



## Strip Chart Recorders Series 2000

**Strip chart recorders Series 2000** are instruments designed to record one or more variables either directly measured or received in the form of a pneumatic or electric signal.

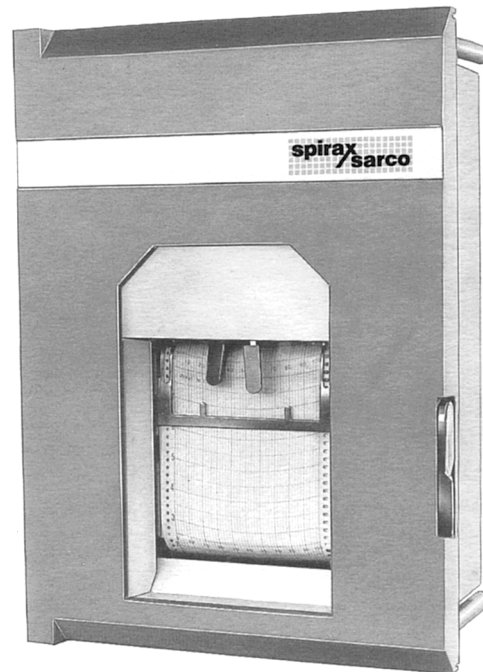
**The maximum number of pens** depends on the type and dimensions of measuring elements (see table on page 2).

Each pen traces a curve of different coloured ink and has a large inking capacity ensuring long efficiency. Recording is performed on a 120 mm wide strip chart, with an effective recording width of 100 mm; standard chart speed is 20 mm/h giving 6 hours visible recording and up to 30 days continuous running; other speeds are available.

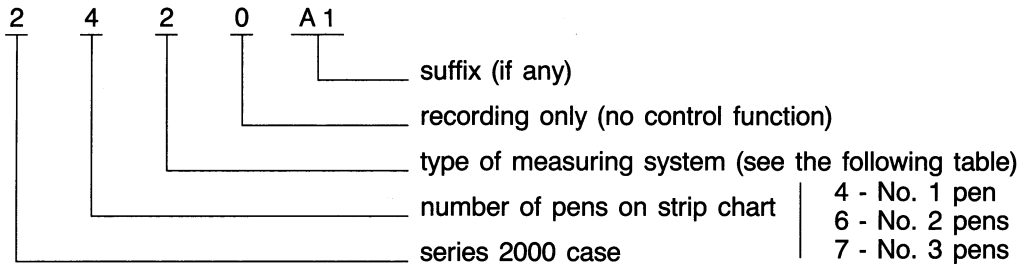
**Chart driving mechanism** may be a seven-day spring-wound clock or a standard electric clock for 24V-50Hz current supply; other voltages are optional. Recording charts are available in a wide choice of scales and the instrument may be provided with a plexiglass transparent scale, with single or multiple graduation in the actual measuring units, permitting the direct reading of values when the instrument is due to record more than one variable with different ranges or when charts with percentage scale are used.

**High and/or low alarm** electric contacts are available on request which can be adjusted throughout the entire instrument range for remote or local alarm system.

**Instrument case** is dust and spray-proof and fitted with accessories for wall or flush panel mounting; optionally, instrument can be supplied with accessories for 2" pipe support mounting. Case internal pressurization is possible on request.



The model number, which identifies the general characteristics of the instrument, with particular reference to the number of pens and the measured variables, is composed by a number of four digits often followed by an alphanumeric suffix. The meaning of digits and letters is explained with an example:



Ref.	Measuring system	Maximum number of pens
0	Pneumatic receiver for 3 to 15psi or 0.2 to 1 bar signal	3
1	Bellows for low pressure, vacuum, absolute pressure or level	2
2	Bourdon tube for pressure and level	3
3	Differential pressure mercury chambers for flow rate or level	1
6	Mercury or nitrogen filled thermometer system with capillary and bulb	3 *
8	Two or more different variables (pressure, temperature, any other pneumatically or electrically received) specified by suffix	3 *
9	Electro-mechanical receiving transducer for electric signal or other measuring system specified by suffix	2

\* Two pens only if thermometer system is ambient temperature compensated.

**Note:** In two or three pens recorders, one or two of them can be replaced with index.

The suffix is used in order to complete or give complementary informations about the characteristics of the instrument: for recorders type 2680 and 2780 with 2 or 3 pens and different measured variables, the model number is followed by 2 or 3 suffixes pointing out the measuring element types.

F = flow rate; L = level; P = pressure, vacuum, absolute pressure; S3 = pneumatic receiver; T = temperature; S4EE = electro-mechanical transducer.

Example: model 2680-FS3-P2 = two pens recorder: for flow rate (measured with pneumatic receiver, suffix S3) and pressure (measured with Bourdon tube, suffix P2).

An accessory function as alarm by means of electric contact is specified with suffix A1 when closed for low limit alarm and A2 when closed for high limit alarm, etc.

## GENERAL SPECIFICATIONS

<b>Type of instrument</b>	strip chart recorder with direct measurement or with pneumatic or electric receiving element
<b>Measuring systems</b>	<ul style="list-style-type: none"> <li>• AISI 316L stainless steel Bourdon tube, spiral type for pressure up to 400 bar and helicoidal type over 400 bar</li> <li>• AISI 316L stainless steel or Tombak bellows</li> <li>• mercury or nitrogen filled thermometer system with stainless steel bulb and capillary tube (for bulb types, dimensions and connections to process see bulletin 7B.390-E). Ambient temperature compensated system available.</li> <li>• differential pressure mercury chambers</li> <li>• pneumatic receiver: Tombak bellows for 3 to 15 psi or 0.2 to 1 bar signal</li> <li>• electro-mechanical receiving transducer for 0 to 20 or 4 to 20 mA signal or for thermoresistance or thermocouple</li> </ul>
<b>Accuracy</b>	1% or range span
<b>Sensitivity</b>	0.2% of range span
<b>Repeatability</b>	0.5% of range span
<b>Linearity</b>	0.5% of range span
<b>Recording chart</b>	120 mm wide strip chart with an effective recording width of 100 mm
<b>Standard recording scales</b>	<ul style="list-style-type: none"> <li>• ranges in effective measuring units as listed in this bulletin</li> <li>• 0 to 100 linear</li> <li>• 0 to 100 square-root</li> </ul>
<b>Auxiliary indicating scale</b>	transparent plexiglass with single, double or triple graduations (on request)
<b>Chart movement</b>	standard speed: 20 mm/h other chart speeds 10-15-40-60-100 mm/h available on request chart driving mechanism may be 7-day spring-wound clock or standard electric clock for 24V-50Hz supply (110V or 220V on request)
<b>Inking and colours</b>	disposable cartridge pen system with different colours 1 pen: red - 2 pens: red and blue - 3 pens: red, blue and green barrel pens with ink available on request
<b>Ambient temperature limits</b>	maximum 65°C      minimum -15°C
<b>Case</b>	die cast aluminium with olive grey enamel finish; spray and dust-proof style with standard protection degree IP 55; connection for internal pressurization (optional)
<b>Mounting</b>	<ul style="list-style-type: none"> <li>• wall or flush panel mounting, by means of standard pillars</li> <li>• on 2" pipe support with clamp (optional)</li> </ul>
<b>Weight</b>	8 kg approx. for one-pen pressure recorder (minimum weight) anyhow related to the type and number of the measuring elements
<b>Overall dimensions</b>	See drawings on page 4
<b>Standard accessories</b>	Two chart rolls and one spare cartridge pen for each colour or one ink bottle for each colour

## STANDARD RANGES OF MEASUREMENT

### FOR PRESSURE AND VACUUM

<b>Pressure</b> in bar with stainless steel Bourdon tube	0-1 0-2 0-3	0-4 0-5 0-7	0-10 0-15 0-20	0-25 0-30 0-50	0-75 0-100 0-200	0-300 0-400 0-500	50-100 50-150 100-200	100-250 100-300 100-400
<b>Vacuum</b> with Tombak bellows	0-500 mm W.G.							
<b>Vacuum</b> with Tombak or stainless steel bellows	0-100 mm Hg 0-250 mm Hg			0-500 mm Hg 0-760 mm Hg				
<b>Pressure</b> with Tombak bellows (1)	0-400 mm W.G.			0-500 mm W.G.			0-750 mm W.G.	
<b>Pressure</b> with Tombak or stainless steel bellows	0-1000 mm W.G. 0-2500 mm W.G.			0-5000 mm W.G. 0-7500 mm W.G.			0-1 bar rel.	
<b>Vacuum-pressure</b> with Tombak bellows (2)	-250 to +250 mm W.G.							
<b>Vacuum-pressure</b> with Tombak or stainless steel bellows (3)	-50 to +50 mm Hg -125 to +125 mm Hg			-250 to +250 mm Hg -380 to +380 mm Hg				
<b>Permissible overpressure</b>	25% of range span for Bourdon tube 2 bar for stainless steel bellows 1.5 bar for Tombak bellows							
<b>Process connection</b>	1/2" Gas male threaded with welding union for 1/4" pipe							

(1) Special ranges on request with span of 250 to 400 mm W.G.

(2) Special ranges on request with span of 500 mm W.G. (ex. -400 to +100 mm W.G., etc.)

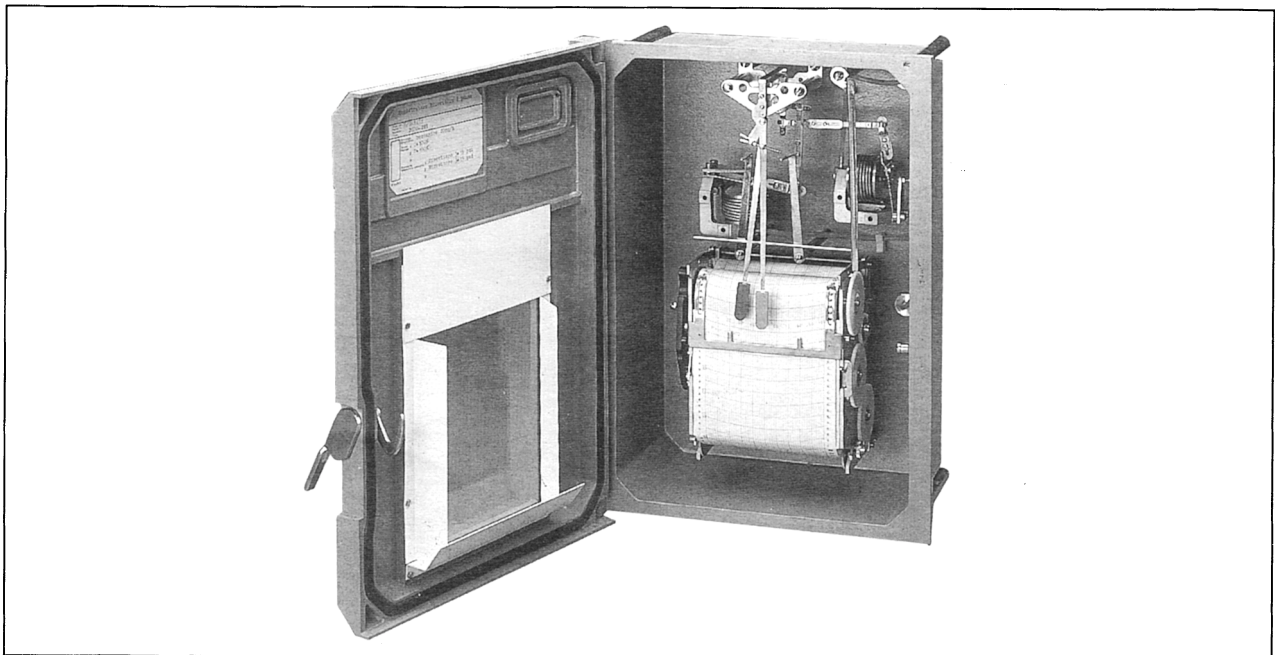
(3) Special ranges on request with span of 100, 250, 500 and 760 mm Hg.

### FOR ABSOLUTE PRESSURE

<b>With balanced stainless steel bellows</b>	0-100 mm Hg 0-250 mm Hg	0-500 mm Hg 0-760 mm Hg	0-1 bar abs. 0-2 bar abs.
<b>With balanced stainless steel spiral Bourdon tube</b>	0-1 bar abs. 0-2 bar abs.	0-3 bar abs. 0-5 bar abs.	
<b>Permissible overpressure</b>	2 bar for stainless steel bellows 25% of range span for Bourdon tube		
<b>Process connection</b>	1/2" Gas male threaded with welding union for 1/4" pipe		

### FOR TEMPERATURE

<b>Measuring spans</b>	25°C	50°C	75°C	100°C	150°C	200°C	300°C	400°C
<b>Ranges in Centigrades</b>	-5-20 0-25 10-35 20-45	-25-25 0-50 25-75 50-100	-25-50 0-75 25-100 50-125	0-100 10-110 25-125 50-150	0-150 25-175 50-200 100-250	0-200 25-225 50-250 100-300	0-300 50-350 100-400	0-400
<b>Permissible overtemperature</b>	25% of range span							
<b>Ambient temperature compensation</b>	Ambient temperature variations and capillary length may require compensation of thermometer system obtained foreseeing two capillaries and double opposite thermometric springs							
<b>Process connection</b>	For bulb types, dimensions and connections to process see bulletin 7B.390-E							



### FOR LEVEL OF LIQUIDS

<b>For open tanks with Tombak bellows</b>	0-400 mm W.G.	0-500 mm W.G.	0-750 mm W.G.	
<b>For open tanks with Tombak or stainless steel bellows</b>	0-1000 mm W.G. 0-1 m W.G. 0-5 m W.G.	0-2500 mm W.G. 0-2 m W.G. 0-7 m W.G.	0-5000 mm W.G. 0-3 m W.G. 0-10 m W.G.	0-7500 mm W.G. 0-4 m W.G.
<b>For open tanks with stainless steel Bourdon tube</b>	0-10 m W.G. 0-50 m W.G.	0-15 m W.G. 0-75 m W.G.	0-20 m W.G. 0-100 m W.G.	0-25 m W.G. 0-100%
<b>Process connection</b>	1/2" Gas male threaded with welding union for 1/4" pipe			

### FOR PNEUMATIC RECEIVERS

<b>Bellows pneumatic receiver for pneumatic signal 3 to 15 psi or 0,2 to 1 bar</b>	The standard available ranges are the same of instruments fitted with measuring element for pressure, vacuum, absolute pressure, temperature and level. Anyhow the range must be the same of the pneumatic transmitter connected with. In additio 0-100 linear or square root scales are available. Special scales for different variables on request. Flow measuring instruments can be equipped with a cam operated device to convert square root signal, received from differential pressure transmitters, into linear one
<b>Receiver connection</b>	1/4 NPT female

### FOR ELECTROMECHANICAL TRANSDUCER

<b>Electromechanical receiver transducer for electric signal</b>	Can be connected to a thermoresistance or thermocouple, to other measuring elements with apt signal and to electronic transmitter for 0 to 20 or 4 to 20 mA signal. Standard and special scales for different variables on request
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### DATA REQUIRED FOR ENQUIRIES AND WHEN ORDERING

	EXAMPLE No. 1	EXAMPLE No. 2
<b>Type of instrument and application</b>	Temperature recorder	Flow-rate (pneumatic receiver) and pressure recorder for steam
<b>Number of pens</b>	1	2
<b>Variation range of the variables</b>	30 to 100°C	200-1000 kg/h (3 to 15 psi linear signal) and 5 to 8 bar
<b>Maximum fluid temperature even occasional</b>	130°C	230°C
<b>Maximum fluid pressure even occasional</b>	25 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>
<b>Chart movement</b>	Standard chart speed with electric clock drive for 24V-50Hz	Chart speed 40 mm/h with spring-wound clock drive
<b>Plexiglass indicating scale</b>	no	yes
<b>Mounting style</b>	on 2" pipe support	wall mounting
<b>Ambient temperature variations</b>	From -5°C to 40°C	From 10°C to 35°C
<b>Length of capillary and bulb (for temperature recorders only)</b>	Capillary 7 m long standard bulb	
<b>Bulb pocket (for temperature recorders only)</b>	yes	

### DIMENSIONS (mm)

