

# SUPER DUTY FILTER

# F254XX-X1X

RELEASED: 5-1-98  
REVISED: 11-12-01  
(REV. B)

F254 X X - X 1 X

## PORT SIZE

3/4" = 5  
1" = 6  
1-1/4" = 7  
1-1/2" = 8  
2" = 9

## DRAIN OPTION

0 = Manual  
1 = Automatic

## BOWL OPTION

1 = Metal w/Sight Glass

## FILTER SERVICE INDICATOR

Without = 1  
With = 2

## FILTER ELEMENT

1 = 40 Micron  
3 = Coalescing

## TECHNICAL SPECIFICATIONS

### OPERATION CONDITIONS

**Fluid:** Compressed Air

**Maximum Inlet Air Pressure:** 250 p.s.i.g. (17 bar)

#### Operating Temperature:

F254X1-11X (40 Micron): -30° to 175°F (-34° to 80°C)

F254X2-31X (Coalescing): -30° to 150°F (-34° to 65°C)

Air supply must be dry enough to avoid ice formation at temperatures below 35°F (2°C).

**Particle Removal:** Coalescing: Down to 0.01 µm.

**Maximum pressure drop across filter for efficient operation:**

10 p.s.i.g. (.7 bar)

**Maximum remaining oil content in outlet air:** Coalescing: 0.01 ppm at 70°F (20°C) with an inlet oil concentration of 17 ppm.

**Typical flow at 90 p.s.i.g. (6.3 bar) inlet pressure and 5 p.s.i.g. (0.35 bar) pressure drop:**

F25451-11X 325 scfm (153 dm<sup>3</sup>/s)

F25461-11X 425 scfm (201 dm<sup>3</sup>/s)

F25471-11X 425 scfm (201 dm<sup>3</sup>/s)

F25481-11X 425 scfm (201 dm<sup>3</sup>/s)

F25491-11X 1400 scfm (661 dm<sup>3</sup>/s)

**Maximum flow at 90 p.s.i.g. (6.3 bar) inlet pressure to maintain stated oil removal performance:**

F25452-31X 90 scfm (42 dm<sup>3</sup>/s)

F25462-31X 125 scfm (59 dm<sup>3</sup>/s)

F25472-31X 125 scfm (59 dm<sup>3</sup>/s)

F25482-31X 250 scfm (118 dm<sup>3</sup>/s)

F25492-31X 300 scfm (142 dm<sup>3</sup>/s)

### Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 5 p.s.i.g. (0.3 bar)

Bowl pressure required to open drain: Less than 3 p.s.i.g. (0.2 bar)

Minimum air flow required to close drain: 2 scfm (1 dm<sup>3</sup>/s)

Manual operation: Depress pin inside drain outlet to drain bowl

### Color Code for Filter Service Indicator:

Green: Pressure drop is less than 6 psid (.4 bar)

Green / Red: Pressure drop between 6 and 15 psid (.4 and 1 bar)

Red: Pressure drop greater than 15 psid (1 bar).

### MATERIALS OF CONSTRUCTION

**MODELS:** See chart above

**Body:** Aluminum

**Intermediate body:** Aluminum

**Bowl:** Aluminum

**Bowl sight glass:** Pyrex

**Elastomers:** Neoprene and Nitrile

**Filter Element:** 40 Micron - Sintered Bronze  
Coalescing - Synthetic fiber and polyurethane foam

### Service Indicator:

**Body:** Transparent nylon

**Internal Parts:** Acetal

**Spring:** Stainless Steel

**Elastomers:** Nitrile



F25481-110



F25491-110

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## OPERATING AND SAFETY PRECAUTIONS

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- Use only genuine ARO replacement parts to assure compatible pressure rating and performance.
- Read carefully all warnings and safety precautions and heed the following before operating, to avoid personal injury and/or property damage.
- Be certain anyone operating this equipment has been trained to use it safely.

**⚠ WARNING** **COMPONENT RUPTURE.** Do not exceed maximum rated operating pressure as stated in technical specifications. To avoid possible damage or personal injury, DO NOT expose the unit to excessive pressure beyond the intended working range.

**⚠ WARNING** **TEMPERATURE LIMITS.** Do not exceed maximum temperature limits as stated in *TECHNICAL SPECIFICATIONS*. Excessive temperature can affect non-metallic parts which may weaken them and cause failure.

**⚠ WARNING** **USE WITH INDUSTRIAL COMPRESSED AIR SYSTEMS ONLY.** Do not use with bottled gas products or fluids. misapplications can result in component failure and personal injury.

**⚠ WARNING** **DISASSEMBLY HAZARD.** Do not disassemble this unit when it is under pressure. Shut off and relieve air supply before attempting service or disassembly procedures. Isolate the unit by closing the shut-off valve or disconnect the supply line or hose.

**⚠ WARNING** **DO NOT USE DEGREASERS OR SOLVENTS TO CLEAN POLYCARBONATE BOWLS.** Exposure internally or externally to incompatible chemicals or their vapors or fumes could attack and weaken polycarbonate material, causing failure. **DO NOT EXPOSE** to acetone, trichloroethane, gasolene, alcohols, ketones, esters, chlorinated hydrocarbons, toluene, etc. Clean polycarbonate bowls with soap and water or kerosene only. **USE COMPATIBLE LUBRICATING OILS ONLY.** Lubricating oils used in plastic bowls must be compatible with polycarbonate plastic (some "fire resistant" oil additives are not compatible). Fumes of these substances in contact with polycarbonate bowls internally or externally can also damage the bowl. Consult Aro catalog or the Aro Corporation, Bryan, Ohio 43506 for comprehensive listings of harmful chemicals and compatible listings of harmful chemicals and compatible lubricating oils. If questions arise, request Form No. 4424.

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### INSTALLATION

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- Install filter with the air flow as indicated by the arrow on the top of the unit.
- Install filter as close as possible to the air operated equipment for best performance.
- Filters must be installed with the bowls downward for proper operation.
- When using filter featuring the sight glass on the bowl, orient the bowl so it is most visible for the operator.
- Locate the filter upstream from the regulator and lubricator.
- Air line piping should be the same size as filter ports.
- Locate filter in air line upstream of cycling directional control valves, and away from any heat source. If used as a main filter, install as close as possible to the air supply.
- Use pipe thread sealant on male threads only when connecting piping. Do not allow sealant to enter the interior of the filter.
- For maximum coalescing element life and efficiency, install a general purpose filter with a 5-micron element upstream from the coalescing filter.
- Connect flexible tubing with 1/8" minimum I.D. to the automatic drain connection (1/8" NPTF). Avoid restrictions in the drain line.

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### OPERATION

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- Monitor the sediment accumulation.
- If the pressure drop across the filter becomes excessive, drain the filter bowl. Clean or replace the filter element.
- Clean the filter element periodically. Soak the filter bowl and clean with soap and water.

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### MAINTENANCE

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- Filters with manual drain must be drained as frequently as necessary to keep the liquid level below the baffle, which could cause liquid to be carried downstream.
- Automatic drains can be operated manually by depressing the needle inside drain outlet.
- Replace element when pressure drop reaches or exceeds 10 psid (0.7 bar) or when service life indicator shows approximately one-half red / green. An excessive pressure drop across a saturated but uncontaminated element, could indicate operation above the maximum flow rate (see Specifications).

#### **CLEANING OF FILTER SERVICE INDICATOR**

- Clean indicator lens or nylon indicator with warm water only. Clean other parts (except element) using warm water and soap. Service Note: Element (7) can't be cleaned.
- Dry parts and blow out internal passages in body using dry compressed air.
- Inspect parts. Replace those found to be damaged.

#### **SERVICE KITS**

Repair Kits are universal and may contain items not used on your product. Always replace used parts with identical parts from the kit.

**F254X1-11X                      3/4" to 1-1/2" Standard Filter**  
**F254X2-31X                      3/4" to 1-1/4" Coalescing Filter**

**SERVICE**

**DISASSEMBLY**

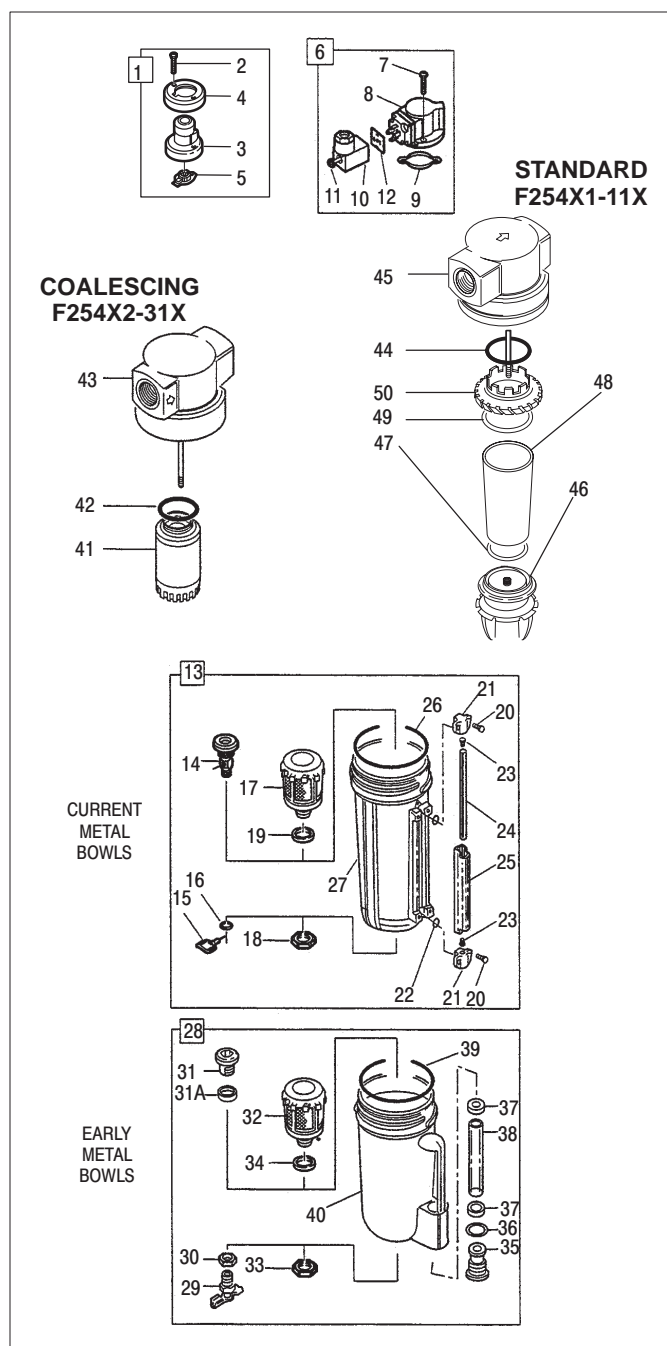
1. Shut off air inlet pressure and reduce pressure in filter to zero.  
Filter can be disassembled without removal from air line.
  2. a.) Unscrew bowl and element.  
b.) Unscrew bowl and baffle (46). Remove element (41 or 48).
- NOTE: Automatic drain is not repairable and should be replaced if inoperative.
3. Inspect parts. Replace those parts found to be damaged.

**REASSEMBLY**

1. Lubricate all "O" rings, the portion of the manual drain body (14) that contacts the bowl, and the hole in the manual drain body (14) that accommodates the stem of drain valve (15) with a good quality "O" ring grease.
2. Arrows on indicator (3) and body (43 or 44) must point in the same direction. Tighten screws (2) to 25 - 35 in. lbs (2.8 - 4.0 Nm).
3. Assemble filter as shown on the exploded view.

**F254X1-11X Standard**

4. Place "O" ring (44) on louver (50) then press into place in body (45).
5. Screw baffle (46) into center post until contact is made with the filter element (48), then tighten an additional 1/4 turn.
6. Press drain (14) thru the hole from inside of the bowl. Place retainer "O" ring (16) over drain, then position in groove.
7. Press drain valve (15) thru hole in drain (14).
8. *Early models: Tighten drain retaining nut (30, 18) to 20 - 25 in. lbs (2.3 - 2.8 Nm). Tighten drain petcock (29) to 15 - 20 in. lbs (1.7 - 2.3 Nm).*
9. Assemble sight glass components (20 thru 25) to bowl. Apply a 2 - 4 lb. (.9 - 1.8 Kg) clamping force to upper and lower sight glass brackets (21) to pull brackets together. Tighten screws (20) to 8 - 10 in. lbs (.9 - 1.1 Nm).
10. *Early models: Tighten retainer (35) to 17 - 20 in. lbs (1.9 - 2.3 Nm). Do not over tighten to avoid damage to gauge glass (38).*
11. Turn bowl into body until arrowhead is in line with or to the right of the arrowhead on body.



Note: Individual parts are not normally sold.

| KIT DESCRIPTION                           | KIT NO. | ITEM NOS. INCLUDED    |
|---|---------|-----------------------|
| Element, 5 micron                         | 104235  | 48                    |
| Element, 40 micron                        | 104119  | 48                    |
| Element Kit, Coalescing                   | 104231  | 19,26,31A,34,39,41,42 |
| Automatic Drain Assembly                  | 104068  | 17,18,19              |
| Seal Kit                                  | 104116  | 26,31A,44,47,49       |
| Sight Glass (Current)                     | 104163  | 20,22,23,24,25,26     |
| Sight Glass (Early)                       | 104123  | 36,37,38              |
| Service Indicator - Mechanical            | 104246  | 1                     |
| Service Indicator - Electrical (Optional) | 104247  | 6                     |
| Manual Drain Assembly (Current)           | 104241  | 14,15,16              |
| Manual Drain Asm (Early) (Cancelled)      | 104212  | 30,31,31A             |

**F25491-11X** **2" Standard Filter**  
**F254X2-31X** **1-1/2" & 2" Coalescing Filter**

**SERVICE**

**DISASSEMBLY**

1. Shut off air inlet pressure and reduce pressure in filter to zero.  
Filter can be disassembled without removal from air line.
2. Unscrew bowl, intermediate body and element.
- NOTE: Automatic drain is not repairable and should be replaced if inoperative.
3. Inspect parts. Replace those parts found to be damaged.

**REASSEMBLY**

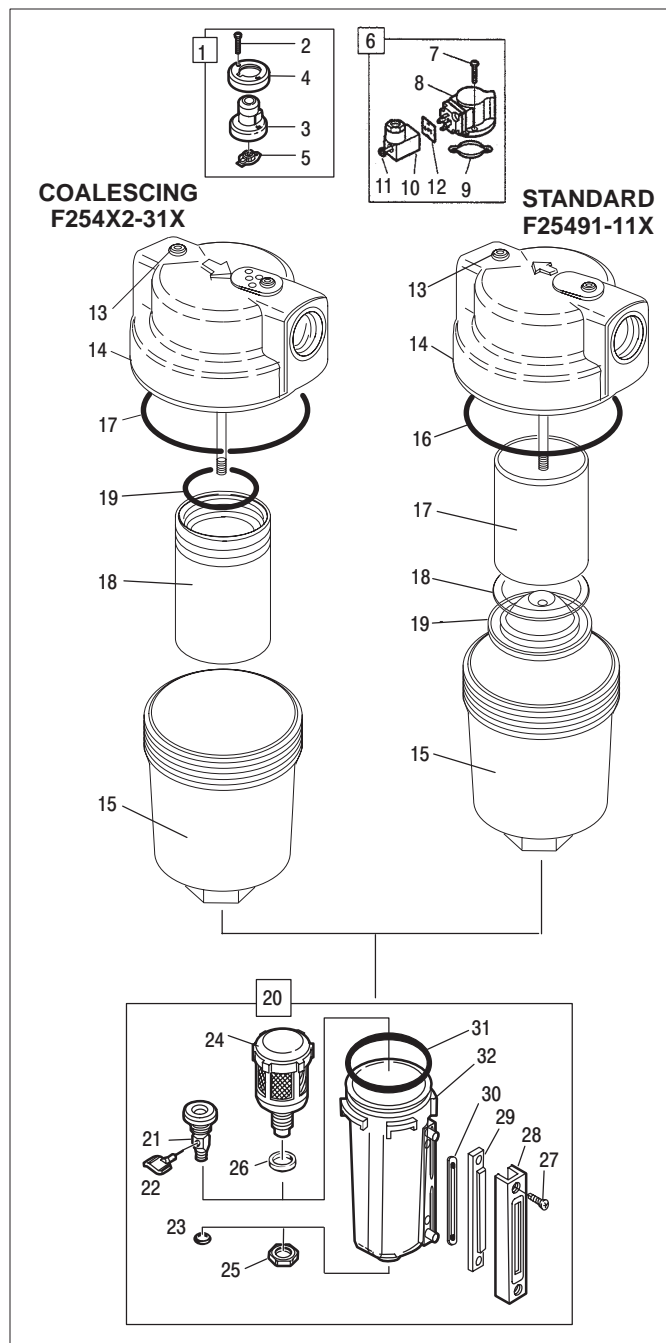
1. Lubricate all "O" rings, the portion of the manual drain body (21) that contacts the bowl and the hole in the manual drain body (21) that accommodates the stem of the drain valve (22) with a good quality "O" ring grease. Lubricate threads on the metal bowl and intermediate body with a small amount of anti-seize compound.
2. Arrows on indicator (3) and body (14) must point in the same direction. Tighten screws (2) to 25 - 35 in. lbs (2.8 - 4.0 Nm).
3. Assemble filter as shown in the exploded view.

**F254X2-31X Coalescing**

4. Install element (18) to 70 - 75 in. lbs (7.9 - 8.5 Nm). Skip step 5.

**F25491-11X Standard**

5. Install element (17), install (19) and tighten to 70 - 75 in. lbs (7.9 - 8.5 Nm).
6. Torque intermediate body (15) to (14) body approximately 12 ft. lbs (1.4 Nm) (snug with two hands).
7. Press drain (21) thru hole from inside of bowl. Place retainer "O" ring (23) over drain, then position in groove. Press drain valve (22) thru hole in drain (21).
8. Tighten drain retaining nut (25) to 20 - 25 in. lbs (2.3 - 2.8 Nm).
9. Tighten screws (27) to 15 - 30 in. lbs (1.7 - 3.4 Nm). Push bowl into intermediate body and turn fully clockwise.



Note: Individual parts are not normally sold.

| KIT DESCRIPTION                           | KIT NO. | ITEM NOS. INCLUDED |
|---|---------|--------------------|
| <b>F254X2-31X Coalescing Filters</b>      |         |                    |
| Element                                   | 104232  | 17,18,19,26,31     |
| Automatic Drain Assembly                  | 104068  | 24,25,26           |
| Manual Drain Assembly                     | 104241  | 21,22,23           |
| Sight Glass                               | 104230  | 27,29,30,31        |
| Service Indicator - Mechanical            | 104246  | 1                  |
| Service Indicator - Electrical (Optional) | 104247  | 6                  |
| <b>F25491-11X Standard Filters</b>        |         |                    |
| Element 5 $\mu$ m                         | 104227  | 17                 |
| Element 40 $\mu$ m                        | 104228  | 17                 |
| Automatic Drain Assembly                  | 104068  | 24,25,26           |
| Manual Drain Assembly                     | 104241  | 21,22,23           |
| Seal Kit                                  | 104229  | 16,18,26,31        |
| Sight Glass                               | 104230  | 27,29,30,31        |

