scandura
Strumentazione e sistemi di calibrazione

Series B-20

S1C414E2-B20I

Intrinsically Safe Portable Calibrator for field testing of Electronic & Pneumatic Process Instruments

Model B-20/IS,

Multi-function Calibrator

ATEX 94/9/CE Ⓔx II 2 G

EEx ib IIC T4 - Tamb. 0 to 50 ˚C

Accuracy: up to 0.025 % f.s.

Calibration and testing of:

- Transmitters
- Converters
- Indicators
- Recorders
- Controllers
- Thermocouples
- Thermoresistances
- Positioners
- Pressure switches
- Manometers

■ TECHNICAL CHARACTERISTICS

- ▶ Pressure measurement from -1 up to 21 bar with internal sensors and up to 700 bar with external sensors
- ▶ Pressure/vacuum generation with built-in-pump from -0,9 bar up to 21 bar with fine adjustment
- ▶ Voltage/current measurement & simulation
- ▶ Frequency measurement
- ▶ Temperature (thermocouples/ thermore-sistance) measurement & simulation
- ▶ Switch status test: Detection of ON/OFF status
- ▶ Automatic Deviation (Error) calculation with indication of the acceptability limits
- ▶ Signal conditioning: Linear, Square Root, Inverse
- ▶ All parameters displayed in selectable engineering units:
- ▶ Pressure: mbar, bar, kPa, psi, mmHg, mmH2O, "H20, "Hg, kg/cm2
  - · Temperature: °C °F
  - · Frequency: Hz
  - · Current: mA
  - · Voltage: mV, V
  - · Resistance: ohm
  - · Percent : % (of the measured range)
- ▶ Double Language: English/Second Language (selectable among Italian, French, Spanish, German)
- ▶ Menu driven operations (set-up configuration/reading/ storing etc.)
- ▶ Full Calibrator set-up Manipulation & Data Display
- ▶ Logging function: up to 999 consecutive readings within a selectable time
- ▶ Up to 63 process Instruments (TAGS) for calibration run for a total of 1200 calibration points stored into non-volatile memory
- ▶ Each point-record (Process Instrument Calibration TAG) includes:
  - · Device (instrument) type
  - · Date
  - · Remarks
  - · Job Number
  - · Signal conditioning type
  - · Operator's code
  - · Maximum permissible error
  - · Tag Number
  - · Errors table (before/after calibration)
  - · Calibration cycle
- ▶ Built-in reporting facility via direct connection to any serial printer
- ▶ Communication Link to a PC via RS-232 serial interface
- ▶ Computer Uploading/Downloading of calibrator set-up

■ TECHNICAL FEATURES

TABLE 1	PRESSURE RANGES *			
	INTERNAL TRANSDUCERS			
Code	**Range**	**Resolution**	**Accuracy[1]**	**Uncertainty[2]**
	1st TRANSDUCER			
151A	0 ÷ 1500 mbar abs	0.01 mbar	0.025 % (f.s.)	0.04 % (f.s.)
251A	0 ÷ 2500 mbar abs	0.01 mbar	0.025 % (f.s.)	0.04 % (f.s.)
501A	0 ÷ 5 bar abs	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
701A	0 ÷ 7 bar abs	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
212A	0 ÷ 21 bar abs	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
060G	-60 ÷ 60 mbar	0.01 mbar	0.15 % (f.s.)	0.15 % (f.s.)
500G	-500 ÷ 500 mbar	0.01 mbar	0.025 % (f.s.)	0.04 % (f.s.)
151G	-900 ÷ 1500 mbar	0.01 mbar	0.025 % (f.s.)	0.04 % (f.s.)
701G	0 ÷ 7 bar	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
212G	0 ÷ 21 bar	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
	2nd TRANSDUCER			
701G	0 ÷ 7 bar	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
212G	0 ÷ 21 bar	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
701A	0 ÷ 7 bar abs	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
212A	0 ÷ 21 bar abs	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)

Table 2	**EXTERNAL TRANSDUCERS** (Pressure Connection: 1/4" BSP M)			
Code	**Range**	**Resolution**	**Accuracy[1]**	**Uncertainty[2]**
	STANDARD RANGES			
SP-1/1.5	-900 ÷ 1500 mbar	0.01 mbar	0.025 % (f.s.)	0.04 % (f.s.)
SP-1/8	-1 ÷ 7 bar	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
SP-1/22	-1 ÷ 21 bar	0.1 mbar	0.025 % (f.s.)	0.04 % (f.s.)
SP-1/50	0 ÷ 50 bar	1 mbar	0.03 % (f.s.)	0.05 % (f.s.)
SP-1/100	0 ÷ 100 bar	1 mbar	0.03 % (f.s.)	0.05 % (f.s.)
SP-1/200	0 ÷ 200 bar	1 mbar	0.075 % (f.s.)	0.1 % (f.s.)
SP-1/400	0 ÷ 400 bar	10 mbar	0.075 % (f.s.)	0.1 % (f.s.)
SP-1/700	0 ÷ 700 bar	10 mbar	0.075 % (f.s.)	0.1 % (f.s.)
	ABSOLUTE PRESSURE RANGES			
SP-1/1.5A	0 ÷ 1500 mbar abs	0.01 mbar	0.025 % (f.s.)	0.04 % (f.s.)
SP-1/2.5A	0 ÷ 2500 mbar abs	0.01 mbar	0.025 % (f.s.)	0.04 % (f.s.)
SP-1/81A	0 ÷ 81 bar abs	1 mbar	0.03 % (f.s.)	0.05 % (f.s.)

* Other ranges available on request

1 - Includes Linearity, Repeatability, Hysteresis in accordance to ISA 51.1

2 - Includes Linearity, Repeatability, Hysteresis, Resolution, Uncertainty of the Master Reference (0,015% rdg).The uncertainty of the instrument is calculated for each sold unit in accordance with UNI CEI ENV 13005 rules. The level of confidence of the uncertainty is close to 95 %.
Temperature Effect: 0,002 % rdg/ °C (range: 0-50°C, reference temperature: 20 °C)

ELECTRICAL PARAMETERS				
SIMULATION	*Range*	*Resolution*	*Uncertainty*	*Input impedence. Load*
1 channel mV d.c.	± 1200 mV	10 µV (up to ± 300 mV) 100 µV (over ± 300 mV)	Up to 0.03 % rdg +0.003 % f.s.	2.5 mA
1 channel V c.c.	0 ÷ 10 V	1 mV	Up to 0.03 % rdg +0.003 % f.s.	4 mA
Trasmitter/2 wires(ext. power)	0 ÷ 25 mA	5 µA	Up to 0.03 % rdg +0.02 % f.s.	40 V (max. ext. P.S.)
1 channel mA c.c.	0 ÷ 20 mA	5 µA	Up to 0.03 % rdg +0.02 % f.s.	500 kΩ at 20 mA
MEASUREMENT	*Range*	*Resolution*	*Uncertainty*	*Input impedence. Load*
mV d.c.	± 1200 mV	10 µV (up to ± 300 mV) 100 µV (over ± 300 mV)	Up to 0.03% rdg. ± 0.003 % f.s.	> 100 MΩ
V d.c.	± 30 V	1 mV (up to ± 20 V)	Up to 0.03% rdg. ± 0.003 % f.s.	1 MΩ
mA d.c.	± 25 mA	1 µA (up to ± 20 mA)	Up to 0.03% rdg. ± 0.003 % f.s.	10 Ω (Shunt res.)
Hz	0,5 ÷ 10 kHz	0.1 Hz	Up to 0.05% rdg.	1 Vpp min.

TEMPERATURE SIMULATION & MEASUREMENT				
	Cold Junct.	*Range*	*Resolution*	*Uncertainty*
Thermocouples (IEC)*	± 0.25 °C	B, E, J, K, N, R, S, T	0.1 °C	e.m.f. error + Lin.error: 0,1 °C + Cold jun. error **
Thermocouples (DIN)	± 0.25 °C	U, L	0.1 °C	e.m.f. error + Lin.error: 0,1 °C + Cold jun. error **
RTD (IEC 751)	-	Pt100 Pt200 Pt500 Pt1000	0.01 °C	0.2 °C (T < 300 °C) 0.4 °C (T > 300 °C)***
RTD (α = 392-10^{-5} °C)	-	Pt100	0.01 °C	0.2 °C (T < 300 °C) 0.4 °C (T > 300 °C)***
Resistance	-	0 ÷ 3900 Ω	0.01Ω (up tp 240Ω) 0.01Ω (over 240Ω)	0.03 % rdg + 20 mΩ ****
mV d.c.	-	± 1200 mV	10 µV (up to ±300 mV) 100 µV (over ±300 mV)	Up to 0.03 % rdg + 0.003 % f.s. *****

* Max Load 2.5mA

** Measurement with internal C.J. compensation only

*** 4 wire measurements – V max = ± 4 V; 0.1 mA < I < 2.5 mA – engineering unit: °C, °F, K – Measuring current 1 mA

**** 4 wire measurements – Measuring current 1 mA

***** e.m.f. error

■ TECHNICAL DATA

- Mechanic block with plug-in connections
- Compact lightweight shock resistant ABS case provided with handle and shoulder strap
- Lid with tubing, leads & accessories bag
- Large, back lighted Alphanumeric and Graphic LCD display for simultaneous presentation of three types of information on three lines
- Membrane Alphanumeric Industrial keyboard
- Standard connector for any Scandura external pressure transducers (see selection table 2)
- Two wires transmitter Power Supply equivalent to 300 S2 Zener barrier - one output 0÷20 mA
- RS-232 Serial Port for Printer or PC connection
- Ext. battery charger 220/240V ac (option 110/120V), 10VA
- Built-in battery-pack, for 8 hours continuous operations
- Operating ambient temperature 0-50°C
- Temperature effect on accuracy less than ± 20 ppm/°C within 0/50°C
- Operating ambient humidity 10-90% non condensing
- Dimensions 290 x 180 x 180 mm (packed 530 x 360 x 360 mm)
- Weight 6,5 kg net (packed 9 kg)

■ STANDARD SUPPLY

- B-20/IS Unit
- External Battery Charger
- Electric kit (code 241027)
- Pneumatic Kit (code depending on pressure range)
- Easy Link Software
- Conformity report
- Calibration work test report
- Operating Manual

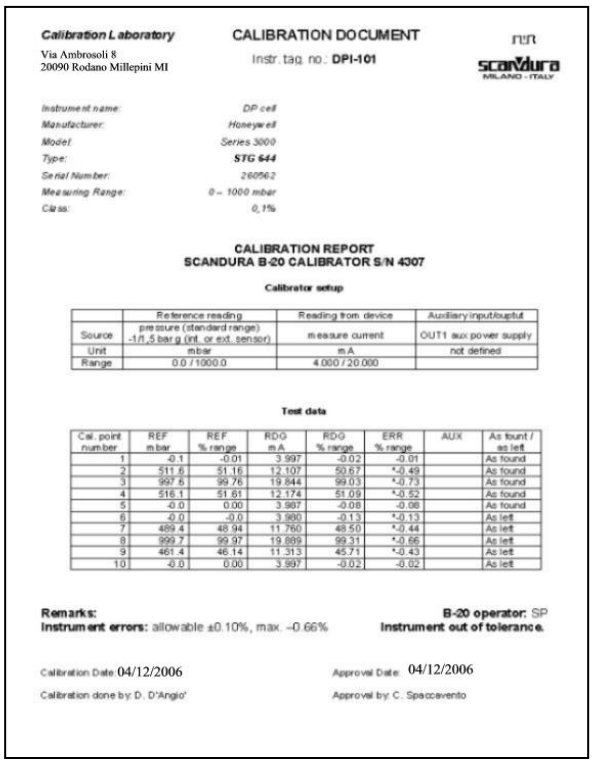
Electric Kit (All models) Cod. 241027
N.4 Flying leads, silicone insulated
N.2 Crocodile Terminals
N.2 Delayed Fuses
N.5 Sub-Miniature Fuses
N.1 Power supply cable
N.1 RS232 Cable for PC
N.1 RS232 Cable for Printer

Pneumatic Kit (7 bar only) Cod. 241028
N.2 Straight joint 468Z ¼"x¼" NPT
N.2 Straight joint 468Z ¼"x1/8" NPT
N.2 Cross jointes 463Z ¼"
N.2 "T" joint 464Z ¼"
mt. 1.5 PVC red hose Ø 6 mm
N.2 ¼" x ½" NPT male joint
N.2 Ring-nuts
N.2 Plug-in cable for **B-20**

Pneumatic Kit (21 bar only) Cod. 241029
N.1 "T" brass joint
N.1 Female adapter C2
N.1 Female adapter C2
mt.1.5 Neutral Rilsan hose 6x4
N.2 Ring-nuts
N.2 Plug-in cable for **B-20**

■ EASY LINK - TEST REPORT SOFTWARE

It is the most user friendly program on the market. It has an immediate impact on the calibration operations allowing configuration, in A4 format, of the calibration reports and/or certificates according to users standards.
Automatic calibration and set-up data transfer (over RS 232 serial interface, from B-20 to PC) makes Easy Link the safer software system to support any calibration procedure according to ISO 9000 standards.
Operating platform: MS-Windows '98 or higher



Calibration Laboratory
Via Ambrosoli 8
20090 Rodano Millepini MI

CALIBRATION DOCUMENT
Instr. tag. no.: DPI-101

scandura MILANO - ITALY

Instrument name: DP cell
Manufacturer: Honeywell
Model: Series 3000
Type: STG 644
Serial Number: 260562
Measuring Range: 0 – 1000 mbar
Class: 0,1%

CALIBRATION REPORT
SCANDURA B-20 CALIBRATOR S/N 4307

Calibrator setup

	Reference reading	Reading from device	Auxiliary input/output
Source	pressure (standard range) -1/1,5 bar g (int. or ext. sensor)	measure current	OUT1 aux power supply
Unit	mbar	mA	not defined
Range	0.0 / 1000.0	4.000 / 20.000	

Test data

Cal. point number	REF mbar	REF % range	RDG mA	RDG % range	ERR % range	AUX	As found / as left
1	-0.1	-0.01	3.997	-0.02	-0.01		As found
2	511.6	51.16	12.107	50.67	*-0.49		As found
3	997.6	99.76	19.944	99.03	*-0.73		As found
4	516.1	51.61	12.174	51.09	*-0.52		As found
5	-0.0	0.00	3.997	-0.08	-0.08		As found
6	-0.0	-0.0	3.980	-0.13	*-0.13		As left
7	489.4	48.94	11.760	48.50	*-0.44		As left
8	999.7	99.97	19.889	99.31	*-0.66		As left
9	461.4	46.14	11.313	45.71	*-0.43		As left
10	-0.0	0.00	3.997	-0.02	-0.02		As left

Remarks:
Instrument errors: allowable ±0.10%, max. -0.66%
B-20 operator: SP
Instrument out of tolerance.

Calibration Date: 04/12/2006
Calibration done by: D. D'Angio'
Approval Date: 04/12/2006
Approval by: C. Spaccavento

■ ORDER GUIDE

B-20/IS- (XX)- XXXX- XXXX-

(ET)
(BT)
(DT)

Electrical + temperature
Pressure (single range) + electric + temperature
Pressure (dual range) + electric + temperature

1st Transducer
Select one range,
Code as per table 1

2nd Transducer
Select one range,
Code as per table 1

Example
B-20/IS (DT)-151G-212G = Electric + Pressure (dual range 1st from - 0,9÷1,5 bar; 2nd da 0÷21 bar) + Temperature card

■ SCANDURA Synonymous with calibration

Scandura is a customer's oriented enterprise that stupports all Instrument & Maintenance Engineers to better serve their requirements and making their job more accurate and valuable.
Although nearly forty years of challenging and competitive activity all over the world have definitively given **Scandura** an international role, the *roots* and the *fruits* remain "Made in Italy". A symbol of sophisticated solutions ensured by an experienced, creative, flexible and open minded team of people that is pleased to respond to customer's needs whatever their needs are.

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LLOYD'S REGISTER QUALITY ASSURANCE - ISO9001
UKAS QUALITY MANAGEMENT 001

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SXY917E0-CAT