



SOFT ROBOTICS AIR PREP KIT FROM AUTOMATION DISTRIBUTION INC.

CLEAN, DRY, OIL-FREE AIR

This kit is intended to provide the knowledge and resources necessary to ensure the highest possible performance and longest possible service life from Soft Robotics' control system and tooling products. Air cleanliness plays a large role in the premature failure of *electro-pneumatic* equipment. Failure to provide clean, dry, oil-free air can not only chronically shorten the life of integrated pneumatic valves to well below their nominal cycle life, but can also, in cases of severe contamination, cause intermittent and inexplicable valve failures only minutes or hours after installation. Once airline equipment and piping becomes contaminated with built up grime or corrosion, it is extremely difficult to clean often leaving no viable alternative to complete replacement.

ISO Standards 8573-2, 8573-3, and 8573-4 describe in further detail the test methods used to determine whether a compressed air sample complies with particle, moisture, and oil content classification [5:5:4].

SOFT ROBOTICS AIR QUALITY RECOMMENDATIONS:

Soft Robotics uses the ISO 8573-1:2010 standard to specify air purity and dryness recommendations. For all control and tooling products, a purity classification of [5:5:4] or lower is recommended. This classification is typical of modestly sensitive applications like: general facility shop air, air tool supply, and sand blasting. The following section will detail the ISO 8573-1 standard's specifications for each contaminant type under this combined classification.

PARTICLE CLASS 5 REQUIREMENTS

Particle content is defined in the standard as a permissible number of particles per cubic meter of compressed air. Class 5 particle purity is the highest (weakest) classification which uses this measure of particle content, and specifies that fewer than 100,000 particles must be present between 1 μm and 5 μm in diameter per cubic meter of compressed air and no particles larger than 5 μm in diameter. Even if similar filtration equipment is present elsewhere in the facility, it's strongly advised to place an additional filtration unit near the final point of use. This provides an additional layer of "last mile" protection should thread tape, dust, metal slivers, or other contaminants be introduced into the piping during maintenance or expansion of the facility air system.

All Soft Robotics control equipment requires a stable regulated supply of air pressure. Both pressure regulation and filtration can be performed in a single combined package.

MOISTURE CLASS 5 REQUIREMENTS (not addressed as part of the air prep kit)

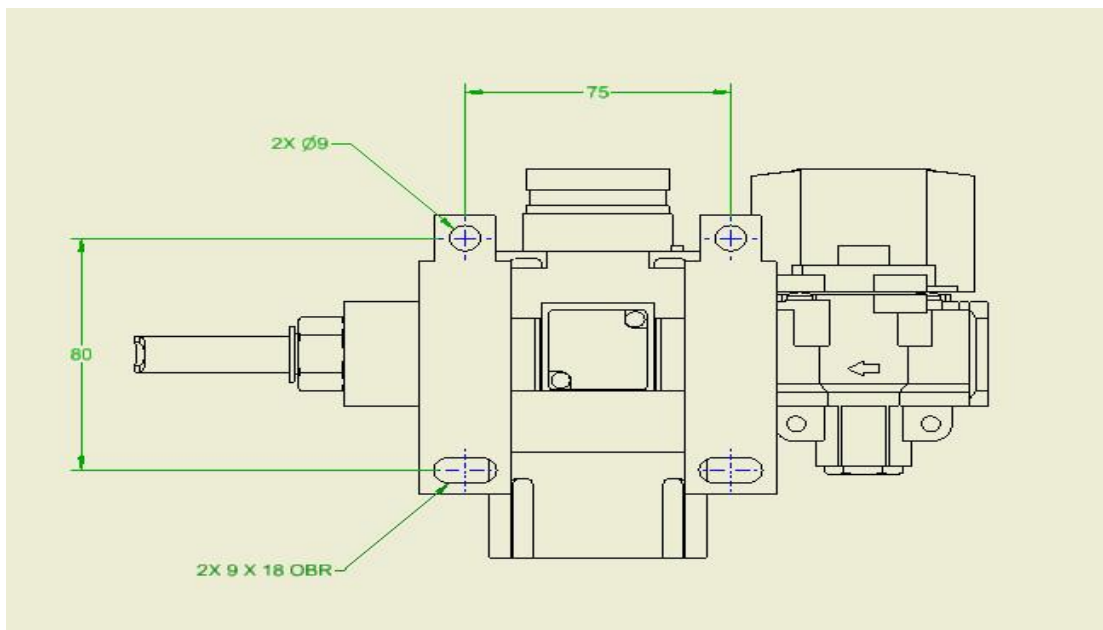
Moisture or liquid water content is defined via two classification tiers. Classes 7 and above permit a specified amount of liquid water whereas classes 6 and below permit no liquid water to be present (as condensate or mist) and specify moisture content as a pressure *dewpoint* that

may not be exceeded. Class 5 water purity classification requires a *pressure dewpoint* lower than 7 °C (45 °F). The most efficient way to achieve a *pressure dewpoint* lower than 7 °C (45 °F) is to integrate a refrigerated air dryer into the facility air system downstream of the compressor, liquid separator, and main *air receiver*. Refrigerated dryers are highly reliable and require minimal maintenance even under continuous use. By using a refrigeration circuit, pressurized air is rapidly cooled to ~35-40 °F which becomes the *pressure dewpoint* as water vapor saturates and condenses out of the air stream. It is always recommended that the final *pressure dewpoint* be at least 20 °F lower than the minimum facility ambient temperature.

OIL CLASS 4 REQUIREMENTS

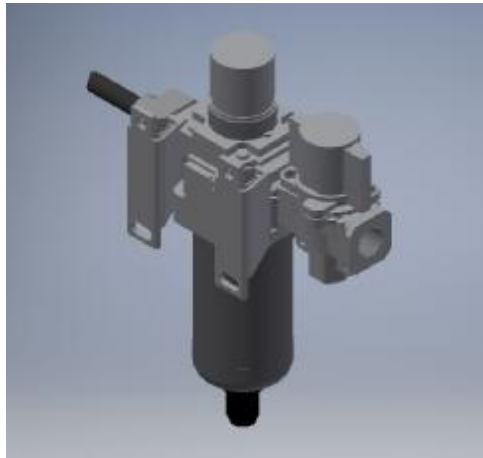
Oil content is defined as a permissible number of mg of oil per cubic meter of compressed air. Class 4 oil purity is the highest (weakest) classification and requires fewer than 5 mg of oil to be present per cubic meter. Oil may be present below this limit as a liquid, aerosol, or vapor but measurement of vapor content is optional when confirming compliance with class 4. Generally, oil content will meet this requirement if not intentionally introduced into the system. In the most typical case, moisture and oil are removed at a central location within the facility near the air compressor. At class 4, Soft Robotics' oil content requirements can easily be achieved by placing a liquid separator directly at the compressor output. Liquid separators are similar in functionality to the particle filters described in the previous sub-section but usually do not contain a filter element, which mitigates pressure drop across the separator. Unless intentionally introduced by an aerosolizing lubricator, the primary source of oil and grease within the air system will be the compressor itself.

Air Prep Kit Filter/Regulator, Pressure Relief Valve, Bracket, & Tubing:

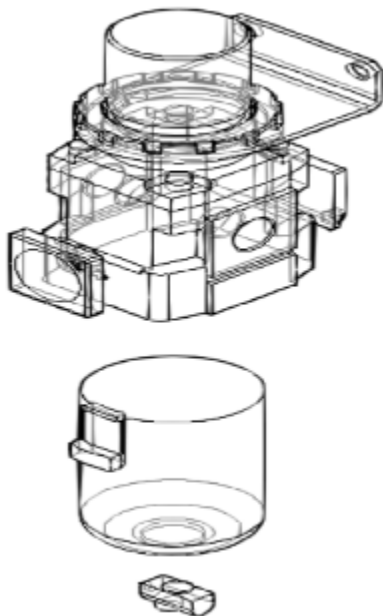


The kit does not include the fitting to attach the unit to the plant air supply since those fitting can vary.

Please add the plant air supply fitting to your order to ensure a complete connection.

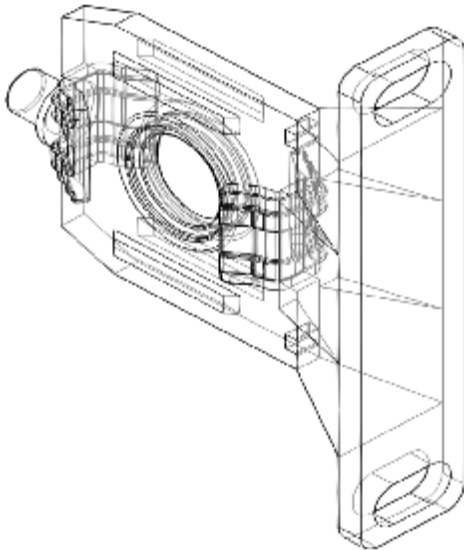


Filter/Regulator:

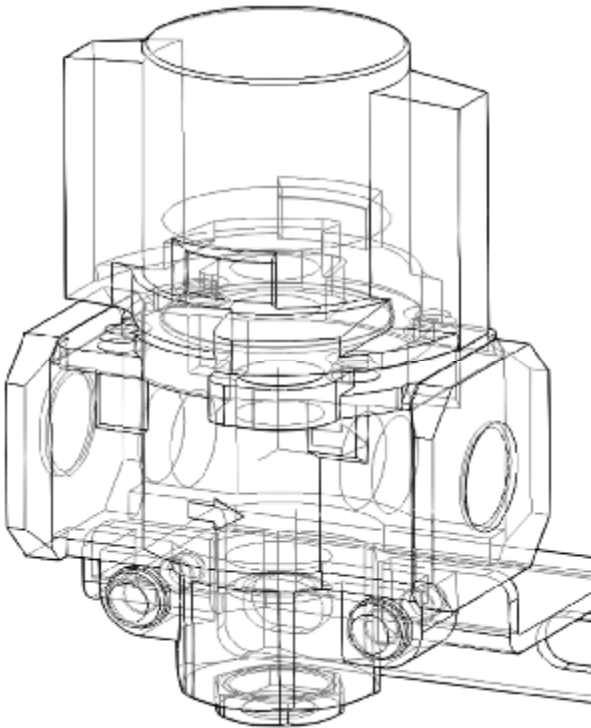


- Thread Type NPT
- Body Size 40
- Press. Gauge Port Size 1/2"
- Material, Bowl Polycarbonate
- Size, Port 1/2"

Spacer with Bracket (2):

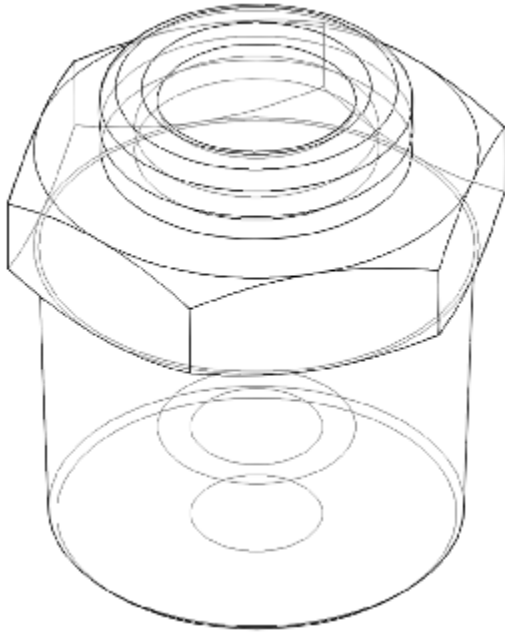


Valve Body:



- 3 port pressure relief valve
- Lockable for energy isolation
- Single action operation, simply turn
- 1/2" NPT (f)

Fitting:



- Male connector
- Accepts nylon and polyurethane tubes
- Stud allows rotation of the body for ease of installation in confined spaces
- Release collar allows easy removal of tubing without damaging the tube
- Size, Tube 1/2 "
- Size, Port 1/2 NPT male