring Characteristic				8511/12 (150)	8521/ 22 (90)	8531/32 (90TR)
	d (in)	De (in)	Lo (in)	Lt	(psi)	(psi)	(psi)
20565225	.08"	1.4"	2"	6	10" – 20"	2 - 3.5#	-
20565125	.09"	1.4"	2"	6	.64 – 1.75#	3 – 6.5#	-
20565126	.11"	1.4"	2"	6	1.40 -3.0#	6 – 13#	-
20565127	.13"	1.4"	2"	6	3# – 5#	12 – 26#	18 – 44#
20565128	.16"	1.4"	2"	6	-	19 – 32.5#	33 - 61#
20565129	.18"	1.4"	2"	6	-	33 – 45.5#	52 – 81#

Spring characteristics:

d: wire diameter Lo: height
De: external diameter Lt: no. of spires

Under Pressure Shut-off Springs (UPS0)

Part #	Spring Characteristic				8511/12 (150)	8521/ 22 (90)	8531/32 (90TR)
	d (in)	De (in)	Lo (in)	Lt	(psi)	(psi)	(psi)
20561022	.04"	.6"	1.4"	7.75	4" – 7"	.87 – 1.45#	-
20560815	.05"	.6"	1.4"	8	5" – 12"	1.45 – 3.5#	2 – 5.8#
20561023	.06"	.6"	1.4"	7.75	11" -24"	1.45 – 4.7#	4.3 – 8.5#
20561024	.07"	.6"	1.4"	7.5	24" – 1.4#	4.3 – 10#	8.4 – 18#
20561121	.08"	.6"	1.4"	7.25	-	8.5 – 16#	17 - 24#
20561122	.09"	.6"	1.4"	7.25	-	-	15.5 – 36#

RB4700 FLOW CAPACITIES

Inlet (PSI)	RB4700 2" Valve Body - capacities in 1000 (SCFH)									
	Outlet Pressure (PSI)									
	7" w.c.	14" w.c.	2psi	5psi	15psi	30psi	60psi	85psi	145psi	190psi
2	37.9	36.8	-	-	-	-	-	-	-	-
5	43.4	42.6	40	-	-	-	-	-	-	-
10	52.6	52.2	61.2	54.3	-	-	-	-	-	-
15	61.8	61.9	82.4	55.1	-	-	-	-	-	-
20	71	71.6	90.5	67.4	56.1	-	-	-	-	-
30	92.7	92.8	92.1	92.1	87.5	-	-	-	-	-
40	114.4	114	93.7	116.8	118.9	83.4	-	-	-	-
50	136.1	135.2	95.3	132.5	136.5	117.4	-	-	-	-
60	154.5	154.3	154.1	154.1	154.1	151.4	-	-	-	-
70	185.4	185.1	185.1	185.1	185.1	185.4	138.1	-	-	-
85	247.2	247.2	247.1	247.1	247.1	247	239.3	163.5	-	-
100	309	309	309	309	309	308	299.9	224.6	-	-
145	339.9	339.9	339.9	339.9	339.9	339.9	339.9	327	-	-
175	401.7	401.7	401.7	401.7	401.7	401.7	401.7	401.7	289.8	-
230	525.3	525.3	525.3	525.3	525.3	525.3	525.3	525.3	502	400.5
360	803.4	803.4	803.4	803.4	803.4	803.4	803.4	803.41	803.4	801

Inlet (PSI)	RB4700 3" Valve Body - capacities in 1000 (SCFH)									
	Outlet Pressure (PSI)									
	7" w.c.	14" w.c.	2psi	5psi	15psi	30psi	60psi	85psi	145psi	190psi
2	82.6	80.8	-	-	-	-	-	-	-	-
5	90.4	88.5	85.5	-	-	-	-	-	-	-
10	103.4	101.3	97.4	94.2	-	-	-	-	-	-
15	131.2	131	130.5	128.5	-	-	-	-	-	-
20	159	160.7	162.8	163.4	161.5	-	-	-	-	-
30	195.9	195.4	194.5	194.3	184.7	-	-	-	-	-
40	232.8	230.1	226.2	225.2	207.9	205.5	-	-	-	-
50	269.7	264.8	256.9	255.1	231.1	229.3	-	-	-	-
60	326.6	326.4	326.1	326.1	326.1	320	-	-	-	-
70	391.9	391.5	391.3	391.1	391	391	-	-	-	-
85	522.6	522.5	522.4	522.1	522	521.1	506	-	-	-
100	652.5	652.4	652.3	652.2	652.1	651.1	636.5	636.5	-	-
145	718.6	718.6	718.6	718.6	718.6	718.6	718.6	691.4	-	-
175	849.3	849.3	849.3	849.3	849.3	849.3	849.3	846.8	612.8	-
230	1110.6	1110.6	1110.6	1110.6	1110.6	1110.6	1110.6	1110.6	1061.5	846.8
360	1698.6	1698.6	1698.6	1698.6	1698.6	1698.6	1698.6	1698.6	1698.6	1693.5

Inlet (PSI)	RB4700 4" Valve Body - capacities in 1000 (SCFH)									
	Outlet Pressure (PSI)									
	7" w.c.	14" w.c.	2psi	5psi	15psi	30psi	60psi	85psi	145psi	190psi
2	85.5	82.4	-	-	-	-	-	-	-	-
5	90.6	90.1	138.4	-	-	-	-	-	-	-
10	100.1	99.2	98.9	98.1	-	-	-	-	-	-
15	211.5	211.2	209.5	182.1	-	-	-	-	-	-
20	246.9	246.8	245.3	226.9	220.1	-	-	-	-	-
30	317.8	317.5	317.1	316.5	299.2	-	-	-	-	-
40	388.7	388.2	387.6	386.2	378.3	330.1	-	-	-	-
50	459.2	458.8	458.4	457.6	453.35	424.5	-	-	-	-
60	529.7	529.5	529.2	529	528.4	519	-	-	-	-
70	635.6	635.5	635.1	634.9	634.5	634.5	473.7	-	-	-
85	847.5	847.4	847.3	847.2	847.1	847.1	820.6	-	-	-
100	1059.4	1059.3	1059.2	1059.1	1059	1059	1048.6	-	-	-
145	1165.3	1165.3	1165.3	1165.3	1165.3	1165.3	1165.3	1121.2	-	-
175	1377.2	1377.2	1377.2	1377.2	1377.2	1377.2	1377.2	1373.1	993.8	-
230	1801	1801	1801	1801	1801	1801	1801	1801	1721.3	1373.1
360	2754.5	2754.5	2754.5	2754.5	2754.5	2754.5	2754.5	2754.5	2754.5	2746.3

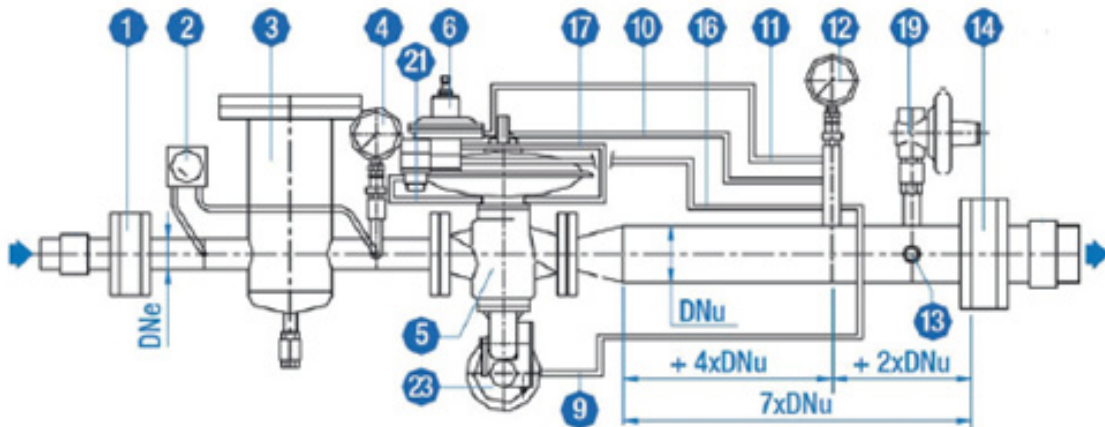
INSTALLATION

- | | |
|---|--|
| 1 Upstream valve | 12 Downstream pressure gauge |
| 2 Differential pressure gauge | 13 Valved Bleed Line |
| 3 Strainer/Filter | 14 Downstream valve |
| 4 Upstream pressure gauge | 15 Pilot feeder sensing line Downstream Pd |
| 5 Regulator | 16 Pilot Sense Line |
| 6 Pilot | 17 Motorization pressure line |
| 7 Pressure gauge
(only with monitor installation) | 18 Inlet pressure sensing line |
| 8 Monitor Regulator
(only with monitor installation) | 19 Relief valve |
| 9 Shut-off valve sensing line (SSV)
Downstream Pd | 20 Inlet Pressure sense line to Pilot(s) |
| 10 Regulator sensing line Downstream Pd | 21 Monitor Pilot |
| 11 Pilot sensing line (TF511/512) | 22 Slam Shut (OPSO/UPSO) |

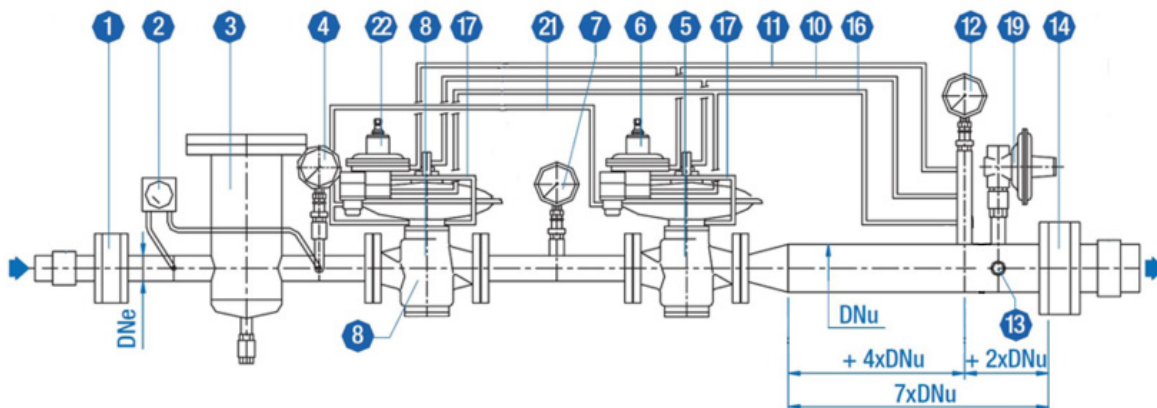
Information to be specified when ordering:

- » Regulator type code
- » SSV type
- » Minimum and maximum inlet pressures
- » Outlet pressure range setting
- » Outlet pressure setting
- » Connection type
- » Options
 - » OPSO setting*
 - » UPSO setting*

*(if requested)



RB47xx typical installation with safety shut-off valve SSV86xx



VENT LINES FOR REGULATORS

When constructing vent lines to be attached to regulators installed indoors, follow a few basic rules:

- A. Never use pipe sizes smaller than the vent size; smaller pipe sizes restrict the gas flow. If a long gas run must be used, Roots advises increasing the pipe one nominal size every ten feet to keep the flow restriction as low as possible.
- B. Keep the vent line length as short as possible to minimize the restriction and reduce the vent's tendency to cause regulator pulsation.
- C. Support the vent pipe to eliminate strain on the regulator diaphragm case.
- D. Always point outdoor vent pipes in the downward position to reduce the possibility of rain, snow, sleet, and other moisture entering the pipe. Install a bug screen in the end of the pipe.
- E. Do not locate the vent line terminus near windows, fans, or other ventilation equipment. See the installation instructions furnished with the regulator.
- F. Adhere to all applicable codes and regulations.
- G. If your vent pipe causes regulator pulsation, consult your sales representative or manufacturer.
- H. Roots strongly recommends running a separate vent line for each regulator. Headers with various installed devices can cause regulator malfunction.

Caution Ensure the end of the vent line is away from ANY potential ignition sources. It is the installer's responsibility to ensure the vent line is exhausting to a safe environment.

INSTALLATION

- **Warning** Roots does not endorse or warrant the completeness or accuracy of any third party regulator installation procedures or practices, unless otherwise provided in writing by Roots. Follow your company's standard operating procedures regarding the use of personal protection equipment (PPE). Adhere to guidelines issued by your company in addition to those given in this document when installing regulators. Remove all shipping plugs from the inlet, outlet, and vent of any ROOTS Regulator before installation.
- Keep the piping interior (inner diameter), ROOTS Regulator inlet, and regulator outlet free of dirt, chemical sealant (pipe dope), Teflon tape, or other debris. Materials in piping or ROOTS Regulator inlet or outlet creating a loss of pressure control.
- Gas must flow through the ROOTS Regulator valve body in the same direction as the arrow on the regulator body. Gas flowing in the wrong direction may cause an over-pressure condition and damage the Root Regulator.
- Apply a gas resistant pipe joint sealant on the male (exterior) pipe threads. Do not use any type of Teflon tape on ROOTS Regulator installations. Do not apply pipe joint sealant on the female (interior) pipe threads of the ROOTS Regulator as joint materials could lodge in the regulator creating a loss of pressure control.
- During product installation, do not clamp the valve body in a vice, this may lead to permanent damage rendering a ROOTS Regulator that is not fit for service. During product installation, use of excessive force and unsafe practices can lead to permanent damage rendering a ROOTS Regulator that is not fit for service. It is recommended to not exceed 3 full turns past hand tight into the ROOTS Regulator valve body per SAE standard AS71051. Do not use oversized pipe wrenches and/or "Cheater" bars during the installation of ROOTS Regulators which can damage valve body from an over torque situation..

START-UP PROCEDURE

After the pressure regulator has been installed, verify that:

- The upstream and downstream on/off valves and the discharge vent pipe are all closed
- The pressure of the inlet gas is not higher than the established design value.

After these checks are completed, proceed as follows :

- Partially open the upstream on/off valve slowly, just enough to verify that a very small amount of gas passes.
- Reset the shutoff valve whenever it was set for minimum pressure intervention; it will be closed in the absence of pressure (see Shutoff Device Reset).
- Verify that the pressure rises slowly on the upstream and downstream pressure gauges. The downstream pressure must stabilize around the pre-set set value or a value slightly higher. If the pressure continues to rise, interrupt the starting procedure by closing the upstream on/off valve and consult the trouble-shooting diagram to identify the cause of the malfunction.
- After the upstream pressure value stabilizes, open the upstream on/off valve completely.
- Slowly open the downstream on/off valve until the piping is completely filled.
- At this point, the pressure regulator is operative. You must use the same procedure when installing monitor-equipped pressure regulators connected on line with the active pressure regulator (see Figure 2).

Note The pressure gauge installed in the section between the two regulators must indicate the same pressure value as the upstream gauge.

Pressure Regulator Setting

(See the Principle of Operation Schematic)

The pressure regulator is typically shipped set to the specifications indicated in the order. If you must modify the set pressure, the new setting value must be within the installed spring's setting range.

Begin by reviewing the installed spring specifications to verify the spring is ...

After verification, proceed as follows:

- To increase the value of the set pressure, rotate the spring adjustment ferrule (lock) nut clockwise using the adjustment wrench until the desired value is reached (monitor the reading on the gauge downstream).
- To decrease the value of the set pressure, proceed as above, rotating the spring adjustment ferrule counter-clockwise.

Pressure regulator settings can be changed regardless of whether the pressure regulator is delivering flow or the downstream on/off cock is closed. Be sure to (in the latter case) open the discharge plug (control line intake), downstream of the regulator. Close this valve after the desired set pressure is obtained.

Shutoff Device Setting

Important If you are Changing the shutoff valve setting, the diaphragm chamber must always be under pressure (see the Principal of Operation schematic).

Begin by reviewing the installed spring specifications to verify the spring is capable of the desired setting value. After verification, check the setting of the shutoff unit.

- To reach the maximum downstream pressure, close the ON/OFF valve downstream (see Figure 1) and slowly increase the pressure downstream until you reach the desired maximum intervention pressure.
- To correct the maximum intervention value, rotate the overpressure adjustment spring nut (see the Principle of Operation Schematic) clockwise to increase the set pressure and counter-clockwise to decrease the value.
- To reach the minimum downstream pressure, close the upstream ON/OFF valve (see Figure 1), and slowly discharge the downstream pressure until the desired minimum intervention pressure is reached.
- To correct the minimum downstream pressure, rotate the under pressure adjustment spring nut (see the Principle of Operation Schematic) clockwise to increase the setting value, and counter-clockwise to decrease the value.

Shutoff Device Reset

(Fig.1, 2 & 3)

Important Identify the cause of the device shutoff prior to resetting the shutoff.

To restore normal operating conditions, perform the following operations:

- Close the ON/OFF valve downstream
- Open the valve for the upstream and downstream pressure gauges
 - Downstream pressure = 0 (discharge any residual pressure by opening the discharge vent pipe).
 - Relief valve and discharge valve closed

Check the unit's valve seat seal by opening the discharge valve (test the unit using the bubble system).

- Slowly rotate the reset lever (see the Principle of Operation schematic) clockwise until the internal bypass is opened. Slowly rotating the reset lever permits the outlet chamber, the downstream piping, and the shutoff valve diaphragm chamber to fill. Verify the outlet chamber, the downstream piping, and the shutoff valve filled on the gauge positioned downstream.
- After the pressure on the gauge stabilizes, continue using the reset lever until it can be connected to the control levers. At this point, the reset lever will remain stable in its open position.

After these operations are completed, the shutoff valve is ready for service and the downstream valve can be slowly reopened.

When you are restoring normal operating conditions, the shutoff valve must always be reset whenever the valve is equipped with the minimum downstream pressure intervention function.

SAFETY WARNING

This product, as of the date of manufacture, is designed and tested to conform to all governmental and industry safety standards as they may apply to the manufacturer. The purchaser/user of this product must comply with all fire control, building codes, and other safety regulations governing the application, installation, operation, and general use of this regulator to avoid leaking gas hazards resulting from improper installation, startup or use of this product.

Roots strongly recommends installation by a qualified professional and periodic inspection of pressure regulators (inspections may be required by local applicable codes or regulations).

Inspections should include checking for gas quality, cycle numbers, external environmental changes, and operating conditions that impact wear on the regulator's moving parts. To ensure safe and efficient operation of this product, replace worn or damaged parts found during inspection.



ROOTS Regulators

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