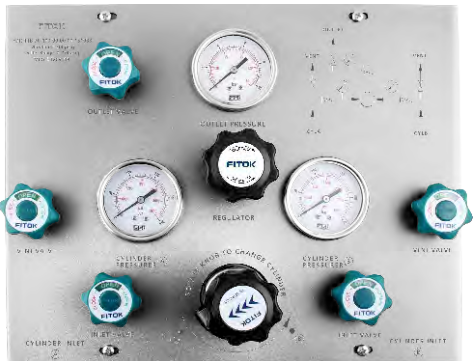


Changeover Systems



Contents

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Manual Changeover Systems

FDR-1 Series

Features

- Two gas sources are connected to the system, when the pressure of one gas source is lower than the switching pressure, manually switch to the other gas source to ensure continuous gas supply.
- With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source.
- With special cleaning and packaging, applicable to oxygen-enriched atmospheres.

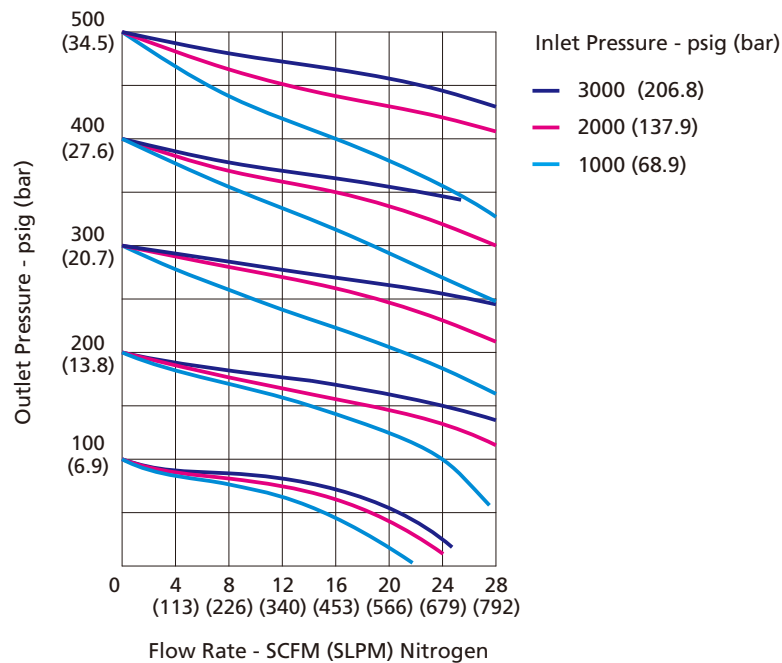


Model: FDR-16L-30-500-00-B-B-01-00-R

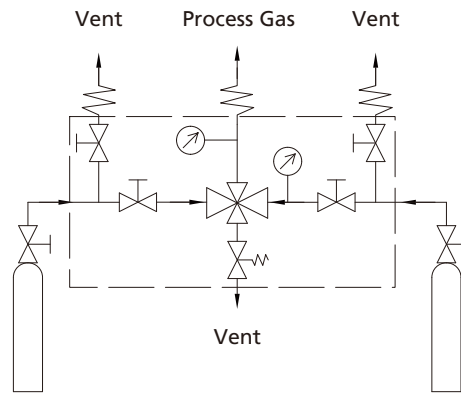
Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Outlet pressure range: 0 ~ 25, 0 ~ 50, 0 ~ 100, 0 ~ 250 or 0 ~ 500 psig
- Material of the main components:
 - Seat: PCTFE (regulator and diaphragm valve)
 - Diaphragm: Hastelloy (regulator), cobalt alloy (diaphragm valve)
 - Diaphragm valve body: 316L SS
 - O-ring: FKM
- Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- Valve leak rates (helium):
 - Internal: $\leq 1 \times 10^{-7}$ std·cm³/s
 - External: $\leq 1 \times 10^{-9}$ std·cm³/s
- Flow coefficient (regulator Cv): 0.06

Typical Flow Chart

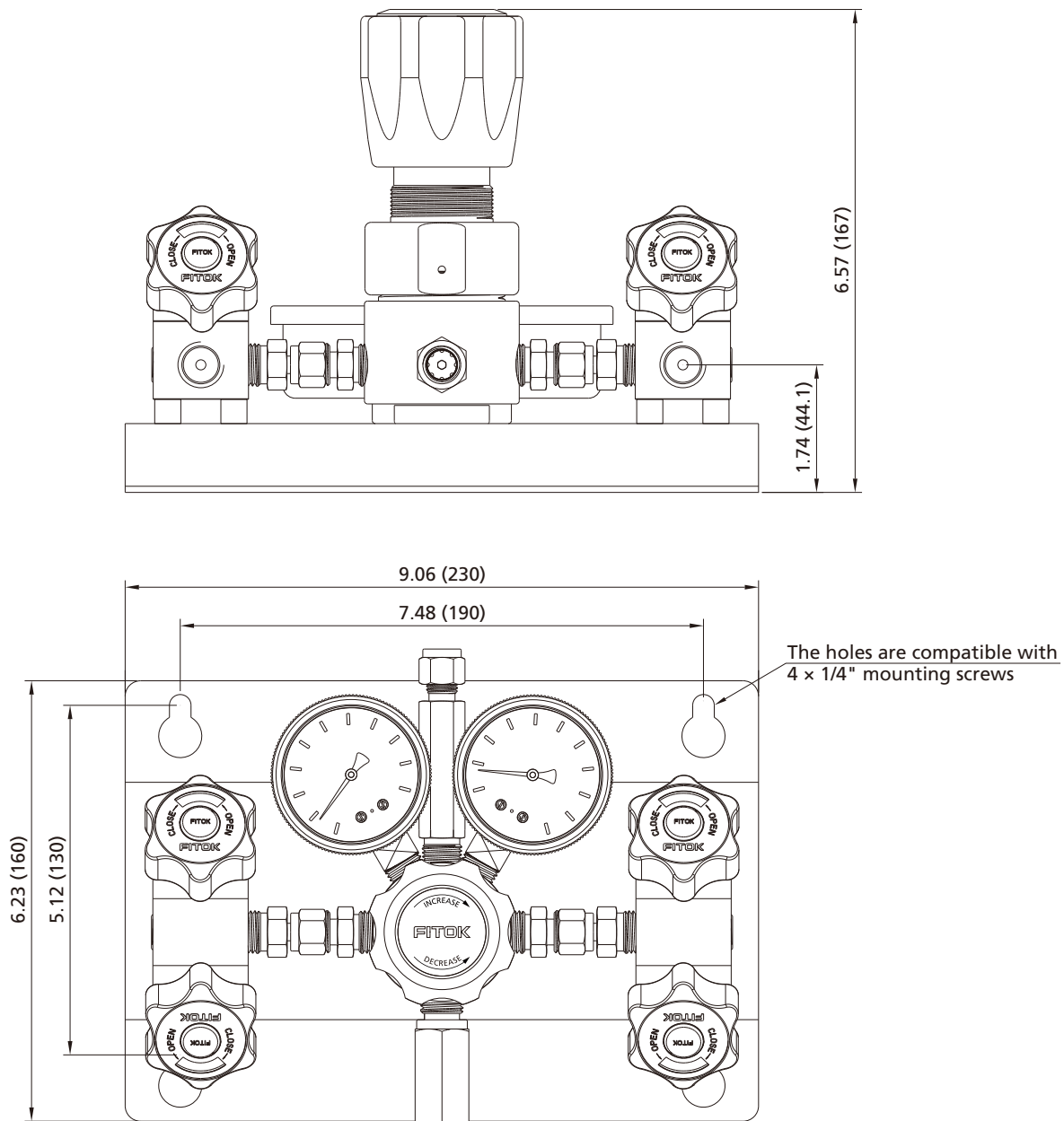


Flow Schematic

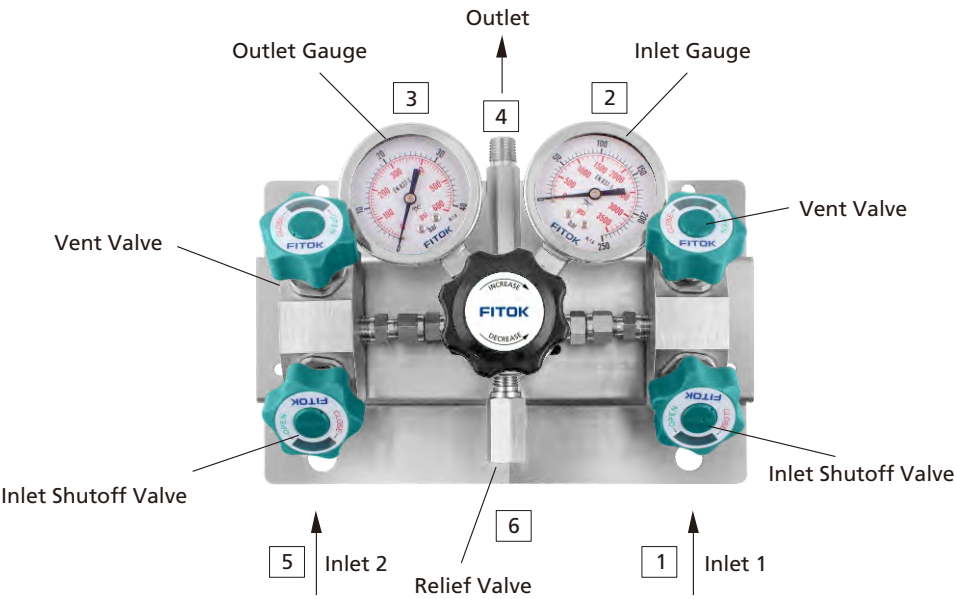


Dimensions

Dimensions, in inches (millimeters), are for reference only.



Components Introduction



Ordering Number Description

FDR - 16L - 30 - 250 - 00 - B - B - 01 - 00 - R

Body Material (Regulator)	
6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)

Inlet Pressure P1	
30	3000 psig
45	4500 psig

Outlet Pressure Range P2	
25	0~25 psig
50	0~50 psig
100	0~100 psig
250	0~250 psig
500	0~500 psig

Connection 1	
00	1/4 Female NPT
01	1/4 Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Connection 2	
B	With Gauge (psi/bar)
M	With Gauge (psi/MPa)
P	Plug
00	1/4 Female NPT

Connection 3	
Same as Connection 2	

Connection 4	
00	1/4 Female NPT
01	1/4 Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Connection 6	
R	Relief Valve
P	Plug
00	1/4 Female NPT

Connection 5	
Same as Connection 1	

- Notes:
1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
 2. Before ordering, please read **User's Guide** on A-13.
 3. When the part number contains "B" or "M", a GC series pressure gauge is configured by default.

Manual Changeover System

FDR-2 Series

Features

- Two gas sources are connected to the system, when the pressure of one gas source is lower than the switching pressure, manually switch to the other gas source to ensure continuous gas supply
- With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source
- With special cleaning and packaging, applicable to oxygen-enriched atmospheres

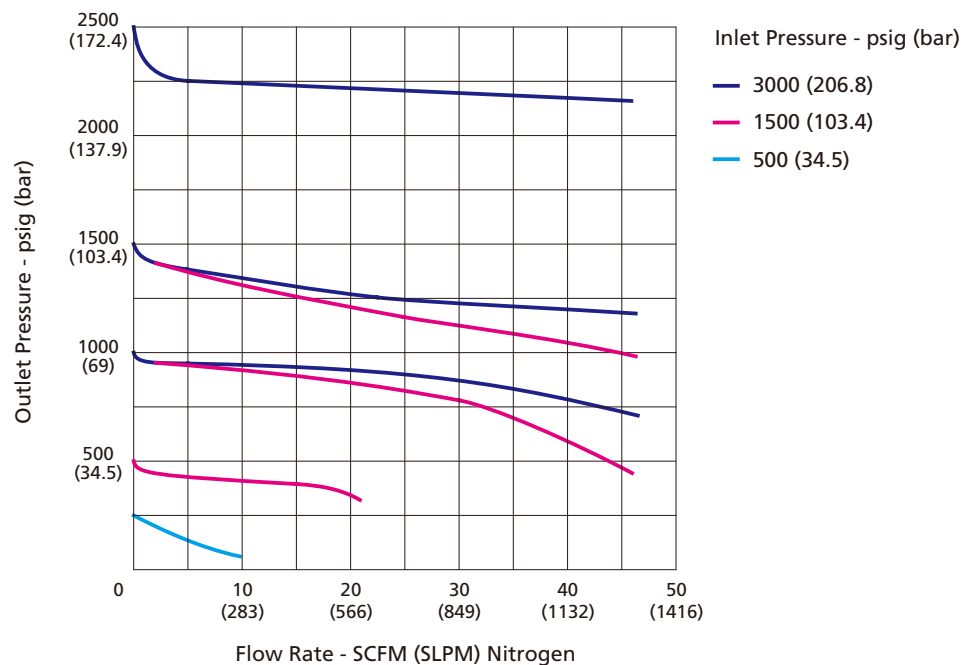


Model: FDR-2VSS-45-2500-00-B-B-01-00

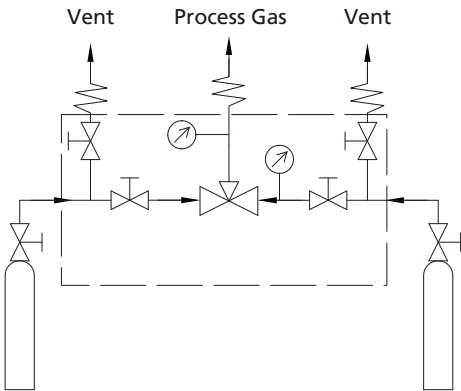
Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Outlet pressure range: 0 ~ 750, 0 ~ 1500 or 0 ~ 2500 psig
- Material of the main components:
 - Seat: PCTFE (regulator and diaphragm valve)
 - Piston: 316L SS
 - Diaphragm: cobalt alloy (diaphragm valve)
 - Diaphragm valve body: 316L SS
 - O-ring: FKM or FFKM
 - Filter: 316L SS
- Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- Leak rates:
 - Internal: Bubble-tight
 - External: Bubble-tight
- Flow coefficient (regulator Cv):
 - Without vent: 0.06
 - Vent: 0.1

Typical Flow Chart

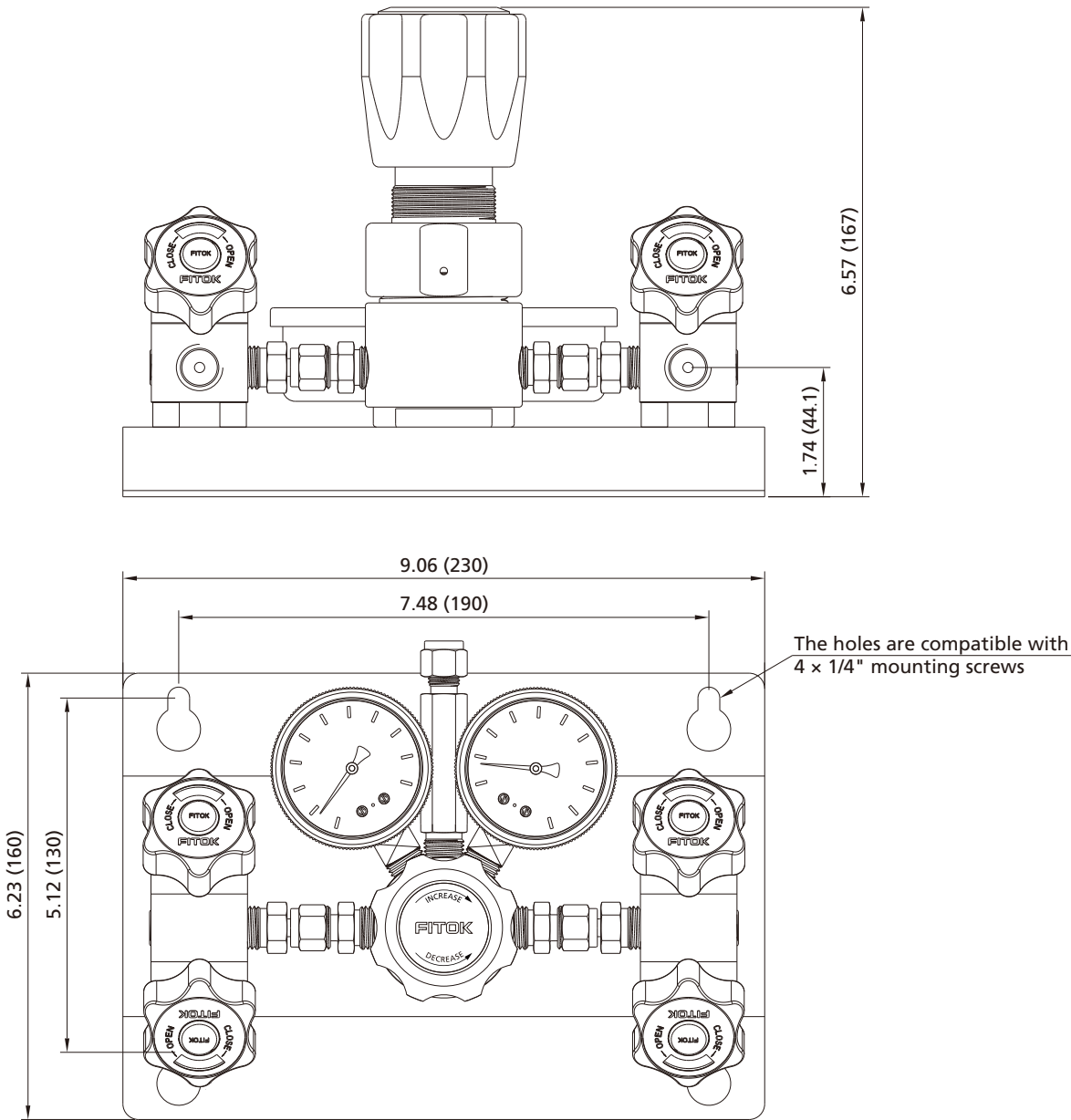


Flow Schematic

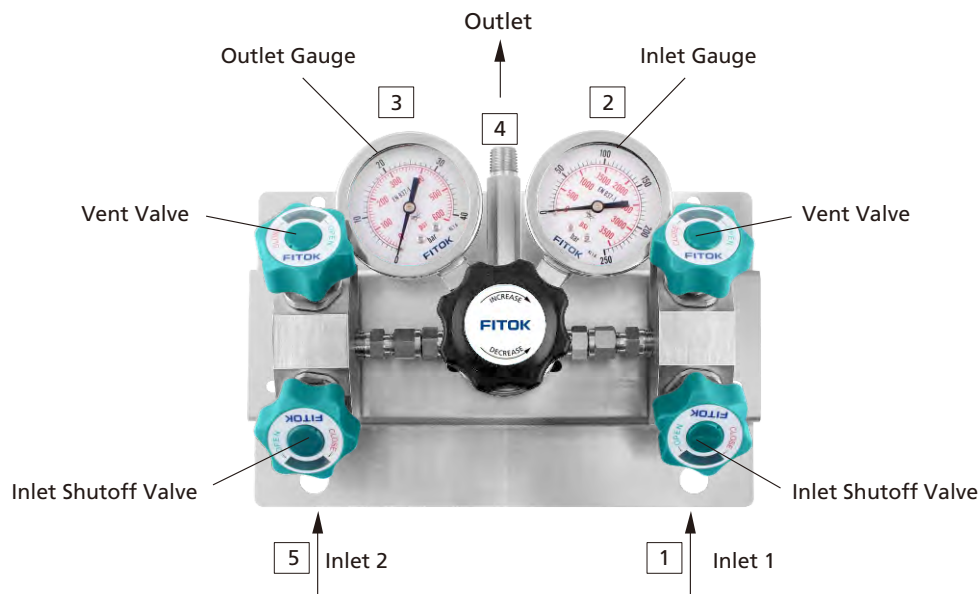


Dimensions

Dimensions, in inches (millimeters), are for reference only.



Components Introduction



Ordering Number Description

FDR - 2V Z 6L - 30 - 750 - 00 - B - B - 01 - 00

Vent Option	Inlet Pressure P1	Connection 1	Connection 2	Connection 4	Connection 5
Without	30 3000 psig	00 1/4 Female NPT	B With Gauge (psi/bar)	00 1/4 Female NPT	Same as Connection 1
V With	45 4500 psig	01 1/4 Male NPT	M With Gauge (psi/MPa)	01 1/4 Male NPT	
O-ring Material	Outlet Pressure Range P2	10 1/4" Tube Fitting	P Plug	10 1/4" Tube Fitting	
FKM	750 0~750 psig	11 3/8" Tube Fitting	00 1/4 Female NPT	11 3/8" Tube Fitting	
Z FFKM	1500 0~1500 psig	20 6 mm Tube Fitting		20 6 mm Tube Fitting	
Body Material (Regulator)	2500 0~2500 psig	21 8 mm Tube Fitting	Connection 3	21 8 mm Tube Fitting	
6L 316L SS		Other connections are available upon request	Same as Connection 2	Other connections are available upon request	
SS 316 SS					
B Brass (Nickel-plated)					

Notes:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number.
Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-13.
3. When the part number contains "B" or "M", a GC series pressure gauge is configured by default.

Automatic Changeover System

CEPR Series

The CEPR series automatic changeover system, suitable for uninterrupted gas supply, uses dual gas sources of main supply cylinder and backup cylinder. When the pressure of one gas source drops below the set pressure, the changeover system will automatically switch from the depleted source to the backup source, thus achieving a continuous gas supply.

Features

- ⦿ Two gas sources are connected to regulators of the automatic changeover system, when the pressure of one gas source is lower than the switching pressure, it will automatically switch to the other gas source to supply gas, thus ensuring continuous gas supply.
- ⦿ Excellent sensitivity and set point pressure stability.

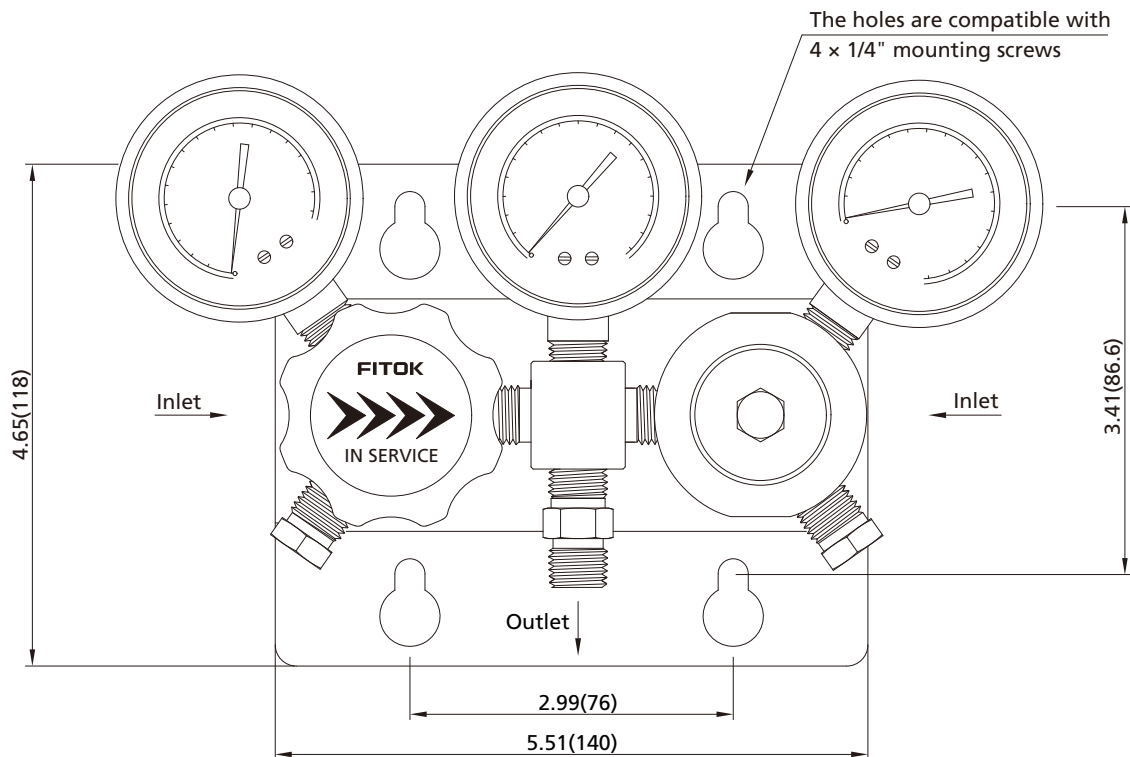
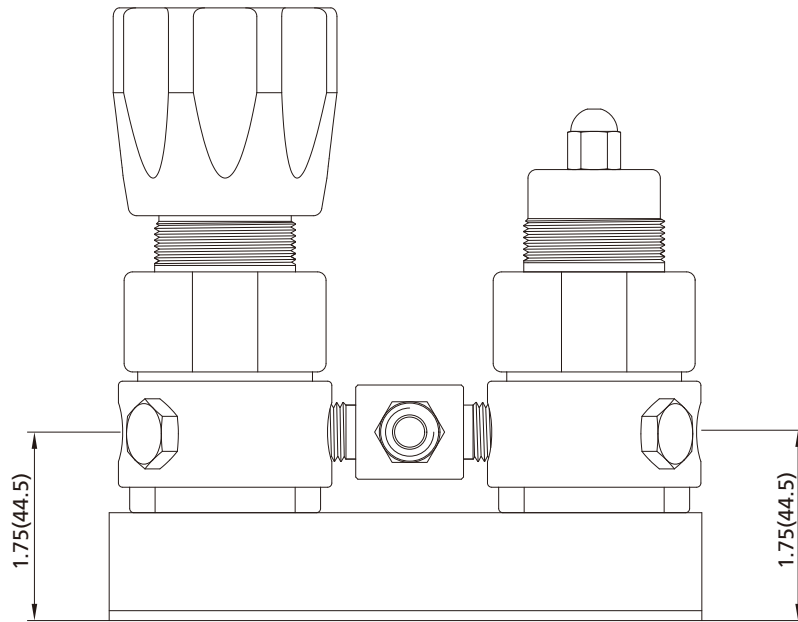
Technical Data

- ⦿ Maximum inlet pressure: 3000 psig
- ⦿ Nominal changeover pressure: 100, 150, 200 and 250 psig
- ⦿ Outlet pressure ranges: 85 ~ 115, 135 ~ 165, 185 ~ 215, 235 ~ 265 psig
- ⦿ Material of the internal components:
 - Seat: PCTFE
 - Diaphragm: Hastelloy
 - Filter: 316L SS
- ⦿ Working Temperature: -40 °F ~ 165 °F (-40 °C ~ 74 °C)
- ⦿ Valve leak rates (helium):
 - Internal: Bubble-tight
 - External: $\leq 2 \times 10^{-8}$ std·cm³/s
- ⦿ Flow coefficient (Cv): 0.06
- ⦿ Weight: ≈ 5.07 lbs (2.3 kg)



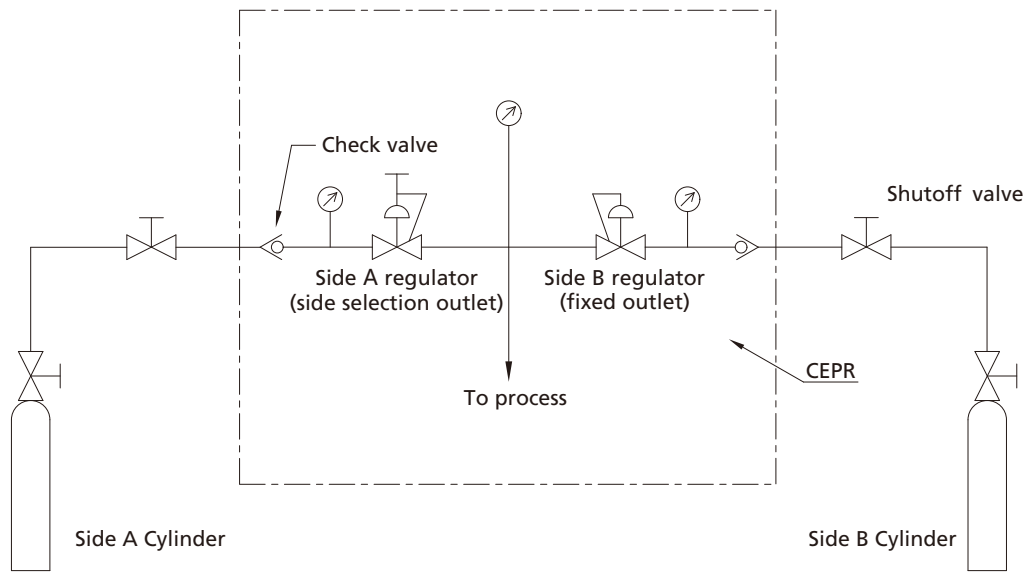
Dimensions

Dimensions, in inches (millimeters), are for reference only.

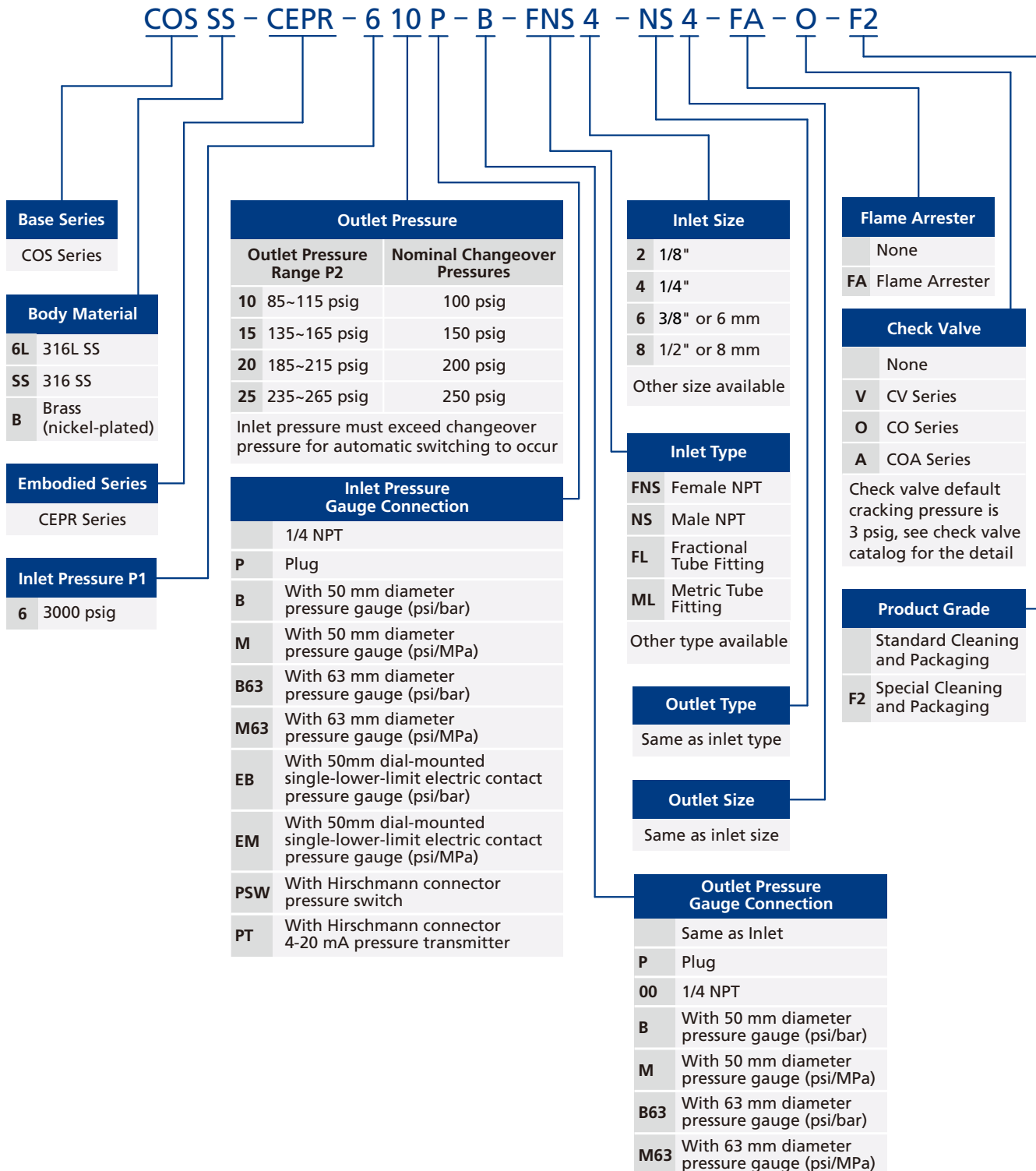


Operation Overview

The CEPR series changeover system consists of two separate regulators. The two regulators are respectively attached to separate source cylinders. One of the regulators has an adjusting handle which can swivel to enable source side selection. The other regulator is preset to an appropriate setting for the system outlet range. The source selection handle adjusts the outlet pressure to be either above or below the preset side within 15 ~ 30 psig. When the handle is turned to point to the standby side, the standby side continues to supply gas due to the change in differential pressure to achieve continuous and uninterrupted gas supply. When one supply drops below the changeover pressure, the selector regulator automatically switches the gas feed from the depleted supply to an alternate supply.



Ordering Number Description



Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- Before ordering, please read **User's Guide** on A-13.
- For EB/EM/PSW/PT/FA options, please consult our engineers with specific application details (medium, pressure, flow rate, temperature) for configuration confirmation.
- When the part number contains "B" or "M", a GC series pressure gauge is configured by default. If the part number contains "B63" or "M63", a GA series pressure gauge is configured by default.

Automatic Changeover Systems

FDR-1L Series

Features

- With CEPR series automatic changeover device
- With vent valves to relieve residual pressure quickly, easy and safe to remove and replace gas source.
- With special cleaning and packaging, applicable to oxygen-enriched atmospheres.

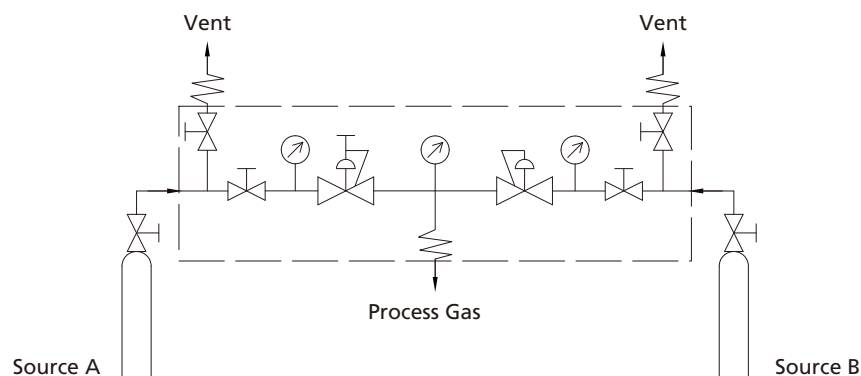


Model: FDR-1L6L-30-10-B-00-00-00

Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Nominal changeover pressure: 100, 150, 200 and 250 psig
- Outlet pressure range: 85 ~ 115, 135 ~ 165, 185 ~ 215 or 235 ~ 265 psig
- Material of the main components:
 - Seat: PCTFE (regulator and diaphragm valve)
 - Diaphragm: Hastelloy (regulator), cobalt alloy (diaphragm valve)
 - Diaphragm valve body: 316L SS
- Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- Valve leak rates (helium):
 - Internal: $\leq 1 \times 10^{-7}$ std·cm³/s
 - External: $\leq 1 \times 10^{-9}$ std·cm³/s
- Flow coefficient (regulator Cv): 0.06
- Weight: ≈ 12.1 lbs (5.5 kg)

Flow Schematic



Operation Overview

The FDR-1L Series Changeover System is mainly comprised of one adjustable outlet pressure regulator together with one fixed outlet pressure regulator.

When the 2 inlets are both open, the one side that the "IN SERVICE" arrow is pointing at by turning the handle would be the 1st source for gas supply.

Fig. 1 When the "In Service" arrow is pointing at side B, side B would be the gas source. At this time, the fixed outlet pressure of side B is higher than the set pressure of side A. Consequently, the diaphragm of side A regulator moves to enable the stem to close the regulator.

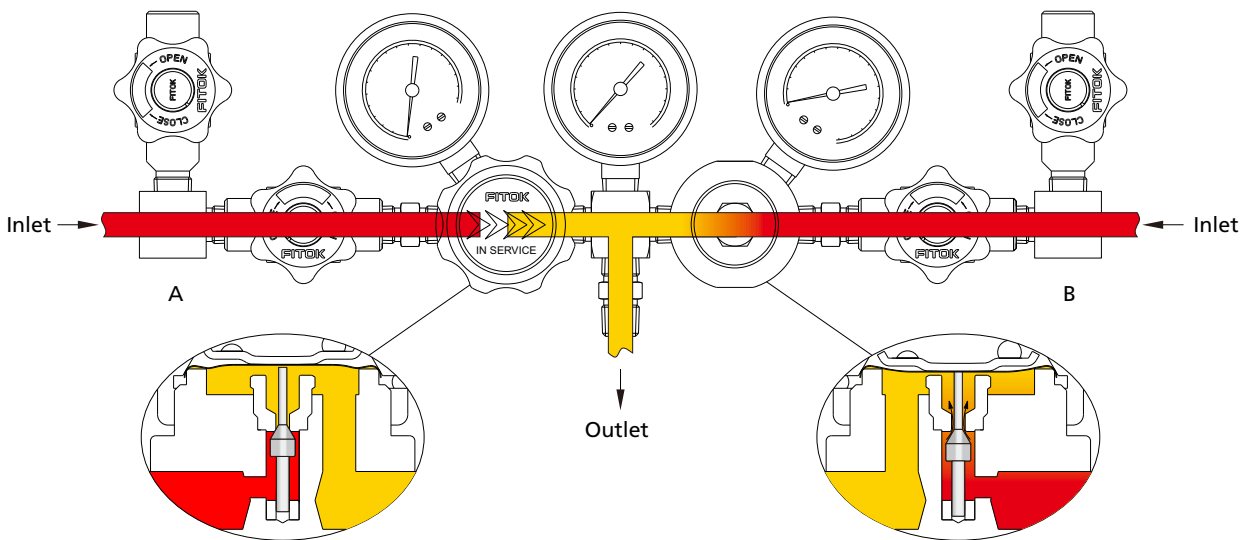


Fig. 1

Fig. 2 If side A is chosen as the gas source, the handle should be turned clockwise until the "IN SERVICE" arrow is pointing at side A. At this time, the set pressure of side A is higher than the fixed outlet pressure of side B. Consequently, the diaphragm of side B regulator moves to enable stem to close the regulator.

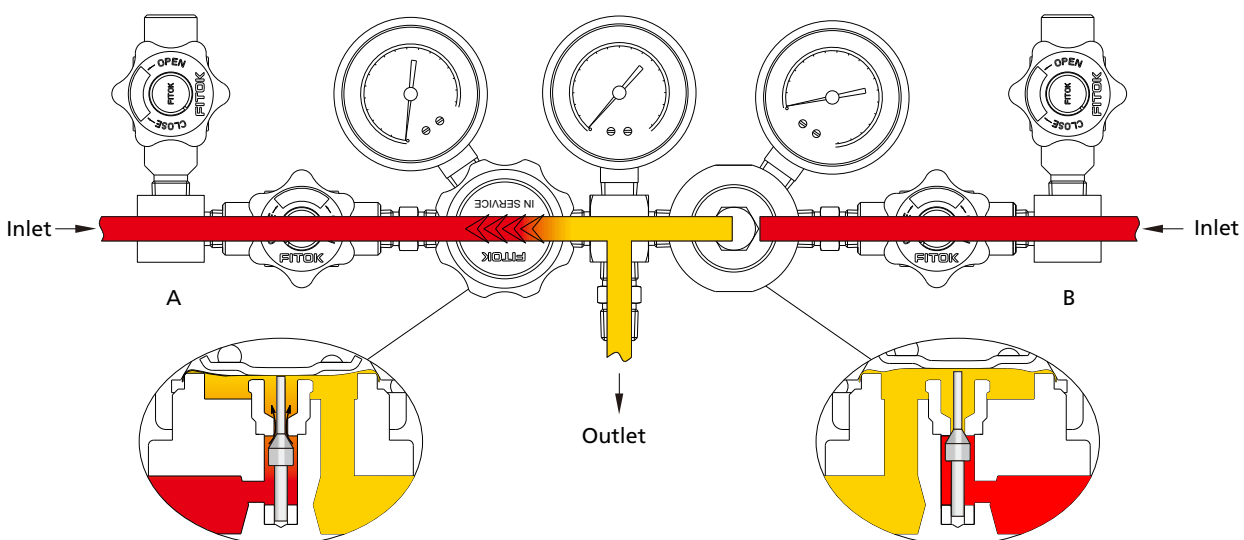


Fig. 2

When gas source of one side is depleted, gas source would automatically change to the other side.

Fig. 1 When "IN SERVICE" arrow is pointing at side B, but gas source of side B is depleted, its outlet pressure shall decrease to be lower than the set pressure of side A. By the force of spring, side A regulator will be opened to begin gas supply as shown in Fig. 3

Gas from side A will flow back into side B. At this time, replace to a new gas source of side B, close the shutoff valve and open the vent valve to exhaust the remaining pressure, then replace to a new gas source. After the replacement, if not rotating the handle, the gas supply will return to the status as of Fig. 1. And if rotating the handle to the status as shown in Fig. 2, the gas supply will be changed to the status as of Fig. 2.

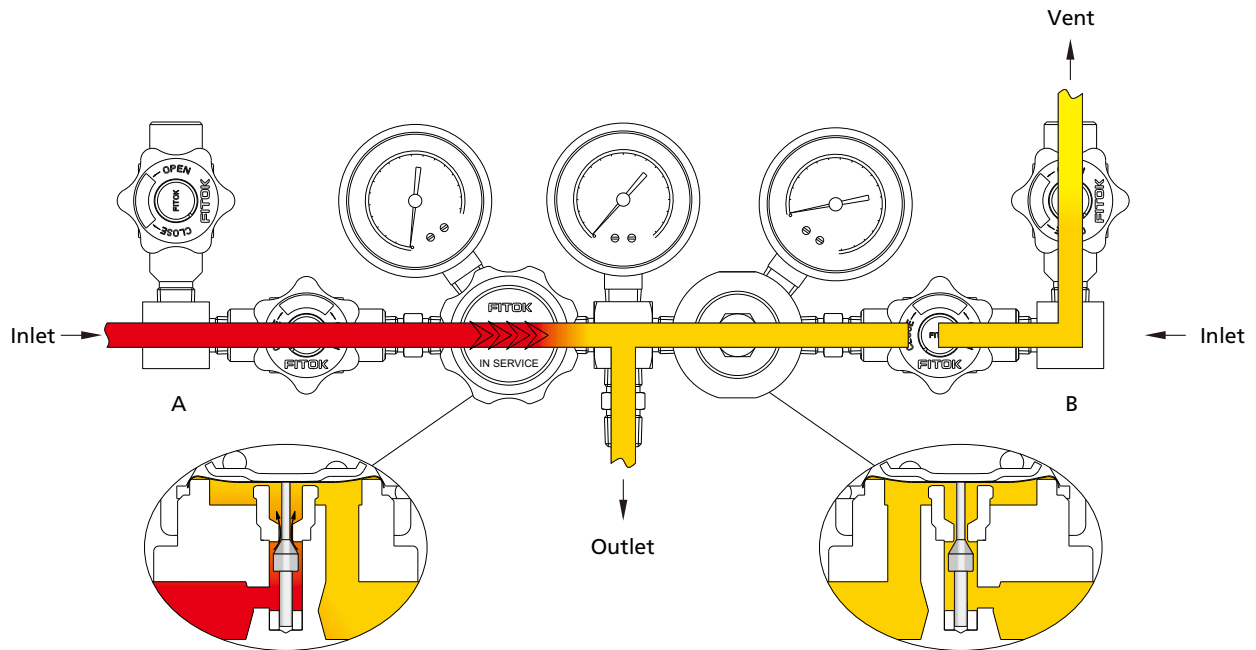
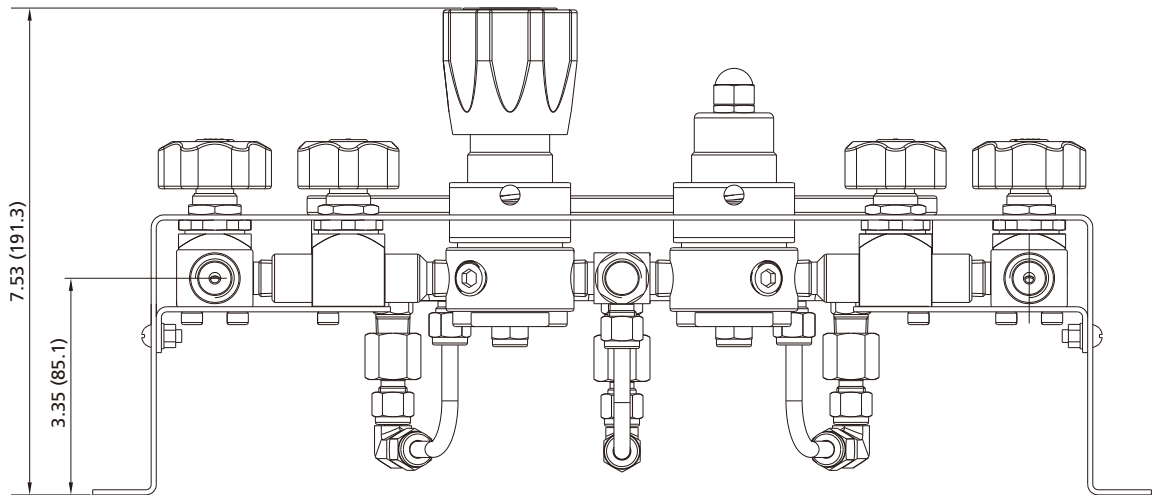
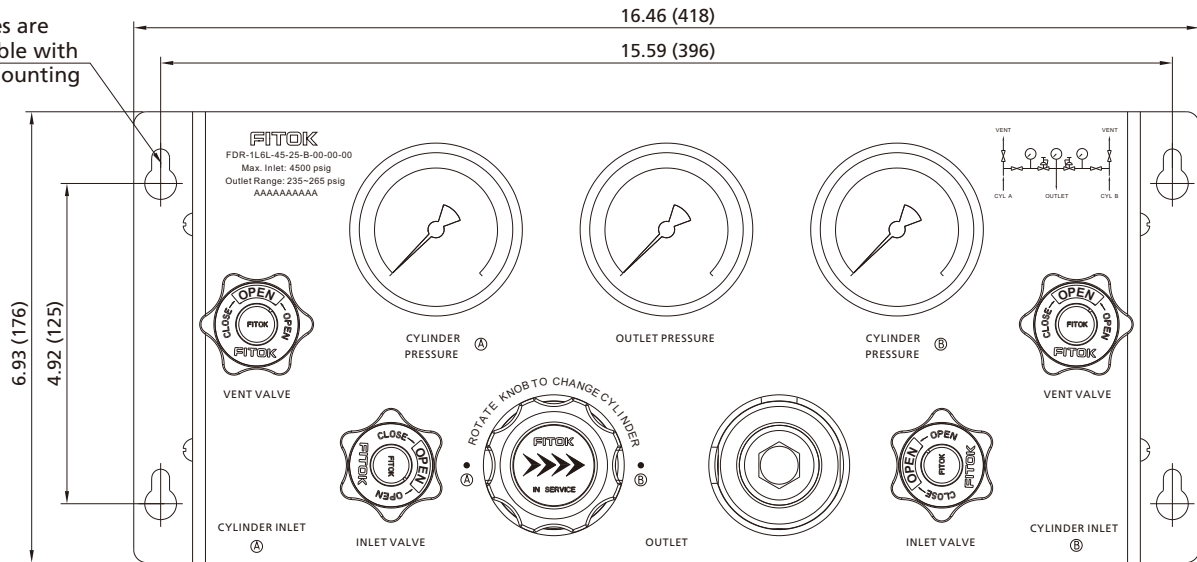


Fig. 3

Dimensions

Dimensions, in inches (millimeters), are for reference only.

The holes are compatible with 4x1/4" mounting screws



Ordering Number Description

FDR - 1L6L - 30 - 20 - B - 10 - 00 - 00

Body Material (Regulator)	
6L	316L SS
SS	316 SS
HC	Hastelloy C-276
B	Brass (Nickel-plated)
Inlet Pressure P1	
30	3000 psig
45	4500 psig

Outlet Pressure		
Outlet Pressure Range P2	Nominal Changeover Pressures	
10	85~115 psig	100 psig
15	135~165 psig	150 psig
20	185~215 psig	200 psig
25	235~265 psig	250 psig

Gauge Scale	
B	With Gauge (psi/bar)
M	With Gauge (psi/MPa)

Inlet A	
00	1/4 Female NPT
01	1/4 Male NPT
10	1/4" Tube Fitting
11	3/8" Tube Fitting
20	6 mm Tube Fitting
21	8 mm Tube Fitting
Other connections are available upon request	

Inlet B	
Same as Inlet A	
Outlet	
Same as Inlet A	

Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- Before ordering, please read **User's Guide** on A-13.
- When the part number contains "B" or "M", a GA series pressure gauge is configured by default.

Automatic Changeover Systems

DPPR Series

The DPPR series automatic changeover system, suitable for uninterrupted gas supply, uses dual gas sources of main supply cylinder and backup cylinder. When the pressure of one gas source drops below the set pressure, the changeover system will automatically switch from the depleted source to the backup source, thus achieving a continuous gas supply.

Features

- Two gas sources are connected to regulators of the automatic changeover system, when the pressure of one gas source is lower than the switching pressure, it will automatically switch to the other gas source to supply gas, thus ensuring continuous gas supply.
- Excellent sensitivity and set point pressure stability.

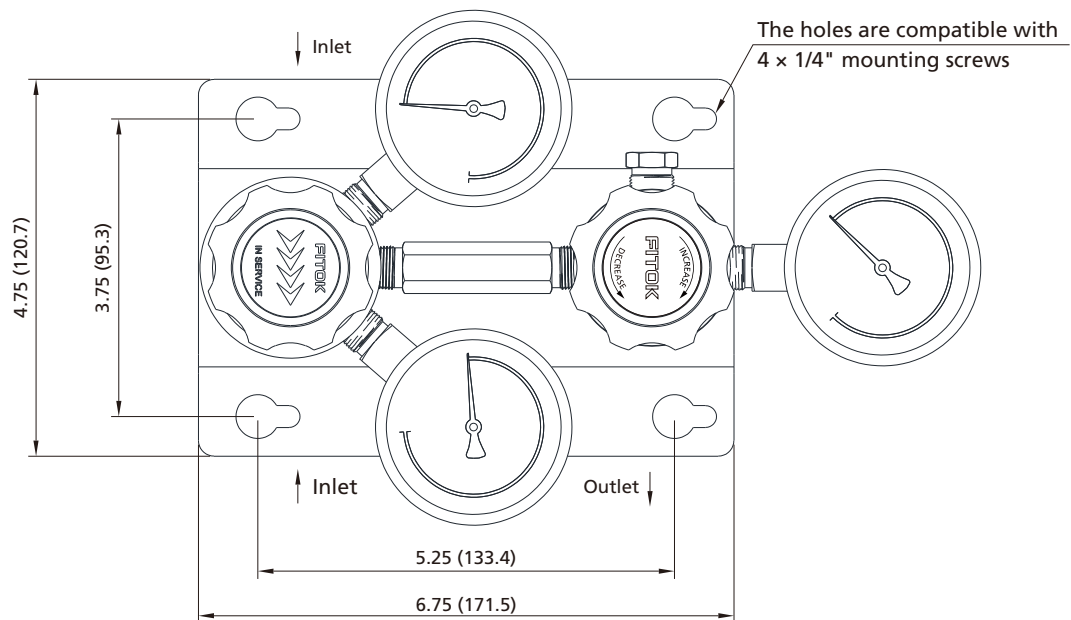
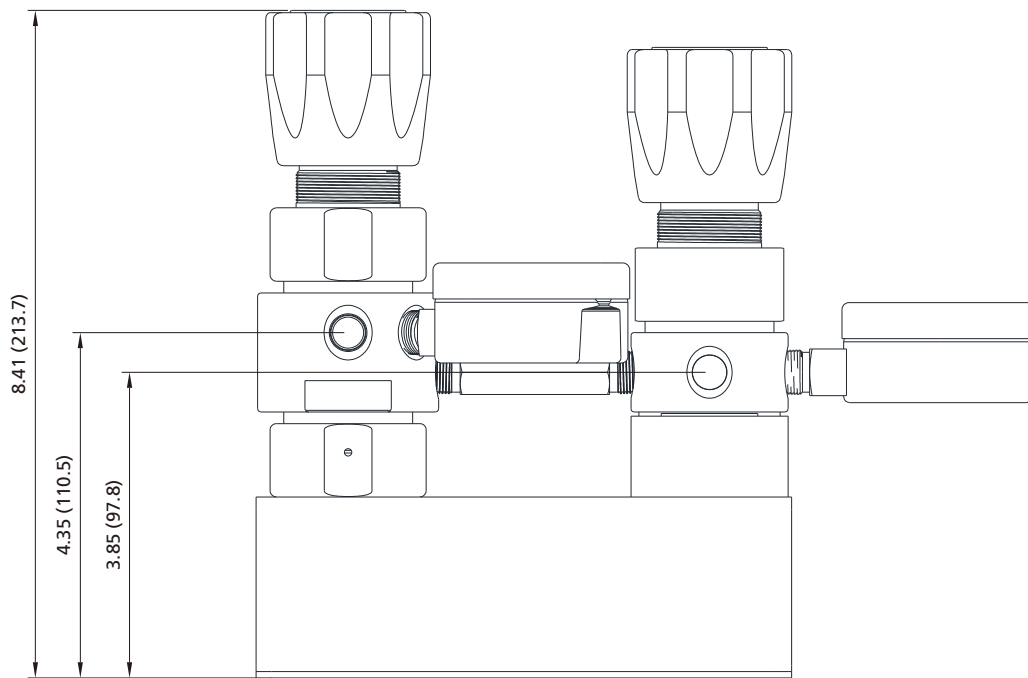
Technical Data

- Maximum inlet pressure: 3000 psig
- Nominal changeover pressures: 250 psig
- Outlet pressure ranges: 0 ~ 25, 0 ~ 50, 0 ~ 100, 0 ~ 150 psig
- Material of the internal components:
 - Seat: PCTFE
 - Diaphragm: Hastelloy
 - Filter: 316L SS
- Temperature: -40 °F ~ 165 °F (-40 °C ~ 74 °C)
- Valve leak rates (helium):
 - Internal: Bubble-tight
 - External: $\leq 2 \times 10^{-8}$ std·cm³/s
- Flow coefficient (Cv): 0.06
- Weight: ≈ 5 lbs (2.3 kg)



Dimensions

Dimensions, in Inches (millimeters), are for reference only.

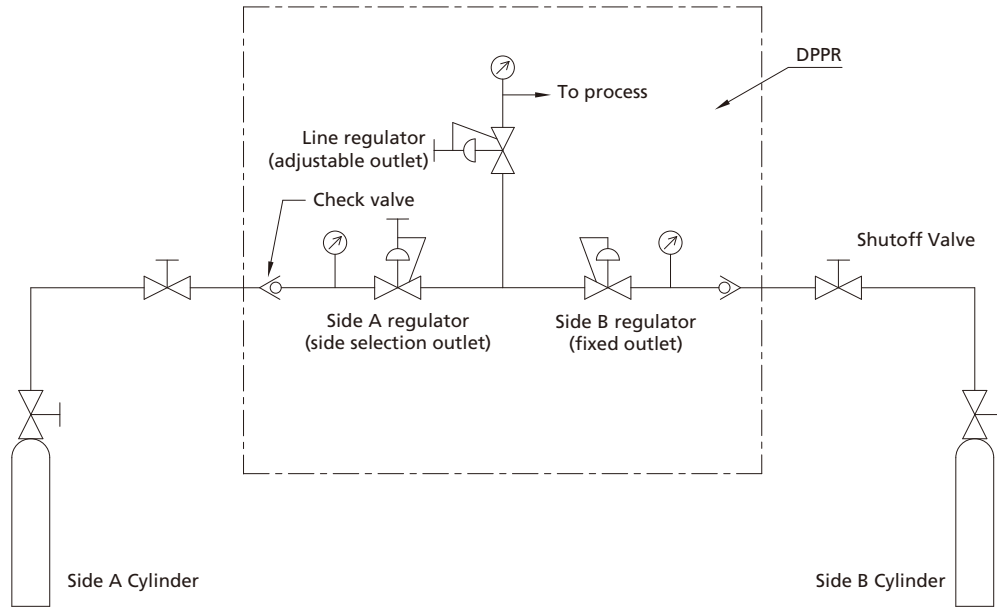


Operation Overview

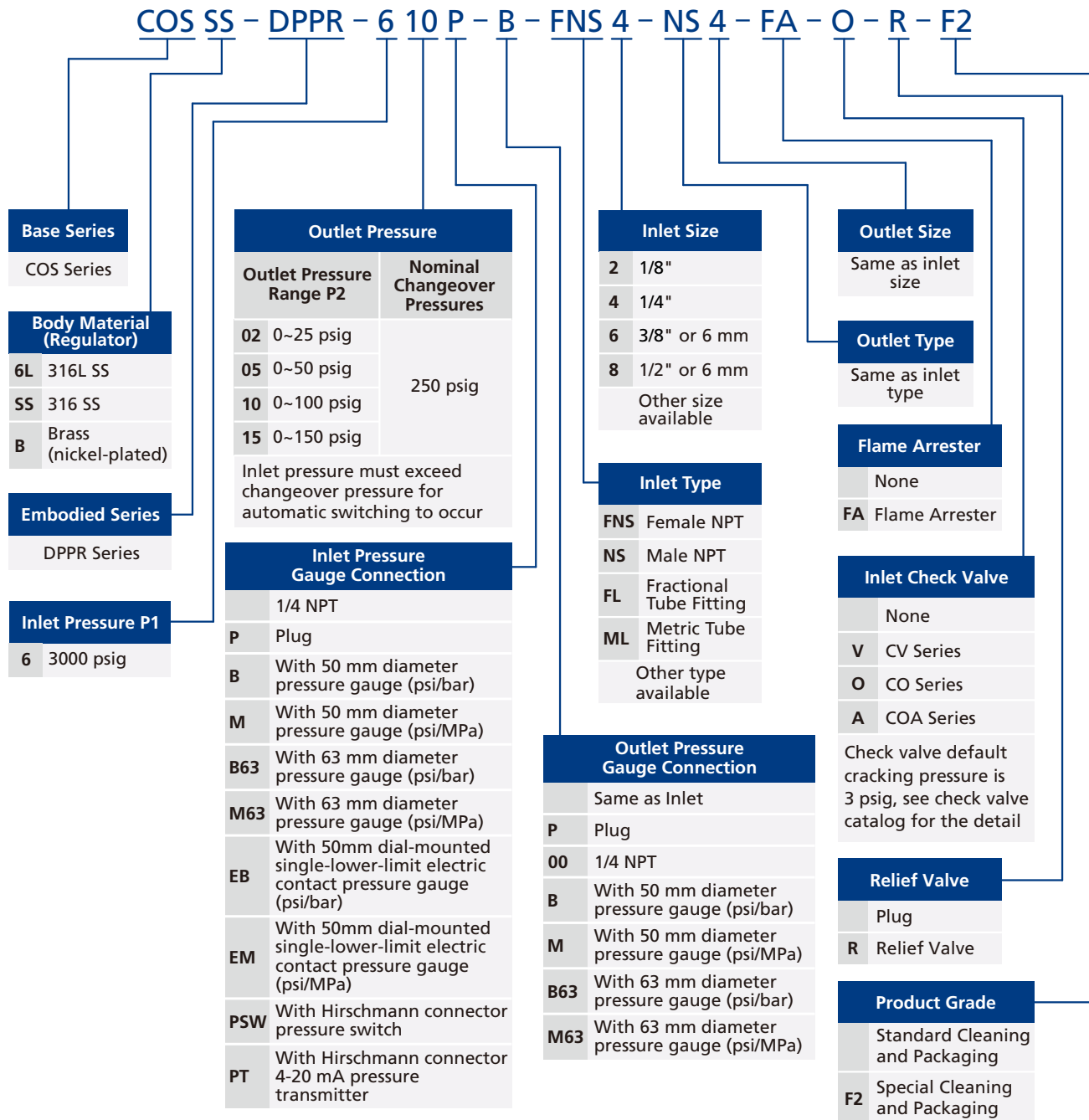
The DPPR series changeover system consists of three pressure regulators, housing two single-stage regulators in a single body and a line regulator. The two single-stage regulators are each attached to separate source cylinders. The adjusting handle can swivel to enable source side selection. The other regulator is preset to an appropriate setting for the system outlet range.

The source selection handle adjusts the outlet pressure to be either above or below the preset side within 15 ~ 30 psig. When the handle is turned to point to the standby side, the standby side continues to supply gas due to the change in differential pressure to achieve continuous and uninterrupted gas supply.

When one supply drops below the changeover pressure, the selector regulator automatically switches the gas feed from the depleted supply to an alternate supply. At this time, the main gas cylinder can be changed for continuous uninterrupted gas supply.



Ordering Number Description



Notes:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-13.
3. For EB/EM/PSW/PT/FA options, please consult our engineers with specific application details (medium, pressure, flow rate, temperature) for configuration confirmation.
4. When the part number contains "B" or "M", a GC series pressure gauge is configured by default. If the part number contains "B63" or "M63", a GA series pressure gauge is configured by default.

Automatic Changeover Systems

FDR-1T Series

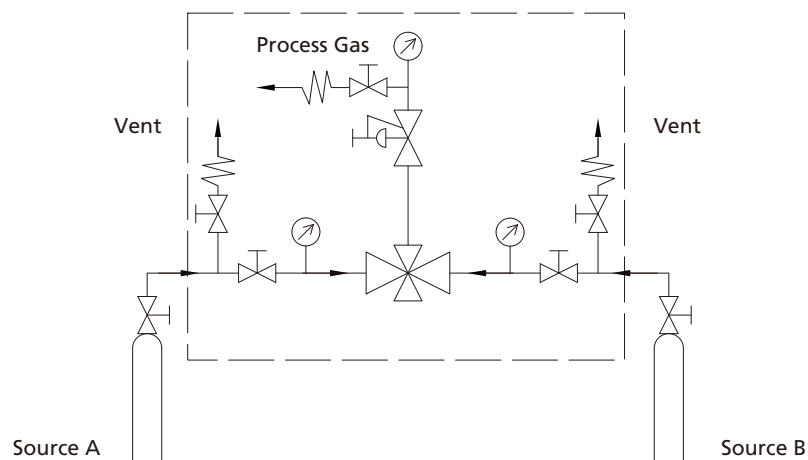
Features

- Two gas sources are connected to pressure regulators of the automatic changeover system, when the pressure of one gas source is lower than the switching pressure, it will automatically switch to the other gas source to supply gas to ensure continuous gas supply.
- Excellent sensitivity and set point pressure stability.
- With special cleaning and packaging, applicable to oxygen-enriched atmospheres.

Technical Data

- Maximum inlet pressure: 3000 or 4500 psig
- Nominal changeover pressures: 250 psig
- Outlet pressure range: 0 ~ 25, 0 ~ 50, 0 ~ 100 or 0 ~ 150 psig
- Material of the main components:
 Seat: PCTFE (regulator and diaphragm valve)
 Diaphragm: Hastelloy (regulator), cobalt alloy (diaphragm valve)
 Diaphragm valve body: 316L SS
- Temperature: -10 °F ~ 150 °F (-23 °C ~ 65 °C)
- Valve leak rates (helium):
 Internal: $\leq 1 \times 10^{-7}$ std·cm³/s
 External: $\leq 1 \times 10^{-9}$ std·cm³/s
- Flow coefficient (regulator Cv): 0.06
- Weight: ≈ 19.6 lbs (8.9 kg)

Flow Schematic



Model: FDR-1T6L-45-150-B-00-00-00

Operation Overview

The FDR-1T Series Changeover System is mainly comprised of one adjustable outlet pressure regulator and one fixed outlet pressure regulator, together with a line pressure regulator on the outlet port.

When the 2 inlets are both open, the one side that the "IN SERVICE" arrow is pointing at by turning the handle would be the 1st source for gas supply.

Fig. 1 When the "In Service" arrow is pointing at side B, side B would be the gas source. At this time, the fixed outlet pressure of side B is higher than the set pressure of side A. Consequently, the diaphragm of side A regulator moves to enable the stem to close the regulator.

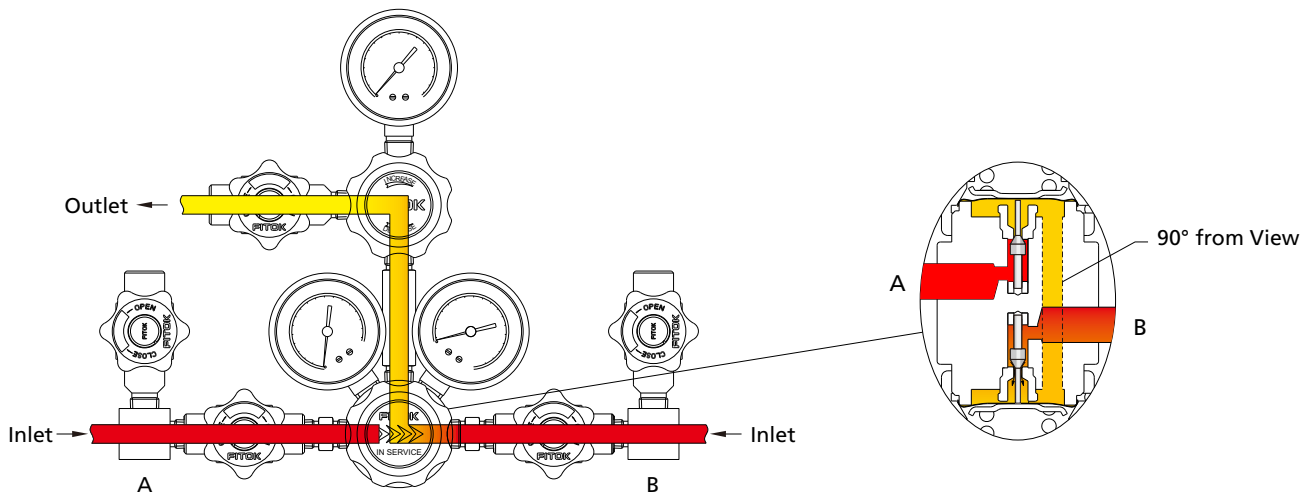


Fig. 1

Fig. 2 If side A is chosen as the gas source, the handle should be turned clockwise until the "IN SERVICE" arrow is pointing at side A. At this time, the set pressure of side A is higher than the fixed outlet pressure of side B. Consequently, the diaphragm of side B regulator moves to enable the stem to close the regulator.

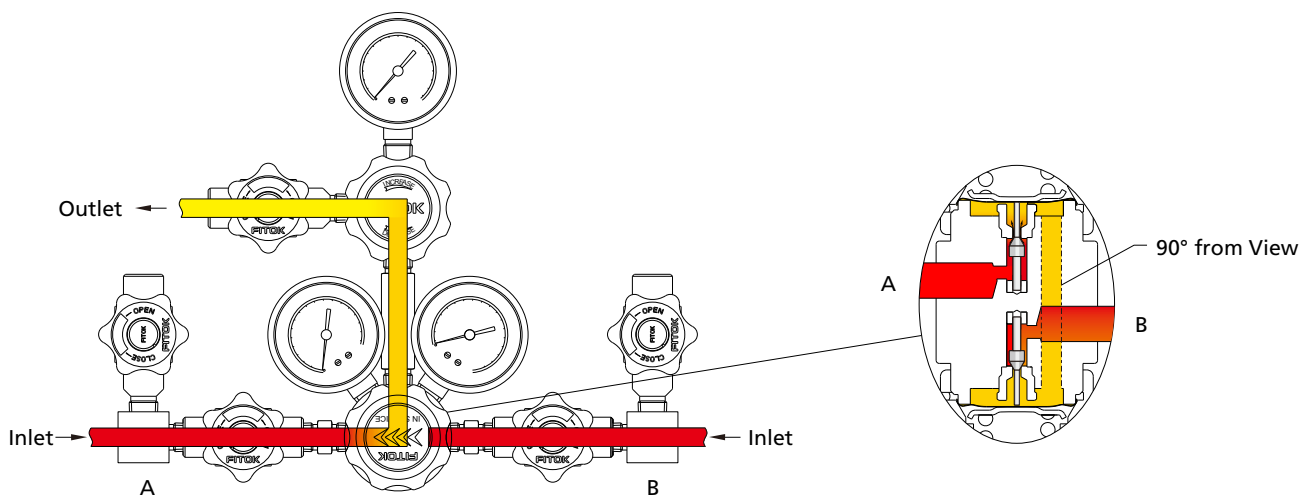


Fig. 2

When gas source of one side is depleted, gas source would automatically change to the other side.

Fig. 3 When "IN SERVICE" arrow is pointing at side B, but gas source of side B is depleted, its outlet pressure shall decrease to be lower than the set pressure of side A. By the force of spring, side A regulator will be opened to begin gas supply.

Gas from side A will flow back into side B. At this time, replace to a new gas source of side B, close the shutoff valve and open the vent valve to exhaust the remaining pressure, then replace to a new gas source. After the replacement, if not rotating the handle, the gas supply will return to the status as of Fig. 1. And if rotating the handle to the status as shown in Fig. 2, the gas supply will be changed to the status as of Fig. 2.

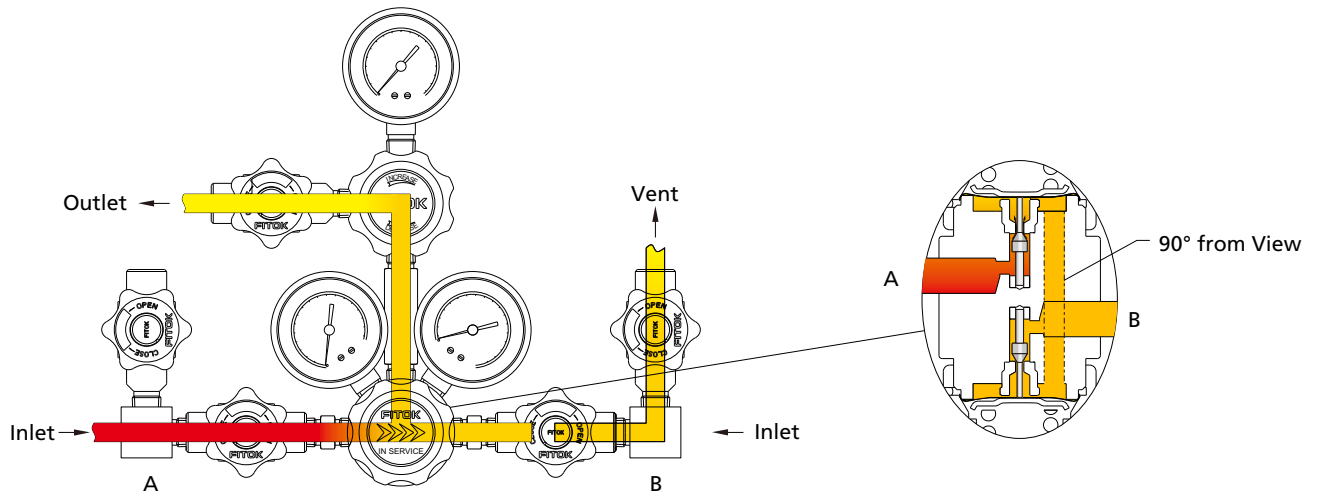
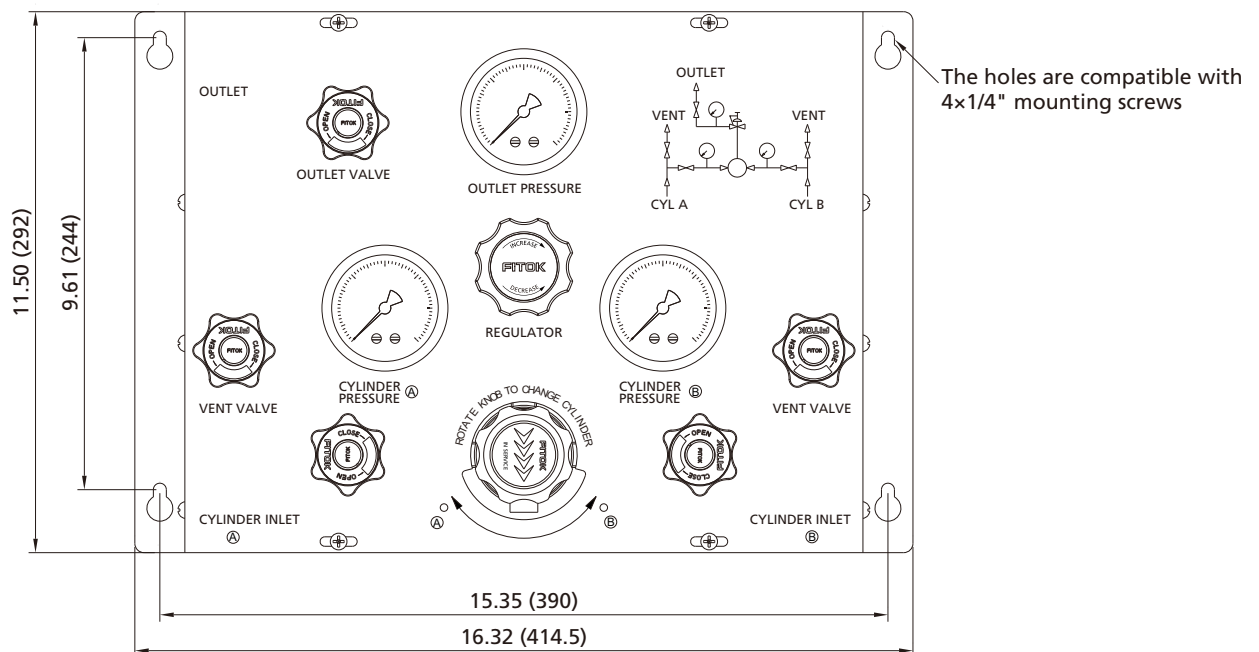
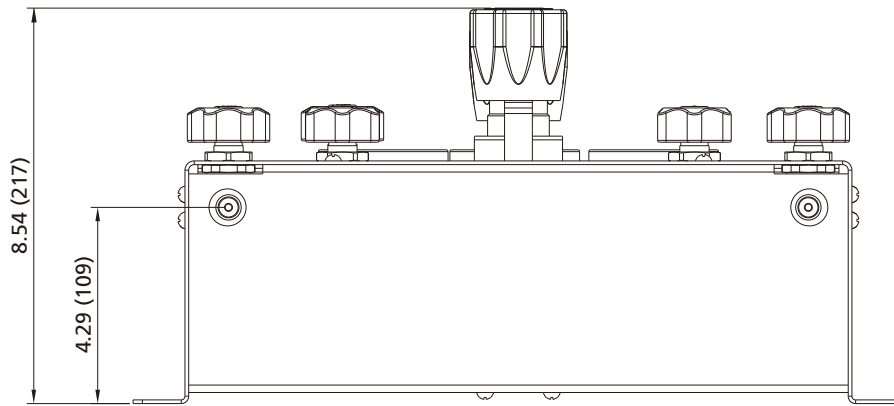


Fig. 3

Dimensions

Dimensions, in inches (millimeters), are for reference only.





Ordering Number Description

FDR – 1T6L		–	30	–	25	–	B	–	10	–	00	–	00
Body Material (Regulator)		Outlet Pressure				Gauge Scale		Inlet A		Inlet B			
6L	316L SS	Outlet Pressure Range P2		Nominal Changeover Pressures		B	With Gauge (psi/bar)	00	1/4 Female NPT	Same as Inlet A			
SS	316 SS	25	0~25 psig	250 psig		M	With Gauge (psi/MPa)	01	1/4 Male NPT	Outlet Same as Inlet A			
HC	Hastelloy C-276	50	0~50 psig										
B	Brass (Nickel-plated)	100	0~100 psig										
		150	0~150 psig										
Inlet Pressure P1		Inlet pressure must exceed changeover pressure for automatic switching to occur											
30	3000 psig												
45	4500 psig												

Notes:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Before ordering, please read **User's Guide** on A-13.
3. When the part number contains "B" or "M", a GA series pressure gauge is configured by default.