

## R32 Split Systems and the Pressure Equipment (Safety) Regulations SI 2015-1105 (PE(S)R)

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This guide shows that most split air conditioning / heat pump systems operating on R32 require UKCA marking in compliance with the PE(S)R. There is a short explanation at the end of this document of the PE(S)R terms used. See Cool Stuff 23 for more information about PE(S)R and the Pressure equipment Directive (PED) – it is an essential reading because it outlines what you must do to comply with this regulation.

R32 has lower flammability so is classed as a group 1 (“dangerous”) fluid. Non-flammable refrigerants such as R410A are classed as “other” for the PE(S)R. This means that, compared to a system of the same size and with the same PS running on R410A, an R32 system will have a higher hazard category.

One of the implications of this is that split systems which are PE(S)R category 1 on R410A are now likely to be PE(S)R category 2 or higher on R32. A category 1 system is likely to be exempt from the PE(S)R but a category 2 system (or above) must comply and must be assessed by an Approved Body.

### PE(S)R Hazard Classification for R32

The table below shows the pipe and vessel size within each hazard category for R410A and R32. PS (maximum allowable pressure) for split systems ranges typically from 34.5 bar g to 40 bar g so both values have been used in the table below to highlight the impact this makes on the category. For simplicity the same PS is used for both refrigerants (although in reality it is slightly higher for R32).

PED category	PS, bar g	R410A		R32	
		Pipe work “ OD	Vessel litres	Pipe work “ OD	Vessel litres
SEP	34.5	≤ 1-1/8	≤ 1.4	≤ 7/8	≤ 1
	40	≤ 1-1/8	≤ 1.2	≤ 7/8	≤ 1
Category 1	34.5	1-3/8 to 3-5/8	1.5 to 5.7	1-1/8	1.1 to 1.4
	40	1-3/8 to 3-5/8	1.3 to 5	-	1.1 to 1.2
Category 2 +	34.5	≥ 4-1/8	≥ 5.8	≥ 1-3/8	≥ 1.5
	40	≥ 4-1/8	≥ 5.1	≥ 1-1/8	≥ 1.3

The main implications of the hazard category are summarised below:

- Systems with a vessel size greater than 1.4 litre will need UKCA marking in compliance with the PE(S)R and will need Approved Body assessment and approval. Although split systems do not have a liquid receiver, the hermetic compressor is categorised as a vessel so its free volume must be considered. Most split system compressors have a free volume greater than 1.4 litre and therefore the outdoor unit is hazard category 2.
- Brazers who braze joints on piping joints in hazard category 2 or above will need a brazer qualification approved by an Approved Body or RTPO. For piping joints falling into hazard category SEP or 1 an industry recognised qualification is sufficient (BRA or equivalent).
- If piping joints fall into hazard category 2 or higher, strength pressure tests shall be carried out at 1.43 x PS.

## Explanation of Terms

### PE(S)R (hazard) category

The PE(S)R category of a complete system usually depends on:

- Receiver size or in some case the hermetic compressor free volume
- PS
- Fluid group (toxicity and / or flammability of the refrigerant)

There are five categories – SEP to cat IV. SEP and cat 1 systems are certificated by the manufacturer / installer, cat II, III and IV system must be assessed by an approved body. The requirements for compliance are similar for all categories although the involvement of the approved body increases with PE(S)R category. Note – SEP is sound engineering practice.

### PS

System design pressure, also called the maximum allowable pressure – see CS22 for an explanation of PS.

### Approved body

An approved body is a third party independent organisation that is accredited by the UK Accreditation Service, UKAS to carry out conformity assessments, in this case for the PE(S)R.

## Further Information

For more information about the PE(S)R and the PED please contact us. We provide PE(S)R and PED compliance help to contractors:

- A PE(S)R / PED Tech Guide
- Training for personnel who are involved in the compliance procedure such as project managers and on site commissioning engineers
- Templates for the design and technical file documents which are used to demonstrate compliance
- Liaison with the approved body

Email [info@coolconcerns.co.uk](mailto:info@coolconcerns.co.uk) for further information.

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