Force measuring machine for tensile and compressive forces

Force measuring machines measure either tensile or compressive forces; they have to be modified when switching between these two operating modes. PTB’s new diversion device makes these adaption times redundant. This enables novel and faster calibrations also over the full range of tensile and of compressive forces with zero crossing. Another advantage, e.g., in the case of high-precision measurements, is that only one air-conditioned testing chamber is required which is used both for tensile and for compressive measurements. The diversion principle can be used for force measuring devices with direct deadweight effect, with lever or hydraulic transmission, with reference transducers and other principles, but also for material testing machines.

The diversion device is equipped with three crossheads which can be displaced, so that the force measuring machine can measure loads induced by tensile forces and by compressive forces within one and the same set-up. Another design also allows force diversion to be realized via a bearing. First, the compressive force is generated in the force generation clearance by means of the deadweights. Then, a tensile force is generated by diversion via an appropriate inversion principle.

Contact:
Andreas Barthel
Technology Transfer
Phone: +49 531 592-8307
Fax: +49 531 592-69-8307
E-mail: andreas.barthel@ptb.de

Dr. Rolf Kumme
Department Solid Mechanics
Phone: +49 531 592-1200
E-mail: rolf.kumme@ptb.de

Physikalisch-Technische Bundesanstalt
Bundesallee 100
38116 Braunschweig
Germany

www.technologietransfer.ptb.de

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