

# Desiccant Air Drying System

309921N

EN

## Model 234401, Series D

Maximum Operating Pressure 160 psi (1.1 MPa, 11 bar)  
Maximum Temperature 150° F (65° C)

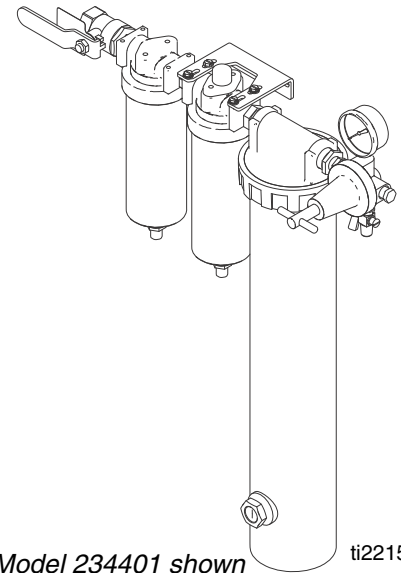
## Model 24M178, Series B

Maximum Operating Pressure 175 psi (1.2 MPa, 12 bar)  
Maximum Temperature 150° F (65° C)



### Important Safety Instructions

Read all warnings and instructions in this manual.  
Save these instructions.

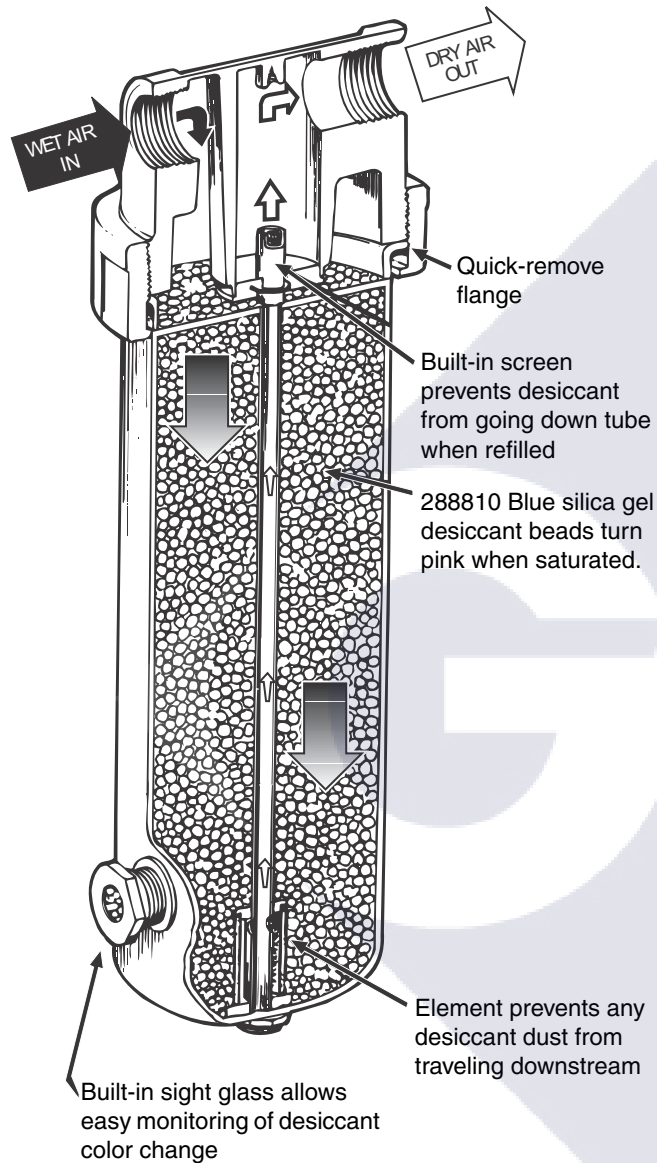


Model 234401 shown ti22155a

### Includes:

Part No.	Series	Description	Air Inlet npt(f)	Air Outlet npt(f)	Air Flow Capacity (CFM) at 100 psi (0.7 MPa, 7 bar)	Maximum Operating Pressure, psi (MPa, bar)
234402	B	Stage 1 - Air Filter with automatic drain. Removes water and contaminants down to 3 microns.	1/2 in.	1/2 in.	100	175 (1.2, 12)
234397	B	Stage 2 - Coalescer with automatic drain. Removes oil and sub-micronic particles down to 1 micron.	1/2 in.	1/2 in.	83	175 (1.2, 12)
234404	B	Stage 3 - Desiccant Housing Removes uncondensed moisture.	3/4 in., reduced to 1/2 in.	3/4 in., reduced to 3/8 in.	30	175 (1.2, 12)
288787	A	Self Relieving Air Regulator	3/8 in.	1/4 in.	100	160 (1.1, 11)
288810	A	Silica Gel Desiccant (5 lb. can)				
288798	A	Shut-off Valve				

# How Desiccant Air Drying System Works



After the moisture has been removed, the dry air passes through an element, up the center tube, and out the outlet port. As long as the desiccant is replaced at saturation point and your compressed air is not exposed to a temperature below the dew point, your equipment will receive dry, moisture-free air.

As the desiccant becomes saturated with moisture, the dew point begins to rise. This is evident when the desiccant changes color from blue to pink, indicating the need for desiccant replacement. Refer to **Desiccant Change-out**, page 9.

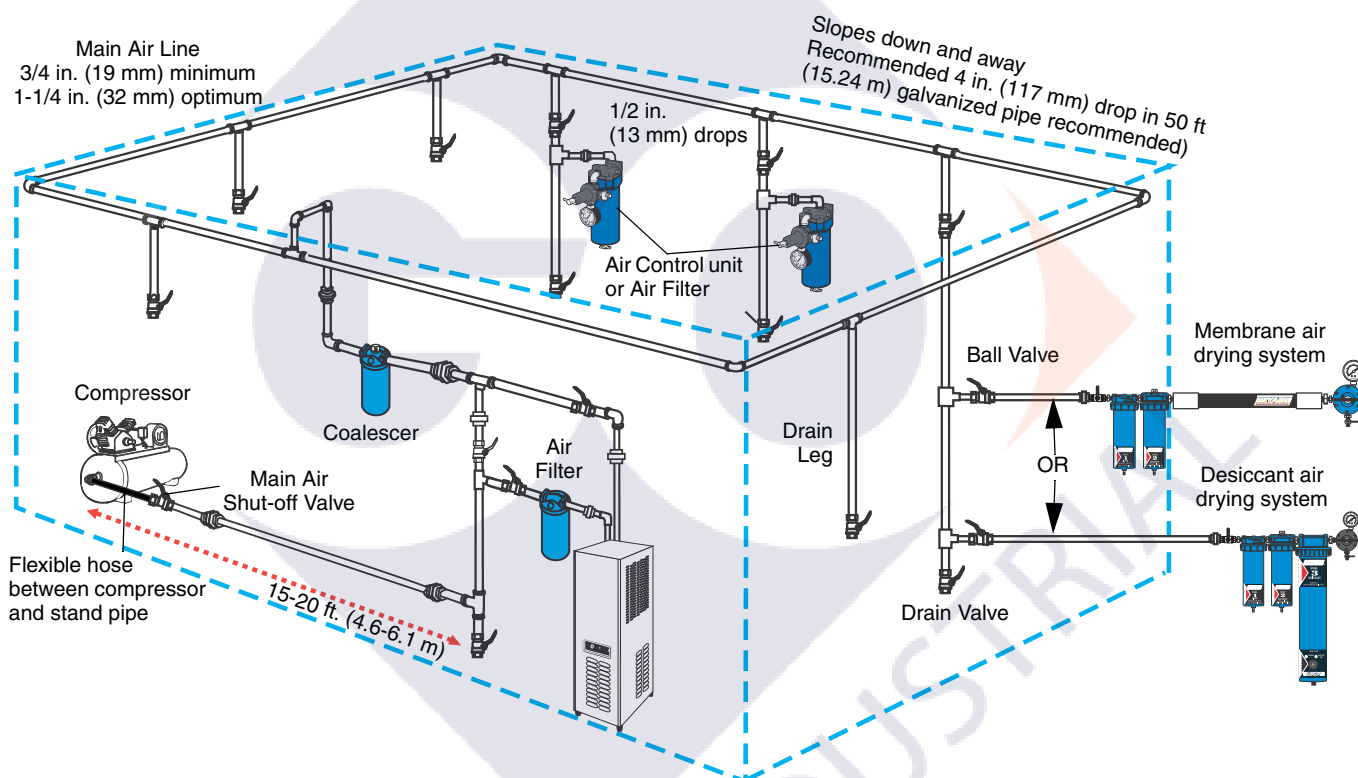
When air is compressed, the temperature of the air increases, as does its capacity to hold moisture. As the hot, moist air travels down through the lines, it cools, allowing the moisture to condense. Filters, drain traps, and driplegs only remove liquid condensation. The Dryaire Desiccant Air Drying System removes liquid condensation, residual water vapor and aerosols.

As the wet compressed air flows through the inlet port and down the bed of desiccant, the desiccant beads absorb the water vapor and aerosols and can reduce the air humidity down to a -40°F (-40°C) pressure dew point.

# Installation

1. Before installing air line components, blow out the pipe line to remove debris. Be sure air to the regulator is clean. Erratic operation or loss of regulation is usually caused by dirt in the regulator.
2. Install the Air Drying System as close as possible to the equipment it serves. Use template 289185, provided, to position system.
3. Install air shut-off valve 288798 upstream from the air system to isolate it for service.
4. Install system so air flows through filters in the direction noted on top of filter.
5. A minimum 1/2 in. npt piping is recommended. Avoid using too many fittings, couplings, etc., which will restrict air flow.

## Shop Air Piping Layout



- Main Air Line stand pipe should not be smaller than compressor outlet size.
- A minimum of 25 ft. (7.62 m) from compressor to first filter outlet is required to cool air [50 ft. (15.24 m) optimum]

<b>Minimum Pipe Size Recommendations</b>			
<b>Compressor</b>		<b>Main Air Line</b>	
<b>Size</b>	<b>Capacity</b>	<b>Length</b>	<b>Size</b>
1-1/2 - 2 HP	6 - 9 CFM	any	3/4 in. (19 mm)
3 - 5 HP	12 - 20 CFM	Up to 200 ft (61 m)	3/4 in. (19 mm)
		Over 200 ft (61 m)	1 in. (25.4 mm))
5 - 10 HP	20 - 40 CFM	Up to 100 ft (30.5)	3/4 in. (19 mm)
		Over 100-200ft(30.5-61 m)	1 in. (25.4 mm)
		Over 200 ft (61 m)	1-1/4 in. (31.8 mm)
10 - 15 HP	40 - 60 CFM	Up to 100 ft (30.5)	3/4 in. (19 mm)
		Over 100-200ft(30.5-61 m)	1-1/4 in. (31.8)
		Over 200 ft (61 m)	1-1/2 in. (38.1)

<b>Air Pressure Drop Through Hose, by hose length and ID</b>						
psi (Kpa, bar)						
<b>Air Hose Inside Diameter</b>	<b>4 ft. (1.22 m)</b>	<b>10 ft. (3.05 m)</b>	<b>15 ft. (4.6 m)</b>	<b>20 ft. (6.1 m)</b>	<b>25 ft. (7.62 m)</b>	<b>50 ft. (15.24 m)</b>
<b>1/4 in. (6.4 mm)</b>						
40 psi (276 kPa, 2.8 bar)	6 (41, .4)	8 (55, .6)	9.5 (66, .7)	11 (76, .8)	12.75 (88, 0.9)	24 (165, 1.7)
50 psi (345 kPa, 3.4 bar)	7.5 (52, .5)	10 (69, .7)	12 (83, .8)	14 (97, 1)	16 (110, 1.1)	28 (193, 1.9)
60 psi (414 kPa, 4.1 bar)	9 (62, .6)	12.5 (86, .9)	14.5 (100, .1)	16.75 (115, 1.2)	19 (131, 1.3)	31 (214, 2.1)
70 psi (483 kPa, 4.8 bar)	10.75 (74, .7)	14.5 (100, 1)	17 (117, 1.2)	19.5 (134, 1.3)	22.5 (155, 1.6)	34 (234, 2.3)
80 psi (552 kPa, 5.5 bar)	12.25 (84, .8)	16.5 (114, 1.1)	19.5 (134, 1.3)	22.5 (155, 1.6)	25.5 (176, 1.8)	37 (255, 2.6)
90 psi (621 kPa, 6.2 bar)	14 (97, 1)	18.75 (129, 1.3)	22 (152, 1.5)	25.25 (172, 1.7)	29 (200, 2)	39.5 (169, 2.7)
<b>5/16 in. (7.9 mm)</b>						
40 psi (276 kPa, 2.8 bar)	2.25 (16, .2)	2.75 (19, .2)	3.25 (22, .2)	3.5 (24, .2)	4 (28, .3)	8.5 (59, .6)
50 psi (345 kPa, 3.4 bar)	3 (21, .2)	3.5 (24, .2)	4 (28, .3)	4.5 (31, .3)	5 (34, .3)	10 (69, .7)
60 psi (414 kPa, 4.1 bar)	3.75 (26, .3)	4.5 (31, .3)	5 (34, .3)	5.5 (38, .4)	6 (41, .4)	11.5 (79, .8)
70 psi (483 kPa, 4.8 bar)	4.5 (31, .3)	5.25 (36, .4)	6 (41, .4)	6.75 (47, .5)	7.25 (50, .5)	13 (90, .9)
80 psi (552 kPa, 5.5 bar)	5.5 (38, .4)	6.25 (43, .4)	7 (48, .5)	8 (55, .6)	8.75 (60, .6)	14.5 (100, 1)
90 psi (621 kPa, 6.2 bar)	6.5 (45, .4)	7.5 (52, .5)	8.5 (59, .6)	9.5 (66, .7)	10.5 (72, .7)	16 (110, 1.1)



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# Operation



Do not exceed the Maximum Incoming Air Pressure of the equipment. Over pressurizing can cause component rupture and serious injury.

## Model 234401, Series D

1. Attach air hose(s) to air regulator outlet valve 289165.
2. Attach air hose to main shut-off valve 288798.
3. Open main shut-off valve 288798.
4. Turn the T-hand adjusting screw in or out to adjust regulator to desired setting.
5. Open outlet valve 289165 to supply air to spray guns or tool.
6. With air flowing, readjust air pressure regulator if necessary.
7. Turn off unit when not in use. Follow **Pressure Relief Procedure**, page 8.

## Model 24M178, Series B

1. Attach air hose(s) to outlet elbow fitting 120375.
2. Attach air hose to inlet elbow fitting C19024.
3. Open main shut-off valve 288798.
4. Turn off unit when not in use. Follow **Pressure Relief Procedure**, page 8.

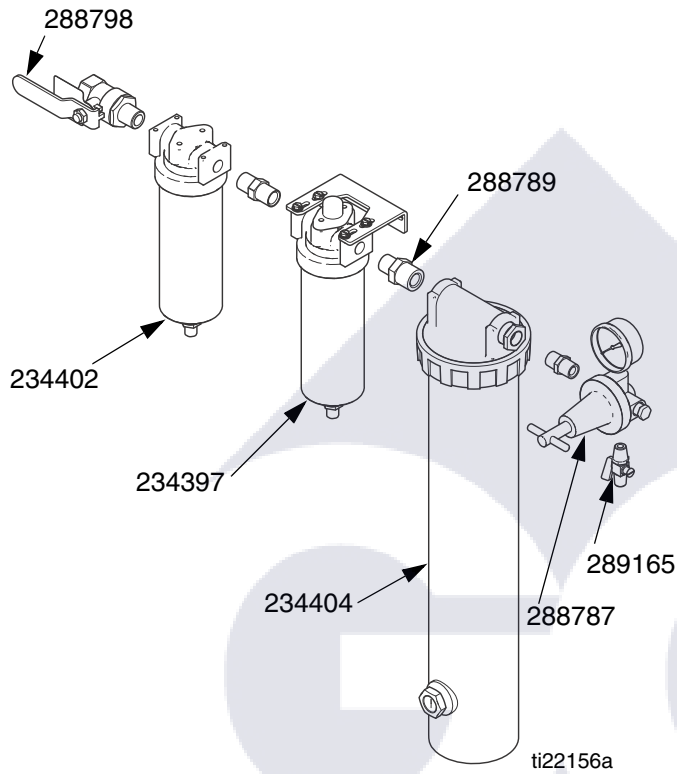
## Automatic Drain

The automatic drain is equipped with a float actuated device which automatically ejects liquid contaminants under pressure.

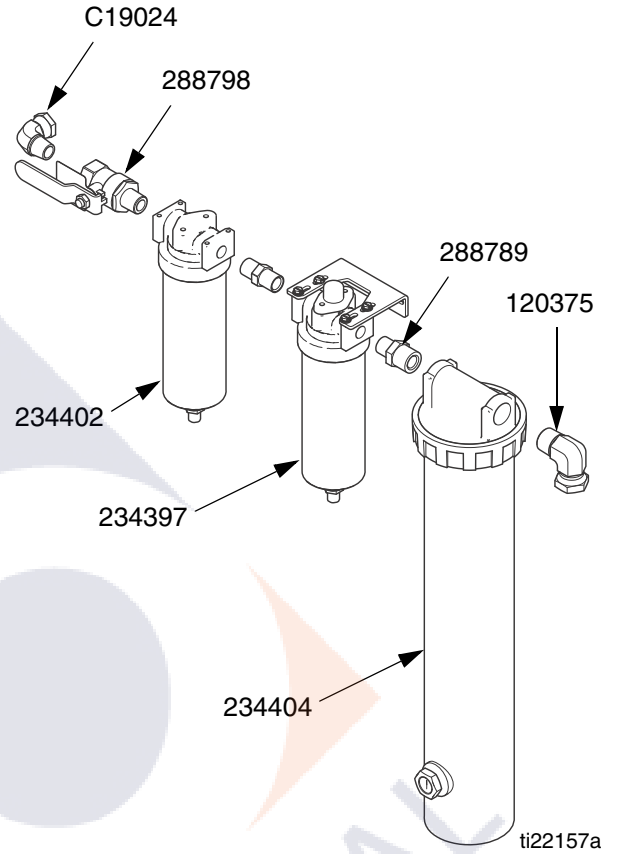
## Coalescer Pressure Drop Indicator

The differential pressure drop indicator provides early detection of a clogged coalescing filter element. As the filter element becomes clogged, the red indicator starts to rise while air is flowing through the unit. When the pressure drop across the element reaches 10-12 psi (69-83 kPa, 0.7-0.8 bar), the red indicator will be in full view, and the element should be replaced. Failure to replace the element when the pressure drop exceeds 10 psi (69 kPa, 0.7 bar) will affect your air quality and tool efficiency.

**Model 234401**



**Model 24M178**



Part No.	Description
234402	Air Filter with auto drain; see Manual 309919 for parts information
234397	Coalescer with auto drain; see Manual 309919 for parts information
234404	Desiccant Housing
288787	Air Regulator, self relieving
288789	Nipple with screen
288798	Shut-off Valve
289165	Regulator Outlet Valve

Part No.	Description
234402	Air Filter with auto drain; see Manual 309919 for parts information
234397	Coalescer with auto drain; see Manual 309919 for parts information
234404	Desiccant Housing
288789	Nipple with screen
288798	Shut-off Valve
C19024	Elbow Fitting
120375	Elbow Fitting

## Pressure Relief Procedure



To avoid injury, relieve air and fluid pressure before checking, cleaning, or repairing the equipment.

The following is a basic pressure relief procedure. Be sure to follow the specific pressure relief procedure in your spray gun and/or fluid supply equipment manuals.

1. Close the main air shut-off valve.
2. Trigger the gun or dispense valve and open any drain valves to relieve pressure.

## Maintenance and Repair

- Relieve the pressure before cleaning, checking or repairing. Follow **Pressure Relief Procedure**, above.
- Check system at least once per shift to ensure proper drainage.
- A supply of low flow/low humidity air will provide longer desiccant life.

## Air Filter 234402, Series B

To maintain maximum filtering efficiency and avoid excessive pressure drop, the filter must be kept clean. See Manual 309919 for cleaning and parts information.

## Coalescer 234397, Series B



**NOTE:** It is recommended that Air Filter 234402 be installed upstream of the coalescing filter to remove 3 micron and larger size particles and separate large droplets of moisture from the air line.

### CAUTION

Never let the liquid level in the bowl reach the base of the coalescing element.

See Manual 309919 for operation, cleaning, and parts information.



## Desiccant Housing 234404, Series B

**NOTE:** Always install a moisture filter, to remove bulk fluids, and a coalescing filter, to remove oil, upstream of the desiccant housing. Desiccant coated with oil will not absorb moisture.

### Desiccant Changeout

**NOTE:** Desiccant beads are non-toxic and non-flammable.

The desiccant gradually changes color from blue to pink, indicating it has absorbed moisture to the saturation point and needs to be regenerated or replaced.

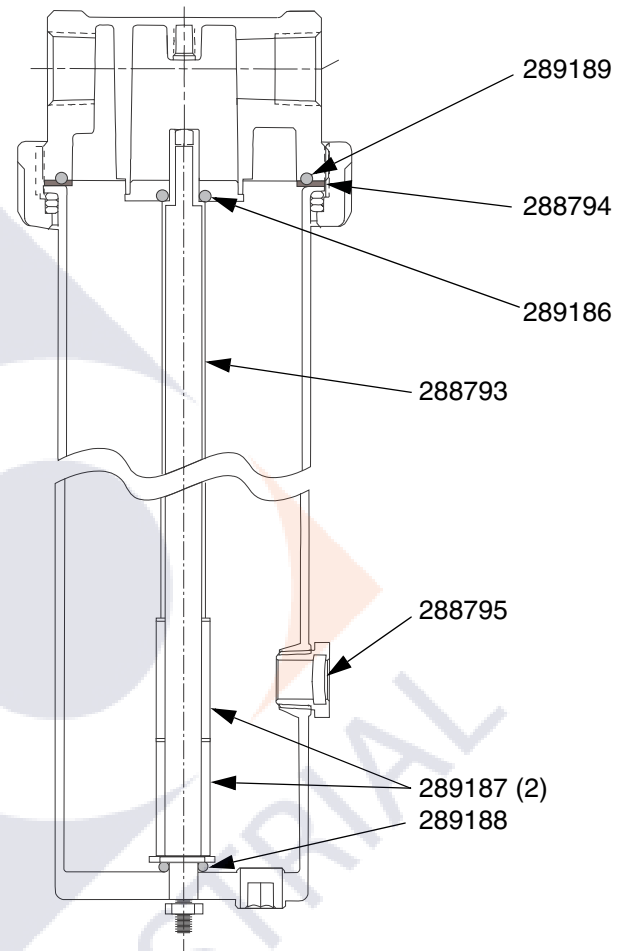
- To regenerate Silica Gel desiccant, heat desiccant for 4 hours at 275°F (135°C).
- To replace desiccant, order desired part no. from the following chart.

Desiccant Part No.	Color when fresh	Color when saturated
288810 Silica Gel (5 lb)	Blue	Pink
288823 Silica Gel (four 5 lb cans)	Blue	Pink

### Desiccant Housing Disassembly

1. Follow the **Pressure Relief Procedure**, page 8.
2. Unscrew the metal collar holding the desiccant bowl to cover. Remove bowl and collar.
3. Dump old desiccant out of bowl.
4. If the pressure drop across the dryer has become unacceptable, the bronze element in the bottom of the bowl may be clogged. To remove clog:
  - a. Place a blow gun at the top of the tube and blow air through the flow tube.
  - b. If element replacement is needed: disassemble flow tube from the bowl by removing the end cap and nut from the bottom of the bowl.
  - c. Turn the flow tube (hand tight) counter clockwise to remove it, then replace elements.
  - d. Reassemble in reverse order.

5. Refill bowl with new or regenerated desiccant. See **Desiccant Changeout**. Desiccant Housing 234404 holds 5 lb. of desiccant.
6. Reassemble bowl to cover, making sure that o-ring 289186 is in place in cover.



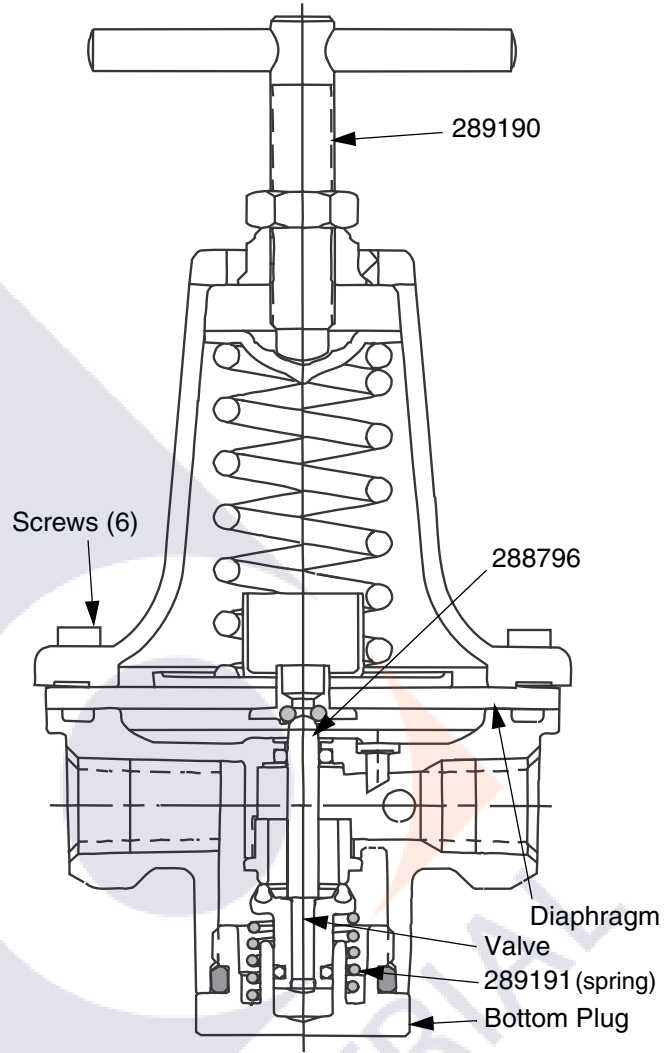
Part No.	Description
288793	Flow Tube Assy., includes flow tube, nut, o-ring, filter elements and retainers
289186	O-Ring
288794	Gasket
289189	O-Ring
289187	Filter Element
289188	O-Ring
288795	Sight Glass
288810	Desiccant, silica gel (5 lb)
288823	Desiccant, silica gel (four 5 lb cans)

# Self-Relieving Air Regulator 288787

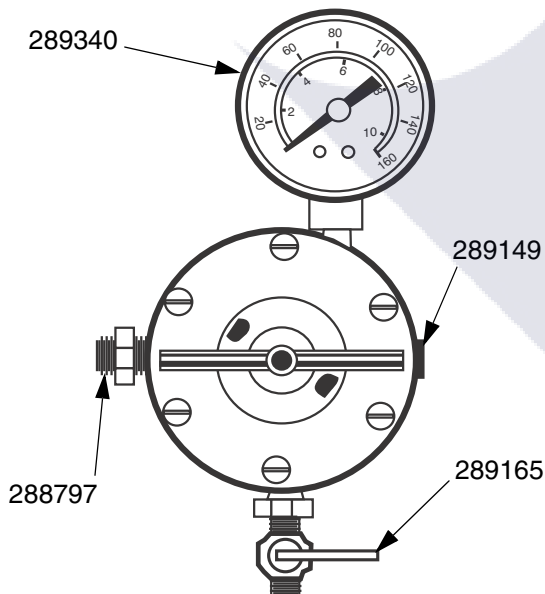
Be sure air to the regulator is clean. Erratic operation or loss of regulation is usually caused by dirt in the regulator.

## Cleaning

1. Follow the **Pressure Relief Procedure**, page 8.
2. Remove bottom plug, spring, and valve.
3. Remove six screws, and separate regulator body.
4. Clean all parts with denatured alcohol. Wipe off seat and blow out body.
5. Inspect parts for damage and replace as needed. To replace the valve and diaphragm, order Repair Kit 288796.
6. Reassemble parts and screw them into the regulator before tightening the bottom plug. Make sure the valve, diaphragm and spring are center aligned.



**Air Regulator Assembly  
for Desiccant Air Drying System**



Part No.	Description
289340	Air Pressure Gauge
289149	Plug
288796	Diaphragm/Valve Repair Kit
289190	T-handle Adjusting Screw
289191	Spring
288797	Nipple, 3/8 in. x 3/8 in.
289165	Shut-off Valve



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Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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