CANADA

DEPARTMENT OF TRADE AND COMMERCE

STANDARDS BRANCH

G-21

OTTAWA March 22, 1966.

NOTICE OF APPROVAL

FOR

DANIEL SERIES 1200 FLOW MEASURING SYSTEMS

Apparatus

Differential Pressure Transducers

1) Minneapolis - Honeywell Series 30300
Ranges ..... 0-20, 0-50, 0-100, 0-150, 0-200, 0-300, 0-400 inches W.G.
Working pressure ..... up to 2500 P.S.I.
Meter body material ..... carbon or stainless steel
Bellows material ..... type 316 stainless steel
Transmitter housing ..... weather-proof or explosion-proof aluminum cases.
Maximum transducer to computer distance..... 1 mile
Transmitter external load resistance ..... up to 800 ohms

Static Pressure Transducers

1) Daniel Model 1206
Ranges ..... 0-60 through 0-1500 P.S.I.G.
Bourdon tube material ..... phosphor bronze or stainless steel
Maximum transducer to computer distance ..... 1500 feet

NOTE:- To be used with cascaded transducer system only (groups 1210 and 1250 computers). It is not recommended for pulsating service or where severe vibration is present.

2) Minneapolis - Honeywell Series 30200

Ranges ..... 0-15 through 0-5000 P.S.I.G.
Bourdon tube material ..... stainless steel
Transmitter housing ..... weather-proof or explosion-proof
Maximum transducer to computer distance ..... 1 mile
Transmitter external load resistance ..... up to 800 ohms

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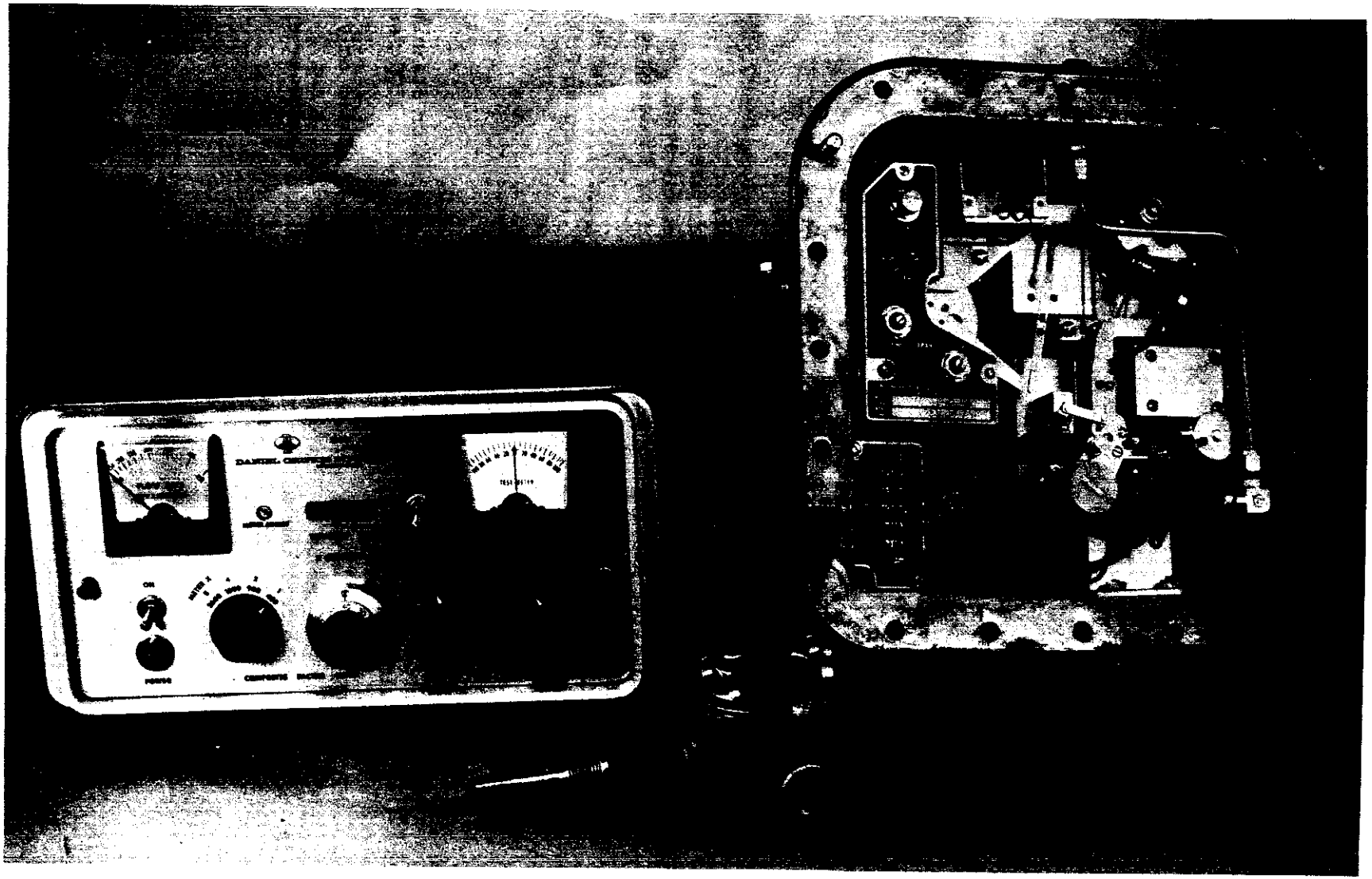
DANIEL SERIES 1200 FLOW MEASURING SYSTEMS



Temperature Transducers

1) Daniel Model 1205
Range ..... -40 to +150°F
Thermowell ..... cadmium-plated carbon steel or stainless steel
Transmitter housing ..... explosion-proof
Maximum transducer to computer distance ..... 1 mile

A. TOTALIZER TYPE COMPUTERS

1. CASCADED TRANSDUCER INPUT (Single Tube)

Model 1211 - Single range
Model 1212 - Dual range
Model 1213 - Triple range
Model 1214 - Quadruple range

2. SEPARATE TRANSDUCER INPUTS

Model 1221 - Single tube
Model 1222 - Dual tube
Model 1223 - Triple tube
Model 1224 - Quadruple tube

B. RATE TYPE COMPUTERS

1. CASCADED TRANSDUCER INPUT (Single Tube)

Model 1251 - Single range
Model 1252 - Dual range
Model 1253 - Triple range
Model 1254 - Quadruple range

2. SEPARATE TRANSDUCER INPUTS

Model 1261 - Single tube
Model 1262 - Dual tube
Model 1263 - Triple tube
Model 1264 - Quadruple tube

Description

Each of the flow systems consists of the following components:

1. Electronic computer
2. Differential pressure transducer
3. Static pressure transducer
4. Temperature transducer

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The differential pressure transducer is a bellows actuated device which converts a differential pressure input signal into a 4 to 20 milliampere d-c electrical output signal proportional to the square root of the differential pressure.

The static pressure transducer is a potentiometer, the movable arm being connected to a Bourdon tube so that changes in pressure cause changes in the position of the arm. The output signal, 4-20ma d-c, is proportional to the square root of the absolute pressure since the average atmospheric pressure for a given locality is designed into the transducer.

The flowing temperature transducer is a resistance thermometer in an explosion-proof housing which is inserted into the flowing medium. Temperature changes produce changes in the resistance of the element resulting in an output signal, inversely proportional to the square root of the absolute temperature, being transmitted to the computer.

The computer is designed to receive the outputs from the three transducers and combine them electronically to solve the flow equation:

$$Q_h = C'' \times F_{tf} \times \sqrt{h_w P_f}$$ where

Q_h = flow rate in C.F.H at base conditions

h_w = differential pressure in inches of water

P_f = absolute pressure of the flowing gas

F_{tf} = flowing temperature factor introduced into the computer by means of the temperature transducer

C'' = orifice flow constant and is equal to C', as calculated in A.G.A. report #3, divided by F_{tf} $(C'' = C'/F_{tf})$

This constant, C", is programmed into the computer by means of various dials and switches located on the face of the computer.

Two types of computers are approved:

1) The TOTALIZER TYPE which makes a direct computation of totalized flow and provides rate of flow information as a by-product of the computation.

2) The RATE TYPE computer, which apart from giving totalized flow, gives a much more accurate indication of instantaneous flow rate.

Each of the transducers is marked with the following information: maker's name, model designation, range and system serial number. The static pressure transducer also includes the atmospheric pressure designed into it. The computer proper is marked with all data pertaining to the complete measuring system, which includes differential pressure, static pressure and temperature transducer data, base conditions and design atmospheric pressure.

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For detailed information concerning the use of various types of computers, method of programming, field testing, etc. refer to technical bulletin 5, section I.

Approval granted to: Daniel Orifice Fitting Company,
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Houston 24, Texas.

2) Barber Engineering and Supply Company Ltd.,
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and

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South Edmonton, Alberta.

3) Process Instrument Systems, Ltd.,
111 Vulcan Street,
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Toronto, Ontario.

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