WOODWARD

Application Note 51638
(Revision -, 01/2022)

Original Instructions

ECE R110 Certification Discontinuation ITT Regulators

ECE R110 Certification Discontinuation

Introduction

ITT Regulator has notified Woodward that the product they had been selling is no longer ECE R110 compliant.

The regulators had been tested and reported by the supplier's former certification tester to a British certifying agency. Annex 5F tests were not performed, as the high pressure lock off valve had met the ECE R110 requirements as a standalone product. The initial regulator approval was an extension or revision of the approval report and was granted type approval in April 2013.

When making recent product improvement changes to the regulator, ECE R110 recertification was no longer available from the previous parties. The certification test company in Europe and the British certification agency severed ties around the time Brexit started, and the person who witnessed tests and prepared report submissions retired and was not replaced. Thus, a new full test was required to recertify. Kiwa was selected by the supplier to perform the certification. Kiwa works with the RDW in the Netherlands, so the testing and report was comprehensive, and the regulator was not "grandfathered" with incremental testing for the type approval.

Dry Heat Annex 5F Testing

Kiwa tested samples of the new improved regulators, with and without the optional integrated high pressure lock off valve and found the urethane O-ring that seals the high pressure lock off valve to the regulator did not pass Dry Heat Annex 5F testing. Since ECE R110 approval had been granted by the previous certification agencies, this was investigated. It was discovered ECE R110 type approval was originally granted in 2007 and was for a lower temperature range (85 °C rating for the stand alone high pressure lock off valve). Testing can pass at 85 °C, but not at 120 °C.

Annex 5F criteria: -30% to 10% elongation change in the non-metallic material after 168 hours at maximum service temperature (120 °C).
Actual results: 16%-18%.

There have been no field issues with the high pressure lock off valve urethane O-ring due to excessive elongation in the Woodward applications, and this is not considered to be a risk for the product. The material has been changed for the new and improved regulators and meets ECE R110 testing.

N-Pentane Annex 5D Testing

After learning that the old certification had this discrepancy, further investigation was carried out by the supplier. It was discovered that the diaphragm material of the regulator per the old test reports did not pass N-Pentane Annex 5D testing. The requirement for Annex 5D is that all non-metallic materials in contact with CNG shall not swell more than 20% from exposure to N-Pentane, nor lose more than 5% of initial mass.

Annex 5D criteria: less than or equal 20% swell, less than or equal 5% mass loss.
Actual results: 23.8% volume swell for the HNBR material and 11.6% mass loss for the NBR material. This non-conformance data had been missed during the previous certifications by the former certifying agency.

There is no exposure to N-Pentane in the Woodward applications, and this is not considered to be a risk for the product. The diaphragm material of the new and improved regulators is fluorosilicone rubber and meets all requirements of ECE R110 testing.

The existing product is not at risk in the field. However, if ECE R110 certification is needed, the customer will need to change to the ITT regulator with fluorosilicone diaphragm.

Released

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Please reference publication 51638.

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