	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: Plumbing Standards	Section: 22 61 19 Laboratory Compressed Air Piping Specialties
		Date: 08/05/2017
		Author: Office of Facilities
CC: Project Folder		

Date	Description of Change	Pages / Sections Modified	ID
8/5/17	Entire document	-	mgl

### **PART 1 - INTRODUCTION**

1.1 This standard applies to Laboratory Compressed Air Piping Specialties.

### **PART 2 - GENERAL DESIGN GUIDELINES**

2.1 Design considerations specific to components in this section:

- A. Requirements: See applicable section of this standard.
- B. Preferred: See Section Minimum Product Requirements.
- C. Disallowed: None
- D. Commissioning: See Section Installation Requirements

2.2 Provide air dryer

2.3 Provide air filter


2.4 Verify dew-point requirement for application, and amend dryer parameters, but in no case shall the dew-point temperature be greater than the requirements of this standard.

2.5 Motor shall conform to other requirements of the MEP Yale Standards.


### **PART 3 - MINIMUM PRODUCT REQUIREMENTS**

3.1 AIR COMPRESSOR

- A. Provide a duplex skid mounted packaged 100% oil free, 100% teflon free, 100% asbestos free air compressors, manufactured by Quincy Compressor or Atlas Copco duplex system.
- B. The system shall be capable of scrubbing inlet air with water. Components shall be factory-assembled and interconnected with wiring to constitute a functional package. Components are as follows: (See following pages)

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<b>DUPLEX AIR COMPRESSOR</b>	
Equipment Tag	Refer to Equipment Naming Standard
Number Required	One with pipe headers and controls.
Mounting Condition Arrangement	Two self-contained compressor package mounted on an ASME air receiver tank.
Type	Single-Stage Oil-less reciprocating
Motor	NEMA frame ODP motor, V-belt drive with total belt guard and belt tension adjustment.
Inlet Filter/Silencer	Provide inlet filter/silencer for each machine with 10 micron replaceable element.
Materials of Construction	Oil-less crankcase with teflon rings for oil free delivery.
Controls	NEMA 12 control cabinet with: NEMA 1 alternator, magnetic starters, thermal overload relays, on/off switches, hour meters, fused disconnects with door interlocks, 120 V control voltage transformer, reset buttons, UL and CSA approved
Electrical	460 V/3 /60 Hz single point
Receiver	120 gallon ASME rated, electronic tank drain, pressure gauges, isolator pads, ASME relief valve, air outlet service valve, piping between the air compressors and receiver shall include:
Valves and Connectors	In-line check, valve spec per A-13 Flexible connectors.
Sundries	NEMA 1 unloading pressure switch Free air unloader 15°F CTD air cooled after cooled with cooling fan NEMA 1 high temperature air safety shutdown feature
Start Up and Warranty	2 years
Cooling Media	Air Cooled Package
Rated Duty	See Drawing Schedule
Other	Single point electrical and piping connections
Acceptable Manufacturers	Quincy Model No. QRD-S Duplex

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<b>DUPLEX AIR COMPRESSOR</b>	
Equipment Tag	Refer to Equipment Naming Standard
Number Required	One
Mounting Condition Arrangement	Two self contained compressor package.
Type	Oil-free rotary scroll with full feature.
Motor	High efficiency TEFC motor with Class F insulation.
Inlet Filter/Silencer	Provide inlet filter/silencer for each machine with 10 micron replaceable element.
Materials of Construction	Oil-less crankcase with interaction of a fixed and an orbiting scroll for oil free delivery.
Controls	Elektronicon D controller and variable flow technology
Electrical	460 V/3 /60 Hz single point
Receiver	120 gallon ASME rated, electronic tank drain, pressure gauges, isolator pads, ASME relief valve, air outlet service valve, piping between the air compressors and receiver shall included.
Valves and Connectors	In-line check, valve spec per A-13 Flexible connectors.
Sundries	NEMA 1 unloading pressure switch Free air unloader 15°F CTD air cooled aftercooled with cooling fan NEMA 1 high temperature air safety shutdown feature
Start Up and Warranty	2 years
Cooling Media	Air Cooled Package
Rated Duty	See Drawing Schedule
Other	Single point electrical and piping connections
Acceptable Manufacturers	Atlas Copco Model No. SF multicore series with integrated refrigerated air dryer.

### 3.2 COMPRESSOR, AIR DRYER

- A. Provide Domnick Hunter, Hankison, Wilkerson Corporation, Speedaire or approved equal, refrigerated air dryer for the compressed air system. The dryer shall be capable of maintaining a 38° F pressure dew point with both inlet air and ambient temperatures not exceeding 100° F. Maximum operating pressure shall be rated at 200 psig.

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B. Internal tubing shall be smooth bore, low pressure drop style. The heat exchanger shall be a flat plate type to increase cooling efficiency. Outgoing compressed air shall be reheated to prevent condensation on discharge piping.

C. Dryer shall be equipped with the following indicators:

1. Refrigerant suction pressure gauge
2. Refrigerant discharge pressure gauge
3. Air inlet temperature gauge
4. Air outlet pressure gauge
- 5.

### 3.3 COMPRESSOR, AIR FILTER

A. Coalescing filter capable of .01 micron filtration at 00.000% D.O.P. efficiency shall be installed after the dryer. The filter shall be equipped with an automatic drain mechanism. The filter shall be sized to pass rated system capacity.

## PART 4 - INSTALLATION REQUIREMENTS:

4.1 All equipment and components supplied by the equipment manufacturer shall be warranted for a period of two (2) years from date of start-up.

4.2 Commissioning:

A. A start-up report shall be issued at turn-over to the owner. The start-up report shall include testing of all equipment, and confirmation of sequence of operation. Each item will be itemized and indicate the testing was completed and passed. Additionally, all critical set-points will be logged.

END OF SECTION