Vapour Compression Cycle Technology for Aviation
Automated Design Methods and a New Experimental Setup

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Propositions

accompanying the dissertation

VAPOUR COMPRESSION CYCLE TECHNOLOGY FOR AVIATION
AUTOMATED DESIGN METHODS AND A NEW EXPERIMENTAL SETUP

by

Federica ASCIONE

1. In the case of energy conversion systems, and vapour compression cycle systems in particular, focusing research on heat exchangers yields more performance gains than on turbomachinery. *(This proposition pertains to this dissertation).*

2. The complexity of integrated system design optimization applied to aerospace energy systems makes it challenging to generalize the results and provide comprehensive design guidelines. *(This proposition pertains to this dissertation).*

3. Using natural refrigerants instead of synthetic refrigerants enables the design of vapour compression cycle systems with higher performance; however, their flammability poses a challenge for aircraft applications, which will limit their deployment in favour of blends. *(This proposition pertains to this dissertation).*

4. In the design of a novel setup for energy conversion, the use of a dynamic model of the facility for simulations is crucial to select appropriate hardware and implement flawless control systems. *(This proposition pertains to this dissertation).*

5. A radical change in people habits is the solution to the environmental crisis, not sustainable technologies.

6. In academia, the use of impact indexes has negative effects on the ethical behaviour of scientists: it reduces the quality of publications and creates communication barriers between research groups.

7. Quotas in the job market do not solve the problem of diversity and create in the new hire belonging to a minority group the perception of being selected for reasons other than merit.

8. The significant number of company-funded research projects is transforming engineering academic schools into low-cost consultancy companies, relegating to the background their academic mission.

9. The massive use of electronic devices and the short attention span of young generations pose a threat to democracy.

10. Modern society underestimates the cultural and spiritual importance of classical music.

These propositions are regarded as opposable and defendable, and have been approved as such by the promotor Prof. dr. ir. P. Colonna and the copromotor Dr. ir. C. M. De Servi.