

Smart Stack Tensioning for SOFC / SOEC Testing and Joining



DIRECT FORCE MEASUREMENT VIA INTEGRATED FORCE TRANSDUCER

Part of a precise, reproducible manufacturing and operating process of SOFC / SOEC stacks are a controlled adjustable, uniform tension across the whole cell area. This is necessary to join gas-tight stacks as well as to operate them with an optimal cell contact in SOFC or SOEC mode.

To exceed these requirements for the tensioning system our test rigs are additionally equipped with a specially designed force transducer type KA-DZ. Seamless integration into the existing system and a guaranteed exact measurement and control of the actual tension force are easily possible.

KEY FEATURES

- tension force up to 20 kN via pneumatical cylinder [1]
- exact vertical alignment via ball bearing levelling instrument [3]
- simplified compression rod alignment in X- and Y-direction [4]
- additional guidance of the double ball bearing compression rod [5]
- force setpoint via E/P proportional pressure regulator [6]
- actual tension force measurement via integrated force transducer [7] within the compression rod
- redundant actual pressure control via pressure sensors within the cylindrical chambers [8]
- rod position screening via stroke measurement system across the whole cylinder [9]
- stack protection in case of compressed air or power supply failure via tension force upkeep [11]
- compression rod velocity control [12]
- additional valve position control [13]
- operation, screening and control via graphical user interface (GUI)

OPTIONS

- force transducer realised as 3-axes sensor in X-, Y- and Z-direction
- inlet pressure increase up to 10 bar via booster [2]
- compression rod gravity compensation
- compression rod position control via magnetic sensors [10]

