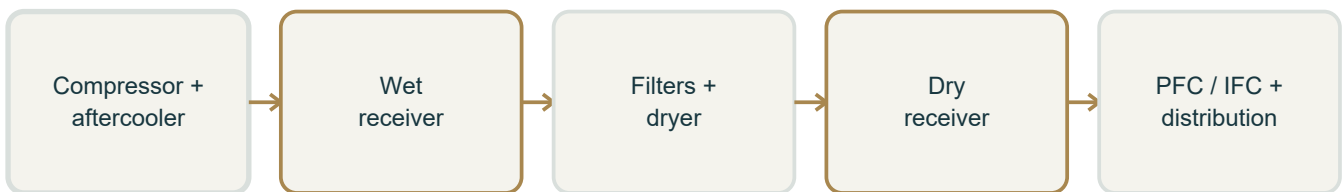


01 / COMPRESSOR-ROOM STORAGE

Wet and Dry Air Receiver Storage

How receiver location, capacity and controls influence air quality and compressor performance.

By Kiron Pande | Based on the technical note dated 9 September 2026



Typical functional arrangement. Treatment equipment, drains and controls must be selected for the actual installation.

Wet storage supports the supply side

A receiver upstream of the dryer provides buffer volume, helps damp pressure fluctuations and allows some further cooling and condensate separation. A functioning drain removes collected liquid. It works with the aftercooler, separator and filters; it does not replace the dryer.

The source note mentions up to 70% moisture removal before the dryer. The actual proportion depends on temperature, pressure, humidity and separation equipment, so it should not be treated as a fixed performance figure.

Dry storage supports short demand peaks

A receiver downstream of the dryer stores treated air. It can help meet a brief demand peak without sending the full transient flow through the dryer, provided the storage is adequately sized and can recover between events.

Where a pressure/flow controller (PFC or IFC) is used, locate useful dry storage upstream of it. The controller then releases stored air to the distribution system while maintaining the required downstream pressure.

Both locations have a role

Wet storage helps compressor control and condensate management. Dry storage provides a reserve of treated air. Select the combination as part of one system.

02 / CAPACITY CONTROL

Give the compressor time to respond

Storage is most useful when its pressure band and capacity match the compressor's control behaviour.

Fixed-speed compressors

When storage is too small, small demand changes can trigger frequent load/unload cycles. A lubricated screw compressor that reloads before completing its unloading or blowdown sequence may spend too little time at its lower unloaded power level.

Appropriate wet storage can extend the cycle and reduce unnecessary reloading. Review the manufacturer's control sequence, pressure settings and measured kW profile rather than using motor current alone as proof of energy savings.

Machine-specific figures

The original note cites about 4 bar(g) internal pressure and 35-40% of full-load power during unloaded operation. These are not universal values. Internal pressure, lubrication arrangements, blowdown time and unloaded power vary by compressor design.

Variable-speed and reciprocating compressors

Storage buffers sudden demand changes and gives a variable-speed compressor time to adjust output. Coordinate it with the minimum speed, control response and any fixed-speed base-load machines. A claim that storage directly protects inverter IGBTs from switching stress needs confirmation from the drive manufacturer.

For reciprocating compressors, a receiver also helps damp pressure pulsations. Receiver sizing and any additional pulsation treatment should reflect the machine and connected piping.

Protect the dryer during demand changes

A large release from wet storage still has to pass through the dryer. If the transient flow exceeds its corrected capacity, outlet air quality may deteriorate. Dry storage can buffer this demand, but it does not correct an undersized dryer or a sustained shortage of compressor capacity.

Compressor-room storage may not solve a distant, short-duration demand event. Consider local storage near that load and verify the recharge flow available through the distribution pipework.

03 / SIZING AND COMMISSIONING

Size for the demand and pressure band

Use rules of thumb for initial screening; calculate and verify the final arrangement.

Record compressor capacity and control type, demand peaks and their duration, allowable pressure drop, dryer/filter pressure losses and recovery time. Higher or variable treatment pressure drops can reduce the effective storage available to the controls.

Source-note screening case	US storage ratio	Equivalent metric ratio*
Lubricated fixed-speed screw; 6-minute load/unload cycle	10 US gal/scfm	0.0223 m ³ per (Sm ³ /h)
Oil-free fixed-speed screw; 6-minute load/unload cycle	5 US gal/scfm	0.0111 m ³ per (Sm ³ /h)
VSD with fixed-speed base load; ratio applied to base-load capacity in the source note	5 US gal/scfm	0.0111 m ³ per (Sm ³ /h)

*Receiver volume per unit of standard air delivery. The metric notation has been clarified from the original table. A six-minute cycle corresponds to ten cycles per hour, but the ratios alone do not guarantee that cycle time. Confirm the reference air conditions and pressure band.

Divide storage to suit the system

The note proposes roughly one-third wet and two-thirds dry storage as an initial allocation. It is a starting point, not a mandatory split. Low-loss refrigerated-dryer systems and higher-loss regenerative-dryer arrangements can require different allocations.

Commission against measured operation

Check drains, usable pressure range, load/unload timing, dryer performance during peaks and receiver recovery. Confirm vessel ratings, relief protection and inspection requirements with the responsible engineer.

Atlas Copco - Air receiver purpose and sizing factors: [Read reference online](#)

CAGI - Compressed Air System Design: [Read reference online](#)

Source: Kiron Pande, Wet and Dry Storage in Air Compressor Room, 9 September 2026. This guide retains the note's operating principles and qualifies machine-specific figures and preliminary sizing rules.