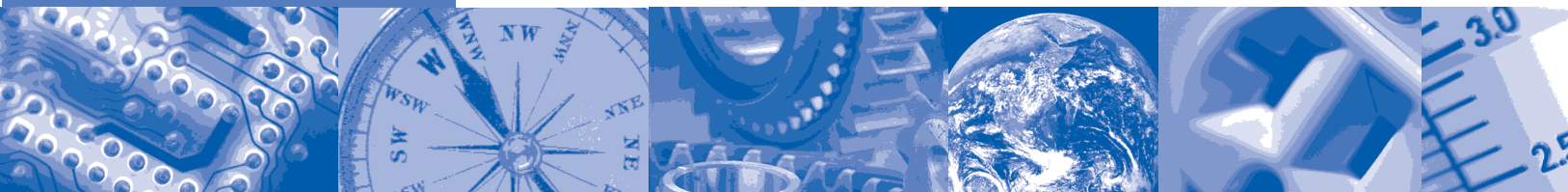


ISA-20-1981

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



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

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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.

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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 ☐ Indicate ☐ Control ☐ Blind ☐ Integ ☐ Deviation ☐ Other _____
3	Case	MFR STD ☐ Nom Size _____ Color: MFR STD ☐ Other _____
4	Mounting	Flush ☐ Surface ☐ Rack ☐ Multi-Case ☐ Other _____ For Multiple Case, See Spec. Sheet _____
5	Enclosure Class	General Purpose ☐ Weather Proof ☐ Explosion-Proof ☐ Class _____ For Use in Intrinsically Safe System. ☐ Other _____
6	Power Supply	117 V 60Hz ☐ Other ac _____ dc ☐ _____ Volts
7	Chart	Strip ☐ Roll ☐ Fold ☐ 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 ☐ PI ☐ PD ☐ PID ☐ If ☐ Df ☐ Is ☐ Ds ☐ Other _____
11	Action	On Meas. Increase Output: Increases ☐ Decreases ☐
12	Auto-Man Switch	None ☐ MFR STD ☐ Other _____
13	Set Point Adj.	Manual ☐ External ☐ Remote ☐ Other _____
14	Manual Reg	None ☐ MFR STD ☐ Other _____
15	Output	4-20 mA ☐ 10-50 mA ☐ 21-103 kPa (3-15 psig) ☐ Other _____ For Transmitters. See Spec Sheet.
16	Input Signals	4-20 mA ☐ 10-50 mA ☐ 21-103 kPa (3-15 psig) ☐ Other _____
17	No. of Inputs	1 ☐ 2 ☐ 3 ☐ 4 ☐
18	Power for XMTRS	External ☐ This Inst ☐ No. of Independent Supplies _____ For Transmitters. See Spec Sheet.
19	Alarm Switches	Quantity _____ Form _____ Rating _____
20	Function	Meas. Var. ☐ Deviation ☐ Contacts To _____ On Meas _____ Other _____
21	Options	Filter-Reg ☐ Supply Gage ☐ Charts ☐ Int. Illumination ☐ Other _____
22	MFR & Model No.	_____
Notes:		

ISA Form S20.1a

3 Receiver instruments

3.1 Instructions for ISA Forms S20.1a and 20.1b.

- 1) To be used for a single item. Use secondary sheet for multiple listing.
- 2) Check as many as apply.
- 3) Nominal size refers to approximate front of case dimensions; width x height.
- 4) It is assumed that the instrument has its own case or shelf suitable for single mounting, unless "MULTICASE" is checked. Shelf or separable case for multiple case mounting instrument is not included unless listed and described as an accessory.
- 5) Enclosure class refers to composite instrument. If electrical contacts are the case they must meet this classification inherently or by reason of the enclosure. Use NEMA identification system or ISA system RP8.1.
- 6) Specify electrical power to the entire instrument from an external source.
- 7) For multiple instruments list ranges on secondary sheet, but specify other chart options on primary sheet. Chart graduations assumed to be uniform unless otherwise noted. Circular charts assumed to have 24 hr/revolution speed; strip charts 3/4 in. to 1 in. per hour.
- 8) Chart drive mechanism assumed to be synchronous motor operating on 117V 60 Hz and suitable for ENCLOSURE CLASS specified on line 5. If the chart drive is pneumatic so state — identify pneumatic pulser under options. Note deviations from standard (MFR) under notes, i.e., dual speed or special speeds.
- 9) The scale type may be SEGMENTAL, VERTICAL, HORIZONTAL, DIAL (CIRCULAR) or other. Ranges 1, 2, 3 and 4 are used for multiple inputs. The first listed (No. 1) is assumed to be the controller input, if a controller is used.
- 10) See explanation of terminology given on specification sheet. For further definition refer to American National Standard C85.1-1963, "Terminology for Automatic Control." Specific ranges of control modes can be listed after "OTHER," if required.
- 11) For multiple items specify on second sheet.
- 12) If standard auto-manual switching is not known or not adequate, specify particular requirements, such as BUMPLESS, PROCEDURELESS, 4-POSITION, or as required.
- 13) Remote set point adjustment assumes full adjustment range. Specify limits if required. Under other can be noted bias or ratio.
- 14) Specify if applicable.
- 15) Specify if applicable.
- 16) All input signals on multi-channel instruments assumed to be the same range unless otherwise noted.
- 17) Specify number of inputs.
- 18) Check if power source for the loop is contained in this instrument or in some external instrument.

- 19) Form may be SPST, SPDT, DPDT or other. Rating refers to electrical rating of switch or contacts in amps.
- 20) Specify if alarm is actuated by measured variable or by deviation from controller set point. Give contact action if single throw form.
- 21) Specify required accessories and options, fill in number of charts. This is assured to be number of chart rolls for strip charts.
- 22) After selection is made fill in manufacturer and specific model number.

SECONDARY SHEET — for listing multiple instruments. List all instruments of the same type specified on the primary sheet, with variations as shown. "Notes" refers to notes listed by number at the bottom of the sheet. Line 11 of sheet 1a is tabulated under measurement increases, output tabulate increase or decrease.

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

GENERAL	1 Tag No. _____ Location: _____ 2 Cabinet Size: _____ Rows High By _____ Columns Wide _____ 3 Mounting: _____ Flush Panel ☐ Surface ☐ 4 Cabinet Style: Plug-In Light Boxes ☐ Swing Door ☐ Remote Logic Cabinet ☐ Watertight Door ☐ 5 Rating: General Purpose ☐ Weather proof ☐ Explosion proof ☐ Class _____ Group _____ Division _____ 6 Power Supply: 117V 60Hz ☐ 125 Vdc ☐ 12 Vdc ☐ 24 Vdc ☐ Other: _____																											
DISPLAY	7 Backlight Nameplates: White Translucent ☐ Other: _____ Size: _____ 8 Alarm Points Per Lightbox: One ☐ Two ☐ Three ☐ Four ☐ Lamps Per Alarm: One ☐ Two ☐ Three ☐ Four ☐ 9 Bullseye Type: Number of Lights: _____ Color: _____ 10 Other Display: _____																											
LOGIC	11 Logic: Electro-Mechanical Relay ☐ Solid-State Electronic ☐ Mercury Bottle ☐ Fluidic ☐ 12 In Display Cabinet ☐ Remote Cabinet ☐ Strip Chassis ☐ 13 General Purpose ☐ Weather proof ☐ Explosion proof ☐ Class _____ Group _____ Division _____ Intrinsically Safe ☐ 14 Field Contact Voltage: 117 Vac ☐ 12 Vdc ☐ 125 Vdc ☐ Other: _____ 15 On Alarm, Actuating Contacts: Open Close Field Selectable Form _____																											
FEATURES	16 Required Features: Lock-In of Momentary Alarms ☐ Auxiliary Contacts ☐ Sequential Alarm Circuit ☐ 17 Ring-Back Circuit: Via Alarm Audible Signal ☐ Via Other Audible Signal ☐ 18 Fail-Safe Circuit to Signal Own Failure ☐ Operational Test ☐ Lamp Test ☐ 19 Flasher: Remote ☐ In Cabinet ☐ Model No.: _____ 20 Acknowledge Common ☐ Unit ☐ Light ☐ Audible ☐ PB Location in Cabinet ☐ Remote ☐ Others ☐ 21 Reset Common ☐ Unit ☐ Light ☐ Audible ☐ PB Location in Cabinet ☐ Remote ☐ Others ☐																											
SEQUENCE	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">STAGE</th> <th style="width: 35%;">VISUAL SIGNAL</th> <th style="width: 50%;">AUDIBLE SIGNAL</th> </tr> </thead> <tbody> <tr><td>Normal</td><td></td><td></td></tr> <tr><td>Alert, Initial</td><td></td><td></td></tr> <tr><td>Alert, Subsequent</td><td></td><td></td></tr> <tr><td>Acknowledge, Int.</td><td></td><td></td></tr> <tr><td>Acknowledge, Subs.</td><td></td><td></td></tr> <tr><td>Return to Normal</td><td></td><td></td></tr> <tr><td>Reset</td><td></td><td></td></tr> <tr><td>Test</td><td></td><td></td></tr> </tbody> </table> ISA Sequence Number: _____	STAGE	VISUAL SIGNAL	AUDIBLE SIGNAL	Normal			Alert, Initial			Alert, Subsequent			Acknowledge, Int.			Acknowledge, Subs.			Return to Normal			Reset			Test		
STAGE	VISUAL SIGNAL	AUDIBLE SIGNAL																										
Normal																												
Alert, Initial																												
Alert, Subsequent																												
Acknowledge, Int.																												
Acknowledge, Subs.																												
Return to Normal																												
Reset																												
Test																												
OPTIONS	23 Horn: _____ 24 Bell: _____ 25 Dimmer: _____ 26 Color Caps: _____ 27 Power Supply Location _____ 28 _____ 29 Manufacturer: _____ Model No. _____																											
Notes:																												

ISA Form S20.2a

4 Annunciators

Instructions for ISA Forms S20.2a and 20.2b

- 1) Write in Tag Number of entire Annunciator system.
- 2) Omit if single unit.
- 3) Specify cabinet mounting.
- 4) Specify type of cabinet.
- 5) Refers only to display and audible.
- 6) Specify power supply required.
- 7) Check WHITE TRANSLUCENT, or write in color of plate and engraving required. Specify window size in height x width.
- 8) Number of independent displays in one box, or position in cabinet.
- 9) If individual bullseyes, specify number and color required. If self-contained unit, specify number of normal and off-normal lights and color of each. (Example — two red independent off-normal and one green common normal light.)
- 10) Describe display if other than blacklighted nameplate or bullseye. For example; Blacklighted prism, Electroluminescent, Two-color pneumatically operated.
- 11) Specify type of logic unit which operates display and audible system.
- 12) Check required location of logic components.
- 13) Check Enclosure Class of logic components and or enclosure. General purpose relays inside an explosion proof housing, or explosion proof relays will both satisfy the hazardous area classification. Use NEMA identification system or ISA system RP8.1.
- 14) Specify voltage across contacts which actuate alarm.
- 15) Give contact action.
- 16) Sequential Alarm refers to "First Out" system.
- 17) Specify type of ring back, if applicable.
- 18) An operational test actuates audible as well as lamps.
- 19) Specify flasher location and model number.
- 20) Specify type of Acknowledgment, and Pushbutton locations.
- 21) Specify reset and pushbutton location.
- 22) Write in ISA Sequence number as described in RP18.1, Specifications and Guides for the Use of General Purpose Annunciators, or fill in the table for the sequence required.
- 23) Write in the model number, or describe type, if required.
- 24) Write in the model number, or describe type, if required.

- 25) Write in the model number, or describe type, if required.
- 26) Specify number required, and color.
- 27) Specify power supply location, i.e., in logic cabinet, or separate cabinet.
- 28) For any additional accessories required.
- 29) Fill in after selection is made.

ISA Form S20.3a

					SHEET _____ OF _____	
					SPEC. NO.	REV.
	NO	BY	DATE	REVISION	CONTRACT	DATE
					REQ. - P.O.	
					BY	CHK'D
						APPR.
ISA Form S20.3c						

	POTENTIOMETER INSTRUMENTS				SHEET _____ OF _____	
					SPEC. NO.	REV.
	NO	BY	DATE	REVISION		
				CONTRACT		DATE
				REQ. - P.O.		
				BY	CHK'D	APPR.
1	Tag No.	Service				
GENERAL	2	Function	Record ☐ Indicate ☐ Control ☐ Blind ☐ Transmit ☐ Other _____			
	3	Type	Auto Bal. ☐ Man Bal. ☐ Galv ☐ Other _____			
	4	Case	MFR STD ☐ Nom Size _____ Color: MFR STD ☐ Other _____			
	5	Mounting	Flush ☐ Surface ☐ Rack ☐ Multi-Case ☐ Other _____ For Multiple Case Spec, See Sheet _____			
	6	Enclosure Class	Gen Purp ☐ Weather Proof ☐ Explosion-Proof ☐ Class _____ Other _____			
	7	Power Supply	117V 60 Hz ☐ Other _____			
	8	Chart	_____ Strip ☐ _____ Circ ☐ Time Marks ☐ Range _____ No _____ Chart Speed: _____ Change Gears _____			
	9	Scale	Type _____ Range 1 _____ 2 _____			
	10	Printout	No. of Points _____ Sec Per Point _____ Full Travel Speed _____ Print Character and Color _____ Point Select ☐			
	11	Selector Switches	No. and Form _____ In Case ☐ External ☐ Switch Cabinet Specs _____			
	XMTR	12	Trans. Output	4-20 mA ☐ 10-50 mA ☐ 21-103 kPa (3-15 psig) ☐ Other _____ Input-Output Isolation ☐ For Receiver See Sheet _____		
CONTROLLER	13	Control Modes	P = Prop (Gain), I = Integral (Auto Reset), D = Derivative (Rate), Sub: s=Slow f=Fast If ☐ Df ☐ P ☐ PI ☐ PD ☐ PID ☐ Is ☐ Ds ☐ Other _____			
	14	Action	On Meas. Increase Output: Increases Decreases			
	15	Auto-Man Switch	None ☐ MFR STD ☐ Specify _____			
	16	Set Point Adj.	Manual ☐ External ☐ Remote ☐ Specify _____			
	17	Manual Reg.	None ☐ MFR-STD ☐ Other _____			
INPUT	18	Output	4-20 mA ☐ 10-50 mA ☐ 21-103 kPa (3-15 psig) ☐ Other _____			
INPUT	19	Thermocouple Type	J(IC) ☐ K(CA) ☐ T(CC) ☐ E(CHR-CON) ☐ Other _____			
	20	Other Input	Ref Junction Comp ☐ Lead Resistance (Galv) _____ Resistance Temp Sensor ☐ Calibration _____ Other _____			
ALARM	21	Alarm Switches	Quantity _____ Form _____ Rating _____			
	22	Function	Meas. Var. ☐ Deviation ☐ Contacts to _____ measure _____ Other _____			
	23		Front Adj _____ Back Adj _____			
OPTIONS	24	T/C Burnout Drive	None ☐ Upscale ☐ Downscale ☐			
	25	Accessories	Case Illuminator ☐ _____ Charts _____ Filter Reg. ☐ Other _____			
26	MFR. & Model No.	_____				
Notes:						

ISA Form S20.10a

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5 Potentiometer instruments specification sheet instructions

Instructions for ISA Forms S20.10a and 20.10b

Prefix number designates line number on corresponding specification sheet.

- 1) To be used for single item. Use secondary sheet for multiple listing.
- 2) Check as many as apply.
- 3) Check one. Note that sheet may be used to specify galvanometric type of instrument.
- 4) Nominal size refers to approximate front of case dimensions; width x height.
- 5) It is assumed that the instrument has its own case or shelf suitable for single mounting unless "multi-case" is checked. Shelf or separable case for multiple case mounting instrument is not included in this sheet unless listed as an accessory.
- 6) Enclosure Class refers to composite instrument. If electrical contacts are in the case, they meet this rating inherently or by reason of the enclosure. Use NEMA identification system or ISA system presented in RP8.1.
- 7) Specify electrical power to entire instrument.
- 8) For multiple instruments list ranges on second sheet, but specify other items here.
- 9) Ranges 1 and 2 refer to multi-channel instruments. The first listed is assumed to be the controller input (if any).
- 10) For multiple items list number of points on second sheet. "Point Select" permits by-passing any or all points by a switching mechanism.
- 11) For multiple items show number of switches on second sheet under "No. of Points."
- 12) Specify if applicable.
- 13) See explanation of terminology given on spec. sheet. Specific ranges of control modes can be listed under "other" if required.
- 14) For multiple items specify on second sheet.
- 15) If standard auto-manual switching is not known or not adequate, specify particular requirements, such as BUMPLESS, PROCEDURELESS, 4-POSITION, or as required.
- 16) Remote set point adjustment assumes full adjustment range. Specify limits if required.
- 17) Specify if applicable.
- 18) Specify if applicable.
- 19) Check if thermocouple input applies. Lead resistance required only for galvanometer.
- 20) Specify any input other than thermocouple. "Calibration" refers to curve used and does not imply that element is specifically calibrated for this instrument.
- 21) Form may be SPST, SPDT, DPDT, etc. Rating is electrical rating of switch in amps.

- 22) Check if alarm is actuated by measured variable or by deviation from controller set point. Give contact action if single throw form. Specify calibrated or blind alarm index setter.
- 23) Specify if applicable.
- 24) Specify if applicable.
- 25) Accessories for multiple items may be covered by "notes" second sheet.
- 26) May be filled in after selection is made.

SECONDARY SHEET — for listing multiple instruments. List all instruments of the same type, specified on Primary Sheet, with variations as shown. "Notes" refers to notes listed by number at the bottom of the sheet. Or use Secondary Sheet to list and identify the multiple points of a single multipoint instrument.

		TEMPERATURE INSTRUMENTS (FILLED SYSTEM)				SHEET ____ OF ____	
						SPEC. NO.	REV.
		NO	BY	DATE	REVISION		
						CONTRACT	DATE
						REQ. - P.O.	
						BY	CHK'D APPR.
1		Tag No.	Service				
GENERAL	2	Function	Record ☐ Indicate ☐ Control ☐ Blind ☐ Trans ☐ Other _____ MFR STD ☐ Nom Size _____ Color: MFR STD ☐ Other _____ Flush ☐ Surface ☐ Yoke ☐ Other _____ General Purpose ☐ Weather proof ☐ Explosion proof ☐ Class _____ For Use in Intrinsically Safe System ☐ Other _____ 117 V 60Hz ☐ Other ac _____ dc ☐ Volts _____ Strip ☐ Roll ☐ Fold ☐ Circular _____ Time Marks _____ Speed _____ Power _____ Type _____ Range 1 _____ 2 _____ 3 _____ 4 _____				
	3	Case					
	4	Mounting					
	5	Enclosure Class					
	6	Power Supply					
	7	Chart					
	8	Chart Drive					
	9	Scales					
	10	XMTR	Transmitter Output	4-20 mA ☐ 10-50 mA ☐ 21-103 kPa (3-15 psig) ☐ Other _____ For Receiver See Spec. Sheet _____			
CONTROLLER	11	Control Modes	P=Prop (Gain), I=Integral (Auto Reset), D=Derivative (Rate), Sub: s = Slow f = Fast P ☐ PI ☐ PD ☐ PID ☐ If ☐ Df ☐ Is ☐ Ds ☐ Other _____ On Meas. Increase Output: Increases ☐ Decreases ☐ None ☐ MFR STD ☐ Other _____ Manual ☐ External ☐ Remote ☐ Other _____ None ☐ MFR STD ☐ Other _____ 4-20 mA ☐ 10-50 mA ☐ 21-103 kPa (3-15 psig) ☐ Other _____				
	12	Action					
	13	Auto-Man Switch					
	14	Set Point Adj.					
	15	Manual Reg.					
	16	Output					
ELEMENT	17	Fill	SAMA Class _____ Compensation _____				
	18	Process Data	Temp: Normal _____ Max _____ Max. Press. _____				
	19	Range	Fixed ☐ Adj. Range _____ Set At _____				
	20	Bulb	Overrange Protection to _____ Type _____ Mtl. _____ Extension: Length _____ Type _____ Size: Diameter _____ Length _____ Insertion _____ Conn: _____ Location _____ Ft. _____ Above ☐ Below ☐ Instr. _____ MFR STD ☐ Length _____ Mtl. _____ Armor _____ Mtl. _____ Insertion _____ Lag Ext. _____ Conn. _____ Const: Drilled ☐ Built-Up ☐ Other _____				
	21	Capillary					
	22	Well					
23	Alarm Switches	Quantity _____ Form _____ Rating _____					
24	Function	Temp ☐ Deviation ☐ Contacts To _____ On Temp. Increase					
25	Options	Filt-Reg. ☐ Sup. Gage ☐ Output Gage ☐ _____ Charts					
26	Mfr. & Model No.	Other _____					
Notes:							

ISA FORM S20.11a

6 Temperature instruments (filled systems)

Instructions for ISA Forms S20.11a and 20.11b

- 1) To be used for a single item. Use secondary sheet for multiple listing.
- 2) Check as many as apply.
- 3) Nominal size refers to approximate front of case dimensions; width x height.
- 4) Yoke refers to a bracket designed for mounting the instrument on a pipe stand.
- 5) Enclosure class refers to composite instrument. If electrical contacts are in the case, they must meet this classification inherently or by reason of enclosure. Use NEMA identification or ISA identification RP8.1.
- 6) Specify electrical power to the entire instrument from an external source.
- 7) Specify chart size, range and number if applicable.
- 8) Chart drive mechanism assumed to be synchronous motor operating in 117V 60 Hz and suitable for ENCLOSURE CLASS specified on line 5. If the chart drive is pneumatic so state — identify pneumatic pulser under options. Note deviations from standard (MFR) under notes, i.e., dual speed or special speeds.
- 9) The scale type may be SEGMENTAL, VERTICAL, HORIZONTAL, DIAL (CIRCULAR) or other. Ranges 1, 2, 3 and 4 are used for multiple inputs. The first listed (No. 1) is assumed to be the controller input, if a controller is used.
- 10) Specify transmitter output if applicable.
- 11) See explanation of terminology given on specifications sheet. For further definition refer to American National Standard C85.1-1963, "Terminology for Automatic Control." Specific ranges of control modes can be listed after "OTHER," if required.
- 12) For multiple items specify on second sheet.
- 13) If standard auto-manual switching is not known or not adequate, specify particular requirements, such as BUMPLESS, PROCEDURELESS, 4-POSITION, or as required.
- 14) Remote set point adjustment assumes full adjustment range. Specify limits if required.
- 15) Specify if applicable.
- 16) Specify if applicable.
- 17) Filled thermal systems can be of the following SAMA classifications:

Class IA:	Liquid filled, uniform scale, fully compensated.
Class IB:	Liquid filled, uniform scale, case compensated only.
Class IIA:	Vapor pressure, non-linear scale with measured temperature above case and tubing temperature.
Class IIB:	Vapor pressure, non-linear scale with measured temperature below case and tubing temperature.

Class IIC: Vapor pressure, non-linear scale with measured temperature above and below case and tubing temperature.

Class IIIA: Gas filled, uniform scale, fully compensated.

Class IIIB: Gas filled, uniform scale, case compensated only.

Class VA: Mercury filled, uniform scale, fully compensated.

Class VB: Mercury filled, uniform scale, case compensated only.

- 19) Range refers to process input span for which an output is desired. Adjustable range means that the unit can give its normal output over a range of inputs.
- 20) Bulb type can be plain, averaging, rigid, adjustable union connections, fixed union connection. Capillary extension length can be rigid or flexible, etc.
- 21) Capillary tube specifications
- 22) Well Specifications
- 23) Form may be SPST, SPDT, DPDT, etc. Rating is electrical rating of switch in volt amps.
- 24) Check if alarm is to be actuated by measured variable or by deviation from controller set point. Give contact action if single throw from.

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