



TRADE AND COMMERCE  
CANADA

STANDARDS BRANCH

OTTAWA, April 1, 1960.

TYPE APPROVAL

HONEYWELL FLOW RECORDERS WITH BELLOWS METER BODY. MODEL 292D15

The apparatus specified and illustrated herein has been duly approved by the Standards Branch under the provisions of the Gas Inspection Act, Chap. 129, R.S. 1952, and may be admitted to verification in Canada.

Apparatus Approved: Orifice Flow Recorders utilizing Bellows Meter Body, Model 292D15, manufactured by Minneapolis-Honeywell Regulator Company, Industrial Division, Philadelphia 44, Pa., and distributed in Canada by Honeywell Controls Limited, Toronto, Ontario.

Rating of Apparatus:

Differential Ranges .....	0-20, 0-25, 0-50, 0-100, 0-150, 0-200, 0-300, 0-400 inches water gauge
Working Pressure .....	Up to 2500 p.s.i.
Static Pressure Range:	
Bronze spiral element .....	0-18 to 0-400 p.s.i.
Mild steel spiral element .....	0-30 to 0-4000 p.s.i.
Stainless steel spiral element .....	0-50 to 0-4000 p.s.i.
	<u>Class III</u> <u>Class IV</u>
Temperature Range .....	-50° to +150°F.              -40° to +150°F.
Maximum Tubing Length .....	175 feet                      150 feet

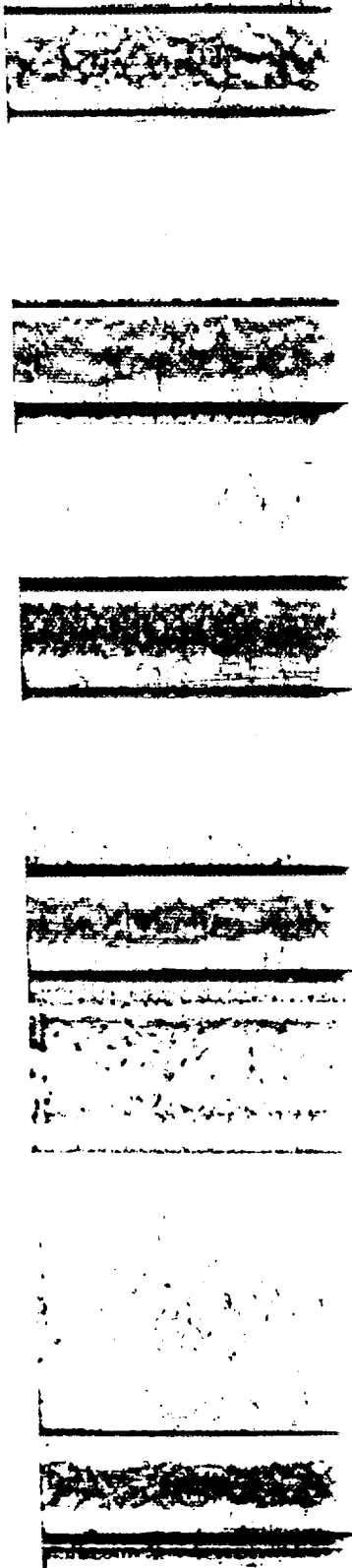
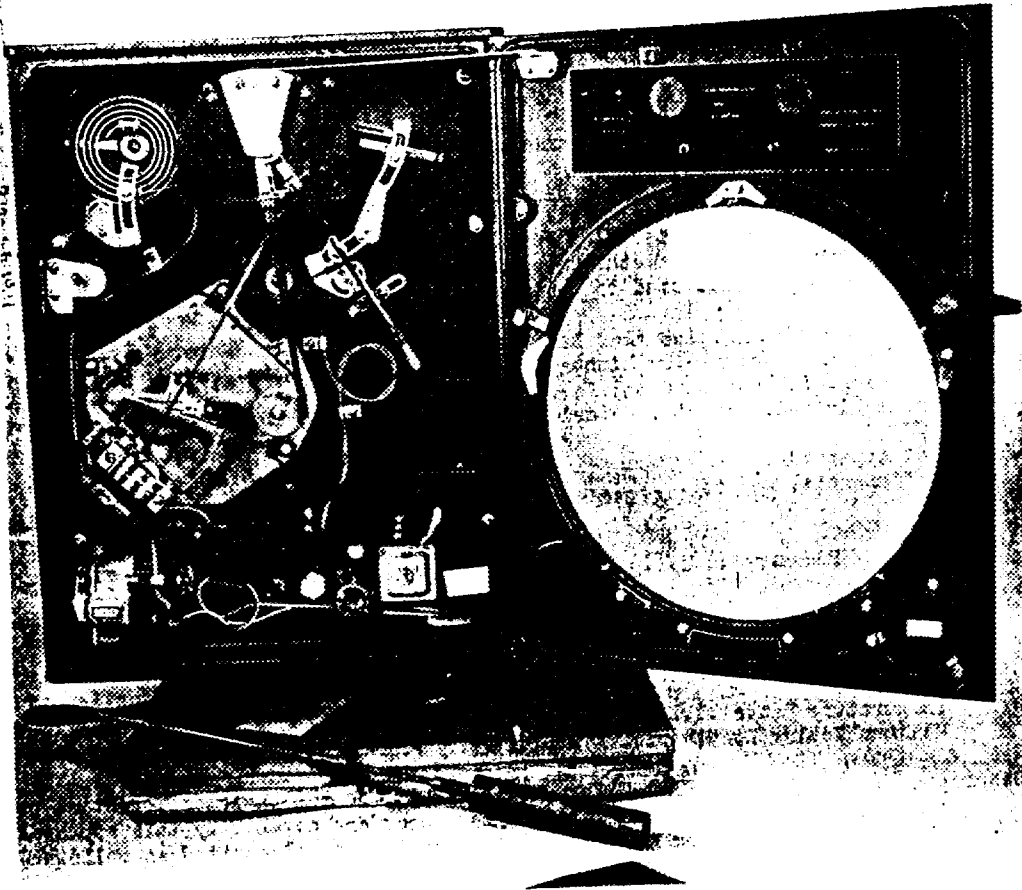
Description: The Bellows Flow Meter, Model 292D15, is the basic differential pressure unit in the several models of Flow Recorders covered by this approval. The model designations of these flow recorders are classified as follows:-

1. Single Pen Flow Recorder - Model 222X1-C2
2. Two Pen Flow Recorder with static pressure record:
  - (i) Model 222X21-C20 (Bronze element)
  - (ii) Model 222X21-C21 (Mild steel element)
  - (iii) Model 222X21-C22 (Stainless steel element)
3. Two Pen Flow Recorder with temperature record:
  - (i) Model 222X24-C23 Class III Thermal System (nitrogen-filled)
  - (ii) Model 222X24-C24 Class IV Thermal System (mercury-filled)

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(4.Three.



HONEYWELL THREE PEN RECORDER WITH INTEGRATOR





4. Three Pen Flow Recorder with pressure and temperature record:

- (i) Model 222X31-C30 Class III System (Bronze element)
- (ii) Model 222X31-C31 Class III System (Mild steel element)
- (iii) Model 222X31-C32 Class III System (Stainless steel element)
- (iv) Model 222X31-C33 Class IV System (Bronze element)
- (v) Model 222X31-C34 Class IV System (Mild steel element)
- (vi) Model 222X31-C35 Class IV System (Stainless steel element).

All the above Flow Recorders may be associated with an Electronic Integrator and in such a case the letter "X" is replaced by the letter "E" in the model designation, thus: Model 222E1-C2 for a Single Pen Recorder and Integrator.

The meter body, Model 292D15, uses seamless stainless steel bellows with provision for static pressure and ambient temperature compensation. Pulsation damping can be adjusted from outside on the back with the instrument in operation. The range of the differential pressure can be altered by changing the range-spring assembly. Pressure connections provide two sets of high and low pressure taps, one set for 1/4-inch NPT vertical connections and one set for 1/2-inch NPT horizontal connections.

The static pressure recorder is of conventional type using spiral elements.

The temperature recorder may use either Class III nitrogen-filled system or Class IV mercury-filled system. With Class III systems, case compensation for ambient temperature variations is always provided. For Class IV thermal systems, case compensation is sufficient when the bulb used has a short extension neck, and when ambient temperature along the capillary does not vary widely. Bulbs with long extension necks, or widely varying ambient temperatures along the capillary must have both case and capillary compensation. Two spirals and two capillary tubes are then used for this purpose.

The electronic integrator incorporated on some models of the flow recorders provides the totalization of the differential pressure or flow record.

The chart drive motor rotates the cam which in turn imparts a scanning motion 12 times per minute to the arm with two sensing coils located at its end. The flow pen, through a linkage system, positions the aluminum vane which has the same centre of rotation as the scanning arm. The sensing coils on the arm are part of the feed-back coupling in the oscillator circuit. When the aluminum vane is interposed between the coils, the oscillations cease, a relay closes, and the supply voltage is connected to the motor driving the integrator counter. When the sensing coils move away from the vane, the oscillations begin again, the relay opens cutting off supply to the counter motor, and counting ceases. The duration of the drive of the integrator counter depends therefore on the position of the aluminum vane or the flow pen, thus effecting the integration.

The integrator counter is supplied with a number of change gears enabling direct reading of the counter in units of flow per second, minute,

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(hour



hour or day. The gear assemblies are marked S, M, H and D correspondingly.  
ONLY THOSE MARKED H, corresponding to hourly rate of flow, are covered by  
this approval.

Application: Measurement in distribution service of heating gases.

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