EN 529:2005 (E)

Respiratory protective devices:
Recommendations for selection, use, care and maintenance — Guidance document

Extract from pages 27, 28 & 29

A.4.5 Compressed air for breathing apparatus (EN 12021)

A.4.5.1 General

A compressor system will have produced the compressed air supplied to a breathing apparatus. The compressor system may be used for filling individual high-pressure pressure vessels or those on a mobile trolley or to supply air direct to breathing apparatus and other air-tools used in the workplace.

Contaminants can mix with the compressed air at various stages of its production and supply. Any presence of contaminants in unacceptable quantities will render the air unsuitable as “breathable air” and can threaten the health and safety of the respiratory protective device wearer. For this reason quality assured compressed air should be supplied to a breathing apparatus. EN 12021 stipulates the minimum quality standards for breathable compressed air and includes the levels for oxygen, carbon monoxide, carbon dioxide, lubricants, water, other types of contaminants and odour.

A.4.5.2 Compressor system

A.4.5.2.1 General

A competent person should be consulted when planning or installing a compressed air system for producing breathable air. This will help to minimise problems associated with compressors and the down stream effects on the quality of the air supplied. Table A.2 provides a summary of the main elements associated with a compressor system for producing breathable air. In addition to the careful planning and installation of the system it should be maintained by a competent person to ensure the safe operation of the system.

The compressor should be installed in an area providing sufficient space on all sides to ensure good ventilation. The area should be cool as possible but avoid places where freezing is possible. The air intake point should be located in open air and away from potential contaminant release points (e.g. not close to ventilation outlets or in the down stream of the outlets or near vehicle exhaust emission points).

A.4.5.2.2 Air purification elements

The air purification elements should be placed in the correct sequence to ensure the delivery of acceptable quality breathable air. These purification elements should be replaced in accordance with the advice provided by the competent person and the manufacturers of these elements.

A.4.5.2.3 Testing and inspection

The volume flow and quality of the supplied air should be thoroughly tested at intervals as specified by a competent person after risk assessment.

Transcription of extract from EN529-2005.

Table A.2 — Summary of main elements associated with a compressor system for producing breathable air

1	Atmospheric air	Typical composition of natural air is given in Table A.1 of EN 12021:1998.
2	Air intake filter	The intake should be located in fresh air, upwind and as far away as possible, both vertically and horizontally from sources of contamination. The filter is to remove coarse particles to protect the compressor.
3	Main compressor	With system controls and alarms or monitoring for pressure, temperature and oil level – with standby compressor when necessary.
4	Aftercooler	With condensate drain facility.
5	Separator	To remove large water and oil droplets – with condensate drain facility.
6	Air receiver	For pressure stabilisation and compressor load control – with condensate drain facility. Typical position in system. See also reserve air storage [13] below.
7	Coalescing filter	To remove small water droplets, oil mist and particles – with condensate drain facility. Elements become blocked and should be monitored for pressure drop.
8	Dryer stage	To remove water vapour to ensure the pressure dew point is below ambient temperature: a) Desiccant type with carbon pre-filter and outlet dust filter. Essential for sub-zero temperatures and/or –11 °C when ambient temperature is not known. Also for protection to following gas and catalyst stages. Fitted with minimum pressure valve when necessary. Self-reactivating or throw-away cartridges. Should be monitored for dryness. Carbon dioxide can also be removed by some types of desiccant dryer filled with molecular sieve. b) Refrigerant type with outlet coalescing filter/carbon filter – with condensate drain facility – for ambient temperatures above zero, heated factory spaces, and when gas filters and catalyst stages are not used.
9	Gas filter stage(s)	To remove carbon dioxide and other gaseous contaminants including odour and taste. Either throw-away elements or self-reactivating. Should be monitored for effectiveness.
10	Catalyst stage	To remove carbon monoxide and ozone. Either throw-away elements or self-reactivating. Should be monitored for effectiveness.
11	Particle filter stage	To remove dust particles generated by previous stages. Often forming an integral part of the gas filter and catalyst filter.
12	non-return valve	To prevent reserve air storage from leaking back through the compressor system.
13	Reserve air storage	To provide enough air for enough time for all users to escape to a place of safety in the event of compressor failure. This is not an EBF (Emergency Breathing Facility). No protection is provided if the hose breaks. Optional position. See air receiver [6] above.
14	Breathable air	Flow control units, monitoring facilities, couplings and distribution tubes.

NOTE 1 Components should be sized for maximum air flow for the total number of breathing apparatus connected to the system at one time.

NOTE 2 Depending on the size of the system, items 7 to 11 can be large units at source or subdivided into smaller units and wall mounted at the take off point or portable to provide personal protection at the point of use.