

PILOTS & ACCESSORIES



KIMRAY
INC.®

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SIGNAL PILOTS

Kimray signal pilots enhance a pneumatic or mechanical signal providing a reversed, multiplied, volume boosted or on-off signal pressure to operate motor valves, burners or dump valves.

SNAP _____ 10.1
Change and reverse a varying pneumatic signal to an On-Off signal of the same or higher pressure. 3 PS

THROTTLE _____ 20.1
Multiply and volume boost a pneumatic signal.
3 PG and 3 PGA

MANUAL RESET _____ 40.1
Output is blocked and downstream vented when monitored pressure goes to zero. 3 PM

MANUAL RELAY _____ 50.1
Manual control pilot that blocks and bleeds output pressure when released. 3 PGMR

THROTTLE REVERSE _____ 60.1
Reverse and multiply varying pneumatic signal. 3 PGRA

THROTTLE PRESSURESTAT _____ 70.1
Reverse and multiply varying pneumatic signal with adjustable output pressure. 3 PGF

BISTABLE _____ 80.1
Two temporary pneumatic signals operate pilot. One to turn output on, one to turn output off. 3 PGB

RELAY _____ 90.1
Used to switch 0 to 300 psig signal with 20 to 30 psig signal. 30 PGR

MECHANICAL _____ 100.1
Mechanically operated signal pilot. 3 PM

PRIORITY SIGNAL RELAY _____ 110.1
By-pass a normal pneumatic signal with a higher priority signal. 4 POR

CONTROL PILOTS

Kimray control pilots operate motor valves in pneumatic systems of up to 1500 psig working pressure. In each Kimray control pilot an upstream or downstream pressure is used to operate a remotely installed motor valve. The Kimray design incorporates a variety of standard and custom configurations applicable to most control systems.

PRESSURE REDUCING _____ 150.1
Supply a set downstream pressure from a greater upstream pressure, 0-1500 psig. 12/30 PG PR and 30 HPG PR-D, 50 PG and 150 PG.

PRESSURE DIFFERENTIAL _____ 170.1
Maintain a constant pressure differential between upstream and downstream pressures, 0-300 psig. 12/30 PG PD and 100/200/400 PDC.

LIQUID DIFFERENTIAL PRESSURE _____ 180.1
Maintain a constant differential pressure between a wet gas upstream pressure and a liquid or gas sensed pressure (requires auxiliary dry supply gas if sensed pressure is wet), 0-300 psig. 30 PG LDP-D

FLOATLESS LIQUID LEVEL CONTROLLER _____ 190.1
Controls 0 to 30 feet of water in vessels up to 125 psig. supply a signal to open or close a diaphragm operated motor valve.

PRESSURE REDUCING TO ATMOSPHERE _____ 195.1
Regulate .5 oz. to 20 psig from a greater upstream pressure, 125 psig. 12 PG OPRA

ACCESSORIES

FILTERS _____ 200.1
Removes particulates from the gas line, 300 psig. F 30

FILTER POP VALVES _____ 210.1
Provides a small pressure relief at 30 psig. FPV 3

DRIP POTS _____ 220.1
Collects condensation for removal from pressure lines, 0-4000 psig. DP 30/200/400

CHECK VALVES _____ 230.1
An in line check valve to prevent reverse flow, 1500 psig. CV 15

SUPPLY GAS REGULATORS _____ 240.1
Gas pressure reducing instrument regulators, 4000 psig.

PNEUMATIC SOLENOID _____ 250.1
For electrical control of a pneumatic pressure used to open and close a motor valve.

MAGNELATCH SOLENOID _____ 260.1
Used to operate a valve by using an electrical current pulse of 0.02 milliseconds duration.

AIR MOTOR _____ 270.1
Provides mechanical movement from pneumatic pressure, 125 psig. 455/-AL

COMPANION FLANGE SETS _____ 280.1
Provides installation of flanged valves in a threaded piping system, 125 psig.

SENSE LINE PROTECTOR _____ 290.1
An adjustable, self-resetting, pressure limiting device to protect instrumentation from over pressurization.

AFLAS ® is a trade mark of Asahi Glass Co**TEMPERATURE:**

+30° to +500° F
0° to +260° C

APPLICATION:

Crude Oil & Gas Production (High heat), Steam
Flood Production Chemicals (corrosion inhibitors) Amine
Sweetener Systems, Gasoline, Diesel, Fuel Oil Systems

FLUID / GAS:

Crude Oil & Gas Production, H₂S, Steam, Petroleum
fluids, Sea Water

HSN (HNBR)**TEMPERATURE:**

-15° to +300° F
-26° to +149° C

APPLICATION:

Crude Oil & Gas Production w/ H₂S, Wet CO₂

FLUID / GAS:

Crude Oil & Gas, H₂S, Wet CO₂, Sea Water

NITRILE**TEMPERATURE:**

Buna-N:
-40° to +220° F
-40° to +105° C
Low-Temp:
-85° to +120° F
-65° to +49° C

APPLICATION:

Crude Oil & Gas Production Glycol Dehydrators,
Gasoline, Jet Fuel & Diesel Fuel Pumping, Water Disposal,
Methanol Injection Pumps, Water pump seals, hydraulic
pump seals

FLUID / GAS:

Crude Oil & Gas, Good to Poor in Sour Production (See
HSN), Water, Glycols, Hydraulic Oils, Resistance to crude
oil in the presence of H₂S and amines, Diesel fuel, fuel oils

DO NOT USE WITH:

Aromatic hydrocarbons, chlorinated hydrocarbons,
phosphate esters (hydraulic fluids)

TEFLON (T)**TEMPERATURE:**

-40° to +400° F
-20° to +204° C

APPLICATION:

Chemically Inert Elastomer Best in static Do not use at
low temps

FLUID / GAS:

Almost All Chemicals

VITON ® is a trade mark of Dupont**TEMPERATURE:**

-10° to +350° F
-23° to +177° C

APPLICATION:

Crude Oil & Gas Production, Glycol Dehydrators,
Gasoline, Jet Fuel & Diesel Fuel Pumping, Water Disposal,
Methanol Injection Pumps. (Also Vacuum Service) (Gas
permeability is very low)

FLUID / GAS:

Crude Oil & Gas, H₂S, Propane, Gasoline, Diesel, Fuel
Oil Systems

DO NOT USE WITH:

Hot Water, Not preferred for wet CO₂, Methyl Alcohol,
Amines, Sodium hydroxide solutions

POLYURETHANE (P)**TEMPERATURE:**

-40° to +220° F
-40° to +104° C

APPLICATION:

High abrasion resistance Seats, Diaphragms

FLUID / GAS:

Crude Oil gas and Water, H₂S, propane, butane, fuel,
mineral oil and grease

APPLICATIONS:

Any system in which it is desired to change and reverse a varying pneumatic signal to an Output signal of the same or higher pressure (up to 4:1).

FEATURES:

- Pneumatic snap action
- No dead center
- Reverse Action

SUPPLY PRESSURE:

5 to 30 psig

VARIABLE PRESSURE (input signal):

- 0 - 10 psig minimum
- 0 - 30 psig maximum

VARIABLE PRESSURE SNAPPING RANGE:

- Depends on Supply Pressure
- Approximately 2 - 7 psig at 30 psig

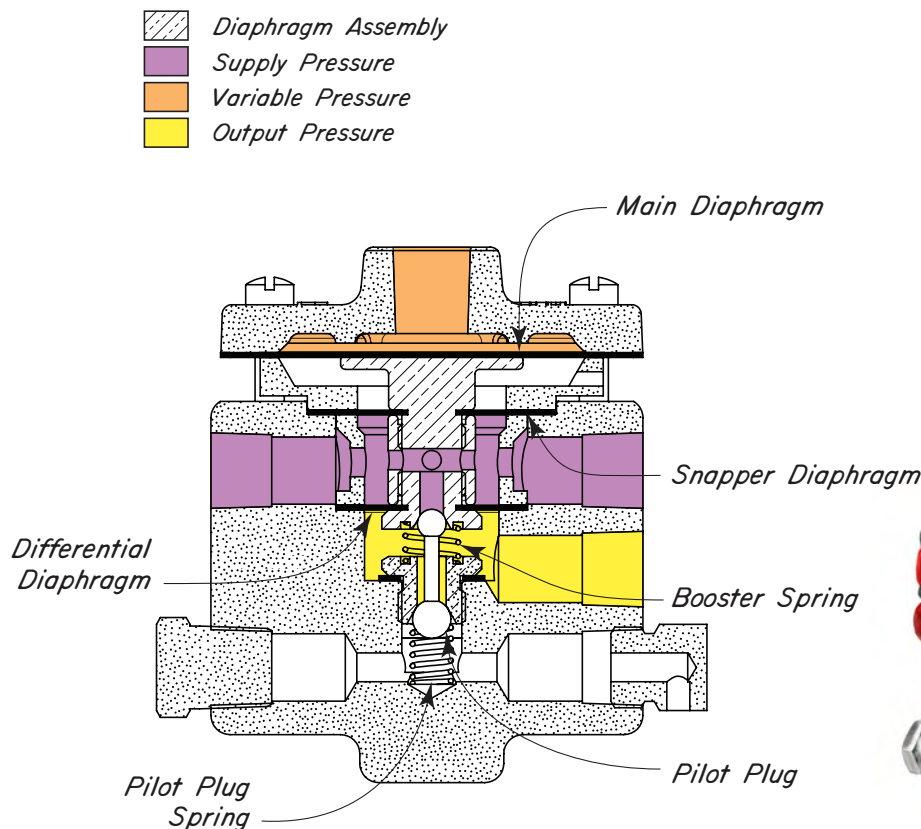
OUTPUT PRESSURE:

0 psig or Supply Pressure

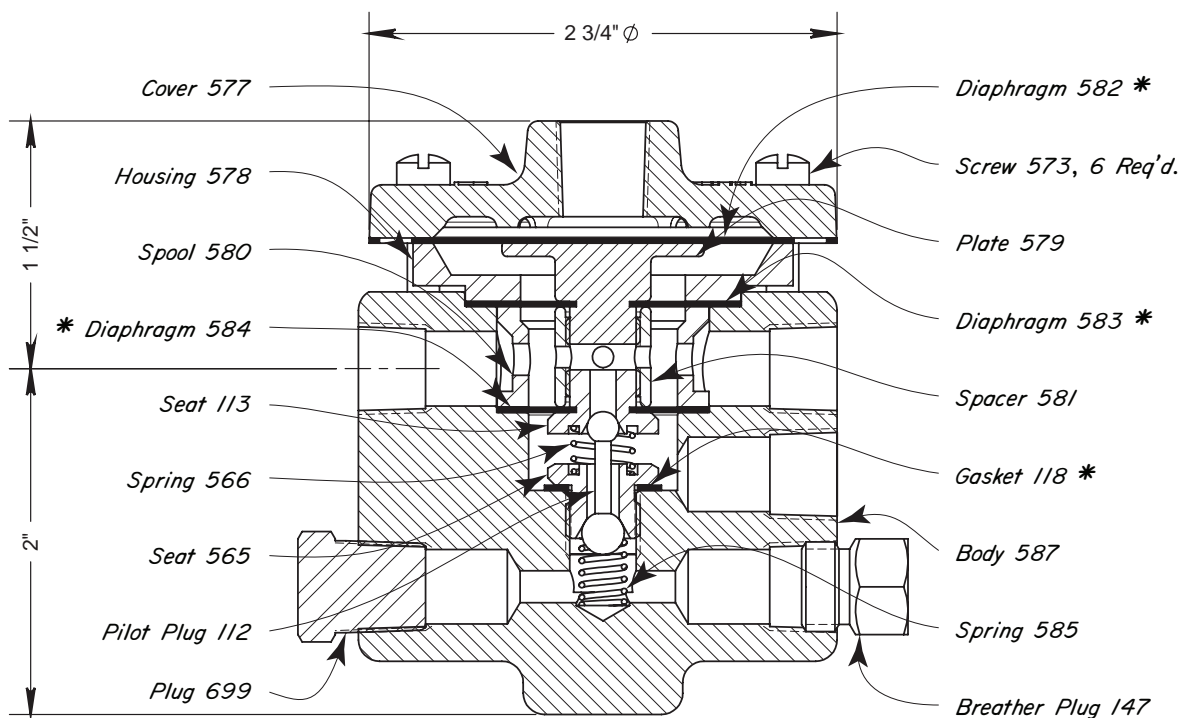
OPERATION:

Assume Variable Pressure (Orange) is at a minimum and the Diaphragm Assembly in an up position. An increase in Variable Pressure (Orange) on the MAIN DIAPHRAGM sufficient to overcome load of the BOOSTER SPRING plus the force of Supply Gas Pressure (Violet) on the full area of the SNAPPER DIAPHRAGM, the Diaphragm Assembly starts to move down. The upper seat, which is the Supply Gas inlet (Violet to Yellow), closes first. The PILOT PLUG SPRING holds the upper ball against its seat while a further downward movement opens the lower seat which is the pressure vent (Yellow to Atmosphere). Decreasing Output Pressure (Yellow) accelerates the downward movement of the Diaphragm Assembly to produce a sudden opening of the pressure vent.

In order to reverse the above action, Variable Pressure (Orange) must be reduced so that the downward force on the MAIN DIAPHRAGM is less than the upward force on the BOOSTER SPRING plus Supply Gas Pressure (Violet) acting on the difference in areas of the SNAPPER and DIFFERENTIAL DIAPHRAGMS. With upward movement of the Diaphragm Assembly the pressure vent (Yellow to Atmosphere) closes first. The PILOT PLUG SPRING holds the lower ball against its seat while a further upward movement of the Diaphragm Assembly opens the Supply Gas Pressure inlet (Violet to Yellow). As Output Pressure (Yellow) increases pressure across the DIFFERENTIAL DIAPHRAGM is reduced, loading the Diaphragm Assembly in an up direction. The accelerated upward movement of the Diaphragm Assembly produces a sudden opening of the Supply Gas Pressure inlet (Violet to Yellow).



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PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YAG	3 PS	30	30	RMA

For steel and stainless steel, see 3 PG, this section.

All openings are tapped 1/4" N.P.T.

*These parts are recommended spare parts and are stocked as repair kits.

APPLICATIONS:

Any system in which it is desired to multiply and volume boost a pneumatic signal to a large motor valve or similar equipment. Amplification of the input pneumatic signal is approximately 4:1.

FEATURES:

- Pneumatic throttle
- Direct action
- Field reversible
- (See 3 PS for snap action)

SUPPLY PRESSURE:

5 to 30 psig

VARIABLE PRESSURE:

0 to 30 psig

OUTPUT PRESSURE:

- Snap - 0 psig or Supply Pressure
- Throttle - Variable (0 - 30 psig)

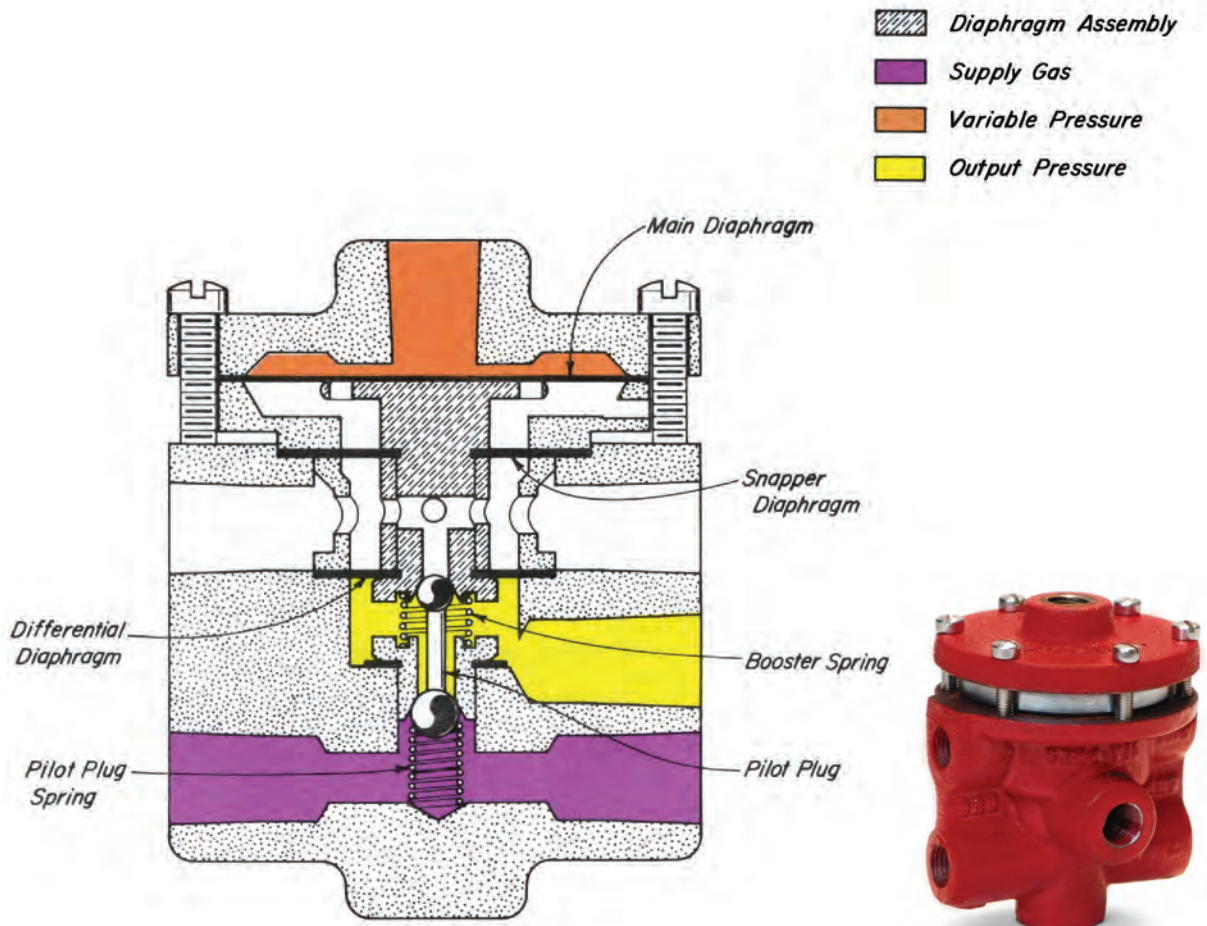
OPERATION (Described for Throttle Action):

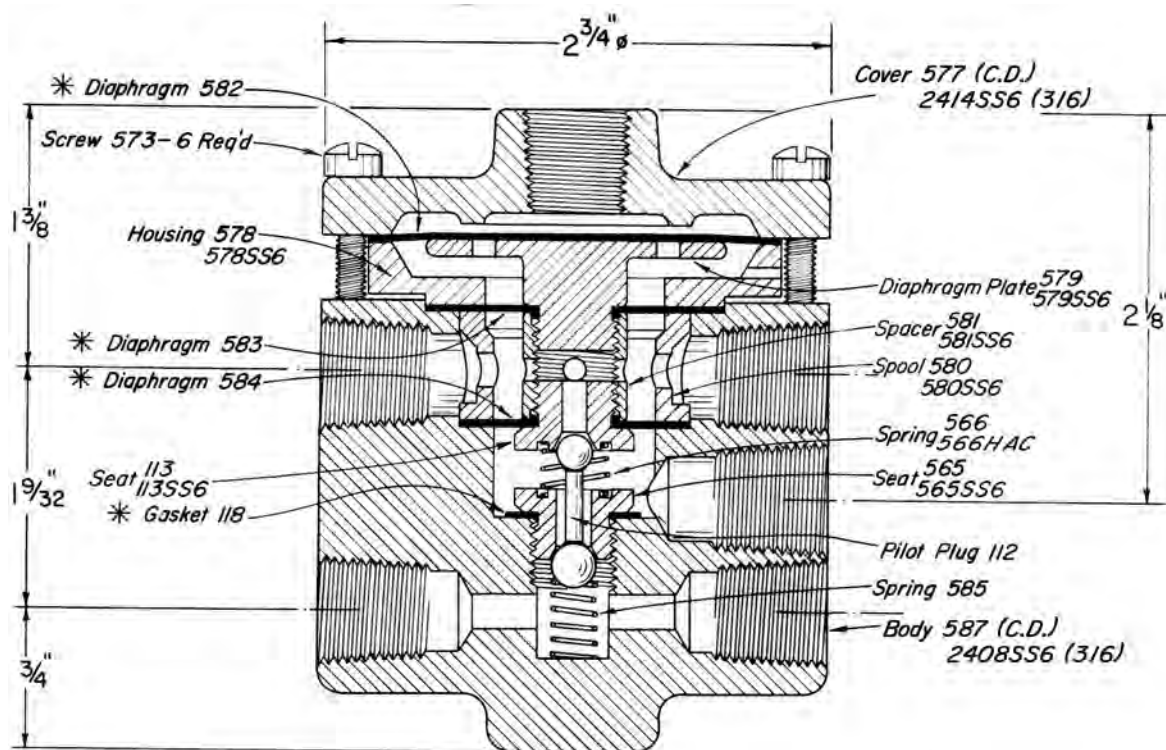
Variable Pressure (Orange) acting on the MAIN DIAPHRAGM is the actuating force of the pilot. The counteracting force is the Output Pressure (Yellow) acting on the DIFFERENTIAL DIAPHRAGM plus the BOOSTER SPRING. When Variable Pressure (Orange) is zero, the Diaphragm Assembly is held in an up position by the BOOSTER SPRING. As Variable Pressure (Orange) increases slightly to overcome the load of the BOOSTER SPRING, the Diaphragm Assembly moves downward to first close the upper seat which is the pressure vent (Yellow to Atmosphere). The lower seat, which is the Supply Gas inlet (Violet to Yellow), has not yet opened, so both seats are closed with the PILOT PLUG. If Variable Pressure (Orange) increases still further, the Supply Gas inlet (Violet to Yellow) opens to increase the Output Pressure (Yellow) only sufficiently to balance the added Variable Pressure (Orange) acting on the MAIN DIAPHRAGM.

With the Diaphragm Assembly in a balanced position any increase or decrease in Variable Pressure (Orange) will produce a proportional change in Output Pressure (Yellow) by opening either the Supply Gas inlet or the Output Pressure vent to re-establish the balance.

The 3 PG Pilot is actually a pressure multiplier and volume booster. Output pressure (Yellow) is approximately 4 times the Variable Pressure (Orange). Output Pressure (Yellow) accurately follows small changes in Variable Pressure (Orange) to properly position motor valves, etc. for throttling control.

For Snap Service, the 3 PG Pilot operates as described for the 3 PS Pilot on Page 40.1.





PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YAE	3 PG	30	30	RMA
YAE1	3 PG-S	30	30	RMA
YAGSS6	3 PG-SS6	30	30	RMA

NOTES:

May be used as a 3 PS by reversing the supply and vent connections.

All openings are tapped 1/4" N.P.T.

*These parts are recommended spare parts and are stocked as repair kits.

APPLICATION:

Any system in which it is necessary to volume boost a pneumatic signal to a large motor valve or similar equipment.

As a volume amplifier for controls with a small feed volume.

FEATURES:

Volume boosts a pneumatic signal without a corresponding pressure boost (1:1 Output Pressure vs. Variable Pressure)

Direct Action
Pneumatic Throttle

SUPPLY PRESSURE:

5 to 30 psig

VARIABLE PRESSURE:

2 to 30 psig

OUTPUT PRESSURE:

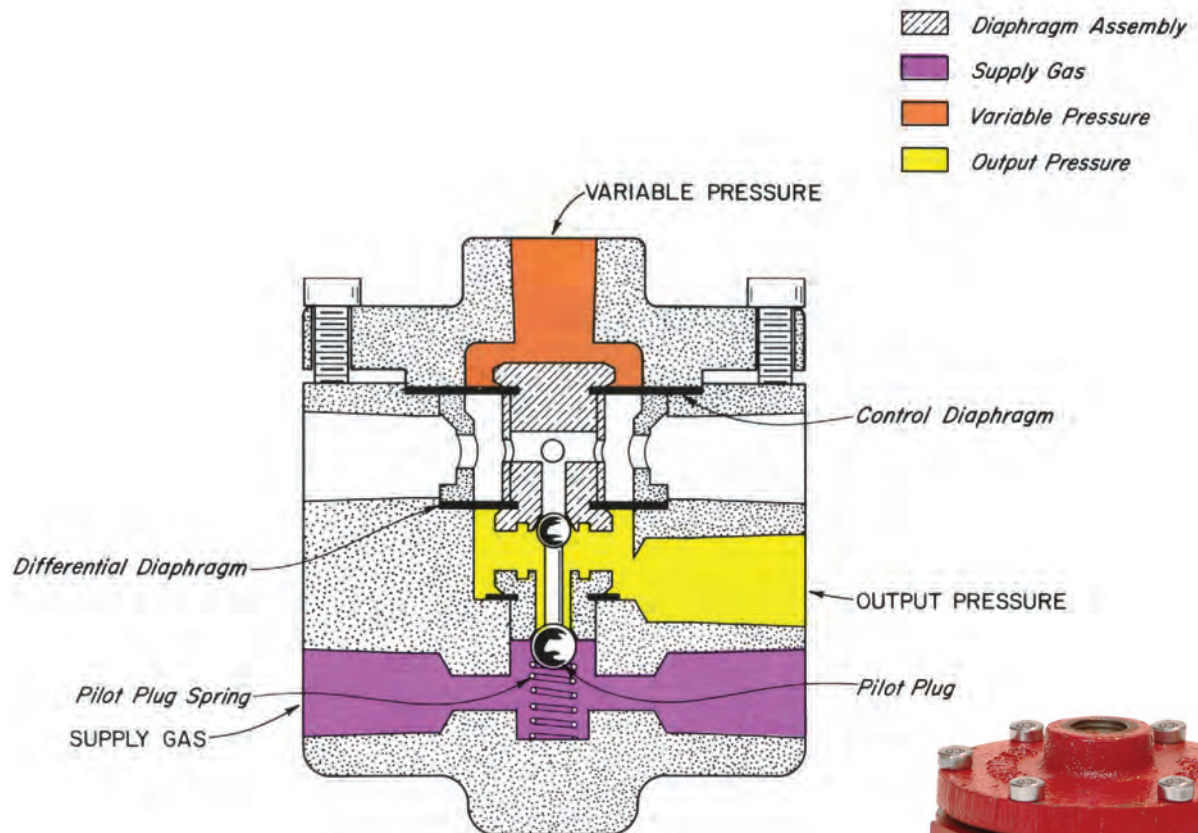
Variable, 2 to 30 psig

OPERATION (Described for Throttle Action):

Variable Pressure (Orange) acting on the CONTROL DIAPHRAGM is the actuating force on the pilot. The counteracting force is the Output Pressure (Yellow) acting on the DIFFERENTIAL DIAPHRAGM. When Variable Pressure (Orange) is zero, the weight of the Diaphragm Assembly forces the upper seat, which is the pressure vent (Yellow to Atmosphere), closed. The lower seat, which is the Supply Gas inlet (Violet to Yellow), is slightly opened. This results in an approximate Output Pressure (Yellow) of 2 psig. If Variable Pressure (Orange) increases, the Supply Gas inlet (Violet to Yellow) opens to increase the Output Pressure (Yellow) only sufficiently to balance the added Variable Pressure (Orange) acting on the CONTROL DIAPHRAGM.

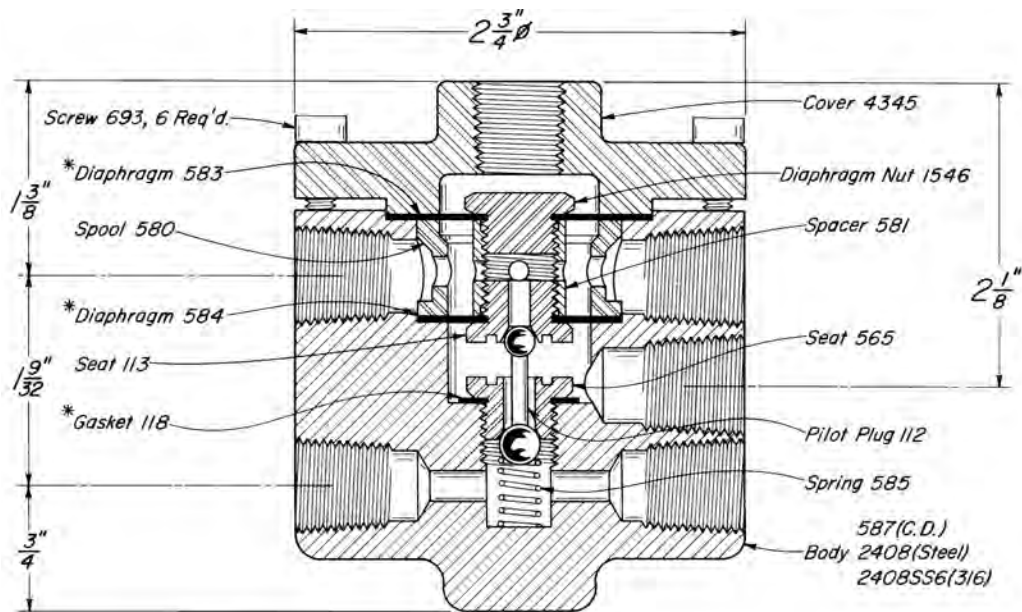
With the Diaphragm Assembly in a balanced position, any increase or decrease in Variable Pressure (Orange) will produce a proportional change in Output Pressure (Yellow) by opening either the Supply Gas inlet (Violet to Yellow) or the Output Pressure vent (Yellow to Atmosphere) to re-establish the balance.

The 3 PGA Pilot is actually a volume booster. Output Pressure (Yellow) is approximately 1 to 1 of Variable Pressure (Orange). Output Pressure (Yellow) accurately follows small changes in Variable Pressure (Orange) to properly position motor valves, etc. for throttling control.

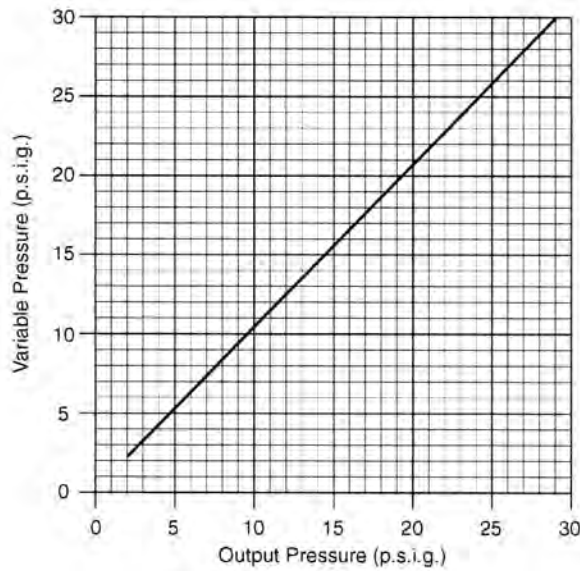


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3PGA THROTTLE PILOTS
DUCTILE / STEEL / 316SS



RESPONSE GRAPH



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YAJ	3 PGA	30	30	RMA

NOTES:

All openings are tapped $\frac{1}{4}$ " N.P.T.
*These parts are recommended spare parts and are stocked as repair kits.

APPLICATION:

Any system where a 3 Way Valve is to be monitored and system supply is to be vented if a preset limit is exceeded.

FEATURES:

- Intermittent vent pilot 3 Way Valving
- Manual reset
- Provides "tattle-tell" signal when preset limit is exceeded
- Rapid venting action
- Direct acting

SUPPLY PRESSURE:

5 to 30 psig

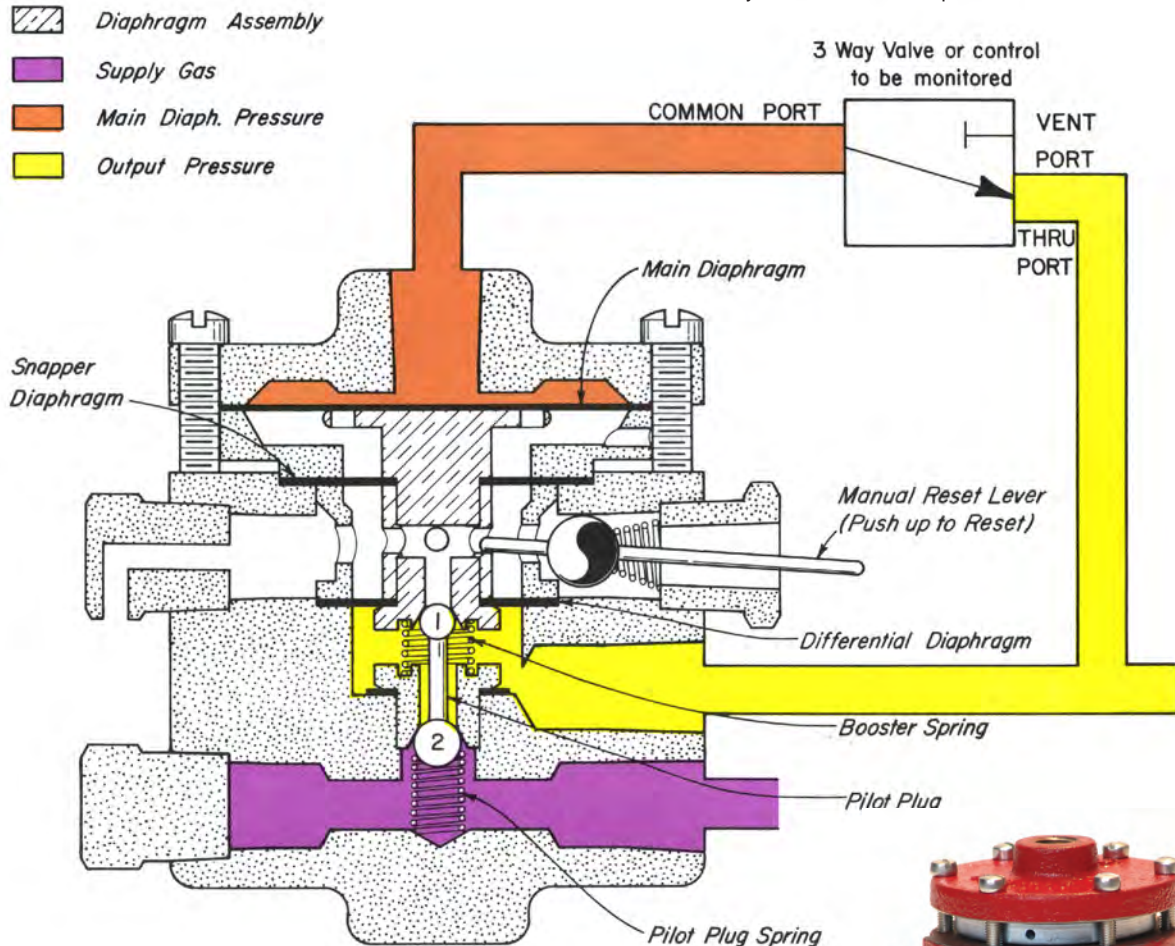
OUTPUT PRESSURE:

0 psig or Supply Pressure

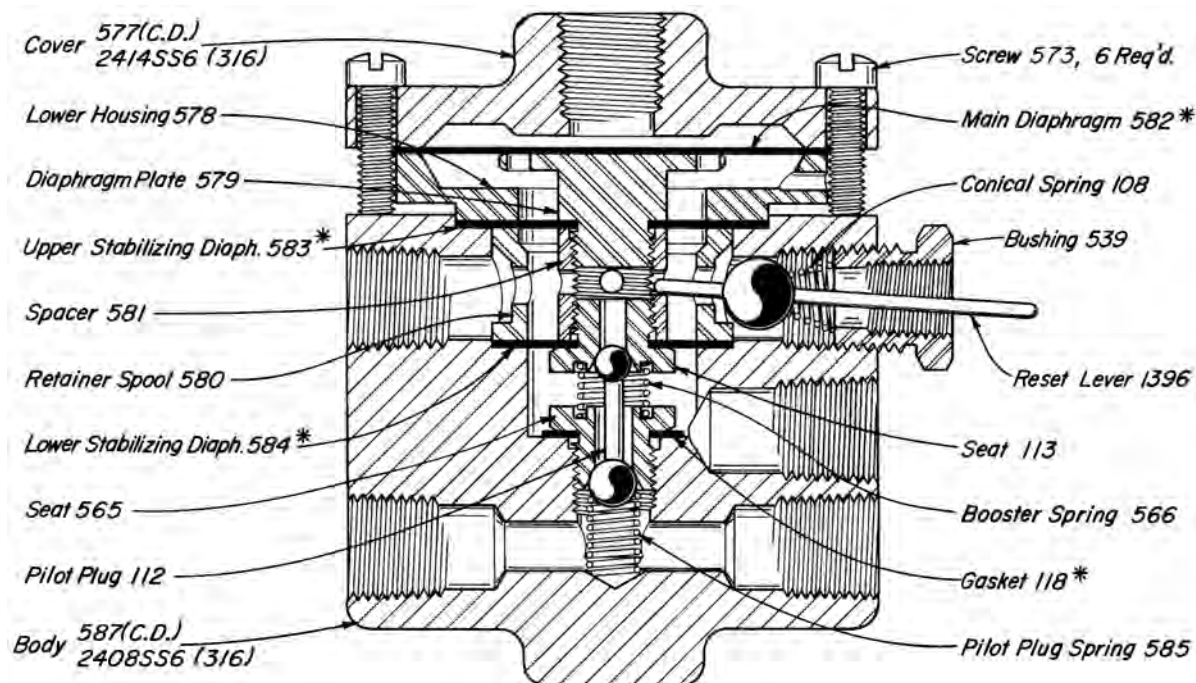
OPERATION:

Assume that the 3 Way Valve to be monitored is "ON." When Supply Pressure (Violet) is connected, Ball 2 of the PILOT PLUG is against the lower seat and prevents Supply Pressure (Violet) from reaching the Output (Yellow).

The Diaphragm Assembly is held in a UP position by the BOOSTER SPRING. The upper seat and Ball 1 of the PILOT PLUG are separated allowing the Output Pressure (Yellow) to be vented. When the Reset Lever is manually raised, the upper seat is closed and the lower seat is opened allowing the Output Pressure (Yellow) to increase. This increase is transferred to the MAIN DIAPHRAGM through the 3 Way Valve and holds the Diaphragm Assembly down allowing the Output Pressure (Yellow) to equalize with the Supply Pressure (Violet). The 3 PGM is now "LOCKED" on and the Output Pressure (Yellow) equals the Supply Pressure (Violet). If the Output Pressure (Yellow) is interrupted by the 3 Way Valve and the Main Diaphragm Pressure (Orange) is vented through the 3 Way Valve, the Diaphragm Assembly will be pushed up by the BOOSTER SPRING and the Output Pressure (Yellow) is vented through the upper seat of the 3 PGM. The 3 Way Valve must be reset to "ON" and then the Reset Lever of the 3 PGM must be manually raised to resume operation.



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PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YAF	3 PGM	30	30	RMC
YAF1	3 PGM-S	30	30	RMC

NOTES:

All openings are tapped 1/4" N.P.T.

For dimensions refer to PG. 20.2 this section

*These parts are recommended spare parts and are stocked as repair kits.

APPLICATION:

Manually sends a control signal to open or close a valve using a palm button. Supply is blocked and control signal bled to vent when released.

FEATURES:

- Direct acting
- Mounting bolts for bracket mounting
- Controls a relatively high pressure (300 psig) with minimal manual effort.

SUPPLY PRESSURE:

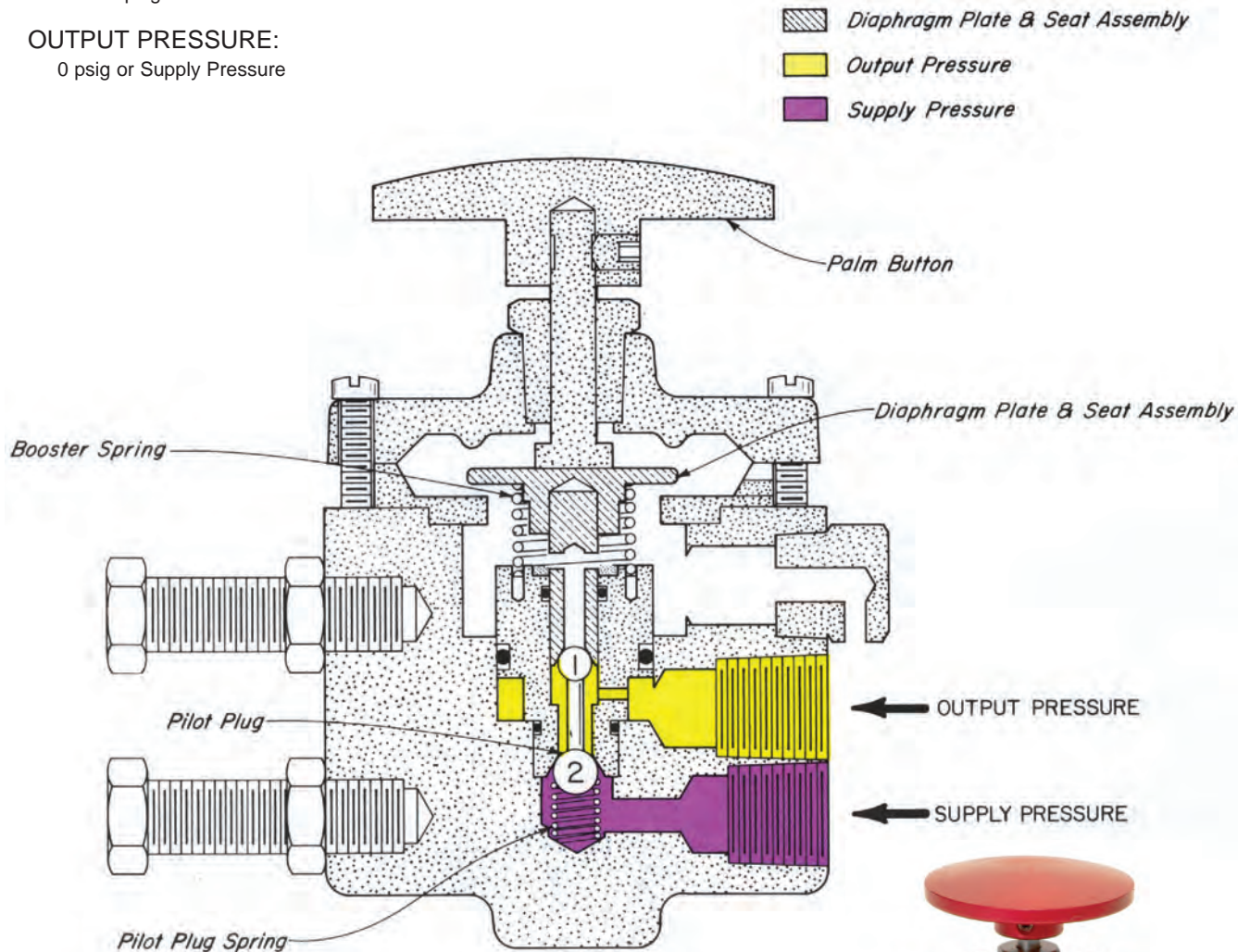
0 to 30 psig

OUTPUT PRESSURE:

0 psig or Supply Pressure

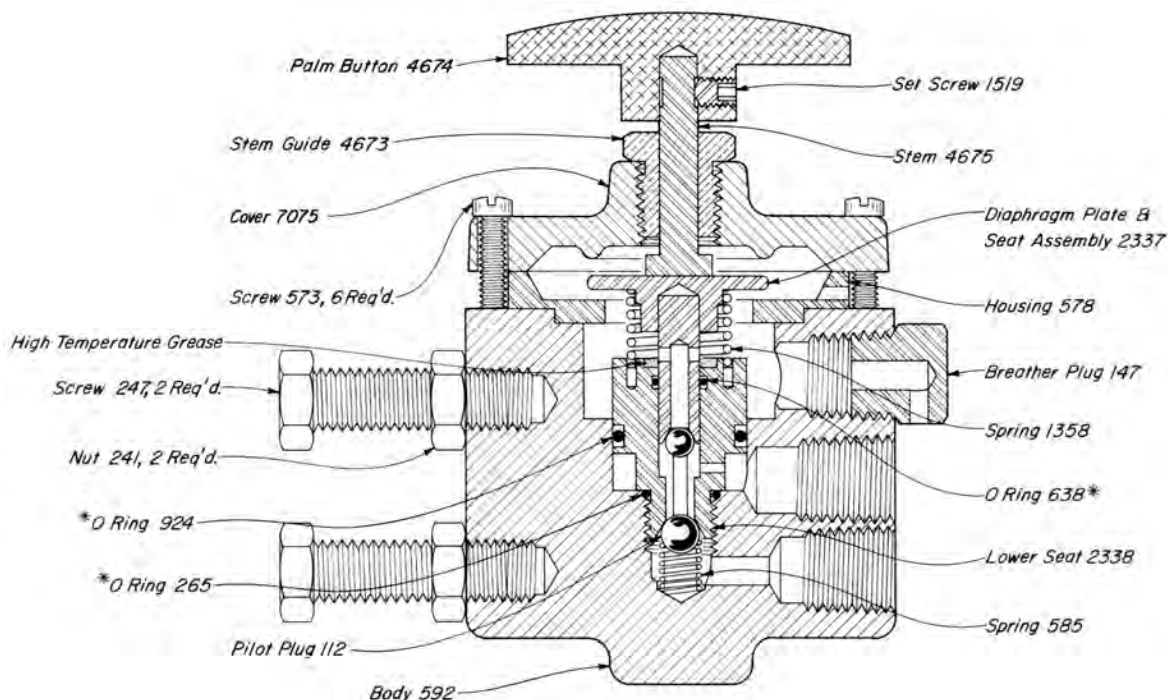
OPERATION:

Manually depressing the PALM BUTTON causes the DIAPHRAGM PLATE and SEAT ASSEMBLY to close the upper seat with Ball 1 of the PILOT PLUG. This blocks the vent, further movement opens the lower seat at Ball 2 of the PILOT PLUG and communicates Supply Pressure to the Output. Releasing the PALM BUTTON reverses the action and allows the PILOT PLUG SPRING to close the lower seat with Ball 2 removing the Supply Pressure from the Output. The BOOSTER SPRING then opens the seat at Ball 1, venting the Output Pressure through the vent.

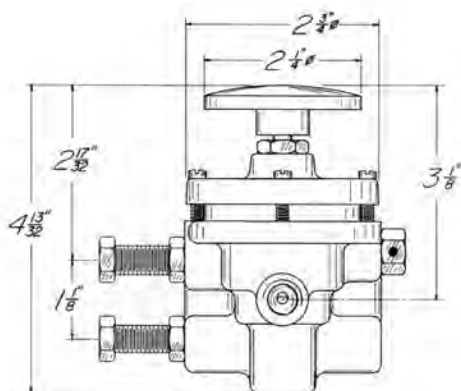


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30 PGMR MANUAL RELAY PILOT DUCTILE IRON



DIMENSIONS



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YAL	30 PGMR-D	300	300	RMP

NOTES:

All openings are tapped $\frac{1}{4}$ " N.P.T.

*These parts are recommended spare parts and are stocked as repair kits.

APPLICATION:

Any system in which it is desired to reverse and multiply a varying pneumatic signal.

FEATURES:

- Intermittent vent pilot
- Reverse acting
- Throttle action
- Adjustable Steam Pressure

SUPPLY PRESSURE:

5 to 30 psig

OUTPUT PRESSURE:

0 to 20 psig
Adjustable Steam Pressure

VARIABLE PRESSURE (input signal):

0 to 12 psig
30 psig maximum

PRESSURE RATIO:

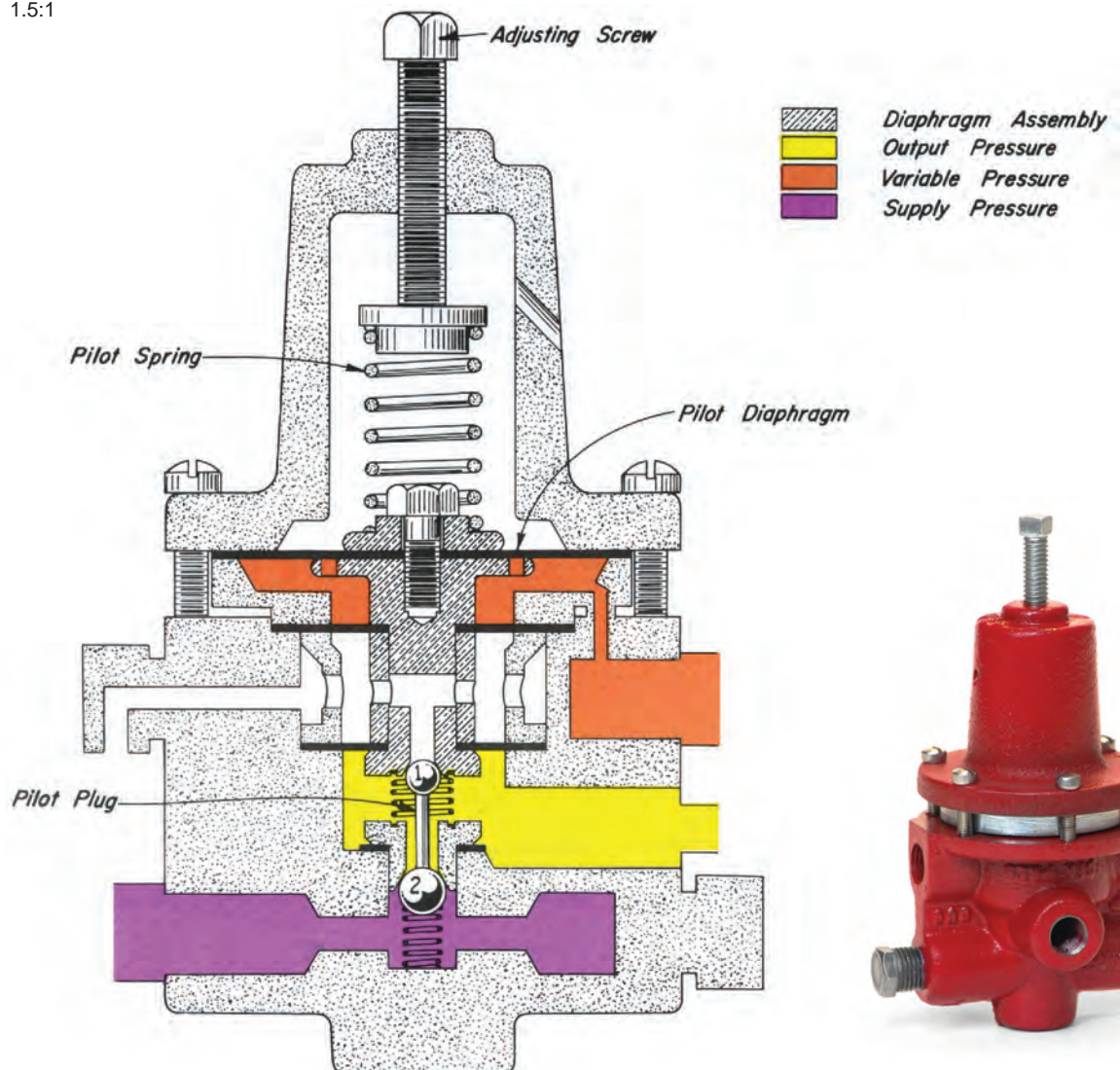
(Orange to Yellow)
1.5:1

OPERATION:

The PILOT SPRING loads the upper side of the Diaphragm Assembly and is opposed by the Variable Pressure (Orange) acting under the PILOT DIAPHRAGM and by the Output Pressure (Yellow).

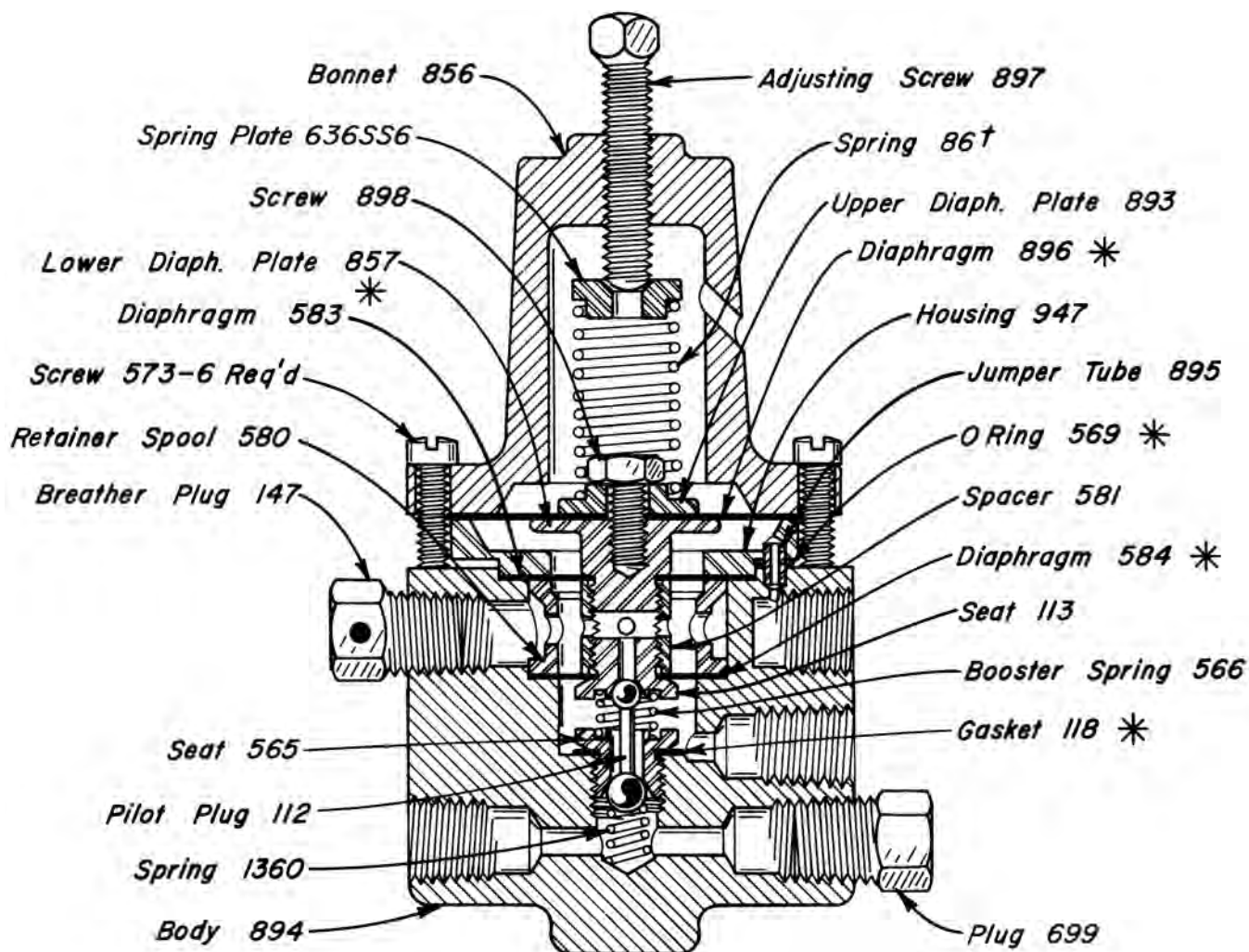
Assume the PILOT SPRING is compressed with the ADJUSTING SCREW set for a desired Variable Pressure (Orange). With the Variable Pressure (Orange) to low, the PILOT SPRING holds the Diaphragm Assembly down, closing the upper seat at Ball 1 (Yellow to Atmosphere) and opening the lower seat at Ball 2 (Violet to Yellow). As the Variable Pressure (Orange) increases to the set pressure, the Diaphragm Assembly moves upward against the PILOT SPRING to first close the lower seat at Ball 2 (Violet to Yellow) and then open the upper seat at Ball 1 (Yellow to Atmosphere). In this position the Supply Pressure (Violet) inlet is closed and the Output Pressure (Yellow) is vented to atmosphere.

PILOT SPRING #86 is furnished as standard. A heavier spring (Part #692) can be furnished on special order, to raise the Variable Pressure (Orange) from 12 psig to 30 psig.



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3 PGRA THROTTLE-REVERSE PILOT
CAST IRON



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YAH	3 PGRA	30	30	RML

NOTES:

†692 heavy spring available upon request.

For dimensions refer to Pg. 70.2 of this section.

All openings are tapped 1/4" N.P.T.

*These parts are recommended spare parts and are stocked as repair kits.

APPLICATION:

Direct firing of small steam generators by controlling flow of gas through the pilot to the burner. Approximate capacity of pilot is 360 SCFH with 15 psig supply pressure.

Pressure control of larger steam generators by regulating flow of gas through a motor valve. Motor valves are shown and described in Sections E-2 and E-3.

FEATURES:

- Intermittent vent pilot
- Reverse acting
- Throttle action
- Adjustable Steam Pressure

SUPPLY PRESSURE:

5 to 30 psig

OUTPUT PRESSURE:

0 to 20 psig
Adjustable Steam Pressure

STEAM PRESSURE:

15 psig maximum

STEAM TEMPERATURE:

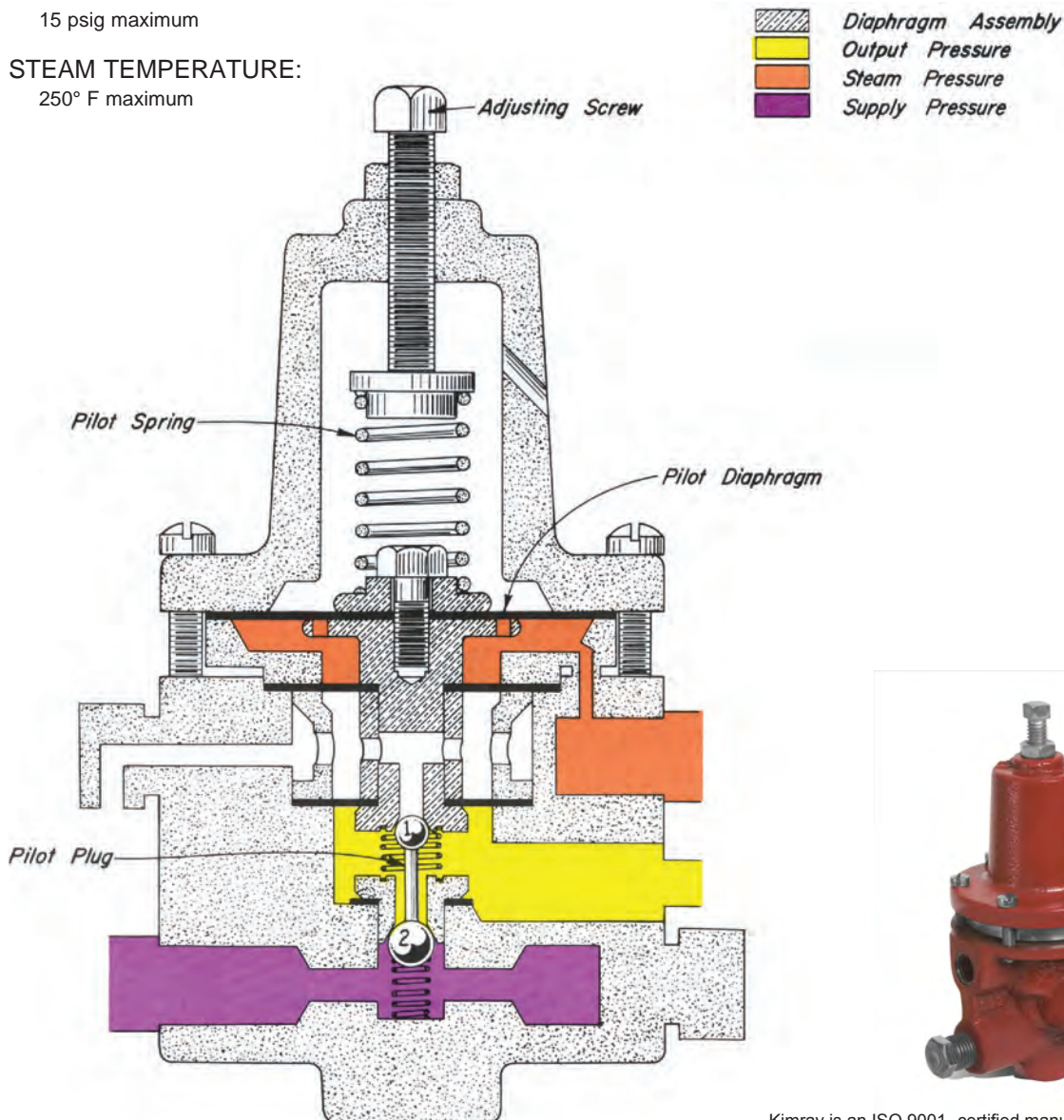
250° F maximum

OPERATION:

The PILOT SPRING loads the upper side of the Diaphragm Assembly and is opposed on the under side by the Steam Pressure (Orange) and the Output Pressure (Yellow).

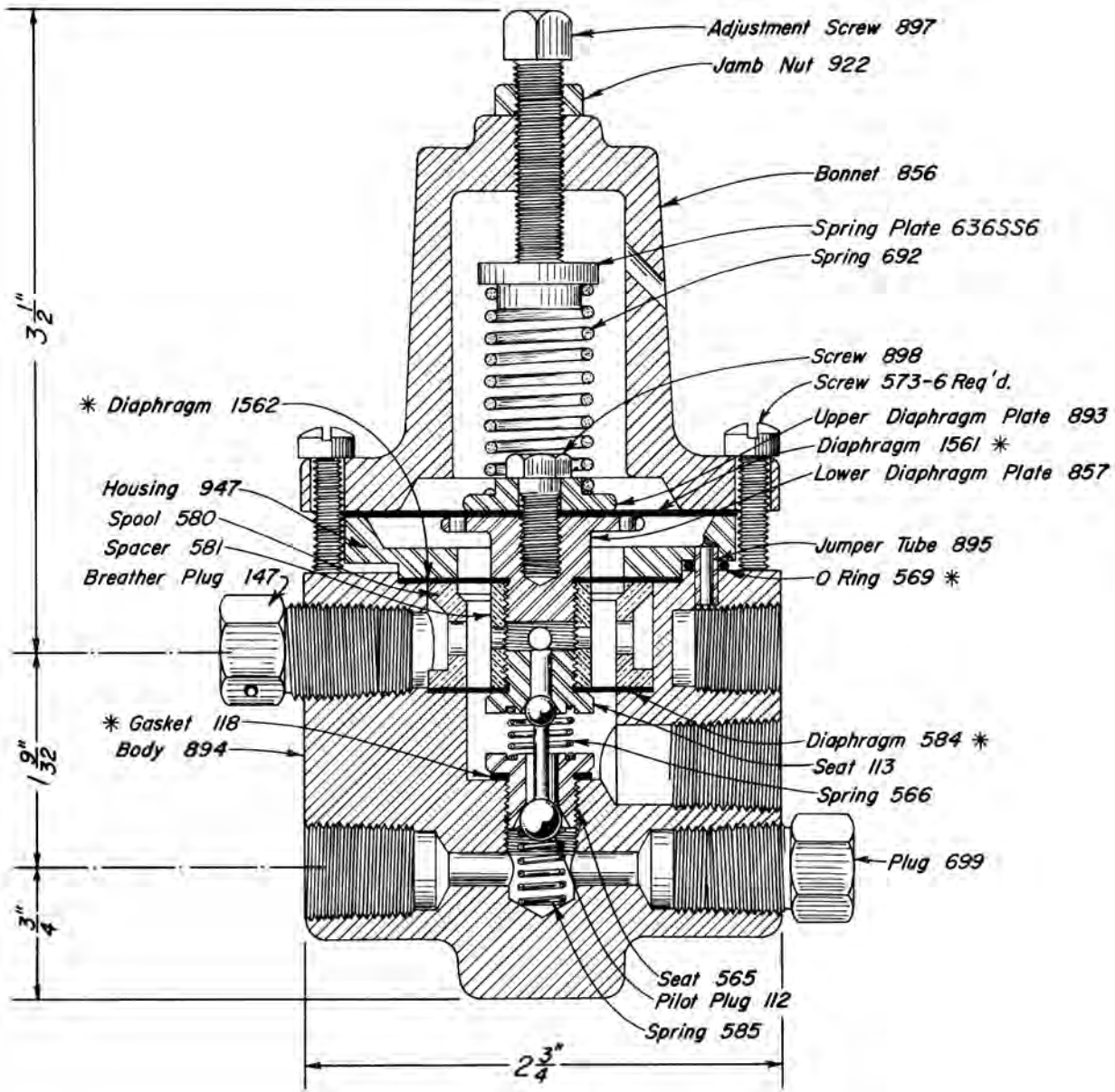
Assume the PILOT SPRING is compressed with the ADJUSTING SCREW set for a desired Steam Pressure (Orange). With the Steam Pressure (Orange) too low, the PILOT SPRING holds the Diaphragm Assembly down, closing the upper seat at Ball 1 (Yellow to Atmosphere) and opening the lower seat at Ball 2 (Violet to Yellow). As the Steam Pressure (Orange) increases to the set pressure, the Diaphragm Assembly moves upward against the PILOT SPRING to first close the lower seat at Ball 2 (Violet to Yellow) and then open the upper seat at Ball 1 (Yellow to Atmosphere).

The 3 PGP PRESSURESTAT may be used to fire small steam generators directly by connecting the Output Pressure (Yellow) to the burner. For larger units the Output Pressure (Yellow) can be used to operate a diaphragm motor valve installed in the burner manifold piping. See Sections E-2 and E-3 for applicable motor valves.



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3 PGP PRESSURESTAT
CAST IRON



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YAA	3 PGP	30	30	RMM

NOTES:

All openings are tapped 1/4" N.P.T.

*These parts are recommended spare parts and are stocked as repair kits.

APPLICATION:

Any system where two temporary pressure signals are available. One signal to turn "ON" the pilot and one signal to turn "OFF" the pilot.

FEATURES:

- Bistable operation
- Temporary signal will turn "ON" or "OFF"
- Intermittent vent pilot
- Semi-snap action

SUPPLY PRESSURE:

20 to 30 psig

OUTPUT PRESSURE:

0 psig or Supply Pressure

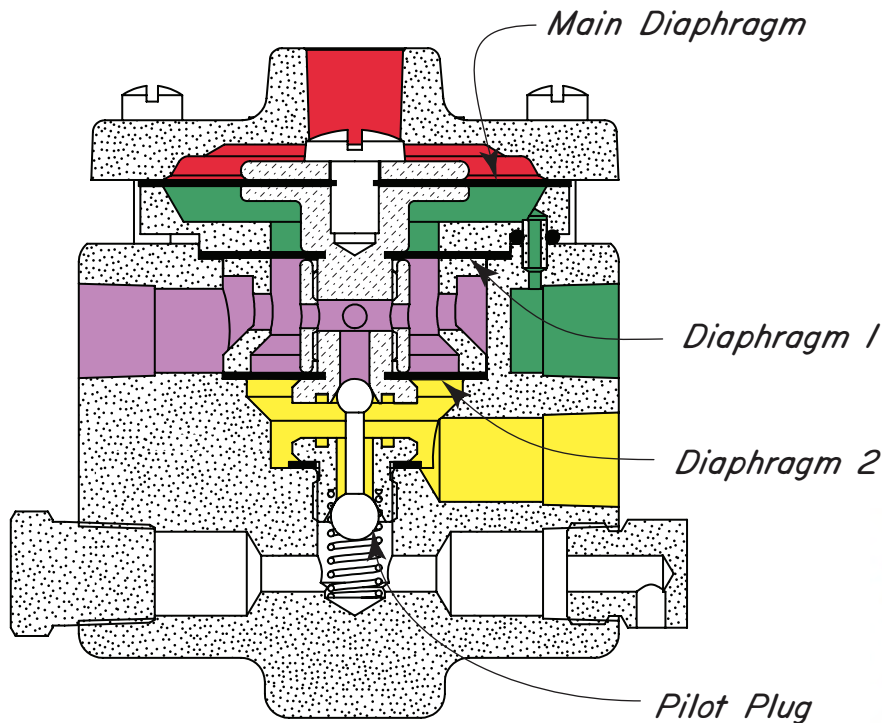
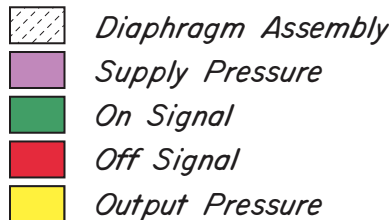
ON/OFF SIGNAL:

20 to 30 psig

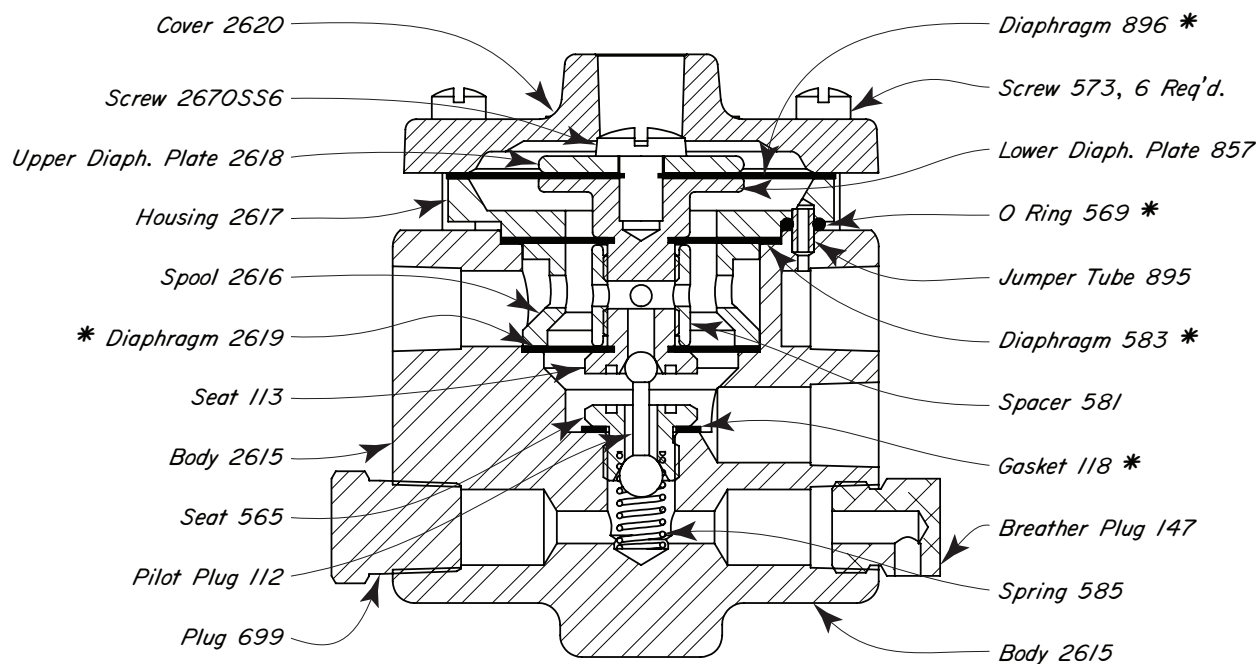
OPERATION:

Assume that when the Supply Pressure (Violet) is applied, the upper seat Ball 1 is closed and the lower seat Ball 2 is opened.

Output Pressure (Yellow) is vented to atmosphere. Since Diaphragm 2 is larger than Diaphragm 1, the Diaphragm Assembly is held down and the Output Pressure (Yellow) remains vented to atmosphere. When an "ON" signal (Green) is applied to the Main Diaphragm, the Diaphragm Assembly is forced upward, closing the lower seat and opening the upper seat. When the Supply Pressure (Violet) equalizes with the Output Pressure (Yellow), the Supply Pressure on Diaphragm 1 then holds the Diaphragm Assembly in the up position and the "ON" signal (Green) can be removed. When an "OFF" signal (Red) is applied to the Main Diaphragm, the Diaphragm Assembly is forced downward, closing the upper seat and opening the lower seat. This vents the Output Pressure (Yellow to Atmosphere). The "OFF" signal (Red) can now be removed and the pilot will remain in the "OFF" position. If the 3 PGB is "ON" when the Supply Pressure (Violet) is applied, an "OFF" signal applied to the Main Diaphragm will turn the 3 PGB "OFF."



3 PGB BISTABLE PILOT CAST IRON



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YAH1	3 PGB	30	30	RME

NOTES:

All openings are tapped 1/4" N.P.T.

NOTE: For dimensions refer to pg. 10.2 of this section

*These parts are recommended spare parts and are stocked as repair kits.

APPLICATION:

Any system where a 0 to 300 psig signal must be switched using a 20 to 30 psig signal.

FEATURES:

- Intermittent vent pilot 3 Way Valving
- Up to 300 psig supply
- 20 to 30 psig ON/OFF signal
- Direct acting

SUPPLY PRESSURE:

0 to 300 psig

OUTPUT PRESSURE:

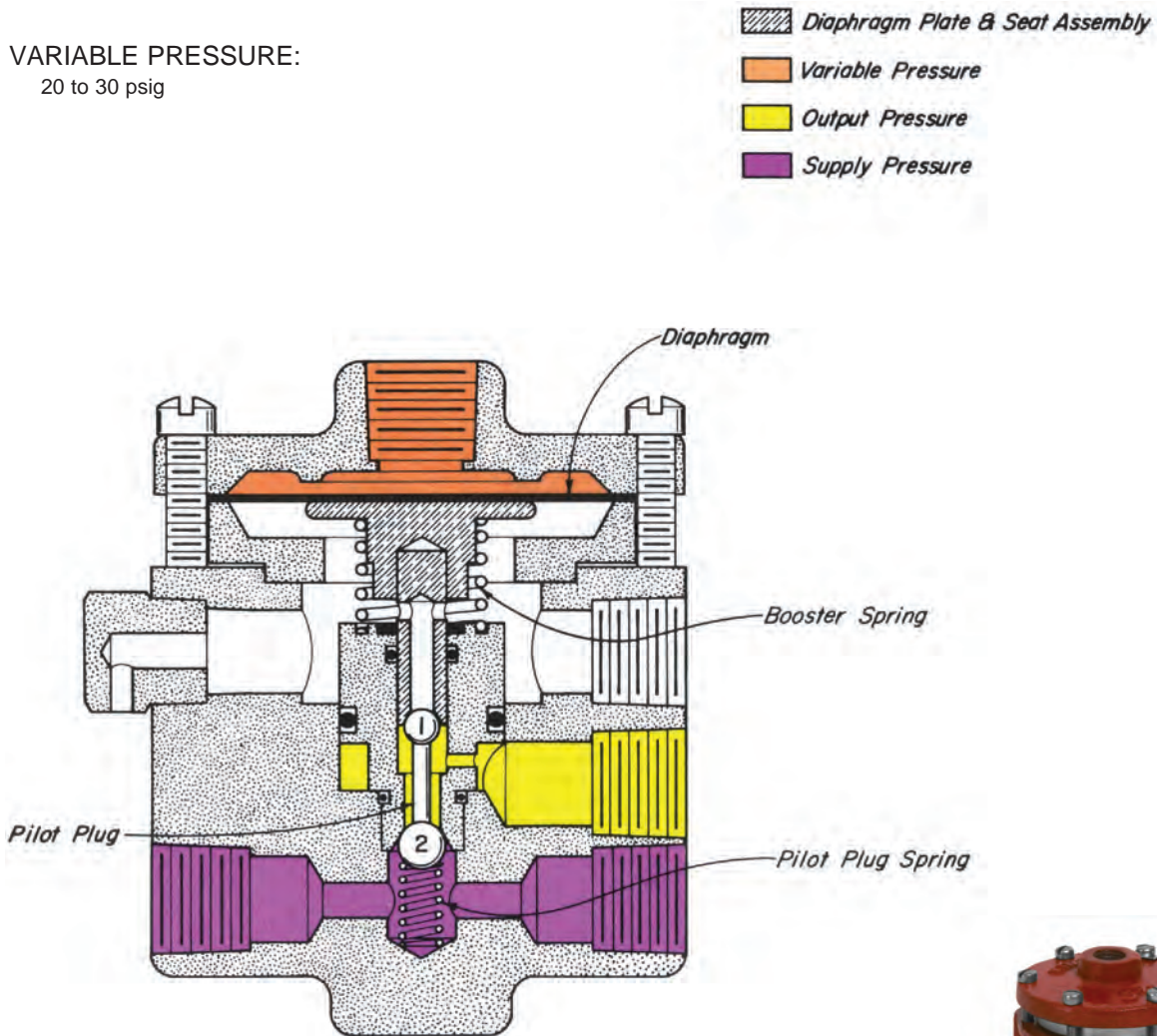
0 psig or Supply Pressure

VARIABLE PRESSURE:

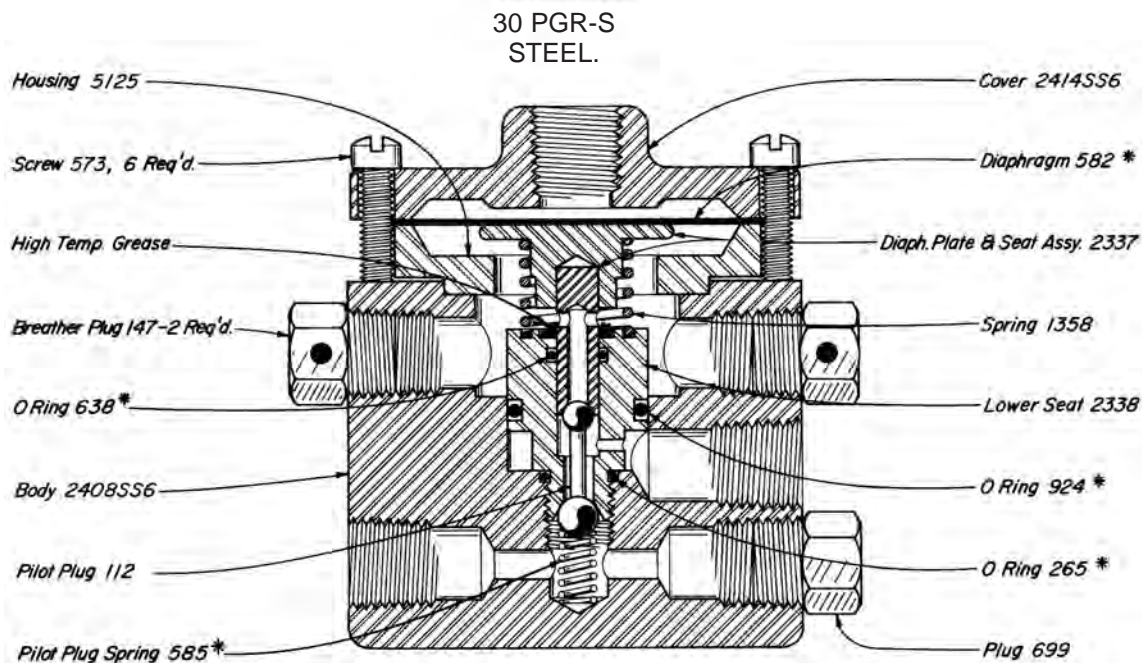
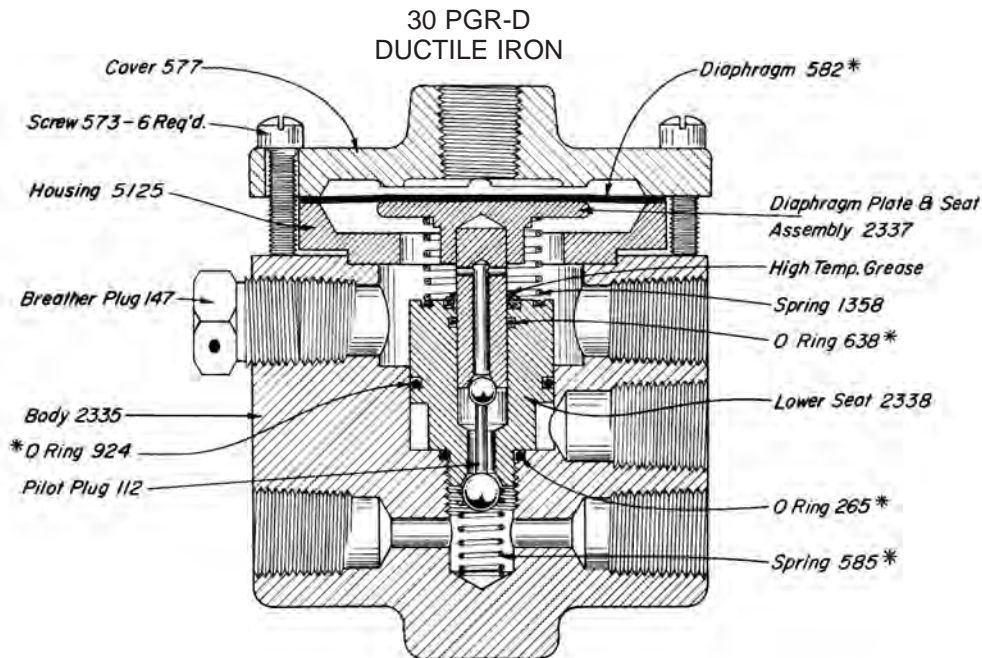
20 to 30 psig

OPERATION:

With the Variable Pressure (Orange) on the Main Diaphragm at a minimum, the Booster Spring lifts the Diaphragm Plate and Seat Assembly closing the lower seat Ball 2 and opening the upper seat Ball 1, venting the Output Pressure (Yellow to Atmosphere). With an increase in Variable Pressure (Orange) sufficient to overcome the Booster Spring, the Diaphragm Plate and Seat Assembly will be moved downward and the upper seat will be closed. As the Variable Pressure (Orange) continues to increase, the lower seat will be opened communicating Supply Pressure (Violet) to Output Pressure (Yellow). When the Variable Pressure (Orange) is decreased to a minimum, the Booster spring will raise the Diaphragm Plate and Seat Assembly, closing the lower seat (Violet to Yellow) and opening the upper seat (Yellow to Atmosphere), reducing the Output Pressure (Yellow to Atmospheric Pressure).



30 PGR RELAYS DUCTILE IRON / STEEL



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YAI	30 PGR-D	300	300	RMY
YAI1	30 PGR-S	300	300	RMY

NOTES:

All openings are tapped 1/4" N.P.T.

NOTE: For dimensions refer to Pg. 20.2 this section.

*These parts are recommended spare parts and are stocked as repair kits.

APPLICATIONS:

On oil and gas separators, water knockouts and similar equipment where motor valves are required.

Where a pneumatic signal is desired from mechanical movements such as a float.

FEATURES:

- Direct float operated
- Snap or throttle action
- Field reversible
- Controls any motor valve requiring up to 30 psig diaphragm pressure.

SUPPLY PRESSURE:

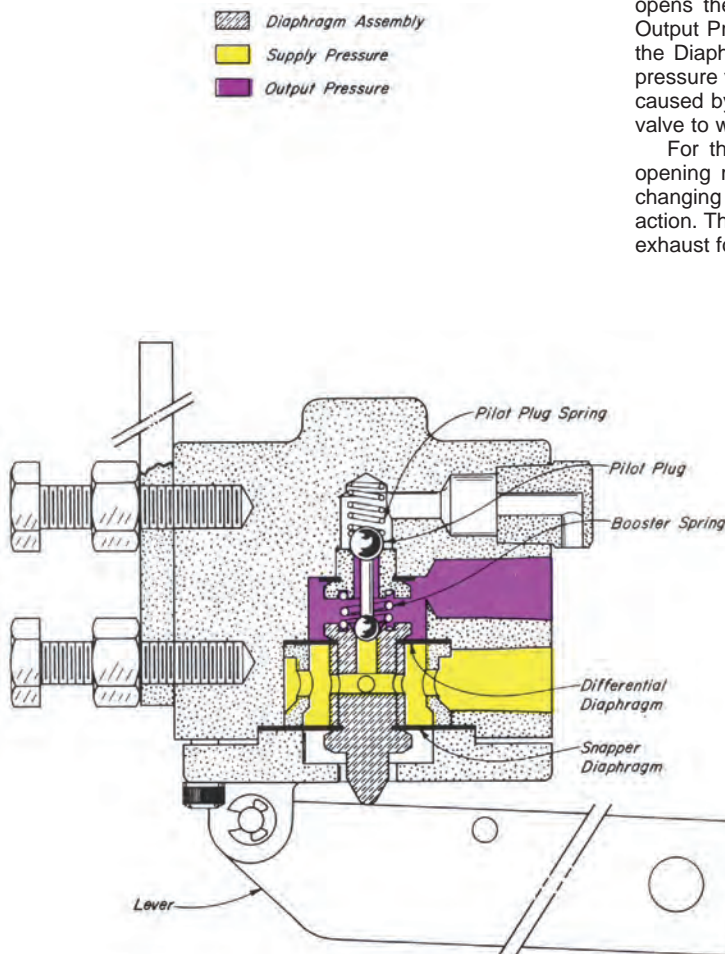
5 to 30 psig

OPERATION:

Assume the Diaphragm Assembly is held in an up position by an outside float arm connected to the pilot LEVER with a turnbuckle. Such an arrangement is shown in the 3 PM installation photograph, lower right-hand corner. The BOOSTER SPRING together with Supply Pressure (Violet), acting on the difference in areas of the SNAPPER and DIFFERENTIAL DIAPHRAGMS, forces the Diaphragm Assembly against the LEVER. With a downward movement of the LEVER the upper seat, which is the pressure vent (Yellow to Atmosphere), closes first. The PILOT PLUG SPRING holds the upper ball against its seat while a further downward movement of the LEVER opens the Supply Pressure inlet (Violet to Yellow). As Output Pressure (Yellow) increases, pressure across the DIFFERENTIAL DIAPHRAGM is reduced, loading the DIAPHRAGM ASSEMBLY in a down direction. The accelerated downward movement of the DIAPHRAGM ASSEMBLY produces a sudden opening of the Supply Pressure inlet (Violet to Yellow).

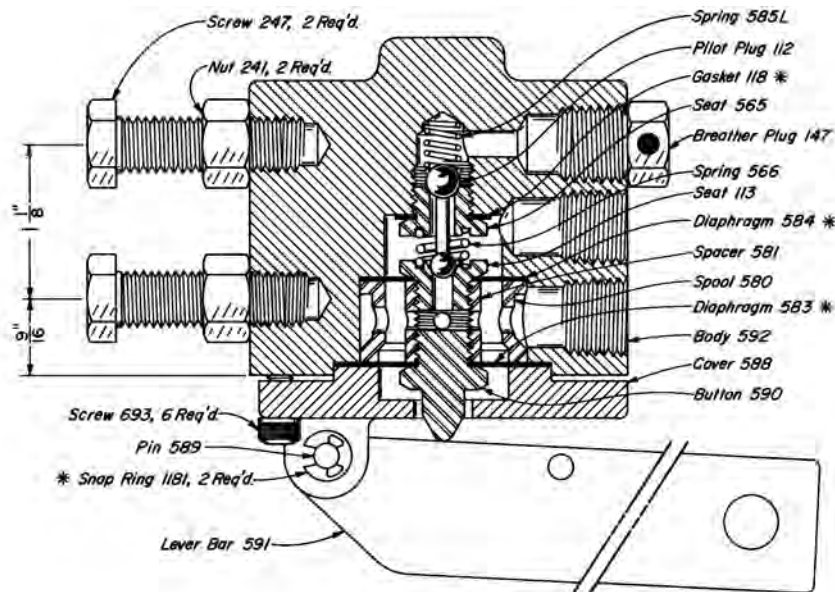
In order to reverse the above action, the upward force of the LEVER on the Diaphragm Assembly must be greater than the force of the BOOSTER SPRING plus Supply Pressure (Violet) acting on the full area of the SNAPPER DIAPHRAGM. As the Diaphragm Assembly moves up, the Supply Pressure inlet is closed first. The PILOT PLUG SPRING holds the lower ball against its seat while a further upward movement of the LEVER opens the pressure vent (Yellow to Atmosphere). Decreasing Output Pressure (Yellow) accelerates the upward movement of the Diaphragm Assembly to produce a sudden opening of the pressure vent. The sudden changes in Output Pressure (Yellow) caused by movements of the LEVER, snap actuates any motor valve to which it is connected.

For throttling Service, connect Supply Pressure (Violet) to opening marked "THROT" on the pilot body. This will require changing the pivot on the LEVER or reversing the motor valve action. The supply gas connection for snap service becomes the exhaust for throttling service.

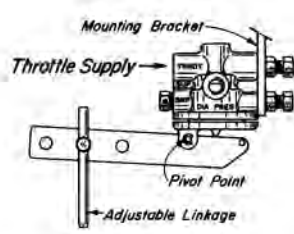
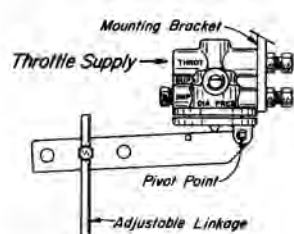
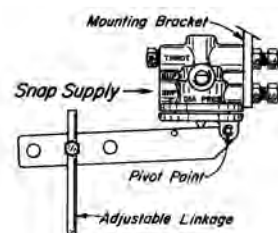
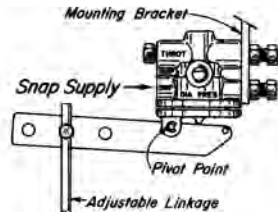


Float operated, 3 PM Pilot mounted on Kimray 8" Float Opening Cover.

3 PM MECHANICAL PILOT
CAST IRON



INSTALLATION



ROD MOVEMENT	OUTPUT
Up	Supply Pressure
Down	Vented

ROD MOVEMENT	OUTPUT
Up	Vented
Down	Supply Pressure

PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
CDA	3 PM	30	30	RMN

MOUNTING BRACKETS AVAILABLE: Order separate

FLOAT OPENING	MOUNTING BRACKET
612 TOB	903
812 TOB	904
1012 TOB	681
50 TOB-D	3035
25 TOB-D	3035
8" HUTA	3035
26 WA/26DM	1856

*These parts are recommended spare parts and are stocked as repair kits. Kimray is an ISO 9001- certified manufacturer.

4 POR PRIORITY SIGNAL RELAY

APPLICATIONS:

- Shut-in relay
- Remote shut-in relay
- Signal priority sensor
- Automatic shut-down relay
- Signal interruption

SPECIFICATIONS:

- Connections - 1/4" N.P.T.
- Max. Body design pressure - 300 psig
- Max. Inlet pressure Port 1 - 40 psig
- Max. Inlet pressure Port 2 - 40 psig
- Max. Operating temperature - 150°F.
- Pressure required at Port 2 to override the pressure at Port 1 20 psig or 70% of the pressure at Port 1 (whichever is greater).

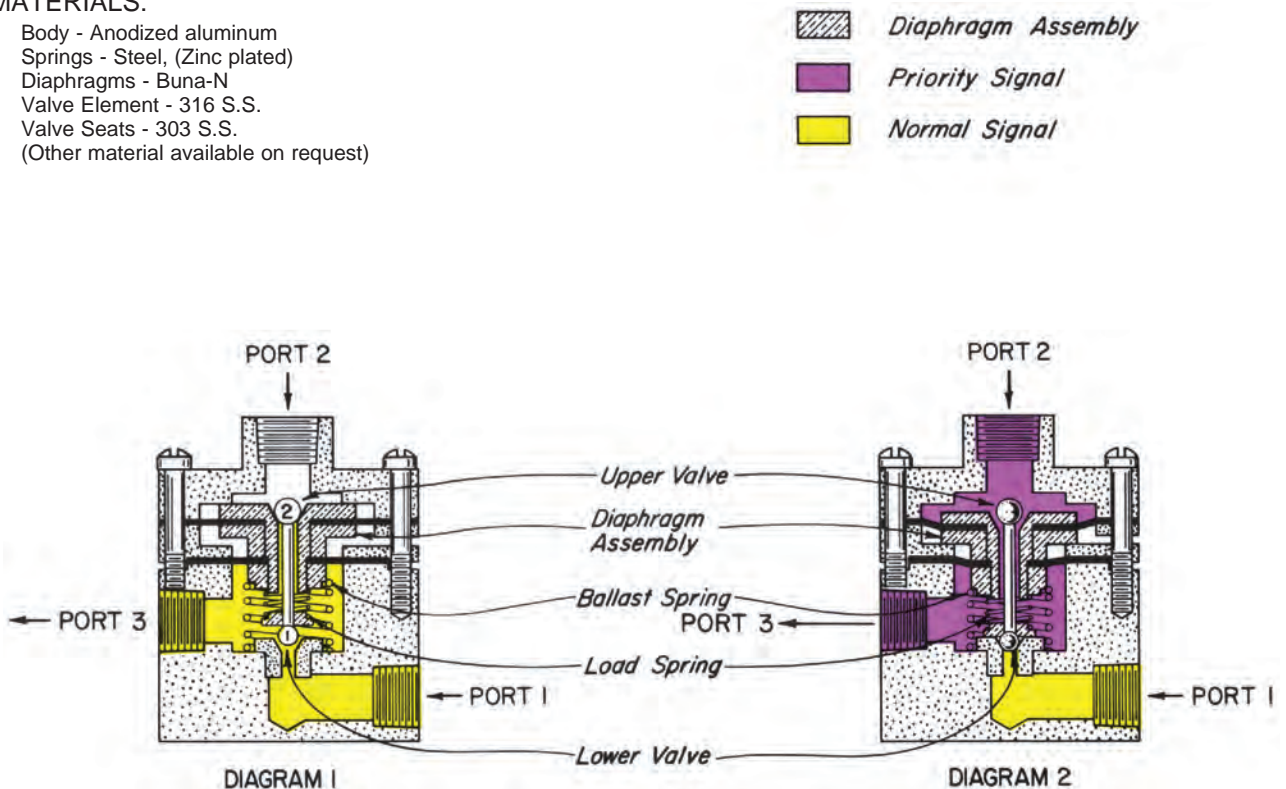
MATERIALS:

- Body - Anodized aluminum
- Springs - Steel, (Zinc plated)
- Diaphragms - Buna-N
- Valve Element - 316 S.S.
- Valve Seats - 303 S.S.
- (Other material available on request)

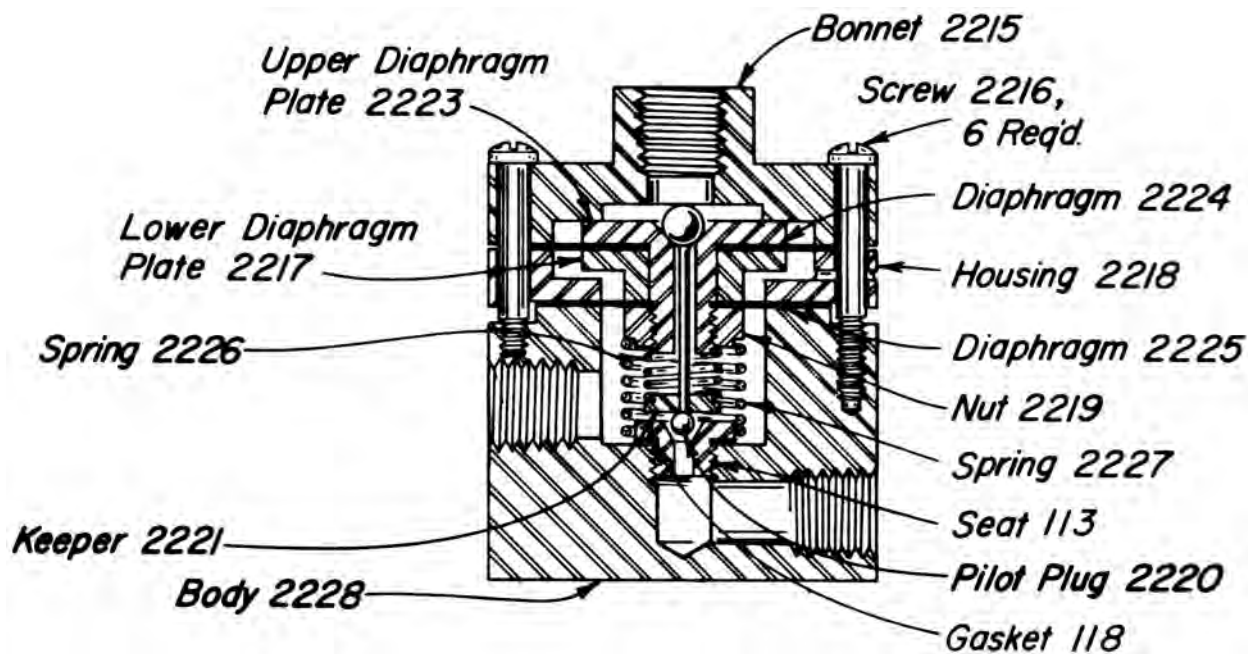
OPERATION:

Assume there is no pressure at Port 2 (see diagram 1). The BALLAST SPRING will raise the DIAPHRAGM ASSEMBLY, lifting Ball 1 and opening the LOWER VALVE. The LOAD SPRING will cause Ball 2 to close the UPPER VALVE. The Normal Signal (Yellow) at Port 3 will be the pressure at Port 1. The pressure at Port 1 can be a constant pressure or a variable pressure.

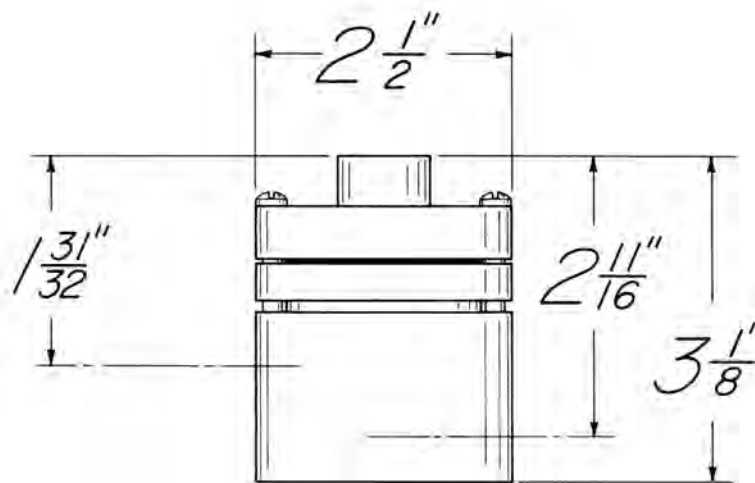
When pressure is applied at Port 2 (See diagram 2), the DIAPHRAGM ASSEMBLY moves downward. This causes Ball 1 to close the LOWER VALVE. As the DIAPHRAGM ASSEMBLY continues to move down, it compresses the LOAD SPRING and unseats Ball 2 in the UPPER VALVE. This allows the Priority Signal (Violet) from Port 2 to be transmitted to Port 3, the Priority Signal (Violet) at Port 2 should be a pressure of 20 to 40 psig. When the Priority Signal (Violet) at Port 2 is reduced below 1 psig the relay will reset to the original position with Port 1 communicated to Port 2.



4 POR PRIORITY SIGNAL RELAY ALUMINUM



PILOT DIMENSIONS



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
YBA	4 POR	40	40	

NOTES:

All openings are tapped $\frac{1}{4}$ " N.P.T.

FEATURES:

- Single Adjusting Screw
- Accurate control
- Proportional control
- Intermittent vent pilot construction
- Indirect or Direct Action
- Remote Installation
- 2500 psig operating pressure

CERTIFICATIONS:

Canadian Registration Number (CRN):
0C05370.24567890NTY

PRESSURE RANGE:

50 PG	75-500 psig
75 PG	75-750 psig
150 PG	125-1500 psig
250 PG	200-2500 psig

SUPPLY PRESSURE:

20 & 30 psig

SENSITIVITY:

	SENSE PRESS CHANGE (psig)	OUTPUT PRESS CHANGE (psig)
50 PG	1 psig	1.6 psig
75 PG	1 psig	1.6 psig
150 PG	1 psig	1 psig
250 PG	1 psig	0.75 psig

ADJUSTMENT:

	SET POINT CHANGE (psig)
50 PG	20 psig / 1 TURN
75 PG	20 psig / 1 TURN
150 PG	40 psig / 1 TURN
250 PG	60 psig / 1 TURN

APPLICATION:

Pilot may be installed as Back Pressure Regulator with a Pressure Closing Motor Valve.

Pilot may be used as a pressure monitor that provides an output signal when the sense pressure falls below the set pressure, or when the signal goes above the set pressure.

Pilot may be used as a Pressure Reducing Regulator with a Pressure Opening Motor Valve.

OPERATION:

The DIAPHRAGM ASSEMBLY and the Bellows Assembly are the only moving units in the pilot. The PILOT PLUG consist of two stainless balls rigidly connected together. The upper seat of the PILOT PLUG is the vent for the Modulated Output Pressure (Yellow to Atmosphere). The lower seat of the PILOT PLUG is the Supply Pressure inlet to the Modulated Output (Violet to Yellow).

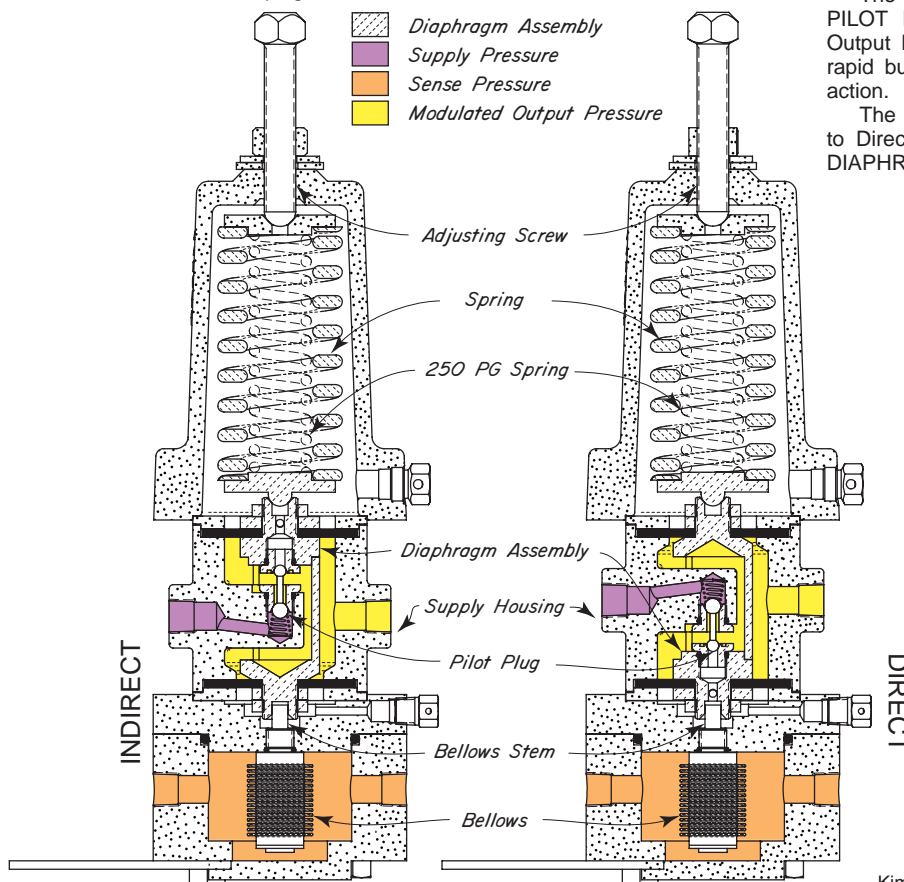
The SPRING in the bonnet loads the upper side of the DIAPHRAGM ASSEMBLY and is opposed at the opposite end by the BELLOWS STEM. The BELLOWS STEM is actuated by the Sense Pressure (Orange) acting on the outside of the BELLOWS.

Assume the SPRING is compressed with the ADJUSTING SCREW for a set pressure greater than the Sense Pressure (Orange). The DIAPHRAGM ASSEMBLY is forced downward by the SPRING. The upper seat of the PILOT PLUG (Yellow to Atmosphere) is closed and the lower seat of the PILOT PLUG (Violet to Yellow) is opened. This allows Supply Pressure (Violet) to provide a Modulated Output Pressure (Yellow).

As the Sense Pressure (Orange) increases to the set pressure, the BELLOWS begins to contract, moving the BELLOWS STEM upward against the DIAPHRAGM ASSEMBLY. This compresses the SPRING and closes the lower seat (Violet to Yellow) and opens the vent for the Modulated Output Pressure (Yellow) to decrease.

The intermittent vent, three-way valve action of the PILOT PLUG against its seat adjusts the Modulated Output Pressure (Yellow) in and the set pressure. The rapid but stable repositioning produces a true throttling action.

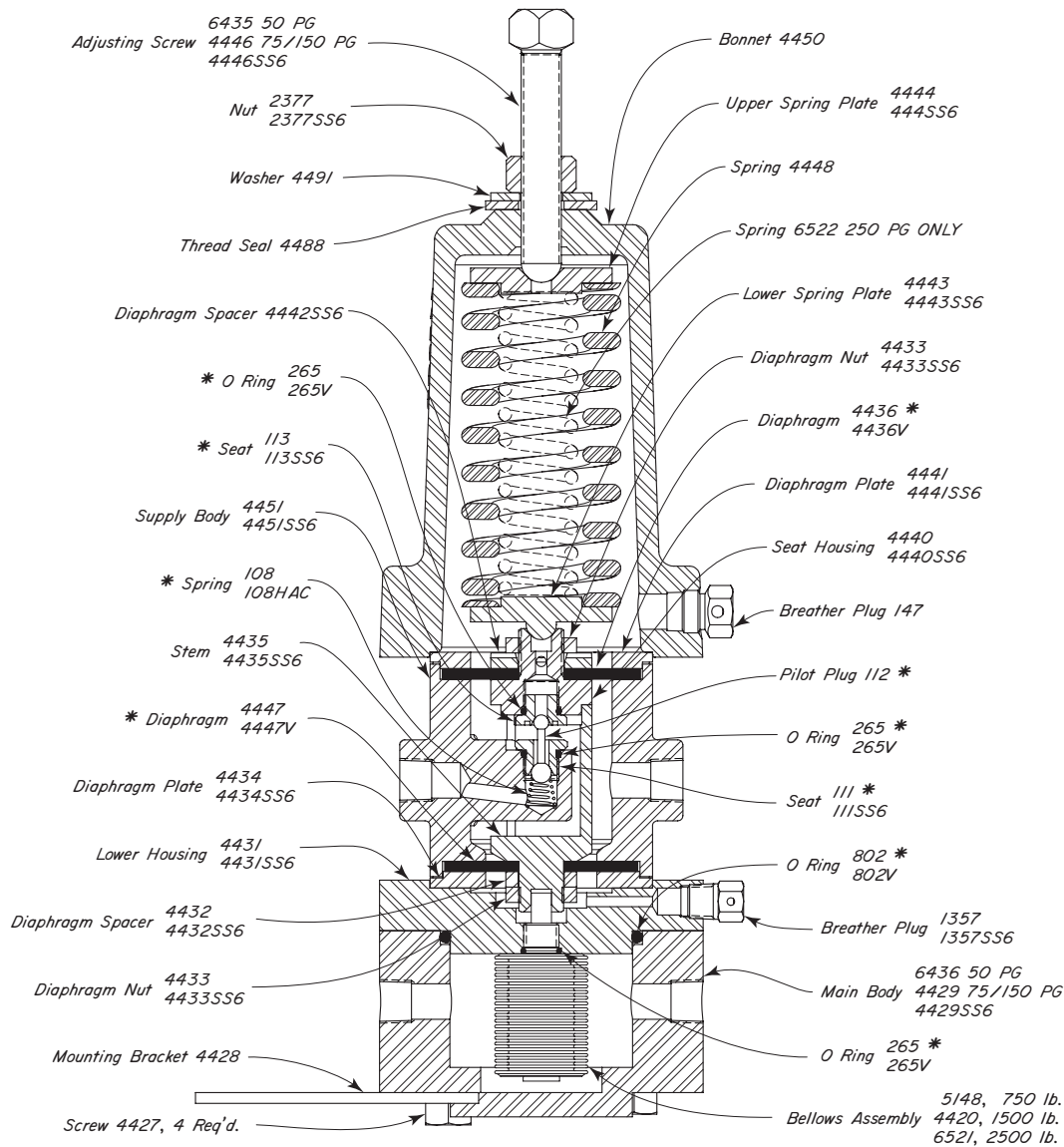
The action of the pilot may be changed from Indirect to Direct by inverting the SUPPLY HOUSING and the DIAPHRAGM ASSEMBLY.



Kimray is an ISO 9001- certified manufacturer.

50 / 75 / 150 / 250 PG PILOTS

STEEL / SS6



PILOTS AVAILABLE:

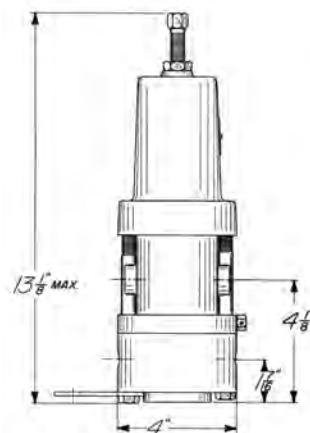
CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
AFZ4	50 PG I.A. ^a	500	500	RBQ
AFZ5	50 PG D.A. ^b	500	500	RBQ
AFZ2	75 PG I.A. ^a	750	750	RBQ
AFZ2SS6	75 PG I.A. ^a SS6	750	750	RBQ-V
AFZ3	75 PG D.A. ^b	750	750	RBQ
AFZ	150 PG I.A. ^a	1500	1500	RBQ
AFZSS6	150 PG I.A. ^a SS6	1500	1500	RBQ-V
AFZ1	150 PG D.A. ^b	1500	1500	RBQ
AFZ1-SS6	150 PG D.A. ^b SS6	1500	1500	RBQ-V
AFZ6	250 PG D.A. ^b	2500	2500	RBQ
AFZ7	250 PG I.A. ^a	2500	2500	RBQ

^a Indirect Action

^b Direct Action

*These are recommended spare parts and are stocked as repair kits.

PILOT DIMENSIONS



Kimray is an ISO 9001- certified manufacturer.

APPLICATION:

Pilot may be installed remotely from the motor valve (see Motor Valves shown in Sections E1 and E2). This pilot is used in the regulation of inlet pressure to gas compressors, the control of supply pressure, or distribution system pressure. It may be used to produce a pneumatic output signal when the monitored pressure falls below the set pressure. The pneumatic signal source is isolated from the monitored pressure.

FEATURES:

- Single Adjustment
- Filtered gas supply
- Accurate control
- Intermittent vent pilot construction
- Remote installation

CERTIFICATIONS:

- Canadian Registration Number (CRN):
- OC15143.24567890NTY (Ductile)
- OC15813.24567890NTY (Steel)

SUPPLY PRESSURE:

Equal to or not less than 60% of maximum upstream pressure when used to operate low pressure motor valves (shown in Section E2).

20 to 30 psig when used to operate high pressure motor valves (shown in Section E1).

PRESSURE RANGE:

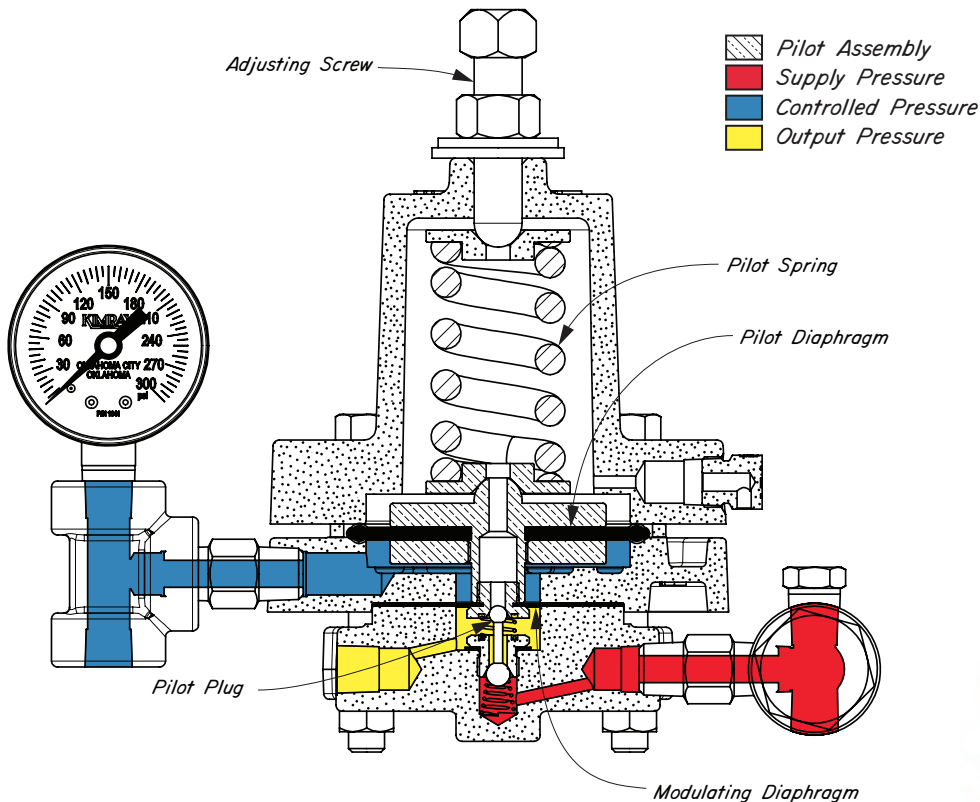
5 psig to 300 psig.

OPERATION:

The Pilot Assembly, which moves as a unit without friction within the housing, is supported by the PILOT DIAPHRAGM and the MODULATING DIAPHRAGM. The PILOT SPRING loads the upper side of the Pilot Assembly and is opposed on the underside by Controlled Pressure (Blue) acting on the net area of the PILOT and MODULATING DIAPHRAGMS (area of PILOT DIAPHRAGM minus area of MODULATING DIAPHRAGM).

The 12/30 PG Pilot can be considered as an inverse multiplier. Each 1 psig change in Controlled Pressure (Blue) results in a change in Output Pressure (Yellow) of 8 psig. A ratio of 8:1.

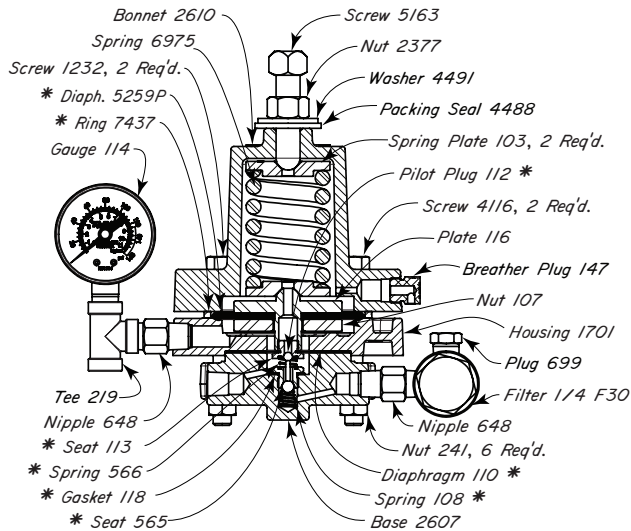
With a slight decrease in Controlled Pressure (Blue) the Pilot Assembly is forced downward by the PILOT SPRING. The upper seat for the PILOT PLUG (Yellow to Atmosphere) is closed and the lower seat for the PILOT PLUG (Red to Yellow) is opened. This results in an increased Output Pressure (Yellow) under the MODULATING DIAPHRAGM which balances the lost upward force due to the slight decrease of Controlled Pressure (Blue). The Pilot Assembly returns to a position at which both the upper and lower seats are closed. A slight increase in Controlled Pressure (Blue) opens the upper seat and closes the lower seat to reduce the Output Pressure (Yellow).



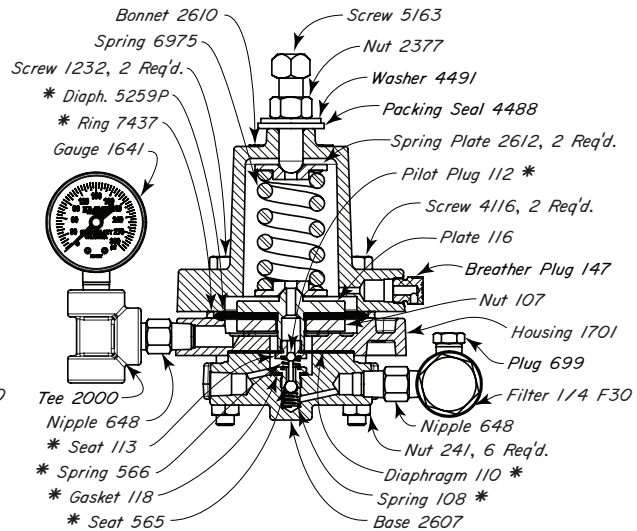
PRESSURE PILOTS

CAST IRON / DUCTILE IRON / STEEL

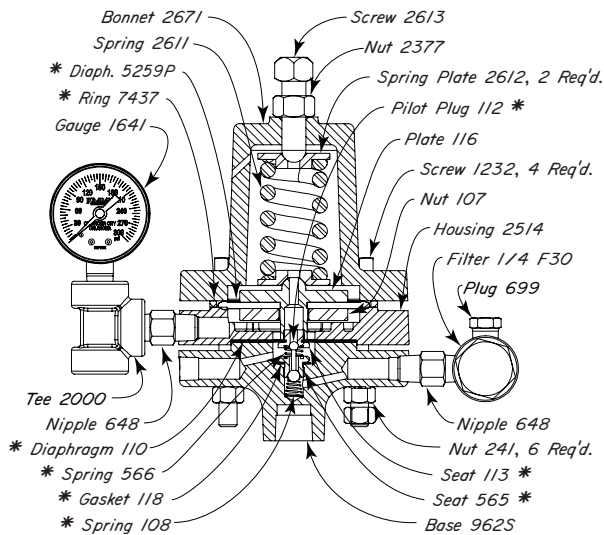
12 PG
CAST IRON



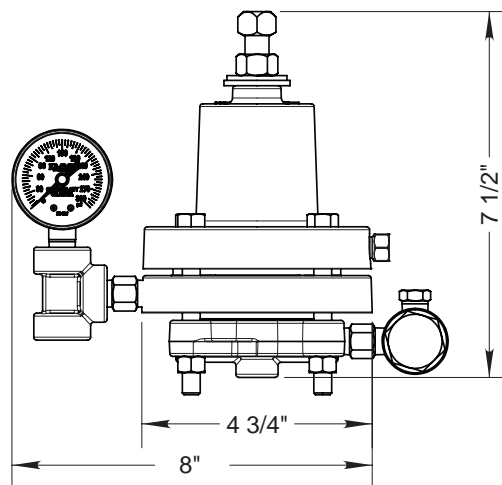
30 PG-D
DUCTILE



30 PG-S
STEEL



PILOT
DIMENSIONS



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
AFN	12 PG PR	175	125	RBM
AFS	30 PG PR-D	300	300	RBM
AHU	30 PG PR-S	300	300	RBM

NOTES:

All openings are tapped 1/4" NPT.

*These are recommended spare parts and are stocked as repair kits.

APPLICATION:

The 30 HPG-D is used to produce a pneumatic output signal when the monitored pressure falls below the set pressure. The pneumatic source is isolated from the monitored pressure by a vent chamber which allows the monitored pressure to vent away if it reaches a high enough pressure to cause diaphragm failure.

The control pilot may be remotely installed to operate a motor valve and function as a pressure reducing regulator.

The best application of this pilot is for instrument protection where the monitored pressure may surge above the rated pressure of the pilot.

FEATURES:

- Single Adjustment
- Filtered gas supply
- Accurate control
- Intermittent vent pilot construction
- Remote installation

CERTIFICATIONS:

Canadian Registration Number (CRN):
0C15143.24567890NTY

SUPPLY PRESSURE:

Equal to or not less than 60% of maximum upstream pressure when used to operate low pressure motor valves (shown in Section E2).

20 to 30 psig when used to operate high pressure motor valves (shown in Section E1).

PRESSURE RANGE:

5 psig to 300 psig

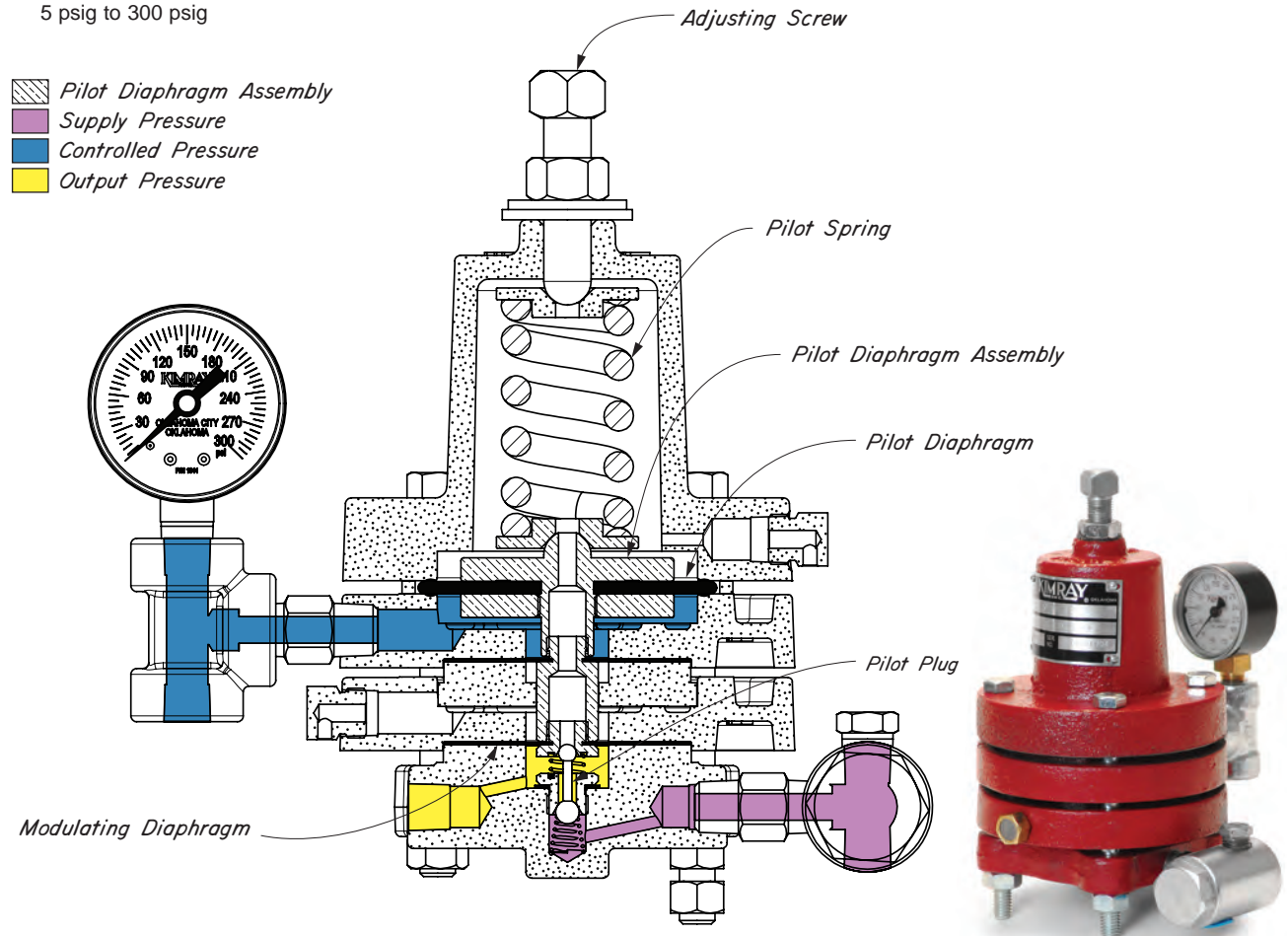
OPERATION:

The 30 HPG-D consists of a PILOT DIAPHRAGM ASSEMBLY which moves without friction within a housing, to operate a 3 way PILOT PLUG. PILOT DIAPHRAGM ASSEMBLY is supported by the PILOT DIAPHRAGM and the MODULATING DIAPHRAGM. The PILOT SPRING loads the upper side of the PILOT DIAPHRAGM ASSEMBLY and is opposed on the underside by Controlled Pressure (Blue) acting on the net area of the PILOT and MODULATING DIAPHRAGMS (area of PILOT DIAPHRAGM minus area of MODULATING DIAPHRAGM).

The 30 HPG-D can be considered as an inverse multiplier. Each 1 psig change in Controlled Pressure (Blue) results in a change in Output Pressure (Yellow) of 8 psig. A ratio of 8:1.

Assume that the Controlled Pressure (Blue) is at the set point. With a decrease in Controlled Pressure (Blue) the PILOT DIAPHRAGM ASSEMBLY is forced downward by the PILOT SPRING. The upper seat for the PILOT PLUG (Yellow to Atmosphere) is closed and the lower seat for the PILOT PLUG (Violet to Yellow) is opened. This results in increased Output Pressure (Yellow) under the MODULATING DIAPHRAGM which balances the lost upward force due to the slight decrease of Controlled Pressure (Blue). The PILOT DIAPHRAGM ASSEMBLY returns to a position at which both the upper and lower seats are closed.

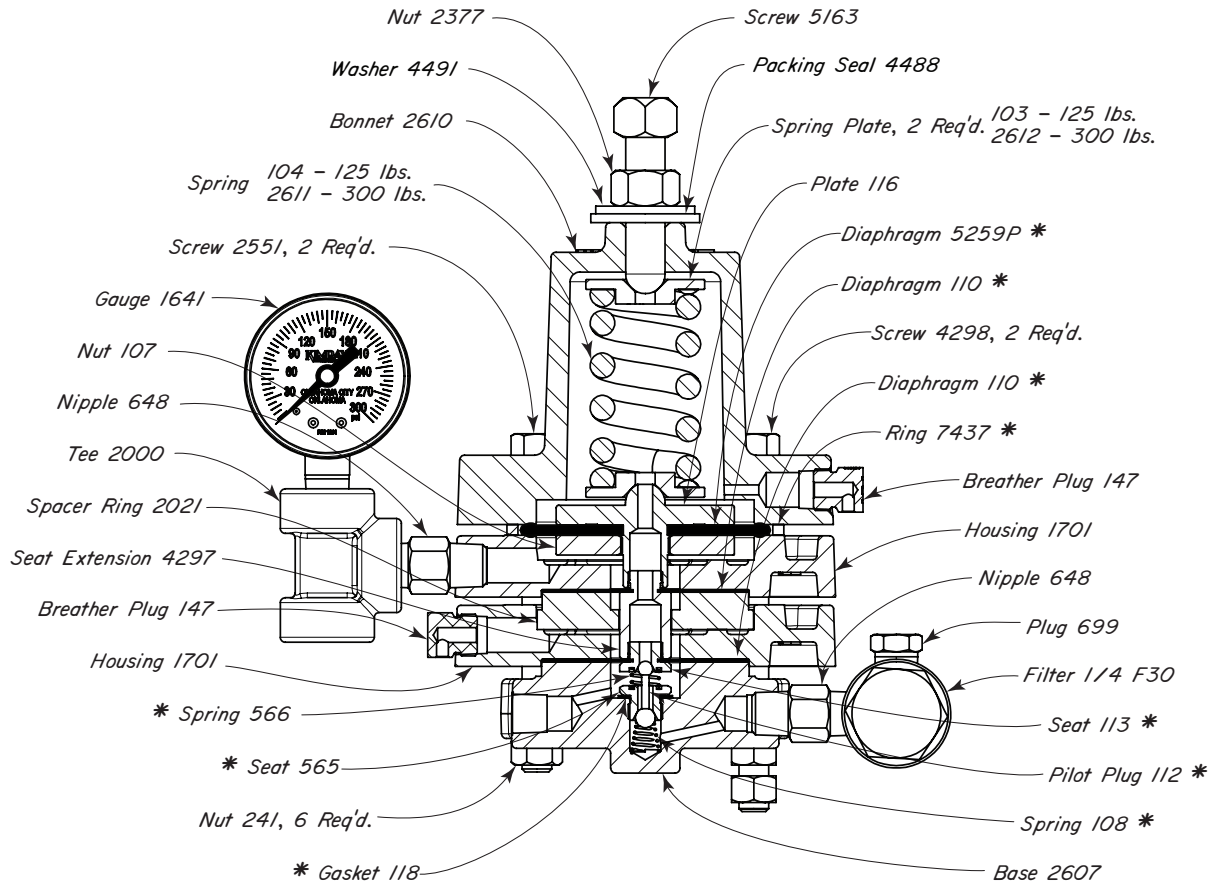
A slight increase in Controlled Pressure (Blue) opens the upper seat and closes the lower seat to reduce the Output Pressure (Yellow).



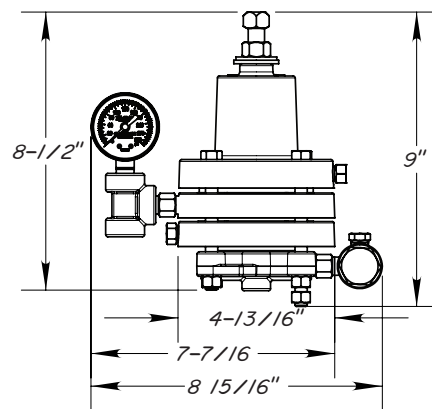
PILOTS AND ACCESSORIES

HIGH PRESSURE - PRESSURE PILOTS DUCTILE IRON

KIMRAY[®]



PILOT DIMENSIONS



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
AHJ	30 HPG-D	300	300	RSR
AHJS6	30 HPG-D w/316SS	300	300	RSR
AHJ2	30 HPG-D w/125 lb Spring	300	125	RSR

NOTES:

All openings are tapped 1/4" NPT.

*These are recommended spare parts and are stocked as repair kits.

Kimray is an ISO 9001- certified manufacturer.

APPLICATIONS:

Pilot may be installed remotely from the motor valve (see Motor Valves shown in Sections E1 and E2). This pilot is used for maintaining a constant pressure drop across meter systems or to produce a pneumatic output signal when the differential pressure of a system falls below the set differential pressure. (see Motor Valves shown in Section B)

FEATURES:

- Single Adjustment
- Filtered gas supply
- Accurate control
- Intermittent vent pilot construction
- Remote installation

SUPPLY PRESSURE:

0-300 psig, (60% or more of upstream pressure recommended for operating motor valves.)

PRESSURE RANGE:

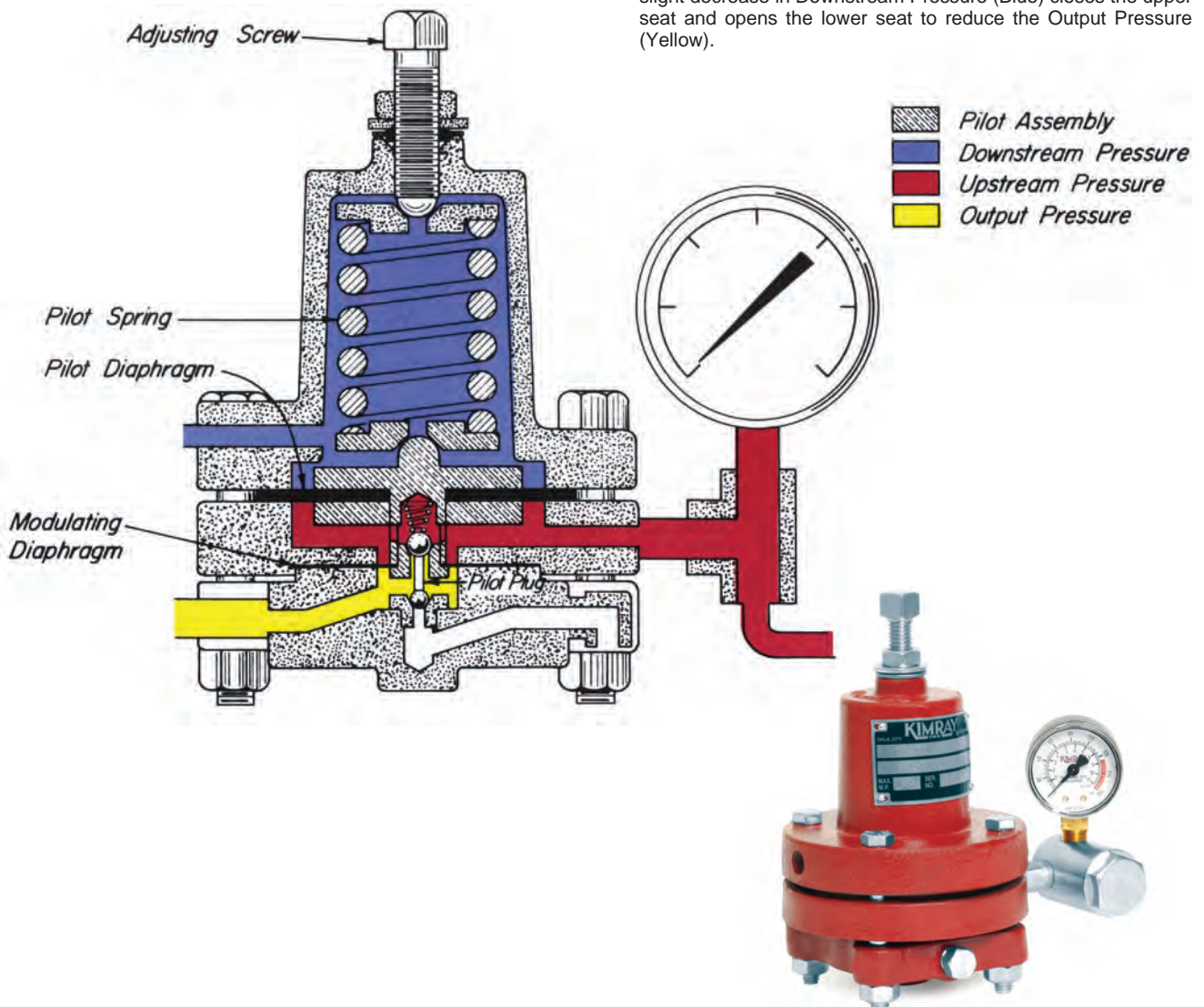
- 5 psig to 125 psig
- 10 psig to 300 psig

OPERATION:

The Pilot Assembly, which moves as a unit without friction within the housing, is supported by the PILOT DIAPHRAGM and the MODULATING DIAPHRAGM. The PILOT SPRING and Downstream Pressure (Blue) loads the upper side of the Pilot Assembly and is opposed on the underside by the Upstream Pressure (Red) acting on the PILOT and MODULATING DIAPHRAGMS (Area of PILOT DIAPHRAGM minus area of MODULATING DIAPHRAGM).

The 12 PG PD Pilot can be considered as an inverse multiplier. Each 1 psig change in Differential pressure, Upstream Pressure (Red) minus Downstream Pressure (Blue), results in a change in Output Pressure (Yellow) of 12 psig. The 30 PG PD-D/S Pilot changes at a rate of 8:1.

With a slight decrease in Upstream Pressure (Red) or a slight increase in Downstream Pressure (Blue) the PILOT ASSEMBLY is forced downward by the PILOT SPRING. The lower seat for the PILOT PLUG (Yellow to Atmosphere) is closed and the upper seat for the PILOT PLUG (Red to Yellow) is opened. This results in an increased Output Pressure (Yellow) under the MODULATING DIAPHRAGM which opposes the change. The PILOT ASSEMBLY returns to a position at which both the upper and lower seats are closed when the Differential Pressure is re-established. A slight increase in Upstream Pressure (Red) or slight decrease in Downstream Pressure (Blue) closes the upper seat and opens the lower seat to reduce the Output Pressure (Yellow).



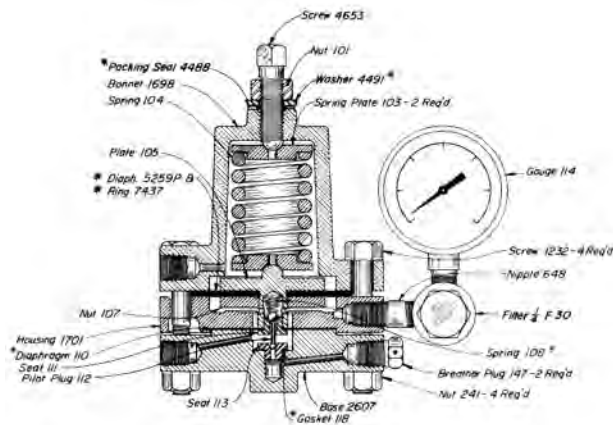
Kimray is an ISO 9001- certified manufacturer.

PILOTS AND ACCESSORIES

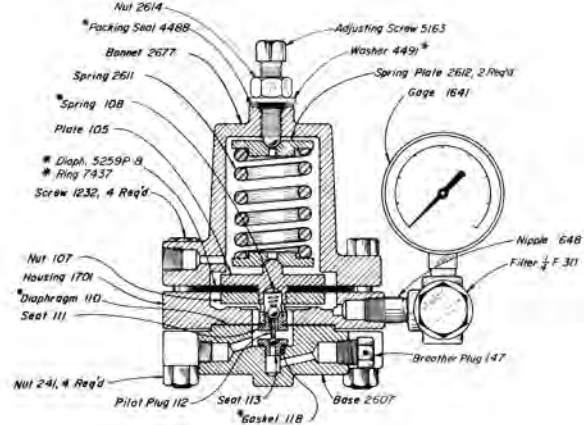
PRESSURE DIFFERENTIAL PILOTS CAST IRON / DUCTILE / STEEL

KIMRAY[®]

12 PG PD
CAST IRON

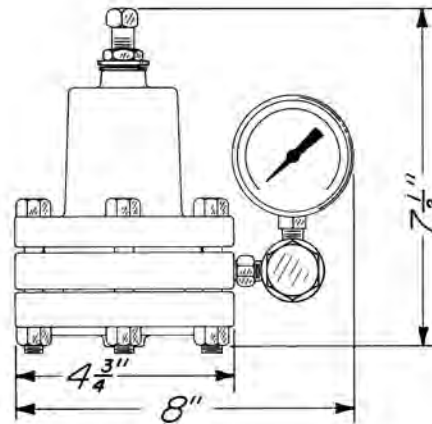
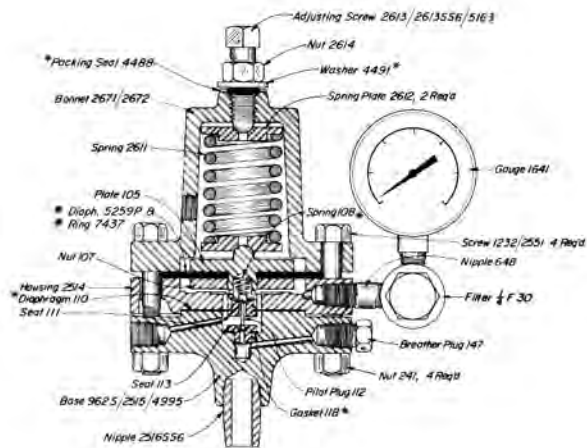


30 PG PD-D
DUCTILE



30 PG PD-S
STEEL

PILOT
DIMENSIONS



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
AFP	12 PG PD	175	125	RBL
AFT	30 PG PD-D	300	300	RBL
AHT	30 PG PD-S	300	300	RBL

NOTES:

All openings are tapped 1/4" NPT.

*These are recommended spare parts and are stocked as repair kits.

Kimray is an ISO 9001- certified manufacturer.

APPLICATIONS:

The "PDC" Series Pressure Differential Controller connects across the orifice plate of a meter run to maintain a constant stable pressure differential across the meter run. This relates to a constant flow rate when the upstream pressure is constant. This pilot adjusts the flow rate to maintain the pressure differential by positioning a pressure opening motor valve that has characterized equal percentage valve trim for precise flow control.

Precise gas flow rate for gas lift.

Pressure differential control across orifice plates for better charts and measurement of gas flow.

Stabilizes gas flow for better well production.

Pressure differential limiting for reducing "off chart" conditions.

Any applications where a constant pressure differential and flow rate is desired.

FEATURES:

Intermittent vent pilot

Throttle operation

1 to 260 inches of water differential pressure

Heavier springs available, if specified

May be used with any type of diaphragm motor valve

WORKING PRESSURE:

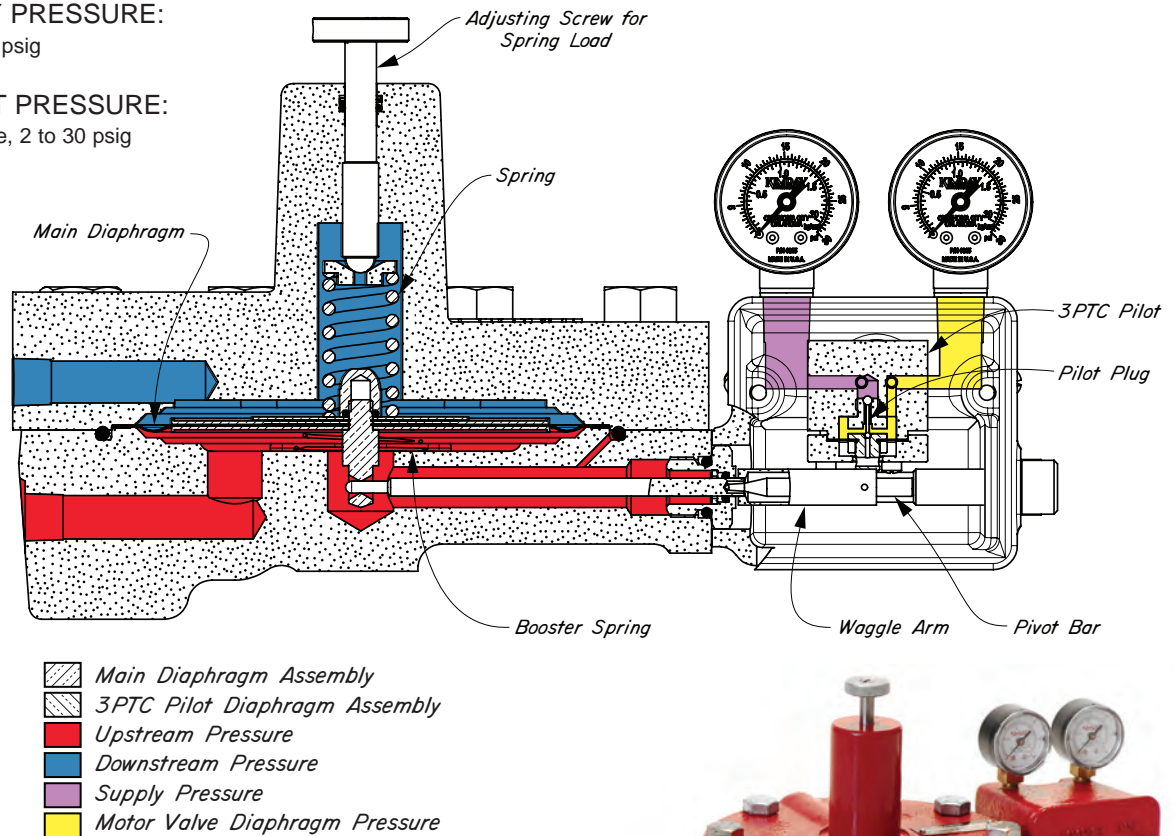
1000 or 2000 psig maximum

SUPPLY PRESSURE:

5 to 30 psig

OUTPUT PRESSURE:

Variable, 2 to 30 psig



OPERATION:

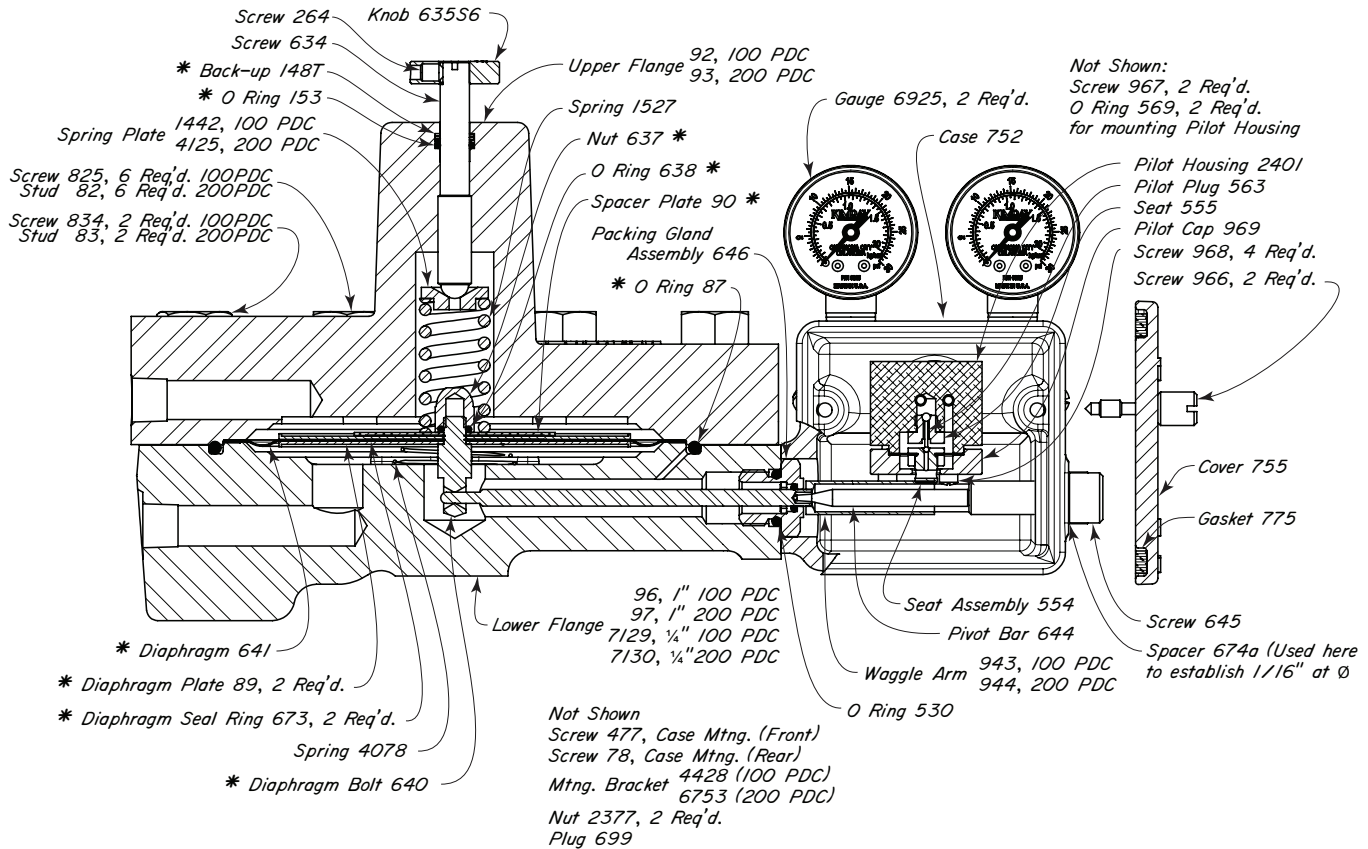
A typical system installation of the PDC Pilot consists of a PDC Pilot mounted so that the pressure differential across an orifice plate is applied across the diaphragm. The output signal from the PDC Pilot operates a diaphragm control valve to maintain the desired pressure differential across the orifice plate (Two stage, filtered, regulation of instrument gas with drip pot or equivalent is recommended).

Assume the control valve is open, and the pressure differential is rising. The Upstream Pressure is opposed by the Downstream Pressure plus an adjustable spring load. As the pressure differential increases to the set point, there is an upward movement of the diaphragm assembly which is transmitted by the WAGGLE ARM causing a downward movement in the 3 PTC PILOT. The 3 PTC is now in a relief mode which allows the pressure opening motor valve to begin to close. As the valve closes, the pressure differential will decrease and reposition the PDC diaphragm assembly to stop the relief of motor valve diaphragm pressure.

If the pressure differential decreases from the set point, the spring forces the diaphragm assembly downward. This causes an upward movement of the WAGGLE ARM on the 3 PTC PILOT, increasing the diaphragm pressure of the pressure opening motor valve. As the valve opens, the pressure differential will begin to increase until it reaches the set point.



100 & 200 PDC STEEL



PILOTS AVAILABLE:

CAT. NO.	CONN. SIZE ‡	PILOT	MAX W.P.	OPER. PRES.	KIT
FAA1	1/4"	100 PDC	1000	1000	RIJ
FAB1	1/4"	200 PDC	2000	2000	RIJ
FAA2	1"	100 PDC	1000	1000	RIJ
FAB2	1"	200 PDC	2000	2000	RIJ

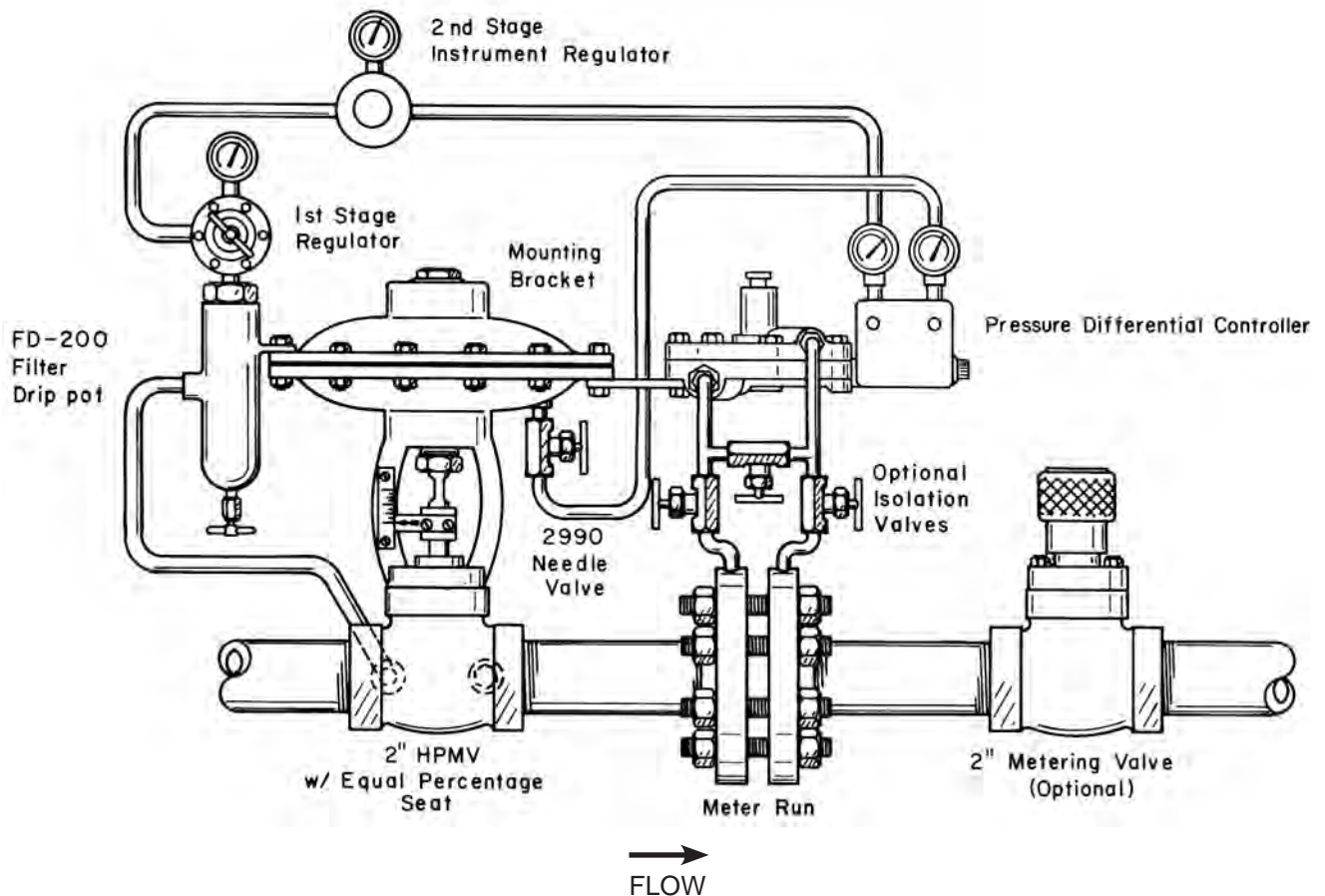
‡ Lower flange connection only

NOTES:

*These are recommended spare parts and are stocked as repair kits.

SIZING, INSTALLATION INSTRUCTIONS:

1. Locate the motor valve conveniently upstream or downstream of the meter run.
2. Size and install the proper orifice plate for flow conditions. Determine the pressure differential set point desired and install the proper spring for the maximum pressure differential to be controlled. (See Fig. 3)
3. The control valve should be sized according to recommended valve sizing procedures using equal percentage characteristic trim for precise flow control. Refer to gas rate charts for valve trim in the Kimray Catalog.
4. A metering valve or adjustable orifice can be installed to take part of the pressure drop to provide better control conditions for the valve.
5. Mount the controller so that it is accessible and level. Connect the 1" connector upstream of the orifice plate and the 1/4" NPT connector downstream. Install isolation valve manifold if desired.
6. Connect a dry instrument gas source (20-30 psig) to the pilot supply and connect the control tubing to the valve. A needle valve on this line is sometimes helpful in stabilizing the motor valve / controller system. (See Fig.1)



START-UP PROCEDURE:

1. Open the isolation valves and close the equalizing valve (if used) prior to applying pressure to the meter run to prevent an excessive pressure drop across the diaphragm. Excessive pressure drops across diaphragm will cause the diaphragm to rupture.
2. Turn the control knob fully counterclockwise.
3. Open the gas stream to the meter run.
4. Adjust the control knob until the motor valve begins to open.
5. Continue to adjust the control knob until the desired pressure differential is obtained. If the valve is fully open and the pressure differential is not obtained, recheck flow conditions, pressure, valve sizing and orifice sizing.
6. If the valve hunts (moves open and closed excessively), close the needle valve in the motor valve supply gas line until the positioning becomes stable or replace the motor valve trim with a smaller inner valve.
7. The Controller can now be set for the maximum limit or adjusted to control the desired pressure differential.

NOTES:



Kimray is an ISO 9001- certified manufacturer.

LIQUID DIFFERENTIAL PRESSURE PILOT

APPLICATION:

The 30 PG LDP-D sends a pneumatic signal when the differential pressure between two wet or dry pressures is less than the desired setting. The signal vents when the difference is higher than the setting.

Pilot may be installed remotely to operate a diaphragm operated motor valve as a liquid differential pressure regulator.

FEATURES:

- Single adjustment
- Filtered gas supply
- Accurate control
- Intermittent vent pilot
- Remote installation

PRESSURE RANGE:

5 psig to 300 psig

SUPPLY PRESSURE:

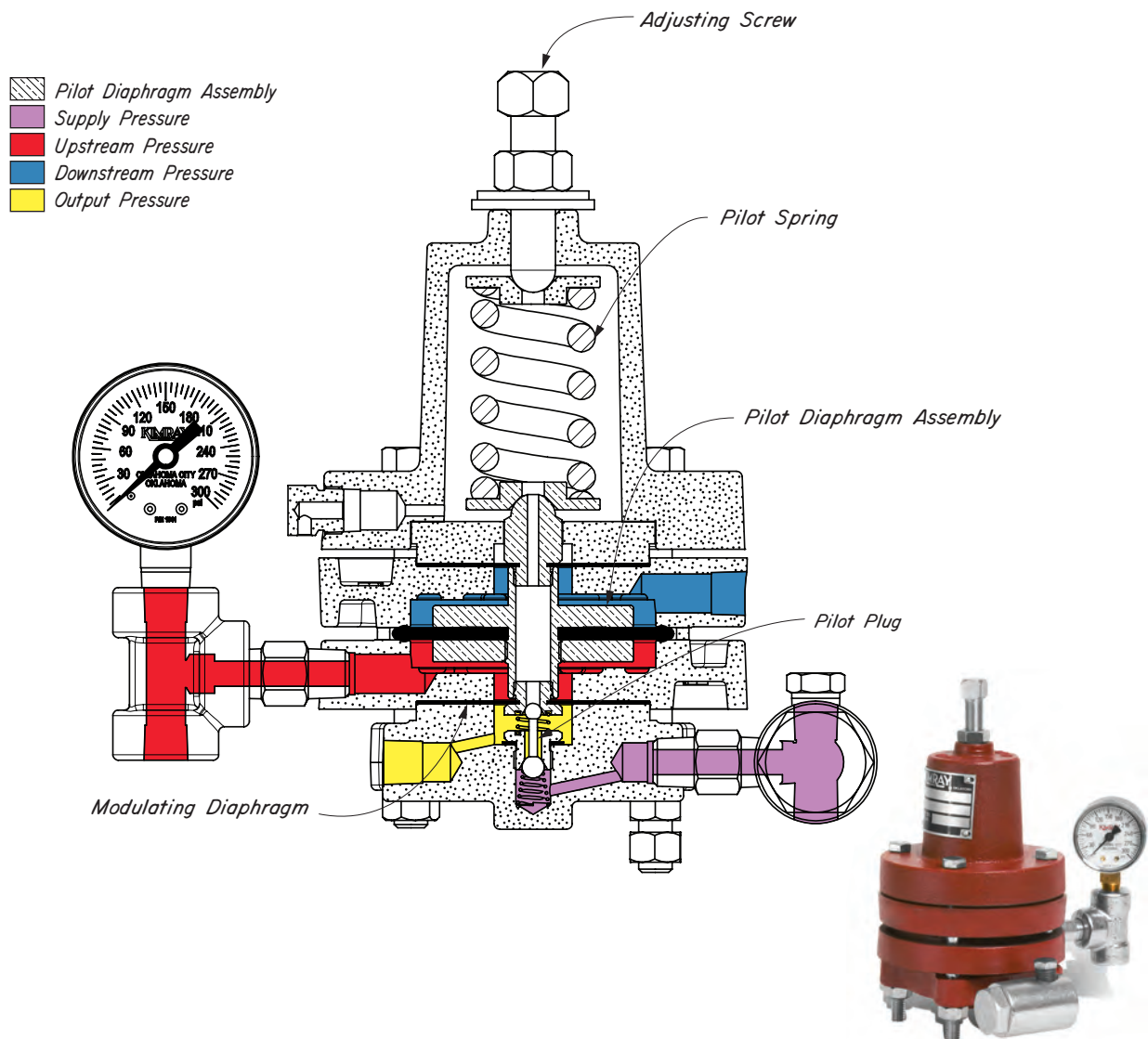
0-300 psig (60% or more of upstream pressure recommended for operating a motor valve)

OPERATION:

The LDP Pilot consists of a PILOT DIAPHRAGM ASSEMBLY which moves without friction to operate a 3 way PILOT PLUG. The Pilot Assembly is supported by the PILOT DIAPHRAGM ASSEMBLY and the MODULATING DIAPHRAGM. The PILOT SPRING and Downstream Pressure (Blue) load the upper side of the Pilot Assembly and is opposed on the underside by the Upstream Pressure (Red) acting on the PILOT DIAPHRAGM ASSEMBLY.

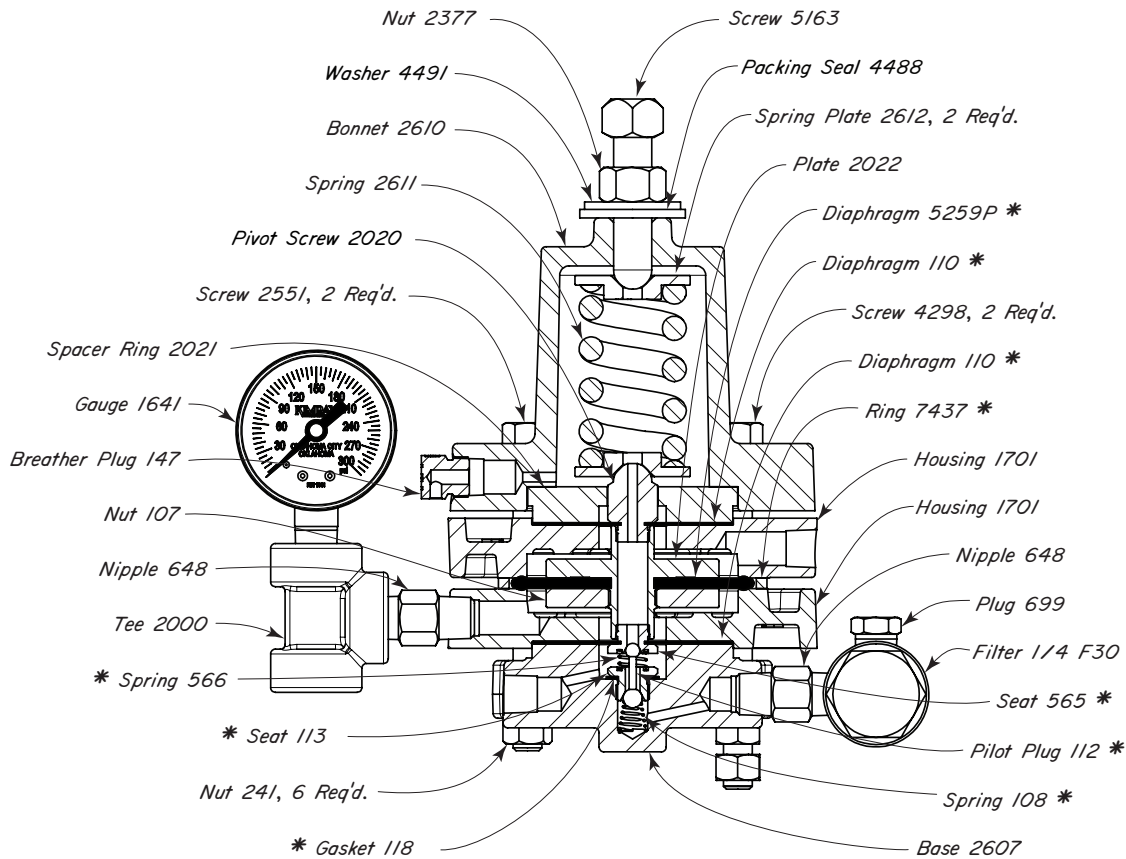
With a slight increase in Downstream Pressure (Blue) or a slight decrease in Upstream Pressure (Red), the PILOT DIAPHRAGM ASSEMBLY is forced downward by the PILOT SPRING. The upper seat for the PILOT PLUG (Yellow to Atmosphere) is closed and the lower seat for the PILOT PLUG (Violet to Yellow) is opened. This results in an increased Output Pressure (Yellow) under the MODULATING DIAPHRAGM which opposes the change. The PILOT DIAPHRAGM ASSEMBLY returns to a position at which both the upper and lower seats are closed when the Differential Pressure is re-established.

A slight decrease in Downstream Pressure (Blue) or a slight increase in Upstream Pressure (Red) closes the lower seat and opens the upper seat to reduce the Output Pressure (Yellow).

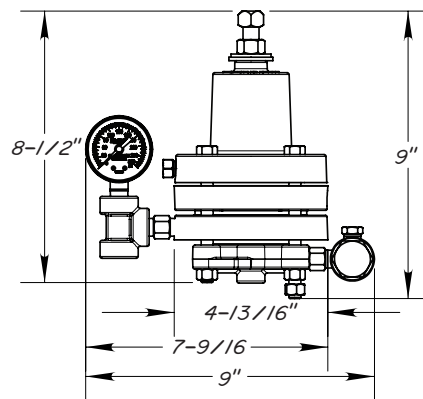


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LIQUID DIFFERENTIAL PRESSURE PILOT DUCTILE



PILOT DIMENSIONS



PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
AHP	30 PG LDP-D	300	300	RSR

NOTES:

All openings are tapped 1/4" N.P.T.

*These are recommended spare parts and are stocked as repair kits.

12 PL FLOATLESS LEVEL CONTROLLER

APPLICATIONS:

Oil and gas separator liquid level control.
High level shut-off control.
For use with Kimray MT series valves or Pressure Closing Motor Valves which use full separator pressure on the motor valve diaphragm.

FEATURES:

No float required
Easily installed
Intermittent vent pilot saves gas
Throttling or semi-snap control
Only one adjustment for changing control
Only one adjustment for changing liquid level

WORKING PRESSURE:

175 psig maximum

SUPPLY PRESSURE:

Separate external supply not required.
Pilot uses separator gas equalizing and supply line for supply.

OUTPUT PRESSURE:

Varies from 0 psig to full separator pressure.

OPERATION:

The Pilot Assembly (Crosshatched) and the PILOT PLUG are the only moving parts in the Liquid Level Pilot.

The Pilot can be adjusted for throttling or semi-snap action using the CONTROL KNOB. With the CONTROL KNOB against its stop, the Pilot will throttle. Unscrew the CONTROL KNOB one-half to one full turn for semi-snap action.

The PILOT PLUG consists of two stainless balls rigidly connected together. The upper seat for the PILOT PLUG controls Separator Pressure to Modulated Pressure (Red to Yellow). The lower seat for the PILOT PLUG is the Modulated Pressure vent (Yellow to Atmosphere).

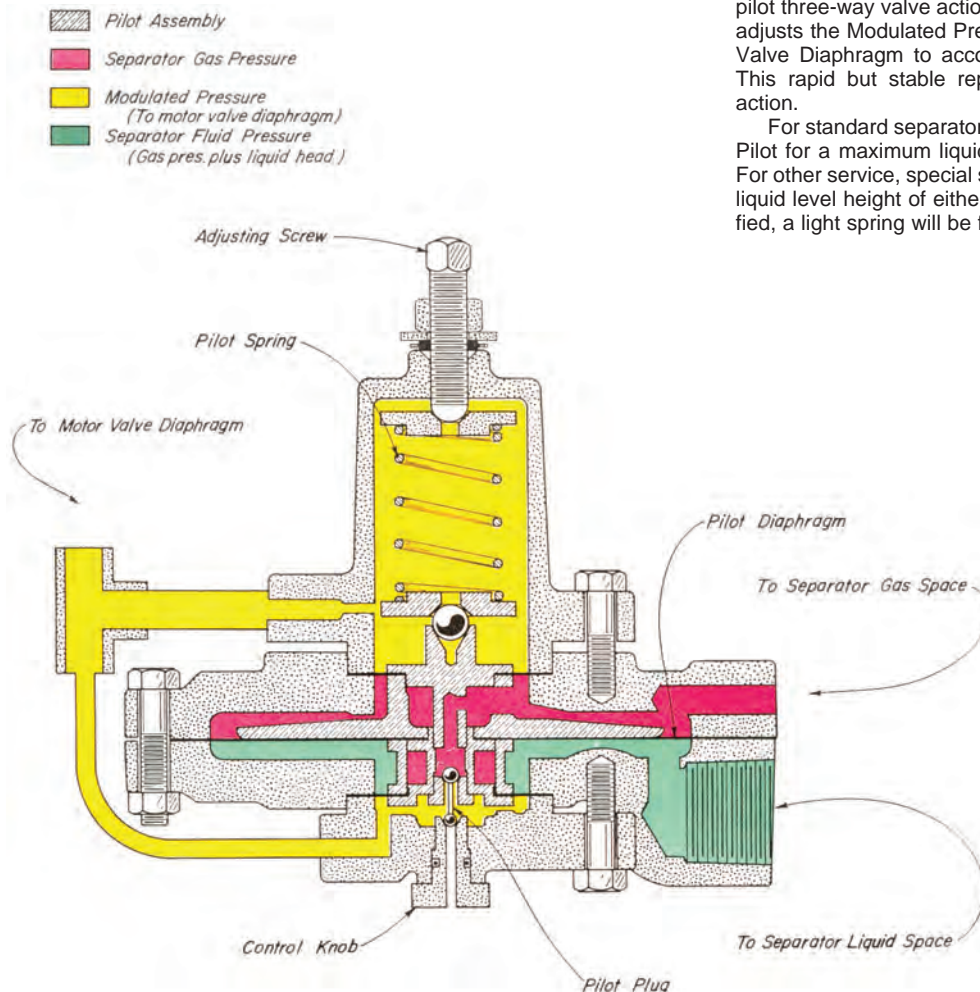
Separator Gas Pressure (Red) is equalized across the PILOT DIAPHRAGM. Separator Gas Pressure (Red) and the Modulated Pressure (Yellow) act in opposite directions on the two small diaphragms of equal area to balance the Pilot against changes in these pressures. The only upward force to move the Pilot Assembly is the liquid head in the separator, opposed by the PILOT SPRING. This spring load can be varied by the ADJUSTING SCREW to increase or decrease the liquid level.

As the liquid level rises in the separator, it overcomes the PILOT SPRING and forces the Pilot Assembly upward, closing the upper seat (Red to Yellow) and opening the lower seat (Yellow to Atmosphere). When the Modulated Pressure (Yellow) is vented, Separator Fluid Pressure then opens the valve.

As the liquid level decreases in the separator, the Pilot Assembly moves downward closing the lower seat (Yellow to Atmosphere) and opening the upper seat (Red to Yellow), which increases Modulated Pressure and closes the valve.

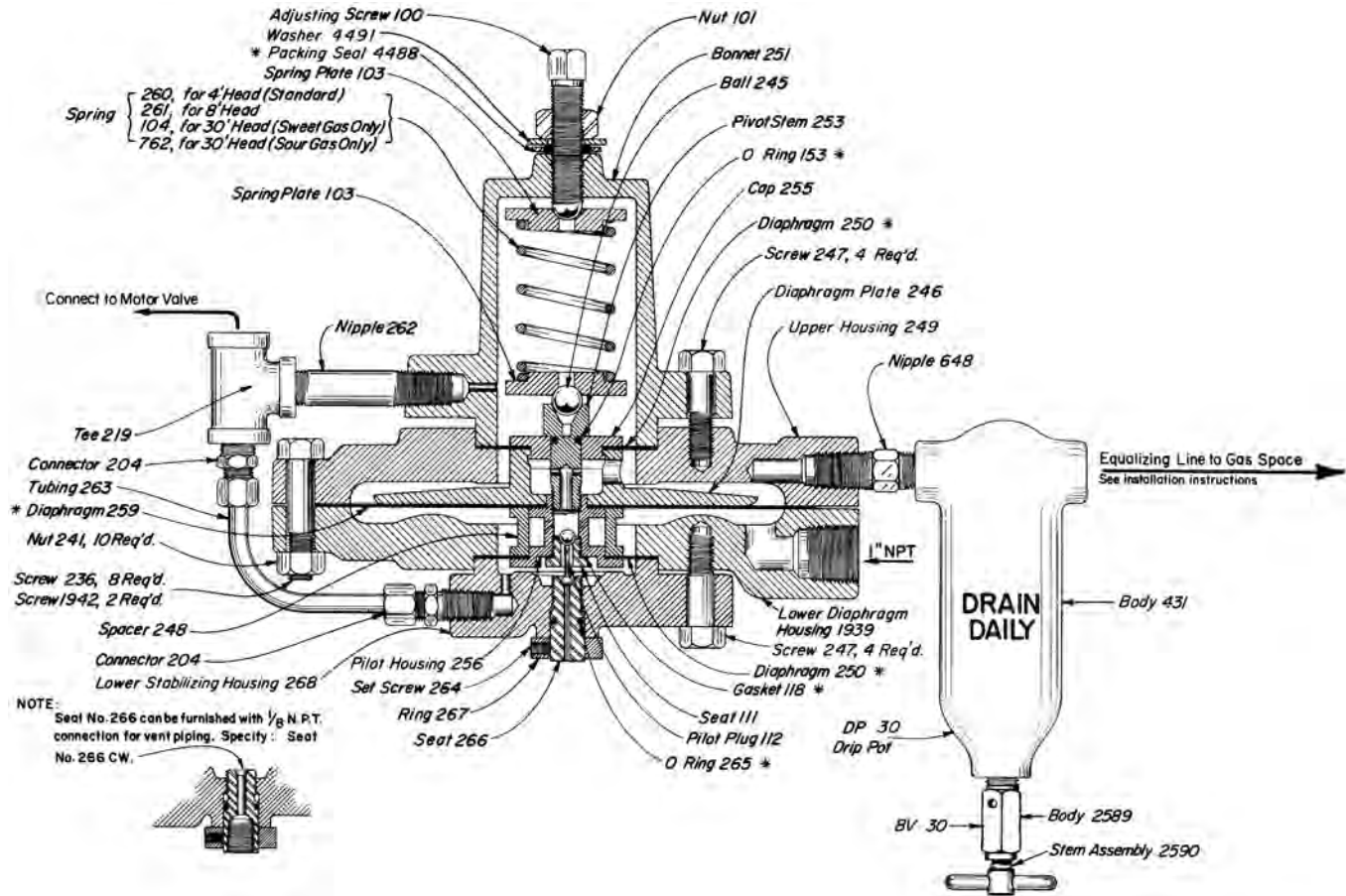
When the Pilot is adjusted for throttling, the intermittent vent pilot three-way valve action of the PILOT PLUG against its seats adjusts the Modulated Pressure (Yellow) to reposition the Motor Valve Diaphragm to accommodate the required rated of flow. This rapid but stable repositioning produces a true throttling action.

For standard separator service a light spring is installed in the Pilot for a maximum liquid level height of approximately 4 feet. For other service, special springs can be installed for a maximum liquid level height of either 8 or 30 feet. Unless otherwise specified, a light spring will be furnished.



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12 PL FLOATLESS LEVEL CONTROLLER DUCTILE IRON



PILOTS AVAILABLE:

CAT. NO.	PILOT	OPER. PRES.	MAX W.P.	REPAIR KIT
BAT	12 PL	175	175	RCL

NOTES:

For standard separator service a light spring is installed in the pilot for a maximum level height of approximately 4 feet. For special service, springs can be installed for a maximum liquid level height of either 8 or 30 feet. Unless otherwise specified, a light spring will be furnished.

*These parts are recommended spare parts and are stocked as repair kits.

12 PL FLOATLESS LEVEL CONTROLLER INSTALLATION & DIMENSIONS

INSTALLATION:

1. Install the Motor Valve in the separator oil outlet line.
2. Install Drip Pot on 12 PL, separator gas line.
3. Mount the 12 PL Pilot on the separator shell in the liquid section. For best operation, the pilot should be located at least 4 inches below the minimum desired liquid level.
4. Connect Gas Equalizing and Pilot Supply Line between the Drip Pot and the gas section of the separator with 5/16 inch tubing and fittings. CARE should be taken so that the equalizing gas is as dry as possible. The equalizing gas must be the SAME pressure as the that in the liquid section. DO NOT connect to the gas outlet line or downstream from mist extractors.
5. Connect pilot output pressure to Motor Valve with 1/4 inch tubing and fittings as shown.

NOTES:

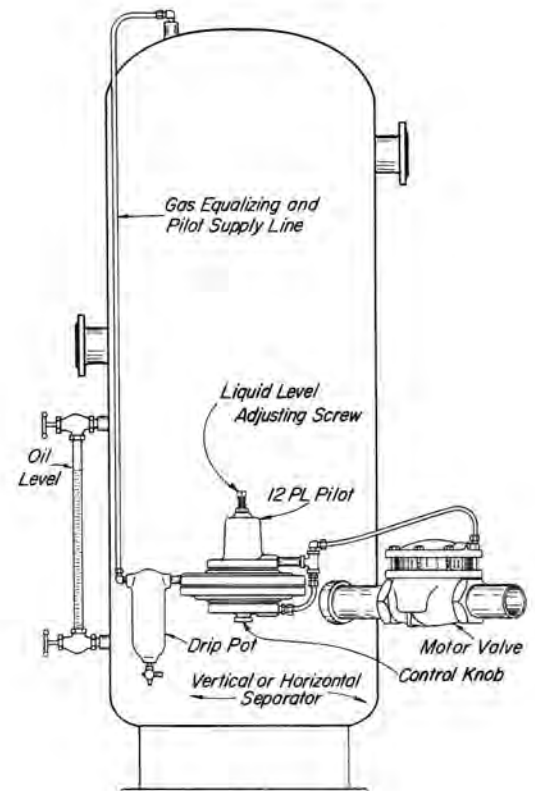
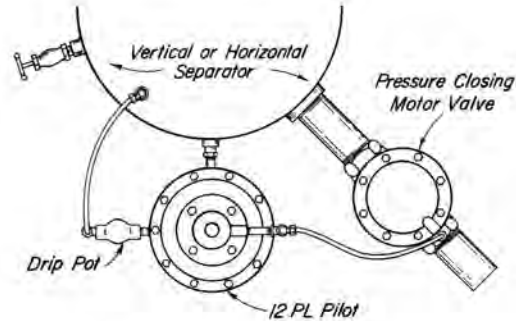
The lower gauge glass connection may be used for mounting the pilot if no other connection to the liquid section of the separator is available.

A connection is provided on the upstream side of the motor valve body for mounting the pilot. However, when the Motor Valve is set remotely from the separator, pressure drop through long piping will make the controller operation erratic.

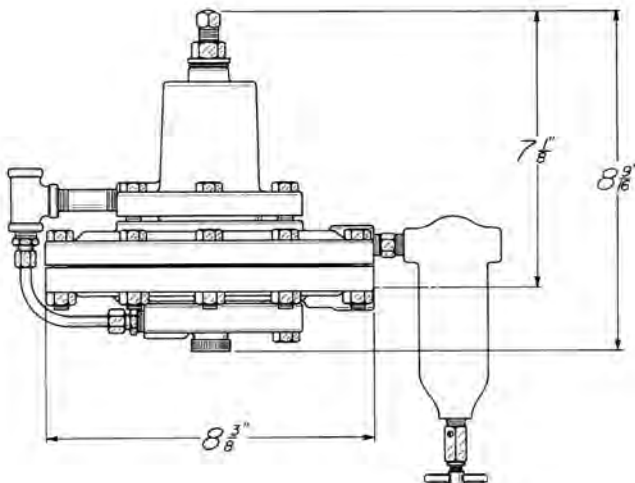
After assembly, the pilot is tested and set for throttling control. It is adjusted to control a liquid level of approximately 7 inches above the pilot, turn the adjusting screw for desired liquid level.

On throttle control, the liquid level will vary approximately 1 inch. When set on semi-snap control, the liquid level will vary between 4 inches and 8 inches.

TYPICAL INSTALLATION



PILOT DIMENSIONS



NOTES:



Kimray is an ISO 9001- certified manufacturer.

APPLICATIONS:

Pilot may be installed remotely from the motor valve.
The Pilot is used in the control of low pressure where the desired controlled pressure ranges from a few ounces to 20 psig on:

- Vessels
- Vent lines
- Distribution systems
- Inlet and recirculation on compressors, pressure

It may be used to produce a pneumatic output signal when the monitored pressure falls below the set pressure. The pneumatic signal source is isolated from the monitored pressure.

FEATURES:

- Single adjustment
- Filtered gas supply
- High accuracy
- Intermittent vent pilot construction
- Remote installation





SUPPLY PRESSURE:

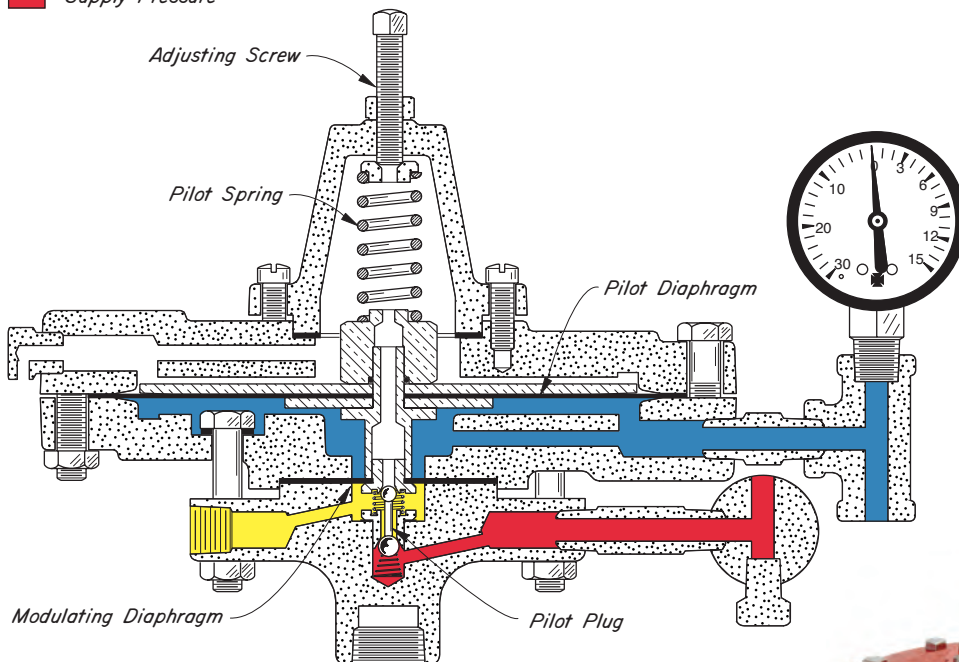
Equal to or not less than 60% of maximum upstream pressure when used to operate low pressure motor valves (shown in Catalog Section E2)

20 to 30 psig when used to operate high pressure motor valves (shown in Catalog Section E1).

PRESSURE RANGE:

Ounces to 20 psig

-  Pilot Assembly
-  Output Pressure
-  Controlled Pressure
-  Supply Pressure

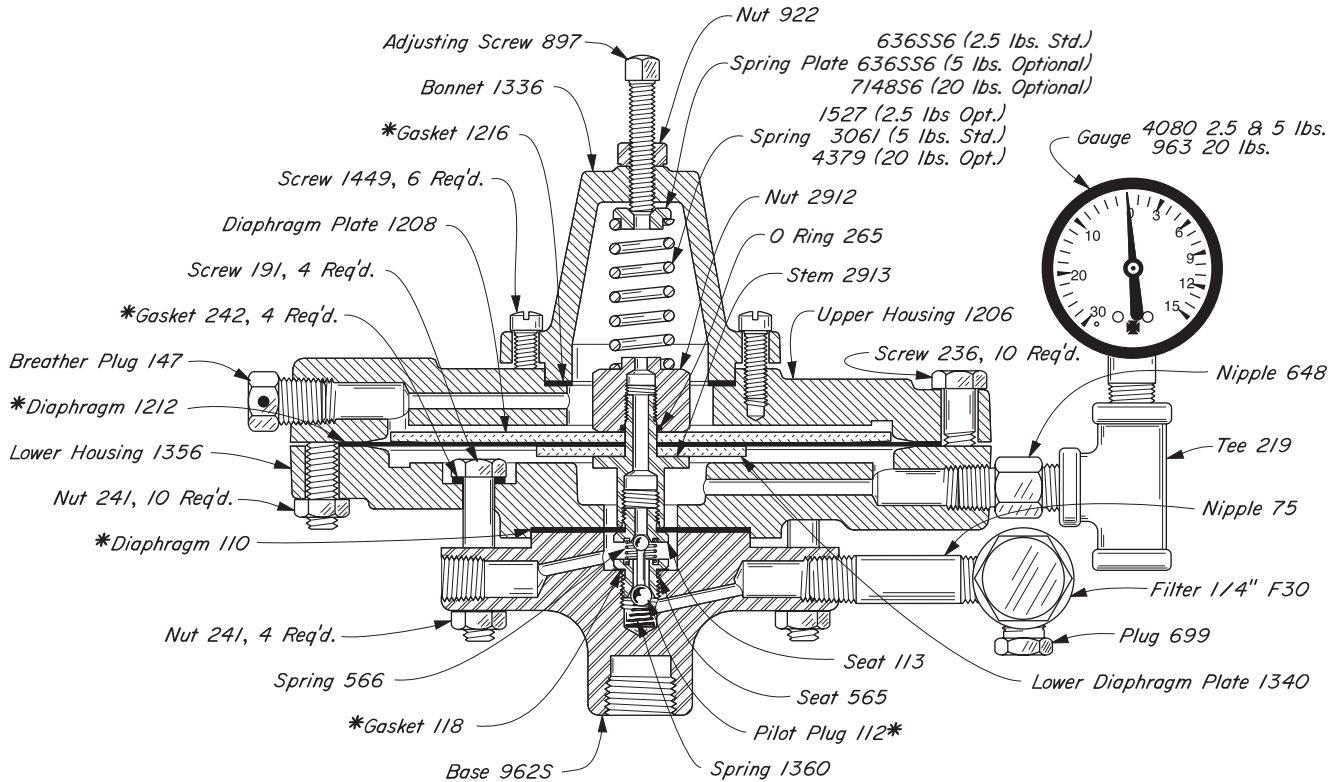


OPERATION:

The Pilot Assembly, which moves as a unit without friction within the housing, is supported by the PILOT DIAPHRAGM and the MODULATING DIAPHRAGM. The PILOT SPRING loads the upper side of the Pilot Assembly and is opposed on the underside by Controlled Pressure (Blue) acting on the net area of the PILOT and MODULATING DIAPHRAGMS (area of PILOT DIAPHRAGM minus area of MODULATING DIAPHRAGM).

With a slight decreased in Controlled Pressure (Blue) the Pilot Assembly is forced downward by the PILOT SPRING. The upper seat for the PILOT PLUG (Yellow to Atmosphere) is closed and the lower seat for the PILOT PLUG (Red to Yellow) is opened. This results in an increased Output Pressure (Yellow) under the MODULATING DIAPHRAGM which balances the lost upward force due to the slight decrease of Controlled Pressure (Blue). The Pilot Assembly returns to a position at which both the upper and lower seats are closed. A light increase in Controlled Pressure (Blue) opens the upper seat and closes the lower seat to reduce the Output Pressure (Yellow).

OUNCES TO ATMOSPHERE PILOT CAST IRON

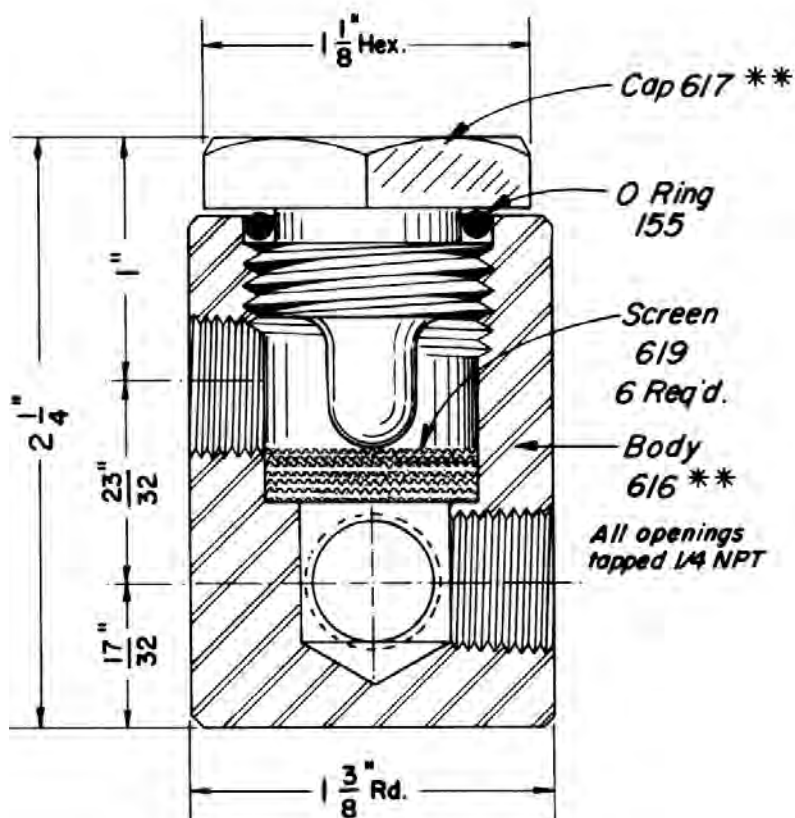


PILOTS AVAILABLE:

CAT. NO.	PILOT	MAX W.P.	OPER. PRES.	KIT
AHK-2.5	0.2 PG OA	175	2.5	RWO
AHK-5	0.5 PG OA	175	5	RWO
AHK-20	2 PG OA	175	20	RWO

NOTES:

*These are recommended spare parts and are stocked as repair kits.



FILTERS AVAILABLE:

CAT. NO.	FILTER	MAX. W.P.	OPER. PRESS.
YAS	1/4 F 30	300	300
YASSS6	1/4 F 100 SS6	1000	1000

**These steel parts are available in 316 stainless steel.

Kimray is an ISO 9001- certified manufacturer.

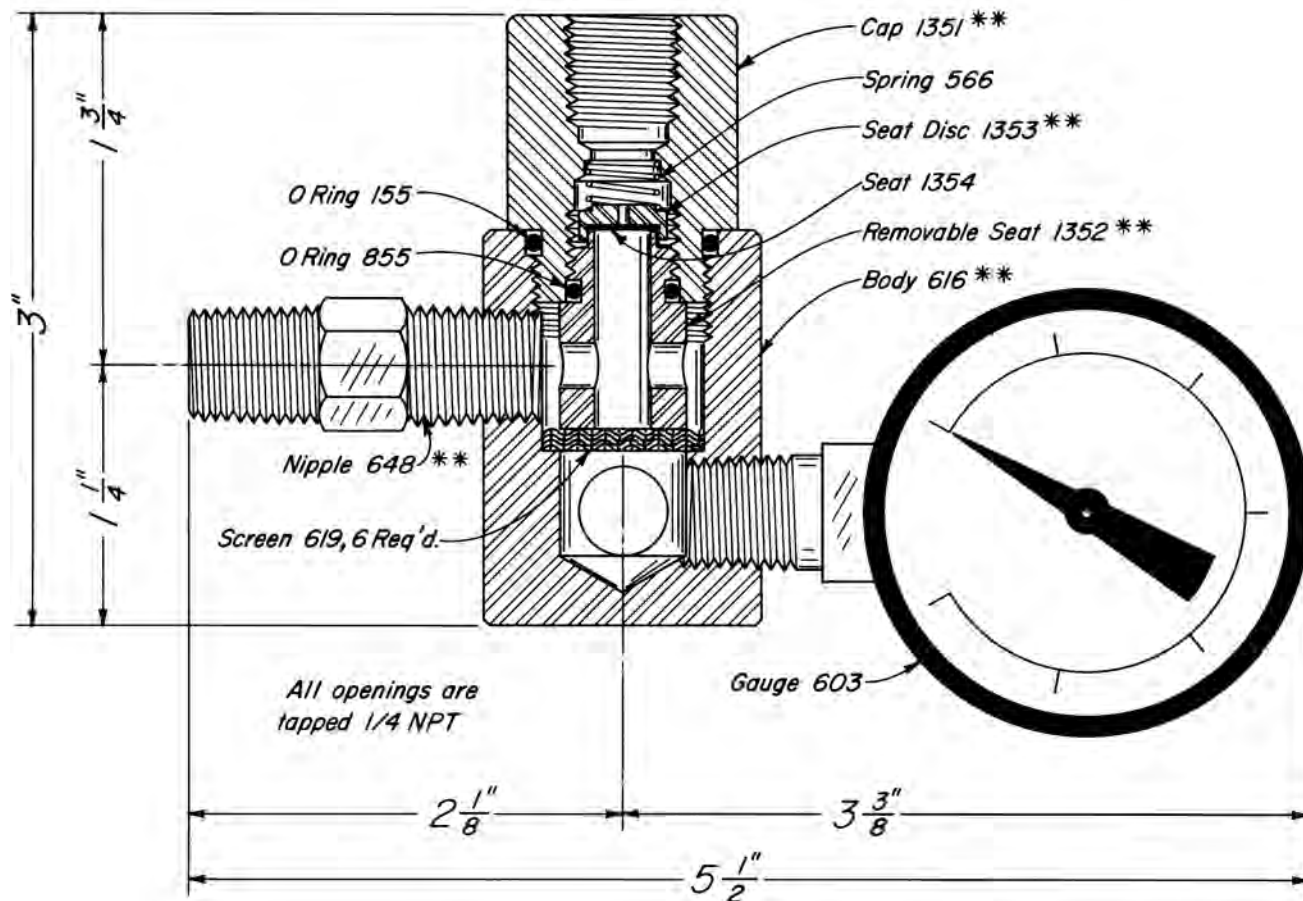
FILTER POP VALVES

APPLICATIONS:

Provides a small pressure relief at 30 psig.

For use with the TC-12 Temperature Controller.

(See catalog section "H" for Temperature Controllers).



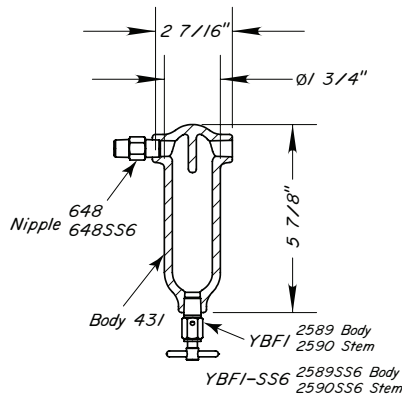
FILTER POP AVAILABLE:

CAT. NO.	PILOT	MAX. W.P.	OPER. PRESS.
YBG	1/4 FPV 3	30	30
YBGSS6	1/4 FPV 3 SS6	30	30

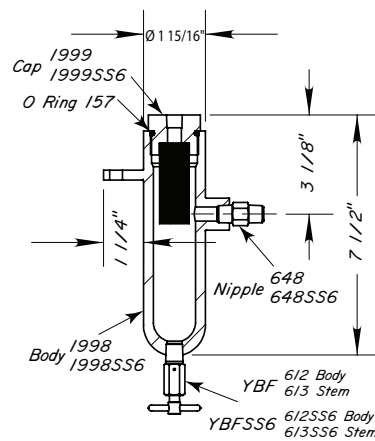
**These steel parts are available in 316 stainless steel.



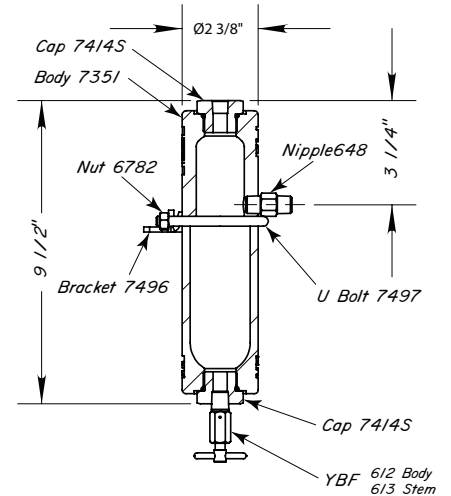
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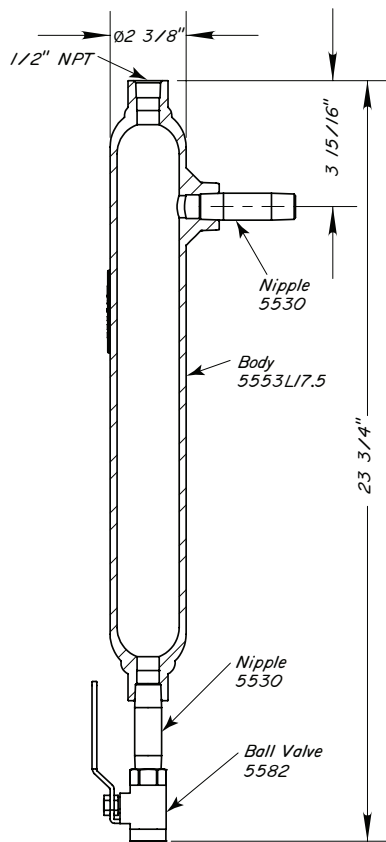
DP-30
DUCTILE & 316SS
CRN #0H10789.253



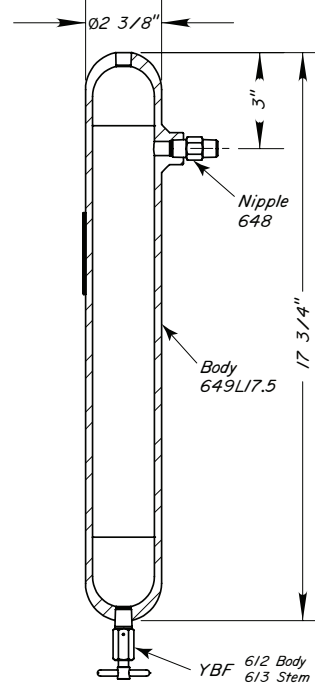
FD 200/200SS6
STEEL & 316SS
CRN #0H14037.2



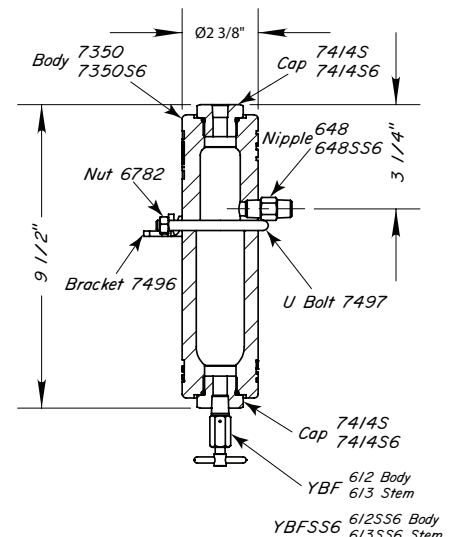
DP200
STEEL
CRN #0H12678.2134567890NTY



DP200
STEEL
CRN #0H07996.2467890NTY



DP 200
STEEL
CRN #0H07996.2467890NTY



DP600/600S6
STEEL & 316SS
CRN #H14312.2134567890NTY

DRIP POTS AVAILABLE:

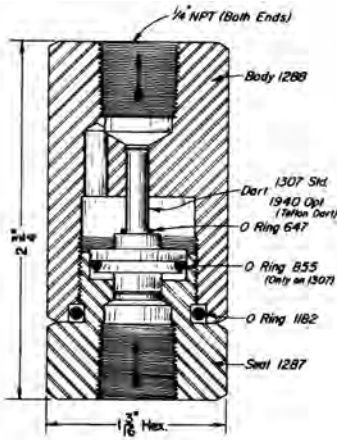
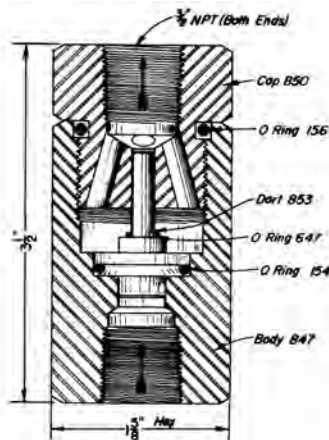
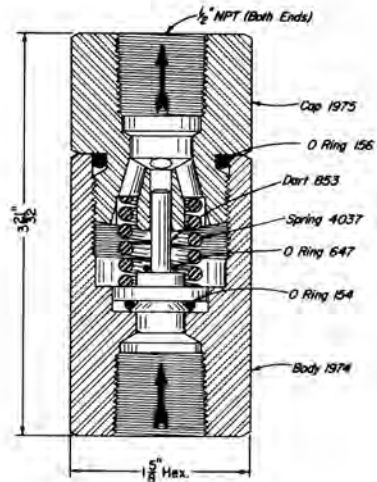
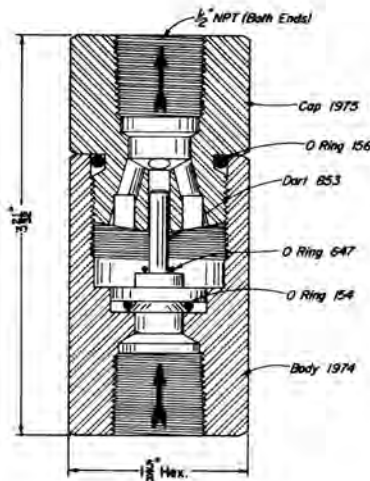
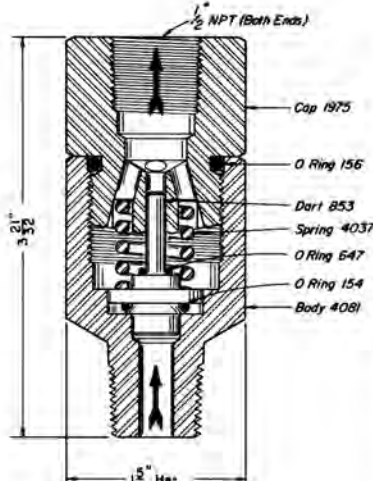
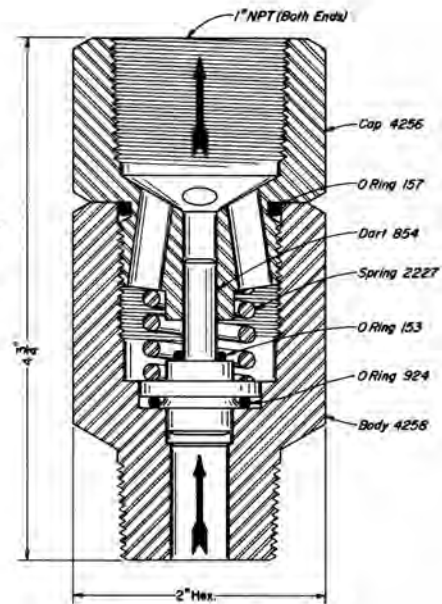
CAT. NO.	DRIP POT DESCRIPTION	MAX. W.P..
YAM	DP 30 LOW PRESSURE	300
YAMSS6	DP 30SS6 LOW PRESSURE	300
YAR	FD 200 FILTERED	2000
YARSS6	FD 200SS6 FILTERED	2000
YTX	DP 200 W/MOUNTING TAB	2000
YTZ	DP 600 W/MOUNTING TAB	6000
YTZS6	DP 600S6	6000
YAN2	DP 200 17 1/2" LG. W/BALL VALVE	2000
YANL17.5	DP 200 17 1/2" LG.	2000

†DRAIN VALVES AVAILABLE SEPARATELY:

CAT. NO.	DRAIN VALVE	MAX. W.P.
YBF	BV 400	4000
YBFSS6	BV 400SS6	4000
YBF1	BV 30	300
YBF1-SS6	BV 30SS6	300

All openings tapped 1/4" NPT unless noted

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1/4 CV 15A
STEEL

3/8 CV 15
STEEL

1/2 CV 15 w/S
STEEL

1/2 CV 15
STEEL

1/2 CV 15 w/S-M
STEEL

1 CV 15 w/S-M
STEEL

CHECK VALVES AVAILABLE:

CAT. NO.	LINE SIZE	CHECK VALVE	MAX. W.P.	OPER. PRESS.
YAU	1/4"	1/4 CV 15A	1500	1500
YAU1	1/4"	1/4 CV 15A w/TD*	1500	1500
YAW	3/8"	3/8 CV 15	1500	1500
YBC	1/2"	1/2 CV 15 w/S-M*	1500	1500
YBD	1/2"	1/2 CV 15 w/S*	1500	1500
YBE	1/2"	1/2 CV 15	1500	1500
YBB	1"	1 CV 15 w/S-M*	1500	1500

NOTES:

- *With Teflon Dart
- *With Spring and 1/2" NPT Male Connection
- *With Spring
- *With Spring and 1" NPT Male Connection

APPLICATION:

For pressure reducing service where a supply of constant reduced pressure is required for pneumatic instruments and pilot operated controllers.

FEATURES:

- Easily adjusted
- Internally relieving
- Available in Aluminum and 316 Stainless Steel

CERTIFICATIONS:

Canadian Registration Number (CRN):
0C15352.24567890NTY

CONNECTIONS:

Inlet and Outlet - 1/4" NPT

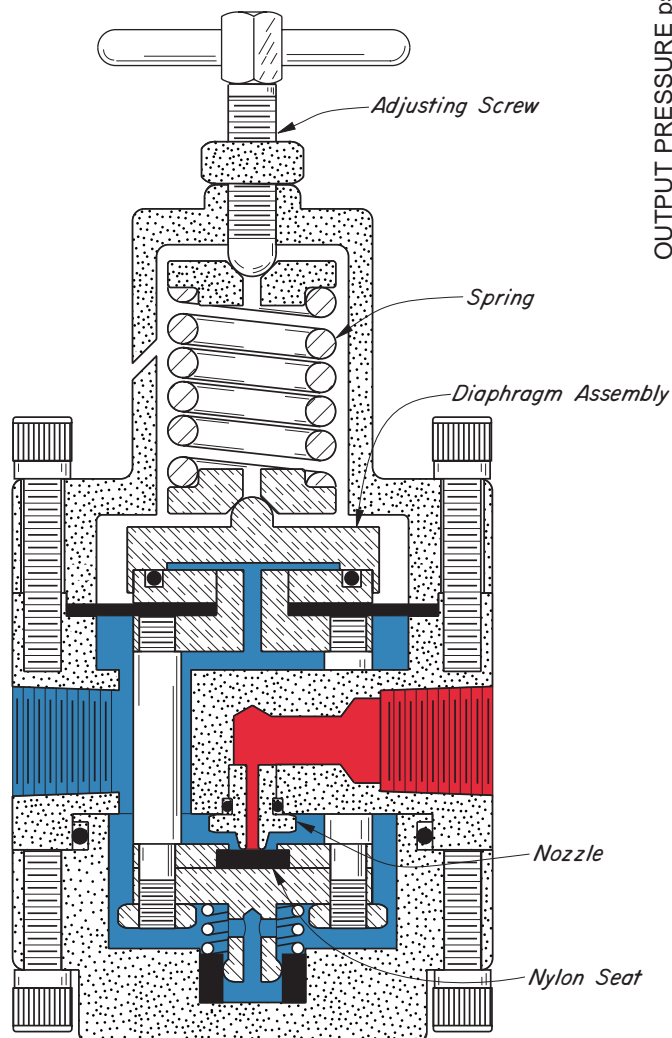
OPERATING TEMPERATURE:

0°F to 200°F (-18°C to 93°C)

 Diaphragm Assembly

 Input Pressure

 Output Pressure



OPERATION:

The diaphragm-operated design delivers constant downstream pressure by quickly responding to changes in volume requirements. The DIAPHRAGM-SEAT ASSEMBLY moves freely up and down in response to slight changes in volume demand at the outlet port. As the DIAPHRAGM-SEAT ASSEMBLY moves the gap between the NOZZLE and NYLON SEAT changes, compensating for the change in volume demand.

INLET PRESSURE:

4000 max. psig

DESIGN PRESSURE:

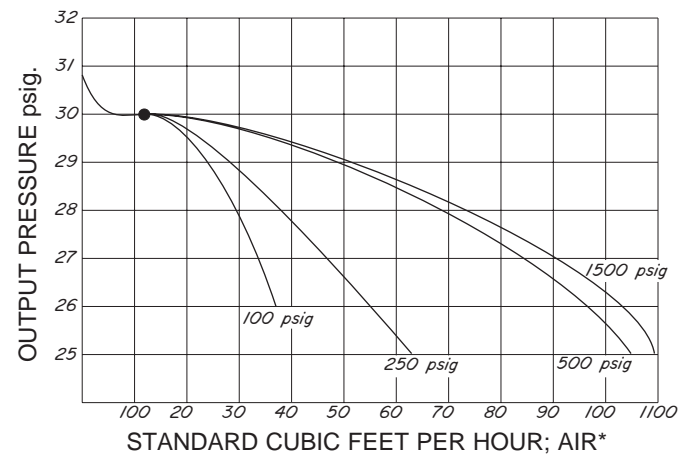
5500 max. psig

OUTPUT PRESSURE:

10 to 250 psig

Cf & Cv VALUES	
Cf	Cv
0.70	0.10

CAPACITY CHART



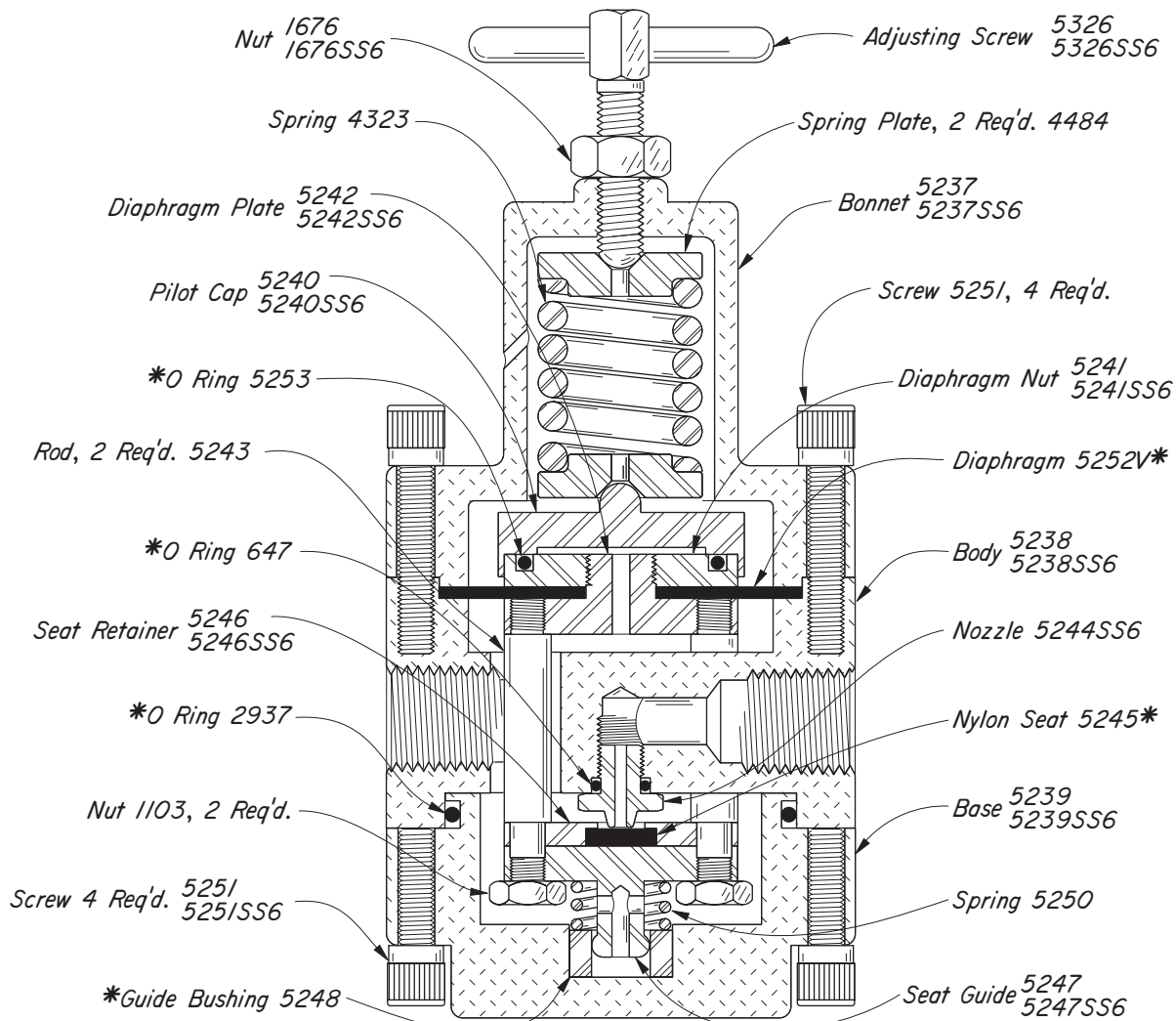
INITIAL SET POINT AT 30 psig AT 120 S.C.F.H.
INLET PRESSURE INDICATED ON EACH CURVE.

*FOR CAPACITIES IN S.C.F.H. OF GAS AT .65 SPECIFIC GRAVITY
MULTIPLY FLOW RATE BY 1.24

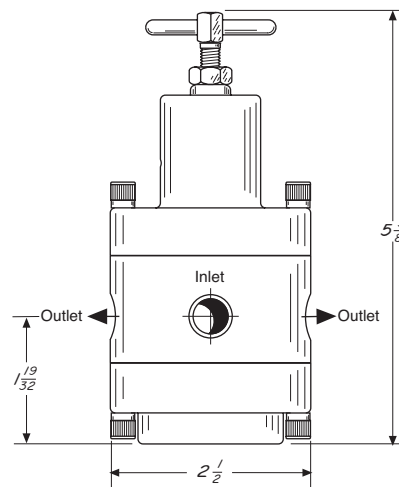


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SUPPLY GAS REGULATOR
ALUMINUM



REGULATOR
DIMENSIONS



Kimray is an ISO 9001- certified manufacturer.

REGULATORS AVAILABLE:

CAT. NO.	REG.	MATERIAL	INLET PRESS.	OUTLET PRESS.	KIT
YAV	12 SGR	ALUM.	4000 max.	10-250	RSP
YAVSS6	12 SGR-SS6	316 SS	4000 max.	10-250	RSP

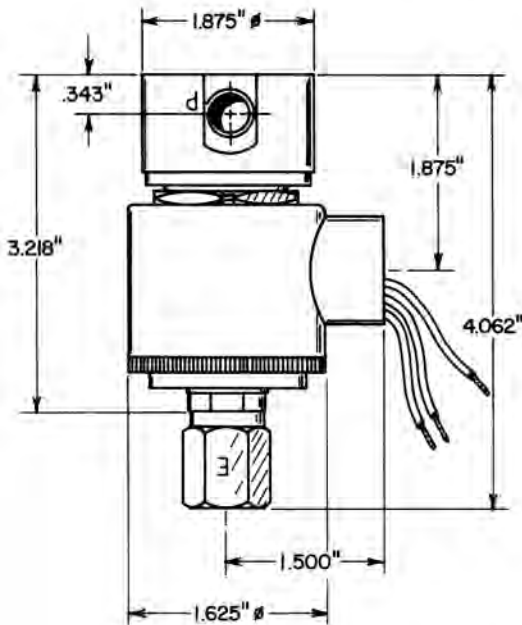
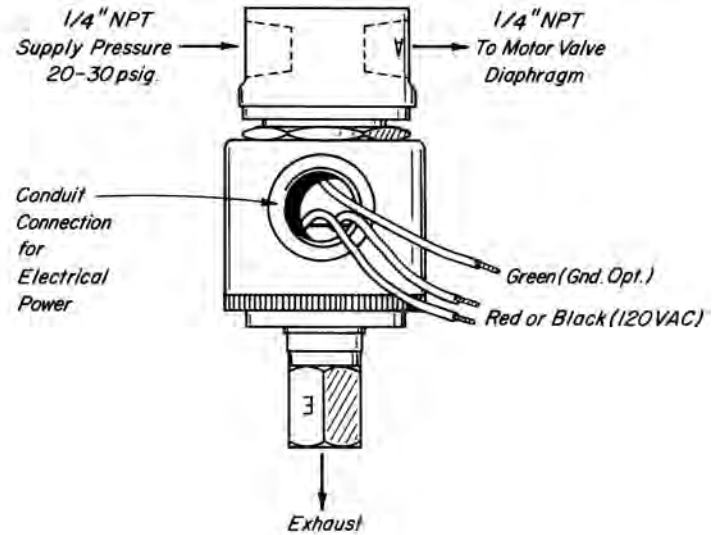
*These parts are recommended spare parts and are stocked as repair kits.

APPLICATIONS:

For electrical control of a pneumatic pressure used to open and close a motor valve.

SPECIFICATIONS:

Voltage 110/120 VAC 50/60 HZ
 Current (inrush) .3 amp
 Current (continuous) .15 amp
 Watts 10
 Maximum supply pressure 100 psig
 Normally closed, with output vented
 1/2" conduit connections
 1/4" NPT pressure connections
 Explosion proof
 1/16" orifice diameter
 Weight 1.4 lbs.
 Body 316 SS
 Electrical housing cadmium plated steel



PILOTS AVAILABLE:

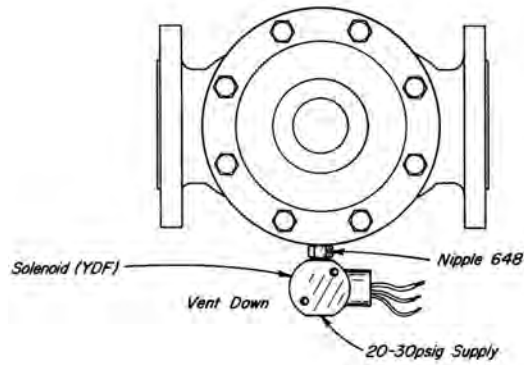
CAT. NO.	SOLENOID	MATERIAL	INLET PRESS.	OUTLET PRESS.
YDF	120 VAC E.P. ^a	316 SS	0 - 100	0 - 100

^aExplosion Proof

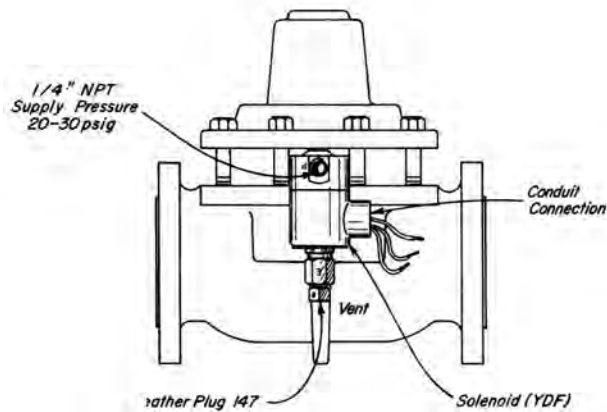
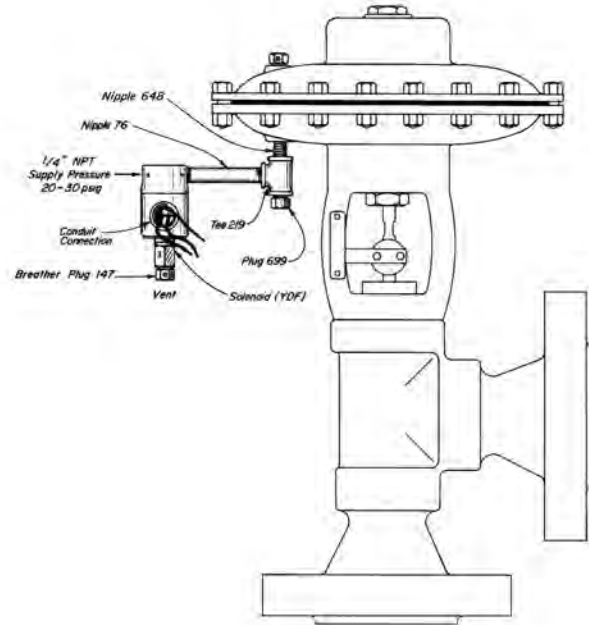
NOTES:

TYPICAL INSTALLATIONS

LOW PRESSURE MOTOR VALVE



HIGH PRESSURE MOTOR VALVE



APPLICATIONS:

For installations where it is necessary to operate a valve by using an electrical current pulse of 0.02 milliseconds duration.

Can be used in applications where a radio frequency or mechanical timer is require to control the solenoid.

Due to the Magnelatch Solenoid's compactness it can be used in conjunction with sensors, such as thermistors and thermocouples.

SPECIFICATIONS:

Maximum operating pressure 100 psig

3-Way explosion proof

1/4" NPT pressure connections

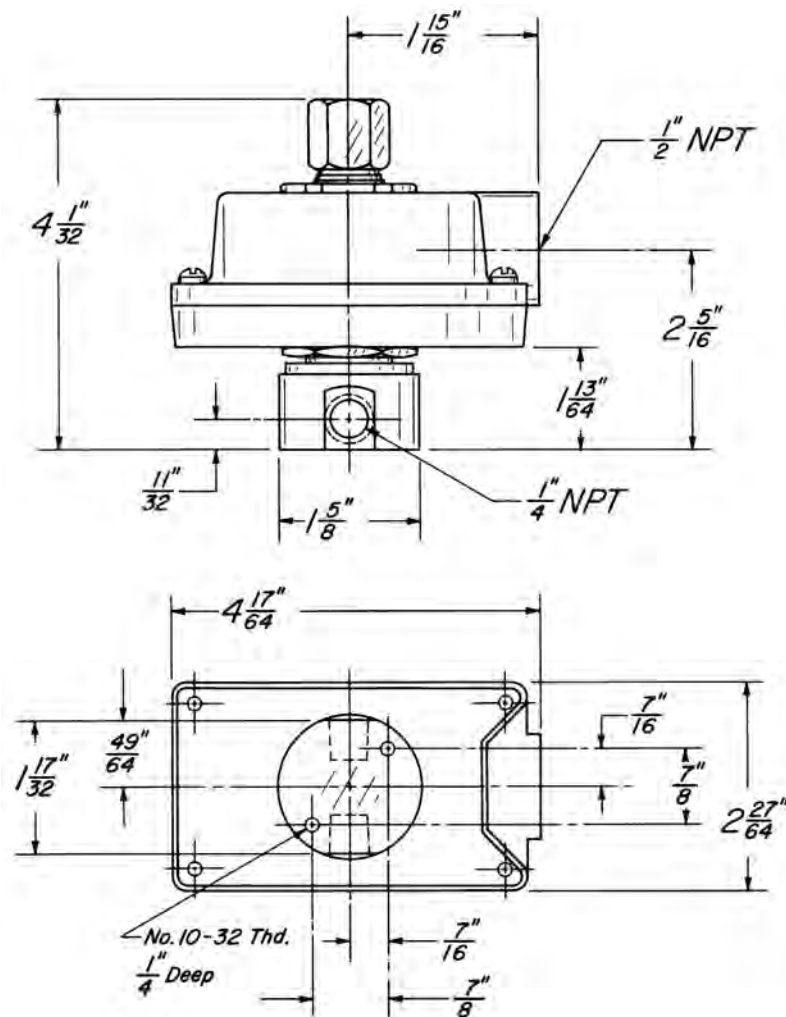
1/2" NPT conduit connection

Voltage 12 VDC

Momentary Latching;

10 Milliseconds to latch @ 1.40 amps

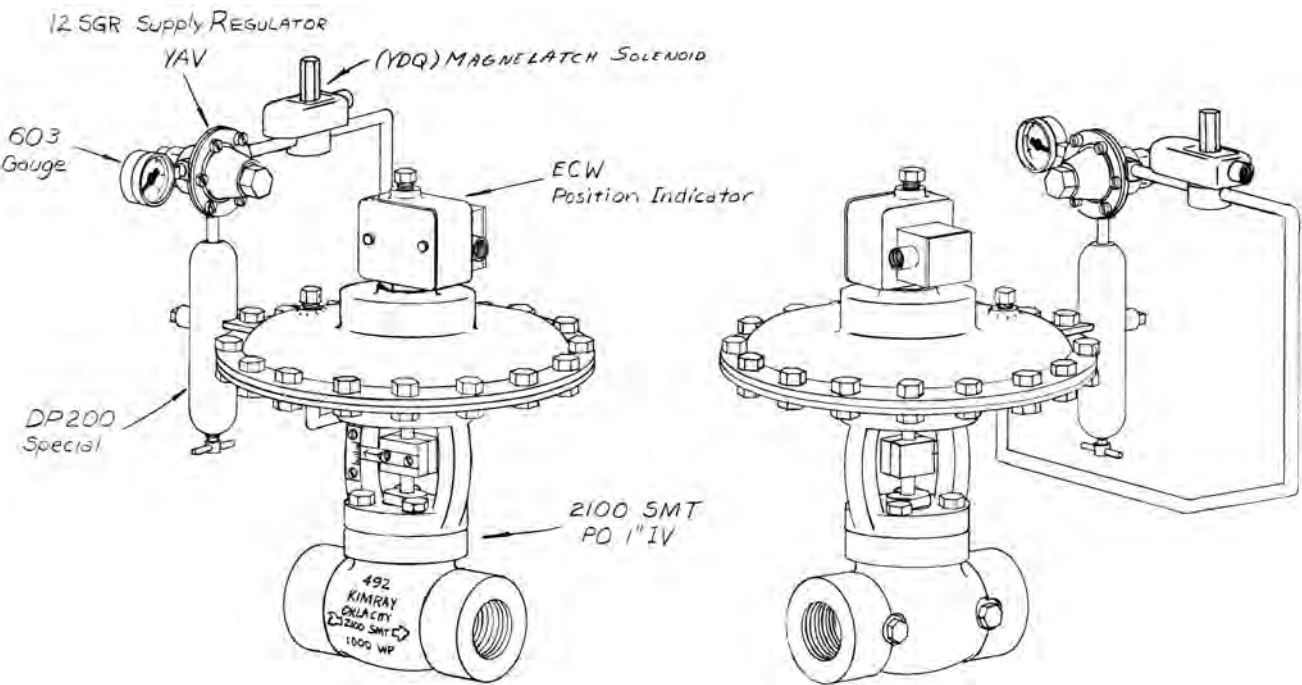
25 Milliseconds to unlatch @ .75 amps



Company or product names mentioned may be trademarks of their respective companies

MAGNELATCH SOLENOID

2100 SMT PO (1" I.V.)
w/POSITION INDICATOR & MAGNELATCH SOLENOID
STEEL



TYPICAL INSTALLATIONS

SOLENOID AVAILABLE:

CAT. NO.	SOLENOID	MAX. W.P.	OPER. PRESS.
YDF3	MAGNELATCH	100	100

NOTES:

Company or product names mentioned may be trademarks of their respective companies

APPLICATIONS:

The Kimray Air Motor is used to operate shutters on air cooled heat exchangers and similar equipment. This unit can be used wherever a linear movement produced by a changing pneumatic signal is required.

FEATURES:

- Aluminum housing
- 5 1/2" inch stroke
- Operates in any position
- Stainless steel stem and pins

WORKING PRESSURE:

125 psig

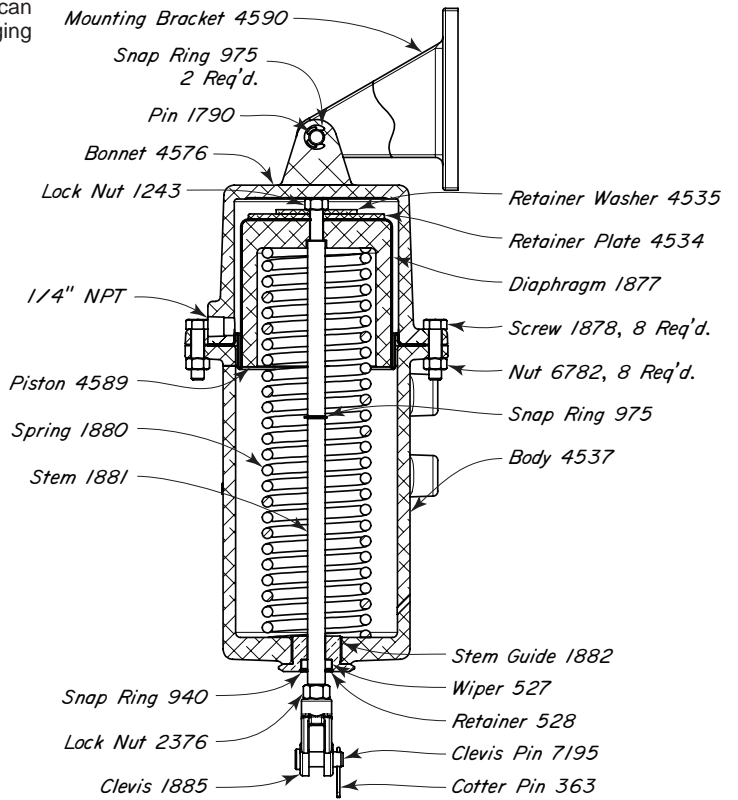
DIAPHRAGM PRESSURE:

(Against Spring Load)

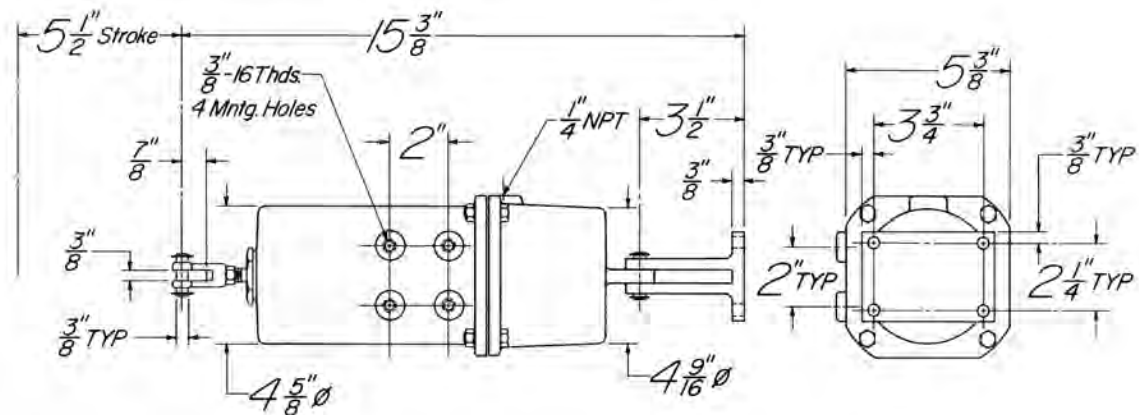
1 1/2" psig to start movement

18 psig to fully stroke

(Additional pressure required to overcome external load)



455AL DIMENSIONS



AIR MOTOR AVAILABLE:

CAT. NO.	AIR MOTOR	MAT'L.	MAX W.P.	OPER PRES
YAX1	455AL AIR MOTOR	ALUM	125	125



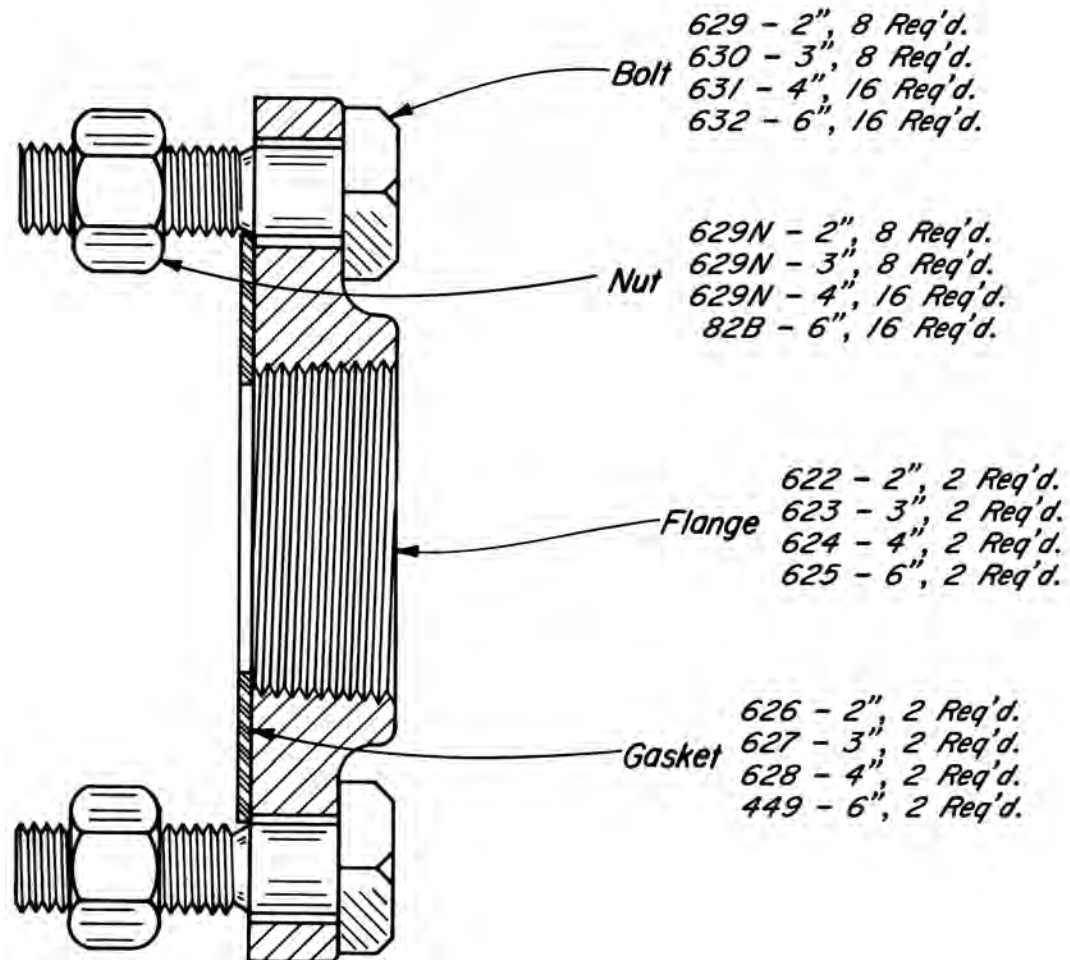
NOTES:



Kimray is an ISO 9001- certified manufacturer.

APPLICATION:

Provides for installation of flanged valves in a screwed piping system.



COMPANION FLANGE SETS AVAILABLE:

CAT. NO.	LINE SIZE	MAX. W.P.	OPER. PRESS.
YFA	2"	125	125
YFB	3"	125	125
YFC	4"	125	125
YFD	6"	125	125

The Companion Flange Sets listed in the above chart are for use on the FGT, FMT & FMA bodies. Hardware and gaskets are provided with each set ordered. To order Companion Flange Set specify: (Line size & catalog number) Companion Flange Set. Example: "2" YFA Compaion Flange Set."



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NOTES:



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APPLICATIONS:

As an adjustable, self-resetting, pressure limiting device to protect instrumentation from over pressurization and subsequent damage.

Designed to protect pilots on high pressure regulators. Blocks the sense line or supply pressure to a device when it exceeds the adjustable limit of 300 psig. Reopens when inlet pressure drops below the limit.

FEATURES:

- Single Adjustment
- Intermittent vent pilot
- Remote Installation
- Compact Design

CONSTRUCTION MATERIALS:

Body (Base)

Standard: Carbon Steel

Optional: 316 Stainless Steel is Sour Service Capability according to NACE MR0175/ISO15156. NACE certification document is available upon request, specify when ordering.

CONNECTIONS:

Inlet and Outlet - 1/4" NPT

NOTE:

This device is not to be installed as a:
Instrument gas regulator,
Pressure reducing regulator.

OPERATION:

The Pilot Spring loads the upper side of the Pilot Diaphragm Assembly and is opposed on the under side by Output Pressure (Blue) acting on the area of the Pilot Diaphragm.

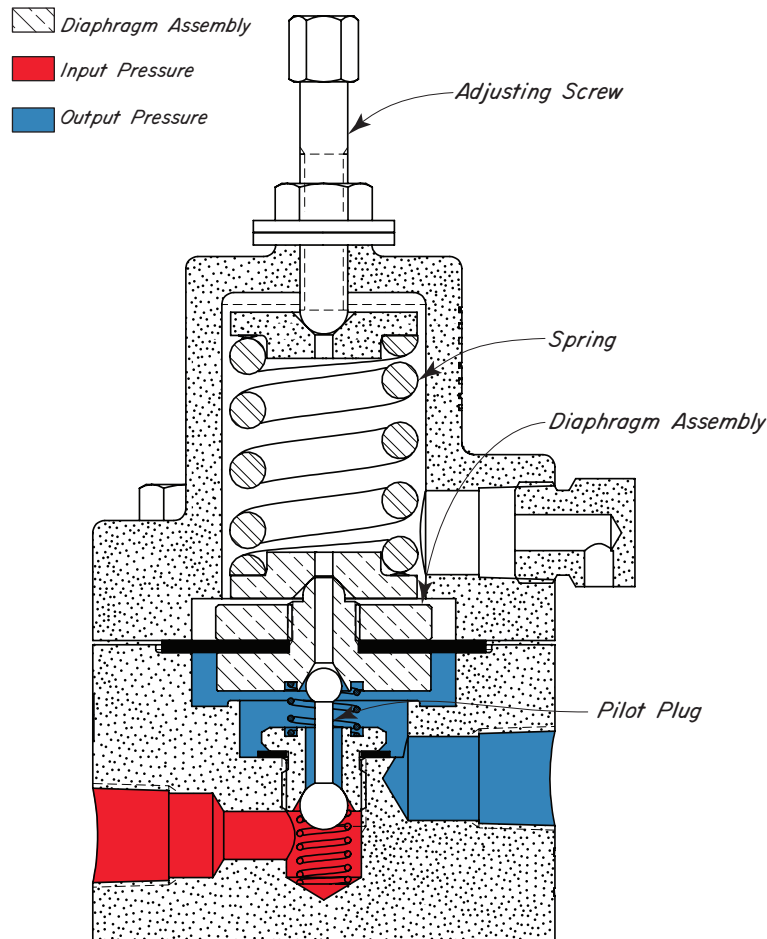
As long as the Input Pressure (Red) is below the setting for the desired maximum Output Pressure (Blue) the Pilot Diaphragm Assembly is held down by the Pilot Spring, and the lower seat of the Pilot Assembly (Red to Blue) is held open, allowing direct communication of input Pressure (Red) to Output Pressure (Blue).

Changes in the Input Pressure (Red) will directly result in changes in the Output Pressure (Blue) unless the pressure reaches the upper limit established by the setting of the Pilot Spring. At this point the Pilot Diaphragm Assembly is forced upward to the point the lower seat for the Pilot Plug (Red to Blue) is closed, preventing any further increases in Output Pressure (Blue).

If for any reason conditions would cause the Output Pressure (Blue) to start to increase above the desired set point, the Pilot Diaphragm Assembly will move upward, opening the upper Pilot Plug Seat (Blue to Atmosphere) and relieving enough pressure to restore Output Pressure (Blue) to the set point.

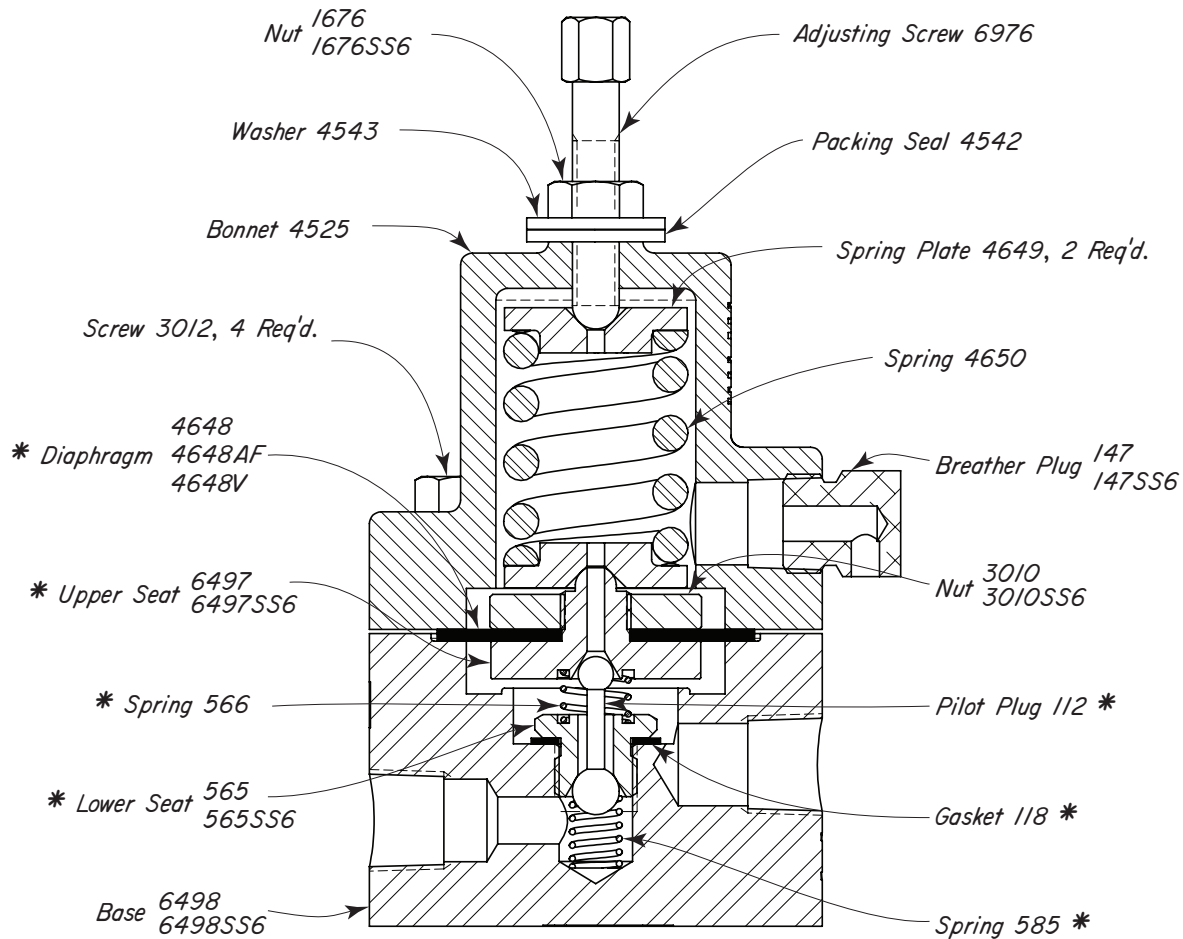
When the Input Pressure (Red) returns to a level below the set point limit, the Pilot Plug will drop slightly allowing Input Pressure (Red) to again communicate with Output Pressure (Blue).

The upper limit for the Output Pressure (Blue) is set with the adjusting screw. Turning the Adjusting Screw clockwise will increase the Output Pressure (Blue) limit, turning the Adjusting Screw counter clockwise will lower the Output Pressure (Blue) limit. The maximum output pressure is 300 psig.

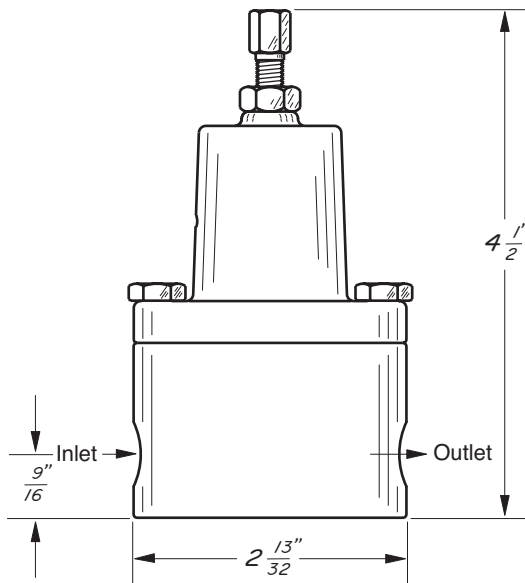


Kimray is an ISO 9001- certified manufacturer.

SENSE LINE PROTECTOR
STEEL



PILOT
DIMENSIONS



PILOTS AVAILABLE:

CAT. NO.	PILOT	MATERIAL	OPER. PRESS.	OUTLET PRESS.	KIT
YDM	30 PR	STEEL	4000	0-300	RMV
YDMSS6	30 PR-SS6	316SS	4000	0-300	RMVSS6

NOTES:

All openings are tapped $\frac{1}{4}$ " N.P.T.

*These parts are recommended spare parts and are stocked as repair kits.

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