

Indicating Pneumatic Controllers Series 600

Series 600 indicating pneumatic controllers are instruments designed for directly measuring a temperature or a pressure which is indicated by a pointer on a segmental graduated scale 100 mm wide.

At the same time the measured variable is automatically controlled by a pneumatic control unit which in turns operates a control valve or any other pneumatic device.

Indicating controlling instruments with a receiving element for 3 to 15 psi (or 0.2 to 1 bar) pneumatic signal from a remote transmitter of any variable are also available.

The measuring element is a spiral stainless steel Bourdon tube for pressure, a **gas filled** system with bulb and capillary for temperature and a tombac bellows receiver for pneumatic signal or an electromechanical receiver for current or voltage electrical signals or for resistance thermometers or thermocouples connection.

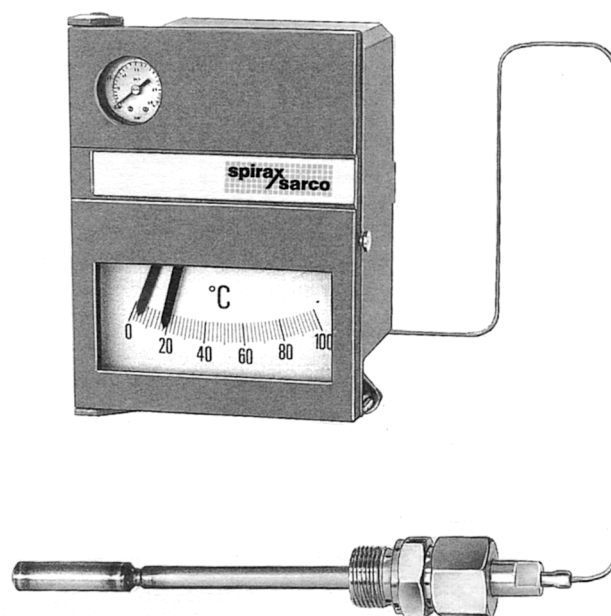
The control units are available in three versions for **on-off**, **proportional with manual reset (P)**, and **proportional-integral (PI) control mode** respectively.

Control modes are adjustable by means of a graduated dial and also the action of the control unit (direct or reverse) may be easily selected in the field by the proportional band setting dial.

The control unit is fitted with an amplifying relay to assure the maximum speed of response.

Set point adjustment may be manual or pneumatically controlled for remote operation.

The instrument is provided with pressure gauge for the output air control signal indication.



Instrument case of reduced size is dust and sprayproof and fitted with accessories for wall or flush panel mounting; optionally instrument may be supplied with accessories for 2" pipe support mounting.

Case internal pressurization is possible on request. Compressed air for instrument supply must be filtered, oil free and completely dry; a pressure of 20 psig (1.4 bar) is required.

MEASURING SYSTEMS

Temperature

Nitrogen filled thermometer system for temperature ranging from -100°C to 600°C ; cylindrical bulb for liquids, available also in sanitary execution for food industry, pharmaceutical processes, etc., or spiral bulb for air and gas.

Bulb and capillary are in AISI 316L stainless steel. The maximum capillary length may be 10 meters.

Pressure

Bourdon type pressure element in AISI 316L stainless steel: spiral tube for pressures up to 400 bar and helical tube for pressures up to 500 bar.

A diaphragm separator with capillary is available for application with very viscous or corrosive fluids.

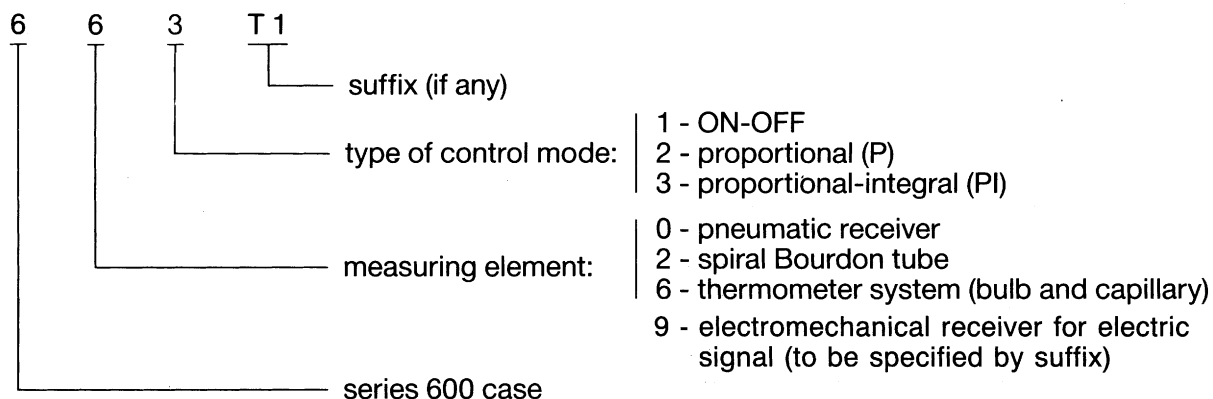
Pneumatic receiving element

Tombak bellows for 3 to 15 psi or 0.2 to 1 bar signal from pneumatic transmitter.

Electromechanical receiver

Receiver for current or voltage electrical signals (4-20 mA, 0-10 V d.c., etc.) and for signals from resistance thermometers or from thermocouples.

The model number, which identifies the general characteristics of the instrument, is composed by a number of three digits often followed by an alphanumerical suffix. The meaning of digits and letter is explained with an example.



The suffix is used in order to complete or give complementary informations about the characteristics of the instrument, for example: T5 is used when the thermometric element is nitrogen filled and has a cylindrical bulb while T5 Sy means that the nitrogen filled thermometer system is fitted with a sensing bulb in sanitary execution; T6 means that the thermometer system is nitrogen filled but fitted with a spiral bulb for air and gas; S5 is used when the instrument is equipped with a pneumatic adjustable set-point, etc.



GENERAL SPECIFICATIONS

Type of instrument	indicating pneumatic controller for temperature or pressure or receiver for 3 to 15 psi (0.2 to 1 bar) pneumatic signal or for electric signal
Measuring limits	<ul style="list-style-type: none"> pressure —1 to 500 bar temperature —100 to 600°C
Scale	segmental 100 mm long
Accuracy	1% of range span
Sensitivity	0.2% of range span
Repeability	0.5% of range span
Linearity	0.5% of range span
Action	<ul style="list-style-type: none"> direct action: control signal increases on increasing of the variable reverse action: control signal decreases on increasing of the variable action can be easily selected on the field
Control modes	<ul style="list-style-type: none"> ON-OFF proportional (P) with manual reset proportional-integral (PI)
Differential	1% of range span; not adjustable (ON-OFF instruments only)
Proportional band	adjustable from 5% up to 200% of the scale span
Integral action	adjustable from 0.1 to 20 repeats per minute
Control signal	3 to 15 psi or 0.2 to 1 bar for modulating control mode 0-20 psi or 0-1.4 bar for ON-OFF control mode
Set point	<ul style="list-style-type: none"> manually adjustable on instrument by knob and index (standard) pneumatically adjustable through a 3 to 15 psi or 0.2 to 1 bar signal (on request)
Air supply	compressed air at 20 psi \pm 1.5 psig (1.4 bar \pm 0.1 bar)
Air consumption	0.2 Nm ³ /h (average)
Air connections	1/4" NPT female for air supply, control signal and signal to the receiving element in fnay
Process connections	<ul style="list-style-type: none"> pressure: 1/4" NPT female temperature: for bulb types, dimensions and connections to process see bulletin 7B.390-E
Ambient temperature limits	maximum +65°C minimum —15°C
Case	die cast aluminium with blue RAL 5010 enamel finish, spray and dust-proof style with standard protection degree IP 54 or IP 55 on request; connection for internal pressurization (optional)
Mounting	<ul style="list-style-type: none"> wall or flush panel mounting by means of standard fittings on 2" pipe support with clamp (optional)
Weight	approx. 3.5 kg
Overall dimensions	see drawings on the next page

STANDARD RANGES OF MEASUREMENT

FOR PRESSURE

Ranges in bar	—1-0	0-1	0-4	0-10	0-25	0- 75	0-300	50-100	100-250
	—1-1	0-2	0-5	0-15	0-30	0-100	0-400	50-150	100-300
	—1-4	0-3	0-7	0-20	0-50	0-200	0-500	100-200	100-400
Permissible overpressure	25% of measuring range span								

FOR TEMPERATURE

Measuring spans	50°C	75°C	100°C	150°C	200°C	300°C	400°C
Ranges in Centigrade degrees	—10- 40 —25- 25 0- 50 25- 75 50-100	0-75 25-100 50-125	0-100 10-110 25-125 50-150	0-150 50-200 100-250	0-200 50-250 100-300	0-300 50-350 100-400	0-400 100-500
Permissible overtemperature	25% of measuring range span						

FOR PNEUMATIC RECEIVER

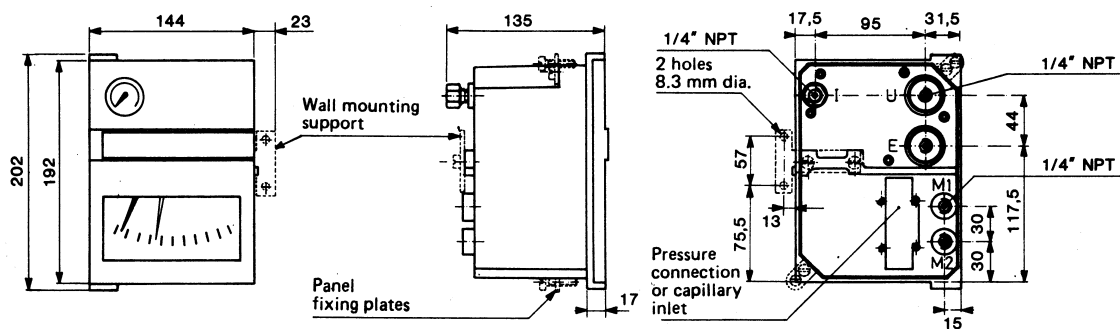
Bellows pneumatic receiver for pneumatic signal 3 to 15 psi or 0.2 to 1 bar	The available ranges are the same of instrument fitted with measuring element. Anyhow the control range must be the same of that the pneumatic transmitter connected with. Scales for special variables and ranges available on request.
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DATA REQUIRED FOR OFFERS AND WHEN ORDERING

Example

Type of instrument	pressure indicating controller
Type of control	proportional-integral (PI)
Measuring control range	0-10 bar
Fluid in contact with measuring element	superheated steam at 350°C
Mounting style	flush panel
Ambient temperature variations	between 5 and 30°C

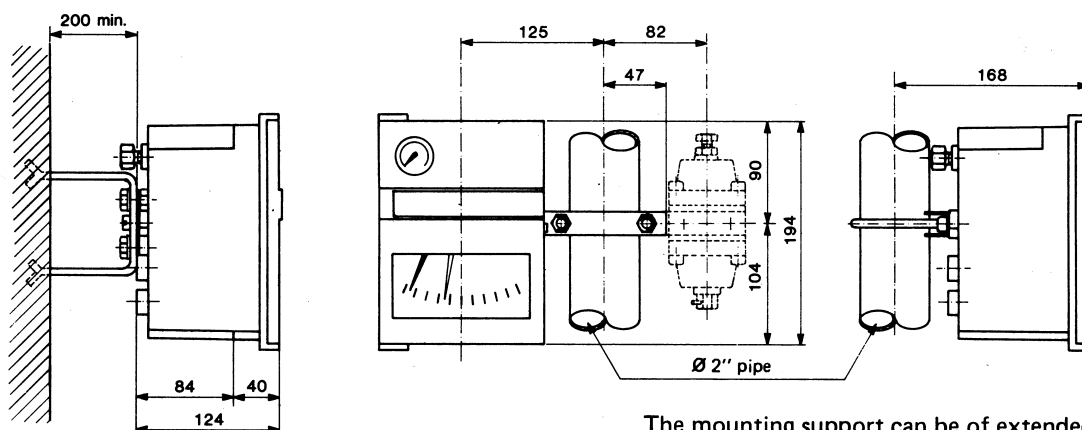
DIMENSIONS (mm)



M1 = Connection to transmitter (if any)
M2 = Connection for pneumatic set (if any)

E = Air supply connection (air inlet)
U = Control signal connection (air outlet)
I = Integral connection (if any)

WALL OR PIPE SUPPORT MOUNTING



The mounting support can be of extended type allowing also the air regulator clamping.

FLUSH PANEL MOUNTING

