

# Datasheet P-506C

## Differential Pressure Transducer

### > Introduction

Bronkhorst High-Tech model P-506C digital differential pressure transducers include a diaphragm type piezo-resistive pressure sensor for differential pressure measurement. The pressure meter performs with high accuracy and repeatability. EL-PRESS model P-506C with on-board PID controller can optionally be combined with a control valve to regulate the pressure difference between two locations in the system according to the set point adjusted.



EL-PRESS Pressure Meter model P-506C

### > Technical specifications

#### Measurement / Control system

Accuracy (incl. linearity and hysteresis)	: $\pm 0,5\%$ of full scale (FS)
Pressure rangeability	: 1 : 50 for pressure meter; 1 : 20 or 1 : 5 for pressure control (depending on configuration)
Repeatability	: $\leq 0,1\%$ RD
Response time sensor	: 2 msec
Operating temperature	: $-10 \dots +70^\circ\text{C}$
Temperature sensitivity	: $0,1\%$ FS/ $^\circ\text{C}$
Leak integrity	: tested $< 2 \times 10^{-9}$ mbar l/s He
Attitude sensitivity (at $90^\circ$ change)	: $< 6$ mbar d
Warm-up time	: negligible

#### Mechanical parts

Material (wetted parts)	: stainless steel 316L or comparable
Process connections	: compression type or face seal couplings
Seals	: standard : Viton options: EPDM, FFKM (Kalrez)
Ingress protection (housing)	: IP40

#### Calibration

References verified by an ISO 17025 calibration laboratory, directly traceable to Dutch and international standards.

*Although all specifications in this datasheet are believed to be accurate, the right is reserved to make changes without notice or obligation.*

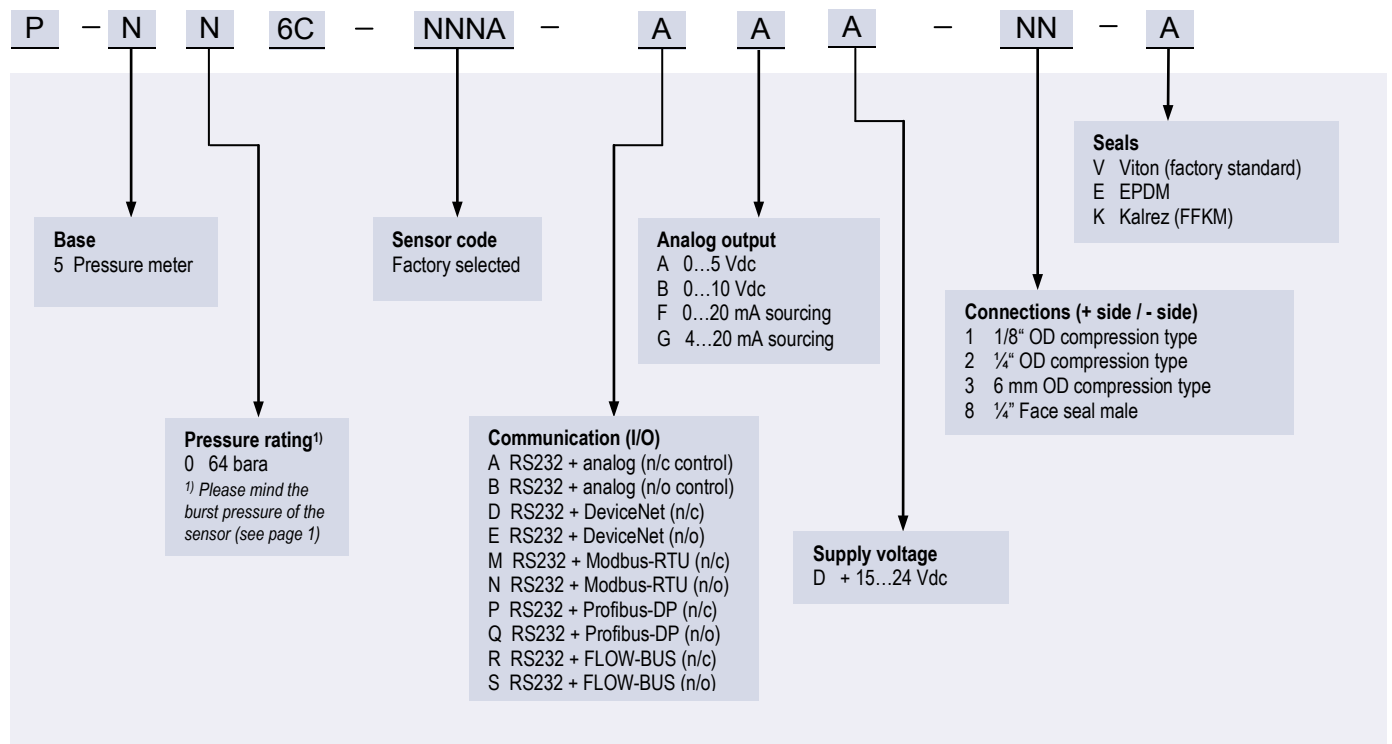
#### Electrical properties

Power supply	: $+15 \dots 24$ Vdc
Power consumption	: max. 385 mA; add 50 mA for Profibus, if applicable
Analog output	: $0 \dots 5$ (10) Vdc, min. load impedance $> 2$ k $\Omega$ $0$ (4) $\dots 20$ mA (sourcing), max. load impedance $< 375$ $\Omega$
Analog setpoint (for EPT + control valve)	: $0 \dots 5$ (10) Vdc, min. load impedance $> 100$ k $\Omega$ ; $0$ (4) $\dots 20$ mA, load impedance $\sim 250$ $\Omega$
Digital communication	
Standard (9-pin D-conn. male)	: RS232
By optional interface board	: Profibus-DP <sup>®</sup> , DeviceNet <sup>™</sup> , Modbus-RTU, FLOW-BUS
Electrical connection	
Analog/RS232	: 9-pin D-connector (male);
Profibus-DP <sup>®</sup>	: bus: 9-pin D connector (female); power: 9-pin D-connector (male);
DeviceNet <sup>™</sup>	: 5-pin M12-connector (male);
Modbus-RTU/FLOW-BUS	: RJ45 modular jack

### > Sensor codes, ranges and burst pressure

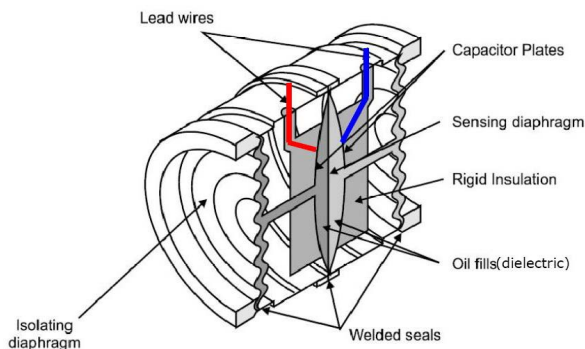
Sensor code	Pressure ranges	Burst pressure
300D (Differential pressure)	100 ... 200 mbar d	2,5 bard
1K0D " "	0,2 ... 1 bard	4 bard
4K0D " "	1 ... 4 bard	7 bard
15KD " "	4 ... 15 bard	30 bard

## > Model number identification



## > Measuring principle

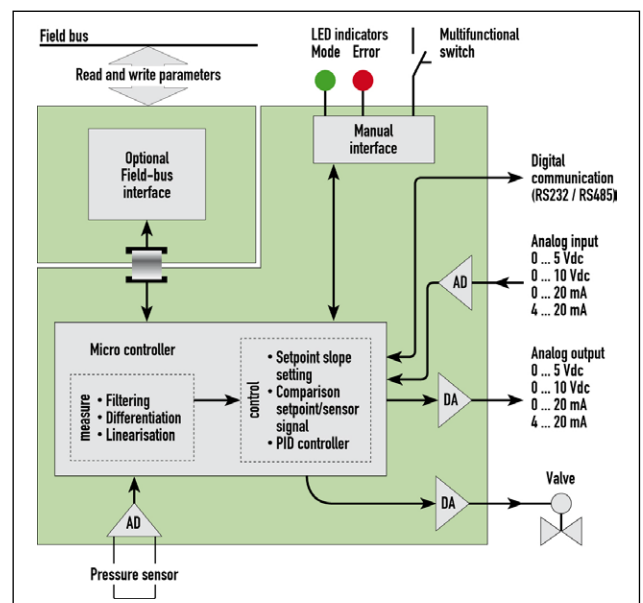
The EL-PRESS differential pressure sensor is a piezo-resistive bridge on the surface of a silicon chip, with a pressure diaphragm, whose thickness determines the pressure range. When a pressure difference acts on this chip, the diaphragm flexes, and the resistor values of the bridge alter in proportion to the delta P ( $\Delta P$ ). Plus and minus side of the sensor are separated from the external pressure by thin, sensitive stainless steel diaphragms, and the sealed off cavities are filled with oil. Since the standard oil filling is flammable, Bronkhorst advises to take precautions when oxygen or any other explosive fluid is used.



Functional scheme of the differential pressure sensor

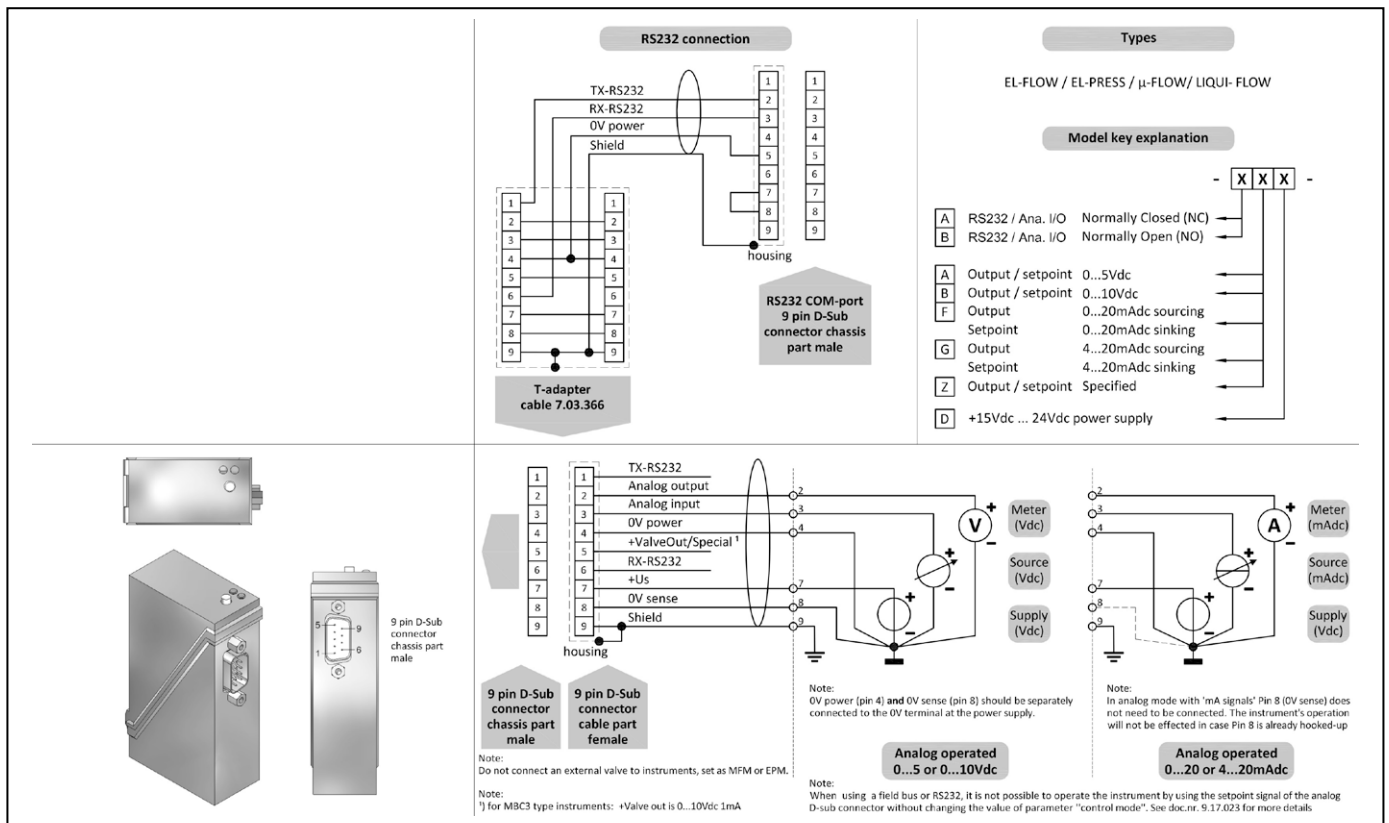
## > State of the art digital design

Today's EL-PRESS series are equipped with a diaphragm type piezoresistive pressure sensor and a digital pc-board, offering high accuracy, excellent temperature stability and fast response. The basic digital pc-board contains all of the general functions needed for measurement and control. In addition to the standard RS232 and RS485 output, the instruments also offer analog I/O. Furthermore, an optionally integrated interface board provides DeviceNet™, Profibus-DP®, Modbus-RTU or FLOW-BUS protocols via a separate connector.



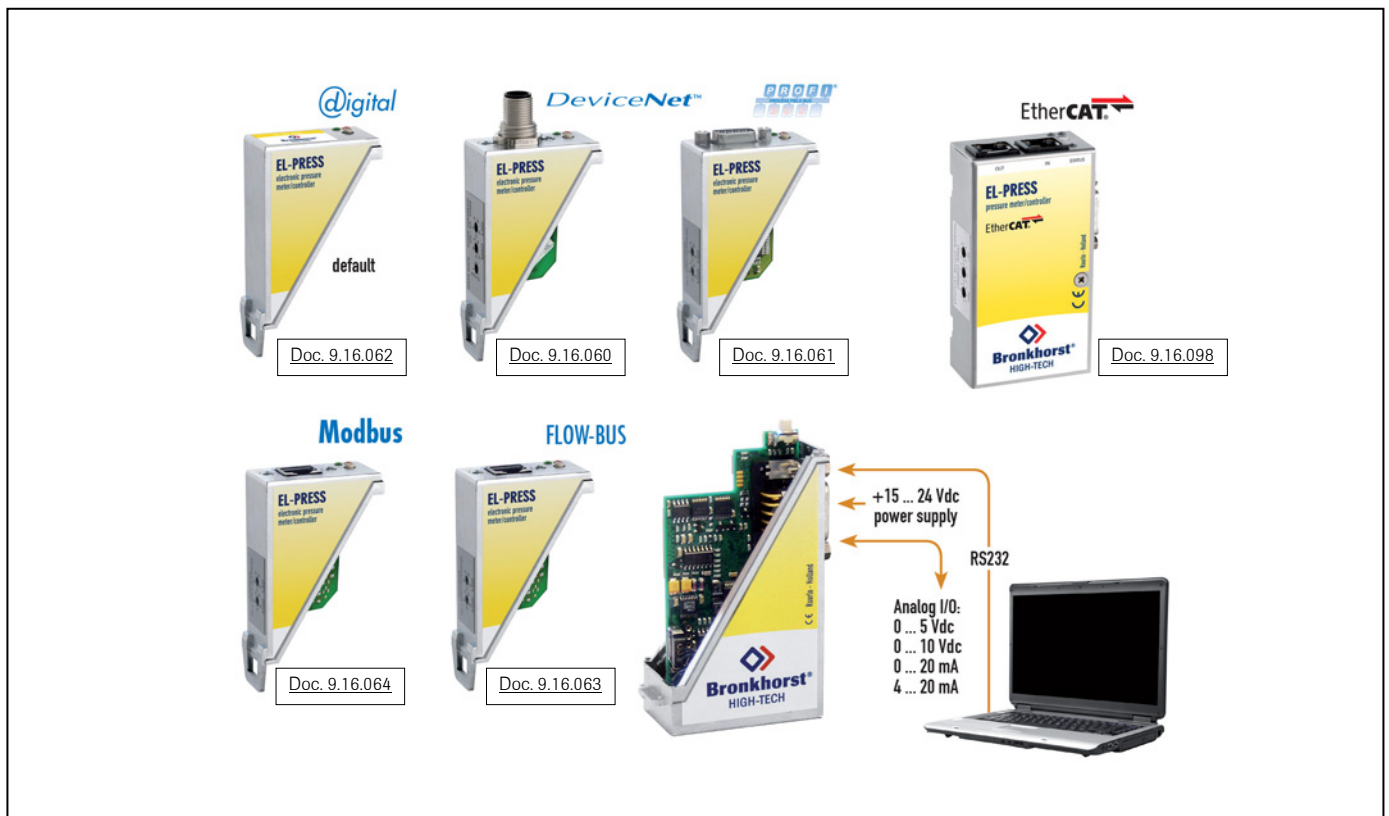
Functional scheme of the digital PC-board

## > Hook-up diagram for analog or RS232 communication

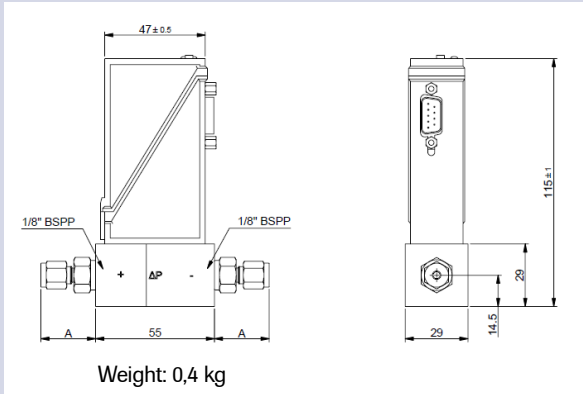


## > Hook-up diagrams for fieldbus communication

For the available fieldbus options we refer to the various hook-up diagrams as indicated below. If you are viewing this datasheet in digital format, you may use the hyperlink to each of the drawings. Otherwise please visit the download section on [www.bronkhorst.com](http://www.bronkhorst.com) or contact our local representatives.



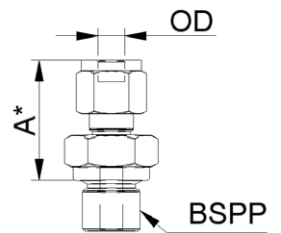
## > Dimensions (mm) and weight (kg)



Dimension table adapters (RS-type)



Compression type		1/4"BSPP	Size A
adapter	3 mm OD		26.1
adapter	6 mm OD		28.4
adapter	8 mm OD		29.4
adapter	10 mm OD		30.2
adapter	12 mm OD		32.5
adapter	1/8" OD		26.1
adapter	1/4" OD		28.4
adapter	3/8" OD		29.9
adapter	1/2" OD		32.7
Face-seal male			Size A
adapter	1/4" inlet		23.2

Compression type



\*) Dimension A is typical finger-tight.

## > Options and accessories

<ul style="list-style-type: none"> <li>- Free software support for operation, monitoring, optimizing or to interface between digital instruments and windows software.</li> </ul>	
<ul style="list-style-type: none"> <li>- BRIGHT compact local Readout/Control modules</li> <li>- E-5700 / E-7000 Power Supply</li> </ul>	
<ul style="list-style-type: none"> <li>- Interconnecting cables for power and analog/digital communication</li> </ul>	