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NOTICE OF APPROVAL
AVIS D'APPROBATION

G-10-1

Ottawa, February 28, 1978

BARTON MODEL 338 RECORDING CONTROLLER
This approval supplements Notice of Approval G-10, dated May 19, 1965

Apparatus

Differential Pressure Ranges	0-20, 0-25, 0-50, 0-100, 0-150, 0-200, 0-300, 0-400 inches w.c.
Maximum Working Pressure:	
Cast Aluminum 356T6	1000 p.s.i.
Forged Steel A.1.S.1. C1018	1000 and 2500 p.s.i.
Forged Stainless Steel 316	1000 and 3000 p.s.i.
Forged Alloy Steel 4140	4500 p.s.i.
Forged Alloy Steel 4140	6000 p.s.i.
Forged Stainless Steel 329	6000 p.s.i.
Static Pressure Ranges	up to 0-6000 p.s.i.
Temperature Ranges	0-100, 0-120, 0-150 ^{o}F
Flow Controller Output Air	3-15 p.s.i., 6-30 p.s.i.

Description

The model 338 recording controller is essentially a Barton model 202A triple pen recorder, (Barton model 199 differential pressure unit, Barton or any other approved static pressure system and Barton model 265 temperature system) with the addition of a Barton pneumatic flow controller (part no. 0070.1003.T) linked to the differential pen and a differential pressure set-point indicator.

The static pressure pen is actuated by a brass, beryllium-copper or type 410 stainless steel pressure helix or any other approved static pressure device.

The model 265 temperature system consists of a sensing bulb with bendable extension neck, five feet of capillary tubing with stainless steel armour, measuring element and linkage system. The temperature system is mercury filled and includes case compensation.

In operation, a pressure change takes place in the sensing bulb when its temperature changes and is transmitted to the measuring

element thrcugh the fine capillary tube. The resulting movement of the measuring element is transferred to the pen by the linkage system. Adequate means for calibration of the temperature system are provided.

The model 199 differential pressure unit is a bellows type differential element which the manufacturer considers to be rupture proof. The unit consists essentially of a central support plate to which are attached a pair of opposed, mechanically-linked, liquid-filled metallic bellows, pressure housings surrounding the bellows, and a torque-tube drive for transmitting movement of the bellows to the indicating or recording mechanism.

The outer or closed ends of the bellows are joined by a dual valve stem which passes through a hole in the central support plate. The bellows thus form twin chambers joined by an annular passage around the valve stem. These chambers are filled and permanently sealed with clean, non-corrosive, low-freezing point liquid. Therefore, when a differential pressure is applied to the unit, the bellows assembly moves as a unit in the direction of the lower pressure.

In doing so, the bellows on the higher pressure side decreases its volume while the bellows on the opposite side expands and the liquid within the bellows assembly must pass from one bellows chamber to the other through the annular passage between the valve stem and the central plate. Movement of the bellows is transmitted to the recording mechanism by means of the torque-tube assembly.

Dampening action is effected by the flow of the liquid from one side of the central support plate to the other. The dampening is externally adjustable.

When an excessive differential pressure is applied, liquid transfer will continue until one of the valves mounted on the stem connecting the two bellows closes against its valve seat located on the central plate. With this arrangement, full line pressure may be imposed across the bellows unit in either direction without damage, regardless of the differential range of the instrument. The range of the unit may be simply changed by changing the range spring assembly on the end of the bellows valve stem.

The unit is temperature-compensated by means of an auxiliary, free-floating bellows attached to one end of the main bellows and by choosing a fill liquid with a low coefficient of thermal expansion. For extreme temperature changes, bellows with special fill liquids may be obtained.

In operation the pneumatic controller senses any deviation in differential pressure from a desired set-point and varies its output air pressure to a pneumatically activated control valve so that meter differential pressure will return to the set-point.

Any approved chart drive with 24 hour or 7 day rotational period may be used with this recorder.

This approval is limited as follows: Any change in gain direction after initial calibration and verification must be followed by re-calibration and verification of the differential pen. This approval is only valid when the integral mode of operation of this device is open.

D. L. Smith P. Eng.,
Chief, Electricity and Gas Division

Approval Granted to: ITT Barton Instruments,
Calgary, Alberta

REF: 6635-B5