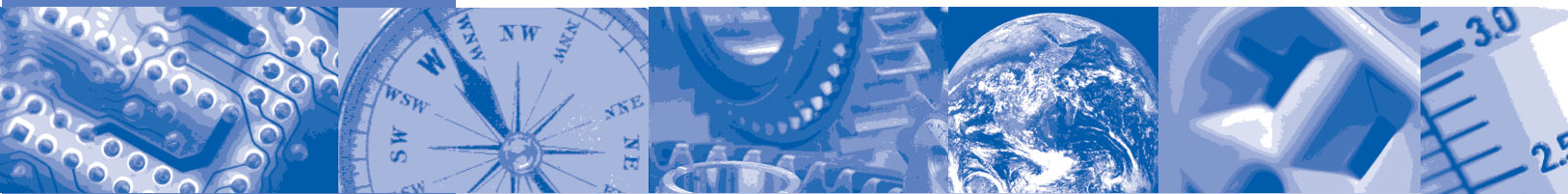


# **ISA–20–1981**

Formerly ISA–S20–1981



## **Specification Forms for Process Measurement and Control Instruments, Primary Elements, and Control Valves**



**ISA–The Instrumentation,  
Systems, and  
Automation Society**

**Approved 30 October 1981**

This is a preview. [Click here to purchase the full publication.](#)

ISA-20-1981, Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves

ISBN 0-87664-347-0

Copyright © 1981 by the Instrument Society of America. All rights reserved. Printed in the United States of America. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), without the prior written permission of the publisher.

ISA  
67 Alexander Drive  
P.O. Box 12277  
Research Triangle Park, North Carolina 27709

---

## Preface

---

This Preface is included for information purposes and is not part of ISA-20-1981.

This Standard has been prepared as a part of the service of the ISA toward a goal of uniformity in the field of instrumentation. To be of real value this report should not be static, but should be subjected to periodic review. Toward this end the Society welcomes all comments and criticisms, and asks that they be addressed to the Standards and Practices Board Secretary, ISA, 67 Alexander Drive, P.O. Box 12277, Research Triangle Park, North Carolina 27709, Telephone (919) 549-8411, Fax (919) 549-8288, e-mail: standards@isa.org.

This document was prepared by the Subcommittee on Instrument Specification Forms (RP20.1) and was originally published in 1956 under the direction of G. G. Gallagher of the Fluor Corporation. In 1961 additional forms were published, prepared by Committee 8D-RP20 under the direction of W. Carmack of the Fluor Corporation. This revision was prepared, with the supervision of the Chairman, R. E. Frey of Rohm and Haas Company, by the committee as listed below.

### SP20 COMMITTEE

NAME	COMPANY
R. E. Frey (deceased)	Rohm and Haas Company
W. S. Buzzard	Fisher and Porter Company
J. G. Converse	Sun Oil Company
G. F. Erk	Sun Oil Company
J. Imber	Atlantic Richfield Company
R. D. Irwin	Honeywell, Inc.
E. F. Kremer	E. I. duPont deNemours & Co., Inc.
R. Leese	Catalytic Inc.
R. D. Prescott	Moore Products Company
A. Rosenthol	Catalytic Incorporated
F. J. Ryan, Jr.	Clifford B. Ives & Co., Inc.
W. C. Thomas	Clifford B. Ives & Co., Inc.

The assistance of those who aided in the preparation of this Standard, by their review of the draft and by offering suggestions toward its improvement, is gratefully acknowledged. The following have reviewed the report and served as Board of Review:

NAME	COMPANY
C. B. Anderson	Armstrong Cork Company
W. A. Bajek	UOP Process Division
A. S. Bartholomew	Reliance Electric Company
C. S. Beard	Bechtel Corporation
J. V. Becker	National Load
O. K. Booth	North American Rockwell
L. R. Brewer	Koppers Company, Inc.

A. M. Calabrese  
F. I. Callisen  
C. P. Clark  
G. T. Clawson  
R. Coel  
L. Costea  
W. G. Cozart  
E. Csaky  
J. W. Eby  
M. W. Fifer  
W. Forsyth  
G. G. Gallagher  
W. J. Greter  
H. P. Haas  
L. A. Haines  
M. G. Haines  
W. Y. Harkins  
E. J. Hayter  
J. E. Holland  
E. A. Houser  
P. Kindersley  
L. Kipnis  
C. D. Kolbe  
W. B. Kostiw  
E. R. Langston  
P. E. Larsen  
B. G. Liptak  
R. Loewe  
F. Maltby  
C. A. Master  
A. F. Marks  
M. W. Marxen  
C. McCrain  
R. T. Miller  
H. E. Nurmi  
P. L. Pettersen  
E. Podolak  
C. Pray  
H. D. Preszler  
C. A. Prior  
G. R. Rauschenberg  
J. Rellford  
W. A. Richards  
E. J. Rogers  
D. E. Sanchez

M. W. Kellogg Company  
C. F. Braun & Company  
United Technology Center  
Goddard Space Flight Center  
The Fluor Corporation  
Hunt-Wesson Foods  
Dow Chemical Company  
Dow Chemical Company  
Honeywell, Inc.  
Proctor & Gamble  
Honeywell, Inc.  
The Fluor Corporation  
Union Carbide Corporation  
Philco-Ford  
Valter, Inc.  
Allied Chemical Corporation  
Tennessee Eastman Company  
Allied Chemical Corporation  
E. I. duPont deNemours & Company  
Beckman Instruments  
Kamyr Inc.  
Instrumentation Consultant  
NASA  
Stone & Webster Engineering Corporation  
Stearns-Roger Corporation  
Dow Chemical Company  
Crawford & Russell, Inc.  
Sargent & Lundy  
Drexelbrook Engineering Company  
Philco-Ford  
Bechtel Corporation  
Dow Badische Company  
Monsanto Company  
Brown & Root, Inc.  
The Detroit Edison Company  
Lockheed Missile & Space Company  
Federal Aviation Administration  
Brown & Root, Inc.  
Johnson Service Company  
E. I. duPont deNemours & Company  
IBM Corporation  
Honeywell, Inc.  
General Electric  
Bourns Life Systems  
Jensen Instrument Company

R. H. Schipper  
K. D. Smith  
E. F. Spalidoro  
W. Speight  
J. L. Thoma  
D. J. Untener  
W. C. Voyles  
J. Walsh, Jr.  
N. S. Waner  
J. P. Wolfinger  
N. R. Zeller  
R. Zielski

Jordan Valve  
General Electric Company  
Barton Sales  
Honeywell Controls, Ltd.  
Wyandotte Chemicals Corporation  
Standard Oil Company  
Cummins Engine Company, Inc.  
Eastman Kodak Company  
Hallikainen Instruments  
Alpha Portland Cement Company  
Tucson Gas & Electric Company  
Georgia-Pacific Corporation

This Standard was approved for publication by the Standards and Practices Board on July 15, 1975.

## **NAME**

W. B. Miller, Vice President  
R. G. Hand, Secretary  
P. Bliss  
L. N. Combs  
B. A. Christensen  
R. L. Galley  
T. J. Harrison  
T. S. Imsland  
P. S. Lederer  
E. C. Magison  
J. R. Mahoney  
R. L. Martin  
R. G. Marvin  
A. P. McCauley  
T. A. Murphy  
R. L. Nickens  
G. Platt  
A. T. Upfold  
K. A. Whitman

## **COMPANY**

Moore Products Company  
ISA  
Pratt Whitney Aircraft Company  
retired from E. I. duPont deNemours & Company  
Continental Oil Company  
Bechtel Corporation  
IBM Corporation  
Fisher Controls Company  
National Bureau of Standards  
Honeywell, Inc.  
IBM Corporation  
Tex-A-Mation Engineering, Inc.  
Dow Chemical Company  
Glidden Durkee Div. SCM Corporation  
The Fluor Corporation, Ltd.  
Reynold Metals Company  
Bechtel Corporation  
Polysar Ltd.  
Allied Chemical Corporation



---

## Contents

---

<b>1 Purpose</b>	<b>9</b>
<b>2 Scope</b>	<b>9</b>
<b>3 Receiver instruments</b>	<b>12</b>
<b>4 Annunciators</b>	<b>16</b>
<b>5 Potentiometer instruments specification sheet instructions</b>	<b>23</b>
<b>6 Temperature instruments (filled systems)</b>	<b>27</b>
<b>7 Thermocouples and thermowells</b>	<b>31</b>
<b>8 Resistance temperature sensors</b>	<b>34</b>
<b>9 Bi-metal thermometers</b>	<b>37</b>
<b>10 Differential pressure instruments</b>	<b>40</b>
<b>11 Orifice plates and flanges</b>	<b>43</b>
<b>12 Rotameters</b>	<b>46</b>
<b>13 Magnetic flowmeters</b>	<b>49</b>
<b>14 Turbine flowmeters</b>	<b>52</b>
<b>15 Positive displacement meters</b>	<b>55</b>
<b>16 Level instruments (displacer or float)</b>	<b>58</b>
<b>17 Level instruments, capacitance type</b>	<b>61</b>
<b>18 Gage glasses and cocks</b>	<b>64</b>
<b>19 Traps and drainers</b>	<b>66</b>
<b>20 Pressure instruments</b>	<b>70</b>
<b>21 Pressure gages</b>	<b>74</b>
<b>22 Pressure switches</b>	<b>77</b>
<b>23 Instructions for control valve data sheet — ISA Form S20.50, Rev. 1</b>	<b>79</b>
<b>24 Pressure control valves — pilots &amp; regulators</b>	<b>84</b>
<b>25 Self-actuated temperature regulators</b>	<b>87</b>
<b>26 Pressure relief valves</b>	<b>91</b>
<b>27 Rupture discs</b>	<b>94</b>
<b>28 Solenoid valves</b>	<b>96</b>





---

# 1 Purpose

---

**1.1** The purpose of this standard is to promote uniformity in instrument specifications, both in content and form. Because of the complexity of present day instruments and controls it is desirable to have some type of specification form to list pertinent details for use by all interested parties. General use of these forms by users and manufacturers offers many advantages, as listed below:

- 1) Assists in preparation of complete specification by listing and providing space for all principal descriptive options.
- 2) Promotes uniform terminology\*.
- 3) Facilitates quoting, purchasing, receiving, accounting and ordering procedures by uniform display of information.
- 4) Provides a useful permanent record and means for checking the installation.
- 5) Improves efficiency from the initial concept to the final installation.

---

# 2 Scope

---

**2.1** These forms are intended to assist the specification writer to present the basic information. In this sense they are "short-form" specifications or "check sheets" and may not include all necessary engineering data or definitions of application requirements. While the types of instruments described by these forms are more common to the process industries the forms should also prove useful in other areas if special requirements are defined elsewhere.

**2.2** Some forms consist of a primary sheet and a secondary (tabulation) sheet. The primary sheet may be used by itself to specify a single instrument or to specify general requirements for a series of similar instruments which are then tabulated on the secondary sheet.

**2.3** The heading used on all forms is designed to permit the user to add company name, plant location, trade mark, or specific project data.

**2.4** The specification forms included in this standard are intended to cover the most commonly used instruments. The list is not a complete catalog of instruments and control valves available. It is intended that new forms shall be added with each general revision of this standard.

**2.5** An instruction sheet is provided for each form to explain the terms used and the intended procedure. The instructions are keyed to the form by reference to the line numbers. The Committee has minimized dependence on the instruction sheet since the forms are frequently reprinted and used without the instructions. The explanation is omitted where the meaning is felt to be obvious.

**2.6** Instrument specifications may be prepared by the use of Automatic Data Processing (ADP) techniques. The format of such specifications may be modified in order to be compatible with ADP machine capabilities. However, general consistency with this Standard shall be retained.

---

\*Where applicable, the terminology used is in accordance with American National Standards C85.1-1963, "Terminology for Automatic Control," sponsored by the American Society of Mechanical Engineers.

	RECEIVER INSTRUMENTS				SHEET _____ OF _____	
					SPEC. NO.	REV.
	NO	BY	DATE	REVISION		
					CONTRACT	DATE
					REQ. P.O.	
					BY	CHK'D
						APPR.

1	Tag No.	Service
2	Function	Record <input type="checkbox"/> Indicate <input type="checkbox"/> Control <input type="checkbox"/> Blind <input type="checkbox"/> Integ <input type="checkbox"/> Deviation <input type="checkbox"/> Other _____
3	Case	MFR STD <input type="checkbox"/> Nom Size _____ Color: MFR STD <input type="checkbox"/> Other _____
4	Mounting	Flush <input type="checkbox"/> Surface <input type="checkbox"/> Rack <input type="checkbox"/> Multi-Case <input type="checkbox"/> Other _____ For Multiple Case, See Spec. Sheet _____
5	Enclosure Class	General Purpose <input type="checkbox"/> Weather Proof <input type="checkbox"/> Explosion-Proof <input type="checkbox"/> Class _____ For Use in Intrinsically Safe System. <input type="checkbox"/> Other _____
6	Power Supply	117 V 60Hz <input type="checkbox"/> Other ac _____ dc <input type="checkbox"/> _____ Volts
7	Chart	Strip <input type="checkbox"/> Roll <input type="checkbox"/> Fold <input type="checkbox"/> Circular _____ Time Marks _____ Range _____ Number _____
8	Chart Drive	Speed _____ Power _____
9	Scales	Type _____
		Range 1 _____ 2 _____ 3 _____ 4 _____
10	Control Modes	P = Prop (Gain), I = Integral (Auto Reset), D = Derivative (Rate), Sub: s = Slow, f = Fast P <input type="checkbox"/> PI <input type="checkbox"/> PD <input type="checkbox"/> PID <input type="checkbox"/> If <input type="checkbox"/> Df <input type="checkbox"/> Is <input type="checkbox"/> Ds <input type="checkbox"/> Other _____
11	Action	On Meas. Increase Output: Increases <input type="checkbox"/> Decreases <input type="checkbox"/>
12	Auto-Man Switch	None <input type="checkbox"/> MFR STD <input type="checkbox"/> Other _____
13	Set Point Adj.	Manual <input type="checkbox"/> External <input type="checkbox"/> Remote <input type="checkbox"/> Other _____
14	Manual Reg	None <input type="checkbox"/> MFR STD <input type="checkbox"/> Other _____
15	Output	4-20 mA <input type="checkbox"/> 10-50 mA <input type="checkbox"/> 21-103 kPa (3-15 psig) <input type="checkbox"/> Other _____ For Transmitters. See Spec Sheet.
16	Input Signals	4-20 mA <input type="checkbox"/> 10-50 mA <input type="checkbox"/> 21-103 kPa (3-15 psig) <input type="checkbox"/> Other _____
17	No. of Inputs	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/>
18	Power for XMTRS	External <input type="checkbox"/> This Inst <input type="checkbox"/> No. of Independent Supplies _____ For Transmitters. See Spec Sheet.
19	Alarm Switches	Quantity _____ Form _____ Rating _____
20	Function	Meas. Var. <input type="checkbox"/> Deviation <input type="checkbox"/> Contacts To _____ On Meas _____ Other _____
21	Options	Filter-Reg <input type="checkbox"/> Supply Gage <input type="checkbox"/> Charts <input type="checkbox"/> Int. Illumination <input type="checkbox"/> Other _____
22	MFR & Model No.	_____
Notes:		

ISA Form S20.1a

[illegible]