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► To cite this version:

The Sample Environment Group. A computer controlled pressurizing apparatus. *Revue de Physique Appliquée*, 1984, 19 (9), pp.825-825. 10.1051/rphysap:01984001909082500 . jpa-00245271

HAL Id: jpa-00245271
<https://hal.science/jpa-00245271>

Submitted on 1 Jan 1984

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A computer controlled pressurizing apparatus

The Sample Environment Group

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Résumé. — Un appareillage de compression hydraulique a été construit en collaboration avec la Compagnie Stanted Fluid Power Ltd. Il permet l'obtention de pression jusqu'à 2 kbar et est relié à un ordinateur selon la politique d'environnement des échantillons en vigueur à SNS. On décrit l'appareillage de pression ainsi que les organes de contrôle.

Abstract. — In conjunction with Stansted Fluid Power Ltd, a hydraulic pressurizing apparatus has been manufactured. The apparatus produces up to 2 kbar, and exploits the SNS philosophy of computer interfaced SE equipment. The pressure apparatus and control elements are described.

A review of the immediate requirements of pressure users in the U.K. indicated a clear need for a hydraulic pressurizing apparatus covering the range 0-2 kbar. This range encompasses many of the requirements in Biochemistry, Physical Chemistry and Polymer Physics.

From our need to provide a good user service at RAL it must also be mobile and wholly self-contained. The option of either manual or computer control of all its functions is also specified.

The pressurizing apparatus to this specification is now being constructed by Stansted Fluid Power Ltd. (U.K.). The apparatus comprises standard SFP pump and valves complemented by instrumentation by Control and Readout Ltd built as a single integrated unit. The main pump pressure will be set at 2 kbar with the option of uprating to 2.8 kbar at a later date. Instrumentation consists of a pressure set point controller, sample pressure indicator and temperature compensated strain indication at 2 points on the sample container. The latter 2 indications are continuously cross referenced to monitor pressure cell

stability. Alarm relays and valve status indicators are also included. The analogue-digital conversion of all transducer information into the BCD format is a feature of all the process controllers and indicators. This information is then directly available to the autonomous Sample Environment (SE) computer sited in each instrument cabin at up to 30 m distance. A Sample Environment information transmission bus is an important feature of all the SNS instruments.

The SE computers will be CAMAC based and have a direct link back to the Front End Mini (FEM) computer. The FEM computers have supervisory control of all other aspects of the experiment i.e. data acquisition, beam pulse monitoring etc. and are themselves also linked to the central computing network.

Initially the pressurizing apparatus will be used by Dr. G. Neilson at Bristol University to undergo proving trials and development of the necessary computer programs.